

Surface Water Movement



Runoff

- Once water reaches Earth's surface as precipitation, it can evaporate into the atmosphere, soak into the ground, or flow down slopes on Earth's surface.

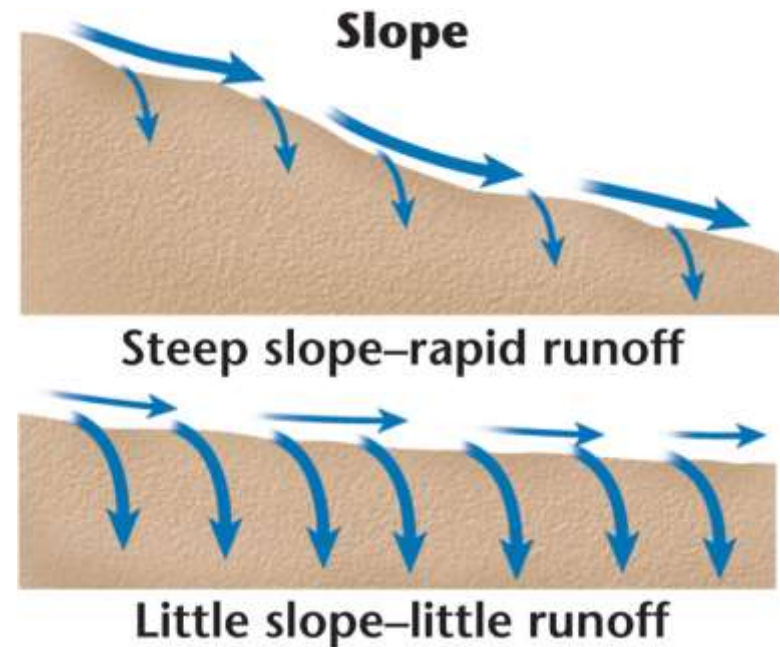
 **Runoff** is water flowing downslope along Earth's surface.

- Runoff may reach a stream, river, or lake, may evaporate or accumulate and eventually seep into the ground.
- Water that seeps into Earth's surface becomes groundwater.

Runoff

Slope

- Water from precipitation falling on slopes flows to areas of lower elevation.
- The steeper the slope, the faster the water flows.
- There is also greater potential for erosion on steep slopes.
- In areas with steep slopes, little water seeps into the ground before it runs off.



Stream Systems

- Some surface water flows in thin sheets and eventually collects in small channels.
- A stream is a channel with permanent water flow.
- All streams flow downslope to lower elevations.
- Tributaries are streams that flow into other streams, increasing the size of the stream it is joining.
- A large stream is called a river, and all its tributaries make up a stream, or river system.
- Small streams are called brooks and creeks.

Watersheds and Divides

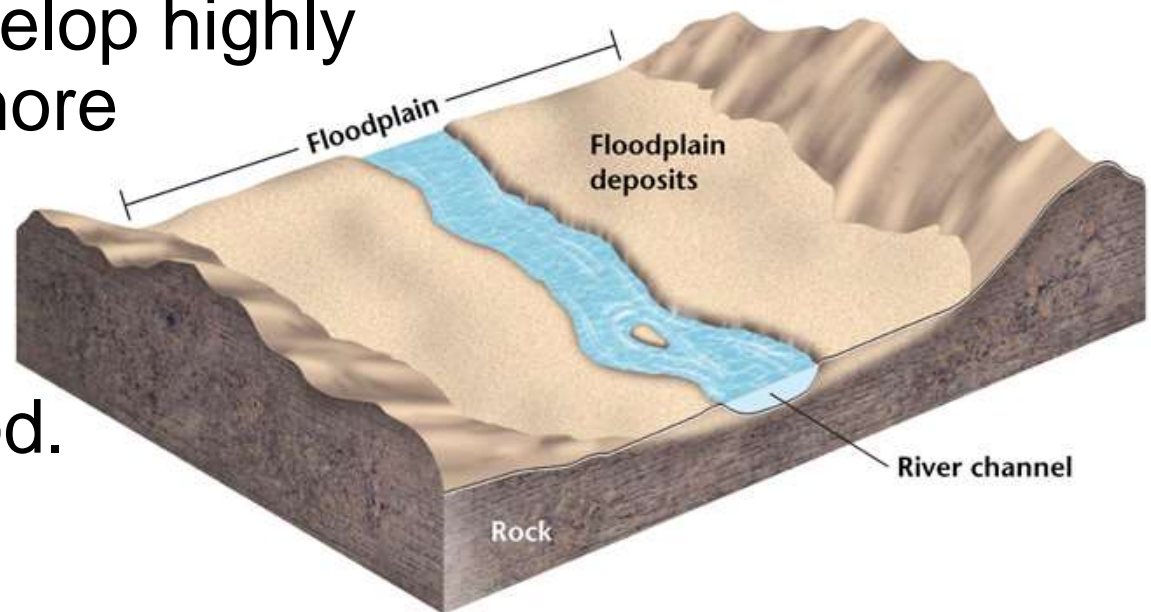
- 🔊 A **watershed**, or drainage basin, is all of the land area whose water drains into a stream system.
- 🔊 A **divide** is a high land area that separates one watershed from another.
- Each tributary in a stream system has its own watershed and divides, but they are all part of the larger stream system to which the tributary belongs.

Watersheds and Divides



Floodplains

- As floodwater recedes and its volume and speed decrease, the water drops its sediment load onto the stream's floodplain.
- Floodplains develop highly fertile soils as more sediment is deposited with each subsequent flood.




End of the Section

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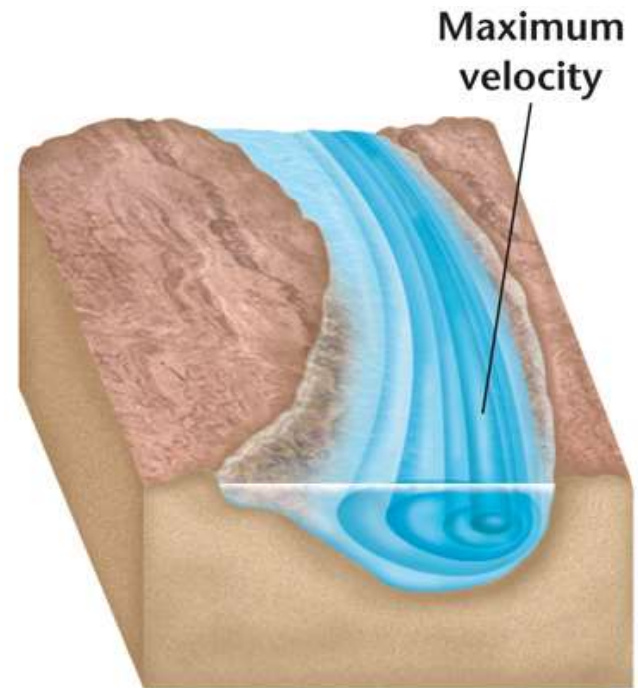


Meandering Streams

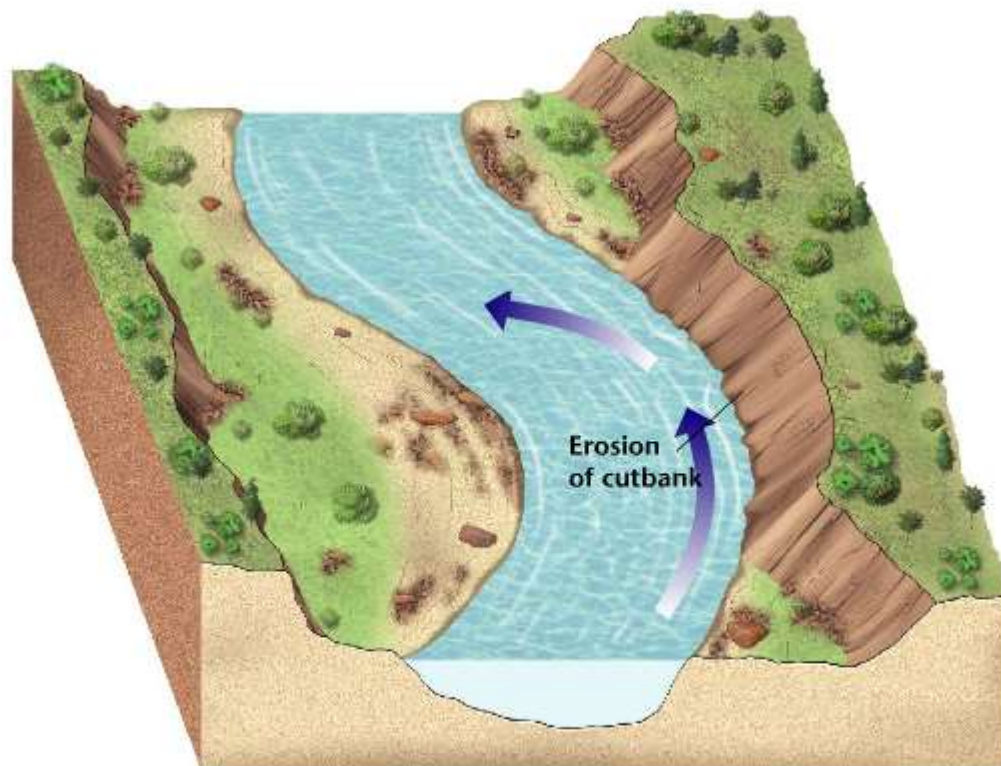
- A stream's slope, or gradient, decreases as it nears its base level, and as a result the channel gets wider.
 - The decrease in gradient causes water to build up within the stream channel.
 - Sometimes, the water begins to erode the sides of the channel in such a way that the overall path of the stream starts to bend or wind.
-  A **meander** is a bend or curve in a stream channel caused by moving water.

Meandering Streams

- The water moving along the outside of a meander curve experiences the greatest rate of flow within the meander.
 - The water that flows along this outside part of the curve continues to erode away the sides of the streambed, thus making the meander larger.
 - Along the inside of the meander, the water moves more slowly and deposition is dominant.



Meandering Streams




Meandering Streams

- It is common for a stream to cut off a meander and once again flow along a straighter path.
- The cut off meander becomes an oxbow lake, which eventually dries up.
- As a stream approaches its ultimate end point, the ocean, the streambed's gradient flattens out and its channel becomes very wide.
- The mouth is the area of the stream that leads into the ocean or another large body of water.


Deposition of Sediments

- Streams also lose velocity and the ability to carry sediment when they join larger bodies of quiet water.

 A delta is the triangular deposit, usually consisting of silt and clay particles, that forms where a stream enters a large body of water.

Lakes Undergo Change

Eutrophication

- The amount of dissolved oxygen helps determine the quality of lake water and its ability to support life.
-  – **Eutrophication** is the process by which lakes become rich in nutrients from the surrounding watershed, thereby resulting in a change in the kinds of organisms in the lake.
- Although eutrophication can be sped up with the addition of nutrients, such as fertilizers, that contain nitrogen and phosphorus.

Lakes Undergo Change

Freshwater Wetlands

- A wetland is a land area that is covered with water for a large part of the year.
- Wetlands include environments commonly known as bogs, marshes, and swamps.
 - Bogs receive their water from precipitation and their waterlogged soil tends to be rich in Sphagnum, also called peat moss.
 - Freshwater marshes frequently form along the mouths of streams and in areas with extensive deltas.
 - The constant supply of water allows for the lush growth of marsh grasses.

Lakes Undergo Change

Freshwater Wetlands

- Wetlands serve as a filtering system that traps pollutants, sediments, and pathogenic bacteria contained in water sources.
- Wetlands also provide vital habitats for migratory waterbirds and homes for an abundance of wildlife.
- From the late 1700s to the mid 1980s, the continental United States lost 50 percent of its wetlands.