

# EECO

Environmental Education Council of Ohio



Summer 2019

Storm Water Education



## Planting a Healthier Community

By Licking Soil and Water Conservation District

Ohio is growing. This growth literally paves the way for new infrastructure like roads, parking lots, and sidewalks. These impervious surfaces cause a lot of problems with regard to stormwater quantity and quality.

We built stormwater infrastructure to channel water away through curbs, gutters, drain pipes, and outfalls to nearby lakes and streams. Unfortunately these human-made structural controls don't always work as well as natural systems. Let's consider an additional tool that we can easily implement into our stormwater infrastructure - trees! We all see and use them for their aesthetic and economic values along our streetscapes and neighborhoods, but let's consider their benefits as a stormwater control measure.

If form follows function, trees have a larger role than just enhancing the look of our community. Integrating a whole forest of trees through urban landscapes can have a tree-mendous impact on stormwater volume and value.

Because of a tree's size it interacts with the urban hydrologic cycle. Every part of the tree captures precipitation, from holding the soil in place with its roots, to soaking up excess water and releasing it through evapotranspiration. Deep root systems allow water to infiltrate down through the soil, contributing to the water table.

A tree's leaves and branches provide ground cover which lessens the impact a hard rain has on the ground. Trees also increase the amount of organic matter in topsoil through the loss of their leaves, helping the soil become more sponge like. This loose spongy soil readily absorbs water and reduces soil erosion. Additionally, the more trees an area has, the more pollutants from impervious surfaces can be filtered before stormwater enters our waterways.

We really can pave the way for a healthier community by planting trees in and around our neighborhoods.

## Save the Date

### *OEEF Grant Deadlines*

Letter of Intent July 9 & Application Due July 16

### *Wet N WILD in the Parks Educator Workshop*

June 17-19, Summit County. For info and registration, contact [gleaster@sbcglobal.net](mailto:gleaster@sbcglobal.net) by June 7

### *Advanced Wonders of Wetlands Workshop*

June 24-26, Old Woman Creek National Estuary. Visit [geaugaswcd.com](http://geaugaswcd.com) for details and registration

### *EE Certification Class*

July 15-19 at Old Woman Creek National Estuarine Research Reserve near Huron. [eeco-online.org](http://eeco-online.org)

### *Project Learning Tree Facilitator Workshop*

July 16 & 17 in Canton, Ohio

### *Healthy Water, Healthy People/ Level 1 Data Collector*

August 8, Wildwood Metropark, Toledo

### *Teachers, Industry and the Environment Conference*

October 9-11, Columbus (see inside)

### *"101 Conference*

Oct 12, Camp Kern, Oregonia

Details will be posted at [eeco-online.org](http://eeco-online.org) soon

### *48th NAAEE Annual Conference*

October 16-19, Lexington, Ky

### *Annual Conference*

April 3-5, 2020 at Hueston Woods State Park

# 2019 EECO Awards

Each year EECO recognizes individuals and organizations that are providing exemplary EE and striving to preserve our natural environment in Ohio.



## ***Finlay-Johnson Award***

- given to an EECO member for making a significant or outstanding contribution to EECO.

Jennifer Dennison,  
***ODNR Division of Wildlife***

(left of Jen is Josh Dyer- EECO President)



## ***Outstanding Environmental Educator in the field of formal education***

Given to a preschool, elementary, middle school, high school or college teacher, administrator or curriculum specialist for outstanding contributions to EE in Ohio.

David Murdock,  
***Champion Local Schools***



## ***Outstanding Environmental Educator in the field of nonformal education***

Given to a nonformal educator for outstanding contributions to environmental education in Ohio.

Greg Emmert,  
***Homerville KOA***



## ***The Charley Harper Award***

Given to an artist who has made a significant or outstanding contribution to EE in Ohio through various forms of art.

Michelle Stitzlein  
[www.artgrange.com](http://www.artgrange.com)



## ***The President's Award***

Given to a member of the organization that has shown special dedication to EECO or was a great influence or mentor to the current President of EECO.

Amanda Kriner,  
***Richland County Park District***

(with Alli Shaw & Josh Dyer)



## ***Outstanding Volunteer Award***

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

Joe Oswald,  
***Five Rivers Metro Park***

# Save the Date

## EECO 2020 Annual Conference

“EE 2020 The Vision of the Future”  
April 3-5, 2020 • Hueston Woods State Park

More information including registration will be made available later in the year at <https://eeco.wildapricot.org/>

## Ohio EPA Introduces New Environmental Recognition Program for Schools

Ohio EPA Director Laurie A. Stevenson introduced the Encouraging Environmental Excellence in Education (E4) program April 22 at Heritage Middle School in Newark as part of an Earth Day celebration with Governor Mike DeWine.

“It’s great to see students learning practical skills to help take care of our planet,” said Governor DeWine. “We must all make a commitment to protecting our environment, and we appreciate the efforts of Ohio’s schools in getting students involved.”

Heritage Middle School was recognized for demonstrating its students’ commitment to environmental stewardship and developing education curriculum through its in-vessel composting, greenhouse, and STEM-team projects. Director Stevenson also recognized Newark High School and Carson Elementary in Newark.

The E4 program recognizes any K-12 public or private school for its achievements in environmental stewardship and efforts to educate students on environmental topics. The program has three recognition levels: root, branch, and leaf, which are based on how many of the “three R” environmental principles (reduce, reuse, and recycle) the school is incorporating in its curriculum or school activities. Schools can apply at any time through an online application.



*Ohio EPA Director Laurie Stevenson (center) presents Encouraging Environmental Excellence in Education award to Heritage Middle School Students in Newark on Earth Day.*



*Newark High School students display the E4 flag awarded to their school on Earth Day for their composting and sustainable gardening efforts.*

“We want to provide an opportunity for schools to receive recognition for incorporating environmental principles into their curriculum or as part of extra activities, and we wanted to make it easy for schools to apply,” said Ohio EPA Director Laurie A. Stevenson. “We have taken the success of our Encouraging Environmental Excellence program and adapted it to schools.”

The new recognition program is based on the Encouraging Environmental Excellence program, which recognizes businesses, nonprofits, and government agencies for going above and beyond compliance with requirements while demonstrating environmental excellence.

To learn more about the E4 program, go to [www.epa.ohio.gov/ohioe3.aspx](http://www.epa.ohio.gov/ohioe3.aspx) and click on the “Education” tab or contact the Ohio EPA Office of Compliance Assistance and Pollution Prevention at 1-800-329-7518.

# 101 Alternatives to the Chalkboard Educators Conference

Saturday October 12th  
at YMCA Camp Kern, Oregonia



Optional events on Fri Oct 11 and Sun Oct 13.

\$30 for all 3 days Includes all sessions, programs, meals, and overnight accommodations.

Scholarships and discounts available

Email Dave Moran to register [dmoran@daytonymca.org](mailto:dmoran@daytonymca.org)

More details will be posted at [www.eeco-online.org](http://www.eeco-online.org) soon.

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

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.

## Project WET and Healthy Water, Healthy People

Project WET and Healthy Water, Healthy People - June 5, Hilliard City Schools (Franklin County). Contact Linda Pettit 614-486-9613 to register and for additional details.

Project WET - June 18, Waterworks Park (Summit County). Contact Gene Easter 330-928-6691 to register and for additional details.

Project WET - June 18 and 19, Watershed Management Office (Franklin County). Contact Linda Pettit 614-486-9613 to register and for additional details.

Project WET and Healthy Water, Healthy People - June 19, Infirmary Mound Park's Bradley Center (Licking County). Contact Michelle Illing 740-670-5330 to register and for additional details.

Project WET - July 8, Cuyahoga SWCD (Cuyahoga County) . Contact Jacki Zevenbergen 216-503-1338 to register and for additional details.

## Ohio Pollinator Habitat Initiative Symposium

August 22, 2019

Ohio Expo Center, Columbus



Knowledgeable Speakers, Including:

- Rob Davis, Director of Center for Pollinators in Energy at Fresh-Energy
  - Adam Baker, PhD Candidate, Department of Entomology at University of Kentucky
  - Brock Harpur, Assistant Professor, Department of Entomology at Purdue University
- Reed Johnson, Associate Professor, Department of Entomology at The Ohio State University

**Cost:** \$45 includes a continental breakfast and lunch.

[www.eventbrite.com/e/2019-ohio-pollinator-habitat-initiative-symposium-tickets-61306418147](http://www.eventbrite.com/e/2019-ohio-pollinator-habitat-initiative-symposium-tickets-61306418147)

# The Occurance and Impact of Microplastics in Freshwater Ecosystems

By Bryan Rego, student at University School

An emerging concern in aquatic environments is the accumulation of plastic debris, specifically microplastic. Microplastics are defined as any fragment, fiber, bead, or foam smaller than 5 mm, and are of special concern because they can bioaccumulate up the food web more readily than larger particles. There are five main groups of microplastics: fibers, fragments foams, films, and beads. Fibers make up 71% of all microplastics found in the tributaries going into the Great Lakes. These fibers come from synthetic clothing that decays in the washing machine process. It is estimated that as many as 250,000 fibers are released during a washing of a few fleece jackets. Researchers have documented that microplastics can emit and transmit toxins, cause blockage in marine creatures' digestive tracts, and transport microbial life forms.

The objective of my study was to see how freshwater mussels interacted with microplastics. I wanted to see how different concentration of microplastics affected their ingestion and to see if there were any observed negative effects of ingesting microplastics.

Live freshwater mussels were purchased from an online supplier and divided randomly into nine sets of 12 mussels. Each set of 12 was then divided randomly into two sets of six mussels. Each set of six mussels was placed in one of two 25-gallon mesocosms, filled with 25 gallons of distilled water and kept at 180°C. Daphnia food and algae were added. Premade microplastics were added to one mesocosm (the exposure tank) and no microplastics were added to the other (the control tank). Three levels of microplastic exposure, over a two-week exposure period, were evaluated: 2 pieces of microplastic per gallon; 6 pieces of microplastic per gallon; and 10 pieces of microplastic per gallon. Each of the three microplastic exposure concentrations were evaluated three times using a new set of mussels each time.



After the two-week exposure period, the mussels were dissected and gills and other organs were massed separately. The different tissues were then placed in a beaker and a wet oxidation using 4N KOH and 30% hydrogen peroxide. The contents were then filtered using a 0.3mm screen and a Büchner flask to drain the liquid, leaving all of the undigested material behind. The remaining material was then examined under a dissecting microscope to determine whether it included microplastics. Any microplastics were counted and sorted by type of microplastic.

To date three treatments of the different exposures have been completed. Microplastics were found in 19% of the exposed mussels. There were four types of microplastics detected: fibers, foam, beads, and fragments. All microplastics were the same color and texture of the added microplastic fibers. Five of 48 exposed mussels had microplastics in their gills; three had inflamed gills and one died with microplastics in its gills before the end of the two-week exposure period. The mussels with inflamed gills had a lower average mass compared to the other exposed mussels. None of the control mussels had inflamed gills. Microplastics were found in the other organs of 5 of 48 exposed mussels. No inflammation was detected in the mussels with microplastics in organs other than the gills. A 2.66 g lower body mass was detected in mussels that had microplastics compared to the mussels that did not show evidence of ingesting microplastics (t-test  $p = 0.005$ ). It was also found that there was an increase in the amount of microplastics ingested with an increase in concentration.

The mussels also generally ingested more microplastics with an increase in concentration and ingested the different types of microplastics at roughly the same proportion of microplastics added to the exposure tanks. This possibly means that if large enough quantities of mussels were studied, they might provide an accurate representation of the ingestible microplastics present in the water column.

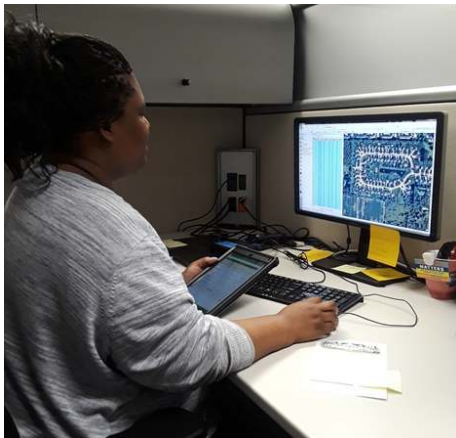
The observed decrease in mass and inflammation of gills is consistent with reports for saltwater mussel species. It is not proven that the microplastics caused a loss in body mass, because it is also possible that smaller mussels are just more likely to ingest microplastics. Since all of the mussels used in the study were roughly the same size (in shell length), this suggests that there was something causing these mussels to be smaller. It seems plausible that freshwater mussels are negatively affected by microplastics caught in the gills.

**Bryan Rego and Thomas Butler presented their research at the Student Wildlife Research Symposium on April 4 during the EECO Annual Conference.**

# GIS at NEORSD Northeast Ohio Regional Sewer District – More Than Just A Map

By Jessica S. Cotton, GISP, GIS Technician Watershed Programs (NEORSD) – Northeast Ohio Regional Sewer District and Vice President (NEOGEO) Northeast Ohio Geospatial Education and Outreach

Historically, District staff have used many mechanisms to access, collect, analyze, and manage data including text documents, hand drawn maps, and spreadsheets. It can be difficult to picture data and perform analysis (such as trending, comparisons, and geographic concepts) from a mere table of numbers. However, with the use of Geographic Information System (GIS) maps and applications, it is much easier for staff and stakeholders to visualize



maps that makes mundane data come to “life.” As a GIS Professional, I am often asked to transform data in an innovative way to help improve processes to increase information access and analysis, as well as support our business activities. GIS gives us a great toolset to allow us to work smarter, and not harder as we compile mega data from a myriad of sources.

A geographic information system (GIS) is a framework for gathering, managing, and analyzing data. GIS is not just a computer system or piece of software but a combination of hardware, software, personnel, processes, and applications that can collect, store, manipulate, analyze, and display geographically-referenced data. With this unique capability, GIS reveals deeper insights into data, such as patterns, relationships, and situations helping users make smarter decisions.

GIS services is not a new phenomenon. For over 20 years, NEORSD staff and consultant teams have used GIS software produced by (ESRI) Environmental Systems Research Institute. In 2012, ESRI released the ArcGIS Online Platform allowing NEORSD’s GIS Services Team to adopt the software to begin to rapidly create, develop, and implement highly-functional, well-organized, and easy-to-use GIS maps and applications to both internal and external stakeholders. The ArcGIS Online platform includes many tools including: ArcGIS Desktop (for “power” GIS users, which is considered an expert in the field), Collector/Explorer (for mobile access and data collection), and Operations Dashboard (to allow the decision-maker to access and analyze data in a “real-time” fashion). These tools provide more effective and efficient access and analysis which helps District staff make informed decisions.

GIS data and applications are used in many business functions of the District. Let’s highlight a few key programs:

- **Regional Stormwater Management Program** - Using GIS provides our customers with accurate stormwater information by digitizing impervious surfaces to analyze and calculate accurate stormwater fees. Stormwater Fee data maintenance and reporting is done using a Stormwater Fee Toolset.

- **Collection System Infrastructure (CSI) Information** One of the most used GIS applications is the CSI viewer which has shared data for internal and external stakeholders. It is used extensively by Sewer System Maintenance & Operations, Engineering and Construction, Cuyahoga County Department of Public Works, and many of the District’s consultant teams. This allows users to access sewer plans, inspection reports, inspection vid-



*Green Infrastructure Grant Program GIS Storymap  
– Public access to view from our NEORSD internet.  
<https://neorsd.maps.arcgis.com/apps/Shortlist/index.html?appid=efd0ff60d52f4860978c5bb4098cb3d9>*

eos, and many other datasets related to the District's local combined, sanitary, and storm sewers.

- **Water Quality** - Our WQIS (Water Quality & Industrial Surveillance) team along with the local County Board of Health collaborate to track illicit discharges (flow that enters the municipal system that is not composed entirely of stormwater) and stormwater outfall inspections.

Working in GIS mapping allows for a visual interpretation of data. I love helping others to better understand trends, impacts, and areas for improvement or tracking success by using GIS software and tools. There are many opportunities in this STEM field that have yet to be imagined. This is the perfect career for someone who has a knack for patterns, numbers, research, and the ability to tell a story through data!



*Jessica S. Cotton (right), Crystal Davis (middle), and Chris Hartman (left), using ESRI GIS Survey 123 in the field to complete data for the NEORS Green Infrastructure Grant Program.*

## Help EECO Grow

Would you like to help further environmental education in Ohio? Consider contributing to EECO. All donations are tax-deductible and will help increase awareness of environmental issues in Ohio. Find out more at <https://eeco.wildapricot.org/support>



Other ways to support EECO:

- **Amazon Smile.** Select the "Environmental Education Council of Ohio" as your charity. Log into Amazon Smile every time you shop at Amazon.
- **Goodshop.** You can also shop hundreds of popular retailers at Goodshop, purchases will benefit EECO.
- **Direct Donation.** You can make a direct donation through your Google account. Your full donation goes directly to EECO.
- **Legacy Donation.** Consider a legacy donation to EECO's endowment fund at The Columbus Foundation.



## Environmental Career Ambassadors

Environmental Career Ambassadors are environmental professionals willing to make classroom or school career fair presentations for middle and high school grades about their careers and/or provide shadowing, internship, field trip and scholarship opportunities.

This career initiative was created to address various needs in Ohio. For instance, there is an emerging need to prepare students in fields emphasizing Science, Technology, Engineering and Mathematics (STEM) for careers in today's high-tech economy. This initiative will also aid employers looking to hire professionals in environmental science and engineering as there is a reported shortage of qualified applicants.

**Teachers**• If you are interested in finding out about the Career Ambassadors available in your area, please contact us at [director@eeco-online.org](mailto:director@eeco-online.org).

**New Career Ambassadors Needed**• If you would like to be more involved by volunteering to be a Career Ambassador you can fill out this form and email back to us at [director@eeco-online.org](mailto:director@eeco-online.org).

The Environmental Career Ambassador (ECA) Initiative was created by the Environmental Education Council of Ohio (EECO) and the Ohio Environmental Protection Agency with the assistance of the Ohio State University School of Environmental and Natural Resources. Find out more at <https://eeco.wildapricot.org/eca>

# “What Do the Bugs Say?” About the Water Quality of the Scioto Brush Creek Watershed

By Shannon Browning, Northwest High School, McDemott, Ohio

My name is Shannon Browning and I am a senior at Northwest High school in Scioto County, Ohio, I will be attending Wilmington College in the fall of 2019 and I will be majoring in Biology with a concentration in Environmental science and minoring in Agriculture. My project started in 2016 through a Future Farmers of America (FFA) requirement called a supervised agricultural experience (SAE). The Friends of Scioto Brush Creek were the main reason why I had picked this project since I had just really started volunteering with them and finding my passion for the environment. I chose to do this project to see what the water quality of the Scioto Brush Creek watershed was but after my first year of doing chemical and biological sampling, I switched to just biological sampling.



*Stonefly nymph*

In the time period of March 2018 to February 2019, I have collected a whole year worth of data and it shows that the water quality is in excellent condition. The way that I determined this is through the aquatic macroinvertebrates that are found in the stream. I used the ODNR Stream Assessment form to score the creek after I collected a sample and by using this method I found that the mainstream of Scioto Brush Creek was in excellent condition since it was almost constantly receiving a rating of 22 or higher.

On May 2-3, 2019 I was selected to go to Ohio State FFA Agriscience Fair and compete with this project which then received a silver rating and third place, the Student wildlife research symposium helped me with that since there were people there who were able to ask questions and were knowledgeable on the subject and that helped me prepare for my interview at state level competition.

This project has helped me find my passion for more than just the environment as it has also allowed me to teach the 7th grade agriculture students at our local middle school about the watershed and how they impact it and they can become citizen scientist, so this project has helped me find my future career paths in education and biology.

Find out more about biological sampling at:

- <http://watercraft.ohiodnr.gov/sqm>
- <https://epa.ohio.gov/dsw/bioassess/ohstrat>



*Dragonfly nymph*

## Water Monitoring Programs

By Lynn White, Butler Soil and Water Conservation District

Throughout the state there are numerous citizen science groups that monitor water quality in their area. Some test the chemistry, some the biology. In SW Ohio, we have four groups:

- Saturday Stream Snapshot (Little Miami River). Chemical.
- Butler County Stream Team (samples from multiple rivers/creeks in Butler County). Chemical and Biological.
- Citizens Water Quality Monitoring Program (Lower Great Miami River). Chemical
- Mill Creek Watershed Group. Chemical.

The Butler County Storm Water District brought the groups together to share data with the public through [streambank.info](http://streambank.info)

This website provides a secure online backup of data and allows participating groups to make their data visible to a wide audience. The goal for the StreamBank Regional Water Quality Database is to provide sound water quality information, collected by volunteers, to the general public, academia, resource agency staff and local decision makers. Although, the initial members of StreamBank are located in Southwest Ohio, but it is hoped that other groups across the state and region will take advantage of this service. If you are interested in posting your data on the site, please contact Bob Lentz at [lentzb@stormwaterdistrict.org](mailto:lentzb@stormwaterdistrict.org).



# “Only Rain Should Go Down the Drain” Presenting the Stormwater Message

By Linda Petit, Franklin Soil & Water Conservation District

Though many of us pass by storm drains on a daily basis, driving around town or to and from school and work, many people are not aware of what they are and where that rainwater goes. Models and simulations are a great way to inform the public about storm drains and stormwater runoff. These visual representations of runoff, erosion and non-point source pollution are effective tools to enhance awareness in both students and adults.

The EnviroScope watershed model is an excellent tool to engage students and the public in the relationship of how what we do to the land affects the quality of the water around us. The model includes a storm drain and locations for erosion and other non-point sources of pollution. Simple household



items like salt, cocoa powder, coconut and chocolate sprinkles can be used to simulate fertilizers, soil, litter and dog waste. The participants quickly see the effect of rain on this situation as they squirt the watershed with a water bottle. If purchasing a model like this is not in your budget, or you want to personalize it a bit, a plastic storage bin with storm drains cut in various locations and duck tape or fabric enhancements can portray a similar message.



Erosion is large contributor to our water quality issues, but is not something that is in the public eye. A simple demonstration with an erosion simulator can bring this issue to light. Using simple stacking shelves, plastic bread pans with holes drilled in them and tool bins on a board for elevation creates a very effective display of the effect rain has on different surfaces. A typical comparison is between bare soil, mulched soil and grass growing in the soil. The addition of a hard surface, such as a shingle or plastic cover cut to shape can demonstrate the difference between pervious and impervious surfaces.



The “dry stream” model is a fun way to portray stream habitats and the importance of water quality. Blue fabric, astroturf runners, nylon tulle, plastic plants and Styrofoam rocks can create a realistic stream set up. This can be used as an indoor stream study site when the weather is bad or field trips are not an option. Other uses include a scavenger hunt for come and go family events or the setting for stories like *Crawdad Creek* by Scott Russell Sanders for school programs. The addition of a pipe outlet and brown netting reinforces the storm drain and storm water message.

The concepts of stormwater runoff and storm drains versus the sewer system are vague at best. Models and simulations can take these abstract concepts and create concrete representations for the public to interact with, witnessing the results. As Benjamin Franklin said “ Tell me and I’ll forget, Teach me and I’ll remember, Involve me and I’ll learn.” This is a good philosophy to follow when preparing educational displays and outreach events!



Contact Linda at [LPetit@franklinswcd.org](mailto:LPetit@franklinswcd.org)

# Ohio Environmental Education Fund

The Ohio Environmental Education Fund (OEEF) invites applications for mini grants (\$500 - \$5,000) and general grants (\$5,000 - \$50,000) for education projects targeting pre-school through university students and teachers, the general public, and the regulated community. The Request for Proposal for the July 2019 grant cycle is expected to open in late May, with some updates expected to the application guidelines posted at <https://epa.ohio.gov/oe/>.

Prospective applicants can start the application process by opening an account in Ohio EPA's eBusiness Center at <https://ebiz.epa.ohio.gov/>.

Ohio EPA encourages OEEF applicants to discuss their proposal ideas with OEEF staff members before completing their applications. OEEF staff members will be happy to provide a pre-review of draft applications as they are under development in the online grant service.

**Electronic Letter of Intent Deadline is July 9, 2019 at 5:00 PM**  
**Application Deadline is July 16, 2019 at 5:00 PM**



## Grant Writing Workshops

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

- **Grant Writing 101: Finding the Right Funder.** Prospecting tips to help you identify foundations, corporations, and government grant programs, and how to approach different kinds of grantmakers.
- **Grant Writing 102: Writing a Winning Proposal.** How to avoid common mistakes applicants make, and develop realistic objectives, activities and budgets. OEEF will be referred to during this session.

## Upcoming 101/102 workshops

**September 5**, 9 am - 3:30 pm at the Ottawa SWCD in Oak Harbor

**October 3**, 9 am - 3:30 pm at Belmont College in St. Clairsville

Contact [Dennis.Clement@epa.ohio.gov](mailto:Dennis.Clement@epa.ohio.gov) to register.

## General Grant Awards, Spring 2019

For the spring, 2019, funding cycle, Ohio EPA awarded the following five general grants, for a total of \$177,914.

### **Black Swamp Bird Observatory, "Ohio Young Birders Club Expansion," \$35,000**

BSBO developed the Ohio Young Birders Club (OYBC) in 2006 to encourage, educate, and empower Ohio's youth leaders in research, education, and conservation disciplines. The OYBC program explores the value of healthy environments, and ultimately inspires youth members to advocate for conservation. Chapter Advisors coordinate monthly outdoor activities for members, including field trips and service projects. Examples of service projects include: Ohio Lights Out monitoring, conducting a "BioBlitz" to inventory all flora and fauna in specific habitats, habitat restoration, nest box construction and monitoring, invasive plant removal, design and installation of bird feeder systems at schools, bird population monitoring, and public education through speeches and presentations. Students provide content for OYBC's newsletter, GOLDEN-WINGS, and participate in OYBC's keystone event, the annual Ohio Young Birders Conference.

### **St. Clair Superior Development Corporation, "Microgrid Engineers of Tomorrow," \$23,112**

Cuyahoga County, Contact: Philip Hewitt, [phewitt@stclairsuperior.org](mailto:phewitt@stclairsuperior.org), (216) 881-0644

The first objective of Microgrid Engineers of Tomorrow is to expose 40 teens to the environmental sciences and careers in environmental engineering through the lens of sustainable community development projects that affect the most pressing environmental issues in Ohio's inner cities. Students will complete career planning exercises, paired with professional speakers and field trips highlighting environmental engineering career paths. Finally, utilizing the St. Clair Plaza as a hands-on classroom, the teens will complete photovoltaic training and gain hands-on education assembling a real residential capacity microgrid.

## Good Luck, Jeff!

His heartbroken colleagues in the Office of Environmental Education would like to wish Jeff Montavon many splendid new adventures as he moves to a position in Ohio EPA's Division of Materials and Waste Management. Always a snappy dresser, Jeff received EECO's highest award, the Finlay Johnson Award, in 2018. He was a frequent contributor to this newsletter, and chaired the Annual Conference committee several times.

Jeff's email is still [Jeffrey.Montavon@epa.ohio.gov](mailto:Jeffrey.Montavon@epa.ohio.gov) but his new phone number is 614-728-5357.



## General Grant Awards Continued

### **Hefner Museum, Miami University - Biology, "Sowing SEEDS II," \$39,234**

Butler County, Contact: Julia Eileen Robinson, [robins48@miamioh.edu](mailto:robins48@miamioh.edu), (513) 529-4618

Sowing SEEDS II (Science, Environmental Education, Discovery and Synthesis), is a two-year program using Hefner Museum's discovery center, the Imaginarium, to continue the Early Childhood Environmental Educator Certificate, previously supported by OEEF. The new grant will also expand the credential program to include a Middle Childhood Environmental Educator Certificate for students teaching grades 4-9. Both certificate programs will stress effective pedagogy and content knowledge. After completing training, undergraduates will become certified environmental educators for their grade levels and receive an Outdoor Area Kit (OAK) to use in their teaching experiences. Like a mighty oak that sows its seeds widely, this program exhibits far-reaching benefits. As undergraduates, every cohort of teachers will positively impact 2,000 young children; each individual will reach 25 children/year. By June 2029, 32 participants will have positively influenced 6,200 children.

### **The Nature Conservancy, "Engaging Teachers and Students in the Oak Openings," \$39,278**

Lucas County, Contact: Ashlee Decker, [ashlee.decker@tnc.org](mailto:ashlee.decker@tnc.org), (419) 455-4192

Approximately 30 primary and secondary school teachers working in the Oak Openings Region will be trained and receive materials and/or bus funding to implement existing Oak Openings lesson plans. Created through a Stranahan Foundation grant, these lesson plans meet the current Ohio Department of Education's learning standards. The lesson plans can be viewed at [www.oakopenings.org/resources/educators](http://www.oakopenings.org/resources/educators). Using the Oak Openings lesson plans, at least 600 students will learn the value and uniqueness of their local ecosystem, i.e. one of the worlds "Last Great Places". Teachers will demonstrate successful implementation of the lesson plans by creating an Oak Openings digital portfolio that will be reviewed by the Green Ribbon Initiative Education and Outreach subcommittee and shared via an Oak Openings Education Summit.

### **HSTW Ohio Network, "Rural STEM Collaborative Energy and the Environment," \$41,200**

Ashland, Huron, Lorain, Medina and Wayne Counties, Contact: Diana Lee Rogers, [hstwdr@gmail.com](mailto:hstwdr@gmail.com), (614) 668-0686

The project will provide opportunities for 250 underserved/underrepresented rural middle school students from five rural school districts in northeast Ohio, to think big and look toward the future as they explore sustainable solutions to our energy needs and investigate the impact of energy on our lives and the world. Students will design and model alternative energy sources and evaluate options for reducing energy consumption while focusing on clean water, clean air and a sustainable world. District leaders will collaborate. Teachers will be networked and trained in Project Lead the Way (PLTW): Energy and the Environment, Project WET and Project WILD. The curriculum is aligned with Ohio Learning Standards in Science, and builds on existing efforts by the five rural school districts to build a K-12 STEM education pipeline with local, state and national STEM/EE partners and businesses. A replicable model will be shared with other rural schools, HSTW network, Ohio School Boards and OSLN.

# Mini Grant Awards, Spring 2019

For the spring 2019 funding cycle, Ohio EPA awarded the following 9 mini grants, for a total of \$32,896.

## **Bulls Run Nature Sanctuary and Arboretum, "Bulls Run Rain Garden," \$4,151**

Butler County, Contact: Sarah Meadows, [smeadows031@gmail.com](mailto:smeadows031@gmail.com), 513-332-7982.

This project will create a Rain Garden to educate the community about native habitat and storm water retention. The Rain Garden will allow us to host workshops for the general public, educate schoolchildren on fieldtrips, and provide a resource for nearby Master Gardener interns. The rain garden will be located next to a shelter near the park entrance where an educational sign will also be placed to inspire park visitors. Sanctuary receives over 40 daily visitors, 400 special program attendees and an estimated 1,500 visitors annually.

## **Butler Soil and Water Conservation District, "Aerial Imagery Conservation Education Program," \$4,928**

Butler County, Contact: Madeline Maurer, [maurermr@butlercountyohio.org](mailto:maurermr@butlercountyohio.org), 513-785-6664.

Aerial Imagery Conservation Education Program will educate landowners and farmers on the natural resources concerns found on their property. In addition, it will provide hands-on educational opportunities for children to experience technology used for conservation purposes. This program will also enable Butler SWCD to produce high-quality images and video to create education materials regarding invasive species control, restoration opportunities, and the importance of conserving our natural resources. A potential audience of over 2,000 landowners could take advantage of this program.

## **City of Delaware Public Utilities Department, "Delaware Run E. Coli Monitoring," \$2,241**

Delaware County, Contact: Caroline Cicerchi, [ccicerchi@delawareohio.net](mailto:ccicerchi@delawareohio.net), 740-203-1905.

The City of Delaware Public Utilities Department is partnering with Ohio Wesleyan University's (OWU) Environment and Sustainability Program to conduct E. coli monitoring in the Delaware Run, an impaired tributary to the Olentangy River. Students will gain hands-on experience in water sampling and lab procedures while getting exposure to careers in water management. Two outreach events will be held during OWU's Green Week. The first will be a stream cleanup with a stream sampling demonstration, and an optional tour of the City of Delaware Wastewater Plant and lab facilities. The second will be an open house, career day program for students to interview water quality professionals. The program and its results will be shared via press releases, web pages, events, the Olentangy Watershed Forum, student posters, at the Northern Olentangy Watershed Festival, and with applicable community partners and stakeholders. Over 400 students and general public (combined) could be involved in this project.

## **Clark County Solid Waste District, "Educational Signs, \$1,717**

Clark County, Contact: Samuel David Perin, [sperin@clarkcountyohio.gov](mailto:sperin@clarkcountyohio.gov), 937-521-2022.

Project goal is to provide more immediate and effective education on various recycling programs, natural resource conservation, habitat restoration, litter prevention, and preventing non-point source pollution through the use of signs. Because many of these environmental issues are constantly changing and evolving, we will use a vinyl sign cutter and associated sign making materials to provide immediate and current educational messages to target audiences throughout the community.

## **Franklin Park Conservatory, "Green STEM Girls," \$4,756**

Franklin County, Contact: Jenny Pope, [jpope@fpconservatory.org](mailto:jpope@fpconservatory.org), 614-715-8026.

Franklin Park Conservatory's Green STEM Girls after school program will work with 35 middle school students from Columbus City Preparatory School for Girls in the second year of a pilot project. Green STEM Girls uses hands-on, experiential learning in botany and applied plant sciences to explore real world environmental issues and encourage critical thinking and creativity to create potential solutions. Female faculty and graduate students from The Ohio State University Center for Applied Plant Sciences will act as guest instructors for the program and positive role models for the students to help them realize the possibilities for study and careers in environmental sciences and other STEM related fields.

## **Madison Soil and Water Conservation District, "Grazing & Growing for Water Quality & Wildlife," \$2,000**

Contact: Julia Cumming, [Julia.cumming@oh.nacdnet.net](mailto:Julia.cumming@oh.nacdnet.net), 740-852-4003.

The Madison SWCD will hold two outreach events to raise awareness and encourage the conservation of natural resources. First is a grazing workshop to promote the establishment of native grasses in pastures for the northern bobwhite. Second is an agricultural drainage workshop for farmers with a focus on reducing nitrogen, phosphorus and sediment runoff from cropland. Potentially over 60 farmers could attend the workshops.

### **ODNR/Burr Oak State Park, "Native Wildflowers for Wildlife," \$4,345**

Morgan County, , Contact: Julie Gee, [julie.gee@dnr.state.oh.us](mailto:julie.gee@dnr.state.oh.us), 740-767-2981.

A native wildflower habitat will be planted outside of the nature center at Burr Oak State Park. A wayside exhibit and Little Lending Library will be installed on the edge of the habitat to educate people about why this type of habitat is important to wildlife. Educational programs for the general public focusing on wildlife attracted to the new habitat, the importance of biodiversity and how to establish similar habitat at home will be offered on a regular basis. The public will also be invited to participate in the Project Wild "Monarch Marathon" and a workshop to learn how to participate in local citizen science projects related to habitat diversity. Approximately 120 people will benefit directly from the project during the grant period with an unlimited number benefiting in the future from the established habitat.

### **Pickaway Soil and Water Conservation District, "Augmented Reality Sandbox, \$3,758**

Pickaway County, Contact: Katerina Sharp, [Katerina-sharp@pickawayswcd.org](mailto:Katerina-sharp@pickawayswcd.org), 740-477-1693.

The augmented reality sandbox is a sandbox with a 3D effect that teaches earth science concepts in a visual and hands-on manner. The sandbox is used to create topography models that show elevation in a color map, topographic contour lines, and simulated water. The system teaches about a variety of geographic, geologic, Earth science and hydrologic concepts such as how to read a topography map, contour lines, watersheds, erosion, weathering, rocks and deposition, and land forms. Project has the potential to reach over 3,000 students and several hundred adults from the annual banquet and county fair.

### **Westerville Parks and Recreation, "Trailblazers," \$5,000**

Franklin County, Contact: Kim Chapman, [kim.chapman@westerville.org](mailto:kim.chapman@westerville.org), 614-901-6516.

Approximately 30 Westerville City Schools high school students and their science and engineering teachers will work with the City of Westerville, Eclipse Aerial & Mapping LLC, and The Ohio State University professionals to map, plan, and develop a recreational trail with educational signs through a wooded portion of Heritage Park in Westerville, OH. This extracurricular program will bring organizations from both the public and private sectors together for a unique educational experience that will give students a jump on the current job skills sought after by employers and provide a look into careers at the intersection of technology and the environment. Students will learn from and work with community stakeholders and organizations that have an interest in land use and management. The finished trail will provide the residents of the City of Westerville as well as over 200 students participating in summer camps with additional recreation options at Heritage Park.

## **Teachers, Industry and the Environment Conference**

**October 9-11 , Columbus**

Free 2 ½ day professional development conference for 3rd-8th grade science educators sponsored by the Ohio Chemistry Technology Council and Ohio EPA's Office of Environmental Education.

Attendance, lodging, meals and a travel stipend are provided.

Registration for this year's conference available at <http://ohiochemistry.org/tieconference>

- The TIE Conference is aligned with state science teaching standards for STEM curriculums.
- Participating educators have the opportunity to visit a working facility that produces sophisticated chemicals for the health care and personal products industries.
- Hands-on demonstrations and experiments provide educators with interesting and exciting tools that are easily adaptable to the classroom. Materials provide educators with an abundance of information on the resources available to them, most at no cost.
- Educators have direct interaction with the Ohio Environmental Protection Agency and representatives from the chemical manufacturing industry.
- Graduate credits from Ashland University available (optional for all participants).

# Celebrating Beyond the Banks of the Cuyahoga River!

By Ebony Hood, Northeast Ohio Regional Sewer District

Congratulations Cuyahoga River for your distinguished award of being named the River of the Year by American Rivers! You will likely be forever remembered as the river that sparked a series of environmental efforts across our nation, most notably, the Clean Water Act of 1972. What began as a conservation council for rivers, the American Rivers organization is working toward advocacy, along with both educational and recreational outreach to help improve wild rivers in our country. Too many of our waterways have been named endangered. Human impacts that impede flow like dams, pollution, and the expansion of our built environment still leave behind a flowing path of potential disastrous outcomes without the work of clean water leaders to help save this vital life force.

However, in the grand scheme of the multifaceted issues facing the health of our planet; how are people of color represented in this effort? June 22, 1969 marks the 50th anniversary since the last time the Cuyahoga River burned. During this time the political and civil unrest in Cleveland rivaled that of the flames leaping from this battered river. In the years leading up to this significant date, African-American communities were failing under systems of toxic racism, disinvestment, and violence stemming from hate. Mayor Carl Stokes, the first African-American mayor of a major metropolitan city surely had his hands full dealing with the tumultuous time of the Civil Rights era. Essentially, during his reign, four little girls died in the 16th Street Baptist Church bombing. (I would be remiss if I did not acknowledge the severely injured older sister of Addie Mae Collins, Ms. Sarah Collins Rudolph who survived the attack.) Minister Malcom X, and the Rev. Dr. Martin Luther King were assassinated and outside the banks of the Cuyahoga River, the city of Cleveland was in the midst of riots, shootouts, and concentrated segregation through federal housing projects and redlining which is the refusal of loans/occupancy in certain neighborhoods due to “financial” risk. These were truly troubled times in the African-American community. So how did the river make a comeback and have the communities fared any better?

Obviously, the narrative of this river has been shared for decades and we know that it is better than ever. We know that the large industry offenders began to clean up their act once regulations were put in place limiting discharge in the river. We know that wastewater treatment plants developed additional stages of treatment reducing pollution and they are building deep tunnels to prevent raw sewage from entering the environment. Also, due to the amount of dredging needed to keep the shipping channel deep enough to navigate, most of polluted sediment has been removed and settled out allowing for improved water quality. Unfortunately, there is not much to brag about when it comes to addressing disinvestment of those same African-American communities that fought for positive change over the past 50 years.

While Cleveland can shine the spotlight for earning the home of the Rock and Roll Hall of Fame, winning the National Republican Convention, and two-time USA Triathlon Championship host, it is as if the Cuyahoga River shed its noxious layers of filth on the communities of color surrounding Cleveland. However, thanks to lesser known change agents, work is still being done on behalf of social justice issues. They are working to address disparities such as infant mortality, chronic disease, crumbling recreational parks, and failing school systems. There is also a small neighborhood non-profit organization (SYATT) working to bring diversity to the river through rowing camps and kayaking exposure opportunities.

SYATT has managed to take incremental strides in this area by bringing communities of color to the river. They recognize the importance of doing work in both our built and natural environments. Nature is gaining recognition as the preventive prescription to help reduce the prevalence of disease in America. Over the past few years, SYATT has invited participants to simply enjoy the river as do many of their counterparts of the dominant culture. Thanks to partnerships with the Cleveland Rowing Foundation, The Foundry (rowing and sailing organization), and support from the United Black Fund, the St. Luke’s Foundation and highly motivated youth leaders they are changing the face of the demographic seen along the banks of the Cuyahoga River. Let’s remain hopeful that the comeback is shared by all.



# Planning Ahead for Cover Crops in School Gardens

By Summit Soil & Water Conservation District

Improve the health of your soil and the quality of lakes and streams in your neighborhood, by adding a simple agricultural practice to your autumn garden care regimen. That practice is the planting of cover crops. At the end of the summer growing season, when you are ready to take a breather from gardening and yard work, your soil is not yet ready to rest. One final effort to plant a cover crop in the fall can make a huge difference over the winter toward improving your soil and helping to reduce soil erosion, stormwater runoff, and non-point source pollution entering our streams and rivers in the spring.

Cover crops, also known as green manures, are an excellent tool for vegetable gardeners, especially when manure and compost are not available. Even small gardens will benefit from the use of cover crops. The tilling, weeding, harvesting, and foot traffic of most school gardens tends to destroy the structure of the soil. Planting cover crops is an easy way to revitalize the soil and promote subsequent plant growth. Cover crops are planted in vacant space and instead of being harvested, are worked into the soil after they mature. They provide a number of advantages to the otherwise unhealthy condition of bare soil during your garden's off-season.

Cover crops help to retain the soil, lessen erosion, and decrease the impact of rainfall on the garden by slowing the runoff of the rainwater. They also reduce soil compaction, suppress weed growth, and reduce the leaching out of nutrients from the soil. Cover crop top growth adds organic matter when it combines with the soil. The root system also provides organic matter and opens passageways that help improve air and water movement in the soil. Scientific studies have shown that cover crops actually drill down into the soil, some as much as six feet. When they decompose, the next crop planted will follow the rooting network laid out by the cover crop.

If you think that you might like to try planting cover crops this fall, consider what combination of cover crops to plant based on your garden's needs.

- If you have difficult clay soils, then use the winter wheat and winter rye because they develop massive root systems which are great for breaking up the tight clay soils.
- Sow oats if this is your first time trying a cover crop or if you want to be able to plant early spring vegetables. Oats are killed by the first hard freeze and leave a brown decomposing mat in spring.
- Combine legumes (nitrogen-fixing plants from the pea and bean family) with non-legumes when possible.
- When you plant your cover crop make sure that the seed makes direct contact with the soil so that it will germinate.
- If you wait until very late in the fall to plant cover crops, your best bet to plant is cereal rye because it is the most cold-hardy of the cover crops.
- If you want to boost your soil's organic matter and nutrient content using plants exclusively, plant oats mixed with cold-hardy winter peas in early fall.

## Wild School Site Workshop For Educators

Aug 6-7

Gwynne Conservation Area, London, Ohio

Join us at a two-day workshop for educators on how to create, maintain, and utilize your outdoor spaces within your curriculum. There will be three strand topics to choose from on each day.



### Day 1 - 9:00am—4:00pm

- Outdoor Classroom Design & Management
- Ecology & Natural Resource Management
- Programs & Activities

### Day 2 - 9:00am—4:00pm

- Species Identification
- Meeting Standards through Outdoor Education & Adventure
- Grant Writing 101

**Cost** is \$40 for both days or \$20 for one day. Registration fee includes materials, instruction, and lunch.

**To register** contact Madison SWCD at 740-852-4003 or [brian.hackett@oh.nacdnet.net](mailto:brian.hackett@oh.nacdnet.net). Register by Aug 2nd, 2019.

# Contact EECO

Partnerships strengthen EE in Ohio, leading to a more environmentally literate population and a healthier environment. You are welcome to become a partner and friend to EECO. Please contact any of our regional directors, officers, advisors, and board members to find out more about becoming a part of EECO.

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