

137° 00′

Map unit name and notations	Nature of material and thickness	Permafrost and ice content	Distribution and Stratigraphy	Comments on geomorphology, surface	Degradation following surface disturbance
F-Fluvial Deposits A-floodplain with active deposition L-floodplain and low level terrace H-intermediate and high	1. Fine grained (F,S,F), Thinly bedded clay, silt, and sand; is generally highly organic and contains some peat layers. Alluvial fans contain some beds and lenses of gravel and sand, especially near their apexes. Thicknesses generally exceed 6m; alluvial fans and the Mackenzie River floodplain may be more than 30m thick.	Perennially frozen except for taliks under stream channels. Excess ice generally ranges between 5 and 20%. Peat, where present, usually has a higher ice content.	Covers large area along the eastern flanks of the Richardson Mountains; forms Mackenzie Delta. Where bedrock is within 20m of the surface, deposits generally lie directly on bedrock. In areas of thick unconsolidated sediments, underlying deposits are known to include marine clay, till, and a variety of other materials.	drainage, and natural hazards Shallow poorly drained channels occassionally present; channels usually peat filled on terraces. Drainage is generally poor, and shallow pools of water and thermokarst ponds and lakes are common. Alluvial fans have gentle slopes, but drainage is only moderate. Floodplains with active deposition are generally inundated once a year, other floodplains, less frequently. Thermal niching and collapse of resulting overhangs occur along actively eroding banks.	Thermokarst subsidence of 1.5 to 2.5m can be expected where an icy organic cover exists, otherwise 0.5 to 1.5m of subsidence. Local thermokarst erosion and gullying ma occur near scarps and where flooding occu. Newly thawed ground is unstable.
F-clay, silt, or fine sand f-fan t-terrace g-glacially deformed g-gravel Example: gFA - Gravel floodplain with annual deposition	2. Coarse grained (aF.sF.gF). Most gravels are coarse and bouldery. Gravels found west of 139°W are relatively clean compared to those found east of 139°W which are diluted by fines from shale units. Thicknesses generally exceed 6m. A veneer of silt and peat generally is present except on active floodplains Where the veneer thickens to more than 0.6m, the unit is prefixed as. f/a, f/s, or f/g	Perennially frozen except for taliks under stream channels. An open system pingo on the Malcolm River fan attests to local intrapermafrost taliks. Excess ice is generally negligible except in veneers of silt.	Found along all major streams; covers a large part of the Coastal Plain between Alaska and Firth River; common on pediments. Where bedrock is within 20m of the surface, deposits lie directly on bedrock. In areas of thick unconsolidated sediment, they undoubtedly lie on a variety of materials.	Generally surfaces have a braided pattern, although this may be obliterated by peat development on terraces. Drainage is poor on broad flat terraces, and small pools of water are common. Floodplains with active deposition are generally inundated once a year, other floodplains less frequently. Aufeis accumulates on some floodplains, causing channel shifts.	Thermokarst subsidence of 1.5 to 2.5m can be expected where an icy organic cover exists. Some gullying of sandy sediments near scarps is possible.
- organic cover 0.5 to 3.5 m thick	3. Glacially deformed (FG). Gravel containing some sandy beds. Logs and woody detritus are common within unit. Deformation results in local thicknesses of up to 60m.	Perennially frozen; negligible excess ice present.	Outcrops on the coastal ridge between Kay and King Points. The unit is interbedded with marine and estuarine deposits and may be capped by thin till or glaciofluvial gravels.	Deposits form well drained, high ridges.	Gullying near scarps may occur.
F-Estuarine Deposits f-clay, silt, or F-clay p-plain	Material is similar to fine grained fluvial deposits. Thicknesses range from 3 to 30m. Logs and organic detritus common throughout.	Perennially frozen; excess ice of 5 to 20% to be expected.	Located on the distal edge of deltas where marine and freshwater deposition is occurring.	Poorly drained because of flatness and low elevation; subject to inundation during floods and storm tides.	Thermokarst subsidence of 0.5 to 1.5m. Minor gullying during floods. Newly thawed ground is unstable.
- Marine Deposits	Fine grained (f ^m p). Tidal deposits are generally high in organic content; logs and woody detritus are common. Some stringers of beach	Perennially frozen; excess ice of 5 to 20% to be expected.	Located on the landward side of spits; commonly occupies drained basins and lies directly on lacustrine deposits.	Poorly drained because of flatness and low elevation; subject to inundation during storm tides	Thermokarst subsidence of 0.5 to 1.5m. Newly thawed ground is unstable.
A-active deposition f-clay, silt, or p-tidal flat fine sand b-beach a-sand or gravel s-sand g-gravel	gravel may be present. Generally 1.5 to 3m thick. 2. Coarse grained (a,S or g m A b). Beach deposits are generally clean sand and gravel; may contain fragments of wood. Deposits in spits may be up to 9m thick, in narrow beaches they probably range between 1.5 and 4.5m.	Active layer may be more than 2m thick on spits and beaches. Excess ice generally absent or negligible.	Large spits are common between Clarence Lagoon and Herschel Island, and at Stokes, Kay, and Shingle Points. Underlying deposits generally are exposed in the base of adjacent cliffs. In places beach materials cap tidal deposits.	Spits and beaches are well drained; subject to inundation and erosion during storms.	Trenches may be eroded if lagoonal drainage becomes established along disturbance. Increased rate of spit and beach migration and retreat of adjacent cliffs possible if a major amount of material removed.
•••••• -marine gravel or pebbly sand beach	3. Glacially deformed (mg). Clay and silt content generally exceeds 90%; thinly bedded fine sand and silt may be present. Deposits are more than 30m thick.	Perennially frozen; excess ice is absent throughout much of the sequence, but large icy beds are present. Reticulate ice present in places in clay.	These deposits compose most of Herschel Island and outcrop on the ridge between Kay and King Points. They are interbedded with fluvial deposits and can be capped by a veneer of till or outwash.	Form high, positive areas on the Coastal Plain. On flat areas, drainage is poor, and pools of water are present. Retrogressive thaw flow slides occur on oversteepened slopes where icy beds are exposed. Thermal niching and block slumping are common along the coast.	Minor thermokarst subsidence may occur on flat areas; gullying on sloping areas. Retrogressive thaw flow slides occur on slopes underlain by icy beds. Newly thawed ground is unstable until dehydrated below the plastic limit.
G-glaciolacustrine (?) No modifier indicates thermokarst origin f-clay, silt, or fine sand a -sand or gravel -organic cover 0.5 to 3.5 m thick	Generally thinly bedded silty clay, silt, and silty fine sand with some layers being high in organic content; mossy peat beds present in places. Deposits contain some sand and gravel near shorelines. Where sand and gravel are predominant textural prefix indicates such. Peat commonly caps sequence. Glaciolacustrine deposits are generally clayey. Deposits range from 3 to 9m thick.	Perennially frozen except for taliks under recently drained lakes at shallow depth. Excess ice contents of 5 to 40% are common. Higher percentages of excess ice common in the upper part of the unit and in the overlying peat.	Extremely common in morainic areas and on pediment surfaces. Also common on estuarine and fluvial deposits. Thermokarst lacustrine deposits generally lie on the material surrounding them. Glaciolacustrine deposits generally lie on morainal deposits, colluvium, or, along the limit of glaciation, bedrock.	Flat to gently sloping, generally with poor surface drainage as indicated by many small tundra pools. Polygonal patterns well developed with water in troughs. Small scarps within basins attest to coalescing lake basins.	Thermokarst subsidence of 1.5 to 3m can be expected. Thermokarst erosion and gullying will occur near scarps. Active layer detachment failures and retrogressive thaw flow slides may occur in glaciolacustri deposits where previously formed steep slo are exposed. Newly thawed ground is unsta
f-clay, silt, or fine 1-slope less than 5° sand 2-slope of 5 to 15° 3-slope greater than 15°	1. Fine grained (_f C). Generally high in organic content; contains some lenses and beds of sand, gravel, and rubble. Material generally is derived from underlying shale, argillite, or till. Thicknesses range from 1.5 to 6m but may be greater towards the base of slopes.	Perennially frozen; excess ice commonly between 30 and 60%; ice lenses are common.	Common on gentle to moderate slopes underlain by shale or argillite; also present on stream-cut and wave-cut scarps; common on pediment surfaces. Generally overlies bedrock but at the edges of valley bottoms it may overlie fluvial, glaciofluvial, or morainic deposits.	Solifluction lobes and terraces are common phenomena of colluvium-covered slopes in mountainous areas. Solifluction lobes and terraces seem stable at present. Active layer detachment failures frequently occur. Vegetated slopes probably move an average of 1.25 cm/year.	Thermokarst subsidence of 0.5 to 3m can be expected on gentle slopes; thermokarst erosion and gullying, active layer detachment failures and retrogressive thaw flow slides occur on steeper slopes. Newly thawed ground is unstable until dehydrated below the plastic limit of the materials.
colluvium t-terraced r-rubble, boulder e-eroded, local slopes size common steeper than slope No modifier indicates a class indicated mixture of above types -organic cover 0.5 to 3.5 m thick	2. Coarse grained (aC or γC) Generally angular chert, sandstone, limestone, granite, or volcanics. Boulder-sized rubble generally composed of lithic sandstone, quartz sandstone, and less commonly of limestone, Thicknesses range from 0.6 to 6m.	Perennially frozen; excess ice is probably negligible.	Common on moderate and steep slopes underlain by chert, sandstone, limestone, granite, or volcanics.	Terracettes and other periglacial phenomena are common. Vegetated to partially vegetated slopes are stable. Unvegetated, moderate to steep slopes move an average of 2.5 cm/year.	Minor rock falls and slides.
a -sand or gravel p-outwash plain, valley train t-terrace g-gravel h-hummocky No modifier indicates a gently sloping surface - organic cover 0.5 to 3.5 m thick	Most deposits are coarse gravel, but some near the coast between Kay and Shingle Points are composed of sand. Gravel and sand are generally cleaner than fluvial deposits. In places a 0.5 to 3m - thick cover of organic silt and peat is present. Deposits range between 3 and 15m thick.	Perennially frozen; excess ice is generally negligible, although thick ice lenses rarely may be present. Organic silt and peat overlying the outwash are generally ice rich.	Glaciofluvial deposits are concentrated in patches along the limit of glaciation, along the inland side of the coastal ridge between Kay and Shingle Points, and on the mainland opposite Herschel Island. In areas of shallow bedrock, glaciofluvial deposits generally lie directly on bedrock; in areas of thick unconsolidated deposits, glaciofluvial deposits overlie fluvial, estuarine and marine deposits	Poor surface drainage prevails due to flatness. over broad areas; standing pools of water are common. Small scarps within the outwash plains give local well drained areas. Kame deposits are usually fairly well drained because they have a moderate amount of relief or are on slopes.	Thermokarst subsidence of 0.5 to 2.5m can expected where an icy organic cover exists. Local gullying near scarps in sandy outwast can be expected.
-Morainic Deposits M	Generally a stony, clayey till: stone (>2 mm) content varies between 1 and 50%, is highest where till overlies gravel. Locally slices of deformed marine clay and silt may be included in the unit. Upper 1.5m of till commonly contains organic silt and peat lenses and stringers; a complex of peat, pond deposits, alluvium, and mudflow debris is common within the unit in its upper 1.5 to 3m. Till is commonly 7.5m thick although it may thin locally on steep slopes, and near the edge of scarps, and may thicken to more than 18m in intermontane valleys.	Perennially frozen; excess ice in upper 3m is generally 10 to 40%; at greater depth it may be negligible. Thick ice lenses and massive icy beds are common under hills in areas of hummocky and rolling moraine. Icy beds also are present in areas of till overlying bedrock. Glacier ice may be present in the cores of rock glaciers.	Morainal deposits cover 50% of area within the limits of glaciation. On the Coastal Plain till overlies a variety of materials ranging from marine clay to fluvial gravels (subtill gravels are concentrated near the mouths of Firth, Babbage, and Blow rivers). In areas where the bedrock is within 30m of the surface, the till generally lies directly on the bedrock although locally, especially on glaciated pediment surfaces, gravel may underlie the till.	Gentle slopes less than 5° are common except in areas of hummocky moraine where steepsided slopes to about 25° are present. Locally, slopes to 25° can also be found where streams have incised themselves. Active layer detachment failures are present in areas where the slopes reflect bedrock control. Retrogressive thaw flow slides are common along actively eroding sea cliffs, stream banks, and lake shores. Rock glaciers are indicated pM1.	Thermokarst subsidence of 0.5 to 2.5m is to expected on flat and gentle areas. Large thermokarst depressions will form if deposi are thawed to a depth in areas where massivicy bodies form the cores of hills Active layer detachment failures occur on slopes greater than 5°, and retrogressive thaw flow slides will result if icy beds or ice-rich sediments are exposed. Some thermokarst erosion will occur on slopes, mainly localized along icy wedges. Newly thawed ground is unstable until dehydrated below the plastic limit of the materials.
Rock-Bedrock -bedrock or near-surface bedrock	East of 139° W shale and siltstone predominate; quartz sandstone, chert, carbonates, and volcanics are less common. West of 139° W argillites and lithic sandstones predominate; chert, carbonates, and shale are less common; granite and volcanics are rarer.	Little or no excess ice is found in rock.	Bedrock outcrops on most hill and ridge crests and steep slopes are generally quartz or lithic sandstone, carbonates, or chert; argillite, shale, and siltstone are more commonly exposed in river canyons or steep cliffs.	Rock exposures form pinnacles (tors) along mountain tops and ridge crests, less commonly they form hoodoos on slopes. Rock slopes are relatively stable although minor rock falls are common along actively eroding stream-cut scarps.	Disturbance should have little effect on surface or near-surface bedrock.

EXTENDED LEGEND

Genetic category → FA←			
Textural modifier → g' p←	– Morphologic modifier		
Genetic Categories	Textural Modifiers		
F -fluvial	C-clay		
E -estuarine	f -clay, silt, or fine sand S -sand G -gravel a -sand or gravel r-bouldery rubble		
M -marine			
L -lacustrine			
C -colluvial			
G -glaciofluvial			
M -morainal			
Genetic Modifiers	Morphologic Modifiers		
A -active deposition	b -beach e -eroded, gullied f -fan		
G -glacial			
H -intermediate and high level terrace			
L-floodplain; low and	h -hummocky		
intermediate level terrace	m-rolling		
P -pediment level	p <i>-plain</i>		
	t-terrace		
	${\sf G}$ -glacially deformed		
] -slope less than 5°		
	2-slope 5° to 15°		
	3 -slope greater than 15 $^\circ$		

Rock outcrop, colluvium present to a depth of 0.6 m

Geological boundary (defined, approximate)

Limit of mapping

Drumlin and drumlinoid ridge

Esker (direction of flow known)

Kame

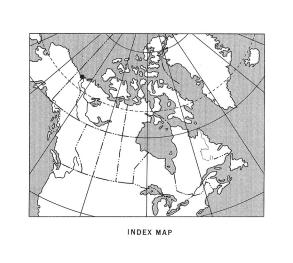
Beach

Stream-cut canyon; X indicates canyon partly cut in bedrock

Stream-cut escarpment; ^ indicates escarpment partly cut in bedrock

Sea cliff or escarpment; ^ indicates escarpment partly cut in bedrock

Retrogressive thaw flow slide



Figure

37

117 D

107 C

117 D

107 C

117 D

107 B

Figure

38

116 O-N(E½)

116 P

106 M

106 N

NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND INDEX TO GEOLOGICAL SURVEY OF CANADA MAPS

Scale 1:125 000

Kilometres 3 0 3 6 9 Kilometres

Miles 2 0 2 4 Miles

Universal Transverse Mercator Projection
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