Chesapeake Fellowship Course Activity
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The overall goals of FIRE are to introduce students to the concepts of independent research and allow them to develop critical thinking skills and capacity as scientists and researchers. The Environmental Pathogens research stream and the accompanying course, FIRE152, specifically focus on issues surrounding water quality and microbial contamination. Thus, this course provides an ideal theater to discuss sustainability issues surrounding water usage, biological pollution and environmental management, and how to safeguard our water supply.

Over the course of the semester we will focus on different types of microbial pollution that can be found in local water systems and how this contamination can affect public health, so students will understand why it is important to protect water sources, especially those that could potentially be used in agricultural settings, from microbial contamination. I will then incorporate 2 in-class discussions related to sustainability and public policy, an independent assignment, and an interactive group activity to emphasize these points and help students to fully understand the implications of water sustainability for our region.

Discussion 1: In class we will discuss how our lab work/research has real-world impacts, including a discussion of the public health implications of pathogen contamination (both social and economic), and the overall environmental consequences of microbial pollution. We will brainstorm ideas for preventing/controlling microbial pollution in the future, and consider ideas for how to mitigate any current contamination we may have identified through our research over the semester.

Assignment: I will first have students independently and outside of class prepare a review of a current piece of legislation or environmental policy related to the Chesapeake Bay or water management, either on the local county or state level. This will get students thinking about what policies are already in place to help protect the bay and/or deal with water scarcity for agricultural use. It will also provide some insight into how governments relate to issues of water sustainability, and specifically who/what agency the legislation is most beneficial for. Students will describe the policy briefly and address several questions and prompts, including:

- What issues does this policy address?
- Who/what group is this policy aimed at controlling/regulating?
- How long has this policy been in place?
- Where is this policy applied?
- Based on our discussions and lab work thus far, do you think this policy is/has been effective?
- Consider at least one pro and one con of this legislation.

Discussion 2: In the following class, we will discuss the various policies that have been found and decide if we think they are effective and sufficient for controlling environmental contamination. We will also discuss the pros and cons of the various pieces of legislation as written and consider how we might change or improve various policies to make the more effective or efficient.

Group Activity, The Bay Game: To help reinforce the concept that decisions made by a number of different people who are related to a number of different private and public industries can have major impacts on the health of the Chesapeake Bay, we will play the Bay Game. This is a simulation/game developed by University of Virginia that uses real-world data and computer modeling to simulate the impacts of decisions made by various players, all representing real-life agents utilizing/involved with the Chesapeake, such as watermen, land developers, farmers, and policy makers.

Students will break into teams of 8 to cover a single watershed, and compete against the other watershed groups. The simulation will measure both economic growth for each team, as well as overall Bay health. The goal is to find a good balance between economic prosperity and Bay health by the end of the game, and the team that has achieved the best balance will win.