

Discovering the deep secrets of volcanoes

The secrets of ancient underwater volcanoes that developed into what we know as the Pacific 'ring of fire', are being uncovered by a Southampton Ocean and Earth Science researcher.

Around 52 million years ago the Pacific crust sunk into the Earth generating a line of ocean trenches between the Pacific and Philippine seas, including the Earth's deepest spot – the Mariana Trench. As the crust descended into the hot interior, it generated magma which produced eruptions on the seabed. However, little is known about how long it took for this crust to break, sink, release water and cause the volcanoes.

Dr Rex Taylor, an Associate Professor in Geochemistry and Volcanology, joined colleagues from Japan on an expedition to take samples from and pictures of the early volcanoes in the deepest section of the Philippine Sea.

The team used a special submarine – the Shinkai 6500 – to reach the volcanic rocks six kilometres below. The Shinkai 6500, which is operated by the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), can dive deeper than any other manned submersible in use for academic research around the world.

During one of the expedition's four dives, Rex descended 5730m onto the flanks of one of the ancient volcanoes and collected more than 100 kg of lava.

He said: "This lava is now being analysed. In the Geological Survey of Japan, Dr Osamu Ishizuka is using radioactive isotopes to determine how old the volcanoes are, while here in Southampton I am investigating what types of magma were erupted in this ancient submarine world."

Ocean and Earth Science undergraduate students will be able to examine the detailed compositions that emerge from this research as part of their dissertations.