



**SUBTROPICAL  
CITIES2013**

**BRAVING A NEW WORLD:**

**DESIGN INTERVENTIONS FOR CHANGING CLIMATES**

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We no longer have the luxury of time as the effects of climate change are being felt, according to the latest Intergovernmental Panel on Climate Change report, on every continent and in every ocean.<sup>1</sup> More than 50% of the population of the United States<sup>2</sup> and 85% of Australians<sup>3</sup> live in coastal regions. The number of people living in the world's coastal regions is expected to increase along with the need to improve capacity to mitigate hazards<sup>4</sup>, and manage the multiple risks that have been identified by the scientific community. Under the auspices of the Association of Collegiate Schools of Architecture design academics and practitioners from the Americas, Asia, and Australia met in Fort Lauderdale, Florida to share outcomes of research and new pedagogies to address the critical transformation of the physical environments and infrastructures of the world's vulnerable coastal communities.

As the broad range of papers presented at this conference suggest, existing architectural and urban typologies and practices are increasingly considered part of the cause and not the solution to adapting to climate change and sea level rise. Design responses and the actions needed to generate new and

unfamiliar forms of urbanism and infrastructure for defense, adaptation, and retreat in subtropical urban regions are being actively explored in academic design studios and research projects around the world.

Many presentations propose provocative and experimental strategies as global climate moves beyond our “comfort zone”. The ideas presented at the *Subtropical Cities* conference are timely as options for low-energy passive climatic design are becoming increasingly limited in the context of changing climate. At the same time, ways of reducing or obsoleting energy intensive mechanical systems in densely populated urban centers present additional challenges for designers and communities as a whole. The conference was marked by a common theme of trans-disciplinary research, where design integration with emerging technologies resonate with a reaffirmation of the centrality of design thinking, expanding the scope of the traditional architecture studio pedagogy to integrate knowledge from other disciplines and the participation of diverse communities:

### **ORIGINS AND MOTIVATION**

The *Subtropical Cities* conference series originated at the Centre for Subtropical Design at the Queensland University of Technology in partnership with the City of Brisbane, Australia in 2006. As academics, built environment design and planning practitioners, and local and state governments grappled with local population growth and an increasingly energy-intensive urban environment, the biennial conference sought to gather and build knowledge about urban design and architecture with a specific focus on subtropical conditions. Theoretically, regions with relatively mild climatic conditions should provide a head-start in the ‘sustainability’ agenda, needing less energy to effect thermal comfort than might be expected in more temperate climates.

The *Subtropical Cities* Conference expanded in 2011 in partnership with Florida Atlantic University to develop regional and global networks to share knowledge, pedagogies, and pursue collaborative research opportunities across the subtropics. Despite comparatively favorable climate conditions, the immediacy of climate change impacts are palpable in the urbanized coastal regions of the US and Australia. These regions present significant exposure to rising sea levels, tropical and extratropical cyclones, storm surge, flood and drought. For instance, with over US\$2.9 trillion in insured value of coastal properties, Florida is on the front-line of sea level rise and creativity over complacency is required to mitigate risks and avert predictable catastrophic losses. With the phenomena of sea level rise now acting upon us, the subtropical urban regions of the world are becoming the harbinger for braving a new world. In this context, the power of local knowledge and focused research is tested against global influences and our everyday engagements and actions reflect our position about the future we design for ourselves and for future generations.

With the majority of the human population now living in highly concentrated urban environments, the built environment – the traditional realm and central preoccupation of architecture - has never been more contingent on the context of the engineered and technological physical environment. The world we built in the 20<sup>th</sup> century, driven by energy derived from fossil fuel, requires a critical and fundamental restructuring in order to adapt to the new conditions that anthropomorphic climate change is bringing in the 21<sup>st</sup> Century.

With the centrality of geographical and environmental concerns that shape the local response while impacting the global, it is appropriate that the ACSA Fall Conference, *Subtropical Cities 2013* was held in South Florida, one of the most vulnerable and exposed regions of the United States. The conference coincided with the Florida Atlantic University Center for Environmental Studies (CES) annual Sea Level Rise Summit where conference attendees heard from regional and national policy makers, public health officials, planners, architects, water and energy utilities, economists and legal experts. Emblematically, flooding attributed to the Spring Tide (or King Tide) occurred in the host city of Fort Lauderdale, a “water-world” of rivers and canals, during the week of these gatherings.

### **ACSA SUBTROPICAL CITIES CONFERENCE OVERVIEW**

The theme of *Subtropical Cities*, adopted by the ACSA for its Fall 2014 Conference, is not confined entirely to a latitudinal or climatic frame of reference. The paper and project presentations addressed a range of theoretical, practice-led, and education-oriented research topics in architecture and urban design related to the subtropics, with emphasis on urban and coastal regions. More than half the papers originate from universities and practices in coastal regions. Threads emerged from a tapestry of localized investigations to reveal a more global understanding about possible futures we are designing for current and future generations.

The one hundred-plus conference delegates and presenters represented 33 universities and institutions from across the United States, Mexico, Canada, Australia, the Middle East, Peru and China. Case studies from India, Morocco, Tahiti, Indonesia, Jordan, and Cambodia were also presented, expanding the global knowledge base. Co-authored submissions presented new directions for architecture and design, with a resounding theme of collaboration across diverse disciplines. The ability to deal with abstraction and complexity, and the capacity to develop synthesis and frameworks for defining problem boundaries can be considered key attributes of architectural thinking. Such a unique set of abilities can forge collaboration with different professional disciplines to achieve extraordinary outcomes.

Perhaps most importantly, the conference provided delegates with new opportunities for regional as well as global collaboration and knowledge sharing.

### **PRE-CONFERENCE MEETING – SEA LEVEL RISE SUMMIT**

The Florida Center for Environmental Studies at Florida Atlantic University hosted a two-day pre-conference Sea Level Rise Summit. This important gathering of regional, national, and international researchers and practitioners provided a forum for updating the current scientific understanding of sea level rise predictions and the broad range of responses anticipated by various sectors. In a practical sense, the agencies, institutions, industries, and interests that establish the context for architecture gathered to identify concern, approaches, and possible responses to the multiple impacts of the unprecedented phenomenon of rising seas. Participants exchanged information and identified areas of mutual concern in this multi-disciplinary forum, setting the stage for the *Subtropical Cities* conference presentations.

The broad range of issues, from the legal implications of risk and transfer of risk, social justice and equity, public health, and mental health, to

insurance, real estate and finance were discussed. The implications arising from these discussions resonated with delegates as they contemplated local responses to pressing issues from concerns about the cost of improvements to storm water management infrastructure in South Florida to the abrupt reversal of coastal management policies and dismantling of climate change adaptation mechanisms in Australia.

**OPENING KEYNOTE SPEAKER, DAVID WAGGONER, WAGGONER AND BALL ARCHITECTS**

David Waggoner bridged the two gatherings as the closing keynote for the Sea Level Rise Summit and opening keynote for the ACSA Fall Conference *Subtropical Cities*.

Waggoner led a multi-disciplinary team in the development of the elegant *Greater New Orleans Urban Water Plan* for the busy subtropical trade-port city of New Orleans, situated near the Mississippi River delta. The work of the team is influenced by the *Room for the Rivers* program in the Netherlands. Waggoner, with the sponsorship of the American Planning Association and the Kingdom of the Netherlands, organized and conducted a series of design workshops characterized by Dutch-American interactions since 2008, known as the '*Dutch Dialogues*'.

The goal of the team was to develop a model of sustainable "delta urbanism" embracing water to improve safety, resiliency and quality of life, and to create new economic and development opportunities that will allow New Orleans to remain a viable and vibrant place to live in the face of significant challenges. The city, ringed by levees, is presented with the simultaneous phenomena of subsidence and rising sea-levels. Nearly half of the metropolitan land area was drained in the late 19<sup>th</sup> and early 20<sup>th</sup> Century from former wetlands that have subsided to elevations below sea level while the annual average high-water mark of the Mississippi River is over 12 feet (4 meters) above sea-level. The region maintains a costly reliance on a pump system to manage frequent street flooding in the rainy season to protect the low-lying territory.

In the wake of Hurricane Katrina, the US Army Corps of Engineers embarked on an ambitious plan to fortify the city with a standard engineered approach to contain and manage the city's outfall canals with high walls rendering them invisible and inaccessible to the inhabitants. Waggoner and Ball's alternative proposals combine strategies for structural and urban design resulting from a collaborative and transdisciplinary approach. A progressive and incremental set of urban interventions create usable public open space and present an aesthetic and purposeful water-based adaptation paradigm. The Waggoner and Ball team's softer more incremental approach, responsive and attuned to natural systems and ecologies, presents a stark contrast to the strategy of fortification with hard infrastructure.

A subtle yet powerful opportunity emerges for the architectural profession and architectural education. The designer-led "Dutch Dialogues," both inform and expand community understanding of the range of response to increased exposure to flooding. The participation and leadership of the architect-designer, using graphical tools, including digital and physical models, drawings, and narrative texts, present what is possible in the face of known vulnerabilities, revealing unexpected opportunities and ultimately providing hope for urban resiliency.

The potentials and opportunities for design-led inter-disciplinary collaboration, demonstrated by Waggoner, aligned with the theme of the conference. Solutions within the spectrum of “hard” and “soft” design interventions for changing climates need to be based on mutual trust among experts from different disciplines and a clear sense of mutual gain, so clearly demonstrated by Waggoner.

### **PARADOXICAL PROBLEMATICS OF THE SUBTROPICS**

The main themes emerging from the conference might be described in terms of the paradoxical problematics of changing contexts presented in subtropical and tropical regions of human settlements: at the local scale, climate conditions are attractive yet prone to increasingly violent weather; economies thrive on global cosmopolitanism yet stress local resources and capacities; infrastructures and environmental technologies support metropolitan densities while suppressing the whispering histories of local adaptation and knowledge; and at the global scale an unabated reliance on carbon dioxide emitting energy resources expose vulnerabilities and compound risks to health, safety, and welfare. Perhaps the most compelling problematic was presented by final keynote speaker Tony Fry, addressing the paradoxical role of architecture in the face of unprecedented times, the decision *not* to build as a design decision, and the emergence of redirective practice.

The call for papers and projects cast a broad net and captured powerful illustrations of different paradigms of defensive and responsive design interventions; formal and informal planning solutions; structural and non-structural methodologies; hard and soft infrastructure, short-term thinking and long-range vision; transformation of communities and the inevitability, acceptance, and inclusion of the conditions of failure and decay. The aphorisms of “doing the thing right” and “doing the right thing” contrasted multi-disciplinary, problem-centred design with trans-disciplinary, goal-directed design approaches.

Papers representing a broad and deep range of perspectives were organized into sessions that sought commonalities as well as conflicts. The themes focused on emerging tendencies, trends, traditions, tools, pedagogies and strategies in addition to reflexive and theoretical positions that broaden awareness, understanding, and the possibility of action.

The session “Toward a Net Zero” discusses challenges and strategies for carbon neutral cities and buildings in a hot-humid climate. In “Complexities of Adaptation,” the value of design studio pedagogy in a transdisciplinary context is eloquently presented by a JoAnne DeRoeun (University of Louisiana at Lafayette), a sociologist. DeRoeun describes how an experimental design studio provided access for scholars by “providing catwalks between disciplinary stove pipes,” demonstrating the capacity of the design studio to serve as a model for transdisciplinary student and faculty collaboration to address complex problems. An international collaboration between faculty at the University of Michigan, Hong Kong University, and the University of Wollongong, led by Meredith L. Miller (University of Michigan) argues that even with increasingly powerful computer-based tools, hands-on methods such as bodily immersion in the physical environment provide powerful learning experiences. For architects “observation is an active practice, closely linked to visual representation.” A collaboration

among architecture, urban design, landscape architecture, and engineering students, revealed aspects of a complex social and economic dynamic in Jakarta, Indonesia that is otherwise inaccessible. Clifton Fordham (Temple University) challenges the sustainability of the current land use and economic model of the Caribbean island nation of Barbados in face of increased risk due of severe weather and pressures of global competitiveness. An historical colonial legacy and careful review of native assets set the context for a comprehensive transdisciplinary solution.

In the session titled “Natural and Artificial” Jeff Carney (Louisiana State University) and Thomas Colbert (University of Houston) reveal how generations of designers divided by disciplinary silos have prevented the development of a shared vision and have seriously hampered proactive planning for disaster mitigation, climate change adaptation or, fundamentally, better design decision-making with a long-term view. Continuing the theme of trans-disciplinary design, Jori Erdman, leading a group from Louisiana State University, integrates architectural design, coastal bio-engineering and horticulture to develop structures for land building and food harvesting that can sustain themselves and the coastline they are designed to protect.

In the “Coastal Currents” and “Designing for Disaster” sessions, several papers discuss innovative design-led solutions originating in architecture schools that respond to challenges that can arise in connection with catastrophic storm events. Architecture schools are expanding beyond traditional disciplinary boundaries and partnering with other social science, science, and engineering disciplines to advance research and revise pedagogies to address climate change and disaster response education. Such trans-disciplinarity creates new and emerging perspectives and understandings. Using the case of the shipping channel at Houston, Thomas Colbert describes how a trans-disciplinary design studio can address coastal security and resolve conflicts between social, environmental and economic uses of public open space. Inundation of this region, the critical heart of the petro-chemical industry in the United States, in a major storm surge event would present an immediate security threat to the national economy, as well devastating impacts on the local ecology and community health. Colbert and his colleagues propose an infrastructure that could be combined with ecological restoration to create new sites for recreation that contribute to community health and value, rather than perpetuate a degraded industrial wasteland characterized by an archaic infrastructure designed solely to mitigate the effects of a 100-year extreme weather event. Meredith Sattler (Louisiana State University) discusses a persistent bias in decision-making favoring short-term flood protection over long-term coastal bio-geochemical system health. Sattler asserts that many towns on the Mississippi delta ringed by levees are experiencing the negative impacts of infrastructure, intended to keep water out of a naturally-soaked landscape, that has failed as flood levels exceed design capacities. Many regions seem to be experiencing simultaneous but opposing strategies of adaptation. Scott Bernhard (Tulane University) aptly described this approach as the “fortified fortress” versus a “more gentle give-and-take with the natural environment.”

In “Rising Currents” the impacts of change are examined. Keren Bolter, a doctoral student (Florida Atlantic University) presents a “coastal

vulnerability index” for communicating sea level rise while John Sandell (Florida Atlantic University) alerts us to inevitable transformation of low-lying coastal communities as existing urban and suburban patterns of development succumb to rising ground water and sea levels. Reluctant to accept the complete abandonment of urban territory, Sandell proposes a tentative framework to propose new forms of urbanism that might emerge as nature transforms an urbanized landscape destined for obsolescence. Shelby Doyle (Louisiana State University) used her Fulbright scholarship to document the relationships between water, architecture, and infrastructure in the rapidly urbanizing city of Phnom Penh, Cambodia where afternoon flooding is a daily occurrence during the monsoon season. Doyle’s paper explores education and public outreach tools for effectively visualising magnitudes of change over time. Her *Mekong Flux* installation documents the seasonal rise of the Mekong River over 25 weeks using a time lapse video coupled with a full-scale three-dimensional graph of rising water levels, placing the volumetric magnitude of flood depth (over thirty feet/ten meters) in context with surrounding buildings and public space.

Throughout the subtropics, populations are burgeoning. Nearly half of predicted urban growth will take the form of informal settlements. In a prescient analysis, Sarosh Anklesaria (Syracuse University) posits that looking at the informal city through a section of its history offers lessons for the city of tomorrow, establishing a platform for generating new and unfamiliar forms of urbanism, infrastructure and participatory design. In this scenario, designers operate through tactical innovation. Anklesaria’s analyses of projects, from makeshift to master-planned in four subtropical cities in south Asia and Latin America reveal a persistence of the human instinct to construct habitat. Anklesaria suggests that informal settlements, rather than being considered undesirable, may emerge as a model for self-organised, socially-cohesive forms of urbanism.

In “Material Understanding” Hollee Hitchcock Becker (Catholic University), points out that in an age filled with sustainability challenges, concrete, steel and timber remain the mainstay of structural education for architecture students. Becker calls attention to the imperative of educating architects about alternative structural materials.

Sessions titled “Recycling Waste,” “Metrics and Rating Systems,” and “Form Follows Performance,” present a broad survey of current explorations in how we consider the by-products of natural resource extraction and waste, how we measure efficiency and consumption of energy, and identify potential sources of renewable energy. Groups of researchers from Rensselaer Polytechnic Institute (Comodromos, Dyson, Puerto, and Vollen) propose a method for extracting chemical energy from urban wastewater and storm water runoff and coastal ecologies while restoring ecosystem services and bio-diversity. A distributed coastal system for locally available emergency energy using building-integrated wind technology (Wilson, Vollen, Menicovich, Rao, and Dyson) may reduce the impact of power outages related to intense storm activity. The relevance of their hypothesis is not limited subtropical regions, but to all regions exposed to severe coastal weather conditions. Anna Dyson, Jason Vollen, and Kelly Winn argue that increased urban densities combined with increasing temperatures create a demand for new materials and building envelope

systems to process solar energy, adapt to a changing climate, and perform an essential role in reducing heat island effect.

#### **SHORED UP FILM DOCUMENTARY**

During the ACSA Fall Conference, the Center for Environmental Studies at Florida Atlantic University presented a screening of documentary film, *Shored Up* and an exchange of questions and answers with filmmaker Ben Kalina. The film exposes the climate change controversy in the United States, evidenced by the misalignment of politics, economics and science in coastal settlements along the Atlantic seaboard. Intimate portrayals of the impact of the devastation wrought by “super storm” Sandy on the daily lives of individuals and families are contrasted with the ineffective communication of alarming concern by the scientific community and the detachment of politicians driven by ideological agendas.

Kalina reminded delegates and attendees that the effects of super-storms and similar climate events on our vulnerable coastlines expose “ a vicious cycle of expensive and unsustainable construction, destruction and re-building. Once you decide to settle in a place that’s so fraught, all the decisions you make have consequences and more consequences.”

#### **WORKSHOP AND CLOSING KEYNOTE PRESENTATION**

Professor Tony Fry (Griffith University) and Professor Jim Gall (Queensland University of Technology) led delegates in a participatory one-day workshop focusing on the simultaneity of global effects of sea level rise and the localized context of South Florida to position these investigations with a larger spatial and temporal frame. The aims of this workshop were four-fold: to gain a better understanding of the threat posed by sea level rises in general and in a local context; examine the host city of Fort Lauderdale as a case study to grasp and envision the major interventions and long-term initiatives needed in urban areas exposed to rising sea levels; establish an appropriate design process for operating in both space and time; and, explore a more detailed design agenda. Echoing conference themes, Fry and Gall reiterated that the key to their approach is to situate the design of cities, landscapes and buildings in a larger frame of space and time informed by collaborative and trans-disciplinary research and design.

Tony Fry argued in his keynote address “An Agenda of Transformation,” that current politics, the persistence of industrial-age philosophies and practices of design cannot get us to a ‘future with a future.’ In this unfolding age of global unsettlement these have to be remade.

#### **CONCLUSION**

The central theme of the ACSA 2013 Fall Conference *Subtropical Cities* was the recognition that transdisciplinary collaboration, informed by science and led by design professionals such as architects, presents challenges and opportunities for schools of architecture and the profession.

Critical design skills are needed to identify patterns and problem definitions for responding to unprecedented phenomena due to climate change and the adaptation and resiliency of vulnerable communities confronted with the multiple effects of extreme weather, sea level rise, and storm surge. In teaching, research, community engagement, and practice, new

ways of thinking and doing require a high level of trust and desire for mutual gain across disciplines and sectors of society.

Built environment design professions will be increasingly called upon to respond and intervene through local community engagement with the complex problems of design of urban settlements and the role of public spaces and buildings and the integration of an adaptive infrastructure.

Even as delegates speculated on paradigm shifts in design philosophy, practice and education that are needed, the system for educating future designers, and the design studio as a model for trans-disciplinary collaboration, holds promise for developing the competency, ethics and accountability to be active participants and leaders in addressing the complex challenges of a changing world.

The 4<sup>th</sup> *International Subtropical Cities Conference* exceeded expectations in becoming the premier think tank for critical design issues in the subtropical regions of the world. This would not have been possible without the support of the Association of Collegiate Schools of Architecture, the delegates, and participants, all who share a common vision to advance architectural education and develop new knowledge for enhancing the quality of life. The focus on a specific region, such as the subtropics, reflects the need for a balance of local practices and culture with global concerns and philosophy, and the development of ideas across these realms. With the challenges inherent in the prospect of the predictable future there are opportunities for those who are positioned on the leading edge of climate change.

The experience of the subtropical world, as elaborated in these proceedings, calls for resistance against short-term thinking and asserting leadership for developing radical and innovative design and trans-disciplinary collaboration, and providing future designers with the skill set necessary for braving a new world.

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#### ENDNOTES

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