Supplementary Materials

Table S1. *p* values of experimental results in Kolmogorov–Smirnov (K-S) test. Each group of experimental results includes the start of growing season (SOS) or the end of growing season (EOS) trends from 120 sites; PL, AG, PCF, Linear, and Spline are piecewise logistic function fitting, asymmetric Gaussian function fitting, polynomial curve fitting, linear interpolation, and cubic spline interpolation, respectively; DT, MRC, and RCC are dynamic threshold, maximum rate of change, and change rate of curvature, respectively; the level of $p > 0.05$ indicate normal distribution.

		Daily	**PL (8 d)**	**AG (8 d)**	**PCF (8 d)**	**Linear (8 d)**	**Spline (8 d)**	**PL (16 d)**	**AG (16 d)**	**PCF (16 d)**	**Linear (16 d)**	**Spline (16 d)**
SOS trends	DT 10%	0.71	1.45	1.83	2.20	1.36	1.22	1.34	1.90	2.15	0.73	0.90
	DT 20%	0.69	1.42	1.83	2.21	1.35	1.23	1.34	1.90	2.15	0.74	0.92
	DT 30%	0.71	1.42	1.82	2.24	1.34	1.20	1.34	1.92	2.15	0.74	0.92
	MRC	0.70	1.36	1.70	2.21	1.22	1.24	1.31	1.78	2.11	0.90	0.96
	RCC	0.86	1.20	1.72	2.21	1.24	1.19	1.38	1.78	2.13	0.92	0.88
	Mean	0.72	1.21	1.73	2.22	1.29	1.21	1.33	1.79	2.16	0.86	0.86
EOS trends	DT 10%	1.11	2.25	1.85	2.43	1.40	1.08	1.86	2.27	1.89	1.52	1.60
	DT 20%	1.11	2.26	1.84	2.42	1.42	1.06	1.87	2.26	1.89	1.48	1.58
	DT 30%	1.11	2.26	1.84	2.41	1.42	1.09	1.87	2.27	1.89	1.48	1.58
	MRC	1.05	2.36	1.80	2.46	1.47	0.86	1.87	2.20	1.82	1.36	1.56
	RCC	1.07	2.34	1.84	2.34	1.45	1.28	1.88	2.22	1.86	1.47	1.43
	Mean	1.11	2.26	1.85	2.41	1.43	1.11	1.87	2.26	1.88	1.46	1.43

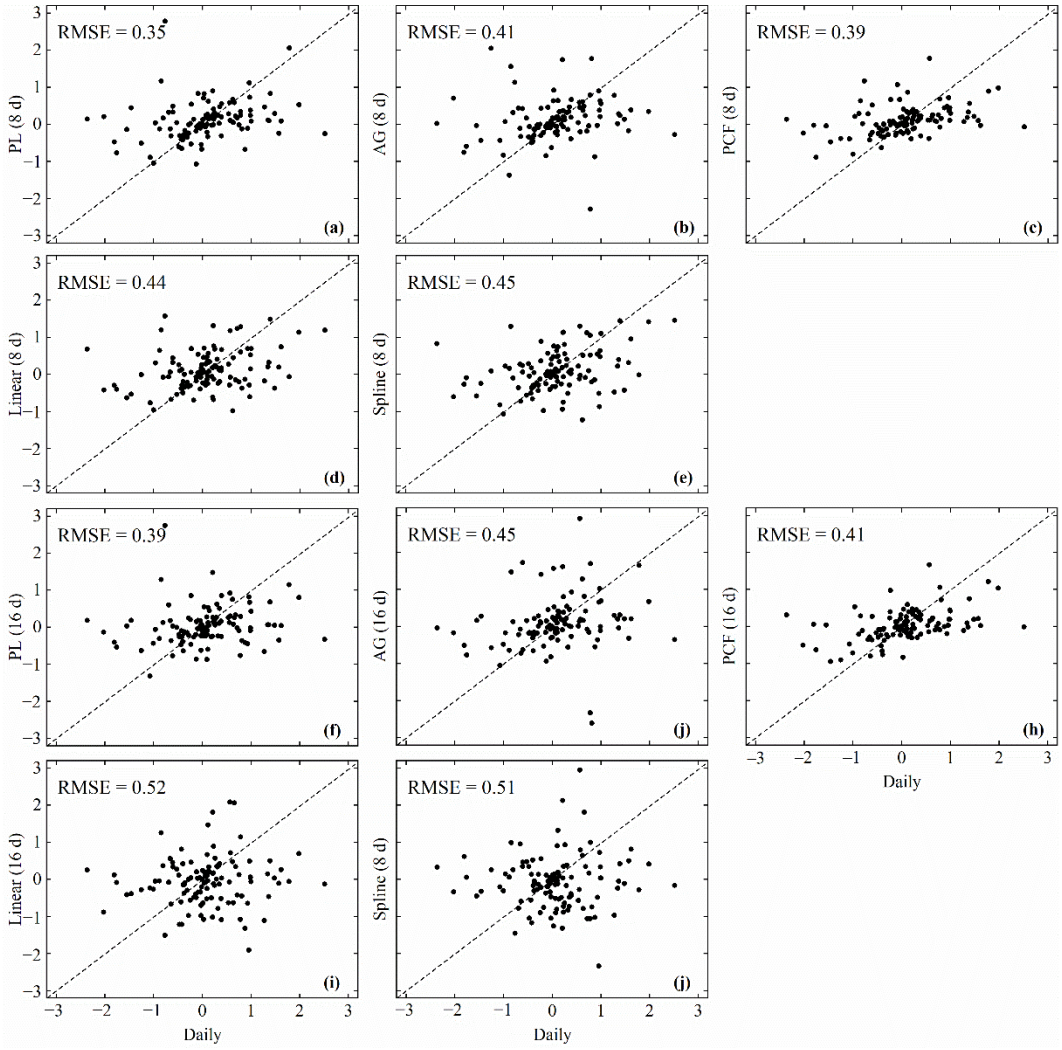


Figure S1. Comparisons of the start of growing season (SOS) trends estimated from daily data and from each interpolation method, according to (a) PL, (b) AG, (c) PCF, (d) Linear, and (e) Spline based on 8-day composite data, (f) PL, (g) AG, (h) PCF, (i) Linear, and (j) Spline based on 16-day composite data. Each subplot includes SOS trends from 120 sites; filled circles represent trends from daily data and from each interpolation method in 120 sites; root-mean-square error (RMSE) and 1:1 lines are provided; PL, AG, PCF, Linear, and Spline are piecewise logistic function fitting, asymmetric Gaussian function fitting, polynomial curve fitting, linear interpolation, and cubic spline interpolation, respectively.

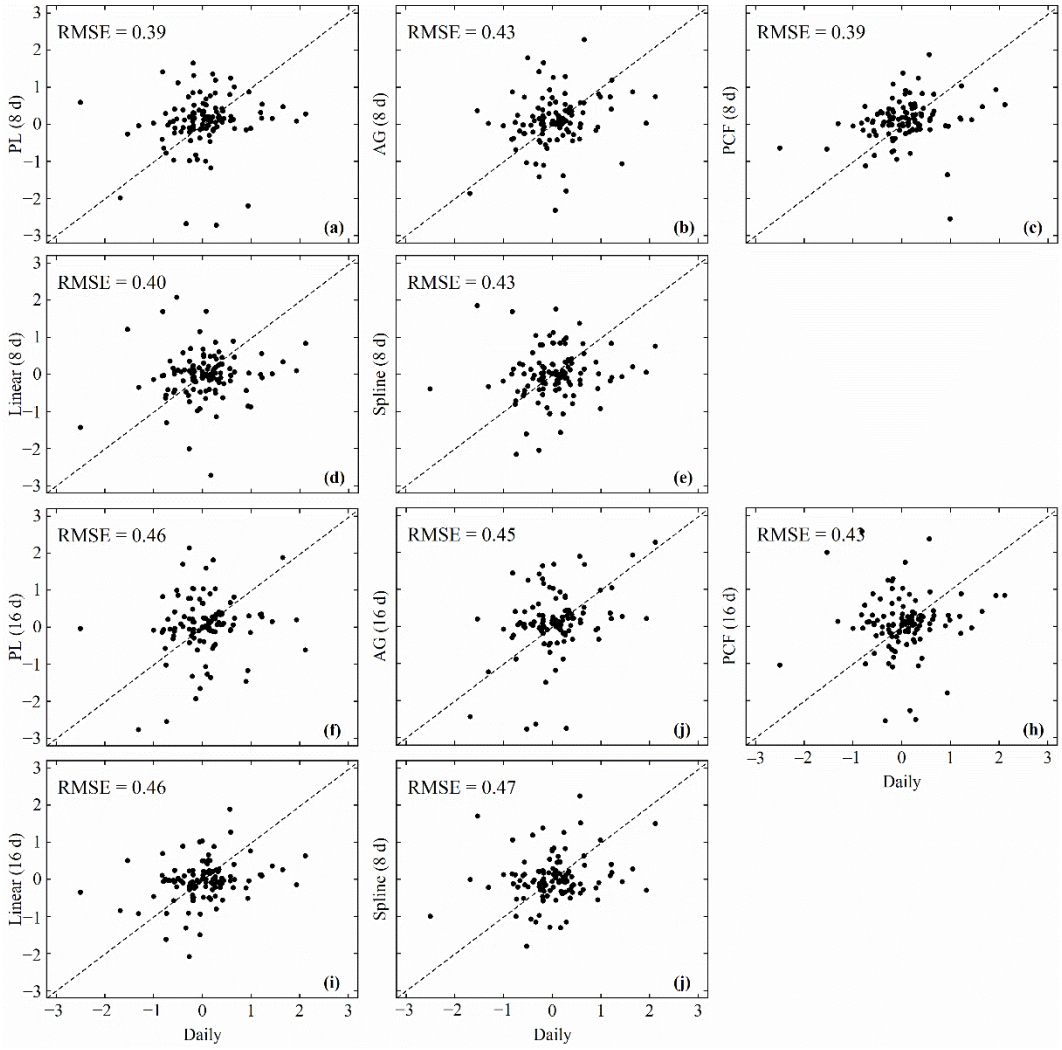


Figure S2. Comparisons of the end of growing season (EOS) trends estimated from the daily data and from each interpolation method, according to (a) PL, (b) AG, (c) PCF, (d) Linear, and (e) Spline based on 8-day composite data, (f) PL, (g) AG, (h) PCF, (i) Linear, and (j) Spline based on 16-day composite data. Each subplot includes EOS trends from 120 sites; filled circles represent trends from daily data and from each interpolation method in 120 sites; root-mean-square error (RMSE) and 1:1 lines are provided; PL, AG, PCF, Linear, and Spline are piecewise logistic function fitting, asymmetric Gaussian function fitting, polynomial curve fitting, linear interpolation, and cubic spline interpolation, respectively.

Table S2. The ratio of sites for which its absolute values of trends were lower than the corresponding root-mean-square error (RMSE) value among each interpolation method. SOS is the start of growing season (SOS); EOS is the end of growing season (EOS); PL, AG, PCF, Linear, and Spline are piecewise logistic function fitting, asymmetric Gaussian function fitting, polynomial curve fitting, linear interpolation, and cubic spline interpolation, respectively.

	PL (8 d)	**AG (8 d)**	**PCF (8 d)**	**Linear (8 d)**	**Spline (8 d)**	**PL (16 d)**	**AG (16 d)**	**PCF (16 d)**	**Linear (16 d)**	**Spline (16 d)**
SOS	67%	60%	77%	63%	56%	67%	64%	76%	68%	62%
EOS	64%	58%	65%	60%	64%	61%	68%	67%	70%	71%