Fall 2017
Volume 9, Issue 1

News from the

Department of Environmental Science

Barnard College

Our 35th Anniversary was a Success!

On November 14th, the Environmental Science Department celebrated its 35th Anniversary by featuring the work and ideas of alumnae through a series of panels and workshops on Environmental Leadership and Innovation. Panels explored environmental policy, communication approaches, and applying knowledge to action. Through round table discussions we received feedback on hour our department could respond to meet emerging challenges. What transpired went far beyond what any of us might have foreseen. In organizing this event, we realized there were many more notable alumnae than could present in one day. Our alumnae present a very impressive breadth of accomplishments!

Inside this issue

Environmental Leadership and Innovation Agenda

Policy Matters Panel:

Polly Trottenberg, History ’86, *Commissioner of the New York City Department of Transportation;* **Diane Pataki,** Environmental Science '93, *Associate Dean for Research and Professor of Biology, University of Utah and Former Program Director, National Science Foundation;* **Jessica Bolson,** Environmental Science '98, *Post-doctoral Fellow at University of Pennsylvania, Wharton Risk Management and Decision Processes Center and Former Miami Waterkeeper;* **Jamie Consuegra,** Environmental Science '06, *Legislative Director for Climate and Clean Air Program at National Resources Defense Council.*

Innovative Communication Approaches Panel:

Jenine Tankoos, Psychology, Environmental Science, Biology '91, *Author and former scientist with the U.S. Environmental Protection Agency;* **Maggie Dressel,** Urban Studies, Environmental Science Minor '07, *Future City Program Manager at DiscoverE, National Society of Professional Engineers;* **Ekaterina Alexandrova,** Environmental Policy '09, *Director of Board Relations at The Nature Conservancy;* **Carly Wertheim,** Environmental Science '14, *Natural foods chef, culinary wellness educator, sustainability advocate.*

From Knowledge to Action Panel:

Alicia Lehrer, Environmental Science '88, *Executive Director of the Woonasquatucket River Watershed Council;* **Salima Jones Daley,** Urban Studies, Environmental Science '03, *Senior Consultant at DB&A and Board Member, the National Young Farmers Coalition;* **Hannah Roth,** Urban Studies, Environmental Science ‘06, *Attorney in General Counsel's Office at New York City Department of Transportation;*
Emily Spokowski, Environmental Science '11, *Senior Claims Analyst - Environmental at AIG.*

Thematic Roundtables: Ecosystem Management, Consulting, Water, Climate, Health, Sustainability Management, Grad School, Entrepreneurship, Hudson River/NYC were hosted by Environmental Science Faculty as well as **Kedari Reddy,** Environmental Science '94, *Senior Executive Director, Office of Environmental Compliance Assessment at New York City Department of Transportation,* **Suzanne Young,** Environmental Policy ‘07, *Postdoctoral Researcher at the Environmental Chemistry Laboratory, Ecole PolytechniqueFédérale de Lausanne, Switzerland;* **Samantha Katz**, Environmental Policy ’01, *Community builder, connector, business advisor, investor;* and Environmental Science Faculty and Staff.

Keynote address:

Annie Leonard, Environmental Science ’86, Executive Director of Greenpeace, USA.

Jessica Bolson presenting during “Policy Matters”

35th Celebration Continued (from page 1)

With the help of the Athena Center for Leadership Studies, the Provost's Office and alumna, Samantha Unger Katz '01, we held three faculty moderated panels with four alumnae each—Policy Matters, Innovative Communication Approaches, From Knowledge to Action—concluding with a keynote by Annie Leonard '86, Executive Director to Greenpeace, USA on the State of the Environment: How to Get to a Better Future.

Each panel was followed by a Q&A and facilitated breaks allowed the audience time to network and admire student research posters from over the years. We also had a series of thematic roundtables staffed by faculty, staff and alumnae for discussions and brainstorming: Ecosystem Management, Consulting, Water, Climate, Health, Sustainability Management, Grad School, Entrepreneurship, Hudson River/NYC.

All day the James Room was active with students and we were thrilled that in addition to the panelists, many other alumnae returned to campus to listen and to share experiences, travelling nationally, internationally, or up the 1-train to discuss where the environment is headed and what we can do to communicate and enact positive change. Over 200 people attended and at its peak, the James Room was entirely filled.

The 35th event highlighted the role Barnard coursework had in developing the professional skills of our alumnae, the impact of research begun here, and the importance of interdisciplinary engagement and communication. Many alumnae voiced their interest in involvement with students directly or in organizing support for student research opportunities. The level of participation in this event marked the excitement and interest in what Barnard's Environmental Science Department and our alumnae can accomplish together for years to come.

Top L: Members of the Class of '86 Polly Trottenberg, Annie Leonard, and Catherine Cook. R: Frank Niche leading a round table discussion on the Hudson River.

Environmental Science
BARNARD
Alumnae

Follow us on Social Media!

Link-in with us

Join us on LinkedIn

Or Search:
"Barnard College Environmental Science Alumnae"

Follow us on Instagram

Instagram

@barnard.environmental.science

@TheOfficialBarnardMagnolia

Volcanic Eruptions Further Linked to Great Permian Extinction

The Great Permian Extiction resulted in the loss of 70% of land species and over 95% of marine species 252 million years ago. Scientists know the extinction was caused by warming the environment. There has, however, always been a question of what caused the warming. It has been hypothesized that it was caused by a meteor impact, volcanism, a nearby supernova, tectonic movement, or a combination of these. Dr. Sedelia Rodriguez, lecturer, and NYU geologist Michael Rampino published a paper in the prestigious journal Nature: *Scientific Reports* this fall showing evidence that the Great Permian Extinction was caused by volcanic activity in Siberia which occurred at the same time.

Rampino explains that "The Siberian volcanic eruptions and related massive intrusions of nickel-rich magmas into the Earth's crust apparently emitted nickel-rich volatiles into the atmosphere, where they were distributed globally. At the same time, explosive interactions of the magma with older coal deposits could have released large amounts of carbon dioxide and methane, two greenhouse gases, which would explain the intense global warming recorded in the oceans and on land at the time of the mass extinctions. The warm oceans also became sluggish and depleted in dissolved oxygen, contributing to the extinction of many forms of life in the sea".

Rodruigez adds that "This new finding, which contributes further evidence that the Siberian Trap eruptions were the catalyst for the most extensive extinction event Earth has ever endured, has exciting implications. We look forward to expanding our research on nickel and other elements to delineate the specific areas affected by this eruption. In doing so, we hope to learn more about how these events trigger massive extinctions that affect both land and marine animals alike. Additionally, we hope this research will contribute to determining whether an event of this magnitude is possible in the future".

Included as co-authers were Yue Cai, a research scientist at Columbia University's Lamont-Doherty Earth Observatory, and Barnard student Eva Baransky '17

You can read the Lamont-Doherty Earth Observatory press release here.

4

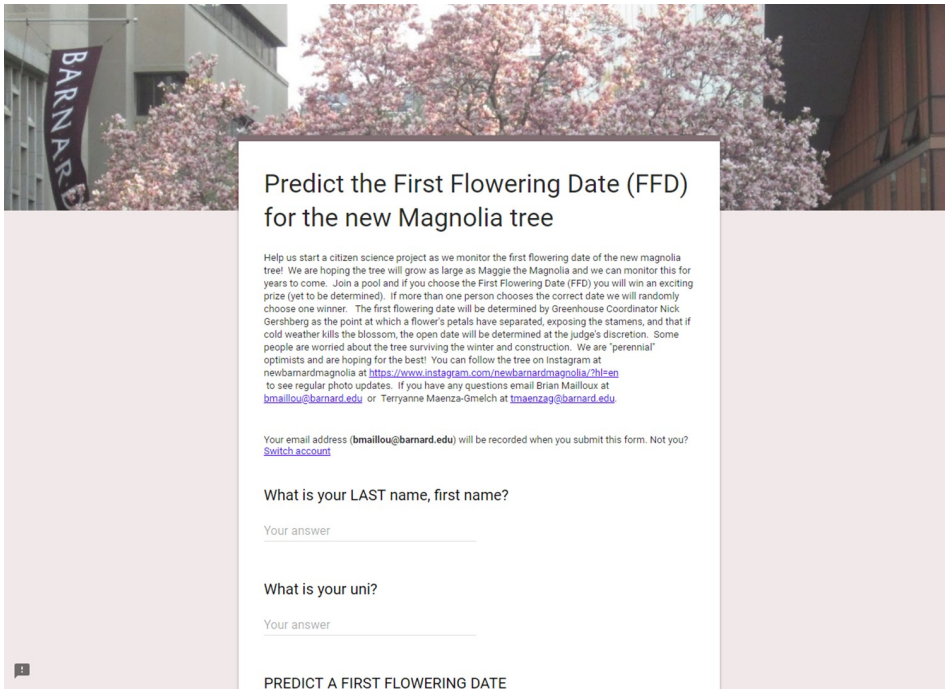
Stephanie Pfirman Featured in National Geographic

Stephanie Pfirman was featured in January's National Geographic Magazine in an article called "Here's Where the Arctic's Wildlife Will Make Its Last Stand." Stephanie has spent the last three decades trying to determine what will happen to the Arctic as the planet warms due to climate change. Her team, including Bruno Tremblay at McGill and Bob Newton at LDEO, has determined that by mid-century, the last remaining area to contain ice all year long will be at the northern edges of Greenland and the Canadian Arctic Archipelago – important information for ensuring preservation efforts are focused in the correct areas.

The ice models don't drop down to zero," Pfirman says. "Some people say it's hopeless, because we're on a trajectory where ice is going to be lost. But if you look at the climate models, it drops down precipitously, and then it has this long tail, which gives us some time to act and potentially mitigate the warming."

Join in on the Barnard Magnolia Poll!

Help start a citizen science project as we monitor the first flowering date of the new magnolia tree! We're hoping the tree will grow as large as Maggie the Magnolia and we can monitor this for years to come. Join the poll and if you choose the First Flowering Date (FFD) you'll win an exciting prize. If more than one person chooses the correct date we'll randomly choose one winner. The first flowering date will be determined by Greenhouse Coordinator Nick Gershberg as the point at which a flower's petals have separated, exposing the stamens, and that if cold weather kills the blossom, the open date will be determined at the judge's discretion. While some worry about the tree surviving the winter and construction, we're "perennial" optimists and hope for the best! Follow the tree on Instagram at https://www.instagram.com/theofficialbarnardmagnolia to see regular photo updates. If you have any questions email Brian Mailloux at bmaillou@barnard.edu or Terryanne Maenza-Gmelch at tmaenzag@barnard.edu.

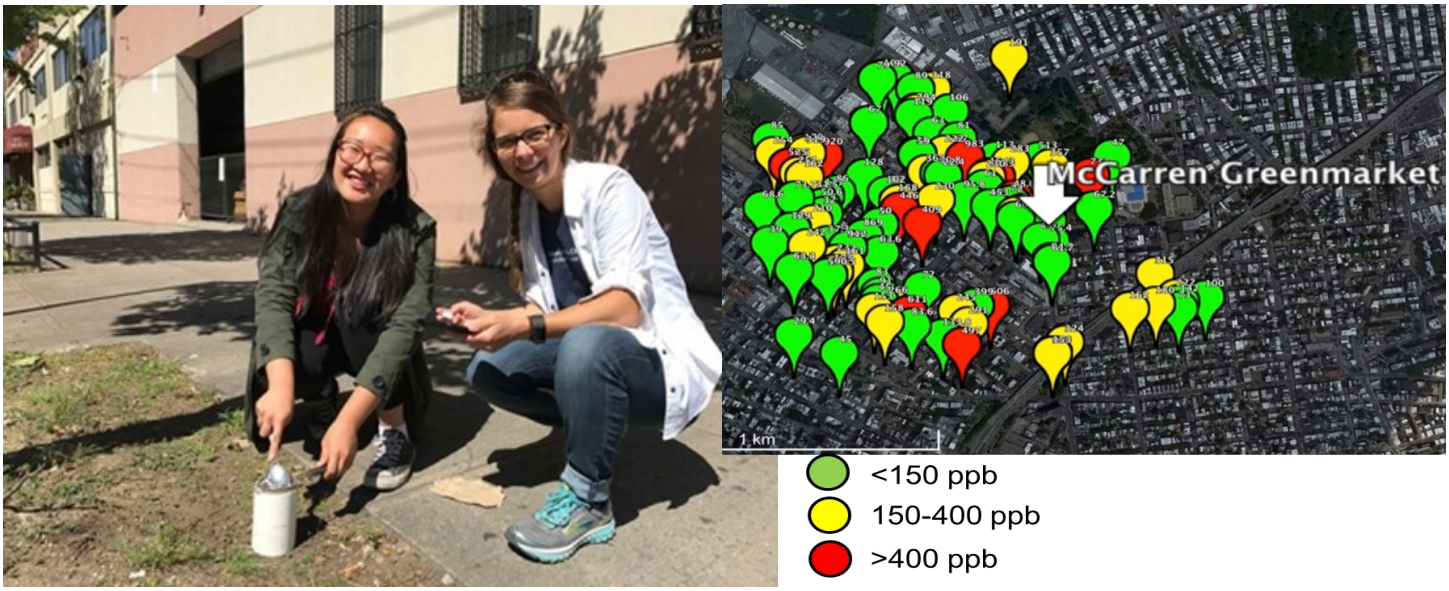


Join the poll at

https://tinyurl.com/bCmagnolia

Curriculum and Research Linked by Lead (Pb)

We have always worked hard to include our students in the research we conduct, but for the first time, the department has made an active effort to integrate current research beyond individual students and into multiple points of the curriculum. This year's theme stemmed from the work of Franziska Landes, a graduate student in Columbia's Department of Earth and Environmental Sciences, who focuses on lead contamination in mining communities in Peru. She developed a low-cost field test kit for these rural communities that only required the use of a cellphone, container, metal spoon, funnel, water and a tablet of rodizinate. The rodizinate changes color based upon the amount of lead in the soil.



Left: Grad student Franziska Landes (right) and her assistant Sabina Giliol BC'17 collect soil samples on a sidewalk in Greenpoint, Brooklyn. Photo: Sarah Fecht. Right: A map showing locations and concentrations of lead in samples.

Our first introduction to the field kit was in the fall of 2016 when Franziska was asked to work with a student in Brian Mailloux's Environmental Measurement's class to develop an independent research project. The project used the field kit to analyze ten tree pit soil samples. Brian noted that this was a great hands-on field project and had the potential to engage more students but did not have plans to continue working with Franziska on further developing the field kit project. It wasn't until Franziska read a recently published paper showing that in Northern Brooklyn, community garden soils were cleaner than private back yard samples, and that the blood lead levels of children in this area were higher than children anywhere else in the city, that they put their heads together to come up with a strategic sampling plan to attempt to determine why.

Their plan involved taking hundreds of samples in public spaces and having private citizens bring soil samples from their yards to the Farmers Market near McCarran Park. Brian decided to include his spring 2017 Water Sanitation and Health class in the endeavor. Students learned about the health issues that stem from high blood lead levels, and then went into the field to explore this issue first-hand. They were tasked with collecting samples from public tree pits near the locations of the private homes that submitted samples to the farmers market. Samples were brought back the lab for analysis under an x-ray fluorescence spectrometer borrowed from Lamont-Dohertry Earth Observatory (we would love our own!)

The work continued when students in the Summer Research Institute (SRI) worked alongside Franzisa.

They made weekly trips down to Greenpoint, Brooklyn to continue sampling because initial results showed that this area had the highest levels of lead. While students were working on different projects during SRI, talk of this project always dominated the lunch conversation. The science behind the analyses, the public health aspects of child lead ingestion, environmental justice, and resulting public policy issues were of interest to all. As an interdisciplinary department, such a project integrated a number of our courses really well.

In the Introduction to Environmental Science, Terryanne Maenza-Gmelch and Sedelia Rodriguez added a new lab. Students took samples from Riverside Park to evaluate lead levels using the field kit. Not only did students get a first look at environmental public health issues, but they also learned how to properly follow a lab protocol.

Martin Stute was able to connect this work with the Workshop in Sustainable Development by engaging the New York City Office of Environmental Remediation as a client. Students created marketing materials for the soil bank program, a valuable urban resource in NYC that aims to reuse clean soil from construction sites. Read more about this on page 10.

Students in Brian Mailloux's Environmental Measurements class made trips out to North Brooklyn to take soil cores in tree pits to see how far back in time the lead was deposited. A new team of students outside of classes are currently working now to continue this work in tree pits and in private yards.

Much of the work in Brooklyn work has been in coordination with a local organization called NAG – Neighbors Allied for Good Growth. The data our students are collecting under the guidance of Brian and Franziska are being put to good use as the organization attempts to educate community members about potential hazards. Through NAG, Brian, Franziska, and several students also had the opportunity to meet with Brooklyn council member Stephen Levin to discuss their research and brainstorm possible public policy options that would lead to cleaner soil in Northern Brooklyn.

In October, the Earth Institute released a blog post that made a huge splash in dozens of news outlets from the Gothemist to Crain's and CBS. Their work was also featured in a November Reuters special on the Legacy of Lead in New York City.

Left: Students in the Intro labs taking samples along their transects in Central Park. Photo: Terryanne Maenaza-Gmelch Right: A map of all the locations of the samples taken by the Intro lab recorded by cellphone GPS.

3rd Annual Departmental Retreat to Black Rock Forest

The 3rd annual departmental retreat was a success! This year's adventure started at the Lamont-Doherty Earth Observatory Open House where students had the opportunity explore the open labs and hear Martin Stute give a high profile lecture to the public on his carbon sequestration work. The group went on a hike along the scenic Palisades overlooking the Hudson River before heading north to Black Rock Forest for the evening. We were met at the forest by a wonderful campfire BBQ dinner (with vegetarian and vegan options!) prepared by Terryanne Maenza-Gmelch. The fun continued well into the night with an evening hike lead by Brian Mailloux to the shore of a nearby lake to watch the moon rise and view a spectacular display of stars. The evening ended with hot chocolate at the lodge and stories from Martin Stute's and Frank Nitche's early days as research scientists.

The next morning started bright and early with Stephanie Pfirman's famous waffle breakfast and a hike. Persis Ticknor-Swanson '18, manager of the Sustainable Development Workshop team working for their client, Black Rock Forest, called for volunteers to help collect GPS coordinate data for their class project (read more about the project on page 10) while on the hike. A great time was had by all.

Faculty Approve Revised Major: Environmental Policy becomes Environment and Sustainability!

On Monday, November 13, Barnard Faculty approved the Environment and Sustainability Major. While similar to the former Environmental Policy Major, the new major has some different requirements to meet the needs of students interested in Environmental Sustainability. Forthcoming majors may choose an Environment and Sustainability major, while current Juniors and Seniors or those who have already elected a Policy major may continue as begun or elect a change of major and follow the new requirements. Requirements for the new major are accessible on our website under Majors & Minor.

Stephanie Pfirman Invited to Help Shape New Nature Magazine

This January, Nature, the prestigious science research magazine, held an international forum to help shape the launching of a new journal in the Nature family, Nature Sustainability. The journal was created to "advance our understanding of sustainability… and the decisions and interventions needed to move humanity towards a sustainable path." The Chief Editor of the journal recognized that interdisciplinary research is key to finding sustainable solutions and invited 30 of the top experts who regularly approach their work in such a manner to this forum. Stephanie Pfirman was one of the invitees and attended the three day event in Beijing, China.

Opening remarks by the Chief Editor of Nature Sustainability

The discussions over the three day event all lead to the conclusion that having knowledge of a problem is not enough. We need to take gather together knowledge from stakeholders as well as academics, and work together to forge solutions. One of the biggest takeaways Stephanie had from attending this event was that the Department of Environmental Science is on the right track with our focus on engaging students in designing solutions - especially in the Workshop in Sustainable Development.

Paper by Elizabeth Trembath-Reichert BC '08 Awarded 2017 Cozzerelli Prize

Center for Dark Energy Biosphere Investigations scientist **Elizabeth Trembath-Reichert '08** was awarded the Cozzerelli prize for her paper published in the Procedings of the National Academy of Sciences, Methyl-compound use and slow growth characterize microbial life in 2-km-deep subseafloor coal and shale beds (C-DEBI Contribution 389). The award acknowledges papers that reflect scientific excellence and originality and is given annually to six papers published in PNAS.

The Workshop In Sustainable Development

In the Workshop for Sustainable Development, taught by Martin Stute, students address real-world issues in sustainable development by working in groups for a non-for-profit external client. Two teams were established this past semester to work with Francie and Bill Schuster of Black Rock Forest and Dan Walsh from the NYC Office of Environmental Remediation. This project-based course provides hands on experience in communication, collaboration, and management while working towards real solutions for their clients. Through research, report writing, and meetings with and presentations to clients and the academic community, students have a true consulting experience. This course draws students from all majors and is a now a requirement for students majoring in Environment and Sustainability.

Development and Applications of Maps on Mobile Devices for Black Rock Forest

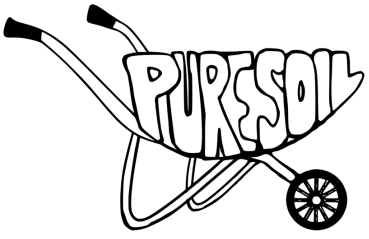
Students on this team were presented with the problem that the digital maps at Black Rock Forest had not been updated in years and were not available for use in the field. The maps were not available on mobile devices and did not contain up to date locations of monitoring stations, experimental plots, etc. Also, important safety information such as the location of hazards could not be conveyed.

Francie Schuster and XXXX testing apps and GPS data collected on cell phones

In order to find a solution, students needed to learn understand how GPS units work and test and select multiple mobile apps to find one that would work best in terms of access and accuracy. Students also needed to understand the learning and research goals of educators and researchers to ensure the app would fulfil their needs. In the end, the students selected an app called AvenzaMaps and provided the Forest with updated maps that are ready to be used by Consortium members.

PURE Soil: Progressive Urban Resource Exchange

The NYC Office of Environmental Remediation engaged with students on their newest initiative, PURE Soil. The program is designed to keep clean soil, dug up from building projects, in NYC and available to community groups. The team was tasked with providing four deliverables to the City that would help with the program's launch. The students provided the City with a literature review that outlined the fate of soil currently and detailed what other programs of the type exisited. As it turns out, this is a first world wide! Secondly, they wrote an educational article that is to be published in Columbia's Newspaper, The Spectator. They then immersed themselves into the world of marketing and advertising and explored what makes a good logo. They made several prototypes, and mocked up subway ads and promotional giveaways. The team also researched the issues surrounding urban soil contamination and the risks to the public and created an informative brochure to be distributed. If you live in NYC, keep your eye out for our student's work!



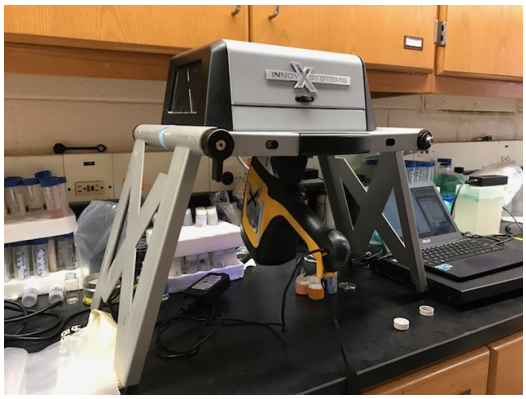
A portion of the pamphlet and the final logo created by students for the NYC OER

Join us at Barnard Reunion 2018 (6/1/2018)

On Friday June 1st from 2:30—3:30 on the 4th floor of Altschul.

- Bring it Back to Barnard: Your Soil! Bring in soil samples for lead analysis*.
- Our Summer Research Institute students will be on hand to talk about their research.

Can't make it? Send us your soil!

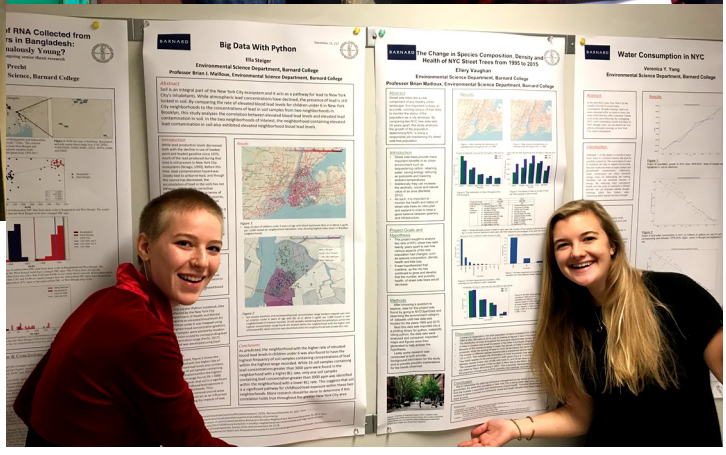


Mail us half a sandwich baggy worth of your back yard soil for lead analysis*. Please include a self addressed envelope or an email address so that we can send back results. All results will be kept confidential.

Mailloux Soil Lab
Barnard College
Environmental Science
3009 Broadway
New York, NY 10027

***Tips for collecting a good sample: Select a one square foot area to sample. remove any debris from the surface (woodchips, leaves etc) and collect the top layer of soil.**

Photos from around the Department



Top Left: Students in Waste Management performing a waste audit, Top Right: Students in Environmental Measurements on the Sea Wolf, Bottom: Students presenting their final posters in Big Data with Python

From the Archives

Prof. W. Goodwin, at blackboard. Circa 1955

Do you have photos we can add to our collection?
Email them to LRaucher@barnard.edu

If you are interested in directly supporting our students' research projects please contact Gary Carskaddan in the Development Office at gcarskad@barnard.edu or by calling 212-870-2573.