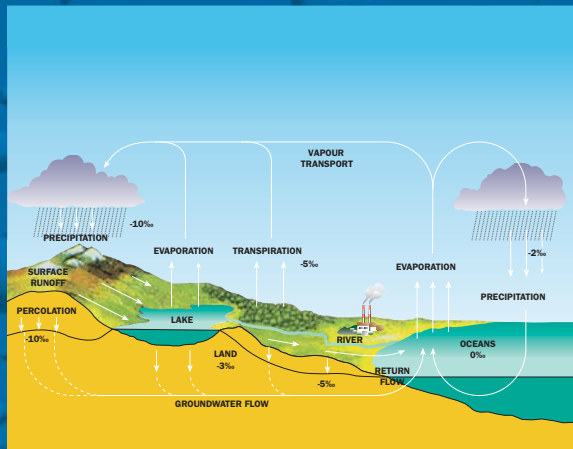


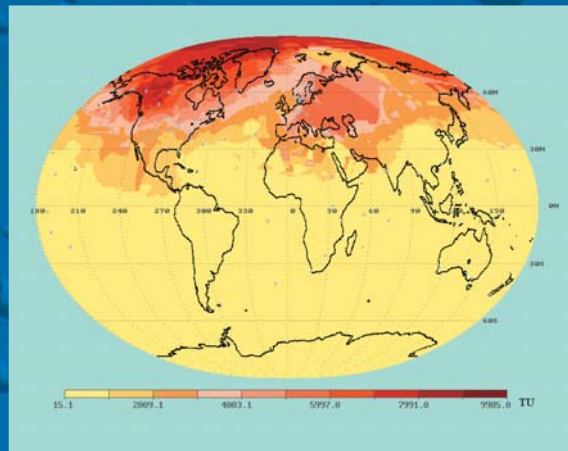
Water "fingerprints" — Where do they come from?

During evaporation and condensation of water, the concentrations of oxygen and hydrogen isotopes (naturally-occurring atoms of different mass) change. Water vapour rising from the oceans carries a lower concentration of heavy isotopes than seawater. When the resulting clouds release water, the heavy isotopes fall out first. As clouds move inland, their isotopic composition again changes, and the water acquires individual and characteristic "fingerprints" in different environments.

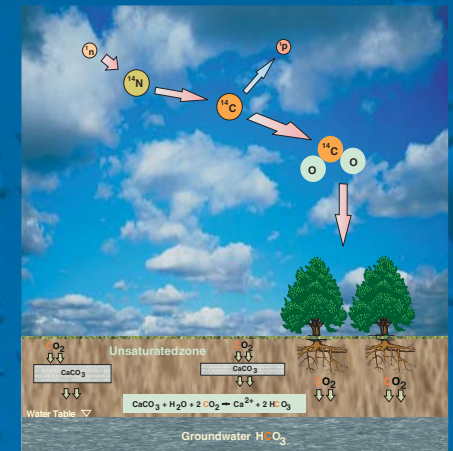
There are other isotopes in rainwater, such as tritium and carbon-14, whose concentration decreases with time. These isotopes in surface or groundwater can be measured to determine the "age" or residence time of water within a particular water body.



Oxygen isotopes in the water cycle



Mean tritium concentration in rain and snow, July 1963 (82 stations)



How carbon-14 gets into groundwater