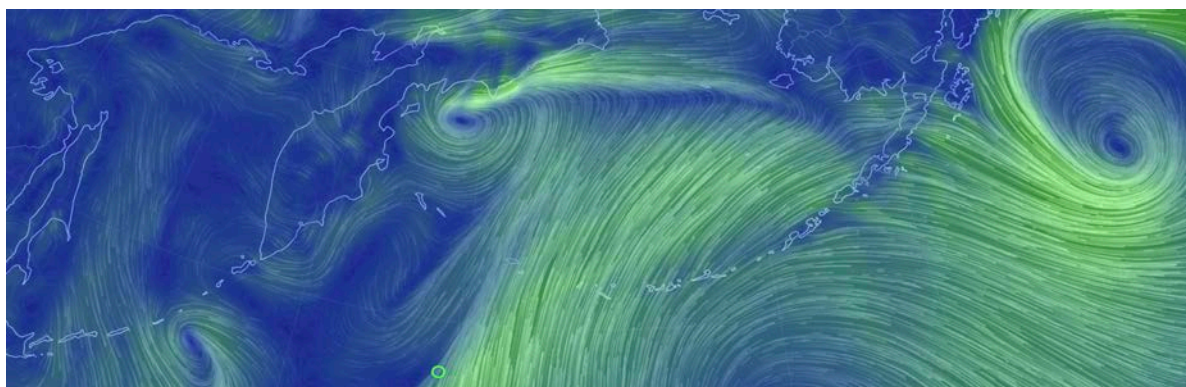




SO264 SONNE-EMPEROR

Weekly Report No. 6
(July 30 – August 5, 2018)

During the first days of last week, the Jimmu volcano became focus of our work. Jimmu, named after the first emperor of Japan, is located at about 46°N, comparable to the latitude of Milan (Italy). Here, however, it is quite cool, with air temperatures around 12°C and water temperatures around 10°C. Since many days we work in a dense fog soup, which is even not blown away by strong winds. We have not seen the sun for days.



Presentation of near-surface winds in the North Pacific region on Saturday, August 4, 2018 (www.earth.nullschool.net). The position of FS SONNE is marked as a green circle.

Our coring equipment for sediment sampling was used in water depths of approx. 1800 m to approx. 3200 m. Our intention was again to sample areas of the volcano that are as shallow as possible in order to reach the upper ocean levels and later to reconstruct them. In the shallow areas, the sediment deposits found are clearly thinner, so that we only used relatively short corers. However, due to the lower sedimentation rates, the short cores include more "time" and allow a deeper look into the geological past than the longer sediment cores from the deeper regions. Unfortunately, the conditions are not always optimal, so that one or the other bent or broken "banana" comes on deck and our contingent of steel tubes shrinks significantly. Nevertheless, the core recovery is more than 80% and shows interesting facies changes from biogenic oozes to terrigenous deposits, intercalated by prominent volcanic ash layers, which allow us to correlate cores over large areas.



Processing of sediment cores

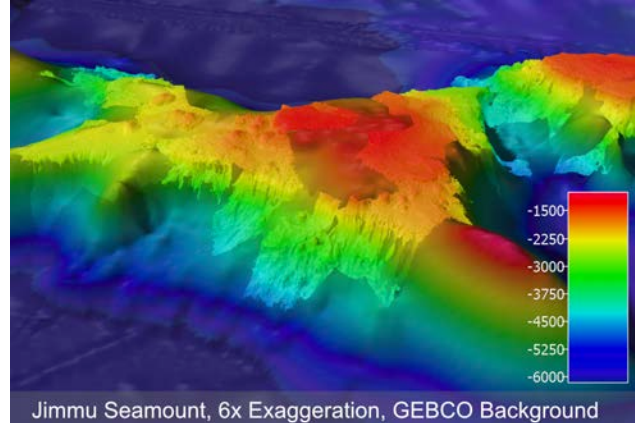
The long row of volcanoes in the Emperor Seamount Chain ultimately reflects the movement of oceanic crustal plates above a stationary magma source from the Earth's mantle, called "hot spot" volcanism. This hot spot breaks through the moving lithospheric plate like a cutting torch. The most obvious geological evidence is that the volcanoes are getting older and deeper from south to north. With increasing distance from the magma source volcanoes lose



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contact with their magma source, become inactive, and subside together with the cooling ocean crust. The volcanic peaks usually appear as flattened and sometimes very extensive plateaus. These are formed when the volcanic cones, which previously lay above sea level, sink to sea level and are leveled by the eroding effect of water. The US geologist Harry H. Hess (1906-1969) described these relationships for the first time in 1945, thus underpinning the theory of plate tectonics. Hess called the flattened submarine volcanic cone 'Guyot'. Not according to the Swiss geographer Arnold H. Guyot (1807-1884), but in reference to the flat-roofed biology and geology building of Princeton University (USA), which in turn was named after Princeton professor Arnold H. Guyot.



The Jimmu Guyot as part of the Emperor Seamount Chain is located at approx. as 46°N and 169°E. The Guyot with the leveled summit area rises from approx. 5200 m water depth up to approx. 1200 m to the sea surface.



Harry Hammond Hess (1906-1969), co-founder of the plate tectonic theory



The Guyot Hall of Princeton University (USA)

Our work progress was slowed down last Thursday night. Beginning in the late evening, wind and wave increased markedly, making the deployment of our equipment increasingly difficult. Over night, a violent southwest storm developed with up to 22 m/s wind speed (9 Beaufort) and wave heights up to 6 m. On Friday to Saturday morning, station work had to be cancelled accordingly, and we used the time to map the next volcano. 'Minnetonka' is his name. This name comes from the Indian Dakota Sioux 'mni tanka' and means 'big water'. With continued good mood and great support from the RV SONNE crew, we send the very best regards from 47°N 169°E to those who stayed at home.

On behalf of all SO264 cruise participants

Dirk Nürnberg