	SO-255 **Vitiaz** **2. Weekly Report** **(06.03. – 12.03.2017)**	**R/V SONNE** 34°10´ S / 178°52´ E

During the past week, we sampled a west to east profile across the Kermadec Arc/Backarc system between 34-36°S latitudes (see map on second page). After a second successful dredge on a block rifted from the Colville Ridge, we began dredging ridge-type and conical seamount structures in the Havre Trough backarc. The ridge-type structures proved difficult to sample, but we did recover dacitic pumice and some mafic lavas from two of them (see photo). The pumices were up to 35 cm in diameter. The subangular shape and absence of pumice on the nearby backarc structures surrounding the ridges suggest that the pumices may be derived locally. We were able to collect a large variety of fresh mafic lavas with varying proportions of olivine, clinopyroxene and plagioclase phenocrysts from the conical seamounts. The largest sampled backarc seamount (1.8 km high) was Gill Volcano named after one of the American scientists on board (see photo). As we progressed eastwards, we reached the Kibblewhite volcanic front stratovolcano, which yielded andesitic to dacitic lavas and pumice. We recovered a large variety of mafic samples from seamounts around Kibblewhite, including a spectacular variety of crystal-rich samples. Some of the samples contained up to 25% crystals ranging from samples with almost exclusively clinopyroxene (chrome diopside) crystals up to 2 cm long and 1 cm wide (see photo) to anakaramitic samples with roughly equal amounts of large olivine and clinopyroxene crystals. After the volcanic front, we proceeded on to the Kermadec Ridge, which million of years ago was attached to the Colville Ridge, forming the older Vitiaz volcanic arc. The Havre Trough formed by rifting and seafloor spreading after the Vitiaz Arc was split in half (see map). Thereafter we progressed to the western wall of the Kermadec deep-sea trench carrying out dredges at depths of up to 7000 m, but thus far have only recovered mud and sedimentary rocks. Some of the sedimentary rocks contain many small volcanic rock clasts several tens of millimeters in diameter, which are large enough to analyze and possibly age date. Of the 36 dredges thus far, 29 (=81%) recovered hard rocks.

The weather during most of the week was very nice. After two days of stormy weather, the sun is shining again and everyone is waiting to test out the glider testing pool set up on the back deck. All on board are doing well and send their greetings.

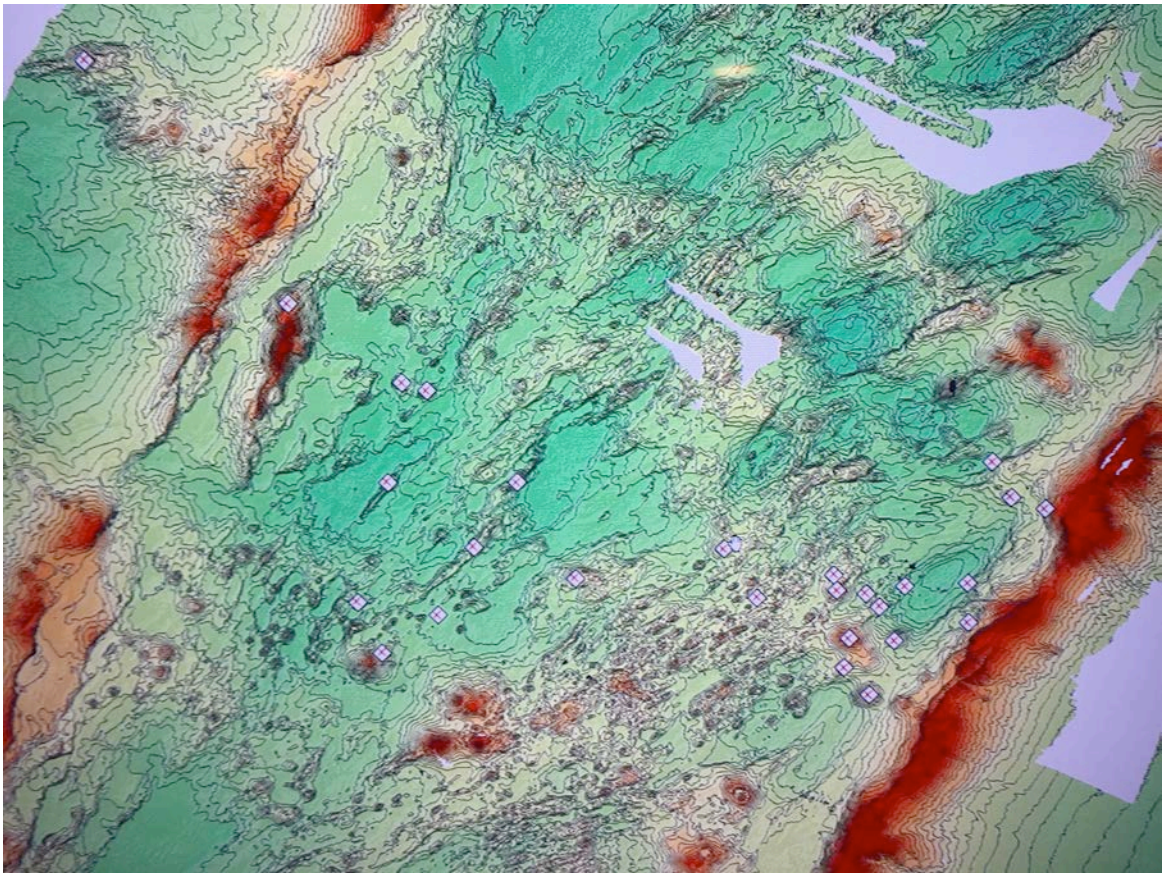
Kaj Hoernle and the SO255 scientific crew

A nearly full dredge of pumice being emptied on deck. (Kaj Hoernle)

Boxes of pumice in the lab waiting to be described and packaged for more detailed studies after the cruise. (Kaj Hoernle)

Prof. James Gill proudly holding a basaltic block recovered from Gill seamount, which he referred to as yet another grandchild. (Kaj Hoernle)

Gems from the seafloor. A basaltic lava containing ~20% chrome diopside crystals. Large chrome diopside crystal, ~2 cm long, has dark green outer zone enclosing lighter green core. (Kaj Hoernle)



Bathymetric map of Havre Trough (mostly yellowish green = deeper depths of ~3000 m) bounded by the NE-striking Colville Ridge in the west (red = shallower depths reaching less than 1000 m) and Kermadec Ridge in the east (also red). Kibblewhite volcanic front stratovolcano is the red seamount with diamond near Kermadec Ridge. Sonne stratovolcano, named after the old R/V Sonne, is the red seamount to the NE above the easternmost sampling sites. Dredge locations (white diamonds with red plus). (Christian Timm)