DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

OPEN-FILE REPORT
89-363
PLATE 1 OF 3

Topographic base from USGS, 1954.

Geology compiled from Cady and others (1955), Decker and others (1984), Reifenstuhl and others (1984), Robinson and others (1984), J.N. Platt (USGS unpub. data, 1955), and the Alaska Division of Geological and Geophysical Surveys (unpub. data).

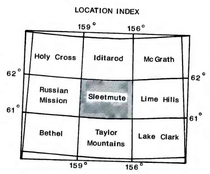
SCALE 1:250 000

5 0 5 10 15 20 25 MILES

5 0 5 10 15 20 25 KILOMETERS

AREA OF MAP

LOCATION INDEX



PRELIMINARY GEOLOGIC MAP, SLEETMUTE QUADRANGLE, ALASKA

COMPILED BY

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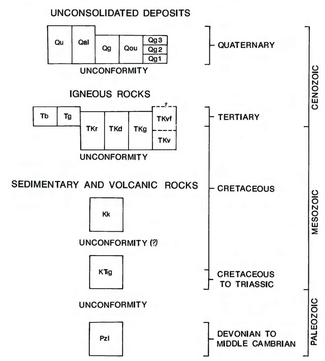
1989

EXPLANATION

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

UNCONSOLIDATED DEPOSITS

Qal Active stream alluvium; Quaternary age

Qg3, Qg2, Qg1 Ground and medial moraines, interpreted from aerial photographs, probably represent three glacial advances; Quaternary age

Qou Glacial outwash deposits; Quaternary age

Qg Undifferentiated glacial deposits; Quaternary age

Qu Undifferentiated alluvial, colluvial, and eolian deposits; Quaternary age

VOLCANIC AND PLUTONIC ROCKS

Tb Columnar basalt, exposed about 9 miles northeast of the Fortyseven Creek landing strip; assigned Tertiary age on the basis of one K-Ar whole rock age determination of 38.2 Ma (table 1)

Tg Small stocks, chiefly quartz monzonite, exposed in the southeast corner of the map; assigned Tertiary age on the basis of one K-Ar age determination of 41.7 Ma (table 1)

TKr Sheets, dikes, and sills of peraluminous biotite + muscovite rhyolite that intrude Kuskokwim Group sedimentary rocks; assigned Late Cretaceous-early Tertiary age on the basis of six K-Ar age determinations ranging from 70.5 to 61.5 Ma (table 1)

TKd Dikes and thin sills of felsic to mafic composition mostly altered to carbonate, quartz, sericite, and clay; Late Cretaceous-early Tertiary age based on intrusive relationship with late Early to Late Cretaceous sedimentary rock

TKvf Felsic volcanic rocks associated with volcano-plutonic complexes; this upper unit primarily composed of rhyolite tuffs and flows equivalent in part to Getmuna Rhyolite Group of Cady and others (1955) (in the Horn Mountains), but also includes part of the Holokuk Basalt of Reifenstuhl and others (1984) (in the Chuilnuk Mountains); probably represents the youngest part of the Holokuk Basalt; assigned Late Cretaceous-early Tertiary age based on conformable stratigraphic relationship with underlying mafic to intermediate volcanic rocks and on one K-Ar whole rock age determination of 43.8 Ma (table 1)

TKv Mafic volcanic rocks associated with volcano-plutonic complexes; this lower unit primarily composed of volcanic flow rock interbedded with lesser tuff, agglomerate, and minor lahar units; mafic compositions dominate, but intermediate and felsic varieties are also present; unit named the Holokuk Basalt by Cady and others (1955); assigned Late Cretaceous - early Tertiary age on the basis of seven K-Ar ages determinations ranging from 74.5 (a minimum age) to 64.3 Ma (table 1)

TKg Plutonic rocks associated with volcano-plutonic complexes; monzonite, quartz monzonite, granodiorite, and granite stocks, and minor dikes of mafic to felsic composition; assigned Late Cretaceous-early Tertiary age on the basis of six K-Ar age determinations ranging from 68.9 to 63.8 (a minimum age) Ma (table 1)

SEDIMENTARY AND VOLCANIC ROCKS

Kk Kuskokwim Group (Cady and others, 1955), interbedded sandstone, siltstone, shale, and minor conglomerate primarily of submarine fan and turbidite association; rare fossils indicate a late Early to Late Cretaceous age (table 2)

KTng Gemuk Group (Cady and others, 1955), chiefly siltstone, interbedded with lesser amounts of chert and volcanic rock (including tuff), and minor limestone, graywacke, and breccia; Early Cretaceous and Cretaceous fossils collected in map area (table 2), but Late Triassic fossils found to the southwest (Cady and others, 1955)

Pzl Holitna Group (Cady and others, 1955), limestone, in part dolomitized, chiefly massive but thinner bedded in the upper zones; contains small reef-like deposits and local intraformational conglomerate and breccia; fossils indicate a Middle Cambrian to early Middle Devonian age (table 2)

MAP SYMBOLS

- Zone of hornfels
- End moraine
- Contact - Dashed where approximately located or inferred
- Fault - Dashed where approximately located or inferred; dotted where concealed; arrows indicate relative lateral motion
- Thrust fault - Dashed where approximately located; dotted where concealed; saw teeth on upper plate
- Anticline
- Syncline
- K-Ar sample locality (table 1)
- Fossil locality (table 2)
- Hot spring

Table 1. -- Summary of available K-Ar radiometric age data, Sleetmute Quadrangle

Map no.	Unit[1]	Rock type	Mineral dated	Age (Ma)	Sample No.	References[2]
1	TKr	rhyolite	biotite	70.5±2.1	82MR316	A
	TKr	rhyolite	whole rock	*67.9±2.1	82MR316	A
2	TKr	rhyolite	biotite	63.6±1.9	83MR172A	A and B
3	TKv	basaltic andesite	plagioclase	*68.0±2.0	83GA122A	B
	TKv	basaltic andesite	whole rock	*74.5±2.2	83GA122A	A and B
4	TKv	basaltic andesite	plagioclase	70.8±2.1	83GA149	A and B
5	TKr	rhyolite	biotite	69.0±1.8	83MR177C	A
6	TKv	basaltic andesite	plagioclase	*70.7±2.1	83GA148	A and C
7	TKvf	rhyolite	whole rock	43.8±1.3	83MR148A	A
8	TKr	rhyolite	white mica	61.5±1.8	83MR158	A and B
9	TKr	rhyolite	white mica	61.7±1.8	83TS631	A and B
	---	vein quartz	white mica	60.9±1.8	83TS632A	A
10	TKv	andesite	whole rock	*73.2±2.2	83MR257	A and B
11	TKv	basaltic andesite	plagioclase	68.3±2.0	83MA23A	A and B
12	TKv	basaltic andesite	plagioclase	64.3±1.9	83MA34A	A and B
13	TKg	granite	biotite	68.7±2.1	83JD372	A and C
14	TKg	granodiorite	biotite	68.4±2.1	83JD317	A and C
15	TKg	granodiorite	biotite	67.5±2.0	82MR311	A and C
16	TKg	quartz monzonite	biotite	68.7±2.1	83MR167	A and B
	TKg	quartz monzonite	hornblende	68.9±2.1	3MR167	A
17	TKg	diorite	hornblende	*63.8±1.9	83JD415	A and D
18	Tb	olivine basalt	whole rock	38.2±1.1	83JD553	A and D
19	Tg	quartz monzonite	biotite	41.7±1.3	83MR232C	A
20	--	vein	white mica	57	--	E, p. 24

[1]Refers to map unit designation
[2]References: A = Robinson and Decker (1986); B = Reifenstuhl and others (1984); C = Robinson and others (1984); D = Decker and others (1984); and E = Bundtzen and Nokleberg (1987)

*Minimum age

Table 2. -- Summary of age diagnostic fossil collections, Sleetmute Quadrangle[1]

Map No.	Unit[2]	Age	Fossil(s)	Collection No.
1	Kk	Cenomanian	*Inoceramus dunveganensis* McLearn	18846
2	Kk	Cenomanian	*I. dunveganensis* McLearn	18646
3	Kk	probably late Cenomanian	*I.* sp. cf. *I. reachensis* Etheridge	9225
4	Kk	Cenomanian	*I. dunveganensis* McLearn	19732
5	Kk	Cenomanian	*I. dunveganensis* McLearn	19390
6	Kk	Cenomanian	*I. dunveganensis* McLearn	9087
7	Kk	Cenomanian	*I. athabaskensis* McLearn, *I. nabwisi* McLearn	19388
8	KTng	Cretaceous	*Inoceramus* sp., *Serpula* sp.	19731
9	Pzl	Silurian-Devonian	*Stromatopora* sp., *Favosites* sp., Cyathophylloid coral	2683-SD, 2685-SD, and 2684-SD
10	Pzl	Silurian-Devonian	*Stromatopora* sp.	2681-SD
11	KTng	Early Cretaceous	*Aucella crassicollis* keyserling	19730
12	Pzl	early Middle Devonian (Eifelian)[3]	*Favosites* sp., *Monotrypa* sp., *Spirifer (Emanuelia?)* sp., *Athyris* sp., *Productella* sp., *Proetus* sp.	2688-SD
13	Pzl	Silurian-Devonian	sponge gen.?, *Favosites* sp., Cyathophylloid coral, *Atrypa* sp., *Spirifer* sp. cf. *S. crispus*	2687-SD
14	Pzl	Middle Cambrian	trilobites (Palmer and others, 1985; R.B. Blodgett, written commun., 1988)	--
15	Pzl	middle or late Early Devonian	*Beyrichia (Scabrizbeyrichia) churkini* Berdan and Copeland, indeterminate smooth palaeocope, *Roshdestvenskayites?* sp., *Platybolbina* sp., *Bairdiocypris* sp., *Newsomites* sp., *Scaphina* sp. (Blodgett, 1983)	
*	Pzl	Middle Devonian	auloporoid coral, *Favosites* sp., *Parastriatopora* sp., *Dendrostella* sp. cf. *D. rhenana* (Frech) (Oliver and others, 1975)	6448-SD, 6450-SD, 6451-SD

[1]This is a summary of previously published data. Except where noted, reference is Cady and others (1955).
[2]Refers to map unit designation. KK = Kuskokwim Group, KTng = Gemuk Group, Pzl = Holitna Group.
[3]Age originally given by Cady and others (1955) as either late Middle or early Late Devonian; R.B. Blodgett assigned the new age after re-examining the collection.

REFERENCES

Blodgett, R.B., 1983, Paleobiogeographic affinities of Devonian fossils from the Nhon Fork terrane, southwestern Alaska, in Stevens, C.H., ed., Pre-Jurassic rocks in western North American suspect terranes: Los Angeles, The Pacific Section, Society of Economic Paleontologists and Mineralogists, p. 125-130.

Bundtzen, T.K., and Nokleberg, W.J., 1987, in Nokleberg, W.J., Bundtzen, T.K., Berg, H.C., Brew, D.A., Grybeck, Donald, Robinson, M.S., Smith, T.E., and Yeend, Warren, Significant metalliferous lode deposits and placer districts of Alaska: U.S. Geological Survey Bulletin 1786, p. 23-31.

Cady, W.M., Wallace, R.E., Hoare, J.M., and Webber, E.J., 1955, The central Kuskokwim region, Alaska: U.S. Geological Survey Professional Paper 268, 132 p.

Decker, John, Robinson, M.S., Murphy, J.M. Reifenstuhl, R.R., and Albanese, M.D., 1984, Geologic map of the Sleetmute A-6 quadrangle: Alaska Division of Geological and Geophysical Surveys Report of Investigations 84-8, scale 1:40,000.

Oliver, W.A., Jr., Merriam, C.W., and Churkin, Michael, Jr., 1975, Ordovician, Silurian, and Devonian corals of Alaska: U.S. Geological Survey Professional Paper 823-B, p. 13-44.

Palmer, A.R., Egbert, R.M., Sullivan, R., and Knoth, J.S., 1985, Cambrian trilobites with Siberian affinities, southwestern Alaska [abs.]: American Association of Petroleum Geologists Bulletin, vol. 69, no. 2, p. 295.

Reifenstuhl, R.R., Robinson, M.S., Smith, T.E., Albanese, M.D., and Allegro, G.A., 1984, Geologic map of the Sleetmute B-6 quadrangle, Alaska: Alaska Division of Geological and Geophysical Surveys Report of Investigations 84-12, scale 1:40,000.

Robinson, M.S., and Decker, John, 1986, Preliminary age dates and analytical data for selected igneous rocks from the Sleetmute, Russian Mission, Taylor Mountains and Bethel Quadrangles, southwestern Alaska: Alaska Division of Geological and Geophysical Surveys Public-Data File 86-99, 9 p.

Robinson, M.S., Decker, John, Reifenstuhl, R.R., Murphy, J.M., and Bice, S.E., 1984, Geologic map of the Sleetmute B-5 quadrangle, Alaska: Alaska Division of Geological and Geophysical Surveys Report of Investigations 84-10, scale 1:40,000.

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