

Ohio Environmental Education Fund

and

Ohio Clean Diesel School Bus Fund

Financial Summary

State Fiscal Year 2016



Office of Environmental Education

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**Ohio Environmental Education Fund
Ohio Clean Diesel School Bus Fund**

**Financial Summary
State Fiscal Year 2016**

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Ohio Environmental Education Fund Fiscal Activity SFY 2007-2016

	SFY 2007	SFY 2008	SFY 2009	SFY2010	SFY2011	SFY2012	SFY 2013	SFY2014	SFY2015	SFY2016
Revenues (1)	1,404,063	1,918,867	1,758,819	1,862,072	1,258,402	1,736,975	1,233,578	849,249	646,840	1,035,413
Expenditures (2)										
Personal Service (3)	311,724	387,470	371,873	341,774	369,837	322,841	336,383	283,692	299,836	300,722
Supplies & Maintenance (4)	62,269	56,775	57,730	64,820	73,513	10,118	72,362	75,202	91,222	98,375
Indirect	55,126	57,332	63,206	64,321	58,744	162,156	67,812	73,125	78,600	91,620
Equipment	7,516	2,062	0	0	1,795	5,560	697	3,333	5,889	0
Total Operating Expenses	436,635	503,639	492,809	470,915	503,889	500,675	477,254	435,352	475,547	490,717
Grant Payments (5)	845,090	1,413,044	956,858	751,210	1,197,847	748,873	719,028	710,629	526,646	605,963
Ending Cash Balance	1,913,146	1,915,183	2,224,335	2,864,282	2,420,949	2,908,376	2,918,377	2,621,644	2,266,291	2,205,024
Open encumbrances	720,995	277,215	286,315	276,790	384,807	466,791	397,288	640,649	880,834	901,745
Grant Awards										
General Grants	741,803	719,511	704,600	737,294	700,000	670,438	631,948	568,497	591,444	451,227
Mini Grants	98,111	97,596	89,227	95,000	100,256	92,813	100,288	69,706	63,366	71,633
EE partner- and sponsorships	163,851	163,550	163,800	147,800	147,800	174,870	155,670	163,656	154,050	161,275
Total Grant Awards	1,003,765	980,657	957,627	980,094	948,056	938,121	887,906	801,859	808,860	684,135
Total Commitments (6)										
Operating + Awards	1,440,400	1,484,296	1,450,436	1,451,009	1,451,945	1,438,796	1,365,160	1,237,211	1,284,407	1,174,852

(1) Includes one-half of civil penalties collected by Ohio EPA air and water programs, plus reimbursements and donations.

(2) Includes a total of \$239,488.29 in funding for Ohio EPA Small Business Assistance Office in SFY01.

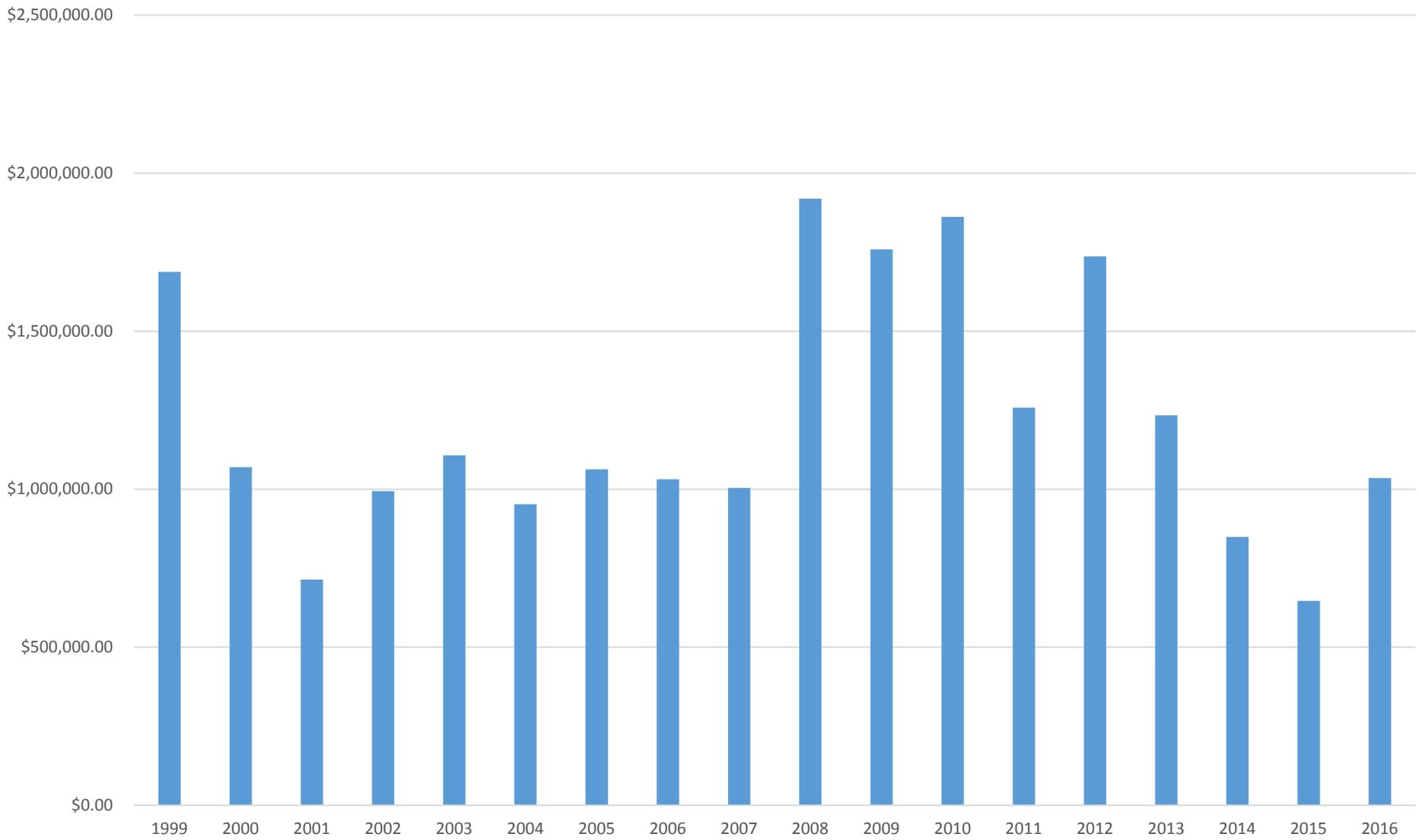
(3) Includes staff salaries and benefits, reimbursements to volunteers for travel, and substitute teachers. 2007 includes \$38,280 for GMS.

(4) Includes rent, printing, communications, and postage.

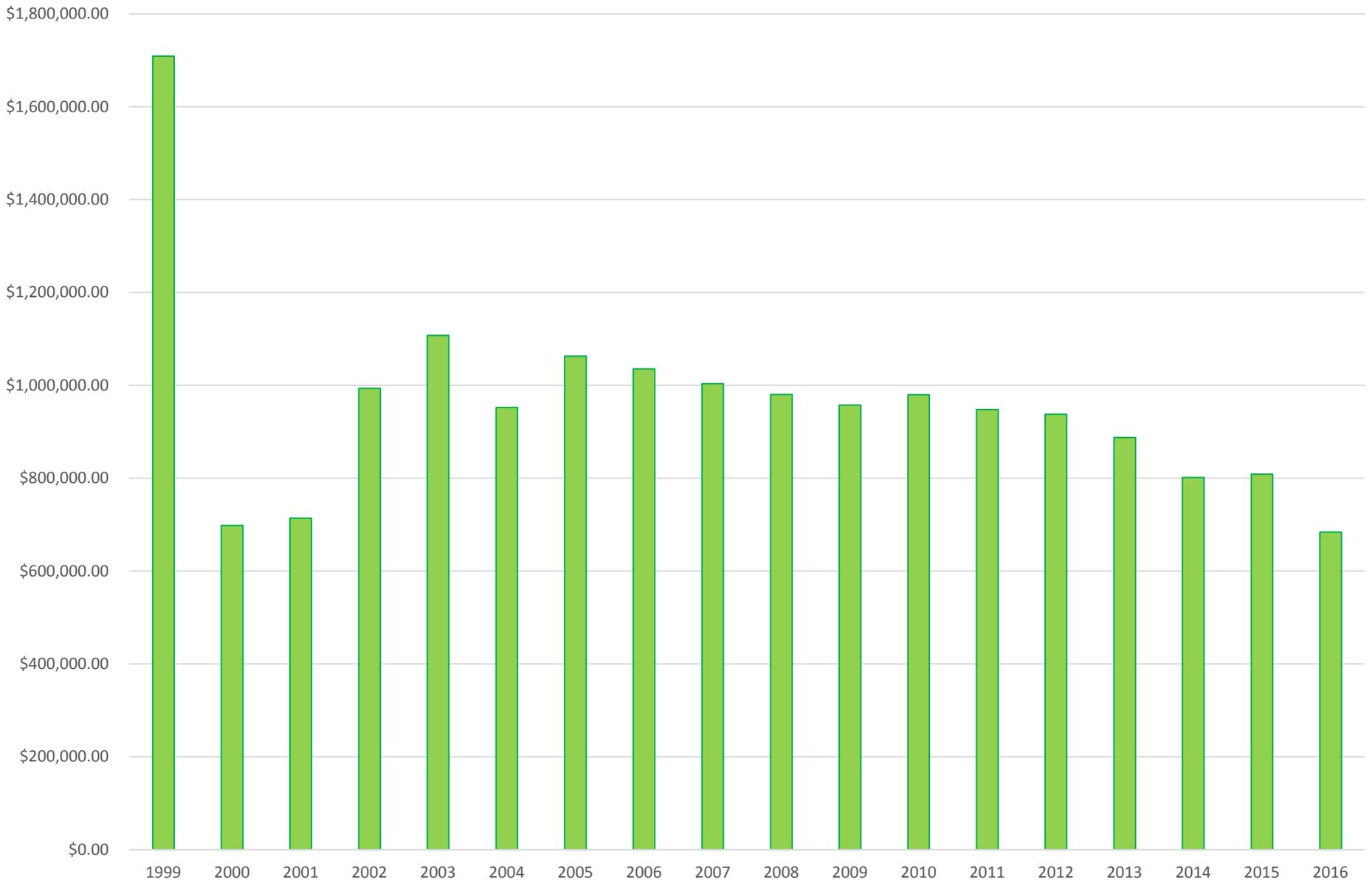
(5) Includes final payments to previous fiscal years' grantees.

(6) Comparable to annual budget.

Ohio Environmental Education Fund *Revenues 1991-2016*



Ohio Environmental Education Fund *Grant Awards 1991-2016*



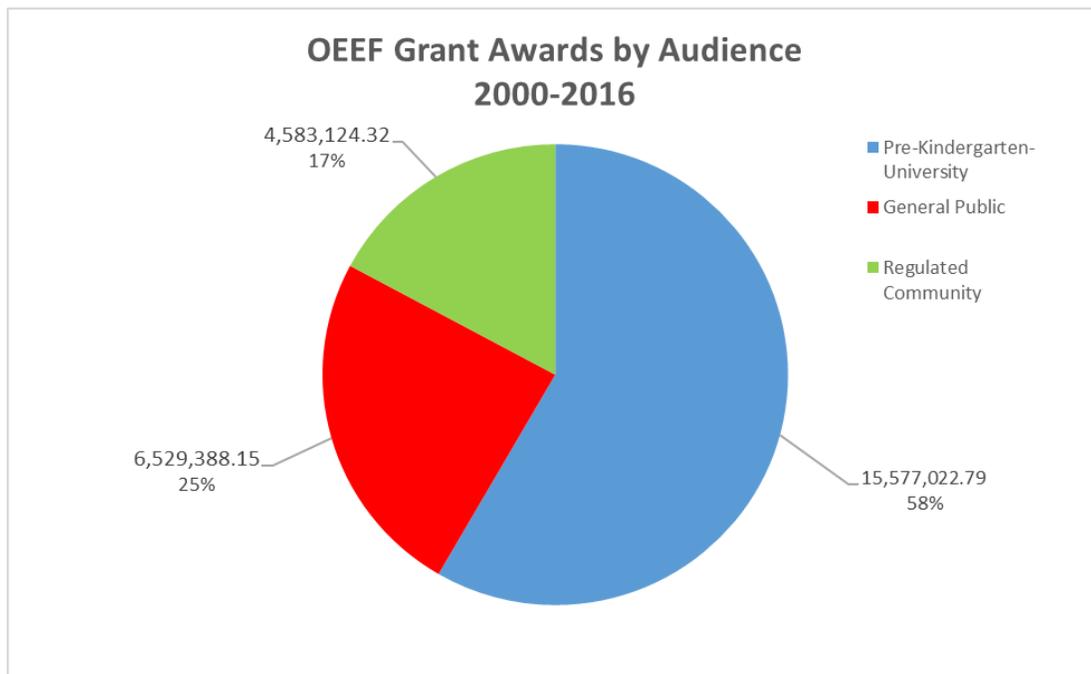
Ohio Environmental Education Fund Program Highlights 2016

Educational Priorities for SFY 2016

Funding priorities for OEEF grant programs are set by the OEEF Advisory Council in consultation with the Ohio EPA director. Ohio EPA is interested in using OEEF funds to support projects that are closely linked to the Agency's overall regulatory priorities and efforts to protect Ohio's environment. This year, funding was directed to four of the most pressing areas where Ohio EPA has determined an immediate need for more education, awareness and outreach efforts due to significant environmental impacts in our state:

- projects that demonstrate and encourage the use of **innovative storm water management** practices;
- projects that demonstrate and encourage **the reduction of air emissions**, including, but not limited to, promotion of alternative modes of transportation;
- projects that encourage and explain the importance of **habitat restoration** efforts to increase biodiversity and improve air and water quality; and
- targeted efforts to encourage nutrient management practices that will **reduce nutrient loadings to rivers and streams** from urban and rural areas.

Ohio EPA strives to serve three target audiences with OEEF funding: pre-kindergarten through university students and teachers, the adult general public, and the regulated community.



Water Quality Monitoring and Education



Ohio EPA provides statewide coordination of Project WET (Water Education for Teachers), a highly respected national curriculum for elementary and middle school grades, and its secondary level curriculum *Healthy Water, Healthy People* (HWHP), training middle and high school students and teachers to monitor water quality in local streams. The Office of Environmental Education also assists Ohio EPA's Division of Surface Water in training adult volunteer monitors to collect stream quality data under Level 1 of Ohio's Credible Data program, using HWHP.

This year, 29 new facilitators were educated using Project WET and HWHP at a combined workshop with Project Learning Tree, which is facilitated by ODNR, Division of Forestry. Approved facilitators are certified to host local educator workshops. A joint facilitator workshop for fall 2016 is planned for Mohican State Park, in cooperation with Project WILD – Ohio, which is coordinated by the Ohio Department of Natural Resources, Division of Wildlife.

This year local facilitators hosted 8 Project WET educator workshops introducing 151 new users to the 2.0 Educator Guide. Another 109 educators received training in the HWHP curriculum.



Northwest Ohio educators doing the activity "Water Quality? Ask the Bugs!" from Project WET 2.0 using aquatic macroinvertebrates as indicators of poor to excellent water quality in Ohio's streams and rivers.



Educators at the combined Project Wet and Learning TREE Facilitator Workshop at Shawnee State Park learning about soil erosion and BMP's



Educators from the Black Swamp Educators Extravaganza "Hitting the Mark" from Healthy Water, Healthy People, to demonstrate the difference between precision and accuracy when collecting water samples for analysis.



Educators with The Nature Conservancy at Grand River Conservation Campus, Rock Creek, Ohio (Ashtabula County) doing the Project WET Activity "Just Passing Through," which involves educators learning about erosion and how to prevent it with Best Management Practices

Environmental Careers

Ohio EPA would like for more Ohio students to consider careers in environmental science and engineering. The OEEF is supporting six initiatives described more fully in the sponsorship and partnership pages of this report, in keeping with the state's emphasis on **STEM (science, technology, engineering and mathematics)** education and preparing students to meet the needs of Ohio's increasingly high-tech job market.

- **Scholarships** for environmental science and engineering students at Ohio colleges and universities <http://ohiosci.org/scholarships/>
- Support to the Ohio Academy of Science for **State Science Day**, recognizing original environmental science research by students in grades 7-12, <http://ohiosci.org/ssd-htm/>
- At the middle school level, the **National Engineers Week Future City Competition®**, <http://futurecity.org/ohio>
- At the high school level, the **Ohio Envirothon®** competition sponsored by Ohio's soil and water conservation districts, <http://www.agri.ohio.gov/divs/SWC/SWC.aspx#tog>
- Sponsorship of the Ohio Chemistry Technology Council's "**Teachers, Industry and the Environment**" conference, <http://www.ohiochemistry.org/aws/OCTC/pt/sp/tieconference> .
- A group of 431 volunteer **environmental career ambassadors** willing to make school presentations, through a partnership with the Environmental Education Council of Ohio and The Ohio State University's Environmental Professionals Network, <http://epn.osu.edu/>

Ohio EPA is also partnering with other state and federal agencies to introduce Ohio's young people to STEM careers, and Ohio EPA staff scientists and engineers provide school presentations and participate in school Career Exploration Days.



Hazardous Waste Inspector Dan DiMeo and Water Quality Scientist Sarah Adams discuss their careers with Walnut Springs Middle School students.

**Ohio Environmental Education Fund
Grants for the Pre-Kindergarten to University Audience**



In SFY2016, the OEEF funded 16 Pre-Kindergarten--University projects for a total of \$297,757.

Ohio State University, College of Education and Human Ecology - Ohio Resource Center, "Curious KIDSS," F-16G-002, \$46,521, Statewide, Audience: Pre-Kindergarten – University (Grades K-2). Contact: Tracy Cindric, tracey.Cindric@education.ohio.gov, (614) 247-7978.

Ohio students are arriving in upper elementary grades unprepared for STEM concepts in science because the K-2 grades have so heavily focused on reading and math in recent years. K-2 teachers have a genuine lack of comfort, knowledge and experience with including science in integrated lessons. The Curious KIDSS (Kindling Investigation and Discovery in Science and Social Studies) program 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.

The Nature Conservancy, "Environmental Education Center at TNC's Grand River Conservation Campus at Morgan Swamp Preserve," F-16G-019, Ashtabula County, \$49,950, Audience: Pre-Kindergarten – University (Grades K-12). Contact: Karen Adair, 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,” F-16G-020, Cuyahoga and Summit Counties, \$47,440, Audience: Pre-Kindergarten – University (Grades 7-12). Contact: Stephanie Pierce, 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.

United Plant Savers, “Explaining United Plant Savers' Role in Habitat Restoration Through Environmental Interpretation,” S16G-034, \$25,000, Meigs County, Audience: Pre-School – University (K-12), Contact: Susan Leopold, susan@unitedplantsavers.org, (703) 667-0208.

Interpretive signage and an exhibit will be created to tell the story of resource extraction and habitat restoration at the Goldenseal Sanctuary in Rutland, OH. Through multimedia, the interpretive exhibit will show what the land looked like in the 1960s and go through the various stages of how the land was restored. A brochure will show visitors steps anyone can take to restore habitat and improve watershed ecology. OEEF funds will also provide transportation for students to the sanctuary. The Meigs Soil and Water Conservation District and Rural Action will collaborate on the project.

Case Western Reserve University - Leonard Gelfand STEM Center, “Kelleys Island Collaborative,” S16G-045, \$45,633, Cuyahoga and Ottawa Counties. Audience: PreK-University (Grades 8-10). Contact: James Bader, jxb14@case.edu, (216) 368-5289.

Professional development workshops will be held for teachers in the Cleveland Metropolitan School District to help expose students to important issues facing Lake Erie. Teachers will participate in a week-long workshop to develop a program they can implement with their students at the newly established Kelley's Island Field Station and the Cleveland Metroparks' Stewardship Center at West Creek. Teachers will study best management practices for nutrient control and the relationship to harmful algal blooms, the relationship between habitat and biodiversity, and stormwater management practices. Students will learn to address ecological problems using a Biology, Environmental Science, Technology (BEST) and Environmental Science Technology Engineering and Math (eSTEM) approach. Initially 15 teachers and 75 students will participate in the activities described in this proposal, but their work will impact 1200-1500 of their peers by the end of the grant period.

Miami University - Hefner Museum of Natural History, "Sowing SEEDS (Science, Environmental Education, Discovery, and Synthesis)," S16G-054, \$40,484, Butler County, Audience: PreK-University (Pre-Service Teachers), Contact: Cecilia Franz Berg, bergcf@miamioh.edu, (513) 529-4617.

The program will train 32 early childhood education majors as environmental educators, stressing content knowledge and effective teaching. Participants will become Certified Early Childhood Environmental Educators and will receive a kit of materials and resources to use in their classrooms. Hefner Museum staff will also be available to answer questions and offer support to participants and host field trips. Undergraduates who complete the program will impact as many as 2,000 students and will continue to use their knowledge and the resources after graduating to impact students in their classrooms.

Benjamin Logan School District – Benjamin Logan High School, *The Riparian Zone and its Role in the Preservation of the Mad River as Important Trout Habitat*, F-16M-003, \$4,949, Champaign and Logan Counties, Audience: Pre-Kindergarten – University (grades 4-12), Contact: Spencer E. Reams, reamess@benjaminlogan.org, 937-935-2358.

Provides sampling equipment to help 400 students understand the role of the riparian zone in maintaining trout habitat in the Mad River. Students will test the soil to understand how nitrates and phosphorus migrate through the riparian zone to the River, and conduct laboratory experiments to analyze the impact of nitrogen, phosphorus and potassium loading on dissolved oxygen levels. They will also conduct field and laboratory studies of the effect of shading on water temperature, and continue to hatch brown trout eggs and raise and release the fry as part of the ongoing Trout in the Classroom program. The results of the project will be shared with the public and local media through a community night.

Land owners will be targeted as an audience for the community night presentations. Ohio EPA will provide an in-service training for teachers county-wide in Project WET and the Healthy Water, Healthy People curricula. The Madmen Chapter of Trout Unlimited and the Logan Soil and Water Conservation District are collaborating.

Miamisburg – Bishop Leibold School, *Waste Not, Want Not*, F-16M-007. \$1,000, Montgomery County, Audience: Pre-Kindergarten – University (grades 4-8), Contact: Linda L. Hillinan, lhallinan@bishopleiboldschool.com, 937-434-9343.

Students will design, build, and maintain a compost system using school cafeteria waste. They will also create and conduct multiple "design experiments" to find out the most efficient composting method with the use of technology to better understand the conservation of mass and energy of the biomass that they are creating. Lastly, they will educate their parents at an open house in the spring with a short presentation and a pamphlet designed by the students, as well as educate our other sister school on the benefits of composting. The end product will be used by the Mission of Mary farm cooperative, which supplies fresh organic vegetables to the underserved Dayton community. Approximately, 335 students and parents from two campuses and the community will benefit from this project.

Wayne Trace Local Schools, Grover Hill Elementary, *Water and Soil Quality Education*, F-16M-012, \$4,900, Paulding County, Pre-Kindergarten – University (grades 4-6), Contact: Wendy L. Baker, bakerw@wt.k12.oh.us, 419-587-3162.

Teachers will work with students in grades 4-6 to collect samples and analyze turbidity, temperature and nutrient loads and headwater macroinvertebrates from Town Creek in the Little Auglaize watershed. Their research will parallel and support an ongoing study by the Defiance Soil and Water Conservation District of nonpoint source nutrient pollution in the larger Maumee watershed contributing to algal blooms in Lake Erie. Grant funds will support installation of a floating aluminum dock and gangplank that will allow students to safely collect samples from deeper water at midstream rather than on a steep streambank, for a more accurate reading of nutrient and sediment conditions. Prior to installation, students will work with the County Engineer to conduct an engineering design project listing materials and methods, building models and testing outcomes to prevent erosion of the creek bank while allowing stable construction of the dock structure. In this career exploration unit, students will see how engineers study stream erosion, ditch construction and slope for public works projects that take into account floodplains, soil quality and heavy traffic.

Cardington-Lincoln Local Schools – Cardington Jr. High, *Quality Water for Quality Life*, F-16M-015, \$4,926, Morrow County, Audience: Pre-Kindergarten – University (grades 3-8), Contact: Beau Michael Wolford, beau.wolford@cardingtonschools.org, 419-864-0609.

Provides equipment to help 150 students learn about water quality in Morrow County by studying the micro- and macroinvertebrate life in local streams. Students will keep journals and logs documenting specific types and numbers of organisms discovered, dissolved oxygen levels, pH levels, and other important variables that determine water quality. The project will incorporate activities from Project WET, Healthy Water, Healthy People, Project WILD Aquatic, and the University of Wisconsin’s Exploring Streams curriculum, and culminate in a stream and river clean up to improve the water quality in our community. The students’ research findings will be published in the school newsletter and their data shared with students in New Mexico through the RiverXchange www.riverxchange.com project.

Alliance for Leadership and Interconnection (ALI), *Green STEM Programs*, F-16M-017, \$4,621, Butler, Clermont, Hamilton and Warren Counties, Audience: Pre-Kindergarten – University (grades K-12), Contact: Calvin Williams, cwilliams43@gmail.com, 513-541-4607.

Provides equipment, science kits, software and promotional materials to support Green STEM Fairs for six Southwest Ohio school districts, and STEM Eco-Mentoring Programs for 2,500 students in Cincinnati Public Schools. Through Green STEM Fairs, adult mentors engage small groups of students with introductions to green technologies and green careers related to energy conservation. In weekly STEM Eco-Mentoring after-school programs for grades 4-6, adult mentors such as LEED architects and engineers provide hands-on, in depth training in green technologies and green careers, and assist students with presentations for a culminating community event. Students study utility bills to measure energy use by their school building; use Watt meters to measure how much energy an appliance uses and calculate the cost to operate it; check for energy “vampire” electronic devices that are constantly using energy in stand-by mode; measure light in foot candles within buildings; use air monitoring equipment to detect pollutants; and assemble and compare the efficiency of toy fuel cell and solar cars.

Delaware City Schools – Dempsey Middle School, “Dempsey Ecology Project,” S-16M-021, \$5,000.00, Delaware County, Audience: Pre-School – University (grades 7-12), Contact: Paul Martin Olen, olenpa@delawarecityschools.net, 740-417-6478.

The focus of the Dempsey Ecology Project is on teaching forest and wetland ecology while actively eradicating alien invasive species (AIS) from the 50 acre forest and mitigated wetland area behind Dempsey Middle School. The area includes an intermittent headwater tributary to the State Scenic Olentangy River. This award-winning program was begun in the spring of 2014. U.S. Forest Service, Delaware SWCD, ODNR, Division of Wildlife, Delaware County Preservation Parks, Ohio Wesleyan University, Olentangy Watershed Alliance and Big Brothers Big Sisters of Central Ohio are all collaborating.

Meigs SWCD, “AWARE – Assessing Water and Rural Environments,” S-16M-026, \$4,836.00, Meigs and Athens Counties, Audience: Pre-School – University (grades 2, 4, 7 and 9-12), Contact: Jenny Ridenour, jenny.ridenour@oh.nacdnet.net, 740-992-4282.

This project will add resources to teach students about how pollution affects our streams and rivers. The resources are hands on kits that are reusable and can be used at different grade levels. The project will focus on second grade, fourth grade, seventh grade and high school. These grade levels have the most focus on water, erosion, pollution, and methods to collect data on water. The younger grade levels will relate water to the ecosystems including plant and animal life. The older students will investigate how water becomes polluted and ways to prevent the pollution. Project WET and Healthy Water, Healthy People will be used for educating teachers. Meigs County General Health District and OSU Extension along with Athens SWCD are collaborating.

Clark County Solid Waste District, “Water and Wetlands Teacher Workshop,” S-16M-029, \$4,050.00, Clark County, Audience: Pre-School – University (grades K-12), Contact: Steve Schlather, sschlather@clarkcountyohio.gov, 937-521-2022.

The Clark County Solid Waste District and the Clark County Parks District plan to offer a workshop in fall 2016 to introduce primary and secondary teachers in Clark County to the Healthy Water Healthy People (HWHP) and Wonders of Wetlands (WOW) curricula. Lessons demonstrated will focus on water runoff, wetlands, water cycle, nonpoint source pollution, and watersheds. The workshop also will include a demonstration of an Enviroscape Model, which will be available to teachers as a hands-on tool. The workshop will offer six contact hours and will be held at George Rogers Clark Park, allowing us to use the creek in the park as a setting for at least one activity, weather permitting. We plan to ask participants to introduce the curriculum to their colleagues and provide a brief

report on how they used the curriculum in class. Clark County Park District and Montgomery SWCD are both collaborating.

Sycamore Community Schools – Symmes Elementary, “A Year on the Trail: A Field Investigations Approach to EnviroEd Using Nature Trail at Symmes,” S-16M-030, \$3,447.00, Hamilton County, Pre-School – University (grades K-4), Contact: Steve Reinke, reinkes@sycamoreschools.org, 513-316-3650.

Grant will directly facilitate the environmental education of 500 K-4 students in Symmes Elementary (as well as the 1,500 in attendance in Sycamore Community Schools' three other elementary buildings) by helping train teachers and fund ongoing scientific inquiry and monitoring of the Nature Trail at Symmes, a nine acre wooded watershed owned by the district. The trail's continuing restoration and removal of invasive species provide hands-on opportunities for even the youngest to design and conduct field investigations to help determine the effect and direction of the renewal efforts. They will then communicate these efforts to the community at large at the end of the school year. Teachers, referencing materials from Project Learning Tree and Project Wild, will be trained to use the monitoring equipment to help the students gather, organize, and interpret data they have collected. PTO, Werthaiser Family and Primrose School of Symmes are all collaborating.

Hathaway Brown School, “For the Birds: Restoration, Exploration and Creative Play in Nature for Early Childhood Learners,” S-16M-036, \$5,000.00, Cuyahoga County, Audience: Pre-School – University (Pre-School), Contact: Victoria (Torrey) McMillan, tmcmillan@hb.edu, 216-932-4214.

This project will restore a small section of Hathaway Brown's (HB) 16 acre suburban campus that is dedicated as a bird sanctuary. The space currently is lightly wooded with some shrubs and lawn beneath it. We want to enhance the bird and pollinator habitat by removing non-native species and planting additional native perennial herbaceous plants and shrubs that will create an edge/woodland habitat to invite in birds. The space will also be designed as a nature exploration and play space for our Early Childhood program, which will develop (with guidance from Shaker Lakes Nature Center) and implement expanded nature play, exploration, and stewardship curriculum using the space. Grant funds would be used for the habitat restoration materials and site work.

**Ohio Environmental Education Fund
Grants for the General Public Audience**



In SFY 2016, the OEEF funded 10 adult education projects for a total of \$173,284.

Western Reserve Land Conservancy, “Neighborhood Tree Steward Program,” F-16G-005, \$41,619, Cuyahoga County, Audience: General Public. Contact: Colby Sattler, csattler@wrlandconservancy.org, (216) 515-8300.

A Neighborhood Tree Steward program will educate and engage Cleveland residents and community leaders about the importance and benefits of urban forests. Through workshops, outreach events and training, residents will learn about the benefits of trees and how they will impact their environment. The activities will help participants change their behavior by establishing tree stewardship habits by demonstrating easy routines to engage in tree care. To ensure long-term success of the program, residents will become actively engaged in reforestation efforts that are currently underway in the city. The project will be a model program that can be expanded throughout the city and be established in other Northeast Ohio cities.

Cincinnati Nature Center, “Habitat Restoration - Speaker's Bureau,” F-16G-015, Adams, Brown, Clermont, Clinton, Hamilton, Highland, Warren Counties, \$37,950, Audience: General Public. Contact: Connie O'Connor, 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 monarch habitat and other pollinators. Speakers will reach a variety of audiences throughout a seven county area and provide people attending habitat 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.

Grange Insurance Audubon Center, “Creating Bird Friendly Communities,” F-16G-028, Franklin County, \$22,800, Audience: General Public. Contact: Amy Boyd, aboyd@audubon.org, (614) 545-5486.

The project will create Bird Friendly Communities by making homeowners aware of the need for backyard conservation and habitat restoration. Through a series of classes, workshops and lectures participants will learn about native plants, ecosystem gardening, bird feeding, nest boxes, sustainable lawn care and a

number of other topics to 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.

Cuyahoga River Community Planning dba Cuyahoga River Restoration, “Depave NEO,” S16G-046, \$46,997, Cuyahoga and Summit Counties. Audience: General Public, Contact: Jane Goodman, goodman@cuyahogariver.org, (216) 496-7694.

Training will be provided to help municipalities, watershed organizations, community development corporations, and the general public plan, implement, and maintain projects that remove impervious surfaces, especially excess or abandoned areas of parking lots in highly urbanized areas and convert them to vegetated stormwater treatment areas. Trainings will include webinars, workshops, and a hands-on depaving project, and trainees will become trainers to broaden and perpetuate projects throughout Northeast Ohio. A Depave handbook that includes the basic training elements, checklists, processes, and resources to enable anyone to plan and carry out projects and a flyer/infographic to introduce the program and handbook will be produced. The project will establish a Depave NEO program to reduce polluted runoff, improve water quality, and provide opportunities for organizations and individuals to participate in greening their communities.

Ohio River Basin Consortium for Research and Education, “*Environmental Workshop for Citizen Scientists: Water Status of Ohio River*,” F-16M-005, \$5,000, Statewide, Audience: General Public, Contact: Tiao J. Chang, chang@ohio.edu, 740-593-1462.

The proposed Environmental Workshop for Citizen Scientists at Youngstown State University will select twenty citizen scientists to participate in an educational workshop that will include the activities of Water Quality App developed by Northern Kentucky University; the Virtual Boat for Environmental Education in Ohio (VBEE-Ohio) developed by Ohio University’s civil engineering program with a previous OEEF grant. These Apps are designed to enable citizen scientists and schools that cannot travel to sample the Ohio River to conduct virtual sampling along with school groups while they are physically on the River sampling dissolved oxygen, E. coli, pH, total phosphate, nitrate, turbidity and total suspended solids. The workshop is being held in conjunction with and ORBCRE's 2016 scientific symposium at Youngstown State University. The Friends of the Mahoning River, Northern Kentucky University, and Youngstown State University are collaborating.

Put-in-Bay Township Park District, *Lake Erie Island Water Trails*, F-16M-009, \$4,918, Erie and Ottawa Counties, Audience: General Public, Contact: Lisa Brohl, lakbrohl@gmail.com, 419-366-2087.

The National Park Service has been working with multiple partners to develop a Lake Erie Islands Water Trails Guide, a defined paddling route with public access sites, safety and natural/cultural history information. Grant funds will support publication of the guide and interpretive signs at each access point, providing information on cultural and natural history, critical habitat resources, invasive species, harmful algal blooms and human impacts on water quality. The Guide will encourage recreational users of the Lake Erie Islands to do it safely, reduce conflicts with private property owners, protect vulnerable natural resources and encourage stewardship. Collaborators include the National Park Service, Ohio Clean Marinas Program, Ohio Chapter of the American Canoe Association, Ohio Sea Grant, and the Put-in-Bay Chamber of Commerce & Visitors Bureau.

Wayne Township, Warren County, *Name that Stream*, F-16M-010, \$2,500, Warren County, Audience: General Public, Contact: Amy Cameron, amy.cameron@co.warren.oh.us, 513-695-3086.

Seeks to promote watershed awareness among 8,500 residents and commuters by placing 43 identification signs at locations where roads cross tributaries of the Little Miami River. To encourage stewardship and connection with the local watershed, mailings to Township residents will include backyard conservation tips for keeping waterways clean, including best management practices addressing fertilizer use, pet waste and vegetative stream buffers. The project will also include guidance on how residents can get an un-named tributary a name through the U.S. Geological Survey. The Warren Soil and Water Conservation District is collaborating.

Fairfield Soil and Water Conservation District, *Interactive Education Experience*, F-16M-011, \$1,500, Fairfield County, Audience: General Public, Contact: Tommy Springer, tspringer@fairfieldswcd.org, 740-653-8154.

The Interactive Education Experience will include purchasing Audience Response System equipment that Fairfield SWCD staff can use to educate several thousand primary and secondary students on environmental issues such as soil health, water quality, stormwater pollution prevention, environmental health, and knowledge of threatened and endangered species. This will be used to supplement teacher-led lessons aligning with Ohio's New Learning Standards. Several hundred farmers, landowners, MS4 community members and wildlife-interested audiences will also be reached through various field clinics and public programs presented annually on ways to reduce stormwater pollution, soil runoff, and nutrient loading, and ways to promote general pond and environmental health. This equipment is a wireless response system that promotes lively

interaction during the presentation by giving the audience the ability to answer questions and submit answers electronically via hand-held devices. It can also be used for pre- and post-testing and store a summary of results, to improve the assessment of what is being learned in these programs.

Cleveland Metroparks, *Food Forest at Rocky River Nature Center*, F-16M-016, \$5,000, Cuyahoga County, Audience: General Public, Contact: Valerie Fetzer, vjf@clevelandmetroparks.com, 440-734-6660.

Cleveland Metroparks plans to create a Food Forest at Rocky River Nature Center using Permaculture techniques. A Food Forest is similar to an orchard but is not reliant on humans for growth and care. It is a sustainable system which includes a wide diversity of plants and animals that support and complement the needs of one another. This forest will include trees and understory plants that produce nuts and fruits for consumption by humans and wildlife, as well as those that attract pollinators and provide habitat for local species. It will serve as the backdrop for school programs and a series of 11 adult education programs on backyard conservation, including topics such as native gardening, edible gardening, sustainable food systems, local habitat conservation, soil and rainwater retention, and permaculture. Over 176,000 people visited the nature center at Rocky River in 2014, which made it the most visited center in all the Cleveland parks.

BrainBox LTD., "Landlord Training Event," S-16M-033, \$5,000.00, Hamilton County, Audience: General Public, Contact: Lauren Campbell, contact@brainboxltd.com, 765-624-8456.

Host a landlord training event, targeting large (5 units or more) multi-family property owners/landlords/property managers, educating on the benefits of incorporating sustainable initiatives on their properties and providing resources that they can pass along to their tenants. The topics of focus will be sustainable lawn care, stormwater management, energy efficiency, air quality, curbside and commercial recycling options. There will also be a legal component to help develop lease language to hold tenants accountable. Primary audience is property owners and land lords, the secondary audience is adults generally, as we anticipate their tenants will also receive information. City of Cincinnati, U.S. Green Building Council, Mill Creek Watershed Council and Hamilton County Environmental Services are all collaborating.

**Ohio Environmental Education Fund
Grants for the Regulated Community Audience**



In SFY2016, the OEEF funded two regulated community projects for a total of \$19,889.

Wood SWCD, “Demonstrating Innovative Conservation Practices,” F-16G-014, Wood County, \$14,903, Audience: Regulated Community. Contact: Beth Landers, 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. Additionally, the efforts will be exhibited at the Wood County Fair, using a new part of the fairground to demonstrate and discuss practices on a small scale or with models. A Drive-it-Yourself conservation tour will be in place for several months, allowing residents and producers to watch a field over an entire season. A social media campaign is intended to give farmers a way to demonstrate how they 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.

Lake County Stormwater Management Department, “Training & Education Materials for Municipal Staff,” S-16M-024, \$4,986.00, Lake County, Audience: Regulated Community, Contact: Susan Haboustak, susan.haboustak@lakecountyohio.gov, 440-350-5902.

Project will adapt materials to provide more user-friendly training and education for municipal operations staff/employees. Our project includes printing of more customized posters and vehicle guides describing stormwater Best Management Practices (BMPs) and pollution prevention; laptop and projector for educational workshops. All materials will include local imagery to encourage community appeal and cover: spill response, installation of sediment and pollution controls during construction, final vegetative stabilization, stormwater pollution prevention during lawn care and fertilizer use. Lake County Engineer, SWCD, General Health District, Planning & Community Development, Chagrin River Watershed Partners, Inc. are collaborating.

OEEF Outstanding Project Award Winners for the Pre-school through University Audience

Every few years, Ohio EPA contracts with the Environmental Education Council of Ohio (EECO) for independent evaluation of the success of completed OEEF grant projects. EECO assembles a team of formal and non-formal educators to select the best completed grant projects to honor with OEEF Outstanding Project Awards. The team reviews publications such as EECO's Best Practices Guidelines for Environmental Education: Guidelines for Success , online at eeco.wildapricot.org/Resources/Documents/bestpractices.pdf, and the North American Association for Environmental Education's Guidelines for Excellence series, available online at naaee.net/publications. Because OEEF grant projects are quite diverse and grant products are often similar in format to portfolios, the team uses a holistic instrument for the evaluation process. For the pre-school through university audience, the team developed paragraph rubrics for three categories: curriculum development, student activity and professional development for K-12 educators. These instruments have been refined several times over the years as technology has changed and new award winners have been selected. A tool for website evaluation has also been added. The instruments and previous award winners are posted at <http://epa.ohio.gov/oeef/EnvironmentalEducation.aspx#135377994-outstanding-projects>.

Ten outstanding projects for the pre-school to university audience were selected in the spring of 2016. Ohio EPA would like to lift up these excellent examples of effective environmental education to inspire educators and prospective grant applicants. Recently completed grant projects targeting the adult general public and regulated community audiences will be reviewed this fall, and Outstanding Project Award winners for that audience will be showcased in the SFY17 OEEF annual report.

Action for Children

“Nurturing Nature Through the Foods We Eat”

F10G-023, \$49,634, Delaware, Fairfield, Franklin, Licking, Madison, Pickaway and Union counties, Audience: Pre-Kindergarten-University (pre-kindergarten and elementary), Contact: Gwen Moman,

actionforchildren.org, (614) 224-0222, ext. 114

Action for Children



Afterschool-age educators were provided with standards-based professional development focused on environmental and agricultural education. The professional development program consisted of four major areas: a 10 hour curriculum module linking food and the environment; technical assistance to support implementation within the afterschool settings; field experiences bringing the educators, children and parents to environmental/agricultural education sites; and a statewide train the trainer for dissemination of the curriculum throughout Ohio. Collaborators included Franklin Soil and Water Conservation District, Ohio Child Care Resource and Referral Agency, Ohio State University Early Childhood Quality Network, Stratford Ecological Center, and Dr. Ruth Wilson, Professor Emeritus with Bowling Green State University.



Ohio State University College of Nursing

“Healthy Homes Education for Nursing Students”

S10G-076, \$48,675, Franklin County, Audience: Pre-Kindergarten-University (Undergraduate), Contact: Barbara Polivka, barbara.polivka@louisville.edu (502) 852-3949

Provided web-based standardized teaching modules to educate at least 300 undergraduate and graduate pre-licensure nursing students per year to U.S. EPA’s Healthy Homes assessment process to identify threats such as radon, lead, pesticides and asthma triggers during their home visits. These students participated in standardized simulation lab exercises to practice Healthy Homes assessments, and at least 20 students piloted actual in-home clinical/experiential Healthy Homes assessments. Columbus Public Health and the Ohio Department of Health collaborated on the project. The project is also described in the following publication: Polivka, B.J., Chaudry, R., Crawford, J. (2012) Home Environmental Hazard Education for Undergraduate and Pre-Licensure Nursing Students. *Journal of Nursing Education*. 51(10), 577-581.

Antioch College Corporation — Glen Helen Ecology Institute



“Glen Helen Residential Environmental Education Program”

F11G-019, \$49,918, Greene County, Audience: Pre-Kindergarten-University, Contact: Nikos Boutis, nboutis@glenhelen.org, (937) 769-1902, ext. 105

The Glen Helen Outdoor Education Center is the oldest residential environmental learning facility in the Midwest. This project transformed the academic internships of the center into professional practica, to enable the center to continue to provide

environmental education instruction to schoolchildren, and professional preparation for outdoor and environmental educators.

ThinkTV – Public Media Connect

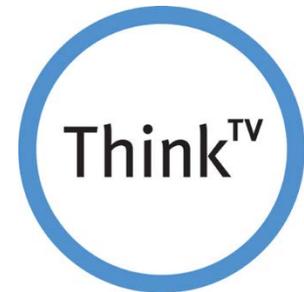
“Growing Up Wild in the Outdoor Classroom”

S11G-049, \$49,853, 21 southwest and central Ohio counties

“Nature as the Outdoor Classroom”

F13G-014, \$49,853, Montgomery County, Audience: Pre-Kindergarten-University

(pre-school). Contact: Tina Spaulding, tspaulding@thinktv.org (937) 220-1670



Three public television stations trained 1,680 child care providers and parents in central and southwest Ohio to use the outdoors as a classroom for teaching young children about nature and science. Half-day workshops presented eight units from Project WILD’s “Growing Up WILD” curriculum, reinforced with a monthly e-newsletter with enrichment ideas for all attendees. Activities included What’s Wild, Tracks, Bird Beak Buffet, Seed Need, Spider Web Wonders, The Deep Blue Sea, Wiggling Worms, and Wildlife is Everywhere. Multiple collaborators included the CET and WOSU Public Media stations, Dayton Area Family Child Care Association, Ohio Job and Family Services agencies in 16 counties, OSU Extension and referral agencies in five other counties.

The Ohio State University Extension, Butler County



“Youth Scientist; Creating Environmental Stewards”

F12G-010, \$46,522.23, Ashland, Clinton, Fayette, Morgan, Ottawa, Trumbull and Van Wert counties, Audience: Pre-Kindergarten-University (high school), Contact: Cindy Meyer, meyer.842@osu.edu, (513) 785-6654

The grant provided eight workshops statewide, curriculum kits, website and blog to introduce 261 school teachers to a new curriculum on the emerald

ash borer, an invasive insect predicted to eliminate five different species of trees in Ohio and the 44 arthropods that rely on these trees for survival. At least 31,349 students learned about the health of Ohio forests and urban trees, using hands-on scientific research methods. ODNR, Division of Forestry, Project Learning Tree-Ohio, the US Forest Service, Ohio Department of Agriculture and OSU, College of Food, Agriculture and Environmental Sciences all collaborated.

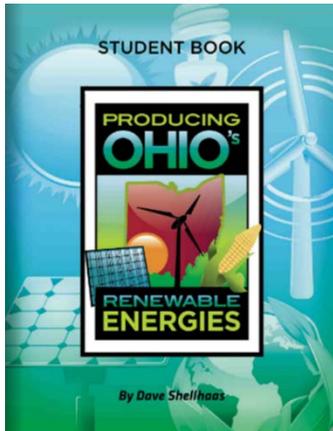
Talawanda School District – Talawanda High School

“Healthy Water, Healthy People Project – Erik Sustainability Initiative”
F12G-019, \$22,065.41, Butler County, Audience: Pre-Kindergarten – University (high school), Contact: Adriane Ruther, ruthera@talawanda.org, (513) 273-3559



Students investigated the impact of agricultural chemicals on the watershed of the 100-acre Erik Outdoor Education Area at the newly constructed LEED Gold-certified Talawanda High School. Students explored the stream, wetlands and woods on the property, measuring and monitoring the flow of agricultural chemicals through the wetlands to determine the effectiveness of the wetland ecosystem in mitigating these chemicals. Students then made recommendations to the Board of Education regarding the future use of the agricultural land. Budget included monitoring equipment and hand-held GPS units for the students to use, and certification of the teachers in Project WET’s secondary water monitoring curriculum, “Healthy Water, Healthy People.” Collaborators included Butler Soil and Water Conservation District, Pheasants Forever and the U.S. Fish and Wildlife Service.

Darke County Educational Service Center



“Producing Ohio’s Renewable Energies (PORE)”
S12G-038, \$22,389.66, Auglaize, Darke, Mercer, Miami, Montgomery, Preble and Shelby counties, Audience: Preschool-University (High School), Contact: Dave Shellhaas, dshellhaas@mresc.org, (937) 498-1354

This pilot project targeted 27 teachers and approximately 2,378 high school students from 19 school districts in Ohio. The goal of the project was to increase high school students’ skills at making evidence-based decisions about renewable energies that are found or produced in Ohio. A series of workshops, online follow-up, a teacher's guide that provides lessons and instructional ideas, and a student booklet with content on biomass (ethanol, biodiesel and methane), wind and geothermal energy sources currently being developed in Ohio, provides a dynamic program that leads students in learning to make decisions about energy options without creating bias themselves.

Ohio University - Civil Engineering

“Virtual Boat for Environmental Education in Ohio”
F13G-002, \$45,253, Athens County, Audience: Pre-school to University (High School, Undergraduate and Graduate), Contact: Tiao J Chang, chang@ohio.edu, (740) 593-1462

The University currently has a five-year National Science Foundation grant to study the impacts of human activity on water quality in the Ohio River basin, and integrate research results into high school curriculum. Local students and teachers sampled water quality from a real boat on the river. However, the number of high school students from the basin who can participate is limited by distance, boat capacity and the short seasonal window when the boat could dock and navigate along the river. This project created 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 tested 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 was field-tested with students and teachers at two high schools in Athens and Meigs counties.





BrightPath Active Learning, LLC

“Outdoor Education for Kindergarten Enrichment”
F12M-016, \$3,775.73, Franklin County, EEF Priority:
Standards Based Education, Audience: PreK-University
(Early Childhood), Contact: Colleen Sharkey,
colleen@brightpathactivelearning.com, (614) 839-
0780.

BrightPath Active Learning is a half-day program that uses outdoor education to provide enrichment for kindergartners who are ready for more than the half-day classroom programs offered by many public and private schools. The grant provided supplies for a stream study, gardening and worm composting activities during all four seasons.

New Albany – Plain Local Schools

“Tracking is Science”

S12M-045, \$4,934, Franklin and Licking counties, Audience: Pre-
Kindergarten – University (High School), Contact: Sandy Willmore,
swillmore@napls.us, (614) 582-9948



Created a Wildlife Tracking Expedition as a week-long summer STEM opportunity for 15 students, which was incorporated into the curriculum of five classrooms to reach at least 150 students in the fall of 2012. An evening “What is in Your Back Yard?” program was also offered to 30 local residents. Participants learned the basics of reading animal tracks and signs to understand animal behavior, and documented their findings using CyberTracker technology, to gain awareness of the presence of wildlife around them, and a better understanding of how human activity is impacting wildlife and habitat. Lessons included the use of animal tracks in forensic anthropology. By blending outdoor learning experiences with hand-held GPS and videoconferencing technology, students were able to gather, sort, analyze, report and share their findings with others, using discussion, debate and research to draw connections and conclusions.

Ohio Environmental Education Fund Statewide Sponsorships in SFY 2016

Ohio Academy of Science, *Environmental Science and Engineering Scholarship Program*, \$50,000, www.ohiosci.org.



OEEF provided environmental science and engineering scholarships to seven university students to encourage them to complete their degrees and enter professional practice in Ohio. According to Ohio EPA Director Craig Butler, “These awards encourage students to consider careers in environmental science and engineering. These fields not only offer many job opportunities, but are critical for training in advanced environmental technologies, advancing Ohio’s technical expertise and building Ohio’s future economy.”

Students in four-year programs who received a \$2,500 scholarship for 2016 include:

- Elizabeth Crowther, Bowling Green State University (Environmental Science & Chemistry), Grove City;
- Kevin Fisher, Ohio State University (Environmental Science), Macedonia;
- Max Frankenberry, Ohio State University (Evolution and Ecology), Newark;
- Emily Gillespie, Miami University (Environmental Earth Science and Geology), Granville;
- Elsa Goodsen, Notre Dame College (Biology), Coeur d’Alene, ID;
- Tyisha Hodges, Bowling Green State University (Environmental Science), St. Clair Shores, MI;
- Alyssa Jones, Ohio State University (Environmental Science), South Park, PA;
- Courtney Kourie, Ashland University (Biology), Dover;
- Kelly Messer, Ohio State University (Environmental Engineering), Chesterland;
- Alec Moore, Ohio State University (Evolution and Ecology), Massillon;
- Troy Neptune, Otterbein University (Zoo and Conservation Science/Herpetology), New Concord;
- Bridget O’Banion, Ohio State University (Environmental Science), Xenia;
- Michelle Platz, University of Cincinnati (Environmental Engineering), Cincinnati;
- Anne Roberto, Cleveland State University (Environmental Science), Mayfield Heights;
- Michaela Rogers, Ohio State University (Chemistry), Powell; and
- Amanda Seidler, Youngstown State University (Environmental Studies), Girard.
- Paul Matak, Ohio Wesleyan University (Geology), Salem
- Cole Benning (Geo-Environmental Science), Springfield, received a \$1,250 scholarship toward his two-year program at Hocking College.

This year’s student recipients have completed research or environmental work experience with projects focusing on treatment processes to reduce the amount of water in manure fertilizer, and decrease the amount of phosphorus and nitrogen that

escape from manure treated soil; magnesium concentrations in drinking water; construction site storm water runoff; fugitive dust emissions from quarry and mining operations; effects of overwinter conditions on survival and growth rate of invasive Asian Carp; validating civil engineering models for green infrastructure for storm water management; surface water – ground water interaction in Four Mile Creek; volunteer water quality monitoring; coral adaptation to changing temperatures and acidification; stable isotope ratios of bees based on variations due to plant photosynthesis pathways, temperature and water stress; and bat sonar detection surveys.

Students are selected to receive scholarships based on an academic record with at least an overall GPA of 3.0; original research, scholarship, employment, volunteering, or other unique contributions to environmental science or environmental engineering; activity in non-athletic extra-curricular activities and organizations; ability to communicate; recommendations from education and environmental professionals; and a major in environmental science or environmental engineering.

Since the program began in 2000, \$787,450 in scholarships have been awarded statewide to 321 students at 49 Ohio colleges and universities.

Ohio Environmental Education Fund Statewide Sponsorships in SFY 2016 (Continued)



Ohio Academy of Science, *State Science Day 2016*,
\$12,700, www.ohiosci.org

OEEF presented \$100 prizes to the 25 winners of the Governor's Awards for Excellence in Environmental Protection Research at this year's State Science Day at the Ohio State University on May 14. In addition, OEEF provided \$10,000 as a title sponsor of the event, the equivalent of a state championship for student science research. The primary objective of State Science Day is to provide an opportunity for young students to demonstrate their abilities and interest in science through individual experimentation and research.



**2016 Governor's Award Winners
for Excellence in Environmental Protection Research**

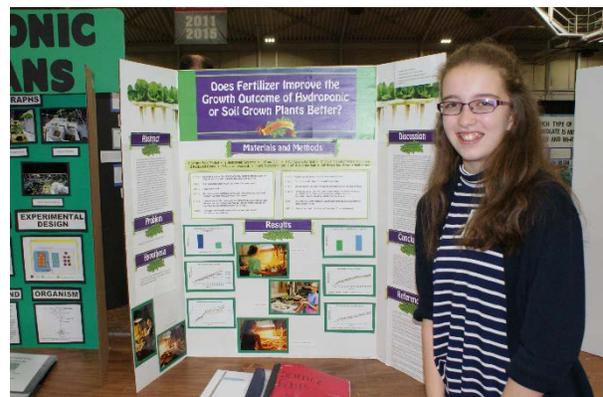
7th Grade

First Place: Ms. Mohini Parvate, Henry Karrer Middle School, Dublin
Controlling Algae Growth: To Bloom or Not To Bloom

Second Place: Ms. Olivia Rademacher, St. Columban, Loveland
Think Before You Drink: A Comparison of Water Filtration Methods

Third Place: Ms. Aileen Bracken, Incarnate Word Academy, Parma Heights
Does Fertilizer Improve the Growth Outcome of Hydroponic or Soil Grown Plants Better?

Honorable Mention: Ms. Evelyn Sarle, St. Paul, Westerville
The Effect of Limestone on Pine Trees Treated with Sulfuric Acid



8th Grade

First Place: Mr. Mukund Anand Seshadri, Village Academy, Powell
Going Green: Using Plants to Clean Up Gasoline (Phytoremediation of Total Petroleum Hydrocarbons in Gasoline Using Brassica Rapa)

Second Place: Ms. Kaylie Malloy, St. Mary, Chardon
I Have 99 Problems and Microbeads Are 1

Third Place: Ms. Adriane E. Thompson, Genoa Middle School, Westerville
Studying the Mutagenic Effects of Glyphosphate and commercial Herbicide Using the Ames Test

Honorable Mention: Mr. Ethan Kaper, Liberty Union Middle School, Baltimore
The Factors of Corn Germination



9th Grade

First Place: Mr. Maximilian J. Chmura, St. Vincent, St. Mary, Akron
The Effect of Electric Fields on Reducing Phosphate Runoff from Soybean Farmland

Second Place: Ms. Swati Bhageria, Sycamore High School, Cincinnati
Cost Effective Water Filtration Systems for Rural Areas and Developing Economies

Third Place: Mr. Travis O'Leary, Carroll High School, Dayton
Liquid Nitrogen's Effect On Oil Spills

Honorable Mention: Mr. Joshua David Alatis, Home Schooled, District 7
Testing for Maximized Hydrogen Output Using Differing Sulfate and Chloride Solutions in the Electrolysis of Water



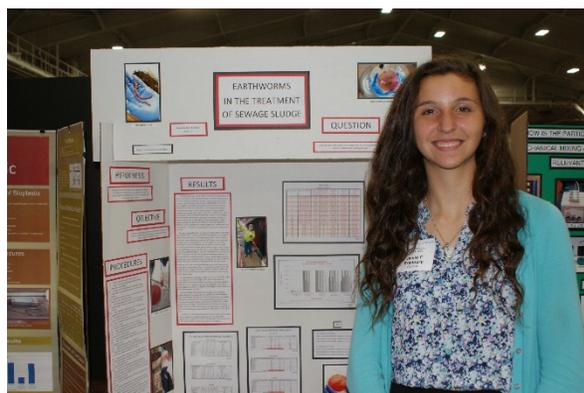
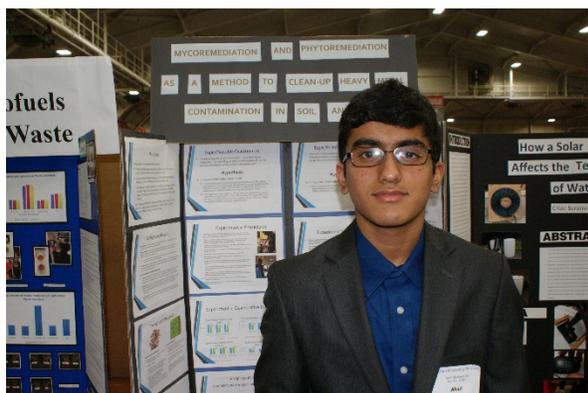
10th Grade

First Place: Mr. Akul Rajan, William Mason High School, Mason
Mycoremediation and Phytoremediation as a Method to Clean Up Heavy Metal Contamination in Soil and Water

Second Place: Ms. Alekya Raghavan and Ms. Ahalya Ramesh, William Mason High School, Mason
Farm to Fuel: The Efficacy of Biofuels from Agricultural Waste

Third Place: Mr. Kavin S. Vedamoorthy, New Albany High School, New Albany
Enhancement of Crude Oil Phytoremediation Using Biodiesel: A Comparative Assessment of Plant Metabolites

Honorable Mention: Ms. Jamie C. Bradbury, Geneva High School, Geneva
Earthworms in the Treatment of Sewage Sludge



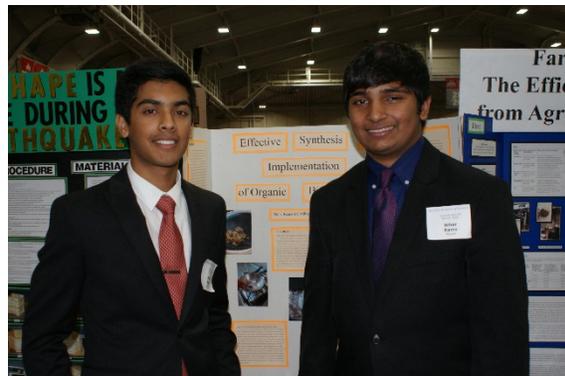
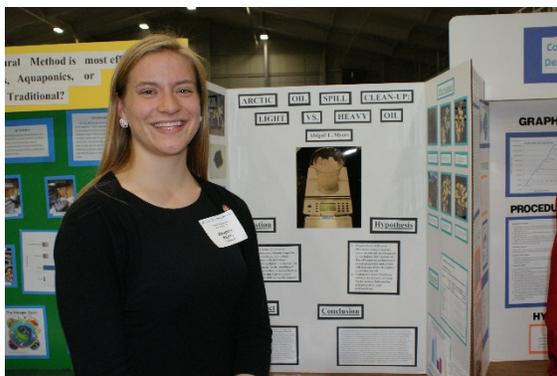
11th Grade

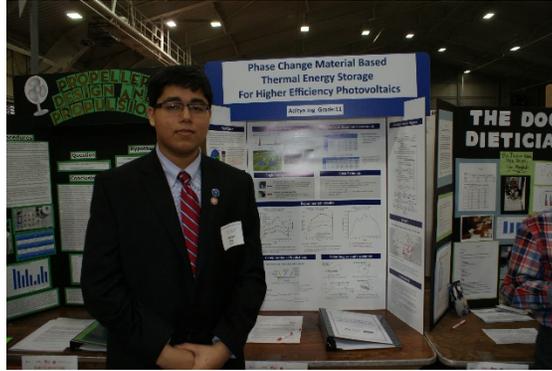
First Place: Ms. Abigail L. Myers, Big Walnut High School, Sunbury
Arctic Oil Spill Clean-Up: Light vs. Heavy Oil

Second Place: Mr. Nihar Rama and Mr. Aditya Singh, William Mason High School, Mason
Effective Synthesis and Implementation of Organic Bioplastics

Third Place: Ms. Vanessa S. Frank, Geneva High School, Geneva
Organic Filtering of Animal Compost

Honorable Mention: Mr. Aditya Jog, William Mason High School, Mason
Phase Change Material Based Thermal Energy Storage for Higher Efficiency Photovoltaics





12th Grade

First Place: Mr. Alan Fong, Sylvania Southview High School, Sylvania
Suitability of ITO as a TCO for Superstrate Configuration Perovskite Solar Cells

Second Place: Mr. Julian Aaron Liber, Sylvania Southview High School, Sylvania
The Relative Biomass Density of Invasive Plant Species in Northwest Ohio

Third Place: Ms. Shelby M. Dalton, Rock Hill Senior High School, Ironton
Water Quality: The Effects of Agricultural Runoff

Honorable Mention: Ms. Abigail E. Ambrose, River View High School, Warsaw
Microbial Catalyst: Finding a Catalyst for a Microbial Fuel Cell



Ohio Environmental Education Fund Statewide Sponsorships in SFY 2016 (Continued)

Ohio Federation of Soil and Water Conservation Districts,
Ohio Envirothon 2016, \$1,000

<http://www.agri.ohio.gov/divs/SWC/SWC.aspx#toq>



OEEF sponsored the Oral Presentation Medallion at this year's Ohio Envirothon state championship for high school teams, June 12-14 at Bowling Green State University. LaBrae High School in Leavittsburg, Ohio won this award and placed first in the overall competition. The Envirothon is the nation's largest high school environmental competition, testing student knowledge of soils and land use, forestry, wildlife, aquatic ecology and current environmental issues. Each year the Envirothon focuses on a specific environmental theme. This year's theme was "Invasive Species."



Ohio Environmental Education Fund Statewide Sponsorships in SFY 2016 (Continued)

National Engineers Week Future City Competition,
Ohio Region, \$1,000, www.futurecity.org and
www.futurecity.org/ohio



Teams from 19 Ohio middle schools built cities of the future for the 2016 state finals competition, January 16 at Columbus State Community College. This national competition for middle school teams introduces students to careers in engineering, architecture and city planning. Teams work with a teacher and engineer-mentor to design a city of the future, using an award-winning computer game, SimCity™. Teams must also build a scale model of their city, write an essay and prepare an oral presentation. Scoring for the competition incorporates realistic engineering factors, social factors such as population density and transportation needs, and environmental factors such as energy efficiency and recycling infrastructure. This year's competition essay topic was "Waste Not, Want Not." Essays must address how engineering can improve the health and welfare of the team's Future City citizens.

Students from Genoa Middle School took top honors at Ohio's Future City Competition this year, with their city Baradwysdon. The 2016 Ohio Special Award for Best Use of Water Resources Engineering (Sam Chebaro Memorial Award), sponsored by Ohio EPA, was won by the team from Heritage Middle School in Westerville, with Honorable Mention to the team from Cardinal Middle School in Middlefield. OEEF support also helped the Genoa team travel to Washington, DC in March to compete in the national Future City Competition.



Genoa Middle School with their winning model at the 2016 Future City Competition.



Ohio Environmental Education Fund Statewide Sponsorships in SFY 2016 (Continued)

Ohio Chemistry Technology Foundation, \$1,000, “Teachers, Industry and the Environment (TIE) Conference”

<http://www.ohiochemistry.org/aws/OCTC/pt/sp/tieconference>

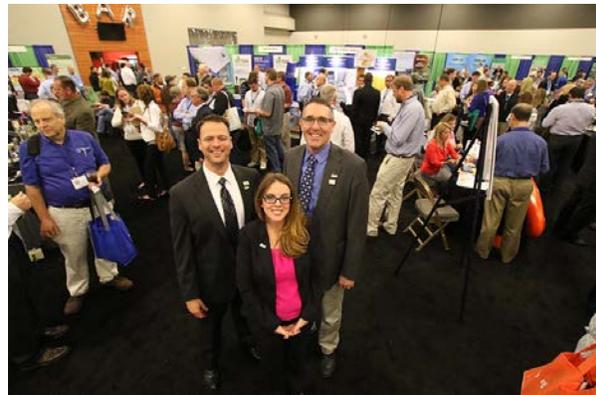
TIE is a 2½-day professional development conference giving teachers the opportunity to experience first-hand real world environmental challenges, and to learn how they are being addressed by scientists and engineers in industry and government. Established in 1993, the conference is presented each October to a select group of 60 elementary and middle school teachers from across Ohio, each sponsored by a member company of the Ohio Chemistry Technology Council. Engineers, educators and scientists from the chemical industry and Ohio EPA present environmental science in understandable, entertaining and action-packed experiments.



Ohio Environmental Education Fund Statewide Sponsorships in SFY 2016 (Continued)

Ohio Stormwater Association and Tinker's Creek Watershed Partners, "Ohio Stormwater Conference 2016," \$1,000, <http://www.ohstormwaterconference.com/past-conferences/2016-ohio-stormwater-conference/>

The annual Ohio Stormwater Conference is dedicated to advance the knowledge and understanding of comprehensive storm water management for those dealing in all aspects of planning, design, implementation and regulatory compliance. The conference provides updates on environmental issues, new technologies, regulatory information and pollution prevention. The 2016 Conference was held at the Sharonville Convention Center located in Sharonville, Ohio, May 4-6, 2016. The conference had 800 attendees, 95 exhibitors & sponsors, and over 90 presentations on Stormwater management.



Ohio Environmental Education Fund Statewide Partnerships in SFY 2016

Environmental Education Council of Ohio, \$94,775

In 1995, Ohio EPA's Office of Environmental Education initiated a long-term partnership with EECO to build statewide capacity for environmental education in ways that could not be accomplished within the confines of a short-term general grant. Through this 21 year partnership, OEEF and EECO are able to provide professional development opportunities for teachers and non-formal environmental educators, as well as quality curriculum resources aligned with the Ohio Department of Education's Learning Standards and Model Curriculum.

Environmental Career Ambassadors

For K-12 education, the partnership continues to focus on the STEM disciplines (science, technology, engineering and mathematics). In 2013 Ohio EPA and EECO joined forces with The Ohio State University School of Environment and Natural Resources to launch a new statewide network of volunteer **career ambassadors in environmental science and engineering**.

More than 400 professionals in 68 Ohio counties have volunteered, indicating their willingness to:

- *Make classroom presentations
- *Participate in school Career Days
- *Host field trips
- *Offer internships
- *Offer job shadowing opportunities
- *Mentor young professionals, and
- *Recruit additional career ambassadors

This year EECO members, Ohio EPA staff members and volunteer career ambassadors spoke with **8,544 middle school, high school and college students at 32 career fairs and career exploration days**. The partners also gave **55 classroom presentations about careers to another 1,376 students**. **Six high school and college students had the opportunity to shadow Ohio EPA employees to observe them at work.**

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COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

In addition, the partners worked with the Ohio Department of Natural Resources Division of Forestry, Project Learning Tree and Ohio Department of Education to develop a new career pathway for arborists and urban foresters, that has received the “Ohio In-Demand Job” designation and been posted on the Ohio Department of Education and Ohio Means Jobs websites, to show students and parents potential salaries and high school and college coursework needed. This joins previously created pathways for environmental scientists, geoenvironmental scientists, water plant operators/utilities directors, and petroleum engineers.



Careers roundtable for college students at the Water Management Association of Ohio 2015 annual conference



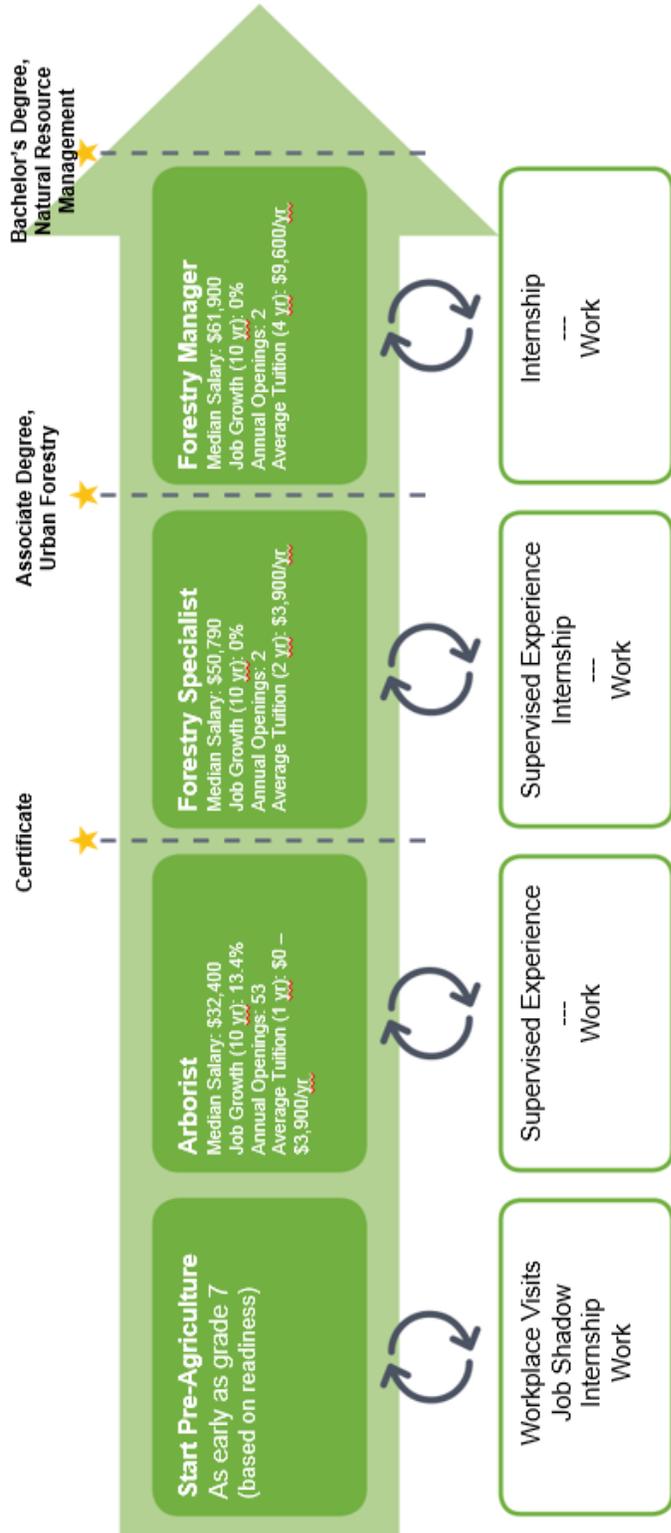
Career Ambassadors from Alloway environmental laboratories.



Ohio EPA hazardous waste inspector Dan DiMeo discusses his career with students at Licking County's combined career fair for all high school sophomores, at Denison University.



Agriculture and Environmental Systems Career Pathway



Provided by middle schools, high schools, employers, Ohio Tech Centers, and colleges.

Preparing students for multiple options after high school:

gainful employment and/or postsecondary study.



Data reflects 2014 Ohio labor statistics and public institutions of higher education for 2013-2014. For specific tuition costs, visit ohiohighered.org.

Ohio
Department of Education

Ohio
MEANS
Jobs

Ohio
Department of Education

Agriculture and Environmental Systems Career Pathway

Secondary Pathway: **Natural Resource Management**

Postsecondary Program: **Urban Forestry**

An Example of Courses with Secondary and Postsecondary Credits

Grade	English I	Algebra I	Science	Social Studies	Fine Arts	Ag, Food, & Natural Resources	
7 8	English I	Algebra I	Science	Social Studies	Fine Arts	Ag, Food, & Natural Resources	
9 10	English II	Geometry	Biology	World History	Health (.5) PE (.5)	Environmental Science	Natural Resources
11	English III	Algebra II	Chemistry	U.S. History	Forestry & Woodland Ecosystems	World Languages	
12	English IV	Trigonometry/Calculus	Physics	U.S. Government	Urban Forestry	Environmental Systems Management	
Postsecondary							
Year 1 1st Semester	English Composition	College Algebra	Computer Systems	Intro to Horticulture	Horticultural Botany	Humanities Elective	
Year 1 2nd Semester	Chemistry	Algebra II	Arboriculture	Plant Identification & Selection I	Landscape Construction	Tree Care Co-Op I	
Year 2 1st Semester	Communication	Intro to Business	Soil & Horticulture Management	Plant Identification & Selection II	Occupational Regulations & Safety	Irrigation Design & Maintenance	
Year 2 2nd Semester	Professional Selling Techniques	Environmental Earth Science	Urban Forestry	Principles of Pest Management	Social Sciences Elective	Tree Care Co-Op II	

High School Career-Technical Education Program Courses

High School Courses for Postsecondary Credit (Including Apprenticeship Hours) and the Corresponding Postsecondary Courses

Required Courses

Recommended Electives

5/2016

Visit education.ohio.gov/CareerConnections for reference information. Course titles and sequences will vary between schools.



Students learn about environmental careers from the US Army Corps of Engineers, U.S. Coast Guard and Metropolitan Sewer District of Greater Cincinnati, aboard BB Riverboats, at Riverworks Discovery's "Who Works the River?" career fair for Cincinnati area high school students.



Students learn about careers in drinking water treatment and safely managing nuclear waste, at the City of Dayton Water Department's High School Water Career Conference and the "Science Alliance" Career Exploration Day at the Fluor-BWXT Gaseous Diffusion facility near Portsmouth.



Other Workshops, Programs and School Presentations

In addition to the career activities outlined above, the partners offered **34 regional professional development workshops to 912 educators**, offering teachers certification in nationally recognized curricula such as *Healthy Water, Healthy People*, www.healthywater.org, The Leopold Education Project, <http://www.aldoleopold.org/Programs/lep.shtml>, Project Learning Tree, www.plt.org; Project WET (Water Education for Teachers), www.projectwet.org, Project WILD, Project WILD Aquatic, Flying WILD, and WILD School Sites, all at www.projectwild.org; and Wow! The Wonders of Wetlands, http://www.wetland.org/education_wow.htm. School presentations included demonstrations of water quality monitoring techniques, the EnviroScape® drinking and wastewater treatment model and Ohio Wildlife History model. EECO and OEE presenters also frequently demonstrate other hands-on models such as the EnviroScape® watershed model, storm drain models, soil tunnels and the EnVision 3100© ground water flow model at schools and teacher conferences.

Conferences

EECO's April 2016 **annual conference** at Mohican State Park featured workshops on curricula aligned to Ohio's New Learning Standards and field trips to area locations to see excellent environmental education in action. The conference showcased concurrent sessions on cutting edge topics and programs for environmental and STEM education. Friday night featured a panel discussion of the Environmental Career Ambassadors Network, Representatives from the Ohio EPA, Ohio Department of Education and MAD Scientist Associates discussed the successful initiative, its benefits to students and teachers and how the program fits with Ohio's New Learning Standards. On Saturday, Herpetologist Greg Lipps shared his experiences researching giant salamanders during his keynote address. Exhibits and presentations also highlighted Project WET (Water Education for Teachers), environmental careers and several projects funded by the Ohio Environmental Education Fund.



Regional Conferences

The partnership also provides financial support for three regional conferences for teachers and non-formal educators: the “**Winter Snow, Out We Go**” conference in northeast Ohio in February; the “**Black Swamp Educators’ Extravaganza**” in northwest Ohio in June, sponsored by a number of soil and water conservation districts; and the “**101 Alternatives to the Chalkboard**” conference in southwest Ohio in October.



Local Programs

To most effectively reach a wider audience and avoid duplication of effort, the partners work closely with local environmental educator collaboratives such as the Earth Day Coalition in Cleveland, Greater Cincinnati Environmental Educators (GCEE), Terrific Resources for Environmental Education (TREE) in central Ohio and the Tri-County Environmental Educators in the Youngstown area. These collaboratives offered **regional resource fairs** for teachers, afterschool care providers and home schoolers. The partners also exhibited or presented at **14 special events and conferences with 9,795 participants**, including the Cincinnati Paddlefest, Children’s Water Festivals in Dayton and Columbus, the Ohio Wildlife Diversity Conference and local Earth Day events. Local collaborators include soil and water conservation districts, solid waste management districts, county extension offices, health departments, zoos, nature centers, botanical gardens, and recycling and litter prevention offices. Adult education opportunities also included **seven OEEF grant writing workshops** offered around the state last year, reaching a total of **184 participants**. EECO’s assistance in hosting and publicizing these workshops has been instrumental in helping the OEEF increase the number of grants awarded in under-served counties.

Partnership Structure

A six-member **partnership steering committee** sets partnership goals in consultation with the EECO Board of Directors and the OEEF Advisory Council. The committee includes the Chief of Ohio EPA's Office of Environmental Education, and the chairmanship alternates between OEE and EECO representatives. The EECO Executive Director sits on the committee in an ex-officio capacity. The partnership supports part-time **regional directors** in each state's education regions, who work closely with teachers and environmental educators at the local level to offer workshops and share teaching resources. A network of **more than 10,000 educators state wide** helps to publicize and distribute the partnership's materials. A **partnership insert** in the EECO newsletter goes out three times each academic year to educators statewide, promoting cross-pollination between the OEEF grant programs, the products resulting from outstanding environmental education grant projects and EECO conference and workshop opportunities.

**Ohio EPA—Environmental Education Council of Ohio
Partnership Regions**



Environmental Career Ambassadors Initiative
<http://epn.osu.edu/>

Ohio's Clean Diesel School Bus Fund Annual Summary, SFY 2016



For the fall 2015 grant cycle, Ohio EPA awarded three new grants to school districts for a total of \$176,344.71, to retrofit pollution control equipment onto 28 diesel school buses. Ohio EPA estimates that these projects will reduce air pollution emissions by nearly half a ton each year: 112 pounds of particulates, 710 pounds of carbon monoxide, and 154 pounds of hydrocarbons. These benefits will compound every year that the buses remain in service.

For the spring 2016 grant cycle, Ohio EPA awarded seven new grants to school districts for a total of \$479,058.25. These grants will assist in the retirement and replacement of aging diesel school buses with new clean diesel or propane powered school buses. School bus replacement and retrofit grants are designed to protect schoolchildren and school bus drivers from the harmful pollutants in diesel exhaust. Projects are supported with funding from civil penalties collected by Ohio EPA for violations of Ohio's environmental protection laws, and a federal grant awarded to Ohio EPA from USEPA under the Diesel Emission Reduction Act.

Since this grant program began in 2006, Ohio EPA has awarded 216 grants totaling more than \$9.2 million to install pollution control equipment on 2,625 school buses statewide, install idle reduction equipment onto 1,037 buses, replace 45 aging diesel buses, and remove more than 204 tons of pollutants from the air. An alphabetical list of all funded projects is posted on the [school bus program](#) web page.

Demand for retrofits has declined because there are few eligible model year (1996-2004) buses that would still be on the road for the four years required after retrofit. For this reason, Ohio EPA ended the retrofit program in 2016 after ten successful years. Ohio EPA will continue to provide funding for replacement school buses in priority counties, through its [Diesel Emission Reduction Grant](#) program and state allocation grants from US EPA under the Diesel Emission Reduction Act.

Recipients this year include:

Barnesville Exempted Village Schools, Belmont County, \$201,258.00 to replace 9 older diesel buses with 9 propane fueled 2016 buses. #D16F-028. This grant is supported with federal DERA funds. Contact: John Blattler, 740-425-3615 or john.blattler@bevsvd.org

Black River Local Schools, Medina County, \$22,458.75 to replace one diesel bus with one new clean diesel fueled bus. #D16F-001. This grant is supported with federal DERA funds. Contact Chris Clark, 419 736-3300 x101 or cclark@blackriver.k12.oh.us

Bloom-Vernon Local Schools, Scioto County, \$79,525.00 to replace four older diesel buses with new diesel buses, #D16F-051. This grant is supported with federal DERA funds. Contact: Adam Howe, adam.howe@mail.bv.k12.oh.us 740-778-2339

Columbus City Schools, Franklin County, \$151,082 to install diesel particulate filters on ten buses. #B2016F-001. Contact Jeff Vrable, Sr., (614) 365-5263 or jvrabelsr@columbus.k12.oh.us

James A. Garfield Local Schools, Portage County, \$14,381 to diesel oxidation catalysts on nine buses. # B2016F-004. Contact: Brenda Byich, (330) 527-4250 or BByich@jagschools.org

Licking Valley Local Schools, Licking County, \$42,497.00 to replace two diesel buses with two new clean diesel fueled buses # D16F-004. This grant is supported with a combination of federal DERA funds and state civil penalties. Contact: Mickie Archer, 740 763-3775 or archerm@lickingvalley.k12.oh.us

Northwest Local Schools, Stark County, \$22,979.25 to replace one older diesel bus with a 2016 propane fueled bus. #D16F-006. This grant is supported with federal DERA funds. Contact: Raymond Gesaman, 330-854-3301 or gesaman.r@northwest.sparcc.org

Piqua City Schools, Miami County, \$89,368.00 to replace four older diesel buses with new diesel buses. #D16F-015. This grant is supported with federal DERA funds. Contact: Curt South, 937-773-4321 or south@piqua.org

Streetsboro City Schools, Portage County, \$14,244 to install diesel oxidation catalysts on nine buses. #B2016F-002. Contact: Beth Kinder, (330) 626-4909 or beth@rockets.sparcc.org

Tuslaw Local Schools, Stark County, \$20,972.25 to replace one older diesel bus with a 2016 diesel bus. #D16F-063. This grant is supported with federal DERA funds. Contact: Linda Earp, 330-837-7813 or learp@tuslawschools.org

Why Retrofit and Replace School Buses?

Research by the U.S. Environmental Protection Agency (U.S. EPA) suggests school bus commutes potentially expose children to significantly higher concentrations of pollutants than what is measured in the community's outdoor air. Children are especially sensitive to air pollution because their respiratory systems are still developing and they have a faster breathing rate than adults. The Ohio Department of Education estimates 1.3 million Ohio children ride school buses to and from school every day. While statistics show school buses are the safest way to transport

children, Ohio EPA wants to ensure they are also the cleanest way to transport children.

Federal mandates on manufacturers of new school buses beginning with the 2007 model year made these buses up to 95% cleaner than those manufactured before 2004. However, diesel engines are durable and long-lasting. It will take a long time for new vehicles to replace the heavy-duty buses currently on the road. These existing school buses could be made much cleaner by retrofitting them with pollution-control devices and by switching to cleaner fuels. The Ohio General Assembly created Ohio's Clean Diesel School Bus Fund for this purpose in 2006. The state portion of the funding comes from civil penalties that Ohio EPA collects for violations of Ohio's environmental protection laws. In SFY 2016, the fund received \$147,687.00 in penalties, all of which was awarded in grants. Administrative costs of the grant program are borne by the Ohio EPA Division of Air Pollution Control, Office of Environmental Education and Office of Fiscal Administration

Ohio Clean Diesel School Bus Fund Fiscal Activity SFY 2006-2016

Revenues Received:				Grants Awarded:
SFY	Ohio civil penalties	Federal DERA grant	ARRA stimulus grant	
2006	\$434,015.00			\$434,257.78
2007	\$726,217.00			\$681,465.68
2008	\$824,238.39			\$599,869.37
2009	\$778,386.11	\$295,230.00	\$1,730,000.00	\$1,647,674.52
2010	\$994,541.00	\$352,941.00		\$2,392,100.45
2011	\$996,542.00	\$352,941.00		\$1,355,427.79
2012	\$477,168.00	\$293,201.00		\$1,068,495.39
2013	\$175,481.10	\$257,466.00		\$429,117.53
2014	\$149,820.53	\$136,686.00		\$332,946.70
2015	\$141,535.12	\$154,722.00		\$262,808.20
2016	\$147,687.00	\$244,031.00		\$176,344.71
2017		\$240,830.00		\$479,058.25
TOTAL	\$5,845,631.15	\$2,328,048.00	\$1,730,000.00	\$9,859,566.37

Note: Grant awards appear to exceed revenues in FY 06 because grantees received 90% payments. Final 10% payments were made as projects were completed into the following FY. Ohio EPA reports totals for the FY they are announced and contracts signed. Because of project modifications approved and buses dropped for technical reasons, actual total amount expended is just over \$8.3 million.

State School Bus Funds Leveraged Additional Federal Dollars

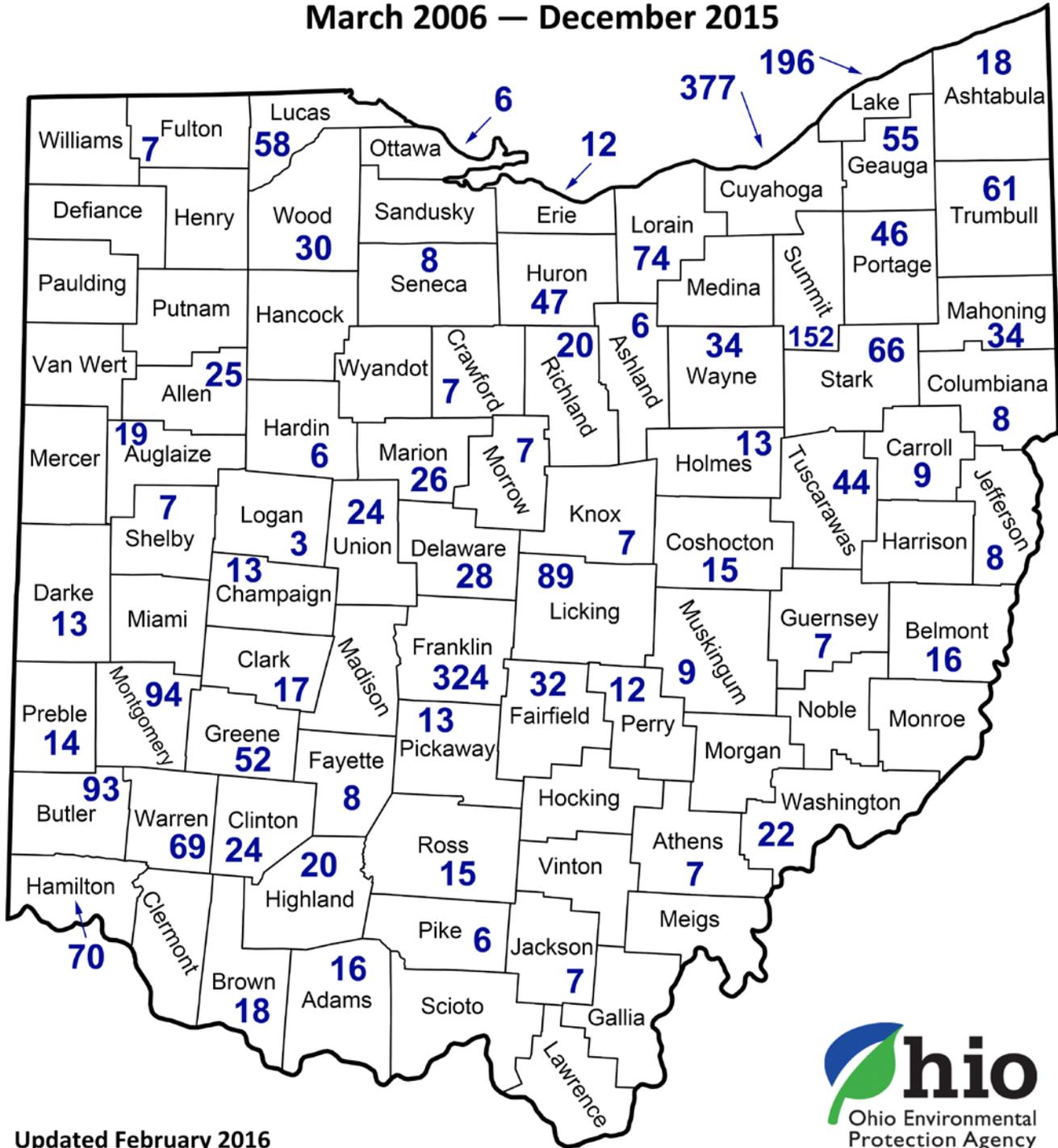
Over the ten-year history of the program, Ohio EPA used \$5.85 million in state civil penalty dollars as the required state match to leverage \$4.05 million in additional federal funds from US EPA under the Diesel Emissions Reduction Act (DERA).



For additional information about diesel emissions from school buses and other clean diesel opportunities, consult U.S. EPA's Clean School Bus USA website, at www.epa.gov/cleanschoolbus/.

For additional information about recent research into health effects, consult the University of Cincinnati's Childhood Allergy and Air Pollution Study website, at <http://eh.uc.edu/ccaaps/>.

**Ohio Clean Diesel School Bus Fund
Number of School Buses Retrofitted
with Emission Controls by County
March 2006 — December 2015**



Updated February 2016



