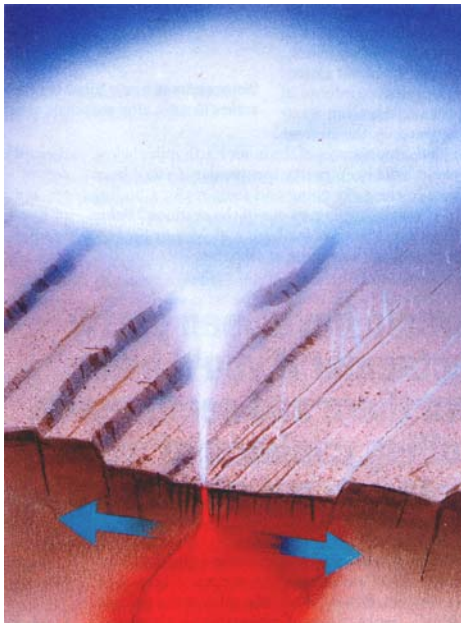


**Question:** During the flood when the whole Earth was covered with water how were the salt water and fresh water creatures able to survive? Didn't the waters get mixed together?

**Answer:** Although the Earth was covered by water this does not necessarily mean that the salt and fresh waters thoroughly mixed. Large bodies of water can stay separated from each other for long periods of time. How long could the waters stay separated? It would depend on the temperature, density, salinity, currents, and other factors. Some oceanic bodies of water do not mix if they are large enough. Notice the example below about ocean megaplumes. These megaplumes of superheated nutrient rich water can stay separated for many months and travel hundreds of miles.

Many fish also have the ability to survive in both fresh and salt water. Many fish in the family Salmonidae which includes the trout, Pacific salmon (*Oncorhynchus salar*), and the Atlantic salmon (*Salmo salar*) migrate between salt and fresh water to spawn. This trait is called anadromy. Many other fish are also anadromous. If these fish were in an environment where fresh and salt waters were mixed they could easily survive.



Megaplumes can soar more than several thousand feet off the ocean floor and spin like slow but gargantuan tornadoes. They can be 12 miles across and travel hundreds of miles.

Megaplumes stir up huge amounts of ocean, carrying minerals and gases and heat to the sea's surface. Vertical mixing doesn't happen easily in the ocean. Cool, dense water tends to stay near the bottom and warmer buoyant water near the top. As they rise from the ocean's depth megaplumes may bring energy and food to animals in shallow water.

Three foot long worms and tiny clams live only in hot spots on the ocean floor, yet they have been found all over the world. How do they cross vast nutrient-free expanses of the sea to find new places to live? Megaplumes, which remain intact, spinning and drifting for months and traveling hundreds of miles, could be mobile ecosystems.

Discover. *In Search of the Elusive Megaplume.*  
March 1999. p. 108-115



During an underwater eruption, boiling water sometimes emerges from the ocean floor and expands until it forms a disk ten miles wide or more. At the same time, it begins to rotate and drift away, traveling for months and possibly hundreds of miles. (All photographs from Discover)