please return to
MINERALS LIBRARY
A.D.G.G.S.

EXPLANATION

Tertiary — Quaternary — Quaternary to Recent

Qs — Surficial deposits. Includes alluvium, colluvium, glacial, glaciofluvial, marine, and lacustrine deposits

Angular Unconformity

Tertiary — Quaternary and Tertiary — Pliocene to Pleistocene

Tcs — Non marine rocks. Olive-gray to yellow sandstone, conglomeratic sandstone, siltstone, and shale; all highly tuffaceous

Tvc — Volcanic Conglomerate. Cobble-pebble conglomerate composed of rounded volcanic rock clasts in a tuffaceous matrix

Disconformity

Tertiary — Oligocene to Pliocene

Qlf — Lava flows. Hypersthene-augite andesite of Iliamna and Augustine Volcanos; hornblende dacite and rhyodacite of Augustine Volcano

Qmr — Volcanic mud and rubble flows. Includes volcanic breccia and agglomerate; confined to Augustine Island

Qpc — Pumice flows. Mainly lapilli and volcanic sand with minor scoria on Augustine Island

QTv — Quaternary-Tertiary Volcanic rocks. Olivine basalt and associated pyroclastics at Seven Sisters; in part post-glacial; andesitic(?) flows on Shaw Island

QTi — Mainly dikes and sills on Iniskin Peninsula; Volcanic neck and dikes at Seven Sisters

Tba — Basalt and andesite. Dark-green to black, glassy to dull basalt and dark-gray andesite; commonly porphyritic

Trd — Rhyolite and dacite. Light-gray, porphyritic rhyolite flows, and locally crystal tuff; dark hornblende dacite

Tv — Volcanic rocks undifferentiated. May include all types; generally used where data is insufficient to differentiate or where flows are to thin to map

Tt — Tuff. Includes lithic tuff, crystal tuff, and fine agglomeratic tuff

Tbr — Breccia and rubble. Flows mainly of coarse, poorly consolidated volcanic rubble and breccia; includes volcanic mud flows

Tqd/gd — Quartz diorite/granodiorite. Small stocks mainly in southern part of quadrangle; K-Ar date of 25-35 my near Mc Neil Lake*

Tiu — Tertiary intrusive rock undifferentiated, mainly dark intermediate to basic rock associated with extrusive centers. Ti - dark intermediate to basic rock of volcanic necks, plugs, and dikes

Tertiary — Paleocene and Eocene (?)

Tpc — Conglomerate. Cobble-pebble conglomerate with coarse sandstone and minor siltstone interbeds; clasts rounded to angular and of intrusive, metamorphic sedimentary, and volcanic rocks; well indurated; contains a few Paleocene plant fossils

Tps — Arkosic sandstone and siltstone with minor shale and conglomeratic sandstone

Unconformity

Cretaceous — Upper

KK — Kaguyak Formation. Sandstone, siltstone, and shale in a few small areas south of Kamishak Bay

Slight angular unconformity

Jurassic(?) or Cretaceous(?)

KJs — Cretaceous-Jurassic sedimentary rock. Conglomerate, sandstone, siltstone, and shale; locally somewhat metamorphosed; restricted to several small areas in northern and northwestern parts of quadrangle

Jurassic — Upper

Jn — Naknek Formation. Conglomerate, sandstone, siltstone, shale, and arkose; marine; fossiliferous

Local Unconformity

Jc — Chinitna Formation. Siltstone and shale with sandstone interbeds and limestone concretions; marine; fossiliferous

Local Unconformity

Angular unconformity

Jurassic — Middle

Jt — Tuxedni Group. Conglomerate, sandstone, siltstone, and shale; marine; fossiliferous

Regional Unconformity

Jurassic — Lower

Jtk — Talkeetna Formation. Bedded tuff, lava flows, agglomerate, and breccia with interbeds of tuffaceous siltstone and sandstone

Disconformity to angular unconformity

Triassic — Upper

RK — Kamishak Formation. Upper part - thin-bedded, light- to dark-gray limestone with minor chert and porcellanite. Lower part - thin-bedded dark-gray to black limestone and calcilutite; siltstone and shale; minor sandstone and conglomerate, green and black chert; greenstone sills and dikes; contains Monotis, Heterastringa, corals, and ammonites

RIs — Limestone. Upper part - thin- to medium-bedded, light- to dark-gray; locally with coral and echinoid reefs; banded green and white chert; Halobia; greenstone dikes and sills. Lower part - massive, white to light gray, fine to coarse crystalline; minor chert; nonfossiliferous; greenstone sills and dikes

Cretaceous or Tertiary

TKqd/gd — Quartz diorite/granodiorite. Medium to coarse crystalline rock with hornblende and biotite. Similar to both Tertiary and Cretaceous plutons; rocks not dated and insufficient field evidence to differentiate

TKgd/qm — Granodiorite/quartz monzonite

TKiu — Tertiary-Cretaceous intrusive rocks undifferentiated

Cretaceous — Lower and Middle

Kgd/qm — Granodiorite/quartz monzonite. Light coarsely crystalline rock with minor hornblende and biotite; chiefly north of Knutson Bay; K-Ar date of 70-80 my*

Kqd/gd — Quartz diorite/granodiorite. Medium to coarse crystalline rock with hornblende and biotite. Chiefly in Knutson Bay and Porcupine Island area

gd/qm — Granodiorite/quartz monzonite. Small stocks of unknown age along east side of batholith; locally intrudes the Jurassic plutonic rocks; may be part of same plutonic event or of younger plutonic episodes

Aleutian Range Batholith

Jiu — Undifferentiated plutonic rocks of the Aleutian Range Batholith

Jqd — Quartz diorite. Medium to coarse crystalline, light, with either or both hornblende and biotite; commonly foliated. K-Ar dated at numerous localities - 155 to 170 my.*

Jqd/d — Quartz diorite/diorite. Medium to coarse crystalline; mainly with hornblende, minor biotite; commonly foliated

Jd — Diorite. Fine- to medium-crystalline; dark, with hornblende, foliated; mainly confined to northeastern part of quadrangle

Jurassic and Triassic(?)

um — Undifferentiated mafic rocks. Chiefly hornblende gabbro, gabbro, hornblendite, and locally pyroxinite in northwestern part of quadrangle; inferred to be chiefly of Jurassic age

mig — Migmatite. Mixed metamorphic and intrusive rocks, grading from gneissic and schistose textures to unoriented plutonic rock. Present only along borders of Aleutian Range batholith

Permian(?) and/or Triassic

JTk/RK — Undifferentiated Talkeetna and Kamishak formations

RPm — Metamorphic rocks. Includes amphibolite, quartz mica schist, garnet schist, chlorite schist, quartzite, phyllite, and marble. Locally well-foliated; considered to be in part equivalent to Upper Triassic sedimentary rocks

Permian(?) and/or Triassic

RGs — Greenstone. Dark-green to dark-gray basic igneous rock; in part amygdaloidal flows and in part intrusive, minor volcanic breccia, locally metamorphosed to hornfels

Contact, dashed where approximately located, queried where doubtful

Intrusive contact, dashed where approximately located, queried where doubtful

Indefinite contact, includes gradational and inferred contacts; used primarily between different types of intrusive rocks; queried where doubtful

Bruin Bay fault, showing dip. Major high angle reverse fault; may have large lateral component of displacement as well as vertical displacement; dashed where approximately located, dotted where concealed; saw teeth on upthrown block

Fault, showing direction of relative movement, dashed where approximately located, queried where doubtful, dotted where concealed; U upthrown block, D downthrown block

Lineaments, in part obtained from aerial photographs; may represent faults or major joint sets

Anticline, showing trace of axial plane and direction of plunge. Dashed where approximately located, queried where doubtful, dotted where concealed

Syncline, showing trace of axial plane and direction of plunge. Dashed where approximately located, queried where doubtful, dotted where concealed

Minor anticlinal and synclinal folds showing trace of axial plane and direction of plunge

46 Inclined — Vertical — 78 Overturned — Horizontal

Aerial photograph — 37 Flow layering and bedding in volcaniclastic rocks

Strike and dip of beds

128 b — Dikes, showing strike, dip, and lithology; b - basalt, p - pegmatite, l - lamprophere, di - quartz diorite

46 / 86 Inclined — Vertical

Strike and dip of foliation and bearing and plunge of lineation

43 Inclined — Vertical

Strike and dip of joints

48 ← Bearing and plunge of lineation

*Detterman, R.L., Reed, B.L., and Lanphere, M.A., 1965, Jurassic plutonism in Cook Inlet region, Alaska: U.S. Geol. Survey Prof. Paper 525-D, pp. D-16 to D-21

Reed, B.L. and Lanphere, M.A., (in press), Age and chemistry of Mesozoic and Tertiary plutonic rocks in south central Alaska: Geol. Soc. Amer. Bull.

Geologic map of the Iliamna quadrangle, Alaska

This map is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards and nomenclature.

300