

ENVS2001/2014 FIELD & LAB METHODS
****DRAFT** GUIDELINES FOR PROJECT REPORTS**

The major assessment of this course is a group project report consisting of the following deliverables:

- 1) a detailed manuscript, written in the style of a peer-reviewed scientific journal article and containing a complete Abstract, Introduction, Methods, and (partial) Results and Discussion. **(70% weighting)**
- 2) a supplementary document detailing recommendations for improved methods to address the specific group project question. **(20% weighting)**
- 3) a joint statement of each group member's role in the execution of the project and report writing. **(5% weighting)**
- 4) A confidential peer review evaluation form where you report on the quality of the efforts by your team members. **(5% weighting).**

These deliverables are detailed below:

1) DETAILED MANUSCRIPT (70%; GROUP)

The purpose of scientific publication is to enable peers to: a) assess observations, b) repeat experiments, and c) evaluate intellectual processes.

Abstract (10 pts)

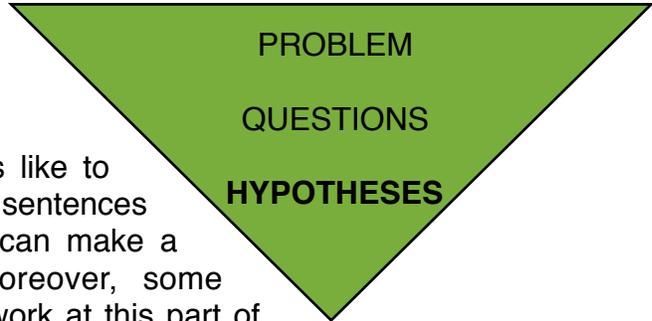
The abstract is a concise summary of the paper you have written. Therefore, some authors write it last. Others write it first to help frame the paper itself. Nevertheless, the abstract must be short, sweet, and to the point. It should mention the problem, question, hypothesis, result(s), and significance of the findings in about 1-2 sentences each. The total length of the abstract should be **<250 words**.

Introduction (25 pts)

The introduction is where you expand on the project briefing you received from me. To write a good introduction you must first conduct a thorough literature search on your topic. The three papers you submitted are just the beginning. Typically, scientific papers cite 20-50 papers. For this exercise, the maximum citation limit is 30. For most topics, you should be able to find more papers than this so the challenge is to cite the papers that are most relevant to the point you are making, and favor recent papers over older ones. Citations can be made to support your writing of the problem/question or on the methodology you used, even if it hasn't been applied to your study system! A deep understanding of the papers you cite is important. Use your team members to divide the reading responsibility (*i.e.* each member might aim to read and understand 4-5 papers).

The introduction should frame the big problem, the major questions, and the specific hypotheses to be tested by your research, in that order. Thus, the pattern of an

introduction is like this where the final portion of the introduction is **a clearly stated hypotheses** and predictions:



After stating the hypothesis, some authors like to state the approach, in the form of a few sentences explaining the methods to be used. This can make a nice transition to the next section. Moreover, some recommend stating the key finding of the work at this part of the Introduction, so that the reader knows where the rest of the paper is going.

TIPS: When I am reading papers I take notes, in my own words, of key points I would like to have in my paper. When I feel I am finished reading I then re-order the notes into a logical flow, and then expand on them and connect the ideas with my own text. Not only does this facilitate proper citations, it also avoids the problem of plagiarism because all text is from **my interpretation** of the cited work, which is cited properly by the text.

The introduction is usually written in the **present tense**.

Methods (25 pts)

A good methods section is detailed enough so that an experienced reader of your work can replicate it exactly. While journals pressure authors to trim and compress methods, which often leads to fewer details we will embrace this section fully. I want you to detail everything you did in your study as much as possible. This information will be vital to your peers who take this course in subsequent years. Special attention should be given to basics, such as sample sizes, sampling locations (most smart phones have GPS chips!), and any likely source of experimental error.

Specific details of the equipment (model, manufacturer), and consumables (distributor, catalog number) should be included in the manuscript.

Species names (binomen) should be properly reported and formatted. A species binomen is represented in italics (*e.g. Homo sapiens*) or underlined (*e.g. Homo sapiens*). If the surrounding text, for some reason, is italicized or underlined then the binomen should be in regular font. This rarely occurs. Note that the first part of the binomen (*e.g. Homo*) is the **GENUS** and is a meaningful taxonomic group. However, the second part (*e.g. sapiens*) is called the **SPECIFIC EPITHET... (NOT SPECIES!!!)**. This part is meaningless without the first part. Together they form the **SPECIES BINOMEN**.

The main purpose is to describe (and at times, defend) the methods you chose. The methods section becomes very important during peer review when other scientists look for issues with how you collected data.

A major criticism in Ecology & Environmental Science is **pseudoreplication**. So, you should be very clear how your samples and/or treatments were replicated in a temporal or spatial fashion. For more information on this issue you can go straight to the source:

Hurlbert S. (1984) Pseudoreplication and the design of ecological field experiments. *Ecological Monographs*. **54** (2), 187-211.

Most of the methods should be written in the **past tense**.

Results (25 pts)

Your results should be very simple but comprehensive and inclusive of all data you collected. The expectation for analysis does not exceed the level of week 1's activity on "The Nature of Data". You should calculate descriptive statistics for treatments (e.g. means) and report an appropriate estimate of error (e.g. standard error). Where appropriate, confidence intervals for the mean can be calculated and non-overlap of these intervals between treatments should be highlighted.

Graphical representation of your data is mandatory for the report. Figures should take priority over tables, and summary statistics over raw data. A tutorial on preparing figures will be offered in November.

It is my hope that you will expand your data analyses from these projects in Dr. Bonebrake's course on Data Analysis.

Discussion (15 pts)

The discussion is your opportunity to frame your results in the context of the background information you detailed in the introduction, and to inject your scientific interpretation (and yes, even your opinion) on what are the most interesting outcomes of your work. Here, you may argue a point using your data with support from previous publications. The discussion should always link back to the original hypothesis. Was it supported or refuted? If refuted, why? What other hypotheses are formed? What other questions should be asked and what future experiments should be conducted? The answers to these questions are all appropriate for the discussion.

FORMAT: The report should follow the guidelines of the journal *Limnology & Oceanography*. **REFER TO "author_guidelines.pdf" SECTION "L&O Style"**.

REFERENCE:

Day RA (1998) How to write and publish a scientific paper. Oryx Press, Phoenix, AZ. 275pp.

ENVS2001: PROJECT EVALUATION FORM (20%; GROUP)

TEAM: _____ **YEAR:** _____

PROJECT TITLE: _____

Answer the following questions in space provided. If you require more space, please copy the form. Be as detailed as possible. Credit will not be given for poor answers.

What were the major challenges encountered during your project?

Type to enter text

How did you overcome those challenges?

Type to enter text

Would you recommend repeating this project? If so, suggest improvements.

Type to enter text

ENVS2001: JOINT STATEMENT OF CONTRIBUTION (5%; GROUP)

TEAM: _____ **YEAR:** _____

PROJECT TITLE: _____

In the space provided, please detail the contributions of each co-author to the project. The statement should indicate the authors who contributed to literature review, data collection, analysis, and report writing. Use initials to indicate each author after completing the following key:

TEAM MEMBER NAME	INITIALS

Type to enter text

ENVS2001: PROJECT EVALUATION FORM (5%; INDIVIDUAL)

NAME: _____ **YEAR:** _____

PROJECT TITLE: _____

Rank your team members according to their level of scientific and creative involvement in your project. Your responses are strictly confidential.

NOTES REF.	TEAM MEMBER NAME	LITERATURE RESEARCH	DATA COLLECTION	ANALYSIS	WRITING
1					
2					
3					
4					
5					

In the space below, feel free to add additional comments/details for each member. Use the reference number in the first column to refer to each team member.

1)
