

# Sharing Cutting-Edge Climate and Paleoclimate Research with Teachers and Students through Earth2Class

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## ● Abstract

How can research scientists investigating climate change and paleoclimatology connect with high school teachers and students to inform and excite them about cutting-edge discoveries?

One effective format has been the Earth2Class Workshops (E2C) at the Lamont-Doherty Earth Observatory of Columbia University.

- > same venue where scientific talks given, which is inspirational
- > easily understood descriptions of the scientific questions, logistics of the investigations, how measurements are made, how data are interpreted, and the importance of the research to Society
- > presentations not intended to be as polished or glossy as technical talks

Teachers and students

- > learn about science concepts that will not be in textbooks for decades
- > have opportunity to request clarification of "jargon" used by scientists
- > network with colleagues from area schools, reducing sense of isolation
- > share what they have learned with others, magnifying the impact of the talk

Each workshop includes

- > introductory slideshow to provide common knowledge and terminology
- > presentation by the scientist(s), sometimes with visit to their labs
- > "lunch with the scientist"
- > exploration of classroom-related activities

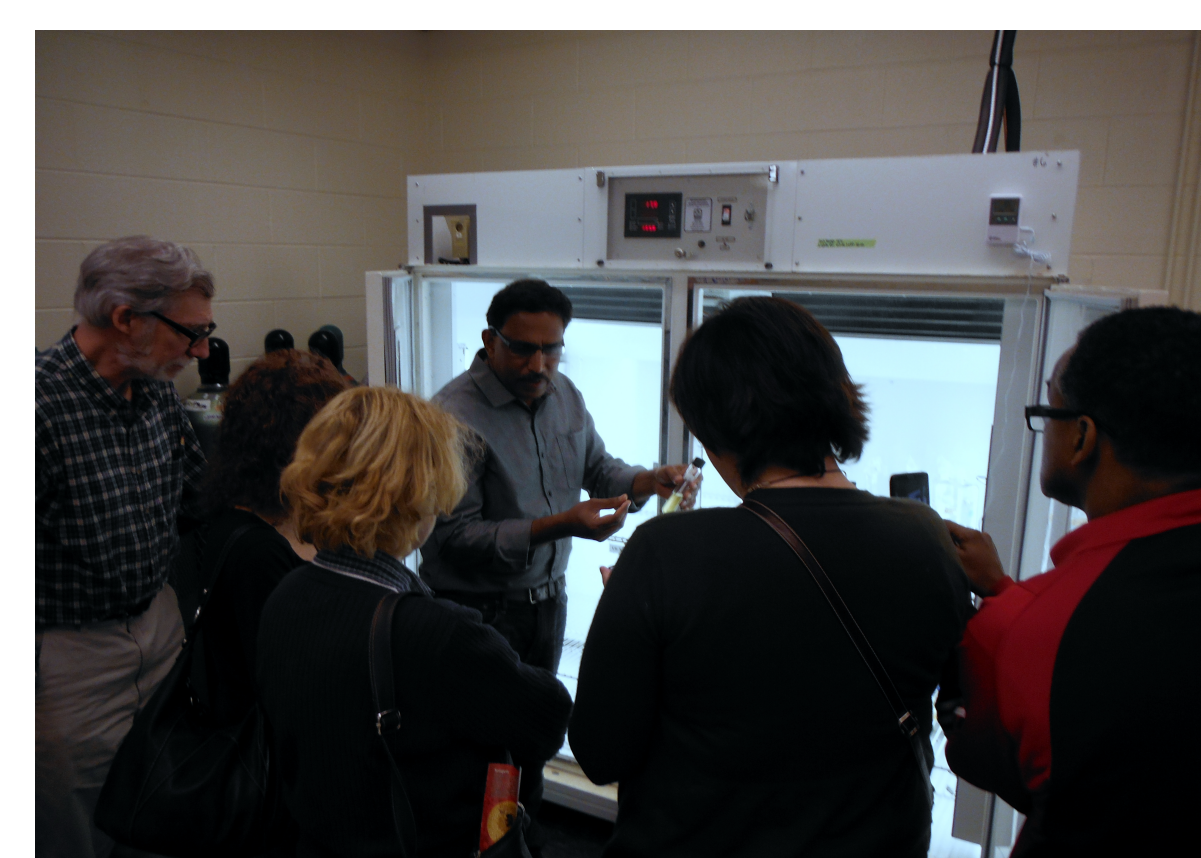
E2C Workshops serve as valuable models for presenting the NGSS vision for integrating Disciplinary Core Ideas, Science and Engineering Practices, Cross-cutting Concepts, and the Nature of Science.

## ● Expanding the Reach and Impact of E2C Workshops

The audience able to get up early on a Saturday morning and go to Palisades NY is smaller than the audience interested in the topics, so archived versions of the workshop resources are available through the E2C website:

<https://earth2class.org/site/>

These versions include the introductory slideshow and, if not proprietary, the scientist's slideshow. We also provide links to related research and educational resources, and pertinent E2C programs. The website also provides access to lesson plans and other curriculum materials created for that Workshop and selected resources developed by others.



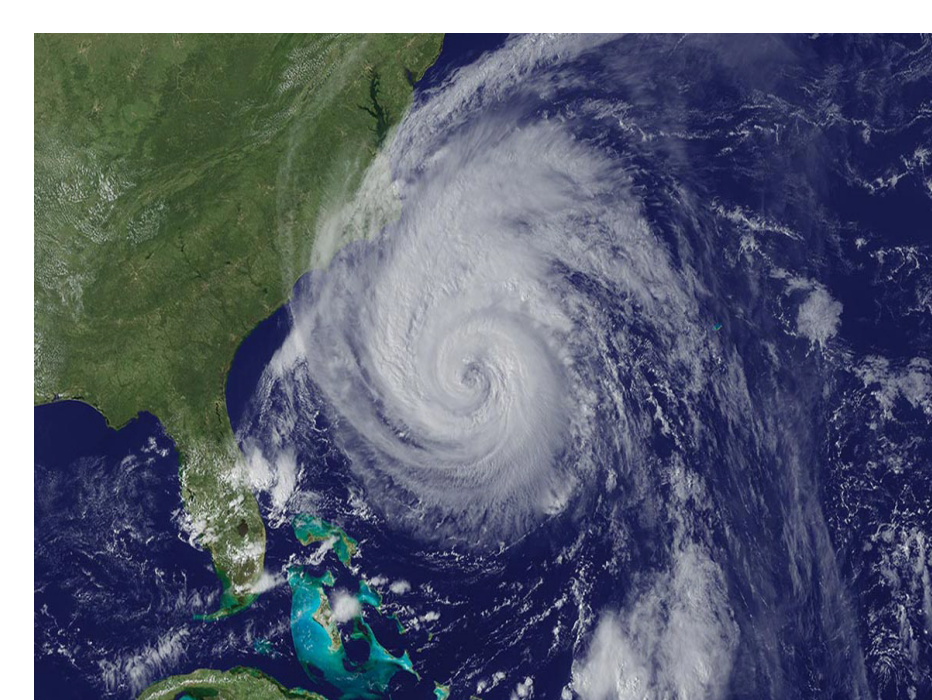
## ● Sharing Cutting-Edge Climate Research

**"IMPACT OF CO2 ON EARTH'S ENVIRONMENT: SCIENCE BEHND THE PARIS CLIMATE ACCORD" - TARO TAKAHASHI** <https://earth2class.org/site/?p=9812>

Dr. Takahashi is one of the world's leading investigators of the global carbon cycle, with decades of experience collecting samples from the world ocean. He provides cogent overviews of the science underlying international agreements.



**"DEVELOPING BETTER UNDERSTANDING OF HURRICANES" --ALLISON WING** <https://earth2class.org/site/?p=9800>



Dr. Wing was a Post-Doc when she presented this discussion of atmospheric dynamics behind tropical meteorology, convection, and cyclogenesis. (She earned her Ph.D. with Dr. Kerry Emanuel at MIT, but began study of Earth Science in 8th grade with Dr. Passow.)

**'MELTING OF ANTARCTIC ICE SHEETS: CONSEQUENCES FOR SEA-LEVEL RISE'**  
**FRANK NITSCHKE** <https://earth2class.org/site/?p=9806>

Dr. Nitsche studies interactions among ice sheets, ocean waters beneath the ice in Antarctica and Greenland, and potential changes in sea level. He shared results from cruises on icebreakers and use of data to construct ice sheet models.



**"AIR QUALITY-CLIMATE-VEGETATION INTERACTIONS" -- ARLENE FIORE and OLIVIA CLIFTON** <https://earth2class.org/site/?p=9804>



Dr. Fiore and PhD student Olivia Clifton explore the multiple connections linking air quality, climate, and vegetation. They are especially interested in ground-level ozone, aerosols, and Earth's radiation budget.

## ● Sharing Cutting-Edge Paleoclimate Research

**"WHAT CAN DUST REVEAL ABOUT PAST CLIMATES?" -- JERRY MCMANUS, GISELA WINKLER, and ALLISON JACOBEL** <https://earth2class.org/site/?p=11750>

Windblown dust plays important roles in influencing and recording climate change. Dust deposited in seafloor sediments in the west-central Pacific during the last 150,000 years provides evidence for 20ky cycles and other patterns during glacial and interglacial episodes.



**'TREES, CLIMATE, AND SOCIETAL RELEVANCE: A CASE STUDY IN MONGOLIA -- CAROLINE LELAND and MAKUND PALAT RAO** <https://earth2class.org/site/?p=6935>

Tree rings are valuable proxies for understanding past environmental conditions. Our studies focus on climate variability in semi-arid Mongolia and elsewhere in Asia, and impact on local societies.



## ● Cooperation with Other Climate Science Programs

The E2C Program has provided a valuable format for broader outreach by more than 80 LDEO researchers through over 165 monthly programs since 1998. E2C cooperation has been included in many NSF and other proposals submitted by LDEO investigators.

E2C has also partnered with other organizations providing Climate Science Education. Selected examples include:

NOAA National Ocean Science Education Program  
Deep Earth Academy/JOIDES Resolution Educator Resources  
Polar Explorer: Sea Level App  
Wilderness Research Foundation

The E2C website averages more than 50k hits per month, and is well known among Earth Science Educators..