



2011 Association for the Advancement of Sustainability in Higher Education Conference

The Association for the Advancement of Sustainability in Higher Education (AASHE) held its 4th conference from October 9th to the 12th at the David L. Lawrence Convention Center in Pittsburgh. Nearly 2,000 people from the United States, Canada, Japan, Germany, and other international institutions of higher education participated in the 2011 AASHE conference. The Steinbrenner Institute and Carnegie Mellon University were pleased to be among eight regional higher education institutions to act as one of the Master Sponsors and Conference Hosts. The theme of the 2011 Conference was “Creating Sustainable Campuses and Communities.” Plenary speakers, keynotes, workshops and tours highlighted the interface of community and campus collaboration. Keynote speakers for the conference included author and activist, Bill McKibben; MacArthur Fellow and founder of Sustainable South Bronx, Majora Carter; the Chancellor of University of California-Riverside, Tim White; and, ecologist and author, Dr. Sandra Steingraber. Carnegie Mellon President Jared Cohon participated in a meeting of presidents and chancellors of AASHE member institutions at the conference. The Steinbrenner Institute was pleased to offer sixteen Carnegie Mellon undergraduates and graduate students the opportunity to attend the Conference through Steinbrenner Institute Sponsorships.

Selected Content:

AASHE Conference a Success.....	1-3
Green Jobs.....	5-6
Environmental Sustainability Fellows.....	7
CAPS Wins EPA Funding.....	10
The “Green Scene” at Carnegie Mellon.....	11
International Greening of Education Conference	15

Carnegie Mellon students were active in the AASHE Poster Session Presentation. Chris Gassman (Tepper School) presented his poster on “*Institutionalizing Zero Waste*” and undergraduate students, Lauren Sittler (Chemical Engineering) and Anna Lenhart (Civil and Environmental Engineering) presented their poster on “*A Feasibility Study of Biogas Digesters and Composting System for a University Campus;*” a project for which they were awarded second place in the 2011 Meeting of the Minds Undergraduate Environmental Research Award (co-sponsored
continues on page 2...



Steinbrenner Institute Faculty Director Dave Dzombak addresses AASHE tour participants

2011 AASHE Conference

continued from page 2...

by the Steinbrenner Institute and the Green Design Institute).

The AASHE conference wrapped up on Wednesday, October 14, with a Green Tour of the Carnegie Mellon campus. The tour participants were treated to a zero waste lunch in Stever House, visited the Intelligent Workplace and the Hamerschlag Green Roof and toured the water saving features of the Gates-Hillman Building. The tour culminated with a docent-led tour of the green features of Phipps Conservatory and Botanical Gardens. For more information on the Association for the Advancement of Sustainability in Higher Education visit <http://www.aashe.org/>



Carnegie Mellon faculty, staff and students were well represented at the conference with workshops presented by:

- Martin Altschul, University Engineer, Facilities Management Services, on *“Continuous and Retro Commissioning in High Performance Buildings”*
- Chris Gassman, Graduate Student, Tepper School of Business, *“Institutionalizing Innovation: Student Government “Sustainability” Bodies and Roles”*
- Barb Kviz, Environmental Coordinator with Facilities Management Services and co-chair of the Green Practices Committee, co-presented (with Chatham University, Duquesne University and University of Pittsburgh) *“The Pittsburgh Higher Education Climate Consortium: A Partner in Community Climate Action”*
- M. Shernell Smith of Multicultural & Diversity Initiatives, Student Affairs, co-presented (with Champlain College, University of Pennsylvania, and University of Texas-Austin) on *“Student Eco-Reps Programs: Meeting the Evolving Needs of an Existing Program”*
- H. Scott Matthews, Professor, Civil and Environmental Engineering, and Engineering and Public Policy; co-director, Green Design Institute; co-chair, Green Practices Committee, *“A New Era in Campus Climate Action: Dynamic Online Inventory and Planning Tools”*

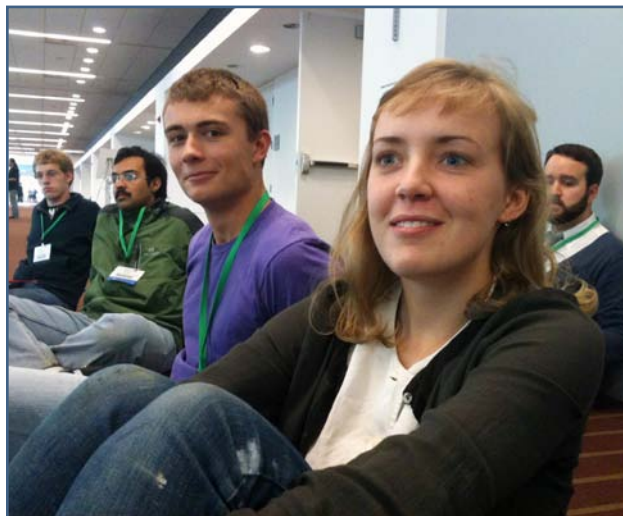
The Student Perspective: Carnegie Mellon Students Attend the AASHE Student Summit

By Leah Wulfman, President, Sustainable Earth

The AASHE 2011 Student Summit offered me, and the other CMU Sustainable Earth members, an opportunity to speak and exchange ideas with other college student groups from across the continent. The design of the Student Summit made it so that we could quite easily interact and share ideas with others at the conference.

The Summit was separated into the keynote address from Bill McKibben, student panel discussions, a designated time for networking opportunities, and an open space session. The panel discussions allowed us to learn of work on other campuses. Our group heard from students who have initiated work on projects that we are envisioning. We were able to connect and gather a wealth of information that should prove helpful to us with our future endeavors.

Sustainable Earth recently formed a sustainable dining practices group, and our goal is to establish a student-run food co-op and café on the Carnegie Mellon campus, in hopes of providing students with local, healthy, and community-based food options right here on our campus. We envision that this project would also provide greater opportunity for community building, with the ideal of a healthy planet and people at its heart, to grow on our campus. During the AASHE Student Summit, insight was provided by Western Michigan University students regarding their student-led sustainable café initiative, The Campus Beet. Through the discussion, we were also able to connect with CoFed, the Cooperative Food Empowerment Directive, which helped to advance the Campus Beet project. CoFed's mission is to "inspire and equip future leaders to create a just and sustainable world through food." Learning about resources that will help us in the future was incredibly exciting and meaningful for us.



Sustainable Earth members Anna Shepperson and William Lush at the Student Summit



Sustainable Earth President Leah Wulfman at the AASHE Student Summit

CEE Faculty Inducted in the National Academy of Engineering

On October 16, 2011 Professor Chris Hendrickson was inducted to the National Academy of Engineering. Professor Hendrickson joins Professors Jacobo Bielak and Steibrenner Institute Faculty Director, Dave Dzombak as active faculty who are also members of the National Academy of Engineers.

In 2008, University Professor Dave Dzombak was inducted to the National Academy of Engineering. Dzombak, the Walter J. Blenko Sr. Professor of Environmental Engineering, received the prestigious recognition for novel development of models used in evaluating chemical behavior in water quality engineering and environmental remediation.

For more than two decades, Dzombak has conducted leading research in the areas of aquatic chemistry, water and wastewater treatment, abandoned mine drainage remediation, river and watershed restoration and hazardous waste site remediation. He also has contributed to the expertise and professional service at the local, state and national levels.



CEE Faculty Dave Dzombak, Chris Hendrickson, and Jacobo Bielak

University Professor Jacobo Bielak was inducted into the National Academy of Engineering in 2010 for his pioneering work in creating three-dimensional models that can simulate how earthquakes impact buildings, bridges and other critical infrastructures.

For more than 15 years Bielak and his research team have collaborated with the Pittsburgh Supercomputing Center in developing and applying methodologies for modeling ground motion and structural performance in large basins in order to identify what can be done to prevent earthquake disasters. Bielak currently leads a four-year, \$1.6 million National Science Foundation-supported project to develop tools for high fidelity, physics-based petascale simulations of entire seismic-prone regions.

Chris T. Hendrickson, Duquesne Light Company Professor of Engineering, was inducted into the National Academy of Engineering on October 16, 2011. Professor Hendrickson was elected for leadership and contributions in transportation and green design engineering.

Professor Hendrickson is the Co-Director of the Green Design Institute at Carnegie Mellon University, and Editor-in-Chief of the *ASCE Journal of Transportation Engineering*. His research, teaching and consulting are in the general area of engineering planning and management, including design for the environment, system performance, construction project management, finance and computer applications.

Source: Department of Civil and Environmental Engineering

Green Jobs: Department of Labor Training

By Deborah Lange, Executive Director, Steinbrenner Institute

In Southwestern Pennsylvania, there are communities with unemployment rates that are much higher than either the State or Federal averages. One of those communities is Braddock and this condition was exacerbated in 2009 with the closing of the UPMC Braddock Hospital. In response to this local need, Heritage Community Initiatives (Heritage) teamed with the Steinbrenner Institute to obtain a US Department of Labor Energy Training Partnership grant. The purpose of the grant was to train eligible residents to become employable in emerging green (and existing 'greener') jobs. Over the course of 7 training sessions, conducted between June 2010 and April 2011, 420 applicants were screened and approximately 100 participants graduated from the program. The demographics of the participants were as follows: ages 22-65, 80% male, 80% African American, 25% Veterans, and predominantly from the Monongahela Valley region. The curriculum included life skills, an introduction to energy and the environment; OSHA Asbestos Worker; OSHA Construction Safety (30 hour); OSHA Confined Space; OSHA Lead Awareness or EPA RRP (renovation, repair and painting); and specialized training in deconstruction, green stormwater management, home energy performance, or environmental monitoring. Each session also had a 'hands-on' portion, one of which included deconstruction activities in the UPMC Braddock Hospital.

Many local organizations assisted in the training including the Mon Valley Initiative, Braddock Employment Training Center, Enterprise Zone Corporation of Braddock, US Steel Corporation, Affordable Comfort, Inc., Penn State Cooperative Extension, Key Environmental, Field Environmental Instruments, Veterans Leadership Program of Western PA, Braddock Carnegie Library, Construction Junction, UPMC - Braddock, Mon Valley Provider's Council, Community College of Allegheny County, Professional Training Associates, Goodwill, Pittsburgh Career Links, Labor Management Clearing House, Hosanna House, Forbes Road Technical Center, and Congressman Mike Doyle.

continues on back cover...



Session 1 trainees assemble after tour of Gulf Materials in Braddock

Green Jobs: The Move-It Program

By Jamie Shairrick, Instruction Coordinator, Move-It Program, Heritage Community Initiatives

Summertime for graduating high school students is typically a time for rest and relaxation, but not for 20 daring graduates who decided to enter an environmental job training program funded by a grant through the US Environmental Protection Agency's Brownfields Program. Heritage Community Initiatives' Mon Valley Energy Innovation Training (MOVE-IT) program, in collaboration with the Steinbrenner Institute for Environmental Education and Research at Carnegie Mellon, developed a unique curriculum for recent high school graduates. The course allowed participants to learn about sustainability and environmental issues while receiving three college credits through the Community College of Allegheny County (CCAC), industry recognized certifications, and gaining unique 'hands-on' applications of techniques used in environmental related industries.



Move-It program participants with instructor Joseph Reznik(L) and Jamie Shairrick (R)

Twenty participants in the MOVE-IT program attended one of two five-week sessions held on the Carnegie Mellon campus. CCAC instructor, Joseph Reznik, facilitated the Principles of Sustainability coursework during weeks one, four, and five. Instructor Reznik's class focused on the pillars of the environment, economics, and equity within the context of sustainability. The participants studied issues relating to air, water, soil, trade, and food while incorporating field trips to the local farmers' market and visits from guest speakers with local organizations such as 10,000 Villages. Successful graduates received three college credits from CCAC. Because many of the participants enrolled in the program with the intention of beginning their college careers at CCAC, this provided an opportunity for them to 'jump-start' their academic careers.

In conjunction with the academic portion of the program, the participants took part in a 30 hour OSHA Construction Safety certification course offered by Professional Training Associates, Inc. This certification provided the participants with the necessary training for creating and maintaining a safe work environment in multiple settings. The participants also received a 40 hour Hazardous Waste Operations and Emergency Response (HAZWOPER) certification through the Allegheny County Fire Department. The coursework and related activities were designed to give participants the basic knowledge of how to respond and handle hazardous wastes in a variety of circumstances.

Other sessions were themed around the practice and industry of environmental monitoring. Field Environmental Instruments, Inc. and Key Environmental provided the background and instruction on the *continues on page 19...*

Steinbrenner Institute Announces 2011-2012 US Environmental Sustainability Fellows

The Steinbrenner Institute for Environmental Education and Research at Carnegie Mellon is pleased to announce the first recipients of the Steinbrenner Institute U.S. Environmental Sustainability Fellowships. The Fellowship program, which is supported by the Colcom Foundation, offers competitive three-year awards to PhD students for the study of interdisciplinary topics related to U.S. environmental sustainability. With support from the Colcom Foundation, the Steinbrenner Institute has been exploring the dimensions of environmental carrying capacity with a focus on the United States. Environmental carrying capacity is an ecological concept defined generally as the population of organisms that can be sustained at a steady state considering the resources available in the ecosystem in which they reside. The Colcom Foundation has provided the opportunity to engage in scholarly exploration of the ways in which changes in the population might impact the availability of natural resources; and how those natural resources might be limiting factors to quality of life standards. For more information about this Steinbrenner Institute Fellowship program, please visit <http://www.cmu.edu/steinbrenner/Initiatives/index.html>

Rachel Hoesly received her undergraduate and master's degrees from Carnegie Mellon, in Civil Engineering and Engineering and Public Policy in 2010 and Civil and Environmental Engineering in 2011, respectively. She is originally from Los Angeles. Rachel is a current PhD student in Civil and Environmental Engineering. Her primary academic and research interests are in sustainability planning in regards to population growth, climate change, and limited resources. *(Advisors: H. Scott Matthews and Chris Hendrickson)*



Rachel Hoesly

Russell Meyer comes to the Engineering & Public Policy PhD program after working at the Pew Center on Global Climate Change, in Arlington, VA, as Senior Fellow for Economics and Policy, and serving as the in-house economist to the Center. Russell holds a Master's of Public Policy from Georgetown University, a BS from James Madison University, and is originally from Fredericksburg, Virginia. At CMU, Russell will be studying climate and energy policy, with a particular focus on the US perspective. *(Advisors: Granger Morgan and Ines Azevedo)*



Russell Meyer

Hui Wang comes to the Civil and Environmental Engineering program after completing her degree in Environmental Engineering in China, and receiving her Masters degree in Environmental Science and Technology from the Institute National Agronomique Paris-Grignon (Paris-Tech) in France. She also has a Masters in Civil Engineering and Statistics from The University of Toledo. Her academic interests include water and waste water treatment, water resource management, and mathematical/statistical modeling of environmental quality. *(Advisors: Mitch Small and Dave Dzombak)*



Hui Wang

Steinbrenner Institute Fellow Jessica Wilson's Research on the Monongahela River

Growing up on Long Island, N.Y., Jessica Wilson became aware of many kinds of water issues. A persistent desire to study water pollution and its impact on drinking water quality led her to pursue a graduate education at Carnegie Mellon University. Under Professor Jeanne VanBriesen's expert guidance, Wilson's work will help ensure safe water quality in the Monongahela River. "I was looking for an environmental engineering program that would let me continue studying emerging environmental issues and Jeanne offered me some really flexible opportunities," Wilson said.



Jessica Wilson collecting source water samples

"When I started, she didn't have a set project for me in mind. I had experience in an environmental laboratory and in analytical chemistry, and she simply had the confidence in me that I would do a good job in the lab."

While working on a chemistry-based project studying kinetics of chelating agents reactions, an opportunity arose for Wilson to analyze drinking water samples for disinfection by-products. Soon after, the WaterQUEST center, which VanBriesen directs, received a grant from the Colcom Foundation to study water quality in the Monongahela River. Wilson was VanBriesen's go-to researcher.

"Initially, we were targeting source water components of total dissolved solids such as bromide, chloride and sulfate. But now we are looking for impacts of energy-related activities in the region and we are trying to identify whether or not these components we're finding are from the wastewater from oil and gas activities, such as Marcellus Shale produced water, wastewater from coal-fired plants or acid mine drainage."

The team started in September 2009. They now have two full years of bi-weekly data on the source water and drinking water. Eyebrows raised when they found a spike in bromide concentration in the summer of 2010. "It's a concern because when bromide enters the drinking water treatment plant it becomes oxidized in the disinfection process and reacts with any organic matter in the water. This results in the formation of disinfection by-products, which are carcinogenic," she explained.

Jessica Wilson is a Steinbrenner Institute graduate fellow and was one of the many researchers to present her findings at the 2011 State of the Monongahela River research Forum held on the Carnegie Mellon campus on November 3, 2011.

Source: Department of Civil and Environmental Engineering

Water QUEST Hosts the 2nd Annual State of Monongahela River Research Symposium

Researchers from Southwestern Pennsylvania universities and government agencies presented information about water quality in the Monongahela River at Carnegie Mellon University's 2nd annual Center for Water Quality in Urban Environmental Systems' (Water Quest) research symposium on November 3, 2011. The event drew approximately 55 attendees from local and regional non-profits, universities and local government organizations, as well as, John Rohe, Vice President of Philanthropy and Carol Zagrocki, Program Director of the Colcom Foundation, the event sponsor.

"For the past two years, my research team has been sampling the Monongahela River at drinking water plant intakes, and we've found higher than expected levels of bromide. Bromide facilitates formation of brominated trihalomethanes, also known as THMs, when it is exposed to disinfection processes in water treatment plants," said Jeanne VanBriesen, professor of civil and environmental engineering at CMU and director of Water Quest. Studies conducted elsewhere have shown a link between ingestion of and exposure to THMs and several types of cancer.

Professor VanBriesen presented her research about the source of water pollution, and Carnegie Mellon graduate student, Jessica Wilson (CEE), presented results for THMs in water from the Monongahela River. Experts including Rose Reilly, biologist with the U.S. Army Corps of Engineers, Bob Ventorini, a biologist with the Pennsylvania Fish and Boat Commission, researchers from the University of Pittsburgh, West Virginia University and California University, and drinking water utilities were also present to unveil their research involving water quality, fish populations and water issues, including taste and odor. To view selected presentations from the research forum visit the WaterQUEST website <http://www.ices.cmu.edu/waterquest/forum/>



Carnegie Mellon's Center for Atmospheric Particle Studies (CAPS) Wins Funding from Environmental Protection Agency for Black Carbon Research

Carnegie Mellon's Center for Atmospheric Particle Studies (CAPS) was recently awarded funding from the U.S. Environmental Protection Agency for a black carbon research project. The EPA awarded over \$6.6 million in grants to eight universities to support black carbon research. The grants will support research to study the role and impacts of black carbon, which is emitted from a wide variety of sources that burn fossil fuel or biomass. Award recipients include the University of Illinois at Urbana-Champaign; the University of California, Irvine; the University of California, Riverside; the University of Iowa; the University of Washington; the University of Wisconsin-Madison; Rutgers University; and Carnegie Mellon University.

The CAPS faculty; Allen Robinson, Neil Donahue, Peter Adams and Spyros Pandis won funding for their proposal, "Black Carbon, Air Quality and Climate: From the Local to the Global Scale." Here is a summary of the research project and tasks:

"Reduction of black carbon (BC) emissions represents a potential win-win strategy in our effort to improve air quality while limiting climate change. However, the magnitude of the benefits remains quite uncertain because of our limited understanding of the contributions of the various source sectors to the BC mass and number concentrations, the atmospheric processing of black carbon particles including their physical and chemical changes, the role of other absorbing organics (brown carbon), the contributions of the various source sectors (and long range transport) to the direct and indirect effects of BC on climate, and the effect of BC on local and regional meteorology. "

Professor Neil Donahue shared the following goals noted in the project proposal: "Reduction of the above uncertainties and quantification of the effects of the various BC control strategies on both air quality and climate change in the US are the main objectives of the proposed study. More specifically focusing on the US, we will:

- Develop size- and composition-resolved number emission inventories for BC-containing sources for the US and also improve the existing mass inventories using a consistent definition of BC.
- Improve our understanding of the atmospheric processing of BC particles.
- Improve the ability of the existing regional and global chemical transport and climate models to simulate the BC mass and number concentrations and their effects on climate.
- Quantify the contributions of the different BC source sectors (including long-range transport) to BC mass and number concentrations.
- Quantify the contributions of the same source sectors to the direct, indirect and semi-direct effects of BC on climate.

continues on page 19...

The “Green Scene” at Carnegie Mellon



In each Steinbrenner Institute newsletter we will feature “Green” news from Carnegie Mellon campus departments, interesting topics being addressed by the Green Practices committee, as well as, upcoming events and environmental education opportunities. It has been a busy late fall and early winter of sustainability initiatives on the Carnegie Mellon Campus. Here is a brief recap of some of the more notable events of the past few months and some upcoming items as well.

Carnegie Mellon to Participate in Campus Conservation Nationals

Campus Conservation Nationals (CCN) is the first nationwide electricity and water reduction competition on college and university campuses. In its second year, CCN gives a common voice and motivation to thousands of students, all working together to reduce consumption and mitigate the impacts of climate. Carnegie Mellon will be participating in the Campus Conservation Nationals 2012 for three weeks from February 6 - February 27. Electricity will be monitored on a weekly basis and compared to baseline data, to see who can save the most electricity. Throughout the competition, Carnegie Mellon will monitor electricity usage in the following residence halls: Scobell, Welch, Henderson, Boss, McGill, Donner, Hamerschlag House & Stever House. For more information on the competition visit <http://www.competetoreduce.org/>

AASHE STARS

Carnegie Mellon recently submitted data for The Sustainability Tracking, Assessment & Rating System (STARS) which is program of Association for the Advancement of Sustainability in Higher Education (AASHE). Carnegie Mellon opted to submit our data and request “Reporter” status instead of receiving a rating. The intention is to use the tracking system as a data repository. However the Green Practices committee is pleased to report that had we chosen to be rated, CMU would have received a Silver Rating. According to the AASHE website, 51% of colleges and universities qualify for the Silver ranking, 25% for Bronze and 18% for Gold. Data submissions and more information on the AASHE STARS program can be found here: <https://stars.aashe.org/>

Mount Lebanon Montessori Students Go Green on the Carnegie Mellon Campus

On October 7th approximately 45 students, with their teacher and parent chaperones, visited Carnegie Mellon for a campus Green Tour led by environmental coordinator, Barb Kviz. The students, 1st through 6th grades, visited the Green Room, the green roofs on Doherty and Gates, the Winter Garden and spent some time learning about the cistern system in Gates-Hillman. The students and teachers also learned about some of the recycling practices in place at Carnegie Mellon and took home some helpful hints on how to reduce their own “footprint” both in school and at home by being more energy and water conscious, and by increasing the amount of material they recycle.



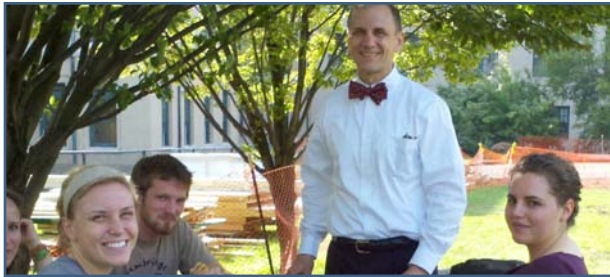
Mt. Lebanon Montessori students on the green roof at Doherty Hall

The “Green Scene” at Carnegie Mellon



Campus Zero Waste Initiatives Grow in Popularity

Orientation 2011 programming included a zero waste dinner for all incoming freshman and the annual Eco-Fabulous Cook Out held at the Solar Decathlon House featuring a “zero waste” style spread for students, faculty and staff. In addition, campus groups and departments continued their own efforts to green their annual events, for example the Diwali Night organized by the Indian Graduate Student Association was an eco-friendly event this year. For more information on how your group or department can plan a “Zero Waste” event or meeting on campus, contact Barb Kviz, at bk11@andrew.cmu.edu.



Steinbrenner faculty director Dave Dzombak and Carnegie Mellon students enjoy zero waste style food at the ecofabulous cookout

Recycle Mania 2012!

The official dates for the 2012 Recycle Mania tournament have been set! Pre-season practice will run January 22 to February 4, 2012. The official competition will kick-off on February 5 and extend 8 weeks to March 31, 2012.

Recycle Mania is a friendly competition among college and university recycling programs in North America and Canada. During 8 weeks each spring, schools compete in different categories to see which institution can collect the largest amount of recyclables per capita, the largest amount of total recyclables, the least amount of waste per capita or have the highest recycling rate.

It's Official: Gates-Hillman Center is Certified Green!

The U.S. Green Building Council recently awarded the School of Computer Science facilities *Gold Leadership in Energy and Environmental Design (LEED) Certification*. Gates Hillman is the 11th Carnegie Mellon building project to receive LEED certification and the fourth to receive the Gold rating. There are many features that allowed Gates Hillman to receive the Gold level certification, here are a few:

- Energy Efficient Heat Recovery System
- Bicycle storage units and changing rooms for those that bike to work
- 10,000 gallon rain water collection tank for reduced storm water runoff rate and quantity
- Nearly 30% of the building materials were produced locally
- Natural lighting is present in 75% of the building space

A full list of green building projects on campus is available at:

<http://www.cmu.edu/greenpractices/greening-the-campus/green-buildings/index.html>

For more information about green practices at Carnegie Mellon, please visit: <http://www.cmu.edu/greenpractices>

Steinbrenner Institute Community and Campus News

Institute for Complex Engineered Systems Hosts Summer Energy Engineering Camp

By Alicia Brown Angemeer

This past summer, the Summer Engineering Experience for Girls (SEE) introduced a new faculty member and project to the program. Electrical and Computer Engineering Assistant Professor Gabriela Hug successfully created and led an activity teaching about energy management. Using peppermint candies, Hug led the girls through an activity illustrating the differences between non-renewable and renewable forms of energy and the consequences of using only non-renewable forms. In the afternoon, she conducted a lab in which groups of girls created simple wind powered electrical generators, learning how the design and position affected the electrical energy produced.

This summer marked the fifth year that SEE has been introducing middle school girls to engineering. Focusing on the theme of energy, SEE shows girls how they can make a difference by finding ways to create efficient and environmentally-friendly forms of energy. Using a multidisciplinary approach, participants focus, each day, on a different area of engineering and engage in hands-on activities.

Each participant also creates a research project for herself based on an area of energy that interests her. This summer, girls presented on areas including how geothermal, nuclear, wind, solar and hydroelectric forms of energy work and what are their effects; how green roofs work; and the advantages and disadvantages of renewable resources of energy; to name a few.



SEE campers try out a new activity

2011 Cèilidh Weekend

Cèilidh 2011 was held on the Carnegie Mellon campus from October 27th through the 30th. This new fall event combines the university's Homecoming, Family Weekend and International Festival into one celebration. The Scottish Gaelic word *Cèilidh* (*kà-lse*) represents a traditional social gathering and pays tribute to the heritage of CMU founder Andrew Carnegie. An estimated 500 alumni, 1000 parents and 2000+ students took part in the extended weekend activities which included campus tours, student and faculty panels, an address by President Jared Cohon, and the alumni awards ceremony. Steinbrenner Institute Executive Director Deborah Lange, and Steinbrenner Environmental Program Coordinator Erika Ninos, took part in welcoming guests as they registered for Cèilidh events, and received a Steinbrenner tote bag, newsletter and Green Walking Tour map of campus.



Steinbrenner Institute Community and Campus News

Steinbrenner Institute Hosts Council of Energy Research and Education Leaders

On November 9, the Steinbrenner Institute welcomed several attendees from the annual conference of the Council of Energy Research and Education Leaders (CEREL) of the National Council on Science Education. This year's CEREL conference, which was co-hosted by the National Energy Technology Lab (NETL), was held in Canonsburg, Pennsylvania from November 7–9. The visitors were treated to a Green Tour of the Carnegie Mellon campus, and participated in a forum with Steinbrenner Faculty Director, Dave Dzombak, where they learned about the research projects occurring at the University within the realm of energy and the environment. The visit wrapped up with a visit to Phipps Conservatory and Botanical Gardens, a presentation and tour of Phipps sustainability practices, and news on the opening of Phipps new Center for Sustainable Landscapes.



CEREL participants tour the Solar Decathlon House

2012 Environment Today Weekend Course Announcement Green Design and Garbage

The “Environment Today” is an annual mini-course that brings students together over a weekend to discuss environmental issues affecting our planet now and for generations to come. The 2012 course will be held from March 30th to April 1st. The theme for Spring 2012 is Green Design and Garbage (Waste). The course will explore the relationship of product design and the waste that we generate, and how design can be used to minimize waste.

Environment Today courses, which were started in 2009, as an initiative of the student group Sustainable Earth, aim to address the environmental issues and crises of today, and their attempted solutions, which span and bring together varying fields of thought. CMU faculty, local and national experts and practitioners serve as course presenters.

In addition to students attending the various sessions for credit, the individual lectures are open to the campus community and to the public. For more information on the Weekend Today intensive courses visit: <http://www.cmu.edu/weekend-today/index.html>

International Greening of Education Conference

By Peter Madsen, Distinguished Service Professor of Ethics and Social Responsibility, Carnegie Mellon

What do green roofs, the use of multimedia in Tanzanian schools, the collapse of the Gulf Stream, transformative thinking and early childhood education all have in common? These were all topics addressed by educators from the around the world at the International Greening of Education Event (IGEE) conducted in Karlsruhe, Germany from October 19 – 23, 2011. IGEE has become an annual gathering of environmental educators who spend close to a week comparing notes about successful strategies they have used in teaching about the environment, discussing the creation of new programs in the field and establishing networks for information sharing. Hosted by Etech Germany, an NGO promoting green technologies in the European Union, the main goals of the conference was to explore “the critical role of educational institutions in the wake of current and emerging challenges posed by environmental disasters and economic crisis,” according to the conveners.

Thanks to a Steinbrenner Institute Environmental Education Development (SEED) grant, I was able to attend this event and found it to be a very intense learning experience. It was a conference that all of us at Carnegie Mellon could appreciate because it was a genuine interdisciplinary approach to environmental education covering a variety of themes by a group of highly diverse presenters. For example, several technical and analytic discussions about problems in environmental degradation such as climate change issues were presented side-by-side with thoughtful recommendations on how to best communicate the issues of ecology and environmental responsibility to students.



The Mayor of Karlsruhe, Klaus Stapf, welcoming IGEE conference participants

Education about the “environment” versus “education for the environment” was one recurring theme at IGEE as the group pondered the question of whether environmental education should be primarily about raising awareness and sharing knowledge or if it should also contain some urging of students and communities to take a proactive stance in their lives to contribute to a sustainable future. This theme, along with the belief that there is now a dire need for successful environmental curricula and programs, dominated many discussions during the conference.

The diversity at IGEE was evident in the kinds of educational programs that were highlighted in the various sessions. Reports were shared of educational activities that are reaching student populations in college and university undergraduate and graduate programs, in K – 12 private and public schools, in early childhood education as well as those designed for various community audiences. Many countries were represented at IGEE as well. Australian professors shared their efforts to create an inter-university wide curriculum that would be required of students throughout Australia. Malaysian educators talked about their work to include environmental concerns and sustainability as core curriculum items in their country. The prospects for teaching
continues on page 16...

International Greening

continued from page 15...

sustainability in the Arab states was detailed by a professor from the College of the North Atlantic Qatar. And, there were presentations given by other representatives from Europe, the Middle East, Africa and Asia. It was clearly an international event.

Some presenters used the occasion to showcase their distance education programs that dealt with environmental concerns of various kinds. For example, one of the more ambitious attempts to deliver educational content was described by Torvald Jacobsson from Lund University in Sweden whose Young Masters Program (YMP) is, as he put it, “reaching out to masses of people” on a global scale. Since 1999, the YMP has had 20,000 teachers and school students aged 16 to 18 from 113 countries take part in an 18-week long program on sustainable development. This effort is part of the United Nations Decade of Education on Sustainable Development conducted by UNESCO. Jacobsson shared his ambitious plan to offer the YMP platform to schools in China where initial enrollment this year could approach 200,000 more students participating in the YMP.

One of the highlights of the conference came in the form of a departure from the usual presenter-stands-at-the-podium-and-speaks format. Several students from a local Karlsruhe high school reported results of a survey that they recently designed and conducted among their classmates on such issues as waste, the protection of forests (Karlsruhe is very close to the Swarzwald) and the impact of consumption on the environment. They creatively interacted with conference participants by having them take a portion of the same survey and then comparing those results with the high school responses.

The “Sustainability Transdisciplinary Education Model” or STEM that serves as a kind of environment across the curriculum program at Central Connecticut State University was outlined by Professor Charles Button, the coordinator of the model. STEM is an attempt to involve as many departments and disciplines as possible at Central Connecticut in environmental education. Thus far, Professor Button said, his program had included virtually all departments and he underscored the activities of the Theatre Department working to produce aesthetic activities in which students from that department create plays and engage in other performing arts dealing with issues of sustainability. It was his view that such a model transforms how students think about, perceive and experience nature and the environment.

The impact that educational institutions themselves have on the environment was also a topic raised at IGEE. For example, Eileen Joseph, Director of Advancement at California Polytechnic State University, San Luis Obispo shared the results of her institution’s planning strategies to reduce their environmental footprint. She gave the history of how several green buildings and green roofs at Cal Poly became reality in the face of many funding challenges and how the “Cal Poly Green Campus Program” was implemented as a way to fulfill the eco-responsibilities of the University.

One conclusion that can be reached from attendance at IGEE is that Carnegie Mellon University can take additional measures in its own environmental education efforts. The innovations and pedagogical advances that were highlighted at this conference are some that could be implemented in our own local efforts to promote awareness of and sensitivity to sustainability and ways to achieve it.

Announcements!

2012 Environmental Public Policy & Conflict Resolution Dissertation Fellowship

The Udall Foundation invites applications for the 2012 Environmental Public Policy & Conflict Resolution Dissertation Fellowship. The Udall Foundation awards two, one-year fellowships of up to \$24,000 to doctoral candidates whose research concerns U.S. environmental public policy and/or U.S. environmental conflict resolution, and who are entering their final year of writing the dissertation. Dissertation Fellowships are intended to cover both academic and living expenses from July 1, 2012 through June 30, 2013. The application deadline is February 24, 2012. For additional information about the Dissertation Fellowship, including eligibility, program conditions, and biographies of recent fellows, please visit www.udall.gov.

Eligible fields of study include geography; marine sciences; environmental anthropology; political science; economics; environmental science, policy and management; ecology; environmental justice; regional planning; natural resource policy; environmental analysis and design, and many more. Interdisciplinary projects are particularly welcome.

Save the Date: April 26, 2012 1st Annual Steinbrenner Institute Earth Day Expo

The 1st annual Steinbrenner Institute Earth Day Expo will take place on April 26, 2012 in the University Center on the Carnegie Mellon campus. The expo will offer students, faculty, staff, and campus organizations the opportunity to showcase their environmental exhibits, research and projects to the entire campus community. The Expo will begin at 4pm and run until 6pm, and is intended to be an informal exposition of environmental talent on the Carnegie Mellon campus. A call for exhibitors will be distributed widely in January 2012. Participants from all Carnegie Mellon colleges and departments are welcome! For more information on how to join the Expo email Erika at elninos@cmu.edu

The Intel International Science and Engineering Fair (Intel ISEF)

Intel ISEF is a program of Society for Science & the Public, and the world's largest international pre-college science competition, is coming to Pittsburgh! The global science competition for students in grades 9–12 provides an annual forum for more than 1,600 high school students from over 55 countries to display their independent research. SSP, Intel, and the Pittsburgh Local Arrangements Committee are seeking volunteers to support the Intel ISEF, May 13-18, 2012 at the David L. Lawrence Convention Center.

General volunteers and judges are needed. Judges will interact with student Finalists, judging their projects in 17 scientific disciplines and must have a Ph.D., M.D., or equivalent (D.O., Ed.D., D.D.S., D.V.M., etc.) OR a minimum of six years related professional experience beyond receiving their B.A., B.S., or Master's degree. For more information on how to get involved email ssnyder@societyforscience.org

Spring Carnival 2012

Planning is underway for the 2012 Spring Carnival! Save these dates, April 19-21, 2012 and join in the celebration!

Battery Bulk: Michalek's Research on Electric Vehicles Shows Smaller Batteries are Better

Thinking about buying a new plug-in vehicle? You may want to check the size of its battery first.

Carnegie Mellon University's Jeremy J. Michalek and co-authors report that plug-in vehicles with small battery packs—and hybrid electric vehicles (HEVs) that don't plug in—can reduce life cycle impacts from air emissions and enhance oil security at low or no additional cost over a lifetime. But plug-in vehicles with large battery packs are more costly and may have higher or lower emissions than HEVs depending on where and when they are plugged in. Michalek, is an associate professor of engineering and public policy and mechanical engineering at CMU, and is the founding director of the Design Decisions Laboratory as well as an active member of the Green Design Institute.



Jeremy Michalek

In a study appearing in the *Proceedings of the National Academy of Sciences*, Michalek argues that electrified vehicles with smaller battery packs are more efficient in reducing societal costs for health care, environmental damages and oil consumption. “Current government policy provides larger subsidies for vehicles with larger battery packs, assuming that larger is better,” said Michalek.

“While larger battery packs allow plug-in vehicles to drive longer distances on electric power instead of gasoline, they are also expensive and heavy, they are underutilized when the battery capacity is larger than needed for a typical trip, they require more charging infrastructure and they produce more emissions during manufacturing.”

Michalek recently received a \$400,000 grant from the National Science Foundation (NSF) to analyze how public policy could help determine the types of vehicles built in coming years and how consumers might respond to these vehicles. His research is aimed at understanding tradeoffs in the capabilities of new technologies and to predict what near- and long-term strategies should be. “In the near term, HEVs and plug-in vehicles with small battery packs offer more cost-effective benefits. More research on batteries—especially lowering cost—and a transition to a cleaner electricity grid are needed to pursue a future where large battery packs may also be able to help address climate change, air pollution and oil dependency at competitive costs.”

Source: College of Engineering, Carnegie Mellon University

The Move-It Program

continued from page 6...

instrumentation used within the industry. This experience was further anchored through a field trip hosted by RiverQuest where the participants learned more about the techniques and instruments used to sample water and how to interpret the results. The participants cycled through several stations on the RiverQuest boat “Explorer” where they examined the water sample they pulled to test for turbidity, water chemistry, aquatic life, etc.

Since the conclusion of the program in August, about half of the participants have entered into programs of higher education. The career coaches at the MOVE-IT program have been working with the others to find sustainable employment and further certification programs. Several of the graduates have taken part in solar panel installation programs and environmental monitoring courses. We believe that this was a very successful program where we successfully exposed the participants to the concepts and industries relating to the environment and sustainability. The fact that several of the graduates have stated their desire to continue learning and working within environmentally related fields attests to the success (and fun) that we had over the summer.

CAPS Wins Funding

continued from page 10...

- Elucidate the role of BC in local and regional meteorology, including temperature and the hydrological cycle.
- Quantify the effectiveness of various US and global strategies of reducing BC on BC mass and particle number concentrations, direct, indirect and semi-direct radiative forcing and climate change.
- Identify and quantify major uncertainties in emissions, atmospheric processing, and climate impacts of BC mitigation.

Our approach will combine laboratory measurements, number emission inventory development, continued development of state-of-the-art chemical transport and coupled chemical transport/climate models, and application of these tools to the US and the world. The proposed work will reduce uncertainties about the sources of BC in the US (both from a mass and a number standpoint), will result in improved tools for the simulation of BC concentrations and its radiative and climate effects, and will allow us to better quantify the benefits of different emission control strategies or emission scenarios.

View the full Environmental Protection Agency press release here:

<http://yosemite.epa.gov/opa/admpress.nsf/1e5ab1124055f3b28525781f0042ed40/9995441262f35d748525792d00637fb2!OpenDocument>



Steinbrenner Institute
Carnegie Mellon University
5000 Forbes Avenue
1209 Hamburg Hall
Pittsburgh, PA 15213

Department of Labor Training

continued from page 5...

As of November 2011, approximately 70% of the graduates have been placed in some level of employment. Compensation has ranged from \$12 to \$48 per hour and a number of graduates have become members of the laborers' union. Beyond the core classroom training, the program provided continuing education (in subjects such as smart electrical systems, sustainable products, green HVAC) and additional certifications (HAZWOPER and Building Professional Institute). A Trainee Resource Center has also been established at Heritage Community Initiatives to encourage graduates to return for support in resume preparation and job search efforts.

Heritage and the Steinbrenner Institute recognize that technical training is only a portion of the 'need' inherent to the chronically unemployed. For this reason, the Heritage program addresses other barriers to employment such as the lack of transportation (or a valid driver's license), childcare obstacles and even criminal records. The program is geared toward creating 'sustainable families,' a goal that far exceeds landing that first job. Heritage also recognizes that job training addresses the 'supply side' of the employment equation. For this reason, Heritage and the Steinbrenner Institute have worked with other local organizations and employers to create 'demand' for workers with basic training in environmentally-related jobs. This is a challenge that will live well beyond the term of the grant, which is due to expire in January, 2012.

For more information about Heritage Community Initiatives and their programs, visit <http://www.heritagecommunityinitiatives.org>

David Dzombak
Faculty Director
412.268.2946
dzombak@cmu.edu

Erika Ninos
Environmental Program Coordinator
412.268.2754
elninos@cmu.edu

Deborah Lange
Executive Director
412.268.7121
dlange@cmu.edu

Contributing Writers: Alicia Brown Angemeer, Deborah Lange, Peter Madsen, Jamie Shairrick,
Chriss Swaney, Leah Wulfman

www.cmu.edu/steinbrenner