Weather & Climate

Section 5: Climate Cycles & Recent Climate Changes

Earth has experienced many climate changes in its history. Scientists use evidence from **ice cores**, or ice drilled from layers of glaciers, fossilized pollen, ocean sediments, and growth rings of trees to gain information on past climates. The climate changes in cycles, which can take longer than a lifetime to complete. **Long term cycles** of change include ice ages and interglacials. **Ice ages** are long, cold periods lasting from hundreds to millions of years when glaciers cover much of the Earth. Glaciers advance during cold periods and retreat during **interglacials**, which are long, warm periods that occur between ice ages.

In addition to long term cycles, climate also changes in **short term cycles**, which include seasons, El Nino, and monsoons. **Seasons** are short periods of climate changes due to the amount of solar energy an area receives. These changes occur at different times of the year because Earth is tilted on an axis, and Earth's revolution around the sun causes the axis to point toward the sun sometimes and away from it at other times. **El Nino** is an occasional climatic event, occurring every 3–8 years. This is when the trade winds weaken, reversing the normal pattern of high and low pressure across the Pacific Ocean. **Monsoons** are wind circulation patterns that change directions with the seasons. Monsoons are caused by temperature differences between land and the ocean.

Humans have greatly impacted climate change. The average temperature on Earth has been increasing for the past 100 years, which is often referred to as **global warming**. **Greenhouse gases** are gases in the atmosphere that absorb Earth's outgoing infrared radiation. Higher levels of greenhouse gases, which include carbon dioxide, create a greater greenhouse effect. The burning of fossil fuels in order to heat homes and power automobiles has increased the amount of carbon dioxide that enters the atmosphere. In addition to the burning of fossil fuels, deforestation, or the large-scale cutting and/or burning of the forests, also increases carbon dioxide in the atmosphere. Aerosols are tiny liquid or solid particles released from the burning of fossil fuels, which prevent the sun's energy from reaching Earth.