Supporting Information

Specific Drivers and Responses to Land Surface Phenology of Different Vegetation Types in the Qinling Mountains, Central China

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Figure S1. The primary factor (SOS or EOS) controlling change in LOS across the entire study area calculated by the C-index. Blue areas denote that SOS is the primary controller of the LOS change and green areas denote that EOS is the primary controller.
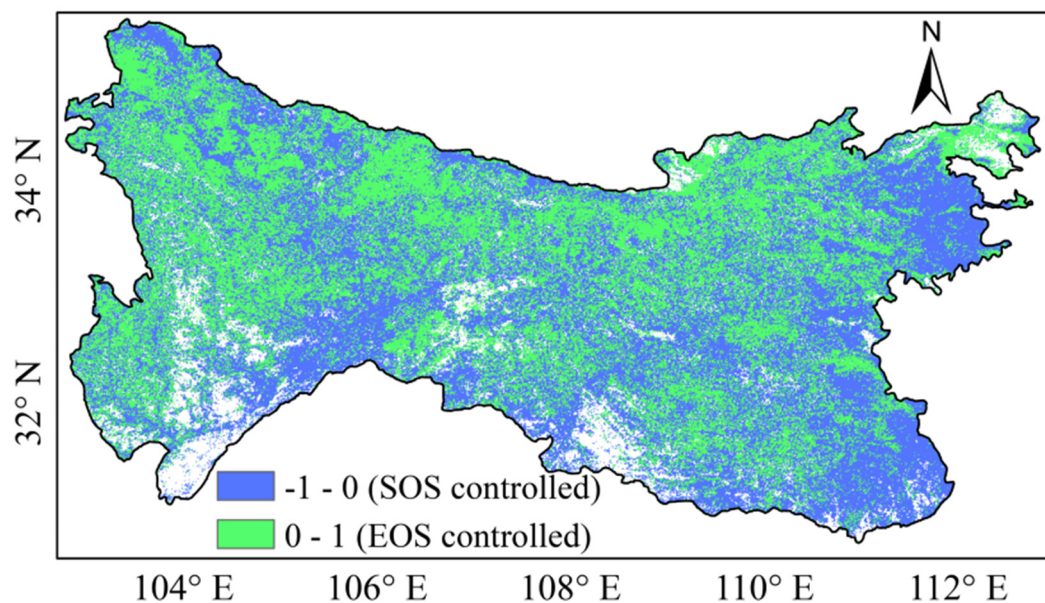
Figure S2. Red fitting curves between predicted LSP dates from RF model and observed LSP dates from MODIS13A2-NDVI. (a) SOS. (b) EOS. Note: "All" refers to all vegetation in the QMs.
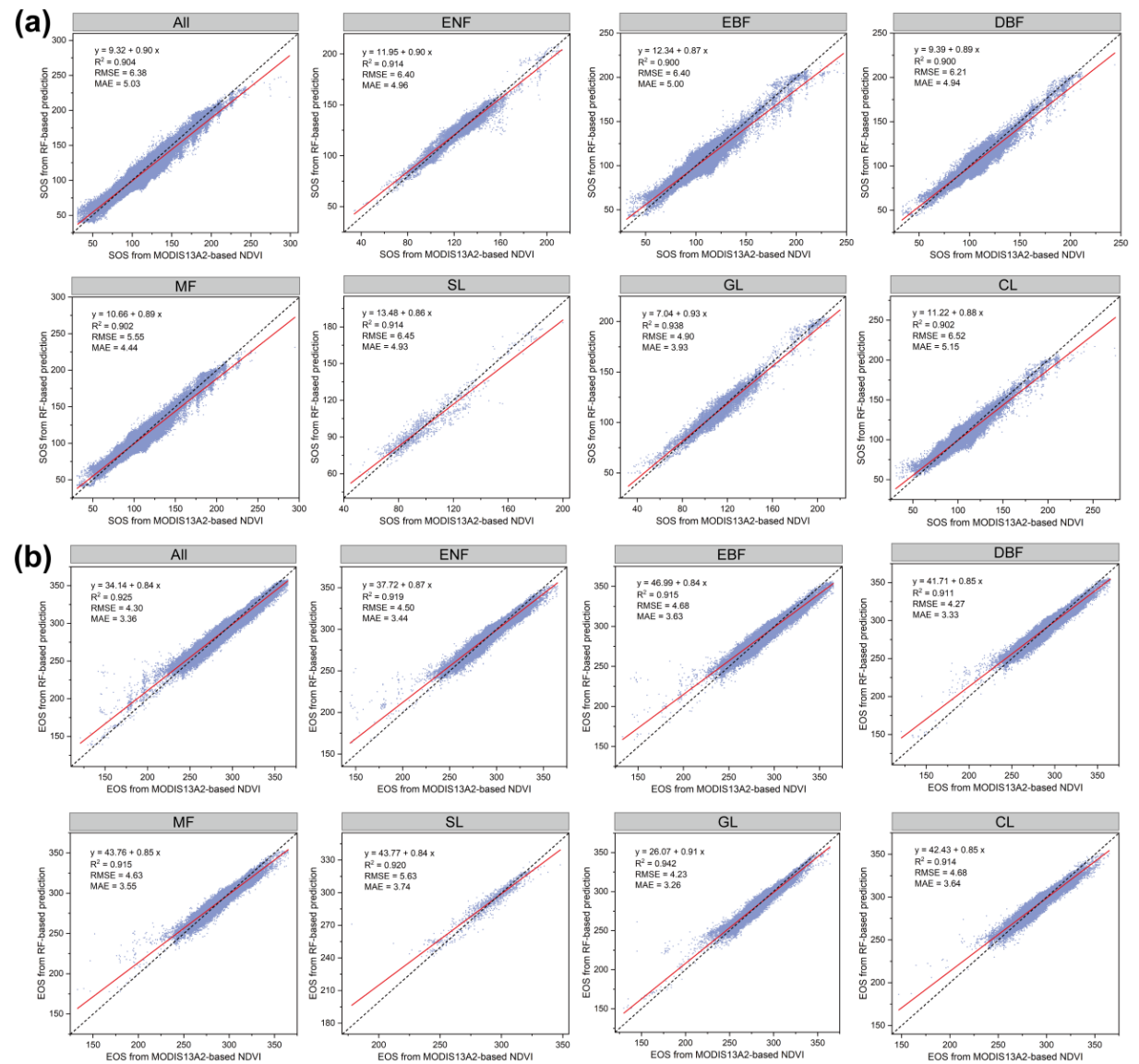
Table S1. The relative importance of each driver affecting interannual variation in LSP. The importance score of each variable (VI) is shown as a percentage.

LSP metrics	All the Vegetation Types	Meteorological factors							Soil factors			Biological factors	
		TP	TG	PP	PG	SWP	SWG	STP	STG	SMP	SMG	MN	MD
SOS	ENF	9.94%	7.86%	8.64%	4.01%	21.28%	2.62%	16.69%	5.42%	1.14%	1.56%	1.12%	19.71%
	EBF	6.36%	10.35%	11.06%	5.92%	17.43%	2.14%	9.59%	6.80%	1.59%	1.29%	1.12%	26.35%
	DBF	7.58%	8.06%	10.72%	5.68%	19.52%	2.44%	12.17%	4.32%	1.39%	1.49%	1.03%	25.60%
	MF	7.49%	9.98%	9.71%	5.29%	22.05%	2.20%	11.64%	6.83%	1.12%	1.11%	1.03%	21.55%
	SL	19.96%	6.65%	3.25%	1.25%	19.27%	1.34%	29.22%	5.84%	0.59%	0.63%	0.65%	11.35%
	GL	10.61%	9.45%	7.11%	2.74%	28.56%	2.79%	13.52%	6.49%	0.91%	1.20%	0.90%	15.71%
	CL	7.62%	13.15%	9.22%	4.63%	22.51%	1.88%	11.03%	8.15%	1.09%	1.10%	0.91%	18.70%
	the whole area	8.62%	9.29%	9.18%	5.05%	21.81%	2.62%	12.08%	7.08%	1.30%	1.40%	1.08%	20.51%
EOS	ENF	15.31%	5.46%	11.80%	4.35%	27.63%	8.47%	7.60%	4.69%	1.40%	1.32%	0.85%	11.12%
	EBF	10.39%	5.54%	12.45%	5.33%	27.60%	7.38%	7.51%	5.52%	1.61%	1.32%	0.85%	14.51%
	DBF	11.25%	5.34%	12.20%	5.53%	30.12%	9.33%	6.85%	4.74%	1.88%	1.68%	1.03%	10.06%

MF	9.97%	5.64%	12.03%	4.51%	30.80%	10.14%	7.56%	4.74%	1.22%	1.21%	0.91%	11.29%
SL	7.81%	5.73%	16.94%	9.49%	20.51%	3.50%	14.97%	2.51%	0.79%	1.02%	0.69%	16.04%
GL	11.22%	3.60%	10.02%	4.41%	36.48%	11.53%	7.45%	4.17%	1.15%	1.40%	1.13%	7.43%
CL	12.77%	6.50%	11.46%	3.93%	30.85%	9.99%	7.23%	4.77%	1.24%	1.33%	0.85%	9.08%
the whole area	10.20%	4.88%	12.12%	5.13%	31.03%	9.92%	7.24%	4.55%	1.58%	1.54%	0.94%	10.86%

Table S2. Correlation results of random forest models built for different vegetation type cover areas.

LSP metrics	Different vegetation areas	Model	R² (training)	OOB prediction error	Number of Predictors
	ENF	SOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.949	17.41	438585
	EBF	SOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.948	17.23	806610
	DBF	SOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.958	13.85	1061730
SOS	MF	SOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.944	20.52	365025
	SL	SOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.931	32.28	5490
	GL	SOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.971	13.19	351600
	CL	SOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.946	20.46	254445

	the whole area	SOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.969	11.17	3283485
	ENF	EOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.961	10.33	438585
	EBF	EOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.959	9.59	806610
	DBF	EOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.963	7.88	1061730
	MF	EOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.948	12.84	365025
EOS	SL	EOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.924	27.78	5490
	GL	EOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.974	8.35	351600
	CL	EOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.948	13.09	254445
	the whole area	EOS ~ TP+TG+PP+PG+SWP+SWG+STP+STG+SMP+SMG+MN+MD	0.975	5.97	3283485