**Abstract**

Coral have a symbiotic relationship with algae (referred to as zooxanthellae). When there is a reduction in water temperature, the symbiotic relationship begins to break. There are many reasons why a coral can bleach such as a decrease in temperature, salinity, ultraviolet radiation, and pollutants. Many marine organisms are very sensitive to water temperature changes which can affect the balance of coral ecosystems. This interaction with zooxanthellae and the host coral is called a symbiotic relationship. Both are independent but have a mutual benefit with each other. Zooxanthellae produce nutrients for the coral through photosynthesis, and the coral gives zooxanthellae housing and protection. The nutrient-exchanging process is not just limited to the coral and fuel helps the zooxanthellae to produce the corals bleaching. When a coral becomes bleached, it loses the nutrients needed to survive. Once a coral becomes bleached, it is susceptible to disease and death.

**What is Coral Bleaching**

Coral reefs systems are one of the most diverse and beautiful ecosystems. A multitude of colors can exist in corals. Pigments are reflected through the corals zooxanthellae. Zooxanthellae are unicellular algae that produce nutrients for the coral. Zooxanthellae and the host coral are called a symbiotic relationship. Both are independent but have a mutual benefit with each other. Zooxanthellae produce nutrients for the coral through photosynthesis, and the coral gives zooxanthellae housing and protection. The nutrient-exchanging process is not just limited to the coral and fuel helps the zooxanthellae to produce the corals bleaching. When a coral becomes bleached, it loses the nutrients needed to survive. Once a coral becomes bleached, it is susceptible to disease and death.

**Types of Corals Affected by Coral Bleaching**

**Coral Bleaching Event**

The Great Barrier Reef is the largest living structure on Earth and can be seen from space. The reef is made up of 2,900 individual reefs and 900 islands, stretching over 2,300 kilometers of the northeast coast of Australia, encompassing 343,000 square kilometers. It is the largest coral reef system in the world, and the third largest structure formed by living organisms on Earth. The Great Barrier Reef is the largest living structure on Earth and can be seen from space. The reef is made up of 2,900 individual reefs and 900 islands, stretching over 2,300 kilometers of the northeast coast of Australia, encompassing 343,000 square kilometers. It is the largest coral reef system in the world, and the third largest structure formed by living organisms on Earth.

**Benefits of Coral Reefs**

Coral reefs are very biodiversity rich. It is estimated that 25% of all the marine species inhabit these reefs. Coral reefs provide habitat for a wide variety of fish and other marine life. They also serve as a source of food for many people around the world. Coral reefs are also important for tourism and recreation. They attract millions of visitors each year who come to dive, snorkel, or simply relax on the beautiful beaches. Coral reefs also play a vital role in the carbon cycle by absorbing carbon dioxide from the atmosphere and releasing oxygen into the ocean. This helps to reduce the amount of carbon dioxide in the atmosphere, which is a major contributor to climate change.

**Causes of Coral Bleaching**

Coral Bleaching is caused by different factors. The increase or decrease in ocean temperatures can cause the water to become too warm or too cold for the coral. This can cause the coral to lose its zooxanthellae, which are responsible for giving the coral its color. When the zooxanthellae are lost, the coral turns white, a condition known as bleaching. Other factors that can cause coral bleaching include pollution, overfishing, and the introduction of invasive species. These factors can stress the coral and make it more susceptible to bleaching. Coral bleaching can also be caused by changes in ocean chemistry, such as increased levels of carbon dioxide in the ocean. This can cause the pH of the ocean to decrease, which can make it more difficult for the coral to build its calcium carbonate skeleton. This can also stress the coral and make it more susceptible to bleaching.

**Solutions**

Scientists have proposed solutions to mitigate the causes of coral bleaching. Most have proposed ways to reduce the greenhouse gas emissions that contribute to climate change. This can help to reduce the amount of heat in the oceans, which can help to prevent coral bleaching. Other solutions include the use of barrier reefs to protect vulnerable areas, the use of water treatment technologies to reduce pollution, and the use of marine protected areas to help protect the coral from overfishing. It is also important to reduce the use of sunscreen and other chemicals that can harm the coral. These solutions can help to reduce the amount of bleaching that occurs and can help to protect the coral for future generations.