

FROM THE OCEAN TO THE CLOUDS

Water: the Great Mystery

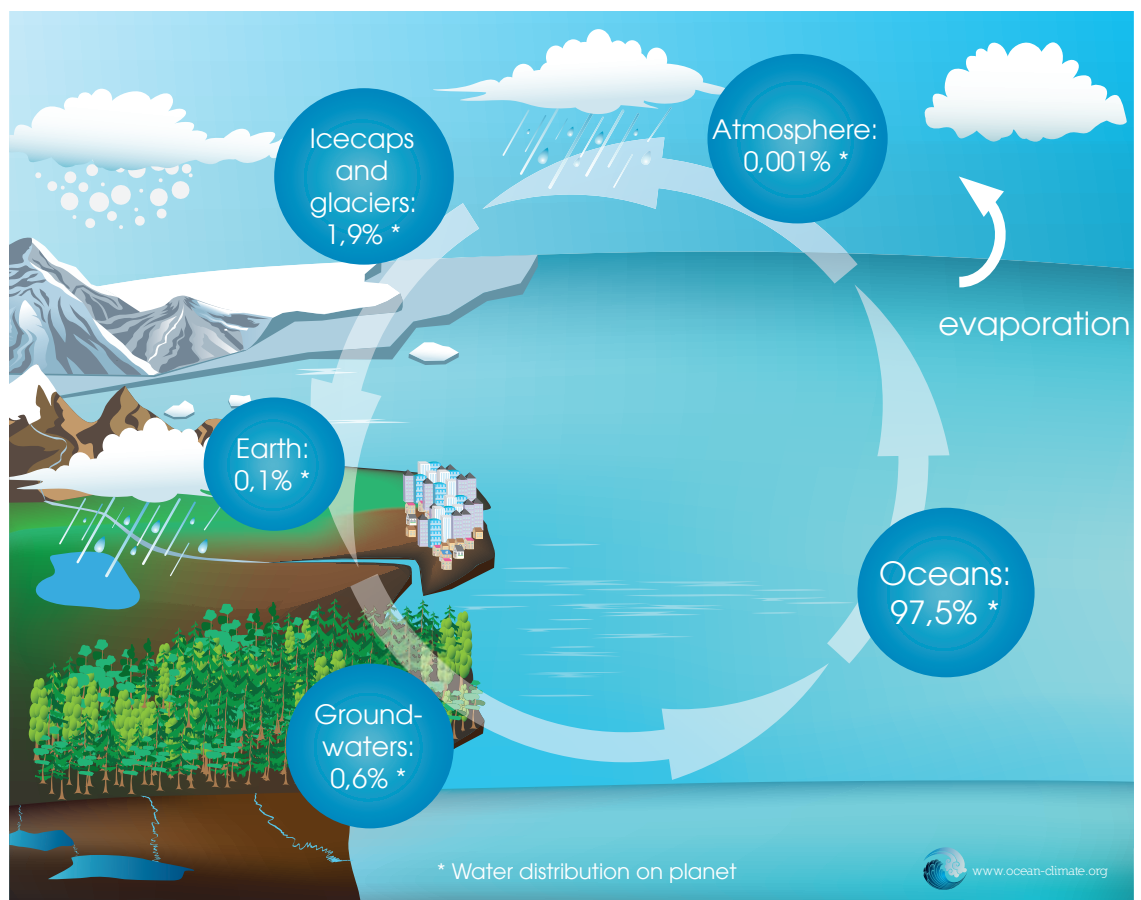
Water is essential to life. The ocean covers more than 70% of the surface of the planet and contains 97% of the water across the globe, making it the largest water reserve in the world. For billions of years, the amount of water ceaselessly circulating and recycling on the planet Earth has remained unchanged.

The Earth is the only known planet where, depending on its temperature, water exists in three states: liquid, solid (glaciers, icebergs ...) and gaseous (vapour). Due to solar radiation, surface ocean water warms up and evaporates into the atmosphere. Hence, the role of the ocean in the climate system is fundamental, requiring that close attention should be paid to it.

The water vapour is transported by the ascending air currents to altitudes where low temperatures condense the steam into water droplets or ice crystals that form clouds. Air masses travel with the wind. Under certain conditions, the droplets or crystals grow and then drop down to earth in the form of rain or snow fall. The snow can accumulate and form polar caps and glaciers. Rain and sleet bring fresh water to lakes and rivers. Much of this water seeps into the soil and feeds rivers and groundwater. This water is in constant motion and always ends up by returning to the ocean: this is the water cycle. Typically, a drop of rainwater, just like a drop of tap water, has therefore already been in the ocean many times. It

may take a thousand years to be transported across the world ocean by global ocean circulation. However, the course of this drop of water can be profoundly altered by climate change.

As it represents the main reservoir for the water cycle, and with its continuous exchanges with the atmosphere, the ocean is closely related to the climate. Consequently, owing to global warming, this cycle presently tends to accelerate and causes more frequent extreme weather events such as rainfall, droughts, or cyclones.



Water cycle