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3D-GloBFP: the first global three-dimensional building footprint dataset

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Table S1. Features with multiple sources used in building height estimation model

Category	Datasets	Feature name	Resolution	Provider	Link
Synthetic aperture radar data	Sentinel-1	VV_mean, VV_std, VV_p5, VV_p25, VV_p50, VV_p75, VH_p95, VH_mean, VH_std, VH_p5, VH_p25, VH_p50, VH_p75, VH_p95	10m	European Union/ESA/ Copernicus	https://earth.esa.int/
	PALSAR	HH_mean, HH_std, HH_p5, HH_p25, HH_p50, HH_p75, HH_p95, HV_mean, HV_std, HV_p5, HV_p25, HV_p50, HV_p75, HV_p95	25m	JAXA EORC	https://www.eorc.jaxa.jp/ALOS/
Optical data	Sentinel-2	B2_mean, B2_std, B2_p5, B2_p25, B2_p50, B2_p75, B2_p95, B3_mean, B3_std, B3_p5, B3_p25, B3_p50, B3_p75, B3_p95 B4_mean, B4_std, B4_p5, B4_p25, B4_p50, B4_p75, B4_p95 B8_mean, B8_std, B8_p5, B8_p25, B8_p50, B8_p75, B8_p95	10m	European Union/ESA/ Copernicus	https://earth.esa.int/
	Nighttime light	LightRad_mean, LightRad _std, LightRad _p5, LightRad _p25, LightRad _p50, LightRad _p75, LightRad _p95	463.83m	Earth Observation Group, Payne Institute for Public Policy, Colorado School of Mines	https://payneinstitute.mines.edu/
Terrian data	DEM	DEM_mean, DEM_std, DEM_p5, DEM_p25, DEM_p50, DEM_p75, DEM_p95	30m	NASA/USGS /JPL-Caltech	https://cmr.earthdata.nasa.gov/
	DSM	DSM_mean, DSM_std, DSM_p5, DSM_p25, DSM_p50, DSM_p75, DSM_p95	30m	JAXA Earth Observation Research Center	https://www.eorc.jaxa.jp/ALOS/
	nDSM	nDSM_mean, nDSM_std, nDSM_p5, nDSM_p25, nDSM_p50, nDSM_p75, nDSM_p95	30m	/	/
Population data	World Population	pop_mean, pop_std, pop_p5, pop_p25, pop_p50, pop_p75, pop_p95	92.77m	WorldPop	https://www.worldpop.org/
Vector-derived data	Area of individual building	Area	/	Microsoft	https://wiki.openstreetmap.org/wiki/Microsoft_Building_Footprint_Data
	Perimeter of individual building	Perimeter	/		
	Compactness of individual building	Compactness	/		
	Fractality of individual building	Fractality	/		
	Cooke JC index of individual building	Cooke JC index	/		

*ndsm is calculated by DSM-DEM

Table S2. Reference datasets collected from GIS government portals.

City	Country of affiliation	Source
Beijing, Shanghai, Guangzhou, Chongqing	China	https://map.baidu.com/
Houston, New York, Jacksonville, Philadelphia, San Francisco, Seattle, Denver, Newport News, Louisville, Portland, Boulder	The United States	https://www.arcgis.com/home
Saint Paul	Brazil	https://geosampa.prefeitura.sp.gov.br
London	England	https://www.emu-analytics.com/
Melbourne	Australia	https://data.melbourne.vic.gov.au
Vancouver	Canada	https://opendata.vancouver.ca

Table S3. Building height datasets for comparison in global and individual regions.

Height dataset	Spatial resolution	Validation region
World Settlement Footprint (WSF) *(Esch et al., 2022)*	90m	Global/Europe
Global Human Settlement Layer-Built-up height (GHSL-H) *(Pesaresi et al., 2021)*	100m	Global/Europe
Height in *Li et al. (2022)*	1km	Global/Europe
Height in *Zhou et al. (2022)*	500m	Global/Europe
Height in *Arehart et al. (2021)*	Building-scale	The United States
Microsoft building height *(Microsoft, 2020)*	Building-scale	The United States
Chinese Building Height (CNBH) *(Wu et al., 2023)*	10m	China
Height in *Huang et al. (2022)*	30m	China

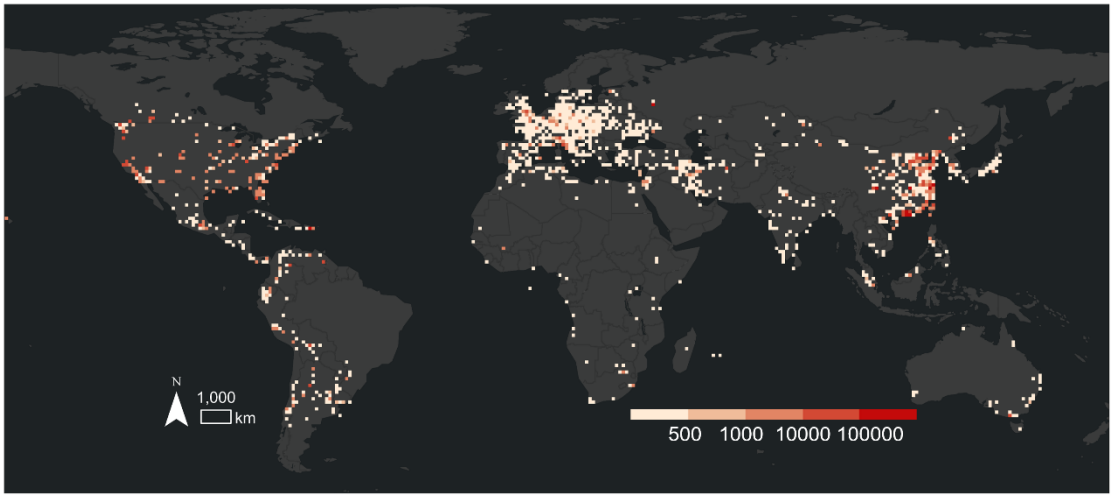

Figure S1. Building with height properties at 0.1°×0.1° scale.

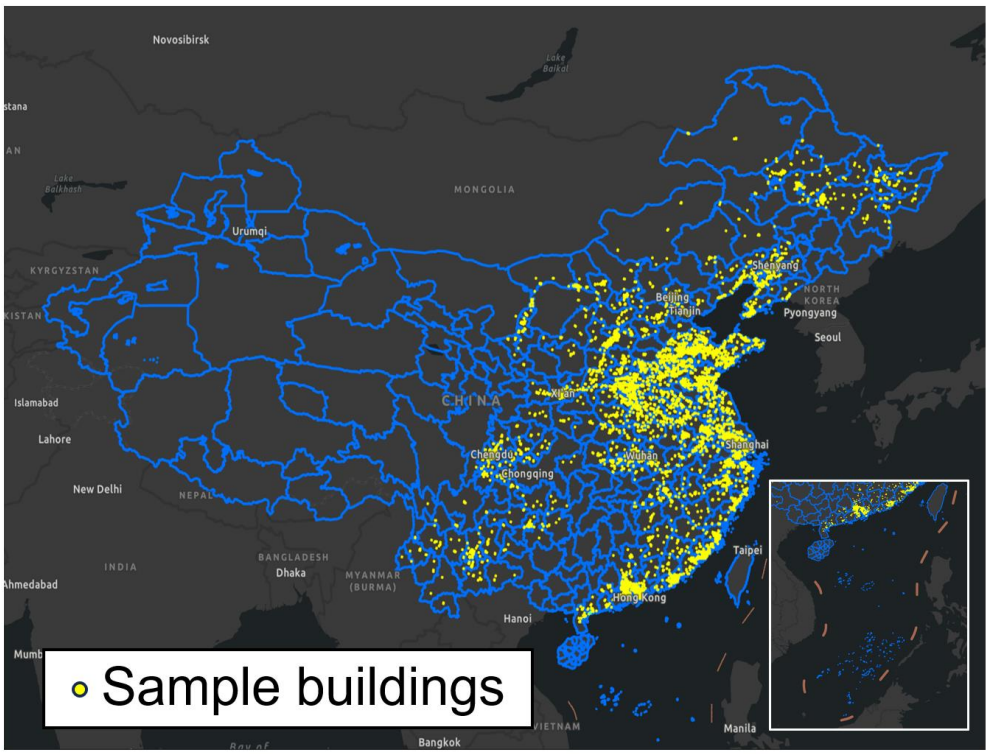

Figure S2. Samples of building height in China.

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