

**Table S1.** Land use table for Yanchi County

Type of land use	Area/ha
Cropland	109,722
Garden land	1,658
Woodland	137,945
Grassland	322,650
Urban, village, industrial and mining land	19,380
Transport	9,536
Waters and water facilities	4,351

**Table S2.** Meteorological data for Yanchi County

Indicator	Indicator volume
Average temperature (°C)	10.2
Maximum temperature (°C)	37.4
Lowest temperature (°C)	- 27.1
Precipitation (mm)	227.9

**Table S3.** ALOS-2 satellite acquisition date information

Imaging date	Main image	Auxiliary images
Waveband	20180707	20190706
Satellite flight azimuth	HH	HH
Angle of incidence	-10.73	-10.73
Imaging date	31.41	31.41

**Table S4.** GNSS monitoring points information

Point No	Latitude	Longitude	Point No	Latitude	Longitude
JF-2-1	37°39'30"	106°51'33"	JF-2-11	37°38'36"	106°52'13"
JF-2-2	37°39'16"	106°51'40"	JF-2-12	37°38'52"	106°52'18"
JF-2-3	37°38'59"	106°51'44"	JF-2-13	37°38'54"	106°52'04"
JF-2-4	37°38'42"	106°51'49"	JF-2-14	37°39'02"	106°52'14"

JF-2-5	37°38'27"	106°51'52"	JF-2-15	37°39'14"	106°52'11"
JF-2-6	37°38'10"	106°51'53"	JF-2-16	37°39'21"	106°52'02"
JF-2-7	37°37'29"	106°51'26"	JF-2-17	37°39'31"	106°52'05"
JF-2-8	37°37'18"	106°51'25"	JF-2-18	37°39'35"	106°51'54"
JF-2-9	37°37'07"	106°51'28"	JF-2-19	37°39'41"	106°52'04"
JF-2-10	37°36'58"	106°51'27"	JF-2-20	37°39'53"	106°52'03"

**Table S5.** Known point information for simulated experiments

Number	Longitude /°	Latitude /°	Phase Value
1	106.86	37.64	50.56404
2	106.87	37.64	50.34814
3	106.88	37.64	50.42162
4	106.86	37.65	49.94814
5	106.87	37.65	50.02163
6	106.88	37.65	50.49302
7	106.86	37.66	49.87484
8	106.87	37.66	49.91217
9	106.88	37.66	50.27504
10	106.86	37.67	49.40364
11	106.87	37.67	49.65801
12	106.88	37.67	49.40598

**Table S6.** Simulation experiment sampling point information table

Number	Longitude /°	Latitude /°	Fitted phase /mm	Unwrapped Phase /mm	Error /mm
1	106.862	37.653	49.81618	49.81666	-0.00048
2	106.875	37.655	50.16642	50.1669	-0.00048
3	106.866	37.666	49.32303	49.32352	-0.00049
4	106.874	37.665	49.71336	49.71384	-0.00048
5	106.861	37.654	49.9488	49.94928	-0.00048

6	106.873	37.657	49.9999	50.00038	-0.00048
7	106.866	37.667	49.62016	49.62065	-0.00049
8	106.872	37.668	49.66496	49.66544	-0.00048
9	106.863	37.657	49.88232	49.8828	-0.00048
10	106.874	37.652	50.09884	50.09932	-0.00048
11	106.865	37.663	49.75967	49.76015	-0.00048
12	106.876	37.664	49.9188	49.91928	-0.00048

**Table S7.** Sample point information

Number	Longitude /°	Latitude /°	Fitted phase /mm	Unwrapped Phase /mm	Error /mm
1	106.862	37.653	-119.026	-77.8358	-41.1907
2	106.866	37.666	-19.3679	-35.4917	16.12381
3	106.874	37.665	-165.122	-152.315	-12.807
4	106.861	37.654	-49.1421	-77.3862	28.24407
5	106.873	37.657	-920.974	-981.592	60.61738
6	106.866	37.667	-1.96721	-34.7957	32.82853
7	106.872	37.668	-82.5051	-39.719	-42.7861
8	106.863	37.657	-534.838	-588.95	54.11148
9	106.874	37.652	-1209.42	-1336.15	126.7298
10	106.865	37.663	-152.529	-157.946	5.416622
11	106.872	37.664	-28.3215	-29.4553	1.133837

**Table S8.** Improved sample point information

Number	Longitude /°	Latitude /°	Fitted phase /mm	Unwrapped Phase /mm	Error /mm
1	106.862	37.653	-119.026	-68.8735	-50.153
2	106.866	37.666	-19.3679	-35.4917	16.12381
3	106.874	37.665	-165.122	-142.848	-22.274
4	106.861	37.654	-49.1421	-72.0183	22.87617
5	106.873	37.657	-920.974	-952.386	31.41147
6	106.866	37.667	-1.96721	-35.0764	33.10919

7	106.872	37.668	-82.5051	-39.4574	-43.0477
8	106.863	37.657	-534.838	-568.348	33.50985
9	106.874	37.652	-1209.42	-1219.47	10.04984
10	106.865	37.663	-152.529	-137.648	-14.8812
11	106.872	37.664	-28.3215	-29.4553	1.133837

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