

DOWNSTREAM

The Environment & Sustainability Program

IN THIS ISSUE:

- Note from Director
- Congratulations class of 2026
- Keck Lab turns 25
- New Postdoc Highlights
- ENSP Ecotherapy Pops-Up
- Terrapin Summer Research by Isabelle Cleaveland and Aubrey Moore
- Muddy Boots Welcome
- Ramp Updates on Jamestown Rd.
- Zable Stadium Osprey's
- ENSP faculty publications



environment@wm.edu

Director's Note



Brent Z. Kaup

*Director of the Environment &
Sustainability Program*

This year, the Environment & Sustainability Program (ENSP) celebrates its 25th anniversary! In Fall of 2001 the Keck Lab officially opened and we began to sign up our first majors. In the beginning, ENSP was shepherded by handful of dedicated William & Mary faculty who believed in examining the environment holistically in an attempt to create a more sustainable planet. Around a dozen or so students a year choose to double major in ENSP. Over the past two decades, ENSP has grown substantially.

We now have over 40 faculty affiliates teaching environmentally oriented classes in nearly every hall of the university. In addition, in Spring 2026 we graduated 48 majors and minors at our annual graduation ceremony on the shores of Lake Matoaka.

We have a number of exciting events lined up for this year. At homecoming, we will have our 25th anniversary party. It is going to be spectacular, so please do join us! In addition, we will be taking part in the Sustainable Stories Filmfest. In collaboration with the Arts at William & Mary, we will be showing the documentary film Underwater Projects and hosting the filmmakers to talk more about the film and issues it addresses.

This academic year, we also welcome a new Mellon Environmental Postdoctoral Fellow, Kyungrok Hwang. Kyungrok joins us from Oklahoma State University with a freshly minted Ph.D. in Quantitative Ecology. He will be working with Dr. Dom Ciruzzi, Dr. Joanmarie Del Vecchio, Dr. Jennifer Swenson, and Dr. Jean-Christophe Domec to examine an array of forest dynamics, biodiversity, and ecosystem functions in the Matoaka Woods and beyond. In addition, he will lead our ENSP Spring Speaker Series titled Forest, Wood, and Civilization. We are excited to have Kyungrok join us for the next couple of years.

Congratulations Class of 2026



Keck Lab Turns 25

The W.M. Keck Environmental Field Laboratory turns 25 on Halloween this year. It's spooky to think the lab has been around that long! We opened our doors the month after 9/11 in 2001 and we have provided teaching and research support for students and faculty every year since. The W.M. Keck Lab was conceived in 1999 by a group of faculty called the Environmental Science and Policy Cluster, and construction was funded entirely by private donations—the first building on campus of its kind. The grand opening on Halloween was overseen by President Terry Sullivan who connected with environmental collaborators at VIMS via a videoconference call, which was a big deal 25 years ago. The festivities continued with a keynote address by British ecologist and textbook author Dr. Paul Colinvax. In his remarks, Dr. Colinvax lauded the College Woods as a wonderful expanse of natural forest, noting in contrast there was hardly a single tree in England that grew without humans deciding it could. Of course, our College Woods is the product of growth some 90 years after the forest was cleared for timber harvest in the 1930s, and humans have since decided to let the forest grow.

The first funding for student research at the Keck Lab in 2001 was provided by BOV member L. Clifford Schroeder who encouraged a watershed approach. Our research on

Keck Lab opens behind Botetourt

■ New field laboratory will offer Environmental Studies/Science students space for field research, sample preparation, specimen collection

By Sarah Ingle

Flat Hat Staff Writer

The Keck Environmental Field Lab by Lake Matoaka will officially open Wednesday, although Aquatic Ecology and Wetland Ecosystems classes have been using the building since the beginning of the semester.

The lab, located in the woods behind the Botetourt Complex, contains a classroom, seminar room, computer lab, dry lab, wet lab and lab preparation room. According to the lab's director, biology professor Randy Chambers, the idea behind the lab is to allow students to go into the field to collect samples and specimens from the lake and then to examine their finds using microscopes and chemical analysis.

"People have been using the building since the beginning of the semester," Chambers said.





land use impacts on water quality was extended through funding from the Virginia Environmental Endowment, then for five years thereafter the lab received NSF funding to complete interdisciplinary watershed studies. That NSF REU program brought undergrads from W&M and from schools around the country to work with faculty on interwoven topics spanning Geology, Biology, Sociology, and Economics, a tradition of collaboration

that continues across departments and schools within W&M today. During that time, the Keck Lab launched a weather station located on Lake Matoaka that has collected weather data every 10 minutes for the last 23 years.

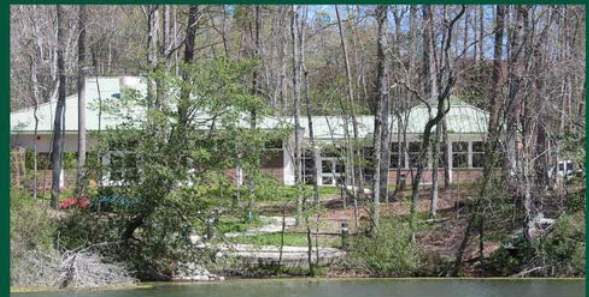
We also launched the College Creek Alliance—a water sampling and analysis program that has reported the water quality from 24 streams, ponds, and tidal creeks in the College Creek watershed every season since 2004. The Keck Lab has been very good at maintaining long-term data sets that have been used in various student and faculty research projects and by the general public interested in water quality and the weather!

Over the years, Lake Matoaka has been filling in with sediment from watershed runoff—something Professor Greg Capelli lamented many years ago. But while the lake has gotten smaller, Keck Lab research has gotten bigger. Our students have worked on all things environmental, with a focus on campus waterways and surrounding land use. From measurement of greenhouse gas emissions in Crim Dell, to installation of floating treatment wetlands in Grim Dell, to planting cypress trees around the margins of Swem Dell, to documenting homing behavior of turtles in Lake Matoaka, to examining tree fall in the College Woods after hurricanes, to counting crayfish and invasive clams in Tinkling Rill, to measuring soil erosion in Williamsburg's Grand Canyon, and everything in-between, Keck Lab research students have had—and still have—campus environments covered.

Courses taught at the Keck Lab similarly exploit learning opportunities presented by our campus environment. Environmental seminar courses often use the surrounding woods and trails for class exploration. A hands-on course on alternate energy strategies for William & Mary considered water, wind, biofuel, geothermal, and solar alternatives to natural gas and off-site electricity generation (spoiler alert: geothermal and solar won, and both are now used on campus). Students in field lab

courses in Aquatic Ecology, Ecological Methodology, Watershed Dynamics, Ecotherapy, and Wetland Ecosystems are almost always in the woods or in canoes on the water, and Sustainable Ag students put skills into soil at Keck's demo garden. Animal Behavior, Ornithology, Botany, Entomology, and Beer Microbiology (!) students comb the woods for insights. Collectively, our environmental students are prepared to work with their heads, their hands, and their hearts!

As we move into the next 25 years, the Keck Lab (the first building on campus with solar panels) will continue to be the focal point for instruction and research into the realm of Environment & Sustainability. We salute our past and current students, collaborators, and faculty. As our changing world offers new and wicked environmental issues, we look forward to supporting the next generation of problem solvers working at the Keck Lab!



THEN & NOW



2025–2027

Mellon Environmental Post-Doc Fellow: Dr. Emma Pask

Emma is a historical anthropologist who received her PhD from the University of Chicago. She primarily conducts her research in Texas where she studies environmental conflicts and the relationship between science and politics, land and myth, disease and property.

Tell us about your research focus.

My research has primarily focused on the ethnographic studies of bat science, property, and access in Texas. I've examined how land access, private property, and scientific data intersect leading to an article tentatively titled "*Texas is 97% Private Property and Other Half-Truths About Access*," which will also form the opening chapter of a book, "*On the Range and Under the Radar: An Ethnography of Bat Science in Texas*." Additionally, I've researched environmental destruction and industrial disasters along the Texas Gulf Coast, as well as historical and contemporary biosecurity issues through archival work on the 1960s screwworm eradication campaign in the U.S. and Mexico. I investigate themes of disgust, loss, and cattle ranching. Together, this connects questions of science, environment, land use, history, and human-animal relations through anthropological and interdisciplinary research.

Your research with bat scientists sounds really intriguing. Are there any cool bat facts you've learned along the way that you could share?

One thing that I keep coming back to is how bats move: it's a little uncanny! And I always thought that because they echolocate—or use their biological sonar to navigate the world—they would be good at avoiding obstacles. Their movements seem so coordinated and choreographed when you watch them. But it turns out that—when there are lots of them emerging from a cave en masse—they bump into each other all the time.

Another thing is how social the animals are. They know how to socially-distance from each other when they are sick and they will care for each other's young, even across species. That's pretty cool.

What is one piece of advice you would give to students seeking to make the world a more sustainable place?

My advice is to learn how to really, truly listen to people. Listen to what they want, need, and are afraid of. This is essential to organizing around sustainability issues (and in general!) and to developing your own personal sustainability ethic in community with others.

What is one book you think every ENSP student should read?

I think every ENSP student should read Sidney Mintz' *Sweetness and Power*. It is a great book that illustrates the interconnectivity of industrial and imperial systems historically and through to the present that determine how we eat and what we taste, and thus how we relate to our environments, with an attention to the individual, the collective, and the world-system all at once.

What do you enjoy doing in your free time?

I have way too many hobbies. I love learning new skills. I love swimming in as many bodies of water as possible, as often as possible. I also make and repair clothing. I am currently learning how to play guitar.

What do you like the most about teaching students in the environmental humanities realm?

I think the environmental humanities are an amazing prism through which students can learn to understand the world in all its complexity. When you study the environmental humanities, you get to engage with interdisciplinary literatures—often including the hard and natural science— but drawing on the humanities tradition, you are given the opportunity read and think deeply about one case or text or situation at a time. And the humanities put people at the centre! Through the environmental humanities, then, I get to introduce students to anthropological research that always sits between the social sciences and their commitment to empiricism and the humanities and their commitment to critical theory. At this intersection, in the classroom and in their writing, I get to know my students and their commitments to the environment and to sustainability in the context of the million and one other investments that they have: to their communities, to justice, to research, to creative pursuits, and to each other.

Ecotherapy Pops Up Across Campus



Clay, banjos, face paint — an ecotherapy nature break built by students for their peers during finals week last May.

Off to a remarkable start, ENSP 320: Ecotherapy & The Good Life (EGL) debuted in spring 2026. The new class is taught by Dr. Dorothy Ibes, ENSP faculty and director of the Parks & Ecotherapy Research Lab. All semester, EGL students engaged in Ecotherapy Experientials — guided outdoor sessions built around nature and health practice, including a

greenhouse, nature nook, nature play, nature nap, gratitude, eco-art, service, green exercise, and bird watching— and responded to each with art and/or writing.

After a semester of practice, students were ready to share their experiences. Ibes challenged them to create interactive stations for their peers during the moment where ecotherapy would matter most: the first day of finals. A free, walkable “Ecotherapy Pop-up” would encourage students to take a much-needed outdoor break during this intense, indoors, and screen-focused time. EGL students built seven stations including artist statements, inspired by the course's key themes:

- *Unplug & Connect — live banjo, watercolor, connection cards, and a phone “vacation” box*
- *We Are Nature — clay self-portraits with a guided shinrin-yoku meditation*
- *Gratitude & Presence — a gratitude tree built from sticky-note leaves*
- *Small Habits, Big Impact — a collaborative fingerprint paint-by-number*
- *Life is Supposed to be Joyful — face painting, frolicking, blankets, and a playlist*
- *Get Out of Your Comfort Zone — a five-minutes-in-nature challenge*
- *Ecotherapy. It's THAT Easy — ecotherapy bingo and spikeball*

Participants followed a student-designed map that illustrated an ecotherapy “trail” from the rock garden at Crim Dell meadow to the Swem sundial. They collected —

Continued on next page

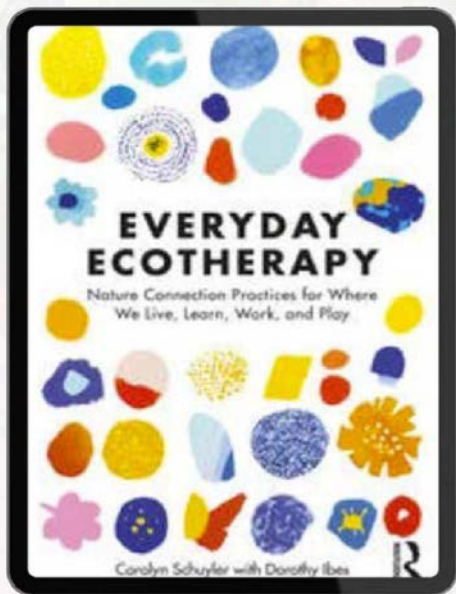
stamps at each station they visited, spending anywhere from a few minutes to a few hours along the trail and receiving a prize at the end for completing all seven stations.

The Pop-Up was a small, local version of a bigger idea long championed by Ibbs, that time in nature improves student mental health. Ibbs is the co-founder and co-director of the Campus Nature Rx Network (CNRx) with Don Rakow of Cornell University, which started in 2019 with four campuses and now includes 116 institutions across 35 states and five countries, reaching more than 2.5 million students. CNRx recognizes that campuses are unusually well positioned to promote mental health through nature--- right where students live, learn, work, and play.

Inspired by EGL and the 2026 Pop-up, Alexandra Hill and Julia Peavey , W&M juniors, recently published "Fallen tree trunks became balancing beams: nature play as a means for emerging adults to identify with ecological systems", in Frontiers in Conservation Science. The authors argue that emerging adults (ages 18-25) need more than just time in nature, they need opportunity to see themselves as part of ecological systems. They promote Nature Play, an ecotherapy modality Hill experienced in EGL, as an effective way to identify with nature, especially in conjunction with CNRx.

continued on next page





Current W&M students interested in Ecotherapy have two options. Science & Experience of Ecotherapy, the ENSP capstone, is offered every semester. ENSP 320: Ecotherapy & The Good Life is expected to return in Spring 2027 — but a third option is open to everyone.

Seven years in the making, Ibes co-authored a new book with Carolyn Schuyler, **Everyday Ecotherapy: Nature Connection Practices for Where We Live, Learn, Work, and Play** (Routledge, September 2026). The book looks at ecotherapy as a path to personal growth, community, and a deeper bond with nature. It shows how everyday places such as schoolyards, campuses, parks, gardens, and neighborhoods can

support mental health, community, and environmental action. At its center is the Nature Connection Continuum, which helps readers see where people are in their relationship with nature (estranged, engaged, or embedded) and choose practices to match. Chapters include stories from practitioners, reflection prompts, and step-by-step group activities for all ages, written for both new and experienced leaders.

Terrapin Summer Research Project

with Isabelle Cleaveland



At Long Beach Island, NJ, Isabelle Cleaveland (Chemistry '28) contributed to ongoing diamondback terrapin research by tagging and measuring adults, documenting nesting behavior and locations, and protecting turtles and nests. Her study area included typical habitat as well as developed areas. Isabelle helped lead community education programs to spread the word about terrapins and how to help them.

What is something you learned about your topic that surprised you?

One thing that surprised me this summer was how involved local beach goers/residents can be in conservation and awareness. The terrapin work I did this summer relied on the participation and openness of locals: neighbors on developed streets needed to be aware and approve of what we were doing in their yard, such as digging up the terrapin nests to go into the hatchery. Project terrapin does a great job with outreach, trying to spread awareness to prevent road mortalities or activities at the field station to get people involved (like monitoring the hatcheries for baby hatchlings emerging!). Many people even called in with terrapin sightings to help us! This summer gave me an incredible wealth of knowledge, but it also made me realize how simple it is to get involved in local communities and help environmental conservation. By doing so, you're broadening your perspective on nature and ultimately bettering yourself.

What is something you'd like others to know about the issue or organism(s) you studied?

I was continually impressed this summer by how resilient the diamondback terrapins species is. As I asked tons of questions this summer, I learned so much about their habitat, patterns, and adaptability to environmental changes (one example being the emergence of hatchlings despite changes in sediment). I think this reminded me how needed conservation work is for our planet, and more importantly, how humility in environmental work is needed. Ongoing research is so important to monitor changes within the population. I encourage others to continue asking questions and interact with nature respectfully and ethically. Humans have the ability to help many species, such as the terrapin, that have seen a decline in population, but it is so important to proceed in an empathetic matter that constantly checks in on the health of the ecosystem. We can evolve policy to best fit the needs of the species it serves.

What is something you saw or felt that you hope to remember for a very long time?

One thing that definitely stuck with me throughout this whole experience was watching the female terrapins nest. It was an extraordinary process to witness, and I was in awe of the labor process. I still remember that one terrapin came ~5 feet from me (I was sitting on the ground) and nested right in front of me. I didn't want to move at all to disturb her, and I felt flattered that she chose a spot to nest right in front of me! Watching the terrapins nest reminded me to observe the world around me more and have patience; it was just also simply astounding to be able to watch the entirety of the life cycle of these terrapins!



Terrapin Summer Research Project

with Aubrey Moore



Aubrey Moore checks the status of a known laid nest that was protected using the cage-protection method

Aubrey Moore, a Coastal and Marine Science major ('29, Virginia Institute of Marine Science) and winner of the Anne Davis '16 Summer Environmental Advocacy Fellowship, led a citizen science project this summer to promote Diamondback Terrapin conservation with the Keck Lab (Randy Chambers) and Brock Environmental Center (Chesapeake Bay Foundation).

Diamondback terrapins—a Species of Greatest Conservation Need-Tier 2a in the Virginia Wildlife Action Plan—require open water, intertidal wetlands, and adjacent uplands to complete their life cycle. Aubrey studied terrapin nesting at Pleasure House Point, VA Beach, where tidal wetland habitat has recently been restored. A thriving presence of nesting turtles would be a hopeful indicator that the restoration was successful. Early returns indicate the answer is YES!

Aubrey and her team documented Diamondback terrapin nests, hatchlings, live and dead adults, and evidence of predation and disturbance. These data provide a monitoring baseline that can be compared to other areas and future monitoring efforts. As the restored wetland gets re-established and terrapins move in, Aubrey's maps and data will be used by both managers and the public in ongoing conservation efforts. "Improved public education is clearly a cornerstone of protecting Diamondback terrapins," Aubrey concluded.

The City of Virginia Beach has already installed additional signs based on the understandings generated from Aubrey's project. Created by students in the VA Beach Public Schools Environmental Studies Program, the signs instruct how diamondback terrapins can be safely observed while minimizing impact to the turtle's movements. Aubrey created a digital story map featuring graphics, pictures, and more to further share project information.

From Aubrey, "This project was an incredibly formative experience for me, and I am proud of the work that we were able to accomplish. It was uplifting to see the local community come together in support of this keystone species."



Image of Pleasure House Point, ideal nesting habitat for diamondback terrapins



Aubrey Moore checks female diamondback terrapin for eggs



New educational signage posted at Pleasure House Point

Muddy Boots Welcome

Molly Womer ('29) samples water in a campus pond. Water quality on campus remains a focus for ENSP's Keck Environmental Field Lab. Student monitors help track pollutants while gaining practical experience.



Collaboration is a cornerstone of environmental research. Here, students Aubery Moore ('29) and Jacob Tozer ('28) measure grass shrimp to help a VIMS/Keck Lab team understand how management of shorelines impacts a fundamental Chesapeake Bay species.



Did you know that approximately 70% of the world's crayfish species occur in the United States? Virginia is home to 34 species, with many inhabiting the campus waters. Student researchers like Evie Brantley ('27) and Roslyn Conner ('28) are helping us understand how crucial crayfish are to nutrient cycling, water quality, food webs, and more.



Continuous water quality monitoring began in Lake Matoaka and its tributaries this summer as green fee funding and technological advances fueled a dream come true for an interdisciplinary team (Geology/Biology/ENSP). Instantaneous water quality data is available via a [web portal](#).

Pictured: Dr. Ajit Joshi & Dr. Joanmarie Del Vecchio (Geology) installing HydroVu equipment on the floating dock by Keck Lab in Lake Matoaka.





Having an on-site field lab facilitates research on complex environmental questions. Above, Ellie Ramsey ('27), Benjamin Harris (27'), and Devin Lichtenstein (28') analyze water samples at Keck Lab for Ellie's honors thesis on larval salamanders. The three are part of a "Stream Team," directed by Matthias Leu (Biology) and Randy Chambers (Keck Lab), studying salamanders with students in the College Woods since 2022.



Ramp Updates:

The wildlife ramp under Jamestown Road has seen a lot of traffic since Randy Chambers (Keck Lab), Tony Orband (Facilities), and Chris Wagner (Art & Art History) deployed it in early spring 2025. A trail camera is widening our perspective on the connection between Lake Matoaka, College Creek and beyond as it documents use of the ramp by otter, raccoons, muskrats, mink, mallards, turtles, and even a bullfrog. Great blue herons, mud turtles, snapping turtles, blue crabs, American eels, and even a cormorant have been inside the culvert near the ramp this summer.





William & Mary Zable Stadium Ospreys

2nd Year! of Fledgling Success

W&M's Zable Stadium ospreys successfully fledged a chick this year, making 2026 the second year in a row and second year ever that ospreys successfully nested on campus. Mom and chick are shown on the nest in this photo from June 9th. Ospreys typically arrive in early March and begin their journey to wintering grounds at the end of summer, but the nest is visited by other species in the off season. Keep up with the live action on YouTube [@WMOspreyCam](#), courtesy of [W&M's Green Fee fund](#).

June 5



June 9



June 26



July 2



July 20



July 23: first flight
away from nest



WILLIAM & MARY
KECK ENVIRONMENTAL
FIELD LABORATORY



@WMOspreyNestCam



August 24

ENSP Faculty Publications

McLaughlin, C. L., Bradley, E. L., Swaddle, J. P., **Leu, M., & Cristol, D. A.** (2026). Ecotoxicology and Environmental Safety, 314, 120019. **Mercury exposure alone, or combined with chronic food stress, elevates blood corticosterone in the zebra finch**

Sullivan, R.A. and **D.A. DeBerry.** 2026. **Cultural methods for the control of the invasive Japanese stiltgrass (*Microstegium vimineum*) in stream restoration.** Plants 15:477.

Dutilly, S.M. and D.A. DeBerry. 2026. **Using soil seed banks for wetland mitigation planning: comparison of seedbank estimation methods.** Wetland Science and Practice 44:20-29.

Joanmarie Del Vecchio, Kinsey Shefelton, Roman A. DiBiase. (2026). **Pleistocene Smoothing and Resurfacing of Appalachian Ridgelines by Periglaciation**

K. L. P. Warburton, **J. Del Vecchio,** C. R. Meyer, M. C. Palucis (2026). **Permafrost Thaw Patterning Through Thermal Channelization**

Fisher, Andrew H. Laliik and the Cultural Landscape of the Hanford Reach. Prepared for the U.S. Fish and Wildlife Service, Hanford Reach National Monument.

Ibes, Dorothy and Schuyler, Caroline (2026). **Everyday Ecotherapy Nature Connection Practices for Where We Live, Learn, Work, and Play.** Published by Routledge.

Lanouette, K. & Taylor, K.H. (2025). **Sociopolitical geographies of climate learning and climate futures: A comparative case study across two coasts.** In A. Sezen-Barrie & H. Kang (co-chairs), Climate Education for Justice: Navigating Geographies, Data, and Agency. In Rajala, A., Cortez, A., Hofmann, R., Jornet, A., Lotz-Sisitka, H., & Markauskaite, L. (Eds.), Proceedings of the 19th International Conference of the Learning Sciences - ICLS 2025 (pp. 2354-2362). International Society of the Learning Sciences.

ENSP Faculty Publications

Lanouette, K., Van Wart, S. & Parikh, T.S. (2025). Participatory digital mapping, dynamic data, and children's science argumentation about local socio-ecological systems. Journal of Science Education and Technology, 34, 215-235.

Lanouette, K., Cortes, K. L., Lopez, L., Bakal, M., & Wilkerson, M. H. (2024). Exploring climate change through students' place connections and public data sets. Science Scope, 47(3), 18-25.

Lanouette, K. & Taylor, K. H. (Eds). (2022). Learning within socio-political landscapes: (Re)imagining children's geographies. Occasional Paper Series, 48, 3-12.