

E E C O

Environmental Education Council Of Ohio

Issue Focus:

..Climate Change

Winter 2013

The Changing Climate of Agriculture

By Casey Brooks

**Sustainable Agriculture Program Coordinator
Zane State College**

It's pretty clear to anyone that has spent any time on a farm that successful farming is a direct result of dealing with environmental challenges (aka storms, floods, droughts and pests). As the average global temperature continues to rise, farmers and ranchers will face even more difficulty growing crops and raising livestock. According to the U.S. Department of Agriculture, over the next 25-50 years, farmers will potentially have to cope with a number of additional challenges. These include: increased risk of crop failure due to temperature extremes, reduced productivity of livestock, changes in water availability, increased pressure from invasive weeds due to higher carbon dioxide levels and greater risk of drought especially in much of the western United States. Internationally, climate change impacts could be further magnified by continued population growth, placing even greater pressure on already limited resources.

So what can be done to minimize these potentially detrimental impacts? Farmers and ranchers will have to continuously improve the efficiency of their farms. A recent report by the Worldwatch Institute illustrates how adopting sustainable agriculture practices can help mitigate some of the impacts of agriculture on climate. Practices such as agroforestry, building soil fertility, urban



farming, cover cropping, improving water conservation and preserving biodiversity can also provide improved resilience to the effects of climate change on farms. In order to face the challenges associated with climate change, farmers may have to adopt some of these farming practices to remain viable.

For More Information

The Worldwatch Institute <http://blogs.worldwatch.org/nourishingth-planet/supporting-climate-friendly-food-production/>

USDA www.usda.gov/oce/climate_change/effects.html

EPA www.epa.gov/climatechange/impacts-adaptation/agriculture.html

View this newsletter online at **www.eeco-online.org**
for easy linking to the web resources in this newsletter

Save the Date

EECO Annual Conference

Mohican State Park

April 11- 14 , 2013

OEEF Letter of Intent Deadline

July 8, 2013, 5 pm

OEEF Grant Submission Deadline

July 15, 2013, 5 pm

See www.eeco-online.org for details

46th Annual Conference

**April 11-14, 2013
Mohican State Park**

This year's theme recognizes the timeliness of a resurgence in the environmental movement.

Discover the many facets of environmental education, from traditional outdoor education and field studies, to the integration of STEM and mobile technology, and focus on sustainability.

Find out more and register at
www.eeco-online.org

**Approved by the Ohio
State Board of
Sanitarian Registration**

EECO is now an Approved Training Agency for the Ohio State Board of Sanitarian Registration. We are currently approved of the EECO 2013 Annual Conference for up to 18 contact hours.

Wildlife and Climate Change

What are the Potential Impacts?

By Jen Dennison, ODNR: Division of Wildlife

In December of 2011, biologists, researchers, naturalists and environmental educators were in attendance at the Ohio's Wildlife in a Changing Climate Conference to learn more about the emerging research on the effects of climate change on wildlife and their habitats. The keynote speaker was Dr. David Karowe, professor of Biological Sciences from Western Michigan University. Dr. Karowe presented compelling evidence of the overall potential impacts of climate change on our country, paying particular attention to the direct impacts on Ohio. Here are some of his findings:

- Since 1950, Earth has warmed ~0.8°C, with the 10 warmest years in history occurring since 1998. This means that this current warming period is the fastest on record.
- Since 1900, energy increase from greenhouse gasses is about 20 times the energy increase from the sun. Volcanic activity is not the culprit because increases in atmospheric ash tend to cool the earth as they block the sun's energy. 90% of the increase is due to greenhouse gasses. Natural factors would have caused slight cooling since 1900, so increases are due to human impacts.
- There is no consistent trend in global rainfall since 1900. However, droughts have increased worldwide since 1950.



Dr Karowe



White oak bud

- Conversely, severe rainstorms have also become more common, with a 43% increase in Ohio since 1948. 2011 held Ohio's wettest spring AND fall on record. Increased rain events cause flooding, erosion, and increased distribution of water-borne and vector-borne diseases. While no one storm can be blamed on climate change, researchers continue to monitor warming ocean waters and their effects on the intensity of hurricanes and weather patterns.

- The seasonal timing of natural events, or phenology, has been inconsistent because of a lack of research. Some Ohio examples include: white oak budburst is 23 days earlier than around 1900; two-thirds of wildflower species are showing significant flowering advancement; in general, plant species that are adapting to climate change are faring better than those species that are not. Research is being compiled

at the National Phenology Network <http://www.usanpn.org/>

- In migratory birds, shorter distance migrants are responding faster than longer distance migrants. And as with plants, those species that are not responding are declining in numbers. For example, flycatchers that lay their eggs earlier are surviving better than those that don't. This is probably due to a mismatch with the timing of major food resources such as caterpillars. If the food is already out of reach by the time the eggs hatch, survival rates are diminished.

- In general, animals are responding to climate change more quickly than plants. This will likely have adverse consequences as animals will not match up well with their habitat needs.

- Higher elevation species will likely decline due to limited expansion capabilities. In other words, they can only go so high before they run out of space.

- Many taxonomic groups are expanding polewards.

For more information about wildlife and climate change, and to view the presentations of Dr. Karowe and the other presenters from this conference, go to <http://bit.ly/WildlifeandClimate> and click on Presentations and Resources.



Willow Flycatcher

Image courtesy of the Ohio Bird Conservation Initiative

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OEEF Letter of Intent Deadline

Jan 8, 2013, 5 pm

OEEF Grant Submission Deadline

Jan 15, 2013, 5 pm

For more information on these grants, Please contact:

Ohio EPA Office of Environmental Education

Phone: 614-644-2873

Website: www.epa.ohio.gov/oeef

Email: oeef@epa.state.oh.us



Upcoming Grant Writing workshops:

Please visit www.epa.ohio.gov/oeef for more information about upcoming grant writing workshops.

Recent OEEF Grants Awarded

The Dawes Arboretum, “The Dawes Arboretum Wetland Education Program”

\$39,732, Licking Co, Aud: Middle School, Contact: Jenny Pope, japope@dawesarb.org, (740) 323-2355

Supports an outdoor education program emphasizing water quality, ecosystems, and environmental impact. Students will engage in an inquiry-based science education program in which classroom concepts are brought outdoors to achieve better comprehension. National curricula from the Wonders of Wetlands (WOW), Project WILD, Project WET (Water Education for Teachers), Project Learning Tree (PLT) and Healthy Water, Healthy People will be used to engage approximately 700 Heritage Middle School students in data collection and citizen science activities and to increase student appreciation of science as a career path by providing them with opportunities to interact with environmental professionals. Field trip activities will include seining for macro-invertebrates, using nets to sample for phytoplankton and zooplankton, and exploring animal habitat, comparing water quality indicators and species sitings with results collected by other organizations such as the Ohio State University Extension’s Certified Volunteer Naturalist program and the Licking County Soil and Water Conservation District. Families will be invited to participate in a weekend litter cleanup along the Licking River.

Ohio Lake Management Society, “Citizen Training for Harmful Algal Bloom (HAB) Identification, Reporting and Sampling”

\$48,440, Portage Co, Aud: General Public, Contact: Dana Oleskiewicz, oleskiewicz@windstream.net, (330) 466-5631

Provides ten local presentations to educate citizens about Harmful Algal Blooms (HABs), how to sample for them in lakes, and how to properly report blooms to Ohio EPA. In addition, ten local volunteers will receive specific training on how to collect samples in lakes they live on, and package them for shipping to a laboratory for algal identification and analysis of cell counts and microcystin. The volunteer sampling effort at additional sites on public and private lakes with a history of algal blooms will augment ongoing sampling efforts by state agencies. Results will be shared with local watershed organizations, published in newsletters, presented at conferences, and posted on the OLMS Website.

Northeast Ohio Regional Sewer District, “Applied Stormwater Management for the Regulated Community”

\$8,750, Cuyahoga Co, Aud: Regulated Community, Contact: Linda Mayer, mackl@neorsd.org (440) 975-3870

Provides training on the use of green infrastructure for cost-effective stormwater management to two different audiences. Seventy-five landscape professionals will receive two days of training on storm water regulations, site selection, soil infiltration and volume requirements for storm water control measures such as pervious pavers, porous concrete, bioretention cells, and tree filter boxes. Training will include on operation, maintenance, and installation pitfalls, with site visits to see best management practices (BMPs). Fact sheets, operational guidance documents and maintenance checklists from the training will also be posted online and distributed through a number of professional organizations and presented at the Central Environmental Nursery Tradeshow. The second audience of 100 storm water professionals and employees of regulated NPDES MS4 municipalities will be trained on how these and other control measures can be successfully retrofitted into urban neighborhoods, and tour 37 BMPs installed in the West Creek neighborhood. Collaborators include the Chagrin River Watershed Partners, Cleveland Metroparks, Holden Arboretum, ODNR Divisions of Forestry and Soil and Water Resources, Ohio EPA Northeast District Office, and West Creek Preservation Committee.

North Central Ohio Educational Service Center, “Watershed Dynamics for 21st Century Learners”

\$48,667, Seneca Co, Aud: High School, Contact: Rhonda Feasel, rfeasel@ncoesc.org, (419) 447-2927

Allows 210 high school students to investigate and explore solutions to complex, real-world problems associated with the Sandusky River watershed. Students will engage with the problems using scientific instrumentation, technology, hands-on field work and computer modeling. Methods are aligned with the Common Core Science Standards and the State of Ohio Model Curriculum. This project will provide extensive professional development for science teachers in participating Seneca County school districts. The National Center for Water Quality Research at Heidelberg University scientists, researchers and environmental science students will contribute their expertise in the field of water quality. The Ohio State University Stone Laboratory will conduct professional development and a culminating student learning experience.

Ohio University - Civil Engineering, “Virtual Boat for Environmental Education in Ohio”

\$45,253, Athens Co, Aud: High School, Undergraduate & Graduate, Contact: Tiao J Chang, chang@ohio.edu, (740) 593-1462

This project will create a Virtual Boat iPad and desktop computer game whereby students conduct two- and three-dimensional water sampling along a virtual river using an existing GIS database to simulate the current conditions along the Ohio River from Marietta to Gallipolis. Structured lesson plans include a Water Quality Index and Fish Kill and Pollutant Locator using GPS. Students will “test” for dissolved oxygen, fecal coliform, biochemical oxygen demand, temperature change, total phosphate, nitrate, turbidity and total solids, with results based on real data collected by the University and the Ohio River Sanitation Commission (ORSANCO). The game will be field-tested with students and teachers at two high schools in Athens and Meigs Counties, and demonstrated to the public through one-week exhibits at public libraries in the two counties, and a Research and Create Activity Expo at the University.

Ottawa National Wildlife Refuge Association, “Wetland Learning Center: Connecting Ottawa NWR and its Partners to the Community”

\$48,460, Erie, Lucas, Ottawa and Sandusky Co, Aud: Pre-school to University, Contact: Jennifer Brown, jennifer_brown@fws.gov, (419) 898-0014

Equips a new environmental education shelter and provides staffing to update existing curriculum on wetlands, coastal ecosystems, native species and migratory birds to align with the Ohio Department of Education’s revised academic content standards for science, to support K-12 classroom visits and field trips for 2,400 students from school districts in four counties. The project will expand the existing Wetland Investigation Network partnership with the Black Swamp Bird Observatory and the Ohio Division of Wildlife Magee Marsh Wildlife Management Area. New internship programs being developed with the University of Toledo and Bowling Green State University will provide student teaching opportunities to continue the school programs once the grant-funded staffing ends. The Friends of Magee Marsh and Ottawa Soil and Water Conservation District are also collaborating.

ThinkTV, “Nature as the Outdoor Classroom”

\$49,853, Montgomery Co, Aud: Pre-school, Contact: Tina Spaulding, tspaulding@thinktv.org, (937) 220-1670

Head Start teachers need practical examples of how very young children can develop literacy, math and science skills while having fun exploring nature in their local neighborhoods. Three PBS stations in Cincinnati, Columbus and Dayton will provide training to 840 Head Start teachers through 42 workshops in 28 counties in their viewing area, using the national Growing Up Wild early childhood curriculum from Project WILD. A follow-up monthly e-newsletter will provide new ideas and activities.

University of Dayton - Rivers Institute/Fitz Center for Leadership in Community, “Rivermobile,”

\$10,845, Montgomery Co, Aud: Middle and High School and General Public, Contact: Don Pair, dpair1@udayton.edu, (937) 229-2602.

Provides a portion of the seed money to develop an interactive Rivermobile to “bring the river” to schools and community events, to help correct public misperceptions about local water quality while building overall community appreciation for the region’s rivers and aquifer. A 53-foot semi-trailer will be transformed into an engaging educational experience that will call youth and the community to action to protect, enjoy and understand the region’s natural water resources.

Western Reserve Resource Conservation and Development Council, “Raising the Environmental IQ of Northeast Ohio,”

\$50,000, Lake Co, Aud: General Public, Contact: Dorothy Farris, dorothy.farris@dnr.state.oh.us, (614) 581-5953

Continues the six-month Conservation Crusader campaign that airs on WKYC in Cleveland, which includes monthly videos hosted on the WKYC weather Web page using TV weather personalities; two monthly four-minute segments on environmental topics on the Good Company TV show; 1 click through rotating banner ad on the Cleveland Yahoo weather page linking to the monthly videos and 4 monthly social media posts. The project further develops the social media component of the initiative and develops a geo/earthcaching component to encourage the public to get outdoors and learn about places of environmental or natural significance in the region. SWCDs will also use this information as part of the education and information they provide to and for NPDES/MS4 regulated communities.

Announcing... OEEF Outstanding Project Award Winners for the General Audience

Periodically, the OEEF contracts with EECO for independent evaluation of the success of completed grant projects targeting a general public audience of adult learners and families. EECO assembles a team of educators and representatives from community-based organizations to select the best completed grant projects to honor with OEEF Outstanding Project Awards. The team reviews current scholarship on adult learning, and publications such as EECO's Best Practices Guidelines for Environmental Education: Guidelines for Success, online at <http://www.eeco-online.org/publications/pdfs/beeps.pdf>, and the North American Association for Environmental Education's Guidelines for Excellence series, available online at <http://www.naaee.net/publications>. Because OEEF grant projects are quite diverse and grant products are often similar in format to portfolios, the team decided to use a holistic instrument for the grant evaluation process. For the adult general public audience, the team developed paragraph rubrics for four categories: seminar or workshop, print product, media product, and a combined rubric for multi-faceted public awareness campaigns that include more than one of these elements. These instruments have been refined several times over the years as new award winners have been selected. A tool for Website evaluation has also been added. The instruments and the award-winners are posted at http://www.epa.ohio.gov/oef/oef_featured_ee_projects.aspx.

In this issue, we showcase 10 new Outstanding Projects for adult learners, that we hope will inspire educators and prospective grant applicants. We would also like to thank Pat Barron and Diane Cantrell for their enthusiasm and expertise in facilitating this latest review!

Butler Soil and Water Conservation District, The Greatest Show in Earth \$50,000, Butler, Hamilton, Montgomery, Preble, and Warren Counties, Contact: Kevin Fall, fallke@butlercountyohio.org, (513) 887-3720.

Provided a three-dimensional, mole's-eye-view of the world that lets visitors feel as if they are underground. A trailer housing a soil tunnel and lab carries a museum-quality interactive exhibit to schools, fairs and other events in several southwest Ohio counties. Topics covered included soil formation and composition; the role of soil in food production, water purification and habitat; and the importance of soil and water conservation. More information and photos are available at www.ButlerSWCD.org



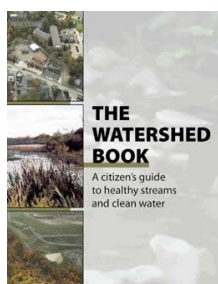
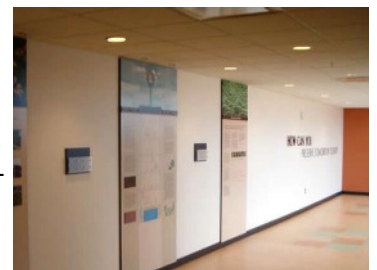
The Breathing Association, CLEAR the Air \$49,982, Franklin County, Contact: Judith Kress, jkress@breathingassociation.org, (614) 457-4570 x- 22.

Provided a DVD, educational displays, games, and brochures in English, Spanish and Somali to educate low-income residents about smog as well as the health and economic benefits of taking steps to improve air quality through personal action. A tool kit for parents, educators, physicians, clinics, and non-profit agencies serving the target population was also created and is available on the agency's website at www.breathingassociation.org/general/toolkit.asp



Columbus Downtown Development Corporation, RiverSouth Exhibits \$41,000, Franklin County, Contact: Elise Yablonsky, eyablonsky@downtowncolumbus.com, (614) 545-4732.

Provided exhibits on the storm water management, energy conservation, and other "green building" features of the LEED (Leadership in Energy and Environmental Design)-gold certified renovation of the Lazarus Department Store building in Columbus. A series of signs along the Town Street façade and in the first floor galleria explain the history and environmental sustainability components of the building. The CDDC also developed a "Tenant Design and Construction Guidelines" booklet with more technical specifications about the green features and materials used in the renovation. Visit downtowncolumbus.com/home/moving-forward/lazarus-building



Cuyahoga River Community Planning Organization, Watershed Stewardship & Management Training for Cuyahoga River Tributaries

\$49,954, Cuyahoga County, Contact: Jane Goodman, goodmanj@cuyahogariverrap.gov. A series of workshops trained community leaders, watershed stewardship groups and the public in four Cuyahoga River tributary watersheds that were undergoing rapid urbanization and loss of natural infrastructure. A comprehensive watershed owner's manual was developed as well as detailed maps of each watersheds' critical natural features and a packet of tools and resources to support better decision making.

**Franklin Soil and Water Conservation District, Central Ohio Rain Gardens
\$49,742, Franklin County, (614) 486-9613**

Provided a series of workshops, educational materials and installed 16 residential rain gardens. Neighborhood storm water runoff volume was monitored before and after rain garden installation to show their effectiveness in reducing flooding and preventing storm water pollution in waterways. Photos and the project report are posted at <http://www.centralohioraingardens.org/?cat=5>.



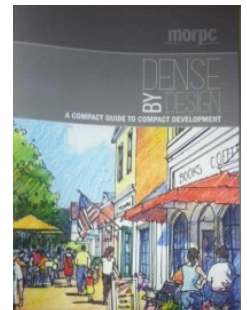
Five Rivers MetroParks, Get Them Outside

\$ 2,032, Montgomery County, Contact: Lauren Stayer lauren.stayer@metroparks.org (937) 277-4178.

Volunteers and staff members engaged 197 families, giving children the opportunity to explore creeks, build forts, and explore nature without much adult intervention. Parents observed their children while staff explained the benefits of unstructured nature play, how to encourage their children to turn off the TV and video games, and how to make their own backyard more inviting for their children and nature. Children were given an Outdoor Nature Play Kit, as a reminder to explore the outdoors.

**Mid Ohio Regional Planning Commission, Lessons in Land Use
\$39,280, Ashland, Crawford, Gallia, Guernsey, Harrison, Holmes, Jefferson, Morgan, Morrow, Noble, Tuscarawas, Washington, and Wyandot Counties.**

This two-pronged project included a series of Planning for Agriculture workshops, especially in counties that have not embraced planning and zoning, and a booklet that demystifies density and shows, with photos from Ohio towns large and small, that density can be desirable, attractive and cost-efficient, and can preserve rural farmland and open space. See www.morpc.org/regional_dev/overview/overview.asp



Ohio Department of Natural Resources, Division of Soil and Water Resources, Project SWEETER/Source Water Environmental Education Teams Enhanced Resources

\$47,540, Statewide, Contact: Jeanne Russell, jeanne.russell@dnr.state.oh.us, (614) 265-6682.

Forty-seven local Source Water Environmental Education Teams (SWEETs) teams were provided with EnviroScape© Drinking Water and Wastewater Treatment models and/or Envision 3000© ground water flow models. Team members were trained to educate the public about protecting drinking water sources and managing storm water and wastewater. Over 300 outreach events were held during the grant period, reaching more than 31,000 citizens.



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.

Provided educational outreach and technical assistance to 190 congregations and 5,000 households in Ohio to conduct energy audits and implement energy conservation and efficiency measures. Components included educational workshops, print and Web-based materials, energy audit resources, Web-based carbon footprint calculators, and energy savings tracking. Energy audit resources are posted at www.ohipl.org/programs/energy-audits/



Western Reserve Land Conservancy, Firelands Chapter, Vermilion River Watershed Educational Book

\$49,825, Ashland, Erie, Huron and Lorain Counties, Contact: Mary Garvin, mary.garvin@oberlin.edu.

Living in the Vermilion River Watershed was created to educate citizens about a small watershed drained by one of the cleanest rivers in the state. The book is intended to encourage local pride in the river, and a commitment to protecting the health of its surrounding natural habitats. Ten thousand copies were distributed to residents of the watershed via

libraries, local government offices, and schools, and the book has been incorporated into the curricula of several school systems in the watershed.

To Find Out More:

Please visit www.epa.ohio.gov/oeef for more information about past award winners and OEEF grants.

EECO Awards- Submit a Nomination

Please help us to recognize the commitment to excellence in Environmental Education that is being accomplished by individuals and organizations in Ohio. EECO has nine awards that you can submit nominations for, including:

- **Finlay-Johnson Award** - given to an EECO member for making a significant or outstanding contribution to EECO.
- **Christy Dixon Award** - given to a young professional who has contributed significantly to EE in Ohio.
- **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 EE 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.
- **The Charley Harper Award** - given to a artist who has made a significant or outstanding contribution to environmental education in Ohio through various forms of art.
- **Organization Award** - given to a business or organization that has made a significant 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).
- **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.

Nominations forms: Visit www.eeco-online.org or contact Vicki Kohli at (740) 653-8154. **Nominations due March 8.**

46th Annual Conference

April 11-14, 2013

Mohican State Park

Strands are: • Discoveries • Responsibilities • Traditions • Technologies

Thursday- Forum: The Economy of Local Foods

Friday- Field trips, workshops & Keynote from Steve McKee

Saturday - Concurrent Sessions and Keynotes with Herb Broda & Bill Dawson

Sunday - Field trips

Lodgings Info: Mohican State park. Ask for the \$109 EECO conference rate available until March 11.

Find out full details and register at www.eeco-online.org

Climate Change Resources

General Information to Better Understand Climate Change

- Climate change research program at OSU <http://changingclimate.osu.edu/>
- Climate Policy: An American Meteorological Society Project www.climatepolicy.org
- Center for Remote Sensing of Ice Sheets at the University of Kansas www.wri.org/publication/charting-the-midwest
- Global Warming International Center www.globalwarming.net
- Intergovernmental Panel on Climate Change (IPCC) www.ipcc.ch
- World Resources Institute (WRI) Climate Analysis Indicators www.wri.org/project/cait
- MetEd Meteorology & Training: University Consortium on Atmospheric Research www.meted.ucar.edu
- NASA: Monitoring Climate Change with Remote Sensing <http://climate.jpl.nasa.gov>
- Pew Center on Global Climate Change www.pewclimate.org

Calculating Your Environmental Impact

- US EPA's Personal Greenhouse Gas Calculator http://epa.gov/climatechange/emissions/ind_calculator.html
- US EPA's Green Vehicle Guide www.epa.gov/autoemissions
- US Dept of Energy www.fueleconomy.gov (click on compare Side-by-Side)

Lesson Ideas for Educators

- Great Lakes Climate Change Curriculum <http://changingclimate.osu.edu/topics/education>
- GLOBE program: Student Climate Research Campaign www.globe.gov/web/scrc/overview
- The National Wildlife Federation's climate change curriculum connections for educators www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Climate-Change/Curriculum.aspx
- Byrd Polar Research Institute at OSU <http://bprc.osu.edu>
- Earth's Changing Climate from Annenberg Media www.learner.org/channel/courses/envsci/index.html

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for easy linking to the
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For information about EECO's programs and services, please contact Brenda Metcalf, Executive Director.

Visit EECO online at

www.eeco-online.org