TABLE 1.

Table 1a Aegean (Greece & Turkey)

Plot No.	Map No.	Basin Name	Site	Lat°	Lon°	L[1] km	W[1] km	Area[1] km^2	L/W[1] Ratio	VE[1] m	AHP[1] m	Average[2] Elevation m	Topo[3] Relief m	Basin[4] Fill m	Structural[5] Relief m	Seismic[6] Thickness km	+-	Max[7] Quake Mw	Moho[8] km	+-	Normal[9] Faulting Initiated Ma	+-	Preceding[10] Tectonism Ma	+-
		Aegean	Greece																					
91	1	Corinth	Greece	22.6	22.6	70	12	840	5.8	-900	2250	675	3150	3000	6150	22.5	2.5	6.5	32	5	4	1.4	4	1
92	2	Evia	Greece	23.2	23.2	105	12	1260	8.8	-440	890	225	1330	500	1830	22.5	2.5		32	5	4		4	
93	3	Karditsa	Greece	22.0	22.0	70	30	2100	2.3	90	1835	963	1745	150	1895	22.5	2.5		32	5	2	0.4	2	0
94	4	Larissa	Greece	22.4	22.4	55	15	825	3.7	55	1750	903	1695	500	2195	22.5	2.5		32	5	4	1.4	4	1
95	5a	Thessoloniki	Greece	22.3	22.3	30	30	900	1.0	5	1700	853	1695	4000	5695	22.5	2.5		32	5	46	11.0	46	11
96	5b	Thermaikos	Greece	23.0	23.0					-200	1640	720	1840	3000	4840	22.5	2.5		32	5	14	9.0	14	9
97	5c	N. Aegean Trough	Greece	23.7	23.7					-2500	400	-1050	2900	2500	5400	22.5	2.5		32	5	38	15.0	38	15
98	5bc	N. Aegean Trough	Greece			140	50	7000	2.8						5400	22.5	2.5							
99	6	Strymon	Greece	23.5	23.5	75	15	1125	5.0	5	1915	960	1910	4000	5910	22.5	2.5		32	5	7	4.5	7	5
100	7	Drama	Greece	22.1	22.1	45	12	540	3.8	50	2100	1075	2050	2000	4050	22.5	2.5		32	5	7	4.5	7	5
101	8	3. Evoikos (Eobian	Turkey	24.0	24.0	45	10	450	4.5	-80	600	260	680	200	880	22.5	2.5				4	1.8	4	2
102	9	Bergama Graben	Turkey	24.1	24.1	45	9	405	5.0	5	960	483	955	500	1455	22.5	2.5	7.2	28	2	8	3.0	8	3
103	10	Gediz-Alesehir	Turkey	27.0	27.0	125	12	1500	10.4	75	1970	1023	1895	4000	5895	22.5	2.5	6.8	28	2	17	6.0	17	6
104	11	Kucuk-Menderes	Turkey	27.6	27.6	80	10	800	8.0	100	1955	1028	1855	270	2125	22.5	2.5		28	2	17	6.0	17	6
105	12	Buyuk-Menderes	Turkey	27.6	27.6	110	10	1100	11.0	50	1710	880	1660	2300	3960	22.5	2.5		28	2	17	6.0	17	6
106	13-OB	Gokova	Aegean	27.9	27.9	90	10	900	9.0	-500	750	125	1250	2500	3750	22.5	2.5				17	6.0	17	6
107	14-OB	North Ikarian	Aegean	26.3	26.3	30	20	600	1.5	-1250	950	-150	2200	1500	3700	22.5	2.5		24	3	14	2.0	14	2
108	15-OB	Cavo d'Oro	Aegean	25.0	25.0	45	30	1350	1.5	-1065	600	-233	1665	1125	2790	22.5	2.5	7.0	24	3	4	1.5	4	2
109	16-OB	N. Mykonos	Aegean	25.6	25.6	40	30	1200	1.3	-920	165	-378	1085	500	1585	22.5	2.5		24	3	4	1.5	4	2
110	17-0B	Anydhros	Aegean	25.6	25.6	40	8	320	5.0	-490	25	-233	515	1800	2315	22.5	2.5	7.7	24	3	4	1.0	4	1
111	18-OB	Christiana	Aegean	25.0	25.0	50	25	1250	2.0	-550	225	-163	775	300	1075	22.5	2.5		24	3	5		5	
112	19-OB	Heraklion	Aegean	25.2	25.2	35	30	1050	1.2	-1910		-955	1910	800	2710	22.5	2.5		24	3	14	9.0	14	9
113	20-OB	Amorgos	Aegean	26.0	26.0	80	14	1120	5.7	-870	-265	-568	605	2400	3005	22.5	2.5		24	3	4	1.5	4	2
114	21-OB	N. & S. Karpathos	Aegean	27.0	27.0	80	9	720	8.9	-2550	1000	-775	3550	1500	5050	22.5	2.5		24	3	7	1.0	7	1
115	22-OB	Myrtoon	Aegean	24.0	24.0	30	30	900	1.0	-1175	520	-328	1695	2250	3945	22.5	2.5		24	3	6	1.0	6	1
116	23-OB	Kamilonissi	Aegean	26.2	26.2	40	15	600	2.7	-2400	760	-820	3160	2000	5160	22.5	2.5		24	3	11	3.3	11	3
117	24-0B	Maleas North	Aegean	23.3	23.3	20	15	300	1.3	-1415	250	-583	1665	1500	3165	22.5	2.5		24	3	5	1.5	5	2
118	25-0B	Maleas South	Aegean	23.5	23.5	15	15	225	1.0	-1330	400	-465	1730	1500	3230	22.5	2.5		24	3	5	1.5	5	2
119	26-OB	Argolkois	Aegean	23.1	23.1	80	10	800	8.0	-820				450	2495	22.5	2.5		24	3	5	1.5	5	2

Table 1b Aegean (Greece & Turkey)

Plot No.	Map No.	Basin Name	Most[11] Recent Volcanism Ma	+-	Heat[12] Flow mW/m^2	+-	Geodetic[13] Strain Rate 10^{-9}	+-	Geodetic[14] Strain Rate 10^{-9}	+-	Geodetic[15] Extension Rate mm/yr	+-	Extension[16] (Individual Basins) Dip 50^0-70^0 km	+-	Extension[17] over Basin Width	+-	Basin[17] Width over Extension	+-	Geologic[18] Extension Cumulative km	+-	Transect Distance km	Strain[19] Total %	+-
91	1	Corinth	1.0	1.0	65	15	120	40	400	100	14	5	12	5	1.0	0.4	1.2	0.5	54.6	21.6	420.0	0.1	0.1
92	2	Evia	1.0	1.0	80	20	120	40	65	5	14	5	4	1	0.3	0.1	3.9	1.6	54.6	21.6	420.0	0.1	0.1
93	3	Karditsa			70	30	25	15	20	10	8	5	4	1	0.1	0.0	9.5	3.8	54.6	21.6	420.0	0.1	0.1
94	4	Larissa			70	10	25	15	5	5	8	5	4	2	0.3	0.1	4.1	1.6	54.6	21.6	420.0	0.1	0.1
95	5a	Thessoloniki	3.0	3.0	80	20	25	15	5	10	8	5	11	4	0.4	0.1	3.2	1.3	54.6	21.6	420.0	0.1	0.1
96	5b	Thermaikos			60	10	25	15	40	10			10	4									
97	5c	N. Aegean Trough			50	10		15	50	10			11	4									
98	5bc	N. Aegean Trough			55	15		15							0.2	0.1	5.6	2.2					
99	6	Strymon			100	10	25	15	35	5	8	5	12	5	0.8	0.3	1.5	0.6	54.6	21.6	420.0	0.1	0.1
100	7	Drama			90	10	25	15	40	10	8	5	8	3	0.7	0.3	1.8	0.7	54.6	21.6	420.0	0.1	0.1
101	8	S. Evoikos (Eobian)			70	10		40	40	10			2	1	0.2	0.1	6.8	2.7					
102	9	Bergama Graben	14.0	2.0	70	10	50	10	60	10	14	3	3	1	0.3	0.1	3.7	1.5	33.8	13.4	320.0	0.1	0.0
103	10	Gediz-Alesehir	3.0	3.0	80	20	50	10	85	5	14	3	12	5	1.0	0.4	1.2	0.5	33.8	13.4	320.0	0.1	0.0
104	11	Kucuk-Menderes	8.5	3.5	85	5	50	10	50	10	14	3	4	2	0.4	0.2	2.8	1.1	33.8	13.4	320.0	0.1	0.0
105	12	Buyuk-Menderes	8.5	3.5	85	15	50	10	130	150	14	3	8	3	0.8	0.3	1.5	0.6	33.8	13.4	320.0	0.1	0.0
106	13-OB	Gokova	3.0	3.0	70	10	50	10	60	10	14	3	7	3	0.7	0.3	1.6	0.6	33.8	13.4	320.0	0.1	0.0
107	14-OB	North Ikarian			70	10			15	5			7	3	0.4	0.1	3.3	1.3					
108	15-OB	Cavo d'Oro			85	15	20	20	15	5	6	6	5	2	0.2	0.1	6.5	2.6	20.6	8.1	320.0	0.1	0.0
109	16-0B	N. Mykonos			75	5	20	20	15	5	6	6	3	1	0.1	0.0	11.4	4.5	20.6	8.1	320.0	0.1	0.0
110	17-0B	Anydhros	3.0	3.0	90	10	20	20	40	10	6	6	5	2	0.6	0.2	2.1	0.8	20.6	8.1	320.0	0.1	0.0
111	18-OB	Christiana	3.0	3.0	110	10	20	20	35	15	6	6	2	1	0.1	0.0	14.0	5.5	20.6	8.1	320.0	0.1	0.0
112	19-OB	Heraklion			85	5	20	20	25	5	6	6	5	2	0.2	0.1	6.7	2.6	20.6	8.1	320.0	0.1	0.0
113	20-OB	Amorgos	3.0	3.0	90	10			50	10			6	2	0.4	0.2	2.8	1.1					
114	21-OB	N. & S. Karpathos			50	10			40	10			10	4	1.1	0.4	1.1	0.4					
115	22-OB	Myrtoon	3.0	3.0	110	10			20	10			8	3	0.3	0.1	4.6	1.8					
116	23-OB	Kamilonissi			45	5			10	10			10	4	0.7	0.3	1.7	0.7					
117	24-0B	Maleas North			70	10			10	10			6	2	0.4	0.2	2.9	1.1					
118	25-0B	Maleas South			70	10			10	10			6	3	0.4	0.2	2.8	1.1					
119	26-OB	Argolkois			70	10			25	5			5	2	0.5	0.2	2.4	1.0					
120	27-0B	N. Skyros			70	10			75	5			6	2									

[1] Values of basin length (L), width (W), aspect ratio (L/W), valley elevation taking into account water fill (VE), and Adjacent High Peak (AHP) from visual examination of SRTM data of Becker et al., 2009ab.

[2] Average of valley elevation and adjacent high peak elevation

[3] Difference between Valley elevation and adjacent high peak elevation

[4] Sources by Map No. (1) Taylor et al. 2011 (2) Perissoratis and Vanandel, 1991 (3) Sakellariou et al., 2007 (4) Caputo et al., 2022 (5) Caputo, 1994 (6a) Arvanitas, 2016 and Chavanidis et al 2024 (6bc)) Beniest et al. 2016 (7) Arvanitas et al. 2010 (8) Georgakopoulos et al. 2001; Dinter et al 1993 (9) Yilmaz et al. 2000 (10) Ciftci and Bozkurt, 2009 (11) Emre, 2007 (12) Timer et al., 2019 (13-ob) Kurt et al, 1999; Iscan et al, 2012 (14-ob) Beneist, 2016 (15-ob) Sakellariou et al 2013 (16-ob) Sakellariou-Tsampourak, 2019 (17-ob) Sakellariou et al 2013 (also see Perissoratis et al 1999-less fill?) (18-ob) Nomikou et al 2016 (19-ob) Mascle and Martin, 1990 (20-ob) Piper & Perissoratis-2003 - Perissoratis et al 1999 (21-ob) Tsamourake and Kraounaki, 2022 Anastasake and 2006 (22-ob) Sakellarious et al. 2019 and Strozyk et al. 2010 (23-ob) Fassoulas, 2001 (24,5-ob) Sakellarious et al, 2019 (26-ob) Papaniklaou 1988 - Piper and Perissoratis 2003 (27-ob) Beneist, 2016

[5] Values of structural relief reflect sea depths for Corinth Basin no. 1 (Taylor et al. 2011), S. Evoikos Gulf Basin No. 2 and Thermoikos Gulf Basin No 6b (GEBCO)

[6] Shaw and Jackson (2010)

[7] Mw 6.8 Alesehir of 1969-03-28 (Eyidogan and Jackson, 1985), Mw 7.0 Samos of 2020-10-30 (Ganas et al, 2021 and Ren et al., 2022), and Mw 6 Corinth of 1981-02-24 (Jackson et al, 1982ab)

[8] Figure 16 of Sodoudi et al. (2006), P & S receiver functions

[9] Corinth No. 1 (Rohais and Moretti, 2017 and Perissoratis and Vanandel, 1991); S. Evoikos No. 2 (Papanikolaou et al., 1988); Evia No. 3 (Caroir et al., 2024); Karditsa No. 4 (Caputo et al., 2022); Larissa No. 5. (Caputo et al., 1994); Thessonoliki No. 6a (Arvanitas et al., 2016); Thermaikos No. 6b (Makrodimitras et al., 2023); North Aegean Trough No 6c (Varesis and Anastasakis, 2021); Strymon No. 7 (Tranos, 2011 and Dinter, 1998); Drama No. 8 (Georgakopoulos et al., 2001 and Dinter, 1998); Bergama No. 9 (Yilmaz et al., 2000); Aleshir-Gediz No. 10 (Yilmaz and Gelisli, 2003 and Çiftçi and Bozkurt, 2009); Kucuk-Menderes No. 11 (Çiftçi and Bozkurt, 2009); Gokova No. 13-OB ((Çiftçi and Bozkurt, 2009 and Tur et al., 2015); N. Ikaria No. 14-OB (Beniest et al., 2016); Cavo D'Oro No. 15-OB (Sakellariou 2013); N. Mykonos No. 16-OB (Sakellariou and Tsampouraki-Kraounaki, 2019); Anhydros No. 18-OB (Nomikou et al 2016 and Preine et al. 2021); Karpathos No 19-OB (Mascle and Martin, 1990); Christiana No. 20-OB (Piper and Perissoratis, 2003); Myrtoon No. 21-OB ((Anastasakis et al., 2006); Kamilonissi No. 22-OB (Bartole et al, 1983 and Sakellariou-Kraouinaki, 2019); Heraklion No. 23-OB (Fassoulas, 2001): Values in accompanying plot show ranges of values in Greece, Turkey, and Aegean Sea regions, respectively.

[10] Region was one of alpine convergence prior to back arc extension, so time of most recent preceding tectonism is considered concurrent as initiation. Values in accompanying plot show ranges of initiation values in Greece, Turkey, and Aegean Sea regions, respectively.

[11] Fytikas, 1984.

[12] Values picked from heat flow contour maps of Greece and Aegean: Fytikas et al., 1979; Papadakis et al, 2016; Turkey: Balkan-Pazvantoglu et al (2021). Range of values reflected in accompanying plot reflects average and standard deviation of these values.

[13] Averaged extensional strain rates from Chousianitis et al. (2015) across Basin No.'s 1 thru 7, same from Aktug et al. (2009) for Basin No.'s 9 thru 13-ob, and same from 15-0B to 19-OB from Kahle et al. (1999), and same for 26-OB and 27-OB from Chousianitis et al. (2015)

[14] Values of averaged extensional strain at individual basins taken from same maps of Chousianitis et al. (2015) , Aktug et al. (2009), and Kahle et al. (1999) used to assess average values along transects of basins.

[15] Extension rates calculated by multiplying average extensional strain rates by 150 km transect transverse to Basin no.'s 1 thru 2, across 250 km transect transverse to Basin No.'s 3 thru 7, across 275 km transect transverse to Basin No.'s 9 thru 13, and 300 km transect transverse to basin no.'s 15-ob, 16-ob,17-ob,18-ob,19ob

[16] Extension in individual basins assuming structural relief accommodated on basin bounding faults that dip 50°-70°.

[17] Ratio of extension calculated in individual basins to basin width and vica versa

[18] Values are sums of individual basin extensions along transect of Greek faults (basin 1 to 8), Turkey (basins 9 thru 13-0B), the Aegean (no.'s 15-ob, 16-ob,17-ob,18-ob,19ob)

[19] Cumulative Extensional Strains of Greek faults (basin 1 to 7), Turkey (basins 9 thru 13-0B), the Aegean (basins 15-ob,16-ob, 18-ob,20-ob, and 23-ob) divided by 420km, 320, and 320 km, respectively (the length of transect appoximately perpendicular to fault strike.

TABLE 2. Africa

Table 1a Africa

Plot No.	Map No.	Basin[1] Name	Lat°	Lon°	L^2 km	W^2 km	Area[2] km²	L/W^2 Ratio	Valley[2] Elevation m	Adjacent[2] High Peak m	Average[2] Elevation	Topo[3] Relief m	Basin[4] Fill m	Structural[5] Relief m	Seismic[6] Thickness km	+-		Max[7] Mag Mw	Moho[8] km	+-	Normal[9] Faulting Initiated Ma	+-	Preceding[10] Tectonism Ma
222	1.0	Kariba	-16.9	28	175	40	7000	4	490	1245	868	755			39	5		40	2	7	2	310	170
223	2.0	Lusaka-Makuti*	-16.0	29	100	50	5000	2	360	1300	830	940			39	5		40	2	7	2	310	170
224	3.0	Cabora Bassa*	-16.0	31	215	90	19350	2	310	1290	800	980			39	5	7	40	2	7	2	310	170
225	4.0	Kabwe*	-14.9	29	110	25	2750	4	460	1200	830	740			39	5		40	2	7	2	310	170
226	5.0	Muchinga*	-14.0	30	80	20	1600	4	500	1290	895	790			39	5		40	2	7	2	310	170
227	6.0	Luangwa	-12.0	32	330	65	21450	5	530	1580	1055	1050			39	5		40	2	7	2	310	170
228	7.0	Lake Malawi	-12.3	34	575	65	37375	9	-80	2260	1090	2340	7000	9340	39	5		40	2	7		310	170
229	8.0	Lake Rukwa	-8.1	32	280	40	11200	7	797	2250	1524	1453	7000	8453	39	5		40	2	5		310	170
230	9.0	Lake Tanganyika	-6.5	30	680	50	34000	14	-633	2370	869	3003	7000	10003	39	5		40	2	12		310	170
231	10.0	Kivu	-2.0	29	75	35	2625	2	980	2850	1915	1870			39	5		40	2	7	2	310	170
232	11.0	Lake Edward	-0.4	30	85	40	3400	2	795	2890	1843	2095			39	5		40	2	5		310	170
233	12.0	Mobutu-Albertine	1.5	31	240	40	9600	6	564	2250	1407	1686	6000	7686	39	5	7	40	2	16		310	170
234	13.0	Usungu Flats	-8.5	34	115	50	5750	2	1015	1700	1358	685			39	5		40	2	10		310	170
235	14.0	Mtera Reservoir*	-7.3	36	150	25	3750	6	690	1170	930	480			39	5		40	2	7	2	310	170
236	15.0	Lake Salunga*	-5.2	35	80	25	2000	3	825	1310	1068	485			39	5		40	2	7	2	310	170
237	16.0	Lake Manyara*	-3.7	36	70	20	1400	4	952	1810	1381	858	3000	3858	39	5		40	2	7	2	310	170
238	17.0	Lake Eyasi	-2.7	36	85	15	1275	6	1027	1940	1484	913	3000	3913	39	5		40	2	7	2	310	170
239	18.0	Magadi-Natron	-2.3	36	85	15	1275	6	600	2770	1685	2170	2000	4170	39	5		40	2	7	2	310	170
240	19.0	Kenyan Rift	0.8	36	140	20	2800	7	1750	3800	2775	2050			39	5		40	2	22		310	170
241	20.0	Lake Turkana /Rudolph	3.6	36	250	30	7500	8	280	630	455	350			39	5		40	2	20		310	170
242	21.0	Ndedo*	5.0	37	110	30	3300	4	496	1970	1233	1474			39	5		40	2	20		310	170
243	22.0	Ethiopian Rift	8.5	39	400	65	26000	6	1570	3700	2635	2130			39	5		40	2	20	5	310	170

Table 1b Africa

Plot No.	Map No.	Basin[1] Name	Most[10] Recent Volcanism Ma	+-	Heat[11] Flow mW/m²	+-	Strain[12] Rate 10^{-9}	+-	Geodetic[13] Extension Rate mm/yr	+-	Extension[14] Individual Basins km	+-	Extension over Basin Width %	+-	Basin Width over Extension	+-	Extension[15] across Rift Branches	+-	Average[16] Width Branches	Strain[17] Across Each Branch	+-	Sum[18] of Average Extensions across East and West Branches	+-	Percentage[19] Strain Across Province (~1000km) %	+-	Total West Branch Ebinger et al. 1991) km	+-
222	1	Kariba			50	10	50	25	2	1																	
223	2	Lusaka-Makuti*			50	25	40	20	2	1																	
224	3	Cabora Bassa*			50	25	22	11	2	1																	
225	4	Kabwe*			50	25	80	40	2	1																	
226	5	Muchinga*			50	25	100	50	2	1																	
227	6	Luangwa			50	25	31	15	2	1																	
228	7	Lake Malawi			50	25	31	15	2	1	18	7	28%	11%	4	2	17	7	100	0.17	##	29	12	3%	1%	7	4
229	8	Lake Rukwa			50	25	50	25	2	1	17	7	42%	16%	3	1	17	7	100	0.17	##	29	12	3%	1%	7	4
230	9	Lake Tanganyika			50	25	40	20	2	1	20	8	39%	16%	3	1	17	7	100	0.17	##	29	12	3%	1%	7	4
231	10	Kivu	1	1	50	25	57	29	2	1																7	4
232	11	Lake Edward			50	25	50	25	2	1																7	4
233	12	Mobutu-Albertine			50	25	50	25	2	1	15	6	38%	15%	3	1	17	7	100	0.17	##	29	12	3%	1%	7	4
234	13	Usungu Flats	1	1	50	25	40	20	2	1																	
235	14	Mtera Reservoir*	1	1	50	25	80	40	2	1																	
236	15	Lake Salunga*	1	1	50	25	80	40	2	1																	
237	16	Lake Manyara*	1	1	50	25	100	50	2	1	8	3	38%	15%	3	1	12	5	100	0.12	##	29	12	3%	1%		
238	17	Lake Eyasi	1	1	50	25	133	67	2	1	8	3	51%	20%	2	1	12	5	100	0.12	##	29	12	3%	1%		
239	18	Magadi-Natron	1	1	50	25	133	67	2	1	8	3	55%	22%	2	1	12	5	100	0.12	##	29	12	3%	1%		
240	19	Kenyan Rift	1	1	50	25	100	50	2	1																	
241	20	Lake Turkana /Rudolph	1	1	50	25	67	33	2	1																	
242	21	Ndedo*	1	1	50	25	150	17	5	1																	
243	22	Ethiopian Rift	1	1	50	25	69	8	5	1																	

1 Asterisk is informal name used by author.

2 Values of basin length (L), width (W), aspect ratio (L/W), valley elevation taking into account water fill (VE), and Adjacent High Peak (AHP) from visual examination of SRTM data of Becker et al., 2009ab.

3 Difference between Valley elevation and adjacent high peak elevation

4 Lake Malawi (Ebinger et al., 1999; Lakes Rukwa and Tangyanika (Rosendahl et al. 1992); Lakes Mobutu/Albertine, Mayara, Eyasi, and Magadi/Natron (Ebigner et al. 1987.

5 Values take into account water depth for Lakes Malawi (Johnson & Davis, 1989; Ebinger et al., 1987), Rukwa (Kilemebe & Rosendahl, 1992), Tanganyika (Ebinger et al., 1989; Kraemer et al., 2015; Naithani et al., 2003) Kivu (Ross et al., 2015), Edward (Russell and Werne, 2009); Mobutu/Albert (Karp et al., 2012), Manrara (Wikepedia), and Turkana (Johnson and Davis, 2009)

6 Craig et al., 2011; Lavayssiere et al,. 2019.

7 Giardini & Beranzola, 1992; Yang and Chen, 2008

8 Dugda et al., 2007; Craig et al., 2011; Hodgson et al., 2017; Wang et al., 2021

9 Values from Macgregor (2015). Those without error bars taken from his Figures 2 and 3. Remaining reflect his statement that majority of fault activity and structural growth along rift occurred in last 5-9 Ma.

Values in accompanying plot show range of reported values across region, with the older ages of northern rift basins separated out because of distinctly olde ages.

10 Thieblemont (2016): Carte Geologique de L'Afrique

11 Wheildon et al. 1994; Davies, 2013

12 Extension Rate Saria et al. (2014) divided by basin width

13 Saria et al. (2014)

14 Values calculated from measures of structural relief for those basins with information on depth of basin fill. Assume dips 50°-70°

15 Values of Individual Basin Extensions along East and West Rifts averaged, respectively.

16 Widest portion of rift system is about 1000 km

17 Approximate value calculatd by dividing Average Extension across rift branches by average widh of branch.

18 Sum of average extensions across East and West Branches of Rift d

19 Sum of average extensions across East and West Branches of Rift divided by approximate 1000 km transect across the two branches.

20 Ebinger et al. 1991: Gravity and Topography analysis along West Branch of African Rift yields less extension than simple geometrical approach used here.

TABLE 3. Baikal

Table 3a Baikal

Plot No.	Map No.	Basin Name	Location	Lat°	Lon°	Length [1] km	Width [1] km	Area [1] km²	L/W [1] Ratio	Valley [1] Elevation m	Adjacent [1] High Peak m	Average [2] Elevation	Topo [3] Relief m	Basin [4] Fill m	Structure [5] Relief m	Seismic [6] Thickness km	+-	Max [7] Quake Mw	Moho [8] km	+-	Initiation [14] of Normal Faulting Ma	+-
200	1	Busingol*	Russia	97.9	51.1	50	12	600	4	1275	2570	1923	1295		1295	35	5		42	3	14	9
201	2	Darkhat*	Mongolia	99.5	51.2	100	25	2500	4	1540	3000	2270	1460		1460	35	5		42	3	14	9
202	3	Hovsgol	Mongolia	100.5	51.2	120	25	3000	5	1380	2900	2140	1520	500	2020	35	5	7	42	3	14	9
203	4	Tunka	Russia	102.4	51.7	130	30	3900	4	715	3000	1858	2285	2750	5035	35	5		42	3	83	18
204	5	Lake Baikal - all		107.3	52.8	650	50	32500	13	-1175	1500	163	2675	7500	10175							
205	5a	south Basin	Russia	105.0	51.7	150	40	6000	4	-945	1000	28	1945	7000	8945	35	5		42	3	83	18
206	5b	central Basin	Russia	107.3	52.8	180	70	12600	3	-1145	1500	178	2645	7500	10145	35	5		42	3	83	18
207	5c	north Basin	Russia	109.0	54.3	250	50	12500	5	-445	1950	753	2395	3500	5895	35	5		42	3	31	8
208	6	Barguzzin	Russia	110.6	54.3	180	30	5400	6	500	2200	1350	1700	2000	3700	35	5		42	3	14	9
209	7	Upper Angorra	Russia	111.7	56.1	90	30	2700	3	470	2300	1385	1830	2000	3830	35	5		42	3	14	9
210	8	Upper Muya*	Russia	54.6	109.1	85	10	850	9	800	2250	1525	1450		1450	35	5		42	3	14	9
211	9	Muya	Russia	113.5	55.8	70	30	2100	2	650	1650	1150	1000	1500	2500	35	5		42	3	14	9
212	10	Chara	Russia	115.7	56.4	90	25	2250	4	700	2150	1425	1450	1000	2450	35	5	7	42	3	14	9

Table 3b Baikal

Plot No.	Map No.	Basin Name	Preceding [15] Tectonism Ma	+-	Most [16] Recent Volcanism Ma	+-	Heat [17] Flow mW/m²	+-	Extension [9] Individual Basins km	+-	Extension over Basin Width (strain)	+-	Basin Width over Extension	+-	Extension [10] Total (transects) km	+-	Strain [10] Total %	+-	Geodetic [12] Extension Rate mm/yr	+-	Geodetic [13] Strain Rate 10^{-9}	+-
200	1	Busingol*	289	247	12	12	63	13	3	1	0.2	0.1	6	2	9	1	4%	1%	2	1	167	83
201	2	Darkhat*	303	238	12	12	63	13	3	1	0.1	0.0	10	4	9	1	4%	1%	2	1	80	40
202	3	Hovsgol	303	238	12	12	63	13	4	2	0.2	0.1	7	3	9	2	4%	1%	2	1	80	40
203	4	Tunka	303	238	12	12	63	13	10	4	0.3	0.1	4	1	10	4	33%	13%	4	1	133	33
204	5	Lake Baikal - all	303	238																		
205	5a	south Basin	303	238	303	238	63	13	18	7	0.4	0.2	3	1	18	7	44%	17%	4	1	100	25
206	5b	central Basin	303	238	303	238	63	13	20	8	0.3	0.1	4	2	20	8	29%	11%	4	1	57	14
207	5c	north Basin	303	238	303	238	63	13	12	5	0.2	0.1	5	2	19	5	9%	4%	2	1	40	20
208	6	Barguzzin	303	238	303	238	63	13	7	3	0.2	0.1	5	2	19	3	9%	4%	2	1	67	33
209	7	Upper Angorra	303	238	303	238	63	13	8	3	0.3	0.1	5	2	10	3	5%	2%	4	1	133	33
210	8	Upper Muya*	303	238	303	238	63	13	3	1	0.3	0.1	4	2	10	1	5%	2%	4	1	400	100
211	9	Muya	303	238	303	238	63	13	5	2	0.2	0.1	7	3	5	2	16%	6%	4	1	133	33
212	10	Chara	303	238	12	12	63	13	5	2	0.2	0.1	6	2	5	2	19%	8%	4	1	160	40

[1] Values from visual excamination of SRTM data of Becker et al., 2009ab.

[2] Average of valley elevation and adjacent high peak elevation

[3] Difference between Valley elevation and adjacent high peak elevation

[4] Hovsgol-Map No.3 (Logatchev and Zorin, 1992); Tunka-Map No.4 (Shchetnikov et al., 2012 citing Logatchev, 1974 and Mazilov et al. 1993); Baikal Basins-Map Nos 5a, b, c (Fig. 4 of Hutchinson et al., 1992);
(Barguzin, Upper Angorea, Uooer Muya, and Chara Basins-Map Nos 6,7, 9, 10 (Logatchev andf Zoren, 1992)

[5] Values take into account lake depths in Hovsgol (Map No. 3) and the South, Central, and North Basins of Lake Baikal (Map No. 5a,b,and c). Hovsgol Lake depth of 260 m
from Table 1 of Ivanov and Demonterova, 2009. South, Central and North depths are 1400 m, 160 0m, and 900 m taken at locations of maximum basin fill obtained from Figure 3 of Gladkohub and Donsakaya, 2009,
Values for Busingol and Darkhat are topographic relief because no information of depth of sedimentary fill.

[6] Figure 3 of Déverchère et al., 2001 and Emmerson et al., 2006

[7] The Mw 7.1 Muya earthquake of May 27, 1957 (Emmerson et al., 2006) and Mw 6.7 Khovsgol (Liu et al., 2021; Ovsyuchenko et al., 2024)

[8] Terrestrial and marine refraction profiles Puzirev et al. 1970, 1973, 1978; ten Brink and Taylor, 2002;and Nielsen and Thybo, 2009ab; gravity modeling of Zorin et al., 1989;
Zorin and Cordell, 1991ab; Burov et al., 1994; Petit et al., 1997; and Petit and Déverchère, 2006; seismic tomography and ray-tracing of Suvorov et al., 2002;
Yakovlev et al., 2007; Nielsen and Thybo, 2009ab, receiver function analysis of Gao et al., 1994; Gao et al., 2004; Emmerson et al., 2006; and Vinnik et al., 2017 and velocity
inversion of earthquake arrival times Gao et al., 1994; and Petit and Deverchere, 1995.

[9] Extension in individual basins assuming structural relief accommodated on basin bounding faults that dip 50°-70°.

[10] Busingol (1) , Darkhat (2), Hovsgol (3) and Baikal North (5c), Barguzzin (6) and Upper Angora, Upper Muya Basins are respectively arranged subparallel.
Values for each basin are the sum of extension across the respective subparallel basins. Remaining values are those of individual basins

[11] Extension total divided by basin width when all extension accommodated by one basin or divided by transect distance when basins arranged subparallel: (250 km across Basin No.s 1 (Busingol), 2 (Darkhat), and 3 (Hovsgol);
200 km across Basiins No.s 5c (South Baikal Basin) and 6 (Barguzin); 200 km across Map No.s 7 (Upper Angora) and No. 8 (Upper Muya)

[12] Calais et al, 2003 and Sankov et al., 2014: Note Busingol (Map No. 1), Darkhat (Map No. 2) and Hovsgol (Map No. 3) are oblique (~45°) to extension direction. The values are approximated as 1/2 of that observed across Lake Baikal Basir
Assumed extension rate shared between subparallel Upper Angora and Upper Muya Basins (Map No.s 7 and 8, respectively.

[13] Value is geodetic extension rate divided by width of respective basin.

[14] review paper of Krivonogov and Safonova, 2017.

[15] Zorin, 1999; Petit and Déverchère, 2006

[16] Ivanov and Demonterova, 2009; Ivanov et al, 2015.

[17] Lysak, 1984; in accord with Lysak and Sherman, 2002; Poort and Klerkx, 2004; Rychkova and Mongush, 2018

TABLE 4. Basin and Range

Table 4a. Basin and Range

Plot No.	Map No.	Basin Name	Lat°	Lon°	Length[1] km	Width[1] km	Area[1] km²	Aspect[1] Ratio	Valley[1] Elevation m	Adjacent[1] High Peak m	Average[2] Elevation m	Topo[3] Relief m	Basin[4] Unconsolidated Fill m	Structural[5] Relief Unconsolidated Fill m	Basin[6] Fill to Crystalline Basement m	Structural[7] Relief Fill to Crystalline Basement m	Seismic[8] Thicknes s km	+-	Max[9] Quake Mw	Moho[10] km	+-	Initiation[17] Ma	+-
130	1	Surprise Valley			80	15	1200	5	1360	2820	2090	1460	600	2060	2100	3560	18	3		33	3	18	2.5
131	2	Long Valley			75	12	900	6	1680	2250	1965	570	600	1170	2500	3070	18	3		33	3	18	2.5
131	3	Black Rock			50	12	600	4	1215	2500	1858	1285	600	1885	6700	7985	18	3		33	3	18	2.5
132	4	Black Rock			120	15	1800	8	1200	2500	1850	1300	600	1900	6500	7800	18	3		33	3	18	2.5
132	5	Desert			115	14	1610	8	1260	2700	1980	1440	600	2040	2792	4232	18	3		33	3	18	2.5
133	6	Silver State -Quinn River			140	14	1960	10	1270	2700	1985	1430	600	2030	2500	3930	18	3		33	3	18	2.5
133	7	Paradise			50	11	550	5	1350	2160	1755	810	600	1410	4432	5242	18	3		33	3	18	2.5
134	8	Grass			40	10	400	4	1350	2650	2000	1300	600	1900	2925	4225	18	3		33	3	18	2.5
134	9	Granite Spring			40	20	800	2	1190	2100	1645	910	600	1510	3250	4160	18	3		33	3	18	2.5
135	10	Humboldt-Rye Patch			55	10	550	6	1280	2600	1940	1320	600	1920	2600	3920	18	3		33	3	18	2.5
135	11	Buena Vista			75	12	900	6	1250	2375	1813	1125	600	1725	4190	5315	18	3		33	3	18	2.5
136	12	Pleasant			35	6	210	6	1380	2815	2098	1435	600	2035	1919	3354	18	3	7	33	3	18	2.5
136	13	Buffalo			25	12	300	2	1410	2512	1961	1102	600	1702	2575	3677	18	3		33	3	18	2.5
137	14	Reese River			75	13	975	6	1400	2800	2100	1400	600	2000	2543	3943	18	3		33	3	18	2.5
137	15	Crescent			20	9	180	2	1445	1975	1710	530	100	630	160	690	18	3		33	3	18	2.5
138	16	Crescent			35	10	350	4	1445	2560	2003	1115	600	1715	4705	5820	18	3		33	3	18	2.5
138	17	Pine			50	15	750	3	1635	2500	2068	865	600	1465	7248	8113	18	3		33	3	18	2.5
139	18	Huntington-Lamoille			130	17	2210	8	1625	3200	2413	1575	35	1610	3103	4678	18	3		33	3	18	2.5
139	19	Ruby			80	15	1200	5	1830	3150	2490	1320	600	1920	997	2317	18	3		33	3	18	2.5
140	20	Clover			45	10	450	5	1710	3200	2455	1490	600	2090	1435	2925	18	3		33	3	18	2.5
140	21	Independence			45	10	450	5	1710	2675	2193	965	600	1565	4040	5005	18	3		33	3	18	2.5
141	22	Goshute			75	12	900	6	1720	2675	2198	955	600	1555	2646	3601	18	3		33	3	18	2.5
141	23	G. Salt Lake (Cedar Mtns)						2	1325	2160	1743	835	411	1246	411	1246	18	3		33	3	18	2.5
142	24	Skull			55	13	715	4	1325	3070	2198	1745	600	2345	3254	4999	18	3		33	3	18	2.5
142	25	G. Salt Lake (Antelope Isl.			145	30	4350	5	1280	1775	1528	495	15	510	5828	6323	18	3		33	3	18	2.5
143	26	Ogden			95	25	2375	4	1280	2750	2015	1470	1037	2507	5368	6838	18	3		33	3	18	2.5
143	27	Cedar			35	10	350	4	1470	2270	1870	800	358	1158	1061	1861	18	3		33	3	18	2.5
144	28	Utah Lake			45	15	675	3	1370	3120	2245	1750	1063	2813	4429	6179	18	3		33	3	18	2.5
144	29	Antelope			35	10	350	4	1505	2250	1878	745	600	1345	5264	6009	18	3		33	3	18	2.5
145	30	Garico			25	15	375	2	1570	2350	1960	780	355	1135	1189	1969	18	3		33	3	18	2.5
145	31	Grass			50	12	600	4	1715	2560	2138	845	600	1445	2382	3227	18	3		33	3	18	2.5
146	32	Diamond			65	13	845	5	1760	2780	2270	1020	600	1620	5331	6351	18	3		33	3	18	2.5
146	33	Newark			55	12	660	5	1780	2525	2153	745	600	1345	1150	1895	18	3		33	3	18	2.5
147	34	Long			40	12	480	3	1860	2650	2255	790	600	1390	3806	4596	18	3		33	3	18	2.5
147	35	Butte			30	9	270	3	1900	2640	2270	740	600	1340	3517	4257	18	3		33	3	18	2.5
148	36	Steptoe			140	10	1400	14	1790	3000	2395	1210	600	1810	4532	5742	18	3		33	3	18	2.5
148	37	Fish Springs			30	12	360	3	1320	2310	1815	990	584	1574	910	1900	18	3		33	3	18	2.5
149	38	Juab			45	6	270	8	1490	3400	2445	1910	307	2217	1644	3554	18	3		33	3	18	2.5
149	39	Carson Sink			85	35	2975	2	1185	2300	1743	1115	600	1715	6531	7646	18	3		33	3	18	2.5
150	40	Dixie			70	12	840	6	1035	2240	1638	1205	600	1805	7061	8266	18	3	7	33	3	18	2.5
150	41	Edwards Cr			38	12	456	3	1560	2875	2218	1315	600	1915	1457	2772	18	3		33	3	18	2.5
151	42	Smith Creek			55	14	770	4	1850	2500	2175	650	600	1250	1687	2337	18	3		33	3	18	2.5
151	43	Reese River			100	13	1300	8	1800	3250	2525	1450	600	2050	1030	2480	18	3		33	3	18	2.5
152	44	Big Smoky			100	15	1500	7	1660	3250	2455	1590	600	2190	5375	6965	18	3		33	3	18	2.5
152	45	Monitor			95	10	950	10	2070	3470	2770	1400	600	2000	6950	8350	18	3		33	3	18	2.5
153	46	Anelope-Koben			45	10	450	5	1925	3000	2463	1075	600	1675	3429	4504	18	3		33	3	18	2.5
153	47	Little Smoky			40	13	520	3	1830	2740	2285	910	600	1510	1428	2338	18	3		33	3	18	2.5
154	48	Jakes			30	10	300	3	1920	2650	2285	730	600	1330	1870	2600	18	3		33	3	18	2.5
154	49	Spring			100	15	1500	7	1690	3450	2570	1760	600	2360	3294	5054	18	3		33	3	18	2.5
155	50	Snake			55	12	660	5	1480	3450	2465	1970	600	2570	3546	5516	18	3		33	3	18	2.5
155	51	Tule			55	9	495	6	1350	2760	2055	1410	600	2010	601	2011	18	3		33	3	18	2.5
156	52	Clear Lake			95	40	3800	2	1380	2080	1730	700	600	1300	5759	6459	18	3		33	3	18	2.5
156	53	Scipio			12	5	60	2	1610	2650	2130	1040	198	1238	418	1458	18	3		33	3	18	2.5
157	54	Gunnison			45	6	270	8	1530	2400	1965	870	600	1470	1260	2130	18	3		33	3	18	2.5
157	55	Sanpete			45	8	360	6	1660	2500	2080	840	600	1440	600	1440	18	3		33	3	18	2.5
158	56	Fairview			35	12	420	3	1320	1825	1573	505	600	1105	3099	3604	18	3	7	33	3	18	2.5
158	57	Little Fish Lake			50	10	500	5	2050	3225	2638	1175	600	1775	2951	4126	18	3		33	3	18	2.5
159	58	Railroad			125	20	2500	6	1450	3200	2325	1750	600	2350	4065	5815	18	3		33	3	18	2.5
159	59	White River			90	16	1440	6	1650	2700	2175	1050	600	1650	5697	6747	18	3		33	3	18	2.5
160	60	Lake			80	15	1200	5	1810	3125	2468	1315	600	1915	6135	7450	18	3		33	3	18	2.5
160	61	Hamlin			35	18	630	2	1750	2750	2250	1000	600	1600	3752	4752	18	3		33	3	18	2.5
161	62	Pine			60	15	900	4	1575	2550	2063	975	600	1575	2642	3617	18	3		33	3	18	2.5
161	63	Wah-Wah			35	10	350	4	1450	2750	2100	1300	600	1900	1139	2439	18	3		33	3	18	2.5
162	64	Sevier			50	15	750	3	1370	2040	1705	670	600	1270	1591	2261	18	3		33	3	18	2.5
162	65	Milford?			60	15	900	4	1510	2700	2105	1190	600	1790	2901	4091	18	3		33	3	18	2.5
163	66	Scipio Lake			20	4	80	5	1820	2925	2373	1105	10	1115	386	1491	18	3		33	3	18	2.5
163	67	Revielle			30	8	240	4	1610	3000	2305	1390	600	1990	2033	3423	18	3		33	3	18	2.5
164	68	Kawich-Hot Crk			140	14	1960	10	1800	3625	2713	1825	100	1925	3650	5475	18	3		33	3	18	2.5
164	69	Dry Lake			55	9	495	6	1400	2750	2075	1350	600	1950	5080	6430	18	3		33	3	18	2.5
165	70	Hamlin			45	15	675	3	1950	2750	2350	800	600	1400	3698	4498	18	3	7	33	3	18	2.5
165	71	Escalante			60	25	1500	2	1560	2225	1893	665	600	1265	1446	2111	18	3		33	3	18	2.5

Table 4b. Basin and Range

Plot No.	Map No.	Basin Name	Preceding[18] Tectonism Ma	+-	Most[19] Recent Volcanism Ma	+-	Heat[20] Flow mW/m²	+-	Moho[10] Depth km	+-	Basin[21] Extension	+-	Extension over Basin Width (strain)	+-	Basin Width over Extension	+-	Extension[11] Total (unconsolidated fill) km	+-	Extension[12] Total (fill to crystalline basement) km	+-	Strain[13] Total (unconsolidated fill) %	+-	Strain[14] Total (fill to crystalline basement) %	+-	Geodetic[15] Extension Rate mm/yr	+-	Geodetic[16] Strain Rate 10^{-9}	+-
130	1	Surprise Valley	30	8	30	8	80	20	33	3	7	3	0.5	0.2	3	1									2	1	3	2
131	2	Long Valley	30	8	30	8	80	20	33	3	6	2	0.5	0.2	2	1									2	1	3	2
131	3	Black Rock	30	8	30	8	80	20	33	3	16	6	1.3	0.5	1	0									2	1	3	2
132	4	Black Rock	30	8	30	8	80	20	33	3	15	6	1.0	0.4	1	0									2	1	3	2
132	5	Desert	30	8	30	8	80	20	33	3	8	3	0.6	0.2	2	1									2	1	3	2
133	6	Silver State -Quinn River	30	8	30	8	80	20	33	3	8	3	0.6	0.2	2	1									2	1	3	2
133	7	Paradise	30	8	30	8	80	20	33	3	10	4	0.9	0.4	1	0									2	1	3	2
134	8	Grass	30	8	30	8	80	20	33	3	8	3	0.8	0.3	1	1									2	1	3	2
134	9	Granite Spring	30	8	30	8	80	20	33	3	8	3	0.4	0.2	3	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
135	10	Humboldt-Rye Patch	30	8	30	8	80	20	33	3	8	3	0.8	0.3	2	1	70	28	179	71	10%	4%	27%		2	1	3	2
135	11	Buena Vista	30	8	30	8	80	20	33	3	10	4	0.9	0.3	1	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
136	12	Pleasant	30	8	30	8	80	20	33	3	7	3	1.1	0.4	1	0	70	28	179	71	10%	4%	27%	11%	2	1	3	2
136	13	Buffalo	30	8	30	8	80	20	33	3	7	3	0.6	0.2	2	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
137	14	Reese River	30	8	30	8	80	20	33	3	8	3	0.6	0.2	2	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
137	15	Crescent	30	8	30	8	80	20	33	3	1	1	0.2	0.1	8	3	70	28	179	71	10%	4%	27%	11%	2	1	3	2
138	16	Crescent	30	8	30	8	80	20	33	3	11	5	1.1	0.5	1	0	70	28	179	71	10%	4%	27%	11%	2	1	3	2
138	17	Pine	30	8	30	8	80	20	33	3	16	6	1.1	0.4	1	0	70	28	179	71	10%	4%	27%	11%	2	1	3	2
139	18	Huntington-Lamoille	30	8	30	8	80	20	33	3	9	4	0.5	0.2	2	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
139	19	Ruby	30	8	30	8	80	20	33	3	5	2	0.3	0.1	4	2	70	28	179	71	10%	4%	27%	11%	2	1	3	2
140	20	Clover	30	8	30	8	80	20	33	3	6	2	0.6	0.2	2	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
140	21	Independence	30	8	30	8	80	20	33	3	10	4	1.0	0.4	1	0	70	28	179	71	10%	4%	27%	11%	2	1	3	2
141	22	Goshute	30	8	30	8	80	20	33	3	7	3	0.6	0.2	2	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
141	23	G. Salt Lake (Cedar Mtns)	30	8	30	8	80	20	33	3	2	1	0.0	0.0	36	14	70	28	179	71	10%	4%	27%	11%	2	1	3	2
142	24	Skull	30	8	30	8	80	20	33	3	10	4	0.8	0.3	2	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
142	25	G. Salt Lake (Antelope Isl.	30	8	30	8	80	20	33	3	12	5	0.4	0.2	3	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
143	26	Ogden	30	8	30	8	80	20	33	3	13	5	0.5	0.2	2	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
143	27	Cedar	30	8	30	8	80	20	33	3	4	1	0.4	0.1	3	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
144	28	Utah Lake	30	8	30	8	80	20	33	3	12	5	0.8	0.3	1	1	70	28	179	71	10%	4%	27%	11%	2	1	3	2
144	29	Antelope	30	8	30	8	80	20	33	3	12	5	1.2	0.5	1	0	70	28	179	71	10%	4%	27%	11%	2	1	3	2
145	30	Garico	30	8	30	8	80	20	33	3	4	2	0.3	0.1	5	2									2	1	3	2
145	31	Grass	30	8	30	8	80	20	33	3	6	3	0.5	0.2	2	1									2	1	3	2
146	32	Diamond	30	8	30	8	80	20	33	3	13	5	1.0	0.4	1	0									2	1	3	2
146	33	Newark	30	8	30	8	80	20	33	3	4	1	0.3	0.1	4	2									2	1	3	2
147	34	Long	30	8	30	8	80	20	33	3	9	4	0.8	0.3	2	1									2	1	3	2
147	35	Butte	30	8	30	8	80	20	33	3	8	3	0.9	0.4	1	1									2	1	3	2
148	36	Steptoe	30	8	30	8	80	20	33	3	11	4	1.1	0.4	1	0									2	1	3	2
148	37	Fish Springs	30	8	30	8	80	20	33	3	4	1	0.3	0.1	4	2									2	1	3	2
149	38	Juab	30	8	30	8	80	20	33	3	7	3	1.2	0.5	1	0									2	1	3	2
149	39	Carson Sink	30	8	30	8	80	20	33	3	15	6	0.4	0.2	3	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
150	40	Dixie	30	8	30	8	80	20	33	3	16	6	1.4	0.5	1	0	59	23	142	56	10%	4%	24%	9%	2	1	3	2
150	41	Edwards Cr	30	8	30	8	80	20	33	3	5	2	0.5	0.2	3	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
151	42	Smith Creek	30	8	30	8	80	20	33	3	5	2	0.3	0.1	4	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
151	43	Reese River	30	8	30	8	80	20	33	3	5	2	0.4	0.1	3	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
152	44	Big Smoky	30	8	30	8	80	20	33	3	14	5	0.9	0.4	1	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
152	45	Monitor	30	8	30	8	80	20	33	3	16	6	1.6	0.6	1	0	59	23	142	56	10%	4%	24%	9%	2	1	3	2
153	46	Anelope-Koben	30	8	30	8	80	20	33	3	9	4	0.9	0.4	1	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
153	47	Little Smoky	30	8	30	8	80	20	33	3	5	2	0.4	0.1	3	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
154	48	Jakes	30	8	30	8	80	20	33	3	5	2	0.5	0.2	2	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
154	49	Spring	30	8	30	8	80	20	33	3	10	4	0.7	0.3	2	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
155	50	Snake	30	8	30	8	80	20	33	3	11	4	0.9	0.4	1	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
155	51	Tule	30	8	30	8	80	20	33	3	4	2	0.4	0.2	3	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
156	52	Clear Lake	30	8	30	8	80	20	33	3	13	5	0.3	0.1	4	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
156	53	Scipio	30	8	30	8	80	20	33	3	3	1	0.6	0.2	2	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
157	54	Gunnison	30	8	30	8	80	20	33	3	4	2	0.7	0.3	2	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
157	55	Sanpete	30	8	30	8	80	20	33	3	3	1	0.4	0.1	3	1	59	23	142	56	10%	4%	24%	9%	2	1	3	2
158	56	Fairview	30	8	30	8	80	20	33	3	7	3	0.6	0.2	2	1									2	1	3	2
158	57	Little Fish Lake	30	8	30	8	80	20	33	3	8	3	0.8	0.3	1	1									2	1	3	2
159	58	Railroad	30	8	30	8	80	20	33	3	11	5	0.6	0.2	2	1									2	1	3	2
159	59	White River	30	8	30	8	80	20	33	3	13	5	0.8	0.3	1	1									2	1	3	2
160	60	Lake	30	8	30	8	80	20	33	3	15	6	1.0	0.4	1	0									2	1	3	2
160	61	Hamlin	30	8	30	8	80	20	33	3	9	4	0.5	0.2	2	1									2	1	3	2
161	62	Pine	30	8	30	8	80	20	33	3	7	3	0.5	0.2	2	1									2	1	3	2
161	63	Wah-Wah	30	8	30	8	80	20	33	3	5	2	0.5	0.2	2	1									2	1	3	2
162	64	Sevier	30	8	30	8	80	20	33	3	4	2	0.3	0.1	4	2									2	1	3	2
162	65	Milford?	30	8	30	8	80	20	33	3	8	3	0.5	0.2	2	1									2	1	3	2
163	66	Scipio Lake	30	8	30	8	80	20	33	3	3	1	0.7	0.3	2	1									2	1	3	2
163	67	Revielle	30	8	30	8	80	20	33	3	7	3	0.8	0.3	1	1									2	1	3	2
164	68	Kawich-Hot Crk	30	8	30	8	80	20	33	3	11	4	0.8	0.3	2	1									2	1	3	2
164	69	Dry Lake	30	8	30	8	80	20	33	3	13	5	1.4	0.6	1	0									2	1	3	2
165	70	Hamlin	30	8	30	8	80	20	33	3	9	3	0.6	0.2	2	1									2	1	3	2
165	71	Escalante	30	8	30	8	80	20	33	3	4	2	0.2	0.1	7	3									2	1	3	2

1	Values from visual examination of SRTM data of Becker et al., 200ab.
2	Average of valley elevation and adjacent high peak elevation
3	Difference between Valley elevation and adjacent high peak elevation
4	Depth to base of unconsolidated sedimentary basin fill reported in gravity analysis of Shah et al. (2018abc)
5	Vertical difference between depth of basin fill (assumed to be base of unconsolidated sediment from Shah et al. (2018abc) and elevation of highest adjacent peak.
6	Depth to crystalline basement below basin fill reported in gravity analysis of Shah et al. (2018abc).
7	Vertical difference between depth of basin fill (interpreted to be depth to base of sediment fill on crystalline basement from Shah et al. (2018abc) and elevation of highest adjacent peak.
8	Pancha et al., 2006.
9	1915 Mw 7.2 Pleasant Valley earthquake (Wallace, 1984); 1954 Mw 6.9 Dixie Valley earthquake (Caskey et al., 1996); 1954 Mw 7.0 Fairview Peak earthquake (Caskey et al., 1996).
	Other large events in Basin & Range province
	(but not on Figure X) include the 1983 Mw 6.8 Borah Peak earthquake (Doser and Smith, 1985) and 1952 Mw 7.3 1959 Hebgen Lake earthquake (Doser, 1985).
10	Numerous studies since 1960's (e.g. Seismic refraction profiles of Pakiser, 1963; Allmendinger et al., 1987; Thompson et al. , 1989): Surface wave studies of Klemperer et al., 1986, Allmendinger et al., 1987:
	Receiver function analyses: Priestley et al., 1982, Gilbert and Sheehan, 2004)
11	Value reflects range of values of total amount of extension alomg transects of basins 9 to 29 and 39 to 55, respectively, assuming structural relief in each basin is result of slip on faults that dip 60° and that
	structural relief is best estimated from measures of depth of unconsolidated basin fill sediments Shah and Boyd, 2018.
12	Same as 11 but using measure of structural relief based on measures of basin fill thickness above xstalline basement reported by Shah et al. (2018abc).
13	Range of values calculated by dividing Total Extension (unconsolidated fill) by 670 km and 600km lengths of transects of basin 9 to 29 and 39 to 66.
14	Range of values calculated by dividing Total Extension (fill to crystalline basement) by 670 km and 600km lengths of transects of basin 9 to 29 and 39 to 66.
15	Range interpreted from Thatcher et al., 1999; Kreemer et al., 2012; and UNAVCO, 2020 (excludes Walker Lane along west edge of province).
16	Range calculated from geodetic extension rate ([15]) divided by assumed basin width of 600 to 670 km.
17	Inception of modern day physiography recorded by faulting of Oligocene-Miocene volcanic rocks and correlated to inception of subduction along west coast of Uinited States
	(e.g. McKee, 1971; Atwater, 1970; Severinghaus and Atwater, 1990, Jones et al, 1996.)
18,19	Large volumes of dominantly rhyolitic ash-flow tuff erupted from numerous calderas across the interior in the Oligocene period, about 37 - 22 Ma (e.g. Armstrong et al, 1969; Henry and John, 2013)
20	Sass et al., 1971; Lachenbruch and Sass, 1978; Blackwell et al., 1991; Blackwell and Richards, 2004; Sass et al., 2005; Blackwell et al., 2011; DeAngelo et al., 2022
21	Extension in individual basins assuming structural relief accommodated on basin bounding faults that dip 50°-70°.

TABLE 5. Italy

Table 5a. Italy

Plot No.	Map No.	Basin Name	Lat°	Lon°	Length[1] km	Width[1] km	Area[1] km^2	Aspect[1] Ratio	Valley[1] Elevation m	Adjacent[1] High Peak m	Average[2] Elevation	Topo[3] Relief m	Basin[4] Fill m	+-	Structural[5] Relief m	+-	Seismic[6] Thickness km	+-	Max[7] Quake Mw	Moho[8] km	+-	Initiation[15] Ma	+-
5	1	Valle d'Arno	43.9	11.1	33	9	297	4	60	1080	570	1020	40	5	1060	5	10	1		28	3	2	1
6	2	Mugello	44.0	11.4	18	6	108	3	200	1040	620	840	500	100	1340	100	15	2		28	3	2	1
7	3	Valdarno	43.5	12.1	16	6	96	3	300	1140	720	840	200	100	1040	100	9	1		28	3	2	1
8	4	Gubbio	43.3	12.6	22	4	88	6	410	920	665	510	400	50	910	50	9	1		28	3	2	1
9	5	G. Taldino	43.3	12.7	30	3	90	10	460	1355	908	895					9	1		28	3	2	1
10	6	Spoletina	43.0	12.6	43	8	344	5	210	1320	765	1110	380	20			11	1		28	3	2	1
11	7	Colfiorito	43.0	12.9	2	1	2	2	750	915	833	165	50	10	215	10	14	2		28	3	2	1
12	8	di Seravalle	43.0	12.9	3	3	9	1	750	1290	1020	540					14	2		28	3	2	1
13	9	Mt. Vettore (PGC basin)	42.8	13.2	2	5	10	0	1280	2390	1835	1110	250	25	1360	25	15	2		28	3	2	1
14	10	Norcia	42.8	13.1	7	4	28	2	590	1760	1175	1170	200	10	1370	10	15	2	7	28	3	2	1
15	10a	Amactrice			6	3	15	2	920	2430	1675	1510	60	5	1570	5	15	2		28	3	2	1
16	11	Leonessa	42.6	13.0	10	3	30	3	900	1790	1345	890	320	10	1210	10	11	1		28	3	2	1
17	12	Terni	42.6	12.6	14	5	70	3	100	1000	550	900	250	50	1150	50	12	1		28	3	2	1
18	13	Rieti	42.4	12.8	11	10	110	1	390	2100	1245	1710	600	50	2310	50	11	1		28	3	2	1
19	14	Campo Imperatore	42.4	13.7	17	2	34	9	1580	2420	2000	840	50	25	890	25	11	1		28	3	2	1
20	15	Montereale	42.5	13.3	5	3	15	2	810	1590	1200	780	160	40	940	40	11	1		28	3	2	1
21	16	L'Aquila (west)	42.4	13.3	7	3	18	3	630	1130	880	500	75	25	575	25	11	1		28	3	2	1
22	17	Paganica-Aterno	42.3	13.5	10	4	40	3	570	1370	970	800	250	50	1050	50	11	1	6	28	3	2	1
23	18	Arishia-Pizzoli	42.4	13.3	7	2	14	4	690	1475	1083	785	100	20	885	20	11	1		28	3	2	1
24	19	Campo-Felice	42.2	13.4	6	2	12	3	1545	2120	1833	575					11	1		28	3	2	1
25	20	Olvindoli-Pezza	42.2	13.5	4	1	4	4	1530	2050	1790	520					11	1		28	3	2	1
26	21	Avenzanno-Fucino	42.0	13.5	19	15	285	1	650	2300	1475	1650	1000	100	2650	100	12	1	7	28	3	2	1
27	22	V. D'Aterno N	42.3	13.7	6	2	12	3	750	1215	983	465	250	50	715	50	10	1		28	3	2	1
28	23	V. D'Aterno S	42.2	13.7	4	1	4	4	675	950	813	275	250	50	525	50	10	1		28	3	2	1
29	24	Tirino	42.3	13.8	9	3	23	4	360	1760	1060	1400					11	1		28	3	2	1
30	25	Sulmona	42.1	13.9	19	17	323	1	370	1970	1170	1600	300	60	1900	60	12	1		28	3	2	1
31	26	Bojano-basin-Monteverde	41.5	14.4	20	3	60	7	530	1315	923	785	300		1085		18	1		28	3	2	1
32	27	Sepino Basin	41.4	14.6	7	4	28	2	510	980	745	470	300		770		18	1		28	3	2	1
33	28	Venafro	41.4	14.4	7	2	11	5	165	975	570	810	350	50	1160	50	14	1		28	3	2	1
34	29	East of Letino/Lago del Matese	41.4	14.3	3	1	3	3	835	1220	1028	385	50	50	435	50	16	1		28	3	2	1
35	30	Upper Volturno	41.3	14.3	13	7	91	2	100	1250	675	1150			1150		16	1		28	3	2	1
36	31	Telese	41.2	14.5	13	6	78	2	60	715	388	655			655		15	1		28	3	2	1
37	32	Valle Ufita	41.0	15.1	10	3	30	3	370	770	570	400	125	10	525	10	15	1		28	3	2	1
38	33	Irpinia-Forluso	40.7	15.3	6	3	14	2	430	1290	860	860	100	100	960	100	17	1	7	28	3	2	1
39	34	Irpinia-San G. Magno	40.7	15.4	4	2	6	3	350	970	660	620	100	100	720	100	17	1		28	3	2	1
40	35	Vallo di Diano	40.4	15.5	29	5	145	6	460	1440	950	980	1000	50	1980	50	17	1		28	3	2	1
41	36	Val d'Agri	15.8	40.3	24	5	120	5	590	1770	1180	1180	450	50	1630	50	17	1		28	3	2	1

Table 5b. Italy

Plot No.	Map No.	BasinName	Preceding[16] Tectonism Ma	+-	Most[17] Recent Volcanism Ma	+-	Heat[18] Flow mW/m^2	+-	Extension[9] from Structural Relief	+-	Extension over Basin Width (strain)	+-	Basin Width over Extension	+-	Extension[10] (geological) Total Measured km	+-	Transect Distance km	Strain[11]	+-	Geodetic[14] Extension Rate mm/yr	+-	Geodetic[14] Strain Rate 10^{-9}	+-
5	1	Valle d'Arno	6	2	none		90	10	2.1	0.8	0.2	0.1	5	2	5	1	70	7%	1%	3	1	50	10
6	2	Mugello	6	2	none		55	5	2.6	1.0	0.4	0.2	3	1	5	1	70	7%	1%	3	1	50	10
7	3	Valdarno	6	2	none		70	10	5.6	2.2	0.9	0.4	1	1						3	1	50	10
8	4	Gubbio	6	2	none		25	5	1.8	0.7	0.4	0.2	3	1	4	1	55	6%	1%	3	1	50	10
9	5	G. Taldino	6	2	none		25	5	1.8	0.7	0.6	0.2	2	1	4	1	55	6%	1%	3	1	50	10
10	6	Spoletina	6	2	none		45	5			0.3	0.1	4	2	4	1	60	2%	1%	3	1	50	10
11	7	Colfiorito	6	2	none		25	5	0.4	0.2	0.4	0.2	3	1	4	1	60	2%	1%	3	1	50	10
12	8	di Seravalle	6	2	none		25	5			0.4	0.1	3	1	4	1	60	2%	1%	3	1	50	10
13	9	Mt. Vettore (PGC basin)	6	2	none		25	5	2.7	1.1	0.5	0.2	2	1	12	1	70	4%	2%	3	1	50	10
14	10	Norcia	6	2	none		25	5	2.7	1.1	0.7	0.3	2	1	12	1	70	4%	2%	3	1	50	10
15	10a	Amactrice	6	2	none		25	5	3.1	1.2	1.2	0.5	1	0			70			3	1	50	10
16	11	Leonessa	6	2	none		25	5	2.4	0.9	0.8	0.3	1	1	12	1	70			3	1	50	10
17	12	Terni	6	2	none		35	5	2.3	0.9	0.5	0.2	3	1				4%	2%	3	1	50	10
18	13	Rieti	6	2	none		25	5	4.5	1.8	0.5	0.2	3	1	12	1	70	4%	2%	3	1	50	10
19	14	Campo Imperatore	6	2	none		35	5	1.8	0.7	0.9	0.3	1	1	7	1	50	13%	1%	3	1	50	10
20	15	Montereale	6	2	none		35	5	1.9	0.7	0.6	0.2	2	1						3	1	50	10
21	16	L'Aquila (west)	6	2	none		35	5	1.1	0.4	0.5	0.2	3	1						3	1	50	10
22	17	Paganica-Aterno	6	2	none		35	5	2.1	0.8	0.5	0.2	2	1	7	1	50	13%	1%	3	1	50	10
23	18	Arishia-Pizzoli	6	2	none		35	5	1.7	0.7	0.9	0.3	1	1	7	1	50	13%	1%	3	1	50	10
24	19	Campo-Felice	6	2	none		35	5			0.6	0.2	2	1	7	1	50	13%	1%	3	1	50	10
25	20	Olvindoli-Pezza	6	2	none		35	5			1.0	0.4	1	0						3	1	50	10
26	21	Avenzanno-Fucino	6	2	none		35	5	6.2	2.5	0.4	0.2	3	1	10	2	60	17%	3%	3	1	50	10
27	22	V. D'Aterno N	6	2	none		35	5	1.4	0.6	0.7	0.3	2	1						3	1	50	10
28	23	V. D'Aterno S	6	2	none		35	5	1.0	0.4	1.0	0.4	1	0						3	1	50	10
29	24	Tirino	6	2	none		35	5			1.1	0.4	1	0						3	1	50	10
30	25	Sulmona	6	2	none		40	5	3.7	1.5	0.2	0.1	5	2	10	2	45	17%	3%	3	1	50	10
31	26	Bojano-basin-Monteverde	6	2	none		50	5	2.1	0.8	0.7	0.3	2	1				12%	5%	3	1	50	10
32	27	Sepino Basin	6	2	none		50	5	1.5	0.6	0.4	0.1	3	1	5	1				3	1	50	10
33	28	Venafro	6	2	none		35	5	2.3	0.9	1.5	0.6	1	0		1				3	1	50	10
34	29	ast of Letino/Lago del Mates	6	2	none		55	5	0.9	0.3	0.9	0.3	1	1			45	12%	5%	3	1	50	10
35	30	Upper Volturno	6	2	none		45	5	2.3	0.9	0.3	0.1	4	1	5	1	45	12%	5%	3	1	50	10
36	31	Telese	6	2	none		60	5	1.3	0.5	0.2	0.1	6	2	5	1				3	1	50	10
37	32	Valle Ufita	6	2	none		45	5	1.0	0.4	0.3	0.1	3	1						3	1	50	10
38	33	Irpinia-Forluso	6	2	none		45	5	1.9	0.7	0.8	0.3	2	1						3	1	50	10
39	34	Irpinia-San G. Magno	6	2	none		45	5	1.4	0.6	0.9	0.4	1	0				18%	4%	3	1	50	10
40	35	Vallo di Diano	6	2	none		45	5	3.9	1.5	0.8	0.3	2	1	7	1	40	18%	4%	3	1	50	10
41	36	Val d'Agri	6	2	none				3.2	1.3	0.6	0.3	2	1	7	1	40			3	1		

[1] Values from visual examination of SRTM data of Becker et al., 2009ab.

[2] Average of valley elevation and adjacent high peak elevation

[3] Difference between Valley elevation and adjacent high peak elevation

[4] Map No. 1, Valle d'Arno (Amorosi et al., 2008); Map No. 2, Mugello (Benvenuti, 2003); Map No. 3, Voldarno (Martini and Sagri, 1993; Map No. 4, Gubbio (Collettini et al., 2003); Map No. 5, none; Map No. 6, Spoletina (Coltorti and Pieruccini, 1997);
Map No. 7, Colfiorito (Messina et al., 2002); Map No. 8, none; Map No. 9, Mt. Vettore (PGC) (Villani et al., 2019); Map No. 10, Norcia (Di Giulio et al., 2020); Map No. 10a, Amatrice (Vignaroli et al., 2019); Map No. 11, Leonessa (Michetti and Serva, 1990);
Map No. 12, (Cattuto et al., 2002); Map No. 13, Rietti (Guerrieri et al., 2004); Map No. 14, Campo Imperatore, (Ortner et al., 2022); Map No. 15, Montereale, (Chiarini et al., 2014); Map No. 16, L'Aquila (west) (Nocentini et al., 2017);
Map No. 17, Paganica-Aterno (Florio et al., 2021); Map No. 18, Arisia-Pizzoli (Cavinato et al., 2002); Map No. 19, none; Map No. 20, none; Map No. 21, Avenzano-Fucino (Cavinato et al, 2002) value is minimum; Map No. 22, V. d'Aterno N (Florio et al., 2021);
Map No. 23, V. d;Aterno S (Florio et al., 2021); Map No. 24, Tirino, none; Map No. 25, Sulmona (Di Giulio et al., 2016)
Map No. 26, Bojano-Monteverde (Amato et al., 2014- minimum); Map No. 27, Sepino (Amato et al., 2014- minimum;)Map No. 28, Venafro (Amato et al., 2017); Map No. 29, Lago del Matese, inferred?;
Map No. 30, Upper Volturno (? Filocamo et al., 2021); Map No. 31, Telese (Filocamo et al., 2021)
Map No. 32, Valle Ufita (Basso et al., 1996); Map No. 33, Irpinia-Fortuso (Matano et al., 2020); Map No. 34, Irpinia-San G. Magno (Matano, 2020); Map No. 35, Vallo di Diano (Villani and Pierdominici, 2010); Map No. 36, Val d'Agri (Zembo, 2010)

[5] Vertical difference between depth of basin fill and elevation of highest adjacent peak.

[6] Values from visual inspection of Figure 3 of Chiarabba and De Gori (2016)

[7] 1963 L'Aquila Mw 6.3 (Chiarabba et al, 2009); 1980 Mw 6.9 Irpinia (Pantosti and Valensise, 1993; Westaway and Jackson 1987); 1915 Fucino Mw 6.7 (Amoruso et al., 1998; Lee and Engdahl, 2015); 2016 Norcia Mw 6.5 (Civico et al, 2018).

[8] Di Stefano et al. (2011) from controlled sourer and teleseismic receiver function analysis. See text for reference to other studies yielding similar values.

[9] Extension required to produce observed structural relief assuming structural relief due to slip on faults dipping between 50° and 70°

[10] Values reflect sum of extension along transects across Apennines asumming faults dip on average 60°. Same sum value is listed for basins along given transects. (e.g. 4.7 km is cumulative extension .
across transect crossing Basins 1 and 2). This is done for plotting purposes

[11] Cumulative extensional strains divided by length of transect. Transect lengths are 70 km for Basins 1 and 2; 55 km for Basins 4, 5, 6; 70 km for Basins 9, 10, 11, 13; 50 km for Basins 14,17,18, and 19; 60 km
for Basins 21 and 25; 45 km for Basins 26, 29, 30; and 40 km for Basins 35, 36.

[13] Strain estimated from calculated extension rate divided by 50 - 70 km width of Apennines encompassing basins.

[14] D'Agostino et al. 2014 describes extension across Apennines to be ~3mm/yr accommodating about 40-60 nanostrain/year across a ~50 km wide zone.

[15] Range from Cavinato and Decelles (1999). Same range applied to all basins, though authors interpret western basins tend to show older initiation ages within the range.
Complimenting studies include Martini and Sagri, 1993; Westaway and Jackson, 1987, Pantosti and Valensise, 1990, and Bernini (1988).

[16] Cavinato and Decelles (1999) state basins were loci of thrusting as recently ad 3.5 - 7.5 Ma.

[17] no volcanism.... Need to explain

[18] Values at basins taken from heat flow contour map of Della Vedova et al., 1991. Range of values reflected in accompanying plot reflects average and standard deviation of these values.

TABLE 6. Ordos

Table 6a. Ordos

Plot No.	Map No.	Basin Name	Lat°	Lon°	Length [1] km	Width[1] km	Area[14] km²	Aspect[1] Ratio	Valley[1] Elevation m	Adjacent[1] High Peak m	Average[2] Elevation	Topo[3] Relief m	Basin[4] Fill m	Structural[5] Relief m	+-	Seismic[6] Thickness km	+-	Max[7] Quake Mw	Moho[14] km	+-	Initiation[14] Ma
175	1	Yinchuan	38.7	106.4	160	50	8000	3	1100	3500	2300	2400	8300	10700	500	32	8	8	43	3	42
176	2	Jilantai (Linhe Trough)	41.0	107.8	250	70	17500	4	1030	2300	1665	1270	10000	11270	500	32	8	0	38	5	32
177	3	Hetao - Baotao/Hohot	40.5	109.6	100	40	4000	3	1010	2280	1645	1270	7000	8270	500	32	8	0	43	3	32
178	4	Weihe	34.8	109.9	300	50	15000	6	400	2590	1495	2190	8000	10190	500	32	8	0	38	5	42
179	5	Linfen	36.1	111.5	55	15	825	4	400	1810	1105	1410	1900	3310	100	32	8	0	43	3	15
180	6	Taiyuan	37.4	112.3	110	35	3850	3	750	2700	1725	1950	3900	5850	100	32	8	0	43	3	15
181	7	Xinxian	38.4	112.9	40	20	800	2	760	2030	1395	1270	1900	3170	100	32	8	0	43	3	15
182	8	Daixian/Fanshi	39.1	113.0	100	10	1000	10	1000	3020	2010	2020	1800	3820	200	32	8	0	43	3	15
183	9	Linqiu	39.4	114.3	25	7	175	4	920	2190	1555	1270	350	1620	50	32	8	0	43	3	15
184	10	Datong	39.4	113.0	125	45	5625	3	1015	2390	1703	1375	1750	3125	250	32	8	0	43	3	15
185	11	Yanyuan	40.0	113.6	75	15	1125	5	880	2360	1620	1480	0	1480	0	32	8	7	43	3	15
186	12	Yangao	40.3	113.9	40	15	600	3	1020	2270	1645	1250	600	1850	100	32	8	0	43	3	15
187	13	Weixian	39.9	114.7	80	20	1600	4	950	2830	1890	1880	700	2580	100	32	8	0	43	3	15
188	14	Hua-an	40.7	114.2	45	5	225	9	925	1740	1333	815	0	815	0	32	8	0	43	3	15
189	15a	Yanqin East	40.4	115.4	45	15	675	3	470	2200	1335	1730	0	1730	0	32	8	0	43	3	15
190	15b	Yanqin West	40.4	115.9	45	12	540	4	500	1900	1200	1400	850	2250	100	32	8	0	43	3	15

Table 6b. Ordos

Plot No.	MapNo.	BasinName	Preceding[15] Tectonism Ma	+-	Most[16] Recent Volcanism Ma	+-	Heat[17] Flow mW/m²	+-	Extension[9] from Structural Relief	+-	Extension over Basin Width (strain)	+-	Basin Width over Extension	+-	Strain[10] Calculated %	+-	Extension[11] Summed Across Province km	+-	Extension[12] Rate (GPS) mm/yr %	+-	Strain[13] Rate 10^{-9}	+-
175	1	Yinchuan	131	31			63	13	21075	8323	0.4	0.2	3	1	0	0	41	8	1	1	24	14
176	2	Jilantai (Linhe Trough)	131	31			63	13	22198	8767	0.3	0.1	4	1	0	0	29	6	2	0	23	6
177	3	Hetao - Baotao/Hohot	131	31			63	13	16289	6433	0.4	0.2	3	1	0	0	28	5	1	1	13	25
178	4	Weihe	131	31			63	13	20070	7926	0.4	0.2	3	1	0	0	41	8	0	1	4	16
179	5	Linfen	131	31			63	13	6519	2575	0.4	0.2	3	1	0	0	29	6	0	1	13	40
180	6	Taiyuan	131	31			63	13	11522	4550	0.3	0.1	4	1	0	0	28	5		1		20
181	7	Xinxian	131	31			63	13	6244	2466	0.3	0.1	4	1	0	0	22	2	0	1	-5	25
182	8	Daixian/Fanshi	131	31			63	13	7524	2971	0.8	0.3	2	1	0	0	22	2				
183	9	Linqiu	131	31			63	13	3191	1260	0.5	0.2	3	1	0	0	11	1				
184	10	Datong	131	31	1	1	63	13	6155	2431	0.1	0.1	9	3	0	0	22	2	1	1	17	11
185	11	Yanyuan	131	31			63	13	2915	1151	0.2	0.1	6	2	0	0	11	2	1	1	50	33
186	12	Yangao	131	31			63	13	3644	1439	0.2	0.1	5	2	0	0	11	1				
187	13	Weixian	131	31			63	13	5082	2007	0.3	0.1	5	2								
188	14	Hua-an	131	31			63	13	1605	634	0.3	0.1	4	1	0	0	11	2				
189	15a	Yanqin East	131	31			63	13	3407	1346	0.2	0.1	5	2								
190	15b	Yanqin West	131	31			63	13	4432	1750	0.4	0.1	3	1			22	2				

[1] Values from visual examination of SRTM data of Becker et al., 2009ab.

[2] Average of valley elevation and adjacent high peak elevation

[3] Difference between valley elevation and adjacent high peak elevation

[4] Sources by Map No.: (1) Fig. 6 & p.45 of Zhang et al. 1998 ; (2) Fig. 6 & p.49 of Zhang et al.,1998; (3) Fig. 6 & p.49 of Zhang et al., 1998 & Fig. 5 of Ye 1987;
(4) Fig. 2 Zhang et al.. 1998 and Fig. 5 of Ye et al. 1987 ; (5,6,7,8,8,10, 12,13,15b) Fig. 3 of Xu et al. 1993

[5] Vertical difference between depth of basin fill and elevation of highest adjacent peak.

[6] Maximum depth distribution of microearthquakes from Figure 8 of Qin et al., 2002

[7] Mw 7.1-7.6 Yinchuan quake of January 1739 (Middleton et al., 2016); Mw 7.2 Shanxi of June 28, 1626 (Wesnousky et al., 1984); Mw 7.3 Shanxi quake of Sept 9, 1303 (Wesnousky et al, 1984).

[8] Fig. 5 of Wang et al., 2014 (teleseismic receiver function analysis)

[9] Extension required to produce observed structural relief assuming structural relief due to slip on faults dipping between 50° and 70° across individual basins

[10] Extension total divided by basin width.

[11] Extension in individual basins assuming structural relief accommodated on basin bounding faults that dip 50°-70°. Values are sums of extension system.
along transects perpendicular to strike of trend of basins composing the basin:
41 km across basins 1 and 4; 29 km Basins 2 and 5; 29 km across Basins 3 and 6; 22 km across basins 7,8 and 10; 11 km across Basins 11, 12, and 14

[12] Value is geodetic extension rate from Zhao et al., 2017.

[13] Strain rate estimated by dividing geodetic extension rate across individual basins by width of respective basins.

[14] Ye et al, 1987 and Ye and Zhang, 1983. Values on accompanying plot for Yinchuan (1), Jilantai (2), Huhei-Hetao (3) and Weihe (4) reflect span of individual initiation ages.

[15] Darby and Ritts, 2002; Middleton et al., 2017; Gao et al., 2018

[16] Ye et al, 1987; limited to early-middle Pleistocene craters in Datong graben. Absent elsewhere.

[17] Tao and Shen, 2008; Gao et al, 2018.

TABLE 7. Tibet

Table 7a. Tibet

Plot No.	Map No.	Lat°	Lon°	Length[1] km	Width[1] km	Area[1] km^2	Aspect[1] Ratio	Valley[1] Elevation m	Adjacent[1] High Peak m	Average[2] Elevation	Topo[3] Relief m	Basin[4] Fill m	Structural[5] Relief m	Seismic[6] Thicknes s km	+-	Max[7] Quake Mw	Moho[8] km	+-	Initiation[9] Ma	+-	Preceding[10] Tectonism Ma	+-
51	t1	31.7	83.7	35	6	210	6	4700	6360	5530	1660		1660	13	3		75	5	12	7	16	9
52	t2	31.3	83.5	20	15	300	1	4750	6100	5425	1350		1350	13	3		75	5	12	7	16	9
53	t3	31.0	83.3	36	10	360	4	5000	6400	5700	1400		1400	13	3		75	5	12	7	16	9
54	t4	30.8	83.5	37	8	296	5	5100	6200	5650	1100		1100	13	3		75	5	12	7	16	9
55	t5	30.7	83.8	14	6	84	2	5200	5900	5550	700		700	13	3		75	5	12	7	16	9
56	t6	30.4	84.1	27	7	189	4	5360	6000	5680	640		640	13	3		75	5	12	7	16	9
57	t7	30.3	84.3	17	4	60	5	5175	6000	5588	825		825	13	3		75	5	12	7	16	9
58	t8	30.4	84.4	35	4	140	9	4900	6000	5450	1100		1100	13	3		75	5	12	7	16	9
59	t9	30.2	84.8	30	5	135	7	5200	6000	5600	800		800	13	3		75	5	12	7	16	9
60	t10	30.0	85.2	24	4	96	6	5170	6000	5585	830		830	13	3		75	5	12	7	16	9
61	t11	29.8	85.7	25	8	200	3	5140	6100	5620	960		960	13	3		75	5	12	7	16	9
62	t12	28.9	86.3	30	5	150	6	4850	5750	5300	900		900	13	3		75	5	12	7	16	9
63	t13	28.8	86.4	40	10	400	4	4700	5650	5175	950		950	13	3		75	5	12	7	16	9
64	t14	28.5	88.6	35	8	280	4	4800	5800	5300	1000		1000	13	3		75	5	12	7	16	9
65	t15	28.5	90.4	15	4	60	4	4300	6300	5300	2000	3000	2000	13	3		75	5	12	7	16	9
66	t16	28.0	84.3	21	7	147	3	4540	6000	5270	1460		1460	13	3		75	5	12	7	16	9
67	t17	28.4	85.6	25	10	250	3	4570	5750	5160	1180		1180	13	3		75	5	12	7	16	9
68	t18	29.6	86.4	40	6	240	7	4375	5750	5063	1375		1375	13	3		75	5	12	7	16	9
69	t19	30.2	87.5	18	7	126	3	4150	5250	4700	1100		1100	13	3	7	75	5	12	7	16	9
70	t20	30.9	87.7	15	5	75	3	4160	5460	4810	1300		1300	13	3		75	5	12	7	16	9
71	t21	31.2	89.3	45	9	405	5	4470	6500	5485	2030		2030	13	3		75	5	12	7	16	9
72	t22	30.4	89.9	37	6	222	6	4500	5700	5100	1200		1200	13	3		75	5	12	7	16	9
73	t23	29.6	86.5	32	20	640	2	4530	5750	5140	1220		1220	13	3		75	5	12	7	16	9
74	t24	29.9	86.7	30	14	420	2	4530	6000	5265	1470	1500	1470	13	3		75	5	12	7	16	9
75	t23	30.0	90.3	17	3	51	6	4500	5300	4900	800		800	13	3		75	5	12	7	16	9
76	t24	30.4	90.3	24	5	120	5	4400	5800	5100	1400		1400	13	3		75	5	12	7	16	9
77	t26	30.5	90.9	28	8	224	4	4300	6250	5275	1950		1950	13	3		75	5	12	7	16	9
78	t27	30.7	91.2	34	6	204	6	4270	5500	4885	1230		1230	13	3		75	5	12	7	16	9
79	t28	32.3	91.6	29	5	145	6	4500	6000	5250	1500		1500	13	3		75	5	12	7	16	9
80	t29	32.4	88.7	47	10	470	5	4970	6000	5485	1030		1030	13	3		75	5	12	7	16	9
81	t30	34.4	88.1	40	13	520	3	4700	6000	5350	1300		1300	13	3		75	5	12	7	16	9

Table 7b. Tibet

Plot No.	Map No.	Most[11] Recent Igneous Activity Ma	+-	Heat[12] Flow mW/m^2	+-	Extension[13] Rate (Geodetic) mm/yr	+-	Geodetic[14] Strain Rate (nanostrain)	+-	Extension[15] from Structural Relief (individual basins) km	+-	Extension over Basin Width (strain) Tibet	+-	Basin Width over Extension Tibet	+-	Extension[16] from Structural Relief (summed across basins) km	+-	Transect[17] Distances km	Strain[18] along two east-west transects	+-	Extension[19] Rate (Ave long term - geologic) mm/yr	+-	Extension[20] Strain Rate (Ave long term - geologic) nanostrain/yr	+-
51	t1	16	9	95	25	22	3	20	2	3.3	1.3	0.5	0.2	2.2	0.9									
52	t2	16	9	95	25	22	3	20	2	2.7	1.1	0.2	0.1	6.7	2.6									
53	t3	16	9	95	25	22	3	20	2	2.8	1.1	0.3	0.1	4.3	1.7	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
54	t4	16	9	95	25	22	3	20	2	2.2	0.9	0.3	0.1	4.4	1.7	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
55	t5	16	9	95	25	22	3	20	2	1.4	0.5	0.2	0.1	5.2	2.0	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
56	t6	16	9	95	25	22	3	20	2	1.3	0.5	0.2	0.1	6.6	2.6	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
57	t7	16	9	95	25	22	3	20	2	1.6	0.6	0.5	0.2	2.6	1.0	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
58	t8	16	9	95	25	22	3	20	2	2.2	0.9	0.5	0.2	2.2	0.9	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
59	t9	16	9	95	25	22	3	20	2	1.6	0.6	0.4	0.1	3.4	1.3	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
60	t10	16	9	95	25	22	3	20	2	1.6	0.6	0.4	0.2	2.9	1.1	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
61	t11	16	9	95	25	22	3	20	2	1.9	0.7	0.2	0.1	5.0	2.0	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
62	t12	16	9	95	25	22	3	20	2	1.8	0.7	0.4	0.1	3.3	1.3	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
63	t13	16	9	95	25	22	3	20	2	1.9	0.7	0.2	0.1	6.3	2.5	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
64	t14	16	9	95	25	22	3	20	2	2.0	0.8	0.2	0.1	4.8	1.9	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
65	t15	16	9	95	25	22	3	20	2	3.9	1.6	1.0	0.4	1.2	0.5	26.0	10.3	800.0	0.03	0.01	2.26	0.82	2.83	1.0
66	t16	16	9	95	25	22	3	20	2	2.9	1.1	0.4	0.2	2.9	1.1	19.0	7.5	700.0	0.03	0.01	1.65	0.60	2.36	0.9
67	t17	16	9	95	25	22	3	20	2	2.3	0.9	0.2	0.1	5.1	2.0	19.0	7.5	700.0	0.03	0.01	1.65	0.60	2.36	0.9
68	t18	16	9	95	25	22	3	20	2	2.7	1.1	0.5	0.2	2.6	1.0	19.0	7.5	700.0	0.03	0.01	1.65	0.60	2.36	0.9
69	t19	16	9	95	25	22	3	20	2	2.2	0.9	0.3	0.1	3.8	1.5	19.0	7.5	700.0	0.03	0.01	1.65	0.60	2.36	0.9
70	t20	16	9	95	25	22	3	20	2	2.6	1.0	0.5	0.2	2.3	0.9	19.0	7.5	700.0	0.03	0.01	1.65	0.60	2.36	0.9
71	t21	16	9	95	25	22	3	20	2	4.0	1.6	0.4	0.2	2.7	1.1	19.0	7.5	700.0	0.03	0.01	1.65	0.60	2.36	0.9
72	t22	16	9	95	25	22	3	20	2	2.4	0.9	0.4	0.2	3.0	1.2	19.0	7.5	700.0	0.03	0.01	1.65	0.60	2.36	0.9
73	t23	16	9	95	25	22	3	20	2	2.4	0.9	0.1	0.0	9.9	3.9									
74	t24	16	9	95	25	22	3	20	2	2.9	1.1	0.2	0.1	5.7	2.3									
75	t23	16	9	95	25	22	3	20	2	1.6	0.6	0.5	0.2	2.3	0.9									
76	t24	16	9	95	25	22	3	20	2	2.8	1.1	0.6	0.2	2.1	0.8									
77	t26	16	9	95	25	22	3	20	2	3.8	1.5	0.5	0.2	2.5	1.0									
78	t27	16	9	95	25	22	3	20	2	2.4	1.0	0.4	0.2	2.9	1.2									
79	t28	16	9	95	25	22	3	20	2	3.0	1.2	0.6	0.2	2.0	0.8									
80	t29	16	9	95	25	22	3	20	2	2.0	0.8	0.2	0.1	5.8	2.3									
81	t30	16	9	95	25	22	3	20	2	2.6	1.0	0.2	0.1	6.0	2.4									

1 Values from visual examination of SRTM data of Becker et al., 2009.

2 Average of valley elevation and adjacent high peak elevation.

3 Difference between valley elevation and adjacent high peak elevation.

4 Observations of depth of basin fill sediments appear largely absent from literature. Exceptions are interpretive cross-sections of Armijo et al. (1986) showing sedimentary basin fill to reach ~1500m and ~3000m in basins 24 and 15, near Yanbajain.

5 Taken to be same as topographic relief in absence of observations bearing onl sedimentation in grabens. Values in this respect are miminums.

6 Elliot et al. (2010) and Baj et al. (2017)

7 Mw 7.1 Xizang earthquake of January 7, 2025 - see location at basin 19. (Kusky and Meng, 2025)); Similar sized Yutian normal mechanism earthquake of Aug 3, 2020 occurred north of the figure area (81.54°E 35.46°N). Elliot et al, 2010)

8 Zhang et al., 2004; Nábelek et al., 2009; Gao et al., 2013; Zhang et al., 2013; Singh et al., 2017; Zhao et al., 2020

9 Mineral cooling ages in dikes and shear zones and pluton thermobarometry ((Pan and Kidd, 1992; Coleman and Hodges, 1995; Harrison et al., 1995; Williams et al., 2001; Maheo et al., 2007)

10 Numerous intrusive igneous rocks in age ranging from about 8 to 25 Ma throughout region (Taylor and Yin, 2009; Ding et al., 2007) postdate widespread volcanism (Linzaong volcanic field) that ended abour 40 ma.

11 Age range of volcanism taken to equal age of most recent tectonism

12 Measurements are extremely few. Values are from map of Lucazeau (2019) that uses the few measures and a global correlation of heat flow to independent geological and geophysical measurements to construct regional head flow map.

13 Zhang et al. (2004) interpret GPS to conclude 21.6 ± 2.5 mm/yr of eastward stretching between 79° - 93°. (Wang et al. (2001) GPS registered east-west extension of 20± 3 mm/yr between ~80°-90°.)

14 Approximated by dividing extension rate (21.6 ± 2.5 mm/yr) by 1300 km, the approximate distance between longitudes 79° and 93°

15 Amount of extension required from slip on fault dipping between 50° and 70° to produce observed structural rellief.

16 Cumulative value of extension across transect of Basins 3 to 16 and 17 to 22, respectively (values same for each transect)

17 Lengths of two transects along which cumulative extension and strain calculated.

19 Cumulative extension divided by approximate age of initiation (between about 11.5 and 18 m.y.)

20 Dividing cumulative extension rate (previous column) by 800 and 700 km distances of transects across region.

TABLE 8. Japan Trench

Table 8a. Japan Trench

Plot No.	Map No.	Lat°	Lon°	Length[1] km	Width[1] km	Area[1] km²	Aspect[1] Ratio	Valley[1] Elevation m	Adjacent[1] High Peak m	Average[2] Elevation m	Topo[3] Relief m	Basin[4] Fill m	Structural[5] Relief m	Seismic[6] Thickness km	+-	Max[7] Quake Mw	Moho[8] km	+-	Initiation[15] Ma	+-
253	1w	39.77	144.45	37	4	148	9	-7194	-7082	-7138	112	0	112	38	3		8.5	1.5	0.4	0.4
254	1e	39.77	144.45	37	4	148	9	-7030	-6569	-6800	461	0	461	38	3		8.5	1.5	0.4	0.4
255	2w	39.78	144.72	36	5	180	7	-6185	-5950	-6068	235	0	235	38	3		8.5	1.5	0.4	0.4
256	2e	39.78	144.72	36	5	180	7	-6181	-5950	-6066	231	0	231	38	3		8.5	1.5	0.4	0.4
257	3w	39.51	144.34	48	6	288	8	-7250	-6900	-7075	350	0	350	38	3		8.5	1.5	0.4	0.4
258	3e	39.51	144.34	48	6	288	8	-7264	-6750	-7007	514	0	514	38	3	8.5	8.5	1.5	0.4	0.4
259	4w	39.44	144.48	35	5	175	7	-6752	-6440	-6596	312	0	312	38	3		8.5	1.5	0.4	0.4
260	4e	39.44	144.48	35	5	175	7	-6750	-6330	-6540	420	0	420	38	3		8.5	1.5	0.4	0.4
261	5w	39.44	144.59	50	4	200	13	-6480	-6239	-6360	241	0	241	38	3		8.5	1.5	0.4	0.4
262	5e	39.44	144.59	50	4	200	13	-6397	-6050	-6224	347	0	347	38	3		8.5	1.5	0.4	0.4
263	6w	39.38	144.71	50	4	200	13	-6110	-5945	-6028	165	0	165	38	3		8.5	1.5	0.4	0.4
264	6e	39.38	144.71	50	4	200	13	-6060	-5840	-5950	220	0	220	38	3		8.5	1.5	0.4	0.4
265	7w	39.34	144.79	27	4	108	7	-5860	-5750	-5805	110	0	110	38	3		8.5	1.5	0.4	0.4
266	7e	39.34	144.79	27	4	108	7	-5820	-5680	-5750	140	0	140	38	3		8.5	1.5	0.4	0.4
267	8w	39.32	144.89	33	5	165	7	-5700	-5630	-5665	70	0	70	38	3		8.5	1.5	0.4	0.4
268	8e	39.32	144.89	33	5	165	7	-5680	-5550	-5615	130	0	130	38	3		8.5	1.5	0.4	0.4
269	9w	39.15	144.34	30	3	90	10	-7070	-6842	-6956	228	0	228	38	3		8.5	1.5	0.4	0.4
270	9e	39.15	144.34	30	3	90	10	-6993	-6735	-6864	258	0	258	38	3		8.5	1.5	0.4	0.4
271	10w	38.79	144.29	8	2	16	4	-7138	-7000	-7069	138	0	138	38	3		8.5	1.5	0.4	0.4
272	10e	38.79	144.29	8	2	16	4	-7138	-6640	-6889	498	0	498	38	3		8.5	1.5	0.4	0.4
273	11w	38.78	144.35	35	4	123	10	-6939	-6643	-6791	296	0	296	38	3		8.5	1.5	0.4	0.4
274	11e	38.78	144.35	35	4	123	10	-6856	-6450	-6653	406	0	406	38	3		8.5	1.5	0.4	0.4
275	12w	38.77	144.50	16	4	64	4	-6240	-6150	-6195	90	0	90	38	3		8.5	1.5	0.4	0.4
276	12e	38.77	144.50	19	4	76	5	-6200	-5971	-6086	229	0	229	38	3	8.3	8.5	1.5	0.4	0.4
277	13w	38.79	144.61	23	5	115	5	-6100	-5931	-6016	169	0	169	38	3		8.5	1.5	0.4	0.4
278	13e	38.79	144.61	23	5	115	5	-6123	-5854	-5989	269	0	269	38	3		8.5	1.5	0.4	0.4
279	14e	38.83	144.69	55	5	275	11	-5900	-5700	-5800	200	0	200	38	3		8.5	1.5	0.4	0.4
280	15w	38.89	144.81	45	4	180	11	-5800	-5700	-5750	100	0	100	38	3		8.5	1.5	0.4	0.4
281	15e	38.89	144.81	45	4	180	11	-5770	-5638	-5704	132	0	132	38	3		8.5	1.5	0.4	0.4
282	16w	38.36	144.15	30	3	90	10	-7458	-7330	-7394	128	0	128	38	3		8.5	1.5	0.4	0.4
283	16e	38.36	144.15	30	3	90	10	-7330	-6750	-7040	580	0	580	38	3		8.5	1.5	0.4	0.4
284	17w	38.29	144.53	26	4	104	7	-5882	-5750	-5816	132	0	132	38	3		8.5	1.5	0.4	0.4
285	17e	38.29	144.53	26	4	104	7	-5831	-5685	-5758	146	0	146	38	3		8.5	1.5	0.4	0.4
286	18w	38.44	144.68	30	4	120	8	-5785	-5626	-5706	159	0	159	38	3		8.5	1.5	0.4	0.4
287	18e	38.44	144.68	30	4	120	8	-5790	-5568	-5679	222	0	222	38	3		8.5	1.5	0.4	0.4
288	19w	37.69	144.17	53	5	265	11	-6660	-6383	-6522	277	0	277	38	3		8.5	1.5	0.4	0.4
289	19e	37.69	144.17	53	5	265	11	-6500	-6251	-6376	249	0	249	38	3		8.5	1.5	0.4	0.4
290	20w	37.83	144.36	33	4	132	8	-6246	-6100	-6173	146	0	146	38	3		8.5	1.5	0.4	0.4
291	20e	37.83	144.36	33	4	132	8	-6200	-6000	-6100	200	0	200	38	3		8.5	1.5	0.4	0.4

Table 8b. Japan Trench

Plot No.	Map No.	Preceding[16] Tectonism Ma	+-	Most[17] Recent Volcanism Ma	+-	Heat[18] Flow mW/m²	+-	Extension[9] (individual basins) km	+-	Strain[10] (individual basins) %	+-	Extension[10] over Basin Width (strain)	+-	Basin Width over Extension	+-	Extension[11] (along transects) km	+-	Strain[12] Calculated %	+-	Extension[13] Rate (long term) mm/yr %	+-	Strain[14] Rate (long term) nanostrain	+-
253	1w	140	10	140	5	70.0	20.0	0.2	0.1	0.0	0.0	0	0	37.4	24.4								
254	1e	140	10	140	5	70.0	20.0	0.8	0.5	0.2	0.1	0	0	9.1	5.9								
255	2w	140	10	140	5	70.0	20.0	0.4	0.3	0.1	0.1	0	0	22.3	14.6								
256	2e	140	10	140	5	70.0	20.0	0.4	0.3	0.1	0.1	0	0	22.7	14.8								
257	3w	140	10	140	5	70.0	20.0	0.6	0.4	0.1	0.1	0	0	18	12	5	3	7%	5%	6	4	89.6	58.5
258	3e	140	10	140	5	70.0	20.0	0.9	0.6	0.1	0.1	0	0	12	8	5	3	7%	5%	6	4	89.6	58.5
259	4w	140	10	140	5	70.0	20.0	0.5	0.3	0.1	0.1	0	0	17	11	5	3	7%	5%	6	4	89.6	58.5
260	4e	140	10	140	5	70.0	20.0	0.7	0.5	0.1	0.1	0	0	12	8	5	3	7%	5%	6	4	89.6	58.5
261	5w	140	10	140	5	70.0	20.0	0.4	0.3	0.1	0.1	0	0	17	11	5	3	7%	5%	6	4	89.6	58.5
262	5e	140	10	140	5	70.0	20.0	0.6	0.4	0.1	0.1	0	0	12	8	5	3	7%	5%	6	4	89.6	58.5
263	6w	140	10	140	5	70.0	20.0	0.3	0.2	0.1	0.0	0	0	25	17	5	3	7%	5%	6	4	89.6	58.5
264	6e	140	10	140	5	70.0	20.0	0.4	0.2	0.1	0.1	0	0	19	12	5	3	7%	5%	6	4	89.6	58.5
265	7w	140	10	140	5	70.0	20.0	0.2	0.1	0.0	0.0	0	0	38	25	5	3	7%	5%	6	4	89.6	58.5
266	7e	140	10	140	5	70.0	20.0	0.2	0.2	0.1	0.0	0	0	30	20	5	3	7%	5%	6	4	89.6	58.5
267	8w	140	10	140	5	70.0	20.0	0.1	0.1	0.0	0.0	0	0	75	49	5	3	7%	5%	6	4	89.6	58.5
268	8e	140	10	140	5	70.0	20.0	0.2	0.1	0.0	0.0	0	0	40	26	5	3	7%	5%	6	4	89.6	58.5
269	9w	140	10	140	5	70.0	20.0	0.4	0.2	0.1	0.1	0	0	14	9								
270	9e	140	10	140	5	70.0	20.0	0.4	0.3	0.1	0.1	0	0	12	8								
271	10w	140	10	140	5	70.0	20.0	0.2	0.1	0.1	0.1	0	0	15	10	4	3	7%	5%	5	3	87.5	57.1
272	10e	140	10	140	5	70.0	20.0	0.8	0.5	0.4	0.3	0	0	4	3	4	3	7%	5%	5	3	87.5	57.1
273	11w	140	10	140	5	70.0	20.0	0.5	0.3	0.1	0.1	0	0	12	8	4	3	7%	5%	5	3	87.5	57.1
274	11e	140	10	140	5	70.0	20.0	0.7	0.4	0.2	0.1	0	0	9	6	4	3	7%	5%	5	3	87.5	57.1
275	12w	140	10	140	5	70.0	20.0	0.1	0.1	0.0	0.0	0	0	47	30	4	3	7%	5%	5	3	87.5	57.1
276	12e	140	10	140	5	70.0	20.0	0.4	0.2	0.1	0.1	0	0	18	12	4	3	7%	5%	5	3	87.5	57.1
277	13w	140	10	140	5	70.0	20.0	0.3	0.2	0.1	0.0	0	0	31	20	4	3	7%	5%	5	3	87.5	57.1
278	13e	140	10	140	5	70.0	20.0	0.4	0.3	0.1	0.1	0	0	19	13	4	3	7%	5%	5	3	87.5	57.1
279	14e	140	10	140	5	70.0	20.0	0.3	0.2	0.1	0.0	0	0	26	17	4	3	7%	5%	5	3	87.5	57.1
280	15w	140	10	140	5	70.0	20.0	0.2	0.1	0.0	0.0	0	0	42	27	4	3	7%	5%	5	3	87.5	57.1
281	15e	140	10	140	5	70.0	20.0	0.2	0.1	0.1	0.0	0	0	32	21	4	3	7%	5%	5	3	87.5	57.1
282	16w	140	10	140	5	70.0	20.0	0.2	0.1	0.1	0.0	0	0	24.6	16.0								
283	16e	140	10	140	5	70.0	20.0	1.0	0.6	0.3	0.2	0	0	5.4	3.5								
284	17w	140	10	140	5	70.0	20.0	0.2	0.1	0.1	0.0	0	0	31.8	20.7								
285	17e	140	10	140	5	70.0	20.0	0.2	0.2	0.1	0.0	0	0	28.7	18.7								
286	18w	140	10	140	5	70.0	20.0	0.3	0.2	0.1	0.0	0	0	26.4	17.2								
287	18e	140	10	140	5	70.0	20.0	0.4	0.2	0.1	0.1	0	0	18.9	12.3								
288	19w	140	10	140	5	70.0	20.0	0.5	0.3	0.1	0.1	0	0	18.9	12.3								
289	19e	140	10	140	5	70.0	20.0	0.4	0.3	0.1	0.1	0	0	21.0	13.7								
290	20w	140	10	140	5	70.0	20.0	0.2	0.2	0.1	0.0	0	0	28.7	18.7								
291	20e	140	10	140	5	70.0	20.0	0.3	0.2	0.1	0.1	0	0	21.0	13.7								

1 Values from visual examination of SRTM data of Becker et al., 2009ab.

2 Average of valley elevation and adjacent high peak elevation.

3 Difference between valley elevation and adjacent high peak elevation.

4 Nakamura et al. (2023) note sediment accumulation in grabens is largely absent or minimal.

5 Taken to be same as topographic relilef with respect to Nakamura et al. (2023) observation of largely absent or minimal sedimentation in grabens. of sedimentation.

6 Gamage et al. (2009).

7 1933 Sanriku earthquake epicenter is at northern limit of area considered here and estimated to have Mw 8.5 (Okal et al., 2016)

8	Fisher & Raitt 1962, Fujie et al 2016, Ludwig et al 1966, Obana et al 2019, Shor & Fisher 1961
9	Amount of extension required from slip on fault dipping between 30° and 70° to produce observed structural rellief.
10	Amount of extension divided by width of respective basin
11	Cumulative value of extension across transect of Basins 4 to 9 and 10 to 15, respectively (values same for each transect)
12	Extension across Basins 4 to 9 and 10 to 15 divided by 70 km (approximate distance along each transect)
13	Extension across transects 4 to 9 and 10 to 15 divided by 800k (aproximate age of oldest graben infrerred by dividing rate of subdcution by length of transect)
14	Extension rates along transects of Basins 4 to 9 and 10 to 15 divided by 70 km (approximate distance along each transect).
15	Oldest graben ages estimated by dividing ~70 km east-west width of zone containing grabens by 90 mm/yr subduction rate (Tectonics_Observatory, 2009).
16	Age of seafloor is about 140 ma ((Müller et al 2008, Tectonics_Observatory 2009, Liu et al., 2017).
17	Assumed no volcanism since seafloor created ~140 ma ((Müller et al 2008, Tectonics_Observatory 2009)
18	Yamano et al (2014, 2018). Values generally fall above ~50 mW/m2 typical of ocean basins of similar age (Hasterock et al., 2011) to that being subucted along Japan trench.
	High values attributed to hydrothermal circulations (Kawada et al 2014, Yamano et al 2014)

TABLE 9. Mid-Atlantic Ridge

Table 9a. Mid-Atlantic

Plot No.	Map No.	Lat°	Lon°	Length[1] km	Width[1] km	Area[1] km^2	Aspect[1] Ratio	Valley Elevation m	Adjacent[1] High Peak m	Average[2] Elevation	Topo[3] Relief m	Basin[4] Fill m	Structural[5] Relief m	Seismic Thickness km	+-	Max[7] Quake Mw	Moho[8] km	+-	Initiation[14] Ma	+-
301	1	33.0	-39.6	120	15	1800	8	-3850	-1000	-2425	2850	0	2850	6	4	6	8	2	0.7	0.4
302	2	32.3	-40.2	75	12	900	6	-3800	-1400	-2600	2400	0	2400	6	4	6	8	2	0.7	0.4
303	3	31.0	-41.4	300	17	5100	18	-3900	-1200	-2550	2700	0	2700	6	4	6	8	2	0.7	0.4
304	4	29.5	-42.8	70	14	980	5	-4000	-1700	-2850	2300	0	2300	6	4	6	8	2	0.7	0.4
305	5	27.3	-44.2	575	20	11500	29	-4700	-1700	-3200	3000	0	3000	6	4	6	8	2	0.7	0.4
306	6	36.0	-46.0	160	15	2400	11	-4600	-1700	-3150	2900	0	2900	6	4	6	8	2	0.7	0.4
307	7	22.8	-45.0	180	20	3600	9	-4400	-1300	-2850	3100	0	3100	6	4	6	8	2	0.7	0.4
308	8	20.0	-45.6	75	8	600	9	-4500	-2100	-3300	2400	0	2400	6	4	6	8	2	0.7	0.4
309	9	19.3	-46.0	55	14	770	4	-3600	-1850	-2725	1750	0	1750	6	4	6	8	2	0.7	0.4
310	10	18.7	-46.3	40	12	480	3	-3900	-2100	-3000	1800	0	1800	6	4	6	8	2	0.7	0.4
311	11	16.6	-46.5	300	18	5400	17	-4700	-1800	-3250	2900	0	2900	6	4	6	8	2	0.7	0.4
312	12	14.6	-45.0	90	25	2250	4	-4200	-1800	-3000	2400	0	2400	6	4	6	8	2	0.7	0.4
313	13	13.2	-44.8	130	20	2600	7	-4400	-1900	-3150	2500	0	2500	6	4	6	8	2	0.7	0.4
314	14	12.3	-44.1	70	10	700	7	-4900	-2100	-3500	2800	0	2800	6	4	6	8	2	0.7	0.4
315	15	11.3	-43.7	90	12	1080	8	-4550	-2350	-3450	2200	0	2200	6	4	6	8	2	0.7	0.4
316	16	10.4	-40.8	50	15	750	3	-4400	-2200	-3300	2200	0	2200	6	4	6	8	2	0.7	0.4
317	17	9.7	-40.6	35	13	455	3	-3700	-1700	-2700	2000	0	2000	6	4	6	8	2	0.7	0.4
318	18	9.2	-40.5	50	15	750	3	-4600	-2450	-3525	2150	0	2150	6	4	6	8	2	0.7	0.4
319	19	8.6	-39.5	23	9	207	3	-4300	-2000	-3150	2300	0	2300	6	4	6	8	2	0.7	0.4
320	20	8.4	-39.6	23	12	276	2	-4300	-2100	-3200	2200	0	2200	6	4	6	8	2	0.7	0.4
321	21	8.0	-38.0	44	10	440	4	-4500	-1650	-3075	2850	0	2850	6	4	6	8	2	0.7	0.4

Table 9b. Mid-Atlantic

Plot No.	MapNo.	Preceding[14] Tectonism Ma	+-	Most[15] Recent Volcanism Ma	+-	Heat[13] Flow mW/m^2	+-	Extension[9] from Structural Relief	+-	Basin Width over Extension	+-	Individual Basin Extension (Mid-Atlantic)	+-	Strain[10] Calculated %	+-	Spreading[11] Rate mm/yr	+-	Strain[12] Rate nanostrain	+-
301	1.0	0.7	0.4	0.6	0.6	100	58	5.6	2.2	0.4	0.1	3.2	1.3	37%	15%	25	5	1667	333
302	2.0	0.7	0.4	0.6	0.6	100	58	4.7	1.9	0.4	0.2	3.0	1.2	39%	16%	25	5	2083	417
303	3.0	0.7	0.4	0.6	0.6	100	58	5.3	2.1	0.3	0.1	3.8	1.5	31%	12%	25	5	1471	294
304	4.0	0.7	0.4	0.6	0.6	100	58	4.5	1.8	0.3	0.1	3.7	1.4	32%	13%	25	5	1786	357
305	5.0	0.7	0.4	0.6	0.6	100	58	5.9	2.3	0.3	0.1	4.0	1.6	30%	12%	25	5	1250	250
306	6.0	0.7	0.4	0.6	0.6	100	58	5.7	2.3	0.4	0.2	3.1	1.2	38%	15%	25	5	1667	333
307	7.0	0.7	0.4	0.6	0.6	100	58	6.1	2.4	0.3	0.1	3.9	1.5	31%	12%	25	5	1250	250
308	8.0	0.7	0.4	0.6	0.6	100	58	4.7	1.9	0.6	0.2	2.0	0.8	59%	23%	25	5	3125	625
309	9.0	0.7	0.4	0.6	0.6	100	58	3.4	1.4	0.2	0.1	4.8	1.9	25%	10%	25	5	1786	357
310	10.0	0.7	0.4	0.6	0.6	100	58	3.5	1.4	0.3	0.1	4.0	1.6	30%	12%	25	5	2083	417
311	11.0	0.7	0.4	0.6	0.6	100	58	5.7	2.3	0.3	0.1	3.7	1.5	32%	13%	25	5	1389	278
312	12.0	0.7	0.4	0.6	0.6	100	58	4.7	1.9	0.2	0.1	6.3	2.5	19%	7%	25	5	1000	200
313	13.0	0.7	0.4	0.6	0.6	100	58	4.9	1.9	0.2	0.1	4.8	1.9	25%	10%	25	5	1250	250
314	14.0	0.7	0.4	0.6	0.6	100	58	5.5	2.2	0.6	0.2	2.1	0.8	55%	22%	25	5	2500	500
315	15.0	0.7	0.4	0.6	0.6	100	58	4.3	1.7	0.4	0.1	3.3	1.3	36%	14%	25	5	2083	417
316	16.0	0.7	0.4	0.6	0.6	100	58	4.3	1.7	0.3	0.1	4.1	1.6	29%	11%	25	5	1667	333
317	17.0	0.7	0.4	0.6	0.6	100	58	3.9	1.6	0.3	0.1	3.9	1.5	30%	12%	25	5	1923	385
318	18.0	0.7	0.4	0.6	0.6	100	58	4.2	1.7	0.3	0.1	4.2	1.7	28%	11%	25	5	1667	333
319	19.0	0.7	0.4	0.6	0.6	100	58	4.5	1.8	0.5	0.2	2.4	0.9	50%	20%	25	5	2778	556
320	20.0	0.7	0.4	0.6	0.6	100	58	4.3	1.7	0.4	0.1	3.3	1.3	36%	14%	25	5	2083	417
321	21.0	0.7	0.4	0.5	0.6	100	58	5.6	2.2	0.6	0.2	2.1	0.8	56%	22%	25	5	2500	500

[1] Values from visual examination of batyhmetyric data of GEBCO (2024) and Sandwell et al., (2002)

[2] Average of valley elevation and adjacent high peak elevation

[3] Difference between valley elevation and adjacent high peak elevation

[4] Sediment thicknesses are negligible to absent near and within the rift (Ewing et al, 1964, 1966; Ballard and Vanandel, 1977)

[5] Vertical difference between depth of basin fill (taken to be zero within basins) and elevation of highest adjacent peak.

[6] Huang and Solomon, 1988; Huang et al., 1986; Barclay et al., 2001; Cessaro and Hjussong, 1986; Wolfe et al., 1995. See text for additional.

[7] Huang and Solomon, 1988; Huang et al., 1986

[8] Dannowski et al., 2010; Dunn et al., 2005; Fowler, 1976, 1978; Fowler and Keen, 1979; Keen and Tramontini, 1970; Planert et al., 2009; Purdy and Detrick, 1986; Sauermilch et al., 2018

[9] Extension in individual basins assuming structural relief accommodated on basin bounding faults that dip 50°-70°.

[10] Extension inferred from structural relief divided by width of respective basin.

[11] e.g., Seton et al. (2020)

[12] Spreading rate divided by width of basin.

[13] Lucazeau et al. 2006. Range is less than older studies of Elderfield and Schultz, 1996; Stein and Stein, 1994; Khutorskoi and Teveleva, 2020.

[14] Initiation and Preceding Tectonism ages assumed to be about same and fall within the age of rocks on seafloor and observation that rocks within and adjacent to the rift occur close in time to Brune-Matayama reversal of earth magnetic field ~ 780 k.y. ago.

[15] Volcanism at oldest post dates creation of rift rocks (initiation and preceding tectonism)

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