

An Overview of Structure and Evolution of the Lithosphere in the North Atlantic Region

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We present a review of the structure of the crust and the upper mantle in an area which covers about 1/8 of the globe and encompasses most of Europe, Iceland, Greenland, and Svalbard. Using the results from seismic (reflection and refraction profiles, P- and S-wave body-wave and surface-wave tomography), thermal, gravity, and petrologic studies (based both on the results of the authors and on literature compilations), we propose an integrated model of the structure and physical properties of the crust (a newly constrained model by the authors) and the upper mantle in the entire region down to a depth of 250-300 km. Our primary attention is to the lithosphere structure of the onshore parts of the region, but the less well constrained deep structure of the North Atlantic is also discussed. The results are summarized in a series of maps of lateral variations in crustal and lithospheric thicknesses, seismic shear wave velocity at different depth slices, heat flow and lithosphere temperatures, as well as density and compositional variations in the lithospheric mantle.