

June 16, 2021 Education Working Group Call

Attendees: Anna Sjodin, Jason McLachlan, Lisa Haber, Alyssa Willson, Mike Dietze, Shannon LaDeau, Olivia Tabares

Agenda/Notes:

1. Inclusive Pedagogy Workshop take aways and prep for Education Meeting
 - a. Inclusive Pedagogy: Had a really good group of people to have the conversation with. Most urgent task is to pull the lessons learned together for the upcoming Education meeting
 - b. Really good conversations about what we know about being inclusive in the classroom setting and developing resources that Alyssa is working to pull together for Education meeting. Also had good discussion on the roadblock and how EFI can address those.
 - c. Major topics discussed:
 - i. Computational/Quantitative Challenges,
 - ii. Access to Resources,
 - iii. Incorporating Alternative Ways of Knowing
 - d. The RCN is focused on the Challenge and have people coming to the Education meeting who are participating in the Challenge, but also have people attending who are not part of the Challenge. So want to make the Education meeting accessible to a wide group. Want to open it up to brainstorming ideas and tasks for moving forward things like curriculum development
2. EFISA Early Career meeting update
 - a. Had 50 people max at any one time
 - b. Had the most people attend the tutorials on day 1
 - c. Day 2 had higher attendance than expecting. Had lots of talks on the Challenge themes, working groups that provided status updates, had breakout groups on what EFISA can do
 - d. Generated interest in the Education working group
3. Forecasting, Prediction, Projection Manuscript Update (Anna and Gretchen)
 - a. No progress yet.
 - b. Jody will send links to two papers that are related to “predictions”
4. Olivia’s R infographic for teaching biostatistics with R Updates. Olivia sent them before the Inclusive Pedagogy Workshop! Jody needs to upload them to the EFI webpage.
 - a. [Teaching biostatistics part 1](#)
 - b. [Teaching biostatistics part 2](#)
 - c. Olivia is also working on infographics for students learning biostatistics - it has similar ideas as the infographics for instructors
 - i. Be excited, Be Patient, Be Observant, Be Curious, Be Thorough, Be Proactive

- ii. Be Proactive - annotate!
- iii. Be Independent - it is good to use Google and Stack Overflow
 - “Friends don’t let friends code alone”
 - Encourage students to form a community to help with coding (in or outside of class)
 - Change from Independent to Be Collaborative
- iv. Be Patient - have a growth mindset. In R, if there is anything you want to do can be done multiple ways. It isn’t just Patience, it is also about Practice in addition to being patient.
- v. Be aware that many people will come into learning R with math anxiety. But coding isn’t math. It is a different skill. Don’t be afraid. Or don’t be afraid to ask questions.
- vi. Which kind of variables would be useful? Related to ecology or general biology?
 - Jason reflecting on in his biostatistics class for premed/gen bio students this year. Had lots of students interested in genomic data which is large and interconnected - working with big datasets and workflows for those types of data were important for that group. Not only is different datasets important but how you analyze the data differs.
 - Students appreciated that they used real datasets and real examples. Think if you do that people are forgiving if the examples are not necessarily in their field
 - Mike: My first undergrad lab starts with a frog dataset from Ben Bolker’s book. The second lab is some basic weather time series
 - Olivia - students she teaches are in their 3rd semester, so haven’t determined what they are specifically going to focus on. So has provided a number of different examples
 - Important things to incorporate moving forward: How to use tidyverse and filter large datasets
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5. Document for People (guidance counselors/instructors) working with students interested in ecological forecasting
 - a. Go over updated formatted pdf draft
 - b. Anna and Lisa are willing to work on reducing text on first page to get that cut down.
 - c. Put the recommended asterisked items in each list at the top of the list. Put harder courses and harder to find courses lower on the list.
 - i. E.g., Decision Science course before Game Theory course
 - ii. Do the same for the math stats. Cores stats course is essential, basic stats course is essential and the rest of the courses are grad level courses
 - d. Update Suggested Courses to Example Courses

- e. Could give examples of the type of forecasts and the types of courses that would be useful
- f. The whole document is stressed on people making forecasts, vs those using the forecasts or those creating the cyberinfrastructure. Also don't have natural resource managers perspective on this.
 - i. In last section with the description of ecoforecasting being iterative and many ways to get involved - maybe could organize instead of by course type, could organize by if you are interested in ecology here are course, if you are interested in the decision making here are the courses you could take
 - ii. All of us came to ecoforecasting in many different ways. So want to highlight that and make it clear
 - iii. How is this going to get to people
 - Handout to share with counselors instructors to share with students as a handout
 - Posted on Ecolog, QUBES, EFI webpage
 - iv. If it is a living document - it can be adjusted
 - v. If it is a handout printed back/front - want to keep it to 2 pages
 - vi. Anna like the idea of working on it hierarchically
 - vii. Is iterative too big of a word for a handout?
 - viii. The challenge - we want to get across all the good things of forecasting when we present it.
 - ix. Highlight forecasts people are most familiar with - weather, covid. If you focus on those kinds of prediction, uncertainty/iterative aspects become more clearly relevant.
 - x. Once we get a draft ready, send it out to oher to make sure we haven't added anything.
 - xi. Plan of action/next steps
 - Anna and Lisa to make updates. Then send to Shannon to make updates
 - Once we get a formatted draft then we will want to share it with the EFI Social Science group and others and career counselors and environmental science advisors (we have some at ND and other can share with their contacts)
- g.
- h. Venues for sharing: Ecolog, Career counselors, QUBES
 - i. QUBES community happy to share (Jody connected with Hayley Orndorf April 23, 2021 about options)
 - ii. There are several ways we could share the resource, outlined below:
 - iii. As a [QUBES Open Educational Resource](#). Materials published on QUBES range from instructional material to reference material like posters and workshops, and this material would be a great resource. All QUBES resources receive a permanent URL, DOI, and citation. Authors may

choose a Creative Commons license that communicates how others can use the material. In this case, you could publish it from the EFI RCN group to generate an automatic connection to the work. For example, [NEON has many of their educational materials published as QUBES resources.](#)

- iv. If this were something you all are interested in, the group should be sure to discuss authorship and how the material will be licensed, considering things like adaptations and commercial use. Also, you should ensure that everyone is comfortable with the material having a DOI for its instance on QUBES.
- v. The content of QUBES resources is flexible and could include the PDFs, electronic versions, or both.
- vi. I'm including two resources on publishing on QUBES, but we will soon be publishing updated versions of these materials. I will send them along as soon as they are available. Don't hesitate to reach out with questions.
 - [Using Publications to Post Resources on QUBES](#)
 - [Information for Authors and Submitters](#)
- vii. In the QUBES newsletter - whether the material is published as a QUBES resource or not, we can certainly share it in the newsletter. If you have electronic versions that will be easy to point to from a story in the newsletter.
- viii. Those are the two best options for sharing the material with the community. Let me know if you have questions or want to chat more about publishing,

6. Task for the future. Jody is leaving this on as a reminder.

- a. What kind of biostats do students need to know to set them up for being able to take a forecasting course?
 - i. Jason - provide update on ideas from RCN Steering Committee Call
 - ii. From Feb 2021 call: How do we make those materials available? Don't want to create a textbook, but could think about an AGU Monograph style resources. 10 chapters that build on each other.
 - iii. Go back to the notes from Feb 2021 call for details about this conversation.
 - iv. Elva Escobar is interested in participating on this project
 - v. Here are some ideas that came from a separate call with the RCN Steering Committee.
 - Quinn is trying to think about how to put some of his course materials together. Thinking of perhaps a How To Guide for the forecasting challenge
 - 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 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.
 - 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
- vi. Disciplinary expertise - think we are downplaying the empirical researchers who are providing data/data collection. Don't want to leave those people out
- Ecological methods course
- vii. Also don't want to leave out people more interested in the social science/partners side of things. But this is where the note up at the top of page 2 will be important to convey that not all courses are necessary.