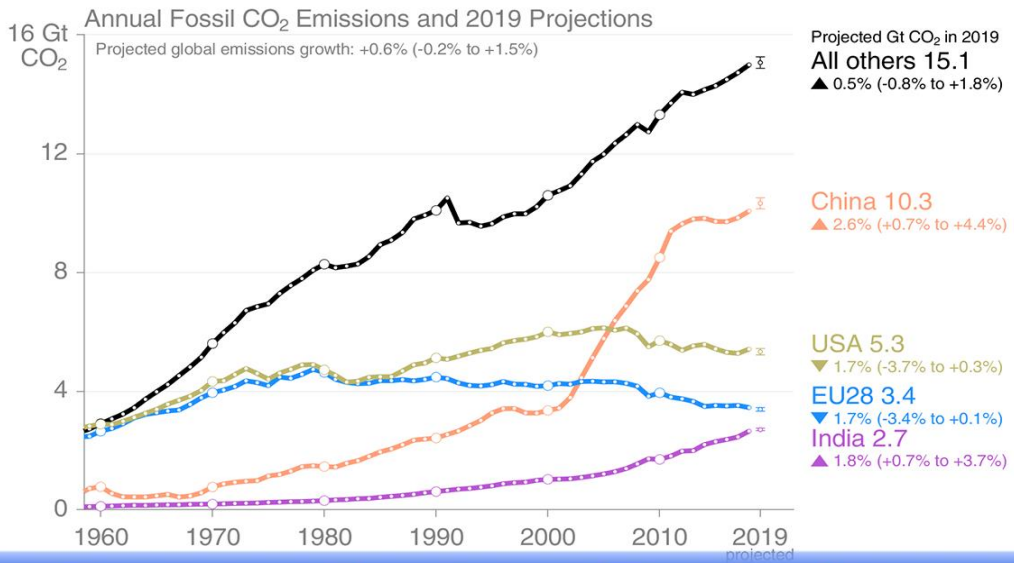


Excess Carbon Emissions

Excess Carbon Dioxide

Excessive carbon dioxide emissions, the burning of fossil fuels, burning, and other human activities release large amounts of CO2 into the atmosphere,resulting from human industrial activities, have led to an imbalance in the Earth's energy budget and contributed to global warming. The Atmosphere traps heat and causes the Earth's temperature to rise. Carbon dioxide emissions also directly contribute to further ocean acidification.

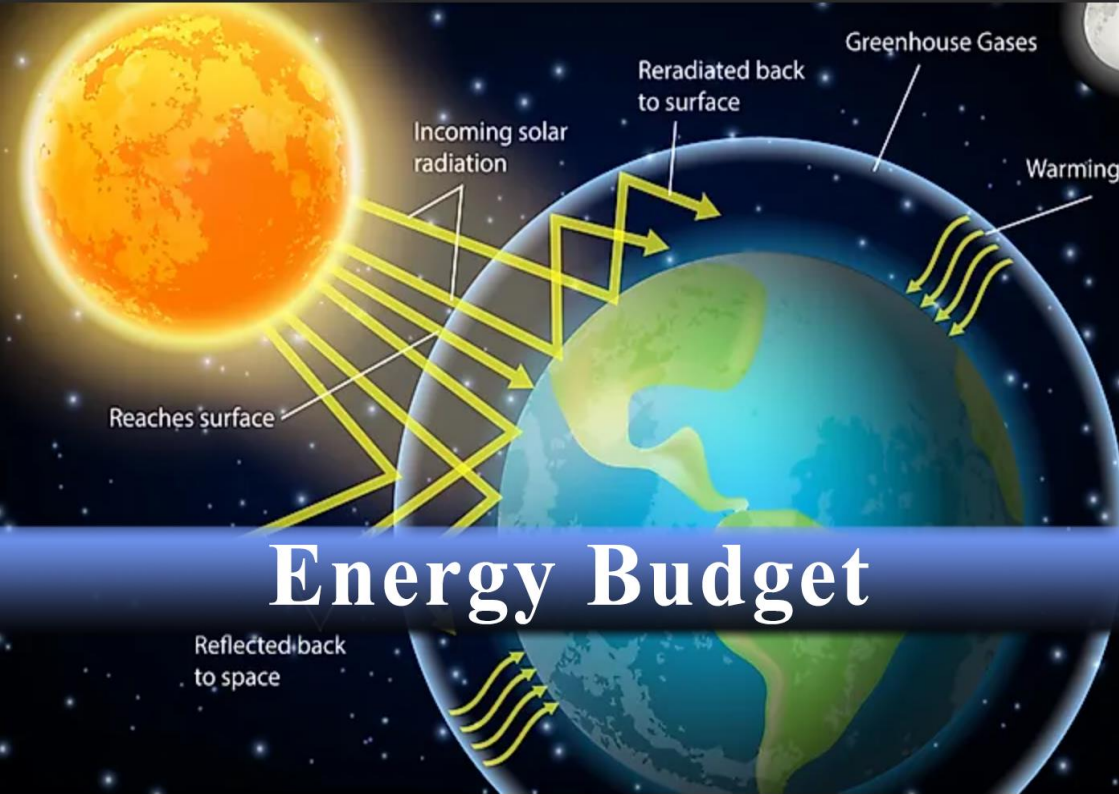
Set 1

Human Activities - Industry

Human Activities- Industry

In order to meet the ever-increasing needs of human beings, frequent activities on the earth, especially industrialization activities, have caused a large amount of carbon dioxide and other greenhouse gases to be released into the atmosphere, causing global warming, causing an imbalance in the earth's energy balance, leading to The rising temperature has caused a series of ecological problems.

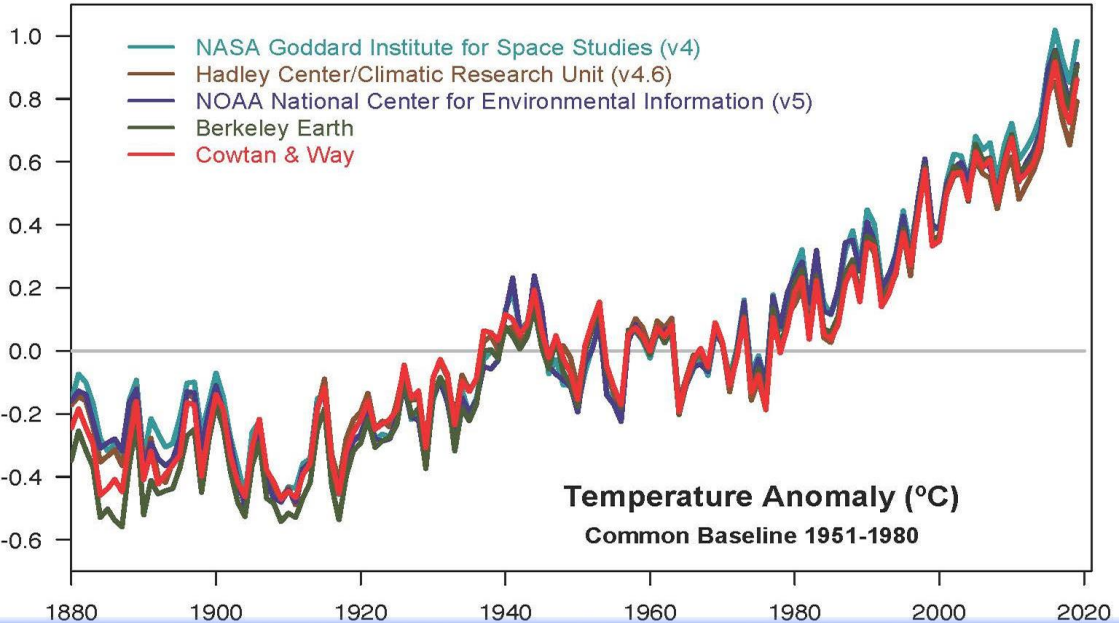
Set 1


Greenhouse Gases
Reradiated back to surface
Incoming solar radiation
Warming
Reaches surface
Energy Budget
Reflected back to space

Energy Budget

Energy budget refers to the difference between the solar energy absorbed by the Earth and the heat radiated back to space. Human activities have caused an increase in greenhouse gases in the atmosphere, leading to an imbalance in energy balance and a rise in global temperatures. Therefore, the energy balance leads to an increase in global temperature

Set 1



Global Temperature Rise

Global Temperature Rise

Global temperature rise refers to the long-term increase in the Earth's average temperature, caused by an imbalance in energy budget and excess carbon dioxide emissions resulting from human activities.

This warming directly leads to the melting of glaciers and ice caps. It is crucial to reduce carbon emissions to mitigate the effects of global warming and address climate change.

Set 1


Melting Glaciers

Melting Glaciers

The melting of glaciers is due to the increase in temperature, and the average atmospheric temperature is higher than 0℃, which leads to the melting of glaciers and ice sheets.

This melting will lead to a large amount of fresh water, some of which is supplied inland and some of which flows into the sea. In addition, the rapid melting of glaciers may also lead to tidal surges in glacial lakes, and there is a certain probability of releasing ancient viruses in permafrost.

Set 1

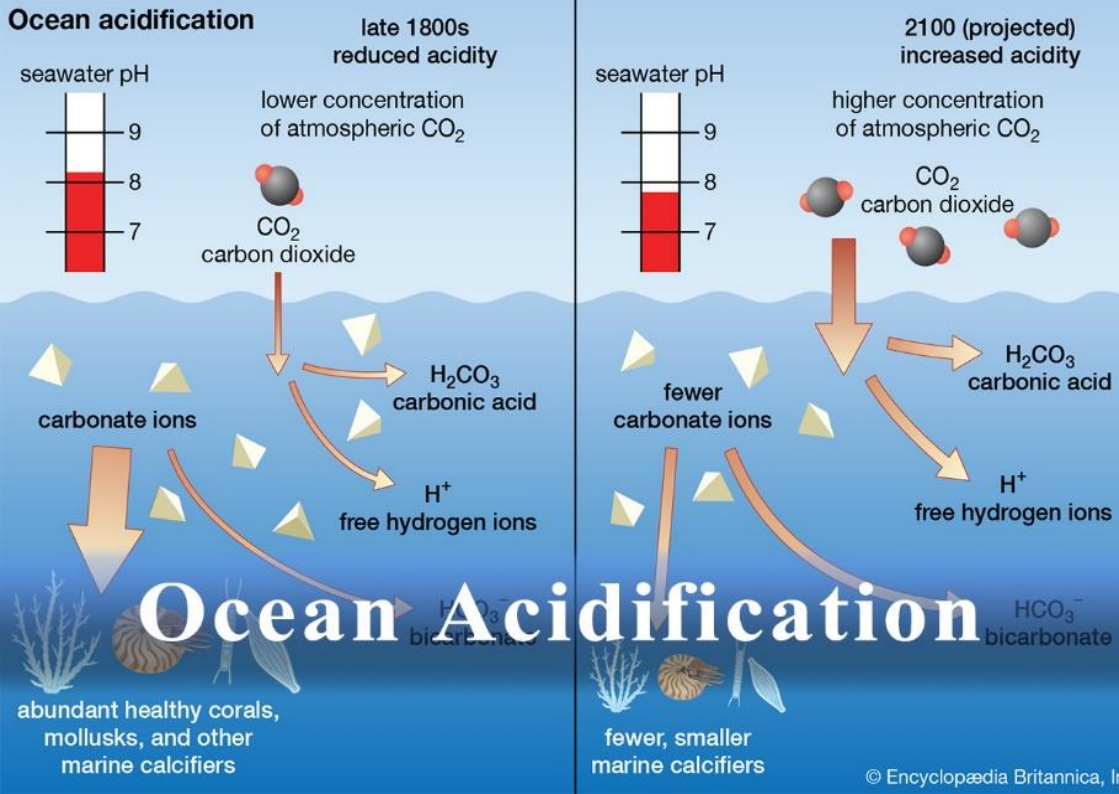

Glacial Lake Surge

Glacial Lake Surge

Glacial lake surge are formed by the accumulation of a large amount of fresh water produced by melting glaciers in the lake.

When the lake water accumulates to a certain extent, the pressure of the lake water will exceed the strength of the ice dam, resulting in a sudden gushing of large amounts of fresh water. A large amount of fresh water will flow into rivers and oceans. Although it will provide fresh water supply for some areas, due to the movement of a large amount of water and materials brought about by tides, it may cause water eutrophication, debris flow and other problems, affecting water health and water quality. sustainable use of resources. The melting of glaciers due to global warming will also lead to rising sea levels, threatening coastal cities and islands.

Set 1


Ocean acidification
late 1800s
reduced acidity
seawater pH
9
8
7
lower concentration
of atmospheric CO_2
CO_2
carbon dioxide
H_2CO_3
carbonic acid
carbonate ions
H^+
free hydrogen ions
HCO_3^-
bicarbonate
abundant healthy corals,
mollusks, and other
marine calcifiers
2100 (projected)
increased acidity
seawater pH
9
8
7
higher concentration
of atmospheric CO_2
CO_2
carbon dioxide
H_2CO_3
carbonic acid
fewer
carbonate ions
H^+
free hydrogen ions
HCO_3^-
bicarbonate
fewer, smaller
marine calcifiers
Ocean Acidification
© Encyclopædia Britannica, I

Ocean Acidification

Ocean acidification refers to the decrease in the pH value of the ocean, mainly due to the excessive emission of carbon dioxide in the atmosphere and the large amount of fresh water flowing into the ocean due to the melting of glaciers.

Even a small change in pH value will cause the death of marine organisms, cause the disorder of the marine ecosystem, and cause a series of ecological problems.

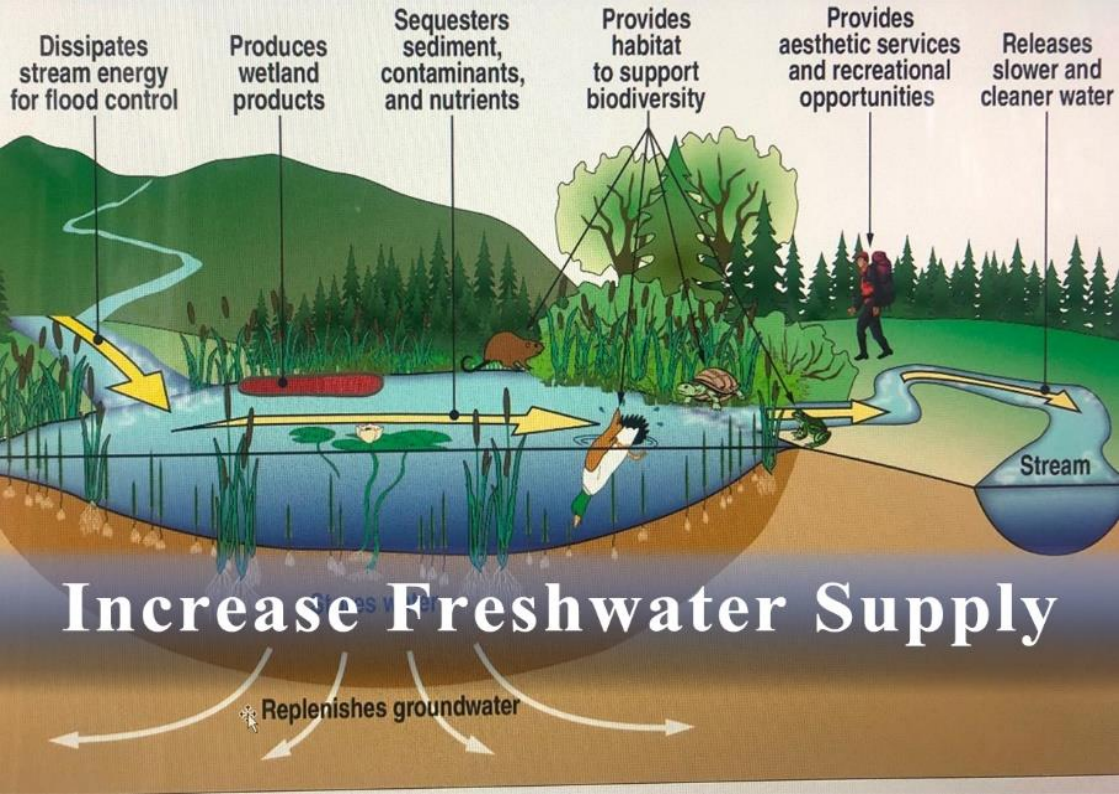
Set 1


Archaea Virus Release

Archaea Virus Release

The melting of glaciers may cause frozen ancient organisms to be released into the environment. With the acceleration of glacial melting, some ancient organisms that have been frozen for a long time, such as viruses, bacteria, and fungi, may be released. Human health poses a great threat.

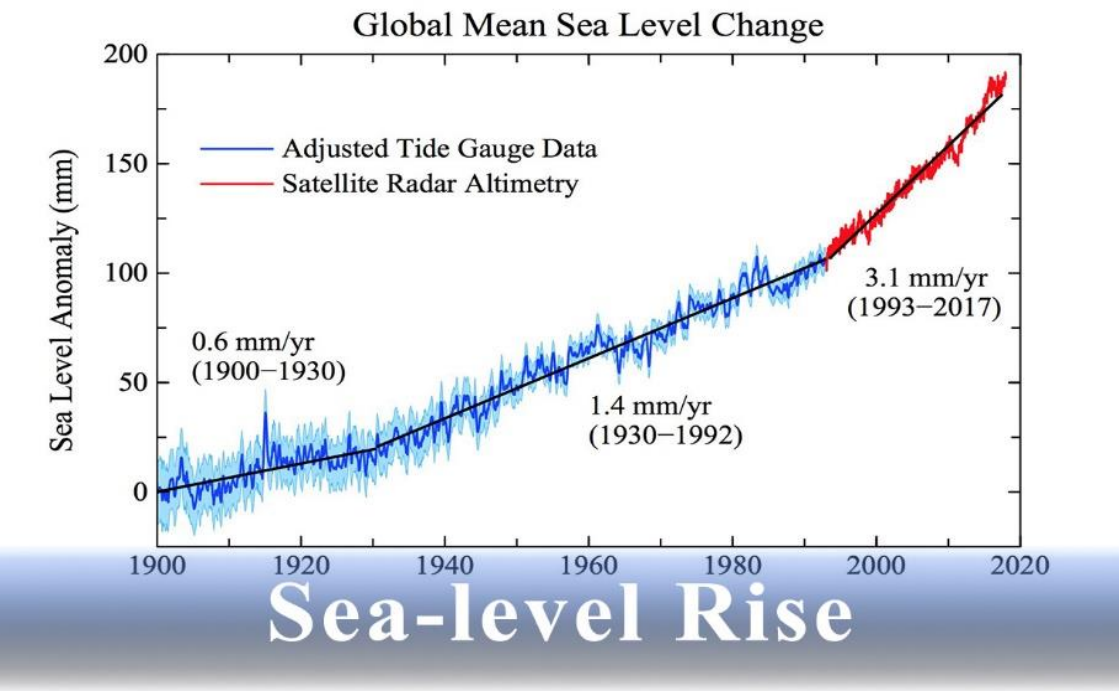
Set 2


Dissipates stream energy for flood control
Produces wetland products
Sequesters sediment, contaminants, and nutrients
Provides habitat to support biodiversity
Provides aesthetic services and recreational opportunities
Releases slower and cleaner water
Stream
Increase Freshwater Supply
Replenishes groundwater

Increase Freshwater Supply

When fresh water flows into the inland or ocean, part of it enters the groundwater, and part of it flows into the urban water system. These water resources bring recharge to the city and greatly relieve the pressure on water-scarce areas.

Set 2

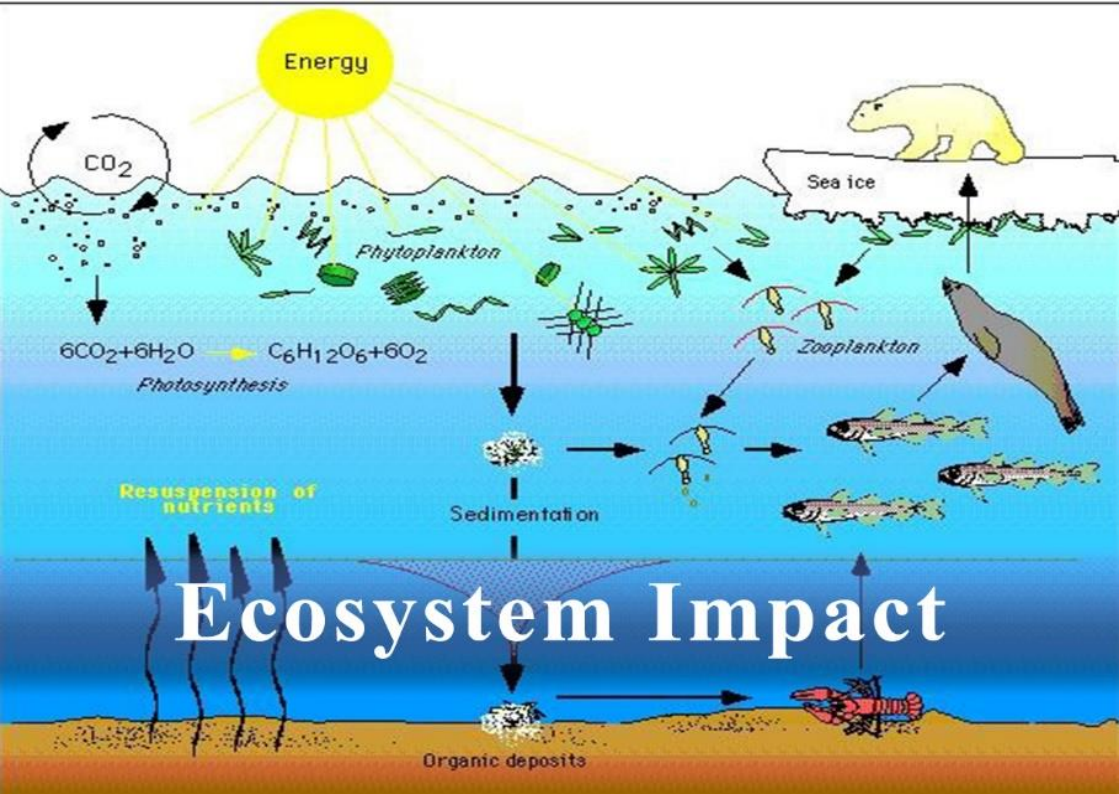


Sea-level Rise

Sea-level Rise

Sea-level rise refers to the gradual increase in the height of the ocean surface over time, primarily caused by melting glaciers and thermal expansion due to global warming. According to data from 1900 to 2020, sea levels have risen by an average of 1.8 mm/year, with an acceleration in the last few decades (3.1mm/year). This rise in sea levels can lead to an increased frequency and severity of coastal flooding and storm surges, threatening human settlements and infrastructure.

Set 2


Energy
CO_2
Sea ice
Phytoplankton
$6CO_2+6H_2O \rightarrow C_6H_{12}O_6+6O_2$
Photosynthesis
Zooplankton
Resuspension of nutrients
Sedimentation
Ecosystem Impact
Organic deposits

Ecosystem Impact

Ocean acidification has led to a surge of carbonate ions in seawater. At the same time, eutrophication of the water body has covered the surface and reduced oxygen levels.

They have both affected the balance and diversity of the marine ecosystem, resulting in damage to marine organisms such as coral reefs, decreased plankton, fishery resources decline, and even affect the ocean's carbon cycle and climate change. These impacts could lead to the migration or extinction of organisms, causing catastrophic effects

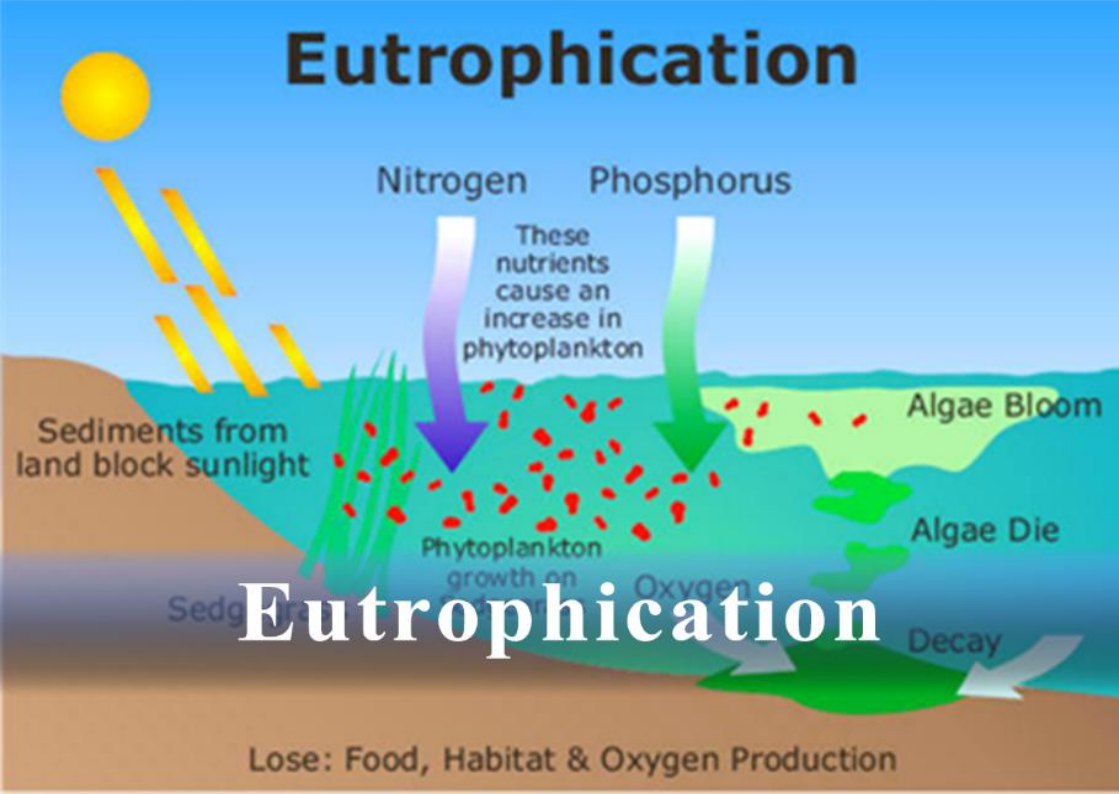
Set 2


Flash Flood

Flash Flood

Flash flood refers to severe floods caused by rising ocean water levels or excessive rainfall due to natural factors. Rising sea levels increase the inundation of coastlines, making flooding more frequent and severe, forcing humans to move to safer areas.

Set 3



Eutrophication

Eutrophication

Eutrophication refers to the fact that the water body is rich in nutrients (such as nitrogen, phosphorus, etc.), leading to excessive growth and death of aquatic organisms, which in turn leads to the water body being rich in organic matter and eutrophication. Its cause is not only the pollution caused by human activities, but also the water body rich in complex nutrients brought by the tidal surge of the glacial lake.

This situation will cause changes in the chemical composition of the water body, resulting in ecological problems such as hypoxia and water toxicity, which will seriously affect the balance of the ecosystem and biodiversity.

Set 3

Landslides & Mudslides

Landslides & Mudslides

Landslides and mudslides are natural disasters, which refer to the loose collapse of soil and rocks accompanied by a large amount of water and soil loss. The tide of glacial lakes will increase the flow of water bodies, which will lead to the loss of stability of mountain soil and increase the risk of landslides and mudslides.

These disasters can threaten humans and other living things and force people to relocate to other areas.

Set 3


Loss of habitat

Loss of Habitat

The living environment of animals, such as habitats and food sources, is easily affected by the ecosystem.

The disorder of the ecosystem will bring about various natural environmental disasters, which may cause them to migrate or find new habitats, or even become displaced until unnatural death.

Set 3


FLOODWAY
Migration
de Villiers

Migration

Animals migrate due to ecosystem disturbances, usually because their original habitat is no longer suitable for the conditions they need to survive or reproduce. For example, some animals may be forced to relocate because of poor water quality in their living environment, less food or less habitat.

This migration can cause them to face new challenges to survival, such as competing with other species or facing new predators. Thus, disturbances in the ecosystem not only affect the animals themselves, but also negatively affect the entire biosphere.

Set 3


Marine Life Death

Marine Life Death

The death of marine life is due to a variety of factors, including overfishing, ocean pollution, climate change and ocean acidification, among others. Among them, ocean acidification and water eutrophication are one of the main reasons, which have led to the destruction of marine habitats, and many species are facing the threat of extinction.

The remains of life bodies deposited on the bottom of the water, may also indirectly contribute to sea-level rise.

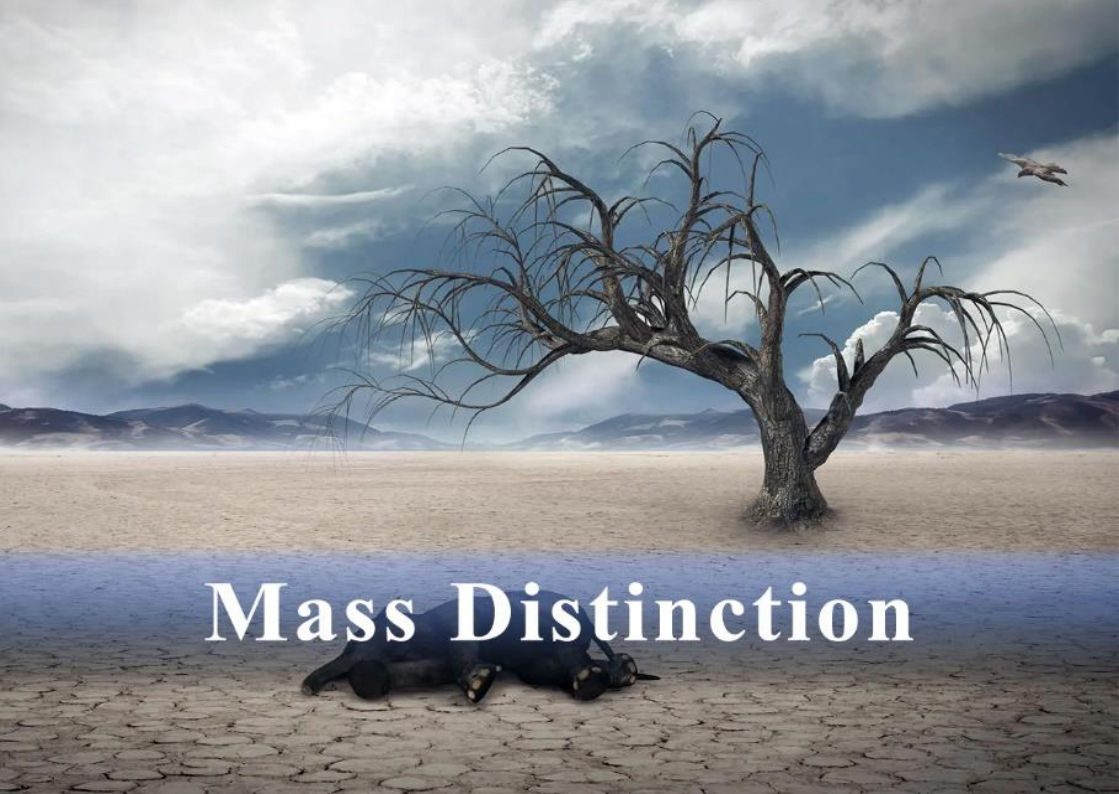
Set 2


Human Displacement

Human Displacement

Human displacement is often due to natural disasters such as landslides, mudslides, floods, and other environmental events. These natural disasters can cause damage to homes, infrastructure, and agriculture, leading to the dis placement of people and forcing them to seek refuge in other areas.

Set 3


Mass Distinction

Mass Distinction

Mass extinction refers to the complete disappearance of a large number of organisms in nature. The disorder of the ecosystem, including factors such as climate change and human activities, will affect the survival and reproduction of organisms. This can cause some animals to lose their original habitat, forcing them to flee or die, eventually leading to extinction.

For example, rising sea levels due to global warming and melting glaciers could destroy beaches and coastal habitats, threatening the survival of marine animals.

Set 3