

## March 1, 2021 Education Working Group Call

Attendees: Diana Dalbotten, Alyssa Willson, Anna Sjodin, Jody Peters, Shannon LaDeau, Olivia Tabares Mendoza, Jason McLachlan, Lisa Haber

Regrets: Tadhg Moore

Agenda/Notes:

1. Check in at some point during the call to get the feeling about the tasks we want to focus on as a group. Are the things we are doing now, the things we want to focus on or are there other things we want to focus on?
  - a. See point 8 below for one possibility to follow up on
  - b. Alyssa - invested in interns working on educational resources who are going through the intro to forecasting videos. As Alyssa identifies gaps it will be good to run those gaps by the group to get input if people know of resources and if there are no resources, then people willing to work on the creating the materials
    - i. Videos are useful as well as having example code
    - ii. Want to grow repository that Alyssa has put together and there are tons of ways to do that with whatever people are most excited to work on
    - iii. Alyssa is working with HSU students who are reviewing forecasting education resources - right now the students are all going through the forecasting video series produced by NEON - e.g., why forecast, particle filtering, and social science aspect. The students are reflecting on what they understood, what they didn't understand, and why. Students have a range of experiences in their program. When students have difficulty grasping a concept, Alyssa will provide additional resources that exist to see if those help.
      - Today is the first day the students are back from spring break and are working on it so only 1 reflection from a student so far, but this reflection was about how the person wasn't able to find the difference between forecasting, prediction, and projection.
      - Use student reviews to help guide students.
      - From Anna's experience at the 2019 DC EFI meeting learning about GitHub. Went back and looked at ~10 videos on what GitHub is and none of them were useful. So knowing the gaps would be really useful.
    - iv. NEFI workshop/videos is targeted to grad students. And is providing a pre-workshop training on intro to Bayes and intro work on GitHub. Noticed in the workshop that even amongst grad students it splits off earlier on for some students who get the code vs those who don't get past the copy and pasting the code and not understanding the code. Anyone can copy and paste the code, but even that separates students who can move forward and understand the code and those that copy and paste and don't understand what they are doing. The NEFI group has talked

about what could be done. Have identified that it is needed to have R tutorials, where you have the data, it is messy, but you are able to get all the way through - have this before state space and before model.

- Students are familiar with regression. So want to have examples of comparisons to regression.
  - From Alyssa: I wonder if there would be an opportunity to adapt the SESYNC Bayes course materials to address the NEFI short course gap
- v. Another opportunity, but a bit divergent - NEFI is short course. But it could be useful to have modular material that could be used in a course that is longer. The design of the short course and the design of a semester course is different. Want to think at the big and small scale.
- vi. If we have all the material online, it is still not that accessible. Would be good to have a textbook to go along with. We probably won't write a text book, but could think about ways to plug into other textbooks already available.
- vii. Diana suggested an [AGU monograph](#) at one point that got accepted and published. This could be something to think about for an AGU monograph. If you have 10 faculty to write something that would all write to a better textbook, could be another option. If you know what you want and you have 10 people who could write the chapters.
- Diana's monograph was: Advancing Civic Understanding of the Anthropocene. Had a couple of people write about citizen science, had K-12 articles, and had diversity articles on community based research.
  - Ideally would want each of the chapters to be interrelated for an EFI Education monograph. If each piece says what you need to know and builds on previous chapters.
  - Statistics For Ecological Forecasting (potential title) - get people interested together to coordinate. Would need a strong editorial contribution/work to code check every chapter to make sure people aren't being introduced to novel concepts not introduced previously. Seems possible. Could think about working on next year or bringing up during the education meeting.
  - Benefit is that AGU Monographs go in every library. It is a good production that AGU puts together.
  - If we could generate some funding for it, wondering if we could make it open access
  - This would tie in nicely with the RCN Education Meeting and the RCN NEON Challenge.
  - Idea would be to get you to the point where Mike's Forecasting book is the next book.

## 2. Forecasting, Prediction, Projection Manuscript Update (Anna and Gretchen)

- a. No update this month
3. Olivia's R infographic for teaching biostatistics with R Updates
  - a. We went over Part II - Teaching with R
    - i. Use IDEs (e.g., R Studio instead of command line with R), Charm Them, Troubleshooting, Not just about p-values (effect size is more important than the significance)
    - ii. There are different styles of programming, don't be afraid to learn something new
    - iii. Olivia will work on it and send it to the group. Jody can add it to the EFI website and twitter.
4. RCN Education Workshop Update (Jason, Alyssa)
  - a. No updates this time
5. Educational resources and collaboration with Humboldt State update (Alyssa)
6. Document for Guidance Counselors and Instructors working with students interested in ecological forecasting
  - a. Here is the draft
  - b. Lisa wrote a paragraph at the beginning of What is Ecological Forecasting section. Likened it to weather forecasting. Tried to stay away from big, fancy words.
  - c. Start with this on our next call.
7. Teaching students stats with R is useful because students have to work through the code as compared to other programs that are more blackbox (SPSS, etc)
8. Task for the future: How do we make the educational resources available?
  - a. For example, R has swirl courses that are helpful to learn R but they are narrow. (if you are on step 5, they expect you to have completed steps 1-4)
  - b. Interesting for this group to think about a flexible repository for people trying to teach intro stats that is not for stats majors. Stats is the first step for forecasting so focusing on this would be useful.
  - c. Repository of code.
  - d. Olivia has Introduction to probability for ecology students material
  - e. If you wanted to train someone so they aren't narrowly thinking about p-values. How to teach an algebra based stats class. Do you get to do bayes in your first semester? Do you get to the point of being able to create forecasts in the first semester? Could someone in their first semester be able to create a forecast by the end of the semester?
  - f. What would be the best version of material to set students up for a forecasting course like Mike teaches (his version of forecasting for grad student)? Jason's class is making some progress.

- g. Still a big part missing for forecasting courses and all 2nd semester stats courses that involve more mechanistic modeling and data-model fusion.
- h. This would tie in with the teaching in this group.
- i. Have this discussion after this semester is over and Jason has more band-width.