

**T11C-2637: Exploring the Origin of the Bering Sea: Initial Results of Cruise SO249-2
(17th July – 13th August 2016)**



Monday, 12 December 2016

08:00 - 12:20



Moscone South - Poster Hall

The Bering Sea is one of the largest marginal seas on Earth with still poorly understood origin and evolution. Cruise SO249-2 of the German research vessel Sonne explored the western half of Bering Sea by multibeam mapping, sediment profiling and dredge sampling in the framework of the joint German-Russian-U.S. American project BERING. Focus areas were A) the Chukotka-Beringian margins, once the possible site of Cretaceous arc volcanism prior to Eocene initiation of the Aleutian arc, B) the enigmatic Shirshov Ridge, separating the Komandorsky from the Aleutian Basin, C) Beta Rise, an area of anomalous high heat flow in the Komandorsky basin, D) the Volcanologists Massif and adjacent volcanic and tectonic structures and E) the Komandorsky block, the westernmost section of the modern arc. While SO249-2 is still ongoing, the following observations have been made upon abstract submission. Seamounts on predicted bathymetry of the Chukotka-Beringian margin are erroneous and igneous basement unexposed. Along the western base of Shirshov Ridge, a series of oval shaped domes yielded homogeneous dredges of freshly broken ultramafic rocks (harzburgites, pyroxenites and dunites), amphibolite facies basalts, dolerites, micro-gabbros and leuco-gabbros along with greenschist facies metasediments. This rock suite comprises an ophiolite inventory of unclear origin. In conjunction with Late Cretaceous to Early Paleocene (65-69 Ma) island arc rocks dredged on the crest of Shirshov (SO201-2; unpubl. data) several working hypothesis emerge: 1) obduction of Aleutian basin ocean crust, 2) uplift of arc crust and mantle of the Cretaceous Olyutorsky arc (Siberia) from which Shirshov rifted or 3) an earlier ophiolite accreted to the Olyutorsky arc. In any case formation of the Komandorsky basin by extensional tectonics appears to play a major role in exposing deep seated metamorphic rocks at Shirshov Ridge. During the remainder of SO249-2, we plan to survey and sample the „Beta“ high heat flow area, the Komandorsky ocean crust along multiple fracture zones and the area around Piip volcano; the westernmost expression of active volcanism in the Aleutians including a chain of roughly circular shaped basement highs southeast of Piip. Finally the early Aleutian arc basement exposed in the canyons of the Komandorsky block will be explored.

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