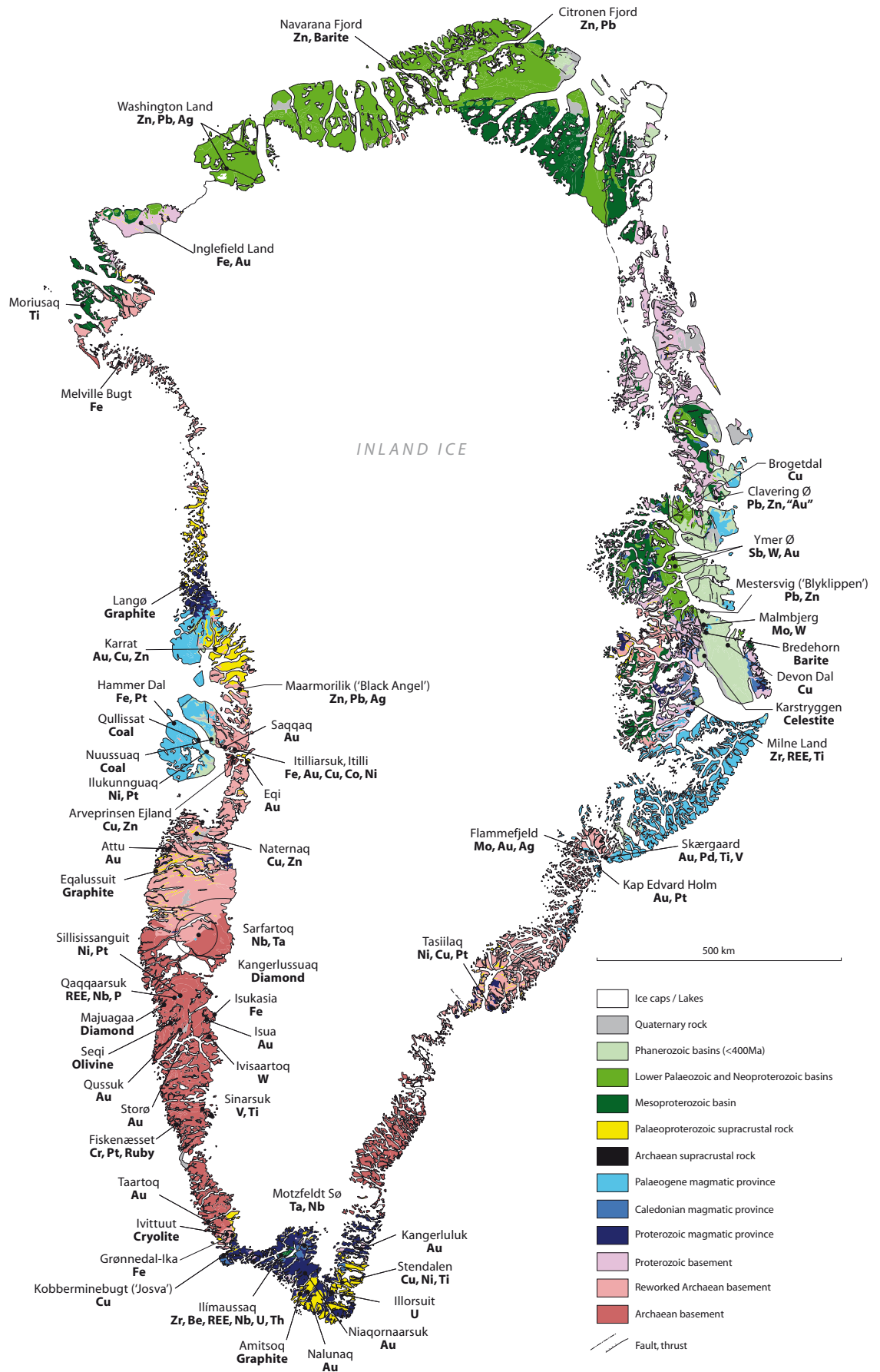
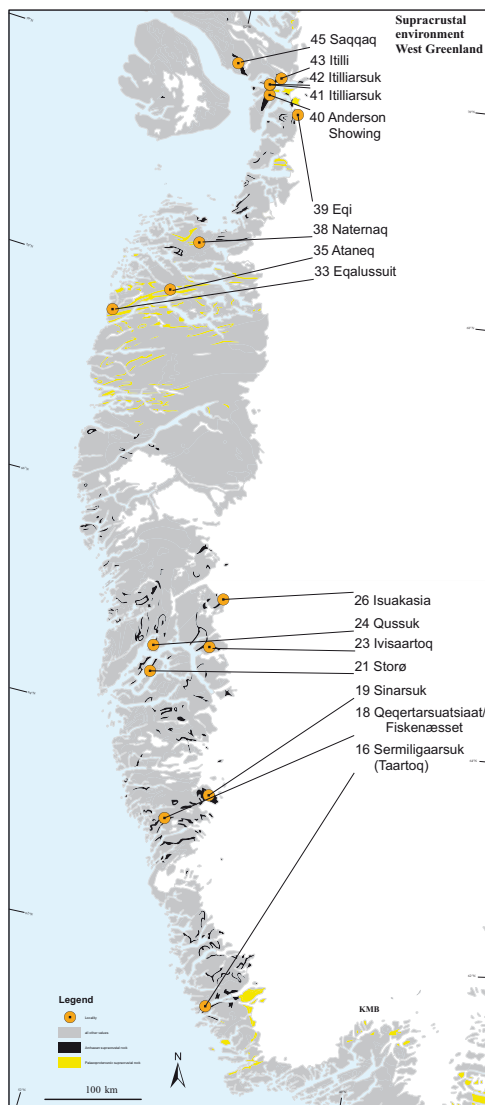


Map of geological environments and selected mineral occurrences



Greenland is geologically and geographically very much related to northern Canada and Scandinavia although recent political history is mostly coupled with Europe. Greenland, the largest island in the world, covers 2,175,600 km². It is 1,250 km wide from east to west and 2,675 km from north to south. The up to three kilometre thick Inland Ice covers some 80% of Greenland; the ice-free zone around the Inland Ice is up to 300 km wide and covers an area of ca. 410,000 km², which, by comparison, is more than Germany (357,000 km²).

The mineral occurrences in a region are determined by the geological environment and the geological processes forming the mineral accumulations. The environments are a reflection of the geotectonic evolution and thus linked to global plate tectonic scenarios through time.



Close-up of the geological map with focus on supracrustal rocks in South-West Greenland.

Geological environments

The geological environments are categorised and named according to their dynamic rock class as being infracrustal, supracrustal, magmatic or sedimentary.

Infracrustal rocks consist mainly of gneiss, tonalitic and granitic rocks of Archaean and Palaeoproterozoic ages. Regions dominated by infracrustals in Greenland are southern West, North-West and South-East Greenland.

Supracrustal rocks are metamorphosed sedimentary and volcanic rocks formed at the surface of the earth. Through the geological processes, the supracrustal rocks have become an integral part of the basement rocks, making 5–20% of the rock volume.

Infracrustal and supracrustal rocks are collectively called the basement. Major supracrustal domains of Palaeoproterozoic age comprise the Karrat Group in northern West Greenland and the Psammite and Pelite zones in South Greenland. Major intrusive complexes of Paleoproterozoic age comprise the Prøven Granite and the Arfersiorfik intrusive suite in central and southern West Greenland, the Julianehåb batholith in South Greenland and the Ammassalik intrusive complex in South-East Greenland.

Major intrusive and extrusive environments are found within the Mesoproterozoic Gardar Province of South Greenland and younger events as the province of carbonatites and kimberlites of West Greenland, and the Caledonian granites and alkaline granitoid intrusions of East Greenland. The youngest extrusive environments are the Palaeogene basaltic provinces of East and central West Greenland.

Sedimentary environments encompass physically and chemically derived minerals from sources related to the formation of basins. The sedimentary basins are dominating in East and North Greenland geological history; the major sedimentary basins are: the Mesoproterozoic Thule Group, Krummedal succession and Independence Fjord Basin, the Neoproterozoic Eleonore Bay Supergroup and Phanerozoic sedimentary basins. Commodities within this environment are dominated by base metals and industrial minerals.

Concluding remarks

The mineral occurrences are tied to geological environments and geological processes forming the mineral accumulations. The combination of this information in one map makes it apparent where to look for specific minerals, both as single commodities, in selected geological environments or among known mineralisation types.



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