

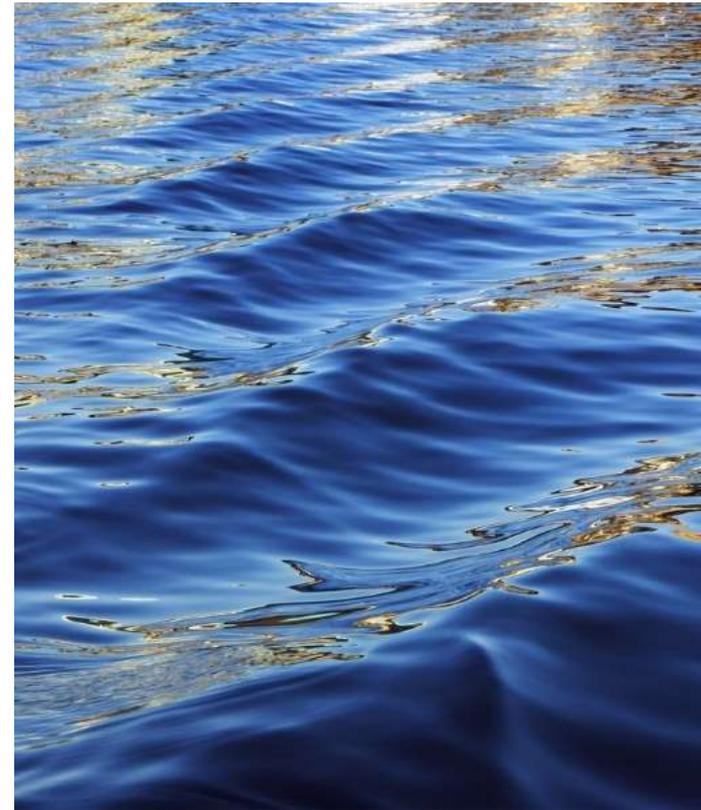
# Environmental Issues

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# • Major Environmental Issues

- 1. Decreasing Resources
- 2. Pollution in the Atmosphere
- 3. Global Warming
- 4. The Problem of Clean Water Supply
- 5. Waste and Waste Disposal
- 6. Accumulation in the Ocean
- 7. Deforestation and Erosion



# Decreasing Resources

- Natural resources are anything that we obtain from the Earth's physical environment. Some such as soils, water and vegetation are renewable: if properly cared for, they will last forever. But others material resources such as fossil fuels (coal, gas, and oil) and metal and mineral ores – are nonrenewable: once supplies are used up, they cannot be replaced.



# Population and Consumption

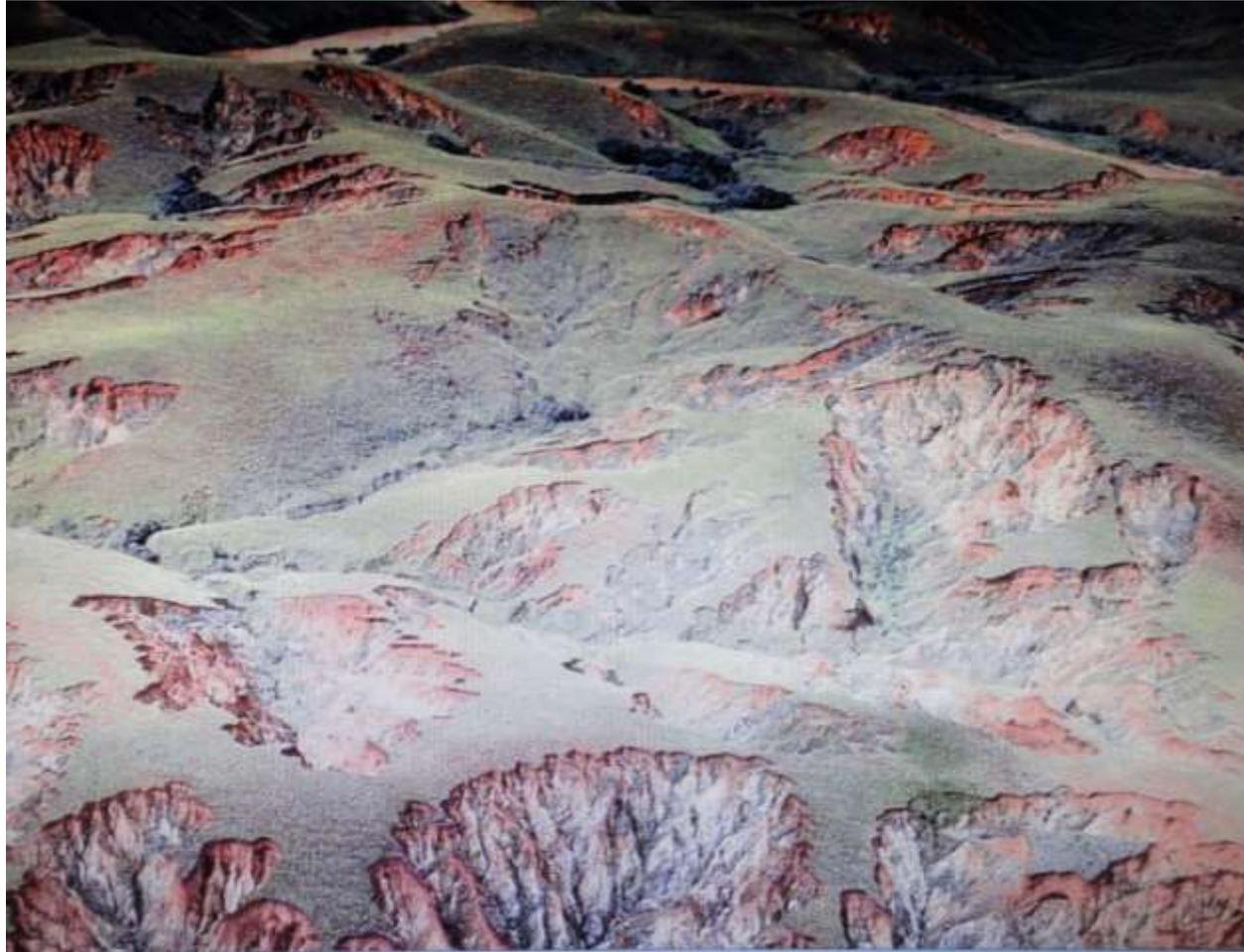
- Driven by unprecedented growth in human numbers and wasteful consumption, many of the basic resources upon which future generations will depend for their survival are being depleted.
- The Earth's resources are quickly being used up, and a billion people are already underfed or starving.



Forests are much more than trees - they are an entire ecosystem unto themselves. They are composed of trees, herbs, fungi, micro-organisms, animals, soils, and numerous plant species. All these interact to influence everything from the availability of freshwater to a region's climate.



Madagascar's once forested species-rich central plateau have been devastated by erosion and gullying the result of extensive deforestation.



# Pollution in the Atmosphere

- The atmosphere acts as a system for recycling carbon, nitrogen, oxygen and hydrogen, which are constituents of all living matter on Earth.
- About 99 per cent of the atmosphere is made of nitrogen and oxygen. Living things convert these elements into sources of carbohydrates and proteins for nourishment.



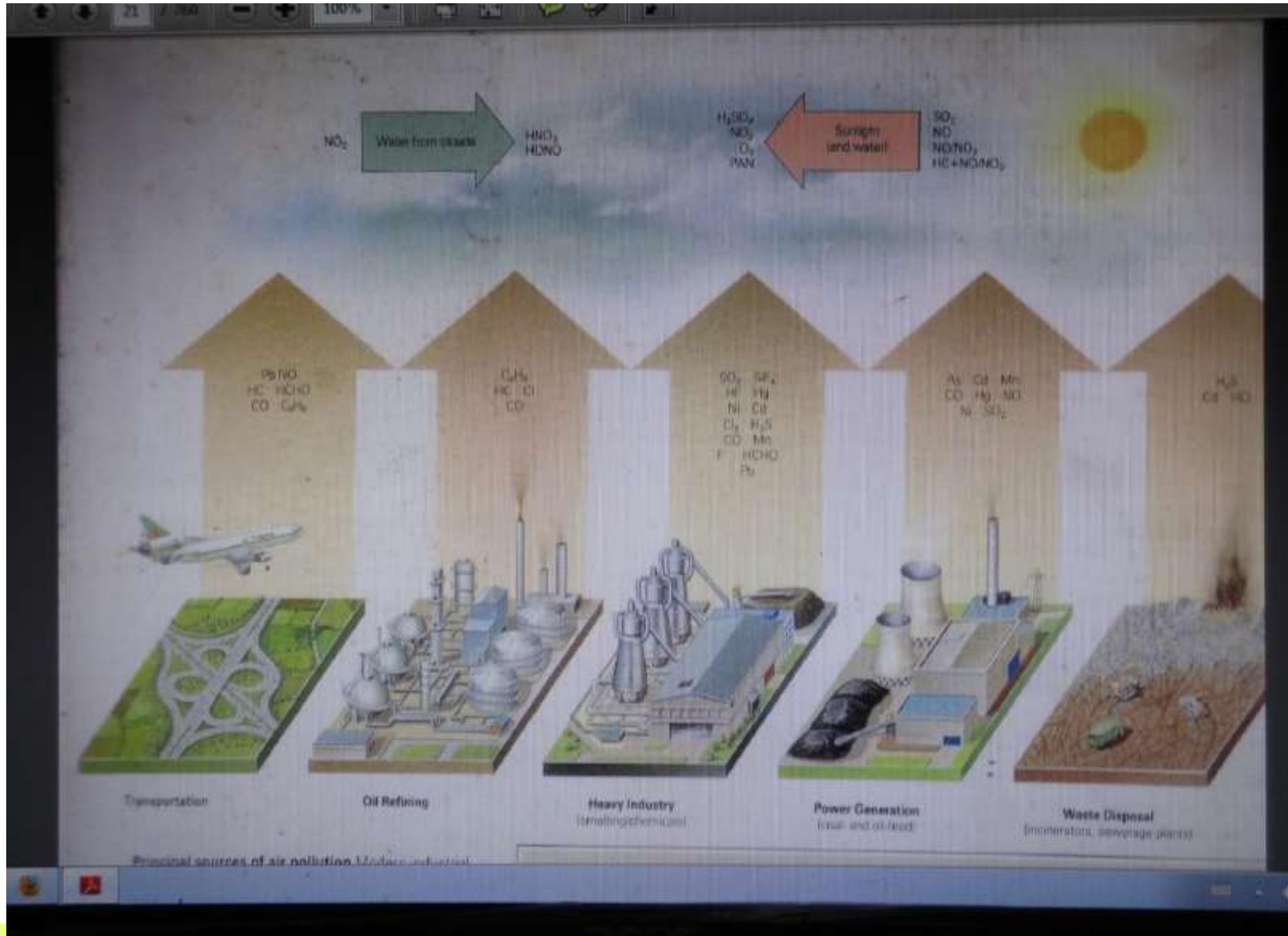
- Our atmosphere also protects us from the threats of meteorites, which for the most part burn up as they go through the atmosphere, and from invisible threats like harmful radiation.
- The air we breath is our basic life support system; we depend on it every minute of our life. Air normally consists of 78% oxygen, 21% nitrogen and 1% of assorted other gases. What we require the air is oxygen.



- Air pollution comes in many forms, but four are particularly threatening: sulphur oxides, emitted mainly by power stations and industry; nitrogen oxides, emitted by power stations, industry and vehicles; carbon monoxide, emitted by vehicles; and soot and dust, known technically as suspended particulate matter (SPM)
- Industrialized countries produce most of the first three; and developing countries, which use coal, wood and charcoal for fuel, produce the most SPM.



# Principal Sources of Air Pollution



# Power Plants are Main Cause of Air Pollution





# Motor Vehicles are Threatening Air Pollution in Unban Areas



# Congested Traffic Cause Air Pollution in Downtown Areas



# Poor Air Quality in Beijing in China



# Smog Causing Poor Visibility in Some Towns in China



eters





# Acid Rain

- When industrial and motor vehicle pollutants, mainly sulfur dioxide, nitrogen oxide and hydrocarbons, react with sunlight and water vapor in the atmosphere they produce sulfuric and nitric acids.
- These substances then fall to Earth as rain and snow. Acid rain has far reaching, damaging effects.
- It raises the acid levels in lakes and rivers, killing fish and other aquatic life. It reduces soil fertility and release heavy metals such as aluminum, copper and cadmium into the soil.



# Industrial Pollutants Cause Acid Rain



# Major Source of Acid Rain



# Global Warming

- Energy from the sun is absorbed by the Earth as heat and then radiated back again. Most of the heat given off by the Earth is prevented from escaping into space by carbon dioxide and methane in the lower atmosphere.
- When forests are cleared and burned for cultivation and fossil fuel are burned for energy vast amounts of carbon dioxide, carbon monoxide and methane are given off

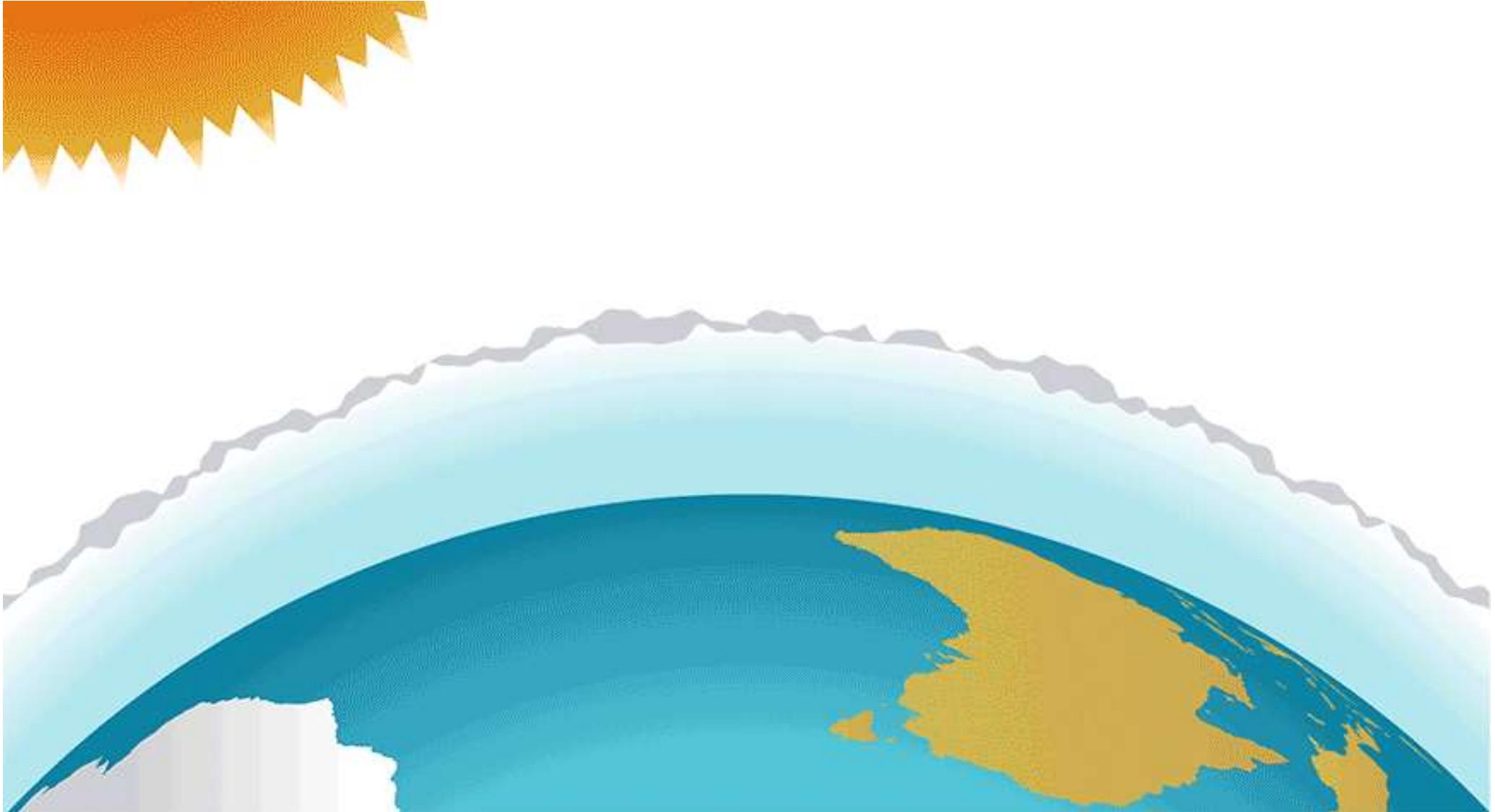


# Greenhouse Effect

- Carbon dioxide, water vapor, and other gases in the Earth's atmosphere act like the window of a greenhouse. Sunlight shines through the atmosphere, warming the planet. Most of that heat is then radiated back into space. But the greenhouse gases trap some of that heat and prevent it from leaving the atmosphere. So the Earth gradually becomes warmer.



# greenhouse effect



- If it were not for greenhouse gases trapping heat in the atmosphere, the Earth would be a very cold place. Greenhouse gases keep the Earth warm through a process called the greenhouse effect.
- The Earth gets energy from the sun in the form of sunlight. The Earth's surface absorbs some of this energy and heats up. That's why the surface of a road can feel hot even after the sun has gone down—because it has absorbed a lot of energy from the sun. The Earth cools down by giving off a different form of energy, called infrared radiation. But before all this radiation can escape to outer space, greenhouse gases in the atmosphere absorb some of it, which makes the atmosphere warmer. As the atmosphere gets warmer, it makes the Earth's surface warmer, too.
- <http://www.epa.gov/climatestudents/basics/today/greenhouse-effect.html#>

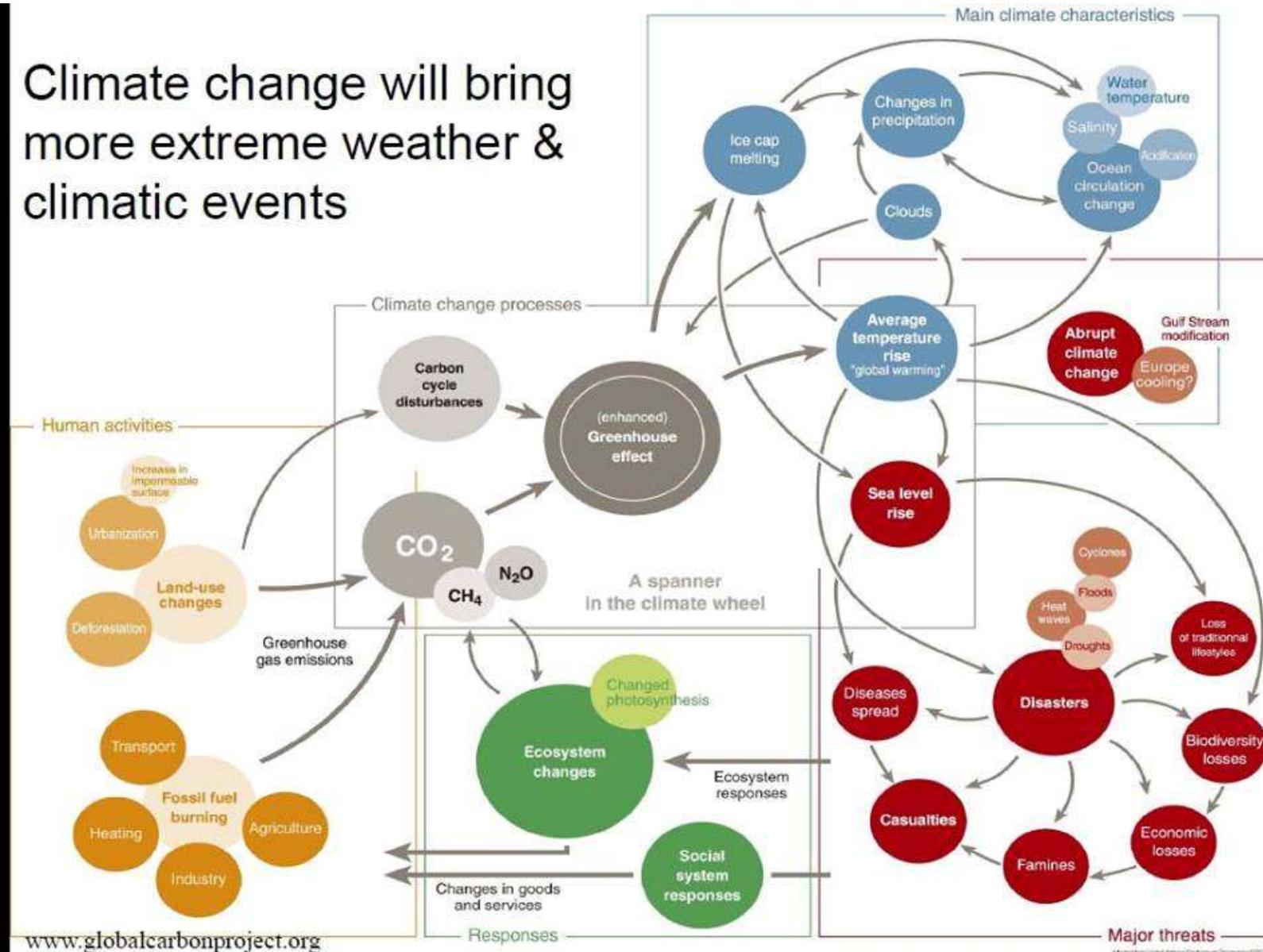


# Effects of Global Warming

- If the climate warms by only a few more degrees, there will be big environmental changes on our planet. Sea level will rise, flooding coastal cities. There could be more tropical storms and hurricanes. Areas that had enough rainfall could become deserts, while some dry areas might become lush fertile. And there would be big changes in living conditions for humans, plants, and animals.



# Climate change will bring more extreme weather & climatic events



The current and future consequences of global change

The potential future effects of global climate change include more frequent wildfires, longer periods of drought in some regions and an increase in the number, duration and intensity of tropical storms.



# Due to Global Warming Sea Level will Rise, Flooding Coastal Areas

**Most likely to disappear beneath the waves – Maldives**

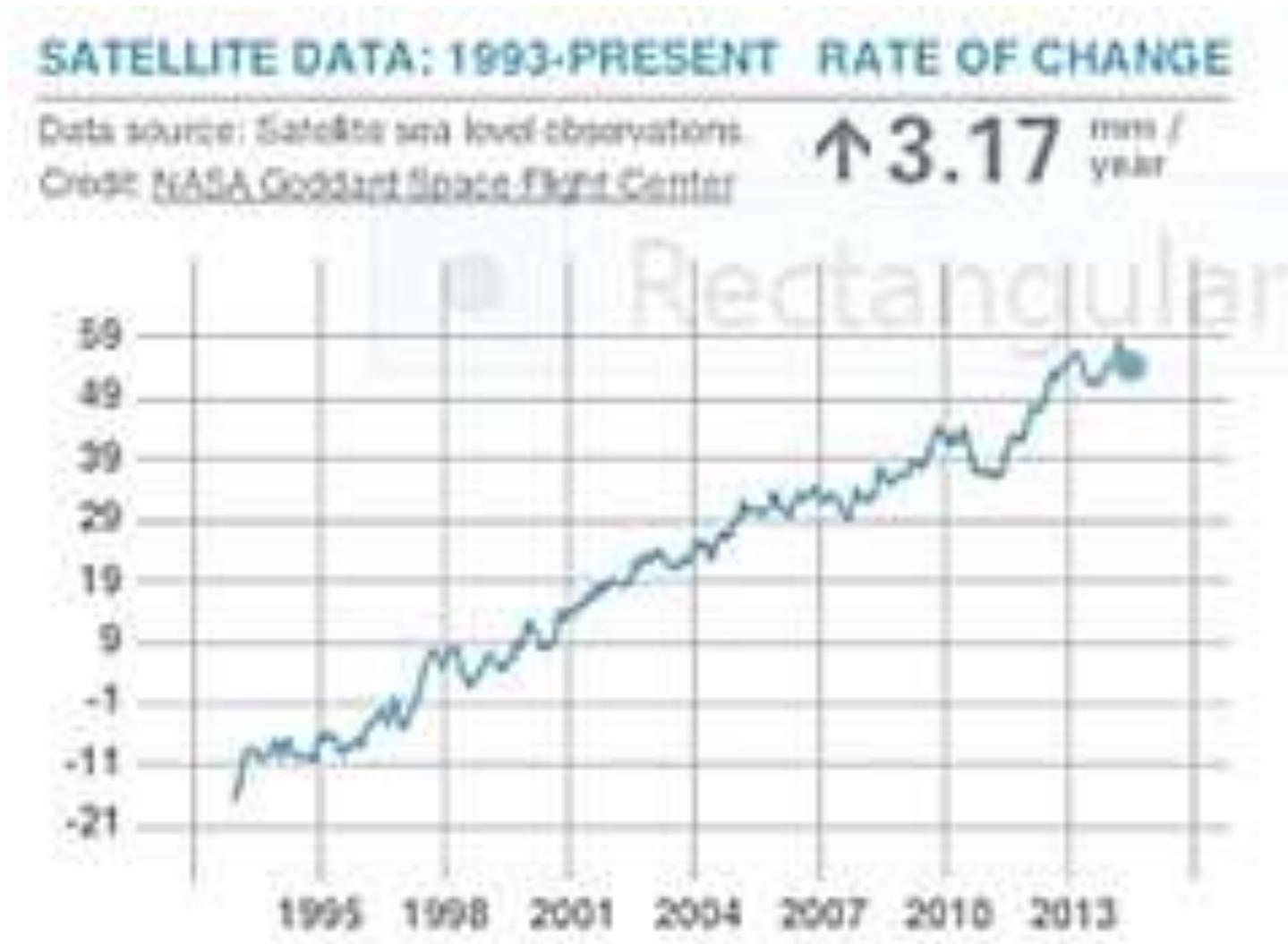


With all the talks of global warming and rising sea levels, it is the residents of the Maldives that have the greatest reason to fear. With an average height of around 1.8 meters above sea level their nation is the lowest on Earth.



## Sea level rise

Global sea level rose about 17 centimeters (6.7 inches) in the last century. The rate in the last decade, however, is nearly double that of the last century.<sup>4</sup>



# There Could be More Tropical Storms and Floods Everywhere



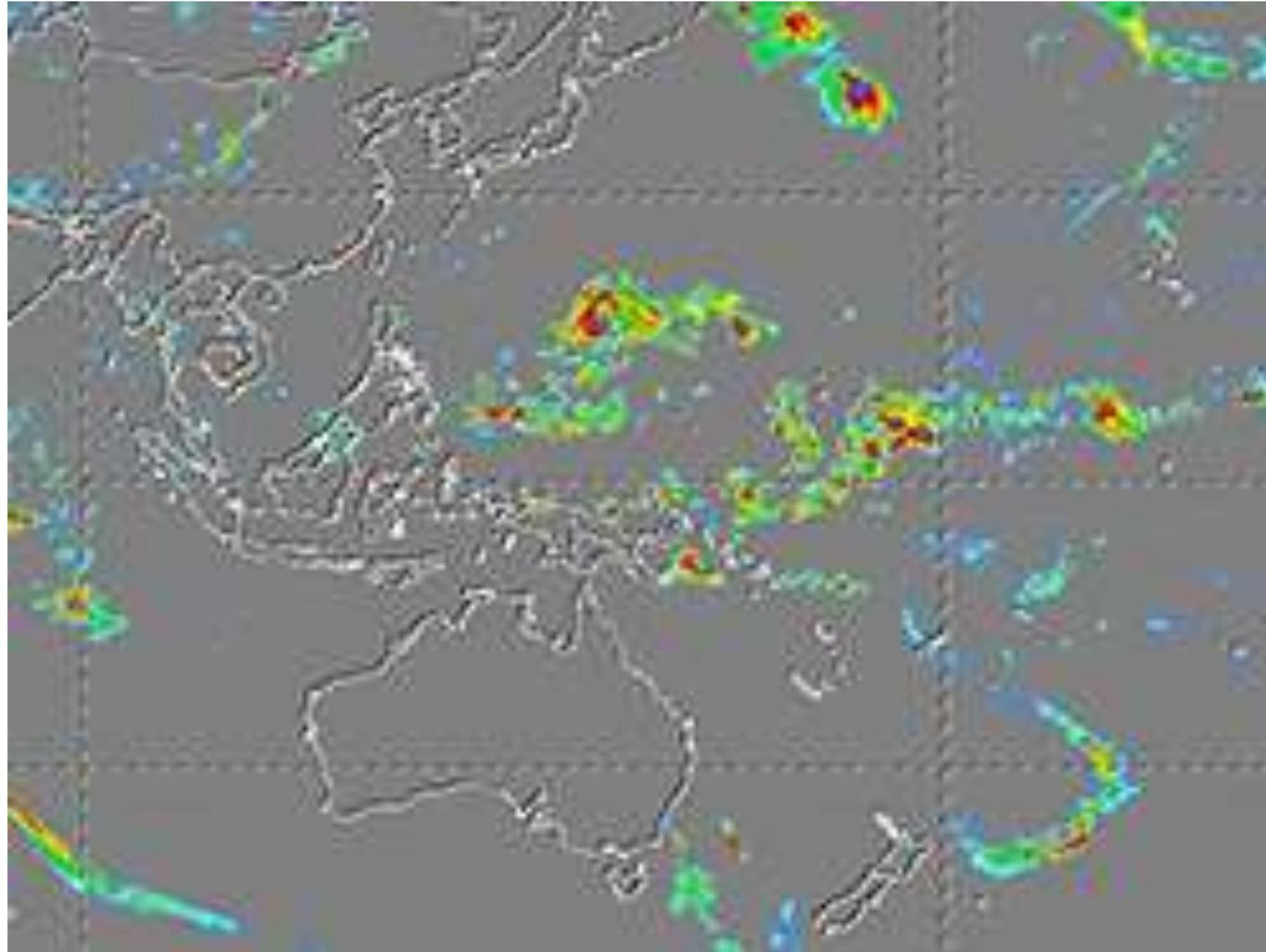
## Extreme events

The number of record high temperature events in the United States has been increasing, while the number of record low temperature events has been decreasing, since 1950. The U.S. has also witnessed increasing numbers of intense rainfall events.<sup>11</sup>



## Precipitation Measurement Missions

The official website for NASA's fleet of Earth science missions that study rainfall and other types precipitation around the globe.







AFP





AFP / GETTY IMAGES



# Retention of the flooded rainwater in urban areas



## NATURAL SYSTEM BENEFITS

- ✓ Provide Habitat
- ✓ Slowly Release Storm Flow
- ✓ Filter Pollutants
- ✓ Recharge Groundwater
- ✓ Reduce Erosion



# Retention of the flooded rainwater in urban areas



## Ocean acidification

Since the beginning of the Industrial Revolution, the acidity of surface ocean waters has increased by about 30 percent.<sup>12,13</sup> This increase is the result of humans emitting more carbon dioxide into the atmosphere and hence more being absorbed into the oceans. The amount of carbon dioxide absorbed by the upper layer of the oceans is increasing by about 2 billion tons per year.



How does climate change affect coral reefs?

Article about how global warming leads to coral bleaching and changes ocean chemistry, leading to acidification.



## Warming oceans

The oceans have absorbed much of this increased heat, with the top 700 meters (about 2,300 feet) of ocean showing warming of 0.302 degrees Fahrenheit since 1969.8



Warming ocean causing most Antarctic ice shelf mass loss

Ocean waters melting the undersides of Antarctic ice shelves are responsible for most of the continent's ice shelf mass loss, a new study by NASA and university researchers has found.



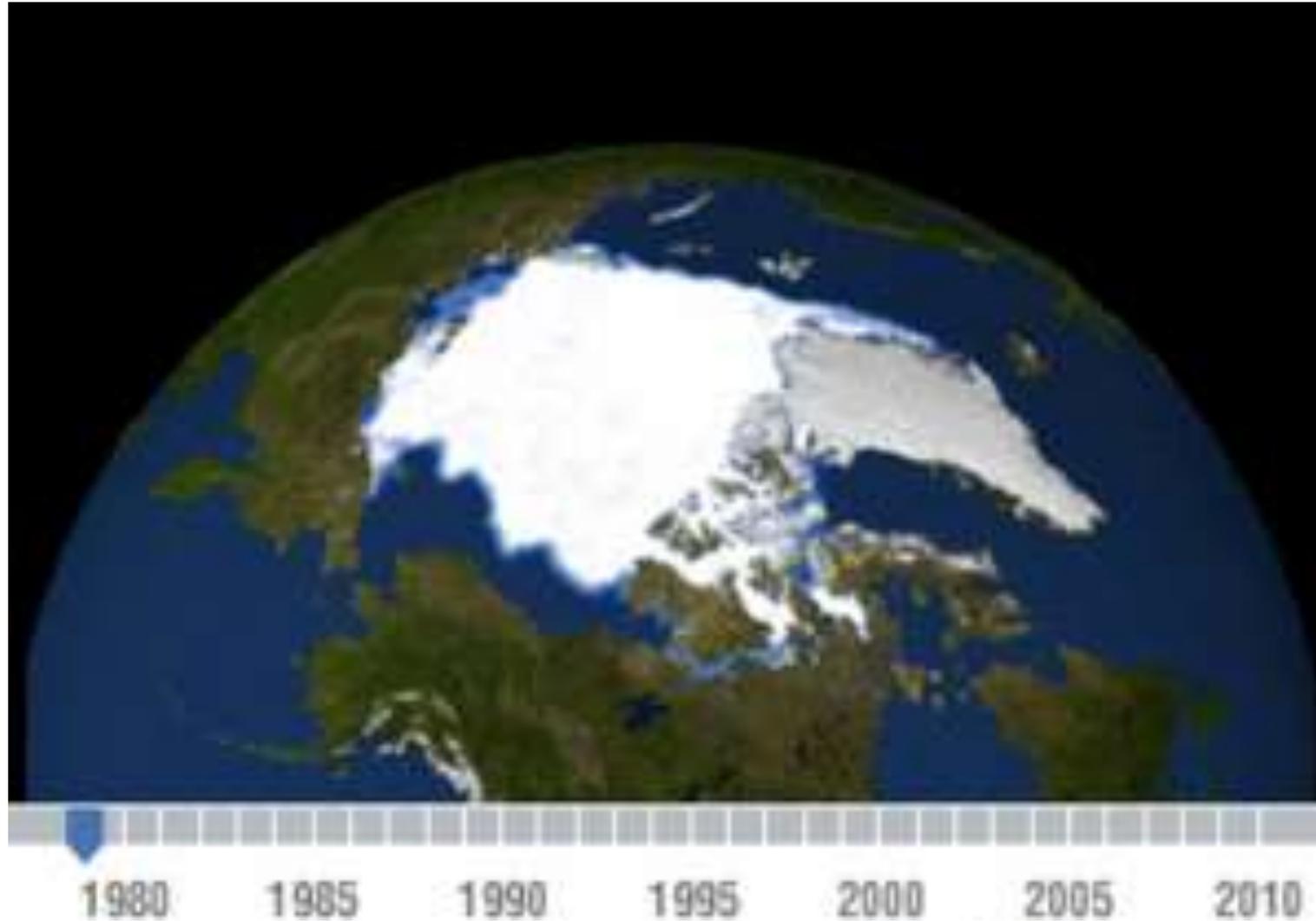
## Shrinking ice sheets

The Greenland and Antarctic ice sheets have decreased in mass. Data from NASA's Gravity Recovery and Climate Experiment show Greenland lost 150 to 250 cubic kilometers (36 to 60 cubic miles) of ice per year between 2002 and 2006, while Antarctica lost about 152 cubic kilometers (36 cubic miles) of ice between 2002 and 2005.



## Declining Arctic sea ice

Both the extent and thickness of Arctic sea ice has declined rapidly over the last several decades.



Areas that had enough rainfall could become deserts









## Drought, Arizona and Utah

Prolonged drought coupled with water withdrawals have caused a dramatic drop in Lake Powell's water level. These images show the northern part of the lake, which is actually a deep, narrow, meandering reservoir that extends from Arizona upstream into southern Utah. The 1999 image shows water levels near full capacity. By May 2014, the lake had dropped to 42 percent of capacity



# Some Dry Areas Might Become Lush Fertile



There would be big changes in living conditions for humans, plants, and animals



The number of people affected by river flooding worldwide could nearly triple in the next 15 years, analysis shows.



# Ozone Layer Depletion

- The ozone layer is a region of the stratosphere that contains high concentrations of ozone gas. It protects the Earth from harmful ultraviolet (UV) radiation, particularly the UV-B radiation that can cause sunburn, skin cancer and eye cataracts. Ozone is destroyed by chlorofluorocarbons (CFCs) released into the atmosphere from refrigerator coolants, aerosol sprays and plastic foams. Nitrogen oxides from the exhaust of jet engines also destroy ozone.

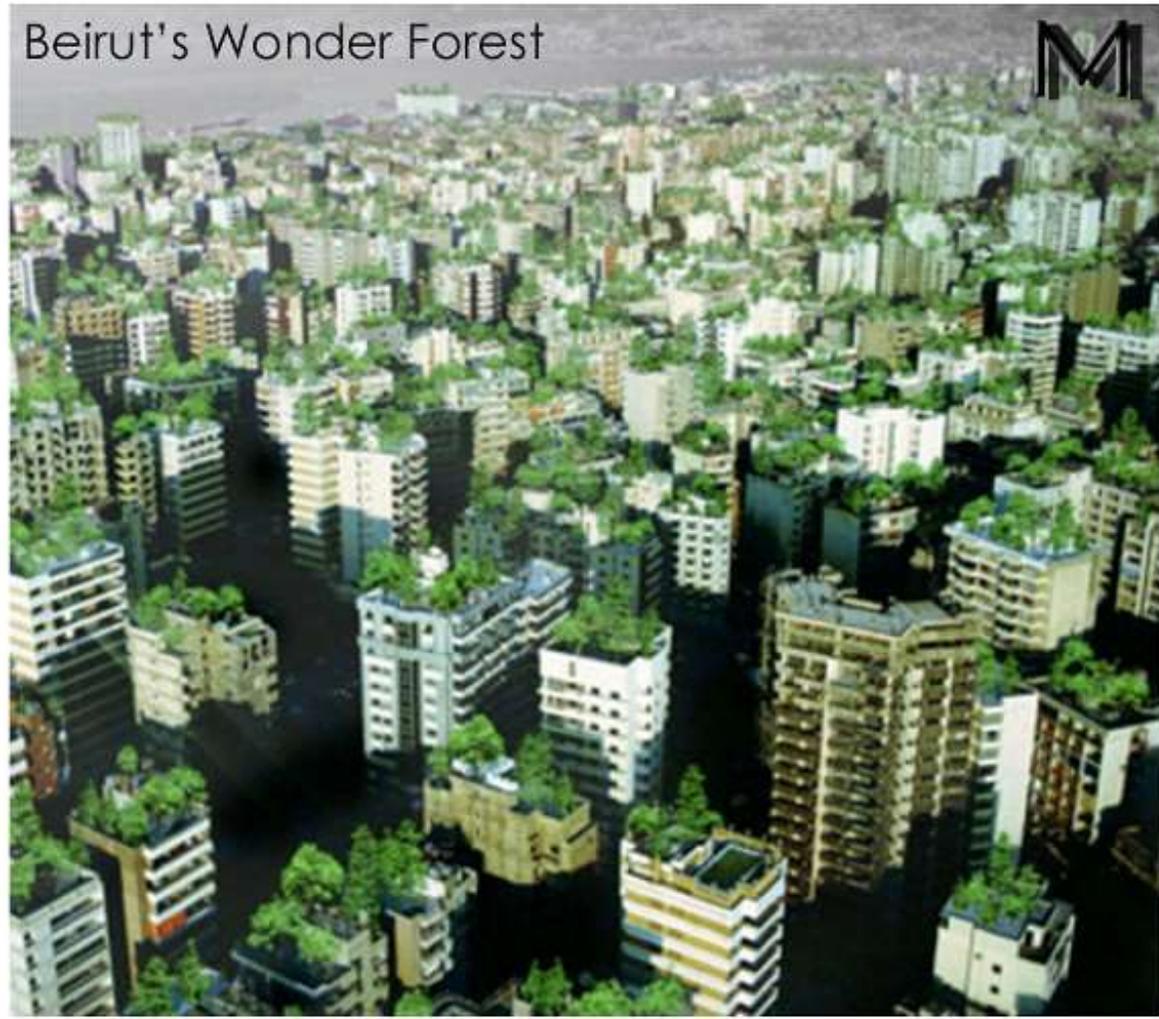


Trees absorb CO<sub>2</sub> from the atmosphere in daytime

- **Plant Trees:** Plant trees next to the wall that receives the most sunlight in warm weather. The trees will shade the building from the sun in warm weather yet allow heat from the sun into the building during cold weather.
- Plant evergreen trees on the side receiving the least sun to shield the building from cold winds.



# In Beirut Trees Were Planted on Top of the Buildings



# To Reduce Urban Heat Trees were Planted on Buildings



# To Reduce Urban Heat Trees were Planted on Buildings



# To Reduce Urban Heat Trees were Planted on Buildings



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Jason Hawkes

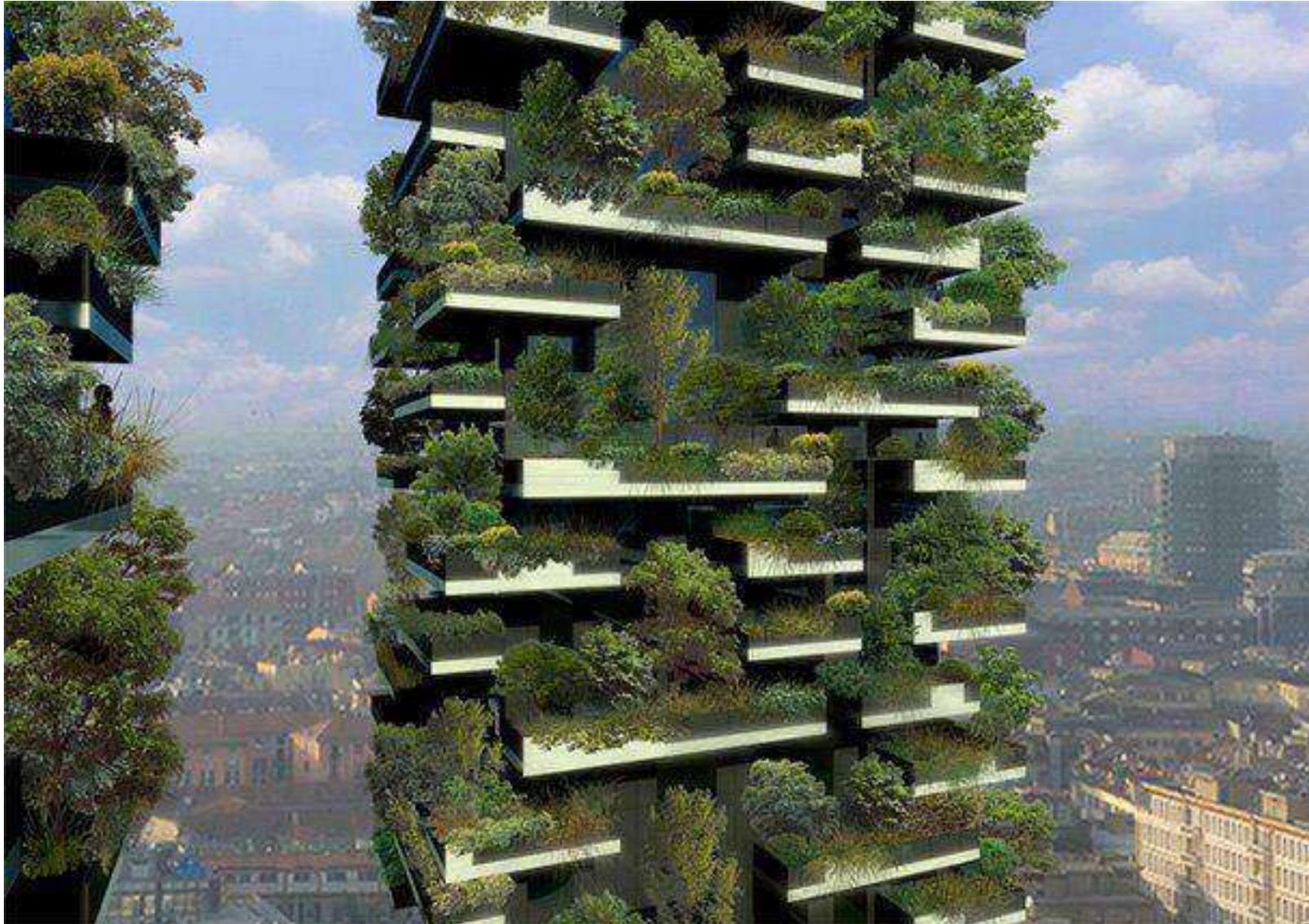
Creative Ideas on FB



# To Reduce Urban Heat Trees were Planted on Buildings



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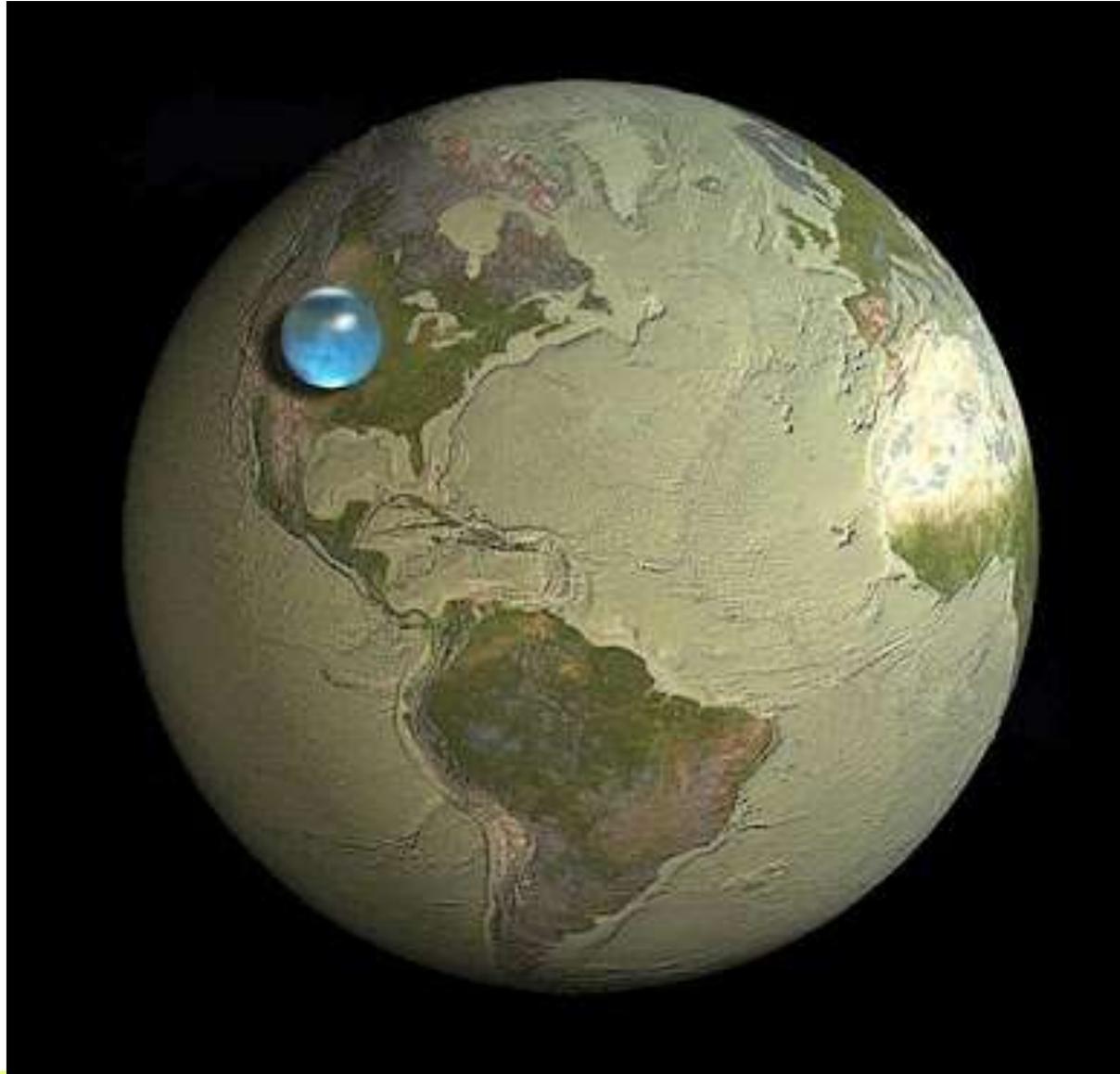


# Water Resources

- Water is the most poorly managed of all the Earth's resources, yet it is essential to all living organisms and a vital commodity for agriculture and industry. Although water covers 71% of the Earth's surface, only a tiny proportion of this (0.25%) is available for human use as fresh water from lakes and rivers. Fresh water is constantly renewed by rain and snow, but it is distributed unequally around the globe.



# Compares of Fresh Water Volume With Earth



## Most lakes in the world – Canada



With over 3 million lakes 9% of Canadian territory is actually fresh water and over 60% of all the lakes in the world are found within its borders.



# Fresh Water Lakes With Scenic View



# Most of the Fresh Water Comes From Desalinization Plant

## The land of no rivers – Saudi Arabia



Sounds a bit strange doesn't it? For a country as big as Saudi Arabia there has to be at least some sort of flowing water. Well, there isn't. Most of their fresh water comes from desalinization plants or underground reservoirs.



# Water Pollution

- Industry is a major source of water pollution. Most countries have strict bans against direct discharge of industrial wastes into streams and rivers, but controls are not always observed. Moreover, toxic industrial wastes are frequently buried in landfill sites. Chemicals seeps through the soil into groundwater and so travel underground to drain into rivers, often many miles away, before eventually entering drinking supplies. Pollution of the water supply affects the health of the living organisms- plants, animals and humans that depend on it.



Direct discharge of industrial wastes into streams and rivers is strictly banned, but controls are not always observed.



Toxic industrial wastes are frequently discharged into nearby streams

















# Eutrophication in Rivers and Lakes

- Organic substances such as decaying vegetation, and animal and human excreta, degrade in water, but if excess amounts accumulate then eutrophication (over enrichment by nutrients and minerals) occurs. This encourages algal growth, which reduces the water's oxygen content and kill fish and other aquatic life. Chemical pesticides and herbicides, used in intensive agriculture, seep into river, killing fish and aquatic life



- Nitrogen, phosphate and potassium from chemical fertilizers drain off from farmland to cause algal blooms and eutrophication in rivers and lakes, and increased levels of all these substances affect the quality of drinking water.
- The buildup of chemicals and heavy metals in drinking water can be highly injurious. Many pollutants are known to cause cancers and tumors.







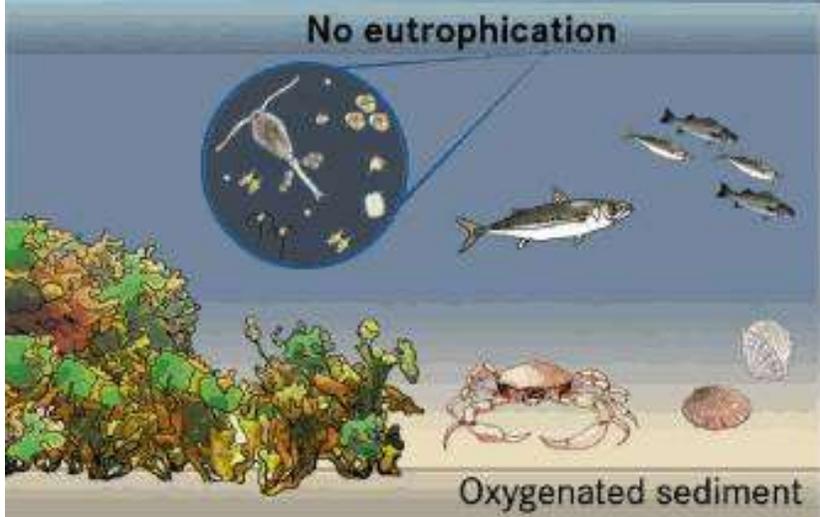




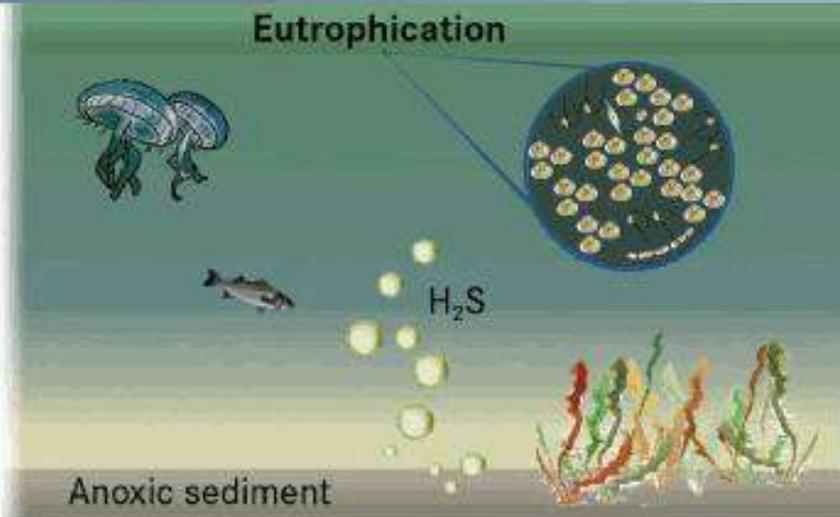


No eutrophication

Eutrophication



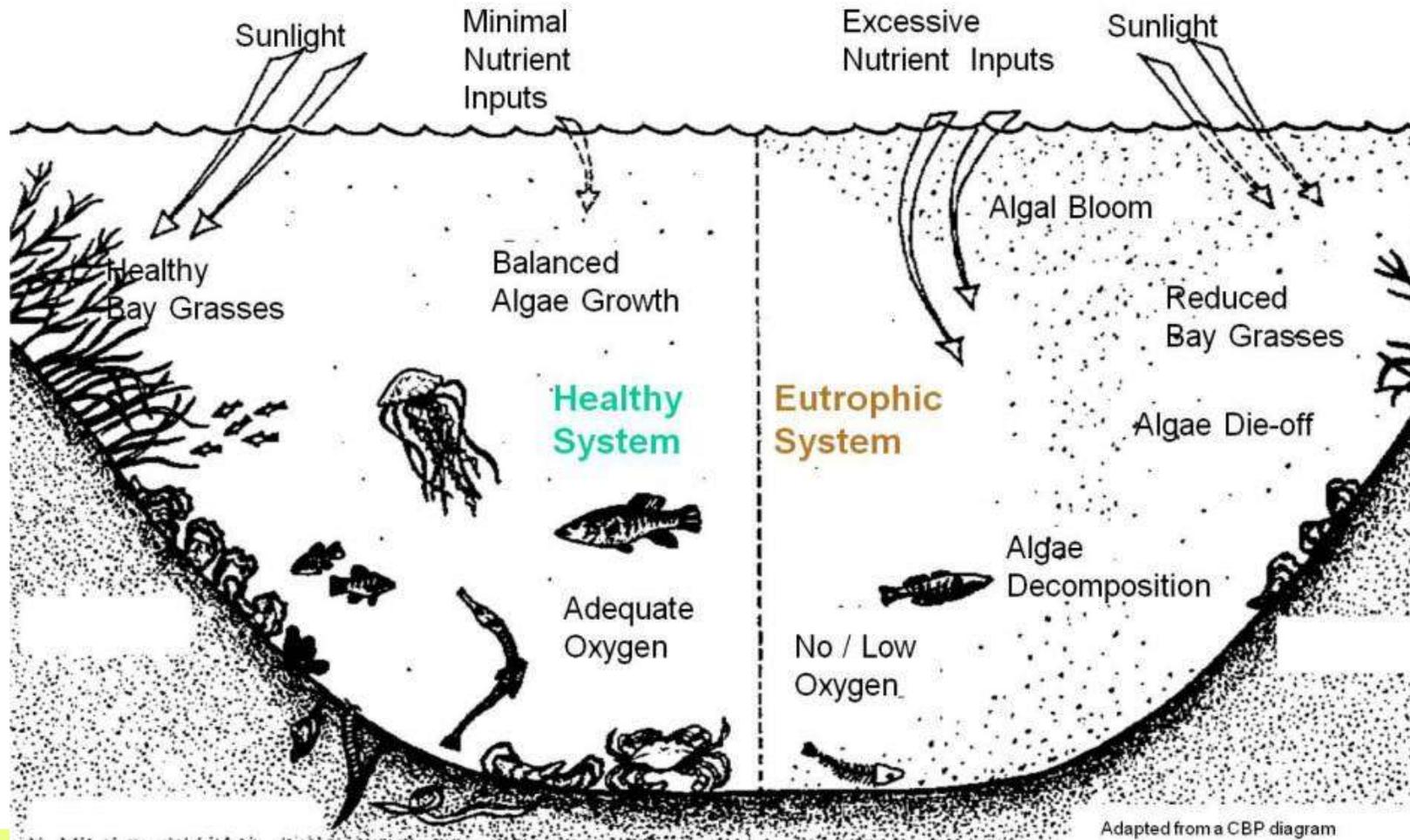
Oxygenated sediment



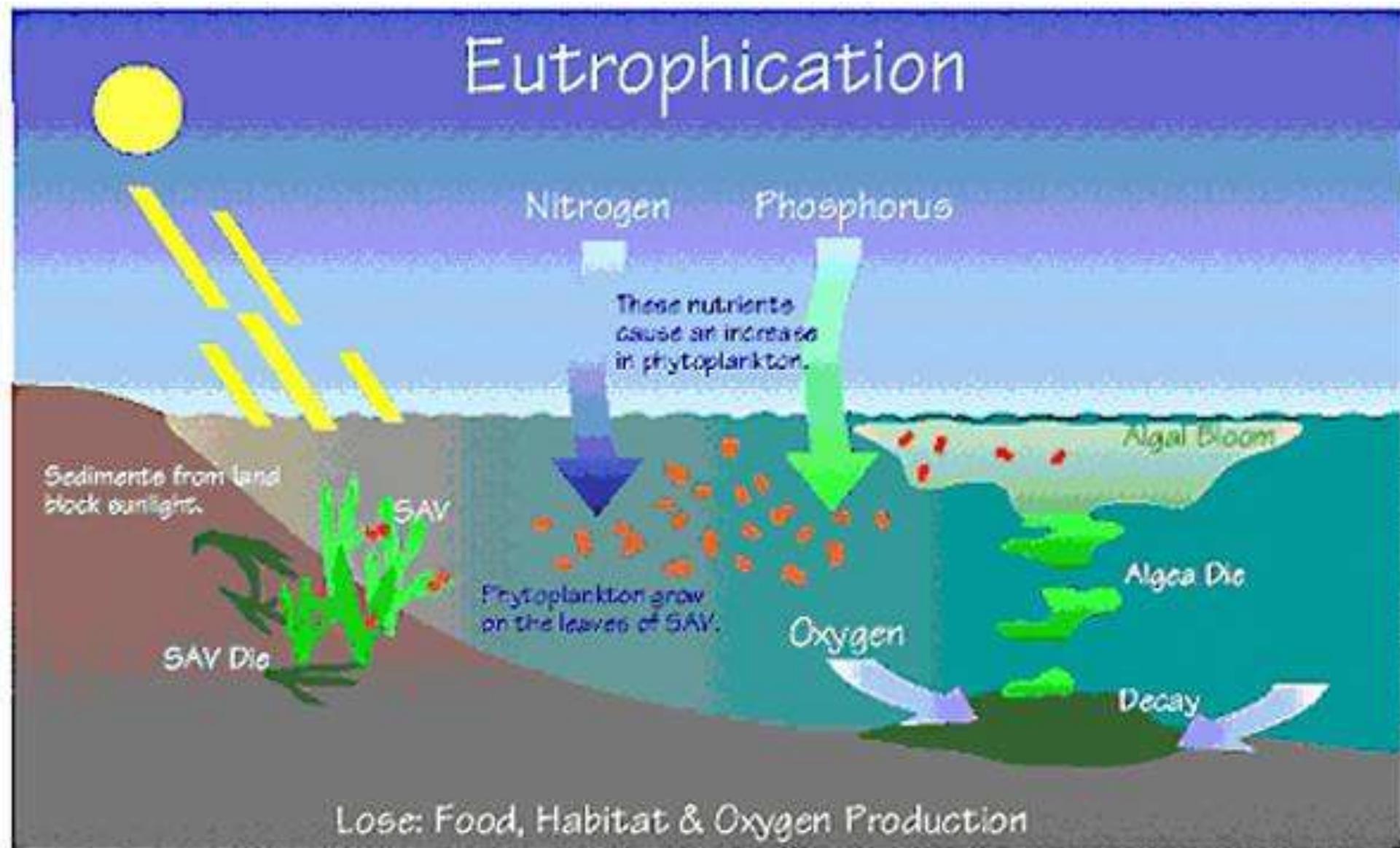
Anoxic sediment



# The Big Picture



# Eutrophication



# Waste and Waste Disposal

- Today's modern consumer societies produce vast amount of waste. Most domestic waste consists of paper, glass, metals and food matter.
- The rate at which domestic waste is produced corresponds directly with standards of living. Domestic waste is rarely toxic (capable of causing death or serious injury) but is frequently hazardous (causing ill health).



Today's modern consumer societies produce vast amount of waste.



Most domestic waste consists of paper, glass, metals and food matter



Domestic waste is rarely toxic but is frequently hazardous





- Industrial wastes may take the form of liquids, solids, or gases. Some, but not all, industrial wastes are toxic (poisonous). Other industrial wastes pollute the environment with greenhouse gases, heat, excess nutrients, or simply large quantities of harmless but unusable material. In order to preserve the quality of the earth's environment, industrial waste must be disposed of in a way that does the least amount of harm.



Industrial waste must be disposed of in a way that does the least amount of harm



Waste containers can disintegrate or be washed ashore, polluting marine life and thus the food chain.



- Dumping at sea has some drawbacks. Waste containers can disintegrate or be washed ashore, polluting marine life and thus the food chain.
- Incineration of the industrial waste increasingly seems the solution. It can reduce the volume of waste by 90% and if the incinerator is equipped with a scrubber, almost all toxins are destroyed



# Waste Reduction and Recycling

- Manufacturing processes in industries such as mining can be altered to reduce the amounts of waste produced. Benefits are to be had from recycling waste. Energy saving of as much as 96% can be made through recycling waste metal in the aluminum industry. Recycling also cut down air and water pollution and reduces the need for scarce landfill sites.



# Accumulation in the Ocean

- Oceans cover some two-third of the Earth's surface. They are of vital importance to the working of the hydrological cycle-the constant circulation of water through the Earth's environment.
- The oceans are also a major source of food, supplying 14% of animal protein in the world diet.
- The oceans are treated as vast dumping grounds for every kind of human detritus.



- All around the world's coasts sewage is discharged into the sea, frequently untreated. When sewage sludge originates from a heavily industrialized area it often contains toxic heavy metals, such as arsenic, lead and mercury. These can enter the food chain and eventually cause serious harm-and even death-to humans.
- Other sources of pollution include oil pollution, either deliberately discharge from tankers at sea, or accidentally split during collisions.



- Coastal wetlands, such as tidal marches and mangroves, are particularly vulnerable to pollution. They are among the world's most productive wildlife habitats.
- Beaches, too support a wide diversity of natural life and are commonly used by people for recreation. Unacceptable high levels of sewage and other pollution pose a direct threat to health, as being aesthetically displeasing. Many once popular resort beaches have now been declared unfit for bathing.



Unacceptable high levels of sewage and other pollution pose a direct threat to lives of fish in sea





# Deforestation and Erosion

- Tropical soils are naturally fertile – the forest's fertility is provided by nutrients that are locked up in the vegetation and recycled through decay and regrowth. Once a patch of forest is cleared the cycle is broken; the land quickly becomes sterile and vulnerable to erosion. Once felled, the tropical forests may be lost forever.
- The destruction of the tropical forests may be the most serious environmental issues facing the world today.



- Once a forest is cleared, there is greater danger of rivers drying up or of flash floods occurring. Moisture is released into the air through transpiration and evaporation from the leaves' surface. If large areas of forest are felled, precipitation declines and droughts can occur. On a world scale, destruction of the rainforests contribute to global warming.





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On a world scale, destruction of the rainforests contribute to global warming.

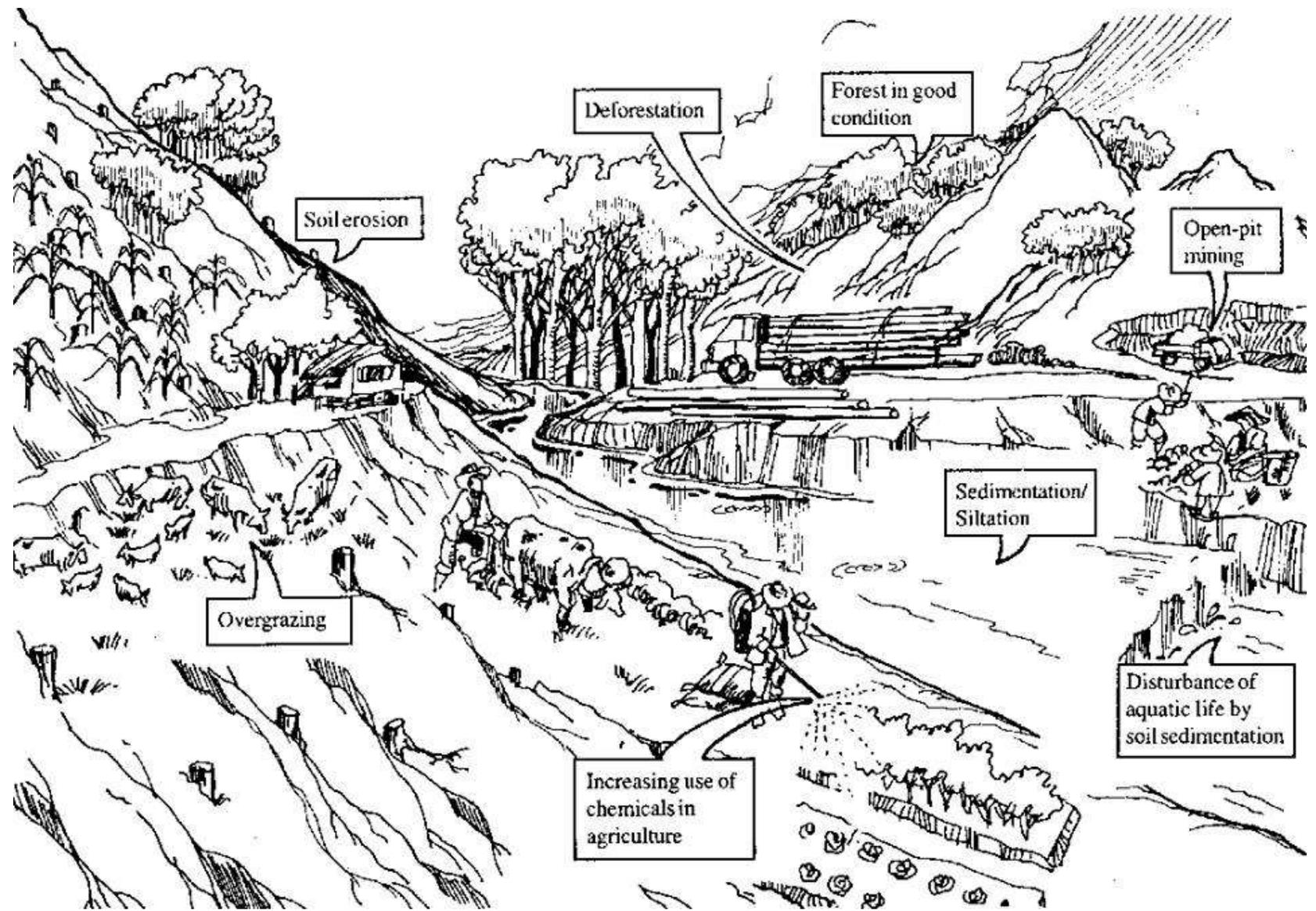


# Erosion and Desertification

- Deforestation is also one of the major causes of soil erosion. Although soil erosion occurs naturally when topsoil is carried away by water, wind, ice or landslides, the process is greatly accelerated by the removal of the natural vegetation. Overgrazing of grasslands, the over plowing of cultivated land contribute to soil erosion which breaks up the soil structure, allowing it to blow away. Deprived of topsoil, the land becomes less productive and ultimately crops fail. In arid and semiarid areas soil erosion can result in desertification.



# Illustration of deforestation, overgrazing and soil erosion



When topsoil is carried away by water, wind, ice or landslides, the process is greatly accelerated by the removal of the natural vegetation







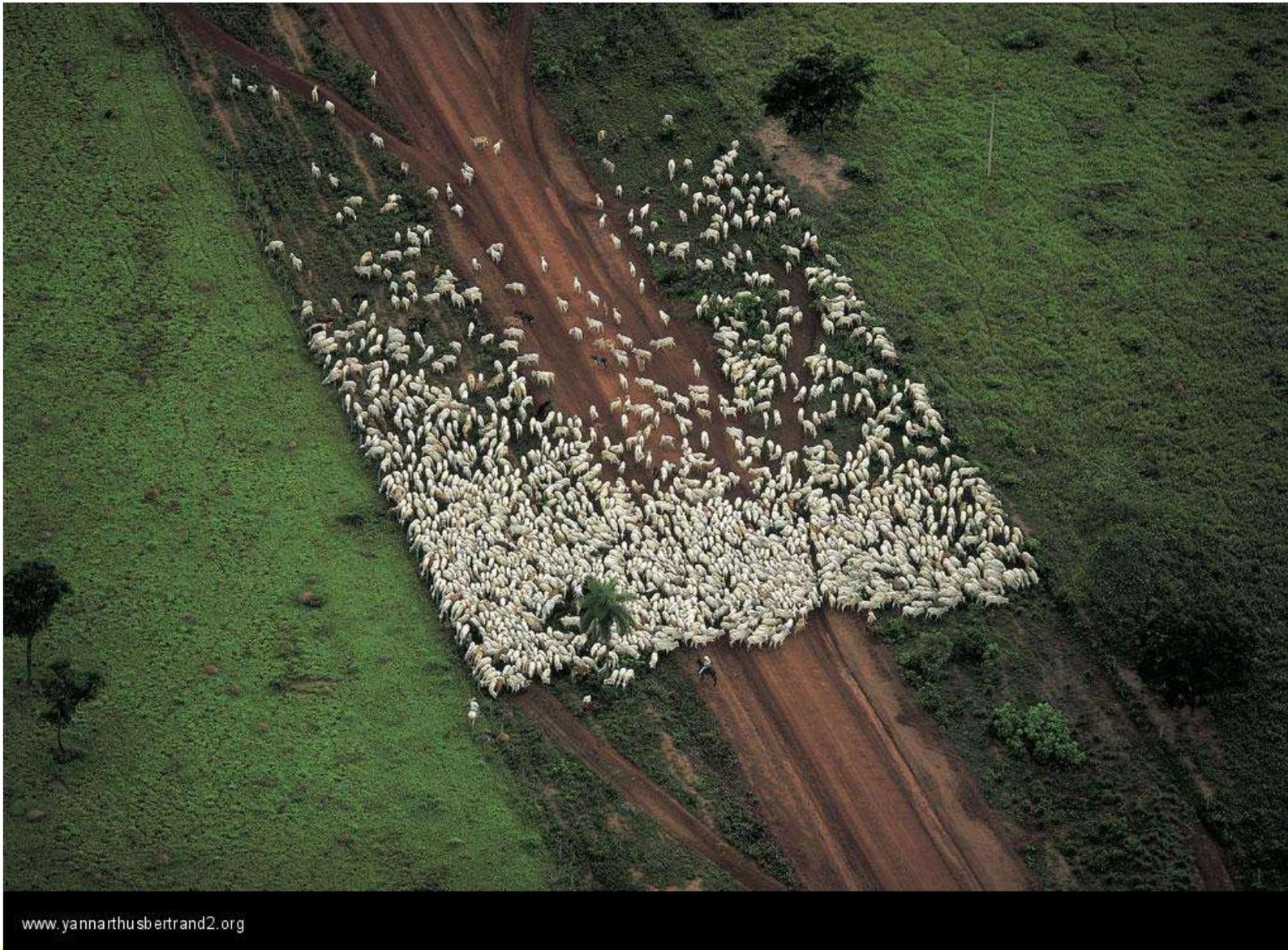


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# Over Grazing



# Soil Erosion



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# New Road Construction Cause Soil Erosion



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# Step Farming Can Prevent Soil Erosion



# Message I Would Like to Share

Knowledge is  
empowering...

Never stop learning!



# Questions and Answers

Thank You

