Designing and Implementing Field Experiences through Distance Learning

Saturday Seminar
May 16, 2020

Important web links

Public-Facing Project Page:
https://nagt.org/nagt/teaching_resources/field/designing_remote_field_experie.html

List of online camps with space available for students:
https://nagt.org/nagt/teaching_resources/field/summer_2020_virtual_field_camp.html

Assessment Workspace:
https://nagt.org/nagt/about/workspaces/field_workgroup/assessment.html

Field Skills & Attitudes Self-Assessment Form:
https://universityofsouthcarolina-yrckc.formstack.com/forms/virtual_field_camp_summer_2020

Project Overview

NSF RAPID (#2029920): support for learning outcomes development, activity development, and new digital infrastructure

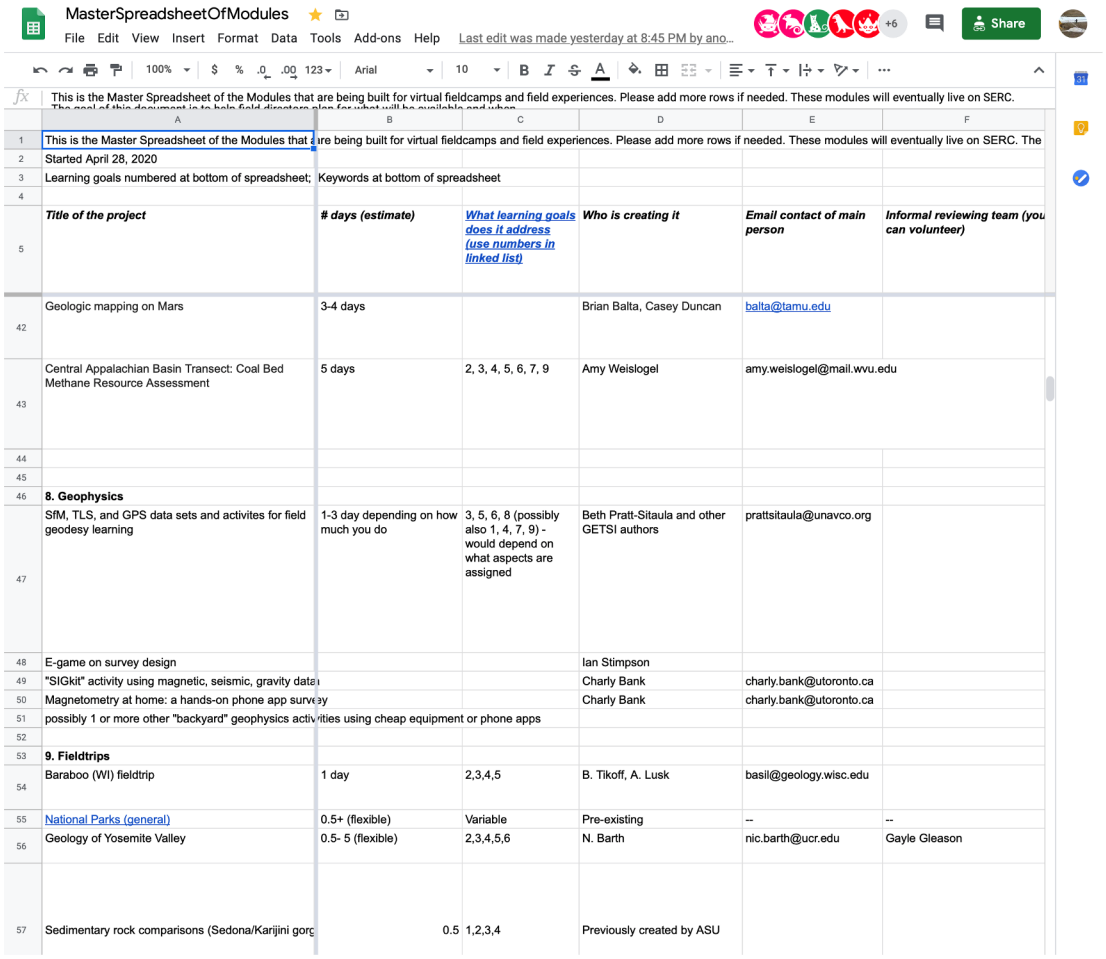
What's available: master spreadsheet of modules
https://docs.google.com/spreadsheets/d/1LomGkHOIp1TfsTZNRZFNR6vpoTcTcABNmWM9_OGULD8/edit#gid=0

Feedback channels: 3 avenues for help

- **Field listserv**
- **Direct contact w developers**: pls use to compile FAQ or strategies section on activity page
- **Summative instructor stories**: *"Used this activity? Share your experiences and modifications"* section at bottom of the module page

Master Spreadsheet

- Help field directors/activity implementers to plan - what will be available & when
- Please add your project where appropriate (add rows if needed)
- Modules will live on the SERC Teach the Earth site



MasterSpreadsheetOfModules

File Edit View Insert Format Data Tools Add-ons Help Last edit was made yesterday at 8:45 PM by ano...

Share

This is the Master Spreadsheet of the Modules that are being built for virtual fieldcamps and field experiences. Please add more rows if needed. These modules will eventually live on SERC.

	A	B	C	D	E	F
1	This is the Master Spreadsheet of the Modules that a	re being built for virtual fieldcamps and field experiences. Please add more rows if needed. These modules will eventually live on SERC. The				
2	Started April 28, 2020					
3	Learning goals numbered at bottom of spreadsheet;	Keywords at bottom of spreadsheet				
4						
5	***Title of the project***	***# days (estimate)***	***What learning goals does it address (use numbers in linked list)***	***Who is creating it***	***Email contact of main person***	***Informal reviewing team (you can volunteer)***
42	Geologic mapping on Mars	3-4 days		Brian Balta, Casey Duncan	balta@tamu.edu	
43	Central Appalachian Basin Transect: Coal Bed Methane Resource Assessment	5 days	2, 3, 4, 5, 6, 7, 9	Amy Weislogel	amy.weislogel@mail.wvu.edu	
44						
45						
46	**8. Geophysics**					
47	SfM, TLS, and GPS data sets and activites for field geodesy learning	1-3 day depending on how much you do	3, 5, 6, 8 (possibly also 1, 4, 7, 9) - would depend on what aspects are assigned	Beth Pratt-Sitaula and other GETSI authors	prattsitaula@unavco.org	
48	E-game on survey design			Ian Stimpson		
49	"SIGkit" activity using magnetic, seismic, gravity data			Charly Bank	charly.bank@utoronto.ca	
50	Magnetometry at home: a hands-on phone app survey			Charly Bank	charly.bank@utoronto.ca	
51	possibly 1 or more other "backyard" geophysics activities using cheap equipment or phone apps					
52						
53	**9. Fieldtrips**					
54	Baraboo (WI) fieldtrip	1 day	2,3,4,5	B. Tikoff, A. Lusk	basil@geology.wisc.edu	
55	National Parks (general)	0.5+ (flexible)	Variable	Pre-existing	--	--
56	Geology of Yosemite Valley	0.5- 5 (flexible)	2,3,4,5,6	N. Barth	nic.barth@ucr.edu	Gayle Gleason
57	Sedimentary rock comparisons (Sedona/Karijini gorg	0.5	1,2,3,4	Previously created by ASU		

Project Assessment Plans

- Separate from activity, modular-level assessments.
- Goals are 1) to understand the student and instructor experiences with the virtual field camp experience, 2) identify which modules help develop which skills, and 3) identify potential areas for improvement.
- Multi-prong:
  - Student, pre-survey
  - Student, post-survey
  - Student work (e.g. virtual field notebooks)
  - Instructor, post-survey

https://nagt.org/nagt/about/workspaces/field_workgroup/assessment.html

Questions? E-mail Katherine Ryker, kryker@seoe.sc.edu

Project Assessment Plan: Student, pre- and post-survey

- No more than 15-20 minutes
- Background information (which field camp, previous geology field experience)
- Anonymized aggregate data will be shared back to instructors ASAP to give instructors (pre-survey) a sense of where students see themselves to be strong/weak, and again at the end (post-survey) to see where students felt they had improved
- Skills self-assessment:
  - Self-report on geology-specific skills tied to community-developed learning outcomes
  - Modeled on navigation learning research
  - For example, for LO 1 on designing a strategy to collect data to answer a question, students use a 7-point scale (strongly agree to strongly disagree) to respond to:
    - Figuring out the best place to start collecting data comes easily to me.
    - I struggle to use the data I have already collected to figure out where to go next.
    - When I go into the field, I have trouble developing a plan for the day.

Questions? E-mail Katherine Ryker, kryker@seoe.sc.edu

Project Assessment Plan: Student, pre- and post-survey

- Attitudinal self-assessment: self-report on other items identified as of interest to instructors during the learning objectives workshop
  - Sense of place/connection to place, e.g.
    - I usually feel personally connected to places I investigate.
  - Experience/appreciation of nature, e.g.
    - Being out in nature is a great stress reducer for me.
  - Development of "grit", e.g.
    - I gain personal satisfaction when I solve a geoscientific problem by figuring it out myself.
  - Sense of belonging in scientific community / scientific identity, e.g.
    - I understand what every day work in the geosciences is like.
- Demographic questions (post-only)
- Reflection questions (post-only)
  - On which two learning outcomes do you think you experienced the greatest gains during your virtual camp experience? Why? What evidence could you provide to support this?
  - What did you expect to gain from your capstone/camp experience that you didn't get?
  - What did you not expect to gain from your capstone/camp experience that you did get?

Project Assessment Plan: Instructor, post-survey

- General questions: name of camp/institution, # of students enrolled, prior experience using online/virtual modules for your capstone/field course
- Big picture
  - Which (if any) of the community-derived learning outcomes were representative of the learning that occurred in your camp/capstone course? Did you use them as is, modified, supplemented/scaled back?
  - What did you expect students to get out of field camp that they did not get out of this summer's experience? Please explain.
  - Was there anything that you did not expect students to get out of this summer's experience that surprised you? Please explain.
  - Which modules did you use? How, if at all, did you adapt them?

https://nagt.org/nagt/about/workspaces/field_workgroup/assessment.html

Questions? E-mail Katherine Ryker, kryker@seoe.sc.edu

Project Assessment Plan: Instructor, post-survey

- Instructor perspective of student achievement and attitudes
  - How well do you think the modules/activities you implemented this summer helped students with the following concepts that students often have difficulty mastering? (Counterproductive; not helpful; neither helpful nor unhelpful; helpful; very helpful; NA)
    - Moving between 2D representations and 3D space (including locating oneself on a map/in real life, data placement, considerations of scale and distance)
    - Creating cross sections from map-based data (i.e., understanding how subsurface interpretations are controlled by surface only data and representing uncertainty)
  - What do you think students (liked/appreciated) or (disliked/did not appreciate) about your online camp implementation this summer?
- Instructor reflections
  - What advice would you offer others who may be faced with implementing a modified camp experience in the future?
  - How does the average number of hours spent per week on the virtual field experience compare to your traditional field experience?
  - Did you encounter any unexpected challenges or successes? If so, what?

Questions? E-mail Katherine Ryker, kryker@seoe.sc.edu

Teach the Earth Tutorial

Screencast with some updated links on public page: https://nagt.org/nagt/teaching_resources/field/designing_remote_field_experie.html

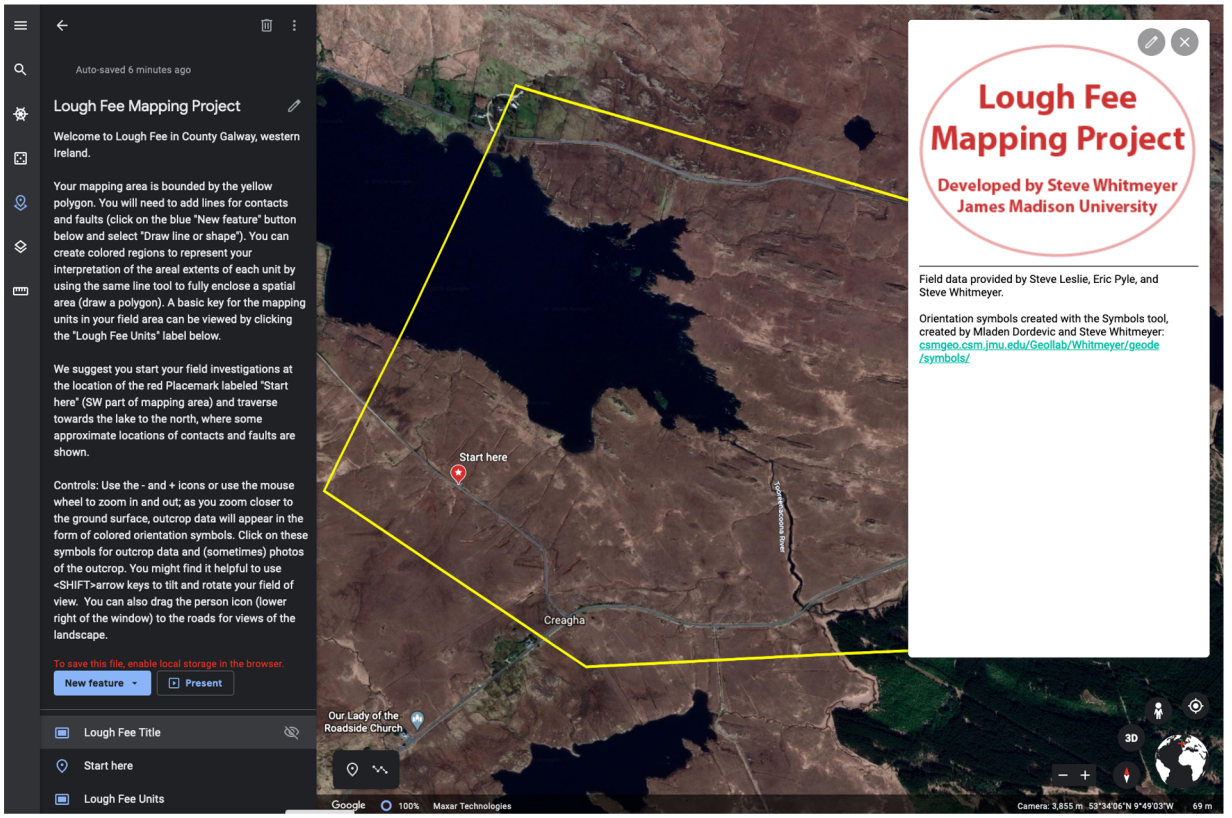
The screencast explains (in about 5 minutes) the Teach the Earth site: https://serc.carleton.edu/NAGTWorkshops/online_field/index.html

Virtual Geologic Mapping Exercise

at Lough Fee, western Ireland

Virtual Mapping Exercise available here:

https://serc.carleton.edu/NAGTWorkshops/online_field/activities/237160.html



Open KML file in web Google Earth

Virtual Geologic Mapping Exercise
at Lough Fee, western Ireland

Virtual Mapping Exercise available here:

https://serc.carleton.edu/NAGTWorkshops/online_field/activities/237160.html

Virtual Geologic Mapping Exercise

This virtual mapping exercise focuses on a 2.5 square kilometer field area along the eastern shore of Lough Fee in County Galway, western Ireland (Figure 1; approximate latitude: 53.579˚, longitude: -9.799˚). The basic geology consists of a layered sequence of Silurian clastic rocks that overlie Neoproterozoic schists. Units are dissected and offset by younger faults. Virtual field investigations and construction of a geologic map will be facilitated by using the Google Earth virtual globe. The exercise works best with the web version of Google Earth, which can be accessed using the Chrome, Firefox, Opera, and Edge browsers at the URL below:

https://earth.google.com/web/

Note that the web version of Google Earth does not work with Safari or Internet Explorer. The exercise will work on the desktop version of Google Earth, but some of the GE tools are located in alternate places and work slightly differently.

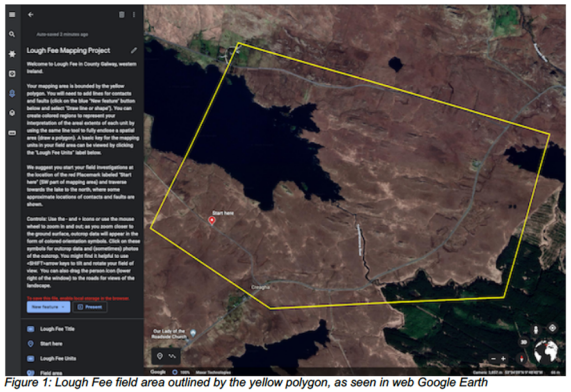


Figure 1: Lough Fee field area outlined by the yellow polygon, as seen in web Google Earth

The Lough Fee mapping exercise makes use of a KML file of field data, which can be downloaded from the URL below:

http://csmgeo.csm.jmu.edu/Geollab/Whitmeyer/geode/Lough_Fee/Lough_Fee_Mapping.kml

Supplementary Data

The supplement contains addition images of the lithologic and mappable units found in the Lough Fee mapping area. Most of these images are good representations of the units, but from locations outside of the Lough Fee mapping area. However, they show features of the units that do occur in your field area and thus this supplementary data can be used for your lithologic descriptions.

Lettergesh Fm.

A typical Lettergesh Fm. outcrop; looking down at bedding, dipping left

Depositional features of Lettergesh Fm.

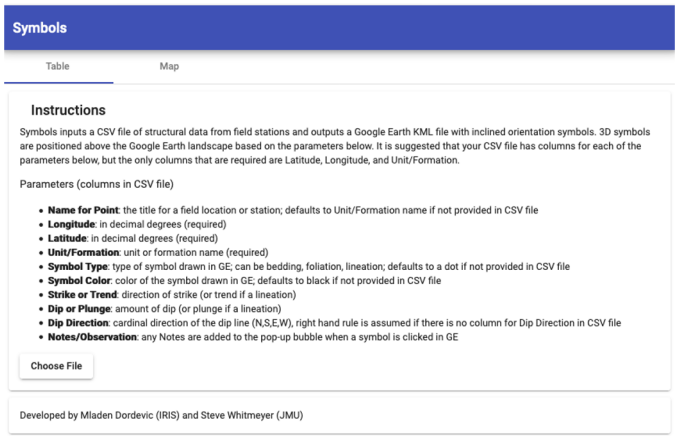
Lettergesh Fm. outcrop features; elongated holes indicate bedding surface

Thin section of a Lettergesh Fm. sample

Includes Exercise instructions and Supplementary Data

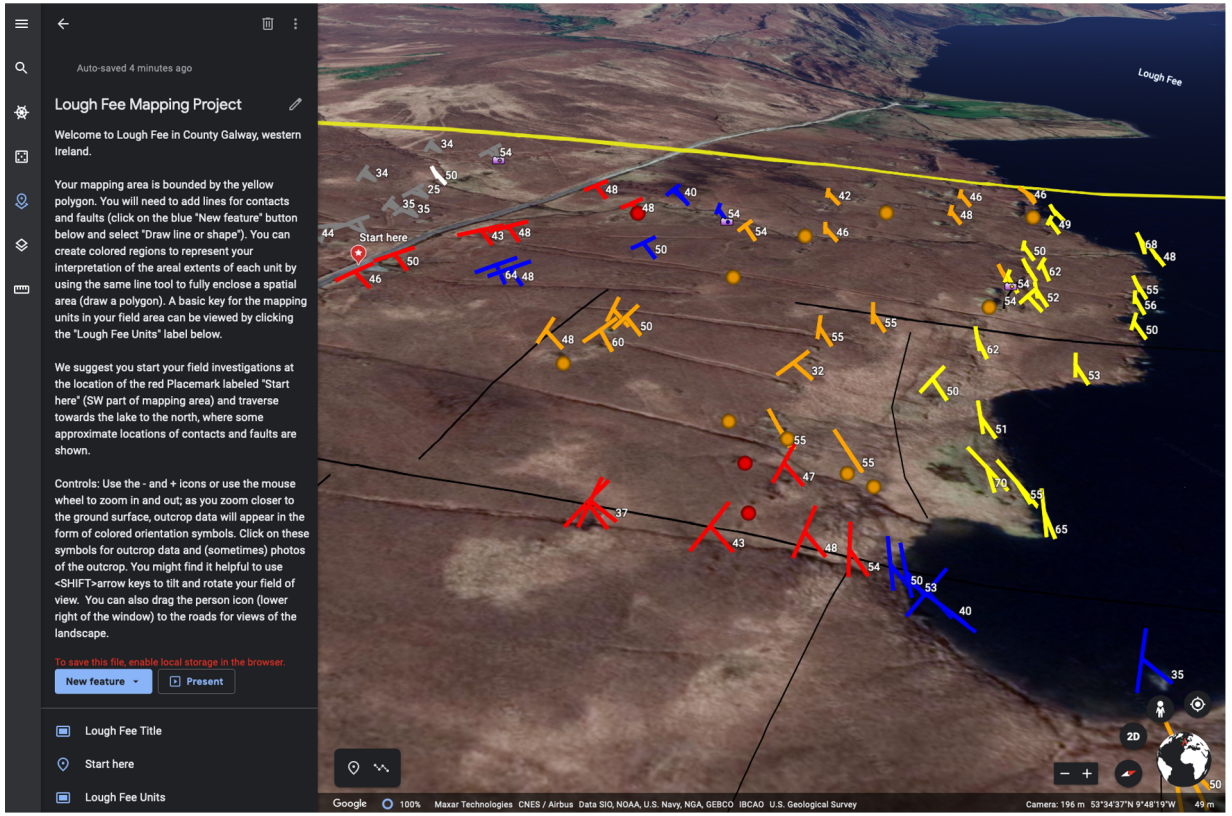
Virtual Geologic Mapping Exercise

at Lough Fee, western Ireland



Symbology created with Symbols tool:

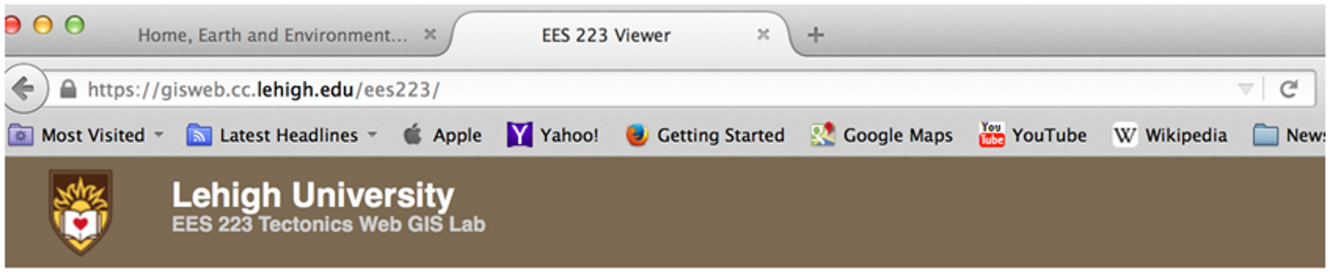
http://csmgeo.csm.jmu.edu/Geollab/Whitmeyer/geode/symbols/



Inclined orientation symbols for outcrop data

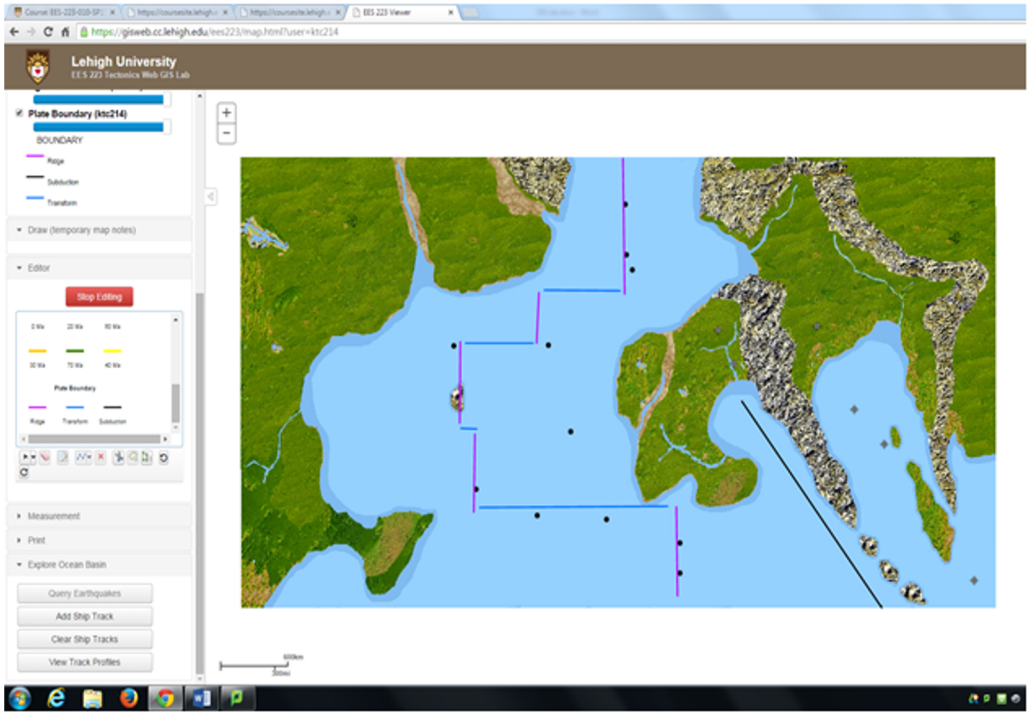
from 2015 National GSA mtg

Dissemination and Scaffolding



Bodzin, A., Anastasio, D., Sharif, R., Rutzmoser, S. 2016. Using a Web GIS Plate Tectonics Simulation to Promote Geospatial Thinking. *Journal of Geological Education. V. 64, p. 279-291.*

Present Plate Boundaries



Student submission

Deliverables

- **Present Plate Boundaries**
- **Age of the Ocean Floor**
- **Plate Reconstructions at 20, 40, 60, and 80Ma**
- **Narrative Reasoning**

Marine Data

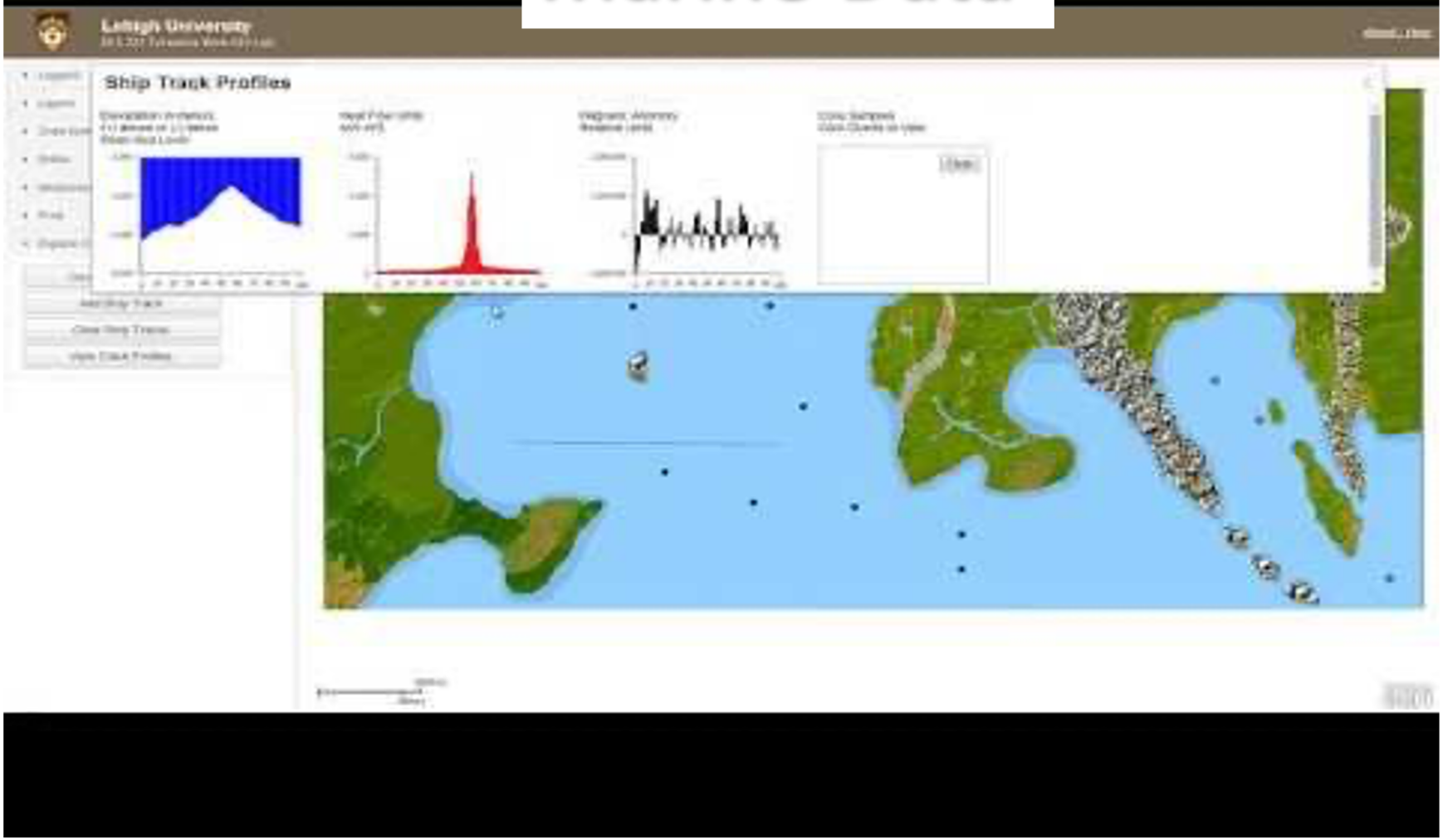


Plate Reconstruction

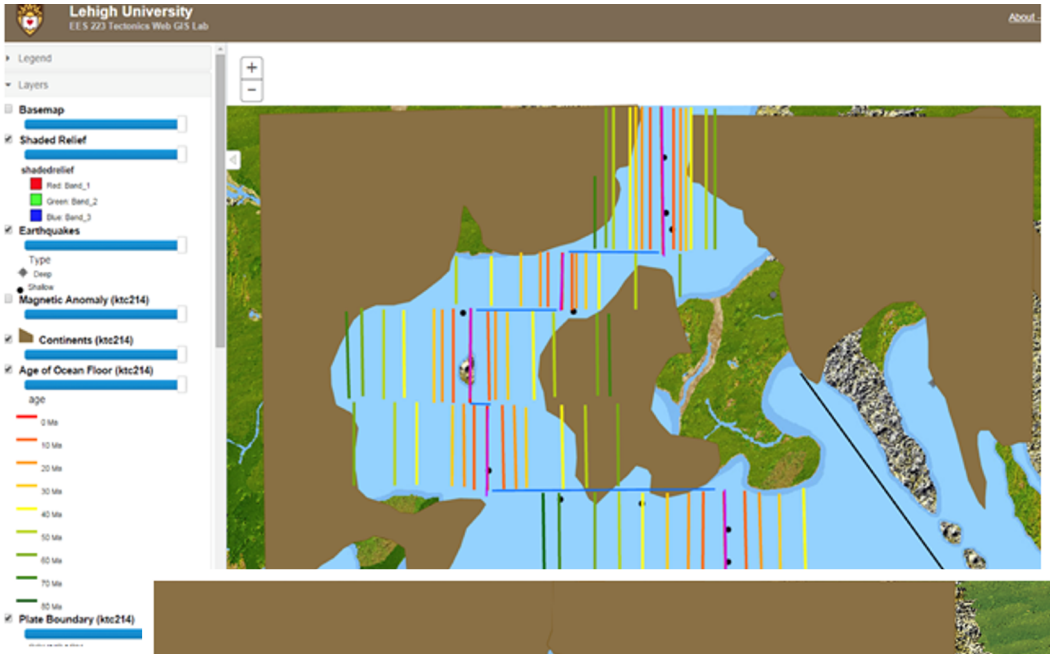
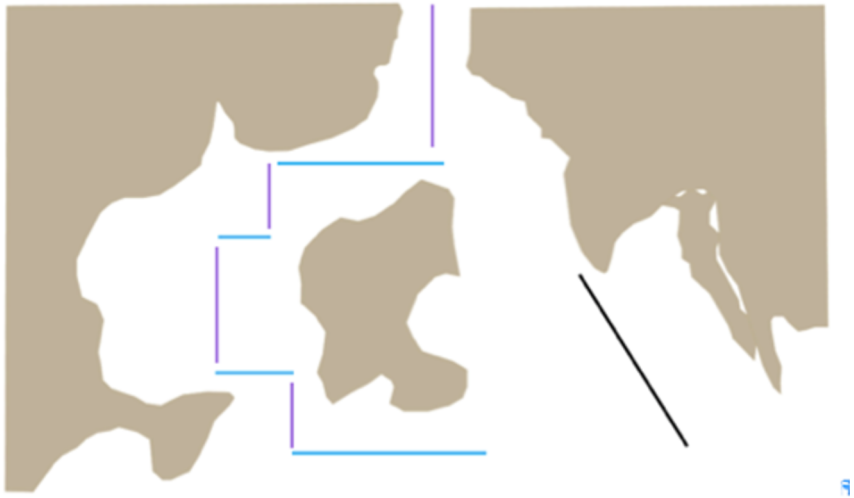


Plate Reconstructions

Student Artifacts



Geology of Yosemite Valley

Nic Barth (nic.barth@ucr.edu) with contributions by Greg Stock (NPS)

Needs: Internet, Google Earth web & desktop versions, 1hr instructor prep

https://serc.carleton.edu/NAGTWorkshops/online_field/activities/237092.html

Four part module:

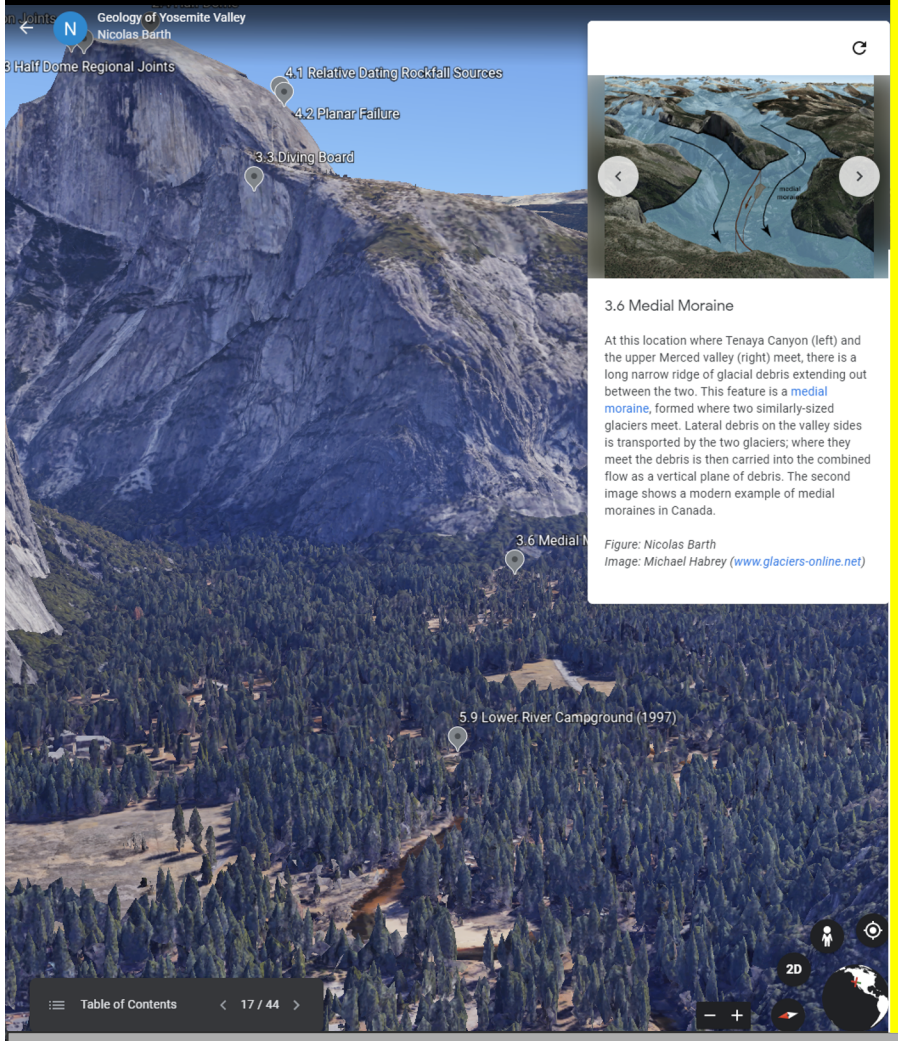
(1) **Tour:** A 44-stop web-based Google Earth VFT.
1-3 hrs

(2) **Exercise:** Cross cutting relationships using El Capitan geologic map.
0.5-2 hrs

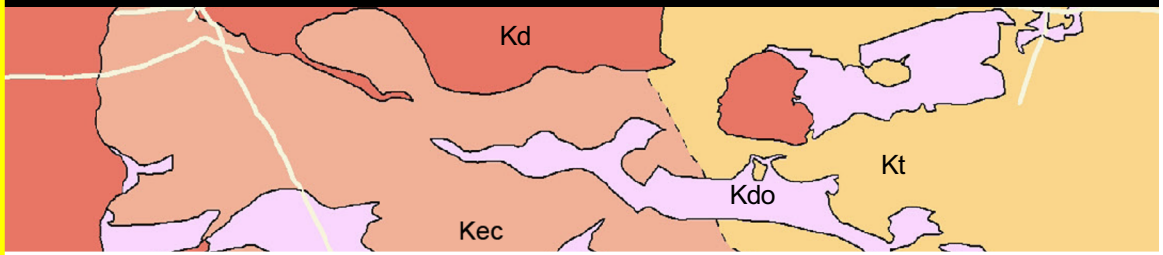
(3) **Exercise:** Geomorphic mapping of Yosemite Valley with lidar.
5-10 hrs

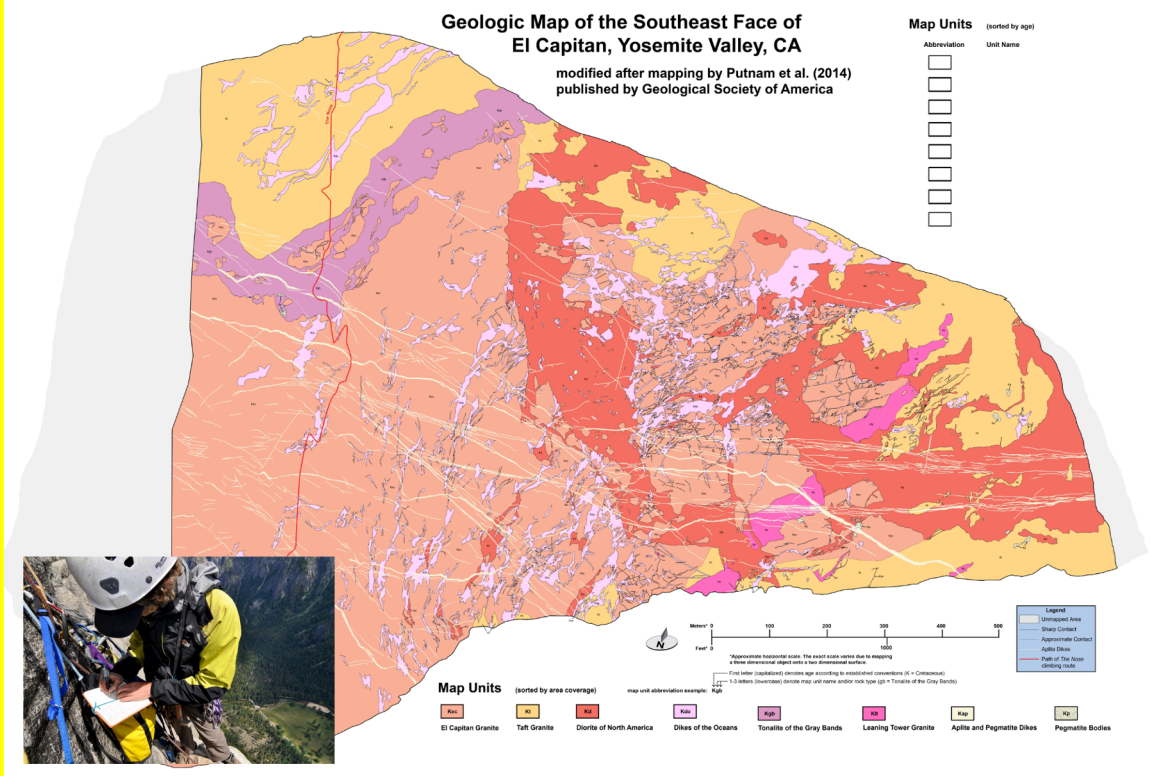
(4) **Professional decision:** Oral presentation or a geologic report.
4-14 hrs

Part 1: Tour



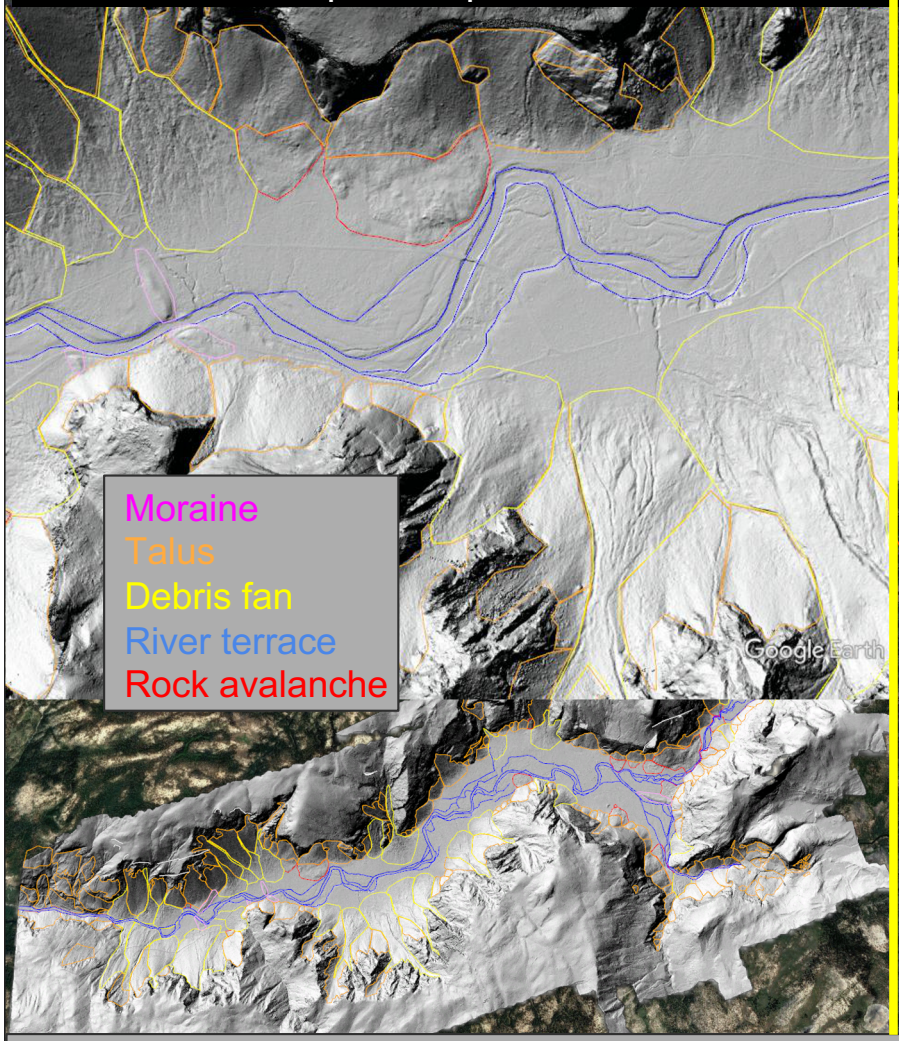
Part 2: XCR exercise



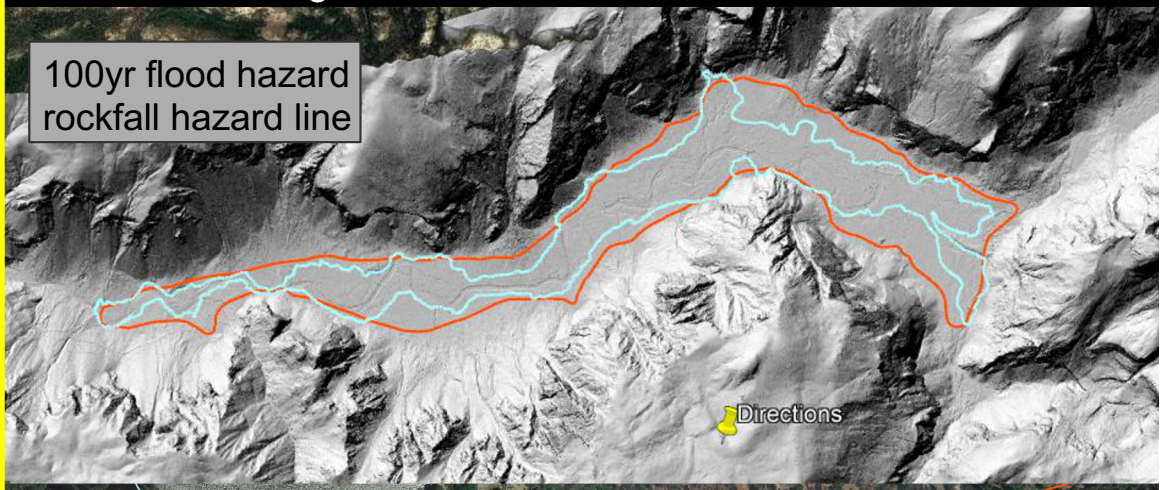


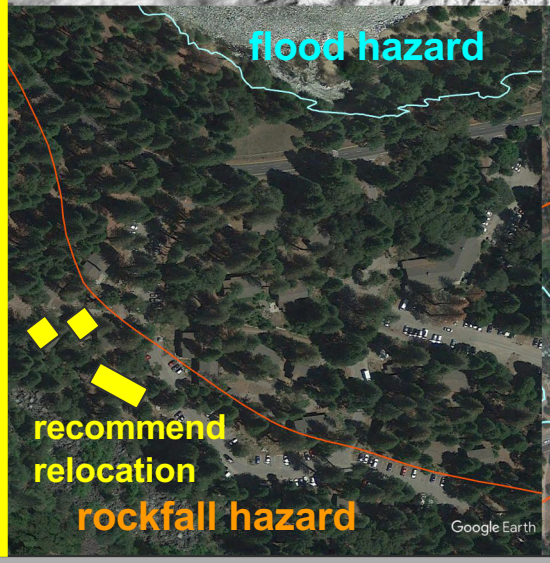
nic.barth@ucr.edu

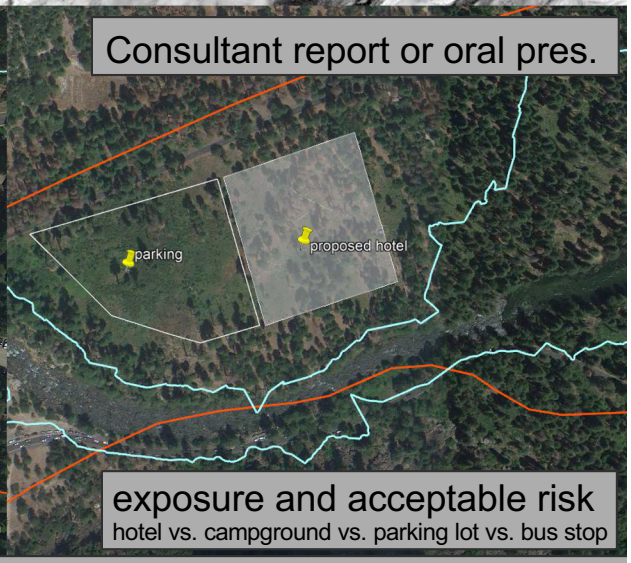
Part 3: Geomorphic Map



Part 4: Geologic Decisions







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