

# **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](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](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](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](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/1LomGkHOlp1TfsTZNRZFNR6vpoTcTcABNmWM9\\_OGULD8/edit#gid=0](https://docs.google.com/spreadsheets/d/1LomGkHOlp1TfsTZNRZFNR6vpoTcTcABNmWM9_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...

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. The goal of this document is to help field directors plan for what will be available and when.

	A	B	C	D	E	F
1	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.					
2	Started April 28, 2020					
3	Learning goals numbered at bottom of spreadsheet; Keywords at bottom of spreadsheet					
4						
5	<b>Title of the project</b>	<b># days (estimate)</b>	<b>What learning goals does it address (use numbers in linked list)</b>	<b>Who is creating it</b>	<b>Email contact of main person</b>	<b>Informal reviewing team (you can volunteer)</b>
42	Geologic mapping on Mars	3-4 days		Brian Balta, Casey Duncan	<a href="mailto:balta@tamu.edu">balta@tamu.edu</a>	
43	Central Appalachian Basin Transect: Coal Bed Methane Resource Assessment	5 days	2, 3, 4, 5, 6, 7, 9	Amy Weislogel	<a href="mailto:amy.weislogel@mail.wvu.edu">amy.weislogel@mail.wvu.edu</a>	
44						
45						
46	<b>8. Geophysics</b>					
47	SIM, TLS, and GPS data sets and activities 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	<a href="mailto:prattsitaula@unavco.org">prattsitaula@unavco.org</a>	
48	E-game on survey design			Ian Stimpson		
49	"SiGKit" activity using magnetic, seismic, gravity data			Charly Bank	<a href="mailto:charly.bank@utoronto.ca">charly.bank@utoronto.ca</a>	
50	Magnetometry at home: a hands-on phone app survey			Charly Bank	<a href="mailto:charly.bank@utoronto.ca">charly.bank@utoronto.ca</a>	
51	possibly 1 or more other "backyard" geophysics activities using cheap equipment or phone apps					
52						
53	<b>9. Fieldtrips</b>					
54	Baraboo (WI) fieldtrip	1 day	2,3,4,5	B. Tikoff, A. Lusk	<a href="mailto:basil@geology.wisc.edu">basil@geology.wisc.edu</a>	
55	<a href="#">National Parks (general)</a>	0.5+ (flexible)	Variable	Pre-existing	--	--
56	Geology of Yosemite Valley	0.5- 5 (flexible)	2,3,4,5,6	N. Barth	<a href="mailto:nic.barth@ucr.edu">nic.barth@ucr.edu</a>	Gayle Gleason
57	Sedimentary rock comparisons (Sedona/Karijini gorge)	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](https://nagt.org/nagt/about/workspaces/field_workgroup/assessment.html)

***Questions? E-mail Katherine Ryker, [kryker@seoe.sc.edu](mailto: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](mailto: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](https://nagt.org/nagt/about/workspaces/field_workgroup/assessment.html)

***Questions? E-mail Katherine Ryker, [kryker@seoe.sc.edu](mailto: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](mailto: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\\_experience.html](https://nagt.org/nagt/teaching_resources/field/designing_remote_field_experience.html)

The screencast explains (in about 5 minutes) the Teach the Earth site:

[https://serc.carleton.edu/NAGTWorkshops/online\\_field/index.html](https://serc.carleton.edu/NAGTWorkshops/online_field/index.html)



The screenshot shows the NAGT website. The header features the NAGT logo and navigation links: "Go to live page", "Full Editor", and "Account/Favorites". Below the header is a breadcrumb trail: "NAGT > Teaching Resources > Teaching in the Field > Designing Remote Field Experiences". The left sidebar contains a menu with categories like "About NAGT", "Membership", "Professional Development", "Sections", "Divisions", "Teaching Resources", "Rock and Mineral Exchange", "Teaching in the Field", "Designing Remote Field Experiences", "Field Experiences Working Group Interest Form", "Developing a Framework for Effective Field & Virtual Capstone Programs Workshop", "Summer 2020 Virtual Field Camps", "Summer 2020 Virtual Field Camp Form", "Textbook Reviews", "Volcano Exploration Project: Puerto Rico", "Department Resources", and "Geoscience Education". The main content area is titled "Designing Remote Field Experiences" and contains a text box stating: "This website provides an overview of the work of more than 300 (!!) geoscience educators in response to the 2020 COVID-19 pandemic to share expertise and existing resources and to develop new resources to support remote or virtual capstone summer field experiences for undergraduate geoscience majors." Below this text box is a paragraph: "This NSF-sponsored project is a collaborative effort of NAGT and the IAGD, and involves over 300 field camp directors, instructors, and resources developers around the world." followed by a link: "Jump to Teaching Resources | Learning Outcomes | Recorded Webinars | How to Get Involved | Who We Are". Below this is a section titled "Teaching Resources" with a list of bullet points: "Master spreadsheet of modules in development: the goal of this document is to help field directors/activity implementers to plan for what will be available and when. If you are a developer, please add your project where appropriate and feel free to add more rows if needed. These modules will eventually live on the SERC Teach the Earth site (below). The goal of this document is to help field directors plan for what will be available and when.", "New resource collection at Teach the Earth: a new digital clearinghouse for teaching modules and resources is in development at Teaching with Online Field Experiences. This collection also contains some virtual field trips", "Looking for space in an online camp: a list of 2020 online field camps with space available for displaced students: Summer 2020 virtual field camps.", "Share your online activity: if you have an online field activity to share, please contribute to the collection.", and "How to contribute: watch a brief, ~5 minute overview of the Teaching with Online Field Experiences site and the contribution process:". At the bottom right, there is a small thumbnail image of a video player showing a screen recording of the "Teaching with Online Field Experiences" website.

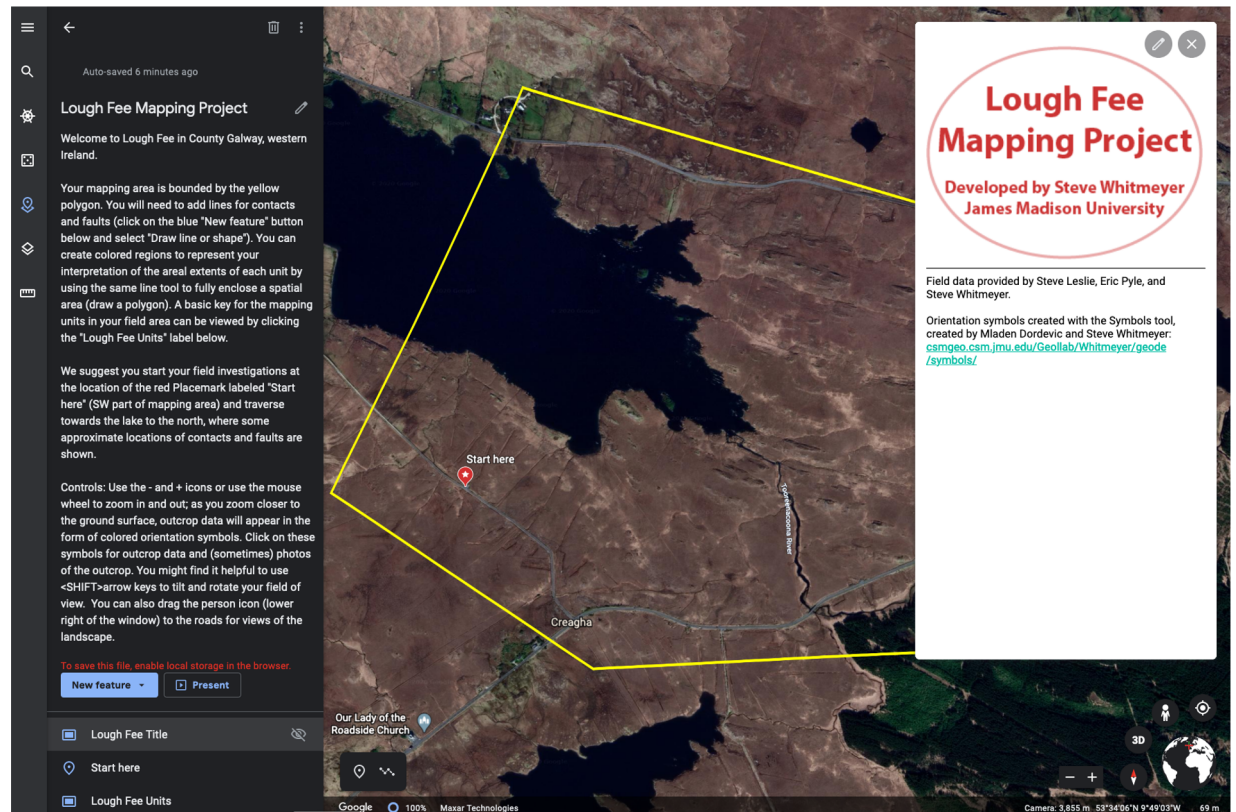


# Virtual Geologic Mapping Exercise at Lough Fee, western Ireland



Virtual Mapping Exercise available here:

[https://serc.carleton.edu/NAGTWorkshops/online\\_field/activities/237160.html](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 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.

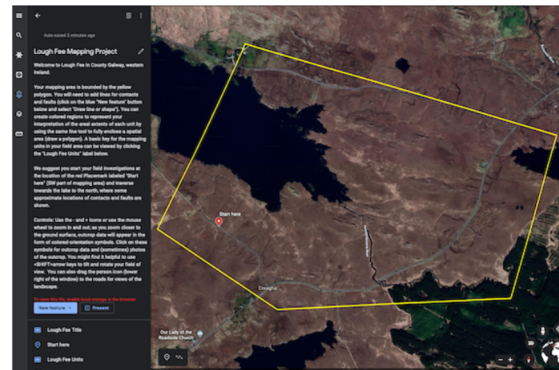


Figure 1: Lough Fee field area outlined by the yellow polygon, as seen in web Google Earth

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

## Supplementary Data

The supplement contains additional 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

Virtual Mapping Exercise available here:

[https://serc.carleton.edu/NAGTWorkshops/online\\_field/activities/237160.html](https://serc.carleton.edu/NAGTWorkshops/online_field/activities/237160.html)

*Includes Exercise instructions and Supplementary Data*



# Virtual Geologic Mapping Exercise at Lough Fee, western Ireland

**Symbols**

TableMap

**Instructions**

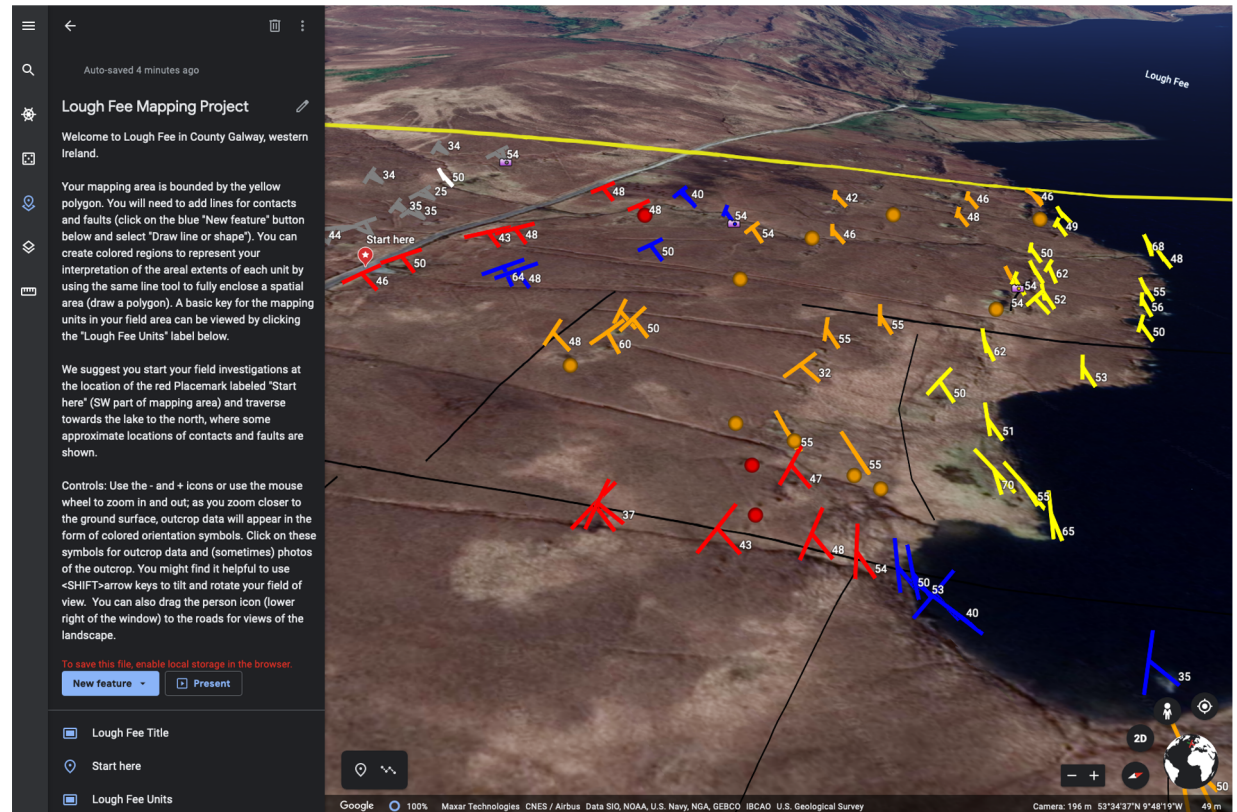
Symbols inputs a CSV file of structural data from field stations and outputs a Google Earth KML file with inclined orientation symbols. 3D symbols are positioned above the Google Earth landscape based on the parameters below. It is suggested that your CSV file has columns for each of the parameters below, but the only columns that are required are Latitude, Longitude, and Unit/Formation.

Parameters (columns in CSV file)

- **Name for Point**: the title for a field location or station; defaults to Unit/Formation name if not provided in CSV file
- **Longitude**: in decimal degrees (required)
- **Latitude**: in decimal degrees (required)
- **Unit/Formation**: unit or formation name (required)
- **Symbol Type**: type of symbol drawn in GE; can be bedding, foliation, lineation; defaults to a dot if not provided in CSV file
- **Symbol Color**: color of the symbol drawn in GE; defaults to black if not provided in CSV file
- **Strike or Trend**: direction of strike (or trend if a lineation)
- **Dip or Plunge**: amount of dip (or plunge if a lineation)
- **Dip Direction**: cardinal direction of the dip line (N,S,E,W), right hand rule is assumed if there is no column for Dip Direction in CSV file
- **Notes/Observation**: any Notes are added to the pop-up bubble when a symbol is clicked in GE

Choose File

Developed by Mladen Dordevic (IRIS) and Steve Whitmeyer (JMU)



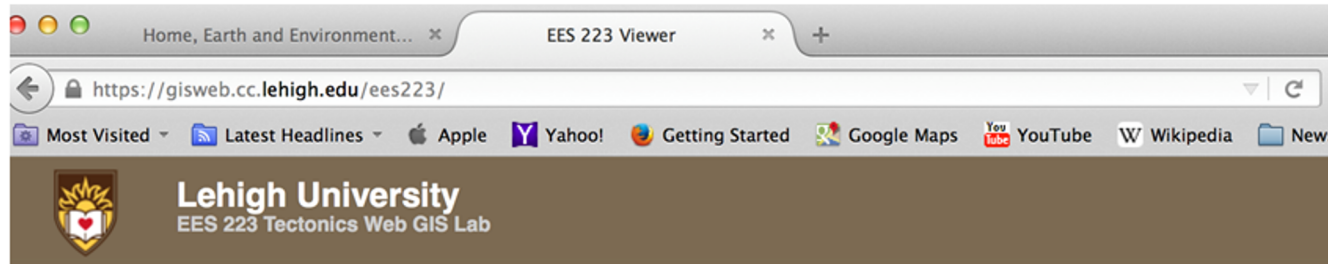
*Symbology created with Symbols tool:*

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

*Inclined orientation symbols for outcrop data*

from  
2015 National GSA mtg

# Dissemination and Scaffolding



**Welcome to the Plate Game Web GIS Simulation Activity**

**Please select a map to continue**

**If you are not affiliated with Lehigh University please use the [public map](#)**

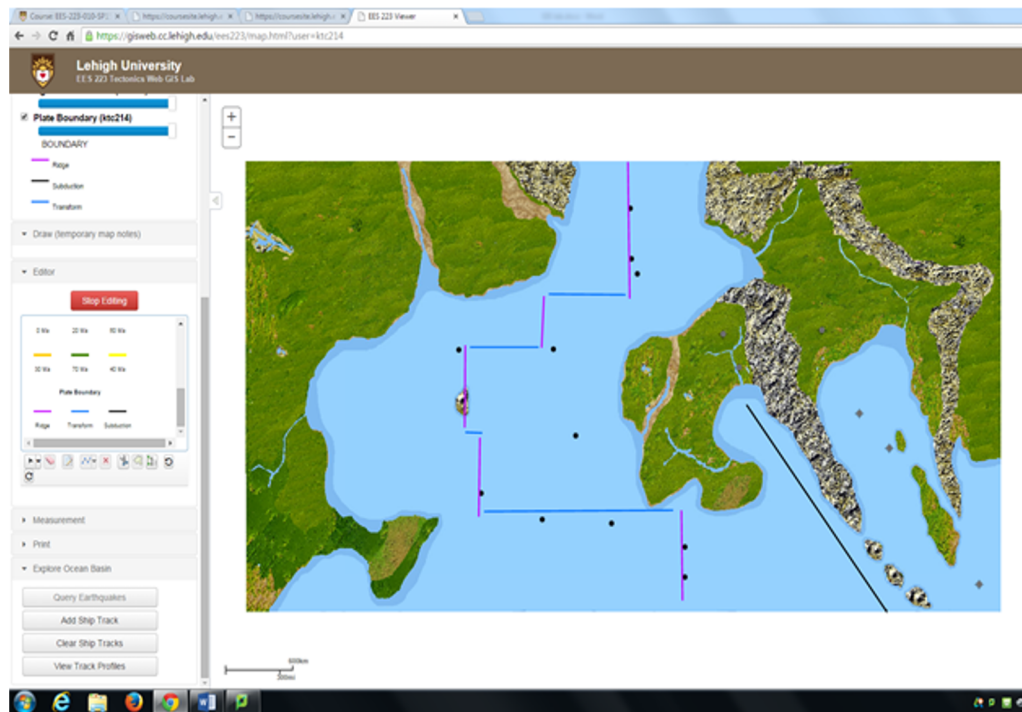
**Our [video library](#) provides step-by-step instructions for using the viewer.**

**[The Plate Game Student Guide](#)  
[The Plate Game Scoring Rubric](#)**

**[Instructions—Content and Web GIS](#)  
[Project Strategies](#)  
[Grading Rubric](#)**

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*

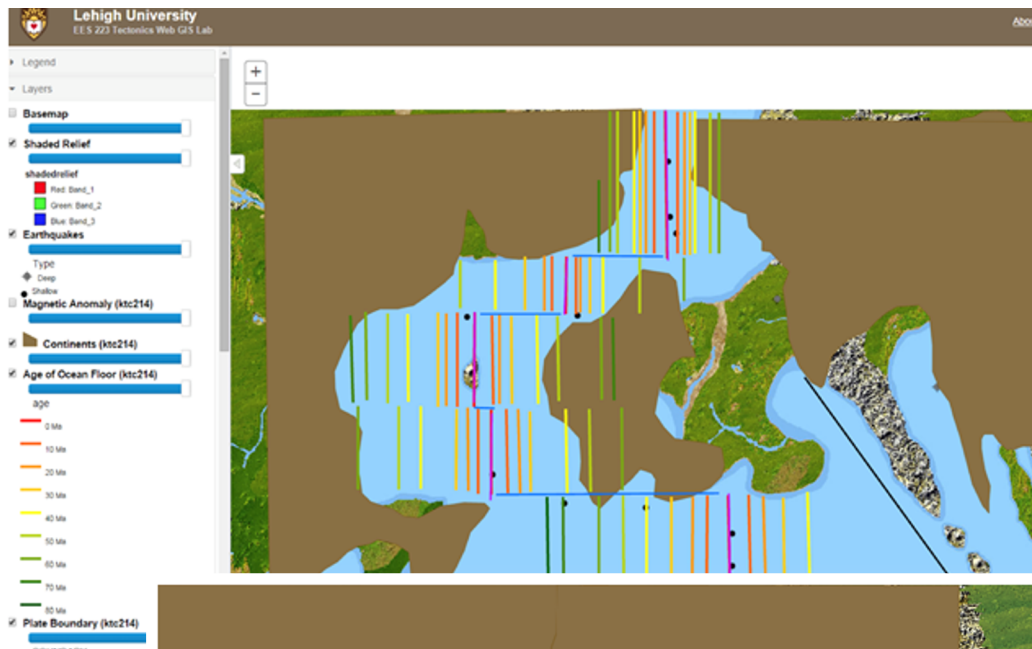
## Deliverables

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

# Marine Data

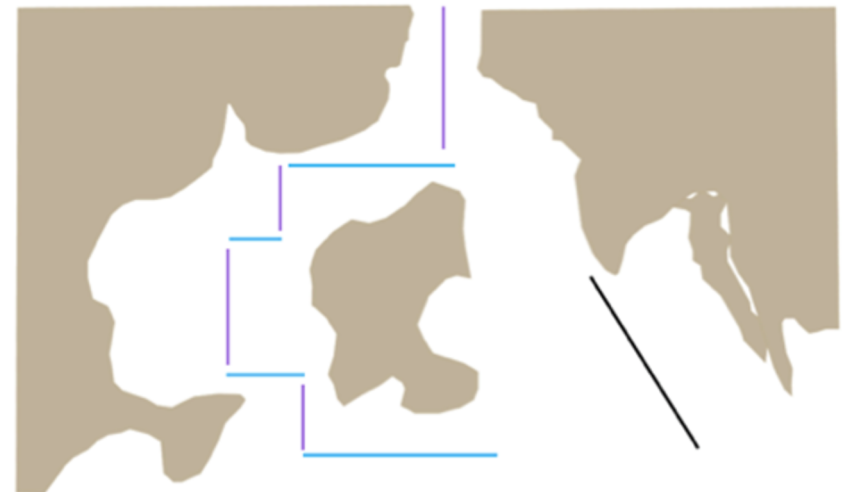
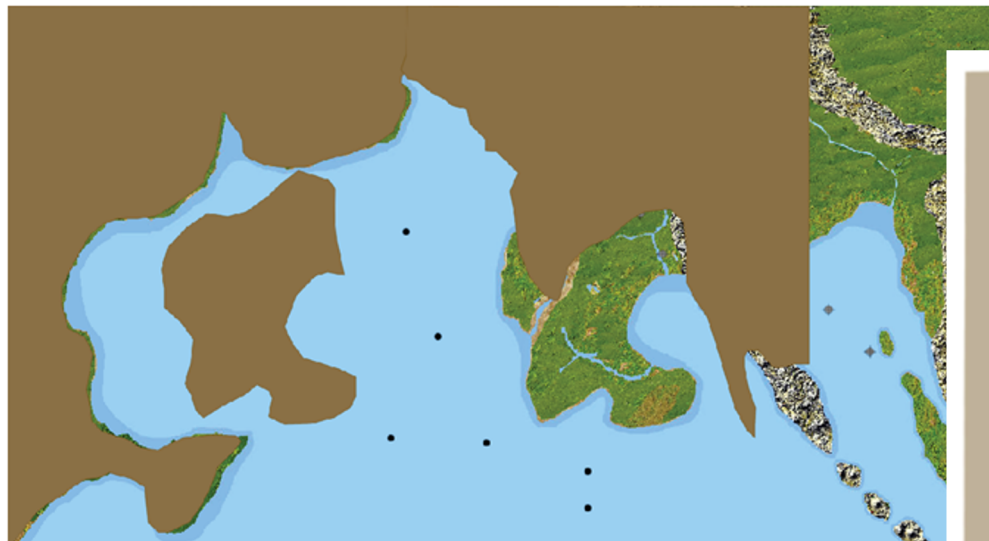


# Plate Reconstruction



# Plate Reconstructions

*Student Artifacts*





# Geology of Yosemite Valley

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

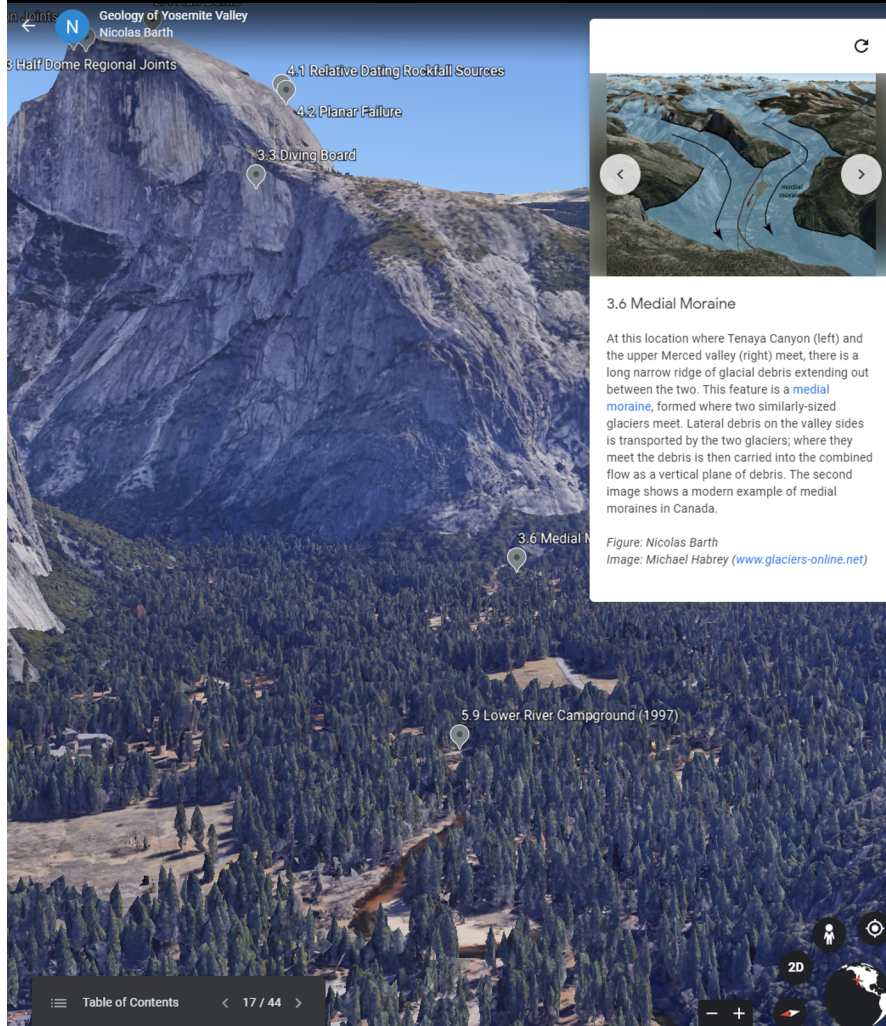
**Needs:** Internet, Google Earth web & desktop versions, 1hr instructor prep

[https://serc.carleton.edu/NAGTWorkshops/online\\_field/activities/237092.html](https://serc.carleton.edu/NAGTWorkshops/online_field/activities/237092.html)

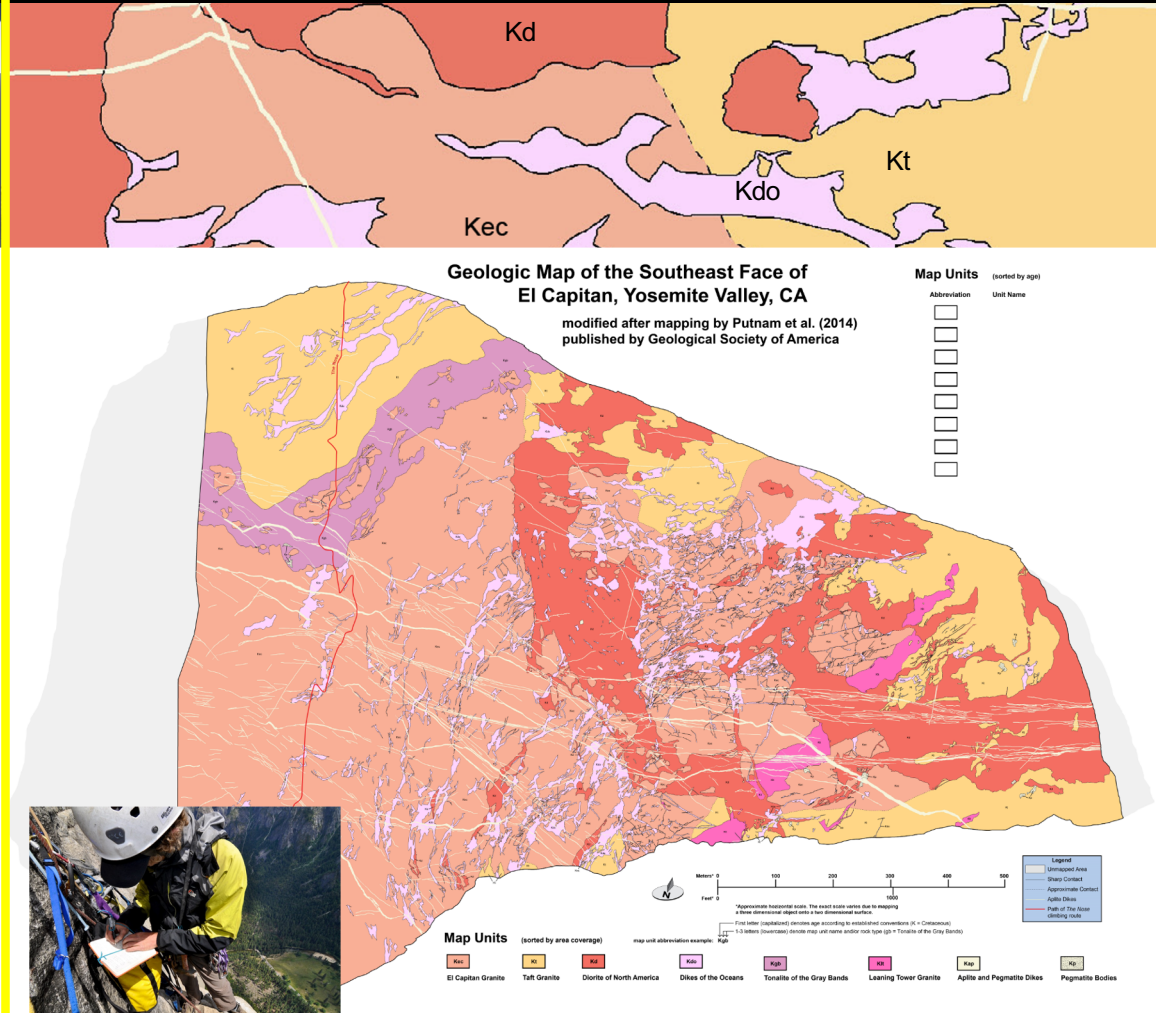
## Four part module:

- |   |  |
|---|--|
| (1) <b>Tour:</b><br>1-3 hrs                   | A 44-stop web-based Google Earth VFT.                      |
| (2) <b>Exercise:</b><br>0.5-2 hrs             | Cross cutting relationships using El Capitan geologic map. |
| (3) <b>Exercise:</b><br>5-10 hrs              | Geomorphic mapping of Yosemite Valley with lidar.          |
| (4) <b>Professional decision:</b><br>4-14 hrs | Oral presentation or a geologic report.                    |

## Part 1: Tour

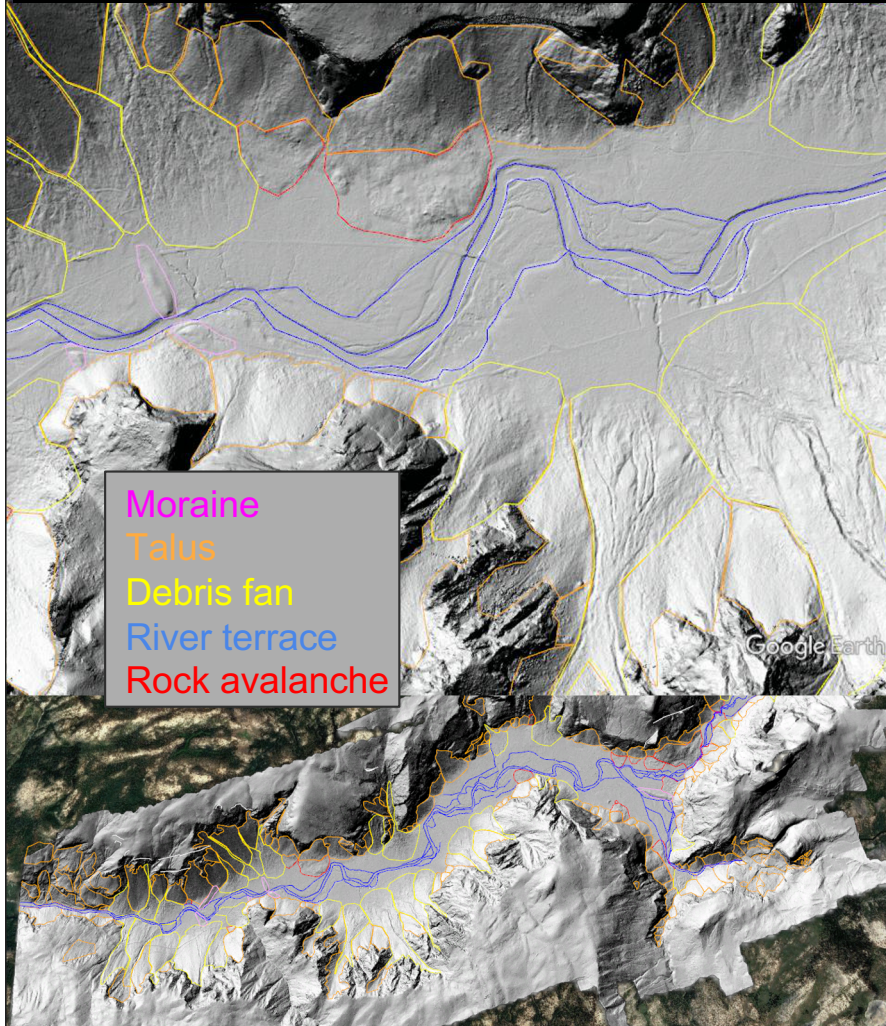


## Part 2: XCR exercise



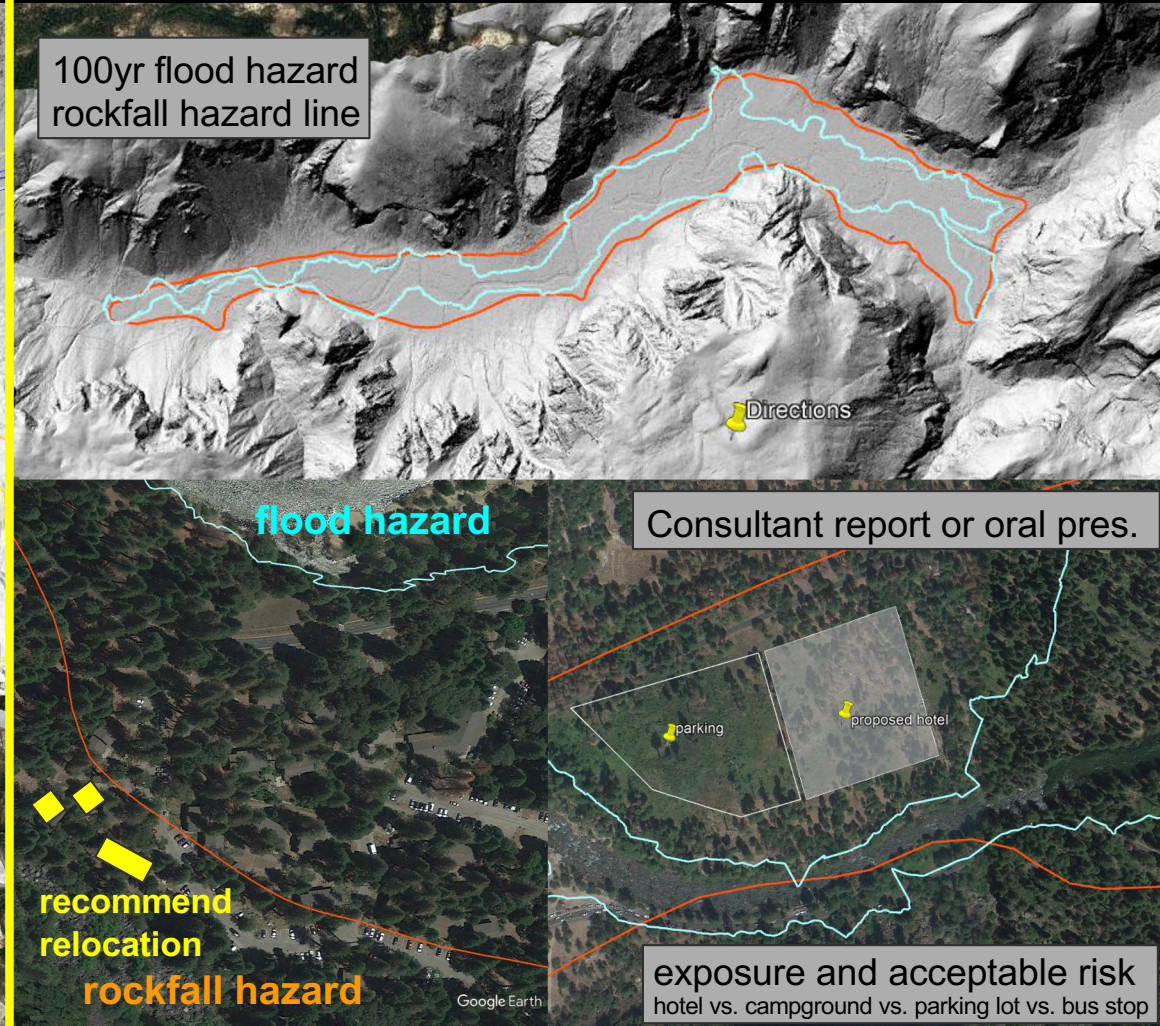


### Part 3: Geomorphic Map



Geology of Yosemite Valley

### Part 4: Geologic Decisions



nic.barth@ucr.edu