Climate change

impacts on the Great Barrier Reef

Climate change and the Reef

The real sea change

Climate change is one of the greatest threats to coral reefs worldwide. More than 30 per cent of coral reefs throughout the world have already been affected and scientists fear that 60 per cent of reefs may lose many corals by 2030 due to increased coral bleaching.

The Great Barrier Reef is one of the largest and healthiest reef systems in the world and can cope with stress better than most reefs, but it is not immune to climate change.

Impacts on coral reefs – the ecosystem effect

Already, coral bleaching and other signs of coral stress are evident. But climate change affects more than corals. Seabirds, marine mammals, turtles, plankton, invertebrates, marine plants, fish and habitats such as wetlands and islands are also under threat. Because plants, animals and habitats are integrally connected, the impacts of climate change will have far reaching impacts on every part of the coral reef ecosystem.

Rising sea level

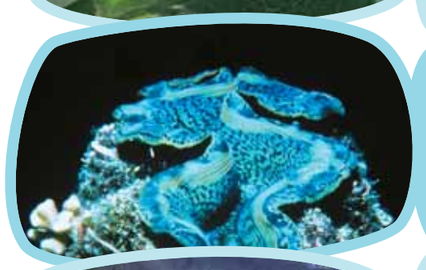
Increased sea levels elevate the risk of coastal flooding from storm surges and intensify coastal erosion. Rising seawater can flood important bird and turtle nesting sites, wetland areas, mangroves and coastal towns.

Changing ocean circulation

Ocean currents transport oxygen, nutrients and an array of marine life. These ocean conveyor belts connect reefs to each other and connect the coastline to the Great Barrier Reef. Changes in ocean circulation impact food webs and influence the productivity of the ecosystem.

Altering rainfall, drought and run-off patterns

Rain patterns are changing. Some places are drier while others receive more rain. Intense rain leads to increased erosion and floodwaters that carry sediments, nutrients and pesticides to the Reef impacting on the plants and animals that live there.



Ocean acidification

Higher levels of carbon dioxide in the atmosphere are absorbed by the oceans, affecting the chemistry of the ocean and making it more acidic. This reduces the growth rate and strength of corals and affects the limestone foundations of the Reef.

Increasing frequency of intense storms

More intense storms will magnify physical impacts on coastal areas, mangroves, seagrass beds, shallow reef habitats, islands and coral cays in the Great Barrier Reef.

Increasing sea temperature

Increases in sea temperature results in more frequent mass coral bleaching and a decrease in the overall growth of the Reef. Temperature increases will impact other marine animals such as fish, turtles and seabirds.

Degrees of change

If carbon dioxide levels continue to rise, the Great Barrier Reef could look very different. It is up to us to determine what reefs of the future will be like.

Increase in temperature: + 1 degree

CO_2 (ppm): 375

Increase in temperature: + 2 degrees

CO_2 (ppm): 450-500

Increase in temperature: > +3 degrees

CO_2 (ppm): > 500

ppm: parts per million

Printed on a waterless press using environmentally responsible print techniques and sustainable paper stocks.

Australian Government
Great Barrier Reef Marine Park Authority

REEF Beat 3