Geophysical Research Abstracts
Vol. 15, EGU2013-6660, 2013
EGU General Assembly 2013

An analysis of seismic tomography, predicted slab volumes and forward modeled mantle structure of the circum-Arctic

Grace Shephard, Christian Heine, Nicolas Flament, Leonardo Quevedo, Daniel Clarke, Maria Seton, and R. Dietmar Müller

School of Geosciences, University of Sydney, Australia (grace.shephard@sydney.edu.au)

Owing largely to the remoteness of the region, the detailed Mesozoic and Cenozoic kinematic evolution of the circum-Arctic is not well known. Highly dynamic plate boundaries, in particular related to the subduction of plates in northern Panthalassa and the South Anuyi oceans since the Jurassic, adds additional complexity due to fragmentation of the lithosphere into a large number of tectonic blocks. We have integrated key observations from publicly available geological and geophysical datasets to define major tectonic elements and generate a new plate tectonic reconstruction of the circum-Arctic. The time-dependent location of subduction, age of subducted lithosphere, convergence rates and intermittent ridge subduction impart significant effects on the evolution of overriding plates and of the mantle structure. We use our new plate tectonic reconstruction of the circum-Arctic, embedded within a global plate model, to drive forward geodynamic models of mantle flow. We analyse the spatio-temporal evolution of subducted slab volumes in the circum-Arctic and compare the present-day prediction of our model with P and S-wave tomography models.