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Commentary

Advantages of Coral Reefs for Ecosystems and Biodiversity

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DESCRIPTION

Coral reefs are significant ocean habitats that make a strong argument for the dangers of climate change. Reefs are a significant contributor to the biodiversity of the planet, earning them the nickname "the tropical forests of the seas." Coral reefs are one of the world's most diverse environments; with scientists estimating that 25 percent of all marine organisms live there. Recreational activities, tourist, erosion prevention, habitat for fishing activities, and the preservation of ocean life are just a few of the economic advantages that reefs offer. "From a practical standpoint, they can, for example, assist in protecting coasts from storm occurrences and assist in maintaining fisheries that are crucial to many people.

Furthermore, complex substances discovered in coral reefs have potential for use in modern medicine. These are what we refer to as ecosystem services, and their replacement would be both expensive and complex. Corals are small creatures that inhabit vast groups of polyps. These polyps excrete a calcium carbonate material that hardens and gradually assembles to create the reef structure. Different coral species, such fan corals and brain corals, develop various kinds of structures. Coral polyps coexist together with the algae that serve as their food source. Coral bleaching is the process by which corals expel the algae and leave only the white limestone carbonate skeleton behind because of disease, temperature extremes, and pollution. With ocean temperatures rising due to global warming and ocean acidification brought on by carbon dioxide, bleaching event is a concern. Because they support bigger colonies of fish, mollusks, crustaceans, and other organisms, coral reefs are significant ecosystems. This symbiotic interaction is very reliant on the water's temperature in the area. The tissue of corals loses zooxanthellae when the water warms, which causes them to lose their color and a significant source of nourishment.

This method is referred to as "coral bleaching." Reef-building corals that live in shallow water and zooxanthellae, which are photosynthetic algae, coexist harmoniously. The coral offers the molecules that zooxanthellae require for photosynthesis as well as a safe environment. In exchange, the coral receives oxygen and carbohydrates that the algae create. The algae also aid in the coral's waste removal. This kind of symbiosis is known as mutualism since both partners gain from their partnership. On and around reefs, fishing, scuba, and swimming generate tens of millions of dollars for nearby businesses. The world's coral reefs are thought to be worth tens of billions of dollars annually in terms of net economic value. These habitats are crucial to indigenous people all around the world from a cultural perspective. A coral reef does not necessarily die when the coral bleaches. Corals can eventually replenish their zooxanthellae, but it takes colder temperatures. The rise in carbon dioxide levels is another factor in ocean acidification. Carbon dioxide that is discharged into the atmosphere is absorbed by the ocean. By lowering pH, a metric of acidity, carbon dioxide changes the chemistry of saltwater. More acidic water has a lower pH. Corals struggle more when the pH of saltwater is lowered due to CO_2 because there are less carbonate ions available, which is one of the key components of their calcium-carbonate skeletons.

Natural dangers include illnesses, predators, and storms. Human activity is also a concern, as seen by pollution, sedimentation, destructive fishing methods, and global warming, which is increasing ocean temperatures and generating ocean acidification. While some of these dangers physically harm these sensitive ecosystems, others can stress corals to the point where they bleach and possibly die. If conditions improve before corals perish, they can recover from bleaching events, though it may take several years for the communities to fully recover. Additionally, researchers are experimenting with Decel approaches to support coastal and marine ecosystems, such as cultivating coral in a hatchery before transplanting it to harmed regions. Long-term reduction of the quantity that really is up in the atmosphere and contributing to both increasing bleaching and acidification is required. But there are additional ways to contribute now, in a more immediate future. By developing what we refer to as "reef resiliency," we may assist by realizing how bleaching and acidification damage corals. Specifically, ensuring that reefs have the ability to recover for instance, preventing pollution from entering the water can benefit corals that are far away. Additionally, people may assist by maintaining marine

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protected zones in important conservation sites, ensuring that the seafood they eat is sustainable, avoiding contributing to the extinction of types of fish that control algae, and adhering to fishing standards.