

## March 9, 2022 Education Working Group Call

February 9, 2022 Education Call Notes [HERE](#)

Attendees: Jason McLachlan, Alyssa Willson, Lisa Haber, Julien Brun, Jody Peters, Antoinette Abeyta, Diana Dalbotten

Regrets: Olivia Tabares

Agenda/Notes:

### 1. Updates

- a. Olivia's Population Ecology Class - we'll check in with Olivia for updates on the next call
- b. Anna - Forecasting, Prediction, Projection Manuscript Update - we'll check with Anna on the next call
- c. Alyssa - ecoforecasting course compilation project update
  - i. Working on a manuscript that uses ecoforecasting as an example of how you can think through making ecology curriculum more inclusive at undergrad level. Synthesizing different activities.
- d. Jason - Sloan-funded education activities
  - i. Helena (ND grad student) and Jason went to visit collaborator Georgia Smies at Salish Kootenai College.
  - ii. Forecasting and data science have become established and are important for making decisions that affect people's lives but some people don't have access to training in these areas. Mainly the resources are at majority-white institutions.
  - iii. What can we do to enable indigenous communities to have more leverage over their data?
  - iv. Indigenous communities often have traditional knowledge and cultural context that does not get incorporated into forecasting/data science.
  - v. For Georgia's class framed a water quality issue as a data science/traditional knowledge activity.
  - vi. Want to talk about ways to use this material and make it more general and usable by other groups.
  - vii. The material for Georgia's class may also be useful for creating EPA reports. Need to think about having code that allows tribes to identify their priorities and their context for thinking about water quality data, while safeguarding data sovereignty.
  - viii. Want to think about the venn diagram of what kind of code would be useful for classes and teaching students and is useful for tribes for working with the EPA
  - ix. There are a couple of grants due in May that we are interested in looking into

- x. The EPA report is something that tribes need to make every 3 years which allows them additional money for monitoring and analysis
  - xi. Data preservation - is there a process in place for tribes to preserve their data?
    - The EPA has worked with a company to have a set format to make sure QA/QC happens and that the data is kept private (only tribal members have access to the data).
2. Forecasting Ethics material from RCN meeting in Summer 2021
- a. Abby Lewis and Ryan McClure had worked to develop material for classrooms during last summer's meeting. Is this something that we would want to
  - b. On teaching side - we know many people who are teaching forecasting. Would be interesting to ask people how ethics ideas come up in their classes?
  - c. Vet it with people who are teaching, vet with people who are creating operational forecasts
  - d. Know Sydne Record is really interested in this as well.
  - e. Think eventually it would be good to Don't think it is ready for a DOI on QUBES
  - f. Abby/Ryan pulled together literature that would be useful. The slides were based on literature that Ryan and Abby knew about, but think there needs to be text to pull it together. Think it would be helpful to have EFI take more of a stance on it.
  - g. Sydne was also thinking about developing things for a class in the realm of quantitative ecology related to one of her projects. Would be good to follow up to see if she developed anything that could be included.
  - h. The group is good to go over this material for the next call.
3. Coming up this summer: ESA, GA, anything else?
- a. May 23-25 EFI Virtual Meeting
  - b. ESA - 3 session. General ecological forecasting session that is the same as what we have had the past many years. ESA-TEK session. Canadian EFI-led session on connecting forecasting and decision making
  - c. Another session that Alyssa found is more paleo focused and using historical data to inform predictions
  - d. Geoscience Alliance meeting - will have a workshop that is long the lines of tools and data science for students and managers and natural resources
4. Julien
- a. Working on a project to provide Long Term Ecological Research (LTER) data to data science teachers. <https://github.com/lter/lterdatasampler>
    - i. The goal of this package is to provide a sampler to gather feedback from the community of what will be a larger package containing 28 datasets - one from each of the existing [US LTER sites](#). Those datasets are subsets of the original data and have been updated - sometimes substantially - from the raw data. They are aimed to be

useful for teaching and training in environmental data science. This content is thus not suitable for research and should only be used for teaching purposes.

- ii. See existing LTER [teaching and training initiatives](#), and the many other available LTER datasets which can be accessed via the [Environmental Data Initiative](#).
- b. And the Environmental Data Science Masters Program Julien mentioned:  
<https://bren.ucsb.edu/masters-programs/master-environmental-data-science/academics-meds/meds-courses>
  - i. This program includes core curriculum in data science, workflows, evaluation and analysis, and data visualization and a capstone project

## 5. Antoinette

- a. Has a syllabus and ideas of what to accomplish for getting started in a data science pathway. Want to connect it to real data, activities, scripts, just not sure where to find the data
- b. Teaching earth science in broad sense (not just geoscience) want to connect to climate change and equity.
  - i. Topics: Biodiversity, climate change, and human interaction with the environment - so lots of leverage
- c. Goal is to have students think critically about their role in the environment and their impact on the planet
- d. Water quality could be an example. This would mesh well with Jason's work with Georgia.
- e. Has a year to get the course developed and wants to start implementing small things/modules over time rather than doing a major overhaul all at once
- f. Want pre-made modules in addition to datasets? Want a bit of both. Many modules assume students are working on computer and have reliable internet. Antoinette could modify to have them work offline or on a mobile device.
- g. Want to develop the training that are useful to Antoinette's geoscience community and the ecological community
- h. Macrosystems EDDIE could provide a good foundation. They aren't available offline, but could be a place to start. They have background powerpoints that are associated with each of the hands on modules for instructors to use. One module thinks about uncertainty and stakeholder needs. It is a theoretical scenario, so could be adjusted to what Antoinette's students are interested in. They are vetted at multiple institutions. Cayelan and Tadhg are very interested in making them accessible so would be eager to work with Antoinette if there were things that would be useful.
- i. UNMG is interested in having research based projects for students. If there was a PI who was interested in having many undergrads work on a research project, there is an opportunity for this.

6. Open Book Project to keep in mind and mash up of notes from previous calls
  - a. There is potential to use the educational materials developed for the Sloan grant or with Olivia's class to start providing content for this that other EFI members could contribute to.
    - i. This is a book you would read before you read Mike's Forecasting book
    - ii. If we start to develop modular materials they could be included in such a book
    - iii. Can start to develop a list of the components that would be useful to include in a book and think about how to make it applicable to a wide range of students from many different backgrounds
    - iv. Think about developing slides/materials that provide context
    - v. Running list of who has expressed interest at one time or another
      - Jason McLachlan, Shannon LaDeau, Elva Escobar
    - vi. Has anyone seen the [Open Forecasting Textbook](#) (does exist as a [paperback](#) as well)
      - In the Preface this is for a 3rd year undergrad intro master's course
      - Interesting template. Success in part due to free online and R packages are nicely user friendly
      - This is a bookdown format where R code is integrated and is a living document
      - Wouldn't get the credit of something like an AGU Monograph, but would be more broadly available.
      - Could do something that are RMarkdowns that could be combined as a book
      - Loop John Zobitz into this. He is also writing a book for his courses. Mike has used some of his chapters in his 300 level course.
      - Do this in the context of NEON data and walking through all the steps of forecasting. Could get long, but would be a nice resource.
      - A self-contained book to walk through. Could reference other books.
    - vii. This sounds like a strong potential for a proposal for NSF Education Directorates, especially if we could bring in an education evaluator who evaluates the open source, collaborative textbook.
      - If we structured it well it could have a strong educational research component