

## **4D Arctic: Structure and Evolution of Arctic Crust and Mantle Based on Multi-Scale Geophysical Studies – results from an international, multi-disciplinary project**

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Arctic geological history contains many grey zones. In particular, the structure of the lithosphere and the spatial and temporal interaction between the crust and upper mantle has been meagerly explored, yet it may hold some of the answers for the formation of passive margins, sedimentary basins, oceanic bathymetric features and volcanic provinces. As part of an interdisciplinary collaborative project between Norway, Russia and other European countries, we built a multi-scale model that unravels the structure and evolution of Arctic's crust and mantle and their interaction through time.

New geophysical data, including seismic reflection, satellite and aerial potential data have been analysed in various regions of the Arctic-including the Fram Strait, Eurasia Basin and East Siberian Shelf. New kinematic models based on this data have been used to improve the Circum-Arctic agegrid.

A Circum-Arctic crustal thickness and depth to Moho models have been obtained by 3D gravity inversion. A new compilation of sediment thickness and model of oceanic lithospheric age were used as input for gravity inversion and also to derive lithospheric thermal and strength model of the Arctic region.

Existent tomographic models have been analyzed and discussed against the kinematic and geodynamic models of the Arctic. A new effort is now underway to construct a novel upper mantle tomography based on a much-improved global catalogue of seismic events by using Automated Multimode Inversion of surface, S and multiple S waves. The Circum-Arctic crustal model developed in this project will be used to improve the new generation of upper mantle tomographic models.