

# Observing our ocean

## WHY IS IT IMPORTANT AND WHAT CAN IT TELL US?

Over 75% of the earth's surface is ocean and it is a fundamental part of our lives, whether we live on the coast or hundreds of kilometres inland.

Monitoring and exploring the ocean is critical to how we understand and predict future changes, and how we can benefit from its resources well into the future.

We observe our ocean in many different ways: from space, from ships, and from robots. Learn more about how we monitor it and what the information can tell us.

### **PREDICT WEATHER**

People who live by the coast, or sail on the ocean, can be put in danger by severe storms, floods and droughts. Weather forecasting helps keep them safe.

### **UNDERSTAND CLIMATE CHANGE EFFECTS**

Climate change will cause rising sea levels, changes to weather, changes to plants and animals, and erosion of land.

### **USE ITS RESOURCES RESPONSIBLY**

We use the ocean for food (fish, shellfish), minerals (metals, oil, salt) and energy (wind, waves).

### **MONITOR POLLUTION**

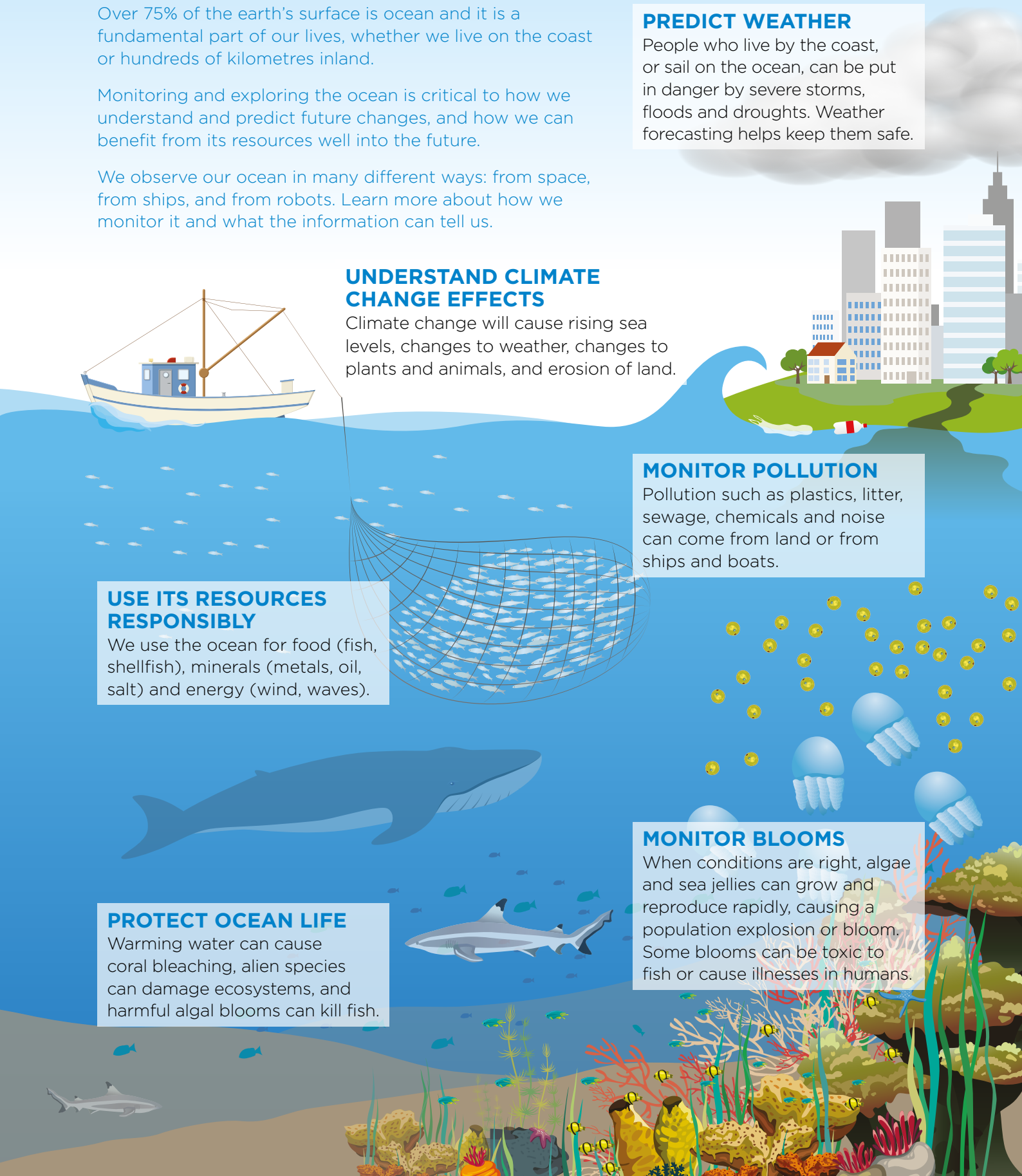
Pollution such as plastics, litter, sewage, chemicals and noise can come from land or from ships and boats.

### **PROTECT OCEAN LIFE**

Warming water can cause coral bleaching, alien species can damage ecosystems, and harmful algal blooms can kill fish.

### **MONITOR BLOOMS**

When conditions are right, algae and sea jellies can grow and reproduce rapidly, causing a population explosion or bloom. Some blooms can be toxic to fish or cause illnesses in humans.



# Types of ocean observations



## PHYSICAL PROPERTIES

Temperature  
Salinity  
Colour  
Water clarity



## CHEMISTRY

pH  
Carbon dioxide levels  
Oxygen levels



## BIOLOGY

Vertebrates  
Invertebrates  
Zooplankton  
Plants  
Phytoplankton



## ECOSYSTEMS

Coral reefs  
Mangroves  
Kelp forests  
Seagrass beds



## GEOLOGY

Ocean depth  
Ocean floor shape  
Underwater volcanoes and earthquakes



## CURRENTS AND WINDS

Wind speed  
Current speed and direction  
Wave height

## How do we observe the ocean?



### FROM SPACE

Satellites provide images of vast areas of the surface ocean. This image of the Barents Sea shows a massive algal bloom.

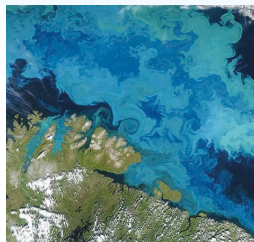


Photo: NASA Earth Observatory

### FROM SHIPS

Instruments and vehicles can be deployed from ships to collect a range of data from various depths.



Photo: CSIRO

### FROM FIXED BUOYS

Instruments attached to buoys can take measurements very often and send the information back to scientists via satellite.



Photo: SIO Ocean Time Series Group

### FROM ROBOTS

Autonomous floats and gliders can be sent out to collect vast amounts of data from the surface to 6000 metres deep.



Photo: M. Müller, GEOMAR

## GLOSSARY OF TERMS

**Algae:** Plants living in water

**Alien species:** animals or plants which are not native to an ecosystem

**Coral bleaching:**  
Expulsion of algae living in corals which causes them to turn white

**Erosion:** removal of soil and rock due to forces of water, wind or ice

**Harmful algal bloom:**  
Population explosion of a toxic algae

**Invertebrates:** animals without backbones, eg crabs, jellies, octopuses

**pH:** acidity or alkalinity of water

**Plankton:** small or microscopic plants (phyto) and animals (zoo) that float in water

**Salinity:** Saltiness of water

**Sea level rise:** Rising of the level of the sea due to melting ice and glaciers

**Toxins:** a poison which can harm humans, plants or animals

**Underwater noise:**  
Noise made by human activities such as military, industry and ships

**Vertebrates:** animals with a backbone, eg fish, whales