

Introduction

This poster series presents a new structural interpretation for the Cretaceous synrift depocentres of the Labrador Shelf (Figure 1), where several qualitative comparisons can be drawn to the Malawi Rift in East Africa.

The Western Branch of the East African Rift System (EARS) is largely amagmatic, with only four volcanic centres throughout the rift (e.g Ebinger, 1989). In the Malawi Rift, at the south end of the Western Branch, extension occurs through normal faulting and the development of half-grabens along the rift axis (McCartney and Scholz, 2016).

The Labrador Shelf contains two sedimentary basins, the Hopedale and Saglek Basins, separated by the Okak Arch (Figure 2), however sediment thickness maps (Figure 3) suggest the Hopedale Basin contains two depocentres, here called the Hopedale and South Hopedale Basins (Figure 1).

The sediment thickness map in Figure 3 is derived from interpretation of 2D reflection seismic data. Depth conversion of the interpretation grids used for total sediment thickness mapping is described in Carey et al., (2019). The thick and thin regions in the depth contours (Figure 3) are in agreement with the thick and thin regions in the original two-way travel time sediment thickness map (colour grid, Figure 3).

The Cretaceous depocentres on the Labrador Shelf can be subdivided into three groups associated with the South Hopedale Basin, the Hopedale Basin, and the Okak Arch, each with distinct structural characteristics that are discussed in the following two posters.

References

Carey, J.S., McCartney, T., Hanna, M.C., Lister, C.J., Ferguson, R., and Kung, L.E., 2019. Qualitative petroleum resource assessment of the Labrador margin: Geological Survey of Canada Open File 8535, 109 p.

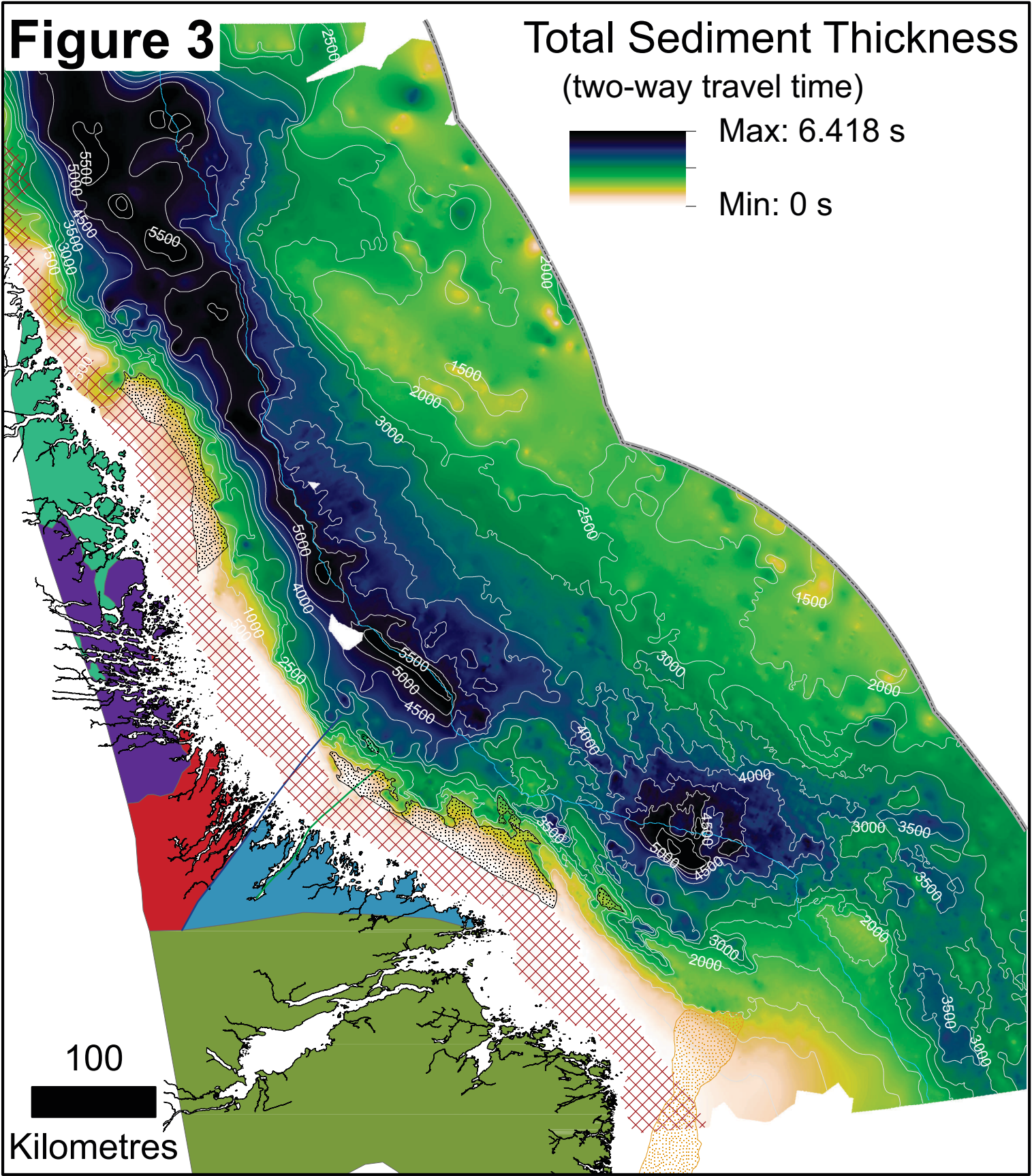
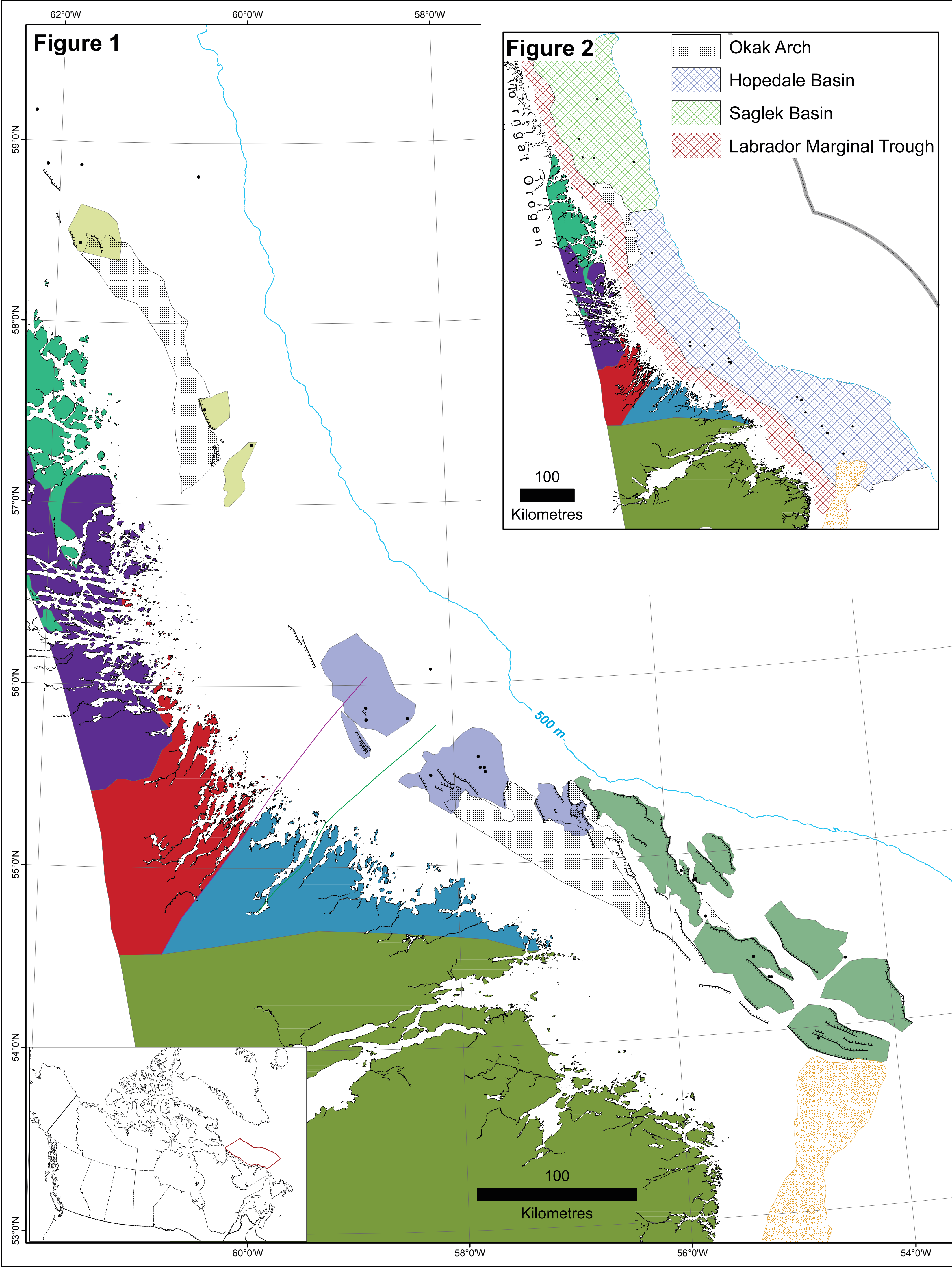
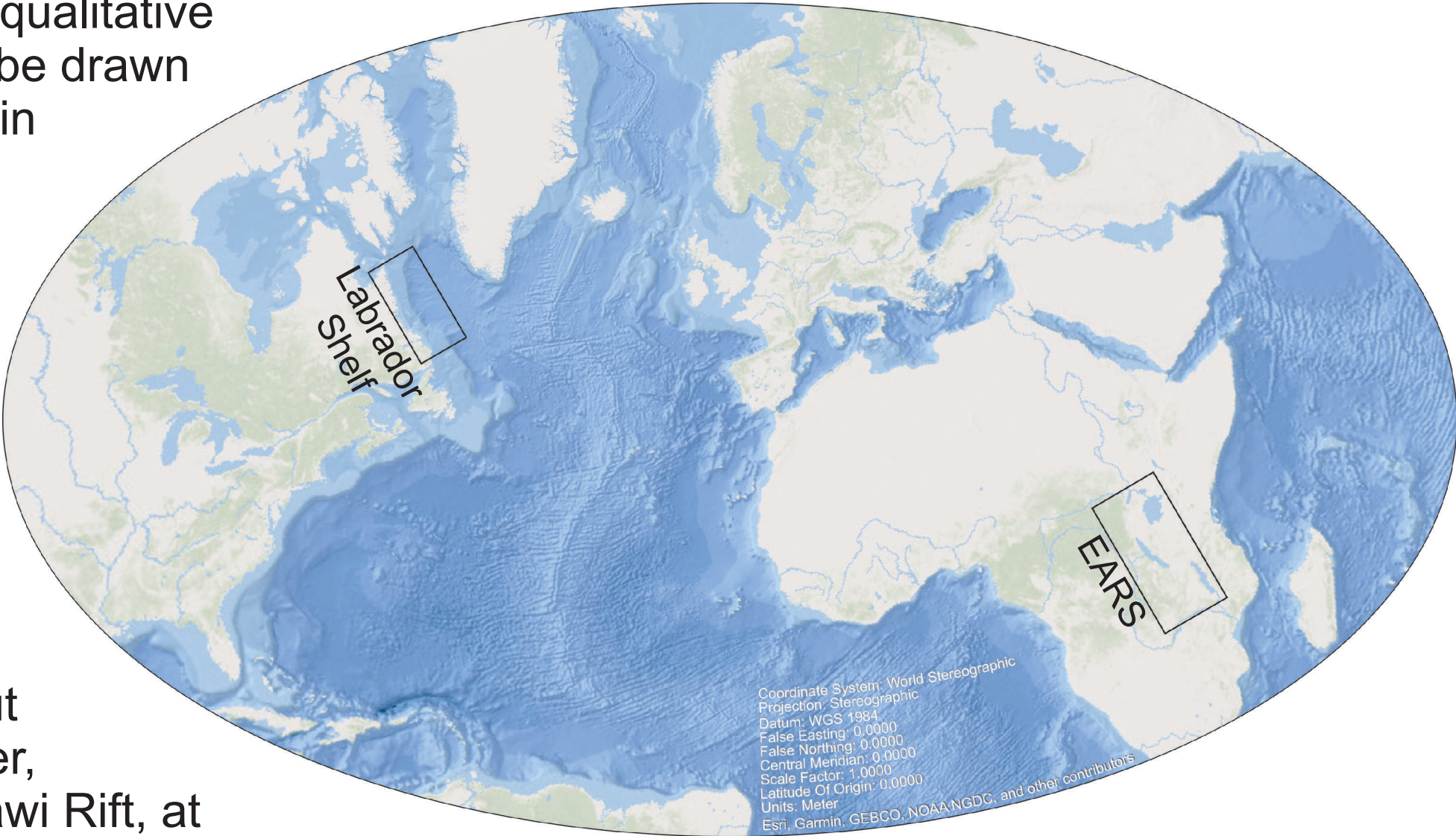
Ebinger, C. 1989. Tectonic development of the Western Branch of the East African Rift System: Geological Society of America Bulletin, v. 101: p. 885–903.

Funck, T., Loudon, K.E., and Reid, I.D. 2001. Crustal structure of the Grenville Province in southeastern Labrador from refraction seismic data: evidence for a high-velocity lower crustal wedge. Canadian Journal of Earth Sciences, v. 38: p. 1463–1478.

McCartney, T., and Scholz, C.A., 2016. A 1.3 million year record of synchronous faulting in the hangingwall and border fault of a half-graben in the Malawi (Nyasa) Rift: Journal of Structural Geology, v. 91, p. 114 –129.

Wardle, R.J., Gower, C., Ryan, B., Nunn, G., James, D., and Kerr, A. 1997. Geological Map of Labrador; 1:1 million scale. 1 sheet.

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contour: total sediment thickness (depth in metres)
contour interval = 500 m

- Exploration wells
- 500 m isobath (shelf break)
- 200 nautical mile limit
- Basement-involved normal faults
- ▨ Basement highs
- ▨ Hopedale Basin depocentres
- ▨ Okak Arch depocentres
- ▨ South Hopedale Basin depocentres
- KBSZ (after Wardle et al, 1997)
- KKSZ (after Wardle et al, 1997)
- ▨ Cartwright Arch (after Funck et al., 2001)
- ▨ Grenville Province thrust belt (after Wardle et al., 1997)
- ▨ Makkovik Province (after Wardle et al., 1997)
- ▨ Nain Province: Hopedale Block (after Wardle et al., 1997)
- ▨ Nain Province: Plutonic Suite (after Wardle et al., 1997)
- ▨ Nain Province: Saglek Block (after Wardle et al., 1997)

Projection: Lambert Conformal Conic
Datum: WGS 1984
False Easting: 0.0000
False Northing: 0.0000
Central Meridian: -60.0000
Standard Parallel 1: 65.0000
Standard Parallel 2: 75.0000
Scale Factor: 1.0000
Latitude Of Origin: 65.0000
Units: Meter