

Table S1. Main active fault zones and their characters in China and adjacent seas.

No.	Fault name		strike	slip type	length/km	slip rate (mm/a)			activity	total Earthquake number($M \geq 7.0$)	The Largest historical Earthquake ($M \geq 5$)
						horizontal	vertical	horizontal shortening rate			
①	Main Frontal Thrust fault zone of Himalaya		Nearly EW	R	3000 (Domestic part 410)			21±1.5	extremely strong	1	1950-08-15 M8.6 Zayü(Tibet) Earthquake
②	Yushu-Xianshuihe-Xiaojiang fault zone	Garzê-Yushu fault zone	NW	LL	600	2-8			strong	5	1320 M8.0 Mani ganggo(Garzê, Sichuan) Earthquake
③		Xianshuihe fault zone	Western segment:NW ; Eastern segment:NNW	LL	400	6-13			strong	8	1786-06-01 M7¾ south Kangding(Sichuan) earthquake
④		Anninghe fault	Nearly NS	LL	180	3.8-8.4			strong	2	1536-03-19 M7½ north Xichang(Sichuan) earthquake
⑤		Zemuhe fault zone	NNW	LL	120	5.0-9.3			strong	1	1850-09-12 M7½ Xichang-Puge(Sichuan) earthquake
⑥		Xiaojiang fault zone	Nearly NS	LL	420	3.4-9.5			strong	4	1833-09-06 M8.0 Songming (Yunnan) earthquake
⑦		Daliangshan fault zone	Nearly NS	LL	280	≤4.5			moderate		1480-09-22 M5½ Yuexi(Sichuan) earthquake
⑧	East Kunlun fault zone		Nearly EW-NWW	LL	1800	10±2			strong	3	2001-11-14 M8.1 west Kunlun Shankou earthquake

⑨	Altyn Tagh fault zone	NW-EW-NE E	LL	1900	10±2			strong	3	2008-03-21 M7.3Yutian (Xinjiang) earthquake
⑩	Haiyuan fault zone	NW-nearly NS	LL	650	2.5~8.0			strong-moderate	2	1920-12-16 M8½ Haiyuan(Ningxia) earthquake
⑪	North Tianshan fold-thrust belt	NWW-nearly EW	R	870		0.8	5.8	strong	2	1906-12-23 M7.7 Manas(Xinjiang) earthquake
⑫	North Qilianshan fault zone	NW	R-LL	1000	≥2.0	3.0		strong	6	1927-05-23 M 8.0 Gulang(Gansu) earthquake
⑬	Cona-Oiga rift	NNE	N	260		0.3-1. 9		strong-moderate	1	1806-06-11 M7½ Cona(Tibet) earthquake
⑭	Yadong-Gulu rift	NNE	N	500		1.5±0. 5		strong-moderate	2	1411-10-08 M8 Yangbajain (Tibet) earthquake
⑮	Dinggyê-Xainza rift	NNE	N	350				strong-moderate	--	1980-02-22 M6.6 south Xainza(Tibet) earthquake
⑯	Gangga-Tangra Yumco rift	Nearly NS	N	380				strong-moderate	--	1986-06-21 M6.4 Wenbu(Nyima,Tibet) earthquake **
⑰	Nyalam-Coqen rift	Nearly NS	N	260				moderate-weak	--	1947-02-10 M6¼ Gêrzê(Tibet) earthquake
⑱	Zhongba-Dawa Co rift	Nearly NS	N	370				strong-moderate	--	1957-04-14 M6½ north Zhongba (Tibet) earthquake; 1958-10-28 M6½ north Zhongba (Tibet) earthquake
⑲	Jiangqu Zangbo-Gêrzê rift	NE	N	240				strong-moderate	--	1944-10-18 M6¾ Ngangla Ringco (Tibet) earthquake; 1944-10-29 M6¾ Ngangla Ringco (Tibet) earthquake;

										2008-08-25 M6.8 Palung Co (north Zhongba, Tibet) earthquake
⑳	Purang-Wenbudangsang rift	NW-NE	N	300				strong-moderate	1	1883-10 M7 Purang(Tibet) earthquake
㉑	Bam Co-Tanggula Shankou graben system	NE	N	300		0.1-0.5		moderate-week	--	1971-05-22 M6.1 east Amdo(Tibet) earthquake
㉒	Norma Co-Xijir Ulan Lake graben system	NNE	N	400		0.1-0.3		moderate-week	--	1977-11-18 M6.6 northeast Nyima (Tibet) earthquake
㉓	Karakoram fault zone	NW	RL	1100	4-11			strong	1	1895-07-05 M7 Taxkorgan (Xinjiang) earthquake
㉔	Gyaring Co fault zone	NW	RL	250	2.2-4.5			moderate	1	1934-12-15 M7.0 Xainza (Tibet) earthquake
㉕	Beng Co fault zone	NW	RL	190	6-14			strong	1	1951-11-01 M8.0 Beng Co(Tibet) earthquake
㉖	Lungmu Co-Gozha Co fault zone	NE	LL	300				strong-moderate		1946-11-07 M6¼ northeast Rutog(Tibet) earthquake
㉗	Margai Caka-Rola Co fault	NEE	LL	300				moderate	1	1997-11-08 M7.5 Manyi(Tibet) earthquake
㉘	Rigain Püco fault zone	NE	LL	340	~1-2			moderate		2008-01-09 M6.8 east Gêrzê (Tibet) earthquake
㉙	West Kunlun frontal fold- thrust belt	NW- nearly EW	R	900			3-6	strong-moderate	2	1924-07-12 M7.2 east Minfeng (Xinjiang) earthquake
㉚	South Tianshan fold - thrust belt	Nearly EW	R	1300			13±7	strong	8	1902-08-22 M8¼ north Artux(Xinjiang) earthquake
㉛	Jinghe fault zone (Lake Alakol -Ebinur lake fault	NW	RL/R	800	4-5			moderate	3	1812-03-08 M8

	zone)									east Nilka(Xinjiang) earthquake
③②	Litang fault zone	NW-NNW	LL	400	1.0-2.3			moderate	1	1948-05-25 M7.3 Litang(Sichuan) Earthquake
③③	Wanding fault zone	NE-nearly EW	LL	250	0.5~2.4			moderate	1	1976-05-29 M7.3 Longling (Yunnan) earthquake
③④	Nantinghe fault zone	NE-nearly EW	LL	500	0.4~4			moderate	1	1941-05-16 M7 Gengma(Yunnan) earthquake
③⑤	Batang fault zone	NE	RL	230	2.0~4.4			moderate	1	1870-04-11 M7¼ Batang(Sichuan) earthquake
③⑥	Red River fault zone	NW	RL	1000	<2			moderate	--	--
③⑦	Eshan fault zone	NWW	RL	100	2.3~4			moderate	1	1970-01-05 M7.7 Tonghai(Yunnan) earthquake
③⑧	Shiping fault zone	NW-NWW	RL	130	≤3.5			moderate	2	1799-08-27 M7 Shiping(Yunnan) earthquake; 1887-12-16 M7 Shiping(Yunnan) earthquake;
③⑨	Lancang-Jinghong fault zone	NW	RL	300	2.2-3.5			moderate	2	1988-11-06 Ms7.6 Lancang-Gengma (Yunnan) earthquake
④⑩	Babianjiang fault zone	NNW	RL	240				week	--	1981-09-19 M6.0 Pu'er(Yunnan) earthquake
④⑪	Pu'er fault zone	NW	RL	120				moderate	--	1884-11-14 M6½ Pu'er(Yunnan) earthquake
④⑫	Sudian fault zone	Nearly NS	RL	80	0.6-0.7			moderate	--	2008-08-21 M6.1 Yingjiang(Yunnan) earthquake; 2014-05-30 M6.1 Yingjiang (Yunnan)

										earthquake; 2014-05-23 M6.1 Yingjiang (Yunnan) earthquake
④③	Longchuanjiang fault zone	Northern segment: nearly NS; Southern segment: NE	RL	130	~0.2			week	--	1976-07-21 M6.6 Tengchong(Yunnan) earthquake
④④	Maoyaba fault	Nearly EW	N	70		0.6±0.1		strong-moderate	--	--
④⑤	Yamocuogen fault	Nearly EW	N	60		~0.3		moderate	--	1989-04-25 M6.6 east Batang(Sichuan) earthquake
④⑥	Lamaya fault	Nearly EW	N	45		~0.5		moderate	--	--
④⑦	Jianchuan fault zone	NNE	N/LL	110	0.3-0.6			moderate	--	1751-05-25 M6¾ Jianchuan(Yunnan) earthquake
④⑧	Haba-Yulongxueshan east piedmont fault	NW-nearly NS	N	90		0.6-1.0		strong	1	1996-02-03 Ms7.0 Lijiang(Yunnan) earthquake
④⑨	Diancangshan east piedmont fault	NNW	N	65		0.5-1.1		strong	1	1925-03-16 M7.0 Dali (Yunnan) Earthquake
⑤⑩	Chenghai-binchuan fault	NNE- nearly NS	N/LL	200	1.0-1.2	0.2-0.6		moderate	2	1515-06-27 M7¾ Yongsheng(Yunnan) earthquake
⑤⑪	Baoshan fault	Nearly NS	N	50		0.1~0.2		moderate	--	2001-04-12 M6.0 Baoshan(Yunnan) earthquake
⑤⑫	Minshan fault zone	Nearly NS	R/LL					moderate	5	1933-08-02 M7½ Diexi(Sichuan) earthquake
⑤⑬	Longmenshan fault zone	NE	R/RL	700	~3.0	<1	1-4	moderate	2	2008-05-12 M8.0 Wenchuan(Sichuan) earthquake
⑤⑭	Fuyun fault zone	NNW	RL	450	0.8~5.0			strong-moderate	2	1931-08-11 M8.0 Fuyun(Xinjiang) earthquake

⑤⑤	west Junggar fault zone		NE	LL/R	260	0.2~3.0			moderate	--	1941-04-05 M5½ south Tacheng(Xinjiang) earthquake
⑤⑥	South Altai Shan fault zone		NWW	R	630		1.0-2.3	<4	moderate	--	1961-05-21 M5½ Habahe (Xinjiang) earthquake
⑤⑦	Yinchuan-Hetao rift	Hetao graben system	NNE- nearly EW	N	550		0.6-1.2		strong-moderate	1	1849-10-24 M7 Baotou (Inner Mongolia) earthquake
⑤⑧		Wuhai-Yinchuan graben system	Nearly NS	N	320		0.5-1.2		strong-moderate	1	1739-01-03 M8 Pingluo (Yinchuan, Ningxia) earthquake
⑤⑨		Jilantai-Alxa Left Banner graben system	NNE-nearly NS	N	250				moderate-weak	1	1954-07-31 M7.0 east Minqin(Gansu) Earthquake
⑥⑩		Yabulai graben system	NNE-NE	LL & N	320		~0.1		moderate-weak	--	1989-09-03 M5.4 northeast Alxa Right Banner(Inner Mongolia) earthquake
⑥⑪	Fenwei rift	Weihe graben system	Nearly EW	N	300		0.2-1.1 1.1-2.7		strong-moderate	3	1556-02-02 M8¼ Huaxian(Shanxi) earthquake
⑥⑫		Shanxi graben system	NE-NEE	N/RL	700		0.6-1.4		strong-moderate	5	1303-09-25 (or 1303-09-17) M8 Hongdong-Zhaocheng (Shanxi) earthquake
⑥⑬		Yangyuan-Yanqing graben system	NEE	N	250		~0.3 0.4-1.0		strong-week	1	1626-06-28 M7 Lingqiu (Datong, Shanxi) earthquake
⑥⑭	Jiyuan-Tangshan buried rift	Taihangshan front fault	NE-NNE	N	620		0.1-0.2		moderate	1	1830-06-12 M8 Cixian(Hebei) earthquake
⑥⑮		Xingtai-Tangshan fault	NE	RL/N	600	>0.3	0.2		moderate-weak	3	1976-07-28 M7.8 Tangshan(Hebei)

											earthquake
⑥⑥		Beijing plain area fault system	NE & NW	NE faults: N/RL; NW faults: LL.	150		~0.21		moderate-week	1	1679-09-02 M8 Sanhe(Hebei)-Pinggu(Beijing) earthquake
⑥⑦	Tanlu fault zone		NE	RL	2400	~2.2-3.2	~0.4		moderate-strong	3	1668-07-25 M8½ Tancheng (Shandong) earthquake
⑥⑧	Changle-zhaoan fault zone		NE	N	360				week	--	1185-06-15 M6½ offshore Zhangzhou (Fujian) earthquake
⑥⑨	Hongkong-Haitan Island fault zone		NE	RL	750				moderate	3	1604-12-29 M7½ offshore Quanzhou(Fujian) earthquake
⑦⑩	Longitudinal Valley fault zone in Taiwan	Central Range fault system	NNE	R	90			<12.8*	strong	1	1951-11-25 M7.3 Hualien(Taiwan) earthquake
⑦⑪		longitudinal valley fault system	NNE	R/LL	150		6-10	22.7*	extremely strong		
⑦⑫	Pear mountain –Quchi fold- and- thrust belt		NE-NNE	northern segment: N; middle segment: LL; southern segment: LL/R.	400		0.9-4.8	6.2*	extremely -moderate	3	2006-12-26 M7.2 offshore Hengchun(Taiwan) earthquake
⑦⑬	West Piedmont thrust and strike-slip fault zone in Taiwan	Chelungpu fault	Nearly NS	R	92			5.8-13.2*	strong	6	1999-09-21 M7.6 Jiji(Taiwan) earthquake
⑦⑭		Changhua fault	Nearly NS	R	86			6.2*	strong		1848-12-03 M6¾ Changhua (Taiwan)

											earthquake
⑦⑤		the right-lateral strike-slip fault system	NE	RL	30-40	0.6-2.0			moderate		1906-03-17 M7.1 Meishan(Taiwan) earthquake; 1935-04-21 M7.1 Miaoli(Taiwan) earthquake

Note: 1. The historical largest earthquake data from Lou, 1996 [169]; Mao et al. 2003 [170]; <http://www.csndmc.ac.cn/index/main> (accessed on 1 July 2023).; and those with “*” from Zhou, 1997 [171].

2. In column “The Largest Earthquake”, “1906-03-17” stands for “yy-mm-dd”. Date of origin since 4th Jan. 1970 in Coordinated Universal Time(UTC), those before 4th Jan. 1970 in Beijing time, and those marked “***” in the local time.

3. The fault slip rate is obtained from field investigations or previous studies, including geology, tectonic geomorphology or GPS observation, with references in chapter 4. Note that the slip rate in Taiwan region with “*” is a dip-slip rate or a rake-slip rate (see in Shyu et al, 2016) [116].

4. The locations of the fault zones see in Figure 4.

5. Slip type, R: reverse; N: normal; LL: left-lateral fault; RL: right-lateral. For oblique-slip fault, the subordinate sense of slip is listed after the primary slip type.