

The Ohio State University  
ES 1100- Planet Earth Final Study Guide

## Chapter 22 – Glaciers

Terms:

Ablation- melting

Albedo- reflectivity

Arête- a “knife edge” ridge: formed by 2 cirques eroded toward one another

Cirque- glacier that fills a mountaintop bowl

Continental glacier- vast ice sheets covering large land areas

Equilibrium line- line where the zone of ablation and zone of accumulation meet

Firn- change from snowflake to compacted grain of ice

Fjord- U-shaped trough flooded by the sea, caused by a glacier

Glacial advance- caused by gravity, toe: leading edge of glacier, always facing downhill

Glacial till- sediment dropped by glacial ice

Glacial retreat- when rate of ablation > rate of accumulation, toe retreats up slope

Hanging valley- intersection of tributary and trunk glacier, creates a waterfall

Horn- pointed mountain peak: formed by 3 or more cirques

Ice sheet- large ice sheets covering land

Loess- wind transported silt

Moraine- unsorted debris deposited by a glacier

Mountain glacier- flow from high to low elevation

Tarn- lake made by a glacier

U-shaped valley- distinctive trough caused by glacial erosion

Zone of ablation- area of net ice loss

Zone of accumulation- area of net snow addition, colder temperature

Topics/Questions:

How does glacial ice behave at the surface? And closer to the base? (elastically, plastically, solid, liquid, ductile, brittle)

- Surface- upper 60m of ice, brittle, has cracks
- Base- below 60m, plastically, ice crystals may stretch or shear past one another

How are sediments sorted in glacial deposits? Well or poorly sorted? Coarse or fine grained?

- All grain sizes, unsorted

What gas concentration in the atmosphere is important to whether glaciers will form?

- Carbon dioxide and methane

What % of Earth’s surface is covered by glaciers?

- About 10%

Where are continental glaciers located?

- Antarctica and Greenland

What does ice with high albedo mean?

- The ice reflects most of the light that falls on it

## Chapter 17 – Streams

Terms:

Base level- lowest elevation to which a river can flow, usually the mouth

Bed load- larger particles that roll, slide, or bounce along the bed

Delta- triangle of sediment at the mouth of a river

Dissolved load- ions in water from mineral weathering

Drainage network (dendritic, rectangular, radial, trellis)- array of linked channels

Ephemeral stream- stream where water doesn't flow all year, only after heavy rainfall or flooding

Floodplain- land adjacent to river or stream

Meanders- looping curves of a river or stream

Oxbow lake- U-shaped freestanding body of water

Point bar- inside curve of a meander

Runoff- water in motion over the land surface

Stream capacity- maximum sediment load transported

Stream competence- maximum particle size transported

Suspended load- fine particles that are suspended in the water

Thalweg- deepest part of the channel

Trunk stream- formed when tributaries merge to form a larger stream

V-shaped valley- gently sloping sidewalls of a river create a "V"

Watershed- drainage basins or catchments

Topics/Questions:

Where does flowing water come from in streams?

- Melted snow, rain, groundwater, ect.

Stream drainage patterns

- dendritic, rectangular, radial, trellis



Stream water flows faster at steep or gentle gradient AND well-developed meanders or straight channel?

- Steep gradient and straight channel

Distinction between valley and canyon.

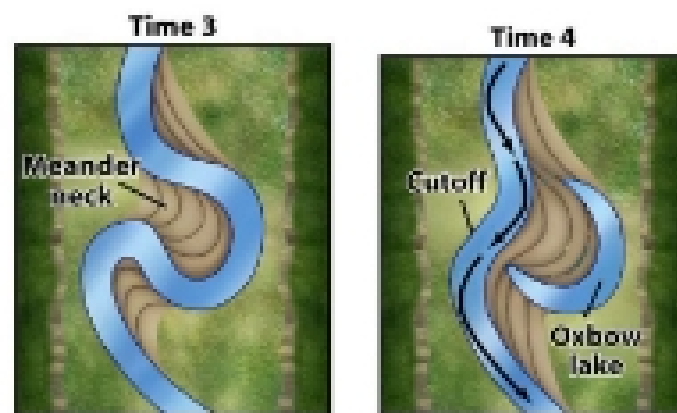
- Valley- gentle sloping sidewalls
- Canyon- steep sidewalls form cliffs, sometimes has stair-like walls

In a meandering stream, where will the sediment be deposited? Where will be eroded?

- Point bar- slower moving water, sediment is deposited
- Cut bank- faster moving water, sediment is eroded

How is an oxbow lake formed?

- When a meander is cut off from the main stream



Which is more catastrophic? 100 year or 50-year flood?

- 100 year flood

## Chapter 19 – Groundwater

Terms:

Aquifer- underground layer of water-bearing permeable rock

Aquitard- confines groundwater, hinders flow

Artesian spring/well- tap confined tilted aquifers

Cone of depression- caused by groundwater pumping, water table declines and forms a pointed conical-shaped surface near the well

Confined aquifer- has an aquitard above it

Groundwater- resides in pore spaces of aquifer

Groundwater contamination- from human activity, from dissolved organic and inorganic compounds, dissolved metals, and pathogens microbes

Hydraulic gradient- special change in hydraulic head

Hydraulic head- potential energy driving flow of groundwater (elevation and pressure)

Karst landscape- from limestone dissolution, forms irregular terrain

Perched water table- lens shaped aquitards, prevents infiltration to water table

Permeability- degree of pore interconnectedness

Pore space- spaced in sediment that hold either air or groundwater

Porosity (primary and secondary)- percent volume of open space in rock or sediment, primary: originally formed with the material, secondary: develops later through fracturing, faulting, or dissolution

Recharge area- land that groundwater infiltrated through

Saline intrusion- beneath costal land, pumping causes intrusion into fresh ground water

Saturated zone- pores filled with water below the water table

Sinkhole- karst landform, roof collapse of caves caused by limestone dissolution

Spring- natural groundwater outlet

Unconfined aquifer- exposed at the earths surface

Unsaturated zone- pores filled with air above the water table

Water table- subsurface boundary that marks the beginning of groundwater

Well- holes excavated or drilled to obtain groundwater