

April 26, 2021 Theory Working Group Call

Attendees: Abby Lewis, Amanda Gallinat, Nick Record, John Foster, Jaime Ashander, Peter Adler, Christy Rollinson, Jody Peters

Agenda:

1. Draft Outline of Theory group manuscript
 - a. Look over who signed up for different sections
 - b. Discuss co-author policy draft that Abby put together.
 - i. We all understand that not everyone can make all the calls, so we want to be clear that there are many ways to contribute and we want people to continue to stay involved with the manuscript even when you can't make the calls
 - ii. General idea - creating authorship guidelines, but want to use these to help inform authorship guidelines for all of EFI
 - iii. The second section about this manuscript would be changed out for each manuscript in EFI
 - iv. General philosophy - provides a guide for foundation for communication. But it isn't that you will check 3 boxes and automatically become a co-author. Could be that you contributed substantially to one area and that would lead to co-authorship
 - v. Want to include an authorship statement in each manuscript
 - vi. Concept & Design = participating in these meetings, participating over Slack or adding to the outline
 - vii. Could remove supervision of authors or could remove the full section.
 - viii. Examples of Research Contributions were drawn from other projects Abby has worked on so isn't tailored to ecological forecasting. Also this section would probably more applicable to other forecasting manuscripts with analyses.
 - ix. In the event of disagreement about authorship, encourage manuscript lead to be inclusive. But this is something we can talk about.
 - x. Could add a co-author conduct section. Amanda is happy to write it in.
 1. Set the tone for authors to be respectful and responsive.
 - xi. Peter wrote first draft of Nutrient Network authorship guidelines. Think we are trying to do 2 things at once, which is hard. Trying to think about EFI and trying to think about this paper. Could provide a template for other EFI manuscripts. Currently have boiler plate that can be pasted in to other authors. Think this will be easier to write if you write it about this manuscript. Since this manuscript doesn't have data.
 1. Think about a general template that can help others write more specific guidelines for other EFI manuscripts
 - xii. Have a table of contributions that people check off?

1. Yes want to have a table that people fill out. But don't want to require individuals have X number of boxes checked to be included
 2. Have people check the box, but don't want to have
 3. Make everyone enter their own name, affiliation, and check off their contributions
 4. Hard to give people opportunities to get involved early enough. Often have a core group of people that writes the paper and then ask people to get involved, but they feel they have
 - xiii. Make the changes suggested and then give it to the EFI Steering
 - xiv. Conflict resolution - implication is that the lead author is given the final call. If this is true, we'll want to make that clear.
 1. Peter suggests that conflict resolution be not resolved by the lead author, but have it be something that comes to the Steering Committee.
 - a. The Steering Committee hasn't talked about this.
 - b. Nutrient Network has an authorship committee that is 2 people that are general NN members that fill this role. If there was conflict with those 2 people for manuscripts the Steering Committee will appoint people to help negotiate the conflicts.
 - xv. Sometimes there are times with manuscript writing where lead authorship is chosen. Seems like there is an assumption in the guidelines about the lead authorship, but there isn't any guidance about how that is chosen.
 1. Any tips and tricks for choosing a lead author?
 - a. In some collaboration there is group work on a manuscript that starts to lack
 - b. Early career - balance between providing opportunity and not placing too much on that early career person - have later career people support the early career person.
 2. For the Theory manuscript guidelines, we can make it clear that Abby is the lead author and that Amanda is the next lead.
 - c. Abby will update the guidelines with these suggestions and add a table for contributions that she will share with the group. She will also provide some general guidelines to pass off to the EFI Steering Committee
2. Next steps for manuscript writing. Review of the manuscript.
 - a. Have had a lot of people who have signed up and made comments or the places they want to contribute.
 - b. There are still a few places where there can be contributions, but for the most part have it covered.
 - c. Wonder if we can add a few questions to the outline. A lot of theory questions that come out of ocean/marine is different from terrestrial theory.
 - i. Forecasting and the appearance of rare or harmful species

- ii. Trait based theory
 - iii. eDNA - more of a method. But something that is coming up in ocean and freshwater systems
 - d. How much do we want to tinker with the outline?
 - i. We've talked a lot and set on having a short perspective piece on 2-3 theory ideas.
 - ii. Forecasting as hypothesis testing. Think that Nick's ideas might fit here.
 - 1. By using forecasting as expression of scientific method let's us do this and could be a good place for forecasting rare and harmful species could be a good fit here as examples
 - iii. Synthesizing across forecast - have 2 questions that show how synthesizing across forecasts are useful
 - e. We want to highlight the questions that are unique that forecasting can answer
 - f. Think there is overlap with the Houlihan 2017 paper. Will be good for everyone to look at that again. Don't think they get into the metaquestions/synthesis questions that we get into. They do highlight transferability, but we probably have more meat than they had.
 - g. Think we can find historical examples of forecast in the lit that we can be added, but will take a bit of work to get to it
 - h. Expect that there will be some rearranging of the outline as the manuscript gets fleshed out
3. Figure 1 - central hypothesis for synthesis question 1. How does predictability relate to spatiotemporal variability?
- a. Thinking of predictability as how close is our forecast to the actual value.
 - b. Predictability decreases with increasing forecast horizon. AND predictability decreases with each repetition of the process scale. When those are layered together predictability decreases over time, but it happens with quick variables.
 - i. Is process scale, temporal scale? Or something of time and space? Was thinking of it as the same unit as the forecast horizon. This makes sense. But need to be clear about this.
 - ii. Middle panel is saying something about autocorrelation. The longer the process scale the longer autocorrelation will stick around and help with the prediction.
 - iii. Another argument could be that it is easier to study fast stuff. It is easier to observe and do experiments.
 - iv. Can learn more about the non-autocorrelation stuff at the short scale.
 - v. Intrinsic predictability - independent of observations you have or our current understanding of the process. If we had the perfect model and the perfect data, how well could we predict it?
 - vi. Peter doesn't think that Figure 1 is the full story. Think it might be good to add another panel. We aren't satisfied with just using autocorrelation. If we want to understand how the system works. For example, chlorophyll

- vs long lived trees. Iterative forecasts will help with chlorophyll but not with 600 year old trees.
- vii. Bringing in discussion of the grain in. Weather vs climate - we know it will be warmer in June then it is in December. LAI - you will know the ballpark it should be in the summer. You may be missing the exact number. The overall pattern is understandable.
 - 1. Weather is less predictable and climate is more predictable - (see middle panel)
 - viii. One of the previously drafted figures showing the process temporal scale (<day to >century) on the y-axis and forecast horizon (time) on the x-axis lists scale and horizon that are easy vs hard to forecast. This previous figure seems to be comparing to a null model. With the tree example - we know the tree diameter will be pretty much the same tomorrow as it is today. Can see how this figure works when comparing it to a null model. Perhaps the easy ridge is where we think there will be the most gains and where it will be most useful for ecological theory.
 - ix. Think about having a second row in Abby's Figure 1 - where we remove autocorrelation.
 - 1. Think about coming up with examples. Tree diameter, chlorophyll examples - put them on the figure.
 - 2. Idea of persistence, what scale is environment changing and what scale is ecological process is happening. If we are lucky those are the 3.
 - a. What do you need to think about to get traction on this problem? Is it just these 3 things?
 - x. Do we have anyone signed up to work on this figure? Not right now.
 - 1. Peter will try to do something before our next call.
 - xi. Goal for this month - think about their sections and provide suggestions for changes/updates. Doesn't have to be polished and then we will have a lot to talk about next month.