

Basal unconformity between the Hearst and Larder Lake Assemblages

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INTRODUCTION

As part of the Metal Earth 2017 summer field program, geological mapping was undertaken in Skead Township, approximately 12 km southeast of the town of Larder Lake. The purpose of this targeted mapping was to provide further insight into the nature and timing of the Hearst assemblage clastic sedimentary rocks and their relationship to the Larder Lake assemblage, a predominantly older succession of mafic to ultramafic volcanic rocks.

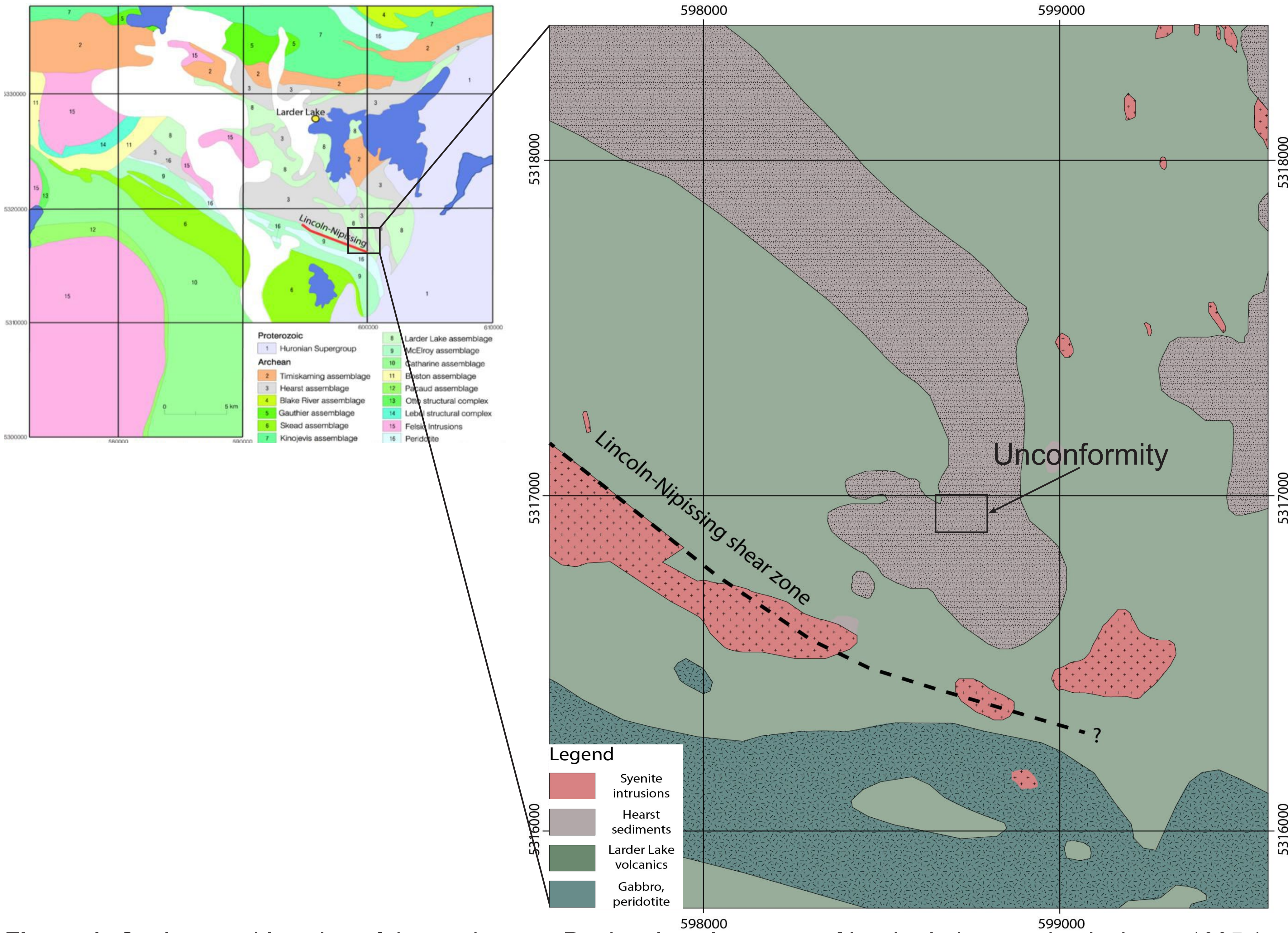


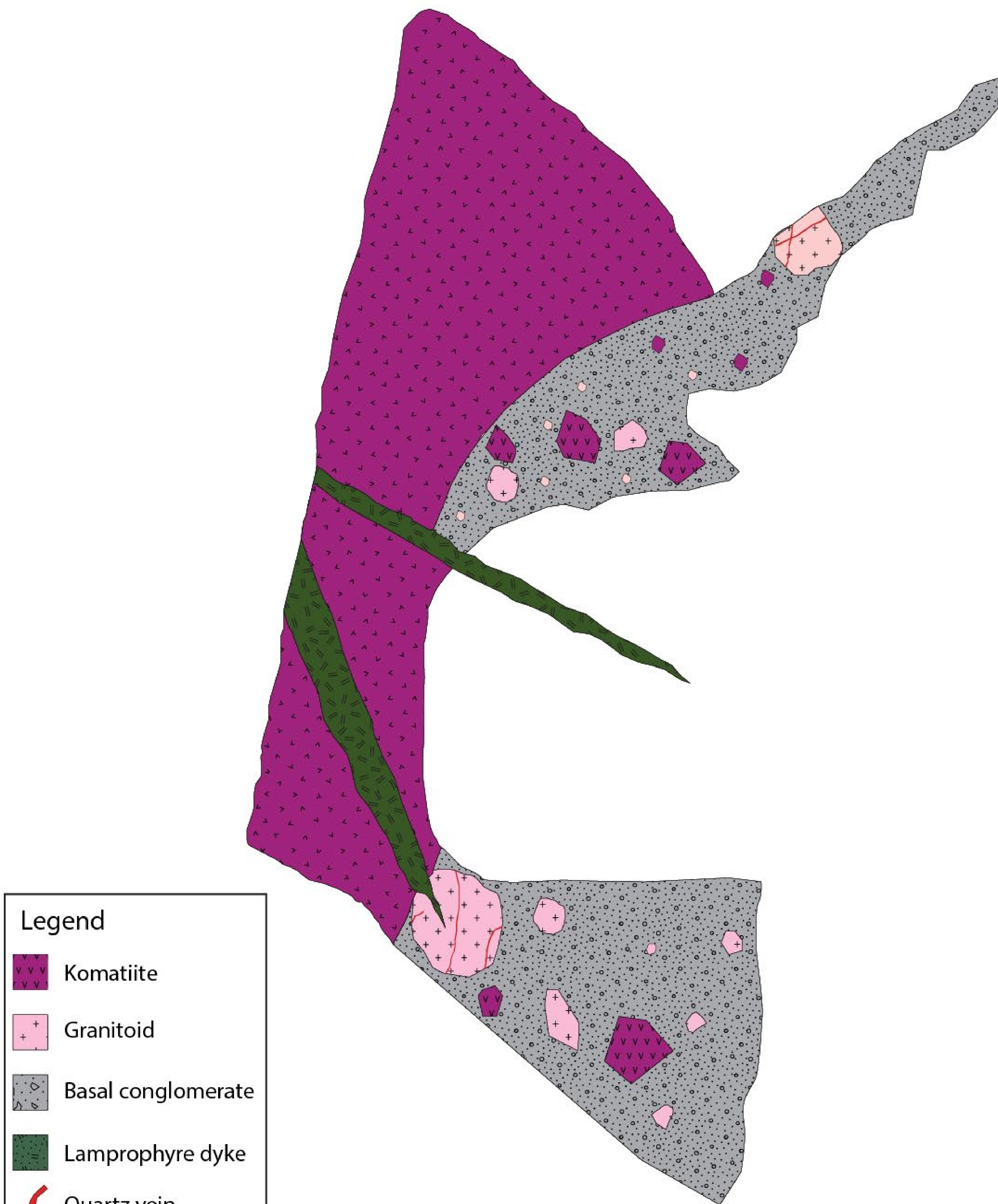
Figure 1. Geology and location of the study area: Regional geology map of Larder Lake area by Jackson, 1995 (top left) and local geology map in northern Skead township (right, modified after Hewitt, 1949), showing the location of the newly mapped unconformity outcrop. Universal Transverse Mercator co-ordinates provided using North American Datum 1983 (NAD83) in Zone 17N.

REGIONAL GEOLOGY

The geology of the northern Skead township is dominated by older mafic and felsic volcanic rocks, mapped by Hewitt (1949) as the Keewatin Formation, and correlated to the Larder Lake group by Jackson, that are overlain unconformably by younger sedimentary rocks ranging from conglomerates to mudstones. The volcanic rocks, consisting mainly of tholeiitic basalts, komatiitic basalts and ultramafic komatiites, underlie the majority of the study area, with smaller northwest-trending sedimentary packages (Hewitt 1949) present locally. The major structural feature of the area is the Lincoln-Nipissing shear zone which trends approximately west-northwest and zone is poorly exposed and is better seen as a pronounced magnetic feature on geophysical maps. The shear zone marks a stratigraphic boundary between the Pacaud assemblage in the south with the Larder Lake group in the north (Jackson, 1995).



Unconformity between basal conglomerate and komatiite flow



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Figure 2. Detailed map of the recently exposed unconformity between the Larder Lake group komatiite flow and a basal conglomerate. The basal conglomerate is composed of angular to subrounded komatiitic and veined granitoid clasts. Both units are later crosscut by lamprophyre dikes of unknown age.

SEDIMENTARY UNITS

The sedimentary rocks in their northern Skead township have been the subject of varying interpretations and confusion. Although Hewitt recognized differences between the sedimentary rocks north of the Larder–Cadillac deformation zone (LCDZ) and those in Skead Township, he considered all sedimentary units as Timiskaming in age. This classification was revised by Ridler (1970) and Jensen (1985), who considered the sedimentary packages south of the LCDZ as part of the Larder Lake group. The rationale for this distinction is the variation in clast composition, as there is a distinct lack of red jasperoid clasts and trachyte clasts in the sedimentary belts south of the LCDZ, suggesting different provenances. Jackson (1995) further divided the Larder Lake group and assigned the sedimentary rocks south of the LCDZ to the Hearst assemblage, which he described as turbiditic, in contrast to the Timiskaming alluvial-fluvial sedimentary units with associated alkali volcanic rocks (Jackson and Fyon 1991).

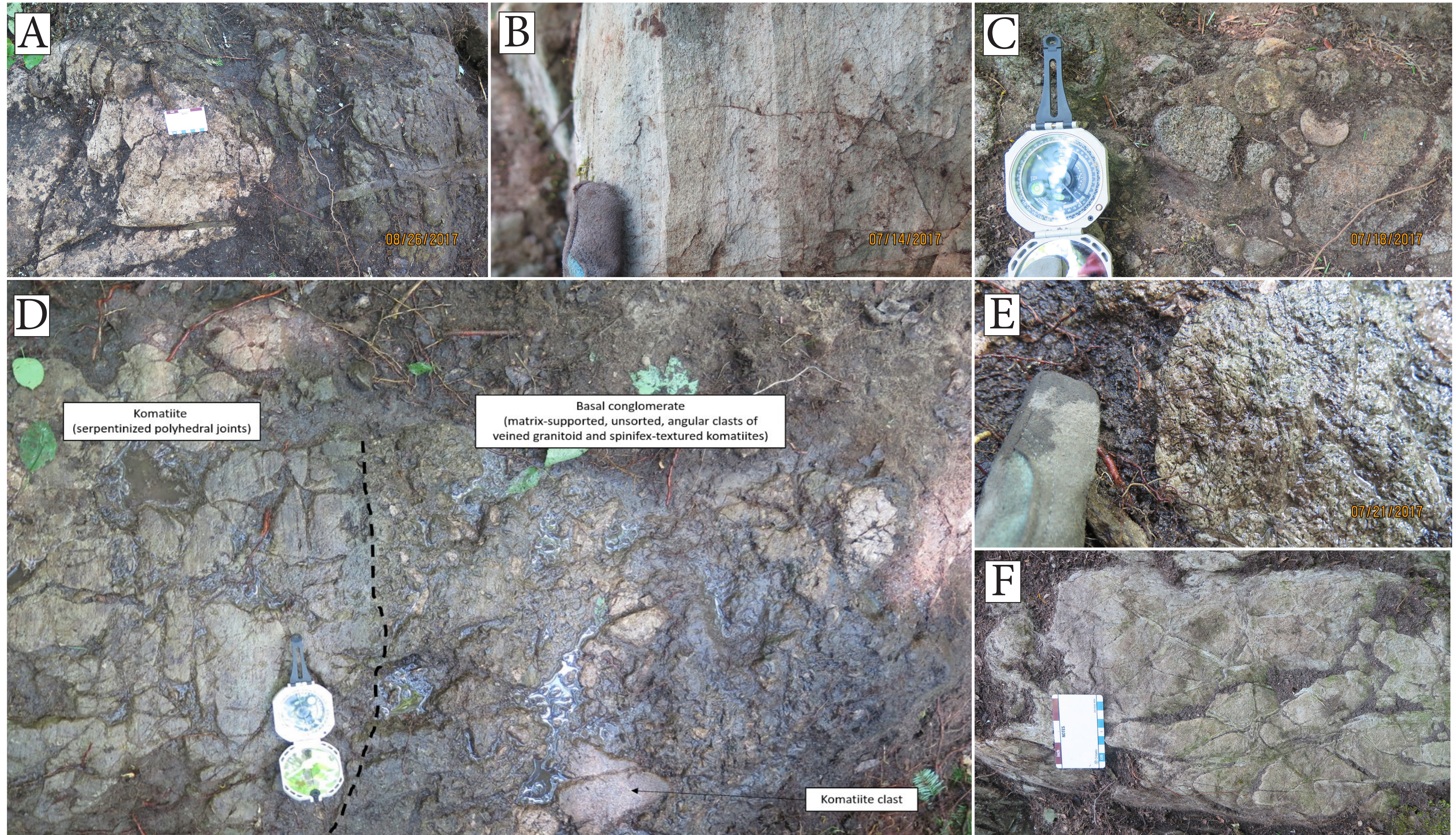


Figure 3. Representative photos of lithologies at the unconformity. A) Granitic boulder at contact with komatiite, both are crosscut by lamprophyre dyke. B) Typical fine grain, graded sandstone of the Hearst Formation. C) Typical polymict conglomerate of the Hearst Formation. D) Conformable contact between komatiite and basal conglomerate. E) Spinel-textured clasts in basal conglomerate proximal to contact. F) Polyhedral, serpentinized joints in komatiite.

FUTURE WORK

Samples were collected from granitic boulders in the basal conglomerate as well as from surrounding conglomerates and sandstones to be analyzed for geochronology. Additional mapping of the contact and lithological units will aid in placing the sedimentary rocks into context within the local and regional stratigraphy.

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