My NASA Data

About The Hydrosphere

This image represents the **hydrosphere** throughout the My NASA data website.

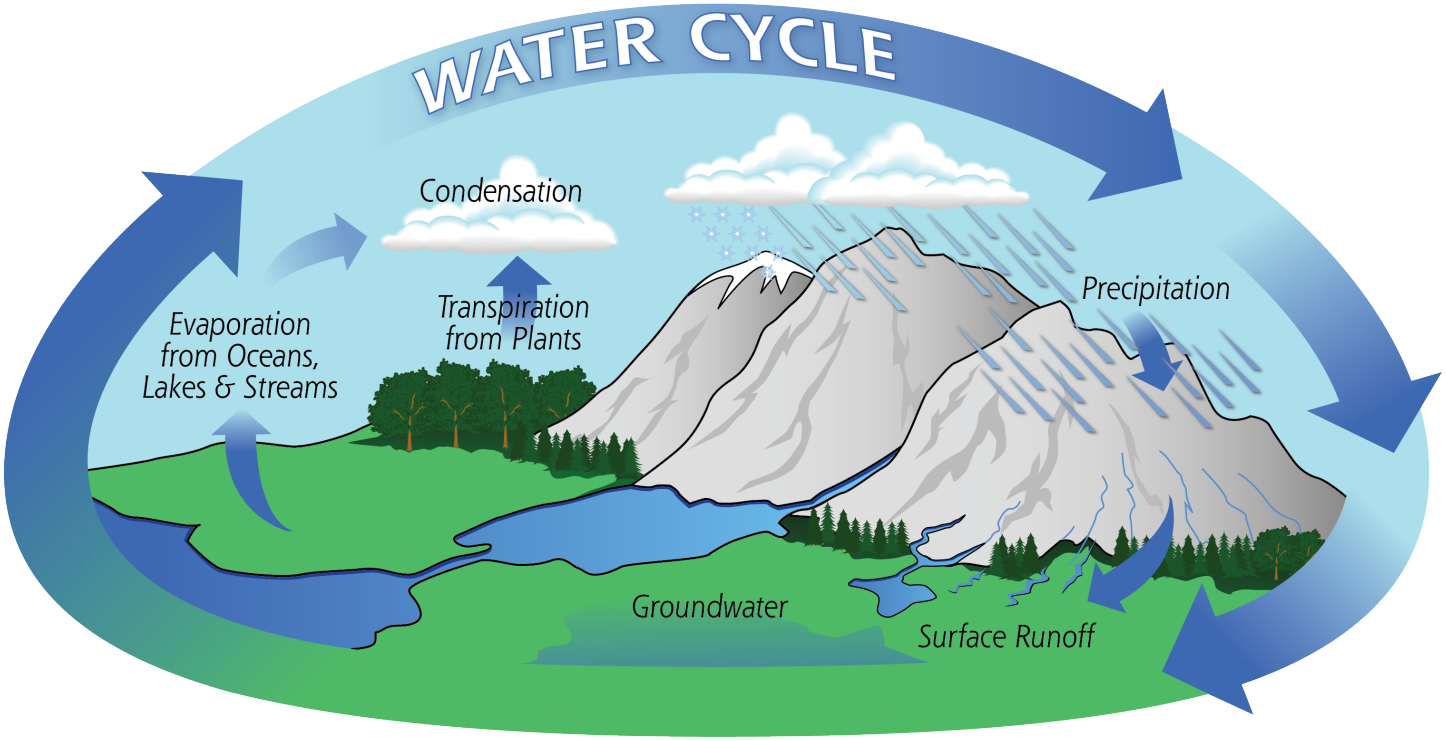
What is the Hydrosphere?

The Hydrosphere is associated with water in the liquid state, which covers about 70% of the Earth's surface. Most liquid water is found in the oceans. Our Hydrosphere gives Earth a distinct appearance as a blue marble and separates us from other planets in the solar system. Only a small portion of the Earth's water is freshwater, found in rivers, lakes, and groundwater. Water in a gas state (water vapor) is probably best considered as a feature of the Atmosphere. Additionally, frozen water in the forms of snow, sea ice, icebergs, ice sheets, and glaciers are identified as part of a separate sphere of the Earth System, the Cryosphere.

Video: Earth's Water Cycle

Earth's Water Cycle | https://www.youtube.com/watch?v=oaDkph9yQBs | Source: NASA Goddard

Water is necessary for sustaining life on Earth and helps connect the Earth's systems. Precipitation, evaporation, freezing and melting and condensation are all part of the hydrological cycle (AKA water cycle)- a never-ending global process of water circulation from clouds to land, to the ocean, and back to the clouds. This cycling of water is intimately linked with energy exchanges among the Atmosphere, Cryosphere, Hydrosphere, and Geosphere. These connections help define the Earth's climate and cause much of natural climate variability. Knowing details about where precipitation occurs, how much, and its characteristics allows scientists to better understand the impact of precipitation on streams, rivers, surface runoff and groundwater. Scientists rely on frequent and detailed measurements to develop models to determine changes and make predictions about future changes in Earth's water cycle.



Graphic Credited to NASA Goddard

Measuring Precipitation

Precipitation (rain, snow, and other forms) affects the overall health of our planet, our freshwater

supply, our crops, and the many different habitats of living things on Earth. Precipitation plays an important part in our weather and climate; too much precipitation or too little can result in the occurrence of natural disasters such as floods, hurricanes, or drought. NASA monitors our precipitation very closely so that we can understand, predict, and plan for the effects of precipitation on the various components of Earth as a system.

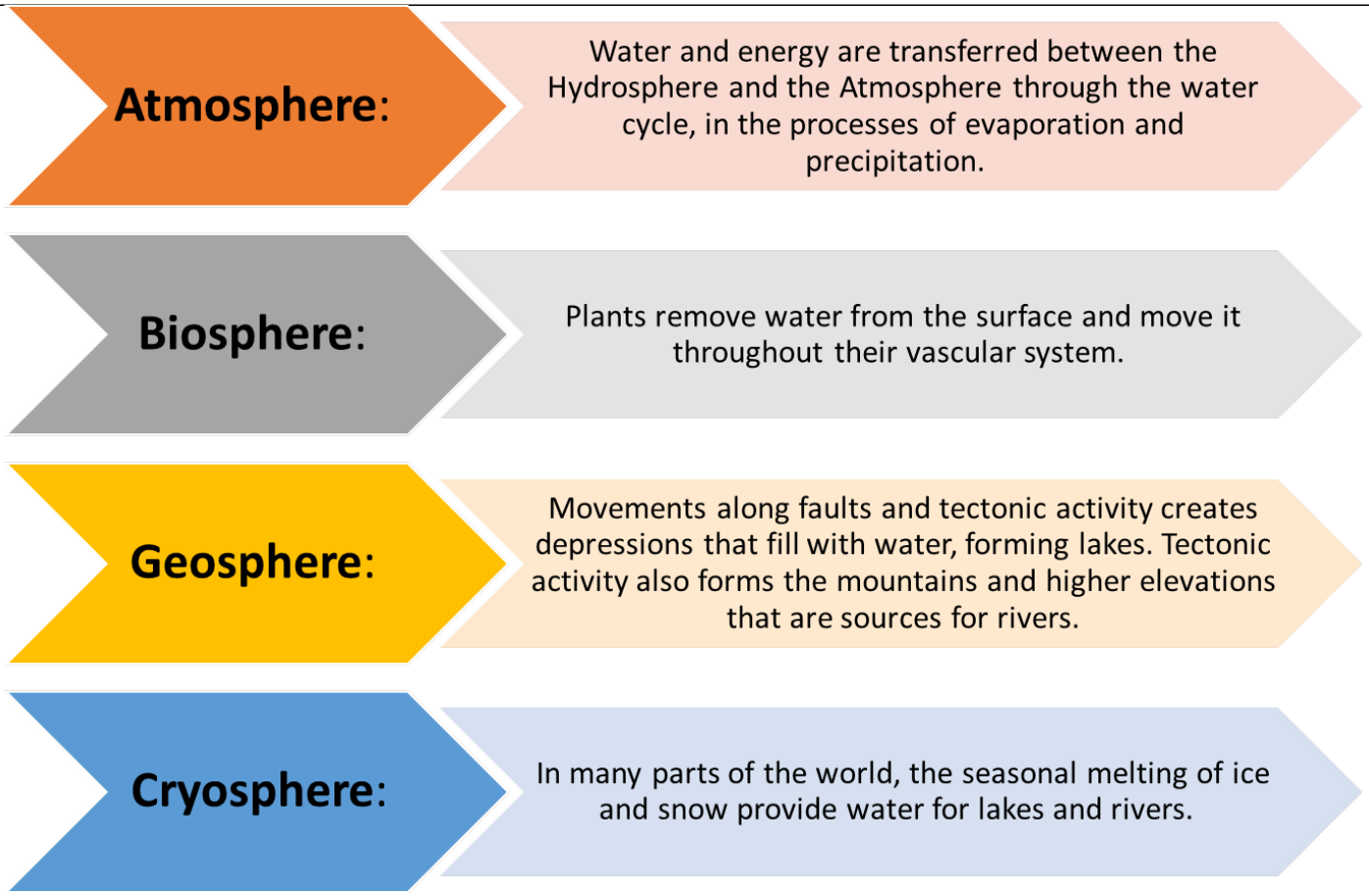
NASA's Missions

GPM: (Global Precipitation Measurements) is an international satellite mission that uses multiple satellites orbiting Earth to collect rain, snow, and other precipitation data worldwide every three hours.To learn more check out NASA's Global Precipitation Measurement (GPM) mission page that provides students and educators with a variety of resources designed to help them learn about Earth's water cycle, weather and climate, and the technology and societal applications of studying them.

My NASA Data's suite of hydrosphere resources support NASA's GPM Mission by engaging educators and students in data, interactives, lessons, and story maps that provide a closer look at various aspects of the hydrosphere and how it impacts other parts of Earth as a system. In addition to these resources, the Earth System Data Explorer provides the following precipitation data sets: daily precipitation amounts, monthly precipitation anomaly (combined sources), monthly precipitation rate (combined sources), and monthly precipitation rate (satellite observed).

PACE (Plankton, Aerosol, Cloud, ocean Ecosystem) will prove valuable in assessing the overall health of our oceans by measuring the distribution of phytoplankton using the Ocean Color Instrument, which is a spectrometer that measures intensity of light over portions of the electromagnetic spectrum at smaller wavelengths than previously possible with other NASA ocean color sensors. This capability will enable NASA to monitor global phytoplankton distribution and quantities, helping us to understand the complex systems that drive ocean ecology. Phytoplankton are a key component of the marine food web, playing an extremely important role in the balance of Earth's web of life.

The Earth System interacts with the Hydrosphere in the following ways:



NGSS Three Dimensional Learning

Crosscutting Concepts

- Systems and System Models
- Structure and Function