

The Ocean is Planet Earth's Life Support System



The ocean plays a fundamental role in supporting life on Earth by regulating our climate. It does this by storing and transporting huge amounts of heat, water and greenhouse gases (such as carbon dioxide). By absorbing heat as well as large amounts of carbon dioxide, the ocean lessens the effects of climate change* experienced on land. However, this comes at a cost to ocean health and therefore human health.

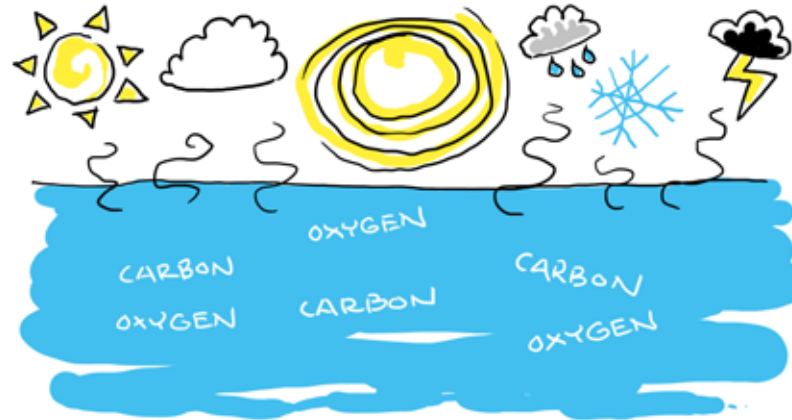
We can reduce the stress we put on the ocean and limit further climate change by decreasing our carbon footprint (a measure of environmental impact in units of carbon dioxide).

*Climate change refers to long-term changes in the Earth's climate as a result of increased concentrations of atmospheric greenhouse gases through human activities, which is warming the planet. Current impacts of climate change include sea level rise, decreasing amounts of snow and ice and changes in rainfall patterns and growing seasons as well as increased occurrences of extreme weather events.



» THE OCEAN AS CLIMATE REGULATOR & CLIMATE CHANGE BUFFER

- Ocean currents redistribute heat around the globe. For example, winters in Northwest Europe are 5°C warmer than they would otherwise be because of the Gulf Stream, an ocean current in the Atlantic that draws warm tropical water northwards. Without currents, regional temperatures would be more extreme, i.e. extremely hot at the equator and frigid toward the poles with the result that much less of Earth's land would be habitable.
- Almost all rain that falls on land comes from water evaporated from the ocean. This water helps support all life on land, and we store it to provide drinking water and irrigate crops.
- The ocean currently plays a critical role in reducing the effects of climate change by acting as a buffer. With a volume of 252 billion billion gallons of water, the ocean acts as a vast store of heat, absorbing about 90% of the additional heat as a result of global warming and about 30% of human emissions of carbon dioxide.



» CLIMATE CHANGE IMPACTS ON THE OCEAN ALSO IMPACT HUMAN HEALTH

- Changes in the distribution of marine life mean that the fish and shellfish we eat could become more abundant in some parts of the world, and less so in others, with profound impacts to commercial fisheries.
- Warming sea temperatures can lead to an increase in the growth rate of marine pathogens (disease-causing microorganisms). Within Europe, there is concern that the bacteria *V. vulnificus* and *V. parahaemolyticus*, a leading cause of seafood-associated illness, may represent an increasing clinical problem as a result of increasing water temperatures.
- The impact of changing ocean conditions on weather patterns also has consequences for food crops grown on land through changes to rainfall patterns, growing seasons and the occurrence of extreme weather events such as drought. This can lead to food shortages and increased food prices.
- Other impacts of changing ocean conditions include changes in the frequency and severity of tropical storms, which have major consequences for human wellbeing. At the coast, increases in sea level, caused by thermal expansion of sea water, and melting ice caps, could have major consequences for coastal cities through increased risk of flooding.

» CLIMATE CHANGE AFFECTS MARINE LIFE

- Increases in water temperature of just 1-2°C can cause coral reefs to become severely stressed, leading to death if thermal stress is prolonged, thereby endangering coral reef ecosystems.
- Marine species may respond to ocean warming by altering their geographic ranges. Temperature change has been linked to geographic range extension and contractions in diverse marine animal and plant species, such as seaweeds, invertebrates and fish. For example, in the Northeast Atlantic, some plankton are moving northwards at a rate of 200-250 km per decade. As a result, the distribution of fish and other animals that feed on them may also change.
- Carbon dioxide reacts with seawater to raise acidity (ocean acidification) and reduces the availability of calcium carbonate for plants and animals to make calcium-based shells, reefs and exoskeletons (outer body coverings). This could have severe consequences for many marine organisms such as coral, clams, mussels, sea urchins, barnacles, and some microscopic plankton.

» REDUCE YOUR CARBON FOOTPRINT

Travel: Use public transport, walk or cycle instead of driving. When you do need to use a car, try to car share.

At Home: Turn down the heating, use energy efficient light bulbs and take shorter showers.

At school or at work: Turn off electrical items (e.g. lights and computers) before you go home.



Find out more about initiatives you can get involved in and the everyday actions you can take by visiting the Sea Change website.

Remember
**OUR OCEAN
OUR HEALTH**

Key Information Sources and Further Reading

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The warm North Atlantic current (red) transfers warm surface waters to Europe, creating a relatively mild climate in North-west Europe. This warm, salty water eventually cools, sinks and returns southwards via deep ocean currents.

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