

DECEMBER 2023

# FALL EDITION

Official Newsletter of Earth & Environmental Systems



## Spring 2023 Awards Banquet

### UNDERGRADUATE AND GRADUATE AWARDS

Our commitment to honor student excellence and support their academic success remains unwavering. Year after year, we proudly continue the long-standing tradition of awarding scholarships to our students based on their academic performance, teaching, and service. The generosity of our Alumni and department friends, who contribute to the our foundation scholarships, makes these awards possible. Their dedicated donations have a profound impact, allowing us to reward deserving students who have excelled in various aspects of their academic lives. It is our pleasure to recognize and celebrate our students efforts.



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## Scholarship Awardees

CAS Outstanding Senior

**Zach Kemp**

Robert Drummond Scholarship

**Marley Snow & Hannah Murray**

Richard E. Kirk Memorial Scholarship

**Destiny Legg**

Richard F. Duewilius Geology Field Camp

**Destiny Legg**

Richard F. Duewilius Geoscience Scholarship

**Tessa Lomax, Chris Winningham, & Paige Havener**

Allan Harrison Graham Memorial Scholarship

**Sam Hunter**

Hildagard Pang Anthropology Scholarship

**Daphney Coffey**

G. David Koch Memorial Scholarship

**Daphney Coffey**

Robert Pace Memorial Scholarship

**Daphney Coffey, Sam Michael, & Hannah Redlin**

Blackwell Scholar

**Zach Kemp**

Donald G. Brown Endowed Scholarship

**Ambriah Bradford & Mahalia Patrick**

Dr. Maxwell W. Britton Scholarship

**Carter Ritzheimer & Justin Vangilder**

Donald & Mary Jo Stanley Endowed Scholarship

**Justin Vangilder & Jenna Nashold**

Emily Troxwell Geology Scholarship

**Rorie Reisner**

Ben Moulton Award

**Sristika Adhikari & Christian Sizemore**

Dr. L. Michael Trapasso Research Grant

**Christian Sizemore**

Dr. Paul Mausel EES Graduate Research and Travel Scholarship

**Shanta Banstola**

John E. Oliver Memorial Scholarship

**Sanjaya Bhandari**

“Go where the science leads you, even if the path is difficult and few have followed it before you.”

KATHY MUDICA  
EES PHD CANDIDATE





## Scholarship Awardees Cont.

- Outstanding Graduating Seniors  
**Zach Kemp - Geology & Isabella Leon - Geog. & Sustainability**
- Outstanding Service Undergraduate  
**Daphney Coffey, Elynor Head, Hannah Redlin, & Rorie Reisner**
- Outstanding Research Undergraduate  
**Hannah Redlin, Justin Vangilder, & Chris Winningham**
- Outstanding Student Worker  
**Camryn Sample**
- Outstanding Service Graduate  
**Ravin Gaines, Hilary Howard, & Kathy Mudica**
- Outstanding Graduate TA/RA Master's level  
**Paige Havener & Maddy Hill**
- Outstanding Graduate TA/RA Doctoral Level  
**Shanta Banstola**

## Thank You

The giving generosity of our alumni and friends help bring to life opportunities that students wouldn't otherwise get to experience.

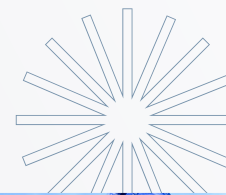
Students in need get a helping hand through scholarships, giving them the freedom to participate in experiences and conduct research.



## FROM ALL OF EES

Supporting department funds allows us to give quality educational experiences, opportunities, and research tools they otherwise wouldn't benefit from.

Your gift supports our faculties ability to provide resources that attract and retain EES students.



# EXCAVATING POMPEII

**Hannah Redlin,  
Anthropology Senior**

Hannah spent her summer as an excavator for the 2023 season of the Pompeii I.14 Project for her Anthropology Field Camp.

The Pompeii I.14 Project is an international collaboration led by Tulane University and the Parco Archeologico di Pompei, and including Oxford University and the Geospatial and Virtual Archaeology Laboratory and Studio (GVALS) of Indiana State University.

## Pompeii Photos

Photos were taken by Tracy Ford and Tony Campbell of ISU.

## Watch the full Interview on



EESatISU

## What was the average work day like?

- Get up at 7 am and be on the dig site at 8:15.
- Work from 8-12:15 consisted of digging and getting things ready for the 3D models.
- Afternoon work was from 1:15-4:30. We would clean pottery and objects, organize finds, and I would do flotation. We would also create 3D models of the items we found.
- After we got back to the Hostile, from 5-8 we would sit, and play games while waiting for our turn in the shower. Supper was 8-10 pm.

## What as the favorite thing you learned?

- Flotation method. I was one of only two studentys who were taught the process.
- I would float samples or finds for people.
- I found a pigment covered rock that was found in bottom a trash pit.

- As a student athlete, (Track & Field) I had to carve out time each evening to get my workouts in. Gyms in Italy (area I was in) are very different from what I'm used to. I made it work and didn't loose any of my muscle mass.



## What did you take away the most from this experience?

- The connections that I made! This semester, I plan on using one of the professors as a reference in my Honors Thesis. Networking at field camp will also help with my future MS degree plans.
- I am much more comfortable with admitting when I need to ask for help.
- I learned more about myself.

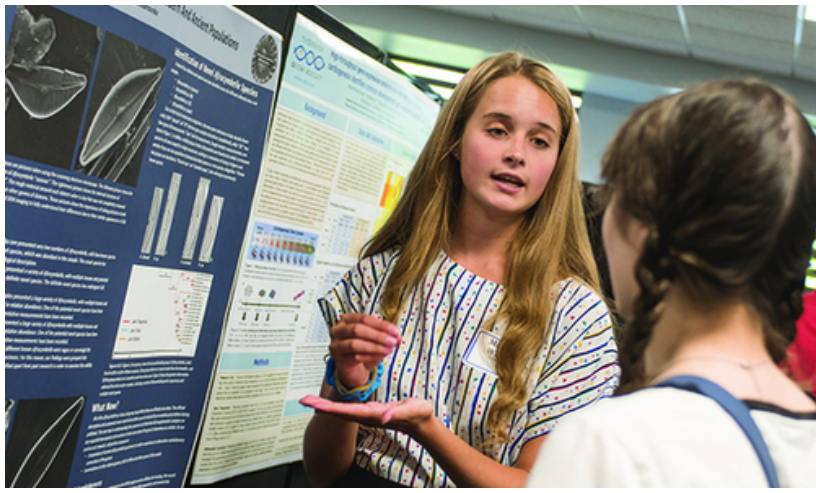
## What is flotation?

- It is a process using water to recover small artifacts like bones, seeds, food, and egg shells. Lighter objects float to the surface.

## What did you do for fun?

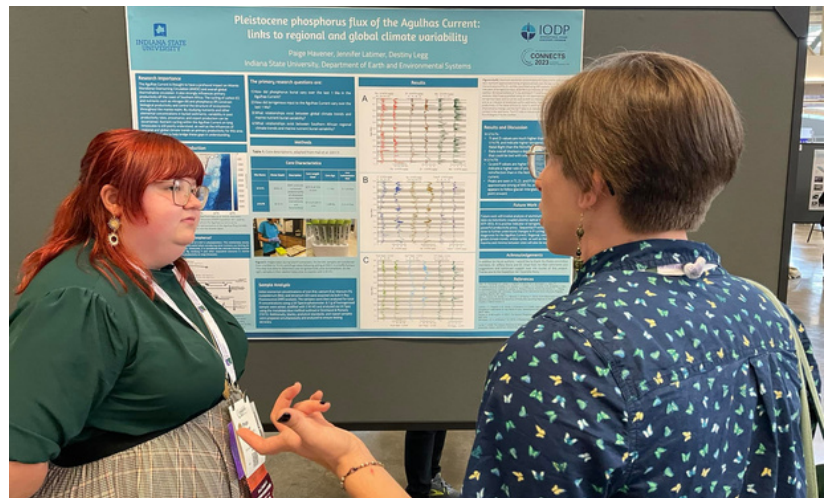
- On the weekends we would go to a beach or another site. Other times we would go to a city and explore.
- It was interesting to see the contrast between Herculaneum and Pompeii. Though they were both destroyed by Vesuvius, it occurred in very different ways.






# SURE PROJECTS

# and CONFERENCES











## Mercury's Affect on the Speciation of Crayfish in Indiana Creeks

Justin Vangilder, Makayla Sura, Kathryn Mudica, Jennifer Latimer

Department of Earth and Environmental Systems



**Abstract**

Mercury is a naturally occurring metal; however, the mercury cycle has been significantly impacted by the burning of fossil fuels. Once deposited into aquatic ecosystems, methylation by bacteria transforms elemental mercury into methylmercury which is bioavailable and toxic. As contaminants, crayfish hold an intermediate trophic position, consuming a myriad of living and nonliving flora and fauna. Different crayfish species seem to tolerate a wide range of mercury exposures in the streams they inhabit. This project aimed to determine if mercury may contribute to the distribution of crayfish species in Indiana freshwater streams. For example, would a higher tolerance to mercury contribute to the survival and propagation of invasive crayfish species. For this research, crayfish, water, foodplank, and sediment samples were collected from 17 streams in Indiana and analyzed for mercury content. Current results suggest some crayfish species have a higher tolerance to mercury and bioaccumulate mercury at differing levels perhaps giving them a competitive edge in these streams.

**Methods**

- Collect crayfish, soil, and water samples from creeks in Indiana
- Identify the species collected
- Dissect the crayfish after identification
- Freeze-dry tissue samples
- Test tissue samples with for Hg concentrations

**Objectives**

- To understand how mercury pollution may play a role in the species distribution, assemblage, and size of crayfish in Indiana creeks.
- To further our understanding of invasive species and their ability to thrive
- To better understand how mercury enters and travels through freshwater food webs.

**References**


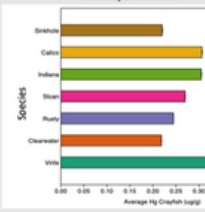
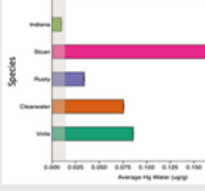
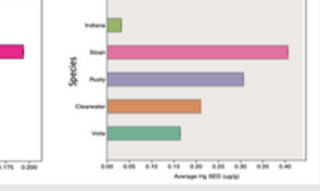
Alford, P., Chan, M., Cochran, M., Bellows, A., & Moore, C. (2010). The use of the average methylmercury (MeHg) concentration of the bioavailable fraction to assess the bioavailability of mercury to fish. *Environmental Toxicology and Chemistry*, 29(12), 2662-2670. <https://doi.org/10.1002/etc.1211>

Dingler, D., & Latimer, J. (2021). "Microbiology: Pollution in Water, Sediment, and Aquatic Foodwebs." *Environmental Systems*, Indiana State University, and SURGE 2021.

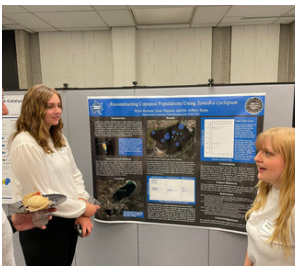
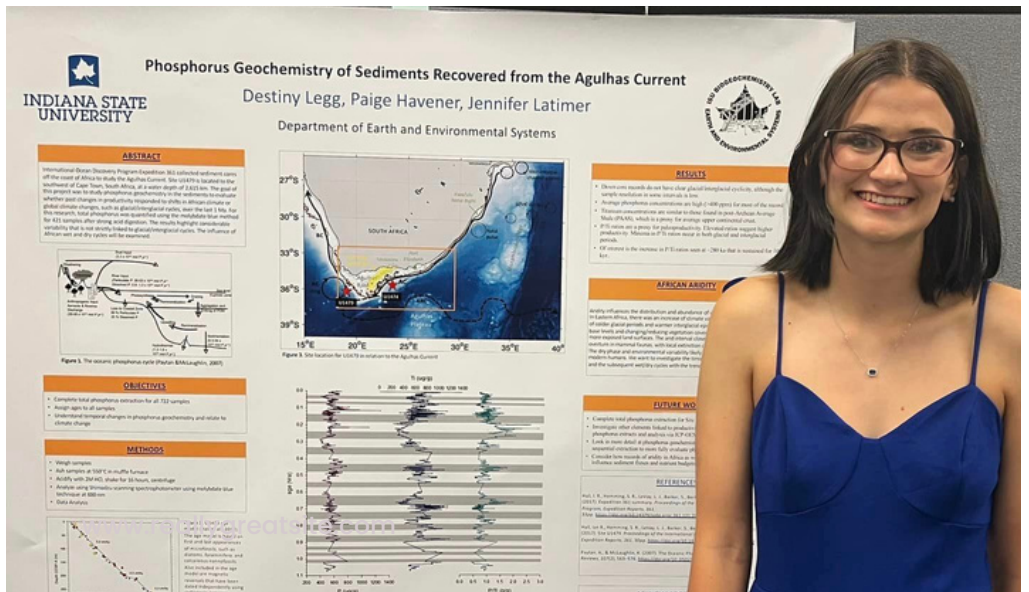
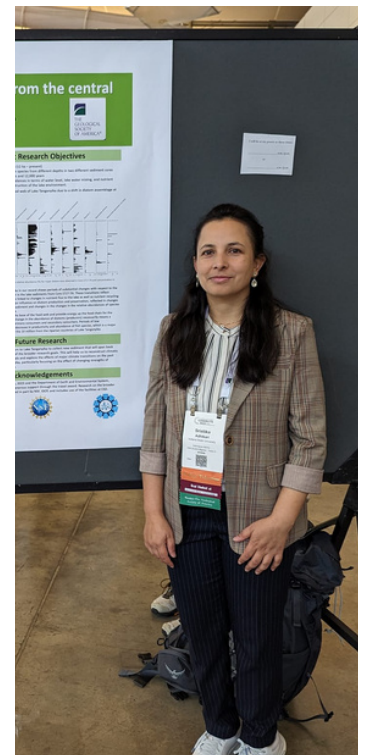
**Acknowledgments**

Special thank you to the Department of Earth and Environmental Systems, Indiana State University, and SURGE 2021.

**Results/Discussion**

- Highest average Hg - Vireo (0.3 ug/g)
- Lowest average Hg - Siskiwake (0.2 ug/g)
- Highest Hg range - Vireo (range)
- Smallest Hg range - Northern Clearewater (range)
- Sloan crayfish were found in water with the highest average Hg (0.2 ug/g)
- Indiana Crayfish were found in water with the lowest average Hg (0.15 ug/g)
- Highest Hg range - Vireo (range)
- Indiana Crayfish were found in sediment with the lowest average Hg (0.025 ug/g)
- West Fork Lick Creek had the highest tissue Hg (0.85 ug/g; species Vireo)
- Sarcox Creek had the lowest tissue Hg (0.14 ug/g; Northern Clearewater)



# TENURE TRACK ASSISTANT PROFESSOR OF GIS & REMOTE SENSING

The Department of Earth and Environmental Systems at Indiana State University invites applications for a tenure track position beginning in Fall 2024 at the Assistant Professor level. Preference will be given to those who apply GIS and Remote Sensing techniques in their research.

**SPECIALIZATION:** Any area of GIS and Remote Sensing; seeking a motivated individual with a strong background in geoscience-related fields especially with regard to applying GIS and Remote Sensing skillsets to research. The candidate's expertise should have an interdisciplinary focus matching expertise in the Department (e.g., geology, geography, environmental science, anthropology, archaeology, sustainability).

**EXCEPTIONS:** The candidate's teaching and research should complement current teaching and research and contribute to the degree programs offered in the Department. Teaching responsibilities will likely include courses titled Introductory Environmental Science, Intro to Geospatial Technologies, Fundamentals of Remote Sensing, and upper level/graduate electives in the areas of the candidate's expertise. The successful candidate is expected to develop a robust externally funded research program in their specialty that actively involves graduate and undergraduate students.

**REQUIRED QUALIFICATIONS:** Ph.D. in a geoscience related field; ABD candidates graduating by Fall 2024 will be considered.

**PREFERRED EXPERIENCE:** Post-doctoral experience and undergraduate teaching experience preferred.

**APPLICATION DEADLINE:** Review of application materials will continue until the position is filled. For full consideration, submit application materials by December 1, 2023. Submit a cover letter, curriculum vitae, references, teaching philosophy, and research statement.

**APPLICATION LINK:** <https://jobs.indstate.edu/postings/46051>

Indiana State University is a world-class center of higher education, located in Terre Haute, Indiana, and serving a multi-state region that stretches from Indianapolis to St. Louis, Chicago, Louisville, Cincinnati, and beyond. It has been recognized by the Princeton Review as among the best universities in the Midwest.



# 24 SPRING

## EVENTS

MONDAY'S AT NOON  
SCIENCE BUILDING ROOM 162

**SPRING SPEAKER SERIES**  
VARIOUS TOPICS

SEMINARS ARE COMPOSED OF SPEAKERS INVITED BY THE DEPARTMENT. A FULL OF SPEAKERS WILL BE POSTED SOON FOR THE SPRING SEMESTER.

MARCH 11-15

SPRING BREAK @ ISU

3RD WEEK OF MARCH  
EXACT DATE COMING SOON!

**LAURA WITTMAN SPEAKER:**  
DR. LOREN DAVIS  
OREGON STATE UNIVERSITY

MONDAY APRIL 8

ECLIPSE STARTS @ 1:30 PM  
TOTALITY @ 3 PM  
COMPLETES @ 4:30 PM  
EASTERN TIME

**2024 SOLAR ECLIPSE**  
TV AND LIVE STREAMING FROM  
INDIANA STATE & VINCENNES BY  
THE JOHN C. HOOK OBSERVATORY CREW  
ON CAMPUS VIEWING  
COMMUNITY PROGRAMS

APRIL 17TH

EARTH DAY @ ISU

WEDNESDAY MAY 1

2024 AWARDS CEREMONY

**\*NEW - Live Streams Aquarium Tanks 24/7**



**CAMERA 1**  
Saltwater &  
Frogs



**CAMERA 2**  
Freshwater