Supplementary Materials for

Regional Mapping of Essential Urban Land Use Categories in China: A Segmentation-based Approach

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Figure S1. Examples for the identification of samples based on Google Earth high-resolution images.

Figure S2. On-site survey photos of different urban land use in Ningbo taken by the authors.

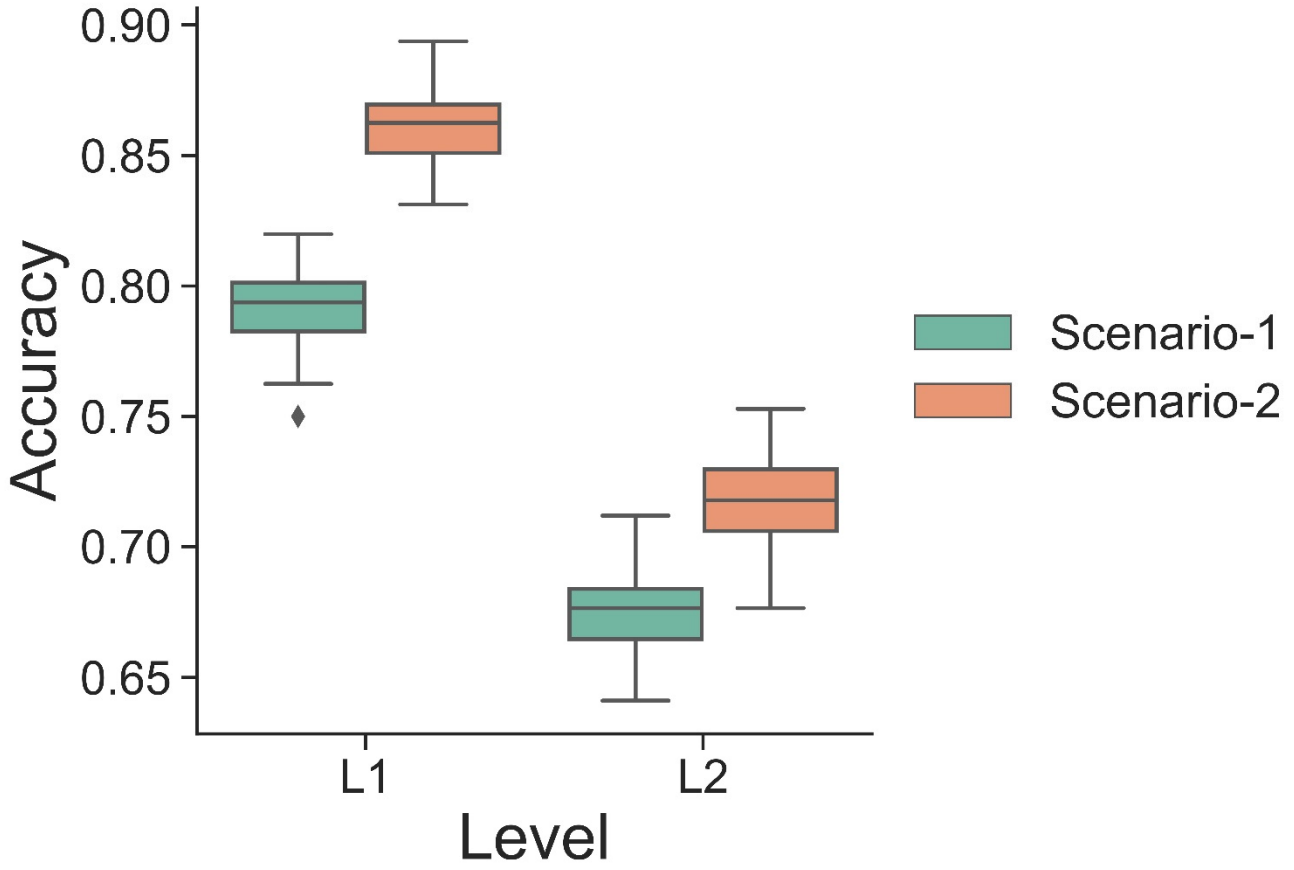

Figure S3. Accuracies of EULUC-seg for Level I and Level II categories with/without additional features. Scenario-1: using features derived from Sentinel-2 (except for texture information), Baidu POIs, and Luojia1 data; Scenario-2: using all derived features. For each scenario, the RF model is repeated 100 times.

Table S1. Confusion matrix for the Level II category of EULUC-seg. UA, PA, and OA denote user's accuracy, producer's accuracy, and overall accuracy, respectively. Res: Residential; Com: Commercial; Trans: Transportation; Admin: Administrative; Edu: Educational.

	Res	**Village**	**Business**	**Com**	**Industrial**	**Trans**	**Admin**	**Edu**	**Medical**	**Sport and cultural**	**Greenspace**	**Undeveloped**	**UA (%)**	**PA (%)**
Res	25	0	1	0	0	0	0	1	0	0	0	0	92.6	80.6
Village	2	18	0	0	0	0	0	0	0	0	0	0	90.0	81.8
Business	0	0	12	0	1	0	1	1	0	0	0	0	80.0	60.0
Com	0	0	1	5	2	0	0	1	0	0	0	0	55.6	62.5
Industrial	0	0	0	1	9	0	0	1	0	0	0	0	81.8	52.9
Trans	0	1	1	1	1	3	0	0	0	0	0	2	33.3	75.0
Admin	4	0	2	0	0	0	3	0	0	0	0	0	33.3	60.0
Edu	0	0	2	0	2	0	0	9	0	0	2	0	60.0	52.9
Medical	0	0	1	0	1	0	1	1	3	0	0	0	42.9	100.0
Sport and cultural	0	1	0	1	0	1	0	2	0	2	1	0	25.0	100.0
Greenspace	0	0	0	0	0	0	0	1	0	0	30	0	96.8	90.9
Undeveloped	0	2	0	0	1	0	0	0	0	0	0	6	66.7	75.0
OA=73.53%, kappa coefficient=0.70														

Table S2. Residential-Entertainment-Transportation-Industrial-Office (RETIO) classification schemes.

Level I	Level II
01 Residential	0101 Residential
	0102 Village
02 Entertainment	0201 Sport and cultural
	0202 Greenspace
03 Transportation	0301 Transportation
04 Industrial	0401 Industrial
05 Office	0501 Business
	0502 Commercial
	0503 Administrative
	0504 Educational
	0505 Medical
	0506 Undeveloped

Table S3. Confusion matrix for the Level I category of RETIO. UA, PA, and OA denote user's accuracy, producer's accuracy, and overall accuracy, respectively.

	Residential	Entertainment	Industrial	Office	UA	PA
Residential	45	0	0	2	95.74%	93.75%
Entertainment	0	31	1	7	79.49%	93.94%
Industrial	0	0	7	4	63.64%	58.33%
Office	3	2	4	55	85.94%	80.88%
OA=85.71%, kappa coefficient=0.79						

Table S4. Confusion matrix for the Level II category of RETIO. UA, PA, and OA denote user's accuracy, producer's accuracy, and overall accuracy, respectively. Res: Residential; Trans: Transportation; Com: Commercial; Admin: Administrative; Edu: Educational.

	Res	**Village**	**Sport and cultural**	**Greenspace**	**Trans**	**Industrial**	**Business**	**Com**	**Admin**	**Edu**	**Medical**	**Undeveloped**	**UA (%)**	**PA (%)**
Res	27	0	0	0	0	0	0	0	0	0	0	0	100.0	84.4
Village	1	19	0	0	0	0	0	0	0	0	0	0	95.0	79.2
Sport and cultural	0	2	1	2	0	1	0	0	0	2	0	0	12.5	100.0
Greenspace	0	0	0	30	0	1	0	0	0	0	0	0	96.8	88.2
Trans	0	1	0	0	1	4	0	2	0	0	0	1	11.1	50.0
Industrial	0	0	0	0	0	10	0	0	0	1	0	0	90.9	45.5
Business	0	0	0	0	0	2	11	0	0	2	0	0	73.3	57.9
Com	0	0	0	0	1	1	3	3	0	1	0	0	33.3	37.5
Admin	4	0	0	0	0	0	2	0	3	0	0	0	33.3	100.0
Edu	0	0	0	2	0	2	1	1	0	9	0	0	60.0	56.3
Medical	0	0	0	0	0	0	2	2	0	1	2	0	28.6	100.0
Undeveloped	0	2	0	0	0	1	0	0	0	0	0	6	66.7	85.7
OA=71.76%, kappa coefficient=0.68														

Table S5. Statistics of urban land use composition in Ningbo for 2018.

Level I			Level II		
Category	**Area (km²)**	**Proportion (%)**	**Category**	**Area (km²)**	**Proportion (%)**
01 Residential	444.07	30.81	0101 Residential	238.18	16.53
			0102 Village	205.88	14.28
02 Commercial	61.97	4.30	0201 Business	20.83	1.45
			0202 Commercial	41.14	2.85
03 Industrial	251.72	17.47	0301 Industrial	251.72	17.47
04 Transportation	6.95	0.48	0401 Transportation	6.95	0.48
05 Public	676.57	46.94	0501 Administrative	4.71	0.33
			0502 Educational	59.34	4.12
			0503 Medical	4.10	0.28
			0504 Sport and cultural	3.18	0.22
			0505 Greenspace	581.54	40.35
			0506 Undeveloped	23.70	1.64
Total	**1441.27**	**100**		**1441.27**	**100**