



CIRCUM-ARCTIC MAGNETIC MAP WITH TECTONIC OVERLAY

Polar Stereographic Projection
Scale 1:6 000 000 at 75°N Latitude

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This magnetic map (GSC Open File 3281) has been combined with a newly assembled digital database of tectonic elements, produced from several sources, to compare relationships of the circumpolar geology. The magnetic data were reduced to the Definitive Geomagnetic Reference Field (DGRF) secular model, gridded to 5 km, and then filtered to remove wavelengths longer than 400 km. White areas define unmapped regions and the irregular white line is the boundary between contour data on the Eurasian Shelf and profile data over the Amerasia Basin.

The magnetic field of the Arctic shows a complex pattern of anomalies corresponding to many phases of geological history. Linear magnetic anomalies, extending from the Norwegian-Greenland Sea into the Eurasian Basin, are offset by a major fracture zone and represent active seafloor spreading. In Baffin Bay, low amplitude anomalies are attributed to Early Tertiary seafloor spreading. In contrast, the magnetic anomalies over the Alpha Ridge have uncharacteristically high amplitudes for oceanic crust and are chaotic. The nature of this oceanic crust is not currently understood. In Canada Basin, low amplitude fan-shaped magnetic anomalies have been attributed to Late Jurassic to Early Cretaceous seafloor spreading. Onshore, tectonic elements are generally correlatable with magnetic lineations. Where crystalline basement is exposed, these relationships are easily apparent; however, many sedimentary basins mask this relationship. Structural elements of the sedimentary basins have been included in this map to highlight the variability in magnetic signatures related to different basement structures below the basins.

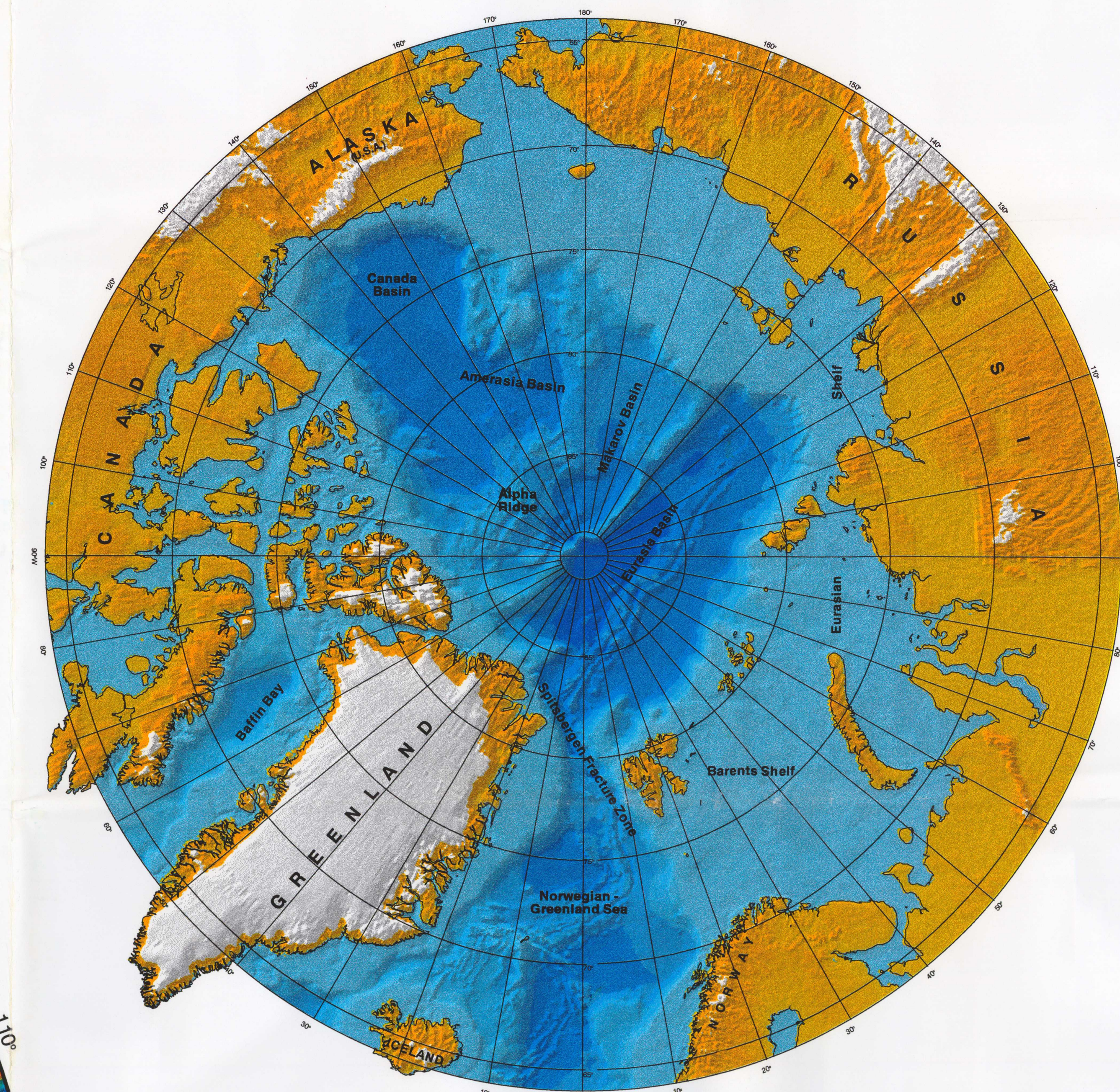
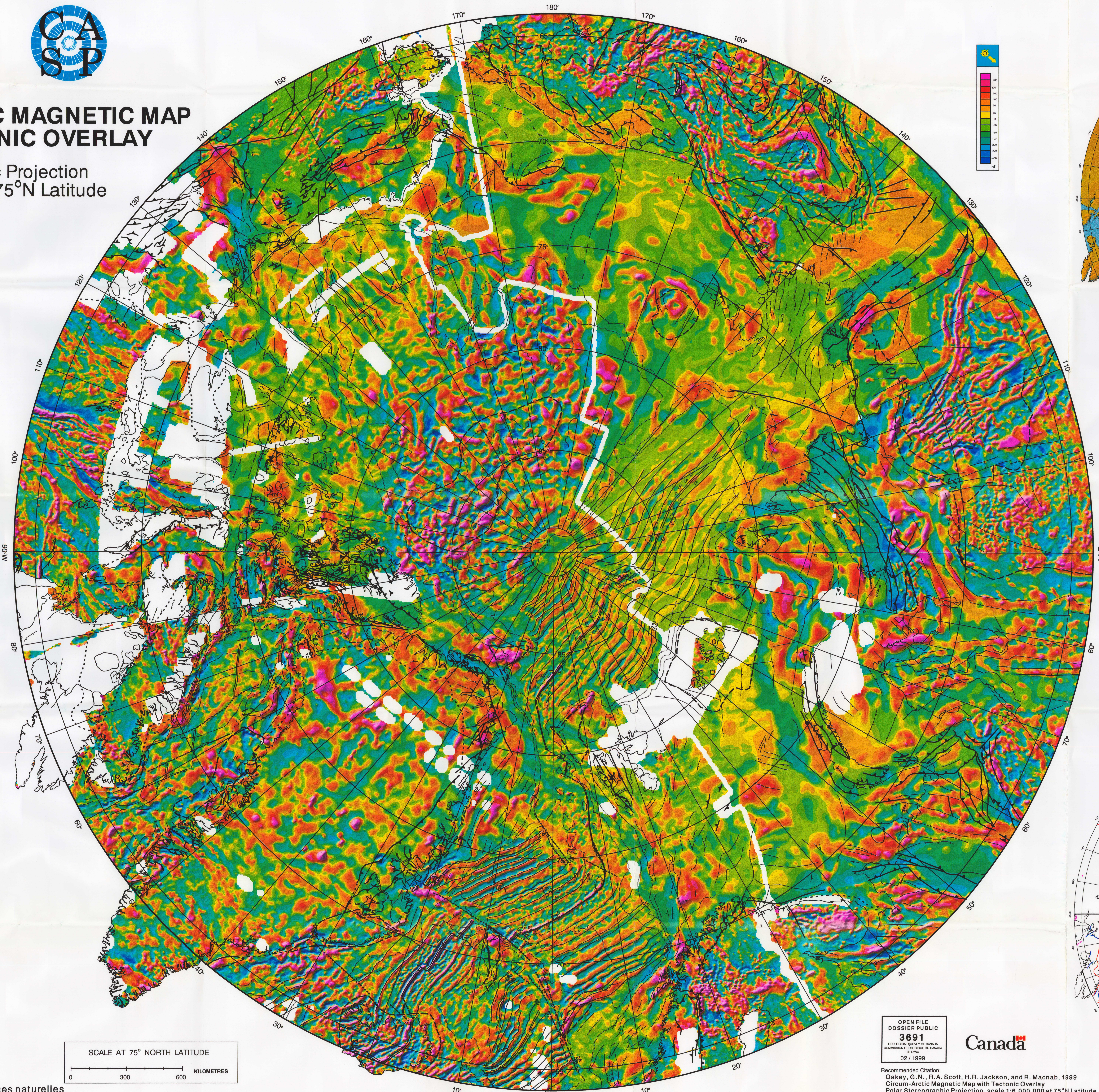
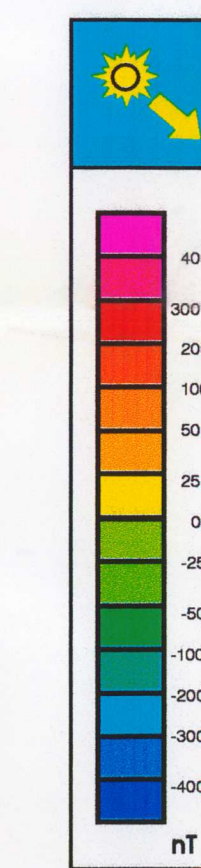
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Copies of this map can be obtained from the Geological Survey of Canada (Atlantic) PO Box 1006, Dartmouth, Nova Scotia, Canada, B5Y 4A2
email: agc@agc.bio.ns.ca
web: http://agcwww.bio.ns.ca

SCALE AT 75° NORTH LATITUDE

0 300 600 KILOMETRES



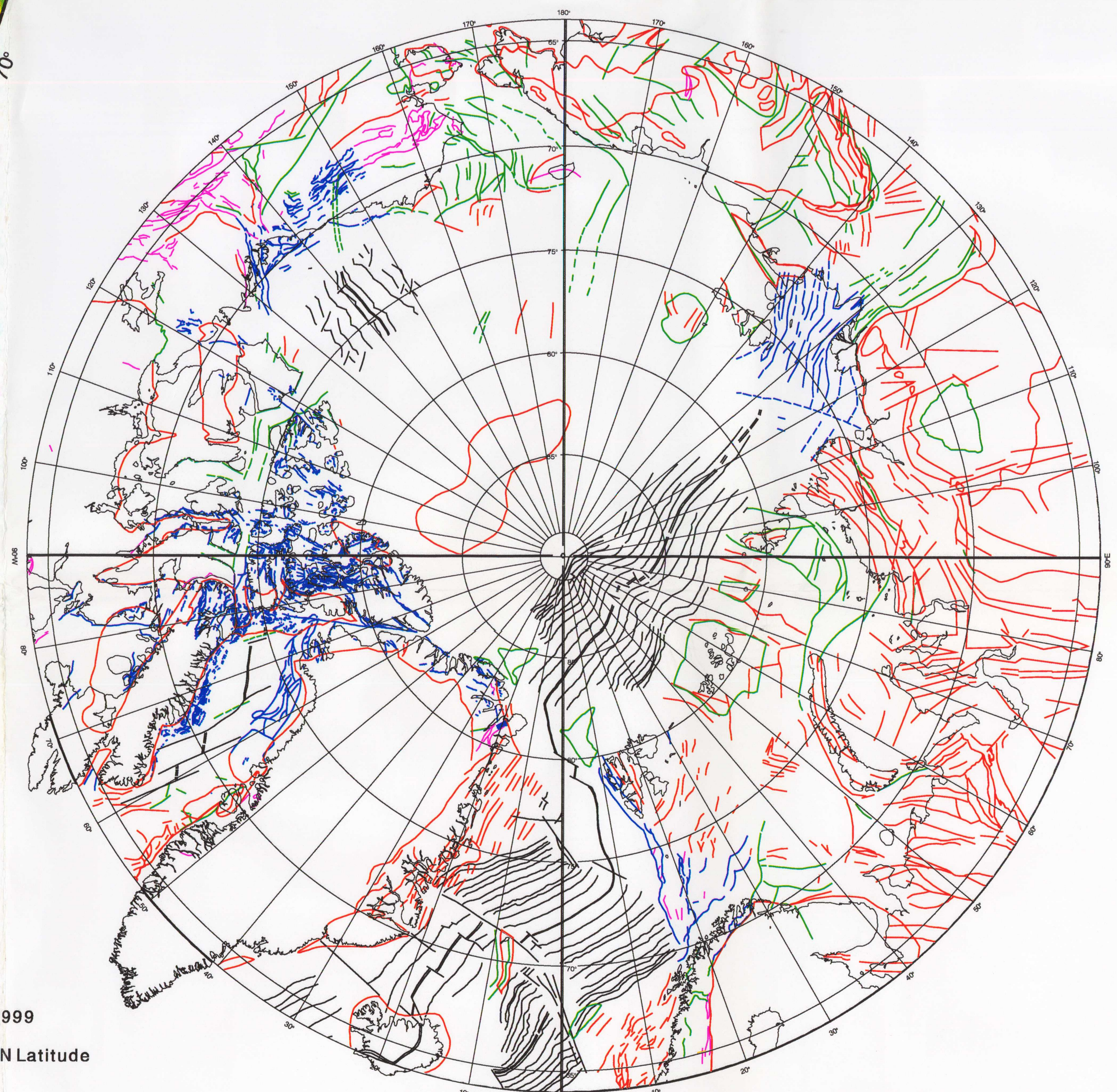
BATHYMETRIC AND TOPOGRAPHIC RELIEF

LEGEND

- Thrust Fault
- Normal Fault
- Strike-slip Fault
- Spreading Ridge
- Magnetic Isochron
- Fracture Zone
- Exposed Craton
- Volcanic Platform
- Bathymetry (1km int)

SOURCES AND DISTRIBUTION OF GEOLOGICAL FEATURES

The coloured line work is keyed to the reference from which the geological features were extracted. The regional references are: Okulitch et al., 1989 (magenta); Grantz et al., 1990 (green); and Scott et al., 1995 (red). All features from geographically localized references are plotted in blue: Jackson et al., 1989; Okulitch, 1991; Jackson and Sweeney, 1993; Whittaker et al., 1995; Oakey, 1995; Chalmers et al., 1995; Drachev et al., in press. The faults, magnetic lineations and other geological features have been maintained in digital form for ease of updating.



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