Carnegie Mellon
STEINBRENNER INSTITUTE
for Environmental Education & Research

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Dzombak Appointed Faculty Director

David Dzombak, Professor of Civil and Environmental Engineering, has been appointed Faculty Director for The Steinbrenner Institute for Environmental Education and Research.

Dave has been a member of the Civil and Environmental Engineering faculty since 1989, when he joined as an assistant professor. He is currently the Walter J. Blenko Sr. Professor of Environmental Engineering, and also Associate Dean for Graduate and Faculty Affairs of the College of Engineering. He served as co-chair of the Carnegie Mellon Green Practices Committee for eight years (1998-2005) and continues to serve on the committee. He is a member of the Environmental Engineering Committee of the US EPA Science Advisory Board, and a member of the US EPA National Advisory Council on Environmental Policy and Technology, Environmental Technology Subcommittee. He chairs the National Research Council's Committee on the Mississippi River and Clean Water Act. Dave is also an associate editor of the journal Environmental Science and Technology, and has served on the editorial boards of the journals Water Environment Research and Ground Water. Dave is enthusiastic about his new opportunity: "I am honored to be entrusted with this new responsibility, and I will work hard to advance the mission of the Steinbrenner Institute."

The Steinbrenner Institute was established in 2004 through a generous gift from Carnegie Mellon Trustee W. Lowell Steinbrenner and his wife, Jan. Professor Chris Hendrickson served as the founding Faculty Director of The Steinbrenner Insitute and through his leadership, The Steinbrenner Institute has been established as a campus-wide entity to promote and coordinate environmental education and research. The Steinbrenner Institute has allocated more than $300,000 in grants to a variety of research and educational initiatives, including industry panel sessions, media boot camps and fellowships across campus.

Upcoming Events

Rachel Carson Legacy Conference:
Sustaining the Web of Life in Modern Society
Carnegie Mellon University
September 29, 2007
www.rachelcarsonhomestead.org

Reclaiming Vacant Properties:
Strategies for Rebuilding America's Neighborhoods Conference
September 24 & 25, 2007
Pittsburgh, PA
www.vacantproperties.org

The Delectable City

"The Chinquapin grows like this," explained the spry David Jacke, lying on his back with his limbs extended upward mimicking the plant's root structure. Jacke, author of the two-volume "The Edible Forest Garden," addressed a packed house on Thursday, January 18. His lecture, "Pittsburgh: Urban Food Forest of the Future," marked the first in the Spring 2007 Environmental Lecture Series developed by Vice Provost for Education Indira Nair and coincided with the beginning of Professor Larry Patrick's Spring Urban Farming course. The energetic Jacke presented four familiar environmental concerns--what he termed "Humanity's Quadruple Threat"—population growth, global climate change, biodevastation, and peak oil.

With the world's population increasing by 3.9 million people in the two and half weeks between New Year's Day and the Jacke's lecture, and oil production ascending to its peak, the lecturer said the most pressing question we can ask ourselves is "How do we make a graceful and ethical descent from the energy peak?" A part of the solution, according to Jacke, is urban farming. By mimicking real forests and drawing on their "architecture, social structure, self-renewing fertility, and succession" small scale urban farming "can inform large scale urban planning," said Jacke. For more information please visit www.edibleforestgardens.com

McGinnis Venture Competition:

Sowing Sustainability

Dr. Seed LLC, a business aimed to help impoverished farmers in China with a technology that improves seeds' crop yield and crop resistance to drought, and reduces the incidence of seed-borne diseases took home the inaugural Sustainable Technology Award at the McGinnis Venture Competition, hosted by the Donald H. Jones Center for Entrepreneurship at the Tepper School of Business March 15-17. The winning team, from Beijing, was represented by Jonathan Chin, who said his team "really wanted to develop an idea that would have a maximum impact on improving the quality of life for Chinese farmers."

The proprietary technology, which has been lab- and field-tested, exposes seeds to a blast of light from a plasma-quartz bulb to produce higher yielding crops for farmers. Dr. Seed will initially be applied to soybean production and later expanded to corn, wheat and other grains. "Demand for food is increasing in China. At the same time many poor farmers are struggling to meet this demand because of the rapid pace of urbanization," Jonathan Chin, a member of the nine-person team behind Dr. Seed, said. Dr. Seed received $15,000 in cash and $20,000 in business services. The Sustainable Technology Award was added this year to the McGinnis Venture Competition through the support of Sarosh Kumana, alumnus of the Tepper School (MBA'77).

Kumana intended the new track to draw submissions from all over the globe. Business can be a positive force for creating global sustainability," said Kumana, who founded Sustainable-Future.org to help stimulate sustainable business ideas. "By sponsoring the Sustainable Technology Award and offering the travel scholarships, we want to help entrepreneurial-minded MBA students from everywhere in the world propose new enterprises that promote global sustainability. For such enterprises to survive and expand, they must be profitable, too. Thus, self-interest becomes congruent with the public interest."

In 2005, Kumana teamed up with The Steinbrenner Institute to create The Great Global Sustainability Challenge, which encouraged teams of students to consider economic, social, political, and technological issues to create multi-disciplinary solutions to challenges of global sustainability. For more information visit www.mcginnisventurecompetition.com.

Research Focus:
Efficient Ethanol?

Chemical Engineering Professor Ignacio E. Grossman and his students have devised a more efficient approach to the production of ethanol from corn. Grossman's research, which combines advanced process design methods with mathematical optimization techniques, boasts a 60% reduction in operating costs of corn-based bio-ethanol plants. Although, the debate continues regarding the use of food for fuel, Ignacio's research is good news for the corn ethanol industry, which has been perceived as economically precarious.

Grossman and his graduate students, Ramkumar Karuppiah, Andreas Peschel and Mariano Martin, adapted the distillation process by using a multicolumn system with a network for energy recovery. Consequently less steam is consumed, reducing a major energy component in corn ethanol's production. "This new design reduces the manufacturing cost for producing ethanol by 11 percent, from $1.61 a gallon to $1.43 a gallon," according to Grossman. This research may be part of a change in corn ethanol's status. Today, 46 percent of the nation's gasoline contains some percentage of ethanol and a federal mandate requires that five percent of the nation's gasoline supply—roughly 7.5 billion gallons—contain some ethanol by 2012. For more information please visit http://capd.cheme.cmu.edu/.

Center Spotlight WaterQUEST

Extreme Makeover: Panther Hollow Lake

Student Alan Eaton measures chemical parameters.

Dr. Jeanne VanBriesen, Co-Director of WaterQUESt (Water Quality in Urban Environmental Systems) and Associate Professor of Civil and Environmental Engineering (CEE), will continue to work with students this summer to help the Pittsburgh Parks Conservancy (PPC) devise a strategy for restoring Panther Hollow Lake in Schenley Park as a fishing and boating spot.

Since its construction at the turn of the twentieth century, the lake has deteriorated from its original status as a recreational amenity. It now suffers from algal blooms that lead to low oxygen levels and fish kills. Tests taken every year by sophomore engineering students in the undergraduate course Environmental Engineering Fundamenals usually show high levels of organisms that indicate contamination with fecal material. Potential sources in the area include animals, stormwater, and possibly leaks from aging sewers. The water does not meet standards set by the PA Department of Environmental Protection or the U.S. Environmental Protection Agency for contact recreation. Contact with the water through swimming and boating is not recommended.

Water QUEST is a multi-disciplinary center housed in the Carnegie Institute of Technology at Carnegie Mellon University with participating faculty from four colleges and eight departments. The goal of this center is to advance the scientific basis for decision-making in urban watersheds.

Directors :
Jeanne VanBriesen, Civil and Environmental Engineering
David Dzombak, Civil and Environmental Engineering

For more information please visit
http://www.ce.cmu.edu/~wquest/index.html.

The above photo depicts pipe flow into the tributary. The tributaries are generally fed by stormwater pipes that come out of the base of the hillside or rock face. This pipe shows foaming discharge suggestive of detergent contamination. Van Briesen's group is working to identify the source of this flow.

VanBriesen's team set out in Summer 2006 to characterize the water quality impairments in the system and to determine the effect of the urban, upstream area—an area that includes Carnegie Mellon, a golf course, and residential areas—on the lake. CEE students from Carnegie Mellon designed and initiated a monitoring program for the Lake and its tributary streams. Microbiological, chemical, and physical parameters were monitored. The differences between the tributary that has undergone some restoration (Phipps Run) and the tributary that meaders along its original stream bed (Panther Hollow Stream) were significant with higher solids and indicator organism loads coming from Panther Hollow but more dissolved oxygen problems in Phipps Run. Additional sampling is needed to characterize sources that might be amenable to remediation.

In the Fall of 2006, the team, including sophomores Alan Eaton, Elena Goldstein, Amanda Mitchell, and Meenah Park, MS student Kristen Wright, and PhD student Mary Schoen presented their results to PPC. The group is continuing their efforts this summer.

Student Elena Goldstein takes notes on the Lake's conditions.

Lessons for Media Darlings

Tips of the Trade:

+Say a complete thought in 10 seconds to provide a successful sound byte.

+Always assume what you say to a reporter is on the record.

+If you are asked for an interview by broadcast media expect to be on camera.

+Speak as simply and clearly as possible. Frank Gottlieb suggests that the next time you are shopping at Walmart, listen and look around because "that's the audience you're reaching when you're talking to the media."

"It's kind of like a race," said Regis Bobonis, Managing Editor of WTAE TV, as he explained the process by which academics responding to national research and events find their way onto the nightly news. If a story develops, for which the stations seek an academic insight, they call the media contacts at the local universities and "whoever gets back to us first," Bobonis explained, "gets on air."

This truth was one of many told at the Steinbrenner Institute's Media Bootcamp, which hosted four broadcast news journalists, including Bobonis—WQED On Q Field Producer Nathalie Berry, WPXI TV Producer Mary Anne Vandevelde, and KQV Radio News Director Frank Gottlieb. The panel spoke to faculty members, graduate students, and a group of students from Winchester Thurston on how the news media covers academic research.

The panelists also relayed their dependence on researchers to make clear the relevance of research--both the scholars' own work as well as research and news occuring outside of the region--to the local audience. The panelists advised the faculty to trust the conduits in place through the Carnegie Mellon Media Department to determine which of the University's news is appropriate for a wider audience than campus and to put researchers in touch with their media contacts.

The Media Boot Camp series is designed to help faculty and researchers better understand the needs of reporters and broadcast producers covering science and the environment. "The spring media boot camp is a great opportunity for our faculty to interact with journalists and to help them better share their research to the public," said SEER Executive Director Deb Lange.

Hazardous Waste: Governor's Pride

The Southwest Pennsylvania Household Hazardous Waste (HHW) Task Force received the 2007 Governor's Award for Environmental Excellence. Carnegie Mellon was a founding member of this regional Task Force that started with a campus HHW collection in November 2000. "The HHW Soutwestern PA Task Force is a great example of academia, government and business working together to find solutions that protect our environment," said Barb Kviz, Carnegie Mellon Environmental Coordinator and Co-Chair of the Green Practices Committee.

Recognizing the need for proper collection and disposal of household hazardous waste in Southwestern Pennsylvania, Green Practices and Environmental Health and Safety started the regional initiative by inviting all of the stakeholders to an exploratory meeting in January of 2002 . The group formed in 2002 with the goal to implement a regional collection program to give homeowners a safe, economical, and environmentally responsible way to dispose of potentially dangerous products. Carnegie Mellon provided a portion of the initital funding for this initiative and The Steinbrenner Institute offered funds for the second year.

"Since forming in 2002, the task force's efforts have grown into a well-managed, cost-effective and sustainable regional household hazardous waste collection and education program," Pennsylvania Department of Environment Secretary Kathleen McGinty said.

Since May 2003, 19 HHW events have been successfully organized and completed in eight western Pennsylvania counties. By 2006, the Task Force served 10,000 households and collected 1 million pounds of household hazardous wastes. The Task Force has launched a website, www.swpahhw.org, as part of its effot to encourage participation in collection events and educate the public on how to recgnize household hazardous wastes, purchase less toxic or non-toxic alternatives, and use these products safely.

Alumni Notebook

Morgan Eli Simmons (ME'00)

I graduated in the year 2000 with a degree in Mechanical Engineering. My primary source of employment since graduating has been with an organization called the Sea Education Association (SEA), where I've worked as an engineer on both of their two-masted 134' brigantine sailing vessels. Their primary semester-long program is for undergraduates from all disciplines and is dual purpose, teaching both practical oceanography, ecology, and the hands-on experience of sailing a traditionally rigged vessel across the oceans.

In 2004, I started a small 501(c)(3) nonprofit corporation called River WaterWorks (http://www.riverwaterworks.org) to promote river and watershed education, and explore the idea of thinking more about where our water comes from, how we choose to use it, and where it goes after we are done with it.

The organization's first project was entitled "WaterWorks: A River Journey to the Sea" which traced the path that drops of water take through an entire watershed, starting from a lake in western New York State and ending at the gateway to the sea, the Gulf of Mexico.

We traveled over 2100 miles down the lengths the Allegheny, Ohio, and Lower Mississippi Rivers, stopping in schools and towns along the way to get people thinking more about water. Our primary audience was 4th grade classrooms in 25 different schools where we went into the classroom and presented an interdisciplinary water education program to over 2000 kids that incorporated elements of science, conservation, history, river culture and river music. We did a few programs in museums in Cincinnati, Louisville, and Memphis as well.

The small vessel that was used to navigate down the rivers was built on an 18' pontoon boat platform and was capable of carrying two people and the necessary program supplies. I designed and built the vessel to have a bicycle powered paddlewheel propulsion system, as well as a small solar powered electricity source. The design is such that bicycles can also be removed from the boat and be ridden on shore once the wheels are reattached. The vessel's name is 'BPV Libelula' which of course stands for 'Bicycle Powered Vessel', and Libelula is a Spanish word of Latin derivation for the dragonfly (often an indicator of healthy aquatic ecosystems).

The vessel provided a good conversation piece of sustainability to supplement our program's watershed education theme. The vessel is also is equipped with a 25 HP outboard and was used for emergency collision avoidance as well as to keep to the rather unintentionally ambitious schedule that I had set forth. We completed the entire journey in a little under four months (Sept-Dec, 2005), but unfortunately had to use the outboard engine more frequently than I had expected due to low river levels during the autumn of that year.

I am giving a bit of thought to doing another program in the Spring of 2008 starting in a similar location (western New York State), but this time traveling east across the Erie Canal and down the Hudson River. Having worked a lot of the bugs out of the vessel and the program during the first journey, a second journey might have the potential to reach out to a much wider audience, especially when it would conclude in the Port of New York City.

CIT Alumnus Morgan Simmons has navigated an unorthodox path with his Carnegie Mellon degree. His journey has given him a greater perspective on the notion of sustainability. Email Morgan at morgan@riverwaterworks.org.

Are you an alum working in the environment? If so, please tell us what you're up to! Email Dlange@cmu.edu.

Pictured above, the New Zealand Conference Participants.

Zealous for New Zealand

The Workshop on Frontier Research Directions and International Collaborations in Sustainability Engineering held near Auckland, New Zealand on February 24, 2007, demonstrated to the 66 participants the current widespread social and political interest in the topic of sustainability. Supported by the US National Science Foundation and organized jointly with the International Centre for Sustainability Engineering and Research (ICSER, University of Auckland, New Zealand), the workshop brought together 28 US professionals and 38 international participants. Civil and Environmental Engineering Professor Chris Hendrickson headed up the workshop, with Carnegie Mellon participants including Cliff Davidson, Mike Griffin, Deanna Matthews, Scott Matthews, and Heather Wakeley plus alumni Jackie Isaacs of Northeastern University, Jim Mihelcic of Michigan Technological Institute, and Annie Pearce of Virginia Polytechnic Institute and State University.

The Workshop made evident that while there is widespread interest in promoting sustainability, there are very different concepts about the policy changes needed to achieve significant movement towards sustainability. There is also considerable scientific ignorance and uncertainty about sustainable technologies, impacts of human activities on natural systems, and the various trade-offs associated with different policies and technologies. Moreover, many participants emphasized the need for sustainability education for students, practitioners, policy makers and the general public. A final report will be available on the Green Design Institute website http://www.ce.cmu.edu/GreenDesign/.

Setting the tone for the workshop, the New Zealand government set ambitious new goals for reduced emissions of pollutants associated with climate change.

Pictured above, a geothermal site visited by conference attendees.

Ambridge and Shaler: the Comeback Kids

Years of research culminated in The Western Pennsylvania Brownfields Center's 'Brownfields Reflections: Proud Past Bright Future' Ambridge workshop, which brought together state, county, and local stakeholders as well as nationally recognized experts to create an action plan for brownfield development in Ambridge Borough, which lies outside the city of Pittsburgh.

The experts participated in a Town Hall Meeting as well as an all-day workshop, leading four panels on issues related to creating regional efficiencies, community visioning, communication, and workforce development in the Ambridge. The results of the workshop were passed onto city council for implementation,

"The Brownfield Center's workshops gave this wonderful town hope; they have given us vision, and more importantly direction," said local business owner Cindy Bologna Ridge.

The Western Pennsylvania Brownfields Center at Carnegie Mellon, funded in 2006 through the Small Business Administration, works with small business owners and municipalities to facilitate the redevelopment of overlooked brownfields in the region. To this end, The Center identifies and brings in national experts to look at site-specific issues in the designated study area. The invited experts bring a fresh set of eyes and recuse themselves of future work on the site. Over the course of several days, the experts meet with a variety of local stakeholder groups in focused small group sessions, a town hall meeting and a community dinner. Ultimately the experts offer the host municipality a list of non-binding recommendations.

The Western Pennsylvania Brownfields Center first became engaged in 2001 to increase awareness, help raise additional funds, and act as an information resouce for the Borough. This workshop followed The Western Pennsylvania Brownfields Center's August 2006 workshop, which brought five nationally-recognized experts to the town. The August workshop focused on a 60-acre Ambridge brownfield corridor. The attention and funds this workshop garnered helped to attract an Australian development firm, The Moltoni Group, who is currently developing a mixed-use residential, commercial, and light industrial complex on the site. The Borough will leverage the momentum created by The Western Pennsylvania Brownfield Center's workshops to facilitate more investment in the area.

Please look for a recap of The Western Pennsylvania Brownfields Center's most recent workshop focused on a light industrial corridor north of Pittsburgh in Shaler Township in the Fall newsletter.

Drum Roll Please...

The 2007 Seed Awards

RainWater Garden
Funds will be used to purchase native perennials to plant on the west side of the Solar Decathlon House in Donner Ditch, to implement a pilot rain garden, designed by students in Fine Arts Professor Bob Bingham's Ecoart course. By acting as a micro-detention pond, raingardens reduce the amount of water that flows from rooftops, lawns, and driveways. Rainwater gardens also remove pollutants from storm water through bioretention.

Green Design Apprenticeship
The Apprenticeship program, led by CEE Adjunct Professor, Dr. Deanna Matthews, brings a cohort of 15 high school students from Allegheny County to experience the work of engineers, with a focus on environmental issues. Over five days, students participate in hands-on activities and work with researchers in the Green Design Institute to investigate how environmental impacts pervade engineering work.

Carnegie Mellon Solar Splash
Fifteen student team members will use Steinbrenner funds in the construction of their solar/electric boat for entry into June 13-17 Solar Splash competition of the World Championship of Intercollegiate Boating in Fayetteville, Arkansas. In their inaugural 2006 year, Carnegie Mellon Solar Splash earned the distinction of "Notable Performance by a Rookie Team."

Corporations and Environmental Responsibility: An Immersion Course
Envisioned by Philosophy Professor Peter Madsen following his Weekend Immersion course in Environmental Justice, this course will bring local and national experts to explore the impact of corporations on the environment.

Solar Decathlon
Funds will be used to support three students in the installation, commissioning, and monitoring of a state of the art Photovoltaic (PV) system for the 2007 Solar Decathlon house. The team, supervised by Architecture Professor Steve Lee, will calculate overall system efficiency, develop educational materials and exhibits to explain the PV system technology and demonstrate the technical, financial, and environmental benefits of renewable energy.

Awards

Chemistry as a Catalyst

Terry Collins, the Thomas Lord Professor of Chemistry, has received the 2007 Excellence in Catalysis Award from the Catalysis Society of Metropolitan New York. Sponsored by the ExxonMobil Research and Engineering Company, the award recognizes Collins for designing innovative, environmentally benign catalysts that have the potential for enormous positive impact on the environment. The catalysts being developed by Professor Collins and his group can be used to replace chlorine-based oxidants in large global technologies so some of society's most toxic chlorinated residuals are not produced by industry. Please visit the Institute for Green Oxidation Chemistry's website for more information: http://www.chem.cmu.edu/groups/Collins/.

WaterWorld

CEE Professor Jean VanBriesen won the 2007 Professional Research Award from the Pennsylvania Water Environment Association (PWEA). The award honors outstanding research in support of the PWEA mission, which is focused on municipal and industrial wastewater treatment and stormwater mangagement. VanBriesen will accept the award in June at the PWEA annual conference in State College, Pennsylvania. Please visit the WaterQUEST website for more information: http://www.ce.cmu.edu/~wquest/contact2.html.

Social Networking for the Environment

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How do you convince the general population to alter their energy consumptiton habits? My Space and Facebook might be a place to start, according to a budding multidisciplinary research group including Deanna Matthews (Civil and Environmental Engineering), Michael Johnson (Heinz School), Jennifer Mankoff (Human Computer Interaction Institute) and Susan Fussell (Human Computer Interaction Institute). In a project called *Footprints*, these researchers are investigating how to leverage the popularity of online social networking groups to influence individuals' behavior.

Online networks like those created by My Space and Facebook allow members to join particular interest groups and brandish their memberships on their user profile. The *Footprints* researchers hypothesize that these groups might be a good vehicle for educating for the masses. According to the researchers, a My Space or Facebook *Footprints* group intent on promoting energy-saving practices could influence behavior and additudes and educate the online social networking community about green ideas.

Want to know more about *Footprints*?
Visit http://www.cmubi.org/footprints/ or
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The Steinbrenner Institute for Environmental Education & Research seeks to change the way the world thinks and acts about the environment. Given the advantage of Carnegie Mellon's well-established interdisciplinary culture and ongoing studies in energy and the environment, the Steinbrenner Institute for Environmental Education and Research promotes the University's core academic strengths and advances emerging interests to identify and create research and education opportunities for our faculty and students across all schools and majors.

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