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

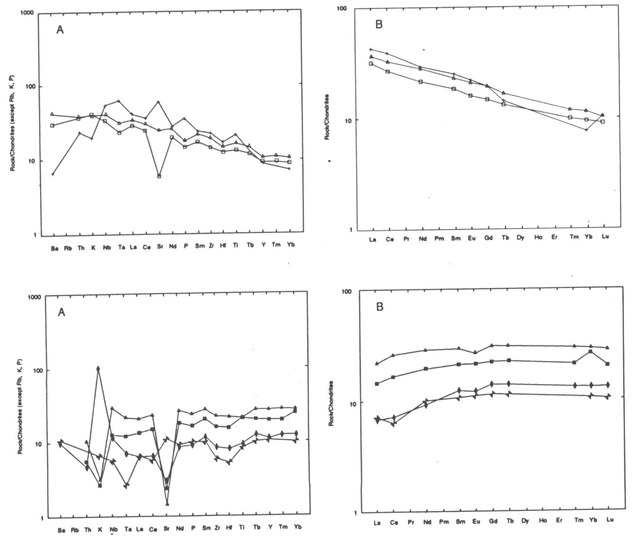
OPHIOLITIC TERRANE

	A Lithology	B Thickness (est)	C Age	D Mineral Deposits
Togiak terrane (Jones and others, 1987)	Tuffs, tuffaceous breccia, pillow basalt, and associated epiclastic rocks.	3+ km	Upper Triassic Pillow basalt interlayered with chert that contains Upper Triassic radiolarians (Box, 1985a).	No deposits reported
	Pillow basalt, pillow breccia, hyaloclastite, and chert.			
	Massive gabbro with abundant sills and dikes of diabase.		Upper Triassic(?) No direct age data. Inferred to be roughly cogenetic with overlying pillow basalt and chert.	
	Chiefly massive clinopyroxene gabbro with rare zones of layered gabbro.			
	Serpentinized ultramafic rocks, chiefly harzburgite with subordinate dunite and rare clinopyroxenite.			
Goodnews terrane (Jones and others, 1987)	Mafic schists including metabasalt, metachert, metatuff, and metagabbro and diabase. Transitional greenschist-blueschist metamorphic facies.	No est. avail.	Jurassic to Triassic Protolith age uncertain. Metamorphism is presumed to be chiefly Late Triassic to Early Jurassic and related to emplacement of the overlying ophiolite complex (Box, 1985c).	No deposits reported
	Metaclastic rocks including metasandstone, metaconglomerate and metapelite containing abundant volcanic detritus. Transitional greenschist-blueschist metamorphic facies.	No est. avail.	same as above	No deposits reported
	Marble, slate, and metavolcanic rocks. Transitional greenschist-blueschist metamorphic facies.	No est. avail.	same as above	No deposits reported
	Unfoliated mafic flows, tuff, and volcaniclastic rocks. Prehnite-pumpellyite metamorphic facies.	No est. avail.	Permian Contains Permian megafossils (Box, 1985a).	No deposits reported
	GOODNEWS FAULT			
	Structurally disrupted assemblage of radiolarian chert, basalt, and mudstone. Rare blocks of carbonate rocks. Mostly altered to prehnite-pumpellyite metamorphic facies. Local greenschist-blueschist metmorphism near thrust fault contact with Kilbuck terrane.		Jurassic to Ordovician Contains radiolarian cherts of Mississippian, Late Triassic, and Early and Late Jurassic ages and carbonate blocks with Ordovician, Devonian, and Permian fossils (Box, 1985a).	No deposits reported
Kilbuck terrane (Jones and others, 1987)	Biotite-hornblende gneiss, pyroxene granulite, garnet amphibolite, orthogneiss, pelitic schist, marble. Upper amphibolite to lower granulite metamorphic facies.		Early Proterozoic Protolith U-Pb age of 2.06 Ga (Box and others, 1990). K-Ar ages of 150-120 Ma presumed to date metamorphic overprint (Box, 1985c).	

EXPLANATION

pillow basalt; epiclastic rocks; tuff, tuffaceous breccia; chert; pillow breccia; massive gabbro; diabase; layered gabbroic rocks; serpentinized harzburgite and dunite; clinopyroxenite; metatuff; metachert; metabasite (greenstone); metagraywacke; pelitic schist; marble; gneiss; quartzite

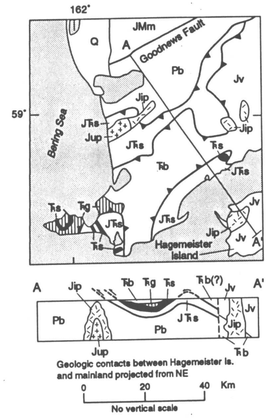
E Geochemistry of Mafic and Ultramafic Rocks



A. Chondrite-normalized spidergrams (using normalization values of Thompson and others,1984) for mafic rocks in southwestern Alaska ophiolite complex.
B. Chondrite-normalized rare earth element diagrams for mafic rocks in southwestern Alaska ophiolite complex (normalization values of Anders and Ebihara, 1982).

- basalt flow, lower pillow basalts (46.8% SiO_2)
- gabbro (48.1% SiO_2)
- diabase sill (52.9% SiO_2)
- diabase sill (55.4% SiO_2)
- diabase dike (46.9% SiO_2)
- basalt flow, upper pillow basalts (50.8% SiO_2)
- basalt flow, upper pillow basalts (49.1% SiO_2)

F Geologic Setting



EXPLANATION

- Q — Surficial deposits

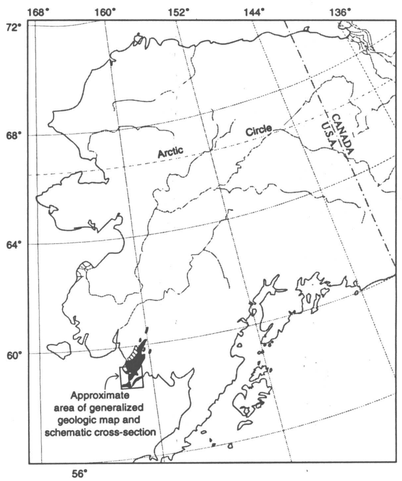
TOGIAK TERRANE

- Jip — Middle Jurassic granitic pluton
- Jup — Middle Jurassic ultramafic pluton
- Jv — Jurassic andesite
- Ṭb — Upper Triassic pillow basalt
- Ṭg — Upper Triassic(?) gabbro
- Ṭs — Upper Triassic(?) serpentinized peridotite

GOODNEWS TERRANE

- J̄ks — Jurassic-Triassic schist
- JMm — Jurassic-Mississippian basalt-chert melange
- Pb — Permian pillow basalt
- Thrust fault. Barbs on upper plate
- Fault. Dashed where inferred

Generalized geologic map and cross section of the northern Bristol Bay region, southwestern Alaska (from Box, 1985a)



Index map showing location of ophiolitic terrane (black) and Kilbuck terrane (pattern) in southwestern Alaska

OPHIOLITIC TERRANE OF SOUTHWEST ALASKA

by
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