BIOL 301, Spring 2020 **Final Exam: Thursday May 14, 9:45 am**
Marine Ecology and Evolution **on Laulima**
Final Exam Questions

For the final, I will ask you to upload answers to 3-4 of the questions below. **Your answers must be prepared in advance, because you will have only a few minutes to upload them**. This part of the test will be worth 35-40% of your total score.

Each answer **can be no longer than 400 words**. You can discuss questions with other students but the answers you upload must be your own work, written in your own words using the 301L guidelines for avoiding plagiarism. All you need to answer each question is the lecture material and the critical thinking skills you have developed in this class and others. You do not need to provide full citations, just refer to studies from class using the last name and year of the primary author.

The remainder of the exam will be similar to the previous quizzes, based on Lectures 18-24. That portion of the test may also include additional questions on hypothesis testing that may require brief written answers (a few sentences at most).

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1. How do the goals and methods of traditional fisheries management differ from those of marine reserves? Do both approaches work as advertised? Support your answers with specific examples from class for full credit.

2. Compare population-based and individual-based genetic methods for inferring rates and patterns of larval dispersal. How do these methods differ and what do they allow us to conclude about larval dispersal and gene flow?

3. Describe the "permanent" thermocline in each of temperate and tropical oceans and the impact it has on the structure and function (all the way down to the cellular level) of these open ocean ecosystems.

4. Describe how and explain why rates of primary production and amounts of fish biomass vary among different parts of the world's oceans.

5. What is the center of origin hypothesis and what are the likely environmental drivers for this hypothesis? Describe one study that provides evidence for this idea in the coral triangle. Be sure to explain why the evidence indicates a center of origin.

6. Why is top-down control of rocky shore communities stronger at Strawberry Hill than at Boiler Bay in coastal Oregon? Describe the physical and biological processes that create these differences in community structure and function.

7. How do planktotrophic larvae differ from lecithotrophic larvae and why is there so much variation in the larval life histories of marine species? What are the hypothesized advantages and disadvantages of these different developmental modes and how do we know these ideas are likely correct?

8. Read the paper posted on the class website by Baker et al. on corals' adaptive response to bleaching. Describe the primary results of the paper and explain the two different processes through which the frequencies of zooxanthellae clades might have changed over time. Propose a way that you could distinguish between these two mechanisms on a coral reef experiencing bleaching conditions.