

November 6, 2023 Education Working Group Call

Attendees: Alyssa Willson, Cazimir Kowalski, Jody Peters, Mary Lofton, Saeed Shafiei Sabet, Jason McLachlan

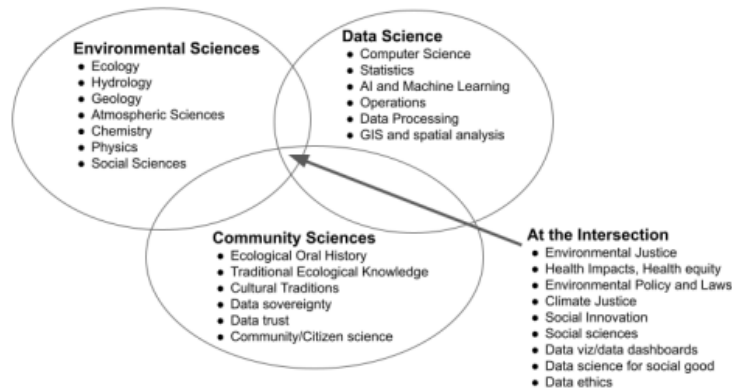
Regrets: Abby Lewis

Agenda/Notes:

1. December call plans:
 - a. Morgan Ernest and/or Ethan White from the University of Florida will be sharing their experience with their ecological forecasting class
 - i. “Ecological Forecasting and Dynamics: A graduate course on the fundamentals of time series and forecasting ecology”
 - b. Cathleen Torres Parisian from the Polar Geospatial Center will share her experience with story maps
2. Macrosystems EDDIE update - the project is wrapping up with revisions and the goal is to get the modules out and get them used (still acknowledging that there will continually be revisions). Mary is working on a manuscript that provides an overview of the modules and the impact
3. Code Review activities
 - a. Developed from a Theory working group call.
 - b. Subgroup has met to discuss the paper: Implementing code review in the scientific workflow: Insights from ecology and evolutionary biology
 - i. <https://onlinelibrary.wiley.com/doi/full/10.1111/jeb.14230>
 - c. The group will meet in the future to continue discussing and think about creating a blog post with suggestions for EFI
 - d. VT - started conversation last semester because there is lot of uncertainty about having a body of code
 - i. Reproducibility review - where someone tries to run the code, but it doesn't help with what code actually should be used
 - ii. Quinn developed a code review with docker
 - iii. Thinking about what stage to do code review
 - iv. VT lab group met to lay out the process to use applied to the use case of a grad student chapter
 - e. ND discussing ways to incorporate a code review for manuscripts
 - f. All groups will continue to connect to share as templates and protocols are developed and tested
4. Paper Discussion: Crall et al. 2023. Identifying Assets and Collaborative Activities to Support Student Success in Environmental Data Science at Minority Serving Institutions
 - a. <https://zenodo.org/records/8231167>

b. The paper defines environmental data science at TCUs and HBCUs

Figure 1. Defining Environmental Data Science at TCUs and HBCUs



c.

- i. This figure aligns with what Jason is working on for his Environmental Justice and Data Science course
 - ii. Nick Record has an ocean sciences and data justice course that he teaches that would be good to connect about
- d. Used the SOAR (strengths, opportunities, aspirations, results) framework to assess EDS at TCUs and HBCUs
- e. Common aspirations for both groups
- i. Integrating community into EDS research (TCU - integrate language and culture)
 - ii. EDS become more flexible with math requirements to prevent requirements from becoming a barrier
 - iii. Early pathways for data analytics - data gathering, cleaning, analysis, and visualization
 - iv. Work with mathematics departments to customize shorter prerequisites-free math sequence that includes linear algebra and calculus skills
- f. Priorities for both group
- i. Gaining admin support
 - ii. Building connections outside the institution through alumni networks, academic journals, etc
 - iii. Having scaffolded or layered pedagogy to support students in independent projects
 - Mini projects could help with the layering
 - When building online resources - want to build a version that hierarchically builds up or can work at multiple levels. But it is a challenge since materials will be used differently by different people or situations are being used
 - But be open that the materials will be used differently
 - Be open to iterative feedback

- Strength of the EFI community - if groups are interested in addressing the scaffolded approach, what can the community do to support that
 - Need people willing to try materials in their classes and provide feedback
 - Having a community of practice
 - Can we use these meetings to challenge or break the products
 - Formal way of diagnosing or troubleshooting or identifying ways to improve
 - Get people's opinions about revised versions and if the revisions are working
- iv. Aspire to see the students as scholars not just as "research assistants, but also as colleagues"
 - This may require a bit of a different approach to funding streams or mechanisms where PIs propose the project and then recruit students
 - Or this could be a way for advisors to incorporate advisees' interests into grant funds
 - How to allow students to use their interests in projects? Thinking about place based values
 - Academia is hierarchical and you don't want to place a false sense of an egalitarian process
 - Need communication, respect, and trust
 - How to enable students to feel ownership and have role in guiding things and still fit with the current funding model and hierarchy that is in place?
 - Be more explicit and clear about project deliverables on grants so the students/team know what they signed up for
 - Let students look over grant proposals and comment on them, even if they won't work on it since it will happen after they graduate
 - Have mini projects that allow students to take lead of and grow their confidence and develop their skills
- v. Points 3 & 4 are things that Jody thinks we can think about how to incorporate in EFI projects
- g. Data Science Organizations listed or involved in the paper and Jody's input about who is the organization is targeting in terms of instructors and/or students
 - i. [Academic Data Science Alliance](#) (ADSA) - a community of leaders, practitioners, and educators who thoughtfully integrate data science and AI best practices in higher education. Our members connect and share their data-intensive approaches and responsible applications. Mainly instructors, but there is also a job board that could be useful for students

- ii. [Environmental Data Science Inclusion Network](#) (EDSIN) - dedicated to facilitating and supporting diversity, equity, and inclusion within the environmental and data science fields - instructors
- iii. [Environmental Data Science Innovation & Inclusion Lab](#) (ESIIL) - instructors and students
- iv. [Native BioData Consortium](#) (NBDC) - Indigenous led genetics and health research - instructors and students
- v. [Atlanta University Center \(AUC\) Data Science Initiative](#) - instructors and students at the HBCU partners in the Center
- vi. [The Carpentries](#) - instructors and students
- vii. [Institute for Racially Just, Inclusive, and Open STEM Education](#) (RIOS) - instructors, RIOS invites proposals for Working Groups with \$2K budget that will function as innovation sandboxes or think tank incubators
- viii. [Biological and Environmental Data Education](#) (BEDE) - instructors

5. Brainstorm Data Science Networks/Organizations and who they are targeting for training student or instructor

- a. Jody briefly mentioned this topic to the group to keep in mind during our discussion of the paper today
- b. This follows up on the October call discussion of the Emery et al 2021: Instructor Training Needs for Data Science paper and can be informed by the Crall et al paper in point 2 above
- c. The Carpentries - Primarily Students, but there is training for instructors
- d. QUBESHub - Instructor
- e. [Biological and Environmental Data Education \(BEDE\) Network](#) - Instructor
- f. [Environmental Data Science Inclusion Network \(EDSIN\)](#) - Instructor

6. What resources need to be added/updated on the [Educational Resources webpage](#)?

- a. Jody briefly mentioned this topic to the group to keep in mind during our discussion of the paper today
- b. Can we write a blog post with recommendations for students, recommendations for instructors?
- c. Can we create a 5 minute recording about the resources? What would go into such a video?
 - i. Facts sheets, simple graphs of the steps needed for the process
- d. Freya's workshop tutorial
- e. CEFI short course material
- f. Syllabi
- g. Do we want to record a short 5 minute video to update the WG page with information about the Education working group and what kind of resources are available?
- h. A how to get started learning about forecasts set of recommendations?

- i. Could do this from a student perspective or from an instructor perspective
7. Are there Education resources that should be added to the compiled list of resources?
 - a. Google doc
 - b. [QUBES](#)
8. Ethics in Forecasting Project Manuscript - Accepted with minor revisions at Teaching Issues and Experiments in Ecology!!
 - a. Didn't get to this on the November call, but keeping it in the notes for reference
 - b. Hope to have revisions submitted within a week of this call
 - c. Papers suggested in the reviews that may be of interest to the group
 - i. Alexaides et al 2021. Traditional Ecological Knowledge and Inclusive Pedagogy Increase Retention and Success Outcomes of STEM Students
 - <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/bes2.1924>
 - ii. Bowser and Cid 2021. Developing the ecological scientist mindset among underrepresented students in ecology fields
 - <https://esajournals.onlinelibrary.wiley.com/doi/10.1002/eap.2348>
9. Jody is leaving this in from the August 2023 call Next steps - not totally clear what the next steps for the group are. Have the list of ideas above. Could try to follow up on those or see if there are others in the bigger EFI community who are interested in working on those projects.
 - a. Could collectively read papers this helps people who are worried about jumping in
 - b. Small Teaching book - new book suggested to Jason recently
 - c. Could also invite people to the calls to discuss
 - i. 1-day challenge workshop - what does it need
 - ii. Invite people who have all taught a class - where are we on that and what do we need
 - Code has developed a lot and class has worked well for different people
 - Mike feels that part of his textbook needs to be updated since the field is developing so quickly
 - Come up with a list of priorities
10. Notes from a long time ago, that may be good as a reference. But doesn't need to be discussed on this call. 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