**Marine Biology and Ecology Final Project**

**The Charge**: We’ve spent all semester reading background literature, spending time in the field and in the lab, and immersing ourselves in marine ecological research. For your final project, I’d like you to engage in your own independent research project based off of something you’ve encountered in lab, in your readings, or just something swimming about in your own head. These can be a short field or lab experiment. They can be something observational. They can be an exploration of an extant data set you find online. They can be based off of work you are doing in someone’s lab – particularly if they have additional data to give to you.

**Due Dates:**

Proposal – Oct 20th

Talk – December 13th

Paper – December 20th

**Groups:** This final project can be done either as a group or individually. For those proposing to do anything in the field, I *highly* recommend that you have at least a partner in order to ensure basic safety. If you are solo, you will be limited to going to the field with either me or your TA in order to ensure basic field safety (i.e., someone is keeping track of you).

**Proposal**: Next Wednesday during lab, we’ll have a session where you and your groups can form, discuss your ideas, and run them by your TA and I. From that, we expect you to turn in a formal proposal (1-2 pages) that will be worth 10% of the project grade. You should reference at least 2 papers from the literature to demonstrate that you’ve thought deeply about your idea. Your proposal should have in it:

A general introduction: 5 pts

A question: 5 pts

How you plan to answer the question: 5 pts

A statement of expected results (e.g., if we do what we said, our results should look like…): 5 pts

Your TA and I will review this and either sign off or give you one week to revise.

**Executing your plan:** We will have 1-2 more normal labs, and then you are off to the races with freedom to use your lab periods with us as advisors/lab monkies to help you pending signing up via a Google signup that I’ll send to you for field access.

*Getting to Field Sites*: From now until the end of the semester, your TA and I will make ourselves available on Wednesdays to transport you to nearby sites for low tide. Please sign-up in advance so that we know how to best make transportation available. This can be for 6am low tides, or afternoon low tides. We are yours to command! For other field sites and/or other days, discuss options with us.

*Lab Experiments*: If you wish to conduct a lab experiment, please discuss the details with us. There is limited cold-room space to set up aquaria, although the Biology labs and my lab have copious amounts of things that you can use for your experiment.

*Fancy Data Analyses*: During lab periods, Prof. Byrnes will be available to teach the fanciest of data analytic techniques that you desire. If there is enough push for it, I would be happy to even run a brief analysis and visualization workshop.

**Final Talk**: At the end of the semester (date TBD in class), you will be asked to give a 15 minute talk (as a group) on your project. We will give a demo on how to build one of these talks towards the end of the semester. However, I have presented a rubric below that gives you a general outline of expectations. This should be a talk suitable for presenting at a student research conference – which you might be able to do next semester!

**Final Paper:** Last, I expect you to turn in a full group write-up of your project. This should be done in the classic Intro, Methods, Results, Discussion style with which you have become so familiar. The Altieri et al. paper we read this semester is an excellent example of the style – including writing style (clear clean topic sentences, etc.) we are looking for. This paper should be 10-12 pages in length not counting figures. But take what you need.

Note that you should reference at least 10 pertinent papers in the literature in your paper.

**Grading**: As always, read this. If your talk and paper satisfy the whole thing, then you should get an A! As always, I advise making an appointment with the writing center to improve the quality of your final paper.

*Talk (30 pts)*

Quality of presentation style? 5 pts.

Was there a clear hypothesis? 5 pts.

Did the methods address the hypothesis? 5 pts.

Were the presentation of results clear and easy to discern the main message? 5 pts.

Was the conclusion supported by the data? 5 pts.

Was it tied together well - a clear take-home? 5 pts.

*Paper (55 pts)*

Clear introduction to the problem and system: 5 pts.

Cleanly stated hypotheses/questions: 5 pts.

Methods understandable and could replicate from description: 5 pts.

Well-executed study: 10 pts.

Results presented understandably: 5 pts.

Good graphical presentation of results: 5 pts.

Discussion ties together ideas and data: 5 pts .

Solid conclusion with a clean take-home message: 5 pts.

Spelling and grammar 5 pts.

Has at least 10 references papers: 5 pts.

Properly formatted references 5 pts

**Additional Notes:**

*Help/Feedback on Writing:*In addition to asking your TA or I to look at an early draft, I suggest making an appointment at The UMass Boston Reading, Writing, and Study Strategies Center - <http://rwssc.wikispaces.umb.edu/>

*Citation Style*:Please cite papers and list them in a reference bibliography using the format for the journal Ecology (see how references are reported in option 1 for examples). References should be sited in the text like so for papers with one, two, and three authors:

*While sea cucumbers eject their viscera when attacked (Parastichopus 1972), they don’t feel very well after doing so (Cucumaria and Pachathyone 1995) despite the ignorant claims of some researchers (Enhydra et al. 1992).*

Your paper should then include a References section where the full citations are ordered in the following format:

Last Name, First. Date. Title. Journal. Volume: Page-Numbers.

For example
Cucumaria, C. and Pachathyone, R. 1995. It hurts when I eject my viscera. **Journal of Echinoderm Self-Reflection.** 3: 45-46.

Note, every time you cite Wikipedia or a source not from the peer-reviewed literature, I will dock you one point.