

Field investigations in the northeastern Ashuanipi Complex, Superior Province, western Labrador (NTS 23J/02, 23J/03 and 23J/04)

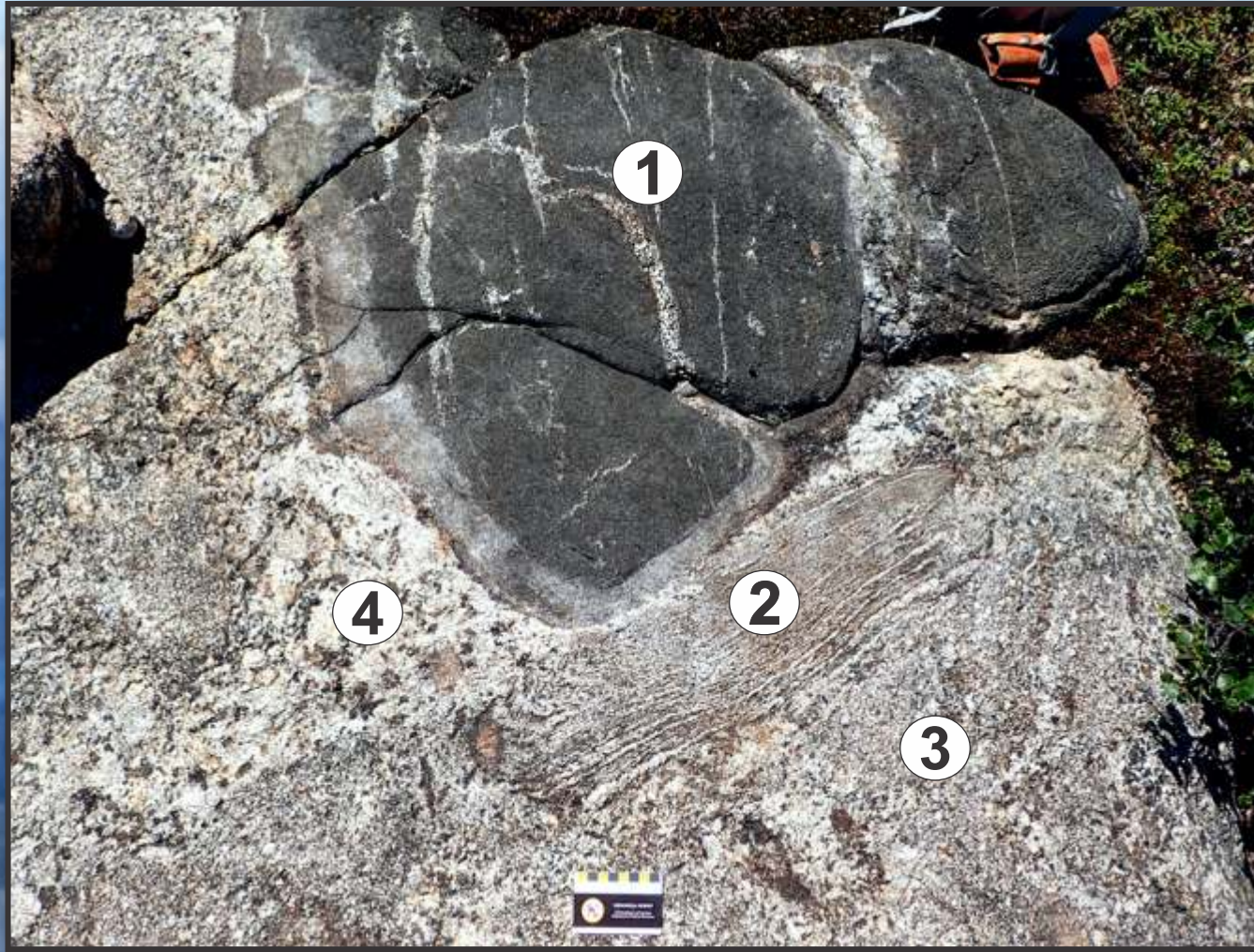
Tim van Nostrand¹ and Shannon Broughm²
¹GSNL, ²Memorial University of Newfoundland



In western Labrador, the ca. 3.0-2.6 Ga. Ashuanipi Complex is the easternmost subprovince of the Archean Superior Province and consists of older pre-D₁ units of migmatitic metasedimentary gneiss (paragneiss), tonalite to diorite orthogneiss of the Desliens igneous suite and layered gabbro-pyroxenite intrusions. These units predate the formation of extensive pre- to late D₂ diatexite migmatite, variably deformed granite, tonalite and syenite plutons, mafic dykes and pegmatite. Late, regional-scale gabbro dykes postdate the Archean-Proterozoic unconformity along the eastern map area. Orthopyroxene-bearing assemblages in most rock types indicates that granulite-facies metamorphism was widespread throughout the region. Retrogression to upper amphibolite facies assemblages is evident in some areas, particularly adjacent to late faults. The structural pattern of the area is dominated by a pervasive, regional west to northwest-striking, south-dipping S₁ foliation or gneissosity and west to northwest-verging macroscopic F₂ folds. Several late, north, northeast and northwest-striking brittle faults transect the area. Mineralization within the map area consists of local gossan zones in paragneiss, orthogneiss, gabbro, diatexite and pegmatite hosting disseminated to locally semi-massive pyrrhotite ± bornite ± chalcocopyrite ± arsenopyrite. Some of these mineralized zones have returned elevated Au and base metal assays from limited exploratory work. Local anomalous radioactive signatures are recorded from syn- to late D₂ pegmatite veins and suggests that these rocks may have potential to host U, Th and Rare Earth Element mineralization.



Proterozoic (7) gabbro dykes crosscutting pre-D₁ tonalite gneiss of the Desliens igneous suite. These dykes are interpreted to be offshoots related to large northeast-striking gabbro dykes which postdate the Archean-Proterozoic unconformity along the eastern map area. Hammer is 30 cm in length.



Enclaves of black-weathering pyroxenite(1) and well-banded paragneiss (2) in massive and homogeneous garnet-dominant diatexite (3), intruded by later coarse orthopyroxene-bearing pegmatite vein (4).



Grey-weathering tonalite of the Desliens igneous suite with deformed mafic layers (remnant dykes?) and folded (F₂) and boudinaged alkali feldspar granite veins.



Moderately-banded paragneiss, intruded by concordant alkali feldspar granite veins which are displaced along late discordant quartz veins. The displacement of the granite veins indicates a central period of movement associated a major late brittle fault which transects the map area.



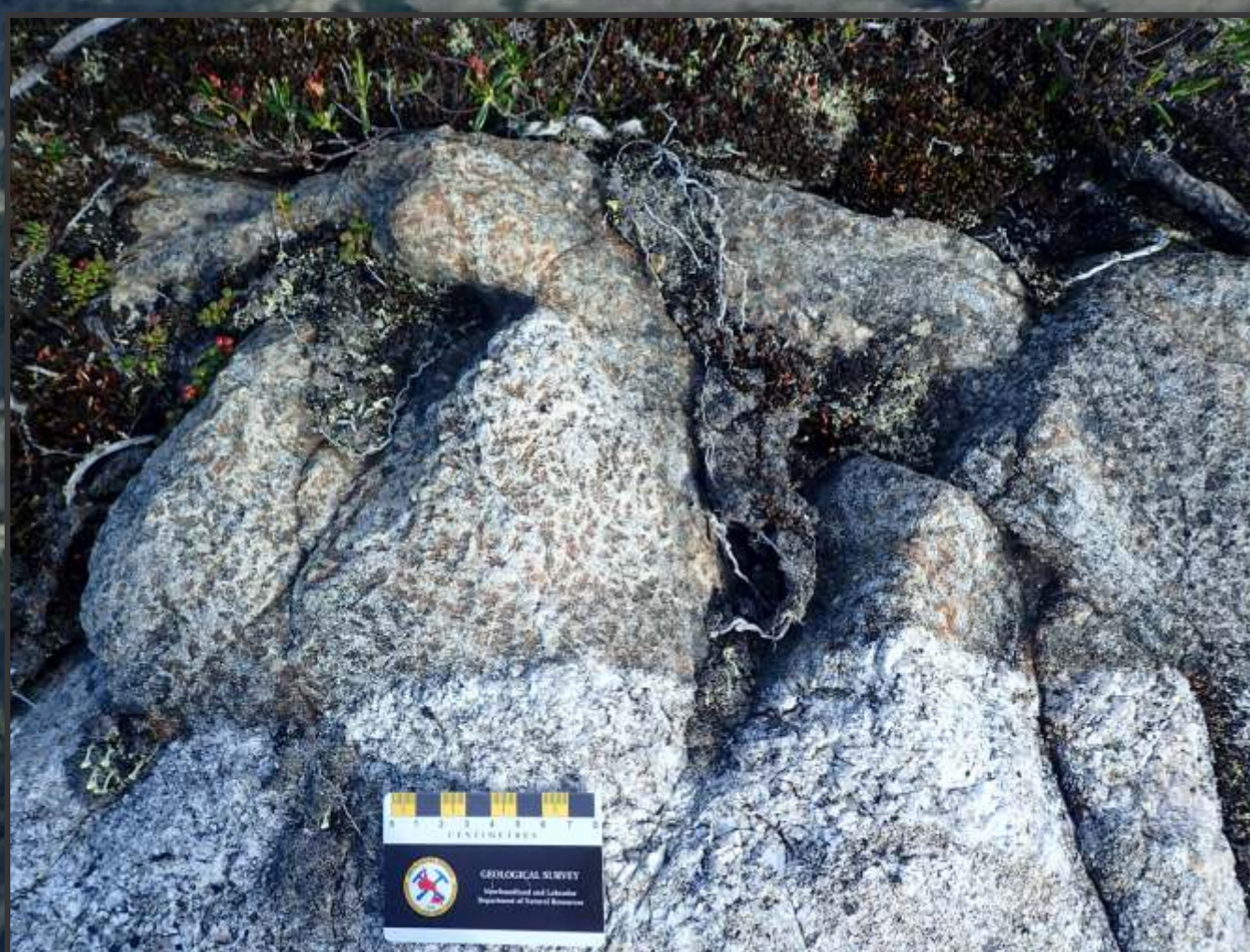
Well-banded paragneiss and paragneiss enclaves in coarse-grained homogeneous massive garnet-biotite pyroxene diatexite. The relationship indicates that diatexite units in the region predate the formation of the regional S₁ fabric.



Dark-weathering strongly-foliated pyroxenite containing a boudinaged granite vein. The tectonic layering in the pyroxenite consists of fine-grained granite veins concordant to the strong S₁ foliation.



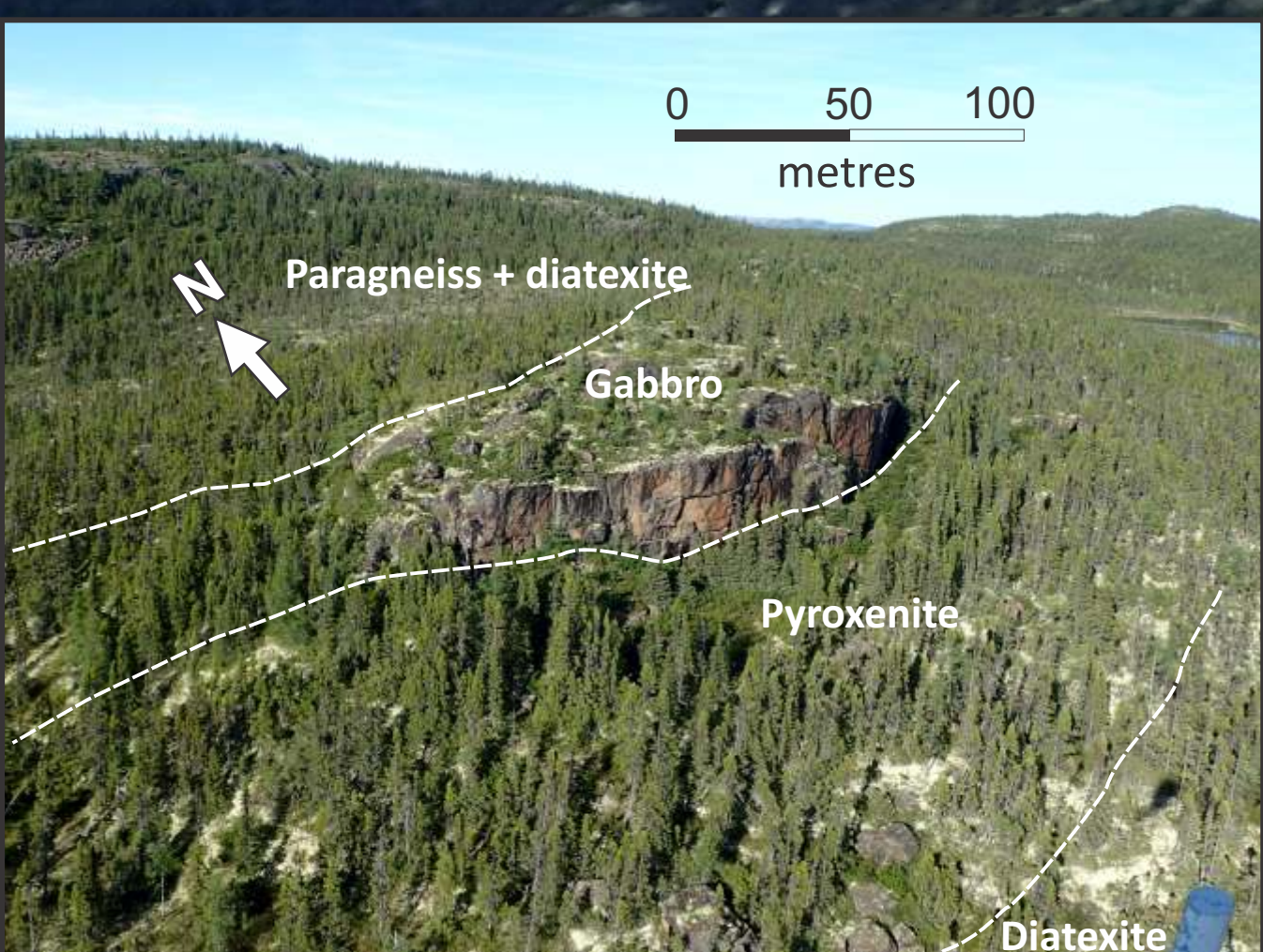
Rare igneous bodies in a matrix of highly-migmatized gneiss. The unfoliated igneous bodies are cut by oriented brittle microfractures along fold axes in the matrix.



Massive and homogeneous grey-weathering tonalite. The tonalite is cut by a network of oriented brittle microfractures. Diorite pegmatite veins are visible in the tonalite. The tonalite contains numerous small-scale gabbro dykes with unaltered diorite containing numerous small-scale gabbro dykes.



Well-banded grey-weathering tonalite intruded by coarse-grained orthopyroxene-bearing pegmatite veins. The tonalite contains numerous small-scale gabbro dykes.



Gossan zone (approximately 25 m strike length) within a east-striking south-dipping contact of gabbro and pyroxenite layers within a 2 km wide mafic diatexite sill. The gossan zone is disseminated by coarse-grained orthopyroxene-bearing pegmatite veins.



Tonalite altered by pyrrhotite with bearing gossan zones within a layered gabbro-pyroxenite sill. Most of the mineralized zones in these plutons are hosted within the gabbro component and occur in contact of gabbro-pyroxenite layers. They are considered to represent late D₂ and/or the formation of a mineralized zone.



Dark-weathering syenite granite pegmatite veins within a tonalite and pink granite (7). Some of these veins are mineralized with gossan zones and anomalous radioactivity. The gossan zones are disseminated by coarse-grained orthopyroxene-bearing pegmatite veins.