

COMMITTEE: Environmental

TOPIC: Ensuring the protection of coral reefs threatened by ocean acidification.

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POSITION: President and Deputy President

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Personal Introduction

My name is Rea Nassar , I'm 17 years old and I'm really excited to be your president for this year of mun..Coral reefs are like under waters cities where lots of fish and sea animals live. They also help people who depend on the ocean for food and work . But because of pollution and climate change the ocean is changing and getting more acidic. This is hurting the animals that live there . I hope this guide will help you understand what's going on and inspire you to come up with good ideas to save our coral reef

General Introduction

Coral reefs are part of the richest and extraordinary marine ecosystems. Coral reefs host about 25 % of marine species and have a key role in the ocean's balance. Unfortunately, they are threatened by numerous issues as for the acidification of the water caused by a surplus of CO₂ in the air.

The acidification of the ocean is a crucial environmental problem. This phenomenon makes the water's pH drop which weakens the corals and endangers their lives. And that is not all, coral reefs benefit marine life as they are also essential to prevent the coast from an erosion as well as to support the fishing and touristic economies and act as a natural fence against all types of natural phenomenon.

Coral reefs are often called "rainforests of the sea" in view of their phenomenal biodiversity. They cover less than 1% of the seabed; however, they welcome about 25 % of all marine species. As we can see, their role is crucial for the environment as well as for the human communities concerned. The augmentation of CO₂ makes the waters more acidic and reduces an essential substance for corals: without it, the corals would struggle to develop and survive.

If the CO₂ continues increasing this way, a study shows that by 2050 more than 90% of coral reefs will disappear. With this disappearance, numerous consequences would affect marine life, economies such as fishing tourism, food supplies, coast's protection, and water 'quality.

Definitions of key terms

Coral reef: A structure underwater made by corals, which are sea animals that produce calcium to build their skeletons.

Ocean acidification: The process where the ocean becomes more acidic because it absorbs CO₂ from the air.

Coral bleaching: When corals release tiny algae (called zooxanthellae) that give them energy, causing the corals to weaken and die.

pH: A measure of how acidic or basic something is. A low pH means something is more acidic.

CO₂ emissions: The release of carbon dioxide into the air, mainly from burning fossil fuels like coal, oil, and gas.

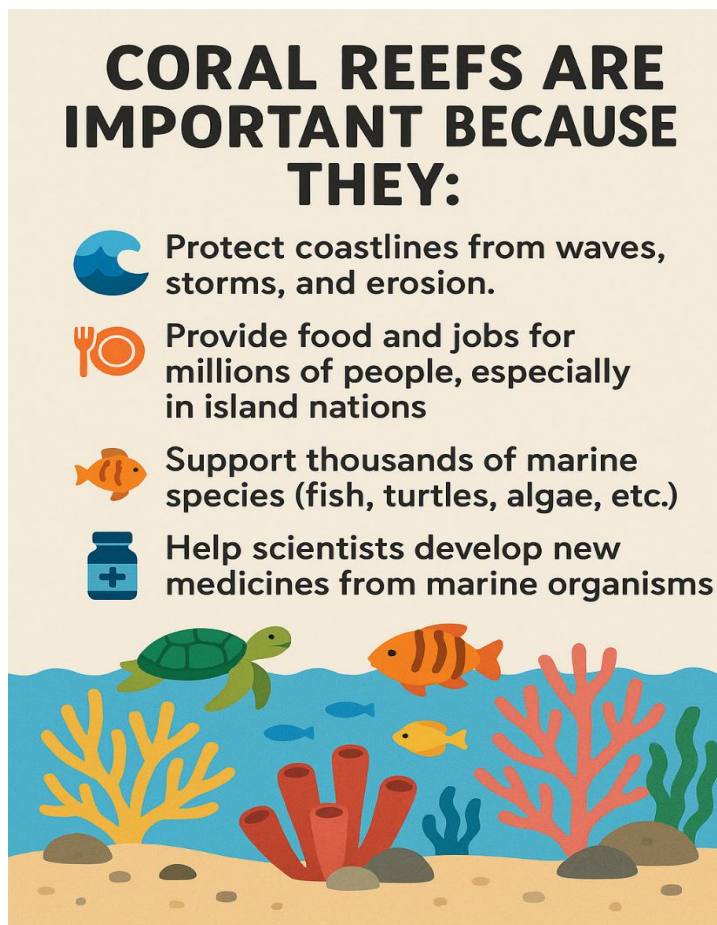
Zooxanthellae: Tiny algae that live inside corals and give them energy through photosynthesis.

Great Barrier Reef: The largest coral reef in the world, located in Australia, which is badly affected by climate change.

Coral Triangle: An area in Southeast Asia with the highest number of sea species on Earth.

General overview

Coral reefs are an underwater structure built by tiny animals called coral polyps. These animals create hard skeletons and over time they form large reef systems. Coral reefs are some of the most beautiful and important ecosystems on earth. They cover less than 1% of the ocean but they cover 25% of all marine life. This is why often people call them “the rainforest of the sea “. In addition, they are essential for marine species of all kinds.

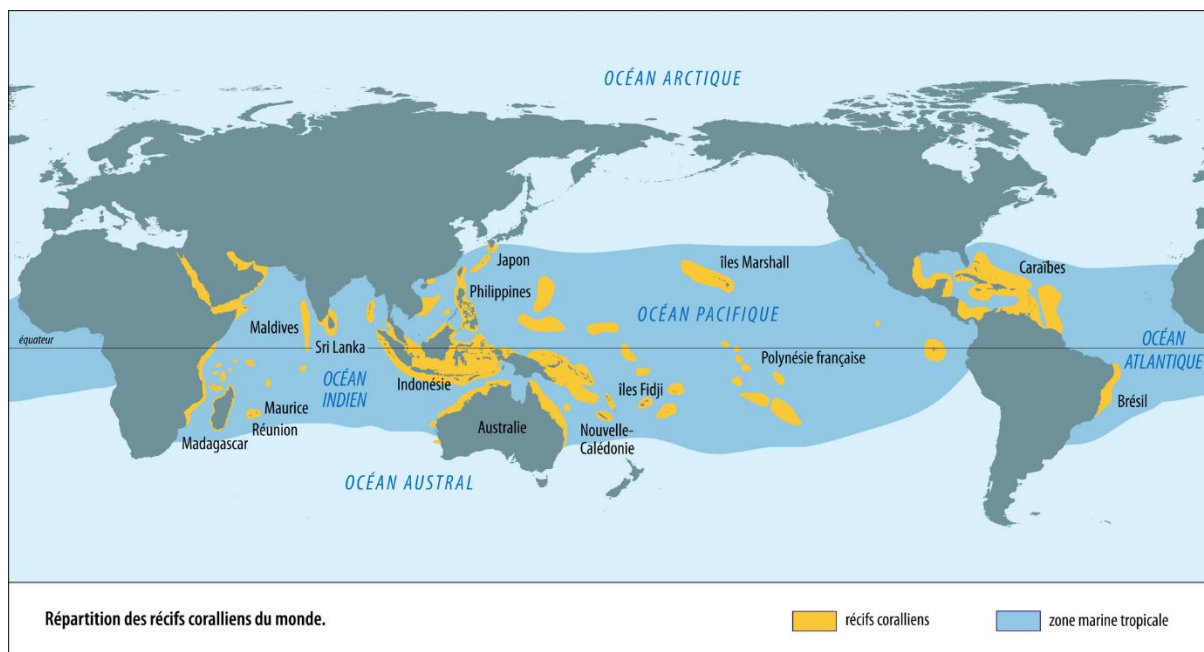


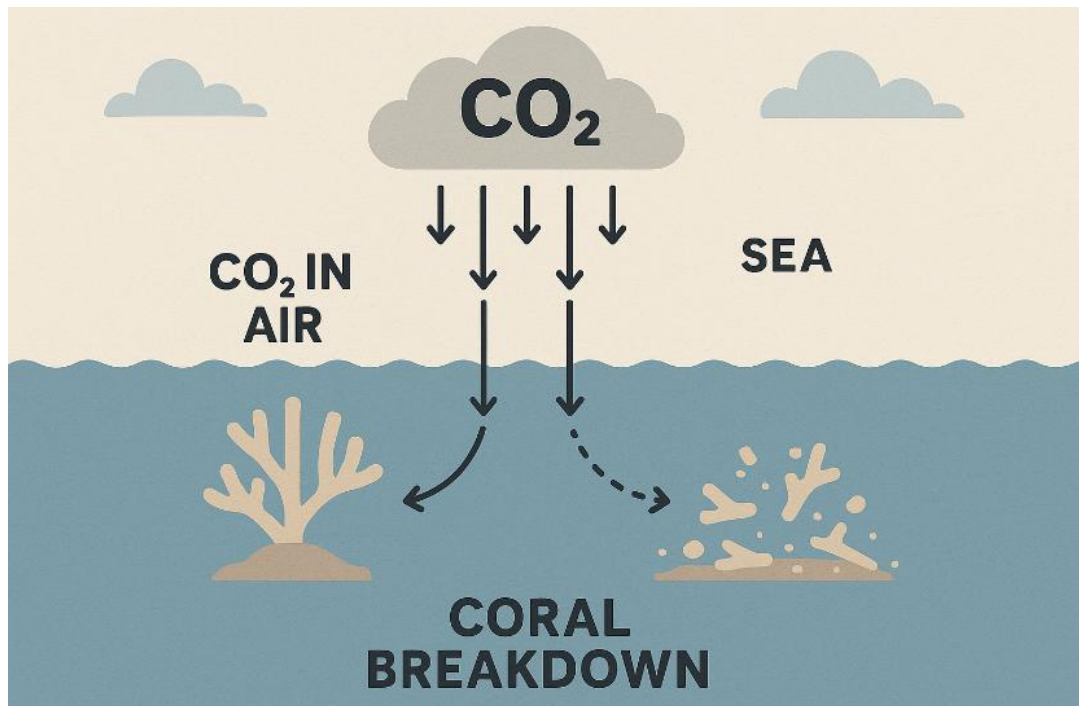
However coral reefs are in danger because one of the biggest threats today is ocean acidification caused by climate change and pollution.

Causes

a) Ocean acidification

Ocean acidification is the main reason why coral reefs are in danger . When humans burn fossil fuels like oil , gas or coal they release carbon dioxide into the air . About 1/3 of this CO₂ is absorbed by the ocean . When the co2 mixes with seawater it causes a chemical reaction that makes the water more acidic , this lowers the ocean's pH .





This is threatening for corals because they are incapable of building strong skeletons, and they need calcium carbonate to grow but acid breaks it down. Furthermore, coral growths slow down or stop growing at all. This phenomenon is invisible but extremely dangerous and it's happening everywhere in the world even in the ocean far from pollution sources.

- Pollution

Trash like plastic bottles, bags, and chemicals often end up in the ocean. These pollutants can cover or poison corals, block sunlight or kill marine animals that live near reefs.

- Overfishing and destructive fishing

Some people use dangerous methods like dynamite or cyanide to catch fish which can destroy coral areas. Also taking too many fish from the reef breaks the natural balance of the ecosystem.

- Climate change and warming oceans

When water becomes too warm corals lose the algae that live inside them. These algae give corals their color and energy. Without them, corals turn white—a process called coral bleaching. If it continues for too long, the corals die.

- Coastal development
Building hotels, ports or roads close to coral reefs can physically damage them because they often bring more pollution and more people which can increase pressure on fragile reef zones.

Consequences

- For nature
 - Loss of biodiversity
Corals reefs are home to about 25% of marine species. If reefs die many fish and other species will lose their homes, food and breeding areas.
 - Weaker ecosystems
Coral reefs play an important role in the balance of the ocean without them the entire food chain become weaker. Some animals might disappear forever
- For humans
 - Less food and fewer jobs

Many people depend on reefs for fishing and tourism. If coral reefs disappear, they may lose their income and food sources.

- More damage from storms
Coral reefs act like natural barriers. They break the force of waves and protect coasts. Without them storms will destroy beaches, houses and farmland more easily
- Lost medical opportunities
Also, some coral reefs are used to create medicine. If reefs disappear, we lose potential cures for diseases we don't even know about yet
- Loss of culture and identity
For many communities especially in the pacific islands and the Caribbean, corals reefs are part of their history and tradition so losing them means losing a piece of who they are.

Case study: The Great Barrier Reef (Australia)

The Great Barrier Reef is the biggest coral reef in the world, it is in the ocean near Australia. It is home too many fish and sea animals. It is also known for tourism and it brings a lot of money to the country.

But today, this reef is in danger, and one major reason is ocean acidification. Acidic water is harmful to corals because it:

- Makes it harder for corals to grow
- Makes old corals easier to break
- Slows down the appearance of new corals

Another problem is warming ocean water. When the sea gets too hot, corals turn white; a process called bleaching. After bleaching, many corals die. Large bleaching events have occurred in 2016,2017,2020,2022



<https://www.vox.com/science-and-health/2017/4/18/15272634/catastrophic-coral-bleaching-great-barrier-reef-map>

Concerned countries and organisations

Countries

Developed countries whose corals are endangered:

Qatar:

“This country is home to 17 coral reef sites, and Qatar possesses 48% of the coral reef population in the Arabian Gulf. Compared to its neighbors, Qatar has strongly mobilized efforts to restore its marine biodiversity. In 2021, the Ministry of Environment and Climate Change (MoECC) was established. In October 2022, the Ministry organized a coral restoration workshop. In addition, since 2024, Qatar has been developing plans and goals under the Qatar National Vision 2030. One of its objectives is to restore 30% of damaged natural habitats, including coral reefs.

The Aquatic Fisheries Research Centre (AFRC) was established at Ras Matbakh, inaugurated in 2020. Furthermore, since 2007, Qatargas has relocated over 12,000 live coral specimens. Nevertheless, the organisation responsible for the restoration is the Qatar energy group, formerly Qatar Petroleum, the largest natural gas producer in the world...This is not protecting the environment even if they invest a little in the coral reefs, they destroyed.

Japan:

Japan coral Reefs in the region of Okinawa were wiped out by 70 %. Okinawa hosts 960 km² of coral seabed seriously endangered in the 1980s. It was crucial to act and change. This country also plays a leading role in the East- Asian region which struggles to reduce environmental damages.

Japan's Ministry of the Environment developed a strategic document to protect and restore coral reefs, along with action plans to achieve this: *The Action Plan to Conserve Coral Reef Ecosystems in Japan (2016–2020)*.

The Okinawa institute of science and technology launched in July 2023, is one of many organisations which participates to the renewal of Japanese coral reefs.

French Polynesia:

Although French corals reefs are forgotten, it welcomes 10 % of the world's corals reefs and 15,000 km² in French Polynesia. In 2020 the French initiative for corals reefs (IFRECOR) stated that by 2025 100 % of French corals would be protected. Unfortunately, the degradation rate is heterogeneous. For now, 67 % of corals are under protection. And in the French Polynesia 43 % of the corals are in a degraded state. However, corals reefs have been increasing since 2015 by 39 %. The French state also encourages projects and initiatives by offering 220,000 euros per new project aiming to protect corals reefs and reach the goal of 100 % protected corals.

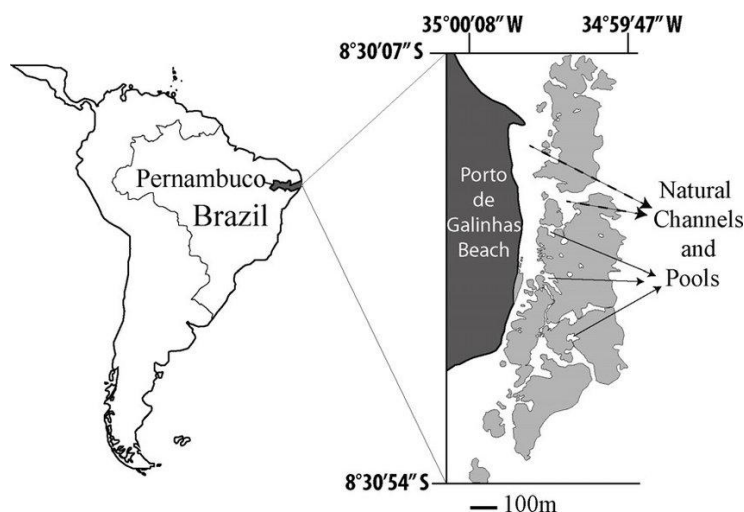
Developing countries whose corals are endangered:

Brazil:

Brazilian corals are also under threat. In 2022, a notable reduction of 18% in coral volume was recorded due to stress and heat waves. In the northeastern region of the country—particularly in Pernambuco, Alagoas, and Bahia—Brazil's coral reefs stretch for 3,000 kilometres. However, they are in a critical state after experiencing one of the worst coral bleaching events.

Despite this, it is important not to lose hope because the Brazilian government is taking matters into its own hands, first thanks to the Blue economy program which launched more than 10 million of dollars for the preservation of corals. Furthermore, in 1997 the Conservation Leadership Program assisted the creation of the first Brazilian Marine protected Area dedicated only for corals of 1,550 square miles called Costa dos Corals. Since then, four new MPAs have come into service, ensuring that 25 % of Brazilian water were protected. This country is an example of quick evolution toward more respectful practices of marine life.

Map showing the location of Porto de Galinhas reefs, Pernambuco, along the Northeastern Coast of Brazil, highlighting the natural pools and channels between the reef structures. Source: Adapted from Giraldes (2007, 2012).



Indonesia:

This country hosts 16 % of the world's coral reefs and 60 % of global coral species. In July 2024 the Indonesian Finance Ministry and the Nature Conservancy agreed to raise a 35-million-dollar fund to help Indonesian seabed and corals. This great investment will revitalize the local organisations and help them restore our sea forest.

Moreover, the Coral Bond project, involving the World Bank and the Indonesian government, consists of a loan dedicated to coral preservation. The loan is repaid through the positive outcomes achieved in improving the state of coral reefs. This illustrates how a country like Indonesia faces challenges in protecting its corals, while developed countries are willing to provide support.

Organisations

The Coral Reef Alliance (CORAL): For 30 years this NGO has fought to protect coral reefs. They are active in Indonesia, Australia, Philippines, Mozambique and Honduras as well as other country in those areas. Moreover, they developed a scientific way of preserving coral. They explain how important it is to take into consideration how the corals can adapt to temperature. Following numerous scientific experiences, they claim that the solution to the coral reefs threat is the diversity, the protection and expending of the underwater forests. In Addition, they also support sustainable fisheries, so the marine ecosystem come back to life. Their victories:

- 47 tonnes of sediments kept out of the water
- A 93% reduction of fecal bacteria
- 34 M gallons of sewage properly treated in Honduras
- 125% fish population increased in the areas where they work
- More than 80 thousand kilometres surveyed by patrol boat to prevent illegal fishing.

Coral Restoration Foundation (CRF):

This organisation helps to reinvigorates corals in numerous ways. For example, they invented the coral tree:



Those underwater structures are considered one of the most efficient methods to help coral growth.

Furthermore, their NGO hosts the largest coral nurseries, exactly 1.5 acres of ocean floors. This nursery contains 500 coral trees, knowing that each tree has a capacity to raise 50,000 corals every year. In addition, this nursery is symbol of diversity thanks to the 20 different species it shelters. CPR is active mainly in the USA (Florida) but slowly expanding to Puerto Rico for instance. Nevertheless, they hold conferences and events all around the world, in Germany and the Maldives for example.

The Nature Conservancy (TNC):

This huge organisation not only serves the coral cause but nature protection in general. Since, 2018 when they grew their first coral hub in the Bahamas to 2024 when Indonesia received 35 million dollars as part of an agreement aimed at protecting marine life and seabed. And it does not stop there, in 2023 TNC and another organisation plan an insurance project for coral reefs. Indeed, hurricanes are regularly destroying shores and seabed. This led to a complexed chaos for the people who lived near the sea and who'd see their houses destroyed. In 2022 Hawaii's coral reefs were insured with a budget of minimum 200,000 dollars. Consequently, the corals were less damaged, as for the houses so the livelihoods were preserved.

<https://youtu.be/uO4skNQIXhs>



Recent developments

Date	Event /action
Jan 2025	Indonesia and the USA made a special deal: Indonesia does not have to pay back 35\$ million in debt. Instead, they use this money to protect coral reefs
April 2025	Scientists (NOAA and ICRI) said that 84% of the world's coral reefs are affected by heat stress and bleaching. This is the worst coral bleaching ever recorded.
April 2025	At the Our Ocean Conference in South Korea, countries like Indonesia shared new ways to get money for reef protection like reef insurance and local community projects.
May 2025	Some Pacific countries signed the Tokyo Statement. They promised to work together to protect the ocean and coral reefs by 2030.
June 2025	At the UN Ocean Conference in Nice, 11 countries (like France, Indonesia, Palau) started a project to protect the strongest coral reefs the ones that can survive climate change.
June 2025	The UN created a new team called the Reef Action Hub. It helps countries restore coral reefs, protect ocean areas, and fight pollution.
2025 futur prediction	Scientists in Hawaii said that ocean acidification will get much worse in 30 years, even if we lower pollution. This means urgent action is needed now.

UN involvement

The United Nations hold an important place when talking of corals protection. Here are the main international agreements and conventions which partly participated to the positive evolution of corals preservations in numerous countries:

- United Nations Convention on the Law of the Sea,

This treaty, produced in 1982 states numerous time the need to protect marine, reduce pollution and avoid overexploitation life as the articles 61-62;192 and 194.

https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

- Convention on Biological Diversity.

It was during the COP16 that UN thought necessary or should I say, crucial to act for the corals. This call for help from 1992, aimed the necessity to create funds to develop new technologies and to protect 30 % of marine areas including coral reefs. It is written in developed in articles 6 and 8 of this treaty.

<https://www.cbd.int/convention/articles/default.shtml?a=cbd-01>

- United Nations Sustainable development goals
This non-binding framework, which mean not mandatory but strongly recommended, pursue the other conventions simply being the 14th goal of the Sustainable development: Conserve and sustainably use the oceans, seas and marine resources for sustainable development. Two axes are particularly interesting:
1.Target 14.2: "Sustainably manage and protect marine and coastal ecosystems... including coral reefs."
2. Target 14.5: Conserve at least 10% of coastal and marine areas (but aim for 30 % by 2030)
[Goal 14 infographic, source: https://unstats.un.org/sdgs/report/2025/](https://unstats.un.org/sdgs/report/2025/)
- The International Coral Reef Initiative (ICRI) & Global fund for Coral Reefs.
This partnership between the ICRI incited by the United Nations and the GFCR led to 125 million USD commitment to finance mechanism dedicated to the conservation and restoration of coral reef ecosystems and the communities that depend on them. This coalition reunite more than 60 nations from across the world.

Possible solutions

- Help coral reefs recover
Grow baby corals in special species and plant them in the ocean. Protect strong corals that don't get sick easily.
- Use science to help reefs
We can give money to scientists to study coral reefs and how they change. Also, we can build warning systems to know when reefs are in danger
- Protect coral reefs from other problems
Make safe zones in the ocean where fishing and pollution are not allowed. And try to speak up about the issue and keep plastic and dirty water out of the sea

We confirmed that creating large, diverse, connected, and well-protected networks of reefs is key to facilitating adaptation and protecting these ecosystems long term

Annex

[playlist.m3u8](#)

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