

**Table 1. Conventional K/Ar isotopic age determinations from Bethel and southern Russian Mission quadrangles, southwestern Alaska**

Map No.	Sample No.	Latitude, Longitude	Material (map unit)	Lithology (map unit)	K <sub>2</sub> O (wt. %)	(Radiogenic <sup>40</sup> Ar) (mol/g)	Age (Ma)	Analysis (C)
1	86ASB7a	60°21'28" N, 159°51'48" W	WR	Orthopyroxene	1.130	6.83 x 10 <sup>-13</sup>	19.0	041801016
2	87AC61	60°56'27" N, 159°39'33" W	tr	Quartz diorite (TKsp)	8.105	7.73 x 10 <sup>-10</sup>	85.2	65.12D
3	87ATD0	60°34'00" N, 160°47'15" W	tr	Granodiorite (Kinc)	7.90	1.353 x 10 <sup>-9</sup>	53.4	115.03.5
4	82MR300	61°07'52" N, 159°49'44" W	tbl	Granodiorite (Kinc)	8.575	1.38 x 10 <sup>-11</sup>	82.2	108.563.3
5	63CD414	61°02'00" N, 160°00'00" W	tr	Granodiorite (Kinc)	8.52	1.52 x 10 <sup>-11</sup>	89	120.03.6
6	82MR307	61°02'21" N, 159°46'22" W	tr	Granodiorite (TKsp)	6.099	59.6 x 10 <sup>-11</sup>	87.1	66.622.0
7	82DA554	60°48'13" N, 159°06'26" W	pl WR	Andesite WR	2.56 1.51	25.9 x 10 <sup>-11</sup> 15.8 x 10 <sup>-11</sup>	96.7 90.9	69.062.1 71.421.1
8	82DA568	60°51'02" N, 160°16'17" W	WR	Rhyolite (TKar)	4.159	35.8 x 10 <sup>-11</sup>	85.5	59.311.8
9	87B1213	60°30'30" N, 160°18'48" W	act	Actinolite schist (MabS)	0.0679	0.000722 ppm	16.8	146.015.0

(a) Abbreviations: tr = trachyte, tbl = hornblende, act = actinolite, pl = plagioclase, WR = whole rock.  
(b) Decay Constants:  $\lambda_{40} = 4.52 \times 10^{-10} \text{ year}^{-1}$   
 $\lambda_{40} = 0.572 \times 10^{-10} \text{ year}^{-1}$   
 $\lambda_{40} = 8.78 \times 10^{-10} \text{ year}^{-1}$   
 $\lambda_{40} = 1.127 \times 10^{-10} \text{ year}^{-1}$   
(c) Analysis: (1) Nye, (2) Marvin Laphon, (3) Marvin Laphon & Wilson, (1977), (4) Don Turner (Robinson and Decker, 1966), (5) Krueger Enterprises, Inc. (W. County, AMOCO, written comm., 1978).

**Table 3. U-Pb zircon ages for Bethel and southern Russian Mission quadrangles, southwestern Alaska (analyses by Joe Wooden)**

Map No.	Sample No.	Latitude, Longitude	Lithology (map unit)	Age (Ma) (upper Concordia intercept)
21	88AT246	61°09'28" N, 159°49'18" W	Granodiorite (Kinc)	104.129
22	87ASB125b	60°71'29" N, 160°29'27" W	Trondhjemite gneiss (Gn)	2070.16
23	88ML22b	60°07'03" N, 160°36'00" W	Granite gneiss (Gn)	2040.74

**Table 4. Uranium-lead isotopic data for zircon samples (analyses by John Murphy)**

Sample No. (Location)	U <sup>238</sup> (ppm)	U <sup>235</sup> (ppm)	Atomic ratios			Apparent ages (Ma)			Measured ratios	
			207Pb/235U	207Pb/238U	206Pb/238U	207Pb/235U	207Pb/238U	206Pb/238U		
86AT246 (NM 45)	761	127	0.01629	0.10826	0.04819	382.2	104.4	108.7	2892	0.13230
86AT246 (NM63-102)	631	103	0.01642	0.0989	0.04833	305.0	105.9	125.0	1459	0.1429
86AT246 (NM63-102)	678	122	0.01685	0.1296	0.04841	310.0	106.9	126.0	934	0.1500
86AT246 (M402-163)	461	8.4	0.017	0.1073	0.0483	310.0	106.9	126.0	740	0.1738
87ASB125b (A162)	543	127	0.01629	0.10826	0.04819	382.2	104.4	108.7	1070	0.1276
87ASB125b (63-102)	278	105	0.01589	0.10706	0.04819	382.2	104.4	108.7	1620	0.1215
87ASB125b (63-102)	240	91	0.01588	0.10715	0.04819	382.2	104.4	108.7	1680	0.1322
87ASB125b (8)	1589	330	0.01283	0.10919	0.04819	382.2	104.4	108.7	2139	0.1193
87ASB125b (9)	724	214	0.01599	0.10718	0.04819	382.2	104.4	108.7	2465	0.1152
87ASB125b (7)	386	122	0.01587	0.10717	0.04819	382.2	104.4	108.7	1715	0.1470

\* All fractions are nonmagnetic splits at 1.7 amps on a Franz Isotopic separator; ages are in microseconds; 88ML22b is a bulk-size fraction split into increasingly more magnetic fractions.  
† Concentrations for total dissolved inorganic carbon in split of dissolved sample using a nitric 25% 200ppm split.  
‡ Corrected for analytical blank of 0.3 ng U and 0.01 ng Pb by using measured 209Pb/209Po.  
§ Pb isotopic composition from Stacey and Krueger (1975) for an age of 2.100 Ma; measured Pb isotopic composition corrected for 0.10 percent per mass unit fractionation; all isotopic ratios measured in situ made on a microprobe Finnigan MAT mass spectrometer in the Pb lab at U.S. Geological Survey, Menlo Park, California.  
¶ Calculated using the decay constants and 238U/235U recommended by Steiger and Jager (1977).  
# ppm-ppm per million.

**Table 2. Age determinations by <sup>40</sup>Ar/<sup>39</sup>Ar total fusion method from Bethel and southern Russian Mission quadrangles, southwestern Alaska (analyses by Marvin Laphon)**

Map No.	Sample No.	Latitude, Longitude	Material (map unit)	Lithology (map unit)	<sup>40</sup> Ar/ <sup>39</sup> Ar (wt. %)	<sup>39</sup> Ar/ <sup>39</sup> Ar (wt. %)	<sup>40</sup> Ar/ <sup>39</sup> Ar (wt. %)	Age (Ma)	
10	88AT132	61°06'18" N, 159°46'22" W	tr	Granodiorite (Kinc)	6.350	0.0026	0.00208	0.67	90.4
11	87AC75M	60°45'58" N, 160°15'48" W	tr	Alkali rhyolite (TKsp)	7.003	0.3910	0.0145	1.08	39.5
12	88ASB99a	60°46'55" N, 159°10'10" W	tr	Dacite Dsw (Kxk)	4.542	0.0244	0.00247	0.19	77.5
13	87AT772	60°38'38" N, 159°39'41" W	tr	Granite (TKsp)	7.497	0.0492	0.00235	0.40	87.1
14	88AT192	60°31'15" N, 159°09'50" W	tr	Granite (TKsp)	4.976	0.0085	0.00639	0.28	62.1
15	88AT156	60°28'04" N, 159°24'32" W	tr	Granite (TKsp)	4.879	0.0386	0.00229	0.19	68.0
16	87ADm2718	60°23'37" N, 159°07'01" W	tbl	Diorite (G2M)	13.35	8.995	0.0039	6.32	25.6
17	86ASB1	60°19'24" N, 159°37'36" W	WR	Andesite (Kxk)	7.156	8.146	0.0030	16.6	55.2
18	87AT151	60°16'29" N, 159°38'00" W	tr	Granite (Kxk)	4.416	0.126	0.00265	1.26	82.5
19	87AJA36a	60°09'08" N, 159°56'11" W	tr	Granodiorite (Kinc)	7.761	0.1636	0.00102	4.25	96.2
20	88AML2	60°34'32" N, 160°23'30" W	pl	Andesite (TKca)	51.20	13.97	0.1660	2.26	6.16

(a) Abbreviations: tr = trachyte, tbl = hornblende, pl = plagioclase, tr = trachyte, WR = whole rock.  
\* Corrected for <sup>39</sup>Ar decay; half-life = 25.4 days.  
\*\* Subscripts indicate radiogenic (<sup>39</sup>Ar) and calcium-derived (<sup>39</sup>Ca) argon.  
# sample analyzed by laser fusion.

**Table 5. Apatite fission-track cooling ages for Bethel and southern Russian Mission quadrangles, southwestern Alaska (analyses by John Murphy)**

Map No.	Sample No.	Latitude, Longitude	Lithology (map unit)	Elevation (ft)	N	ps (N <sub>0</sub> ) (10 <sup>16</sup> cm <sup>-2</sup> )	pl (N <sub>0</sub> ) (10 <sup>16</sup> cm <sup>-2</sup> )	pD (N <sub>0</sub> ) (10 <sup>16</sup> cm <sup>-2</sup> )	Pz (%)	r	N <sub>0</sub> N <sub>0</sub> ±1σ (mean ratio)	Pooled age (Ma)±1σ
24	88ML22b	60°07'03" N, 160°36'00" W	Granite gneiss (Gn)	1,750	19	0.2071 (847)	0.6224 (1043)	1.150 (5214)	83.0	0.974	0.3330±0.021	66.6±6.6
25	89ASB101	60°18'22" N, 159°07'00" W	Dacite (G2M)	2,600	20	0.0606 (62)	0.2596 (264)	1.168 (5214)	99.8	0.658	0.2550±0.033	47.5±6.9
26	89ASB38	60°05'18" N, 159°16'08" W	Sandstone (Ss)	2,450	8	0.1287 (40)	0.3410 (106)	1.380 (5618)	52.2	0.741	0.377±0.070	50.5±17.0
27	89AJM34	60°03'17" N, 159°15'28" W	Sandstone (Ss)	700	21	0.106 (40)	0.7228 (392)	1.113 (5214)	73.1	0.713	0.1940±0.022	29.7±4.2

N<sub>0</sub>: Number of individual crystals dated; ps, spontaneous track density; N<sub>0</sub>: Number of spontaneous tracks counted; pD, induced track density; N<sub>0</sub>: Number of induced tracks counted; pD, track density measured in external mine detectors adjacent to SRM511 detector glass after irradiation. N<sub>0</sub>: Number of tracks counted in determining pD. \* Correlation coefficient between individual crystal spontaneous and induced counts; Pz (%), Chi square probability; N<sub>0</sub>N<sub>0</sub>±1σ, Mean ratio of individual crystals N<sub>0</sub>N<sub>0</sub>±1σ (mean ratio); Pooled age calculated using sample pD and 350 rate; error is one standard deviation.

**PRELIMINARY GEOLOGIC MAP OF THE BETHEL AND SOUTHERN RUSSIAN MISSION QUADRANGLES, SOUTHWESTERN ALASKA**

By  
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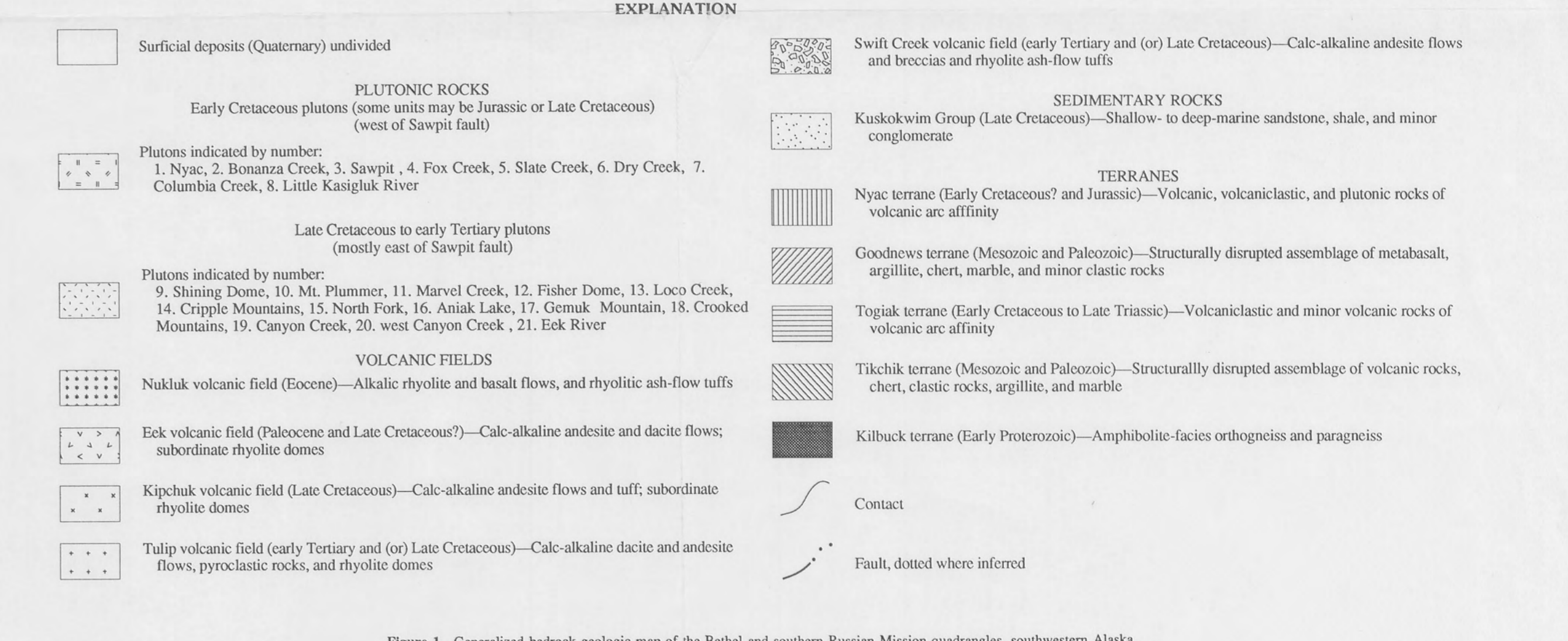
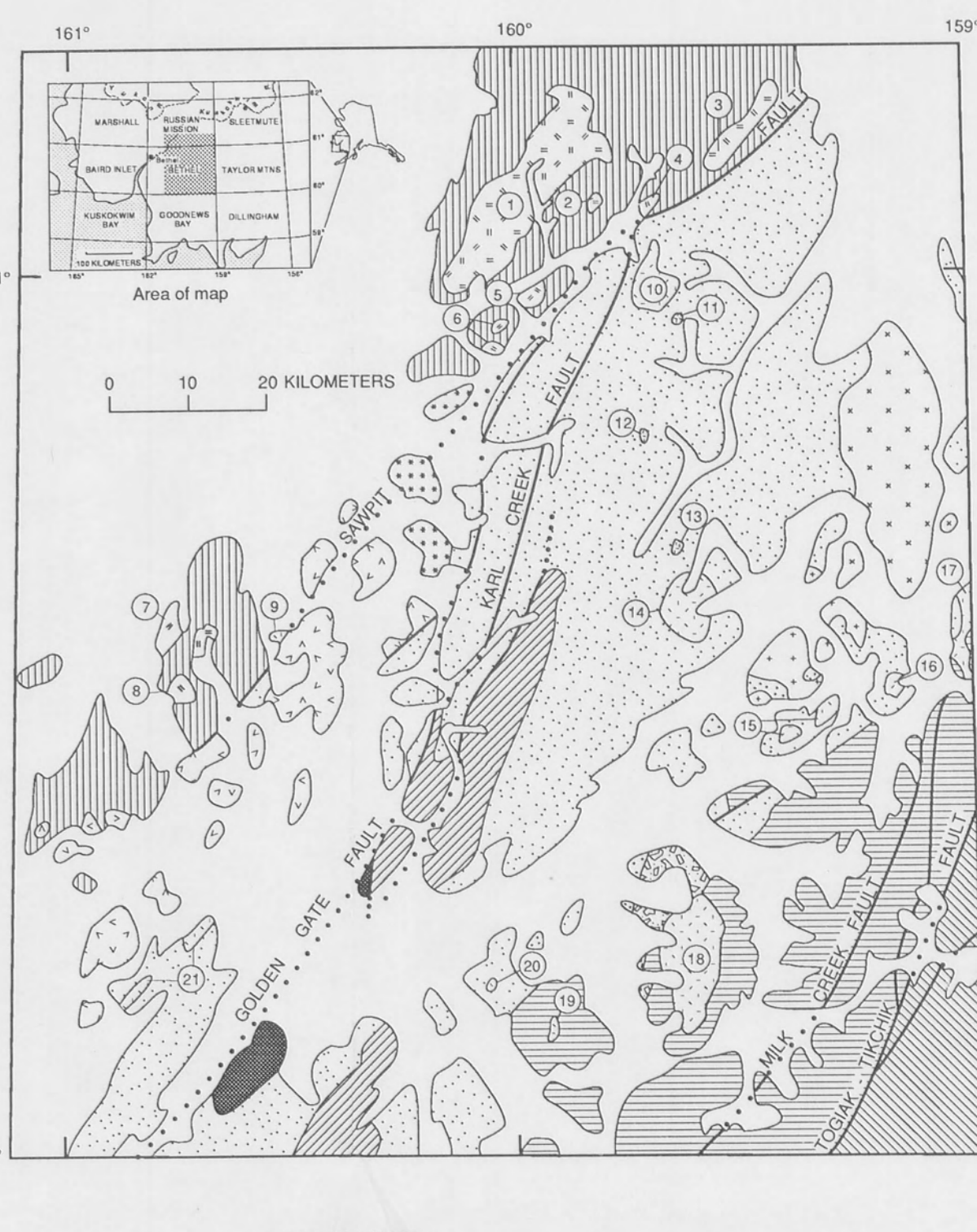


Figure 1. Generalized bedrock geologic map of the Bethel and southern Russian Mission quadrangles, southwestern Alaska, emphasizing pre-Late Cretaceous terranes, Cretaceous and Tertiary plutonic bodies (numbers refer to pluton names in explanation), and Late Cretaceous-early Tertiary volcanic fields.