

## Density of seawater at the sea surface

Seawater is more dense than freshwater because of the mass of its dissolved salts and because the ions of those salts break up the rings of H<sub>2</sub>O molecules that would otherwise create void space in pure H<sub>2</sub>O. Thus the lines for increasing values of salinity progress from the bottom to top of this graph.

As water cools and its molecules vibrate less, it becomes more dense. (hence the general slope of all the curves upward to the left). However, in freshwater, the formation of ring structures at low temperature causes density to decrease, rather than increase, as water cools from 4°C to 0°C (note the downward slope to the left in the S=0 curve). That effect diminishes with greater salinity as ions break up those rings, and it does not exist at S > ~24.7.

