

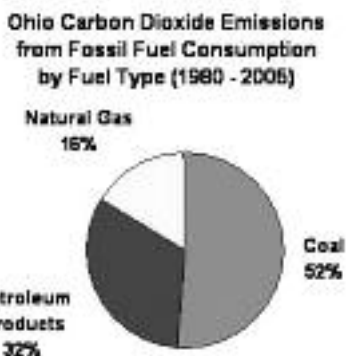
The Challenge of Global Warming Impacts in Ohio

Leanne M. Jablonski

My most transformative experience as an environmental educator occurred when first faced with the injustice of global warming. I was guest teaching in a global environmental issues course at Chaminade University in Honolulu. The students were all Pacific islanders – some from low-lying islands no larger than a college campus. I taught the science of climate change and the predicted effects on the Pacific: a rise in ocean level, more frequent severe storms and the loss of coastal land and freshwater sources. Iumi, a student, spoke out, “Are you telling me that my island and my culture are going to disappear? What are you all going to do about it? Move us somewhere else, and ship us bottled water?” Iumi’s words pierced my heart and still move me to tears in each re-telling. Ohio’s contribution to climate change and, by extension, the quality of life of Iumi and vulnerable peoples around the globe, motivates my ongoing efforts to educate Ohioans about climate change.

The reality of global warming.

Burning fossil fuels produces heat-trapping gases, predominantly carbon dioxide (CO₂), that blanket the earth. Scientists are convinced this is warming the earth’s climate and that negative impacts will worsen with time. The Intergovernmental Panel on Climate Change synthesis (IPCC 2007a) has stated the earth is warming, the warming is largely the result of human activities, and the warming rate is accelerating. Atmospheric CO₂ has risen from its pre-industrial value of 280 parts per million (ppm) to 383 ppm. The IPCC report shows that over the past 50 years, global temperature increased 0.65°C, ocean level rose 90 mm, and snow and polar ice cover declined.



Environmental Justice Considerations. Global climate change has the greatest impact on those who contributed least to its cause and are least able to do anything about it. This includes the low income and vulnerable in high risk areas who are already struggling to meet their basic health and sustenance needs (IPCC 2007b). Many indigenous cultures relying on natural resources for subsistence will suffer negative impacts. In urban areas, global warming impacts will be exacerbated for those of low income and people of color who are already often more exposed to polluted air and water. Disease, starvation, natural disasters and land loss are expected to increase and will threaten the poor and increase environmental refugees (IPCC 2007b).

Predicted Impacts in Ohio. Scientists from our region synthesized data and offered predictions for Ohio in 2100 (Kling et al. 2003).

- Temperatures will rise 5-7°F in winter and 7-9°F in summer.
- Average annual precipitation may not change much, but an overall drier climate is expected because rainfall cannot compensate for the increase in evaporation at warmer temperatures.
- There will be drier soils and more droughts due to winter precipitation increasing by 15-20% and summer rainfall decreasing 10-15%.
- Extreme heat events and heavy rainstorms will increase.

The impacts of these and other climate factors on Ohio’s natural resources and economy are summarized in the following sections.

Agriculture productivity and water use. Some crop yields will increase with higher carbon and a longer growing season. However, floods during the planting season and heat stress and drought during the growing season will offset benefits. Longer freeze-free periods and warmer temperatures will favor pests by increasing the rate of development and the migration of southerly pests. Livestock productivity and milk quality will decrease with higher temperatures that reduce appetite, weight gain, and the quantity and quality of forage.

Human health risks. Warming will increase the frequency and severity of pollution-related risks such as ozone, and exacerbate asthma and respiratory disease. Waterborne infectious diseases and tropical diseases will spread.

Natural resources. The amount and quality of wetlands, fish populations and wildlife habitat, including safe breeding sites for amphibians and waterfowl, will all be reduced. Wildfires will increase in size and frequency. Forest bird diversity will decline as climate changes favor resident songbirds over migratory birds

Confronting the Impacts of Climate Change in Ohio. Ohio has a moral responsibility to address climate change. Ohio contributes about 1% of total global carbon emissions. Ohio places fifth among states that generate electricity from power plants. The 133 million tons CO₂ is higher than many countries, including Mexico and Turkey (Center for Global Development 2007). Coal generates 90% of Ohio’s electricity (EIA 2008a) and makes the largest contribution of the carbon emission sources. Ohio ranks fourth among the states (behind Texas, California and Pennsylvania) in total volume of carbon emissions and ranks second to Texas per capita (EIA 2008b).

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Letter From Senator Voinovich

I write today to bring to your attention a critical matter facing our nation and our planet...the issue of global warming.

For far too long we have failed to adequately harmonize our country's energy, environmental, and economic policies. This has resulted in substantial unintended costs in the form of loss of thousands of good-paying jobs, shocking increases in natural gas, electricity and gasoline prices, and pocket-numbing decreases in household incomes. Moreover, because of the regressive effects of escalating energy prices, the economic consequences of these policies fall hardest on the most vulnerable members of our population – the poor and elderly. I note that in the winter of 2007-2008 nationwide applications for the Low Income Home Energy Assistance Program (LIHEAP) increased by 26 percent from 4.6 million to about 5.8 million—about 15.6 percent of the eligible population. In Ohio, more than half of the program's \$37 million budget for the winter of 2007-2008 was exhausted during the first six weeks of the program.

LIHEAP participants are not the only ones affected by our nation's efforts to address environmental challenges such as climate change. Climate change is global in its reach and economy-wide in its breadth. And, as we weigh policies to reduce greenhouse gas emissions such as carbon dioxide, we must remember that climate change is fundamentally different than any other environmental challenge we have undertaken.

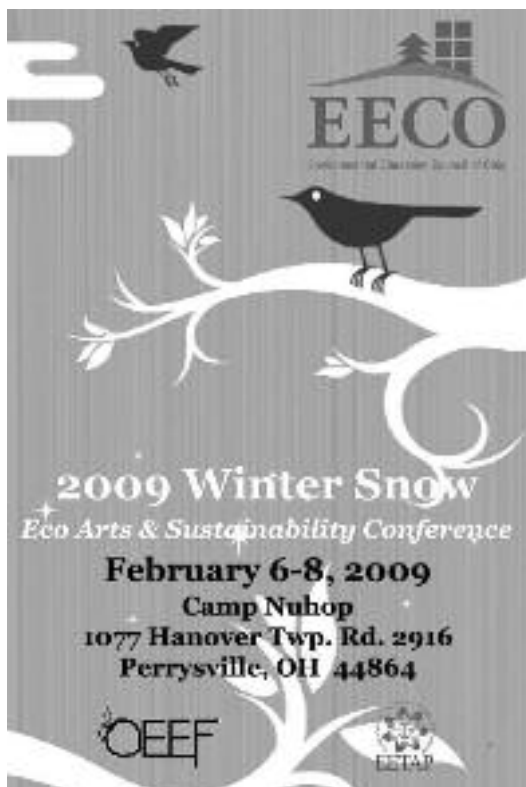
We must be smart and measured in our steps forward, always keeping in mind what is best for working families, seniors, and those trying to make ends meet on fixed incomes. We must address this problem through collaborative, multinational efforts to develop and deploy the clean energy technologies that everyone recognizes as necessary to solve this global environmental problem. We must also put technology first.

As Ranking Member of the Senate Environment and Public Works Subcommittee on Clean Air and Nuclear Safety, I am at the center of this debate, and I believe Ohioans should pay close attention. I have long championed harmonizing our economic, energy and environmental needs. I did so as mayor of Cleveland and governor of Ohio and had great success bringing both sides to the table for the betterment of Ohio and the nation. That is why I am so committed to educating my colleagues and Ohioans about the unprecedented opportunity we have before us when it comes to crafting a comprehensive solution to climate change that is less intrusive, less costly, that will achieve greater environmental benefits; and one that includes economic stability, achievable requirements, incentives for technology, and targets for international reductions.

By working together on a solution to global warming, we can truly reduce greenhouse gas emissions, move toward energy independence, create new jobs, and enhance Ohio and America's competitive position in the global marketplace; while taking care that we do not create an economic problem in our attempts to solve an environmental one.

Sincerely,

George V. Voinovich
United States Senator



The Winter Snow Conference is geared to how arts in different mediums are linked to ecology as well as the sustainability and conservation of our natural world. Many sessions will be aligned to the academic content standards. CEU and one semester hour of graduate credit from Ashland University (\$264) will be available.

Registration Fees

Full weekend: \$145 (\$135, EECO Members)

Saturday only: \$95 (\$85, EECO Members)

Fees include all meals, instruction, and *overnight accommodations (*Full weekend only)

Online registration is now available at www.eeco-online.org

Space is limited.

Camp Nuhop is surrounded by The Mohican State Forest, Pleasant Hill Lake and Malabar Farm State Parks. These nearby attractions in combination with Camp Nuhop provide an excellent venue for winter activities like winter hiking & snowshoeing, cross country skiing and bird watching. Come to Winter Snow to learn, commune with nature, and to experience what the Mohican Valley has to offer during the Winter.



Deer Creek State Park April 30 - May 3, 2009

EASY TO BE GREEN

www.eeco-online.org

Being "green" used to mean being different - apart from the mainstream. But as awareness of the importance of everything from energy use to water conservation has increased, we find that green design, practices, and products are becoming more common. Join us to celebrate the emergence of a future in which it is "Easy to be Green."

GREEN BUILDING & GREEN ENERGY: This strand will explore the implementation of green principles in the design, construction, and maintenance of buildings and associated green spaces.

GREEN CONSUMER: From green events and green products to energy efficiency, water conservation, and transportation, this strand explores ways to help individuals, organizations, and companies make truly sustainable purchasing decisions.

GREEN ENVIRONMENT: Exposure to nature is known to have health benefits for adults and children. Sessions in this strand will help you learn more about how you can increase, protect and enjoy the "greenness" of your community.

GREEN EDUCATION STRAND: Formal and non-formal educators will give presentations on how to learn about and investigate the environment, and offer teaching strategies to help you guide students to make intelligent, informed decisions to create and maintain a "greener" environment.

GREEN HEALTH STRAND: This strand examines the role that green health factors into physical activity, mental health, healthy eating habits and tobacco free, walk-able environments.

Each year EECO recognizes outstanding contributions to environmental education in Ohio. The awards are given at the annual conference. Each award is described here. Visit www.eeco-online.org to download a nomination form.

Charley Harper Award: Given to an individual or organization who shows exemplary efforts in the field of Eco-Arts in Ohio. In memory of Charley Harper.

Christy Dixon Award: Given to a young professional who has contributed significantly to environmental education in Ohio. In memory of Christy Dixon.

Finlay-Johnson Award: Given to an EECO member for making a significant or outstanding contribution to EECO.

Ohio Alliance for the Environment Award: Given to a business or industry that is dedicated to fostering a climate of cooperation for resolving environmental problems.

Outstanding Environmental Educator in the Field of Formal Education: Given to a preschool, elementary, middle school, high school or college teacher, administrator or curriculum specialist for outstanding contributions to environmental education in Ohio.

Outstanding Environmental Educator in the Field of Nonformal Education: Given to a nonformal educator for outstanding contributions to environmental education in Ohio.

Outstanding Volunteer Award: Given to a volunteer who has made a significant or outstanding contribution to environmental education in Ohio.

Publications Award: Given to a publication that has made a significant contribution to the public understanding of an environmental issue(s).

CEU's and Graduate Credits (up to two semester hours, \$264 per hour) available through Ashland University

Sessions aligned to the Ohio Academic Content Standards will be available in the Green Education Strand

Online registration begins January 15, 2009

More conference information will be posted soon!

www.eeco-online.org



Charley Harper: Wildlife Minimal Realism

David Wright, immediate past President of EECO



Wildlife Minimal Realism, it sounds quite involved in some way. It connotes accuracy but with no frills. Something to make you think. The art of Charley Harper is that, and so much more. Except, Charley's work is anything but complicated. If you've visited a nature center, or a camp, you've probably seen his outstanding work. Best known for his style that captured the essence of flora and fauna, and their interrelationships, Charley published a significant portfolio of prints, books and posters. The Cincinnati native created works for a host of nature based groups and organizations, including the Nature Center at Shaker Lakes, the National Park Service, the Cincinnati Zoo, the Cincinnati Nature Center, the Hamilton County Park District and even the Everglades National Park.

Others called him an American Modernist artist whose work captured nature with "the fewest possible visual elements", hence the term minimal realism. Charley described his style thus: "When I look at a wildlife or nature subject, I don't see the feathers in the wings, I just count the wings. I see exciting shapes, color combinations, patterns, textures, fascinating behavior and endless possibilities for making interesting pictures. I regard the picture as an ecosystem in which all the elements are interrelated, interdependent, perfectly balanced without trimming or unutilized parts; and herein lies the lure of painting; in a world of chaos, the picture is one small rectangle in which the artist can create an ordered universe."

Charley Harper worked with his wife Edie, whom he met when the two of them were students at the Art Academy of Cincinnati. They worked initially out of their homes before opening the Harper Studios with their son Brett. His work was simple, yet bold, fun, often whimsical and ultimately realistic in their own way. He often painted birds, but not in a Sibley or an Audubon way. Harper's renderings were unique, and highly arranged to tell stories. Says Harper, "Over time I have developed an enjoyment of birds. After I found out what a feeding station was, I got one and started drawing birds. But they wouldn't sit still. I found a bird guide by Don Eckelberry and realized that was all I needed--those birds didn't move. I'm the world's worst bird watcher. That's my dirty little secret, I do all of my bird watching in bird guides. Usually before I start painting I look at how everyone else has interpreted birds. If I can, I do look at birds...In the early 60's I was asked by Golden Press to illustrate the Golden Book of Biology, which was published in 1961, followed by The Animal Kingdom, published in 1968. This was my first education in nature, and it's gone on from there..." Irreverent, humorous, ridiculously talented, that was Charley Harper.

He was born in Frenchton, West Virginia, August 4, 1922. Charley died on Sunday, June 10th 2007, after a bout with pneumonia. He will be missed by so many of us. EECO has named a new award after him. The Charley Harper Award goes to the individual or group who through art has contributed significantly to EE in Ohio over the year. This past spring, at the EECO Annual Conference at Mohican State Park Lodge, Brett Harper accepted the first such award, awarded posthumously to Charley Harper. Fitting we think.

Harper was a great influence upon New York designer Todd Oldham. The two became friends during the last decade and a half, and Oldham is publishing a book about Harper entitled Charley Harper: An Illustrated Life. Old Navy has a Charley Harper clothing line, and his work is continually the subject of international study. His "Beguiled By The Wild" is a coffee table staple of naturalists and artists, in cabins and cottages and nature centers throughout the country.

Climate Change Links

Byrd Polar Research Institute at The Ohio State University, Antarctica and earth science lessons for grades 2-12, www/bprc.osu.edu/

Center for Remote Sensing of Ice Sheets at the University of Kansas, includes K-12 lessons on topics like ice sheets, glaciers, sea level change, weather, climate and global warming, www.cresis.ku.edu/education/iceicebaby.html

Charting the Midwest: An Inventory and Analysis of Greenhouse Gas Emissions in America's Heartland Report from World Resources Institute, includes Ohio Profile, www.wri.org/publication/charting-the-midwest#

"Earth's Changing Climate" unit in the Habitable Planet multimedia environmental science course for high school teachers and adult learners, from Annenberg Media, www.learner.org/channel/courses/envsci/index.html

NASA' site on monitoring climate change through remote sensing, www.climate.jpl.nasa.gov/

Ohio EPA's Climate Change Central Web pages, www.epa.state.oh.us/dir/climatechange.html

U.S. EPA Climate Change, www.epa.gov/climatechange and Climate Change for Kids, www.epa.gov/climatechange/kids/index.html

US EPA fact sheet "Climate Change and Ohio"
[www.yosemite.epa.gov/oar/GlobalWarming.nsf/UniqueKeyLookup/SHSU5BVJVM/\\$File/oh_impct.pdf](http://www.yosemite.epa.gov/oar/GlobalWarming.nsf/UniqueKeyLookup/SHSU5BVJVM/$File/oh_impct.pdf)

U.S. EPA global warming publications list, www.yosemite.epa.gov/OAR/globalwarming.nsf/content/ResourceCenterPublications.html

World Resources Institute (WRI) Climate Analysis Indicators Tool, www.wri.org/project/cait

*A complete list of Climate Change Links can be found at www.eeco-online.org

Insert and funding for this newsletter is generously provided by Ohio Environmental Education Fund (OEEF)



Recent OEEF Grants for K-12 and University Education

Keep Akron Beautiful, Energy Efficiency Education for Sixth Grade Students Attending Akron Public Schools, \$50,000, Summit County, Audience: Middle School, Contact: Deanna Craver, cravede@ci.akron.oh.us, 330-375-2116.

Provides a series of interactive energy efficiency lessons to all 2,000 sixth-grade students attending Akron Public Schools in the spring of 2009. The Ohio Energy Project's (OEP) curriculum, "Be E3 Smart" (where E=Energy Efficiency Education), will be used to educate students about energy conservation. Students will receive Home Energy Efficiency Kits to use at home with the help of their parents. Students will install nine energy efficiency measures and conduct two energy audits, comparing to see how much energy was saved. Akron Public Schools are collaborating.



Clermont Soil and Water Conservation District, Partnering to Protect Water Resources: A Rain Garden Demonstration and Education Project, \$50,000, Clermont County, Audience: Pre-Kindergarten – University, Contact: Paul Berringer, paul.berringer@oh.nacdn.net, 513-732-7075.



Provides demonstration rain gardens on the campuses of each of the nine local school districts within Clermont County, plus the Grant Career Center in Bethel. An accompanying classroom and field study curriculum will help teachers explain the installations and environmental benefits of rain gardens and rain barrels. A rain garden workshop for the general public will be held in conjunction with the installation of one of the rain gardens, and will be filmed by the Clermont County Today cable television program. A printed guide and local Web page will instruct residents on how to create and register their own rain garden to help with storm water management. Collaborators include the Clermont County Stormwater Management Department, Office of Environmental Quality and Office of Public Information, East Fork Watershed Collaborative, Greenacres Foundation, and Marvin's Organic Gardens.

Springfield Schools Foundation, Taking a New Look at the Grove, an Endangered Oak Openings Ecosystem., \$14,328, Lucas County, Audience: Elementary and High School, Contact: Marty Perlaky, sphs_mwp@nwoca.org, 419-867-5633.

Honors biology students and gifted elementary students will collaborate on a project documenting the condition of the Oak Openings ecosystem in The Grove, a 12-acre property owned by the Springfield Local School District. Students will conduct a 12-month baseline survey of the site by sampling water and soil and preparing an inventory of native and invasive plant and animal species. They will share their findings with other students, community residents and leaders, and organizations with online environmental databases. The data gathered in this project will be the basis for a multi-use restoration plan for The Grove that will include an outdoor classroom where students can study the unique characteristics of the Oak Openings ecosystem.



Elgin Local Schools, Elgin South Elementary, "All About Energy," \$4,966, Marion County, Audience: Elementary School, Contact: Sandy Stevens, stevens_s@elgin.k12.oh.us, 740-494-2677.

Provides supplies and a field trip to help 44 fourth and 52 fifth grade students learn about different forms of energy, how energy consumption affects the environment, alternative energy sources, and how to calculate and reduce their personal carbon footprint as well as the school's. Collaborators include Mid-Ohio Energy, the Prospect Park Commission, the Sandusky Plains Environmental Education Center, and Veggie U, a gardening curriculum of the Culinary Vegetable Institute.

Big Walnut Creek Water Quality Partnership, "Investigating Water Quality Among Delaware County Watersheds," \$4,979, Delaware County, Audience: High School, Contact: Kris Bruestle, kris-bruestle@delawareswcd.org, 740-368-1921 ext. 4.

Provides monitoring supplies and equipment so that high school students (Grades 9 and 10) and adult volunteers from the Scioto, Olentangy, and Upper Big Walnut watersheds will be trained and certified as an EPA level I Qualified Data Collectors to monitor local water quality. Data collected will be analyzed by the students and stored in a custom Access database, housed by the Delaware SWCD fileserver. All findings will be disseminated in watershed reports and students' science fair projects. Delaware Soil and Water Conservation District and Delaware Area Career Center are collaborating.

Tolles Career and Technical Center, "Tolles Bird Discovery Project," \$3,621, Franklin, Madison and Union Counties, Audience: High School, Contact: John Thomas, johmas@hotmail.com, 614-890-0463.



Provides binoculars, field guides, handheld GPS units, supplies and interpretive signs to help students in landscaping and environmental science classes map bird territories, monitor populations, and improve habitat along a nature trail adjacent to the school and a tributary of the Big Darby Creek. The Grange Insurance Audubon Center and Hummer/Bird Bander Research Collaborative are participating.

Union Local School District, Union Local High School, "Implementation of Forestry Management into the Vocation Agriculture Curriculum," \$5,000, Belmont County, Audience: High School, Contact: Jon Jones, jon.jones@omeres.net, 740-782-1181.



Provides books, supplies, equipment, and instructional support to implement a Forestry Management class into the Vocational Agriculture curriculum. Students will read plat maps, learn tree identification and orienteering skills, sample soils, and study wildlife ecology, tree growth, and timber stand improvement techniques for forest management. Belmont Soil and Water Conservation District and OSU Extension are collaborating.

Recent OEEF Grants for Adult Education

Friends of the Lower Olentangy Watershed, MONITOR: Monitoring, Observing & Naming Impacted Tributaries of the Olentangy River, \$39,024, Delaware County, Contact: Heather Dean, flow2004@sbcglobal.net, 614-267-3386.

Provides two 40-hour hands-on watershed training courses and follow up support to prepare adult volunteers to monitor 15 previously unnamed, unstudied tributaries of the Olentangy State Scenic River in southern Delaware County. Ohio EPA's Qualitative Habitat Evaluation Index (QHEI), Headwater Habitat Evaluation Index (HHEI) and ODNR's Scenic Rivers macroinvertebrate training will be incorporated in order to certify the volunteers to conduct Level I macroinvertebrate assessments and Level II stream habitat assessments. Monitoring data will be shared with the public through newsletters, brochures, public meetings, and a Web site with clickable maps, to inform land use decision making and prioritize streams for protection or restoration. Volunteers will seek public input to name the tributaries, and encourage residents to take ownership of their watershed. Collaborators include the Delaware Regional Planning Commission and Soil and Water Conservation District, Mid-Ohio Regional Planning Commission, ODNR Division of Natural Areas and Preserves, Ohio EPA Division of Surface Water, and Preservation Parks.

FLOW

Voinovich School of Leadership and Public Affairs at Ohio University, Ohio Businesses and the New Energy Climate: Integrating energy efficiency and environmental sustainability into business planning, \$44,600, Athens County, Contact: Scott Miller, millers1@ohio.edu, 740-593-0827.

Delivers a targeted workshop for leaders of Ohio-based businesses to help them integrate energy efficiency, environmental sustainability, and anticipated regulatory reductions in greenhouse gas emissions into their strategic, financial, and supply chain planning. The workshop will include Ohio-specific case studies. The Ohio Manufacturers Association is collaborating.

Franklin Soil and Water Conservation District, Central Ohio Rain Gardens, \$49,742, Franklin County, Contact: Stephanie Suter, ssuter@franklinswcd.org, 614-486-9613.



Provide a series of educational workshops, brochures, a website, and demonstration projects to show residents how rain gardens can collect storm water runoff from downspouts, driveways and sidewalks to reduce flooding and prevent storm water pollution of waterways. Volunteers will monitor storm water run off before and after rain garden installation to look for changes in both water quantity and quality. Collaborators include the Cities of Columbus and Westerville, Friends of the Lower Olentangy Watershed, Mid-Ohio Regional Planning Commission, and Sierra Club Central Ohio Group.

Ohio Department of Natural Resources, Division of Soil and Water Conservation, Project SWEETER/Source Water Environmental Education Teams Enhanced Resources, \$47,540, Statewide, Contact: Jeanne Russell, Jeanne.Russell@dnr.state.oh.us, 614-265-6682.

Equips 34 existing Source Water Environmental Education Teams (SWEETs) with EnviroScape® Drinking Water and Wastewater Treatment models. Also provides six new SWEETs with the EnviroScape® models and the Envision 3000® ground water simulator flow models. Regional training workshops will be provided to expand their capacity to educate the public about protecting drinking water sources (both surface and ground water) and managing storm water and waste water. The teams include Soil and Water Conservation District educators and at least two other partner organizations and/or agencies. The Ohio EPA Division of Drinking and Ground Waters is collaborating.



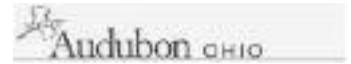
Ohio Interfaith Power and Light, Energy Education and Audits for Ohio Congregations, \$49,838, Statewide, Contact: Gregory Hitzhusen, hitzhusen.3@osu.edu, 614-292-7739.



Provides educational outreach and technical assistance to at least 50 congregations and 250 households in Ohio to conduct energy audits and implement energy conservation and efficiency measures. Components include educational workshops, print and web-based materials, webinar training and set-up for energy tracking software, expert energy audit of institutional facilities, training and resources for household audits, congregational and household web-based carbon footprint calculators, support for energy saving measures, tracking of energy savings, and recognition of participants' energy and emissions savings achievements. The Byrd Polar Research Center is collaborating.

Audubon Ohio, Grange Insurance Audubon Center Interpretive Displays, \$49,634, Franklin County, Contact: Heather Starck, hstarck@audubon.org, 614-224-3303.

Involves local residents in the design and development of interpretive displays for a new nature center located on the Whittier Peninsula in downtown Columbus. Exhibits will focus on protecting the adjacent Scioto River and riparian forest from threats that include invasive exotic species, construction projects, recreational use, hydromodification, urban runoff and pollution. Exhibits will help visitors to the center understand the connection to the Mississippi River Basin, and residents' role in improving water quality in the watershed. Franklin County Metro Parks and Soil and Water Conservation District are collaborating.



The Five Colleges of Ohio, Inc., A Collaborative College Environmental Management System Initiative, \$49,894, Delaware, Knox, Licking, Lorain, and Wayne Counties, Contact: Susan Palmer, palmers@kenyon.edu, 740-427-5234.

Establishes environmental management systems (EMS) at The College of Wooster, Denison University, Kenyon College, Oberlin College, and Ohio Wesleyan University. Training sessions will help campus teams verify applicable regulations, inventory activities that affect the environment, perform on-site assessments of operations in relation to regulations, prepare gap analyses comparing current status to goals, and engage the college communities through public outreach events and publications. A dissemination workshop will share the results with other colleges in Ohio. Collaborators include the University of Findlay School of Environmental and Emergency Management, The Laboratory Safety Institute, and the University of South Carolina School of the Environment.

The Wilderness Center, Inc., "Vernal Pool Workshop," \$2,267, Statewide, Contact: Tamara Seikel, tammy@wildernesscenter.org, 330-359-5235.



The project goal is to increase awareness and understanding of the key role that vernal pools play in Ohio's ecosystem. A one day workshop at The Wilderness Center (TWC) will train 50 volunteers from across the state to monitor vernal pools in their areas and to report the findings; this will add information to a state wide data base created by the Ohio Environmental Council (OEC) so that better protection and resource management decisions can be made that will protect these spring-time wetlands. Better protection of vernal pools will further the state's environmental goals in terms of biodiversity, sustainability of ecosystems, ground water quality, surface water quality, natural flows of water, and recreational opportunities. OEC's Vernal Pool Database can be found at http://www.theoec.org/vernalpool_submit.html.

Cuyahoga County Board of Health, "Ohio Storm Water Conference," \$5,000, Statewide, Contact: Harry Stark, hstark@ccbh.net, 216-201-2001 ext. 1205.

In 2008, a very successful Northeast Ohio Storm Water Conference brought together 393 attendees and 50 speakers over two days, to help municipal officials and local watershed organizations understand and educate their residents about storm water issues. This mini grant will provide facility rental to support a 2009 storm water conference in Cincinnati, to promote regional collaborative approaches to these issues in southwest Ohio. The Ohio Department of Natural Resources, US EPA's Cincinnati Office, and multiple local agencies and organizations are collaborating.



Warren Soil and Water Conservation District, "Southwest Ohio Sediment and Erosion Control Field Day Audience Expansion Initiative," \$5,000, Statewide, Contact: Marsha Rolph, mrolph2000@yahoo.com, 513-695-1337.

The Southwest Ohio Sediment and Erosion Control Field Day was developed by employees of Southwest Ohio Soil and Water Conservation Districts (SWCDs) as a means to educate homebuilders, developers, contractors, engineers, public officials, and a myriad of other NPDES Phase II stakeholders about compliance with construction site non-point source pollution regulations. Since its inception in 2002, this event has been tremendously successful in spreading the importance of erosion and sediment control, storm water management, and water quality protection through the expertise of various speakers, the exhibition of hands-on demonstrations of Best Management Practices, and product vending. Provides funding for a keynote speaker to help the 2009 event attract approximately 100 more homebuilders and contractors responsible for the installation and maintenance of sediment and erosion controls on development sites. Collaborators include the Butler and Hamilton SWCDs, Clermont County Office of Environmental Quality, and Home Builders Association of Greater Cincinnati.

Great Lakes Chapter International Erosion Control, "Storm Water Professional Development," \$5,000, Statewide, Contact: Brett Berggefurd, bbergefurd@co.delaware.oh.us, 740-272-3098.



Three different review classes and associated exams for storm water management professionals will each be offered twice during 2009. Participants will have the opportunity to become certified professionals in sediment and erosion control and storm water quality management, to improve compliance by small municipal separate storm sewer systems (MS4) communities and the construction industry. Collaborators include the Cuyahoga Soil and Water Conservation District, Great Lakes Environmental Finance Center at Cleveland State University, Ohio EPA Northeast District Office and USDA Natural Resources Conservation Service.

Eaton Township Storm Water Management Committee, "Eaton Township Rain Garden Community Awareness Project," \$3,761, Lorain County, Contact: Bob Hudak, hawkwind5usa@yahoo.com, (440) 748-3775.

Provides a 600 square foot demonstration rain garden at the Town Hall, to educate residents about this low-cost method of alleviating problems associated with flooding and storm water runoff. Collaborators include the Black River Watershed Project, Eaton Township Trustees, and Lorain Soil and Water Conservation District.

Warren County Park District, "Hisey Park Wetland Interpretative Signs Project," \$5,000, Warren County, Contact: David Nuscher, parkboard@co.warren.oh.us, 513-695-1109.

Provides interpretive signage for a 12-acre wetland area in the Little Miami flood plain, as part of a stream relocation and restoration project, to help educate residents using the adjacent trails and ball fields in a 158-acre park about the value of wetlands for water quality and flood control. Collaborators include the Friends of the Warren County Park District, Ohio Wetlands Coudation, Warren County Convention and Visitors Bureau, and Wayne Township Trustees.

Mahoning Soil and Water Conservation District, "Rain Garden Education and Demonstration Project," \$3,776, Mahoning County, Contact: Kathleen Vrable-Bryan, kvrable-bryan@mahoningcountyoh.gov, 330-740-7995.

Provides a demonstration rain garden at the Mahoning SWCD office site in Youngstown, to educate county residents, business owners, developers, contractors, landscapers and others about simple, cost-effective and aesthetically pleasing ways to protect water quality and prevent flooding in urban areas. Mahoning County Green Team and Mahoning Valley Landscape and Nursery Association are collaborating.

City of Milford, "Storm Water Drain Labeling," \$857, Clermont County, Contact: Susan Ellerhorst, sellerhorst@milfordohio.org, 513-248-5092.

Provides "No Dumping: Drains to the Little Miami River" labels for volunteer groups to mark 200 catch basins, to educate the public regarding the water quality effects of dumping materials in storm drains. Also provides 600 door hangers in affected neighborhoods and 100 "When it Rains, Clermont Drains" brochures in new resident's packets, to increase watershed community awareness. This project will help the city meet public outreach, community involvement and illicit discharge detection and elimination requirements in the Phase II storm water regulations. Clermont County Storm Water Management Department and the East Fork Watershed Collaborative are participating.

Ohio EPA-EECO Partnership Regional Priorities



- Region 2: high school, environmental careers
- Region 3: social studies, environmental careers
- Region 4: urban/multicultural, environmental careers
- Region 5: pre-service teachers
- Region 6: language arts
- Region 7: adult education
- Region 8: urban/multicultural, environmental careers
- Region 9: pre-service teachers, high school
- Region 10: high school, environmental careers
- Region 11: adult education, environmental careers
- Region 12: early childhood, urban/multicultural

Simple Activities for Exploring Key Concepts Related to Climate Change

Reprinted with permission from *Teaching About Climate Change* (ed, Tim Grant and Gail Littlejohn, Green Teacher 2001).
This book is available from Green Teacher online at www.greenteacher.com or by calling 888-804-1486.

Gases Have No Borders

Concept: Diffusion is the movement of gas molecules from places of high concentration to places of lower concentration. Greenhouse gases diffuse outward from their sources and become mixed in the atmosphere.

Method: put a small amount of a strong-smelling (and non-allergenic) substance such as vinegar or peppermint oil onto a cloth or Kleenex. Stand on one side of the classroom and wave the cloth. Ask students to raise their hands as soon as they detect the odor, and time how long it takes for everyone to smell it. Discuss the role of diffusion (and wind) in making greenhouse gas emissions a global problem.

Mayonnaise Jar Greenhouse

Purpose: To demonstrate the concept of the Earth as a greenhouse.

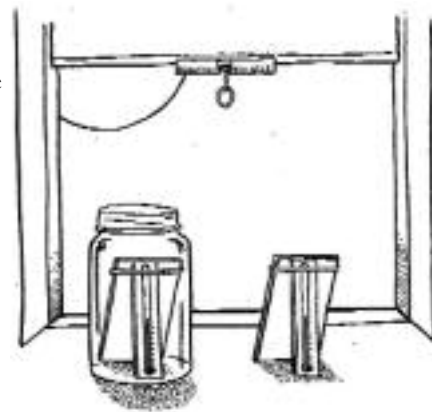
Materials: One large mayonnaise jar with lid; two small thermometers; two pieces of cardboard; rubber bands; bright desk lamp or sunny window.

Introduction for students: A greenhouse is a building especially constructed for growing plants when the weather outside is cold. The walls of a greenhouse are made of glass or clear plastic. Sunlight passes through the walls, is absorbed by the soil and plants, and is then emitted as heat energy which warms the air inside the greenhouse. The walls prevent the heated air from escaping, so it remains trapped inside the greenhouse.

Certain gases in the atmosphere are called greenhouse gases because they act like the glass in a greenhouse. Greenhouse gases allow sunlight to pass through to the Earth's surface. When sunlight hits the Earth, it heats the surface (think of a blacktop parking lot in the summer). As the heat rises, some of it is trapped by the greenhouse gases. Without the greenhouse gases creating what is called the natural greenhouse effect, the atmosphere and climate on Earth would be too cold to sustain life.

Method:

1. Using rubber bands, attach the top of each thermometer to a piece of cardboard. Make sure the numbers are facing out when you stand the thermometers.
2. Place one of the thermometers inside the jar and put the lid on the jar.
3. Place the jar in a sunny window or beside a desk lamp. Next to it place the second thermometer. Be sure that both thermometers are shaded from direct light by the cardboard (see diagram).
4. Record the temperatures of both thermometers every 10 minutes for one hour.
5. You might want to continue the experiment and record the two temperatures every day at the same time for a week. Graph the data and discuss how the temperature fluctuates from day to day.



Discussion:

- Why does the thermometer inside the jar show a higher temperature? (The glass and lid trap the heated air, so the temperature rises and stays higher than the temperature outside.)
- Would the mayonnaise jar greenhouse be more effective on some days than others, or at certain times of the day? (Variations will result from different light conditions and the length of exposure to direct sunlight.)
- How is the jar behaving like the Earth's atmosphere? How is it different? (Like greenhouse gases, the jar traps heat. However, the Earth's atmosphere is not a solid barrier which stops hot air from leaving, as a glass jar does. Some of the heat radiating from the Earth's surface escapes directly into space. Some is absorbed temporarily by greenhouse gases and then emitted back to the Earth's surface.)

Consider making your tax-deductible gift to the EECO Endowment

The EECO Endowment has been established at the Columbus Foundation to provide Ohio excellence in environmental education for generations. An endowment contribution to EECO is an investment in Ohio's future, in education, in the natural world we pass on, and in our people. Contributions are kept within the fund to generate sustainability and annual income to support our vital projects.

The EECO Endowment will assure continued professional development for our special interest sections throughout Ohio:

- Business, Industry & Trade Associations
- Environmental Education & Outdoor Education Organizations
- Preschool, Elementary & Secondary Education
- Environmental & Community-based Organizations
- Government Agencies
- Higher Education
- Research



Naturally Nelson

Nelson Strong, EECO Contributing Editor

I'm sitting at my dining room table staring out at the birds at the backyard feeding station, thinking about global warming – this despite the much-lower-than-normal temperature outside. True, it is November (the dark-eyed juncos have returned), but last night's low (about 20) is more typical of January.

What do you do with a thing like global warming? Especially when it's colder than normal outside? Lesson #1: GW has nothing to do with the weather. Huh? It has to do with climate – long-term temperature patterns and trends. Lesson #2: GW is complex and not all that easy for many people (me included) to really understand. Climate study is pretty arcane stuff even minus the political-economic-social trappings GW brings to the issue.



I've decided to leave the real discussion of global warming/climate change to others in this issue of the EECO Newsletter (Lesson #3: don't discuss sex, religion, politics, or global warming in polite society).

I'd really rather discuss the dark-eyed juncos (*Junco hyemalis*) hopping around the yard looking for seed. I've always called them slate-colored juncos (still do), but in 1973, the American Ornithologists' Union decided that five variations on the junco theme were really one species...all "dark-eyed."

As you might guess, they aren't all that flashy (nothing "slate-colored" is going to be very flashy), but they are interesting and fun to watch. For one thing, at a time when other birds are leaving Ohio for warmer climes to our south, the juncos are just arriving – from colder climes to

the north; for them, we are the south! Another common name for them is "snowbirds."

If you want to see an EARLY bird, this is it; I usually see them hopping around under the feeder before it's really light enough to see much of anything outside. And they're back there again when it's getting too dark to see. When you're an 8-5 office worker, these are about the only birds you get to see Monday thru Friday this time of year – which makes them pretty special.

And while they aren't colorful, they do flash white tail feathers when they fly and they have pink bills – pink! Juncos are in the same family (Emberizidae) as American sparrows and towhees. Not surprisingly, then, they are small birds.

As mentioned earlier, these little birds breed north of Ohio and at higher elevations down the Appalachians. Might global warming force their breeding habitat still farther to the north? Might the Appalachians become unsuitable for breeding? While juncos are common today, what would either of these climate-related changes mean to this species population?

Oops! Back to the GW discussion. And therein lies the problem. No one knows the answers. Because everything truly IS connected – the living and the nonliving – and because Earth is a closed system, what affects one thing ultimately affects everything in ways both subtle and profound.

GW provides the ultimate – and imperative - educable opportunity.

Global Warming Impacts on Ohio, continued

Solutions to global warming fall into two categories. The first category is reducing atmospheric CO₂ by decreasing total fossil fuel emissions. The second is carbon capture by conserving vegetated land that store carbon through plant photosynthesis. Ideal solutions involve adaptation and mitigation, at cost-effective in the long-term, create jobs and minimize impacts on the poor.

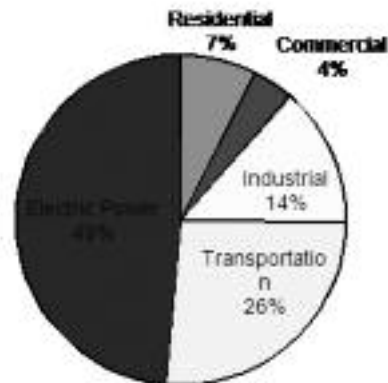
Some strategies to explore:

- Decrease carbon emissions by reducing total energy consumption and increasing energy efficiency and re-capture.
- Use renewable energy sources that do not emit carbon including wind, landfill, methane, low-impact hydroelectric, biomass and solar electric.
- Build fuel-efficient vehicles, reduce miles driven and improve public transportation within cities and rapid transit between cities.
- Reduce urban sprawl and protect healthy ecosystems to sequester carbon and mitigate the impacts of climate change.
- Educate and take action to reduce our carbon footprint at individual, organizational and civic levels.

Ohio has a rich legacy of natural resources, technology innovation and industry expertise and a vibrant environmental community. Drawing on Ohio's legacy, let us take up Lumi's challenge by educating and inspiring actions in Ohio for a globally just and sustainable climate future.

Leanne Jablonski is a scientist, educator and pastoral minister who directs the Marianist Environmental Education Center (MEEC) in Dayton. A Marianist sister, she holds a PhD in plant ecology/global climate change. Leanne serves on EECO's Board and has coordinated faith community environmental initiatives with the Ohio Council of Churches. Development of this article and web resources was supported in part by a grant of the Ohio EPA OEEF, Faithful Care for Ohio's Environment. For more information and educational activities, consult the web resource lists in this issue, and the climate change and energy curriculum resources at the MEEC website: (<http://meec.udayton.edu>). Visit www.eeco-online.org for a complete list of climate change links and references used in this article.

Ohio Carbon Dioxide Emissions from Fossil Fuel Consumption (1980 - 2005) By Sectors



Educators and the Environment

David Wright, immediate past President of EECO



What can the average person do to make a positive difference for the environment? What can that same person do to effect positive change in education? Or to change wasteful behaviors?

Ask the students at Price Elementary School in Cuyahoga Falls and they can give you dozens of answers. Price students have benefited from classroom programs introduced by Sustainability for Educators and the Environment (SEE), a non-profit organization that believes that, with the right education, our children can become the environmental stewards of the future.

SEE is the brainchild of Brian Grimm, co-owner of Emerald Environmental, Inc., a northeastern Ohio-based recycling company that specializes in environmental services, waste management and industrial hygiene. “Every day, we make simple choices that impact our environment and these choices matter. That’s where SEE comes in – we empower teachers to impart this knowledge to their students,” he explains.

Grimm is a shining example of how one person can make a difference in a big way. In 14 years at Emerald Environmental, he has helped businesses uncover environmentally friendly solutions to recovering and recycling waste. In fact, Grimm has recently partnered with Upcyclers, Inc., an organization that holds a process patent for the conditioning and beneficial reuse of alum residuals. This patent allows alum residuals from wastewater treatment plants to be conditioned in such a way that it can be blended with topsoil to create a marketable landscaping material.

“Upcyclers is a way for us to continue to offer our clients innovative ways to be sustainable. It’s rewarding to help companies understand how these creative and resourceful solutions can be beneficial for both the business and the environment.” But, for Grimm, selling green solutions to businesses simply wasn’t enough.

“Companies are more focused on how they can meet government regulations or impact their bottom line,” he said. “Sure, the solutions we develop for them are designed to reduce environmental impact, but many times these concepts don’t extend beyond the workplace.” Grimm wanted to take his years of green knowledge and develop a program that gained grassroots momentum. Thus, the introduction of SEE.

SEE’s motto, “Talk Less. Do More.” exemplifies the organization’s mission to encourage immediate action by making simple lifestyle changes that will benefit the environment. “We all know that we need to start doing something to make a difference but, for some, the hassle of taking action outweighs the benefits.” SEE overcomes this obstacle by introducing simple Zero Waste principles to students. Zero Waste maximizes recycling, minimizes waste, reduces consumption and ensures that products are made to be reused, repaired or recycled back into nature or the marketplace.

In SEE classrooms, the catch-all trash can is a thing of the past. In its place are recycling and compost bins that force students to think about how much garbage they produce and how it can be reused. Additionally, students can think through systems, trace energy, and analyze/interpret how thinking scientifically is helpful in daily life.

Couple this hands-on learning experience with lesson plans that meet state academic content standards and the terms “Reduce, Recycle, Reuse” truly come alive. As Grimm explains, “Our goal is to make an impression with these kids so that they take the concepts into their own homes. The younger they start developing these habits, the more likely they are to continue them over a course of their lifetime.”

As if the potential long-term benefits aren’t enough, SEE also boasts immediate returns – quite literally. The Classroom Compost Program is a SEE program that allows students to see how their garbage can be returned to the environment in productive ways. This interactive learning experience brings compost bins into classrooms. Students add their food scraps and, over the course of the year, the “trash” is transformed into valuable fertilizer that can then be used for school gardens. “For many people, especially children, sustainability is a big, intimidating word with very little meaning. By integrating programs like Classroom Compost, we demonstrate the power of this concept in ways everyone can understand,” says Grimm.

The Classroom Compost Program is one of many that SEE integrates into participating school curriculum. The organization also holds student rallies to encourage school-wide recycling and, ultimately, work towards the goal of Zero Waste. This environmental pursuit then becomes an integrating context for learning across multiple academic disciplines, civics, science, business, communications. And it gets better, Grimm hires interns as educators, teaching students, administrators and support staff and especially custodial staff how they can become part of the solution. There is indeed zero waste with Grimm, even in terms of the audiences that he serves.

SEE relies on companies such as Emerald Environmental for much of its funding. Along with corporate sponsors, it also receives support from government grants and individual donors. To find out more about how you can participate in this green school movement, visit TalkLessDoMore.org.

Trash Facts

- 1) Each person in the US make 5lbs of waste per day; therefore a person makes approximately 1/3 lb of trash in their waking hours (~15 hrs)
- 2) If a child spends 8 hours per day in school, he or she makes 2 2/3 lb trash per day in school.
- 3) If a child spends 20 days per month in school, he or she makes 53 1/3 lbs trash per month.
- 4) If a child spends 9 months per year in school, he or she makes 480 lbs of trash per school year (Sept - May)
- 5) If there are 408 students in an average school, they make 98 tons of trash per school year (Sept - May)

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Betsy Banks ewb@case.edu	Leanne Jablonski leanne.jablonski@notes.udayton.edu	Mary Sheridan marysheridan1@mac.com
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EECO Regional Directors

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Region 3 - Dawn Wingate OSU-Lima, Galvin Hall 4240 Campus Drive Lima, OH 45804 T:419.995.8437 wingate.2@osu.edu	Region 6 - Janet Ellsworth Mansfield City Schools Outdoor Exploration 606 Highridge Rd. Lexington, OH 44904 T:419.884.0818 / F:419.525.6389 wellsworth@neorr.com	Region 11 - Vicki Kohli Fairfield Soil and Water Conservation District 831 College Avenue, Suite B Lancaster, OH 43130 T:740.653.8154 / F:740.653.1135 vicki.kohli@oh.nacdnet.net
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Region 5 - Sue Magness Recycling Coordinator Cincinnati Office of Environmental Quality 805 Central Avenue Two Centennial Plaza, Ste. 320 T:513.352.5332 / F:513.352.6995 sue.magness@cincinnati-oh.gov	Region 8 - Dawn Wrench Earth Day Coalition 3606 Bridge Avenue Cleveland, OH 44113 T:216.281.6468 ext 225 F:216.281.5112 dwrench@earthdaycoalition.org	

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