Evaluate Hypotheses using R-Studio and Excel  

**Assignment Description**

*Faculty Author:* David Ginsburg  
*Course:* Environmental Studies 310  
*Department or School:* Environmental Studies  
*Student Population:* Senior and sophomore Environmental Science majors  
*Duration:* 1 semester  

**Deliverables:**
- 6 individual data analyses with 2-3 page report  
- 1 group final data analysis project with 4-5 page report  

**Keywords:** writing, data, analysis, essay, research paper, R, R-studio, Excel, hypotheses

**Description**

**Summary**

Students learn and use R-Studio and Microsoft Excel to complete six individual data analysis reports and one complex group data analysis report. Each analysis tests the validity of a hypothesis.

**Assignment Goals**

Students will learn to use R-Studio, an open source, statistical programming and graphics program, and become proficient in the use of Microsoft Excel, a spreadsheet application used for data management. Using these software packages, students analyze a series of datasets (7 total; provided by the instructor) and look for trends that support their hypotheses. Each data assignment (n=6) requires an individual student to organize and quantitatively evaluate a relatively simple dataset (e.g., single parameter such as fish size), as well as provide a 2-3 page written report (single-spaced) on the results. The final data assignment (n=1) is a group project (2 students per group) and requires students to analyze a more complicated set of data (e.g., multiple parameters such as fish size and biomass). Final projects include a written (4-5 pages, single-spaced) and oral presentation where students
showcase their research question and findings based on their analysis of the relevant data. Each data assignment (including the final project) is evaluated for originality, accuracy and thoroughness of research, attention to detail, and quality of finished project.

**Recommended Tools**

- Microsoft Excel
- R Studio
- Blackboard LMS
- Microsoft Word or other word-processing program

**Faculty Author Advice**

There were some difficulties for students with the software because they were using different operating systems: Mac and Windows. It would be better to have access to a computer lab with consistent operating systems and software versions for this project.

It took a lot of time to help students learn how to look at data, read a data table, extract information from a chart.