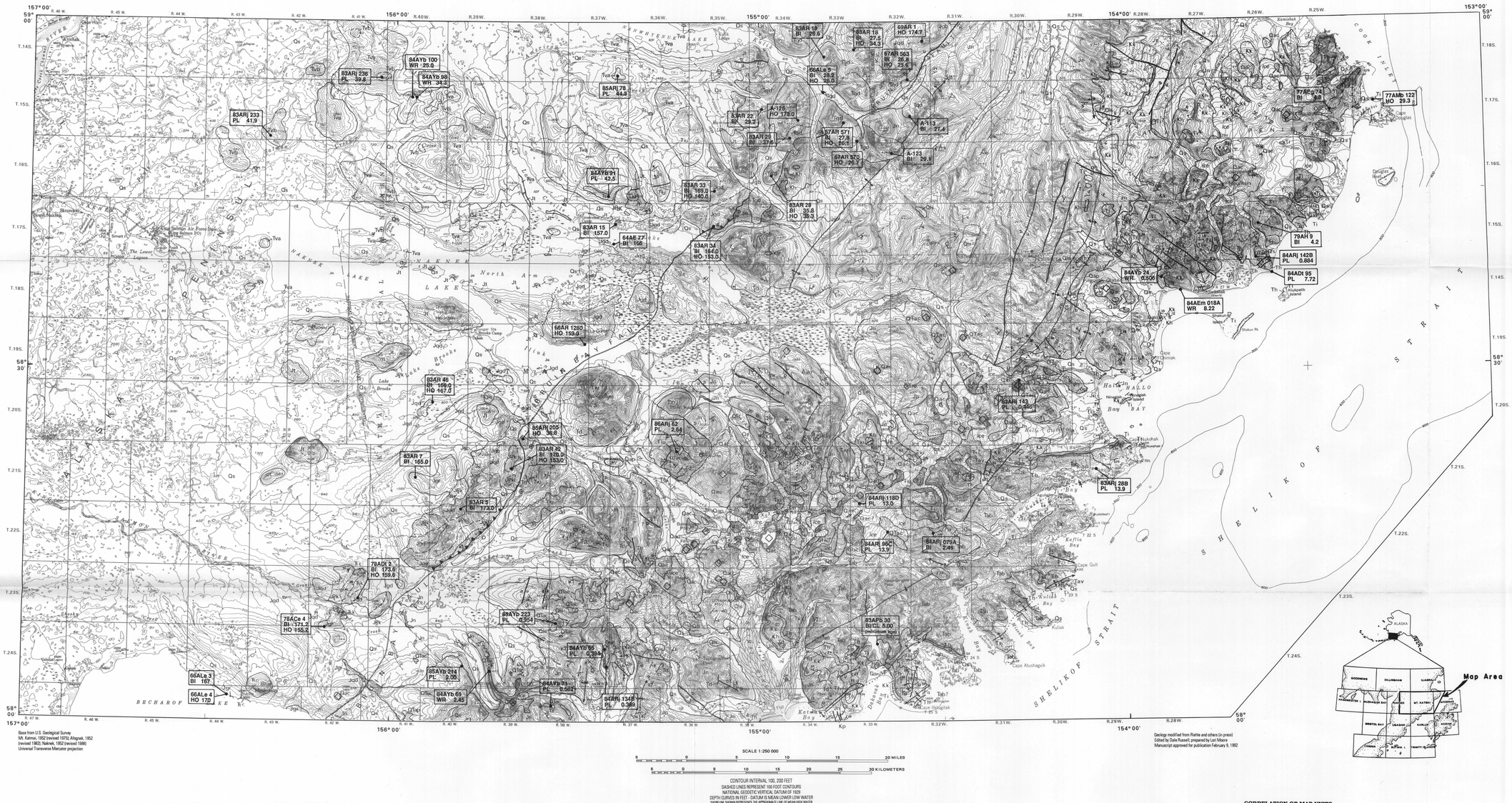
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

FOLIO OF THE MOUNT KATMAI AREA
MISCELLANEOUS FIELD STUDIES
MAP MF-2021-E



Base from U.S. Geological Survey
Mt. Katmai, 1952 (revised 1975); Afognak, 1952 (revised 1962); Naknek, 1952 (revised 1966)
Universal Transverse Mercator projection

Geology modified from Riehle and others (in press)
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Manuscript approved for publication February 9, 1992

DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS AND SEDIMENTARY ROCKS

Qs **Surficial deposits (Holocene and Pleistocene)**--Unconsolidated to poorly consolidated alluvial, colluvial, glacial, marine, lacustrine, and eolian deposits. Locally includes extensive redeposited pumice and ash from Novarupta eruption

Qls **Landslide deposits (Holocene and Pleistocene)**--Nonsorted, nonstratified, coarse angular rubble forming lobate masses

Ts **Sedimentary rocks (Tertiary)**--Poorly to moderately well indurated, fluvial sandstone, siltstone, tuff, and conglomerate; larger clasts consist of locally derived plutonic and volcanic rocks

Th **Hemlock Conglomerate (Oligocene)**--Poorly indurated fluvial conglomerate, pale-brown tuffaceous sandstone, siltstone, shale, coal, and tuff. Age is late Oligocene

Tc **Copper Lake Formation (Eocene and Paleocene?)**--Well-indurated, polymictic conglomerate, sandstone, and siltstone

Kk **Kaguyak Formation (Late Cretaceous)**--Upper part consists of interbedded siltstone and graded graywacke sandstone that represent upper and middle regimes of submarine fan. Lower part consists of thinly bedded siltstone and some thin limestone beds and includes abundant ammonites, pelecypods, and limestone concretions

Kp **Pedmar Formation (Early Cretaceous)**--Thick-bedded gray sandstone and minor amounts of siltstone and shale that contain ammonites of Albian age

Kh **Herendeen Formation (Early Cretaceous)**--Calcareous sandstone and interbedded siltstone, thinly bedded, light- to dark-olive gray

Ks **Staniukovich Formation (Early Cretaceous)**--Siltstone, shale, and thinly bedded, fine-grained, feldspathic, brown sandstone

Jn **Naknek Formation (Late Jurassic)**--Main sedimentary rock unit of map area, consisting of sandstone, conglomerate, siltstone, and dark shale. Divided into five members (not mapped here), from oldest to youngest: massive nonmarine conglomerate and thinly bedded sandstone member; thick-bedded marine sandstone member; thinly bedded, dark-gray marine siltstone member with limestone concretions; thinly bedded marine sandstone and siltstone member; massive conglomerate member. Clasts in both oldest and youngest conglomerate members are metamorphic, volcanic, and sedimentary rocks with subordinate plutonic rocks

Jt **Talkeetna Formation (Early Jurassic)**--Lava flows, breccias, and lahars locally interbedded with volcaniclastic sandstone, conglomerate, and shale. Includes sills of uncertain ages. Locally metamorphosed to nonschistose epidote-albite-calcite assemblages suggestive of lower greenschist facies

Ŧk **Kamishak Formation (Late Triassic)**--Slightly recrystallized, nonfossiliferous limestone and interbedded basalt flows and breccia

VOLCANIC DEPOSITS AND ROCKS

Deposits and rocks of Aleutian volcanic arc (Holocene to late Tertiary)--Divided into:

Qap **Pyroclastic-flow deposits (Holocene)**--Poorly sorted, variably indurated deposits of ash, vitrophyric blocks, and (or) pumiceous lapilli. Comprises 1912 ash flow of Novarupta and Holocene block-and-ash flows of Kaguyak caldera

Qad **Domes (Holocene)**--Domes of dacitic or rhyolitic composition

Qac **Younger central-vent deposits and rocks (Holocene and Pleistocene)**--Lava flows, tuffs, and breccias dominantly of andesitic composition but locally including lava flows of low-silica dacitic composition, airfall deposits of andesitic to rhyolitic composition on Baked Mountain and Broken Mountain, and scoria cones of basaltic composition

QTap **Pyroclastic-flow deposits (Pleistocene and late Tertiary)**--Poorly sorted, variably indurated deposits of ash, vitrophyric blocks, and (or) pumiceous lapilli. Primary compositions are uncertain because of alteration but probably range from andesitic to dacitic

QTac **Older central-vent deposits and rocks (Pleistocene and late Tertiary)**--Lava flows, breccias, and domes of andesitic and dacitic composition. Locally moderate to extensive alteration associated with fossil fumaroles (bleaching to shades of light red or yellow)

Tab **Volcanic rocks of Barrier Range (late Tertiary)**--Breccias, lava flows, sills, and local pyroclastic and epiclastic tuffs of late Tertiary volcanic field located southeast of Aleutian Range crest and extending from Katmai River to Kukak Bay. Dominantly of andesitic and dacitic composition. Propylitic alteration is extensive and argillic or potassic alteration is locally intensive, such as near contacts with hypabyssal intrusive rocks (unit Ti)

Volcanic rocks north of Naknek Lake (early Tertiary)--Based on age and rock type, these rocks may be considered part of the Meshik arc of Wilson (1985). Divided into:

Tvb **Basaltic lava (early Tertiary)**--Plugs, dikes, and flows of basaltic composition that intrude or overlie andesitic and dacitic lava flows and breccia (unit Tva)

Tva **Andesitic and dacitic lava flows and breccia (early Tertiary)**--Unit also includes local domes or tuffs of rhyolitic(?) composition, now altered to quartz and sericite or kaolinite

Ŧc **Cottonwood Bay Greenstone (Late Triassic)**--Slightly metamorphosed basalt; locally includes fine- to medium-grained diabase sills(?)

INTRUSIVE ROCKS

Td **Dikes (Tertiary)**--Dikes from 1 to 20 m wide that are found mainly southeast of Ihrain Bay fault and trend northwest. Many are in rocks as young as Hemlock Conglomerate (Th), suggesting that most dikes are middle to late Tertiary in age

Ti **Hypabyssal intrusive rocks near Shelikof Strait (late Tertiary)**--Sill-like or cross-cutting subvolcanic intrusive bodies generally less than 10 km^2 in outcrop area, as well as larger plutonic bodies such as those beneath Fourpeaked Volcano or along Aleutian Range crest east of Serpent Tongue Glacier. Fine-grained, porphyritic to equigranular rocks that consist dominantly of granodiorite or tonalite with minor quartz diorite

Tiu **Hypabyssal intrusive rocks, undivided (Tertiary)**--Intrusive bodies ranging from small plugs and sills to plutons exposed over as much as 30 km^2. Rocks are fine to medium grained, commonly porphyritic, and consist chiefly of quartz diorite or tonalite

Tgd **Granodiorite (Tertiary)**--Medium-grained equigranular to marginally porphyritic rocks in which modal quartz rarely exceeds 25 percent; unit includes rocks that are mineralogically classified as quartz monzodiorite or quartz diorite

Tqd **Quartz diorite (Tertiary)**--Medium-grained equigranular rocks in which accessory hornblende exceeds biotite; also found as zones within intrusions of granodiorite (unit Tgd)

Tgb **Gabbro and diorite (Tertiary)**--Gabbroic- or diabasic-textured, medium-grained rocks

Jgr **Granite (Jurassic)**--Medium-grained equigranular or fine-grained porphyritic rocks in which biotite exceeds hornblende

Jgd **Granodiorite (Jurassic)**--Medium-grained equigranular or fine-grained porphyritic rocks. Also includes isolated outcrops of tonalite and quartz diorite. Modal quartz comprises 22 to 44 percent

Jqd **Quartz diorite and tonalite (Jurassic)**--Medium-grained equigranular rocks having accessory biotite; unit includes some granodiorite

Jgb **Diorite and gabbro (Jurassic)**--Dark, diabasic- and gabbroic-textured rocks

METAMORPHIC ROCKS

JP̶k **Kaknonak Complex (Jurassic, Triassic, and Paleozoic?)**--Locally foliated or banded quartzite, schist, amphibolite, and garnet-bearing gneiss indicative of amphibolite-facies metamorphism. Protoliths presumably consist of Talkeetna Formation (Jt), Kamishak Formation (Ŧk), Cottonwood Bay Greenstone (Ŧc), and unnamed sandstone and argillite

Contact--Dashed where inferred or approximately located; queried where uncertain

Fault--Dashed where inferred or approximately located, dotted where concealed; queried where uncertain. U, upthrown side; D, downthrown side; queried where uncertain. Arrows indicate direction of relative movement

Thrust or reverse fault--Dotted where concealed. Sawteeth on upper plate; bar with number indicates dip of fault plane

Major folds--Showing direction of plunge; dashed where approximately located; dotted where concealed; queried where existence uncertain

Anticlinal axis

Synclinal axis

Strike and dip of beds

Measured

Approximate

Horizontal

Strike and dip of foliation

Volcanic vent (Quaternary)

Area of alteration

Area of hornfels

84AYb 98 / WR 34.5 — **K-Ar sample location**--Showing field number, phase analyzed, and K-Ar age in Ma. Bi, biotite. HO, hornblende. CH, chlorite. Pl., plagioclase. WR, whole rock

Ice — **Area covered by glacier**

CORRELATION OF MAP UNITS

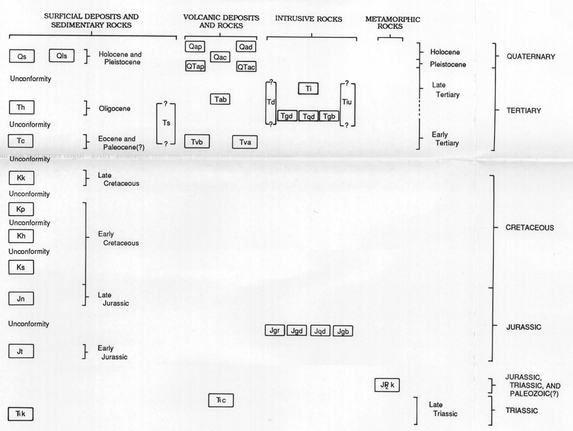

Table 1. *Potassium-argon ages and analytical data from Mount Katmai and adjacent parts of Naknek and Afognak quads., Alaska*

[Constants used were $^{40}K/K = 1.167 \times 10^{-4}$ mol/mol; $\lambda_B = 4.962 \times 10^{-1}$/year; $\lambda_E + \lambda_e = 0.581 \times 10^{-10}$/year. Potassium measurements by L.F. Espos, P.H. Klock, Byron Lei, Stuart MacPherson, John Martinelli, S.T. Neil, S.T. Pribble, and L.B. Schlocker. Source of data: a = Reed and Lanphere, 1969; b = Reed and Lanphere, 1973; c = Riehle and others, 1979; d = Krueger Enterprises, Inc., Geochron Laboratory, Travis Hudson, written commun., 1990; e = U.S.G.S., Anchorage, Alaska; f = U.S.G.S., Menlo Park, California, unpublished data]. A few of the dated samples do not agree with the map unit in which it falls. In some cases, it is because the sample was collected from an exposure that was too small to show at this scale, and some map units may be incorrect.

Sample number	Location (latitude, longitude, quadrangle)	Rock type	Field setting	Phase analyzed	K_2O (weight percent)	Mean K_2O (weight percent)	$^{40}Ar_{rad}$ (mol/gm)	$^{40}Ar_{rad}$ (percent)	Mean Age (Ma)	Error (m.y.)	Source
Jurassic rocks of Alaska-Aleutian Range batholith (map units Jgd, Jgr, Jqd)											
69AR 1	58°58'27" N. 154°32'55" W. Mt. Katmai D-2	Quartz diorite	Batholith	Hornblende	0.158 .165	0.162	4.266×10^{-11}	64.	174.7	±8.8	b,c
78ADt 2	58°10'30" N. 156°04'54" W. Naknek A-2	Granite	Batholith	Biotite	8.89 8.91 8.92	8.91	2.319×10^{-9} 2.354×10^{-9}	87.1 84.1	173.6	±2.0	e
				Hornblende	.646 .646 .646 .648	.647	1.553×10^{-10}	78.3	159.6	±2.0	e
83AR 5	58°18'11" N. 155°48'41" W. Mt. Katmai B-6	Granodiorite	Batholith	Biotite	8.01 8.06	8.04	2.095×10^{-9}	86.5	173.0	±5.2	f
A-126	58°51'36" N. 154°53'28" W. Mt. Katmai D-3	Quartz diorite	Batholith	Hornblende	.225 .226	.226	5.903×10^{-11}	69.0	173.0	±5.2	a,b,c
78ACe 4	58°08'12" N. 156°10'18" W. Naknek A-2	Tonalite	Batholith	Biotite	8.82 8.84 8.84 8.84	8.84	2.288×10^{-9} 2.279×10^{-9}	89.1 85.3	171.2	±1.0	e
				Hornblende	.581 .583 .582 .576	.581	1.358×10^{-10} 1.350×10^{-10}	83.6 69.2	155.2	±1.7	e
83AR 42	58°21'42" N. 155°40'30" W. Mt. Katmai B-6	Granodiorite	Batholith	Biotite	8.78 8.82	8.80	2.261×10^{-9}	87.0	170.0	±5.1	f
				Hornblende	.489 .495	.492	1.129×10^{-10}	68.4	153.0	±4.6	f
66ALe 4	58°02'06" N. 156°26'38" W. Naknek A-2	Granite	Batholith	Hornblende	.261 .263	.262	6.712×10^{-11}	42.	170.	±5.	a,b,c
83AR 33	58°45'31" N. 155°07'22" W. Mt. Katmai D-4	Granodiorite	Batholith	Biotite	8.29 8.30	8.30	2.117×10^{-9}	82.8	169.0	±5.1	f
				Hornblende	.903 .929	.916	1.913×10^{-10}	73.4	140.0	±4.2	f
83AR 46	58°27'20" N. 155°53'35" W. Mt. Katmai B-6	Quartz diorite	Batholith	Biotite	8.35 8.40	8.38	2.100×10^{-9}	89.7	166.0	±5.0	f
				Hornblende	.722 .724	.723	1.823×10^{-10}	69.1	167.0	±5.0	f
66ALe 3	58°02'06" N. 156°26'38" W. Naknek A-2	Granodiorite	Batholith	Biotite	7.95 7.96	7.96	2.000×10^{-9}	97.	167.	±5.	a,b,c
64AE 77	58°41'06" N. 155°23'51" W. Mt. Katmai C-5	Granodiorite	Batholith	Biotite	8.84 8.89	8.87	2.217×10^{-9}	94.3	166.	±5.	a,b,c
83AR 7	58°50'45" N. 155°56'09" W. Mt. Katmai B-6	Granite	Batholith	Biotite	9.29 9.31	9.30	2.317×10^{-9}	86.8	165.0	±5.0	f
83AR 34	58°42'31" N. 155°07'20" W. Mt. Katmai C-4	Quartz diorite	Batholith	Biotite	6.40 6.44	6.42	1.586×10^{-9}	86.6	164.0	±4.9	f
				Hornblende	.799 .801	.800	1.839×10^{-10}	69.4	153.0	±4.6	f
66AR 1280	58°32'23" N. 155°28'30" W. Mt. Katmai C-5	Granodiorite	Batholith	Hornblende	.590 .592	.591	1.417×10^{-10}	80.2	159.0	±4.8	a,b,c
83AR 15	58°42'39" N. 155°23'49" W. Mt. Katmai C-5	Granodiorite	Batholith	Biotite	8.80 8.88	8.84	2.081×10^{-9}	83.6	157.0	±4.7	f
Tertiary rocks of Alaska-Aleutian Range batholith (map units Tgd, Tqd)											
83AR 29	58°50'01" N. 154°54'44" W. Mt. Katmai D-3	Granodiorite	Batholith	Biotite	5.34 5.55	5.45	2.978×10^{-10}	51.5	37.6	±1.1	f
83AR 28	58°46'50" N. 154°57'57" W. Mt. Katmai D-3	Quartz diorite	Batholith	Biotite	9.04 9.12	9.08	4.733×10^{-10}	68.7	35.8	±1.1	f
				Hornblende	.397 .397	.397	2.036×10^{-11}	34.2	35.3	±1.1	f
83AR 18	58°57'39" N. 154°44'15" W. Mt. Katmai D-3	Quartz diorite	Batholith	Biotite	8.81 8.84	8.83	3.521×10^{-10}	29.4	27.5	±.8	f
				Hornblende	.373 .381	.377	1.878×10^{-11}	15.1	34.3	±1.2	f
83AR 22	58°52'34" N. 154°59'21" W. Mt. Katmai D-3	Granodiorite	Batholith	Biotite	9.29 9.33	9.31	3.944×10^{-10}	52.4	29.2	±.9	f
A-123	58°48'27" N. 154°37'45" W. Mt. Katmai D-2	Granodiorite	Batholith	Biotite	8.15 8.26	8.21	3.465×10^{-10}	81.0	29.1	±.9	b,c
66ALe 5	58°53'42" N. 154°49'06" W. Mt. Katmai D-3	Granodiorite	Batholith	Biotite	8.14 8.17	8.16	3.341×10^{-10}	85.6	28.2	±.8	a,b,c
				Hornblende	.397 .398	.398	1.498×10^{-11}	50.4	26.0	±.8	a,b,c
67AR 571	58°51'17" N. 154°45'55" W. Mt. Katmai D-3	Quartz diorite	Batholith	Biotite	8.69 8.72	8.71	3.498×10^{-10} 3.527×10^{-10}	80.8 65.0	27.8	±.6	b,c
				Hornblende	.369 .372	.371	1.402×10^{-11}	36.2	26.1	±.8	b,c
A-113	58°52'16" N. 154°34'58" W. Mt. Katmai D-2	Granodiorite	Batholith	Biotite	8.04 8.11	8.08	3.203×10^{-10}	77.0	27.4	±.8	a,b,c
67AR 563	58°55'06" N. 154°34'58" W. Mt. Katmai D-2	Quartz diorite	Batholith	Biotite	8.16 8.17	8.17	3.176×10^{-10}	81.2	26.8	±.8	b,c
				Hornblende	.335 .341	.338	1.256×10^{-11}	27.2	25.6	±.8	b,c
67AR 570	58°49'44" N. 154°43'45" W. Mt. Katmai D-3	Granodiorite	Batholith	Hornblende	.357 .358	.358	1.384×10^{-11}	28.4	26.7	±.8	b,c
83AR 19	58°57'01" N. 154°48'51" W. Mt. Katmai D-3	Granodiorite	Batholith	Biotite	8.94 9.00	8.97	3.465×10^{-10}	58.0	26.6	±.8	f
Other Tertiary intrusive rocks (map unit Ti)											
77AMb 122	58°52'48" N. 153°17'45" W. Afognak D-4	Andesite	Sill	Hornblende	0.160 .154	0.157	8.200×10^{-12} 5.125×10^{-12}	6.2 4.0	29.3	±8.4	d
83APb 30	58°06'35" N. 154°41'00" W. Mt. Katmai A-3	Granodiorite	Pluton	Biotite (chloritized)	8.20 8.22 8.25 8.27	8.24	6.076×10^{-11} 5.794×10^{-11}	28.7 43.5	[1]5.00	±.18	e
77AEg 74	58°51'54" N. 153°24'48" W. Afognak D-5	Granodiorite	Dike or sill	Biotite	7.86 7.71	7.78	6.170×10^{-11} 4.663×10^{-11}	10.4 16.9	4.8	±.5	d
79AH 9	58°42'04" N. 153°37'19" W. Afognak C-5	Quartz diorite	Dike or sill	Biotite	7.44 7.42	7.43	5.048×10^{-11} 3.903×10^{-11}	19.7 12.0	4.2	±.2	d
84ARj 079A	58°16'44" N. 154°30'00" W. Mt. Katmai B-2	Granodiorite	Serpent Tongue pluton	Biotite	8.94 8.97	8.96	3.166×10^{-11}	19.7	2.45	±.07	f
Volcanic rocks north of Naknek Lake (map units Tma, Tmb)											
85ARj 78	58°55'30" N. 155°23'16" W. Mt. Katmai D-5	Dacite porphyry	Lava flow	Plagioclase HF treated	0.333 .337	0.335	2.148×10^{-11} 2.182×10^{-11}	75.8 83.3	44.3	±.8	e
84AYb 91	55°44'56" N. 155°24'25" W. Mt. Katmai C-5	Basaltic andesite	Lava flow	Plagioclase HF treated	.338 .347	.343	2.151×10^{-11} 2.062×10^{-11}	88.7 91.3	42.5	±1.5	e
83ARj 233	58°50'00" N. 156°20'55" W. Naknek D-2	Andesite	Lava flow	Plagioclase HF treated	.386 .391	.389	2.334×10^{-11} 2.411×10^{-11}	68.1 86.5	41.9	±1.3	e
83ARj 236	58°55'08" N. 156°02'26" W. Naknek D-1	Basaltic andesite	Lava flow	Plagioclase HF treated	.054 .056 .057 .061	.057	3.314×10^{-12} 3.288×10^{-12}	33.8 46.1	39.8	±3.0	e
85ARj 205	58°24'13" N. 155°38'32" W. Mt. Katmai B-5	Andesite(?) porphyry	Dike	Hornblende	.217 .217	.217	1.163×10^{-11} 1.157×10^{-11}	23.6 17.3	36.8	±.3	e
84AYb 98	58°53'37" N. 155°56'44" W. Mt. Katmai D-6	Basaltic andesite	Lava flow	Whole rock HF treated	1.05 1.06	1.06	5.312×10^{-11} 5.214×10^{-11}	85.1 76.3	34.3	±.7	e
84AYb 100	58°53'37" N. 155°57'05" W. Mt. Katmai D-6	Andesite	Dike	Whole rock HF treated	1.13 1.14	1.14	4.360×10^{-11} 3.844×10^{-11} 4.148×10^{-11}	85.1 84.1 79.3	25.0	±1.6	e
Miocene volcanic rocks (map units Tav, QTac (part))											
83ARj 28B	58°21'25" N. 154°04'55" W. Mt. Katmai B-1	Andesite	Lava flow	Plagioclase HF treated	0.166 .171	0.169	3.506×10^{-12} 3.280×10^{-12}	27.7 39.4	13.9	±.8	e
84ARj 96C	58°16'17" N. 154°39'09" W. Mt. Katmai B-2	Andesite vitrophyre	Lava flow	Plagioclase HF treated	.264 .266	.265	5.435×10^{-12} 5.178×10^{-12}	55.1 58.2	13.9	±.5	e
84ARj 118D	58°18'40" N. 154°43'34" W. Mt. Katmai B-3	Andesite	Lava flow	Plagioclase HF treated	.274 .280	.277	5.160×10^{-12} 5.232×10^{-12}	58.4 49.9	13.0	±.3	e
84AEm 018A	58°36'43" N. 153°50'38" W. Afognak C-6	Basaltic andesite porphyry	Sill	Whole rock	.354 .355 .356 .357	.356	4.216×10^{-12}	24.8	8.22	±.25	f
84ADt 95	58°38'03" N. 153°35'28" W. Afognak C-5	Andesite?	Sill	Plagioclase HF treated	.142 .143	.143	1.511×10^{-12} 1.663×10^{-12}	22.2 36.3	7.72	±.54	e
Quaternary and Tertiary volcanic rocks (map unit QTac)											
86ARj 62	58°23'12" N. 155°13'36" W. Mt. Katmai B-4	Basaltic andesite porphyry	Lava flow	Plagioclase HF treated	0.481 .482	0.482	1.817×10^{-12} 1.840×10^{-12}	40.2 33.5	2.64	±.04	e
84AYb 69	58°04'13" N. 155°43'51" W. Mt. Katmai A-6	Andesite	Lava flow	Whole rock HF treated	.404 .439	.422	1.471×10^{-12} 1.504×10^{-12}	18.7 17.2	2.45	±.21	e
85AYb 214	58°04'44" N. 155°48'26" W. Mt. Katmai A-6	Basaltic andesite porphyry	Lava flow	Plagioclase HF treated	.230 .243	.237	6.756×10^{-13} 6.863×10^{-13}	13.5 11.7	2.00	±.11	e
85AYb 223	58°08'25" N. 155°33'10" W. Mt. Katmai A-5	Andesite porphyry	Lava flow	Plagioclase HF treated	.398 .404	.401	5.948×10^{-13} 5.070×10^{-13}	13.4 11.3	.954	±.109	e
84ARj 142B	58°39'24" N. 153°37'48" W. Afognak C-5	Andesite	Lava flow	Plagioclase HF treated	.191 .196	.194	2.922×10^{-13} 2.004×10^{-13}	6.0 6.3	.884	±.246	e
84AYb 71	58°01'20" N. 155°33'57" W. Mt. Katmai A-5	Andesite	Lava flow	Plagioclase HF treated	.251 .255	.253	1.934×10^{-13} 2.306×10^{-13}	5.1 7.0	.582	±.085	e
84AYb 24	58°37'50" N. 153°53'40" W. Afognak C-6	Basaltic andesite	Plug or dome	Whole-rock HF treated	.479 .501	.490	3.623×10^{-13} 3.507×10^{-13}	1.3 1.1	.506	±.182	e
83ARj 143	58°29'11" N. 154°17'00" W. Mt. Katmai B-1	Andesite	Lava flow	Plagioclase HF treated	.096 .097 .099 .101	.098	6.575×10^{-14} 6.033×10^{-14}	.9 .2	.446	±.388	e
84AYb 65	58°06'13" N. 155°25'09" W. Mt. Katmai A-5	Dacite	Lava flow	Plagioclase HF treated	.446 .449	.448	2.721×10^{-13} 2.353×10^{-13}	6.8 7.1	.394	±.046	e
84ARj 134B	58°04'42" N. 155°25'06" W. Mt. Katmai A-5	Andesite	Lava flow	Plagioclase HF treated	.444 .446	.445	2.207×10^{-13} 2.773×10^{-13}	4.5 4.6	.389	±.071	e

[1] Possible minimum age due to chlorite alteration.

DISCUSSION

The U.S. Geological Survey is required, by the Alaskan National Interests Lands Conservation Act (ANILCA, Public Law 96-487, 1980), to survey certain Federal lands to determine their mineral values, if any. Results from the Alaska Mineral Resource Assessment Program (AMRAP) must be made available to the public and be submitted to the President and the Congress. This report presents a compilation of potassium-argon ages resulting from an integrated geologic study of the Mount Katmai and adjacent parts of the Naknek and Afognak quadrangles, Alaska Peninsula, Alaska.

This map and accompanying table present results of potassium-argon analysis and ages of igneous rocks. Most of the samples were collected during helicopter-supported fieldwork conducted from 1983 to 1987. Some samples were collected prior to 1983 during studies of the Alaska-Aleutian Range batholith and a mineral-resource assessment of the Ugashik quadrangle.

Of the 64 ages reported (table 1), 15 have been previously published. Early published ages are shown here recalculated with the decay and abundance constants recommended by the International Union of Geological Sciences (IUGS) in 1976 (Steiger and Jäger, 1977). Forty-nine ages are published here for the first time. Most of the samples were analyzed at USGS laboratories in Menlo Park, California, and Anchorage, Alaska. Three K-Ar ages of shallow intrusions in the Afognak quadrangle were determined by Geochron Enterprises (Travis Hudson, written commun., 1990).

All potassium-argon analyses were conducted using the principles outlined in Dalrymple and Lanphere (1969). Potassium was determined by flame photometry using a lithium metaborate fusion technique (Engels and Ingamells, 1970). Argon extraction and measurement were obtained following standard isotope dilution techniques described in Dalrymple and Lanphere (1969).

Ongoing studies show that some plagioclase contain enough excess argon to yield ages that are too old to be geologically reasonable. For example, sample 84ARj 118D was collected from a Quaternary volcanic center near Snowy Peak, however a pair of K-Ar determinations yield a suspicious Miocene age. In general, however, plagioclase age determinations tend to agree with the geologic mapping.

Sample locations are plotted on a simplified version of the geologic map of Riehle and others (in press). Each locality is labled with a field number, the phase analyzed, and K-Ar age. Petrographic description and major-element composition of these samples are to be reported elsewhere.

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MAP SHOWING POTASSIUM-ARGON AGES FROM THE MOUNT KATMAI AND ADJACENT PARTS OF THE NAKNEK AND AFOGNAK QUADRANGLES, ALASKA PENINSULA, ALASKA

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1992

INTERIOR—GEOLOGICAL SURVEY, RESTON, VA—1992

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