Cascadia EarthScope Earthquake and Tsunami Education Program (CEETEP)

Aberdeen, Washington Workshop

August 11-14, 2014

Exchange of Pedagogies: Working Together in Coastal Communities to Engage Students, Visitors and Residents on Earthquake and Tsunami Science and Preparedness

Bob Lillie

Certified Interpretive Trainer

Emeritus Professor of Geosciences

Oregon State University

www.robertjlillie.com

Elk River Estuary, Washington

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Action Teams:
2 Tasks

1. **Develop and present Action Team Plan**
   - **Develop this afternoon and tomorrow**
   - **Present tomorrow afternoon**
2. **Develop product(s) for your community that serve your audiences in your settings**
   - **Plan tomorrow afternoon**
   - **Develop Now - February**
   - **Present at March 7, 2015 Share-a-Thon in Quinault**

Earth Science Literacy Principles

http://www.earthscienceliteracy.org

Big Ideas:

1. Earth scientists use repeatable observations and testable ideas to understand and explain our planet.
2. Earth is 4.6 billion years old.
3. Earth is a complex system of interacting rock, water, air, and life.
4. Earth is continuously changing.
5. Earth is the water planet.
6. Life evolves on a dynamic Earth and continuously modifies Earth.
7. Humans depend on Earth for resources.
8. Natural hazards pose risks to humans.
9. Humans significantly alter the Earth.

Education and Outreach Goals

1. Create high profile EarthScope identity
2. Promote science literacy through informal education
3. Advance formal education in the classroom
4. Foster use of data, discoveries, technology
5. Establish sense of community ownership

Niawiakum River, Washington

Elk River Estuary, Washington

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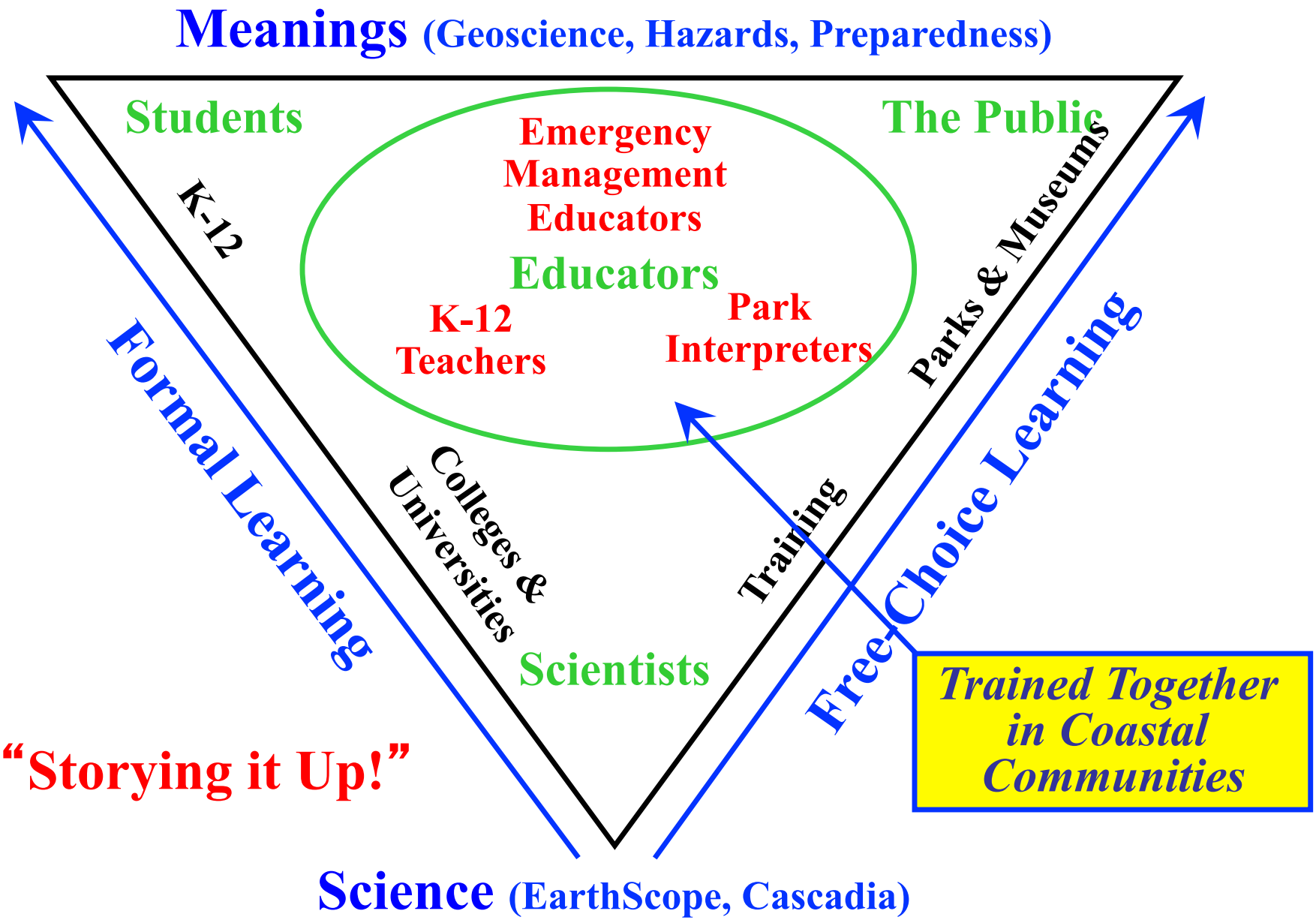

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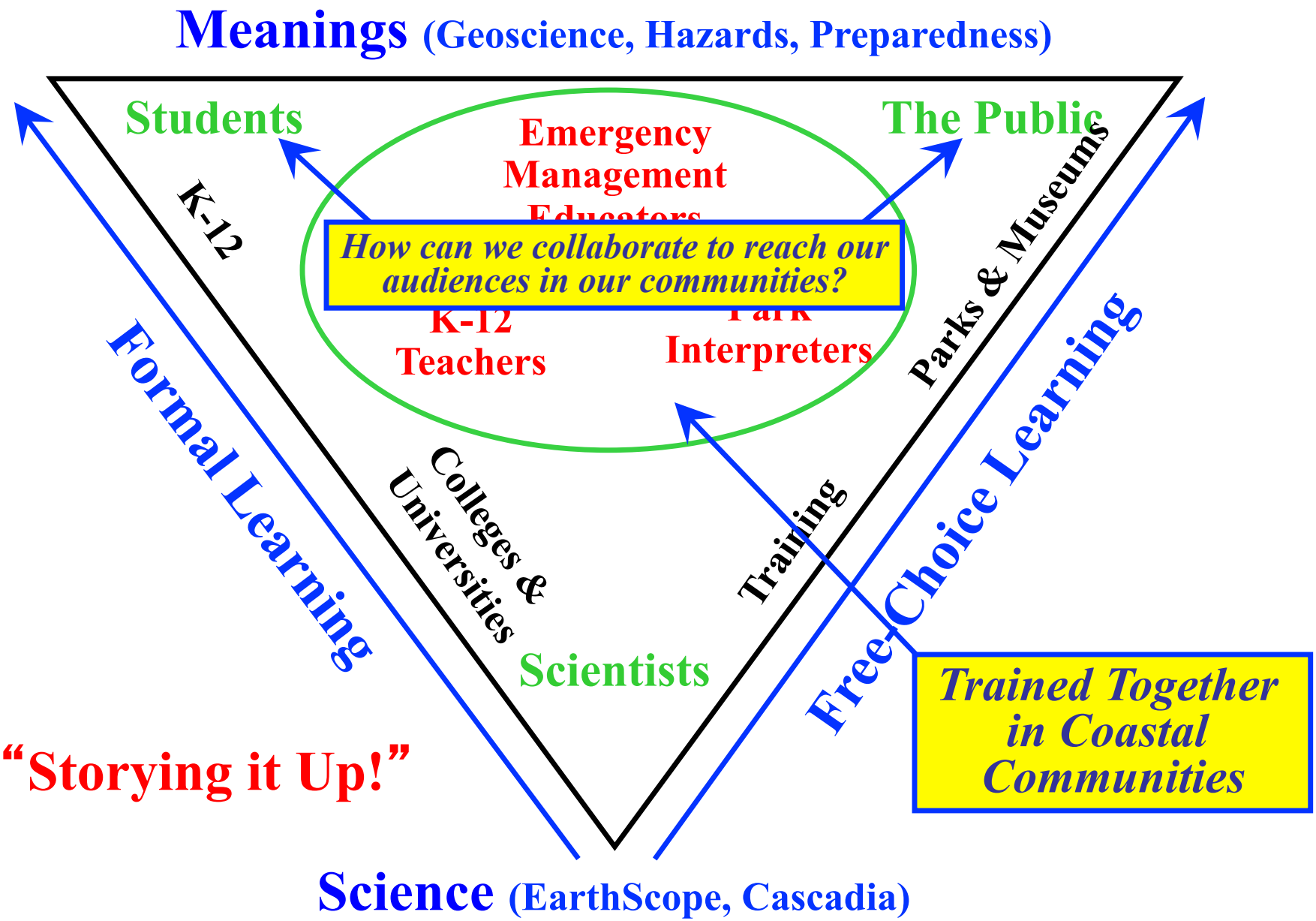

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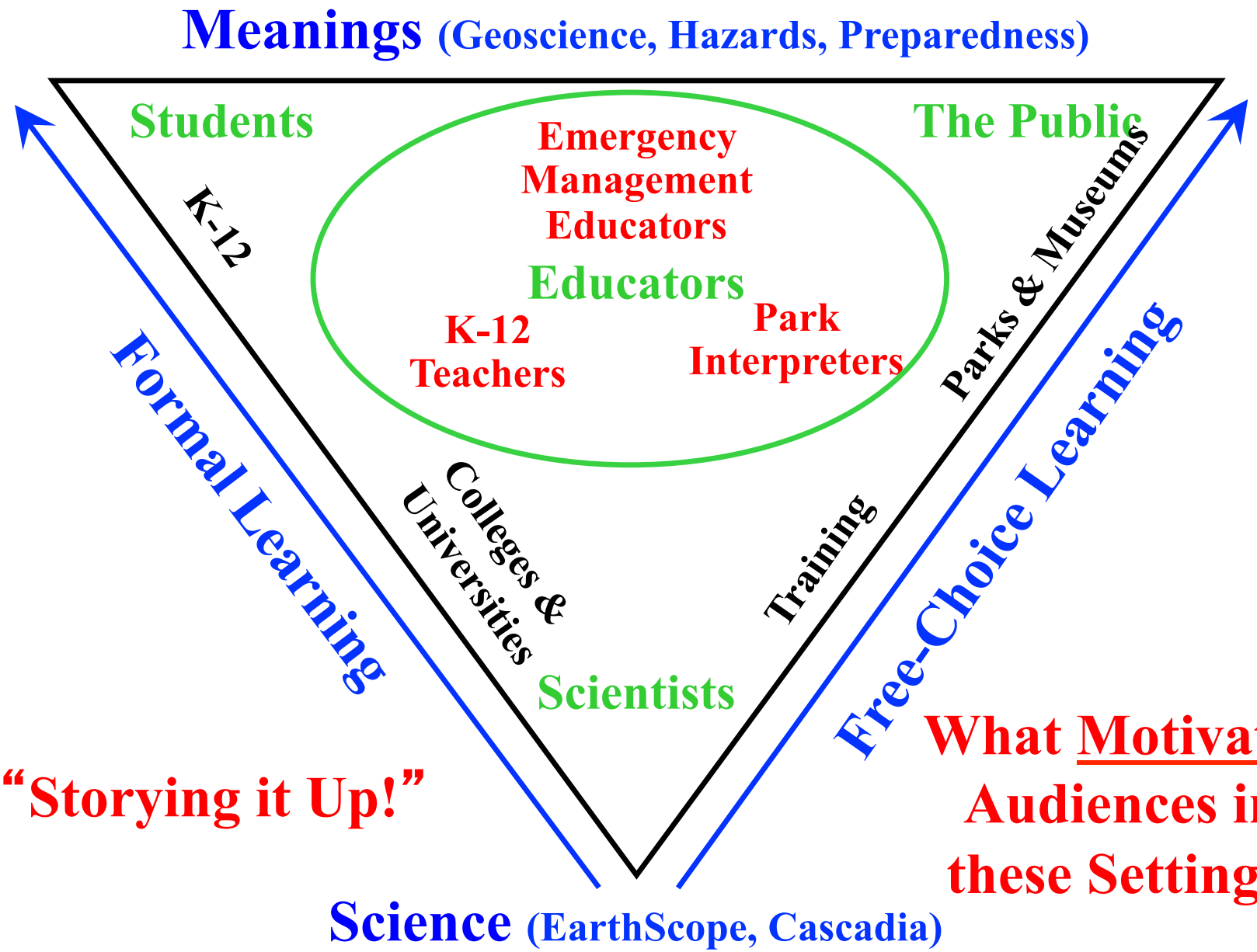

Interpretation vs. Formal Instruction

Audiences:

- **Captive**
  - Have to be there

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- **Non-captive**
  - Want to be there

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Captive vs. Non-Captive Audiences

- **Captive Audience**
  - Formal Education
  - Taught by Instructor
  - Students in Classroom
  - Trainees in Workshop
  - Involuntary
  - Accept formal approach
  - Must pay attention if bored

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- **Non-Captive Audience**
  - Informal Education
  - Engaged by Interpreter
  - Visitors to Parks, Museums, Zoos
  - Watching Sporting Event; Television Program; Play
  - Voluntary
  - Expect informal atmosphere
  - Switch attention if bored

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Motivations

- **Captive Audience**
  - Grades
  - Diplomas
  - Jobs
  - Certificates
  - Advancement

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- **Non-Captive Audience**
  - Interest
  - Fun
  - Self-Improvement
  - Self-Enrichment
  - Entertainment

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When do people from Oregon go to Crater Lake?

- Commonly, when family or friends visit from out-of-state
- Facilitating a special experience is a powerful motivation!

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Free-Choice Learning

All about the motivation.

- **Participants:**
  - Want to learn
  - Want to facilitate
  - Want to be enlightened
  - Want to be inspire

- **Interpretation:**
  - A way of "teaching" in free-choice learning environments

What is Interpretation?

"Interpretation involves translating the technical language of a natural science or related field into terms and ideas that people who aren't scientists can readily understand."

From: *"Environmental Interpretation: A Practical Guide for People with Big Ideas and Small Budgets"* (Sam Ham, 1992)

Elk River Estuary, Washington

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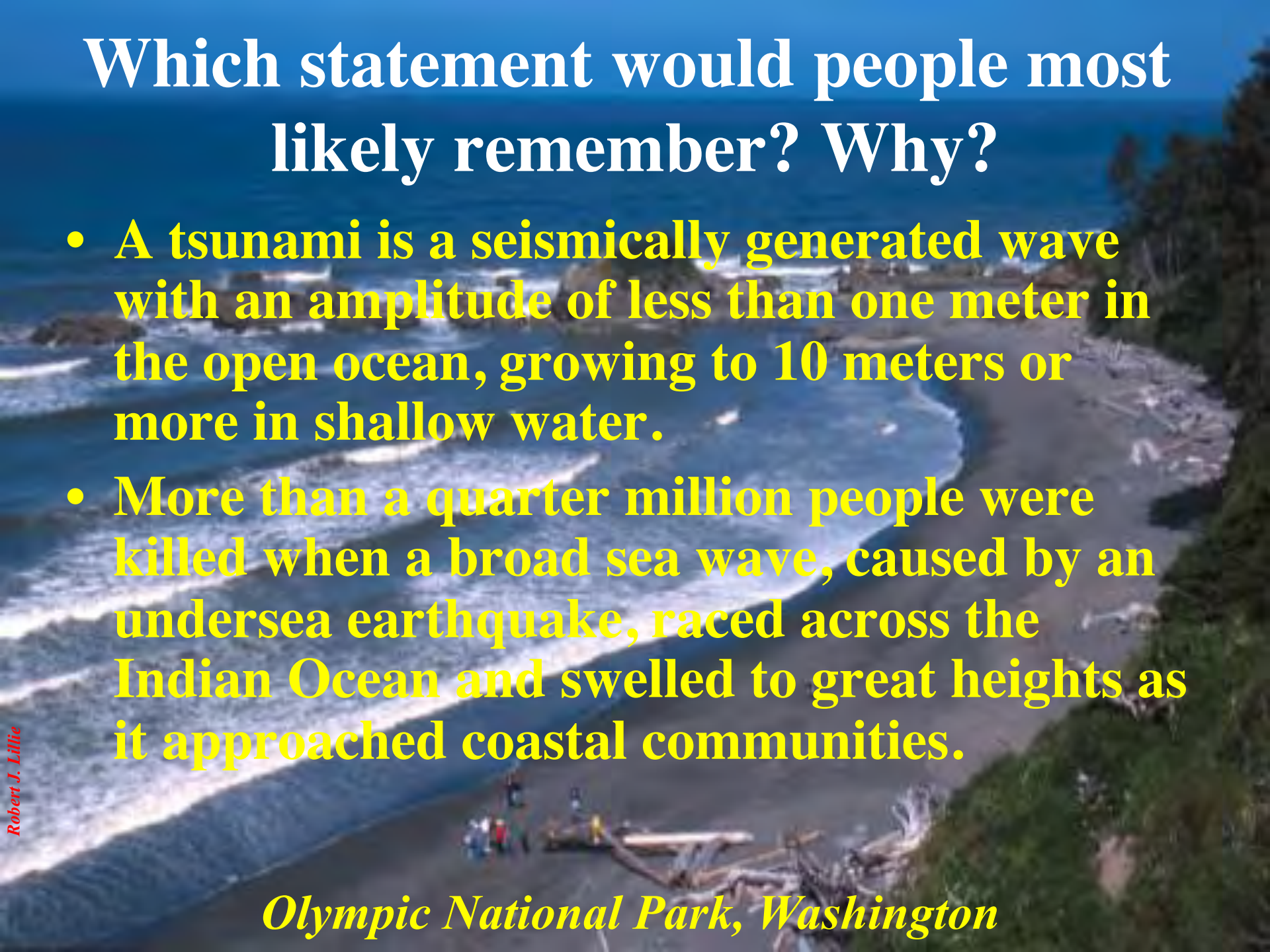
Which statement would people most likely remember? Why?

- A tsunami is a seismically generated wave with an amplitude of less than one meter in the open ocean, growing to 10 meters or more in shallow water.
- More than a quarter million people were killed when a broad sea wave, caused by an undersea earthquake, raced across the Indian Ocean and swelled to great heights as it approached coastal communities.



Olympic National Park, Washington

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Intellectual Connections

Olympic National Park, Washington

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Intellectual Connections Emotional Connections

Olympic National Park, Washington

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What is Interpretation?

National Park Service (NPS):

"Interpretation ….. creates opportunities for visitors to form their own intellectual and emotional connections to the meanings inherent in a park resource."

Ranger Shelton Johnson, Yosemite National Park, California

Agate Beach State Recreation Site, Oregon

http://kezi.com/news/local/248218

Agate Beach State Recreation Site, Oregon

Came from Misawa, Japan,
on the north tip of Honshu

http://kezi.com/news/local/248218


Agate Beach State Recreation Site, Oregon
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Large dock washed up on Oregon Coast June 5, 2012.

Agate Beach State Recreation Site, Oregon

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Agate Beach State Recreation Site, Oregon

Japan and the Pacific Northwest are linked by a special Sense of Place

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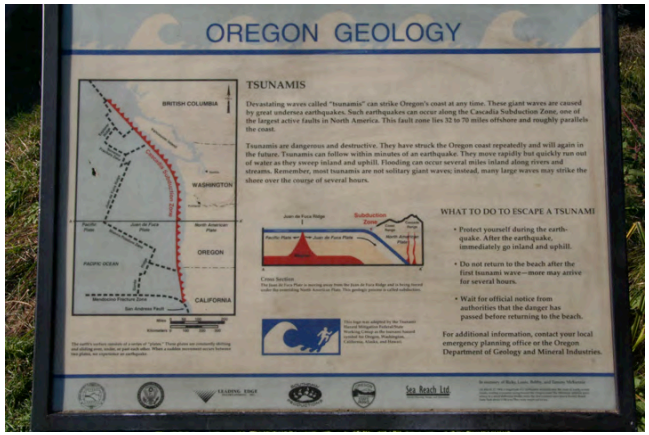
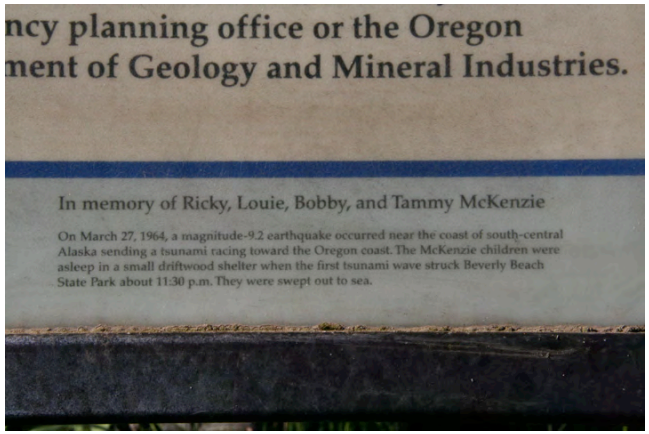
Agate Beach State Recreation Site, Oregon

Japanese Tsunami Dock Interpretive Exhibit

OSU Hatfield Marine Science Center, Newport, Oregon





Beverly Beach State Park, Oregon

Interpretation is about revealing the rest of the story.

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How can we incorporate EarthScope and other geological observations into educational programs spanning a variety of topics in parks, museums, and classrooms along the Cascadia coast?

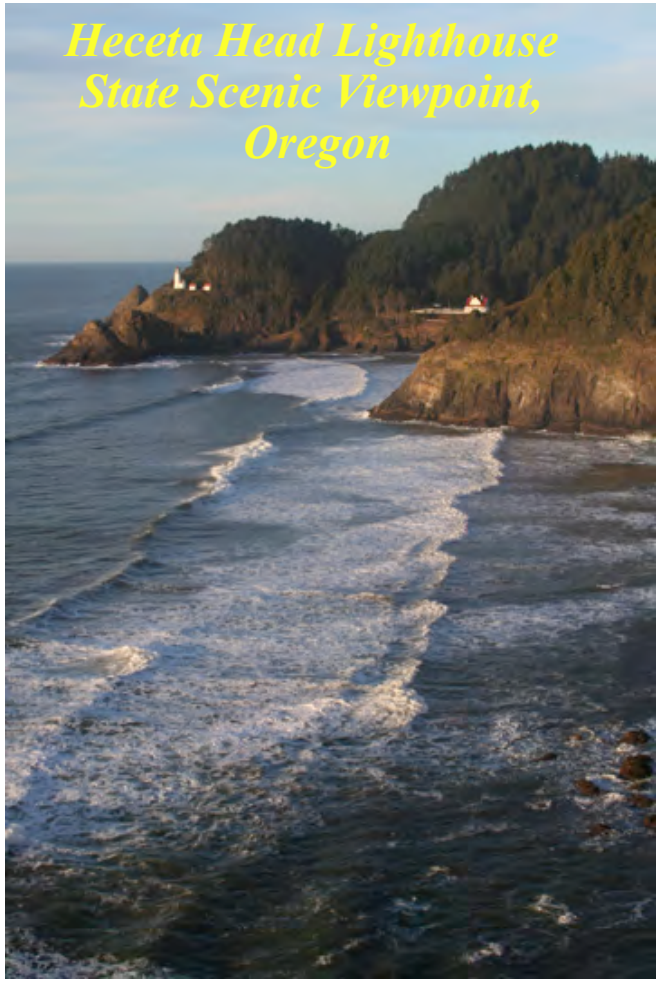
Ilwaco, Washington

Newport, Oregon GPS Station

It's all about Telling a Story:

1. Landscape:

- Shows how geological materials and processes affect biology, ecology, and human history.



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2. EarthScope and other Geophysical Monitoring:

- Reinforce these connections by highlighting a dynamic Earth.

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Beauty and the Beast Theme

"The same geological processes that sculpt our breathtaking headlands and beaches also threaten our lives with earthquakes and tsunamis."

Otter Crest State Scenic Viewpoint

Governor Patterson Memorial State Recreation Site

http://www.oregoncoasttoday.com/bigstumpbeach.html

You've heard of "Fun with Phonics?"
This is fun with, Plate Tectonics ☺

Jen Natolli, OSU Geosciences Graduate Student
Park Ranger, Redwood National and State Parks, California

CEETEP Newport Workshop
August 12-15, 2013

Action Team 1: Elephant in the Room
Title: "What will be YOUR Story?"
Setting: TV Studio in an Oregon coastal community
Audience: News watchers
Theme: "The stories from anyone, anywhere, anytime, any age will survive."

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Action Team 6: South Coast Shakers
Title: "As the Plates Move"
Setting: National conference for the geologically impaired
Audience: Adult
Theme: "Friction created along the Cascadia Subduction Zone leads to devastating earthquakes and tsunamis."

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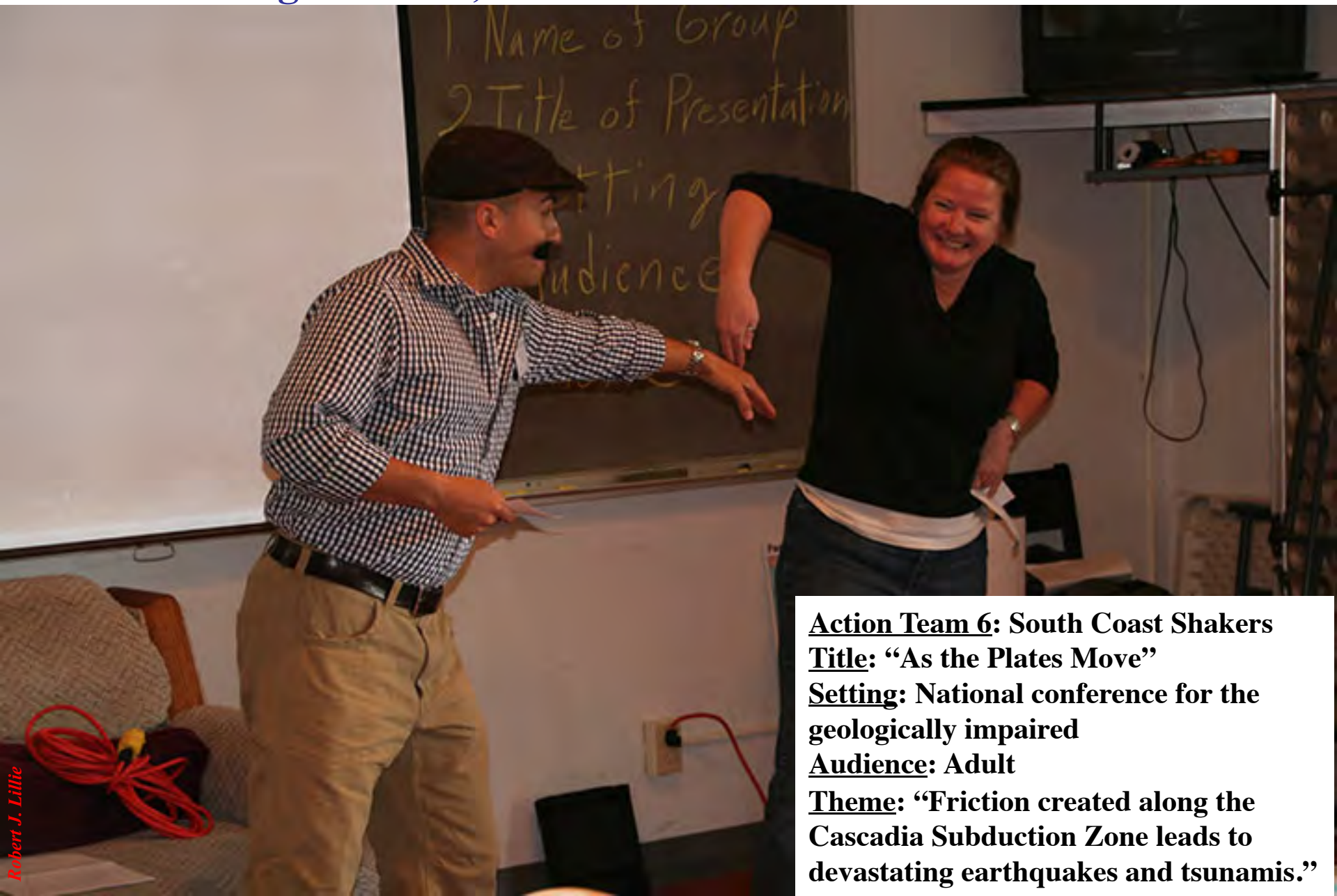

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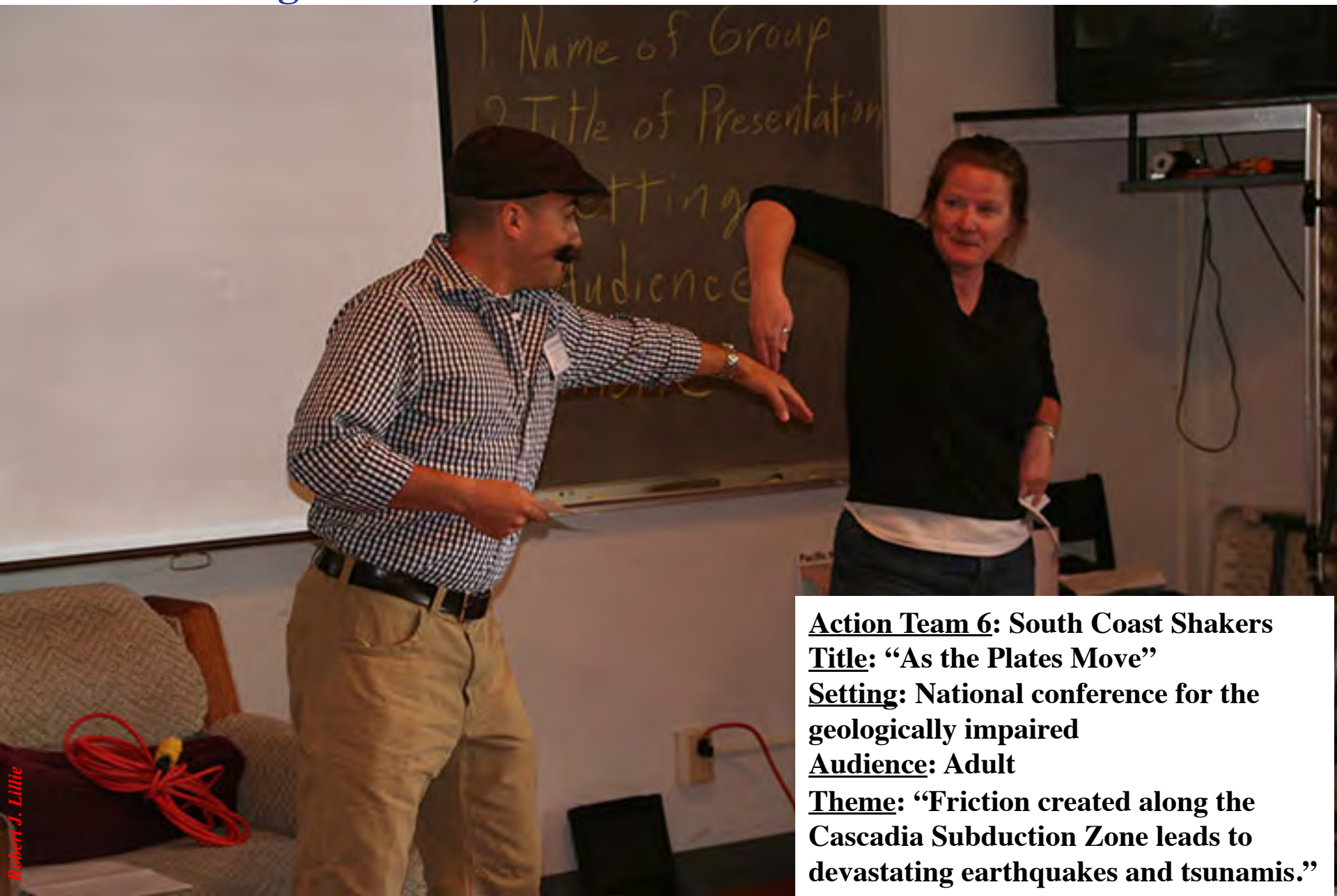

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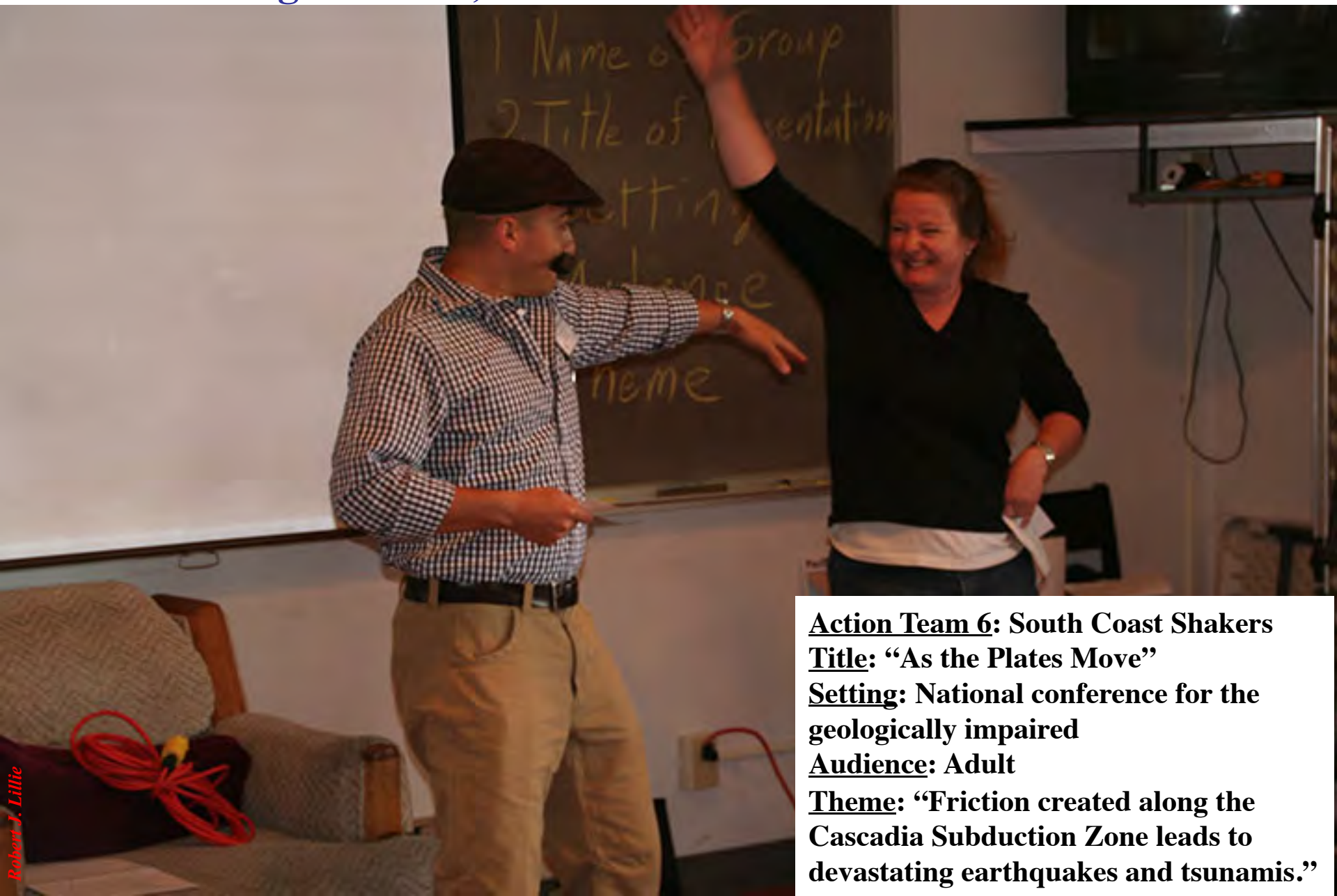

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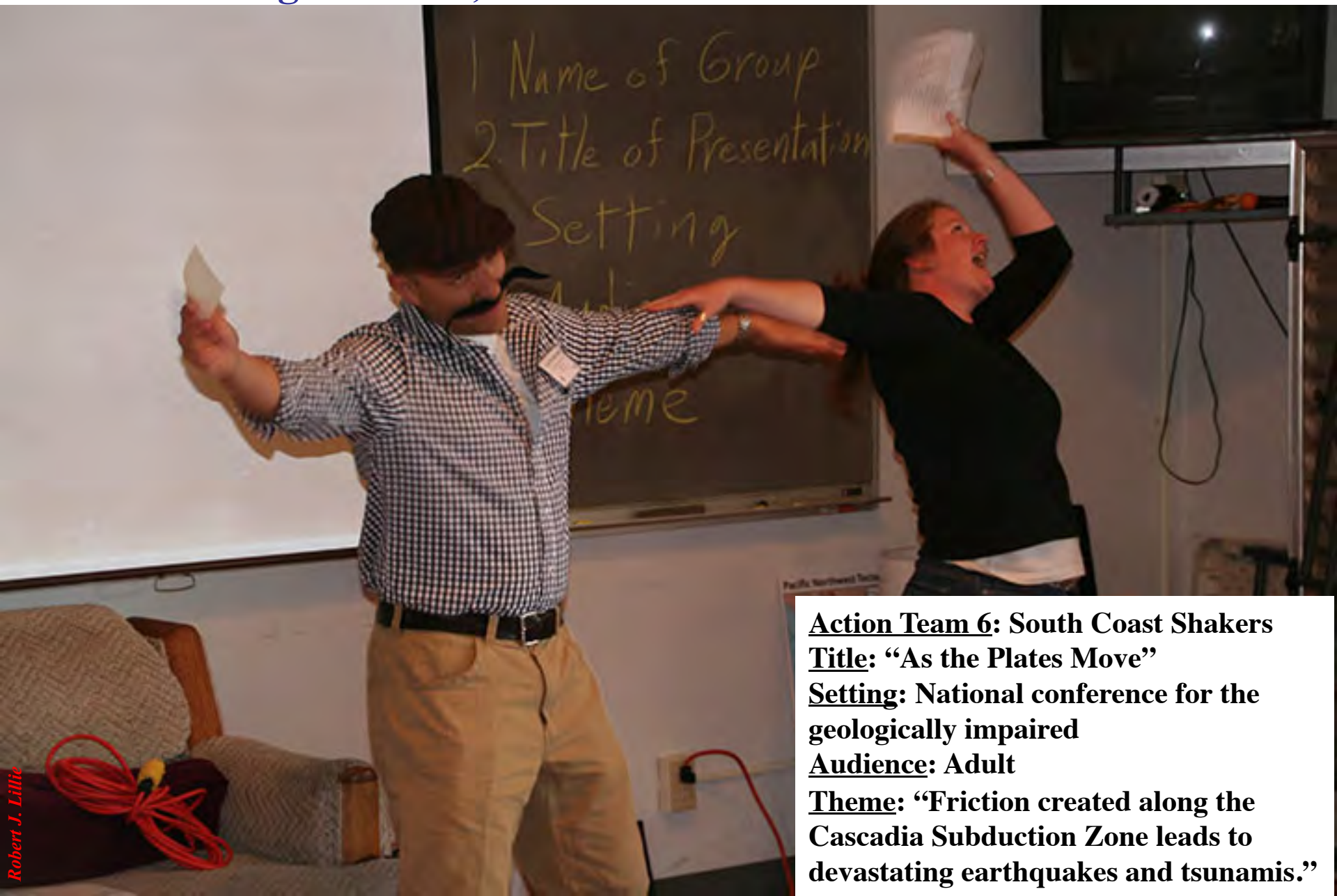

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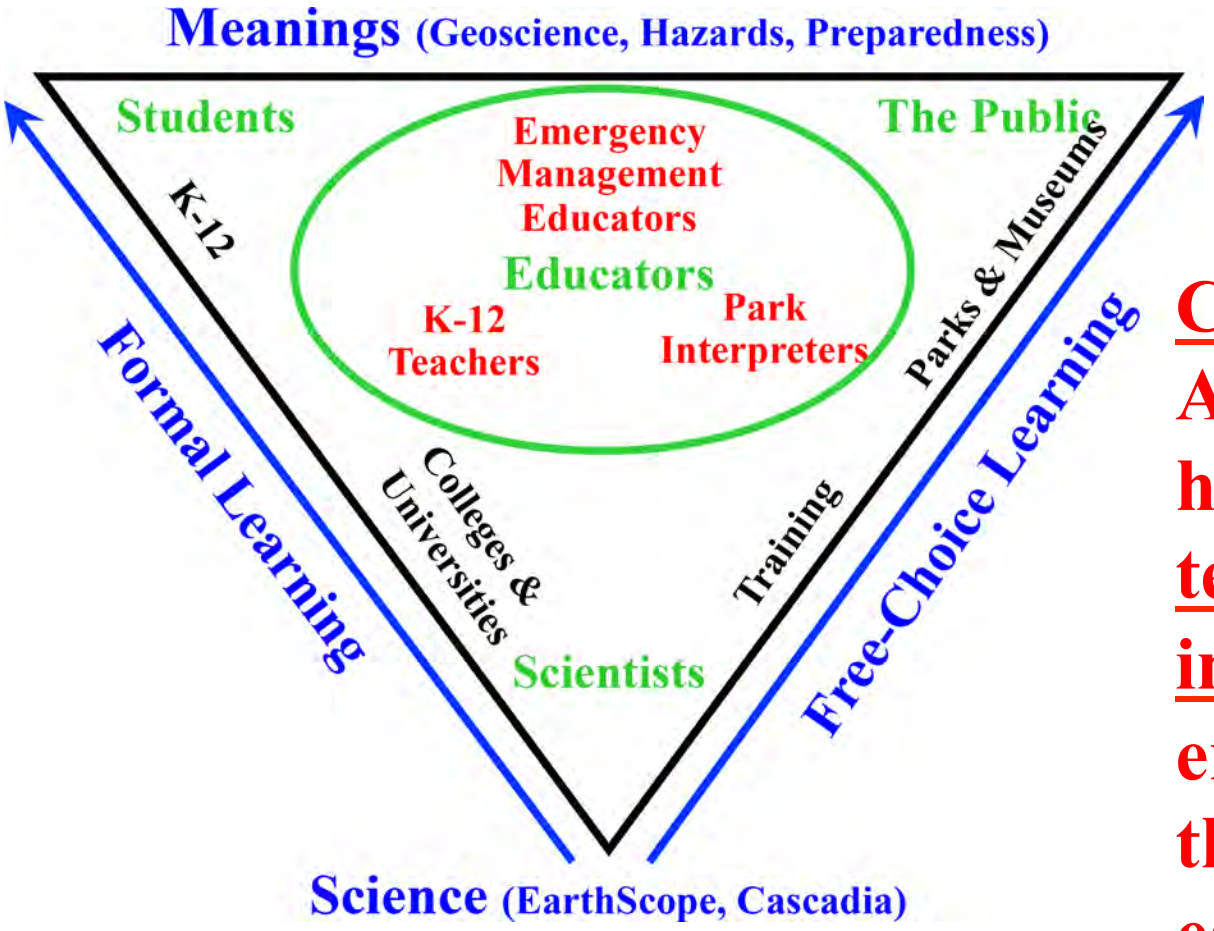

Challenge:
As a community, how do we combine teaching and interpretation to engage students and the public on earthquake/tsunami science and preparedness?

Goal for each Action Team

Work within your local community to implement emergency preparedness plans and teach/interpret subduction zone processes and accompanying hazards in order to advance public understanding of, and preparedness for, earthquakes and tsunamis.

Action Teams:
2 Tasks

1. **Develop and present Action Team Plan**
   - **Develop this afternoon and tomorrow**
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1. Action-Team Presentations (Thursday Afternoon)

Today and Thursday:

Teams develop Action Plans (see page 6)

Thursday Afternoon:

Each team presents a 10-minute overview of their Action Team Project Plan

1. Before each presentation, the team leader announces or describes the following (2 minutes).
    a) Name of the Group (this should be clever ☺)
    b) Title of the Project
    c) Theme Statement
    d) Setting(s)
    e) Audience(s)

2. Then the project overview presentation (10 minutes). You are welcome to use props, posters, PowerPoint slides, etc.

3. After each group presents, workshop participants and instructors will have an opportunity to provide suggestions and comments (8 minutes).

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Previous CEETEP Presentations
OSU Hatfield Marine Science Center
Newport, Oregon

2. Educational Products
(Now - February)

A product or related products that serve:

1. Students
2. Park/museum visitors
3. Concerned citizens

Messaging should include:

1. Some science content, for example:
   - Landscape Development
   - Seismic/GPS monitoring
2. Emergency Preparedness

Time Frame:

- Plan Thursday Afternoon
- Develop Now - February
- Present at March 7, 2015 Share-a-Thon

Examples:

- Posters, Exhibits
- Trail Guides, Brochures
- Presentations at beaches, overlooks, classrooms, visitor/community centers
- Movies, Animations, Flip Books

Oregon Paleo Lands Institute, Fossil, Oregon

2. Educational Products
(Now - February)

Should include direct interaction among team members. Examples:

1. Class visits a park or museum and is engaged by a CEETEP-trained interpreter

2. CEETEP interpreter visits a classroom and collaborates with the teacher on a presentation or activity

3. Teacher presents a children's program at a park or museum

4. CEETEP-trained emergency management educator gives guest presentations in classrooms and museums, and at park beaches and lookouts

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2. Educational Products
(Now - February)

Example of a collaborative project involving multiple Educators, Audiences, and Pedagogy:

- **Emergency Management Educator works on program for Senior Citizen Center**
- **EM Educator Collaborates with Teacher to involve his/her students**
- **Teacher has Interpreter work with students on skit involving earthquake/tsunami science and preparedness**
- **Students present skit at Senior Citizen Center, followed by question/answer session involving Teacher, Interpreter, and EM Educator.**

Elk River Estuary, Washington

Aberdeen, Washington GPS Station