

## Supplemental Information

**Table**

**Table S1.** Proportion of trade-offs and synergies between ecosystem services

	Percentage of each class(%)		
	NPP&SC	NPP&WY	SC&WY
Nodata	6.83	0.05	6.19
Significant positive correlation	74.94	91.26	1.80
Nonsignificant positive correlation	16.35	7.49	24.03
Significant negative correlation	0.04	0.01	15.92
Nonsignificant negative correlation	1.83	1.18	52.06

**Table S2.** Trade-offs and synergies for changes in ecosystem services

	NPP	SC	WY
NPP	—	—	—
SC	0.561	—	—
WY	-0.044	-0.038	—

**Table S3.** Mean correlation (R) of ecosystem services and climate factors on the Loess Plateau

	NPP	SC	WY	CES
ATP	0.479	0.729	0.588	0.814
MAT	0.128	-0.008	-0.270	-0.123
ASR	-0.173	-0.187	-0.023	-0.129

**Table S4.** Proportion of ecosystem services correlated with climate factors

	Percentage of each class(%)			
	NPP&ATP	SC&ATP	WY&ATP	TES&ATP
Nodata	3.65	0.05	6.19	6.19
Significant positive correlation	65.30	82.88	71.30	1.80
Nonsignificant positive correlation	30.07	16.57	21.31	24.03
Significant negative correlation	0.01	0.03	0.00	15.92
Nonsignificant negative correlation	0.98	0.47	1.20	52.06

  

	Percentage of each class(%)			
	NPP&MAT	SC&MAT	WY&MAT	TES&MAT
Nodata	3.65	0.05	6.19	1.12
Significant positive correlation	3.55	1.03	0.00	0.25
Nonsignificant positive correlation	70.64	47.37	2.34	18.94
Significant negative correlation	0.13	0.73	11.44	2.41
Nonsignificant negative correlation	22.03	50.83	80.03	77.28

  

	Percentage of each class(%)			
	NPP&ASR	SC&ASR	WY&ASR	TES&ASR

Nodata	3.65	0.05	6.19	1.12
Significant positive correlation	1.55	1.93	1.60	0.43
Nonsignificant positive correlation	30.20	27.18	40.14	28.89
Significant negative correlation	23.74	25.23	1.89	11.10
Nonsignificant negative correlation	40.87	45.60	50.17	58.46

**Table S5.** Three-fold fitted equations for ecosystem services and climate factors

Type	Three-fold fitted equation	R <sup>2</sup>
NPP&ATP	$y = -1.53e-09x^3 + 2.25e-06x^2 - 1.96e-05x + 0.089$	0.954
NPP&MAT	$y = 2.36e-04x^3 - 0.0064x^2 + 0.056x + 0.35$	0.751
NPP&ASR	$y = 2.89e-11x^3 - 5.46e-07x^2 + 0.0033x - 5.66$	0.591
SC&ATP	$y = -1.42e-10x^3 + 9.51e-07x^2 - 1.69e-05x - 0.027$	0.947
SC&MAT	$y = 3.39e-04x^3 - 0.0081x^2 + 0.028x + 0.39$	0.605
SC&ASR	$y = -1.56e-11x^3 + 2.56e-07x^2 - 0.0013x + 2.29$	0.251
WY&ATP	$y = -1.59e-09x^3 + 2.89e-06x^2 - 0.00033x + 0.0057$	0.988
WY&MAT	$y = -1.91e-04x^3 + 0.0075x^2 - 0.046x + 0.31$	0.871
WY&ASR	$y = 6.81e-11x^3 - 1.20e-06x^2 + 0.0068x - 11.76$	0.822
CES&ATP	$y = -3.25e-09x^3 + 6.09e-06x^2 - 0.00037x + 0.068$	0.988
CES&MAT	$y = 3.83e-04x^3 - 0.0070x^2 + 0.037x + 1.06$	0.387
CES&ASR	$y = 8.14e-11x^3 - 1.49e-06x^2 + 0.0087x - 15.12$	0.447