Active Learning in a large lecture classroom

120-150 non-science majors
GE Intro to Physical Geology “lecture” section *(with labs taught by TAs)*
Large(ish) lecture hall

Challenges

Time[1]- too many topics in my syllabus

Solution- Triage the syllabus- what topics *need* more/less attention?

Time[2]- 50 minute class periods

Known: For any given topic, interactive lecture format ***will*** take longer than traditional lecture

Solution- skip the textbook stuff- they can read!!!!

(& take graded reading quizzes daily!)

Challenges

Time^3: What works? (for me & for students)

Solution (?): PLAN PLAN PLAN!

- Start small
- Steal resources (InTeGrate/SERC etc.)

Be ok with stuff not working, reflect, revise, repeat

My Activities Goal:

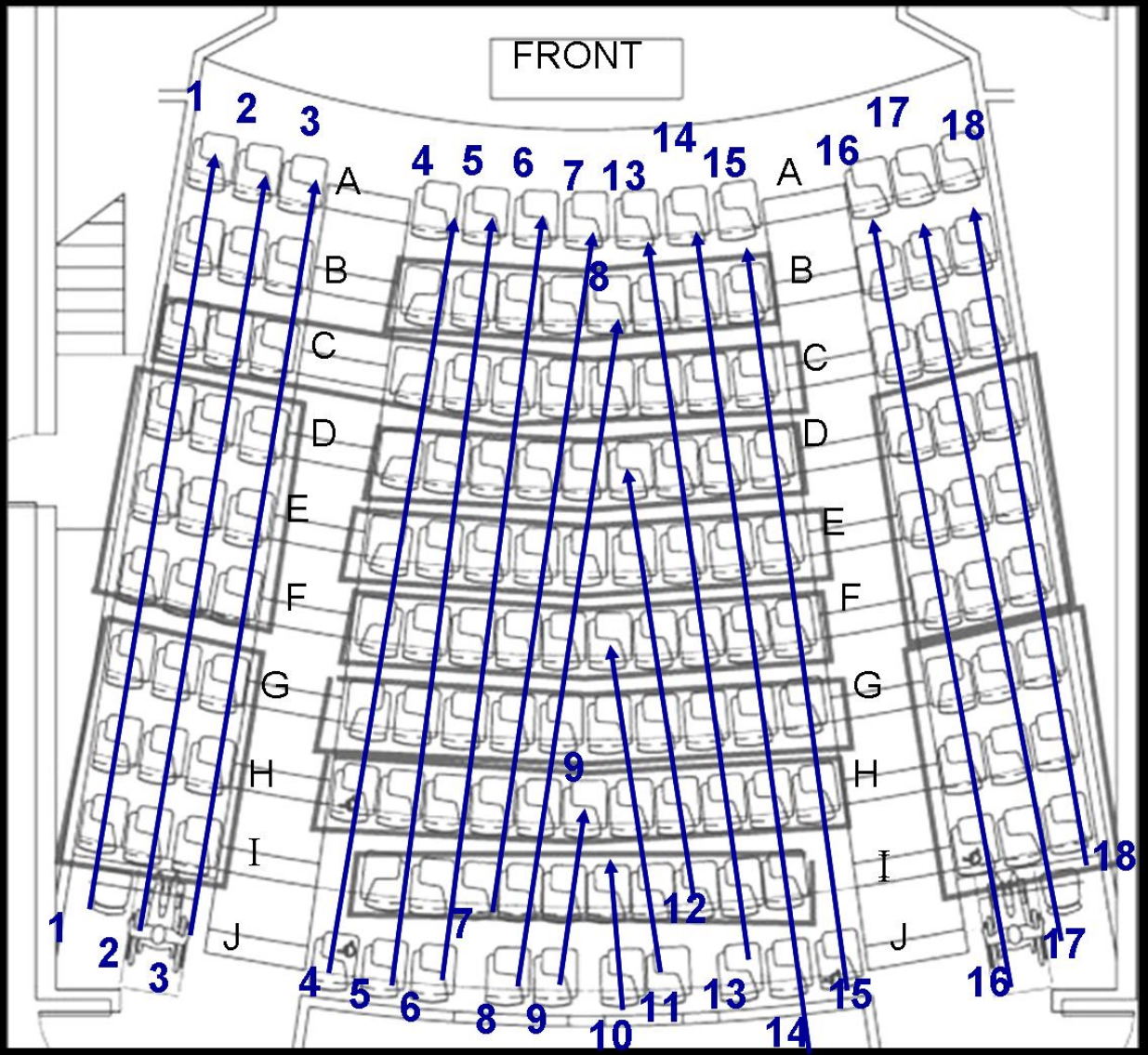
One activity each class period to have students work together…

- with the use of data *&/or*
- on topics relevant to them *&/or*
- on topics relevant to northern California regions
- Interact with me (a little)

Reality:

Pretty much works- not all are clever, but get better every term:

Can we do interactive activities with a big group? How?



Turn them into a bunch of small groups

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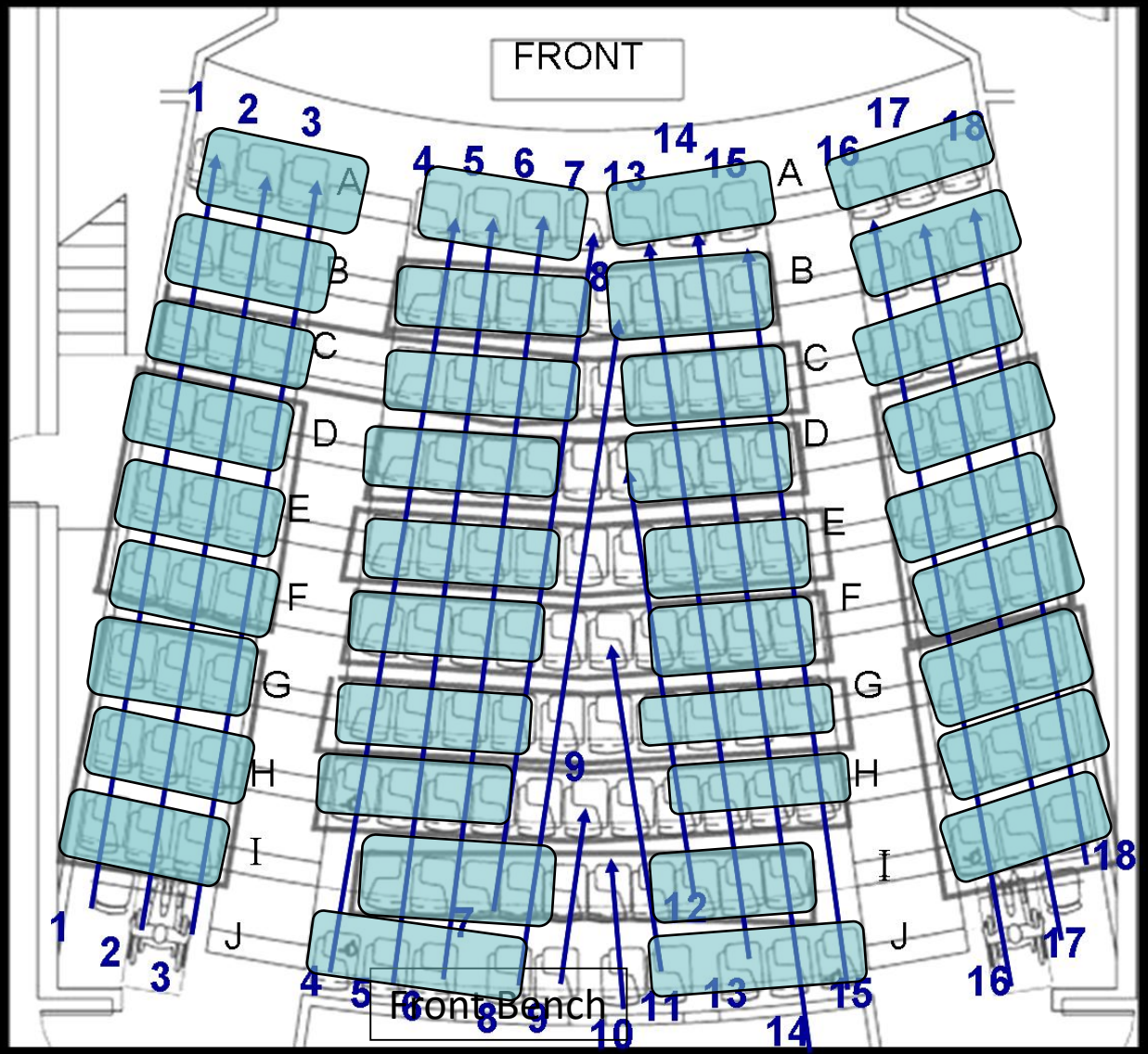


Turn them into a bunch of small groups

Pod Activities- work together, local

Recurring Map

ID Coast Lines
Mtns (Sierra, accretionary terrains)
Structural Geology (Basin & Range, SAF)

For later use on sea level change,
Geologic dev western N. Am;
EQ hazards

Pod Activities (work together, local, relevant)

"Think – Pair – Share" format

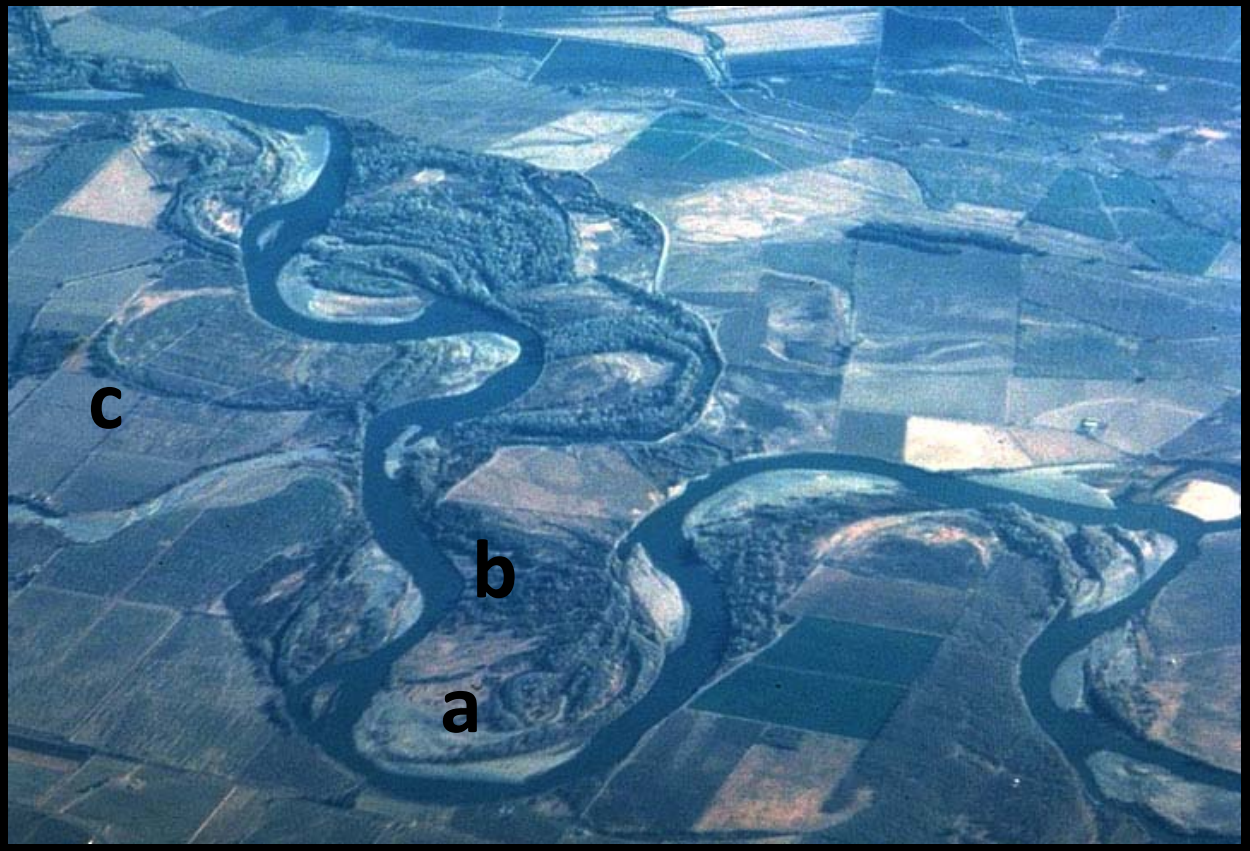
Example:

Where is the best place to build your dream home?

a)

b)

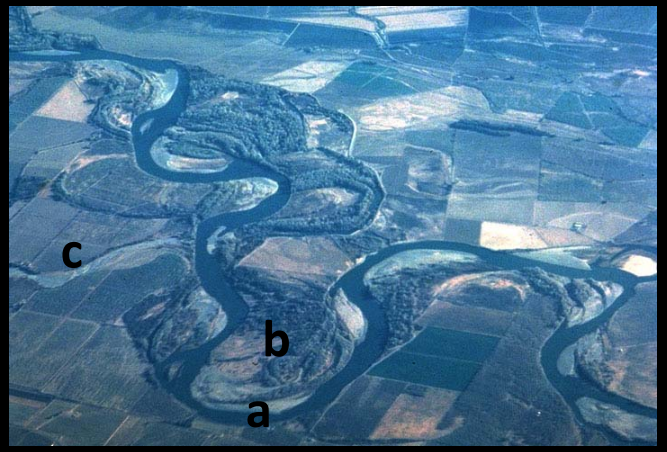
WHY???



How does Sacramento River play into politics of northern California?

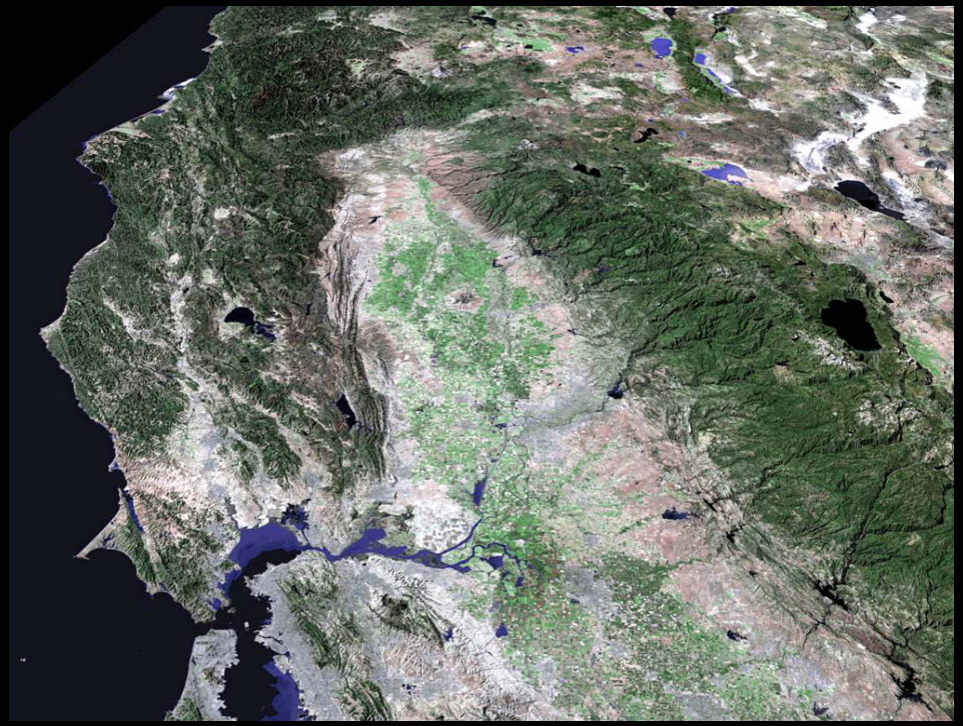
Pod Activities (work together, local, relevant)

"Think – Pair – Share" format



(After answering MC question):

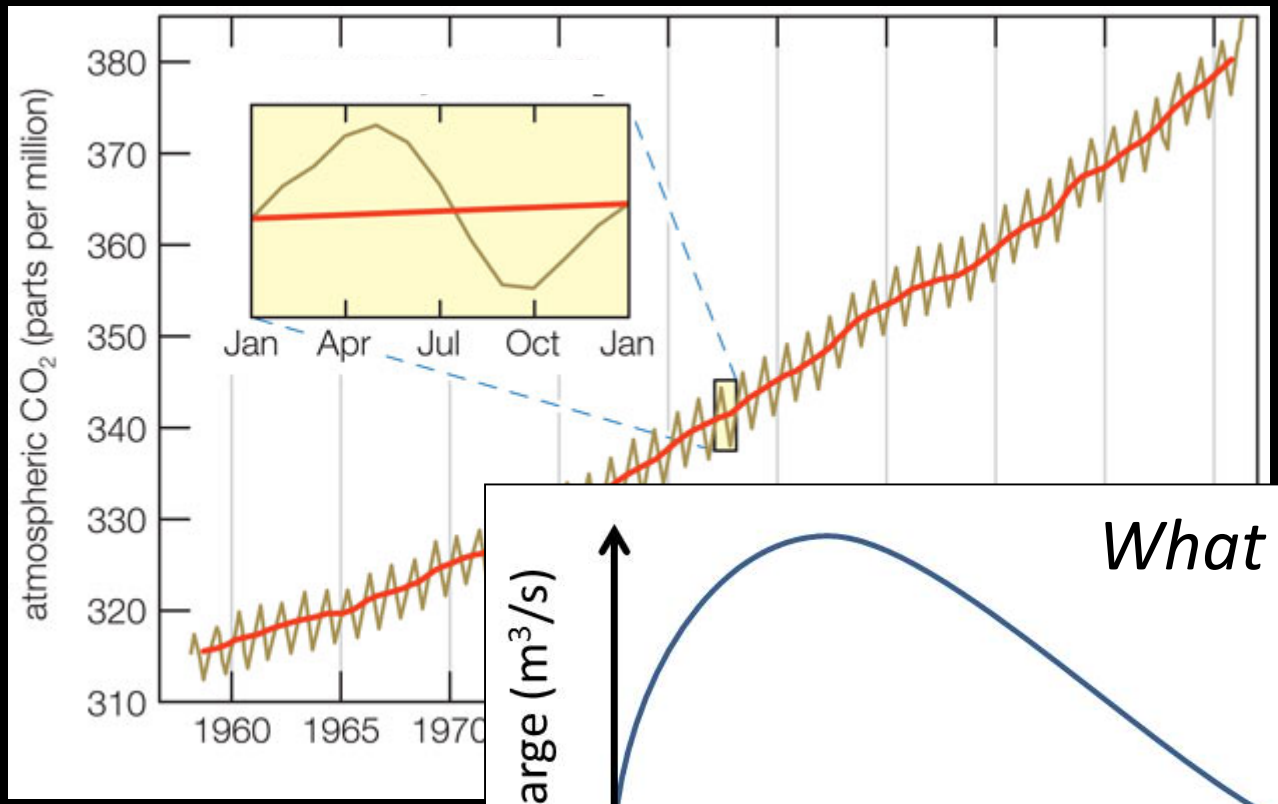
Find location of Sacramento River on map of Northern California. Where are headwaters, where does it drain to?

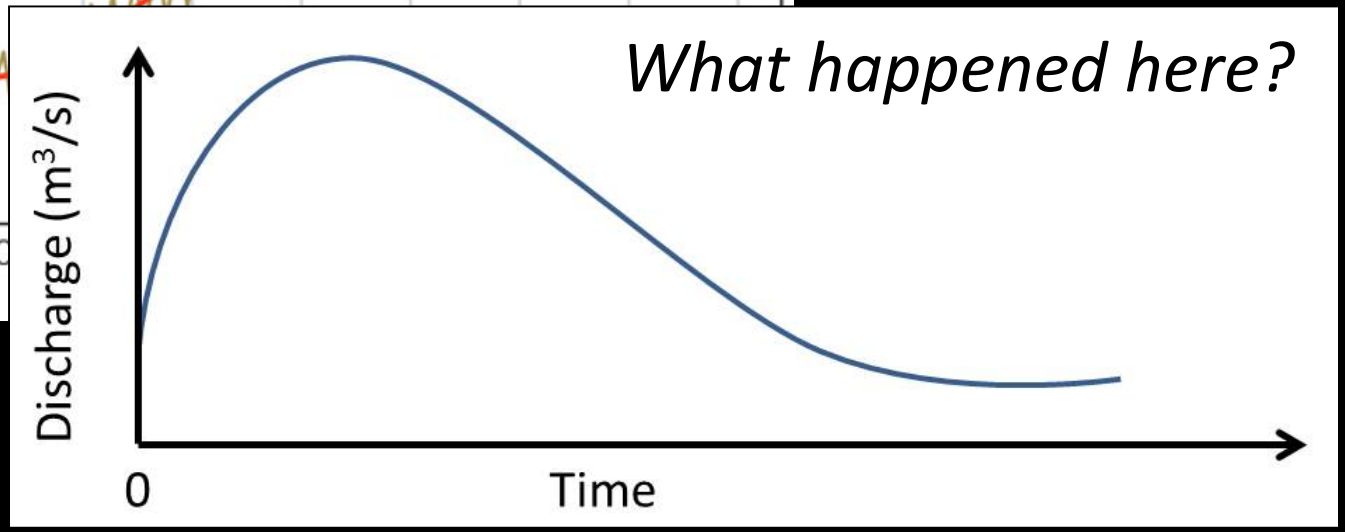


How does Sacramento River play into politics of northern California?

Pod Activities: Use of data

What is it? (Keeling Curve)



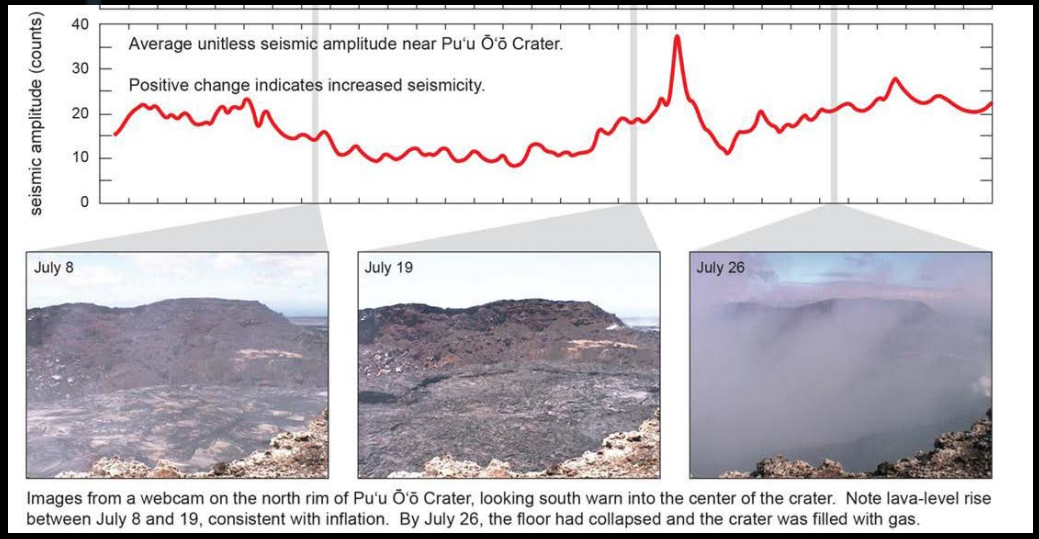


https://scripps.ucsd.edu/programs/keelingcurve/

Pod Activities: Use of data, scientific collaboration, work like scientists

Monday Morning Meeting:

Jigsaw- 4 types of data, each pod reviews time series data to become “experts”



Images from a webcam on the north rim of Pu‘u Ō‘ō Crater, looking south warn into the center of the crater. Note lava-level rise between July 8 and 19, consistent with inflation. By July 26, the floor had collapsed and the crater was filled with gas.

http://nagt.org/nagt/teaching_resources/vepp/examples/48383.html

Pod Activities: Use of data, scientific collaboration, work like scientists

Monday Morning Meeting:

Jigsaw- 4 types of data, each pod reviews time series data to become "experts"

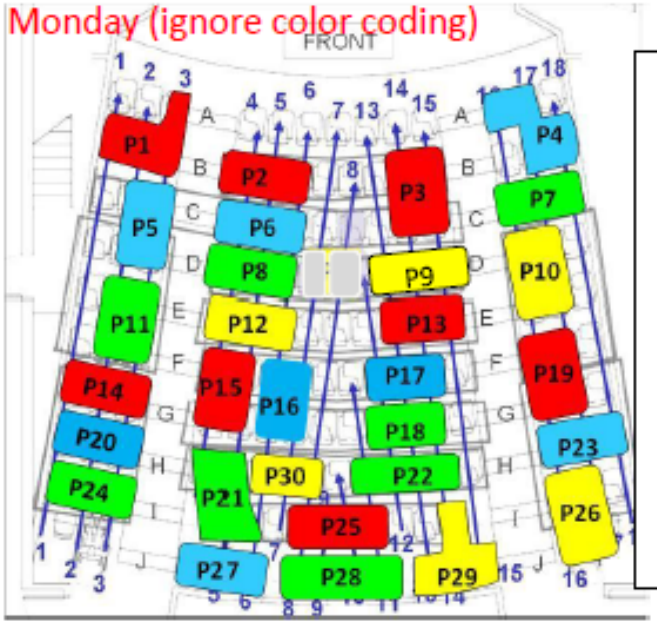
Experts discuss trends (earthquake locations & frequency, tilt data)

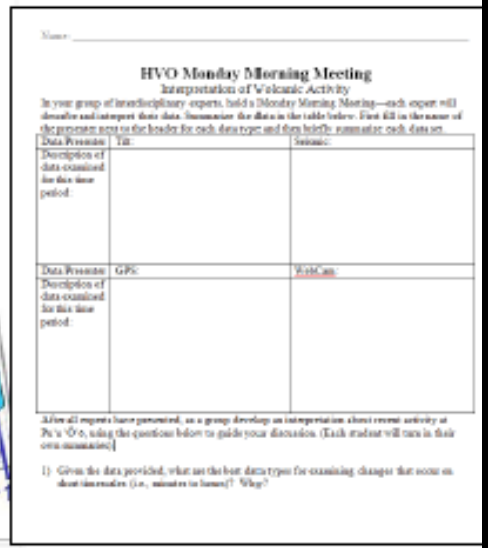
2nd day: Class reconfigures to one discipline expert per group,

Discuss data trends,

make eruption forecast

Seating Today: Go to pod number on the worksheet you completed on Monday (ignore color coding)





HVO Monday Morning Meeting

Interpretation of Volcanic Activity

In your group of interdisciplinary experts, hold a Monday Morning Meeting—each expert will describe and interpret their data. Summarize the data in the table below. First fill in the name of the pertinent area in the header for each data type and then briefly summarize each data set.

Data Presenter:	Tilt:	Seismic:
Description of data examined for this time period:		
Data Presenter:	GPS:	EvenCam:
Description of data examined for this time period:		

After all experts have presented, as a group develop an interpretation about recent activity at Pu'u 'O'o, using the questions below to guide your discussion. (Each student will turn in their own summaries.)

1) Given the data provided, what are the best data types for examining changes that occur on short timescales (i.e., minutes to hours)? Why?

In your new group, complete the worksheet:

HVO Monday Morning Meeting: Interpretation (1 per person)

Do NOT leave when done! (raise your hand & I'll give next info)

http://nagt.org/nagt/teaching_resources/vepp/examples/48383.html

Student buy in (especially pre-work)

Structure of my class:

Give ‘em points for doing what I want them to ***do*** (learn!)--

a. Participation in class (stuff they turn in)
b. Reading assignments (w/ Bb quizzes that close before class)
c. Exams
d. Labs

{

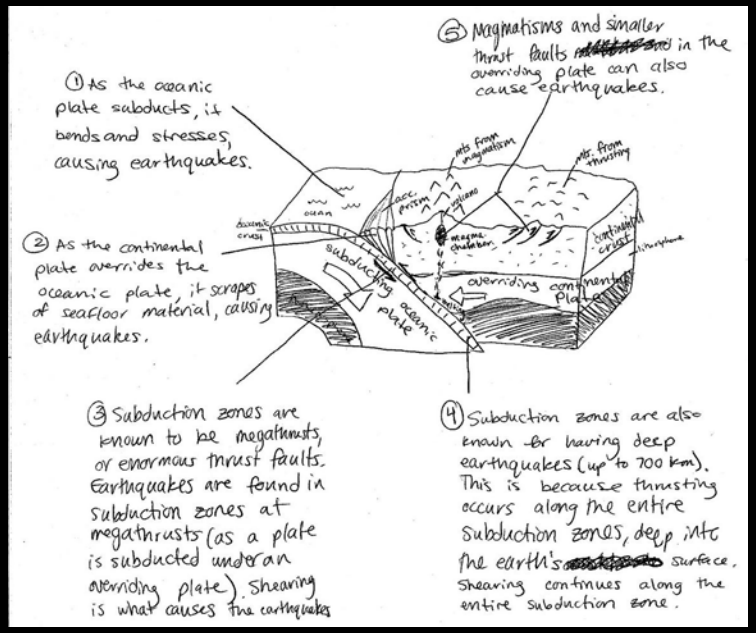
Graded Item	% Possible	% Earned
Lecture Class Participation	10%	
Reading Quizzes	10%	
Lecture Exam 1	15%	
Lecture Exam 2	17%	
Lecture Exam 3	18%	
Labs + Lab Exams	30% total	
Total Points Possible	100 %	

Group Exams

Exams: Similar format as class activities
multiple choice questions
short answer: concept maps/sketches
both practiced during class, individually & with pod

1st day of exam is MC + short answer
worth ¾ of exam score
taken as individuals

2nd day of exam is optional, in pods,
MC only
worth ¼ of exam score



Results

- 2nd day of exam scores

= avg score increases by ~7 pts

- Max scores go up 4 points

http://serc.carleton.edu/68879