



RET II Curriculum Plan

Getting students to think about how Water and Earth interact

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Inspiration and Goals

- Building interest in the natural world.
- Getting students involved/interested/caring about...
- This:



Instead of:



My Classes

9th grade Earth Science

Most students here are not honors or AP.

They come from a wide variety of middle schools.

Some don't cover science well.

Demographic is disconnected from nature.

Computers? Tablets? Not really happening on a 1:1 scale yet.

RET 1: What can a marsh tell us about past Earthquake events?

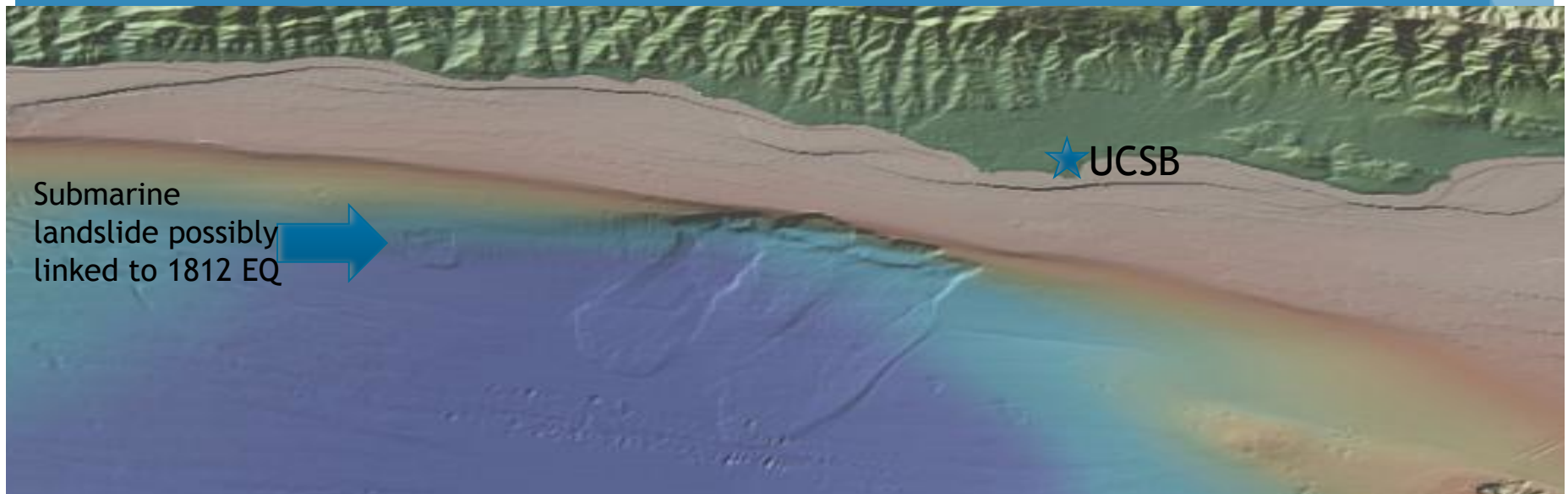
It can tell us many things actually:

- Preserves environments of the past (buried)
- Physical evidence for historical accounts
- Further evidence to support scientific theories (plate tectonics)

In addition, understanding the information preserved in the marsh can help us to be aware of potential *future* disasters.

Last years purpose of research

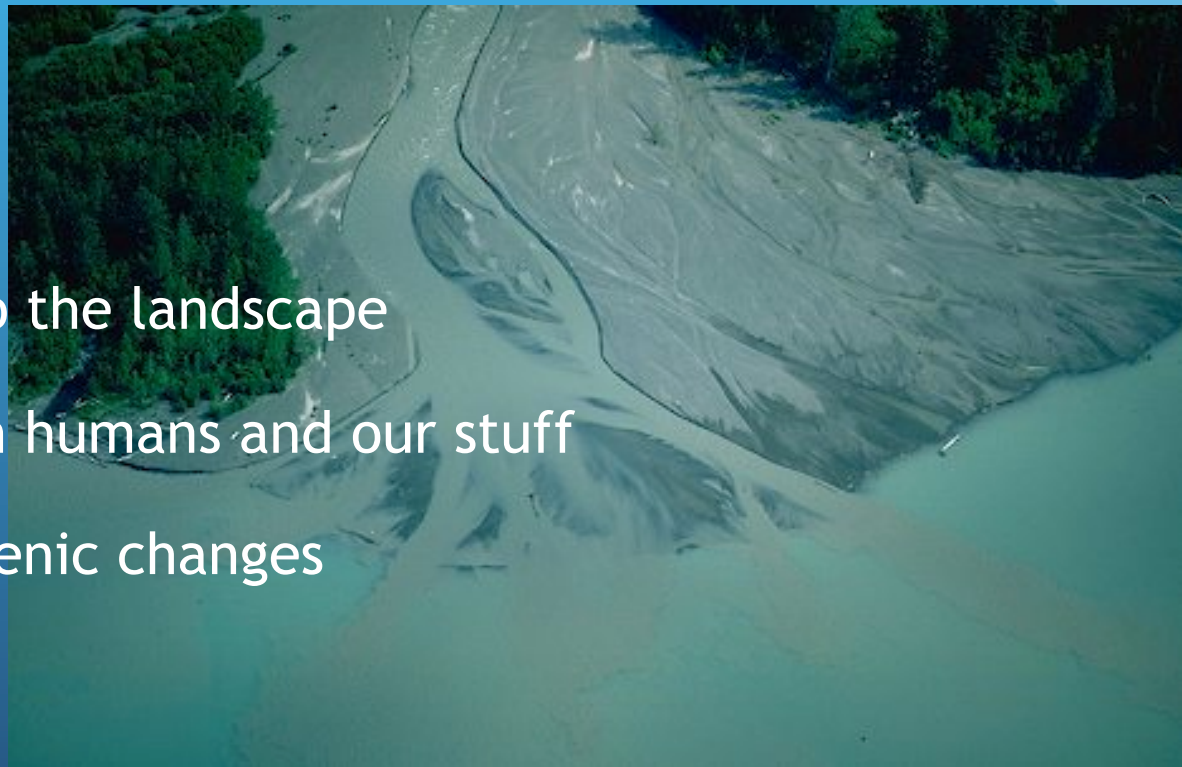
- Count charcoal particles in cores from Carpinteria Slough in order to establish an additional date constraint for the deposition of a sand layer found throughout the marsh.
- Sand layer is theorized to have been the result of a localized tsunami event caused by an earthquake and subsequent submarine landslide in the Santa Barbara Channel on 21 December 1812.



RET II connections: Water = Change

When water and Earth interact, interesting things happen:

- Erosion
- Deposition
- Changes to the landscape
- Impacts on humans and our stuff
- Anthropogenic changes



Activity Design

- Activities 1-3 Science Inquiry and Experimentation
 1. Students will observe a stream table and examine in miniature what happens when water moves over land.
 2. Students will design an experiment to measure stream velocity.
 3. Students will design and execute an experiment to model chemical weathering.
- Activities 4-5 Properties of Soil
 4. Sponge lab : an analog for soil porosity
 5. Soil Percolation lab : Students will test soil samples and collect data on permeability.

Unit Assessment

- Students will use all the knowledge gained in the previous activity to design a riverfront development that has the least impact on the environment and their neighbors.
 - Erosion
 - Pollution
 - Freshwater source
 - Waste disposal
 - Control runoff

NGSS

- HS ESS 2-5 Planning an investigation of the properties of water and its effects on Earth's materials and surface features.
- How to do it?
 - Models
 - Analogs for surface features
 - Small scale, repeatable

Where does it fit?

A curriculum in flux...

My other summer project, new digital curriculum.

Right now it is sandwiched between rocks and oceans.

This would be a 2 week unit.

The screenshot displays a digital curriculum interface. On the left, a table lists units with their respective durations. The 'Unit 6: Hydrology' unit is highlighted in blue. On the right, there are two panels for resource management. The top panel is titled 'Engage: Active Reading Resource' and shows a list of resources including 'oceanography-midoceanridgereading' and 'icelandreading'. The bottom panel is titled 'Engage: Activity Resources' and shows a resource named 'seafloorfeatureshandout'. Below these panels, there is a section for 'Explore: Lab/Activity Resources'.

Unit 1: Expanding Universe	25
Unit 2: Life Cycle of Stars	33
Unit 3: Motion of the Universe	11
Unit 4: Formation of the Solar System	13
Unit 5: Plate Tectonics	43
Unit 6: Hydrology	26
Unit Narrative	
Engage: Active Reading Resources	2
Engage: Activity Resources	1
Explore: Lab/Activity Resources	2
Explore: Video Resources	

Engage: Active Reading Resource

New Add Existing Activities

oceanography-midoceanridgereading

icelandreading

Engage: Activity Resources

New Add Existing Activities

seafloorfeatureshandout

Explore: Lab/Activity Resources

Stream Table Activities

- Activity 1 Observing
- Witness a run on the stream table, record the features that develop
- Activity 2 Designing a lab
- Given materials, design an experiment to test how velocity affects deposition



Stream Table Activities What's the big deal?

Students will have a chance to witness thousands of years of 'action' in only a few minutes:

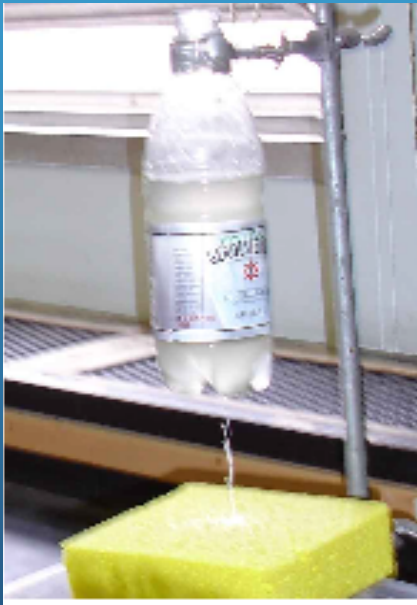
[Life of a Stream](#)

Some of what will students be doing.

- Observe and model with large stream table
- Draw it! Describe what you saw!
- See activity 1 in packet

Sponge runoff activity

- Examining infiltration and runoff
- How is a sponge like the soil?



What did I learn?

- Challenges to the status quo (NGSS)
- Let students work it out
- Good science takes time

Thank You

- Dr. Alex Simms and the Sedimentology Department
- Frank Kinnaman - Taskmaster
- Teresa Leza - RET II compadre
- UCSB and MRL

Practicality of hands on components

- Will the stream table work? Where will it be in the classroom for everyone to see?
- Stream Table
- Smaller versions
 - Repeatable
 - Not messy
 - Rainfall simulator/infiltrimeter
- Soil runoff lab - apparatus needs to be built