

Ecosystem Services Fact File



Ecosystem services

'Ecosystem services' are defined as the benefits people derive from ecosystems.

We rely heavily on the sea to provide us with food, water, oxygen, to regulate our climate, and to provide transport. It's clear that our ocean provides us with extensive economic, environmental, ecological and cultural benefits. Our seas also support thousands of jobs in numerous different industries which provide us with many of the resources we use daily.

Our actions are having devastating impacts on ecosystems on land and in the ocean. We need to increase the understanding that damaging activities not only affect biodiversity but also affect services these ecosystems provide, and therefore affect humans too. To learn more about the impact humans are having on our ocean, take a look at our [Threats to the ocean](#) resource pack.



Fishery worker
© NOAA



Seagrass habitat ©
Benjamin L. Jones

Protecting our seas will help ensure that we can continue to enjoy and benefit from them in the future. One way to reduce threats and protect an ecosystem is by establishing Marine Protected Areas (MPAs) and banning damaging activities in these areas.

It's estimated that, in Europe, for every euro invested into MPAs there could be a return of €3 due to the value of the services they provide. (1) This is one of the driving forces behind nations across the world committing to protecting 30% of the sea by 2030.

1. Marine Biodiversity objectives, European Commission, 2021

Ecosystem Services Fact File

There are three main categories of services we gain from ecosystems:

1. **Provisioning services or direct services** – including harvestable goods

Food – Millions of people around the world consume fish, making it an incredibly important food source. As the population grows, so will the demand for food, putting fish stocks at risk. The fishing industry in the UK accounts for around 12,000 jobs. (2) In 2020, UK boats landed approximately 623 tonnes of fish with a value of £831 million. (3)



Fish and chips
© Meelan Bawjee

Minerals & sediment – The ocean provides us with many valuable resources including oil, gas, sediments and minerals. Each year in the UK around 15–20 million tonnes of marine sediments are removed. (4) In 2019, 18% of marine aggregate removal was used for beach nourishment. (5)



Sandy seabed
© Martin Lopatka

Medicines – Medicines are largely derived from natural sources, many terrestrial but some from marine flora and fauna. It is thought that with the ever growing demand for new medicines marine species could provide sources for new medicines.



Some sponges and corals can be used in medicines © Richard Ling

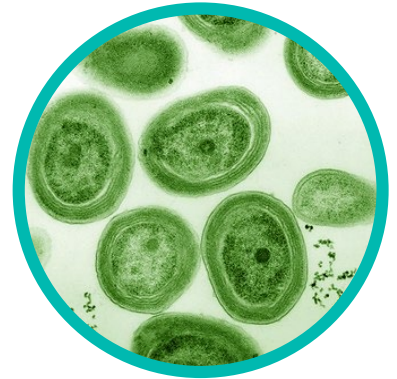
2.& 3. Fishing industry in 2020 statistics published, Marine Management Organisation 2021

4.& 5. Marine accounts, natural capital, UK, Office for National Statistics, 2021

Ecosystem Services Fact File

2. Regulating or indirect services

Oxygen – Plants, algae and even some bacteria in the ocean photosynthesise, and therefore produce oxygen. One litre of seawater can contain thousands of microscopic algae known as phytoplankton. Even smaller still is a species of cyanobacteria called *Prochlorococcus*, which is the smallest and probably most abundant photosynthetic organism on earth. *Prochlorococcus* produces around 20% of the oxygen in our atmosphere.



Prochlorococcus
© Chisholm Lab

Blue Carbon – Carbon that is removed from the atmosphere and stored by ocean ecosystems is referred to as blue carbon. Habitats found in the UK like seagrass beds, salt marshes and kelp beds, and mangrove forests found in tropical waters, are particularly good at absorbing carbon dioxide from the atmosphere through photosynthesis. These habitats absorb and store more carbon per metre than forests on land.



Kelp forest
© Natural England

Microscopic algae, called phytoplankton, also take up carbon, and this carbon is then transferred up the food chain to larger fish species. When marine animals die, and when plankton that isn't eaten dies, their bodies could sink down to the seafloor and much of the carbon stored in their bodies would eventually be stored and buried in deep ocean sediments.

Damaging activities such as dredging can release the carbon that has been sequestered over time, along with methane and nitrous oxide, having a negative impact on our climate.

Ecosystem Services Fact File

2. Regulating or indirect services (continued)

Water cycle - The ocean covers 70% of the earth's surface and holds 97% of the total water on the planet, playing a major role in the water cycle. The ocean also circulates water, nutrients and heat around the globe through ocean currents. The ocean provides water to the atmosphere as evaporated water, and due to its size, accounts for most of Earth's water evaporation.



Open ocean
© Berenice Melis

Climate - The ocean plays a major role in regulating the earth's climate. Ocean currents transport water around the globe, moving cold water from the poles and warm water from the tropics. This mixing of sea temperatures helps to regulate the climate, and helps avoid extreme climate conditions in many areas of the world. Evaporation from the sea surface also helps with the movement of heat in the atmosphere.



© Ivan Bandura

Reduce pollution - Coastal ecosystems such as seagrass beds, saltmarshes, oyster beds and mussel beds can help to reduce pollution by filtering water. One oyster can filter 180 litres of water per day! Water filtration helps to reduce the amount of land-based nutrients entering the open ocean, improving water quality in coastal areas. However, too much pollution will harm these ecosystems, and will render them unable to provide this service.



Oyster bed
© Nathan Adams

Ecosystem Services Fact File

2. Regulating or indirect services (continued)

Coastal protection – Many coastal areas are facing difficulties with erosion, and climate change is expected to lead to a rapid increase in erosion. The UK spends millions per year on manmade coastal defences, but many marine ecosystems, including kelp beds, seagrass meadows and saltmarshes act as natural coastal barriers. Though these habitats don't provide as fool proof protection as manmade defences, they still provide a valuable service in reducing wave energy. Protecting these ecosystems will therefore help to reduce the amount of money spent on manmade defences.



Saltmarsh © Doug Beckers

3. Cultural services or ethical, spiritual and aesthetic services

Our beautiful beaches and coastline across the UK attract huge numbers of tourists. Over 5.3 million residents live in coastal towns in England and Wales (6), and approximately 40% of the Scottish population live in coastal areas. (7) With so many people enjoying coastal scenery and activities, healthy seas are vital for our health and wellbeing.



Before the Covid pandemic, coastal tourism generated an incredible £17.1 billion per year in Britain, but during 2020 there was a loss of £10.23 billion. (8) Pre-Covid, coastal tourism supported 285,000 jobs in Great Britain but approximately 179,000 jobs were lost during 2020. (9)

6. Coastal towns in England and Wales: October 2020, Office for National Statistics, 2020

7. Scotland's coastal assets, The James Hutton Institute, 2016

8 & 9. Coastal tourism, National coastal tourism academy, November 2020

Ecosystem Services Fact File



Supporting services

Underpinning all other services ecosystems provide humans are the supporting services – the services that support biodiversity and maintain ocean life cycles. These services include the process of photosynthesis, primary production and nutrient cycling.



Seaweed
© Elizabeth Gomm



Container ship
© budak



Other benefits

There are several other benefits gained from the ocean that are not directly linked to ecosystems, and do not directly rely on healthy ecosystems. Some of these are:

Seabed telecommunication cabling is extremely important for the digital economy. The impact of the UK electricity subsea cables industry is around £2.8 billion per annum. (10)

Ocean transportation through both commercial shipping and ferries is a huge ocean industry. Shipping alone contributes £10 billion to the UK GDP and supports 240,000 jobs. (11)

Renewable energy in the form of wind, waves and tides. Offshore wind supplies 9.5% of the UK's electricity production. (12)

10. An Economic and Social Evaluation of the UK Subsea Cables Industry, Elliott et al 2016

11. Shipping, Maritime UK, 2021

12. Department for Business Energy & Industrial Strategy, Digest of United Kingdom Energy Statistics, DUKES, 2019