

Table S1*. Basic information of the cross sections located in the upper Yellow River Basin.

Station ID	River names	Cross section names	Flow to	Longitude (°)	Latitude (°)	Altitude (m)	Contributing area (×10 ⁴ km ²)	Distance to estuary (km)	Cross sections used to extract river widths	Cross sections of the mainstream (reservoir effect removed)	Annual peak discharge used to calculate flood frequency
1	Heilin River	Heilin2(HL2)	Beichuan River	101.400	37.083	2760	0.028	21			
2	Yellow River	Huangheyan4(HHY4)	Bohai Sea	98.169	34.890	4214	2.093	5194	√	√	1967-2018
3	Yellow River	Jimai4(JM4)	Bohai Sea	99.650	33.767	3959	4.502	4869	√	√	1967-2018
4	Yellow River	Mentang(MT)	Bohai Sea	101.046	33.767	3636	5.966	4618	√	√	2007-2018
5	Yellow River	Maqu2(MQ2)	Bohai Sea	102.083	33.958	3412	8.605	4284	√	√	1967-2018
6	Yellow River	Jungong(JG)	Bohai Sea	100.651	34.688	3081	9.841	4057	√	√	1982-2018
7	Yellow River	Tangnaihai(TNH)	Bohai Sea	100.150	35.500	2689	12.197	3911	√	√	1967-2018
8	Yellow River	Guide2(GD2)	Bohai Sea	101.405	36.045	2200	13.365	3722	√		1967-2018
9	Yellow River	Xunhua3(XH3)	Bohai Sea	102.450	35.868	1864	14.533	3563	√		1967-2018
10	Yellow River	Xiaochuan(XC)	Bohai Sea	103.333	35.933	1631	18.177	3442	√		1967-2018
11	Yellow River	Shangquan6(SQ6)	Bohai Sea	103.245	36.027	1619	18.282	3409	√		1967-2017
12	Yellow River	Lanzhou(LZ)	Bohai Sea	103.817	36.067	1518	22.255	3345	√	√	1967-2018
13	Yellow River	Anningdu (AND)	Bohai Sea	104.683	36.583	1400	24.154	3208	√	√	1967-2018
14	Dong River	Dingxi(DX)	Guanchuan River	104.625	35.584	1901	0.079	1.2			
15	Xi River	Dingxixihe(DXXH)	Guanchuan River	104.603	35.563	1911	0.064	2			
16	Bayan Gou River	Hualong(HL)	Yellow River	102.251	36.100	2796	0.022	29			
17	Bai River	Tangke(TK)	Yellow River	102.452	33.417	3428	0.537	6.3	√		1967-2018
18	Daheba River	Shangcun(SC)	Yellow River	100.134	35.506	2694	0.398	1.8			
19	Daxia River	Xiahe2(XH2)	Yellow River	102.484	35.182	2957	0.169	144			
20	Daxia River	Shuangcheng(SC)	Yellow River	103.050	35.483	2040	0.614	55	√		1967-2018
21	Daxia River	Zheqiao(ZQ)	Yellow River	103.260	35.636	1835	0.684	27			
22	Hei River	Ruoergai(REG)	Yellow River	102.935	33.601	3437	0.400	163			
23	Hei River	Dashui(DS)	Yellow River	102.263	33.990	3427	0.742	31			
24	Huangshui River	Haiyan3(HY3)	Yellow River	101.015	36.900	2995	0.138	296			
25	Huangshui River	Huangyuan(HY)	Yellow River	101.267	36.682	2628	0.303	254	√		2007-2018
26	Huangshui River	Xining(XN)	Yellow River	101.783	36.632	2226	0.902	200	√		1967-2018
27	Huangshui River	Ledu(LD)	Yellow River	102.424	36.474	1968	1.303	129			
28	Huangshui River	Minhe3(MH3)	Yellow River	102.809	36.337	1761	1.534	75	√		1967-2018

29	Longwu River	Tongren(TR)	Yellow River	102.022	35.516	2482	0.283	44	√	1967-2018
30	Qingshui River	Qingshui(QS)	Yellow River	102.551	35.834	1884	0.069	1.2	√	1982-2018
31	Qushi'an River	Damitan(DMT)	Yellow River	100.228	35.321	2747	0.579	1.3		
32	Requ River	Huanghe(HH)	Yellow River	98.267	34.600	4209	0.645	7		
33	Shakequ River	Jiuzhi(JZ)	Yellow River	101.491	33.433	3619	0.125	34	√	2007-2018
34	Tao River	Luqu(LQ)	Yellow River	102.459	34.601	3121	0.504	529	√	1982-2018
35	Tao River	Minxian4(MX4)	Yellow River	104.033	34.445	2303	1.411	254	√	1967-2018
36	Tao River	Lijiacun2(LJC2)	Yellow River	103.817	35.267	1911	1.969	108		
37	Tao River	Hongqi(HQ)	Yellow River	103.567	35.800	1747	2.497	27		
38	Zhuanglang River	Tianzhu(TZ)	Yellow River	103.148	36.966	2384	0.162	102		
39	Zhuanglang River	Wushengyi3(WSY3)	Yellow River	103.187	36.870	2272	0.200	90		
40	Zhuanglang River	Hongyazi(HYZ)	Yellow River	103.444	36.184	1571	0.401	1.3		
41	Zuli River	Huining2(HN2)	Yellow River	105.050	35.685	1715	0.099	176		
42	Zuli River	Guochengyi(GCY)	Yellow River	104.880	36.217	1526	0.547	83		
43	Zuli River	Jingyuan(JY)	Yellow River	104.660	36.549	1404	1.065	3.8		
44	Bazhou Gou River	Jijiaobao(JJB)	Hungshui River	102.793	36.317	1803	0.019	3.6		
45	Beichuan River	Niuchang(NC)	Hungshui River	101.350	37.256	3007	0.078	98		
46	Beichuan River	Qiaotou5(QT5)	Hungshui River	101.684	36.934	2444	0.277	37		
47	Datong River	Garide(GRD)	Hungshui River	100.517	37.749	3448	0.458	372		
48	Datong River	Qingshizui(QSZ)	Hungshui River	101.417	37.458	2935	0.801	255		
49	Datong River	Tiantang(TT)	Hungshui River	102.498	36.950	2276	1.257	100		
50	Datong River	Liancheng2(LC2)	Hungshui River	102.817	36.602	1922	1.391	40		
51	Datong River	Xiangtang3(XT3)	Hungshui River	102.833	36.350	1742	1.513	1.9		
52	Nanchuan River	Nanchuanhekou2(NCHK2)	Hungshui River	101.774	36.626	2244	0.040	1.3		
53	Shatang Chuan River	Fujiazhai(FJZ)	Hungshui River	101.874	36.573	2185	0.111	1.7		
54	Xina Chuan River	Xinachuan2(XNC)	Hungshui River	101.483	36.767	2484	0.081	14		
55	Xiaonan Chuan River	Wangjiazhuang(WJZ)	Hungshui River	101.936	36.550	2168	0.037	0.5		
56	Yaoshui River	Dongjiazhuang3(DJZ3)	Hungshui River	101.273	36.667	2639	0.064	1.6		
57	Yinsheng Gou River	Baliqiao3(BLQ3)	Hungshui River	102.409	36.517	2066	0.046	6.9		
58	Suji River	Kangle(KL)	Sancha River	103.700	35.375	2005	0.033	1.5		
59	Bola River	Xiabagou-bo3(XBG-B3)	Tao River	102.997	34.711	2795	0.170	0.7		
60	Dayu Gou River	Duoba(DB)	Tao River	103.589	34.567	2500	0.078	1.7		
61	Dongyu Gou River	Yaodian(YD)	Tao River	104.052	35.301	2042	0.027	31		

62	Dongyu Gou River2	Lintao3(LT3)	Tao River	103.868	35.401	1881	0.058	2.9
63	Guangtong River	Sanjiaji2(SJJ2)	Tao River	103.733	35.554	1840	0.152	6.7
64	Manba River	Wangjiamo(WJM)	Tao River	103.833	35.248	1936	0.046	1.2
65	Yemu River	Yeliguan2(YLG2)	Tao River	103.667	34.961	2182	0.119	14
66	Xinglong River	Yuzhong2(YZ2)	Wanchuan River	104.064	35.800	2196	0.008	15
67	Qiechang Gou River	Qieyang(QZ)	Yinchuan River	102.959	35.637	2062	0.047	4.8
68	Guanchuan River	Dayangying(DYY)	Zuli River	104.865	36.217	1529	0.348	8

*Revised from Table S1 and Table S2 of Qin et al. (2021).