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Supplementary Materials for

Kinematics and dynamics of the East Pacific Rise linked to a stable, deep-mantle upwelling

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Published 23 December 2016, *Sci. Adv.* **2**, e1601107 (2016)
DOI: 10.1126/sciadv.1601107

The PDF file includes:

Supplementary Materials

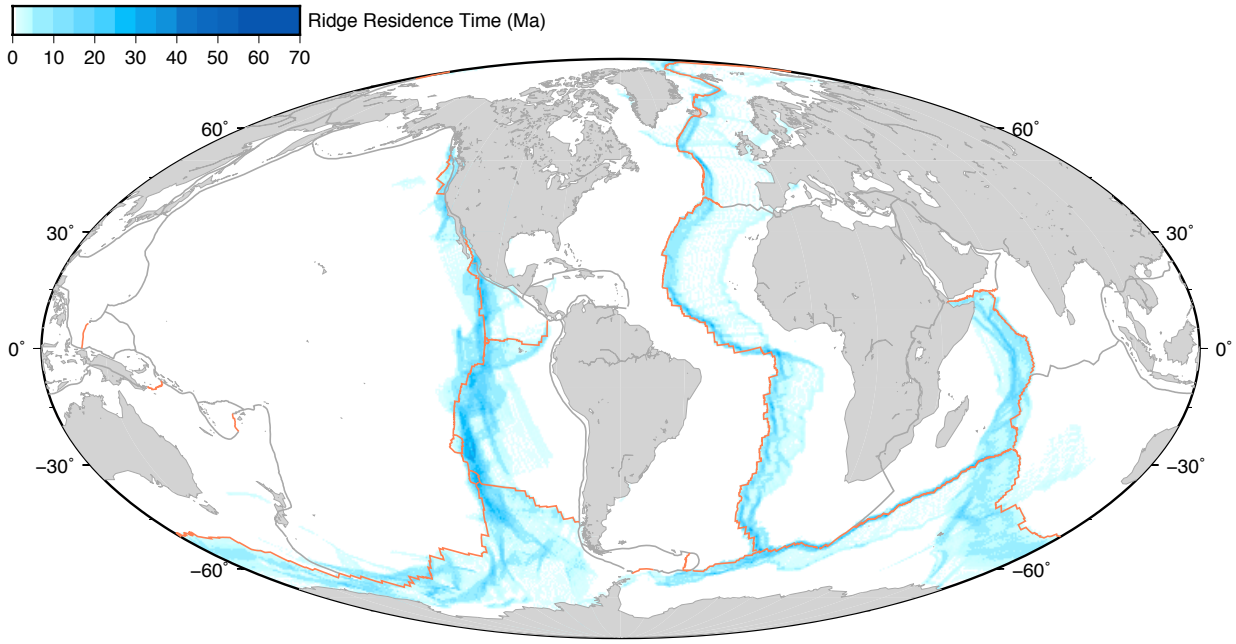

fig. S1. RRT in the NNR frame of reference from present to 50 Ma.

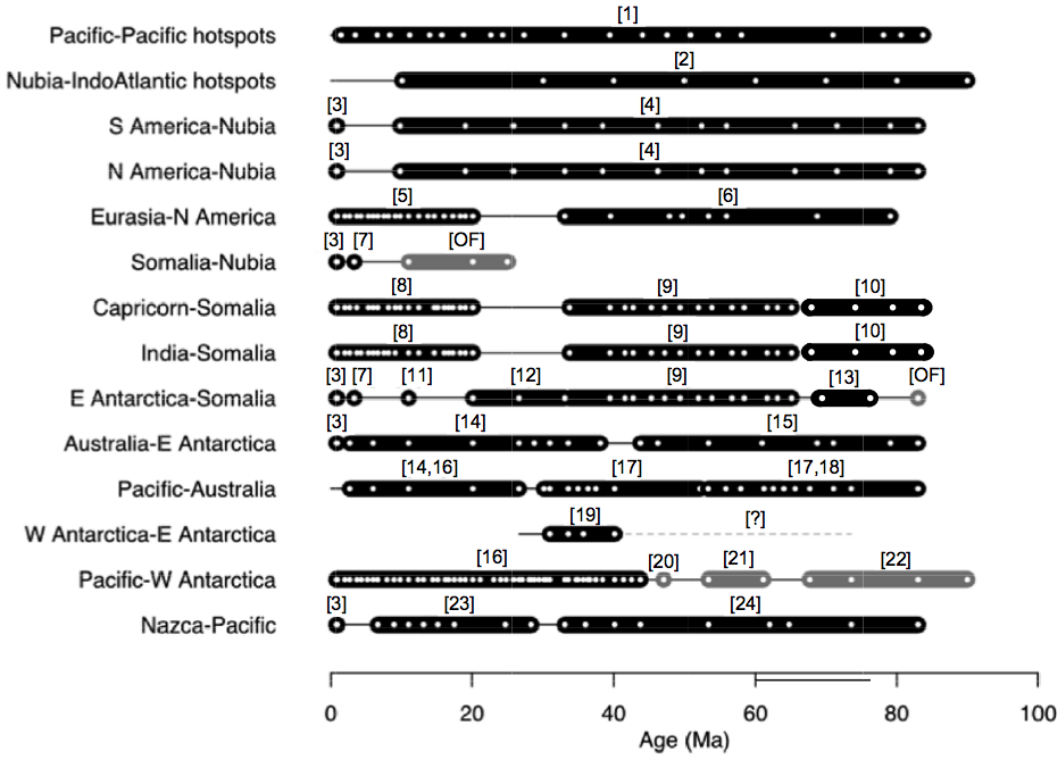

fig. S2. Data sources for ridge drift calculations. Black indicates poles have been published with covariance matrices, allowing rotation errors to be estimated; gray indicates no covariances are available, requiring covariances to be set at an arbitrarily low value (1E-15) during pole addition. OF = Own fit. References corresponding to numbers listed in the supplemental information table S2.

Pacific Basin Subduction Buoyancy Fluxes over past 78 Myr

We present the following results of this analysis for the Pacific plate (figs. S3a-c) and the Farallon plate and its progeny (Nazca, Cocos, Vancouver, and Juan de Fuca plates (figs. S3d-f). Figures S3a and S3d present the mean of the square root of age relative to length-weighted mean subduction rate for all subduction plate boundary pairs for all ages to 78 Ma. In these two figures each plate boundary between overriding plates (e.g. North America, Eurasia, Philippines, etc. relative to the Pacific plate, and North America, Caribbean, South America, etc. relative to the Farallon and derived plates) and subducting Pacific and Farallon plates are treated independently. Total effective subduction zone length as a function of age, and area-weighted mean of the square root of trench ages as a function of age versus length-weighted mean subduction rate are shown in figs. S3b and S3e along with Pacific and Farallon plate areas as a function of age. The subduction-related buoyancy proxy as a function of age versus length-weighted mean subduction rate for the Pacific and Farallon plates are shown in figs. S3c and S3f.

The primary observation that can be derived from this analysis is, based on these reconstructions of plate boundaries and plate ages over time, that the correlation between subduction-related buoyancy flux proxies and subduction rate, whether examined using plate boundary pairs of overriding relative to subducting plates (figs. S3a and S3d), or when aggregated relative to the subducting Pacific (fig. S3b, S3c) and Farallon plates (fig. S3d, S3e) is modest. The data particularly presented in figs. S3c and S3f show some correlation (~0.462) and (~0.254), for the Pacific and Farallon, respectively, for the subduction-related buoyancy flux proxy to the mean subduction rate. The absence of the expected correlation of the subduction-related buoyancy flux proxy to the subduction rate is certainly surprising given that our understanding of plate dynamics has been largely predicated on this expected correlation since the early 1970s (*1*, *3*). This supports the view that subduction buoyancy flux contributes to the plate driving force, but is not the only source of buoyancy driving plates, compelling an assessment of other potential contributors, independent of the kinematic observations related to the EPR

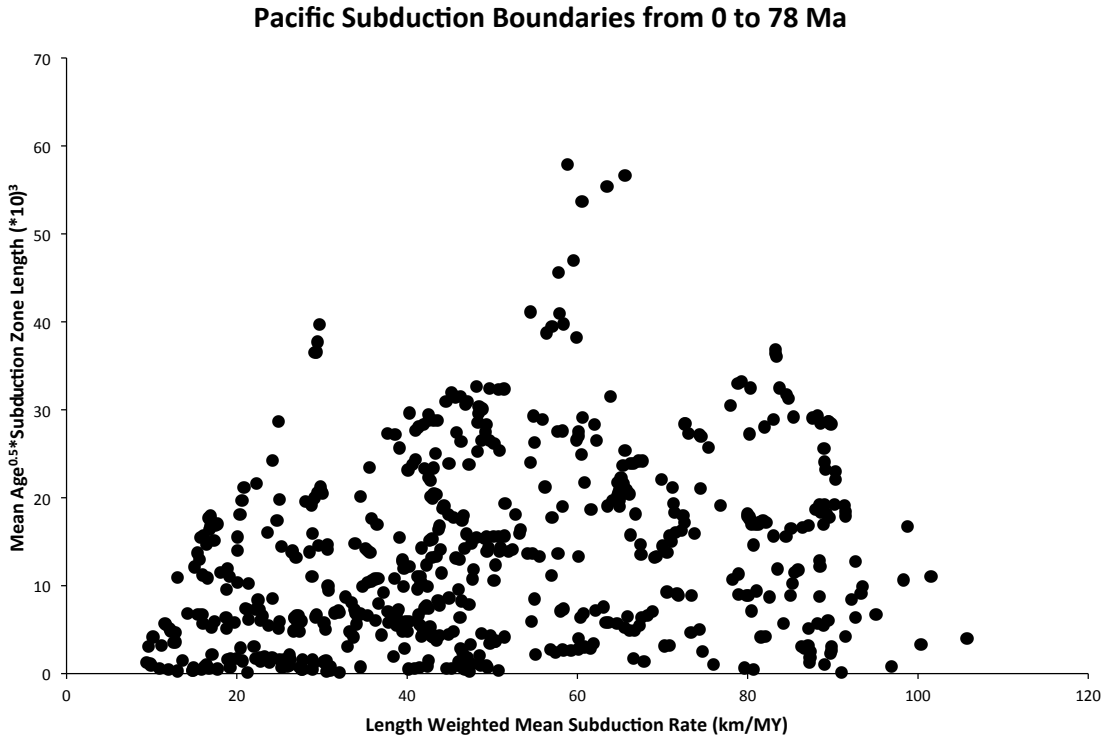

fig. S3a. Buoyancy flux proxy of the Pacific plate versus length-weighted mean subduction rate relative to all overriding plate boundaries from 0 to 78 Ma (n = 594).

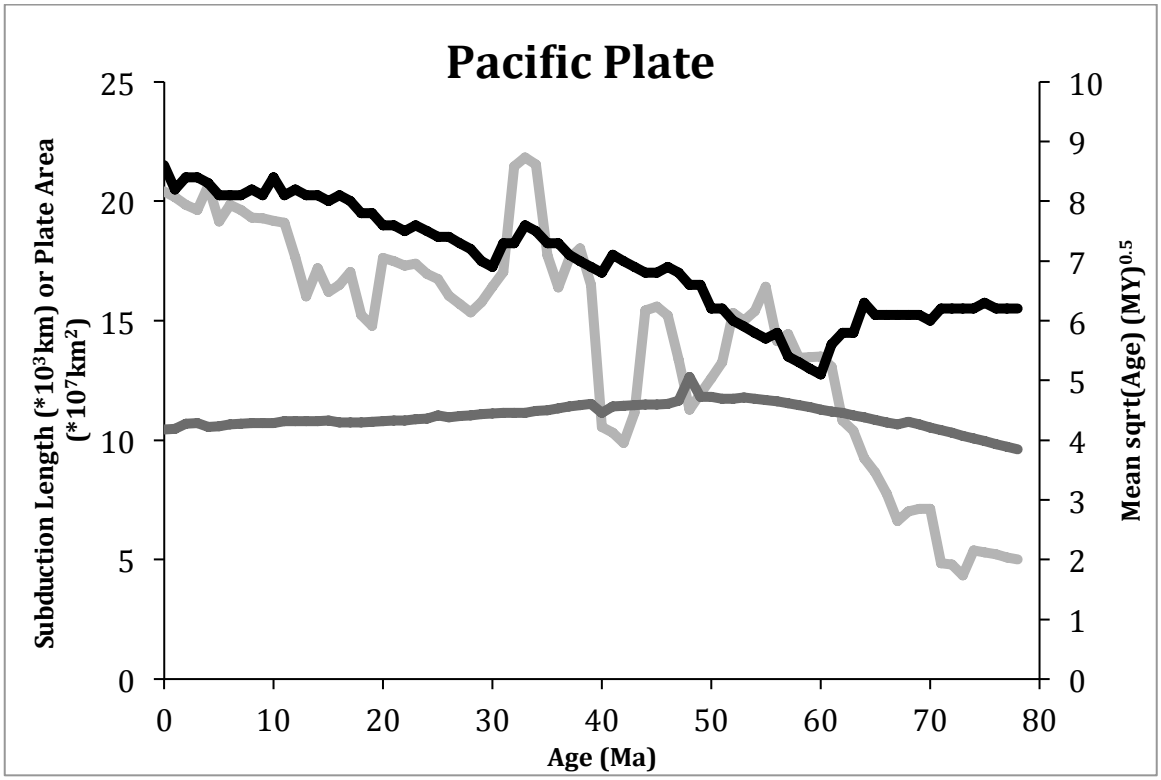

fig. S3b. Total Pacific plate effective subduction zone length (lighter gray), Pacific plate area (medium gray) and area-weighted mean square root of age of subducting Pacific plate (black) as a function age from 0 to 78 Ma.

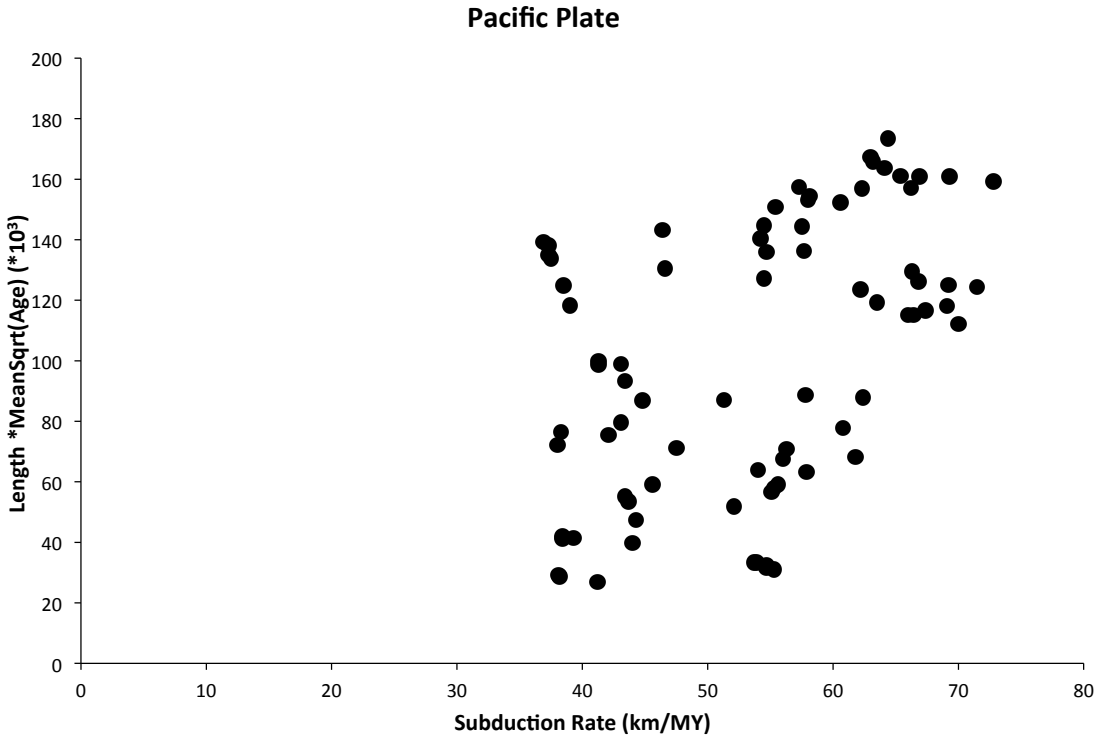

fig. S3c. Pacific plate subduction-related buoyancy flux proxy relative to length-weighted mean subduction rate from 0 to 78 Ma.

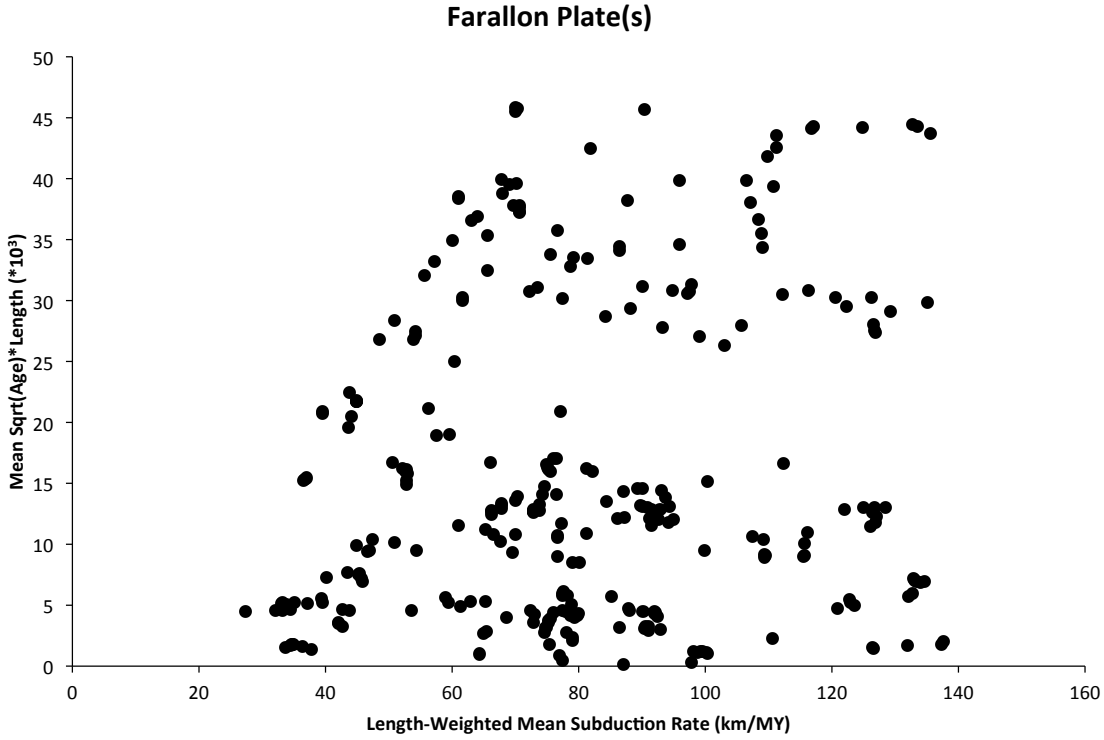

fig. S3d. Buoyancy flux proxy of the Farallon+Nazca+Cocos+Juan de Fuca/Vancouver plates relative to length-weighted mean subduction rate at all overriding plate boundaries from 0 to 78 Ma (n = 299).

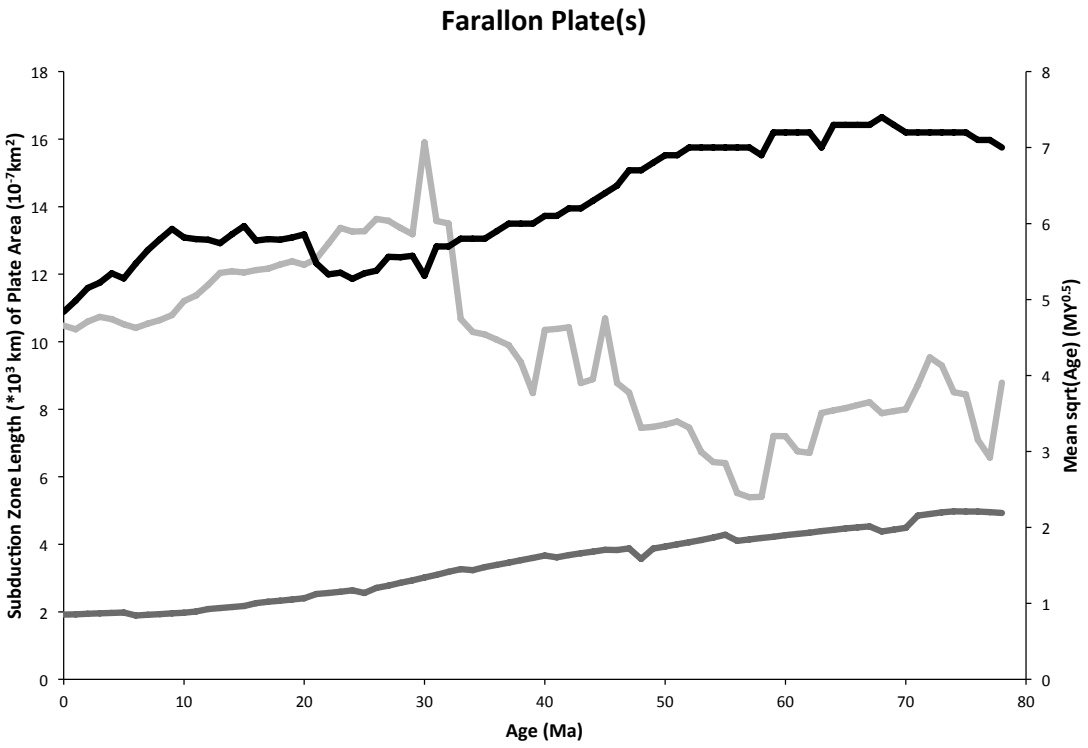

fig. S3e. Total Farallon+Nazca+Cocos+Juan de Fuca/Vancouver effective subduction zone length (lighter gray), plate area (medium gray) and area-weighted mean square root of the age of subducting Farallon plate(s) (black) as a function age from 0 to 78 Ma.

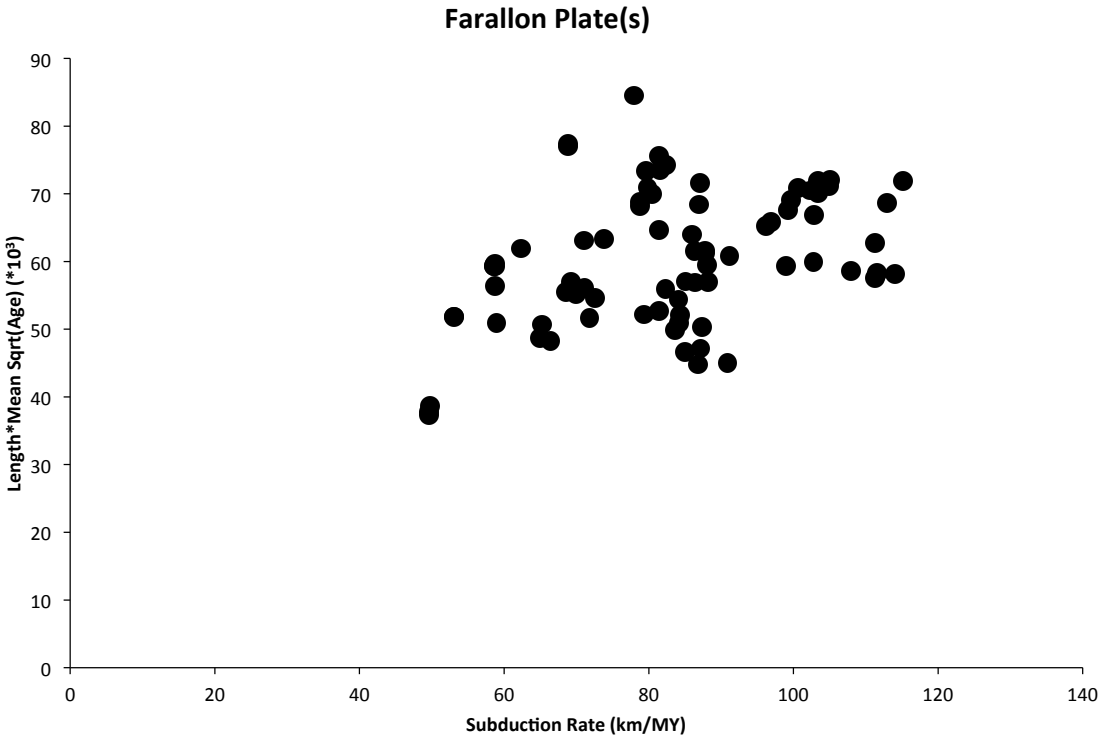

fig. S3f. Total Farallon+Nazca+Cocos+Juan de Fuca/Vancouver plate(s) subduction-related buoyancy flux proxy relative to length-weighted mean subduction rate present to 78 Ma.

table S1. Rotation poles and associated covariance parameters used in our reconstructions.

Chron	Ma	Lat. (°)	Long. (°)	Angle (°)	k	a	b	c	d	e	f	Source	Source Table#
Pacific-Pacific Hotspots													
-	1.31	57.17	-52.72	1.70	1	1.16E-05	-2.09E-06	1.79E-05	4.06E-05	-5.22E-05	1.20E-04	(*22*)	
-	3.36	59.65	-70.92	3.40	1	3.29E-05	-6.56E-06	7.70E-06	2.16E-05	-1.56E-05	2.45E-05	(*22*)	
-	6.48	59.22	-65.62	6.00	1	3.66E-05	-8.71E-06	2.49E-05	3.64E-05	-4.93E-05	9.39E-05	(*22*)	
-	8.27	60.05	-68.92	7.60	1	3.76E-05	1.32E-05	-1.11E-06	2.82E-05	-1.44E-05	5.46E-05	(*22*)	
-	11.11	63.87	-68.82	10.00	1	2.54E-05	1.26E-05	7.64E-06	3.16E-05	-1.91E-05	6.66E-05	(*22*)	
-	13.95	67.58	-60.80	12.40	1	4.21E-05	-1.66E-06	7.54E-06	1.07E-04	-2.97E-05	4.68E-05	(*22*)	
-	15.67	66.15	-62.55	13.90	1	5.95E-05	3.22E-05	9.93E-06	1.04E-04	-2.36E-05	1.01E-04	(*22*)	
-	18.76	68.43	-62.57	16.60	1	2.75E-04	2.42E-04	-2.09E-04	2.83E-04	-2.21E-04	4.21E-04	(*22*)	
-	22.66	69.65	-66.55	20.00	1	2.10E-04	9.96E-05	6.91E-05	6.43E-05	2.11E-05	1.17E-04	(*22*)	
-	24.35	69.75	-64.23	21.50	1	4.01E-04	3.73E-04	-4.23E-05	3.87E-04	-4.70E-05	3.07E-05	(*22*)	
-	27.28	67.52	-70.43	24.00	1	1.16E-04	4.06E-05	6.88E-05	5.22E-05	5.22E-06	8.43E-05	(*22*)	
-	33	66.53	-68.75	27.00	1	5.99E-05	2.70E-06	1.46E-05	5.70E-05	-5.52E-05	1.00E-04	(*22*)	
-	39.44	66.17	-65.62	30.20	1	3.35E-05	8.23E-06	-2.62E-06	1.81E-05	-2.25E-06	6.35E-06	(*22*)	
-	44.08	65.55	-64.52	32.50	1	6.86E-05	-1.13E-05	1.79E-05	1.06E-05	-1.56E-05	3.69E-05	(*22*)	
-	47.56	63.80	-66.33	34.30	1	9.24E-05	7.79E-05	-3.29E-05	1.81E-04	-7.69E-05	5.48E-05	(*22*)	
-	50.8	61.27	-68.77	35.90	1	1.13E-04	1.24E-04	-7.83E-06	3.06E-04	-3.63E-05	2.29E-05	(*22*)	
-	54.7	57.57	-71.87	37.80	1	6.26E-05	1.70E-05	9.31E-06	1.87E-04	-4.62E-05	3.10E-05	(*22*)	
-	58	55.38	-73.55	39.50	1	9.39E-05	8.04E-05	-1.14E-05	1.62E-04	-2.72E-05	1.47E-05	(*22*)	
-	71	51.08	-76.32	42.40	1	5.61E-05	2.75E-05	-8.01E-06	1.47E-04	-2.05E-05	1.50E-05	(*22*)	
-	78.1	50.30	-79.45	44.30	1	1.67E-04	3.81E-05	-9.38E-05	4.34E-05	-2.30E-05	6.11E-05	(*22*)	
-	80.6	48.48	-80.73	46.00	1	4.91E-04	-1.61E-05	-2.88E-04	6.82E-05	-1.15E-05	1.83E-04	(*22*)	
-	83.7	47.48	-81.02	48.00	1	5.44E-04	-4.28E-05	-8.50E-05	7.96E-05	-4.63E-05	5.87E-05	(*22*)	
Nubia-Indo-Atlantic hotspots													
-	10	57.73	-51.26	-1.36	3.3	9.49E-05	-6.07E-06	1.08E-05	2.89E-05	-2.43E-05	6.98E-05	(*21*)	Aux. Material
-	30	49.42	-61.90	-5.80	3.17	8.15E-05	2.58E-05	-6.80E-06	8.77E-05	-5.86E-05	8.69E-05	(*21*)	Aux. Material
-	40	44.56	-55.74	-7.42	0.73	7.16E-04	-5.47E-05	-2.88E-04	1.50E-04	-4.90E-05	2.71E-04	(*21*)	Aux. Material
-	50	8.84	-34.84	-12.43	0.83	6.78E-04	3.61E-05	-3.59E-04	1.57E-04	-1.06E-04	3.45E-04	(*21*)	Aux. Material

-	60	14.24	-40.32	-13.73	2.08	1.47E-03	3.64E-04	-5.43E-04	7.01E-04	-2.72E-04	5.51E-04	(*21*)	Aux. Material
-	70	26.52	-47.46	-14.60	0.65	8.45E-04	1.29E-04	-3.33E-04	2.79E-04	-1.23E-04	4.43E-04	(*21*)	Aux. Material
-	80	26.85	-46.92	-17.71	0.47	7.83E-04	1.44E-04	-3.50E-04	2.77E-04	-1.35E-04	3.47E-04	(*21*)	Aux. Material
-	90	7.24	-33.73	-22.75	0.69	6.15E-04	5.43E-05	-1.45E-04	1.75E-04	-2.25E-04	6.15E-04	(*21*)	Aux. Material
South Mid-Atlantic Ridge (South America-Nubia)													
1no	0.78	60.90	-39.00	0.23	1	1.33E-09	-4.68E-10	0.00E+00	5.46E-10	-3.12E-10	2.50E-09	(*34*)	1
5n.1ny	9.74	62.05	-40.59	3.18	0.71	2.72E-04	-7.07E-05	-2.04E-04	3.18E-05	5.49E-05	1.67E-04	(*77*)	1b & 2b
6ny	19.05	58.77	-37.32	7.05	1.1	2.09E-04	-4.35E-05	-1.31E-04	1.97E-05	2.80E-05	9.42E-05	(*77*)	1b & 2b
8n.1ny	25.82	57.59	-36.27	9.96	0.85	6.33E-04	-2.07E-04	-3.59E-04	8.13E-05	1.16E-04	2.33E-04	(*77*)	1b & 2b
13ny	33.06	56.17	-33.64	13.41	0.67	9.53E-05	-2.39E-05	-5.37E-05	2.12E-05	1.68E-05	3.77E-05	(*77*)	1b & 2b
18n.1ny	38.43	57.10	-33.00	15.91	1.44	3.17E-04	-1.21E-04	-1.84E-04	5.77E-05	7.12E-05	1.27E-04	(*77*)	1b & 2b
21ny	46.26	56.95	-31.15	19.11	0.89	1.12E-04	-3.96E-05	-6.41E-05	2.55E-05	2.53E-05	4.33E-05	(*77*)	1b & 2b
24n.1ny	52.36	58.89	-31.18	21.38	0.87	2.51E-04	-1.10E-04	-1.17E-04	6.07E-05	5.35E-05	6.72E-05	(*77*)	1b & 2b
25ny	55.9	61.35	-32.21	22.27	1.01	2.51E-04	-1.16E-04	-1.33E-04	7.34E-05	6.68E-05	8.14E-05	(*77*)	1b & 2b
30ny	65.58	63.88	-33.61	24.76	1.74	1.50E-04	-6.99E-05	-8.17E-05	5.21E-05	4.32E-05	5.36E-05	(*77*)	1b & 2b
32n.2ny	71.59	63.41	-33.38	26.57	1.16	3.02E-04	-1.40E-04	-1.67E-04	9.70E-05	8.33E-05	1.02E-04	(*77*)	1b & 2b
33no	79.08	62.92	-34.36	30.99	1.74	9.25E-05	-2.90E-05	-4.70E-05	3.49E-05	2.51E-05	3.35E-05	(*77*)	1b & 2b
34ny	83	61.88	-34.26	33.51	0.97	8.71E-05	-4.33E-05	-4.97E-05	4.01E-05	3.23E-05	3.65E-05	(*77*)	1b & 2b
Central Mid-Atlantic Ridge (North America-Nubia)													
1no	0.78	79.20	40.20	0.18	1	7.41E-09	-5.77E-09	4.29E-09	5.93E-09	-3.35E-09	5.15E-09	(*34*)	1
5n.1ny	9.74	80.98	22.82	2.48	2.46	4.72E-05	-4.05E-05	2.79E-05	4.35E-05	-2.90E-05	2.06E-05	(*77*)	1b & 2b
6ny	19.05	80.89	23.28	5.24	1.96	6.13E-05	-4.97E-05	3.56E-05	5.20E-05	-3.59E-05	2.68E-05	(*77*)	1b & 2b
8n.1ny	25.82	79.34	28.56	7.04	2.53	1.71E-04	-1.71E-04	1.24E-04	1.96E-04	-1.41E-04	1.04E-04	(*77*)	1b & 2b
13ny	33.06	75.99	5.98	9.77	1.19	8.32E-05	-8.47E-05	5.97E-05	1.03E-04	-7.14E-05	5.21E-05	(*77*)	1b & 2b
18n1ny	38.43	74.54	0.19	11.92	1.65	1.98E-04	-2.08E-04	1.43E-04	2.41E-04	-1.64E-04	1.16E-04	(*77*)	1b & 2b
21ny	46.26	74.23	-5.01	15.11	1.19	1.80E-04	-2.03E-04	1.36E-04	2.68E-04	-1.80E-04	1.26E-04	(*77*)	1b & 2b
24n.1ny	52.36	77.34	-1.61	16.96	3.08	2.65E-04	-3.13E-04	2.07E-04	4.05E-04	-2.67E-04	1.80E-04	(*77*)	1b & 2b
25ny	55.9	80.64	6.57	17.90	1.26	1.19E-04	-1.36E-04	8.64E-05	1.87E-04	-1.18E-04	7.87E-05	(*77*)	1b & 2b
30ny	65.58	82.74	2.93	20.84	1.07	9.12E-05	-1.07E-04	6.64E-05	1.58E-04	-9.83E-05	6.45E-05	(*77*)	1b & 2b

32n.2ny	71.59	81.35	-8.32	22.75	1.33	1.23E-04	-1.62E-04	9.70E-05	2.42E-04	-1.46E-04	9.10E-05	(*77*)	1b & 2b
33no	79.08	78.64	-18.16	26.98	1.85	4.09E-05	-4.02E-05	2.34E-05	5.73E-05	-3.48E-05	2.38E-05	(*77*)	1b & 2b
34ny	83	76.81	-20.59	29.51	1.82	6.20E-05	-4.83E-05	2.47E-05	6.96E-05	-4.29E-05	3.07E-05	(*77*)	1b & 2b
North Mid-Atlantic Ridge (Eurasia-North America)													
1no	0.78	66.89	137.20	-0.20	1	1.41E-07	-7.40E-08	2.47E-07	4.20E-08	-1.30E-07	4.82E-07	(*78*)	2
2nm	1.86	62.20	138.79	-0.39	1	8.70E-08	-4.50E-08	1.65E-07	3.50E-08	-7.80E-08	3.45E-07	(*78*)	2
2An.1ny	2.58	63.63	137.44	-0.56	1	4.90E-08	6.00E-09	5.10E-08	5.10E-08	-7.70E-08	2.11E-07	(*78*)	2
2An.3no	3.58	61.84	139.00	-0.76	1	1.89E-07	2.20E-08	1.74E-07	1.08E-07	-1.07E-07	3.59E-07	(*78*)	2
3n.1ny	4.18	63.83	135.81	-0.89	1	3.04E-07	1.30E-08	2.50E-07	1.08E-07	-1.71E-07	5.64E-07	(*78*)	2
3n.4no	5.23	61.10	137.88	-1.09	1	2.58E-07	-1.00E-08	3.24E-07	2.01E-07	-2.84E-07	8.55E-07	(*78*)	2
3An.1ny	5.89	63.29	135.33	-1.26	1	1.27E-07	-1.70E-08	1.79E-07	1.30E-07	-2.13E-07	5.78E-07	(*78*)	2
3An.2no	6.57	65.73	134.86	-1.46	1	5.17E-07	-1.15E-07	7.70E-07	3.34E-07	-6.75E-07	2.08E-06	(*78*)	2
4n.1ny	7.43	63.21	137.88	-1.59	1	2.95E-07	-5.10E-08	4.33E-07	2.71E-07	-4.92E-07	1.39E-06	(*78*)	2
4n.2no	8.07	64.43	137.29	-1.78	1	4.85E-07	-4.60E-08	5.93E-07	3.82E-07	-7.04E-07	1.93E-06	(*78*)	2
4Ano	9.03	64.86	135.65	-2.05	1	7.58E-07	-1.46E-07	1.00E-06	8.29E-07	-1.61E-06	3.94E-06	(*78*)	2
5n.1ny	9.74	66.10	137.62	-2.27	1	2.65E-06	4.27E-07	2.01E-06	1.12E-06	-1.27E-06	4.22E-06	(*78*)	2
5n.2no	10.95	67.75	133.17	-2.62	1	8.14E-07	-1.25E-07	1.00E-06	5.35E-07	-1.07E-06	2.98E-06	(*78*)	2
5An.2o	12.4	67.19	133.86	-2.99	1	9.29E-06	1.90E-07	8.35E-06	1.70E-06	-2.61E-06	1.24E-05	(*78*)	2
5Any	13.7	67.39	132.58	-3.35	1	3.26E-05	-7.56E-06	4.37E-05	2.54E-06	-1.14E-05	6.08E-05	(*78*)	2
5ADno	14.61	69.50	127.69	-3.69	1	1.19E-04	-2.54E-05	1.51E-04	8.39E-06	-3.71E-05	2.00E-04	(*78*)	2
5n.1ny	16.01	67.97	133.21	-4.02	1	1.37E-05	-1.21E-06	1.47E-05	1.98E-06	-4.31E-06	2.10E-05	(*78*)	2
5Dny	17.23	68.85	129.75	-4.39	1	1.00E-05	-1.30E-06	1.27E-05	7.59E-07	-2.40E-06	1.72E-05	(*78*)	2
5Eny	18.28	70.16	129.10	-4.71	1	1.24E-05	-3.27E-06	1.78E-05	1.16E-06	-5.18E-06	2.66E-05	(*78*)	2
6ny	19.05	72.12	126.70	-5.05	1	3.41E-05	-1.85E-06	4.17E-05	4.76E-06	-7.17E-06	5.67E-05	(*78*)	2
6no	20.13	68.62	131.76	-5.03	1	6.16E-06	-7.42E-07	7.17E-06	5.08E-07	-1.56E-06	9.64E-06	(*78*)	2
13ny	33.06	68.22	131.53	-7.65	1.56	8.39E-08	1.84E-08	7.40E-08	5.81E-08	-7.53E-08	3.24E-07	(*79*)	1a & b
18n.1no	39.55	67.72	133.91	-9.25	2.52	1.38E-07	1.75E-07	5.51E-08	4.41E-07	-1.01E-07	3.69E-07	(*79*)	1a & b
21no	47.91	65.38	138.44	-10.96	0.74	9.52E-08	2.43E-08	1.03E-07	9.25E-08	-2.76E-08	2.63E-07	(*79*)	1a & b
22no	49.71	64.52	138.18	-11.50	1.06	1.37E-07	1.26E-07	9.91E-08	3.24E-07	-3.50E-08	3.03E-07	(*79*)	1a & b
24n.3no	53.35	63.07	144.26	-12.82	0.84	1.48E-07	9.96E-08	1.97E-07	3.42E-07	9.63E-08	4.16E-07	(*79*)	1a & b

25ny	55.9	56.17	145.06	-13.24	0.89	5.29E-06	-2.42E-06	6.57E-06	1.29E-06	-3.02E-06	8.25E-06	(*79*)	1a & b
31no	68.74	54.45	147.06	-15.86	1.04	6.65E-06	-2.69E-06	7.95E-06	1.34E-06	-3.21E-06	9.59E-06	(*79*)	1a & b
33no	79.08	63.40	147.75	-18.48	1	4.39E-06	-1.66E-06	5.14E-06	8.57E-07	-1.93E-06	6.09E-06	(*79*)	1a & b
East African Rift (Somalia-Nubia)													
1no	0.78	-35.30	33.80	0.06	1	4.60E-09	1.25E-09	-2.73E-09	6.32E-09	1.01E-09	5.15E-09	(*34*)	1
2A.2no	3.22	-44.70	2.80	0.27	1	4.29E-09	1.26E-09	-5.01E-09	1.62E-09	-1.44E-09	7.19E-09	(*80*)	6 &7
5n.2no	10.95	-27.40	43.28	0.40	1								This Paper
6no	20.13	-27.40	43.28	0.80	1								This Paper
7.2nm	25.01	-27.40	43.28	1.00	1								This Paper
34ny	83	-27.40	43.28	1.00	1								This Paper
Central East Indian Ridge (Capricorn-Somalia)													
1no	0.78	-11.66	-128.78	0.54	1	1.03E-06	1.20E-06	-8.65E-07	2.22E-06	-1.11E-06	7.65E-07	(*81*)	DR1
2ny	1.77	-10.92	-130.82	1.18	1	2.34E-06	1.97E-06	-1.76E-06	3.15E-06	-1.65E-06	1.39E-06	(*81*)	DR1
2An.1ny	2.58	-11.28	-131.29	1.69	1	1.28E-06	1.59E-06	-9.73E-07	2.85E-06	-1.28E-06	7.87E-07	(*81*)	DR1
2An.3no	3.58	-13.71	-130.38	2.24	1	1.94E-06	1.73E-06	-1.55E-06	3.02E-06	-1.40E-06	1.28E-06	(*81*)	DR1
3n.4no	5.23	-10.49	-130.96	3.40	1	2.80E-06	3.42E-06	-2.22E-06	6.27E-06	-2.75E-06	1.87E-06	(*81*)	DR1
3An.1ny	5.89	-12.64	-131.18	3.69	1	4.93E-06	5.97E-06	-3.93E-06	9.46E-06	-4.91E-06	3.25E-06	(*81*)	DR1
3An.2no	6.57	-11.98	-130.89	4.20	1	8.16E-06	9.65E-06	-6.72E-06	1.31E-05	-8.05E-06	5.63E-06	(*81*)	DR1
4n.2no	8.07	-11.62	-130.26	5.11	1	3.83E-06	3.70E-06	-3.47E-06	5.19E-06	-3.38E-06	3.21E-06	(*81*)	DR1
4Ano	9.03	-13.95	-131.80	5.29	1	6.41E-06	8.79E-06	-5.03E-06	1.55E-05	-7.08E-06	4.11E-06	(*81*)	DR1
5n.1ny	9.74	-12.33	-132.30	5.78	1	1.76E-05	2.91E-05	-1.20E-05	5.37E-05	-1.97E-05	8.44E-06	(*81*)	DR1
5n.2no	10.95	-13.99	-133.16	6.26	1	7.52E-06	9.54E-06	-5.65E-06	2.10E-05	-7.27E-06	4.47E-06	(*81*)	DR1
5An.2no	12.4	-14.23	-134.19	6.98	1	5.64E-06	7.96E-06	-4.08E-06	2.18E-05	-5.56E-06	3.22E-06	(*81*)	DR1
5ADno	14.61	-16.06	-135.53	7.83	1	1.33E-05	2.72E-05	-9.13E-06	6.47E-05	-1.83E-05	6.81E-06	(*81*)	DR1
5Bn.2	15.16	-16.73	-136.02	8.01	1	1.77E-05	3.55E-05	-1.28E-05	8.61E-05	-2.45E-05	1.00E-05	(*81*)	DR1
5Cn.1ny	16.01	-15.14	-135.08	8.93	1	5.89E-06	1.01E-05	-4.25E-06	2.26E-05	-6.94E-06	3.36E-06	(*81*)	DR1
5Cn.3ny	16.56	-15.66	-135.52	9.33	1	3.71E-06	7.21E-06	-2.54E-06	1.78E-05	-4.76E-06	1.95E-06	(*81*)	DR1
5Dny	17.23	-16.24	-136.08	9.54	1	6.40E-06	1.41E-05	-3.99E-06	3.50E-05	-8.49E-06	2.79E-06	(*81*)	DR1
5Eny	18.28	-16.08	-135.67	10.19	1	7.02E-06	1.35E-05	-4.63E-06	3.16E-05	-8.56E-06	3.35E-06	(*81*)	DR1

6ny	19.05	-17.38	-136.67	10.31	1	1.43E-05	2.44E-05	-9.70E-06	5.31E-05	-1.61E-05	7.03E-06	(*81*)	DR1
6no	20.13	-17.29	-136.75	10.90	1	5.15E-06	1.10E-05	-3.47E-06	2.94E-05	-7.10E-06	2.56E-06	(*81*)	DR1
13no	33.55	-16.32	-132.31	18.93	0.59	8.90E-07	2.66E-06	-8.66E-07	8.79E-06	-2.80E-06	9.62E-07	(*82*)	2 ('basic')[a]
18n.2no	40.13	-16.76	-131.58	22.22	0.63	2.11E-06	7.20E-06	-2.05E-06	2.60E-05	-7.29E-06	2.14E-06	(*82*)	2 ('basic')[a]
20ny	42.54	-17.24	-132.14	23.12	0.93	4.95E-07	1.42E-06	-4.11E-07	4.52E-06	-1.30E-06	4.85E-07	(*82*)	5 ('all')[a]
20no	43.79	-17.71	-132.64	23.50	0.78	3.31E-07	1.08E-06	-3.59E-07	3.94E-06	-1.20E-06	5.34E-07	(*82*)	5 ('all')[a]
21ny	46.26	-17.06	-133.30	24.69	0.55	2.38E-07	5.98E-07	-1.82E-07	1.82E-06	-4.83E-07	2.74E-07	(*82*)	5 ('all')[a]
21no	47.91	-17.03	-134.13	25.74	1.86	2.51E-07	7.17E-07	-2.26E-07	2.35E-06	-6.63E-07	3.59E-07	(*82*)	5 ('all')[a]
22no	49.71	-17.22	-136.65	26.87	1.4	4.87E-07	1.64E-06	-4.45E-07	5.99E-06	-1.58E-06	5.81E-07	(*82*)	5 ('all')[a]
23n.2no	51.74	-15.72	-138.50	29.55	0.74	7.87E-07	2.96E-06	-7.36E-07	1.16E-05	-2.85E-06	8.46E-07	(*82*)	3 (with SWIR)[a]
24n.3no	53.35	-15.65	-141.06	31.40	0.72	1.12E-06	4.30E-06	-9.77E-07	1.72E-05	-3.81E-06	1.03E-06	(*82*)	3 (with SWIR)[a]
25ny	55.9	-15.71	-144.32	34.05	0.52	2.10E-06	8.13E-06	-1.53E-06	3.27E-05	-6.04E-06	1.33E-06	(*82*)	3 (with SWIR)[a]
26ny	57.55	-14.95	-145.15	36.37	1.35	2.80E-06	1.14E-05	-2.02E-06	4.82E-05	-8.52E-06	1.71E-06	(*82*)	3 (with SWIR)[a]
27ny	60.92	-13.35	-146.15	40.64	1.15	2.98E-06	1.21E-05	-1.78E-06	5.08E-05	-7.44E-06	1.32E-06	(*82*)	3 (with SWIR)[a]
28ny	62.5	-12.86	-146.60	42.71	0.66	7.50E-06	3.00E-05	-3.91E-06	1.22E-04	-1.59E-05	2.28E-06	(*82*)	3 (with SWIR)[a]
29no	64.75	-13.72	-149.94	44.76	0.53	1.15E-06	4.89E-06	-4.85E-07	2.24E-05	-2.17E-06	3.81E-07	(*82*)	3 (with SWIR)[a]
Carlsberg Ridge (India-Somalia)													
1no	0.78	19.57	27.97	-0.35	1	1.99E-06	3.41E-06	1.86E-09	6.82E-06	6.01E-07	4.67E-07	(*81*)	DR2
2ny	1.77	21.59	30.83	-0.76	1	4.26E-07	6.51E-07	-4.44E-08	1.32E-06	1.74E-07	2.11E-07	(*81*)	DR2
2An.1ny	2.58	22.48	30.60	-1.07	1	2.94E-06	4.33E-06	-6.73E-07	7.77E-06	-7.56E-09	9.55E-07	(*81*)	DR2
2An.3no	3.58	18.70	34.62	-1.64	1	4.51E-06	7.30E-06	-5.40E-07	1.42E-05	7.06E-07	1.35E-06	(*81*)	DR2
3n.1ny	4.18	22.11	28.45	-1.74	1	4.31E-06	7.11E-06	-2.86E-07	1.34E-05	5.49E-07	8.80E-07	(*81*)	DR2
3n.4no	5.23	22.05	31.64	-2.18	1	2.18E-06	3.53E-06	-3.32E-07	6.89E-06	1.84E-07	6.19E-07	(*81*)	DR2
3An.1ny	5.89	22.89	28.11	-2.33	1	6.98E-06	1.15E-05	-1.71E-06	2.29E-05	-3.39E-07	2.37E-06	(*81*)	DR2
3An.2no	6.57	21.32	30.92	-2.75	1	2.41E-06	4.68E-06	-5.41E-10	9.68E-06	4.53E-07	4.53E-07	(*81*)	DR2
4n.1ny	7.43	22.61	30.57	-2.98	1	5.75E-06	1.17E-05	-2.81E-07	2.68E-05	1.70E-06	1.92E-06	(*81*)	DR2
4n.2no	8.07	22.01	30.79	-3.28	1	4.62E-06	8.01E-06	-1.16E-06	1.58E-05	-6.77E-07	1.40E-06	(*81*)	DR2
4Any	8.67	22.48	30.77	-3.49	1	4.46E-06	6.32E-06	-1.54E-06	1.36E-05	1.13E-06	3.14E-06	(*81*)	DR2
4Ano	9.03	22.59	30.78	-3.69	1	1.45E-06	1.82E-06	-6.92E-07	3.84E-06	3.34E-07	1.33E-06	(*81*)	DR2
5n.1ny	9.74	23.59	30.49	-3.89	1	3.08E-06	4.97E-06	-2.38E-07	1.01E-05	1.36E-06	1.63E-06	(*81*)	DR2

5n.2no	10.95	23.62	29.30	-4.31	1	4.43E-06	7.25E-06	-1.58E-07	1.58E-05	2.01E-06	1.56E-06	(*81*)	DR2
5An.2no	12.4	23.80	29.26	-4.88	1	3.39E-06	5.42E-06	-5.85E-07	1.04E-05	5.02E-07	1.44E-06	(*81*)	DR2
5ADno	14.61	24.60	29.14	-5.76	1	2.83E-06	6.13E-06	4.51E-07	1.40E-05	1.29E-06	3.29E-07	(*81*)	DR2
5Cn.1ny	16.01	24.80	29.30	-6.40	1	1.27E-06	2.26E-06	-1.70E-07	5.70E-06	4.81E-07	5.08E-07	(*81*)	DR2
5Dny	17.23	24.83	30.29	-7.15	1	1.76E-06	2.98E-06	-2.06E-07	6.53E-06	6.03E-07	7.15E-07	(*81*)	DR2
5Eny	18.28	24.77	30.27	-7.64	1	2.47E-06	5.44E-06	3.58E-07	1.32E-05	1.44E-06	5.17E-07	(*81*)	DR2
6no	20.13	25.41	30.60	-8.47	1	3.00E-05	3.60E-05	-1.63E-05	6.11E-05	-7.20E-06	1.81E-05	(*81*)	DR2
13no	33.55	-19.35	-137.70	16.05	1	3.85E-05	5.31E-05	-2.14E-05	1.05E-04	-1.84E-05	2.19E-05		(*81, 82*)[b]
18n.2no	40.13	-19.48	-135.85	19.31	1	4.06E-05	6.05E-05	-2.33E-05	1.31E-04	-2.52E-05	2.37E-05		(*81, 82*)[b]
20ny	42.54	-19.94	-136.28	20.23	1	3.74E-05	4.99E-05	-2.03E-05	9.48E-05	-1.51E-05	2.08E-05		(*81, 82*)[b]
20no	43.79	-20.44	-136.77	20.63	1	3.73E-05	4.98E-05	-2.03E-05	9.50E-05	-1.52E-05	2.10E-05		(*81, 82*)[b]
21ny	46.26	-19.60	-137.27	21.82	1	3.73E-05	4.94E-05	-2.02E-05	9.33E-05	-1.46E-05	2.08E-05		(*81, 82*)[b]
21no	47.91	-19.49	-138.01	22.90	1	3.70E-05	4.87E-05	-1.99E-05	9.13E-05	-1.41E-05	2.05E-05		(*81, 82*)[b]
22no	49.71	-19.63	-140.64	24.10	1	3.72E-05	4.96E-05	-2.01E-05	9.42E-05	-1.48E-05	2.07E-05		(*81, 82*)[b]
23n.2no	51.74	-17.83	-142.26	26.82	1	3.80E-05	5.26E-05	-2.09E-05	1.06E-04	-1.75E-05	2.15E-05		(*81, 82*)[b]
24n.3no	53.35	-17.69	-144.80	28.76	1	3.86E-05	5.46E-05	-2.13E-05	1.14E-04	-1.90E-05	2.17E-05		(*81, 82*)[b]
25ny	55.9	-17.68	-147.99	31.52	1	4.13E-05	6.48E-05	-2.29E-05	1.52E-04	-2.53E-05	2.29E-05		(*81, 82*)[b]
26ny	57.55	-16.81	-148.61	33.86	1	3.91E-05	5.72E-05	-2.14E-05	1.25E-04	-2.00E-05	2.16E-05		(*81, 82*)[b]
27ny	60.92	-15.03	-149.25	38.15	1	3.97E-05	5.93E-05	-2.15E-05	1.34E-04	-2.02E-05	2.15E-05		(*81, 82*)[b]
28ny	62.5	-14.48	-149.55	40.23	1	4.93E-05	9.58E-05	-2.61E-05	2.74E-04	-3.79E-05	2.38E-05		(*81, 82*)[b]
29no	64.75	-15.39	-152.91	42.42	1	3.92E-05	5.79E-05	-2.08E-05	1.32E-04	-1.79E-05	2.10E-05		(*81, 82*)[b]
31y	67.74	18.45	23/47	-44.14	1	7.26E-05	1.70E-04	-3.59E-05	6.67E-04	-1.73E-04	9.53E-05		(*83*)
33ny	73.62	19.48	21.95	-48.11	1	4.24E-05	1.64E-04	-1.54E-05	8.53E-04	-8.96E-05	3.36E-05		(*83*)
33no	79.08	20.32	21.39	-51.30	1	2.61E-04	1.42E-03	-3.33E-05	8.27E-03	-2.05E-04	2.64E-05		(*83*)
34ny	83.00	23.36	19.57	-51.54	1	2.60E-04	1.42E-03	-1.92E-06	8.28E-03	-2.31E-05	2.20E-05		(*83*)
South West Indian Ridge (East Antarctica-Somalia)													
1no	0.78	11.20	-56.70	0.11	1	1.47E-08	2.66E-08	-1.62E-08	5.89E-08	-3.54E-08	2.60E-08	(*34*)	1
2A.2no	3.22	7.90	-44.10	0.43	1	7.90E-10	8.80E-10	-8.20E-10	1.49E-09	-1.22E-09	1.15E-09	(*80*)	8
5n.2no	10.95	14.60	-49.10	1.53	1	2.21E-08	2.36E-08	-9.20E-09	3.04E-08	-1.67E-08	2.45E-08	(*84*)	Figure S1
6no	20.13	10.80	-46.00	2.70	1	1.03E-07	8.83E-08	-2.34E-08	1.76E-07	-1.35E-07	2.24E-07	(*85*)	Supp. Material

8n.2no	26.55	14.30	-46.90	3.91	1	1.48E-07	1.49E-07	-9.66E-08	2.58E-07	-2.46E-07	3.70E-07	(*85*)	Supp. Material
13ny	33.06	16.20	-44.70	5.66	1	8.56E-07	6.73E-07	-1.66E-07	6.90E-07	-3.74E-07	5.82E-07	(*85*)	Supp. Material
13no	33.55	12.69	-44.61	5.67	0.59	5.71E-07	5.12E-07	-2.35E-07	5.63E-07	-2.53E-07	3.99E-07	(*82*)	2 ('basic')[a]
18n.2no	40.13	13.80	-43.75	7.05	0.63	6.60E-07	5.69E-07	-1.00E-09	5.56E-07	-7.90E-08	6.80E-07	(*82*)	2 ('basic')[a]
20ny	42.54	11.84	-42.32	7.53	0.93	2.36E-07	1.91E-07	-2.28E-07	2.31E-07	-2.63E-07	5.98E-07	(*82*)	5 ('all')[a]
20no	43.79	11.84	-42.16	7.87	0.78	1.64E-07	1.23E-07	-1.95E-07	1.79E-07	-2.42E-07	4.97E-07	(*82*)	5 ('all')[a]
21ny	46.26	11.29	-41.54	8.49	0.55	1.89E-07	1.60E-07	-2.76E-07	2.24E-07	-3.25E-07	6.86E-07	(*82*)	5 ('all')[a]
21no	47.91	9.82	-40.70	8.83	1.86	2.26E-07	1.98E-07	-3.69E-07	2.67E-07	-4.00E-07	8.38E-07	(*82*)	5 ('all')[a]
22no	49.71	9.19	-40.63	9.21	1.4	2.73E-07	2.54E-07	-4.70E-07	3.70E-07	-5.40E-07	1.08E-06	(*82*)	5 ('all')[a]
23n.2no	51.74	9.31	-41.53	9.61	0.74	2.78E-07	2.77E-07	-4.41E-07	4.22E-07	-5.38E-07	9.45E-07	(*82*)	3 (with SWIR)[a]
24n.3no	53.35	10.16	-43.30	9.96	0.72	4.74E-07	4.34E-07	-7.41E-07	5.65E-07	-7.62E-07	1.40E-06	(*82*)	3 (with SWIR)[a]
25ny	55.9	9.86	-45.24	10.49	0.52	1.15E-06	1.38E-06	-2.02E-06	1.93E-06	-2.60E-06	3.95E-06	(*82*)	3 (with SWIR)[a]
26ny	57.55	10.64	-47.47	10.78	1.35	1.27E-06	1.41E-06	-1.89E-06	1.75E-06	-2.25E-06	3.33E-06	(*82*)	3 (with SWIR)[a]
27ny	60.92	7.10	-45.80	11.08	1.15	1.62E-06	1.75E-06	-2.46E-06	2.19E-06	-2.84E-06	4.29E-06	(*82*)	3 (with SWIR)[a]
28ny	62.5	4.75	-44.79	11.39	0.66	1.36E-06	1.55E-06	-2.35E-06	2.05E-06	-2.84E-06	4.49E-06	(*82*)	3 (with SWIR)[a]
29no	64.75	4.79	-45.56	11.70	0.53	9.16E-07	9.94E-07	-1.65E-06	1.27E-06	-1.91E-06	3.29E-06	(*82*)	3 (with SWIR)[a]
32ny	72.07	-1.20	-42.40	12.38	-	-	-	-	-	-	-	(*82, 86*)	3 (with SWIR)[a]
29no	64.75	4.79	-45.56	11.70	-	-	-	-	-	-	-	(*82, 86*)	3 (with SWIR)[a]
34y	83	-1.80	-38.70	17.90	-	-	-	-	-	-	-		This Paper
South East Indian Ridge (Australia-East Antarctica)													
1no	0.78	11.30	41.80	-0.49	1	2.03E-08	1.44E-08	7.59E-09	1.70E-08	1.39E-09	8.04E-09	(*34*)	1
2An.1ny	2.58	-11.16	-139.70	1.66	5.33	2.81E-07	-3.35E-07	2.60E-07	5.15E-07	-4.87E-07	9.06E-07	(*87*)	1&2
3An.1ny	5.89	-11.59	-139.23	3.83	2.12	2.94E-07	-3.90E-07	3.19E-07	6.27E-07	-5.83E-07	8.97E-07	(*87*)	1&2
5n.2no	10.95	-11.90	-142.06	6.79	1.02	1.36E-07	-1.71E-07	5.56E-08	3.05E-07	-1.89E-07	4.47E-07	(*87*)	1&2
6no	20.13	-13.39	-145.63	12.05	1.06	1.61E-07	-1.85E-07	2.56E-08	3.00E-07	-1.59E-07	4.22E-07	(*87*)	1&2
8n.2no	26.55	-13.81	-146.44	15.92	1.01	1.95E-07	-2.24E-07	5.79E-08	3.71E-07	-2.39E-07	5.90E-07	(*87*)	1&2
10n.2no	28.75	-13.58	-146.02	17.32	1.17	2.32E-07	-2.56E-07	8.48E-08	3.94E-07	-2.77E-07	7.51E-07	(*87*)	1&2
12no	30.94	-13.40	-145.62	18.89	0.75	2.60E-07	-3.14E-07	5.53E-08	5.18E-07	-3.10E-07	9.82E-07	(*87*)	1&2

13no	33.55	-13.45	-145.62	20.50	1.07	2.44E-07	-3.26E-07	1.49E-07	5.56E-07	-3.43E-07	6.93E-07	(*87*)	1&2
17n.3no	38.11	-13.65	-146.53	22.88	0.49	6.88E-07	-8.39E-07	-2.51E-07	1.34E-06	-1.37E-07	1.31E-06	(*87*)	1&2
20no	43.79	14.92	32.50	-24.51	0.74	1.68E-06	-1.89E-06	2.49E-06	4.10E-06	-3.43E-06	3.29E-06	(*88*)	S3 &S4
21ny	46.26	13.60	33.60	-24.64	3.06	9.31E-06	-1.21E-05	1.19E-05	1.59E-05	-1.55E-05	1.59E-05	(*88*)	S3 &S4
24n.3no	53.35	9.01	36.00	-25.06	0.99	3.84E-06	-5.09E-06	4.36E-06	6.96E-06	-6.09E-06	6.39E-06	(*88*)	S3 &S4
27ny	60.92	5.51	38.57	-25.30	0.73	1.03E-05	-1.35E-05	1.41E-05	1.78E-05	-1.88E-05	2.20E-05	(*88*)	S3 &S4
31no	68.74	3.97	39.11	-25.51	1.19	1.38E-05	-1.81E-05	1.87E-05	2.38E-05	-2.46E-05	2.80E-05	(*88*)	S3 &S4
32n.1ny	71.07	1.04	40.65	-25.85	0.83	1.08E-05	-1.50E-05	1.50E-05	2.12E-05	-2.12E-05	2.56E-05	(*88*)	S3 &S4
33no	79.08	-3.54	42.94	-26.58	0.58	6.93E-06	-9.98E-06	9.59E-06	1.47E-05	-1.39E-05	1.54E-05	(*88*)	S3 &S4
34ny	83	-7.69	44.79	-27.49	0.79	9.10E-06	-1.30E-05	1.09E-05	1.88E-05	-1.57E-05	1.47E-05	(*88*)	S3 &S4
Macquarie Ridge (Pacific-Australia)													
1no	0.78	59.87	4.39	0.82	1	2.11E-08	1.46E-08	8.12E-09	1.83E-08	4.26E-09	9.72E-09		(*28, 87*)[c]
2nm	1.86	59.08	4.26	1.96	1	2.83E-08	-1.91E-08	2.49E-08	4.28E-08	-2.48E-08	6.64E-08		(*28, 87*)[c]
2An.1ny	2.58	58.90	4.31	2.72	1	6.12E-08	-6.00E-08	4.73E-08	9.83E-08	-8.99E-08	1.79E-07		(*28, 87*)[c]
2An.3no	3.58	59.00	5.13	3.82	1	4.03E-08	-4.31E-08	4.36E-08	8.04E-08	-6.07E-08	1.58E-07		(*28, 87*)[c]
3n.1nm	4.24	59.00	5.88	4.56	1	4.32E-08	-5.48E-08	4.94E-08	1.01E-07	-8.82E-08	1.72E-07		(*28, 87*)[c]
3n.4nm	5.11	59.03	5.96	5.53	1	7.01E-08	-9.55E-08	8.76E-08	1.80E-07	-1.63E-07	2.96E-07		(*28, 87*)[c]
3An.1ny	5.89	59.19	5.73	6.42	1	1.17E-07	-1.49E-07	1.46E-07	3.08E-07	-2.68E-07	4.84E-07		(*28, 87*)[c]
3An.2no	6.57	59.24	4.85	7.15	1	8.70E-08	-1.18E-07	1.13E-07	2.35E-07	-2.05E-07	3.97E-07		(*28, 87*)[c]
4n.2nm	7.86	58.79	4.87	8.48	1	6.68E-08	-7.04E-08	8.44E-08	1.68E-07	-1.14E-07	3.28E-07		(*28, 87*)[c]
4Anm	8.86	58.54	4.97	9.54	1	5.47E-08	-6.85E-08	4.68E-08	1.65E-07	-9.85E-08	2.80E-07		(*28, 87*)[c]
5n.1ny	9.74	58.36	5.32	10.57	1	6.99E-08	-7.75E-08	5.95E-08	2.08E-07	-9.65E-08	3.91E-07		(*28, 87*)[c]
5n.2no	10.95	58.24	5.15	11.94	1	9.49E-08	-1.21E-07	5.46E-08	3.27E-07	-1.56E-07	5.40E-07		(*28, 87*)[c]
5An.2nm	12.29	58.00	5.07	13.51	1	6.42E-08	-8.65E-08	3.55E-08	2.44E-07	-1.19E-07	3.92E-07		(*28, 87*)[c]
5AAnm	13.07	57.84	5.03	14.40	1	5.84E-08	-7.02E-08	3.49E-08	2.12E-07	-9.79E-08	3.48E-07		(*28, 87*)[c]
5ADnm	14.4	57.58	4.84	15.96	1	4.39E-08	-5.79E-08	1.99E-08	1.72E-07	-8.04E-08	2.70E-07		(*28, 87*)[c]
5Bn.2nm	15.1	57.50	4.62	16.75	1	5.09E-08	-5.10E-08	2.61E-08	1.68E-07	-6.53E-08	2.74E-07		(*28, 87*)[c]
5Cn.1nm	16.15	57.42	4.32	18.00	1	6.12E-08	-4.37E-08	3.97E-08	1.77E-07	-5.14E-08	3.09E-07		(*28, 87*)[c]
5Cn.3nm	16.64	57.33	4.33	18.55	1	4.64E-08	-5.41E-08	2.15E-08	1.73E-07	-6.44E-08	2.82E-07		(*28, 87*)[c]
5Dnm	17.45	57.11	4.30	19.39	1	4.82E-08	-6.06E-08	1.65E-08	1.91E-07	-7.13E-08	2.97E-07		(*28, 87*)[c]

5Eny	18.28	56.72	4.52	20.17	1	6.10E-08	-6.44E-08	2.08E-08	2.23E-07	-7.83E-08	3.37E-07		(*28, 87*)[c]
6ny	19.05	56.55	4.36	20.92	1	6.34E-08	-7.98E-08	2.00E-08	2.57E-07	-9.27E-08	3.94E-07		(*28, 87*)[c]
6no	20.13	56.28	4.36	22.06	1	6.95E-08	-1.00E-07	1.55E-08	3.20E-07	-1.22E-07	4.83E-07		(*28, 87*)[c]
6An.2nm	21.16	55.98	4.36	23.05	1	4.77E-08	-7.22E-08	9.92E-09	2.37E-07	-9.03E-08	3.58E-07		(*28, 87*)[c]
6nB.2no	23.07	55.49	4.23	24.96	1	4.11E-08	-4.56E-08	1.68E-08	1.80E-07	-7.00E-08	3.15E-07		(*28, 87*)[c]
6Cn.3nm	24.06	55.26	4.11	25.95	1	4.19E-08	-4.92E-08	1.56E-08	1.97E-07	-7.88E-08	3.54E-07		(*28, 87*)[c]
8n.2no	26.55	54.85	3.30	28.52	1	7.93E-08	-8.62E-08	3.41E-08	3.97E-07	-1.58E-07	7.52E-07		(*28, 87*)[c]
Emerald/Macquarie Basin (Pacific-Australia)													
11n.2no	30.1	-53.19	-178.74	-33.73	2.22	5.01E-04	-1.36E-04	5.78E-04	3.77E-05	-1.57E-04	6.69E-04	(*30*)	2.2 & 2.3
12no	30.94	-52.83	-178.81	-34.58	3.04	5.56E-04	-1.62E-04	6.45E-04	4.75E-05	-1.87E-04	7.48E-04	(*30*)	2.2 & 2.3
13no	33.55	-51.70	-178.45	-35.99	2.07	7.79E-06	-2.93E-06	9.56E-06	1.13E-06	-3.55E-06	1.19E-05	(*30*)	2.2 & 2.3
15no	34.94	-51.19	-178.62	-37.49	1.14	2.05E-05	-7.80E-06	2.65E-05	3.05E-06	-1.00E-05	3.45E-05	(*30*)	2.2 & 2.3
16n.2no	36.34	-50.82	-179.30	-39.61	1.58	1.17E-05	-4.33E-06	1.48E-05	1.69E-06	-5.42E-06	1.89E-05	(*30*)	2.2 & 2.3
18n.2no	37.47	-50.36	-178.97	-39.62	1.98	3.02E-05	-1.12E-05	3.83E-05	4.32E-06	-1.42E-05	4.88E-05	(*30*)	2.2 & 2.3
18n.2no	40.13	-49.81	-179.55	-41.77	4.06	2.40E-04	-8.36E-05	2.86E-04	2.96E-05	-9.99E-05	3.41E-04	(*30*)	2.2 & 2.3
-	52.14	-49.67	177.95	-47.86	2.01	2.19E-05	-7.15E-06	2.54E-05	2.51E-06	-8.09E-06	3.01E-05	(*30*)	3.1[d]
Tasman Sea (Pacific[e]-Australia)													
24n.3no	53.35	49.39	-3.31	48.04	2.15	2.59E-06	-8.87E-06	3.94E-06	3.93E-06	-1.11E-05	6.98E-06		(*30, 32*)[f]
25ny	55.9	48.67	-5.56	48.40	2.07	4.19E-06	-9.80E-06	6.09E-06	4.53E-06	-1.26E-05	1.10E-05		(*30, 32*)[t]
26no	57.91	47.62	-8.04	48.90	1.74	-3.64E-06	-9.38E-06	-4.40E-08	4.61E-06	-1.31E-05	7.32E-06		(*30, 32*)[f]
27no	61.28	48.22	-9.14	49.72	1.54	-6.96E-07	-6.14E-06	7.58E-06	1.84E-06	-1.32E-05	1.46E-05		(*30, 32*)[t]
28ny	62.5	47.85	-10.13	50.10	1.73	1.57E-06	-5.80E-06	5.95E-06	9.30E-07	-1.10E-05	9.15E-06		(*30, 32*)[f]
29ny	63.98	48.24	-10.58	50.46	2.51	7.17E-06	-1.02E-05	5.80E-06	4.19E-06	-1.15E-05	7.99E-06		(*30, 32*)[t]
30ny	65.58	47.38	-12.40	50.87	2.45	1.71E-06	-8.01E-06	2.82E-06	3.15E-06	-1.02E-05	7.46E-06		(*30, 32*)[f]
31ny	67.74	45.68	-15.00	51.53	1.36	2.90E-06	-5.87E-06	5.91E-07	5.25E-06	-1.09E-05	4.64E-06		(*30, 32*)[t]
32n.1ny	71.07	41.97	-19.08	53.10	1.27	4.30E-06	-5.05E-06	6.85E-07	6.90E-06	-1.26E-05	7.12E-06		(*30, 32*)[f]
33ny	73.62	43.14	-19.18	53.78	1.08	3.94E-06	-5.22E-06	6.62E-07	6.48E-06	-1.22E-05	6.56E-06		(*30, 32*)[t]
34ny	83	43.14	-19.18	53.78	1.08	3.94E-06	-5.22E-06	6.62E-07	6.48E-06	-1.22E-05	6.56E-06		(*30, 32*)[f]

West Antarctica-East Antarctica													
8n.2no	26.55	-84.78	190.99	0.00	1	1.99E-06	-5.06E-07	5.89E-06	2.57E-07	-1.62E-06	1.76E-05	(*25*)	
12no	30.94	-84.78	190.99	1.33	0.81	1.99E-06	-5.06E-07	5.89E-06	2.57E-07	-1.62E-06	1.76E-05	(*25*)	
13no	33.55	-81.09	200.37	3.17	0.69	1.18E-05	5.04E-07	3.03E-05	3.94E-07	8.75E-07	7.82E-05	(*25*)	
16n.2ny	35.69	-70.72	338.78	1.38	0.47	3.20E-06	-6.23E-07	9.70E-06	2.57E-07	-1.96E-06	2.92E-05	(*25*)	
18n.2no	40.13	-85.87	220.49	4.48	1.02	1.10E-05	-2.24E-06	3.26E-05	6.80E-07	-6.76E-06	9.68E-05	(*25*)	
34ny	83	-85.87	220.49	4.48	1.02	1.10E-05	-2.24E-06	3.26E-05	6.80E-07	-6.76E-06	9.68E-05	(*25*)	
Pacific-Antarctic Ridge (Pacific-West Antarctica)													
1no	0.78	64.30	-81.21	0.68	2.62	1.18E-09	6.47E-10	1.59E-09	4.26E-09	7.92E-09	4.43E-09	(*28*)	1
2nm	1.86	64.90	-81.14	1.61	1.21	9.05E-09	2.51E-10	8.38E-09	6.54E-09	9.72E-09	3.00E-09	(*28*)	1
2An.1ny	2.58	65.20	-81.23	2.23	2.05	2.78E-08	-6.69E-10	2.00E-09	2.37E-09	3.41E-09	8.94E-09	(*28*)	1
2An.3no	3.58	65.90	-81.17	3.11	1.38	1.04E-08	6.61E-10	1.23E-08	8.30E-09	1.31E-08	4.28E-08	(*28*)	1
3n.1nm	4.24	66.62	-80.53	3.70	2.43	1.00E-08	6.62E-10	1.01E-08	7.62E-09	1.14E-08	3.44E-08	(*28*)	1
3n.4nm	5.11	66.91	-80.66	4.48	2.62	1.36E-08	1.47E-09	1.96E-08	7.24E-09	1.33E-08	5.86E-08	(*28*)	1
3An.1ny	5.89	67.09	-81.08	5.21	2.91	3.53E-08	2.55E-08	4.27E-08	3.23E-08	4.07E-08	8.12E-08	(*28*)	1
3An.2no	6.57	67.33	-81.20	5.81	1.48	1.32E-08	2.40E-09	2.17E-08	8.21E-09	1.54E-08	6.55E-08	(*28*)	1
4n.2nm	7.86	68.16	-80.54	6.83	1.41	2.38E-08	9.54E-09	4.41E-08	1.50E-08	2.67E-08	1.18E-07	(*28*)	1
4Anm	8.86	68.83	-79.97	7.64	1.34	1.12E-08	3.39E-09	1.69E-08	9.68E-09	1.56E-08	5.03E-08	(*28*)	1
5n.1ny	9.74	69.71	-78.57	8.42	1.01	1.59E-08	5.97E-09	3.17E-08	1.22E-08	2.32E-08	8.91E-08	(*28*)	1
5n.2no	10.95	70.36	-77.81	9.48	1.75	2.52E-08	6.62E-09	3.49E-08	2.72E-08	3.92E-08	1.06E-07	(*28*)	1
5An.2nm	12.29	71.29	-76.12	10.63	1.25	9.64E-09	4.97E-09	1.45E-08	1.12E-08	1.60E-08	3.84E-08	(*28*)	1
5AAnm	13.07	71.75	-75.12	11.28	1.37	1.55E-08	8.50E-09	2.19E-08	1.34E-08	1.92E-08	5.25E-08	(*28*)	1
5ADnm	14.4	72.38	-73.58	12.42	2.13	1.43E-08	7.02E-09	1.60E-08	1.11E-08	1.55E-08	3.61E-08	(*28*)	1
5Bn.2nm	15.1	72.60	-73.19	13.01	2.78	4.48E-08	1.92E-08	4.50E-08	2.97E-08	4.15E-08	9.77E-08	(*28*)	1
5Cn.1nm	16.15	72.97	-72.50	13.95	2.27	6.11E-08	3.17E-08	7.43E-08	4.10E-08	5.52E-08	1.63E-07	(*28*)	1
5Cn.3nm	16.64	73.18	-72.03	14.34	1.47	1.66E-08	8.02E-09	2.28E-08	1.21E-08	1.75E-08	5.33E-08	(*28*)	1
5Dnm	17.45	73.39	-71.58	14.93	1.47	1.47E-08	6.78E-09	1.72E-08	1.04E-08	1.47E-08	3.97E-08	(*28*)	1
5Eny	18.28	73.62	-70.91	15.42	1.88	3.33E-08	1.92E-08	3.18E-08	1.90E-08	2.40E-08	4.94E-08	(*28*)	1
6ny	19.05	73.71	-70.94	15.95	1.41	2.02E-08	8.76E-09	2.31E-08	1.18E-08	1.65E-08	4.44E-08	(*28*)	1
6no	20.13	74.00	-70.16	16.73	1.93	2.00E-08	8.48E-09	2.37E-08	1.13E-08	1.54E-08	4.65E-08	(*28*)	1

6An.2nm	21.16	74.13	-70.09	17.38	2.66	1.68E-08	7.96E-09	2.09E-08	1.14E-08	1.58E-08	4.36E-08	(*28*)	1
6nB.2no	23.07	74.39	-69.73	18.68	2.83	3.51E-08	1.83E-08	4.07E-08	1.95E-08	1.71E-08	9.31E-08	(*28*)	1
6Cn.3nm	24.06	74.48	-69.58	19.35	2.08	2.33E-08	1.21E-08	2.56E-08	1.36E-08	1.77E-08	4.59E-08	(*28*)	1
7n.2ny	24.84	74.51	-69.66	19.92	2.45	3.89E-08	1.35E-08	6.05E-08	1.82E-08	4.16E-09	1.86E-08	(*28*)	1
8n.1ny	25.82	74.50	-69.84	20.63	2.03	4.18E-08	2.23E-08	4.20E-08	2.04E-08	2.35E-08	6.79E-08	(*28*)	1
8n.2no	26.55	74.51	-69.81	21.18	1.12	2.73E-08	1.51E-08	3.01E-08	1.63E-08	2.13E-08	5.22E-08	(*28*)	1
9ny	27.03	74.46	-69.90	21.53	1.3	2.75E-08	1.54E-08	3.04E-08	1.64E-08	2.03E-08	5.38E-08	(*28*)	1
9no	27.97	74.40	-69.75	22.23	1.3	2.42E-08	1.44E-08	2.63E-08	1.57E-08	2.08E-08	4.34E-08	(*28*)	1
10n.1ny	28.28	74.41	-69.50	22.58	1.58	2.13E-08	1.32E-08	2.28E-08	1.51E-08	2.03E-08	3.88E-08	(*28*)	1
10n.2no	28.75	74.33	-69.54	22.95	2.92	2.33E-08	1.32E-08	2.48E-08	1.36E-08	1.77E-08	3.95E-08	(*28*)	1
11n.1ny	29.4	74.38	-68.71	23.66	2.2	1.81E-08	1.09E-08	2.14E-08	1.42E-08	1.91E-08	4.16E-08	(*28*)	1
11n.2no	30.1	74.33	-68.43	24.23	1.12	1.94E-08	9.60E-09	2.34E-08	1.25E-08	1.67E-08	4.75E-08	(*28*)	1
12ny	30.48	74.37	-67.75	24.71	2.67	1.97E-08	1.00E-08	2.10E-08	1.30E-08	1.74E-08	3.88E-08	(*28*)	1
12no	30.94	74.32	-67.59	25.06	1.15	1.92E-08	1.00E-08	1.99E-08	1.30E-08	1.74E-08	3.95E-08	(*28*)	1
13ny	33.06	74.44	-64.74	26.97	1.83	3.27E-08	1.67E-08	3.13E-08	1.63E-08	2.17E-08	4.92E-08	(*28*)	1
13no	33.55	74.48	-64.02	27.40	1.57	5.29E-08	3.16E-08	7.20E-09	2.68E-08	3.37E-08	6.19E-08	(*28*)	1
15ny	34.66	74.62	-61.89	28.40	1.11	4.21E-08	2.70E-08	4.19E-08	2.47E-08	3.27E-08	5.61E-08	(*28*)	1
15no	34.94	74.63	-61.49	28.62	2.77	1.22E-07	8.05E-08	1.21E-07	7.38E-08	9.56E-08	1.64E-07	(*28*)	1
16n.2ny	35.69	74.70	-60.18	29.23	1.46	4.22E-08	2.73E-08	4.36E-08	2.54E-08	3.22E-08	6.03E-08	(*28*)	1
16n.2no	36.34	74.75	-59.05	29.81	2.96	1.27E-07	8.52E-08	1.30E-07	8.01E-08	1.03E-07	1.80E-07	(*28*)	1
17n.1ny	36.62	74.76	-58.64	30.05	1.15	4.14E-08	2.73E-08	4.31E-08	2.55E-08	3.36E-08	5.90E-08	(*28*)	1
18n.2no	37.47	74.82	-57.44	30.68	2.01	1.32E-07	8.85E-08	1.37E-07	8.25E-08	1.08E-07	1.89E-07	(*28*)	1
18n.1ny	38.43	74.86	-56.21	31.41	2.13	4.11E-08	3.04E-08	4.83E-08	3.05E-08	4.02E-08	7.09E-08	(*28*)	1
18n.2no	40.13	74.87	-54.46	32.62	2.77	1.48E-07	1.04E-07	1.61E-07	9.82E-08	1.34E-07	2.24E-07	(*28*)	1
19nm	41.39	74.86	-53.25	33.53	1.01	4.91E-08	2.75E-08	5.98E-08	2.72E-08	4.00E-08	9.71E-08	(*28*)	1
20ny	42.54	74.86	-52.23	34.22	1.85	3.21E-07	1.60E-07	3.94E-07	1.48E-07	1.94E-07	6.15E-07	(*28*)	1
20no	43.79	74.78	-51.61	35.29	1.06	5.71E-07	2.27E-08	8.84E-07	2.58E-08	2.95E-08	1.46E-06	(*28*)	1
21no	47.91	74.52	-50.19	37.64	1							(*29*)	
24n.3no	53.35	73.62	-52.50	40.03	1							(*29*)	1
27nm	61.1	71.46	-55.07	45.20	1							(*89*)	1
30rm	67.7	68.94	-55.52	49.60	1							(*90*)	1

33ny	73.62	66.72	-55.04	53.74	1							(*90*)	1
34ny	83	65.58	-52.38	63.07	1							(*90*)	1
East Pacific Rise (Nazca-Pacific)–Half spreading poles													
1no	0.78	52.70	-88.60	-0.47	1	1.62E-08	2.46E-08	1.09E-08	9.61E-08	2.81E-08	3.05E-08	(*34*)	1[g]
3An.2no	6.57	-54.38	85.34	4.36	0.17	2.73E-07	5.95E-07	3.06E-07	2.28E-06	1.12E-06	5.85E-07	(*91*)	1&2[g]
4Any	8.86	-58.23	86.36	5.80	0.25	3.05E-07	6.56E-07	3.48E-07	3.02E-06	1.50E-06	7.90E-07	(*91*)	1&2[g]
5n.2no	10.95	-60.01	86.73	7.59	0.34	3.01E-07	5.50E-07	2.92E-07	3.15E-06	1.48E-06	7.44E-07	(*91*)	1&2[g]
5AAnm	13.07	-62.00	87.21	9.03	0.29	2.39E-07	2.97E-07	1.71E-07	1.93E-06	8.73E-07	4.43E-07	(*91*)	1&2[g]
5B.2nm	15.1	-64.52	83.61	10.63	0.29	3.90E-07	6.69E-07	3.66E-07	4.34E-06	2.00E-06	1.01E-06	(*91*)	1&2[g]
5Dnm	17.45	-72.22	89.27	11.92	0.07	7.51E-07	7.73E-07	5.96E-07	5.09E-06	2.73E-06	1.60E-06	(*91*)	1&2[g]
7n.1ny	24.73	-61.15	88.86	15.55	0.18	1.27E-07	-4.05E-07	-2.11E-07	3.01E-06	1.52E-06	8.46E-07	(*91*)	1&2[g]
10n.1ny	28.28	-66.11	82.81	17.96	0.59	2.79E-07	-4.92E-07	-1.75E-07	4.00E-06	1.82E-06	9.57E-07	(*24*)	
13ny	33.06	-70.93	79.32	20.85	0.36	9.54E-07	-3.91E-07	-4.46E-07	4.66E-06	1.49E-06	1.22E-06	(*24*)	
17n.1ny	36.62	-74.60	77.93	22.72	1	4.69E-06	-3.42E-07	-2.27E-06	1.54E-05	3.02E-06	4.76E-06	(*24*)	
18n.2no	40.13	-77.81	78.34	24.01	1	8.36E-06	2.12E-06	-3.88E-06	2.06E-05	1.07E-06	7.02E-06	(*24*)	
20no	43.79	-79.97	75.81	25.83	1	1.20E-05	4.72E-06	-5.65E-06	2.54E-05	-9.83E-07	9.33E-06	(*24*)	
24n.3no	53.35	-85.93	71.35	29.87	1	1.27E-05	4.57E-06	-6.08E-06	2.78E-05	-2.16E-06	1.05E-05	(*24*)	
29no	64.75	-89.25	30.46	33.44	1	1.22E-05	3.69E-06	-6.09E-06	2.86E-05	-2.82E-06	1.10E-05	(*24*)	
33ny	73.62	-88.24	-86.61	36.29	1	1.21E-05	3.07E-06	-6.24E-06	2.92E-05	-3.42E-06	1.16E-05	(*24*)	
34ny	83	-85.02	-109.44	39.42	1	2.73E-05	1.01E-05	-1.36E-05	3.80E-05	-9.01E-06	1.88E-05	(*24*)	

a Selected rotations from (*82*) are those with the minimum misfit, as stated by the authors.

b Chron 6no India-Capricorn rotation of (*81*), DR4 summed with Capricorn-Somalia rotations of (*82*).

c Calculated from closure of the PAC-AUS-ANT triple junction.

d Covariance parameters corrected from misprint [J. Stock, written comm.]

e Tasman spreading parameters of (*32*) for Lord Howe Rise added to Emerald Basin closure fit of (*30*).

f Suggested extrapolation of C13no pole.

g Scaled to account for spreading asymmetry.

table S2. Rotation poles for the major mid-ocean ridges relative to the Indo-Atlantic hot spot reference frame, listed in 5-My increments. The oldest calculated pole for each ridge is also listed. Covariance parameters as in S1; $\kappa = 1$ for all rotations. Sources of rotations are:

Supplemental Table S2

Ma	Lat.(°)	Long.(°)	Angle (°)	a	b	c	d	e	f
East Pacific Rise: Pacific-Australia-E Antarctica circuit fixed Indo-Atlantic hotspots									
5	40.86	5.418	1.102	8.19E-06	1.17E-06	1.90E-06	9.54E-06	1.41E-06	7.68E-06
10	43	12.504	1.934	2.93E-05	-1.75E-06	3.59E-06	1.41E-05	-4.76E-06	2.35E-05
15	22.6	23.309	2.781	1.91E-05	1.02E-06	2.64E-06	2.00E-05	1.09E-06	1.79E-05
20	23.09	25.091	3.128	1.86E-05	5.07E-06	2.98E-06	4.14E-05	1.10E-05	2.44E-05
25	28.28	45.664	4.935	1.81E-05	2.20E-06	-3.64E-06	2.82E-05	-3.53E-06	2.33E-05
30	25.99	13.39	6.804	1.96E-04	1.39E-05	2.34E-04	3.22E-05	-1.64E-06	3.82E-04
35	11.05	-1.787	7.372	2.46E-04	-5.62E-05	-8.30E-05	7.70E-05	4.89E-06	1.55E-04
40	6.57	-11.926	8.697	9.18E-04	-2.34E-04	-3.52E-04	2.64E-04	4.47E-05	5.59E-04
45	14.47	-16.433	7.451	4.10E-04	-8.88E-05	-1.94E-04	1.28E-04	1.51E-05	3.15E-04
50	36.05	-23.598	7.916	6.60E-04	-1.55E-04	-4.49E-04	1.94E-04	3.17E-05	6.31E-04
55	26.66	-36.021	10.654	3.02E-04	-4.43E-05	-2.03E-04	1.35E-04	-1.05E-05	3.15E-04
60	18.33	-41.888	13.627	5.39E-04	-2.47E-05	-3.53E-04	2.58E-04	-7.84E-05	6.04E-04
65	7.68	-43.713	16.504	3.60E-04	-4.56E-05	-2.31E-04	1.88E-04	1.05E-06	4.81E-04
70	-1.49	-43.04	24.689	7.96E-04	-1.80E-04	-5.26E-04	4.08E-04	1.71E-04	1.28E-03
75	-1.48	-44.372	26.885	4.11E-04	-1.23E-04	-2.95E-04	2.56E-04	1.05E-04	7.81E-04
80	-4.34	-46.392	28.034	8.01E-04	-2.86E-04	-6.87E-04	5.21E-04	2.46E-04	1.78E-03
83	0.25	-48.953	27.596	4.71E-04	-1.47E-04	-3.15E-04	3.19E-04	1.42E-04	1.02E-03
East Pacific Rise: Pacific-W Antarctica-E Antarctica circuit fixed Indo-Atlantic hotspots									
5	40.68	5.76	1.107	9.99E-06	8.37E-07	7.55E-06	9.51E-06	5.15E-08	2.48E-05
10	43.07	12.523	1.937	3.10E-05	-2.08E-06	9.22E-06	1.40E-05	-6.19E-06	4.07E-05

15	22.58	23.331	2.783	2.07E-05	7.20E-07	8.18E-06	2.00E-05	-2.48E-07	3.53E-05
20	23.16	25.082	3.13	2.02E-05	4.85E-06	8.53E-06	4.12E-05	9.64E-06	4.14E-05
25	28.32	45.787	4.943	1.94E-05	1.91E-06	1.38E-06	2.82E-05	-5.09E-06	4.08E-05
30	12.5	18.865	5.333	2.96E-05	5.94E-06	-1.02E-06	3.24E-05	-1.47E-05	4.91E-05
35	8.74	-0.082	7.126	2.38E-04	-5.47E-05	-9.04E-05	7.61E-05	3.64E-06	1.61E-04
40	-1.97	-10.611	8.178	8.93E-04	-2.21E-04	-3.88E-04	2.51E-04	2.67E-05	5.57E-04
45	16.4	-13.357	7.491	4.03E-04	-9.27E-05	-1.88E-04	1.28E-04	1.40E-05	3.65E-04
50	32.29	-24.283	7.03	6.71E-04	-1.44E-04	-4.27E-04	1.88E-04	2.20E-05	7.01E-04
55	22.62	-36.692	8.82	3.22E-04	-3.15E-05	-1.71E-04	1.33E-04	-1.21E-05	3.84E-04
60	19.12	-41.419	11.334	5.72E-04	-2.24E-06	-3.31E-04	2.61E-04	-7.62E-05	6.17E-04
65	9.74	-42.085	14.892	3.90E-04	-3.69E-05	-2.02E-04	1.89E-04	7.88E-06	5.24E-04
70	3.72	-41.408	19.777	8.81E-04	-1.68E-04	-5.28E-04	4.02E-04	1.46E-04	1.27E-03
75	3.56	-41.832	23.296	4.59E-04	-1.17E-04	-2.87E-04	2.57E-04	1.14E-04	7.89E-04
80	5.79	-42.345	26.574	8.51E-04	-3.23E-04	-6.85E-04	5.76E-04	3.23E-04	1.72E-03
83	12.02	-43.53	27.733	4.90E-04	-1.68E-04	-2.98E-04	3.63E-04	2.15E-04	9.92E-04

East Pacific Rise: Pacific hotspot reference frame

5	52.623	-15.733	1.828	1.81E-05	-1.24E-06	9.92E-06	2.16E-05	-1.33E-05	3.40E-05
10	52.913	-11.177	2.793	1.39E-05	7.98E-06	2.95E-06	2.27E-05	-6.00E-06	3.47E-05
15	44.649	2.553	4.022	2.56E-05	9.82E-06	6.46E-06	7.17E-05	-5.50E-06	4.89E-05
25	67.022	14.002	7.589	1.46E-04	2.06E-04	2.01E-06	3.57E-04	4.59E-06	2.49E-05
30	52.488	-19.457	7.724	3.24E-05	1.43E-05	2.24E-05	4.58E-05	2.17E-06	5.39E-05
35	37.254	-27.913	8.498	2.92E-05	4.52E-06	1.25E-05	4.29E-05	-1.85E-05	5.49E-05
40	28.88	-34.777	9.949	2.67E-05	9.76E-06	-1.21E-06	4.75E-05	1.61E-06	1.26E-05
45	21.122	-38.589	11.786	4.51E-05	1.27E-05	1.14E-05	5.02E-05	-7.50E-06	3.33E-05
50	13.06	-47.122	14.888	3.77E-05	-4.14E-06	5.74E-06	2.42E-04	-2.59E-05	2.29E-05
55	6.035	-53.451	19.056	7.23E-05	-3.48E-05	2.53E-05	1.71E-04	-3.06E-05	3.55E-05
60	2.785	-56.079	22.161	3.55E-05	4.18E-06	2.48E-06	1.77E-04	-2.22E-05	1.68E-05
65	-0.751	-57.343	24.373	3.48E-05	-7.09E-06	5.47E-07	1.24E-04	-1.31E-05	1.79E-05
70	-3.723	-58.343	26.65	5.69E-05	-2.79E-05	3.32E-06	1.43E-04	-1.90E-05	1.88E-05

75	-5.485	-60.51	28.596	4.57E-05	1.61E-05	-2.05E-05	9.64E-05	-2.87E-05	3.17E-05
80	-6.745	-63.539	31.783	2.02E-04	1.21E-04	-1.36E-04	1.61E-04	-1.21E-04	1.27E-04
83	-6.63	-64.295	34.236	2.71E-04	1.48E-04	-4.93E-05	1.99E-04	-7.62E-05	6.39E-05
Pacific-Antarctic Ridge									
5	50.17	-60.423	1.797	7.19E-06	-6.86E-07	7.11E-07	2.18E-06	-1.81E-06	5.33E-06
10	57.08	-61.214	3.641	2.86E-05	-3.50E-06	2.52E-06	8.82E-06	-7.16E-06	2.14E-05
15	61.9	-51.114	4.921	1.77E-05	-1.88E-06	9.88E-07	6.52E-06	-5.14E-06	1.40E-05
20	63.43	-42.654	5.913	1.41E-05	5.15E-07	-8.16E-07	8.19E-06	-6.43E-06	1.32E-05
25	63.14	-40.404	7.115	1.74E-05	3.10E-06	-3.19E-06	1.34E-05	-1.08E-05	1.89E-05
30	58.8	-42.755	8.015	2.98E-05	4.92E-06	-1.11E-06	2.24E-05	-2.02E-05	4.53E-05
35	54.98	-42.115	9.529	2.10E-04	-6.75E-05	-9.56E-05	7.78E-05	1.00E-05	1.69E-04
40	50.21	-42.72	9.266	7.93E-04	-2.73E-04	-4.05E-04	2.85E-04	6.52E-05	5.83E-04
45	68.45	-52.002	11.26	3.57E-04	-1.20E-04	-1.91E-04	1.30E-04	2.42E-05	3.67E-04
50	78.87	-79.24	13.549	6.17E-04	-1.87E-04	-4.34E-04	2.18E-04	5.13E-05	6.94E-04
55	75.08	-76.109	14.43	3.09E-04	-5.52E-05	-1.77E-04	1.23E-04	-4.58E-06	3.63E-04
60	71.57	-72.676	15.185	6.01E-04	-2.92E-05	-3.43E-04	2.60E-04	-4.71E-05	5.58E-04
65	63.16	-63.558	15.088	3.97E-04	-5.96E-05	-2.14E-04	1.70E-04	4.11E-06	4.80E-04
70	51.75	-56.19	15.955	9.21E-04	-2.09E-04	-5.62E-04	4.21E-04	1.21E-04	1.18E-03
75	47.79	-55.22	17.272	4.83E-04	-1.30E-04	-3.24E-04	2.48E-04	7.82E-05	7.28E-04
80	45.87	-53.982	19.042	9.53E-04	-3.10E-04	-8.01E-04	5.80E-04	2.37E-04	1.57E-03
83	51.43	-57.181	21.085	5.15E-04	-1.84E-04	-3.70E-04	3.19E-04	1.39E-04	9.23E-04
South East Indian Ridge									
5	-34.35	-123.448	1.703	7.32E-06	-6.08E-07	8.43E-07	2.38E-06	-2.01E-06	5.46E-06
10	-31.14	-129.37	3.195	2.92E-05	-2.17E-06	2.95E-06	9.28E-06	-7.65E-06	2.09E-05
15	-37.85	-138.23	4.617	1.81E-05	-7.34E-07	1.52E-06	7.15E-06	-5.59E-06	1.33E-05
20	-41.7	-143.942	6.129	1.39E-05	1.07E-06	3.50E-07	1.01E-05	-6.99E-06	1.22E-05
25	-41.8	-144.845	7.597	1.61E-05	3.25E-06	-5.27E-07	1.78E-05	-1.16E-05	1.64E-05
30	-40.23	-142.037	9.056	2.53E-05	5.62E-06	-1.02E-06	3.09E-05	-1.97E-05	2.64E-05
35	-38.47	-140.922	10.648	2.17E-04	-7.87E-06	-1.19E-04	6.16E-05	-2.69E-05	1.34E-04

40	-37.33	-141.585	11.719	8.29E-04	-3.14E-05	-4.78E-04	2.14E-04	-9.21E-05	5.22E-04
45	-25.21	-151.624	12.774	3.63E-04	5.55E-06	-2.35E-04	1.08E-04	-6.94E-05	2.82E-04
50	-12.53	-156.959	14.062	6.19E-04	4.95E-05	-4.68E-04	2.08E-04	-1.73E-04	6.03E-04
55	-11.8	-153.689	14.133	2.90E-04	4.60E-05	-1.97E-04	1.47E-04	-9.35E-05	2.65E-04
60	-13.81	-152.11	14.178	5.52E-04	1.36E-04	-3.14E-04	3.75E-04	-2.03E-04	4.40E-04
65	-22.83	-149.382	14.022	3.84E-04	7.08E-05	-2.23E-04	2.15E-04	-1.28E-04	3.71E-04
70	-31.77	-141.977	13.757	9.63E-04	1.44E-04	-5.82E-04	4.50E-04	-2.71E-04	1.03E-03
75	-33.47	-139.093	13.963	5.19E-04	7.19E-05	-3.57E-04	2.64E-04	-1.68E-04	6.04E-04
80	-35.13	-136.367	14.257	1.09E-03	1.54E-04	-8.57E-04	5.77E-04	-3.79E-04	1.36E-03
83	-24.52	-138.093	14.288	6.02E-04	5.52E-05	-4.24E-04	3.12E-04	-2.13E-04	7.90E-04
South West Indian Ridge									
5	-71.72	25.873	0.735	7.20E-06	-4.74E-07	8.03E-07	2.16E-06	-1.81E-06	5.32E-06
10	-73.1	48.19	1.219	2.88E-05	-1.81E-06	3.25E-06	8.60E-06	-7.22E-06	2.13E-05
15	-66.23	73.298	2.21	1.78E-05	-4.15E-07	1.71E-06	6.48E-06	-5.21E-06	1.39E-05
20	-63.23	78.353	3.269	1.38E-05	1.66E-06	1.96E-07	8.86E-06	-6.55E-06	1.28E-05
25	-62.16	78.777	4.152	1.64E-05	4.37E-06	-1.25E-06	1.55E-05	-1.10E-05	1.78E-05
30	-62.55	78.085	4.83	2.59E-05	7.93E-06	-2.54E-06	2.64E-05	-1.87E-05	2.92E-05
35	-63.65	82.844	5.219	2.46E-04	-2.33E-05	-1.03E-04	5.73E-05	-1.79E-05	1.08E-04
40	-63.33	88.683	5.512	9.56E-04	-1.02E-04	-4.08E-04	2.01E-04	-5.21E-05	4.03E-04
45	-35.59	130.029	5.654	4.33E-04	-2.56E-05	-2.15E-04	9.33E-05	-3.98E-05	2.19E-04
50	-12.71	142.711	7.737	7.80E-04	4.41E-06	-4.50E-04	1.72E-04	-1.08E-04	4.70E-04
55	-16.67	141.034	7.93	3.65E-04	3.78E-05	-1.89E-04	1.23E-04	-6.42E-05	2.01E-04
60	-21.95	138.471	8.394	6.76E-04	1.45E-04	-2.99E-04	3.16E-04	-1.43E-04	3.21E-04
65	-34.88	132.662	8.816	4.77E-04	7.21E-05	-2.18E-04	1.81E-04	-8.25E-05	2.82E-04
70	-47.24	123.779	9.395	1.22E-03	1.38E-04	-5.66E-04	3.97E-04	-1.74E-04	7.95E-04
75	-48.82	123.514	10.49	6.88E-04	8.35E-05	-3.51E-04	2.30E-04	-1.14E-04	4.35E-04
80	-50.15	123.409	11.589	1.53E-03	1.96E-04	-8.36E-04	5.24E-04	-2.83E-04	9.43E-04
83	-40.57	133.435	11.429	8.25E-04	9.98E-05	-4.29E-04	2.73E-04	-1.55E-04	5.53E-04

Central Mid-Atlantic Ridge									
5	7.89	112.416	0.355	1.15E-05	-4.19E-06	3.31E-06	6.08E-06	-4.44E-06	7.15E-06
10	9.11	112.069	0.707	4.68E-05	-1.78E-05	1.39E-05	2.55E-05	-1.86E-05	2.91E-05
15	1.05	108.588	1.467	3.14E-05	-1.20E-05	9.51E-06	1.84E-05	-1.34E-05	1.96E-05
20	-1.97	107.016	2.247	3.82E-05	-1.87E-05	1.43E-05	2.99E-05	-2.11E-05	2.32E-05
25	-4.75	105.347	3.074	6.96E-05	-4.82E-05	3.64E-05	7.54E-05	-5.40E-05	4.89E-05
30	-3.75	101.539	3.638	6.24E-05	-2.76E-05	2.19E-05	6.85E-05	-4.82E-05	4.99E-05
35	3.5	102.428	4.077	2.90E-04	-8.25E-05	-6.86E-05	1.17E-04	-4.84E-05	1.28E-04
40	9.71	103.578	4.603	1.04E-03	-2.54E-04	-3.36E-04	3.31E-04	-9.04E-05	4.23E-04
45	24.96	125.605	7.965	5.49E-04	-1.82E-04	-1.28E-04	2.67E-04	-1.28E-04	2.78E-04
50	28.47	135.355	12.236	8.68E-04	-1.22E-04	-4.04E-04	2.68E-04	-1.14E-04	4.61E-04
55	26.66	132.636	13.129	4.51E-04	-5.65E-05	-1.39E-04	2.09E-04	-9.44E-05	2.10E-04
60	25.51	130.148	13.773	8.00E-04	4.49E-05	-2.48E-04	3.62E-04	-1.34E-04	3.01E-04
65	22.61	126.354	13.373	5.99E-04	-6.15E-05	-1.51E-04	2.98E-04	-1.24E-04	2.93E-04
70	19.85	121.75	12.711	1.39E-03	-6.74E-05	-4.99E-04	4.91E-04	-1.46E-04	7.33E-04
75	20.13	121.2	13.586	7.94E-04	-3.89E-05	-3.15E-04	2.81E-04	-8.19E-05	3.91E-04
80	21.22	120.219	14.427	1.73E-03	-2.31E-05	-8.04E-04	5.20E-04	-1.07E-04	7.90E-04
83	27.21	125.366	16.594	9.52E-04	-5.07E-05	-4.09E-04	3.04E-04	-7.88E-05	4.85E-04
South Mid-Atlantic Ridge									
5	62.56	29.793	0.157	9.27E-05	-2.21E-05	-6.31E-05	1.18E-05	1.48E-05	5.73E-05
10	62.96	24.748	0.335	3.91E-04	-9.67E-05	-2.69E-04	5.11E-05	6.59E-05	2.43E-04
15	34.01	54.907	0.615	1.51E-04	-3.27E-05	-9.08E-05	2.09E-05	1.78E-05	8.57E-05
20	23.48	58.956	0.975	1.69E-04	-3.29E-05	-9.64E-05	2.37E-05	1.52E-05	8.13E-05
25	18.89	58.826	1.36	5.95E-04	-1.83E-04	-3.30E-04	8.81E-05	9.43E-05	2.31E-04
30	17.06	55.222	1.831	2.07E-04	-4.87E-05	-1.06E-04	5.29E-05	1.49E-05	9.72E-05
35	29.38	58.275	2.238	3.23E-04	-6.90E-05	-1.54E-04	8.13E-05	1.04E-05	1.45E-04
40	37.27	63.553	2.734	1.06E-03	-2.48E-04	-4.98E-04	2.61E-04	3.23E-05	4.68E-04
45	47.17	119.434	5.661	5.12E-04	-1.05E-04	-2.72E-04	1.26E-04	1.19E-05	2.59E-04
50	43.98	135.354	9.674	8.93E-04	-1.44E-04	-5.22E-04	2.13E-04	-9.82E-06	5.09E-04

55	42.37	130.945	10.181	5.29E-04	-7.71E-05	-2.75E-04	1.60E-04	1.02E-05	2.45E-04
60	40.13	127.273	10.588	8.20E-04	2.60E-05	-3.65E-04	3.04E-04	-5.96E-05	3.44E-04
65	36.59	121.61	9.928	5.76E-04	-2.68E-05	-2.64E-04	1.89E-04	-1.37E-05	2.96E-04
70	32.8	114.293	9.129	1.42E-03	-1.07E-04	-6.58E-04	4.23E-04	-1.33E-05	8.14E-04
75	31.87	114.355	9.919	8.08E-04	-6.42E-05	-4.07E-04	2.47E-04	-7.12E-06	4.44E-04
80	32.34	113.736	10.687	1.64E-03	-8.11E-05	-8.80E-04	5.07E-04	-5.56E-05	9.06E-04
83	38.32	121.628	12.925	9.52E-04	-9.94E-05	-4.97E-04	3.03E-04	-3.67E-06	5.66E-04
North Mid-Atlantic Ridge									
5	40.68	54.729	0.323	1.18E-05	-4.21E-06	3.55E-06	6.09E-06	-4.57E-06	7.71E-06
10	31.19	57.083	0.572	4.92E-05	-1.76E-05	1.54E-05	2.54E-05	-1.90E-05	3.20E-05
15	13.25	75.3	1.07	9.53E-05	-2.53E-05	8.95E-05	2.19E-05	-3.26E-05	1.25E-04
20	8.7	77.84	1.738	4.55E-05	-1.92E-05	2.10E-05	2.82E-05	-2.16E-05	3.17E-05
25	6.05	78.451	2.522	7.85E-05	-4.88E-05	4.14E-05	6.87E-05	-5.22E-05	5.31E-05
30	11.7	68.663	3.122	6.80E-05	-2.83E-05	2.37E-05	6.22E-05	-4.63E-05	5.18E-05
35	23.58	62.747	3.728	2.92E-04	-9.13E-05	-6.66E-05	1.11E-04	-4.10E-05	1.32E-04
40	31.93	58.592	4.511	1.03E-03	-2.96E-04	-3.32E-04	3.26E-04	-6.12E-05	4.41E-04
45	49.52	95.569	7.211	5.59E-04	-2.11E-04	-1.18E-04	2.44E-04	-1.03E-04	2.91E-04
50	48.67	118.576	11.032	8.51E-04	-1.83E-04	-4.03E-04	2.56E-04	-6.93E-05	4.92E-04
55	46.93	112.933	11.939	4.59E-04	-8.86E-05	-1.35E-04	1.87E-04	-7.59E-05	2.31E-04
60	46.78	108.714	12.697	8.08E-04	-1.52E-05	-2.62E-04	3.24E-04	-1.15E-04	3.40E-04
65	45.45	101.688	12.381	6.14E-04	-1.10E-04	-1.45E-04	2.63E-04	-9.66E-05	3.23E-04
70	44.18	91.377	11.77	1.37E-03	-1.98E-04	-5.02E-04	4.66E-04	-6.51E-05	7.95E-04
75	43.94	90.82	12.641	7.76E-04	-1.20E-04	-3.17E-04	2.68E-04	-3.34E-05	4.30E-04
79	44.64	89.402	13.511	1.36E-03	-1.84E-04	-6.66E-04	4.38E-04	-7.05E-06	7.25E-04
Central East Indian Ridge									
5	-37.89	-141.55	1.732	9.34E-06	2.08E-06	-9.03E-07	6.93E-06	-3.93E-06	6.62E-06
10	-37.77	-148.758	3.211	4.02E-05	1.65E-05	-4.59E-06	4.32E-05	-2.01E-05	2.59E-05

15	-44.57	-162.603	4.729	2.80E-05	1.97E-05	-5.55E-06	5.58E-05	-1.94E-05	1.87E-05
20	-45.35	-167.046	6.558	1.78E-05	1.03E-05	-2.35E-06	3.34E-05	-1.24E-05	1.35E-05
25	-45.49	-166.659	8.275	1.81E-05	8.69E-06	-1.89E-06	3.18E-05	-1.46E-05	1.66E-05
30	-44.41	-165.719	10.032	2.59E-05	9.54E-06	-1.57E-06	4.17E-05	-2.20E-05	2.55E-05
35	-41.32	-164.66	11.682	2.29E-04	3.40E-06	-1.15E-04	7.35E-05	-3.43E-05	1.21E-04
40	-39.4	-164.639	13.252	8.79E-04	1.90E-05	-4.61E-04	2.61E-04	-1.24E-04	4.64E-04
45	-25.4	-171.728	15.862	3.88E-04	3.31E-05	-2.28E-04	1.19E-04	-8.08E-05	2.42E-04
50	-14.6	-175.712	20.065	6.76E-04	1.31E-04	-4.48E-04	2.59E-04	-2.13E-04	4.91E-04
55	-14.57	-176.961	23.544	3.16E-04	1.04E-04	-1.78E-04	2.08E-04	-1.04E-04	1.91E-04
60	-13.84	-176.752	26.834	5.78E-04	2.48E-04	-2.58E-04	4.79E-04	-1.63E-04	2.80E-04
64	-15.58	-177.642	29.211	3.77E-04	1.58E-04	-1.68E-04	3.13E-04	-1.15E-04	2.10E-04
	Carlsberg Ridge								
5	-53.13	-170.166	1.441	8.75E-06	2.04E-06	5.85E-07	7.06E-06	-1.72E-06	5.66E-06
10	-49.7	-176.081	2.781	3.10E-05	1.73E-06	3.11E-06	1.60E-05	-6.63E-06	2.18E-05
15	-50.56	173.407	4.449	1.94E-05	3.06E-06	2.01E-06	1.47E-05	-4.78E-06	1.34E-05
20	-50.66	171.926	6.307	3.95E-05	3.27E-05	-1.36E-05	6.26E-05	-1.29E-05	2.72E-05
25	-49.92	177.053	7.914	3.31E-05	2.56E-05	-9.74E-06	5.63E-05	-1.64E-05	2.58E-05
30	-48.13	-178.478	9.547	4.79E-05	3.82E-05	-1.34E-05	9.22E-05	-2.92E-05	3.78E-05
35	-44.49	-174.748	11.081	2.60E-04	3.51E-05	-1.24E-04	1.32E-04	-4.27E-05	1.28E-04
40	-42.27	-173.102	12.62	9.41E-04	6.50E-05	-4.68E-04	3.45E-04	-1.35E-04	4.59E-04
45	-27.08	-178.033	15.274	4.19E-04	5.74E-05	-2.34E-04	1.62E-04	-8.55E-05	2.40E-04
50	-15.76	179.564	19.526	7.29E-04	1.69E-04	-4.58E-04	3.23E-04	-2.17E-04	4.85E-04
55	-15.78	179.048	23.035	3.46E-04	1.32E-04	-1.85E-04	2.55E-04	-1.08E-04	1.94E-04
60	-15.08	179.81	26.317	6.15E-04	2.80E-04	-2.63E-04	5.31E-04	-1.67E-04	2.80E-04
64	-16.87	179.206	28.724	4.07E-04	1.88E-04	-1.75E-04	3.61E-04	-1.19E-04	2.13E-04