Our Mission
Ohio Wetlands Association is dedicated to the protection, restoration and enjoyment of Ohio’s wetlands and associated ecosystems through science-based programs, education and advocacy.

REGISTRATION OPEN!

OHIO WETLANDS SCIENCE SUMMIT
H2-OH! Ohio Wetlands Work for Water Quality

Saturday October 14, 2017
Everal Barn & Homestead
60 N Cleveland Ave., Westerville, Ohio

Keynote: Dr. Wm. Mitsch will present
"Wetlands: The Kidneys of Our Planet"

The day's events include morning programs, a vegetarian lunch, and a field trip to a wetland.

Water is everyone’s concern. All across Ohio water quality is a serious matter. This 6th Annual Ohio Wetlands Science Summit brings together wetland experts to share their research and practical application of wetland restoration for improving water quality. Communities across the state are recognizing that wetlands provide cost-effective natural services that improve our quality of life and OH yes, improve water quality by removing excess nutrients, sediments, toxins and other contaminants that keep us from fully enjoying our rich Ohio water resources.

Following Professor Mitsch’s global perspective on wetlands and the health of the planet we will get very specific and local. Mark Dilley, Ohio Wetlands Association President and Co-owner of Mad Scientist Associates will address “Improving the Quality of Water and the Quality of Life in a Growing Suburb”. He will detail the work in Westerville to assure long-term water quality supply and wetlands. John Watts, Columbus and Franklin County Metro Parks, Resource Manager expands the topic with “Columbus Metro Parks Wetland Restorations: Establishing Beneficial Functions Including Water Quality Improvement”.

Kristi Arend, Research Coordinator and Fisheries Biologist with ODNR at Old Woman Creek National Estuarine Research Reserve provides a regional perspective with “Wetland Restoration as a Tool for Lake Erie Water Quality Improvement: What Do We Know and Where Do We Go From Here?”

Adding a crosscutting dimension to the conference Dr. Kevin Egan, University of Toledo, Department of Economics will explain "Using Benefit-Cost Analysis to Estimate the Value of Wetlands to Society”. We will see how the value of the natural services of wetlands should be considered in any policy or practice that will alter wetland functions in the landscape.

For years, OWA has promoted the idea that wetlands are essential parts of every watershed and are necessary to assure high water quality. We advocate for wetland restoration and that it be a part of any comprehensive plan to reduce the nutrients that feed harmful algal blooms. Our tag line, “Wetlands for a Better Ohio” supports the notion that we are all better off, for many reasons, with healthy and abundant wetlands across the state. This conference focuses on the singular subject of water quality improvement that is critically needed. If you LIKE clean water, you will LOVE wetlands. Go to www.OHwetlands.org and look under the Events tab for full details on the Wetlands Science Summit. Online registration is available using PayPal or your credit card.
A Plant to Kill. Flowering Rush (*Butomus umbellatus*)

By Mark Dilley

Editor’s Note: Board Member Mark Dilley delivered a presentation at the 2016 Flora Quest conference with the title “Wetland Plants: Twenty to thrill, five to kill.” He will be sharing details of select plants from this talk in a series of articles for the OWA newsletter. This is the first “kill” article, focusing on introduced invasive plants that are damaging to the ecology of wetlands in Ohio and elsewhere.

A member of the Family Butomaceae, Flowering Rush is a striking wetland plant. I recall first encountering this plant along the Olentangy River in Columbus, while taking Dr. Ron Stuckey’s Aquatic Botany course at The Ohio State University. Also called Grassy Rush or Water Gladiolus, it grows along rivers and lakes and in floodplain wetlands. Its pink flowers attract bees, flies and butterflies, and its seeds are sometimes eaten by waterfowl. It spreads rapidly across flood-prone areas, with seeds and bulb-lets (from the root system) that float, and also through rapid vegetative spread. The interior portion of the “billabong” wetland at the Olentangy River Wetland Research Park in Columbus now contains a near monoculture of this plant that occur upstream of the site in the Olentangy River watershed. There are undoubtedly other wetlands in our State that have suffered the same fate.

Although it is now illegal to buy, sell or possess the plant, established populations create an ongoing management challenge. Control of this noxious invader can be accomplished using a variety of techniques:

- Lowering water levels in early spring to expose leaves and shoots followed by an application of a systemic herbicide (Diquate, Glyphosate or Imazamox) to leaves while maintaining low water conditions for proper absorption; and
- Hand-cutting below the water’s surface can be effective when cut stems remain submersed throughout the growing season (this may require several trips to re-cut shoots during the growing season).

As a preventative measure, maintaining dense populations of native species is a must. Disturbance benefits this species, but the good news is that it does not compete well in healthy, dense, and intact wetland plant communities!

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Flowering Rush. Photo by Mark Dilley.

Flowering Rush. Photo by Oneida County Land and Water Conservation Departments.
Letter to Director Butler Regarding the Rover Pipeline
By OWA Policy Committee

Craig W. Butler, Director
Ohio Environmental Protection Agency
50 West Town Street, Suite 700
P.O. Box 1049
Columbus, Ohio 43216-1049

Director Butler;

Ohio Wetlands Association has been watching the actions of the Rover Pipeline project with great concern for the damage to wetlands and waters of the state by inadvertent return of bentonite drilling lubricant. We have also been monitoring the response of the Ohio EPA to the irresponsible behavior of the project. We are concerned that the recent spills and damage to Category 3 wetlands is indicative of the Energy Transfer Partners corporate culture of tolerance for lax operating procedures and a cavalier neglect for natural areas protection.

Listening to your explanations and reactions to the bentonite spills the Rover Pipeline project on the WOSU radio program, All Things with Ann Fisher, I were pleased to hear your quick review and oversite of this incident. OWA applauds your quick response to assure compliance by engaging the Federal Energy Regulatory Commission that put a halt to any new Horizontal Directional Drilling on the project.

Our continuing concern regards the cleanup and restoration effort of the 6.5 acre Category 3 wetland that was flooded with Bentonite. It could take years to restore the conditions that ranked it as a highest quality wetland. While fines and cleanup are appropriate a mitigation requirement is especially prudent. Tuscarawas water quality benefits from riparian wetlands. During prolonged restoration efforts, those wetland services will likely be reduced. Mitigation would help assure that the quality of waters in question will not suffer during this period of time. Many of us think that additional punitive and compensatory actions are warranted.

We appreciate your work in support of wetland protection. Thank you for your comprehensive and decisive response to these Rover Pipeline incidents.

Sincerely,
Ohio Wetlands Association
Policy Committee

You Shop. Amazon Gives

AmazonSmile is a website operated by Amazon that lets customers enjoy the same wide selection of products, low prices, and convenient shopping features as on Amazon.com. The difference is that when customers shop on AmazonSmile (www.smile.amazon.com), the AmazonSmile Foundation will donate 0.5% of the price of eligible purchases to the charitable organizations selected by customers. Link your Amazon account to the Ohio Wetlands Association today! Just go to www.smile.amazon.com.
August 23, 2017

Lane Bryant Corporate Office Expansion
3344 Morse Crossing
Columbus, Ohio 43219

The Ohio Wetlands Association is very familiar with the site containing a vernal pool wetland at the property just north of the Lane Bryant Corporate Office at 3344 Morse Crossing, Columbus, OH. The wetland was avoided during the building of the Lane Bryant Corporate Office and adjacent parking lots in the early 2000s. Shortly after that the wetland was selected to be included in a 2006 study of urban wetlands in the central Ohio area (Mack and Micacchion 2007).

In the years since the wetland has served as a training site and has been visited many times by instructors and attendees of Ohio EPA’s Ohio Rapid Assessment Method for Wetlands (ORAM) courses. Within this process the wetland has become an all too typical example of how urban wetlands become degraded and then are open targets for future development, often by the identical entities that earlier avoided filling and building on the same wetlands.

A quick review of historic aerial photos of the site show beyond doubt that the wetland was a Category 3 wetland prior to construction of the Lane Bryant Corporate Office. We suspect this is why it was avoided as the likelihood of receiving a permit at that time was not probable. Now the same wetland is unfortunately wetland. However, we disagree with the applicant for the wetland as several

What has happened to this wetland to change it from a Category 3 wetland to a Category 2 wetland? The simple answer “avoid” impacting the wetland but in predictable process of the construction of parking lot, conversion of forested tracks associated disturbances that have wetland. These activities resulted in a wetland and its current Category 2

In now appears that Lane Bryant is Category 3 wetland on its property that it high ecological quality. This wetland protection and therefore made developing the wetland at that time not possible. However, Lane Bryant has degraded the wetland without a permit and the Ohio Wetlands Association believes these activities violate provisions of the Isolated Wetland Statute and the Wetland Water Quality Standards including provisions of the Wetland Narrative Criteria (Ohio Administrative Code 3745-1-51) and the Wetland Antidegradation Rule (OAC 3745-1-54).

Under the scenario described above, which is repeated time after time in Ohio’s urban settings, none of the very few remaining wetlands in our metropolitan areas will ever have a chance of surviving the urban sprawl that occurs over time without exception. If this continues Ohio will have very few or no urban wetlands. This is nonsensical in a time when green structure is being built by many Ohio cities to soften the landscape to reduce flooding and improve water quality and to help offset the loss of their natural areas including wetlands. These green projects are difficult and expensive projects to pull off in the urban setting and it is the taxpayers of those cities and the state of Ohio are who footing the bill for the loss of urban wetlands.

The Lane Bryant vernal pool wetland was also the subject of a 2008 Ohio EPA study of urban wetlands (Micacchion and Gara 2008). Fourteen wetlands, exhibiting amphibian breeding habitat characteristics, inside the Interstate 270 Outerbelt, around the city of Columbus, in Franklin County, central Ohio were monitored using Level 1, 2 and 3 wetland assessment tools. However, in order to find 14 wetlands that met the criteria as potential wetland amphibian breeding habitat, 200 randomly selected urban wetlands were evaluated for
Aquatic Ape
By Ray Stewart

What environment drove Homo sapiens’ evolution to become so distinct from our closest animal relatives? Did ancestors of modern humans flourish in shallow water? Can humanity’s unique abilities be explained by a pre-historic mastery of the space between land and sea? What adaptations would assure an aquatic ape’s success, with added benefits of self-awareness, communications, and the dexterity that are so exquisitely human?

Some 20th century scientists have tried to explain the special characteristics of modern humans with the notion that our ape-like ancestors found a successful niche on the beach. This hypothesis attempts to explain an upright posture, reduced hair, required dietary iodine and essential fatty acids. These and other physiological, anatomical and behavioral characteristics are included in the Aquatic Ape hypothesis. Well-informed anthropologists are not all in agreement, however. Many, in fact, dismiss the notion entirely.

Human’s lack of body hair is similar to the same loss in certain other marine mammals, such as the whale and the hippopotamus. These, like all mammals, evolved from terrestrial ancestors. While mammals are typically hairy, those that have moved into aquatic niches have much less. So, why have humans become the “Naked Apes,” as Desmond Morris put it?

Standing posture has usually been attributed to our distant ancestors who moved out of the trees and onto the plains to hunt. Our present-day posture is better suited to running and gives us the advantage of seeing over the tall grassland vegetation. An upright posture, however, would be an advantage in waterside living and may have more to do with headfirst diving and underwater propulsion to forage for shellfish and anemones. The rich and relatively easy seafood diet might have facilitated the growth of brain capacity.

Shell middens are prehistoric heaps of the hard remains from mollusks, echinoderms and arthropods. They are associated with ancient human settlements worldwide where there is ready access to the sea. The earliest evidence of shell middens are from South Africa roughly 160,000 Before the Present Era (BPE), where near-shore caves once provided shelter. This period corresponds with the emergence of anatomically and behaviorally modern humans. Such evidence is rare since most evidence of coastal life during the ice ages would have been erased as rising sea levels washed low-lying settlements away. Rising sea levels were the result of expanding water volumes due to increased temperatures and by continental glaciers melting into the oceans during this period of climate change.

Garden of Eden
Is it any wonder that some of the oldest stories ever told refer to these special places where the distinction between land and water are blurred, diffuse and rich with wildlife? There are lush wetlands in Iraq that surround the lower Tigris and Euphrates Rivers. Some Biblical scholars have identified these Mesopotamian Marshes as the very ‘Garden of Eden’ described in Genesis. Historians recognize that in this region 5,000 years ago, arose the cradle of civilization, the use of writing and the wheel as well as many other milestones. Some historians speculate that the actual beginning was in a spot that is now off shore in the Persian Gulf.

Egyptian God Horus
Among the pantheon of Egyptian deities, Horus the falcon-headed man is widely recognized. The goddess Isis fled to the Nile Delta to give birth to Horus, knowing that Set, who killed Horus’ father would try to kill the son as well. The high opera of Egyptian mythology usually portrays Horus’ triumph over upper and lower Egypt. The delta served not only as a sanctuary from persecution, it was widely considered to be the perfect place for hunting and fishing. Some of the delta was cultivated and treasured for agricultural food production. It is small wonder that the concept of blissful afterlife for this early culture was seen as a Field of Reeds, an expanse of marshlands.

As modern civilization arose in Athens, Rome, Paris, London and in major cultures around the world, river and ocean settings were of paramount importance. Trade and culture grew out of successful waterside communities. As cities grew, wetlands were converted to more ‘civilized’ purposes. When the ‘New World’ was conquered these same patterns of occupation prevailed. Port cities converted marshy estuaries into commercial centers. Though our domination of nature has felt like ‘destiny,’ we often feel comfort and yearning for a distant antecedent pastoral or integrated natural existence. For some, it is a spring break at a sub-tropical beach. Others don camo or fishing reels to capture meals directly from the source. Our instinct to go where water meets the land and find solace, sanctuary and sustenance is written deep in our psyches. Many of us still find this comfort in wetlands wherever we can find them.
If Sandusky Bay were not open to Lake Erie, it would be Ohio’s largest inland lake. By most accounts of early settlement, the marshy habitat of the bay was surrounded by the Great Black Swamp that stretched west all the way to Ft. Wayne, Indiana. Waterfowl were so abundant that market hunters would be able to fire a large punt gun and drop as many as 90 birds with a single shot. The shallow bay was rich in floating and emergent vegetation. Wild rice graced the shorelines, providing nutritious grains for Native Americans and wildlife alike.

In a misguided attempt to further enrich the bay, common carp were introduced to assure an abundant fishery. In short order, the flourishing carp uprooted vegetation and muddied the waters, putting an end to any rooted marsh plants. This one introduced species diminished the abundance and diversity of all manner of fin, fur and feather of the bay.

Today Sandusky Bay remains a wasteland, a watery desert visited mostly by gulls and cormorants. Ringing the west end of the bay are a number of private shooting clubs and state wildlife areas that manage their waters with dikes and pumps. Though exemplary in their investment toward wildlife management, a select few individuals can enjoy the bounty of these controlled environments.

For the most part, Sandusky Bay is a warm, shallow nutrient concoction. Most of the tributaries to the bay do not meet water quality standards, according to the Ohio Environmental Protection Agency (EPA). Manure runoff and failing septic systems are often cited causes of impairment. Crop production contributes nutrients, especially nitrogen and phosphorus, pesticides, and the associated silt that accompanies row crop farming. Algae thrive in this incubator, including the much-publicized *Microcystis* cyanobacteria, one of the so-called blue-green algae responsible for hazardous algal blooms (HABs). OWA has often discussed the prospect of a restored Sandusky Bay. We wondered about extensive dikes, carp excluders and floating wetlands. All have seemed like an ‘Apollo Mission’ of ecological engineering. Now, a new state initiative coming from the Ohio Department of Natural Resources and the Ohio Environmental Protection Agency working with the City of Sandusky and other partners has initiated Phase 1 with $1 million for planning and design for “The Sandusky Bay Enhancement Initiative”. The stated goal is to restore wetlands and other nature-based shoreline improvements designed to improve water quality by reducing nutrient and sediment loads reaching Lake Erie.

The key to this project, and, perhaps, the inspiration, is the State of Ohio’s July 2020 ban on disposing of dredged material in the open waters of Lake Erie. The ‘beneficial reuse’ of the dredge material from the navigation channel in Sandusky will be used to create wetland shallows at strategic locations in the bay. While this concept raises questions regarding the efficacy of dredge material as a platform for water quality improvement, there is hope that this innovative approach will expand wetland habitats for all the various natural services we have long discussed. OWA is eager to see progress on this initiative and will watch closely as this project unfolds.

Water flowing into the bay will flow through a gauntlet of restored wetland islands and coastal habitats on its way to Lake Erie.
In August, I was on Kelly’s Island for a botany workshop. One of our richest field trip locations was the North Pond State Nature Preserve. In recent years, I have visited this site regularly, enjoying the unusually-rich wetland plant diversity, assessing its condition and reporting to the Ohio Natural Areas and Preserves Association (ONAPA) regarding invasive species, trail conditions and visitor impacts. [Editor’s Note: For more on monitoring, go to the ONAPA web site (www.onapa.org) and look under the volunteer tab]. The condition of North Pond was different in a couple ways. First, the water level was much higher. Lake Erie water levels are near record highs this year. Though not directly connected with Lake Erie on the surface, it adjusts to lake water levels through a narrow sandy beach.

There have been invasive plants present before. New on the scene are more recent arrivals that are muscling in across northern Ohio coastal marshes: Flowering Rush (Butomus umbellatus; see Dilley article in this newsletter) and European Frog-bit (Hydrocharis morsus-ranae).

**Frog-bit**

Originally introduced about 80 years ago as a possible ornamental plant, it has escaped into rivers and wetlands across the continent. This perennial plant grows rapidly to form dense floating mats in slow or still waters where it crowds out native plants. This dioecious plant normally forms stands of all either male or all female populations. Seed is therefore not the normal form of propagation. Instead, small buds form at the ends of stolons that lie on the bottom, dormant over the winter. In the spring, these buds rise to the surface and begin growing. Each plant can produce more than 100 buds, expanding into new habitats rapidly.

Frog-bit forms dense mats, blocking light that prevents growth of any submerged plant life. At season’s end, the dying vegetation decomposes consuming oxygen from the water that restricts the activity of other aquatic life forms. In some locations, the living mat hinders boat traffic and clogs ditches.

The Frog-bit leaf is round or nearly so. Individual white flowers have a yellow center with 3 rounded petals. The cleft in the somewhat ‘heart-shaped’ leaf 1- 2 -inch diameter leaf is much smaller than the White Water Lily (Nymphaea odorata). The bottom of the leaf is purplish-red with a spongy coating along the mid-vein.

North American frog-bit (Limnobium spongia), a native wetland plant, has a spongy coating across the entire underside, not just the midrib. Watershield (Brasenia schreberi), another native, does not form a rosette of leaves and the stems have a slimy coating.

To control this noxious invader, remember:

- Boaters: Do not transport invasives – thoroughly clean up your boat before moving it to another lake.
- Hand harvesting early in the growing season, before dormant buds form, may be an effective control.
- Water draw-down, when possible can also be an effective control.

Indirect action: nutrient loading of waters favors European Frog-bit over most native plants. Preventing fertilizer and manure runoff will reduce the establishment and expansion of this nuisance aquatic plant.

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**WETLAND TRUMPETER SPONSORSHIP PROGRAM**

Ohio Wetlands Association recognizes the individuals and organizations that show a deep commitment to OWA’s mission by understanding the ecological, social and economic value of conserving Ohio’s wetlands. This is your opportunity to be one of those we celebrate!

Become a Wetland Trumpeter Sponsor for our 6th Annual Wetlands Science Summit. Sponsorship levels range from $1,000 to $100 and information, as well as a sponsorship form can be found at www.ohwetlands.org/wetland-trumpeters-sponsorship-program.html Thank You!
Solving Harmful Algal Blooms: Progress in 2016-2017 at a Wetlaculture Experiment at Buckeye Lake, Ohio
By William J. Mitsch, Ph.D.
Eminent Scholar and Endowed Chair, Everglades Wetland Research Park, Florida Gulf Coast University, Naples, Florida
Professor Emeritus, The Ohio State University, Columbus, Ohio

Wetlaculture (Wetlaculture = wetlands + agriculture) is described as a landscape-scale integration of wetland retention of nutrients (phosphorus and nitrogen) from polluted agricultural and urban runoff with systematic recycling of those nutrients to agriculture, horticulture or forestry. The approach involves the development of interlinking physical, mathematical, and business models to optimize design parameters in regions with different climate, soil, landscapes and waterscapes. The idea of wetlaculture was a result of our preliminary investigation of a candidate approach to win the Barley Prize offered by the Everglades Foundation in Florida. Our project, with a team of 12 scientists and engineers from eastern USA (Table 1), was one of 15 finalist projects for Phase 1 of the Barley Prize that was announced publically in March 22, 2017. To date we have 4 wetlaculture physical models completed or under current development in eastern USA (Figure 1). The Buckeye Lake wetlaculture mesocosm compound represents the first completed mesocosm site (Figure 2) and its first year of development and construction are described here.

In July 2016, OWA Board Director, Mike Peppe and I took a Monthly Breakfast Club field trip from Ohio State University to Buckeye Lake Ohio. While there, we met several folks from Buckeye Lake, including Dr. Doug Poorman, a local veterinarian whose animal hospital was nearby. We were investigating potential locations for our first wetlaculture experiment (Ohio and Florida were both candidate states). Doug was welcoming and suggested that perhaps we could establish the experiment adjacent to his hospital (Continued on page 9)
and next to the South Fork of the Licking River (Figure 3). Discussions ensued and before I headed south to Florida for the 2016-17 academic year we had several meetings with Doug and others to discuss details. We also began investigating sources of support for such a project.

By mid-September 2016 we had sufficient financial support from several sources to begin construction of a 30-tub mesocosm compound (Figure 4) at Buckeye Lake and we were able to backfill and plant the mesocosms on October 22, 2016, a mere 3 months after the initial discussions. Fifty volunteers from 5 or 6 universities, local NGOs, and Buckeye Lake and Columbus regions came to help with the backfilling and planting (Figure 5). The mesocosms were then allowed to winter and research began in April 2017.

Every-other-week water sampling (Figure 6) and the development and implementation of hydraulic loading rates (HLR) of 10 and 30 cm/week to 28 mesocosms were refined over the summer of 2017. Water is fed to the mesocosms from three large tanks positioned on an adjacent levee along the South Fork of the Licking River (Figure 7). In addition to two HLR rates, the experiment also includes two water depths in the wetland mesocosms.

After gravel was spread around the mesocosms (Figure 8) to prevent weeds and allow easier sampling, an open house was held on July 10, 2017 for the public and local universities that included support from the Ohio Wetlands Association, MAD Scientist Associates, Inc. LLC,
The Ohio Vernal Pool Network Welcomes Lauren Blyth as its New Project Assistant!

Lauren is a vernal pool aficionado who grew up exploring a neighbor’s pool. She has worked a variety of education and field jobs including coordinating bat acoustic surveys for the Ohio Division of Wildlife, working as a naturalist for Columbus and Franklin County Metro Parks, and working as a Research Technician for two seasons doing fieldwork at MBI. Lauren received her Master of Environment and Natural Resources from The Ohio State University, where she studied the effect of forest management practices on salamanders, including vernal pool obligates.

Lauren began her work with the OVPN in July and is currently working out of the MBI offices. She will be working with MBI and the Ohio Wetlands Association to take the Ohio Vernal Pool Network to the next level. Lauren will provide general coordination of OVPN efforts. One major focus will be to update, standardize, organize, and document vernal pool workshops in preparation for a new train-the-trainer format with the goal of allowing Vernal Pool education to reach a larger audience.

Ohio Revised Code 6111.023(c)(3)(Proposed filling of wetland subject to level two review) states “The isolated wetland that will be subject to filling is not locally or regionally scarce within the watershed in which it is located and does not contain rare, threatened, or endangered species.” As explained above the vernal pool wetland on the Lane Bryant site is locally and regionally scarce within its watershed and contains the Small-mouthed Salamander, *Ambystoma texanum*, a species that is rare in the watershed.

For all these reasons the Ohio Wetlands Association believes that Ohio EPA must deny Lane Bryant’s and RT Easton III LLC’s application for an Isolated Wetland Permit (Level 2) to fill this wetland. They have degraded the wetland without a permit which is a violation of Ohio’s rules and laws. They should not be rewarded with a permit that will allow them to eradicate this wetland that for many reasons is a rarity and of the highest quality attainable in Ohio’s urban settings.

The Ohio Wetlands Association also respectfully asks for a public hearing on the Isolated Wetland Permit (Level 2) application for Ohio EPA Project Number 175375. We would also like to on Ohio’s interested parties mailing list for this project at the address below.

Sincerely,

Mick Micacchion
Vice President,
Ohio Wetlands Association
Chairman, Policy Committee
and our collaborating colleges and universities (Figure 9). The universities involved in the research at these mesocosms is listed in Table 2.

Ms. BingBing Jiang, who is pursuing a Ph.D. at University of South Florida and advised by me at my FGCU lab in Naples Florida currently has the water quality aspects of this experiment as part of her Ph.D. dissertation research. She expects to sample for 2 or 3 more years and graduate in 2020 or 2021. We expect that the experiment could run up 10 years or more as it involves not only determining the rate at which the mesocosm wetlands sequester phosphorus and nitrogen but also determining the number of years that are required before there are sufficient nutrients retained to recycle to agriculture. The project was also part of a 2017 undergraduate research project for two students at Kenyon College and will be part of the dissertation of Ms. Pattama Ulrich from the College of Public Health at The Ohio State University. Ultimately these mesocosm experiments, in conjunction with mathematical models and business models, will provide guidelines for landscape-scale application of this approach at Buckeye Lake, Lake Erie, and the Florida Everglades, among other sites.

Figure 8. Gravel spreading completed at Buckeye Lake mesocosm compound, June 2017. Photo by W.J. Mitsch.

Figure 9. Open house at the Buckeye Lake mesocosm compound, July 10, 2017. Photos by L. Zhang.

Table 1. Scientists and Engineers who are advisors to the overall Wetlaculture project

- Bill Mitsch, Ph.D., Florida Gulf Coast University, Naples (chair)
- Jim Bays, CH2M, Tampa, FL
- Bhavik Bakshi, Ph.D., Ohio State University, Columbus
- Siobhan Fennessy, Ph.D., Kenyon College, Gambier, OH
- Chris Lenhart, Ph.D., University of Minnesota, St. Paul
- Jiyoungh Lee, Ph.D., Ohio State University, Columbus
- Jay Martin, Ph.D., Ohio State University, Columbus
- Sam Miller, University of Notre Dame, IN
- Hans Paerl, Ph.D., University of North Carolina, Morehead City
- Mark Rains, Ph.D., University of South Florida, Tampa
- Jennifer Tank, Ph.D., University of Notre Dame, IN
- Li Zhang, Ph.D., Florida Gulf Coast University, Naples

Table 2. Colleges, universities, and other research organizations collaborating on research and teaching as supporters at Buckeye Lake Mesocosms, 2016-17

**Primary research universities:**
- Florida Gulf Coast University
- University of South Florida
- Kenyon College
- The Ohio State University

**Other Collaborators**
- Denison University
- Akron University
- The Wilds, Cumberland, Ohio

**Supporters:**
- Petplex Animal Hospital, Buckeye Lake
- Everglades Wetland Research Park Advisory Committee Members
- Steiner & Associates, Columbus, Ohio
- Ohio Wetland Association
- MAD Scientist Associates, Inc. LLC
- Buckeye Lake 2030
Ohio Wetlands Association

P.O. Box 3
Amherst, Ohio 44001
www.OHwetlands.org

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GIVE US YOUR BEST WETLANDS SHOT!
(Contest ends 9/15)

Wetlands for a Better Ohio

September 2017 Issue

Ohio Wetlands Association

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Membership Year: June 1 - May 31

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