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Breitsprecher et al. (2003), Geochemical confirmation of the Kula-Farallon slab window in the Pacific Northwest, Repository Items

FIGURE AND TABLE CAPTIONS FOR REPOSITORY ITEMS

TABLE DR1. Sources of data used to generate the geochemical contour diagrams.

TABLE DR2. New geochemical data from the Kamloops, Princeton and Penticton Groups (south-central British Columbia). BIL samples collected by B.N. Church.

TABLE DR3. Eocene adakites from southern British Columbia (from Breitsprecher, 2002). Adakite criteria from Defant and Kepezhinskas (2001).

FIGURE DR2. Distribution of geochemical samples used to generate the contour diagrams in Figure 1 (see Table DR1 for data sources). Shaded areas represent Eocene volcanics (darker) and intrusions (lighter). Sampling density is slightly lower for Ta/Ce because Ta and/or Ce were not reported in some of the sources. See Figure 1 for geographic and geologic reference.

FIGURE DR3. Selected time-frames of Kula-Farallon slab window paleo-geometry (dark shading) which results from a Kula-Farallon break-away positioned approximately midway between the “north” and “south” margins of the range suggested by Engebretson et al. (1985) (Fig. 1d). Vectors used in the model were calculated from the stage poles of Engebretson et al. (1985), recalibrated to the timescale of Cande and Kent (1995). Thick grey arrows represent 2 m.y. of displacement for the Kula and Farallon plates, relative to the North American plate, based on vectors calculated for the 1 m.y. incremental modeling. Magmatic delineation from Friedman et al. (2001) (Late Cretaceous) and Armstrong and Ward (1991) (Paleocene). Paleo-trench positions after Dickinson (1991). Eocene geology and geography can be referenced at Fig.1A. Note change of scale between Cretaceous and Tertiary diagrams. Abbreviations used: CMB=Colorado Mineral Belt; CPC=Coast Plutonic Complex; IB=Idaho Batholith; SNB=Sierra-Nevada Batholith.

Figure reference not cited in paper:

Friedman, R.M., Diakow, L.J., Lane, R.A., and Mortensen, J.K., 2001, Cretaceous magmatism and associated mineralization in the Fawnie Range, Nechako Plateau, central British Columbia: Canadian Journal of Earth Sciences, v. 38, p. 619–637.

Table DR1. Sources of data used to generate the geochemical contour diagrams.

Regional volcanic field	Source (see below)	#	**Samples included in the compilation used to produce the geochemical contour diagrams (Fig. 1).** All have SiO_2 wt% from 55-60.
Absaroka (Wyoming)	16	7	1004, 1010, 1066, 2091, 2157, 2515v, 2903
	12	8	HMd 1195, HGB 1995, HGB7 95, HM 194, HMf 694, HPt v196, ISH 4995, ISH 795
Challis (Idaho)	14	2	RL391, RL496
	18	13	87-1, 87-2, 87-6, 87-7, 87-8, 87-9, 87-10, '87-11, 87-12, 87-13, 87-14, 87-15, 87-16
MAP (Montana alkaline province)	20	1	76
	15	1	H71-19
	19	3	HM334a, HM494a, HM598b
	8	2	BF10, CT28
	7	1	202336
Colville (Washington)	17	5	GAM 93 096, GAM 93 118, GAM 94 020, LW KM-64, LW KM-84
	13	2	HCD3, KCP-3
	23	2	GM-14, ME-93
Kamloops, Princeton and Penticton Groups (southern British Columbia)	11	1	PLK200
	21	19	AS1-11, AS1-13, AS1-14A, AS1-14B, AS1-15A, AS1-15C, AS1-17, AS1-19A, AS1-19B, AS1-19C, AS1-19D, AS1-19L, AS1-20A, AS1-21B, AS2-25, AS2-26B, AS2-27A, AS2-75, AS2-76
	9	4	TP-1-1A, TP-4-2, TP-10-4, TP-27-9
	2	23	*Kamloops:* KB-99-03-4-1, KB-99-03-5-1B, KB-99-05-4-3, KB-99-07-6a-1B, KB-99-08-4-1B, KB-99-11-6-1B, KB-99-12-1-2, KB-99-13-2-3, KB-99-14-4-2B, KB-99-16-6-1B, KB-99-16-14-1B, KB-99-24-2-1B, KB-99-24-3-2, KB-99-24-6-3B, KB-99-24-7-2, KB-99-24-9-1B, KB-99-24-10-1B, KB-99-24-11-1B, KB-99-25-5-1B, KB-99-25-6-1B. *Penticton:* KB-99-23-1-1B, KB-99-23-7-2. *Princeton:* KB-99-22-2-1B
	2a	7	Kamloops: BIL 46, BIL 47, BIL 53, BIL 55, BIL 69, BIL 71, BIL 87A
	1	4	Penticton: 33, 49, 55, 59, 62
	3	6	Penticton: ROCK39, ROK71, ROK84, ROK92A, ROK248, RX144
Endako, Ootsa Lake and upper Francois Lake groups (central British Columbia)	6	5	Endako: JD13.7, LD47.22. Ootsa Lake: JD3.2, JD7.5, LD37.5
	22	4	DT-96-2-1-18, DT-96-3-2-1B, DT-97-4-3-1B, DT-97-5-4-1B
	10	1	ATG-98-0406
	5	3	10, 66, HU21
	4	7	BC-77, HU-67, NGV-4-33, OPG-330, OPG-515, OPG-519, OPG-651

Sources:

1 Bardoux, M., 1993, The Okanagan valley normal fault from Penticton to Enderby, south-central British Columbia: [Ph.D. thesis], Ottawa, Carleton University, 292 p.

2 Breitsprecher, K., 2002, Volcanic stratigraphy, petrology and tectonic setting of the eastern margin of the Eocene Kamloops Group, south-central British Columbia [M.Sc. thesis]: Burnaby, Simon Fraser University, 221 p.

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(continues)

TABLE DR1 (continued)

15 MacDonald, R., Upton, B.G., Collerson, K.D., Hearn, B.C. and James, D., 1992, Potassic mafic lavas of the Bearpaw Mountains, Montana; Mineralogy, chemistry and origin: Journal of Petrology, v.33, p.305-346.

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17 Morris, G.A., Larson, P.B. and Hooper, P.R., 2000, 'Subduction style' magmatism in a non-subduction setting; the Colville Igneous Complex, NE Washington State, USA: Journal of Petrology, v.41, p.43-67.

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Table DR2. New geochemical data from the Kamloops, Princeton and Penticton Groups (south-central British Columbia).

Sample	KB-99-03-4-1	KB-99-03-5-1B	KB-99-05-4-3	KB-99-07-6a-1B	KB-99-08-4-1B	KB-99-11-6-1B	KB-99-12-1-2	KB-99-13-2-3	KB-99-14-4-2b	KB-99-16-6-1B	KB-99-16-14-1B	KB-99-24-2-1B	KB-99-24-3-2	KB-99-24-6-3B	KB-99-24-7-2
group	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops
rock	tr. and.	tr. and.	tr. and.	andesite	tr. and.	tr. and.	tr. and.	tr. and.	tr. and.	andesite	b.tr.and.	b.tr. and.	b.tr. and.	b.tr. and.	b.tr. and.
UTM E	*11 352831*	*11 352685*	*11 352193*	*11 350750*	*11 352800*	*11 371042*	*11 370343*	*11 366093*	*11 309500*	*11 362256*	*11 364074*	*11 310561*	*11 291512*	*11 309495*	*11 296602*
UTM N	*5605541*	*5605395*	*5603759*	*5600150*	*5604500*	*5597467*	*5586348*	*5597505*	*5521500*	*5592430*	*5594820*	*5563942*	*5564630*	*5592952*	*5599519*
SiO_2	59.60	56.89	58.55	58.38	58.76	58.07	57.46	57.06	59.12	57.62	55.38	55.20	55.18	55.83	55.14
TiO_2	1.33	1.38	1.33	1.17	1.32	1.11	1.16	1.37	1.06	1.11	1.35	1.06	1.23	1.17	1.06
Al_2O_3	15.50	15.57	15.49	15.70	15.23	16.55	17.13	15.88	14.99	16.19	15.87	15.89	16.30	16.85	15.54
FeO*	7.11	7.66	7.43	7.11	7.26	6.84	6.20	7.72	6.46	7.28	8.01	8.18	8.46	6.45	7.78
MnO	0.15	0.17	0.22	0.16	0.15	0.10	0.14	0.14	0.11	0.14	0.15	0.16	0.07	0.18	0.13
MgO	3.16	3.84	3.43	4.25	3.38	3.58	2.93	3.21	4.02	4.52	4.89	3.98	3.62	3.83	5.03
CaO	5.42	6.49	5.19	7.44	5.39	6.12	4.25	5.37	5.74	7.28	7.32	8.19	7.82	8.61	8.15
Na_2O	4.26	4.15	3.82	3.58	3.88	4.06	3.66	4.45	2.87	3.62	3.89	2.93	3.55	2.74	3.29
K_2O	2.44	2.91	3.50	1.52	3.60	2.96	6.38	3.88	5.13	1.57	2.41	3.68	3.17	3.71	3.31
P_2O_5	1.02	0.93	1.03	0.69	1.02	0.62	0.69	0.94	0.49	0.68	0.73	0.74	0.59	0.63	0.57
LOI	3.1	2.3	1.9	3.7	1.2	2.8	3.5	4.5	1.9	4.9	1.4	3.8	3.3	4.3	2.4
Total	97.2	97.4	98	96	99	97.1	96.8	95.6	98.6	95	98.9	96.8	96.8	95.8	98.3
Cr	81	79	67	105	61	82	119	59	159	107	160	226	190	35	126
Ni	24	31	22	35	19	30	46	19	44	45	97	36	104	b.d.	b.d.
Co	14	17	15	18	16	16	16	17	20	20	28	28	37	12	20
Sc	14	17	15	16	15	14	11	16	17	15	20	21	25	19	21
V	146	161	151	145	147	144	160	165	165	152	165	196	218	194	199
Ga	20	19	20	18	20	20	22	19	19	19	18	18	19	20	19
Cu	28	31	28	27	25	33	34	18	25	42	41	25	21	b.d.	11
Zn	107	114	109	98	113	97	99	81	79	97	101	86	97	93	92
Ba	1700	1600	1600	1400	1700	1200	2600	2200	2000	1400	1300	1600	1200	1100	1200
Rb	120	40	94	25	100	73	200	90	160	40	50	110	110	120	150
Sr	970	920	910	930	920	750	1400	1000	1200	1000	810	1200	990	810	880
Zr	280	320	280	300	280	230	260	290	200	200	260	170	160	160	150
Y	44	49	46	43	47	26	24	41	25	25	42	24	30	30	25
Nb	38	31	36	24	36	22	51	35	37	24	24	13	14	19	14
U	2.9	1.8	2.8	1.6	2.7	2.1	5.1	2.1	2.7	2.1	1.5	2.7	1.2	5.2	2.7
Pb	17	11	17	11	16	11	31	9	17	11	10	16	9	14	12
Th	12	5.9	12	5.1	11	7.8	16	8.6	13	7.8	5.1	8	4.4	10	6.7
Hf	7	7.8	7	7	6.9	5.7	6.7	6.8	5.7	5.3	6.5	4.8	3.7	4.4	3.6
Ta	1.5	1.2	1.5	0.96	1.5	0.91	2.4	1.3	1.8	1	1	0.61	0.67	0.89	0.77
Be	2.4	1.9	2.4	1.7	2.4	1.6	4.5	2.1	2.6	1.4	1.8	2.5	1.6	2.9	2.2
Cs	3.9	0.24	0.96	3.5	1.5	0.58	2	2.5	2.5	10	1.2	2	1.3	0.64	6.2
Mo	3.4	2.1	3.3	2.4	3.1	1.8	4.3	0.8	1.3	3.1	3.3	1.8	1.1	2.9	1.8
Sn	2.3	2	2.3	1.7	1.9	1.2	1.7	2.2	1.5	1.3	2.2	1.2	1.2	1.7	1.1
Tl	1.2	0.14	0.39	0.1	0.44	0.34	0.8	0.84	0.6	0.4	0.27	0.37	0.11	0.68	0.5
La	91	72	93	54	89	52	67	85	54	55	53	35	28	40	29
Ce	180	140	190	110	180	100	130	170	110	110	110	71	58	79	59
Pr	20	16	20	12	20	11	13	18	12	12	12	9	7.8	9.5	7.6
Nd	75	64	78	47	73	41	49	68	44	43	47	38	33	39	31
Sm	12	11	12	8.5	13	7.6	8.5	11	8.4	7.4	8.9	7.6	6.9	7.8	6.2
Eu	2.7	2.6	2.6	2	2.8	1.9	2.3	2.7	2	1.9	2.2	1.9	1.8	1.9	1.6
Gd	9.4	8.9	9.4	7.6	10	5.9	6.2	8.6	6.7	5.8	7.8	6	6.3	6.6	5.5
Tb	1.3	1.3	1.3	1.1	1.4	0.82	0.8	1.2	0.89	0.83	1.2	0.82	0.88	0.93	0.77
Dy	7.3	7.8	7.2	6.7	7.6	4.3	4	6.4	4.5	4.3	6.7	4.2	5	5.2	4.3
Ho	1.5	1.6	1.5	1.4	1.5	0.85	0.78	1.3	0.85	0.85	1.4	0.8	0.98	1	0.81
Er	3.9	4.2	3.8	3.8	4.2	2.3	2.1	3.5	2.3	2.3	3.8	2.2	2.7	2.8	2.3
Tm	0.58	0.64	0.57	0.57	0.63	0.33	0.29	0.53	0.33	0.31	0.56	0.33	0.39	0.42	0.33
Lu	0.64	0.71	0.63	0.61	0.65	0.32	0.32	0.56	0.34	0.33	0.61	0.33	0.39	0.45	0.36
Yb	3.9	4.2	3.9	3.8	4.1	2	1.9	3.5	2.1	2.1	3.9	2	2.4	2.6	2

(continues)

TABLE DR2 (continued)

Sample	KB-99-24-9-1B	KB-99-24-10-1B	KB-99-24-11-1B	KB-99-25-5-1B	KB-99-25-6-1B	BIL 46	BIL 47	BIL 53	BIL 55	BIL 69	BIL 71	BIL 87A	KB-99-22-2-1B	KB-99-23-1-1B	KB-99-23-7-2
group	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Kamloops	Princeton	Penticton	Penticton
rock	tr. and.	tr. and.	b.tr. and.	tr. and.	tr. and.	tr. and.	tr. and.	tr. and.	tr. and.	andesite	andesite	tr. and.	andesite	t.phono.	trachyte
UTM E	*10 708917*	*10 674301*	*10 661916*	*11 322160*	*11 312847*	*10 652800*	*10 653000*	*10 651200*	*10 650800*	*10 645600*	*10 655400*	*10 622500*	*10 675549*	*11 357855*	*11 367870*
UTM N	*5612665*	*5324692*	*5639741*	*5630380*	*5609859*	*5619400*	*5620200*	*5617300*	*5618200*	*5615800*	*5622200*	*5629700*	*5462945*	*5435576*	*5485922*
SiO2	57.78	58.26	55.71	57.74	58.11	57.62	58.56	58.08	57.41	59.89	59.14	57.97	59.45	56.13	59.70
TiO2	1.07	0.98	1.19	1.20	1.12	1.14	1.15	1.05	1.13	0.78	0.83	1.03	0.72	0.75	1.13
Al2O3	17.60	17.11	16.89	15.98	15.13	16.10	17.03	16.05	16.09	16.02	16.10	16.88	16.84	20.20	18.01
FeO*	5.50	6.16	6.99	7.24	6.95	6.55	6.91	6.90	7.00	5.60	6.59	7.07	5.64	4.78	4.99
MnO	0.10	0.06	0.08	0.15	0.13	0.08	0.04	0.09	0.08	0.09	0.12	0.08	0.10	0.11	0.06
MgO	3.11	3.65	3.03	3.43	4.68	3.68	3.23	3.91	3.84	5.00	4.95	2.92	4.79	2.09	1.77
CaO	7.38	5.57	9.07	6.65	6.58	6.59	5.86	6.93	7.34	6.42	6.20	6.86	7.04	3.97	2.67
Na2O	4.35	4.35	3.99	3.92	3.96	4.72	4.31	4.19	4.31	3.47	3.92	4.46	3.90	4.25	3.67
K_2O	2.62	3.31	2.46	2.96	2.65	2.74	2.42	2.32	2.36	2.41	1.87	2.26	1.17	7.15	7.55
P2O5	0.49	0.55	0.60	0.73	0.70	0.78	0.50	0.47	0.44	0.33	0.27	0.47	0.35	0.56	0.44
LOI	2.7	2.5	4.2	2.2	3.8	1.1	3.2	1.5	3.9	2.1	2.5	4.6	2.8	4.5	3.3
Total	97.4	97.4	96.4	97.9	96.9	98.6	96.2	98.8	96.1	98.9	97.7	95.2	98.2	95.3	96.3
Cr	172	41	214	97	196	65	141	187	115	226	296	372	123	16	20
Ni	62	19	86	41	67	42	52	76	47	96	103	87	53	b.d.	12
Co	21	16	32	21	23	21	23	26	20	23	27	15	20	11	9
Sc	17	12	18	16	15	12	15	17	12	14	17	15	15	3.4	9.1
V	200	148	173	155	143	152	168	168	105	128	152	160	143	81	164
Ga	19	20	19	20	18	21	21	19	21	19	18	21	20	23	22
Cu	18	25	50	34	30	28	46	28	40	40	40	63	37	32	42
Zn	200	88	63	104	93	84	96	93	87	79	80	96	76	93	73
Ba	1200	1400	1100	1400	1400	1600	1200	1100	1100	1100	890	1400	850	3800	2300
Rb	55	90	56	66	130	37	46	42	35	45	33	37	26	190	250
Sr	870	880	1200	880	930	1800	1100	1000	930	980	690	1000	1200	3700	790
Zr	150	180	160	250	200	170	140	160	160	140	130	130	110	430	280
Y	22	19	20	30	25	18	16	17	14	13	17	13	15	24	22
Nb	11	15	16	26	31	11	8.4	7.8	7.5	6.1	5.1	6.8	4.6	130	44
U	3.2	3.1	2	2.4	2.9	1.5	1.4	1.6	0.71	1.6	1.4	1	1.5	11	5.1
Pb	11	11	9	12	14	11	8	9	6	12	7	9	10	51	25
Th	5.8	7.5	9.2	8.2	11	4.1	4.7	4.5	3.2	4.5	3	3.2	4	58	18
Hf	4.2	4.4	4.2	6.2	5.4	4.4	4	4	4	3.2	3	3.6	3.1	8.8	7.2
Ta	0.62	0.65	0.7	1.1	1.3	0.45	0.38	0.38	0.36	0.33	0.27	0.32	0.21	5.1	2.1
Be	1.3	1.8	1.6	1.8	1.8	1.5	1.1	1.2	1.1	1.1	0.8	1.1	0.8	4.9	3
Cs	1.2	1.1	0.5	0.42	3.2	0.35	0.85	0.64	0.37	0.81	0.8	1.6	2.2	7	2.6
Mo	1.2	2	1.6	2.3	3.3	1.8	1.9	2.1	0.6	1.7	1.7	1.3	0.6	1.2	0.9
Sn	1.1	1	0.8	1.6	2.3	2.4	1	1	1.7	0.8	1	1.6	0.8	1.4	2.2
Tl	0.29	0.32	0.1	0.3	0.58	0.19	0.1	0.2	0.08	0.24	0.2	0.16	0.5	0.28	1.1
La	31	42	50	59	68	57	32	35	30	27	20	28	29	264	65
Ce	64	82	98	110	130	120	68	76	65	54	42	59	60	390	120
Pr	8	9.5	11	13	14	15	8.3	9	7.7	6.4	5	7	7.6	39	14
Nd	32	37	43	50	51	60	34	36	31	26	20	29	31	120	50
Sm	6	6.3	7.1	8.7	8.2	8.4	5.8	5.7	5.2	4.7	4.1	5.1	5.4	16	8.4
Eu	1.6	1.6	1.9	2	2	2.2	1.6	1.5	1.5	1.3	1.2	1.4	1.4	3.6	2
Gd	4.9	4.9	5.2	6.9	6.2	5.3	4.1	4.2	4	3.4	3.5	3.6	3.8	8.2	5.9
Tb	0.71	0.64	0.71	0.95	0.87	0.66	0.53	0.55	0.49	0.43	0.52	0.45	0.49	0.98	0.76
Dy	3.9	3.3	3.7	5.2	4.6	3.2	2.8	3	2.6	2.3	2.9	2.5	2.6	4.5	3.9
Ho	0.73	0.6	0.69	1	0.84	0.56	0.52	0.59	0.47	0.44	0.57	0.44	0.48	0.75	0.72
Er	2	1.7	1.8	2.8	2.3	1.4	1.2	1.5	1.1	1.1	1.5	1.1	1.3	1.8	1.9
Tm	0.3	0.25	0.27	0.41	0.33	0.19	0.18	0.22	0.16	0.16	0.23	0.15	0.2	0.28	0.32
Lu	0.3	0.25	0.26	0.43	0.35	0.2	0.18	0.21	0.15	0.16	0.22	0.15	0.2	0.31	0.32
Yb	1.7	1.5	1.6	2.5	2.2	1.2	1.1	1.4	1	1	1.6	0.98	1.3	1.7	1.9

TABLE DR3 Eocene adakites from southern British Columbia.

Sample	adakite criteria	Princeton Group					westermost Kamloops Group						Penticton
		KB-99-22-2-1B	**KB-99-22-2-2B**	**KB-99-26-4-1**	**MVT-84-421-aB**	**DT-97-9-8-1B**	**BIL46**	**BIL47**	**BIL53**	**BIL55**	**BIL66**	**BIL87A**	**KB-99-14-2-3**
Locality		Friday Crk	Friday Crk	Merritt	Fig Lake	Friday Crk	Savona	Savona	Savona	Savona	Mt. Fehr	Cache Crk	Kelowna
Rock type		andesite	andesite	dacite	dacite	andesite	tr. and.	tr. and.	tr. and.	tr. and.	tr. and.	tr. and.	rhyolite
(zn) easting		*10 675549*	*10 675549*	*10 696823*	*10 649500*	*10 674484*	*10 652800*	*10 653000*	*10 651200*	*10 650800*	*10 644600*	*10 622500*	*11 308800*
northing		*5462945*	*5462445*	*5690845*	*5533000*	*5462232*	*5619400*	*5620200*	*5617300*	*5618200*	*5617000*	*5629700*	*5520500*
SiO_2 (wt %)	**> 56**	59.45	60.28	67.99	66.67	60.27	57.62	58.56	58.08	57.41	61.78	57.97	69.93
Al_2O_3	**> 15**	16.84	16.34	15.29	15.47	16.94	16.10	17.03	16.05	16.09	15.83	16.88	15.47
Na_2O	**> 3.5**	3.90	4.24	3.62	4.15	4.11	4.72	4.31	4.19	4.31	4.32	4.46	4.48
Sr (ppm)	**> 400**	1200	1200	940	720	1209	1800	1100	1000	930	1000	1000	1200
Y	**< 18**	15	15	6.2	9.1	14.8	18	16	17	14	11	13	17
Sr/Y	**> 40**	80	80	152	79	82	100	69	59	66	91	77	71
La (ppm)	**n.a.**	29	33	15	16	29	57	32	35	30	27	28	125
Yb	**< 1.9**	1.3	1.3	0.45	0.76	1.19	1.2	1.1	1.4	1.0	0.88	1.0	1.3
La/Yb	**> 20**	22	25	33	21	25	48	29	25	30	31	29	96

Adakite criteria from Defant and Kepezhinskas (2001). BIL samples collected by B.N. Church.

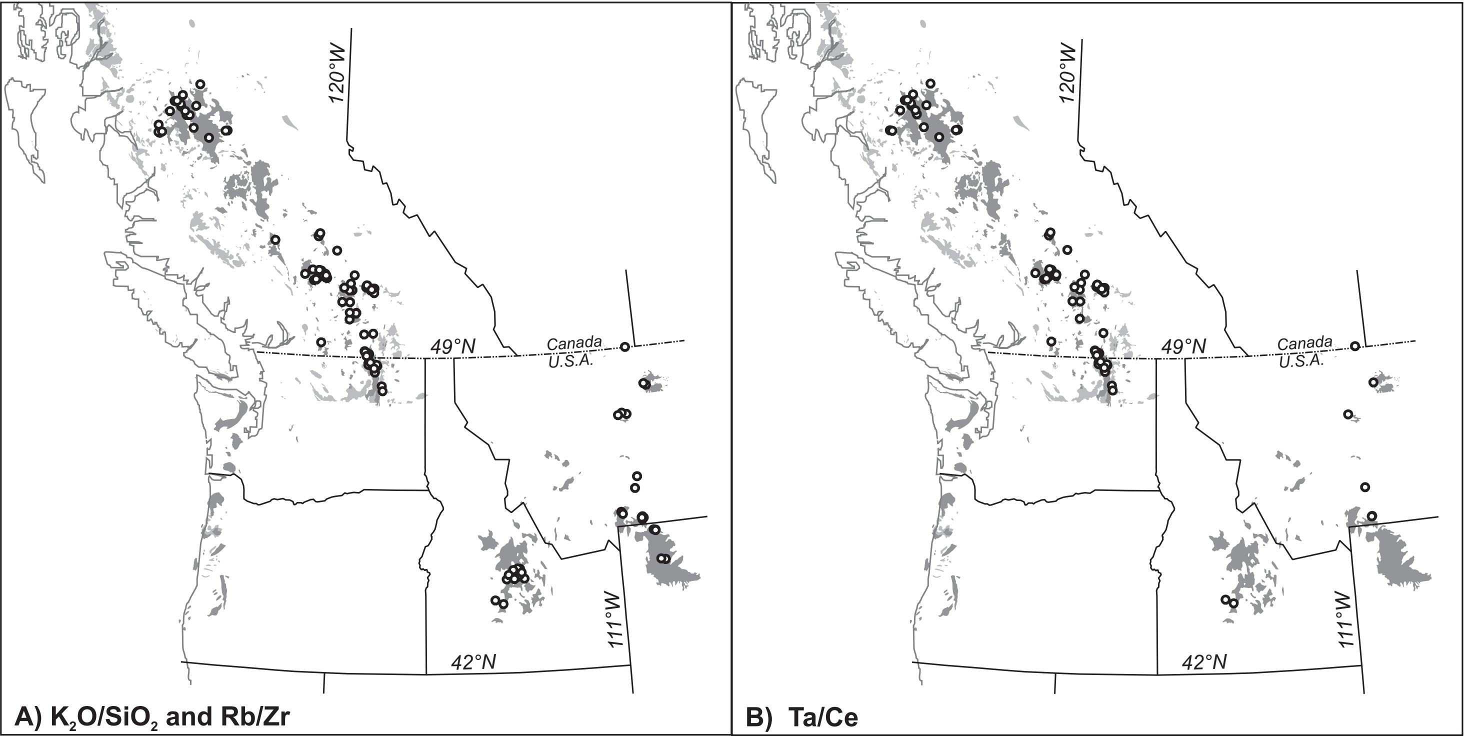

FIGURE DR2. Distribution of geochemical samples used to generate the contour diagrams in Figure 1.

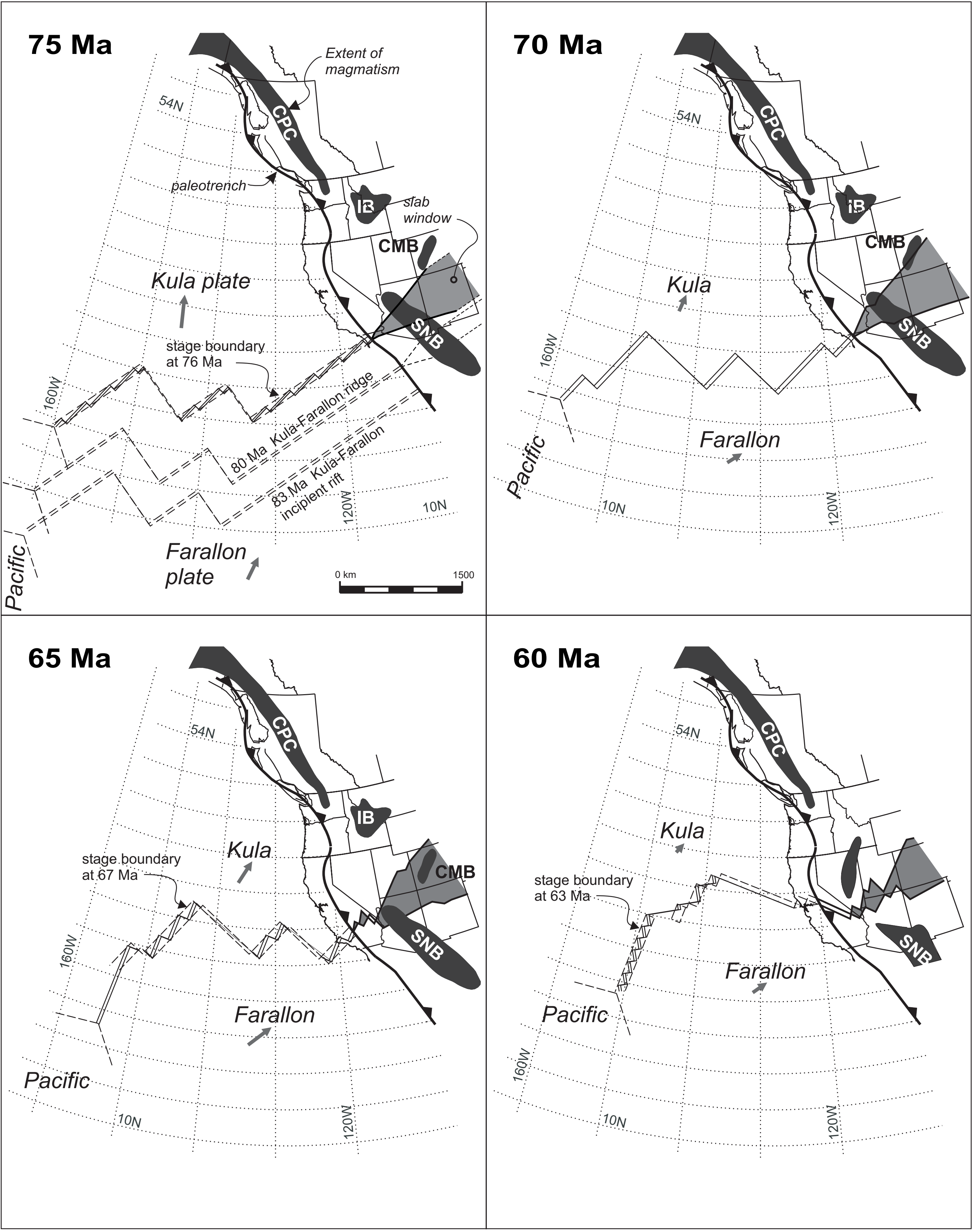

Figure DR3 Geometric model of the Kula-Farallon slab window (continues)

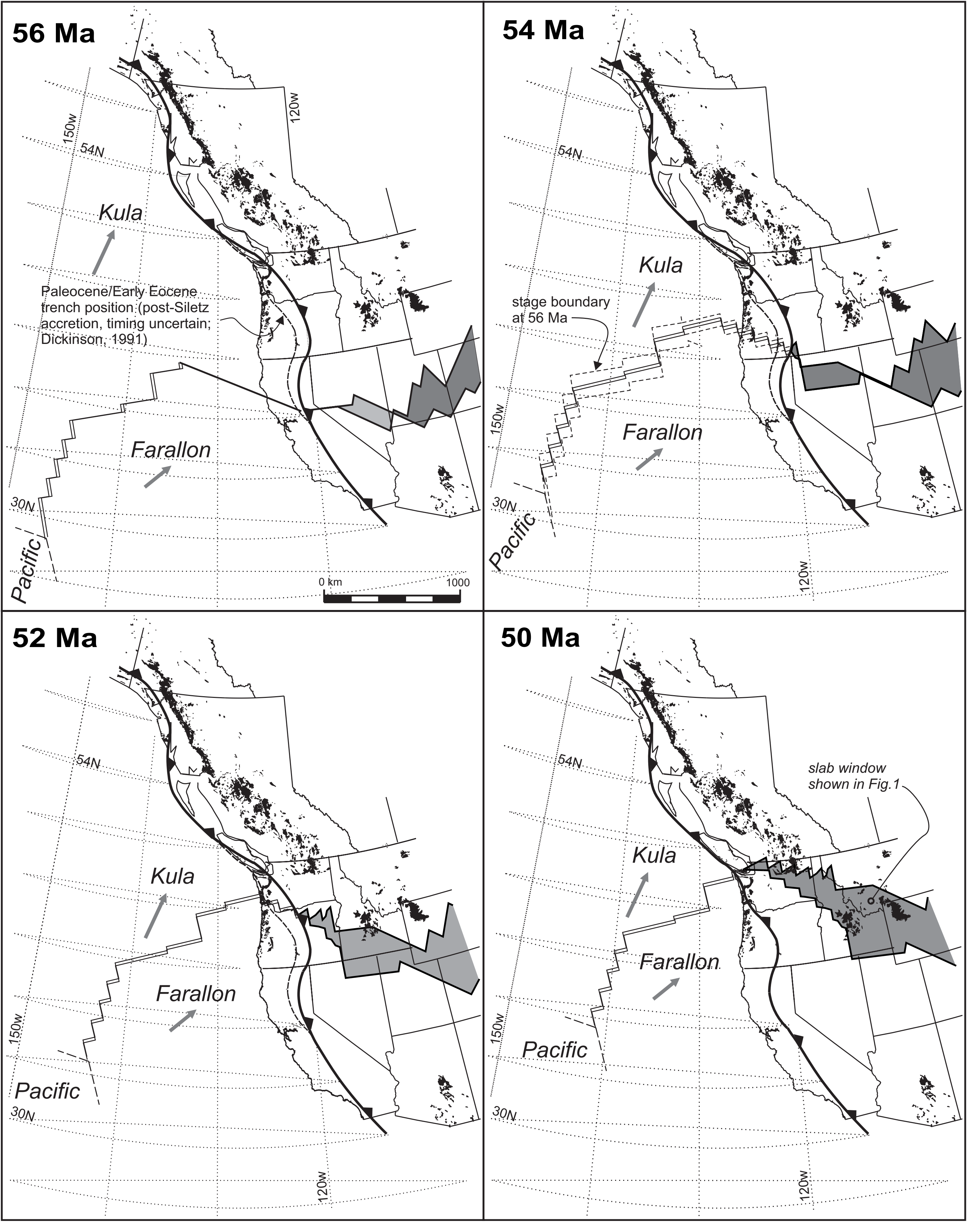

Figure DR3 Geometric model of the Kula-Farallon slab window (continued)