

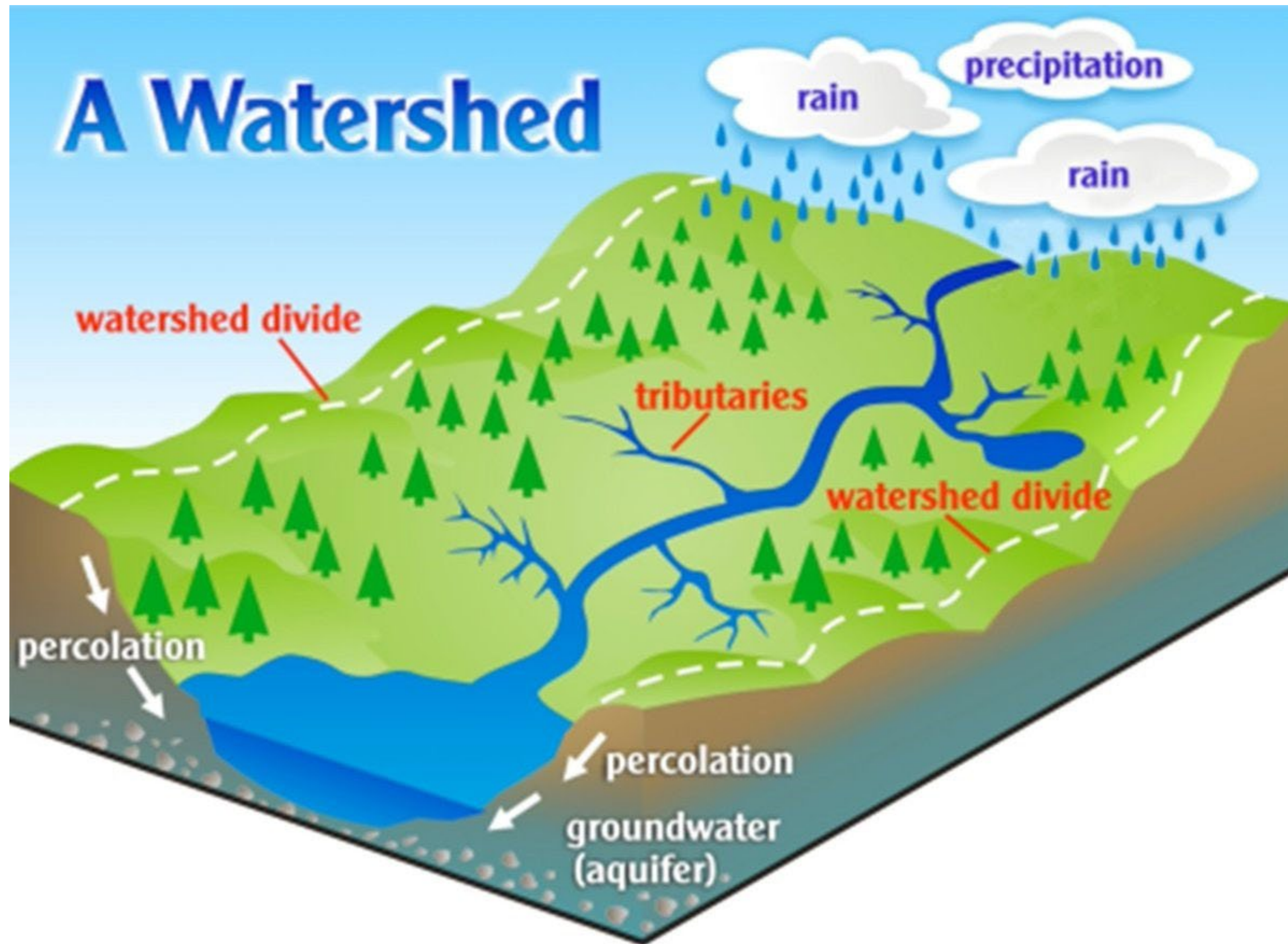
# Understanding watersheds and impacts on ecosystems

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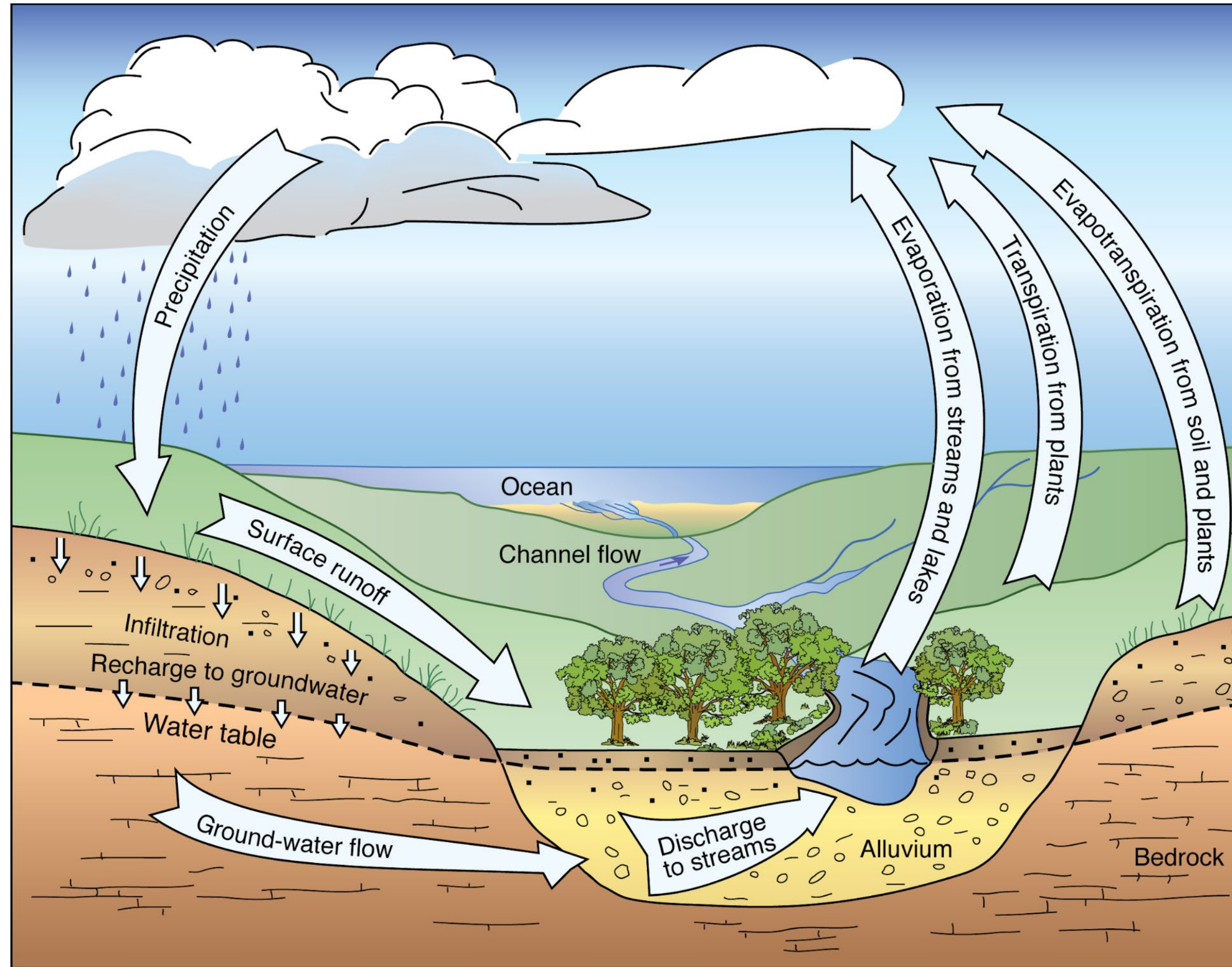
# Key terms

- **Watershed:** an area of land that runs off into a water system such as a river, stream, lake, or ocean.
- **Watershed boundary:** divides one drainage area from another.
- **Runoff:** drainage away of water from a land surface, building structure, roadway, or other surface.
- **Erosion:** gradual destruction of land surface from wind, water, or glaciers.
- **Groundwater:** water that seeps into cracks in rocks underground and between soil particles.

# Hydrologic cycle

**Process by which water cycles through the Earth and its atmosphere.**

- Water is primarily produced through precipitation, condensation, or melting snow/ice.
- It makes its way across terrain and either runs off into a water system or percolates into the ground water where it may be used as a water source.
- Some water will be held within the soil particles. This moisture is held until utilized by plants or other organisms that live in the soil.
- Water is released from plants by a process of transpiration or evaporates from bodies of water or land into the atmosphere.
- Condensation then occurs in the atmosphere to eventually create precipitation to begin the cycle over.



# Erosion

- **Water:** Water moves across a surface of land or rock resulting in the transport of rock, minerals, and soil particles/sediment into nearby watersheds.
- **Wind:** Wind moves sediment from one location to another through the air.
- **Glacial:** Rock and sediment is plucked from its original location and moved with the glacier to another location.



Gully erosion



Wind storm



Hubbard Glacier in Alaska

# Soil types and sediments

- **Sand:** Largest sediment (small, medium, large coarse)  
.075 mm to 4.75 mm size
- **Silt:** .002 to .075 mm in size
- **Clay:** Less than .002 mm

Most soil particles are not much larger than 2 mm in size. In the Midwest, a majority of soils are made up of a mixture of sand, silt, and clay. A large percent of clay in soil can result in soils that are quickly saturated, and more runoff may occur in these soil types as the water is not able to penetrate into the ground as easily due to the lack of space between the soil particles.





# Which soil is most susceptible to runoff?

## Soil texture and erosion lab

Run the experiment to determine the answer.

# Erosion lab

- In this lab you will model erosion and then attempt to create a solution to reduce/prevent erosion in the second part of the experiment.
- You will take measurements, make reliable observations, and calculate the velocity of the water flow.
- You will work together to solve a real-world problem.
- You will write a detailed laboratory report explaining your experiment and displaying data in tables and graphs.

# Additional key terms

- **Nitrates:** a nitrogen-based compound that is bonded to three oxygen atoms and is commonly used in chemical fertilizers for the growth and development of plants/crops.
- **Phosphates:** utilized in commercial fertilizers used in plant/crop growth essential for storage, seed development, and energy in plants.
- **Potassium:** another macronutrient included in chemical fertilizers that are essential in disease resistance and increased crop yields.