Name:	

Date:

Block: _____

Glacier:

A glacier is a long-lasting (decades or more) body of ice that is large enough to move under its own weight.

- They are at least tens of metres thick and at least hundreds of metres in extent
- About 10% of Earth's land surface is currently covered with glacial ice
- At various times during the past million years, glacial ice has been much more extensive,
- covering at least 30% of the Earth's land surface at times.
- Glaciers currently represent the largest repository of fresh water on Earth (~69% of all fresh water).
- They are highly sensitive to changes in climate, and in recent decades have been melting rapidly worldwide
- Although some of the larger glacial masses may still last for several centuries, smaller glaciers,
- including many in western Canada, may be gone within decades.

Formountainous regions, glaciers are an important sources of drinking water.

Continental Glaciers:

Continental glaciers cover vast areas of land. Today, continental glaciers are only present in extreme polar regions: Antarctica and Greenland, Historically, continental glaciers also covered

large regions of Canada Europe, and Asia

Continent glaciers can form and grow when climate conditions in a region cool over extended periods of time. Snow can build up over time in regions that do not warm up seasonally, and if the snow accumulates in vast amounts, it can compact under its own weight and form ice.

Earth's two current continental glaciers, the Antarctic and Greenland Ice Sheets, comprise about 99% of Earth's glacial ice, and approximately 68% of Earth's fresh water. The Antarctic Ice Sheet is vastly

larger than the Greenland Ice Sheet and contains about 17 times as much ice. If the entire Antarctic Ice Sheet melted, sea level would rise by about 80 m and most of Earth's major Acting Glaciers would be submerged.

Alpine glaciers (aka valley glaciers) originate high up in the mountains, mostly in temperate and polar regions, but also in tropical regions in high mountains (e.g. in the Andes Mountainsof South America). The flow of alpine glaciers is driven by gravity, and primarily controlled by the slope of the ice surface. Alpineglaciers grow due to accumulation of snow over time.

Glacial Deposits:

Sediments transported and deposited during glaciations are abundant throughout Canada. They are important sources of aggregate for construction materials (sand, gravel), and are also important groundwater reservoirs. Because they are almost all unconsolidated, they have significant implications for slope stability and mass wasting

Unconsolidated Sediment: A sediment that is loosely arranged or unstratified (not in layers) or whose particles are not cemented together (soft rock)

Mass wasting: the movement of rock and soil down slope under the influence of gravity.

Paleoclimatology: _____the study of how climate has changed during the entire history of the Earth.

can be used to understand how and why our climate changes and to predict future climate change.

lately: thermomenters, radar, satelites

historically: tree rings, ice layers, sediment varves

Why study Paleoclimatology: ____

The paleoclimate records show that the Earth's climate has always been changing. Scientists want to know if contemporary (present day) climate changes are natural or unprecedented.

Climate Proxies: ____

Scientists have been recording climate data for around 150 years. Therefore, when they need to estimate climate conditions from long before that in the geologic past, they study climate data that has been preserved in the environment. These environmental records are called climate proxies.

ex: ice cores, tree rings, coral, ocean and lake sediment, sedimentary varves Sedimentary Varves:

A varve is composed of an annual sediment layer taken from a core.

Varves as Climate Proxies: _

Varves can be used as a climate proxy due to the variability in their annual thickness.

Thicker varves indicate warmer climate years.

Thinner varves indicate colder climate years.

Changes in varve thickness can be plotted against time to determine climate variability.

Varves in a core

