

## Water is Life: The 4.5 Billion year Perspective



A common expression is “Water is Life”, which usually refers to the fact that all living things need water.

A lesser known aspect of this phrase is that water shaped our planet, is where life originated, and is where our atmosphere was created. Here is an abridged version of the last 4.5 billion years.

Debris left over from the formation of the sun clumped together to form the Earth. Gravity compacted the material, shifting a cold, dead rock into a warming planet.

Over millions of years, volcanoes ejected gases from the rock - including sulphur, methane, and water vapour - into an early atmosphere that was essentially poisonous, on a planet that was too hot to allow rain to reach the ground.

Once the Earth cooled, the water vapor in the atmosphere condensed and it rained for millions of years, submerging the planet in an ocean of liquid water.

Later, once land rose above the one ocean, the interplay of rain, wind, and sun formed an early climatic system, but in an atmosphere that still lacked both oxygen.

When life eventually emerged, it consisted for a long time only of microscopic beings in the water. Yet life evolved, shaping the environment as much as the environment shaped life.

For example, some early life forms evolved into cyanobacteria, the first organism to develop oxygenic photosynthesis, converting sunlight and into energy while producing oxygen.

Indeed, cyanobacteria produced so much oxygen that, over several hundred million years, it eventually rose from the oceans to alter the atmosphere into its current elements.

In this same period, other early life forms engulfed some of the cyanobacteria, forming algae, from which all of Earth’s plants evolved.

In short, water shaped the planet, is where life first emerged, is where oxygen was first made, where all the plants began, and is needed today by every living organism.

Water is life and must be protected, now and for future generations.

*Feb 2024: Adapted by Dr. Usha Lingappa, UC Berkeley and Andrew McCammon, OHI, from “Ancient Earth: Birth of the Sky”, a 54-minute documentary by PBS SoCal.*

**Promoting Watershed Security in Ontario: Water for People and for Nature**