

Supplementary Material

Table S1. Eigenvalues extracted from correlation matrix of relevant photosynthetic parameters and soil water content data and their principal components obtained through principal component analysis (PCA).

Principal component	Initialized eigenvalue			Rotated eigenvalue		
	Eigenvalue	Contribution rate to total variance	Cumulative contribution rate to total variance	Eigenvalue	Contribution rate to total variance	Cumulative contribution rate to total variance
			%			%
1	9.79	69.9	69.9	6.28	44.9	44.9
2	2.17	15.5	85.4	3.99	28.5	73.3
3	1.16	8.25	93.7	2.85	20.4	93.7
4	0.43	3.09	96.8			
5	0.22	1.60	98.4			
6	0.08	0.59	99.0			
7	0.07	0.46	99.4			
8	0.02	0.17	99.6			
9	0.02	0.16	99.8			
10	0.01	0.09	99.9			
11	0.01	0.06	99.9			
12	0.01	0.05	100.0			
13	0.00	0.03	100.0			
14	0.00	0.01	100.0			

Table S2. Rotated components matrix based on principal component procedure using Kaiser's standard orthogonal rotation after the six iterations.

Abbreviation in SEM	Latent variables	Measured variables	Component 1	Component 2	Component 3
Photosynthesis	Photosynthetic parameters	Pn	0.295	0.094	0.925
		Cd	0.064	0.114	0.962
		Ci	0.761	0.124	0.698
		Tr	0.712	0.103	0.759
WaterTop	Top-layer soil water storage	D10	0.139	0.923	0.029
		D30	0.277	0.925	0.141
		D50	0.457	0.796	0.146
		D70	0.743	0.517	0.165
WaterDeep	Deep-layer soil water storage	D90	0.762	0.502	0.092
		D110	0.805	0.485	0.13
		D130	0.859	0.445	0.181

D150	0.859	0.434	0.225
D170	0.895	0.323	0.228
D190	0.9	0.141	0.224
