

**Cascadia EarthScope  
Earthquake and Tsunami  
Education Program (CEETEP)**

**Exchange of Pedagogies:  
Interpreting the “Beauty  
and the Beast” Story of the  
Oregon Coast**

*Robert J. Lillie*



## Goal and Objectives CEETEP Training Workshop

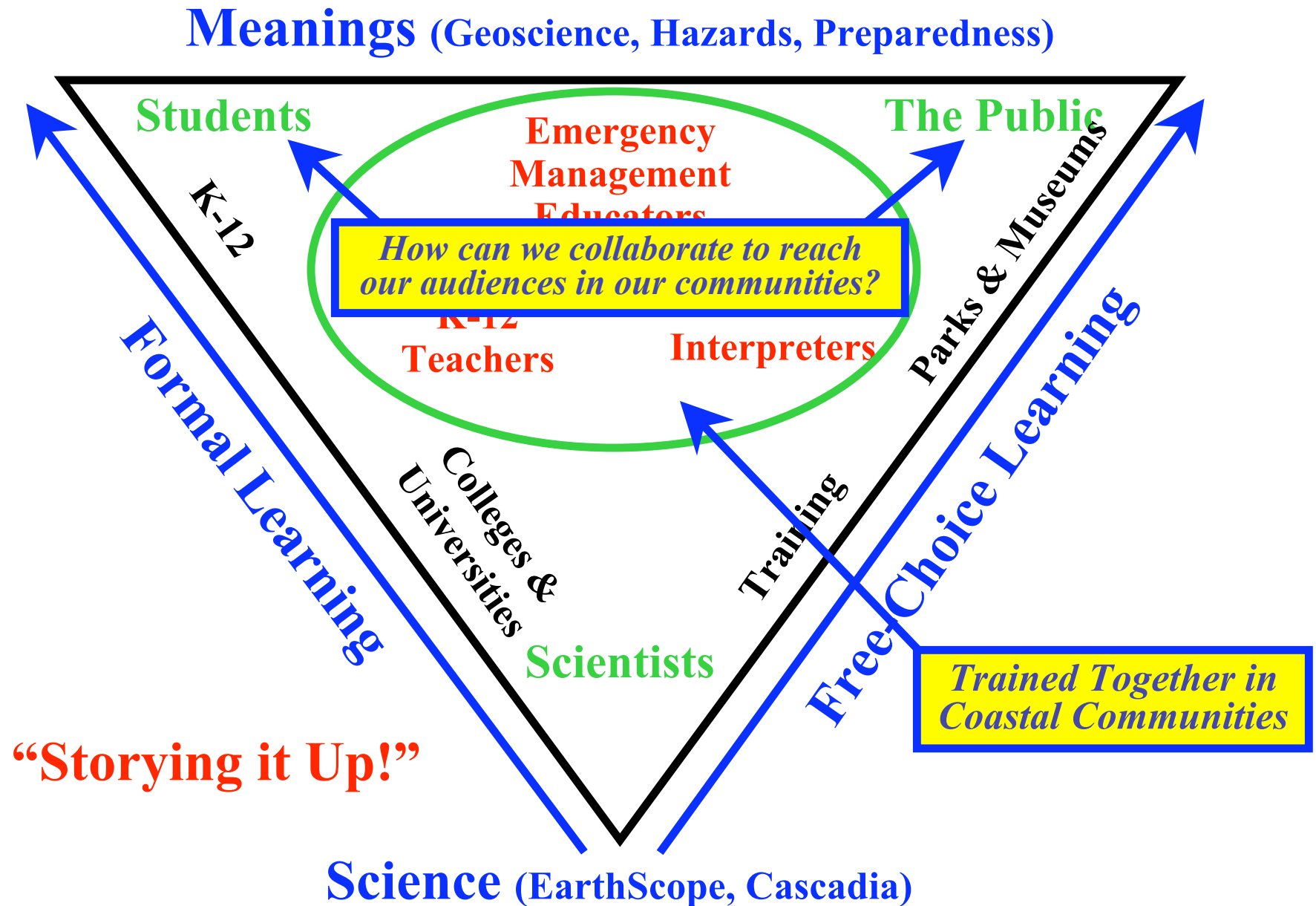
**Goal:** To provide coastal educators with background knowledge, strategies, and materials to engage students and visitors on the science of, and preparedness for, earthquakes and tsunamis.

**Objectives:** Participants will be able to:

- 1. Explain how the Oregon Coast Range formed.**
- 2. Discuss geological hazards of the Oregon Coast.**
- 3. Incorporate the region's geological landscape and geophysical monitoring into lesson plans and interpretive programs that tell the story of the Coast's formation and potential for earthquakes and tsunamis.**

*Beverly Beach State Park, Oregon*

# Cascadia Earthquake and Tsunami EarthScope Education Program (CETEEP)





# Action Teams:

## 2 Tasks

### 1. Develop and present 10-Minute Interpretive Program

- Develop this afternoon
- 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 8 Share-a-Thon

Robert J. Lillie





# Geology for Normal People

*Normal Person:*

*“Anyone who is not a geologist.”*

Robert J. Lillie

*Devils Punch Bowl State Natural Area, Oregon*

# Comments Overheard:

- From park staff:
  - “Gee, it’s wonderful you’re here. We had a geologist here a couple years ago. A nice guy who really knew his stuff. Unfortunately, we didn’t understand a word he said.”
- From a geologist:
  - “Yea, I went to a ranger talk. But the ranger knew nothing about geology. Didn’t even know the difference between a granite and a granodiorite.”



Robert J. Lillie

*Yosemite National Park,  
California*



# Fortune Cookie:

*“Your romantic  
life is interesting  
only to you.”*

*Yaquina Head Outstanding  
Natural Area, Oregon*



# 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)

*Heceta Head Lighthouse State  
Scenic Viewpoint, Oregon*

Robert J. Lillie





# 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.

Robert J. Lillie

*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*

# 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*



Robert J. Lillie

**Large dock washed up on Oregon Coast June 5, 2012.**

## *Agate Beach State Recreation Site, Oregon*





*Agate Beach State Recreation Site,  
Oregon*

**Japan and Oregon:  
Linked by a special  
Sense of Place**

*Robert J. Lillie*



*Interpretation is about revealing  
the rest of the story.*



Robert J. Little

*Agate Beach State Recreation Site, Oregon*

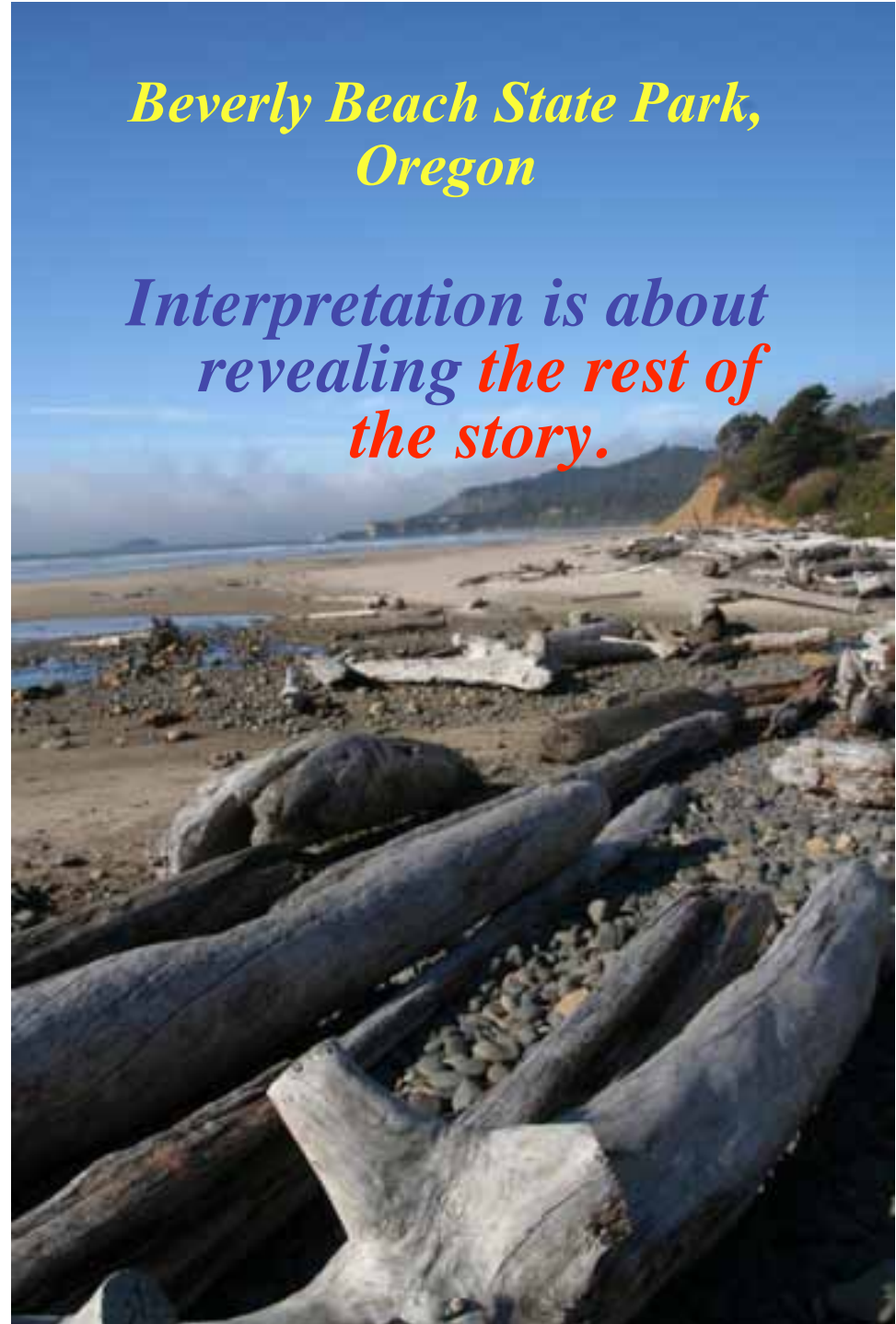
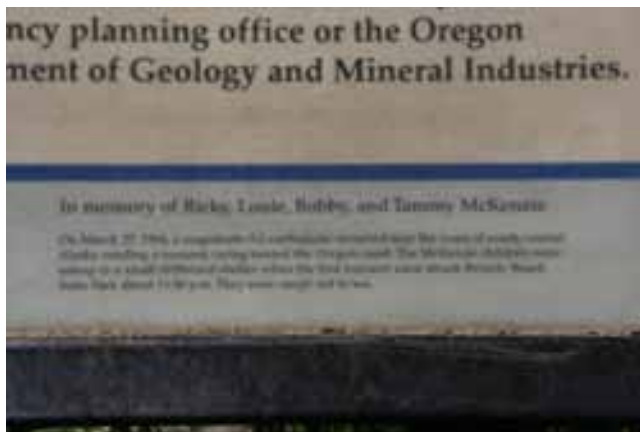
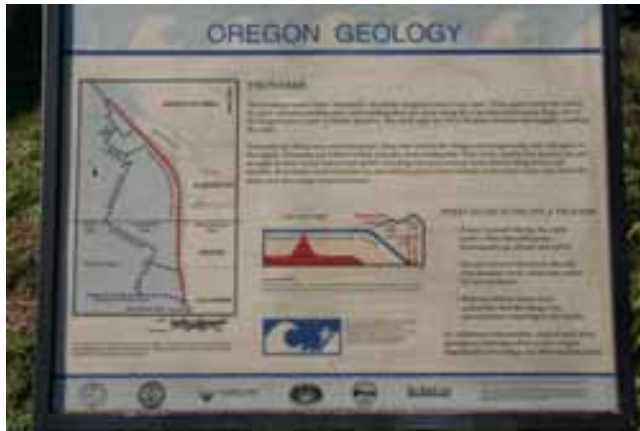


## Japanese Tsunami Dock Interpretive Exhibit



Robert J. Lillie

*OSU Hatfield Marine Science Center, Newport, Oregon*



## *Beverly Beach State Park, Oregon*

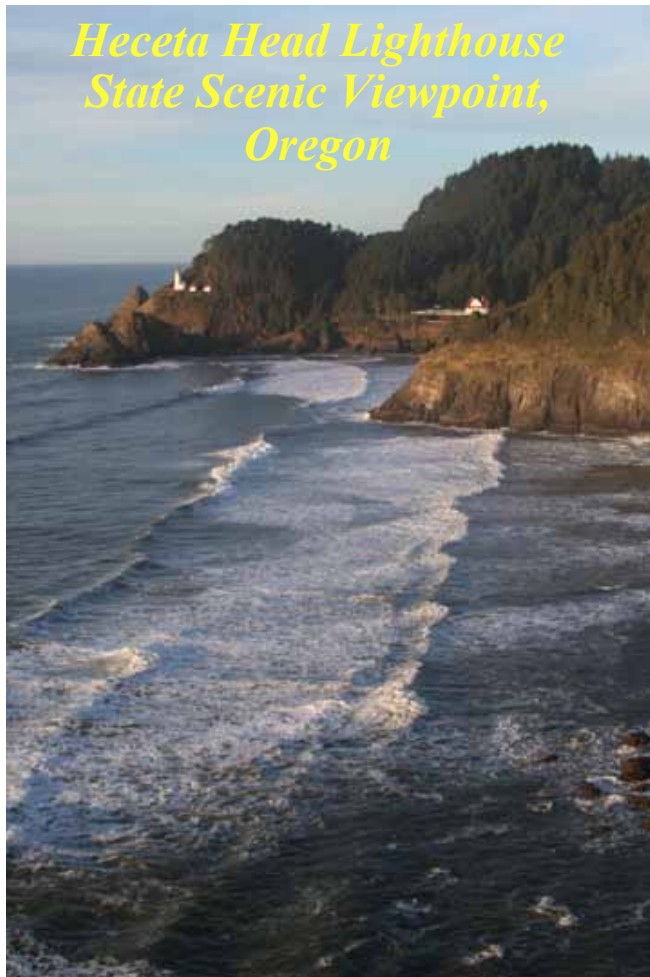
*Interpretation is about  
revealing **the rest of  
the story.***



# It's all about Telling a Story:

## 1. Landscape:

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



*Robert J. Lillie*

## 2. EarthScope and other Geophysical Monitoring:

- Reinforce these connections by highlighting a dynamic Earth.



*Robert J. Lillie*



## Tangibles and Intangibles

### Dock washed up on an Oregon beach .....

- **What do you see when you look at the dock?**  
The physical things you can see and describe are tangibles:  
(Size, shape, color, materials, plants/animals attached, word “Japan”)
- **What about the rest of the story .....**  
Things that come to mind are likely intangibles:  
(Awe, power, destruction, family, struggle, life, death, sense of place)
- **Helpful if some of the intangibles are universal .....**  
Most anyone can relate to them, and tend to be more emotional:  
(Life, death, family, etc.)
- **But some of the intangibles can be scientific .....**  
Also important and tend to be more intellectual:  
(Plate tectonic forces, frequency of earthquakes, causes of tsunamis)

*Agate Beach State Recreation Site, Oregon*

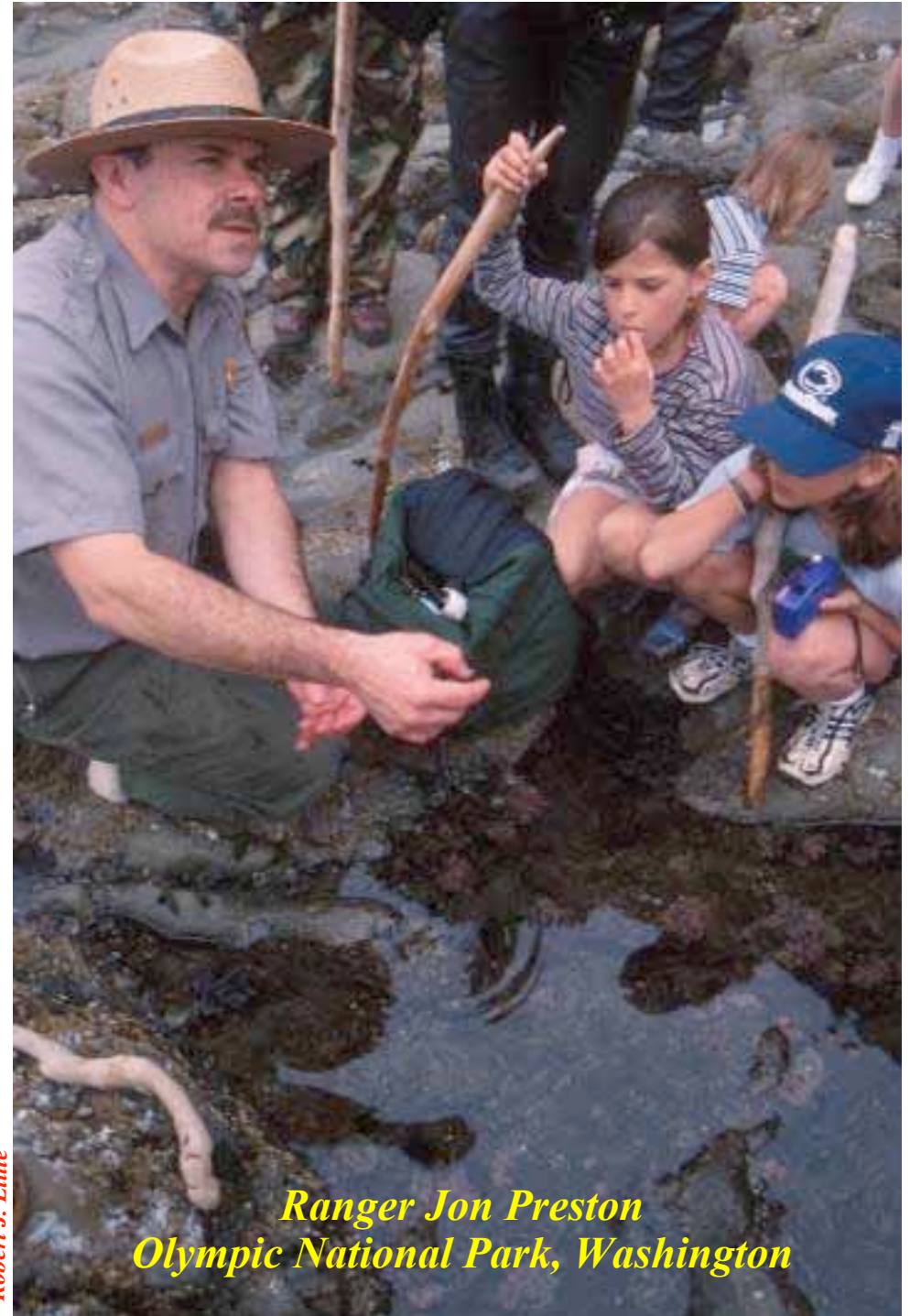
<http://kezi.com/news/local/248218>



# Effective Ranger Program

- Personal experience of the ranger
- Good factual content
- Level appropriate for audience
- Relates factual content to people's lives

Robert J. Lillie



*Ranger Jon Preston  
Olympic National Park, Washington*

# PAIRing People with Parks



Park  
Visitors

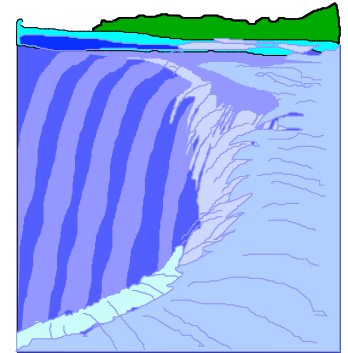
PAIR

Presentation  
Setting

Audience  
Characteristics

Interpretive  
Methods

Resource  
Information



National  
Park

*Adopted from Allyson Mathis, Grand Canyon National Park*



# PAIRing People with Parks



Park  
Visitors

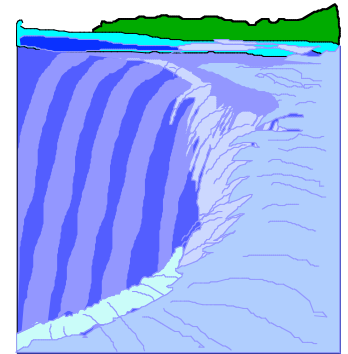
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ntation  
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I R

Interpretive  
Methods

Resource  
Information



National  
Park



A

*Grand Canyon National Park*

*Won't work  
if any link  
is missing!*

# Theme

1. Complete sentence
2. Connects tangibles and intangibles
3. Answers “so what”
4. A message, an idea





## Themes for Cape Arago Region State Parks: Geological Connections

- **Theme: The Cape Arago Region is a dynamic edge where powerful forces shape the land and create a resource-rich environment.**
- **Sub-themes:**
  1. At this coastal edge, landforms shift slowly but constantly through the interplay of natural processes and cycles that occur on a spectrum of scales from large to small.
  2. Sudden, cataclysmic events such as earthquakes and tsunamis change the landscape and present ongoing challenges for coastal communities.
  3. Pinnipeds depend on this coastal edge to rest on offshore rocks and rear their pups in safety. Other communities thrive on this dynamic edge as well.



*North Cove Tidepool Area, Cape Arago State Park, Oregon*



## Beauty and the Beast Theme

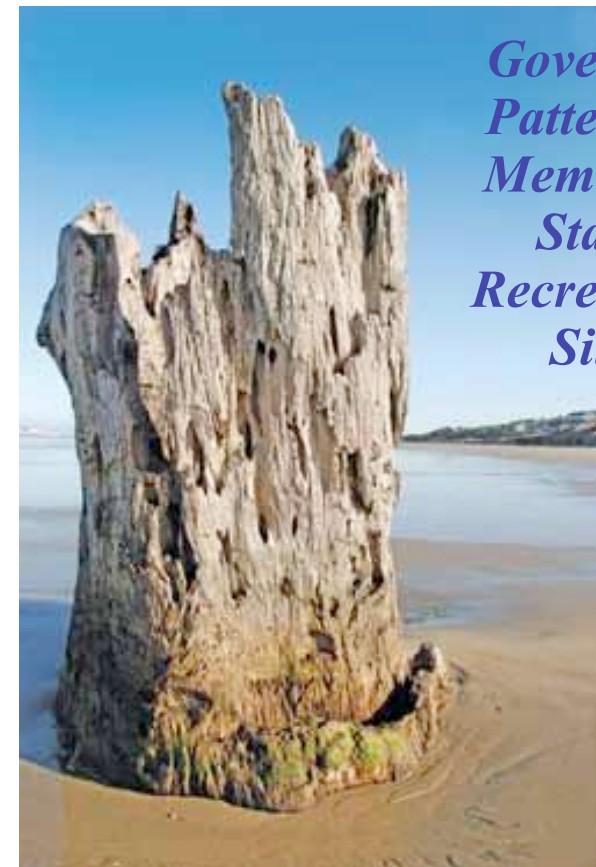


*“The same geological processes that sculpt Oregon’s breathtaking headlands and beaches also threaten our lives with earthquakes and tsunamis.”*



Robert J. Lillie

*Otter Crest State Scenic Viewpoint*



*Governor  
Patterson  
Memorial  
State  
Recreation  
Site*

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



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?



Robert J. Lillie

*Salmon River, Oregon*



Robert J. Lillie

*Newport, Oregon GPS Station*

# Interpretive Presentations

**Groups of 3-5, including at least:**

- one Teacher
- one Interpreter
- one Emergency Management Educator

**Develop presentation today, including:**

- Content
  - Landscape
  - Geological Processes
  - Seismic and/or GPS monitoring
  - Emergency Preparedness
- Might have Props:
  - Posters? Rocks?
  - Slide for background (beach?)

**Thursday Afternoon Presentation:**

- “Fearless Leader” tells us:
  - Name of Group
  - Title of Presentation
  - Setting
  - Audience
  - Theme Statement
- Then:
  - 10-Minute Presentation



Robert J. Lillie

*Newport, Oregon GPS Station*



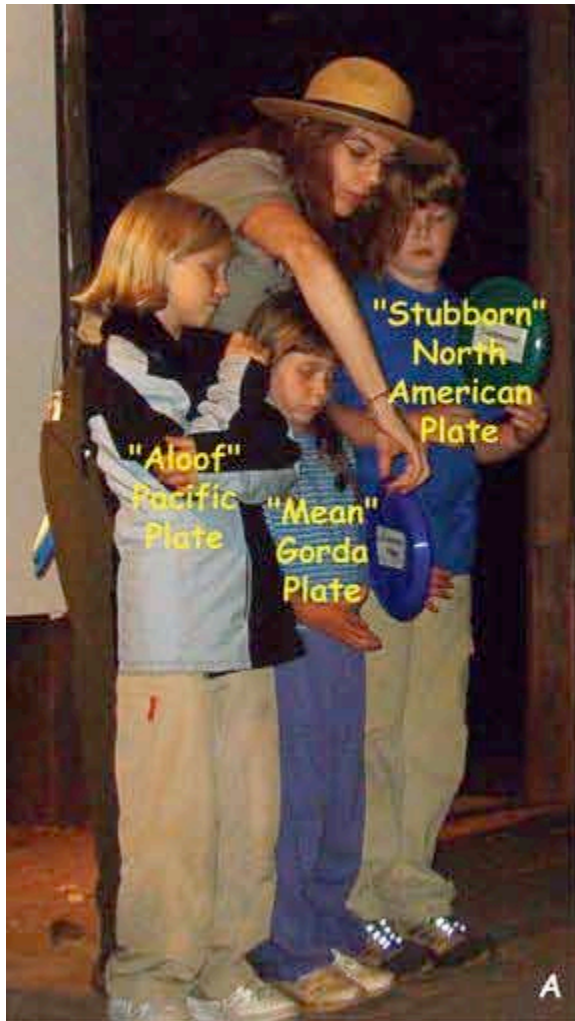
Robert J. Lillie

*OSU Hatfield Marine Science Center,  
Newport, Oregon*



# You've heard of "Fun with Phonics?"

## This is fun with, Plate Tectonics ☺

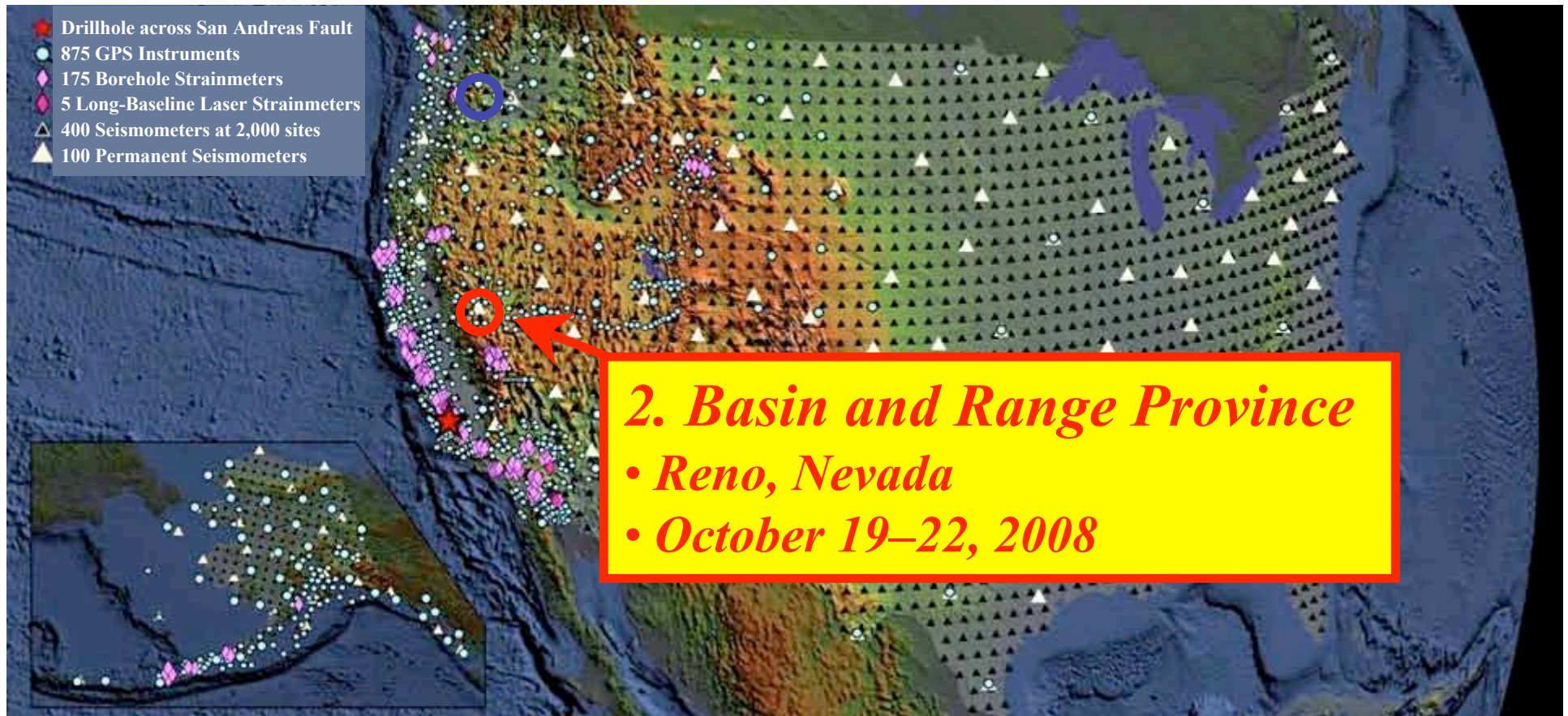


*Jen Natolli, OSU Geosciences Graduate Student  
Park Ranger, Redwood National and State Parks, California*



## For Interpretive Professionals in Parks and Museums

### Monitoring the Dynamic Landscape Enhances our “Sense of Place”





University of Nevada – Reno  
October, 2008

Plate Boundary Observatory  
GPS Station

Slide Mountain, Nevada

Brian Wernicke, Cal Tech



Ellen Bishop

University of Nevada – Reno  
October, 2008

Plate Boundary Observatory  
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Bob Roney



**Plate Boundary Observatory  
GPS Station**

**Slide Mountain, Nevada**

**Bill Hammond, University  
of Nevada – Reno**



Ellen Bishop

*EarthScope Workshop for Interpretive Professionals  
in the Basin and Range Province, 2008*



*We're not  
standing still ...*

**PBO – GPS  
Slide Mountain,  
Nevada**

Robert J. Lillie



*EarthScope Workshop for Interpretive Professionals  
in the Basin and Range Province, 2008*





Robert J. Lillie

*We're moving away  
from Kansas ☺*

**PBO – GPS  
Slide Mountain,  
Nevada**

***Sense of Place: Our place is moving!***

***EarthScope Workshop for Interpretive Professionals  
in the Basin and Range Province, 2008***



# EarthScope GPS Stations

Backbone Network

Subduction Cluster

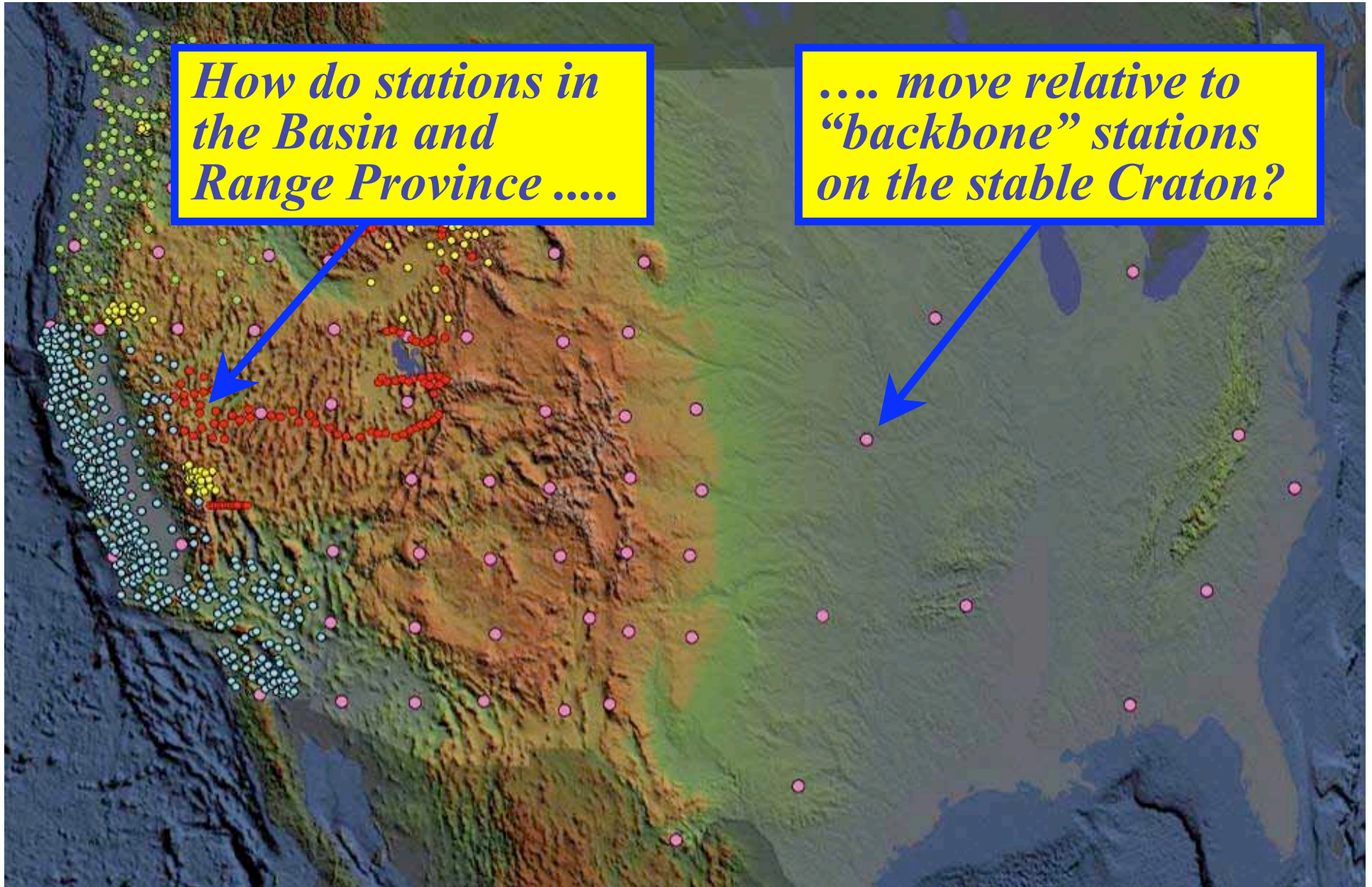
Volcanic Cluster

Transform Cluster

Extension Cluster

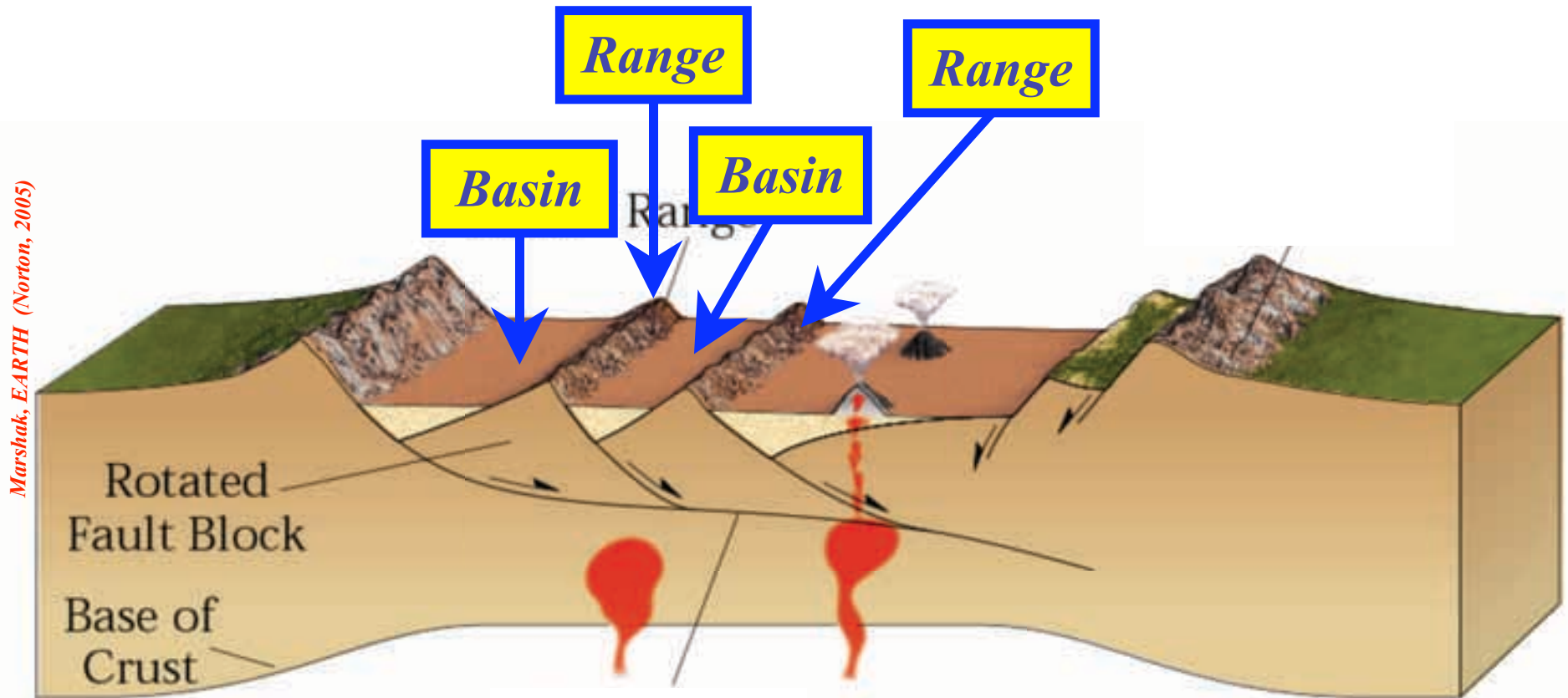
*How do stations in the Basin and Range Province .....*

*.... move relative to “backbone” stations on the stable Craton?*





# BASIN AND RANGE PROVINCE



# Interpretive Presentation: Basin – Range Tectonic Development

*Future  
Mountain Ranges*

Robert J. Illie

*EarthScope Workshop for Interpretive Professionals  
in the Basin and Range Province, 2008*



# Interpretive Presentation: Basin – Range Tectonic Development

Robert J. Little

*GPS*

*GPS*

**Kansas**



*EarthScope Workshop for Interpretive Professionals  
in the Basin and Range Province, 2008*

# Interpretive Presentation: Basin – Range Tectonic Development

*GPS  
Motion*

*GPS  
Motion* **Kansas**

Robert J. Lillie



*EarthScope Workshop for Interpretive Professionals  
in the Basin and Range Province, 2008*



# Interpretive Presentation: Basin – Range Tectonic Development

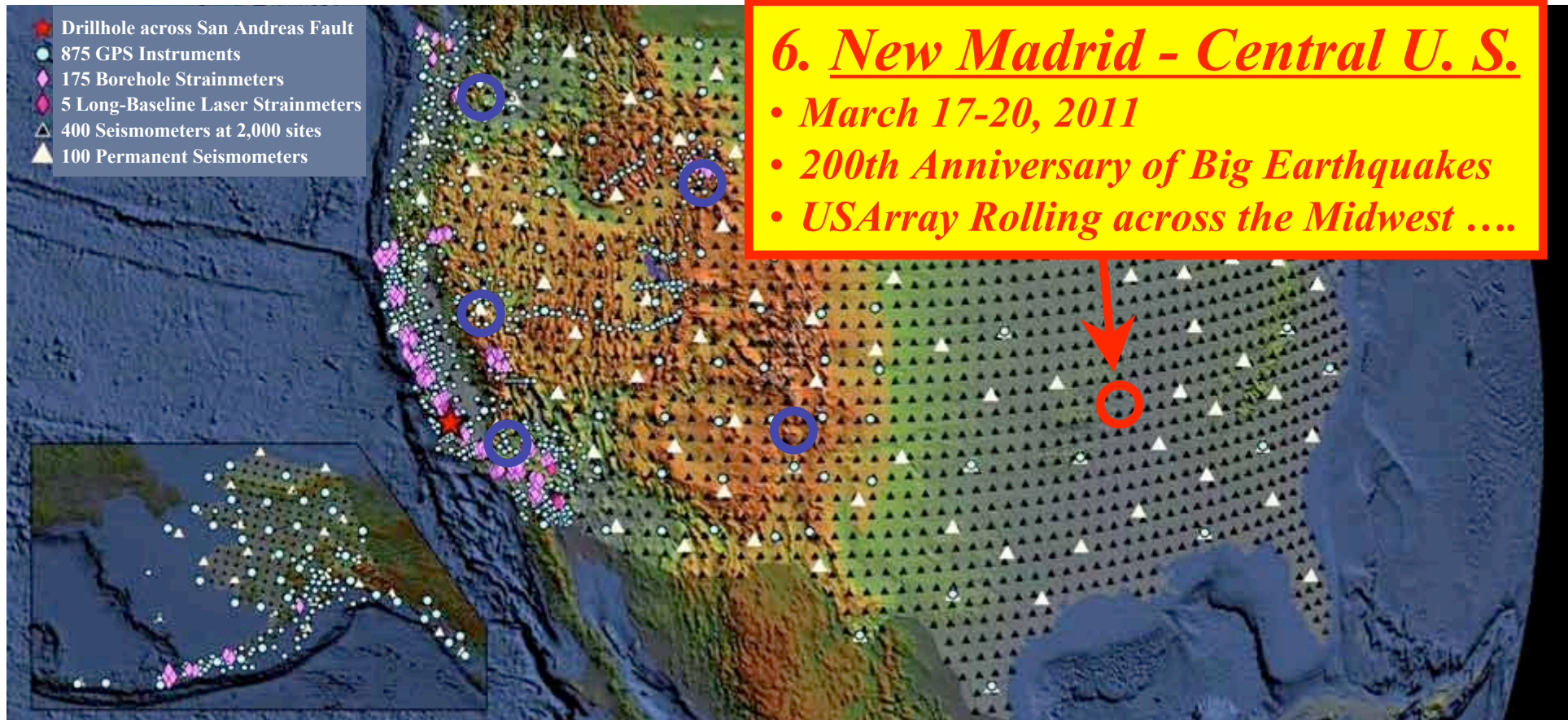
Robert J. Little

*Basin* *Range* *Basin* *Range* **Kansas**

*Sense of Place: Our place is moving and changing!*

*EarthScope Workshop for Interpretive Professionals  
in the Basin and Range Province, 2008*

## For Interpretive Professionals in Parks and Museums Monitoring the Dynamic Landscape Enhances our “Sense of Place”





## *Grace Landforms*



*EarthScope New Madrid -- Central U.S. Interpretive Workshop, March 17-20, 2011*

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*EarthScope New Madrid -- Central U.S. Interpretive Workshop, March 17-20, 2011*

*Shaken' Bacon*

*Who's afraid of the Big  
Bad Earthquake Wolf?*

*Sense of Place: Our home can fall down ....  
But we can do something about it!*



*EarthScope New Madrid -- Central U.S. Interpretive Workshop, March 17-20, 2011*



# Interpretive Presentations (Thursday Afternoon)

## Develop presentation today, including:

- Content
  - Landscape
  - Geological Processes
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- Might have Props:
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Robert J. Lillie

*Newport, Oregon GPS Station*



Robert J. Lillie

*OSU Hatfield Marine Science Center,  
Newport, Oregon*

# Educational Products (Now - February)

A product or related products that serve:

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

Messaging should include:

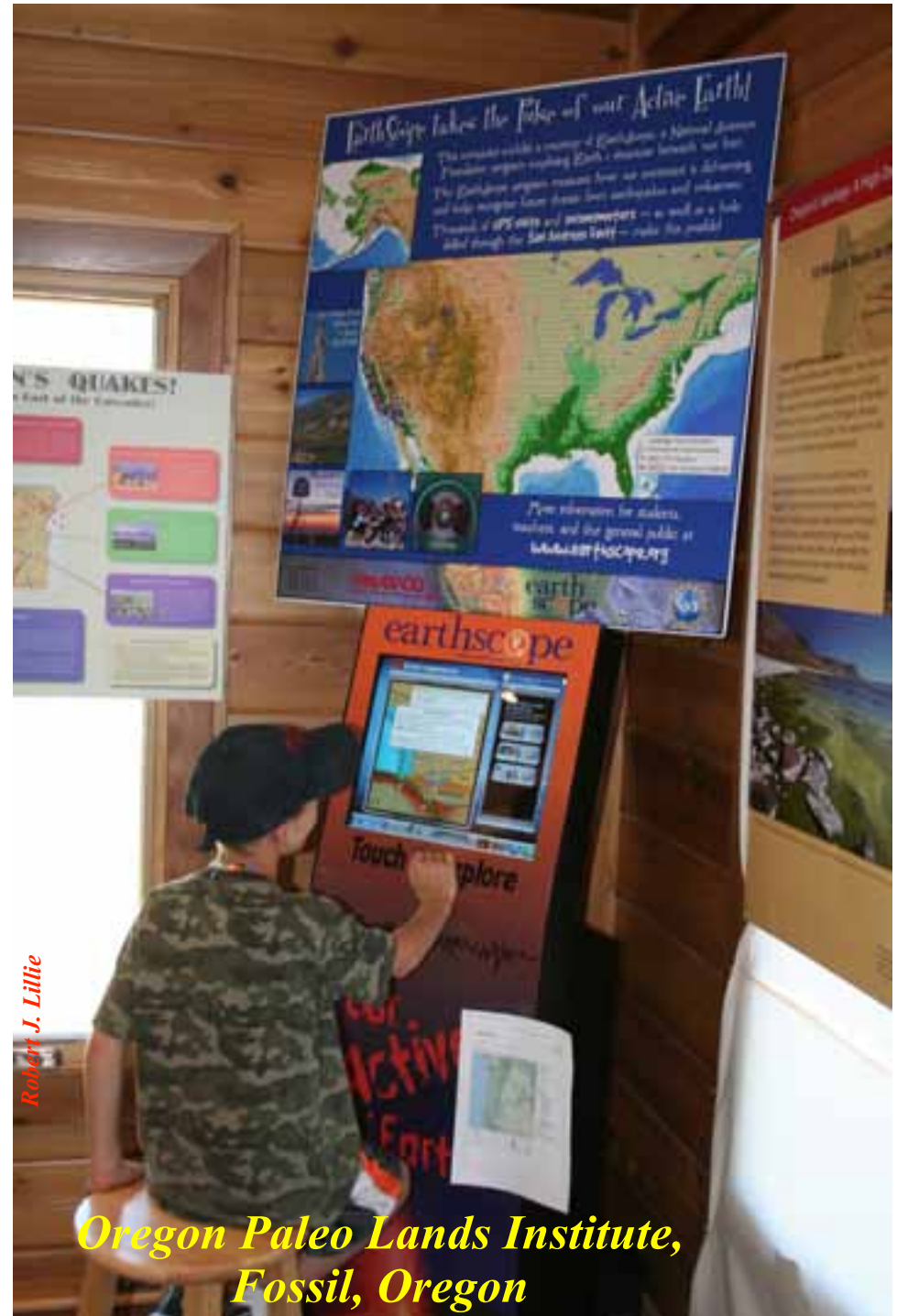
1. Some science content, for example:
  - Landscape Development
  - Seismic/GPS monitoring
2. Emergency Preparedness

Time Frame:

- Plan Thursday Afternoon
- Develop Now - February
- Present at March 8, 2014 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*



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## Kip's “Ideal” Example:

- 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.

