Science Advances

AAAS

advances.sciencemag.org/cgi/content/full/3/11/eaao2303/DC1

Supplementary Materials for

Intraoceanic subduction spanned the Pacific in the Late Cretaceous–Paleocene

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Published 8 November 2017, *Sci. Adv.* **3**, eaao2303 (2017)
DOI: 10.1126/sciadv.aao2303

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table S1. Paleomagnetic data from intraoceanic arcs OA, KA, and TA. Slat/Slon, site latitude/longitude; Inc, inclination; α_{95}, 95% confidence angle; Abs. Age, best-estimate of absolute age; Ref Inc, recalculated inclination at arc reference site; PLat, calculated paleolatitude; Ref, reference. *entries which were corrected for inclination shallowing assuming *f*=0.6 in *f*-corrected mean (individual entries are listed as uncorrected).

Unit	Slat	Slon	Inc	α_{95}	Relative Age	Abs. Age	Ref Inc	±Inc	PLat	Ref.
Olutorsky Arc (OA)										
Iruney Formation, northern Median Range*	59.3	162.1	66	6.3	Campanian	78±6	66			36
Khapitsa Formation, North Kumroch Range	56.5	162	67	7.3	Campanian	78±6	69			37
Late Cretaceous-Paleocene rocks, Karaginsky Is.*	59	164.4	63	4.5	Campanian-Danian	73±11	64			38
MEAN at reference site	*60*	*163*				*76.3*	*66.3*	*3.5*	*49*	
f-corrected	***60***	***163***				***76.3***	***72.6***	***3.5***	***58***	
Paleogene rocks, Ilpinsky Peninsula*	59.8	164.9	75	8	Thanetian	58±2	75.6			39
Paleogene rocks, Ilpinsky Peninsula	59.8	164.9	76	6	Ypresian	52±4	76.4			39
MEAN at reference site	*60*	*163*				*55.0*	*76.0*	*5.0*	*63*	
f-corrected	***60***	***163***				***55.0***	***78.9***	***5.1***	***69***	
Paleogene rocks, Ilpinsky Peninsula	59.8	164.9	73	10	Lutetian-Bartonian	43±5	73.6			39
Paleogene rocks, Ilpinsky Peninsula	59.8	164.9	80	9	Priabonian-Rupelian	33±5	80.3			39
MEAN at reference site	***60***	***163***				***38.0***	***76.9***	***6.8***	***65***	
Kapinsky Arc (KA)										
Cape Kamensity Formation	54.5	162	63	6.4	Campanian-Maastrichtian	75±9				22
At reference site	***55***	***162***				***75.0***	***63***	***6.4***	***45***	
Tarkhov Formation	56.2	162.3	58	3.2	Danian	64±2	57			40
"Ypresian" basalts	54.5	162	58	3.2	pre-Ypresian	56±?	58.1			22
MEAN at reference site	***55***	***162***				***60.0***	***57.6***	***2.3***	***38***	
Baklan Formation*	56.2	162.3	64	5.3	Lutetian	45±3	63.1			40
Eocene rocks	54.5	162	63	5.6	Bartonian	40±2	63.2			22
MEAN at reference site	*55*	*162*				*42.5*	*63.2*	*3.8*	*45*	
f-corrected	***55***	***162***				***42.5***	***68.1***	***3.8***	***51***	
Tokoro Arc (TA)										
Chayka Fm., Tonino-Aniva Peninsula*	46.8	143	46.9	8.5	Campanian-Maastrichtian	75±9	42			21
Malokuril Formation*	43.5	146.5	56	3.9	Maastrichtian	69±4	56			41

Notsukamappu and Nemuro Fms., Nemuro Pen.	43	145	54	5.9	Santonian(?)	85±2	54			41
Yosenkyo Fm.*	43.2	143.8	43	15	Campanian-Maastrichtian	75±9	42.7			21
MEAN at reference site	*43*	*145*				*76.0*	*48.7*	*4.7*	*30*	
f-corrected	***43***	***145***				***76.0***	***59.1***	***4.6***	***40***	

table S2. Example depth-age associations assuming average slab sinking rates of 2.0 and 1.5 cm/year for the upper and lower mantle, respectively.

Depth (km)	Sinking Rate (cm/yr)	Time (Ma)
200	2	10
300	2	15
400	2	20
500	2	25
600	2	30
Sinking Rate Transition		
700	1.5	36.7
750	1.5	40.0
800	1.5	43.3
850	1.5	46.7
900	1.5	50.0
950	1.5	53.3
1000	1.5	56.7
1050	1.5	60.0
1100	1.5	63.3
1150	1.5	66.7
1200	1.5	70.0
1250	1.5	73.3
1300	1.5	76.7
1350	1.5	80.0
1400	1.5	83.3

table S3. Global *P*- and *S*-wave tomography models used to construct the tomographic vote maps shown in Fig. 3.

Global *P* wave models	Reference
GAP-P4	42, 43
GyPSuM-P	44
HMSL-P06	45
LLNL_G3Dv3	46
MITP_2011	47
PRI-P05	48
UU-P07	49
Global *S* wave models	**Reference**
GyPSuM-S	44
HMSL-S06	45
PRI-S05	48
S40RTS	50
SAVANI	51
SEMUCB-WM1	52
TX2011	53