



YALE INSTITUTE FOR BIOSPHERIC STUDIES

NEWSLETTER

FALL 2023

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A newsletter by the Yale Institute for Biospheric Studies.

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Yale

FROM THE DIRECTORS

Welcome back for the fall semester! We hope everyone had a good summer. We're thrilled to welcome four new Donnelley postdocs (p. 3) and six new Hutchinson postdocs across two new clusters (one on p. 4 and the other to be highlighted in the Spring newsletter). We're also excited to host four Bass Distinguished Environmental scholars this year (pp. 5-6). Join us to hear about their research during our seminar series this Fall (p. 8) and into the Spring!

This summer we greatly expanded our internship program, which brings undergraduates from HBCUs, HSIs, and TCUs to work with YIBS affiliates for lab or field research. In 2023, the Summer Undergraduate Research in the Environmental Sciences (SURES) program included fifteen new students and one returning student from our 2022 pilot program. Fourteen students worked here in New Haven in EEB, EPS, and YSE labs, and two did fieldwork in Brazil. We finished the summer with a lively symposium and a trip to the Peabody's Horse Island.



Director Eric Sargis and Associate Director Carla Staver at the Yale Peabody Museum's Horse Island Research Station on the last day of the 2023 SURES program.

TIMOTHY SANDREY

Finally, our community mourns the loss, on February 11, 2023, of Eleanor Sterling, a longtime member of YIBS's board. Dr. Nora Bynum (Yale Ph.D. 1995) reflects on Eleanor's influence and legacy on Page 2.

ELEANOR STERLING

1960–2023



AMERICAN MUSEUM OF NATURAL HISTORY

Eleanor Jane Sterling, PhD., Director of the Hawai'i Institute of Marine Biology, died on February 11th, 2023. Many words have been written about this scholar, researcher, teacher, and beloved friend, but there still remains many things to say.

Eleanor's work spans multiple generations, institutions, and disciplines. Her academic work began with primate behavior and ecology at Yale University, where she was both an undergraduate and a graduate student.

Eleanor's early work was already spectacular, as she took on one of the toughest assignments of field studies – highly reclusive, nocturnal primates that live in remote areas, specifically the aye-ayes (*Daubentonia*) of Madagascar. It is quite possible that Eleanor's work in this area will never be replicated simply because no one else has been as persistent and dedicated as she was in this topic.

Eleanor continued her professional journey at the American Museum of Natural History, in New York, as the Director of the Center for Biodiversity and Conservation for more than 20 years.

Throughout her career, Eleanor was both brilliant and exceedingly generous and found multiple ways of serving the biodiversity community, including teaching, sitting on boards, consulting, and mentoring dozens of students.

Over the past ten years, Eleanor made a major shift in her focus, developing expertise in biocultural studies with a particular focus on the South Pacific. This allowed Eleanor and her husband, Kevin, to make a significant move to the island of Oahu, where Eleanor was the Director of the Hawai'i Institute of Marine Biology at the University of Hawai'i at Mānoa.

Eleanor received a variety of awards for her dedication and commitment to biodiversity. Most recently, she was a recipient of the Fred Packard Award in recognition of a lifetime of conservation work.

Eleanor's work has put Indigenous knowledge at the heart of practice in conservation. Her work resulted in over 120 publications, stronger protected-area management, and the establishment of locally managed conservation areas in biodiverse and unique ecosystems.

Eleanor has always had a special relationship with Yale, which was the site of so many of her early experiences with academia. While at Yale, she also showed great singing talent, such as her soprano work with Whim 'n Rhythm, the senior SSAA a cappella group. Those who knew her loved her solo performance of the song "Somewhere Over the Rainbow." I remember being awestruck by her performance. She was also a track and field long-distance runner, an activity she continued for many years after graduation, and an expert in quilting and other crafts. Eleanor will be greatly missed and fondly remembered.

Nora Bynum, Ph.D.

Yale PhD, 1995, Anthropology and School of Forestry & Environmental Studies;
Dean of Academic Programs, Organization for Tropical Studies (OTS)

INCOMING DONNELLEY POSTDOCS

The Donnelley Postdoctoral Fellowship supports research in biodiversity or a combination of biodiversity with conservation and public policy. The Fellowship was created to honor the memory of Mr. Gaylord Donnelley, Yale College Class of 1931, a conservationist dedicated to advances in research and education. The Fellowship, which was established by Mr. Donnelley's widow Dorothy and son Strachan, is funded by an endowment from the Gaylord and Dorothy Donnelley Foundation and the Donnelley Family and is administered by YIBS.

Hannah Greenwald



SEAS

Appointment:

Aug. 2023– Jul. 2025

Advisor:

Jordan Peccia

Hannah's doctoral research focused on health-relevant microorganisms in engineered water systems, including opportunistic pathogens in drinking water plumbing and SARS-CoV-2 in wastewater. As a YIBS Gaylord Donnelley Postdoctoral Associate, Hannah will study abiotic and biotic factors influencing the biodiversity, resilience to invasion, and antibiotic resistance of biofilms, with a focus on biofilms in healthcare settings.

Heather LeClerc



SEAS

Appointment:

Jul. 2023 – Jun. 2025

Advisor:

Julie Zimmerman

Heather's research harnesses her background in both chemistry and chemical engineering to understand the fundamental chemical reactions that inhibit the wide-scale realization of green energy technologies. Due to the prevalence of lignin as a byproduct of ethanol and paper production, Heather will focus her efforts on determining limiting factors in lignin depolymerization and subsequent repolymerization into useful platform chemicals and even synthetic wood.

Maya LaGrange Rao



EPS

Appointment:

Sept. 2023–Aug. 2025

Advisor:

Lidya Tarhan

Maya's research focus lies at the intersection of geobiology and geochemistry; in particular, she is interested in understanding past marine conditions through bioturbation and chemical proxies recorded in sedimentary rocks. By comparing the trace fossil assemblages of ancient coastal rock units to present-day coastal sediments, Maya's work at Yale will investigate the response of shoreline burrowing animals to changes in temperature.

Katlin Schroeder



EPS

Appointment:

Aug. 2023–Jul. 2025

Advisor:

Pincelli Hull

Katlin Schroeder studies the effects of extreme body size on the community ecology, diversity, and behavior of non-avian dinosaurs. Her research includes large data analysis of dinosaur body size diversity across spatial scales, the role of juvenile megatheropods in the structuring of dinosaur communities, the evolution of skull structure in tyrannosauroids, and the dietary ecology of tyrannosaurids through ontogeny.

INCOMING HUTCHINSON CLUSTER III

THE GENOMIC BASIS OF CLIMATE RESILIENCY

Current climate models predict more extreme and variable temperature and precipitation regimes, and hotter, more extreme droughts are a leading cause of widespread forest mortality. Despite their central role in plant ecological adaptation, potential variation in complex physiological processes such as drought tolerance are rarely surveyed at a population level. Furthermore, we know very little about either the genetic basis or potential plasticity of plant drought tolerance. This is problematic, because if and how species will adapt to climate change depends in large part on the amount and distribution of genetic variation for ecologically relevant traits. This project seeks to bridge global ecology and evolutionary genetics by exploring the genetic architecture and within species variation of plant drought tolerance.

Henry Arenas-Castro



Pauline Raimondeau



Vanessa Tonet



EEB

Appointment:

Aug. 2023–Jul. 2025

Advisor:

Jennifer Coughlan

Henry Arenas-Castro is an evolutionary geneticist interested in studying the processes that create and maintain biodiversity. Originally from Colombia, he completed his PhD at the University of Queensland, Australia, where he investigated the evolution of mate choice in plants. Henry has also studied the consequences of language barriers in science.

EEB

Appointment:

Aug. 2023–Jul. 2025

Advisor:

Erika Edwards

Pauline seeks to understand the factors influencing plant evolution and adaptation. She uses comparative genomic methods to investigate the origin of drought physiological differences across the geographic distribution of *Mimulus guttatus*. This work will help predict population persistence and future species distributions.

YSE

Appointment:

Aug. 2023–Jul. 2025

Advisor:

Craig Brodersen

Vanessa is a plant physiologist, and her research focuses on understanding plant tolerance and adaptation to drought by looking at the plant water transport system. Her work integrates the understanding at a fine scale of key leaf physiological processes with plant traits variation along environmental gradients.

Information about Hutchinson Cluster IV “Mechanisms and Trajectories of Post-Disturbance Recovery in Tropical Forests” will be announced in our Spring Newsletter.

INCOMING YIBS SCHOLARS

The Edward P. Bass Distinguished Visiting Environmental Scholars Program was created with a generous gift by Edward P. Bass to YIBS. This program brings premier scholars in any field dealing with the study of the environment – past or present – to Yale for an extended period of time. The scholars are nominated by the YIBS Faculty Affiliates, and while in residence at Yale, scholars present seminars, interact with faculty, students, and research groups, and participate in the life of one or more academic units.

Fall 2023



Thomas Bianchi

*Professor of Geology, Jon L. and Beverly A. Thompson
Endowed Chair of Geological Sciences,
University of Florida*

Hosts: Pete Raymond (YSE), Lidya Tarhan (EPS)

Many of the central issues in research concerning global climate change involve understanding the exchange and transport of organic and inorganic pools of carbon – in the context of the global carbon budget. If we are to successfully balance and model global carbon fluxes, it is important to understand the dynamics of carbon cycling in the most productive environments. In general, the most productive environments are located in land-margin ecosystems such as watershed soils, freshwater, and marine coastal systems. Dr. Bianchi's research has centered on organic carbon cycling from source-to-sink with work focused on the transport of soils in watersheds of large river systems to coastal environments. Dr. Bianchi used state-of-the-art chemical techniques to determine the role of terrestrial versus aquatic carbon sources in the overall carbon cycles of these ecosystems.



Carlos Navas

*Professor of Physiology
University of São Paulo
Host: Martha Muñoz (EEB)*

Carlos Navas is a physiological ecologist based at the Physiology Department of the Biosciences Institute at the University of São Paulo. He is originally from Colombia and started his career investigating adaptation of amphibians to extreme tropical elevation, adaptation to cold including freezing, and other topics related to life in the tropical Andes, above the treeline. Later he addressed other extreme environments such as the Brazilian semiarid Caatinga, and expanded research to other animal lineages including insects. Over the past 15 years he has studied the impact of climate change on fauna. Currently, he maintains this original interest in classical physiological ecology, but more recently has focused on the interdisciplinary convergences of biology and science education.

INCOMING YIBS SCHOLARS

We are looking forward to the arrival of Stanley Ambrose and Timothy Lyons next spring. YIBS will begin soliciting nominations for the spring of 2025 early next year.

Spring 2024



Stanley Ambrose
*Professor of Anthropology,
University of Illinois*
Host: Jessica Thompson (ANTH)

Stanley Ambrose is a paleoanthropologist conducting research on early hominid origins and evolution in Africa, and modern human origins, adaptations and expansions out of Africa during the last three ice ages. He uses archaeological and geological methods, and environmental isotope biogeochemistry of modern and fossil plants, animals, and soils to reconstruct past habitats, climates, diets, residential life histories, and human social interaction networks. Fossil tooth enamel and ostrich eggshell are highly resistant to alteration over time. Their carbon and oxygen isotope ratios preserve environmental information with high fidelity. He is developing new methods to improve reliability of stable and radiometric dating analyses. His ultimate goal is to understand the evolution of human cooperation in variable ice age and stable interglacial environments.



Timothy Lyons
*Distinguished Professor of Biogeochemistry,
University of California, Riverside*
Host: Noah Planavsky (EPS)

Timothy Lyons (Yale, PhD, 1992), a distinguished professor at the University of California, Riverside, will work with Yale colleague Noah Planavsky in the Department of Earth and Planetary Sciences to study the many environmental and ecological challenges linked to shrinking lakes in arid regions around the world. In the face of intense droughts, increased evaporation with warming temperatures, and greater demand on water resources, lakes throughout the world are drying, exposing surrounding regions to diverse consequences that include threats to human health from increased dust loads. Initially focusing on the largest lake in California, the Salton Sea, the two biogeochemists will use traditional and novel readily extrapolatable methods to explore the cycling of potentially toxic metals, microbial pathogens, and pesticide/herbicides and the pathways by which these contaminants once airborne can impact communities and ecologies near and far.

Each year, recipients of YIBS fellowships receive job offers, and here we highlight two of them. Congratulations to Karen and Sappho on their next positions!



Karen Chen
Gaylord Donnelley Postdoctoral Fellow

Karen Chen, a former Donnelley Postdoctoral Associate, is embarking on a new chapter in her career as she joins the faculty at the University of Washington. Karen will hold a joint position between the Departments of Environmental and Occupational Health Sciences and Urban Design and Planning, where her expertise will contribute to interdisciplinary research and teaching initiatives across the built environment, public health, and data science. Karen's recent projects revolve around three central themes: changing urban form, environmental psychology, and climate-related hazards. Leveraging her expertise in machine learning and time-series satellite data analysis (2022 Leading Women in ML4EO), she has developed novel methods to characterize large-scale urban environments. Through collaborations with regional experts, she investigates the implications of these urban environments for public health in various regions, including Africa, Asia, Europe, and the United States. Karen's ultimate goal is to foster an international community of scholars, students, and practitioners dedicated to understanding and shaping healthier and equitable cities. Check out the most recent discussion on her urban mental health research!



Sappho Gilbert
YIBS Science Communication Fellow

During PhD orientation week, a Yale School of Public Health staff member suggested Sappho and her peers explore courses, seminars, and organizations beyond the medical campus; after all, "Science Hill isn't that far!" This nudge motivated Sappho to connect with such opportunities salient to her interests in the socio-environmental dimensions of the contemporary Inuit food system in the Canadian Arctic. It was in seeking funding for her first dissertation paper that she came across the Yale Institute for Biospheric Studies (YIBS). That spring, Sappho was awarded a YIBS Doctoral Pilot Grant and presented a poster at YIBS-hosted Yale Climate Day. Inspiring, interdisciplinary conversations? Sappho was hooked! For 5 academic years, she served as a YIBS Science Communication Fellow. Through educational and networking events, grant and fellowship support, and much more, she grew as a scholar studying the complex dynamics between people, place, food, and health. Sappho will continue this work through her postdoctoral training at the Harvard T.H. Chan School of Public Health, which began in August 2023. Sappho finds this moment bittersweet, as she misses the wonderful YIBS community of faculty, staff, students, and other affiliates and looks forward to staying in touch and seeing them again soon!

YIBS FRIDAY SEMINAR SERIES FALL 2023, 3 PM (EASTERN)

For seminar location details and Zoom/Panopto links, more information about YIBS lectures and events, or to join our mailing list, visit <https://yibs.yale.edu/seminars-lectures>



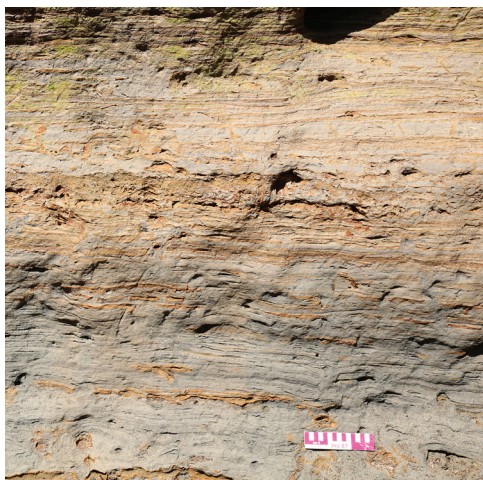
During campus closures to limit the spread of COVID-19 in 2020, co-author Dr. Lauren Kennedy samples a university water fountain using our portable sampling wagon.

HANNAH GREENWALD



Katlin Schroeder collecting dental microwear.

JONATHAN KELLER



Maya LaGrange Rao: Pleistocene intertidal flat deposits at Rhodesia Beach, Willapa Bay, Washington.

MURRAY GINGRAS

September

- 8** Carlos Navas, Professor of Physiology, University of São Paulo & YIBS Bass Scholar
Montane frogs and experimental fogs: How I came to study thermal boldness in fruit flies
- 15** Thomas Bianchi, Jon and Beverly Thompson Endowed Chair in Geological Sciences, University of Florida & YIBS Bass Scholar
Carbon processing in aquatic critical zones: biogeochemical challenges in the 21st century
- 22** Nicholas Fisher, Distinguished Professor, School of Marine and Atmospheric Sciences, Stony Brook University
Long-lived radionuclides from the Fukushima nuclear power plant in Japan, and consequences for Pacific ecosystems and seafood consumers
- 29** Anita Weissflog, Hutchinson Postdoctoral Associate, YSE
Insects, fungi, and tropical tree diversity

October

- 6** Hannah Greenwald, YIBS Donnelley Postdoctoral Associate, SEAS
Impacts of COVID-19 lockdowns on drinking water microbial abundance and community composition
- 13** Heather LeClerc, YIBS Donnelley Postdoctoral Associate, SEAS
Enabling the integrated biorefinery through continuous flow lignocellulose upgrading
- 27** Katlin Schroeder, YIBS Donnelley Postdoctoral Associate, EPS
Ontogenetic niche shift as a driver of community structure and diversity of non-avian dinosaurs

November

- 3** Maya LaGrange Rao, YIBS Donnelley Postdoctoral Associate, EPS
Assessing temperature-driven changes in coastal bioturbation at Willapa Bay, Washington
- 10** Quentin Bateau, YIBS Hutchinson Postdoctoral Associate, SEAS
Automating large scale trait extraction from plant imagery with computer vision: applications to herbarium specimens

December

- 1** Nadia Zikiou, YIBS Hutchinson Postdoctoral Associate, CPSC
Dynamic landscapes: exploring changes in land use, land cover, and fire severity in northern Algeria using spectral indices and machine learning