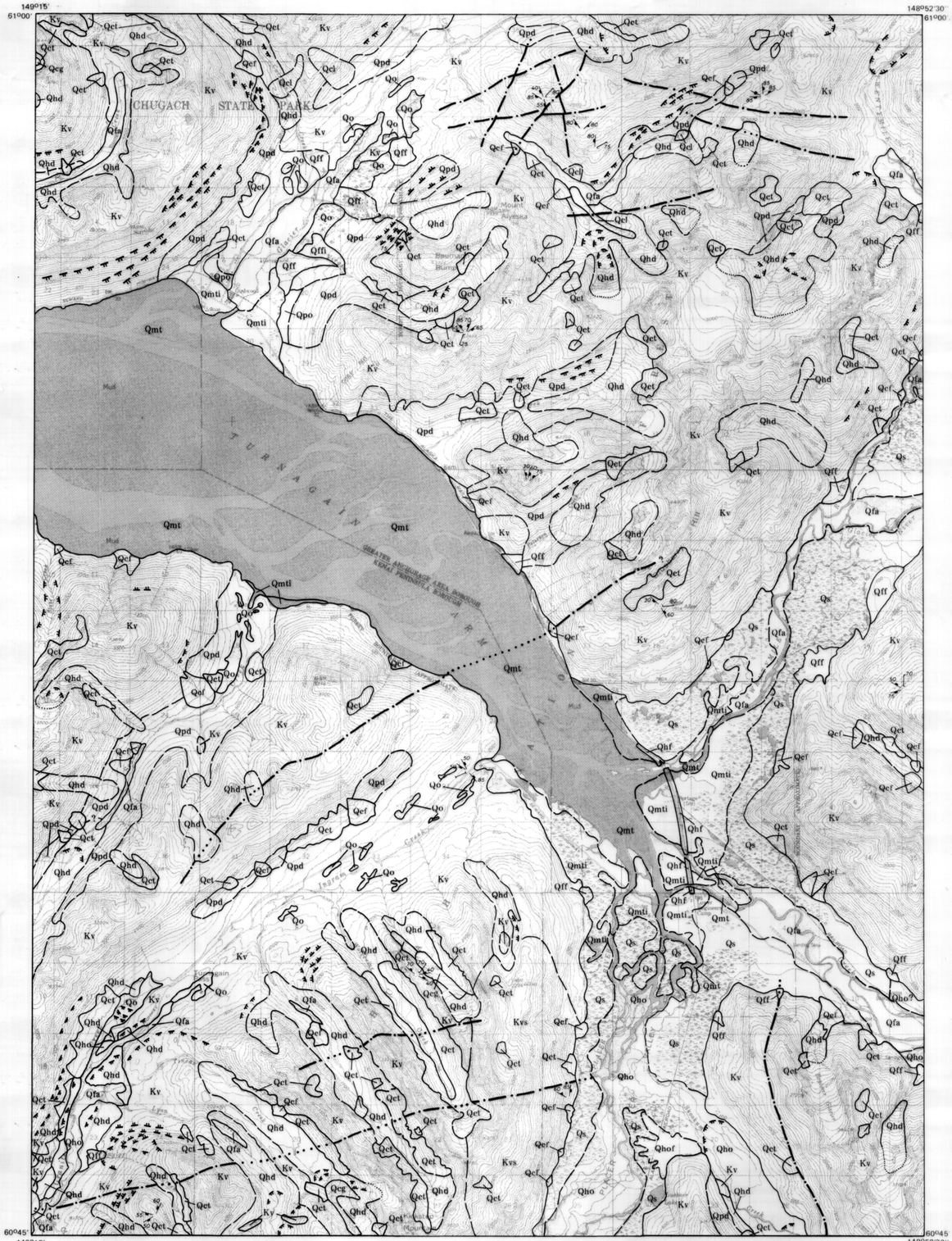


Base from U.S. Geological Survey Seward D-6 (1951) Quadrangle, Alaska.

ALASKA

QUADRANGLE LOCATION

SCALE 1:63,360

1 0 1 2 3 4 MILES

1 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET

DATUM MEAN SEA LEVEL

TRUE NORTH

MAGNETIC N

22°

APPROXIMATE MEAN DECLINATION, 1951

Mapped from 1:60,000-scale false-color infrared aerial photographs taken in August 1978. Field checked by R.A. Combellick and J.H. Ewing, June 21-July 4, 1983. Bedrock geology from Tysdal and Case (1979). Reviewed by S.E. Rawlinson. Cartography by J.H. Ewing.

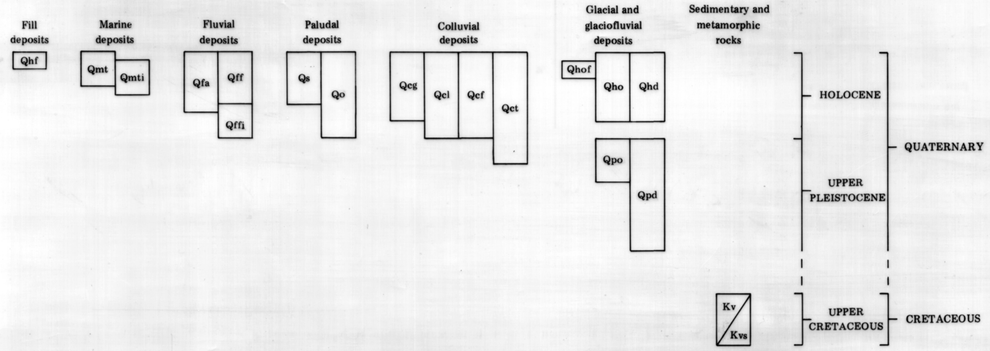
SURFICIAL-GEOLOGIC MAP OF THE SEWARD D-6 QUADRANGLE, ALASKA

by

R.A. COMBELLICK

1984

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qhf ARTIFICIAL FILL—Road-base material composed of boulders, cobbles, pebbles, and sand; not shown where width of unit is < 60 m.

Qmt ACTIVE TIDAL DEPOSITS—Moderately to very well sorted fine sand, silty fine sand, sandy silt, and silt deposited in modern intertidal estuary. Laminated to thin bedded, parallel and cross stratified. Thickness measured in a borehole near Portage was approximately 7 m; unit overlies at least 300 m of interlayered and interfingering estuarine, shallow-marine, glacial(?), and stream sediments that fill the Turnagain Arm fjord (Bartsch-Winkler and others, 1983). Low to moderate permeability; poor to fair drainage.

Qmti INACTIVE TIDAL DEPOSITS—Moderately to well-sorted silt and sandy silt with minor clay and organic material; deposited in former intertidal environment that is presently above normal tide range. Laminated to thin bedded. Generally vegetated with grasses, willow, alder, lupine, and cottonwood trees, many of which have died from salt-water intrusion. Corresponds roughly to the Placer River Silt of Ovenshine and others (1976).

Qfa FLOOD-PLAIN ALLUVIUM—Moderately to well-sorted cobbles, pebbles, sand, and minor silt deposited by modern rivers (excluding those that originate at modern glaciers; see unit Qho). Thin to medium bedded, with subrounded to well-rounded pebbles and cobbles. Lithologies dominated by graywacke and phyllite of the Valdez Group. Surface material consists primarily of cobbles, pebbles, and sand in and near active channels and primarily silt and sand in adjacent areas that are subject to infrequent overbank flooding. Moderate to high permeability; good drainage.

Qff ALLUVIAL-FAN DEPOSITS—Poorly to moderately sorted boulders, cobbles, pebbles, and sand with minor silt deposited by streams at valley mouths. Medium to thick bedded with subangular to rounded pebbles and cobbles and angular to subangular boulders. Thickness up to 30 m. Surface generally smooth but dissected by one or more stream channels. Surface slope <15° and slightly concave upward. Moderate to high permeability; good drainage.

Qffi INACTIVE ALLUVIAL-FAN DEPOSITS—Poorly to moderately sorted boulders, cobbles, pebbles, and sand with minor silt deposited by former streams at valley mouths. Similar to alluvial-fan deposits (Qff) but surface more irregular because deposit was partially eroded by streams.

Qs SWAMP DEPOSITS—Organic-rich silt and clay deposited in poorly drained lowlands of inactive flood plains and tidal flats. No visible layering. Abundant roots; generally water saturated and blanketed with peat up to 30 cm thick. Vegetated mostly with grasses and some willow, alder, and cottonwood. Low to very low permeability; poor drainage.

Qo ORGANIC DEPOSITS—*Sphagnum*, sedge, and woody peat with minor organic-rich silt primarily in glacier-scoured bedrock depressions on valley floors. Maximum thickness >1 m. Generally overlie local basin fillings of gray, pebbly clay of unknown thickness that may have been deposited subglacially as lodgment till (Qpd) or in proximal glaciomarine or glaciolacustrine environments. Vegetated with sedge grasses, *Sphagnum* moss, other small plants, and few trees. Poor drainage.

Qcg ACTIVE ROCK-GLACIER AND PROTALUS-LOBE DEPOSITS—Poorly sorted, angular boulder rubble, with varying proportions of cobbles, pebbles and sand. Active glacier-like movement is indicated by steep terminus, concentric surface ridges, elongation, lobate form, crevasses, and little or no vegetation. Originated from preexisting moraine and talus deposits; includes lobate and tongue-shaped rock glaciers of Domaradzki (1951) and protalus lobes of Richmond (1962). Generally restricted to northeast- to northwest-facing slopes above 600-m elevation.

Qcl LANDSLIDE DEPOSITS—Poorly sorted, nonstratified boulders, cobbles, pebbles, sand, and silt in varying proportions deposited by rock slides, debris slides, debris avalanches, and snow avalanches; potentially unstable. Surface highly irregular to moderately smooth. Moderate to very high permeability; fair to excellent drainage.

Qcf COLLUVIUM AND ALLUVIUM, UNDIFFERENTIATED—Poorly sorted, subangular to very angular boulders, cobbles, and pebbles with minor sand and silt; deposited at base of gullies along cliffs and steep slopes through a combination of water transport and mass wasting; potentially unstable. Up to 30 m thick, with cone-shaped, steep (> 15°), concave-upward, and channeled surface. High permeability; good drainage.

Qct TALUS DEPOSITS—Poorly sorted boulders, cobbles, pebbles, and minor sand deposited at the base of cliffs and steep slopes by debris falls; nonstratified and potentially unstable. Surface generally steep and irregular. Very high permeability; excellent drainage.

Qhof HOLOCENE OUTWASH-FAN DEPOSIT—Fan-shaped deposit of cobbles, pebbles, and sand (inferred from distinct distribution of cottonwood trees in association with side-glacial features). Deposits are overlain by overbank silt and swamp sediments but have sufficient subsurface permeability to support numerous trees. Probably deposited in an ice-marginal glaciofluvial environment during late Holocene time.

Qho HOLOCENE GLACIOFLUVIAL DEPOSITS, UNDIFFERENTIATED—Moderately to well-sorted cobbles, pebbles, and sand with minor silt; deposited as outwash trains and terraces. Includes deposits of braided streams that originate from modern glaciers. Thin to medium bedded with some boulders up to 1-m diam. Generally subrounded to well-rounded pebbles, cobbles, and boulders. Lithologies dominated by graywacke and phyllite of the Valdez Group. Surfaces are generally flat and dissected by active or abandoned channels. High permeability; very good drainage.

Qhd HOLOCENE DRIFT, UNDIFFERENTIATED—Poorly sorted boulders, cobbles, pebbles, sand, and silt deposited as moraine, lodgment or ablation till, or water-washed ice-contact deposits; includes colluviated slopes of steep moraines. Locally thin (< 30 cm) and discontinuous over bedrock. Till and moraine are nonstratified except where reworked. Ice-contact deposits are thin to medium bedded. Contains angular to subangular cobbles and boulders that are up to several meters diameter. Generally irregular surface, with relatively distinct glacial morphology. Low to moderate permeability; good drainage.

Qpo PLEISTOCENE GLACIOFLUVIAL DEPOSITS, UNDIFFERENTIATED—Moderately to well-sorted cobbles, pebbles, and sand with minor silt; deposited as outwash trains, fans, and fan deltas. Cobbles and boulders are subangular to well rounded and up to 50-cm diam. Thin to medium bedded, with planar beds dipping locally up to 20° in fan-delta deposits. Thickness varies from 3 to 10 m. Moderate to high permeability; good drainage.

Qpd PLEISTOCENE DRIFT, UNDIFFERENTIATED—Poorly sorted, angular to subangular boulders and cobbles, with pebbles, sand, and silt; deposited as moraine or lodgment or ablation till. Locally weathered to medium brown, although most exposed cobbles and boulders lack well-developed weathering rinds. Generally dense and nonstratified except where reworked. Locally thin (<30 cm) and discontinuous over bedrock. Irregular surface, with relatively indistinct glacial morphology. Clay-rich facies may underlie organic deposits (Qo) in glacier-scoured bedrock depressions on valley floors. Very low permeability in clay-rich areas; higher permeability where reworked. Poor to good drainage.

Kv SEDIMENTARY ROCKS, UNDIFFERENTIATED (Valdez Group; Tysdal and Case, 1979)—Medium- to dark-gray, tabular, thin- to thick-bedded sandstone and mudstone. Sandstone is very fine to very coarse grained feldspathic litharenite (graywacke) composed mainly of subangular to very angular quartz, plagioclase feldspar, and fine-grained sedimentary-rock fragments in a matrix of silt, chlorite, and minor muscovite and biotite; other common constituents include potassium feldspar, polycrystalline quartz, and felsic plutonic- and volcanic-rock fragments. Calcite present as minor veinlets and cement and partially replaces feldspar, matrix, and argillaceous-rock fragments. Mudstone beds are generally dark gray, laminated to massive, phyllitic, and exhibit well-developed fracture cleavage subparallel to bedding planes; silt laminae, where visible, are locally modified by secondary folding. Unit commonly blanketed with thin (<30 cm), discontinuous cover of drift or colluvium on slopes and frost-shattered debris at high elevations. Displays well-developed joints in one to four directions.

Kvs SCHIST (Valdez Group; Tysdal and Case, 1979)—Medium- to dark-gray, schistose, interlayered metasandstone and metasiltstone; metamorphosed to biotite and chlorite zones of greenschist facies. Where field checked, rocks are muscovite-quartz-biotite schist.

MAP SYMBOLS

- Contact; dashed where approximately located, dotted where concealed.
- Fault or lineament from aerial photographs; not checked or identified on the ground; dotted where inferred.
- Former ice margin, inferred from side-glacial erosional or depositional features; tick marks toward ice.
- Strike and dip of fracture cleavage; normally parallel or subparallel to bedding
  - 58 Inclined
  - Vertical
- Strike and dip of foliation.
  - 51 Inclined
  - Vertical
- Strike and dip of joints
  - 39 Inclined
  - Vertical

REFERENCES CITED

Bartsch-Winkler, S.R., Ovenshine, A.T., and Kachadoorian, Reuben, 1983, Holocene history of the estuarine area surrounding Portage, Alaska as recorded in a 93-m core: Canadian Journal of Earth Sciences, v. 20, no. 5, p. 802-820.

Domaradzki, J., 1951, Blockströme in Kanton Graubünden: Ergebnisse der Wissenschaft Untersuchungen der Schweiz, Nationalparks N.S., v. 3, p. 173-235.

Ovenshine, A.T., Lawson, D.E., and Bartsch-Winkler, S.R., 1976, The Placer River Silt - an intertidal deposit caused by the 1964 Alaska earthquake: U.S. Geological Survey, Journal of Research, v. 4, no. 2, p. 151-162.

Richmond, G.M., 1962, Quaternary stratigraphy of the La Sal Mountains, Utah: U.S. Geological Survey Professional Paper 324, 135 p.

Tysdal, R.G., and Case, J.E., 1979, Geologic map of the Seward and Blying Sound Quadrangles, Alaska: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-1150, scale 1:250,000, 1 sheet.

This report is a preliminary publication of DGGS. The author is solely responsible for its content and will appreciate candid comments on the accuracy of the data as well as suggestions to improve the report.