

WINNING THE WATER QUALITY GAME

Board games have long been a staple of entertainment. They are usually played with a group of people, and the goals are roughly the same: win the game by acquiring the most resources or by surviving various challenges.

By Brock Parker

The Alabama Water Institute at The University of Alabama is taking that a step further by using the Watershed Game to teach people around campus and Tuscaloosa how to win water quality battles in real life.

“We believe bringing tools like this game to the Alabama Water Institute helps faculty train and educate students about the complex nature of watershed management,” said Dr. Patricia Sobecky, executive director of AWI. “It can also be a tremendously useful tool for helping elected leaders in their decision-making and for helping communities work collaboratively when it comes to managing their watersheds.”

Created by Minnesota Sea Grant and University of Minnesota Extension, the Watershed Game is an interactive tool that helps elected and appointed officials, community leaders and other stakeholders understand how critical good water quality is to community and environmental well-being and how important active management is to maintaining a proper balance of community growth and protecting natural resources. In the education realm, faculty members can also use it in their courses. Minnesota Extension educators John Bilotta and Cindy Hagley recently visited UA to train water researchers on how to facilitate the game.

According to Bilotta, many local officials might not have the background to fully understand how changes in land use can alter water quality. Instead of using lectures and literature to educate them, they wanted to make the lessons more memorable.

“We developed the game after years of



UA water researchers, students and guests learn how to play the Watershed Game.

hearing from the people we work with that they wanted a more interactive way to learn,” Bilotta said.

The Watershed Game for Local Leaders comes in three models: streams, rivers and lakes. Each version is played on a large map that shows various examples of everyday life surrounding each source of water, such as construction, farming and residential areas. The goal of the game is to reduce the overall amount of pollutants, including excess sediment and phosphorous, from entering the water from the surrounding land. Each area has different practices and policies that can help. Players form “land-use teams” and are given a budget that dictates which of the practices they can afford and how many pollutants can be deducted from their area. A team’s budget can be affected by unexpected events and advance planning, which help teach players how to deal with and prepare for external factors in the real world.

“Winning” the game after the third round requires the teams to work together as

a watershed community, though they began the game as separate teams. This fosters cooperation and a collective vision among all stakeholders. It also helps them consider a variety of factors in managing clean water while improving the livelihood of local residents, businesses and the ecosystem itself.

The game can also help young students understand the role they can play in managing water quality.

“After repeated requests from classroom teachers, we are excited to report that we now have a classroom version of the game designed for middle school students, but usable with other ages,” said Hagley.

The classroom version is designed for use with a full class, has an electronic scoring component and includes small-group and whole-class play components.

Campus and local groups interested in getting access to and playing the Watershed Game may contact Sobecky at: psobecky@ua.edu.

ALABAMA WATER INSTITUTE RESEARCHERS FEATURED AT 2018 ALABAMA WATER RESOURCES CONFERENCE

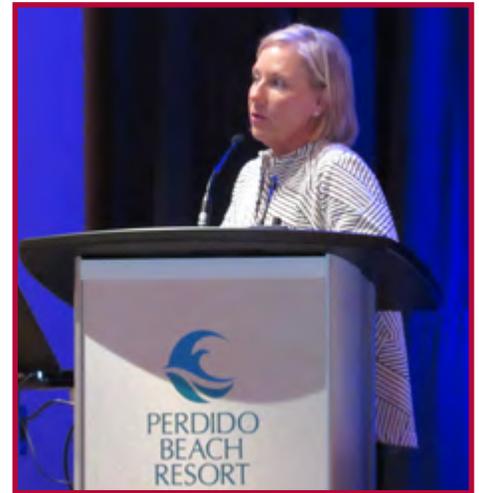
Researchers from the Alabama Water Institute were featured speakers at the 2018 Alabama Water Resources Conference and Symposium in Orange Beach, Ala. This year's theme was "The Many Faces of Aquatic Restoration."

Among the speakers affiliated with AWI were:

- Bennett Bearden, associate research professor, "Who's on First? The Status of Water Law and Policy in Mississippi and Alabama."
- Nikaela Flournoy, postdoctoral research scientist, "Resilience and Recovery: A Three Year Biodiversity Assessment of Oil-Impacted Salt Marsh and the Effect on Denitrifying Microbial Communities."
- Leigh Terry, assistant professor, "Biological Filtration Performance for Water Treatment: Evaluating the Effects of Extended EBCT, Temperature and DOM Character."
- Karen Bareford, National Water Extension liaison at the National Water Center, "The National Water Center and the Future of Water Information."
- Taylor Ledford, graduate student, "The Impact of Nutrient Loading on Nitrogen Removal in a *Juncus roemerianus* and *Spartina alterniflora* Saltmarsh in the Northern Gulf of Mexico."
- Brenna Sweetman, NOAA's Office for Coastal Management, "Digital Coast: Resources for Coastal Decision Making."

The conference also featured speakers from several agencies around Alabama, poster presentations, networking opportunities and displays from various vendors and sponsors, including the AWI.

Established in 1986, the conference, which was delayed this year by one



From left to right: Nikaela Flournoy, Leigh Terry, Karen Bareford, Brenna Sweetman, Taylor Ledford, Keynote Speaker, Eliska Morgan, Exe. Dir., Alabama Gulf Coast Recovery Council

day due to Tropical Storm Gordon, is an annual event presented by various state agencies. According to the website, the conference "is a forum for all participants of our water resources community, providing opportunities for conversation about the many multidisciplinary aspects of water resources and making connections

that will improve how we understand the complex water issues that are of importance to this state, the region and the nation."



WHEN LIONFISH ROAR: CONTROLLING AN INVASIVE SPECIES TO PROTECT THE GULF OF MEXICO'S NATURAL HABITAT

By Brock Parker

Much like the South's favorite non-native and far-reaching plant, kudzu, the Gulf of Mexico has its own invasive species. Lionfish may be beautiful, but they have been creating problems in the Gulf for more than 30 years.



*Julie Olson,
Director of the undergraduate
program in marine science at
The University of Alabama*

Native to the Indo-Pacific Ocean, lionfish found a new home in the waters around Miami in the mid-1980s. A prized aquarium-dwelling species, there are two theories as to how they found their way into the Gulf. The first theory is owners would release them into the Gulf when they were no longer wanted. The other is when a hurricane came through, there were reports of people who had left aquariums outside, and the fish were then killed or swept away into the waters. No matter how they were freed, a new hunter was on the loose and threatening indigenous fish in the ecosystem.

"The native fish species, because this is an invasive predator, had no idea how to respond. We've seen massive decreases in a lot of the smaller fish species, particularly the young," said Julie Olson, director of the undergraduate program in marine science at The University of Alabama. "It's something that we may be feeling the effects of for years to come. We haven't, to my knowledge, seen any species completely wiped out, but they've had to adapt to a very different kind of predator. You're seeing this microevolution in practice as only

those that survive are going to be able to have their genetics continue."

Humans typically don't have to fear lionfish because they tend to live in deeper areas around reefs or other artificial habitats. Divers around oil rigs and reefs may encounter a community of lionfish, but the chance to see them near the beach is small.

"Most of the time, they will be found in areas where there are a good number of prey items. They're not normally in the surf. They're going to found around any type of substrate, whether artificial or natural, where there are communities for them to prey upon," Olson said.

Because of this, agencies such as the Alabama Department of Conservation and Natural Resources will hold annual challenges for divers in an attempt to cull the lionfish. Catching them involves individually spearing them and using specially-designed holding cases, which decreases the chances of being punctured by their spines.

"They have been responsible for a number of sticks where the spine goes into a human, and the toxins are transferred to the individual. Depending upon the individual and how much of the toxin they get into their body, it can cause massive swelling, problems breathing for some and very intense pain," said Olson. "I don't know of any deaths that have occurred, but if you talk to people who have been stuck, many will tell you it's one of the worst experiences they've ever had."

Divers have more reasons for taking that risk other than helping to protect native fish species. Olson said lionfish taste good, similar to flounder with white flaky meat.



Many restaurants and grocery stores around the Southeast now offer the fish to customers, and that's helping to create a demand and could be a way to help control the population.

However, lionfish aren't going away any time soon. They can go to depths divers are not easily able to access, and they have antibiotic-producing bacteria on their skin. That protects them from other harmful bacteria, so they're resistant to foreign pathogens. They can also lay up to 2 million eggs per year, so total eradication of the species in the Gulf isn't likely. While human hunting and consumption can potentially help maintain the number of lionfish, native fish will need to find new methods of survival against this predator.

"The organisms in their invaded range are starting to figure out how to deal with having them there, so we're starting to see fewer and smaller lionfish now compared to when this was a huge problem initially," said Olson. "It's a matter of the environment learning how to accept them. We're hearing anecdotally that some of the natural predators are starting to eat the lionfish as well, things like moray eels and nurse sharks. I'm not sure if the nurse sharks will go after a living one, but I've seen them happily consume injured or dead lionfish."



HOW TO GET AFFILIATED WITH THE ALABAMA WATER INSTITUTE

The Alabama Water Institute (AWI) consists of a diverse group of more than 100 members representing multiple departments, colleges and center/institutes here at The University of Alabama (UA). If you have expertise that could contribute to addressing complex water issues, please register yourself on our website. All registered members are considered affiliated with AWI and have access to all AWI resources. Affiliate members retain their positions in their tenure department homes where all administrative and performance review functions are carried out. Affiliate members are added to the AWI listserv and are notified of upcoming seminars, initiatives and research opportunities. Register below to add your new profile.

Registration Link

https://universityofalabama.az1.qualtrics.com/jfe/form/SV_cBxISQHzVgNWIkJ

Eligibility Criteria:

- A faculty/staff/student appointment at the University of Alabama
- Research expertise in a water-related field
- Completion of registration form

Registration Form Components (required):

- Name
- Title
- Department/College
- Education
- Office address
- Email
- Office phone number
- Link to faculty profile on department website
- Google Scholar profile link (if applicable)
- 250-500 word short statement on research interest, focus and keywords
- Headshot photo (optional)

Questions? Please contact Stefanie O'Neill at: soneill2@ua.edu or 205-348-9128.



THE UNIVERSITY OF ALABAMA®



THE WATERSHED GAME NOW AVAILABLE FOR CHECK OUT

The Watershed Game is an interactive tool that helps individuals understand the connections between land use and water quality. Participants learn how a variety of land uses impact water and natural resources, increase their knowledge of best-management practices, and learn how their choices can prevent adverse impacts. Participants apply plans, practices, and policies that help them achieve a water quality goal for a stream, lake, or river.

Trained Watershed Game Facilitators can now check out any of the 4 game versions:

- Local Leaders Stream
- Local Leaders River
- Local Leaders Lake
- Classroom

Game versions will be reserved and checked out on a first reserve, first served basis.

If you have not been trained to use the Watershed Game, or would like assistance with facilitating the game, please contact Carly Jones (cejones13@ua.edu) for more information.

Alabama Water Institute Newsletter Vol. 1 No. 2

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