

Supplementary materials to “Long-term (1990-2013) changes and spatial variations of cropland runoff across China”

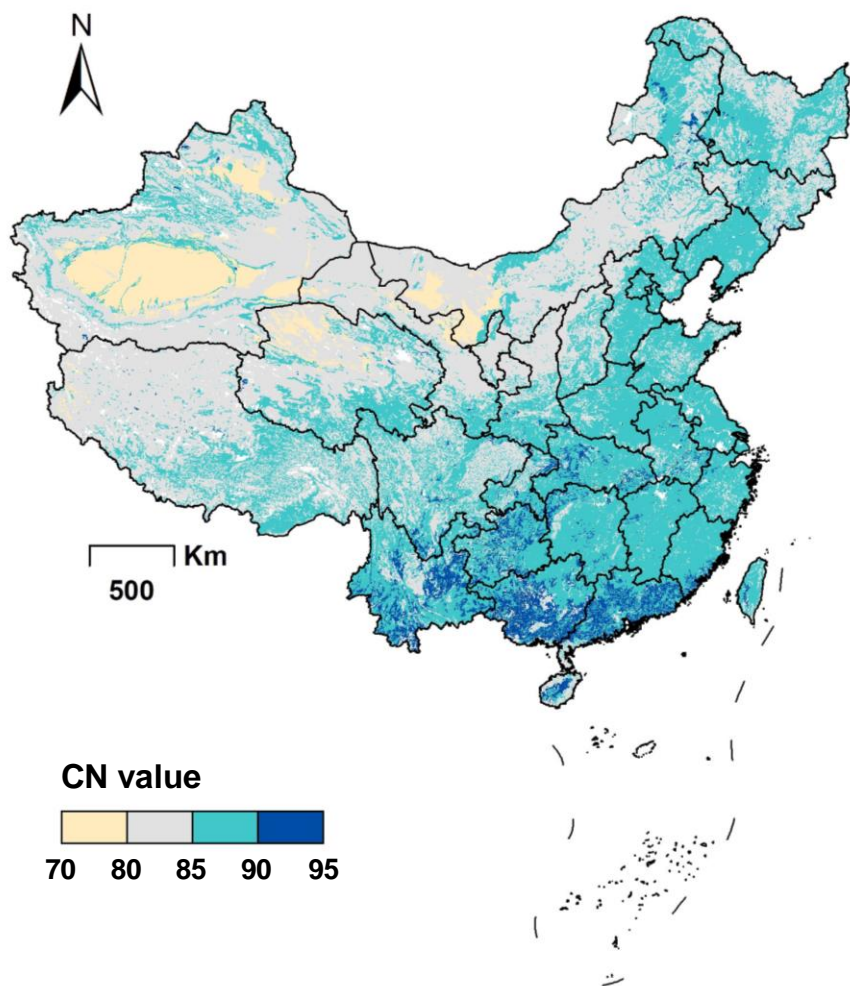


Figure S1. Map of predicted cropland CN values in China.

Table S1. The 1990-2013 province-level irrigation intensity (mm yr⁻¹).

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
ZJ	1169	1169	1145	983	1093	1062	1037	998	983	995	991	1025	1040	1056	1003	960	901	889	836	817	795	781	782	815
YN	907	905	886	770	855	833	807	819	777	809	669	655	641	641	639	634	762	766	753	732	673	662	651	656
XJ	1593	1588	1544	1112	1503	1333	1293	1191	1225	1339	1240	1211	1159	1138	1134	857	869	837	809	800	777	692	829	717
XZ	858	872	874	836	863	855	845	855	835	1376	1353	1563	1493	1506	1702	1875	1930	2073	1485	1124	1290	1088	987	1094
SC	624	643	642	634	663	659	652	597	591	570	545	516	505	483	477	481	469	453	428	458	471	473	501	519
SHX	292	305	304	352	308	310	322	319	328	339	349	350	334	315	310	333	359	344	348	341	331	340	335	498
SX	273	282	278	262	278	282	276	327	322	323	314	313	311	309	309	301	278	254	249	245	269	287	299	297
SD	399	407	395	341	374	369	358	346	340	330	317	309	319	310	300	294	290	281	268	258	250	245	245	251
QH	1105	1123	1110	1060	1125	1176	1157	1124	1051	1066	949	920	963	1074	1071	1102	1130	1013	1058	1152	730	750	657	864
NX	2766	2757	2965	2367	2639	2573	2464	1871	1905	2302	1862	1712	1610	1214	1375	1401	1532	1459	1494	1445	1394	1318	1231	1187
NMG	748	745	732	835	694	639	643	639	588	586	634	602	579	515	515	511	487	470	447	446	427	411	386	403
LN	629	635	627	684	657	646	671	660	618	596	552	517	484	491	482	520	482	476	465	465	425	400	363	436
JX	666	725	773	667	823	860	884	975	941	969	973	955	833	635	796	833	822	950	931	1091	945	1083	934	1015
JL	638	621	557	529	555	555	554	504	469	442	387	349	329	342	305	284	299	283	296	279	281	300	290	380
HUN	877	901	896	986	893	886	878	839	802	804	805	880	859	836	808	803	772	772	753	728	715	714	716	648
HUB	766	793	781	757	782	781	756	786	599	757	813	820	622	741	657	717	702	672	556	752	630	631	691	616
HLJ	830	810	718	659	791	739	636	535	547	398	400	363	355	368	331	326	283	238	235	237	224	163	149	172
HEN	419	417	404	318	390	380	383	401	337	310	264	317	280	214	227	206	248	210	229	235	207	206	212	232
BJ	605	623	640	479	680	626	710	610	592	627	580	651	658	676	671	687	659	695	633	663	620	515	478	537
TJ	225	228	223	171	227	202	222	232	166	193	173	139	137	140	152	168	179	215	182	168	142	148	151	143
HN	2677	2691	2689	2217	2689	2671	2634	1916	2404	2413	2227	2214	2206	2325	2513	2436	2513	2473	1670	1612	1670	1540	1703	2011
GZ	450	555	613	864	751	811	848	838	878	883	966	999	973	981	966	930	942	794	671	613	611	571	546	689
GX	1115	1168	1174	1130	1211	1230	1234	1171	1266	1349	1405	1400	1508	1477	1487	1562	1594	1486	1476	1426	1427	1444	1525	1503
GS	1005	1007	989	957	961	971	900	846	829	828	785	761	701	667	713	745	742	785	637	666	775	620	592	677
FJ	1564	1624	1647	1645	1686	1676	1666	1459	1603	1584	1640	1665	1685	1627	1579	1570	1490	1556	1528	1547	1501	1549	1409	1266

AH	727	726	691	692	683	575	451	460	448	441	430	463	385	401	380	352	408	357	430	464	503	546	496	424
SH	1269	1228	1147	754	978	904	819	716	668	517	462	420	379	364	440	438	560	449	405	468	452	436	459	417
CQ	624	643	642	634	663	659	652	597	591	570	545	516	505	483	477	481	469	453	428	458	471	473	501	519
JS	771	802	796	1068	829	914	664	941	666	701	793	908	863	717	839	745	736	821	778	665	929	991	938	958
GD	1675	1737	1781	1962	1772	1855	1870	1836	1897	1902	1837	1920	1899	2040	1965	1929	2272	2204	2343	1911	1864	1341	1416	1470
HEB	395	397	384	360	375	359	331	354	344	335	325	319	310	304	296	282	284	276	261	264	263	255	253	266

The irrigation data was obtained from Zhou, *et al.* [1] and China Water Resources Bulletin (<http://www.mwr.gov.cn/sj/tjgb/szygb/>)

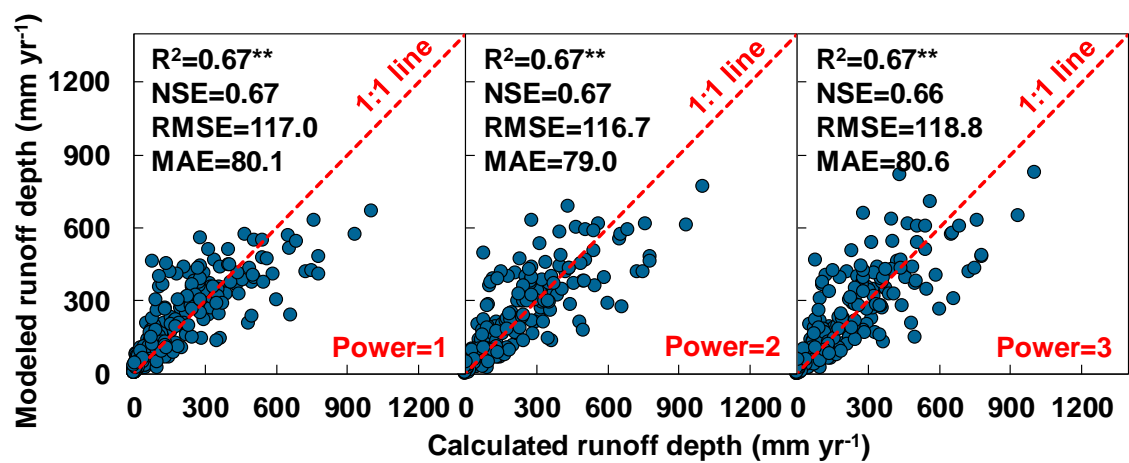


Figure S2. Prediction accuracy of runoff depth by three power parameters. ** indicates $p < 0.01$.

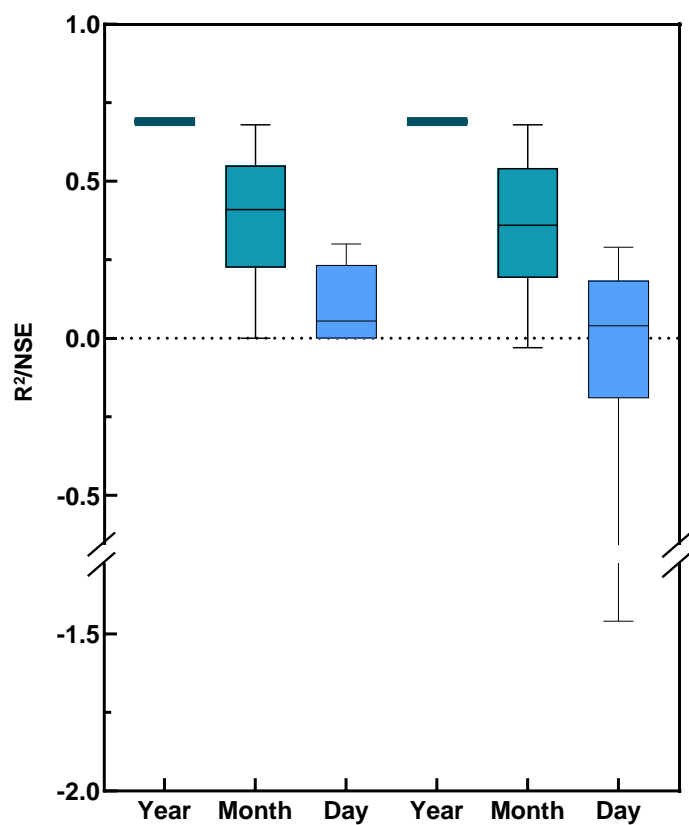


Figure S3. Prediction accuracy of runoff depth under multiple time scales.

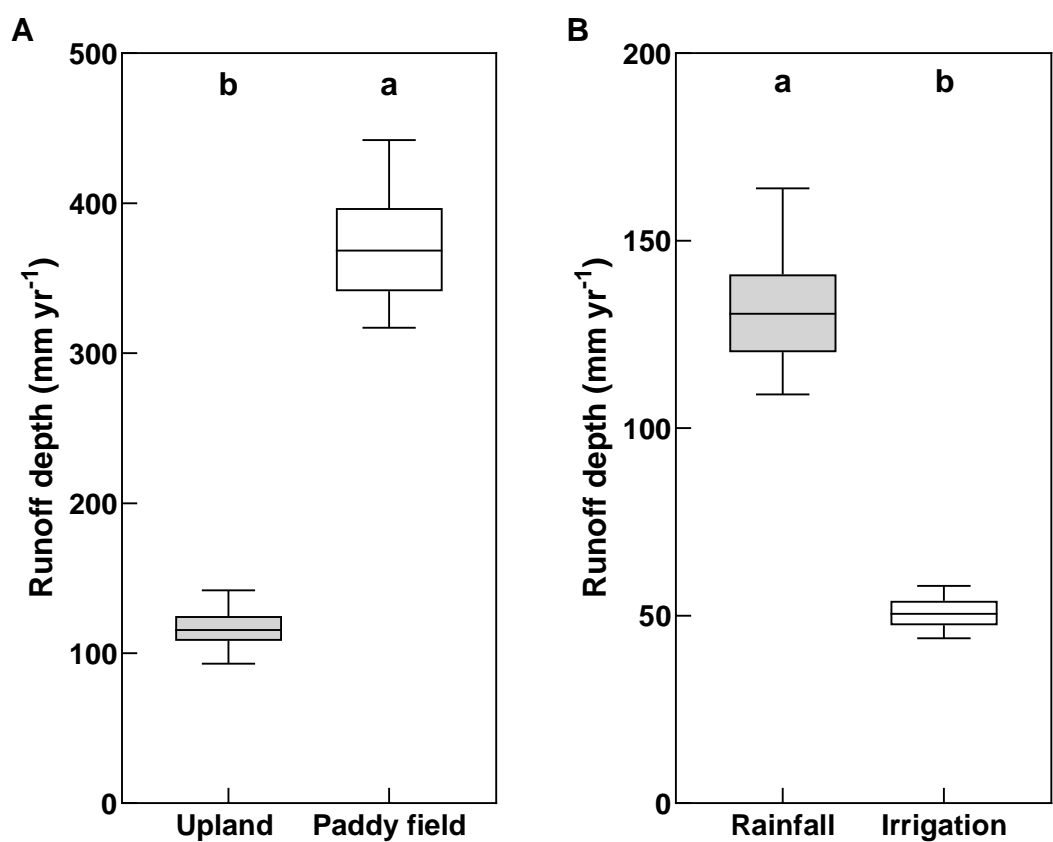


Figure S4. Comparison of runoff depth under different (A) land use types and (B) runoff resources.

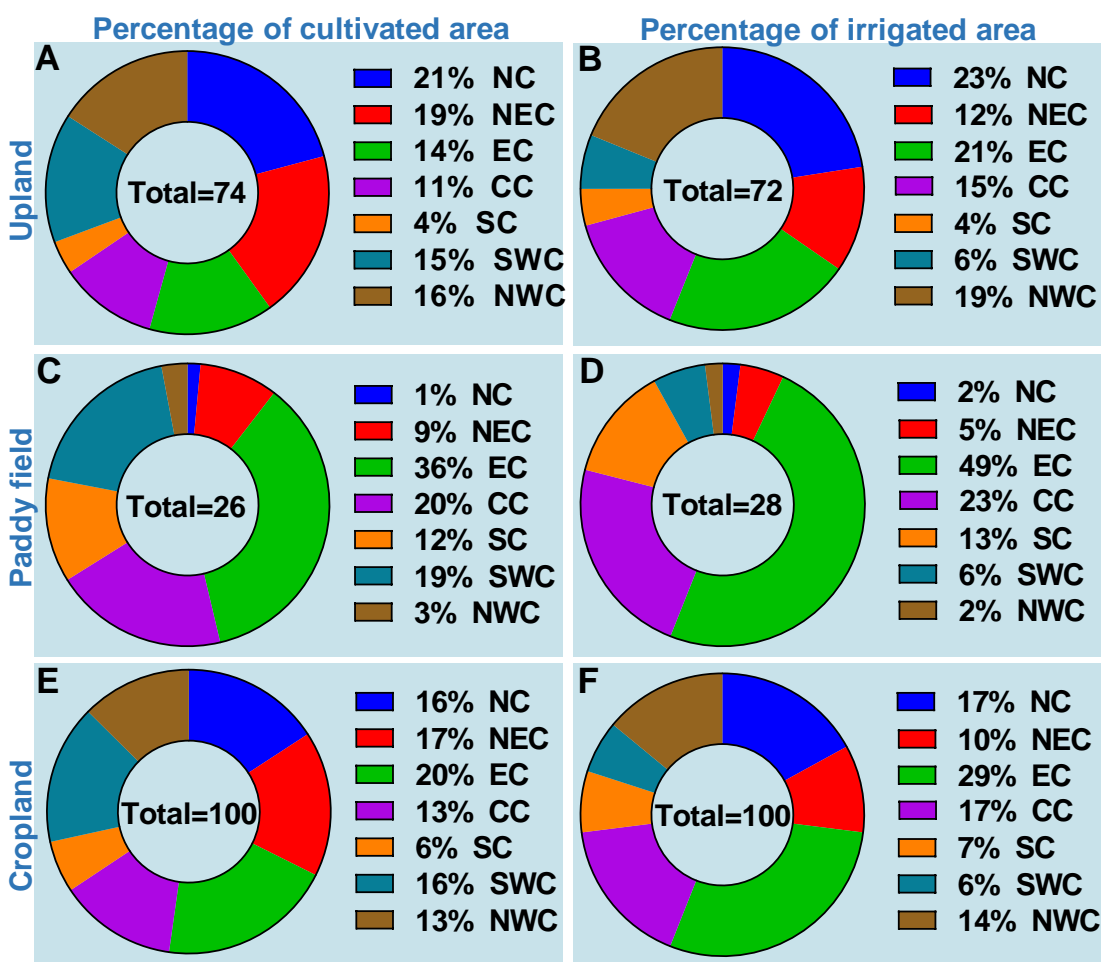


Figure S5. Contribution percentage of cultivated area and irrigated area across seven geographic regions in China.

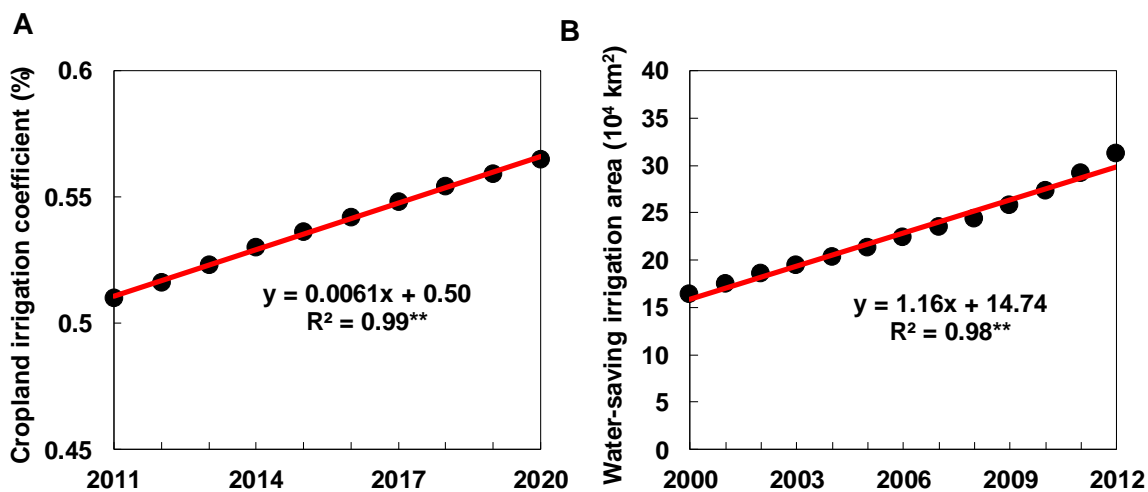


Figure S6. Temporal trend of (A) cropland irrigation water utilization efficiency and (B) irrigated area with the adoption of water-saving irrigation technology. ** indicates $p < 0.01$. Cropland irrigation water utilization efficiency and irrigated area with the adoption of water-saving irrigation technology obtained from China Water Resources Bulletin (<http://www.mwr.gov.cn/sj/tjgb/szygb/>) and China Water Conservancy Yearbook (<https://navi.cnki.net/knavi/yearbooks/YAGUJ/detail>), respectively.

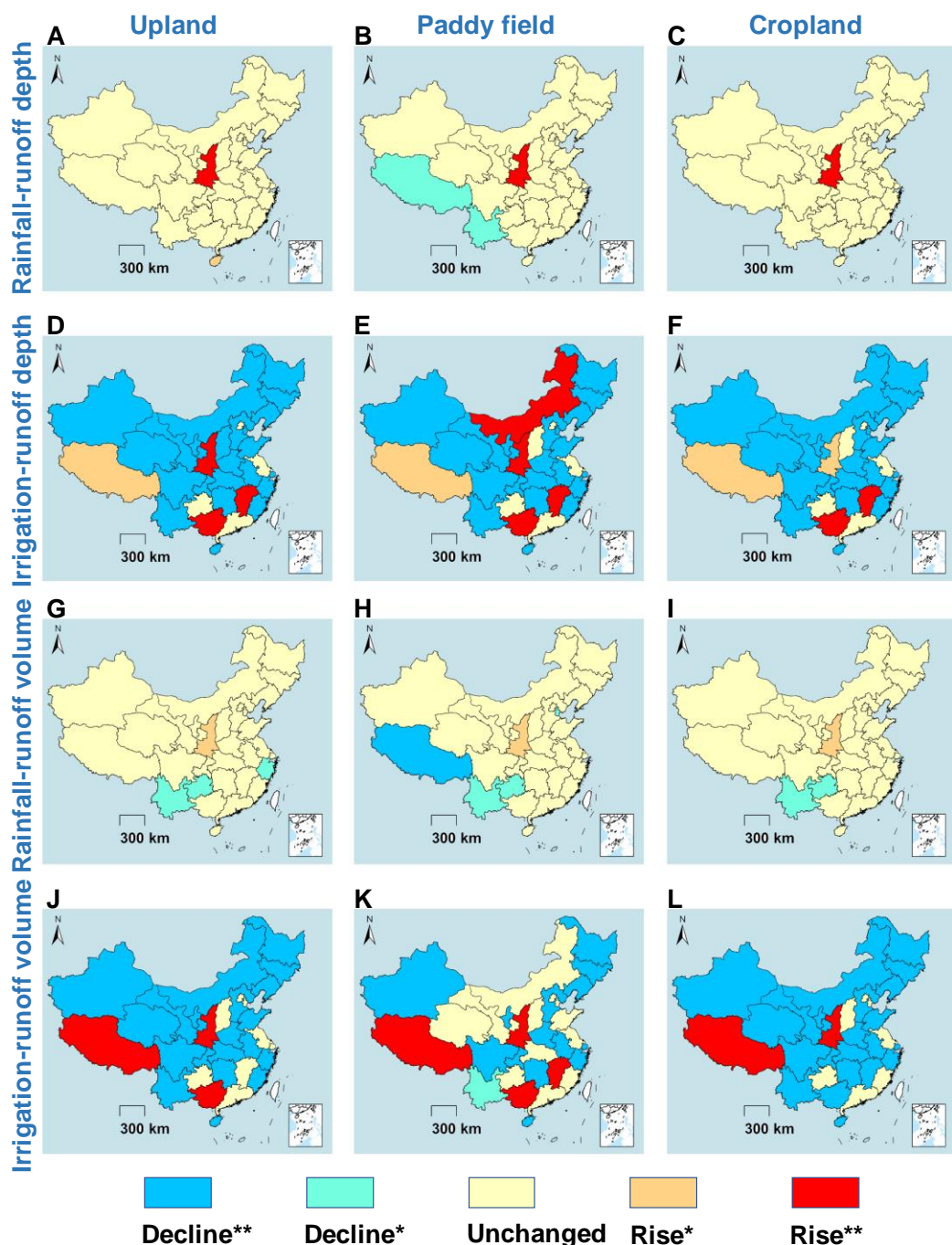


Figure S7. Temporal trend of (A-C) rainfall-runoff depth, irrigation-runoff depth, rainfall-runoff volume and (J-L) irrigation-runoff volume during 1990-2013. Unchanged indicates

$p>0.05$, * indicates $p<0.05$, ** indicates $p<0.01$.

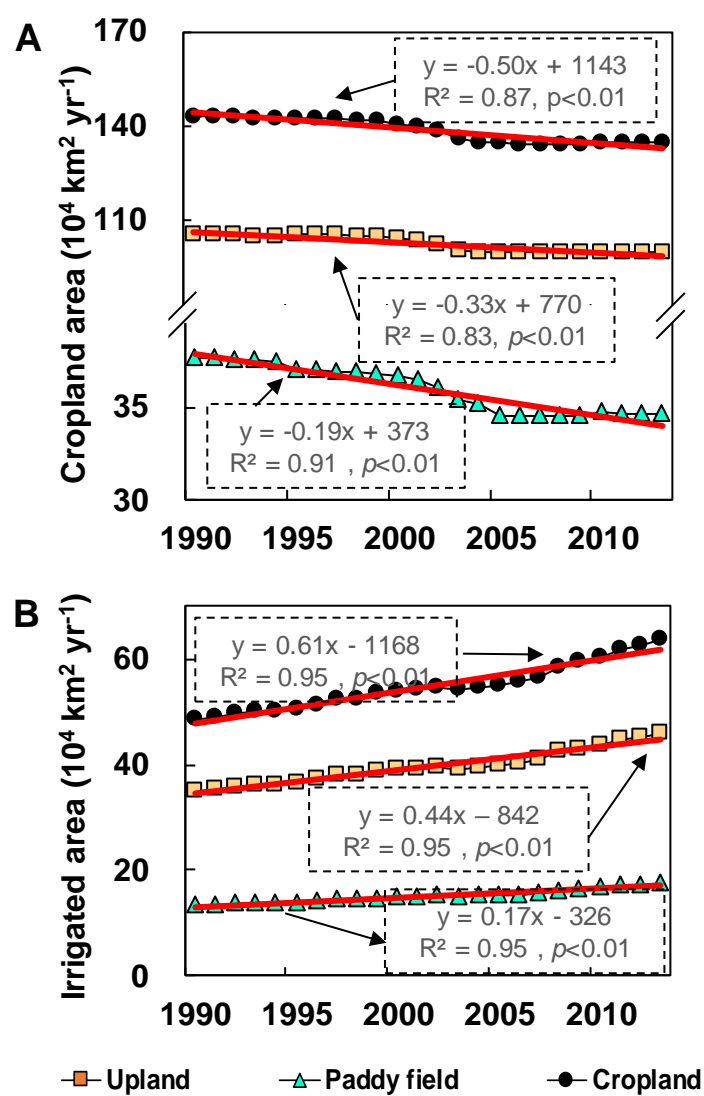


Figure S8. Temporal trend of (A) cultivated area and (B) irrigated area during 1990-2013 in China.

Reference

1. Zhou, F.; Bo, Y.; Ciais, P.; Dumas, P.; Tang, Q.; Wang, X.; Liu, J.; Zheng, C.; Polcher, J.; Yin, Z. Deceleration of China’s human water use and its key drivers. *Proc. Natl. Acad. Sci. USA* **2020**, *117*, 7702-7711.