Virtual Field Experiences in

Science Disciplines Discussion

On Wednesday, April 29, 2020, 49 members of the UMN teaching community convened to discuss virtual field experiences in science disciplines (e.g. earth science, biology, natural resources, forestry). Ideas and effective practices generated during that discussion are documented here. Contact cei@umn.edu to suggest an addition to this resource.

**Facilitator and experienced faculty:**

* [Kris Gorman](https://cei.umn.edu/staff/kris-gorman), Center for Educational Innovation
* [Sue Galatowitsch](https://fwcb.cfans.umn.edu/personnel/susan-galatowitsch), Fisheries, Wildlife, and Conservation Biology, Twin Cities

**Recording and resources**

* [Recording](https://www.youtube.com/watch?v=WLIDTQtMqTc&feature=youtu.be) of the session
* [Slides](https://drive.google.com/file/d/1q5Sb9v5XqJsTQXyvYp9T8sZtIdLJk4yo/view?usp=sharing) describing Sue Galatowitsch and Julia Bohnen’s online field course
* [Designing Remote Field Experiences](https://nagt.org/nagt/teaching_resources/field/designing_remote_field_experie.html) by the geoscience community (NAGT) to support the design of virtual field camps (shared by [Karen Gran](https://www.d.umn.edu/~kgran/))

**Google Group Email List**

* fIf you are a member of the UMN community and would like to be part of a Google Group email listserv to ask questions or share resources with others teaching or supporting these courses, please request to join the [UMN Virtual Field Experience Instructors](https://groups.google.com/a/umn.edu/d/forum/science-field-experiences) group.

**Additional Support**

* Email TeachingSupport@umn.edu to connect with academic technologists, teaching specialists and librarians who can assist with designing your virtual field experience.

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# Fully virtual field experiences

One possibility for moving a field experience to remote teaching is to offer a fully virtual field course/experience where students engage in all activities related to the course in an online space.

Sue Galatowitsch shared the [structure and design of her and Julia Bohnen’s 5-course series (~5 credits total) on ecological restoration](https://drive.google.com/file/d/1q5Sb9v5XqJsTQXyvYp9T8sZtIdLJk4yo/view?usp=sharing) that is taught completely online via asynchronous, self-paced elements. Students did not go into the field physically, but completed assignments tied to “site portfolios”, which are online maps that contain detailed place-based information about an area. She had advice for others planning this type of field experience:

* **Explicitly lay out the learning objectives for the course** at the beginning of designing an online course (hers were based on [Bloom’s Taxonomy](https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/)) and only building out elements for the course which are tied to measurable competencies that can be assessed.
* **Be prepared to prioritize the objectives**: what can be done now, and what should be/can be delayed. Some skills, such as psychomotor skills, may have to be taught at other times or through other activities.
* **Include guest lectures**. If possible, record your guest lecturers and edit them to only include their best segments.
* **Give students access to the same types of information they would get in the field.** Although they can’t gather data from a particular plot, this gives them rich analysis experience using actual (or simulated) field data.
* **Collaborate with an instructional designer and academic technologists**. These teaching support professionals can help clarify learning objectives and build out technical components.

To create virtual field sites, instructors could consider:

* [Custom Google maps](https://www.google.com/maps/about/mymaps/) with pins that link to photos, descriptions, other links/media. These could be used by instructors to create sites or for students to report on sites.
* Virtual “walks” in [Google Tour Creator](https://arvr.google.com/tourcreator/), including audio and video with the ability to zoom in. Backgrounds are 360° shots that can be taken on your smartphone. Here is an example from [Cedar Creek](http://z.umn.edu/CBL_summer) (UMN field site).
* [Story Maps](http://storymaps.umn.edu/) which integrates maps with other media

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# Learning “field skills”

In order to acquire some of the field skills (e.g. keeping a field notebook, making observations, taking measurements, reporting data), Jay Hatch and Karen Gran are planning to have students engage in a hybrid experience where most aspects are online but they also complete activities that require going outside wherever they are or can be conducted in their own home. A few considerations for these activities:

* **Be flexible.** Consider how the activity can be accomplished in a variety of locations, including a very urban environment (e.g., measuring the height of buildings rather than trees) or in their own home (e.g. sketch anywhere you can, even in your living room)
* **Consider emulating logistics.** Josh Feinberg described a possible approach to starting each day of a geoscience field camp with a planning meeting where the TA/instructor lays out the site, the weather, the conditions and students need to jointly make a plan for the tasks they will accomplish for the day, what gear they would need and what may or may not be accessible.
* **Offer options.** Marcella Windmuller is designing a May session field experience that would give students 3 options for each activity, two of which could be completed virtually and one which requires going outside in order to provide options for those who want to get outdoors and those for whom it’s not possible or safe.
* **Consider sending key equipment if tools are important.** Some are considering sending compasses, microscopes ([Foldscope](https://www.foldscope.com/) and [Lunchbox microscope](https://www.lakeregionoptics.com/) are options) or other needed equipment that could potentially be returned.

# Building community among students

Several participants emphasized the camaraderie that develops among students from different backgrounds when they engage in a shared field experience, and they asked how to accomplish this in an online setting.

Methods suggested for building community included:

* **Setting expectations and including a “get to know you” phase**. State that building relationships with other students is part of your intention for the course. Make it clear how you’d like them to work together and build in low-stakes activities early in the course to get to know one another.
* **Using synchronous tools** like Zoom [breakout rooms](https://it.umn.edu/services-technologies/how-tos/zoom-manage-breakout-rooms) to allow students to socialize and share experiences in addition to performing formal class-related work.
* **Using video/audio-based tools** like [Flipgrid](https://it.umn.edu/services-technologies/flipgrid) and [VoiceThread](https://it.umn.edu/services-technologies/voicethread) can add personalization and help students get to know each other in ways that feel more informal than discussions in Canvas.
* **More ideas -** [Guidelines for Online Teaching and Design](https://pressbooks.umn.edu/guidelinesforonlineteaching/chapter/how-to-budget-time-for-this-online-course/) and [ACUE’s Online Teaching Toolkit](http://acue.org/online-teaching-toolkit/)