CONFLUENCE

Fall 2024

Director's Overflow by Dr. Michael Flinn

That is a “new record”! The exclamation is used in many different contexts, and we hear it almost daily. What does it mean to break a record? The typical use is to recognize an act, observation or achievement that has surpassed all previous “records”. Importantly, this requires that standards of measurement are used and accepted by record keepers with high precision and accuracy. At Hancock Biological Station, we keep “records” on a wide range of environmental data.

November 26th, 2024 was a record-breaking day that marked the latest freeze in our region (EVER), breaking the previous record by two weeks. The difference between a single degree at the threshold of 0°C makes a world of difference to life as we know it (see image below). Importantly, even when covered in ice, life goes on in most aquatic systems. Life is resilient and bounces back from one-off records, but when the records become routine, the organisms that make up communities in a given area change. The balance between the typical winners and losers starts to shift. Climate and ecological responses are often less influenced by extreme events and likely more influenced by subtle long-term changes (especially in aquatic systems where water buffers short-term changes in temperature). The Kentucky Lake Long-term Monitoring Program at HBS provides the foundation to detect these subtle changes. We are currently investigating changes in zooplankton and invasive carp populations, temperature, calcium, sulfate and primary production to name a few.

Figure 1. Arrays of cattle tanks at HBS represent small ponds where we can conduct experiments. The difference between these two mesocosms is 1°C (artificially heated with an aquarium heater) and highlights the presence or absence of ice covering the tank.

Inside this Issue

More Information
Follow us:

Featured Faculty: Dr. Howard Whiteman

I have three hats at Murray State: Director of WSI, Professor of Biology, and my most recent hat is being the Commonwealth Endowed Chair of Environmental Studies. In these three roles I administer WSI, teach and do research in the Department of Biological Science, and conduct outreach activities.

My work with WSI perhaps speaks for itself—I help oversee everything WSI does, help support HBS, MARC, and CSL, and also act as a co-chair for three joint faculty members, one each in Biology, Earth and Environmental Sciences, and Chemistry.

I teach a variety of classes related to ecology and focused on our Wildlife and Conservation Biology (WCB) program and graduate programs, including Introduction to WCB, Saving Planet Earth, Vertebrate Natural History, Conservation Biology, and Advanced Ecology. I am also the advisor for our student chapter of Backcountry Hunters and Anglers, and aid Dr. Darracq as much as I can with our student chapter of The Wildlife Society. Both of these organizations have been extremely rewarding to me both personally and professionally.

Whiteman and undergraduate students sampling salamanders.

Arizona tiger salamanders, which are native to Colorado.

My research is centered in conservation and evolutionary ecology, but has broadened over time to include a variety of other questions centered on behavioral ecology, population dynamics, community structure, and ecosystem function. My recent work has become more conservation-oriented, with a focus on climate change and restoration ecology, and I conduct field research and experiments in both Kentucky and Colorado, mostly on amphibians. My students have taken full advantage of JCSET's wonderful resources over the years, including recent students doing mesocosm experiments with amphibians at HBS and using GIS to study species distributions through MARC. My research success is a testament to the amazing undergraduate and graduate students as well as the postdoctoral scholars I have had the opportunity to work with, as well as the terrific support that JCSET, the Department of Biological Sciences, and our research centers have provided for us.

Whiteman, graduate students Jordan Tandy, Megan Zerger, Melissa Ocampo, and Karissa Coffield, and WSI postdoc Dr. Dustin Owen at the 2023 MSU Sigma Xi Poster Competition, in which the lab swept the graduate poster awards.

Outreach-wise I am involved in a variety of WSI-related activities, including the Four Rivers Sustainability Festival which will again happen this April (get ready!!). I also do a variety of other things to help educate the general public about science, including hosting Science Cafes in an attempt to educate the general, writing articles for local and regional newspapers, visiting senior centers, and giving presentations about the research in my lab.

I've been at Murray State for 27 years and that is a very long time for some people, but you have to remember that I started here when I was 14 (that's a joke!). Actually, I've always followed the lead of my salamanders and remained as young at heart as possible. Because administration, teaching, research, and outreach are still challenging, rewarding, and dare I say fun at times, I plan to continue my work for as long as my body remains vertical (as Leon Duobinis-Gray used to enjoy saying) and my mind is sharp (or at least sharp enough).

Featured Graduate Student: Emily Freeman

Pictured above: White crappie caught in the trapnet set, Picture below: Blue Heron sitting on the trapnet while sampling for crappie. Picture on bottom left: My family and I holding the Pan-American Trophy, Bottom middle: All of Team USA celebrating after winning the 2024 Pan-American Championship.

**bottom photos courtesy of Macoy Fisher

Hey! My name is Emily Freeman, and I am from Ozark, Missouri. From a very young age, my focus has been on the outdoors. For me, fishing has always been a passion, either going fly fishing on pristine Missouri spring-fed creeks by kayak or going on my father's guide boat to track down some striped bass. I knew this was a passion for which I could take a different direction than a hobby. By the time I was a senior in high school, my mind was made up; I wanted to pursue a degree in Fisheries Biology and tournament fish in college. I believe this would ensure that future generations will enjoy the vast watershed I grew up on as much as I did.

I came to Murray State University to fish on the bass fishing team and pursue a degree in fisheries biology. This past May, I completed my undergraduate degree as a 4+1 student. I continued with my master's program here at Murray State. My graduate research focuses on one of the most sought-after fish in the United States: the white crappie, *Pomoxis annularis*, black crappie, and *Pomoxis nigromaculatus*. Due to Kentucky Lake being the last reservoir in the Tennessee River Chain, it fluctuates from 107.9 meters in the winter to 109.4 meters in the summer, with an overall fluctuation of around 1.5 meters. Historically, the crappie spawn occurs during this transitional period between winter and summer pool. Many studies have observed the overall spawning characteristics of crappie and how there are skipped spawning generations based on the environmental effects. However, why there are boom and bust years within Kentucky Lake has not been studied. Our research focuses on the proportion of viable females within Kentucky Lake. Hopefully, it will represent a crucial puzzle piece in unraveling the factors contributing to crappie spawning success or failure in Kentucky Lake.

I am an active Murray State Bass team member and compete professionally in tournament fishing. Most recently, I qualified to fish for the Team USA bass team through a tournament on Lake Toho in Kissimmee, Florida, the Icast Cup. I won this tournament in the summer of 2023. This tournament was set in place for females to get the opportunity to fish on the national team. The Pan-American Black Bass Championship was held in New Brunswick, Canada, on the St. Johns River this year. At this event, ten countries were represented: Canada, USA, China, Mexico, Dominican Republic, Colombia, Puerto Rico, Costa Rica, and two native American teams, Turtle Island and Wolastoqey. This year was the first time an all-female team was represented. My partner, Rhonda Pitts, with whom I qualified, fished a Women Pro trail, LBAA (Lady Bass Angers Association), with me, and we met through that. Fishing with some of the top professional anglers in the country, the USA was able to take home gold!

College fishing was my place to grow and gain connections in the industry as an individual angler. It provides an environment where you can truly develop your passion for being an angler and compete at the highest level. Not only at a national level but also at the international level. The Murray State Bass team welcomed female anglers into the sport with open arms and allowed doors to open for me. I wouldn't be where I am today if I didn't have the opportunity to compete
at the collegiate level.

HBS HVAC Construction

Construction started October 1st with a complete overhaul of the HVAC system. Expected finish date is February 2025.









Brittany Forgey's Wildlife & Forestry class visits from Murray High School

HBS led groups focusing on dendrology, wildlife management and fire ecology.

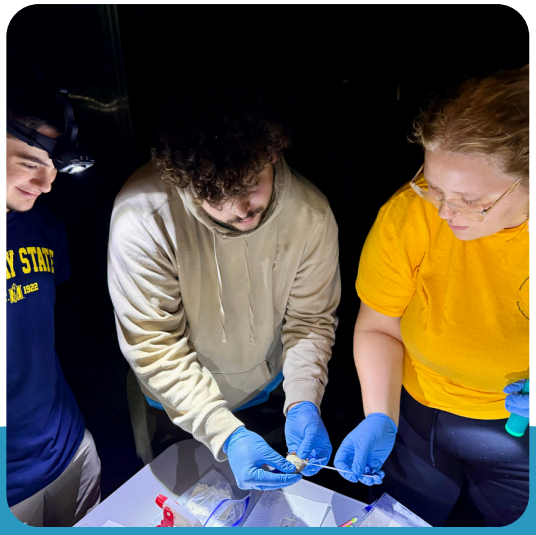
Rebecca Burgess' AP Environmental Science Class visits from Murray High School

HBS led sessions on life history, specialists vs generalists, invasive species and had the class model effects of trophic cascades in Kentucky Lake.

Toad Fest

Fall 2024

Students from Dr. Andrea Darracq's wildlife techniques class (BIO 380), the MSU Wildlife and Fisheries Society, and Dr. Howard Whiteman's lab came together during Toad Fest. They all shared a common objective - to find as many toads as possible. Toads that were found were swabbed by BIO 380 students as a part of the Student Network for Amphibian Pathogen Surveillance (https://snaps.amphibiandisease.org/). If toads were large enough, they then became a part of undergraduate student Emily Haner's research project where she is evaluating the use of PIT tags to mark Fowlers toads (*Anaxyrus fowleri*).



Tennessee Naturalists

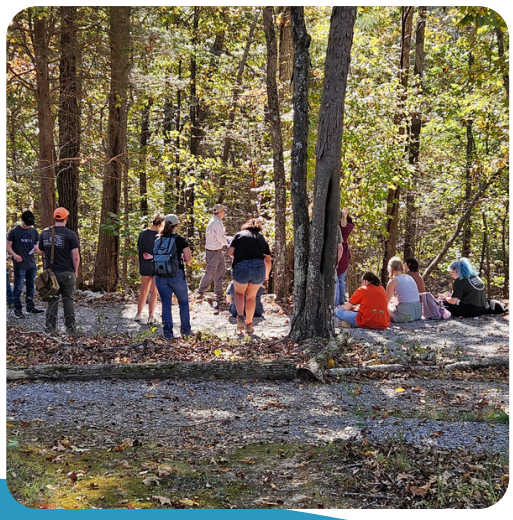
Fall 2024

The Tennessee Naturalists returned for certification in aquatic ecology. The group participated in several hours of coursework and field experiences to increase their understanding of our natural resources. Dr. Flinn uses contemporary “hot topic” issues to prime naturalists for questions they may receive while volunteering. The group ventured to Lake Hancock to learn about using macronvertebrates as biological indicators and then to Kentucky Lake to experience

Dr. Matt Carroll's Dendrology class

Fall 2024

Dendrology is the scientific study of trees and what better place for Dr. Carroll to bring his class.



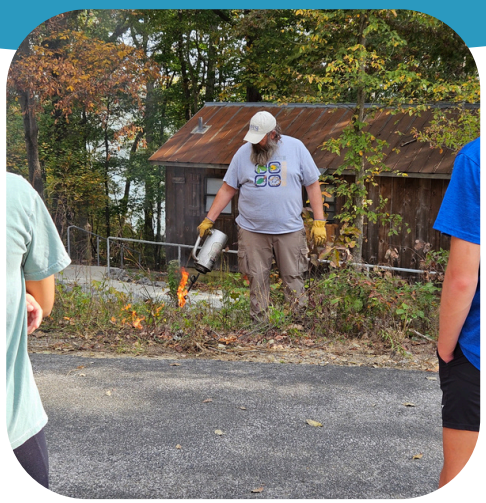
Damian Loveless' Biology classes visits from Calloway County High School

Fall 2024

Damian Loveless returned with 70+ students from the CCHS. The students spent the day at HBS learning about reservoir ecology, fisheries biology, wildlife management, evolution and population ecology and forest and prairie restoration.

Above, Clay Thompson and Justin Graben teach the students about the electrofishing

CCHS Biology Field Trip continued


Above, Jason Harris Operation Supervisor, teaches the students about prescribed fires.



Above pictures from the wildlife management, and reservoir ecology trips.



Above, Andrew Brown, Watershed Science graduate student, explains his salamander research.

Dr. Darracq's Necropsy Lab

Fall 2024

Dr. Chrissy Casey (State Wildlife Vet) and Kate Willams with Kentucky Department of Fish and Wildlife led this lab.

Students gained instruction on using techniques for detecting wildlife diseases, identifying important anatomy and techniques for aging wildlife. Students dissected beavers, opossums, bears, raccoons, otters, deer and more.

Dr. Darracq's Necropsy Lab

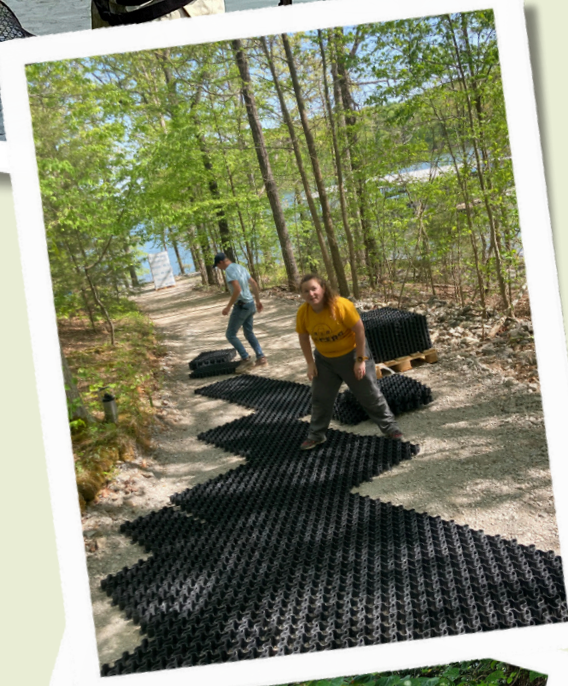
Part 2

Dr. Darracq's Wildlife Techniques class Tractor and Trailer training day

Dr. Darracq returned with the Wildlife Techniques students to gain experience using equipment of the trade. Clay Thompson honed their trailer-backing skills and Jason Harris provided instruction on tractor operation and implement use.

EXPLORE *Giving*

DONATIONS HELP US IN MANY WAYS! YOUR SUPPORT PROVIDES OPPORTUNITIES FOR STUDENTS IN THE FORM OF SCHOLARSHIPS AND RESEARCH SUPPLIES. YOUR DONATIONS HELP FUND PROJECTS THAT IMPROVE OUR INFRASTRUCTURE: UPDATING LABS, RENOVATING STUDENT AND GUEST HOUSING, AND PROVIDING FUNDS FOR ITEMS NOT COVERED BY GRANTS. LISTED BELOW ARE PROJECTS WE ARE WORKING ON.



- *Monitoring Kentucky Lake Water Quality every 16 days
- *Native and invasive fish tracking on lake and streams
- *eDNA research
- *Backpack electric fishing stream surveys
- *Threatened species tagging and population estimate
- *Shad population age studies
- *Methane emissions from Cypress Trees
- *Golden mouse habitat research
- *Monitoring Armadillo burrows
- *Toad monitoring and tagging
- *Native Beetle surveys
- *Ecology, Herpetology and Wildlife management classes

For a list of Current Needs click QR code:

CONTACT US

561 Emma Drive, Murray, KY

270-809-2272

murraystate.edu/hbs