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**Sustainable and Cleaner production in the  
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# The Bio-physical Environment

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# Presentation Sequence

- Definition of Environment
- History of Natural Environment
- History of Environmental Pollution
- Environmental Pollution
- Impacts of Environmental Pollution



# Definition of Environment

- The **natural environment** encompasses all living and non-living things occurring naturally on Earth or some region thereof.
  - Lithosphere: Natural Resources
  - Hydrosphere: Water
  - Atmosphere: Air
  - Biosphere: Life



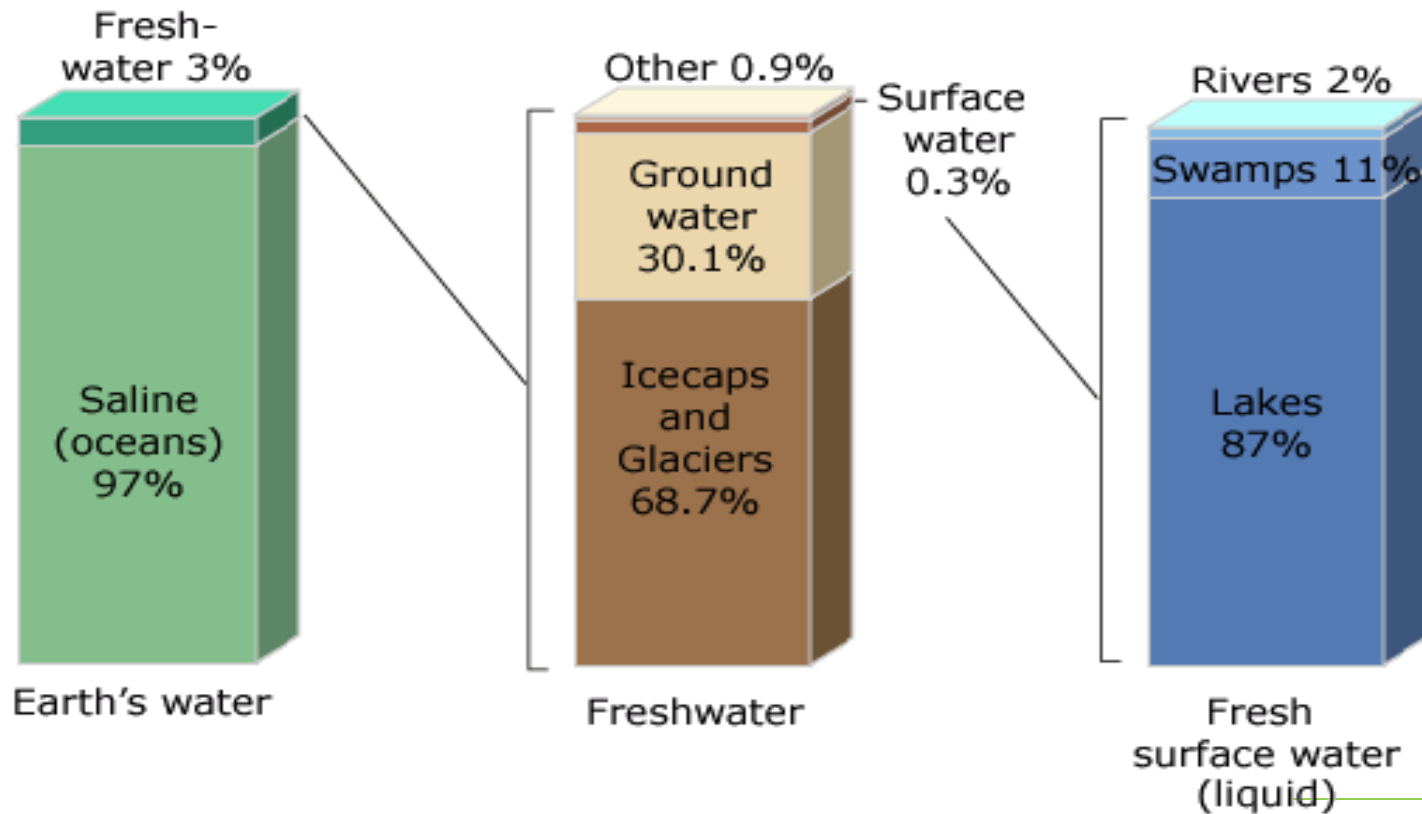
# Lithosphere: Natural Resources

- Agriculture—agronomy is the science and technology of using plants for food, fuel, feed, and fiber.
- Air, wind and atmosphere
- Plants
- Animals
- Coal, fossil fuels, rock and mineral resources
- Forestry
- Soils
- Water, oceans, lakes, groundwater and river



# Hydrosphere: Water

Distribution of Earth's Water





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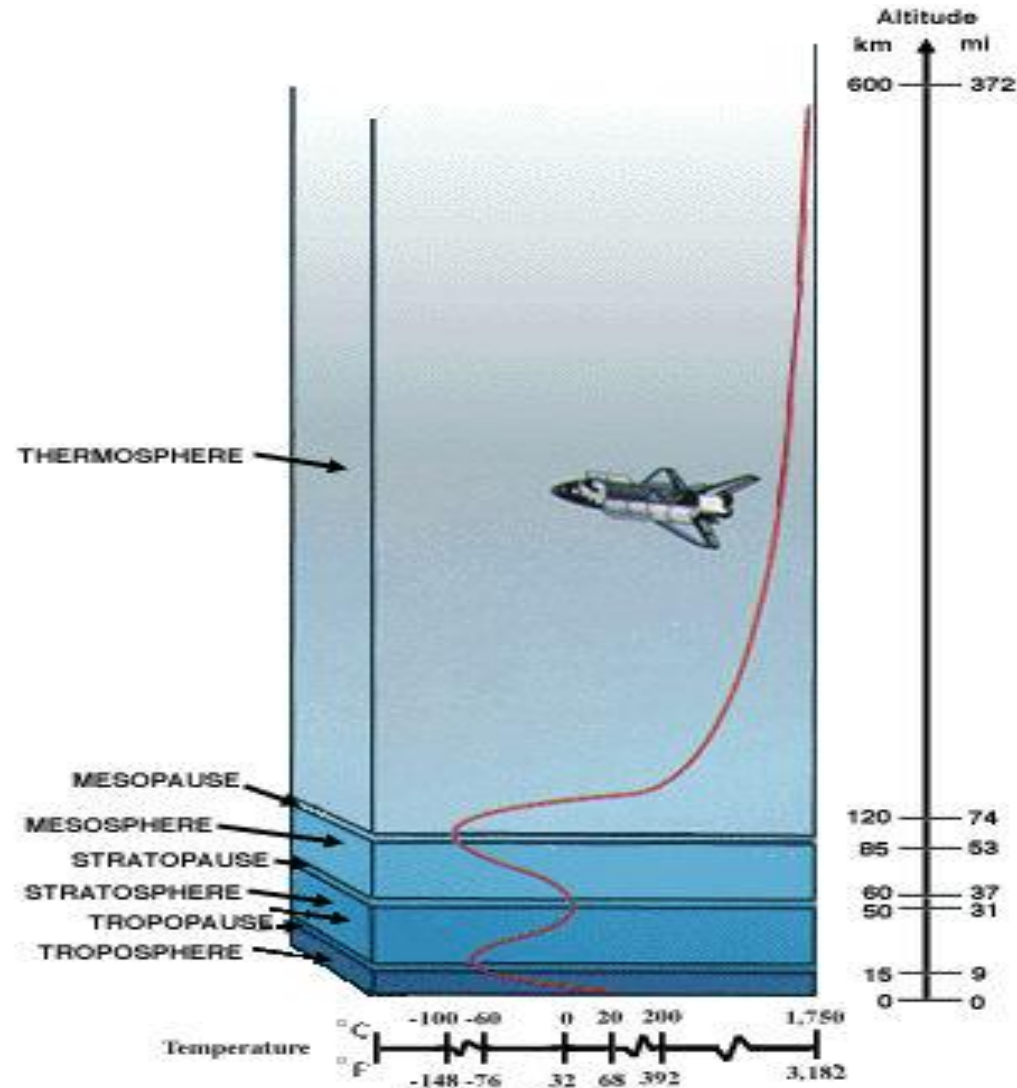
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# Atmosphere

- Thermosphere
- Mesosphere
- Stratosphere
- Troposphere



<http://liftoff.msfc.nasa.gov/academy/space/atmosphere.html>



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# Biosphere

- flora and
- fauna





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# History of Natural Environment

- Big Bang Theory
- Creation of Earth
- Formation of Environment
  - Lowering of Temperature
  - Water Condensation
  - Geological Activity
  - Start of Life





# Environmental Pollution

- Undesirable change in the physical, chemical or biological characteristics of air, water and soil that may harmfully effect the life or create a potential health hazard of any living organism. Pollution is thus direct or indirect change in any component of the biosphere that is harmful to the living components and in particular, undesirable for man.
- Two Major Types
  - Bio Degradable (Domestic Waste, General Organic Matter)
  - Non-Biodegradables (Industrial Waste such as plastics, pesticides and heavy metals)



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# History of Environmental Pollution

- Initial Human Interaction
- Industrial Revolution
  - Impact on Air
  - Impact of Water
  - Impact on Natural Resources



# What are Pollutants

- Deposited Matters e.g. Sooth, Smoke, Dust etc.
- Gases: NOX, SOX, CO, Halogen
- Acid Droplets: Sulfuric Acid, Nitric Acid etc.
- Fluorides: Mainly from production of super Phosphate fertilizers
- Metals (Heavy): Mercury, Lead, Chromium, Cadmium
- Agro Chemicals: Pesticides, Herbicides, Chemical Fertilizers etc.



# What are Pollutants

- Volatile Organic Components: Benzene, Ether, CFC etc.
- Photochemical Oxidants: Smog, Ozone, NOX, Aldehydes etc
- Solid Waste: Municipal, and industrial
- Radioactive Waste
- Noise
- Odor



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► The BBC's Carrie Gracie

You are in: World: **Europe**  
Sunday, 13 February, 2000, 22:35 GMT

## Cyanide spill reaches Danube



Almost all fish in the river Tisza have perished

Hundreds of fish are floating belly-up in the Danube river but experts say the river may escape the worst effects of a cyanide spill from a Romanian gold smelter.

The spill originated in northwest Romania, near the town of Oradea where a dam at the Baia Mare goldmine overflowed two weeks ago.

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- 10 Feb 00 | Europe Cyanide spill wreaks havoc
- 11 Feb 00 | Media reports Hungary's shock at cyanide disaster

### Internet links:

- Hungarian Prime Minister's Office
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# Case Studies

- As Global Phenomenon
  - Case Study of USA Fossil Fuel Power Generation
- As Localized Phenomenon
  - Case Study of Bhopal Incident
  - Case Study of Kasur Tanneries