

Photosynthesis vs. Chemosynthesis (oceanexplorer.noaa.gov)

“Photosynthesis and chemosynthesis are both processes by which organisms produce food; photosynthesis is powered by sunlight while chemosynthesis runs on chemical energy.

Ecosystems depend upon the ability of some organisms to convert inorganic compounds into food that other organisms can then exploit (or eat!). In most cases, primary food production occurs in a process called photosynthesis, which is powered by sunlight. In a few environments, primary production happens through a process called chemosynthesis, which runs on chemical energy. Together, photosynthesis and chemosynthesis fuel all life on Earth.”

<http://oceanexplorer.noaa.gov/facts/photochemo.html>

Photosynthesis – occurs in plants and some bacteria, wherever there is enough sunlight – on land, in shallow water, even inside and below clear ice. All photosynthetic organisms use the sun’s energy to turn carbon dioxide and water into sugar and oxygen.

Chemosynthesis – is the use of the energy released by chemical reactions (instead of the sun’s energy) to produce food. No light is available to support photosynthesis by marine algae or plants, so primary productivity occurs when bacteria-like organisms turn chemical energy from vents into usable energy.

The vent ecosystems depend on microbes that use chemical energy available in the minerals from the hot spring water. Sulfur in the form of hydrogen sulfide is an energy rich, but deadly molecule. Bacteria that use hydrogen sulfide as an energy source are important to most vent food chains. They exist as both free-living organisms (often mat-shaped mounds near the hydrothermal vents), and within animals where both individuals benefit. (ie. within the tubeworm’s body)