

Supplementary materials for

A 500-m crop water requirement and irrigation water demand dataset for 25 crop types in the Yellow River Basin (2000–2020): Revealing significant underestimation from incomplete crop coverage

Shizhen Tang^{1,2,3,4}, Ziyang Li^{1,2}, Xueyan Sun⁵, Lun Luo⁶, Liwen Zhang^{1,2,5}, Yanghai Duan⁷, Jiaqi Wang^{1,2}, Qian Li³, Hongbo Zhang^{1,2,3*}

¹ State Key Laboratory of Efficient Utilization of Agricultural Water Resources, China Agricultural University, Beijing, China

² College of Water Resources & Civil Engineering, China Agricultural University, Beijing, China

³ Xinjiang Key Laboratory of Water Cycle and Utilization in Arid Zone, Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences 830011, Urumqi, China

⁴ Water Affairs Bureau of Baiyun District, Guangzhou, China

⁵ Yantai Research Institute, China Agricultural University, Yantai, China

⁶ Bomi Field Scientific Observation and Research Station for Alpine Mountain Geo-Hazard Chains, Institute of Mountain Hazards and Environment, Chinese Academy of Sciences

⁷ Middle Yarlung Zangbo River Natural Resources Observation and Research Station of Tibet Autonomous Region, Research Center of Applied Geology of China Geological Survey, Cheng Du 610036, China

Contents of this file

Tables S1

Table S1. The crop coefficients compiled from 45 observation stations.

Crop	Site id	Kc_ini	Kc_fro	Kc_mid	Kc_end
Beet	K05	0.33	-	1.22	0.72
	K06	0.37	-	1.2	0.7
	K02	0.39	-	1.19	0.67
	K03	0.36	-	1.21	0.71
	K04	0.35	-	1.22	0.7
	K01	0.32	-	1.23	0.71
	K07	0.4	-	1.21	0.69
Cotton	K17	0.34	-	1.14	0.66
	K13	0.36	-	1.15	0.67
	K15	0.36	-	1.14	0.65
	K10	0.47	-	1.13	0.65
	K18	0.4	-	1.16	0.68
	K14	0.35	-	1.21	0.73
	K16	0.35	-	1.16	0.68
	K11	0.44	-	1.15	0.65
	K27	0.43	-	1.14	0.64
	K25	0.64	-	1.13	0.63
	K29	0.48	-	1.15	0.64
	K30	0.6	-	1.14	0.64
	K28	0.44	-	1.16	0.66
	K38	0.55	-	1.13	0.6
	K40	0.57	-	1.15	0.63
	K34	0.23	-	1.21	0.72
	K37	0.34	-	1.16	0.66
	K32	0.45	-	1.16	0.65
	K36	0.23	-	1.23	0.74
K33	0.27	-	1.2	0.7	
Flax	K05	0.27	-	1.13	0.25
	K06	0.35	-	1.1	0.25
	K02	0.4	-	1.06	0.25
	K03	0.36	-	1.11	0.25
	K04	0.37	-	1.11	0.25
	K01	0.33	-	1.11	0.25
	K07	0.42	-	1.1	0.25
Fruit	K34	0.29	-	0.97	0.73

	K37	0.4	-	0.9	0.65
	K31	0.52	-	0.89	0.64
	K35	0.31	-	0.97	0.72
	K32	0.5	-	0.9	0.65
	K36	0.3	-	0.99	0.76
	K33	0.33	-	0.95	0.71
Melons and gourds	K17	0.4	-	1	0.72
	K13	0.4	-	1.01	0.73
	K15	0.38	-	1	0.72
	K10	0.48	-	0.99	0.71
	K18	0.45	-	1.01	1
	K14	0.36	-	1.05	0.76
	K16	0.4	-	1.02	0.73
	K11	0.4	-	1	0.71
	K09	0.35	-	0.98	0.72
	K08	0.32	-	1.01	0.75
Millet	K23	0.39	-	0.97	0.3
	K20	0.31	-	0.97	0.3
	K21	0.32	-	0.98	0.3
	K01	0.29	-	1.02	0.3
	K17	0.36	-	0.94	0.3
	K13	0.38	-	0.96	0.3
Peanut	K17	0.31	-	1.1	0.56
	K13	0.31	-	1.11	0.57
	K15	0.31	-	1.11	0.56
	K10	0.45	-	1.1	0.55
	K18	0.37	-	1.12	0.57
	K14	0.3	-	1.15	0.6
	K16	0.33	-	1.12	0.57
	K11	0.4	-	0.98	0.48
	K27	0.36	-	1.11	0.56
	K25	0.64	-	1.1	0.55
	K29	0.42	-	1.12	0.56
	K30	0.59	-	1.11	0.55
	K28	0.36	-	1.12	0.56
Potato	K23	0.42	-	1.17	0.74
	K19	0.4	-	1.16	0.73

	K22	0.36	-	1.15	0.73
	K24	0.42	-	1.14	0.71
	K20	0.38	-	1.14	0.62
	K21	0.31	-	1.16	0.73
	K05	0.21	-	1.17	0.77
	K06	0.28	-	1.15	0.74
	K04	0.31	-	1.15	0.76
	K01	0.35	-	1.16	0.67
	K07	0.33	-	1.14	0.75
	K05	1	-	1.22	0.62
	K02	1	-	1.17	0.58
	K03	1	-	1.2	0.61
	K04	1	-	1.21	0.63
	K01	1	-	1.21	0.63
	K07	1	-	1.19	0.61
	K17	1	-	1.15	0.57
	K13	1	-	1.15	0.59
	K15	1	-	1.15	0.57
	K10	1	-	1.14	0.56
	K18	1	-	1.15	0.59
	K14	1	-	1.21	0.64
	K16	1	-	1.17	0.59
	K11	1	-	1.15	0.57
	K27	1	-	1.14	0.57
	K25	1	-	1.14	0.54
	K29	1	-	1.15	0.57
	K30	1	-	1.14	0.55
	K28	1	-	1.15	0.58
	K38	1	-	1.14	0.5
	K40	1	-	1.16	0.54
	K39	1	-	1.19	0.59
	K09	1	-	1.16	0.58
	K08	1	-	1.2	0.6
	K27	0.4	-	1.04	0.25
	K25	0.68	-	1.04	0.25
	K29	0.47	-	1.05	0.25
	K30	0.63	-	1.05	0.25

	K28	0.45	-	1.06	0.25
Sorghum	K23	0.42	-	1.03	0.5
	K19	0.39	-	1.01	0.5
	K22	0.39	-	1.02	0.52
	K24	0.46	-	0.99	0.48
	K20	0.33	-	1.03	0.51
	K21	0.35	-	1.04	0.53
	K05	0.25	-	1.08	0.57
	K06	0.32	-	1.05	0.54
	K02	0.34	-	1.02	0.51
	K03	0.32	-	1.07	0.55
	K04	0.31	-	1.06	0.56
	K01	0.28	-	1.08	0.57
	K07	0.34	-	1.05	0.54
	K17	0.47	-	1.01	0.47
	K13	0.42	-	0.98	0.48
	K15	0.41	-	0.96	0.49
	K10	0.51	-	0.94	0.48
	K18	0.44	-	1.03	0.49
	K14	0.39	-	1.08	0.56
	K16	0.41	-	1.04	0.5
K11	0.48	-	1.01	0.48	
Spring maize	K23	0.36	-	1.16	0.35
	K19	0.33	-	1.14	0.35
	K22	0.32	-	1.16	0.35
	K24	0.41	-	1.14	0.35
	K20	0.27	-	1.15	0.35
	K21	0.28	-	1.17	0.35
	K05	0.18	-	1.23	0.35
	K06	0.24	-	1.19	0.35
	K02	0.28	-	1.15	0.35
	K03	0.24	-	1.21	0.35
	K04	0.26	-	1.2	0.35
	K01	0.24	-	1.21	0.35
	K07	0.29	-	1.18	0.35
	K17	0.33	-	1.15	0.35
K13	0.35	-	1.17	0.35	

	K15	0.34	-	1.15	0.35
	K10	0.35	-	1.17	0.35
	K18	0.4	-	1.13	0.4
	K14	0.35	-	1.22	0.36
	K16	0.36	-	1.18	0.35
	K11	0.41	-	1.16	0.35
	K27	0.4	-	1.15	0.35
	K25	0.66	-	1.13	0.35
	K29	0.45	-	1.16	0.35
	K30	0.59	-	1.15	0.35
	K28	0.43	-	1.16	0.35
	K38	0.55	-	1.13	0.35
	K40	0.52	-	1.15	0.35
	K39	0.33	-	1.18	0.35
	K34	0.18	-	1.21	0.35
	K37	0.32	-	1.16	0.35
	K31	0.47	-	1.16	0.35
	K32	0.43	-	1.16	0.35
	K36	0.19	-	1.23	0.35
	K33	0.23	-	1.2	0.35
	K09	0.27	-	1.15	0.35
	K08	0.25	-	1.2	0.35
Spring soybean	K05	0.24	-	1.17	0.52
	K06	0.3	-	1.14	0.49
	K02	0.34	-	1.12	0.48
	K04	0.35	-	1.16	0.53
	K01	0.27	-	1.17	0.54
	K07	0.34	-	1.14	0.52
	K28	0.62	-	1.1	0.46
	K38	0.71	-	1.08	0.42
	K39	0.38	-	1.14	0.49
Spring wheat	K22	0.34	-	1.16	0.4
	K20	0.27	-	1.16	0.4
	K21	0.26	-	1.16	0.4
	K05	0.17	-	1.19	0.4
	K06	0.22	-	1.16	0.4
	K02	0.22	-	1.14	0.4

	K03	0.2	-	1.18	0.4
	K04	0.21	-	1.16	0.4
	K01	0.21	-	1.19	0.4
	K07	0.24	-	1.16	0.4
	K39	0.3	-	1.16	0.4
	K34	0.23	-	1.17	0.4
	K37	0.29	-	1.13	0.4
	K31	0.33	-	1.12	0.4
	K35	0.23	-	1.16	0.4
	K36	0.18	-	1.19	0.4
	K33	0.23	-	1.16	0.4
	K43	0.2	-	1.16	0.4
	K41	0.26	-	1.16	0.4
	K44	0.14	-	1.18	0.4
	K42	0.26	-	1.15	0.4
	K45	0.25	-	1.13	0.4
	K09	0.26	-	1.14	0.4
	K08	0.23	-	1.17	0.4
Summer maize	K17	0.53	-	1.12	0.55
	K13	0.52	-	1.13	0.58
	K15	0.51	-	1.13	0.56
	K10	0.64	-	1.12	0.55
	K18	0.63	-	1.14	0.59
	K14	0.5	-	1.2	0.65
	K16	0.66	-	1.15	0.59
	K11	0.55	-	1.13	0.56
	K27	0.51	-	1.12	0.55
	K25	0.64	-	1.12	0.52
	K29	0.5	-	1.13	0.55
	K30	0.64	-	1.13	0.54
	K28	0.51	-	1.13	0.56
	K38	0.58	-	1.11	0.5
K40	0.5	-	1.14	0.53	
Sunflower seed	K05	0.27	-	1.19	0.35
	K06	0.33	-	1.15	0.35
	K02	0.36	-	1.14	0.35
	K03	0.32	-	1.18	0.35

	K04	0.32	-	1.18	0.35
	K01	0.3	-	1.2	0.35
	K07	0.35	-	1.16	0.35
Sweet potato	K27	0.42	-	1.15	0.71
	K25	0.64	-	1.11	0.7
	K29	0.46	-	1.15	0.72
	K30	0.59	-	1.13	0.71
	K28	0.45	-	1.12	0.73
Tubers	K17	0.35	-	1.14	0.7
	K13	0.35	-	1.14	0.71
	K15	0.35	-	1.13	0.7
	K10	0.39	-	1.14	0.7
	K18	0.4	-	1.14	0.71
	K14	0.3	-	1.19	0.75
	K16	0.36	-	1.15	0.72
	K11	0.33	-	1.14	0.71
	K34	0.2	-	1.16	0.76
	K37	0.3	-	1.13	0.71
	K31	0.54	-	1.12	0.71
	K35	0.24	-	1.16	0.75
	K32	0.45	-	1.12	0.71
	K36	0.21	-	1.17	0.78
	K33	0.27	-	1.15	0.75
	K43	0.28	-	1.16	0.75
	K41	0.41	-	1.16	0.76
	K44	0.2	-	1.17	0.76
	K42	0.43	-	1.16	0.76
	K45	0.39	-	1.14	0.72
	K09	0.13	-	1.12	0.72
	K08	0.12	-	1.15	0.75
Winter wheat	K23	0.6	0.4	1.17	0.4
	K27	0.6	0.4	1.15	0.4
	K17	0.6	0.4	1.16	0.4
	K13	0.6	0.4	1.17	0.4
	K30	0.6	0.4	1.13	0.4
	K25	0.6	0.4	1.11	0.4
	K29	0.6	0.4	1.15	0.4

	K12	0.6	0.4	1.15	0.4
	K11	0.6	0.4	1.15	0.4
	K10	0.6	0.4	1.14	0.4
	K15	0.6	0.4	1.15	0.4
	K16	0.6	0.4	1.18	0.4
	K18	0.6	0.4	1.17	0.4
	K32	0.6	0.4	1.14	0.4
	K38	0.6	0.4	1.11	0.4
	K19	0.6	0.4	1.16	0.4
	K40	0.6	0.4	1.12	0.4
	K24	0.6	0.4	1.14	0.4
	K26	0.6	0.4	1.15	0.4
	K28	0.6	0.4	1.16	0.4
	K14	0.6	0.4	1.23	0.4
Summer soybean	K23	0.71	-	1.11	0.48
	K19	0.59	-	1.1	0.48
	K22	0.41	-	1.13	0.47
	K24	0.67	-	1.09	0.48
	K20	0.56	-	1.11	0.5
	K21	0.32	-	1.14	0.51
	K17	0.55	-	1.09	0.46
	K13	0.58	-	1.1	0.47
	K15	0.58	-	1.09	0.45
	K10	0.72	-	1.09	0.47
	K18	0.61	-	1.11	0.46
	K14	0.56	-	1.15	0.53
	K16	0.63	-	1.11	0.47
	K11	0.61	-	1.09	0.46
	K27	0.62	-	1.09	0.46
	K25	0.69	-	1.09	0.45
	K29	0.58	-	1.1	0.45
	K30	0.66	-	1.09	0.46
	K40	0.57	-	1.1	0.44
K09	0.31	-	1.12	0.48	
K08	0.3	-	1.15	0.5	