Geophysical Research Abstracts
Vol. 20, EGU2018-5602, 2018
EGU General Assembly 2018

Understanding the Continental Crust of the Norwegian Barents Sea through Regional Deep Seismic Profiles

Jan Erik Lie (1), Stuart Clark (2), and Mats Andersson (1)

(1) Lundin Norway AS, Lysaker 1366 Norway, (2) University of New South Wales, Sydney, Petroleum Engineering, UNSW Sydney, Australia (stuart.clark@unsw.edu.au)

In this paper, we present an early interpretation of a 4000km grid of new deep seismic profiles crossing the Barents Sea. Lundin and Seabird acquired the deep-tow, long-offset seismic data in 2016. The profiles cover a region across the Barents Sea platform, from the Atlantic continent-ocean transition in the west to the eastern border of the Norwegian Barents Sea. We present new observations of the crustal imprints interpreted to be the accumulative result of the major tectonic events shaping the crust of the western Barents Sea. The seismic profiles image the entire crust and upper mantle allowing for interpretation of deep features like terrane sutures, Moho-offsets and whole-crust truncating fault zones. The Precambrian basement provinces appear to show crustal imprints from the Caledonian thrust tectonics. In addition, the Mesozoic rift episodes and movements caused by the Early Paleogene break-up of the north Atlantic are apparent. To constrain the seismic observations, we analysed the potential field data to derive addition information on crustal composition, structure and depth. In addition, the regional extent of the gravity and magnetic data across the Barents Sea and the Baltic shield made it possible to map continuous onshore-offshore structural trends, for example the northward prolongation of Archean and Proterozoic lithologies beneath the Caledonian nappe units of various thickness. Finally, we present a regional tectonic reconstruction of the Barents Sea in light of the new data and discuss the impact the data may have on the understanding of the western continental margin, its magmatic character and relation to the conjugate Greenland margin.