

CONFLUENCE

Director's Overflow by Dr. Michael Flinn Winter in the Temperate Zone – When Everything Seems Dead



It's easy to believe that everything dies in winter. The grass turns brown, most trees drop their leaves, and—blissfully—the biting insects disappear. Add in the sharp sting of cold wind on a long walk, and the landscape feels lifeless.

But what we're actually seeing is one of nature's most remarkable survival strategies: the art of cheating the season. The trees aren't dead at all—they're just as alive as

ever. So are many plants, insects, frogs, fungi, and even some of those annoying biting flies. Most organisms are simply powering down, slipping into a winter version of "sleep mode."

For perennial plants, that means shedding vulnerable tissues and packing energy into roots, rhizomes, and stems. For insects like flies, grasshoppers, lady beetles, stink bugs, and many moths, winter is spent tucked away under leaves, beneath tree bark, or—if you're unlucky—in the quiet corners of your attic. Think of it as a months-long nap combined with a very strict energy-saving plan.

Of course, this strategy is also a gamble. To survive until spring, organisms must store enough fuel to last the entire winter. And counterintuitively, it's often the warm spells—not the cold—that pose the biggest threat. When temperatures rise above critical thresholds, metabolic rates spike, and those carefully rationed energy reserves burn too quickly.

We take for granted that spring will greet us with a flush of green, but that yearly miracle depends on the success of millions of overwintering organisms. Imagine if everything did have to start from seed each year. While that's the norm for many annual plants, overwintering strategies vary tremendously—even among closely related species.

Winter may look like a season of death, but beneath the surface it's a season of patience, preparation, and astonishing biological resilience. Which means that when you go for that second turkey leg or extra slice of pumpkin pie this holiday season, you're not overindulging—you're simply practicing time-honored overwintering strategy until the warm days return.

Fall 2025

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Featured Student: Delaney McCoy



My name is Delaney McCoy, and I am a senior Biology major here at Murray State. At the beginning of my freshman year, I really did not have much of a plan as to what the next four years were going to look like. I always knew that I wanted to go into a science field, but I wasn't sure which one specifically was the right choice. Since I was undeclared, I was taking most of my gen-ed courses to get them out of the way. During this time, I was lucky enough to have an introductory biology class with a professor that teaches many wildlife courses at MSU. We met and discussed some of my interests, most of which revolve around being outside and enjoying nature. He encouraged me to pursue a major in biology with a focus on wildlife and conservation classes, which is what I have been doing ever since.



During my sophomore year, I was offered the opportunity to assist two graduate students that were working on projects in Dr. Jessica Moon's lab. These studies focused on greenhouse gas emissions (GHGs) from trees in wetland systems, which was something that, at the time, I was largely unfamiliar with. Eventually, this experience led to me taking over a similar project in the Moon lab for my Honors thesis – for the last several semesters, I have been working on a mesocosm study, the goal of which is to determine the effects of spatial patterning and microtopography on GHG fluxes in wetland soils. Essentially, what this means is that we are taking needles from bald cypress trees and burying them in different arrangements in tubs of soil, some of which have higher or lower areas relative to an eventual water table and seeing how these factors impact fluxes of GHGs such as methane, nitrous oxide, and carbon dioxide. Currently, we are working on finishing the initial setup, and we hope to begin taking measurements early in the spring semester. A paired core study that we did earlier in the semester has given us some data, but we are eagerly anticipating the day

that the mesocosms are fully up and running. All of the components (including the plumbing system) were designed and hand-built by us, which has been incredibly challenging but also a fantastic learning experience.

In my free time, I love being outside- taking pictures of cool things I find in the woods is one of my favorite pastimes. I also enjoy reading, crocheting, and music; fun fact, I am a four-year member of the Murray State Racer Band!

Christian County Visit

September 2025



Christian County teacher Lea Brumfield wrote to us after the class visit and said: "Thank you for the wonderfully planned experiences that the students had on Friday! It was packed full of information and so much fun. Many students stated that it was the best trip they had ever attended! We are looking forward to planning our next adventures at HBS! Thanks again".

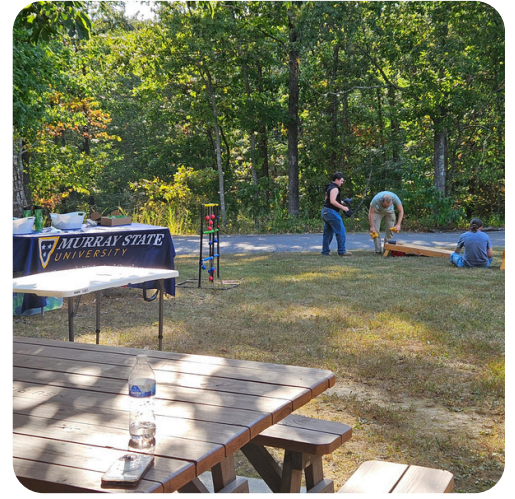


CALM

September 2025



C.A.L.M. day (Cruise and Landmark Meditation) was an MSU QEP grant funded experience aimed at providing outdoor relaxation and exploring opportunities for the broader MSU campus. Visitors had the opportunity to recharge with guided trail walks, meditation opportunities, pontoon cruises and food.



New Flag from Woodmen of the World

September 2025



Pictured above is Sidney and Phyllis Gutting that presented the new flag provided by Rachel Brown from Woodmen of the World.



Public Lands Day

September 2025



Backcountry Hunters and Anglers chapter (BHA) celebrated Public Lands Day with a trash pickup of White Beach followed by a meal and watching the movie “Public Trust” with the outdoor movie screen.



MHS AP Environmental Science Class

October 2025



Murray High Schools AP Environmental Science class taught by Rebecca Burgess came to HBS for a field day to learn more about population and community ecology.



MSU Lab classes: Fisheries Techniques and Dendrology

October 2025



Dr. Spier's fisheries class learning how to implant telemetry tags used for tracking fish movement.



Dr. Matt Carroll's Dendrology Lab enjoying the beautiful fall day and learning about characters needed for tree identification.



Calloway County Visit

October 2025



Calloway County High School's Biology class visited with Damian Loveless for their annual visit to the station. This years trip included Pond ecology, limnology and fisheries biology, plant restoration, salamander research and botany.

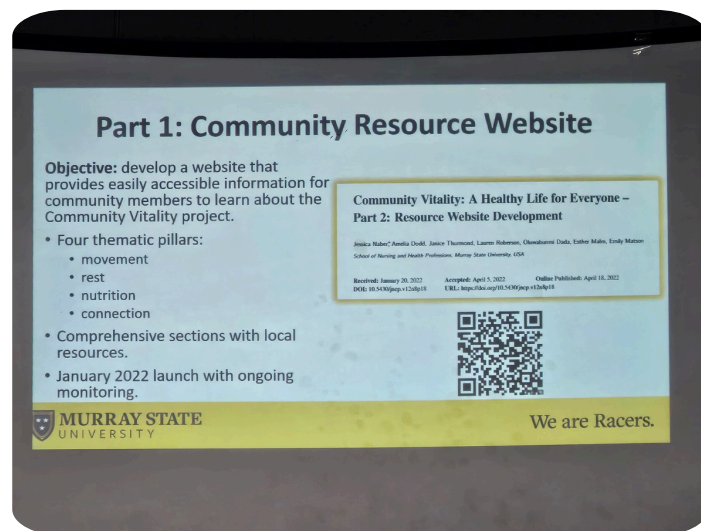
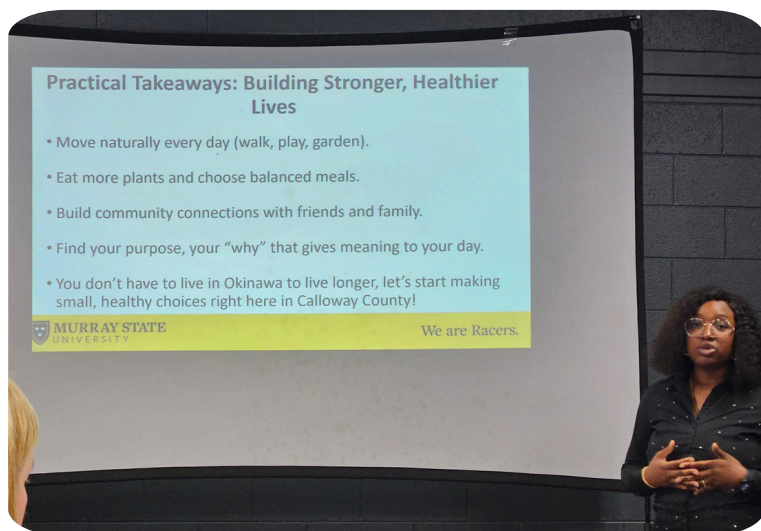


Science Cafe

October 2025



The Fall Science Cafe speaker was Dr. Oluwabunmi Dada from the Department of Occupational Safety and Health at Murray State University. The title was Community Vitality in Calloway County: What Blue Zone communities teach us about living longer and healthier. Discussion lead to discovering how healthy habits can transform lives and strengthen our community.



Make sure to follow us on the Watershed Studies Institute Facebook for all calendar events and details about the next Science Cafe. Click on the Facebook icon, to the right, to go to the page.

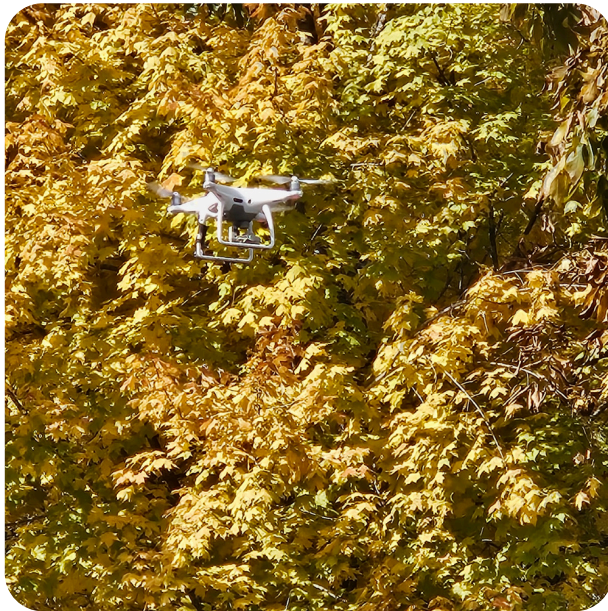


MHS AP Forestry and Wildlife Class

November 2025

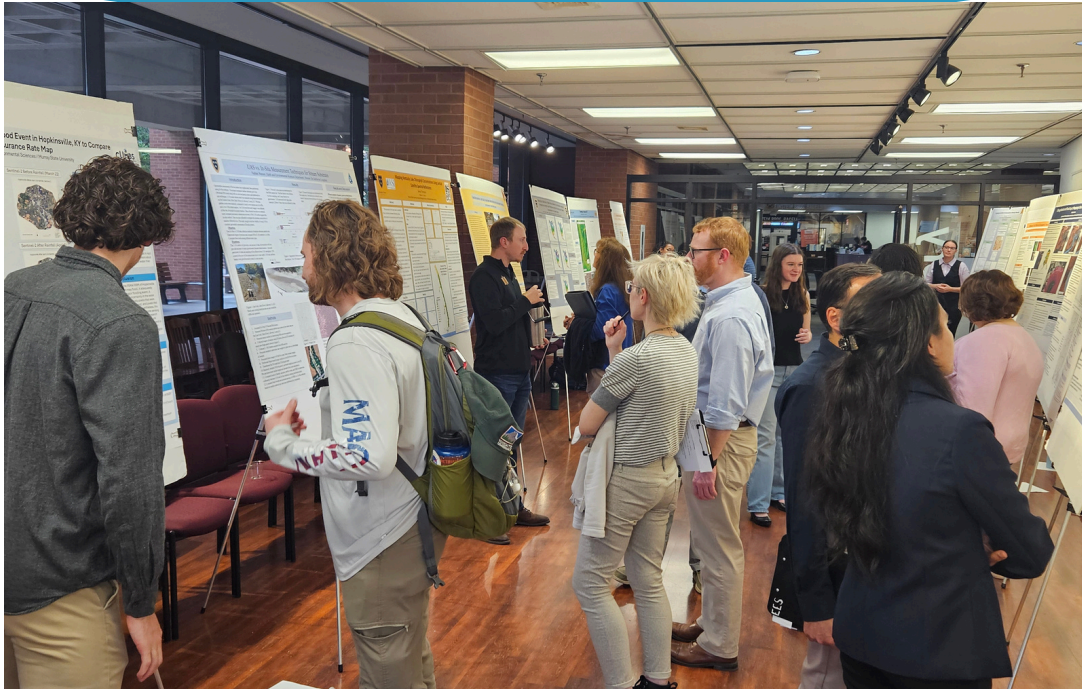


Murray High Schools AP Forestry and Wildlife Class learned more about pond ecology, salamander research, trail camera research, importance of prescribed fires and using drones for research.

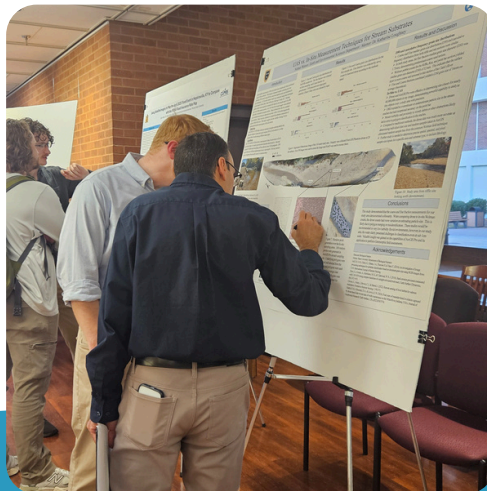
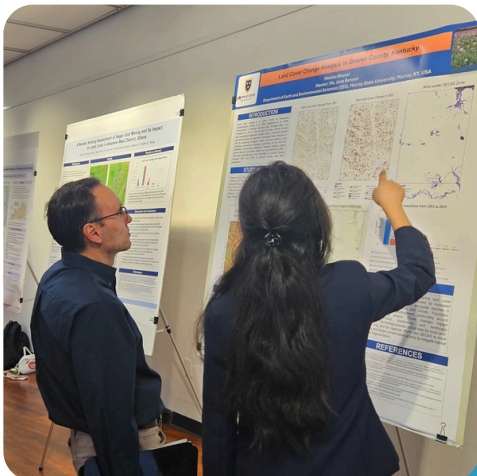
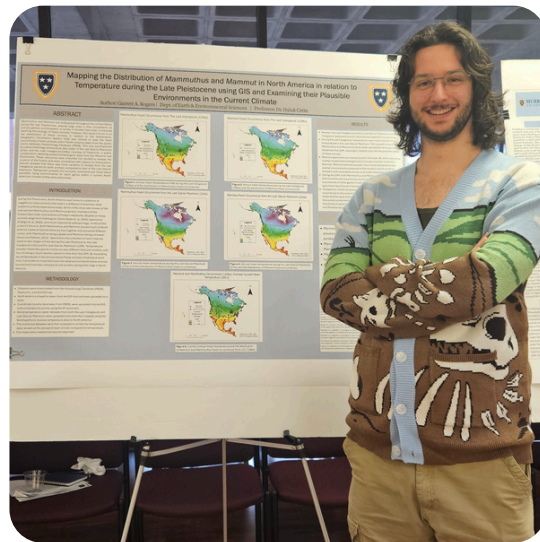


MSU Fall Poster session for Scholars Week

November 2025



Pictured below is Clay Thompson and Garrett Rodgers with their research posters.



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:



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