



Waves of Change
CalsMUN 2024

Research Report

Forum: UNFCCC

Issue: Addressing the Impacts of Climate
Change on the Great Barrier Reef

Chairs: Amelia Wincenciak and Miyuki
Blankers



Introduction

The Great Barrier Reef, located off the coast of Queensland, Australia, is the world's largest coral reef system and a UNESCO World Heritage site. It is an invaluable ecosystem, providing habitat to a diverse range of marine species and contributing significantly to global biodiversity. The Great Barrier Reef is unique as it extends over 14 degrees of latitude, from shallow estuarine areas to deep oceanic waters.

However, the Great Barrier Reef faces severe threats due to climate change, primarily driven by the rise in global temperatures and associated impacts. This report will explore the impacts of climate change on the Great Barrier Reef and propose potential strategies for mitigation and adaptation.

The committee

The United Nations Educational Scientific and Cultural Organisation (UNESCO) was formed 16 November 1945. Its ideals were shaped by the second world war and it aimed to provide security through shared appreciation and collaboration in education, culture, art and science. It has a history of working on issues such as racism and education and collaborating with organisations such as CERN and IB. The committee includes all member states excluding Israel and until recently the USA. It currently recognises 50 marine heritage sites of which 3 are considered world heritage in danger.

Definition of Key Terms

Mitigation

the action of reducing the severity, seriousness, or painfulness of something.

"the identification and mitigation of pollution"

Coral bleaching

Coral bleaching is the process when corals become white due to all kinds of stressing factors, such as changes in temperature, light, or nutrients.

General Overview

As mentioned before, it faces unprecedented challenges due to the impacts of climate change. Rising sea temperatures, ocean acidification, and extreme weather events pose significant threats to the health and resilience of this delicate ecosystem. This overview explores the urgent need for global action to address the impacts of climate change on the Great Barrier Reef. To understand this issue we first have to recognize the ecological importance and global significance of the Great Barrier Reef as one of the most diverse and extensive coral reef ecosystems. Highlight its role in supporting marine biodiversity and providing livelihoods for coastal communities and we have to understand the specific climate change-induced stressors affecting the reef, including coral bleaching, ocean acidification, and the increased frequency of extreme weather events while acknowledging the interconnectedness of these factors and their cumulative impact on the reef's health. Furthermore we also have to know that there are international consequences. As the Great Barrier Reef extends beyond national borders, with global implications for biodiversity, fisheries, and climate regulation.

Major Parties Involved

Australian Government

As the country where the Great Barrier Reef is located, the Australian government plays a crucial role in policy-making, conservation efforts, and implementing measures to address climate change impacts on the reef. The government is responsible for implementing national and regional policies related to climate change mitigation, emission reduction, and reef conservation. It may also engage in international collaborations to address global climate issues

Local Communities and Indigenous Groups:

The communities living in proximity to the Great Barrier Reef, including Indigenous groups, have a vested interest in its preservation. Local communities engage in sustainable practices, participate in conservation efforts, and contribute traditional knowledge to reef management. Indigenous groups often play a crucial role in advocating for the reef's protection and maintaining ecological balance

International Organisations:

Various international organisations, including the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations Framework Convention on Climate Change (UNFCCC), have an interest in global biodiversity and climate change.

These organisations may provide support, guidance, and frameworks for international cooperation on climate change mitigation, adaptation, and conservation of critical ecosystems like the Great Barrier Reef.

Timeline of events

First Global Coral Bleaching Event (1998):

The 1998 global coral bleaching event, linked to elevated sea temperatures, raised widespread awareness of the vulnerability of coral reefs, including the Great Barrier Reef, to climate change.

It prompted increased research into the effects of climate change on coral reefs and contributed to a growing international focus on the need for conservation and mitigation measures.

Great Barrier Reef Marine Park Authority (GBRMPA) Outlook Report (2014):

The GBRMPA's Outlook Report provides a comprehensive assessment of the health of the Great Barrier Reef and identifies key threats, including climate change. The report highlighted the urgent need for action to address climate change impacts and set the stage for subsequent conservation and

The Paris Agreement (2015):

The Paris Agreement, adopted at COP21, represents a global commitment to limit global warming to well below 2 degrees Celsius. The agreement underscores the importance of international cooperation in addressing climate change, with implications for the protection of vulnerable ecosystems, including the Great Barrier Reef.

Reef 2050 Plan (2015):

The Australian and Queensland governments jointly released the Reef 2050 Long-Term Sustainability Plan to address threats to the Great Barrier Reef. The plan outlines strategies for improving water quality, managing coastal development, and enhancing resilience to climate change, emphasising a coordinated and long-term approach to reef conservation.

Coral Bleaching Events (2016 and 2017):

Significance: Widespread coral bleaching events in 2016 and 2017, attributed to rising sea temperatures, garnered global attention and emphasised the immediate threat climate change poses to coral reefs, including the Great Barrier Reef.

Outcome: These events spurred increased international discussions on climate change, coral reef conservation, and the need for urgent measures to reduce global greenhouse gas emissions.

UNESCO Decision on the Great Barrier Reef (2017):

Significance: In 2017, UNESCO expressed concern over the state of the Great Barrier Reef and considered listing it as "in danger."

Outcome: The decision prompted Australia to accelerate its efforts to address threats to the reef, including water quality issues and climate change impacts, to avoid the "in danger" designation.

Great Barrier Reef Foundation's Resilient Reefs Initiative (2020):

The Great Barrier Reef Foundation launched the Resilient Reefs initiative to support projects focused on enhancing the resilience of coral reefs, including the Great Barrier Reef, to climate change. This initiative represents a collaborative effort involving government, research institutions, and philanthropy to implement innovative strategies for reef conservation.

Previous attempts to solve the issue

Efforts to address the impacts of climate change on the Great Barrier Reef have been ongoing for several years, involving a combination of scientific research, conservation initiatives, and policy measures. While the complex nature of climate change poses ongoing challenges, here are some previous attempts to mitigate and adapt to the impacts on the Great Barrier Reef.

Through International collaboration for example. The Great Barrier Reef is a global concern, and international collaboration has been sought through various agreements and forums. Nations have participated in discussions under the United Nations Framework Convention on Climate Change (UNFCCC) to address broader climate issues affecting the reef. Australia has implemented policies to reduce greenhouse gas emissions, including the Renewable Energy Target and the Emissions Reduction Fund.

These policies aim to contribute to global efforts in reducing the drivers of climate change, potentially mitigating some of the impacts on the Great Barrier Reef.

The Great Barrier Reef Marine Park Authority (GBRMPA) has developed Coral Bleaching Response Plans to guide immediate responses to coral bleaching events.

These plans include monitoring and research efforts, as well as adaptive management strategies to assist in the recovery of bleached corals.

Research and Monitoring Programs:

Numerous research programs and monitoring initiatives have been established to better understand the impacts of climate change on the reef, including the Coral Sea Foundation, the Australian Institute of Marine Science (AIMS), and the Cooperative Research Centre for Reef Studies. Research outcomes contribute to evidence-based decision-making and inform adaptive management strategies for the Great Barrier Reef.

Control Programs: The threat of Crown-of-Thorns Starfish (COTS) outbreaks, exacerbated by nutrient runoff, has been addressed through targeted control programs. These programs aim to reduce the impact of COTS on coral cover and enhance the reef's resilience to other stressors, including those associated with climate change.

Community Engagement and Education:

Efforts: Various programs focus on engaging local communities and raising awareness about the importance of the Great Barrier Reef.

Outcomes: Community involvement is essential for sustainable reef management, and education initiatives seek to promote responsible tourism and reduce local stressors on the ecosystem.

Despite these efforts, challenges persist, and the urgency of addressing climate change remains a central concern. Ongoing research, adaptive management, and a commitment to global climate action are crucial for the long-term conservation of the Great Barrier Reef. The international community's continued collaboration is essential in developing and implementing effective strategies to protect this iconic marine ecosystem.

Possible Solutions

Two main points that are important for solving this issue is to restore the reef and to protect it. This can be done by for example:

- Coral Reef Restoration:
 - Invest in research and initiatives focused on coral reef restoration, including the development of resilient coral species and restoration techniques.
 - Implement large-scale coral propagation and transplantation projects.
- Marine Protected Areas (MPAs):
 - Establish and effectively manage marine protected areas around the Great Barrier Reef to reduce human impacts, fishing pressure, and other stressors.
 - Implement zoning and regulations that prioritise reef conservation within MPAs.
- And we have to think about minimising the source, climate change itself by:
 - Global Emission Reduction:
 - Advocate for and participate in international efforts to reduce greenhouse gas emissions, aligning with agreements like the Paris Agreement.
 - Invest in clean energy sources and technologies to transition away from fossil fuels.
- Renewable Energy Transition:
 - Accelerate the shift to renewable energy sources to decrease reliance on carbon-intensive energy production.
 - Incentivize and support the development and implementation of renewable energy projects.
- Sustainable Land Use Practices:
 - Implement and enforce sustainable land use practices, especially in coastal areas, to minimise runoff of pollutants into the reef.
 - Promote responsible agricultural practices to reduce nutrient and sediment runoff.

Bibliography

Australia's biodiversity and climate change - australian government (pages 1-2)

<https://www.dcceew.gov.au/sites/default/files/documents/biodiversity-vulnerability-great-barrier-reef.pdf>

Climate change pressure on the Great Barrier Reef- department of environment and science, Queensland

<https://www.stateoftheenvironment.des.qld.gov.au/biodiversity/estuarine-and-marine-ecosystems/climate-change-pressure-on-the-great-barrier-reef>

Great barrier reef- WWF

<https://www.wwf.org.au/what-we-do/oceans/great-barrier-reef/>

The Great Barrier Reef is a victim of climate change – but it could be part of the solution
-Peter Thomson and Ove Hoegh-Guldberg

<https://www.theguardian.com/environment/commentisfree/2021/jul/26/the-great-barrier-reef-is-a-victim-of-climate-change-but-it-could-be-part-of-the-solution>

What is Coral Bleaching and What Causes It - Fight For Our Reef

<https://www.marineconservation.org.au/coral-bleaching/>