Workshop Descriptions

Click on each working group to see more details. This list is subject to change prior to the Conference

Making Forecasts Usable: Open-Science Decision Support with SyncroSim
This workshop introduces SyncroSim as an open-science platform built for decision support. By reframing applied ecological forecasting around both communication and model complexity, this workshop will equip participants to bridge the gap between research and decision making.

Slow Data: Building intentionality and accessibility to environmental data science and forecasting
This workshop will share examples of slow data science - activities developed to build foundational data science skills to lay the groundwork for future ecological forecasting analyses. These activities make data science education more intentional and accessible for historically underrepresented students, thereby supporting a welcoming environment for all students.

Building ocean digital twins on your own computer with SPINE Programming
This workshop will introduce participants to creating ocean digital twins and using them to forecast over time. Presenters will demonstrate the Smart Aquaculture platform with its fish population and fishing boat digital twins.

Tools for forecasting populations and communities: A hands-on example from the NEON Forecasting Challenge using ground beetle abundance and richness
Participants in this workshop will learn about forecasting ground beetle abundance and richness across NEON terrestrial sites. The workshop will include code-along instructions to create and submit a simple forecast to the EFI RCN NEON forecasting challenge platform.

Tools for forecasting soil carbon fluxes: building an independent forecast challenge using NEON soil data products
This workshop demonstrates how the cyberinfrastructure developed from NEON forecast challenges was adapted to create a forecast of soil carbon fluxes. It will highlight opportunities to contribute models to this emerging effort.

Introducing the sdmModelEvaluationTool: an open source tool for soliciting and learning from expert evaluation of (bird) species distribution and abundance models
The Northern Ontario Bird Modeling Working Group is developing a tool to elicit, synthesize and learn from expert evaluations of (bird) species distribution models. This hands-on workshop will introduce the tool and invite discussion about further development.

Making Forecasts Usable: Open-Science Decision Support with SyncroSim

This workshop introduces SyncroSim as an open-science platform built for decision support. By reframing applied ecological forecasting around both communication and model complexity, this workshop will equip participants to bridge the gap between research and decision making.

Workshop details

Forecasting models rarely reach the people who need them most. Models don't sell themselves on technical merit alone, and in practice, the tool that gets used is often simply the one that's most accessible. In our consulting work at ApexRMS, we've repeatedly faced the same challenge: how do we translate complex models of vegetation change, wildfire, wildlife habitat, or conservation planning into formats that decision-makers can understand and act upon? SyncroSim was created to solve this problem. This workshop introduces SyncroSim as an open-science platform built from the ground up for delivering complex models to decision makers. Participants will learn how open-source reproducible modeling workflows can be packaged, automated, and communicated through transparent pipelines that integrate ecological forecasts, uncertainty, and scenario analyses. We will use SyncroSim to highlight the broader principles and elements required to support decision-makers with forecasting models. By reframing applied ecological forecasting around both communication and model complexity, this workshop will equip participants with practical skills and a new perspective on delivering science through open-science methods, bridging the gap between research and real-world decisions.

Workshop organizers

Alessandro Filazzola - ApexRMS

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Slow Data: Building intentionality and accessibility to environmental data science and forecasting

This workshop will share examples of slow data science - activities developed to build foundational data science skills to lay the groundwork for future ecological forecasting analyses. These activities make data science education more intentional and accessible for historically underrepresented students, thereby supporting a welcoming environment for all students.

Workshop details

One of the foundations of building an inclusive community of ecological forecasters is access to data science. With the rise of numerous digital and computational tools (e.g., AI, machine learning, remote sensing), there is tremendous pressure to increase productivity and efficiency with our data analysis. We offer an alternative approach through slowing down our analysis and processing of data to make data tools more intentional and facilitate accessible entry points into ecological forecasting.

We will share examples of slow data science - activities developed to build foundational data science skills through hand drawn data visualizations journal prompts. These activities engage learners in slowing down, observing, and visualizing, within the context of environmental science and ecological forecasting. The tools we will be using are particularly useful for those starting on their forecasting journey and for environments where there is limited access to internet and computer resources.

Regardless of your prior skill level with ecological forecasting or the populations you work with (e.g., high school students, undergraduates, researchers, or anyone who is new to data science and coding), we want to bring researchers, educators, and learners together from all levels. We aim to collaboratively create data science material that is inclusive, accessible, culturally-relevant, and place based. This workshop is inspired by the EFI book circle in summer of 2025, Data Feminism by Catherine D'Ignazio and Lauren F. Klein, and by additional resources created from the book Dear Data by Giorgia Lupi and Stefanie Posavec.

Workshop organizers

Antoinette Abeyta - University of New Mexico, Gallup
Rachel Torres - California State Polytechnic University, Humboldt

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Building ocean digital twins on your own computer with SPINE Programming

This workshop will introduce participants to creating ocean digital twins and using them to forecast over time. Presenters will demonstrate the Smart Aquaculture platform with its fish population and fishing boat digital twins.

Workshop details
This workshop is to show the power of your own computer to create ocean digital twins and forecasting over time, using enterprise open source cloud environments and open source software. We will demonstrate the Smart Aquaculture platform with its fish population and fishing boat digital twins. Participants will learn how to create event driven ocean digital twin simulations that report fish population time series metrics over time. We will use Prometheus to graph fish populations through incubation periods over time. Fishing boat digital twins travel from docks, through fish populations, and back to docs on a map that decrease the fish populations at the same time. Then we will use observability tools to graph the fish population metrics over time and adjust parameters. We will have conversations with ocean scientists to talk about the important model parameters in forecasting fish populations and ocean events, like water temperature, salinity, oxygen, and pH. This workshop works on computers running Linux and Windows 11 Pro. See our Smart Aquaculture Digital Twin Youtube playlist for examples of these Smart Aquaculture digital twin simulations:
https://studio.youtube.com/playlist/PLcVjtgfCeLvTrTccO-H5XgPNKq99MFAIn/videos

Workshop organizers
Christopher Tate - Red Hat

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Tools for forecasting populations and communities: A hands-on example from the NEON Forecasting Challenge using ground beetle abundance and richness

Participants in this workshop will learn about forecasting ground beetle abundance and richness across NEON terrestrial sites. The workshop will include code-along instructions to create and submit a simple forecast to the EFI RCN NEON forecasting challenge platform.

Workshop details

The Ecological Forecasting Initiative Research Coordination Network (EFI-RCN) has created a forecasting challenge (https://ecoforecast.org/efi-rcn-forecast-challenges/) for participants to forecast five different themes (aquatic ecosystems, terrestrial ecosystems, tick populations, phenology, and beetle communities) of publicly available data published by the National Ecological Observatory Network (NEON, https://data.neonscience.org). The overall objectives of the challenge are to develop a community of practice for ecological forecasting, develop standards, build tools and cyberinfrastructure to facilitate forecasting, and create a platform for visualizing and evaluating forecast performance. These resources are openly available to anyone who is interested in learning about, creating, and/or using ecological forecasts. In this workshop we provide an overview of the theme focusing on forecasting ground beetle abundance and richness across NEON terrestrial sites. The workshop will include code-along instructions to help participants create and submit a relatively simple forecast to the EFI RCN NEON forecasting challenge platform, and how to interpret metrics of forecast skill. Our goal is to provide a foundation that participants can build upon to create more sophisticated predictions about ecological communities, and use the EFI RCN resources in future forecasting applications.

Basic familiarity with R is required for participation in this workshop.

Workshop organizers

Eric Sokol - National Ecological Observatory Network, Battelle
Tera Del Prior, National Ecological Observatory Network, Battelle
Wei Fang, Pace University

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Tools for forecasting soil carbon fluxes: building an independent forecast challenge using NEON soil data products

This workshop demonstrates how the cyberinfrastructure developed from NEON forecast challenges was adapted to create a forecast of soil carbon fluxes. It will highlight opportunities to contribute models to this emerging effort.

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For more than two decades, automated measurements of ecosystem carbon exchange have deepened our understanding of the processes shaping terrestrial carbon dynamics and have enabled near-term, iterative forecasts of ecosystem fluxes. One key component — soil respiration — remains particularly important and highly uncertain, especially when scaled to the global carbon cycle.

This workshop will outline the conceptual, mathematical, and computational decisions involved in developing a soil flux forecasting challenge as a framework to developing your own forecasting challenges with NEON data. I will also highlight opportunities to contribute models to this emerging effort and discuss how this challenge could integrate with existing NEON Forecasting Challenges.

Basic familiarity with R and RStudio is required for participation in this workshop.

Workshop organizers

John Zobitz - Augsburg University
Eric R. Sokol - National Ecological Observatory Network, Battelle
Tera Del Prior - National Ecological Observatory Network, Battelle

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Introducing the sdmModelEvaluationTool: an open source tool for soliciting and learning from expert evaluation of (bird) species distribution and abundance models

The Northern Ontario Bird Modeling Working Group is developing a tool to elicit, synthesize and learn from expert evaluations of (bird) species distribution models. This hands-on workshop will introduce the tool and invite discussion about further development.

Workshop details

Species distribution and abundance models can inform decisions about land use, impact mitigation, and monitoring. Experience with bird models in data sparse regions has clarified that, although essential, quantitative evaluation is not sufficient for understanding model reliability, building trust, and guiding appropriate use. The Northern Ontario Bird Modeling Working Group is an informal initiative that brings together experts from federal and provincial governments, academia and environmental non-government organizations who are developing Northern Ontario bird models. The group is supporting development of a Shiny app to enable modelers to solicit, synthesize, and learn from expert evaluation. In this workshop we will provide a hands-on introduction to the prototype sdmModelEvaluationTool, and invite discussion to inform next steps in tool development. Our goal is a practical flexible tool that helps modelers, users, and evaluators engage more constructively with models and with one another to improve models and inform their use in real-world applications.

Workshop organizers

Josie Hughes - Environment and Climate Change Canada
Elly Knight - University of Alberta
Péter Sólymos - Analythium Solutions Inc.
Juan Zuloaga - University of Alberta
David Hope - Environment and Climate Change Canada

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