TABLE DR1. CONSTRAINTS ON THE THERMAL STRUCTURE OF BACKARCS WITH NO THERMALLY-SIGNIFICANT EXTENSION

Name (arc-backarc)	Backarc width (km)	Surface heat flow (mW/m^2)†				Mantle seismic velocities			
		# of data	avg	std dev	Ref††	Pn (km/s)	P_{tomo}§ (%)	S_{tomo}§ (%)	Ref††
N. Can. Cordillera	650	23	76‡	21	1	7.8-7.9	-1.5	-3.5	1, 2, 3, 4, 5, 6
Cascadia – SW Canada	500	73	75‡	15	7, 8, 9	7.8-7.9	-2.5	-4	3, 5, 6, 9, 10
Mexico	>200	6	72	17	11	7.8	-2.5	-4	3, 5, 10, 12
S. America-Cen. Andes	400	17	85	16	13, 14	--	-2	-5	5, 15
Alaska	>600	--	--	--	--	7.8-8.0	-2	--	2, 5, 16, 17, 18, 19, 20
Aleutian – Bering Sea	>900	31	75#	18	21, 22	7.8-8.0	-1.5	--	2, 5, 17, 20, 23
Kamchatka –Okhotsk S.	>800	82	70	18	22	7.8-7.9	-2	-4	2, 5, 20, 24, 25, 26
Ryukyu – Korea	>750	78	69	16	27	7.8-7.9	-2	--	5, 20, 24, 28
Sunda – Borneo	>900	76	76	18	22	--	-2	--	5, 20, 29, 30

Notes:

† In the compilation, we have not included heat flow data with large uncertainties (>20%), nor values that are unreasonably low (<10 mW/m^2) or unreasonably high (>120 mW/m^2), that may be affected by recent volcanic activity.

‡ The Northern Cordillera and Cascadia heat flow data have been corrected to an upper crustal radiogenic heat production of 1.3 $\mu W/m^3$ (Hyndman and Lewis, 1999; Lewis et al., 2003).

The Aleutian heat flow data has been corrected for the effects of sedimentation, following Langseth et al. (1980).

[§] The seismic tomography data reflects the average large-scale velocity anomaly for the backarc between depths of 50 and 150 km. Tomography results are reported as a velocity perturbation with respect to a global reference model for average mantle velocities. Between depths of 50 and 150 km, the reference P-wave velocity is ~8.05 km/s and the reference S-wave velocity is ~4.5 km/s (e.g., Kennett et al., 1995). These velocities are intermediate between mobile belt and craton values. Relative to cratons, the seismic velocity anomalies for the backarcs are even larger (P-waves are approximately 4% slower and S-waves are approximately 7% slower).

[††] Data sources: 1, Lewis et al., 2003; 2, Levshin et al., 2001; 3, Grand, 1994; 4, Frederiksen et al., 1998; 5, Bijwaard and Spakman, 2000; 6, Frederiksen et al., 2001; 7, Lewis et al., 1992; 8, Blackwell et al., 1990; 9, Hyndman and Lewis, 1999; 10, van der Lee and Nolet, 1997; 11, Ziagos et al., 1985; 12, Gomberg et al., 1988; 13, Hamza and Munoz, 1996; 14, Springer and Forster, 1998; 15, van der Lee et al., 2001; 16, McNamara and Pasyanos, 2002; 17, Jin and Herrin, 1980; 18, Estabrook et al., 1988; 19, Zhao et al., 1995; 20, Bijwaard et al., 1998; 21, Langseth et al., 1980; 22, Global Heat Flow Database, 2004; 23, Fliedner and Klemperer, 2000; 24, Ritzwoller et al., 2002; 25, Gorbotov et al., 1999; 26, Shapiro et al., 2000; 27, Yamano, 1995; 28, Sedeghi et al., 2000; 29, Puspito and Shimazaki, 1995; 30, Widiyantoro and van der Hilst, 1997

REFERENCES CITED IN DATA REPOSITORY

Bijwaard, H., and Spakman, W., 2000, Non-linear global P-wave tomography by iterated linearized inversion: Geophysical Journal International, v. 141, p. 71-82.

Bijwaard, H., Spakman, W., and Engdahl, E.R., 1998, Closing the gap between regional and global travel time tomography: Journal of Geophysical Research, v. 103, p. 30,055-30,078.

Blackwell, D.D., Steele, J.L., Kelley, S., and Korosec, M.A., 1990, Heat flow in the state of Washington and thermal conditions in the Cascade Range: Journal of Geophysical Research, v. 95, p. 19,495-19,516.

Estabrook, C.H., Sone, D.B., and Davies, J.N., 1988, Seismotectonics of northern Alaska: Journal of Geophysical Research, v. 93, p. 12,026-12,040.

Fliedner, M.M., and Klemperer, S.L., 2000, Crustal structure transition from oceanic arc to

continental arc, eastern Aleutian Islands and Alaska Peninsula: Earth and Planetary Science Letters, v. 179, p. 567-579.

Frederiksen, A.W., Bostock, M.G., and Cassidy, J.F., 2001, S-wave velocity structure of the Canadian upper mantle: Physics of the Earth and Planetary Interiors, v. 124, p. 175-191.

Frederiksen, A.W., Bostock, M.G., van Decar, J.C., and Cassidy, J.F., 1998, Seismic structure of the upper mantle beneath the northern Canadian Cordillera from teleseismic travel-time inversion: Tectonophysics, v. 294, p. 43-55.

Global Heat Flow Data Base, International Heat Flow Commission (see also Pollack et al., 1993), http://www.heatflow.und.edu, last accessed, May 2004.

Gomberg, J.S., Priestly, K.F., Masters, T.G., and Brune, J.N., 1988, The structure of the crust and upper mantle of northern Mexico: Geophysical Journal, v. 94, p. 1-20.

Gorbotov, A., Dominguez, J., Suarez, G., Kostoglodov, V., Zhao, D., and Gordeev, E., 1999, Tomographic imaging of the P-wave velocity structure beneath the Kamchatka peninsula: Geophysical Journal International, v. 137, p. 269-279.

Grand, S.P., 1994, Mantle shear structure beneath the Americas and surrounding oceans: Journal of Geophysical Research, v. 99, p. 11,591-11,621.

Hamza, V.M., and Munoz, M., 1996, Heat flow map of South America: Geothermics, v. 25, p. 599-646.

Hyndman, R.D. and Lewis, T.J., 1999, Geophysical consequences of the Cordillera-Craton thermal transition in southwestern Canada: Tectonophysics, v. 306, p. 397-422.

Jin, D.J., and Herrin, E., 1980, Surface wave studies of the Bering Sea and Alaska area: Bulletin of the Seismological Society of America, v. 70, p. 2117-2144.

Kennett, B.L.N., Engdahl, E.R., and Buland, R., 1995, Constraints on seismic velocities in the Earth from traveltimes: Geophysical Journal International, v. 122, p. 108-124.

Langseth, M.G., Hobart, M.A., and Horia, K., 1980, Heat flow in the Bering Sea: Journal of Geophysical Research, v. 85, p. 3740-3750.

Levshin, A.L., Ritzwoller, M.H., Barmin, M.P., Villasieor, A., and Padgett, C.A., 2001, New constraints on the arctic crust and uppermost mantle: Surface wave group velocities, Pn, and Sn: Physics of the Earth and Planetary Interiors, v. 123, p. 185-204.

Lewis, T.J., Bentkowski, W.H., and Hyndman, R.D., 1992, Crustal temperatures near the Lithoprobe Southern Canadian Cordillera transect: Canadian Journal of Earth Sciences, v. 29,

p. 1197-1214.

Lewis, T.J., Hyndman, R.D., and Fluck, P., 2003, Heat flow, heat generation, and crustal temperatures in the northern Canadian Cordillera: Thermal control of tectonics: Journal of Geophysical Research, v. 108(B6), doi: 10.1029/2002JB002090.

McNamara, D.E., and Pasyanos, M.E., 2002, Seismological evidence for a sub-volcanic arc mantle wedge beneath the Denali volcanic gap, Alaska: Geophysical Research Letters, v. 29(16), doi: 10.1029/2001GL014088.

Pollack, H.N., Hurter, S.J., and Johnson, J.R., 1993, Heat flow from the Earth's interior: Analysis of the global data set: Reviews of Geophysics, v. 31, p. 267-280.

Puspito, N.T., and Shimazake, K., 1995, Mantle structure and seismotectonics of the Sunda and Banda arcs: Tectonophysics, v. 251, p. 215-228.

Ritzwoller, M.H., Barmin, M.P., Villasenor, A., Levshin, A.L., and Engdahl, E.R., 2002, Pn and Sn tomography across Eurasia to improve regional seismic event locations: Tectonophysics, v. 358, p. 39-55.

Sedeghi, H., Suzuki, S., and Takenaka, H., 2000, Tomographic low-velocity anomalies in the uppermost mantle around the northeastern edge of Okinawa trough, the backarc of Kyushu: Geophysical Research Letters, v. 27, p. 277-280.

Shapiro, N.M., Gorbotov, A.V., Gordeev, E., and Dominguez, J., 2000, Average shear-wave velocity structure of the Kamchatka peninsula from the dispersion of surface waves: Earth Planets Space, v. 52, p. 573-577.

Springer, M., and Forster, A., 1998, Heat-flow density across the Central Andean subduction zone: Tectonophysics, v. 291, p. 123-139.

van der Lee, S. and Nolet, G., 1997, Upper mantle S velocity structure of North America: Journal of Geophysical Research, v. 102, p. 22,815-22,838.

van der Lee, S., James, D. and P. Silver, 2001, Upper mantle S velocity structure of central and western South America: Journal of Geophysical Research, v. 106, p. 30,821-30,824.

Widiyantoro, S., and van der Hilst, R., 1997, Mantle structure beneath Indonesia inferred from high-resolution tomographic imaging: Geophysical Journal International, v. 130, p. 167-182.

Yamano, M., 1995, Recent heat flow studies in and around Japan, *in* Mohan, L.G. and Yamano, M, eds., Terrestrial heat flow and geothermal energy in Asia, Oxford and IBH Publishing Co. Pvt. Ltd., Bombay, p. 173-201.

Zhao, D., Christensen, D., and Pulpan, H., 1995, Tomographic imaging of the Alaska subduction zone: Journal of Geophysical Research, v. 100, p. 6487-6504.

Ziagos, J.P., Blackwell, D.D., and Mooser, F., 1985, Heat flow in southern Mexico and the thermal effects of subduction: Journal of Geophysical Research, v. 90, p. 5410-5420.