Table S1. Water footprint per ton (WFP) of maize for provinces of China in 2013.

Province	Irrigated								Rain-fed	National	
	Average		Furrow		Micro		Sprinkler				
	WFP	WFP_b	WFP	WFP_b	WFP	WFP_b	WFP	WFP_b	WFP	WFP	WFP_b
	($m^3\ t^{-1}$)	(%)	($m^3\ t^{-1}$)	(%)	($m^3\ t^{-1}$)	(%)	($m^3\ t^{-1}$)	(%)	($m^3\ t^{-1}$)	($m^3\ t^{-1}$)	(%)
Beijing	860	50	856	49	741	47	907	52	744	813	31
Tianjin	1079	50	1080	50	933	47	1144	52	948	1025	30
Hebei	931	37	931	37	921	37	935	37	853	898	22
Shanxi	931	49	931	49	862	48	962	51	881	900	19
Inner Mongolia	705	56	708	56	633	56	743	58	776	742	26
Liaoning	712	47	716	47	667	46	739	48	697	702	14
Jilin	680	46	680	46	663	47	685	47	645	652	9
Heilongjiang	872	44	870	44	836	44	884	45	818	840	19
Shanghai	695	31	695	31	668	36	695	31	635	695	31
Jiangsu	1058	37	1058	37	1044	38	1064	38	986	1025	21
Zhejiang	1230	34	1230	34	1228	35	1231	34	1167	1230	34
Anhui	1129	36	1129	36	1110	38	1133	37	996	1040	13
Fujian	1150	26	1150	26	1138	23	1155	26	1083	1150	26
Jiangxi	1311	38	1311	38	1299	39	1317	38	1222	1311	38
Shandong	815	39	816	39	764	36	840	40	723	782	26
Henan	959	42	958	42	905	43	982	43	843	916	28
Hubei	1144	32	1144	32	1140	33	1145	32	1002	1043	10
Hunan	943	44	943	44	938	44	945	44	889	918	24
Guangdong	957	18	957	18	957	12	958	18	928	945	11
Guangxi	1016	28	1016	28	1016	25	1017	28	994	998	5
Hainan	993	3	993	3	993	0	993	3	947	976	2
Chongqing	864	29	864	29	863	28	864	29	833	839	6
Sichuan	801	24	801	24	800	19	801	24	763	772	6
Guizhou	1387	40	1387	40	1382	40	1387	40	1312	1317	3
Yunnan	844	31	844	31	844	27	844	31	824	825	2
Tibet	624	19	624	19	0	0	624	19	664	643	10
Shaanxi	1072	41	1072	41	1054	40	1079	41	1010	1037	19
Gansu	790	59	794	59	727	58	824	60	808	797	36
Qinghai	687	56	688	56	646	58	707	57	670	687	56
Ningxia	628	62	634	62	570	62	664	64	863	654	53
Xinjiang	510	76	536	76	488	75	559	77	994	560	62
China	828	45	850	44	588	61	829	47	800	813	20

Table S2. Water footprint per ton (WFP) of wheat for provinces of China in 2013.

Province	Irrigated								Rain-fed	National	
	Average		Furrow		Micro		Sprinkler				
	WFP	WFP_b	WFP	WFP_b	WFP	WFP_b	WFP	WFP_b	WFP	WFP	WFP_b
	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	($m^3 t^{-1}$)	(%)
Beijing	1178	64	1174	64	1040	65	1230	65	0	1178	64
Tianjin	1178	61	1178	61	1048	62	1235	62	0	1178	61
Hebei	1002	61	1002	61	888	61	1053	62	1535	1002	61
Shanxi	1567	60	1566	60	1375	58	1647	62	1539	1563	53
Inner Mongolia	1947	66	1952	66	1830	67	2005	67	1368	1945	66
Liaoning	1048	58	1051	58	1015	58	1067	58	0	1048	58
Jilin	0	0	0	0	0	0	0	0	0	0	0
Heilongjiang	1430	53	1426	52	1367	52	1453	53	1200	1430	53
Shanghai	1284	30	1284	30	1225	23	1309	31	1199	1252	20
Jiangsu	1053	42	1054	42	986	38	1090	43	980	1004	15
Zhejiang	1366	26	1366	26	1353	19	1382	26	1372	1366	26
Anhui	1033	41	1032	41	939	37	1076	42	939	970	14
Fujian	1880	35	1879	35	1783	28	1925	36	0	1880	35
Jiangxi	2564	30	2564	30	2439	23	2631	31	2397	2564	30
Shandong	946	59	946	59	853	58	986	60	999	953	50
Henan	882	51	882	51	792	49	922	52	817	857	32
Hubei	1287	37	1286	37	1175	30	1338	38	1176	1218	15
Hunan	1316	30	1316	30	1241	23	1359	31	1210	1315	30
Guangdong	1657	34	1657	34	1531	25	1709	35	0	1657	34
Guangxi	3716	37	3717	37	3516	30	3815	38	5324	3720	37
Hainan	0	0	0	0	0	0	0	0	0	0	0
Chongqing	1382	39	1381	39	1335	36	1409	40	1319	1365	29
Sichuan	1177	44	1177	44	1119	42	1210	45	1187	1181	27
Guizhou	1575	44	1576	44	1524	40	1613	45	1588	1584	14
Yunnan	2450	63	2451	63	2248	61	2556	64	4144	3010	34
Tibet	737	57	737	57	648	55	771	58	820	745	51
Shaanxi	1271	49	1272	49	1168	46	1325	50	1200	1242	30
Gansu	1451	62	1460	62	1304	62	1529	63	1306	1387	36
Qinghai	761	62	762	62	666	62	802	63	705	731	30
Ningxia	1486	61	1501	61	1342	62	1576	62	1316	1472	57
Xinjiang	760	69	804	69	722	68	842	70	666	760	68
China	1021	55	1028	54	822	65	1170	59	983	1008	37

Table S3. Water footprint per ton (WFP) of two crops for provinces of China in the 2030s under RCP2.6 and RCP8.5.

Province	RCP2.6				RCP8.5			
	Maize		Wheat		Maize		Wheat	
	WFP	WFP_b	WFP	WFP_b	WFP	WFP_b	WFP	WFP_b
	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)
Beijing	984	31	1056	60	978	31	1037	61
Tianjin	1187	31	1043	57	1190	31	1026	58
Hebei	1000	27	967	58	991	26	951	60
Shanxi	1171	22	1616	53	1115	22	1594	54
Inner Mongolia	804	25	1820	66	788	25	1777	66
Liaoning	814	13	1058	57	809	13	1029	57
Jilin	695	9	0	0	690	9	0	0
Heilongjiang	976	21	1632	57	964	21	1592	57
Shanghai	714	31	1454	28	714	32	1414	28
Jiangsu	1099	20	1121	16	1094	20	1095	16
Zhejiang	1374	32	1706	38	1374	33	1664	38
Anhui	1128	13	1118	16	1117	13	1095	16
Fujian	1417	31	2358	42	1416	31	2300	42
Jiangxi	1462	35	3260	39	1464	36	3179	38
Shandong	889	27	895	48	885	27	883	48
Henan	1053	28	994	33	1051	28	975	34
Hubei	1201	10	1654	17	1201	11	1610	17
Hunan	1100	21	1888	37	1105	21	1842	37
Guangdong	1277	16	2195	47	1278	16	2144	48
Guangxi	1341	5	5537	48	1343	5	5400	49
Hainan	1338	9	0	0	1337	9	0	0
Chongqing	1060	7	1990	36	1063	8	1940	36
Sichuan	1037	9	1742	35	1038	9	1699	35
Guizhou	1795	3	2367	17	1799	3	2290	18
Yunnan	1179	2	3696	36	1178	2	3547	36
Tibet	902	22	921	63	900	22	912	64
Shaanxi	1382	26	1639	37	1364	26	1619	38
Gansu	1054	42	1773	41	1047	41	1758	41
Qinghai	808	55	861	31	808	54	848	31
Ningxia	773	57	1720	61	771	57	1699	62
Xinjiang	540	66	837	70	540	66	823	70
China	948	21	1117	37	939	21	1095	38

Table S4. Water footprint per ton (WFP) of two crops for provinces of China in the 2050s under RCP2.6 and RCP8.5.

Province	RCP2.6				RCP8.5			
	Maize		Wheat		Maize		Wheat	
	WFP	WFP_b	WFP	WFP_b	WFP	WFP_b	WFP	WFP_b
	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)
Beijing	987	31	1051	60	966	30	966	61
Tianjin	1189	31	1038	57	1173	31	960	58
Hebei	1005	27	964	59	995	26	890	59
Shanxi	1175	22	1607	53	1121	21	1478	54
Inner Mongolia	799	25	1794	66	784	25	1638	65
Liaoning	804	13	1046	57	801	13	950	56
Jilin	692	9	0	0	685	9	0	0
Heilongjiang	970	21	1606	57	960	21	1473	57
Shanghai	714	30	1435	27	711	31	1294	28
Jiangsu	1096	20	1113	16	1089	20	998	16
Zhejiang	1373	31	1688	38	1368	32	1539	39
Anhui	1123	13	1111	16	1118	13	1001	16
Fujian	1419	30	2332	42	1404	30	2124	43
Jiangxi	1463	34	3236	38	1457	35	2955	39
Shandong	890	27	891	48	884	27	818	48
Henan	1056	28	986	33	1052	28	898	34
Hubei	1206	10	1634	17	1200	11	1475	18
Hunan	1103	20	1872	37	1102	21	1722	38
Guangdong	1279	16	2172	47	1263	16	1973	48
Guangxi	1348	5	5496	49	1331	5	4996	50
Hainan	1337	10	0	0	1318	9	0	0
Chongqing	1062	7	1968	36	1063	8	1795	37
Sichuan	1039	9	1725	35	1037	9	1565	35
Guizhou	1800	3	2348	17	1796	3	2092	18
Yunnan	1181	2	3679	36	1171	2	3172	36
Tibet	902	22	916	63	897	21	858	64
Shaanxi	1388	26	1628	37	1368	26	1491	37
Gansu	1054	42	1756	40	1053	41	1625	40
Qinghai	809	54	850	31	810	54	798	31
Ningxia	776	57	1706	61	769	56	1583	60
Xinjiang	539	66	824	70	541	65	763	70
China	946	21	1108	37	937	21	1010	38

Table S5. Water footprint per ton (WFP) of two crops for provinces of China in the 2080s under RCP2.6 and RCP8.5.

Province	RCP2.6				RCP8.5			
	Maize		Wheat		Maize		Wheat	
	WFP	WFP_b	WFP	WFP_b	WFP	WFP_b	WFP	WFP_b
	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)	($m^3 t^{-1}$)	(%)
Beijing	987	31	1061	60	957	31	851	60
Tianjin	1189	31	1051	57	1160	31	847	57
Hebei	1008	27	974	59	967	26	786	58
Shanxi	1157	22	1628	53	1131	21	1304	52
Inner Mongolia	795	25	1816	65	773	25	1414	65
Liaoning	802	12	1053	56	785	13	826	56
Jilin	691	9	0	0	672	9	0	0
Heilongjiang	974	21	1630	56	946	21	1274	56
Shanghai	715	30	1466	27	697	31	1138	29
Jiangsu	1099	20	1139	16	1069	20	887	16
Zhejiang	1379	31	1717	37	1343	32	1350	41
Anhui	1127	13	1133	16	1103	13	899	16
Fujian	1424	30	2384	41	1370	30	1842	44
Jiangxi	1469	34	3287	38	1432	35	2597	41
Shandong	894	27	907	47	862	27	721	47
Henan	1056	28	1002	33	1035	27	792	33
Hubei	1202	10	1665	17	1188	10	1315	18
Hunan	1106	20	1904	36	1079	20	1515	39
Guangdong	1284	16	2208	47	1223	15	1702	48
Guangxi	1350	5	5573	48	1294	5	4318	50
Hainan	1343	9	0	0	1271	9	0	0
Chongqing	1062	7	2017	35	1041	8	1582	37
Sichuan	1039	9	1758	34	1022	9	1374	35
Guizhou	1801	3	2368	17	1753	3	1817	18
Yunnan	1187	2	3651	36	1136	2	2694	35
Tibet	908	22	927	63	876	20	750	63
Shaanxi	1400	26	1650	36	1352	24	1306	36
Gansu	1059	41	1789	40	1032	40	1432	39
Qinghai	811	54	863	31	800	53	702	31
Ningxia	778	57	1729	60	759	56	1395	60
Xinjiang	541	66	841	70	529	65	668	70
China	947	21	1128	37	920	21	892	37

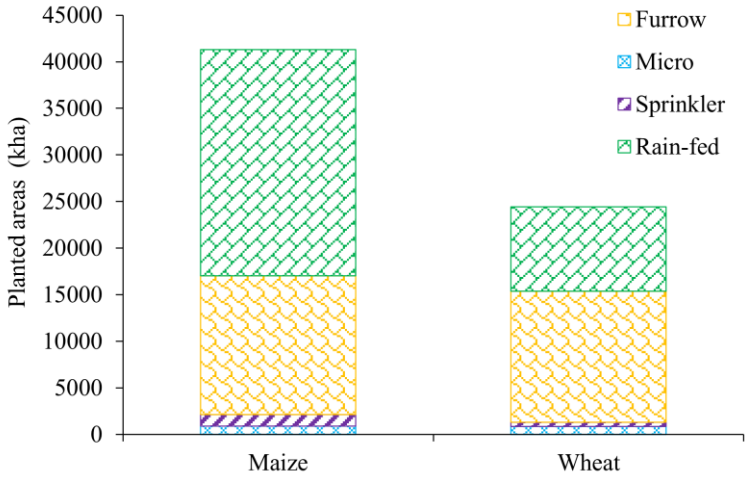

Figure S1. The planted areas (kha) of maize and wheat under different irrigation techniques in 2013 in China.

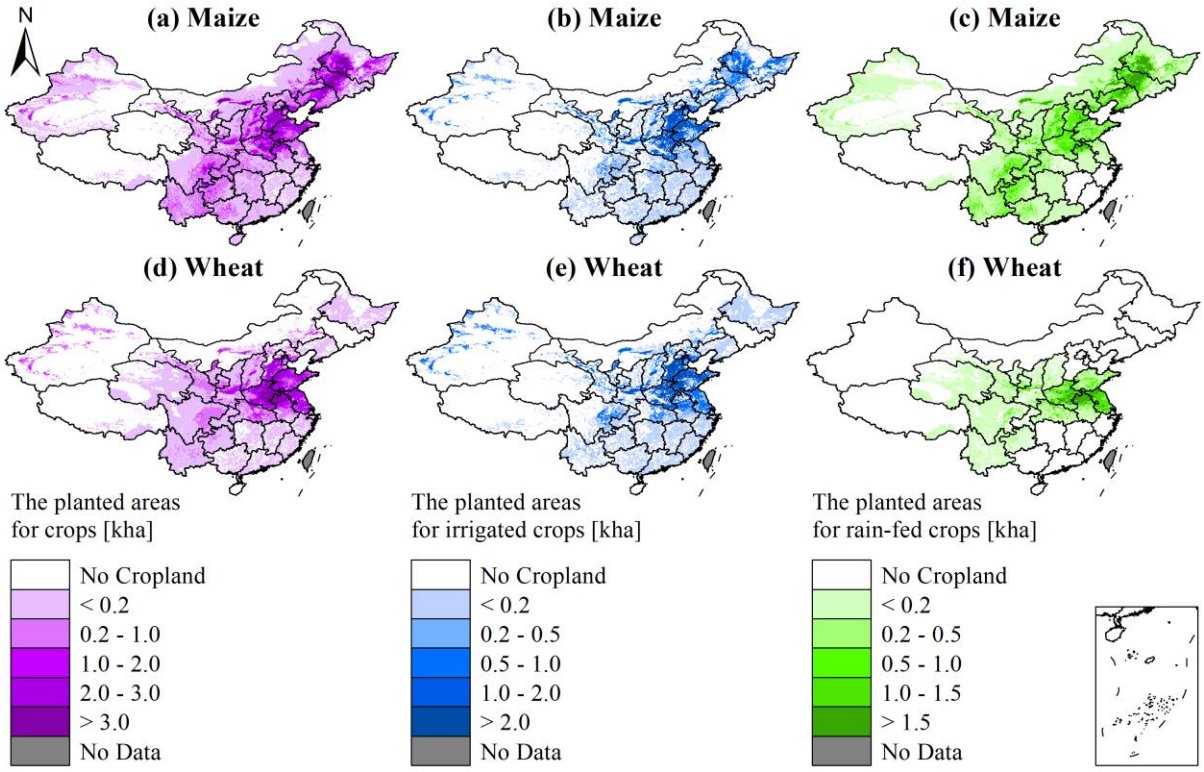

Figure S2. The spatial distribution of planted areas (kha) for two crops in 2013 in China: (a) and (d) refer to the areas for maize and wheat; (b) and (e) refer to the areas for irrigated maize and wheat; (c) and (f) refer to the areas for rain-fed maize and wheat.

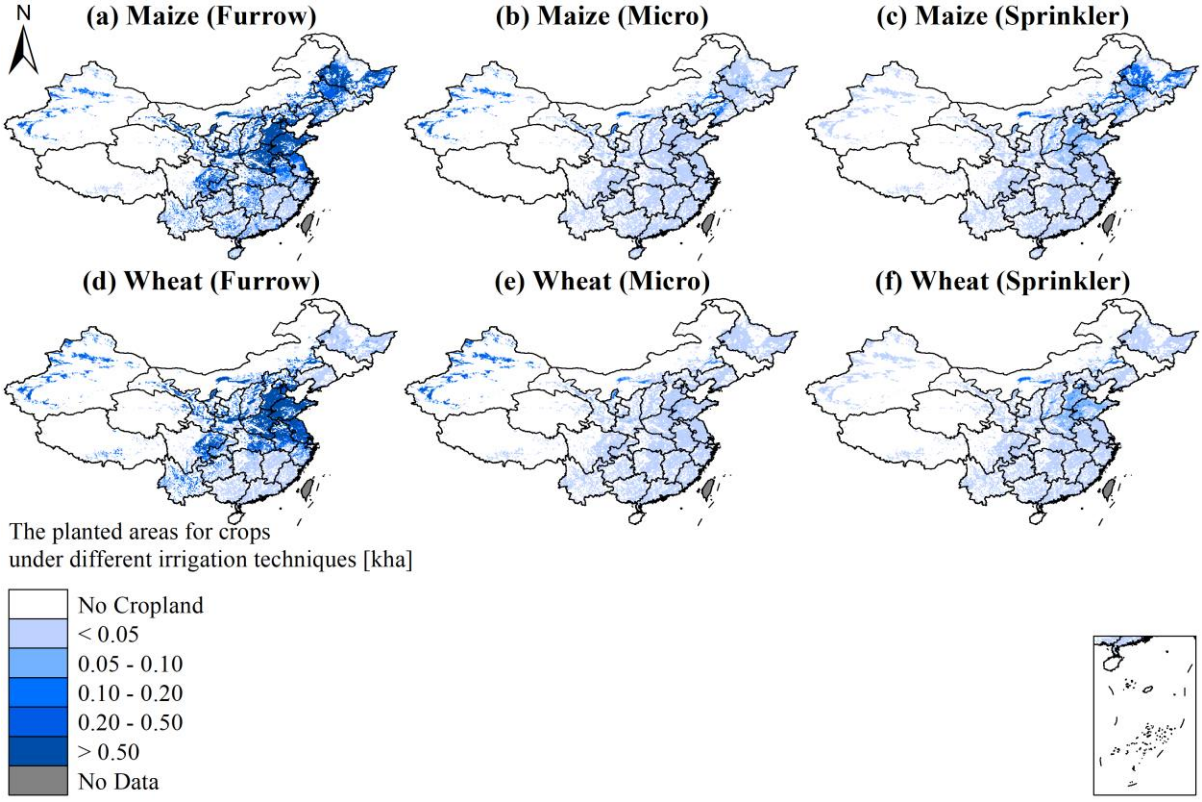

Figure S3. The spatial distribution of planted areas (kha) for two crops under different irrigation techniques in 2013 in China: (a) and (d) refer to maize and wheat under furrow irrigation; (b) and (e) refer to maize and wheat under micro irrigation; (c) and (f) refer to maize and wheat under sprinkler irrigation.

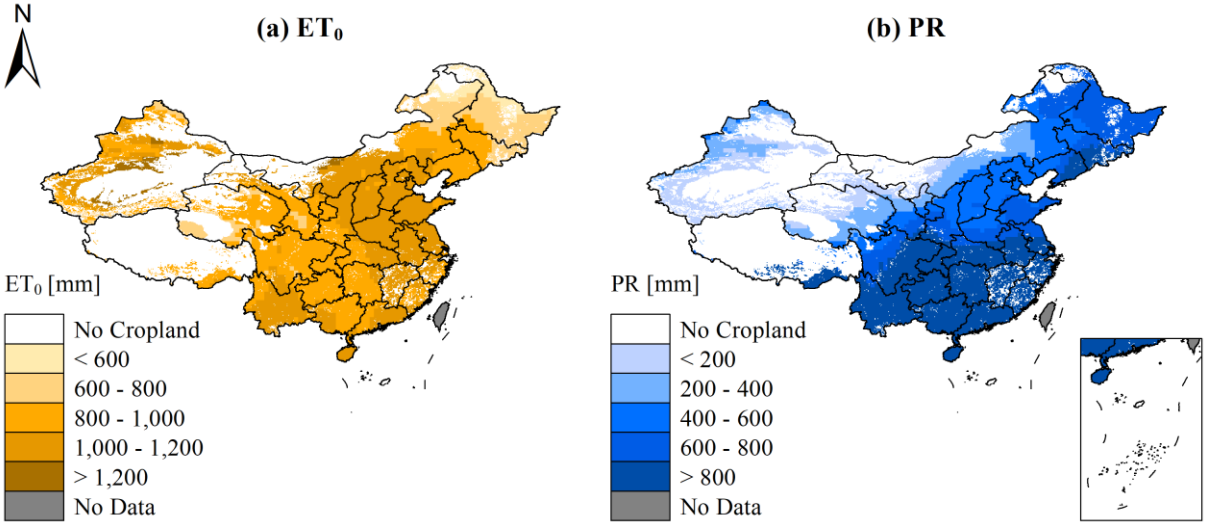

Figure S4. The spatial distribution of annual ET_0 and PR in the planted areas of two crops in China in 2013.

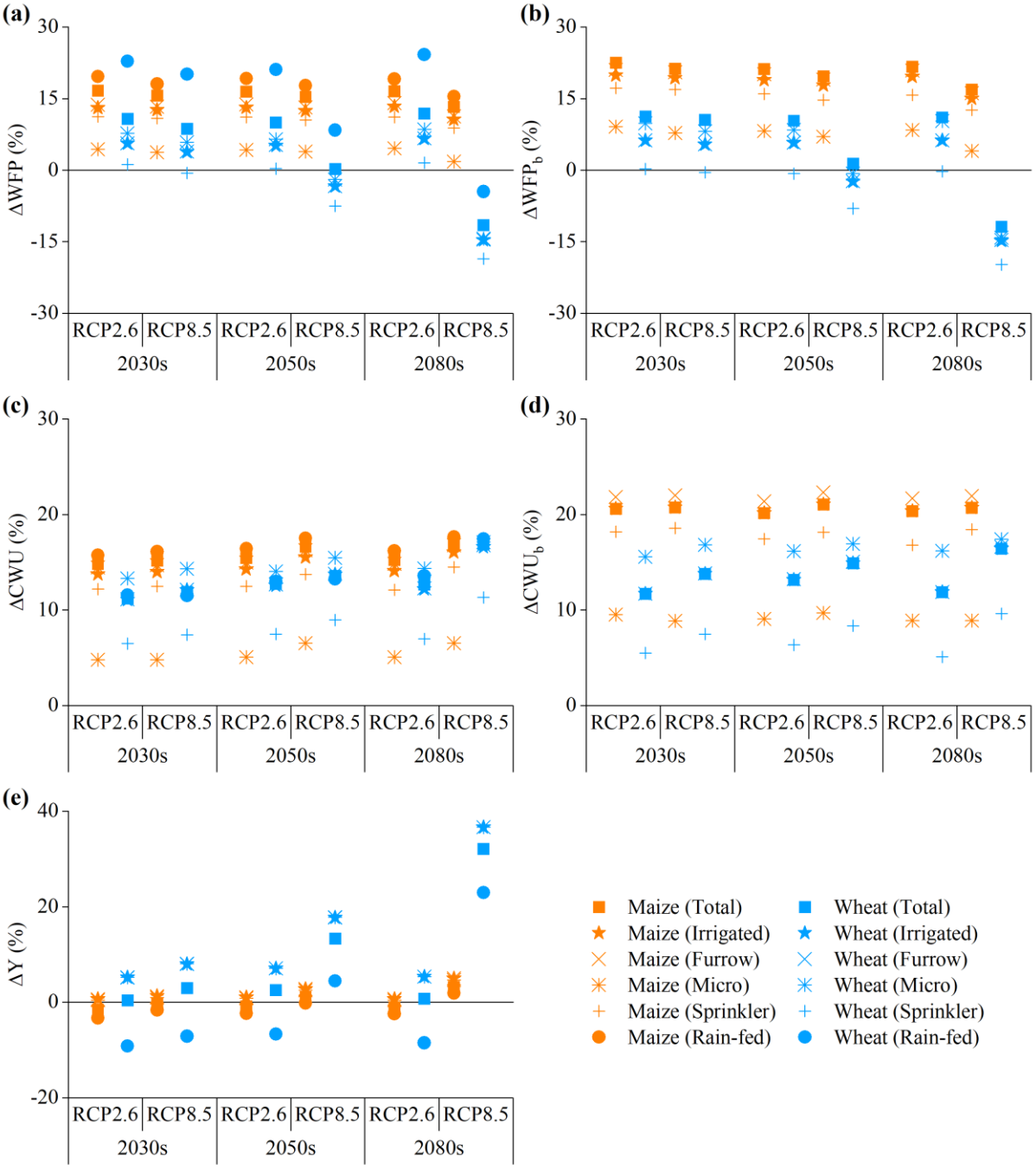

Figure S5. Relative changes Δ (%) in (a) WFP, (b) WFP$_b$, (c) CWU, (d) CWU$_b$, (e) Y of two crops with different irrigation techniques under RCP2.6 and RCP8.5 compared to the baseline year 2013.

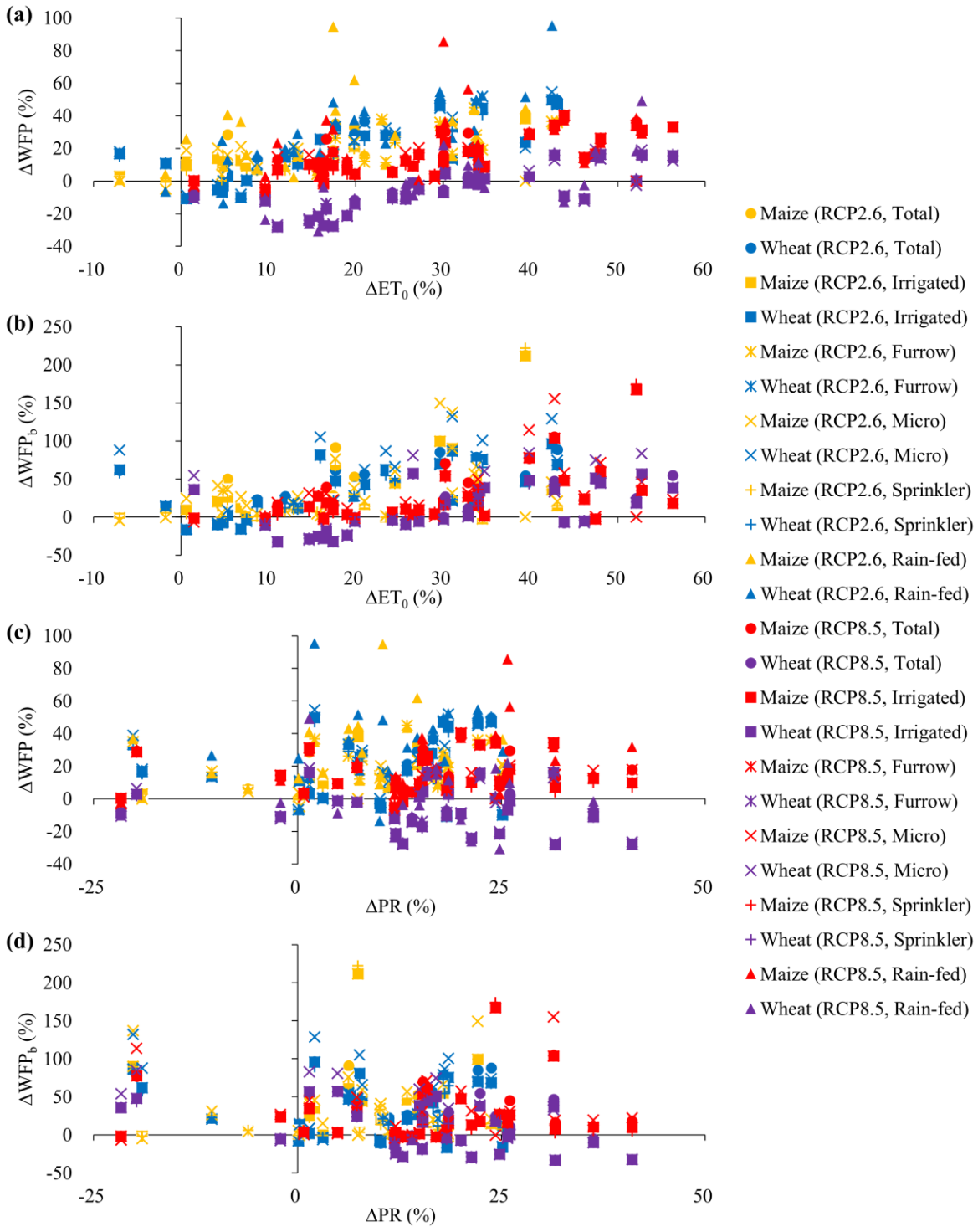

Figure S6. Relationship between relative changes Δ (%) in annual ET_0 and corresponding (a) WFP and (b) WFP_b, annual PR and corresponding (c) WFP and (d) WFP_b in the planted areas of two crops.

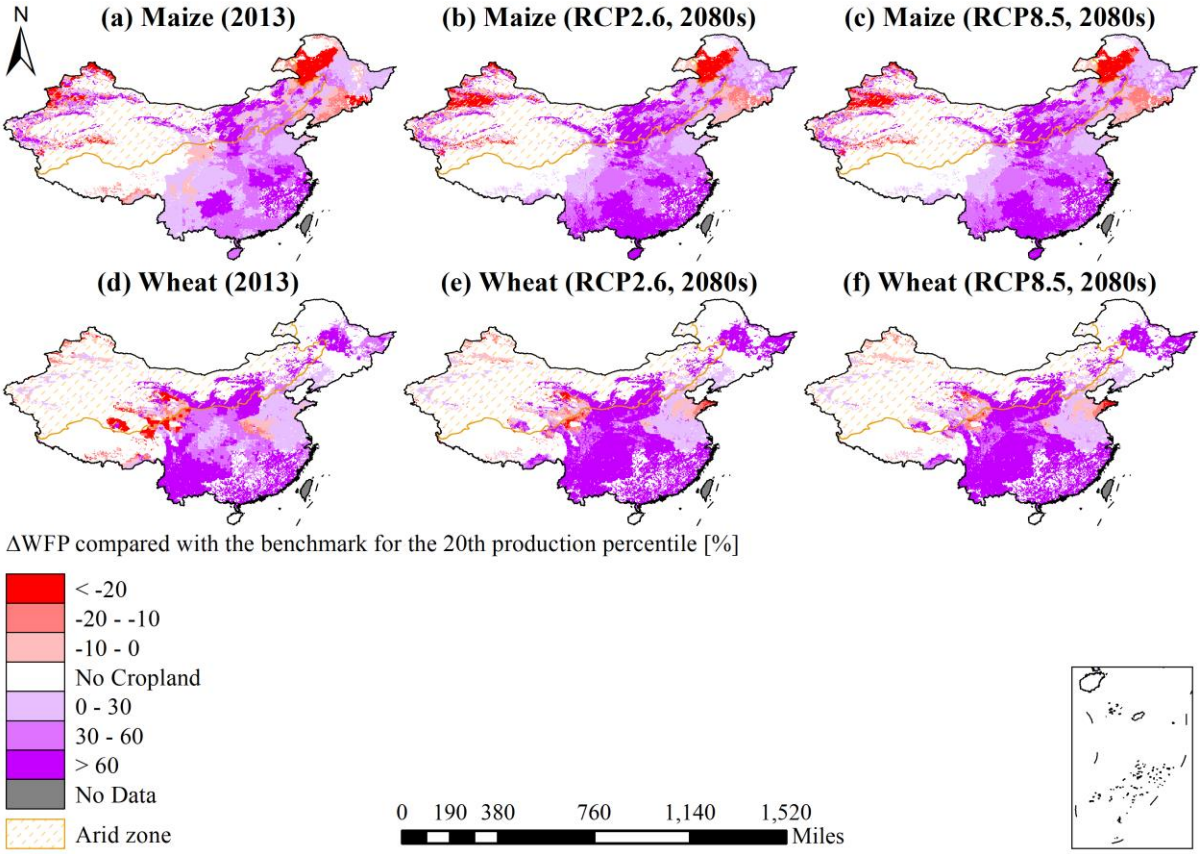

Figure S7. Relative changes Δ (%) in WFP of two crops compared with the benchmark for the 20th production percentile in 2013 and the 2080s under RCP2.6 and RCP8.5 in different climate zones of China. (a), (b) and (c) refer to maize in 2013 and the 2080s under RCP2.6 and RCP8.5. (d), (e) and (f) refer to wheat in 2013 and the 2080s under RCP2.6 and RCP8.5.