



Impacts of Climate Change: Decline of Marine Species

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Introduction

Anthropogenic climate change has decreased ocean productivity and altered water chemistry

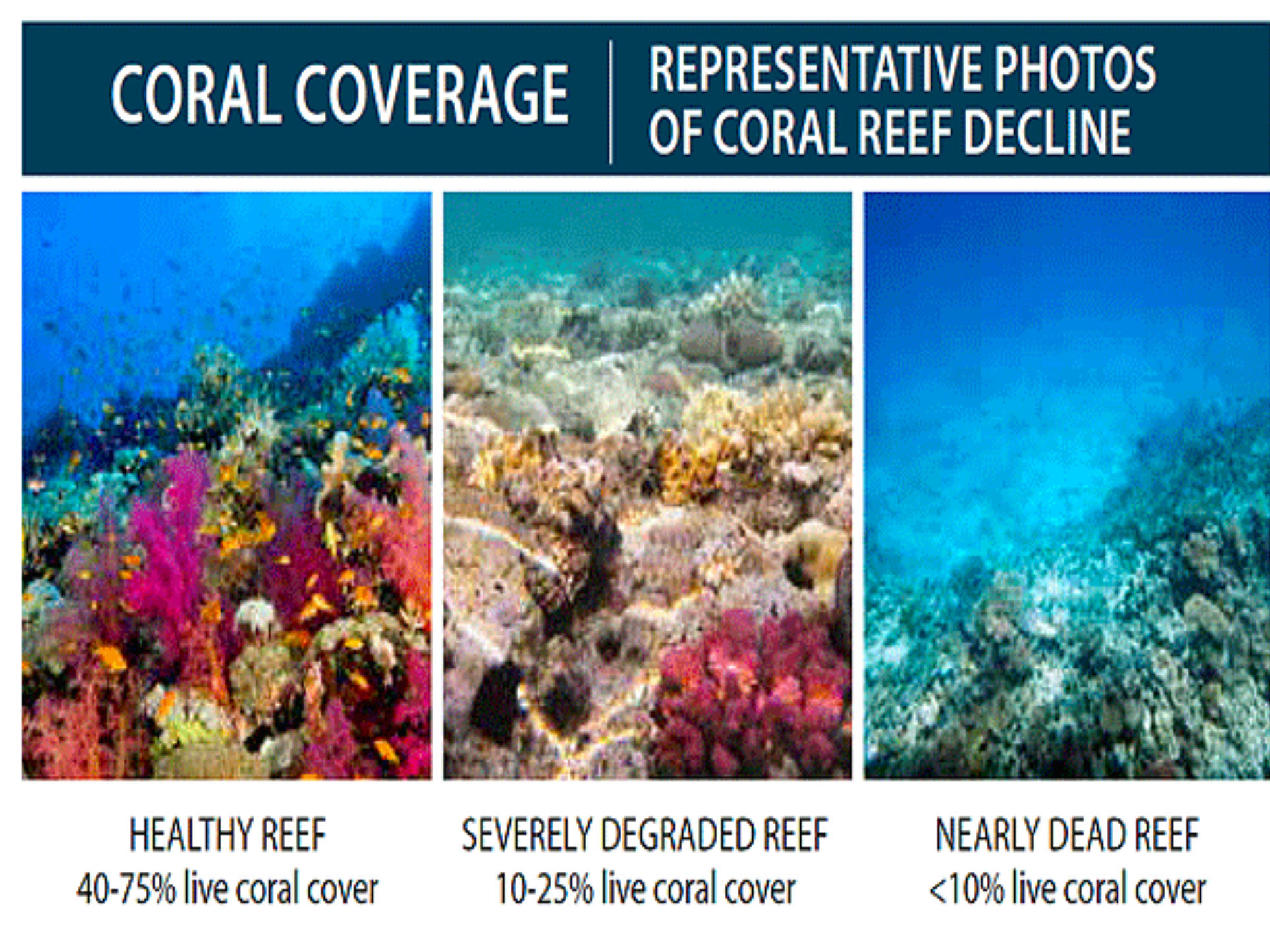
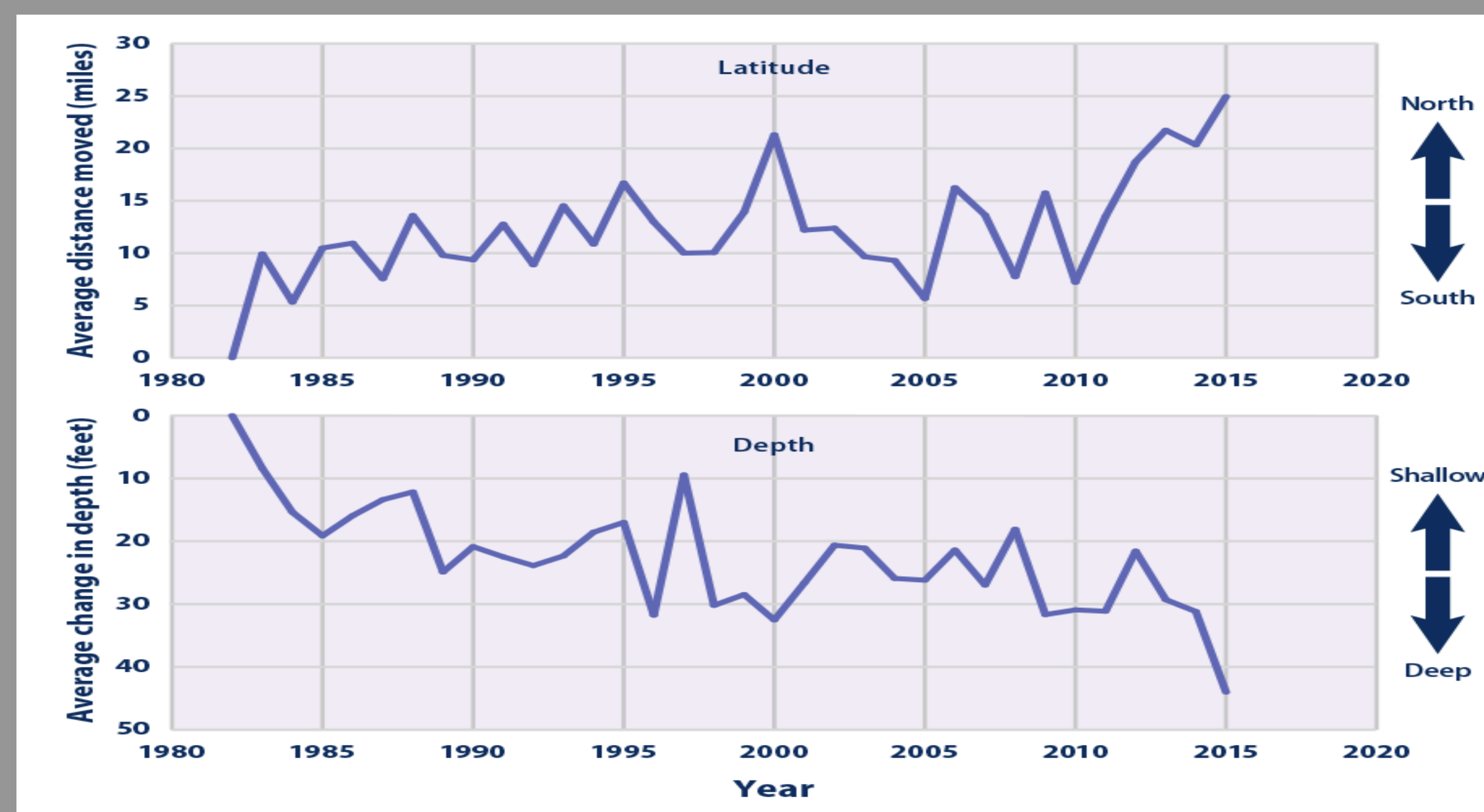
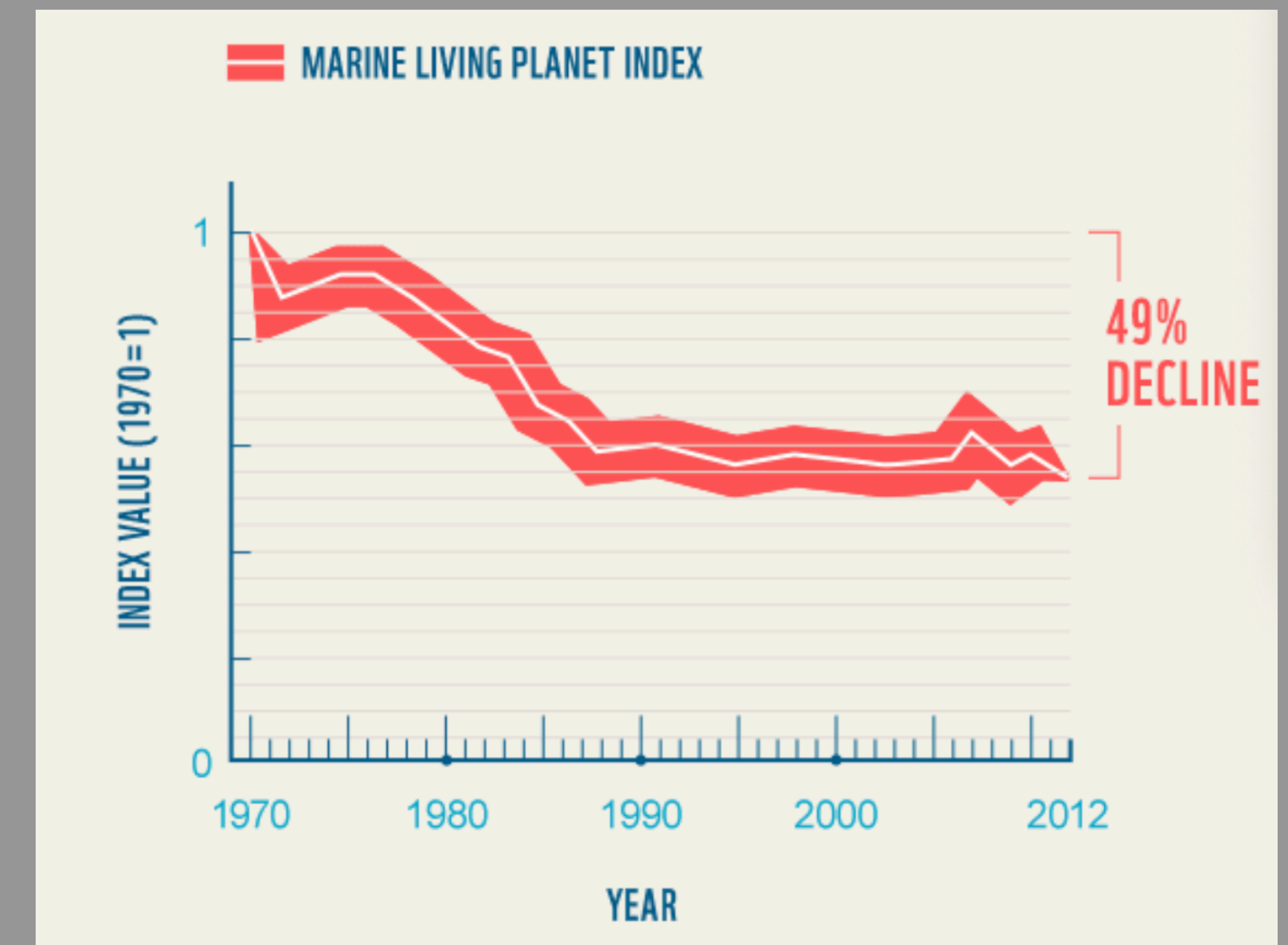
Coral Reefs and Ocean

Acidification

- Increased CO₂ levels have lowered the pH of the ocean, which reduces calcification rates of the formation of coral reefs.
- The increase in water temperature causes a stress response by coral, which includes expelling algae from their tissues.
- The loss in coral reefs impacts many coastal and oceanic ecosystems by reducing the habitat for marine species and biodiversity.

Increased Rainfall/Storm Activity

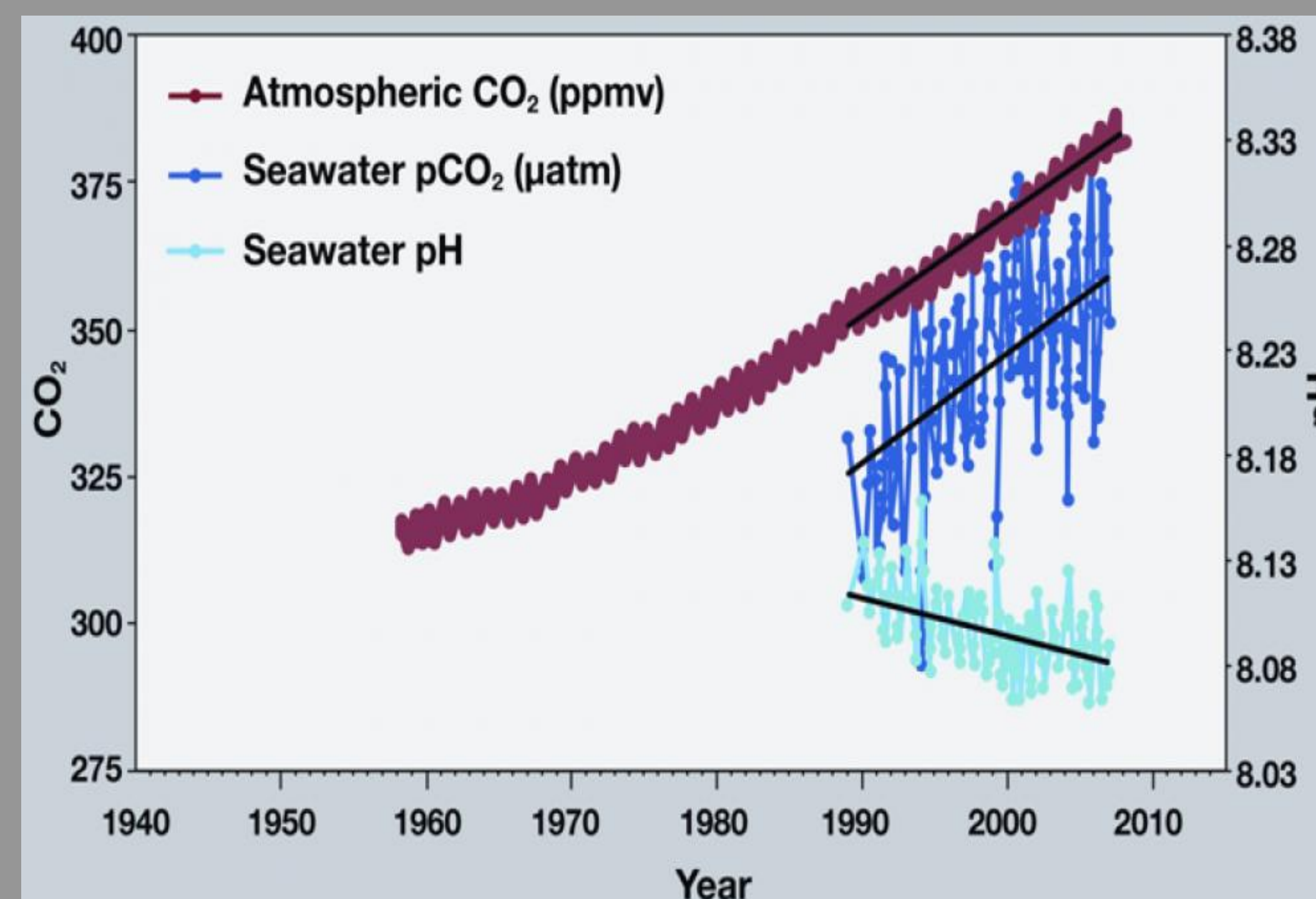
- An increase of water evaporation of the oceans from warmer temperatures creates more rainfall and storms.
 - This causes physical damage to marine habitats and affects the oxygen and nutrient levels in the water.
- Rainfall leads to a higher amount of runoff into waters from surrounding coastal environments, polluting the water.
 - Excess pollutants deplete oxygen levels due to pollutants such as agricultural fertilizers, creating dead zones in the water. Ex: Gulf of Mexico



Changes in Stratification of the Water Column



Warming of the upper layers of the ocean will cause increased stratification of the water column. This reduces mixing of the ocean layers and will effect the amount of nutrients and primary production in certain parts of the Pacific and Atlantic Oceans.



Ecosystem Function

- With the warming of ocean waters, marine species must migrate north for colder waters or deeper into ocean layers in order to meet their physiological needs. These migrating species will disrupt the flow of the system they are moving into, making them invasive species.
- Rising temperatures also directly affect the metabolism and life cycles of many marine species. This can alter their behavior and reproduction levels, causing many species to not reproduce.

Bibliography:

1. "Climate Change." World Wide Fund for Nature. Accessed 31 March 2019.
2. Dien, K. 13 November 2013. "The Effects of Ocean Acidification on Coral Reefs." Climate Interpreter. Accessed 31 March 2019.
3. "Effects of Climate Change on Marine Life." Mass Audubon. Accessed 31 March 2019.
4. Hoegh-Guldberg, O. and J. Bruno. 2010. *Impact of Climate Change on the World's Marine Ecosystems*. *Science* 328: 1523-1528. doi: 10.1126/science.1189930
5. Living Blue Planet. (2015, September 15). Retrieved April 10, 2019, from http://assets.wwf.org.uk/custom/stories/living_blue_planet/
6. Whited, Brittney. 4 August 2016. "Three Ways Climate Change is Harming Marine Species." The EPA Blog. Accessed 31 March 2019.
7. "Change in Latitude and Depth of Marine Species, 1982-2015" The EPA. Accessed 22 April 2019.