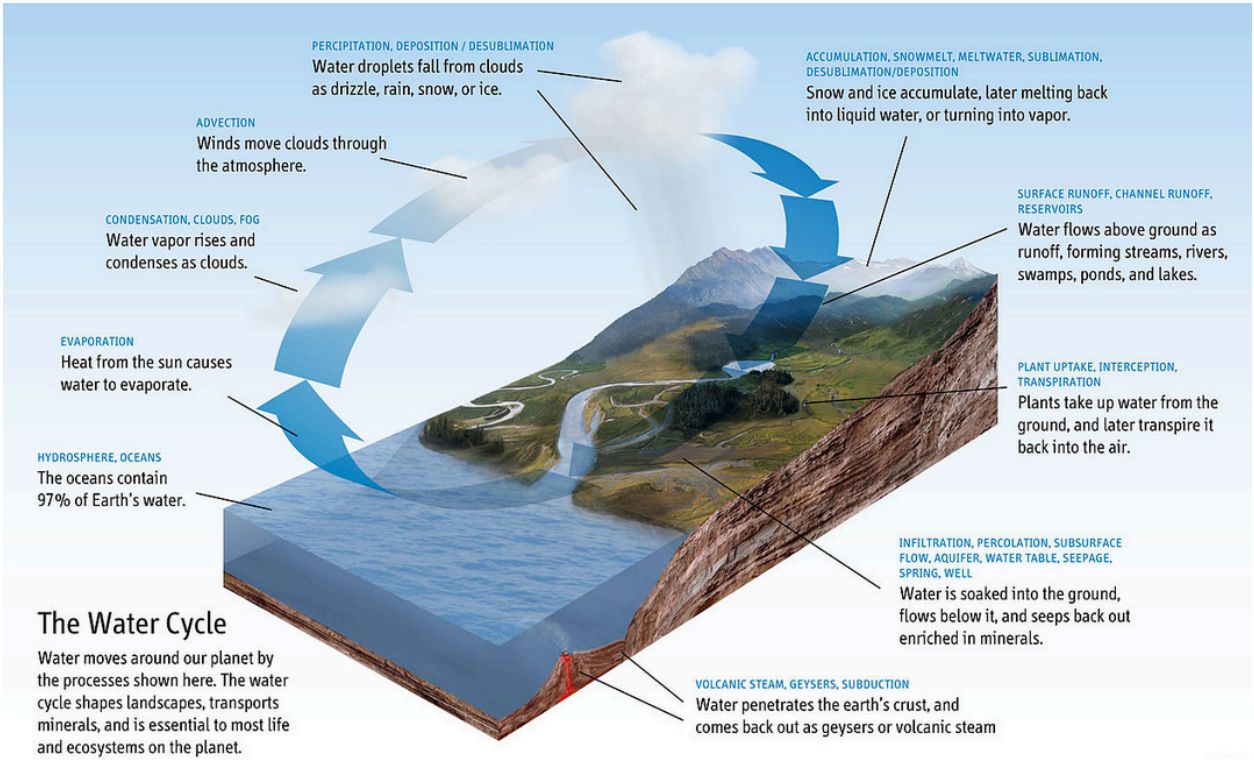
# The water cycle

- Bill Nye the Science Guy discusses in his own special way how condensation in the water cycle happens (2:57)
  https://www.youtube.com/watch?v=hehXEYkDq_Y

The movement of water among bodies of water (lakes, the ocean, rivers), the air, and the biosphere is called the water cycle. Water continually evaporates, condenses, and precipitates in a cycle. Evaporation from oceans, seas, lakes, rivers, and streams provides nearly 90% of the moisture in our atmosphere. Most of the remaining 10% is released by plants through transpiration. (See "Life" section.) In fact, **water vapor is the most abundant greenhouse gas**!




By Ehud Tal - https://commons.wikimedia.org/w/index.php?curid=47658638

Over land there is usually more precipitation than evaporation. Over the sea there is usually more evaporation than precipitation. The oceans would eventually run dry, but runoff from land replenishes it. Now, the oceans are being *over*-replenished. Sea level has risen around 17 centimeters.

The water cycle also cycles heat energy. Evaporation occurs when water is heated enough to change from a liquid to a gas. The warmer the water is, the faster it evaporates. Evaporation cools the water since it takes energy to pull apart the molecules in a liquid and turn them into gas. In large bodies of water like the oceans, evaporation moves a huge amount of heat into the atmosphere.

Warm air can hold more water vapor than cold air can. Higher temperatures from global warming cause more evaporation. More evaporation results in more water vapor in the atmosphere. This is

an important reinforcing feedback. More water vapor in the air acts as a greenhouse gas, which absorbs more thermal energy. The higher temperature that results leads to more evaporation. The additional moisture in the atmosphere is the reason that global warming models predict heavier rainfalls during storms.

**In systems terms.** In system terms, liquid water, water vapor, and ice can be thought of as reservoirs of water. Evaporation, condensation and precipitation are responsible for flows of water from one reservoir to another. You could also look at the heat energy contained in the water cycle as a system of reservoirs and flows of heat between them.

### *More information*

- This video from the National Science Foundation discusses how water moves through the water cycle (6:46)
  https://www.youtube.com/watch?v=al-do-HGuIk
- Earth's water is always in movement: A breakdown of the water cycle from the United States Geological Survey.
  http://water.usgs.gov/edu/watercycle.html