DIGITAL GLOSSARY

This is a digital glossary about paleoclimatology, which is the main topic of the STEM project.
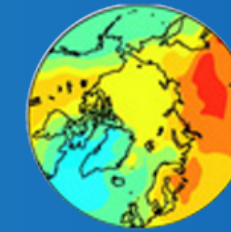
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Paleoclimatology: The scientific study of Earth's past climates using natural evidence such as ice, rocks, and fossils. It helps scientists understand how and why the climate has changed through history.

Paleoclimatology

Ice Core: Cylindrical samples of ice drilled from glaciers or ice sheets. They trap air bubbles that record past temperatures and atmospheric gases.

Ice Core

Sediment Core: Layers of mud or sand extracted from the seafloor or lakes.These layers hold information about environmental and climate changes over time.

Sediment Core

Fossil: The preserved remains or impressions of ancient plants or animals. They reveal what kinds of species lived during different climate periods.

Fossil

Isotope: Atoms of the same element with different numbers of neutrons. Their ratios help scientists determine past temperatures and climate conditions.

Isotope

Carbon Dating: A method used to find the age of once-living materials. It measures the amount of radioactive carbon-14 remaining in the sample.

Carbon Dating

Glacial Period: A long time span when massive ice sheets covered large land areas. It represents colder global temperatures and lower sea levels.

Glacial Period

Ice Age: A long-term cooling phase in Earth's history.
It is characterized by the expansion of glaciers across continents.

Ice Age

Holocene: The current warm geological epoch that began about 11,700 years ago.
It includes the rise of human civilizations and stable climate patterns.

Holocene

Pleistocene: The epoch before the Holocene, starting about 2.6 million years ago.
It featured repeated glacial and interglacial cycles.

Pleistocene

Climate Archive: Any natural record that stores past climate information.
Examples include lake sediments, corals, and ice cores.

Climate Archive

Volcanic Ash: Fine particles from volcanic eruptions that spread through the atmosphere.
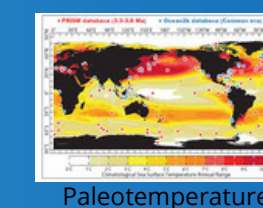They can cool the planet by blocking sunlight temporarily.

Volcanic Ash

Atmospheric CO_2: The concentration of carbon dioxide in the air.
Changes in CO_2 levels are closely linked to global temperature shifts.

Atmospheric CO_2

Radiocarbon: A radioactive isotope of carbon used for dating.
It helps scientists determine the age of fossils or sediments.

Radiocarbon

Paleotemperature: The temperature conditions that existed in Earth's past.
It is reconstructed using chemical and biological evidence.

Paleotemperature

Coral Record: Layers within coral skeletons that grow annually.
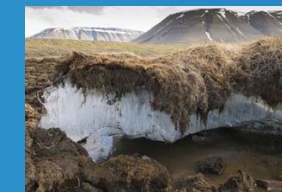They capture information about ocean temperature and chemistry.

Coral Record

Ice Sheet: A massive body of glacial ice covering large regions.
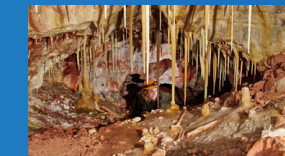The Antarctic and Greenland ice sheets store ancient climate data.

Ice Sheet

Permafrost: Permanently frozen soil found in cold regions.
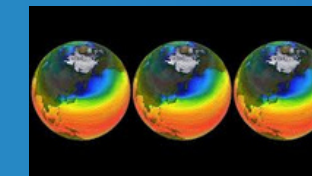It traps gases, fossils, and ancient biological materials.

Permafrost

Speleothem: Mineral formations like stalactites and stalagmites found in caves.
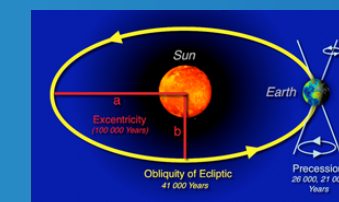Their layers contain clues about past rainfall and humidity.

Speleothem

Climate Model: A computer simulation of Earth's climate system.
Scientists use them to study past trends and predict future changes.
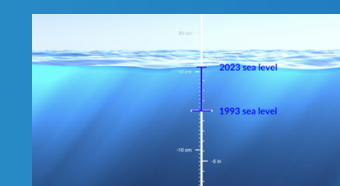

Climate Model

Milankovitch Cycles: Natural variations in Earth's orbit and tilt.
They influence long-term patterns of glacial and interglacial periods.

Milankovitch Cycles

Sea Level Change: The rise or fall of ocean water over time.
It is mainly caused by melting ice and thermal expansion of water.

Sea Level Change

Interglacial: A warmer period between two ice ages.
During this time, glaciers melt and ecosystems expand.

Interglacial

Proxy Data: Indirect clues used to reconstruct ancient climates.
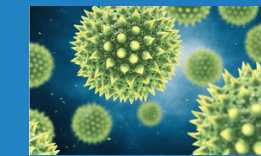Examples include tree rings, corals, ice cores, and sediments.

Proxy Data

Tree Rings: Circular growth layers inside trees that form each year.
Their thickness indicates past rainfall and temperature conditions.

Tree Rings

Pollen Analysis: The study of fossilized pollen grains found in sediments.
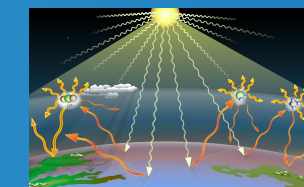It reveals past vegetation types and environmental changes.

Pollen Analysis

Marine Sediments: Deposits of particles that accumulate on the ocean floor.
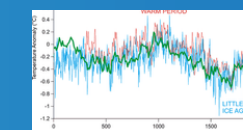They contain microfossils and chemicals that reflect past ocean climates.

Marine Sediments

Greenhouse Gas: A gas that traps heat in the Earth's atmosphere.
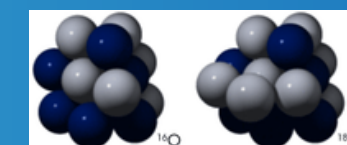Examples include carbon dioxide, methane, and water vapor.

Greenhouse Gas

Temperature Reconstruction: The estimation of ancient temperatures.
 Scientists use proxies to chart how global temperatures have varied.

Temperature Reconstruction

Oxygen Isotopes: Variations of oxygen atoms found in ice or shells.
 Their ratios indicate ocean temperatures and ice sheet sizes.

Oxygen Isotopes