

## October 16, 2019 Education Working Group Call

Participants: Anna Sjodin, Jason McLachlan, Jody Peters, Diana Dalbotten, Cayelan Carey

Agenda:

- Education: Top tasks from July 12 call:
  - Key vocabulary words: at least ID terms, if not define them
    - Anna and Gretchen have been working on this
      - Split between fields. Gretchen focused on the vocab for science world. Anna - finance, business, economics, sports
      - Specific definitions seemed to matter more for science. Definition for forecasting being specific to event/date. Prediction - was in current time, something is happening. "I predict that it is a certain temp on Mars" while "forecasts" is looking to the future.
      - Very specific in earthquake forecasting
      - In business/sports - less loosely defined and used interchangeable
    - JMc: Many folks in EFI have the more narrow Dietze-like definition for forecasts - a statistically based conception with uncertainty.
    - Cayelan: Quantifying uncertainty is important. Prediction = mean of ensembles. Forecasts include the uncertainty
    - Most people consider uncertainty as bad or don't know how to interpret the uncertainty (e.g., cone of uncertainty with hurricanes). Or since it is bad want to reduce uncertainty and often just ignore it.
    - This is a communication thing that would be good to focus on (stats folks have been working on this so maybe we can borrow things from them)
    - Diana: prediction is more of a loose term. E.g., magic/horse-sense
    - Cayelan is analyzing a study of 470 undergrads on how they think about ecosystem models - in most cases they use prediction/forecast interchangeably
    - When teaching about this, have examples that are really intuitive e.g., weather forecasts, Cayelan's water quality are good examples
    - Do we want to move forward with formal definitions in EFI?
      - On About EFI Webpage - want to make sure we have a formal definition and have a bunch of examples. Here is why these are forecasts. Here is what they have in common
      - How is ecological forecasting different than other ecological science (as opposed to comparing ecological forecasts to ecological predictions)
      - What is it that makes ecological forecasting new and exciting (applicability, accounting for uncertainty - have examples so this doesn't sound boring/bad)

- 3 components from Clark's seminal paper: making predictions about future conditions, accounting for uncertainty, and what can be used for decision support
  - Having forecast/prediction well-defined will be important moving forward
    - Cayelan's study about how students view the term "random".
    - Once people understand the definitions then it can help inform how they view their work
  - Moving forward: Think about the webpage as the first place to flesh this out. Have definition and examples
- Feedback from other instructors about what works and doesn't work
  - Cayelan might lead, existing IRB
    - Caylen's email 9-16-19:
    - I should be good to go to collect data from forecasting instructors as part of my Macrosystems EDDIE grant IRB (my homework from last time was to check in on this). It would be helpful if the group could let me know which assessment questions would be most helpful to ask - e.g., I'm envisioning that we would use the survey to collect their current syllabi, gather information on what topics they are currently teaching, as well as ask about which new forecasting teaching materials would be most useful. Let me know what else you come up with?
- Wikipedia hackathon
- Blog ideas
  - Pull:
  - Push: how to teach EF at the undergrad level (John)
  - Google Doc...
- Other items listed in the notes from July's call:
  - Could put together a survey to existing EF about lessons learned and effective strategies? What's been useful (or not) so far that could be useful to new instructors
  - Another piece: maybe writing a how-to piece on how to develop new modules for a different context (e.g. different, local data)
- Diversity Note: Mike posted this to Slack: NEON blog on "Building Diversity, Equity and Inclusion in Environmental Data Science" <https://t.co/5CT1U9Jqog>
- EFI-RCN:
  - One of the RCN's Major Tasks is to create online tutorial material. The RCN group has started this Online Tutorial Material Brain Dump doc [LINK REMOVED]
  - Education-related impacts from the RCN Proposal: (2) *Opportunities for cross-disciplinary STEM training for graduate students and postgraduates* - Graduate students will be directly involved in the planning and execution of network activities, and a graduate student will be included on the steering committee.

Additionally, a formal training session for early career scientists will be held prior to the EFI-RCN Hackathon event. (3) *Broadening access to course materials and tutorials for forecasting* - We will synthesize existing forecasting instructional materials used in university classes and summer workshops to create tutorials that will be publicly available for self-paced learning or for university courses to use. These resources will help remove the barrier to teaching forecasting concepts at universities that have not previously included forecasting in their curricula.

- Is there some way we can take advantage of the broader EFI efforts within the narrowness of the RCN? Use the RCN to document where we are with Education tools and where we want to have more tools
- RCN is focused on grad student education rather than undergrads
- Most of the forecasting courses being taught are at the grad level
- Things that would be useful
  - Collating courses that have been developed so far
  - Use a survey to ask things like
    - what background are you expecting your students to have
    - How much stats do students need to have before taking the courses
    - How much code is used in the courses
    - What are people worried about in their courses
    - What works well for the courses
    - Pre-requisites. Do you require them? Prior to taking your class did your students have previous related courses or previous experience.
      - Are there other ways for students to get this knowledge without formal coursework?
      - How to help students learn to apply tools in novel/innovative ways
  - Would it be possible to have students first year ecology/biology course be a forecasting course?
  - Think about a timeline for this that works for this group and for the RCN
  - This will also be helpful for the Diversity needs as well
  - Cayelan is working on the survey right now. Would be great to get it out later this fall/early winter
  - **Cayelan will send out the survey draft to get feedback over the next two weeks**
- **For DEI call/Next Edu calls:**
  - **Diana to work on Strategic Plan**
  - **Anna (and maybe Gretchen) to work on prediction/forecast definitions**
    - **Look at the website - how/what needs to be updated**
- Need summary of the call for the Newsletter