Environmental Science, BC
Earth & Environmental Science, CU
Ecology, Evolution &
Environmental Biology, CU

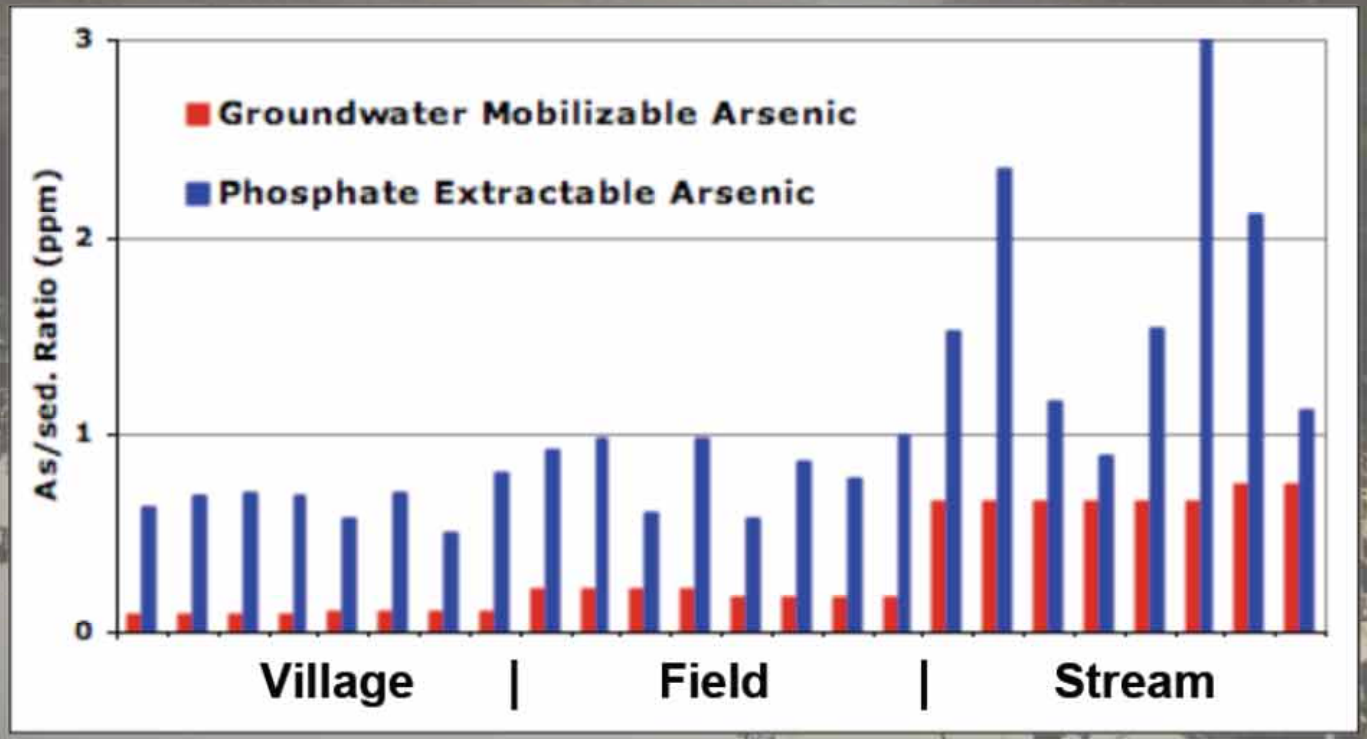
2011 Senior Thesis Poster Session

Thursday, April 21

4:30-5:00 pm 1-Minute Presentations
5:00-6:30 pm Presentations and Reception
Event Oval, LL100, Diana Center, Barnard College

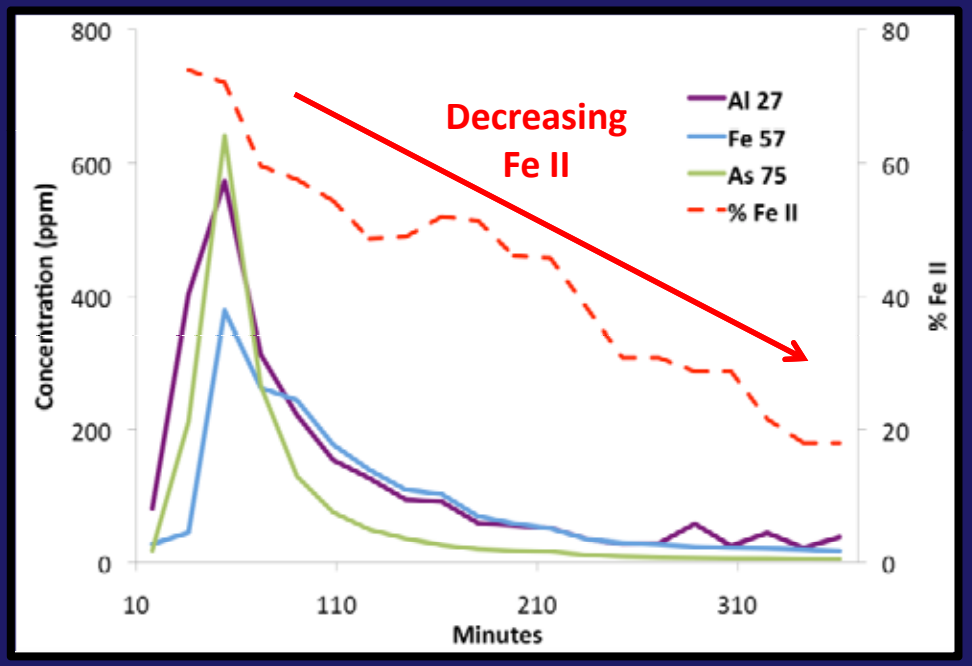
A Comparison of Phosphate Extractable Arsenic and Total Mobilizable Arsenic in the Sediments of Bangladesh

Stephen Barten, DEES, Columbia University
Ivan Mihajlov, PhD candidate, DEES, Columbia University
Dr. Martin Stute, Department of Environmental Sciences, Barnard College and LDEO



The Controls on As, Fe, and Al Retention in Contaminated Soils Treated with Oxalic Acid

Hannah Perls
Columbia College, Department of Earth and Environmental Science



Dr. Steven Chillrud, Lamont Doherty Earth Observatory
Dr. Brian Mailloux, Barnard Department of Environmental Science

Controls on Bacterial Concentrations in Sediment Grab Samples from the Hudson River Estuary

By Janelle Batta[1]
Mentors: Timothy Kenna[2], Frank Nitsche[2], Brian Mailloux[1]
(1) Barnard College Department of Environmental Science
(2) Lamont-Doherty Earth Observatory, Columbia University

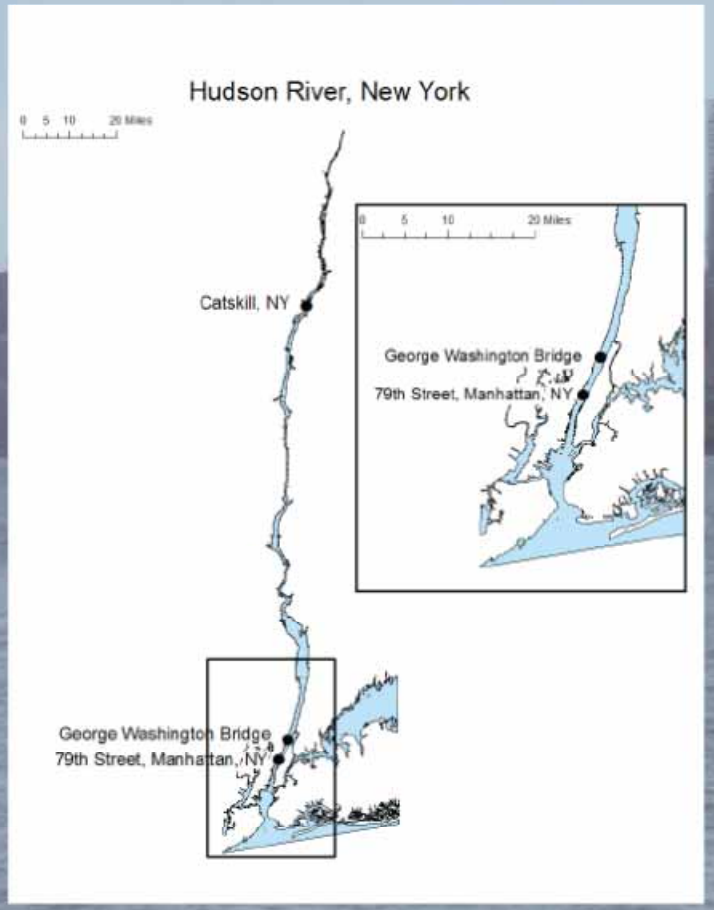
Lamont-Doherty Earth Observatory
Columbia University | Earth Institute

Columbia University

Question:

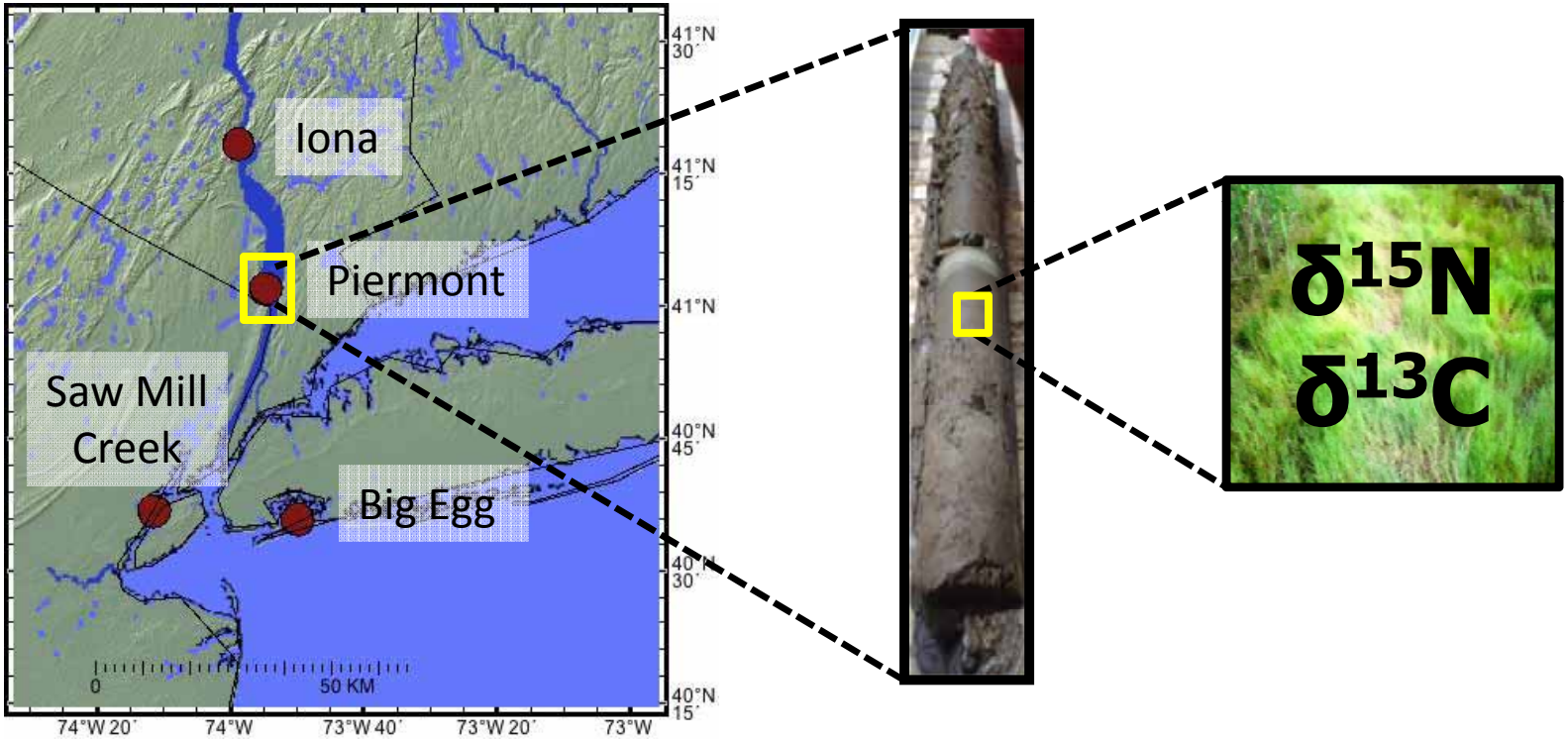
What determines survival and distribution of fecal bacteria in Hudson River sediments?

Sample Sites:



CARBON AND NITROGEN STABLE ISOTOPES IN THE HUDSON RIVER MARSHES, NY:

IMPLICATIONS FOR HUMAN ACTIVITY AND ECOSYSTEM CHANGE

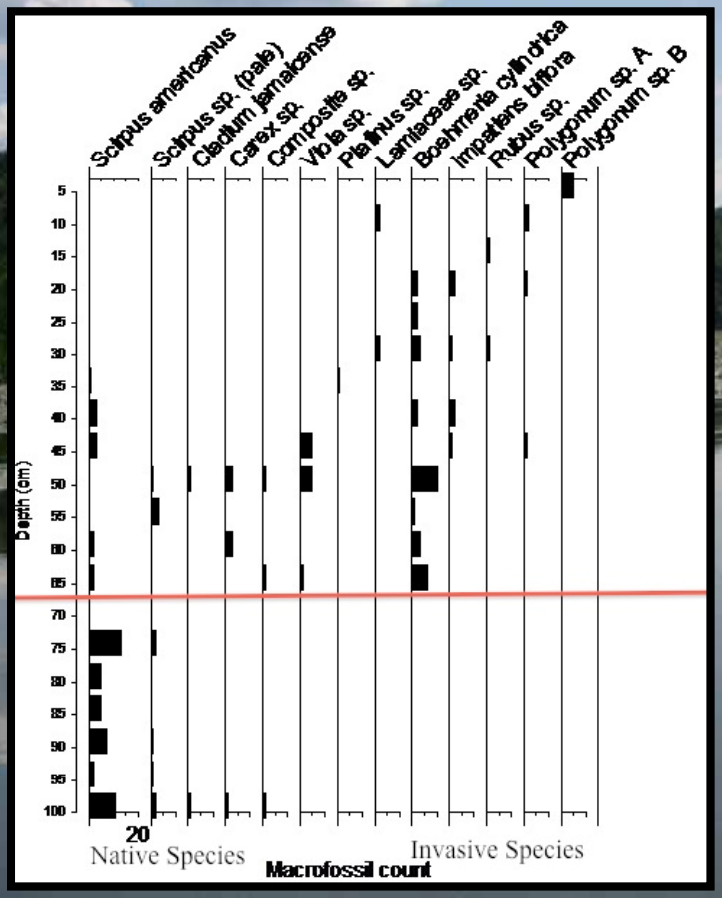


Presented by: **Khoi Nguyen**, *Columbia University*

Mentor: **Dorothy Peteet**, *Lamont Doherty Earth Observatory*

Wetland macrofossil and geochemical evidence for environmental change during the late Holocene from Constitution Marsh, Cold Spring, NY

Sriya Sundaresan, Department of Earth and Environmental Sciences
Dorothy Peteet, Lamont-Doherty Earth Observatory

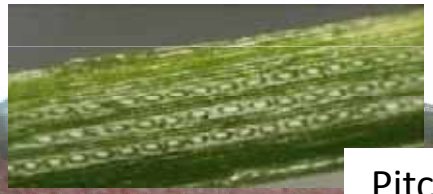


Research Questions

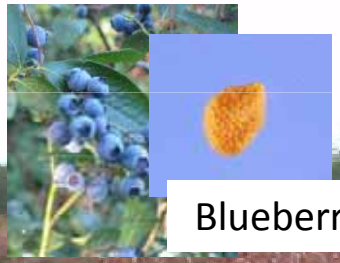
What is the environmental history of Constitution Marsh?

What were the effects of human impact on the marsh?

Plant Macrofossil Evidence of the Climate History of No Bottom Pond, Nantucket



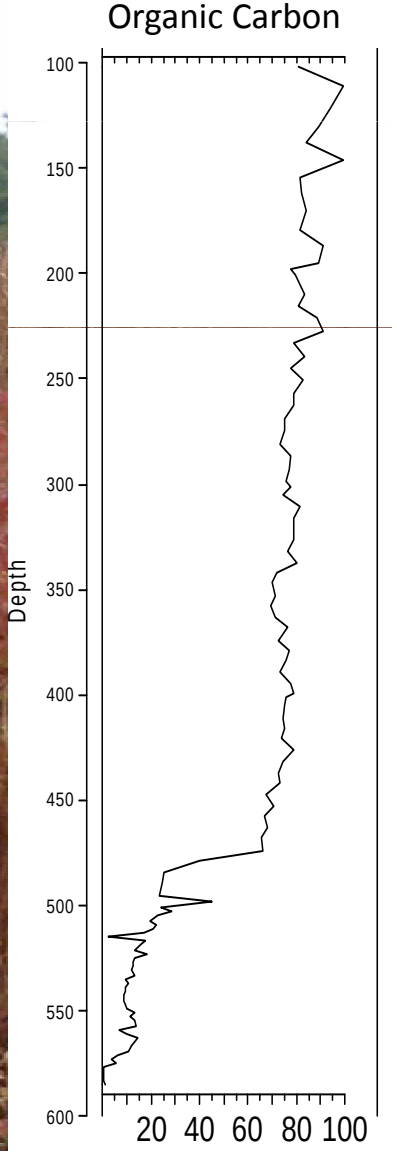
Pitch Pine



Blueberry

Water lily

Water shield

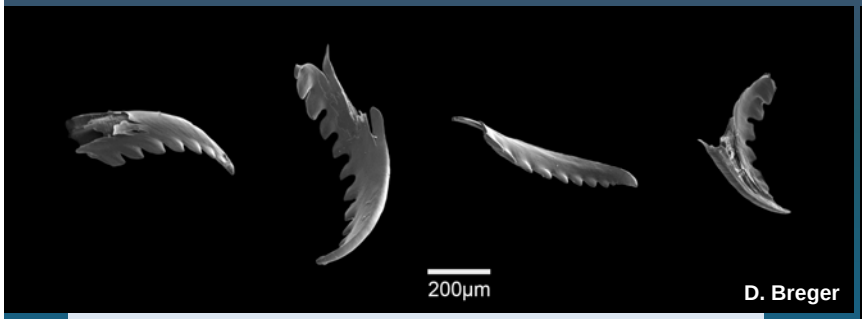


Kathrin Sears, DEES, Columbia University
Dr. Dorothy Peteet, LDEO, DEES, Columbia University, NASA GISS

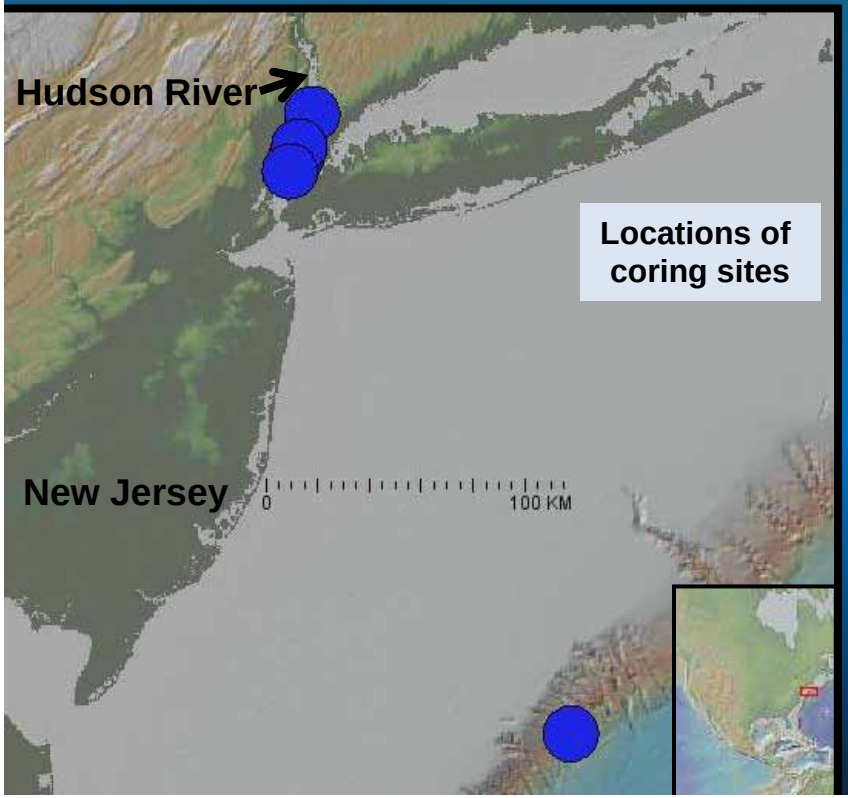
A Novel Technique:

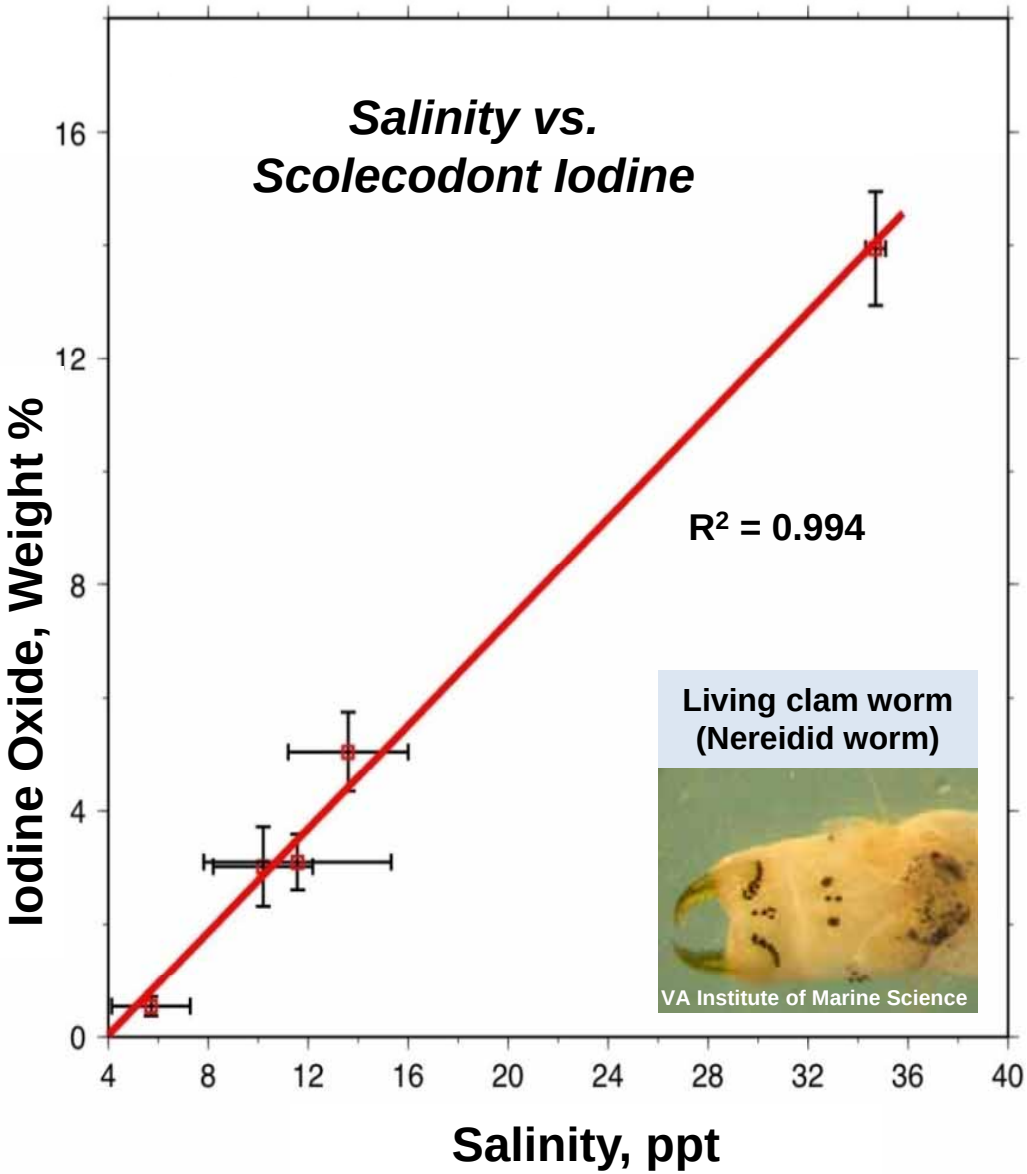
Using Scolecodont Compositions as a Tracer for Paleosalinity in the Hudson River

Lisa Weber, Department of Earth and Environmental Sciences, Columbia University
Research Mentor: Dr. Dallas Abbott, Lamont-Doherty Earth Observatory of Columbia University



Photomicrograph of scolecodonts
(jaws of polychaete annelids)

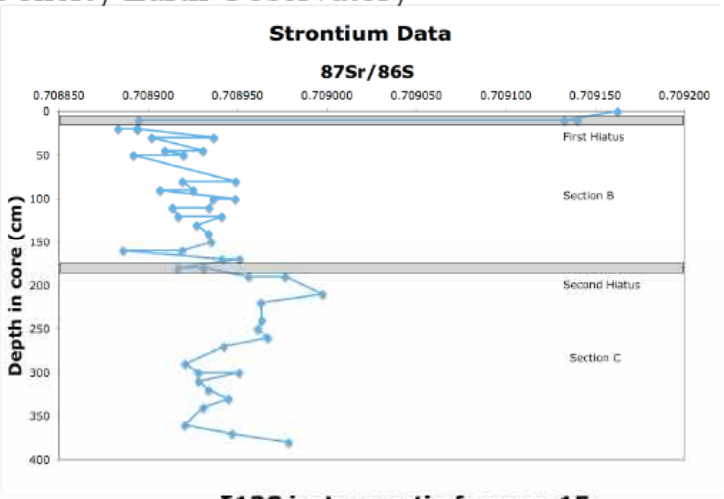




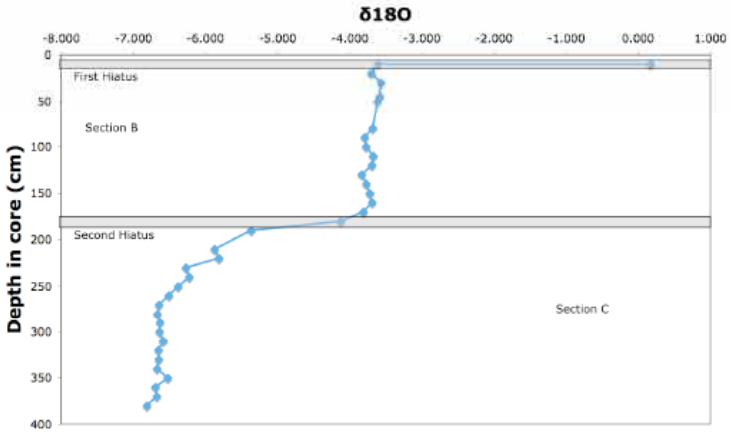
Black Sea Low Stands During the Holocene and Pleistocene and Reconnection with the Global Ocean.

Daniel Cohen, Columbia University Department of Earth and Environmental Science

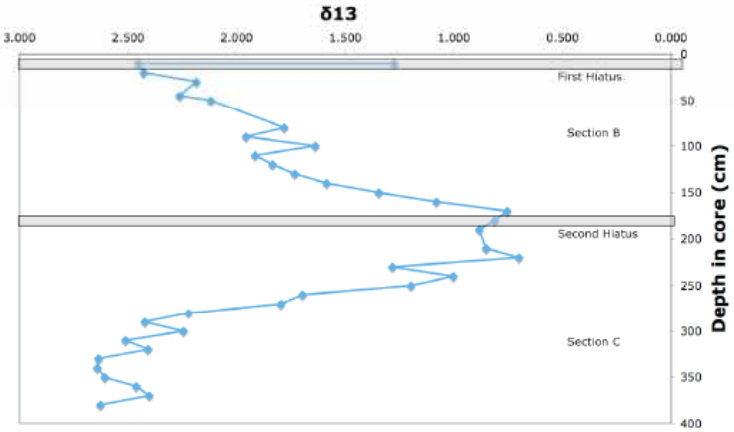
Dr. William Ryan, Lamont Doherty Earth Observatory



δ18O isotope ratios for core 15



δ13C isotope ratio for core 15

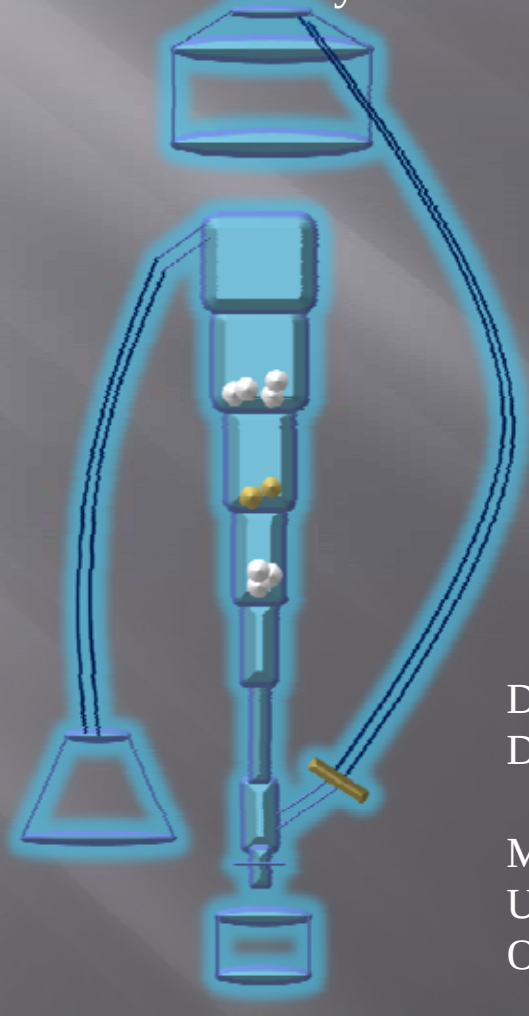


Improved Separation of Fish Teeth and Debris for Neodymium Isotope Measurements in Marine Sedimentary Cores

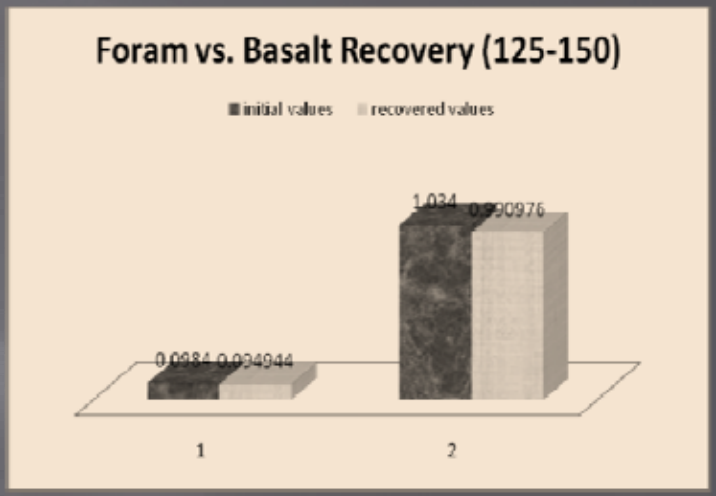
Sample Pre-Elutriator Run

Sample Post-Elutriator Run

Elutriator System



Important Results



Daniel Myers, Environmental Science Department, Columbia University

Mentor: Sidney Hemming, Columbia University and Lamont Doherty Earth Observatory

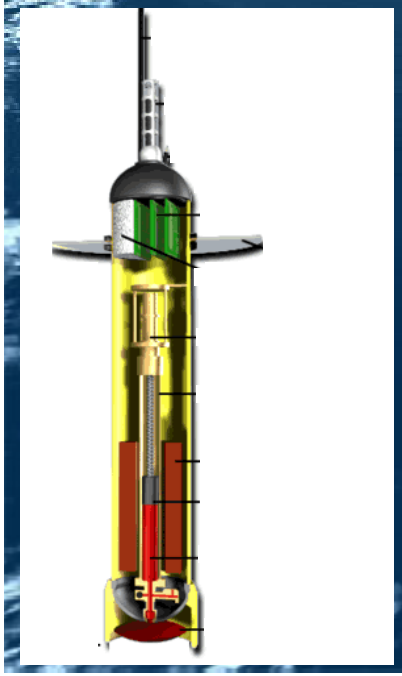
Salinity and Temperature Anomalies in the Subtropical North Atlantic

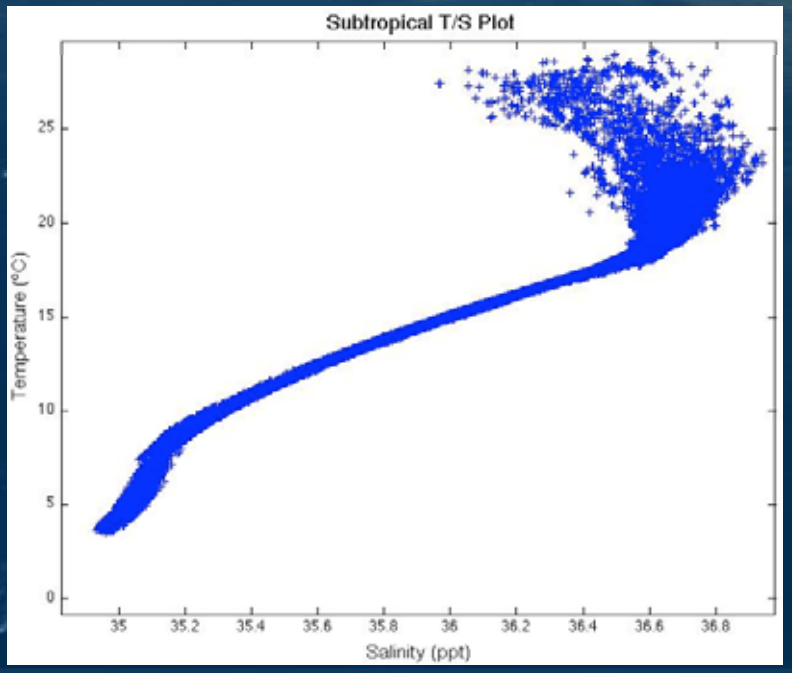
Ted Kalaidjian

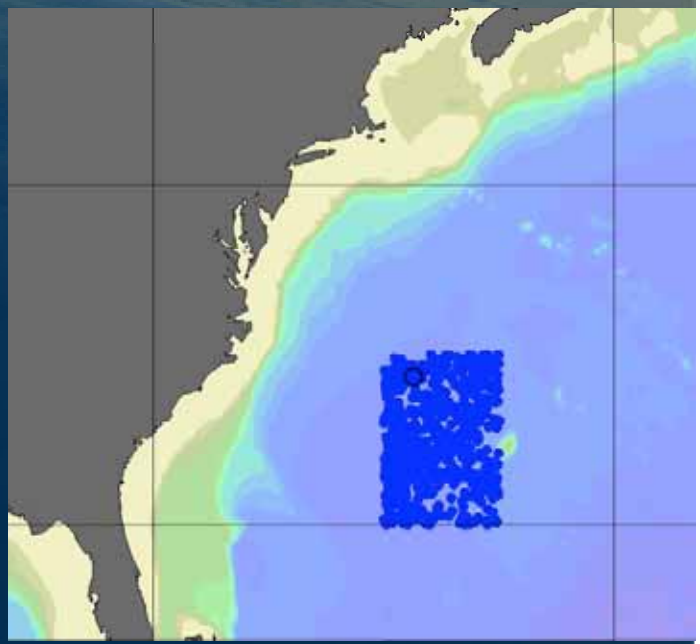
DEES, Columbia University

Dr. Arnold Gordon

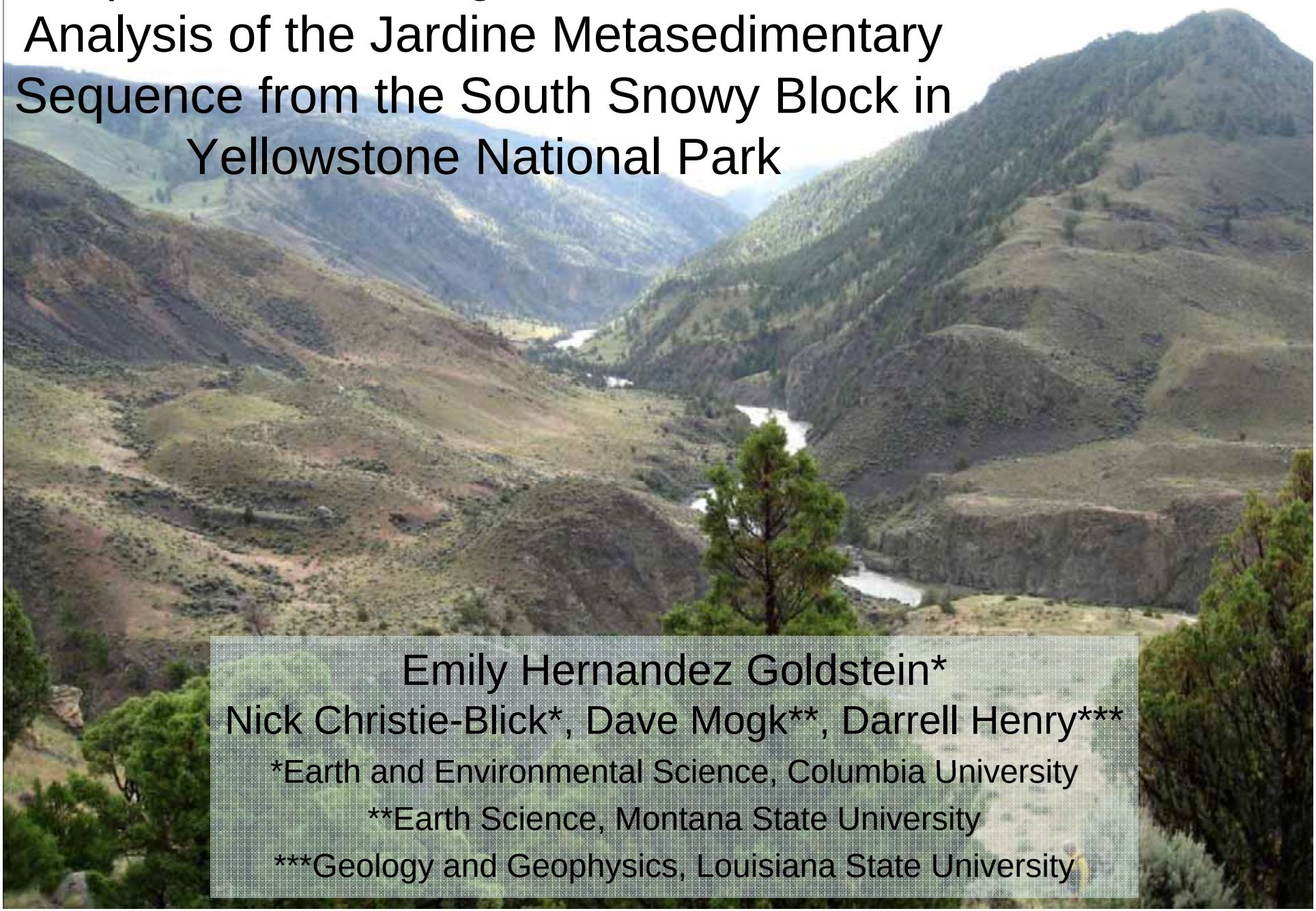
Lamont Doherty Earth Observatory







Depositional Setting and Detrital Zircon Analysis of the Jardine Metasedimentary Sequence from the South Snowy Block in Yellowstone National Park

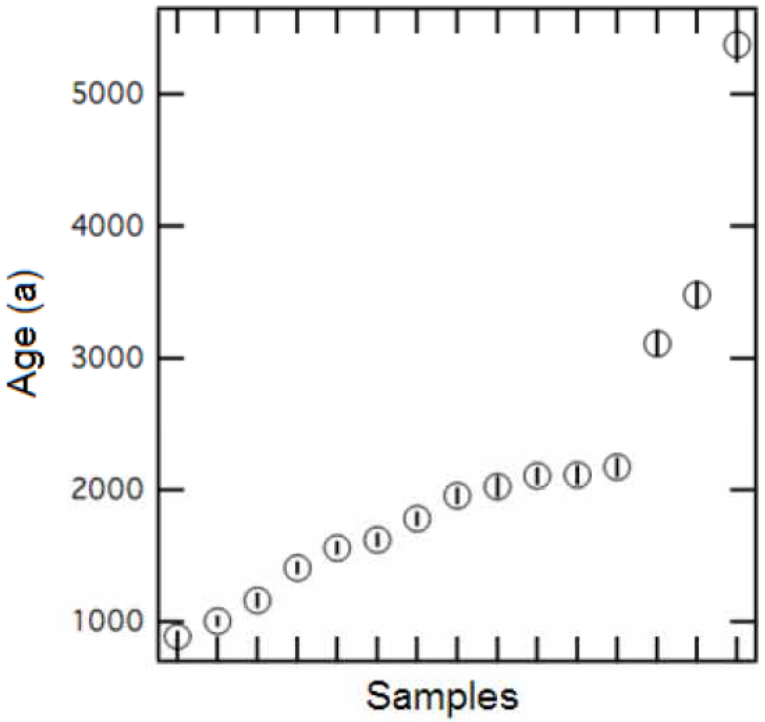


Emily Hernandez Goldstein*
Nick Christie-Blick*, Dave Mogk**, Darrell Henry***
*Earth and Environmental Science, Columbia University
**Earth Science, Montana State University
***Geology and Geophysics, Louisiana State University

Surface exposure dating of phreatic eruptions at Ubehebe Crater, Death Valley, California

Peri Sasnett, Brent Goehring, Nick Christie-Blick, Joerg Schaefer, Mark Anders

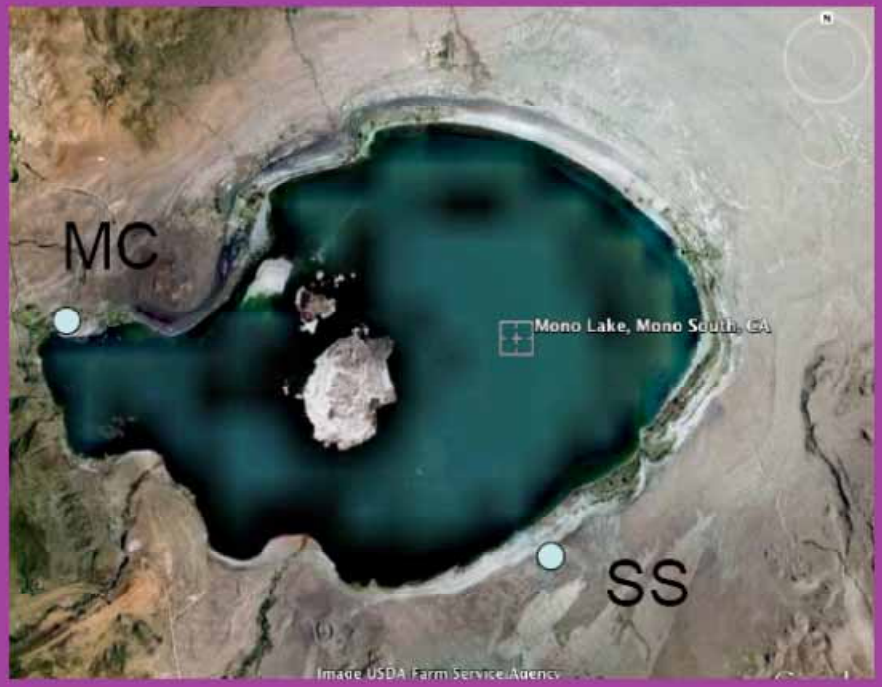
- **Phreatic crater field—link to climate?**
- **^{10}Be surface exposure dating of ejected cobbles**
- **2.1-0.8 ka: formation of Ubehebe Crater**
- **3 older eruptions from neighboring craters**



- **No apparent link to climate**
- **Water likely sourced from an aquifer beneath the crater field**

Characterizing Sediments that Record the Mono Lake Excursion in the Mono Basin, California

Emily Spokowski, Barnard College
Mentor: Joseph Liddicoat, Barnard College



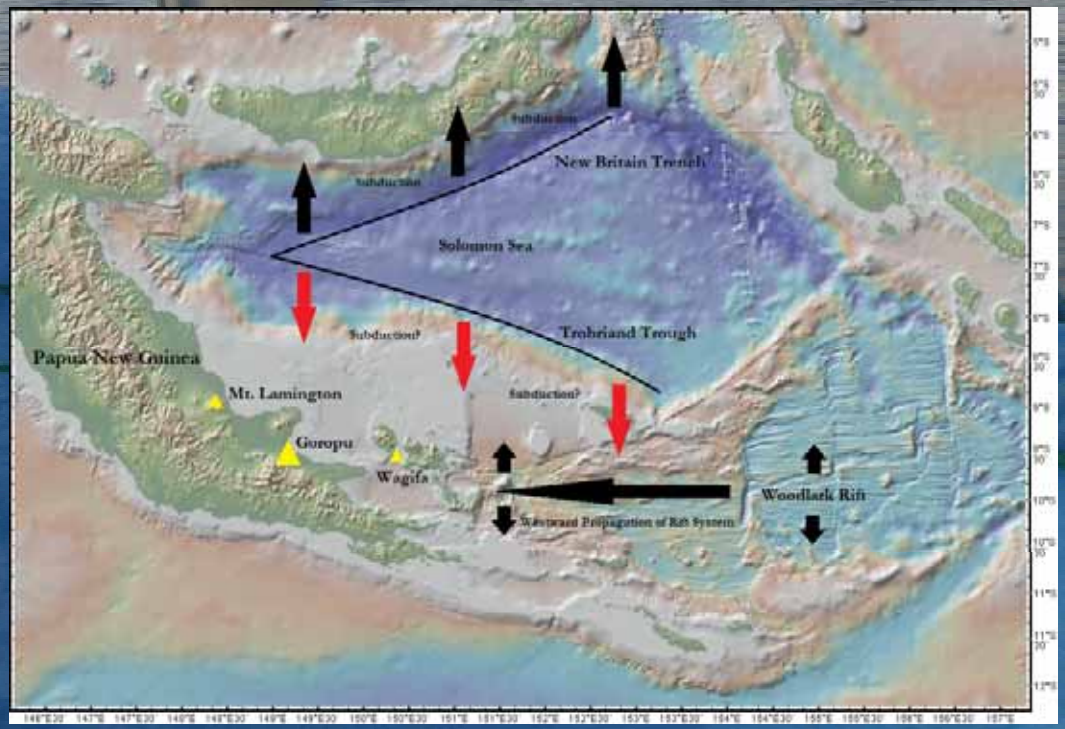
MS1

The Goropu Volcanic Center in eastern Papua New Guinea: new evidence for active subduction at the Trobriand Trough?

Timothy G. Greene, DEES
Terry Plank, Philipp Ruprecht, LDEO

-Subduction-like features: 2-8 wt% H_2O, abundant hydrous minerals

-Non subduction-like features: melt temperature calculated at 1050 °C (vs. ~1200 °C for other arc systems)

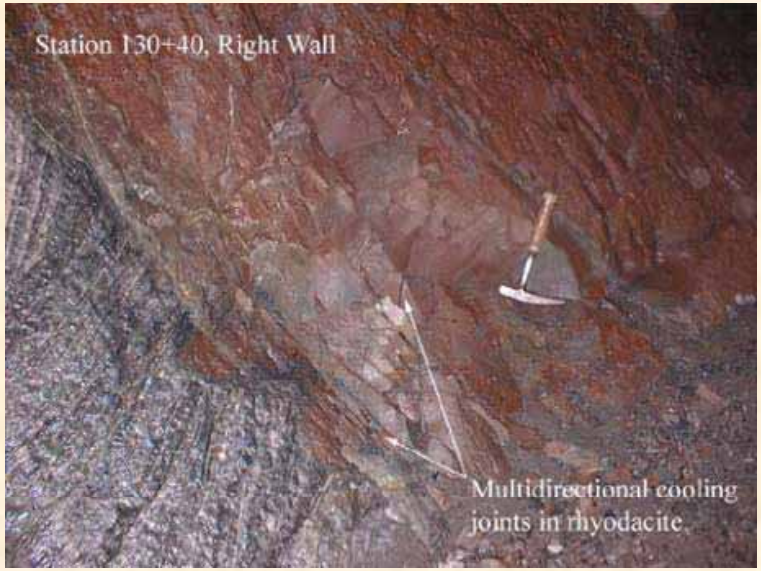


Slide 15

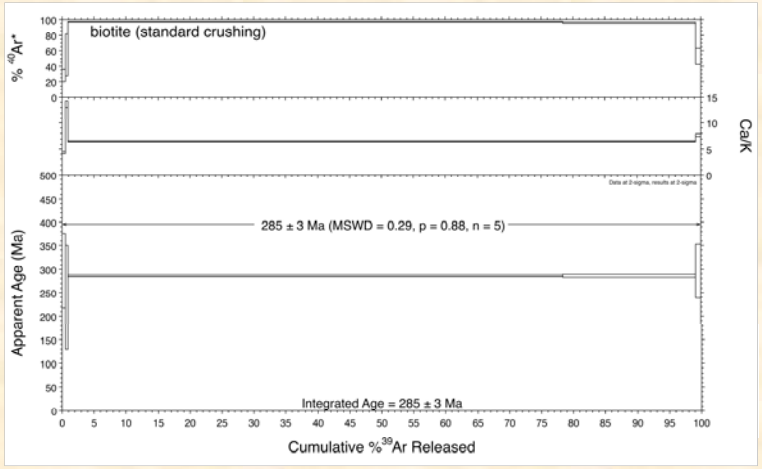
MS1 I changed that font to something that is easier to read. Background image fine and so is teh photograph
Martin Stute, 4/15/2011

Timing of the End of Appalachian Mountain Building in New York City: Ar-Ar Dating of Biotite and Hornblende from an Undeformed Dike in the Queens Water Tunnel

Brendan Hannon: Columbia University, Department of Earth and Environmental Science
Sidney Hemming: Columbia University, Lamont Doherty Earth Observatory



- *What can the age of a rhyodacite buried beneath New York City tell us about the history of the Appalachian Mountains?*
- *How does this previously undiscovered formation fit into the geologic history of New York?*

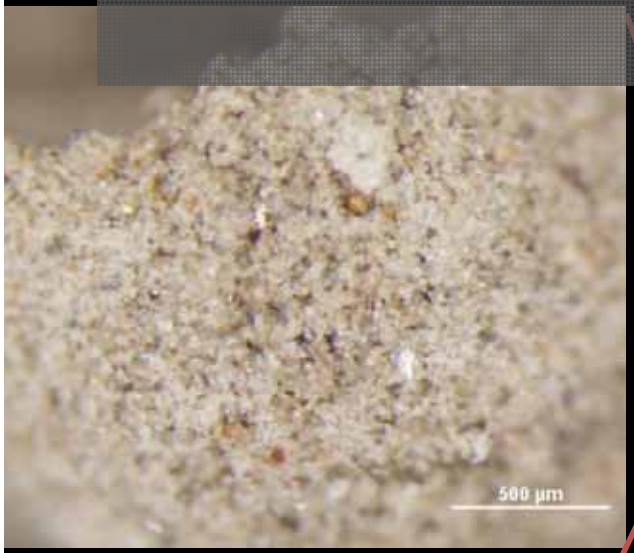


Evidence for the Missoula Floods in deep-sea sediments off Vancouver Island using K/Ar dates and geochemistry

Joel Gombiner, Sidney Hemming, and Ingrid Hendy

The Missoula Floods left their mark on land

What about deep-sea sediments?



Early season respiration in *Betula nana nana* and *Eriophorium vaginatum*, two important tundra plant species

Danielle Bitterman, Ecology, Evolution, and Environmental Biology
Mentor: Kevin Griffin, Earth and Environmental Sciences

Eriophorum vaginatum

Betula nana nana

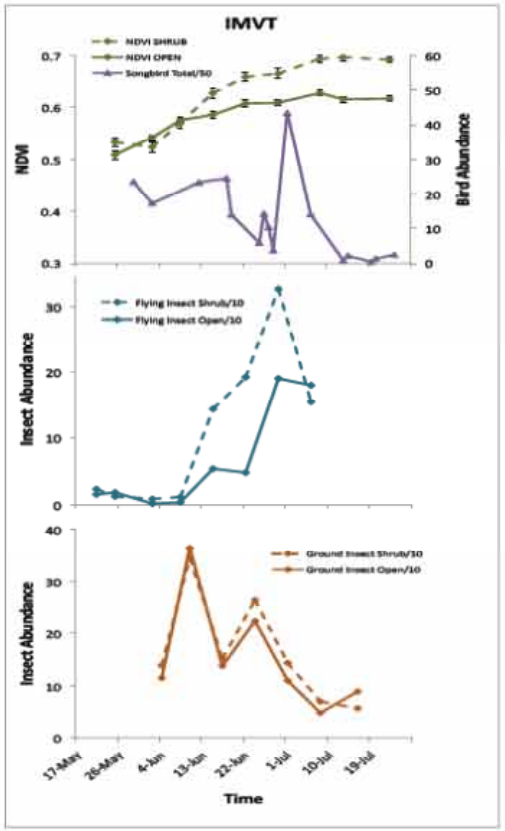
Does temperature change alter the amount of CO_2 these tundra species release into the atmosphere?
Maybe not!

Seasonal Change in Arctic Vegetation Types and Associated Effects on Insect and Bird Communities

Victoria Diaz-Bonilla

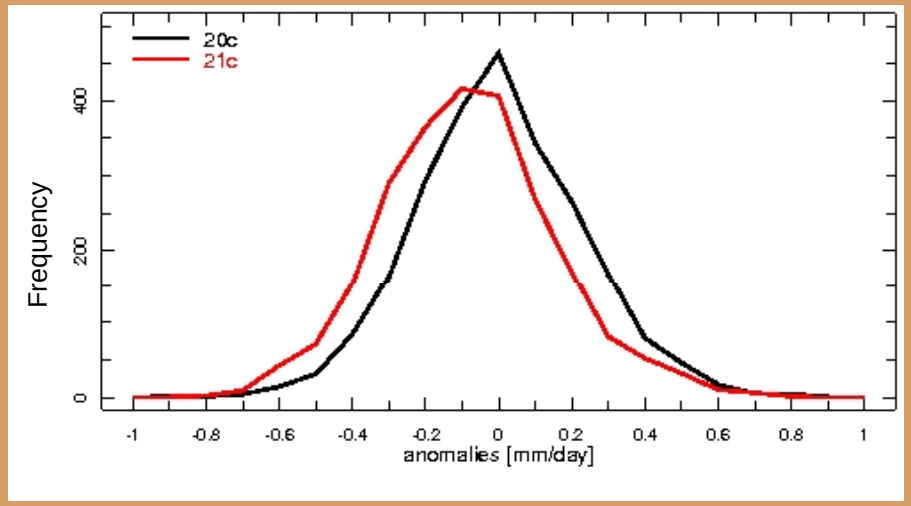
Mentor: Natalie Boelman; Advisor: Matt Palmer

- Shrub vs. tussock ("open") tundra
  - NDVI: shrub > open
  - Ground insects: shrub ≈ open
  - Flying insects: shrub > open
- Future implications for migratory songbird species



The effects of global warming on seasonal-to-interannual precipitation anomalies in southwestern North America

Laura Vogel
Research Mentor: Richard Seager
Seminar Adviser: Satyajit Bose

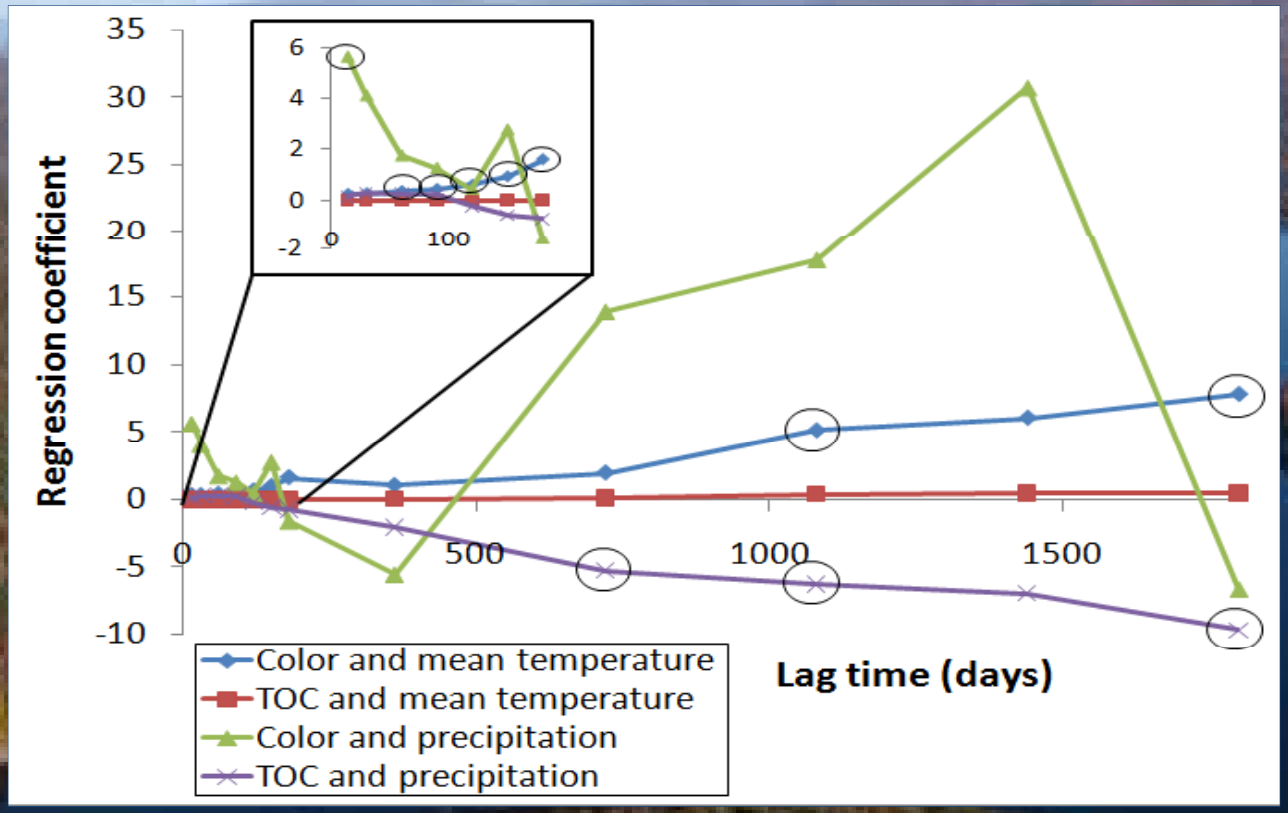


- Addressing the popular idea that greenhouse warming will lead to 'more severe and frequent' droughts
- Prior work establishes a mean shift to a more arid climate
- IPCC global climate model projections of 20th and 21st c. precipitation and components of atmospheric circulation
- Important for water availability in the Southwest

Effect of Climate Change on Natural Organic Matter Level in the Cannonsville and Pepacton Reservoirs, NY

Orly Stampfer - Columbia College, Columbia University

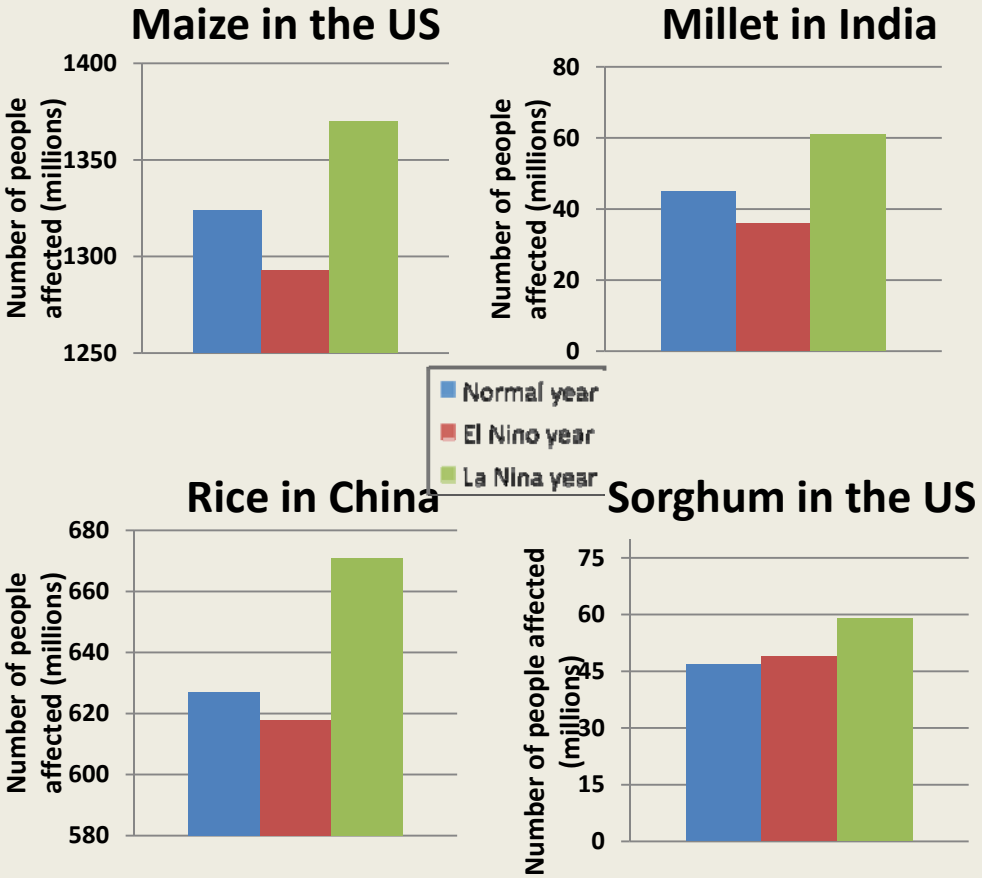
William Becker - SEAS, Columbia University and Hazen and Sawyer

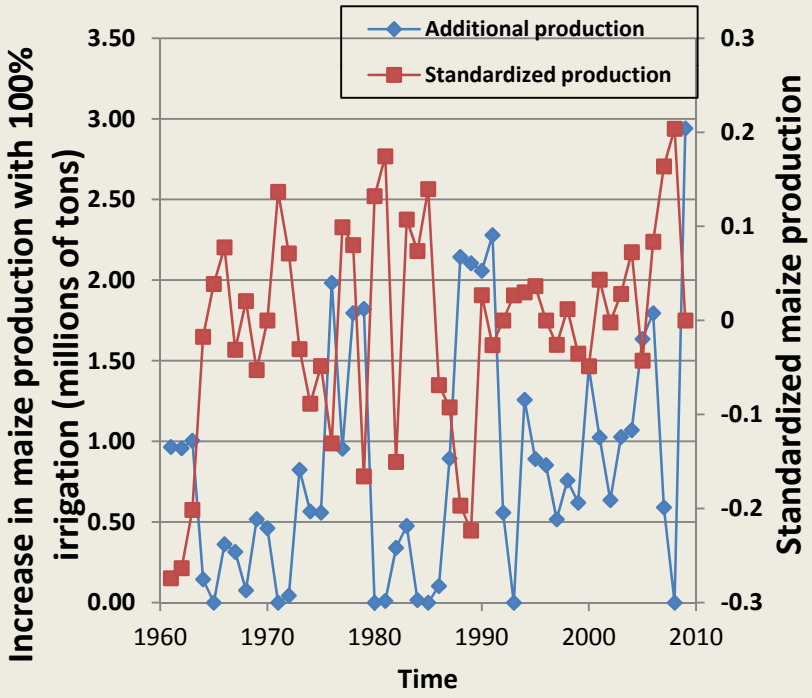


Pepacton Cabins

Cereal production in the world's top producing countries: effects of extreme precipitation conditions and buffering through irrigation

Angela Wong, Department of Environmental Science, Barnard College
Mentor: Dr. Paul Block, International Research Institute for Climate and Society (IRI)





Perceiving Climate Change & Variability: Water Resource Management and Community Adaptation in the Agricultural Sector of the Elqui River Valley, Chile

Allyza Lustig, Environmental Policy,
Department of Environmental Science
Barnard College

Sabine Marx, *CRED, Columbia University*
Ben Orlove, *CRED, Columbia University*
Paul Block, *IRI, Columbia University*

The Remittance Phenomenon: Studying the Effects of **Remittances** on Economic Development after **Natural Disasters**

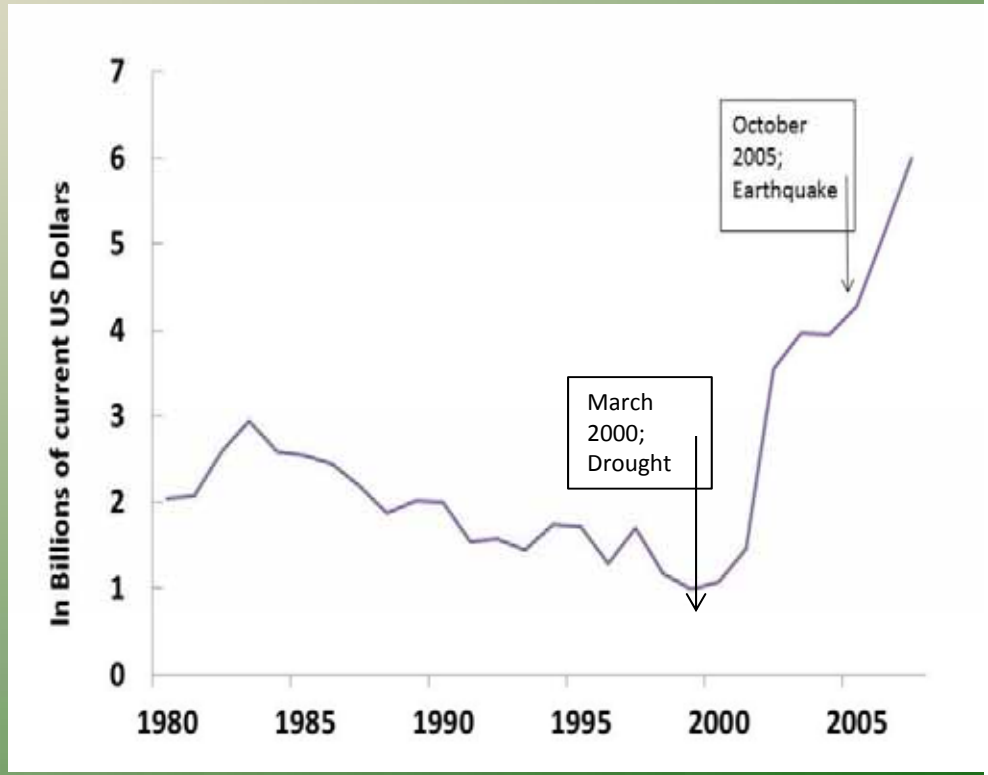
By: Danni Pi

Mentors: John Mutter & Satyajit Bose **Advisor:** Martin Stute

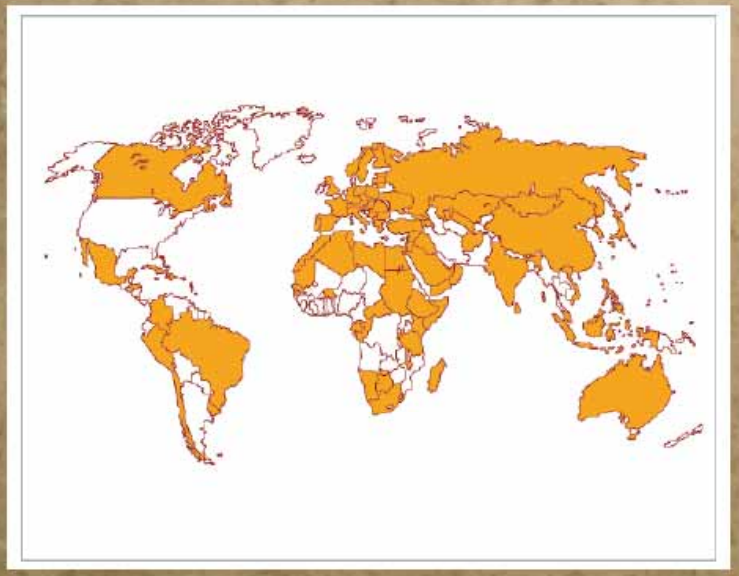
Background:

- Natural disasters result in **economic** and **human** loss; countries need substantial funding to rebuild
- **Remittances** surpassed Foreign Direct Investments and Official Aid to become the **largest source** of external finance
- **Remittances** are inherently **direct** in nature

Results and Implications:



Education for Sustainable Development: how flexible goals prevent measurable outcomes



Source:Review of Contexts and Structures for Education for Sustainable Development (Wals, 2009)

Source:Educating for a Sustainable Future: A National Environmental Statement for Australian Schools (Cloud, 2005)

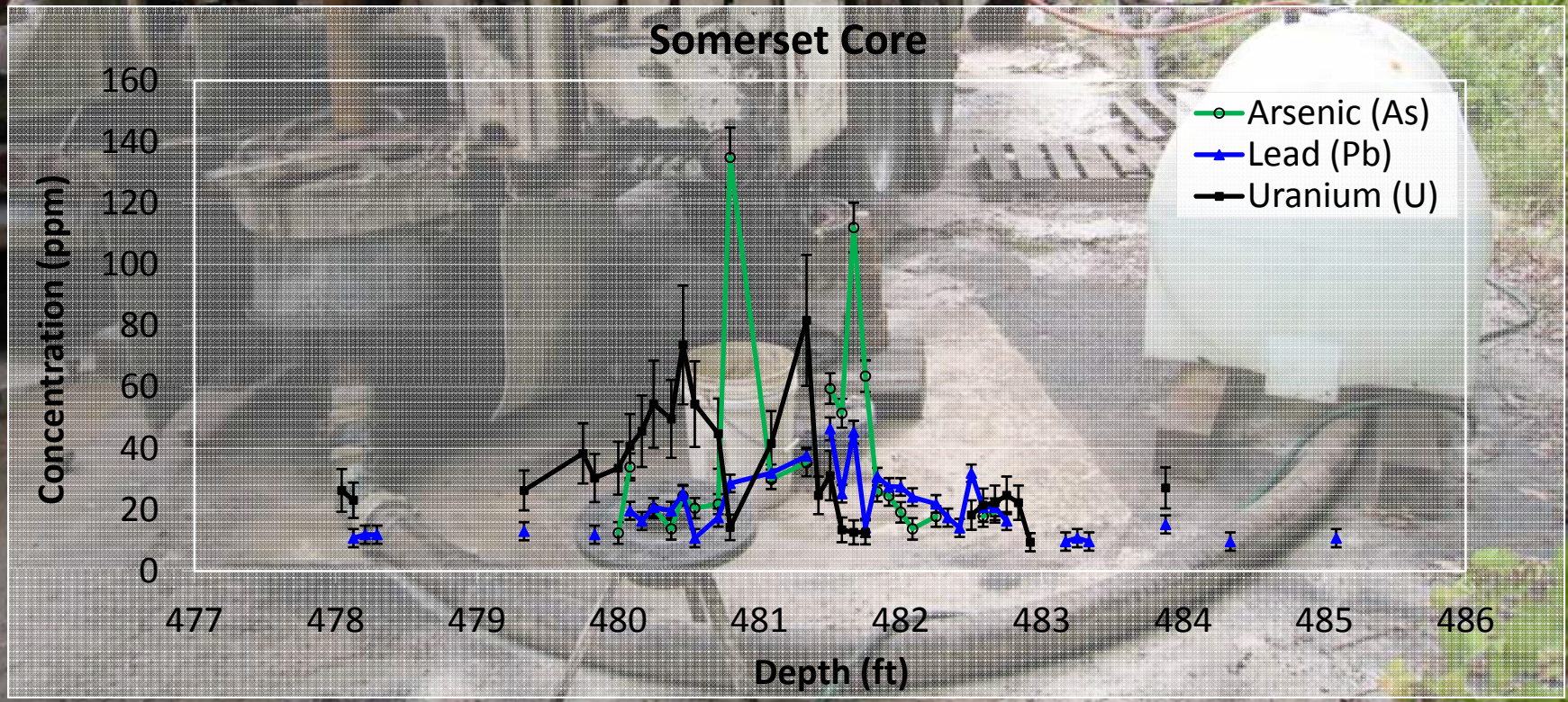
Claire Fram

Department of Environmental Science, Barnard College

Thesis Advisor: Professor Satyajit Bose, Columbia Earth Institute

CHEMISTRY OF NEWARK BASIN SEDIMENTS IN CONTEXT OF VULNERABILITY TO A CO_2 LEAK

Ai-Lin Shao, Barnard College
Martin Stute, Barnard College, Lamont Doherty



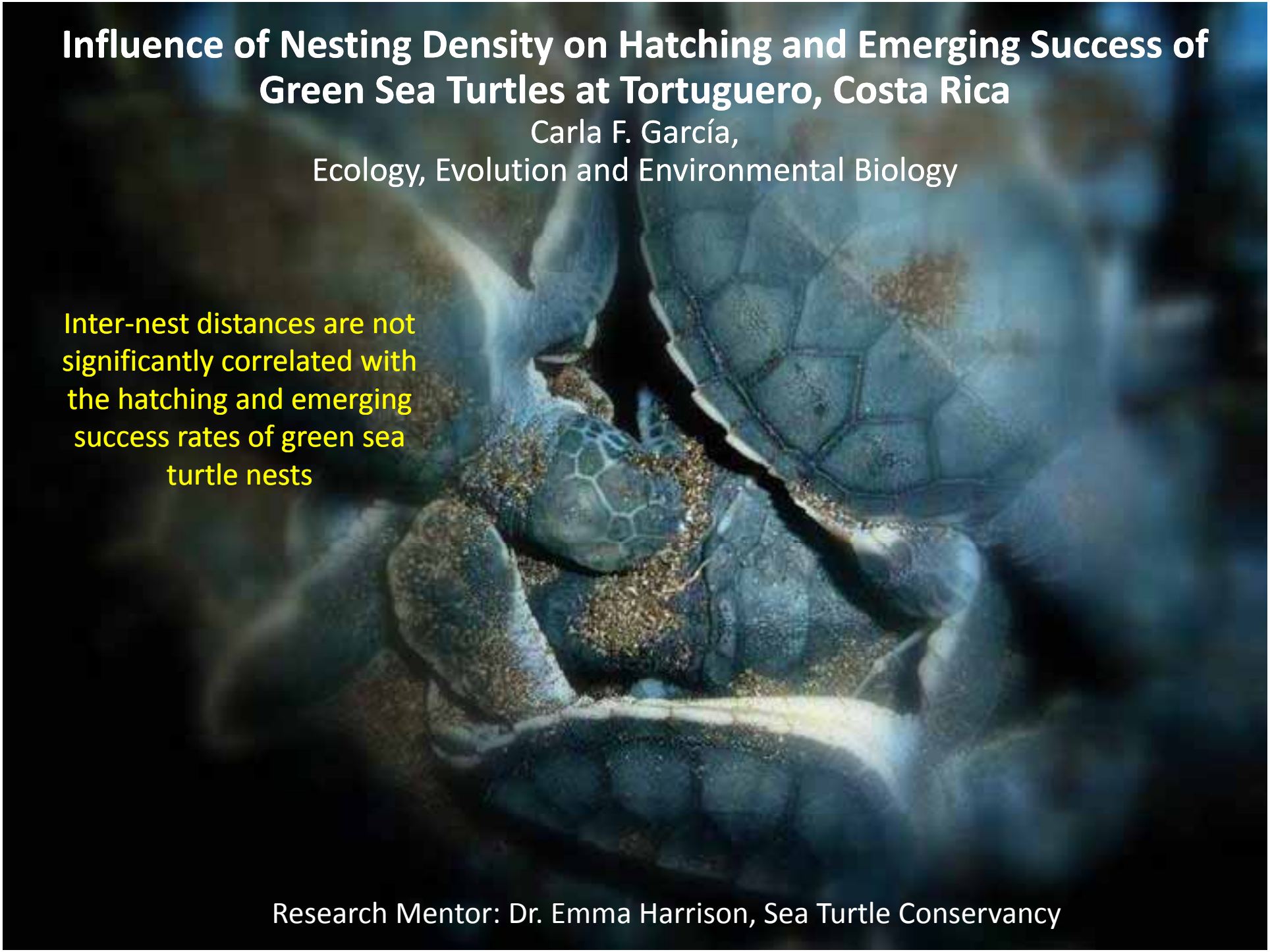
The Effects of Hardwood Biochar on Growing Medium Quality, Lettuce Productivity and Carbon Sequestration

A Greenhouse Study at the Stone Barns Center for Food and Agriculture

Gelseigh Karl-Cannon, Columbia University
Dr. Cynthia Rosenzweig[1,2] and Dr. Angela Kong[1]
NASA Goddard Institute for Space Studies[1] Columbia University Earth Institute[2]

Influence of Nesting Density on Hatching and Emerging Success of Green Sea Turtles at Tortuguero, Costa Rica

Carla F. García,
Ecology, Evolution and Environmental Biology



Inter-nest distances are not significantly correlated with the hatching and emerging success rates of green sea turtle nests

Research Mentor: Dr. Emma Harrison, Sea Turtle Conservancy

A long way from home:

Identifying the origins of loggerhead turtles by-caught by the Spanish fishing fleet

Stephen Gaughran, Columbia University

Mentor: Dr. Lluís Cardona, Universitat de Barcelona

Mechanisms for recognition of two socially dissimilar species of *Synalpheus* snapping shrimps

Jeremy Law, E3B, Columbia University
Research Mentor: **Dr. Dustin Rubenstein**, E3B

Influence of Cestode Parasites on the Spatial Distribution of *A. parthenogenetica* Brine Shrimp in Wetlands

Cristina Matesanz, Ecology, Evolution and Environmental Biology, Columbia University

Mentor: Dr. Andy Green, Doñana Biological Station CSIC, Seville, Spain

Flamingolepis liguloides

Castration

Gigantism

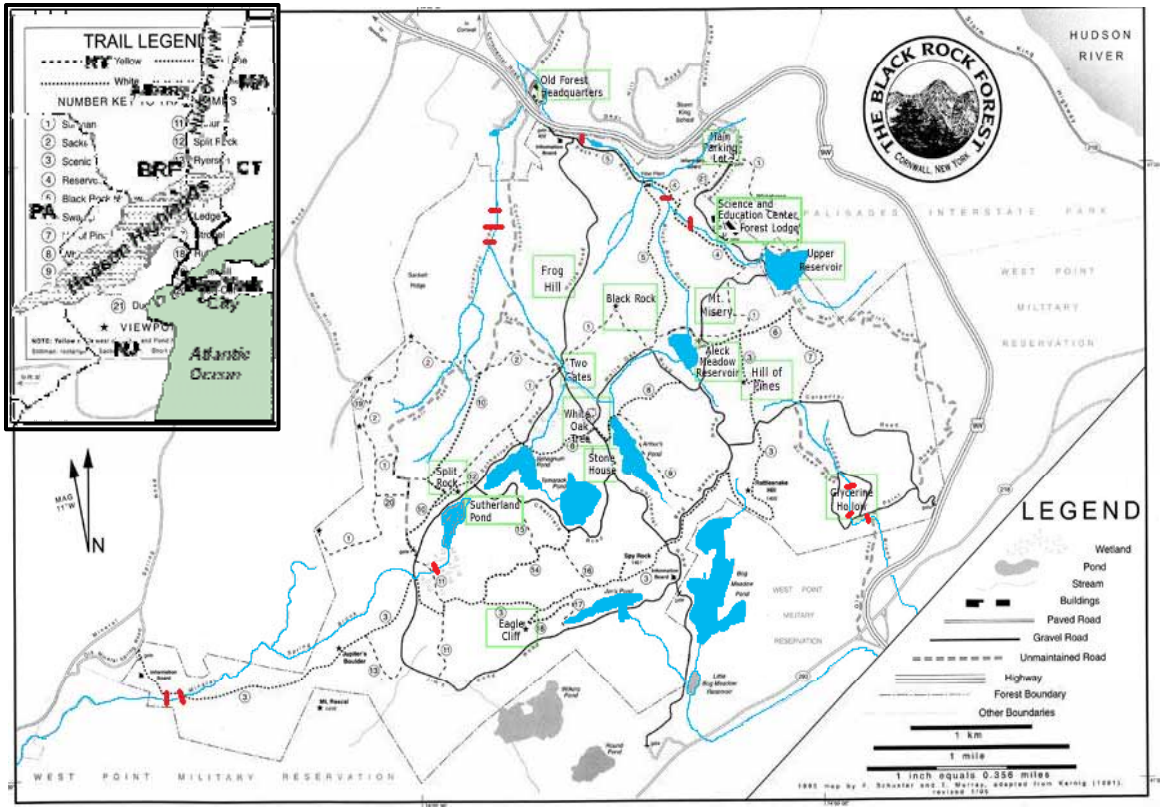
Reddish Color

Surface Behavior

Artemia parthenogenetica

Site Suitability Analysis of Brook Trout in Black Rock Forest

Astrika Wilhelm, Barnard College
William Schuster, LMDO and Black Rock Forest Executive Director
John Brady, Black Rock Forest Manager



Location (Cascade Brook)	0-40mm	>40mm	Total
CaB1	1	25	26
CaB2	1	18	19

Changes in Social Behavior in Female Blue Monkeys (*Cercopithecus mitis stuhlmanni)* Following Major Life Events

Do female blue monkeys seek out more social interactions during times of stress, like other social primates seem to do?

Potentially.

Eliza McGovern, Barnard College

Mentor: Dr. Marina Cords, Columbia E3B

Monitoring the Effects of a Traffic Related Air Pollutants on Semi-Volatile & Non-Volatile PAH levels in NYC

Patricia Rojas, Environmental Biology (E3B) Department, Columbia University
Research Mentor: **Kyung Hwa Jung, PhD.,** Division of Pulmonary, Allergy and Critical Care Medicine
College of Physicians and Surgeons, Columbia University
Seminar Advisor: **Brian Mailloux,** Department of Environmental Science, Barnard College

Years of registered concentrations: 2005-2010

Particulate Matter ($PM_{2.5}$)

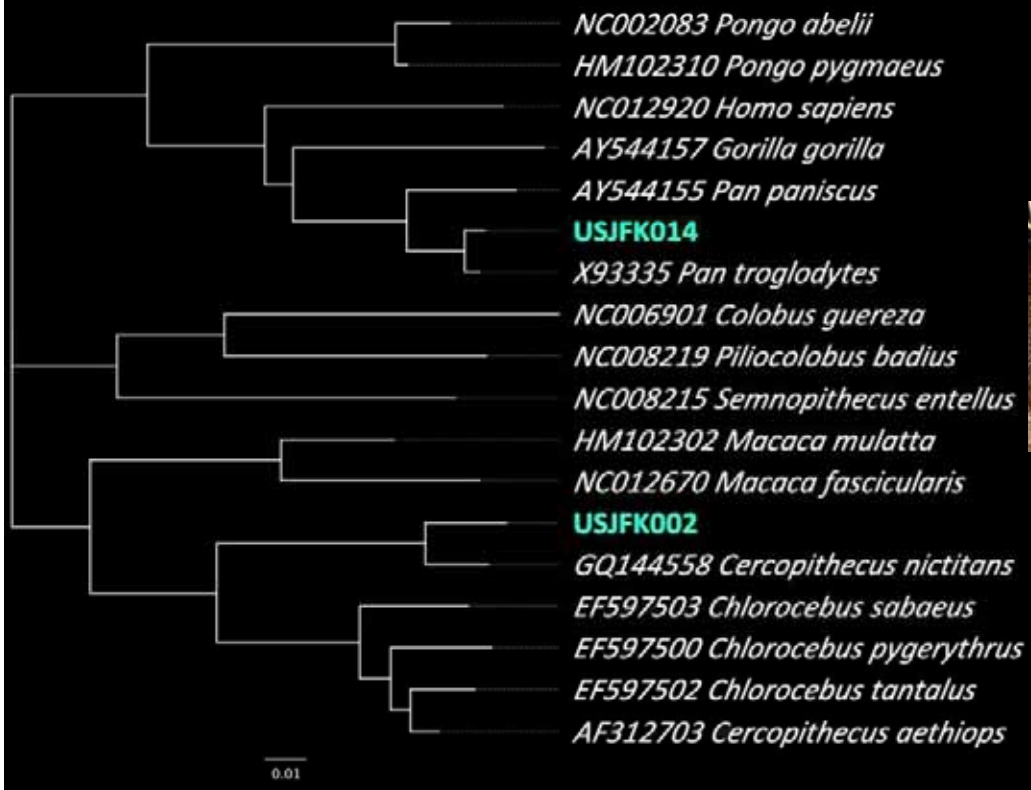
Semi-volatile & Non-volatile PAH's

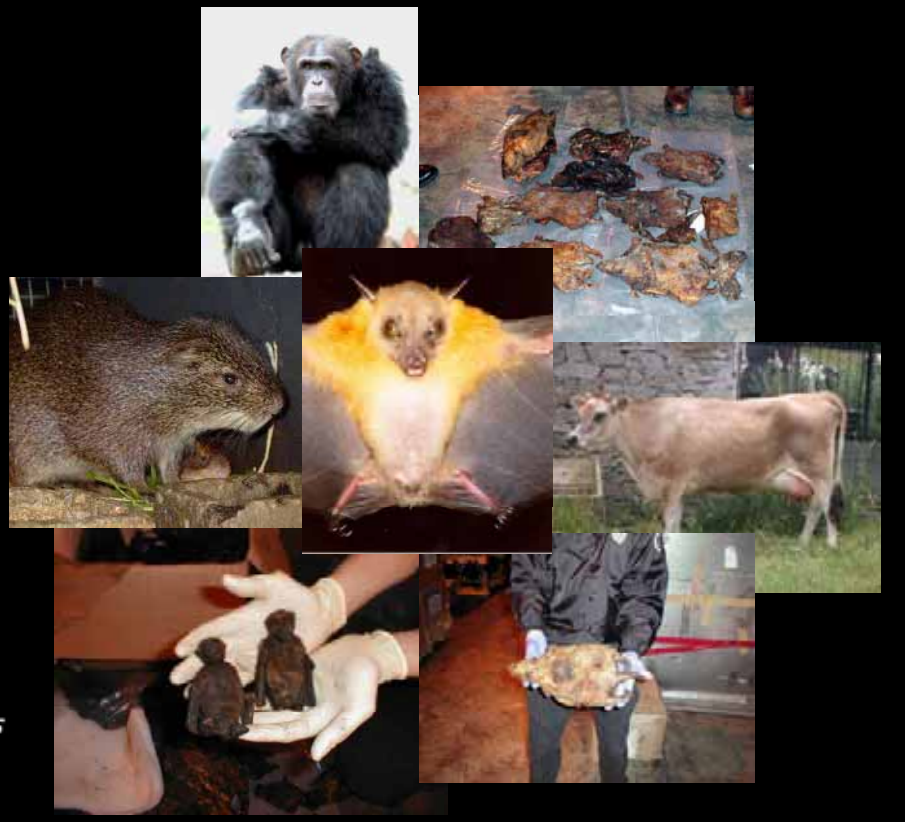
261 Homes monitored Indoor and Outdoor Levels during the heating & non-heating season in NYC

Results determined whether or not New York City complies with current Air Policies and Regulations

Using Molecular Techniques to Identify Bushmeat for Pathogen Surveillance

Margot Stuchin
Department of Ecology, Evolution, and Environmental Biology, Columbia University
Mentor: Sergios-Orestis Kolokotronis
Sackler Institute for Comparative Genomics, American Museum of Natural History





The Wild Meat Crisis: Identifying Mislabeled Species in New York City Markets with DNA Barcodes

Berenice Villegas-Ramirez, Department of Ecology, Evolution, and Environmental Biology, Columbia University

Research Mentor: Dr. George Amato, Sackler Institute for Comparative Genomics, American Museum of Natural History


Thanks!