January 12, 2022 Education Working Group Call

December 9, 2021 Education Call Notes HERE

Attendees: Lisa Haber, Olivia Tabares, Jason McLachlan, Jody Peters, Shannon LaDeau
Regrets: Anna Sjodin

Agenda/Notes:

1. New QUBES Resources!
    a. Olivia's infographics for learning and teaching R
        i. Learning R Infographic: https://qubeshub.org/publications/2788/1
        ii. Teaching R Infographic: https://qubeshub.org/publications/2789/1
    b. Alyssa's educational resources: https://qubeshub.org/publications/2827/1

2. Updates and What Does The Group Want to Focus on in Jan-May 2022?
    a. Previous items discussed:
        i. Anna - Forecasting, Prediction, Projection Manuscript Update
            - Gretchen is back from traveling and ready to work with Anna on the manuscript.
        ii. Alyssa - ecoforecasting course compilation project update
            - Not on the call, can check for updates next time.
        iii. RCN-funding for education. Funded Alyssa's work
            - Also have Forecasting Challenges which can help for making modules or exercises for undergrads. Provide examples of forecasts that have an ecological or environmental science context where forecasting is really interesting
                - RCN Forecasting dashboard can be useful for providing examples of forecasts
        iv. Jason - Sloan-funded education activities
            - Tess at BU (currently) and Alyssa at ND (previously) working with undergrads at Humboldt State to work through forecasting materials
            - Helena at ND helping Georgia at Salish Kootenai College to develop code and materials for Georgia's class
        v. Open Book Idea (see point 2.d.x. below) - Shannon is interested. There is potential to use the educational materials developed for the Sloan grant to start providing content for this that other EFI members could contribute to (see point 3 below for previous notes about this idea)
            - This is a book you would read before you read Mike's Forecasting book
            - If we start to develop modular materials they could be included in such a book
        vi. RCN June Educational Meeting Material follow ups

b. Upcoming -
    i. Opportunities with HBCUs - Jason had a call with prof at Tuskegee who may join the group later
    ii. National Center Proposals - if funding comes through new opportunities will be available
    iii. What are the priorities for our Working Group for this semester?
        - Design team for Challenge - good place to leverage. Compelling group of projects. The idea of prediction is a good hook for students.
            - Build access by leveraging code. They are available online, but could make them available more broadly
            - From Tick experiment- there was winnowing of enthusiasm from “yeah I want to forecast” to “submitting forecasts”
            - Take an example - go through it from the example of a hypothetical class/group of students. Would need to define who that target group is. If we have the group in mind, then we can step through it and imagine where there are bottlenecks and give it a try.
                - Could work with our classes.
                - Who are the targets?
                    - Groups at schools we are reaching out to with Sloan collaboration.
                    - Teachers reaching students who are not at R1 where ecoforecasting courses are being taught
                - Don’t want to develop all on our own. Want to bring in collaborators early. Think of a way to package it and then run it by people to ask if this would be helpful and have them set the goal.
            - Talk about it, then check in with partners for what works for their students.
            - Work on this, this semester and think about writing a grant proposal.
        - When the RCN design teams were meeting at the end of last fall to prep for round 2, there was dicussion about building broader participation in the Challenges
        - Invest time into creating something that is modular. How generic can we make the materials for the Challenges?
            - All challenges revolve around data from NEON. Each challenge has different data types
            - EFI RCN provides the data and an initial random walk forecast

    - Issue was that more needed to happen after the initial random walk to make forecasts that were of interest.
    - Other issue was the data latency for ticks and beetles
    - But if we consider them as building blocks as data types. The nice things about NEON is that the data types exist everywhere
    - Think about doing a simple version. Students don't need to go through Kalman Filtering coding. Want to get them in the process of using data and updating models
    - Vector born disease model that is a simulation model. Here is a forecast of lyme disease based on this sampling of ticks. Your priority is to predict this community. Where would you collect more ticks? Then they could go out on a fake landscape to test where getting more ticks would be useful.
    - This is useful because it builds on Forecast Challenge. Also useful for NEON who wants to reach out more broadly than just locations at NEON.
    - Nagy paper - focuses on NEON, but also about diversity and inclusion and getting people into ecology.
- What will be most interesting to Olivia's students is making the link to applications in conservation science - any application in ecology
    - Olivia thinking of using the tick challenge in her population ecology class
    - How can we get feedback from her students. How can the international community make use of NEON data? Looking for useful database for teaching.
    - Do final projects using major population database. Students build model and management recommendations looking at population models. Wants to switch that up a bit.
    - Testing it in Olivia's class allows it to be modular and annotated
        - Start class on Feb 1 and goes to Jun
        - Use this year to try out some things
        - Use Education WG to help provide feedback
    - Could develop a paper listing bottlenecks e.g.,
        - NEON is supposed to be for everyone (Nagy et al)
        - Here is where we are hearing about bottlenecks
- End products - what format,
    - What skills to include?
        - Have students go through iterative process.
        - Plug and play visualization of forecast equation
        - App thing or R code

        - Provide ensemble of products
        - Check in with Cayelan and Tadhg to see if/where there is overlap.
    iv. Next steps
        - Olivia to think about what could be most useful and where the group can provide help. Working with co-instructor this Friday to talk about syllabus for the upcoming semester
            - What is a tangible product? R skills
        - Jason will check in with Georgia at SKC. She is more interested in water quality
        - Jason will check with Project EDDIE people
        - One other thing to add to next call - thinking about testing out the 2-page educational resources pdf that is on QUBES.

3. Previous Notes about the Open Book:
    a. Jason - provide update on ideas from RCN Steering Committee Call
    b. 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.
    c. Go back to the notes from Feb 2021 call for details about this conversation.
    d. Elva Escobar is interested in participating on this project
    e. Here are some ideas that came from a separate call with the RCN Steering Committee.
        i. 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
        ii. 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.

iii. 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