

Sewanee Integrated Programs in the Environment (SIPE)

Research

Matt Schrader published two papers as part of separate international collaborations. The [first paper](#) is a review of the ecology, evolution, and behavior of burying beetles (*Nicrophorus* sp.). The [second paper](#) describes how behaviors expressed by parents and offspring coevolve upon exposure to a new environmental challenge.

Photos are of parenting in several *Nicrophorus* beetles.



A team of students from Sewanee and Tennessee State University worked together this summer at Fall Creek Falls State Park as part of the USDA-funded research on old-growth forest dynamics being conducted by **Jon Evans** and **Sarah Neumann C'99** (TSU). **Keegan Congleton C'25**, **JT Michel C'24** and **Rob Phillips C'25** served as crew leaders, identifying and mapping trees within long-term forest dynamics plots. The data is being used to analyze the role of plant-soil feedbacks (such as mycorrhizal associations) in controlling spatial patterns of tree regeneration in upland forests. The research addresses the critical need for science to inform the management of Tennessee's state forests.

Breeding begins when parents find a small vertebrate carcass (a). Parents prepare the carcass by removing the fur, rolling it into a ball and covering it with antimicrobials. Parents directly feed larvae from the carcass (d) once the carcass is consumed they larvae, they disperse in the soil (e) and pupate.



Keegan Congleton, Cecilia McFadden, Rob Phillips, Katrina Seaman (undergrad, TSU), JT Michel, Izzy Schutte (PhD student, TSU) at the Old Times Cafe in Spencer, TN near Fall Creek Falls.

Sewanee Integrated Programs in the Environment (SIPE)

Research

Grady Wells, Marley Barton C'24, Katie McGhee, and Graham Nystrom C'26 had the following paper accepted into *Southeastern Naturalist* - **Preliminary Evaluation of Two Active Sampling Methods for Crayfishes on the Southern Cumberland Plateau, Tennessee**. The researchers compared the effectiveness of electrofishing and kick seining as sampling methods for crayfishes from four headwaters streams in the southern Cumberland Plateau ecoregion in Sewanee, Tennessee. In their preliminary study, four times as many crayfish were captured with the electrofishing method compared with the kick seining method. This study demonstrates that electrofishing is the best sampling method for headwater streams on the southern Cumberland Plateau for Triangleclaw (*Cambarus sphenoides*) and Bigclaw (*Faxonius placidus*) crayfishes.



Marley Barton sampling for Triangleclaw Crayfish above Shakerag Hollow.

Six students working with **Kristen Cecala** traveled to Kiawah Island in September to fulfill the 41st year of diamondback terrapin sampling. They captured one turtle who had been captured 25 times since his first capture as an adult in 1991. He is more than 15-20 years older than our students! To the right the crew is pictured just after releasing their 11 captures from a boat borrowed from the Kiawah Island Golf Resort. This project was featured in [Garden & Gun](#) including video footage of the challenging field sampling methods.



Graham Nystrom and Davis Peltier (taking photo).



Ansley Carpenter, Parker Gibbons, Kevin Fouts, James McGrory and Kristen Cecala

Sewanee Integrated Programs in the Environment (SIPE)

Research

Daniela Pisquiy C'25 and **Grady Wells** spent the summer working with two crayfish species on the Domain. Daniela collected life history data on the Digger Crayfish, which only occurs in one vernal pool on the Domain. Daniela also observed movement patterns of the Triangleclaw crayfish in Depot Creek. These efforts were associated with Daniela's SURF experience.



Digger Crayfish

Davis Peltier C'27, Graham Nystrom C'26, James McGrory C'25, and Kostas Andriotis C'25 chased waterfalls this summer on the Cumberland Plateau to fulfill a state grant to understand the distribution and potential effects of drought on stream salamanders. They also spent a few weeks on the coast of South Carolina looking for terrapins to fulfill Graham Nystrom's Ledford Scholarship. Graham delivered a short presentation on his research, which can be viewed [here](#).



Triangleclaw crayfish with PIT tag



James McGrory, Kostas Andriotis, and Davis Peltier ready to divert a stream (and catch salamanders).

Sewanee Integrated Programs in the Environment (SIPE)

Research



Photo. Jasper Jones, Jamie Jenkins, Aydah Daniel, Audrey Francell, and Tom Powell in a high elevation meadow near their forest research plot. Credit T. Powell

SURF student **Rowland Fournier C'27** and Life Science Research Fellow **Max Patterson C'27** worked with Southeast TN Young Farmers (SeTNYF) to continue **Deborah McGrath's** study of the impact of regenerative grazing on soil and ecosystem health. The research is a collaborative effort between McGrath, SeTNYF and **Keri Watson**, who is surveying farmers to learn how their sense of place and perception of ecosystem services influences farm management decisions.

Photos: Fournier and Patterson examine grass diversity in a conventionally hayed pasture (top) and assess soil aggregate stability in McGrath's lab (bottom).

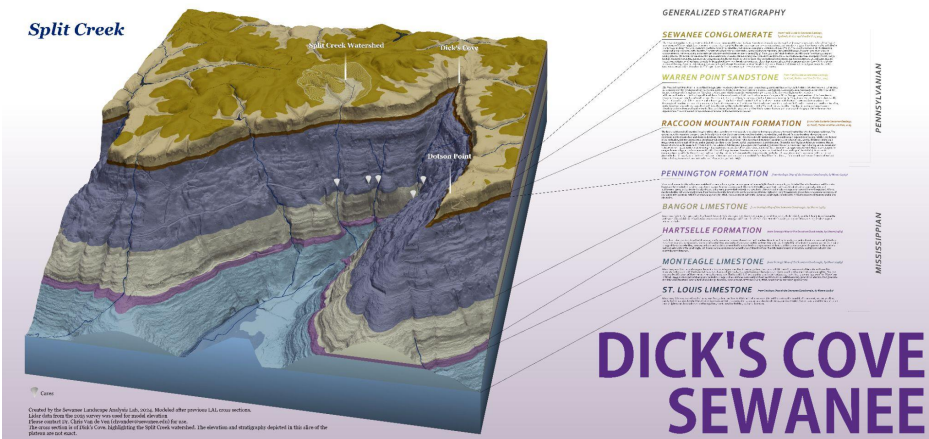
Aydah Daniel C'26, Audrey Francell C'26, Jamie Jenkins C'27, Jasper Jones C'27 and **Tom Powell** went to Colorado in August for an 11 day research campaign to measure tree mortality in Rocky Mountain subalpine forests. These forests are a critical control over the upper-elevation snow pack that supplies over 75% of the water to the Colorado River. A video of their adventure can be viewed [HERE](#).



Sewanee Integrated Programs in the Environment (SIPE)

Split Creek Observatory (SCO)

The Split Creek Observatory uses a place-based, multidisciplinary and collaborative framework to empower students to solve grand ecological challenges and teach skills that catalyze behavior change.



(Top) Greta Mathes C'26 and Julia McClain C'25 teaching SEI students about their research. (left) 3D image of Dick's Cove and Split Creek generated by Annie Kennedy C'24.

Collaborative is research underway!

- Hydrology: **Keri Watson** is measuring stream dynamics.
- Forest ecology: **Julia McClain C'25** and **Tom Powell** are measuring tree growth and carbon sequestration and growth of trees in different topographic positions (ridges versus depressions).
- Tree physiology: **Ansley Carpenter C'25**, **Tom Powell** and **Deborah McGrath** are measuring sap flow of tulip poplars and white oaks in different topographic positions.
- Wildlife biology: **Kristen Cecala** is monitoring terrestrial salamander movement within the watershed.
- Geology: **Avery Marx C'25**, **Lilly Daniels C'25** and **Max Dahlquist** are mapping soil depth and bedrock architecture of the watershed.
- Forest meteorology: Kevin Fouts, **Keri Watson** and **Tom Powell** are measuring climate variables and forest evapotranspiration from a newly installed antenna tower in the watershed.
- Landscape Analysis: **Chris Van de Ven** and **Annie Kennedy C'24** are creating 3D maps and aerial imagery.

Science storytelling: Environmental Arts and Humanities major, **Greta Mathes C'26**, developed a [website](#) for the SCO to learn about environmental communication using different digital tools. Users of the website can go on a virtual forest tour, read the student blog, and read about research opportunities. The website will eventually be a means for archiving and accessing data.

Ansley Carpenter C'25 installing a sap flow sensor in a white oak tree.



Fall 2024

Sewanee Integrated Programs in the Environment (SIPE)

Split Creek Observatory (SCO)

A Cross-Disciplinary Workshop led by **Kristen Cecala** was held in August that drew participation from 24 faculty representing 9 departments. During the workshop, participants

- toured the Split Creek Watershed and learned about its instrumentation
- networked and developed ideas for using the observatory for place-based learning
- identified opportunities for collaborative teaching within and among disciplines,
- evaluated ideas for increasing teaching access to the natural areas of campus.



Class and program tours were offered this fall to students in FYP, Forestry, Geology, Biology, and Anthropology classes as well as the Sewanee Environmental Institute Pre-College Program. In October, Profs. **Deborah McGrath** (BIOL), **Jennifer Michael** (ENGL), and **Keri Watson** (ENST), **Tom Powell** (FORS) and **Richard Tate** (ANTH) will be carrying out an interdisciplinary teaching activity among four classes.

Workshop participants new to the SCO collaborative were **Lydia Renig** (OCE), **Myles Elledge** (Babson Center for Global Commerce), **Sarah Rimkus** (Music), **Maria Falikman** (Psychology), **Eric Ezell** (EES), **Garrett Heatherly** (Psychology), **Jennifer Michael** (English), **Kirk Zigler** (Biology), **Richard Tate** (Anthropology), **Kevin Rodriguez** (Biology), **Jisoo Kim** (EES), **Brian McCray** (IGS and EES).

Want to get involved in SCO or offer ideas for improvement? Here are some ways to connect -

- 1 - Request a tour - we are happy to offer individual or class tours of the watershed! Learn about climate change and carbon cycles, water cycles, tree rhythms, and/or human and natural history of our region.
- 2 - Email a Collaborative faculty member to explore your ideas!
Current leadership: Profs. Cecala, McGrath, Dahlquist, Powell, Van de Ven, & Watson
- 3 - Keep an eye out for another workshop in the spring!

[Apply for a \\$250 stipend for teaching a collaborative activity with connections to our local environment!](#)

Please reach out! We'd love to hear from you!

Fall 2024

Sewanee Integrated Programs in the Environment (SIPE)

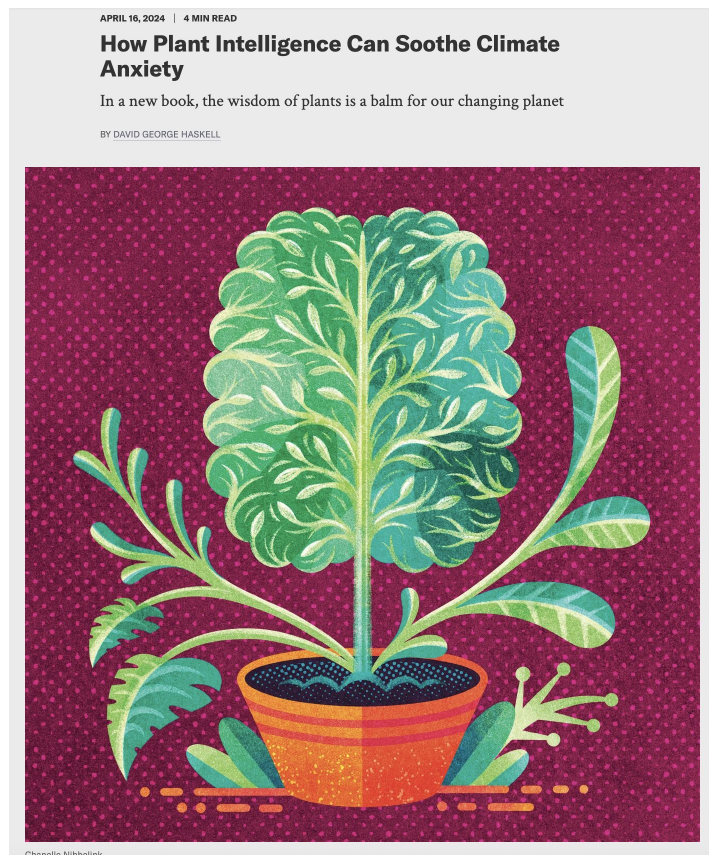
Environmental Arts and Humanities (EAH)

David Haskell published “Atoms on the wall: Elements and relationship in science education.” chapter in [Elemental Life](#), edited by John Hausdoerffer and Gavin Van Horn, Humans and Nature Press. Haskell also published a book review in *Scientific American* "[Green intelligence: A revolution in plant science](#)". Haskell's review inspired **Deborah McGrath** to use Schlanger's book in her Environmental Physiology of Plants course. **Kevin Rodriguez**, who teaches Molecular Methods, has invited Ernesto Gianoli, a scientist featured in the book to speak to their classes about his research on *Boquila trifoliolata*, the “mimic plant”.

David Haskell also taught workshops at Kachemak Bay Writers' Conference, Alaska, and Art Center East/Eastern Oregon University. He gave presentations at the Venice Art Biennale and Cornell's Yang Center for Conservation Bioacoustics.

Jennifer Michael's Poetry, Nature, and Contemplation (ENGL 320) class made a visit to the University Farm on September 16 as part of their study of the georgic mode (poetry that deals with labor, especially farm labor). **Carolyn Hoagland** offered several tasks that could be done in a meditative way. Some students trimmed basil, others prepared beds for planting or made seed balls, while others herded goats into the woods.

Camilla Hipp, EAH C'25, spent this summer working with [Hobcaw Barony](#) in Pawleys Island, South Carolina, as Coastal Ecology educator for 2nd through 5th graders, and doing archival research for the Belle W. Baruch Foundation.



Mary Margaret Lemburg, Biology and EAH major, C'26, spent June working with **Dr. Eric Ezell** for BC Whales to write an R function that allows the user to compute the error in a theodolite reading based on the height above sea level and the distance of a whale under study. In July she worked with Ezell and another student, **Caroline Lively**, on a literature report related to ship-whale avoidance and the effects of slower ship speeds on strike rates.

Sewanee Integrated Programs in the Environment (SIPE)

Sustainability News

Myles Elledge is serving on the 15-member U.S. technical advisory group on International Organization for Standardization (ISO) standards for water and sanitation technologies. As part of the advisory group supported by the Gates Foundation, Myles will join the U.S. working group meeting at the American National Standards Institute (ANSI) offices in NYC in December 2024.



The Gates Foundation Discovery Center is currently running an exhibition on water and sanitation, displaying a number of innovative initiatives Myles has been involved in over the last 10 years

<https://www.discovergates.org/exhibitions/>.

The Office of Environmental Stewardship and Sustainability (OESS) has been transportation focused this summer and fall. In support of the University's new transportation and parking plan, OESS planned the new Sewanee shuttle Tiger Transit, purchasing buses, creating routes, and identifying funding. After piloting the project in 2023, the Sewanee bike lending program has grown to 60 bikes in circulation across campus this fall. Many thanks to the Biology department for donating their bio bike fleet. Our office still has a greater need for bikes than we can supply. If you have a bike you would like to donate to the program please email domain@sewanee.edu.



Bikes lending program so popular that OESS had to purchase another fleet of bikes.



Tiger Transit circulates through campus

Sewanee Integrated Programs in the Environment (SIPE)

New Partnerships

In September, **Cory Gurman C'25**, **Walker McKay C'25**, **Nate Wilson**, and **Tom Powell** attended the Society of American Foresters National Convention in Loveland, Colorado. In addition to networking and learning about the latest advances in forest science, policy, and practices, they were able to catch-up with **Chad Oliver C'68** (B.S. Forestry and Professor Emeritus of Forestry, Yale School of the Environment) and congratulate him on receiving the Barrington Moore Memorial Award in Biological Science from the Society of American Forestry (SAF), which recognizes outstanding achievements in advancing forestry. Nate and Tom were representing the University in our application for accreditation by the Society for our Forestry and Natural Resources majors.



Mt Olympus, near Estes Park CO. Credit. Tom Powell.
Photo credit Tom Powell.

The **Appalachian Conservation Institute (ACI)** is a new organization founded just 20 minutes north of Sewanee in the Little Sequatchie Cove. As a premier example of philanthropic land ownership, the ACI, led by Rick Huffines and Quentin Miller, manages nearly 10,000 acres of plateau and cove forest with the goal of restoring and protecting habitat for rare and threatened species of our region. A key component of their mission is to serve as an educational resource, and they are seeking research and education partnerships. In August, **Cory Gurman C'25** organized a visit to ACI with **Kristen Cecala**, **Tom Powell**, **Scott Torreano**, and **Nate Wilson**, and they, in turn, visited several of Sewanee's research sites to discuss opportunities for future collaboration.

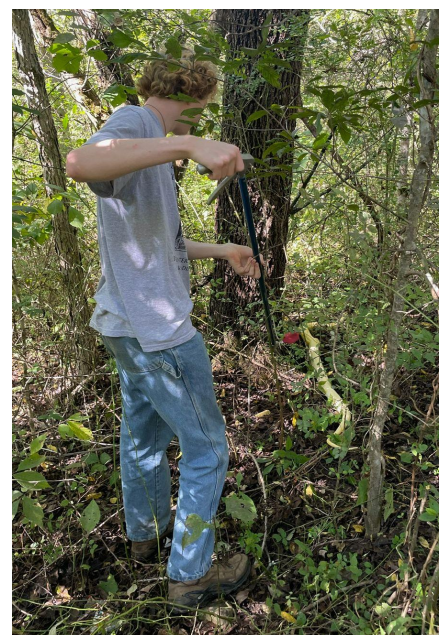
[Find out more!](#)



Sewanee Integrated Programs in the Environment (SIPE)

Other News

OESS wildlife manager **Kevin Fouts** received photos of a large yellow snake spotted by a hiker near the Normandy reservoir and was asked to come search the area and retrieve it. Students **Rowland Fournier** and **Alison Heimsness** went and collected the python. Rowland recounted “I was thankful for my herpetology class, otherwise I would've had no idea how to approach an eight foot snake. We all believed it was dead, so I went to grab it and just about picked it up before it lunged away. It made all of its survival methods clear: it coiled up, struck at us, peed on us, and when all else failed tried to wrangle its way away.” Allison added “This was an opportunity like no other to do right by an exotic animal that had been mistreated. I learned some ways of evaluating snake health. With teamwork we quickly and successfully retrieved the snake. Definitely my favorite day of volunteering at the OESS.” OESS is currently looking for an appropriate place to rehome the exotic Burmese python.



Rowland Fournier (bottom) and Alison Heimsness (right top) with the rescued python.



JT Michel, working this summer at the Franklin State Forest with **Jon Evans**, was awarded a Ramseur Post-Baccalaureate Fellowship with the Sewanee Herbarium.

Sewanee Integrated Programs in the Environment (SIPE)

Island Ecology Program

Co-directed by **Kirk Zigler** and **Eric Ezell**, Sewanee's Island Ecology welcomed a 37th cohort of exuberant students onto St. Catherine's Island. Instructors included **Kristen Cecala**, **David Haskell**, **Deborah McGrath**, **Tom Powell**, and **Keri Watson**. IEP also welcomed the expertise of long term collaborators Tom Howick and Christa and Royce Hayes.



This year's IEP student cohort included (from left to right): William Overton, James Murff, Lacy Creswell, Hannah Barrow, Samantha Ude, Elizabeth Muller, Liz Calabria, Sparrow Womack, Samantha Moore, and Autumn Sims.



Fall 2024

Sewanee Integrated Programs in the Environment (SIPE)

Local to Global

Last summer the STARTALK-Sewanee Chinese Language Camp directed by **Marcus Murphy** hosted 20 high-school students from across the country to study environmental sustainability, enjoy the many outdoor recreation opportunities on campus, all the while remaining immersed in the Chinese language. The camp collaborated with OESS to hunt for herps one evening, developed projects based on the UN Sustainable Development Goals and then produced tea from plants being grown at the University Farm. Next summer's [application](#) is open and will be completely free for 20 high-school students.



STARTALK campers after exploring Solomon's Temple cave.

Eight Sewanee students traveled to Japan and Taiwan this summer with Associate Professor of Art and Art History **Alison Miller** and Associate Director of Global Citizenship **Marcus Murphy**. Students enrolled in the course Transnational Asian Studies visited Japan and Taiwan to learn about regional cultures of Buddhism and tea by participating in tea ceremony, Buddhist meditation, picking and processing tea, and visiting temples, shrines, tea houses, and historic sites. In addition to experiencing the sustainability of public transportation and well developed recycling programs in urban areas, students also explored the sustainability of tea growing in rural areas.



Transnational Asian Studies Students picking *Camellia sinensis* leaves in the Alishan Mountains, which the students then processed into black tea.

Sewanee Integrated Programs in the Environment (SIPE)

The University Farm Welcomes Classes



Jessica Wohl's Painting From Life class get inspiration on the farm. Students painted what they saw - a floral or a landscape, working first with an underpainting and then building up their surfaces with oil.



Deborah McGrath's Environmental Physiology of Plants class measured light- and CO₂-response curves in a "three sisters" garden and then enjoyed grilled squash from the plot.



JD Franklin in Jennifer Michael's Poetry Nature and Contemplation class performed a meditative farm task for the study of the georgic mode.



Guided by Farm Manager **Carolyn Hoagland**, **Tom Powell's Forest Food and Medicine** class learned how to ferment kudzu and grape leaves harvested from the forest and used them to make dolmas.

Fall 2024