

SUGGESTED SKILL

 Data Analysis

5.D

Interpret experimental data and results in relation to a given hypothesis.



AVAILABLE RESOURCES

- Classroom Resource > [AP Environmental Science Teacher's Guide](#)
- External Resource > [Environmental Literacy Council's AP Environmental Science Course Material](#)
- External Source > [GLOBE for the Environmental Science Classroom](#)
- The Exam > [Student Performance Q&A 2014, Q4](#)
- The Exam > [Samples and Commentary 2014, Q4](#)

TOPIC 9.5

Global Climate Change

Required Course Content

ENDURING UNDERSTANDING

STB-4

Local and regional human activities can have impacts at the global level.

LEARNING OBJECTIVE

STB-4.F

Explain how changes in climate, both short- and long-term, impact ecosystems.

ESSENTIAL KNOWLEDGE

STB-4.F.1

The Earth has undergone climate change throughout geologic time, with major shifts in global temperatures causing periods of warming and cooling as recorded with CO₂ data and ice cores.

STB-4.F.2

Effects of climate change include rising temperatures, melting permafrost and sea ice, rising sea levels, and displacement of coastal populations.

STB-4.F.3

Marine ecosystems are affected by changes in sea level, some positively, such as in newly created habitats on now-flooded continental shelves, and some negatively, such as deeper communities that may no longer be in the photic zone of seawater.

STB-4.F.4

Winds generated by atmospheric circulation help transport heat throughout the Earth. Climate change may change circulation patterns, as temperature changes may impact Hadley cells and the jet stream.

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LEARNING OBJECTIVE

STB-4.F

Explain how changes in climate, both short- and long-term, impact ecosystems.

ESSENTIAL KNOWLEDGE

STB-4.F.5

Oceanic currents, or the ocean conveyor belt, carry heat throughout the world. When these currents change, it can have a big impact on global climate, especially in coastal regions.

STB-4.F.6

Climate change can affect soil through changes in temperature and rainfall, which can impact soil's viability and potentially increase erosion.

STB-4.F.7

Earth's polar regions are showing faster response times to global climate change because ice and snow in these regions reflect the most energy back out to space, leading to a positive feedback loop.

STB-4.F.8

As the Earth warms, this ice and snow melts, meaning less solar energy is radiated back into space and instead is absorbed by the Earth's surface. This in turn causes more warming of the polar regions.

STB-4.F.9

Global climate change response time in the Arctic is due to positive feedback loops involving melting sea ice and thawing tundra, and the subsequent release of greenhouse gases like methane.

STB-4.F.10

One consequence of the loss of ice and snow in polar regions is the effect on species that depend on the ice for habitat and food.