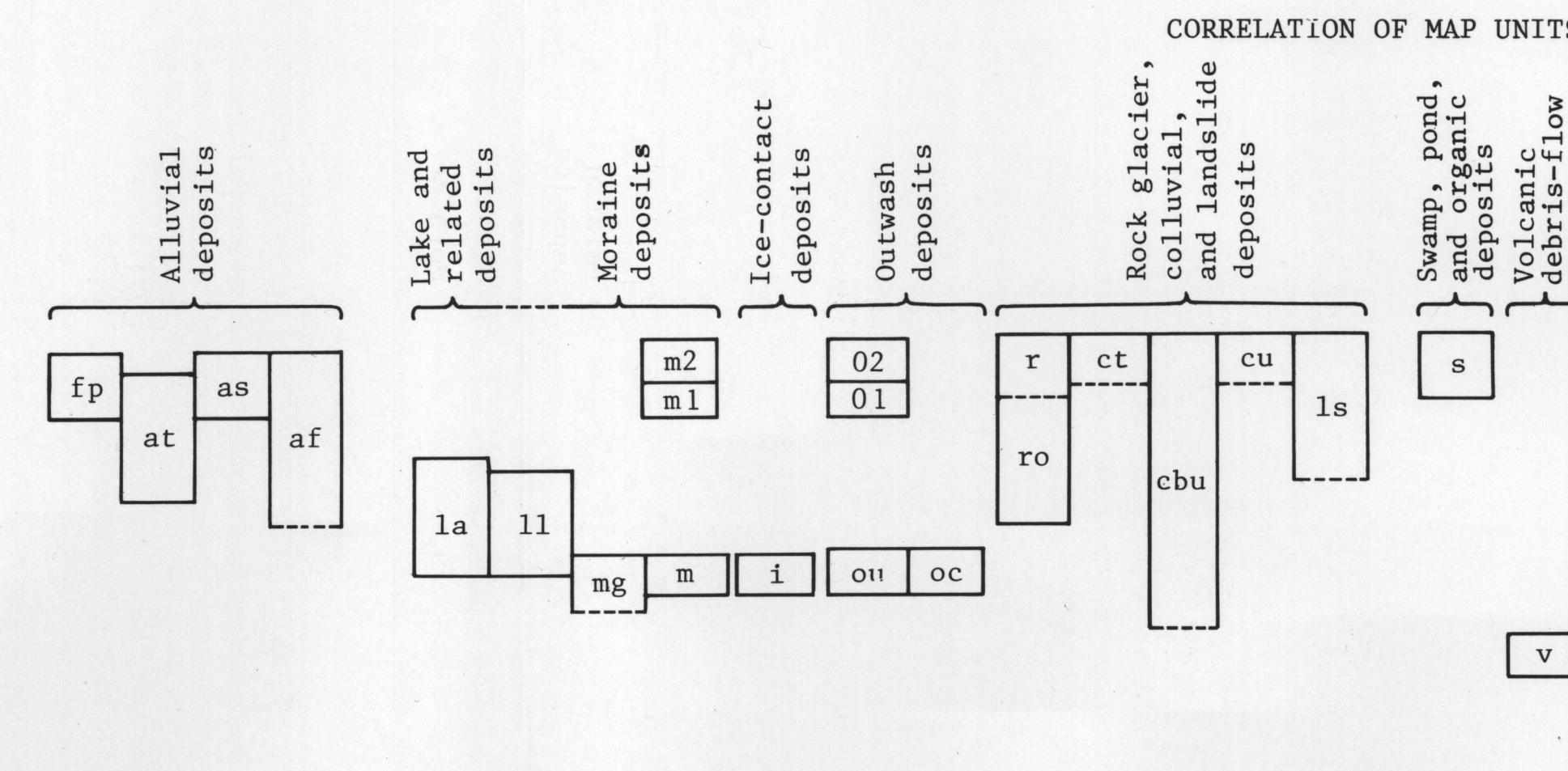
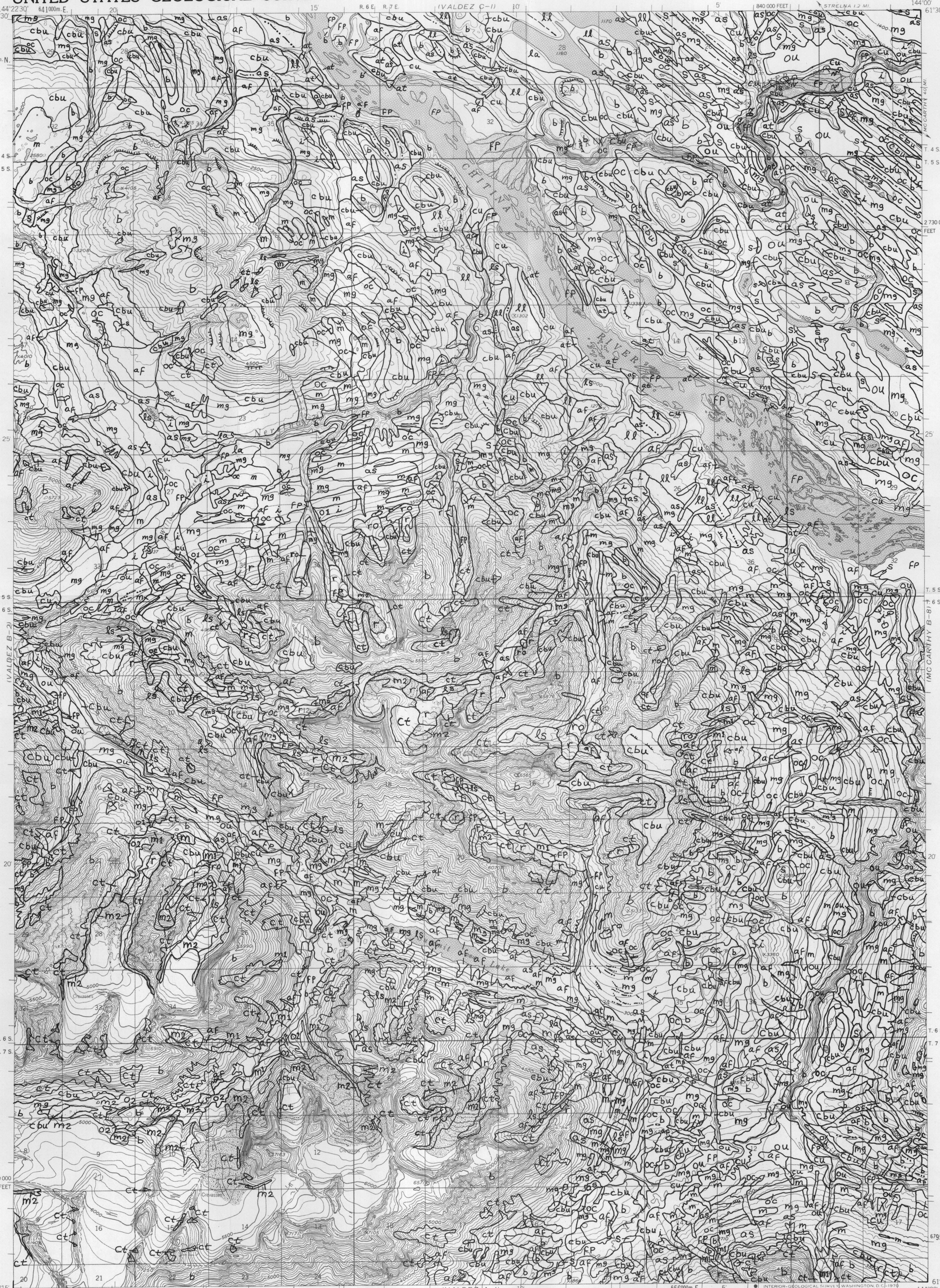


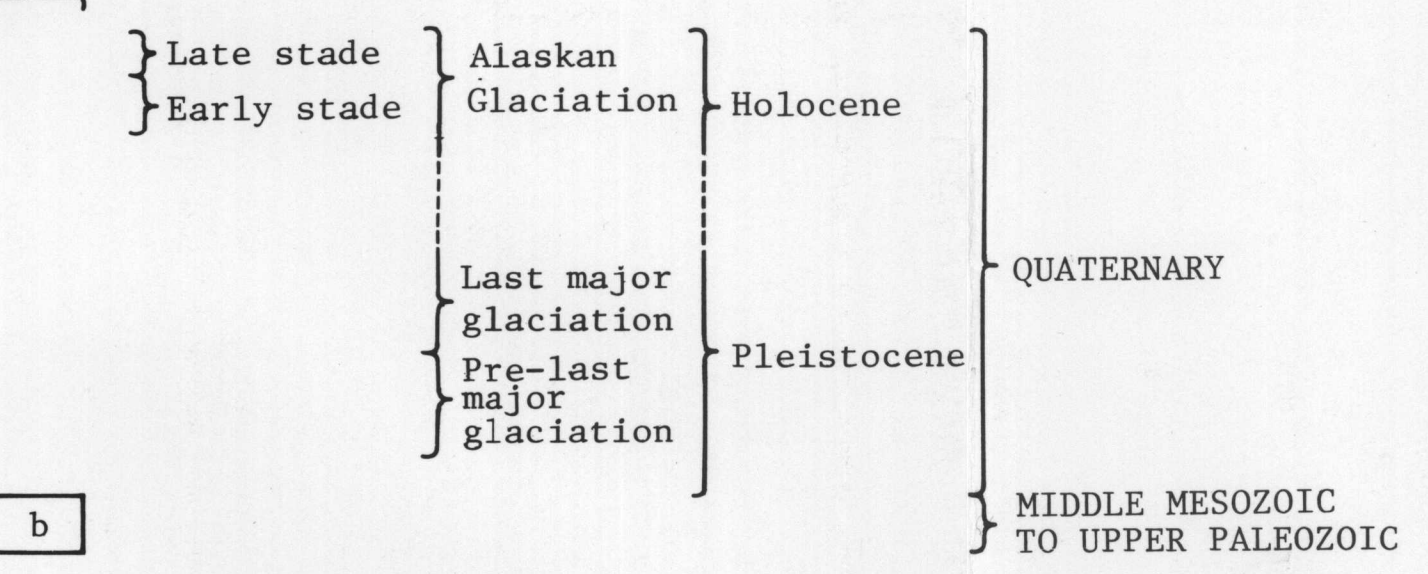
DEPARTMENT OF THE INTERIOR
 UNITED STATES GEOLOGICAL SURVEY



DESCRIPTION OF MAP UNITS

[Map units represent deposits considered to be 1 or more meters thick. Sizes of unconsolidated particles follow scale of Wentworth (1922). Age symbol "Q" omitted from map symbols because all units (with the exception of unit "b") are of Quaternary age]

- ALUVIAL DEPOSITS (Holocene)**--Chiefly sandy gravel and gravel deposited along present, mostly low gradient, major- and moderate-size streams and along some medium-gradient and a few high-gradient minor streams. Includes some low terrace deposits as much as a few meters higher than the stream level. Largely unvegetated. Present mostly along Chitina, Kuskulana, and Tebay Rivers. Thickness probably less than 20 m
- fp** Flood-plain deposits (Holocene)--Chiefly sandy gravel and gravel deposited along present, mostly low gradient, major- and moderate-size streams and along some medium-gradient and a few high-gradient minor streams. Includes some low terrace deposits as much as a few meters higher than the stream level. Largely unvegetated. Present mostly along Chitina, Kuskulana, and Tebay Rivers. Thickness probably less than 20 m
- at** Terrace deposits (Holocene)--Mostly sandy gravel and gravel deposited by former streams adjacent to present major streams. Deposits at various levels up to many tens of meters higher than the present stream. Distributed chiefly adjacent to Chitina River. Thickness probably less than 10 m
- as** Fine-grained alluvial deposits (Holocene)--Chiefly sand, but ranges from silty sand and organic sand to pebbly sand; locally includes some pond and swamp deposits too small to map separately. Deposits form the alluvium of (1) many small, low-gradient, (2) some medium-gradient streams and (3) alluvial fans, and form distal edges of some large alluvial fans. In many places deposits overlie glacial outwash channel deposits. Widespread in northeastern part of quadrangle. Thickness less than 5 m
- af** Alluvial fan deposits (Holocene)--Mostly gravelly sand and gravel deposited by steep gradient streams. In some places distal edges of fan deposits merge to fine-grained alluvium. Widespread along mountain slopes. Thickness less than 15 m
- LAKE AND RELATED DEPOSITS**
- la** Lake deposits (lower Holocene and Pleistocene)--Chiefly laminated to massive silt and clay; some deposits are pebbly to sandy silt and clay. Near center of northern edge of quadrangle deposited in glacial Lake Atna (Nichols, 1965) which extended many kilometers to the northwest (Nichols and Yehle, 1969; Richter and others, 1979; Williams and Johnson, 1980; Yehle, 1980). In west-central part of quadrangle deposited in local lake at mouth of Willow Creek, and in area south of outlet of Summit Lake also deposited in a local lake. Lake Atna-related deposits intertongue with lacustrine lag deposits. Thickness less than 5 m
- ll** Lacustrine lag deposits related to glacial Lake Atna (Lower Holocene and Pleistocene)--Mostly variably stony silt to clay; probably includes scattered concentrations of cobbles, boulders and some lenses of sand. Mantles gently sloping low hills of mostly ground moraine in lowland areas west of the longitude of Strelina Creek but mapped only in broad areas (1) southwest of Chitina River, and (2) northwest of the terrain marked by numerous bedrock hills near and southeast of Kuskulana River. Intertongues and in part probably overlies finer grained lake deposits. Thickness as much as 3 m
- MORAINIC DEPOSITS**
- mg** Ground-moraine deposits (Pleistocene)--Slightly weathered till (a heterogeneous, unsorted, nonstratified mixture of stony silt and sand with some clay) formed into (1) irregularly shaped to uniformly linear hills and (2) some small plains with gently rolling surfaces. Deposits include some stratified sand and pebble gravel and some small unmapped bedrock outcrops. Generally widespread except along steep and upper slopes in mountainous terrain. In northeastern part of quadrangle these deposits form numerous linear hills all apparently shaped by northwestward-moving ice of the Chitina River valley glacier system. Map unit includes some ground-moraine deposits older than the last major glaciation, notably, deposits on the two rounded mountaintops east of Taral Creek in the northwestern part of quadrangle. Thickness probably less than 20 m
- m2** Moraine deposits of late stage Alaskan Glaciation (Karlstrom, 1964; Péwé, 1975) (Holocene)--Chiefly unweathered end and lateral moraine deposits consisting of glacial till with a high percent of coarse clasts. Distributed mostly in steep-sided valleys headed by glaciers in upper part of Canyon Creek, in tributaries of lower part of Canyon Creek, and in valleys radiating from the mountain mass northwest of Summit Lake. Thickness probably less than 15 m
- 02** Outwash deposits of late stage Alaskan Glaciation (Karlstrom, 1964; Péwé, 1975) (Holocene)--Chiefly pebble gravel and cobble gravel and sand in remnants of former glacial streams a few meters above and adjacent to present glacier-meltwater streams. Distributed along Canyon Creek and some of its tributaries. Thickness less than 10 m
- 01** Outwash deposits of early stage Alaskan Glaciation (Karlstrom, 1964, Péwé, 1975) (Holocene)--Chiefly pebble and some cobble gravel in scattered remnants of former glacial streams. Distributed sparsely along some tributaries of Canyon Creek and Nerelina Creek. Thickness less than 10 m
- ou** Outwash deposits, undifferentiated (Pleistocene)--Chiefly stratified sandy pebble to cobble gravel. Locally somewhat finer grained materials, commonly with a cover of organic materials, may predominate near the surface. (Where thicker than 1 m, these finer materials mapped as fine-grained alluvial deposits.) Deposited as valley trains which locally merge to outwash channels. Includes some remnants of somewhat older outwash terraces several meters higher than the level of most of the outwash deposits. Mapped in the northeastern part of the quadrangle, and along Tebay River and lower part of Canyon Creek. Deposits probably less than 20 m in thickness
- ro** Old rock glacier deposits (Lower(?) Holocene)--Rock glaciers chiefly of large size and mostly down-valley from and in places overrun by younger rock glaciers; believed inactive. Present in mountain valleys southeast of Nerelina Creek and northeast of Summit Lake. Thickness as much as 100 m
- ct** Talus deposits (Holocene)--Rubbly fragments of bedrock chiefly of cobble and pebble sizes derived by rapid mechanical weathering and moved downslope by gravity processes. Very common along steep upper slopes of mountain valleys. Thickness probably less than 10 m
- cu** Colluvial deposits, undifferentiated (Holocene and Pleistocene)--Widely distributed heterogeneous deposits consisting of earth-material fragments of various sizes, chiefly pebbles, in a matrix of silt and sand. Includes some organic, solifluction, and eolian deposits. Formed mostly on moderate to steep slopes by mechanical weathering



cu Colluvial deposits derived mostly from unconsolidated surficial deposits (Holocene)--Chiefly drift, fine-grained alluvial and lacustrine deposits, and minor organic and eolian deposits. Formed mostly on steep to moderate slopes adjacent to streams. Principal exposures along Chitina River, Strelina Creek, and part of Kuskulana River. Thickness probably less than 10 m

ls Landslide deposits (Holocene)--All types of landslide deposits ranging from thin slurry flows to very massive block slides. Largest areas of deposits (1) in mountains about 5 km north of Summit Lake, (2) near a tributary of Canyon Creek about 5 km west of Summit Lake, and (3) about 4 km southeast of the mouth of Nerelina Creek. Thickness may be as much as 75 m

s SWAMP, POND, AND ORGANIC DEPOSITS (HOLOCENE)--Silty organic deposits to organic-rich, fine sandy silt deposits. Grades downward to fine-grained alluvial deposits, outwash channel deposits, and outwash valley train deposits. Many deposits too small to map at this scale. Found sparsely in larger valleys and lowland areas especially in the northeastern part of quadrangle. Thickness probably less than 5 m

v CHETASLINA VOLCANIC DEBRIS-FLOW DEPOSITS (YEHLE AND NICHOLS, 1980) (PLEISTOCENE)--Volcanic-rich diamicton containing different colored, boulder-size clasts, some of which are as much as 10 m in maximum dimension; matrix composed chiefly of silty sand with pebble- and some cobble-size volcanic rocks, and, locally, materials rich in montmorillonite clay. Exposed locally in bluffs along Kuskulana River near mouth of Strelina Creek, and in bluffs along northeast side of Chitina River about 7 km southeast of mouth of Kuskulana River. Thickness as much as 20 m

b PRE-QUATERNARY BEDROCK, UNDIVIDED (MIDDLE MESOZOIC TO UPPER PALEOZOIC)--Includes a variety of rock types principally greenschist, greenstone, granitic rocks, amphibolite, limestone, and various metasedimentary rocks (Moffitt, 1938; Herreid, 1970; Beikman and others, 1977)

- CONTACT--Approximately located
- ABANDONED GLACIAL OUTWASH CHANNEL--Too small to map separately at this scale
- ESCARPMENT--Prominent within map unit; hachures on downslope side
- RIDGES--Prominent linear ridges (drumlins or fluted landforms) within map unit

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SCALE 1:63 360

0 1 2 3 4 MILES

0 1 2 3 4 KILOMETERS

APPROXIMATE MEAN SEASIDE ELEVATION, 1981

PRELIMINARY SURFICIAL GEOLOGIC MAP OF THE VALDEZ B-1 QUADRANGLE, ALASKA

By
 Lynn A. Yehle
 1981

