The User Guides of GLC_FCS30D (global 30 m land-cover dynamic monitoring product with fine classification system) from 1985 to 2022

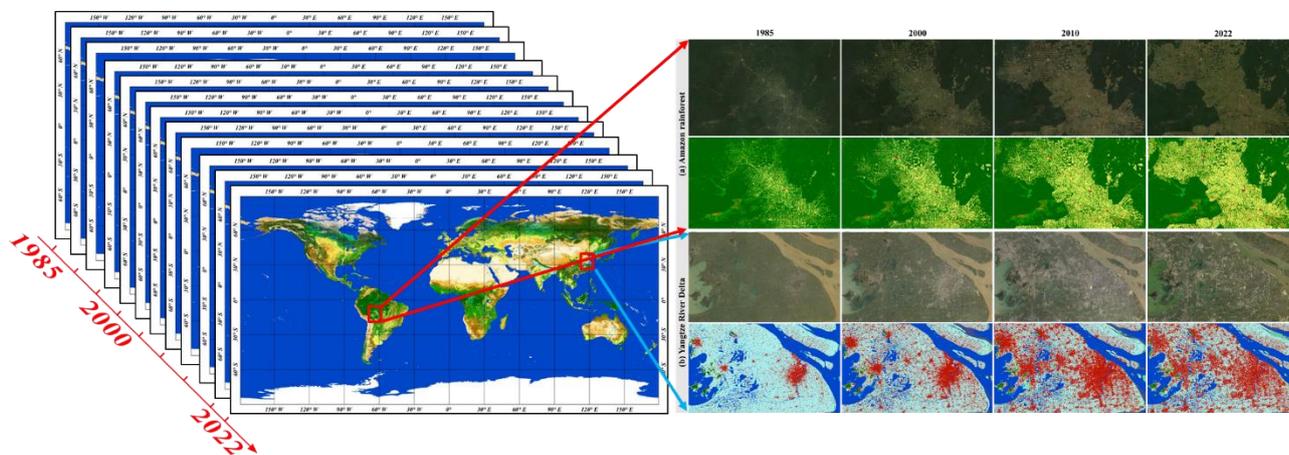Liangyun Liu and Xiao Zhang

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■ Background

GLC_FCS30D is the first global fine land cover dynamic product at a 30-meter resolution that adopts continuous change detection. It utilizes a refined classification system containing **35 land-cover categories** and covers the time span from 1985 to 2022. **Before the year 2000, the update cycle was every 5 years, while after 2000, it is updated annually**. In specific, it developed by combining the continuous change detection method, local adaptive updating models and the spatiotemporal optimization algorithm from dense time-series Landsat imagery, and was validated to achieve an overall accuracy of 80.88% (±0.27%) for the basic classification system 10 major land-cover types) and 73.24% (±0.30%) for the LCCS level-1 validation system (17 LCCS land-cover types).

Figure 1. The overview of the GLC_FCS30D dataset during 1985 to 2022.

Note: Each tile in the GLC_FCS30D was split into two files, and named as 'GLC_FCS30D_19851995_5years_E/W**N/S**' and 'GLC_FCS30D_20002022_ E/W**N/S**'. The former contains 3 bands and denotes the land-cover maps in 1985, 1990 and 1995, and the latter has 23 bands and denotes the land-cover maps in 2000, 2001, 2002… 2021, 2022.

■ The fine classification system containing 35 land-cover sub-categories

LC id	Classification System	Color	
10	Rainfed cropland	(255,255,100)	
11	Herbaceous cover cropland	(255,255,100)	
12	Tree or shrub cover (Orchard) cropland	(255,255,0)	
20	Irrigated cropland	(170,240,240)	
51	Open evergreen broadleaved forest	(76,115,0)	
52	Closed evergreen broadleaved forest	(0,100,0)	
61	Open deciduous broadleaved forest (0.15<fc<0.4)	(170,200,0)	
62	Closed deciduous broadleaved forest (fc>0.4)	(0,160,0)	
71	Open evergreen needle-leaved forest (0.15< fc <0.4)	(0,80,0)	
72	Closed evergreen needle-leaved forest (fc >0.4)	(0,60,0)	
81	Open deciduous needle-leaved forest (0.15< fc <0.4)	(40,100,0)	
82	Closed deciduous needle-leaved forest (fc >0.4)	(40,80,0)	
91	Open mixed leaf forest (broadleaved and needle-leaved)	(160,180,50)	
92	Closed mixed leaf forest (broadleaved and needle-leaved)	(120,130,0)	
120	Shrubland	(150,100,0)	
121	Evergreen shrubland	(150,75,0)	
122	Deciduous shrubland	(150,100,0)	
130	Grassland	(255,180,50)	
140	Lichens and mosses	(255,220,210)	
150	Sparse vegetation (fc<0.15)	(255,235,175)	
152	Sparse shrubland (fc<0.15)	(255,210,120)	
153	Sparse herbaceous (fc<0.15)	(255,235,175)	
181	Swamp	(0,168,132)	
182	Marsh	(115,255,223)	
183	Flooded flat	(158,187,215)	
184	Saline	(130,130,130)	
185	Mangrove	(245,122,182)	
186	Salt marsh	(102,205,171)	
187	Tidal flat	(68,79,137)	
190	Impervious surfaces	(195,20,0)	
200	Bare areas	(255,245,215)	
201	Consolidated bare areas	(220,220,220)	
202	Unconsolidated bare areas	(255,245,215)	
210	Water body	(0,70,200)	
220	Permanent ice and snow	(255,255,255)	
0, 250	Filled value	(255,255,255)	

■ Data Use Policy

If you plan to use our data in **a scientific analysis paper**, we strongly recommend contacting us in advance to seek opinions and consider our contributions in the acknowledgments or as co-authors.

■ Citations

Zhang, X., Liu, L., Chen, X., Gao, Y., Xie, S., Mi, J., 2021. GLC_FCS30: global land-cover product with fine classification system at 30 m using time-series Landsat imagery. Earth Syst. Sci. Data 13, 2753-2776 , https://doi.org/10.5194/essd-13-2753-2021.

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Zhang, X., Liu, L., Zhao, T., Gao, Y., Chen, X., and Mi, J.: GISD30: global 30 m impervious-surface dynamic dataset from 1985 to 2020 using time-series Landsat imagery on the Google Earth Engine platform, Earth Syst. Sci. Data, 14, 1831–1856, https://doi.org/10.5194/essd-14-1831-2022, 2022.