

# Freshwater resources

1

Freshwater accounts for only 1.8% of all water on the earth and 97% of it come from Ice sheets, glaciers and snow. Freshwater Resources supports a range of human activities from irrigation to industrial processes.

# Eutrophication

A close-up photograph showing a person's hand holding a large, bright green, slimy mass of algae or cyanobacteria. The mass is dripping with a yellowish-green liquid. The background is a dark, murky body of water with some bubbles and small green patches of algae floating on the surface.

Eutrophication is the process by which a body of water becomes enriched with minerals and nutrients, particularly nitrogen and phosphorus. It is the main cause of algal blooms which has influence on entire ecosystems, food webs and the freshwater quality.



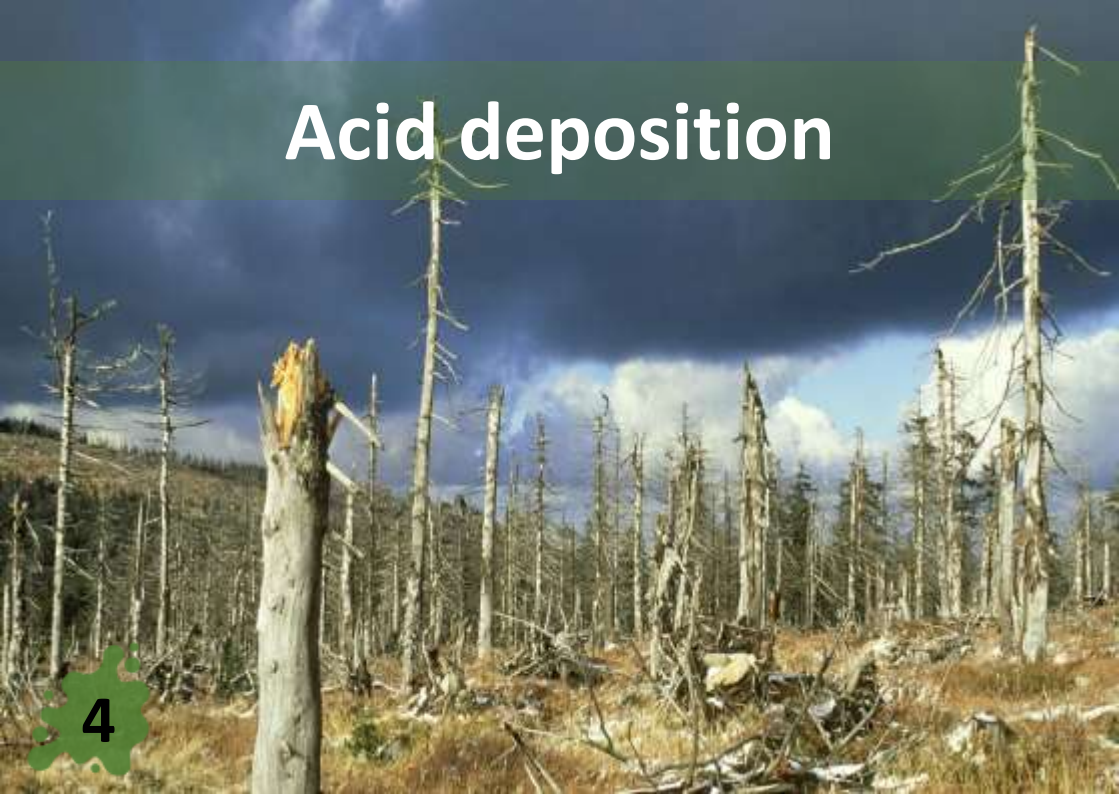
# Agriculture

An aerial photograph showing a green tractor with a long blue spray boom moving through a field of young corn plants. The tractor is positioned in the upper center of the frame, moving away from the viewer. The spray boom extends horizontally across the middle of the image, with fine mist or droplets being dispersed from nozzles along its length. The field is filled with rows of vibrant green corn seedlings, with dark brown soil visible between the rows. The perspective is from a high angle, looking down on the tractor and the field.

Increased fertilizer use required for agricultural intensification has greatly accelerated the leakage of N and P across the land-water interface.



# Acid deposition



Acid deposition includes any form of precipitation with acidic components that fall to the ground from the atmosphere in wet or dry forms. This can include rain, snow, fog, hail or even dust that is acidic.

As it flows through the soil, acidic rainwater can leach aluminum from soil clay particles and then flow into streams and lakes.



# Air pollution

5

Rotting vegetation and erupting volcanoes could release some chemicals but the biggest sources of air pollution are coal-burning power plants, factories, and automobiles.

When humans burn fossil fuels, sulfur dioxide ( $\text{SO}_2$ ) and nitrogen oxides ( $\text{NO}_x$ ) are released into the atmosphere.

# Human activity



Human activities require enough freshwater that can be drawn from rivers, lakes, groundwater stores, half of global river discharge is redistributed each year by human water use.

# Marine submersion

Marine submersion is a result of the elevation of floodwater that penetrates the inland which is controlled by the topography of the coastal land exposed to flooding.



# Sea level rise

An aerial photograph showing a coastal city with numerous high-rise buildings. The foreground and middle ground are heavily flooded, with water reaching the windows of the lower floors of the skyscrapers. In the flooded areas, many small islands of land remain, each with a few houses and palm trees. The water is a deep blue, and the sky is overcast.

Earth's radiative budget, hydrology, and atmospheric circulation has influences on ocean circulation through freshwater input.

Average sea levels have swelled over 8 inches (about 23 cm) since 1880, with about three of those inches gained in the last 25 years.

# Glacier melting

Large ice formations naturally melt a bit each summer. In the winter, snows, primarily from evaporated seawater, are generally sufficient to balance out the melting.

Persistently higher temperatures have led to greater-than-average summer melting as well as diminished snowfall that creates an imbalance between runoff and ocean evaporation.

# Energy budget



10

Energy budget is the main flows of energy into and out of the Earth system, and how these energy flows govern the climate response to a radiative forcing.



# Drought



Drought impacts streamflow, dissolved oxygen content, water quality, stream connectivity, available habitat.

Other impacts, such as changes in aquatic populations and altered biogeochemical processes are becoming evident.