

Mapping Our World

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Geoscientists use maps to examine and analyze the world on a larger scale. Maps enable people to understand how the hydrosphere, atmosphere, geosphere, and biosphere are all interrelated and interdependent. Geoscientists use maps to monitor sea surface temperatures around the globe for extended periods of time. The temperature of ocean waters can affect the Earth immensely. It is essential for geoscientists to use maps to recognize the significance of sea surface temperature.

Sea surface temperature affects the Earth's hydrosphere as a major influence on the water cycle. As water evaporates, it creates water vapor, the most crucial greenhouse gas in the atmosphere. It allows heat and energy to be transferred from Earth's geosphere to the atmosphere. The warmer the water, the more water vapor is produced. The sea surface temperature can also affect the atmosphere by creating dramatic changes in rainfall patterns and developing tropical cyclones. NASA scientists obtain periodic maps from the satellite known as Moderate Resolution Imaging Spectroradiometer, or MODIS. It measures only the top millimeter of sea surface temperatures around the globe (NASA Earth Observatory).

Phytoplankton are highly dependent on the sea surface temperature. These single celled organisms are the basis of the aquatic biosphere's food web (Lindsey and Scott). Phytoplankton tend to live in colder waters because there are high quantities of nutrients there. Along with sunlight, they need these nutrients to obtain chlorophyll, a substance that helps carry out photosynthesis. NASA scientists use maps taken by MODIS to locate different chlorophyll concentration levels. Using these maps, geoscientists are able to estimate phytoplankton populations by analyzing the chlorophyll amounts in certain areas (NASA Earth Observatory).

The sea surface temperature impacts the Earth's hydrosphere, atmosphere, geosphere, and biosphere in a variety of ways. Using maps, scientists are able to understand how sea surface temperature enables the biosphere, geosphere, hydrosphere, and atmosphere to function properly and effectively.

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