



News from the Department of Environmental Science

Volume 11, Issue 1

Fall 2019

Interesting Nature Facts:

- ★ The average American uses 60 -70 gallons of water per day.¹
- ★ Dolphins shed the top layer of their skin every two hours.²

Inside this issue:

Welcome!	1
Bowers Book Release	2
Black Rock Forest Retreat	3
Climate Strike	4
Highlights	5
New Faculty	6-7
Award Recipients	8-9
2018-2019 Senior Theses	10
Celebrating our Seniors	11
From the Archives	12

Welcome to our new Faculty and Staff

This semester we welcomed a lot of new faces to the department! We are very pleased to introduce two new faculty hires, Elizabeth Cook and Logan Brenner and our new program manager, Eleanor Ludkey.



From left to right: Elizabeth Cook, Eleanor Ludkey and Logan Brenner

Assistant Professor Elizabeth Cook is an urban ecosystem scientist with interdisciplinary expertise in social and natural sciences, including ecology, cultural geography, and sustainability sciences. Her research focuses on the future of urban sustainability and human-environment feedbacks.

Assistant Professor Logan Brenner is a paleoclimatologist whose interests lie at the intersection of climate and environmental science. Her current research focuses on studying geochemical composition of coral skeletons to reconstruct past ocean conditions.

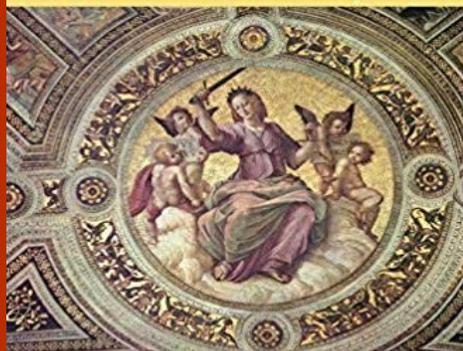
See page 6 and 7 for a more detailed look at their work!

Program manager Eleanor Ludkey comes to us from the United States Geological Survey. She received her undergraduate degree in Hydrology from the University of Wisconsin – Stevens Point. Since then she has been working for the Department of the Interior in a variety of different roles including interning as an assistant hydrologist at Saguaro National Park and as a biological science technician for the Fisheries and Vegetation program at Grand Canyon National Park.

We are happy to announce that Leslie Raucher is moving on to a new position in the college as the Associate Director of Campus Sustainability and Climate Action. She will still be working very closely with the department from her new office in Milbank Hall. Our next issue will feature an in-depth look into her current projects.

INTRODUCTION TO U.S. LAW, POLICY, AND RESEARCH

An Environmental Perspective



PETER M. BOWER
DANA NEACȘU

Environmental Science Professors Bower and Neacsu Published a Book

Peter Bower (Senior Lecturer in the Dept. of Environmental Science) and Dana Neacsu (Reference Librarian and Lecturer in Law at the Columbia Law School) have had their book, *Introduction to U.S. Law, Policy and Research— An Environmental Perspective*

published by Vandepnas Publishing, a well-known publisher of legal texts.

With the co-sponsorship of the library, the Environmental Science department threw a book release event for the occasion. This book is the culmination of over 30 years of teaching and law experience. The book will be used as a textbook for their course Environmental Law. Dr. Bower has taught this course since 1993 and has taught it every spring with Dr. Neacsu since 2003. Neacsu will continue this tradition and lead the course in the spring.

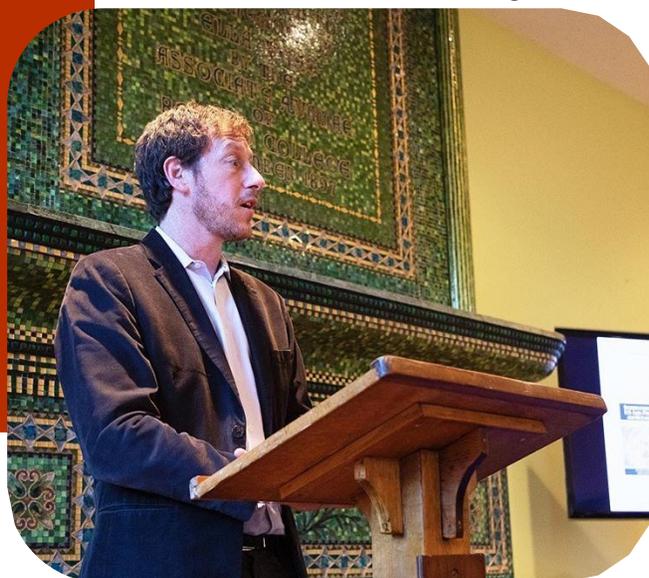
At the book release party, Michael Burger, executive director of the Sabin Center for Climate Change Law and Senior Research Scholar and

Lecturer in Law at Columbia Law School, spoke about his experience working in environmental law. He highlighted the importance of law in our current political climate. It was an emotional night as Peter reflected on his past 33 years of experience working in the department and Dana read a personal letter to Peter highlighting the importance of their partnership in the development of the course.



“This book is the culmination of over 30 years of teaching and law experience.”

Michael Burger speaking at the book release.



5th Annual Black Rock Forest Retreat



The annual Black Rock Forest Retreat took place in early October. This was the fifth year of the trip and we had the highest level of attendance ever! 41 students and all of our faculty, staff and their families enjoyed amazing weather, beautiful fall colors, late night hikes and even a campfire singalong! Hikes were led by our faculty and staff, and highlighted some of the ecology, history and beauty of Black Rock Forest.



“What I love about this trip is that everyone from the department makes themselves so available to talk to students in a casual setting. I remember feeling so much more of a sense of community within the department after the first retreat that I went on, and this year's retreat only solidified that.”



The Climate Strike



Students, faculty, staff at the climate march



Students, with the support of our faculty and staff, organized a walkout to participate in the larger climate strike taking place worldwide on September 20th. The students and faculty spelled out 1.5°C on Futter field. This number represents the calculated global average temperature increase that humans must remain below in order to prevent disastrous climate change. The students made signs and T-shirts on the lawn using reused materials and headed downtown to join in the protest.

Over 250,000 people took to the streets in New York City to march against climate change. The event ended at Battery Park with speeches given by youth climate activists such as Varshini Prakash, Isabella Fallahi and Greta Thunberg.



The Barnard community spelling out 1.5C

Highlights from around the department...

Spotlight on Fieldwork



Students in the Field Methods Course at Black Rock Forest felling and measuring a Black Birch



Students at the Newtown Creek Wastewater Treatment Plant standing in front of one of the digester eggs.



Students sampling surface water at the 125th St Pier for Intro to Environmental Science

Franziska Landes earns her PhD

Franziska Landes completed her PhD with the Earth and Environmental Sciences program at Columbia University. She became an integral part of the department by helping with courses and including many students in her research. She also taught a course on New York City and Health at Columbia.

Franziska studied environmental geochemistry and public health, especially focusing on the potential for community and public participation in science in order to reduce exposure to environmental contaminants while at the same time increasing environmental literacy. After receiving her B.Sc. from Jacobs University in Germany, she worked for two years at the Oklahoma Department of Environmental Quality, conducting and reviewing environmental assessments and remediation plans for the Brownfields Program.

Her PhD research worked on developing a field test kit for lead in soils and working with communities to discover the extent of soil-lead contamination in New York City and Peru. She currently lives in Oregon.





Logan Brenner

Assistant Professor Logan Brenner graduated from Skidmore College in 2012 with a B.A. in Geosciences where she studied stalagmites to develop a history of precipitation in Yucatan, Mexico. She received her Ph.D. in Earth and Environmental Science from Columbia University and the Lamont-Doherty Earth Observatory, where she studied coral geochemistry with one project focusing on the hydroclimate off the Pacific coast of Panamá and another on the changing sea surface temperatures in the Great Barrier Reef.

Dr. Brenner's research focuses on the geochemical composition of stony corals in order to develop histories of ocean temperature, precipitation, salinity, and coastal factors such as river discharge. Stony corals are powerful tools in the field of paleoclimatology. An individual coral colony can provide insight into significant environmental perturbations with proxies, which are indirect geochemical fingerprints of past environmental conditions. She applies these same methodologies to answer questions about modern coastal conditions.

This March, Dr. Brenner presented at Barnard on the development of the coral Barium/Calcium-River Discharge proxy to reconstruct the coastal conditions off the Pacific Coast of Panama. In Panama, a country consistently in the top five for total annual rainfall, understanding how precipitation and river discharge will evolve over the course of impending warming is of the utmost importance to the functioning of the Panama Canal. During her lecture, Dr. Brenner discussed one of the first uses of the Ba/Ca- river discharge proxy, and preliminary results indicate that this will be an area of active research. Dr. Brenner is teaching the Workshop in Sustainable Development and Senior Seminar this semester.



Logan Brenner diving in Turks and Caicos

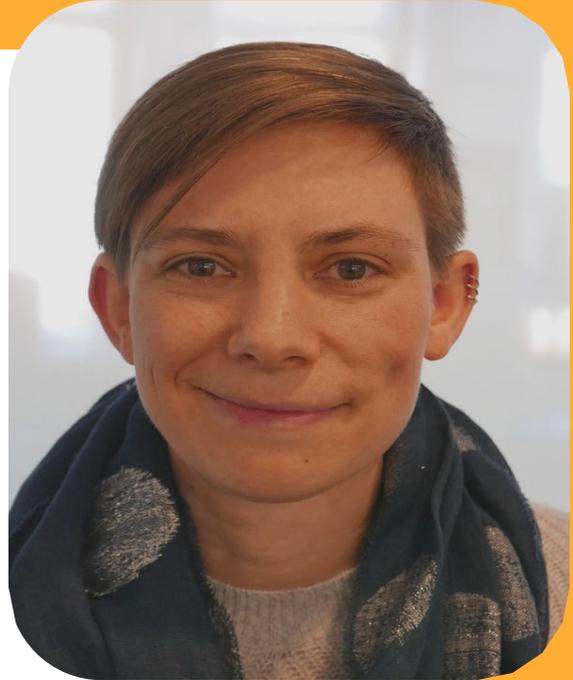
*Keep up with our
new faculty and
their research on
social media!*

@thebrennerlab



Elizabeth Cook

Assistant Professor Elizabeth Cook earned her PhD at Arizona State University where she was an NSF-funded Fellow in the Interdisciplinary Graduate Education and Research Training (IGERT) program. She was previously awarded a Chilean National Commission on Science and Technology (CONICYT) Postdoctoral Fellowship at the Universidad Austral de Chile, Valdivia and served as a Postdoctoral Fellow in Urban Ecology in the Environmental Studies Department and the Urban Systems Lab at The New School where she taught Climate Justice and Urban Ecology. Dr. Cook seeks to advance a broader understanding of cities through the integration of trans-disciplinary frameworks, mixed methods, and a comparative approach with examples from cities in Latin and North America.



In March, Dr. Cook presented her research “A Comparative Urban Systems Science to Improve Future Resilience and Sustainability” on campus. In her lecture, Dr. Cook highlighted how interdisciplinary urban systems science can be used to link knowledge to action and enhance the capacity of cities to implement long-term resilience planning.

Cities are increasingly threatened by changing climate, extreme events, and persistent inequities. Dr. Cook’s research uses a future-oriented urban systems science that integrates planning and action inspired by trans-disciplinary scientific and community-based knowledge. She studies peoples direct and indirect impacts on urban ecosystems and ecosystem services in peoples yards, city parks, and public spaces. Dr. Cook is teaching Environmental Data Analysis and the Senior Seminar this semester.

Follow:

@e_m_cook



Award winners in the department...



Dr. Bower lecturing at Black Rock Forest

Professor Peter Bower wins Hal Tryon Stewardship

Peter Bower was honored at the Black Rock Forest Annual Meeting held at Barnard on October 7th. He was given the first Hal Tryon Stewardship Award for his teaching and dedication to students and student research at Black Rock Forest. Dr. Bower has brought students to BRF for over 40 years and as a founder of the Environmental Science Department, began Barnard's involvement with Black Rock Forest (BRF).

Peter has demonstrated exemplary forest stewardship through education and support of Barnard student research for 30 years. For example, through his course entitled Field Methods, he has engaged students in data collection in the long term forest plots to show how the trees store carbon. He also has engaged students in the study of dendrochronology and climate, and the importance of deer management at the forest.

In addition to his course, Peter has sponsored at least one student per summer to do senior thesis research at the forest. Last summer he sent three students; Clara Fernandez-Odell, who is studying carbon sequestration in trees, Grace Palmer who is studying carbon sequestration in soils, and Emma Palmer, who is studying coyote behavioral dynamics at Black Rock Forest.

Peter served as the acting executive director for a year in 2000 during which time he had two particularly interesting tasks: one was getting involved in the plans for the new forest lodge and the second was to negotiate a \$30,000 settlement with US Army at West Point for damage caused by two forest fires caused by artillery practice.



Bill Schuster, Executive Director of Black Rock Forest, presents Peter Bower with the Hal Tryon award

Award winners in the department...



Nicki Franks 19' wins major scholarship

The Udall Foundation awards scholarships of up to \$7,000 to college sophomores and juniors in recognition of their leadership, public service, and commitment to issues related to Native American nations or to the environment. Nicki Franks, a senior majoring in Environmental Science and Political Science, has spent much of her college career in-

involved in environmental justice issues: she is a member of Barnard Divest for Climate Justice and the Sustainable Initiatives Consulting Board on campus, and works off-campus in the Environmental Policy and Advocacy office at WE ACT, a West Harlem nonprofit. After graduating next spring, Franks plans to return home to America's industrial Rust Belt to pursue a dual degree in law and natural resources, which she will use to advocate for environmental justice in Appalachia.

Alumna Natalia Figueredo '18 worked on winning project of Davis Projects for Peace Grant

The Davis Grant supports projects that will contribute to peace and a better world. Natalia Figueredo, Emily Miller, and Samantha Ortega and Samantha Figueredo have developed a project that took them to the rural community of Copacabana in the Bolivian Amazon. This past summer, they rehabilitated ancient indigenous farming practices of raised fields and canals, using Davis Project funding to buy seeds, compensate workers, and subsidize farming equipment. They also facilitated several workshops on climate change adaptation and resiliency planning for the community.

Natalia Figueredo majored in Environmental Science and after graduation served as the summer team leader for the SIT Conservation and Biodiversity study abroad program in the Galápagos Island.



Natalia Figueredo is on the far right.

2018-2019 Senior Theses

Environmental Science
BARNARD
Alumnae

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Alvarez, Blanca: Importance of Intact Herbivore Guilds in Cropping Turf Algae

Andrews, Abigail: Developing High-Resolution Air Pollution Maps via Mobile Monitoring Platforms

Benesch, Ambria: Urban Toxicity, Community Organizing, and the Lack of Environmentally-Motivated Political Action in Marginalized Neighborhoods

Nina Castro: Early Miocene Oncolite and Stromatolites from the Lake Manuherikia Region, New Zealand

Estrada, Mireya: Understanding the effects of climate change on smallholder farmers in Loma Bonita, Panamá

Estrella, Kristal: The Social, Environmental, and Health Consequences of Cold Stress in Rent-Occupied Homes

Figueredo Botello, Natalia: The Impact of Particle Association on Temperature-Dependent Growth and Light-Induced Mortality of *Vibrio* sp. in the Hudson River Estuary

Gibson, Marion: Harvey’s Injustice: Flood Exposure and Access to Recovery Resources for Immigrant Communities

Guillermo, Jessica: Monitoring Air Movement in Buildings Using Perfluorocarbon Tracer Compounds and Sulfur Hexafluoride

Israel, Maggie: Urban Agriculture, Crime, and Community Perceptions of Safety in New York City Public Housing

Kayle, Avery: Using Perfluorocarbons and SF₆ as Tracers for Groundwater Contaminants Related to Hydraulic Fracturing

Lim, Shelly: Distribution of Microplastics around New York City Waterways and Ingestion of Microplastics by *Noctiluca scintillans*

Mateescu, Irina: Comparing Abiotic Variations and the Arctic-Boreal Soundscape: a Machine Learning Approach

Meza, Brenda: The Effects of Surging Waters and Inequality in Puerto Rico

Pallone, Celeste: Sources of Carbon and Grain Size of Surface Sediments in the Eastern Long Island Sound

Sahwell, Gemma: Resettlement in the Face of Gamma Radiation and a Rising Sea: A Survey of the Northern Atolls of the Republic of the Marshall Islands

Shin, Alexandra: An Analysis of Large vs. Small Anaerobic Digester Utility in Kumasi, Ghana Using Compositional Excreta Flow Diagrams

Singh-Smith, Kiran: Post-Clean Air Act pH, Alkalinity, and Ecosystem Recovery of 26 Bodies of Water in the Hudson Highlands

Steiger, Ella: Low Nitrogen to Phosphorus Ratios in Gulf of Mexico Surface Water

Valdivia-McCarthy, Ailín: Species Specific Fossil Leaf Based CO₂ Reconstruction from the Oligocene-Miocene Boundary

Vaughan, Ellery: Dietary Analysis of the Coyote (*Canis latrans*) Population at Black Rock Forest

Congratulations to the Class of 2019!



Our graduates make great employees!

Feel free to let us know anytime you have an opening in your workplace.



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If you are interested in directly supporting our students' research projects please contact:
annualgiving@barnard.edu

From the Archives



A photo of a science class at Barnard in 1928

1. Department of Environmental Protection. (2019, May 17). Water Consumption In The New York City: NYC Open Data. Retrieved from <https://data.cityofnewyork.us/Environment/Water-Consumption-In-The-New-York-City/ia2d-e54m>.
2. Institute Of Physics. (2004, May 17). Scientists Discover Secret Of Dolphin Speed: How Dolphins Evolved To Fly Like Birds Under Water. *ScienceDaily*. Retrieved October 15, 2019 from www.sciencedaily.com/releases/2004/05/040517072242.html