DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

U.S. GEOLOGICAL SURVEY
OPEN FILE MAP
77-169-B

Base map from the National Atlas of the United States of America, U.S. Geological Survey, 1970

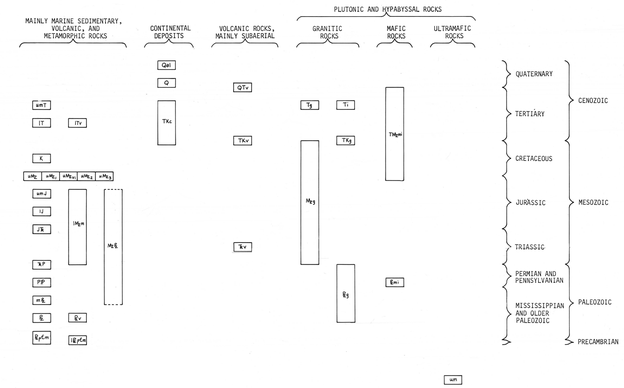
GENERALIZED GEOLOGIC MAP OF THE EASTERN PART OF SOUTHERN ALASKA

COMPILED BY

HELEN M. BEIKMAN, C.D. HOLLOWAY AND E.M. MACKEVETT, JR.

1977

CORRELATION OF MAP UNITS



MAP SYMBOLS

Fault, approximately located
Dotted where concealed or inferred

Contact, approximately located
Dashed where concealed or inferred

Volcanic cone or vent

DESCRIPTION OF MAP UNITS

MAINLY MARINE SEDIMENTARY, VOLCANIC, AND METAMORPHIC ROCKS

		Partial List of Included Units
umT	UPPER AND MIDDLE TERTIARY ROCKS -- Siltstone, sandstone, organic shale, locally abundant submarine volcanic rocks of late Eocene(?), Oligocene, and early Miocene age, and conglomeratic sandy mudstone (marine tillite) of Miocene and Pliocene age	Yakataga Formation Poul Creek Formation Katalla Formation Tokun Formation
lT	LOWER TERTIARY ROCKS -- Marine and continental clastic rocks of Paleocene and Eocene age. Intensely deformed. Includes some coal-bearing rocks	Kulthieth Formation Kushtaka Formation Clastic rocks of Orca Group Stillwater Formation
lTv	LOWER TERTIARY VOLCANIC ROCKS -- Mafic pillow lavas and pyroclastic rocks with minor chert, limestone, and shale of Paleocene and Eocene age. Intensely deformed	Volcanic rocks of Orca Group
K	CRETACEOUS ROCKS -- Shelf deposits of sandstone, siltstone, shale, limestone, claystone, conglomerate, mudstone, and porcellanite ranging in age from Early Cretaceous (Valanginian) to Late Cretaceous (Maastrichtian). Includes some deep-sea deposits, which are apparently absent, interlayered sandstone and subaerial andesitic fragmental volcanic rocks, volcanic flows, lapilli tuffs, and volcaniclastic rocks of Early Cretaceous age; graded beds of slate and sandstone of Maastrichtian age on Kodiak and Afognak Islands	Chisana Formation Kennicott Formation Moonshine Creek Formation Matanuska Formation Chitina Formation MacColl Ridge Formation Matanuska Formation Kaguyak Formation
uMzK	CRETACEOUS AND JURASSIC ROCKS -- Argillite, shale, greywacke, chert, limestone, and conglomerate ranging in age from Late Jurassic to Late Cretaceous. In places moderately to highly (amphibolite facies) metamorphosed	
uMzL	CRETACEOUS AND UPPER JURASSIC(?) ROCKS, IN PART METAMORPHOSED -- Greywacke, slate, argillite, with minor conglomerate, volcanic detritus, and interbedded mafic volcanic rocks in the Kenai and Chugach Mountains. Rocks range in age from Late Jurassic to Late Cretaceous, but includes some rocks of Early Cretaceous and possible Late Jurassic age; sparsely fossiliferous. Mildly metamorphosed locally to greenschist facies	Valdez Group Yakutat Group
uMzJ	CRETACEOUS AND UPPER JURASSIC(?) SEDIMENTARY AND VOLCANIC ROCKS, IN PART METAMORPHOSED -- Chiefly slate and greywacke, with local areas of basaltic flows, pillows and intrusives, tuff breccia, and conglomerate containing abraded ether, and pillow basalts on Resurrection Peninsula	Valdez Group
uMzE	CRETACEOUS AND UPPER JURASSIC (?) ROCKS, IN PART METAMORPHOSED -- A dismembered clastic sequence of siltstone, greywacke, argillite, and conglomeratic sandstone chaotically juxtaposed with a sequence containing massive pillow basalts and associated mafic-ultramafic chert, argillite, and minor ultramafic rocks and jadeite. Rocks are metamorphosed (prehnite-pumpellyite facies) in part a melange	McHugh Complex Yakutat Group melange
uMzg	LOWER CRETACEOUS AND UPPER JURASSIC ROCKS -- Shallow- and deep-water clastic deposits of argillite and greywacke with interbedded massive lenses of extraformational conglomerate of Late Jurassic (Tithonian) to Early Cretaceous (Barremian) age. Includes a sequence of non-marine clastic rocks at the top	Gravina-Nutzotin belt
uMzJ	UPPER AND MIDDLE JURASSIC ROCKS -- Siltstone, sandstone, shale, and conglomerate; may locally include rocks of late Jurassic age	Chinitna Formation Naknek Formation Tuxedni Formation Tuxedni Group Nizina Mountain Formation Kotsina Conglomerate
lJ	LOWER JURASSIC ROCKS -- Sandstone and argillite interbedded with volcanic flows and pyroclastic rocks in the Cape Inlet area and southern Talkeetna Mountains	Talkeetna Formation
JTR	JURASSIC AND TRIASSIC ROCKS, IN PART METAMORPHOSED -- Shallow- to deepwater limestone with minor dolomite, shale, and chert ranging in age from Late Triassic (Karnian) to Early Jurassic (Pliensbachian); Triassic shale, tuff, tuffaceous conglomerate and minor limestone; Triassic and Jurassic(?) mafic volcanic basalt. Includes interstratified blueschist, greenschist, mica schist, impure marble, and subordinate metachert of Late Triassic and Early Jurassic age at southern tip of Kenai Peninsula	Chilkitsina limestone Nizina Limestone McCarthy Formation Kamishak Formation
uMzm	LOWER MESOZOIC METAMORPHIC ROCKS -- Metasedimentary, metavolcanic, and metaplutonic rocks; largely of pre-Cretaceous age, consisting of a variety of metamorphosed country rock scattered throughout the Alaska Range batholith	
TRP	TRIASSIC AND PERMIAN ROCKS, IN PART METAMORPHOSED -- Mafic volcanic rocks, red beds, limestone, and calcareous argillite of Triassic age; Permian(?) argillite, chert, and limestone with siltstone and conglomerate and abundant gabbroic sills along the east-central Alaska Range. Includes minor amounts of marble, quartzite, greenschist, chlorite schist, garnet schist, and subordinate gneiss in Aleutian Range batholith; melity of Late Triassic age	Upper part of Mankomen Group
PIP	PERMIAN AND PENNSYLVANIAN ROCKS -- Basaltic and andesitic lavas and tuffs, tuffaceous sandstone, siltstone, shale, chert, gabbro, and local shallowwater sedimentary rocks. Metamorphosed to greenschist facies and, locally, amphibolite facies in the south, mainly between the Border Ranges and the Chitina Valley faults, and to prehnite-pumpellyite facies elsewhere. Rocks in the Chugach Mountains subjected to greenschist facies, locally to amphibolite facies	Skolai Group Station Formation Tetelna Volcanics
mIE	MIDDLE PALEOZOIC ROCKS -- Pyroclastic rocks and ash flows interbedded with thin layers of sedimentary rocks metamorphosed to quartz-orthoclase- sericite schist and gneiss on northcentral flank of Alaska Range. Includes Totatlanika Schist considered Mississippian(?) by Wahrhaftig (1968) and Devonian by Gilbert and Redden (1973)	Totatlanika Schist
IE	PALEOZOIC ROCKS -- Argillite, greywacke, phyllite, quartzite, chert, limestone, and basalt of Ordovician (?) and Silurian through Devonian age. Mainly north of upper Jizitna Valley, marble, in places containing tremolite, with subordinate quartzite, phyllite, and greenschist. Rocks range in age from Late Devonian to Late Ordovician(?) and Silurian age. Rocks south of Chulitna River, unfossiliferous argillite and greywacke, mildly metamorphosed. Unmetamorphosed rocks in northeast corner of map area; slightly to moderately metamorphosed to greenschist facies in the south, mainly between the Denali and Hines Creek faults. Includes rocks formerly included in the Birch Creek Schist, metamorphosed in places to greenschist and amphibolite facies	Keskawulish Group (Canadian Usage) Nasina Limestone Funeral Creek Formation Hillard Formation Nelchina Formation McLean Hill Formation Nation River Formation Tonzona Formation Birch Creek Schist(?)
Ꞓv	PALEOZOIC VOLCANIC ROCKS -- Greenstone with some metadiorite, metagabbro, and interbedded phyllite of Devonian age and older	
MzIE	MESOZOIC AND (OR) PALEOZOIC ROCKS, IN PART METAMORPHOSED -- Metasedimentary and metavolcanic rocks of Devonian and older age; anchorage and amphibolite-facies schist along south side of Matanuska Valley. Also includes middle Jurassic and older(?) metavolcanic and metasedimentary rocks in the Talkeetna Mountains and rocks of Jurassic, Permian, and Pennsylvanian age in the Chugach Mountains	
ꞒIꞒ€m	PALEOZOIC AND (OR) PRECAMBRIAN METAMORPHIC ROCKS -- Schist and gneiss of uncertain age and origin. Includes some rocks of schist and amphibolite facies, most of which were formerly included in the Birch Creek Schist. Probably includes some rocks of the Totatlanika Schist	Totatlanika Schist (?) Birch Creek Schist (?)
ꞒIꞒ€m	LOWER PALEOZOIC AND (OR) PRECAMBRIAN METAMORPHIC ROCKS -- Undifferentiated metasedimentary and metaigneous rocks of Devonian age and older north of the Denali fault in the Healy-Mount Hayes area. Includes some Paleozoic clastic rocks, including the Keevy Peak Formation and rocks formerly included in the Birch Creek Schist in the north-central part of the map area	Keevy Peak Formation Birch Creek Schist (?)

CONTINENTAL DEPOSITS

Qal	ALLUVIUM -- Quaternary alluvium; also includes minor glacial, lacustrine, swamp, landslide, and beach deposits	
Q	OLDER ALLUVIUM -- Older Quaternary deposits of alluvium, alluvial fans, glacial material, sand, dune sand, loess, terrace and pediment gravel, and some marine clay	Bootlegger Cove Clay
TKc	TERTIARY AND (OR) CRETACEOUS CONTINENTAL ROCKS -- Conglomerate, sandstone, siltstone, claystone, shale, coal beds, and minor amounts of ankose, coaly shale, breccia, mudstone, tuff, tuffaceous sandstone, chert, and coarse sandstone with interbedded mudflow deposits. Rocks range in age from Pliocene to Late Cretaceous	Nenana Gravel Upper part of Kenai Group Chickaloon Formation Sanitchna Formation Grubstake Formation Lignite Creek Formation Frederika Formation Chickaloon Formation Oakden Formation Tsadaka Formation Chickaloon Formation Whitmore Formation Cantwell Formation Arkose Ridge Formation Teklanika Formation

VOLCANIC ROCKS, MAINLY SUBAERIAL

QTv	QUATERNARY AND TERTIARY VOLCANIC ROCKS -- Mainly andesite and basaltic andesite flows and associated pyroclastic rocks of southern Alaska Range and Aleutian Island; basaltic flows and cones of Wrangell Mts. Includes some hypabyssal intrusives and granulite inclusions) and pyroclastic rocks northeast of the Tanana River. In Talkeetna Mountains, dominantly andesitic to dacitic with minor volcanic rocks, rhyolitic to andesitic in composition	Wrangell Lava
TKv	TERTIARY AND (OR) UPPER CRETACEOUS VOLCANIC ROCKS -- Tertiary lava, tuff, tuff breccia, pahoehoe breccia, volcanic conglomerate, and tuffaceous sedimentary rocks; andesitic lava, breccia, and tuff northeast of Tanana River; acidic lava flows, mostly rhyolite and trachyte with some andesite, south of the Tanana River; andesite, dacite, and rhyolite lava and flow breccia in the southern Alaska Range; lapilli and ash of Miocene or younger age west of Cook Inlet; rhyolitic and andesitic volcanic rocks in the Talkeetna Mountains of Tertiary or Late Cretaceous age in northwest part of map area	
Ꞓv	TRIASSIC VOLCANIC ROCKS -- Basaltic lava, commonly amygdaloidal, with local thin interbeds of volcaniclastic rocks, and local basal conglomerate, of Middle and (or) Late Triassic age	Nikolai Greenstone

GRANITIC ROCKS

Tg	TERTIARY GRANITIC ROCKS -- Middle and late Tertiary quartz diorite to granite in the Alaska-Aleutian Range batholith; quartz monzonite and granodiorite in Kodiak batholith; the central Alaska Range; shallow-seated dacite, rhyodacite, granodiorite, and quartz diorite in the Wrangell Mountains; quartz diorite, granodiorite, and quartz monzonite and granodiorite in the Gulf of Alaska area and eastern Chugach Mountains. Oligocene quartz diorite, granodiorite, and quartz monzonite in the Prince William Sound area; in northern Talkeetna Mountains, includes metamorphosed and migmatized country rocks, originally of Mesozoic age	
Ti	TERTIARY INTRUSIVE ROCKS -- Hypabyssal rocks of felsic to mafic composition in the Talkeetna Mountains	
TKg	TERTIARY AND CRETACEOUS GRANITIC ROCKS -- Late Cretaceous and early Tertiary granodiorite to granite in the Alaska-Aleutian Range batholith and quartz monzonite and granodiorite in the Kodiak batholith; quartz monzonite, granodiorite, and quartz diorite with subordinate granite and diorite of probable Mesozoic age, but possibly Tertiary in the Wrangell Mountains and upper Copper River; Cretaceous granodiorite with subordinate granite, quartz monzonite, and diorite; includes some extensive migmatitic granodiorites in the central Alaska Range	
MZg	MESOZOIC GRANITIC ROCKS -- Cretaceous and Jurassic quartz diorite with subordinate granodiorite and diorite. Mesozoic granitic rocks ranging in composition from diorite to granite, but predominantly granodiorite, in the Alaska Range batholith; quartz diorite and granodiorite in the Alaska-Aleutian Range batholith; granodiorite with subordinate quartz monzonite and granite in the Kodiak batholith; granodiorite and diorite in the Talkeetna Mountains (includes extensive migmatitic granodiorite as well as metamorphic rocks of amphibolite grade); and syenite porphyry and granodiorite northeast of the Tanana River. Late Triassic or Early Jurassic granodiorite, locally quartz monzonite, quartz diorite, or diorite	
ꞒIg	PALEOZOIC GRANITIC ROCKS -- Quartz diorite, quartz diorite porphyry, monzonite, and syenite of probable Pennsylvanian and (or) Permian age	

MAFIC ROCKS

TMgm	TERTIARY AND (OR) MESOZOIC MAFIC ROCKS -- Basalt and basaltic breccia, in places highly altered, and associated diabase sills, ranging in age from Late Jurassic to Tertiary	
ꞒIm	PALEOZOIC MAFIC ROCKS -- Gabbroic rocks of probable Pennsylvanian and Permian age. May include rocks of Triassic age	

ULTRAMAFIC ROCKS

um	ULTRAMAFIC ROCKS -- Includes serpentinite, dunite, peridotite, and pyroxenite ranging in age from Paleozoic to Tertiary	

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