

16.1 Human Population Growth And Natural Resources

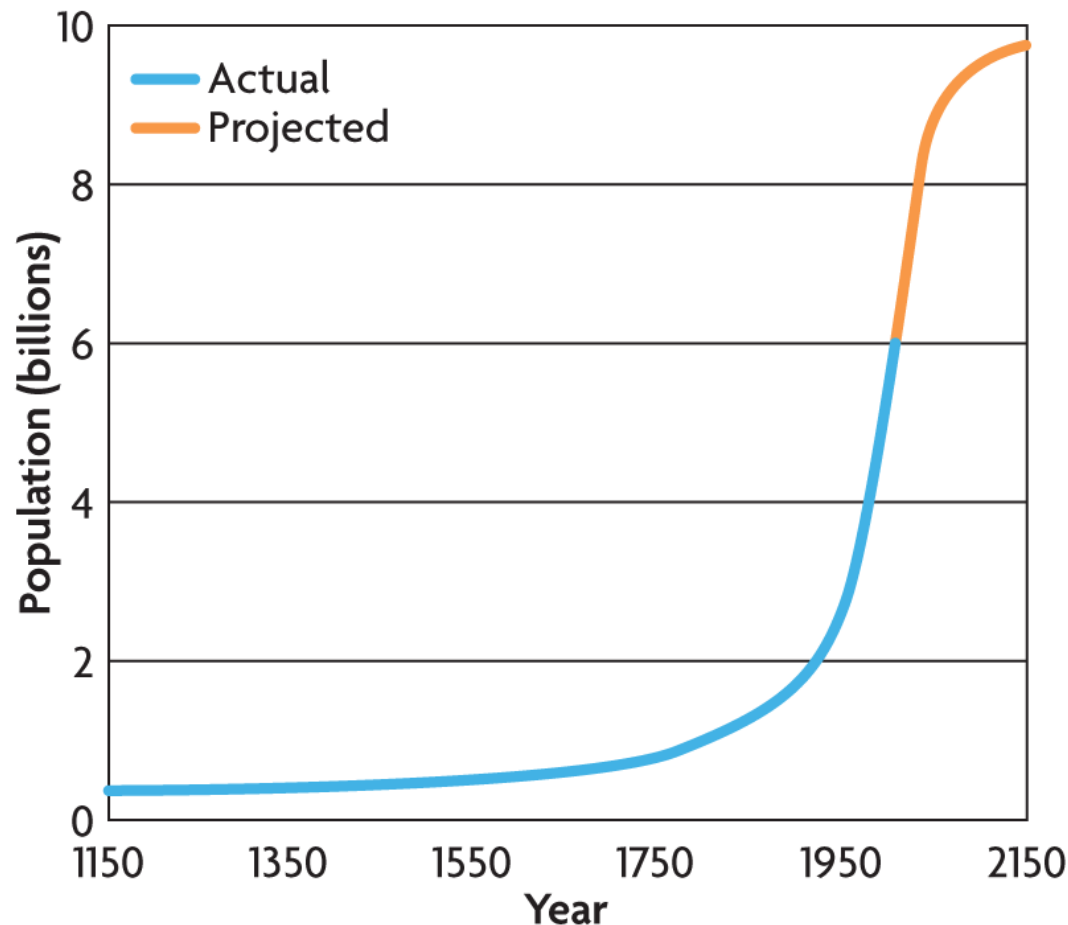
KEY CONCEPT

As the human population grows, the demand for Earth's resources increases.



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- ▶ **Earth's human population continues to grow.**
 - Earth's human carrying capacity is unknown.



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- Technology has helped to increase Earth's carrying capacity.
 - gas-powered farm equipment
 - medical advancements



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- ▶ **The growing human population exerts pressure on Earth's natural resources.**
 - Nonrenewable resources are used faster than they form.
 - coal
 - oil

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- Renewable resources cannot be used up or can replenish themselves over time.
 - wind
 - water
 - sunlight
- Growing use of nonrenewable resources may lead to a crisis.
- Resources must be properly managed.



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► **Effective management of Earth's resources will help meet the needs of the future.**

- Earth's resources must be used responsibly.
- Careless use of resources makes them unavailable to future generations.
- Easter Island is an example of irresponsible resource use.

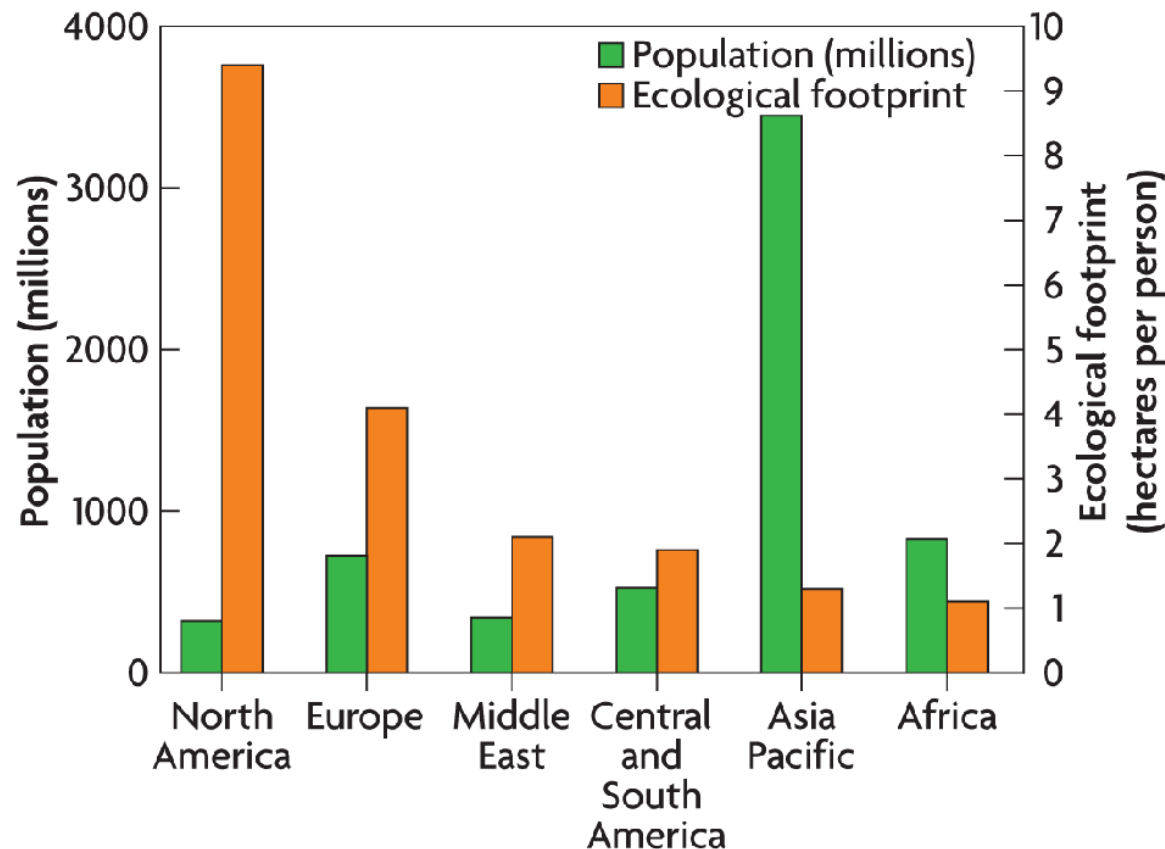


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- An ecological footprint is the amount of land needed to support a person.
- The land must produce and maintain enough
 - food and water
 - shelter
 - energy
 - waste

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- Several factors affect the size of the ecological footprint.
 - amount and efficiency of resource use
 - amount and toxicity of waste produced



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KEY CONCEPT

Fossil fuel emissions affect the biosphere.



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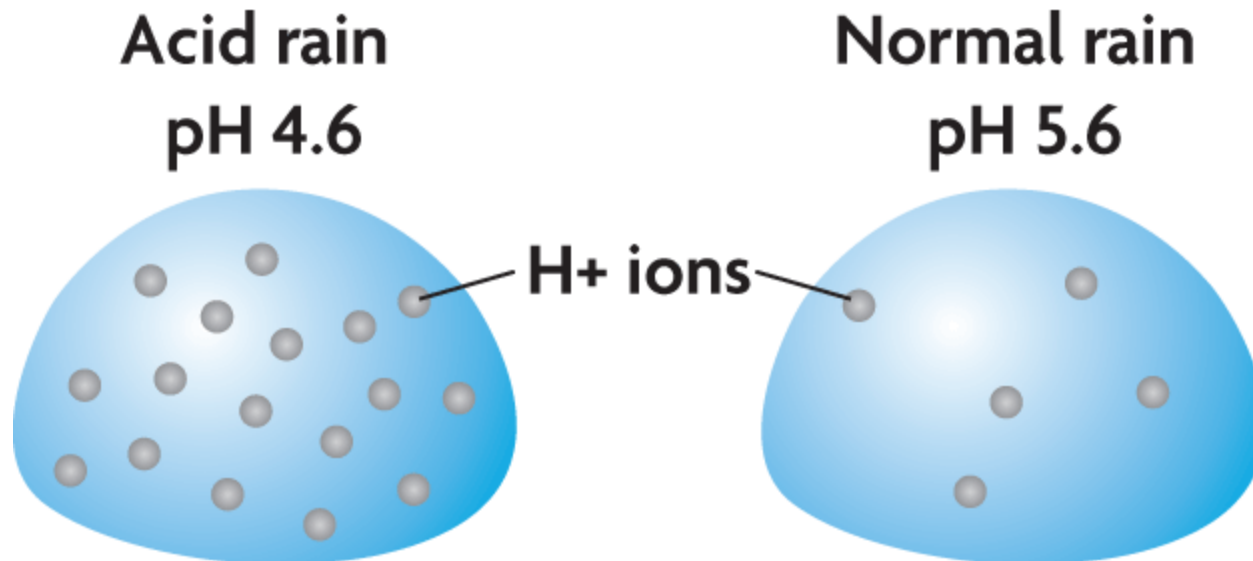
▶ Pollutants accumulate in the air.

- Pollution is any undesirable factor added to the air, water, or soil.
- Smog is one type of air pollution.
 - sunlight interacts with pollutants in the air
 - pollutants produced by fossil fuel emissions
 - made of particulates and ground-level ozone



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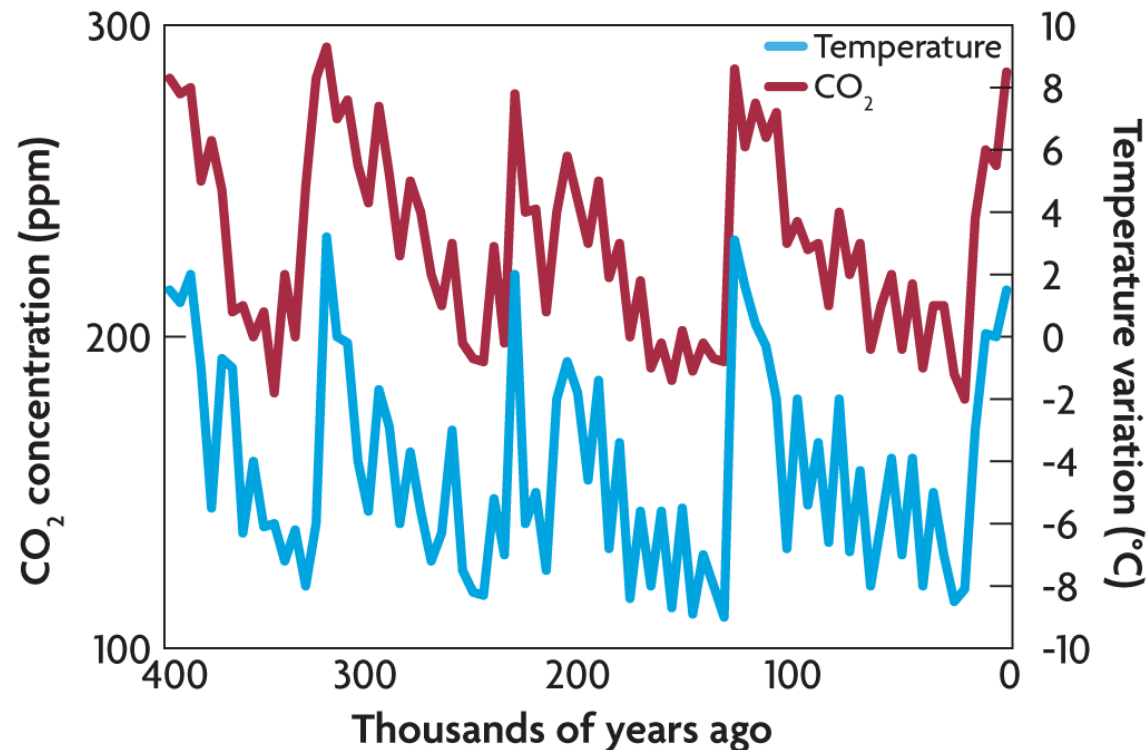
- Smog can be harmful to human health.
- Acid rain is caused by fossil fuel emissions.
 - produced when pollutants in the water cycle cause rain pH to drop
 - can lower the pH of a lake or stream
 - can harm trees



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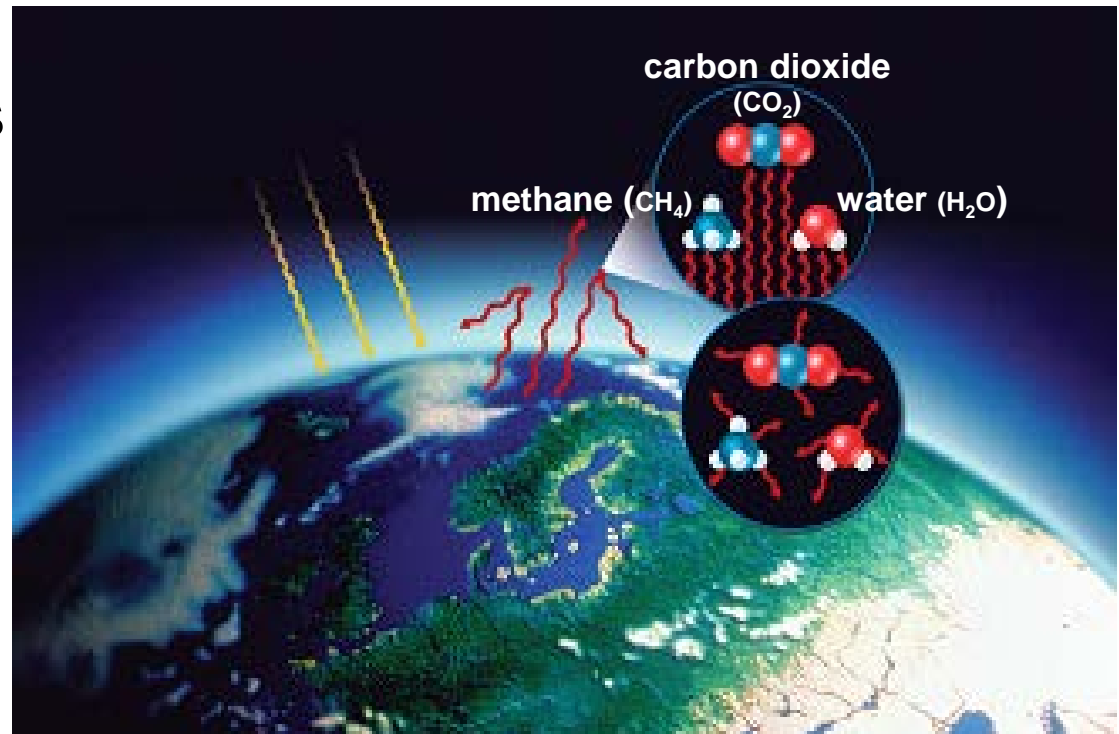
▶ Air pollution is changing Earth's biosphere.

- The levels of atmospheric carbon dioxide rise and fall over time.
- High levels of carbon dioxide are typical of Earth's warmer periods.



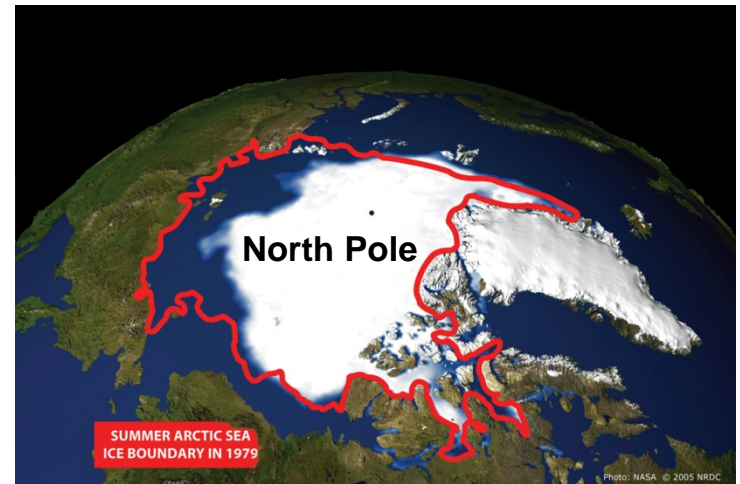
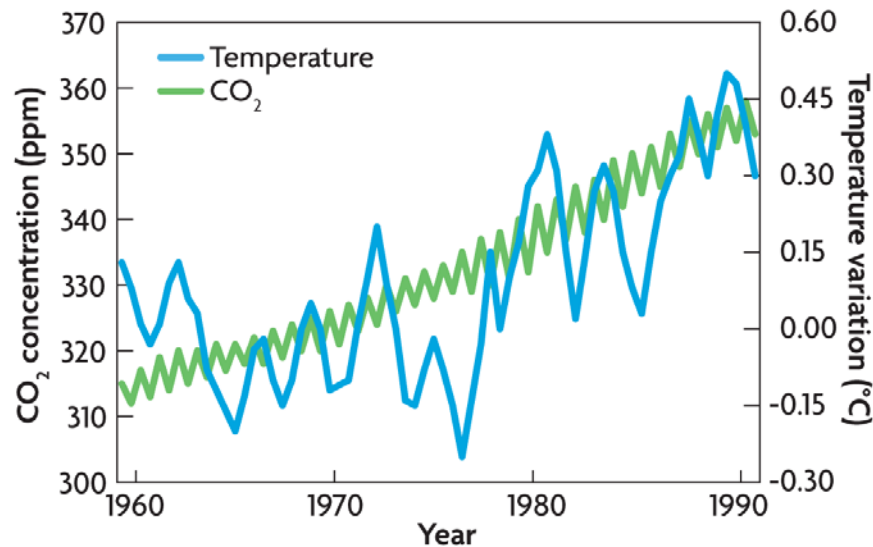
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- The greenhouse effect slows the release of energy from Earth's atmosphere.
 - sunlight penetrates Earth's atmosphere
 - energy is absorbed and reradiated as heat
 - greenhouse gases absorb longer wavelengths
 - Greenhouse gas molecules rerelease infrared radiation



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- Global warming refers to the trend of increasing global temperatures.



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KEY CONCEPT

Pollution of Earth's freshwater supply threatens habitat and health.



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▶ Water pollution affects ecosystems.

- Pollution can put entire freshwater ecosystems at risk.



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- Indicator species provide a sign of an ecosystem's health.
 - amphibians
 - top predators



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▶ Biomagnification causes accumulation of toxins in the food chain.

- Pollutants can move up the food chain.
 - predators eat contaminated prey
 - pollution accumulates at each stage of the food chain
- Top consumers, including humans, are most affected.

