



Fall 2021 continued to bring unique challenges to Murray St. due to the Delta-variant of the COVID-19 pandemic. We welcomed new students, faculty, and staff back at our 2021 Fall Kickoff Event. The giant jenga game was fun!

Department of Earth and Environmental Sciences

Greetings from the Chair

The 2020-2021 Academic Year was different, unusual, strange, odd, exhausting and challenging. We lived our lives on Zoom a lot. Zoom has been used as a noun, a verb, an adjective, and an exclamation. We are tired of it though. Through it all, we persisted. Our students moved along in their programs, graduated, continued to graduate schools and jobs. We welcomed many new students. Our faculty taught in hybrid classrooms and had great success publishing and obtaining grants. The Murray State values - Hope, Endeavor, and Achievement - shine through. ● Robin Zhang

Gracie Schneeman receives the inaugural Neil and Joan Weber Endowed Scholarship



Miss Gracie Schneeman, a freshman from Paducah, Kentucky, is the inaugural recipient of the Neil and Joan Weber Endowed Scholarship in Earth and Environmental Sciences. Gracie is pursuing a degree in our Archaeology Track. She loves going to museums and aspires to become a museum curator after graduation. "When deciding on a school I found that the Murray State Earth and Environmental Sciences department offered a smaller student to teacher ratio, which is exactly what I was looking for. I am very excited to be a recipient of the Neil and Joan Webber Scholarship. It is pushing me one step further to my goal." Says Gracie. The Scholarship was established in 2019 by Dr. Neil Weber and his wife Joan, to give annually to incoming

freshmen pursuing a degree in the Earth and Environmental Sciences. Dr. Weber served as the Chair of the Department of Geoscience (predecessor of EES) and the Dean of the College of Science, Engineering and Technology, before his retirement in 2007.

Dr. Gary Stinchcomb is the 2021 MSU Distinguished Researcher



Dr. Gary Stinchcomb, Associated Professor jointly appointed in the Department of Earth and Environmental Sciences and the Watershed Studies Institute, received the MSU Alumni Association's Distinguished Researcher Award for 2021. The award is given to a faculty member each year to recognize excellence in research and reflects the significance of faculty research to the educational environment at Murray State University.

Dr. Stinchcomb studies the physical and chemical processes of soils and paleosols to understand human-environmental interactions in the past, present and the future. His research spans several regions, including paleoenvironmental reconstruction of paleoanthropological discoveries at open-air sites in Kenya and Ethiopia, paleoflood investigations along the Middle Tennessee River, and modern soil geomorphic response to environmental change at the Clarks River National Wildlife Refuge. Dr. Stinchcomb has contributed to 40+ publications, and received external grants from several federal, state, and private funding agencies including the National Science Foundation.

Faculty Spotlight - Christine Witkowski



Christine Witkowski grew up playing in the woods of Massachusetts and hiking in the mountains during summer trips to New Hampshire, but no one ever encouraged her to follow her love of the outdoors into a career. And like many students, she never took an earth or environmental science course in high school or college (earth science was considered "rocks for jocks"). She planned to attend medical school and obtained a B.S. in Physiology and Neurobiology from the University of Connecticut (1995). Luckily she decided to take time off to work after college, because that was when she started to explore other options. When she returned to school, it was to pursue a master's degree in geology (University of Connecticut, 2002).

Her experiences as a graduate teaching assistant ultimately convinced her to focus on teaching. She has experience in museum education and community outreach through work at Dinosaur State Park in Connecticut, and was a professor and coordinator of the Environmental Science program at Middlesex Community College in Connecticut for ten years prior to coming to Murray State.

At Murray State, Christine enjoys teaching a variety of courses, coordinating the EES 101 labs, mentoring teaching assistants in the department, and advising the EES Club. She creates outreach programs to increase the visibility of the EES department in the community and area schools. She is also working with Dr. Robert Fritz in the Global Languages to develop a study abroad course in the geology of Portugal.

(Text and picture by Christine Witkowski)

2020 - 2021 Undergraduate and Graduate Student Awards



(L-R: Matthew Owen, Levi Belangee, Rachel Stuckey, Matthew Meyer, Cole Fletcher, Madeline Beasley)

2020 - 2021 Outstanding Seniors and Graduate Students

Outstanding Senior in Environmental Science: Rachel Stuckey

Outstanding Senior in Geoarchaeology: Matthew Meyer

BS Degree Recipients: Madeline Beasley, William Levi Belangee, Cole Fletcher, Matthew Meyer, Matthew Owen, Rachel Stuckey, Jonathan Topper, Nolan Whitt

Certificate in GIS Recipients: Madeline Beasley, William Levi Belangee, Cole Fletcher, Matthew Owen, Madissen Prinster, Rachel Stuckey, Kaylin Wilson

MS Degree Recipients: Zachariah Elliott, Christopher Lance Stewart, Javus Yandal

2021-2022 Departmental Scholarship Recipients

A B Waters Scholarship: Logan McGowan

Alice and George Kippfut Sr. Scholarship: Skylar Ross

Clyde Reed-Jim Smith Scholarship: Pam Rodriguez

James Allan Roberts STEM Internship Scholarship: Ash Medlock

Jesse D. and Deborah C. Jones Scholarship: Sofia Bayer, Taylor Vickers

Matthai-Panzer Scholarship: Leola Dillehay, Amber Koenig

Neil and Joan Weber Endowed Scholarship: Gracie Schneeman



EES students receive instruction from EES alumni Kyle Klass ('16) and Donnie Keeling ('01) of the local USGS office.

EES faculty receive significant grants

Assistant Professor **Dr. Marcie L. Venter** (PI) and Dr. Christopher A. Pool (Co-PI) of the Department of Anthropology at University of Kentucky have received a collaborative grant from the **National Science Foundation** in the amount of about \$350,000 total. The grant will support four years of research in southern Veracruz, Mexico, entitled "The Tuxtla Ingenio Project: Changes In Landscape, Labor And Livelihood In Long Chronological Context". Murray State University will serve as the primary home for the grant. **Dr. Gary Stinchcomb** is a collaborator. They will study the strategies that households and communities undertake when dealing with economic and environmental uncertainty. This investigation focuses on how global and local swings in sugar markets, political shifts, demographic declines, and environmental changes, have affected the households and communities of field and mill workers, beginning with conscripted indigenous, African, and Afro-mestizo communities of the colonial era.

Associate Professor **Dr. Bassil El Masri** has received a \$40,753 from the **NASA EPSCoR Research Infrastructure Development Grant (RIDG)** to help better understand how plants respond to changes in water availability. The research team will evaluate and assess the impacts of evapotranspiration and gross primary production (GPP) on Ecosystem Spaceborne Thermal Radiometer Experiment on Space Station (ECOSTRESS) water use efficiency (WUE) product, using observed data from two eddy covariance flux towers in Kentucky. The grant will allow El Masri and a colleague at the University of Kentucky to validate ECOSTRESS WUE and quantify the impacts of GPP errors and solar-induced fluorescence-derived GPP on the overall accuracy of ECOSTRESS WUE. Such information can be used to determine whether plants are stressed, providing necessary information for stakeholders to address potential drought conditions.

Associate Professors **Dr. Gary Stinchcomb** and **Dr. Bassil El Masri** received a grant of \$9,954 from **USGS-Kentucky Water Resources Research Institute**. The faculty and students research team will explore how changes in soil hydrology and respiration influence long-term differences in soil phosphorus (P) loss by forest type along the Clarks River valley bottom. Their work will add new knowledge on baseline soil P loss rates in the Purchase region, which has seen large P yields due to land use.

Professor **Dr. Haluk Cetin** was awarded \$25,000 Enhanced Mini-Grant from the **Kentucky Space Grant Consortium** for his project to map invasive plant species in Kentucky using LiDAR, UAS and satellite imagery, and GIS. Dr. Cetin also obtained \$23,500 from the AmericaView Program supported by USGS to continue KentuckyView, a member of the **AmericaView Consortium**. KentuckyView supports K-16 education, applied research, and public outreach using geospatial technologies in the Commonwealth of Kentucky.

More great news came recently. In July 2021, **Drs. Bassil El Masri, Gary Stinchcomb** and J. B. Moon of Biological Sciences received a grant of \$299,866 from the **Department of Energy**, among the \$11 million DoE gave to study critical ecosystems and improve climate and earth system modeling. The main goal of their research is to investigate the spatial and temporal carbon dynamics of a temperate bald cypress (*Taxodium distichum*), mineral soil wetland, and an adjacent bottomland hardwood stand using a suite of measurements including new soil and tree (i.e., stem and "knee") methane (CH₄) flux observations. This proposal is based on the premise that understanding methane fluxes in a temperate, forested wetland will advance mechanistic and model-ready science across a wide range of terrestrial-aquatic interface processes. The proposed design and activities will help to stimulate the adaptation of wetland ecosystems to a changing climate through better representations of the soil-vegetation interactions.

Recent Faculty Publications (*donates graduate students)

- Carlson, J. N., Maggard, G. J., **Stinchcomb, G. E.**, Daniel Sea, C., 2021, 'Middle Archaic lifeways and the Holocene Climatic Optimum in the Falls region', pp. 44-56, in Pollack, D., Bader, A.T. and Carlson, J.N. eds., Falls of the Ohio River: Archaeology of Native American Settlement. University of Florida Press
- Driese, S.G., Nordt, L.C., and **Stinchcomb, G.E.**, 2021, Chapter 2: Soils, chemical weathering and climate change in Earth history, pp. 23-65, in Hunt, A, Egli, M., and Faybishenko, B. (eds.), Hydrology, Chemical Weathering, and Soil Formation, Geophysical Monograph 257, 1st edition: AGU Book Series.
- El Masri, B.; **Stinchcomb, G.E.**; Cetin, H.; *Ferguson, B.; Kim, S.L.; Xiao, J.; Fisher, J.B., 2021. Linking Remotely Sensed Carbon and Water Use Efficiencies with In Situ Soil Properties. Remote Sens. 2021, 13, 2593. <https://doi.org/10.3390/rs1312593>
- Lombardi, R., Davis, L., **Stinchcomb, G. E.**, Munoz, S. E., *Stewart, L., & Therrell, M. D., 2020, Fluvial activity in major river basins of the eastern United States during the Holocene: The Holocene, <https://doi.org/10.1177/0959683620919978>
- Ferguson, B., Lukens, W. E., El Masri, B., **Stinchcomb, G. E.**, 2020, Valley bottom landform and the occurrence of paleosols in a humid-subtropical climate have an effect on long-term C storage: Geoderma 371, 114388. <https://doi.org/10.1016/j.geoderma.2020.114388>
- Semaw, S., Rogers, M.J., Simpson, S.W., Levin, N.E., Quade, J., Dunbar, N., McIntosh, W.C., Cáceres, I., **Stinchcomb, G.E.**, Holloway, R.L., Brown, F.H., Butler, R.F., Stout, D., Everett, M., 2020. Co-occurrence of Acheulian and Oldowan artifacts with *Homo erectus* cranial fossils from Gona, Afar, Ethiopia. Sci Adv 6, eaaw4694. <https://doi.org/10.1126/sciadv.aaw4694>
- Somelar, P., Soomer, S., Driese, S. G., Lepland, A., **Stinchcomb, G. E.**, Kirsimäe, K., 2020, CO₂ drawdown and cooling at the onset of the Great Oxidation Event recorded in 2.45 Ga paleoweathering crust: Chemical Geology 548, 119678. <https://doi.org/10.1016/j.chemgeo.2020.119678>
- Venter, Marcie L., 2020. Representaciones del agua en la cerámica de Tototal durante el Posclásico Tardío. En Uso y Representación del Agua en la Costa del Golfo, Editoras: Lourdes Budar y Sara Ladrón de Guevara, pp. 365-380. Universidad Veracruzana e Instituto Literario de Veracruz S.C., Mexico
- Venter, Marcie L., Daniel Pierce, Michael D. Glascock, 2021. Ceramic exchange networks in the south - central Tuxtla Mountains, southern Veracruz, Mexico. Geoarchaeology 1 – 26
- Yang, Y.; Tao, B.; Liang, L.; Huang, Y.; Matocha, C.; Lee, C.D.; Sama, M.; El Masri, B.; Ren, W. Detecting Recent Crop Phenology Dynamics in Corn and Soybean Cropping Systems of Kentucky. Remote Sens. 2021, 13, 1615. <https://doi.org/10.3390/rs13091615>

Alumni Update: Paige Carlisle - BS16', GIS Manager, Pennyrile Area Development District



After completing my basics at Madisonville Community College, I transferred to MSU - to continue working towards my Bachelor of Arts degree in English. Science had always held immense appeal for me though, and after one year there, I decided to switch to Geosciences. It turned out that GIS met my need for something more objective and scientific, yet still with the creative potential that mapmaking has.

I graduated from Murray on Saturday, May 14th, 2016 with a Bachelor in Geosciences, certificate in GIS, and 2016 Outstanding Student in GIS. The immediate next Monday, I went to work full-time in an internship with the Pennyrile Area Development District in Hopkinsville, KY. That internship extended into a temporary position until the fall, when a

contract job opened up at the Barren River Area Development District. I then moved to Bowling Green, traversing cave country, sinkhole-dotted pastures, backroads and busy highways, and Appalachian hills to map their region's sewer, water, and road systems. As my contract at BRADD was nearing its end, Pennyrile ADD's longtime GIS manager Pat Lee was retiring. Having been taught by her during my internship, I was offered her position. So I moved back to western KY, and have been balancing the myriad responsibilities of a GIS manager at PeADD ever since. I cover everything from maps for grant applications, fixing address records for the 2020 census, helping local 911 systems to keep their data current as well as prepare it for upcoming next-generation 911 paradigms, creating maps for local trail, sidewalk, and park construction proposal, to updating and maintaining state records on nearly every county, city, federal, and other-agency-owned road in our region. I often don't know exactly what mapping task will come to my office next, so I have had to develop a broad skillset to handle it all.

An internship assignment to map the water & sewer system of Marion, KY indirectly led to a volunteer position I hold today. While on lunch break from mapping fire hydrants and sewer manholes, I would take the opportunity to visit the Ben E. Clement Mineral Museum in town. And I continued to come back in the years since, marveling over their collection and enjoying talking with the staff, until I was offered a position on the museum's board of directors just last year.

My work has so far spanned our nine counties, and the BRADD's ten. Though I don't get to do as much of it with my current in-office responsibilities, I really enjoy locating and recording so many often-overlooked yet vital details of our infrastructure and utility systems. I also love exploring obscure corners of our local region. I am glad to be able to bring the specialized skill of GIS to the service of my rural region. I currently live in Madisonville KY, with my snake Apollo, cat Luna, and rat terrier Teenie.

(Text and pictures by Paige Carlisle)

Alumni Update: Caitlin Nichols, BS 2013 (Murray State University), MS 2016 (Ball State University)



There's a concept of "love at first sight" with regards to human relationships. I can honestly say that this is the most accurate portrayal of my interest in archaeology. Ever since I was six years old, I just knew that Archaeologist would be my job as an adult. Being able to learn about the past by looking at what was left behind sounded like the coolest job on the planet and everything else paled in comparison. When time came to select a University, I was fortunate enough to really stumble upon Murray State University during a Thanksgiving holiday at Kenlake State Park.

While the program of Geosciences didn't have a "traditional" Anthropology approach, it had a plethora of archaeological courses mixed with a healthy introduction to the technology of the field, specifically ArcGIS and Remote Sensing. It also had some necessary focus on a subject that shockingly many archaeologists aren't well trained in: soils. Last, it gave me a volunteer opportunity at Wickliffe Mounds State Historic Site which introduced me to the world of the Native American Grave Protection and Repatriation Act (NAGPRA). All of these factors played a quintessential part into the archaeologist I eventually became, from how I approach my research to the type of archaeology I practice.

After completing my Bachelor's degree at Murray, I went on to complete my Master's degree at Ball State University in 2016. It was about a year after finishing my Master's program until I was able to finally get jobs as a temporary field technician for various companies which took me to places as far as North Dakota and Texas. In the summer of 2018 Cultural Resource Analysts, Inc. (CRA), a cultural resource management firm in Lexington Kentucky, offered me a full time position as a staff archaeologist which is where I am currently employed. Due to CRA performing cultural resource work for contracts specifically in infrastructure and transportation, I was considered an essential worker and stayed employed throughout 2020 during lockdown. I direct various Phase I survey projects, assist on Phase II investigation and Phase III mitigation excavation projects, write reports and interpret findings, and complete faunal analysis when faunal remains are present in an assemblage. While I am typically performing survey, excavation, or interpretation work for areas in Kentucky, I have also worked on projects in Indiana, Tennessee, and Ohio.

For now, I am building my career in the field I've always wanted to work in. I am right where I need to be and I couldn't have done it without the education, opportunities, and support I received from the Department of Geosciences (now Department of Earth and Environmental Sciences) at Murray State.

(Text and pictures by Caitlin Nichols)





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Update from Retired Faculty - Dr. George Kipphut



I retired in June 2016 after 25 years at MSU. I have remained in Murray, but like most retirees, I found that urge for recreational travel and exploration is strong. I wanted to see more of the wonders of both the U.S and Europe. Destinations have included a number National Park environments. My partner and I have visited and hiked in Grand Teton and Yellowstone N.P.'s, Cape Lookout National Seashore in North Carolina, Saguaro N.P. in Arizona, and some of the Redwood forests of northern California. Most recently, we took a post-Covid trip to Yosemite N.P. in California. As a geologist, I am not sure why I had waited so long to visit Yosemite. Back in Murray, I am involved with the local chapter of the Sierra Club, and I continue to be involved in

Watershed Watch, a volunteer group that assists in monitoring the health of local water bodies.

It turned out that my Murray State days were not entirely over after retirement. In 2018, I was asked to accept a one-year appointment as Interim Director of MSU's Hancock Biological Station on Kentucky Lake. Most of my research as a faculty member had been based out of the Biological Station and it was fun to be back there again and enjoy the beautiful Kentucky Lake environment and it was only for one year.

(Text and picture by Dr. Kipphut)

Giving and Gifting

If you would like to donate to the Department of Earth and Environmental Sciences, we have a number of scholarships to select from, including the Wesler Scholarship, the Matthai-Panzer Scholarship, the Reed-Smith Scholarship, the Alice and George Kipphut Sr. Scholarship and the recently formed Neil and Joan Weber Endowed Scholarship. Gifts to the Department of Earth and Environmental Sciences encourage student success in a variety of ways, by providing grants and scholarships, funding travel, or by purchasing equipment upgrades. Gifts of any size are greatly appreciated and always needed!

Checks should be sent to the Office of Development, Heritage Hall, Murray, KY 42071-3441. Please specify a fund in the memo field. Donations can be made over the phone by calling 1-877-282-0033 or 270-809-3001. Visit murraystate.edu/giving to make an online donation. Thank you for your support!

Invitation to Share Experiences or Research

The Department of Earth and Environmental Sciences is always on the lookout for alumni willing to speak about their employment experiences or research. Our students greatly value the experience and guidance from our alumni! If you are in the area and would like to present on a subject or employment opportunities, please contact us. Email our administrative assistant, Ms. Tracie Russo, trusso@murraystate.edu, or call 270-809-2591 to schedule.