Designing and Implementing Field Experiences through Distance Learning
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

<table>
<thead>
<tr>
<th>Title of the project</th>
<th>8 days (estimate)</th>
<th>What learning goals does it address (use numbers in linked list)</th>
<th>Who is creating it</th>
<th>Email contact of main person</th>
<th>Informal reviewing team (you can volunteer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geologic mapping on Mars</td>
<td>3-4 days</td>
<td></td>
<td>Brian Banta, Corey Duncan</td>
<td><a href="mailto:banta@tamu.edu">banta@tamu.edu</a></td>
<td></td>
</tr>
<tr>
<td>Central Appalachian Basin Transect: Coal Bed Methane Resource Assessment</td>
<td>5 days</td>
<td>2, 3, 4, 5, 6, 7, 9</td>
<td>Amy Weisengel</td>
<td><a href="mailto:amy.weisengel@mail.wvu.edu">amy.weisengel@mail.wvu.edu</a></td>
<td></td>
</tr>
<tr>
<td>Geophysics</td>
<td></td>
<td>1-3 days depending on how much you do</td>
<td>Beth Prat, et al.</td>
<td><a href="mailto:prat@unr.edu">prat@unr.edu</a></td>
<td></td>
</tr>
<tr>
<td>E-game or survey design</td>
<td></td>
<td></td>
<td>Ian Simpson</td>
<td><a href="mailto:ian.simpson@fiu.edu">ian.simpson@fiu.edu</a></td>
<td></td>
</tr>
<tr>
<td>&quot;SIDAH&quot; activity using magnetic, seismic, gravity data</td>
<td></td>
<td></td>
<td>Charly Bank</td>
<td><a href="mailto:charly.bank@utoronto.ca">charly.bank@utoronto.ca</a></td>
<td></td>
</tr>
<tr>
<td>Magnetometry at home: a hands-on phone app survey</td>
<td></td>
<td></td>
<td>Charly Bank</td>
<td><a href="mailto:charly.bank@utoronto.ca">charly.bank@utoronto.ca</a></td>
<td></td>
</tr>
<tr>
<td>Possibly 1 or more other &quot;backyard&quot; geophysics activities using cheap equipment or phone apps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fieldtrips</td>
<td></td>
<td></td>
<td>B. Toth, A. Lukas</td>
<td><a href="mailto:toth@geology.wisc.edu">toth@geology.wisc.edu</a></td>
<td></td>
</tr>
<tr>
<td>National Parks (optional)</td>
<td>0.5+ (flexible)</td>
<td>Variable</td>
<td>Pre-visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geology of Yosemite Valley</td>
<td>0.5-5 (flexible)</td>
<td>3, 4, 5, 6</td>
<td>N. Barth</td>
<td><a href="mailto:nic.barth@ucr.edu">nic.barth@ucr.edu</a></td>
<td>Gayle Gleason</td>
</tr>
<tr>
<td>Sedimentary rock comparison (Sedona/Karijini project)</td>
<td></td>
<td>0.3, 1, 3, 4</td>
<td>Previously created by ASU</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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
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

Includes Exercise instructions and Supplementary Data
Virtual Geologic Mapping Exercise
at Lough Fee, western Ireland

Symbols

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 Inclination.

Parameters [columns in CSV file]:
- Name or Plot: the name for a field location or station, defaults to unit/formation name if not provided in CSV file
- Latitude: in decimal degrees (required)
- Longitude: in decimal degrees (required)
- Inclination: unit or formation name (required)
- Symbol Type: type of symbol drawn in GE, can be building, fault, lineation, default 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) of a lineation
- Dip or Plunge: amount of dip or plunge in a lineation
- Dip Direction: cardinal direction of the dip line (N,S,E,W, right-hand rule assumed if there is no columns for Dip Direction in CSV file
- Notes/Observation: any notes are added to the pop-up bubble when a symbol is clicked in GE

Symbology created with Symbols tool:

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

Inclined orientation symbols for outcrop data
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

Present Plate Boundaries

Deliverables

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

Student submission
Marine Data
Plate Reconstruction
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:**
   - 1-3 hrs
   - A 44-stop web-based Google Earth VFT.

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

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

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

Punchline: 4 million visitors per year | few places in the valley safe from rockfall or floods!
3.6 Medial Moraines

At this location where Tenaya Canyon (left) and the upper Merced valley (right) meet, there is a long narrow ridge of glacial debris extending out between the two. This feature is a medial moraine, formed where two similarly sized glaciers meet. Lateral debris on the valley sides is transported by the two glaciers, where they meet the debris is then carried into the combined flow as a vertical plane of debris. The second image shows a modern example of medial moraines in Canada.

Figure: Nicolas Barth
Image: Michael Habney (www.glaciers-online.net)
Part 3: Geomorphic Map

- Moraine
- Talus
- Debris fan
- River terrace
- Rock avalanche

Part 4: Geologic Decisions

- 100yr flood hazard
- Rockfall hazard line

Recommend relocation

Consultant report or oral pres.

Exposure and acceptable risk

Hotel vs. campground vs. parking lot vs. bus stop

nic.barth@ucr.edu