



# Greenhouse Gases: Water Vapor

**T**here is more water vapor in the atmosphere than any of the other greenhouse gases.

But the effect of water vapor on global temperature is difficult to understand, because water vapor plays a role in so many processes.



Water is always moving between the atmosphere and Earth's surface in a process called the **water cycle**. Water can exist on Earth in three states: solid, liquid, or gas. Water is always changing from one state to another. When temperatures are warmer, more liquid water on Earth's surface evaporates and becomes water vapor in the atmosphere. When Earth is cooler, more water vapor comes out of the atmosphere, changing to rain or snow. The ice caps on Earth's poles grow and shrink as global temperature falls and rises.

**What happens to the size of Earth's ice caps when global temperature rises?**



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For example, warming temperatures could lead to more evaporation on the ocean surface. This could create more clouds. The greater albedo effect of the clouds could cool Earth. This kind of change that brings back balance is called a **negative feedback**. Warming temperatures have already begun to melt ice caps. Smaller ice caps would create a lower albedo effect on Earth, which would lead to yet more warming and more melting of the ice caps. This kind of process that leads to more and more change is called a **positive feedback**. It is difficult to know how water vapor in the atmosphere will affect global warming.