Title: Best practices in reproduceable R workflows for ecological data analysis and visualization

Host: Ecological Society of America: Great Lakes Chapter Regional Conference

Location: 2251 Business Ct, Kalamazoo Michigan, USA

Date and time: April 6th 2024, 12:00 – 1:40 PM EST

Instructor: Grant Falvo <falvogra@msu.edu>

Materials: Personal computer with R and Rstudio installed and updated
https://github.com/grantfalvo/Intro_to_the_R_Software_for_Ecologists

Objectives: Attendees will be able to write code that processes data, conducts analyses and produces visual results for publication in an automated, efficient and reproducible manner.

Lesson Plan:

- Discuss the importance of creating automated, efficient and reproducible workflows
- Orient attendees to the Github repository hosting the workshop content
- Investigate the Bill et al. (2023) manuscript for R methods and links to data and workflow scripts
- (**Script 1**) Reproduce Bill et al. (2023)'s analysis by downloading the data they provide
    - Acquire their data
    - Reproduce Figure 2 in their manuscript
    - Reproduce one of their statistical models
    - Publish the output of the statistical model in a table and a figure
- Break
- (**Script 2**) Answer a novel research question with public data
    - Review code written to query the MODIS API
    - **Coding challenge**
        - Modify the existing code and write new code to answer your own research question
        - Choose new sites on Google Maps and add their information to your site database
        - Download the data and save it to your local machine
        - Run your statistical model and check it's diagnostics
        - Output your results in a table and figure to share with the group
- Share coding challenge results with the group