WELCOME!

Effective Training: Useful Methodology from the Earth to Sky Partnership

National Interpreters Workshop Denver, CO November 2014

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**National Interpreters Workshop:**
A Self Assessment of Knowledge and Skills

Please assess your knowledge or ability to apply the learning goals identified below using the following legend:

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What is “Earth to Sky?”

- Unique Inter-Agency Partnership
- Professional Development for Informal and Environmental Educators
- Community of Practice

http://www.earthtosky.org
Earth to Sky Partners

ETS began in 2004 with NPS and NASA; USFWS joined in 2008
NOAA in 2013
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 the Only Interagency Partnership addressing Informal Educators and Climate Change

**USFWS and NPS** *place*

- 330 MILLION visits per year
- Access to and expertise with diverse audiences
- Powerful linkage to meaningful stories; tangible connections to human experiences
- Expert, effective educators (interpretation methodology)
- Very high approval rating (96% of visitors)
- Staff time and training center resources

**NASA | NOAA** *science*

- Global view that helps provide context for site-specific information
- Concrete, highly respected, relevant science
- Incredible visual resources; Office of Communications products
- Wide array of educational products and programs
- Scientists, education and communication staff
- Staff position at NASA
 Conduct Professional Development
Nurture a Community of Practice

✝Purpose

• Train educators
• Foster collaborative work (scientists & educators)
• Enrich the experiences of visitors

✝Activities:

• Five Day Face-to-Face Course
• Regionally focused blended learning
• E-Course
• Webinars
• Conference Presentations and Workshops

✝Primary Audience:

• Informal/Environmental Educators
• Education/Outreach Specialists
• Public Affairs Specialists

✝Website http://www.earthtosky.org
• Listserv (500 members)
• Facebook Group https://www.facebook.com/groups/274560916051139/
700+ Educators Trained at Sites Across the U.S.
Session Agenda

- Ice Breaker
- Experience in the Room
- Results from Successful Training
- Your Task!
- Using Best Practices from ETS
- Reflection Time
- The Authentic Task Illustrated
- Feedback
Ice Breaker

1. Where are you from? (or where do you work?)
2. What was your favorite training ever, and the main reason why
3. Who is the audience for the training you expect to give within the next year?
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Evaluation Metrics

Over 4 million visitors to National Parks and Wildlife Refuges Reached

2004-2013 Earth to Sky

- Conducted 6 week-long courses
- Hosted 75 NASA scientist presenters
- Presented 100 NASA science sessions
- Trained Educators:
  - 135 participants in week-long face to face courses
  - 35 participants in one and two day workshops at professional conferences
  - Over 535 educators via distance learning and sessions at conferences, in a variety of subjects, including climate science, and best practices in science communication
- Shared the ETS training model internally and externally so others can replicate similar efforts.
Alumni become Trainers

Jr. Ranger Day Camp at Rock Creek; demonstrated at ETS IV by Ranger Ron Harvey
Connecting the Wonders of Science with the Power of Place

Changing Landscapes
What the future holds for the Kenai and its residents

Global Temperatures on the rise
Alaska temperatures continue an increase of 3-5°F over the past 50 years.

Shrinking Lakes
Causing wetlands to disappear
Inferences how reduced snow, reduced rainfall, and rising temperatures are changing the landscape.

Forest Dynamics
Soil and land are changing
Winter seasons are shorter, and snowmelt is occurring earlier in the spring.

Glacial Retreat
Longer term wisdoms
Glaciers are melting, and the Kenai landscape is changing over time.

Rising Tree line
New species trying to push
Trees are growing higher in elevation as the climate changes.

Predictive Models offer a choices
Scientists are looking to the future to better understand what changes are likely to occur.

What does this mean to the land?
Ecosystems are changing, and it's important to understand how these changes are affecting the landscape.

On The Refuge
Protective land conservation
The Kenai Refuge is working to protect land and ecosystems for future generations.

What you can do:
Volunteer your time, get involved, and help protect the Kenai landscape.

At Your Home
Learn more about the Kenai and how you can make a difference in protecting the landscape.

For more information and updates, visit the Kenai Refuge website.
Status (3/24/14): In progress with expected date of completion: Winter 2014

Product: interpretive program

Audience: Families, general public visiting Refuge

Thematic Statement: Climate changes are visible on the Kenai Peninsula in southcentral Alaska. Citizen science observations of weather, seasonal change will contribute to hands-on exploration of weather and climate by visitors to the Kenai National Wildlife Refuge.

Measurable Objectives: 100 visitors will participate in weather monitoring interpretive programs in 2015.

Technique: citizen science investigation

Brief Description: Newly installed weather station at the Refuge Visitor Center supports citizen science investigations into weather and climate. Guided walks will incorporate these observations to further explain climatic change and impacts to the ecosystem.

Timeline to Complete: Delays in new Visitor Center construction have pushed the completion date to this winter, but the weather station is installed and data collection software/process is being piloted this summer.

NASA Resources Used: www.gpm.nasa.gov, climate.nasa.gov

For more Information: Leah Eskelin, 907-260-2811, leah_eskelin@fws.gov

Supported by the GPM mission: http://pmm.nasa.gov/GPM

Kenai NWR, in southcentral Alaska is 2 million acres of diverse habitats supporting over 1000 species of flora and fauna.
Expansion of “Adopt-a-Phenology Plot” project in Great Smoky Mountains National Park
A GPM-Earth to Sky Collaborative Effort

- **Status** (3/24/14): complete but the project is on-going since it is long-term monitoring
- **Product:** support materials for an on-going citizen science project involving students and community volunteers
- **Audience:** middle & high school students, adults
- **Thematic Statement:** Monitoring phenology is a way to notice subtle changes in our ecosystem due to climate change.
- **Measurable Objectives:** 2,000 students, teachers and volunteers will participate in phenology monitoring in the Smokies in 2013.
- **Technique:** citizen science monitoring of tree phenology, weather measurements in plots & fog monitors
- **Brief Description:** GRSM will expand its phenology monitoring sites in the park used in curriculum based education and “Adopt-a-Phenology Plot” programs. This will include support materials for the new plots and weather monitoring equipment.
- **Timeline to Complete:** Project was completed during the summer of 2013 – materials purchased, 6 new sites set up and equipment distributed to volunteers.
- **NASA Resources Used:** Climate change website, scientist expertise, Earth to Sky website, Landsat images

For more Information: Susan Sachs, susan_sachs@nps.gov
Expansion of “Adopt-a-Phenology Plot” project in Great Smoky Mountains National Park.

A GPM-Earth to Sky Collaborative Effort

- **Measurable Objective(s)** We had 3,000 students participate in phenology monitoring programs in 2013 and have 86 volunteers who have adopted phenology plots to monitor.

- **Evidence of Achieving Objectives**: Statistics for our school programs and volunteer training workshops.

- **Evidence of Impact on Audience**: We evaluate each education program for its impacts on students via a teacher questionnaire. We consistently receive high ratings for our phenology programs which include trees, salamanders and terrestrial invertebrates.

- **Unintended impacts**: The phenology monitoring project for students and community volunteers has been very popular with other educators who are struggling to connect people directly with climate change in areas where impacts are subtle. We have been interviewed by several national news outlets and have been part of two NPS videos on how to connect the public with the issue of climate change.

- **Anecdotes (stories) about impact on individuals**: We see a light bulb go off for many people (both young and old) when they understand that earlier springs mean more than just flowers blooming but it impacts the entire ecosystem. This may mean that some species lose their synchronicity with one another and that can create layers of impacts.

- **Spinoffs, partnerships, other impacts**: This project is still growing. This summer we are starting a spin-off project with Montreat College to offer 6 one-week phenology monitoring science camps in the park for high school students. Monitoring will occur along the Appalachian Trail in the Smokies and is part of the National Phenology Networks AT Seasons monitoring study.
One of four **new exhibit panels** at Apostle Islands National Lakeshore Visitor Center.

**450,000 of these brochures** have been distributed in parks around the US.

**Flyer on climate change impacts at Arctic National Wildlife Refuge.**
Personal Interpretation explains effects of climate change in Refuges and Parks

Traveling exhibits showcased at National Parks and training venues throughout the US.
WebRanger Climate Change Activity *Investigating Global Connections* for grade school level. 4,900 registered WebRangers have completed this activity. Two more under development.  
www.webrangers.us/activities/climate

Outdoor Exhibit at Crissy Field, Golden Gate NRA - depicts predicted sea level rise, received front page coverage in San Francisco Chronicle. Duplicate exhibits under development.
Improving Science Communication

http://www.youtube.com/watch?v=uStoBFtjy8U
2nd version (animated)  http://geeked.gsfc.nasa.gov/?cat=170

Dr. Peter Griffith, founding director of NASA's Carbon Cycle & Ecosystems Office
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Best Practices for Effective Professional Development

Your commitment to these principles will help you create training opportunities that promote change or growth, reach clear outcomes, and help people develop new relationships.

1. Establish and share clear outcomes
   - What are the goals and objectives of your training session?
   - List the ways you will help participants to know where they are within the training process.

2. Design and list activities you will use to engage all participants
   - How will you provide for varied learning styles? How will you ensure that all participants are involved in learning?

3. Model effective learning processes and environments: Make sure participants are learning by being engaged in the process (model good interpretive technique if you are teaching interpretation)

4. Establish clear roles
   - List who is involved in the training/workshop/task and their primary role(s)
   - State the task you wish your participants to accomplish
   - What method(s) will you use to remind participants of their responsibility for achieving the task as appropriate/needed

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Use Best Practices for Professional Development

1. Establish & share clear expectations
2. Design activities to engage all participants
3. Model effective learning processes
4. Establish clear roles
5. Have participants take responsibility
6. Connect with participant’s own work
7. Provide time to do “authentic” work
8. Encourage participants to share
9. Provide ample time for reflection
10. Provide guidance and support
11. Provide opportunities for continued learning
12. Incorporate evaluation throughout
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Time to Think!

What did I just see?

What did I learn?

...What am I thinking?
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Elements of the Authentic Task Approach

- **Clarify Your Task**
- **Identify Criteria for Success**
- **Use data to make decisions and track your work**
- **Identify Relevant Resources**
- **Scheduling Activities**
- **Take Time to Reflect**
- **Develop an Implementation Plan**

key features:
- guided facilitation
- protected time
- a resource rich environment
- continuous reflection

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<th>MORE emphasis on…</th>
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<td>Participants' needs</td>
<td>Participants define beforehand what they will work on in the context of their own work</td>
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<td>Pre-determined general topic with the hope that everyone &quot;gets what they need&quot;</td>
<td>Content sessions determined by specific participant tasks</td>
<td>Course planners analyze tasks to determine specific concurrent and general sessions</td>
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<td>“Sit and get” presentations</td>
<td>Active engagement and learning while doing</td>
<td>Team time to work on tasks and develop strategies for implementation at work site</td>
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<td>Looking for answers and solutions from others</td>
<td>Discovering and creating solutions with others</td>
<td>Reflective partners (structured opportunities for participants to provide feedback to one another) Appointment cards (structure to provide participants with opportunities to schedule time with resource experts)</td>
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<td>National and state perspectives</td>
<td>Local context, challenges and critical issues</td>
<td>Teams clarify tasks and define criteria for success</td>
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<td>Generic understanding of existing knowledge</td>
<td>Application of existing knowledge</td>
<td>Development of Action Plans Providing adequate time to reflect</td>
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<td>Concerns about information (how much, what level, etc)</td>
<td>Concerns about how to use the information and skills learned</td>
<td>Creating a product that focuses on implementation at work site</td>
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<td>Shallow treatment of a lot of information</td>
<td>Intensive study of information that focuses on specific tasks</td>
<td>Customized course design Resource-rich environment (materials and subject matter experts)</td>
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Course Structure Builds Expertise and Community

**Leaders**
- course coordinators
- develop courses
- select coaches and participants
- pair coaches with presenters

**Presenters**
- learn better communication technique from coaches
- provide expertise to participants during and after the course
- a few have partnered with course alumni

**Coaches**
- alumni with leadership qualities
  - coach presenters
  - mentor participants
  - advise course coordinators (before, during and after course)

**Participants**
- learn from presenters, coaches and each other
- provide feedback
- participate in longitudinal evaluation
Face-to-Face Course Structure

• NASA Scientists provide science content

• Alumni Informal/Environmental Educators coach science presenters and participants

• NASA Education and Outreach staff provide NASA education and communication materials

• Visit to NASA Goddard Space Flight Center (MD)