Comparing Paleoproterozoic orthogneisses in northern Idaho with glacial igneous clasts of East Antarctica; evidence for linkage between western Laurentia and East Antarctica during Columbia supercontinent assembly

**Overview & Locations**

**Purpose:** to test a potential Paleoproterozoic link between western Laurentia and East Antarctica.
- comparing metaigneous rocks of the Priest River complex, Idaho (1.87-1.84 Ga) to granitic glacial cobbles (1.88-1.85 Ga) from East Antarctica.
- comparing whole-rock chemistries, U-Pb ages, and Hf-isotope compositions.

**Priest River metamorphic complex** in northeast Washington and northern Idaho, represents western Laurentian basement located adjacent to the Neoproterozoic rifted margin. Two Paleoproterozoic-Noroeanarchean basement localities: Cougar Gulch and Priest River locations (see figures below and Buddington et al., 2016, and Wang, 2015).
- Cougar Gulch orthogneiss (monzogranite-granodiorite) and Kidd Creek orthogneiss (tonalite-granodiorite).
- Priest River amphibolite inclusions are dissected mafic dikes (basaltic to basaltic andesite) within 2.65 Ga Pend Oreille Gneiss.

**Central East Antarctica** craton is ice covered, but glacial clasts eroded from the interior were deposited in maraines in the Transantarctic Mountains adjacent to the Neoproterozoic rift margin. Sites were sampled at Lonewolf Nunataks and Mt. Sirius (see figures below and Goodge et al., 2017).
- glacial cobbles composed of granitic orthogneiss.

**Idaho Orthogneisses**

**East Antarctic Erratics**

**New Ages & Hf-Isotopes**

**Major-Element Chemistry**

**Trace-Element Chemistry**

**Conclusions**

The Paleoproterozoic orthogneissites from the Priest River complex & East Antarctica (Lonewolf Nunataks & Mt. Sirius) exhibit striking similarities. Both groups occur adjacent to their respective Precambrian rifted margins (see figure below) and both exhibit:
- overlapping of major & trace element chemistries; consistent withogensic origin
- similar crystalization ages & initial Hf-isotope compositions, indicating a common source of melts
- a volcanic arc fingerprint, indicating these rocks formed during active-margin convergence.

Based on these similarities, we propose a potential linkage between western Laurentia and the Nevres Province in East Antarctica during the Paleoproterozoic assembly of supercontinent Columbia. Such ties may also extend to the Gawler Craton in Australia.

**Sources**


