GEOLOGICAL SURVEY OF FINLAND

Open File Research Report 57/2021

Mineral Prospectivity and Exploration Targeting – MinProXT 2021 Webinar

October 12-13 & 26-27, 2021

Abstract proceedings

Edited by Johanna Torppa and Bijal Chudasama

Figures in each abstract are prepared by the author(s) of that specific abstract.

Front cover: Terrain base map from ArcGIS® Earth, Earthstar Geographics – ESRI.
Picture by Riitta Turunen, GTK.

Layout: Elvi Turtiainen Oy

Espoo 2021

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MINERAL PROSPECTIVITY MAPPING FOR CRITICAL RAW MATERIALS AT THE EUROPEAN SCALE WITH THE CBA METHOD

by

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This contribution presents pan-European prospectivity maps for lithium, cobalt, natural graphite, niobium, tantalum, phosphates and rare earth elements that were produced by the GeoERA FRAME project. These maps are based on the cell-based association (CBA) method, which was specifically developed for mineral prospectivity mapping at regional to continental scales. The purpose of this method is to address issues such as uncertainties in the location of cartographic objects and the need to consider geological contexts. Several options to calculate favourability scores were statistically tested and compared to improve the accuracy of the method and produce the final maps.

INTRODUCTION

Lithium (Li), cobalt (Co) and natural graphite are essential for energy storage technologies and electric transportation. Niobium (Nb) is essentially used to produce high-strength low-alloy (HSLA) steels for construction, the automotive industry and pipelines. Tantalum (Ta) is needed for applications in electronics (capacitors), metallurgy (crucibles, heat exchangers, etc.), chemistry, superalloys or carbides (e.g., cutting tools). Phosphates are largely used across the world for the production of fertilizers, and rare earth elements (REE) are used in a wide range of equipment for green energy and digital technologies. All these commodities are considered critical raw materials (CRM) for the EU (2020). As these elements are mostly produced outside Europe, their supply for European industry is potentially a threat. Moreover, primary resources should be exploited as a priority in Europe