Global Change Teacher Institute
~ July 13-17, 2009 ~

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Conducted by the Ecosystem Science Center of the School of Forest Resources & Environmental Science at Michigan Technological University.

Coordinated by the Western U.P. Center for Science, Math & Environmental Education
About the Institute

This five-day Institute will prepare you to engage your middle and high school students in a real-world study of the effects of global change on ecosystems, including the impacts of climatic change, elevated carbon dioxide and ozone levels, nitrogen saturation, acid rain, and invasive species. Through lecture, hands-on data collection and field trips, participants will interact with scientists and gain new knowledge and skills. Teachers will receive training in and receive the Michigan Air Quality unit (easily adapted to other states). National and Michigan content standards for mathematics; life, earth and physical sciences; and technology will be addressed.

The Institute will be taught by internationally-recognized faculty and researchers from Michigan Technological University’s School of Forest Resources and Environmental Sciences, along with guest scientists from the University of Michigan and the USDA Forest Service’s Forestry Sciences Laboratory. Another benefit of the institute is the opportunity to interact and collaborate with teachers from across the Midwest and the United States. To date, teachers from California, Connecticut, Illinois, Maryland, Michigan, Missouri, Ohio, and Wisconsin, have attended.

Participants will visit the fascinating Aspen FACE (Free-Air Carbon Dioxide Enrichment) Experiment research site (http://aspenface.mtu.edu/) at the Harshaw Experimental Forest near Rhinelander, Wisconsin (see photo on cover), where the effects of elevated CO₂ and ozone on forest productivity are clearly observed.

Additionally, participants will visit a long-term field research location that is used to understand the subtle impacts of nitrogen deposition and climatic variability on forest growth, and a new subterranean rhizotron research facility where scientists study soil carbon sequestration, the process by which plants “inhale” CO₂ from the atmosphere and store carbon in roots and soil. The $500,000 tunnel is paneled with glass windows and stretches 75 feet into the hillside exposing roots, fungi, insects and worms without disturbing the soil.

The Institute will provide teachers with standards-based professional development and the time to plan, discuss, and develop new classroom curricula. Participants will receive a course notebook, handouts, a CD with ready-to-use powerpoint presentations from the course, and other curriculum-support materials.

About Michigan Technological University

Michigan Tech is located in Houghton, Michigan, along the shores of the Portage Waterway. Houghton is a quaint town with roots in the historic copper mining days of the mid-19th century. While every season is a great time to be in Houghton, summertime is relaxed and the weather refreshingly cool. Stroll along the waterfront, get an ice cream or cappuccino, or take in a movie. There’s hiking and mountain biking on the awesome Michigan Tech Recreational Trail System. Or hike up Mont Ripley Ski Hill or along Lake Superior at McLain State Park, or take in a round of golf at the Portage Lake Golf Course. To learn more about Michigan Tech visit: http://www.mtu.edu.
Course Credit & Requirements

Participants will earn three semester hours of graduate credit (FW5641/ED5641) from Michigan Technological University. Course requirements are to:

- Complete assigned readings and identify learning objectives for their students prior to the course.
- Participate fully in the entire Institute, including lecture, field trips, and evening programs.
- Keep a field journal during the Institute.
- Design a 5-day teaching unit that includes three to five lessons related to global change (using the rubric provided) and that meets Michigan (or national) content expectations. Participants should plan to implement the unit during the 2009-10 school year. Due September 1, 2009.

Planned Course of Study (18 credits)

The credits earned from this Institute can be applied towards an 18 semester-hour planned course of study for teachers working towards their Michigan Professional Certificate. Michigan Tech is a great place to design your planned course of study, with so many great summer institutes available. For more information, contact Judy Anderson at the MTU Department of Education at 906-487-2460 or juanders@mtu.edu.

Master of Applied Science Education

Graduate credits may also be applied towards Michigan Tech’s Master of Science in Applied Science Education. For more information about the Master’s program, contact Dr. Brad Baltensperger at 906-487-2460 or brad@mtu.edu. Participants interested in pursuing an advanced degree at Michigan Tech in a field other than education, should contact the department of interest (http://www.mtu.edu/).

Institute Instructors

Dr. Andrew Burton, Ecosystem Science Center, School of Forest Resources & Environmental Science, Michigan Technological University, teaches forest ecology, advanced terrestrial ecology and ecophysiology of global change. His research examines the effects of global change factors (climatic variation, nitrogen deposition/acid rain, elevated atmospheric CO2 and ozone) on carbon and nutrient cycling, forest health, productivity, and soil processes. He has published more than 40 papers in top scientific journals.

Maria Janowiak, Northern Institute of Applied Carbon Science, School of Forest Resources & Environmental Science, Michigan Technological University, is an outreach scientist who specializes in communicating the role of carbon in northern forest ecosystems. She develops information and tools to manage forests to mitigate the effects of increased carbon in the atmosphere.

Dr. Erik Lilleskov, Ecosystem Science Center & USDA Forest Service Northern Research Station, is an expert on mycorrhizae, the symbiotic fungi critical to the health of most plants. He investigates how global change will influence the fungi that control soil food webs and forest health, and examines the role of exotic earthworms in the forest ecosystem.

Dr. Janet Vail, Annis Water Resources Institute, Grand Valley State University, manages outreach/education programs at Annis Water Resources Institute, is a GLOBE trainer, and author of Michigan’s new Air Quality Unit for middle/high school students.

Joan Chadde, Western U. P. Center for Science, Math & Environmental Education, Michigan Tech University, develops K-12 science education programs for students, teachers, and communities. She’s coordinated more than two dozen teacher institutes on the Great Lakes, forestry, global change, stream monitoring, and authored Michigan’s new Water Quality unit for middle school students.

Dr. Inés Ibáñez, Assistant Professor, School of Natural Resources and Environment and Dept of Ecology & Evolutionary Biology, University of Michigan. Her research focuses on: forest species response to climate change (distributional shifts, migratory potential), forecasting potential distributions of invasive species in forest ecosystems, landscape fragmentation, and tracking shifts in species phenology in response to climate change.
General Information

Cost

Cost per participant for the 5-day Institute is only $400 for both Michigan and out-of-state participants and includes lunches, field trips, instructional materials, and tuition for three graduate credits from Michigan Tech University. If staying on-campus, the cost is $600, and includes four nights lodging and all meals. (The actual cost of the Institute is $1800. A grant from the National Science Foundation, along with a departmental stipend from the School of Forest Resources and Environmental Sciences reduces the official 2008/09 Michigan Tech Applied Science Education Graduate Resident and Non-Resident tuition of $391 per credit). Payment of the full registration fee is due Friday, June 5. Make checks payable to” Michigan Technological University. Applicants who are K-12 teachers in the eight Great Lakes states may apply for a Marine Immersion scholarship through the COSEE Great Lakes program http://coseegreatlakes.net/ or contact Helen Domske hmd4@cornell.edu

Location and Accommodations

Participants will receive four nights lodging in MTU’s newly remodeled Wadsworth Hall in a single room with private bath and receive meals from Monday lunch through Friday dinner. Michigan Tech Trails and downtown Houghton are within easy walking distance.

Getting to Michigan Tech

Michigan Technological University is located along US 41 just east of downtown Houghton, MI. Houghton is served daily by Delta Airlines from Minneapolis through Houghton County Airport in Hancock. The nationwide reservations number is 800-225-2525, or visit the Northwest Airlines website at: www.nwa.com. Commercial taxi service is available from the airport to the Michigan Tech campus for approximately $20 per person by calling Neil’s Cab at 906-482-5515.

Websites for More Information

MTU School of Forest Resources & Environmental Science: http://forest.mtu.edu
Michigan Technological University: www.mtu.edu
Western U.P. Math/Science Center: wupcenter.mtu.edu
Tourism information: www.thekeweenaw.com

Questions

For more information, contact course coordinator Joan Chadde at 906-487-3341 or jchadde@mtu.edu.

How to Apply

Send completed applications by email or postal mail to: Joan Chadde, Course Coordinator
Western U.P. Math/Science Center
105 Dillman Hall - Michigan Technological University
1400 Townsend Dr., Houghton, MI 49931
Tel: 906-487-3341 Fax: 906-487-1620

Application forms are available on the web at:
http://forest.mtu.edu
http://wupcenter.mtu.edu

Application deadline is Friday, May 15.
Participants are accepted on a first-come basis.

Participants’ registration will be confirmed by email as their applications are received.

Limited to 20 participants.

Need more credits?! Attend another Michigan Tech teacher institute listed at http://www.ed.mtu.edu/pd.html.