

In 42 meteorological stations, we tested the reliability of gridded climate data by regressing them with measured climate variables during 2000-2011, which were acquired from the China Meteorological Administration. Results showed that R²s (goodness of fit) between grid annual temperature and measured annual temperature, and between grid annual precipitation and measured annual precipitation in 42 stations, all passed the significance test at the level of 0.05. The simulated RMSEs (root means square error) of annual temperature were ranging from 0.04 to 1.85 (°C) and the simulated RMSEs of annual precipitation were ranging from 4.86 to 47.82 (mm). The regression results suggested the gridded climate data used in this study have enough precision to characterize the ground hydrothermal status.

Table S1. Linear regression of grid climate data and measured climate variables in meteorological stations. R² and RMSE denote the goodness of fit and the root means square errors of regression equation, respectively. ** means the statistical results passed the significance test at the level of 0.05.

Site number	Latitude (°N)	Longitude (°E)	Annual temperature		Annual precipitation	
			R ²	RMSE(°C)	R ²	RMSE(mm)
1	38.83	105.66	0.942**	0.73	0.988**	9.52
2	39.1	107.98	0.951**	0.36	0.970**	13.24
3	39.83	109.98	0.997**	0.11	0.990**	10.04
4	40.26	111.18	0.822**	0.26	0.707**	45.55
5	40.66	109.85	0.972**	0.29	0.996**	4.86
6	40.75	107.4	0.945**	0.21	0.973**	7.44
7	40.82	111.68	0.987**	0.12	0.994**	11.50
8	41.02	109.13	0.864**	0.17	0.627**	44.17
9	41.03	113.07	0.993**	0.19	0.995**	6.93
10	41.37	102.37	0.532**	0.26	0.932**	6.50
11	41.53	111.68	0.992**	0.34	0.997**	6.19
12	41.57	108.52	0.997**	0.23	0.981**	9.45
13	41.7	110.43	0.963**	0.17	0.989**	8.02
14	41.76	109.96	0.713**	0.21	0.840**	31.74
15	41.88	115.26	0.802**	0.62	0.825**	37.92
16	41.9	114	0.994**	0.16	0.996**	6.95
17	41.93	118.7	0.878**	1.85	0.681**	47.82
18	42.18	116.47	0.996**	0.10	0.995**	6.72
19	42.23	113.83	0.991**	0.05	0.934**	22.58
20	42.27	118.97	0.998**	0.07	0.998**	5.24
21	42.33	120.7	0.990**	0.59	0.990**	8.03
22	42.4	112.9	0.997**	0.05	0.993**	6.60
23	42.58	118.42	0.579**	0.27	0.517**	42.89
24	42.92	119.02	0.997**	0.09	0.981**	6.94
25	43.6	118.07	0.994**	0.10	0.988**	7.90
26	43.6	121.28	0.999**	0.11	0.981**	10.27
27	43.75	122.27	0.991**	0.07	0.911**	25.52

28	43.95	116.14	0.997**	0.25	0.998**	5.20
29	43.98	119.4	0.996**	0.06	0.955**	16.07
30	44.57	120.9	0.998**	0.27	0.950**	21.28
31	44.58	117.6	0.991**	0.37	0.989**	6.51
32	44.62	114.15	0.998**	0.22	0.993**	6.05
33	45.52	116.97	0.994**	0.06	0.979**	9.63
34	46.6	121.21	0.995**	0.51	0.977**	16.53
35	47.17	119.93	0.996**	0.31	0.999**	5.72
36	48	122.73	0.997**	1.27	0.988**	14.78
37	48.67	116.82	0.998**	0.12	0.968**	10.90
38	49.2	123.72	0.994**	0.13	0.963**	14.89
39	49.22	119.75	0.999**	0.07	0.982**	9.91
40	49.56	117.43	0.999**	0.44	0.991**	6.76
41	50.25	120.18	0.997**	0.04	0.983**	7.02
42	50.48	121.68	0.992**	1.12	0.997**	4.90
