



How are Human Activities Amplifying the Greenhouse Effect's Impact on Earth's Systems – FACT SHEET

Refresher:

1. What is Climate Change?

- Climate change is a prolonged alteration in Earth's climate patterns, driven primarily by human activities such as the combustion of fossil fuels and deforestation.
- The resulting increase in greenhouse gases, like carbon dioxide and methane, enhances the natural greenhouse effect, leading to a warming of the Earth's surface.

2. The Greenhouse Effect Explained:

- The greenhouse effect is a natural process where certain gases in the Earth's atmosphere trap solar energy, maintaining a suitable temperature for life.
- Human activities intensify this effect by adding more greenhouse gases, disrupting the delicate balance and causing a rise in global temperatures.

How is it affecting different regions:

3. Cold Regions - Arctic and Antarctic:

a. Melting Ice Caps:

- Warmer temperatures accelerate the melting of polar ice caps and glaciers, contributing to rising sea levels.
- Impacts on polar bears and penguins include habitat loss, altered food sources, and increased competition for space.

b. Permafrost Thaw:

- The thawing of permafrost, frozen soil in cold regions, releases stored carbon and methane, amplifying the greenhouse effect.
- Ecosystems experience shifts as the release of gases influences local climates and vegetation.



AU2.2 Teacher Fact Sheet

c. Shifts in Ecosystems:

- Changes in temperature prompt shifts in plant and animal distributions.
- Native species may face challenges adapting to new conditions, while non-native species may expand their ranges.

4. Temperate Regions - Changes in the Middle:

a. Warmer Winters and Springs:

- Temperate regions experience milder winters and springs, impacting the natural cycles of plants and animals.
- Phenological events, such as flowering and migration, may occur earlier or later than usual.

b. Impact on Agriculture:

- Altered temperature and precipitation patterns affect agriculture, influencing crop yields and the types of crops that can be grown.
- Farmers may need to adopt new practices to adapt to changing conditions.

c. Altered Seasons:

- Changes in temperature and weather patterns can lead to shifts in the timing of seasons.
- This can affect the behavior of plants, animals, and even humans in these regions.

5. Tropical Regions - What Happens:

a. Rising Sea Levels:

- Melting ice and the thermal expansion of seawater contribute to rising sea levels in tropical regions.
- Low-lying coastal areas face increased risks of inundation and flooding.

b. Extreme Weather Events:

- Warmer ocean temperatures intensify hurricanes, typhoons, and tropical storms.
- Increased frequency and severity of droughts and floods impact communities and ecosystems.

c. Coral Bleaching:

- Elevated sea temperatures stress coral reefs, leading to coral bleaching.
- This phenomenon threatens marine biodiversity and disrupts the delicate balance of underwater ecosystems.