

CREATING RESILIENCE IN SUSTAINABLE COMMUNITIES

September 29 & 30, 2008 | Oncenter, Syracuse
syracusecoe.org/symposium/2008



ABSTRACTS: KEYNOTE & PLENARY SPEAKERS

MONDAY, SEPTEMBER 29, 2008

- 8:15 am **J. Marty Anderies**, Associate Professor, School of Human Evolution and Social Change, Arizona State University
Adaptation, resilience, and capacity to cope with environmental change. The evolution of many human societies can be characterized by ever increasing technological and social sophistication. There is a dynamic feedback between challenges that drive a wave of innovation and the new opportunities and challenges that may result. Through multiple waves of innovation, societies can become extremely well-adapted to particular types of environmental variation and change. However, theory and case-studies suggest that in so doing, societies may become vulnerable to new types of variation and change they have not experienced before. That is, there is a fundamental trade-off between becoming resilient to some types of shocks and vulnerable to others. This talk will explore the concept of resilience, resilience-vulnerability trade-offs, and their implications for long term change in human societies.
- 3:00 pm **Kevin Surace**, CEO, Serious Materials
- 4:00 pm **Majora Carter**, Founder, Sustainable South Bronx

TUESDAY, SEPTEMBER 30, 2008

- 8:30 am **Keith Tidball**, Associate Director, Civic Ecology Initiative, Cornell University: "Civic Ecology—Resilience Thinking in Urban Social-Ecological Systems"
Difficulties in achieving successful urban conservation and sustainability results have their root in the Cartesian Dichotomy and "paradigm problems." A challenge for planners is to think systematically and "work our way out" of entrenched notions of humans and cities "outside" of or excluded from "real" nature. Keys to accomplishing this include a mix of urban ecology and resilience theory, influenced by notions of biophilia and participatory approaches. Civic Ecology balances this mix in ways that help people organize, learn, and act in ways that increase their capacity to withstand--and where appropriate, to grow from--environmental change and uncertainty. Examples of civic ecology practices include community gardening, community forestry, watershed enhancement, and other forms of urban restoration.
- 9:30 am **Majora Carter**: Bronx Environmental Stewardship Training
- 10:00 am **David Doyle**, US Environmental Protection Agency, Region 7: "From Tragedy to New Hope—The Greening of Greensburg, KS"
On the evening of May 4, 2007, the small city of Greensburg, Kansas, was destroyed by one of the most powerful tornados to strike the United States. With a declining population and economy, Greensburg's leaders inherently knew that their city could not be quickly rebuilt as it was before the storm in order for it to survive. Instead they decided to explore how it could be rebuilt into the greenest community in the State of Kansas. This presentation will describe how the community worked with federal and state service providers, not-for-profit organizations, and private entities to take the initial steps to make this happen.
- 10:30 am **Matt Raimi**, Raimi + Associates: LEED-Neighborhood Development
- 11:00 am **Paul Beyer**, Director of Smart Growth, NYS Department of State: "Smart Growth Is Smart Energy"
Topics: What is Smart Growth?; Land Use and Transportation; Consequences of Sprawl; Smart Growth Solutions; Benefits of Smart Growth; Opportunities for the Future

RESEARCH & TECHNOLOGY FORUM ABSTRACTS—Monday, Sept. 29

CLEAN & RENEWABLE ENERGY TRACK

- 11:00 am **Jeff Petersen**, NYSERDA: “Opportunities for Renewable Energy Businesses in New York State”
- 11:30 am **Darek Letkiewicz & Parikhit Sinha**, O’Brien & Gere: “Reducing Your Carbon Footprint: Practical Guidance for Developing and Implementing a Plan for Your Facility”

Many industrial and institutional customers are interested in making their facility more sustainable primarily by reducing the green house gas (GHG) emissions resulting from their operations. Carbon markets and monitoring protocols are quickly developing to track and trade GHG reductions. This presentation will discuss current and evolving markets, methods and protocols to determine and track your organizations carbon foot print, and the most cost effective approaches—e.g. green energy purchases, on-site renewable energy, energy efficiency, or distributed generation—to meet your GHG reduction goals.



- 1:00 pm **Hugh Henderson**, CDH Energy, & **Kevin Stack**, Northeast Green Building Consulting: “Home Performance Improvement Challenge: Making Moderately Priced Homes More Energy Efficient”

The HomePIC project seeks to demonstrate that highly energy efficient design practices can be applied in moderately-priced homes. The approach of this NYSERDA-sponsored project is to work closely with production home builders to incorporate energy efficient building techniques into practice. A key focus is to carefully detail design improvements, document construction costs, and measure energy savings that result from a more efficient envelope and space conditioning system. Our team is working with Home Headquarters and has developed improved designs for two homes under construction in the City of Syracuse. The presentation will review the proposed design improvements, present the estimated cost and energy impacts, and discuss future plans for measuring and verifying performance.

- 1:30 pm **Ken Visser**, Clarkson University: “Wind Energy: The Home Heating and Commercial 300 kW Optiwind Project”

Rising energy prices and concerns about global warming have significantly increased interest in alternative energy concepts. Clarkson University's efforts in small wind energy research over the past 10 years have recently led to several commercial technology transfer opportunities. Several projects will be presented including the Optiwind 300 kW turbine from Connecticut, a small turbine concept by Future Energy Solutions of Livonia, NY and a novel wind driven home heating concept. Software developed at Clarkson and experimental facilities available for full scale testing will also be highlighted.

- 2:00 pm **Timothy Volk**, SUNY-ESF: “Assessing the Sustainability of Willow Biomass Crops as a Feedstock of Bioenergy, Biofuels, and Bioproducts”

Global energy use projections indicate that biomass will be an important component of primary energy sources and a main source of renewable energy in the coming decades. Short-rotation woody crops (SRWC) will be a major component of this supply. In central NY shrub willows have been studied for over 20 years as an alternative farm crop for biomass production. As the commercial deployment of willow biomass crops begins in the region and across North America, questions have been raised about their sustainability. Internationally agreed upon criteria to assess sustainability or sustainable forestry include: conservation of biological diversity; conservation of soil and water resources; maintenance of forest ecosystem's contribution to global carbon cycles; forest ecosystem productivity and health; socio-economic benefits. These criteria have been used to assess the sustainability of willow biomass crops. Since willow is established on open agricultural land, this is the benchmark used with these criteria. The biological characteristics of willow in combination with the use of good management practices during crop establishment and crop production are important factors determining the sustainability of the system. Research data and experience from research and commercial operations in Europe and North America indicates that willow biomass crops are sustainable. The recognition and economic valuation of these benefits will facilitate the deployment of willow biomass crops in NY and across the northeast and Midwest U.S. and Canada.

INDOOR ENVIRONMENTAL QUALITY TRACK


- 11:00 am **John Spengler**, Harvard University: “A generation of indoor air science: accomplishments and challenges”

Indoor air science begins its second generation with the recognition that there will continue to be new challenges. Over the past 50 years many new chemicals have been introduced into building materials, coatings, cleaning agents, pesticides and personal care products. Market processes will continue to introduce potentially harmful products and designs that will compromise indoor environments. Among these will be products with the potential to release endocrine-disrupting compounds and nanoparticles. It will be years before governments around the world implement appropriate pre-commercialization evaluation for products. Nongovernmental organizations developing “green” building guidelines are often consensus derived with the participation of the private sector responsible for manufacturing new products. While there is ample research to be done, there is less independent sponsorship for that research. The challenge we face as university-based indoor air scientists is to maintain our role as “honest purveyors” of knowledge for all sectors of our society.



- 11:30 am **Peter V. Nielsen**, Aalborg University: "Ventilation for Control of Airborne Infectious Diseases in Built Environments"
- We protect ourselves from cross infection by supplying fresh air to a room by a diffuser, and this air is distributed in the room according to different principles such as: mixing ventilation, displacement ventilation, vertical ventilation, etc. It can be shown that the protection is high if we use either a high air flow rate or a high personal exposure index. A high air flow rate results in the most efficient reduction of contaminant level in the room, however, draught in the occupied zone and a high running costs set a limit to the flow rate. A high personal exposure index is difficult to obtain in practice, but a small effect can be seen in some systems. The exposure index is dependent on the running conditions and the system can generally not be recommended. There is also a possibility to supply air direct to the breathing zone when people are located in fixed positions as in a hospital bed or in an aircraft seat. This principle, called "Personalized Ventilation", has shown to be very efficient in the protection of people from cross infection, and it may be an interesting application in the further isolation rooms.*
- 1:00 pm **John Vasselli**, Carrier Corp.: "Air Conditioning Redefined"
- 1:30 pm **Jim Miller**, NuClimate: "The Q Air Terminal"
- 1:45 pm **Crista Shopis & Yossi Bronsnick**, Taitem Engineering: "A Desiccant Split-Stream Air Conditioning System"
- 2:00 pm **Larry Wetzel**, Air Innovations & **Andrea Ferro**, Clarkson University: "The HEPAiRx System and Field Study"
- 2:15 pm **Joe Kummer**, Propulsive Wing: "A Multi-Use Personal Ventilation/Filtration System"
- Allergens and other contaminants in public places adversely affect many people. Poor air quality results in reduced productivity at work, and airplanes travelers are often exposed to diseases from other passengers. One potential solution is through the use of personal air ventilation systems, or PAVs; however, the current technology lags the need tremendously. Through funding from the Syracuse Center of Excellence, Propulsive Wing, LLC, in collaboration with Allred & Associates, Inc. and Syracuse University, has developed a unique personal air purifier system to reduce contaminant and allergen exposure, delivering clean, fresh air to an individual. This methodology utilizes an individual's thermal plume to enhance cleaning effectiveness, is compact, quiet, and consumes only 2 Watts of power. In addition to air quality improvement, the unit interfaces with a computer for power, control, and performance monitoring. Analytical, computational, and experimental tools were used to achieve the design objectives. Computational fluid dynamics simulations of the personal environment and the PAV device were used to optimize the design. The Building Energy and Environmental Systems Laboratory tested particle and VOC filter media, as well as complete PAV prototypes. Results show dramatic air quality improvement and targeted delivery of this filtered air to the user.*

WATER RESOURCES TRACK

- 11:00 am **Steve Effler**, Upstate Freshwater Institute: "Dramatic Improvements in Water Quality of Onondaga Lake from Increased Wastewater Treatment"
- A review of retrospective analyses of long-term trends in loading of phosphorus (P) and nitrogen (N) from the Metropolitan Syracuse Wastewater Treatment (Metro), and coupled trends in Onondaga Lake water column concentrations of these constituents and related features of water quality, is presented. Dramatic decreases in loading from Metro from increased treatment, and coupled improvements in the water quality of the lake, are documented. Until recently Onondaga Lake has been considered a classic case of severe cultural eutrophication, with conspicuous coupled features of degraded water quality. For example, the P load has decreased about 100-fold since 1970. Summertime P concentrations in the upper productive layers of the lake have been linearly coupled to the Metro load, and decreased to ~ 20 µg/L, a concentration that is indicative of mesotrophy. Coupled improvements in common metrics of trophic state and water quality are documented. Extremely high concentrations of ammonia-N and nitrite-N that exceeded water quality standards, prevailed in the lake in response to Metro inputs until the most recent (2004) upgrade. These violations have been eliminated by increased treatment at Metro. Potential interactions of these changes in impact of domestic waste with an ongoing rehabilitation program for cleanup of residual mercury contamination of the system from industry are identified.*
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- 11:30 am **Greg Boyer**, SUNY-ESF: "Harmful Algal Blooms in the Great Lakes: Issues & Opportunities"
- 1:00 pm **Jim Bonner**, Clarkson University: "River and Estuary Observation Network (REON): A Coastal Margin Environmental Assessment System"
- In 1994, our laboratory initiated a River and Estuary in situ monitoring system. This has evolved over the last 14 years through, private, state and federal funded grants leading to the establishment of a River and Estuary Observation Network. This is a model system 'a testbed' involving sensor and sensor networks for coastal margin observation and assessment. This research and development testbed involves intelligent environmental systems that include new specialized coastal monitoring networks, and management of near-real-time data, including water quality assessment models. Our testbed is composed of three environmental sensing platforms: remote, mobile, and fixed located in three distinct geographical areas namely; the Hudson River, St Lawrence River, and Corpus Christi Bay including the Texas continental shelf. These field facilities act as a prototype for coastal margin*

observation systems. The various field facilities comprising the network have been designed, are under construction, and are undergoing testing and evaluation. Lessons learned from this project will be relevant for the design of other observatories, particularly those dealing with coastal margin assessment. Results from REON have been used to estimate mass balances, fluxes, residence time, reaction rates, flow paths, and also to evaluate the impact of human activities. Information obtained will be used in an adaptive management framework to adjust environmental policies for regional industries and municipalities.

1:30 pm

Michael Hooker, Onondaga County Water Authority: "Developing Technologies, Needs, and Opportunities in the Drinking Water Industry"

2:00 pm

Mark Meyers, Quantative Environmental Analysis: "Real-Time Compliance Assessment for Contaminated Sediment Site Remediation"

Remedial actions at contaminated sediment sites governed by comprehensive performance standards place a burden on traditional remedial monitoring and reporting processes. Compliance monitoring of performance standards can necessitate near real-time data acquisition and assessment that requires a data management approach that rapidly integrates multiple data streams from field, laboratory, and construction management monitoring activities. Such a system is currently being developed to support remedial activities on the Hudson River Superfund Site, where USEPA has established Performance Standards designed to protect the community and the environment during dredging related activities. Achievement of these standards will be documented through real-time, continuous measurement, grab sampling with rapid turn-around laboratory analyses, and near real-time automated data assessment and reporting. In addition, project managers will have efficient access to project information, enabling them to respond to contractor and citizen issues, fulfill regulatory requirements, to assess project performance metrics, and to coordinate activities among construction personnel, environmental monitoring teams, and site managers

