**8th Grade Earth Science**

**Literacy Fusion Article: “Global Seafloor Survey Reveals Volcanic Wonderland”**

A new topographic map of Earth's mysterious ocean floor reveals thousands of towering volcanoes, hidden gashes where supercontinents ripped apart and other never-before-seen features once veiled by miles of water and thick sediment.

The topography of Earth's seafloor is as corrugated and bumpy as a book set in Braille. By reading these peaks and ridges, scientists can chronicle the birth of new ocean crust and the past wanderings of Earth's continents.

However, even though the seafloor carries the pivotal clues to plate tectonics, the dry surface of Mars has been detailed more clearly than the ocean's watery depths.

The new survey, published Thursday in the journal Science, promises to fill in some of the blanks. Compared with the previous map, from 1997, the resolution is twice as accurate overall and four times as better in coastal areas and the Arctic, said lead study author David Sandwell, a marine geophysicist at the Scripps Institution of Oceanography in La Jolla, California. [Hidden Undersea Mountains Uncovered With Satellites (Photos)]

The seafloor topography comes from a gravity model of the ocean, which is in turn based on altimetry from the Jason-1 and Cryosat-2 satellites. Altimetry measures sea surface height from space by timing how long it takes a radar signal to reflect off the ocean and return. The ocean surface has subtle highs and lows that mimic both seafloor topography and Earth's gravity field.

The results represent "a breakthrough in space-based marine gravity observation," Cheinway Hwang, who was not involved in the study, wrote in a commentary accompanying the report. Hwang is a professor at National Chiao Tung University in Hsinchu, Taiwan.

The world's volcano count jumped tremendously thanks to the new map. The number of seamounts soared from around 5,000 to about 20,000, Sandwell said. Seamounts are small, conical volcanoes that are usually inactive or extinct. In the deep ocean, tall seamounts attract a riot of marine life. The map captures all seamounts more than 0.9 miles (1.5 kilometers) tall.

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