

# E E C O

Environmental Education Council of Ohio

**Issue Focus:**  
**Energy  
in  
Education**  
**Spring 2016**



## EECO Annual Conference

**March 31- April 3, 2016**  
**Mohican State Park Lodge**

You sometimes have to take a break from the “work” of your work to sharpen your skills. Remember that scene in Dead Poet’s Society when Robin Williams made his students stand on a desk to get a fresh perspective? Joining us at the 49th Annual EECO conference is a great way to sharpen your skills and learn new ideas while networking.

What will you do?

- Enjoy Greg Lipps’ Keynote “Giant Salamanders Around the World”
- Hike through the Mohican Forest
- Learn how to build support for your organization
- Use the Mohican Country to experience using the outdoors as a teaching tool
- Tour parks, school programs and local environmental programs
- Build your knowledge about the natural world
- Connect EE to STEM and Careers
- Expand your knowledge with our CAREER PANEL
- Earn Ohio State Board of Sanitarian credits

Register online at <https://eeco.wildapricot.org/> March 21 is the early bird deadline.

## Lead in Drinking Water

The presence of lead in drinking water has recently been at the forefront of media broadcasts. The following collection of materials can help support teachers in discussing these issues. <http://communities.ohiorc.org/science-window/resources-about-lead-in-drinking-water/#sthash.pa2yTXnc.dpuf>

## Ohio’s Learning Standards

**Comment period now open for revisions**

The Ohio Department of Education invites Ohioans to submit suggestions through April 5 as part of a periodic revision process for Ohio’s Learning Standards in English language arts and math. This feedback will help ensure the standards continue reflecting the most recent research and the experience of educators as they help students become ready for college and careers. <http://tinyurl.com/hqa6cew>

**Nominations open for standards revision committees**

Beginning today through March 11, educators who have expertise in Ohio’s Learning Standards for English language arts or mathematics may nominate themselves or colleagues to serve on working committees for a standards review process. We are seeking content experts with experience ranging from kindergarten through higher education. <http://tinyurl.com/jccgqgq>

## Save the Date

More information about each opportunity at [www.eeco-online.org](http://www.eeco-online.org)

### **OEEF Grant**

Letter of Intent due July 8, 2016

Grant Due July 15, 2016

[www.epa.state.oh.us/oeeef/](http://www.epa.state.oh.us/oeeef/)

### **Grant Writing**

**March 24**, Painesville, Ohio

**April 6**, Harrison, Ohio.

See [www.epa.state.oh.us/oeeef/](http://www.epa.state.oh.us/oeeef/)

### **Project WET & Healthy Water, Healthy People**

**March 26, 2016**

Camp Ot’y Okwa. Register by Mar 18

[dennis.clement@epa.ohio.gov](mailto:dennis.clement@epa.ohio.gov)

### **49th Annual EECO Conference**

**March 31- April 3, 2016**

Mohican State Park Lodge

Details will be posted at

[www.eeco-online.org](http://www.eeco-online.org)

### **Wildlife Diversity Conference**

**April 12, 2016**

Ohio State University

<http://tinyurl.com/hlq9y56>

### **Projects Learning Tree & Wet Facilitator Training**

**April 20-21, 2016**

Shawnee State Park

<http://wmao.org/2016/02/1029/>

### **Water & Wildlife**

**July 24 – 30, 2016**

OSU Stone Laboratory,

<http://stonelab.osu.edu/applynow>



## EE Certification Course

June 13-17, 2016

Old Woman Creek

National Estuarine Research Reserve

This new, week-long format will allow classroom teachers, naturalists, and anyone who is looking to expand their knowledge and skills in environmental education to experience a week of learning in a beautiful outdoor setting along Lake Erie.

Overnight accommodations provided as well as breakfast and lunch daily and two group dinners.

There are follow-up requirements, including written assignments and participation in the EECO Annual Conference on April 8, 2017.

Two graduate credits can be earned with successful completion of the certification program through Kent State University for an additional fee.

Space in the workshop is limited. Acceptance to the program will be based on a first come, first served basis given successful completion of the full application.

Find out more about the EE Certification and registration at

<https://eeco.wildapricot.org/eecertification>

## Save the Date:

# 101 Alternatives to Chalkboard Conference

Saturday, October 8, 2016

At YMCA Camp Kern

The "101" Conference is THE weekend outdoor education experience designed to inspire teachers and outdoor educators with creative ways to provide exciting learning experiences. Enjoy meaningful large and small group sessions, excellent company, and fine eating.

**Location:** At YMCA Camp Kern, 5291 St Rt 350 Oregonia, Ohio 45054  
(32 miles northeast of Cincinnati)

**Cost:** \$30

Includes all sessions, programs, meals, and overnight accommodations. You have the option to stay on the Friday and/or Saturday nights.

Scholarships and discounts available

**For more information, contact:** Dave Moran

Outdoor Education Director

YMCA CAMP KERN

5291 St Rt 350 Oregonia, OH 45054

513-932-3756 x1527

[dmoran@daytonymca.org](mailto:dmoran@daytonymca.org)

**Interested in presenting?:** Please contact Dave Moran (see above information) for details.

This event made possible by YMCA Camp Kern, the Environmental Education Council of Ohio, and the Ohio Environmental Education Fund



# Increasing Energy Efficiency:

## *Over 1000 Ohio K-12 Public School Buildings Going Green*

***By Lisa A. Laney, LEED AP, BD+C, Sustainability Administrator, Ohio Facilities Construction Commission***

Email: [Lisa.Laney@ofcc.ohio.gov](mailto:Lisa.Laney@ofcc.ohio.gov)

Since 1997, the Ohio School Facilities Commission has been rebuilding Ohio's public K-12 schools in order to provide education-ready facilities across the state for all children. Funded by appropriations from the General Assembly and with the support of the Kasich administration, the OSFC has completed over 1000 schools through renovation or new construction.

The Ohio School Design Manual was created to establish the base design standards for all Ohio schools. As the new buildings came online with more complicated building operation systems, air conditioning and technology needs, the operational costs were showing increases that were an issue for public schools. The Commission staff set out to review various building rating systems in an attempt to design and construct energy efficient and high performing schools. In September of 2007, the Commission executed a Resolution requiring all K-12 schools that received funding from the OSFC be built to a minimum of the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Silver standards with a focus on the Energy & Atmosphere category.

The OSFC has initiated 370 LEED for Schools projects and currently leads the nation with LEED schools. Of the 370 projects, 252 have achieved certification through the USGBC LEED for Schools rating system. The certifications include 3 Platinum; 83 Gold; 160 Silver and 6 Certified.

The LEED rating system relies on industry and building construction codes & standards as a basis for the design and construction. For instance, a buildings energy performance is designed to the American Society of Heating, Refrigeration, Air-conditioning Engineers (ASHRAE) building standard 90:1 2004 & 90:1 – 2007. The LEED for schools rating system awards points for being more efficient than the baseline standard. The Ohio School Design Manual calls for the architects to design the schools with a 30% increase above the ASHRAE 90:1 2007 standard.

A school is like any other facility in that it consumes energy, water, produces CO<sub>2</sub> and has an impact on the community and environment. In the evaluation of schools, it was determined that approximately 81% of energy consumption consisted of HVAC and lighting usage. If a targeted approach is used to ensure that these building systems are designed as efficient as possible, it provides the districts significant savings over the life cycle of the school. As an example, two of the strategies used to address energy costs include selecting more efficient HVAC systems for their new buildings and the use of day light harvesting. Day light harvesting allows the interior lights to dim when the natural light entering the spaces increases. The more efficient HVAC systems that are being selected now include variations of a geo-thermal systems, chilled beam and variable air volume systems. It is important to note, the success of these systems depends entirely upon the occupants of the building. If no one manages the systems, they will not perform to their potential.

While the OSFC does not fund renewable energy (such as solar panels), the schools are constructed to be what we call "solar ready" on the roof areas. Once the price decreases enough to be considered cost effective, the schools may add the panels with minimal disruptions.

OSFC is receiving reports from districts that they are significantly improving their utility cost per square foot by actively managing their energy consumption. While the actual performance varies with the individual circumstance, we can say that the LEED schools were designed on average, 33% more efficient than the ASHRAE standard. This gives a school a much better starting point on their energy management.

## **Miami Valley Leave No Child Inside Summit 2016**

***Sunday, March 12, 11:30 am - 4:30 pm***  
***At Wegerzyn Gardens Metropark Auditorium, Dayton***

The Summit builds access to nature for our children making them happier, healthier, and smarter. Highlights will include Keynotes, Networking, resource Displays, and Nature Clubs for Families Workshops.

**Register:** [www.metroparks.org](http://www.metroparks.org)

Please use program number P54 to register.

# Ohio Environmental Education Fund



The OEEF grant program is administered by Ohio EPA and awards general grants up to \$50,000 and mini grants between \$500 and \$5,000, with application deadlines every January 15 and July 15. Grants are funded from civil penalties collected by Ohio EPA for violations of air and water pollution control laws. Eligible recipients include local governments, non-profit organizations, public and private schools.

The Request for Proposals for the July 2016 grant cycle is expected to be opened in early May in Ohio EPA's eBusiness Center, <https://ebiz.epa.ohio.gov/>.

Application information is available at <http://epa.ohio.gov/oeef/EnvironmentalEducation.aspx>.

Applicants are invited to contact the OEEF staff at [oeef@epa.ohio.gov](mailto:oeef@epa.ohio.gov) or 614-644-2873 to discuss project ideas.

## Grant Writing Workshops

The Ohio EPA Office of Environmental Education offers grant writing workshops around the state throughout the year.

- **March 24, 9 a.m. – 3:30 p.m., Painesville, Ohio**

Lake County Utilities Learning and Business Center, 1981 Blasé Nemeth Road, Painesville, OH 44077, co-sponsored by the Lake County Health District and EECO Region 8. Register by e-mail to [Dennis.Clement@epa.ohio.gov](mailto:Dennis.Clement@epa.ohio.gov) by March 19.

- **April 6, 9 a.m. – 3:30 p.m. Harrison, Ohio**

at Crosby Senior/Community Center, 8910 Willey Road, Harrison, OH 45030, co-sponsored by Crosby Township and EECO Region 5. Register by e-mail to Brenda Jackson, [bjackson@crosbytpw.org](mailto:bjackson@crosbytpw.org) by April 1.

Please visit the website to view the most up to date list of upcoming workshops [www.epa.ohio.gov/oeef](http://www.epa.ohio.gov/oeef)

# Awarded General Grants, December 2015

In the fall 2015 application cycle, Ohio EPA awarded the following seven new general grants, for a total of \$261,183.

## **Cincinnati Nature Center, “Habitat Restoration - Speaker’s Bureau,” Adams, Brown, Clermont, Clinton, Hamilton, Highland, Warren Counties, \$37,950**

**Audience:** General Public.

**Contact:** Connie O’Connor, [coconnor@cincynature.org](mailto:coconnor@cincynature.org), (513) 831-1711.

The project will promote and expand the Cincinnati Nature Center’s Speakers Bureau and focus on programs that create and maintain habitat for monarchs and other pollinators. Speakers will provide people attending presentations with planting guidance and milkweed seeds or plants. Press releases, mailings and social media will be used to promote events and a website showcasing the effort of planting native milkweed in Southwest Ohio will be developed. An interactive exhibit will be installed in the Visitor Center to teach about the importance of monarch and pollinator habitat.

## **Ohio State University, College of Education and Human Ecology - Ohio Resource Center, “Curious KIDSS,” \$46,521**

**Audience:** Statewide, Audience: Pre-Kindergarten – University (Grades K-2).

**Contact:** Tracy Cindric, [tcindric@ohiorc.org](mailto:tcindric@ohiorc.org), (614) 247-7978.

Curious KIDSS (Kindling Investigation and Discovery in Science and Social Studies) will provide professional development to teachers of Grades K-2 to adapt lessons from Project WILD’s Growing Up WILD early childhood curriculum to address Ohio’s New Learning Standards in science and social studies, as well as math and English language arts. The program will increase teacher effectiveness, comfort level, and frequency of usage of the natural environment as an extension of the classroom; increase frequency of science and social studies lessons taught in K-2 classrooms; illustrate to teachers and students the importance of habitat restoration efforts in increasing biodiversity and improving air and water quality; and provide teachers with resources and lesson plans, as well as scientific instruments and trade books aligned to Ohio’s New Learning Standards. The project would initially include twenty Ohio teachers, impacting approximately 450 students. Workshops will continue and Curious KIDSS resources will continue to be available at no cost to all Ohio teachers through the ORC, ODNR, SECO (Science Education Council of Ohio) and OCSS (Ohio Council for Social Studies) websites.

### **Western Reserve Land Conservancy, “Neighborhood Tree Steward Program, Cuyahoga County, ” \$41,619**

**Audience:** General Public.

**Contact:** Colby Sattler, [csattler@wrlandconservancy.org](mailto:csattler@wrlandconservancy.org), (216) 515-8300.

Through workshops, outreach events and training, Cleveland residents and community leaders will learn about the benefits and importance of urban forests, and easy routines to care for newly planted trees as a part of reforestation efforts currently underway in the city. The project is based on successful models in cities like Atlanta, Chicago and Seattle.

### **Wood SWCD, “Demonstrating Innovative Conservation Practices,” Wood County, \$14,903**

**Audience:** Regulated Community.

**Contact:** Beth Landers, [bethlanders@woodswcd.com](mailto:bethlanders@woodswcd.com), (419) 354-5517.

Wood SWCD will collaborate with OSU Extension, Riker Farm Seed, Wood County Farm Bureau and landowners to convert a former hybrid demonstration site to a conservation practice demonstration site. Wood SWCD and OSU Extension will host a series of workshops using the sample plots to demonstrate various tillage practices, cover crops, and conservation practices that can reduce phosphorus runoff to Lake Erie tributaries. A Drive-it-Yourself conservation tour will be in place for several months, allowing residents and producers to watch a field over an entire growing season. A social media campaign is intended to give farmers a way to demonstrate how they address are working every day to address runoff concerns, via Instagram, Facebook, and a blog. The social media campaign will use 7-8 billboards to drive traffic to the Farm4CleanWater social media sites.

### **The Nature Conservancy, “Environmental Education Center at TNC’s Grand River Conservation Campus at Morgan Swamp Preserve,” Ashtabula County, \$49,950**

**Audience:** Pre-Kindergarten – University (Grades K-12).

**Contact:** Karen Adair, [kadair@tnc.org](mailto:kadair@tnc.org), (614) 717-2770.

The first environmental education center in Ashtabula County will be created in an existing building at the Nature Conservancy’s Grand River Conservation Campus at Morgan Swamp Preserve. Funds will pay to design, fabricate and install a beaver lodge exhibit with a replica of a beaver lodge and a taxidermy beaver on its lodge; a rotten log exhibit with models of plants, animals, and fungus that live around a rotten log, a 3D watershed contour map featuring the Grand River, Ashtabula River and Conneaut Creek watersheds and interpretive signage. Workshops for teachers will be held to familiarize them with the center trails, resources and programs available to them. Existing curriculum such as Project WET, Project WILD and Project Learning Tree will be used to develop programming for the center. A teacher assessment will be used to measure if they are prepared to use the center and whether students leave with a greater understanding of the subject matter.

### **Great Lakes Biomimicry, “Deep learning in shallow aquatic environments: Cultivating a biomimicry lens in two wetland habitats,” Cuyahoga and Summit Counties, \$47,440**

**Audience:** Pre-Kindergarten – University (Grades 7-12).

**Contact:** Stephanie Pierce, [pierce.stephanie.diane@gmail.com](mailto:pierce.stephanie.diane@gmail.com), (206) 832-9317.

Project uses biomimicry as the integrating concept for new site-specific wetland ecology lessons and project-based learning activities for school field trips to two University of Akron field stations. Approximately 800 Akron City Schools students in grades 7-12 will visit the Panzer Wetland Wildlife Reserve and Bath Nature Preserve for interdisciplinary activities. Students will be responsible for designing interpretive signs, maps, brochures for self-guided walking tours, and a field library, for use by other groups and school districts. The project also includes teacher training workshops and creation of Biomimicry-Water Toolkits.

### **Grange Insurance Audubon Center, “Creating Bird Friendly Communities,” Franklin County, \$22,800**

**Audience:** General Public.

**Contact:** Amy Boyd, [aboyd@audubon.org](mailto:aboyd@audubon.org), (614) 545-5486.

The project will provide a series of classes, workshops and lectures about native plants, ecosystem gardening, bird feeding, nest boxes, sustainable lawn care and a number of other topics to help homeowners improve bird habitat. Citizens will also participate in bird counts and contribute data to a citizen science project, documenting changes in their yard. Avian habitat demonstration gardens will also be installed and staff will be trained to describe the benefits of implementing successful habitats. The Franklin Soil and Water Conservation District, Greenspot, The Columbus Zoo, Columbus Audubon Society, Metro Parks, and the National Audubon Society will collaborate on the project.

Please remember to visit the website to view the most up to date information about these grants and upcoming workshops  
[www.epa.ohio.gov/oeo](http://www.epa.ohio.gov/oeo)

# Simple Steps for Year-Round Indoor Comfort

**By Rob McCracken, Project Dev Manager, Greater Cincinnati Energy Alliance**

As the heating season comes to an end and summer approaches, one of the last things on some people's minds is the science behind heating and cooling our homes. Also, rarely considered is the energy used in our homes and the impact of maintaining our comfort in indoor environments has on the environment. As an example, each winter, approximately 57 percent of American homes become their own power plants as they burn natural gas for space heating and release greenhouse gases into the atmosphere. Below are examples of how we can reduce our energy consumption, improve comfort, and protect the environment by taking a few simple steps.

**Thermostats** The DOE estimates that homeowners can reduce energy usage by up to 9 percent through proper usage of a programmable thermostat. This requires setting back your thermostat 8 to 10 degrees when you are away from home. Unfortunately, only 30 percent of American homes actually have a programmable thermostat installed. Of those homes, a majority of the thermostats have not been installed or programmed properly. The Energy Alliance has a great article on thermostats and the role they play in energy efficiency.

**Air sealing** Reducing the amount of air that leaks into or out of your home is a great way to cut heating and cooling costs. Most homes have gaps and penetrations where air can leak in or out that while usually quite small, when added together these many little spaces can be the same as leaving a window open all winter. The so-called stack effect allows outside air to enter your home near the foundation and forces heated or air conditioned air out through your attic plane. While insulation can help, actually sealing these penetrations is the best way to prevent warm air from escaping your home. The DOE and ENERGY STAR both have helpful resources outlining do-it-yourself tips for air sealing.

**Fireplaces** Each winter many people look forward to sitting around the fireplace with family and friends. However, when not used properly, fireplaces can contribute to significant heat loss. Lower the temperature on your thermostat when you have a fire to prevent warm air from being pulled out of your home. Make sure that the fireplace damper is closed and sealed tightly when the fireplace is not in use, including over the summer cooling season. And if you do not use your fireplace at all, then it is best to have the chimney plugged and sealed.



**Illustration by Albert Dorne, from a 1940's U.S. Office for Emergency Management poster**



**Illustration in Life Magazine: 1950's Westinghouse Air Conditioning Ad**

**Lighting** While we are more than ready for the longer daylight hours of summer, winter has the challenges of those shorter days and more time spent inside. Installing energy efficient lighting is a great way to reduce electricity consumption year round. LED bulbs use 75 percent less energy than incandescent bulbs while providing the same amount of light. The cost of LED bulbs have dropped significantly over the past several years and there are now a variety of options from which to choose. ENERGY STAR has a great infographic that explains everything you need to know about light bulbs and can help you make smart decisions the next time you venture down the lighting aisle.

**Home Energy Assessment** The best way to determine how your home is using and losing energy is with a home energy assessment. It provides a comprehensive overview of your home and identifies opportunities to reduce energy consumption and improve comfort. Many utilities offer energy assessments or energy audits to their customers at reduced rates. More and more private companies are also beginning to offer energy assessments. To ensure that your energy audit is optimal, use a company that is certified by the Building Performance Institute or another certifying body that is fully qualified to complete energy assessments. If you are feeling adventurous and want to conduct your own assessment, then the DOE has some great guidance on performing do-it-yourself energy assessments.

These and other simple steps you can take around your home that can help you save even more energy regardless of the season. Reducing the amount of energy you use will reduce your carbon footprint and save you money. By following these simple steps and making smart decisions you won't have to sacrifice comfort summer or winter, or in between.

The Greater Cincinnati Energy Alliance is a nonprofit organization dedicated to helping property owners reduce energy costs through energy efficiency and renewable energy. The Energy Alliance offers home energy assessments, incentive programs, and its Solarize Cincinnati program for residential property owners and its GC-PACE financing for commercial property owners.

Find out more about the Greater Cincinnati Energy Alliance at <http://greatercea.org/>



## Save the Date: Life on a Sandy Delta

**June 5 - 11, 2016**  
**BBBS Camp Oty'Okwa**

Join us for our 8th year experiencing the natural history of Ohio at Camp Oty'Okwa. The 700-acre camp is under conservation easement and includes a dedicated state nature preserve, beautiful woodlands, hiking trails, and wonderful rock outcrops. Participants will be encouraged to broaden their knowledge and learn techniques that will help them improve their skills as an educator.

The delicate balance of people, natural resource use, and technological advances is at the heart of many local, national, and global news stories. Throughout the week, participants will explore hands-on best practice strategies for introducing people to the natural world and these issues. Using their professional expertise and experience, top naturalists and educators from around the state will facilitate sessions using the camp and local resources. Sessions will provide opportunities to gain an understanding of topics related to state standards by immersing the participants in a natural setting and a stimulating learning environment.

**Credit:** Participants can earn up to 3 semester hours of graduate credit or 50+ contact hours.

**Arrival and Registration:** 4:00pm Sunday, June 5  
**Departure:** 1:00pm Saturday, June 11

**Cost:**

Workshop fee for all participants: (50 contact hours, lodging, meals, sessions, and materials): \$400  
Additional fee for graduate credit: (3 semester hours): \$525.00 fee to Ashland University  
(2 semester hours): \$350.00 fee to Ashland University

**For more information, contact:** Cathy Knoop  
19772 Keifel Road, Laurelville, Ohio 43135  
740-603-3911  
[cathy.h.knoop@gmail.com](mailto:cathy.h.knoop@gmail.com)

## Career Planning Resources for EE and STEM

### Workshop for Secondary School & Career Counselors

**March 16, 2016**  
**Mahoning County ESC**

This workshop will demonstrate a toolbox of resources including websites, videos, and scholarship opportunities for students to investigate environmental and STEM career paths.

To register or find out more, please contact Sheila Cubick at [SheilaCubick@ohiosci.org](mailto:SheilaCubick@ohiosci.org) or 330-718-0186.

Sponsored by Environmental Education Council of Ohio (EECO) and the Ohio Academy of Science Believe in Ohio Program

# Antioch College

## Talks and Walks Path Toward a Sustainable Future

*By Matt Desjardins, Director of Communications, Antioch College*

Winter in Ohio means snow days and sledding, just as summer means gardening and picnics. Both seasons bring higher energy bills. If you're a start-up college with a tight budget like Antioch, rising heating costs can significantly impact operations.

For the last century, Antioch College has been a place where new and better ways of living are discovered and fostered. To that end, when the College reopened in 2011, leadership seized the opportunity to live its values by making a conscious decision to become a greener campus by walking the sustainable walk. And, it as often is the case, living one's values had other positive effects, namely financial energy savings.

Reopening was challenging in many ways, but it also presented a golden opportunity in terms of upgrading physical infrastructure to benefit both the environment and reap financial benefits of renewable energy investments. While many colleges and universities must live with past poor infrastructure decisions (old boilers, poorly insulated buildings, etc.), Antioch, having long suffered from deferred maintenance under previous university conditions, was able to start again from nearly from scratch. In the last five years, the College has invested over \$40 million in campus infrastructure, much of it to make the campus more sustainable, i.e. carbon neutral. Antioch aims to get 90 percent of its energy from renewable resources by 2018.

For example, North Hall (vintage 1852 dormitory) has been extensively renovated, making it the second oldest building in the United States to meet the LEED Gold standards for existing construction. North Hall's energy self-sufficiency includes solar panels on its roof and geothermal energy for heating and cooling. Dozens of geothermal wells were sunk 600 feet deep on the lawn near North Hall to supply water pumped through the building to maintain livable temperatures. As of Fall 2014, students are once again housed in this completely renovated, energy sufficient building.



The College is in the process of implementing a green dashboard in several campus buildings that will monitor and report out on utility usage. The interactive dashboard is modeled after a successful project at Oberlin and funded through a generous Great Lakes Colleges Association grant. The dashboard will help resident students make better decisions leading to cost savings.



In 2014, Antioch installed a five-acre solar array along with additional geothermal wells in its South Campus. Approximately 3,300 solar panels generate 1.2 million kilowatt hours of energy annually, enough power to offset the electrical consumption of the College's state-of-the-art Central Geothermal Plant. This year, sheep from the campus farm were welcomed to campus to graze amongst the solar panels and sustainably maintain the grass in that area.

Antioch College maintains a 1,000-acre nature preserve and a working farm. The farm contains a large crop growing area, a hoop house, and pasture for sheep and chickens. The farm is used as a living laboratory where Antioch students work and learn about sustainable cultivation methods such as organic farming and permaculture. Much of what is grown on the farm is served just 1,500 feet away in the Antioch Kitchens—a leader in the Real Food Challenge and field-to-fork movements.

In early November, College President Mark Roosevelt, signed the American College and University Presidents Climate Commitment. Signing this Commitment positions the College as a leader in the global fight against climate change and in sustainability best practices. The pledge shines a light on the role Antioch and all other colleges and universities play in fighting global warming while demonstrating leadership and committed values to students and surrounding communities. Antioch stands with the hundreds of other institutions of higher education from around the country that are collectively committed to reducing greenhouse emissions by 80 percent by mid-century.

Antioch is serious about its responsibility to both educate students and preserve the environment. Together, with other schools in Ohio, the College is making a difference. But, what separates Antioch from its peer institutions is the intentional focus on sustainability that runs through all departments. There is no "green washing of the curriculum" at Antioch. Rather, there is a campus-wide focus on sustainability woven into the very fabric of the entire campus. Most courses, whether environmental science or philosophy, find ways to make connections with sustainability and the environment. This strengthens the resolve that all Antiochians have a responsibility to preserve our planet for future generations. Fortunately for a start-up minded school facing the coming winter, this resolve will result in significant energy and financial savings.

# Reducing Cost & Carbon Footprint At Miami University

*By Yvette Kline, Dir. of Sustainability & Energy Conservation, Miami University*

Miami University in Oxford Ohio stands out in energy reduction. From 2004 to 2014, the school exceeded the state’s mandated 20% per square foot reduction in energy use for higher education institutions. Further reductions were made through a 315 well ground source geothermal heat exchange system that came online in 2014. The system is currently being expanded to 705 wells in accordance with Miami’s utility master plan (UMP). The UMP was created in response to student demand to stop burning coal, a demand that came about through the Sierra Club’s Beyond Coal movement. Working with the Physical Facilities Department (PFD), the university’s Sustainability Committee (SC) translated the demand as a goal to be achieved in 2025, the expected replacement time for the existing coal burning equipment. As planned, elements of the UMP have been included in the approximately \$ 420 million of major construction projects that have taken place on the Oxford campus from 2011 through 2015.



*The Geothermal Plant was built to accommodate the Phase 2 expansion now underway. While it features a vegetated roof, rain chains and a rain garden, long term carbon footprint reductions are also part of its story.*

Miami’s construction boom produced 27% more conditioned space compared to 2004, and 2015 has demonstrated an impressive 26.5% energy decrease per square foot compared to that year. Students are no longer protesting coal use.

Now they are considering the complexities of fugitive methane emissions and other environmental impacts associated with natural gas extraction. In the meantime, PFD and the SC have been seeking a system-level tool and relevant expertise to revisit the UMP to determine if they could do better at reducing Miami’s carbon footprint.

That issue of doing better goes back a ways. Although Miami did not join 679 colleges to set a carbon neutrality date, the SC had been tasked to work with PFD to determine how far the university could afford to go towards carbon neutrality without purchasing carbon offsets. “We needed a way to compare utility system options, their total costs and carbon footprint outputs over a 25 year period,” said Yvette Kline, PFD’s Director of Sustainability. When the National Renewable Energy Lab (NREL) approached Miami to discuss their Renewable Energy Optimization (REOpt) tool, Kline and Miami’s Director of Utility Systems, Doug Hammerle, started a conversation that resulted in a commissioned system level study.

	Scenario Name	Utility Costs			Carbon Constrained?	Carbon Costed?
		Nominal	Low NG&E	High NG&E		
1.0	Baseline development plan	x			No	No
1.1	Optimal development plan	x			No	No
1.2	Optimal, CO2 limits	x			Yes	No
2	Baseline, SCC	x			No	Yes
2.2	Optimal, SCC	x			No	Yes
2.3	Optimal, SCC, CO2 limits	x			Yes	Yes
3.1.a	Baseline, Low Cost NG&E		x		No	No
3.2.a	Optimal, Low Cost NG&E		x		No	No
3.3.a	Optimal, Low Cost NG&E, CO2 limits		x		Yes	No
3.1.b	Baseline, High Cost NG&E			x	No	No
3.2.b	Optimal, High Cost NG&E			x	No	No
3.3.b	Optimal, High Cost NG&E, CO2 limits			x	Yes	No

*Scenarios used in the Renewable Energy Optimization study of Utility Master Plan by the National Renewable Energy Laboratory.*

With NREL, they defined a dozen study scenarios (see table), all of which include central estimates of fugitive methane emissions and expected carbon footprint reductions of purchased electricity, and some of which also include specific carbon reduction targets (constraints) and/or the social cost of carbon (SCC). The SCC is a metric used by major corporations and federal agencies to estimate the costs of carbon dioxide emissions to future damages resulting from climate change effects on food

production, human health, energy use, and property damage. Including it in the selected scenarios will allow Miami the option of using it as a decision-making tool – to see if the cost-optimized utility systems selected by the REOpt program change when the SCC and carbon constraints are in play. According to SC chair, Dr. Tom Crist, “because both the 25 year life cycle costs and the total carbon footprint emissions are included with each scenario, Miami will also be able to assess the incremental cost of carbon reduction associated with the various utility systems under study.” “This method allows us to deal with the model uncertainty in estimating the SCC, while still providing a means to make sound decisions about carbon reduction,” says Crist.

Results are now being evaluated internally. In addition to their use in Miami’s cost and carbon footprint reductions, the SC and PFD have agreed to make the study available for academic use – to help students understand decision-making in a carbon economy. For more information contact Doug Hammerle, Director of Utility Systems. [hammerd@MiamiOH.edu](mailto:hammerd@MiamiOH.edu)

# A Snapshot of Sustainability on the Campuses of Ohio State University, Denison University and Oberlin College.

## Ohio State University

The nearly 12,000 sq. ft. Nationwide and Ohio Farm Bureau 4-H Center was the initial building at Ohio State University to achieve LEED certification and for years has been used primarily as an office and conference facility. More information at: [www.ohio4-hcenter.org/green.html](http://www.ohio4-hcenter.org/green.html).

By comparison, the Dieter Cunz Hall of Languages, first opened in 1969, was completely renovated and reopened in Fall 2011 with state of the art spaces for The College of Public Health. Cunz Hall is one of the most recent buildings at OSU to achieve LEED certification. Cunz Hall is a four story, is approximately 66,000 sq. ft. The project included renovations to a 1960's era concrete structure to improve interior configurations and energy efficiencies by increasing daylighting to dark interior spaces and transforming the building's exterior and interior space.

Improvements included: replacement of the existing windows and improvements to the exterior skin, adding an external stair tower, completely renovating/improving mechanical /electrical and plumbing systems, and complete renovation of the interior for offices, classrooms and laboratory space. Additionally, Cunz Hall now has a vegetative Green Roof and a stormwater runoff minimizing Rain Garden feature.

Cunz Hall recently became the first renovated building on campus with wet lab space to become LEED (Leadership in Energy & Environmental Design) certified. The building's LEED silver certification was made official in 2013 by the U.S. Green Building Council.

Learn more at: <http://cph.osu.edu/about/cunz-hall>

As a basis for comparison, FY 15 (July 1, 2014 - June 30, 2015) data indicates that average energy consumption for a building on OSU Campus is 214,819 BTU/ sq. ft. Data in this comparison is not adjusted for influence of weather.



## Energy usage for the 4-H building and for Cunz Hall.

Building Number/Name	Electric KWH	Sq. Footage
191 - 4-H Center, Nationwide & OH Farm Bureau	573,362	~ 12,000
293 - Cunz Hall, Dieter	1,163,626	66,000

## Denison University takes a different approach to resource conservation

Built in 1894, the Barney Davis building was constructed as a science hall. In 1996, renovations started with a focus on environmental concerns and an eye for Greening the building. While no baseline data is available as a starting point for energy use of Barney Davis building, the cost to renovate the 26,784 square foot building in 1996 was \$2.5 million, which translates to approximately \$3.8 million in today's dollars.



Original building features were optimized to conserve energy such as the large, south-facing windows, skylights and transoms to take maximum advantage of natural light and solar heat gain. Restoration and reuse of the original wood floors, window and door moldings and storage cabinets saved natural resources. Carpet from recycled plastic bottles was installed and feldspar waste used in the floor tiles.

Today the Barney Davis Building is home to the English Department and the McPhail Center for Environmental Studies.

## Another Path to Sustainability Used at Oberlin College

When planning began for Oberlin College's Adam Joseph Lewis Center in 1992, ENERGY STAR and LEED certification plaques didn't hang in building lobbies. Few new construction projects incorporated ecological design — the notion that human systems should mimic and integrate with natural ecosystems.

The AJLC on Oberlin's campus has drawn a lot of attention for its innovative approach to sustainable operations as outlined in the Winter 2011 High Performing Buildings publication, <http://www.hpbmagazine.org/attachments/article/12142/11W-Oberlin-College-Adam-Joseph-Lewis-Center-Oberlin-OH.pdf>

Features of the AJLC are spelled out in educational brochures and highlighted in an Environmental Dashboard (see right)

### In Conclusion

As illustrated above, three uniquely different higher education campuses in Ohio have employed different, yet valid approaches to achieving sustainability. Ohio State University takes a data-driven scientific approach to plot the Building Energy Utilization Index to capture information about the electric, gas, water and recycling that each building uses. Dennison University, on the other hand, took a more holistic approach when renovating the century-old Barney Davis building. And Oberlin College, known for innovation and sustainability, took an entirely unique yet holistic path in 1992 while creating the Adam Joseph Lewis Center. Needless to say, however one arrives at energy efficiency and resource conservation, each step taken toward environmental responsibility and sustainable action is a step in the right direction.



Oberlin College's Adam Joseph Lewis Center

*Data shows the energy savings and resource conservation of Oberlin University's AJLC.*

# ENVIRONMENTAL DASHBOARD

Combining Displays of Water and Electricity Flows and Environmental Quality with Community Voices to Empower Conservation

### 1 Building Dashboard

- Monitors and displays patterns of electricity and water use in schools, homes, businesses and public facilities
- Engages, educates, motivates and empowers conservation
- Flash the Energy Squirrel and Wally Walleye help communicate the implications of consumption and conservation

### 2 City-wide Dashboard

- An animated display of electricity and water use and environmental conditions in entire communities or organizations
- Gauges and animations of water flowing through pipes and electrons flowing down power lines communicate how decisions made in our homes and workplaces are reflected in city-wide patterns and conditions

### 3 Community Voices

- Combines pictures and words to celebrate thoughts and actions that move our community towards sustainability
- Emphasizes neighbors, children, nature, community service and local economic development
- Generates a shared vision of a sustainable future

[www.oberlindashboard.org](http://www.oberlindashboard.org)

#### Why Dashboard?

Dashboard is a venue for communities, municipalities and organizations to:

- Discover and understand connections, choices and consequences
- Build "system thinking" consciousness and skills
- Share the thoughts and actions of residents who are working together to build a more vibrant, resilient and sustainable community

**A dashboard for your community!**

A pilot implementation in Oberlin Ohio is being used to develop technology that can be shared with communities throughout the Great Lakes region and beyond. Contact us if your community is interested.

**Partners:**

Contact: john.petersen@oberlin.edu

#### ENVIRONMENTAL DASHBOARD

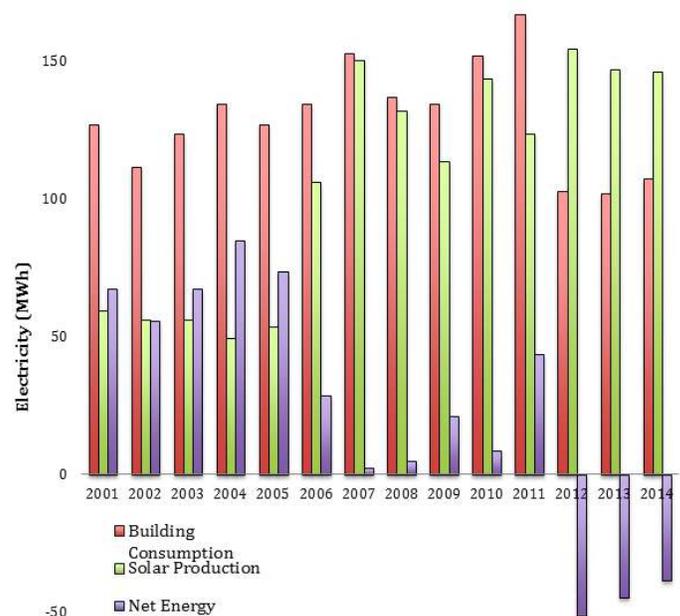
**Animating flows of water and electricity and sharing community voices to build more vibrant, resilient and sustainable communities**

#### How does it work?

Community members are informed through a complete feedback loop designed to connect them with the implications of environmental decisions:

- Sophisticated software continuously gathers information on electricity and water use from utility meters, building control systems, independent sensors and municipal utilities
- This information is translated into compelling visuals that are displayed on electronic signs in store fronts, libraries, schools and other public spaces
- A community-specific website encourages deeper interaction, exploration and discovery

200 AJLC Annual Energy Balance



# What EECO Region are you from?

## *And, who is your local contact?*

Your Regional Director is one of your most important links to EECO. Regional Directors are our boots on the ground throughout Ohio. They are there for you as a link to training, networking and more.

Have you got a great idea for an EECO event in your area? Is there an event that EECO is missing? Get in touch with your regional director and let them know.

If you haven't met, or spoken to, your regional director before, get in touch. Or even better, come and meet them at the EECO conference at Mohican State Park, April 1-3. See page 1 for more info on the conference or visit <https://eeco.wildapricot.org/>



## **Your Regional Directors Contact Information**

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