



# KIRA GALLANT

INTEGRATED SCIENCE  
AMBASSADOR

4th YEAR, MAJOR

## THEME OF MY INTEGRATION:

### Climate change effects on ocean chemistry and biology

Climate change is altering both chemical circulations and biological compositions in marine ecosystems. These large-scale shifts are causing ripples which can lead to negative effects, such as species extinctions and decreases in ecosystem services. With my program I aim to gain a deeper understanding of these complex oceanographic processes, and how best to combat the negative effects of climate change from a position in government or industry.

## SAMPLE CURRICULUM RATIONALE

### EOSC 470 - Biological oceanography

This class contains essential material for my proposed program. This course will provide a quantitative examination of processes regulating the abundance, distribution and production of phytoplankton, zooplankton, microbes and fish. It will also examine the ecological and geographic controls of primary and secondary production, ecosystem dynamics and food webs, which in turn control the distribution of corals and other marine invertebrates. With my program, I want to study the linking of the chemical and biological systems with climate changes, so having this understanding of the biological controls would fulfill these criteria.

### BIOL 428 - Evolutionary Morphology of Invertebrates

This course will provide an exploration of comparative organismal diversity, focused on the macroevolution of morphology in marine invertebrates. It will begin to explain why and how these organisms have evolved to suit their individual needs and habitats within their oceanic environments. Having an understanding of the extent of diversity, even if only within invertebrates, will provide me with the knowledge of what types of environments organisms require to survive, and how invertebrate community composition could be different in a future with climate change.

## WHAT I AM INTEGRATING:

### DISCIPLINE #1

#### Oceanography:

Earth's oceanic ecosystems are not the same as they once were. How much of this change is natural and how much is anthropogenically forced?

### DISCIPLINE #2

#### Organic chemistry:

Chemical circulation in the ocean is an important bottom-up control for biological presence and composition. However, oceanic chemistry can be influenced by atmospheric events, such as increasing temperatures caused by climate change.

### DISCIPLINE #3

#### Marine invertebrate biology:

Ocean acidification is decimating calcifying invertebrate populations. The loss of these primary consumer species alters food webs, with the potential to decrease species in higher trophic levels.

## CONTACT

kgallant777@gmail.com