DIGITAL GLOSSARY

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.

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

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

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

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

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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

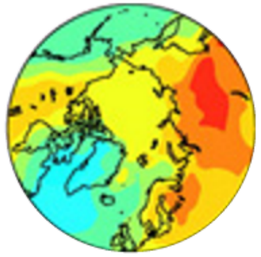
Permafrost: Permanently frozen soil found in cold regions.
It traps gases, fossils, and ancient biological materials.

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

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

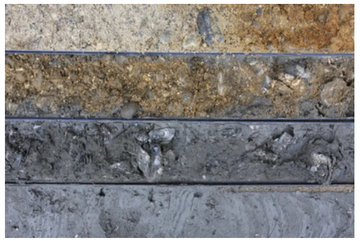
Milankovitch Cycles: Natural variations in Earth’s orbit and tilt.
They influence long-term patterns of glacial and interglacial periods.

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



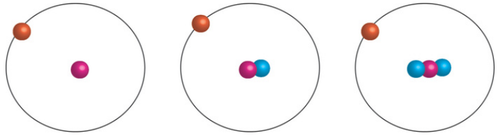
Paleoclimatology

Ice Core



Sediment Core

Fossil



Isotope

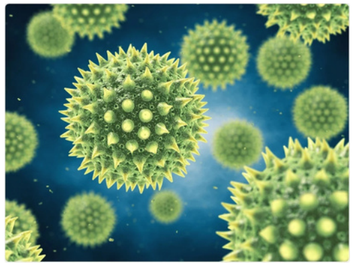
Carbon Dating

Glacial Period

Interglacial

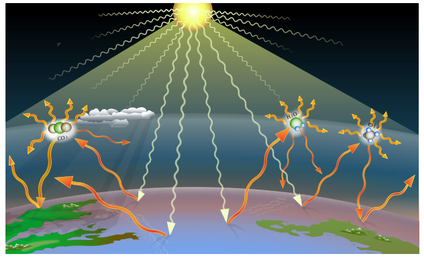
Proxy Data

Tree Rings

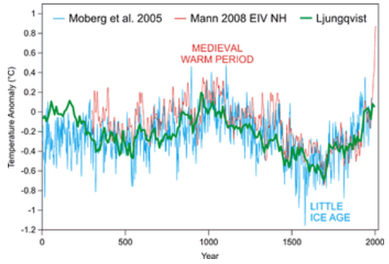


Pollen Analysis

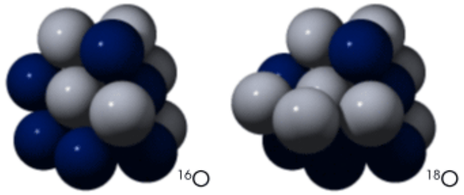
Marine Sediments



Greenhouse Gas



Temperature Reconstruction



Oxygen Isotopes

Ice Age

Holocene

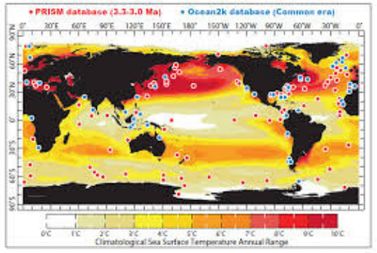
Pleistocene

Climate Archive

Volcanic Ash

Atmospheric CO_2

Radiocarbon



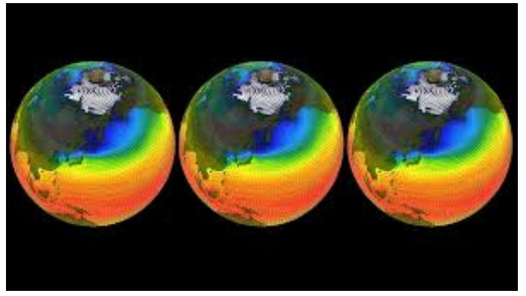
Paleotemperature

Coral Record

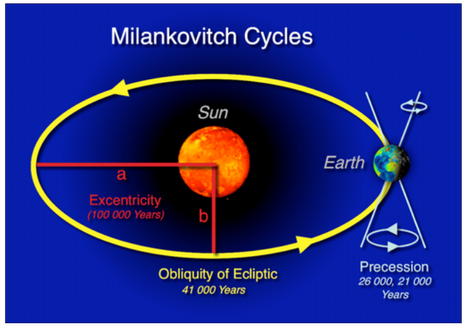
Ice Sheet

Permafrost

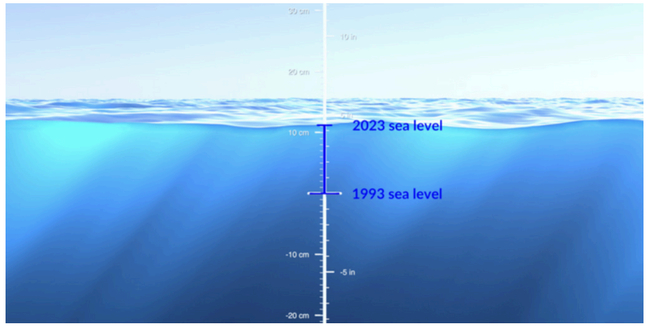
Speleothem



Climate Model



Milankovitch Cycles



Sea Level Change