

Climate Change Fact File

Climate change is the long-term global shift in the planet's average temperatures and weather patterns



How is climate change caused?

Human activities are adding greenhouse gases like carbon dioxide, methane and nitrous oxide into the atmosphere. These gases form a kind of bubble over the earth. This atmospheric bubble traps the sun's rays and heats up the planet. Activities that increase greenhouse gases include:

- The burning of **fossil fuels** (coal, gas, and oil) for electricity, heat and transport releases large amounts of carbon dioxide into the atmosphere
- The meat industry, through the production of **methane** by livestock
- The destruction of carbon-storing **habitats** like forests and seagrass beds



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Climate change is causing a rise in both atmospheric and sea temperatures, causing many negative effects to our planet.



How does climate change affect the land?

- Increased frequency and intensity of **storms** are having devastating effects on whole communities, livelihoods, agriculture and industries across the globe
- **Wildfires** are destroying large areas of forests, killing animals and wiping out people's homes
- Increased **drought** affects many people through lack of water and severe hunger
- The change to seasonal weather systems is having negative impacts throughout the **natural world**, with plants and animals struggling to find food and reproduce.



Porthcawl, UK
© Marcus Woodbridge
via Unsplash



Wildfire devastation
© Egor Vikhrev via Unsplash



Drought conditions
© Markus Spiske via Unsplash

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How does climate change affect the ocean?



Ice melting on land in our polar regions is causing **sea levels to rise**. It is estimated that by 2050 sea levels will rise globally by one metre. Flooding caused by sea level rise will affect many coastal communities and habitats, with some low-lying islands in countries like the Maldives becoming submerged. Sea level rise also leads to increased coastal erosion, threatening UK towns like Happisburgh which is losing 2 metres of land per year



Increasing concentrations of carbon dioxide are causing a decrease in ocean pH, known as **ocean acidification**. This causes problems for animals that grow a calcium carbonate shell, like corals. Coral reefs create vitally important habitats for many other animals. Shellfish and some plankton species, which are important food sources, also have calcium carbonate shells and will be affected by ocean acidification



The ocean plays a huge role in regulating our climate and our water cycle. But rising temperatures are impacting **ocean currents** and the circulation of water around our planet, which in turn is having an impact on our climate



Climate change is causing an increase in the frequency and size of storms and **extreme weather events**. These events have devastating effects on fragile marine coastal environments, like coral reefs and seagrass beds

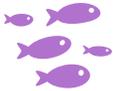


Plant and animal species are **travelling further north**, and to greater depths, to search for cooler waters. These new areas may not provide animals with the food they need or effective reproduction sites. New species moving to an area could also have a negative impact on native plants and animals through competition for resources and space



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Blue Carbon refers to carbon that is removed from the atmosphere by ocean plants and is then stored in ocean habitats and sediments.



How does the ocean help to reduce climate change?

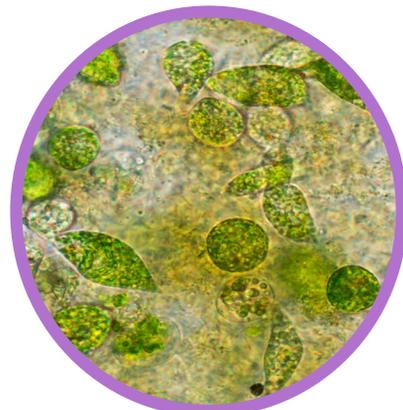
Habitats in the UK like seagrass beds and salt marshes, as well as mangrove forests in tropical waters, are brilliant at absorbing carbon dioxide from the atmosphere through photosynthesis. These habitats take up and store more carbon per metre than forests on land.

Plankton is the term for tiny algae (phytoplankton) and animals (zooplankton). Phytoplankton produce huge amounts of oxygen and absorb huge amounts of carbon dioxide through photosynthesis. Carbon is transferred up the food chain from small plankton species to larger fish species. When plankton that isn't eaten dies, their bodies sink down to the seafloor (known as marine snow), and carbon in the plankton is buried and stored in the seabed.

As **fish** move from deep waters to shallow waters to feed, they bring nutrient-rich waters from below. These nutrients enhance the production of plankton, and therefore enhance the uptake of carbon dioxide. Carbon also builds up through the food chain and is stored in the bodies of marine species. When they die, their bodies can sink to the seafloor and some of this carbon is eventually stored and buried in deep ocean sediments.



Seagrass habitat © Benjamin Jones via Unsplash



Phytoplankton © Rattiya Thongdumhyu



Horse mackerel © Peter Bardsley

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Globally, we all need to reduce carbon emissions from activities both on land and at sea.



What needs to change to reduce the effects of climate change on the ocean?



We need to increase the amount of **renewable energy** sources such as wind, wave and tidal, and decrease the extraction of fossil fuels

Marine industries like shipping, ferries and fishing need to improve their **environmental efficiency** to reduce carbon emissions



Damaging activities like dredging, coastal development or destructive fishing methods, can release carbon from sediments and destroy important blue carbon habitats. These activities need to be **managed in a climate-smart way**.



For most people, the majority of the protein in our diet comes from meat grown on land, which produces huge amounts of carbon emissions. **Sustainable fishing** practices produce much less carbon, and a shift towards a sustainable fish diet could offer positive solutions to providing protein with less carbon emissions. Protein doesn't just come from fish, but other seafood species like mussels, crabs and even seaweed, which have especially low carbon emissions



Marine protected areas are like nature reserves in the ocean, providing a great way to help protect and recover blue carbon habitats

Outreach and education helps to raise awareness amongst schools, universities, the public and businesses, and guide them on how to take action for the climate



Everybody can help to reduce the effects of climate change on the ocean. Shifting diets to eat more sustainable protein, buying second hand clothing, buying less and fixing things when they're broken, switching energy suppliers to support green energy, and decreasing electricity, heating and transport use all help reduce your own carbon emissions

We can all make positive changes to our lives to help protect the ocean and reduce climate change.