

# [Ball college essay](https://assignbuster.com/ball-college-essay/)

Water vapor is water in its gaseous state. Water vapor may form by evaporation of liquid water or by sublimation of solid water (ice). Water vapor (H2O) is a chemical combination of two atoms of hydrogen and one of oxygen in which both the hydrogen and oxygen possess isotopes.

For a sample of water at a given temperature, the molecules of lower mass move with higher speeds than the more massive molecules and therefore more readily evaporate or sublimate. Thus, atmospheric water vapor is enriched in the lighter forms. In epochs of higher average planetary surface temperature, more low-mass water vapor forms, some of which is ultimately deposited as snow and ice in polar regions. The ratio of low-to-high mass water in ice cores yields a profile of how temperature has varied through time. Water vapor is the principle atmospheric gas responsible for greenhouse warming of the Earth’s surface.

In terms of its ability to absorb infrared radiation, wavelengths from approximately 0. 7 micron to 100 microns, water vapor is about one hundred times more effective as a greenhouse gas (GHG) than is carbon dioxide (CO2) and four times more effective than methane (CH4). The concentration of water vapor in Earth’s atmosphere varies with height and also varies both regionally and seasonally from 0 percent to 4 percent. Normally, it is the third most abundant gas in the atmosphere after nitrogen and oxygen. The highest concentrations of water vapor in Earth’s atmosphere occur in the planet’s equatorial regions over the oceans and rain forests.

In contrast, over continental deserts such as the Gobi and Sahara the water vapor concentration approaches zero percent as it does in the frigid air of the polar regions. Nearly all of atmospheric water vapor is found within the troposphere, a region of Earth’s atmosphere that varies in thickness from about 20 kilometers over equatorial regions and thinning to about 5 kilometers over the poles. Deducing the effects of…