Water on Earth

Streams and Rivers

Earth Science

Streams

Streams are bodies of water that have a current (in constant motion).

- Geologists categorize streams depending on size, depth, speed, and location.
  - Creeks, brooks, tributaries, bayous, and rivers are all streams
  - Rivers are the largest streams
- Streams have water which always flows downhill.
  - Form that downhill movement takes varies with rock type, topography, and other factors.
- Stream erosion and deposition are creators and destroyers of landforms.

Fun Fact!

The farmland in the Central Valley of California is among the most productive in the world. Besides good soil and a mild climate, the region has a lot of water. Streams drain off of the Sierra Nevada Mountains to the east and join the mighty Sacramento and San Joaquin Rivers in the Central Valley.

Parts of a Stream

- Source
  - A stream originates at its source
  - Likely to be in the high mountains (snow collects in winter and melts in summer)
  - Might be a spring
  - A stream may have more than one source
- **Confluence:** Where two streams come together
  - **Tributary:** the smaller of two streams is a tributary of the larger stream
- **Mouth:** where a stream enters a larger body of water (lake or ocean)
- **Estuary:** where a stream meets an ocean or lake
  - Mix of fresh and salt water creates a diversity of environments
  - Many different organism types create unique ecosystems

The confluence between the Yellowstone River and one of its tributaries, the Gardiner River, in Montana.

The mouth of the Klamath River creates an estuary where it flows into the Pacific Ocean in California.

Stages of a Stream

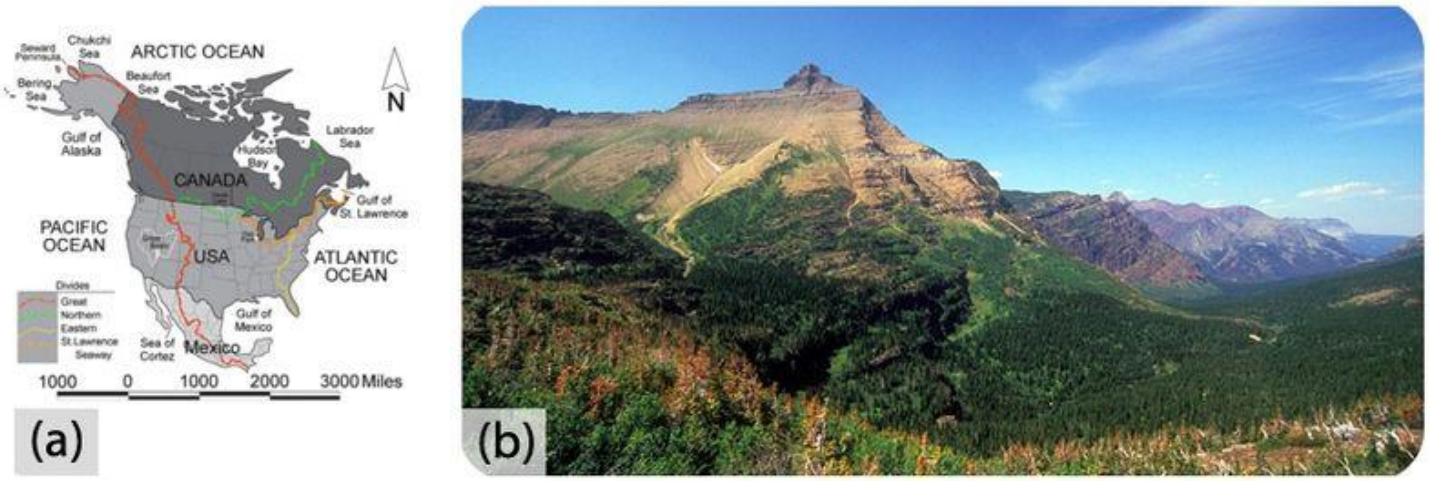
As a stream flows from higher elevations (i.e. mountains) to lower elevations (i.e. ocean), work of stream changes

- **Headwaters:** Location where stream forms (usually high in mountains)
    - Gradients are steep, stream moves fast, and stream bed is eroded
- **Meander:** a bend or curve in a stream channel; develops when a stream…
    - Moves into lower areas, the gradient is not as steep
    - Does more work eroding the edges of its banks
- **Floodplain:** region near a stream where water from stream overflows during floods
    - River moves onto flatter ground and stream erodes the outer edges of its banks to carve a floodplain
- **Base level:** where a stream meets a large body of standing water
    - Streams work to down cut in their stream beds until they reach base level
    - The higher the elevation, the farther the stream is from where it will reach base level (and the more cutting it has to do)
    - The ultimate base level is sea level

Divides

A **divide** is a topographically high area that separates a landscape into different water basins

- Rain that falls on the north side of a ridge flows into the northern drainage basin
- Rain that falls on the south side flows into the southern drainage basin
- **Continental divides:** divides on entire continents



(a) The divides of North America. In the Rocky Mountains in Colorado, where does a raindrop falling on the western slope end up. b) At Triple Divide Peak in Montana water may flow to the Pacific, the Atlantic, or Hudson Bay depending on where it falls.

Concept Check

- What is a stream?
- Describe the parts of a stream (confluence, tributary, mouth).
- Explain, in order, the different stages of a stream (headwaters, meander, floodplain, base level).