Rising SSt are the main risk for coral bleaching in the Great Barrier reef

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Rising Sea Surface Temperatures are Bleaching the Great Barrier Reef

**Rising Sea Surface Temperatures and Coral Bleaching in the Great Barrier Reef**

 Sea Surface Temperatures are rising and causing the corals in the Great Barrier Reef to bleach, and as a result are unable to recover. Coral bleaching happens when coral lose their photosynthetic pigments due to rising Sea Surface Temperatures. It has been said by Donner, that as Sea Surface Temperatures continue to increase coral bleaching will become a frequent occurrence and will threaten the future of coral reefs ecosystems. As for The Great Barrier Reefs ecosystem, it is very vulnerable to the increase in Sea Surface Temperatures. This is because most of the reef experiences annual bleaching events and is home to many vulnerable coral species like the tabular coral Acropora Hyacinthus. This is because it dominates the shallow wave-exposed habitats in The Great Barrier Reef and is therefore greatly impacted by the climate-induced rising Sea Surface Temperatures.

 According to Ainsworth, if the Sea Surface Temperatures increases by +2 degrees Celsius, which could occur by 2100 due to the current warming trajectories, which will cause thermal stress events to increase and cause coral bleaching. This increase in temperature will make it hard for corals to recover and or acclimate, and as a result the corals will be in great decline. If corals decline due to the increase in temperature, then there will be less biodiversity in species and an imbalance in the ecosystem. Also, according to Pandolfi, coral bleaching can cause mortality among colonies of corals. This happens when corals are negatively affected by the rising Sea Surface Temperatures and haven’t acquired tolerance to the rising Temperature. This issue causes mortality among the vulnerable species because they do not possess tolerance to increased Sea Surface Temperatures. As Sea Surface Temperatures continue to rise, coral bleaching will continue to happen and will negatively affect the corals in The Great Barrier Reef.

**Importance of rising Sea Surface Temperatures on the Great Barrier Reef**

As Sea Surface Temperatures continue to rise, the changes to the ecosystem cause negative effects. According to Pandolfi, tropical reef fish are migrating to higher latitudes like Florida due to the rising Sea Surface Temperatures and coral bleaching. This migration of tropical reef fish results in real and projected shifts in species ranges. Also, due to the tropical reef fish migrating out of The Great Barrier Reef, the fishing industry will be negatively affected by losing profits or business. Without the tropical reef fish there will be no fish sales, which results in no profits and the business failing.

 Another negative effect of rising Sea Surface Temperatures is the loss of coral reefs due to coral bleaching and the inability for them to recover. As a result, tourism will decrease, and vulnerable species of coral may go extinct. If tourism decreases, then many businesses will lose profits and or may go out of business. As for the vulnerable species of coral, they are unable to acclimate and as a result they cannot recover from annual bleaching events, therefore they may go extinct. If the vulnerable species of coral go extinct, then it will negatively affect tourism in The Great Barrier Reef and other reefs as well.

**Solutions/ Benefits**

 A possible solution to coral bleaching caused by rising Sea Surface Temperatures, is forming and designing marine reserves, which are marine protected areas that have legal protection. According to Pandolfi, in forming marine reserves we can study and figure out a way for corals to acclimate and or adapt to rising Sea Surface Temperatures. Also, in forming marine reserves, the corals can begin to grow again and the organisms that once left the reef can return, like the tropical reef fish that had migrated to higher latitudes. Another possible solution to coral bleaching caused by rising Sea Surface Temperatures is forming effective reef management policies, which was suggested by Pandolfi. In forming effective reef management policies, reef health and the protection of reefs can be promoted to the public. Also, scientists can study the coral reefs and come up with ways to stop the constant threats of rising Sea Surface Temperatures like coral bleaching. If these solutions and benefits happen then the fishing industry and tourism won’t decline, and vulnerable species of coral may not go extinct.

**Conclusion**

 Rising Sea Surface Temperatures are the main risk for coral bleaching in The Great Barrier Reef, and corals are unable to recover or acclimate. This is because the temperature continues to rise causing coral bleaching, which results in reef decline. The Great Barrier Reef is home to many species of coral and organisms like tropical reef fish, but if the Sea Surface Temperatures continue to rise, they may not be around much longer. That is why it is important to protect the Great Barrier Reef by forming marine reserves and or effective management policies. The Great Barrier Reef is the world’s most diverse coral reef and deserves to be here in the future.