

# Goods and services factsheet



## Scientific research

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The ocean not only covers 71% of the earth but it provides critical support for life on earth, such as the hydrological cycle. To ensure we implement the most effective policies we need to understand what we are protecting. Due to human behavior the ocean faces increasing threats such as over-exploitation of marine life, pollution and rising sea temperatures. It is therefore no surprise that there is a crucial need for targeted scientific research that builds up our understanding of Earth's processes.

## Raw material

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In 2012, 93.5 million cubic metres of sand were removed from European waters. The Netherlands used approximately 63 million cubic meters. Roughly 37 million cubic meters was used to replenish the coastline and the rest was used to expand the port of Rotterdam.

## Habitats for species

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The ocean provides a range of habitats from warm, shallow, light-filled waters to deep, dark and cold areas. One example of a marine habitat is coral reefs. They cover less than 1% of the ocean, are found in warm, shallow tropical waters and support more species per unit area than any other marine environment. Another example of a marine habitat is The Deep Sea, it consists of approximately 80% of the ocean but is possibly the least understood environment on Earth, with much of it unexplored. It includes ocean found 200m deep and below.

## Climate regulation

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The surface of the ocean absorbs over half of all the heat reaching the Earth. This heat is then distributed around the world by the ocean currents. The ocean therefore, has a huge impact on weather and climate worldwide.

## STUDENT SHEET 2a

### Food

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In 2016, 171 million tons of fish were processed by the world's fisheries. These fisheries contribute to livelihoods, employment and income. The fishing industry is particularly important to coastal communities in developing countries. Recent statistics indicate that 59.6 million people are directly employed in the primary sector of capture fisheries and aquaculture. Fish and seafood are the major source of protein for over a billion people.

### Biodiversity

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The ocean covers 71% of the Earth and contains the greatest diversity of life on Earth. The ocean is vast, and some scientist have suggested that 91% of ocean species are yet to be classified and 95% of the ocean remains unexplored. There are an estimated 1,000,000 different species in the oceans. Only 250,000 species have been formally described in scientific literature.

### Recreational services

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The ocean is a popular place for recreational activities, including scuba diving, fishing, kayaking, whale watching and surfing. In Australia surfing is iconic and a huge part of the culture. It's no surprise that roughly 10% of the population surfs and surfing is estimated to have an annual economic value of AUS\$26 million.

### Coastal defence

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It is estimated 150,000km of shoreline in 100 countries and territories receive some protection from coral reefs. This saves countries billions of dollars each year, not only in the cost of coastal defence strategies and insurance costs but also avoiding loss of life and displacement.

### Transportation

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The ocean has been used as a source of transportation since The Ancient Egyptians, around 3000BC. The ocean has therefore played a key role in migration and global trade networks.

With globalization that role has increased, for example the quantity of goods carried by containers has risen from around 102 million metric tons in 1980 to 183 billion metric tons in 2017. It is estimated there are over 20 million shipping containers in the world.

### Nutrient cycling

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Nutrients are not spread out evenly across the ocean. Different ecosystems have adapted how they utilize nutrients.

Coral reefs have developed 'tight recycling' of the nutrients. For example, some algae live inside coral polyps harnessing energy from sunlight to photosynthesize. The waste produced in this process is then available for the coral polyp to utilize.

### Carbon sequestration and storage

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Ocean waters absorb carbon dioxide (CO<sub>2</sub>), the CO<sub>2</sub> changes state to hydrocarbon and can be used by corals to create their calcium carbonate skeleton. It has been estimated that over 50% of all biological carbon emissions have been absorbed by the ocean. Therefore, helping buffer the effects of climate change.

### Spiritual services

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The ocean evokes a sense of awe and wonder in many cultures across the globe. It often creates a special sense of place for people with it being referenced in many religious books. There is also research which suggests the sea can restore physical, mental and emotional well-being.