Acronyms

Calendar

Outreach

3. Disturbance >>
4. Carbon Dynamics >>
5. Wildlife & Ecosystem Services >>
6. Modeling Framework & Comparisons >>
7. Notional Airborne Remote Sensing Strategy >>

4. **Data Management**
    1. Sites & Measurements >>
    2. Standard Projection and Reference Grid- May 4, 2016 >>
    3. Data Management Life Cycle >>

5. **Collaborations and Engagement Working Group** >>
    0. Introduction
    1. Engagement with Other Researchers
    2. Engagement with Indigenous, Local, State/Provincial/Territorial, Regional, and Federal D
    3. Coordinating Activities with the CCE Office

6. **Public Engagement**
    0. Introduction >>
    1. Professional Development for Environmental Educators (Earth to Sky) >>
    2. GLOBE Program for K12 and Citizen Science >>
    3. NASA Office of Communications (Press releases, Social Media, Earth Expeditions) >>
    4. ABoVE Science Team Outreach (Interviews, videos, talks, etc.) >>

Earth to Sky Partnership

connecting the wonders of science with the power of place

http://www.earthtosky.org

- Unique Inter-Agency Partnership
- Professional Development for Informal and Environmental Educators
- Community of Practice
- Engagement with the Public

Anita Davis/SSAI at NASA Goddard Space Flight Center
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Connecting the Wonders of Science with the Power of Place

The connection between NASA's big picture, global perspective and place-based experiences provides powerful opportunities for meaningful learning.

ETS is a Component of NASA Infrastructure

Summary Description: Earth to Sky (ETS) is an interagency partnership that conducts a variety of professional development efforts on science, and science communication for informal educators and interpreters (principally those in National Parks, Wildlife Refuges and similar public lands). ETS also maintains and nurtures an expanding community of practice comprised of ETS course alumni who in turn reach millions of people annually with content derived from our courses and resources.

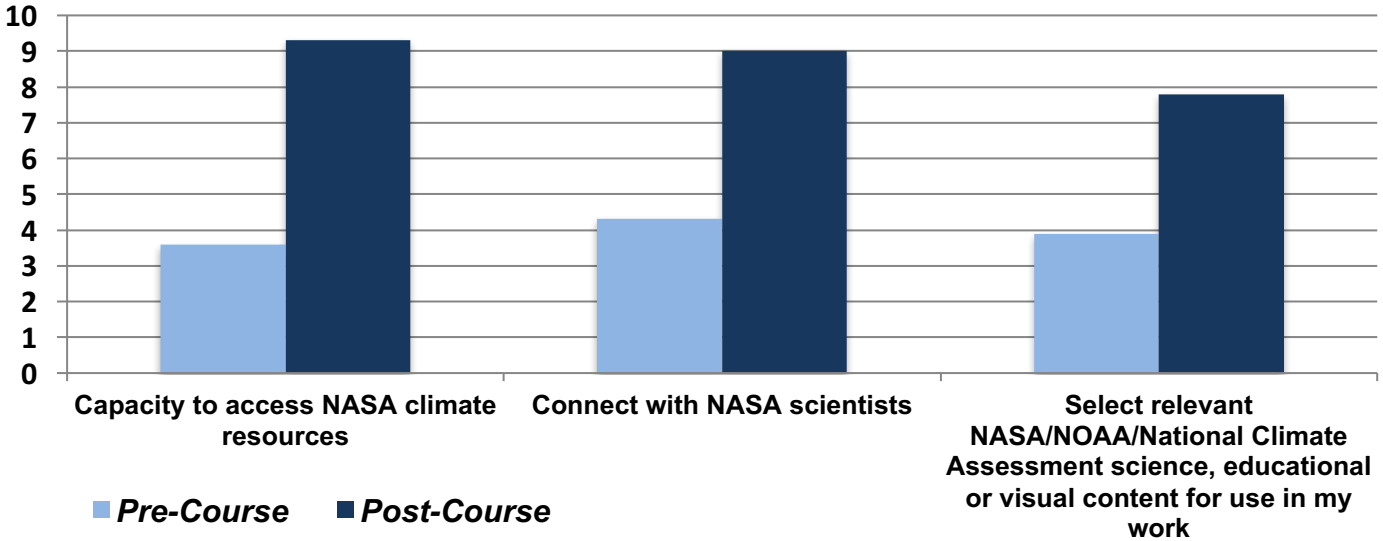
Science Focus: ***Cross SMD – Primarily Climate; plus focusing on the 2017 total Solar Eclipse in first year of ETS expanded topical content***

Audience(s): Informal educators/Interpreters in National Parks, U.S. Fish and Wildlife Service and similar organizations

Website: http://www.earthtosky.org

OUTCOMES

Statistically significant increase in capacity to access NASA content/resources



Participant Action Plans

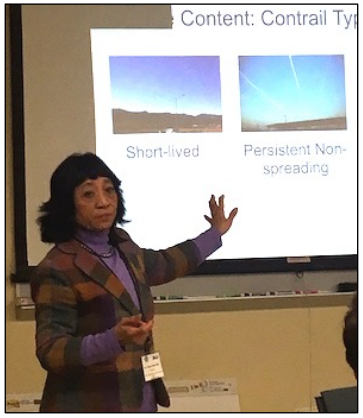
- Ranger led evening programs and ranger led walks
- Interpretive posters, signs, and exhibits
- Teacher workshops on water cycle and climate
- Curriculum and training on ocean acidification
- Training staff and youth corps on climate
- New classroom activities
- Community programming

Earth to Sky and ABoVE Mini-Course Fairbanks, AK October 21, 2016

The NASA-National Park Service-U.S. Fish and Wildlife Service Earth to Sky partnership (ETS) conducted a *Climate Science and Communication* mini-course at the Morris Thompson Cultural and Visitors Center, in Fairbanks AK

- Presentations featured scientists from the NASA ABoVE campaign, the International Arctic Research Center at the Univ. of Alaska, Fairbanks, and the National Park Service
- Communication techniques presented by interpreters and environmental educators from the ETS partnership, NPS and the Univ. of Alaska, Fairbanks
- 21 participants attended, representing University and Academic programs, National Parks, State agencies, and museum and non-governmental organizations
- Content included recent developments in climate science, potential communication strategies and products, and the new GLOBE Observer Citizen Science Cloud App
- Course assignments included video presentations by NASA Scientists and an Earth Systems Science Module developed by ETS and posted on the partnership website
- Early evaluation results indicate strong intention by participants to use content from the course in their work and to further engage with the ETS community of practice

John Walsh, Chief Scientist, International Arctic Research Center, describes regional climate trends, as NASA's Dr. Peter Griffith looks on



Looking Ahead – 2017

Climate Science and Communication Regional Course

NW Territories (Yellowknife, NWT, Canada, April 19- 21, 2017)

- Planning underway with Dept. of the Environment and Natural Resources, Government of the Northwest Territories; Parks Canada; the Regional Science Coordinator, NWT; and ETS leadership team and alumni
- ABoVE science topics of immediate interest include, carbon cycle, fire, permafrost thaw, hydrology, shifting migratory patterns
- Indigenous voice will have a prominent role in this course along with western science

Looking Ahead – 2017

Climate Science and Communication Regional Course

Arid Lands of U.S. (Flagstaff, tentatively Sept 2017) in early stages of planning - awaiting funding from NPS Intermountain Region. Planning at request of NPS Pacific West and Intermountain Regions. Ideal location to include ABoVE scientists from Arizona institutions.

Eclipse Aug 21, 2017 – NPS and other agency involvement; ETS providing support and relevant resources
Eclipse webinars (begin January, run through March)
Supporting NPS event at Homestead National Monument of America

National Association for Interpretation (November 2017, Spokane, WA

The Global Learning and Observations to Benefit the Environment (GLOBE) Program is an international science and education program that provides students and the public worldwide with the opportunity to participate in data collection and the scientific process, and contribute meaningfully to our understanding of the Earth system and global environment. Announced by the U.S. Government on Earth Day in 1994, GLOBE launched its worldwide implementation in 1995.
http://www.globe.gov/about/overview

Student Science: GLOBE

- 20+ year old program in which students follow well-defined protocols to collect environmental data
- 50+ protocols to choose from
- A teacher must be trained for students to participate. Training is available online as of April 2016: https://www.globe.gov/get-trained/protocol-etraining
- For ABoVE, recommend selecting the protocols most useful and encouraging teachers/schools in stakeholder communities to collect that data.
- Most likely to be successful if you make the connection from student (or citizen science) data collection to your data collection needs. Communication back to students and citizen scientists is critical

Expanding GLOBE for citizen science

- More data
  - Fewer temporal data gaps (no school holidays)
  - Better geographic coverage
- Technology reduces error
- More people can participate in more settings

Citizen Science: GLOBE Observer

- App-based data collection in support of Earth System Science. Data stored in the GLOBE database.
- Current app includes a protocol to observe clouds

Available in App Store and Google Play

https://observer.globe.gov

GLOBE Observer in 2017

- Adding a mosquito protocol this spring
  - Protocol asks people to identify breeding sites, report larvae density, and look at larvae taxonomy to identify three major disease carriers
  - ABoVE scientists may be interested in breeding site identification data
- Adding a land cover (phenology?) protocol in the late spring/summer
  - Looking for science input to define the scope of the protocol.
  - Will definitely include land cover identification
  - May also include phenology and snow cover

What can ABoVE Scientists Do?

- Use GLOBE data to support your research
  - Identify GLOBE data relevant to your research at https://www.globe.gov/globe-data
  - If no data exists, encourage students and citizens to take data for that protocol or encourage GLOBE to create a new protocol
- Communicate with students and citizen scientists
  - write blogs, social media posts
  - help us make videos, etc. explaining how you use the data
  - let us feature your research on the GLOBE and GLOBE Observer web sites
  - Talk to students and citizens in stakeholder communities about the value of their observations

What can ABoVE Scientists Do?

- Advise GLOBE Observer on development of land cover app (near term)
- Join the GLOBE International Scientist Network to be a general advisor, judge science fairs, etc.
- Join the ABoVE Student and Citizen Science Working Group
- Download and use the app yourself!

But wait there's more…

- NASA Office of Communications: Earth Expeditions
- Discovery Channel director, producer, and video crew in March? June?
- Your media coverage