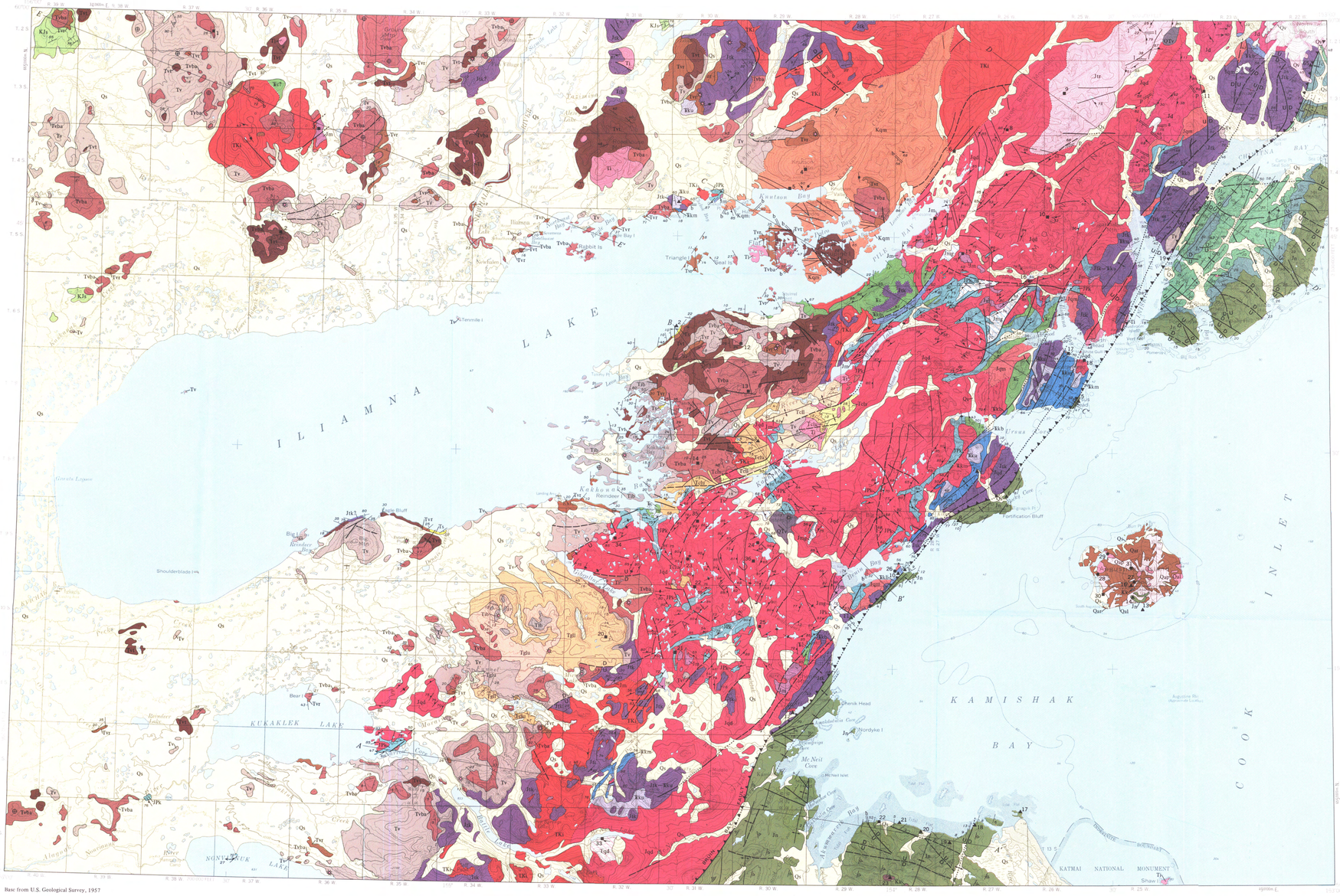
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

BULLETIN 1368-B
PLATE 1



Base from U.S. Geological Survey, 1957

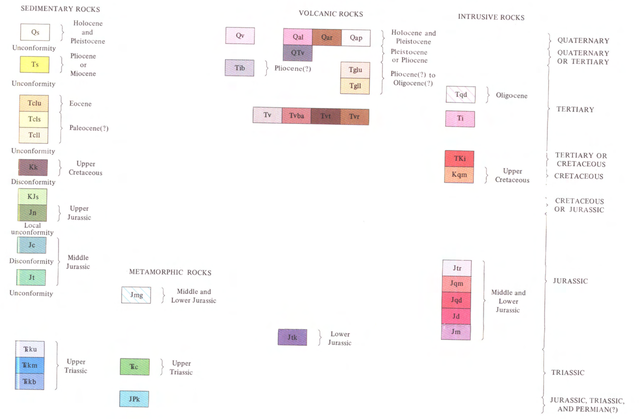
SCALE 1:250 000

5 0 5 10 15 20 MILES
5 0 5 10 15 20 25 30 KILOMETERS

CONTOUR INTERVAL 200 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOWER LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
1957 MAGNETIC DECLINATION AT SOUTH EDGE OF SHEET VARIES FROM 21°30' TO 23°00'

Geology by R. L. Detterman and B. L. Reed, 1961-67. Assisted by Roger Hopp, 1961; Douglas McDowell, 1962; C. E. Bickel, 1963-64; Travis Hudson, 1965-66; John Erfurth, 1967

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

SEDIMENTARY ROCKS

Qs SURFICIAL DEPOSITS (Holocene and Pleistocene)—Unsorted to well-sorted; alluvial, colluvial, glacial, glaciofluvial, lacustrine, marine, and eolian

Ts SEDIMENTARY ROCKS, UNDIVIDED (Pliocene or Miocene)—Pebble conglomerate, sandstone, siltstone, and shale; poorly consolidated

Tclu COPPER LAKE FORMATION (Eocene and Paleocene?)—Includes:
Upper conglomerate member—Pebble-cobble conglomerate; mainly volcanic rock clasts; minor tuff; red-weathering

Tcls Sandstone and siltstone member—Greenish to dark-gray; well-indurated

Tcll Lower conglomerate member—Cobble conglomerate; chiefly intrusive and metamorphic rock clasts

Kk KAGUYAK FORMATION (Upper Cretaceous)—Sandstone, siltstone, and shale

KJs SEDIMENTARY ROCKS, UNDIVIDED (Cretaceous or Jurassic)—Sandstone, conglomerate, siltstone, and shale; slightly metamorphosed

Jn NAKNEK FORMATION (Upper Jurassic)—Arkose, conglomerate, sandstone, siltstone, and shale

Jc CHINITNA FORMATION (Middle Jurassic)—Dark-gray to brown siltstone and shale with limestone concretions; minor sandstone

Jt TUXEDNI GROUP (Middle Jurassic)—Graywacke, conglomerate, siltstone, and shale; light- to dark-gray and green

KAMISHAK FORMATION (Upper Triassic)—Includes:

Tku Ursus Member—Thin-bedded light-gray limestone; gray chert and porcellanite

Tkm Middle member—Thin- to medium-bedded, dark-gray to black limestone and calcilutite; black chert and gray tuff

Tkb Bruin Limestone Member—Massive to thin-bedded, light- to dark-gray limestone; coral and echinoid bioherms; banded green and white chert

VOLCANIC ROCKS

Qv VOLCANIC ROCKS, UNDIVIDED (Quaternary)—Lava flows and associated pyroclastic rocks

AUGUSTINE VOLCANICS (Holocene and Pleistocene)—Divided into:

Qal Lava flows—Chiefly hypersthene-augite andesite; minor dacite and rhyolite

Qar Volcanic rubble and mud flows

Qap Pumice and scoria—Light- to dark-gray, rhyolitic

QTv VOLCANIC ROCKS, UNDIVIDED (Pleistocene or Pliocene)—Olivine basalt and associated pyroclastic rocks

Tib INTRICATE BASALT (Pliocene?)—Glassy to porphyritic; black to dark-green

GIBRALTAR LAKE TUFF (Pliocene? to Oligocene?)—Divided into:

Tglu Upper member—Light-gray to white ash-flow tuff

Tgll Lower member—Welded tuff and porphyritic rhyolite

Tv VOLCANIC ROCKS, UNDIVIDED (Tertiary)—Includes:

Tvba Basalt and andesite—Porphyritic to glassy; dark-gray to green

Tvt Tuff—Lithic, crystal, and vitric; gray, green, and purple

Tvr Volcanic rubble and breccia—Includes agglomerate

Jtk TALKEETNA FORMATION (Lower Jurassic)—Andesite flows, agglomerate, tuff, and volcanic breccia; pink to dark-green; minor sedimentary rocks

INTRUSIVE ROCKS

Tqd QUARTZ DIORITE (Oligocene)—Coarse-grained, light-gray, hornblende-biotite quartz diorite near McNeil Lake

Ti INTRUSIVE ROCKS (Tertiary)—Granodiorite and quartz diorite, fine- to medium-grained; includes volcanic necks, sills, and dikes

TKi INTRUSIVE ROCK (Tertiary or Cretaceous)—Granodiorite, quartz monzonite, and quartz diorite; chiefly medium- to coarse-grained; light-gray

Kqm QUARTZ MONZONITE (Upper Cretaceous)—Coarse-grained, porphyritic; includes minor granodiorite and quartz diorite; may include rocks of Tertiary age; contacts uncertain

Jtr TRONDHJEMITE (Middle and Lower Jurassic)—Medium- to coarse-grained, light-gray; muscovite-bearing; locally contains biotite

Jqm QUARTZ MONZONITE (Middle and Lower Jurassic)—Medium-grained, light-gray; locally includes granodiorite and trondhjemite; age uncertain

Jqd QUARTZ DIORITE (Middle and Lower Jurassic)—Medium- to coarse-grained, light-gray; contains biotite and hornblende; locally includes small areas of diorite and granodiorite

Jd DIORITE (Middle and Lower Jurassic)—Medium- to coarse-grained; locally includes quartz diorite and small areas of gabbro; numerous xenoliths

Jm MAFIC AND ULTRAMAFIC PLUTONIC ROCKS (Middle and Lower Jurassic)—Includes gabbro, hornblende gabbro, hornblendite, and pyroxenite

METAMORPHIC ROCKS

Jmg MIGMATITE (Middle and Lower Jurassic)—Admixture of intrusive and metamorphic rocks, grading from gneissic to schistose texture; exposed along east margin of batholith

Tc COTTONWOOD BAY GREENSTONE (Upper Triassic)—Porphyritic to amygdaloidal flows; chiefly basaltic; minor mafic intrusive rock; dark-gray to dark-green

JPk KAKHONAK COMPLEX (Jurassic, Triassic, and Permian?)—Includes schist, gneiss, quartzite, marble, phyllite, argillite, and slate; exposed chiefly as roof pendants in batholith; low- to high-grade metamorphism

Contact—Dotted where gradational or inferred

Fault—Long-dashed where approximately located; dotted where concealed. U, upthrown side; D, downthrown side. Arrows show relative movement

Bruin Bay fault, showing dip—High-angle reverse fault; dotted where concealed. Sawteeth on upper plate

Lineament—Linear topographic feature that may indicate fault, fracture, or joint system; amount and direction of movement, if any, unknown; dotted where concealed

Anticline—Showing trace of crestal plane and direction of plunge; dashed where approximately located; dotted where concealed

Syncline—Showing trace of trough plane and direction of plunge; dashed where approximately located; dotted where concealed; queried where doubtful

Minor fold
Anticline—Showing plunge
Syncline—Showing plunge

Strike and dip of beds
Inclined
Vertical
Overturned
Horizontal
Crenulated
Aerial photo interpretation

Strike and dip of dikes—Lithology indicated by symbol: b-basalt; a-aplite; l-lamprophyre; p-pegmatite

Strike and dip of foliation
Inclined
Vertical

Strike and dip of joints

Strike of vertical joints

Bearing and plunge of lineation

Volcanic neck or plug

Sample site for rocks used for age date or chemical analysis

Fossil locality—For location of data on 210 Middle and Upper Jurassic sites in northeastern part of quadrangle, see Detterman and Hartsock (1966)

☆ Interior—Geological Survey, Reston, Va.—1979—G 78464

GEOLOGIC MAP OF THE ILIAMNA QUADRANGLE, ALASKA