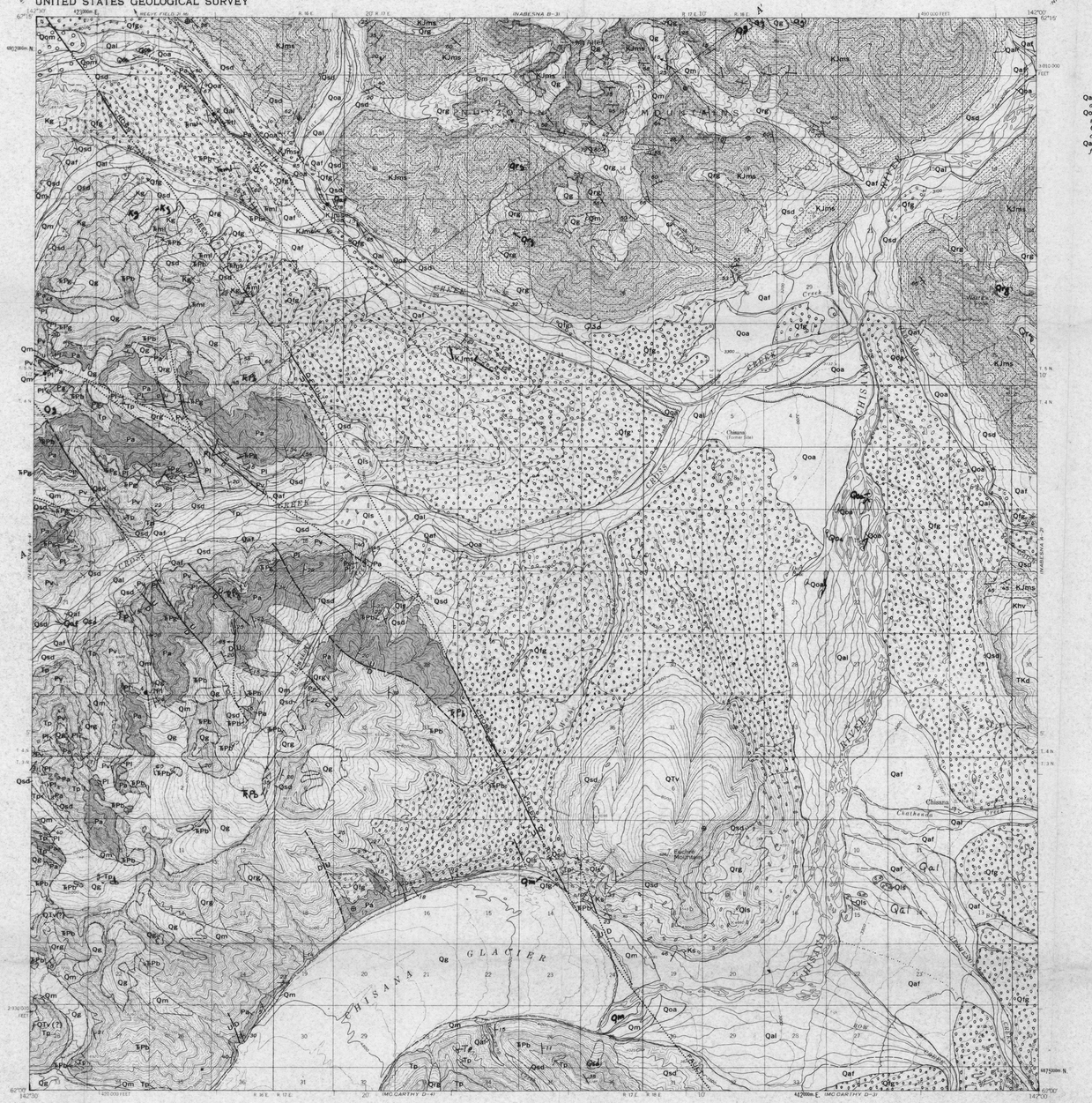
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY



Base from U.S. Geological Survey, 1960

Geology mapped by D. H. Richter, N. A. Matson, Jr., and D. Grybeck, 1968. Surficial geology chiefly by aerial photo interpretation.

SCALE 1:63 360

1 ½ 0 1 2 3 4 5 MILES

1 5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM IS MEAN SEA LEVEL

APPROXIMATE MEAN DECLINATION, 1970

U.S. GEOLOGICAL SURVEY
OPEN FILE MAP

EXPLANATION

UNCONSOLIDATED DEPOSITS

Qal | Qaf | Qoa

Alluvium

Qal, alluvium on presently active flood plains; includes glacial outwash and stream channels on alluvial fans; supports little or no vegetation
Qoa, older alluvium; forms vegetation-covered terraces above present stream levels in the Chisana River and Cross, Notch, and Chavolda Creek valleys. Large low gradient fan of Cross and Notch Creek included in this unit. The more prominent terrace scarps shown
Qaf, alluvial fans; includes both presently active and vegetation-covered fans; only relatively large fans shown

Qls | Qsd

Landslide and slope deposits

Qls, landslide deposits. Overlapping landslides of markedly different age delineated by discontinuous dotted lines
Qsd, undifferentiated slope deposits including talus, cliff debris, small landslides, rock glaciers, and alluvium, generally on and below steep slopes; shown only where deposits cover relatively large areas of bedrock. In Ramshole Creek valley unit includes local moraine deposits. Low gradient on north slopes of Euchre Mountain covered by mixture of colluviated high-level drift (Qfg) and rubble bedrock

Qfg | Qom

Fluvioglacial and glacial deposits

Qfg, undifferentiated fluvioglacial and glacial deposits formed during recession of large glaciers. Unit consists chiefly of unconsolidated but commonly stratified silt, sand, gravel, and boulder deposits as much as 500 feet thick and glacial deposits including ground moraine and thin drift cover. At higher elevation deposits merge with and are covered by slope deposits (Qsd). Most of the unit is apparently related to Jatahmund Lake Glaciation of Wisconsin age (Fernald, 1965). Post-depositional mud flows delineated by discontinuous dotted lines
Qom, old terminal moraine in Notch Creek valley

Qg | Qm | Qrg

Glacier and rock glacier deposits

Qg, glacier and snowfield; includes rock stripes and other morainal debris on ice
Qm, glacial moraines formed during recession of present alpine glaciers; includes talus cones feeding onto glacier or moraine. Unit may include rock glaciers formed by recent mobilization of morainal deposits
Qrg, rock glaciers and their feeding, talus cones and slopes; includes both active and stagnant types. Distinguished from glacial moraines (Qm) chiefly by pronounced flow pattern

QUATERNARY

SEDIMENTARY AND VOLCANIC ROCKS

QTv

Volcanic rocks

Chiefly pyroxene- and olivine-bearing andesite flows, but includes minor bedded ash fall and reworked ash fall deposits. Bedded deposits are only weakly consolidated and generally confined to base of unit

TERTIARY AND QUATERNARY

ANGULAR UNCONFORMITY

Ks

Continental sedimentary rocks

Fine- to coarse-grained sandstone, siltstone, shale, and subordinate grit and conglomerate. Carbonaceous debris, including lignitized wood and locally well-preserved leaves, common throughout unit. Rocks are well consolidated, generally drab brown or gray and massive to thin bedded

Upper Cretaceous(?) — CRETACEOUS(?)

ANGULAR UNCONFORMITY (?)

Khv

Hornfelsed volcanic rocks

Dark, fine- to medium-grained massive volcanic flows containing secondary biotite, chlorite, and poikilitic hornblende. Unit contains abundant apophyses of pyroxene diorite (TKd)

CRETACEOUS

KJms

Marine sedimentary rocks

Chiefly argillite, siltstone, and graywacke in thin graded beds with minor interbedded massive coarse-grained sandstone, polymictic conglomerate, and thin calcareous siltstone

Upper Jurassic — Lower Cretaceous — JURASSIC AND CRETACEOUS

ANGULAR UNCONFORMITY

Trl

Thin-bedded limestone

Dark-gray, fine-grained limestone in beds 3 inches to 5 feet thick with thin interbeds of black chert, siliceous argillite, and carbonaceous shale. Mainly micrite, biomicrite, and biomicrudite. The Pelecypod Monotis subcircularis Gabb common in similar strata to northwest in Nabesna B-4 quadrangle

Upper Triassic

ANGULAR LOCAL UNCONFORMITY

Tml

Massive limestone

Gray to dark-gray, fine-grained massive limestone with lenses and zones of lenses of black chert and irregular patches of siliceous material. Bedding generally indistinguishable. Chiefly micrite or dismicrite with some biomicrite. Commonly strongly brecciated and veined by coarsely crytalline calcite. South of William Creek limestone has been thermally metamorphosed to white, serpentine- and tremolite-bearing marble

TRIASSIC

DISCONFORMITY

PPb

Amygdaloidal basalt

Green, brown, and reddish-brown amygdaloidal basalt flows separated in a few places by a layer of thin reddish-brown volcaniclastic material. Intermixed aa and pahoehoe flows with individual flow units ranging from a few inches to more than 20 feet thick. Base of unit north of Chisana Glacier characterized by flows containing inclusions of underlying sedimentary rock. Amygdules consist of quartz, calcite, chlorite, epidote, pumpellyite, prehnite, and some zeolite minerals. South of William Creek, in vicinity of large intrusive, flows have been thermally metamorphosed to dense fine-grained amphibolites. Gabbro intrusives (not shown) locally abundant, especially near base of unit

PERMIAN OR TRIASSIC

Pa

Argillite

Chiefly dark argillite with interbedded calcareous siltstone and sandstone, sandy and silty bioclastic limestone, and minor intraformational conglomerate. Upper part of unit may include some thin-bedded limy and carbonaceous shales of Middle Triassic age. Concretions locally abundant. Gabbro intrusives (not shown) very common; may constitute more than 70 percent of the section

Pl

Limestone

Thin- to thick-bedded, light-gray to gray fossiliferous limestone. Chiefly biosparrudite but commonly recrystallized. Dikes and sills of gabbro (PPg) intrude the unit

Pv

Volcanic and volcaniclastic rocks

Interbedded volcanic flows, fragmental volcanic rocks, tuffs, ash flows, fine- to coarse-grained volcanic sandstones, volcanic siltstone, and mudstone. Volcanic rocks, chiefly intermediate in composition. Flows range from massive to thin and amygdaloidal; some exhibit ellipsoidal structures. Volcaniclastic rocks characteristically dark green to gray green and thin bedded. Gabbro intrusive rocks (not shown) locally abundant

PERMIAN

INTRUSIVE ROCKS

HYPABYSSAL ROCKS

Tp

Hornblende-plagioclase porphyry

Includes many different color, textural, and phenocrystal varieties, all apparently of intermediate to acid composition. Only the larger dikes, sills, and bodies shown. Larger bodies consist of complex multiple intrusions, and mapped units may include abundant country rock. Intrusive on fault between Euchre Mountain and Chisana Glacier is a fine-grained pyroxene porphyry

TERTIARY

PPg

Augite and hypersthene gabbro

Dark, medium- to coarse-grained dikes, sills and irregular bodies, generally with blocky fracture. Intrudes amygdaloidal basalt (PPb) and older rocks, but shown only where it cuts and splits Permian limestone (Pl)

PERMIAN OR TRIASSIC

PLUTONIC ROCKS

TKd

Pyroxene diorite

Dark, medium to coarse grained, subhedral granular. Pyroxene largely altered to actinolite and chlorite

CRETACEOUS OR TERTIARY

Kg

Biotite-hornblende granodiorite

Includes minor diorite. More mafic varieties appear to be restricted to border zone of intrusive. Rocks are medium to coarse grained, subhedral granular, nonfoliated, and unaltered. Pluton intruded by abundant dikes of porphyry (Tp) and dikes and veins of aplite

CRETACEOUS

25 — Contact, showing dip
Dashed where approximate or inferred

Contact between individual alluvial fans

Contact between individual landslides

Extent of mud flow

U D 25 — Fault, showing dip
Dashed where approximate or inferred; dotted where concealed. U, upthrown side D, downthrown side. Arrows indicate relative lateral movement

Overturned anticline — *Showing axis. Dotted where concealed*
Overturned syncline — *Showing axis and direction of plunge. Dotted where concealed*

60 Inclined — Vertical — 85 Overturned
Strike and dip of beds or flows

Horizontal beds or flows

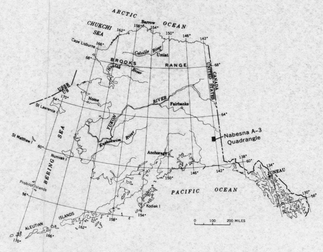
65 Inclined — Vertical
Strike and dip of slaty cleavage

10 Lineation
Showing direction and amount of plunge of minor fold axes

Fossil locality — Terrace scarp
Hachures point downslope

REFERENCE

Fernald, A. T., 1965, Glaciation in the Nabesna River area, upper Tanana River valley, Alaska: U.S. Geol. Survey Prof. Paper 525-C, p. 120-123



INDEX MAP OF ALASKA
SHOWING LOCATION OF AREA

RECONNAISSANCE GEOLOGIC MAP AND SECTION OF THE NABESNA A-3 QUADRANGLE, ALASKA

By
D. H. Richter

1970

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For sale by U.S. Geological Survey, price $