Supplementary Materials: Addressing Challenges for Mapping Irrigated Fields in Subhumid Temperate U.S. Systems by Integrating Remote Sensing and Hydroclimatic Data

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Table S1. The mean, quantiles for the cumulative probabilities 0.025 and 0.975 quantiles of number of available scenes for all pixels in the study domain between June 10th and August 5th for each year in the study period (2001-2016).

Year	Mean	2.5%	97.5%
2001	6.35	2.4	13
2002	5.93	3	12
2003	4.30	2.5	8
2004	3.28	0	7
2005	3.41	1	8
2006	3.95	1	8
2007	4.16	1	9
2008	5.45	2	13
2009	3.74	1	8
2010	3.82	1	10
2011	3.22	1	7
2012	1.67	0	4
2013	4.23	2.3	9
2014	1.58	0	4
2015	3.12	0	8
2016	4.40	2.1	9

Table S2. All input variables of the random forest classifier grouped into seven categories. Suffixes _mean, _max, _min, _range refer to statistical summaries, _p90 and p_40 refer to spatial anomaly relative to 0.9 and 0.4 quantiles, respectively, and _pdsi, _SM, _ppt refer to scenes selected based on three criteria as described in Section 2.3. .

No.	Category	Variable code
1	Basic climate	Aridity
2		Dryspell
3		GDD
4		Heatwave
5		PDSI
6		p_early
7		p_sum
8		T_mean
9		VPD_mean
10	Model simulation	SM
11	Static	awc
12		ksat
13		lat
14		long
15		slope_mean
16	Basic remote sensing	EVI_max
17		EVI_mean
18		EVI_range
19		GI_max
20		GI_mean
21		GI_range
22		NDVI_max
23		NDVI_mean
24		NDWI_max
25		NDWI_mean
26		NDWI_min
27		NDWI_range
28		Thermal_max
29		Thermal_mean
30		Thermal_range
31	Weather-sensitive remote sensing	dryspellMaxGI
32		VPDMaxGI
33		EVI_pdsi
34		EVI_SM
35		EVI_ppt
36		GI_pdsi
37		GI_SM
38		GI_ppt
39		NDVI_pdsi
40		NDVI_SM
41		NDVI_ppt
42		NDWI_pdsi
43		NDWI_SM
44		NDWI_ppt
45	Composite indices	AGI
46		AGI_ppt
47		WGI
48		WGI_ppt
49	Spatial anomaly	EVI_pdsi_p40
50		EVI_pdsi_p90
51		EVI_SM_p40
52		EVI_SM_p90
53		EVI_max_p40
54		EVI_max_p90
55		EVI_mean_p40
56		EVI_mean_p90
57		EVI_ppt_p40
58		EVI_ppt_p90
59		GI_pdsi_p40
60		GI_pdsi_p90
61		GI_SM_p40
62		GI_SM_p90
63		GI_max_p40
64		GI_max_p90
65		GI_mean_p40
66		GI_mean_p90
67		GI_ppt_p40
68		GI_ppt_p90
69		NDVI_pdsi_p40
70		NDVI_pdsi_p90
71		NDVI_SM_p40
72		NDVI_SM_p90
73		NDVI_max_p40
74		NDVI_max_p90
75		NDVI_mean_p40
76		NDVI_mean_p90
77		NDVI_ppt_p40
78		NDVI_ppt_p90
79		NDWI_pdsi_p40
80		NDWI_pdsi_p90
81		NDWI_SM_p40
82		NDWI_SM_p90
83		NDWI_max_p40
84		NDWI_max_p90
85		NDWI_mean_p40
86		NDWI_mean_p90
87		NDWI_min_p40
88		NDWI_min_p90
89		NDWI_ppt_p40
90		NDWI_ppt_p90
91		NDWI_range_p40
92		NDWI_range_p90
93		Thermal_max_p40
94		Thermal_max_p90
95		Thermal_mean_p40
96		Thermal_mean_p90
97		Thermal_range_p40
98		Thermal_range_p90

Table 3. Unsuccessful input variables that were not used in the final random forest classifier.

Source	Variable code	Time scale	Statistics	Description
MODIS	thermal	June, July, August	max, min, mean, range	MOD11A2.005 Land Surface Temperature
	ET	June, July, August	max, min, mean, range	MOD16A2 Global Terrestrial Evapotranspiration [1]
	PET	June, July, August	max, min, mean, range	MOD16A2 Global Terrestrial Evapotranspiration [1]
PRISM	$p - \bar{p}$	June, July, August	monthly total	Monthly precipitation for a given year subtracted by 2001–2016 annual average precipitation for this month
Composite	ET-P	June, July, August	-	Monthly precipitation deficit
	ET/VPD	June, July, August	-	Ratio of MODIS ET to VPD
Landsat	GI_July/GI_June	-	-	Ratio of July to June maximum GI
	GI_August/GI_July	-	-	Ratio of July to June maximum GI
	GI/EVI	June, July, August	-	Ratio of monthly maximum GI to maximum EVI
	GI/SM	June, July, August	-	Ratio of monthly maximum GI to NLDAS-Noah soil moisture

References

1. Running, S. W., Mu, Q., Zhao, M., & Moreno, A. *Modis Global Terrestrial Evapotranspiration (ET) Product (NASA MOD16A2/A3) NASA Earth Observing System Modis Land Algorithm*. NASA: Washington, DC, USA, 2017.