

Supplementary Material for

Monitoring post-flood recovery of croplands using Sentinel-1/2 imagery

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Table S1. The acquisition date and identifier information of the employed Sentinel-1 IW datasets for flood extent extraction.

Study region	Acquisition date	Identifier information
Huai River	2020/07/27	S1A_IW_GRDH_1SDV_20200727T101147_20200727T101212_033639_03E612_8FD4
		S1A_IW_GRDH_1SDV_20200727T101212_20200727T101237_033639_03E612_2DD2
Huai River	2020/08/01	S1A_IW_GRDH_1SDV_20200801T101941_20200801T102006_033712_03E840_44A3
		S1A_IW_GRDH_1SDV_20200801T102006_20200801T102031_033712_03E840_D694
Chao Lake	2020/07/27	S1A_IW_GRDH_1SDV_20200727T101122_20200727T101147_033639_03E612_6A3E
		S1A_IW_GRDH_1SDV_20200727T101147_20200727T101212_033639_03E612_8FD4
Chao Lake	2020/08/08	S1A_IW_GRDH_1SDV_20200808T101123_20200808T101148_033814_03EB9C_0FCE
		S1A_IW_GRDH_1SDV_20200808T101148_20200808T101213_033814_03EB9C_F9E3
Poyang Lake	2020/7/8	S1A_IW_GRDH_1SDV_20200708T101849_20200708T101914_033362_03DD85_5B9E
		S1A_IW_GRDH_1SDV_20200708T101914_20200708T101939_033362_03DD85_0B97
Poyang Lake	2020/7/14	S1B_IW_GRDH_1SDV_20200714T101817_20200714T101852_022466_02AA36_A270
		S1A_IW_GRDH_1SDV_20200715T101031_20200715T101056_033464_03E0B4_DDA1
Poyang Lake	2020/7/15	S1A_IW_GRDH_1SDV_20200715T101056_20200715T101121_033464_03E0B4_42CD

Table S2. Water areas within croplands extracted by different thresholds and sieving values between the normal year (2019) and the flood year (2020).

Threshold (dB)	Removed patches (Connectivity)	Chao Lake Region			Poyang Lake Region			Huai River Region		
		Water area (2020)	Water area (2019)	$\frac{Area_{20} - Area_{19}}{Area_{20}}$	Water area (2020)	Water area (2019)	$\frac{Area_{20} - Area_{19}}{Area_{20}}$	Water area (2020)	Water area (2019)	$\frac{Area_{20} - Area_{19}}{Area_{20}}$
-16.5	2	489	76	84.5%	1016	402	60.4%	1221	462	62.2%
	50	405	17	95.8%	822	271	67.0%	1011	218	78.4%
	100	379	8	97.9%	750	229	69.5%	962	163	83.1%
-16	2	531	108	79.7%	1093	450	58.8%	1371	671	51.1%
	50	433	30	93.1%	880	301	65.8%	1098	349	68.2%
	100	402	15	96.3%	806	255	68.4%	1028	268	73.9%
-15.5	2	582	150	74.2%	1176	508	56.8%	1569	951	39.4%
	50	466	51	89.1%	946	337	64.4%	1229	545	55.7%
	100	430	28	93.5%	863	286	66.9%	1131	426	62.3%
-15	2	644	206	68.0%	1269	580	54.3%	1821	1314	27.8%
	50	510	83	83.7%	1017	380	62.6%	1421	830	41.6%
	100	466	48	89.7%	929	320	65.6%	1293	671	48.1%
-14.5	2	719	279	61.2%	1373	671	51.1%	2137	1769	17.2%
	50	567	130	77.1%	1096	435	60.3%	1693	1229	27.4%
	100	514	84	83.7%	1000	366	63.4%	1527	1028	32.7%
-14	2	809	374	53.8%	1496	788	47.3%	2521	2315	8.2%
	50	640	198	69.1%	1190	503	57.7%	2048	1743	14.9%
	100	580	138	76.2%	1082	428	60.4%	1864	1522	18.3%

Table S3. Statistics of the flood-affected croplands and recovery conditions in the three study areas.

(A) Study area near the Huai River	CI (2016-2018)		Disaster area (2020)							
	Area (km ²)	Proportion in the study area	Area (km ²)	Proportion in the specific cropping pattern	October		November		December	
					Recovered area (km ²)	Recovered proportion	Recovered area (km ²)	Recovered proportion	Recovered area (km ²)	Recovered proportion
Single cropping	5705	24.24%	238	4.17%	71.5	30.04%	96.9	40.71%	111.8	46.97%
Double cropping	11020	46.82%	720	6.53%	319.6	44.39%	514.6	71.47%	582.1	80.85%
Total	16842	71.56%	958	5.69%	391.1	40.82%	611.5	63.83%	693.9	72.43%
(B) Study area around the Poyang Lake	CI (2016-2018)		Disaster area (2020)							
	Area (km ²)	Proportion in the study area	Area (km ²)	Proportion in the specific cropping pattern	October		November		December	
					Recovered area (km ²)	Recovered proportion	Recovered area (km ²)	Recovered proportion	Recovered area (km ²)	Recovered proportion
Single cropping	6878	24.45%	580	8.43%	346.7	59.78%	370.1	63.81%	414.1	71.40%
Double cropping	3446	12.25%	169	4.90%	83.7	49.53%	94.9	56.15%	112.9	66.80%
Total	10345	36.78%	749	7.24%	430.4	57.46%	465	62.08%	527	70.36%
(C) Study area around the Chao Lake	CI (2016-2018)		Disaster area (2020)							
	Area (km ²)	Proportion in the study area	Area (km ²)	Proportion in the specific cropping pattern	October		November		December	
					Recovered area (km ²)	Recovered proportion	Recovered area (km ²)	Recovered proportion	Recovered area (km ²)	Recovered proportion
Single cropping	2651	36.99%	190	7.17%	29.5	15.53%	44.1	23.21%	57.9	30.47%
Double cropping	1848	25.78%	189	10.23%	34.3	18.15%	46.7	24.71%	65.3	34.55%
Total	4504	62.84%	379	8.41%	63.8	16.83%	90.8	23.96%	123.2	32.51%

Table S4. Active arrangements summarized in reference to the official announcements.

Flood-stricken paddy types	Planting period	Flood duration	Active arrangements (after draining, fertilizing, and spraying insecticide)
Double-cropped early rice	Harvest period	Short	Rush harvesting and planting double-season cropland
		Long	Replace double-season late rice with early rice varieties; replant dry crops (i.e., corns); replant vegetables
Single-cropped rice	Late tillering stage or booting stage	Short	Recover the growth of single-season rice
		Long	Apply ratooning rice technologies; replant dry crops; replant vegetables
Double-cropped late rice	Seeding stage	Short	Wash seedings and transplanting timely

Figure S1

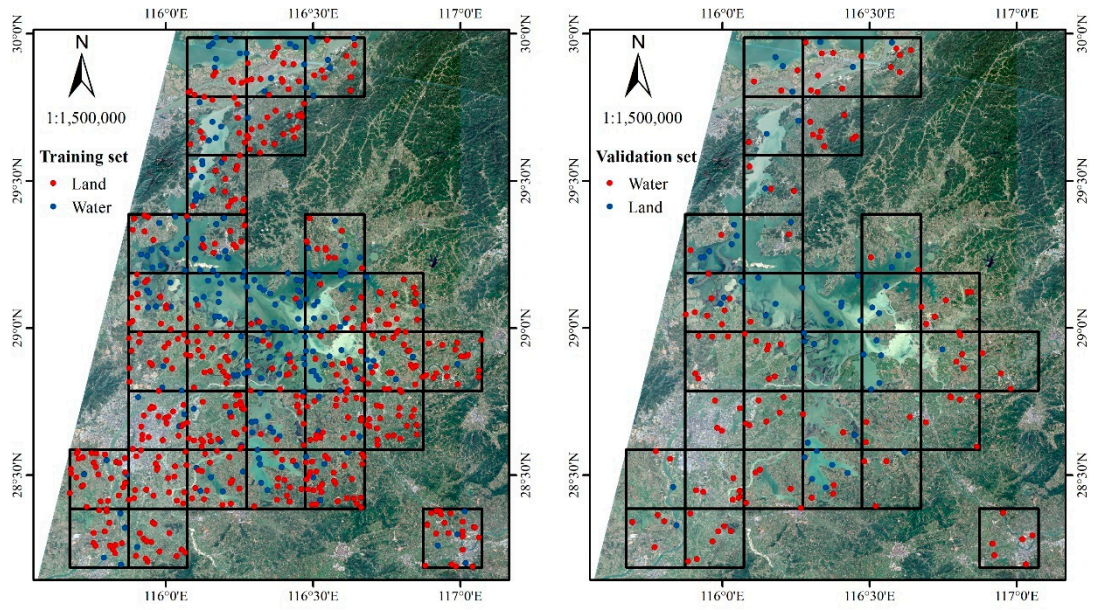


Figure S1. Spatial distribution of visually interpreted training and test samples for water extraction method comparison.

Figure S2

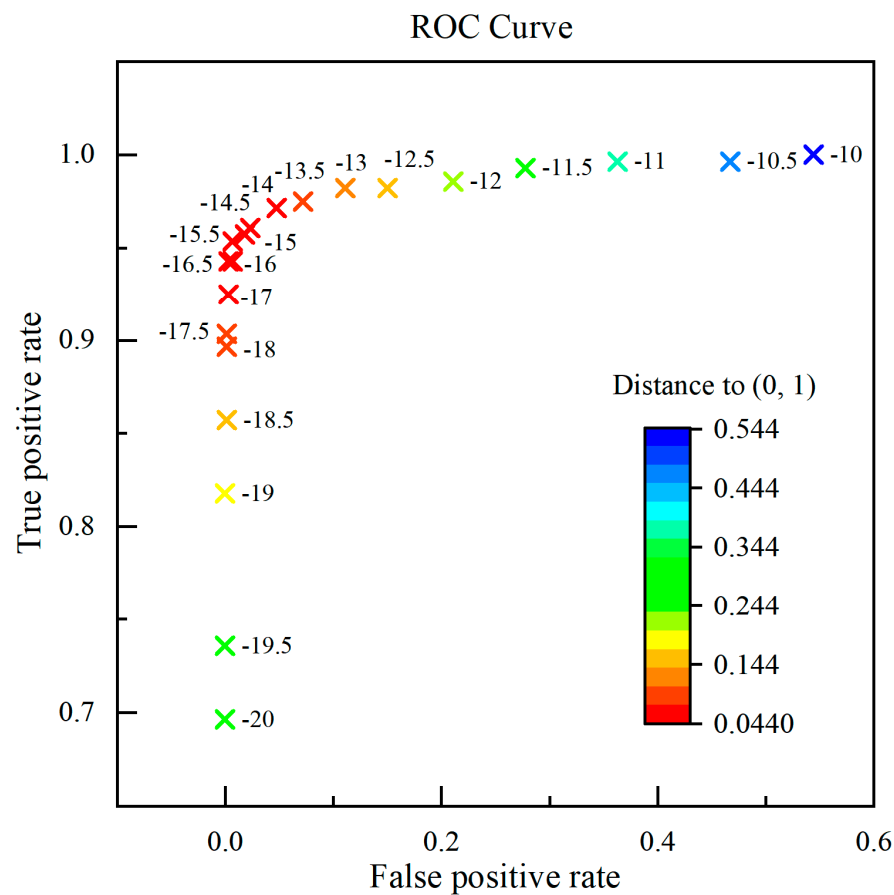


Figure S2. Receiver operating characteristic (ROC) curve for water extraction threshold selection. The ROC curve was calculated over the dataset of 892 validation points.