

Water Section 1

[< Back](#)

[Next >](#)

[Preview 🏠](#)

[Main 🏠](#)

Water



Chapter 11



< Back

Next >

Preview 🏠

Main 🏠

Bellringer

- *Think about where water comes from.*
- Is there more or less water on Earth that there was 1 billion years ago?



Section 1 Preview: Water Resources

- The Water Cycle
- Global Water distribution
- Surface Water
 - River Systems
 - Watersheds
- Groundwater
 - Aquifers
 - Porosity/ Permeability
 - The Recharge Zone
 - Wells

More

< Back

Next >

Preview 🏠

Main 🏠

Objectives

1. **Describe** the distribution of Earth's water resources.
2. **Explain** why fresh water is one of Earth's limited resources.
3. **Describe** the distribution of Earth's surface water.
4. **Describe** the relationship between groundwater and surface water in a watershed.

True or False: Water

< Back

Next >

Preview 🏠

Main 🏠

DEFINITION:

FACTS:

CHARACTERISTICS:

USERS:



About $\frac{2}{3}$ of the earth's surface is covered in water, why do you think there are shortages, droughts and famine?



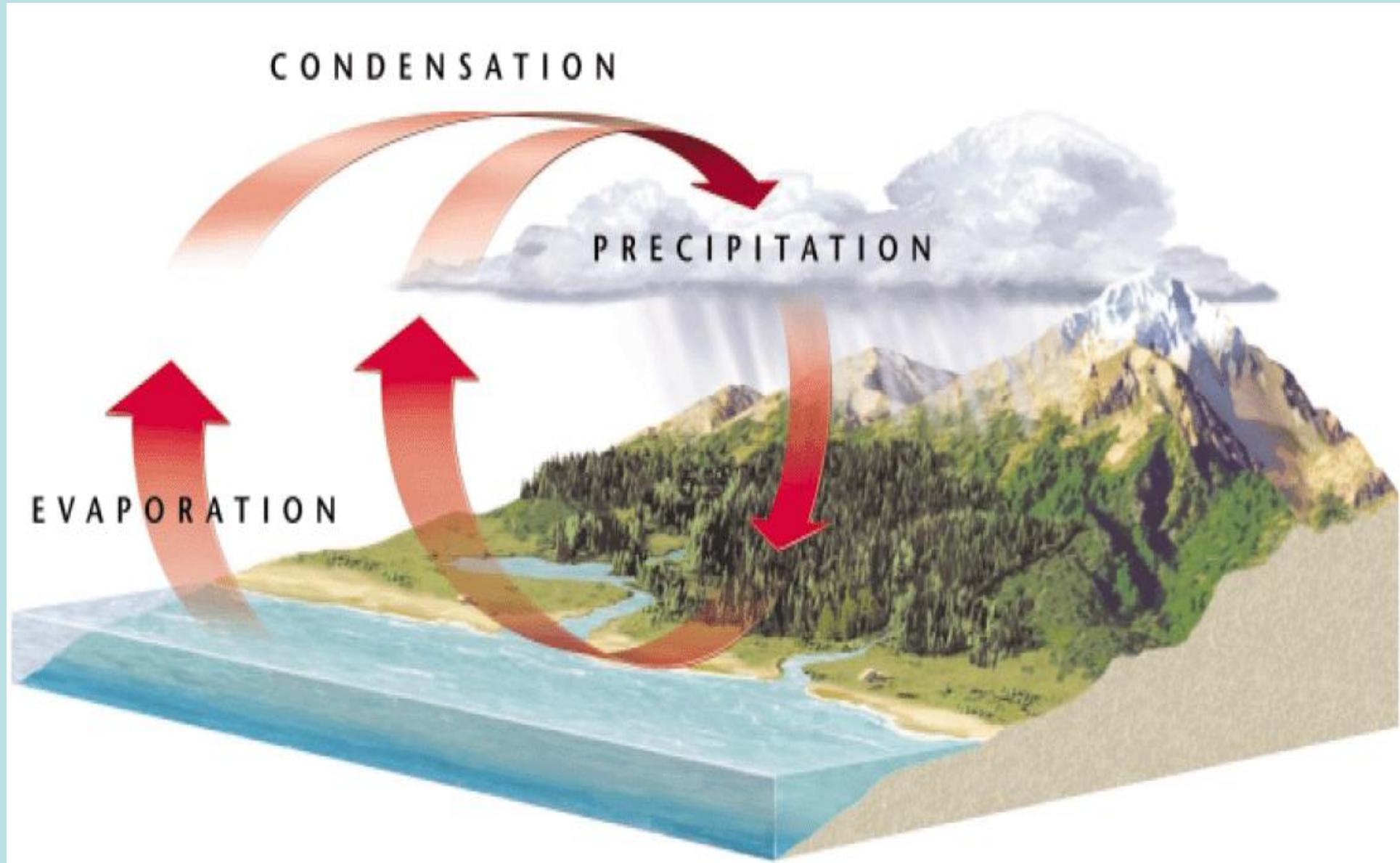
Water Resources

- Water
 - essential to life on Earth.
 - An average US household of 4 uses about 400 gallons of water
 - Humans can live
 - for more than month without food,
 - But for only a few days without water

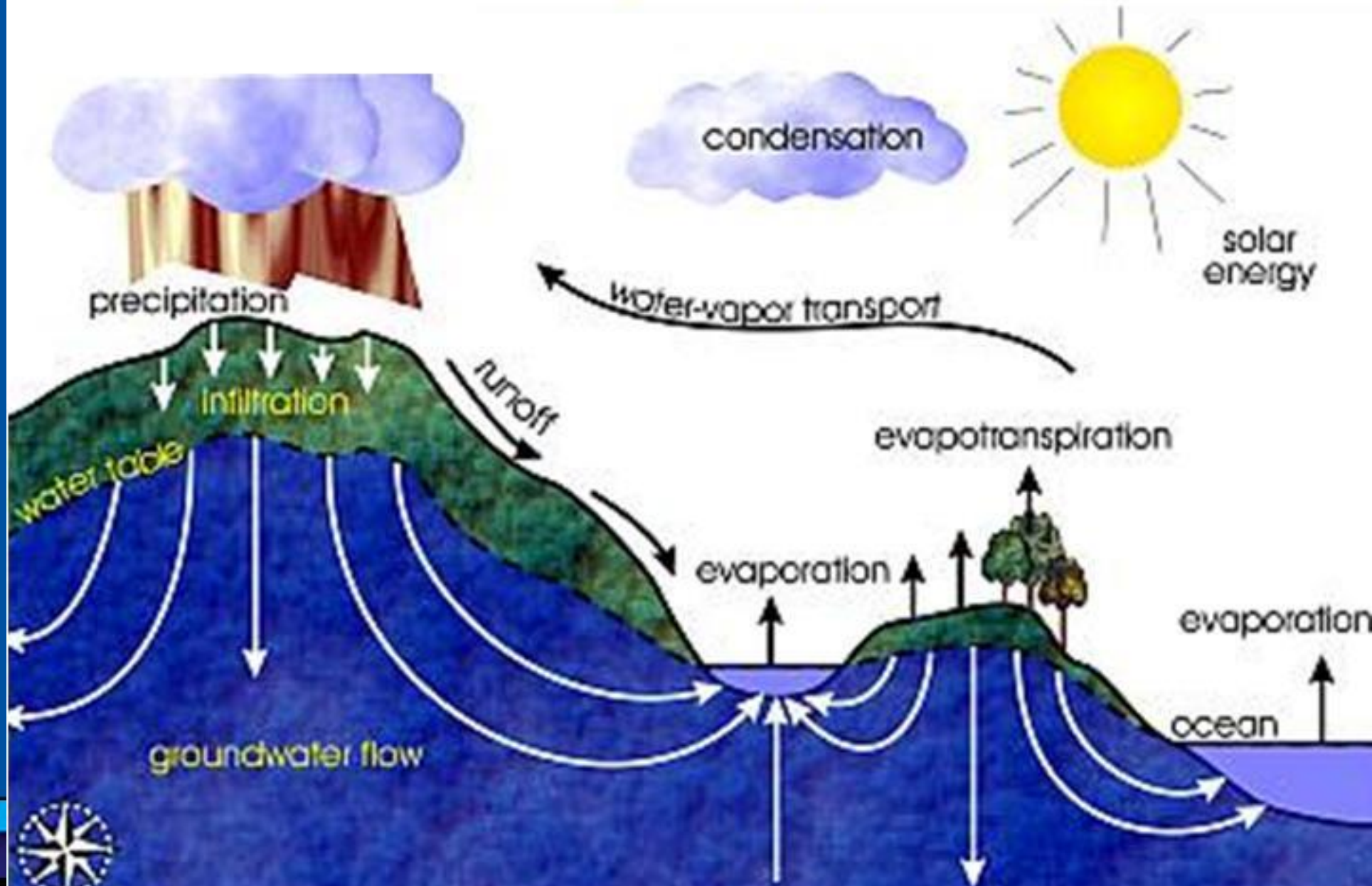
The Water Cycle or Hydrologic Cycle

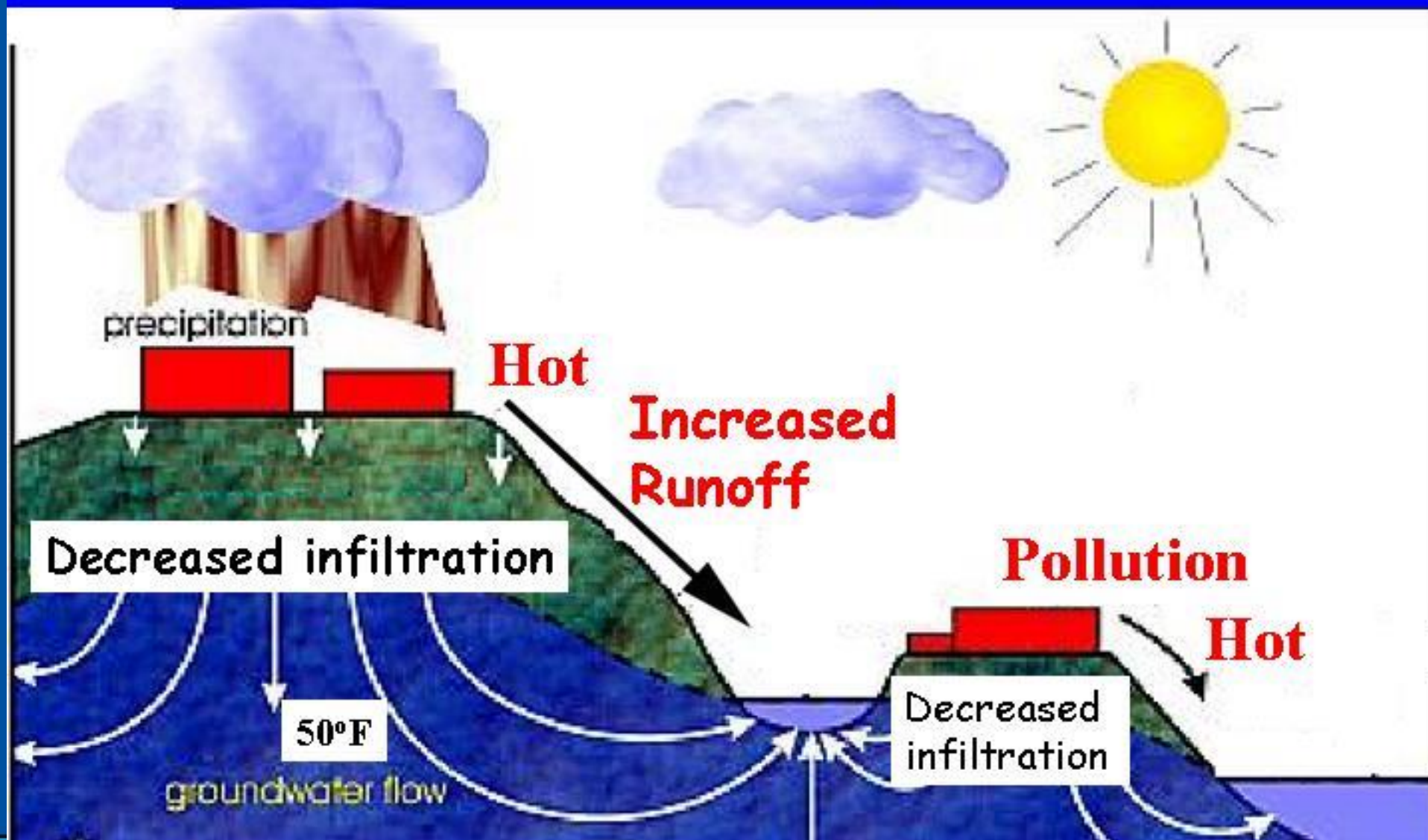
- Makes Water a **renewable** resource
- Water molecules
 - Cycles between the Earth's surface & the atmosphere.
 - Evaporates at the Earth's surface → *water vapor*
 - Water vapor (pure H₂O)
 - rises into the air.
 - condenses to form *clouds*.
 - Eventually falls back to the Earth as *precipitation*

The Water Cycle



Water Cycle (natural)





Less infiltration and more runoff

Global Water Distribution

Water covers nearly **71 percent** of the Earth's surface

Two kinds of water found on Earth:

1. Salt water,
2. Fresh water,

Salt water,

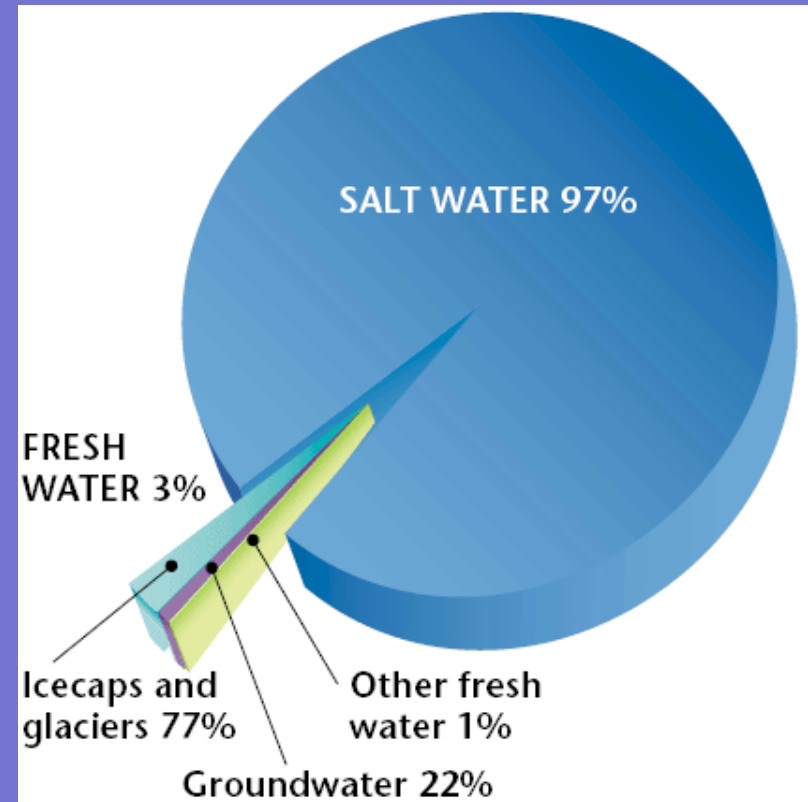
- comprises nearly 97 %
- Found in oceans and seas.
 - which contain *almost all of the Earth's water*
- contains a higher concentration of dissolved salts

Fresh

- 3% of total water
- About 77% of that is frozen in glaciers & polar icecaps.
- contains little salt.
- primary source for human (drinking & agriculture)
- Found in lakes, rivers, aquifers, atmosphere

Global Water Distribution

- Only a small percentage of the water on Earth is liquid fresh water that humans can use.
- The fresh comes mainly from
 1. lakes and rivers and
 2. a relatively narrow zone beneath the Earth's surface. (ground water)



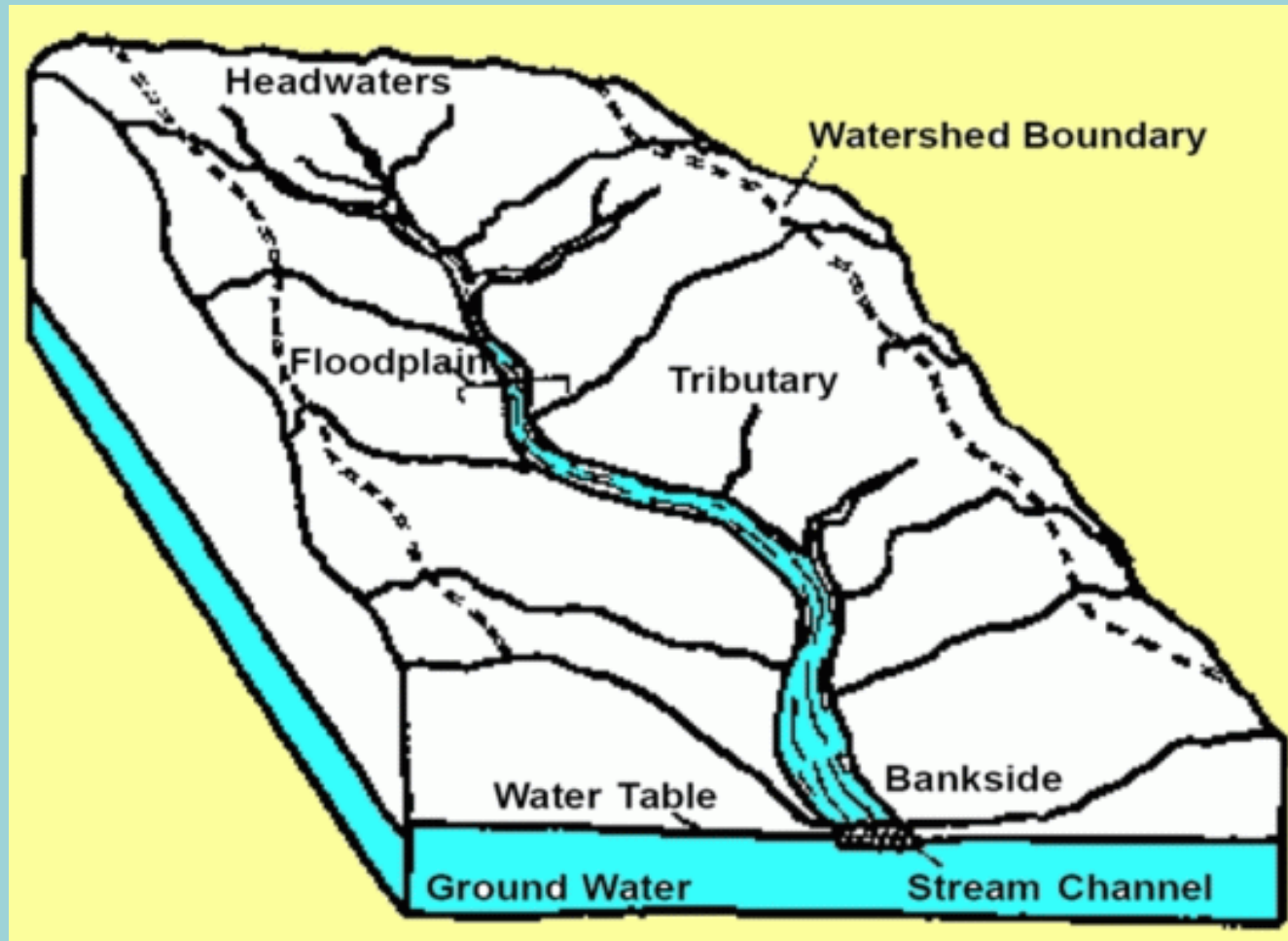
Surface Water

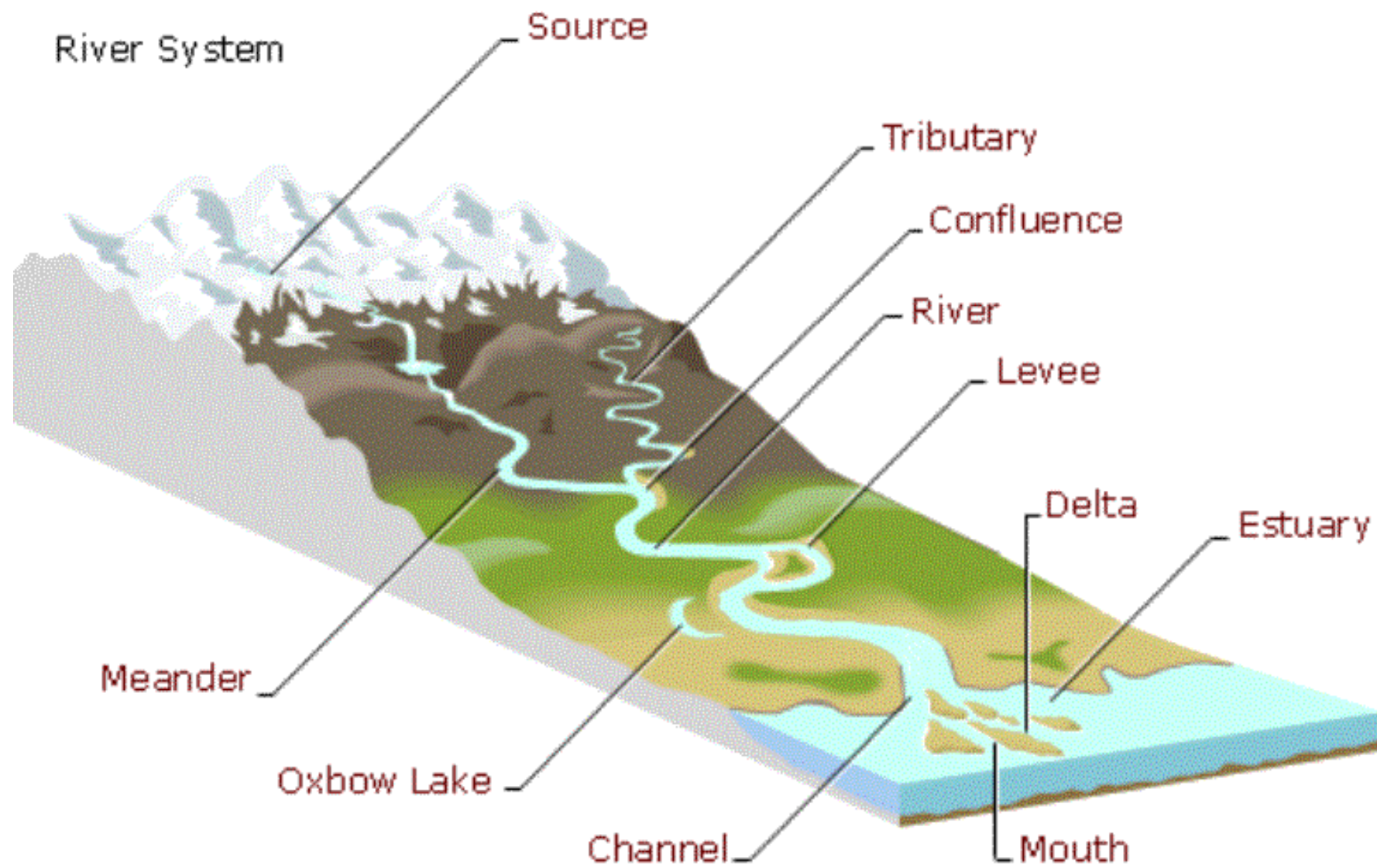
- Water that is found above the ground.
 - Fresh water on Earth's surface
 - Lakes, rivers, streams, wetlands
 - Distribution of the surface water has played a vital role in the development of human societies

The Distribution of surface water

- Today, most large cities depend on surface water for
 - drinking water,
 - water to grow crops,
 - food such as fish,
 - power for industry, and
 - transportation.

River Systems





River Systems

- Streams form from falling rain and melting snow
- Network of rivers; appears like the roots of a tree if viewed from above

US River System

- Mississippi River Drains water from 30 states and covers 40% of the land area of the US



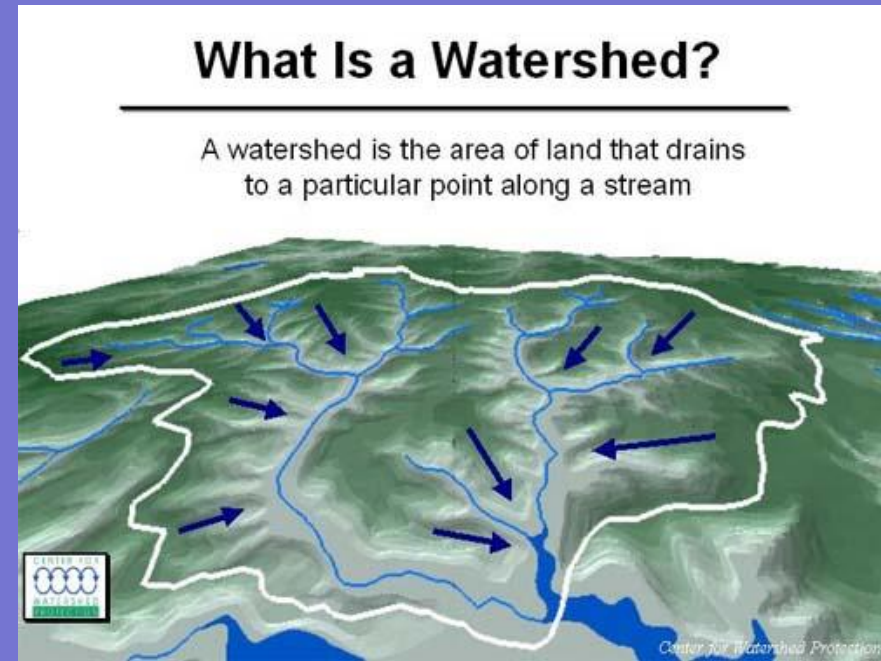
Examples:

- the longest river in the world is the Nile
- The largest is river system in the world is the Amazon

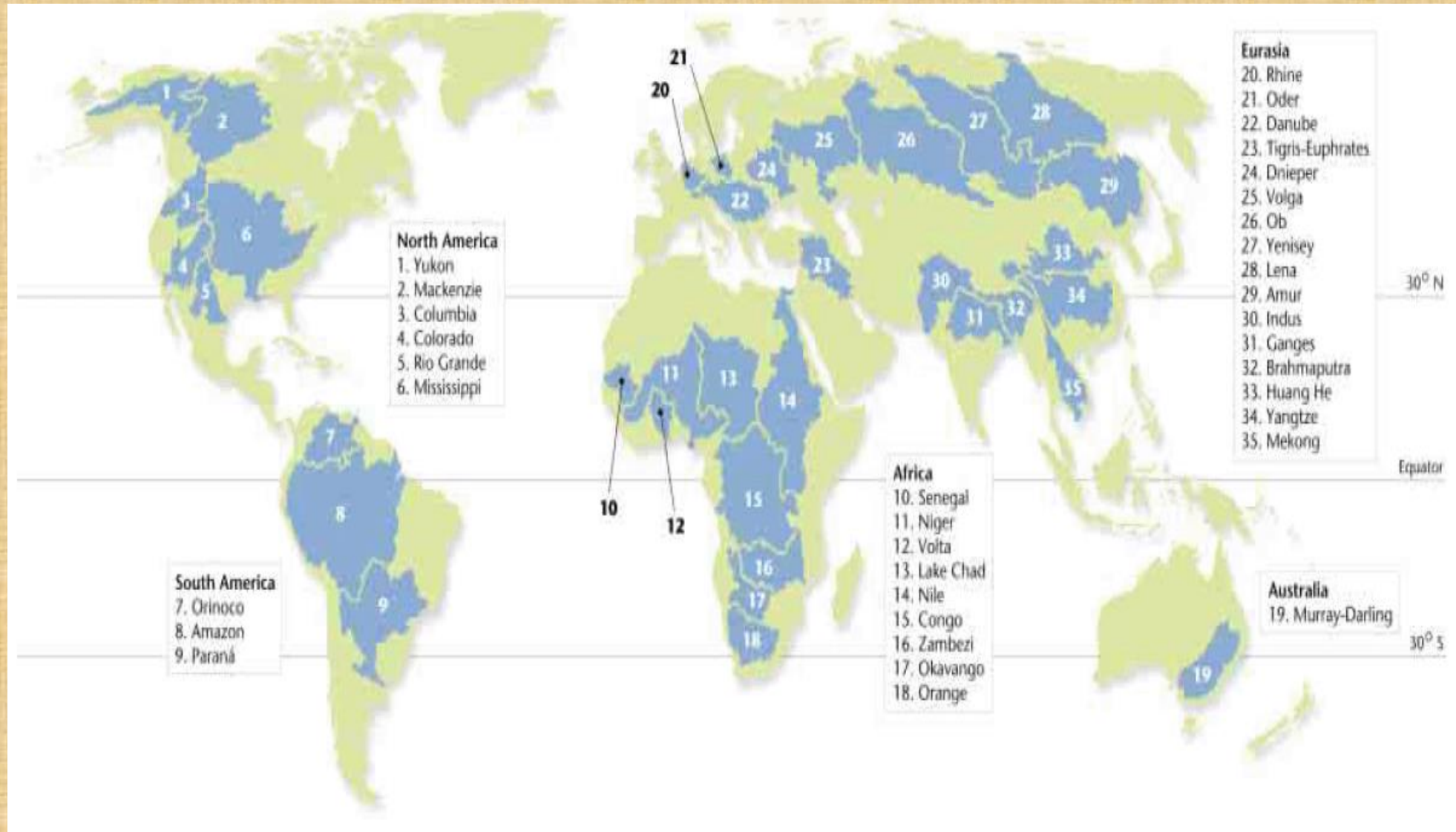
[Back](#)[Next](#)[Preview](#)[Main](#)

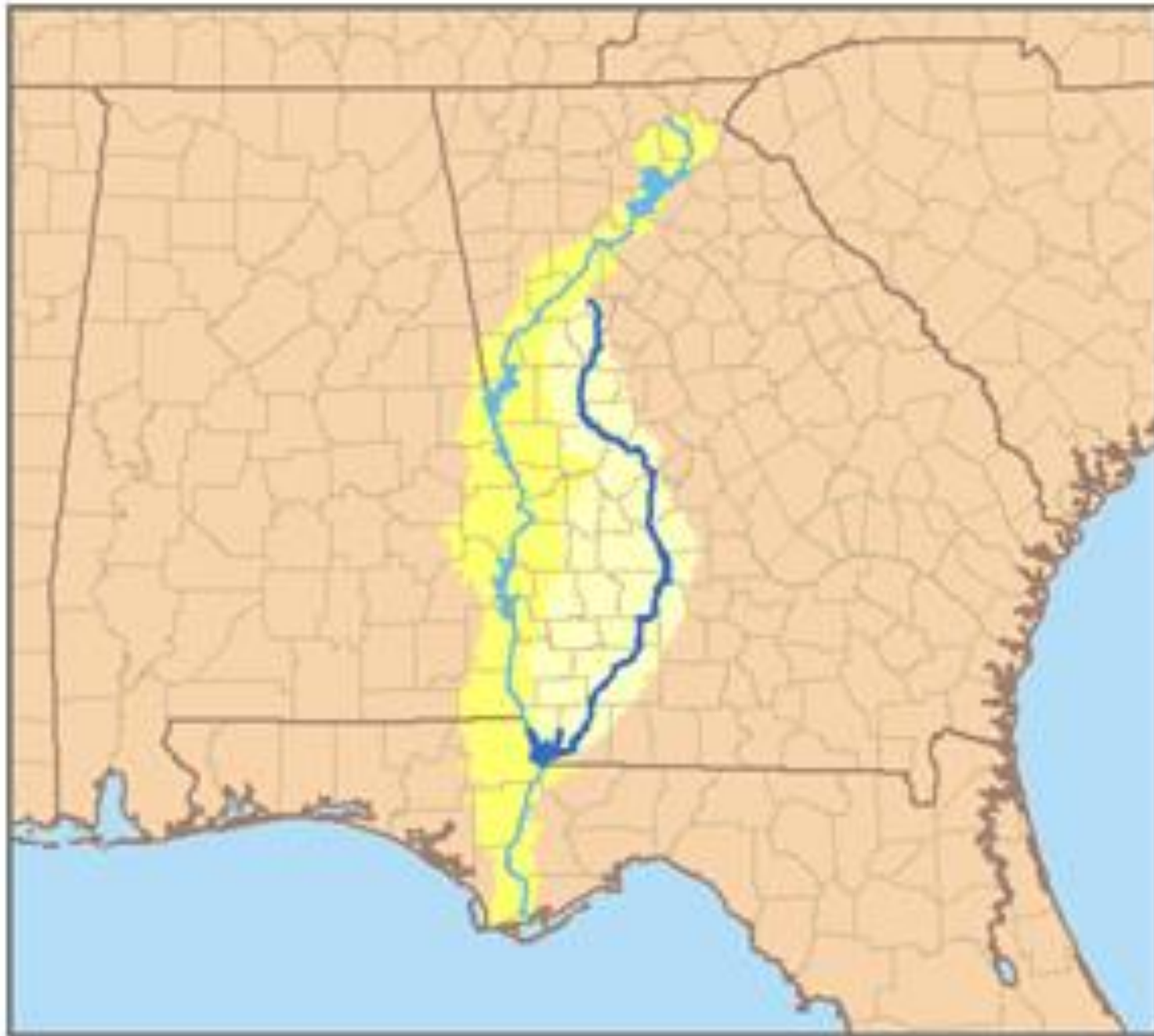
Watersheds

- the area of land that is drained by a river system.
- The amount of water that enters a watershed **varies** throughout the year.
 - (Spring and Summer higher)



Watersheds





View 

Main 

Map skills Worksheet

[< Back](#)

[Next >](#)

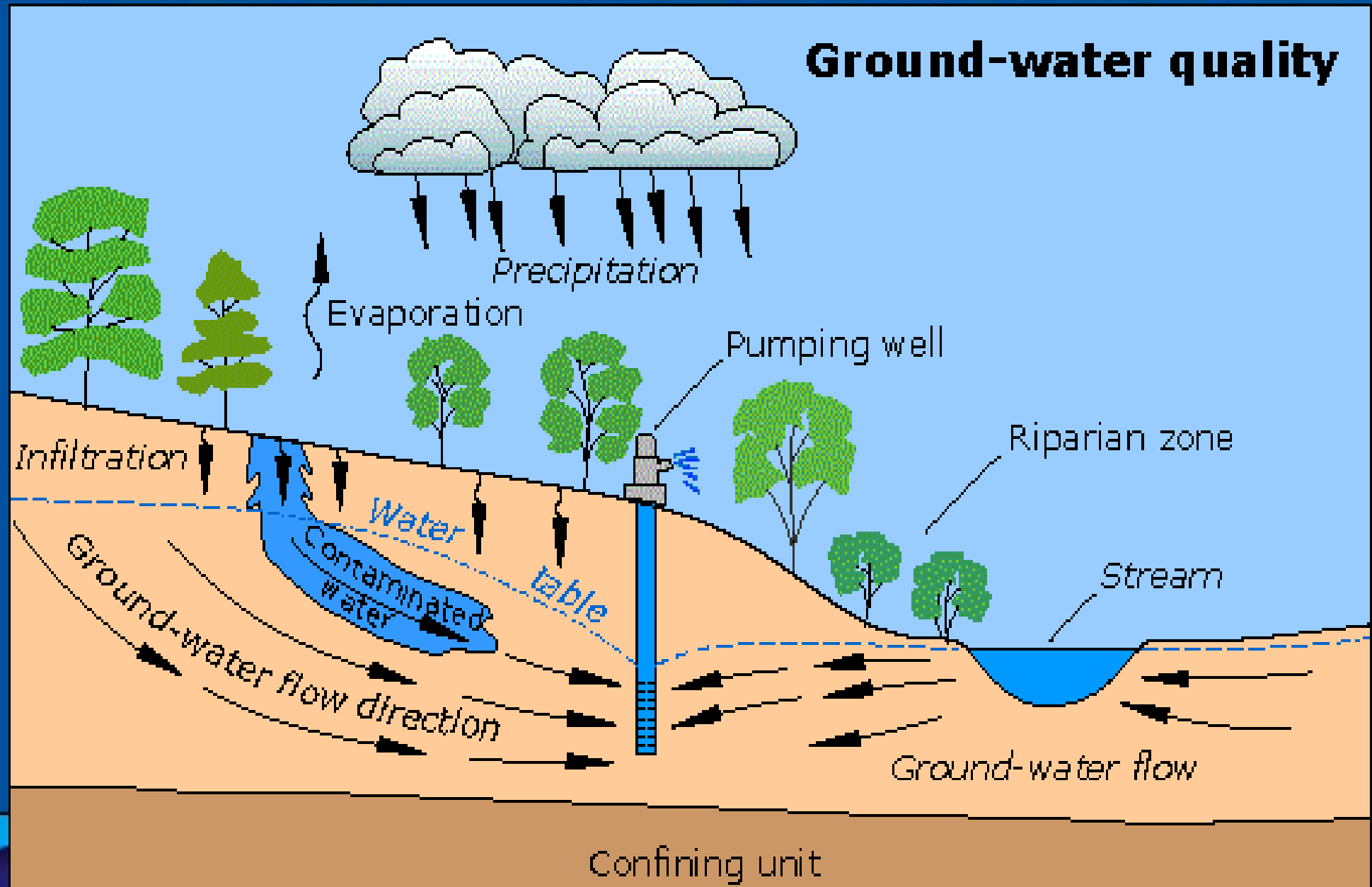
[Preview 🏠](#)

[Main 🏠](#)

Groundwater (beneath surface)

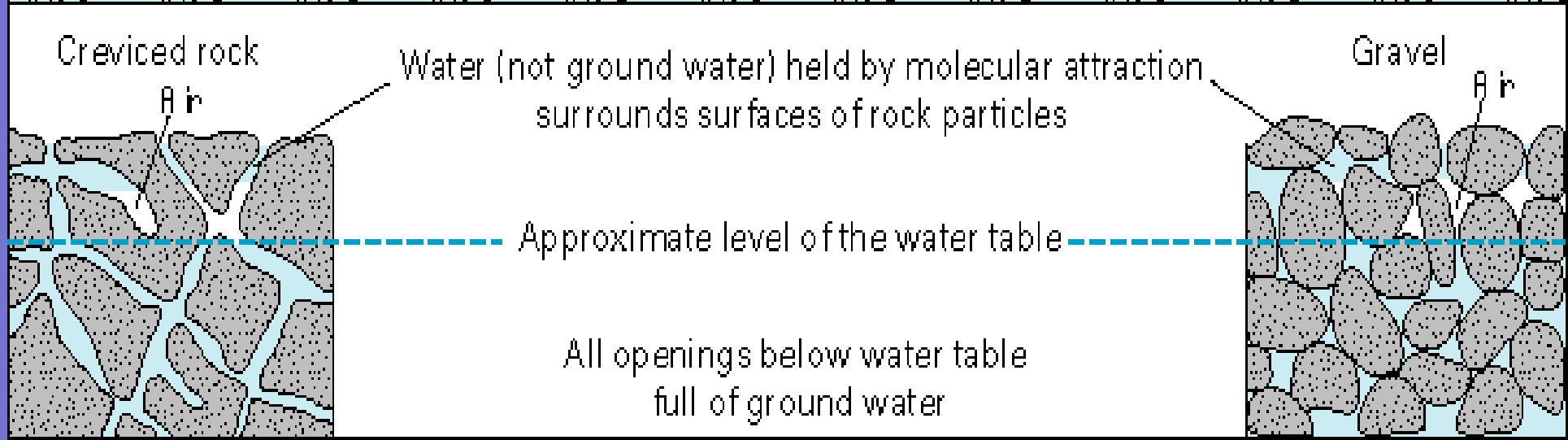
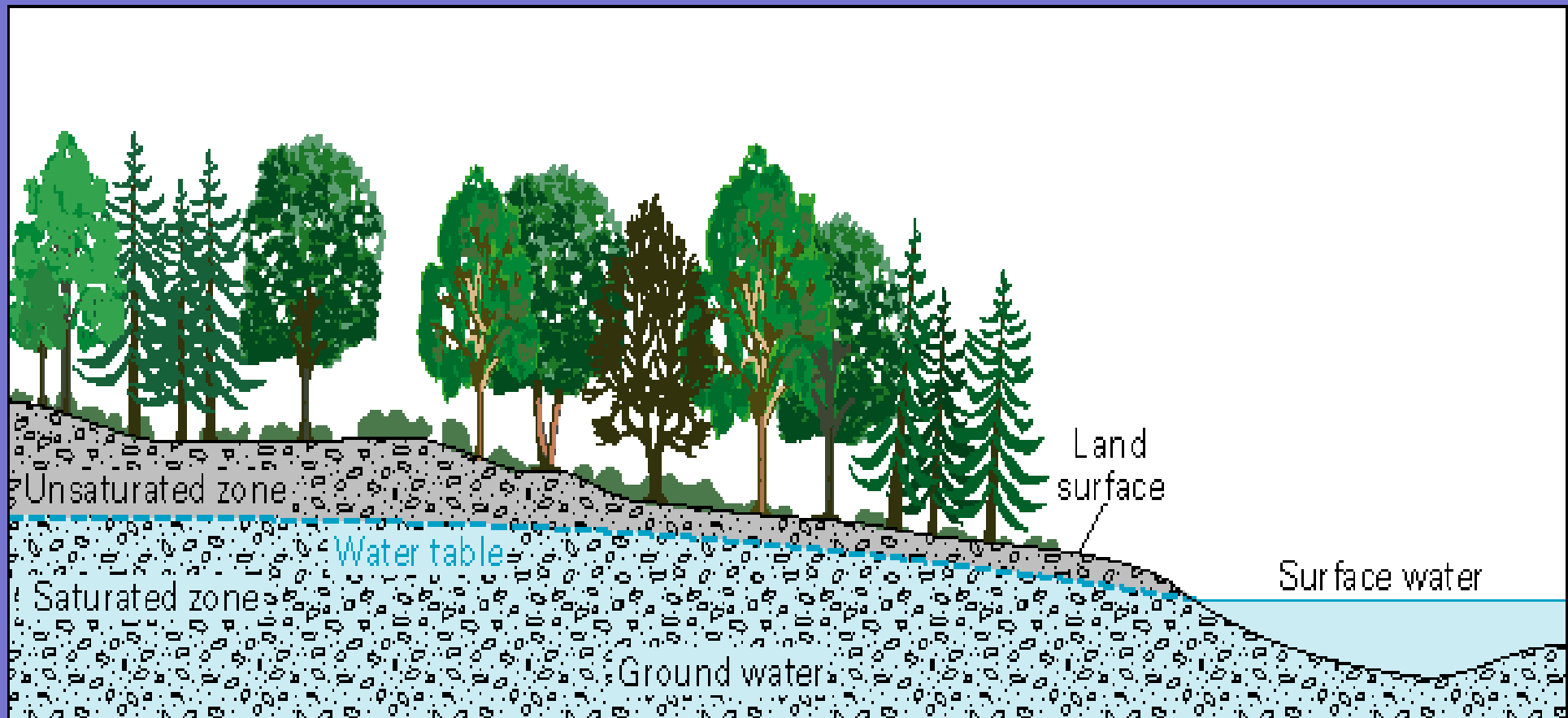
- When water percolates through soil and down into the rocks beneath (most FW found here)
- Water table: area where rocks and soil are saturated with water

Ground-water quality



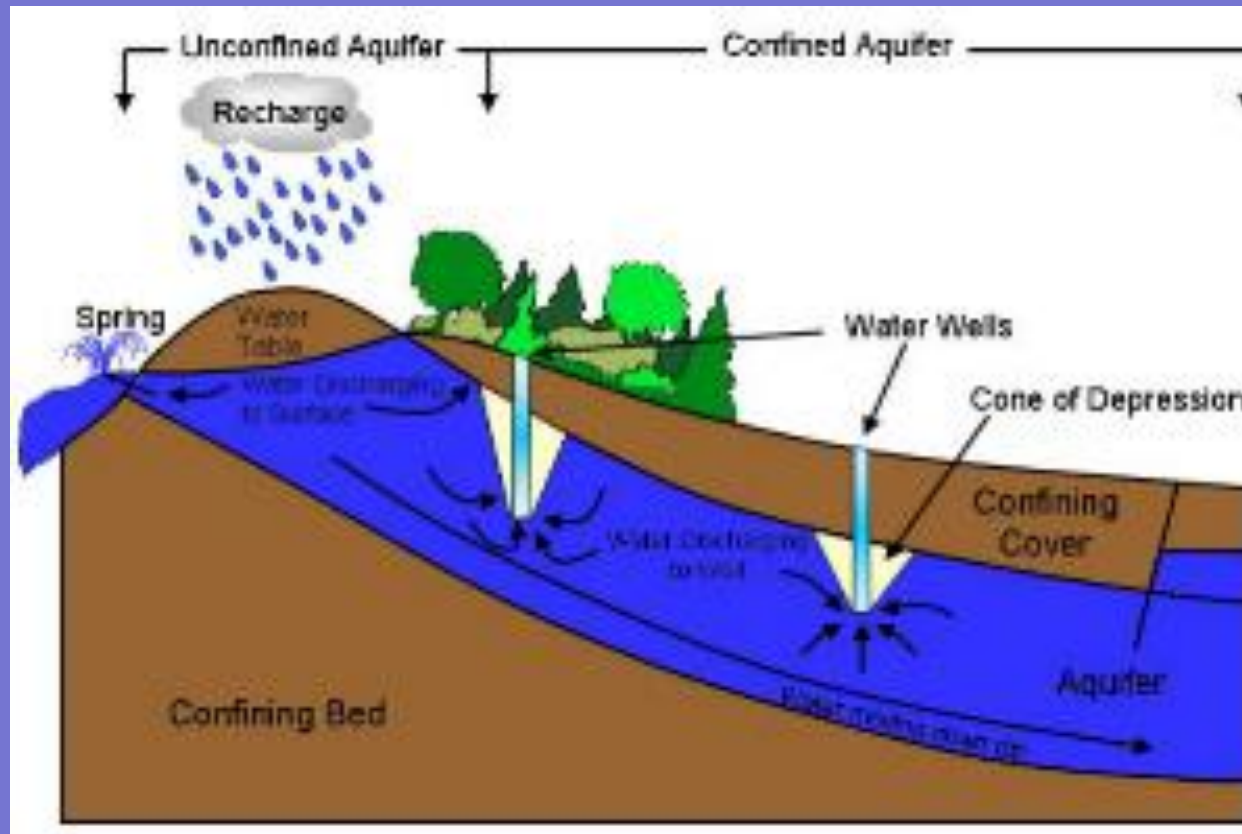
Groundwater

- If the water table is high, FW springs may flow out of ground
- In deserts, the water table is often 100 m below the surface
- The water table is made of peaks and valley that conform to land



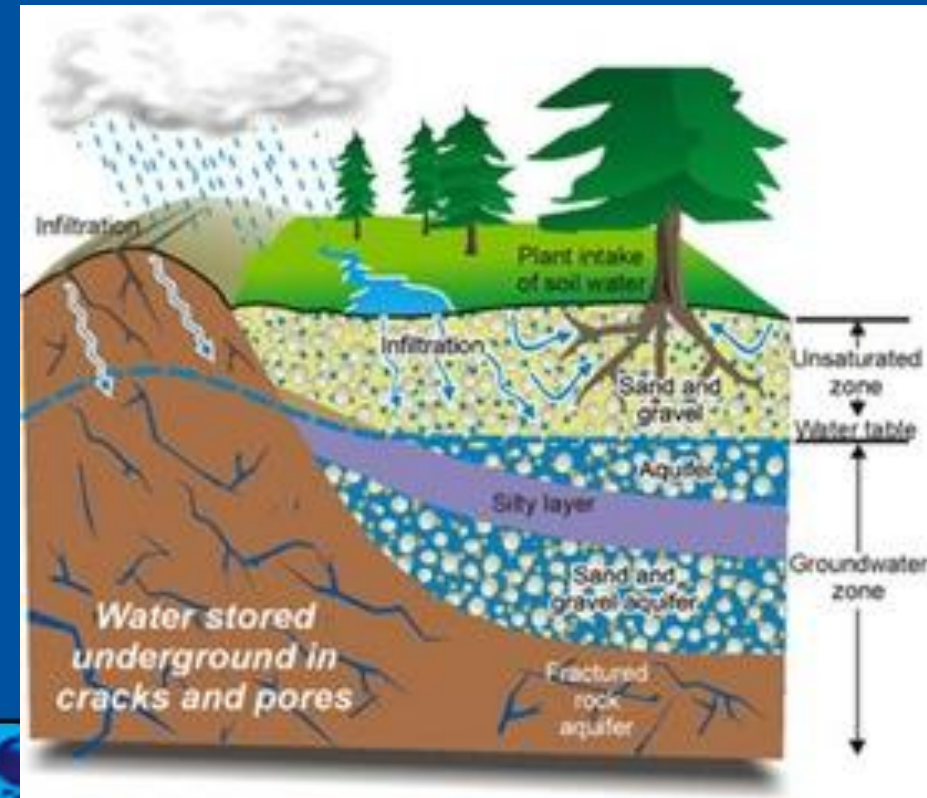
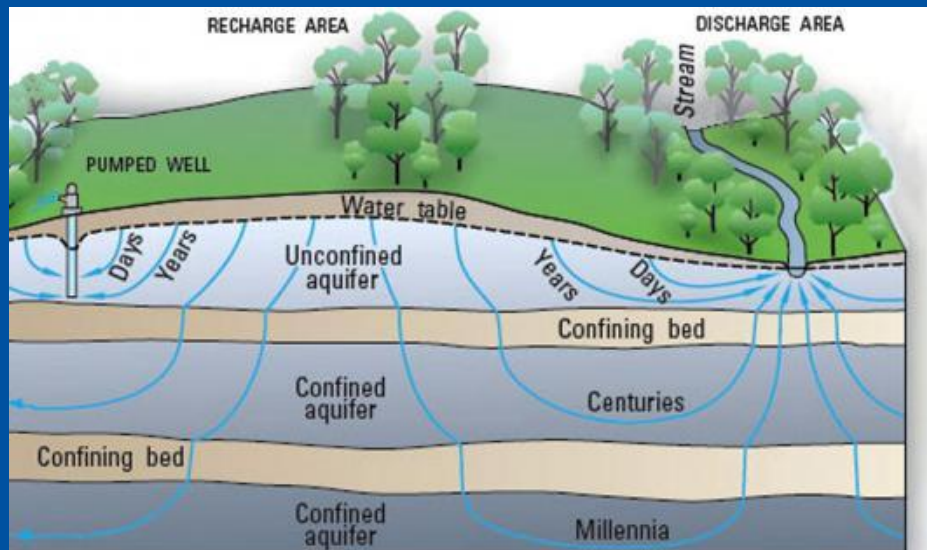
Aquifers

- A body of rock or sediment that stores groundwater and allows the flow of groundwater.
- An important water source for many cities.



Aquifers

- Most Productive aquifers form in sandstone, limestone, or layers of sand or gravel

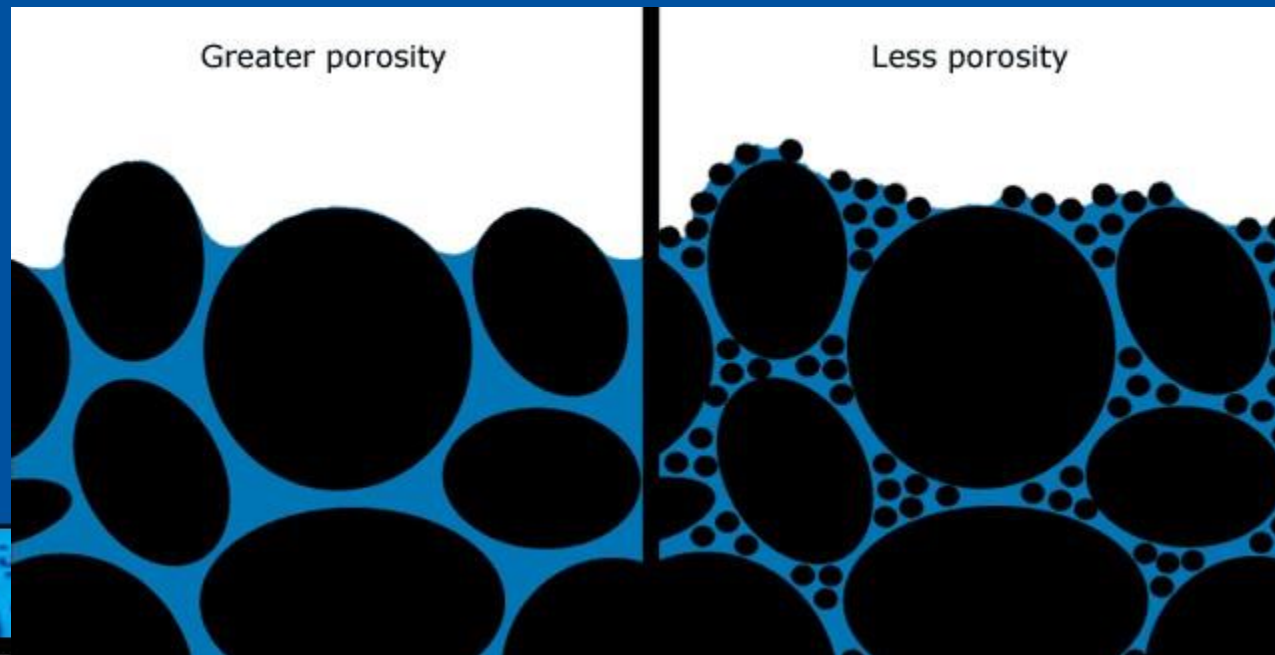


Two Factors affecting Aquifers

1. **Porosity**
2. **Permeability**

Porosity

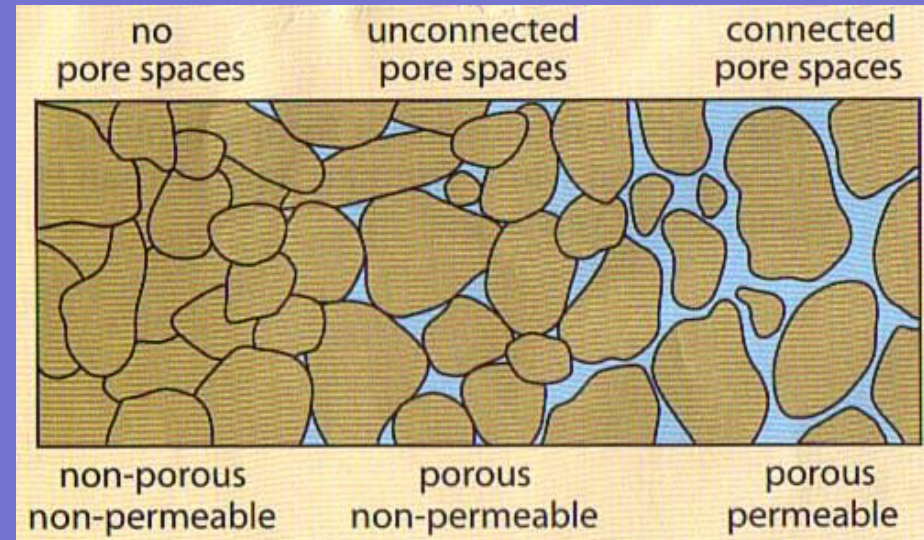
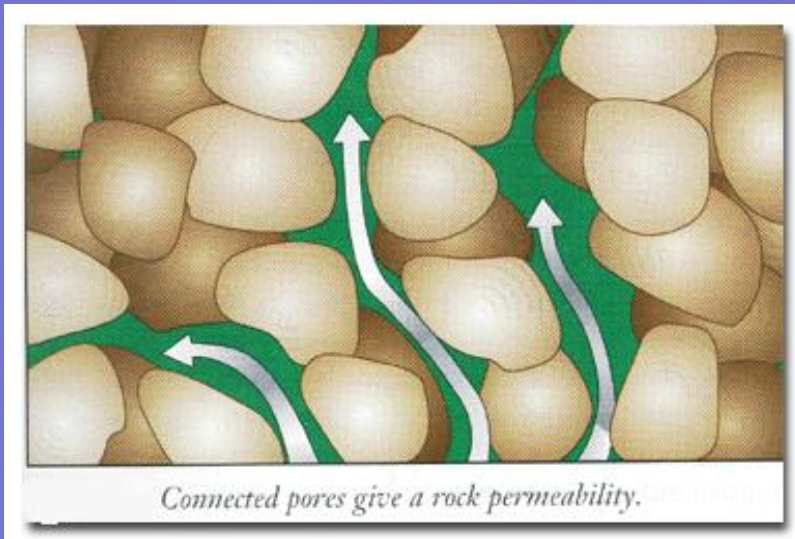
- *the **% of the total volume** of a rock or sediment that consists of open spaces.*
 - The more porous a rock is, the more water it can hold.

[Preview](#)[Main](#)

Permeability

The ability of a rock or sediment to let fluids pass through its open spaces or pores.

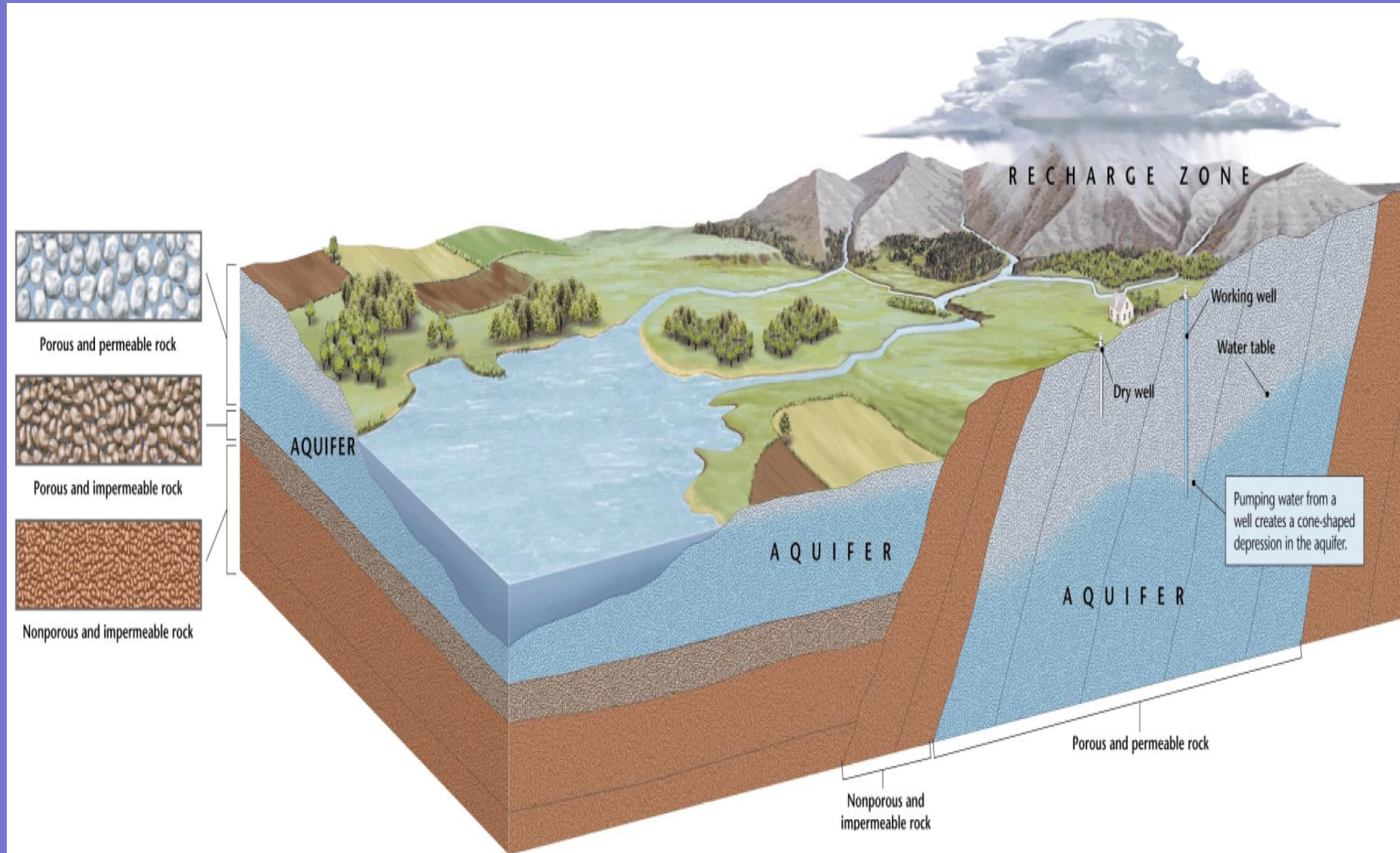
- *Permeable Materials*: (gravel)
- *Impermeable Materials* (clay or granite)



Recharge Zone

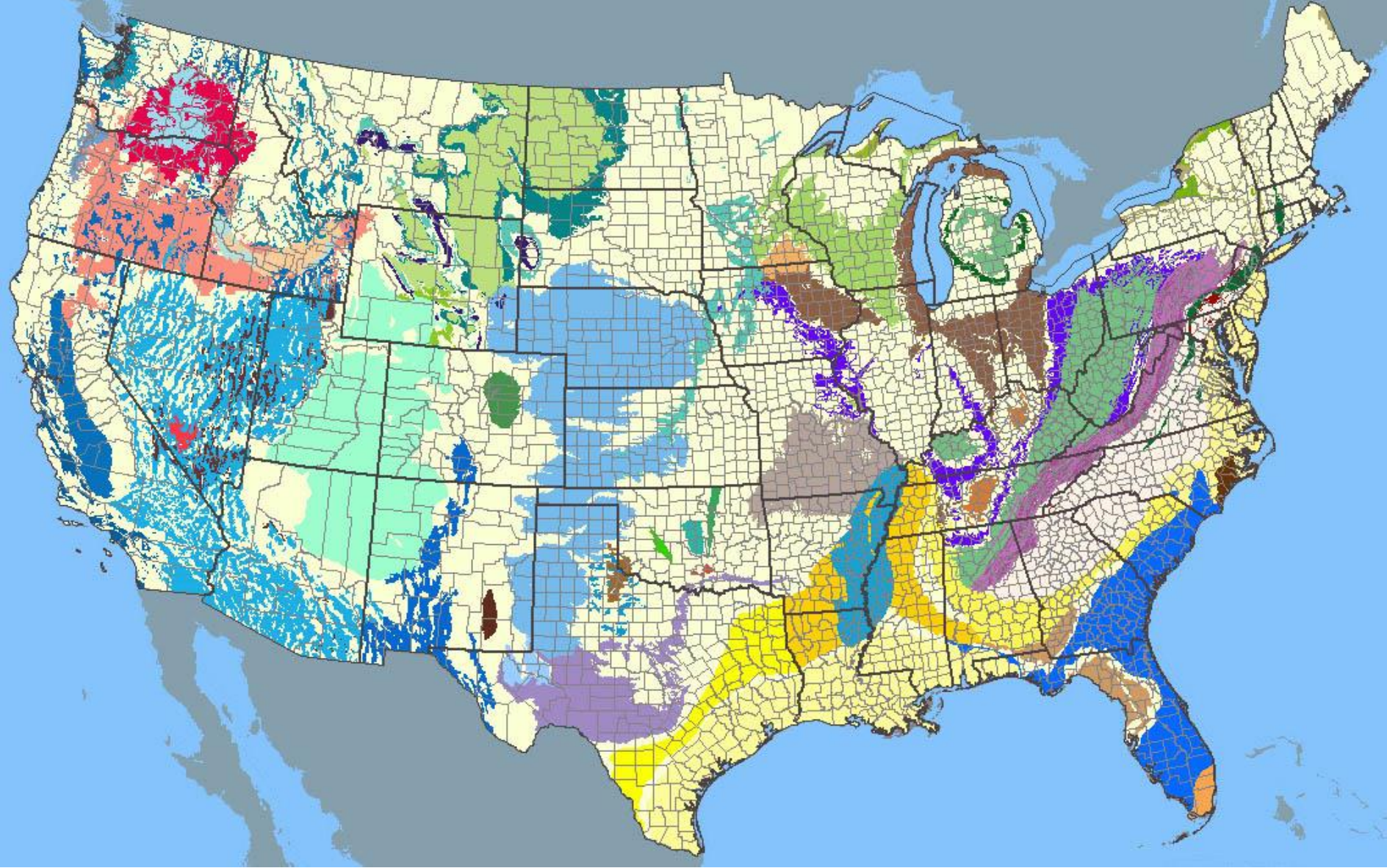
- an area in which water travels downward to become part of an aquifer.
- To reach aquifer, surface water must **travel** down through permeable layers of soil and rock.

The Recharge Zone



The Recharge Zone

- The size of an aquifer's recharge zone is affected by **permeability**.
- Environmentally sensitive (pollution can enter)
- Can take thousands of years to refill



The Ogallala Aquifer of the central US

- one of the world's great aquifers,
- underlies portions of eight states,
- contains primarily fossil water from the time of the last glaciation.

The Ogallala Aquifer of the central US

- is being rapidly depleted in places by:
 - growing municipal use, and
 - continuing agricultural use.

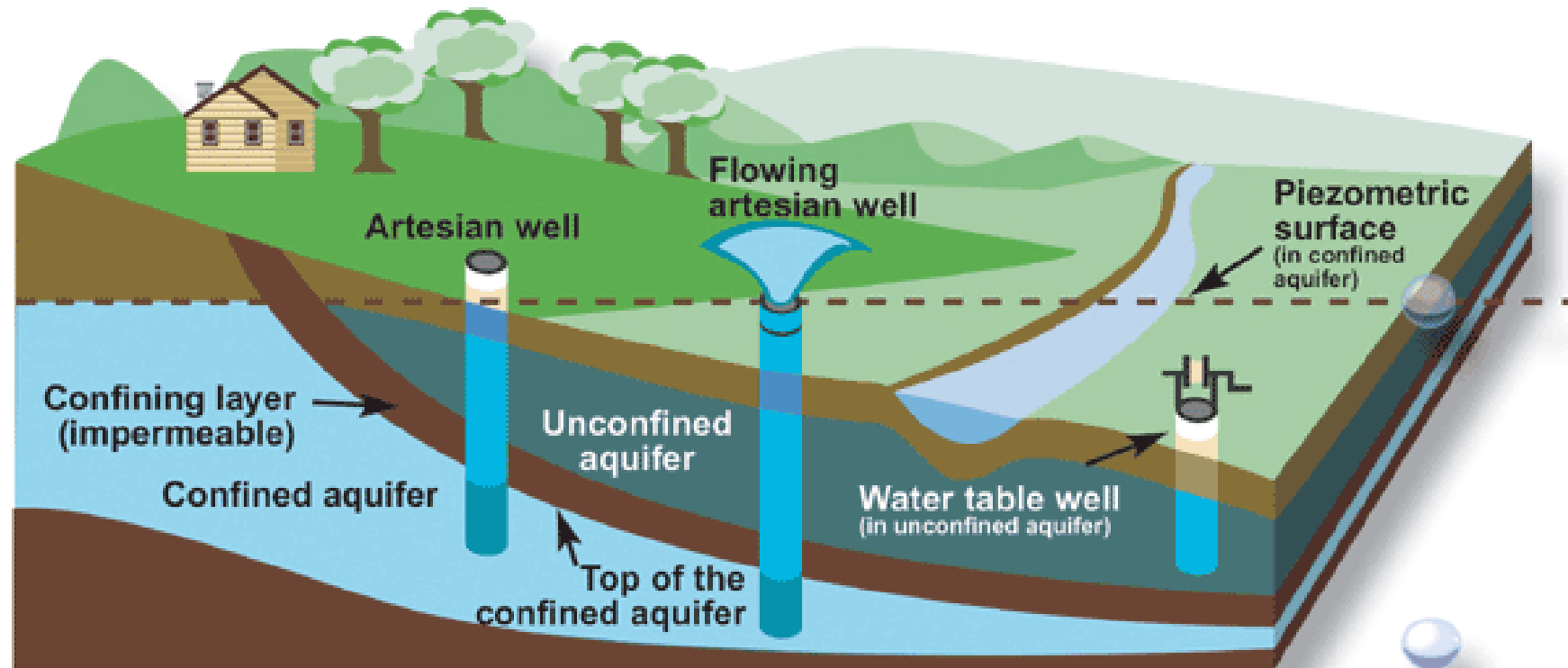
Wells

- A hole that is dug or drilled to reach groundwater
- Used to reach groundwater for thousands of years.
- Water from wells
 - may be a more reliable source of water than surface water
 - is filtered and purified as it travels underground.



Aquifers and wells

Play



Source: Environment Canada

< Back

Next >

Preview 🏠

Main 🏠