Geophysical Research Abstracts
Vol. 14, EGU2012-8507, 2012
EGU General Assembly 2012

Structural evolution and paleostress pattern of the New Siberian Islands and De Long Islands, NE Russia

C. Brandes (1) and K. Piepjohn (2)

(1) Leibniz Universität Hannover, Institut für Geologie, Hannover, Germany (brandes@geowi.uni-hannover.de), (2) Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), Stilleweg 2, 30655 Hannover, Germany

In the last decades, different tectonic models were developed to explain the evolution of the arctic region (e.g. Jones, 1980; Miller et al., 2006). Many of these models are in some parts relatively unconstrained because of limited data from distinct areas. Only little was known so far about the structural evolution of the New Siberian Islands and De Long Islands, which are located in a key position on the east Russian arctic shelf between the Laptev and the East Siberian Sea. Current tectonic models largely depend on offshore reflection seismics (Franke et al., 2001). To enhance the knowledge of this area, a comprehensive structural analysis was carried out during the CASE 13 expedition in 2011. Paleostress directions were derived based on the orientation of faults, slickensides, intersection lineations and conjugate joints.

Preliminary results indicate that there is evidence for at least one roughly north-south oriented contractional and one more or less northeast-southwest directed extensional deformation phase. Several outcrops in the southern part of Great Lyakhovsky Island give evidence for a horizontal compressional stress regime with a general north-south trending maximum principle stress that is perpendicular to the trend of the South Anyui suture zone in this area. This north-south contractional deformation is probably related to the closure of the Anyui Ocean. Contractional deformation is also exposed on Belkovsky Island and expressed by folding and the formation of a distinct cleavage. Normal faults, developed in relatively unconsolidated (Paleogene) sediments, imply that the extension is younger than the contraction and probably formed due to the evolution of the Laptev Sea Rift. Strike-slip movements along NNE-SSW and NNW-SSE trending faults are dominating the whole area.

References:

Franke, D., Hinz, K., & Oncken, O. (2001) The Laptev Sea Rift. Marine and Petroleum Geology, 18, 1083-1127.

Jones, P.B. (1980) Evidence from Canada and Alaska on plate tectonic evolution of the Arctic Ocean Basin. Nature, 285, 215-217.

Miller, E.L., Toro, J., Gehrels, G., Amato, J.M., Prokopiev, A., Tuchkova, M.I., Akinin, V.V., Dumitru, T.A., Moore, T.E. & Cecile, M.P. (2006) New insights into Arctic paleogeography and tectonics from U-Pb detrital zircon geochronology. Tectonics, 25, TC3013, doi:1029/2005TC001830