BEDROCK MAPPING OF THE KLUANE RANGES, SOUTHWEST YUKON (parts of NTS 115G/2, 3, 5, 6, 7)

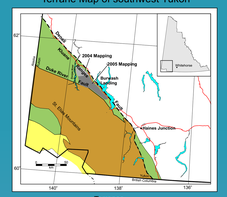
STEVE ISRAEL and Amy Tizzard

Yukon Geological Survey

Introduction

Bedrock mapping in the Kluane Ranges continued in 2005, expanding to the southeast from Quill Creek, to encompass the area between the Alaska Highway and Kluane National Park and Preserve (Figure 1). The aims of this project are; 1) to decipher the structural and stratigraphic relationships within the Kluane Ranges, 2) to determine the nature of the Kluane mafic-ultramafic bodies which are host to significant Ni-Cu-PGE mineralization, 3) to determine the extent of Alexander terrane stratigraphy (host to the Windy Craggy deposit in northwestern BC) in southwest Yukon.

Terrane Map of southwest Yukon



Terranes

Wrangellia | Alexander | Chugach

Figure 1

Stratigraphy

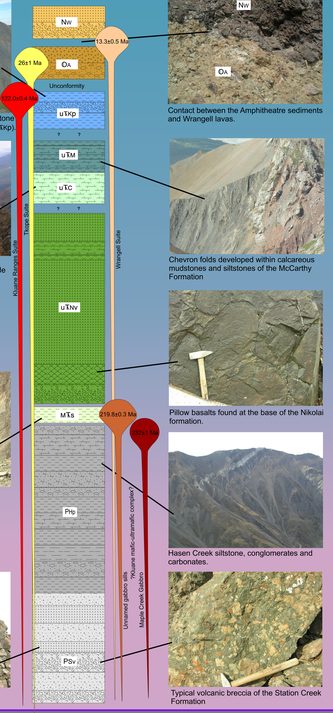
Much of the Kluane Ranges are underlain by Late Paleozoic arc volcanic and sedimentary rocks of the Skolai Group which in turn is overlain by Triassic flood basalts and shallow marine sediments and carbonates of the Nikolai, Chitistone and McCarthy formations. A poorly defined unit of sedimentary rocks of Upper Triassic to Cretaceous in age(Tatamagouche succession) unconformably overlies the Triassic stratigraphy. Tertiary terrestrial sedimentary and volcanic deposits are found scattered throughout the area. Stratified units are intruded by plutons, dykes and sills of variable age and composition. The age of mineralized ultramafic intrusions is problematic, falling somewhere between Middle and Upper Triassic.

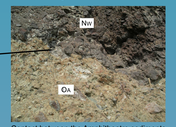
Bedded sandstone, conglomerate and siltstone typical of the Tatamagouche succession (uTKp).

Typical resistant weathering Chitistone limestone forming the footwall of the Wade Mtn. Fault.

Well bedded siltstones and fine-grained sandstones of unit M`ts.

Columnar jointed flows within the Station Creek Formation





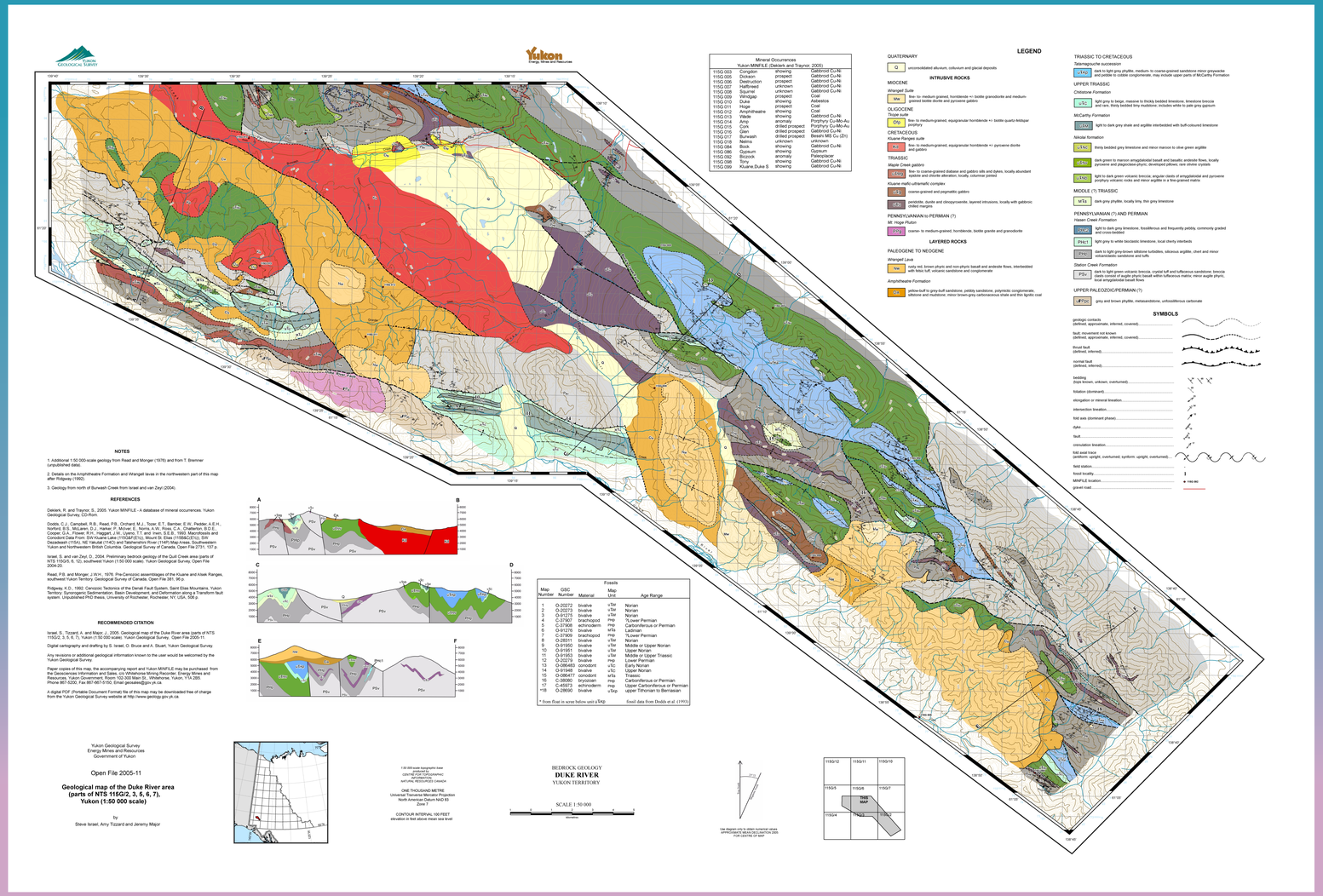
Contact between the Amphitheatre sediments and Wrangell lavas.

Chevron folds developed within calcareous mudstones and siltstones of the McCarthy Formation

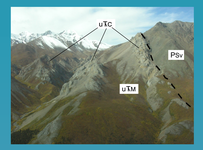
Pillow basalts found at the base of the Nikolai formation.

Hasen Creek siltstone, conglomerates and carbonates.

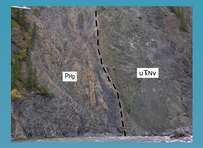
Typical volcanic breccia of the Station Creek Formation



Structure



Pre-Upper Triassic uplift and erosion is probable but not well preserved. Lack of Early Triassic stratigraphy and tighter folds within Paleozoic rocks may be indicators of this event.



Effects of northeast-southwest compression are exhibited throughout the area by tight folds and large thrust faults that place Paleozoic rocks over Upper Triassic units. This event deforms uTKp but apparently does not affect mid-Cretaceous diorite of the Kluane suite.

Post-mid-Cretaceous steeply dipping strike-slip faults associated with motion on the Denali Fault system are ubiquitous in the Duke River area. Associated with this event are extensional and compressional structures that bound and deform Tertiary sedimentary basins. There are certainly separate generations of strike-slip faults reflecting the protracted history of movement along the Denali system.

Significant young (post-Pliocene (?)) deformation is recorded in the Amphitheatre Formation and the Wrangell lava as folds and thrust faults. In some instances Upper Triassic sedimentary units are thrust over Oligocene strata. Earthquakes recorded along the Duke River Fault is a testament to ongoing deformation within the region.

Mineral Potential

The main mineralized target within the Kluane Ranges is the Ni-Cu-PGE rich Kluane mafic-ultramafic complex. The complex is comprised of Upper Triassic ultramafic sills and dykes that are associated with gabbro rimming phases. These intrusions host the Wellgreen deposit as well as several significant prospects and showings. The belt has seen little activity until very recently and is considered a highly prospective area for exploration.

Massive sulphide ore from the Wellgreen deposit. With probable reserves of 42.326 323 tonnes grading 0.36% Ni, 0.35% Ni, 0.51 g/t Pt and 0.34 g/t Pd, it is the largest ultramafic hosted deposit known in the belt.

Malachite staining found within the Nikolai flood basalts indicate the elevated copper values found within the volcanic package.

Massive magnetite located at the "Spy" showing (MINFile 115G 003). A grab sample taken by Inco from near this location returned assay values of 3.1% Ni, 2.8% Cu, 3.1 g/t Pt, 1.4 g/t Pd and 1.0 g/t Au.

New "North Zone" showing at Wellgreen, a several metre wide shear zone with values of 1.4% Cu, 0.1% Ni, 51g/t Ag, 5.5 g/t Au, 35.8 g/t Pt, 64.3 g/t Pd and 1.37 g/t Rh over 1.2 m returned from the "Discovery" chip sample .

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