

Freshwater Ecology Lab Project
Fall 2018
Guidelines for the Results and Discussion
Each section is worth 50 pts

Some ground rules:

- Due Tuesday, 11 December 2018 at final.
- All text must be typed, double spaced, 12-pt font
- **Six** references to peer-reviewed scientific literature required in the Discussion. You must include a literature cited section at the end.
- You may work with others to conduct data analyses in case you are Excel-phobic. You may NOT turn in the same Results or Discussion sections as others. In other words, your statistical results may be performed at the same time, but it's each individual's responsibility to summarize these results in words, tables, and graphs **on their own**. Of course, I expect you to ask me questions about helping with appropriate analyses, Excel issues, etc. By the way, you are not required to complete your statistics or graphs in Excel; you can use other suitable programs.

Results section:

The results section describes the findings for each objective and hypothesis using words, tables, and graphs. Do NOT just include tables and graphs and captions—I expect paragraphs describing the findings. Remember to focus on results in the actual sentences and put most of the statistical summary (i.e., **df** or **n**, **p-value** if it's available, calculated test statistic, **t_{calc}** [which is **t_{stat}** in Excel; compare to the 2-tailed test] if it's a t-test, **R²** if it's a regression, **R** if it's a correlation) in parentheses that substantiates whether a finding was significant or not. Your graphs will be graded, as well. Do NOT include “raw” statistical output—just report the essential information described above.

Your analyses **must** address the following 3 items:

Objective 1 (litter mass loss): Compare breakdown rates (*k*) between the two treatments (stream vs. depressions outside the channel). Include one graphs showing *k* by treatment.

Objective 2 (invertebrate colonization): Compare average values for total abundance, taxa richness, and shredder abundance between the treatments using an appropriate statistical test and present graphs as needed. Use the averages in the Bug Summary sheet. You also may wish to compare some of the other averages I've provided in “Bug Summary” if they help you, but those latter comparisons are not required. I've provided the data for each date in separate sheets for your information, but you are not required to work with these data.

Objective 3: Use the abiotic data to explore the results found in Objective 1 and 2. The most direct approach is to use the Abiotic Summary Data sheet. This does NOT mean just comparing some these data between treatments, but rather use these abiotic data to further your understanding of the mass loss and macroinvertebrate data sets. I recommend using correlation or regression analysis to complete this task. In other words, were breakdown rates and colonizing macroinvertebrates associated with some abiotic factor we measured? By the way, conducting these statistical relationships requires you to copy and paste data from different files together.

Discussion section:

What did I find? Why did I find what I found? How do my findings relate to the broader field of study?

Answering these questions should be foremost in your mind when writing a discussion to a scientific paper. An effective discussion first summarizes the key findings of your study. In fact, your first paragraph should broadly summarize all of the key findings.

From this general beginning, you then focus on more specific findings and explanations for these findings (e.g., whether the hypothesis for objective 1 was supported or not and why). It is helpful to the reader if you follow the organization that you used in the Results (e.g., start discussing objective 1, and then in another paragraph deal with objective 2). In these more focused paragraphs, you should incorporate scientific literature that relates to your specific findings: Has anyone else found this same thing? How do my data compare to data others have collected for these kinds of systems? Relating your findings to the broader scientific field is a vital component to a discussion. Providing this context is your opportunity to show how your work is important, and that you can think. Your ending should be broad where you synthesize your findings in relationship to the 'big picture'.

To summarize, your discussion will start with an opening summary paragraph and then address your specific objectives individually. End with a synthesis paragraph or two that puts the study in a broad context. There is no page requirement, but do not be long-winded—including extra information just for the sake of filling in pages results in your point being lost on the reader. Instead, I expect a focused, well-written document.