

# Macrosystems EDDIE: Getting Started + Troubleshooting Tips

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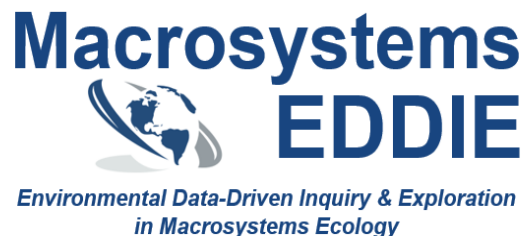
Woelmer, W.M., T.N. Moore, R.Q. Thomas, and C.C. Carey. 25 August 2022.

Macrosystems EDDIE: Using Ecological Forecasts to Guide Decision Making

Macrosystems EDDIE Module 8, Version 2.

<https://serc.carleton.edu/eddie/macrosystems/module8>.

Module development was supported by NSF grants DEB-1926050 and DBI-1922016.



# R Shiny Applications



- Statistical environment



- Interactive web app built using R.
  - Allows users to interact with data
  - Conduct their own analysis

## Check-in:

- Can you access the Shiny app or this module?
  - Copy and paste this link into your browser:  
<https://macrosystemseddie.shinyapps.io/module5/>
  - If this is not working contact us at [MacrosystemsEDDIE@gmail.com](mailto:MacrosystemsEDDIE@gmail.com) and we will help you resolve this issue.

# Landing Page of the Shiny App

Module 8: Using Ecological Forecasts to Guide Decision Making

Module Overview

Presentation

Introduction

Activity A: Explore

Activity B: Decide

Activity C: Customize



## Using Ecological Forecasts to Guide Decision Making

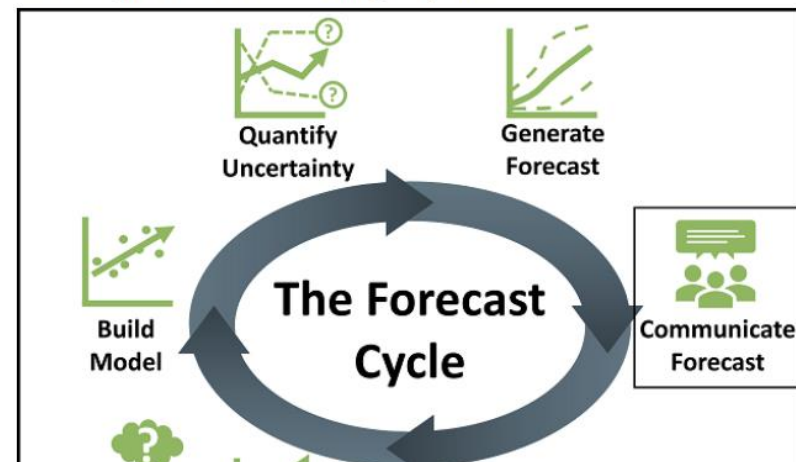
Today's focal question:

How can ecological forecasts and their visualizations aid in decision making?

To answer this question, you will complete three activities:

- Activity A - Explore ecological forecast visualizations
  - Identify different ways to visualize a forecast
  - Recognize how uncertainty is represented (or not!) in forecast visualizations
  - Pair forecast visualizations with a forecast user decision
- Activity B - Make decisions using an ecological forecast
  - Match ProACT components with a decision-making scenario
  - Make decisions using a forecast and balance multiple decision trade-offs
  - Discuss the implications of forecast visualizations on decision-making
- Activity C - Create a customized visualization for a specific forecast user
  - Explore forecast output which includes uncertainty

## Ecological Forecasting Cycle



# Navigating the Shiny App

Resume Progress

Help!

Browse... No file selected

Module 8: Using Ecological Forecasts to Guide Decision Making

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## Activity A: Explore ecological forecast visualizations and decision-use

Many of us use various types of forecasts in our daily lives to make decisions (e.g., weather forecasts). However, we often take for granted the way in which the forecast is presented to us. In this activity, you will examine several ecological forecasts and analyze the visualizations they provide as decision-support tools for their users.

Objective 1

Objective 2

### Objective 1: Explore how uncertainty is visualized in an ecological forecast

Choose an ecological forecast visualization from the list of visualizations below. Spend a few minutes looking through all of the visualizations and then select one by clicking on the image. You should answer the questions below based on the image alone, but you can visit the website if you would like to learn more about the forecast.

**Make sure to coordinate with your partner so you select different forecast visualizations!**

Select a tab by clicking on it

# Answer questions

Q1. What is the name of the forecasting system you chose?

EcoCast

Q2. What ecological variable(s) are being forecasted?

Q3. Does the visualization represent uncertainty? Please refer only to the figure within this app to answer this question. Do not use information from the website to answer your answer.

☐ Yes

☐ No



Q4. Is the visualization presenting forecast output or a forecast index?

☐ Forecast output

☐ Forecast index

Type your answers into the text boxes and select answers



# Navigate slides

Advance slides by clicking on the arrows

The presentation accompanying this module covers an introduction to ecological forecasting, forecast user decision support, and uncertainty visualization.

What is a forecast?

- A forecast is a prediction of future conditions with uncertainty.

How can we include uncertainty in a forecast?

- Forecast uncertainty is calculated by running many different forecasts with slightly different conditions.

Who uses a forecast?

- A forecast user is anyone who can interact with a forecast to gain understanding or to make a decision.

How can we communicate uncertainty in a forecast?

- Forecasts can be communicated using forecast model output or translated into an index.
- Forecast results can be communicated using words, numbers, icons, or figures.

Click through the slides to recap some of the main points from the lecture.

## Key Slides

Slide 1 of 15

### Macrosystems EDDIE: Using Ecological Forecasts to Guide Decision Making

Woelmer, W.M., T.N. Moore, R.Q. Thomas, and C.C. Carey. 21 April 2021.  
Macrosystems EDDIE: Using Ecological Forecasts to Guide Decision Making  
Macrosystems EDDIE Module 8, Version 1.  
<https://serc.carleton.edu/eddie/macrosystems/module8>.  
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**Macrosystems EDDIE**  
Environmental Data-Driven Inquiry & Exploration  
in Macrosystems Ecology

**SERC** Science Education Resource Center  
at Carleton College

**GLEON**  
global life ecological observatory network



# Interact with app

First, let's explore the forecast output.

Use the 'Select Calculation' button to calculate various statistics for one day of the forecast and input them into Q24-25.

Show  entries

Search:

	date	sd	ens_1	ens_2	ens_3	ens_4	ens_5	ens_6	ens_7	ens_8	ens_9	ens_10	ens_11	ens_12
2	2021-05-24	1.67	30.68	31.55	33.11	30.32	31.61	34.74	31	28.3	31.93	29.83	31.39	29.87
3	2021-05-25	2.11	25.12	24.31	23.04	22.51	25.11	29.16	29.08	27.15	24.21	25.65	25.49	28.69
4	2021-05-26	3.51	20.07	23.52	21.93	22.2	17.95	23.32	22	21.98	23.71	26.19	17.48	19.03
5	2021-05-27	4.25	35.62	26.21	24.84	32.66	37.85	32.49	31.71	28.59	35.93	34.59	26.5	25.34
6	2021-05-28	4.54	28.54	26.51	24.94	17.84	31.09	19.59	32.48	25.63	18.56	33.39	27.85	28.44
7	2021-05-29	6.59	33.84	33.27	29.92	31.6	40.38	35.79	33.68	41.23	18.08	29.69	35.19	23.84
8	2021-05-30	6.36	27.23	37.13	29.46	42.13	32.11	49.84	23.63	33.52	24.16	34.8	26.15	36.46
9	2021-05-31	7.65	47.12	46.58	47.63	38.14	23.39	45.27	51.48	39.51	49.84	37.26	35.33	42.43
10	2021-06-01	9.02	37.47	47.19	37.19	40.59	28.88	31.48	29.49	33.39	37.67	51.61	45.29	24.2
11	2021-06-02	7.54	29.43	20.12	31.63	42.96	28.39	31.12	41.06	25.83	26.29	40.85	24.41	32.05

Showing 1 to 10 of 14 entries

## Calculate statistics

Select a date

2021-05-24

Select calculation:

Pick a summary statistic

You have selected: 2021-05-24

Choose one day and answer the fol

Q24. What is the mean concentration of all the forecasts for 2021-05-24?

Enter answer here

Q25. What is the minimum concentration of all the forecasts for 2021-05-24?

Enter answer here

Q26. What is the maximum concentration of all the forecasts for 2021-05-24?

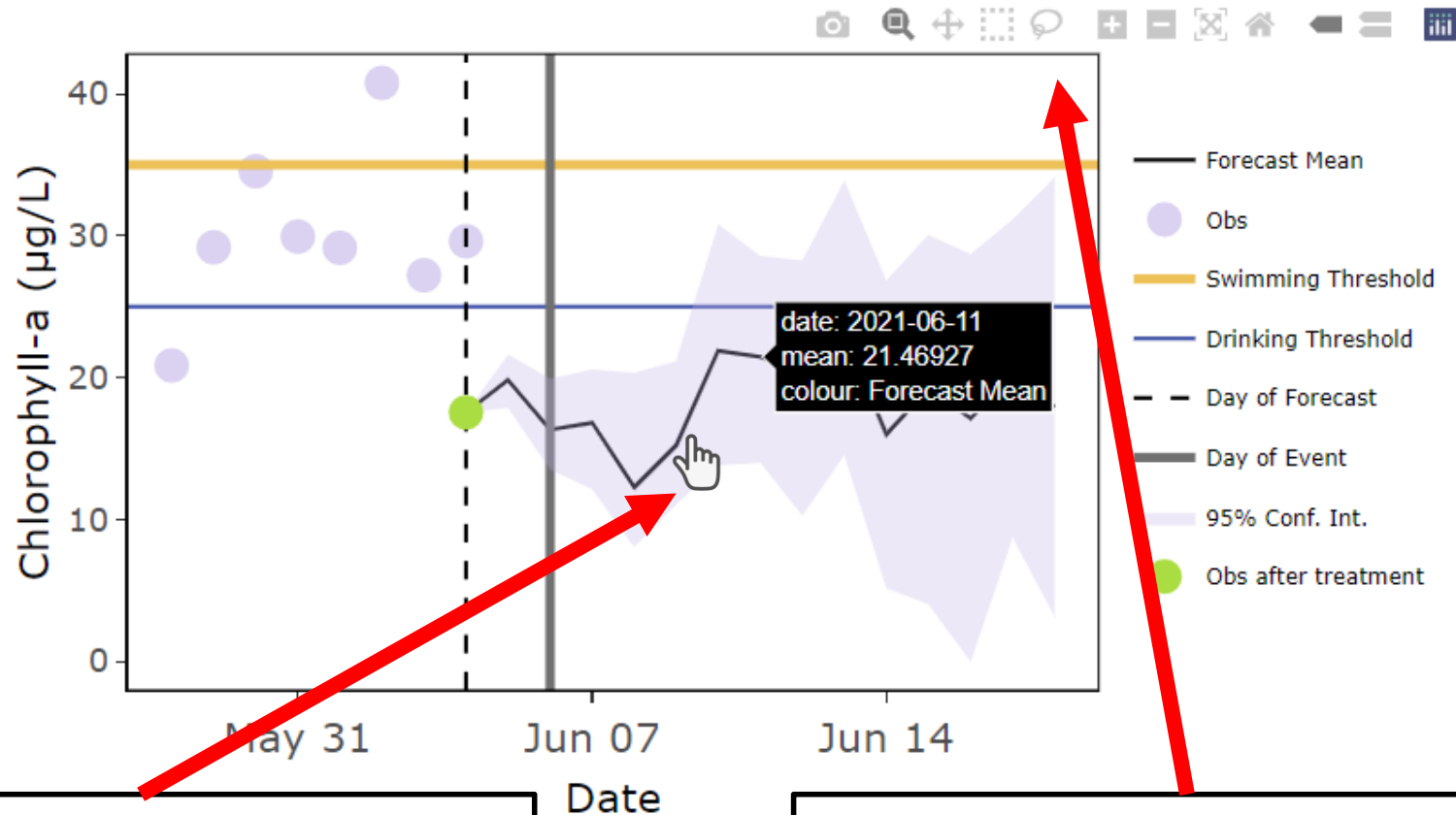
Enter answer here

Q27. What is one reason why there is uncertainty among the forecasts for 2021-05-24? (are there so many different estimates here?)

Select data table rows and click buttons

# Interact with plots

Forecast



Hover cursor over points or click and drag to zoom in

Hover cursor over plot to bring up options



# Saving plots

## Days Before the Event: 2

What is the mean forecasted concentration for June 6 in the 2-day forecast?

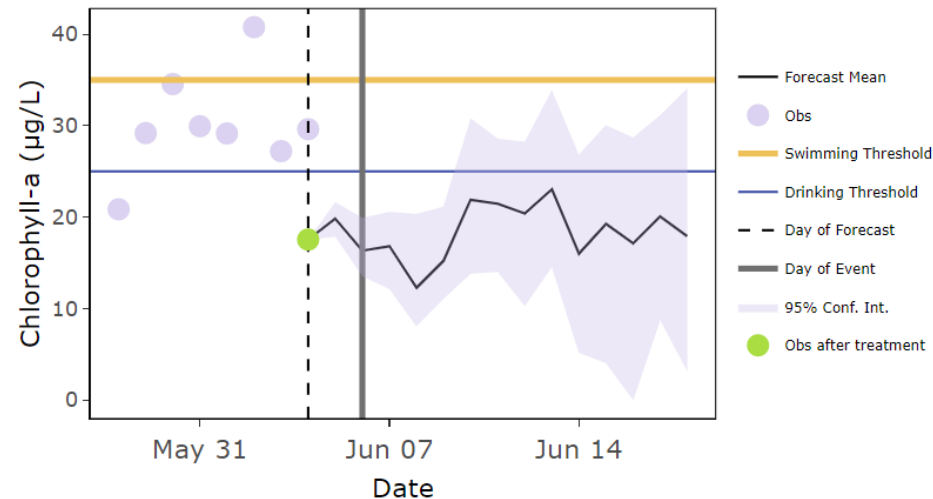
Hover mouse over figure to answer question

### Decision 2 days before the event

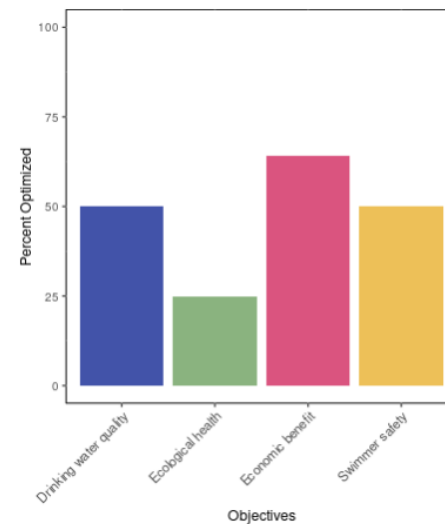
- ☒ A) Continue with the swimming event as planned (take no action)
- ☐ B) Cancel the event
- ☐ C) Treat the reservoir with an algaecide

Once you've made your decisions, please select 'Save plot' under your objectives monitor at right before proceeding to the next objective.

Forecast



## Today's Objectives



Save plot

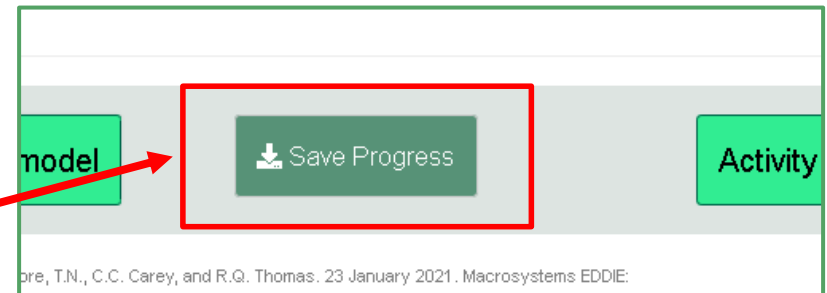


Save plots for downloading with your final report

# Saving & Resuming Progress

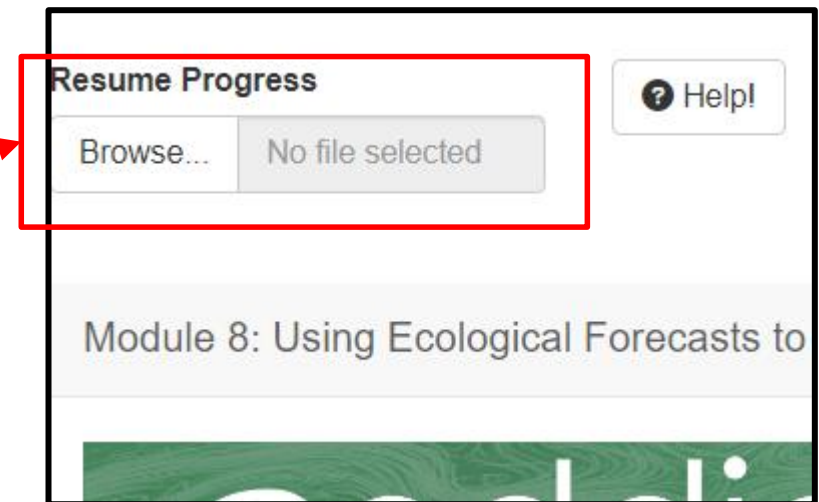
## Saving Progress

1. Scroll to bottom of the page
2. Click on the “Save Progress” button. An ‘.eddie’ file will download. Your computer might prompt you to open this in R. This will not work, it only works for uploading to the Shiny app
3. Store this file somewhere safe on your computer



## Resuming progress

1. Scroll to the top of the page
2. Upload the ‘.eddie’ file
3. This will populate your saved text answers and saved parameters





# Downloading the Report

1. Navigate to the “Introduction” tab
2. Scroll down to “Save your progress” section
3. Click on the “Generate Report (.docx)” button.
4. Then the “Download Report” button will appear. Click this to download the report with answer and plots embedded within a Word document.

## Generate Report

This will take the answers you have input into this app and generate a Microsoft Word document (.docx) document with your answers which you can download and make further edits before submitting. Return here when you have completed the module.

Generate Report (.docx)

Download Report

**Questions still to be completed:**

Activity A: Objective 5 - Q. 15 Save plot of model run

Activity B: Objective 9 - Q. 21

Activity B: Objective 10 - Q. 22

Activity B: Objective 11 - Q. 23 Save plot of new ecological forecast