Bell Ringer

1. Where does Las Vegas get most of its water?
2. What problem exists with Las Vegas right now, concerning its water?
3. Do you think a similar problem might exist in Utah? Why or why not?

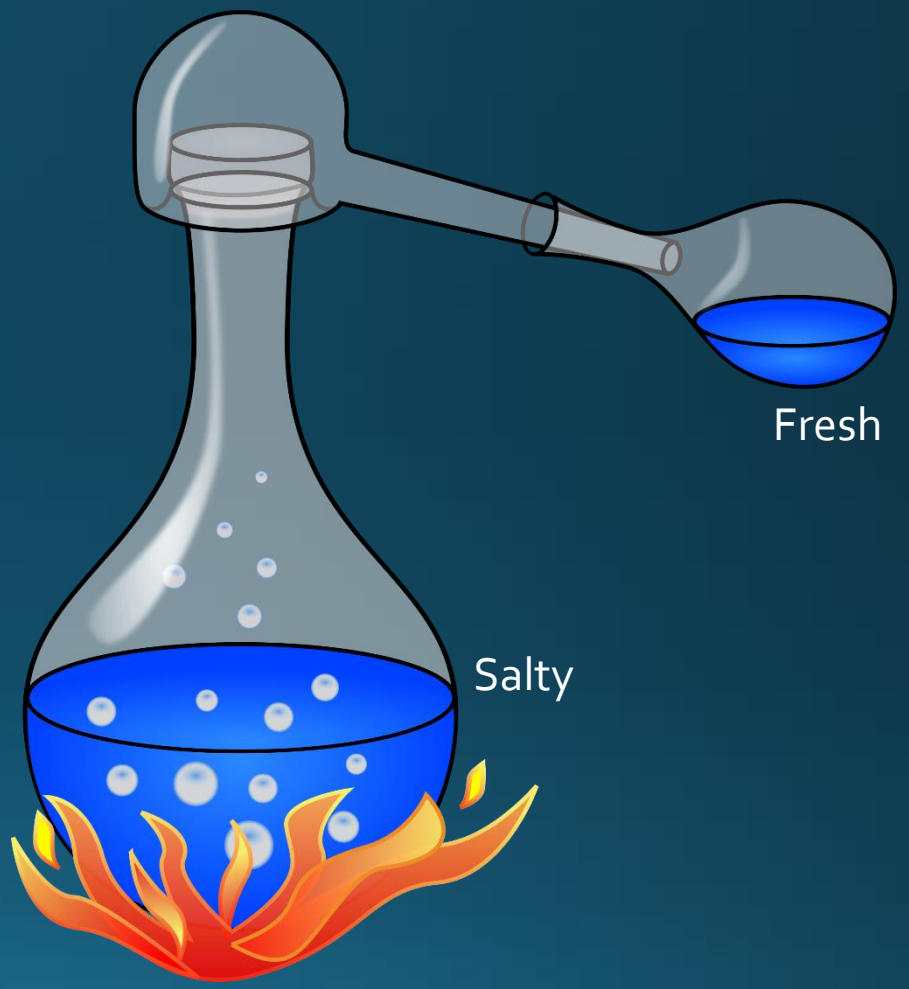
FRESHWATER

Overview

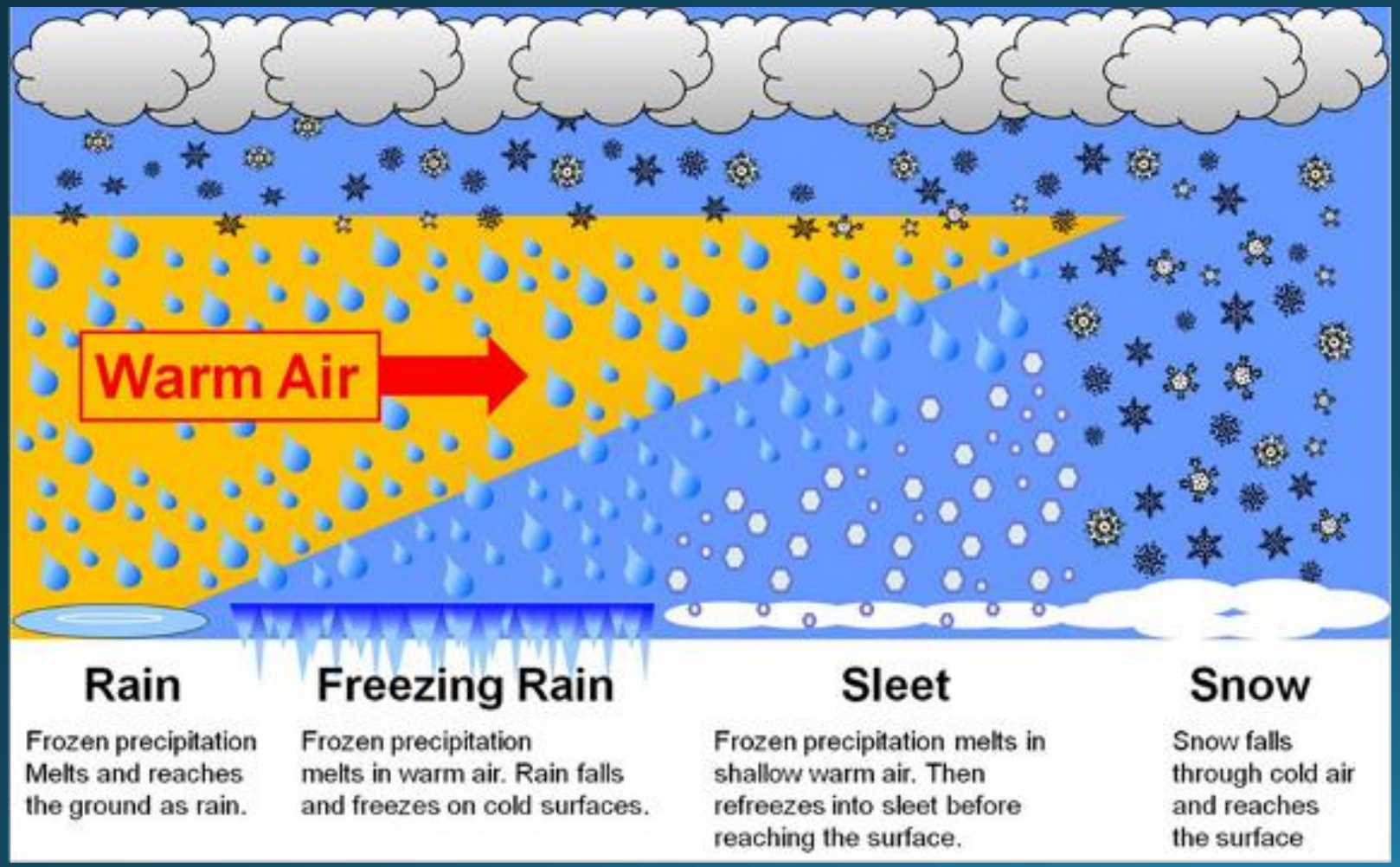
- Where does fresh water come from?
- Types of precipitation. How it happens
- Types of fresh water
  - Significant examples of each.
  - Lakes, ponds, swamps
  - Rivers, streams
  - Glaciers
  - Groundwater
- Pollution
  - Hard vs. Soft water
  - Too much, too little water
- GROUND WATER
  - Water table
  - Aquifers
  - Wells, springs
  - Infiltration

Freshwater

- Very difficult to get pure, fresh, not-salty water.
- Only way is to **distil** it.
  - Distilling is the process of evaporating water from a solution and collecting it elsewhere.
- Earth does this naturally through the water cycle.
- Demo



Precipitation

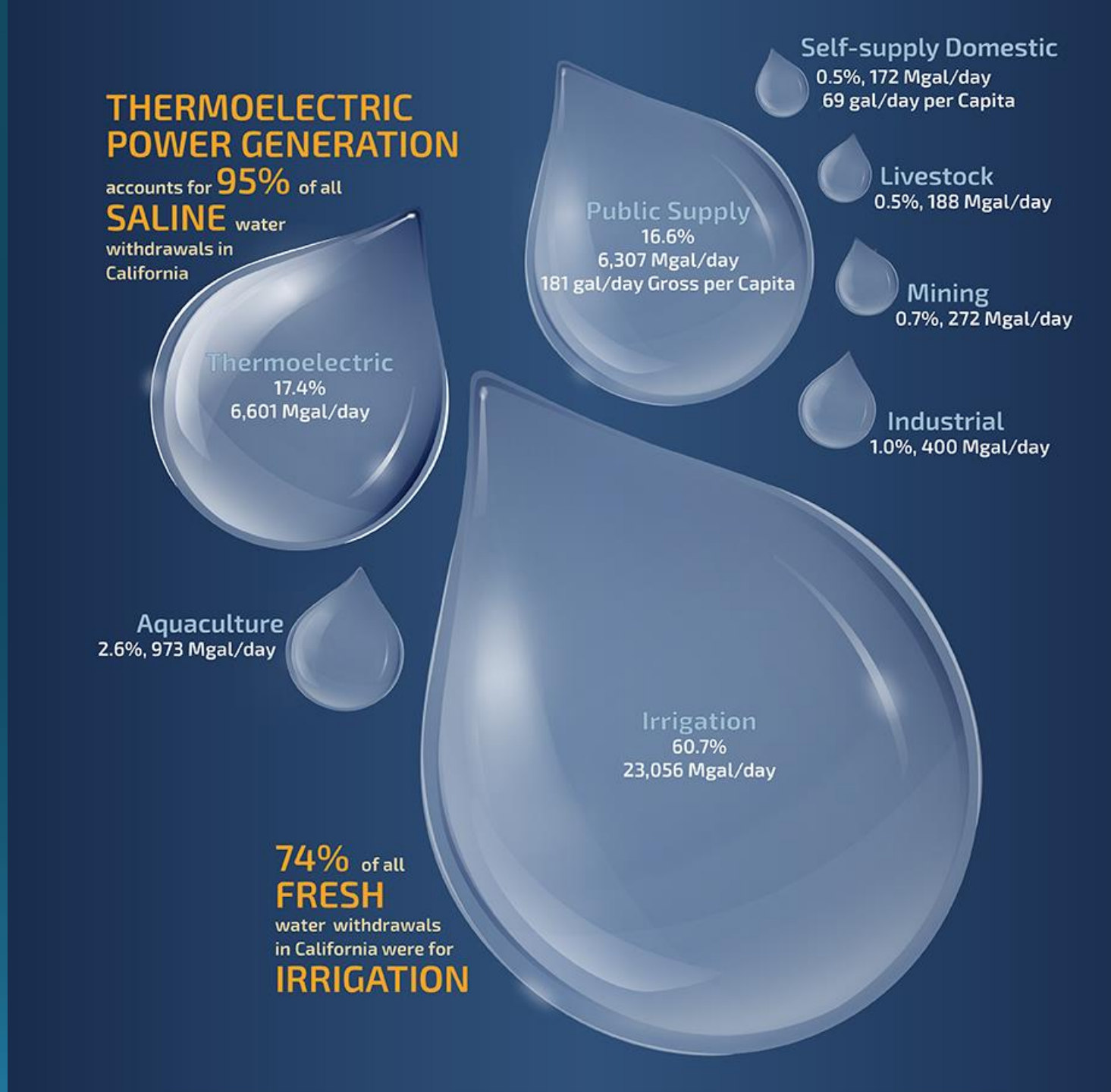


- Instead of collecting in a beaker, Earth's water collects in basins after being distilled.
  - Basins are low points on Earth relative to its surroundings.
- If it's cold enough, it turns into snow, sleet, etc. and collects anywhere it falls.
- Eventually snow melts and then collects in basins.

Types of freshwater

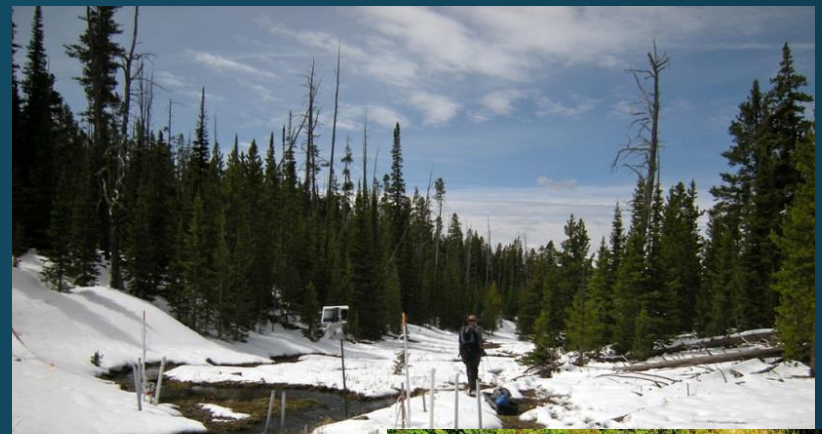
- Lakes, ponds, swamps
- Rivers, streams
- Glaciers
- Groundwater

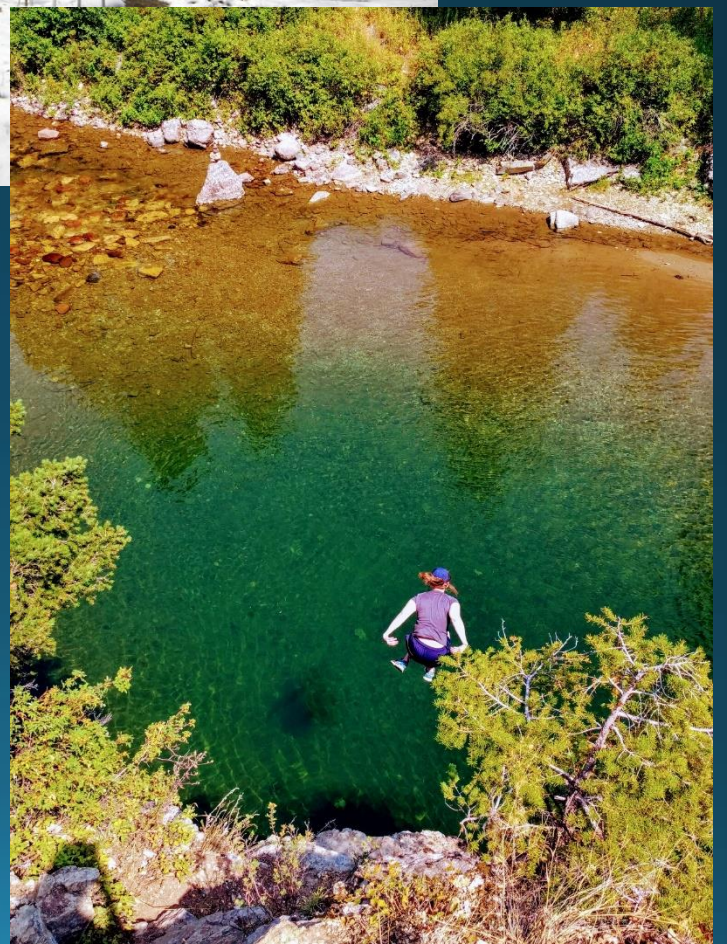
What do we use it for?



Rivers and Streams

- Streams are bodies of water that flow over land in a channel
- Most streams begin on high ground, among hills or mountains
- The sources of a stream usually consist of melting snow/ice or an overflowing lake
- At the end of a stream is the mouth which empties into another body of water





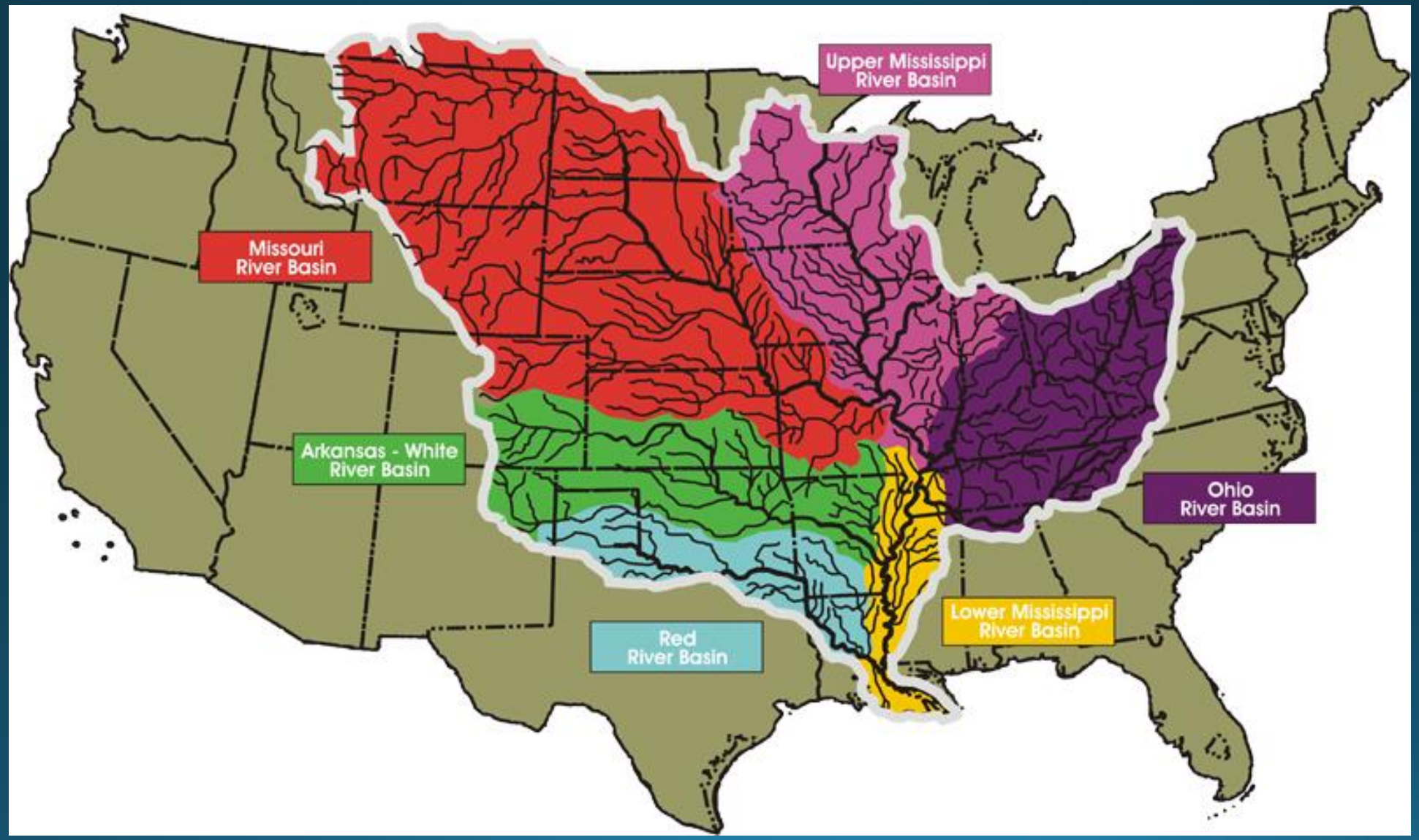
Rivers and Streams

- Small streams are called brooks.
- Large streams are called rivers, the largest and most important streams.
- Most rivers form from many smaller streams coming together, these are called tributaries.
- Tributaries – are streams or rivers that flow into a larger stream or river.

Rivers and Streams

- The more tributaries that empty into a river the larger the river grows
- Together the river and its tributaries are called a river system
- River system: A river and all its tributaries.

Rivers and Streams



Rivers and Streams

- Each continent, except Antarctica, has major rivers and river systems.
- Africa has the Nile, Asia has the Yangtze, Australia has the Murray, Europe has the Danube, North America has the Mississippi, and South America has the Amazon



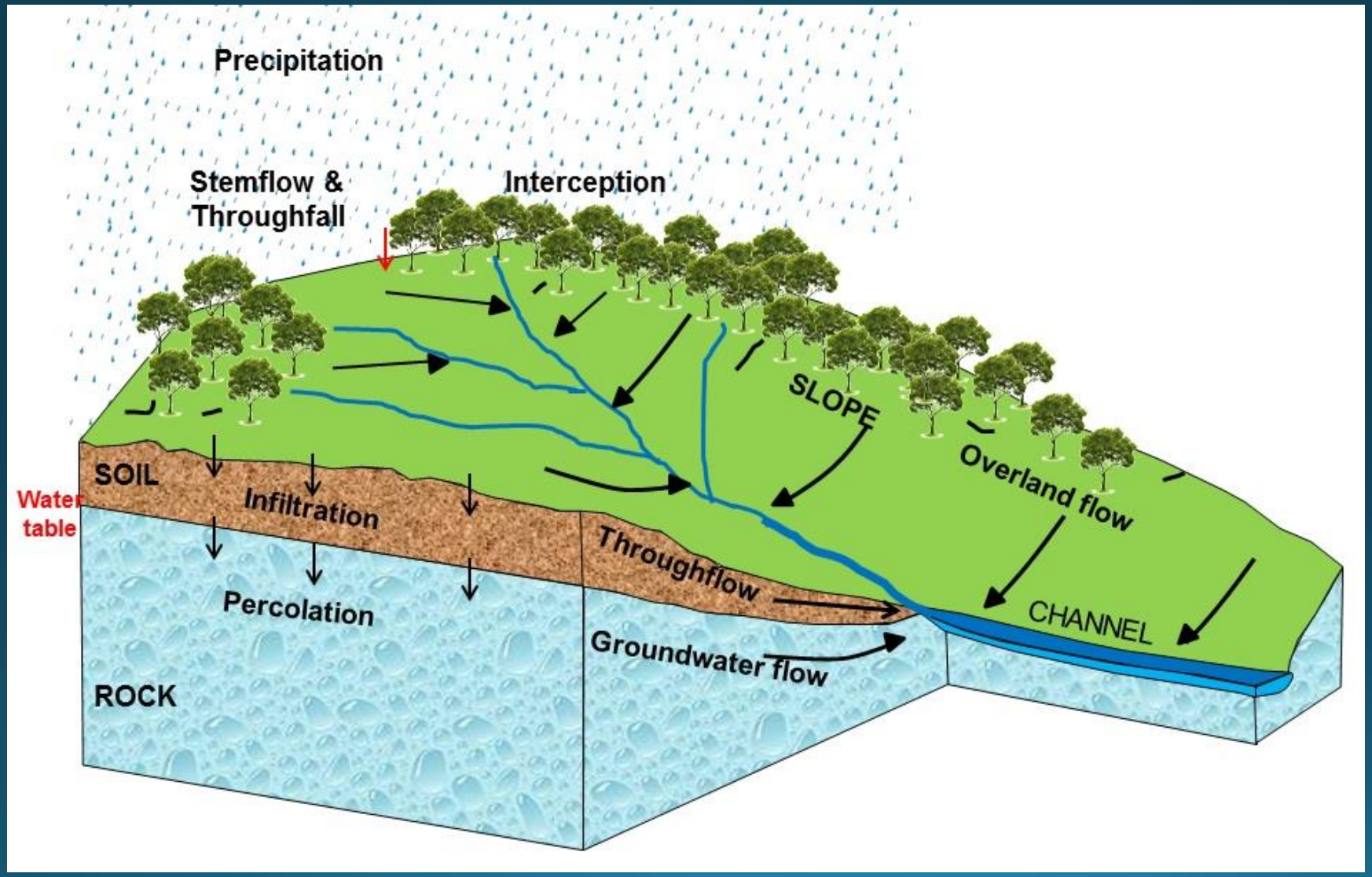



Rivers and Streams

RIVER NILE MAP

- Nile = Earth's longest river
- Amazon = Earth's largest river
- River Systems carry or drain water away from the land around them (drainage basin).
- Drainage Basin – Land drained by a river system
- Rivers are important for many reasons including drinking, cleaning, travel and trade

Drainage Basin



Lakes, ponds, swamps

- Lakes are bodies of water surrounded by land
- The word lake comes from the Greek language meaning hole because most lakes are holes in the Earth that fill with water
- Lakes exist on every continent except Antarctica
- The greatest amount of lakes exist where there was once many glaciers such as North America and northern Europe

Lakes, ponds, swamps

- During the last Ice Age, glaciers gouged huge holes in the Earth and the holes filled with the water from the melted glaciers
- Lakes also form where rainwater collects in huge holes made in other ways
- Crater Lake in Oregon was formed in a crater of an extinct volcano

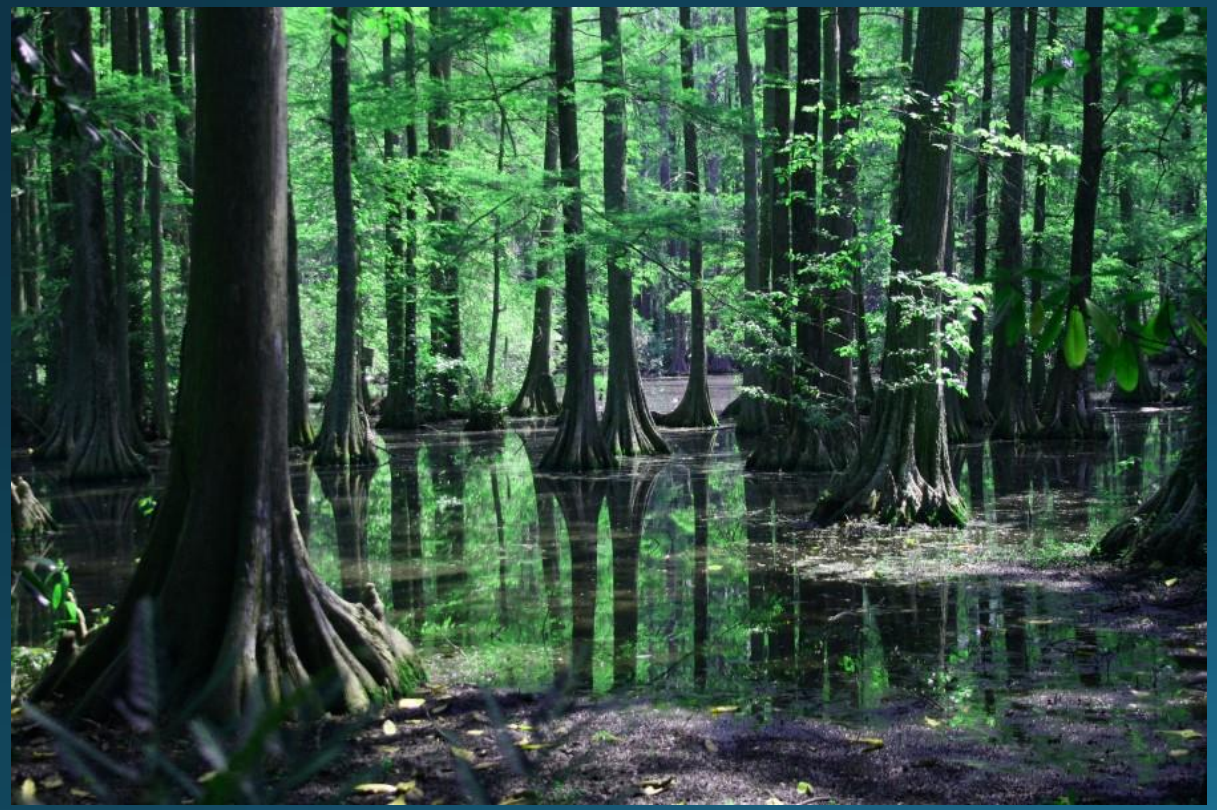
Lakes, ponds, swamps

- North America has the most lakes out of all of the continents
- The largest of the North American lakes are the Great Lakes
- One fifth of all of the fresh water on the Earth's surface is found in the Great Lakes

Lakes, ponds, swamps

- Not all lakes are made by nature
- Some are man-made and are called reservoirs
- People build dams to control river flooding or to generate electricity
- P.S. a pond = small lake.

Swamps



- A swamp is a wetland that is forested.
- Most occur alongside river systems, but some also occur around lakes
- Swamps depend on fluctuations in water levels
- https://www.youtube.com/watch?v=2YCHRSqNubo

Glaciers

- Snow is a frozen form of water.
- The pressure of piled-up snow causes some of the snow to change into ice and eventually glaciers form.
- A glacier is a huge mass of moving ice and snow.

Glaciers

- There are two types of glaciers:
  - Continental glaciers
  - Valley glaciers
- Antarctica and Greenland have the biggest continental glaciers
- Valley glaciers are like slow moving rivers of ice.
- https://www.youtube.com/watch?v=RL3EjH9-WSs

Bell Ringer

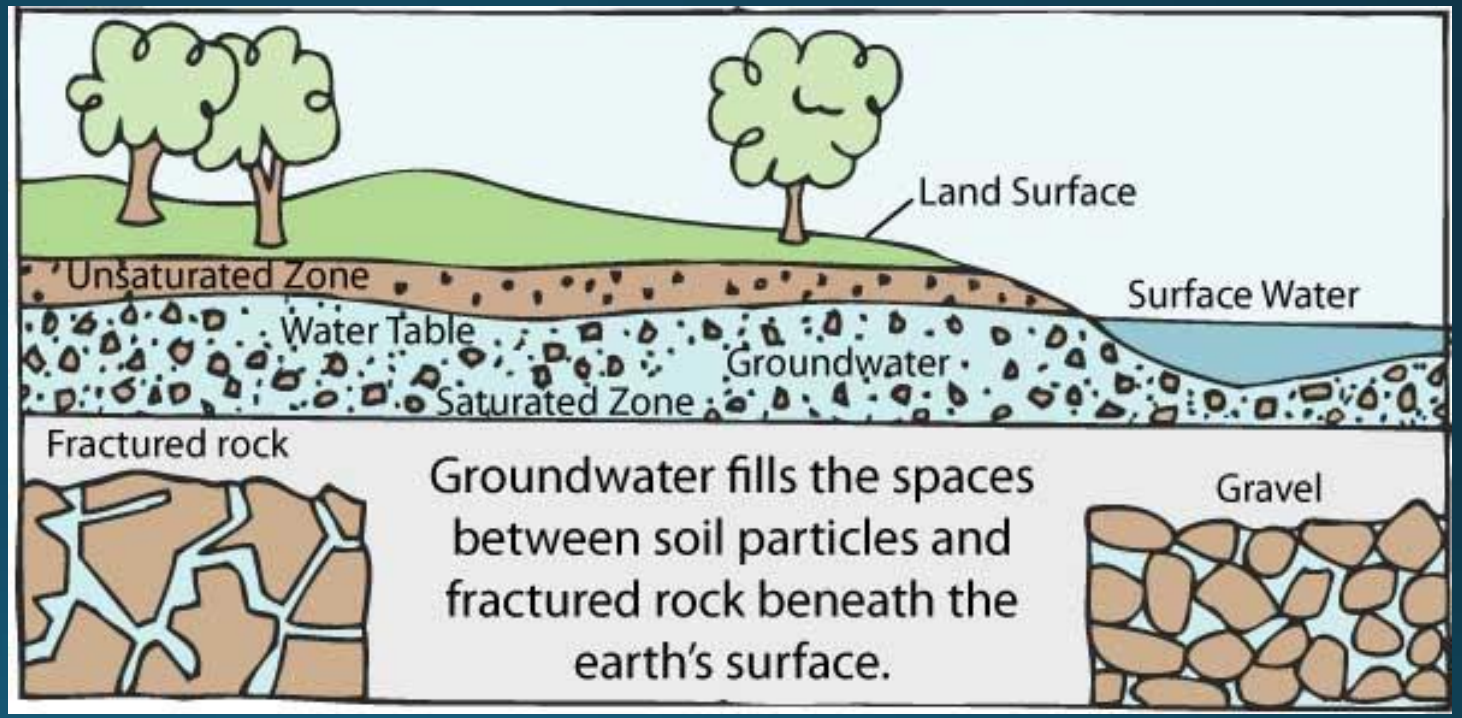
1. What makes something a swamp?
2. What makes something a reservoir?
3. Which river is the **Largest** in the world?

Water.org

Article – Finish up movie notes

Groundwater

- Some of the water that falls as precipitation may run off into land, ponds, streams, river or oceans.
- Some may soak into the ground and become groundwater.
- At some point, the groundwater flows underground to the oceans.



Groundwater

- There is more fresh water below the surface of the land than in all the lakes and reservoirs on the Earth's surface.
- Ground water moves slowly downward through pores in the rocks and soil.
- Material through which water can move quickly is described as permeable.
- Water cannot move quickly through impermeable material.

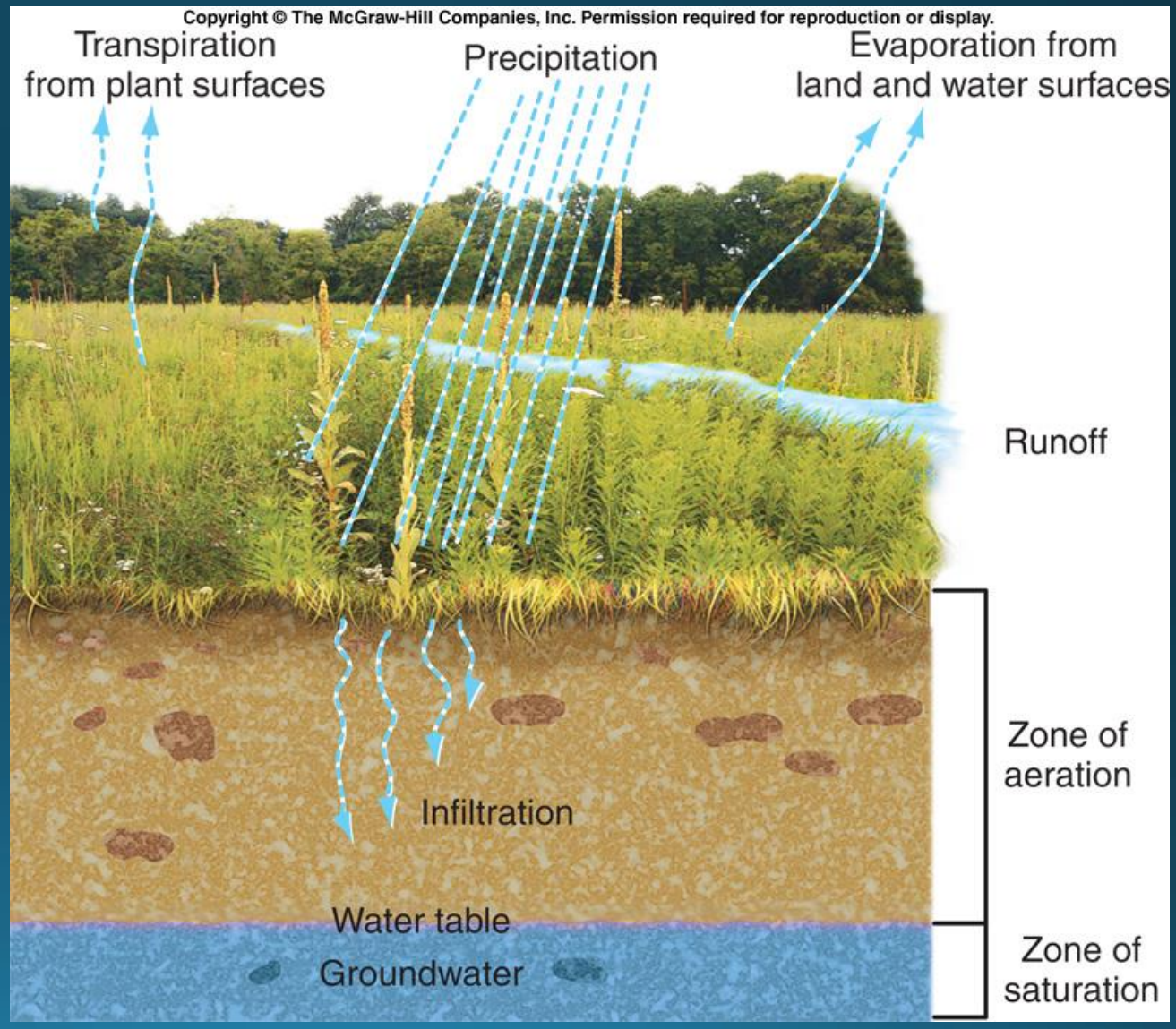
Groundwater

Infiltration - Process of water percolating through the soil and into cracks and permeable rocks.

Zone of Aeration - Upper soil layers that hold both air and water.

Zone of Saturation Lower soil layers where all spaces are filled with water.

Water Table - Top of zone of saturation

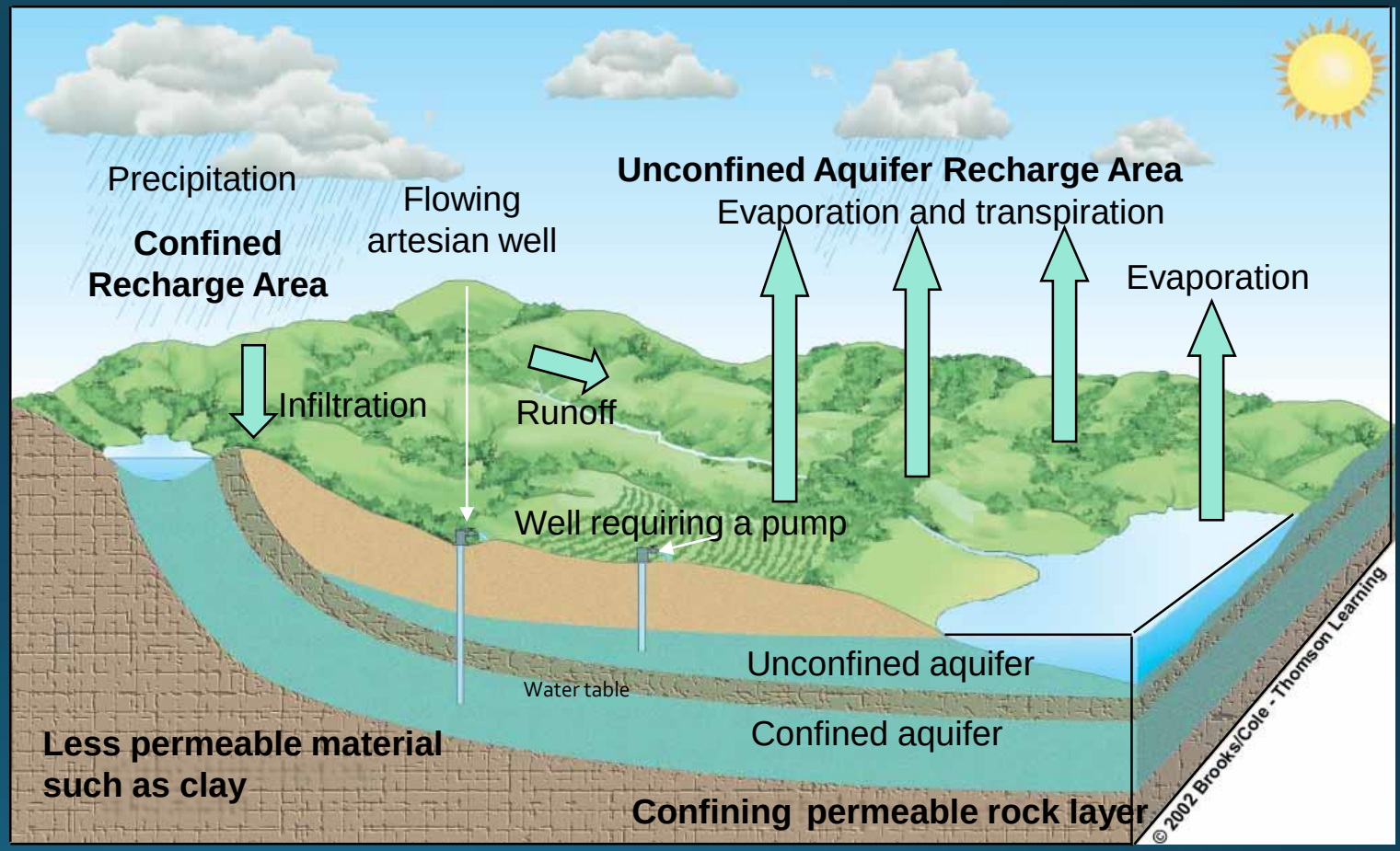


Groundwater

- Sometimes groundwater eats away at the rock around it and causes holes to appear.
- These are called sinkholes
- https://www.youtube.com/watch?v=zvoi99X4170

Groundwater

- Recharge Zone - Area where water infiltrates into an aquifer.
- Recharge rate is often very slow.
- Presently, groundwater is being removed faster than it can be replenished.

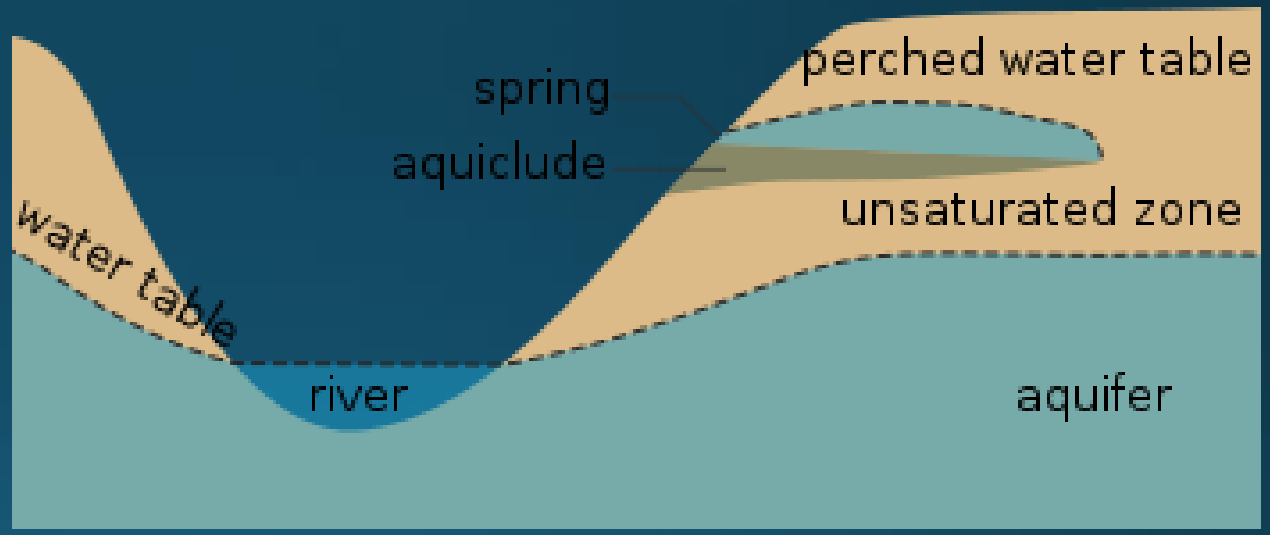


Depth of the Water Table

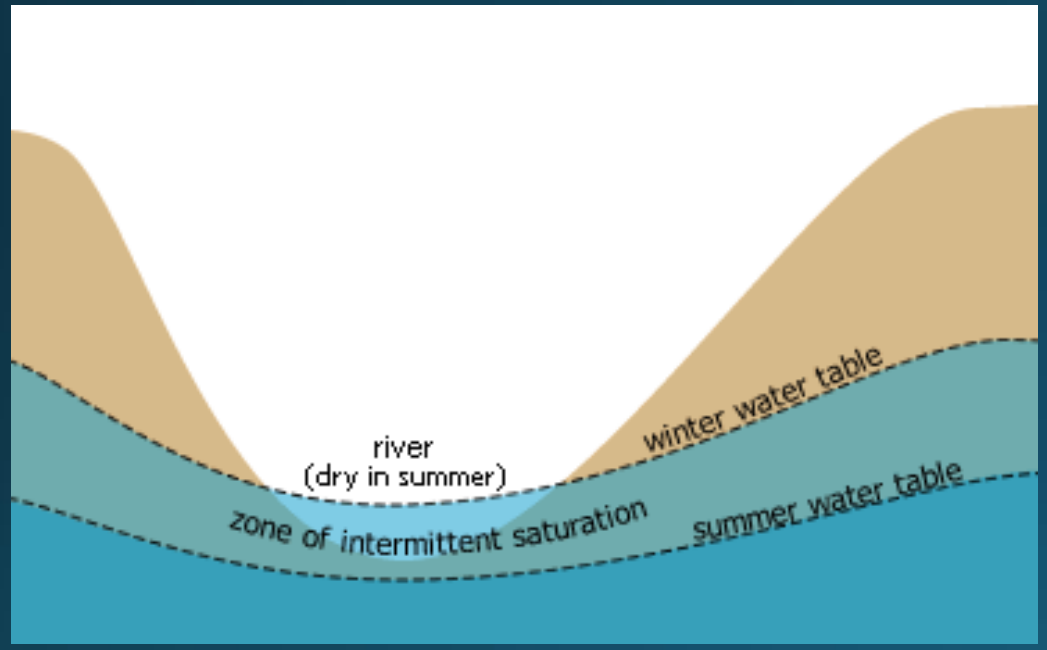
- The depth of the water table varies based on location, climate, weather and man-made structures.
- Aquifer – A permeable layer of rock that contains or transmits groundwater.

Water Table Location

- In general, the water table is not very deep near large bodies of water.
- In high areas nears hills or mountains, the water table may be deep within the ground.
- In low-lying areas such as valleys with swamps and marshes, the water table may be close to the surface.

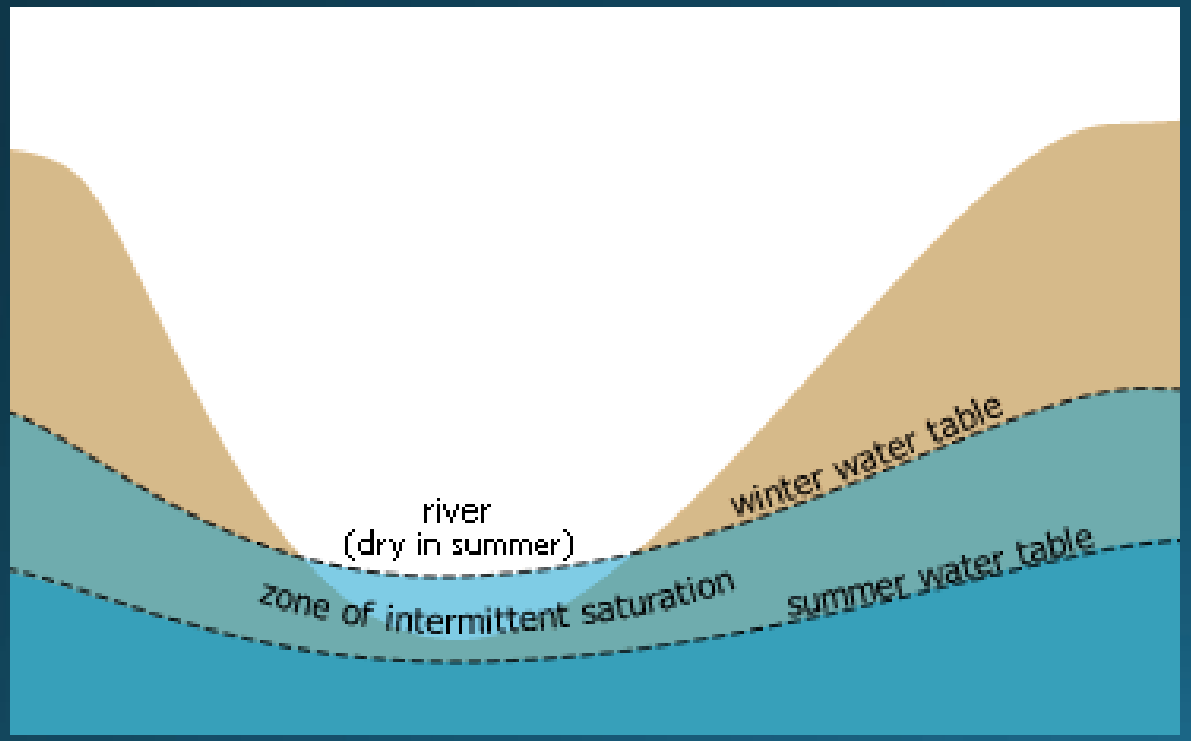


Water Table and Climate



- The depth of the water table varies with the climate of an area.
- It will be deep in dry areas such as deserts.
- It will be near the surface in low-lying forest areas.
- In very moist climates, the water table may come right to the surface and form a swamp, lake or spring.

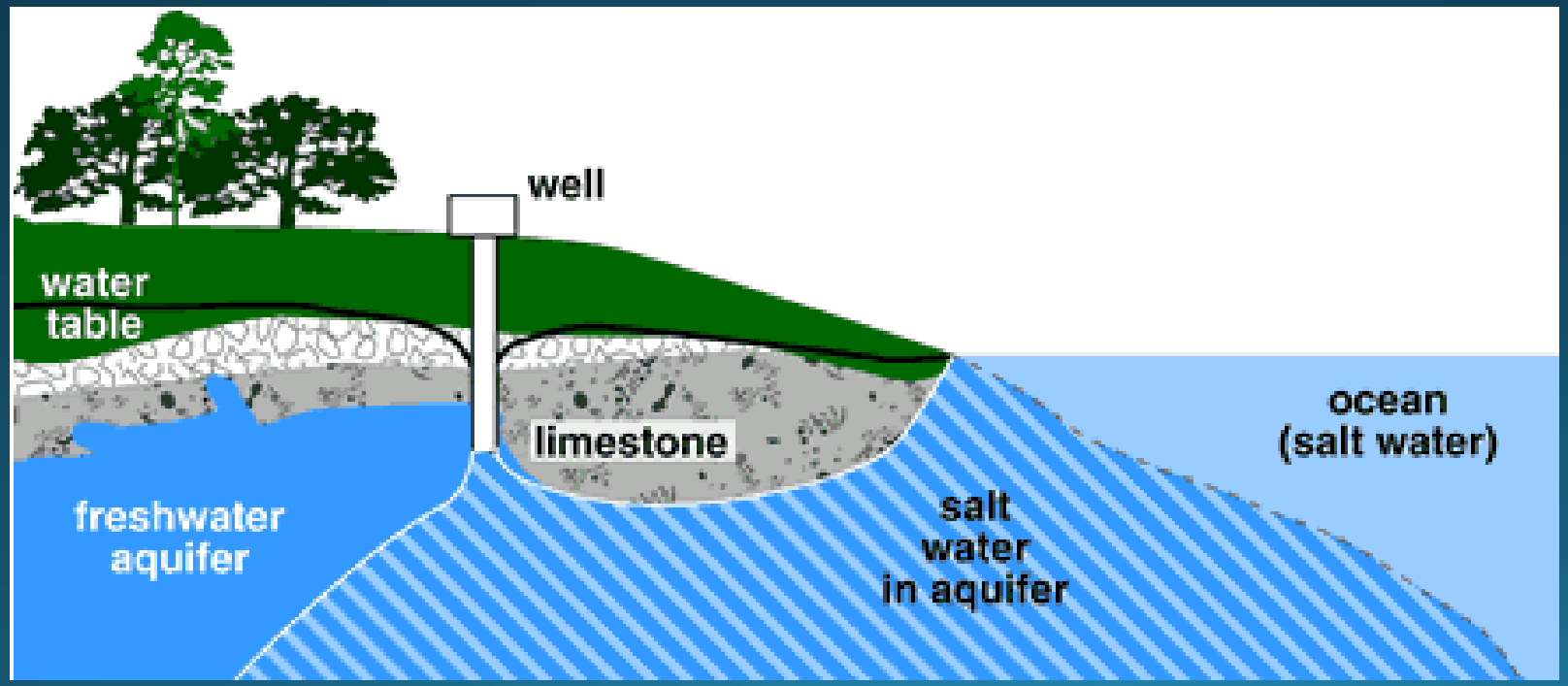
Water Table and Weather



- Even in the same area, the water table may change.
- Heavy rains and snow may make the water table rise.
- If there is a long dry period, the water table will fall.

Water Table and Man

- The depth of the water table will also change if wells are overused or if many wells are located in a small area. Wells are holes drilled to bring the water table to bring water to the surface.
- Infiltration – Especially near oceans, when wells are overused, salt water can overrun the aquifer.



Groundwater Lab