

**EXPLANATION OF LANDFORM UNIT NOTATIONS**

Compositional-Genetic Category — Age Modifier — Textural Modifier — Morphologic Modifiers

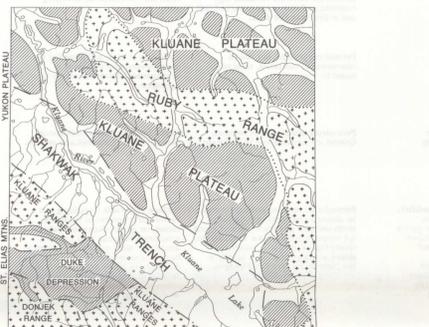
Stratigraphic relationship given where thickness of upper unit is irregular and where underlying unit is a known compositional-genetic unit other than bedrock.

- Compositional-Genetic Category**
- A- Alluvial Deposits: sand and gravel with veneer of fine sediments; Postglacial, rarely older; floodplain (A<sub>1</sub>) modern.
  - C- Colluvium: various materials, mainly rubble, includes landslides (C<sub>2</sub>); undifferentiated Pleistocene in agglutatus aprons (C<sub>3</sub>); Neoglacial, mainly modern.
  - D- Drifts undifferentiated till, sand, gravel, and lacustrine sediment; Late Wisconsinan (Macaulay).
  - E- Eolian Deposits: sand, silt, or tephra; Postglacial.
  - G- Glacioluvial Deposits: sand and gravel with veneer of fine sediment; Late Wisconsinan (Macaulay).
  - I- Ice snow and firm veneer; Neoglacial.
  - L- Lacustrine Deposits: mainly silt and clay with little fine sand; Late Wisconsinan (Macaulay).
  - M- Morainal Deposits: till, silty/sandy, Late Wisconsinan (Macaulay); ice-cored moraines and debris-covered glaciers (M/J) and rock glaciers (MR), rubble, Neoglacial.
  - R- Bedrock: various types pre-Pleistocene.
- Age Modifier**
- A- Modern
  - L- Late Wisconsinan (Macaulay)
  - N- Neoglacial
  - P- Postglacial
  - 2- Early Wisconsinan or Illinoian (Mirror Creek)
- CHRONOLOGY**
- MODERN NEOGLACIAL
  - HYPSITHERMAL POSTGLACIAL
  - EARLY POSTGLACIAL
  - MACAULEY GLACIATION LATE WISCONSINAN
  - NONGLACIAL INTERVALS EARLY WISCONSINAN or ILLINOIAN
  - MIRROR CREEK GLACIATION
- Textural Modifiers**
- a- sand or gravel, M- till containing a high proportion of sand, gravel, rubble, or boulders
  - b- boulders, blocks, bouldery
  - c- clay, clayey
  - f- silt, clay, and fine sand commonly with high organic content
  - g- gravel, gravelly
  - r- rubble; predominantly sand to boulder-sized fragments
  - s- sand, sandy
  - v- volcanic tephra, sand or fine gravel
  - i- interbedded volcanic tephra (v) and sand (s) or fines (f) overlies gravel in alluvial fans (A<sub>1</sub>)
- Morphologic Modifiers**
- a- apron
  - b- blanket<sup>2</sup>
  - c- castled outcrop
  - d- delta
  - f- fan
  - h- hummocky
  - m- undulating, rolling
  - p- plain, floodplain
  - r- ridge, ridged
  - s- steep slope (greater than 35°) cliff
  - t- terrace, terraced
  - v- veneer<sup>3</sup>
  - 1- gentle to moderate slope (3-15°)
  - 2- moderate to steep slope (15-35°)

- General descriptions of texture and age are given for each category; only where texture and age differ from the general description are texture and age modifiers used.**
- Blanket indicates category forms nearly continuous cover greater than 1 m thick, generally 0.5 to 3 m thick, over underlying unit.**
- Veneer indicates category forms broken thin cover, usually less than 1 m thick, but averaging 0.5 m thick, over underlying unit.**
- Geological boundary (defined, approximate, assumed)**
- Drumlin, fluted till**
- Rock drumlin, crag and tail, fluted bedrock**
- Glacially scoured bedrock hillock**
- Esker**
- Kame**
- Kame terrace**
- Pits (kettle holes)**
- Morainic ridges**
- Early Wisconsinan(?)**
- Late Wisconsinan**
- Neoglacial**
- Lake strandlines**
- Early Wisconsinan(?)**
- Late Wisconsinan**
- Neoglacial**
- Meltwater channels**
- Early Wisconsinan(?)**
- Late Wisconsinan**
- Neoglacial**
- Stratigraphic section**
- Note: Symbols in red may form geological boundaries.**



**PHYSIOGRAPHY**

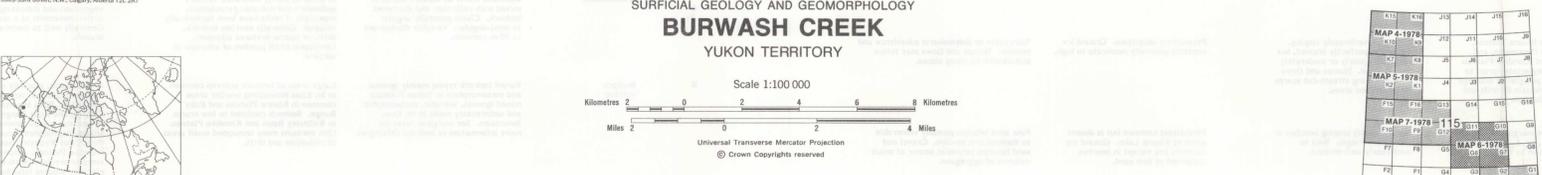


- VALLEY or BASIN (DEPRESSION)** - Low-lying land bordered by higher ground; flat, smooth, or gently undulating terrain with few surface irregularities.
- PLATEAU** - Land standing well above valleys but below elevation of nearby mountains; flat, smooth, gently sloping to moderately hilly terrain in places dissected by valleys, but major part of surface is near summit level.
- HILLS** - Prominences that rise above surrounding terrain; relief less than 350 m rounded summits.
- MOUNTAINS** - Prominences that rise above surrounding terrain; relief more than 350 m have restrictive summit area and steep slopes.
- BOUNDARIES**
- - - Between physiographic systems.
  - - - Between major physiographic subdivisions.
  - ..... Delineating minor physiographic subdivisions.
  - Between physiographic elements.

MAP 6-1978  
SURFICIAL GEOLOGY AND GEOMORPHOLOGY  
**BURWASH CREEK**  
YUKON TERRITORY

Scale 1:100 000

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**SUPERFICIAL GEOLOGY AND GEOMORPHOLOGY**  
**BURWASH CREEK**  
(113G-C)

**DESCRIPTIVE NOTES**

Kluane Plateau consists of an upper surface of rounded peaks connected by broad, undulating ridges that are dissected by broad, unconnected valleys. Ruby Range is a group of sharp-crested peaks and ridges that rise above the general level of the upper surface. Relief ranges between 300 and 920 m over most of the Kluane Plateau and rarely exceeds 1200 m in the Ruby Range. High ground is generally well drained, whereas low ground is poorly to moderately well drained. Most streams flow into Kluane Lake, which is drained by Kluane River. Plateau is underlain by metamorphic rocks of Precambrian or Paleozoic age that have been intruded by granitic rocks of Mesozoic age.

The Shawkak Valley is a large trench-like valley that separates the St. Elias Mountains from the Yukon Plateau. Except for gaps formed by major stream valleys, Shawkak Trench is bounded by steep escarpments up to 930 m high on its southwestern edge and up to 900 m on its northeastern edge. Drainage is poor to moderately good on the broad floor of the trench. Shawkak Trench is a physiographic expression of the Denali Fault system which late Tertiary, and probably Pleistocene, faulting has occurred.

The Kluane Ranges are characterized by steep slopes and serrated, narrow ridges and peaks which rise 750 to 950 m above intervening valleys. Streams have developed a trellis-type drainage pattern with most streams flowing parallel or perpendicular to the major northeast-southwest physiographic and structural trend of the Kluane Ranges. The Kluane Ranges are mainly Permo-Triassic metamorphosed volcanics, argillites, and siltstones, which have been intruded by younger granitic rocks. Locally, basic intrusive rocks and Tertiary volcanics and sediments are present. Duke Depression transects the Kluane Ranges.

Duke Depression is a complex of valleys and plateaus that separates the Kluane and Icefield Ranges. Locally Duke Depression is represented by the Burwash Uplands, a gently rolling plateau surface having moderately good to imperfect drainage. As a result of dissection, local relief is 250 m. The Burwash Uplands are underlain by a suite of rocks similar to those of the adjacent Kluane Ranges, although tertiary sediments are more prevalent.

The Donjek Range forms the northeastern edge of the St. Elias Mountains. The sharp-crested peaks and ridges, which rise to elevations near 3000 m, are marked by small glaciers. The Donjek Range is well drained because of the down valley flow from their present position. Rock glaciers also underlie in places similar to those of the Kluane Ranges; similarly, structural elements including the Duke River fault have a northeast-southwest trend.

Much of the area lies within the zone of widespread permafrost; however the southern part lies within the southern fringe of the permafrost region. Locally, permafrost may be absent over broad areas under south-facing slopes at low elevations and in Shawkak Trench southeast of Duke River. Permafrost is absent under the Kluane and Icefield Ranges. Where permafrost is present, it probably is up to 30 m or more in depth. In fine grained sediments and peat, permafrost is present in the form of ice lenses and veinlets and ice wedges in some places; the latter is indicated by polygonal ground. Ice wedges also may be present in morainal and colluvial deposits, even though they are not marked by obvious surface expression. Many shallow flat-bottomed lakes in peat and fine grained sediments have thermokarst origins.

The plateau-like surface forming the Burwash Uplands appears to be part of an erosion surface or pediment that formed between Pliocene or Eocene time and Pliocene or early Pleistocene time. Local, Cenozoic, tectonism and stream dissection have resulted in this surface being elevated above present stream levels.

During the Pleistocene periglacial processes continually have affected the terrain, especially at high elevations. Tors and alignment tors on ridges at high elevations are mainly confined to unglaciated parts of the Kluane Plateau. Soilification lobes and sorted stripes, steps, and polygons commonly are present at high elevations and indicate frost creep and sporadic active soilification. The presence of permafrost has allowed peat to accumulate on some poorly drained surfaces.

Two late Pleistocene limits can be traced sporadically on slopes and valley walls. The more extensive glaciation, the Mirror Creek glaciation, seems to be early Wisconsinan in age, whereas the least extensive glaciation, the Macaulay glaciation, is late Wisconsinan. During both glaciations, ice flowed northeast along Shawkak Trench; tributary glaciers

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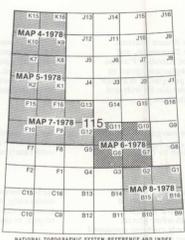
**SECTION DESCRIPTIONS**

- A1: Covered (sand?) (9 m) / Boulder lag / Gravel (90 m) / Gravel, oxidized (20 m) / Rock (25 m)
- A2: Silt, organic (0.5 m) / Tephra (8 cm) / Silt (0.3 m) / Till (0.4 m) / Gravel (6 m) / Silt, clayey (0-1 m) / Till (0-2.5 m) / Gravel
- A3: Peat, silty (9 cm) / Sand (13 cm) / Gravel
- A4: Till (7.6 m) / Gravel (4.5 m)
- A5: Sand, silty (3-5 m) / Till (6 m) / Covered (9 m)
- A6: Peat (0.1 m) / Clay, silty (1.5 m) / Gravel (1 m) / Covered (gravel?) (6 m)
- A7: Silt (0.8 m) / Till (6 m) / Covered (silt?) (18 m) / Gravel (2 m)
- B1: Silt (0.8 m) / Gravel (1 m) / Till (2 m)
- B2: Peat, silty (18 cm) / Silt (0.4 m) / Till (2 m)
- B3: Gravel (4.5 m) / Till (3 m) / Sand (4.5 m) / Till (3 m) / Gravel (4.5 m) / Covered (7.3 m)
- B4: Covered (gravel?) (12 m) / Till (6 m) / Covered (gravel?) (4.5 m) / Sand (3 m) / Covered (sand?) (10 m) / Till (9 m) / Sand (6 m) / Till (10 m) / Gravel (3 m) / Covered (12 m)
- C1: Covered (sand?) (9 m) / Sand (4.5 m) / Clay and silt (13 m) / Gravel (10 m)
- C2: Gravel (6 m) / Till (3 m) / Gravel (6 m)
- D1: Till (2.5 m) / Gravel (12 m)
- D2: Sand, pebbly (1 m) / Silt, sandy, organic (0.6m) / Silt, sandy (4.5 m) / Covered (10 m)
- D3: Sand and gravel, much wood (9 m) / Silt, sandy (6 m)
- D4: Peat (17 cm) / Clay, silty (6 cm) / Clay, silty, organic (10 cm) / Gravel
- D5: Tephra (8 cm) / Silt (10 cm) / Till (2.5 m) / Gravel and sand (4.5 m)
- D6: Silt, organic (0.2 m) / Silt (0.8 m) / Gravel (0.8 m)
- D7: Peat (0.2 m) / Silt (0.1 m) / Peat (0.2 m) / Tephra (0.3 m) / Peat (0.3 m) / Sand, silty (2 m)
- D8: Silt, organic (0.3 m) / Tephra (9 cm) / Silt (0.2 m) / Ash (6 cm) / Silt (0.8 m) / Sand (12 cm) / Clay (1 m) / Covered (clay?) (3 m)

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Elevations in feet above mean sea-level.



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