

**INTRODUCTION**

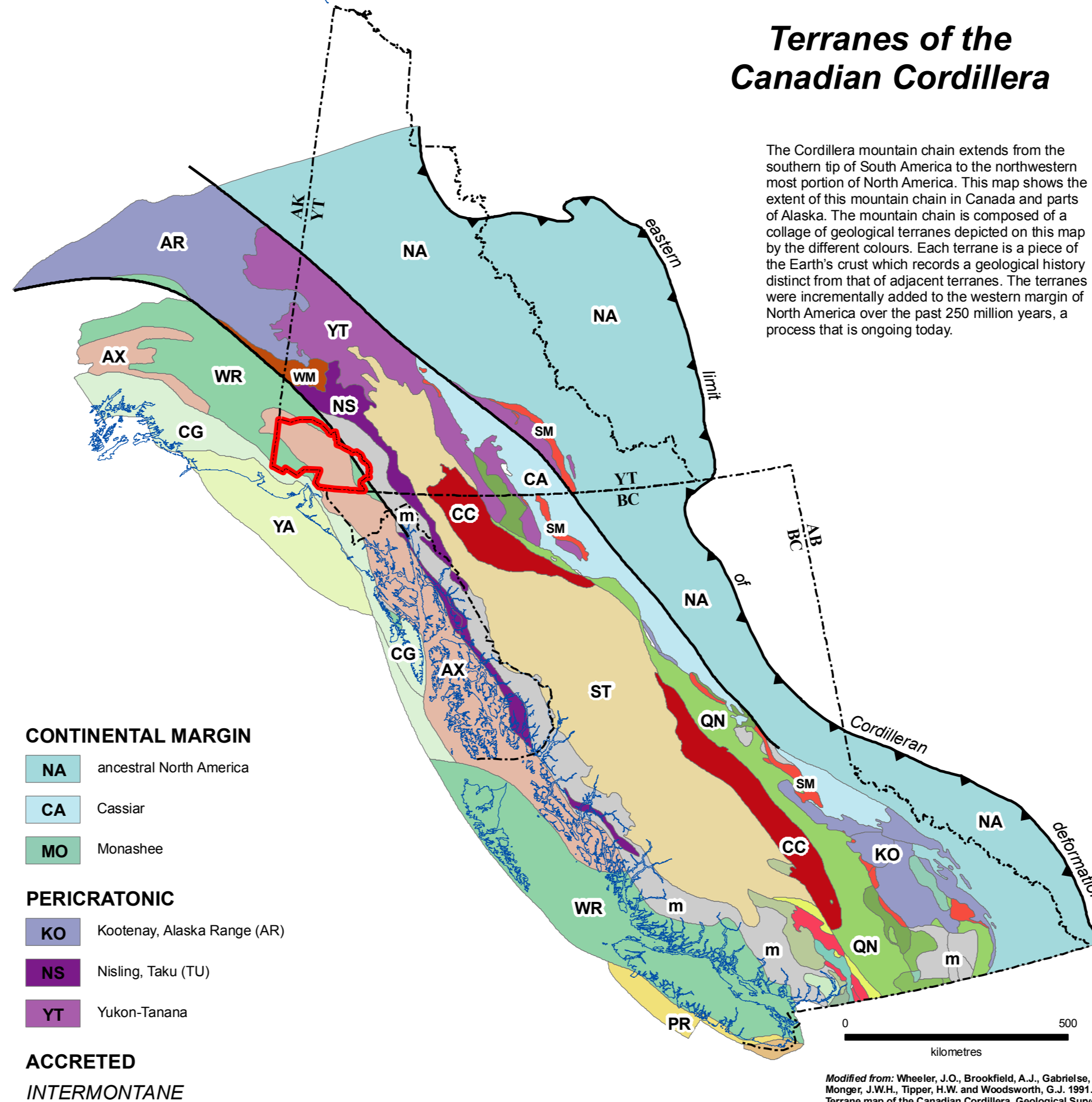
This map represents the bedrock geology in southwest Yukon. The legend located at the far right of the map describes numerous packages of rocks that are divided into separate units based mainly upon age and characteristic rock types. Each of the colours on the legend corresponds to coloured areas known as polygons on the map, which vary in both shape and size. The polygons represent the spatial distribution of the different rock units.

The first striking feature of this map is the contrast between the rocks north of the Alaska Highway and those found south of the highway. This contrast can be seen by the differences in landforms: rounded, small mountains north of the highway and rugged, tall mountains south of the highway. The striking contrast is the direct result of over 300 million years of mountain building processes that are still active today.

North of the Alaska Highway the land is made up of metamorphic rocks, those that have undergone physical changes brought on by very high pressures and temperatures found deep down in the Earth's crust, and igneous rocks, molten rocks that are injected into the Earth's crust from below. These metamorphic and igneous rocks are the remnants of a mountain belt that is at least 80 million years old that was formed near what was then the edge of the North American continent. Prior to the formation of this mountain belt, the rocks exposed today were covered by a thick accumulation of cover rocks and were buried several kilometres beneath the surface. During the formation of the mountain belt the land was gradually uplifted and the cover rocks were slowly eroded over 80 million years to expose those rocks now seen north of the highway.

South of the Alaska Highway the land is composed of sedimentary and volcanic rocks whose ages span between 300 and 3 million years old. The oldest rock units are composed of volcanic and sedimentary rocks that were deposited on the ocean floor. These rocks make up a large tectonic block known as the Wrangella Terrane which is an ancient piece of crust that was formed somewhere out in the proto-Pacific ocean. During ongoing plate tectonic processes the Wrangella Terrane traveled a great distance and eventually became part of the Yukon when it collided with North America. Following this collision the Wrangella Terrane with North America, other terranes continued to collide into the outer edge of Wrangella.

For about the past 10 million years a tectonic block known as the Yakutat Terrane has been traveling north, sliding past the southwest Yukon and forcing itself underneath Alaska. This continuing collision is responsible for the formation of the St. Elias Mountains, the highest coastal mountain range on Earth. The St. Elias Mountains are a young mountain range and have not been eroded to the point of those rocks north of the Alaska Highway. This is the main reason for the dramatic difference in landforms across the highway. The northward movement of the Yakutat Terrane is causing volcanoes in Alaska and earthquakes in both Alaska and the Yukon. Several earthquakes felt every year in the Yukon are the result of the mountains readjusting themselves to accommodate the arrival of the colliding Yakutat Terrane. The earthquakes occur along faults such as the Denali Fault, located within the Alaska Highway corridor, which has moved the rocks north of the Alaska Highway several hundreds of kilometres from Alaska to southwest Yukon.



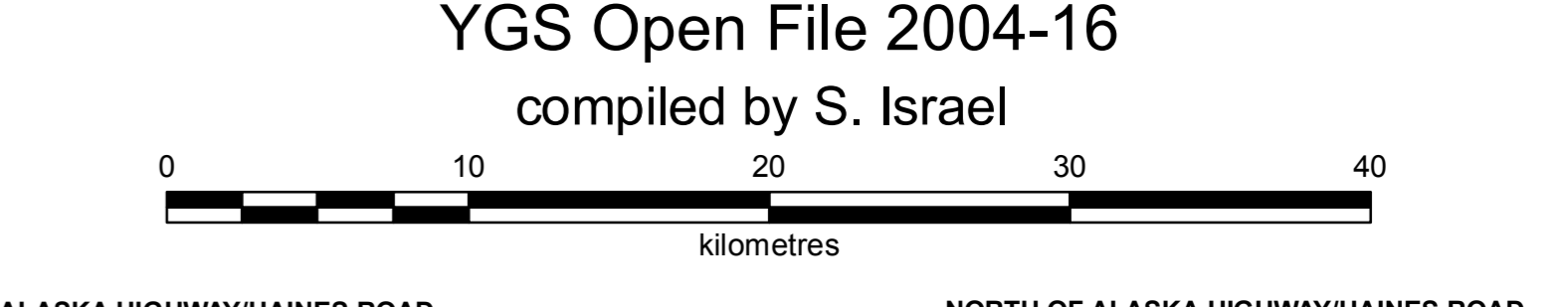
- CONTINENTAL MARGIN**
- NA ancestral North America
  - CA Cassiar
  - MO Monashee
- PERICRATONIC**
- KO Koonenay, Alaska Range (AR)
  - NS Nainina Taku (TU)
  - YT Yukon-Tanana
- ACCRETED**
- INTERMONTANE**
- SM Slide Mountain
  - QN Queenella
  - HR Harper Ranch, Kikilait
  - OK Okanagan
  - CC Cache Creek
  - ST Stikinia
  - VM Windy McKinley
- COAST**
- CD Catwelder
  - MT Mellow
  - BR Bridge River
  - HA Harrison
  - CK Chilkwick
  - SH Shuksan
- OUTER**
- CG Chugach
  - YA Yakutat
  - PR Pacific Rim
  - CR Crescent
- INSULAR**
- AX Alexander
  - WR Wrangella
- OTHER**
- m undivided metamorphic rocks

## GEOLOGY OF SOUTHWESTERN YUKON

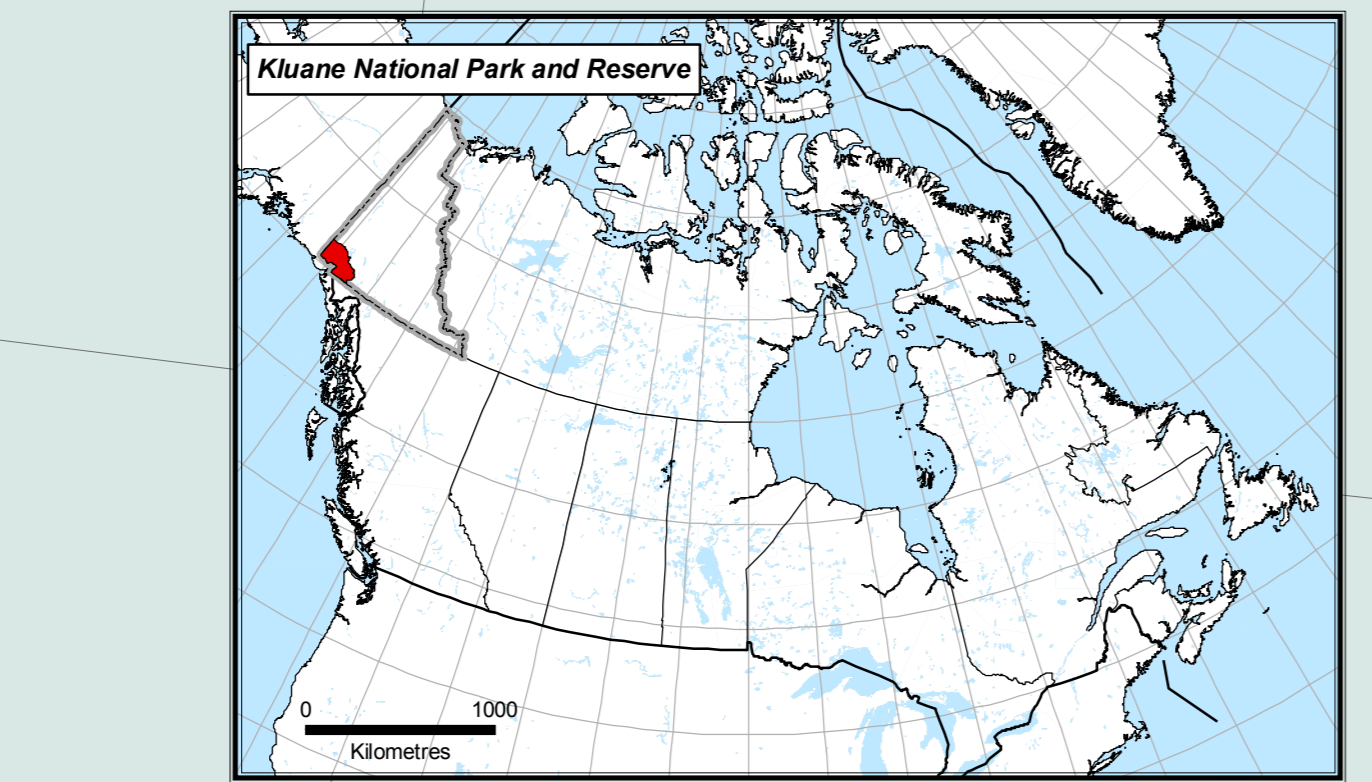
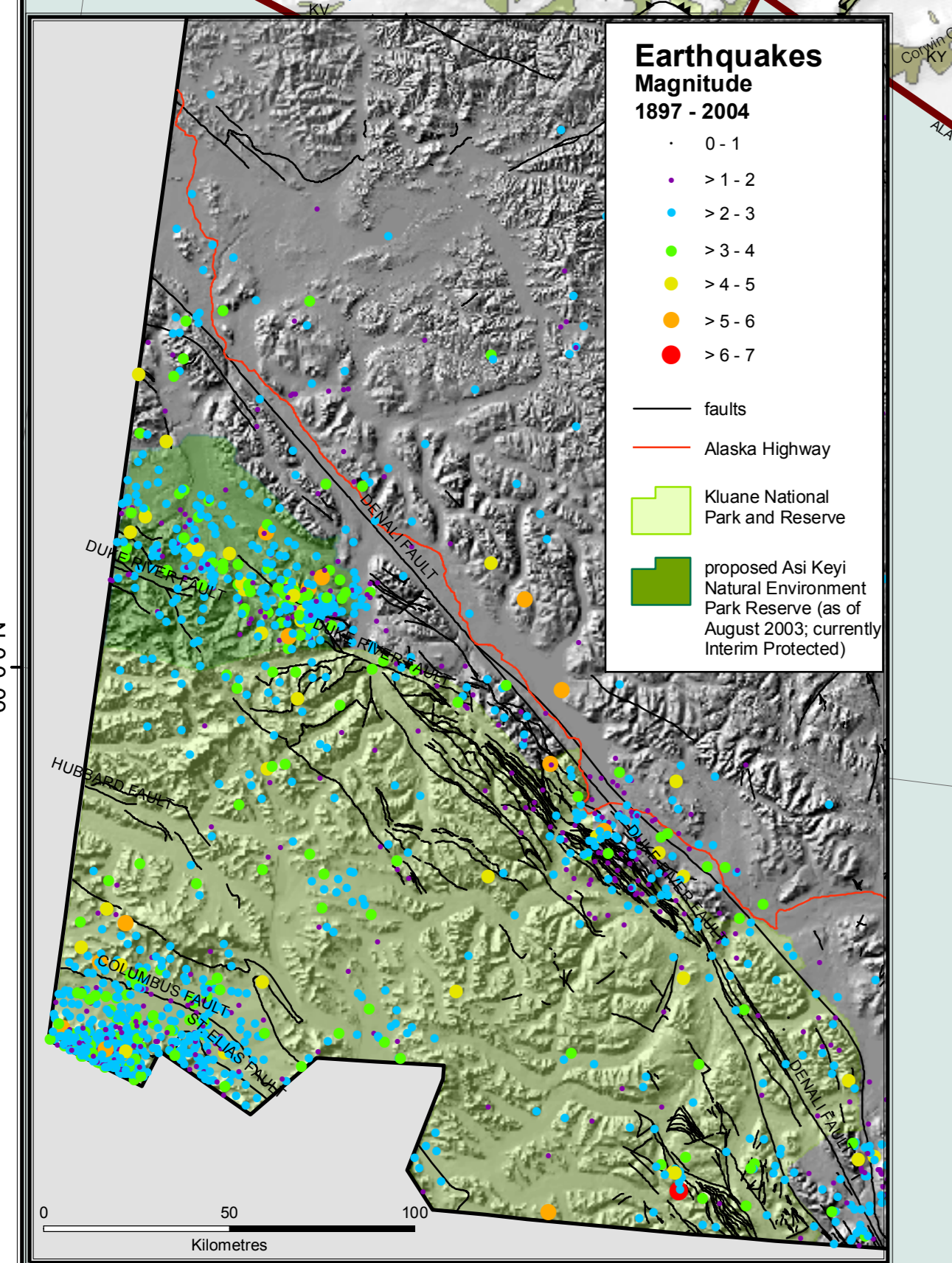
### 1:250 000 scale

#### YGS Open File 2004-16

compiled by S. Israel



- SOUTH OF ALASKA HIGHWAY/HAINES ROAD**
- QUATERNARY**
- Q QUATERNARY: recent to Holocene, glacial and post-glacial deposits, fluvial, alluvial, lacustrine, and other recent deposits of last and ongoing glacial cycles.
- MIOCENE TO PLEISTOCENE AND (?) YOUNGER**
- NW NW WRANGELL LAVA: NW Wrangell Lava (1) with minor conglomerate (2).
  - MO TO LATE MIOCENE: MIOCENE TO PLEISTOCENE: coarse to fine-grained sandstone, siltstone, shale, and claystone.
  - MO WRANGELL SUITE: MIOCENE TO PLEISTOCENE: coarse to fine-grained sandstone, siltstone, shale, and claystone.
- OLIGOCENE**
- OT OTI TROPIC SITE: TROPIC SITE: coarse-grained, homogeneous, sandstone and siltstone.
- PALEOCENE TO OLILOCENE**
- CA CA MONTAGNE: CA MONTAGNE: coarse-grained sandstone, siltstone, shale, and claystone.
- Eocene**
- ES ESWARD SUITE: ESWARD SUITE: medium-grained, homogeneous, sandstone and siltstone.
- LATE EARLY CRETACEOUS**
- LA EARLY CRETACEOUS SUITE: EARLY CRETACEOUS SUITE: coarse-grained sandstone, siltstone, shale, and claystone.
- UPPER JURASSIC TO LOWER CRETACEOUS**
- UPPER JURASSIC TO LOWER CRETACEOUS SUITE: UPPER JURASSIC TO LOWER CRETACEOUS SUITE: coarse-grained sandstone, siltstone, shale, and claystone.
- LATE JURASSIC TO EARLIEST CRETACEOUS**
- LA JURASSIC TO EARLIEST CRETACEOUS SUITE: JURASSIC TO EARLIEST CRETACEOUS SUITE: coarse-grained sandstone, siltstone, shale, and claystone.
- CRETACEOUS AND (?) OLDER**
- KT MOUNTAIN: MOUNTAIN: coarse-grained sandstone, siltstone, shale, and claystone.
  - KT VALLEY: VALLEY: coarse-grained sandstone, siltstone, shale, and claystone.
- UPPER TRASSIC**
- UPPER TRASSIC SUITE: UPPER TRASSIC SUITE: coarse-grained sandstone, siltstone, shale, and claystone.
- DEVONIAN TO UPPER TRASSIC AND (?) OLDER**
- DEVONIAN TO UPPER TRASSIC SUITE: DEVONIAN TO UPPER TRASSIC SUITE: coarse-grained sandstone, siltstone, shale, and claystone.
- SILURIAN AND DEVONIAN**
- SILURIAN AND DEVONIAN SUITE: SILURIAN AND DEVONIAN SUITE: coarse-grained sandstone, siltstone, shale, and claystone.
- LOWER ORDOVICIAN TO DEVONIAN AND (?) OLDER**
- LOWER ORDOVICIAN TO DEVONIAN SUITE: LOWER ORDOVICIAN TO DEVONIAN SUITE: coarse-grained sandstone, siltstone, shale, and claystone.
- CAMBRIAN TO ORDOVICIAN AND (?) YOUNGER**
- CAMBRIAN TO ORDOVICIAN SUITE: CAMBRIAN TO ORDOVICIAN SUITE: coarse-grained sandstone, siltstone, shale, and claystone.
- MINERAL OCCURRENCES** (size of symbol indicates status)
- POREPHYRY-COPPER DEPOSITS**
- ▲ copper
  - ▲ gold
  - ▲ silver
  - ▲ uranium
  - ▲ other
- MAGNETIC-ULTRAMAFIC ASSOCIATED DEPOSITS**
- ▲ copper
  - ▲ nickel
  - ▲ platinum group metals
  - ▲ other
- VOLCANIC ASSOCIATED DEPOSITS**
- ▲ copper
  - ▲ gold
  - ▲ silver
  - ▲ other
- INDUSTRIAL MINERAL DEPOSITS**
- ▲ asbestos
  - ▲ gypsum
  - ▲ other
- VERMICULITE DEPOSITS**
- ▲ vermiculite
  - ▲ other
- SKARN REPLACEMENT DEPOSITS**
- ▲ copper
  - ▲ gold
  - ▲ silver
  - ▲ lead-zinc
  - ▲ other
- STATUS**
- showing
  - present
  - deposit or past producer



Magnetic Declination for centre of map: 24°30' E decreasing 17' annually

**DATA SOURCES:**

BEDROCK GEOLOGY: Gordon, S.P. and Malespina, A.J. (comp.), 2003. Yukon digital geology, version 2.0. Geological Survey of Canada, Open File 1748, and Yukon Geological Survey, Open File 2003-010, 2 CD-ROMs.

FIRST NATIONS SETTLEMENT LANDS: Land Status Implementation, Land Resources, Yukon Region, Indian and Northern Affairs Canada, Renewable Resources, Yukon Government and Claims and Indian Government.

HILLSHADE: 90m DEM provided by Renewable Resources, Yukon Government, Hillshade produced by A.J. Stuart.

MINIFLE: Dekker, R. and Traylor, S. (comp.), 2004. YUKON MINIFLE - A database of mineral occurrences, Yukon Geological Survey, CD-ROM.

PARKS & SPECIAL MANAGEMENT AREAS: Renewable Resources, Yukon Government.

TOPOGRAPHIC BASE: Natural Resources Canada, Renewable Resources, Yukon Government, and Land Information Management System, Yukon Government.

**RECOMMENDED CITATION:**

Israel, S., 2004. Geology of Southwestern Yukon (1:250 000 scale). Yukon Geological Survey, Open File 2004-16.

Map compilation and digital cartography by A.J. Stuart and J.D. Bruce, Yukon Geological Survey.

Paper copies of this map may be purchased from Geoscience Information and Sales, c/o Whitehorse Mining Recorder, Energy, Mines and Resources, Yukon Government, P.O. Box 2703 (K-102), Whitehorse, Yukon, Y1A 2C6, P1, (867) 667-5200, Fax: (867) 667-5150, Email: geosales@gov.yk.ca.

A digital PDF (Portable Document File) file of this map may be downloaded free of charge from the Yukon Geological Survey website: <http://www.geology.gov.yk.ca>.

Any revisions or additional geological information known to the user would be welcomed by the Yukon Geological Survey.

NOTE: This map is issued as a preliminary guide only and is not intended to be used for navigation or to define legal boundaries. The map was produced by compiling data from various sources, and no responsibility will be taken by the Yukon Geological Survey for any errors, inaccuracies or omissions whatsoever.

