

The data suggest that a small positive Bouguer anomaly of a little more than 10 mgal is located a short distance north of the center of St. Matthew Island, and that the gravity decreases towards both the south and northwest. Although contouring is handicapped by lack of data on the west side of the island, the Bouguer anomaly is constant on the northeast shore near a few outcrops of granodiorite (unit Tg). This rock unit is also the probable cause of significant thermal alteration of the intermediate and silicic pyroclastics. The density contrast between the rock and may thus have sufficient volume at depth to explain the anomaly. An average density contrast of 0.2 g per cm³ between the granodiorite and these pyroclastics is indicated by the density of the granodiorite and the density of the gabbro with a stock with such a density contrast and a depth of 1 to 2 km. A different and less probable cause of the anomaly might be the gabbroic rocks, whose single field exposure is much smaller than the granodiorite.

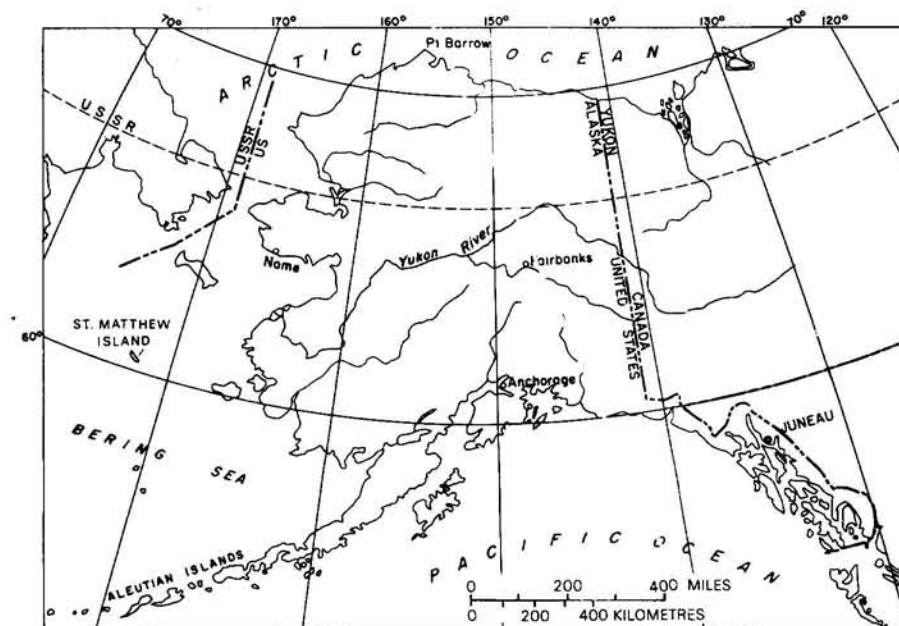
Map No.	Field No.	Latitude and Longitude	Mineral or whole rock	Map Symbol	X ₂ O (percent)	A ²³ Th _{rad} (mc/mg/gal)	A ²³ Th _{rad} ± A ²³ Th _{total}	Calculated age (millions of years)
	1	60°24' N, 127°42' W.	Bernhardine	Tg	0.301 0.305 avg. 0.303	2.760 × 10 ⁻¹¹	0.47	64.7 ± 2
	2	60°34' N, 127°56' W.	Basalt	Tks	1.081 1.080 avg. 1.080	1.052 × 10 ⁻¹⁰	0.87	64.8 ± 2
	3	60°35' N, 127°58' W.	Basalt	Tks	0.880 0.904 avg. 0.901	1.043 × 10 ⁻¹⁰	0.80	76.8 ± 2
	4	60°39' N, 127°03' W.	Hettite	KZ	7.77 7.775 avg. 7.775	8.664 × 10 ⁻¹⁰	0.93	74.1 ± 2
			Bernhardine		0.425	4.766 × 10 ⁻¹¹	0.52	74.4 ± 2

Potassium measurements: Lois Schlocker

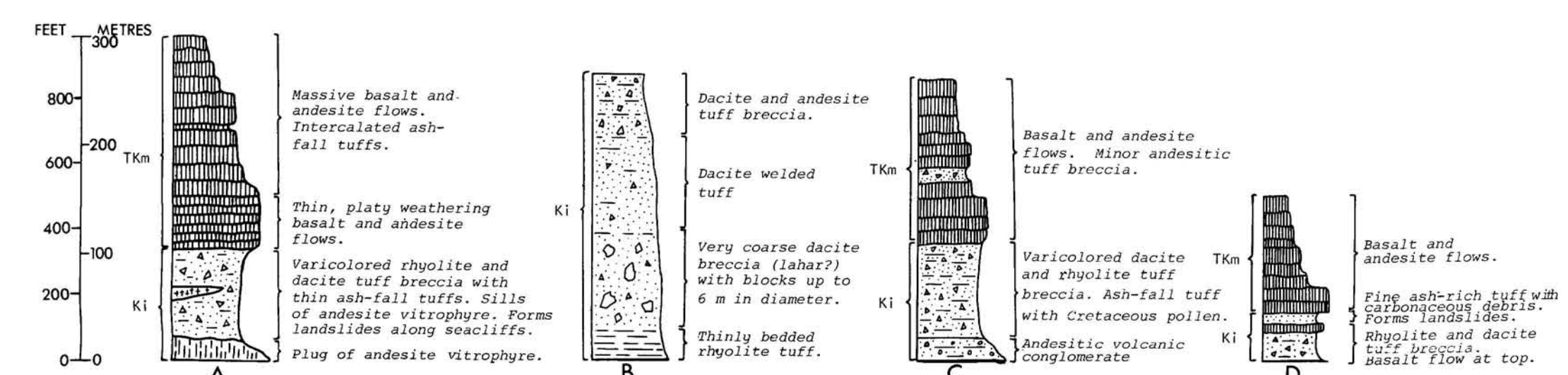
Argon measurements and age calculations: A. Atkinson, J. Von Essen

[K^{40} decay constants: $\lambda_1 = 0.585 \times 10^{-10}$ year $^{-1}$; $\lambda_2 = 4.72 \times 10^{-10}$ year $^{-1}$]

Abundance ratio: $K^{40}/K = 1.19 \times 10^{-4}$ atom percent]



Index map showing location of St Mathew Island



DIAGRAMMATIC SKETCHES OF VOLCANIC SEQUENCES EXPOSED AT SELECTED LOCALITIES (A-D)
ON ST. MATTHEW ISLAND