

# Underwater Art: Coral Reef Restoration

## Abstract

This case study examines the living coral statues of Jason DeCaires Taylor. These sculptures, made out of a pH neutral substrate to encourage coral growth, help restore previously barren areas of seafloor; supporting biodiversity and marine life against an increasingly acidic ocean.

With more than 10 different sites of these statues across the world, it is clear that thousands of people visit them annually. Often, these visitors are traveling far distances using planes, cars, and boats, greatly increasing overall emissions. Furthermore, these tourists often bring physical harm to the reefs and local communities they stay in, even if they don't intend to. The current research into Taylor's work is very limited, necessitating a discussion of both the benefits and potential risks of them.

## Background

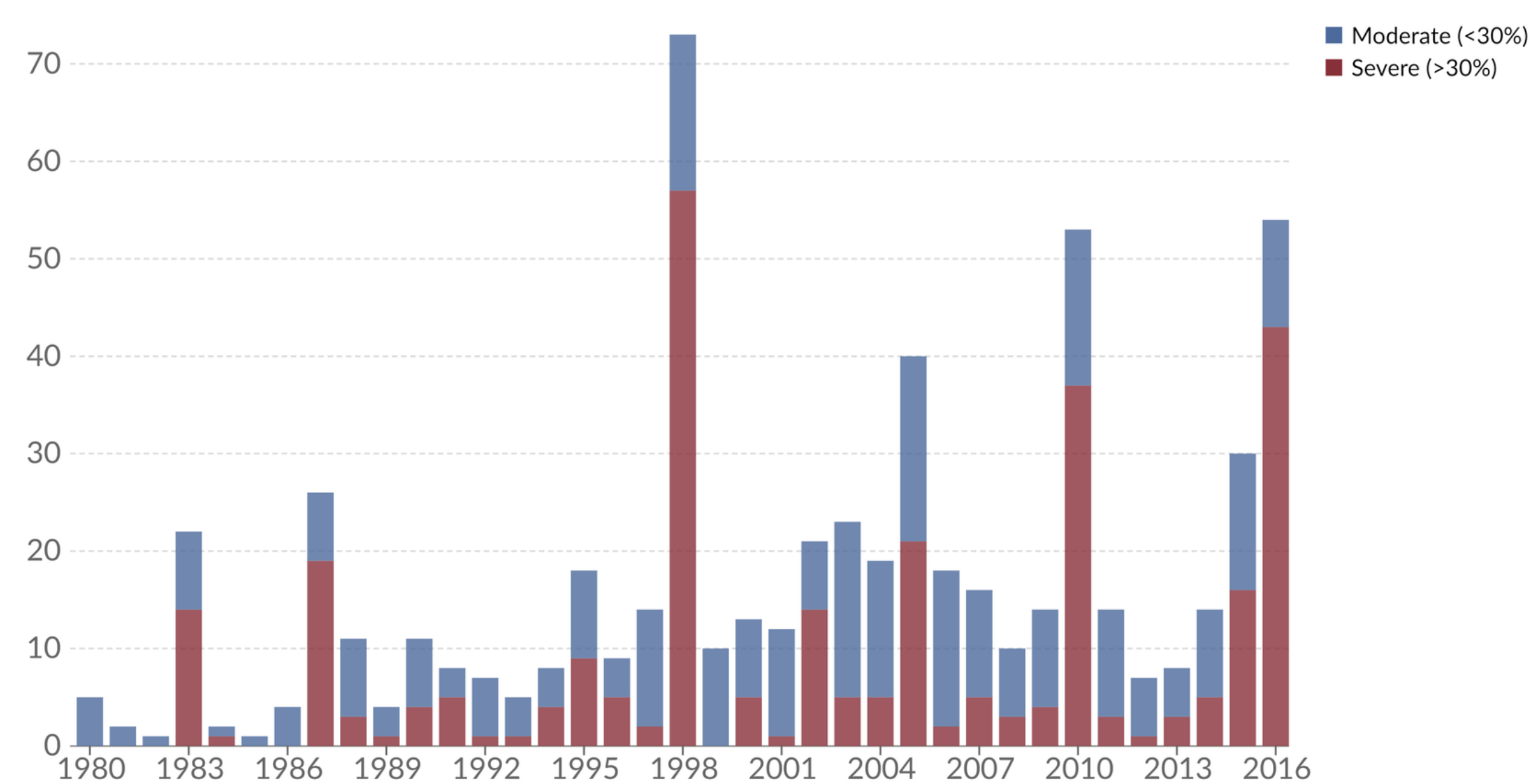


Figure 1: Number of Coral Bleaching Events, World Source: Our World In Data

- More and more people are traveling since the lifting of covid guidelines
- Eco-tourism helps the local economy by bringing tourists to the area to spend money and support businesses and increasing environmental awareness
- The environmental attraction they are visiting at risk is also placed at risk though through increasing emissions and physical damage
- As the ocean is becoming more acidic, coral reefs are suffering and biodiversity is decreasing, leading many organizations to consider alternative or man-made reefs

## Data/Details

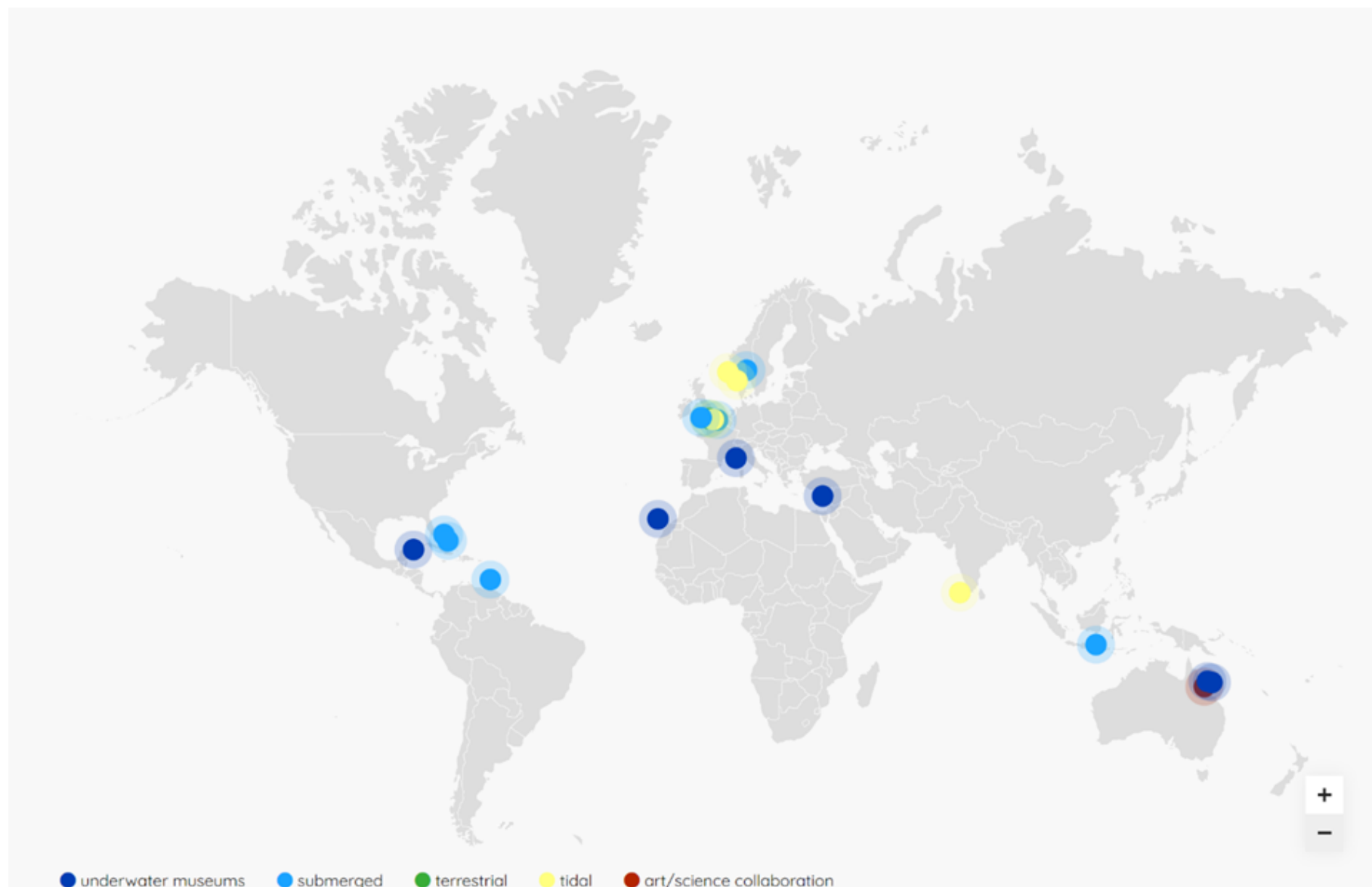


Figure 2: Map of Project Sites Source: Jason Decaires Taylor

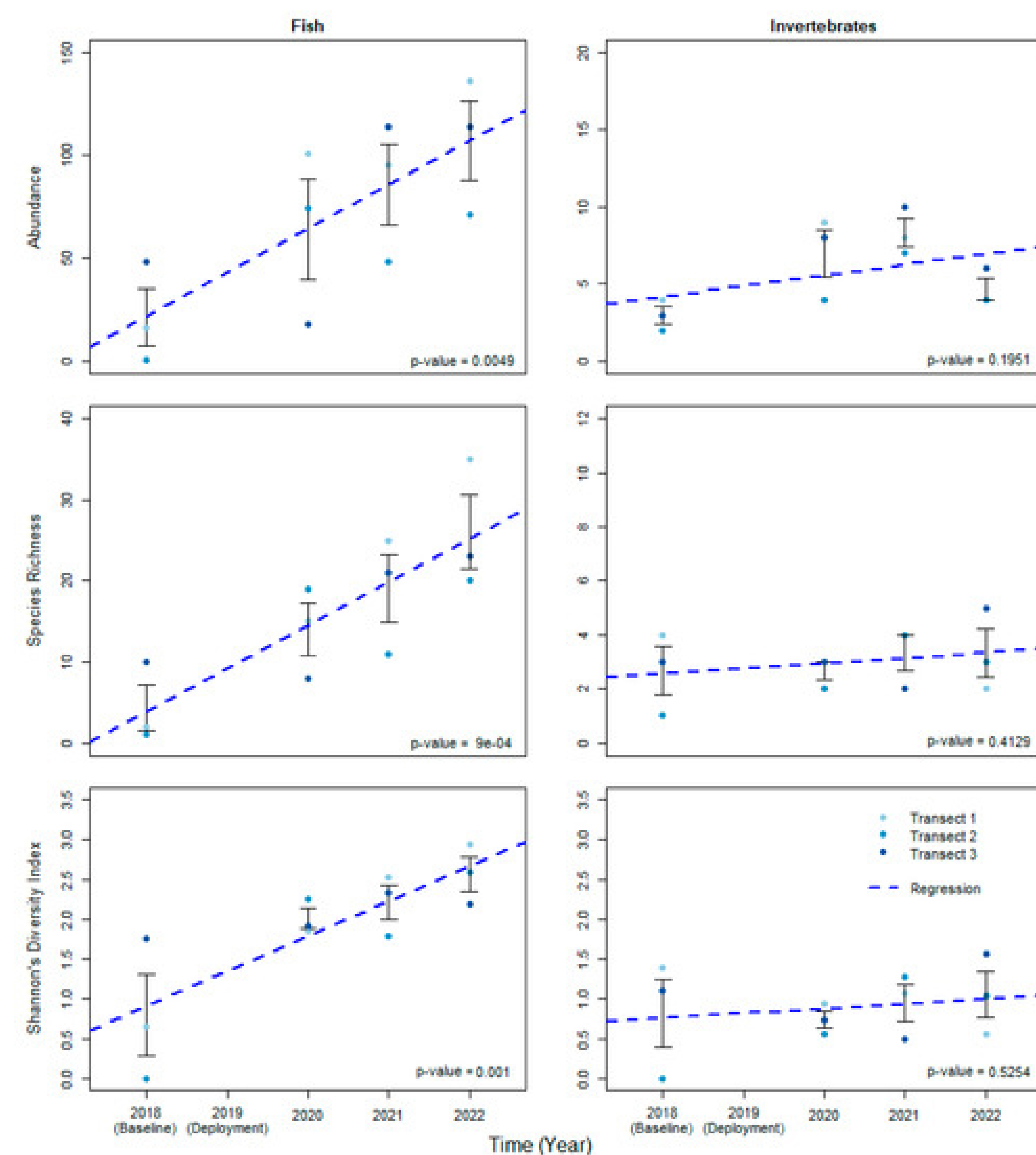


Figure 3: Comparing the mean abundance, mean species richness and mean diversity of fish across time between fish (n = 75) and invertebrates (n = 10). Source: Smith 2022

- Taylor's Coral Greenhouse placed off the coast of townsville has been monitored from 2019-2021
- The researchers measured the species abundance, richness, and diversity from 2019 to 2022 along with the visitors' perceptions of the Greenhouse with and without the presence of coral

## References

References  
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## Discussion

- Researchers found that the coral increased overall biodiversity and visitors attitudes on the aesthetics of the area
- However, the researchers did not measure the emissions created from the visitors' travel to the site or physical damage they may have caused the reef
- There are limitations to this study, as other sites have much larger amounts of visitors and this site in particular is only accessible by diving, which requires much more skill than snorkeling; therefore decreasing the overall number of people that visit it

## Conclusion

### Pros

- Restores part of the reef
- Creates new habitats and encourages new life
- Increases biodiversity
- Increases tourism to area

### Cons

- Increased visitors in areas without the infrastructure to support them
- Visiting these sites requires travel (boats, cars, planes, etc.)
- Visitors disturbing the wildlife/harming the statues

## Learning Activity

### Pre-Class

- Read: Background and Details/data section of case study
- Answer: Why are man-made reefs being considered? How does Taylor create his sculptures? Research another one of Taylor's works. Along with an image of it, provide a short description of where it is located, the local community (demographics, industry, etc.), and any other stakeholders that may be involved

### In-Class

- A sculpture installation is being considered for a reef off the coast of West Maui in Hawaii
- The students will then split up into three groups; in support of, against, and the government of Hawaii that will be asking questions to each group
- After preparation time, the groups will debate while the Government moderates