Coral Bleaching and Biodiversity Loss in the Great Barrier Reef

What's Happening to the Great Barrier Reef?

- Ocean acidification due to high levels of atmospheric CO_2 and rise in water temperature causes stress on coral, leading to bleaching events (Fig. 1)
- Bleaching leaves coral vulnerable to disease, stunts their growth, and affects their reproduction. Severe bleaching kills them entirely
- Species that rely on the reefs are in danger due to loss of habitat
- Bleaching alters the natural food chain because when coral is bleached, some of its normal inhabitants die off, lowering food availability and species diversity

What is Acidification?

The ocean absorbs excess carbon dioxide, which lowers the pH and makes the water more acidic; coral thrives within a specific pH range, so when this is altered it puts stress on the coral

healthy vs bleached coral

What is Bleaching?

When corals are stressed by changes in conditions such as temperature and pH, they expel the symbiotic algae living in their tissues, causing them to turn completely white.

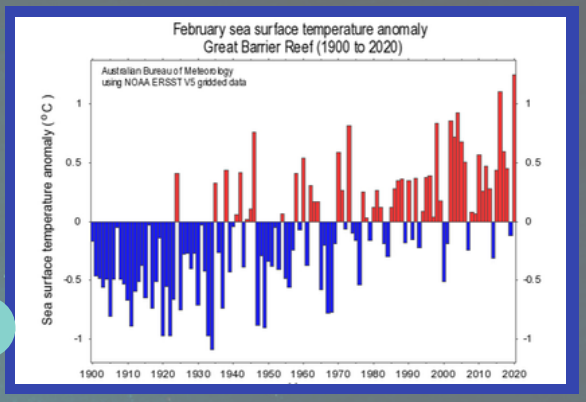

Figure 1: Sea surface temperature in the Great Barrier Reef from 1900-2020

Why Is the Great Barrier Reef Important?

- The Great Barrier Reef contributes more than $6.4B per year and 64,000 full time jobs (Fig. 2)
- Supports over 9,000 known species
- Over 500 million people depend on reefs for food, income, and protection
- Support more species per unit area than any other marine environment
- Protect coastlines from storms and erosion
- Culturally important to indigenous groups, like the Aboriginal and Torres Strait Islander peoples in Australia

What Would Happen If There Were No Reefs?

- 25% of marine life would lose their habitat ~ over 1 million species
- 500 million people would lose their source of food, disproportionally impacting indigenous coastal communities
- Coastal tourism economies would shrink, hitting local business especially hard (Fig 2)
- More than 2 million people living on coastline would be impacted by erosion

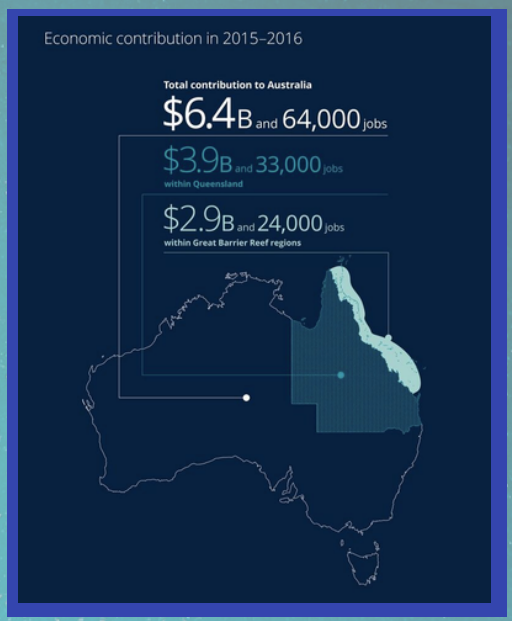

Figure 2: The Economic Contribution of the Great Barrier Reef in 2015-16

What Can We Do to Help?

- Help mitigate climate change through spreading awareness and reducing your carbon footprint
- Avoid buying sunscreen from brands that contain chemicals that harm reefs such as Hawaiian Tropic and Banana Boat
- Donate to organizations that help coral, like Great Barrier Reef Legacy or Reef Restoration Foundation

DONATE HERE!

What Are Scientists Doing?

- Micro-fragmenting: breaks coral apart, forcing it to grow and repair itself
- "Cloud-brightening": artificial clouds cast shadow over reef and cool water
- "BioRock" sends low-voltage electricity through water to coat the coral with limestone minerals that replicates the coating on young coral