Diving Deeper Into Coral Bleaching

Allyson Flora (MAC), Matthew Liliedahl (AE), Molly Sunray (CS), Shelby Tweedie (BME)
Professor Bakermans (BB), Professor Spanagel (HUA), PLA Anxhelo Ripa (ME)

Background
The Great Barrier Reef is one of the most biodiverse ecosystems in the world, spanning more than 350,000 square kilometers with more than 2,900 individual reefs and contributing heavily to the fishing and tourism industries. However, rising sea temperatures, ocean acidification, and declining water quality due to climate change have impacted the health of the ecosystem and reduced the ability of the Reef to recover from environmental catastrophes.

Reduced Coral Cover
Increasing ocean temperatures have led to two mass coral bleaching events in 2016 and 2017, sparking unprecedented coral devastation in the Reef’s history. These events in combination with coral disease, a category 4 cyclone, and outbreaks of the invasive crown-of-thorns starfish have resulted in decreased coral density and biodiversity.

Current Solutions
- **Coral Gardening**: Remove pieces of coral from healthy reefs, grow them in nurseries, and transplant them into degraded reefs.
- **Coral Propagation**: Raise coral gametes in labs and release them during spawning periods.
- **Zoe Underwater Art Installation**: Creates a zone of higher pH that stimulates mineral formation and incorporates corals into its structure.

Approach
- Performing research about climate change, coral bleaching, and loss of biodiversity in the Great Barrier Reef in addition to current solutions
- Contacting professionals who work with reef restoration
- Researching the role of art in environmental activism

References

Next Steps
- The painting is being displayed in the Global Lab and Mixed Reality Room in Foisie Innovation Studio on the WPI campus.
- We will be presenting our project at the Climate Summit in April of 2020.

Acknowledgments
We would like to thank Nathan Cook from Reef Check Australia and Reef Ecologic for his assistance and the information and resources he provided, as well as Sam Grillo and Jessica Liliedahl for helping to create our Reef Relief logo.

Project Goals
Our objective was to research the effects of climate change on the Great Barrier Reef, explore possible solutions to preserve coral reefs, and raise awareness on the WPI campus about the significance of coral reefs as a marine ecosystem.

Current Solutions

- **Coral Gardening**
  - Remove pieces of coral from healthy reefs, grow them in nurseries, and transplant them into degraded reefs.

- **Coral Propagation**
  - Raise coral gametes in labs and release them during spawning periods.

- **Zoe Underwater Art Installation**
  - Creates a zone of higher pH that stimulates mineral formation and incorporates corals into its structure.

Approach
- Performing research about climate change, coral bleaching, and loss of biodiversity in the Great Barrier Reef in addition to current solutions.
- Contacting professionals who work with reef restoration.
- Researching the role of art in environmental activism.

References