

A close-up photograph of water ripples on a light blue surface, creating a textured, circular pattern that fills the top half of the page.

# FINDING CENTER LANDSCAPE+VALUES

Conference Abstracts

MARCH 28–31, 2012

**CELA Annual Meeting**  
University of Illinois at Urbana-Champaign

# **FINDING CENTER** LANDSCAPE+VALUES

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Conference Abstracts

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Department of Landscape Architecture  
University of Illinois at Urbana-Champaign

**Edited by**

Christopher D. Ellis, PhD, PLA  
University of Maryland

# **Finding Center: Landscape & Values**

## **CELA 2012**

Department of Landscape Architecture  
University of Illinois at Urbana-Champaign

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# Acknowledgments

## **Conference Host and Planning Committee: Department of Landscape Architecture, University of Illinois at Urbana-Champaign**

Conference Chair: M. Elen Deming

medeming@illinois.edu

Host Committee: Stephen Sears

ssears@illinois.edu

Host Committee: Amita Sinha

sinha2@illinois.edu

Grad Assistant: Caroline Wisler

wisler2@illinois.edu

## **CELA Conference Planning Committee:**

Terry Clements, Virginia Tech University

tclement@vt.edu

Christopher D. Ellis, University of Maryland

cdellis@umd.edu

Patrick Mooney, University of British Columbia

patrick.mooney@ubc.ca

Pat Taylor, University of Texas at Arlington

pdt@uta.edu

## **CELA Conference Staff:**

Dee Solco, Interim Business Manager

dsolco@uta.edu

## **Track Chairs:**

Landscape & Values (theme track)

M. Elen Deming

medeming@illinois.edu

Amita Sinha

sinha2@illinois.edu

Service Learning/Community Engagement

Paula Horrigan

phh3@cornell.edu

Cheryl Doble

csdoble@mailbox.syr.edu

Research and Methods

Byoung-Suk Kweon

kweonb@umd.edu

Kerry R. Brooks

kerrybrooks@wsu.edu

Urban Design

Madis Pihlak

mxp51@psu.edu

People-Environment Relationships

Lynne Manzo

lmanzo@u.washington.edu

Landscape Planning and Ecology

Charlene LeBleu

leblecm@auburn.edu

Communication and Visualization

Kevin Thompson

mail@spatialist.com

History, Theory and Culture

Elizabeth Brabec

ebrabec@larp.umass.edu

David Hopman

dhopman@uta.edu

Design Implementation

Margie Borecki

mborecki@hass.usu.edu

Daniel Roehr

roehrd@interchange.ubc.ca

Ming-Han Li

MingHan@tamu.edu

Sustainability

Will Green

wagre@uri.edu

Design Education and Pedagogy

Terry Clements

tclement@vt.edu

## **Abstract Reviewers:**

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## **Foreword—*Finding Center: Landscape & Values***

From our vantage in the middle of the great North American continent, the theme ***Finding Center*** is easily understood as a multiple entendre. First and foremost, centering is a relational metaphor implying spatial, visual and phenomenal geographies. It can suggest moral, political, social, and economic centers, or “heartland” themes. It captures the disciplinary sense of returning to core, to basics and fundamentals. Centering is also the place where we hope to find ourselves—to be centered means to be graceful, simple, and grounded.

With only a little effort, the conference theme can also imply a dialectic, a back-and-forth dynamic between a center and its opposite dimension—the frontier—and all that is marginal, peripheral, and innovative. “Center” may thus invoke the tensions between insiders and outsiders, between norms and deviations, and every sort of gradation to the edge. Depending on what it is possible to measure, we may find multiple centers, each having an impact on all the others. Centers shift as politics shift. Values that we find possible to tolerate or impossible to even imagine today, may shift tomorrow. The University itself is a type of center, a value-laden symbol of intellectual aspiration and community in a world that is rapidly changing. The theme challenges us to provide non-traditional social metrics for what we do, or to assess the values of pedagogy, research, service, and activism in higher education, yet may also accommodate time-honored and elemental values such as “health, safety, and welfare.”

With all this in mind, we hope to re-evaluate notions of what is “central” for higher education, for landscape architecture, and for the direction of contemporary life. Participants in CELA 2012 are welcome to address the range of gradations and values inherent in the conference theme in a broad or focused fashion. There are interesting implications for CELA in resetting the margins of our field, of our influence, of our interests—as well as resetting our goals at several scales, local, regional, national, and global. Whether from a central perspective looking out to the horizon, or from a more liminal perspective peering in, we hope this conference will generate a critical and imaginative focus on the broad range of values expressed in our respective curricula, as well as in our various fields of practice. Come and join the conversation.



# Landscape & Values

## The Interpreted Vineyard: Values in the Cultural Landscape of Wine

Jennifer Britton, Montana State University, USA, [jennifer.britton@montana.edu](mailto:jennifer.britton@montana.edu)

**Keywords:** Landscape interpretation, Cultural landscape, Landscape values, Viticulture, Wine, Napa Valley, Social constructivism, Hermeneutics, Environmental aesthetics, Semiotics.

Shaping landscapes for millennia, viticulture evokes a unique iconology of alluring idyllic scenes. Yet as an agricultural crop, grape cultivation's realities sharply contrast with its romantic image. To promote a deeper understanding of our relationship with this environment, for the benefit of sustainable practices and placemaking in design and planning, The Interpreted Vineyard reveals culturally perceived value marked on the viticultural landscape. Based in social constructivism with an emphasis on hermeneutical verisimilitude this qualitative case study interprets significations in the wine landscape through historical review, aesthetic description and semiotic analysis.

As significant places of cultural heritage wine landscapes represent unique sources of life and inspiration. In a little over a decade The United Nations Educational, Scientific and Cultural Organization (UNESCO) has inscribed eight European viticultural landscapes as World Heritage Cultural Sites. UNESCO's election criterion describes these landscapes as places significant for interchanges of human values, illustrating development in human history, and representative of cultural interaction with the environment. Yet despite palpable global recognition little research critically interprets viticulture's cultural landscape. By leaving unexplored why we appreciate these unique places we overlook salient factors in understanding the bond between people and place.

Seen through a social, political and economic context viticulture represents society's mediation between an ideal and necessity. The wine landscape embodies hedonistic pleasure, mythical paradise, and social power; this ideological worth displaces undesirable realities of globalization, labor, and environmental destruction. Implied and explicit qualities create a place with enduring value and serve as design and planning cues to incorporate a culture's physical, emotional, and intellectual desires. Utilizing this triptych may imbue a place with such worth as to perpetuate an ideal and create a landscape beyond temporary alteration.

## Phenomenology Influences to Landscape Values

Dan Chen, University of Florida, USA, danchen222@ufl.edu

**Keywords:** Phenomenology, Landscape values, Reduction

Recently, phenomenology has had a significant influence on architecture—specifically when one talks with the relationship of people, buildings, and the environment. Also, phenomenology influences landscape values in drawing people return to the basic requirement in landscape architecture. In order to illustrate how phenomenology works with landscape values, this paper will use the interpretive-historical method and case studies. The Interpretive-historical method is used to study the transition of certain phenomenological ideas into landscape values. Husserl's (1964) idea of using description to analyze everything objectively and encouraging imagination draws people back to essence. Heidegger (1951) proposes that being, reduction and dwelling can be translated into site-spirit in landscape and also direct people back to the center of the spirit that back to themselves. Meanwhile, Merleau-Ponty (1962), arguing that body and subject cannot be separated, focuses on human perception and experience, which can be seen as the basic foundation of space experience analysis. Tuan (1974) uses a descriptive approach in analyzing how humans experience site, space and environment. Human experience, in this view, involves developing a love of the land and the centering of the spirit. Norberg Schulz (1980) argues that orientation and identification are important when experiencing an environment, while, Holl (1995) relying on Merleau-Ponty's perceptual phenomenology discusses the relationship of perception, experience and design. Also, Bachelard (1969) illustrates the symbolic meaning of space, buildings and environment showing a value of return. Philosophers and architects alike, try to determine the relationship between phenomenology and building environment. By studying their writings one can see how they have influenced landscape values. Furthermore, case studies can be used to study how landscape theory develops with phenomenology. For example, Halprin's love joy fountain shows how to replicate nature in an urban setting and integrate experience into design process, which is tied to reduction and perceptual phenomenology. Maya Lin's Veteran's Memorial, by emphasizing site-spirit and human experience, also represents the reduction idea. Blodel reserve, designed by Richard Haag, uses a combination of phenomenology and Taoism to show landscape values as finding the center in human's heart. Finally, the paper concludes that phenomenology helps people to reduction, back to their central world, find the importance of site spirit; landscape values are influenced from visual oriented to experience oriented; description as a phenomenological method can be applied into landscape design. Landscape design is not only a technique but also a combination of art, spirit and experience.



## SLUM Lab— Sustainable Living Urban Model

**Denise Hoffman Brandt**, The City College of New York, USA, hoffmanbrandt@nyc.rr.com

**Julia Farr, Kjirsten Alexander, Jing Fan, Brian Geraghty**, The City College of New York, USA

**Keywords:** human rights, global ecosystems, landscape pedagogy, infrastructure

In Spring 2011 The City College of New York's (CCNY) Masters in Landscape Architecture Program joined with ETH Zurich's Urban Design Program and Columbia University's Graduate School of Architecture and Planning in running studio "labs" exploring the confluence of economic and environmental forces shaping contemporary urbanism in many sites around the globe. 'Slum' is used not as a derogatory term, but in reference to positive, opportunistic, urban tactics, often associated with favela settlement, that can be redeployed to generate more socially and environmentally sustaining cities.

Student projects examining real-world sites were edited, and interwoven with contributions from an array of international architects, landscape architects and urban designers in the third issue of SLUM Lab magazine: Last Round Ecology. The issue was co-edited by the Directors of ETH Zurich's Urban Design Program and the Director of The CCNY Landscape Architecture Program.

Five projects from The CCNY Landscape Lab will be presented.

**Plot Design:** Mapping the amplitude and frequency of environmental hazard, with anticipated alteration to the cycles due to climate change, projects a diverse contextual field for human settlement material and structuring. This field was juxtaposed with evidence of increasingly homogenous built urban conditions. This project, a contribution to the publication by the instructor, framed the approach to the student work.

**Communications Breakdown:** Designers must represent urban ecologies with complexity and to hit the public in the gut in order to provoke cultural change. In this project, the complex industrial-web of small electronic production, consumption and disposal is laid out to simultaneously present global electronic waste-stream networks and the ground-level landscapes they stimulate. **Haiti Waste-works:** Haiti's slum denizens develop revenue streams out of what other societies would consider waste material. That informal economy provides 'regular' employment, for many people outside the mainstream workforce. A landscape to accommodate feedback loops for waste recycling and clean energy production in an industrial slum in Port au Prince was devised.

**New West: Shrinking Vegas:** The burst housing bubble has abruptly reined in much of the building frenzy leaving places like Henderson, NV in development whiplash. This project suggests an approach to shrinking Vegas that account for water scarcity and use hydrologic flows as a factor in 'un-building' a sprawl city.

**Dead End to Open Ended:** Examines the impacts of the physical components of the U.S.-Mexico border on habitat, economic, social and environmental systems and suggests reexamining the permeability of border structures to accommodate necessary crossers.

## Designations

**Michael A. King**, City College of New York, USA, michael\_king10@yahoo.com

**Keywords:** Design, Literature, Emerson, Olmsted, Whitman, Civic Identity, Democracy, Naturalism

Design is a form of thinking, which is another way of saying that it is a language. From this, landscape architecture, which is a form of design, can be thought of as a language and its history a form of literature. Taking these statements as axioms, we can consider design as literature: the very act of designating or denominating space over time. More specifically, we can view landscape architecture as sharing an affinity with American literature.

Under the influence of Ralph Waldo Emerson, American writers were charged with the task of “giving a sense of place.” It is the same task that landscape architects are called upon to perform—to understand the unique topographical and social characteristics of a site and to design in such a way that the site becomes a place. From this, we might deem landscape architecture and American literature to be two sides of the same coin.

The voices arising from the land in the 19th Century avowed democracy and naturalism. Frederick Law Olmsted and Walt Whitman are paradigmatic examples who sought the renewal and restoration of civic space and American identity. With Emerson, Olmsted and Whitman in mind, a sense of landscape architecture’s strong connection to the literature of the United States can be developed and we can begin to revalue landscape architects to be as fundamental to civic identity as poets.

## Valuable Brownfields: Evolving Concepts to Postindustrial Landscapes in North America and Europe

**Wolfram Hoefler**, Rutgers, The State University of New Jersey, USA,  
whoefer@sebs.rutgers.edu

**Vera Vicenzotti**, Newcastle University, United Kingdom, vicenzotti@gmx.de

**Keywords:** Cultural values, postindustrial landscapes, new vernacular

Cultural values impact our approaches to the land. This paper investigates how evolving concepts on the adaptive re-use of brownfields may have an impact on landscape values.

After centuries of industrialization, the adaptive re-use of brownfields is a major topic for landscape architecture and landscape planning worldwide. Brownfields show great similarities internationally, because industrial production was primarily shaped by economic values and technologies that were not related to local population or the characteristics of a region. By way of a comparative literature review between the United States and Europe, this presentation brings to the fore the ways in which the discourses on postindustrial landscapes differ considerably in different cultural contexts. Although the challenges of brownfields are similar, the perception and definition of the problems at hand—the ‘facts’—are culturally determined.

It has been shown in numerous studies how the ideas of ‘landscape’ in Europe and Germany differ from those in the United States. While the diversity within American as well as European cultural heritage makes it difficult to speak of a general ‘American’, ‘European’ or ‘German’ approach, we can identify some general patterns concerning the popular conceptions of designed (and not-designed) landscape. Those patterns reflect sets of values that are at times in conflict, but refer in general to the common narrative of the US as an immigrant nation (landscape as a presumably virgin land that needs to be conquered) and are thus distinctively different from the European cultural heritage—where landscape is most commonly read as a homeland inherited from the ancestors, demanding stewardship.

Thus a critical understanding of the cultural context allows a certain freedom from traditional and long-established perspectives. Building on the thesis that the different value systems and approaches toward postindustrial sites are a consequence of historically diverse concepts of ‘landscape,’ we investigate conceptual changes and paradigm shifts in both discourses. Since one can observe the evolution of a new vernacular character in postindustrial landscapes on both sides of the Atlantic, this contribution poses the question whether this development leads to a congruence of the different concepts of landscape in North America and Europe.

These evolving concepts consider brownfields no longer as nuisances but as potential elements of the public realm, as meaningful postindustrial landscapes. This outcome contributes to the ongoing development of landscape theory and may provide insights into the interdependence between economic development, use of the space and the cultural meaning of landscape.

## Publishing Landscape Architectural Textbooks: Exploring Its Thrills and Challenges in the Digital Age

**Norman Booth**, The Ohio State University, USA, booth.2@osu.edu

**Meg Calkins**, Ball State University, USA, calkins@bsu.edu

**Margaret Cummins**, John Wiley and Sons, USA, mcummins@wiley.com

**Chip Sullivan**, UC Berkeley, USA, csully4@yahoo.com

**Keywords:** publication, textbook, core knowledge, evolving technology

Rationale: The writing and illustrating of textbooks is one means of documenting and communicating core knowledge in landscape architecture. While writing and using textbooks is integral to the academic setting, it is not always clear what it takes to write, illustrate, and market such books. In addition, conventional avenues of publication are giving way to evolving forms of disseminating knowledge, further complicating an already challenging undertaking.

Consequently, the purpose of this panel is to:

- discuss what it takes to successfully publish a landscape architectural textbook.
- explore how technology is affecting the process of writing, illustrating, and publishing textbooks (fulfilling the conference theme regarding the dynamic between core and transforming values)

Learning Objectives: At the end of the session, an attendee should:

- understand the process for getting a textbook published in the discipline
- be informed about the desired qualities of a textbook project sought by a publisher
- appreciate the intellectual, physical, and time demands for producing a manuscript
- be conscious of various techniques and tricks used by authors to write and illustrate a book • understand the expectations of an author after completing a manuscript
- be aware of the affect of technology on present-day and future publishing

Format: Each member of the panel will make a ten-minute presentation followed by an open discussion with members of the audience. Author presentations will explore: Inspiration for a textbook; process for getting a textbook written, illustrated, and published; the reality of writing and illustrating a book; balancing book writing with other academic obligations; tricks and recommended guidelines; expectations of an author after submitting a manuscript; and opportunities and limitations afforded by technology. Editor presentation will explore: Desired qualities of a book project sought by a publisher; what a publisher needs from an author in order to accept a book proposal; current trends in landscape architecture textbooks; and influence of technology on the publication of textbooks.

## **Border Crossings: Indigeneity, exoticism and value in public open space design**

**Rod Barnett**, Auburn University, USA, rod.barnett@auburn.edu

**Keywords:** public space design, indigeneity, exoticism, boundaries, values

As we construct an increasingly human planet, questions arise about how the evolving relationships between human and nonhuman species are negotiated in landscape architecture. The project described in this paper explores the complexity of environmental attitudes and values by means of design within the edge condition that humans have created between themselves and other species. It suggests that awareness of this ambivalent condition should not lead to simplification or detachment, but may be viewed as a source of renewed efforts of revaluation, particularly in the light of the mass population movements that are occurring across the globe today.

A series of public open space interventions in Auburn, Alabama explores the fate of three dislocated 'species': Creek Indians, kudzu vine and urban coyotes. Motivated by ideas of migration, displacement, and boundary-making, the project investigates the movement of species through different terrains, asking questions about indigeneity and exoticism.

Coyotes entered Alabama after the native wolf population had been completely eliminated, by drifting westwards and adapting to new ecological niches. There are approximately 600 urban coyotes (*Canis canis*) in Lee County, Alabama. These animals have adapted well to the urban environment but Auburn City employs pest eradicators to cull coyotes when they become too visible. Another migrant, kudzu, the 'wonder vine', (*Pueraria montana* var. *lobata*) was introduced early in the 20th century and is now invasive species number one, finding a particularly amenable habitat along highways where it can be seen smothering tall trees and is cursed by travelers. Auburn University's Forestry and Wildlife Department has spent forty years researching an effective pesticide but so far to no avail. For many centuries Central Alabama was home to Creek Indians, who moved along the rivers and fed off the plentiful wildlife that gathered there. After the Indian Removal in the 1830s, only a few families remained. An 1832 map of Lee County shows an abundance of Indian settlements and their names, but the physical record of their long duree has been all but obliterated.

The design research program that this paper describes has been devised to investigate the way that populations negotiate cultural and physical boundaries, and to catalyze the potential transformation of inherited values that these negotiations provoke. The proposed interventions are explained and reactions to them reviewed. Inevitably, emotive and value-laden concepts of place, purity and contamination come to the fore.

## Movements in [Semi]Urban Landscapes: A Case Study of Ludlam Trail in Miami Florida

**Christopher Cabezas**, Florida International University, USA, ccabe003@fiu.edu

**Ebru Ozer**, Florida International University, USA, eozer@fiu.edu

**Keywords:** greenways, urban trails, semi-urban, context, open space

Urban sprawl and unmanaged suburban growth in many cities has led to a dissection of the environment and a decrease in quality of life. Today, less than 13% of children walk or bike to school, as opposed to 50% in the 1960's (United States Department of Health and Human Services, 2004). According to the 2001 National Household Travel Survey, nearly half of all trips are less than three miles and twenty-eight percent are less than one mile (FHWA, 2006, p.4). In response to this trend, linear open spaces such as greenways have come to the forefront of city planning. Research has shown that providing these multi-functional routes improve transportation, social equity, the environment, energy consumption, climate and most importantly public health (Shafer, 2000, p.164).

Former railroad paths offer opportunities to apply these measures in moderately dense semi-urban landscapes to fulfill local community needs. In Miami, Florida, such a space exists as a six-mile former railroad corridor called Ludlam Trail. This paper presents a landscape design approach that seeks to mitigate the effects of a sprawling city and provide avenues of community enhancement through the transformation of Ludlam to a greenway trail.

This unused tract of land cuts through mixed-use neighborhoods of West Miami, Coral Terrace, South Miami, and Kendall, and borders multiple parks, schools, and businesses within a half-mile. Analysis of the surrounding conditions reveal four community-shaping typologies: Residential, Educational, Recreational, and Commercial. The proposal connects these adjacent community classifications with zone-based interventions interspersed with strategic placement of educational and sustainable installations aimed at expanding the health and vibrancy of the area. This paper investigates and theorizes that in creating multi-functional zones with specific goals along Ludlam Trail, a transit hierarchy can facilitate levels of movement and stillness that are essential for the health of the community and its residents.

## **Valuing the In-Between—Recovering Post-Industrial and Post-Disaster Landscapes**

**Joern Langhorst**, University of Colorado Denver, USA, joern.langhorst@ucdenver.edu

**Keywords:** Post-industrial / post-disaster landscapes, landscape recovery, landscape urbanism, cultural landscapes, ethics, aesthetics

The increasing number of post-disaster and post-industrial landscapes, continually created by rapid economic shifts or natural and man-made disasters emphasize the need for the field, discipline and profession of landscape architecture to develop meaningful responses. Based on the author's ongoing involvement in the recovery of post-Katrina New Orleans, superfund mining sites in the Rocky Mountains, and abandoned industrial sites in Detroit and the Ruhrgebiet area in Germany, this paper investigates the relationship between pragmatic-functional and aesthetic considerations on the one, and ethical demands on the other side.

The recovery of such landscapes, characterized by often traumatic and frequently rapid change, is operating in complex, multivalent, highly dynamic and contested contexts. In response, spatial design and planning disciplines are re-engaging landscape as a cultural construct, a medium of diverse imaginations and realities, critiquing the nature/culture dichotomy, and emphasizing the performative and processual aspects of landscape. Consequentially they become increasingly critical of design and planning responses that are considered static and formalistic. Recent contributions to the (mostly theoretical) discourse suggest "to engage complex ecologies of urban phenomena, to achieve sustainability and to advocate for social and environmental justice" (Mostafavi 2010).

By investigating actual practices engaging post-disaster and post-industrial conditions, three issues can be identified:

- projects emphasize either functional and programmatic (ecological, economic and social) concerns, or prioritize aesthetic qualities,
- projects are frequently ignoring hidden political and hegemonial agendas, and become inadvertently complicit in perpetuating acts of exclusion and injustice, and
- projects are still rooted in picturesque aesthetics and ideologies that tend to naturalize and inscribe power relationships.

Most projects in post-industrial / post-disaster conditions locate themselves in the discourses on "landscape urbanism" or "ecological urbanism", but a) fail to critically and openly engage the underlying interests and values, and b) hide behind a general and generic concept of landscape as both product and agency of cultural change, as "metaphor for inclusive multiplicity that allows (...) differences to play themselves out" (Corner 1999).

This paper suggests an alternative framework, rooted in the identification and open engagement of underlying values as a critical basis for a discursive, context-responsive, ethical and aesthetical discipline. The focus on critical values has the potential to change the discourse on intentional landscape change, and invites previously excluded interests, protagonists and communities to participate in the design and planning processes that affect the places and landscapes they occupy.

## Landscape Observatory: Regionalism in the Work of Terry Harkness

**Molly Briggs**, University of Illinois at Urbana Champaign, USA, mbriggs@illinois.edu

**M. Elen Deming**, University of Illinois at Urbana Champaign, USA, medeming@illinois.edu

**Keywords:** design research, phenomenology, pedagogy, midwest, regionalism

As sustainability in design continues to gain momentum, interest in regionalist design persists in a variety of ways. Since the early 1970s, Terence G. Harkness's design speculations, built work, and teaching have exhibited a critical regional design sensibility, incorporating exquisite awareness of local phenomena and place-based processes. By "critical regionalism," we refer to Kenneth Frampton's (1983) idea of an analytical, poetic, and material resistance to generic, mechanistic, and universalizing expression in design. This study reviews and contextualizes Harkness's work within the trajectory of critical regionalist thinking in landscape design and pedagogy.

Harkness, now Professor Emeritus at University of Illinois, is known best for iconic Midwestern projects such as An East Central Illinois Garden (Van Valkenburgh 1988), and Foothill Mountain Observatory, which reflects a regionalist sensibility for California (Brown et al. 1998). Harkness's collaborative work for the Great Plains Software headquarters in Fargo, South Dakota, translates his regional analysis into built form. Harkness's long-term teaching career runs parallel to these projects, integrating technical subjects (e.g. plant materials, construction, irrigation, grading, etc.) with his clear understanding of place and region. Harkness uses the metaphor of landscape observatory to explain this didactic overlap:

*"Landscape observatories provide a lens, an experiential window onto our past and present ... designed to focus the observation and experience of natural and cultural processes at local, community scales—water and flood, erosion, seasonal drought on the one hand, and human labor and industry, harvest and wealth, misuse and care on the other."*  
(Harkness 2000)

Avoiding the false dichotomies of nature and culture, Harkness's unique grasp of the interdependency between landscape form and cultural process imprinted a generation of students moving into professional ranks from the late 1970s to the first decade of the 21st century, and brought fresh awareness of geographical factors into the field. New analysis of Harkness's built works, unbuilt plans, published essays, lecture notes, design competitions, syllabi, lessons, diagrams, photography, and depth interviews provide the audience with a rich basis for understanding his integrated approach to design, research, and pedagogy. An exhibition of selected plans and models from Harkness's projects is planned to run concurrently with the conference.

Revisiting Harkness's approach to critical regionalism affords new opportunities to reflect on the current state of professional education now caught between the paradigms of globalism and technological virtuosity. It helps us mediate contemporary interests in contingency while also maintaining crisp, sensitive formal interpretations of place and region.



## **The Role of Landscape Architecture in Cultivating the Agricultural Landscape in New Jersey**

**Holly Grace Nelson**, Rutgers, USA, hgrace@rci.rutgers.edu

**JeanMarie Hartman**, Rutgers, USA, jhartman@rci.rutgers.edu

**Keywords:** agriculture, landscape, landscape architecture, stewardship

What are the appropriate roles related to agriculture for landscape architects at Land Grant Universities? This paper broadens the answer to the question posed by Laura L. Jackson (2008), presenting a study undertaken in conjunction with studio projects and an undergraduate colloquium taught within the context of a Land Grant University. The state of agriculture in New Jersey is poised for change. Niche farming trends have positive potential in terms of various issues, including food justice, food security, and ecosystem services/stewardship. Our examination of the relationships between landscape structure and landscape use on New Jersey farms led to an improved understanding of the value of agricultural landscapes to society and to stewardship of the earth. Additionally, we reviewed design literature concerning agriculture to document current design work in this landscape type.

The profession of landscape architecture has not fully engaged the design of the agricultural landscape. Two broad roles for landscape architects become clear: spatial design of farm spaces for public interaction and improved agricultural literacy; and design for ecosystems services. The New Jersey agricultural landscape reflects patterns for cultivating and harvesting, as well as ownership patterns, economic realities, and traditions. Traditional patterns reflected little attention to social space beyond the homestead; most visual amenities were inadvertent consequences of the fitting of landform to cultivation. Now, agricultural landscapes are used by the public with new intensity in old and new formats: roadside stands; farm retail markets; CSAs; farm educational facilities; agritourism; etc. Public events/festivals draw people to buy directly from the farmer while more directly connecting the public to their food production source.

How does a particular farm fit into the openspace mosaic? Farms could provide ecosystem services to benefit the region; private land can contribute to public health and wellbeing (Steiner, 2009). Agriculture, representing over 50% of privately-held land in the continental U.S., becomes an important tool in improving the environment; clearly, how we farm matters. For landscape architects to effectively address the complex processes that form agricultural landscapes, we must increase our agricultural literacy and bring this new level of understanding to students, colleagues, and clients. The importance of this work relates to the goals of (1) defining, documenting, measuring ecological processes in landscapes and (2) increasing agricultural literacy in order to provide support for programs in land stewardship and food security. The enhancement of agricultural literacy within the academic landscape architecture community is an important starting point.

## Designing landscape experiences: Exploring ‘soft’ solutions in a national park in Aotearoa New Zealand

**Mick Abbott**, University of Otago, New Zealand, mick.abbott@otago.ac.nz

**Keywords:** landscape phenomenology; ‘soft’ design

A renewed emphasis on phenomenological understandings of landscape in the fields of social geography and anthropology potentially expand the scope of landscape design and the form of the discipline’s productions (Ingold, 2011; Ingold 2000; Thrift, 2006; Wylie 2007). Such theoretical work foregrounds the experience and engagement of landscape, and suggests potentials for designs that shape people’s interactions with landscape, without the need to modify specific sites (Abbott, 2011). These possibilities become increasingly beneficial given the value of creating greater connections with landscapes while also fostering an ethic of treading lightly on the land.

In this research one of the 14 national parks in Aotearoa New Zealand—Arthur’s Pass National Park—is used as an experimental context for landscape-centric interventions that prompt a shift in experiences member of the public have there. Three specific design projects that apply Ingold’s articulation of landscape’s temporality, and in particular the manner in which activities are a generator of landscape quality, are examined. These are: Author’s Pass Walk in which current structures become the location for elements that engage walkers with the cultural associations people have had with the park; Scavenger Hunt iApp in which groups of walkers are prompted to search out various fauna, flora, sites and experiences, and upon completion can download a tailored map that documents their experience over both space and time; Twig Stove in which users are prompted to seek out from the forest floor twigs to fuel a wood-based gasification cooker as the means to have a more intimate and—when compared to fossil fuels—more sustainable interaction (and making) of place.

Preliminary evaluations of the Author’s Pass and Scavenger Hunt iApp demonstrate these to be valuable tools in terms of encouraging new users to take ‘first steps’ into a national park environment, while the twig cooker can be considered a means for moderately experienced overnight hikers to deepen their interactions with the park while exploring ethical issues related to protected areas. Also, these studies suggest opportunities for wider application and evaluation in other national parks in Aotearoa New Zealand. With their emphasis on layering interactions, augmenting reality and the haptic, they also indicate significant scope for the field of landscape design to support ‘softer’ design interventions that modify experiences of place and landscape, without a necessary requirement to physically shape the site itself.

## **Toward Ecological Sovereignty: The Role of Sustainability Activism in Higher Education**

**Kyle Brown**, Cal Poly Pomona University, USA, [kdbrown@csupomona.edu](mailto:kdbrown@csupomona.edu)

**Keywords:** community engagement, sovereignty, marginalized communities, sustainability

As marginalized communities gain interest in environmental sustainability, they are often aided by faculty, staff and students from institutions of higher education, through community engagement projects typically focused on providing technical assistance. These projects may work to address one or more environmental or social concern, but they often fail to adequately recognize power relationships within society which inevitably shape the future of such marginalized communities. While well-intentioned, these efforts may result in primarily serving the desires of those providing the service (Guthman, 2008), or in a form of false generosity, whereby privileged classes seek to relieve the suffering of the oppressed, without addressing their own privilege as root causes of the oppression (Freire, 1970).

Some marginalized communities have realized they cannot rely on traditional institutions such as the free market, governmental, or even aid organizations, to chart sustainable futures. They are exploring strategies to increase their own control over resources and systems critical to their sustainability, including food, water, energy, and other ecological resources—a process of ecological sovereignty. Community engagement activities by institutions of higher education can aid in this process, but they require an approach that moves beyond technical assistance, instills critical social consciousness in student activists and community participants alike, and empowers locals to plan and act for themselves. Previous literature in the landscape architecture discourse has offered possible frameworks for just such an approach (Brown & Jennings, 2003; Juarez & Brown, 2008; Thering & Chantse, 2011).

This paper reflects on case studies of community engagement in Southern California and Mexico to uncover central questions about supporting ecological sovereignty in community engagement activities and their implications for landscape architecture. Experiences have revealed that while systems analyses have identified new opportunities for advancing sustainability within the case study communities, challenges of limited critical social consciousness among students, difficulties of effective access to diverse communities, and difficulties empowering local leaders persist. These opportunities and challenges suggest important questions concerning the focus of landscape architecture education, the scope of community engagement activities, and the emphasis of discourse on environmental sustainability.

## Schools at the edge: High school landscapes on the fringe

**William Sullivan**, University of Illinois at Urbana-Champaign, USA, wcsulliv@illinois.edu

**Keywords:** High school landscapes, rural-urban fringe

In the last few decades, there has been a dramatic shift in the location of high schools in North America. Whereas almost all high schools more than 50 years old are located in urban and suburban areas, almost all newer high schools (those less than 30 years old) are located at the rural-urban fringe or in rural areas. That is, we used to build high schools that were embedded in neighborhoods, but today we build high schools at the edge of the community.

What changes have conspired to create this shift? Why do we see this pattern in schools from Grayland, Washington to Horseshoe, Florida? In this paper, I examine these questions by exploring the ways in which preferences, accreditation standards, land prices, and the quest for economic efficiency have contributed in the last fifty years to a desire for larger and larger plots of land upon which to build high schools. The result is not only a change during that period in the landscapes of individual public high schools across the United States, but also of the neighborhoods in which they are or used to be located.

For many school districts seeking to build a new high school, the rural-urban fringe offers the attractive combination of large tracts of land and affordable land prices. Recently, however, as farmland prices have increased to record high levels, the trend may be shifting back to building more neighborhood-based schools.

This shifting pattern has enormous consequences for the built environments of cities, small towns, and rural communities—consequences that are not merely aesthetic. The change in public high school design has significant implications for high school students and their families. I end this paper with a review of the social costs and benefits to students and families of attending a large school at the edge of a community.

## **Landscape as social construct: Seen through documentary photographs**

**Sungkyung Lee**, University of Georgia, USA, sklee@uga.edu

**Keywords:** social construction of space, South Korean market landscape, documentary photography

This paper emphasizes the significance of social and cultural factors in the contemporary urban landscape context. It proposes that analyzing human experience, everyday use, spatial appropriation, and other human dimensions provides a critical standpoint in understanding the impact of modernization and urbanization on landscapes. Using Jagalchi Fish Market in Busan, South Korea as a case study, this project investigates the market landscape and its cultural landscape values formed by human improvisation. Further, it analyzes changes made to the physical landscape and use of the market by recent market modernization using documentary photography, interviews with the photographer, and ethnography. As one of the oldest traditional markets formed during the Korean War (1950-53), the site is a nationally significant cultural landmark. However, its old and dilapidated facilities have promoted a call for renovation and the traditional market landscape based on outdoor streets is being replaced by compartmentalized stores within multi-story modern buildings. This research argues that on-going market modernization may have improved its overall physical condition but has altered everyday landscape practices and the use of the space, thus the market's authentic cultural landscape values.

Documentary photographs taken by Mink-shik Choi are analyzed to illustrate market landscape changes from a vantage point of marketers and everyday landscape practices. The market has been his life-long photographic subject over the past fifty years and his work captures vivid life scenes of marketers. Landscape representations and visual contents are analyzed to identify story-telling images of people, events, and everyday landscape practices. Interviews with the photographer, his autobiographical essays, and ethnography conducted on site by the author provide further information on how market modernization has altered unique social dynamics and everyday landscape practices of marketers. Based on the findings from the analyses, the traditional market landscape and newly emerging modern market space are represented as two different social landscape constructions in which the sense of place is defined by distinctively different relationships between people and the landscape. Unlike the modernized market building designed and constructed intentionally by planners, the traditional market street is formed and maintained voluntarily by the working class. Depicting the traditional market as a center place of the working class, this research recognizes cultural landscape values undermined by market modernization process and characterizes the traditional Jagalchi Fish Market as a unique gendered space maintained and operated by female fishmongers and vendors.

## Exploring the Values of Place Through the Digital Essay

**Austin Allen**, Louisiana State University, USA, Austin.allen811@gmail.com

**Susan Gunn**, University of Colorado, USA, susan.gunn@colorado.edu

**Keywords:** Values, pedagogy, cinema, film, video

Given the inherent distance between designer, landscape and community perpetuated by traditional forms of representation (1) and a difficulty in recording and characterizing the dynamic processes of place and site (2, 3), there is a recognized need for a more inclusive and comprehensive discourse on landscape. Some have turned to film and, more recently, digital video to address the rich complexity of landscape and site: the former for its ability to represent culturally derived ideas about place and the latter for its democratic accessibility and creative expressive potential. Marc Trieb wrote that “In the age of mechanical reproduction, the photographic image (and its sister the cinematic image) dominate and coerce how we perceive and live.” (4) While planning scholars have made a case for using films in the classroom to discuss the political and social implications of intervention (5,6,7,8), others have argued that video is an appropriate tool to represent evolving urbanity. (9) Landscape scholars such as Kenneth Helphand have advocated for the study of cinema in landscape architecture. (10, 11, 12) However, despite its potential to represent and engage design interventions, the medium has been relatively underutilized. (13)

The Digital Essay, a discursive process used to explore temporal and spatial meaning of place through the medium of a cinematic montage, has the potential to re-present landscape experiences and reveal underlying cultural values. The Digital Essay arranges acquired and appropriated images and sound into the narrative sequence of a short film using non-linear editing tools, building upon the tradition of the Essay Film, a searching hybrid of narrative, documentary and experimental filmmaking referred to by filmmaker Jean-Luc Godard as “research in the form of the spectacle.” (14) It is also inspired by what Edward S. Small calls Direct Theory, a theoretical understanding of production that promotes films as primary texts. (15) In landscape investigation it may be used to survey nodes, paths, boundaries, landmarks, rhythm, improvisation and scale; explore representation and meaning around the phenomenological and cultural aspects of place; and develop a coherent lexicon and syntax through active collaboration with icon, symbol and metaphor. As both process and product, the Digital Essay invites further dialogue in both the theory and practice of landscape planning and design. This presentation will provide examples of Digital Essays that address landscape architecture concerns as well as the means for educators to engage student work and scholarly research around salient issues in our discipline.

## **Awareness, Understanding and Value: Building Better Campus Experiences through Strategic Partnerships**

**Andrew Fox**, North Carolina State University, USA, [andrew\\_fox@ncsu.edu](mailto:andrew_fox@ncsu.edu)

**Keywords:** Engagement, Education, Service Learning, Design-Build, Campus Design

How are individuals and organizations that are unfamiliar with the technicalities of design, construction, and maintenance processes supposed to truly understand and value the holistic systems required to both develop and maintain sustainable sites? An inclusive, participatory approach to the design-construction cycle offers one solution. The experiences accrued through hands-on participation offer rich lessons for educators, students, and the lay public alike. A community-based, hands-on approach helps synthesize beneficial relationships and promote innovation that exceed standard solutions by integrating creative, technical, financial, and managerial aspects into a framework of engagement and education.

The strategic partnerships fostered through a proactive, participatory development model produce economical, innovative, engaging, and resilient public landscapes because their integrated assemblies nurture cooperation and collaboration, embrace localized environmental processes, and celebrate the profound connections between our social and physical environs. Deep contextual understanding helps foster healthy relationships and personal growth; individuals participating in community development projects are required to draw on myriad intra- and inter-personal skills, including empathy, sincerity, judiciousness, peer-to-peer communication, compromise, and conflict resolution. Hands-on learning also allows participants to transform fragmented knowledge of individualized components into a unified understanding of the fundamental whole. Ultimately, the integration of design, learning, and engagement processes culminate in a community-scaled sense of ownership. Once vested, this larger, more diversified collection of “owners” is better able to actively maintain and sustain (re)developed civic spaces through communal use, enthusiasm, and pride. The process of training environmental design students through direct(ed) exposure to real-world situations thus becomes paramount, and the importance of service learning readily apparent.

This presentation will describe an integrated design methodology that fuses practice, policy, place, and participation to achieve environmentally and socially responsive solutions within university campus environments. The presentation will describe the ways in which these principles are currently guiding the development of a creative partnership between the Department of Landscape Architecture and University Housing at North Carolina State University. The discussion will reference a variety of planning, design, teaching, construction, and research methods that are being used to effectively engage the campus community in the design and construction of communal spaces, and highlight the ways in which student learners have been thrust into these dynamic processes. In total, the presentation will illustrate how various models of programming, policy, participation, and interdisciplinary design, education, and research can centralize student, faculty, and campus development agendas, while also transforming dysfunctional landscape spaces into viable campus places.

## Connections between design and land use planning: Learning from Pershing Square, Los Angeles

**Lanbin Ren**, University of Oregon, USA, lren@uoregon.edu

**Mark Gillem**, University of Oregon, USA, mark@uoregon.edu

**Keywords:** Park-above-Parking, Design, Land Use Planning, Downtown

Park or open space is an important land use in every downtown. In order to more efficiently use the parkland, a few communities added parking structures directly underneath their downtown parks. The author defines this kind of project as park-above-parking. Park-above-parking meets the demand for open space and parking space in downtown. Some projects contribute to downtown development but the others raise problems such as inappropriate use and low economic impact. While a few existing literatures focus on downtown parks, most research focuses on downtown parking. Few studies have explored park-above-parking, especially its design and adjacent land use planning. What are appropriate land uses around park-above-parking and how are they benefited by it? What is the good design of park-above-parking that connects to adjacent land uses? Lessons from precedents are prerequisite to future successful projects. In this paper, the author presents findings from one case study: Pershing Square, Los Angeles. Pershing Square is a public park in downtown Los Angeles with a rich history that dates back to 1850s. In 1952, an underground parking garage was added underneath the square. In 1994, the park was reopened with an award-winning design by Ricardo Legorreta and Laurie Olin. Despite the new design, Pershing Square shows poor use and low economic performance. Both qualitative and quantitative methods have been employed to uncover the linkage between design, adjacent land use and economic performance. Indicators of park and parking design such as the diversity of landscaping and the ratio of undivided open space are examined through layout and maps. Indicators of economic performance such as the increase/decrease of adjacent property value and the diversity of adjacent land use are explored through tax records and available GIS data. The park is also investigated for its use and connections to the adjacent land use through observation and behavioral map. This study categorizes its adjacent land uses and discusses the influence of park design on each land use. Key findings are: 1) low economic impact is associated with low diversity of adjacent land use; 2) more surface parking lots around the park leads to fewer economic benefits; 3) the more semi-private or private space in the park, the less daily users; 4) the location of parking entrance-exit affects the design quality; and 5) fewer shortcut pathways result in more limited connections to the adjacent neighborhoods.



## **Finding Multiplicity at the Center: Lessons from Contemporary South African Landscapes**

**Jocelyn Zanzot**, Auburn University, USA, [jocelyn@auburn.edu](mailto:jocelyn@auburn.edu)

**Keywords:** multiplicity, civic landscape imagination, South Africa

Public urban spaces struggle to re-conceive of civic and democratic life in a post-modern, post-911, global world in which culture is increasingly privatized and public space increasingly under surveillance. Cities however, continue to invest in public open space as a means of self-identification that improves quality of life. Concepts such as multiple publics, hybrid landscapes and assemblages enable design in dialogue with the imagination of increasingly diverse and disparate publics. This paper presents two contemporary South African public spaces that re-configure the rules of the public realm in a post-apartheid democracy, expanding the story of who is included and how this realm is defined by new thinking about the South African landscape. This paper presents a comparative analysis of two new national landmark projects: Freedom Park in Pretoria and Constitutional Hill in Johannesburg as they seek to uphold the world's most progressive democratic constitution through practices of landscape urbanism.

Occupying the former Old Fort prison site, one of the most notorious during the Apartheid, the new Constitutional Court reconnects its precinct with the adjacent neighborhoods, a beacon on the hill that shelters the institution of justice. The landscape interprets the past, and choreographs numerous future uses. Freedom Park is a nationally designated "garden of remembrance" in Pretoria identified in the Truth and Reconciliation process and inaugurated by President Mandela, that affords a view of the city and a new outlook on South Africa's future in light of the struggle for freedom. Engaging indigenous knowledge systems through a design that integrates the ecology of the quartzite ridge within which it is settled, the park elevates traditional rural/village customs to national significance and artistic grandeur.

The comparative analysis of these projects undertaken through multiple site observations, conversations with the designers, literature and peer review, examines the controversies of the sites and their new uses, focusing on design strategies that seek to renew the significance of the past as they re-conceive the future for an expanded civic landscape imaginary. This paper that examines both the problems and potentials that emerge in these nationally motivated landscape centers, and draws out innovative design experiments for consideration in other projects. Situated within a broader conversation about contemporary landscape architectural practice in South Africa the paper brings these design approaches to bear on similar issues of design for new urban centers given increasing diversity and disparity in public spaces in the states.

## Proposal of the Total Human Ecosystem on Blakeley Island, Mobile AL

Long Zhou, Auburn University, USA, lzz0014@auburn.edu

**Keywords:** landscape ecology, Total Human Ecosystem, brownfields remediation, wetlands recovery, industrial process, natural processes, ecological and sustainable development models

The principle of industrial ecology and landscape ecology has been touched upon in the past decades by scientists, ecologists and landscape architects. The concepts of industrial ecology have passed beyond the idea of controlling pollution and are trying to foster “thinking like an ecosystem”. Landscape ecology focuses on the spatial pattern intertwined with processes and changes. Through applying the model of “Total Human Ecosystem” with the structure of patch-corridor-matrix, landscape ecology provides a model applied to the environment with human disturbance.[1] Mobile, AL is a city built in wetlands and it was dominated by heavy industry. Blakeley Island is one of the largest industrial areas in Mobile, AL. The situation in Blakeley Island reflects the paradox at a global scale. On one hand, people are searching for more methods to take full advantage of the environment and create jobs. On the other hand, people complain about the degradation of their living habitats due to the overdevelopment. This paper focuses on how to create an ecological and sustainable living system that provides reconciliation between the industrial park and natural wetlands on Blakeley Island. The methods explore the application of the Total Human Ecosystem model through landscape transition at urban scale in a way that, natural processes and industrial processes cooperate. Besides science, such as landscape ecology, has provided knowledge about the role of human in creating and affecting patterns and processes. “But science has been less effective in transforming this knowledge to society and design is a common ground for scientists and practitioners to bring scientific knowledge into decision-making.”[2] The novelty of the method is the integration of science and design from dysfunctional patch recovery and corridors creation, to the new cybernetic symbiosis cycle formulation.

## Using Regionalism as a Central Organizing Focus for Research and Education

**David Hopman**, dhopman@uta.edu, **Pat Taylor**, pdt@uta.edu, **Don Gatzke**, gatzke@uta.edu, **Taner Ozdil**, tozdil@uta.edu, **Brad Bell**, bbell@uta.edu, The University of Texas at Arlington, USA

**Keywords:** regionalism, region, collaboration, interdisciplinary, research

This panel reports on the re-emergence of regionalism as an organizing focus for research and education at a public University in the Dallas/Fort Worth area. It specifies how and why regionalism, as a time-honored practice in landscape architecture, is shaping the physical planning policies and procedures of the public and private sectors, thereby forging a model for acceptable growth in North Texas, and beyond.

The panel includes the Dean of the School of Architecture, the Director of the Program in Landscape Architecture, two landscape architecture Professors, and a professor of architecture. Each participant will explain his regional research initiatives and how they contribute to a comprehensive collaboration among the design professions regarding the idea of regionalism. Specific regional issues and recent accomplishments are explained. The material presented concentrates on the ways and means of closing the disconnect between theory and practice in both the architectural and planning fields (Hoyt in Hardin et. al. ed., 2006; Seidel et. al. 2006).

The panel will emphasize how regionalism emerges as a resistant force, working in the background, to inform all design activity in a concerted effort to contribute to the greater good. The region is therefore a de facto client that is modified and will suffer or benefit from design decisions.

The two administrators will focus on how regionalism helps them fulfill both their university institutional imperatives, and the institution-building processes necessary to support research collaborations with entities such as Vision North Texas, the Center for Metropolitan Density, the Dallas Urban Solution Center, The American Institute of Architects, and The North Central Texas Council of Governments. The design professors will summarize their focus on research and project-based service/outreach activities as well as the institution building efforts above. For example, one will specifically discuss parametricism, with digital fabrication, and propose that it must combine the physical consequences of such a universal process with the materiality, technique, and interpersonal relationships with fabricators which are often regional affairs. The others will discuss the rationale for a variety of research initiatives that have arisen from both regional research and regionalist practice. Examples include evolving regionalism theory, green roof research, and studies of local ecological relationships suitable for planting design.

This panel documents how regionalism underscores the tutorial model pursued by the University and raises the intellectual grounding for practicing landscape architecture globally, beyond the region that serves as the primary teaching and research laboratory.

## Students visit the Hill

**Barry Kew**, Penn State, USA, [bwk2@psu.edu](mailto:bwk2@psu.edu)

**Keywords:** Professionalism, U.S. Congress, Advocacy Network, Post-evaluation Survey

As part of this professional practice course, students are reminded that professionalism bears its responsibilities (Baird, Szczygiel 2006) and as landscape architects a need to exhibit expert knowledge, credentialed standards, and public acknowledgement. Public approbation of this profession continues to develop and by linking students with government legislators, advanced understanding of landscape architecture can occur. Using a “position paper” on specific Federal Legislation (in the form of a bill) as the vehicle to engage, the process of preparing correspondence with national legislative teams, and disseminating views on this legislation is tested with meetings in D.C. Capitol Hill Congressional Offices.

Background on why these 535 congressional members play a unique role in how legislation meets the needs for their districts, states, and nation provides insight to how conversations might move forward between students and legislators. And choosing a particular piece of legislation to take a position on becomes a process in itself, and the range of person qualities of listening, observation, and relationship building can make an impact in effective lobbying of the issue (McGrath 2006).

ASLA's Government Affairs team provides resources to the profession in an attempt to provide a unified and strategic approach to lobbying specific legislation pending in Congress; however, while this may help national impacts, it is not necessarily reflective of regional representation. Passion can run high on local issues, which often is why individuals will take a stand one way or another. Directing local support toward a regional unified approach without losing that passion takes science and art, something inherent in landscape architecture. The Advocacy Network on ASLA's website allows our students to search out regional and national issues that impact our profession, and in a unique way helps to set the stage for how students tie these issues back to their home community.

This presentation discusses student's reflection on the process, and its impact on their sense of the profession. The class was given a post evaluation survey which raised a series of questions about preparation, correspondence, values, and leadership. The initial findings of this survey are shared.

## Forgotten Frames

**Joni M Palmer**, joni.palmer@colorado.edu, **Joern Langhorst**, joern.langhorst@ucdenver.edu,

**Kathleen Kambic** kathy.kambic@gmail.com, University of Colorado, USA

**Paula Horrigan**, Cornell University, USA, phh3@cornell.edu

**Caroline Lavoie**, Utah State University, USA, caroline.lavoie@usu.edu

**Keywords:** communication, education, framing, slides, teaching, exhibition

Forgotten Frames addresses the “finding center” theme by asking, “whither the slide?” By mounting an exhibition and accompanying presentation, this panel of design scholars and educators will engage in a dialogue concerning the transition from slide to digital imagery in landscape architecture. Specifically they ask us to ponder the “slide,” as an artifact and an instrumental factor in a “performative triangle consisting of speaker, audience, and image” (Nelson, 2000).

Conventional slides are familiar frames in landscape architectural design, history, and education. Using their carefully selected slides or “projections,” landscape architecture educators have long cultivated the skills of critical looking and seeing. Their vast personal slide collections offer a reliable record of landscapes they’ve directly witnessed, experienced, and returned to tell about. Practices— two slides on a screen; rituals— sorting, emptying and filling carousels; and rooms— intimate, intensely darkened; these are the stuff that slide lectures are made of.

Like the diapositive Kodachrome slide and the lantern slide before it, digital imagery and the Internet are remaking our vision, visual knowledge and visual consciousness. Educators are increasingly incorporating digital imaging into their teaching while making use of digitized slide collections. Their students are retrieving landscape images from the Internet— often without certainty regarding an image’s origin and presentation. This rapid shift from slide to digital imagery leaves us wondering at its ultimate impact and with questions such as: Will the technological change increase or inhibit our visual capacity? If our students are truly visually oriented “digital natives,” (Prensky 2001), why are empirical studies suggesting they are in fact lacking in their ability to respond critically to visual material (Brumberger 2011)? Still other questions include:

- Do slides still have a role to play in the representation of landscapes?
- How do slides act as “parallel sites,” representing landscapes and also offering their own physicality/ process
- How do slides occur as physical objects and artifacts?
- What of the slide ritual and the physical engagement in mounting, sorting, viewing?

Presentation: Each exhibitor and panelist will respond to the “Forgotten Frames” theme and questions by engaging the slide as an artifact and an instrumental factor relating image, speaker and performance. Each will forensically investigate and mine their personal slide collections to develop their exhibition/installation. Finally, each will offer an individual paper presentation discussing their work. A moderator will respond to and critique the installation pieces created by each of the collaborators.

## City Parks as Integral Urban Infrastructures: Environmental Sustainability through Park Design

**Ebru Ozer**, Florida International University, USA, eozer@fiu.edu

**Douglas Thompson**, USA, trentondouglas@gmail.com

**Keywords:** environment, sustainability, design, parks, infrastructure

With the increased societal awareness of the Earth's environmental limitations, it has become of greater importance that human beings understand their connections to natural systems. This is even more critical in urban contexts, where traces of natural systems are fewer and human interactions with them are limited and highly controlled. The city park often represents one of the most visible, and sometimes the only, connection between humans and nature. Therefore, it also houses an opportunity to educate people on the function of natural systems. However, the value of natural systems and ecologies in the urban context is often in competition with the value of other priorities. Landscape architects can increase the opportunities for connecting people and natural systems in more sustainable ways, by pursuing park design that increases the value of natural systems and ecologies relative to other priorities. This can be accomplished by incorporating into park projects direct ties between natural systems and infrastructures for solutions to urban environmental problems. This research focuses on understanding the current role of the city park and the profession of landscape architecture in promoting connections between cities and natural systems. It examines the prevalence of park projects that connect natural systems and functional ecologies and relative importance of such projects in the landscape architecture profession. This is tied to an examination of the frequency of the park being utilized as solutions to urban environmental problems. The study is conducted through analyses of park projects reviewed in Landscape Architecture Magazine. Additionally, this research develops a case analysis of the park system of Miami Beach, Florida. Significant environmental threats such as frequent flooding, shoreline erosion, and global seawater rise make the city a relevant site for study of issues of the environment and urban park design. This portion of the study includes an analysis of the man-made beach system as a model for sustainable design, and contrasts it with two recently completed city parks designed by landscape architects. Taken as a whole, this research develops a picture of the role of the city park as it is utilized by landscape architects as a connector between people and nature.

## Healthy Landscape, Healthy People

**William Sullivan**, University of Illinois at Urbana-Champaign, USA, [wcsulliv@illinois.edu](mailto:wcsulliv@illinois.edu)

**Chun-Yen Chang**, National Taiwan University, Taiwan, [cycmail@ntu.edu.tw](mailto:cycmail@ntu.edu.tw)

**Keywords:** Landscape ecology, sustainability, human health, green infrastructure

One of the most important findings of the Millennium Ecosystem Assessment (2005) was that, over the past 50 years, “humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history” (p. 1). The changes have contributed to substantial gains in human wellbeing and economic development, but were achieved at growing costs to the ecosystems upon which human life depends.

One key to protecting ecosystems is to design and manage landscapes that support biodiversity, natural processes (e.g., nutrient cycling, water cycling) and that increase the resilience of natural and built landscapes. To do so will require that we overcome many challenges not the least of which is that humans appear to have strong preferences for landscapes that are harmful to ecological health and functioning.

And yet there is reason to believe this challenge can be overcome. Communities such as Prairie Crossing in Grayslake, Illinois, or the Holiday neighborhood of Boulder, Colorado suggest that it is possible to create healthy landscapes that in turn support human health.

This symposium explores the challenge of bringing together the science on ecology with the science on human health in the context of design that seeks to create sustainable, healthy landscapes. We will begin the session with an overview of the challenge, then pull the challenge apart by examining current research that tests human health outcomes associated with various landscape configurations that differ in terms of ecological health. We will also focus on research and measurement strategies for assessing landscape characteristics (e.g., Chang’s landscape ecological metric system, microclimate monitor) and human stress responses to landscapes (e.g., biofeedback instruments).

Several of the studies will probe landscape impacts on human physiological reactions (stress reactions). Other papers will present on-going research examining the impact of landscapes on human attentional functioning, willpower, fear, preference, and physical activity. The session will end with a panel discussion.

The discussion will invite considerable audience participation and will explore the direction and impact of research designed to investigate links between healthy landscapes and healthy people. We will also discuss the continued collaboration and cooperation among scholars from National Taiwan University and the University of Illinois as we work toward addressing this challenge.

## Interpreting Harriet Tubman and the Underground Railroad: A Transdisciplinary Team's Approach

**Mary Anne Akers**, maryanne.akers@morgan.edu, **Paul Voos**, paul.voos@morgan.edu, **Courtney McQueen**, crbruner16@hotmail.com, Morgan State University, School of Architecture and Planning, USA

**Keywords:** heritage tourism, transdisciplinary, phenomenology

The Underground Railroad was a complex secret network of people who assisted enslaved individuals to escape bondage from the South to the North or Canada. On Maryland's Eastern Shore, daring escapes transpired; some were successful, and others failed, resulting in scarring punishments, and, subsequently, stricter laws. The setting for these labyrinthine activities presents significant land-and-water-scapes (i.e., backroads, forest trails, waterways, hidden places in trees, etc...) that fugitives and slave catchers used for their respective purposes.

Harriet Tubman, a native of Maryland's Eastern Shore, is an iconic figure for the Underground Railroad because of her role in conducting the bold rescues of about 300 people. To commemorate her life and others involved in the Underground Railroad, a master plan was developed by a diverse student and faculty team of landscape architects, architects, and historians. We engaged in a transdisciplinary process of learning how to create visitors' experiences that encompassed landscape immersion and active/passive recreational activities, all of which nested in deep cultural interpretation, histories and memories.

The paper's purpose is to deconstruct team members' perspectives as they proposed visitor experiences ranging from a boat trip across the Choptank River, kayak excursion, and walk along the Marsh Creek, to site visits in a historic African-American cemetery, and Quaker meeting house. Using various theoretical concepts associated with heritage sites (i.e., affordance, plural interpretations and subjective meanings), the paper presents a phenomenological analysis of three team member's participation. The analysis reveals that their perceptions, worldviews, and approaches to the project were based on age, gender, race (i.e., African-American, Caucasian, Asian), professional status (i.e., student, faculty), educational training (i.e., landscape architecture, planning) and other individual characteristics. The paper is important in that it provides the landscape architecture field, a deeper understanding of transdisciplinary teams and the value they bring to the interpretation and planning of special landscapes.



## School Transportation and Parental Safety Concerns: Subjective versus objective measures of crime and crash safety along home to school routes

Young-Jae Kim, yjkim2011@neo.tamu.edu, Chanam Lee, cleee@arch.tamu.edu, Texas A&M University, USA

**Keywords:** walking to school, crime safety, traffic safety

Walking to school is being promoted as an important means to foster active lifestyles among school-aged children. However, due to many personal and environmental barriers, school travel mode share by walking has decreased dramatically from 47.7% in 1969 to 12.7% in 2009.<sup>1</sup> Among the top barriers are related to the environmental conditions such as long distance to school and safety concerns.<sup>2-4</sup> Especially, parental concerns about crime and traffic safety have shown to be the key deterrent to walking even for those living very close to school.<sup>5</sup> More empirical studies are needed to better understand the multi-level factors associated with parental safety concerns, and to guide the development of intervention strategies to relieve those concerns.

This study used 4,287-repondent parental survey data collected in 2010 from 20 elementary schools in Austin, TX. Perceived safety was measured by eight survey items (all 5-point likert scale items), asking parental perceptions about neighborhood safety conditions related to children's walking to school behaviors. Objective safety measures were captured in Geographic Information System (GIS) using individually geo-coded crime and crash locations. Crime and crash hotspot analyses were used to further assess the spatial patterns of incidences along the GIS-generated shortest home-to-school routes. The outcome variable (parental safety concerns) was measured as the mean of all eight survey items, and multiple regression analyses were used to identify significant predictors.

Preliminary results showed that socio-economic status, distance, and objectively measured safety variables were significantly associated with parental safety concerns related to children's school transportation. As expected, safety concerns of parents with older children and White (vs. Hispanic) children were lower than their counterparts ( $p < .001$ ). However, gender and income levels were not significant. From the GIS-measured environmental variables, distance to school was positively associated with parental safety concerns ( $p < .001$ ). Crime hotspot values along HTS routes were positively correlated with parental safety concerns ( $p < .001$ ), while crash hotspot values were not significant.

This research found significant correlations between perceived and objectively measured safety conditions. However, crime-related versus traffic-related safety measures may have different roles in parental safety concerns. Further studies are needed to identify additional factors that may contribute to explaining parental safety perceptions, and to examine variations in these factors across different neighborhood/school settings and different socioeconomic status groups.

## **Forging CommonPlace: The Old Northwest Territory's Transition from Wilderness to Landscape as Representative of a Larger American Mythology**

**Stephen Sears**, University of Illinois at Urbana Champaign, USA, [ssears@illinois.edu](mailto:ssears@illinois.edu)

**Keywords:** Mid-continent, agrarian, American mythos, culture, values

The purpose of this work is to establish the Old Northwest Territory agrarian landscape as a nationally significant cultural phenomenon and a key signifier in the development of a larger, particularly American mythos. The formation of the region's commonplace heritage was a cumulative process incrementally wrought by its inhabitants throughout the nineteenth century. The conceptual shift in defining the wider environment first as wilderness, then later as landscape, is an important social, environmental and existential circumstance that has created an ethical relationship between land and work in the United States.

The unique composition of the contemporary Midwestern region is the result of particular coincidences of geography, natural resources, technology eras, and human endeavor. The patterns of the region's environment are the result of both ecological systems and the purposeful practices of settlement—or nature plus culture. The term landscape denotes shaped land—purposely built space—and the land in states formed from the Old Northwest Territory, like Indiana and Illinois, is largely an uninterrupted built environment from one state line to another.

In the early nineteenth century the rapid transformation of wilderness into landscape, by an extraordinary exploitation of resources, was considered a virtuous practice. Later, virtue was ascribed to regenerative initiatives, such as the State of Indiana passing some of the earliest land reclamation legislation. Examples are presented to show the relationship between idealistic and purposeful practice and the expansive working landscapes that has characterized the Midwest region for almost two hundred years.

From Thomas Jefferson's desire to civilize Native Americans through the deployment of the public land survey system grid, first used in Ohio, to many utopianist leaders' belief in attaining perfection through toil, the Midwestern regional landscape has been transformed through the implementation of idealism since the time when the term "wilderness" was an apt description of the territory's environment. Such pervasive beliefs about wilderness and yeoman farmers' capacity to act upon it as agents of a larger national mythos, to subdue or regularize land, persisted throughout the next one hundred years.

This work traces a nineteenth century American orientation about the environment: evolving from common understandings of "wilderness" to subsequent conceptions of "landscape" in order to gain understanding of contemporary perspectives and practices about landscape heritage, social idealism and shaped land.

## Tending the Garden: Bio-Techno-Social Stewardship and Management at Biosphere 2

Meredith Sattler, Louisiana State University, USA, msattler@lsu.edu

**Keywords:** Biosphere 2, Stewardship, Management, Sustainability, Ecosystem Services, Life Support

This paper examines the environmental and ethical world views of the creators of Biosphere 2 (B2) and traces their implications on the project's stewardship. In the early 1990's, B2 was designed by a multidisciplinary group of visionaries eager to test a biodiverse closed-loop life support system. Based on a holistic environmental ethic and a systems ecology approach, the project resulted in a three acre mega-structure housing seven biomes, mechanical equipment, and all the atoms necessary to support eight people for twenty-four months at a time. This materially closed, energetically open structure is the tightest envelope ever built, in addition to being ecos (home) to the biospherians during Missions 1 (1991-3) and 2 (1994). Ultimately a greenhouse supporting a garden providing ecosystem services(1) necessary for long-term occupation, its "small" cubic volume required mating natural systems with technology, resulting in a truly "constructed environment": ecologically, infrastructurally, socially and politically; "...a [physical] metaphor for thinking about planet earth"(2). Despite the biospherians' holistic vision and utopian intentions, the project rapidly evolved into a complex network of ideological and managerial pluralisms requiring unique strategies of seemingly incompatible stewardship methodologies.

B2 was constructed from ecological systems diagrams which scripted relationships and dictated protocols of control, leaving little room for unscripted agency among its inhabitants: both ecological and technological. Despite rigorous environmental management performed by keystone species (humans), these people experienced B2 as nature's "psycho-spiritual resource" (3) and felt "...a very tangible sense of [their]...connection to every other part of the earth", (4) resulting in a fierce ethic of intrinsic and personal environmental value and stewardship. However, this ethic increasingly did not apply to the social/cultural component of their holistic system, particularly fellow biospherians and the members of their "mission control" support team. Nor did it translate into Biosphere 1's environment: the carbon sink for B2's high energy consumption. A host of evolving valuation strategies, enmeshed with deep concerns about economic viability and life-support contributed.

Today re-purposed, the facility now tests the effects of rising levels of atmospheric carbon and altered patterns of the hydrological cycle attributed to anthropogenic forces. The perfect venue to conduct experimentation of Earthscience(5) scale, the project again demands a plurality of management approaches. In our world of net-zero architecture designed to facilitate life support for a planet experiencing dramatic change, B2 assists us in unpacking core values surrounding stewardship and management by rehearsing "right relationships"(6) between humans, constructed environments and the planet.

## On Valuing the Landscapes: From the Eye of the Beholder to the Mind of the Agent

Hyejung Chang, University of New Mexico, USA, hjchang@unm.edu

**Keywords:** Landscape aesthetics, Environmental ethics, Evaluation, Practical reasoning, Aesthetic appreciation

To value landscape is essentially concerned with our customary ways of viewing nature and art, because both embody the inextricable conception of beauty (i.e. aesthetics)—an equally popular as problematic value for landscape design. Attempting to make a logical and psychological connection between the value of landscape as nature and as art has been a constant theoretical challenge due to the following reasons:

1) The value of art and the value of nature are deemed incompatible, for each has different aesthetic properties of its own; 2) the aesthetic value of art tends to be seen as more subjective whereas that of nature ought to be more objective; 3) the aesthetic value of landscape is often seen as having little to do with economic, ecological, and social values, and thus is deemed difficult to defend; 4) a static conception of landscape aesthetics is seen in conflict with ecological dynamics: there is a need for a single contextual approach to ecological aesthetics; 5) aesthetics is generally regarded as a less important subject than ethics: a luxury rather than an practical issue of right and wrong for our lives.

The paper proposes that valuing something requires four structures of reasoning to form a value claim: 1) appreciation (or depreciation): a desire to recognize either positive or negative qualities and properties of something; 2) explanation: understanding the nature of our admiration by illuminating our motives; 3) evaluation: a reasoning for a judgment that demands objectivity; 4) justification: a declaration of the appropriate ethical reasons for how to act.

Expanding on these structures of reasoning, the paper responds to the above conceptions. First, the process of valuing involves qualities and properties of landscapes informed by both art and science. Second, landscape value is both objective and subjective. Third, aesthetic accounts of landscapes can become more inclusive of the economic, ecological, and social good to become more morally acceptable. Fourth, these structures of reasoning may serve for a single contextual approach to ecological aesthetics. Lastly, landscape aesthetics ultimately will make normative associations of what's appropriate, right or best, thus affirming Leopold's vision of "aesthetically and ethically right."

This conceptual framework of practical reasoning aims to suggest a logical and psychological explanation for aesthetic and ethical values of landscapes, to help us classify and clarify a rational system of landscape evaluation, and to provide justifiable reasons for our pursuit of the good and the beautiful in landscape design.

## **Positioning Site Within the Discourse of Contemporary Landscape Architectural Practice**

**Christine Calorusso**, Virginia Tech, USA, ccalorus@vt.edu

**Keywords:** site, professional discourse, practice

Site is central to the work of landscape architects. It provides both a literal and figurative grounding for the discipline. Without sites, design ideas would remain relegated to the realm of fantasy. Without sites, rich sources of design inspiration would be lost (Meyer, 2005). Despite its importance, however, site as a topic of disciplinary inquiry has received relatively little scholarly attention by landscape architects or other designers (Burns & Kahn, 2005). Although Meyer (2005) argues that an emphasis on site has been a hallmark of landscape architectural practice since the time of Frederick Law Olmsted, the need to clearly articulate landscape architecture's general approach to site and how it differs from that of other design disciplines seems especially important now as landscape urbanism continues to blur the traditional disciplinary boundaries between architecture and landscape architecture. As architects working in urban design are abandoning the building as the key element in urban design in favor of the landscape (Waldheim, 2006), they also threaten to annex the traditional territory of landscape architects. At a time when architects are increasingly claiming landscape as their medium, it seems especially urgent for landscape architects to articulate what distinguishes its typical approach or approaches to the landscape, and specifically sites.

The research presented here uses a discursive approach to define site as a disciplinary concept in contemporary landscape architectural practice. Rather than emphasizing site as a physical object or a product of the designer's mental processes, a discursive approach emphasizes site as constructed by the language that landscape architects use to talk about sites. More specifically, the research uses a particular type of discourse analysis that identifies the interpretive repertoires—or “clusters of terms, descriptions, and figures of speech often assembled around metaphors or vivid images” (Wetherell & Potter, 1992, p. 90)—that are drawn on to explain or describe sites. The research focuses on the interpretive repertoires of site used by five landscape architecture firms that, by virtue of the number of prominent design awards and competitions they have won, represent the vanguard of contemporary landscape architectural practice: Michael Van Valkenburgh Associates, Nelson Byrd Woltz Landscape Architects, OLIN Partnership, Gustafson Guthrie Nichol, and Reed Hilderbrandt. The analysis draws on texts authored by the firms or their principals (firm Web sites, published interviews, and monographs) that address their general approach(es) to site and represents one step in a dissertation project on site in contemporary landscape architectural practice.

## Engaging Values Using the Case Study Teaching Method in Landscape Architecture and Design Education

**Charles Chase**, charles.chase@colorado.edu, **Susan Gunn**, susan.gunn@colorado.edu, University of Colorado, USA

**Keywords:** Values, Ethics, Pedagogy, Case Study Method

Design is the process of “changing existing situations into preferred ones.” (1) However, deciding what is “preferred” cannot occur without assessing human desires and values. Thus, design is value-laden. Engaging ethics and values is critical for the successful collaboration with and sustainability of our communities. While these skills have been addressed to some degree in the design curriculum, recently there has been some concern that an historic schism between theory and studios contributes to a lack of understanding of the impact of design decisions. (2) Fisher advocates using case studies to encourage a dialogue around ethics in the design field. (3)

The Case Study Teaching Method holds promise for the design pedagogy by providing a platform for students to explore and develop personal, professional and community values in preparation for careers in design. A broad range of disciplines, including law, business, medicine, and public policy, use the Case Study Teaching Method. Not to be confused with case studies typically taught in design schools that focus on exemplary outcomes, (4) Teaching Cases are problem-based, open-ended, and explore the breadth of issues associated with the case where there is no obvious conclusion. This methodology employs pre-written Teaching Cases and the Socratic questioning method to convey key principles, core concepts and broad perspectives of a case. The educational value of this approach—critical thinking, development of communication and persuasive skills, and heightened confidence and leadership qualities—has been noted by various theorists and confirmed by empirical research. While such potential benefits are apparent, this approach is rarely used in design education, despite its potential to bridge several gaps and criticisms. (5,6)

In this paper the authors discuss their integration of the Case Study Teaching Method as a strategy to incorporate a consideration of values and ethics into design through a course titled, “Ethics in Intervention,” intentionally developed to bridge the gap between theory and studio courses. Students communicated in the post-evaluations that analyzing cases and developing new cases around ethical dilemmas in the discipline provided them with a novel way to think about their design process and they were able to directly apply these new skills to their studio work. This paper outlines both the challenges and benefits involved in teaching with the Case Study Teaching Method in an environmental design and architecture program, as well as identifying areas for future research, strategies for implementation, and implications for course development within a design curriculum.

## **Embedded Values In Landscape Infrastructure**

**Gary Austin**, University of Idaho, USA, gaustin@uidaho.edu

**Keywords:** Stewardship Values, Green Infrastructure, Ecological Networks, Urban Ecology

**Purpose and Importance:** The purpose of this paper is to explore the stated stewardship ethic of landscape architecture, according to its anthropocentric and ecocentric dimensions. The paper presents recent research important to landscape architecture and proposes a hierarchical framework for the understanding of urban ecology. This is important because landscape architects will contribute to either the loss or the preservation of biodiversity and species extinctions resulting from habitat conversion. The paper demonstrates how higher density suburban development can be coupled with ecological networks to meet future challenges.

**Background:** The assessment of the profession of landscape architecture has been that the stated stewardship ethic is its “grand delusion” (Scarfo, 1989; ASLA, 2002). With species extinction rates at 600 to 6,000 times the normal rate () and the loss of 11,500,000 acres of land (US Census) to residential development in the next 40 years, stewardship is ever more important. The ecosystem service approach to understanding the contributions to humans by, and the requirements of, healthy ecosystems abandons the polarization paradigm of urban and natural systems (Tzoulas, 2007). This and other recent advances in urban ecology research are not incorporated into the knowledge base of the profession. Landscape architects need a framework and research data to address the ecosystem health and services impacts of their plans. Landscape infrastructure that preserves biodiversity while producing compelling urban spaces and residential patterns requires updated planning standards and mitigation of the disadvantages of high-density living.

**Method:** The method uses recent literature in urban ecology to report findings relevant to physical planning and design. The cases of Stockholm and Stapleton are used to illustrate the scope, values, and skills that a landscape infrastructure focus can bring to bear at the regional and community scales.

**Findings:** This paper defines ecological structure and function based on recent urban ecology research and refutes the claim that nature is only a social construct (Geuze, 2011). Similarly, empirical evidence challenges the view that landscape infrastructure is a decorative ruralization (Duany, 2010). Case studies demonstrate the centrality of green infrastructure as organized by an urban ecology paradigm. This organization includes the sustainable sites initiative, but illustrates much greater stewardship opportunities at other scales. Landscape infrastructure is a call for landscape architecture to balance its anthropocentric values with meaningful ecological proposals in its search for effective stewardship.

## Maine's Approach to Evaluating the Scenic Impacts of Wind Energy Development

James Palmer, Scenic Quality Consultants (or SUNY ESF), USA, palmer.jf@gmail.com

**Keywords:** visual impact analysis, wind energy development

Scenic quality can be thought of as intrinsic to the landscape resource or an attribute perceived by people viewing the landscape. The most widely known system for scenic management (e.g. USFS SMS) and impact assessment (e.g., BLM Contrast Rating System) assume that scenic quality is an intrinsic attribute that is measured by scenic quality experts. In contrast Maine's (2008) Wind Energy Act explicitly requires that viewer experience be central among the criteria for evaluating scenic impacts from wind energy development. Specifically, it requires consideration of the following perceptual attributes:

- The expectations of the typical viewer
- The potential effect of the generating facilities' presence on the public's continued use of the scenic resource of state or national significance
- The potential effect of the generating facilities' presence on the public's enjoyment of the scenic resource of state or national significance

Surveys of users at viewpoints within significant scenic resources have been conducted for five proposed wind energy developments. This paper introduces Maine's unique approach to visual impact assessment and presents a meta-analysis of from 4 wind energy project surveys evaluating 7 viewpoints. The approach used follows Stamps' (2000) recommendation for using effect size as a measure of the importance of the change or impact.

In general, respondents find that the scenic impact is very large ( $ES < 1.1$ ), while its effect on enjoyment is so small that it is difficult to distinguish the difference ( $0.2 < ES < 0.5$ ), and respondents say that it will have a trivial effect ( $ES < 0.2$ ) on their continued use the scenic resource where they were surveyed.



## Democracy and Deliberation in Alternative Futures Landscape Planning Approaches

Mark Hoversten, USA, hoverstm@uidaho.edu

**Keywords:** Alternative Futures, Deliberation, Discursive Moments

The purpose of the presentation is to provide a conceptual framework for alternative futures studies based upon principles of deliberative planning. The proposed framework provides a classification based on the alternative futures literature followed by development of a logical conceptual framework derived from both the deliberative literature and analysis of three alternative futures projects.

Competing demands for resource extraction, recreation, wilderness preservation and urbanization combine to make landscape management increasingly complex. Because of these complexities and the uncertainties that accompany them, deliberative and communicative planners such as Forrester, Dryzek, and Healy insist that democracy is situated in public discourse and reasonable deliberation (Dryzek, 2005). Alternative Futures landscape planning approaches position such deliberation between social choice models that posit a zero sum outcome of winners and losers, and collaborative governance models that presume positive sum outcomes based on consensus building.

This paper argues that although the Alternative Futures literature suggests deliberative processes (Hulse et. al., 2002; Hulse et. al., 2004; Nassauer & Corry, 2004; Shearer, 2005; Steinitz, et al., 2003), it fails to place those processes in the context of the robust literature on deliberative and communicative planning. As a result, there is a lack of clarity about deliberation, especially as it pertains to the roles of actors and institutions. Yet the deliberative literature makes clear that attention to deliberative processes is key to successful planning practice (Dryzek J. s., 2005; Dryzek J. , 2000; Forrester, 1989; Healey, 1998).

Key concepts are drawn from Habermas' theory of communicative rationality (Habermas, 1991–1992) are applied to identify six discursive moments that represent critical time periods when decisions are made that impact all remaining portions of the planning process. From Alternative Futures and deliberative literature, six questions are derived that can be asked during each discursive moment. A critical examination of each moment can clarify what is being decided, who is involved in making the decision(s), what kind of communication takes place, the process by which or how decisions are made, what decision results, and, what are the impacts or implications for subsequent phases of the planning process. It is argued that application of this critical framework to Alternative Futures studies might improve understanding of deliberative processes that, in turn, could improve the likelihood that such studies result in observable, on the ground, environmental outcomes.

## Interpreting landscape character and consequently illustrating an approach with values as guiding principles towards intervention in a cultural landscape

**Urmila Rajadhyaksha**, Urmila Rajadhyaksha, India, amarurmi@gmail.com

**Keywords:** Landscape Character, Values, Interpretation, Collective Memory, Narrated Memory, Tangible, Intangible, Ephemeral, Ethnographic

The starting point for all landscape scale conservation schemes is an understanding of the character of the landscape. Landscape character assessment and interpretation involves a deep understanding of how the landscape functions with respect to communities, cultural heritage and development, local and macro economies as well as the wildlife and natural resources of the area. This helps determine an appropriate scale.

Assessment of landscape character here, would involve an evaluation which recognises the continuity with the past and people living and working on the land today. Along with man-made structures, the very structure of the landscape itself, with settlements, approaches, roads, tracks, path-ways, and fields in their geomorphologic setting do so too. From this comes a distinctiveness and then, among people, a sense of place, cultural identity and traditions. These aspects overlay the landscape with intangible social and personal values.

Values can then be applied to the relevant landscape character areas as part of the decision making process. Identification of values goes beyond the physical, and focuses more on the environmental or cultural benefits, including services and functions, rather than the material resources that provide these values. Such values could include aesthetic, ecological, historical, socio-cultural, religious and mythological. Sometimes, these values are not immediately self evident as much of the Landscape has undergone continuous interaction of humans and can be sourced from collective memory like narratives. Consequently Management strategies and techniques require to extend boundaries beyond the tangible to the intangible and ephemeral as revealed by ethnographic research.

My interactive poster presentation looks at the site of the Prince of Wales Museum of Western India now called the Chattrapati Shivaji Maharaj Vastu Sangrahalaya in Mumbai the former Bombay to arrive at a strategy for management. This colonial Landscape and many others built largely at the end of the nineteenth and the beginning of the twentieth century are fashioned both by the Indian citizens and the Colonial rulers/citizens of this great city. Much of this development came about at a time when the Colonial rule was waning countrywide and hence had a chequered path towards completion. Direct archival information is therefore not always available and conservation strategies have to necessarily look at the story behind these landscapes and conjecture what might be.

## **Changing the status quo: Design for a sustainable research agroecosystem at the University of Illinois**

**David Kovacic**, dkovacic@illinois.edu, **Aaron Petri**, petri@illinois.edu,  
**Michael Wallace**, mwallace@illinois.edu, **Timothy Marten**, temarten@gmail.com,  
**Peter McAvoy**, pete@octagonal.org, University of Illinois at Urbana-Champaign, USA

**Keywords:** Agroecology, status quo, carbon sequestration, environmental sustainability, environmental protection

As pressures to feed an ever growing world population increase, values about the landscape and the ultimate sustainability of our planet must change. Agriculture must develop sustainable agroecosystems that reconcile increased production with greater environmental protection (Pimentel & Pimentel, 1996). We created a hypothetical design for a sustainable agroecosystem research farm at the University of Illinois. Our goal was to plan a center that would challenge the status quo, where cutting-edge best management practices are showcased for students, farmers, researchers, and residents of the Midwest. The hypothetical design would improve production sustainability on the farm while also improving environmental resource sustainability. The sustainable farm design provides all research needs (both plant, animal and food); provides all energy needs; sequesters carbon; treats all animal and human waste on site (Helsel, 1992); controls all runoff on site; and, ceases the export of pesticides and nutrients (Clover, 2005) from the site via surface waters (Kovacic et al., 2000).

Our plan uses methodologies developed by the design arts (landscape architecture, architecture, and urban and regional planning) to help bridge the typical gap between basic scientific knowledge and its real world application. To compare overall energy, carbon, hydrologic, and nutrient budgets between the hypothetical sustainable design and the existing status quo practices, a spreadsheet sustainability calculator was developed. Under the status quo model a total food surplus of 21.1 million lbs. was produced; but no energy for heat or electricity was produced on site. Heating and electrical energy ran an annual deficit (270.6 billion BTUs). All liquid fuel was purchased, and embodied energy used in crop production was not offset. This resulted in an overall hypothetical negative energy balance of 292.5 billion BTUs.

Under the sustainable model the food surplus was 12.4 million lbs. and the energy balance was positive (23.9 billion BTUs). Canola production (750 acres) completely balanced the annual liquid biodiesel budget ( $\approx$  1.4 billion BTUs), all building heat was provided, and embodied energy (used in crop production) was offset. Excess electricity was produced using methane derived from animal waste and sold to the grid or diverted to the main campus. With added pasture area and the application of no-till agriculture on 50% of the site, annual potential carbon sequestration exceeded total carbon emissions. Results indicate that it is feasible to create a sustainable University farm through realistic changes in conventional cropping, the use of animal waste, and the added production of biofuels.

## Centering the Design Process: Toward an Emerging Communicative Built Environment Ethic

**Elizabeth Graff**, University of Idaho, USA, [egraff@uidaho.edu](mailto:egraff@uidaho.edu)

**Rula Awwad-Rafferty**, University of Idaho, USA, [rulaa@uidaho.edu](mailto:rulaa@uidaho.edu)

**Keywords:** Authentic Inquiry, Systems Thinking, Visioning, Ethical Placemaking, Service-learning, Design Thinking, Deep Learning

Looking at education as a nexus for place stewardship, increased environmental awareness and human prospect, we propose a model of authentic inquiry within the landscape architectural design process in a university, service-learning setting. “Authentic Inquiry is an approach to learning which begins with the learner’s interest and experience, rooted in concrete place object or artifact and moves from there through a process of facilitated knowledge construction, to a particular negotiated outcome which meets publicly agreed assessment criteria ... It’s authentic because it is ‘authored’ by the learner and because it is ‘real and genuine’ in their life story” (Learning Emergence, 2011). By providing an opportunity for students to intentionally and critically question and develop their personal worldview as a starting point in the engagement and design process, alongside traditional client, site and program-focused inquiry, deeper awareness of individual responses arise around what is deemed most meaningful. Similarly, bridging individuality of a project to an overall system of landscape is considered while examining the dialectics of connection between site and world, self and problem, and vision and reality. Conceptual and universal desires begin to emerge when design thinking is founded upon the perspective of both self and global citizenship, thus forming a basis of linking the designer to the client community; design components to larger systems; and the individual to the collective. This approach addresses what David Orr refers to as “...the relationship between an increasingly specialized education process and our ability to ask large questions having to do with the human condition” (2004). Thus, responding to societal transition from the Information Age to the Conceptual Age, an “Authentic Inquiry, Systems Thinking and Visioning within a context of Deep Learning” serves as the framework for this exploration and development of emergent communicative built environment ethics. Looking to the realm of business for thinking and learning models to reinvigorate and broaden design thinking for designers of the built environment, we parallel “The Six Senses” put forth by Daniel Pink in “A Whole New Mind” (2006) with the design process for the built environment. Consequently, we propose a process framework for Intuitive Design that readily integrates qualitative components such as story, symphony, and meaning as necessary values to celebrating inclusive and dynamic placemaking and sustaining life while facing an intensely changing world—both locally and globally.

## **Crossings: Natural and Cultural Values for Sustainable Development of the NaturTejo Geopark, Portugal**

**Crystal Simons**, UC Berkeley, USA, [crystalward@berkeley.edu](mailto:crystalward@berkeley.edu)

**G. Mathias Kondolf**, UC Berkeley, USA, [kondolf@berkeley.edu](mailto:kondolf@berkeley.edu)

**Keywords:** Cultural landscape, geopark, sustainable development, eco-tourism, international

The Naturtejo Geopark (UNESCO, 2006) aims to revitalize a region of eastern Portugal with an important geological heritage and a rich cultural history. In May 2011, sixteen graduate students from the Department of Landscape Architecture and Environmental Planning at UC Berkeley partnered with thirteen Portuguese students in anthropology, geology and landscape architecture from the Universities of Minho and Fernando Pessoa. Four weeks were spent conducting remote analysis prior to the workshop and ten days were spent in the field developing strategies to balance values for the region's ecological and cultural landscapes.

A key area in Roman Lusitania, the Geopark landscape features some of the world's best-preserved trilobite ichnofossils, thermal springs, Roman ruins, olive-oil mills, and a long tradition of wine and cheese making. Despite such rich cultural and natural attractions, the area's population continues to decline as young adults and families migrate to coastal urban areas.

Through cultural immersion with local residents, reconnaissance research, GIS analysis, sketching, interviews, and over 120 kilometers of on-foot systematic surveying, the studio analyzed the array of ecological and cultural values held by residents and visitors to the Geopark. Preservation of the region's unique geological formations is well underway. The famous village of Monsanto is known for its unique position atop and among boulders the size of buildings. The village of Penha Garcia is known for its rock climbing and hiking route that feature remarkably well preserved trilobite fossils. While these values have effectively put the Geopark on the map, our analysis suggests that the area's cultural and heritage landscapes represent additional values that are necessary to keep the Geopark on the map.

We developed recommendations for the continued preservation of geological features while enhancing cultural values in the Geopark. Our proposals center on the creation of additional travel routes for experiencing the array of landscapes present in the Geopark. These enhance wildlife tourism, promote local artesian foods and wine, create connective way-finding strategies, expose historical smuggling culture, and connect an existing olive oil heritage museum with its surrounding landscape.

Proposals for enhancing cultural value in the Geopark landscape were formally presented to regional experts, Geopark management, and local residents. Our findings were well received overall. The international and interdisciplinary workshop sought to build upon the region's existing resources and values to promote sustainable futures. It successfully demonstrated the dynamic relationship between the area's geology, culture, economics and tourism; and defined a changing rural landscape.

## Material Externalities: Sourcing landscape

**Jane Hutton**, Harvard Graduate School of Design, Landscape Architecture, USA, [jhutton@gsd.harvard.edu](mailto:jhutton@gsd.harvard.edu)

**Keywords:** Materials, social factors, case study, material cycles

Landscapes are shaped by continuous flows of materials and energy driven by both socio-technical and biophysical forces. Material stocks bound for varying periods of time as highways, buildings, parks, and farms are eventually redistributed through the economic processes of land valuation, redevelopment, or abandonment, and the physical processes of renovation, demolition, and erosion. The composition and concentration of material accumulations, whether soil, concrete, hardwoods, or high-tech alloys, shift with contemporaneous technological, economic, and social imperatives. Materials are, therefore, entangled and embedded with the politics, social relations, and ecological implications of their own extraction, production, use, maintenance, and disposal. For example, geo-political control, international trade and environmental policy steer the access to material sources. Natural resource markets bear the difficulties and contradictions of trying to reconcile conditions of raw materials (forest growth habits, insect attacks, dry rot, overburden) with the demands of the perfect commodity. Industrial lobbies, building codes, and materials testing and safety standard mechanisms guide the use and application of specific materials. Diverse public opinions and contemporaneous aesthetic agendas privilege the use of certain materials over others. Material flows necessarily point to over-determined relationships between biophysical traits, economic and legal constraints, and design and construction experimentation/efficiency.

Attention to materials in landscape design has typically focused on aesthetic traits and construction detailing in situ. Recent contributions in landscape architecture (1), architecture (2), urbanism, and industrial ecology (3) have provided significant resources for considering the vast environmental externalities of material practice in design. From evaluation systems such as the Sustainable Sites Initiative (4) and Leadership in Energy and Environmental Design (LEED) to more comprehensive analytic tools such as Lifecycle Analysis (LCA), the impacts of material practice beyond design sites are starting to be formalized. These systems are critical, however are, by necessity, reductive. As a counterpart, this paper argues for a case-based examination of forces that have driven and mediated material lifecycles in New York City. Case studies will focus on the use of wood, stone, and cultivated plant material in three moments of accelerated park building in New York: Olmstedian, New Deal, and Post-Fordist. These moments characterize relationships between political economy, material flows, and design culture. The paper concludes with speculations for an aesthetic role for the consideration of these factors as a material practice in itself, drawing from contemporary interests in landscape dynamics and the rejection of static temporal and spatial definitions of landscape.

## Grounds for Agriculture

**Mary Pat Mattson**, Illinois Institute of Technology, USA, mpmattson@gmail.com

**Keywords:** ecological campus, sustainable food, campus design, values-based education, ecological consciousness, design methods and decisions

National discourse on sustainable food production and the potential for this transformative project has yet to fully reach university campus environments. Yet the setting of a university holds the potential to inform and influence a deep intelligence surrounding food sustainability to a key sector of our population who inhabit these institutions during a formative time in their lives, not to mention the faculty and staff who spread ideas through writing, teaching, travel, lecture, and other local community involvement.

My thesis and research has been driven by an interest in challenging the notion that the university campus is an inappropriate place for food production, and instead, to highlight the ideal conditions of the university for such an activity. The availability of land, and the assets and resources of the university community, make one case. The role of the university as a pioneer in research, innovation, and leadership create another. The opportunities for increasing knowledge and values-based educational models form yet another.

The BACKGROUND research for this project includes campus design histories, resources consumption and impacts, curriculum and program potential, etcetera, and the PURPOSE of the work is focused on the following: 1) to challenge our design field to test possibilities for agriculture on campuses, particularly where notions of campus landscape typology interfere, 2) to demonstrate the potential for linking productive land-use on university grounds to other performance outcomes—economics, curriculum, community-outreach, and university sustainability objectives, and 3) to make an eco-psychological case for campus agriculture by uncovering deeper connections between the effects of land-use decision-making and the creation of an ecologically-conscious culture.

Ultimately the FINDING of this project is that an 'ecological, productive campus' is fundamental to an ecologically-conscious academic community. This is founded on the notion that food, along with water and energy, while providing an ultimate resource and production challenge for our design, planning, and policy professions, is also an enormous opportunity to teach through design. The value of local food is not simply its ability to sustainably feed and nurture a community, but lies in its power to raise collective consciousness and to reorient our focus and activity.

For landscape architects, the linkages made here between a campus food/farm system and economic/social/environmental well-being, are CRITICALLY supplemented by linkages to aesthetics, behavior, and eco-psychology. These latter concerns drive our connection to the land, and therefore to ecological and sustainable decisions regarding its use, function, and stewardship.

## De-domestication and the Wild: The Carnivorous Wolf and the Feral Herbivore

Catherine Seavitt Nordenson, The City College of New York, USA, cseavitt@seavitt.com

**Keywords:** de-domestication, reintroduction, animal impact, land ethic

This paper examines the ethical issues of humans acting within a Land Ethic toward animals considered wild (non-domesticated) and feral (de-domesticated), given the return of a potential predator-prey relationship for the purposes of environmental restoration.

The ethical Parliament of Things is expanding. In his prescient essay *The Land Ethic*, Aldo Leopold states: "All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. The land ethic simply enlarges the boundaries of the community to include soils, waters, plants and animals, or collectively the land." The work of Tom Regan and Peter Singer extends the idea of moral rights to animals, conceiving a broader realm of ethics in human-to-animal relationships. Bruno Latour envisages this community to be a "parliament of things," noting that nature herself is part of the complex relationship between humans and non-humans.

Consider the re-introduced wolf. Humans have historically domesticated animals, and subsequently attempted to exterminate predators threatening domesticated herds. The attempt in the United States to exterminate the gray wolf, *Canis lupus*, was formalized in 1914 with a government-sponsored predator control program; its population was near extinction by 1950. It was not until 1973 that this wolf was given protection status by the Endangered Species Act. In the late 1990s, thirty-one gray wolves were released back into the wild in Yellowstone National Park; today over one thousand wolves roam the northern Rocky Mountains.

Consider the de-domesticated herbivore. A similar reversal, de-domestication, is now occurring within landscape restoration practices. This process returns herd cattle to their feral wanderings in the wild, without the limits of managed pasturing. Many land restoration projects use the technique of animal impact (trampling, grazing, and dunging at high impact for a short duration) to revitalize damaged grasslands. The paper will examine the use of wild Heck cattle, the reconstructed aurochs (*Bos primigenius*), for restoration purposes in the Oostvaardersplassen in the Netherlands. These wild cattle have no natural predators; their population is managed by the rangers.

What becomes of the Parliament? The process of animal de-domestication raises ethical questions. What is the role of human management, particularly concerning feeding and veterinary assistance? But perhaps the greater question is that of the ethics of ecological health and animal welfare in the wild, given the Land Ethic. What are the ethical implications given the natural predation of successfully reintroduced carnivores upon herds of feral herbivores?





# Communication & Visualization

## Got an app for that? Using smartphone technology for informal environmental learning

**Robert Brzuszek**, Landscape Architecture-MSU, USA, rbrzuszek@lalc.msstate.edu

**Renee Clary**, Geosciences- MSU, USA, rclary@geosci.msstate.edu

**Keywords:** technology, smartphones, education, app

According to a 2011 consumer survey, smartphones are now being used by 27% of the U.S. population (Carranza 2011). This is a 10% increase from 2010 reports and this percentage is projected to dramatically increase. The survey also noted that 36% of American smartphone owners use phones to browse the web or download content, and that new mobile innovations are projected to also increase (Carranza 2011). Research has only recently begun to evaluate the use of smartphone technology for informal learning purposes (Clough et al. 2007, Chen et al. 2010, Jo and Lim 2011). For this study, we tested how well smartphone users are able to transfer informal environmental learning content to their own personal life situations. Through GPTrex, an interactive application that can create scavenger hunts or provide additional exhibit educational content, we created a treasure hunt game for smartphone users along the trails at the Crosby Arboretum, a native plant arboretum in south Mississippi. GPTrex has the ability to incorporate photographs, videos, and text, as well as GPS mapping features. We developed and tested our nature trail game, which consisted of a series of short thematic questions that were supported through the use of related photographs and videos, about the exhibit concepts. At each of the 9 viewing stations along the pond and savanna trails, ecology facts about the exhibit in front of them were presented. Five of the destinations contain questions that asked how the user could improve the ecology of their own backyard or neighborhood. In addition to regular visitors to the Arboretum, a college class was brought in to test their responses to the app. Responses to the questions were stored on the app-provider's website and tabulated into an Excel spreadsheet. While the results for this study are still preliminary, the submitted ratings averaged 5 stars out of 5 stars indicating there is a high public satisfaction for smartphone apps. The main concerns of respondents using the app were unstated directions of how to navigate the app. The student user group strongly correlated to the public responses and noted that smartphone apps are a fun and novel way of learning about subjects in the landscape. We propose that smartphone applications serve as an enhanced way to extend informal learning and facilitate reflective time for users to apply learning concepts to their own backyards.

## Envision Information

**Peter Summerlin**, psumme3@lsu.edu, **Lucas Frey**, lfrey3@lsu.edu,  
**Bradley Cantrell**, bcantrell@visual-logic.com, Louisiana State University, USA

**Keywords:** Database, Visualization, Plant, Explore

Today, information is more readily available than ever with a myriad of innovative ways to represent data. Media can be stored, tagged, organized and sorted through various types of websites and search engines. Ultimately, the strategies for representing this information is what allows these databases to be intuitive, educational, exploratory and fun and allow information to reach a broader audience. As websites like Flickr have advanced the way we think, sort and explore photography, we hope to generate ideas that similarly progress the ways that we think about and work with plant material. Our research is two-pronged; first, gaining a deeper understanding of plant characteristics and rethinking ways we classify that data, and second, focusing on strategies that existing websites are utilizing for envisioning all types of information.

Existing plant websites were analyzed for ease of navigation, data interfaces and their breakdown of plant characteristics. The precedents included an international selection of plant databases as well as databases specific to particular plant typologies. Research of innovative web-interfaces centered on more mainstream websites like housingmaps.com, visualthesaurus.com, kuler.com, and namely flickr.com. Their efficient and powerful lenses for visualizing data queries of existing databases is what has made them a successful tool for both education and exploration. These visualization techniques inspired us and subsequently, laid groundwork for our plant database designs.

Ultimately, the goal for our interface is to combine our knowledge of contemporary database visualizations with research into advanced classifications of plant characteristics. The desired result is a way to explore plants that empowers users to discover relationships that are traditionally hidden in generic database designs, promote exploration of plant material and plant systems, inspire design while also educating users from all backgrounds. The approach for accomplishing these goals are laid out in 11 core strategies which includes; accounting for the 'in-between's', various 'ways to explore', continuous navigation, and primary and secondary queried results, among others.

Current plant database construction does not lack for scientific content. Websites like [www.plants.usda.gov/](http://www.plants.usda.gov/) (United States Department of Agriculture) provide a wealth of information that is practical for both design and identification. However, it's websites like Flickr that challenge us to rethink how we organize this plant data in ways that are more intuitive and engaging. Our vision attempts to blend these ideas and form a framework for reorganizing how we classify plants and rethinking how we visualize relationships of plant data.

## Perspectives on Representation as Generative Design Catalyst

**Blake Belanger**, Kansas State University, USA, belanger@ksu.edu

**Bradley Cantrell**, Louisiana State University, USA, cantrell@lsu.edu

**Katya Crawford**, University of New Mexico, USA, katyac@unm.edu

**David Dugas**, ddugas@vt.edu, **Brian Katen**, bkatens@vt.edu, Virginia Tech, USA

**Keywords:** representation, critical thinking, creative process, experience, emergent form

Representation remains fundamental to the work of the discipline of landscape architecture. Despite technological advances and profound shifts in both theory and practice, landscape architects continue to make images, and only indirectly make landscape.

The role of representation has assumed new levels of importance within work that resides at the very core of the discipline's creative explorations and understandings of landscape. Exploring representation's capacity as a generative act, at every stage of the professional project and at all levels of the landscape architecture curriculum, has refocused attention on representation as a means of providing richer understandings of landscape, and of evoking, revealing, and expressing the multiple dimensions and experiences of place. Representation strategies and techniques may be used deliberately as catalytic instruments for discovery, analysis, invention, and creativity in both the study of existing landscapes and for the creation and understanding of new landscapes and places.

This panel will present and discuss diverse approaches and explorations that seek to understand representation as a generative activity in the creative design process, as an engaged pedagogical practice (Biggs 2010) and as "evidence of thought in formation" (Kahn, 2005, p. 289). What is representation's role in understanding the experience of a landscape or how a landscape performs (Meyer 2008)? Is there a direct correlation between current representation techniques, conventions and the understanding and design of landscape (Corner 1999)? Is there a correlation as well between representation and those cultural values deeply embedded in any landscape? The panel will invite the audience to share ideas on representational methods and their experiences using representation as a generative design activity.

## Outcomes of a Design Studio Using Time-based Media

**Stephen Sears**, University of Illinois at Urbana Champaign, USA, ssears@illinois.edu

**Keywords:** time-based media, film, video, urban design, marginal landscapes

A spring 2011 design workshop for BLA and MLA students focused on a large-scale urban territory south of downtown Chicago. The course was initiated to explore methodological alternatives for design investigation, thereby provoking new conceptual models in urban design.

The project brief surmised that traditional studio techniques and visual products were inadequate for exploring the unique dynamics and processes affecting the project territory's evolution and devolution over time. In addition, the workshop was an opportunity for student designers to gain fluency using culturally predominant media techniques.

Students were challenged to develop proposals using time-based media techniques as the sole means of investigation and production—from preliminary analysis to final concept. Over a sixteen-week period students acquired the necessary technical skills and followed self-determined paths to produce five-minute short films—which included content roughly equivalent in scope to traditional project boards.

This work outlines the successes and failures of relying on time-based media techniques as a studio methodology. Reported outcomes give some initial insight into the method's capacity for catalyzing goals of the design process. Outcome topics include: 1) The effectiveness in provoking and channeling design students' creative impulses; 2) The influence on delivering instruction, meeting design expectations and serving pedagogical goals; and 3) The potential for building project frameworks that are perceptible to viewers.

## Finding Multi-Centers: Using Crowdsourcing Technologies to Define Communities of Landscape Architecture

**Robert Hewitt**, hewitt@clemson.edu, **Geoff Taylor**, geoffrt@clemson.edu,

**Hala Nassar**, hnassar@clemson.edu, Clemson University, USA

**Brooks Patrick**, Stockholm University, Sweden

**Keywords:** Social Media, Landscape Architecture, Technology, Education

With the increasing use of Web 2.0 applications facilitating user generated content and exchange, and the exponential growth in social media use, new evaluative methods for understanding the relationship between the individual, community and landscape are emerging (Centola 2010). Gabi identifies intensive networks for the virtual exchange of knowledge, data and information beneath the surface of an expanding built environment (Gabi 2006). Healey describes the knowledge produced by this intensive network as “a social process of making meanings, shaped by the situation, trajectories, activities and values of particular social groupings.” (Healey 2007) Taylor et al have identified landscape architecture related organizations, commercial enterprises, educational institutions, individuals and landscape architects employing social media techniques as part of this social process of meaning making and social grouping (Hewitt, Taylor, Nassar 2011). However, no scholarly work to date has examined the broader influence and impacts of social media in shaping communities of knowledge within landscape architecture and related professions.

This paper presents findings from website-based analytics identifying social and geographic topic hotspots within the fields of architecture, landscape architecture, urban design, and technology. Two surveys are utilized to record thousands of user’s topic interests and pin-point locations on a global scale. Topics include projects, research, visualization, sustainability, and competitions within architecture, landscape architecture, and urban design. Technology topics include software, research, visualization, and sustainability. The surveys also identify user locations, topics of interest, day and time of contact, social sharing, and user demographics.

Preliminary findings from the surveys suggest that:

- The social process of making meanings through social media exchanges of knowledge facilitates multi-centered geospatial social groupings according to topical interests.
- Similar social groups topical interests vary by geolocation suggesting place- based meaning formation
- Individual group members tend to respond to certain topics on certain days of the week and times of day suggesting optimal communication periods between social groups.
- Social user groups tend to grow and function organically according to their degree of social sharing.
- Growth in topical interest aligns most frequently with projects, technology, and video posting.
- Traditional groups of planners, architects, and landscape architects share degrees of common topical interests related to competitions, projects, and research topics.

## Fabricated Landscapes: Digital Fabrication in Landscape Architecture Education

**Sean Burkholder**, the Pennsylvania State University, USA, slb59@psu.edu

**Sarah Cowles**, The Ohio State University, USA, theworstperson@gmail.com

**Keywords:** digital fabrication, models, landscape process

Physical models are used by architects and landscape architects as a tool for exploration and representation. Yet conventional physical models of landscapes fail to convey the qualities or dynamic processes inherent within those landscapes. Duration, ecological processes and perception are elusive yet essential elements of landscape design. This paper will discuss the development of innovative, alternative modeling techniques that address the dynamic and ephemeral components of landscape design.

The practice of landscape architecture requires the integration of form and performance at a range of scales. In contrast to architecture, landscapes are inherently open systems. Ecological processes and physical form operate as concurrent forces as opposed to the sequential ones typically conveyed in architecture. Form equals function as opposed to form follows function.

State of the art digital tools for architecture and engineering are used by landscape architecture professionals, researchers, instructors and students. Yet the adoption of new techniques often lags many years behind allied disciplines. This delay may be attributed to the time that is necessary to “hack” or adapt these tools for use in landscape design. In particular, digital fabrication techniques and tools such as laser cutting, CNC routing and rapid prototyping have provided new opportunities to explore and convey the dynamic and ephemeral processes of landscape.

This paper will present the work of two landscape design courses held between 2010 and 2011 that explored the potential of digital fabrication as a means to represent dynamic processes in landscape. While connected topically, these two courses differed in pedagogy and outcomes. The first course focused on introducing students to a range of fabrication resources, providing a laboratory for exploration of digital tools and how they can be used to create accurate and compelling landscape representations of both physical and functional landscapes. The second focused on a deformation/disturbance of digitally fabricated models as a means to physically “work” the work of the ecological disturbance phases. These experiments provided a means to compare at a fine level of detail the formal and physical responses of ecosystems to anthropogenic disturbance.

The outlining of these two courses will serve as examples of how to integrate introductory instruction in digital fabrication as a means to explore and represent dynamic and ephemeral aspects of landscape design into site design studios and workshops, providing both instructors and students with tools and techniques for further exploration and research.



## Mapping Landscape as Process, and Inspiring the Ecological Imagination

**Cathleen Corlett**, University of Oregon, USA, cathleen.corlett@gmail.com

**Liska Chan**, University of Oregon, USA

**Keywords:** perception, ecological imagination, mapping, intuition, analogic thinking

“Our ability to perceive quality in nature begins as in art with the pretty. It expands through successive stages of the beautiful to values as yet uncaptured by language.” —Aldo Leopold “We shall require a substantially new manner of thinking if mankind is to survive.” —Albert Einstein

**Purpose** • This paper is about the potential impact of “values yet uncaptured by language” in ecological design education. Mapping landscape values through a lens of universal patterns, processes, and systems, human culture becomes inseparably part of the living flows of landscape ecology, inspiring a designed environment as integrated meta-organism, composed of networks, nested systems, cycles, and flows (Capra). Holistic understanding may inspire design responses simultaneously maximizing ecological, cultural and economic health.

**Background** • Our relationship to the earth is in crisis. Historical efforts to separate humankind from the infinite chaos of our environment showed early success, but nature, battling last, is demonstrating the long-term consequences of this false dichotomy. Interestingly, separation is culturally normalized, with academics in “silos”, and doctors in specialty clinics. A bias toward linear, sequential thinking and verbalization by the left brain hemisphere seems to prevent the non-verbal, artistic right hemisphere from affecting conscious thought (Edwards). Our brains themselves seem to prevent intuitive, holistic and analogic thinking from catalyzing a cultural adjustment to ecological reality (McGilchrist). For us, embracing “a substantially new manner of thinking” means activating the non-rational, artistic, analogy-loving, ecologically imaginative right hemisphere.

**Methods** • Since subtle environmental and social cues have a profound effect on subconscious motivations (Carey), we tried “priming” creative visualization, exploration and integration through various means (Corlett/Keeler). Visually-rich lectures portrayed systems as living processes, flows and networks, inspiring student posts to the organically growing course blog. Place-based interpretation of sites representing “successive stages of the beautiful” emphasized sensory experience and creative media, resulting in videos, 3-D assemblages, and an ice sculpture. Random teams supported grad-undergrad skills sharing, while an iterative/cumulative approach encouraged individual mastery of concepts. Students used collages, maps, diagrams and overlays to portray nested systems affecting the study sites at various scales.

**Findings and Importance** • Intuitive, relational thinking and embrace of ecological principles appear connected. Students’ visions for design couched in ecological systems naturally resulted from imaginative open-ended collaging and mapping. This demonstrates an important correspondence between holistic engagement in teaching and learning, and ecologically sound designs.

## Creating Community Through Charrettes

**Stephanie Rolley**, srolley@k-state.edu, **Jeremy Merrill**, jmerrill@ksu.edu, Kansas State University, USA  
**Kurt Culbertson**, Design Workshop, USA, kculbertson@designworkshop.com  
**Laurel McSherry**, Virginia Tech Alexandria Center, USA, aarmcsh@vt.edu

**Keywords:** charrette, community, design culture, process

This session presents three distinctive design charrette events used by academic landscape architecture programs to develop a culture of design and dialogue. Originating in the academic environment of the École des Beaux-Arts, today's charrettes are used regularly as a tool for communication between design professionals and stakeholders, sometimes including students (Lennertz and Lutzenhiser, 2006). Such charrettes are convened with the purpose of making decisions and determining outcomes. The intense work environment and compressed time frame of a charrette also can provide an excellent vehicle for creating community within design programs, convening for the process rather than specific outcomes.

Three programs involving landscape architecture students utilize charrette events to make connections within design communities:

Design Workshop's Design Week held at one university each year creates a link between practice and education, blurring the lines between practice and the Academy and using practice-based activities to connect students in new ways.

Virginia Tech's Washington-Alexandria Architecture Center's Annual Fall Material Competition. Traditionally, this competition asked interdisciplinary student teams to work in the medium of concrete. Most recently the faculty "changed up" the competition, asking individual students and student teams to try their hand at filmmaking.

Kansas State University's Design Days launches the academic year with an interdisciplinary event for students from landscape architecture and city planning that uses design to build new teams within the department as well as to reach out to disciplines outside of the college.

Tools engaged by these three events include team building, crowd sourcing, game theory, construction, making and film as well as a broad range of drawing and representation approaches. Outcomes range from conceptual to complete, targeted at communicating with one another and, in some cases, the public, student body or university administration. The community of design can shape new relationships within programs, departments and the university.

The panelists will present the origins; goals and objectives; tools and organizational strategies; and outcomes of established design charette events involving landscape architecture programs. Following 15 minute presentations by the panelists, discussion will allow audience members to share information about additional events.

## Evaluation of Current Applications of 3D Visualization Software in Landscape Architecture

**Jie Yan**, Utah State University, USA, j.yan@aggiemail.usu.edu

**Yang Bo**, Utah State University, USA, bo.yang@usu.edu

**Shujuan Li**, Utah State University, USA, shujuan.li@usu.edu

**Keywords:** Landscape visualization; 3D software; Survey

With the rapid development and widespread use of 3D software, an increasing amount of landscape architects are applying 3D technology to their projects in order to supplement their traditional 2D methods. This software can create visualizations that simplify complex and abstract information for clients. This type of software allows, and even insists, that landscape architects integrate other disciplines and the related information of those disciplines into their work. Because the information is available, landscape architects are held accountable for that information and are increasingly expected to use that information to inform and substantiate their work. Landscape architects are often expected to produce quantifiable substantiation that their designs will yield ecological, economic, and functional benefits. Some argue that the high cost and time investment needed for the use of 3D software is a significant deterrent for most designers and firms to use the software. However, little research has been performed to investigate the extent to which landscape architects have adopted 3D technology. In addition, even less is known about their opinions on the software's suitability for their professional needs.

A nationwide survey of current usage and future demand of 3D software will be conducted as a feasibility study for 3D visualization tools. A comprehensive questionnaire will be sent via email to two groups: (1) 4,789 landscape architecture firms registered with ASLA; (2) 82 university Landscape Architecture programs listed on the CELA website. The survey seeks to answer the following questions:

- What is the frequency of use of 3D software in the daily work of landscape architects?
- What are the benefits and challenges of using 3D software?
- In which types of work do landscape architects most often use 3D software?
- Do users of 3D software feel that it serves as an adequate communication medium between landscape architects and clients?
- What problems do users face with using 3D software?
- What is the potential future demand for 3D software?
- What improvements to 3D software teaching should be considered?

The opportunities and challenges of 3D technology and its potential for application in landscape architecture will be examined based on the finding from survey results. The results of the study can assist landscape architecture educators with curriculum development and may also influence future developments in 3D visualization software.

## Digital Monument: Memory and Memorialization Process Through Semi-Virtual Model of Sacred Landscape Environment, Case Study of Cedar Creek Battlefield, Virginia

Shamsul Abu Bakar, shunown@gmail.com, Mintai Kim, mintkim@gmail.com, Virginia Tech, USA

**Keywords:** Digital Monuments, Memorialization, Battlefield, Augmented-Reality

This paper examines the possibility of using mobile technology in recreating a historic landscape where the original landscape is significantly degraded, modified, or simply inaccessible due to ownership issues.

According to Sellers (2005), the process of creating and marking battlefields not only serves as part of the commemorative efforts, but also as an attempt to “impose an order on the past on landscape of conflict and confusion” (Sellers 2005). Through visual dialogue and interpretation, these features unconsciously ignite and facilitate visitors’ imagination to comprehend “relevant lessons learned from the battle.”

Over the last decade, mobile information technology (IT) has advanced to provide ways of representing historical information through personal mobile computing devices. Augmented Reality (AR) technology allows historic scenes, created from photographs and drawings, to be overlaid on the contemporary landscape when viewed through their mobile device. AR also allows users to easily navigate historic sites.

Cedar Creek Civil War battlefield has been added as a National Historic Park although little of historic landscape has survived the trial of time. Visitors to the site will not recognize any sign of the historic battle on a visual level. Collaborating with the National Park Service, we were able to document and reconstruct longitudinal environmental changes over the last three centuries, in addition to reconstruct a historic scene of the Cedar Creek Battle.

The reconstructed longitudinal landscape realized through AR helps viewers see historic changes over time, not just a snapshot of a specific period. The longitudinal landscape changes are difficult to represent without the aid of AR. The hope is that the digital monuments created by AR can help the public visualize and personally experience the human conflicts embedded within ‘inaccessible’ sacred spaces. Anyone with smartphones would be able to use the AR of the battle by simply downloading an application. Considering the rapid adoption of smartphones, particularly among younger demographics, AR can be a valuable learning tool.

Ultimately, AR technology has the potential to be used to represent designed space over existing landscapes showing longitudinal changes. This study demonstrates the potential of AR technology as a representational tool for landscape architects.



# **Design Education & Pedagogy**

## Landscape Architectural Strategies in Urban Revitalization / The Tejido Group in Panama

Mark Frederickson, University of Arizona / Tejido Group, USA, mpf@u.arizona.edu

**Keywords:** Apprenticeship Learning, International Community Outreach, Landscape Urbanism, Interdisciplinary Studio Education

Landscape Architectural Strategies in Urban Revitalization / the Tejido Group in Panama For the past twenty years the Tejido Group has developed into an interdisciplinary and collaborative applied research program in which faculty, students and professionals in Architecture, Landscape Architecture, Planning and Business Management collaborate in apprenticeship-style learning environments. Tejido is also a multi-cultural experience with projects throughout the United States, Latin America and the Middle-East. Over the years we have developed a series of interesting design and planning methodologies that seem to serve us well in the formation of sustainable urban fabric. As Tejido is inherently interdisciplinary in nature, we engage a range of design tools on any one project. But, in the formation of intelligent and versatile urban fabric, we have come to understand and embrace Landscape Architecture as an effective catalyst of consequential change in urban environments. Although our process inevitably varies from project to project, we find that in most complex planning endeavors, landscape architectural organizational criteria and sources of form prove quite effective as design tools.

We appreciate that a truly sustainable urban environment must necessarily be defined across an array of dimensions: economic, cultural, environmental, functional, and aesthetic. These “ordering systems” have in turn become a form of checklist deeply embedded in our design process, and we believe that an idea’s relevance and usefulness increases according to the number of different ordering systems that it engages.

In the summer of 2011, the Governor of Panama invited Tejido to develop an urban revitalization master plan for Avenida Central; a distressed 1 km urban corridor in Panama City. As the project evolved into a “sustainable urban living prototype” for the city, a unique learning environment emerged in which student participants began to recognize that they are in the process of acquiring an array of global professional skills capable of transforming urban fabric. As a result a shared sentiment began to surface that we are a part of something significant and enduring.

This presentation will introduce the purpose, processes and products of the Tejido Group, as well as discuss the often innovative and at times unpredictable, educational and professional outcomes. This will be accomplished primarily through review of the design processes and outcomes associated with project Avenida Central, post-project and post-graduation interviews with student participants, as well as discussion of our interdisciplinary strategies regarding collaborative dynamics among architects, landscape architects, Planners and Business Management participants.

## “I am thinking brand new thoughts”: Students’ impressions of active learning in a lecture-based Urban Planning course

**Katarzyna Gallo**, Mississippi State University, USA, kasia.gallo@gmail.com

**Rachel Cannady**, Mississippi State University, USA, rcannady@library.msstate.edu

**Keywords:** active learning, writing to learn

Much of landscape architecture education consists of assignment-based design studios and technical courses. Such teaching fosters critical thinking to a greater degree than traditional lecture-based teaching because it forces the students to analyze, evaluate, and create. These actions require higher order critical skills, which results in more learning (Bloom 1956). In contrast, lecture-based classes may or may not require students to use these skills.

Active learning, or “anything that involves students in doing things and thinking about the things they are doing” (Bonwell, Eison et al. 1991, p.2), promotes engagement with the material and successful learning. One active learning method is writing, including reflective, analytical, and creative. Reflective writing compels students to consider critically what they are learning. It allows the instructor to correct students’ misconceptions about the material, promote exploration of personal values and ethics, and allow for the development of professional identity. Analytical writing forces students to take a stand and provide the supporting arguments, a skill essential in their future careers. Creative writing requires making something new, thus engaging them at the highest levels of thinking and learning.

The interdisciplinary collaboration for this study involved a subject matter expert (the Urban Planning class instructor) and instructional design expert (Education Reference Librarian). The researchers intended to maximize student learning in a lecture-based class and to understand the students’ attitudes towards active learning.

A class of twenty-three students completed twenty-one various writing assignments throughout the semester. At the end of the semester, they filled out an anonymous IRB-approved survey containing multiple-choice (five point Likert items) and open-ended questions gauging their perceptions of the active learning techniques they experienced. The students felt that, in general, the writing assignments were a helpful teaching tool. The answers to the open-ended question regarding their perception of writing as a teaching tool contained overlapping themes. Students’ responses generally fit into the following categories: writing improved critical thinking, fostered deeper understanding of the subject, allowed for greater self-knowledge, writing improved writing, and writing increased clarity of thoughts. Most students listed more than one benefit. It is important to mention that the instructor did not describe the expected teaching outcomes; the students analyzed their experiences and stated their own conclusions.

As this data represents only a one-semester long pilot project, more research is needed to confirm the findings and streamline the course content to maximize learning for the students.



## Envisioning the Agricultural Landscape

Holly Grace Nelson, Rutgers, USA, hgrace@rci.rutgers.edu

**Keywords:** agriculture landscape landscape architecture mapping

What kind of future can agricultural education have in a land grant university located in an urbanized state? How do we engage students to learn about agricultural issues, and what role can landscape architecture play in this education? Land grant universities have historic ties to improving agriculture. This paper presents an undergraduate colloquium taught within the context of a School of Environmental and Biological Sciences at a Land Grant University. Although landscape architects are trained to look at complex issues through a multidisciplinary lens, exploration of agricultural landscapes by students from different disciplines provides a new platform for the appreciation of unrecognized connections as students apply knowledges from different fields to the topic. Learning objectives are to: introduce landscape as a product of complex interrelationships between the farmer, natural processes, and community; introduce critical thinking skills about connections between landscape structure and landscape use; provide a platform for informed debate about agricultural land.

The farm is the unit of study. The student learns to “read” the agricultural landscape by building upon Joan Nassauer’s work relating to landscape perception. Students use Lucy Lippard’s creative mapping techniques to create cognitive and thematic maps, visiting and documenting natural and human processes at New Jersey farms. Mapping exercises are a way to unleash creative thinking—to “make the complex accessible, the hidden visible, the unmappable mappable.” (Janet Abrams & Peter Hall, *Else/Where: Mapping*)

Students complete three different learning exercises. First, based on issues foregrounded by readings and faculty presentations, students create thematic maps that depict how natural and cultural systems are classified on different New Jersey farms. Second, students conduct interviews with farmers and produce cognitive maps representing the farmer’s perception of the landscape through its organization and use. In reconciling the two kinds of maps, the student compares and contrasts foregrounded human activities and user priorities with natural processes and landscape structure. Third, the thematic and cognitive maps are annotated in an atlas of contemporary New Jersey agriculture, documenting different farmers and different kinds of farms (agritourism, CSA, plant nursery, etc.).

The state of agriculture is poised for change. Firsthand knowledge of farms and farmers within the context of a dialogue expanded by lectures and documentaries prepares the student to see new possibilities for what agriculture might provide. Students demonstrate unconventional and creative ways to apply a design perspective to agriculture, confirming that learning objectives have been met.

## Finding Center Through Plein Air Drawing and Watercolor

**Brad Davis**, University of Georgia, USA, bdavis@uga.edu

**Keywords:** sketching, watercolor, observation, seeing, reflection-in-action

The tools used by design professionals to collect and synthesize information continue to change. Hand based methods of only forty years ago have been largely replaced by computer based tools. Today's college students have grown up with technology at their fingertips and design educators must often introduce hand based methods and help students understand the potential benefits of hand methods to both process and product (Lavoie, 2005).

This paper presents the results of a qualitative study of students enrolled in a new drawing and watercolor course for landscape architecture students. This elective course included graduate and undergraduate students who spent ten days camping, sketching, and learning watercolor in Jekyll Island, Georgia. Students were given a survey one semester after taking the course and were asked to answer reflective questions on the value of the course and whether the course had influenced their design process or product drawings. Roughly half of the students responded that they had used watercolor in subsequent studio work and reported greater confidence in overall drawing and graphic presentation ability. Students also reported having a deeper understanding of the need to "see" a site through careful on site observation and an appreciation for peer learning.

While watercolor is often viewed as "off-center" from mainstream landscape architectural graphics and curricula, many current software programs enable watercolor-like affects. A review of the graphics featured by firms around the globe reveals an enduring appreciation for watercolor renderings produced both in-house and by specialized consultants. The author of this paper posits that plein air drawing and watercolor can exert a powerful influence on later process and product drawings, enabling a deeper understanding of site, fluid process drawing, and elegant product drawings that communicate design ideas with a time investment similar to that of other graphic techniques. Other studies have shown that drawing facilitates analysis and interpretation in ways that written words and the camera miss (Byrd & Nelson, 1985; Lavoie, 2005). Watercolor may also aid the design student in becoming more comfortable with experimentation, risk taking, and reflection-in-action (Schon, 1988) through a low stakes plein air experience where process is highly valued and may be applied in subsequent design studios. Becoming facile at drawing and painting may foster more skilled and informed use of software programs. The precise sequence of hand and computer based coursework and field experience must be carefully considered by faculty educating today's design students.

## Wider Horizons of the American Landscape

Brian Davis, University of Virginia, USA, brd6eq@virginia.edu

**Keywords:** american landscape, frontier, borders, bigness

This presentation makes the argument that the American landscape is a unique hemispheric condition which shapes design intentions and larger cultural notions. Hemispheric studies offers a conceptual framework for considering South, Central and North America as a geopolitical entity wherein the geographies, economies, and societies are considered to share fundamental attributes and concerns. Building off the work of historian Herbert Eugene Bolton, I propose that a hemispheric approach should be developed for the pedagogy of landscape architecture in the United States. I will draw from the literature of American history, hemispheric studies, geography, archeology and landscape architecture to put forth the thesis that a hemispheric approach should be developed for landscape studies in the United States. While the traditional pedagogy and canon within landscape architecture emphasizes European and post-Central Park United States precedents this paper will sketch a framework that offers a methodology to bring pre-Columbian indigenous forms and precedents into the fold, as well as placing new emphasis on contemporary and historical South American projects as appropriate and important precedents for landscape design in the United States.

This thesis will be built on a comparative analysis of six points that are both geographical and social: the frontier concept, population size and distribution, land mass, number and size of large rivers, development and deployment of novel and adapted technologies, and wealth disparity among the population. This thesis will draw from the writings of 19th century politicians and scholars including Thomas Jefferson, Henry Clay, Simon Bolivar, and Benjamin Chew, 20th century American historian Herbert Eugene Bolton and technological historians such as David Nye, as well as texts on the theory and history landscape architectural practice in the Americas. A graphic synthesis of data from the USGS, census reports, and the USDA will be used to emphasize fundamental historical, geomorphological, and socio-political links throughout the Americas. Graphics will be presented which illustrate the above six points through comparative analysis, specifically the ways in which the points are similar throughout the Americas and fundamentally different in the European landscape. While the horizontal axis connecting the US and Europe dominates pedagogy in the United States, I propose that by integrating a vertical axis connecting South, Central, and North America into the theory and practice of landscape we might be better able to grapple with the social, economic, and environmental issues we now confront.

## Designer Ecologies: Linking design, ecology & aesthetics: A Synthesis Design Approach

Paul Russell, Clemson University, USA, russel5@clemson.edu

**Keywords:** design implementation ecology aesthetics

**Abstract:** This paper explores the concepts of designer ecologies and the integration of those concepts within a landscape architecture 5th year design studio employing a Synthesis Design Approach. Increasingly, landscape architecture curricula focuses on ethical aims grounded in ecological and environmental design. With this trend, the question arises; are basic design principles and aesthetics being reduced from the core of landscape architecture education. Corner suggests that this reduction is occurring and as a result, “there is in effect a loss of foundational traditions, especially landscape architecture’s agency as a representational and productive art, as a cultural product”. Through examples of student work this paper addresses how to effectively develop an approach, which explicitly links the ideas and principles of design, ecology and aesthetics. This strategy synthesizes aesthetic design considerations and ethical values, as they relate to ecology and environment, as a way to critically engage and resolve complex design challenges with solutions grounded in both design principles and ecological values.

The Synthesis Design Approach is a design strategy, which makes an explicit link between design, ecology, and aesthetics. This strategy recognizes ethical value and aesthetic consideration not as isolated concepts, but rather, considers each as equally contributing components within a series of critical analyses and an iterative process. The site design studio allows the flexibility to explore ideas of ecology, design and aesthetics with a focus and attention to detail that tends to be overlooked in studios with a focus on larger scales. Case studio examples of student work from a site design course will be reviewed to assess the effectiveness of the synthesis design approach as a strategy for teaching design, ecology, and aesthetics as cooperative ideas within landscape architecture education.

## Alternative Verbal Feedback and Student Emotions in the Landscape Architecture Studio

**Carl Smith**, University of Arkansas, USA, cas002@uark.edu

**Mark Boyer**, University of Arkansas, USA, mboyer@uark.edu

**Keywords:** Landscape architecture students; verbal feedback; emotional phenomena

This presentation provides an update and expansion of our research findings, as first presented in pilot form at CELA 2010 (Smith & Boyer, 2010). Design studios uniquely affect teaching and learning environments; the creative nature of design can give rise to strong emotions in students, particularly during critiques. The manner in which feedback is delivered can have a profound effect on student well being. Thus, the authors have moved towards a mentor/trainee approach whereby landscape architecture students are provided with one-to-one discussion/grading sessions with their instructor in addendum to, or as a partial replacement for, the traditional desk and final jury crits. This presentation outlines eighty-two undergraduate landscape architecture students' experiences gathered over four semesters. The study suggests an overwhelming positive student experience of mentor/trainee verbal feedback approaches, indicating that they should experience greater use in landscape architecture programs. Importantly, students valued these sessions irrespective of any negative emotions generated towards the instructor during the preceding class. Nevertheless, avoidance of negative student/instructor relations during class time is obviously important for morale and the overall student experience. Therefore, our work also investigated the relationship between students' feelings of negativity towards their instructor and the relative levels of intuitive and rational thought they employed to complete their work. It was hypothesized that intuitive thought is more prevalent in design studios compared with technical construction projects, and that the former would therefore be associated with increased emotional investment and jeopardy, and greater risk of inculcating negativity toward the instructor. However, we could not find evidence to either support or dismiss this hypothesis. Instead we observed students reporting a narrow range of similarly high levels of both intuitive and rational thought in all classes. Our findings suggest that intuitive thought and its attendant emotional investment may be experienced in highly technical landscape construction project, as well as in more obviously 'high-design' studio projects. The further take-away for praxis, therefore, is instructors' efforts to provide nurturing and support to balance criticism and challenge could well be important to student emotional well being across the landscape architectural curriculum.

## Networked Knowledge: Where good ideas come from

**Ryan Hargrove**, University of Kentucky, USA, ryan.hargrove@uky.edu

**Keywords:** pedagogy, creativity, metacognition, schema

This paper will address one of the most important questions in creative culture: Where do good ideas come from? It is a question of intrinsic interest for all design educators. We want our students to be more creative, we want them to come up with better ideas, and we want their design solutions to be more innovative. In this paper I look at this problem from a cognitive perspective. How can we build in students the capacity to increase levels of creativity and innovation?

In answering this question I will demonstrate a pedagogical process to foster students' ability to collect, combine and transform knowledge to make unique solutions to complex problems. This paper captures something we all understand on a deep, intuitive level, but our creative egos don't really want to accept: that ideas are born out of the myriad pieces of stuff populating our memories, our knowledge base, our mental pool of inspiration and resources, and creativity is simply the capacity to put those together in incredible new ways. A belief that the most dramatic results happen when ideas are combined and that by connecting ideas together, creative leaps can be made.

A combinatorial perspective allows us to model creativity as a search process through the space of possible combinations. This paper will examine current practices being utilized to develop the skill of association in a newly developed creative thinking course for students of all disciplines at the University of Kentucky. The goal is to help students become metacognitive thinkers with the ability to access and develop rich mental structures, or schema, in an effort to make new connections leading to creative solutions. This paper will present examples of course content, student work, and ongoing research findings to demonstrate the effectiveness of this combinatorial approach in enhancing students' creative thinking abilities.

From an educational standpoint this course highlights the importance of networked knowledge. The idea that in order for us to truly create and contribute we have to be able to connect countless dots, to cross-pollinate ideas from a wealth of disciplines, to combine and recombine these pieces and build new solutions. The goal is to help students not only recognize the absolute value of content but also its relational value, the value not just of information itself but also of information architecture, and ultimately to educate them on what it takes to be creative.

## American Pragmatism Meets European Modernism: John Dewey, Josef Albers, and Their Influence on Contemporary Design Education

**Carter Crawford**, carter\_crawford@ncsu.edu, **Arthur Rice**, art\_rice@ncsu.edu, North Carolina State University College of Design, USA

**Keywords:** pragmatism, modernism, design education, dewey, albers

The goal of this paper (part of a larger effort) is to explore the connection between American Pragmatism, Constructivist education theory, and design education, particularly in the discipline of landscape architecture. From its genesis with the efforts of Pragmatist philosopher John Dewey, and continuing today, Constructivism has been a central theory and point of discussion in the field of education. Constructivism emphasizes: learners building their own knowledge; social interaction among learners; self-regulation and metacognition; and the relationship of curricular content to students' experience outside the classroom.

The studio system in design school allows and requires that students find their own paths, that they work together, that they understand their unique design processes, and that they both draw on their own life experience and project themselves forward into their creative futures. In other words, the means of educating future designers is remarkably similar to the program described by Constructivist theory. The central questions are: Why is this so? How did it happen?

Specifically, the work explores the relationship between the philosophy of Dewey and the teaching methods of Josef Albers after his immigration to the United States in 1933. Albers spent thirteen years as a student and teacher at the Bauhaus, and within a few months of its dissolution, he was on the faculty of Black Mountain College (an experimental school deeply influenced by Dewey's thinking) in North Carolina. Albers was at Black Mountain for fifteen years; he then became chair of the Yale Design department. "The rejection of top-down learning, the promotion of shared learning experiences, an openness to the new, education as problem-solving: these qualities characterize art education virtually everywhere today, and can be traced back directly to Albers's beliefs and teaching practices" (Horowitz, 2006). Why and how did the intersection of American Pragmatism and European Modernism at Black Mountain affect that legacy?

The research involves the examination and interpretation of archival documents in North Carolina, Connecticut, and Illinois. The interpretation requires the methods of hermeneutics, whereby the context in which the document was produced, the mindset of the intended audience, and the detail of the passage are considered in a circular process that leads to useful understanding. Preliminary findings indicate an epistemological resonance between Dewey and Albers that has not previously been explored. This work is important in that it establishes a foundation for broader and deeper knowledge of the history of design education and its philosophical roots.

## The Creative Classroom: Exploring the Relationship Between Reflective Practice and Creativity

**Ryan Hargrove**, University of Kentucky, USA, ryan.hargrove@uky.edu

**Louis Johnson**, Urban Collage, USA, Louis.Johnson@urbancollage.com

**Keywords:** pedagogy, creativity, metacognition, reflection

This poster will illustrate a series of educational practices developed as a part of a newly developed creative thinking course for design students. Why are some people more creative than others? Is it possible to teach creativity? How do you develop creative skill sets? This type of questioning drives the content of this course. Although the questions are not new, our understanding of these questions continues to change as research into creative thinking as a multidisciplinary field of study evolves.

The course also focuses on being mindful of our own thinking processes. Self-awareness is the key to this. Creative thinkers are often self-regulated thinkers and have a flexibility of thought to make choices based on their own experiences and the experiences of others. Rather than reacting purely from a place of emotion, creative individuals are reflective and utilize knowledge based on both past success and failure. This reflective ability is primarily linked to our level of metacognition and influences the ability to think creatively.

The course includes a wide variety of interdisciplinary projects and activities with extended learner outcomes. Direct instruction in creative thinking strategies, problem solving skills and inquiry models are provided. A variety of student outcomes are developed that synthesize the concepts presented and the information gained from this course. Project examples that will be highlighted include design thought models, creative blockbusters, self-reflective essays, oral presentations and multimedia creations. Results from preliminary research findings will also be used to demonstrate the success of the course in developing students' creative abilities.

Tomorrow's decision makers must use a variety of thinking styles, methodologies and creative processes. Students can learn to develop their skills as creative thinkers and problem solvers by leveraging their personal thinking processes using tools and techniques based on cutting-edge research. Having an awareness and understanding of our thought processes, ideas, beliefs and experiences in a way that both informs, engages and inspires is at the heart of and vital for our continued personal and professional development in today's competitive world.



## Pilot studio: Sound, Landscapes, and their Reciprocal Design

**Brenda Brown**, University of Manitoba, Canada, brownb@cc.umanitoba.ca

**Keywords:** landscape architecture studio, sound, landscape architecture, design

In *The Soundscape: Our Sonic Environment and the Tuning of the World*, first published in 1977, R. Murray Schafer called for a new interdisciplinary acoustic design to address our sonic environment, design—like other environmental design—made urgent by humans’ pervasive influence on the planet. Today the word soundscape is commonplace; books and articles have been published on the soundscapes of other times and places; recordings of exotic and everyday landscapes are part of music compositions. However, the design approach Schafer advocated remains underdeveloped, particularly in landscape architecture where its lack may stem from the profession’s emphasis on visual communication. In landscape architecture education, considerations of sound (if they occur) are typically limited to strategies to mitigate noise such as the masking afforded by flowing water. Meanwhile, design decisions regarding such things as context, composition, topography, plants, and hardscape materials can strongly affect sonic experience.

This presentation’s purpose is to raise awareness of this lack, present one multi-pronged effort to address it, and stimulate further discussion and similarly-minded efforts. Its focus is a master’s level studio course on sound, landscapes, their interactions, their reciprocal influences, and their potential integration in design. Pedagogical methods, resources, and design results are reviewed. The design sites were located on a rural property of a musician, composer, conductor and retired professor in Elkader, Iowa who acted as quasi teacher, client and collaborator for the project. Due to his interest in native plant communities as well as sound, concern for sound converged with landscape restoration. Cornelia Mutel’s *The Emerald Horizon* and Schafer’s book were required reading. Besides two field trips to Elkader there were in situ observations, documentations and representations of sounds in of local landscapes. These along with pertinent musical compositions were reviewed and discussed. Students were charged to design interventions to increase visitors’ awareness of relationships and interactions of sound and landscape and address landscape restoration, ideally in a way supporting the sound aspects of the design. Within these constraints there was considerable flexibility and experimentation. Each student chose her own site.

In this talk, resources, studies, documentations, and selected final design projects are presented and discussed. Students’ evaluations at the course’s end and one and a half years later are also considered. These augment and balance a general impression of students’ enthusiasm for the course. Sensitivity to landscape sound increased, but emphasizing sound also illuminated other design considerations.

## A Mirror to Practice—Landscape Studio Education at Tsinghua University, China

**Xiaodi Zheng**, Tsinghua University, China, xiaodister@gmail.com

**Keywords:** Landscape studio, Education, China, Tsinghua University, Design, Planning

**Purpose:** This paper reflects on the three design studios held in the Landscape Program at Tsinghua University in Beijing, China, and examines values and current status of landscape practice expressed in the studio set-up, teaching methods and pedagogy.

**Background:** Landscape education has boomed in China in recent years. Statistics show that the number of undergraduate landscape programs increase at an average of 14% annually in the past 12 years, while graduate programs increase at 20%. This trend reflects the large market in China's landscape practice realm and a surging need for trained professionals. As one of the top universities in China, Tsinghua University established its current Landscape Department in 2003 with Laurie Olin as the first Chair. Referenced upon several landscape programs in the US, design studios are designated as the core course in Tsinghua's Landscape curriculum, rather than thesis as in the majority of Chinese universities. A three-tier studio system was set up, ranging from undergraduate site design, graduate urban landscape design, to graduate regional landscape planning.

**Methods:** Being the only studio instructor who participated in teaching all three studios in the academic year of 2010-2011, the author gained an in-depth insight of the studios' pedagogy, their success and lessons, as well as their connections with the practice realm in China. These observations are complemented by conversations with other faculty members, and feedback from the students.

**Findings:** Hot topics and challenges in real world often become studio subjects at school. In turn, the way studios are taught and obstacles students encounter can reflect core values in current practice, as well as what is missing or needs to be improved.

The following aspects are observed:

- 1, Large-scale landscape projects have become an important body of work in China, which require comprehensive knowledge of various disciplines.
- 2, It has been a challenge for some students to learn how to read a site, to ask the right questions and to build up a vision. Because of rushed schedule in China, many projects are not rooted to their specific site conditions.
- 3, Design challenges can be shared among countries. International workshops provide students with a broad vision, and an ability to observe and to deal with unfamiliar situations. Importance: Students are future professionals who will be shaping our landscapes and environments. It is critical to be aware of what the challenges they will face are, and what is missing in their current training.

## **CED-ICPI: Innovative Online Tools for Teaching Place-making, Environmental Approaches, and Technical Expertise in Landscape Architecture**

**Douglas Pardue**, pardue@uga.edu, **Stuart Jones**, 12smj@uga.edu, **Daniel Nadenicek**, dnadeni@uga.edu, University of Georgia, USA

**Andrew Fox**, North Carolina State University, USA, andrew\_fox@ncsu.edu

**David Smith**, Interlocking Concrete Pavement Institute, USA, dsmith@icpi.org

**Keywords:** Multimedia learning, public private partnerships, online curriculum, segmenting principle, animation and interactivity

Through a grant sponsored by a non-profit institution for pavements, a university college of design has developed a collaborative online curriculum to provide landscape architecture students and educators with materials on place making, environmental approaches, and technical knowledge using concrete pavements. The site draws on several multimedia principles to provide a diverse set of modes for exploring site content, including self-guided presentations, interactive animations, and a growing library of studio projects and completed work that spans concept to construction.

Faculty are encouraged to use the site's studio project templates to supplement existing curricula, as well as provide new projects. Students are encouraged to explore articles, presentations, and animations as well as complete and upload studio projects. For both faculty and students, the site may be explored linearly, through suggested routes that link presentations to animations and studio projects, or a la carte, through targeted interests and needs. The site's open nature allows it to continuously share faculty and student projects, articles, presentations, and research, thus keeping the site current and helping it to grow more robust over time.

A panel of academic, institutional partners, and project team members will discuss the site's development and structure, application potentials for students and faculty, and lessons learned in creating and populating the site and curriculum. Each panel member will present a different angle of the process. A University administrator will provide a perspective on the role that public private partnerships can play in advancing the University's mission. An Institutional partner will discuss how academic research complements professional objectives. The principle investigator of the grant will illuminate the process of balancing subject matter and content delivery. An academic partner will give an overview of the incorporation of studio methods into the curriculum. A graduate assistant developer will share experiences of meshing initial objectives with the realities of technology and future potentials.

## Collaborative Design Studios: Creative Endeavor or Exercise in Frustration?

Melissa Currie, Texas Tech University, USA, melissa.currie@ttu.edu

**Keywords:** interdisciplinary; collaboration; design; studio; landscape; architecture; interior

Collaborate is defined as, “to work jointly with others or together especially in an intellectual endeavor;” or “to cooperate with or willingly assist an enemy of one’s country and especially an occupying force” (Merriam-Webster online dictionary), or “to cooperate traitorously with an enemy” (New Oxford American Dictionary). In this light, collaboration is, indeed, working together but with the possibility of producing two very different results. One collaborative effort brings about a creative, positive experience while another is viewed as an act of treachery! Does the collaborative studio in higher education serve to bridge the gap that often exists between the design disciplines, or does it only deepen the chasm? Interdisciplinary studios have been used to explore the intersections of design fields that have often been described as territorial (Mendoza et. al. 2007). In this study, the experiences of three collaborative studios, at two different universities, involving faculty and students from landscape architecture, architecture and interior design, are examined. All studios engaged outside professional consultants who advised and reviewed student progress throughout the semester. In all three experiences, students worked in interdisciplinary teams to produce an original design solution in a highly urban context. The projects followed a similar development progression through conceptual, preliminary, and final design phases. Teams were formed in two ways—either by the students themselves, or chosen by the faculty. The student-selected teams were somewhat arbitrary, as the students did not know those from disciplines outside their own. The faculty-appointed teams were assembled using Myers-Briggs personality-types assessment, combined with performance evaluation, in an attempt to create balanced teams. At the second university, students completed peer evaluations for each member of their team at the end of the semester, the results of which were used in computing final grade averages. These evaluations rated such things as attitude, dependability, technical contribution, and professionalism. Both universities viewed the collaborative studio as a unique opportunity to afford a diverse learning environment in design education that mimics the interdisciplinary nature of professional practice. Valuable lessons can be learned from these collaborative studio experiences as seen from the perspectives of both student and faculty. This paper discusses such lessons and the developed strategies that can lead to a creative, intellectual endeavor, and identifies those which tend to travel a path riddled with minefields and dysfunction.

## The effects and assessment benefits of digital “mastery quizzes” on student performance in site engineering

Kyle Beidler, Chatham University, USA, kbeidler@chatham.edu

Lauren Panton, Chatham University, USA, LPanton@Chatham.edu

**Keywords:** Mastery quizzing, site engineering pedagogy, assessment and learning strategies

The comprehension and execution of site engineering concepts typically present a significant challenge for many students in landscape architecture programs. This material and the associated techniques remain problematic beyond the academic setting, as demonstrated by the low passing rates of the grading, drainage, and stormwater management section of the L.A.R.E. licensing exam (CLARB 2011). Recently, educators have begun to develop innovative digital techniques in the classroom studio setting with the goal of increasing student comprehension (Li 2007).

One method of signaling key concepts and focusing student attention is to implement “mastery quizzing” in the classroom. A mastery quiz is a “miniquiz” given at the start and end of a lecture period to emphasize key lecture concepts and provide an incentive for focused attention and punctual attendance (Nevid and Mahon 2009). Mastery quizzes have been shown to significantly improve student knowledge of the targeted content and increase student performance on final examinations (ibid, 31). In addition, online chapter quizzes have been related to better exam and course performance (Johnson and Kiviniemi 2009, 36). Pre- and post-mastery quizzes also generate valuable assessment data and indicate to the instructor if additional review of the targeted concepts is needed.

This presentation will describe and discuss the results of implementing mastery quizzing in a digital format in the context of a landscape architecture site engineering course. Specific emphasis is placed on the use of digital mastery quizzes as assessment tools that are capable of facilitating student learning. Additional benefits include increased grading efficiency which provides students with immediate feedback and allows for potential “back channel” communication. This form of digital communication can promote the discussion of the targeted concepts within the classroom. As such, digital mastery quizzes are presented as an effective two-way teaching and learning strategy, as opposed to a simple one-way monitoring tool.

## A Slow Reading: A site inquiry over four seasons

**Katya Crawford**, University of New Mexico, School of Architecture and Planning, USA,  
katyac@unm.edu

**Keywords:** site analysis, representation, phenomenology, design process

This paper critically examines the notion of a “slow reading” of a specific site in an era defined by speed and constant technological stimuli. As students, instructors and design practitioners of the built environment we have an acute responsibility to know a place before proposing a design. This getting-to-know phase typically falls under site analysis, the beginning stage in the design process. Unfortunately, little time (in school and in practice) is traditionally given to this phase of design.

This paper explores two methods of obtaining a deeper understanding of a place through the critical element of time. The first is through a rigorous commitment to physical and mental presence within the site over an extended period of time, and demonstrates how simple tools (pen, paper, camera) turn passive observation into active engagement. The second explores how representational methods of the site can extend the process of discovery and knowing. The work product from this investigation culminated in a public exhibition in which the author manipulated two-dimensional photographs into 3-dimensional space through cutting, folding, projecting and recessing. The three-dimensional manipulation transforms the passive act of documentation to the active act of synthesis and interpretation. Mounted on translucent Plexiglass, the photographs change throughout the day with the movement of the sun.

Over four seasons the author observed, documented and interpreted (through writing, photography and film) a vernacular landscape on the southern edge of Albuquerque, New Mexico. The research from this work challenges traditional site analysis and modes of representation within the discipline of landscape architecture. The paper posits that a deeper, phenomenological understanding of site must include the simple, precious element of time.

## LAAB's 2010 Assessment Mandate: How to Integrate into Landscape Architecture Curriculum and the SER Process

**Claudia Goetz Phillips**, Philadelphia University, USA, phillipsc@philau.edu

**Mary Myers**, Temple University, USA, mary.myers@temple.edu

**Ron Leighton**, LAAB, USA, rleighton@asla.org

**M. Elen Deming**, University of Illinois at Urbana-Champaign, USA, medeming@illinois.edu

**Keywords:** assessment, accreditation

In 2010, the Landscape Architecture Accreditation Board (LAAB) disseminated its new guidelines to be used by current accredited programs and in-process programs in landscape architecture. Assessment is now a major component of the LAAB accreditation process.

The Higher Learning Commission has identified five fundamental questions for institutions to use in discussing and defining assessment:

- How are your stated student learning outcomes appropriate to your mission, programs, and degrees?
- What evidence do you have that students achieve your stated learning outcomes?
- In what ways do you analyze and use evidence of student learning?
- How do you ensure shared responsibility for assessment of student learning?
- How do you evaluate and improve the effectiveness of your efforts to assess and improve student learning?

Further, various academics have discussed several types of assessment: “Assessment for Learning” and “Assessment as Learning.” Assessment for Learning—active from instructor’s point of view; passive from perspective of student—turns the classroom assessment process and its results into an instructional intervention designed to increase, not merely monitor, student learning. Assessment as learning—active from both instructor’s and student’s perspective—begins as students become aware of the goals of instruction and the criteria for performance; involves goal-setting, monitoring progress, and reflecting on results; implies student ownership and responsibility for moving his or her thinking forward (metacognition); and occurs throughout the learning process.

The panel will discuss (1) the LAAB assessment mandate as a key component of the accreditation process (purpose and expected outcomes); (2) assessment goals from the University and College/School perspective; (3) assessment process at the program or departmental level (purpose and expected outcomes); as well as theory behind various assessment strategies. Examples of assessment tools, including various rubrics, will be presented for design studios, technical courses, and lecture courses.

## Finding a center for universal design

**Carla Radoslovich Delcambre**, North Carolina State University, USA,  
carla\_delcambre@ncsu.edu

**Keywords:** Immobility, Aging, Disabled, Accessible Routes

Landscape architects practicing in the United States need to design spaces to accommodate the visually or hearing impaired, a mobility impairment, or someone with a temporary physical injury. All these conditions render unique perceptions within one landscape. Consider for instance the gradient challenges parents face when pushing young children in strollers and mobility issues for aging adults who have difficulty walking as a function of reduced strength in arms, hands and legs. The elderly and the disabled are populations most obvious, but consider other site users which include young children, our growing obese population, skateboarders and bikers. All are searching for the quickest, yet safest route to their desired destination. Many individuals are unable to independently obtain access to the landscape because of barriers. Barriers in the landscape include steep slopes, stairs, uneven surfaces which are not wheelchair-negotiable and misplaced light poles or bollards which create obstacles undetected by a cane. The concept of "Universal Design" has emerged to help designers in the United States address issues of concern to the widest possible range of individuals without segregating different users. 1 Time-Savers Standards for Landscape Architecture p. 240-2. This paper will identify design strategies used in an advanced landscape architecture studio at North Carolina State University. With a pencil down, hands on approach, our students roll and hop through an inaccessible journey on campus the first day of class. With borrowed wheelchairs, crutches, walkers and eye patches from Rex Hospital Rehabilitation Center and bulky jackets, ankle weights and obesity suits from Center for Universal Design at North Carolina State University, our landscape architecture students begin to understand the complexity and the need to plan accessible routes within design parameters. What is the experience getting to a destination in a wheelchair versus crutches versus walking? What is the experience when pushing a stroller or riding a bike? Navigating through tight, walled in ramps, steep cross-slopes and cracked pavement is a safety concern for all users. The students are asked to document their findings through a series of black and white sketches, photographs and videos. It has been 20 years since the Americans with Disabilities Act passed. This paper will also evaluate the way landscapes have changed in the United States since 1990 and review global efforts to make universal design feasible in emerging landscapes overseas.



## Take me there: Situated cognition and virtual tours in landscape architecture history curricula

**Benjamin H. George, MLA**, Utah State University, USA, b.h.g@aggiemail.usu.edu

**Sean E. Michael, PhD**, Utah State University, USA, Sean.michael@usu.edu

**Keywords:** Landscape Architecture History, Constructivism, Situated Cognition, Virtual Tours

In the broader field of education, recent decades have witnessed an increased use of constructivist theory in higher education pedagogy, which suggests that learning is not a passive experience, but that learners actively construct and re-construct their understanding as a result of their experiences (Perkins, 2004; Dewey, 1966; Piaget, 1973). Closely related concepts from situated cognition theory assert that learning happens best in authentic situations, in which the learner experiences subject matter in its proper contextual setting (Brown, Collins & Duguid, 1989). Despite these advances in educational theory, the history of landscape architecture is often taught in a passive and decontextualized environment, reliant upon traditional pedagogical methods such as lecture-based classes and the use of required textbooks (Michael, 2007). This article describes the construction and use of virtual tours of historic European gardens in teaching landscape architecture history, comparing delivery in a face-to-face and an on-line setting. Each virtual tour constitutes a case-based learning element designed around constructivist and situated cognition theory by which students learn through manipulating the virtual tour to access the learning content. The virtual tour provides the learner with an opportunity to internalize the subject matter in a media-rich, contextualized setting, including high-fidelity images, sound and video. Additionally, while pedagogical scaffolding exists throughout each virtual tour, students have control over how they interact with the historic site and learning content. This exploratory component, combined with the student's physical ability to manipulate the virtual world, should lead to increased learning motivation and a better understanding of the historical concepts (James, Humphrey & Goodale, 2001; Guthrie, et al., 2004). Session participants will engage in discussion relating to this approach to teaching landscape architecture history courses.

## Applying Teaching Methods from the Education Classroom to the Landscape Architecture Classroom

Joshua Beblo, Chatham University, USA, jbeblo@chatham.edu

**Keywords:** learning outcomes, teaching methods, curriculum design

Effective instruction in landscape architecture is more than simply a result of experience in professional practice; it is a skill intentionally developed to understand more than what to teach, but how to teach the knowledge specific to the profession. This paper discusses the application of pedagogical methods and practices from the education profession to several, graduate, landscape architecture classes taught at Chatham University. The paper proposes that methods used to teach individuals, who are pursuing primary or secondary teaching certification, how to establish a class can contribute to the collegiate level of instruction. The paper describes the development of two, graduate, landscape architecture classes (planting design and professional practice) and includes the organization of the course framework, selection of readings, implementation of exercises to actively engage the students, and analysis of assessment and evaluation techniques. The courses were developed and taught by an adjunct faculty member who was concurrently enrolled in a Master of Science in Educational Studies program at another university. Development of the courses began with rewriting the learning outcomes, which guided the course activities and assessment, and writing grading rubrics, which clearly described the evaluations used throughout the course. Using personal experience as a student and previous course documents as the foundation, the courses were modified to include teaching methods not previously used. By implementing several teaching methods like: representing-to-learn, classroom workshops, reflective assessment, and integrative units into the activities, students were able to meet the course goals through a variety of ways that more closely aligned to their interests and abilities. The students were aware of the instructor's desire to implement new methods, were informed when one was going to be implemented and why, and were asked for their comments afterwards regarding its success. The paper concludes that the collegiate teaching of landscape architecture can be enriched through the application of methods and practices from the education profession. This understanding is based on guidance received in the education classes, observations made during class, and students' verbal and written reactions to the activities. The goal of the paper is to suggest that many established teaching methods from the field of education can be applied to the teaching of landscape architecture.

## Geodesign in Landscape Architecture and Planning Education

**Elizabeth Scott**, The University of Arizona, USA, [eascott@email.arizona.edu](mailto:eascott@email.arizona.edu)

**Karen C. Hanna**, California State Polytechnic University, Pomona, USA,  
[kchanna@csupomona.edu](mailto:kchanna@csupomona.edu)

**Keywords:** Geodesign, GIS, design pedagogy, geospatial technology

Changes in landscape architecture practice are not always in sync with changes in landscape architecture curriculum. Technology commonly influences the way that trends in our discipline are incorporated into education and professional practice (Tai, 2003). One emerging area of practice that relies on recent technological advances is geodesign, the use of geographic information systems (GIS) and related tools in design and planning. As defined in recent symposia on the topic, geodesign “is a design and planning method which tightly couples the creation of design proposals with impact simulations informed by geographic contexts” using new tools and methods integrated into geographic information systems (Flaxman, 2010). While it is clear that the technical capability exists to test design ideas in real time, with feedback from an array of geospatial data, it is not clear how broadly applied this capability is in practice, nor whether it is being taught in professional landscape architecture and planning programs. In 2011, a survey was developed to: 1) determine the extent to which GIS is currently incorporated into professional landscape architecture and planning curricula, 2) understand how GIS is being used in these programs and in scholarly work outside of the classroom; and 3) to determine what types of institutional support and/or deterrents affect the use of GIS in design and planning programs. The survey [was] distributed to over 200 accredited programs of landscape architecture and planning in North America. [Preliminary] results show that the analysis tools available in GIS are widely recognized as useful additions to professional practice, but the study of GIS is not universally required in either undergraduate or graduate landscape architecture and planning programs. Further, descriptions of the types of courses and scholarly work that makes use of GIS suggest that the geodesign capabilities of geospatial technologies are not typically recognized as design tools, as opposed to strictly analysis tools. A confounding factor may be that the geodesign is not widely recognized as a distinct approach to design, and there is lingering confusion about how it differs from traditional design and planning methods.

## Large urban systems in a remote location: An exercise in mapping

**Carlos Licon**, Utah State University, USA, carlos.licon@usu.edu

**Caroline Lavoie**, Utah State University, USA, caroline.lavoie@usu.edu

**Keywords:** mapping; metropolitan systems; representation

Studio projects offer students opportunities to shape and test their approach to design. These challenges require increasing knowledge and skills to address complex situations, which prepare them to develop insightful, creative, and informed design approaches. This paper presents the case of a studio project where students in Utah had to structure and map their understanding and conclusions regarding possible interventions in a large urban area in Monterrey, Northern Mexico. As the final studio course for senior students, the idea was to offer them an exercise to make them more aware of their own design process. The studio worked on the integration of urban systems at the metropolitan scale and the representation of findings through mapped concepts. Building connections among systems presented the students with a unique creative challenge, especially at such a large scale, to define their own understanding of relevant issues to address.

The studio process was structured in three main phases: mapping, representation and intervention. Mapping exercises and lectures helped capture available information and required students to establish a common graphic language to represent what they learned about the place. Through representation students focused on how to integrate mapped information and construct a design statement. Intervention required to frame their analysis and conclusions delineating an intervention in a more prescriptive statement, which needed to be mapped as well.

During studio sessions, students soon realized the need to summarize and represent their ideas and conclusions, so not to lose grasp of the topic due to the large scale and the remote location. Cultural and physical distance with the site offered a variety of challenges that made the students reflect on their own approach to design and planning. Final works were classified in three main areas: the ones dealing with the physical and formal aspects of the place, those identifying a single issue and describing its association with the urban form, and those selecting a non-formal characteristic or a specific place and representing it.

## Student-led Professional Practice Course offerings

**Elizabeth Tofte**, Utah State University, USA, elizabeth.tofte@usu.edu

**Keywords:** Professional Practice course content, trends in Pro Practice, Professional Career Tracks

**Purpose:** The topic of this poster is in keeping with the theme Finding Center. This poster will track what is central in the minds of upper division landscape architecture students in terms of their educational focus and ultimate professional goals. The poster will report students' interest in new trends that may result in them being required to gain additional skills to address from innovative specialty practices.

**Background:** This study was inspired by research conducted for the revision and publication of *The Professional Practice of Landscape Architecture* by Walter Rogers and research conducted by Judy Brittenum, et. al., for The American Society of Landscape Architects and presented at the annual meeting of the Council of Educators in Landscape Architecture, 2011.

**Methods:** Students completing a 1 credit course in professional practice were asked to describe their preferred professional career track. In narrative form, they described the personal decisions they were making regarding future course work, internships, advanced schooling, timing of licensure, and professional specialties. The act of writing allowed students to discover new career possibilities based on their personal interests. Key words were used to code the narratives. Students then participated in focus groups centered on key word concepts. Some students were able to develop deeper understanding of how their own professional interests relate to professional career tracks described in Roger's revised textbook. Other students held interests outside traditional landscape architecture. During the focus group sessions, both sets of students were able to explore their professional interests and compare them to trends in the profession.

**Findings:** This study provides insight into what upper division students consider as relevant career opportunities while contrasting their career choices with those suggested in Rogers' revised text.

**Importance:** The recent publication of Walter Rogers', *The Professional Practice of Landscape Architecture: A Complete Guide to Starting and Running Your Own Firm*, 2nd ed., provides updated information about many types of practice. However, information in this textbook must be tested by its intended audience—the students. The results of this study provide a better understanding of types of career tracks that interest students. This is important because students are future practitioners of landscape architecture. Knowing students' career preferences is valuable as a pedagogical tool. It allows educators to design illustrations and use students' preferences as a way to engage them in the learning process.

## Disturbing the System: Retooling Disciplinarity in the Education of a Landscape Architect

**Kristi Dykema Cheramie**, kdykema@lsu.edu, **Brett Davis**, cbdavis4@gmail.com, Robert Reich School of Landscape Architecture, Louisiana State University, USA

**Keywords:** pedagogy, transdisciplinarity

Increasingly, landscape architects are being called upon to engage conversations about strategic environmental planning because of the discipline's well-positioned ability to work across scales and information types. In coastal Louisiana in particular, where 35-square miles of wetlands disappear each year causing dramatic annual shifts in both micro-ecologies and regional-scale systems, discipline-specific approaches favor solutions, which can only be obtained by narrowing the field to answerable questions. But as the complexity increases, so too must the composition of team members enlisted for input, a transition that often necessitates a new language and dataset. This is not to suggest that there are flaws in the logic of any one discipline. Rather, it suggests that there is a missing tool.

Though the pedagogic sequence in landscape architecture remains necessarily committed to disciplinarity, this paper will focus on opportunities for expansion, exploring the role played by landscape architects in re-presenting discipline-specific data related to wetlands loss in coastal Louisiana. Of particular focus will be the teaching materials developed to support transdisciplinary coursework for students and faculty from geology, environmental management, and landscape architecture.

Specifically, this course addresses the potential of wetlands mitigation banking to reverse land loss in Cheniere Caminada, a regressive beach ridge plain within the Mississippi deltaic plain. Students worked in teams, developing strategies to convert this highly disturbed environment into a productive compensatory bank, an ecological foil for the destructive activity of the adjacent Port Fourchon. More broadly, this project challenged instructors to develop an interface capable of both filtering the layers of information relevant to each discipline as well as identifying gaps in the system where new interpretations could be identified. Building on the collaborative tradition of wikis, instructors developed an interactive digital model of the site, one that could be layered with text and diagrammatic information. Students were able to isolate disturbances, visualize connections and adjacencies, and retool perceptions of known disciplinary boundaries.

## “Park(ing)” Design for Public Life

Jayoung Koo, University of California, Davis, USA, jlkoo@ucdavis.edu

Patsy Eubanks Owens, University of California, Davis, USA, peowens@ucdavis.edu

**Keywords:** social factors, pedestrian promenade, Park(ing) Day, public life

Designing for particular user groups can present unique challenges and opportunities. When designing space that serves wide range of user groups simultaneously, interpreting and creating suitable landscapes can be complex. Understanding the manner in which users of different groups (age, type, size and abilities) experience and interact with their environment is an important precursor to designing appropriate places (Gehl, 1989; Kaplan, Kaplan & Ryan, 1998). When it comes to public space, particularly pedestrian environments, the physical, social and/or cultural setting presents unique sets of design parameters. Though they are not regarded spaces for formal activities, public space presents opportunities for public life experiences outdoors (Carr et al., 1995; Gehl, 2011).

The goal of this research is to understand what social factors design students considered important and how students reflected them in their public space design prior to re-designing E Street Promenade in downtown Davis, CA. The corridor is busy with various types of businesses and transportation modes passing through in a moderate size suburban city. It is in fairly good condition with high use by the public; however, as a significant part of downtown, E Street can become more vibrant and comfortable for the public especially pedestrians.

Students were asked to document social factors to be addressed through reviewing plans, post-occupancy evaluation (POE), surveys, interviews and actual installation of their public space designs. Each student designed a parking space for public life by reflecting the corridor's fullest potential through communication with business and property owners, tenants and the public using and not using the space. Students then pre-tested their designs by constructing it on “Park(ing) Day in Downtown Davis” inspired by San Francisco based Rebar Group's “Park(ing) Day” movement (Rebar, 2011, p2).

Through the temporary installation of reclaiming public space, students learned whether their designs attended to relevant audience. Downtown users were excited about the event and engaged in each parked design despite conditional street use permits. Students benefited from direct interaction with the public. They solicited public comments, conducted peer evaluations and filled out a social factors reflection checklist. From the design evaluations and public responses, we found that students reflected a range of social factors in their “Park(ing)” projects and further in the promenade design. In conclusion, the practical “Park(ing)” designs proved to be an informative and productive learning process for public life.

## A Design Educator's Model of Creativity

**Jeremy Merrill**, Kansas State University, USA, jmerrill@k-state.edu

**Stephanie Rolley**, Kansas State University, USA, srolley@k-state.edu

**Keywords:** Creativity, Psychological Theory, Design, Model

Creativity is an important component of the design process. Creativity results in a product or response that is novel and appropriate as well as heuristic. (Amabile, 1996, p. 35) Bryan Lawson states, "In the creative arts, the whole point of the business is to create something which other people will experience and which is in some way or other original and new." (2006, p. 145) Therefore, understanding how design educators can raise student creativity is central to advancing the design professions. Creativity often is emphasized in problem statements and design critiques without articulating attention to how it is developed or measured. Critics of contemporary education, including Sir Ken Robinson assert that existing educational practices stifle student creativity (2011). If this is indeed so, understanding how design educators can nurture and encourage creativity is critical to the education of future designers.

Current creative theories, including cognitive psychological theories, metacognition, social cognitive theory (Bandura, 1994), and social psychological theory (Amabile, 1996) present possible vehicles to enhance students' creativity in the three-dimensional design disciplines, as they are defined by Lawson (2006). These theories and their models differ greatly one from another because they are grounded in contradictory theories and their models are limited by their own parameters. To date these models have not been integrated and applied to the education of three-dimensional designers.

This paper analyzes the spectrum of creative theories through the lens of the three-dimensional design process (Lawson, 2006) and presents a model of creativity for design educators. This proposed model identifies the aspects of creativity educators may be able to influence as well as those outside of their control and proposes components of creativity that are measurable. Controllable aspects include: metacognitive skills, self-efficacy, physical environmental factors, performance modeling, and tacit knowledge. Those factors that are less under educator's control include: family influences, personality, societal, political, and cultural influences. This paper also articulates the theoretical framework for data collection through an ongoing cognitive study of student creativity in the design studio. Future papers will address the methodology and findings of this effort.



## From Harriet Tubman to Horizontal Research: Case Study of the Poplar Neck Master Plan Methodology

**Paul Voos**, paul.voos@morgan.edu, **Mary Anne Akers, Ph.D.**, MaryAnne.Akers@morgan.edu, **Courtney McQueen**, crbruner16@hotmail.com, Morgan State University, USA

**Keywords:** National historic Site, Harriet Tubman, Cultural Landscape

This panel discussion is intended to illustrate integrated research methods and teaching within a single setting. The panel will discuss the value of trans-disciplinary education through assessment of civic landscapes (landscapes that cross boundaries of property, history, and social morays), application of an historical overlay, and blending of traditional professional boundaries to achieve a cultural master plan that would become the prototype for the nation's newest National Historic Site.

The perspectives of Dean (administrator), Instructor, and Student will focus on the intersection of student learning and dynamic, open exchange through research as a project imperative. These varying perspectives will be presented as a case study of pedagogical collaboration, academia as consultant, and research inquiry.

Awarded a grant to provide a master plan strategy and, ultimately, a master plan, for the development of a National Historic Site, the team began research for the ~2600 acres of rural landscape.

Carried out using a wide variety of methods including 10 courses, ~30 students, and 7 faculty, the process relied upon students to experience "horizontal" research methods while camping, hiking, biking, and kayaking the site area. Participants experienced "site" far from studio and immersed themselves in conditions rather than simply reviewing maps, interviewing stakeholders, and drawing.

Horizontal research brings research specialists together from the beginning in immersive activities. Although "muddy" and even perceptually ill-defined from the start, it yielded a continuous and blended definition of the project allowing an openness to receiving, discussing, and developing knowledge that was perhaps outside the scope of one's discipline. True conversation, objectivity, and ultimately, knowledge was developed out of the project. The resultant research environment was one in which all players were reliant upon the other.

The project provides an excellent case study for the integration of administration, faculty, and students. Primarily, the result illustrates learning as a product of trans-disciplinary discussion, experience, and presentation.

The use of project-based education within design education is not unique. However, this project developed a civic landscape for the national park while providing the medium to further illustrate that design education is ongoing and must focus upon intelligent conversation amongst participants.

The panel will pose horizontal research methodologies as perhaps the logical next step to the traditional studio structure. As research becomes increasingly important within landscape architecture departments and even within private practice, the horizontal research structure provides a framework to lead a new generation of students.

## Studio MMMM: An Interdisciplinary Exploration

**Gale Fulton**, University of Illinois at Urbana-Champaign, USA, [gfulton@illinois.edu](mailto:gfulton@illinois.edu)

**Stewart Hicks**, University of Illinois at Urbana-Champaign, USA, [hickss@illinois.edu](mailto:hickss@illinois.edu)

**Keywords:** studio, pedagogy, research

This paper tracks an interdisciplinary graduate design studio co-taught by an Assistant Professor of Landscape Architecture and an Assistant Professor of Architecture at the University of Illinois at Urbana-Champaign. The goal of this paper is to enter into a discussion with colleagues about new pedagogical and disciplinary possibilities to be found in such interdisciplinary approaches. "Studio MMMM..." focuses on two primary goals: 1) to explore a series of 'm-types' such as mats, megaforms, and megastructures, which have seen a resurgence of interest in architectural and landscape architectural investigations in recent years in order to critically and creatively re-evaluate their potentials for contemporary architectural and landscape architectural design; and 2) to leverage narrative as a strategy to catalyze the m-type research in the creation of new formal and programmatic effects. Rather than focus on the logistics and procedures of the course, this paper exposes the new disciplinary and pedagogical territory uncovered within the studio's research and production.

The studio began with analytical research into various 'm-types.' Interdisciplinary teams developed a series of case studies on prototypical projects from the following landscape and architecture hybrids: Mats, Mountains, Malls, Megaforms, Megastructures, Monsters, Mutants, and Malapropos. This research required students to construct genealogies and further develop their design vocabulary in preparation for the generation of 'chimerical,' hybrid design strategies in the second half of the semester. These particular 'm-types' almost always contain ambiguous boundaries between landscape and architecture while simultaneously providing the city with the potentials of both. Part of our presentation will be dedicated to explaining the creative potentials of developing new hybrids from the m-type research through a critical analysis of the final products of the studio.

Following the midterm, students explored the generative potentials of combining the m-types research with the production of site 'fictions' in order to stage alternatives to the dominant urban landscape types of contemporary post-industrial cities. Within the sometimes counter-intuitive "solutions," traditional distinctions between buildings and landscapes were suppressed in favor of developing new events, experiences, forms, and spaces within these hybrid assemblages. The resultant designs privileged a more human-centric design, concerned with embodied phenomenal and sensual effects instead of diagrammatic organizations and environmental performance checklists. Pursued in this way, interdisciplinarity leverages the potentials of both disciplines to achieve new effects, territories for intervention and new audiences that would be impossible in the absence of real interdisciplinarity.

## **Policy and Place: A studio method to understand, evaluate and implement place-appropriate stormwater BMPs to craft multi-functional landscapes that satisfy Clean Water Act requirements**

**Bradford Collett**, The University of Tennessee, USA, bcollett@utk.edu

**Keywords:** Studio Method, Low Impact Development Best Practices, Landscape Performance, Evaluative Process, Watershed, Clean Water Act, Integrated Stormwater Design

In a development marketplace and regulatory environment that is increasingly attentive to stormwater quantity and quality, it is advantageous for landscape architecture students to develop an evaluative process to identify appropriate, effective site stormwater management (SM) methods. In professional practice, decisions to implement low impact development (LID) SM methods such as rainwater harvesting, green roofs, permeable pavements, bioswales, bioretention, constructed wetlands and urban forestation are based on qualitative and evidence-based performance criteria. These criteria include relevance to regional and site stormwater issues, applicability given inventoried opportunities and constraints of a site, measurable quality and quantity management performance, code compliance and cost-effectiveness. This is consistent with the decision tree and performance matrix included in cited resources.

The researcher believes students can recognize interrelationships between the sustainability of regional water resources and site SM that enables them to develop an informed evaluative process for selecting appropriate stormwater BMPs, and subsequently exercise that process to design multi-functional landscapes compliant with federal policy.

To test this hypothesis, a studio was developed to foster students' ability to understand and react to policy and place. The studio began with an exploration of watersheds as multi-scalar, nested landscape systems and a comprehensive inventory of hydrologic features, processes and cycles on native and post-development sites in East Tennessee. Special attention was paid to regional terrain characteristics, soil properties and native sub-surface geologic features, in addition to observed, documented and measured anthropogenic impacts of typical urban, suburban and rural sites within the Knoxville MSA. Subsequent research assignments focused on developing an understanding of hydrologic cycles, management capabilities, performance metrics, construction details, suitable plant species, common regulatory impediments, product technologies and costs of select LID SM methods. The inventory and research phases of the studio provided students with an understanding of place and toolbox of SM methods to retrofit urbanized sites. Clean Water Act quantity and quality requirements for the Knox County and City of Knoxville MS4s were used as required performance metrics for the design study in addition to addressing observed opportunities for enhancements to site program, function and aesthetic.

Outcomes of the studio's process-driven approach, including a BMP performance matrix consistent with research, multifunctional site designs that enhance landscape function, aesthetic and performance of existing urbanized sites, an understanding of the connection between site and region and policy and place-oriented recommendations for enhanced regional and site SM, in addition to researcher's observations will be presented.

## Creating a New Teaching Guide About Green Roofs in Semi-Arid and Arid Climates

Leila Tolderlund, University of Colorado Denver, USA, Leila.Tolderlund@ucdenver.edu

**Keywords:** Green roof, Sustainability, Urban Environment, Ecological Balance, Stormwater Management, Integrated Student Learning, Integrated Systems, Green Infrastructure, Living Systems

The purpose of this study was to create new guide and teaching tool about green roofs in semi-arid and arid climates with students through interactive learning.

Green roofs have many economic, social and environmental benefits that are increasingly being identified, measured, and acknowledged by the general public. However, green roofs in semi-arid and arid climates require significantly different strategies for design, implementation and maintenance than green roofs in temperate climates. Many student jump on the green roof wagon without paying attention to local climate conditions. Little green roof research has been done for semi-arid and arid regions and important lessons are to be learned from trials and errors occurred through design, implementation and maintenance (or lack thereof) of these pioneering green roofs.

This document is a significant teaching tool as it contains crucial information about green roof success in some of toughest climate conditions in the U.S. This guide is also relevant for teaching how green roofs are an important Low Impact Development (LID) strategy and can help achieve Green Building and Leadership for Energy and Environmental Design (LEED) points. This 50-page comprehensive guide provides general recommendations and guidance for design, implementation and maintenance of green roofs in semi-arid and arid climates and is the first of its kind in the U.S. This guide has now become a platform for cross-disciplinary teaching about green infrastructure at UCD.

During green roof seminars and independent studies, students researched, visited, investigated and collected information about design, implementation and maintenance of green roof projects in semi-arid and arid regions. Through service learning and community outreach projects students have created innovative green roof and green infrastructure design solutions specifically appropriate for local climate conditions, including conceptual design for green infrastructure at the Denver Public Library, the Denver Zoo, the Denver Living City Block and the newly launched UCD Green Roof IRIS Project.

Having a guide to help support the learning process has improved the efficiency and quality of learning. The basic material is covered in a more succinct and coherent fashion. Through this guide, discussions, assignments, and quizzes students are being prepared and advanced towards attaining the Green Roofs For Healthy Cities' (GRHC's) green roof professional accreditation.

Collecting this information in a continuous evolving guide is imperative to teach students about prevention of costly mistakes and to help them gain a thorough understanding of the benefits associated with green roofs in this region.

## From the Hand-Drawing Design to the Digital Design: Reflections on Two Pedagogies

Hooman Koliji, University of Maryland, College Park, USA, koliji@umd.edu

**Keywords:** Imagination, hand drawing, digital design, design thinking, presence-in-absence

Studio environments increasingly embrace digital platforms as design tools. Yet, the role of the hand drawing as a compelling vehicle for design remains valuable. These two different design paths, however, allude to two different intellectual pedagogies relevant to the notion of “imagination,” a cognitive realm core to the design activity. This paper examines either of the pedagogies in regard to the imagination as a cognitive faculty.

Imagination ontologically experienced a shift in post-modern philosophy, which marked a new era in the design pedagogy. Pre-modern philosophy viewed imagination as an ontological state between reason and senses, an “intermediary” realm capable of transforming the ideal into the real. Modern philosophy, however, developed the basic understanding of the “imagination as presence-in-absence, the act of making what is present absent and what is absent present” (Kearney, 1998). This perspective deemphasizes the intermediary aspect and highlights the “immediacy” presence of imagination.

These perspectives on imagination shaped theoretical discourses on the design ontology and epistemology (Wood, 2002). The hand drawing regards imagination as an intermediary cognitive faculty that unifies hand and mind (Pallasmaa, 2009), while the digital design separates the designer from experiential engagement and invites the individual to inhabit the virtual space (Treib, 2008).

This paper distinguishes these two design conventions not only as visualization processes but also in terms of their speculative and reflective capacities. It examines how these two design conventions are different in their “conceptual” (e.g. use of geometry) and “performance” (e.g. drawing process) attributes. These are discussed in terms of drawings of noted architects and landscape architects in both of the design conventions. For example consider this: The hand drawing design—engaging the designer in a scalar and multisensory relationship with the drawing and the landscape—creates an intermediate cognitive environment for the designer (Frascari, 2011) different from that of the digital space that potentially promotes artificial (yet immediate) landscapes with no scalar and/or multisensory relationship between the drawing and the designer. These two processes result in different conceptions of the space, thus, dissimilar avenues of conceiving spaces.

In conclusion, the two studio model pedagogies, the traditional model and the digital oriented (appropriate to the two conceptions of imagination), will be examined and compared and their cons and pros will be discussed. This will be supported by material evidence from design studios as well as pertinent literature.

## Construction Documents: A crossroads of misunderstanding

David Watts, California Polytechnic State University, San Luis Obispo, USA, djwatts@calpoly.edu

**Keywords:** Construction documents, communication, implementation, digital graphics

Construction Documents: A crossroad of misunderstanding The methodology with which landscape architects communicate their design ideas to clients has embraced new technology at every turn. Virtual tours, three dimensional vignettes, and literal graphic renderings allow clients to step into our designs, and experience the space. The opposite is true of communications to general and landscape contractors as they attempt to interpret and execute the design intent conveyed to the client. There has been little advancement in communication techniques since the days of Humphry Repton riding on horseback and throwing potato pieces to identify where trees were to be planted. Two dimensional drawings, schedules, details, and written specifications remain the primary tools utilized to transform an idea into reality. The shortcomings of this approach to clearly and fully communicate the design are seen in almost every project with the issuance of addendum and change orders. Clients incur additional costs, projects are delayed, and business relationships can become strained.

The proposed study seeks to explore the underlying factors that contribute to the reliance on current construction documents and inhibit exploration of alternative communication techniques through case studies, interviews, and surveys of landscape architects and contractors. The study will look for recurring themes and patterns of miscommunication. It will also seek to identify internal and external influences to the process from both perspectives. Possible external factors include legal, financial, and contractual concerns. Factors inherent to the process itself could include our design culture, document preparation techniques, and budget constraints. It is perceived that technology and software availability could be a shared contributing factor impacting communications. The study will go on to examine alternative forms of communication, primarily the introduction of technology new to the landscape architect/contractor relationship, and the viability of their integration into the process. This would include, but not be limited to project modeling techniques, videos, and realistic graphic renderings.

This study is significant in that it highlights and explores a possible deficiency, or at least an antiquated approach, within our procedural theory base. We have found and employed new ways to communicate our ideas to the client and the public. This has not kept pace with our next most important audience, the people who are responsible for making our ideas a reality. Clearer communication of design intent at the start of the project will elevate a project's sustainability through reduced waste of re-doing work that has already been completed.

## Hyperbonding and Landscape Architecture

**Peter Miniutti**, University of Connecticut, USA, peter.miniutti@uconn.edu

**Madeline Schad**, University of Connecticut, USA, madeline.schad@gmail.com

**Keywords:** class relationships, hyperbonding, learning communities, cohorts

Landscape architecture programs often accept a limited number of students due to the nature of the studio environment. This results in smaller class sizes than seen in other programs of study. Over the course of study, LA students develop a degree of closeness as a group. This group relationship demonstrates positive and negative results in the success of classes progressing through the program.

In certain cases, intensely close relationships develop among a class. A term describing this is “hyperbonding”<sup>1</sup>. Studies have been conducted where students are intentionally enrolled in the same classes for a degree program. These programs are labeled “learning communities” or “cohorts.” While an LA program may not be formally set up to be a learning community, the result is usually just that. Students in the program have the same course requirements, often taken in the same sequence. They may have as little as one course per semester outside of the ones taken in their LA “family.”

The positive results of a small group of students are evident. “Each yearly cohort of students has become a tight-knit group of mutually supportive and encouraging friends,” says Jack Sullivan of the University of Maryland MLA program. In one study of a cohort, students admitted to being able to reach deeper levels of analysis and reflection in conversations with one another<sup>2</sup>. Negative results also occur. When hyperbonding occurs, a sense of group agency can develop. The class may realize their strength as a group, using this to influence the workload expected of them. The quality of a classes’ work may suffer due to them acting as a unit. If everyone’s work is at a certain level, it can prevent students from excelling. “Groupthink” is a psychological concept that can explain this. When a group is extremely close, they attempt to minimize conflict amongst themselves. If one person strives to produce better work this may create conflict within the group. As a result, the classes’ work will likely remain at a certain level, failing to reach their full potential.

Over the years, hyperbonding has occurred in two LA classes at UConn. A correlation has been seen between faculty sabbatical leaves and hyperbonding within these two classes. The use of adjunct instructors results from sabbaticals and is a contributing factor. If the problems associated with hyperbonding are recognized, educators in landscape architecture can learn how to better manage a tight-knit class.

## Things we think with: A few thoughts on how technology influences design thinking

Jean Trottier, University of Manitoba, Canada, [trottier@cc.umanitoba.ca](mailto:trottier@cc.umanitoba.ca)

**Keywords:** Design pedagogy, design methods, technology, problem solving

We think what we design with. Or do we? Using a study conducted by the author over the last seven years (Trottier, 2011) the paper makes the argument that such is indeed the case. It presents a number of ways in which this is manifested in design studios and identifies the challenges this raises for design pedagogy.

The paper first briefly reviews the framework developed to assist with the recording of design processes. Building on earlier design methods research (Schön, 1983; Cross, 1990; Lawson, 1980, 2009; Mitchell, 1993) the framework provides an incremental, structured, and comparative approach to describing one's design process by recording the activities accomplished, their sequencing, the tools employed, and the outcomes generated. This paper will emphasize the role of technology within that framework and will then draw on in-studio implementation to highlight the interaction between technological choices and design thinking.

The study suggests that, while students tend to reflect on the strategic value of technological alternatives for conducting various design activities, their technological choices often internalize the design process by maintaining a disconnect between the symbolic constructs employed in design thinking and the ecological, socio-cultural, and material contexts within which design operates. To put it differently, contemporary technologies seem to promote reflection-in-action practices while failing to support an effective dialectical conversation between designers and the external world.

I would propose that it is this technologically induced internalizing tendency that makes it difficult for students to move between the ideation and evaluation stages of the design process—a state I would call eidetic paralysis. I would also contend that this conundrum will not be eased until the technology used for both ideation and evaluation contain within themselves limits, or boundary conditions, analog to real-world conditions. The paper thus ends with a search for such boundary conditions by contrasting various technological approaches traditionally associated with design.



## Short filmmaking as a teaching tool in the landscape architecture design studio

**Katya Crawford**, University of New Mexico, School of Architecture and Planning, USA,  
katyac@unm.edu

**Susan Frye**, University of New Mexico, School of Architecture and Planning, USA,  
sfrye@unm.edu

**Keywords:** creative process, filmmaking, site analysis, design pedagogy

Good design and creativity are inseparable, hence studio instructors must develop innovative methods to encourage students to explore and expand their creative potential. The studio design process traditionally includes site analysis and synthesis, the use of collage and montage, diagramming, sketching, writing and research. All of these tools, some more rational and some more poetic, are the foundation for the students' design explorations. The authors posit that adding short filmmaking to this traditional studio toolkit can provide a rich and contemporary method for engaging the creative process. Our primary question is how students might see, and develop a deeper understanding of the urban environment in which they design through filmmaking.

Digital media has become part of our everyday lives. The vast majority of cell phones and digital cameras have video capacity, and both PCs and MACs come with basic editing software. In the past, filmmaking was expensive and time consuming. The extreme accessibility shift has opened up a myriad of explorative, creative possibilities. Film has the capability of expressing essential landscape elements that can be difficult to portray in traditional modes of representation, such as the passage of time, movement through space and an auditory and tactile understanding of place.

As an experiment, the authors introduced a short filmmaking project into the second semester of the first year graduate landscape architecture studio. The students were given a short filmmaking workshop, then charged with making a 3-minute film, using the site as the leading character. The films were shared with the studio, which opened up a broad dialogue on the design process and the site from diverse perspectives. The films reflected a sensitive interpretation of space, time, sensory experience and narrative. The films were also vastly different, giving voice to unique expressions of site interpretation not often found in traditional 2-D representations.

The instructors were able to visibly track the influence of the films on the final designs, which was also confirmed in a student questionnaire. Out of eighteen students, sixteen felt it was a seminal component in influencing the final design and fourteen felt that it helped with programming the site. Compared with traditional site analysis and precedent study, fifteen felt it was the most influential component of the design process. This paper anchors the question of filmmaking as a studio design tool within a contemporary cultural context, and shares the method, outcomes and examples of student work.

## The Use of GRE and TOEFL Exams: Predictors of Success in Landscape Architecture Programs?

**Carol Emmerling-DiNovo**, University of Illinois at Urbana-Champaign, USA, cemmer@illinois.edu

**Keywords:** GRE, TOEFL, review of graduate applicants

In the absence of a discipline-specific admission exam, some landscape architecture programs in the United States recommend or require the GRE (Graduate Record Exam) of MLA and PhD applicants. International applicants are additionally required to submit results of the TOEFL (Test of English as a Foreign Language) exam. Both exams are assumed to be good predictors of academic success and of the ability to be an effective teaching assistant. While commonly used, academics would benefit from having a better knowledge of the history, reliability, scoring, and limitations of these exams. This paper will address the history and background of the exams. It will also present findings of a survey of the GRE and TOEFL requirements of landscape architecture programs in the United States. In addition, the Landscape Architecture program at the University of Illinois will be used as a case study as it requires the GRE of all graduate applicants and has a high percentage (30-60% in any given year) of international graduate students of whom the TOEFL is required. Graduate student GRE and TOEFL scores and sub-scores from the past ten years will be analyzed to identify potential relationships with such variables as entering/undergraduate GPA, cumulative GPA, and graduation rates. Alternative assessment techniques and remediation measures for students with marginal English skills will also be presented.

## Where Can I Go? What Should I Do? A Review of Off-campus Educational Offerings in Landscape Architecture

Terry Clements, Virginia Tech, USA, tclement@vt.edu

**Keywords:** Off-campus Education, Education Abroad, Pedagogy

Since the early 1900s American landscape architecture students have been encouraged to travel and explore the great sites studied in their history courses and those special places touted by their faculty. Today's landscape architecture degree programs offer a myriad of off-campus choices to entice students to go away and to gain experience and awareness that is often difficult to attain within their familiar routines and places. These include grand tours, residency programs, exchange programs and a number of coop, internship and focused study options. The value and relevancy of off-campus programs is being questioned by administrators, parents and others demanding educational efficiency and efficacy. Some see the programs as distractions from the business of educating young professionals; others question the relevance of off-campus activities in streamlined educational programs and to professional practice. Still others find it difficult to justify efforts that do not yield easily and immediately measurable outcomes.

This paper expands upon earlier research focused on international education to include definition and description the range of off-campus offerings in landscape architecture programs through an analysis of three sets of data collected from CELA member institutions in North America during fall 2011. These include a review of degree program websites, a survey of program chairs, and follow-up interviews with faculty members responsible for the off-campus offerings.

To understand more clearly the intention and importance of off-campus programs in North American landscape architecture curricula, this survey of degree programs inventories and studies the following:

- Off-campus options available to undergraduate and/or graduate students
- Approaches to and models of off-campus offerings
- 'Fit' into the program pedagogy and degree curricula
- Impediments to and incentives for offering off-campus programs

The paper concludes with recommendations for further research, as well as developing a more robust sharing of lessons learned and cross-institution access to off-campus program options.

## Zero+ Transdisciplinary Pedagogy

**Barry Lehrman**, California State Polytechnic University Pomona, USA, blehrman@csupomona.edu

**Lance Neckar**, University of Minnesota, USA, necka001@umn.edu

**Derek Schilling**, University of Minnesota, USA, schilling.derek@gmail.com

**Keywords:** Transdisciplinary, pedagogy; performance-based design; performance metrics; integrated modeling; campus design; sustainability education; student engagement

The Salovich Zero+ Campus Project (Zero+) is teaching how to optimize urban form through the integration of the performance modeling of water and energy. This paper shares the graduate-level transdisciplinary (architecture and landscape architecture) pedagogy developed at the University of Minnesota College of Design with funding from the Provost.

'Zero+' refers to the project's goal of creating zero-energy, carbon-neutral places that provide positive environmental benefits (Guzowski, 2010) aligned with precepts of regenerative design (Lyle, 1996) by offering the ability to directly mitigate looming environmental issues (Rockstrom et al., 2009) through the design process. The Zero+ learning outcomes focus on having students applying energy and environmental performance metrics, mastering water and energy modeling tools (Guzowski & Abraham, 2009), and understanding sustainability decision-making processes at the institutional/municipal level.

To achieve these learning outcomes, the Zero+ team has shifting from the traditional 'designerly ways of knowing' (Cross, 2001, 2007), to a mix of practices borrowed from ecopedagogy (Kahn, 2010), transdisciplinary action research pedagogy (Stokols, 2006; Thering, 2011), and performative design pedagogy (Oxman, 2008). We will also discuss the impacts of working with a stakeholder in both the course planning process and for student evaluations.

Additionally, we use the university campus as an analog for the larger metropolitan fabric with the advantages of simplified ownership and regulatory structures, plus easy access to performance data and decision makers. This simplification allows students to practice defining and applying design solutions while engaging stakeholders in a 'safe' situation. Working with a campus also provides students the opportunity to implement real projects, gaining practical experience that is harder to get outside the institution (Turner, Schilling, & Lehrman, 2011).

Assignments unique to the Zero+ courses that were used for the first time in this combination (in our knowledge) in a landscape architecture design studio include:

- Baseline performance analysis of site systems and ecosystem services
- "Shoebox" modeling that approximate the design under consideration (buildings, hardscapes, vegetation, water systems, and other infrastructure) for design optimization (Balcomb & Hayter, 2001)
- "Patchwork Calculator" aggregation and integration of several assessment tools

The session will share and reflect on the results from the four Zero+ courses taught to date:

- Teaching systems thinking for landscape architecture students
- Tools for performance-based design
- Optimization processes that can be applied to the design process
- Enabling transdisciplinary collaboration between students
- Overcoming institutional obstacles to implement sustainable designs

## Redefining the Design Studio for the Millennial Student

Lee-Anne Milburn, Cal Poly Pomona, USA, lsmilburn@csupomona.edu

Susan Mulley, Cal Poly Pomona, USA, sjmulley@gmail.com

**Keywords:** pedagogy, androgogy, design studio, millennial, generation Y

The current approach to teaching design studios is firmly rooted in the evolution of landscape architecture (Dutton, 1987). Educators adopted an apprentice model of education with an idealized studio leader (Balfour, 1981) and a small group of learners that worked intensively for long periods together. Traditionally, the instructor's opinion and experience dominated the assessment of design effectiveness and innovation. Over time this model has evolved to a minimal extent, as a response to changing demands from higher education, and as technology has increased in importance.

We know that "Millennials" (Twenge, 2007) or "Generation Y" (Tulgan, 2009) live in a different world from that in which today's educators were trained. Information availability, interpersonal interactions, and personal expectations have changed with increasing technology availability, changing parenting styles, and a shift to short-term and transactional mindsets (Twenge and Campbell, 2010).

This traditional studio model is poorly matched to Millennials. Millennials see the world differently: everything is in flux; they question authority; things constantly move faster; everything is short term; innovation and immediacy are key; and, relationships rather than accomplishments are priorities (based on Twenge, 2007; Tulgan, 2009; Twenge and Campbell, 2009; Howe and Strauss, 2000). These approaches were tested in two graduate studios and 2 undergraduate and 2 graduate lecture classes. The results suggest the following advice to effectively teach design to this challenging group:

1. Articulate the rules—provide a set of specific guidelines for design—what works and why.
2. Articulate intangibles—make no assumptions about things that "everyone knows".
3. Break skills and content into distinct pieces and teach one at a time—an integrative model of learning is difficult for Millennials. They need design divided into disparate pieces, taught separately, and "stitched" together.
4. Connect learning to marketable skills—explain "how it works in practice"
5. Keep score and reward performance (and give credit)—competition is assumed and lack of transparency undermines success, whereas rewards support performance.
6. Show them you care—personal relationships are the most important thing.

As we face increasing pressure to move to online or hybrid teaching, increase efficiency in our teaching, and demonstrate quantitative impacts of our techniques, studio methods will come under increasing scrutiny. As educators, we have the responsibility to teach to maximize student learning. Challenging old modes of education that assume different social structures, definitions of success, and communication tools will be a necessity.

## Unleashing the Power of Design in Education

Mark Elison Hoversten, University of Idaho, USA, hoverstm@uidaho.edu

**Keywords:** Design Education, Change

The purpose of this session is exploratory: to suggest the need for greater experimentation and flexibility in design education and to suggest a range of strategies in response to this need. It argues that two realities will shape design education in the next decade.

First, we exist in an environment of profound change: in our students, the economy, our professions, and our institutions. Today's students, whose childhoods were marked by lessons, athletic practices, and organized recreation, come to the university as perhaps the most programmed generation ever (Brooks 2011). Upon graduation, however, they will face a world characterized by changing global economics, unprecedented environmental challenges, rancorous political maneuvers, media sensationalism, and devastating effects of recession on traditional, private sector design firms. Their careers, indeed the lives they will lead, will be anything but programmed.

Second, higher education faces unprecedented corrosion of state funding and public confidence. These realities converge at a time when design programs place higher expectations on faculty members to adapt to change while increasing research productivity and establishing a more relevant place in society (Schrecker 2010, Kirp 2003). They also occur at a time when design is increasingly viewed as a powerful problem solving process (Pink 2005, Martin 2009). Yet despite these conditions, the mechanisms of higher education continue more or less as usual (Coleman 2011).

This session argues that design schools will need to respond in the coming decade by increasing experimentation in a) organizational structure, b) curricula, c) use of architecture as a tool for change, d) search for relevance with constituents, e) faculty expectations related to new constituent relationships and, most important, f) introduction of flexibility and a culture of change. This experimentation will result in both successes and failures that will tax the ability of accrediting bodies to respond in a timely fashion. The author will cite examples from his own institution to explain the need for and opportunities in each of these categories.

## Pedagogical Cartographies—A ‘Real Time’ Curricular Assessment

**Daniel Ortega**, University of Nevada Las Vegas, USA, [dhortega@unlv.nevada.edu](mailto:dhortega@unlv.nevada.edu)

**Michael Corrente**, University of Nevada Las Vegas, USA, [michael.corrente@unlv.edu](mailto:michael.corrente@unlv.edu)

**Keywords:** Design Education, Digital Technology, Curricular Assessment

Pedagogical Cartographies—‘Real Time’ Curricular Assessment This poster presentation will document the initial stages of what will become a comprehensive look at how tablet based teaching can be used to construct a curriculum-wide ‘real time’ formative assessment mechanism. For the purposes of this work, we consider the definition of ‘formative assessment,’ to mean “the use, by student and/or teacher, of feedback from an assessment to prove the knowledge of the assessed student on the assessed topic.” (Trumpower and Sarwar, 2010) In addition, we will also subscribe to the position that suggests that, “[e]ffective formative assessment must meet four criteria: it must assess higher order knowledge, identify students strengths and weaknesses, provide effective feedback, and be easy to use.” (ibid)

Our project used two main modes of investigation to test the aforementioned four part criteria. The first was the development of initial concept maps that were designed to “combine the instructional domain with the technological one in order to offer practical guidelines to design and develop...” (Benlloch-Dualde, et. al., 2010) a pedagogical cartography related to student learning objectives and the higher order concept development common to a second year landscape architecture design studio and an introductory digital media course. The second was the use of annotation software applications in combination with Dropbox to record specific student strengths and weaknesses while offering the opportunity for instant feedback. We chose the Apple iPad 2 to satisfy the need to make our formative assessment process ‘easy.’

The strengths and weaknesses recorded during student feedback sessions were incorporated into new concept maps that worked to validate/modify teaching methods. The information contained in these new maps worked to create unique pedagogical cartographies that synthesize the delivery/recognition of course related learning objectives. Contrary to the results typically related to summative assessment methods, where the success/failure of work is determined after a defined period of time, we propose that these pedagogical cartographies facilitate a more meaningful teaching/learning relationship that is unique to the specific groups of students who participate in this type of ‘real time’ assessment.

The poster will illustrate: our mapping process showing when and how changes in teaching strategies occurred, samples of the annotated feedback workflow, a matrix displaying the hardware and software applications used, a discussion of experienced technological difficulties/barriers, and a brief description of how this project can potentially be used as a model for real time formative assessment across the curriculum.

## The State of, and Barriers to, Interdisciplinary design education in Landscape Architecture and Architecture

**Tae Seo Koo**, North Carolina State University, USA, [tskoo@ncsu.edu](mailto:tskoo@ncsu.edu)

**Arthur Rice**, North Carolina State University, USA, [art\\_rice@ncsu.edu](mailto:art_rice@ncsu.edu)

**Keywords:** Education, Interdisciplinary, Collaboration

Disciplines work together to accomplish results. Lattuca, Professor of education at Penn State University, defines the term 'interdisciplinary' as "the interaction among two or more different disciplines. This interaction may range from simple communication of ideas to the mutual integration of organizing concepts, methodology, procedures, epistemology, terminology, data, and organization of research and education in a fairly large field." In an interdisciplinary learning environment two or more disciplines collaborate in the processes of teaching and learning with the main goal of developing skills related to productive inter-professional interactions that enhance the practice of each discipline. Interdisciplinary design approaches are based on a common understanding and respect for the potential contributions of each discipline.

This paper presents preliminary results of a research project that describes the current state of interdisciplinary collaboration between landscape architecture and architecture in the academic environment. Research is presented that examines how often and in what forms formal interdisciplinary teaching and learning occurs between programs that reside within the same college. The focus is on colleges that contain graduate level accredited landscape architecture and architecture programs. The impact of this interdisciplinary environment on program goals is explored and the frequency and type of formal interdisciplinary courses; opportunities for cross-disciplinary learning, and the structure and diversity of collaborative teaching environments are presented.

A questionnaire was sent to twenty six universities that had both landscape architecture and architecture at a master level in the same college. The questionnaire was composed of two parts. The first part was designed to obtain quantitative data using closed or fixed-response questions. The second part consisted of open ended questions asking respondents' opinions and thoughts. This questionnaire investigated general understandings, thoughts, and attitudes on a range of issues and explored the general perception of the role of interdisciplinary design education in landscape architecture and architecture.

In addition, this research effort addressed both actual and perceived barriers to interdisciplinary learning. Faculty perceptions are addressed and alternative methods for creating a positive interdisciplinary learning experience are discussed. The intent is to provide educators with an objective perspective on the state of interdisciplinary learning between the disciplines and to promote discussion related to the importance of this activity.



## Revealing a Foundation Design Pedagogy and Rationale

**Shabnam Kavousi**, shabnam.k@gmail.com, **Zheng Chen**, zchen07@vt.edu, **Patrick Miller**, pmiller@vt.edu, Virginia Tech, USA

**Keywords:** Revealing a Foundation Design Pedagogy and Rationale

As landscape architecture students progress through their pre-university education, they become very good at following recipes, “Tell me what to do and I will do it well.” However, when it comes to learning design in architecture and landscape architecture there is no recipe. A somewhat unique pedagogy for foundation design has been developed at Virginia Tech that in some instances goes against accepted beliefs and practices at many universities. For example, answering questions with questions, not telling a student what is wrong with their work, not grading individual projects or sheltering the design studio from the rest of the university. It is not written down, but is loosely embraced by those who teach foundation design. A new faculty person obtains an understating of this pedagogy by apprenticing with (i.e. teaching with) a faculty person who understands the pedagogy. The purpose of this project will be to reveal and document this pedagogy and offer hypothetical reasons, based on the education literature, for why it might work.

The poster presentation starts with a literature review, consisting primarily of the proceedings of the National Conference on the Beginning Design Student (NCBDS) and papers written by a former dean of architecture at Virginia Tech, Charles H. Burchard. This presentation draws upon qualitative approaches to trace the development of the foundation design pedagogy over the last 50 years. An observational study was conducted over a semester and instructors were interviewed. While these findings are based on observations at only one university, they are sufficiently provocative to challenge the audience to reflect upon accepted teaching practices. The resulting information could go a long way towards establishing a foundation design education model that will contribute to the enrichment of students’ overall design thinking and learning.

## Web-enhanced Teaching of Landscape Architecture Digital Graphics: An Evaluation of Benefits and Challenges

**Bo Yang**, Utah State University, USA, bo.yang@usu.edu

**Shujuan Li**, Utah State University, USA, shujuan.li@usu.edu

**Keywords:** landscape architecture education, digital communication graphics, web-enhanced teaching, classroom interaction

With the rapid development of Web courses in higher education, there is a growing interest in the assessment of online education pedagogy. Previous studies suggest that the Web can enable students to achieve a similar, or even better, performance level as through traditional classroom instruction. Landscape architecture digital graphics courses are traditionally taught in classrooms and require extensive interactions between students and instructors. This study assesses the benefits and challenges of using the Web as a teaching method supplemental to classroom instruction. An experiment that integrated an online session with a classroom session for an introductory course of digital graphics was conducted. There were 52 students in this class (44 undergraduate and 8 graduate students) and 47 students participated in this study. Survey instruments were used to solicit students' feedback on the challenges and benefits of the transition from classroom to Web teaching. In addition, students reported eight different learning vehicles (e.g., classroom lecture, take-home assignments) that were emphasized in different sessions. Last, logistic regression analysis was conducted to examine whether the effectiveness of the Web session project tutorials and students' digital literacy of the computer programs are variables that determine students' learning satisfaction. Results indicate that Web teaching can bring multiple benefits to both students and instructors (e.g., self-paced study and improved performance). Students' perceptions of Web teaching was overall positive—60% of the students thought that the online session offered them enhanced learning experiences. However, the reduced level of interaction from the Web session is still a major challenge, and this transition may have greater impacts on undergraduate students than on graduate students. The former group generally prefers a learning environment that maintains significant face-to-face interactions, whereas the latter group appreciates the independent learning opportunities provided by the Web session. The ability that Web interface can supplement or even replace traditional classroom teaching remains an issue according to this study, and it should be further explored in landscape architecture pedagogy. Future study should also examine differentiated instruction methods in an online environment for students with different learning requirements.

## Landscape Architecture Education + the Potential of Interdisciplinary Foundation Programs

**Carla Corbin**, Ball State University, USA, cicorbin2@bsu.edu

**Judy Brittenum**, University of Arkansas, USA, jbritten@uark.edu

**Keywords:** foundation program, interdisciplinary, curriculum models, common first year programs

Currently, about 20% of the CELA member schools have undergraduate foundation programs that include landscape architecture and one or more disciplines that share content in the first year or two of the educational sequence. The aims of this presentation are to investigate the range and variations of program types, to stimulate communication among faculty with current experience or future interest, to connect those who are doing research, and to assess the potential of this curriculum structure for increasing the number of students in landscape architecture. The Occupational Employment Statistics Survey Program has projected that the profession needs to grow 20% between 2008 and 2018 to meet demands; one source may be interdisciplinary entry programs that encourage informed choices. The author of this presentation has been program director for a common first year program, as well as teaching in landscape architecture, thus personal experience with curriculum development and management has informed this research investigation.

Very little research exists as a basis for assessing benefits and drawbacks, nor work that addresses specific impacts for landscape architecture education. Some benefits seem obvious: interdisciplinary exposure, and potential for a collaborative sensibility. In programs that defer declaring majors to the end of a shared core program, students have an enhanced basis for important decisions. Drawbacks are less obvious; anecdotally, these include tension between departments, dissention regarding project types or content, and perceived or actual wooing of talented students.

A survey of CELA member schools was conducted using each program's website, looking for significant overlaps of coursework among disciplines at the foundation level. With additional investigation and analysis of the programs, findings show three predominant models: a shared one or two year program; a pre-professional program with degree, leading to a professional degree at the masters level; and a pre-professional program leading to accelerated entry into a masters first professional degree program. It is clear that the continuum is more complex, with gradations ranging from a single course to programs having studio, communications / representations class, and a third course that may introduce theory or be profession-specific.

Due to the scarcity of documentation, studies or research, the presentation aims to raise questions as well as providing some answers. The mapping of current programs, with an understanding of current forms of interdisciplinary foundation curricula, will foster discussion, support connectivity, and lay groundwork for future investigations, including the viability of this curriculum model to increase landscape architecture enrollment.

# Design Implementation

## Effect of An Internal Water Storage Layer on Bioretention Performance: A Study for Highway Application

**Ming-Han Li**, minghan@tamu.edu, **Myung Hee Kim**, myungheekim@neo.tamu.edu,

**Kung-Hui Chu**, kchu@civil.tamu.edu, Texas A&M University, USA

**Chan Yong Sung**, Texas Transportation Institute, USA, cysung@gmail.com

**Keywords:** stormwater, hot and arid climate, pollutant removal, bioswale, low-impact development

The purpose of this presentation is to provide updates of an on-going bioretention research project sponsored by Texas Department of Transportation (TxDOT) (Li et al., 2011 in press). The preliminary results of the project (presentation title: "Performance of Bioretention Boxes for Hot Climate, Large-Scale Application") were first presented at the 2010 Council of Educators in Landscape Architecture annual conference held in Maastricht, The

Netherlands. In this follow-up presentation, the research team will present the results in evaluating the effect of an internal water storage (IWS) layer on bioretention's stormwater performance. The research team compared the new results with those presented in 2010 to determine the performance difference between the bioretention designs with and without the IWS layer. Five large-scale 1.8 m (6 ft) (L) × 1.8 m (6 ft) (W) × 1.2 m (4 ft) (D) steel boxes were constructed with an option to form a 61 cm (2 ft) deep IWS layer at the bottom. Four of the five boxes were vegetated and one was bare soil as control. For vegetated boxes, one had shrubs and three others were grasses of selected native and non-native species. Synthetic stormwater runoff containing sediment, nutrients and heavy metals that simulated the quantity and quality of highway runoff were used to evaluate performances of bioretention boxes with and without the IWS layer. The results showed that the IWS layer had a positive effect on peak discharge reduction and detention time extension. The IWS layer also significantly improved the removal of copper, total suspended solids, total nitrogen and total phosphorus. Despite the improved performance by the IWS layer, holding water in the IWS layer presents a challenge in hot and arid areas because a significant amount of water can be lost via evapotranspiration. Future research should develop further guidelines regarding the application of an IWS layer in hot and arid areas.

## Total Phosphorous, Nitrogen and Metal Reduction by Seven Plant Species in a Controlled Greenhouse Experiment

**Malgorzata Rycewicz-Borecki**, Utah State University, USA, margie.borecki@usu.edu

**R. Ryan Dupont**, Utah State University, USA, ryan.dupont@usu.edu

**Joan E. McLean**, Utah State University, USA, joan.mclean@usu.edu

**Keywords:** Phosphorous, Nitrogen and Metal Reduction by Seven Individual Plant Species

The state of Utah is experiencing the second highest population growth in the nation, resulting in large increases of P and N discharged into downstream water bodies from untreated stormwater runoff. The Cutler Reservoir watershed is experiencing excess phosphorus loading and low dissolved oxygen, causing the system to be included in Utah's "Impaired Waters" list and is therefore required to be part of the Utah's Total Maximum Daily Load (TMDL) process (Wilbur 2009). Through the Cutler TMDL Development Process interim P standards for the reservoir have been developed that limit mean seasonal total phosphorus concentrations to 0.075 mg/L at Cutler Dam outfall (UDEQ 2009) to protect this water body from excessive algal growth and subsequent deterioration of water quality and water quality impairment from eutrophic conditions that ensue.

Many municipalities are required by law to implement on-site structural storm water best management practices (BMPs) to meet water quality objectives (US EPA 2006). Many of these structural BMPs use plants to remove pollutants from stormwater runoff. This controlled greenhouse study evaluated the phosphorous (P), nitrogen (N) and metal (Cu, Pb and Zn) removal potential of plant species typically found in stormwater structural BMPs (Brisson 2009). The seven plant species selected for study were: *Carex microptera*, *Carex praegracilis*, *Helianthus maximiliani*, *Phragmites communis*, *Scirpus acutus*, *Scirpus validus*, and *Typha latifolia*.

The results of this quantitative study document the extent to which various plant species contribute to maximum nutrient load reductions when undergoing identical environmental stresses and N/P and metal input levels typical of stormwater BMP operation. These findings will assist municipalities, institutions, and state governments in the selection of plants for use in stormwater BMPs to optimize pollutant removal via plant uptake. A discussion regarding the possible explanations for the differences in removal efficiencies of the various species will be provided along with suggestions for use of the species in various applications. Site design parameters will also be proposed for vegetated BMPs.

## Using Sustainable Design as a means for Cultural Exchange, Education and Conservation

**Daniel Winterbottom**, University of Washington, USA, nina@u.washington.edu

**Keywords:** ecological design, service learning, cultural expression, green building

Over the last decade in the United States, sustainable ecological design has been integrated into landscape architecture programs and embraced by professional practitioners. The acceptance of sustainable design is less pervasive in many countries abroad, in particular Eastern Europe. In the Balkans, the physical destruction, emotional trauma, fractured economic system and rampant corruption caused by the ethnic genocide in the mid 90's impede the awareness and adoption of the practices of sustainable design and green building, yet there is a notable curiosity among a few individuals and some youth in these ideas. (1)

In 2009, a group of students from the University of Washington global design/build program traveled to Rijeka, Croatia and with Ucenicki Dom "Podmurvice", a dormitory for high school and college students receiving their secondary education. Working with the students and teachers, the design team proposed a series of sustainable interventions including rain water harvesting, bio filtration, straw bale construction and green roofs which they designed and built. These proposals led to an engaged dialogue with our Croatian collaborators and became a platform for cultural exchange, environmental education and conservation. Instead of a top down model, the students in the design team conducted presentations and workshops to explain green building methods and their environmental benefits. They led workshops to demonstrate to their Croatian colleagues how to implement these interventions. The Croatians were much attached to their cultural and regional heritage and requested that certain building techniques be integrated into the project. Local craftspeople offered workshops on stone carving and wall building. (2) The resulting project incorporates both cultural iconic forms and craft with sustainable building and conservation techniques, and as such it offers a replicable model for other dormitories within Croatia. Some of the questions that emerged were: How can sustainable practices and therapeutic design goals be integrated into a culturally appropriate landscapes? How can green building be integrated aesthetically into a project?

The author will explain the process of community engagement, describe the project, explain the specific sustainable interventions and offer a post project evaluation conducted by Croatian physiologists that measured the Croatian students' participation and the project outcomes and whether sustainable practices are compatible with local culture and heritage.

## Green Roof Energy Efficiency: Investigating Oklahoma's Winnie Mae House

**Reid Coffman**, University of Oklahoma, USA, rrcoffman@ou.edu

**Diane Cocchiara**, University of Oklahoma, USA, dcocchiara@ou.edu

**Keywords:** vegetative roof, green roof, meadow roof, Great Plains

Summer heat is problematic for dwellers of the southern Great Plains. Historically, triple digit temperatures were moderated by sod roofs. Yet, little is known about the evolution of vegetative roofs on the Great Plains and any performance impacts. Fortunately, a meadow roof built circa 1951 gives a glimpse of the changing character of one roof's identity.

Many Great Plains green roofs grow native vegetation for contextualization while optimizing ecological services (Dvorak and Volder 2010). Sutton et al. (pending) shows the prairie style popularity and common advantages to monospecific roofs. The Winnie Mae roof appears to have begun as a diverse meadow roof under the goals of aesthetics and temperature regulation, but after sixty years it has evolved. Originally planted with plains vegetation, the roof is now a monospecific roof of *Liriope muscari* Big Blue Lilyturf, an introduced horticultural variety. To examine the assumptions of design goals, and their evolutionary change, a warm season temperature study was initiated in 2011. Also during this time, interviews, site observations, and reviews of design materials were employed to better understand the aesthetic intent and the roofs character.

Although the original roof was replaced in the late 1990s any effect of cooling inhabited space underneath it appears to have been extended through the new roof. We began recording thermal characteristics of the roof in Summer 2011. The cabin quarters beneath the roof has no central air or heating. Air temperature measured in the interior of the cabin and the adjacent garage are being compared to ambient air. Preliminary results show the green roof interior is moderated from summer air temperature and cooler than non-vegetated garage. The study is continuing into 2012 to record cold season effects. Aesthetics appear to be influenced by ownership and urbanization.

With these results we describe the Winnie Mae house and roof, designed by the architect Robert L. Byrd, and the changes impacting its 60 year evolution.

This descriptive study is an important precedent to the establishment of Great Plains vegetative roofs. In addition, it calls attention to the temporal scale of green roofs, which is currently lacking in the literature. More overly, it provides insight into the design, evolution, and performance of a contemporary plains roof.



## 'The Nursery School' Green Roof, of Athens, Greece

**Fotis Kousiakis**, University of Oklahoma, USA, fotis@ou.edu

**Reid Coffman**, University of Oklahoma, USA, rrcoffman@ou.edu

**Matheos Santamouris**, University of Athens, Greece, msantam@phys.uoa.gr

**Keywords:** Green Roofs; Vegetative Roofs, Vegetated Roofs, Greece

The hot and dry Mediterranean climate of Greece will soon be ameliorated by a plethora of vegetative roof systems. One green roof installed in 2002 on an Athens nursery demonstrated energy savings and now, a decade later, has spawned 20 million Euro public investments for the creation of 2000 roofs by 2025. In the race towards energy goals, little has been discussed about the precedent roof's other attributes leaving Greek green roofs character unknown. This paper reviews and broadens the originally published study for further examination and describes the new incentive for legislation soon to be implemented in Greece.

A team of Greek scientists led an investigation looking at the efficiency added by installing a green roof to an existing structure, and as a second phase calculated the cooling and heating load produced by the roof known as 'the nursery school' (Santamouris et. al. 2007). The results indicated cooling reductions between 12 and 87 percent. Additionally, the heating load of the building was not impacted by the installation of the green roof, making it much more effective in increasing the cooling load of the building. Even though the analysis went into great depth in examining heat and cooling load reductions from the installation, not many details were given on the green roof itself, including plants, substrates, lining materials, weight loads and irrigation techniques. This creates information potential for the roof to provide alternative services such as capturing storm water, creating habitat and promoting biophilia, more descriptive assessment of this roof is needed. Therefore we evaluate 'the nursery school' roof across a broader set of parameters in order to better understand this precedent's character and full eco-social contributions.

This will be done by site visits and documenting products and materials contributing to the project. These include drawings, photographs, as well as written and oral reports. By collecting this information we expect to gain a better understanding of the factors that contributed in the creation of the roof, the existing conditions on the roof, and the eco-social contribution that may have occurred.

Studying Greece's dry subtropical climate will produce information applicable to many climates in the parts of the Southern United States and locations experiencing severe weather, as a part of global climate change. Professionals will be able to utilize the findings in design decision-making and academics and students will be able to use this as a precedent in educational settings.

## Planning for Pollutant Removal Efficiency and Effectiveness Using Bioretention and Permeable Concrete

**Charlene LeBleu**, Auburn University, USA, leblecm@auburn.edu

**Keywords:** Bioretention, permeable concrete, stormwater mitigation

This study focuses on the widely known Best Management Practices of bioretention and permeable concrete, and the pollutant removal efficiency of these stormwater mitigation practices. Both bioretention and permeable concrete have been used to reduce stormwater runoff, but there is still a lack of sufficient data on how well these BMPs remove pollutants resulting in doubt of their ability to meet the requirements of the municipal (MS4) stormwater permit. This project seeks to reinforce the benefits of bioretention and permeable concrete in mitigating the negative effects of stormwater runoff quality from parking lots, and report quantifiable data to support the efficiency and effectiveness of the pollutant removal properties of these BMPs to meet MS4 standards.

Bioretention is a structural BMP and is similar to the homeowner practice, rain gardens, with the exception that bioretention cells have an underlying specialized soil media and need to be designed to meet a desired stormwater quantity. Bioretention is typically designed for the water quality or “first flush” event to treat stormwater pollutants. Davis et al. 2009, reported that reductions in pollutant load result from the combination of pollutant removal and runoff volume attenuation, linking water quality and hydrologic processes.

Pervious concrete paving is gaining popularity as an impervious paved surface to reduce and potentially treat stormwater runoff. This technology has been accepted as a beneficial urban stormwater mitigation practice, but has not been adequately evaluated by EPA and state stormwater agencies for pollutant removal effectiveness. Ferguson, 2005, reported that studies conducted indicate that a pervious concrete system consisting of a pervious concrete structural slab and a sub-base of porous gravel can be extremely effective in reducing the negative impacts of stormwater runoff contaminants.

Methods for this study include a current literature search and reports on two years of data collected from in ground BMP studies supported by the United States Geological Survey (USGS) Water Resources Research Institute (WRRRI) grant program. Results show that both bioretention and permeable concrete demonstrate a consistent reduction of measured contaminants (Nitrogen, Phosphorus and heavy metals) ranging from 20% to 85%, as well as increase in pH with corresponding increases in conductivity, alkalinity and hardness. A general decline in infiltration rates shows gradual clogging over time of both BMPs.

The importance of this study is it consolidates existing information into an easily accessible and readable format for stormwater professionals and students.

## **Managing Stormwater with Green Roofs: Findings from North American Research**

**Bruce Dvorak**, Texas A&M University, USA, bdvorak@tamu.edu

**Keywords:** Green roof, Volume, Velocity, Substrate, Component, Ecoregion

Green roof technology has become familiar to landscape architects in North America over the past decade. There is good documentation of the European experiences with managing stormwater with green roofs (Mentens 2005); however, there is a need for review of the effectiveness of green roofs across North America with its varied patterns of precipitation and ecological diversity. There are many individual reports of green roof stormwater research in North America, but there is no summative analysis. This information is valuable for green roof designers and managers or stormwater and for the development of design guidelines and green roof policy.

The methods used in this review include collection, review and reporting of peer-reviewed green roof stormwater research in North America. The evaluation period is from 1998 to present. Academic journals, conference papers and proceedings were reviewed for content. Summaries of findings were grouped into categories including runoff rates, volume reduction, effects of slope, substrate thickness and composition. Green roof leachate water quality findings were also found but are not reported here.

Findings indicate that there is much variation in the effectiveness of green roofs both individually and regionally. The duration of the storm event, the timing of the preceding precipitation event and the thickness of the substrate are very influential factors. Small to moderate storms are very effectively managed by green roofs in nearly all the studies; however, when a small rain event follows a large rain event and the substrate is shallow (5-7 cm), the green roof becomes marginally effective. With moderate substrate depths (10-12 cm) the green roofs become modestly effective tools for managing stormwater. There were also seasonal differences depending upon rainfall patterns across ecological regions. Findings demonstrate that green roofs need to respond to seasonal rainfall patterns. If a region's winters are wet and summers are dry, a different approach may be required compared to regions with wet summers and dormant winters. There are also variations found with different types of green roof systems. Some of the modular systems were less effective than the monolithic systems, and substrate composition was also found to be an important design element (Simmons et al., 2008).

These findings are important because those responsible for teaching green roof design and managing urban stormwater need to know that not all green roofs perform the same and design characteristics are important. One should not assume that any green roof will effectively manage stormwater.

## Design(ing) Strategies for a Sustainable and Resilient Coastal Beachfront Community

**Miran Day**, University of Illinois at Urbana-Champaign, USA, mirjung@gmail.com

**Keywords:** climate change, sea level rise, coastal environment, beachfront, design implementation

Coastal beachfront environments are especially vulnerable because of conflict between growing development pressure toward coastal areas, and insufficient protection from natural hazards, particularly storm events and rising tides. Much research concerning that situation has been undertaken and many proposals have been prepared by scholars and professionals. Yet, many of the coastal communities have struggled to implement new ideas on the ground. Among the challenges from the design and planning perspective have been a lack of multi-disciplinary approaches (Booz Allen Hamilton 2010), of applied examples, and of recognizable scale to which stakeholders can relate (Cowley, Gough 2009).

The primary objective of this thesis is to offer guidance to the stakeholders in coastal beachfront communities about how to address environmental and socio-economic factors synthetically. The thesis outlines the principles of a synthetic approach to planning and design and then applies them to a specific site—coastal Harrison County, Mississippi—at a neighborhood scale. That method follows an interpretive strategy model for research, reviewing case studies and investigating site conditions to develop unique design strategies. The outcomes of the research include design strategies developed through the understanding of numerous case studies, the synthetic condition for the coastal area, and specific conditions of the beachfront communities in Harrison County, MS. Proposed design strategies are applied to the coastal beachfront area, and a diagrammatic concept is developed in at neighborhood scale. The value of this thesis comes from its potential to guide stakeholders in coastal contexts design and develop more effective strategies, plans, agendas, and alternatives for improving the overall quality (balance, resilience, and efficiency) of their communities.

## Landscape Applications for Compressed Earth Block (CEB)

**Scott B. Williams**, University of Oklahoma, USA, sbw@ou.edu

**Thomas M. Woodfin**, University of Oklahoma, USA, twoodfin@ou.edu

**Keywords:** Innovative construction technologies and materials, Earthen Building Materials, International Building Code, CEB, Compressed Earth Block

**Purpose:** This paper will address an experimental material and production process involving an interdisciplinary team of faculty and students in a College of Architecture. We hope to demonstrate the advantages of compressed earth block (CEB) as an innovative construction technology and material in landscape construction comparable to traditional building materials and construction methods.

**Background:** Compressed Earth Block (CEB) is an inherently sustainable earthen construction material produced by mechanically compressing a regional soil mix of non-expansive clay, sand, water, and stabilizing additives to form modular, solid bricks. CEB does not need to be fired in its curing process thus reducing energy consumption and reducing the production of CO<sub>2</sub>. Situating the production process on the actual construction site using spoil dirt has eliminated the necessity of long-distance transport.

CEB is similar to the ancient technology of adobe and rammed-earth in that its main component is earth. This experimental method produced CEB with high-tech equipment to current industrial and engineering standards fabricated from local, indigenous soils. The 2009 International Building Code (IBC) addresses Adobe Construction and the New Mexico Earthen Building Materials Code (New Mexico, 2004) has amended its adoption of the IBC to require that CEB block have a minimum strength of 300 psi. CEB produced in this experiment yielded compressive strengths up to 1,500 psi.

**Methods:** Both small- and full-scale structural testing has been funded by university and EPA grants. Students are engaged in the manufacture of CEB and the construction of functional site walls at a local residential site using both traditional masonry and CEB techniques. A major challenge of this project is that the material, production techniques, and construction process are not industrially standardized. Typical of earthen building material production and construction, CEB methods are comparatively simple and inexpensive, requiring intensive minimal-skill, manual labor. This project demonstrates that a balanced process combining low-cost raw materials, minimal fabrication machinery and facilities, and intensive manual labor needs to be devised.

**Findings:** Experiments to date have produced the following results: first, material mix designs from local soils (proportions of clay, sand, moisture, and stabilizers) that meet or exceed IBC requirements, second, full-scale mock-up walls tested for strength, constructability and durability, and third, refined fabrication processes to increase efficiency and improve consistency of product.

The presentation will describe the production processes and implementation and illustrate the interdisciplinary engagement of students and faculty in constructing and testing the initial walls.

## Unearthing Fundamental Skills

**Peter Trowbridge**, Cornell University, USA, [pjt4@cornell.edu](mailto:pjt4@cornell.edu)

**Keywords:** Soils assessment, ground penetrating radar, vegetation protection, manufactured soils

As technology expands and advances, the means and methods of design implementation, especially related to soils, have become “stuck”. Contemporary design often focuses upon material qualities, innovations, but rarely on the fundamentals of soils, what most site designs are based on. It is with soils that we as Landscape Architects have our most fundamental connection, our greatest preview. Soil assessment techniques have been lost to most academicians and practitioners. This paper will “re-acquaint” the participants with fundamentals, new materials such as structural soils, manufactured soils, and advancements with ground penetrating radar to “reveal” the ground we stand on, including protecting and enhancing vegetation. Over 15 years of concurrent and multidisciplinary research on soils assessment methods including percolation and storm water attenuation, monitoring of manufactured and structural soils and methods for the use of ground penetrating radar to locate and protect plant roots will be the focus of this paper. Participants will have access to primary references and data in support of this work.

## **Tectonic Sites: Structuring the landscape with textile-derived construction techniques**

**Janet Broughton**, brought2@illinois.edu, **Gale Fulton**, **Richard Hindle**, **Roger Hubeli**, University of Illinois at Urbana-Champaign, USA,

**Keywords:** tectonic, textile, construction, nature, landscape

Tectonic Sites: Structuring the Landscape with Textile-Derived Construction Techniques Tectonic theory has a rich tradition in architecture. Tectonics can be briefly defined as the “poetics of construction” (Frampton, 2001). Discussion of tectonics has guided architects toward expressive construction and even pushed the discipline to redefine itself as one concerned with the creation of space, not symbolic form. Despite its influence in our allied profession, a tectonic theory of landscape architecture remains undeveloped. This thesis explores the role of such a theory in landscape architecture. Inquiry was guided by the development of tectonic theory in architecture. This development started with Gottfried Semper’s focus on textiles in shaping a new origin point and theory of style for architecture in the late 19th century, and followed through to Kenneth Frampton’s description of a tectonic theory at the turn of the 21st century. Analyzing over one hundred landscapes that used textiles in their construction and model making showed the landscape-specific potentials of Semper and Frampton’s ideas.

Textiles are porous and flexible, uniquely suiting them to integrating, responding to, and even structuring landscape contingency. Textiles visibly intertwine with materials and organisms. They symbolize true integration of humans and their materials with other nature: the “natural cyborg” (Marrati, 2010). These concepts provide basis for a possible tectonic theory of landscape architecture, and could even give shape to a new myth of origin that replaces the definition of landscape gardening as an imitative art by John Claudius Loudon over a century ago with an alternative firmly grounded in landscape-specific constructive practice.

The adoption of tectonic theory based on these ideas would require landscape architects to act not as stewards but as actualized natural agents; to realize and engage the constructive potentials of contingency and time; to embrace and develop new expectations for successful design and aesthetics; and develop strong political and ethical stances.

## Adaptive Rain Gardens

**Reid Coffman**, University of Oklahoma, USA, rrcoffman@ou.edu

**Leslie Novotny**, University of Oklahoma, USA, Leslie.A.Novotny-1@ou.edu

**Zack Roach**, Ideal Homes, USA, zroach@ideal-homes.com

**Keywords:** bioretention, rain garden, system design, temporal design

U.S. communities are increasingly dependent on runoff for potable water consumption. However, land development is decreasing water quality levels in reservoirs. To reduce this decline pre-construction and post construction measures retaining sediment and nutrients are commonplace. Historically, measures have been conceptualized and built exclusively as separate features creating potential opportunity to discover efficiencies through a systems design approach linking the two measures. Efficiencies discovered in this design approach could lead to improved performance and reduced costs. Therefore, this project investigates how rain gardens can be designed and constructed as an integrated adaptive landscape infrastructure.

The group performed preliminary in-situ site retention studies in new residential communities in Central Oklahoma. From these observations, seventeen rain gardens were planned, designed and constructed for a public street right-of-way to capture sediment runoff during the construction phase. That same sediment is then used in the post-construction rain garden creation. At this time 100% of the gardens have been installed as pre-construction measures and 40% have been adapted to conventional bioretention rain gardens as a part of site build out.

This poster presents the project to date, goals, design concept, phasing of the system, details of installation, monitoring and factors influencing the project. Additionally, we will discuss the advantages and disadvantages of such proposal. With this information, professionals, academics and students will broaden their working knowledge of stormwater and systems design.



## An Inside Look at the New L.A.R.E. from Development to Administration

**James Penrod**, Council of Landscape Architectural Registration Boards, USA,  
jpenrod@clarb.org

**Keywords:** Health, safety and welfare; CLARB, L.A.R.E.; practice analysis; task analysis; core competencies; licensure; registration; exam; assessment

**Purpose:** Discuss the development process, content, and administration methods for the new Landscape Architecture Registration Exam (L.A.R.E.), scheduled for release in September 2012.

**Background:** The L.A.R.E., developed and administered by the Council of Landscape Architectural Registration Boards (CLARB), assesses the capacity of prospective licensed landscape architects to protect public health, safety and welfare, according to legislative mandate. According to best practices in the professional testing industry an analysis of practice should be conducted every five to seven years to ensure that the exam is both relevant and defensible. The results of this study form the basis for the content of the L.A.R.E. and the content informs the assessment methods.

**Methods:** The 2010 landscape architecture practice analysis was based on an online survey of landscape architects in the U.S. and Canada. With the assistance of ASLA and licensure boards every identifiable landscape architect was offered an opportunity to participate and 1,600 completed the survey. After data were assembled, a diverse group of practitioners, in sessions held across the U.S., determined what knowledge and competencies were associated with health, safety and welfare, what tasks were completed with substantial frequency, and a newly licensed landscape architect should know. Next different groups of licensed landscape architects, guided by a psychometrician, developed a content blueprint for the new exam. Still other groups of landscape architects will develop exam questions, which will be pretested before being utilized.

**Findings:** The practice analysis revealed nine domain areas that were core to initial licensure, including:

- Site Inventory
- Analysis of Existing Conditions
- Project Related Research
- Concept Development
- Design Development
- Bidding and Construction
- Project Management
- Construction Documentation
- Additional Supporting Graphics

**Importance:** These findings have potential significance to the instructional scope, content, and methods as well as timing of exam delivery. It is also an opportunity to increase mutual understanding between academy and practice with respect to curriculum and how it relates to entry to licensed practice in the U.S. and Canada.

**Learning Outcomes:** Attendees will gain an enhanced understanding of how the L.A.R.E. is developed, core content areas and administration methods for the new exam.

# History, Theory & Culture

## Stanley Hart White and the “Vegetation-Bearing Architectonic Structure and System (1938)”

Richard Hindle, University of Illinois at Urbana-Champaign, USA, rhindle@illinois.edu

**Keywords:** University of Illinois, Stanley Hart White, Patents, Innovation, Vertical Gardens, E.B. White

The “Vegetation-Bearing Architectonic Structure and System” is the first known design for a vertical garden, patented by Professor Stanley Hart White in 1938. White’s invention is previously undocumented in scholarly literature, providing a valuable historical context for related and emergent technologies. Methods for establishing this context will include archival research of White’s personal journals and unpublished manuscripts, genealogical timelines of related patent technologies, and interpretation of White’s design in relation to landscape history and theory. Although White’s patent describes a new technological garden type, its potential impact is not merely technical, having evolved as an expression of a specific place, time, and intellectual milieu as all gardens have and will. In this sense, a garden may be understood as a place where the “geography of the mind meets that of the earth” (Marot 2003), making it entirely apropos that the Vertical Garden Type finds its origins in the monumentally horizontal prairies and farmlands of the American Middle West, where the topography of Professor Stanley Hart White’s creative intellect meets a seemingly endless geography of flatness.

This paper traces the techno-historical origins of the Vertical Garden Type through the US patent archives to Stanley Hart White, Professor of Landscape Architecture at the University of Illinois Urbana-Champaign from 1922-1959. Professor White was granted US Patent 2,113,523 on April 5th 1938, for the “Vegetation-Bearing Architectonic Structure and System” in which he describes the new method for creating an “architectonic structure of any buildable size, shape, or height, whose visible or exposed surfaces may present a permanently growing covering of vegetation”. In six beautifully illustrated pages, Professor White reveals the new art of cultivating plants within an architectonic frame, and in the process describes a new vertical garden type which was not fully realized till after his death in 1979. All that remains of this invention are Professor White’s careful diaries, a series of patents, and E.B White’s correspondences about this crazy brother Stan’s invention for “Botanical Bricks” (EB White 1937). Extant traces of White’s invention will be placed in direct dialogue with broader historical and theoretical concerns to catalyze discourse on the origins and implications of vegetation-bearing architecture from modernism to contemporary ecological urbanism.

## The 1961 Grand Valley State College Campus Plan and the Shaping of Johnson, Johnson and Roy's Campus Planning Philosophy

**Cory Gallo**, cgallo@lalc.msstate.edu, **Michael Seymour**, mseymour@lalc.msstate.edu, **Emily Overbey**, ego13@msstate.edu, Mississippi State University, USA

**Keywords:** campus planning, johnson johnson and roy, grand valley state college, history

In 1960 the Landscape Architects and brothers, Bill and Carl Johnson along with Clarence Roy opened a small firm in Ann Arbor, MI named Johnson, Johnson and Roy (JJR) which would go on plan more than 100 university campuses. In 1961, they began working on one of their first major commissions for the newly created Grand Valley State College (today Grand Valley State University or GVSU). While the firm's most identifiable early planning work was the University of Michigan's Central Campus Master Plan, the GVSU campus plan is a relatively unknown.

As a tier two public institution, on the less populated western side of Michigan, the GVSU campus is not widely known outside of the region. However, as a start-from-scratch campus, the plan developed by JJR represents a pure diagram of the approach the young firm was exploring at the University of Michigan and elsewhere to analyze and plan for educational campuses.

Through interviews with two of the original planners, including Bill Johnson, and a review of previously unpublished drawings, this presentation attempts to frame the importance of the GVSU campus as a unique and valuable contribution to modern campus planning by Landscape Architects.

The plan becomes significant when it is considered that: it was one of the first commissions by the JJR office; it was the office's first start-from-scratch campus plan where they were able to test new ideas on a "blank" canvas; it was developed during the same time period as other important campus plans including Hideo Sasaki's Foothills College Plan; and it sits in a unique landscape context.

The landscape includes deep ravines that extend from the Grand River to the plains stretching to Lake Michigan. It was the ravines that led to a unique development pattern that supported a decentralized educational concept where small academic complexes supporting 1,500 students were planned to be connected across 100' deep ravines via pedestrian bridges. This "cluster concept" was praised in periodicals of the day including *Architectural Record*, and it created a dramatic contrast between the built and natural environment

Much of the original plan for GVSU was developed during the first two decades of the campus. While the campus diverged from the original plan in later years, much of what the Johnson brothers planned for was implemented, allowing for a living document of their innovative vision for a clustered learning environment on the banks of the Grand Rapids River.

## Re-positioning greenways in context of urbanisms

Archana Sharma, Morgan State University (Spring 2012), USA, archsharma1@gmail.com

**Keywords:** landscape, urbanism, sustainable development, greenways

Greenways have been positioned as a multi-functional, multi-objective landscape to address socio-cultural and ecological concerns. The priorities have since then shifted from landscape value based conservation to human life based conservation such as climate change and sustainable development. Has the design and philosophical position on greenways evolved thus? This paper critically re-evaluates the contemporary evolution of greenways design and thinking in sustainability context. The critical analysis of this information leads to inquiry on the philosophical positioning of greenways; whether and which of the thinking framework out of the emerging ones on sustainable design, ecological urbanism and landscape urbanism is most appropriate to frame ongoing greenways discussion.

The paper begins with a review of predominant design typologies of greenways followed by an assessment of those designs in context of strategies presented under landscape and ecological urbanisms. The greenways theory and design approaches are critically reviewed through scholastic publications, design proposals, reports by government and other participating agencies. The experiences from field visits and outcomes from community survey are used to inform the research. The critical review indicates that current design and philosophical discussions on greenways needs to be more inclusive of current design and environmental context. Through an improved understanding, definition, design and disciplinary context of landscape urbanism, the greenways strategy would be empowered to effectively impact the spatial design and climate of our neighbourhoods and cities.

## Argentine Landscape Practice the early 20th Century- Political Economy, Design, and the Case of Benito Carrasco

Brian Davis, University of Virginia, USA, brd6eq@virginia.edu

**Keywords:** urbanism, argentina, industrialization, performance, political economy

This presentation will examine the work of early 20th c. Argentine urbanist Benito Javier Carrasco. His emphasis on plant performance, public urban landscapes, national parks and the importance of a regional sensitivity all seem prescient and are germane to the contemporary discourse within our profession. Using source documents heretofore only available in Spanish, I will situate Carrasco's work among the efforts of other urbanists and designers working in Argentina at the time, especially that of Carlos Thays and JCN. The presentation will rely on historical maps and contemporary photographs as well as original analytical diagrams of plans and documents produced by Carrasco. By establishing the political context and connecting contemporary issues of landscape performance and design through the practice and theory of a historical figure, I propose that landscape practitioners in North Americas might begin to look to South American examples for important precedents and ideas.

From 1910 to 1960 Buenos Aires grew from a regional center of 500,000 to a major industrial and financial capital of 5,000,000. While wars were raging in Europe the Argentine economy was booming and immigrants from southern Europe flooded its shores. Benito Carrasco was a native-born Argentine agronomy engineer who studied urbanism at the University of Buenos Aires under Carlos Thays. Working at this time of incredible growth and industrial urbanization, his focus on the performative aspects of the urban landscape and emphasis on the landscape as fundamental unit of analysis for the city were ahead of their time and a harbinger of the ecological considerations that mark landscape practice today.

As Director of Parks and Promenades for the city of Buenos Aires he undertook hundreds of projects as part of a plan to remake the city as a cosmopolitan manufacturing and population center. Much like Frederick Law Olmsted, he actively engaged in the public discourse through newspaper editorials and later in his career he worked to establish institutions, focusing his efforts on a school of urban landscape design at the University of Buenos Aires. His early advocacy for a national parks system based on the North American model was instrumental in the creation an Argentine system of national parks. Carrasco's theoretical contributions, his criticism of imported design fashions, his body of built work, and the establishment of a school of landscape and urbanism at the University of Buenos Aires make him an important figure in the history of South American landscape design.

## Sites of Memory: [un] Plugging Time Below the Old River Control Structure

**Kristi Dykema Cheramie**, Louisiana State University, USA, [kdykema@lsu.edu](mailto:kdykema@lsu.edu)

**Michael Pasquier**, Louisiana State University, USA, [mpasquier@lsu.edu](mailto:mpasquier@lsu.edu)

**Keywords:** landscape morphology, cultural landscape

For over 7000 years, the Mississippi River moved freely across the surface in search of the most efficient meander. In Louisiana, settlement patterns responsively clung to high ground near the river or loess deposits of the Tunica Hills, steering clear of the fragile slurry found between ancestral stream channels. In 1830, the river system experienced the first of what would become a sweeping effort to manage its flow. Over the next century, flood control measures were federalized and the lower Mississippi Basin was re-branded as a “menace to national welfare,”<sup>1</sup> nationalizing the perception of the alluvial landscape as an unpredictable, dangerous battleground. Localized controls gave way to a multi billion-dollar effort to redirect an entire system, confronting fluctuations in river level and the threat of a large-scale shift in the river’s course. <sup>2</sup>

Though scripted into the geologic cards of the river system, and in fact long overdue, the avulsion of the lower reach of the Mississippi would be catastrophic for the American economy, preventing passage of goods in and out of the Midwest and rendering New Orleans uninhabitable. So, in the 1950’s, the Army Corps of Engineers undertook a massive series of constructions to prevent the capture of the Mississippi by the Atchafalaya.<sup>3</sup> Central to the control system is the Old River Control Structure (ORCS), built to prevent the Mississippi from redirecting by allowing only 30% of water volume to enter the Atchafalaya.

By 1963, the geomorphology around ORCS had been reworked into something more akin to a PVC plumbing system than a fluctuating alluvial ecology. Communities relocated to “safe ground,” leaving behind buildings, rituals, and land use practices, forever altering the interface between settled ground and water. This project explores the natural and human consequences of the Army Corps’ efforts to stop the Mississippi River from changing course, assembling three categories of information: human narrative (through ethnographic fieldwork), geologic manipulation (through layered sectional drawings and collages), and evidence of change (through geospatial analysis and mapping). The work speculates on the often-conflicting cycles of time by tracking communities and waterways displaced, replaced or emplaced by the ORCS. Geologic forces will continuously pull the river towards its most efficient state, local ecologies will respond seasonally, and residents will secure permanent and stable environments. This project identifies intersections within these three cycles, building a collection of visual and textual pieces that explore the notion of stability in the face of change.

## **Biomimicry: Eco-urban Poetry in contemporary China**

**Mary Padua**, University of Florida, USA, mgpadua@dcp.ufl.edu

**Keywords:** aesthetics, biomimicry, contemporary urban China, ecological design, theory-building, post-sustainable design

Biomimicry: Eco-urban Poetry in contemporary China Biomimicry and ecological design have been the trend in the emerging profession of landscape architecture in China. In the west, landscape architecture praxis has generally demonstrated that biomimetic strategies are employed in varying contexts: environmentally impaired sites and urban areas to replace or adapt existing conventional subterranean stormwater conveyance systems to green infrastructure. Often, science has been the focus of the design discourse. This qualitative research takes an interpretative trajectory that departs from Meyer's (2008) heroic rescue of beauty and her claim to make prominent the aesthetic in the sustainability discourse. Through the deployment of field research and case study analysis, the aesthetic dimensions of biomimicry as an ecological design instrument were explored in two public parks: Living Water Garden, Chengdu, capital city of Sichuan province, by Betsy Damon and Margie Ruddick completed circa 1998; and Bridge Park (Qiaoyuan), Tianjin, by Turenscape completed circa 2008. I asked what design language (vocabulary and grammar) could be used to characterize the aesthetics of biomimicry in China's ecological park typology? And what primary data, if any, could be used to indicate progress in China's landscape architecture praxis from 1998 to 2008? Preliminary findings indicate that the parks' aesthetics could be interpreted as a new type of eco-poetry—a form of lyricism that weaves ecology with creativity (Spirn 2000) in China's urban experience. I also speculate that the aesthetics of biomimicry and ecological design are indicators for China's landscape architecture praxis rapidly advancing to a post-sustainable paradigm.



## The “Shan-shui City”—An Ecological City with Chinese Characteristics

Jie Hu, Beijing Tsinghua Urban Planning & Design Institute, China, tsinghuala@gmail.com

**Keywords:** Shan-shui city; collaborative design; Beijing Olympic forest park; Tieling Fanhe new city; Tangshan Nanhu eco-city

China is under rapid urbanization development in the 21st century. Resolving the contradiction between local economic development and environment protection has become the key point for urban sustainable development, while creating an urban space considering both human and natural demands with Chinese characteristics is a non-ignorable focus for new city development in China. Mr. Qian Xue-sen proposed in 1990: “Is it possible to combine Chinese landscape poetry and Chinese classical architecture in gardens and Chinese landscape paintings all together, to create a concept of ‘Shan-shui city’? People left nature but also have to return to nature. The socialist China has the capability to create communities in a ‘Shan-shui city’ style.” According to Chen Yulin, the “Shan-Shui-City” is “one of the most unique spatial planning concepts in the China’s history. It combines the urban construction and the natural environment which is mainly composed of the mountains (“Shan”) and the water (“Shui”).” The article reviews the traditional Chinese living environment concept of “man is an integral part of nature” and “harmonious co-existence between man and nature”, as well as the concept of “Shan-shui city”, interpreting and restructuring urban landscapes from the perspective of the Natural State, the Picturesque State, and the Ideal State. 3 urban scale landscape planning projects are taken as case studies to discuss the detailed working process—Beijing Olympic Forest Park, Landscape Planning of Tieling Fanhe New City Core Area, and Tangshan Nanhu Eco-City Central Park. Taking urban eco-security demand as the limit of the landscape planning, the 3 case studies are designed based on Chinese mountain-water-structure with traditional cultural features, and functional requirement of open spaces in urban land-use. The article discusses urban landscape planning methods and process combining urban development and natural environment with Chinese characteristics, in order to provide useful references and experience for landscape planning of other new cities.

## What Did Gene Stratton-Porter See From Her Million Dollar View: Preserving Early 20th Century Landscapes in the 21st Century

Christopher Baas, Ball State University, USA, rcbaas@bsu.edu

**Keywords:** Cultural Landscapes, Landscape Preservation, Historic Garden Design

In 1914 Hoosier nature writer and bestselling author Gene Stratton-Porter constructed a two-story residence on the shore of Sylvan Lake in northeast Indiana. The new home was set in a wooded landscape selected for its natural qualities, and she named it the Cabin at Wildflower Woods. In laying out and planting the grounds, Stratton-Porter proclaimed “there was only one thing to do, and that was to let nature take her course” (Plum 153). However, this was hardly the case. In the ensuing eight years she proceeded to collect and transplant “very close to fifteen thousand trees, shrubs, vines, bushes, and flowers” from the surrounding “swamps, forests, and highways” (Stratton-Porter 219). The woodland surrounding the house was divided into six parts and planted according to a color theme. Red flowering plants were located along the property’s west border, followed by white, pink, blue, and mauve, with plantings of yellow surrounding the cabin. She described her design as a “wild garden” and a “wild flower sanctuary” in her writings, and constructed a huge window in the cabin’s parlor to frame her self-proclaimed million dollar view (Plum 140, 158). In the ensuing century, Gene’s wild garden has been replaced by a multitude of invasive species (perhaps even ones introduced by Gene). Now a state historic site, property management is exploring preservation strategies for restoring the landscape to represent the 1912-1924 period of Gene residing on and actively managing the property.

While Stratton-Porter is universally famous as a proponent of natural landscape conservation, her private landscape is a contrived and idealized version of nature (perhaps, as nature is idealized in her fiction). This paper seeks to: 1.) Examine Stratton-Porter’s perceptions of the “natural” landscape in light of developments of the fields of landscape restoration and historic preservation in the century since her garden’s construction; and 2.) Present how an appreciation of these perceptions can guide restoration decisions for this significant cultural landscape.

Using field work, archival sources, and Stratton-Porter’s personal writings, this paper will:

- Examine the historic meanings of Stratton-Porter’s writings (i.e. natural, native, and wild)
- Examine the plant species Gene transplanted in her garden
- Examine the ethics of harvesting native plants (which will draw upon Stratton-Porter’s book *The Harvester*)
- Offer preservation options for the restoration of Gene’s gardens
- Discuss the implications of this research as it relates to landscape preservation in the 21st century

## The Landscape of Neglect: Wastelands as a Catalyst for Future Design Projects

Galen Newman, Texas A&M University, USA, [gnewman@arch.tamu.edu](mailto:gnewman@arch.tamu.edu)

**Keywords:** wasteland, neglect, urbanization, suburbanization, cultural landscape, retrofit, reclamation, restoration

The successional cycle of activation and obsolescence has always been a salient characteristic of urban growth. Unfortunately, this cycle has left in its wake an abundance of vacant and derelict land, historic core areas, and abandoned building stock—a landscape of neglect. Nature unavoidably produces waste as it grows. Similarly, urbanization also produces waste; dilapidated leftovers of growth and derelict stains within the cultural landscape. Vacant housing, inactive landfills, decommissioned rail yards, obsolete industrial plants, dismantled military installations, abandoned riverside harbors, unused parking lots, disheveled open space, unkempt transmission corridors, and deserted historic structures are wasted lands which are replete in any urbanizing environment. The continual fluctuation between use and decay of space has always and will always create neglected space. Some theorists suggest that these wastelands are an indicator of healthy economic growth (Berger 2007). However, current development patterns have resulted in an over abundance of this space, in both urban and suburban environs, and the amount of excess is accruing at a much more rapid pace than in the past. These by-products of the man modified environment have increased in quantity to the point where they have become a field of study in their own right. Retrofitting vacant suburban spaces, the reclamation of devastated natural lands, and the restoration of abandoned historic buildings are all strategies aimed at reversing this condition. This research presents a literature review on theories of urban wasteland formation and statistics on the existence of this type of space in an effort to expose the degree to which neglected areas have formed in American cities. As an analytical strategy, spatial statistics on amounts of abandoned structures and vacant lands for cities with populations higher than 100,000 persons are compared by census region on a national scale. Existing secondary data utilizing three typologies—abandoned big box developments, decommissioned industrial lands, and threatened historic structures—are then also compared on a national scale. Results show that an average of 15% of each American city is occupied by neglected space and acreages of all three typologies are projected to increase which will unavoidably increase the percentage of neglected land. Therefore, an increase in demand for design projects aimed at reversing this condition (specifically preservation, reclamation, and retrofit projects) is also projected. Therefore, typologies of this space need to be developed, mapped, and measured in preparation for this increase.

## From low-cost to design technique: The evolution of Borrowed Scenery in Chinese classical gardening

Hongjun Zhou, The University of Tokyo, Japan, zhouhj04@gmail.com

**Keywords:** Borrowed Scenery, design technique, evolution, low-cost

The research question is how the term of Borrowed Scenery evolved to be one design technique in gardening. In modern context, Borrowed Scenery is usually interpreted as a gardening technique visually connecting garden inside and outside, as one significant concept in Chinese classical gardening. Literally, the anticipated scenery belongs to someone else, so it seems like that the scenery is borrowed from someone else, but only visually. In this sense, Borrowed Scenery is comparable to Ha-ha in European context. "Borrowed" means low-cost, and is usually connected with moral merits of economists. The first case of this term was seen in one literature of 12th century, where the term was employed to praise the moral merit of one governor as he only "borrowed" the scenery from his people's garden nearby rather than to construct one.

This study is conducted mainly by the survey into the classical literature related to this term. From these historical records, the composition of Borrowed Scenery is summed up as three unique types, and accordingly three typical cases are extracted: Huang Tingjian of 12th century as the first case, Ji Cheng and Li Yu of 17th century. Then the three are analyzed in details, in aspects of historic background, meaning and indication, followed by the comparison. Especially, the landscape and space structure in cases of Ji Cheng and Li Yu who were gardeners of 17th century is summarized.

It is found that compared to the moral praise in the case of Huang Tingjian, in *Yuanye* (The Craft of Gardens) Ji Cheng transferred this term into the field of gardening, while it was defined to be one concrete technique by Li Yu subsequently. Overall, Borrowed Scenery is explained based on the judgment of low-cost, in which garden should be designed and constructed at the cost as low as possible. Then it was transformed to aesthetic concept, in which the borrowed scenery is regarded more attractive. In Li Yu's treatise, the design technique of Borrowed Scenery is interpreted mainly as the alienation operation to the visual media between the visual point and the borrowed landscape.

This finding echo with one topmost ideal of Chinese art called Qiao or Miao, in which limited ordinary material is changed into the unordinary by limited but creative processing. It also reminds planners and designers of contemporary landscape to practice in a more modest way, inspired by the traditional wisdom.

## Halprin in Israel

**Kenneth Helphand**, University of Oregon, USA, [helphand@uoregon.edu](mailto:helphand@uoregon.edu)

**Keywords:** Halprin, Israel, Drawing

Lawrence Halprin's contribution to the Israeli landscape is little known, but he made a significant contribution to planning and design in Israel. Halprin's relationship to Israel spans his lifetime. Born into a Zionist family he spent two years on a kibbutz in the 1930s, when they were in their pioneering idealistic even utopian stage, which profoundly influenced his ethics, philosophy and sense of community. He returned to Israel throughout his life and its landscape and people, would remain as touchstones. His contributions were both as advisor and designer. He advised on national landscape planning, national parks and was an influential member of Mayor Teddy Kollek's Jerusalem Committee. His design projects, all in Jerusalem, include: The Hadassah Medical Center, the Israel Museum and Ben Yehuda Mall. His most significant work is the Haas (with Shlomo Aronson) and the Rhoda Goldman Promenades (with Bruce Levin) at Armon Hanatziv. His Israeli work exemplifies aspects of his most significant contributions as a designer. The work is derived from intense personal experience. It is passionate and idealistic. It exemplifies his continued attention to choreography and performance. It drew from lessons learned from the thoughtful examination of other places, yet was based on a careful sensitivity to the cultural and physical conditions of the place. It demonstrated his attention and consummate skill at all phases and scales of design, planning and construction.

This presentation is about Halprin's Israel work told through his largely unpublished Notebooks. Halprin's drawings demonstrate a remarkable ability to capture the essential qualities of place and succinctly conceptualize landscape design at multiple scales. His design derives from multiple sources that are revealed in his Notebooks especially in the design of the promenade (known as the tayelet) in Jerusalem. Halprin's Jerusalem drawings highlight the relationship between places, noting not only what is in the eye of the beholder, but that which is beyond the visual field in recognition that those connections are equally part of design thinking and process. This encompassing view is nowhere more apparent than in his design and understanding of Armon Hanatziv, a site that encompasses one of the world's great vistas, a view that is not only spatial and visual, but historic, sacred and laden with unfathomable depth of meaning. The tayelet design summarizes many of Halprin's concerns and passions: his concepts of community, studies of movement and choreography, and the method and meaning of aspects of the RSVP cycles.

## The Landscape Observation Systems of the Maginot Line

Chip Sullivan, UC Berkeley, USA, csully4@yahoo.com

**Keywords:** Landscape Observation

The purpose of this presentation is to discuss and illustrate the unique systems of landscape observation employed at the Maginot line. The Maginot Line was one of the more obscure wonders of earth architecture which integrated a sophisticated graphic landscape communication network.

**Historical Background:** France lost over a 1 ½ million soldiers in the horrific First World War. Shortly after the Armistice was signed, Britain and America withdrew their war-weary troops and would not sign a unilateral agreement with France to protect the French from any future attacks from Germany. Severely lacking in manpower, the French had to find an alternative method to defend themselves. In the mid 1920s military planners began reviewing the potential of a highly organized defense system to effectively protect their borders with a minimum number of troops which became known as the Maginot Line.

**A Miniature Self-Sustaining Subterranean City:** The Maginot Line was a succession of subterranean fortresses sited according to the nature of the terrain, natural cover, and lines of site. Garrisons of up to 1,550 men were housed in complexes deep below the ground which included kitchens, hospitals, munitions storage and command centers. The whole system was connected with a narrow-gauge railway and led to armored surface turrets. Each fortress generated its own power, had self-contained water supply systems and enough supplies to live underground for several months. Powerful ventilation systems produced enough air pressure to keep out poisonous gas. They even had tanning rooms with artificial sunlight to overcome the lack of natural light.

**The Landscape Observation Systems:** Each fortress had several types of observation cupolas. One was equipped with powerful retractable telescopes for indirect viewing across a wide field. Another had panoramic photographs pinned directly above the protected binocular viewing slots, so that an observer could quickly reference the photo and determine an enemy attack.

For this presentation, I will briefly introduce the history and design concepts of the Maginot Line, then focus on two specific sites—Fortress Hackenberg and Fort Immerhof. My visual presentation will incorporate historical and contemporary documentation, plus a large number of analytical drawings I produced on site of the landscape elements that I will be discussing. I will illustrate the different types of subterranean structures and their observation systems with sequential drawings, sections and illustrative diagrams.

## Looking for the Origins of Midwest Park Lagoons in Lakeside Park

Kimball Erdman, University of Arkansas, USA, kerdman@uark.edu

**Keywords:** lagoon, parks of the Midwest, Lakeside Park, Fort Wayne, City Beautiful, Jackson Park, World's Columbian Exposition, Louisiana Purchase Exposition, Frederick Law Olmsted, Japanese stroll garden

On March 6, 1911 Henry J. Doswell, Superintendent of the Lindenwood Cemetery in Fort Wayne, Indiana, presented his design for Lakeside Park to the city's board of commissioners. The city had purchased a small manmade lake, bathhouse, and adjoining property in 1908 from the Fort Wayne Land and Improvement Company, developers of the city's first suburb, Lakeside Park Addition. The centerpiece of the design consisted of four islands nestled into a network of lagoons constructed in the existing woodland north of the lake, which the commissioners felt would create "the most beautiful breathing spot owned by any municipality in Indiana."

Lakeside Park's lagoons were completed the following year, and they did indeed become a much-admired attraction. Of course, it is impossible to compare the beauty of the new park to others in Indiana, but it certainly was not unique. By the early 1900's exotic, lushly planted lagoons had become an extremely popular (and common) park feature, particularly in cities of the upper Midwest.

Lakeside Park was built during a time when Fort Wayne intently focused on improving its image. Outside consultants, including City Beautiful advocate Charles Mulford Robinson and landscape architect George Kessler, were brought in to develop plans for greening the city through the addition and connection of parks and boulevards. Their efforts, combined with Doswell and several other Fort Wayne park designers, point directly to the world fair responsible for popularizing and transmitting the ideals that became the City Beautiful movement—the World's Columbian Exposition, held in Chicago in 1893.

While much has been written about the far-reaching impacts of this exposition, little attention has been paid to the pervasive phenomenon of the parkland lagoon that, due in large part to the Columbian Exposition and the subsequent Louisiana Purchase Exposition of 1904, became commonplace in the American Midwest during the early 20th century. Doswell did not reveal the source of his inspiration for Lakeside Park's lagoons; in fact, he may not have fully recognized the origins of the genre he was using. An examination trends and evidence contained in park reports, newspaper articles, and other documents related to both local and regional events at the time of Lakeside Park's creation, however, yields clues to these origins, as well as to the evolution and potential demise that many of these once-common manmade landforms face.

## Garrett Eckbo in the Minneapolis Park System: Urban Nature or Urban Renewal?

Heidi Hohmann, Iowa State University, USA, hhohmann@iastate.edu

**Keywords:** eckbo, parkway, Minneapolis, Modernism

The design of the Minneapolis Park System, heralded as “the best located, best-financed, best designed, best-maintained public open space in America” (Tate, 179), is generally attributed to H.W.S. Cleveland and Theodore Wirth and the period 1883-1937. However, the system, as perceived today, is not just a 19th century scenic park design. Significant portions of the system represent late-20th-century Modernist ideas of landscape, implemented in response to a 1970 Garrett Eckbo plan. Minneapolis brought Eckbo in to re-examine the “purpose of the parkways,” and his work helped create a compelling Modern identity for the park system, accomplished through the design and implementation of standardized lighting, signage, and details, many of which are still used today. To relieve perceived automobile congestion, Eckbo also proposed a major reorganization of the system’s parkways, changing sectional relationships, adding parking, and perhaps most significantly, creating a primarily unidirectional flow around the park’s signature chain of lakes. Many of these changes were highly controversial at the time, sparking angry citizen protests. Although revised by a citizen commission, much of the plan was ultimately implemented, permanently changing both the parkways and park planning processes. Lamenting the resulting physical changes, one local historian called the redesign an example of “urban renewal in parks,” a perhaps damning commentary on the work of one of the century’s best-known landscape architects (Wright, 150-175).

Using the Minneapolis parks as a case study, this paper hopes to re-evaluate the nature of Modernism in the context of urban park design, to determine how it perpetuated, re-envisioned or destroyed late-19th- and early-20th-century ideas of park design as “urban nature.” Were the physical effects of mid-century modernization the result of ‘stylistic’ Modern ideas about landscape, of social change, of population and use pressure, or of some combination of the above? Through research in primary historic documents and graphic analysis, this paper also seeks to understand Eckbo’s design ideas in the context of larger traditions of park design, considering, for example, how his circulation redesign reveals new relationships between the 18th-century circuit drive, the 19th-century urban parkway and the national park perimeter drive. Finally, the paper examines a little-considered aspect of Modernism—the redesign and re-engineering of extant parks apart from their historic uses as “new” environments for new modes of living. In so doing the paper hopes to complement and expand existing historical readings of both Eckbo’s oeuvre and Modernist landscapes in general.



## Landscape Architecture in Vitruvius' Treatise On Architecture

Kathryn Gleason, Cornell University, USA, klg16@cornell.edu

**Keywords:** history, treatise, Vitruvius, public gardens, Rome, archaeology

Over the past 15 years, new archaeological excavations around Rome and the Bay of Naples have revealed the design characteristics of ancient public parks and the public areas of large private villas. (1) These new discoveries include the author's work at the Villa Arianna at ancient Stabiae and on the fragments of Forma Urbis, the marble plan of Rome (210 CE). At last, we have enough new evidence to reinterpret the ancient texts, providing fresh understandings of the ancient literature that has shaped garden history for millennia.

This paper offers a new assessment of the architectural treatise, *De architectura*, by Marcus Vitruvius Pollio (c.75-15 BCE, a seminal work in the development of European and European-American architectural design (2). From the rediscovery of its manuscript in 1414 and its widespread dissemination by Leon Battista Alberti, this treatise is the foundation of knowledge for classical architecture. It continues to structure our knowledge of ancient architecture and our interpretation of archaeological remains. The treatise, however, has long been notable for the writer's apparent disinterest in gardens and other designed landscapes.

The author of this paper suggests, in light of the new archaeological evidence and recent scholarship on specific Latin terms used by Vitruvius (3), that this is a far richer source of evidence for ancient landscape architecture than previously imagined. The paper will examine Vitruvius' choice of landscape terms and set them in comparison to features of gardens and designed landscapes recovered through excavation and other forms of archaeological detection.

We can now propose that the current translations and interpretations of Vitruvius are too limited. Vitruvius assumed his readers could see the places he discusses, and he is weighing in with his opinion of them. We also see that that Vitruvius is less concerned with gardens in this treatise than with a scope of work that we call landscape architecture today. He also allows us to see how he is distinguishing the work of the architect from that of the topiarius, an ancient landscape professional whose scope of work is starting to come into focus as a "designer of places."

## Dramatic Topographies: Landscape Character as Appearance and Performance

Allan Shearer, The University of Texas at Austin, USA, ashearer@austin.utexas.edu

**Keywords:** landscape character, 18th century England

The first appearance of the phrase “landscape character” is often cited as Whately’s, *\_Observations on Modern Gardening\_* (1755). That text was written while Whately stepped aside from writing another book that was published uncompleted and posthumously, *\_Remarks on Some of the Characters in Shakespeare\_* (1785). It is argued in this paper that, more than a bibliographic oddity, Whately’s texts are emblematic of a complex translation of theories about drama to theories about landscape.

The method of inquiry begins with an examination of primary and secondary sources related to eighteenth century drama and its role in cultural production. The idea that drama can serve as a model for life was established during the Renaissance, but in the eighteenth century particular attention was given to an evolving notion of “character.” At the beginning of the century, the term referred to distinctive physical marks; by the end of the century, its meaning referred also to moral qualities that guided action. Correspondence between outward appearances and inward qualities were desired, but it was recognized that the relationship was not always concordant. This constable condition was underscored by the fact that actors played “persons on the drama,” rather than their genuine selves. Similar deception was possible off-stage in social interactions. Unable to give full access to the inner lives of protagonists and, thereby, align visage and values, dramatists resorted what has been called “motives of form” that provided a sense of character integrity by grounding appearance in the conventions of genre (Freeman, 2002).

These texts are then used to inform readings of landscape treatises written in the same period. Emphasis is given to the texts of Humphry Repton, which make explicit reference to landscape character. As in discussions on dramatic character, discussions on landscape character centered on relationships between distinctive visual qualities and action—how the landscape performs. Here, appearance was fixed through a range of strategies including comparisons to landscape painting and historicism. Just as dramatic genres were used to stabilize a newly appreciated uncertainty inherent within the modernizing notion of “self,” these strategies might be understood as helping to stabilize new uncertainties about the modernizing notions of landscape.

The potential significance of this investigation is its opening of the often used notion of “landscape character” to critical scrutiny. In doing so, it may provide a way to frame relationships between how a landscape looks and what a landscape does.

## Good Roads, the Automobile, and the Rediscovery the Virginia Landscape

Brian Katen, Virginia Tech, USA, bkaten@vt.edu

**Keywords:** tourism, automobile travel, Good Roads Movement, African American Landscape

The Good Roads Movement and automobile travel transformed Virginian's experience of the landscape in the first two decades of the twentieth Century. The Commonwealth's network of early roads served as a testing ground for both the automobile and the skills of pioneering "automobilists." Early twentieth century automobile travel would alter the spatial and temporal experience of the landscape and reinvigorate tourism in the Commonwealth as Virginians rediscovered the richness of the state's natural wonders and history.

Using accounts from period newspapers and periodicals, including *The Automobile* and *Good Roads Magazine*, and the records of the U.S. Office of Public Roads, the Southern Appalachian Good Roads Association, and the Richmond Automobile Club, this paper presents automobile travel as central to the transformation of Virginians' experience, appreciation, and understanding of the Commonwealth's landscape. Early automobile travel is revealed as a missing chapter in the Commonwealth's tourism history, and influential in re-establishing the aesthetic appreciation of nature and in reinforcing stereotypes concerning the state's "poverty stricken mountain section, where people live by hunting and nutting"

By 1910, "touring" automobilists, and "scouting" parties and endurance run participants sponsored by the East's major newspapers were crisscrossing the Commonwealth searching for shorter and faster routes between major east coast cities. Descriptions of their travels, and the beauty of the Virginia landscape, appeared in newspapers throughout the East, frequently accompanied by photographs of the automobilists and their cars in various landscape settings. Typical was an account in the *Washington Post* from May, 1910 describing a drive to the Shenandoah Valley with "a panorama presented to the eye which cannot be duplicated anywhere in the United States."

By 1913, the *Washington Post* was advertising auto-touring guides that included "well laid-out routes" for "summer and vacation tours." Soon, African American Journalists were travelling Virginia's roads and turnpikes and their experiences were recounted in the Black press. Their Jim Crow era depictions of the beauty of Virginia's mountain scenery would set the stage for later demands for equal access to Virginia's natural wonders for all Virginians.

The early twentieth century travel accounts in the White and Black press echoed nineteenth century travel accounts to the Virginia mineral springs signaled a renewed appreciation and understanding of the Virginia landscape—a "landscape "picturesque, historic, and useful"—that would shape discourse on the Virginia landscape and tourism throughout the twentieth century.

## The Sacred Wu-Yue: A Politically Constructed Landscape in Imperial China

**Wei Zhao**, University of Illinois at Urbana Champaign, USA, weizhao4@illinois.edu

**Keywords:** political landscape, state ritual, sacred mountain, constructed landscape, the center of the earth, imperial China

Wu-Yue, translated as “five large mountains,” refers to five specific mountains in central China. The origin of the term dates back to the Western Zhou Dynasty (1046–771 BC). Without ever using the word sacred to describe Wu-Yue, the Chinese people have considered each mountain as a sacred site for the past Millennia. Currently, each mountain hosts an array of centuries-old sacrificial temples or alters, as well as by building complexes dedicated to Buddhist, Daoist, or Confucian beliefs.

Drawing upon mostly primary sources including Chinese classical writings, official accounts, and chronicles, this paper argues that Wu-Yue, considered as a whole, is a cultural concept and a political construct established upon, yet detached from, the physical landscape of the five mountains. This paper will provide a unique case in understanding the way in which landscape can be manipulated to suit political agenda. In so doing, this paper seeks to understand the unspoken sacredness of Wu-Yue as manifested in its origin, its historical development, and the evolving state rituals associated with Wu-Yue. Although embedded with political connotations from the very beginning, the origin of Wu-Yue illustrated the way in which the ancient Chinese people perceived the universe. As a cultural concept, Wu-Yue started to attract religious practices which gradually established its sacredness. The changing designations of Wu-Yue and the evolving state rituals through the centuries represented the shifting political landscape in central China; Wu-Yue became a media and a stage for the ruling class of imperial China to reveal, demonstrate, and perform their supreme power. This power was further manifested through the emperors’ ability to manipulate the sacred sites. As a result, the unspoken sacredness of Wu-Yue was heavily constructed by its political implication than its religious significance.

## **“Memory Work”: The Forgotten Submissions to the Oklahoma City Memorial Design Competition.**

**Martin Holland**, University of Illinois at Urbana Champaign, USA, holland4@illinois.edu

**Keywords:** Memory Work, Design Competition, Unpublished Submissions, Oklahoma City National Memorial and Museum

A large, untapped source of material concerning the Oklahoma City National Memorial & Museum lies within the 624 entry boards submitted as part of the design competition held in 1996. This “memory work” plays a vital role in our understanding of public memory; these boards offer an array of design concepts for the site, and represent hundreds of thousands of hours dedicated towards the competition. James Young has observed that while “contemporary art invites viewers and critics to contemplate its own materiality, or relationship to other works before or after itself, the aim of memorials is not to call attention to their own presence so much as to past events because they are no longer present.” (Young, p.12) Memorials indeed have their own history. The competition boards suggest a host of alternate meanings of the tragedy of April 19, 1995, interpretations not captured in the designs of the five competition finalists, or in the memorial that was eventually constructed. However, unlike current standard practices of design competitions, those alternate submissions were never published. (See note below.) My presentation corrects that oversight by first identifying emergent themes within the boards concerning commemoration; second, by indicating continuities between professional and amateur approaches to the representation and interpretation of the bombing, and third, by articulating possible alternative memorial practices. Close analysis of the boards highlights the state of the design profession at the time of the competition while shedding light on the position in which designers find themselves when trying to navigate the minefield of grief, loss, and trauma.

## A Place for Soldiers on the Mall: The Landscape Narrative of the Korean War Veterans Memorial

**Alan London**, Chatham University, USA, [alondon@chatham.edu](mailto:alondon@chatham.edu)

**Kyle Beidler**, Chatham University, USA, [kbeidler@chatham.edu](mailto:kbeidler@chatham.edu)

**Keywords:** Memorials, Commemoration, Narrative

Scholars have considered how landscapes can be experienced as narratives. Public memorial landscapes often communicate meaning by constructing narratives of commemoration, tying the past to the present. The ongoing proliferation of commemorative landscapes suggests value in studying late-twentieth century memorials as cultural landscape precedents.

With its convoluted, multi-year design history, Washington D.C.'s Korean War Veterans Memorial (1995) provides several potential lessons for future commemorative projects but has received limited scholarly attention. In their design competition guidelines, the KWVM's sponsors (who were also the competition jurors) mandated an overtly patriotic message, in contrast to the rhetorical silence of the nearby Vietnam Veterans Memorial. Aspects of the winning design (featuring a column of larger-than-life sculptures of soldiers moving across a symbolic landscape) were attacked, sometimes inconsistently, by critics, governmental approval bodies, and the very sponsors who chose it. The sponsors hired additional designers and the winning team then sued, claiming they'd been shut out of the implementation process. The Commission of Fine Arts—despite its insistence that it could not design the Memorial—had extensive design input.

Framed as a qualitative case study of the KWVM's design history, this research analyzes how narrative was used at various stages of that history. Our findings suggest, somewhat surprisingly, that an inverse relationship developed over time: as more and more people had important design input, the narrative ideas expressed in the landscape design became progressively simpler. The KWVM invites visitor interaction and engagement by combining evocative figurative sculpture, succinct but thought-provoking inscriptions and a "nation's mantelpiece" photographic mural, all within a modernist geometry of overlapping ground planes. While some negative critical reactions to the multiple design devices cannot be ignored, the Memorial's essential narrative message, summarized by the tersely ironic inscription "Freedom Is Not Free", is conveyed clearly and, we argue, effectively.

A veterans' group, while praising the existing KWVM, believes that it should be expanded to honor the American war dead in a more personal way. At the veterans' urging, a bill was recently introduced in Congress to authorize installation within the Memorial of yet another design element, a glass wall etched with 36,000 names of those who perished. The National Park Service opposes the bill, arguing that the Memorial is a "completed work of civic art." This controversy underscores the timeliness and importance of the research, as the design of this prominent cultural resource continues to be called into question.

## Finding Paradigmatic Centers: Examining Shifts in the Relationship between Late 19th-Century Medicine and Environmental Design

**Robert Hewitt**, Clemson University, USA, hewitt@clemson.edu

**Hala Nassar**, Clemson University, USA, hnassar@clemson.edu

**Keywords:** Health, Environmental Design, Landscape, Medicine, Cultural Landscape

A brief review of the scholarly literature concerning historical influences of medical thought on environmental design affirms a significant shift in theoretical paradigms away from environmentally based etiologies to clinically ascertainable pathogenic etiologies during the late 19th century (Warner 1992). During this period the influence of miasma theory on environmental design (Hewitt 2000) began to give way to what Mitman describes as new patterns in the landscape of health, conservation, humans, nature, city and country (Mitman 2005). The paper builds on this established work, suggesting that relationship between medicine and environmental design that had gained prominence through early 19th-century British environmental designers (Hewitt 2011), early international medical protocols (Nassar 2004), and F L Olmsted's design proposals (Nadenicek 2005) began to incorporate paradigmatic shifts in medical theories identified with clinically oriented "germ theories" during the late 19th-century.

The paper addresses the relationship between period medical theory and environmental design, which reshaped late 19th- century notions of landscape health, conservation, city and country, specifically the influence of period medical theories in the writings and design proposals of Charles Eliot. The paper traces paths of diffusion and knowledge sources through Elliot's writings and proposals over several decades primarily within Boston and Massachusetts suggesting broad scientific groundings in medical thought and evolutionary theory related to health, ecology, and conservation. These paths of diffusion and sources of knowledge are compared to the paths of diffusion and sources of knowledge from a survey of contemporary writings and proposals related to therapeutic landscapes. The findings suggest consistent networks of knowledge and diffusion with significant theoretical variation affecting the creation of landscape during the last century. The presentation is useful to landscape architecture education as a contribution to landscape history and to methods of analysis.

## Articulating an Aesthetic of Engagement in Planting Design

**Nicholas Serrano**, Ball State University and the Smithsonian Insitute, USA,  
naserrano@bsu.edu

**Keywords:** aesthetics, planting design, engagement

Landscape architecture is a fine art and planting design is crucial to creating beautiful landscapes, yet contemporary discourse on the art of planting remains anemic. Part of the problem stems from the formalist critique of plantings based in traditional theories of art as visual objects. This theoretical research argues the beauty of planting design is founded in the sublime, an appreciation necessarily understood through subjective experience. These foundations are actualized through a proposed aesthetic of engagement that is used to analyze planting design in professional practice.

Much current treatment of planting design is, to borrow a phrase from Juhani Pallasmaa, an “architecture of visual image” addressed in the familiar line, form, color, and texture. This favors visual perception at the cost of peripheral sensation and ignores the materiality of nature. A plants’ true beauty cannot be found in surface qualities but lies in an internal sensibility activated through the sublime. In the words of Christian Norberg-Schulz, plants are “the manifestation of living reality.”

Planting design seeks to engender an experience of landscape; a participatory experience necessarily understood through phenomenological perception. What has previously been seen as visually remote compositions of plants instead becomes a series of events, sequences of encounters with the sublime. Borrowing from the work of Arnold Berleant, an aesthetic of engagement accounts for the experiential realization of plants coupled with the intuitive recognition of beauty and is proposed as the correct agency of planting design in landscape architecture.

The aesthetic of engagement is articulated in four ways. Direct engagement is found in moments of focused attention on individual plants with a sculptural presence; indirect engagement is when plants subserviently frame captivating moments of landscape; ethical engagement is pleasure gained through knowledge of ecological function; therapeutic engagement results from direct interaction such as instances of gardening or horticultural therapy. These theoretical principles are used to analyze existing projects and illustrate how they can aid in the discourse on aesthetics of planting design in professional practice. Although formalism is used to clarify aspects of plants, the aesthetic of engagement constitutes a more inclusive understanding of the beauty found in planting design.



## Mobile Studio Project: Landscape Studies on the Road

Jocelyn Zanzot, Auburn University, USA, [jocelyn@auburn.edu](mailto:jocelyn@auburn.edu)

**Keywords:** mobile studio, landscape transect, cinematic, sustainable futures

Landscapes are too large and complex to study without moving, too intimate and storied to understand remotely via satellite data or maps. Many theories advocate walking, the drift or derive, or other modes of exploring sites first hand, negotiating between a clinical forensics and a subjective phenomenology. Christophe Girot advances an approach called movism, a cinematic study of landscapes through movement, and a cinesthetic approach to landscape design, however; the videographic studies and design proposals generated still derive from a singular perspective and are challenged to handle change through time. Auburn University is initiating a new Mobile Studio that premises mobility and multiplicity as conditions of landscape, mixed media and dialogic process as key to community-based design.

This paper reviews the Mobile Studio, an extension of Auburn University's Master of Landscape Architecture Program, a trans-disciplinary collective that uses an open-air studio for framing diverse views of the landscape. Its first route is the Old Federal Road (OFR), a postal route and later a military path that was first constructed to connect Washington City (D.C.) and New Orleans. Appropriating well-established trade routes, the OFR bisected and eventually decimated the Creek Confederacy. As a primary road for the emerging state of Alabama it serves as a critical landscape transect for understanding multiple public histories and is ripe for re-interpretation and design. The Mobile Studio has attempted to use the road, not only as device for discovering history, debating contemporary land-use issues, or engaging dialogue about landscape perception and diversity, but as a means of interpreting the landscape through image making, identifying and designing new landscape futures through critical exploration.

In Alabama, the remnant of the Old Federal Road now runs through 13 of the most under-served counties in the state. The AL Legislature has identified the historic road's potential for tourism and rural economic development. The research presented here examines the relationship between an odologically-inspired, or movist methodology for Landscape Studies and design proposals that interpret history as part of the project of planning and designing for sustainable futures. As a design research project it seeks to connect critical engaged practices of studying the landscape with an approach to design that is both open to discovery and interpretive of history and contemporary culture. The pedagogy, products and replicability of the Mobile Studio are evaluated and reviewed.

## A Natural History of Form: Lawrence Halprin and The Sea Ranch Ecoscore

**Kathleen John-Alder**, Rutgers University, USA, kjohnalder@gmail.com

**Keywords:** Lawrence Halprin, The Sea Ranch, Richard Reynolds, Ecoscores

The landscape architect Lawrence Halprin believed that form, like purpose, evolved — emerging via a series of incremental modifications impressed upon the landscape by human action. In a notable journal entry from 1961, he compared human settlement patterns to the natural process of erosion. Just as a stream of water slowly cuts its way through bedrock until it forms a deep canyon sheltering an intricate biological community, Halprin argued an analogous process of “human-helped erosion” was a play in the formation of ideal communities. First, a structure is carved from the natural materials of the land, then another, and so on. For Halprin, the ensemble arising from this slow accretion displayed a “sense of inevitability,” and an “alive, almost biological, quality.”

In the *RSVP Cycles: Creative Processes in the Human Environment* (1969), Halprin recast this natural history into a new evolutionary order defined by systems theory. Here, though he once again considered form in terms of environmental interaction overtime, he presented the why, what and how of this process as an iterative feedback loop defined by action and response. As explained, design was contingent, self-regulating and reversible. And spatial definition, as the over all manifestation of a systems framework, was open-ended, though it tended toward dynamic equilibrium.

Using The Sea Ranch design, and its famous ecoscore, as a case study, this essay critically examines Halprin’s feedback methodology in terms of its underlying biological imperative. This unique perspective allows The *RSVP Cycles* to be situated within a larger design discourse concerned with the complex regulatory mechanisms of dynamic systems. Proponents of this approach, who in addition to Halprin included Victor Olgay in *Design with Climate* (1963) and Christopher Alexander in *The Synthesis of Form* (1967), advocated design outcomes that involved balanced homeostatic exchange between human constructs and the surrounding environment. In this paradigm, every design had its own best, or optimum form, which emerged through an iterative process of trial and error, or biophysical disturbance and response. Further, by taking this systems analysis as a point of departure, this essay positions The *RSVP Cycles* within a design continuum that extends from early modern biocentric theories through to contemporary recursive field design.

## Cities, ecology, and change: Engaging resilience theory in urban landscape architecture

**Blake Belanger**, Kansas State University, USA, belanger@ksu.edu

**Kevin Cunningham**, Kansas State University, USA, kc303kc@ksu.edu

**Keywords:** Landscape architecture, urban design, resilience theory, panarchy, complex adaptive systems

Resilience theory examines how socio-ecological systems change through time, and evaluates their capacity to absorb shock and reconfigure while retaining overall systemic integrity (Holling, 1973). Along with complexity theory, nonlinear dynamics, and the concept of emergence, resilience theory has contributed to a paradigm shift in the understanding interactions among complex adaptive systems and their evolution through time. Cities are now being described in these terms, and this knowledge has begun influencing the theoretical approach of some urban designers (Ahern 2011, Allen 2011, Belanger 2009, Lister 2007). This paper builds on research into resilience theory and complexity theory, and presents three foundational principles for advancing a conceptual framework that enables landscape architects to better understand and interact with cities.

First, a city is best understood as a complex ecology. Influential scholars including Kevin Lynch and Jane Jacobs repeatedly made this assertion decades ago, but only within the last ten years has this notion gained traction in the landscape architecture community, supported by research in urban ecology and other fields (Alberti et al. 2003, Du Plessis 2008).

Second, cities change like any other complex adaptive system; they undergo a process known as the adaptive cycle, which is made of four distinct phases: rapid growth, conservation, release, and reorganization (Walker and Salt, 2007). Systems may also go through a rapid and radical transformation in the release phase, called bifurcation, and lose basic function, structure, identity, and feedbacks. Human influences may be dominant relative to other forces, but are still part of the system.

Third, complex adaptive systems cycle at different rates and interact with one another across different scales of space and time. This understanding, known as panarchy, displaces antiquated notions of hierarchy, and addresses the dynamic nature of complex adaptive systems (Holling, 2001).

Through a review of resilience theory literature and case studies, along with a review of contemporary landscape architecture theory, we have arrived at two broad conclusions that point toward a significant trajectory for future research. First, landscape architects should shift focus away from simple notions of formal design, and toward the complex interactions between spatial organization and systems. Second, landscape architects should use resilience theory as a foundation to engage cities, and should model strategies that respond to and leverage the interaction between complex adaptive urban systems. Along with advancing a resilience framework, new questions will be posed within the context of the burgeoning paradigm of resilience theory.

## Sustaining Small Urban Spaces: Is Whyte Still Right?

**Dominic Fischer**, North Dakota State University, USA, fischer.dominic@gmail.com

**Keywords:** Social Factors, Pocket Parks, Urban Theory, Environmental Behavior, Small Urban Space, Ethnographic Assessment

Sustaining Small Urban Spaces Is Whyte Still Right? William H. Whyte opened his acclaimed film “The Social Life of Small Urban Spaces” with a Harlem street, replete with the virtues of a successful small urban space in Manhattan. Whyte then quickly panned to the plazas of Midtown. Mapping the spatial units of the film reveals the emergence of several constraints. The networks of these spaces provide principles for similar urban spaces, but few answers on how to sustain equivalent small urban spaces outside the Midtown network.

This paper takes a critical look at the limitations of Whyte’s presentation through the comparative histories of these excised spaces and concomitant sociospatial implications. With hybrid post-war modernists calling for a renewed sense of public democracy and public spaces for citizens to meet and deliberate, vest-pocket parks began to appear in the urban fabric. This paper chronicles the inception of pocket parks, the theories that lead to their rise in the 1960s, and also their separate futures, by reevaluating and linking them to modernist and post-modernist design work. The theories which accompanied these works are now more equipped to reexamine socially driven public space analysis as seen by recent work in ethnography (Low), public/private space and place (Miller), social and spatial justice (Soja), and new technologies in video capturing (Bleeker) and mapping (Graham) social life in public spaces from new points of view.

The story of these spaces is an opportunity to engage in the dialectics of small urban spaces. Their networks are multivalent yet traceable, and pose relevant questions to Whyte’s omissions; evidenced by the decay of comparative spaces once deemed “The Paley Park(s)” of Harlem?

This study is based on the case study analysis of six small public urban spaces. Each spatial unit was explored historically, socially, and ecologically to define new performance dimensions for similar public space typologies. The case studies included a variety of research techniques that included literature review, field observation, time-lapse video recording, historic and new interviews, rapid ethnographies, and the analysis of integrated geographic information systems maps to describe spatial and social patterns throughout the life of each selected site. Tracing these histories through the lens of Whyte, the study concludes with supplemental suggestions for sustaining these types of spaces in disparate settings.

## How Civil War Experience and the Work of Samuel W. Fordyce Affected the National Public Health Movement from the Arkansas Frontier

Judy Byrd Brittenum, University of Arkansas, USA, jbritten@uark.edu

**Keywords:** public health, Army and Navy General Hospital, Hot Springs Reservation Arkansas, Samuel Wesley Fordyce, Civil War, F. L. Olmsted

The history of public health in America recognizes that the period surrounding the Civil War contributed greatly to the movement's continuing development in this country. Those returning from war brought personal experiences that would persuade them to view concerns about the public good differently. The men who developed post-war, public health initiatives were from many parts of the country and from different walks of life. During this time, landscape architects like Fredrick Law Olmsted would continue to believe that the natural environment should play a role in public health, yet others would use their influence to support and enact measures to bring it into fruition.

Because landscape architecture as a profession was in its infancy, its influence on public health during that period is rarely studied by landscape historians. Men at that time, whose wartime experiences influenced their eventual benevolence for others, provided the impetus for envisioning a national landscape, often a landscape for both physical and mental healing.

The purpose of this landscape history paper is to reveal the work of a particular man who used his influence to garner national support for a frontier town that was on the fringe of federal attention. Although Hot Springs Reservation was the first national, set-aside land for its natural resources, by 1870 little had been done to allow it to contribute accordingly. Landscape architects today should be aware of Colonel Samuel W. Fordyce's contribution to public health in the United States and his influence on the national landscape there. His persuasive tenacity would be driven by his wartime experiences with field hospitals, particularly at the battles of Shiloh, Chattanooga and Chickamauga, as well as the deterioration of his personal health. His convincing strategies to ultimately invigorate the hot springs resources for visitors, bring about the first Army and Navy general hospital established in peacetime, and ensure the longevity of the landscape, which was ultimately designated as a national park, have made his name one that should be revered in national annals. He lobbied his Union Army contacts for favors and insisted that landscape architects like Olmsted, provide design services therein.

Based on original research in Tennessee, Kentucky, Alabama, and Arkansas, as well as private and archived, Fordyce family papers certain information is provided that reveals the man who used his wartime experience and associations for the greater national good.

## A Central and Centered Space: The Oxford Courthouse Square

Michael Seymour, Mississippi State University, USA, mseymour@lalc.msstate.edu

**Keywords:** Cultural Landscapes, Landscape History, Courthouse Squares, New Urbanism

Perhaps no space has inspired Mississippians as much as the Oxford Courthouse Square. Oxford residents and Ole Miss fans speak of the square reverently with obvious pride, while several of the state's most famous authors including William Faulkner and John Grisham have used the setting as inspiration for their fictional communities. For others, the square simply provides an example of successful urbanism and a civic forum in a predominantly rural state where most citizens pride themselves on rugged individualism. But what is it about this particular square that citizens find so enchanting and inspiring? This presentation will explore this question by examining the history and evolution of the Oxford Square using primary sources including a series of historic maps and photographs.

The courthouse square has a long history in the US; geographer Edward Price traced the origins back to William Penn's 1682 plan for Centre Square in Philadelphia. Price was the first to categorize the squares and identified four traditional types that he explained were most prevalent in the South and West. Robert Veselka identified an additional five non-traditional types of squares in his text *The Courthouse Square in Texas*. Although the two authors disagree regarding categorization, both express a profound respect for this distinctively American form of urban design and its ability to promote civic life and serve as a symbol of community.

Mississippi is home to thirty-six courthouse squares; the Oxford Square is the most renowned and the only Harrisonburg-type. Although the square's layout plays some role in its success, the most critical factors are the surrounding density and land use patterns that allow the square to function unlike others in the state. The square's evolution will be explored in this presentation through use of a series of color-coded maps; this detailed graphic method of analysis advances the work of prior authors by providing a more comprehensive understanding of the relationship between uses. Historic photographs will provide an additional perspective by revealing the square's changing character and function. In combination, these documents provide a clear picture of the square's evolution offering lessons for preservationists and designers of new towns and public spaces. However, the ultimate significance of this study lies in its ability to provide an example of a central and centered space where civic life is enhanced through a combination of public and private uses, mixture of open and intimate spaces, and balance of landscape interest and architectural drama.

## Reconciling Vernacular and Designed Landscape Values in Preservation Management Planning

Douglas Hadley, University of Wisconsin–Madison, USA, dbhadley@wisc.edu

**Keywords:** Preservation, management, historic

In preservation, vernacular landscapes continue to be underrepresented or ignored. This is especially true of rural landscapes. This case study explores landscape preservation approaches with the goal of developing cultural landscape management guidelines for the current and future use of the Michels Farm, a 160 acre historic family farm that dates back to 1833 and abuts the National Historic Landmark Taliesin property.

Originally settled by Frank Lloyd Wright's Uncle Thomas Lloyd-Jones and recently acquired by the Frank Lloyd Wright Foundation and Taliesin Preservation, Inc., the farm has a long time association with these organizations as well as with Frank Lloyd Wright, the Taliesin Fellowship, and the Frank Lloyd Wright School of Architecture. Existing in the shadow of National Historic Landmark Taliesin, the Michels farm has largely been ignored. Currently changes to the landscape are occurring without guidelines. There are no comprehensive plans for the management and preservation of the farm. While perhaps lacking exemplary qualities on its own, it is the very vernacular landscape that Wright discusses in his autobiography and that he experienced during his formative years when he spent summers working on his uncles' farms and began developing his understanding of nature.

Because National Park Service historic preservation procedures and criteria were used at Taliesin to attain National Historic Landmark status, using them as a framework at the Michels Farm will help better integrate the management and preservation planning of the two properties.

The Frank Lloyd Wright Foundation, The Taliesin Fellowship, Taliesin Preservation, Inc., and the Frank Lloyd Wright School of Architecture, sometimes have competing goals and missions. Integrating the management and preservation planning of two properties with different preservation values proved challenging. I explored four management alternatives for the Michels Farm and evaluated them based on preservation values as well as the current and future needs of the Taliesin community. These alternatives included a pre-settlement native landscape restoration plan, a restoration of the Thomas Lloyd-Jones Farm, a plan based on optimizing current conditions, and a redevelopment plan for the farm. I selected the plan for optimizing the current conditions as the preferred alternative because it reflects preservation values from the entire farm's history and best highlights the differences between a rural designed landscape such as Taliesin and a rural vernacular landscape such as the Michels Farm. The physical juxtaposition of the two properties provided unique opportunities to interpret and illustrate differing landscape preservation values.

## The Masque of Landscape: Italian Theatre and Landscape in England

Joshua Beblo, Chatham University, USA, jbeblo@chatham.edu

**Keywords:** theatre, space, narrative, Italian villa, English estate

Landscape architecture borrows theoretical and practical ideas from many, related, artistic fields. Even though the similarities to theatre may not be as apparent as other fields, there were designers who, having training and experience in both theatre and landscape, were perhaps able to translate creativity from one to the other. This presentation will examine similar theatrical and landscape concepts and the dynamics of the relationship between them. First, general definitions of terms and an overview of theatre and landscape history will be presented to express how space was understood, represented, and used up to the period of research focus. Secondly, these ideas will be specifically applied to the theatrical and landscape advancements made during the Italian Renaissance and their appearance in English theatre and landscapes shortly following. An interpretive-historical analysis was conducted focusing on works by Inigo Jones and William Kent, who practiced both landscape and theatre design. This research is based on archival sources of primary or secondary literary texts, a comparison of drawings and images of sketches or projects by each of the designers, and several landscape case studies. In addition to general Italian villas, several specific villas were examined: Villa Doria Pamphili in Rome, Villa d'Este in Tivoli, Villa Aldobrandini in Frascati, and Villa Lante in Bagnaia, all of which were often visited by those on the Grand Tour. In England, both Wilton and Rousham were the two extant examples of Jones's and Kent's work respectively at which field observations were also conducted, but Arundel House and Chiswick were also considered. Examples of theatrical elements like scripted or episodic sequence, classical reference, and framing the scene will all be shown to manifest themselves in landscape forms like prescribed circuit, garden narrative, and framing the view. Also an examination of how people animate these designed spaces in either sketch, stone, or real form will be included. This discussion of the similarities between theatre and landscape will emphasize the degree to which the application of theatrical techniques had informed the crafting of landscape experience in the past and provide an additional framework to envision landscapes today.



## Landscape—Architecture, Architecture—Landscape: Inversion Across the Envelope at Katsura Imperial Villa

Meredith Sattler, Louisiana State University, USA, msattler@lsu.edu

**Keywords:** Landscape, Architecture, Entropy, Landscape Ecology, Katsura, Sustainability

Utilizing Forman's Landscape Ecology principles of structure, function, and change(1) this paper analyzes the functional and symbolic operational relationships between landscape and architecture at the Katsura Imperial Villa and Gardens. Though Landscape Ecology principles were originally extracted from models of natural systems, as evidenced by form changing through time, here their analytical structure is expanded to test their facility as a methodology for structuring eco-cultural formal analysis across time in order to decode this constructed cultural geography. Katsura is a particularly appropriate case study because we have historic evidence of its symbolic and formal conception and because the property has been maintained almost continuously according to its original conception.

Katsura inverts western assumptions of functionality; here landscape is semiotic—conceived and maintained as symbolic representations of distant cultural geographies, its natural processes controlled to the point of freezing form in a condition of perpetually constructed memory. Conversely, architecture is perpetually present, ever changing with diurnal and cultural cycles, facilitating temporal and spatial fluidity. This reversal of typical western functionality forces reconsideration of relationships between 'inside' and 'outside' and roles of spatio-temporal memory and measurement in the design of integrated environments.

Built by Prince Toshitada beginning in 1616, Katsura was designed as a country retreat, or *bess* (2), inspired by literary descriptions of palatial estates of 11th century Japan and court life in the Tale of Genji. Toshitada utilized descriptions of landscapes within historic texts to recreate once distant scenery with deliberate literary symbolism(3). Elements were selected, transported and arranged as permanent, choreographed, formal objects that made "Katsura...one of the first..." "Stroll gardens" (*kaiki shiki teien*)(4) where overall structure, as well as architecture and age of each individual species create scenes frozen in time—an anti-entropic landscape.

Paradoxically, the buildings are highly entropic, predominantly roof-plane and floor-plane, with thin walls continuously "...flung open to sunlight and air."(5) This motion of shifting walls perpetually dissolves the building envelope, both visually and climactically. Inside, inhabitants remake interiors with "...slight sliding screens"(6) laid into thin tracks on the floor that are the only indications of "rooms". The main house is laid out in a "V" plan that facilitates maximum surface area and fluid diagonal circulation which delivers occupants to the periphery, framing the static garden where memory is seated. Here, a specific cast of natural characters mark time: only the moon or a butterfly are permitted motion when viewed through the apertures of the buildings.

## Re-Situating Landscape Architecture for the 21st Century: How Economic Downturns have provided opportunities for Landscape Architecture to Find New Direction

Christine Edstrom O'Hara, Cal Poly, San Luis Obispo, USA, cohara@calpoly.edu

**Keywords:** economic trends, future, history

A historical analysis of American landscape architecture reveals sporadic high points of creativity rather than a steady climb, a common trajectory in the arts. In a critical review of the past 130 years, innovation in landscape architecture often followed an economic recession or depression. In this essay, an historic overview provides the framework for comparing past economic conditions and the evolution of landscape architecture during that period with current economic conditions, proposing how landscape architecture can take advantage of the recession to re-envision the field in a fresh approach for the 21st century.

Significant economic crises in the United States over the past 130 years include the Panic of 1893; the Great Depression initially in 1920 and continuing through the 1930s; the Carter Administration era of 1973–75; the early 1980s recession; and the current economic crisis. Design tends to thrive in economically hard times. During downturns, designers shift from consumer driven design to more pressing needs of infrastructure, housing, city planning, transit and energy (Cannell, 2009). After the Panic of 1893, for example, the City Beautiful Movement flourished and the ASLA was founded. Political support of WPA programs during the 1930s provided unusually collaborative design and opportunity, followed by the first modern revolution in landscape architecture by visionaries Eckbo, Kiley and Rose. The historical reasons that caused the economic crisis are not necessarily responded to in landscape architecture. Rather the downturn appears to afford a period of contemplation and creative re-situating, providing auspicious momentum when the economy begins to thrive.

The current recession has opportunities for landscape architecture to evolve once again. With a visionary at the helm and political backing, landscape architecture has the opportunity to immerse itself into solving problems of great complexity for which practitioners are trained, and showcase a new sense of relevance outside the profession.

## Susquehanna Riverfront Towns: Developing a Framework for Categorization

Gregory Tenn, The Pennsylvania State University, USA, gat137@psu.edu

**Keywords:** Susquehanna River Basin, River Towns, Framework

The streams of the Susquehanna River Basin have long held a significant role in the development of the region's riverfront towns. Though a once widespread utilitarian relationship between town and stream has waned, the conceptualization of river towns is being used to guide regional economic and cultural revitalization. (3, 6, 11, 13) As physical manifestations of culture and society, the typological form of towns can give clues to less tangible factors associated with their development. (7, 15) With the ultimate goal of providing both regional and local insights into flood hazard mitigation planning and design strategies, this study explores the interface between river and community by examining variation in Susquehanna riverfront town typologies.

Numerous methods have been utilized to explore both physical and cultural associations with landscape. (1, 5, 9, 12, 14, 15, 16) This study narrows the scope of the question of river-community relationships in a number of ways. Due to their important historical roles (2) and persistence through time, only the thirty-five (35) county seats with significant physical presence within the Susquehanna River Basin were chosen for examination. No such place exists in Maryland, making the town of Havre de Grace (located prominently at the mouth of the Susquehanna River) the lone exception. Town typologies were examined utilizing historical maps, documents, photos, and, whenever possible, first-hand qualitative assessments. This information was then correlated with a categorization of riverfront towns based on four quantifiable factors that are hypothesized to be influential in the development of the region: the prevalence of transportation infrastructure through time, (4, 8, 10) rates of population change, soil categorization (as an indicator of realized and potential economic activities), and stream typology.

While the dynamic nature of river-community relationships makes them inherently complex, a better understanding of the physical interface between town and stream can provide insight into other facets of the region's cultural landscapes. This in turn can guide planning and design initiatives aimed at both shared regional and targeted local issues such as riverine flooding. In the future, it is hoped that this work can be continued and enhanced by consideration of other variables related to the physical and cultural development of riverfront towns, as well as through the implementation of other methodologies utilized in the study of other regions.

## The Legacy of Berkeley Parks: A Century of Planning and Making

Louise Mozingo, UC Berkeley, USA, lmozingo@berkeley.edu

**Keywords:** public parks, public park history, Berkeley

In 2007, Berkeley's park system marked its hundredth anniversary—a beloved, well used, and vital part of living in the city. This paper looks back at this century of park making, the people and plans that have shaped the city's system, and the motivations and principles that guided the growth of the system and serve as benchmarks in its history. It discusses the active role that citizens have played since the formation of the Playground Commission in 1909 and the notable citizen advocacy of the last thirty years. Six concepts structure the history of the park system. 1) Berkeley has its own biolocality: Berkeley's very distinct formation of hills with rock outcrops, sloping alluvial fan, flatlands, and Bayside, fingered together by meandering creeks, created its own "geographic genetics" that are reflected in the park system. 2) National trends found local traction: The legacy of the Berkeley park system reflects national trends and ideas about how cities and the parks within them should function and whom they should serve. At the same time the parks formed in a dynamic between particular local impetus and these larger contexts. 3) Self interest rightly understood: The formation of the park system reflected both self-interest of elites and exuberant, democratic participation. This inevitably exposed competing claims on Berkeley's public landscape, often contested but ultimately generating the belief that Berkeley's parks are part of what makes it a good place to live. 4) Parks plain and simple: The essence of Berkeley parks is subtle and contradicts the assumptions of the necessity of grand aesthetic vision in park design. Their largely open format—a kind of loose pastoral—reads as boring but is experienced as compelling and democratic space. 5) Visions matter: Berkeley's park system formed when events, people, governments, and institutions galvanized around particular notions of citizenship, health, and equity. Though the details of particular visions may not have come about, they set the stage for the next round of action and expansion. 6) The future is connectivity: As a built out urban area, the future of Berkeley's park system lies in nurturing what it has, finding the occasional opportunity for new acquisitions, and, most of all, looking for ways to stitch the city's system together. The paper presents the evolution of a park system, not as a linear progression but as a dynamic, sometimes opportunistic, evolution between citizens, place, professionals, and political concerns both national and local.

## Imagining New Orleans through Frank S. Horne's Open City

Austin Allen, Louisiana State University, USA, austina@lsu.edu

**Keywords:** Frank S. Horne and the Location of Race in the Open City

After the end of World War II, the popular idea of the “Open City” began to shift from a military designation meant to save an urban population from devastation, while saving a city from destruction and cultural annihilation in the midst of the open hostilities of war . A new “Open City” was emerging useful for imagining the possibilities of a diverse, sustainable and democratic city. Often these newer visions are rooted in the 1945 publication, of Karl R. Popper’s *The Open Society and Its Enemies* . Kees Christianne stated in an interview, “ “Open city” is a somewhat utopian term: it refers to efforts by architects and urban designers to translate the ideals of an “open society”—a society with a tolerant and inclusive government, where diverse groups develop flexible mechanisms for resolving inevitable differences—into physical spaces .” Richard Sennett who has given form to the concept of an “Open City” states, “The idea of the Open City is not my own: credit for it belongs to the great urbanist Jane Jacobs in the course of arguing against the urban vision of Le Corbusier. ”

It belongs as well to Frank S. Horne, a noted Harlem Renaissance poet and housing expert, stating in 1957 : I would like to consider here another kind of conflict and another kind of open city... .. Experience teaches that the open city will be built upon three solid foundations:

- 1) Revised concept of neighborhoods,
- 2) Destruction of every vestige of separate-but-equal concept,
- 3) Substitution of heterogeneity for homogeneity.

Three years earlier, Horne saw the possibilities of a proliferation of “Open Cities” across the United States after the Supreme Court ruling of *Brown versus the Board of Education of Topeka* (1954), which reversed *Plessey verse Ferguson* (1896) . One year later in 1955, the Eisenhower Administration fired Horne, ending what historian Arnold R. Hirsch called “...his seventeen-year tenure as the most outspoken, high-ranking minority official in the nation’s housing agencies. ”

Born in 1899, Horne, worked with Robert Weaver as part of the Black Cabinet of President Franklin D. Roosevelt during World War II developing strategies for advancing “freedom, liberty and birthrights” through efforts at desegregating public and private housing in urban America. Exploring Horne’s efforts during the post-war 1940’s and 1950’s may provide insight into the current American housing crisis and further shape the idea of an “Open City.”

## Strange Events in the Landscape: Validating Intangibles in Historic Landscape Management Efforts

**Katie Hess-Reichard**, The Pennsylvania State University, USA, kah44@psu.edu

**Keywords:** alternative, historic, imagination, language, intangible, preservation

There is a phenomenon occurring in our historic landscapes —“the phenomena...has to do with what is there in front of [us] and what is said to have possibility taken place, as well as [our] emotional reaction to viewing the artifact remnants...” (Benassi 2004). However, empirical data and objectivity determine land value of North American lands and we have lost a connection willing to acknowledge, “sites might have [power] over the imagination” and “initiate a thinking about possibilities that are neither apparent to the senses nor obvious to the intellect” (Benassi 2004). As such, landscape designers and managers leave hard and detached landscapes that do little to reconnect man and nature (Corner 1991).

Increased attention on cultural landscapes makes apparent society’s ability to accept the landscape is a “cultural construct in which our sense of place and memories inhere” and landscape value is determined when judged “with our mind and ascribe values to landscape for intangible—spiritual—reasons” (Taylor 2008). However, landscape designers and managers do not discuss or value that many are drawn to and connected to historic landscapes through intangible and unexplainable experience. North American landscape designers and managers rarely assess value and incorporate such information into a landscape plan because it is difficult to produce quantifiable data and is sometimes difficult to identify and understand when studying qualitatively (ICOMOS).

This suggests the need for a common language through which to express and add weight to unexplainable experiences to correctly value a landscape in its context. Through a hermeneutic approach suggested by Corner, one can study the expression of landscape experience through both “contemporary circumstance and tradition” to “return... to our...landscapes the powers of the everyday and the revelatory—the grounds of memory and hope” (Corner 1991). Such an approach calls for a process “ever-open, permitting a free association of ideas” (Corner1991). Philosophical Phenomenology will be incorporated to study academic language regarding experience and used to translate intangible experiences expressed by users of a historic landscape.

## **The Lure of Fishless Fishing: The enduring friendship between Frank A. Waugh and Ray Stannard Baker**

**Annaliese Bischoff**, University of Massachusetts, USA, abischof@larp.umass.edu

**Keywords:** pioneers, history, influences on creative work

New research on often overlooked landscape architect pioneer Frank A. Waugh (1869-1943) reveals a significant friendship with noted muckraking pioneer, Ray Stannard Baker (1870-1946), a friendship which in fact directly influenced both men's work towards the end of their lives. Baker, a pioneer in investigative reporting and journalism, the chronicler at turn-of-the-century labor battles, won the Pulitzer Prize for his writings about President Woodrow Wilson, under whom he also served. Shortly after moving to Amherst, MA, in 1910, Baker became an important personal friend of Waugh, the founder of the first landscape gardening program at Massachusetts Agricultural College. The two men shared leisure time together and exchanged ideas for the rest of their lives. Their early fishing adventures, which Waugh chronicled in a 1914 article, forged the basis for a lasting, deep friendship. In the first decade of the twentieth century, Baker had also begun to write under the pseudonym of "David Grayson." In his endearing essays infused with Emersonian idealism, David Grayson's writing captured the hearts of millions, as he epitomized the kind of life that Waugh actually lived. In 1921 Waugh founded a social culture club in which Baker avidly participated. Newly discovered daily diaries (1899-1922) of Waugh help illuminate the unique connections between these two pioneers from different fields. How the shared friendship shaped their subsequent work directly is a dramatically significant story to report. In the 1942 "Under My Elm: Country Discoveries and Reflections" Baker, writing as Grayson, devoted a chapter to the beloved fishing adventures with Waugh, in which Baker refers to Waugh by his real name. And one of the last works that Waugh ever created devoted itself to representing "David Grayson's" elm in the form of a delicate etching. The actual elm tree featured in the book and etching actually is a real tree which continues to grow in Amherst today. How Baker honored Waugh with his passing in 1942 will also be reported as added testimony to the esteem Baker held for Waugh, so worthy of more scholarly consideration.

## The Writings and Lectures of Lawrence Halprin from 1959–1969

Judith Wasserman, University of Georgia, USA, judithw@uga.edu

**Keywords:** Lawrence Halprin, Modernism, Professional Practice

Lawrence Halprin's prolific built work and copious drawings publicized via his collection of published Notebooks are well known and have had tremendous influence on professional practice. What is less known is his additional practice of writing articles and lecturing, promoting ideas pertinent to broad sweeping notions of landscape architectural practice. His lecturing and writing spanned many decades, and offered a voice and identity for the value of landscape architecture.

Halprin's writing are significant in their high level of scholarship, passion, and activist intent in promoting the role of landscape architecture in designing open public space for social equality, environmentalism, preservation, and other issues related to the vital role landscape architects can play in bettering the human condition. Engaged heavily in the written word to promulgate the role of landscape architecture, his books and published notebooks offer multiple opportunities to understand his concerns and ideas. Halprin's writings and presentations squarely addressed the concerns of his time. He, like Olmsted, revealed landscape architecture in its broadest sense, and discussed the profession and its potential accordingly. His work spanned multiple issues, thoughtfully addressing topics such as the importance of public open space in urban area, community participation in urban design, the Gestalt of design, best urban street tree planting practices to insure longevity, mythology and the garden, transportation concerns, and both wilderness and historic preservation.

This paper focuses on a particular active period of his lecturing life; from 1959 to 1969. This is also an interesting and extremely transformational time in the United States, and in his redefining his professional boundaries. It offers not only a glimpse of his interests and attitude about landscape architecture as set against the background of that transformative decade, but also a slice of modernist history as interpreted and solved through landscape architectural means. While some of this work is published, most had been stored in his files, and was obtained through archival work at the University of Pennsylvania.



## A Framework for the Design of an Archaeological Park in Erzurum, Turkey

Allison James, Cornell University, USA, aap82@cornell.edu

Sevgi Yilmaz, Ataturk University, Turkey, syilmaz\_68@hotmail.com

**Keywords:** archaeological parks; cultural heritage preservation

As Turkish cities modernize and evolve, cultural heritage sites become symbols of the modern nation's historical foundations. This abstract looks specifically at cultural views of ruins and meaning as a key factor of the design of an archaeological park in Erzurum, Turkey. The city of Erzurum, Turkey is embarking on a strategy of preserving cultural heritage sites in the historic city center. This paper seeks to use a "post romantic" theory of ruins to question the monumentation and romantic view of ruins in the West in the approach to landscape architecture interventions of heritage sites in the Near East. As such, to create a framework for understanding how heritage conservation/preservation can be informed by the way in which residents of Erzurum use public space as a framework for understanding 'place' and to inform the design process in the contemporary re-design and preservation of this site. The theoretical approach applied in this article can be summarized as:

- A semi-structured oral history survey will be used as a tool for investigating collective memory and everyday use of the public space. Surveys will be conducted January 3-15 and February 10-25, 2012. Faculty and students from Ataturk University have agreed to assist me in identifying participants as well as with the interview process. A total of 150 people will participate including users of 3 teahouses surrounding the site, a shopping area in the western part of the city and faculty/students from Ataturk University and their extended family members of different ages. Selections will be made by choosing a cross section of socio-economic backgrounds, gender, age and ethnicity.
- Diagrams and maps of findings will be created and used as a tool for proposing future programming of the site.
- These findings will be presented at the CELA conference in March 2012 and I will elicit discussion with the audience.

## The Framed View and The Creation of Yellowstone National Park

Scott Whitham, Cornell University, USA, sww2@cornell.edu

**Keywords:** Yellowstone, Framing

On March 1, 1872, President Ulysses S. Grant signed the enacting legislation to establish Yellowstone National Park. This Act of Dedication was not only the formal beginning of the United States National Park Service, but a culminating cultural moment in the perception of a national landscape, its value, and its meaning to a recently divided country. The choice to preserve this land followed on the heels of a debate about a place that few Americans had seen, and the new park was the voted into law by a Congress whose members had no direct experience or image of the landscape this legislation preserved. The visions of place which informed Congress in their debate were the creations of others, most notably the painter Thomas Moran and the photographer William Henry Jackson, who had framed and depicted a landscape that had the power to make this new entity law. Jackson's stereoscopic images in particular had a profound effect on the members of Congress, each of whom received a folio of images prior to their vote. This paper will explore the role of the product of these artists as mediator in an understanding of the framed landscape, and how culturally embedded notions of framing supported a political movement for landscape curation and preservation.

The Yellowstone work of Jackson and Moran was created in a nation with painfully fresh memories of a brutal civil war. The widely reproduced photographs of Mathew Brady and others brought homes stark images of dead boys and devastated landscapes. For the first time in the history of war, citizens could see first hand the cost and waste of battle, stripped of the romance of cause and glory. The ruin seen in such intimate and terrible view was not only uncomfortable; it was barely credible as a recognizable image of the nation. Turning from that shattered image toward a newly wrought view of national wilderness was, in part, a perspective healing, and a re-knitting of national image. Embedded in that conflation of national image with national identity lies not only a long cultural tradition of myth-making, but a distinct and rich narrative of landscape semiotics. In examining the landscape art of Jackson and Moran, this paper will unfold the landscape iconography that informed their view, and an attempt to trace the semiotic genealogy of their particular "touristic gaze" that led to the creation of the first National Park.



# Landscape Planning and Ecology

## Exploring the Influence of Stormwater Sizing Approaches on Innovative Stormwater Design in Portland, OR

**Cory Gallo**, Mississippi State University, USA, cgallo@lalc.msstate.edu

**Brian Wethington**, Portland Bureau of Environmental Science, USA,  
Brian.Wethington@portlandoregon.gov

**Emily Overbay**, Mississippi State University, USA, ego13@msstate.edu

**Keywords:** stormwater, policy, design, portland

New paradigms require new tools. One of the most difficult challenges to implementing sustainable stormwater facilities is working with stormwater policies that were designed to use complex stormwater models to size large detention basins. Research has shown that Portland, OR has established itself as a leader in implementing creative stormwater techniques. These accomplishments may in part be credited to the city's unique policies that facilitate and promote the design of such facilities.

This presentation will explore Portland's unique stormwater facility sizing approaches that have been used and modified for over ten years by landscape architects, architects and civil engineers. Through a survey of design professionals, the research highlights the opportunities for creative policies to influence where and how stormwater facilities are incorporated into the design process.

Originally developed in 1999, the Portland Stormwater Management Manual (SMM) primarily utilizes two approaches to meet the city's stormwater requirements. The Simplified Approach uses simple sizing factors accompanied by standard design details and specifications to make the process as simple and streamlined as possible. The Presumptive approach utilizes a unique sizing calculator that allows for maximum design flexibility and control of an array of Best Management Practices. Both of these approaches promote multiple, small-scaled facilities that infiltrate and manage stormwater as close to where it falls as possible.

The results of the survey indicate that design professionals differ on how they utilize the sizing tools in the design process. The more art based disciplines, lean toward the Simplified Approach that allows them to explore multiple solutions, early in the design process. While engineers tend to lean toward the more robust Presumptive Approach which allows them to refine the intricacies of the facility design.

The new and evolving paradigm of sustainable stormwater management can be shaped by policies that are designed specifically for the implementation of small-scaled infiltration facilities. By simplifying the sizing process, these tools can promote designers to use the facilities as an integral part of the overall site design. However, simplifying the sizing methodology is not a short cut for simplifying the design of the individual facility which requires careful consideration and refinement to meet the specific needs of the site.

## Using the Landscape Development Index to Support Land Management Decisions

**Jon Calabria**, jcalabr@uga.edu, **Jason Evans**, jme@uga.edu,  
**Alison Bramlet**, alisonsb@uga.edu, University of Georgia, USA  
**Sam Esswein**, Forest Resources, Clemson University, USA, sesswei@clemson.edu

**Keywords:** Decision support, landscape planning, bioassessment, Landscape Development Intensity Index, water quality

Landscape design and land management decisions are sometimes based on divergent goals, making it difficult to reliably predict outcomes to improve ecological function. For instance, improved water quality is often cited as a management goal, yet demonstrating water quality improvement is elusive and making meaningful predictions about future water quality is even more difficult. Often, impacts to water quality are predicted using the percentage of impervious cover in a watershed or catchment. However, water quality may be impaired by land uses absent of impervious cover, such as forestry or agriculture. The Landscape Development Intensity Index (LDI) may offer finer resolution than impervious cover because it incorporates energy inputs. The LDI reclassifies the National Land Cover Dataset using embodied fossil fuel energy values associated with each land cover class. LDI values range from low values that describe natural conditions to higher values indicative of agriculture uses. The highest values indicate urban areas. Although limitations may exist in the collection and classification of land cover data, the mean LDI could be used as a planning and design decision support tool to assist with improving water quality of receiving surface waters. Originally, the LDI was calibrated based on data from Florida wetlands. Based on the success of LDI predicting impairments in other ecoregions, this study investigates how reliably the LDI can predict the biological integrity of headwater catchments in the Southern Appalachian Mountains, which is clearly a different ecoregion than where the model was calibrated. A variety of environmental variables were added to a penalty based, stepwise regression model to explain variance associated with benthic macroinvertebrate assemblages. Results suggest that LDI scores in watersheds explain more variance than impervious cover. If this relationship is tested in other ecoregions, LDI could benefit design, planning and management decisions to improve environmental quality and public health by predicting alternative outcomes from different design and policy decisions.

## Comparing Web-based Surveys and Community Workshops as Participatory Techniques for Planning: The Case of Pittsburgh's Open Space, Parks, and Recreation Plan

Kathryn Stratmann, Chatham University, USA, kstratmann@chatham.edu

**Keywords:** public involvement, participatory techniques, digital technology

New forms of public involvement are needed to maximize civic engagement in local, regional and national planning processes. In recent years, there has been a growing debate regarding the use of web-based participatory tools and techniques. As planning and design fields rely more on technological advancements to facilitate public involvement, it is important to assess the pros and cons of web-based approaches in comparison to traditional participatory techniques.

Based on the experience gained by Pittsburgh, Pennsylvania's Department of City Planning (DCP) in preparing its Open Space, Parks, and Recreation (OSPR) Plan, this study will explore: how do web-based surveys compare with traditional community workshops as participatory techniques for informing the plan? In addition, it will investigate: what is the quality of information and participation that is generated from these techniques?

The inquiry focuses on a real-world case, in which two techniques: (a) An online survey conducted in 2010 and, (b) Community workshops held in 2011 were practiced to inform DCP's OSPR Plan. Data is drawn from interviews with the OSPR Plan decision makers, directly involved city planners. An evaluation criteria supports the case by illustrating how the planners view web-based approaches in comparison to traditional techniques, and how effectively web-based input is incorporated into final plans.

Authors Mandarano, Meenar, and Steins concluded that further studies are necessary "to understand the impacts of digital civic engagement" (2010, p. 132). This presentation will identify how web-based and traditional approaches to public involvement inform decision-making in an era of new information and communication technologies. Based on the case of Pittsburgh's OSPR Plan, the findings from the study will demonstrate how web-based participatory techniques impact the welfare of the public, the decision makers, and the plan itself.

## Coalscape: Reclaiming the New Appalachian Plateaus

**Kjirsten Alexander**, City College New York, USA, [kjirstenalexander@gmail.com](mailto:kjirstenalexander@gmail.com)

**Keywords:** reclamation, mining, hydrology, ecology, mountaintop, coal, Appalachia

Coping with mountaintop coal mining in Appalachia is a large and largely overlooked challenge of our era. Landscapes are rapidly rendered unrecognizable and bluntly patched up. Communities face mono-industry economic dependence, undergo drastic changes, and sometimes end in ruin. Understanding the forces behind this extraction and what it means to reclaim positive values for these sites is vital to the future of the people and ecosystems of Appalachia.

The core research will examine environmental processes over the multiple stages of surface mining and reclamation. This may reveal opportunities to intervene and mitigate some of the negative impacts on local communities and ecologies. Erosion, slope stability, subsidence, soil composition, air quality, biodiversity and chemical contamination of soil and water all demand careful consideration.

Hydrology is arguably the most important and most challenging system to manage. Monitoring and treating mine runoff is required to ensure it meets both aquatic life and drinking water standards. Maintaining or re-establishing stream flow regimes and ecology of headwaters lost to blasting is an enormous and questionably attainable task. Protecting streams, groundwater and well-water from contaminated runoff and toxic waste water is a long term charge with very high stakes.

In addition to ecosystem functions, mountaintop mining can also disrupt the landscape's socio-cultural values. Losing sense of place is devastating to families with roots generations deep. These roots extend beyond official valley property lines, uphill where land companies hold titles and sell mineral rights. Hunting and foraging can be important dietary supplements in many families, especially the high percentage that live in poverty in Appalachia. Local knowledge, a sense of strong attachment to the land and site-specific memories all face extinction when the landscape they are tied to becomes something new.

This research will culminate in a case study and design proposal. The goal is not to reestablish a pre-existing condition but to rebuild values in the land. It will instigate processes to develop a functional ecosystem with special consideration for hydrology. The project will also seek to carry through a sense of place to the new landscape. Additionally the proposal will include potential productive land-use options to sustain the community's long-term economic viability.

As energy sources become more scarce and we go to greater lengths to recover them, we must reckon with ever more dramatic results. The role landscape architects can play in guiding this process is increasingly important.



## From Regional Planning to Site Design—The Application of ‘Shan-shui City’ Concept in Multi-scale Landscape Planning of New Cities in China

Jie Hu, Beijing Tsinghua Urban Planning & Design Institute, China, tsinghuala@gmail.com

**Keywords:** Shan-shui City; Relationship between Humans and Nature; Multi-scale; Landscape; Eco-system

As developing countries become increasingly a part of the global economy, the tendency of populations to concentrate in urban areas is becoming clear, resulting in an inevitable contradiction between urban artificial eco-systems and natural eco-systems. Landscape planning that includes both regional and site scales will be more objective in creating an ecologically secure landscape that meets both aesthetic and urban requirements at the site scale, based on evaluation of the landscape eco-structure at a regional scale, paying much attention to the urban planning and design activities that integrated the natural environment under the guidance of the Chinese traditional human settlement ideas.

Mr. Qian Xue-sen proposed in 1990: “Is it possible to combine Chinese landscape poetry and Chinese classical architecture in gardens and Chinese landscape paintings all together, to create a concept of ‘Shan-shui city’? People left nature but also have to return to nature. The socialist China has the capability to create communities in a ‘Shan-shui city’ style.” According to Chen Yulin, the “Shan-Shui-City” is “one of the most unique spatial planning concepts in the China’s history. It combines the urban construction and the natural environment which is mainly composed of the mountains (“Shan”) and the water (“Shui”).”

The article begins with the analysis of Shan-shui cities in ancient China, such as Beijing, Xianyang, Hangzhou, the Mountain Resort in Chengde, etc., introducing the long history and origins of the planning and design of “Shan-shui City”. 3 practices are followed, advocating the philosophy of “adjusting measures to local demands” and “design with nature”, which includes comprehensive consideration of the relationship between urban and peripheral ecological areas at many scales.

The Yulong New City Area landscape planning and design focuses on the abstraction and reformation of dragon culture from natural mountain-water patterns. Based on a detailed investigation of the existing trees and river on the site, the design blends the landscape axis of the new city into the wide natural environment. The landscape planning and design of Dalian New Harbor City core area strengthens the ecological circulation between urban green space and peripheral water conserved mountains, as well as the water retention function of artificial lowlands. The Longwan Central Business District landscape planning and design illustrates how the urban green system and mountain-water landscape axis take advantage of the existing natural mountain-water patterns, stressing preservation of original plants and artificial restoration measures for river purification and maintenance of biological diversity functions.

## An Industrial Green: An Alternative Future for an Aging Infrastructure

**Paul Russell**, Clemson University, USA, russel5@clemson.edu

**David Pearson**, Clemson University, USA, pearso5@clemson.edu

**Keywords:** planning sustainability re-use ecology

Industrial Green is a technology development center, laboratory, research center and test track for alternative and sustainable modes of transportation. The facility will focus on electric vehicles, hydrogen power and the associated technologies to support new vehicles. A conference center and viewing tower is planned to engage and educate the public about the site's functions and Industrial Green's aspirations to establish a world leading research and development center. The site is located at South Carolina Technology and Aviation Center (SCTAC) in Greenville. The booming center occupies 2,600 acres of the former Donaldson Air Force Base. SCTAC is recognized as a major aviation-related and aircraft maintenance center due to its active runway and large scale facilities. The challenge with Industrial Green was to accommodate the complex requirements of the program while integrating into the SCTAC context and responding to the environmental conditions of the surrounding area. The intent of the analysis and planning phase was to create a long-term vision for the center as a laboratory, test track, research campus and to develop sustainable landscape strategies for engaging the public and addressing specific site conditions. The role of the landscape architects was to complete a comprehensive site analysis for the 577-acre parcel, determine opportunities, constraints and suitability of the site and to develop a conceptual master plan. The site has been highly manipulated and transformed over time as a former air force base. The site consists of poor soils, little vegetation, brownfields and vast expanses of vacant land. The landscape strategies focus on storm water management, reforestation, remediation and experiential spaces for employees and visitors. An open system of water management including bio-canals, constructed wetlands, ponds and riparian corridors is proposed to allow a transformation over time through ecological succession. Long-term management and maintenance strategies were also considered as design strategies. The projects significance is because of its scale, ambitious goals and importance related to sustainable transportation. Furthermore the decision to plan the project on a former airfield offers a model for reclaiming and reactivating abandoned industrial sites. The analysis studied the site in the Greenville metropolitan context with relationship to proposed growth corridors, transportation, greenways and parks. The projects long-term goals are to be a positive influence that will connect adjacent neighborhoods through economic development and job creation. Furthermore, the project seeks to connect to Lake Conestee Nature Park thru greenway connections.

## **Sustainable Community Enterprises and Integrated Regional Watershed Management: A Case Study in Voluntary Participation within New York's Western Watershed**

**John Crone**, University of Arkansas, USA, jcrone@uark.edu

**Keywords:** sustainable agriculture, watershed management, regional tourism

Approximately 90% of New York City water comes from the state's Catskills/Delaware Watershed, which covers about 1,600 rugged square miles of farms and densely forested land some 125 miles northwest of The City. This system of watershed planning, including reservoirs and underground aqueducts, comprises the largest surface-water storage and supply complex in the world and is a positive natural-resources management model for regions around the globe to study and, where feasible, emulate. This model promotes a community-based approach of public/private participation that integrates watershed agricultural and forestry enterprises (the dominant economic sectors alongside tourism), which respond to C/D Watershed management needs by adopting/implementing best management practices (BMPs) that support a sustainable farming, forestry, environmental, and water-quality future.

This analytical case study presents four major goals to increase understanding of this model's successful integration of regional water-quality management with local and regional economies. Learning outcomes are enriched by the paper's elaboration of the four goals.

1. Identify the core values in the Mission Statement of the Catskills Watershed Corporation that have application in other regions.
2. Identify successful interrelationships among the cooperating watershed entities at the federal, state, and local governmental and institutional levels.
3. Analyze the successful public/private organizational structure and strategies of the Watershed Agricultural Council (WAC), which is charged with managing water quality and quantity
4. Identify the long-term economic viability of this exemplary watershed protection model that integrates agricultural, forestry, tourism, and residential interests with eco-tourism and water-quality management benefits.

The recent, historic flood-stage records and destruction hurricanes Irene and Lee brought to the Catskills/Delaware region could have been more devastating had the state not created an extensive, forest land bank program as part of its strategic vision. In conclusion this watershed model promoting health, safety and welfare among state, local, and neighboring communities through networked agencies has facilitated tackling this massive environmental damage with renewed appreciation of the value of a clean water supply linked to integrated and sustainable land use planning policy that is poised to respond to disasters quickly and efficiently.

## The Other Landscape History

**Tim Keane**, Kansas State University, USA, whisker@ksu.edu

**William W. Emmett**, USGS ret. emeritus, USA, williamwemmett@gmail.com

**Cheryl Harrelson**, Steady Stream Hydrology, Inc., USA, cheryl@steadystreamhydro.com

**Keywords:** Long-term Landscape Change, Landscape Evolution, Fluvial Landscape Processes and Regimes

This work explains and documents a landscape history of a different color, one of unintentional landscapes. The research investigates the processes and changes of six fluvial landscapes in Wyoming and Montana over the past sixty years in order to provide insight regarding environmental degradation and landscape evolution. These fluvial landscapes were surveyed and mapped in the summer of 2011. All six sites were first surveyed in 1962 and several were plane table mapped in 1950. Subsequent re-surveys were conducted between 1962 and 1991. Our 2011 survey provides a fifty-year record of landscape change and represents a unique contribution to the geomorphic record and to our understanding of landscape change regimes. Patterns, rates, and sediment yields associated with degradation, aggradation, and landscape evolution are reported.

In 1961, Luna B. Leopold, then Chief Hydraulic Engineer at the U. S. Geological Survey proposed the "Vigil Network", a systematic watch over time on small watersheds of principal hydrologic and landscape factors. Such long-term monitoring provides an effective means of relating observed changes to possible causes such as land use and climate. Indeed, such observations might well provide an early warning on global climate change and impact of land use. Equally important are the detailed data on erosion, sediment yield, and rates of landscape evolution. William W. Emmett was working as the Research Assistant to Leopold at the time he proposed the Vigil Network. To implement the Vigil Network, Emmett conducted the first field surveys and measurements of about a dozen sites during the summer of 1962. Many of the Wyoming sites established by Emmett were earlier visited in 1950 by Leopold and John P. Miller during their study of a post-glacial chronology of alluvial valleys in Wyoming (Leopold and Miller, 1954). Subsequently, Emmett resurveyed most Vigil Network sites six times during the 1960s, again in 1973, and conducted a last survey during 1991.

Work here documents fifty years of landscape change in six, semi-arid landscapes of Wyoming and Montana. Comparative analysis of cross-sections and longitudinal profiles allow quantification of area and elevation change as well as head-cut advances and sediment dynamics. Suggestions are offered regarding how our findings might predict future impacts of land use or climate change. Finally we speak to the importance of long-term landscape process study in a world where our collective "attention span" seems to be growing shorter.

## I-10 Corridor—Mega-region, Houston to Mobile

**Bradley Cantrell**, cantrell@lsu.edu, **Matthew Seibert**, **Ling Zhang**, Louisiana State University, USA  
**Jeffrey Carney**, jcarney@lsu.edu

**Keywords:** Mega Region, Corridor, New Orleans, Houston, Framework, Infrastructure

The I-10 corridor from Houston to Mobile is the central spine to one of eleven vast American mega-regions. The corridor has grown in recent decades to overtake the East/West system of intra-coastal canals that once connected the region. In the coming decades the corridor will augment and challenge the dominance of the Mississippi River which has traditionally determined the ecological, economic, and social landscape of Southern Louisiana. As the Mississippi Delta continues to suffer from the dramatic deterioration of its ecological foundations the I-10 corridor plays an increasingly central role in the economic, cultural, and ecological health of Southern and coastal Louisiana.

The mega-region scale transcends cultural, political, and ecological boundaries. The elevation of what have traditionally been city-functions to the level of the mega-region provokes a new order—framing and prioritizing settlement concerns at scales usually reserved for ecological processes. The expanding scope of our urban region places a growing burden on landscape, urban, and ecological planners' ability to envision the framework of a mega-regional infrastructural and settlement landscape to create socially meaningful, ecologically regenerative, and economically vital spaces. Planning at the mega-region scale will be strategic, opportunistic, and situational. Like many problems that we face, there are no simple solutions, no clearly defined means to implement changes, no unified beneficiary, an antiquated regional authority, and no clearly defined timetable.

Design at the mega-regional scale requires a dramatically expanded field for design that reorganizes the conception of settlement through a wide angled lens. The overall framework from Houston, Texas to Mobile, Alabama is at once a whole system unto itself but also a chain of localities that operate as conduits of exchange between the overall system and particularities of place. The planning of this system must embrace this duality to properly leverage multi-scalar networks as well as local relationships.

This paper will present visualizations of the forces at work in the Gulf Coast Mega-region broadly focused on several dynamics defined through the lens of ecological connections, ecosystem services, transportation networks, settlement patterns, and protection or resiliency methods. The broader systems analysis will then provide the base for a series of speculations on future conditions and opportunities for change. This study will provide a platform for understanding the mega-region as an organizer for seeding a variety of local economic and cultural initiatives that function symbiotically outside of normal political and/or cultural boundaries.

## The ability of land use policies in sustaining the earth system— A study of top 50 cities in the United States

**Zhifang Wang**, zhifangw@tamu.edu, **Nancy Volkman**, nvolkman@arch.tamu.edu,  
**Yi Luo**, Laeony.luo@gmail.com, Texas A&M University, USA

**Keywords:** land use, mitigation, ecological services, sustainability

The planet is facing many key pressures regarding sustainable development. Land-use policies are one of the solutions to reduce or mitigate pressures on the planet, because land-use policies are decisions that lead to direct changes in the physical earth system. Well-formulated land-use policies promote transformative changes for a sustainable global future by preserving/restoring ecosystem services to a system that better replicates natural processes. However, to what extent a place can adopt innovative policies is influenced by its social/economic context.

This study investigated how different cities in the USA utilize land-use policies to manage urban development for a sustainable future. The top 50 sustainable cities in the US, as defined by Sustainlane\*, were selected and examined for comparison. Two research questions were addressed: 1) What are those land-use decision-making strategies and policies used by different cities to achieve sustainable development? 2) How can social and economic context of these cities impact the adoption and implementation of their policies? A program protocol evaluated varied policies related to sustainable urban development and resource use. The protocol evaluation results were then correlated with social-economic status rankings of the 50 cities to examine the potential role of social-economic background in promoting sustainable policies.

This study revealed the complications in promoting innovative land-use policies that preserve/restore ecological services. The concept of sustainable city development was linked with a wide variety of land-use programs and policies in different cities. Results demonstrated that these programs had strong regional autocorrelations. Poverty rate, population density and racial percentage were most directly related with policy adaptation possibilities addressing sustainable development. The study demonstrated the strong relationships between social/economic context and innovative land-use policies addressing sustainable development. As a result, the study should provoke reflections and discussion on the wide variety and lack of consistency in land-use policies regarding environmental health among designers, planners and policy makers. It also suggests the need for adoption of different innovative ecological services policies under different social/economic contexts.

\*As listed at <http://www.sustainlane.com/us-city-rankings/overall-rankings>

## From Macro to Micro: Green Infrastructure for the Metropolitan Landscape— A Case of the Green Space System for Hong Kong

Leslie H.C Chen, lhccchen@hku.hk, Yajing Liu, gracelyj@hku.hk,  
Weijia Shang, weijia.shang@gmail.com, the University of Hong Kong, Hong Kong

**Keywords:** Urban greenspace; Green infrastructure; High-density city; Landscape ecology; Hong Kong

Green space is generally viewed as an essential ingredient of an urban ecosystem. Its ecological, social and economic benefits have been widely recognized. However, due to the unique characteristics in their urban spatial pattern, traditional strategies of establishing and improving urban green space systems are difficult to apply to most compact cities. The heavy conflict between development and preserving green areas in urban areas requires a new efficient green space system.

Hong Kong is a compact city. In contrast to the built-up area, the suburban area in Hong Kong has been generously protected with rich flora and fauna resources and encloses the urban areas. The unique topography and governmental protection in early times are the basis for Hong Kong to achieve a rich green infrastructure. However, the previous analysis of green spaces is from a micro-scale perspective, resulting in a fragmented system. This paper, from a multi-scale perspective, proposes an alternative framework to reevaluate the spatial characteristics of Hong Kong's green space system, optimizes its multiple functions in ecology, society and economy, and demonstrates that connectivity is crucial for increasing the multiple functions of the urban green space system.

At the regional level, different categories of green areas are perceived as a whole and illustrate that a large unfragmented natural landscape network exists, which generates a mainly landscape structure in Hong Kong.

At the city level, the suburban area has a strong connection of green spaces, while in the urban areas, artificial pocket urban parks are scattered with little environmental value. GIS and landscape structure metrics analysis illustrates a lack of connection between suburban and urban green spaces, as well as within the urban area, and shows the importance of maintaining the connection between urban green spaces and the conserved areas in the compact cities.

At the neighborhood level, the areas of deficiency of green infrastructure are identified and viable strategies are discussed to improve the existing urban green spaces into an interconnected network. The possible linkages can be established by linear spaces, such as riversides, greenways, trails and civil infrastructure.

In conclusion, this paper demonstrates a useful framework that would reevaluate the green space system from a multi-scale perspective and integrate active and passive greenways to help reduce fragmentation in compact cities. It proposes a sustainable development for Hong Kong and can be a significant reference for future high-density city green space system development.

## Relationships between fish assemblages structures and streamline geometry

**Jin-Ah Kim**, lethe88@naver.com, **Sang-Woo Lee**, sw17311@konkuk.ac.kr,

**Jo-Mee Lee**, mei199@naver.com, Konkuk University, Korea

**Gil-Son Hwang**, Halla Engineering and Construction, Korea, gilsonh@naver.com

**Keywords:** IBI; Fish assemblage structure; Streamline geometry; Fractal dimension

Numerous studies suggested that fish assemblage structure reflects the status of stream ecosystems. The status of streams integrity, including various trophic levels, water quality and habitat degradation, can be assessed by fish assemblages. In this study, we investigated the relationships between fish assemblages and streamline geometry using a modified Index of Biotic Integrity (IBI). We selected the Nakdong river, which is one of major rivers and the longest (525 km) river in South Korea, as the study river. It passes through two major cities including City of Daegu and Busan. The total watershed area of the river is 23,384 km<sup>2</sup>, and the mean width, depth, and flow velocity are 143.19 m, 47.41 cm, and 39.19 cm/s, respectively. We used the revised IBI representing overall ecological characteristics of Korean fish assemblages and eight sub-assessment criteria of modified IBI, collected from 82 sampling sites along Nakdong river. The sub-assessment criteria used in the study are the total number of native fish, the number of native species, riffle benthic species, sensitive species, the ratio of tolerant species and native insectivore species, omnivorous species and abnormal species. For calculating the streamline geometry, we measured fractal dimension index that generally used in biology, ecology and landscape ecology. We used the vector land-use/land-cover map and generated a 1-km buffer for each sampling site. We then converted the streamlines within 1-km buffer into GRID format with 5-m resolution. In FRAGSTATS3.3, fractal dimensions representing the streamline geometry of the sampling sites were computed and correlated them with sub-assessment criteria of IBI. The results showed that IBI and six sub-assessments are significantly correlated with streamline geometry. The fractal dimension of streamline geometry were related with IBI ( $r = 0.48$ ) and six sub-assessments, including the total number of native fish ( $r = 0.37$ ), the number of native species ( $r = 0.34$ ), riffle benthic species ( $r = 0.26$ ), sensitive species ( $r = 0.43$ ), the ratio of tolerant species ( $r = -0.52$ ) and native insectivore species ( $r = 0.52$ ). The results indicated that complex streamlines may at some extent enhance the fish assemblages by potentially supplying insects and more heterogeneous habitats. The results of this study can be applied into stream restorations to enhance the fish assemblages in the stream. It would be interesting to investigate the mechanisms how streamline geometry affect fish assemblages.



## A multi-scale investigation on the effects of edges and burn severity on short-term post-fire vegetation regeneration

**Joo-Mee Lee**, mei199@naver.com, **Sang-Woo Lee**, sw17311@konkuk.ac.kr,

**Jin-Ah Kim**, lethe88@naver.com, Konkuk University, Korea

**Joo-Hoon Lim**, forefire@forest.go.kr, **Myung-Soo Won**, mswon@forest.go.kr, Korea Forest Research Institute, Korea

**Keywords:** Forest fire, Vegetation regeneration, Burn severity, Edge effect

Post-fire vegetation response is a key area of study for restoring ecological integrity of burned forests and preventing secondary damages. Some variables such as burn severity (BS) were known to play important roles in post-fire vegetation regeneration (VR). Edges were known as to play critical roles in determining the rate of interaction between two adjacent systems in Landscape Ecology. This study aim to investigate the effects of edges formed between burned and unburned forests on early post-fire VR with taking into account the BS effect. Burned forests in Samcheok areas, the study site, in Korea were mainly covered by *Pinus densiflora* and mixed forest of *P. densiflora* and *Quercus mongolica*. We adopted 2 (edge/interior) by 2 (low/high BS) study design with considering scale effects. We generated 0.05-ha grids and 0.1-ha grids covering entire burned areas in GIS. For each scale, we identified grids as edges when grids touch any part of borderline of burned areas, otherwise we identified as interiors. BS map was generated with  $\Delta\text{NBR}$  (delta Normalized Burn Index) using LandSat-TM images. Grids are identified as low or high BS when BS within a grid is lower or higher than the mean BS of the entire area. These process lead us four groups of grids including low BS-interior (A), low BS-edge (B), high BS-interior (C) and high BS-edge (D) for two spatial scales. Early VR map was computed with  $\Delta\text{NDVI}$  (delta Normalized Difference Vegetation Index) using Landsat-TM images and difference of  $\Delta\text{NDVI}$  between groups were compared. The results indicated that C and D ( $\Delta\text{NDVI}=0.055, 0.062$ ) showed greater VR than A and B ( $\Delta\text{NDVI}=-0.047, -0.03$ ) in low BS areas at 0.05-ha spatial scale. And it is consistent at 0.1-ha spatial scale. This result suggested that BS is critical for post-fire VR regardless spatial scales. It was also observed that edges areas showed greater VR than interior areas when BS is the same. For example, B ( $\Delta\text{NDVI}= -0.03$ ) showed greater than A ( $\Delta\text{NDVI}= -0.047$ ) in low BS condition at 0.05-ha scale. Similar relationship is observed between C and D in high BS condition at both spatial scales. The results indicate that VR in early stages might be affected by BS first. Edge effect for post-fire VR is also important, but a sub-factor of BS. Thus restoration practices for burned areas might need to pay attention to interior areas with low BS to minimize the secondary damages and to rehabilitate the burned forests.

## Transitioning the Urban Forest of Today into the Urban Forest of Tomorrow

**Evan Slocum**, University of Wisconsin-Madison, USA, eslocum@wisc.edu

**John Harrington**, University of Wisconsin-Madison, USA, jaharrin@wisc.edu

**Keywords:** iTree, urban forest, ecosystem services, forest composition

With the rapid expansion of urban areas and the widespread loss of tree species to pests and diseases, such as emerald ash borer and Dutch elm disease, many public and private property owners are planning major tree planting programs. Urban foresters, planners and landscape architects must consider how the species planted today shape the urban forests of tomorrow in terms of the ecosystem, economic, and aesthetic services provided. Quantifying these services is of growing importance to urban and regional planners and is made possible by means of various computer-modeling programs. One common objective is for an urban forest diversity of 10-20-30 or 5-10-20 (ratio of species, genus, family, respectively). However, these calculations are based only on public lands and do not include private lands where the majority of the urban forest resides.

The objectives of this study were to analyze (1) the current urban forest composition of the Madison, Wisconsin Urban Area, as defined by the U.S. Census, (2) the ecosystem services it provides (3) the planting trends shaping its future structure and (4) the future projections of species composition and ecosystem services. Two computer-modeling programs and a written survey were used to address these objectives. Two hundred randomly generated 0.04-hectare plots were input into the U.S. Forest Service's i-Tree program to model the composition and structure of the urban forest and the ecosystem services (CO<sub>2</sub> sequestration, storm water mitigation, air purification, and home energy savings) it provides. To determine current planting trends a mail survey was sent to nurseries, landscape architects, landscape contractors, and municipal foresters. Survey data was used with the program "City Trees Lite" to model future composition and structure based on parameters such as species planted, growth rate, mortality, pruning frequency, and pest/disease outbreak. Ecosystem services and susceptibility to pests/diseases were then recalculated in i-Tree to compare Madison's current and predicted future compositions.

The study results will be used to discuss whether what is being planted today on public and private property will advance or hinder ecosystem services and species diversity of the urban forest in the future. Furthermore, the results emphasize that one-time surveys of tree species may not be representative of the future urban forest composition and that the dynamic management of urban forests requires understanding that nurseries, arborists and landscape architects play a critical role in shaping the urban forest through species selection and demand creation.

## Land Management Approaches in the Lost World of Bibb County Glades

Susan Godwin, Auburn University, USA, smg0024@auburn.edu

**Keywords:** diversity, land management, Glades

In May of 1992, a Georgia botanist on a canoe trip through Bibb County, Alabama in search of a single rare plant species stumbled upon one of the most significant biological finds of the century. A series of mostly treeless glades located on limestone outcroppings of rare Ketona dolomite along the Little Cahaba River revealed several populations of rare plants, including eight species new to science. Botanical explorations since 1992 have discovered more than sixty rare plants (two previously thought to be extinct) in an area of approximately eleven miles in Bibb County, making it the most biologically diverse land in the continental United States.

Fortunately, the significance of this find did not go unnoticed by such groups as the Nature Conservancy of Alabama and the US Fish and Wildlife Service, both of which partnered in an effort to create a refuge for the rare plants and animals found within the Cahaba watershed of Bibb County, Alabama. The glade, now known as the Bibb County Glades, is located at the intersection of three geographic regions: the upper coastal plain, the ridge and valley, and the Cumberland plateau all come together here. A visitor can walk from hardwood forested bluffs to rocky dolomite glades, to longleaf pine forests within a matter of a few feet. Perhaps nowhere else in North America can one notice such sudden changes in geography and flora in so small an area. Here, the public is invited to observe and appreciate a unique, ancient plant community unlike any other. Bibb County Glades discoverer Jim Allison has noted that botanical discoveries of this kind are usually made in remote regions of South America, Africa or Asia. The fact that a discovery of this caliber occurred in Bibb County, Alabama is truly unprecedented. Alabama holds within the Cahaba River system a treasure trove of biological diversity.

This paper seeks to examine current practices in land management in the Bibb County Glades including the roles of the Nature Conservancy, the Cahaba River Society, US Wildlife and Fisheries, and that of private landowners. It seeks to discuss the impact of encroaching development and the effects of water management upstream in the Cahaba and Little Cahaba River watersheds; and will also explore the implication of possibilities of land transfer from private to public ownership.

## **World Trade Center Memorial: Evidence of Landscape Patterns Defining Form, Function, Materiality, and Society**

**Kelly Curl**, Colorado State University, USA, [kelly.curl@colostate.edu](mailto:kelly.curl@colostate.edu)

**Keywords:** hydrology, patterns, process

Patterns of nature are visible at varying scales and encompass our world. Natural patterns of form and function are visible in geometric plant anatomy, weathered beaches, tree bark, riparian scarring, and eroded landscapes. Natural formations or arrangements may result over time due to global environmental altercations in evolution. How have these millions of patterns we see every day influenced in the way we see or analyze the world? How do the patterns influence us, as designers, to create successfully formed, functional, and social landscapes? The purpose of this paper is to review how water patterns have influenced successful and influential historical landscape designs through planting schemes, site infrastructure, materiality, and social engagements. Historic precedents to be studied and discussed include the benches and cistern system of Parc Guëll, the irrigated hardscape pattern in the Courtyard of Oranges in Seville, the retained gardens of Chateau de Chenonceau, the aqueduct of Segovia, and the hydraulic system in the Alhambra. How have these past projects dealt with getting water to site, dealt with water on site, and dealt with how water influenced the design through its materiality and ability to sculpt space for an audience. After looking at earlier national and international projects, I will focus on the design of the World Trade Center Memorial as a current well-crafted design where water and patterns dominate. The World Trade Center Memorial has an integrated cistern system, crafted patterns of planting and paving materials, and includes the largest man-made waterfalls in the world that mark the footprint of the past towers. This project is a complex system on structure, where water, both seen and unseen, will influence the visitor's experience on the memorial site and create social patterns of its own.

## Developing an Approach for Communities to Assess Stormwater Application and Detention Requirements for Overall Watershed Health

**Katherine Kraszewska**, Mississippi State University, USA, ktl53@msstate.edu

**Cory Gallo**, Mississippi State University, USA, cgallo@lalc.msstate.edu

**Keywords:** stormwater, policy, watershed, sustainability, design

One of the many issues communities, especially those with limited resources, will face when trying to protect their local watershed is the lack of experience and background their policy makers have in environmental protection and watershed health. Policies that communities impose on developers have the ability to detract or enhance a community's overall watershed health; however, they typically relate only to large sites and require large detention facilities which focus on flood protection. This approach does not reflect the end goal of sustainable design and of mimicking natural hydrologic processes.

The purpose of this study is to test a range of on-site stormwater management policies against a selection of new development projects from a specific small city of the Southeast United States in order to determine what combination of policies works best in a particular urban environment. The results clarify what policy combinations encourage a sustainable stormwater management program and promote overall watershed health. The two major elements that are measured in this research are the Application Trigger and overall Detention Requirement.

Every policy requires stormwater protection to be implemented after a certain threshold of development has been reached. This can be as little as 500 sq. ft. of impervious area or as much as one acre of disturbed land. Therefore, for the purpose of this study, a policy's Application Trigger is defined as the amount of disturbed or impervious area proposed by a new development. The Detention Requirement is the size event that the site needs to accommodate and manage if it's triggered into meeting a stormwater policy.

Three policies were selected to test the range of stormwater approaches being used in the United States. The first policy states that any site greater than one acre of disturbed area shall accommodate for the 100-year storm event. The second policy maintains that any new development which exceeds 10,000 sq ft. in impervious area must manage for the 10-year storm event. The third and final policy requires all new developments exceeding 500 sq. ft. in impervious area to allow for a 2-year storm event.

These policies were then measured in a spreadsheet analysis against one year's worth of new development from the city of Starkville, MS. The outcomes of this research can provide communities and municipalities with a tool to help them determine which combination of Application Trigger and Detention Requirement for on-site stormwater management will best serve their watershed needs.

## Tracking open and built space changes: A formal-analysis in Northern UT

**Carlos Licon**, Utah State University, USA, carlos.licon@usu.edu

**Cameron Bodine**, National Park Service, USA, cam.bodine@aggiemail.usu.edu

**Keywords:** open space and urban growth; urban form metrics; time series mapping

Open and built space have a dynamic interaction in such a way their health, configuration and future depend on each other. Often, open space is treated as the vacant land surrounding development, the future receptacle of a variety of uses. Understanding how development and open space change will help determine trends, development pressures, and potential areas for open space recovery and protection. The authors seek to present a visualization method of describing changes in order to enhance understanding of the short and long term implications of development decisions.

This project identifies, through 100 years of recorded data on parcels and built structures, the changes in the Cache Valley built and open space environments using geographic information systems. County data is classified and mapped in sequential series visualizing and measuring different features describing the system. Maps are created by sequences of aggregated shapes based on different features of the built environment such as neighbor proximity, lot sizes, and land uses. Through this analysis new shapes are produced, and new urban forms capture additional formal features. Quantitative analysis explains associations between different variables describing space changes.

The study tests different ways of representing physical attributes of development, such as density, connectivity, and proximity. By creating a graphic expression based on the values of these urban features in a descriptive sequence, the authors produce a series of maps with measurable attributes of the development process, helpful to describe open-space and built space transformations, and to establish mutual influences.

Through the use of landscape ecology metrics, the authors measure the resulting urban boundary and track the change of connectivity, network systems, and edges, quantifying and describing the relationship of open space and development based on pattern size, distribution, and time. This is an exploratory visual exercise describing spatial transformation as a result of development processes.

As new built environments take shape, the open space created needs to establish a viable and integrated relationship with development. Capturing, describing, and explaining the dynamic nature of these two “entities” contributes to building stronger ties along this edge separating to interlinked dynamic environments.

## **Greenways as Synergistic Landscape to Address Urban Fragmentation: Academic Exploration of Lonsdale Neighborhood Greenway Planning**

**Yilin Shi**, University of Tennessee Knoxville, USA, shiyilin890@gmail.com

**Archana Sharma**, University of Tennessee Knoxville, USA, archsharma1@gmail.com

**Keywords:** greenway, synergism, urbanism, landscape architecture, sustainable design, connectivity, planning

Review of contemporary greenways design projects in North America reveals that the focus is more on connecting the residential neighborhoods with singular natural elements such as a stream or a ridge, with the intention of improving accessibility of man to nature. The broader interconnections from ecosystemic level are overlooked or undermined in such cases. As a result, you see fragmented and not so sustainable greenways cropping up in our already fragmented urban landscapes.

The hypothesis of landscape synergism advocates for design and operation of the landscape and urban systems as mutually beneficial constructs scales of residence, neighborhood and city (Sharma, 2010). Could greenways be the mechanism to induce synergism between disparate built and unbuilt components of our cities and thus address urban fragmentation is the central question raised through this paper. Landscape architects' perception of urban fragmentation, what constitutes synergistic landscape and whether it starts informing the concept and character of landscape synergism are the aspects that would be discussed in the process.

This paper critically reviews the contemporary greenway planning and design and explores the need and possibility of approaching greenways as synergistic landscape that creates harmony amongst the urban system with broader biophysical system. The exploration is to be undertaken through the study of a selected area, Lonsdale neighborhood in Knoxville, Tennessee, which is in need of renovation and has no greenways within walkable distance. The study is informed by critical literature review, field visits and community surveys. In this academic exploration, greenway is approached as a multi-functional tool for the purpose of improving the quality of life of local community, including improving built environment, promoting social interaction, providing venue for outdoor activity and alternative transportation routes. As suggested by the concept of landscape synergism, the paper proposes to incorporate multiple goals in the planning phase so that each of the goals can enhance each other and the whole project will be better prepared for the challenges proposed by expanding human development.

## Gradient Analysis, Adaptive Management, and a Review of the Original Assumptions in the Development of the Crosby Arboretum Master Plan

**Timothy Schauwecker**, tschauwecker@lalc.msstate.edu, **Robert Brzuszek**, rbrzuszek@lalc.msstate.edu, **Katy Lunstrum**, ktl53@msstate.edu, Mississippi State University, USA

**Keywords:** gradient analysis adaptive management Crosby Arboretum

Design is an iterative process, but ecological design is especially so, due to the variable of time and succession being so important to the process. In this way, ecological design is similar to the conservation framework of adaptive management (Holling 1978, Lee 1999) The design of Crosby Arboretum began with a collaboration between landscape architects and a biologist. By allowing for natural process to reveal itself (Spirn 1988) via succession, Crosby designers subjected themselves to continuous re-checking of original assumptions and were also, over time, affected by a forested site that continued to mature after design and management began. The 64-acre site, located in the southeastern U.S. was initially divided using a 100 square-foot grid system, a pattern that later manifested itself as the design evolved. For each of the grid squares, botanists recorded each of the species present. The collected data contains coarse information ecologically, but nonetheless represents a detailed description of the plant communities that were present onsite when the exhibits were being envisioned in the master plan.

For this study, the original botanical data has been reanalyzed using a common ordination analysis, detrended correspondence analysis, an indirect gradient analysis technique that helps one visualize the response of species to environmental gradients at a given site. The knowledge of the researcher is important for the interpretation of indirect gradient analysis plots, because the environmental gradients causing the spatial distribution of species are not explicitly correlated, but rather have to be interpreted from species distribution. The ordination showed that the dominant environmental gradients driving species distribution at the Arboretum circa 1981 were soil moisture and forest shade. 31 of 67 species were found in greater than 98% of the plots, indicating low beta-diversity for the site and presenting a great challenge for designers whose intent was, and continues to be, to showcase corresponding plant communities of the entire Pearl River basin. Using this original data, we revisit the original Crosby Arboretum master plan and review the original assumptions that continue to drive the design to this day. As the term ecological design indicates, the process should be a marriage of science and art, offering an evolving system as an alternative to a pre-determined product. The evolving system represents the open narrative described by Potteiger and Purinton (1998), a narrative which continues with this study.



## Typology of Urban Left-Over Space

**Mintai Kim**, Virginia Tech, USA, mintkim@vt.edu

**Gunwoo Kim**, Virginia Tech, USA, gwkim@vt.edu

**Keywords:** left-over space, drosscape, wasted space, vacant lots

Urban left-over spaces are products of urban development and the waste product of economic and industrial processes. Urban left-over spaces have gained interest among design professionals and scholars due to the opportunities for redesign and adaptive re-use, socially and ecologically. Cities like New York, Denver, and Paris are trying to adaptively use left-over spaces. Multiple scholarly sources have discussed the meaning and design of left-over spaces. However, there has not been a comprehensive examination of what, collectively, are urban left-over spaces. This study attempts to review scholarly papers and case studies on left-over spaces to gain a clearer understanding of the spaces. Examined are various terms used for urban left-over spaces and a discussion of cultural and ecological values of left-over spaces. It concludes with typology of left-over spaces and an examination of left-over spaces in a case study.

Historically, urban left-over space implied “waste landscapes” within urbanized regions. Berger (2006) coined “drosscape,” as a concept, that implies dross, or waste, which is “scaped”, or resurfaced, and reprogrammed for adaptive reuse. In her article, “Vacancy and the Landscape”, Corbin (2003) examines the cultural meaning of left-over space in everyday language. Many others, including Kim (2011), studied ecological values of these spaces. Kim finds that left-over spaces might improve urban ecology by allowing vegetation to grow freely, thus, providing sanctuaries for wildlife in urban areas. However, most of these scholars examined specific aspects of left-over spaces and lack a comprehensive understanding of the spaces.

In this study, a typology of left-over spaces was developed using the city of Roanoke as a case study site. Aerial images and ground-truth method were used to identify and catalog the spaces. The results were mapped using GIS software. Spatial relationships between left-over spaces and other types of open space were studied. Attempts were made to understand which left-over spaces were more valuable.

The city of Roanoke will find its hidden open space resources that are not identified through their existing plans, such as “City-Wide Brownfield Redevelopment Plan” which only address large sites. This study will provide the city with a different framework to look at all of its open spaces. The goal is a clarification of terms used for urban left-over spaces, and the classification of these types of spaces, to aid in better understand these spaces and increase their utilization.

## Strategies for Protecting Natural and Cultural Resources on Federal Lands During Incident Response

Eric Bardenhagen, Texas A&M University, USA, bardenhagen@tamu.edu

**Keywords:** Natural Resources, Cultural Resources, Hazard Planning, incident response

This paper introduces two complementary efforts to plan for and respond to hazard incidents that affect natural and cultural resources on Federal lands. A storm recovery plan for Cape Lookout National Seashore of the National Park Service and an All-Hazards Resource Advisor training curriculum are both first-of-their-kind tools that share the goals of informing decision processes during crises, mitigating further resource degradation during response efforts and offering long-term recovery guidance.

Hazard incidents, whether the result of natural processes or planned events, continually threaten vital natural and cultural resources on Federal recreation lands such as National Parks, wildlife refuges and cultural landscapes. Planning related to disasters and incident responses, however, have typically focused on preparedness actions often tied most directly to infrastructure and operational processes. This has exposed a gap in how we deal with post-incident guidance for responses focused on natural and cultural resources and has resulted in response efforts for these vital resources being largely reactive efforts.

To address this need for proactive guidance that can inform decision-making processes during an incident and long-term recovery, two efforts have been undertaken. First, a storm recovery plan has been created as an adaptable framework for planning in coastal parks. This plan identifies short-, medium-, and long-term actions to protect resources and incorporates stakeholder input, GPS-linked resource mapping, and sea level rise scenarios in recovery guidance. Second, an All-Hazards Resource Advisor training curriculum has been developed to cross-train individuals to serve as advocates, within the incident command structure, for the natural and cultural resources that may be affected either by the incident itself, or by the responders themselves.

Both of these two methods have been utilized during recent events including the 2009 Tsunami in American Samoa, the 2010 Gulf of Mexico Oil Spill and Hurricane Irene in 2011. Through interviews with responders and lessons learned surveys, both efforts shown to have a positive impact on response activities. Equally important, several key tools and response strategies have been identified that can be strengthened to better allow responders to protect resources during future incident responses.

Looking forward, the effects of climate change and sea level rise present increasing challenges for the protection of natural and cultural resources. These two efforts foster the ability to discuss and enact response and adaptation actions that can be taken prior to the onset of crises in order to protect these vital resources for future generations.

## Redeveloping Domesticity in Bangkok: An agroecology

**Katherine Bennett**, Ohio State University, USA, bennett.755@osu.edu

**Parwinder Grewal**, Ohio State University, USA, grewal.4@osu.edu

**Kanokwalee Suteethorn**, Chulanlongkorn University, Thailand, kanokwalee@gmail.com

**Keywords:** agroecology, agriculture, Bangkok, global south, habitat, political ecology, Thailand

Agroecology has been advanced as a framework for addressing environmental concerns alongside social issues of food access, land tenure and neoliberal policy in the global south. An emerging interest in urban agriculture within Bangkok's planning and architectural community leads us to an agroecological analysis of urban and rural socio-spatial structures on the city's development.

We consider the proposed redevelopment of a 516,800 sq. m. property owned by the State Railway of Thailand in Bangkok's northern Jatujak district. The new transit oriented, mixed-use development poses the usual implications for older middle class, low income and informal residential zones within and adjacent to the property, established in company-town fashion by the State Railway. A portion of the site is currently leased to the Petroleum Authority of Thailand's headquarters, slated to expand as an energy complex.

The pending replacement of this domesticated post-industrial landscape and displacement of its resident populations—human, animal, plant, material—will stress drainage and nutrient flows, already stretched with climate change and rising sea level, along with localized resources and means for subsistence. Within the city-centered hegemony of over-consumption, we look to prerogatives for water, soil, interspecies habitat, and evolving terms of domesticity.

## Mapping values for conservation planning: Assessing ecosystem services in San Jose's Coyote Valley

**Crystal Simons**, University of California, Berkeley, USA, [crystalward@berkeley.edu](mailto:crystalward@berkeley.edu)

**Keywords:** Ecosystem services assessment, conservation planning, regional development, InVEST, land-use trade-offs

Ecosystem services and their economic and inherent values have become an important topic in environmental and economic discussions worldwide. Given this expanding influence a planner asks, how might ecosystem services assessment (ESA) influence regional planning and local land-use decision-making? What implications might it have for linking growth management with environmental conservation?

A new Geographic Information System (GIS) plug-in software, called InVEST 2.1 (Integrated Valuation of Ecosystem Services and Tradeoffs), has been developed to assess the presence and value of ecosystem services in the landscape. GIS is a geographical and spatial tool that quantifies and models complex relationships between multiple influences in a landscape. GIS is frequently used to assess spatial priorities that inform land-use decisions, employing methods of suitability analysis, habitat quality assessment and biodiversity baseline measurements. The ability to graphically communicate complex spatial relationships is a powerful planning tool. The InVEST 2.1 methodology first determines supply (biophysical and cultural services provided by a defined landscape), then demand (benefits to humans), and lastly, economic valuation of defined services.

Spatially combining existing supply and demand with economic value brings alternative use scenarios like conservation to the decision-making table that is so often dominated by profitable development options. This research tests the InVEST model's applicability to conservation planning at the local scale in San Jose, California. Results show that the model, like many, cannot provide an appropriate land-use planning solution on its own. The new information generated by the InVEST model is nonetheless valuable to the conservation and land-use planning processes. By integrating its results with more traditional suitability analysis and regional landscape design, an appropriate plan to balance conservation and development in Coyote Valley emerges. In this way, maximum values from multiple land-use scenarios are combined into a single master plan that (a) demonstrates the limitations and benefits of ESA at the local scale, (b) integrates conflicting development alternatives, (c) exposes relationships between how we value landscapes, and (d) balances our growth and conservation objectives. Results are shown in illustrative maps, diagrams and graphics.

The case study site is Coyote Valley, a 7,000 acre area in San Jose, California. For over a decade, Coyote Valley has been the focal point for many planning and development debates. It's proximity to Silicon Valley and it's connection of critical habitat for important species and wildlife makes it a particularly contentious and complex site for local and regional planning interests.



# People-Environment Relationships

## Theorizing the Efforts of Situating Ecology in Landscape Aesthetics— Taking Stormwater Design as an Example

Bo Zhang, University of Florida, USA, zhangbo008@ufl.edu

**Keywords:** Stormwater, Ecological Aesthetic

This study shows an endeavor to theorize contemporary reception of the ecological aesthetic theory. While ecology has widely been recognized as a core value in the landscape architecture discipline, the lack of theoretical support in human scale is always an obstacle. In one aspect, landscape architects find that the fundamental ecology-derived conclusions can hardly deduce decent formative or spatial clues; on the other hand, bold design explorations that artistically celebrate ecological values might bear the risks of resource consumption and environment degradation. Theories of ecological aesthetic, eco-revelatory design and environmental art offer competing, if not conflicting proposals. While scholars call for the necessity and value of merging of ecology with aesthetics, few recognize the consequential conflicts or the irrelevance. This research studies the reactions from writers on landscape architecture projects and explores potential theoretical relationship types between ecological health and aesthetics.

I conduct a rhetorical analysis of recent writings on eco-interpretive designs. 50 articles on projects associated with stormwater are selected that ranged from 1990 to 2010 from Landscape Architecture Magazine. I investigated how the significance of each project is highlighted and generalized by writers. According to the study objective setting, five code categories are conceptualized and employed in the later phase, as ecological effect quality (disturbance-healing), ecological effect degree (in site-beyond territory), design scale (human scale-regional scale), aesthetic (innovative-conventional) and commentary attitude (reasonability-criticism). Not only the different emphases on each category revealed, but the conflicts, competitions, and compatibleness among them are also examined. Lastly, a set of theoretical types that resolve potential conflicts of ecology and aesthetics and celebrate potential resonations result are summarized as a framework guiding future eco-interpretive designs.

## Implementing Traditional and Modern Potentials in Participatory Urban Landscape Design in Iran

**Nastaran Tebyanian**, Faculty of Architecture and Urban planning, Shahid Beheshti University, Evin, Tehran, Iran, nastaran.tebyanian@gmail.com

**Maziar Memar**, School of Art and Architecture, Shiraz University, Shiraz, Iran, maziar.memar@gmail.com

**Keywords:** Participatory design, community participation, urban landscape, democracy, native participation mechanisms, virtual environment, native landscape narratives, Iran

This paper provides a hypothetical framework for community participation in shaping urban landscape in Semnan, Iran. In current Iranian Society, amid multiple political and cultural obstacles for social participation, there are still two main potentials that provide opportunities for refining it; digital social networks and lasting old traditions in social participation. This framework takes advantage of both traditional indigenous mechanisms associated with shaping urban landscape and modern methods of participation in design that can be experienced in physical and especially virtual space.

The presented framework consists of three parts: The first part draws an outline for shaping urban landscape in Semnan and provides the participants with clues for sustainable design; this is achieved through analysis of public open spaces, urban farms and gardens and the traditional water division system. In the second part primary objectives and principles for participation are defined based on ecological concerns, reaching democratic values and practical aspects of projects and events.

The third part is designing a structure for participation. Presented in a concept model, it identifies issues including spectrum of participants, their relationships, subject and means of participation and ratio between participation in virtual and physical environment. This structure is defined through two sources; first, the traditional mechanisms of participation in city's water management system, indigenous games and the Muharram ritual. Documenting roles and relationship between people and with urban context in a diagram provides a setting to this part. The second source is the analysis based on modern methods that concentrate on participation in real and/or virtual environment (design texts and HCI studies are indicated in references). These analyses are used to acquire adequate means and methods to design participation structure under the mentioned circumstances.

Initial feedbacks to this framework, received through questionnaires and early events, have revealed potentials for achieving the objectives in future. But there are also several problems which can be included in the concept model. Importance of the subject would be more explicit, considering the dominant top-bottom processes in contemporary design in Iran and lack of social participation. This research provides a plan for reading traditional mechanisms of participation and their relation to urban physical context in Iran and translating them into an internet-based model for participation in landscape design. Such findings yield opportunities in all circumstances to utilize local knowledge and memories in design process and also in dialogue, choice and participation as an experiment for democracy.



## Twenty-First Century Frontier: Immigration, Mexican-Americans, and the Landscape of the Non-Metro Midwest

Susan Dieterlen, College of Environmental Science and Forestry, SUNY, USA,  
sdieterl@esf.edu

**Keywords:** sociocultural issues, vernacular landscapes, globalization, rural landscapes

From the Great Deluge of the 1890s to recent legislation in Arizona, Indiana, and Alabama, immigration remains a contentious topic of debate within the United States. Despite an abundance of media coverage and limited scholarship within cultural geography (Arreola, 2004; Rojas, 2006), impacts on place and space outside the Southwest are not well documented. The Midwestern United States has become increasingly diverse in recent decades as larger economic trends and changes in immigration policy have drawn immigrants to areas that have not seen significant immigration in decades, referred to as “New Destinations” (Zúñiga & Hernández-León, 2005). Other recent literature also has documented this demographic shift in the Midwest and in the Southeast (Millard & Chapa, 2004; Singer, Hardwick, & Brettell, 2008). This paper reports the growth of city-level landscapes (described within the paper) characteristic of newly arrived Mexican-American communities in the non-metro Midwest, comparing data from 2000 and 2010. The paper also documents the distribution of similar landscapes characteristic of well-established Mexican-American communities as a context. The study included all small cities in Indiana, Ohio, and Michigan (n=828), using quantitative 2000 economic and demographic data to sort these cities into groups according to Mexican-American community and city-level landscape characteristics. Mapping then revealed the regional geographic distribution and relative abundance of the three groups of cities. Repetition of this procedure with 2010 data revealed an increase in cities with landscapes associated with newly arrived Mexican-American communities against a static background of other kinds of Mexican-American landscapes. This increase was particularly marked within Indiana, where well-established Mexican-American communities were rare. These findings move beyond abstract discussions of placemaking and “Latino urbanism” to illustrate the impact of immigration to non-traditional destinations like the Midwest on individual small cities as well as its cumulative impact on regions. Specific physical landscape elements and spatial relationships are tied with specific cities, thus enabling more targeted design and planning. The findings also provide an example of the application of landscape architectural paradigmatic values to issues usually addressed by sociologists and anthropologists in a non-spatial fashion, providing a convincing argument that landscape architects have much to offer to debates about hot button issues such as immigration and globalization.

## Towards Democracy in Urban Public Space: Park Design and Cultural/Ethnic Differentiation in American Chinatowns

Chuo Li, Mississippi State University, USA, cl1004@msstate.edu

**Keywords:** Urban Park, Cultural/Ethnic differences, Ethnic Community, Insurgent Citizenship

In American Chinatowns, the historical processes of racial segregation and social control, combined with forces of urban (re)development, have led to a constrained physical layout and unique social pattern of ethnic communities (Lin 1998). Within these communities, neighborhood parks have been rarely provided, poorly maintained, or progressively diminished to make way for new development (Li 2011). Leisure researchers and human geographers have investigated how people use parks in different ways because of the socio-demographic factors and distinct ideologies of race/ethnicity, class, and nature (Hutchison 1987; Byrne and Wolch 2009). However, it remains unclear how ethnicity/culture serves as a creative force to facilitate a shift of use, meaning, and identity in urban parks, and how the alternative perceptions and behaviors based on ethnic/cultural differentiation provide new expressions of cultural identity and insurgent citizenship (Holston and Appadurai 1999; Hou 2010).

This article focuses on neighborhood parks of Chinatowns in metropolitan cities of San Francisco, Chicago, and New York to explore the Chinese perceptions and attitudes towards landscape and park. The culture-specific perspective, combined with the particular social and physical needs of the Chinatown community, counter with a dominant discourse of park design based on the values of white, male, and middle-income park users (Marcus and Francis 1998, 88). The study uses Edward Hall's (1959) conception of polychromic and monochromic time to understand culturally-defined distinction on spatial perception. The socio-cultural norms that derive from a particular history of Chinese immigration are also manifested in the patterns of spatial use. A combination of research methods of field observation, personal interview, and archival research are adopted in order to address empirically the implications of culture/ethnic specific values in park uses by the ethnic community. The paper suggests that the sensitivity of a park design to cultural/ethnic difference determines the level of integration of the park space into the everyday life of the ethnic group. What is needed in Chinatown is not a park with "proper" appearance based on the dominant standards, but a lively space that can bring the various social groups together to conduct multiple activities and help creating a sense of community. It addresses the importance of developing a comprehensive and nuanced understanding of different cultural/ethnic paradigms in park design and emphasizes park as a democratic terrain that should be able to address the material particularities of citizen and their accessibility to substantive rights of citizenship (Holston and Appadurai 1999).

## Urban Landscape Spatial Patterns and Obesity of Hispanic Population

**Jun-Hyun Kim**, jhkim@arch.tamu.edu, **Chanam Lee**, chanam@tamu.edu, Texas A&M University, USA  
**Christopher D. Ellis**, University of Maryland, USA, cdellis@umd.edu

**Keywords:** Landscape spatial patterns, Hispanic, Body Mass Index (BMI), obesity, minority, active living, physical activity, urban forest

Studies have shown that the quality of residential environments influence health and well-being of the residents. Obesity has received growing attention due to its epidemic rates. Recent multi-disciplinary studies have identified built environmental factors, such as access to physical activity resources and availability of healthy food options, are associated obesity. However, environment-obesity relationships vary across different ethnic and income groups, and these variations have not been fully examined. Especially, Hispanic population requires urgent attention as one of the highest risk groups for developing obesity in the US. Although most previous studies on environment-obesity relationships have focused on built environmental factors, there are few empirical studies attempting to interpret physical activity and obesity of Hispanic population regarding the potentially important role of urban natural environment, such as landscape spatial patterns.

This paper examines correlations between landscape spatial patterns and obesity among Hispanic populations. It used surveys and objectively measured Body Mass Index (BMI) from 63 child-mother pairs from five elementary schools located in inner-city neighborhoods in Houston, TX. Landscape spatial patterns of urban forests and trees were classified with three major land-cover types: tree, grass, and developed areas. Then each land-cover type was measured by GIS and remote sensing techniques. To measure the quality of landscape spatial patterns of home neighborhood, FRAGSTATS was utilized to calculate various landscape indices within a half-mile and a quarter-mile area from each participant's home, using the airline and network buffers.

Preliminary results from bivariate analyses showed significant relationships between landscape spatial patterns and obesity. From the half-mile airline buffer assessments, well-connected landscape spatial patterns were related to lower BMI values in both mothers and children. Area-related landscape indices, such as total landscape area, total edge of each landscape patch, and dominance of tree patches, were also negatively associated with BMI in mothers and children. Less fragmented landscape patterns were correlated with lower BMI among children only. From the quarter-mile airline buffer assessments, both mothers and children's BMI were significantly correlated with the size of landscape patches, whereas no significant relationships were found between BMI and well-connected landscape spatial patterns. Results from the network buffer assessments showed weaker relationships with BMI. Two half-mile measures, total landscape area and connectivity, showed significant associations with children's lower BMI; and only one measure, dominance of tree patches, showed negative associations with mothers' BMI. For the future research, further advanced analyses will be considered with other variables including socio-demographic factors.

## After the Dam: Ruination and the Self-Willed Landscape

David Drake, Washington State University, USA, mrdrake@wsu.edu

**Keywords:** Dam Removal; Restoration Ecology; Wilderness; Disturbance History

After decades of dam-building, the United States is entering an era of dam decommissioning and removal. Aging infrastructure and an appreciation of free-flowing rivers suggest this trajectory will continue. "Restoration" is an oft-cited benefit of dam decommissioning. Extensive modeling attempts to predict the post-dam riparian ecology before decommissioning projects are carried out. Afterward, the freed river becomes a closely monitored living laboratory.

To date, there has been little focus on the social complexities of dam removal. When decommissioned, a dam has been a presence in the landscape for generations. Yet most restoration schemes propose removal of all traces of the dam structure and intensive reconstruction of the reservoir area. The stated goal is return to an imagined "natural" condition.

In "After the Dam: Ruination and the Self-Willed Landscape" I examine the paradox of restoration which tries to simulate landscapes free of human manipulation. Erasing evidence of our history with the land creates a nature-ized theme park, rather than a truly 'self-willed' ecology (to use the wilderness definition offered by Roderick Nash).

I argue revealing the landscape's disturbance history is a more appropriate conceptual model. Leaving structural remnants in place, while restoring ecological function, is honest acknowledgment of human presence in all its complexity. A minimal breach of a dam, freeing the river to flow through its mass, will accomplish this. If the area is allowed to self-restore, slow ruination of the remains of the dam will mark our species' place in the larger ecology, and embed our experience within the timescale of landscape processes. Physical modeling shows breaching a concrete gravity dam is technically feasible, and compatible with recovery of fish runs and other environmental goals.

I use Hells Canyon Dam on the Snake River as a speculative case study for this alternative conceptual model. Hells Canyon Dam represents a class of mid-sized dams that will end their working lives in coming decades and be considered for decommissioning. Isolated by challenging terrain, the dam is similar to other aging works of industry in the rural West.

Hells Canyon after the dam suggests the creation of a new kind of wilderness, where post-industrial ruins are a slowly eroding part of a truly self-willed landscape. Experiencing these new ruins through the wilderness tradition of a roadless, non-mechanized journey (eg, backpacking and whitewater rafting) increases our connection to non-human processes forming the new lands, and the journeys of earlier peoples.

## Returning to Kitimat

**Michael Martin**, Iowa State University, USA, [mdmartin@iastate.edu](mailto:mdmartin@iastate.edu)

**Keywords:** Kitimat, Clarence Stein, Radburn, New Towns, neighborhood landscapes

The author will describe how the neighborhood landscapes of Clarence Stein's Kitimat have evolved over half a century to reflect the social dynamics and preferences of the community's residents. The designer's intentions are well-understood, with regard to the utilization of open spaces and the landscape relationships among private, semi-private and public realms. The residents however have made their own choices in structuring neighborhood space—sometimes in a manner that suggests a different set of landscape priorities than Stein may have assumed. The purpose of this presentation is to explain how and why residents have made their adaptations to the original scheme, toward a greater understanding of principles of effective neighborhood/community design.

The design for the planned new town of Kitimat in British Columbia, Canada was a late-career project for Clarence Stein, who had designed the revolutionary Radburn community in Fair Lawn, New Jersey three decades earlier. In Radburn, Stein had rejected the premise that houses should “address” a street with a formal architectural or landscape gesture; instead, homes faced an inner pedestrian commons. Only a fragment of Radburn was built before the stock market crash of 1929. At Kitimat, Stein was able to finally build his “Radburnian” scheme on a community scale.

The author conducted an on-site study in the spring of 2011 that included landscape mapping/ photography, research of archival planning materials, and in-depth focused interviews with Kitimat planners and residents. Residents were chosen for interviews on the basis of their tenure at Kitimat; some were people who had built homes there in the 1950s. Their stories provided the basis for an oral landscape history that reveals how and why the structure of landscape space has changed over time. Archival photographs from Kitimat's early years, contrasted with the author's contemporary images (in some cases utilizing “rephotography” for side-by-side comparison), help illustrate this history; now/then illustrative maps and section-elevation drawings will add further clarification. The narrative theme told through these stories and pictures is one of fragmentation and complexification of the interior neighborhood landscape. Over decades, residents have established an accretion of transitional spaces, edges and layers, effectively separating homes from commons.

This study contributes to the understanding of how the innovative Radburn model fares over decades of residents' adjustments, building on scholarship established by Stein and continued through case studies by others (Wright, Schaffer, Martin, Francis et al.) of other postwar communities inspired by Radburn.

## **Making Transcultural Cities: Outcomes from an Interdisciplinary Research Collaborative**

**Jeffrey Hou**, University of Washington, USA, [jhou@uw.edu](mailto:jhou@uw.edu)

**Keywords:** Migration, multiculturalism, placemaking, transcultural cities, cross-cultural learning

In cities around the world, migration and movements of people have continued to reshape the demographic and physical compositions of cities. Specifically, international migration has increased ethnic diversity in immigrant receiving countries (Castle and Miller 2009). In the context of North American cities, the new ethnic diversity is not limited just to the traditional sites of settlements in core downtown areas, but is instead widely dispersed to the suburbs, creating a complex patchwork of new ethnic enclaves (Qadeer 1997; Krase 2002; Li 1999). In the face of the multicultural reality of today's cities and regions, many have argued for a multicultural approach to planning and design (see Sandercock 1998, 2003; Burayidi 2000; Qadeer 1997). Building on, yet moving beyond the notion of multiculturalism, how do cross-cultural learning and interactions take place in the contemporary urban environments? How can cross-cultural understanding be constructed, "staged," or engendered through social and spatial practices? How can a better understanding of the 'transcultural' processes inform the transformation of the contemporary city? This paper examines the outcomes of a recent symposium at the University of Washington as part of a collaborative research project funded by the Worldwide Universities Network, that addresses these questions. Specifically, the project compares cases of transcultural placemaking from Asia, Australia, Europe, and North America—ranging from community garden as a place for cross-cultural learning in Oakland, California and forging of social ties among immigrant public housing residents in Seattle, to Brazilian restaurants as a transcultural third place in Tokyo and immigrants' perception of open space in Sheffield, UK. Presented by a multidisciplinary group of scholars in architecture, art, environmental psychology, geography, landscape architecture, political science, social work, and urban planning, these cases offer glimpses of cultural complexity in today's cities. In examining selected cases from the symposium, five important dimensions of transcultural placemaking were identified, which include focus on everyday sites of interactions, safe space, and medium of understanding. Together, these findings speak to the current literature on intercultural cities (Wood and Landry 2008; Sandercock 2004) and everyday cross-cultural interactions (Amin 2002) but go further in terms of articulating 'transcultural placemaking' as a framework for inquiry and actions that address the process of design and placemaking in the shifting cultural and demographic terrains of today's cities.

## **Writing a pattern language from Istanbul's informal settlements**

**Noah Billig**, University of Arkansas, USA, nsbillig@uark.edu

**Keywords:** Informal housing, squatter settlements, pattern language, urban landscapes, open space

This paper develops a new pattern language from two informal neighborhoods in Istanbul, Turkey—Karanfilkoy and Fatih Sultan Mehmet. These settlements were divided by the construction of the Trans-European Motorway (TEM) in the 1980s. Government development policies also changed in the 1980s: Fatih Sultan Mehmet was allowed to develop higher buildings, while Karanfilkoy was required to retain their building footprints and densities. Subsequently, the two neighborhoods developed different patterns, forms and open spaces. Fatih Sultan Mehmet built many four- to six-story buildings and has a high population density. Karanfilkoy, in contrast, maintained low-rise residential structures, a lower population density and a large amount of green space adjacent to residential buildings. Subsequently, the patterns and open space typologies that developed in each settlement are often different, yet also emerged from similar cultural antecedents (i.e., the Turkish squatter culture) and geographic context (i.e., the emerging world city of Istanbul).

Istanbul's informal settlements contain spaces with innovative adaptations. It is often these spaces—the roadside, building stoops, ad hoc patios, the street itself, etc—that become the most socially lively and used areas in a given settlement. This paper compares the patterns and urban open spaces in the two neighborhoods of Karanfilkoy and Fatih Sultan Mehmet. Through the methods established in Christopher Alexander's "eleven essential ideas of pattern language theory," patterns are identified, compared and cross-analyzed (e.g., one pattern found in both settlements is, "seasonal gardens on or near the street"). These patterns are ascertained through observations, personal interviews, and reviews of reports on each settlement. Subsequently, a new pattern language is developed for each settlement. The patterns reflect functional, social and cultural aspects of each development manifested in physical form, social arrangements and the organization of connections. The results show interesting similarities and differences in the patterns, uses and forms in Fatih Sultan Mehmet and Karanfilkoy neighborhoods. The observations in these squatter settlements also provide compelling examples of what is valued, useful and available in informal urbanizing areas. In particular, this study shows successful patterns in the built environment that were largely determined by the local populations. The insights gained from this new pattern language will be worthwhile as typologies and precedents for landscapes, open spaces and neighborhoods in the world's emerging informal cities. The study also explains the successful wholeness, connections and community that result from bottom-up forms of self-organization.

## Understanding Landscape Architecture's Symbiotic Language

**Adam Bailey**, Auburn University, USA, abb0016@auburn.edu

**Keywords:** landscape architecture, ecology, sustainability, symbiotic landscape, Fresh Kills

Landscape architects of today often find themselves working on sites at the derelict fringes of society, on industrial waste-grounds, the edges of motorways, and close to airports. They are often forced to work with sites that are ripe with pollution, toxins, scrap materials and waste products. The transformation of such sites by landscape architects must be in accordance with principles of sustainability, ecology, and environmental balance. It is therefore important that landscape architects continuously find that they have an immense amount to learn about their discipline from the ways of life, science, habitat, architecture, and their symbiotic relationship with the landscape. A landscape architect might observe that buried within a site's intimate and intricate relationship are the ideal principles with which to compensate an insatiable appetite for and consumption of the environment. Within the heart of nature are the concepts of balance and equilibrium. It is by these principles that society will continue to enjoy the bountiful fruits of nature without exhausting its own ability to produce them. It is this exhaustive, relentless, and apparently unstoppable taking from nature by society's culture, economy, and political practices that has disturbed the delicate balance cherished by the generations before us.

This paper explores landscape architecture, landscape theory, and the role of the landscape architect as a fluid instrument to narrate the past, experience the present, and project the future. It defines landscape architecture as to show the better understanding of its own symbiotic language. The Fresh Kills project in New York City is used to understand and compare the principals of existing symbiotic relationships and their relevant systems. The findings reveal how ecological networks of landscape architecture collide with interstitial and abandoned spaces within the urban context and uncover relationships that are vital to understanding the language of the symbiotic landscape.



## Gardens and Music

**Brenda Brown**, University of Manitoba, Canada, brownb@cc.umanitoba.ca

**Keywords:** music, landscape architecture, gardens, design, music and design

While one can find many connections between music and landscapes, connections between music and gardens are of particular interest in relation to landscape architecture. Liszt's *Villa d'Este* works, Debussy's *Jardins sous la pluie*, Falla's *Noches en los jardines de España*, and Takemitsu's *Autumn Garden*, *A Flock Descends into the Pentagonal Garden* and *Spirit Garden* are just a few of the many musical compositions that refer to gardens. Gardens that have somehow responded to, or incorporated music, include *Villa d'Este* and *Versailles* as well as the more contemporary *Parc de la Villette* and *Toronto Music Garden*.

The purpose of this presentation is to identify and categorize these and other instances of connected music and gardens so as to better comprehend historical continuities and future possibilities. With the aid of visual images and music excerpts, ways in which music has related to gardens and gardens to music will be considered. Categories of analysis will include:

- (1) Gardens as loci for natural phenomena are observed and musically evoked
- (2) Musical portrayals of gardens as places in of themselves
- (3) Gardens as settings and/or environments for musical performances
- (4) The bounded garden form as a spatial metaphor for a musical work's time-bound character
- (5) Gardens as musical analogues, as in the not unusual landscape design problem in which a musical work is translated into a garden
- (6) Gardens as instruments and/or sites for instruments to be "played" by environmental phenomena and/or visitors.

A series of "listening gardens" created by the presenter will also be presented, providing examples of alternate ways to consider the garden/music relationship.

## Design and nature connection in the Pennsylvania State Parks

**Jake Powell**, Student, USA, jfp5092@psu.edu

**Keywords:** nature connection, landscape experience

People visit public wilderness landscapes seeking a variety of experiences, many of which include interacting and enjoying nature (Clayton, 2009). Perhaps independently, people form strong attachments to nature that lead them to conservation-oriented behaviors and activities that support the protection of nature, often in the context of these lands (Mayer, Frantz, 2004). In Pennsylvania, State Parks are typically a recreation-focused form of public wilderness landscape located in a variety of settings, each with unique physical, contextual, and programmatic features that influence visitor's experience. This research aims to assess what features visitors perceive as aiding or distracting from their ability to emotionally bond or connect with nature by comparing visitor responses in three different Pennsylvania State Parks.

The complex emotional connection with nature and its resulting behaviors develop on a personal level, calling for an approach that solicits personal responses. Three State Parks that vary in age, size, program, and facilities were selected as case studies and 158 visitors within these parks agreed to participate in the research. Three techniques were used to assess how these visitors perceive their emotional connections were influenced by the park. First, questionnaires regarding the visitor experience were administered at the park. Questionnaires asked visitors to rank their expectations for connections and identify and describe what features aided or distracted from their ability to connect with nature. Second, visitors were asked to identify locations where they experienced a connection to nature on a provided park map. Third, visitors were invited to record these experiences through photographing scenes, spaces, or things they perceived as aiding in this connection with a provided disposable camera.

Anticipated results from the visitor responses include: first, a variation in the quality of visitor's nature connection experiences based on differences in physical makeup, programming, and design of each park. Second, identification of discreet elements that create a contextual environment where visitors feel an emotional connection to nature and finally, an understanding of visitors expectations regarding the role of the park in providing this nature connection. Understanding which park features visitors perceive as important to personal nature connection experiences, and how each park's manipulation of these features through design influences those experiences, would enable park designers and planners to deliberately enhance visitors' emotional bonds or connections with nature.

## Community Gardeners: Growing Strong Relationships in a Low-income, African-American Neighborhood

Douglas Williams, University of Illinois at Urbana-Champaign, USA, dwillia8@illinois.edu

**Keywords:** Community Garden, Social Capital, African American

African-Americans living in urban areas comprise a large and increasing percentage of the U.S. population in low-income areas where social relationships are severely stressed. Community gardens have been credited for their success for fostering social capital. But, to what extent does a community garden in a low-income, African-American neighborhood contribute to social capital within that neighborhood? Even though scholars have addressed this question regarding the broader built environment among diverse populations, few have focused on community trust, sharing and collective efficacy in conjunction with the common community garden (Landman, 1993; Armstrong, 2000; Glover, 2003; Milligan et al., 2004; Wakefield et al., 2007; Sokolovsky, 2010; Alaimo et al., 2010; Bellin & Hunter, 2011, Firth et al., 2011); and none seem to have qualitatively investigated the critical role that urban community gardens play in the social well-being of low-income African-American gardeners at the neighborhood level. This is a major gap in our knowledge and is critically important to comprehending social capital for this specific population.

To address this question, I interviewed 25 African-Americans from one Chicago neighborhood. Using a snowball sampling technique, participants were selected from one of the six majority Black low-income neighborhoods in Chicago. An initial set of participants was selected from various community garden activities, meetings, and related public forums in the neighborhood. During my interviews, averaging over an hour each, participants responded to over 20 questions about their use of community gardens, their social ties and their social networks. Topics covered included: their past, current and future use of gardens to the possible reasons why others choose not to use the garden. During the same data-gathering period in 2011, conversations and photographs took place during several guided tours of their thirteen community gardens, which have existed for a decade, on average.

Only anecdotal research indicates that community gardens have the lowest cost (Voicu and Been, 2008, 243) and highest beneficial impact for “meeting the needs” of urban dwelling low-income African-Americans (Armstrong, 2000, 324; Alaimo et al., 2010, 510), my findings bring empirical data that supports, disproves, and clarifies the impact of community gardens. Similar to previous research findings: leadership, block clubs, and non-profit organizations foster social capital as a result of community gardens. Using “Grounded Theory” analysis, my study shows that profound limitations are overcome by social capital generated by locally controlled, faith-based and food-focused nearby community gardens.

## The Link Between Urban Form, Nearby Nature, and Health: Nature as a Stress Reliever

Melissa Currie, Texas Tech University, USA, melissa.currie@ttu.edu

**Keywords:** nature; stress; landscape; architecture; street; trees; urban; design; health

It can be posited that being in the presence of nature makes the vast majority of people feel good. Nature is a stress reliever and an important necessity in our lives (Olmsted 1870; Seymour 1969; Udall 1988; Amidon 2001). Today, however, for the first time in human history more people live in urban areas than in rural ones (Pretty 2004). Access to open spaces and green areas will be as important, but more difficult to obtain. It can therefore be inferred that the design of our urban spaces will become the basis of how everyday life in American cities will be experienced, and for some, how they will experience nature. Because of the lack of available land in urban areas and the insatiable demand for housing, providing for open space has become more difficult. Our public spaces, including streets and small parks or plazas, are a vital part of embracing nature in urban settings. Such small-scale insertions of “nature” provide easy, nearby access to nature for a greater number of people, contributes to the overall quality of urban life, and are an important part of the built environment. A question was raised by an architecture professor during a multi-disciplinary studio project review as to the validity of including street trees within urban design. It was suggested that they did not contribute to the design, and were perhaps only included because that is what is expected of landscape architects, or because they ‘look good’ on the plan view. How should a landscape architect respond to such questions? Do street trees offer benefits beside their aesthetic qualities, and if so, what are they? This article examines a body of literature to understand the link between urban form, nearby nature, and health; the tangible, measurable benefits of street trees and the services they provide in urban ecology; and the role of small parks, street trees, and urban spaces within the contemporary environment as demonstrated by how we relate to nature in an urban context.

## Wilksburg, Pennsylvania: A Case Study in Community Design

Anne Withey, Chatham University, USA, awithey@chatham.edu

**Keywords:** Borough of Wilksburg, urban change, Pittsburgh, community design, plural design

This paper examines community development efforts in the Borough of Wilksburg, Pennsylvania within the context of this small municipality's need to rebuild its population and economy in the aftermath of Pittsburgh's industrial decline. Wilksburg is situated within six miles of Pittsburgh's central business district and shares its boundary with three of the city's easternmost neighborhoods. This 2.2 square mile community has been a self-governing municipality since its date of incorporation in 1887. In the 1920's and 30's the Borough was known for its good schools, its upwardly mobile population, and the shopping opportunities offered by its 70 acre business district. With the expansion of Pittsburgh's suburbs and the collapse of the steel industry, Wilksburg suffered a gradual, and then a dramatic, loss of population from the 1950's to 2,000, a decline that was proportional to that of populations within the City. While the City of Pittsburgh is known for its successful urban regeneration efforts in recent years, Wilksburg and other inner ring suburbs have not benefited from the expansive re-development projects of the City.

This paper asks how can and do professional design firms undertake projects which effect positive change in communities with limited economic resources such as Wilksburg. The study will document the diverse efforts of Wilksburg residents and officials to regenerate both the economic and human capital in a community known for its high crime rate, its abandoned homes, its struggling school district, its high unemployment and its predominantly vacant business district. The research will be framed within the construct of a "plural design" typology (Crewe and Forsyth, 2003), which "assumes that users can be given power over their own environments, and address larger issues of inequality by dealing with immediate needs (Ibid.)." Within the "plural design" context, careful attention will be given to the potential for environmental inequity and the exclusion of marginalized populations from the community design process.

Research methods will include an investigation of community design undertakings by the Municipal Government, the Wilksburg Community Development Corporation, the Nine Mile Run Watershed Association, and other groups organized for environmental stewardship, civic design, crime prevention and social services. The role of professional designers in these ongoing activities will be examined to provide a view of the specific contributions which designers can make within the context of plural design typologies. The study will include transect and other mapping and current photographs of Borough neighborhoods, features and development sites.

## Multicultural Open Space Design: A Visual Preference Study with Guidelines for Design

**Matthew Powers**, Clemson University, USA, powers8@clemson.edu

**Keywords:** Park Design, Visual Preference, Diversity

As cities grow and change, designers are reconsidering the role and function of their parks and open space. For many, this means creating parks that try to reflect the aesthetic of various user groups while attempting to confront issues like post-industrialization, crime, and decay (Harnik 2010; Williams and Carr 1993; Carr et. al. 1993). However, an important but often overlooked issue is the increasingly multicultural city and the ways that people from different cultural backgrounds use open space differently (Carr and Williams 1993; Williams 2004). This is significant because without fully understanding the diversity of preferences and patterns of use between cultural groups, particularly when designing in multicultural neighborhoods, then the park becomes an agent of segregation rather than integration. This occurs, as a particular group chooses not use the park as intended because it does not reflect their preferences and needs (Francis 2003). In addition, people may use only those features of the park that they prefer and avoid the rest. This study examines issues of cultural preference as they pertain to natural and built elements within parks.

The study addresses the following research questions: (1) what park amenities and activities do people from different ethnic groups (African American, White Americans, and Hispanics) prefer?; (2) how do preferences compare among groups?; and, (3) how can park designers accommodate different preferences for amenities and activities without segregating user groups? The study uses a multi-method approach to answer the research questions. The first method uses a visual preference survey and questionnaire. The visual preference survey has 54 scenes representing park amenities and activities scenarios. The questionnaire has 47 questions about availability, access, exercise, safety, demographics, and others. Method one includes 405 total participants. The second method uses a photo selection survey and open-ended questionnaire. This method contains 30 images of different elements found in parks from which the participants are asked to select their favorite images and least favorite images. Selections were followed by an open-ended questionnaire. Method two includes 30 total participants. Factor analysis, content analysis, and other procedures were used to analyze the data. Study findings reveal group preferences in park design. The results are used to create a set of design guidelines that are applied theoretically in a conceptual master plan for a multicultural park in Orlando, Florida. Overall, the study helps frame the process of designing parks in multicultural areas by integrating the preferences of different groups.

## Urban Outreach Studio—Calibrating Thrift

Douglas Pardue, University of Georgia, USA, pardue@uga.edu

**Keywords:** Homelessness, thrift, synthesis, productivity, studio methods, therapeutic gardens, landscape

In 2011 Athens, Georgia approved the transformation of a former warehouse into a winter shelter for homeless. This shelter, located within a floodplain, along a new greenway, and adjacent to an emerging river district, has generated controversy and stirred debate on the needs, values, and costs of homelessness. Within this context, a third year graduate studio was asked to develop operative frameworks for the shelter's outdoor environment that can re-center this debate through empowering and engaging homeless, reversing stigmatism, and working toward larger civic, economic, and ecologic goals. This paper details the unique role, challenges, and opportunities of landscape-based studio engagements with homelessness, and describes methodologies, relevant research, design synthesis, findings and lessons learned.

Research guiding this project included Catherine Dee's, *Aesthetics of Thrift*, which established a framework of utility for studio inquiry, Cooper Marcus's and Barnes's research on garden's effects on health, which revealed powerful therapeutic potentials in landscapes, Zetter's and Souza's sensitive research methods, which provided valuable guidance for working with homelessness, and James Corner's and Raoul Bunschoten's studio methods, which encouraged process over product and novel ways of solving familiar problems. Precedent studies included urban design focused encampments such as Portland's Dignity Village, transformational campuses such as San Antonio's Haven for Hope, and work programs such as New York's Ready, Willing, and Able and Atlanta's Project Superb. Exercises that considered site and user needs were coupled with surveys, and discussions with homeless, local developers, city and greenway personnel, service providers, and faculty.

Findings revealed several landscape potentials for empowering homeless and designs that wove everyday materials into strategic operations. Foremost, landscape's therapeutic value to those in stress suggests that carefully, evocatively designed outdoor spaces can offer homeless critical spaces to rest, talk, gather, play, and commune with nature. Secondly, the landscape offers a productive set of potentials in respect to training and employment opportunities. Skills including gardening, landscape management, cleanup, and outreach all have real power to teach valuable career skills and reshape the perception of homeless from stigma to societal contributor. Finally, the landscape offers untapped offerings in environmental stewardship and management, which draw on homeless familiarity with landscape, and also encourages responsibility over larger wholes. Ultimately, these findings, and the processes that generated them, opened the students to the potentials of thrift, catalyzed their ingenuity, and expanded their values to include those with less as equally as those with much.

## What are you looking at? Applying eye-tracking techniques to landscape evaluation, towards an understanding of walkability perception

**Claudia Bernasconi**, bernascl@udmercy.edu, **Harold Green**, greenehh@udmercy.edu, **Alan Hoback**, hobackas@udmercy.edu, University of Detroit Mercy, USA

**Keywords:** walkability perception, eye-tracking, landscape evaluation techniques

This study investigated public perception of a walking environment in Detroit, Michigan, pairing eye-tracking technology and landscape evaluation techniques in order to establish connections between perceptions of the general public and characteristics of the street environment. In the first phase of the study, we employed landscape evaluation techniques shifting the target from the natural landscape to the urban landscape and referred to the psychophysical method (Lothian 1999; Daniel, 2001). In this phase we administered visual questionnaires to the general public, asking respondents to rate urban scenes portraying pedestrian corridors in reference to walkability. Pictures were categorized based on visible elements included in the scene and perceived walkability was captured through a five-category descriptor of walkability (aesthetic quality, orientation, comfort, safety, and security), which was derived from literature review and on site observations. In a second phase of the project we utilized an eye-tracking tool that allowed us to monitor eye fixations, i.e. the spots in the picture the eye is focusing on, as observers viewed and rated the urban scenes on a computer screen. Eye movement research has been employed in a wide variety of areas such as reading, visual search, and scene perception, as well as face perception, typing, driving, and advertising (Rayner, 2009). The body of research on eye movement and visual cognition can assist in overcoming some limitations of landscape evaluation studies, for example the issue of multicollinearity determined by scene complexity (Bernasconi et al, 2009) and the difficulty of effectively measuring incremental values of each scene element towards the overall scene rating (Hull et al, 1987). Whereas in the traditional landscape evaluation method respondents' ratings of scenes reflect the product of their mental processing of a scene, eye fixations reveal what aspects of the scene were of interest (i.e. selected objects or areas). This allows for a more in detail understanding of what is really looked at within the scene. Finally, we compared walkability ratings obtained through the traditional picture-based landscape evaluation approach and those gathered through the eye-tracking tests. Results allowed us to determine which elements in the scene were looked at more often and for longer periods of time when the observers were questioned separately on each of the five descriptors of walkability. Scene elements included people, street furniture, environmental graphics, cars, sidewalk, vegetation, and building facades. Findings will be discussed together with considerations of the applicability of eye-tracking techniques to landscape assessments.



## Examining the Relationship between Place Attachment and Neighborhood's Green Spaces

Aliaa Elabd, North Carolina State University, USA, aliaa\_elabd@ncsu.edu

**Keywords:** Place Attachment-Urban neighborhoods- Green spaces-neighborhood livability-social cohesion

Place attachment is defined as the affective and emotional ties between people and their places. Place attachment as a place-person psychological construct can be considered an asset in a community that helps motivate residents to participate in the neighborhood redevelopment efforts, as well as provide them with a sense of stability, familiarity and security in their neighborhood. Place attachment has primarily been studied from geographical, psychological, and phenomenological perspectives. Previous indexes used to measure place attachment involved items such as the feeling of pride of living in a particular place, the length of residency, or the feeling of sadness to move out from a place; however, they lacked dealing with the physical features of the residential environment and their possible role in influencing the degree of attachment to a place.

This ongoing study builds on previous knowledge acquired from place attachment studies, but with a focus on identifying the degree of place attachment in relation to neighborhood's green spaces. Place attachment is nourished through the daily encounter between people and their environment. Therefore, neighborhood green spaces represent a milieu for the residents to interact with their neighbors as well as their neighborhood features. This investigation employs case study strategy that compares four urban neighborhoods surrounding Durham downtown. The four neighborhoods share similar features and differ in the scale and the functionality of their green spaces. The study is interested in exploring the role that place attachment plays in attracting residents to live and stay in those neighborhoods. In addition, the goal is to identify a measurable index of place attachment in a 'neighborhood' scale through ascertaining three main categories that may help establish residents' sense of attachment; and these categories are: green spaces' physical features, related activities, and associated symbolic meanings. Methods for collecting data vary between questionnaire, interviews, and observation techniques.

## School Design: Looking Outward

Susan Tomizawa, Ball State University, USA, satomizawa@bsu.edu

**Keywords:** schoolgrounds, learning landscapes, recess, adolescent health, academic achievement, play

SCHOOL DESIGN: LOOKING OUTWARD Abstract Despite a growing body of research findings indicating the need for schools to provide a multi-dimensional learning and play experience beyond the traditional classroom setting, a majority of schools have been unable to provide the landscapes and facilities to do so. This paper summarizes research findings found in the literature related to the following: a) the need for a new approach to school design which addresses educational, lifestyle, and health-related issues through development of outdoor learning landscapes; b) the potential benefits of such an approach for students and teachers with regard to student academic achievement, behavior, and health; and c) data from sample school districts that are successfully transforming their school grounds into learning landscapes.

The need for expanding learning beyond the classroom to the outdoors is evidenced by data showing that changes in educational curricula and youth lifestyles have decreased opportunities and time young people spend outdoors. Faced with budget cuts, pressured by an emphasis on standardized testing results, and struggling with discipline issues, many schools have turned inward—eliminating recess time, playgrounds, field trips, and other opportunities for students to be outdoors. Outside of school, youth of all ages spend a great deal of time indoors with electronic media, and less and less time outdoors. Not coincidentally, several studies, including those from the Centers for Disease Control and Prevention, show health problems such as depression, diabetes, ADHD, and obesity on the rise among youth.

With regard to the benefits of outdoor learning environments, this paper summarizes findings from a variety of related professions that indicate that the movement of students to the indoors runs counter to improved health, behavior, and academic performance. Data that link learning and simply spending time outdoors to improvements in attitude and behavior, academic performance, and health are presented.

Examples of the Boston Schoolyard Initiative and Denver Public Schools are provided as ways in which schools can organize and fund the transformation of school grounds into outdoor learning environments.

## **A courtyard is a perfect spot to sun bath, dig worms, or ... dry meat? Understanding how cultural factors influence the way people avoid, use, or modify neighborhood open spaces**

**Tzufen Li**, University of Wisconsin-Madison, USA, tzufenli@wisc.edu

**Keywords:** cultural factors in design, public neighborhood spaces, multi-cultural neighborhood, space and place, built forms

The goal of this research project is to explore how public neighborhood spaces are used or altered in order to support particular cultural desires. The subject of cultural influences has begun to gain attention from Landscape Architects, planners, and open space managers but literature on the subject is limited. The studied neighborhood is part of the University Of Wisconsin Division Of University Housing. It was chosen because it has a multi-cultural population including Asian, Indian, European, American African, Americans, and others. The first stage of the research employed the System for Observing Play and Recreation in Communities (SOPARC) to document residents' general uses such as exercising or social gathering in the outdoor space. The second stage used Participatory Photo Mapping (PPM) to engage residents in order to gather stories about why certain spaces are used based on their needs. 37 residents, selected by the snowball sampling method, were interviewed to learn their opinions and experiences. Together these data sets were analyzed using a grounded-theory framework for revealing emergent themes. This analysis shows that cultural factors influenced people's use of yard space, the Major Park, and Community Garden. Cultural factors were found to be that catalyst behind actions that transformed spaces into places. People looked for built forms that were similar to those with which they were culturally familiar. For example, drying laundry is a common use of yard space, but many Asian residents use this space to dry fresh produce from their garden, and meat/fish. These are common uses of the courtyards present in the traditional Chinese "three compounds" built form called Zan-ho-yuan. The study provides examples that illustrate the cultural complexities of the relationship between people and their environment. Understanding this relationship is critical to the success of a design that will be used by a culturally diverse group. This research will also help develop a new approach to creating multi-functional and flexible landscapes.

## Energies of Space: An investigation of energy flux in landscape architecture

**Courtney McQueen**, Morgan State University, USA, crbruner16@hotmail.com

**Prof. Paul Voos**, Morgan State University, USA, paul.voos@morgan.edu

**Keywords:** energy, nature, site design

Throughout history man has utilized natural energy to inform design and the spatial construct. Looking at historical Asian, European, and South American landscapes, their sites were established through the constraints of topologies to experience solar energies, water power, wind exposure, and to encourage natural sound flow and dynamics. Historical landscapes and philosophies have focused on natural energies to develop a relationship between their cultural environments and their place of inhabitation.

This project investigates sound energy flows, its types, and its relationship to designed spaces. This study defines energy as the power to create ability; ability to encounter the landscape. From the user's perspective, "Energies of Space" deals with micro climates and its relationships to its designed environments. Webster's dictionary defines energy as usable power, and power is defined as the ability to produce. Our human spirit wants to have an encounter with nature in the mist of our landscape; the ability to have everyday interaction with the land and natural elements. There is an opportunity to do so through the "energies of space". These energies are natural elements, e.g. solar, wind, sound, and temperature that flow throughout a site.

This study focus on sound and how this expression of energy is experienced through a site. This project looks at the philosophies of land and sound found in the book of Psalms. There are multiple Psalms that connect different land elements to making a sound of praise. My method of exploration starts with an analysis of the definitions of praise found in Psalms. It looks at the connections between space, sound, and the environment through those definitions of praise. It then explores how the sounds of praise can be experienced audibly, visually, and physically through a site. The product of this study is the analysis and design for the redevelopment of Symphony Woods Park in Columbia, Maryland. The park currently is being redeveloped into a downtown cultural center. The 36 acre site encircles Merryweather Post Pavilion, a popular outdoor music venue. As part of the original vision of Columbia Maryland, interfaith centers were intended for each district of the city. This park design will integrate the existing music pavilion with the surrounding downtown's retail and office complex, by providing an exploration of sounds of praise as the downtown district interfaith center.

The study will investigate the built environment literature and document existing conditions and materials that illustrate the "energies of space."

## Demystifying Greenway Design for Healthy Communities: Case Study of Knoxville

**Yilin Shi**, University of Tennessee Knoxville, USA, shiyilin890@gmail.com

**Archana Sharma**, University of Tennessee Knoxville, USA, archsharma1@gmail.com

**Keywords:** greenways, community, health, planning, design, connectivity, urban landscape, sustainable design

Greenway design and planning have become a multi-functional, multi-objective approach to address social, cultural and ecological concerns. Traditional greenway design and planning have focused more on ecological, historic and recreational values. However, the current focus of greenway planning is also shifting to community health, which includes both physical health and emotional health (this paper will focus on physical health). This concern arises out of observations on obesity and physical inactivity as two of the most serious health problems in the United States which greatly threaten the quality of life in the country.

Research has shown that spatial proximity of greenways and communities will increase greenway use. Greenways have been shown to be a popular location of physical activity. The positive relationship between physical activity and health has also been verified by various studies. Based on this, this article proposes to improve the connections between greenways and communities, for the purpose of increasing the level of physical activity, and ultimately improving community health. Tennessee, as well as Knoxville, has a very high level of obesity (27.5%) and physical inactivity (58%). What is the cause of high obesity rates in Knoxville then? This article observes that it is not the lack of outdoor places for physical activity but accessibility to those places- parks, trails and greenways; that is the culprit. This article takes a closer look at the greenways design aimed at healthy communities with intention to understand and explain if the focus on health is influencing the current practice of greenways design. This is done through a critical review of current designs of greenways for healthy communities across America and taking into account the community response to those issues. We propose connections between greenways and communities building on Knoxville's greenway plan and making critiques and recommendations, with an emphasis on community health. Through this article we approach the concept of greenways as a compound green network design at the urbanized neighborhood scale to address the issue of localized accessibility to parks and greenways.

## Plants, People and Prisons

**Julie Stevens**, Iowa State University, USA, [jstevens@iastate.edu](mailto:jstevens@iastate.edu)

**Keywords:** Plants, People and Prisons

In 2005, the Iowa Correctional Institute for Women (ICIW) was granted funding to build a state-of-the-art institution to house 888 women in various stages of incarceration. However, the expansion project's program failed to consider the landscape as a design medium within this 30-acre site located at the edge of a small rural community. Careful consideration had already been given to the programming needs within the architectural spaces to aid in healing; the design program for this research seminar/design studio project was to create rehabilitative outdoor environments while maintaining sight lines for security.

How do designers determine the type of environment that others want, need, or in the case of this project, deserve? How do we set aside our preconceived notions of a place or a client population? This paper describes how student design teams worked directly with the client and offenders to find creative solutions that support the ICIW's mission to transcend confinement (whether in or out-of-doors) and to focus on rehabilitating the 95% of resident offenders who will eventually return to society.

Research regarding views of vegetation through hospital windows and their ability to aid in healing patients post-surgery (Ulrich, 1984) was a precedent for one level of consideration in the landscape. Through focus group sessions, the design team learned, for example, that the women at ICIW report increased feelings of hope, pride and personal significance through acts of gardening. As a result, the design team focused on developing production gardens and greenhouses to serve as a food source and vocational training opportunity. The women also report that opportunities for work and recreation reduce conflicts among members of the prison population. As a result, passive and active recreational areas were created to improve physical and mental health. During concept-stage presentations, the client responded favorably to the depth and complexity of the landscape proposals, which offered solutions for a restorative environment while responding to concerns about security.

The project is notable in two ways: first, for its innovative and adaptive use of applied landscape design theory, such as healing gardens, originally developed for a different kind of healing (Marcus, 1999). Second, it is notable for its success in building trust and cooperation between student designers and the members of the prison community. These working relationships affirm the effectiveness of the participatory process, and suggest that this project can serve as a prototype for similar institutional endeavors.

## Is “Green” the Best Answer?: Restoration Experiences and Psychophysiological Responses between Mountain and Sea Landscape

Ying-Hsuan Lin, r90628311@ntu.edu.tw, Shu-Fang Peng, Chun-Yen Chang, cycmail@ntu.edu.tw, National Taiwan University, Taiwan

**Keywords:** restoration experience, recovery, reflection, psychophysiological response, natural landscape

In the past decade, there are growing interests in health benefits of natural environments. As mounted evidence showing the effects of nature environment upon psychological health (e.g., attention capacity restoration, stress reduction, etc.), the focus has shifted from an emphasis on comparison of different types of landscape to the understanding of the nature experiencing process. The link between natural landscape content and the restoration experiences, however, is scant. This study seeks to test the effects of restorative elements in regards to people’s preferences after accessing views of mountains or seas as well as people’s psychophysiological responses to the landscapes. 147 college students and faculties of National Taiwan University participated in this study. In an experimental lab setting, participants were randomly and individually assigned to four different experiment groups including “mountain with fatigue”, “mountain without fatigue”, “sea with fatigue” and “sea without fatigue” group. Begin with the procedure; first, we asked the participant in the groups of “mountain with fatigue” or “sea with fatigue” to imagine themselves being fully exhausted by daily work for one minute while the other two groups were viewing blank slide. We then projected 12 slides which simulated a walk through the mountains or by the sea for three minutes. The photos projected in the experiment sessions were rated and chosen by a class of landscape students as most representative mountain views or sea views in Taiwan. During the course of experiment, a biofeedback system recording participants’ electromyogram (EMG) and heart rates (HR) was carried out. Participants subsequently rated their preferences, recovery, and reflection on a questionnaire. The between group comparison was conducted through Analysis of Variance and Pearson correlation in order to indicate the direction and relationship. The results show that people’s preferences and recovery for mountain and sea views differ significantly, although their reflection did not. Sea views had greater effects than mountain views. In regards to psychophysiological responses, the EMG data indicated that sea views provided better responses than mountain views. Moreover, whether one is exhausted or not also showed greater psychophysiological outcomes. Finally, preference correlated closely with recovery and reflection, meaning the greater the preference, the better the recovery and reflection.

## The Texture of Water in Cities

**Tony Somers**, Virginia Tech, USA, [tonysomers@vt.edu](mailto:tonysomers@vt.edu)

**Mintai Kim**, Virginia Tech, USA, [mkim07@vt.edu](mailto:mkim07@vt.edu)

**Keywords:** Cities, Culture, Infrastructure, Neighborhood, Stormwater, Sustainability, Texture, Urban, Water

Cities, historically situated along major water bodies, evolved and depended on lakes, rivers, and oceans as the lifeblood of commerce, nourishment, and transportation (Meyer, 2003). While many of today's urban waterfronts are experiencing a renaissance, water systems within the city have been incrementally disappearing from the collective consciousness (France, 2003). Today, urban water remains largely marginalized by its physical and cultural displacement from inhabitants (Dreiseitl & Grau, 2005). "At the very moment when we need the closeness of water to feed our humanity and imagination, we seem to be denied literal contact, and have lost sight and sound of its magic," observed Common Ground Directors Susan Clifford and Angela King (Common Ground, 2000).

The Texture of Water in Cities envisions the reintegration of water into the cultural construct, inviting interchange between citizens and their primal benefactor. Elevating stormwater, specifically, to cultural prominence and interweaving water's dynamic qualities into the fabric of daily life increases human understanding and appreciation of the world's most vital resource.

Capturing and integrating stormwater into the immediate landscape creates possibilities for both human engagement and sustainable hydraulic design. Bringing water to the forefront of the landscape creates infrastructure solutions that are no longer linear and confined to the diameter of a pipe.

Using a comparative case study method, this presentation will analyze the examples of infrastructure modification below to develop a set of design guidelines that reintegrate water into the urban cultural fabric:

Chicago's Green Alley Program—Every city has alleys. Chicago sees alleys as an opportunity for green infrastructure across large tracts of impermeable surface with relatively low traffic volume (The Civic Federation, 2007). Utilizing these modifications as urban tributaries will channel water away from stressed infrastructural systems and feed the hydraulic landscape.

The works of Herbert Dreiseitl—Dissatisfied with the idea of water in the public realm being mere decoration or an imperceptible functional element, Herbert Dreiseitl set out to combine form with function (Dreiseitl & Grau, 2005). Analyzing Dreiseitl's works gives insight into the artistic ways underutilized water sources, such as stormwater, can be used to create culturally engaging space within urban constraints.



## **Add the Green, Cut the Grease: The Relationship Between Landscape and Obesity**

**Pongsakorn Suppakitpaisarn**, University of Georgia, USA, psuppak@gmail.com

**Keywords:** Obesity, Green Space, Psychology, Nutrition, Cortisol, Human health

Obesity had become an epidemic in the United States. At the first look, the expansion on serving sizes and the habit of midnight snacks might be the main culprit of obesity, but in the closer studies, it seemed that the pandemic across country had so many more factors. One of them was the surrounding spaces that human live in.

An existing literature review was conducted by the other to form a hypothesis about the relevance between landscape and obesity. The focus of this research aimed specifically in to two areas: the reason of obesity and the environmental effects on human health.

Besides the physical effect of green space that induce exercises, the questions can be raised that human hormones and cognitive health that lead to obesity can also be linked back to being surrounded by green space. Amen and Roizen link obesity and fat storage to human's lack of focus and fat-storing stress hormones while Van den Burg, Kaplan, and others indicated that green space can relieve stress and mental fatigue.

The clear link has not been made between landscape and obesity, yet the hypothesis can be made that there are some relationship between the exposure of green space and human obesity.

However, there are also contradictions that might make the study less clear. For example, the rates of obesity in countries in South America are very high even though they have more green space per capita than other countries that have lower obesity rate, which may come from cultures or some other factors that need to be explored further.

The findings pinpoint the relationship between health, hormone, and obesity. The finding of the research will create the opportunity to refine the design suggestions that can be implemented into every day's life landscape and used to decrease obesity epidemic.

## The impact of Marcellus Shale drilling activity on rural communities in Pennsylvania: Exploring the role of the natural environment

**Mallika Bose**, mub13@psu.edu, **Brian Orland**, boo1@psu.edu, **Kelly Davis**, kdc156@psu.edu, **Martin Sliwinski**, mjs56@psu.edu, **Charles Cole**, cac13@psu.edu, Penn State University, USA

**Keywords:** Marcellus Shale activity; perceived importance of natural environment, case study

Rural Pennsylvania is currently in the throes of a natural gas development frenzy. The number of well permits awarded is exponentially increasing since 2008. While the activity is bringing an economic boom to a previously underdeveloped area, the media are rife with negative stories resulting from Marcellus shale activity: methane in water (Gasland movie by Josh Fox), leaks leading to the dispersal of toxic chemicals at gas drilling heads/pads, and potential contamination of aquifers. In contrast, relatively little is known or being debated about the impact of Marcellus Shale activity on the natural (rural) landscape. This large-scale naturally occurring experiment allows us to explore the relationship between landscape change and its effects on fundamental health issues of special importance to a region that is demographically among the oldest in the nation. How does Marcellus Shale related drilling activity impact the rural landscape of Pennsylvania? How will the changes resulting from such activity impact the quality of life and fundamental health of residents living in these areas? We focus on two regions: one with low and another with high Marcellus Shale drilling activity to explore these questions.

Using a mailed survey we collected information on: health outcomes, life satisfaction, personal control, knowledge of Marcellus activity, expected impact of Marcellus Shale activity, perceptions of green space, perceived importance of the natural environment, access to outdoor activity and demographic features from nearly 600 residents living in the two study areas. We have also collected detailed GIS information to allow for analysis of the natural environment in the two study regions. For this paper we report results regarding perceptions of green space, perceived importance of the natural environment in conjunction with information on the existing natural environment, quality of life and health. Our focus is not on attachment to place but on psychological responses that may contribute to health effects ranging from positive changes in satisfaction as a result of economic improvement to stress and its associated chronic illness outcomes. Comparing the results of the two areas (controlling for demographic features), coupled with analysis of changes in the natural environment as a result of drilling activity allows us to make preliminary hypotheses regarding expected impact of drilling activity on the landscape and resident well-being as mediated through effect of green space and the natural environment. We hope to use these hypotheses to direct future work in communities being impacted with Marcellus Shale drilling activity.

## The Impact of Climate Change on Tribal Resource Management

R. Alfred Vick, University of Georgia, USA, ravick@uga.edu

**Keywords:** American Indian, climate change, adaptation, tribal resources

“Indigenous peoples are disproportionately impacted by climate change, layering new challenges on top of existing problems. Conversely, resources available to many native communities to address climate change impacts are disproportionately scarce. They are also impacted by unintended consequences of some mitigation measures.” (Galloway et.al., 2009)

Climate change is affecting the landscape and human communities in ways that are unfamiliar to contemporary populations. Some communities have been actively preparing for imminent changes, some are scrambling to cope with current impacts, while still others remain indifferent to potential repercussions of a changing climate. (Swinomish Indian Tribal Community, 2010) American Indian communities, like any other populations, span all of these positions. However, as the quote above states, geographic constraints of tribal land, close relationships to the land and natural cycles, limited resources, and a history of difficult transitions make American Indian communities “disproportionately impacted by climate change”. (Galloway et.al., 2009)

In August of 2011, a symposium and workshop was conducted to bring together federal agencies managing vast amounts of land and southeastern tribal governments to begin a dialogue on the impact of climate change on tribal resource management. Conference organizers invited every federally recognized southeastern tribe, with five tribal governments ultimately participating. Invited speakers from tribal resource management, academia, and federal agencies presented cutting edge climate change science (Elliot, 2011; Mote, 2011; Vose, 2011; Yager, 2011), evidence of historic climate change adaptation (Riggs, 2011; Vick, 2011; Weaver, 2011), and case studies of contemporary efforts to address climate change impacts (Gwin, 2011; Lavoie, 2011). Break-out sessions gave attendees the opportunity to share observations of on-the-ground changes that have been noticed in their communities, such as changing trout habitat and altered planting seasons.

Throughout the symposium, participants commented that language was perhaps the biggest barrier to increasing awareness of climate change impacts and building support for mitigation and adaptation efforts in their communities. Ongoing efforts by the conference organizers seek to assist community leaders in preparing educational resources and toolkits that are relevant to their own communities in order to best prepare for impending climate change impacts. The Eastern Band of Cherokee Indians is engaged in this cooperative effort, and will likely serve as a model for other southeastern tribes.

## Exploring the Beneficial Effects of Gardening for Children

**Yuan-Yu Chang**, National Taiwan University, Taiwan, f94628313@ntu.edu.tw

**Chun-Yen Chang**, National Taiwan University, Taiwan, cycmail@ntu.edu.tw

**Keywords:** gardening, benefits of gardening, beneficial effects of gardening

In recent years, there is a growing amount of research on examining the benefits of gardening activities for children. Some of these benefits include giving children pleasant experiences, increasing their knowledge of the environment, helping them develop a more positive attitude towards plants, nature and the environment, helping them develop social and interpersonal skills, and giving them a chance to interact directly with nature and living things, etc. However, only a few studies have explored the beneficial effects of school gardening. The purpose of this study was to investigate the beneficial effects of school gardening for children. This study interviewed 43 participants from six elementary schools that focus on teaching gardening and nature exploration. This study used a group interview format, inviting 2-4 participants to a conference room at the same time. The interviewer asked each participant to share their own feelings and experiences about gardening. The interview transcripts were analyzed using the grounded theory open coding method. The results indicated that the beneficial effects of gardening can be organized into four core groupings and 15 categories. Besides, this results also organized 10 categories of benefits of gardening for children.

## Achieving Conservation: New Cognitive Based Zoo Design Guidelines and Typologies

**Russell Ploutz**, Kansas State University, USA, ploutz@ksu.edu

**Eric Bernard**, Kansas State University, USA, ebernard@ksu.edu

**Keywords:** Zoo Design, Cognitive Processes, Design Process, Exhibit Design, Design Charrette

Typical aspects of a zoo's mission are conservation of wildlife and habitats. As part of conservation efforts zoos provide opportunities for visitors to learn about animals and their environments. Ultimately their goal is visitor understanding leading to conservation behavior. While documented zoo design methods such as landscape immersion, cultural resonance and interpretation elements provide opportunities to learn, current literature stops short of explaining how visitors learn. This research intends to bridge this gap through an innovative mixed methods approach under the hypothesis: if designers understand how visitors learn, their design approach would change to integrate learning and cognitive process theories, resulting in whole exhibit designs which engage cognitive processes increasing learning there by increasing the potential for conservation behavior.

A thorough literature review revealed cognitive psychology and learning theories vital to exhibit design. Cognitive processes are the mental processes visitors use to learn, think and act (Leonard, 2002). To design for visitor's cognitive processes designers need to be concerned with visitor's attention, perception, recall, understanding and memory (Koran, 1983). A personal design exercise testing novel approaches for incorporating cognitive processes into theoretical exhibits yielded potential new guidelines and typologies for exhibit design. To test these personal insights, integrated survey and participatory methods were envisioned to engage zoo design professionals.

In Seattle and St. Louis six participants attended the two workshops. In the workshops professionals learned about cognitive processes and learning theories, discussed and sketched ideas for learning in zoos, and focused on how to integrate theories in design. The interactive charrette engaged zoo design professional's cognitive processes to uncover new approaches and typologies for zoo exhibit design. Participants completed pre and post-surveys to measure design approach changes. Chan's (Chan, 2001) five components of an individual's design style are used as a framework for the survey questions.

Preliminary results from the workshop suggest designers augmented their design approach to consider learning theories in design processes. Designers showed an increased ability to more strategically design the visitor experience to engage and facilitate cognitive processes. Results suggests the participants had a fundamental understanding of applying learning however some important stages such as application and receiving feedback demonstrated a relative increase. From the analysis of the surveys, discussions, and sketches new design guidelines, typologies and strategies are emerging to guide the design of exhibits to engage cognitive processes and enhance visitor learning, thereby increasing potential to achieve zoo conservation missions.

## A Case Study of the Psychological Effect of Gardening on Older Adults

**Hsiang Ching Huang**, hsiangching@gmail.com, **Yuan Yu Chang**, circle0409@hotmail.com,  
**Chun-Yen Chang**, cycmail@ntu.edu.tw, National Taiwan University, Taiwan

**Keywords:** Older adult, horticultural activities, interview

In recent years, many studies have indicated that having contact with nature has a positive effect on the mental health of humans. But there have not been many studies about the cognitive and physical benefits of horticultural activities in older adults. We interviewed 28 older adults who were over 65 years old in order to understand the benefits of the gardening activities and what they felt when they were gardening. After analyzing the contents of the interview, we classified the benefits into three categories: physical, mental and psychological benefits. This study not only can be applied to program planning for the elderly but can also help to motivate other non-gardening older adults to participate in the activities.

## The Dose of Viewing Nature on Physiological and Psychological Benefits

Hsiao-Ling Yu, fishdomoto@hotmail.com, Ying-Hsuan Lin, r90628311@ntu.edu.tw,  
Chun-Yen Chang, cycmail@ntu.edu.tw, National Taiwan University, Taiwan

**Keywords:** attention capacity, Electromyographic, heart rate, Electroencephalographic, waterscape

Mounted empirical studies revealed that natural environment elicit positive and restorative responses. However, how fast would one psychologically and physiologically react to a restorative environment? Totally 125 college students of National Taiwan University were randomly assigned into four experiment group and individually shown a series of waterscape photos took in Taiwan, while their physiological indices—electromyography (EMG), heart rate (HR), and brain waves (EEG)—being recorded by the biofeedback instrument in either 2, 5, 10, or 15 minutes. Attention capacity was also tested with Necker Cube Pattern Control Test (NCPCT) before and after viewing the slides. The quantitative analysis was conducted through descriptive statistics and Analysis of Variance. Results showed an overall relaxing trend of physiological responses while viewing the landscape within 15 minutes, the significantly improvement of EMG and HR elicited on fifth to eighth minute while attention capacity improved most after viewing the landscape for 5 minutes. In sum, viewing natural waterscape elicits positive physiological and psychological outcomes. Reaction time to viewing waterscape as the indicator to dose of viewing natural landscape will be further discussed.

## Psychological and Physiological Responses to Various Landscape Types: A Comparison of Cultural Differences

**Yen-Hui Ho**, National Taiwan University, Taiwan, hui320@hotmail.com

**William C. Sullivan**, University of Illinois at Urbana-Champaign, USA, wcsulliv@illinois.edu

**Chun-Yen Chang**, National Taiwan University, Taiwan, cycmail@ntu.edu.tw

**Keywords:** cultural difference, landscape preference, familiarity, attention restoration, safety

People prefer natural environments more than built urban ones, and benefit psychologically and physiologically from contact with nature. Although a human preference for natural settings is well-established across multiple cultures, it is also true that there are variations in landscape preferences between cultures. This variation is often evident as a function of the familiarity that individuals have with particular settings. Thus, we wondered about the extent to which individuals from two different cultures (Taiwan and the United States) would respond to landscape scenes that they were more or less familiar. We measured our 178 participant's psychological responses including preference, sense of safety and attention restoration, and their physiological responses including the electrical activity on their forehead through electromyogram (EMG) and their heart rates (HR). People more likely to stay in an environment, which provide a better surrounding to survive. Evolution theory shows that human beings originated from the forest and moved out eventually. In this survey we used black-and-white photographic images of different natural landscape types, which were classified in three groups: 1) in the forest, 2) edge of forest, and 3) outside of forest. Two photographs were represented for each of the three landscape groups. We also collected participants' oral descriptions of their reactions to these photographs. Taiwanese participants were examined local residents around National Taiwan University; American participants were examined in University of Urbana-Champaign and must be native American. The findings revealed similarities in how Taiwanese (N=101) and Americans (N=77) ranked preferences for nature. Both groups prefer forest setting the most, meadow the second, edge the last. However, there were also significant psychological (preference, sense of safety, attention restoration) and physiological (EMG) differences between these two groups of participants. In addition, this study found that familiarity can be an important factor in cross-cultural psychological responses, especially landscape preferences. Specifically, people more familiar with the natural environment may obtain greater psychological benefits involving preference, safety and attention restoration, while experiencing these environments. Results of this study can be used as a reference for planning outdoor recreation activities that will allow people to obtain greater benefits from nature.



## Parkitecture: The Role of Design Competitions in Academia and Practice

Carl Rogers, Iowa State University, USA, rogersc@iastate.edu

**Keywords:** urban park, design competition, urban resource, city matrix, practice

This paper examines steps involved in creating a design competition to analyze the role of design competitions in design practice. In June of 2011, Des Moines Water Works Park in partnership with Iowa State University launched a major design competition to illicit a new vision for the 1,500 acre park. Fifth year Iowa State University landscape architecture students researched past competitions, wrote the competition brief, and built the website for “Water Works: Parkitecture Competition.”

Water Works Park, a 1,500 acre park located in the center of Des Moines has grown as a major public open space throughout the history of the city. For nearly 100 years, Des Moines Water Works has supplied water to the residents of Des Moines from Water Works Park, located along the Raccoon River. Throughout its history, the 1,500 acre park has also served as a destination park and major open space in Des Moines. In response to the park’s history as a prominent landscape of the city of Des Moines, and to the recent redevelopment of the Des Moines River, from the confluence with the Raccoon through the downtown core, the attitude toward Water Works Park is poised to see a historic shift. This study examines the continued development of the park as a historic urban resource and how the role of Water Works Park expands the understanding of not only an urban watershed but also how the park fits in the public matrix of the city’s riverfront.

Students examined past and current design competitions and determined submission requirements, collected site data and historical information of the park, as well as, interviewed practitioners about the value of the design competition in a professional office. Examining the steps to create the competition, this paper also looks at the practitioner’s response to the role of competitions and seeks to understand how design competitions fit into the mission and culture of a professional office. In addition to examining the actual competition structure, this paper looks at the first and second stage submissions in order to better understand how firms address current issues or trends within the landscape architecture profession. Initial findings are that competitions do have a positive effect on the profession and firms value the role of competitions to push the boundaries of the profession. The results of this study can help guide the structure of future competitions.

## Here and Gone: Examining the Visual Effects of Seasonal Plant Changes on Predictors of Landscape Preference

Robert Kuper, Temple University, USA, rkuper@temple.edu

**Keywords:** landscape preferences, coherence, complexity, legibility, mystery, seasonal change

The purpose of this study is to relate seasonal plant changes to predictors of visual landscape preferences. In the early 1970s, Kaplan, Kaplan, and Wendt (1972) and Kaplan (1975) examined the least and most preferred of 56 landscape scenes shown to groups of respondents and found that natural scenes were preferred to urban and that the informational factors of “complexity,” “mystery,” and “coherence” were useful in predicting preference. Kaplan and Kaplan (1989) later added “legibility” to the group and organized the four factors into the Preference Matrix, a framework for investigating landscape perceptions in terms of the human needs to understand and explore landscapes based upon immediate and inferred information. Complexity describes the quantity and variety of elements that are present in a scene; coherence relates to the organization of the scene into regions; mystery promises new information by continued movement; and legibility refers to how memorable or easily navigable a scene is. Since the Kaplans began their research, Stamps (2004) noted, the environmental research community has devoted 61 papers to the matrix. For practitioners, Kaplan, Kaplan, and Ryan (1998) developed forty-five “patterns” that address the basic needs to understand and explore landscapes and serve as core solutions to recurring problems in landscape design, planning, and management. While useful, the visual effects of seasonal plant changes on predictors of landscape preference have received little attention in these patterns or in research using the predictors of preference. This study uses the informational needs, degrees of inference, predictors, and patterns put forth by Kaplan et al. over the years to define a framework for identifying and comparing visual attributes of three landscape architecture project sites in the northeastern United States. Color photographs taken at four times over the course of a year, published or proprietary literature, and interviews with clients, landscape architects, and maintenance managers comprised the methods used to perform each case study. A meta-analysis compares them and provides a perspective on how each predictor of visual landscape preference may be affected by seasonal plant changes. Landscape coherence and legibility were affected by maintenance, the relationship between native plants and their preferred growing conditions, native plant lifecycles, and weather. Complexity changed when the project was implemented, over the course of the growing season, and over the life of the project. Mystery was primarily affected by plant growth. Suggestions for future preference studies and design applications are provided.

## Exploring the Relationship between Neighborhood Social Interactions and Urban Sprawl in U.S Metropolitan Regions

Liliana Carvajal, University of Massachusetts Amherst, USA, lilicarvajal@gmail.com

**Keywords:** Urban sprawl, social interactions, public space

As a pattern of growth, sprawl is often criticized for its extensive negative impacts, ranging from economic costs to health and environmental problems (Burchell, 1998; Benfield et al., 1999, Ewing et al., 2003) Critics of sprawl have also emphasized the negative consequences of this type of growth for social neighborhood ties. The built environment of sprawling areas characterized by low population density, segregation of land-uses, and lack of public spaces may not provide adequate spaces for social interaction, thus reducing the opportunities for informal contact and gathering among residents. (Burchell, 1998; Calthorpe, 1993; Kunstler, 1993; Leyden, 2003).

Although there is a large body of research that study the impacts of sprawl, there is little empirical research of the impacts of sprawl on social interactions among neighbors. The purpose of this study is to contribute to the understanding of sprawl impacts and to fill this gap in the current literature by exploring the relationship between urban sprawl and neighborhood social interactions in U.S. metropolitan regions. In addition, because the impact of sprawl on neighborhood social interactions is likely to be mediated through the use of public spaces, I also explore to what extent the use of public spaces may affect these social interactions.

The neighborhood social interactions data came from the Pew Internet & American Life Project. The sprawl data are from the research conducted by Ewing et al. (2002). The authors developed a sprawl index that includes four main factors: a) residential density b) mixed land-use c) strength of activity center(s), and d) street network connectivity.

According to my results, while neither an overall index of sprawl, nor individual indicators are observed to have a statistical significant association with different dimensions of neighborhood interaction; a statistically significant association was found between the use of public spaces and the type and frequency of neighborhood interaction among participants. As such, the use of public parks and plazas, public libraries, and community centers is positively associated with four dimensions of neighborhood social interaction: a) the extent to which participants know the name of their neighbors, b) their frequency of social contact, c) the extent to which participants report helping their neighbors, and d) the extent to which participants report participating in local and community groups. These results, obtained while statistically controlling for demographic characteristics, highlight the importance of public spaces on the social behavior of participants.

## Memory and Resilience of Urban Space: A Case Study of Wenceslas Square

Cynthia Anderson, USA, anderson.1442@osu.edu

**Keywords:** Memory, resilience, urban landscape

Disruption changes the form, use and perception of public spaces. A clear example of disruption witnessed in the last 20 years has been the abrupt change in economic and governance systems in Eastern Europe, a disruption that occurred just as issues of sustainability were being raised and codified in the United Nations' Agenda 21 plan released in 1992. This paper examines the case of Wenceslas Square in Prague, Czech Republic to explore the role of memory in enhancing the resilience potential of an urban space.

Within the last few years, the term "resilient cities" has entered the lexicon. A resilient city can "absorb disturbance and still retain its basic function and structure"; resilience theory also recognizes the inevitability of change and the need to enable systems to absorb and reorganize after disruption. Urban landscapes play an important role in enhancing resilience potential as the site of interaction of social, economic and environmental systems within the city, where connections are made across systems and diversity may flourish. Memory imbued in a space, whether on a personal and societal basis, facilitates connections across a population and may enhance resilience. In what situations are these memory-based ties to place strong enough to shape resilience in the face of factors contravening resilience?

Prague's Wenceslas Square serves as the case study through which to examine the changes in urban social spaces subsequent to the political and economic upheaval of 1989 and assess contributors to resilience. Personal and political events in the square have created a set of memories for Prague residents; however, the increasing population of international visitors to the square does not share perceptions of the square's importance. Field observation, resident interviews and visitor surveys provide information describing memories related to Wenceslas Square. Analysis of this information draws upon a framework developed from writings on space, landscape and memory as well as works on urban resilience. In addition, the resilience of Wenceslas Square is compared to contemporary Eastern European urban spaces to identify other methods of using societal memory to enhance resilience.

Memory alone cannot create a sufficiently strong set of social connections to reinforce resilience of an urban space. However, when spaces are constructed with a holistic view towards producing resilient social, economic and environmental systems, memory can provide an important basis for social connection and corresponding improvement in resilience potential.

## Finding meaning in creative media: How design influences popular culture

**La Barbara James Wigfall**, Kansas State University, USA, lbjw@k-state.edu

**Huston John Gibson**, Kansas State University, USA, hgibson@k-state.edu

**Keywords:** popular culture, creative media, public perception

**ISSUE:** This paper analyzes how the built and natural environment is portrayed in popular culture, specifically through song and film. Too often these issues and themes are addressed as subtle subordinate plots in the creative work or arranged so obviously that society attaches very little meaning to the nuances. Despite the oversight, these forms of entertainment and/or delight offer a unique perspective of how society's perception of planning and design are shaped by creative media. In addition to understanding environmental ethics, service learning, or environmental psychology, students in the planning and design disciplines should be aware of the influence of media on public perception of their professions.

**METHODS:** In order to explore the influence of environmental, social, and economic development on creative media, we offered an exploratory educational adventure of design and planning issues through the cultural media of song and film. This two-week course took an entertaining, thematic glance into the subject. Our special topics class was subdivided into categorical issue oriented themes such as suburban sprawl, inner city urban blight, environmental degradation, gentrification, and so forth. Content analysis is used to examine the student's response to the media conveyed in the four-hour sessions. Each day was comprised of a mixture of listening/viewing experience and discussion for both popular song and film that addressed the subject matter via mainstream cinema and lyrical music expression. Music genres included country, rock and roll, rap, alternative and so forth while film genres included drama, comedy, foreign, animation and science fiction. Student discussion and comparative papers were used as a device for collective and individual reflection on the media shown in class.

**OUTCOMES:** The objective of the course was to encourage students to think creatively about how our built environment affects us as individuals and as a society, providing evidence of this through the "everyday life" cultural arts. Students in the course showed great initiative in discovery of alternative creative works that added to our cultural arts inventory for subsequent course offerings. The findings of this study demonstrate how perspective of society's perception of planning and design are shaped by creative media. The findings are intended to help the planning and design professions better understand popular discourse about the professions we study and practice.

## Space for water: The 'talaab' system in India

**Alpa Nawre**, Kansas State University, USA, [anawre@k-state.edu](mailto:anawre@k-state.edu)

**Keywords:** Talaab System, Central India, Monsoon Water Management, Water Harvesting

The 'talaab', which roughly translates to 'pond' in English, is one of the most ubiquitous and indispensable monsoon water managing devices of the Indian landscape. This paper documents the historic role of the talaab in the Indian life and landscape as a well-established water-harvesting element. The study further surveys the state of existing talaab systems in urban and rural contexts in central India and in storm-water management strategies being applied in contemporary urban development in the region. This study was carried out through data collection and research on published literature, online web portals and field studies. The sites for these studies are in central India because the tradition of making and maintaining a talaab was the strongest in this region.

A new town coming up in central India, Naya Raipur in Chhattisgarh is used to study the storm-water management systems being proposed, with a focus on the treatment of existing talaab in its Master Plan. The city of Naya Raipur has a mission to uphold principles of sustainable development. In contrast, developer-driven projects, which form the majority of new urban projects, are also studied to document the contemporary relation between settlement and talaab water bodies.

In the colonial and post-Independence period, the talaab system in India has deteriorated. The problems that the talaab system faces are many; while some existing talaab are becoming defunct, many others are being filled up. Through studies it emerges that the majority of new urban developments do not have effective water management strategies nor establish a good relationship with existing water harvesting devices like the talaab. In India, issues related to water management are a very serious concern and set to become worse with the impending climate change in the region. In the face of the increasing frequency of severe water shortages and flooding incidents, the talaab can be reemployed to address these issues.



# Research & Methods



## Illustrating Ecologies

**Bradley Cantrell**, Louisiana State University, USA, [cantrell@lsu.edu](mailto:cantrell@lsu.edu)

**Keywords:** diagramming, media, analysis, representation, analog, digital, simulation, ecologies

In an attempt to understand the complex relationships occurring within ecological systems, methods of representation must explore modes that focus on illustration, simulation and dynamic modeling. Illustrating Ecologies, an advanced research seminar at the Louisiana State University Robert Reich School of Landscape Architecture, explores animating and modeling ephemeral ecological systems through analog and digital models. Students are asked to research ecological processes, infrastructure and/or biotic systems through processes that deconstruct through modeling and animation. Students learn techniques necessary to model ephemeral processes such as decomposition, deposition, growth and hydrology utilizing particle systems and other techniques that are at times simulations and at other times illustrations. Digital and analog representations were combined with field observations of ecological processes as well as recording methods such as video, photography, sensing and sketching in order to fully understand the complex processes that were illustrated.

The research was conducted in groups where each group focused on a representation methodology and ecological system definition. Within the course of the seminar students became experts on specific software and representation techniques, as well as their chosen ecological system. The two concurrent research streams would focus the groups research on the ecological science and the representation techniques. The information was documented throughout the semester at [lab.visual-logic.com](http://lab.visual-logic.com) to serve as a resource for the seminar and for outside collaborators.

Through this process research groups were asked to clearly define the scope of an ecological system. This required the creation of a comprehensive body of research that included both scientific and anecdotal evidence that would be used to describe an ecological system model. This research required the development of observation methods that were used to document dynamic, ephemeral processes for the purpose of developing representations of ecosystem complexity. The observations and research were tied directly to the concurrent research into software, techniques and methodologies for illustration and simulation.

## Water Conservation in Master-Planned Communities in Intermountain West Desert Environments

**Bo Yang**, Utah State University, USA, bo.yang@usu.edu

**Amanda Goodwin**, Utah State University, USA, wisescapes@gmail.com

**Keywords:** Community planning, low-impact development, stormwater management, post-occupancy evaluation, Design Workshop

Water conservation in the Intermountain West continues to be an important topic in community development. In Utah Salt Lake County, for example, the available water resources cannot meet the projected population growth, if the status quo water consumption model continues. Reusing stormwater for landscape irrigation as a means to save potable water is gaining popularity. However, less post-occupancy evaluation has been conducted to examine the extent to which these water conservation best practices are effective, especially in large-scale community development projects in high desert environments. Lack of such understanding of the performance benefits poses barriers for the future practices of water conservation through planning and design interventions. The study reports findings from the Landscape Architecture Foundation's 2011 Landscape Performance Series, Case Study Investigation program. This study analyzes three master-planned communities designed by Design Workshop, Inc. Two projects are located in New Mexico and the third one is in Utah. The study compares the performance benefits of water conservation with what the projects would have been if completed using conventional practices. Through comparing water use of adjacent communities, this study analyzed the potential savings of irrigation water use and further calculated the cost savings. Findings suggest substantial water savings—In Daybreak community (Utah), for example, through innovative drip irrigation design and low-impact development techniques, the project saves 1.5 million gallons of potable water per year. This translates into projected annual savings of almost \$1 million as community fully built-out. The study ends with discussion on further performance benefits of the three projects in addition to the measurement of water savings.

## **Green and Blue Schools**

**Allison Jensen**, apalmer3@umd.edu, **Byoung-Suk Kweon**, kweonb@umd.edu, **David Myers**, dnmyers@umd.edu, University of Maryland, USA

**Keywords:** stormwater, schools

Artful management of stormwater has the wonderful capability to create educational arenas not only by using practices already found to function well, but also by applying principles of environmentally sensitive rainwater design. Is this what is needed to inspire a new generation of stewardship? In order for this to be imaginable, a key question asks what if the social perception of rainwater and significant storm events were a welcome asset instead of being sent to the nearest drain pipes with ignored downstream consequences.

Stormwater management principles can be applied to many scales, but educational settings in particular have great opportunities for integration into many aspects of the curriculum from the sciences to the arts. As a result, many communities are seeing new initiatives for creating green schools which broadly cover all levels of sustainability, especially relevant in cities. The focus of this research is on stormwater and water design for urban school campuses.

The research begins with a comparison between conventional stormwater management techniques on school campuses and new practices that keep the stormwater on the site. Evaluated criteria will be the school's campus stormwater management techniques and how, in the literature, they worked with using the stormwater areas on the campus as a supplement to existing curriculum.

The site that will be assessed is Visitation Preparatory School, a 200-year old historic Catholic girls high school in Georgetown, Washington DC. The main research will be an assessment of the campus' existing stormwater usage and runoff and also evaluating possibilities for new stormwater management techniques to be a supplement to curriculum. The design goals will include practical, instructional, and inspirational applications that respect the neighborhood's historic character and the school's educational mission. The campus was originally built as a self-sufficient site in terms of fresh water use and waste disposal, new regulations in Washington now require buildings to move off the urban stormwater infra-structure grid.

Examples of some stormwater devices in practice include rain gardens, bioswales, constructed wetlands, green roofs, permeable pavers, and rain barrel cisterns. The site itself for the stormwater management techniques could become outdoor rooms that classes could go for a lecture, or monitoring equipment could be installed to follow data such as water draw-down after a storm event. These devices are useful from a technical perspective, and also have demonstrative capability where students can interact and learn about water and stormwater management.

## Assessing Social Benefit of Green Space: Post Occupancy Evaluation of Lubert Plaza

Mary Myers, Temple University, USA, mary.myers@temple.edu

**Keywords:** landscape performance, case study investigation, social benefit

Assessing Social Benefit of Green Space: Post Occupancy Evaluation of Lubert Plaza Green space is considered to be an important element contributing to a city's quality of life (Barbarosa, et. al., 2007). Post occupancy evaluation of such space is helpful in understanding how to improve design and enhance user experience and satisfaction. This study presents the results of a post occupancy evaluation (POE) of an urban plaza located in busy, dense downtown Philadelphia. Thomas Jefferson University's Lubert Plaza designed by Andropogon Associates, LTD, was built in 2006. The 60,000 sq. ft. plaza was designed to be the heart of the university's medical campus. It is also open and accessible to neighborhood residents and nearby office workers.

This evaluation was conducted as part of the Landscape Performance Series Case Study Investigation, a national research effort whose goal is to develop metrics for landscape benefits. The aim of the POE was to assess the plaza's social benefit. A questionnaire was developed to understand who uses the plaza and how they experience and respond to the setting. This evaluation method is based upon measures developed by Cooper Marcus and Barnes (1999), Whitehouse, et.al (2001); Sherman, et.al (2005) and others. The survey, conducted on June 25, 2011, yielded data sets for 163 respondents who answered questions related to demographics, activities and perceptions. Questions asked about the impact of the plaza (if any) on mood; activities engaged in while using the plaza; contribution of the plaza to satisfaction with Thomas Jefferson University as a study/work environment; and perception of the plaza's contribution to environmental improvement through storm water mitigation.

Results indicate a number of benefits. People of varied backgrounds and occupations use the plaza. It is perceived as a calming and restorative place. The plaza contributes to satisfaction with Thomas Jefferson University as a work/study place and with the overall urban environment. However, the plaza's connection to stormwater mitigation is not perceived by the majority of respondents. This finding can be used by the designer and client to retrofit existing design to make the environmental benefit of the plaza more apparent to the public. The finding can also inform future design.

## **Determining Landscape Areas for Targeted Reforestation Efforts**

**Brian Lee**, blee@uky.edu, **Corey Wilson**, wilcorey@gmail.com, University of Kentucky—Landscape Architecture, USA

**Christopher Barton**, University of Kentucky—Forestry, USA, barton@uky.edu

**Keywords:** Surface Coal Mining, Reclamation, Scenario Modeling, Enhanced Land Evaluation and Site Assessment

This interactive presentation demonstrates the power of combining landscape analysis with environmental science to determine suitability for targeted reforestation efforts. Multiple scenarios were developed for improving water quality, reducing forest fragments, increasing Cerulean Warbler habitat, etc., based on literature review and expert opinion. Identifying planting locations where a tree can serve multiple purposes across multiple scales simultaneously is valued.

Decades of surface coal mining throughout Appalachia have left an estimated million acres that are providing limited ecosystem function and are potentially available for targeted reforestation activity. Additionally, if carbon-emission restrictions were ever implemented, it is likely that coal-burning electric-power producers will need to offset atmospheric carbon emissions. Reforestation of productive post-mined soils is a viable way to produce a measurable carbon sink (Amichev et al., 2008). Forests growing on mine sites can sequester 3 to 5 times more carbon than the grasslands that were established through the original reclamation (Burger and Zipper, 2009).

Despite the Appalachian Regional Reforestation Initiative (ARRI) pledging to plant 38 million trees in this project's 4,487 square mile mixed land cover study area, at the tree density required for effective reforestation, just fewer than two-percent (~79 square miles) can actually be replanted. ARRI has completed the necessary field studies to ensure establishment and growth success upon planting. The weakness thus far is a specific landscape scale suitability study to determine targeted reforestation areas from a spatial perspective that considers multiple objectives. This is important because there are not enough resources to reforest all mined lands; therefore, identifying the most effective areas for reforestation is vital.

This land use suitability problem lends itself to the use of multiple weighted overlay models using a Land Evaluation and Site Assessment framework (Pease and Coughlin, 1996). The overlay analysis considered multiple landscape factors and combined thematic sub-suitability analyses to produce an overall suitability map identifying valuable places to target on-the-ground reforestation efforts. This project was executed by valuing the relative landscape suitability for the improvement of ecosystem function. When applied across the landscape, a suitability rating for each factor was determined for each 30 meter x 30 meter portion of the landscape. All factors were initially weighted based on the literature review as well as professional expertise and combined to produce an overall comprehensive suitability rating encompassing all sub-suitability analyses. The importance of this study is the identification of critical areas to invest limited financial resources for improving ecosystem function.

## Editorial Perspectives on Advancing Professional and Disciplinary Understandings Through Landscape Architectural Scholarship

**David Pitt**, pittx001@umn.edu, **Lance Neckar**, necka001@umn.edu, University of Minnesota, co-Editors of Landscape Journal

**James Palmer**, Scenic Quality Consultants, Consulting Editor of Landscape Journal, palmer.jf@gmail.com

**Karsten Jorgensen**, Agricultural University of Norway, co-Editor of JoLA, karsten.jorgensen@umb.no

**Kelly Shannon**, Katholieke Universiteit Leuven, co-Editor of JoLA, kelly.shannon@asro.kuleuven.be

**Bradford McKee**, ASLA, Editor of Landscape Architecture Magazine, USA, bmckee@asla.org

**Paul Gobster**, USDA Forest Service, co-Editor of Landscape and Urban Planning, pgobster@fs.fed.us

**Wei-Ning Xiang**, University of North Carolina, co-Editor of Landscape and Urban Planning, wxiang@uncc.edu

**Keywords:** professional and disciplinary perspectives on landscape architecture scholarship, venues for publication of landscape architecture scholarship, Landscape and Urban Planning, Journal of Landscape Architecture, Landscape Architecture Magazine, Landscape Journal

The academic context in which landscape architecture faculty operate requires them to be active participants in the generation and publication of scholarship that is relevant to the profession and its underlying discipline(s). In a field having responsibility for advancement of both a profession and the disciplinary understandings that underlie this profession, publication venues of relevance to landscape architecture scholarship include professionally oriented periodic literature as well as peer-reviewed journals.

Retirement of the large “baby boom” cohort of landscape architectural faculty and the fact that many mid-level and senior faculty join the academe after extended periods of public and/or private practice suggests that new faculty members may be unfamiliar with norms and protocols of producing scholarship, both professional and peer-reviewed, that is valuable to the profession. Outlets for publication of this scholarship are expanding within the realm of landscape architecture and in allied disciplines. The editorial staffs (and thus the editorial direction) of many of the major landscape architectural publication venues have changed within the past three years. Thus, there is a need to acquaint faculty at CELA institutions with the current editorial perspectives of the major publication venues for landscape architectural scholarship.

The Landscape Journal editors are proposing a panel discussion that engages editors of four major outlets for landscape architecture scholarship, including Landscape and Urban Planning, Landscape Architecture Magazine, Journal of Landscape Architecture, and Landscape Journal. Using the contents of recent editions, the editors will discuss the perspective of their respective publications relative to advancing scholarship in landscape architecture on a continuum ranging from informing policy (defined broadly) about design, planning and management of the land to a more abstract or broader notion of advancing knowledge and understanding of landscape and person-environment relations as they affect and are affected by design interventions.

The objectives of this discussion are to enable CELA 2012 attendees to better understand the continuum and juxtaposition of values around peer-reviewed and professional scholarship that seeks enhancement of professional practice as well as enrichment of disciplinary understandings in landscape architecture, to understand the perspective of the major publications in the field on these issues, and to focus their manuscript submissions relative to the concerns of the various publications.

## **Prioritizing Subwatershed Opportunities to Reduce Nitrogen and Phosphorus in Surface Waters**

**Brian Lee**, University of Kentucky—Landscape Architecture, USA, blee@uky.edu

**Corey Wilson**, University of Kentucky—Landscape Architecture, USA, wilcorey@gmail.com

**Keywords:** Hypoxia in the Northern Gulf of Mexico, Excess Nutrients, Ambient Water Quality Network, Watershed Indicators, Licking River Basin

This interactive presentation demonstrates an approach to prioritize subwatersheds for landscape interventions. The areas of hypoxic zones in the Northern Gulf of Mexico and in other coastal environments around the world are generally increasing primarily because of excess nutrients coming from anthropogenic causes/sources (Breitburg et al., 2009). These expanding zones have negative implications for ecosystem functioning (Diaz & Rosenberg, 2008). In order to address this issue, the Natural Resources Conservation Service is investing over \$320 million in the Mississippi River Basin Healthy Watersheds Initiative (USDA, 2010). This funding is not enough to intervene in every subwatershed, so the essential question becomes where one should focus initial efforts for effective nutrient reduction.

This study uses a combination of methods to identify relative subwatershed priority that are likely to reduce nutrient yield. The first phase involved utilizing TN and TP yield estimations derived from the Kentucky Ambient Water-Quality Monitoring Network (Crain & Martin, 2009). Estimations for 37 monitoring stations were used to develop multivariate regression equations based on variables of natural and human induced drainage area characteristics that explained dependent variable TN and TP variance. Initially, more than 50 watershed variables were used to develop the regression equations that were subsequently reduced using a modified stepwise approach. Reduced models showed adjusted R-Squared for TN was 0.59 using three variables and 0.56 for TP using two variables. Independent variables included, for example, statistics regarding land cover type as a percentage of watershed area, topographic character, etc. This phase resulted in variable coefficients that will be used in the third phase to determine variable weighting in order to identify targeted subwatersheds for interventions.

In order to target individual subwatersheds, the second phase determined descriptive watershed condition characteristics for the 828 HUC14 study basin subwatersheds. This phase involved iteratively running a geospatial model to accumulate the same characteristics as were accumulated during phase one, resulting in a database with over 41,000 data points describing every subwatershed so that potential targeting for watershed action could begin to be prioritized.

In the future, a third phase of this work will involve applying the variables determined during phase one that explain nutrient variance for the additional river basins. The importance of this subwatershed approach is that it draws on several indicators and can include weighting them differently in order to test “what if” scenarios that involve expert input and data for wider planning options and decision making.

## The Effect of Slope and Media Depth on Growth Performance of Sedum Species in a Green Roof System in Mississippi's Semi-tropical Climate

**Sinan Kordon**, sk829@msstate.edu, **Robert M. Anders**, rma42@msstate.edu, **Jason Walker**, jwalker@lalc.msstate.edu, **Timothy J. Schauwecker**, tschauwecker@lalc.msstate.edu, Mississippi State University, USA

**Keywords:** Vegetated roof, Sedum spp., Plant growth performance

In recent years, green roofs have become an environmentally-friendly design solution in urban areas to mitigate adverse effects of impervious surfaces (U.S. Environmental Protection Agency 2009). Past research shows that green roofs take advantage of unused roof space to provide numerous economic, environmental, and social benefits like reducing energy demand, increasing air and water quality, and improving mental well being in urban areas (Environment Canada and National Research Council 2003).

Green roof vegetation plays a crucial role in green roof performance (Dunnett et al. 2008a). Plant growth performance is directly dependent on factors such as correct plant species selection (Getter and Rowe 2008), planting medium depth (Dunnett et al. 2008; Getter and Rowe 2008), and slope gradient of the rooftop (Kinder 2006).

This study determined the effect of medium depth and slope on plant growth and survival in Mississippi's humid sub-tropical climate. Twelve 4'x4' green roof platforms were constructed with 4-inch and 6-inch medium depth and 2% and 33% slope at the Green Infrastructure Research Area on the South Farm of Mississippi State University. Four sedum species (*Sedum album*, *Sedum spurium*, *Sedum sexangulare* and *Sedum rupestre*) were planted by using a grid pattern, 6-inches on center in spring 2010. Their survival and growth rates were measured photographically in June and July of 2011.

Plant growth was monitored monthly by photographing the plants, and AutoCAD software was used to calculate plant cover by digitizing the images. Statistical analysis showed that there was a significant difference between 6- inch and 4- inch medium depth in terms of growth performance as measured by total plant cover ( $p < 0.003$ ). The analysis also showed that slope had a significant effect on plant growth, with a 2% slope providing better growth performance ( $p < 0.05$ ).

Average plant survival on all platforms was: *Sedum album* 77.08%, *Sedum spurium* 55.73%, *Sedum sexangulare* 27.6%, and *Sedum rupestre* 13.54%. Average plant cover measurements from all the platforms were: *Sedum album* performed best with 20.94 % coverage, 3.48 % for *Sedum spurium*, 2.69% for *Sedum sexangulare* and 0.87% for *Sedum rupestre*. This presentation will share the lessons learned and provide suggestions for future research and experiments for more successful green roof design and implementation in the southeastern United States.



## **Visual Impact and Wind Farm Development in Colorado: Three Case studies**

**Elizabeth Mogen**, Colorado State University, USA, e.mogen@colostate.edu

**Keywords:** wind farm visual impact development policy

Wind potential in Colorado is 11th nationwide and far exceeds in-state needs. Installed capacity has grown from 22 Megawatts (MW) in 1999 to 1299 MW in 2010. To date wind farms have been welcomed in Colorado's agricultural communities, far from population centers, due to economic compatibility and historic familiarity. However, as more renewable energy sources are needed closer to population and scenic areas, it becomes necessary to ask what role visual/landscape impact has on wind farm development.

The intent of this poster is to compare the planning and development process for three utility scale wind farms located on private lands in Colorado with specific attention to the influence visual impact had, if any. The three wind farms represent early development (Colorado Green Wind Power completed in 2003), recent construction (Cedar Creek Wind Farm completed 2008), and recently denied (Silver Mountain Wind Farm 2011). The three wind farms are described in a tabular form relating their various sizes, in terms of energy output as well as physical presence. Each planning process is described in terms of timing and requirements. A written description will be included to summarize ancillary information. Data is compiled from public documents as well as conducting interviews with the county planners, journalist and the developer's representative for each case.

The findings reflect a pattern that has been repeated in Europe and New Zealand. Initially wind farms are accepted locally as an economic boom. Then either due to a more suspicious public or more cavalier developers, visual impact becomes a point of dissent. For example some of the reasons cited for the denial of the Silver Mountain Wind Farm in Colorado were: potential negative impact on scenery, views and the application's general failure to "protect the landscape." In New Zealand, Visual Impact Assessment (VIA) Guidelines are being developed because without recognized standards currently most proposed wind farms go to court to settle disputes concerning visual and landscape impact. Across the United States VIA guidelines for non-federal lands are sporadic or general in nature. There are successful examples of guidelines written with the intent of providing a structure for public input, discussion and education which can empower local residents as well as provide a more predictable approval process for developers. This poster represents the author's further inquiries into the potential need for VIA Guidelines in Colorado.

## Landscape Performance: Documenting the Benefits of Sustainable Landscape Solutions

**Forster Ndubisi**, Texas A&M University—College of Architecture, USA, FNdubisi@archmail.tamu.edu

**Christopher D. Ellis**, University of Maryland, USA, cdellis@umd.edu

**Linda Ashby**, lashby@lafoundation.org, **Barbara Deutsch**, bdeutsch@lafoundation.org, **Heather Whitlow**, hwhitlow@lafoundation.org, Landscape Architecture Foundation, USA

**Keywords:** landscape performance, Landscape Performance Series, Case Study Investigation, landscape research, case studies, sustainable landscape solutions, performance benchmarks and metrics

Quantifying the ecological, social and economic benefits of sustainable landscape solutions is essential to making informed and defensible decisions about how the landscape functions and changes over time. In today's climate of downsizing, budget reductions and program cuts, providing proof of performance with quantifiable and objective data has become increasingly important. Decision-makers who impact policies, programs, investments, and land development need this information, but how is landscape architecture responding?

In 2010, the Landscape Architecture Foundation (LAF) launched a new research initiative, the Landscape Performance Series (LPS), to document the contributions that landscape solutions make toward achieving sustainability.[1] The LPS is an online, interactive set of resources that shows the value of sustainable design and provides tools for designers, agencies and advocates to quantify benefits and make the case for sustainable landscape solutions. The LPS is not a rating system, but rather a hub that brings together information and innovations from research, professional practice and student work in the form of Case Study Briefs, Benefits Toolkit, Fast Fact Library, and Scholarly Works.

To date, 50 LPS Case Study Briefs of exemplary high-performing landscapes have been developed and published in the LPS database. Of these, 25 were generated through an LAF pilot program, Case Study Investigation (CSI), which ran during the summer and fall of 2011.

CSI seeks to forge a research partnership between academia and professional practice. Research teams comprised of 10 LAF Research Fellows (university faculty members from across the country), 12 Research Assistants (select graduate students), and more than 20 firm practitioners documented high-performing landscape projects and developed methods to quantify landscape performance benefits.

This presentation introduces the Landscape Performance Series, explores how CSI can facilitate methodological innovations in documenting performance, and examines the implications for research and education in landscape architecture. Specifically, the session will consider the following questions: (1) Why is it important to examine landscape performance and its role in documenting sustainable landscape solutions? (2) How can the Landscape Performance Series be used for teaching, research, and dissemination of information? (3) What research and methodological issues emerge in using CSI to investigate the quantifiable benefits of high-performing landscapes? (4) How can the partnerships that emerge among researchers and practitioners through CSI be strengthened and sustained?

The presentation concludes with a discussion on how landscape performance can be integrated in landscape architecture education, a topic which will be further investigated in a subsequent LAF-moderated panel.

## **High school campus landscapes and academic performance: An experiment**

**Shimon Zimbovsky**, University of Illinois at Urbana-Champaign, USA, szimbov2@illinois.edu

**William Sullivan**, University of Illinois at Urbana-Champaign, USA, wcsulliv@illinois.edu

**Keywords:** Urban Forestry, Education, Intervention Study

Kaplan and Kaplan observed that our capacity to direct attention is subject to fatigue. That is, just like muscles that require rest after a period of intense use, our capacity to deliberately pay attention declines with use. The costs of attentional fatigue (what many call mental fatigue) are considerable. An individual experiencing mental fatigue will have a reduced ability to concentrate, and may also become antisocial, irritable, distractible, impulsive, and accident prone.

There is considerable evidence that exposure to green landscapes can restore one's capacity to pay attention. Indeed, a recent study published in *Landscape and Urban Planning* demonstrates that views of green landscapes from high school buildings are related to a variety of positive educational outcomes. On 101 high school campuses, the presence and extent of an urban forest predicted multiple measures of student performance, including standardized test scores, graduation rates, plans to attend college, and classroom behaviors (Matsuoka, 2011). These public schools were located in urban, suburban, and rural areas.

The Matsuoka study was retrospective and thus we have questions about the extent to which green views actually improve student performance. Can the exciting results he reported be replicated using an experimental design—a design that will help us address the question of causation?

With support from the US Forest Service, we are in the process of conducting an experimental intervention at 36 high schools (with a treatment and two control groups). We are planting trees on a number of high school campuses (but not on others), and will track student performance and behaviors over time.

For all schools, we are collecting data on student performance and behavior. This research design allows us to examine the impact of planting trees on student performance over time. We will be able to compare between treatment and control groups and within the treatment group (before and after the trees were planted).

This paper's contribution is to describe the challenges of executing an experimental design that involves real landscapes and real stakeholders. We explore the intricacy of selecting and recruiting high schools to participate, the use of unobtrusive outcome measures, and the lessons learned about developing an intervention study with thirty-six high schools.

## Landscape Performance: Methods to Quantify Benefits

**Heather Whitlow**, Landscape Architecture Foundation, USA, hwhitlow@lafoundation.org

**Christopher D. Ellis**, University of Maryland, USA, cdellis@umd.edu

**M. Elen Deming**, University of Illinois at Urbana-Champaign, USA, medeming@illinois.edu

**Keywords:** landscape performance, landscape research, sustainable landscape solutions, performance benchmarks and metrics, Case Study Investigation, post-occupancy evaluation, quantified benefits

The Landscape Architecture Foundation's Landscape Performance Series (LPS) is an online, interactive set of resources to quantify benefits, show value, and make the case for sustainable landscape solutions. This hub brings together information and innovations from research, professional practice and student work in the form of Case Study Briefs, a Benefits Toolkit, a Fast Fact Library, and Scholarly Works.

The LPS Case Study Briefs showcase exemplary built projects with quantified landscape performance benefits. Each case study includes a variety of ecological, economic, and/or social benefits along with a methodology document explaining how the various landscape performance benefits were determined.

Since the LPS was launched in Fall 2010, the database has grown to include over 50 Case Study Briefs, representing a wide range of scales, geographic locations and landscape typologies. Half of these case studies were generated through LAF's 2011 Case Study Investigation (CSI) program, a collaborative research initiative that matches LAF-funded student and faculty research teams with design firms to document high-performing landscape projects and develop methods to quantify benefits.

Using examples from the LPS Case Study Briefs, this session presents a typology of methods to quantify benefits. Rather than requiring "best available science", the LPS focuses on providing a set of defensible quantitative metrics, that have been evaluated according to their practical usefulness as well as their validity. Methods range from estimates based on design parameters to results from online tools and calculators to actual measurements gleaned from monitoring or post-occupancy evaluation data.

Metrics are discussed within the context of the information that is typically available for completed projects and the drivers behind that information, such as regulations, rating systems, and client need to show return on investment. The methods most commonly used to determine specific types of benefits (e.g. stormwater, educational value, economic development) are highlighted, and considerations to identify the most appropriate methods to assess a given project are discussed. The session will also explore the opportunities and challenges in standardizing the way performance data is collected and reported.

The presentation concludes with a discussion of future trends and the roles of researchers, educators, and practitioners in designing for landscape performance and providing evidence to drive demand for sustainable landscape solutions.

## Moving Forward: Integrating Landscape Performance in Academia and Practice

**Barbara Deutsch**, Landscape Architecture Foundation, USA, [bdeutsch@lafoundation.org](mailto:bdeutsch@lafoundation.org)

**Kristina Hill**, University of Virginia, USA, [keh3u@virginia.edu](mailto:keh3u@virginia.edu)

**Nancy Rottle**, University of Washington, USA, [nrottle@uw.edu](mailto:nrottle@uw.edu)

**Kurt Culbertson**, Design Workshop, USA, [KCulbertson@designworkshop.com](mailto:KCulbertson@designworkshop.com)

**Keywords:** landscape performance, landscape research, sustainable landscape solutions, performance benchmarks and metrics, coursework, research methods, collaboration

Previous sessions on landscape performance at CELA have discussed the opportunities and challenges in documenting performance, methods to quantify benefits, and emerging research and methodological issues. Following on from these sessions, this panel discussion will identify key issues, opportunities, trends and directions in incorporating landscape performance in design research and professional education. Two academic panelists who have recently taught new courses in landscape performance will be joined by representatives of a firm and a leading non-profit.

Panelists will explore:

- Emerging models for collaboration among researchers, practitioners, and other disciplines to document landscape performance, such as the Landscape Architecture Foundation's Landscape Performance Series and Case Study Investigation (CSI) programs;
- Strategies for integrating landscape performance into university coursework, including studios and research methods classes;
- Future of landscape performance: identifying a research agenda for collaborations between academics and practitioners in the discipline of Landscape Architecture

The panel will conclude with a critical discussion on the current barriers to sharing knowledge and skills regarding landscape performance, and how they might be overcome.

## Monitoring Native Plant Survival, Stormwater Runoff, and Other Variables on a Small Integrated Green Roof System at Kansas State University—with Implications for Facilities Planning/Design and Management

**Lee R. Skabelund**, lskab@ksu.edu, **Carolyn Blocksom**, blocksom@ksu.edu, **Mary Knapp**, mknapp@ksu.edu, **Stacy Hutchinson**, slhutch@ksu.edu, **Rhonda Janke**, rranke@ksu.edu, Kansas State University, USA

**Keywords:** green roof monitoring, native plant, survival rates, stormwater capture

This paper discusses findings-to-date from an integrated (non-tray) native plant green roof research project. Complementing green roof research by Sutton (2008) and Dvorak and Volder (2010), the primary goal for this project is to monitor the viability of four native grasses on a south-facing green roof in north-central Kansas. This prairie-based green roof experiences very rigorous climatic conditions in a region where green roof monitoring data is currently absent.

On May 19, 2009, a 300 square-foot rooftop in Manhattan, Kansas was planted with fifteen grasses and forbs (all native to the Flint Hills Eco-region). A four-to-seven-inch lightweight soil was planted with eight rows of drought-tolerant grasses and interspersed with ten species of forbs and one low-profile forb-like-shrub. Sedums were planted in four-inch soils along outer portions of the roof.

Our research plan envisions documenting plant growth and survival for at least five years. The following green roof variables are being monitored: subsoil and surface temperatures, water quality and quantity, and vegetative survival, growth, and coverage. Plants were evaluated after the first growing season for height, basal diameter, and number of flowering stems. Growing conditions were exceptionally favorable and plant survival was nearly 100 percent with most plants exhibiting flowers and increased basal diameter. Despite a cold winter following the 2009 growing season, and a hot summer in 2010, native plant survival remained well over 90 percent and many new grass seedlings took root. Supplemental watering was eliminated on the west side of the green roof following the second growing season (2010) and many species browned out during the very hot summer of 2011. After eliminating irrigation on the west side, plant growth was recorded in mid-October 2011. Plant growth will also be documented in 2012 and 2013.

Beyond documenting plant survivability, stormwater runoff and rooftop temperatures are monitored. Rainwater leaving the green roof is captured and measured. A range of variables (including air and soil temperatures, rainfall, and wind speed direction) are monitored every five minutes using a data-logger. Climatic data collected since June 1, 2009 indicates that southwest end green roof surface temperatures frequently reach 120°F or warmer, exceeding 150°F in 2011 on several days. Rooftop temperatures on adjacent rooftops (one silver-colored, one asphalt-and-gravel) are recorded for comparison. Between 4/15/10 and 6/15/10 approximately 1,464 gallons of precipitation was held on the green roof (60-65 percent of recorded rainfall). Lessons learned are likely to be relevant to other design projects.

## **Quantifying the impact of urban form on space-cooling energy use: The case of Sacramento, CA**

**Yekang Ko**, University of California, Berkeley, USA, yekangko@berkeley.edu

**John Radke**, University of California, Berkeley, USA, ratt@berkeley.edu

**Keywords:** urban form, cooling energy use, energy saving urban design, GIS, LiDAR

Urban form, spatial pattern and the density of urban physical objects, such as: buildings, streets, vegetation, and surface coverage in general, has been recognized as affecting the solar access of houses, thus influencing the space-conditioning energy demand (Olgay 1963; Owen 1986; Givoni 1998; Littlefair 2000). Since the late 1970s, researchers in planning and design have developed energy efficient site layout guidelines (Erley and Jaffe 1979; Hammond et al. 1981, Robinette 1983) and tree planting strategies (McClenon and Robinette 1977; Moffat and Schiler 1981). These design principles are evaluated through simulation studies (Paradis et al. 1983; Littlefair 1998) where the effects of vegetation received the most attention (Huang et al. 1987; McPherson et al. 1988; McPherson and Rowntree 1993; Simpson and McPherson 1998). However, because of the lack of data and rigorous methods to model complex urban environments, the impact of urban form on residential energy savings is rarely quantified using empirical data.

Given this gap in scholarship, we investigate the relationship between urban form and residential energy use, particularly space-cooling demand. We employ spatial analysis within a GIS that includes Light Detection and Ranging (LiDAR) data to quantify urban form variables. Multivariate analysis including urban form, property, and demographic data is then applied to examine the relationship between each urban form variable and space-cooling energy use for each urban form typology. We develop urban form metrics that classify the neighborhoods along a spectrum of energy performance within a region of the City of Sacramento (about 50 km<sup>2</sup>, 20K parcels), California.

Our method enables planners and designers to understand and quantify how cooling energy demand interacts with the built environment in urban systems. The result of this study is an energy audit schema mapping energy consumption. Our scheme adds a quantitative element to visual neighborhood descriptions, allowing more rigorous assessment of current energy consumption and potential solar energy generation based on urban form.

## Is Drawing Research? Towards a Drawing-oriented Scholarship Paradigm

Hooman Koliji, University of Maryland, College Park, USA, koliji@umd.edu

**Keywords:** Drawing, Research, Visual Representation, Design Process, Scholarship, Cognitive, Intellectual

Drawings are often viewed as documentations of ideas rather than intellectual means of investigation. Conventional view of the design drawings views them as neutral tools based on a visual relationship to the built work. While the fundamental function of the visual investigations, drawings, in the design disciplines is commonly accepted as core to the education (i.e. design studios), their role as a research apparatus remains controversial. This raises questions pertaining to the intellectual nature of the visual representation (Treib, 2008a): when and how drawing can be viewed as research vehicle? When we could call a design as research? Research, nevertheless, is generally viewed as a robust and systematic investigation often contributing to the creation of knowledge or new understandings. Research in the design fields is a relatively new concept and has not been fully integrated with the visual field. Research as “systematic inquiry directed toward the creation of knowledge” (Snyder 1984, Groat & Wang 2002) seems to maintain minimal overlap with design and particularly to drawing that involves intuitive acts. Recent literature on landscape research admits, “research and design share the same beginning” (Deming & Swaffield, 2011); however, it does not recognize the drawing as research.

This paper investigates the intellectual dimension of the drawing and its cognitive and meditative function in the context of landscape architecture discipline and discusses the cons and pros of the drawing as research apparatus (Frasconi 2007 & 2011; Treib, 2008b). Looking at the spectrum of the design in landscape architecture, which extends from regional planning to detail design, or from non-physical to physical issues, etc. , this paper discusses the role of interpretive site sketch drawings, analytical diagrams, design drawings, and presentational drawings in regards to research. The paper also examines various modes of drawings and their probing attributes, e.g. axonometric as intellectual eyes of the designer (D. Imbert in Treib (2008a)). These are discussed in terms of drawing examples of noted landscape architects and supporting literature as well as student works. Drawing to the literature, the paper also discusses conditions in which drawings partially/fully function as critical intellectual tools for scholarship in the field. The paper speculates a model of scholarship appropriate for the landscape discipline, in which drawing is recognized as an integral component for research. Concluding remarks investigate the cons and pros of this model in a studio setting.



## Tools to assess landscape performance: The Salvation Army Kroc Community Center Case Study

Mary Myers, Temple University, USA, mary.myers@temple.edu

Andrew Hayes, Temple University, USA, hayesandrewc@gmail.com

**Keywords:** case study investigation, stormwater, waste reduction, plant stewardship index

This presentation describes tools used to assess storm water and ecological health benefits associated with the landscape design of a 12.43 acre site in North Philadelphia, PA. The research is part of the Landscape Architecture Foundation Case Study Investigation series which seeks to develop metrics for assessing landscape performance.

Designed by Andropogon Associates, the Salvation Army Kroc Community Center (SAKC) is a recreation facility located on a contaminated brown field. The site was formerly used to manufacture pulleys, then used as a city impoundment parking lot. The new facility opened in October 2010 with recreation fields, rain gardens, porous parking lots, community farm, outdoor classroom, outdoor dining area, children's play ground and new athletic building.

**Tools:** The research team calculated storm water reduction and construction materials to quantify the benefits to the Philadelphia sewer and solid waste systems. Post construction storm water reports were examined to assess support for the claim that the site holds back 100% of the first 1" of storm water runoff. The results indicated dramatically improved post development runoff conditions. The landscape architects' innovative approach to grading and material selection prevented 17,500 tons of pavement from being land filled. Instead, the pavements were sorted, crushed and reused as base courses beneath paths, lawn and parking lot.

The Plant Stewardship Index (PSI) online calculator was used to assess the ecological integrity of the site. PSI is based on a series of calculations related to plant coefficients of conservatism numbers. PSI scores increase with the presence of native plants, specialist plants and diversity of plants. The landscape architect employed a "plant community approach" to the design, using native species representative of the fresh water wetland, forest and meadow habitats of southeastern Pennsylvania. This design approach resulted in a PSI score of 33.72, a high score for an urban site. (Urban PSI scores are typically in the 0–10 range.) However, the SAKC score is considered somewhat artificial because of the "newness" of the planting. As time passes, the site must be revisited and inventoried for the presence of exotic species.

Important lessons learned from the performance assessment is that vigilant follow up is needed to ensure that stormwater systems are operating as envisioned and that the ecological integrity of the site is maintained through identifying and managing invasive species.

## The Use of Spatial and Mixed Methods in Analyzing Cultural Landscapes

**Elizabeth Brabec**, University of Massachusetts Amherst, USA, ebrabec@larp.umass.edu

**Chingwen Cheng**, University of Massachusetts Amherst, USA, chingwen@larp.umass.edu

**Kristina Molnarova**, Czech University of Life Sciences, Czech Republic,  
kristina.molnarova@gmail.com

**Keywords:** landscape research methods, cultural landscape analysis, spatial mixed-methods

The cultural landscape is a complex phenomenon resulting from both natural-geographical and social-cultural processes. Defining the normative patterns produced by each culture and/or historical period is essential to understanding the patterns and features of the anthropogenic landscape and the inherent meaning. Currently, an understanding of both historical and contemporary patterns is developed from the qualitative analysis of a single or small number of cases. Results obtained from a single or small number of cases are inherently limited in their ability to clearly identify the pattern in a complex system, particularly when a chosen case may present an anomaly rather than the norm.

A more comprehensive and robust research methodology can be found in a population sample design using a mixed method approach including qualitative, quantitative and spatial analysis methods. While classic statistical methods are useful for quantifying objects and analyzing distribution patterns in the landscapes, qualitative methods can illuminate and interpret the cultural meanings in the patterns. Therefore, a mixed methods approach takes advantage of the strengths of applying both quantitative and qualitative methods in a sequential, concurrent, and transformative manner (Creswell 2009). Stated another way, while spatial analysis is useful in finding statistically significant relationships between objects in landscapes, qualitative analysis methods are crucial in making the spatial pattern meaningful. Combining the two into an integrated spatial and mixed method approach can provide a full analysis and understanding of the cultural landscape.

Spatial analysis has long been in use in the fields of archeology and heritage management to identify cultural patterns (Baena et al. 1998; Soltysiak and Jaskulski 1998). Based in part on these existing methodologies, a sequential and iterative, spatial mixed-method approach for analyzing settlement patterns in cultural landscapes is presented and evaluated in this paper. The methodology is applied and evaluated in two contexts: the Gullah community of St. Helena Island, South Carolina, and the pluzina patterns of medieval settlement and field patterns in the Czech Republic. The cultural landscape patterns are analyzed at the regional, community and individual household levels, using iterative applications of spatial, quantitative and qualitative methods to both individual cases and large sample sizes. The paper presents the strengths and weaknesses of single cases versus samples that are reflective of entire populations, the application of quantitative, qualitative spatial analysis methods and subsequently the benefits of a mixed-methods approach to cultural landscape analysis.

## **Revealing Landscape Value through Post Occupancy Evaluations The case study of Lowry a military base redeveloped using new urbanist principles**

**Isabel Fernandez**, SUNY ESF, USA, [icf6@esf.edu](mailto:icf6@esf.edu)

**Keywords:** Post Occupancy Evaluation, User-Designer Gap, Parks and Open Space Systems, Surveys, Interviews

In thinking about the socio-cultural, environmental, economic and artistic role public spaces will have to fulfill in the future, the post occupancy evaluations of existing spaces become a crucial step that is typically forgone. This paper presents the multi-method post occupancy evaluation of the open space system within the Lowry community in Denver, CO and five of its parks. Lowry is one of the first examples of military base redevelopments designed and built based on New Urbanist principles. It contributes to the understanding and narrowing of the gap between user perception and designers intentions (user/designer gap); and it is unique in the way it provides the dual perspective of the author as both researcher and member of the design team for the community and its parks. With approval from Cornell University's IRB board the paper includes data gathered through 183 surveys and numerous formal and informal interviews and observations with users, designers, and developers.

Findings provide evidence of users' preferred park features while identifying several gaps between design intent and user response, principal uses and user preferences of each park's design, and user suggestions for park improvements. Research also found: that park proximity is affecting the way users invest their leisurely time; and a direct correlation between the amount of time a person has lived in the community and the physical distance this person will venture to travel to get to one of its parks. The study also suggests that existing liability issues in the state of Colorado shape public spaces in ways not readily apparent to the users. Additionally the author found that completing public space observations while snow is on the ground enhances a researchers ability to analyze patterns of movement and types of activities as preserved in the layers of information this medium records.

With 30 million acres in military bases located in land-strapped regions of high real estate value and slated for redevelopment, the lessons learned from this case study can aid those communities as they craft their parks and open space systems. Furthermore, this research informs those charged with improving the quality of our built environment to conceive more humane and resilient landscapes. Therefore it is imperative to quantify this data and make it readily available to others as a way to aid in the generation of guidelines, policies and features contributing to the future role of public space within our communities.

## **Infiltration systems—A systematic comparison of functional values**

**Frank Slegers**, UMass—Department of Landscape Architecture and Regional Planning, USA, [slegers@larp.umass.edu](mailto:slegers@larp.umass.edu)

**Keywords:** Stormwater, BMP, Filtering, Bioswale, Bioretention, Contaminants

Numerous infiltration systems have been implemented in the last two decades to reduce the impact of runoff on urban watersheds. A synoptic study of their performance is missing to date. The focus of this paper is a systematic comparison and assessment of functional values of infiltration systems through a comprehensive literature review. It investigates current research on infiltration practices as BMP devices and compares their effectiveness of contaminant removal. The systems were categorized into a) stormwater infiltration systems, b) stormwater filtering systems, c) open channel systems and stormwater ponds. Each of these systems was subdivided into specific modules such as infiltration trenches, infiltration basins, sand filter systems, organic filters, bioretention systems, bioswale systems, stormwater ponds and wetlands, detention basins and other common systems like porous pavement.

The purpose of these modules is described in relationship to stormwater management and their potential to remove contaminants. Design drawings illustrate the basic and specific physical structure of the modules; a tabular overview depicts the diverging findings of contaminant removal.

The systematic approach of this study clarifies the nomenclature of infiltration systems. It allows improving the planning and evaluation of stormwater systems according to their performance. It offers a framework for further research on function and specific investigation on site.

## **Using New Technologies for the Accumulation of Representational Sediment**

**Natalie Yates**, Sam Fox School of Design and Visual Arts, Washington University in St. Louis, USA, [yates@samfox.wustl.edu](mailto:yates@samfox.wustl.edu)

**Keywords:** drawing, sketching, device, technology

Digital technology is more often incorporated during analytical and final representational stages of design process. The result is often a disconnect between the communication of the overall design intent and the oscillating process of design development which incorporates both intuitive, creative developments that create overall connections and rational, analytical methods that focus on detail. These process representations become leftover fragments—sediment of the process. This paper seeks to explore the use of new technologies and their correlation with the generative processes of sketching and drawing as an emerging method of iterative design that integrates analytical with intuitive processing styles.

The ability to design devices through DIY electronics and interpret data through open-source software allows designers access to realms that previously required more technical background. Through use of new methods to accumulate and reveal spatial, temporal, and phenomenal experience, including sensor data input, data tabulation interpretation, and the translation of analog sketches such as hand mapping, a new technique of drawing emerges that bridges the gap between the act of making as an iterative discovery process and typically product-oriented digital representation.

By embracing this access to new methods, landscape architecture has an opportunity to entwine methods of representation, imagine more responsive, adaptive, and experiential spaces, and make greater connections that can illuminate the process of design.

In addition to presentation of personal research into device development and use within the classroom for methods of design exploration, this study will examine trends of design process as they apply to both traditional representation methods, such as the works of James Corner and Sergei Eisenstein, as well as digital explorations such as those by Casey Reas, Ben Fry, and Usman Haque.

## Vertical Gardens: Patent Genealogy and Research Methods

**Laura A. Schatzman**, University of Illinois at Urbana-Champaign, USA, schatzmn@illinois.edu

**Richard L. Hindle**, University of Illinois at Urbana-Champaign, USA, rhindle@illinois.edu

**Keywords:** Vertical Garden, research methods

**ABSTRACT:** Vertical Gardens: patent genealogy and research methods This paper traces the evolution of Vertical Gardens through patent archives, from their origins at the University of Illinois in 1938 to the contemporary forms popularized by Patrick Blanc. Integral to this research is the organization of patent genealogies that trace patent citations and relationships. This research method is relevant and timely as the subject of emerging technologies in Landscape Architecture is forwarded by theories of Landscape Urbanism. While Patrick Blanc is credited for introducing vertical gardens to the architecture community, the idea of a vegetative structure is not original as revealed through mapping of complex patent citations and relationships. In 1938 a University of Illinois Landscape Architecture professor, Stanley White, filed the first known patent for vertical garden designs. This patent titled, Vegetation bearing architectonic structure and system, provides the basis for modern vertical gardens. Thirty-four patents following White's cite this original form and are known as the first generation. Each of these first generation patents were then cited in one to twenty subsequent patents resulting in 298 second generation patents. The first and second-generation patents have resulted in multiple patent generations drawing upon the earlier works. This project seeks to catalogue the patents using genealogical methods, and uses historical analysis to provide context for new designs and should help reinvigorate the development, design and construction of vertical gardens. Although a central focus of this project is to produce a patent timeline for the vertical garden, the methods proposed here suggest that patent research and legalese can provide value insights into landscape history and theory. These methods can be applied in other related studies concerned with technology in the garden and landscape.

## **The Roles of Computer Pattern Recognition in Landscape Architecture— Constructing 3D Urban Landscape with High Resolution Remote Sensing Imageries and LiDAR DATA**

**Weimin Li**, California State Polytechnic University, Pomona, USA, [wli@csupomona.edu](mailto:wli@csupomona.edu)

**Keywords:** Computer Pattern Recognition, 3D Urban Landscape, LiDAR

In Landscape Architecture, design is often considered as a process of data collection, information interpretation, knowledge development, wisdom idea creation and presentation [1]. During such a process, rational and creative decision making often heavily rely on the quantity and quality of data or information about a landscape system. In the past ten years, revolutionary improvement has undergone in remote sensing to provide high-resolution landscape data about detailed landscape features on the ground. Such mass landscape data in high quality brings both opportunities and challenges to landscape architects to successfully recognize landscape patterns from remote sensing imageries and seamlessly integrate such data into the traditional design process.

In this paper, the author seeks to discuss the roles of computer pattern recognition in landscape architecture through demonstrating how to construct 3D urban landscape with high resolution remote sensing imageries and LiDAR that are increasingly popular and accessible in recent years. There are two major objectives that the author seeks to achieve. First is to develop an enhanced comprehensive approach of measuring 2D detailed landscape settings with both high-resolution remote sensing imageries and LiDAR data. Second is to seamlessly integrate the vertical dimensional measurement of urban landscape features provided by LiDAR data to the 2D measurement of the geographic locations and shapes of landscape features to construct an accurate 3D urban landscape and simulate it in a GIS environment.

To achieve the above research objectives, the author constructed an enhanced comprehensive approach to integrate LiDAR data with high-resolution airborne and space-borne remote sensing data for the conduction of high accuracy object-based classification and 3D modeling of detailed urban landscape features. In this approach, first is an image rectification algorithm to further rectify the USGS Orthoimage with a Digital Surface Model (DSM) built with LiDAR data. Second is an automatic registration algorithm to align the unorthorectified QuickBird imagery to the DSM rectified USGS image. Third is an image segmentation process to delineate landscape objects from multi-source image pixels. Fourth is an object-based image classification to accurately match image objects with their in-situ counterparts using spectral, geometric, topological, attribute classification features from both remotes sensing data and ancillary GIS data. Fifth is the accurate measurement of erected dimension of landscape features and 3D modeling of landscape settings through geospatial modeling and geovisualization. Sixth is an assessment process to evaluate the accuracy of extraction, classification and 3D modeling of landscape features.

## **Integrating High Resolution Survey Tools for Environmental and Heritage Studies into Landscape Architectural Problem Solving Frameworks**

**Charles Yuill**, cyuill@wvu.edu, **Peter Butler**, pbutler@wvu.edu,  
**Angela Campbell**, acampbell@wvu.edu, West Virginia University, USA

**Keywords:** visualization, Lidar, heritage studies

This paper / presentation will describe ongoing efforts integrating a number of high-resolution environmental survey tools for applications in landscape architecture such as heritage resource documentation, environmental restoration and landscape characterization. The tools to be discussed include terrestrial laser scanning, airborne Lidar, and photorealistic visualizations. The landscape architecture program at West Virginia University participates in the Natural Resource Analysis Center at the University which houses instruments for gathering environmental data with ground based and airborne Lidar, as well as the integration of Lidar derived models into various visualization / geo-analysis environments. This world integrating spatial analysis with visualization and landscape planning is emerging as an area of research and practice that is often called Geodesign. Geodesign is an emerging framework for community and environmental design that attempts to adapt the outputs from various technology based data collection methods such as laser scanning and remote sensing for community level stakeholder group understanding and utilization.

The projects that will be discussed include a couple of heritage documentation efforts including Frank Lloyd Wright's Falling Water, a high-elevation heritage protection /stream restoration project, and a brownfield site located in southern West Virginia. Technical methods for data collection (with a particular focus on terrestrial laser scanning) and analysis as well as the integration of such methods into downstream planning and design efforts will be discussed.

Learning outcomes are focused on understanding the roles that high resolution survey methods using Lidar can assume in a range of environmental planning and design contexts.



## The Doctorate

**D. Fairchild Ruggles**, University of Illinois at Urbana-Champaign, USA, dfr1@illinois.edu

**M. Elen Deming**, University of Illinois at Urbana-Champaign, USA, medeming@illinois.edu

**Deni Ruggeri**, University of Oregon, USA, druggeri@uoregon.edu

**Forster Ndubisi**, Texas A&M University, USA, fndubisi@arch.tamu.edu

**Keywords:** Education, doctorate, scholarship, research

Roundtable Discussion: the Doctorate What is a doctorate in Landscape Architecture? The proposed roundtable, comprised of faculty and chairs from landscape doctoral programs, will engage in a guided discussion to explain and explore the value of doctoral education for Departments of Landscape Architecture in both practical and theoretical terms. Many departments have recently begun or expanded PhD/DDes programs, and the roundtable will ask what the doctorate provides to landscape schools, to the design profession, and to the research scholarship that guides both design and education. Specifically, how do the PhD, DDes and MLA differ? Does the introduction of the doctorate diminish the MLA's current status as the terminal field degree? Does it have the potential to enhance and add stature to the field? Should the MLA be required for the PhD? For the DDes? How does a doctorate in landscape differ from a PhD in architecture or planning (and related fields), or should these be combined at the doctoral level, where there is no professional accreditation and no need for preparation for licensure? The purpose of the roundtable will be to share ideas and information among existing institutions with doctoral programs, and also to explain the purpose of the doctoral degree to attendees who may be considering it for the future.

Participants will include landscape faculty who direct doctoral programs as well as faculty in doctoral programs who have obtained doctorates.

## The Watershed Atlas Project

**Brian Lee**, University of Kentucky, USA, blee@uky.edu

**Corey Wilson**, University of Kentucky, USA, wilcorey@gmail.com

**Keywords:** Landscape Characterization, Geospatial Methods, Publicly Available Data

This interactive presentation demonstrates an approach that utilizes publicly available geospatial data to visualize landscape indicators to describe watersheds. Initial grounding for this work can be found in Jones et al. (1997). By viewing the landscape from a watershed perspective, this atlas is intended to present an understanding of land use management decisions, as well as insight into how those decisions impact waterways and water. This project used the Hydrologic Unit Code (HUC)14 watersheds as the fundamental unit of analysis. Each of the 9,109 HUC14 subwatersheds spanning 13 river basins was characterized using over 40 indicators.

The atlas is divided into six sections by the following themes: Geographic Introduction, Geomorphic, Human, Vegetative, Riparian, and Specialty Indicators. An indicator glossary is included to provide source information and a description of each analysis. The geographic introduction section provides base information to introduce the basin and its subwatersheds and waterways in the context of notable landmarks. The second section provides a geomorphic watershed characterization that focuses on data attributes such as size, elevation, aspect, terrain, etc. Section three addresses the human modified aspects such as impervious cover, impervious cover change over time, and roadways in relationship to water resources, etc. Section four details the vegetative land cover of the watersheds with specific indicators focusing on percentage of agriculture and forest, as well as the relationship of agriculture on land slopes of three-percent and greater. In addition, this section characterizes changes in land cover type that occurred between 2001 and 2005 as well as 2001 and 2006. Section five focuses on stream and riparian area characteristics, and section six focuses on specialty indicators such as pollutant discharge elimination system points and regulated dams.

The primary benefit of characterizing the landscape from a watershed perspective is the ability to recognize the human influenced impacts using a flexible data approach (Hawkins et al., 2000; Patil, 2002). This atlas can be used as a tool to identify landscape characteristics that are relevant to land management decisions particularly when water resources are concerned. For example, when watershed plans need to be made to reduce nutrient loading or identifying restoration potential (USEPA, 2005). A watershed-based approach for making decisions requires cities, counties, and states to recognize that though they may appear to be distinct entities, ecological features and processes connect them. This is an inherent argument for land decisions to be made with watershed characterizations in mind.

## The Role of Parametric Design in Landscape Architecture

Stuart Jones, University of Georgia, USA, 12smj@uga.edu

**Keywords:** Grasshopper, Parametric Design, Architecture, digital fabrication, Biodynamic, Emergence, Landscape Urbanism

This paper will outline the importance and potential role of parametric design in landscape architectural practice. It is imperative that landscape architects have at least a cursory understanding of the role of parametric design and digital technology in order to better communicate with the allied design professions.

Parametric design is increasingly being used in architecture but is underutilized in landscape architecture. While architects have been creating advanced constructions with parametric tools for over a decade, landscape architecture has been slow to embrace the technology. Although many of the architecture applications of parametric design apply to skins, apertures, and building form, some designs are beginning to touch on landscape-based applications, such as the effect of walls on the pooling of water on a surface. Parametric tools can be used for a variety of landscape applications, from increasing daily productivity by reducing repetitive tasks to exploring ecological urbanist theories of adaptive landscapes. Through the use of parametric design, architects are finding new roles at the design table for ecologists, psychologists, biologists, and other non-design professions.

This paper discusses parametric design tools through the use of articles, books, built projects, and personal experience with parametric tools. While parametric tools offer a powerful and exciting future for landscape architecture, the software may be too radical a departure from traditional design programs to interest many landscape architects.

## Viable Agricultural Solutions

William Tietje, Louisiana State University, USA, wtietj1@gmail.com

**Keywords:** Viable Agricultural Solution

The rural American farm is structurally defined by the United States Farm Bill. The policies and programs outlined in the bill influence the economic and cultural viability of the productive farm and directly shape the form and function of the land. This project investigates the systems, spaces, and products privileged by the legislation and speculates on the embedded potential to rethink productivity in urban and suburban landscapes using a systems-based approach to transformation.

The growing movement towards urban agriculture has primarily focused on the discrete community garden, with little attention given to the collective spaces available within suburban and urban networks. This project examines the model of a rural farm, in particular, the systems and phasing strategies that allow this type of farm to be viable. Today, the structure of a typical rural farm reflects the systematic response to the US Farm Bill. Under the new policy farmers were pushed to “get big or get out”, this political shift caused a rise in major corporate agribusiness and a decline in the financial stability of small family farms.

This project draws on a 460-acre crawfish, rice, and soybean farm in southwest Louisiana as the model farm. Because the Farm Bill has pushed site specificity out of the farm equation in favor of commodity crops and high levels of productivity, how can these rural strategies of maximization and flexible land use be translated to the suburban and urban environments to test for new spatial typologies.

The crops of the model farm are unique to its region; once choosing the appropriate urban/suburban sites, the value of each typology was weighed by carefully studying the structural and cultural relationship of the specific communities. One application focuses on the process of shared community farming, thereby creating a dialogue between community and productive goals. While another application responded to the contextual specificity of each neighborhood and how agricultural production would be evolved within cultural, spatial, and social norms.

The cultural, economic, and political changes within each of the sites through the different applications would be the biggest change. Understanding of the quantifiable farming practices allows the landscape architect to take a new roll and break past conventional spatial practices. With a viable agricultural solution to the new structural organization of the farm one could begin to understand the implications and effects that new modes of agriculture may have to cultural, economic, and political issues.

## **Quantifiable landscape performance benefits: The case of the Kresge Foundation Headquarters**

**Byoung-Suk Kweon**, kweonb@umd.edu, **Christopher D. Ellis**, cdellis@umich.edu, University of Maryland, USA

**Sarah Alward**, Conservation Design Forum, USA, sarah.alward@gmail.com

**Robin Burke**, University of Michigan, USA, rburke@umich.edu

**Keywords:** Landscape Architecture Performance, Quantifiable Benefits, Social, Psychological and Environmental Benefits

The Landscape Architecture Foundation (LAF) has been documenting the environmental, economic and social benefits of high-performing landscape projects. Kresge Foundation Headquarters—one of the Case Study Investigations published in the LAF Landscape Performance Series—was designed by Conservation Design Forum. This innovative sustainable design reflects the mission of the Foundation which is to promote the well-being of mankind by supporting sustainable innovation. For eight weeks during the summer of 2011, in collaboration with Conservation Design Forum, we quantified social, environmental and economic benefits.

Our methods included the quantification of rain water infiltration, drinking water conservation and carbon emissions. We also measured changes in surface and air temperatures throughout the day for lawn and prairie, asphalt, permeable parking, green roofs and a high-reflective roof. Maintenance costs were calculated for the extensive native prairie plantings and compared with the costs of maintaining a traditional lawn and garden. Social benefits were quantified in part by an earlier post-occupancy evaluation of the building but were re-evaluated for landscape performance measurements.

The Kresge design was found to increase satisfaction and restorative benefits with 87% of their employees reporting that they were satisfied with the design of the exterior grounds, including plazas, landscape, and outdoor seating areas. Sustainable design solutions promoted environmental awareness and stewardship by introducing Kresge's many visitors to the site's native plantings and stormwater management practices.

Sustainable landscape design solutions produced many environmental benefits as well. Sustainable stormwater solutions allowed 1.7 million gallons of rain water to recharge groundwater (64% of average annual rainfall). In other words, the site absorbed all water from storms up to 0.86 inches in 24 hours. Also, the use of native vegetation eliminated the need for potable water in irrigation, saving over 1 million gallons of water and \$6,400 per year. Native landscapes saved \$30,500 in maintenance cost each year, when compared to maintaining the same area as a traditional perennial garden. Local surface temperatures were reduced by using prairie plantings instead of turf grass (average decrease of 12.1°F), light-colored permeable pavers instead of asphalt (average decrease of 5.4°F), and green roof and high reflectance white roof instead of traditional roof surfaces (average decrease of 4.7°F and 10.5°F respectively, as compared to asphalt).

Quantifying the benefits of landscape architecture projects provides powerful evidence of the value of design and enables the comparison of different design solutions. This will ultimately lead to improved communities for people and better functioning physical environments.

## Measuring Landscape Performance at Uptown Normal Circle and Streetscape

**Christopher D. Ellis**, University of Maryland, USA, cdellis@umd.edu

**Byoung-Suk Kweon**, University of Maryland, USA, kweonb@umd.edu

**Robin Burke**, University of Michigan, USA, rlburke@umich.edu

**Sarah Alward**, Conservation Design Forum, USA, sarah.alward@gmail.com

**Keywords:** landscape performance, stormwater, carbon sequestration, sustainability

Quantifying the benefits of design provides a basis for communicating the value that design brings to non-designers and the general public. The Landscape Architecture Foundation Case Study Initiative and Landscape Performance Series is building a knowledge base of quantified design benefits to provide decision-makers who impact public policies, programs, investments, and land development with information they need to effectively move communities toward sustainable design solutions. This paper describes the methods and results of quantifying the benefits of Uptown Normal Circle and Streetscape designed by Hoerr Schaudt Landscape Architects for the city of Normal, Illinois.

At the heart of the Normal Uptown Redevelopment Plan is a roundabout and town green that incorporates stormwater management and public recreation into a central public gathering space. Runoff from two streets is captured, stored, and recycled through a water feature that makes stormwater management a visible public amenity. This saves \$7,600 annually in potable water costs by capturing 1.4 million gallons of stormwater from a 58,800 sf area and reusing it in the water feature and for irrigation. It also improves water quality in the fountain by removing an estimated 91% of total suspended solids, 79% of total phosphorous, and 64% of total nitrogen from stormwater with each pass through the sand, UV, and bog filter system.

The streetscape includes tree wells with uncompacted soils that add to stormwater storage and prolong tree life, increasing carbon sequestration. An additional 1.4 million gallons of stormwater is prevented from entering the municipal storm sewer by directing runoff from sidewalks into tree wells and planter areas augmented by underground structural cells. The use of structural cells is expected to save \$61,000 in tree purchase and installation costs over 50 years by more than tripling the expected lifespan of street trees from 13 to 50+ years. The 104 new tree plantings are estimated to sequester at least 10,790 pounds of carbon annually.

Other quantified benefits include reductions in traffic accidents, increases in property values and the generation of revenues from increased non-resident visits to Normal directly tied to the design of the circle and streetscape.

The presentation of this paper will focus on the methods used to estimate each of the benefits quantified. These include interviews with public officials, reviewing documents provided by the landscape architects, and forecasting with tools provided by the USDA Forest Service, the National Cooperative Highway Research Program, and peer-reviewed scientific reports.

## Living Shoreline Design for Residential Properties

**Michael Boeck**, mboeck@umd.edu, **Christopher D. Ellis**, cdellis@umd.edu,  
**Byoung Suk Kweon**, kweonb@umd.edu, University of Maryland, USA

**Keywords:** Living Shoreline, Residential, Chesapeake Bay, Shoreline, Erosion Control

This presentation evaluates residential living shoreline projects in the Chesapeake Bay area. Implemented living shorelines are evaluated for how well they maintain the expected benefits of owning waterfront property while providing transition space between the built and natural environment. The results are used to identify effective design features and gaps in existing models, and to improve standards for implementing residential living shorelines.

Residential development of shorelines affects the interaction between water and land by removing naturally occurring marsh and wooded areas and accelerating shoreline erosion. Engineered erosion control methods such as revetments and bulkheads sever the relationship between water and land. There is no functional transition between the built and marine environments. Living shorelines are hybrid erosion control methods that employ stone groins to reduce wave action and trap sediment. Within these groins, transitional marshes are constructed which provide habitat for animals, insects and fishes. They serve as a constructed ecotone between the natural and built realms.

Protection and regulation of shoreline buffers is the responsibility of the Maryland Department of Environment (MDE) and the Critical Areas Commission (CAC). The Critical Area Commission goals are to:

- Minimize the adverse effects of pollution from point source and runoff on water quality
- Conserve fish, plant and animal life in Maryland's critical areas
- Establish growth accommodating land use policies that address human impact on critical areas

Owners of waterfront property desire access to the water, beautiful views, and protection from erosion. But what are the best ways to design this transition space between the built and the natural environments? The three goals of the CAC do not consider maintaining the benefits of living near the water that homeowners expect nor concerns over the high costs of mitigation and maintenance.

Research questions include: How well do living shorelines serve as visual and ecological transitions? Do they support the expected benefits of owning waterfront property?

These questions are investigated through case studies. Completed residential living shorelines and another under construction are examined. The owners and designers of each property are interviewed to investigate their motivation for owning waterfront property and to determine how well living shorelines meet their needs. In addition, a visual preference survey helps determine preferred design elements for residential living shorelines. Any perceived ecological benefits pertaining to case study sites will also be recorded.

# **Service Learning & Community Engagement**



## Hands-On Design for Hands-On Learning

**Peter Butler**, peter.butler@mail.wvu.edu, **Ashley Kyber**, cyberkyber@gmail.com,

**Angela Campbell**, angela.campbell@mail.wvu.edu,

**Kathryn Wittner**, kathryn.wittner@mail.wvu.edu, West Virginia University, USA

**Keywords:** Community Design, Participation, Design Process, Outdoor Learning

Context: Wyoming County in southern West Virginia is an economically and ecologically compromised area long dependent on extractive industries. Public space for recreation, community building and education is dwindling as non-resident landowners, controlling ninety percent of predominantly forested landscapes, continue a trend of physical enclosure and controlled access to previously quasi-public areas. In particular, children lack local access to the experience of nature and the ability to interact with their environment within an educational setting. Identifying opportunities and devoting space for outdoor learning, especially in STEM fields, is a concern of local educators who desire project-based learning opportunities to increase student interest, motivation and performance (Dillon et al., 2003; Fortus, Krajcikb, Dershimerb, Marx, & Mamlok-Naamand, 2005 and DfES, 2005).

Community Partners: This project, the design of a two-acre community space/outdoor classroom for Wyoming County high schools, brought together local youth, private industry, and non-profit and academic groups to envision and design an outdoor classroom at a site along Indian Creek, equidistant between East and Westside high schools. Faculty and students from West Virginia University (WVU) landscape architecture and environmental design program joined with WVU Extension's local 4H, Friends of the Earth (a high school environmental club), Groundwork Wyoming County (a local non-profit), and the Upper Guyandotte Watershed Association to develop a vision for site development to be funded by the private landowner Cliffs Natural Resources, a significant local employer.

Process: Stakeholder meetings identified developing themes, issues, physical changes/elements, and potential activities/engagement/program for site design. High school students attending 4H camp were then offered the opportunity to participate in the design process. On day one of a two day workshop WVU faculty and students led the self-selected group of fourteen students through a variety of onsite activities with specific themes: ecology, experience/geomancy and culture. Specific products were created in each track. The second day of the workshop began with an introduction to design process, abstraction, archetypes and environmental psychology. The products of day one's activities guided design teams in sketching out conceptual plans for presentation at the end of the workshop. Faculty then worked to produce a singular conceptual design for the project integrating the richness of the youth's contributions.

Conclusion: The design process and local partnerships created during this project will serve as a model for a statewide project in promoting outdoor education, STEM, and sustainability through participatory action research, cultivating stewardship in local youth.

## RE-creating Home, Place Making for the Displaced

**Daniel Winterbottom**, University of Washington, USA, nina@u.washington.edu

**Keywords:** Homelessness, service, design/build, participatory design

Homelessness is growing in the United States. In 2010, the homeless population was estimated at 700,000. (1) In Guatemala, in the wake of civil war, the number is much higher; 500,000 to 1.5 million displaced persons, most living in or near Guatemala City. (2) Most suffer from profound social, educational and physiological deficits. The organizations we partnered with believe that supportive, accessible and appropriate environments help to foster a less difficult transition from nomadism to stability and from alienation to re-engagement. Through these projects we attempted to address the complex issues of home and homelessness by easing the transition by increasing the opportunities for social interaction and support, developing healthy culturally appropriate family friendly spaces and offering opportunities for improved parenting skills, community cohesion and the physical and psychological health of residents and staff.

Partnering with two homeless advocacy organizations, Safe Passage in Guatemala and Catholic Community Services in Seattle, the University of Washington Design/Build Program created three projects that begin to probe the issues raised above. The projects serve two distinct communities, one in Guatemala City, Guatemala, the other in Seattle, Washington. In both, community engagements, reflection and dialogue were used to develop the program, define appropriate activities and determine what aspects of culturally appropriate design would be desired. In one of the projects the community participation continued through the construction process as residents participated in the actual building. The projects have been evaluated using interviews with the non-profit partners, surveys of the residents and anecdotal responses from the users. The effects on the students have been evaluated using written survey data.

The author will describe each community, the engagement and design processes used and how the resulting information informed the strategies used in each project to ease the transition from homelessness to stability. An assessment of the impacts and outcomes will be offered based on going research including a survey with the residents and staff to assess the design's role in addressing homelessness and the impact of the project on the student's involved.

## Building Public Domain: Service Learning and Public Transit

**Hans Herrmann**, Mississippi State University, USA, hh289@caad.msstate.edu

**John Poros**, Carl Small Town Center, Mississippi State University, USA,  
jporos@caad.msstate.edu

**Keywords:** Transit, Civic, Infrastructure, Native American, Service Learning

As public funding is made available for transit infrastructure development, all too often is it used in the most practical, i.e. the lowest first cost, and most “productive” way. The definition of productive should be a contested point when design and implementation are considered. Communities have fallen victim to a definition of productivity that contains only the economic component of this much larger conception.

This paper will outline how a university based community design and planning center and a fourth year architectural design studio worked with a local Native American tribe to help define a multifaceted “productive” infrastructure. The project, to assist in the development of a strategic rural transit service enhancement plan and system infrastructure design and branding platform, was brought forward by the Mississippi Band of Choctaw Indians. As a way of developing a planned approach to the Choctaw Transit system, Public Surveys of ridership and Patron Satisfaction were undertaken. Local employment centers were interviewed to reveal shift schedules and worker demand and numerous working sessions were held with public officials to understand existing community growth strategies. These findings along with GIS analysis of census data, existing infrastructure and transit routing, were compiled into a planning document that was adopted by the MBCI. With components of the plan adopted for over 2 years this paper will consider the short-term outcomes via ridership analysis and Choctaw Transit Administration satisfaction reports.

The student work outlined in this paper will demonstrate an effort to define productive with regard to public works and the public domain. By designing and locating a prototype bus stop/public pavilion in the small Tribal community of Bogue Chitto, MS, students attempted to seed an important and increasingly relevant principle. We (Americans) must consider our building practices, our environment and individual constructive efforts as communally important. The use of public moneys to fund the development of a civic infrastructure<sup>1</sup> must be the priority in design, planning and construction. This project not only attempted to build a physical infrastructure, in the productive sense, but also the civic infrastructure, i.e. relationships, communications, and shared visions needed to make a community thrive.

It is the intent of this work to demonstrate that even a small example of socially-minded design can have a lasting effect on the way communities move ahead in growing their built environment.

## Adapting Transdisciplinary Action Research to Collaborative Design of Multifunctional Rural Landscapes

**David Pitt**, pittx001@umn.edu, **Carissa Schively Slotterback**, schiv05@umn.edu, **Nicholas Jordan**, jorda020@umn.edu, **David Mulla**, mulla003@umn.edu, **Kristen Cadieux**, cadieux@umn.edu, University of Minnesota, USA

**Keywords:** transdisciplinary action research, collaborative stakeholder design process, landscape performance modeling, landscape visualization, multifunctional rural landscapes

Transdisciplinary action research (TDAR) seeks the construction of new knowledge through collaborative work: a) among scholars from multiple disciplines; b) between scholars and community based perspectives; and c) among community organizations at diverse geographic scales. It presumes use of participatory action research toward the resolution of community issues (Stokols 2006, Thering and Chanse 2011). This presentation develops a conceptual transdisciplinary framework to engage diverse sets of stakeholders collaboratively in constructing and evaluating alternative multifunctional landscape scenarios that produce a diverse array of ecosystem services. Created by investigators from the disciplines of hydrology, geography, and agroecology as well as landscape architecture and planning, the framework allows stakeholders to employ communicative and reflective decision making processes (P) and multi-media communication modes (C) to consider multiple types of information (I) about landscape performance in an process of scenario design and evaluation (Jordan et al. 2011).

Using information about landscape performance (e.g. SWAT modeling of hydrologic flow and water quality) and experience (e.g. Community Viz, SketchUp, and Google Earth static and dynamic depictions of landscape appearance), the CIP framework enables conduct of an iterative process of proposing and disposing of alternative scenario design ideas (Lyle 1985). It facilitates dynamic and multivariate examination of questions relating to the effectiveness of various types of information (I), modes of communication (C), and decision-making processes (P) on collaborative multi-stakeholder design and evaluation of multifunctional rural landscape design scenarios. Effectiveness is evaluated by modeling the performance of landscapes created by the collaborative design process and by monitoring stakeholder engagement in the process.

Two cases illustrate the use of CIP in exurban and rural landscape design in Minnesota. The first examines the framework's use by diverse public and private interests in establishing future direction for land use planning in an exurban township. Using the CIP framework, stakeholders constructed and evaluated a consensus landscape conservation plan, four development scenarios framed around the plan, as well as implementation policies. The second case presents on-going work with stakeholders in two Minnesota River valley watersheds. A CIP-based collaborative rural landscape design process seeks to meet total maximum daily loading (TMDL) goals for water quality improvement while also producing sustaining ecosystem services related to biodiversity and provisioning services related to production of food, cellulosic biofuel commodities, and scenic amenity values.

## Toward a New Paradigm: The Role of the General Systems Theory in Design Teaching and Learning

Safei Hamed, Chatham University, USA, shamed@chatham.edu

**Keywords:** design education, general systems theory, design studio

In spite of the fluid and creative nature of the design thinking process, the human mind ultimately follows a certain path. Therefore, one can argue that we can articulate, document, and systematize this process. Without such efforts, landscape design cannot be taught or researched. Further, some scholars argue that the optimum contribution to the design paradigm could eventually come from innovative applications of the General Systems Theory (Hamed, 2003). The idea of the whole as more than the sum of its parts is as old as Aristotle. It asserts that there are characteristics of systems that are homologous to all systems, simply because they are systems. Complementing this pedagogy, system ecologists acquainted with landscape architecture suggest that good design teachers should be immersed in environmental sciences and ecology (Giles, 1971).

To verify the validity of these propositions, this paper will assess a model conceived by the author and was applied in a number of landscape design studios on different programs between 2001 and 2011. The structural concept of this model is based on the solid grounds of general systems theory as suggested by Bertalanffy (Bertalanffy, 1948). The model comprises six components:

- Context: The limit of the system is the field of landscape design as it has been developed since the turn of the 20th century.
- Outputs: A number of developed site design schemes produced by students.
- Inputs: Information regarding the site, the users, and the program.
- Process: This consists of a number of related sub-processes including the traditional inventory, analysis, and synthesis cycle and its associated techniques.
- Feedback: These are validating, monitoring and adaptive processes. An effective feedback subsystem may include a data bank that stores comprehensive Post Occupancy Evaluation (POE) studies stressing reliability indices, valid sampling, and adequate reporting.
- Feed forward: Designing to assure the future proposed schemes are “most right” or maximally suitable over the long run. It is predicting the best estimates of future conditions and bringing them as inputs to the system based on our processed experience and cumulative wisdom. These include “Best Practices” publications, which are growing in numbers, developing in quality, and continually integrating new knowledge.

In this dynamic model, all six components are interactive. If this new model is accepted by academic communities, teaching design may need a major paradigm shift.

## Testing the efficacy of meaningful community participation in water resource management in Mazomanie, WI

**Bradley T. Vowels**, University of Wisconsin–Madison, USA, vowels@wisc.edu

**Keywords:** Participation, Community Design, Community Engagement, Grounded Theory, Constant Comparative Analysis

Government mandates often require public participation when developing community plans and there are many participation strategies available for design practitioners working to gather public input. Little research, however, has explored the relationship between meaningful participation strategies (those practices which excite and motivate participants) and useful participation strategies (those practices that inform and guide decision makers). This research evaluates the efficacy of common participation strategies to determine a relationship between meaningful participation and useful participation.

This case study was conducted in partnership with the Water Resource Management Practicum (WRMP) in the Nelson Institute for Environmental Studies at the University of Wisconsin—Madison. WRMP students acted as design consultants studying a small community lake and surrounding open space. WRMP students worked closely with community stakeholders including local and regional government officials, members of local organizations, adjacent landowners, and residents of surrounding towns and villages to organize meetings and conduct their study. Interactions between stakeholders and WRMP students at meetings and other events provided a way to elicit information to include for the final planning recommendations. In the final report, WRMP students suggested a variety of methods consistent with the community's wishes to improve water quality and the associated open space configuration.

The research was conducted in three stages. First, empirical evidence was gathered and documented during public meetings and focused on stakeholder-consultant interactions. Second, on-line surveys were given to WRMP students after each meeting to evaluate their perception of useful participation strategies. Third, stakeholders were interviewed two weeks after each meeting to evaluate their perception of meaningful participation strategies. In total, 13 WRMP students completed 28 surveys and 8 interviews, while 18 stakeholders completed 49 interviews. Interviews and survey responses were coded using the grounded theory method, a systematic generation of themes, or codes, from qualitative data.

Interview and survey response analysis shows relationships between the stakeholder and consultant groups and their perception of meaningful and useful public participation strategies. Definitions of the terms meaningful and useful emerged from codes used to analyze participant responses describing each participation strategy. A Stakeholder-Consultant Opinion Matrix was developed to visualize the relationship between meaningful and useful public participation strategies. Participation methods described as useful by the consultants were not always meaningful to stakeholders and vice versa. The results may guide design consultants using participation strategies in professional and academic environments.

## Building a Bridge Between Theory and Practice One Project at a Time: Lessons Learned from Collaborative Design Studios in North Texas

Taner R. Ozdil, The University of Texas at Arlington, USA, tozdil@uta.edu

**Keywords:** Service Learning, Community Partnership., Design Education, Pedagogy, North Texas

There is a longstanding perception and criticism in architectural and planning fields that a disconnect exist between theory and practice (Butin ed., 2010; Hoyt in Hardin et. al. ed., 2006; Seidel et. al. 2006). This gap commonly attributed to the heightened concentration of academic institutions to theoretical and pedagogical issues and to the focused pragmatic concerns of professional practice on immediate human conditions and needs. On the contrary, unlike many other disciplines, the very nature of design and planning fields require seamless continuation between the understanding of theoretical concepts and its applications to human issues, settlements, and needs.

Service-learning or partnership projects are educational approaches adopted by the architectural and planning schools that combine conventional academic instruction with participation in direct, meaningful community design and service. They are designed to develop critical and reflective thinking skills and to promote a sense of civic conscientiousness and commitment to the community while creating visionary solutions for communities and meeting their needs through the service projects conducted (Artunc et. al., 2009; LSA, 2010; CCSL, 2010).

The purpose of this research is to have a systematic review of five advance level graduate studio projects taught by the presenter within the past three years in North Texas and to discuss their educational and professional value from instructor's, clients, and students' perspectives. The projects selected and reviewed include but are not limited to; mixed-use developments, town centers, residential neighborhood improvements, master planned communities, parks and open spaces design and planning projects with five different partners repressing private sector, educational institution, municipally, non-profit, and community collaborators/clients to assess their varying value in bridging theory and practice. As a secondary outcome the presentation also attempts to shed some light on the questions of: What type of community design and planning problems produces partnership opportunities in education and/or research? Why academic institutions should partner with others to conduct community based design and planning projects? How partnership projects may influence future educational theory and professional practice in landscape architecture?

In conclusion, this evaluation is not only illustrates the varying roles of different partnership projects to develop critical and reflective thinking skills valued by both academy and practice, but also informs instructors, student, and clients about the opportunities and constraints surrounding such collaborative efforts. The research also makes additional inferences on how to use the knowledge base of local institutions and professionals in addressing various design and planning concerns of communities.

## The Scholarship of Transdisciplinary Action-Research: Follow-up and Next Steps

**Susan Thering**, sathering@wisc.edu, **John Sheffy**, jjsheffy@wisc.edu,  
University of Wisconsin–Madison, USA

**David Pitt**, University of Minnesota–Minneapolis, USA, pittx001@umn.edu

**Vikki Chanse**, University of Maryland, USA, vchanse@umd.edu

**Olaf Schroth**, Centre for Interactive Research on Sustainability, Canada, schroth@interchange.ubc.ca

**Burcu Yigit Turan**, Ball State University, USA, bturan@bsu.edu

**Keywords:** Action-Research; Community-Based Research; Participatory; Transdisciplinary

This pre-arranged session is a follow-up to the 2011 special issue of *Landscape Journal* and the related papers, panel presentations, and discussions that took place during CELA 2011. That multi-disciplinary multi-year international partnership effort firmly establishes a leading role for the planning and design professions in the “The Scholarship of Transdisciplinary Action-Research.” This scholarly paradigm carves out a multi-faceted research program that responds to persistent critiques about the scope, impact, and rigor of community-based participatory approaches to planning and design.

Panelists will briefly present a) updates to TDAR scholarship they presented at CELA 2011; b) additional TDAR scholarship they have begun since that time; and c) reflections and insights they have gained about TDAR scholarship in landscape design and planning. Participants in last year’s discussion will present updates on the “action items” that were generated during the wrap-up session.



## Agroecological Service Learning: Linking Beginning and Experienced Farmers to Build Capacity for Sustainable Agriculture

John Sheffy, University of Wisconsin–Madison, Nelson Institute for Environmental Studies, USA, [jjsheffy@wisc.edu](mailto:jjsheffy@wisc.edu)

**Keywords:** Agroecology, service learning, transdisciplinary action research, sustainability

The sustainability of agriculture, food security, and food systems have all become critical issues in recent scholarship, policy, and social movements worldwide. Two key aspects of these debates are how to help transitioning farmers develop more sustainable practices and how to encourage more beginning farmers. This paper reviews the literature on agroecology, service learning, and transdisciplinary action research approaches to building capacity. I suggest a model of Agroecological Service Learning as an effective transdisciplinary action research approach to building partnerships between transitioning and beginning farmers, academia, government agencies, and community organizations for sustainable agriculture. Following the Social, Economic, and Environmental Design (SEED) certification framework, I present three case studies of Agroecological Service Learning projects in Kenya, Mexico, and the United States from 2006-2010 based on interviews, participant observation, and document reviews. I conduct a meta-analysis of the case studies to link them to themes from the literature review surrounding participatory development, technology transfer, and empowerment. This methodology produces substantive and procedural theory about participatory processes for sustainability, which are relevant to other sustainable design projects.

Agroecology provides principles and methodological structures to improve the technical capacity building aspects of service learning, while service learning provides empowering partnership building processes to improve the social capacity building of agroecology. Agriculture education is transitioning from farmer training programs that rely on top-down transfer of specific technologies and skills, to capacity building programs for sustainability that utilize holistic principles of agroecological analysis (Warner 2008, Briner et al. 2006). Agroecology emphasizes contextually rooted, farmer-centered approaches to capacity building that view farmers as dynamic knowledge producers and decision makers, rather than technology end users. Building capacity for sustainability involves breaking down hierarchical information flows and relationships and rearranging them into multifunctional, mutually respectful and beneficial partnerships that are ideal settings for service learning (Jordan and Mercer 2005, Schneider et al. 2009). Similar to agroecology, service learning is evolving from being centered primarily on academia towards community-centered approaches, although the tools and methods to do so remain under construction (Blouin and Perry 2009, Stoecker and Tryon 2009, Kelshaw et al. 2009). The results of this research suggest that there are synergies created by the Agroecological Service Learning combination that enhance capacity building for sustainable agriculture by creating new partnerships between farmers, students, community organizations, and universities. This can be a model for the design of other sustainability projects.

## Climate Change Mainstreaming in Landscape Planning

**Olaf Schroth**, schrotho@interchange.ubc.ca, **Ellen Pond**, epond@interchange.ubc.ca,  
**Laura Cornish**, laura.m.cornish@gmail.com, **Stephen Sheppard**, Stephen.Sheppard@ubc.ca,  
Collaborative for Advanced Landscape Planning / UBC, Canada

**Keywords:** landscape planning, climate change, transdisciplinary action research, case study method

The presentation will focus on the results of a multiple-case study of five landscape-related planning processes in the Greater Toronto Area, Metro Vancouver, the Calgary/Elbow River watershed, and Clyde River, Nunavut. The study shows that new landscape architecture and planning approaches are appropriate to local climate change mitigation/adaptation. Such methods include: site-level design-oriented approaches; participatory 3D landscape visualization approaches for contentious issues at neighborhood to city scales; and regional model-based approaches.

**Methods:** Cases differed with regard to landscape types (urban, suburban, rural, Arctic), scale, the nature of climate change impacts, and mitigation/adaptation measures. For evaluation, the study builds on the scholarship of Transdisciplinary Action Research (TDAR), discussed at CELA 2011 (Thering and Chanse 2011) and the case study method (Francis 2001). Key instruments were 1) a cross comparison and 2) a longitudinal evaluation. In each case, researchers interacted with local stakeholders in up to two workshops per year, and data collection took place in three steps: 1) Case study researchers summarized their observations in annual reports for 2009 and 2010 and provided additional text and visual documents from the planning processes. 2) A shared one-day workshop with 12 researchers from all five cases was held in Toronto in May 2011, where all planning processes were summarized, mapped, and compared. 3) In 2011, researchers handed out longitudinal post questionnaires to key stakeholders in their case study areas asking them to assess the planning processes. Geographical scale, analytical scope, organizational scope, and time (Stokols 2006) guided the qualitative data analysis and the cross-case comparison, finished in summer 2011; the longitudinal evaluation is still ongoing with 20 questionnaires returned so far.

**Results:** The cross-case comparison confirms Quay (2010) who suggested iterative planning cycles, cross-scale work, and flexibility as principles for climate action planning. The study provides new insights into Kok and de Coninck's (2007) argument about "climate change mainstreaming": Water management and housing became effective means of climate mitigation/adaptation. However, the study also shows that it is a difficult challenge to communicate the (often uncertain) long term climate change impact and that current planning instrument are not always suited for interdisciplinary climate change mainstreaming. There has not been any longitudinal evaluation of climate action planning in Canada yet and this novel research focused on the role of "change agents". There is evidence that TDAR supported local change agents in their wider efforts in climate mainstreaming and therefore, foster resilient capacity building.

## Evaluating the Design and Planning Impacts of the Arlington Urban Design Center: Clients Perspectives

**Yunhui Zhou**, University of Texas at Arlington, USA, yunhui.zhou@mavs.uta.edu

**Taner R. Ozdil**, University of Texas at Arlington, USA, tozdil@uta.edu

**Keywords:** Design Center, Service Learning, Community Partnership, Evaluation, Arlington, Texas

In North Texas, recognizing the potential benefits of combining community service and outreach, three design centers in Arlington, Dallas, and Oak Cliff were established since 2009. Two others are also in the process of being established in Waco, and Fort Worth. Similar to their counterparts across North America, these centers were established to provide services to clients by benefiting from the resources of partnering institutions.

Although design centers are broadly reviewed in the literature (Hardin et al., 2006; Forsyth et al., 1999), there is limited understanding of their role from the clients' perspectives. Porter et al., by referring to others, indicates that much of the research in the U.S. on service-learning focuses on the impact of its activities on students, while "...the impact of service-learning on the community has not been sufficiently studied" (Porter et al., 2008, p.1). Given their increasing representation across North Texas, there is a need and opportunity to better understand and evaluate their potential impacts.

This research focuses on the first design center, the Arlington Urban Design Center (AUDC), established in North Texas to evaluate its impact by assessing its' benefits to clients who used its services over a three-year period. The research also reports on other stakeholders' perspectives (city planners, university faculty, and student interns) to further elaborate on the AUDC's design and planning mission.

This research primarily follows qualitative research methods (Taylor et al., 1998) and evaluation techniques (Rossi, et al., 1993) to analyze and assess the clients' perspectives on design and planning impacts of the AUDC through completed projects since 2009. Nineteen interviews were conducted with various stakeholders. Systematic review of the City of Arlington archives of over 70 projects along with observations on five constructed projects was conducted as supporting procedures to document and illustrate the type of design and planning activities undertaken by the AUDC.

The results of the study illustrate that the AUDC produce positive results for all stakeholders. The clients held positive attitudes toward the AUDC, and they believe it brings effective design and planning strategies to the city and its residents. It is also noted that while most of the clients concentrate on the design and planning outcome of the projects reviewed, other stakeholders put emphasis on the educational and service impacts of the program. The results illustrated that understanding clients' perspectives is needed not only to benefit the AUDC but also various design centers across the region.

## Can we improve Listening skills prior to engaging Community Design

**Barry Kew**, Penn State, USA, [bwk2@psu.edu](mailto:bwk2@psu.edu)

**Keywords:** Service Learning, Antithesis, Listening

Service learning is seen to enhance student educational outcomes, foster citizenry and develop more equitable society; however theorists suggest there can be limiting community impact based in part by narrowed perspective of service learners (Butin 2003). Will improved listening and understanding alternative perspectives enable service learners? In the context of a community planning studio, an exercise to recognize skill in listening, observation, and relationship building is provided for student service learners. Deeply held values, different backgrounds and viewpoints can tug at emotions, and preparing students to be open to these variations commonly found in community design is needed. This presentation uses a case study from a community design studio to addresses how service learners can prepare themselves to become more effective listeners to better engage in service learning.

Often community based design employs an ability to work with someone with whom you may not identify (Fisher, Ury, and Patton 2011). On the first day of class, students in this studio explore impacts of decision making through reflection. Each student begins by writing a one page reflective statement about community land-use. Next students watch a documentary film, "Land and How it Gets that Way" which traces five people over a ten year period with varied perspective in the context of land-use policy and growth. After the film, students write another one page essay, but this time from the perspective of one person in the film they consider their antithesis. Negotiating ways to connect to alternative perspective can be done by separating the people from the problem. The entanglement of personalities challenges one to consider the other way of thinking, and putting yourself in their shoes, one of the most important skills in negotiation.

Advances in the field of cognitive psychology suggest the assimilative approach to learning occurs only when new inputs are linked with already existing schemata (McKeachie et. al 1986). One month into the semester, a scheduled three-day workshop on land-use planning engages the service learners with the targeted community. This helps students and community representatives to identify known perspectives within the community of land-use policy and planning, and challenges each in considering how to link new inputs of land-use policy.

This presentation shares insights gained by having students first prepare their listening skills, and how this helped to negotiate and promote a rich civic engagement between the service learners and targeted community.

## Prioritizing Challenges Facing Small Rural Communities in the Pacific Northwest: Role of Participatory Design

**Ole Sleipness**, ole\_sleipness@wsu.edu, **Kathleen Ryan**, karyan@wsu.edu,  
**Janetta McCoy**, janetta@wsu.edu, Washington State University, USA

**Keywords:** Rural Communities, Participatory Design

**Purpose & Background:** The purpose of this research was to identify key challenges facing small rural communities through a collaborative exercise involving university design disciplines and individuals engaged in understanding and addressing community challenges within the economic, environmental, and cultural context of the rural Pacific Northwest.

As natural resource and agriculture based economies have changed, rural communities that serve these sectors have experienced declines in population and become economically disadvantaged. Consequently, younger residents have migrated to larger, urban centers, leaving behind a core of older, retired, and often low income residents (Howe et.al, 1997) (Messer and Dillman, 2011). The health and viability of such communities is critical to food and resource security, as they supply the majority of natural resources, raw materials, and agriculture products in the U.S. Reinvigorating such communities can spur economic development and provide opportunities for those who have fled to return.

**Methods:** To identify and prioritize the most pressing challenges facing small rural communities in the Pacific Northwest, a participatory design charrette format was organized. Thirty-four participants were recruited, each representing unique areas of expertise including rural entrepreneurship, policy and governance, communication, health and education, and physical planning. Participants were affiliated with academia, state and local governments, and private enterprise.

Employing an interactive format, the charrette modeled a participatory community design process commonly used in design studios, demonstrating how collaboration can be used to identify and address community issues. With participants organized into teams representing key areas of expertise, each team brainstormed, prioritized, and presented their findings from the perspective of their disciplines. All symposium participants collectively prioritized these rural challenges through preference voting. These prioritized challenges were then aggregated and categorized.

**Findings:** Challenges facing rural communities in Washington were categorized and prioritized according to the number of votes received by each. Broad categories of rural challenges were Rural Culture (53 votes), Government Policy and Economics (each receiving 28 votes), and Infrastructure (15 votes). These categories carry implications for all design disciplines, as they strive to reinvigorate small rural communities.

**Significance:** Through a participatory design approach, key challenges were identified and prioritized. As problems must be defined before they can be addressed, this project has defined critical issues on which design studios might focus individual design interventions within the economic, environmental, and cultural context of the rural Pacific Northwest.

## Shovels, Sketchbooks and Travel Guides: New methods for academic and professional collaboration

**Peter Stam**, UrbanBuddy, USA, petestam@urbanbuddy.com

**Daniel Winterbottom**, University of Washington, USA, nina@u.washington.edu

**Art Rice**, North Carolina State University, USA, art\_rice@ncsu.edu

**Monica Chadha**, Converge Exchange, Illinois Institute of Technology, USA, monica@converxchange.org

**Keywords:** international study abroad, design / build, participatory design, academic-professional collaboration

**Abstract:** Landscape architecture has become an interconnected and global profession. Recent graduates find the professional world far different than what the technical instruction and education of our university system has prepared them for. In the rapid transition from academia to practice, connection and vital reflection back on education is lost. Similarly, the unique opportunity for students to project their new energy into professional practice is squandered by unpreparedness.

In order to alleviate further disconnect, a collaborative platform based on cooperation between the academic, professional and private sectors is needed, practice must become more like education and our education must become more like practice. Creating a period that allows students to challenge the limits of the profession, both geographically and conceptually, while also preparing them for challenges ahead. Academic institutions have identified this necessity; employing global learning opportunities to address recent changes in the economy that have driven practice into emerging and international markets, while using domestic off-campus study and service-learning projects as an extension of the classroom; exploring the social, physical, and collaborative aspects of design.

There is enormous potential for stronger strategic academic-professional collaborations that would reposition practitioners in a supportive role, directly affecting the quality, readiness, and abilities of their future employees; enriching the profession through a more active role in landscape architecture education; and encouraging students to support professional practice with a greater understanding of the relationship between thinking, making and collaboration.

Learning Objectives:

- Recognize the disconnect present between academic instruction and professional practice
- Increase understanding of how academic-professional collaboration can alleviate this disconnect
- Explore unique examples of this collaborative platform that are already in use
- Discuss how programs like this can be created, how to establish a self-sustaining model and how to create value for students, communities and institutions
- Identify how these programs benefit and drive changes within the profession and how the profession can directly affect the quality of landscape architecture education
- Theorize about how landscape architecture leadership can use these models to better position the profession

## Transdisciplinary Approaches to Studio Pedagogy: Civic Engagement on Climate Change in Dorchester County, MD

Victoria Chanse, vchanse@umd.edu, Luis Diego Quiros, ldquiros@umd.edu,  
Kevin Adams, adamskw3@yahoo.com, University of Maryland, USA

**Keywords:** transdisciplinary, civic engagement

With the complexities of climate change science, engaging with stakeholders and communities to develop an understanding of the localized impacts and the design responses at the regional and site scales is critical (Schroth et. al. 2009). Drawing from other climate change and coastal surge responses, coastal communities workshops, and design competitions, this 2-semester studio project examines potential impacts throughout the county, engages stakeholders on climate change planning, and develops adaptation strategies across different scales. Some of the areas of design exploration examine the potential displacement of buildings, wetland migration, and adaptation to shorelines. This studio project on civic engagement in climate change design and planning is used to investigate how transdisciplinary approaches may provide 1) new ways of framing the problem, 2) new collaborations and processes in solving the problem, and 3) new design solutions.

During the first semester, landscape architecture studio students developed visuals of potential impacts and design responses, led a 2-day stakeholder workshop using these visuals to communicate with stakeholders, and developed refined design responses across scales based upon stakeholder responses during the workshop. Outreach and communication with different agencies, County staff, and residents was made during this workshop. During the Spring Semester, architecture students will delve into design responses at the building and infrastructure scales. By integrating solutions at different scales in both the natural and built environment, the studio seeks to prepare and involve the community in the design solutions. This stakeholder involvement was and will continue to be composed of workshops using visuals developed by the design students during both semesters.

This collaborative approach between design and science and between academics, government agencies and county residents will inform the technical, political, economic, and social aspects of the design and planning responses. One dimension of this project is the exploration of how this studio project may shape involvement and approaches by different agencies and institutions. Government agencies and residents are grappling with 1) communicating immediate and local impacts of sea level change and 2) shifting from policies to on-the-ground planning and design responses. This transdisciplinary studio class project has the potential to 1) begin to resolve some of these communication issues through civic engagement with stakeholders and with other disciplines and 2) address the gap from science and policy to planning and design responses.

## Envisioning Francisville's Future: A Case Study of Community Engagement in an Undergraduate Urban Revitalization Design Studio

**Robert Kuper**, Temple University, USA, rkuper@temple.edu

**Pauline Hurley-Kurtz**, Temple University, USA, phurleyk@temple.edu

**Keywords:** undergraduate design studio; community planning; vacant land; urban revitalization; community engagement

This presentation describes the process of community engagement in an undergraduate design studio focused on revitalizing an urban neighborhood. The studio was sited within the Philadelphia, Pennsylvania neighborhood of Francisville, which has experienced a large residential migration, decay of the neighborhood's physical form, and loss of significant commercial activity over the last half-century. In 2004, Penelope Giles, a lifelong resident, founded the Francisville Neighborhood Development Corporation (FNDC) with the goal of creating an ethnically and economically diverse, walkable community that possesses the infrastructure, services, and amenities residents need to sustain the neighborhood. In 2005, a plan produced by University of Pennsylvania students was presented to the FNDC to assist in the redevelopment of the neighborhood's commercial corridor; in 2007, Interface Studio, LLC., completed a comprehensive plan for redeveloping the neighborhood over ten to twenty years. Our students were expected to provide the FNDC with a document that verified and extended the information included in these plans. To do so, students read three texts that would provide them with theoretical and practical background; performed three local case studies focusing on dense urban form, a viable commercial corridor, and urban green network; undertook an extensive inventory and analysis of the region, city, and neighborhood; and produced neighborhood master plans. The two faculty members directing the studio devised five methods for faculty and students to interact with Francisville residents, business owners, and professional planners possessing an intimate knowledge of the neighborhood: evaluations of inventory and analysis; guided site visits; interviews; a work day; and presentations of design work. Presentations of inventory and analysis work allowed residents and business owners to verify the validity of the information and suggest revisions and topics for expansion. Giles's guided tour through the neighborhood provided students with an intimate perspective on the FNDC's challenges, aspirations, and accomplishments. Interviews with seven longtime residents illustrated the former physical conditions, socio-economic activities, and future desires for Francisville. As jurors in design reviews, members of the Philadelphia City Planning Commission and Interface Studio synthesized professional and neighborhood knowledge by sharing their experiences with students. An afternoon aiding Giles and community members with the construction of a vineyard and community garden made students participants in the neighborhood revitalization. Finally, students articulated and validated the synthesis of their newfound knowledge by presenting their master plans to Francisville residents and business owners. Suggestions for future community engagement in undergraduate design studios will be provided.



## Engagement in Today's University: Dilemmas and Prospects

Patrick Miller, Virginia Tech, USA, pmiller@vt.edu

**Keywords:** engagement, engaged, scholarship, learning, university

Colleges and Universities create their own cultures as well as cultures within cultures. This presentation describes the results of focus group research with faculty, administrators, and graduate students in a planning and design college that revealed factors that support and hinder engagement, as well as, the role that engagement plays in today's university.

The presentation begins with a review of the literature on the university engagement, including: what constitutes engagement engaged scholarship and engaged learning? It examines how that role is changing as a result of the increasing availability of knowledge and how universities are increasingly being called upon to show their relevance in today's society through engagement activities.

The research involved focus group interviews with faculty, administrators and graduate students, as well as, a content analysis of the strategic plans for 11 colleges. Both the focus group interviews and the strategic plan analyses were conducted at Virginia Tech.

The study revealed that engagement projects are perceived to be very important to a significant number of planning and design faculty, in spite of the fact that faculty perceived that engagement work did not receive recognition from university administrators. Department heads readily admitted that they discourage junior faculty from becoming involved in engagement projects, because it would not help them get tenure. This was found in spite of the fact that senior university administrators said that engagement work was important and should be included in promotion and tenure considerations. Finally, college strategic plans did not include engagement in their mission statements and engagement was only infrequently mentioned in college plans.

If planning and design colleges are to better position themselves to respond to the changing role of the modern university, they must find ways to better recognize faculty engagement, both for the sake of faculty morale and for the recognition this work brings from outside the university. This study makes recommendations on how departments and colleges can move to a better understanding and recognition of faculty engagement.

The learning outcomes for this presentation include: a better understanding of what constitutes engagement, engaged scholarship, the scholarship of engagement and engaged learning. The outcomes also include an understanding of how engagement is viewed by faculty and university administrators' at one major university. The study also recommends how universities remove impediments to faculty engagement and improve faculty morale as well as, improve the university status as one responding to today's societal problems.

## **Eldervoice: The oral history video project as catalyst in community development prospecting**

**Kevin Thompson**, University of Florida, USA, [gday@ufl.edu](mailto:gday@ufl.edu)

**Christina Lathrop**, University of Florida, USA, [clathrop@dixlathrop.com](mailto:clathrop@dixlathrop.com)

**Keywords:** eldervoice, youth participation, participatory video, community visioning, development prospecting

**Background:** As participatory practice continues to offer benefits in the community design and development process, new strategies of engagement are showing increases in participant recruitment and sustained levels of involvement in participatory activities. New process approaches centering on accessible technologies such as video, soundscape, mobile GIS and digital photography have seen increases in voluntary participation of one particular demographic: community youth. While youth participants offer a unique perspective in participatory planning activities, they will often turn to community elders who provide what the youth perceive to be valuable input in community planning exercises, specifically, insights into the history of place, its people and their landscape. How can the voice of elders be more directly incorporated into community visioning processes and how can the tradition of oral history inform a forward-looking participatory endeavor?

This paper reflects on the apparent benefits and challenges of eldervoice: an oral history video project that is integrated into the process of visioning and community development prospecting.

**Methods:** Landscape architecture students in a traditional Site Planning and Design studio were invited to contribute visions to development prospects for an African-American neighborhood in a rural community in the southern US. Running in parallel to conventional visioning workshop approaches, students conducted an eldervoice project to solicit engagement from an important sub-group within the study's population: the community elders. Excerpts from the oral history video project were used to produce a short "eldervoice" documentary and a screening of this documentary was used to help recruit younger community members to participate in a shorter, one day workshop. The eldervoice documentary was also available throughout the workshop as a resource that could be used to inform the visioning process itself.

**Findings:** This study finds that the inclusion of eldervoice in community visioning and development workshops may lead to increased participation these activities. Workshop participants viewed the inclusion of the eldervoice documentary as an endorsement of the process by the elders and as validation that the process was more authentically focused-on and derived-from the hosting community rather than its external agents.



# Sustainability

## Aesthetic Preferences for Cemeteries: Implications for Water-Conserving Landscapes

**Stephanie Clements**, clementsstephanie@hotmail.com, **Kyle Brown**, kdbrown@csupomona.edu, Lyle Center for Regenerative Studies, Cal Poly University Pomona, USA

**Keywords:** cemeteries landscape preferences regenerative sustainable water conservation

Southern California is watering dead people. We are running out of water. The Los Angeles area's annual rainfall is adequate to support a population of 100,000 to 300,000 people, not its present population of 10,000,000. (Miller, 2003) Los Angeles sustains itself on water imported from the San Francisco Bay Delta, and the Colorado River. Due to legal entanglements, and environmental issues, these suppliers will decrease water deliveries this year, and in the future. In Los Angeles County, about 70% of residential water supplies are used to water lawns and fill pools and spas. (Los Angeles County Department of Public Works, 2011) Water-consuming lawns are the dominant aesthetic feature of most urban landscapes and of memorial park cemeteries in particular.

This lawn-intensive, water-consuming landscape aesthetic evolved from simple home burials and churchyard cemeteries of early American settlers to the complex business enterprises they are today. Cemeteries, unlike other businesses, must continue operating after inventory (graves) is sold; if not maintained cemeteries are on a path leading to neglect, vandalism, abandonment and to becoming public nuisances/safety hazards, and public liabilities. (Llewellyn, 1998) As water becomes more costly and less available, reducing the cost of water could significantly reduce operating expenses. Reducing lawn areas, and replacing them with regenerative, water-conserving landscapes could be a viable way to significantly reduce the use and cost of water.

We have been taught to accept the unsustainable water-consuming landscape aesthetic of the lawn-intensive, memorial park cemetery. Our preferences need to change. How can we serve the needs of the living to mourn and honor the dead, conserve water and respect the needs of the environment, which sustains us? Would people prefer a new landscape aesthetic, to the memorial park aesthetic, which was established about 100 years ago?

Landscape preference studies have revealed much about peoples' preferences in various urban, and non-urban landscapes. Little is known about peoples' preferences and cemetery landscapes. However, existing preference research may inform our understanding of peoples' preferences in this landscape. This study adapts methodologies used in previous studies to answer the question: If people are shown water-conserving alternative designs for the cemetery landscape, will their preferences shift in the direction of the water-conserving alternatives?

## Landscape Laboratory at Danville Prison

**Bridgette Moen**, University of Illinois at Urbana-Champaign, USA, bmoen2@illinois.edu

**William Sullivan**, University of Illinois at Urbana-Champaign, USA, wcsulliv@illinois.edu

n/a, USA,

**Keywords:** prison, sustainability, learning model

The Productive Prison Landscape Project at the Danville Correctional Center uses the resources of an Illinois state prison to develop a landscape laboratory that not only produces high-quality food, but also serves as a series of outdoor classrooms for active, engaged, hands-on learning. This paper describes the project, identifies the evaluation criteria we are using to assess our effectiveness, and discusses the collaborative strategies we are using to engage the prison administration and the men incarcerated at the prison.

The Danville Correctional Center is a medium-high security prison. It was built in 1970 with a capacity to house 925 men. Today, 1,850 men are incarcerated at the prison—double the design capacity. The prison grounds include 13.1 acres of turf grass. Although the prison serves roughly 4,000 meals per day, not a calorie came from the prison grounds until the formation of this program. Numerous resources, including open space, rich soil, and enthusiastic, talented men, allow the development of the program to be a success.

The Productive Prison Landscape Project is converting a significant portion of the turf grass at the prison into a system of productive settings (e.g. vegetable, wildlife, and water gardens; an orchard and composting area). Our intentions extend beyond food production, though that is an important component of our effort. The landscape will also create a set of outdoor laboratories for the study of biology, soil science, food production, plant propagation, composting, and business management. The landscape will support courses already being taught at the prison by faculty from the University of Illinois and the Danville Area Community College.

Participation is a central value of this effort. We describe the multiple ways that men incarcerated at the prison participate in this project and the various ways in which the prison administration has become a partner in our efforts.

Our goals include increasing and enriching learning opportunities at the prison, especially those that support employability; producing an infrastructure that will support sustainable practices; and establishing a model that other public institutions can replicate.

## Applicability of the Scale-Sensitive Indicators in LEED-ND: Scenario Simulations from Two Real Sites

**Tsung-Pei Cheng**, eric429@tamu.edu, **Ming-Han Li**, minghan@tamu.edu, **Forster Ndubisi**, fndubisi@arch.tamu.edu, Texas A&M University, USA

**Keywords:** LEED-ND; Scale; Sustainability; New Urbanism; Smart Growth; Green Building; Neighborhood Development

LEED-ND serves as a voluntary standard for assessing site sustainability that was developed by the U.S. Green Building Council, the Congress for the New Urbanism, and the Natural Resources Defense Council in 2007. Its conceptual foundation is shared from smart growth, new urbanism, and green building movements. It aims to evaluate neighborhood development projects for site sustainability, in terms of smart location and linkage, suitable neighborhood pattern and design, and green infrastructure and buildings (USGBC, 2009). However, it uses one set of criteria to evaluate these projects for sustainability at several spatial scales, from the block to multiple neighborhoods. As a result, the acreage of sites can vary from less than one acre to more than 10,000 acres, which raises a fundamental question: Can one set of evaluative criteria produce valid and reliable results when employed at multiple spatial scales?

First, the potential scale-sensitive indicators in LEED-ND were identified pertinently. Secondly, development scenarios were simulated graphically at four types of neighborhood scales from two real sites. Four types of neighborhoods were considered and categorized by sizes and land use settings. These are the block-scale (less than 40 acres), fractional-neighborhood-scale (between 40 to 160 acres), whole-neighborhood-scale (between 160 to 320 acres) and multiple-neighborhood-scale (larger than 320 acres). Two selected study sites are both airport redevelopment projects. One is the Mueller community in Austin, Texas, which is a LEED-ND registered pilot project. The other is the Stapleton community in Denver, Colorado, which is a national demonstration site for its economic feasibility, environmental responsibility, and social diversity. A total of 128 hypothetical neighborhoods of different scales were simulated from the two sites. Thirdly, the potential scale-sensitive indicators in LEED-ND were utilized to evaluate site sustainability at different scale-levels. Lastly, this study ascertained whether the results, in the form of points for each individual and cluster of indicators, differed or were roughly similar for each spatial scale and explored the applicability of the scale-sensitive indicators.

Several indicators produce significant difference in the outcome, when they are used in hypothetical neighborhoods of different scales. Scale-sensitive indicators include Restoration of Habitat or Wetlands and Water Bodies, Walkable Streets, Mixed-Income Diverse Communities, Existing Building Reuse, Historic Building Preservation and Adaptive Use, Preferred Locations, Street Network, and Neighborhood Schools. Although LEED-ND is not perfect to address scale-related issues, scale issues highlight a possibility and challenge to achieving better neighborhood development performance.

## Sustainable Tactics in Emerging Communities: Lessons for Educators

**Simon Bussiere**, Ball State University, USA, sbussiere@bsu.edu

**Keywords:** Community Engagement, Ecological Design, Landscape Urbanism, Sustainability

As global urban centers increase in population by 2 billion over the next fifty years, practitioners of the future will need to anticipate the conditions under which new landscape and infrastructure typologies will emerge (UNDP, 2003). This presentation examines the relationship between the role of sustainability in student design work and informal development forces in two emergent and distinct urban environments; La Prusia in Granada, Nicaragua and Anam City in southern Nigeria.

Familiar ribbons of units and substructures stretch to link urban regions today just as they have for decades without sufficient regard for underlying ecological systems. Infrastructure networks and the territories they cross are most commonly manufactured as the result of arithmetical priorities of the 20th century (Waldheim, 2006). The emergent development tactics in Granada and Anam however, offer opportunities for students and community agencies to critically examine contemporary design approaches through the framework of existing ecologies and local needs, consequently enriching productive landscapes and preparing students and communities for a future that is difficult to predict (Lutz, 2010). Emerging communities are defined as places of human settlement in developing countries where configurations of informal social and political networks and the negotiation of resources and boundaries represent the most significant forces in a growing accretion of spatial patterns and processes.

Identification and discussion of key moments in the design process for both projects is used to explore similarities and contrasting development patterns and processes. Student deliverables are similar in scale and scope to provide cross-reference between the two studies. In both cases, students engaged with neighborhood and non-government organizations to isolate and draw from the most supportive attributes of each local environment. Key design principles and recommendations were the result of analyses, interviews and group workshops, and were developed to promote a socially and ecologically sustainable design process. Unknown long-term maintenance costs and unclear technology applications were the primary concerns expressed by communities and were central to the design frameworks.

Having attended this presentation, attendees will be able to: 1) demonstrate to students a method used to produce a sustainable design framework that supports informal community design adaptations, and 2) name methods for the creation of detailed visualizations that communicate sustainable applications and techniques. This presentation will address the above implications, and suggest changes to landscape architecture education that can facilitate the practice of sustainable design in emerging communities at the scale of site design.



## Suburban Street Stormwater Retrofitting: Design and Implementation Strategies in the Southern Piedmont

**Andrew Fox**, North Carolina State University, USA, andrew\_fox@ncsu.edu

**Jim Cooper**, North Carolina State University, USA, jimc999@gmail.com

**Keywords:** Low Impact Development (LID), Suburban Retrofitting, Green Streets, Complete Streets

Low impact development (LID) stormwater retrofitting is an exciting new approach to managing stormwater within existing street rights-of-way. This approach is gaining increased traction in numerous urbanized areas across the country. Direct benefits of installing LID stormwater retrofits include enhanced water quality, heat island mitigation, localized wildlife habitat enhancement, traffic calming, cost savings, and general improvement of the pedestrian experience (Metro 2002). However, little is known about their effectiveness in conventional suburban housing developments. Existing research regarding LID best management practices (BMPs) at the subdivision scale has been focused on new, or “greenfield”, applications rather than the study of retrofitting the entirety of existing housing developments.

The adverse environmental consequences of traditional suburban development patterns, commonly referred to as sprawl, are well documented (Hirschhorn 2005; Frumkin, Frank and Jackson 2004). Streams, wetlands, and other surface waters are acutely sensitive to the land disturbance activities characteristic of conventional residential subdivisions. Impacts to surface waters typically include accelerated sedimentation, increased nutrient loading and pollutant inputs, and widespread alteration of localized watershed conditions that adversely affect the hydraulic dynamics of these tightly interwoven systems (Thorp, Thoms and Delon 2008). Unsustainable design and planning practices are further revealed when considered against with the prevalence of the automobile in contemporary suburban housing developments. A trademark feature resulting from these land-consuming development policies and practices are unnecessarily wide streets and orientations that perpetuate the prevalence of the automobile at the expense of both water quality and the pedestrian experience.

This paper addresses stormwater through the study of LID BMPs in an existing 300-acre residential suburban housing development in the Southern Piedmont Region of the United States. More specifically, this study developed hydrologic models to calculate the volumetric flow variation(s) resulting from various LID street retrofit configurations, and compared them to the existing flow levels achieved through standardized local development and stormwater regulations. The results of this study demonstrate that stormwater retrofits in suburban conditions provide benefits because they mitigate already degraded hydrologic processes and systems, especially when regarded cumulatively at greater scales. Additional outcomes include the development specific LID streetscape criteria and an associated LID retrofitting plan for the street network(s) located within the study area. Lastly, the study draws preliminary conclusions related to the probable costs related to various LID retrofitting elements and/or schemes; the quality of the post-retrofit pedestrian environment, including aspects of vehicular traffic calming; and creation of biodiversity corridors and habitat zones.

## Academic and Professional Discourse—Making Research Relevant and Accessible to Practitioners.

**Baldev Lamba**, Temple University, USA, blamba@temple.edu

**Skip Graffam**, OLIN, USA, SGraffam@theolinstudio.com

**Keywords:** Research, Practice, Sustainability

Our review of past and recent discourse in the professional and academic circles of landscape architecture points to a persistent dichotomy between research and practice. It shows that most of the academic research conducted over the last 25 years has very little relevance to practice. This presentation will reflect on some of the reasons for this lack of research applicable to practice. Our research also shows that respected scholars and leading practitioners have advocated the integration of practice and research in order to keep our profession relevant, competitive and growing.

Landscape architecture is undergoing profound changes that is pushing the traditional roles into uncharted territories. The emerging ideas of evidence based design, being embraced by the public at large, is changing how design is practiced and more importantly how it's performance is measured.

Practicing in the context of heightened environmental awareness and economic austerity is posing new challenges and opportunities for the profession. Emerging sustainability, performance and evidence-based design standards, rating systems (such as LEED and SITES), ordinances and codes offer fertile ground for building a research based knowledge geared towards providing credibility for landscape architectural services offers promising models for meeting the emerging challenges for our discipline.

This paper will discuss models for transcending the boundaries between traditional notions of design and research and recent initiatives designed to provide performance measures for landscape projects to promote sustainable practices. The goals of this paper, based on interviews with selected practitioners and researchers, include the following:

1. Providing an overview of the differences between research and practice in the larger context of the historic cultural divide between the sciences and the humanities, both integral to the practice of landscape architecture, and ways of bridging this divide.
2. Understanding the pressures facing practitioners that is driving the increasing need and opportunities for research and innovations.
3. Advancing a conversation with practitioners in order to understand their research needs in the context of fundamental cultural shifts towards evidence based practice.
4. Analyzing sources and strategies being used by practitioners to gather and apply information and knowledge that offer new venues for scholarly inquiry.

This discourse between practitioners and researchers is meant to highlight a shared agenda and to create pathways to more applicable and accessible research for our profession. The trajectory of research needs discovered in this investigation has implications on the educational goals of the next generation of landscape architects.

## Discovering Appropriate Native Plant Communities for Extensive Green Roof Applications

**Gordon M. Lackey**, Mississippi State University, USA, gml60@msstate.edu

**Timothy J. Schauwecker**, Mississippi State University, USA, tschauwecker@lalc.msstate.edu

**Keywords:** native plant communities, extensive green roofs, prairie soil, Mississippi

A growing amount of research indicates that vegetated green roofs can provide a passive and cost effective means to manage stormwater runoff and at the same time increase urban biodiversity (Oberndorfer et al., 2007). However, the identification and selection of appropriate plant communities for green roof use is largely unaddressed. Extremely drought tolerant *Sedum* monocultures have almost exclusively been used on non-irrigated green roofs (White and Snodgrass, 2003), but there has been much interest expressed in using native plants on green roofs and more specifically to use green roofs to recreate prairie systems (Getter and Rowe, 2006). It has been suggested that non-succulent plant species may not be suitable for such applications (Sutton, 2008), however this notion seems unlikely considering that spontaneous plant colonization has been observed on conventional tar covered flat roofs lacking any growing media (Shriner, 2003). Regionally unique microclimates that share environmental conditions with rooftops should be examined for clues as to what plant communities may be suitable for vegetated green roofs (Lundholm, 2006). Mississippi State University is located in the physiographic region of Mississippi known as The Black Land Prairie where micro-topographic features such as chalk outcroppings may provide appropriate habitat templates. An experiment is being conducted to identify native plant species that are adapted for survival on green roofs in the climate of North Central Mississippi and to determine whether the introduction of native prairie soil and its associated micro-fauna affects the resulting plant community. Ten non-irrigated, experimental green roof plots (4' by 4', 6" depth, 2% slope), 5 with only commercially available growing media as a control, and 5 with an addition of native prairie soil have been constructed. 24 species of locally indigenous, drought tolerant prairie species were selected for establishment. 5 species were purchased as plugs and randomly planted 12" on center. 21 species having similar qualities were introduced as seed. Spontaneous colonization by extraneous species has been allowed. The ecological structure of the resulting plant communities in terms of survival of plugs, recruitment, diversity and evenness of species cover as response variables will be measured. Preliminary results indicate that there is a difference in diversity between control and treatment groups. This experiment is intended to provide a model for the indeterminate ecological design of regionally responsive vegetated green roof plant communities and contribute to the discussion of vegetated green roofs as urban ecosystems.

## As Edges Dissolve, New Centers Evolve

**Carla Radoslovich Delcambre**, North Carolina State University, USA,  
carla\_delcambre@ncsu.edu

**Keywords:** Historical Development, Infrastructure, Reclaimed, Adaptive Reuse

There are three distinct geographic regions of North Carolina: the Coastal Plain, the Piedmont and the Mountains. Historically, one might associate this southern landscape with rich agricultural fields of sweet potatoes, soybeans and cotton, alongside stalks of tobacco, near acres of chestnut, hickory, oak and pine forests. In between these diverse farmlands are 85 rural towns dotted with shotgun houses for factory workers, surrounded by churches, schools and town centers. Manufacturing companies such as HAINES hosiery and R.J. REYNOLDS cigarettes were vibrant companies in the 20th century, but have left behind abandoned warehouses and low economic gain in the 21st century. The U.S. Census Bureau predicts over the next two decades, North Carolina's total population is expected to increase by 2.2 million people. As a result, places such as Edenton Cotton Mill Village, in Edenton, North Carolina, the American Tobacco Warehouse District, in Durham, North Carolina, and the Hans Rees Tannery in Asheville, North Carolina are seeing a resurgence of redevelopment in areas that were once known for the manufacturing of leather, cigarettes and socks. In the early 1890's, industry took notice of the prime, real-estate to be found near rivers and railroads: edges. Products were either shipped in or exported out traversing waterways and rail lines. Historical development organized around ports and rail corridors. These became centers for transporting goods. Looking forward to the 22nd century, how can rural town centers in North Carolina evolve into healthy activity hubs for redevelopment and renewal of abandoned industries? Will China and India experience the same ramifications of in situ and ex situ development? This abstract will identify and compare three towns in North Carolina which are currently experiencing successful redevelopment of long, abandoned industries along the coast, in the piedmont and the mountains.

## A Win-Win Situation for Landowners and Conservation in Rural Landscapes?

**Julia Ela**, ela@wisc.edu, **John Harrington**, jaharrin@wisc.edu,  
**Katie Baumann**, kjbaumann2@wisc.edu, University of Wisconsin–Madison, USA

**Keywords:** woodlands, browse, graze, land management

Over time, landscape management determines the land cover patterns of rural landscapes. These patterns have implications to wildlife, vegetation dynamics, environmental quality, conservation, and landowner livelihoods. One such pattern is the woodland-savanna-grassland matrix. In the Midwest, these systems were historically kept open by fire and browser activity, which were suppressed with European settlement. As a result, mid-story shrubs dominate, canopy closes, and grasses and ignitable fuels decline. Reintroduced fire is seldom effective at restoring the original open structure. The majority of the remaining remnant systems occur on private lands where fire poses a liability and mechanical methods are costly, limiting incentive for management. Therefore, as urbanization moves into rural areas, alternative management solutions are necessary to assist landscape architects engaged in ecological restoration and land management. Managed grazing may be one alternate and environmentally-acceptable tool for reducing shrub densities and restoring savanna structure. For several years, we have worked with agronomists to determine whether managed grazing can successfully restore oak community structure without the negative impacts on soils and native vegetation often associated with past unmanaged grazing.

We explored whether rotational grazing conducted in shrub-infested oak communities can be used as a tool to (1) restore the natural composition and structure of native vegetation, (2) expand grazing land opportunities to private landowners, (3) provide landowners with a profitable and accessible tool to manage their property, and (4) support conservation efforts without adverse environmental effects. An initial study conducted with Scottish Highland Cattle resulted in substantial shrub reduction but difficult logistics. A second study using goats is occurring in an oak woodland at Yellowstone State Wildlife Area, Lafayette County, Wisconsin. This study compares two rotational grazing regimes (light and heavy) in five replicate blocks of 1.5-acre paddocks. The study observes goat behavior, browse preferences, and goat weight change to measure productivity. Changes in cover, density and height of shrubs, saplings and herbaceous species are measured, along with litter depth and soil compaction. Measurements were taken before and after treatment. The goat grazing study shows a reduction in overall cover, but no significant reduction in shrub count or shrub height, showing further grazing repetitions will be needed to effectively reduce the shrub layer. Additionally, no negative environmental impacts were recorded and there was good goat productivity. Our paper discusses additional results of both studies and the use of grazing animals in land management.

## Rural Conservation: The Sustainable hybrid between rural and urban communities

David Gewurtz, Florida International University, USA, Dgewu001@fiu.edu

Ebru Ozer, Florida International University, USA, eozer@fiu.edu

**Keywords:** Rural, Sustainability, urbanization, Hybrid

For long, rural communities exemplify what economic stability is through merchant sales such as exporting of agriculture and livestock commodities. However, their real contribution, that of the overall economy has only recently become evident through its progressive decrease in population size. A reason for this decrease is due to the lack of job opportunities available. Furthermore, a correlation is made between the decrease in rural populations and the current increase in urban populations.

One of the defining factors in the decrease or increase of rural populations is sustainability issues. At times when rural communities have been self-sufficient economically, they have flourished. With the foreclosure rates highest though in rural communities, the inevitable is to turn to the urban communities for support. As a result, rural residents then chose to migrate to urban areas for economical purposes.

Although economically the consequence for the loss of rural communities is significant, the environment itself will suffer most. Researching the overall effects that it has on geologic and geomorphic elements have shown the negative capacity and ripple effects that man can have on the environment. The reduction in soil and water quality together with threats of deforestations leads to a rise in greenhouse gases. The specific ripple effects that losing rural communities have will be analyzed using independent research and case studies. Therefore, it is in the best interest to preserve rural communities and thus preserve a clean environment.

There are various methods to approach the sustainability of rural communities with each country, state, or city requiring its own unique method. Some require raised agricultural intervention methods alone for rural residents while others may require the aid of global assistance programs. Even after establishing global aid to intervene on behalf of the rural community though, there are no guarantees. For example, no significant positive effect occurred in employment growth despite a \$6.2 billion economic stimulus into the rural industry by the United States Agriculture Department in 2011 (N.Y. Times 2011) However, without additional aid there is little hope in drastically raising the rural population and preserving the environment.

In conclusion, while there is no record of self-efficiency in rural communities established, there are social, cultural, economic, and environmental benefits to consider. This is manifests itself through sustainable agriculture methods. A hybrid of effects can then occur between the preserving of rural communities and the increase in urban populations.

## Strategies for Shrinkage

**Jill Desimini**, Harvard University Graduate School of Design, USA,  
desimini@gsd.harvard.edu

**Keywords:** vacant land, participatory planning

Many of the largest cities in the United States and Europe have lost more than 25% of their population since 1950. The shrinking city is a definitive, widespread urban condition where large swaths of land lies vacant in the middle of a previously-occupied territory. With many cities adopting demolition policies, this land is increasing.

It is the hypothesis of this research that this land has social and ecological value, and its systemic workings and untapped potential should be understood and tested to inform future decision-making. With reduced developmental pressure, opportunities emerge to create a balance between environmental renewal and human vitality. The shrinking city could become a model of sustainability for all cities.

Through the spatial, social, environmental and economic analysis of three case study projects—the Urban Cores and Landscape Zones in Dessau, Germany; the Lots of Green and Lots of Green 2.0 vacant land reuse projects in Youngstown, Ohio; and the Design Your Own Park project in Binghamton, New York—the potential contributions of shrinking cities are explored.

These three projects are exemplary for their community involvement and for their re-tooling of the traditional approaches to landscape planning and design. The three projects take different approaches to the issue of population decline and vacant land. The Urban Cores and Landscape Zones Dessau operates both at a city-wide scale and at the scale of the community plot. The project identifies strong urban islands to build on and landscape zones to develop, using a 20 meter x 20 meter module where community groups adopt a piece of the city to cultivate. It builds on a rich tradition of the garden in Dessau and the strong metaphor of the claim, adapted from the North American gold rush. The Lots of Green and Lots of Green 2.0 programs work on a neighborhood scale in Youngstown focusing on places with strong community leadership and identifiable amenities to curb disinvestment one lot at a time. The Design Your Own Park initiative is informed by evolutionary biology using competition and community investment to foster empowerment. The project argues that through the design, implementation and maintenance of parks, communities begin to take control of their own affairs in other ways.

All three projects combine human resources and ecological principles to foster innovation and experimentation. At the same time, they are turning vacant lots into community assets, offering valuable lessons for the future design of urban environments.

## Urban Ecologies: Towards an Ethos of Experimentation

**Gale Fulton**, University of Illinois at Urbana-Champaign, USA, [gfulton@illinois.edu](mailto:gfulton@illinois.edu)

**Sarah Taylor Lovell**, University of Illinois at Urbana-Champaign, USA, [stlovell@illinois.edu](mailto:stlovell@illinois.edu)

**Keywords:** urban, ecological, experiments, infrastructure

Whether framed as ecological urbanism, urban ecology, green infrastructure, or green urbanism, much contemporary research and speculation aimed at increasing the sustainability of our cities centers upon the need for more 'ecological' approaches to design and planning. The mechanistic approaches of the past, which rely on 'command and control' strategies and technical solutions allow little room for innovation. New knowledge and practices must evolve to deal with the complex issues we currently face—climate change, threatened water resources, biodiversity loss, and others. In this paper, we propose a solution in which a new culture of experimentation becomes an integral part of urban design and planning. 'Urban ecological experiments' can be established as relatively small-scale, low-risk, decentralized, infrastructural interventions aimed at increasing the ecological fitness and resiliency of a city, while simultaneously allowing for rigorous quantitative and qualitative research and increased public awareness and education. Urban ecological experiments can be used as leverage for the adoption of a much needed 21st-century approach to city planning and design that is rooted in the combination of rigorous science, technological innovation, and practical experimentation. This work is based on a critical review of the literature across several fields, and is supplemented by independent case studies from abroad as well as a recently established research program by the authors situated in urban parks.

Our findings reveal three primary components of urban ecological experiments: the scientific, the technological, and the practical. From a scientific point of view, urban ecological experiments are designed to gather data, test hypotheses, and contribute to our understanding of urban ecology through the generation of knowledge. Technologically, experiments such as these allow for localized testing of new sustainable technologies, spur technological innovation, and ease the transition from one technological paradigm to the next. Practically, such experiments work to increase awareness, assuage fears about performance, and provide demonstrable proof to citizens and municipal managers that such alternative methods can contribute to increased sustainability of cities.

The promotion of an 'ethos of experimentation' will be critically important for sustainable urban planning in order to overcome the barriers to adopting innovative technologies for the landscape. This strategy will help to usher in new knowledge and practices that can evolve to deal with the complex issue of sustainability. Urban ecological experiments provide cities with a pragmatic approach for the development of such knowledge and practices.



## Growing Sustainable Energy and Recycling Resources—Toward an Integration of Algae Cultivation in the Built Environment

Gundula Proksch, University of Washington, USA, prokschg@u.washington.edu

**Keywords:** algae cultivation, alternative energy, carbon neutral, bio fuel, resource recycling, CO<sub>2</sub> sequestration, pollution mitigation

Designers are expanding the definition of Ecological Design by incorporating biological processes and systems directly in their design. Systems like green roofs and living machines have proved themselves invaluable for reducing a design's overall environmental footprint. More recently, advanced algae cultivation technologies—some still in the testing phase—inspire architects and designers. Algae-based energy is almost 30 times less expensive per unit than energy generated by photovoltaic technology and algae biodiesel can already be produced at market-competitive prices. With its efficient energy production and potential for improving the health of the environment, algae cultivation is the next photosynthetically driven system primed for architectural integration.

This paper examines the various methods of algae farming; their support of cyclical systems, design implications, and integration into urban space. Cultivation methods range from low-tech open ponds to computer-automated bioreactors. Each method varies the balance of yields, land, water, and energy usage, susceptibility to contamination, initial costs, and operating costs.

The paper supports its findings with data derived from built case studies, such as Algae Photo-Bioreactors, 3D-Matrix-System “airlift” reactors, Rotating-Algal-Contactors RAC's, and Green Power Houses. It addresses the design implications of these novel systems through the review of speculative projects, for example the WPA 2.0 Competition winner, Carbon T.A.P. and the Metropolitan Magazine's 2011 Design Competition winner, Process-Zero: Retrofit Resolution.

Algae can effectively sequester carbon dioxide and treat wastewater while increasing its growth efficiency. These properties give it great potential for integration with other infrastructural systems. These synergies can be developed into closed-loop systems within the built environment, resulting in lower CO<sub>2</sub> emissions, O<sub>2</sub> production, nutrient reuse and efficient energy generation.

These multi-layered benefits of algae cultivation initiate a rethinking of the relationships between sunlight, alternative energy, water consumption, and material recycling. This paper argues these new relationships have strong potential for future development of algae-integrated systems. Possibilities include integration into urban landscapes, existing building stock, and power generation on the neighborhood scale. Challenges include economically down-scaling algal systems, onsite harvesting, and the logistics of combining new infrastructures.

To conclude, algae's high ecological performance generates a multi-fold contribution towards improving the health of the environment. With its combination of carbon neutral/negative energy production and ecological recycling of environmental pollutants, the integration of algae cultivation in the built environment opens a new dimension to ecological design.

## Ecological Design Through Urban Wood Stands: Architecture as Urban Deadwood

Leonard Yui, University of Oregon, USA, yui@uoregon.edu

**Keywords:** Deadwood, Ecological Restoration, Ecological Design, Ecological Architecture, Urban Wood Waste, Urban Forest, Urban Design, Post-Industrial, Lumber Mill, Demonstration Forests, Dynamic Forest Management, Coarse Woody Debris, Cultural Landscapes

An intersection of research disciplines such as urban forestry, the science of deadwood and forest management help to unveil ecological design strategies for incorporating a “dynamic” and productive urban wood stand on historical lumber mill sites—in this case a prominent post-industrial site in the city of Springfield, Oregon. This project reveals at least two distinct benefits. First is an ecologically restorative context where a designer is encouraged to form beneficial human and non-human relationships by helping to expand design opportunities with wood. Second is an educational opportunity to preserve and recognize a cultural logging landscape by offering a renewed understanding of wood production.

A historical review of perceptions about logging practices at times emphasize opposing qualities, but also share common goals to benefit humans. The success of early logging practices exhibits the versatility of, and the human dependence on, wood. The later environmental backlash, to preserve and sustain landscapes through forest management attempts to reconnect the ecology of wood to the larger landscape. These differing perceptions about wood help lead to dualistic identities of wood that are largely separated between the urban and non-urban landscapes.

Lumber mills represent a significant point of transformation—from dead trees into exclusively human products. Designing a post-industrial mill site that re-contextualizes new connections between human and non-human variables could explicitly educate the public through test plots that reveal ecological processes currently utilized by “demonstration forests.” The plots showcase a variety of forest management strategies like burning, clear-cutting, and laying coarse woody debris that help to visualize what some scientist refer to as the practice of “Dynamic” forest management that utilizes a newer theoretical framework for ecosystems in disequilibrium. The close urban context also offers opportunities to integrate urban wood waste toward a more complex understanding of forests.

Research on urban forestry conducted by the U.S. Forest Service reveals that construction and demolition makes up 57% of the total urban wood waste. Reclamation is one emerging strategy to mitigate this, but waste integrated into a dynamic forest offers a step toward blurring lines drawn by a false duality as well as helping to expand the possible ecological uses of wood for buildings and landscapes. A design framework for a dynamic forest will help show that landscape architects are especially well-equipped to bridge ecological understandings for related designers like architects and their desire to more directly engage with ecological issues.

## Constructed wetlands to improve water quality in the Lake Bloomington watershed

**David Kovacic**, dkovacic@illinois.edu, **Eric Wright**, wright35@illinois.edu,  
**Michael Wallace**, mwallace@illinois.edu, University of Illinois at Urbana-Champaign, USA

**Keywords:** Wetlands, Water quality, Nitrate, Watershed

Subterranean tile-drained farmlands in the Midwest contribute 90% of the nitrate-N [860,500 metric tons(Mg)per year] and 79% of the total P (118,100 Mg per year) to the Mississippi River basin, and have been identified as the primary cause of Gulf hypoxia (USEPA, 2007). Tile-drainage is required in over a third of the Midwest to support modern intensive agricultural production, however, tiles inherently increase the rate of nutrient losses and export an average of 25-50 kilograms of nitrate-N per hectare per year to surface waters that ultimately drain to the Gulf of Mexico (David et al., 1997; McIsaac and Hu, 2004). The Mackinaw River (Central Illinois, is representative of the many tile-drained and intensively row-cropped watersheds of the Midwest's Upper Mississippi River Basin. Two agricultural sub-basins of the Mackinaw feed Lakes Bloomington and Evergreen supplying drinking water to approximately 80,000 people in Bloomington/Normal, IL. Similar to many drinking water reservoirs throughout the Midwest, tile drainage is a major cause of nitrate loading in Lake Bloomington (LBWP, 2008). Lake Bloomington historically exceeds EPA's drinking water standard of 10 parts per million (ppm) for nitrate and is listed as impaired due to excessive nitrate and phosphorus loadings (IEPA, 2006). There is an urgent need to implement conservation practices that allow tile drainage to support agricultural production, yet reduce tile-drained nutrient exports to our streams and rivers. Our research at Illinois has shown that tile-drainage treatment wetland systems covering 5% of the effective drainage (i.e., actual area drained by tiles) can remove 37-45% of the tile N load (Kovacic et al., 2000; Kovacic et al., 2006). In 2010, a partnership formed by TNC, the Environmental Defense Fund (EDF), the City of Bloomington , McLean County SWCD, NRCS, and the Farm Service Agency (FSA) established the Mackinaw River Drinking Watersheds Project (MRDWP), a project that supports the targeted establishment of wetlands to reduce N loading in drinking water supplies of Lakes Bloomington and Evergreen. Researchers at UIUC and Illinois State joined with the MRDWP to address water quality issues in the watersheds. Using GIS, LiDAR topography, soils data, aerial color infrared and standard aerial photography of the Lake Bloomington watershed a plan has been developed to establish tile-drainage wetlands in the watershed and a paired watershed proof-of-concept study to demonstrate the improvement of water quality at the watershed scale. In addition a conceptual program that provides support to landowners for tile-drainage wetland construction was developed.

## Towards “Cool Urbanity”: Green Infrastructure and Spatial Realignment of City Form for Natural Ventilation

**Antony Wambui**, North Carolina State University, USA, [tonycren@gmail.com](mailto:tonycren@gmail.com)

**Kofi Boone**, North Carolina State University, USA, [kofiboone@gmail.com](mailto:kofiboone@gmail.com)

**Keywords:** Urban Heat Island, Green Infrastructure, Natural Airflow Patterns, Cool Urbanity

This paper presents a literature review and proposed methodology for retrofitting a Southeastern United States urban area using green infrastructure to maximize the benefits of natural airflow patterns. The paper identifies the many ways the Urban Heat Island effect contributes negatively to environmental and social issues in the urban setting, ranging from increases in heat fatalities in summer months, to escalating economic and energy consumption costs of artificial cooling. Global climate change, combined with continuing urban population growth, suggest a critical need to pursue strategies that can harness ecosystem services, such as natural airflow patterns, to mitigate negative impacts. Green infrastructure, including connected urban open space systems, offers a comprehensive framework for addressing urban issues through landscape processes and systems. Although there are examples of new urban development that utilize green infrastructure to preserve natural airflow patterns, the use of air spaces to retrofit existing city areas is an emerging area. This paper asks the research question: How can the summer effects of the urban heat island be alleviated using natural wind flows as a spatial framework for urban green infrastructure?

Literature review and case study research suggest that tools and techniques are available at a range of landscape scales to 1) identify the most critical urban heat island affected areas, 2) identify natural airflow patterns, and 3) identify a wide range of variables that are components of urban morphology that can be manipulated to maximize natural airflow in urban areas. Places like Stuttgart City, Germany serve as models that use policy and urban design tools, informed by geo-spatial analysis, to promote thermal comfort and decrease energy consumption through natural ventilation. GIS tools can be used to model the interaction between these three areas, resulting in a matrix of situations that can be addressed through strategic deployment of green infrastructure.

Given the environmental, economic, and socio-political context of the Southeastern United States, methodologies need to adapt to suit urban areas there. In particular, adapting to the realities of private property rights, economic incentives (present and absent) for valuing the negative impacts of Urban Heat Island effect, natural ventilation characteristics of connected open space systems, and the role of public policy in shaping cities are key variables. The rise in urban greenways, and their ability for alignment with existing urban patterns, is presented as a component of green infrastructure that could significantly impact Urban Heat Island effect, and promote “cool urbanity”.

## Spatial contagion: Gardening along the street in residential neighborhoods

**MaryCarol Hunter**, University of Michigan, USA, mchunter@umich.edu

**Daniel Brown**, University of Michigan, USA, mchunter@umich.edu

**Keywords:** Urban garden mapping; green space structure; neighborhood mimicry; connectivity for urban ecological restoration; garden form; urban ecosystem

Residential gardens make up a significant portion of urban green space (Gill et al., 2008; Goddard et al., 2010; Mathieu et al., 2007) and are considered important for conservation (Doody et al., 2010) and healthy urban ecosystem function (Sperling and Lortie, 2010). As designed and managed components of the urban environment, residential gardens are increasingly seen as important in urban conservation efforts (Gaston et al., 2005; Loram et al., 2008) and the collective impact of privately managed gardens across urban space is known to support urban (Aurora et al., 2009; Lortie and Sperling, 2008; Rudd et al., 2002). Understanding the factors that encourage the spread of gardening within cities may help planners facilitate healthier and more biodiverse urban communities.

The research presented here characterizes the spatial distribution and attributes of gardens found in easement areas of Ann Arbor, Michigan. Spatial analyses of these privately managed public spaces provide evidence of clustering for both the presence of gardens and their aesthetic quality. Data were collected on the location and attributes of easements from 22,562 properties during summer of 2009. Eleven percent of these properties held an easement garden. Analyses support the hypothesis that easement gardens are spatially clustered with the contagion effect maximized at a neighborhood size of 91 meters from “home.” The gardens rated most aesthetically pleasing are themselves spatially clustered with apparent imitation of garden quality greatest between closest neighbors with easement gardens. A discussion of alternative hypothesis about the cause of garden clustering includes the potential role of social contagion and property value. The spatial scale of clusters supports the role of social contagion in the production of easement gardens. The value of imitation behavior is discussed in light of current literature (e.g., Daniels and Kirkpatrick, 2006; Goddard et al., 2010) as a cost-effective mechanism to spread sustainable behaviors that support ecological resilience in urban areas.

## Towards Simulating Ecosystem Services

**Barry Lehrman**, California State Polytechnic University Pomona, USA,  
blehrman@csupomona.edu

**Derek Schilling**, University of Minnesota, USA, schilling.derek@gmail.com

**Keywords:** Ecosystem services; landscape performance indices; quantification of sustainability; urban resilience; climate change; sustainable sites initiative; regenerative design; performance-based design; new practice opportunities for landscape architects

Landscape architecture needs performance-based design tools to advance our practice into the 21st century (Shane & Graedel, 2000). Ecosystem services (ES) can provide a multi-scalar holistic framework for quantifying landscape and urban performance that supports the development of such tools. The role of ES in creating resilient urban places (Ahern, 2011) and ES design tools have not yet been adequately explored (Lovell & Johnston, 2009; Termorshuizen & Opdam, 2009; Windhager, Steiner, Simmons, & Heymann, 2010). The Sustainable Sites Initiative (2009) utilizes ES in their underlying performance indices, but offers limited tools beyond simple spreadsheets to model ES or quantify landscape performance.

This paper focuses on efforts and methodology to develop ES tools by the authors, touches on their application in the design process, pedagogy related to ES simulation, and shares examples of student work using and developing these tools. ES are defined as the direct and indirect economic benefits humans gain from natural processes (Boyd & Banzhaf, 2007; Carpenter et al., 2009; Hermann, Schleifer, & Wrbka, 2011; Kremen, 2005). These benefits includes:

- Supporting services (soil formation and primary production)
- Provisioning services (food, fresh water, and materials)
- Regulating services (climate regulation, and flood prevention)
- Cultural services (tourism, recreation, and spirituality)

Monetizing and commoditizing natural process and places is a powerful economic and policy tool that can promote conservation and reduction of environmental impacts across all economic sectors (Gomez-Baggethun, de Groot, Lomas, & Montes, 2010). ES simulation methods borrow from several disciplines, most closely from architectural energy simulation tools. Methodology and findings covered includes:

- Practices for establishing the baseline performance of a site
- Generating “shoebox” models that approximate the design under consideration (buildings, hardscapes, vegetation, water systems, and other infrastructure) for design optimization (Balcomb & Hayter, 2001).
- “Patchwork Calculator” tools to aggregate and integrate several assessment tools
- ES optimization methods
- Decision making tools

Performance simulation of ES by design disciplines is a nascent field that has the potential to lead towards the creation of truly resilient places, validate the claims of eco-city designers, and strengthen the development and application of the Sustainable Sites Initiative. Developing ES performance simulation tools is essential for landscape architecture if humanity is to start regenerating the planet and avert environmental catastrophe (Rockstrom et al., 2009).

## A Trilogy of Case Studies Surrounding Green Roof Design for Residential Structures

**Joanne Westphal**, westphal@msu.edu, **Jeremy Monsma**, monsm@msu.edu,  
**Erik Cronk**, cronkeri@msu.edu, Michigan State University, USA

**Keywords:** green roof design, ecological benefits, current barriers, adoption

This presentation proposes to review three studies—two recently completed and one on-going—concerning the use of green roofs on residential structures. The first study will examine the potential of green roofs to increase biodiversity in communities. The focus of this study was to establish the types of insect and spider species that use green roofs as habitat in urbanized areas. One of the first studies of its kind in North America, the research found a highly diverse population of insects and spiders on each of the eight green roofs examined during the study. Central to the biodiversity issues was whether certain green roof types (e.g., extensive versus intensive, large versus small, Sedum dominated versus grass/herbaceous prevalent, etc.) tended to attract a more diverse set of insect and spider species, which in turn would attract a more diverse set of wildlife. The second study was a comparison of different vegetated treatments of green roofs and conventional roofing materials (steel and fiberglass shingle) in terms of stormwater management. At issue in this study is the degree to which green roofs outperform conventional roofing materials in terms of reducing peak flows and overall water volume release following a rain event. Significant differences in the performance of the green roof treatments when compared to standard roofing treatments was found in this study, and the author will describe the magnitude and implications of the data for watershed management in urban areas. The third study examines current public perceptions of real and perceived barriers to green roof adoption for residential structures in the Midwest. In this on-going study, the author builds on earlier work of Hendricks and Calkins (2004), but expands the study to include the knowledge level and willingness of residents to adopt, green roof technology on their own homes. Nearly a thousand households in Michigan were involved in this latest study; findings suggest that significant work in educating the public about green roof technology will be necessary if widespread adoption is to occur.

# Urban Design



## Mayawati and the making of Lucknow as a city of spectacle

**Amita Sinha**, University of Illinois at Urbana Champaign, USA, [sinha2@illinois.edu](mailto:sinha2@illinois.edu)

**Rajat Kant**, Government College of Architecture, Lucknow, India, [rajatkm@sify.com](mailto:rajatkm@sify.com)

**Keywords:** urban spectacle, post-colonial India, memorial parks

Mayawati, the Chief Minister of the province of Uttar Pradesh in India, has set about transforming its capital into an urban spectacle. Lucknow has an illustrious past as the 19th city of Nawabs, reconfigured in colonial times, and much expanded in the post-independence period (Sinha, 1996; Sinha and Kant, 1997; Nagpal and Sinha, 2008). In the last decade, in addition to memorial buildings built on a monumental scale, it has been getting a 'face-lift' with handsome boulevards, large plazas, ornate fountains, huge maidans (open spaces) and a gigantic amphitheater (Sinha, 2010). Replete with Buddhist imagery of chaitya windows, railings and domes resembling stupas, the buildings, inspired by Lutyen's and Baker's designs in colonial New Delhi, sit within an urban landscape of large plazas lined with elephants (symbol of Mayawati's Bahajun Samaj Party—BSP) and statues of BSP leaders. Their commemorative function over-rides other urban uses, with some of the memorial complexes for the exclusive use of BSP celebrations. Described as 'land-banks' ensuring that no urban development occurs at these sites, they are an exercise in power, aimed at impressing the locals and visitors alike with their grandiosity.

The 'city of spectacle' reaffirms political might of the ruling party and promotes continuing re-enactment of ceremonial rituals featuring party members and commemorating social reformers. The paper analyzes the ramifications of Mayawati's projects on Lucknow's urban fabric, its land uses and transportation patterns and assesses their contribution to the public realm. It argues that the urban transformation, far from cosmetic, is structural, and re-invents the city as the symbol of empowerment of the lower castes. The newly designed parts of Lucknow thus represent a new kind of urban order, different from that of other provincial capitals and the four metro cities in India that are growing rapidly with economic growth and global capitalism. The new sections are a rupture from its urbane past, and are a simulacrum, their design vocabulary a synthesis of past styles and imagery never seen before in the city. Although a symbol of enfranchisement of the downtrodden, they are in reality autocratic gestures. The critical reading of the new urban order is undertaken to speculate on other possible urban futures that could have been more historically grounded, people friendly and participatory in nature.

## Productive Fiction: Reconstructed Grounds

**Peter Goché**, Iowa State University, USA, goche@iastate.edu

**Keywords:** Design laboratory, Holistic Design, Interdisciplinary, Social Design, Actionable Proposition

In this presentation, I will discuss the generative role of design narration and video production in the provocation and rehabilitation of an existing environment

Bemis Gardens was an exhibition and design laboratory that sought to consider the urban condition of the contemporary art center and its relationship with downtown Omaha through the transformation of the Bemis Center's exterior into a public art site and urban garden. In the midst of the Building | Bemis construction process, a project that will result in a significant expansion of the artist-in-residence program, renovated fabrication facilities and a restored front dock—this exhibition and project series served to initiate a holistic reconsideration of the Center's land use and exterior relationships with the public.

In recent years, artists, architects, ecologists and social designers have formed new hybrids between food production and social space, urban ecologies and public art, forgotten space and material ingenuity, and public spectacle. Bemis Gardens was structured as an open laboratory and interactive exhibition. Throughout its three-month run the exhibition hosted a series of workshops consisting of professionals from diverse fields in effort to consider urban land use futures and speculate on specific actionable possibilities for the Bemis Center's site.

The installation of the Water Hutch designed and constructed by [author's name] is one such actionable proposition. Reminiscent of the many waterways that meander through the Midwest, the work consists of a sinuous line made up of three oxbows. The constituent forms are constructed of built up dimensional lumber. The set of parts serve as an ambiguous measure by which people situate themselves. It operates metaphorically as an open set of shelves onto which people, and thereby, memories accumulate. This set of parts served as provocateur for the subsequent design strategies developed as a result of this open laboratory and interactive exhibition. Our hope was to consider the socio-spatial effects of this form as it relates to the new space of the dock through the development of interdisciplinary performance was staged on the Water Hutch in Gallery One at the Bemis Center for Contemporary Art. As an introduction to the social phenomenon associated with the hutch, a literary abstract and video was presented. In addition, we developed a generative literary narrative in effort to inform the mock installation of the Water Hutch and all subsequent installations specific to the space of the reconstructed dock.

## **Medieval Town Making and Sustainability: A Return to the Center**

**Beverly Bass**, California Polytechnic University, San Luis Obispo, USA, [bjbass@calpoly.edu](mailto:bjbass@calpoly.edu)

**Keywords:** neo-traditional communities, sustainable design, medieval urban form

For decades now, planners and designers have looked to traditional town-making as a model for sustainable development in planning new or retrofitting existing communities. Attributes of traditional towns developed before the advent of automotive travel include compact development, a mixture of land uses, multiple modes of transportation, and street networks that are scaled for humans. These qualities are of particular interest in that they are believed to contribute to more livable communities and promote less of a reliance on single-occupant automobile travel at the exclusion of all other modes (Cervero & Radisch, 1996).

This study aims to expand upon the understanding of traditional town-making practices by examining historic medieval Dutch towns which have been successful at retaining the scale and character of livable communities while limiting intrusions of automobile travel (Pressman, 1987). The Dutch report the lowest level of sedentarism in Europe in part due to travel choices that are more centered on walking and biking. Indeed it is in highly urbanized areas of the Netherlands that walking and bicycling present themselves as a significant method of mobility (Racioppi et al, 2005). What elements in Dutch town making, both historical and current, have contributed to these choices? This paper examines historic Dutch town-making along with past and current transportation and land use policy to determine what efforts have most contributed to this condition of higher than normal uses of alternative transportation modes among its populace. Dutch water towns, settlements that were created during the middle ages upon reclaimed marshes and water bodies, form the focus of this examination in that these towns show a higher level of planning and care at their inception when compared to other medieval towns from the same era (Burke, 1956. Gutkind, 1971). Case studies of three Dutch water towns were conducted that describes the historic development of these towns along with a discussion of Dutch planning policies, past and present. These findings may be useful in the planning of new communities or retrofit of existing communities that promote more sustainable, livable communities.

## Who's Talking to Whom? Villager Participation in the Relocation of El Gourna, Egypt

**Paul Duggan**, Clemson University, USA, pduggan@g.clemson.edu

**Hala Nassar**, Clemson University, USA, HNASSAR@clemson.edu

**Keywords:** relocation, participation, mediation, El Gourna, Egypt, village talk

From 1986 to 1993, about 80 to 90 million people worldwide were displaced due to large development projects, a number greater than those displaced by wars, famines, and natural disasters (Betts, 2009; Cernea, 1997; Cernea & McDowell, 2000). More recent figures are still between 4 to 8 million, per year (Betts, 2009; Stanley, 2004).

Development induced displacement typically results in long term impoverishment (Cernea & McDowell, 2000), and permanent, irreversible changes that engender a deep sense of loss and grief (Fahim, 1983; Fernea & Kennedy, 1966; Scudder, 2003). It is a process over which residents have little or no control. The scholarly literature however, suggests that significant improvement can result from meaningful participation designed to tap into the "initiative, energy, and self-organizing capacity of ousters" since it provides critical local knowledge, and strengthens residents' determination to succeed in the new environment (Cernea & Guggenheim, 1993).

In 2005, residents from the historic village of El Gourna, Egypt were relocated to a new village at El-Tarif 4 km to the north. A goal of the relocation was to achieve meaningful participation. A 15 month study was conducted in Cairo and Upper Egypt. Forty-six participants were interviewed regarding their experiences. Specifically, the study focused on the role of participation in facilitating the relocation process and minimizing negative impacts on the residents.

Research findings identified two critical considerations for local participation. First, based on interviews conducted during the study, an important but informal communicative process involving the entire village was identified and labeled "village talk". This was occurring primarily at the village level and was a significant source of valuable local knowledge (Innes & Booher, 2010). Tapping into this source of knowledge requires personal contact between planners and local populations usually within the community itself rather than more formalized participation methods (Innes & Booher, 2010; Peattie, 1968).

Second, designers and planners need to play a role in assisting the local community in developing effective representation and sufficient social organization in order to effectively participate in the relocation project (Peattie, 1968).

This study shows that a) social, political and communicative structures of local communities can be carefully studied, and a strategy of participation and inclusion be designed to fit the unique aspect of these systems, b) existing communicative structures of a local community can be utilized to enhance local participation but need to be accessed using alternative participations methods.

## **Urban Engagements: Official Participation versus Design Activism at Can Batlló, Barcelona**

**David de la Peña**, University of California, Berkeley, USA, [delapena@berkeley.edu](mailto:delapena@berkeley.edu)

**Keywords:** Urban Design, Participation, Consensus, Conflict, Activism, Public Space, Barcelona

Over the past three decades, Barcelona has been transformed into what many deem the city par excellence of urban design. (Marshall 2004; Rowe 2006) But while the design establishment has celebrated the high quality of urban space, others have criticized the prioritization of the Barcelona brand over the needs of its citizens. (Paz Balibrea 2004; Borja 2009; Delgado 2007) In a city where urban space is often charged with contradictory notions of democracy and anarchy, one finds politicians touting the openness of participatory processes while activists denounce them as a sham. Designers, working in this context, participate in processes of urban transformation where the successful application of their skills depends on understanding and often challenging given roles.

This paper examines official and activist processes of participation in Barcelona. It focuses on designers and their relationships with officials, citizens, intellectuals and developers. It begins by tracing the evolution of participatory urban design in Barcelona from the late 20th century to the present. It briefly describes the normative rules, methods, and practices of consensus-driven participation, and analyzes the outcomes of these processes. Second, it introduces alternative practices, often rooted in conflict, and evaluates the successes of these emerging forms of design activism.

This research focuses on a particular case, Can Batlló, a proposed 30-acre industrial redevelopment in the historic barrió of Sants. This redevelopment, now 36 years in the making, provides a window into both official and activist modes of participatory design. Here, official modes of practice have been challenged by a concerted effort of designers and residents, whose threats of occupation (*okupació*) have generated developer concessions and led sustained community self-governance (*autogestió*). Through archival research, participant observation, and interviews, this research project exposes the often tricky relationships that designers must negotiate in order to co-produce inclusive and successful urban spaces.

The endeavor to understand these complex dynamics is significant not only for Barcelona, but also for its implications for urban design practice elsewhere. Normative participatory practices in the U.S. are also expert-controlled and consensus-driven. Yet, the manufacture of consensus often belies the conflicts and contradictions inherent in public spaces that are used by diverse publics. (Fraser 1990; Amin 2008) The study of Can Batlló allows us to consider how designers ought to respond to the evolving context of urban transformation in which outmoded top-down practices must address grass-roots social movements.

## Tempelhof Airfield Park and the Landscapes of Urban Airport Redevelopment

Sean Burkholder, Pennsylvania State University, USA, slb59@psu.edu

**Keywords:** Tempelhof, Berlin, Urban Airport, Competition

The redevelopment of the Former Tempelhof airfield site in Berlin will likely become one of the more important landscape projects Europe has seen in decades. Its size, history and underlying politics are matched only by its inherent potential as a new world-class park urban park. Located just minutes from the city center, it was initially designed to become the center of European air travel during the period of Nazi control. Spanning an area larger than Central Park, Tempelhof now lies fallow, embracing opportunistic intervention by pioneering Berliners. The airfield's relationship to surrounding neighborhoods and the country's powerful history make it a complex location. Yet such complexity is tempered by the vastness of the site itself. Expansive planes of grassland and asphalt allow thousands of visitors to spread out into a single layer offering extreme isolation and tranquility, even at the busiest times. This paper aims to address the challenges and opportunities that have arisen in the midst of reconceptualizing the historic Tempelhof airport as an urban park within the context of contemporary land use and demographic changes.

In 2010, a design competition was held to decide the future of the airport, the finalists of which included GROSS.MAX, Topotek 1 and BASE. Due to the airport site's aforementioned complexity the brief for the competition was nearly 200 pages long, painstakingly outlining the myriad of expectations for the design. Even with these stringent stipulations, the promotion of the project has not proceeded without conflict. Given that the site already functions as a public park without the overlay of the proposed 61 million euro project, neighboring citizens are hesitant at the prospect of change. Issues of gentrification and ecology have become central to discussions of the park's future as plants and animals begin to call Tempelhof home and park-side residents watch rents rise.

The repurposing of urban airports is quickly becoming a typology of urban landscape projects. Well known examples include Downsview Park in Toronto, The Stapleton development in Denver and Fornebu in Sweden. This paper will comparatively look at how this new typology of project is forced to deal with fluctuating urban agendas, large scale landscape process and complex site histories. By means of literature/media reviews, site visits and interviews, the paper will also discuss how the design proposals for Tempelhof, when compared to other projects of this typology, establish it as a "watershed" event in the redevelopment of the urban airport.

## Las Ciudades Y Pueblos Que Nunca Fueron—The Cities and Towns that Never Were

**Christopher Marcinkoski**, University of Pennsylvania, USA, marcinko@design.upenn.edu

**Keywords:** Urbanism, Spain, Real Estate Bubble, Ghost Towns, Dormitory Towns, Urban Growth Model, Interim Occupancies

One rarely associates struggling post-industrial Detroit, Cleveland, Manchester, Liverpool or Leipzig with the cosmopolitan global metropolis of Madrid. Yet as of the autumn of 2008, Madrid, and much of Spain for that matter, has been facing a widespread condition of massive over-urbanization and vacancy brought on by nearly two decades of untamed real estate speculation and highly lubricated credit that suddenly went dry with the global financial collapse of that year. The result is vast and numerous territories of incomplete and unoccupied real estate development at the periphery of established cities like Madrid, as well as entirely new dormitory towns well outside of these conurbations without a commensurate population and revenue stream to occupy and support them. In many cases, building foundations, train platforms, public parks and roadways have been left incomplete or abandoned, producing the vaguely familiar markings of attempts at urbanization, like giant Druid crop-circles on the Iberian landscape.

In the context of near universal disciplinary discourse about the ascendancy of the city and the massive projected increase of global populations in the coming decades, there remains a clear and immediate need to develop robust, flexible strategies for projectively negotiating transitional urbanisms—urbanization in process, urbanization in decline, or urbanization in pause—whether in Europe, North America or emerging contexts like China, India and Brazil. In fact, one need only look at the increasing number of accounts citing huge, unoccupied developments in central and west China or the egregious overbuilding of the United States' Sun Belt region to understand that despite the best (or worst) of intentions, demographic and economic analysis, and quality of planning and design, urbanization generally and real estate development specifically are speculative practices that necessitate interim and provisional strategies in order to achieve long-term successes.

To frame this discussion, this paper will sketch out the current situation at the periphery of Spain's major cities, and building upon the research of a graduate studio conducted at the University of Pennsylvania, it will outline a set of strategies for negotiating the particular circumstances in Spain, as well as prospective applicability to other urban situations residing in a state of (potentially) perpetual incompleteness. In particular, the essay will look to establish a more projective, entrepreneurial mode of operation in dealing with these incomplete urbanisms as compared with the somewhat limiting Shrinking Cities discourse that has dominated similar discussions within the U.S., U.K., and northern Europe.

## Finding Virtual Center: Tahrir Square and Student Perception of Socially Mediated Public Space

**Hala Nassar**, Clemson University, USA, hnassar@clemson.edu

**Robert Hewitt**, Clemson University, USA, hewitt@clemson.edu

**Keywords:** public space, communication, education, landscape, social media

Recent events in Europe and Africa have focused attention on changes in communication technology and public space prompted by the rise of social media and the advent of Web 2.0. While some scholars envision these changes in terms of diminished democratic discourse, greater consumption, commerce, and social surveillance (Madden 2010), others recognize the potential for new forms of voluntary association, mutual aid, pluralism and a social liberation (Springer 2010). De Certeau describes the manifestations of these new associations as creating spheres of autonomous action and self-determination within their imposed political and social constraints (de Certeau 2010).

In light of formidable challenges to civic expression in public spaces recently in London, Cairo, Damascus, and Tunis, new ways of articulating dissent, innovations in mobilization, have (re)claimed contested public spaces and transformed them into zones for public protest. The potential of these new forms of voluntary association to empower public space is evident in the extent of their influence on political change, evidenced in the recent democratic revolutions in North Africa. The results of these changes are of specific interest to urban designers and to urban design educators.

The paper examines the influence of social media on student perception of landscape change and the role of public space in urban environments. The paper focuses specifically on student perceptions from two groups of students participating in an international urban design studio during the Tahrir Square Revolution in Cairo: one group of landscape architecture students studying urban design at Clemson University, and another group of architecture students studying urban design in Cairo Egypt. The paper presents findings from two surveys administered to the two groups of students. The surveys elicited responses intended to understand: 1) extent of student use of social media; 2) the role of social media in civic, private, and commercial space; and 3) personal use of social media and public space; 4) perceived differences between physical and virtual spaces in times of conflict; 5) interrelationships between physical and virtual space; and 6) differences and similarities between the two groups given their experiences related to the Tahrir Square Revolution.

Findings suggest considerable student exposure to civic unrest in public space in America and Egypt, varying use of social media to navigate politically and socially active public space, constraints on the use of social media based on its surveillance potential, and distinct cultural/social perspectives concerning virtual public space between the two groups of students.



## Critical Engagement with Informality: Urban Landscape Research and Design for Dharavi

Sameera Rao, Ball State University, USA, [scrao@bsu.edu](mailto:scrao@bsu.edu)

Burcu Yigit Turan, Ball State University, USA, [burcuyigitturan@gmail.com](mailto:burcuyigitturan@gmail.com)

**Keywords:** Urban Informality, design interventions, mapping informality, infrastructures and materials in informal urbanism

With 60% of the population of Mumbai living in Informal Settlements, Dharavi is the largest informal settlement in Mumbai with around 600,000 people living in 500 acres of land. Dharavi has developed from marshes to a land of high returns. It has several small scale industries and every house is like a tool house. It is very rich in social spaces and has a highly integrated urban fabric. It is a perfect example of doing more with less but at the same time it cannot be ignored that Dharavi needs better infrastructure. Although several redevelopment plans have been proposed, neither of them is really in the interest of the people of Dharavi.

The slum rehabilitation authority's (SRA) vision is to create monochromatic buildings, which are more like a vertical slum. The existing hierarchy of rich social spaces in the user-generated city of Dharavi is lost in the dead corridor of the SRA buildings. According to Indian architect Charles Correa, these plans are more like illusions with very little vision.

With the increasing urban population, urban informality is not limited to Dharavi and Mumbai, but it is a global concern. As a field of study, informal urbanism provides an alternative way of comprehending emerging urban practices that are shaped by the inhabitants as basis for exploring the potentials of design for "adaptation" and innovation" (Brillembourg et al., 2010). In this regard, this study has developed different urban environmental analysis methods that integrate qualitative research methods with spatial/ecological research methods in order to map the complexity of social and ecological systems and spaces as the operative context for design. Furthermore, it questions the adaptability of low-cost materials and technologies in developing rich cultural ecologies and quality spaces for the local people. Consequently, this study attempts to explore the design interventions that can be made to the dynamic neighborhood of Dharavi without compromising the existing social richness of the space.

## Landscape Dynamics

**Jill Desimini**, Harvard University Graduate School of Design, USA,  
desimini@gsd.harvard.edu

**Keywords:** spontaneous vegetation, successional woodlands, modern architecture, shrinking cities, vacant land

Charles Jencks declared “Modern Architecture died in Saint Louis, Missouri on July 15, 1972 at 3:32 p.m. (or thereabouts) [1] when the infamous Pruitt-Igoe scheme, or rather several of its slab blocks, were given the final coup de grâce by dynamite.” [2] However, since its destruction, a landscape has been growing in its place. The burgeoning forest supports a diverse set of flora and fauna species. As Juan Williams Chavez, a prominent local artist and educator, discovered, the bees are alive on the 57-acre site on the city’s near North side.

German ecologists have begun to recognize potential benefits of the shrinking city. Shrinking cities have rich ecosystems, paradoxically demonstrating higher biodiversity than areas often considered “near-natural” such as agricultural areas.[3] This is due to the complex and compact land use patterns of urban areas that allow for many habitats in a relatively small area.[4] The volunteer species that establish in these swaths of wild land are productive ecosystems, “‘hotspots’ of botanic and animal diversity.” [5]

The Schöneberger Südgelände Nature Park on the site of the former Templehof switching yard in Berlin arose out of such a realization. The switching yard closed in 1952, was abandoned for fifty years, and a rich grassland and successional woodland developed on the site. Realizing the importance of this rare oasis in the city, the site was deftly converted to a nature park in 2000, preserving 62 of 173 acres, while providing public access, art and amenity.

This paper argues that the Pruitt Igoe site is the closest North American equivalent to the European urban-industrial woodlands found in the Schöneberger Südgelände Nature Park and other similar sites. With potential development pressure—and a current ideas competition for Pruitt Igoe, it is an important time to consider the future of the wooded site, which unlike the former Templehof switching yards, is loaded with cultural, political and architectural significance.

At the time of its building and its demolition, Saint Louis City was losing population. This continues to be the case. Saint Louis has lost a greater percentage of its population than any city in the United States; over sixty percent of its former inhabitants have moved elsewhere. The physical ramifications of this are particularly evident near the Pruitt-Igoe site. It is time to ask: how can, or should, this emblematic space serve as a catalyst for a productive social and ecological transformation of the city?

## **An Opportunity for Public Space in the Landscape of Infrastructure: The Case of Hance Park in Phoenix, AZ**

**Gabriel Diaz Montemayor**, Arizona State University, USA, gmontema@asu.edu

**Keywords:** Landscape Infrastructure, Polyvalent Space, Public Space

Hance Park in Phoenix, Arizona, has never fulfilled the expectations it originally caused due to its significant economic investment, and remains partly abandoned and mainly used by homeless people and stubbornly committed neighbors. The park is commonly called “Deck Park”, as it is effectively a bridged-platform built on top of interstate 10, which, at the moment of its construction sectioned off neighborhoods historically linked to the downtown area. The City of Phoenix organized a citizen committee to define a mission for the park in order to develop a funding search tool. The committee, the city, and a joint architecture and landscape architecture graduate studio group concentrated on the development of an updated design with the objective to recover the site as a multi-scale-function amenity. Deck Park is a unique piece of infrastructure but the current master plan downsized the park as an ordinary, almost standard, space. The studio’s approach focused on the singular opportunity to retrofit the site leveraging its infrastructural factors including: multimodal transportation, public space and services (the Phoenix Central Library sits on-site), and artificial nature / systems. The methodology and work process of the studio diverted from the committee’s civic understanding and the city’s maintenance logic with the inclusion of contemporary discourses currently existing in the state of the discipline: i.e. landscape urbanism or landscape infrastructure, and capacities for energy production/efficiency and performative/interactive relationships between the park and the users. The project was also informed by extensive case study research and field visits to sites in Spain. The developed project reveals the site as a laboratory to test and address issues of aging infrastructures, monovalent systems, and the failure to build community around and because of an expensive park. The studio embraced the chance to visualize future landscapes where infrastructure concedes additional uses or accepts change in favor of a more human focused sense of the public. Phoenix is one of the remaining infrastructural/sprawling cities in the U.S.A. and its Central Park atop an interstate is presented as a signature construction exploring and promoting extraordinary qualities and programs. As a tool to sell what can happen with Hance Park, the studio’s project takes the risk of polyvalent, multi-purpose space and constructed nature in hopes of finding the trust of potential investors or the coincidence with the emergence of quality as the main criteria employed in the design of public space in the region.

## Completing Mexican Suburbia: Guidelines for a Bottom Up Approach Retrofitting the Urban Design of Low Income Housing Peripheries in the Border Region Between the U.S. and Mexico

**Gabriel Diaz Montemayor**, Arizona State University, USA, gmontema@asu.edu

**Keywords:** Urban periphery, Low Income Housing, Green Networks, Urban Tactics, Design Guidelines

The Suburban American Dream has been a model for a long time in Northern Mexico. Supply and demand of housing, from every income level, is determined by a rather singular shrunken version of suburbia. This kind of urban housing emerged after the de-regulation of rural property found in the urban periphery fueled by the signing of the NAFTA agreement. Since housing typologies are a miniaturized version of the original; architectural adaptations have surfaced from the bottom up in order to make these structures functional. Dwellings sold as finished products immediately become customized, enlarged and improved due to inconsistent programmatic and spatial organization. Although similar typologies exist throughout all of Mexico the particular openness, or barrenness, of arid Northern Mexico urban peripheries exposes the social interest housing to aggravated environmental conditions, insufficient and ineffective infrastructure, poor transportation, and, most recently, a surge in crime.

The resulting figure ground of the urban fringe is one where the void or ground prevails over the solid or figure. The potential hierarchy of open space is lowered with the common perception that “there is nothing” in the desert. However, all of those open spaces allow for the re-construction of the continuity of natural systems and the construction of community by the insertion of green networks, corridors, and landscape infrastructure. Although not always ubiquitous, there are traces left by manipulated landscapes and local inhabitants revealing adaptive tactics and potential connectivity.

This paper discusses how the development of design guidelines for the urban edge understanding and leveraging the presence of nature, urban fractures, and bottom up tactics for the construction of the public realm are all opportunities with significant potential for these peripheries. As proven by a series of diagrams and drawings exploring the extension of architectural ingenuity into urban design, these communities have the capacity to articulate a more rewarding urban fabric.

With a very large availability of open spaces this is sure to be a long standing condition of the region's urban peripheries. This is also why this is such a critical issue for these low income populations. If the traditions of architectural adaptations have not yet had an effect on the abandonment of inefficient typologies by developers (public and private), it is possible that allowing the exercise of urban design adaptations defined by the dwellers themselves might have the capacity to uncover an unexpected resiliency of the effective social capacities of shrunken suburbia.

## **Synergies between Living and Growing—Integrating Urban Agriculture in Multi-family Housing Developments**

**Gundula Proksch**, University of Washington, USA, prokschg@u.washington.edu

**Keywords:** urban agriculture, multi-family housing, site planning, urban redevelopment, growing methods, farming operation, metrics of productivity

Interest in urban agriculture and local food production has taken hold in urban communities. Due to its multiple benefits, it is slowly becoming an important part of urban design, site planning, or redevelopment projects. The beneficial overlap between living and growing systems suggests that the incorporation of multi-story housing and agriculture is a viable solution for creating dense, healthy, and agriculturally productive cities.

This study develops a framework for architects, landscape architects, and planners to estimate the in- and outputs as well as social, economic, and environmental benefits of intense urban agriculture in housing projects. It is based on proposals for a large-scale, 30-acre redevelopment project in downtown Seattle, WA, with 5000 units. The framework evaluates a variety of growing systems, different types of agricultural operations, as well as their integration with new and existing urban infrastructure and building systems.

The findings show that different types of urban agriculture operations, such as intense, entrepreneurial ventures, community and educational gardens, and individual growing spaces need to be incorporated in neighborhoods to capitalize on their diverse benefits. Depending on the mode of agriculture operation, different growing systems are appropriate. The study compares the performance of hydroponic and soil based rooftop farms, vertical growing structures/ greenhouses and conventional gardens, which are supported by sustainable building systems, including rainwater harvesting, irrigation with grey water, and composting.

The key metrics established for the different scenarios include: efficiency of growing method, amount of food produced, percentage of land and building area devoted to agriculture, jobs created and in kind contributions by the residents provided. “Growing productivity” (amount of food produced per growing area) and “land productivity” (amount of food produced per total site area) are figures that allow comparing different scenarios, but do not give the complete picture of the sustainability value of a project.

The study concludes that the integration of diverse agriculture types maximize the impact in a dense urban neighborhood and housing developments. Estimates suggest that 35% of the food needed for up to 10,000 inhabitants could be produced on the 30-acre site and buildings, while maintaining and intensifying social, economical and environmental networks. These findings show that the promotion of urban agriculture through rethinking of public space in multi-family housing schemes strengthens inner-city communities. Wherever applicable, it should be actively integrated into the (re)development of urban neighborhoods.

## Re-visiting utopia: Landscape, Identity, and the past/present of modernist new towns

Deni Ruggeri, University of Oregon, USA, druggeri@uoregon.edu

**Keywords:** New Town movement, ecocities, master planned communities

Since WWII, planners have attempted to redefine the traditional notion of what a city is through the creation of self-contained, easily accessible, and more sustainable communities. New Towns continue to be built around the world, from China to India, and Korea to North Africa. This paper investigates the evolution of the New Town paradigm from its inceptions to the current applications. It employs case studies to illustrate challenges and opportunities

New Towns have offered, and how this type of community can still serve as a model for sustainable living. New Town planners have struggled to find the perfect solution to the challenge of creating community “from scratch” (Forsyth, p.369). While academics cannot agree on a definition ambiguous, past and present New Towns share a series of basic characteristics that identify them as expressions of a common paradigm (Merlin; Gaborit; Forsyth):

- 1) Mixed use, self-contained environments;
- 2) Modernist emphasis on efficiency and innovation;
- 3) Provision of services and leisure opportunities for all residents;
- 4) Use of urban design as a marketing tool;
- 5) Landscape as an element of identity and imageability;

In his 1983 “The World, the Text, and The Critic” Edward Said acknowledges that “[t]he movement of ideas and theories from one place to another is both a fact of life and a usefully enabling condition of intellectual activity.” He further suggests that theories evolve according to a four-stage process, which includes “a point of origin”, “a distance transferred”, “a set of conditions for acceptance or rejection”, and “a new position in a new time and place” (Said). This paper employs the New Towns of Harlow, England; Cergy-Pontoise, France; Zingonia and Librino, Italy; Irvine, USA; Almere, Netherlands, and Caofeidian, China as case studies to illustrate how the New Town ideals have traveled across cultures and time, with an emphasis on the study of key defining elements: physical design and aesthetics, social concerns, economic activity, transportation systems, and nature (Forsyth and Crewe).

The findings show that despite geographical and cultural idiosyncrasies, New Towns have struggled to confront common problems: disconnect between vision and implementation; lack of stewardship and livability; weak place identity and place attachment (Ruggeri). Similarly, the case studies show that the landscape played a key role in defining their sense of place, and continues to direct their evolution and path towards sustainability. The paper concludes with suggestions for the planning of the sustainable New Towns of tomorrow.

## **Engaging People: A Community Based Movement To Revitalize A Historic City Center**

**Carl Rogers**, Iowa State University, USA, rogersc@iastate.edu

**Keywords:** urban corridor, community revitalization, public input, empowerment

The complexity of many urban neighborhood problems often makes citizens ill suited to employ traditional research and interventions. Social issues together with local community's calls for genuine partnership in the research process has identified the value of an alternative paradigm. Community-based research (CBR) is a collaborative approach combining systematic inquiry, participation, and action to resolve urban design issues (Strand et al., 2003). This paper reviews the principles and historical roots of community based research and identify key ways how it creates new strategies for community development. The study combines methods of inquiry with community building strategies to bridge the gap between knowledge produced through research and what is practiced to revitalize urban communities.

Using a case study example from a non-profit initiative to revitalize an urban commercial district the author illustrates some of the challenges facing community based research. The study examines how collaboration between undergraduate students in landscape architecture, university faculty and community citizens shaped how the study was designed and how the research was conducted. The author identifies that collaboration is a vital tool for social change that links research skills of university with the lived experience of the community. Here the author discusses an emerging framework aimed toward fostering community impact through university and community civic engagement. Literature defines community based research as a partnership of students, faculty, and community members who collaboratively engage in research with the purpose of solving a pressing community problem or effecting social change. The paper describes how a non-profit organization's mission to revitalize an historic urban corridor might have greater effect utilizing community based research principles.

The 6th Avenue Corridor, Inc, is a non-profit organization located in Des Moines, Iowa coordinating the commercial revitalization of 6th Avenue, an historic center between the city's downtown district and its neighborhoods to the north. Since 2008, the 6th Avenue Corridor, Inc, has engaged with community citizens in a series of public forums but lacks a strong framework to impact social change in the neighborhood that meets the needs of its citizens. One reason for this absence is the time required for social improvement to become visible. Of interest to the author, however, is the lack of frameworks and models to help research partnerships plan for and reach long-term results. Initial analysis from the case study reveals that engaging community citizens has a positive effect on community activity and is a successful community empowerment tool.

## Stair Culture: Defining pedestrian infrastructure in Hong Kong

**Melissa Cate Christ**, Hong Kong University, Hong Kong, mcchrist@hku.hk

**Keywords:** stairs, Hong Kong, pedestrian infrastructure, heritage

As part of the everyday landscape of mountainous Hong Kong, outdoor stairways play a critical role in creating a permeable and accessible public realm. Embedded in hillsides, stacked on sidewalks or replacing streets and alleys altogether, Hong Kong's ubiquitous stairs are a reflection of the diverse character of the city itself.

Obliquely defined by the city as utilitarian uphill access routes, Hong Kong stairs are often designed and maintained with function and frugality in mind even though they number among the oldest remaining built insertions in the city, some dating back to the 1840's. Besides those built recently as a planning gain associated with lot redevelopment, consolidated documentation concerning stairways is limited to the few deemed Monuments due to their relatively intact material condition (e.g. Colonial Duddell Street Steps in Central) or to those given graded Built Heritage status for their historical role in the development of the city (e.g. Ladder Street or Pottinger Street in ShuengWan/Central). However, beyond those with or deserving of heritage status, there are hundreds of other stairways in Hong Kong which also play a vital urban role as pedestrian and community infrastructure, serving as market places, ephemeral gathering spots, secret short-cuts or quiet rest areas away from vehicular traffic.

Drawing on student work from an applied research seminar at the University of Hong Kong and supported by mapping and archival research, first hand observation, interviews and community workshops, this paper examines the role of the stairway in Hong Kong history, culture, and urban development and argues for its recognition as a significant pedestrian infrastructural typology worthy of public, heritage, and municipal recognition and documentation. This recognition would help not only to preserve and protect the historic fabric of the stairways and their adjacent communities, but also to further develop their untapped potential as meeting, gathering, and commercial spaces which prioritize the movement of pedestrians through local communities.



## Body-Centered, Community-Minded: The Value of Halprin's RSVP Cycles to Invigorate Contemporary Landscapes

Judith Wasserman, University of Georgia, USA, judithw@uga.edu

**Keywords:** design process, participation, Lawrence Halprin, Motation, Scoring

Our lives are centered in our bodies, which are situated in place. Creative design of public space is determined by how we envision our body carving through space to create environments to invigorate mobility and instill authentic value in place. In order to incorporate a body centered participatory approach, Lawrence Halprin developed a structure for scoring movement for the purpose of creating and structuring use. "Motation," his graphic system, was originally created as a notational structural device to record and relay his wife Anna's complex dance ideas. "Scoring" was the integration of "Motation" with multiple other site and programmatic factors.

The beauty of the process orientation of the movement score, informed by inter-arts Bauhausian training under Gropius at Harvard, and embellished by Anna's unique choreographic intent, Lawrence Halprin offers a way to engage complexity and individual motivation into the design, allowing for products that are centered both in individual and community uniqueness.

Since this technique was developed in conjunction with dance and bodily movement ideas it has special relevance to engaging the physical body in the design process, and in the creation of spaces that invites movement. In promoting active physical use of space, it is worth delving deeper into Halprin's writings and lectures on his intent and technique of scoring for the purpose of physical involvement and spatial inclusivity. Based on research in the University of Pennsylvania Architectural Archives, and site visits of specific projects which offer a high degree of performativity, and have been used both historically and currently to stage choreographic works (The Portland Open Space Sequence in Portland, Oregon, Manhattan Plaza in Rochester, New York, and Stern Grove in San Francisco), and a deeper examination of his published writings, this paper provides a fresh interpretation of possibilities for the use of "Motation" and "Scoring" in contemporary design work.

Revisiting Halprin's emphasis on "Motation" and "Scoring" as integral to the design process can offer ideas and inspiration to invigorate pedestrian motion in contemporary urban centers. In today's car oriented environment, and with a rising rate of obesity, offering spaces which encourage active use can assist in promoting healthier, physically engaged, and more meaningful, urban environments.

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