

Impact of Climate Change on Coral Reefs

I. What are coral reefs:

Coral reefs are made by the building up of the calcium carbonate (limestone) bony skeleton produced by thousands of organisms called “hard corals” (Coral.org, 2019). They comprise the highest biodiversity of an ecosystem in the entire world and this can be evident from the fact that around one quarter of the ocean species are dependent on coral reefs to obtain food and shelter, even though they occupy less than one percent of the ocean floor. Moreover, the coral polyps, which form the reefs, maintain a symbiotic relationship with a type of algae called zooxanthellae in which the algae provide energy by photosynthesis in exchange for the coral’s waste that is nutritive to the algae. Though coral polyps can feed on tiny organisms at night through their tentacles, the energy provided by a key role in the survival of coral polyps and maintaining a sufficient rate of growth. Last and not least, the zooxanthellae, which live inside coral polyps, are responsible for giving the coral reefs their brilliant colors. (Knowlton, 2018).

II. The interaction between climate change and coral reefs:

The retention of greenhouse gases, which is attributed to many factors including fuel combustion and deforestation, has led to a total increase in Earth’s surface temperature by one degree Celsius compared to the pre-industrial times (Heron et al., 2017). Warmer water temperatures lead to the expulsion of algae from the tissue of coral polyps rendering them white, which is known as coral bleaching. Furthermore, climate change result in acidification of the ocean due increased carbon dioxide levels in water and threatens the integrity of coral reefs among other drastic effects on the ecosystem such as altering ocean currents affecting food and habitat. In the last three years, mass bleaching of the coral reefs heritage worldwide has occurred rendering them among the most endangered ecosystems on Earth. For instance, bleaching that has occurred to the Great Barrier Reef, Australia in 2016 and 2017 have resulted in the death of half of its corals. In brief, corals will not be able to survive the current bleaching frequency.

III. Why is this issue important?

In 2017, UNESCO carried out the first global scientific assessment on the impact of climate change on coral reefs and it was predicted that unless the emission of greenhouse gases is significantly reduced, the worldwide coral reef heritage will cease to exist in the near future. While taking into consideration the high variety of services provided by the coral ecosystem from providing food and shelter, flooding protection and maintaining fish and tourism industries, it is easy to predict that coral destruction by climate change will have social, economic and health consequences. Not only are coral reefs estimated to directly support over 500 million people worldwide, but also they act as key indicators for global ecosystems' health. They simply act as warning signs for less sensitive ecosystems, indicating an alarming possibility of their destruction or significant affection. In other words, affection of the coral ecosystem indicates a soon and easier affection of other less sensitive ecosystems (Heron et al.,2017).

-

References:

- 1) Coral.org. (2019). Coral Polyps | Coral Reef Alliance. [online]
Available at: <https://coral.org/coral-reefs-101/coral-reef-ecology/coral-polyps/> [Accessed 17 Jun. 2019]
- 2) Heron et al. (2017). Impacts of Climate Change on World Heritage Coral Reefs: A First Global Scientific Assessment. Paris, France: UNESCO World Heritage Centre.
- 3) Knowlton, N. (2018). Corals and Coral Reefs. [online] Smithsonian Ocean. Available at: https://ocean.si.edu/ocean-life/invertebrates/corals-and-coral-reefs#section_1018 [Accessed 17 Jun. 2019].