D-REx project in Fennoscandia

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The D-REx project addresses the ERA-MIN Joint Call 2019 “Raw materials for sustainable development and the circular economy”, topic 1: “Supply of raw materials from exploration and mining”. Formation and concentration of metals into economic mineral deposits requires a combination of processes operating at different scales. Mineral deposits are themselves a small part of a very large geological context, the so-called mineral system, which further includes an often deeply seated source for fluids, a source region for metals, an energy source for driving hydrothermal circulation, pathways for the migration of enriched fluids, a depositional mechanism responsible for the formation of the deposit and a fluid outflow. The primary objective of the D-REx project is to improve the identification of previously unrealized endowed regions. Historically, efforts to understand mineralized systems have focused on the near surface identification and evaluation of individual resource bodies using shallow imaging techniques. The manageable logistical requirements and small environmental footprint of magnetotellurics coupled with its broadband depth sensitivity (from 10s of meters to 100+ kilometres) are making it an increasingly important and powerful tool for geophysical studies with multiple depth scales of interest. For these reasons magnetotellurics is the primary new geophysical data set collected in D-REx. We have collected regional datasets at three prospective areas in Sweden, Norway and Finland to generate the regional and deposit scale models needed to identify the deeper footprints of metal concentration. The D-REx approach shade the light on the early earth history and processes responsible for the concentration of metals in the current uppermost crust of the Fennoscandian shield.