

## March 10, 2022 Joint Methods & CI Working Group Call

Attendees: Rob Kooper, Matt Brousil, Libby Mohr, Jody Peters, Mike Dietze

Regrets: Jake Zwart, Kelly Heilman

Agenda/Notes:

1. Visualization/Decision Support Tools, User Interface Task View
  - a. Link to the New Copy of the Doc
  - b. Link to the Original Version
  - c. Concepts now Guiding Principles
    - i. Jody and Matt made updates, check to see what people think about the new flow and check in about Matt's suggestions about
      1. Design - check in with Jessica to see if she has anything she could add.
      2. Development paragraph has design concepts in it. Focus on design on this. Co-development could become Development and can talk about development and co-development together.
      3. Co-development example - give an example of what co-development is. Include one sentence to frame it more and make it more concrete - do that in the first sentence.
      4. From Rob: "Development" in Computer Science - who wants something, what they want. User stories - talk to the users and make sure what they want, what their requirements are. Then CS come up with tasks for implementation. Then it fits nicely with section 2 where you implement user stories. You want an outcome defined so you can say you are finished. The user story is complete. Trying to get from the user what they want (not what to look like, but if I build something will the user be able to use it because it is what they wanted).
    - ii. Guiding principles - relating to interactive things as opposed to the stationary (just making a figure), so not sure how it fits with Accessibility since accessibility was more of a broad topic. Accessibility is part of the design.
    - iii. Thinking about publishing/publications we are moving more towards having things interactive publications where we can point them to where you can play with the data as long as the website is up and running. E.g., Kathryn's work publishing in Jupyter notebooks to make them available
    - iv. Keep Accessibility as a numbered bullet item rather than putting it into Design and development. Make Subheadings for color blind, alternative text, to be more formally distinguished to show up in the table to contents.
    - v. Also think about Jessica's suggestion about creating a figure similar to Fig.1 in task 2 with the following stages: Planning and Design (esp. including co-production), Development (much of this task view focuses

here), Deployment (not discussed here but maybe worth highlighting, since how it will be pushed out will influence the web-based platforms used to develop)

1. Workflows don't have a similar figure, but if this figure helps give people a road map that can be useful.
2. Mike - can envision something less workflow like, but one that is more like a binary tree. Static, Animated, Geospatial, Uncertainty could be branches on a tree that would show content of the Task View. Concepts would be the trunk of the tree.
3. Bonus if we can click on each topic to go to it.

d. Static Visuals

- i. David/Matt's resources for spreadsheets - add here and in Data Ingest, Cleaning, Management Task View? Or indicate it will be included in that next Task View?
  1. Don't have it here. It is data ingest. Include it. Move this text to the Data Ingest Task View
- ii. Also check in with David about comment in Distributions
  1. See if Libby's updated text solved David's concern
- iii. Animated section - Libby will work on HOPS

e. Interactive and Reactive Features

- i. Libby made a lot of update to the description which is awesome!
- ii. Jody (and Libby?) add links and text for the Interactive tools
- iii. Need to finish getting details for the Reactive tools
  1. Jody can see if Josh Cullen can help with this section
  2. Need to add reactive links
  3. The high-level reactive tools overlaps with the webapp tools. Do we need to combine? And perhaps combine with the dashboard section?
  4. From Rob: Differences between the tools. For example, have Tableau - where you give it a database then can play with the data. You don't need to know how to code.
  5. Shiny is a framework for you to build the applications. So you don't have anything until you start developing. Some of them you just need the data and then you can play with it/visualize it. Whereas other ones are a framework that you don't get anything until you do the coding.
  6. This is also reflected in Table 1 where there are libraries and stand alone tools. Want to be clear what resources are the libraries and which are the collection fo libraries
  7. Rob will write up the paragraph and then needs help putting resources into the correct categories.

f. Geospatial Visualizations

- i. Kelly added text to this section (thanks Kelly!)

- ii. We have a section about types of plots for spatial data. Matt added reference from CDC with list of types of plots. Need to check in about what to do with this section and where to put it? Should it go before Tools or after Tools? Or leave before Interactive Spatial Visualization
    - 1. Matt's intention was to add the types of plots to the types of plots. Rasters and vectors seem to be types of data compared to types of plots.
    - 2. There is a lot of overlap between the types of visuals and the types of data - the way you visualize rasters is different from the types of way you visualize vectors.
    - 3. Think of it as an analog to the static visuals where we list out histogram, etc.
    - 4. ESPG - is WKT becoming more of the standard? Should we mention the one or two other types of code? Yes. Matt will work on this to mention other reference coordinates.
      - a. Say ESPG really complex, here are some good resources and books and standard references we WSG84 and Mercator
    - 5. It sounds like R Raster package is being deprecated and is people are being encouraged to migrate from raster to terra. Say that Raster depreciation is coming
  - iii. Tools section needs additional details for pros/cons of tools or provide some descriptions
  - g. Uncertainty Visualization is coming along. Think we need to refine the outline a little bit more into text and add links as needed
    - i. Libby will work on cleaning up this section.
  - h. User Interfaces and Dashboards - need someone to take the lead on this.
    - i. Unclear on how this dashboard is different from web application section.
    - ii. Mike thinks we should shelf this section to release this with an altered title and then think about adding it back in later on. It is a challenging area because when we move from data viz and decision support we overlap with the Social Science working group and we are moving beyond the technical portion the Task View is focused on. Finish up the Visualization information and then get it sent out! If people work on their homework over the next month, we should have a version ready to go out by our April call!
2. Tasks from the February Call - Jody is putting this in as a reminder
- i. Concept Section - I worked on this and have shared it with Matt Brousil to get another set of eyes to look over it.
  - ii. Static Visuals Section - very close. Just a few more comments to wrap up. David and Matt - we can go over this on Thursday.

- iii. Animated Visuals Section - this section is also getting close. Think we just need to finalize a couple of examples. Also, is anyone familiar with SVG-based animation? There is a question mark beside it in the doc. Also, is anyone familiar with ImageMagick? Matt has had limited experience with it a few years ago when it appeared there were security issues. If those issues are still present, we should add a note about that for this tool
  - iv. Interactive and Reactive Features - we have a short intro that needs to be reviewed and we need to work on adding links to the list of Interactive and Reactive Features tools
  - v. Geospatial Visualization - this section is getting close. Matt added a list of types of Interactive Spatial Visualizations that would be good to incorporate into the text and we need a few short descriptions for the Static and Interactive Geospatial subsections?
  - vi. Uncertainty Visualization - we decide to make this its own section instead of being lumped with a Big Data section that just pointed to the 4th Task View. Leah added add some citations about uncertainty with mapping. This section looks like it is getting close.
  - vii. User Interfaces and Dashboards Section (with subsections on Decision Support/Decision Science tools and Connecting dashboards to models/forecasts) - This section needs the most work.
3. Uncertainty Quantification & Propagation, Modeling & Stats and Workflow Task Views to use as Reference: <https://projects.ecoforecast.org/taskviews/>
4. Note from Carl after February Call
- a. Quinn and I were talking about how we'd love to start engaging this WG more directly with methods/CI in the neon4cast challenge. In particular, now that we have a decent pipeline for gathering in forecasts and publishing scores, there's a lot to be explored with visualization. The current flexdashboard is maybe an example of this (<https://projects.ecoforecast.org/neon4cast-dashboard/phenology>), it shows a range of possible visualizations and summaries but is kinda all-over-the-place, probably few people visiting the site can make much sense of it. For an audience that knows ggplot and wants to learn/practice more advanced tools like interactive visualizations and dashboard layouts, this could be a good entry point. It would also be fun to get more folks engaged with the data coming out of the challenge, and using visualization to explore interesting questions about forecast horizons performance according to different metrics, visualizing uncertainty, etc etc.

- b. We could get people started in creating simple interactive dashboards with minimal R code showing an overall team rankings or a single forecast of a single team. I imagine then that WG members might work individually or in groups to generate some visualizations, and/or critique and tweak existing visuals (and supporting text!) so we slowly move towards dashboards that really tell a story about these forecasts.
  - c. Anyway, just wanted to bounce the idea off you. I don't want to derail the ongoing work of the group, and maybe this idea is terribly impractical, as you know I'm prone to being carried away with impractical ideas!
- 5. There is a community solicited workshop for the May 2022 EFI Community meeting - there are workshops that can be 30 or 60 minutes. Think there is a lot of demand on the CI/methods side. Are there workshops that this WG would like to run at that meeting and what would be the legacy of those workshops to persist to help the community after the workshop. Mike has nudged Quinn/Carl to show the NEON Forecast CI. There is so much about cloud based infrastructure that Mike has learned from Quinn and Carl from.
  - a. Could be workshops around the 3 task views. Or new things that we want to get done at that meeting to get greater input. Breakouts can bring in a lot of fresh ideas and voices.
- 6. Jody is leaving in as a placeholder. This would be good to discuss when Mike is able to join the call. Any more gaps people thought of in response to Mike's prompt for the November call?
  - a. Mike's prompt: Discuss next steps beyond the current task views (2 done, 1 in progress, 1 on deck). In particular, I think we've completed enough of the task views that we could have some useful discussions about identifying gaps and bottlenecks in current methods and tools and ways we might think about moving forward on identifying and addressing those (e.g. surveys, workshops, hackathons, group projects, virtual panels / webinars, etc). This is also motivated by some recent interagency (NOAA, NASA, CDC) roundtables that EFI has been sponsoring where standards and community CI are emerging as priority items for the federal agencies (caveat, that doesn't mean there's any funds). It is also relevant to the next round of the [EFI NEON challenge](#) and the upcoming [EFI2022 "all-hands" conference](#)
- 7. Data Ingest, Cleaning, Management
  - a. Placeholder until we are further along with the other Task Views or have an identified leader for this
- 8. [NEON Ecological Forecast Challenge](#) CI Update