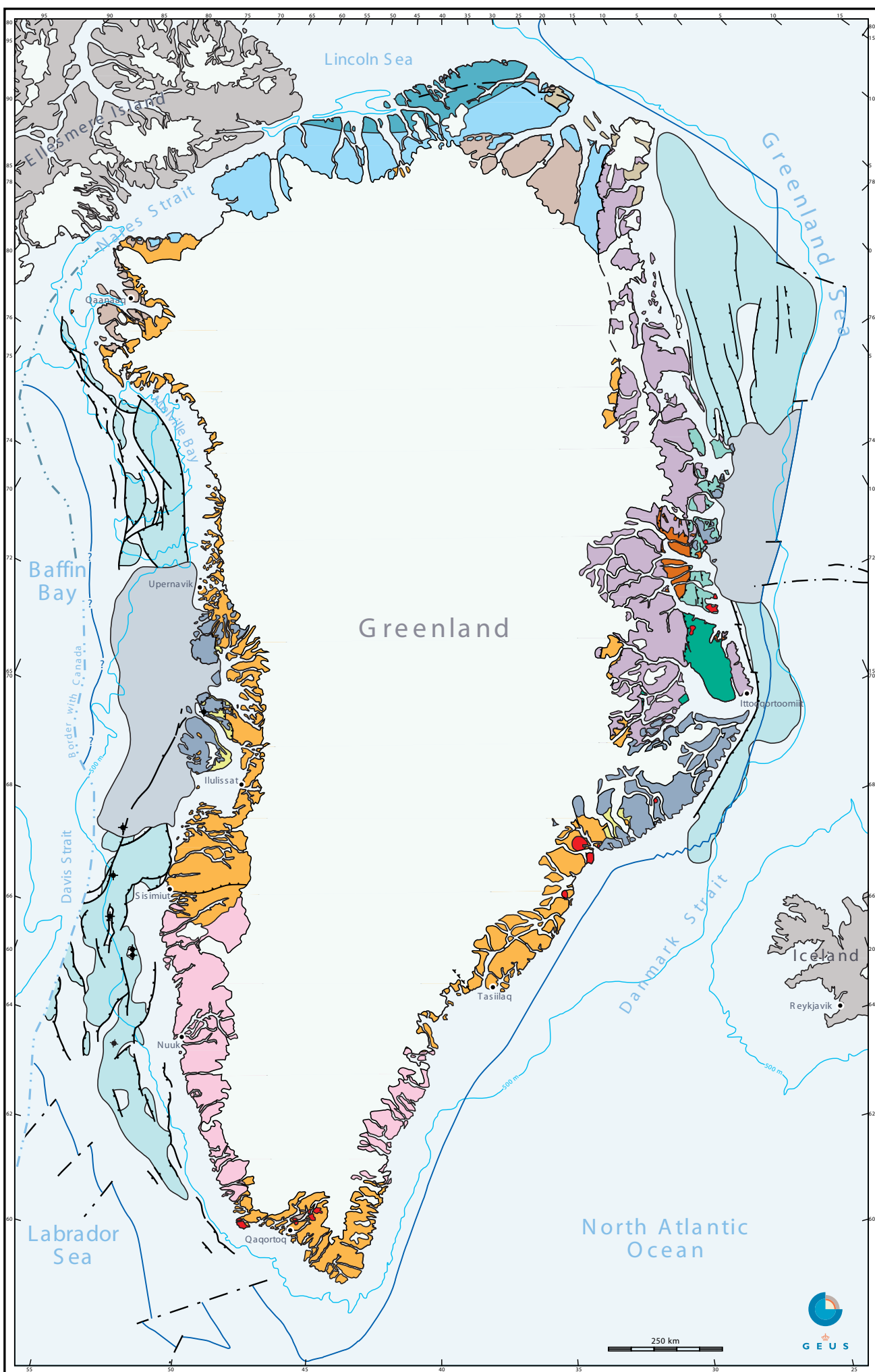


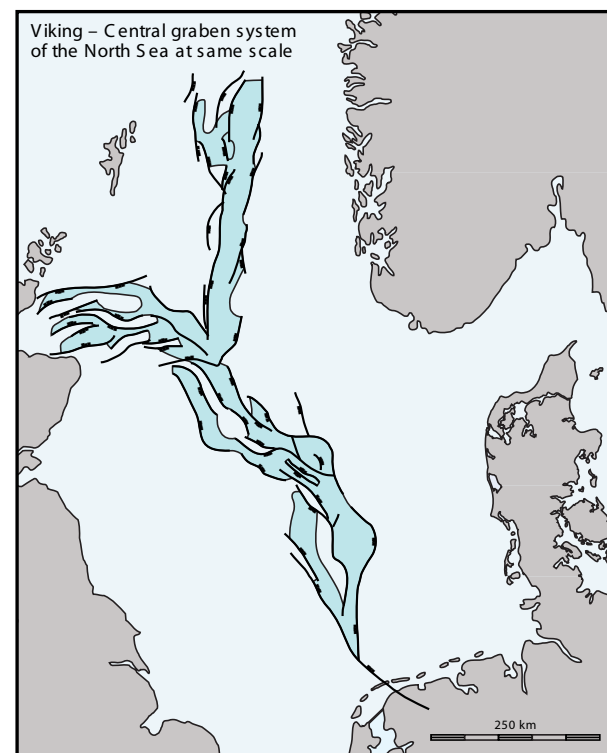
SEDIMENTARY BASINS OF GREENLAND

Geological Survey of Denmark and Greenland
2000



LEGEND

- Inland Ice
- Lower Tertiary basals
- Cretaceous – Lower Tertiary sediments of West Greenland (Nuussuaq Basin) and East Greenland (Kangerlussuaq Basin)
- Carboniferous – Lower Tertiary sediments of the Wandel Sea Basin of eastern North Greenland
- Carboniferous – Cretaceous sediments of North-East Greenland basins
- Carboniferous – Cretaceous sediments of the Jameson Land Basin in East Greenland
- Devonian Basin of North-East Greenland
- Shelf } Lower Palaeozoic sediments of North Greenland (Franklinian Basin)
- Trough }
- Middle–Upper Proterozoic sediments and volcanic rocks
- Caledonian orogenic belt
- Lower Proterozoic orogenic belts
- Archaean craton
- Intrusive complexes; Lower Tertiary in East Greenland, Middle Proterozoic in South Greenland
- Offshore basins with substantial thicknesses of sediments (>~3km)
- Offshore basins where deeper sedimentary successions concealed by Lower Tertiary basals
- Landward limit of proven oceanic crust
- Extensional fault
- Compressional fault, thrust
- Transform fault
- Site of exploration well



Sedimentary basins of Greenland

Total area of sedimentary basins with petroleum prospectivity exceeds 350 000 km² (135 000 square miles). Total seismic data base c. 110 000 km, but coverage uneven. Only 6 offshore wells and 1 onshore wells drilled, all in West Greenland. Large areas still untested.

Onshore basins

West Greenland basin (Cretaceous–Tertiary):

More than 6 km Cretaceous–Tertiary sediments overlain to the west by Lower Tertiary basals. Extensive oil impregnation in vesicular basalts. Wet gas in marine Upper Cretaceous. Source rocks not exposed. Fluvio-deltaic and slope turbidite sandstones provide potential reservoirs.

Jameson Land Basin, central East Greenland (Upper

Palaeozoic–Mesozoic):

More than 16 km Devonian. Cretaceous syn- and post-rift sediments. High quality source rocks in Upper Carboniferous (lacustrine), Upper Permian (marine) and Lower Jurassic (lacustrine). Respective reservoirs are syn-rift fluvial Carboniferous sandstones, Upper Permian carbonate build-ups, and Lower Jurassic deltaic sandstones.

North-East Greenland rift basins (Upper Palaeozoic–Mesozoic):

Thick Devonian–Cretaceous syn-rift sediments. Lacustrine Upper Carboniferous, marine Upper Permian, and marine Upper Jurassic oil source rocks. Several good reservoir intervals. Exhumed palaeo-oil field in mid-Jurassic sandstone.

Franklinian Basin, North Greenland (Lower Palaeozoic):

Platform carbonates passing northwards into clastic trough. Lower–Middle Cambrian and Lower Silurian marginal marine source rocks. Basal Cambrian sandstone and Silurian reef reservoirs. Extensive bitumen showings.

Offshore basins

Melville Bay basins:

Major grabens and half-grabens. More than 13 km of syn- and post-rift sediments of Cretaceous (? and earlier) to Recent age. Suggested source rocks in the Cenomanian, Turonian and Paleocene. Syn-rift sandstones likely to provide excellent reservoirs.

Southern West Greenland:

Rifted margin with passive margin cover; more than 8 km sediments of Early Cretaceous to Recent age. Suggested source rocks at base of Cenomanian/Turonian–Mastrichtian mudstone unit and also in Paleocene. Syn-rift deltaic and fan sandstones are main reservoir targets.

Central East Greenland:

South of 70°N, more than 4 km of Tertiary sediments overlie Lower Tertiary basals. North of 70°N even thicker Tertiary successions unconformably overlie faulted and tilted Upper Palaeozoic–Mesozoic sediments.

North-East Greenland shelf:

Aeromagnetic and regional seismic data show presence of large sedimentary basins; by analogy with adjacent onshore area and the west Norwegian shelf, prolific source rocks and several reservoir intervals of Late Palaeozoic and Mesozoic age are anticipated. On strike with major oil province of northern North Sea. Access extremely difficult.