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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.

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.

PROTECT OCEAN LIFE

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

Types of ocean observations





PHYSICAL **PROPERTIES** Temperature Salinity

Colour

Water clarity

CHEMISTRY

pН Carbon dioxide levels Oxygen levels



BIOLOGY

Vertebrates Invertebrates Zooplankton Plants Phytoplankton

Mangroves

Kelp forests



GEOLOGY Coral reefs

Ocean depth Ocean floor shape Underwater Seagrass beds 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.





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 Serie Group

FROM ROBOTS

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



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