



Supplement of

Spatiotemporal continuous estimates of daily 1 km PM_{2.5} from 2000 to present under the Tracking Air Pollution in China (TAP) framework

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Table S1. The R^2 of linear regressions between various reanalysis meteorological data products and measurements from local monitors.

Products	Spatial resolution	Temperature at 2 m	Wind speed at 10 m
ERA5-Land	0.1 degree	0.94	0.30
ERA5	0.25 degree	0.82	0.01
MERRA-2	0.5×0.625 degree	0.95	0.26

Table S2 The types of roads used in this study

This study	OpenStreetMap	Survey road map
High way	Motors	High way
Primary road	Trunk and primary road	National road and provincial road
Secondary road	Secondary road and tertiary road	County road

Table S3. Correlation coefficients of comparisons between various road length data

	Year	Highway	Primary road	Secondary road
OpenStreetMap and survey map	2014	0.88	0.74	0.35
OpenStreetMap and estimated OpenStreetMap	2015	0.92	0.84	0.56
Survey map and estimated OpenStreetMap	2000	0.44		
	2004	0.83	0.75	0.31
	2005	0.93	0.82	0.54
	2010	0.91	0.83	0.56
	2012	0.93	0.83	0.51
	2015	0.91	0.82	0.57

Table S4. Validation of the sum road length prediction model at the city level

	Road type	Correlation coefficient
By-year cross validation (2013-2019)	High way	0.68
	Primary	0.67
	Secondary	0.73
Four-year cross validation (2013-2015)	High way	0.64
	Primary	0.64
	Secondary	0.76

Table S5. Performance of the 2019 model with various meteorological predictors

	R^2 (RMSE)	Out-of-bag	Test data
Full model		0.85	0.85
Remove precipitation		0.84	0.85
Remove precipitation, wind fields		0.83	0.84
Remove precipitation, wind fields, surface pressure		0.82	0.83
Remove precipitation, wind fields, surface pressure, relative humidity		0.81	0.83
Remove precipitation, wind fields, surface pressure, relative humidity and temperature		0.80	0.83

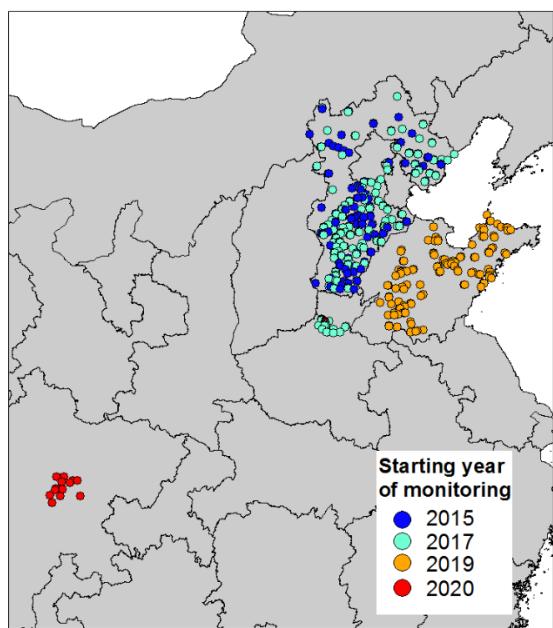


Figure S1. Location of local monitors with the year that monitoring started

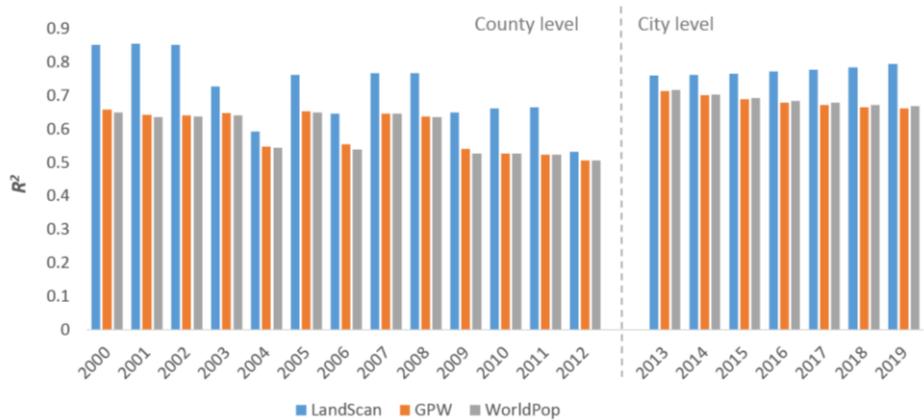


Figure S2. Population distribution dataset performance compared to the yearbook records at the county level (before 2013) and the city level (after 2013).

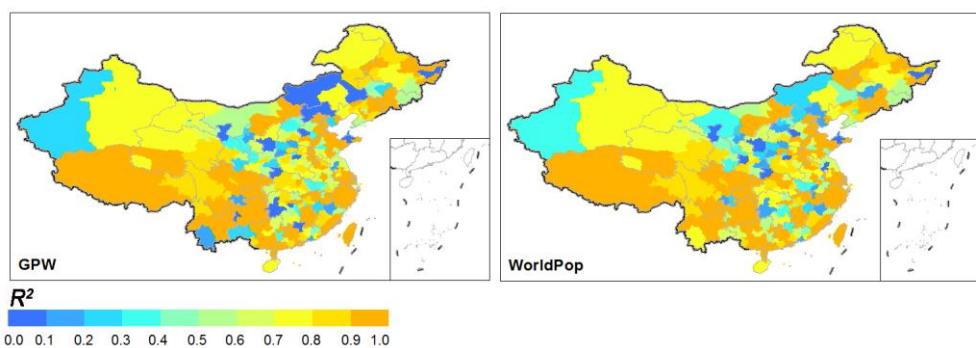
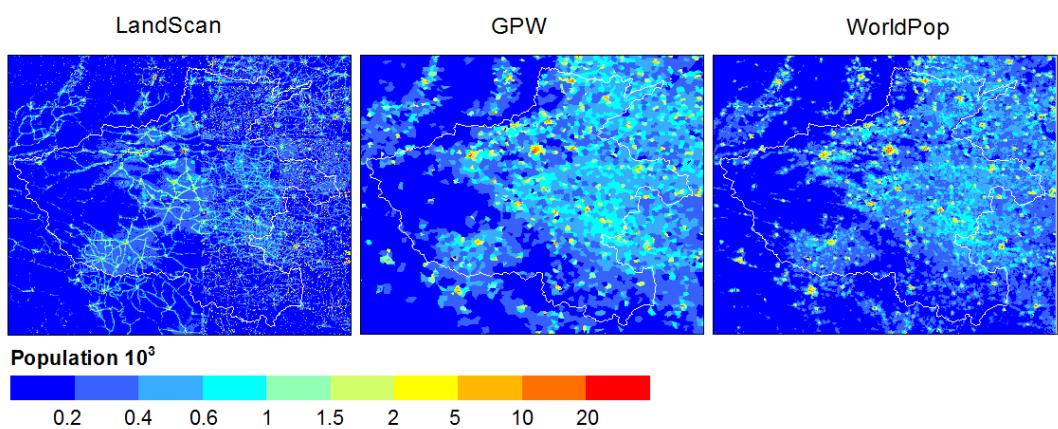
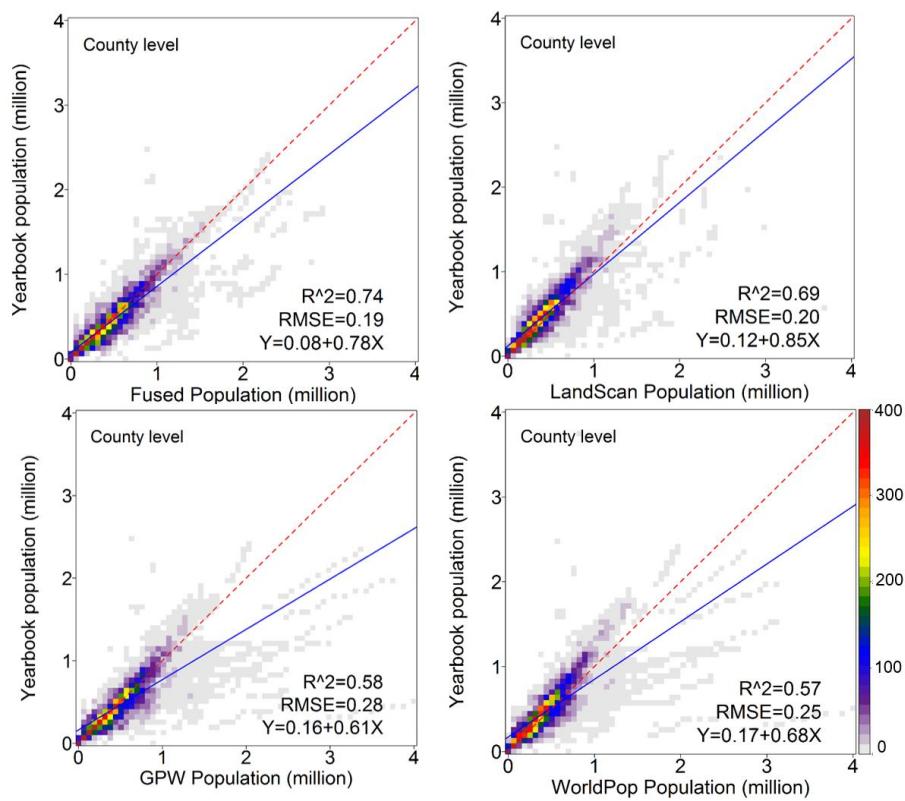


Figure S3. The spatial distribution of the coefficient of determination of the GPW and WorldPop gridded population products.



Supplementary Figure 4. The spatial distribution of population of LanScan, GPW, and WorldPop over Henan province in 2000.



Supplementary Figure 5. The population distribution dataset performance compared to the yearbook records at the county level (before 2013) and the city level (after 2013).

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