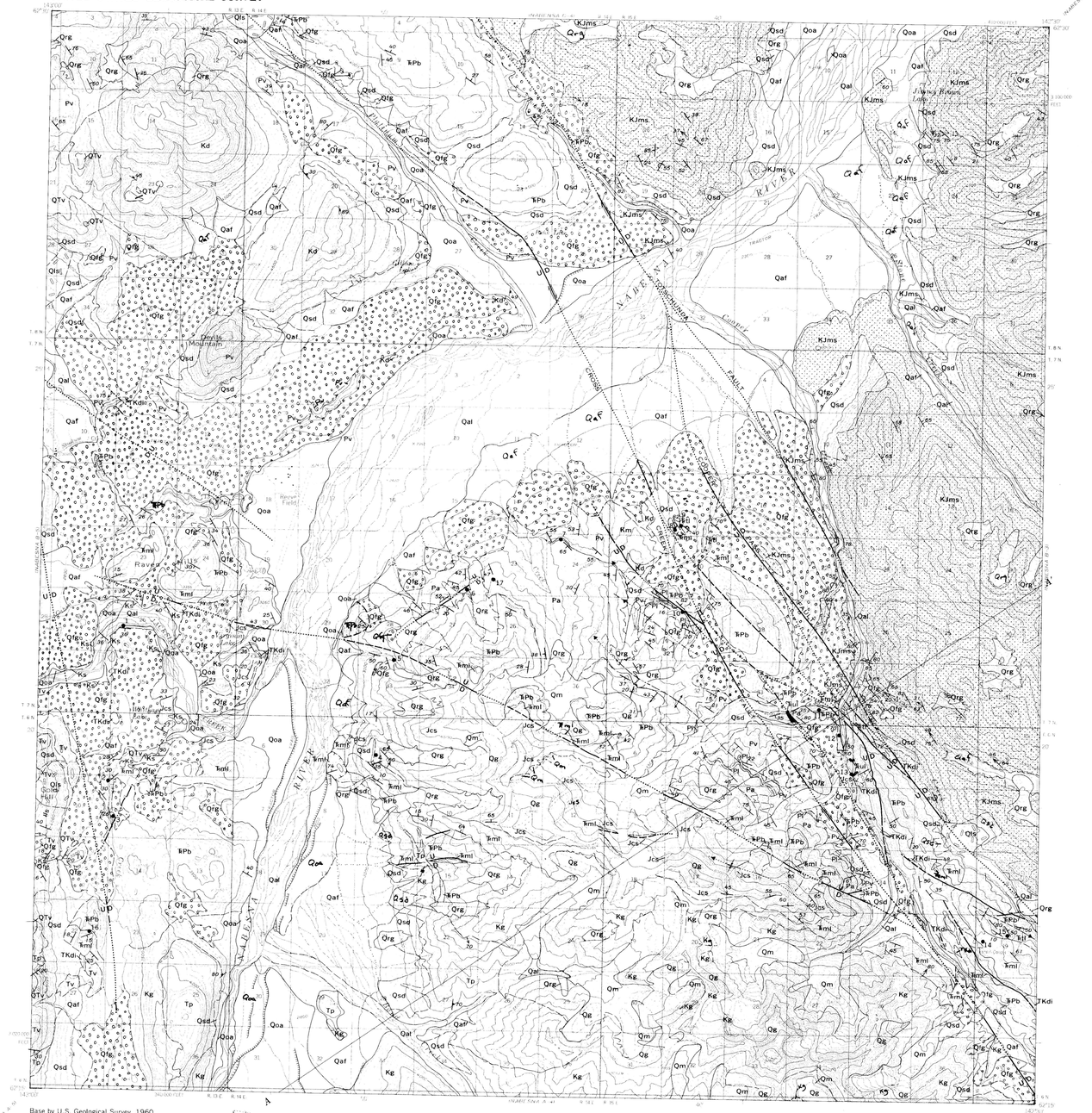
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY



RECONNAISSANCE GEOLOGIC MAP AND SECTION OF THE NABESNA B–4 QUADRANGLE, ALASKA

By
D. H. Richter

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EXPLANATION

UNCONSOLIDATED DEPOSITS

Qal | Qaf / Qoa — Alluvium

Qal, alluvium deposited along presently active floodplains and fans of streams and supporting little or no vegetation
Qoa, older alluvium, forming vegetation-covered terraces above present stream levels in the Nabesna River and Jacksina and Platinum Creek valleys. The more prominent terrace scarps within unit shown by hachures
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. Landslide on east flank of Gold Hill has moved relatively short distance as a single unit
Qsd, undifferentiated slope deposits including talus, cliff debris, small landslides, rock glaciers, and alluvium, generally on and below steep slopes. May also include glacial deposits, especially along steep southeast side of Nabesna River. Shown only where deposits cover relatively large areas of bedrock

Qfg — 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 400 feet thick and glacial deposits, including large areas of ground moraine, and thin drift cover and remnants of high-level lateral moraines. At higher elevations deposits merge with and are covered by slope deposits (Qsd). Most of the unit apparently is related to the Jatkhmund Lake Glaciation, of Wisconsin age; some of the highest drift may be as old as Black Hills Glaciation, of Illinoian age (Fernald, 1965)

Qg | Qm | Qrg — Glacial and rock glacier deposits

Qg, glacier or snowfield
Qm, glacial moraines formed during recession of high alpine glaciers, including talus cones feeding onto glacier or moraine. 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 pyrozene- and olivine-bearing andesite flows, but includes bedded ash fall and reworked ash-fall deposits and massive fine-grained ash flow(?) deposits. Bedded deposits are weakly consolidated and generally confined to base of unit. Massive ash flow(?) deposits occupy old valleys

TERTIARY AND QUATERNARY

ANGULAR UNCONFORMITY

Tv — Fragmental volcanic rocks

Chiefly dark-colored andesite and basalt fragmental flows, breccias and lahars with minor interbedded tuffs and carbonaceous volcaniclastics. Rounded to angular fragments and clasts in volcanic rocks consist almost entirely of various hornblende-plagioclase and augite-plagioclase porphyries. May be locally interbedded with Upper Cretaceous(?) sedimentary rocks

TERTIARY(?)

Upper Cretaceous(?)

Ks — Continental sedimentary rocks

Arkosic fine- to coarse-grained sandstone, siltstone, shale with 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

CRETACEOUS(?)

ANGULAR UNCONFORMITY(?)

Upper Jurassic Lower Cretaceous

KJms — Marine sedimentary rocks

Chiefly argillite, siltstone, and graywacke in thin graded beds with minor interbedded massive sandstone, cobble conglomerate, and thin calcareous siltstone. Thick-bedded argillite locally common at base of unit

JURASSIC AND CRETACEOUS

Upper Jurassic

Jcs — Conglomerate and siltstone

Massive cobble conglomerate and interbedded dark-gray siltstone and minor graywacke. Clasts include holocrystalline plutonic rocks, fine-grained volcanic rocks and porphyries, volcaniclastics, chert, limestone, and white vein quartz. Siltstone exhibits weak slaty cleavage and is locally fossiliferous

JURASSIC

ANGULAR UNCONFORMITY(?)

Upper Triassic

Trl — Thin-bedded limestone

Dark-gray, fine-grained limestone in beds 2 inches to 3 feet thick with thin interbeds of dark chert, siliceous argillite, and carbonaceous shale. Mainly micrite, biomicrite, and biomicrudite. Pelecypod Monotis subcircularis Gabb relatively common in unit
Trul, undifferentiated limestone; thin bedded limestone and carbonaceous shale. Forms three small exposures on complex fault zone along Copper Creek. No diagnostic fossil observed, but presence of Daonella? may indicate a Middle Triassic age for some of these rocks

TRIASSIC

ANGULAR LOCAL UNCONFORMITY

Trml — Massive limestone

Gray to dark-gray massive limestone with lenses and zones of lenses or nodules 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 crystalline calcite. Near larger intrusive masses limestone has been recrystallized to a serpentine-bearing tremolite marble

DISCONFORMITY

TrPb — Amygdaloidal basalt

Green, reddish-brown, and maroon amygdaloidal basalt flows with an occasional thin volcaniclastic interbed. Intermixed aa and pahoehoe flows with individual flow units ranging in thickness from a few inches to more than 20 feet. Characteristic amygdule minerals are chlorite, quartz, calcite, epidote, pumpellyite, prehnite, and some zeolite minerals. Near larger intrusives flows have been thermally metamorphosed to dense fine-grained amphibolites

PERMIAN OR TRIASSIC

Pa — Argillite

Chiefly argillite with interbedded calcareous siltstone and sandstone, sandy and silty bioclastic limestone, and minor intraformational conglomerate. Cone-in-cone structure common in some calcareous siltstone beds. Upper part of unit may include some thin-bedded limy and carbonaceous shales of Middle Triassic age. Unit is intruded by dikes, sills, and irregular bodies of augite- and hypersthene-bearing gabbro that may constitute more than 50 percent of the section

Pl — Limestone

Thin- to thick-bedded light-gray to gray fossiliferous limestone. Chiefly biosparrudite. Locally recrystallized. Unit is thin to absent in northern part of quadrangle

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 generally massive but occasionally exhibit ellipsoidal structures and locally are amygdaloidal. Volcaniclastic rocks characteristically thin-bedded and dark green to gray green

PERMIAN

INTRUSIVE ROCKS

HYPABYSSAL ROCKS

Tp — Hornblende-plagioclase porphyry

Includes many different color, textural, and phenocrystal varieties, all apparently of intermediate composition. Only the larger dikes, sills, and bodies shown. Intrudes biotite-hornblende granodiorite. May include some massive andesitic extrusive rocks (QTv and Tv)

TERTIARY

PLUTONIC ROCKS

Kg — Biotite-hornblende granodiorite

Contains minor biotite-diorite and hornblende diorite. More mafic varieties appear to be restricted to border of stock. Rocks are medium to coarse grained, subhedral granular, and non-foliate

CRETACEOUS(?)

Km | Kd — Hornblende quartz monzonite and hornblende diorite

Km, hornblende quartz monzonite, associated with hornblende diorite south of the Nabesna River. Medium grained, subhedral granular, and strongly chloritized
Kd, hornblende diorite with minor quartz diorite. Rocks are medium to coarse grained, subhedral granular, locally weakly foliated, and generally chloritized

CRETACEOUS OR TERTIARY

UNDIFFERENTIATED INTRUSIVE ROCKS

TKdi — Diorite

Chiefly quartz diorite, diorite, and mafic diorite in small bodies

CRETACEOUS OR TERTIARY

70 — Contact, showing dip
Dashed where approximate or inferred

Contact between individual alluvial fans

U 75 D — Fault, showing dip
Dashed where approximate or inferred; dotted where concealed. U, upthrown side; D, downthrown side. Arrows indicate relative lateral movement

Anticline — *Showing axis and direction of plunge. Dotted where concealed*
Syncline — *Showing axis and direction of plunge. Dotted where concealed*

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

70 Strike and dip of foliation

65 Strike and dip of slaty cleavage

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

60 Strike and dip of major joints

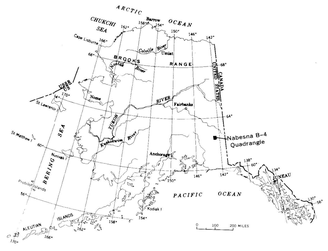
Gravity slide block
Hachures on block

Terrace scarp
Hachures point downslope

15 Fossil locality

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