

We thank all the editors and producers for the careful copy-editing and typesetting work to the manuscript, which have improved the quality of this article. We have checked remarks from the typesetter in the proofreading file, and gave point-by-point responses in the following. The modified words or sentences are highlighted in yellow. Additionally, we thoroughly checked the proofreading file and found several areas that need correction. The comments are also listed below.

Response to remarks from the typesetter

TS1. Please give an explanation of why this needs to be changed. We have to ask the handling editor for approval. Thanks.

Response: Thanks for your careful review. we confirm that the **original** equation (3) as shown in following figure is correct.

$$\Omega = \left\{ \begin{array}{l} \text{cropland, forest, grassland,} \\ \text{shrubland, wetland, water bodies,} \\ \text{tundra, impervious surfaces, bare land,} \\ \text{permanent snow and ice} \end{array} \right\} \quad (3)$$

As you stated, the original equation (3) was too long for the two-column layout. To Shorten the length of the equation, we suggested using class IDs to represent classes in the equation (3). The **new** equation and the expressions of its variables are as follows:

“

$$\Omega = \{10, 20, 30, 40, 50, 60, 70, 80, 90, 100\} \quad (3)$$

where 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 are IDs of land cover classes listed in Table 2, respectively.”

These two equations have the same meaning. If the layout of this **original** equation (3) meets the formatting requirements, we suggest the **original** version of the equation (3) be retained. Otherwise, the new equation can be adopted.

Additionally, there are some areas that require corrections or completion. Please find below a detailed list:

1. Please change “the Dempster rule of combination” in Abstract to “the **Dempster’s** rule of combination”.
2. Page 3, Line 105: Please change the in-text citation “Bunting et al., 2018” to “Bunting et al., **2022**”.
3. Page 3, Line 82-84: The original sentence “FROM_GLC was first generated using numerous Landsat images, which have a fine classification system with a two-level structure.” is not clearly expressed. What we want to convey is that FROM_GLC has a two-level classification system, not Landsat images. So, we suggest correcting this sentence as:

“FROM_GLC, the first 30m GLC product generated using numerous Landsat images, has a fine classification system with a two-level structure.”

4. Page 7: There is a typo in the label of Fig.3 (marked by red rectangle in the following figure). The word “path-based sample” should be revised as “patch-based sample”. We have enclosed the revised Fig.3 with the email, please kindly update it.

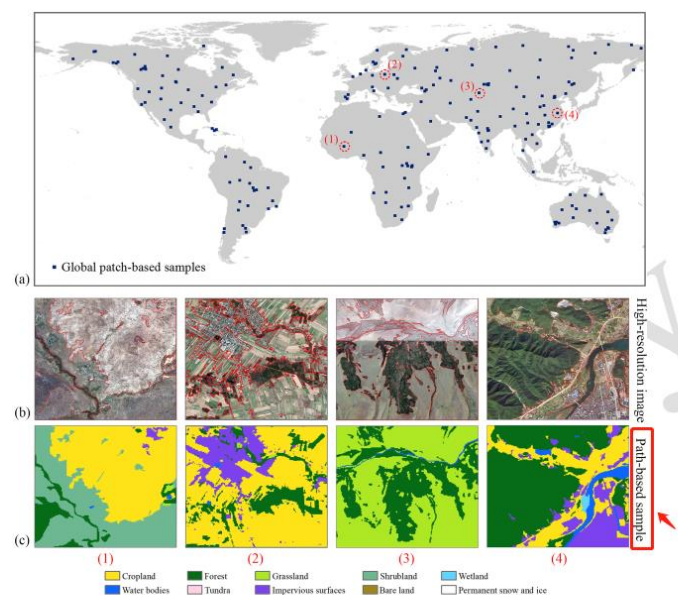


Figure 3. Spatial distribution and selected examples of the global patch-based samples. The locations of 5 km × 5 km patch-based samples are shown as panel (a), and the locations of the four selected samples are shown by red dash circles. Panels (b) and (c) illustrate the production of global patch-based samples on manual interpretation. The red lines in high-resolution images circa 2015 result after vectorization using ArcGIS 10.5 software. Four corresponding patch-based samples are shown as panel (c).

5. Page 7: There is a grammar error in the figure caption of Fig.3. The verb phrase “result after” should be “result from”.

Figure 3. Spatial distribution and selected examples of the global patch-based samples. The locations of 5 km × 5 km patch-based samples are shown as panel (a), and the locations of the four selected samples are shown by red dash circles. Panels (b) and (c) illustrate the production of global patch-based samples on manual interpretation. The red lines in high-resolution images circa 2015 result from vectorization using ArcGIS 10.5 software. Four corresponding patch-based samples are shown as panel (c).

6. Page 7, Line 25: We suggest changing “product fusion” to “product-fusion”.

7. Page 9, Line 12: There is a typographical error in which the symbol for the empty set was mistakenly written as “ Φ ”, please change “ $m(\Phi) = 0$ ” to “ $m(\emptyset) = 0$ ”.

8. Page 9, Line 12: There is a typographical error. The original equation shown in the following figure should be “ $\sum_{A \subseteq 2^\Omega} m(A) = 1$ ”.

$$\sum_{A \subseteq 2^\Omega} m(A) = 1$$

9. Page 9, Line 27-28: There are typographical errors in equation (1) and (2) where the subscripts are misplaced into the side. Please kindly revised these two equations as follows:

$$m(c) = \frac{\sum_{B_1 \cap B_2 \dots \cap B_n = C} \prod_{1 \leq i \leq n} m_i(B_i)}{1 - k} \quad (1)$$

$$k = \sum_{B_1 \cap B_2 \dots \cap B_n = \emptyset} \prod_{1 \leq i \leq n} m_i(B_i) \quad (2)$$

10. Page 9, Line 81-86: There are typographical errors in equation (5) and (6) where the Product Notation is neglected. Please kindly revised these two equations and the expressions of their variables as follows:

“

$$m(T_j) = \frac{1}{k} \sum_{T_{1j} \cap T_{2j} \dots \cap T_{nj} = T_j} \prod_{1 \leq i \leq n} m_i(T_j) \quad (5)$$

$$k = \sum_{T_{1j} \cap T_{2j} \dots \cap T_{nj}} \prod_{1 \leq i \leq n} m_i(T_j) \quad (6)$$

where k represents the basic probability mass associated with conflict, n represents the total number of the input maps, and $m_i(T_j)$ represents the basic probability mass of a certain pixel belonging to LC class T_j from i th LC map.”

11. Page 10, Line 2: There is a redundant dot in equation (7), as remarked by red circle in the following figure, please kindly delete it.

$$\text{Bel}(T_j) = \sum_{T_{ij} \subseteq T_j} m_i(T_j) \quad (7)$$

12. Page 10, Line 89: please change “global LC” to “GLC” as we have defined the abbreviation for “global land cover” as “GLC”.

13. Page 16, Line 39: “farm rack” is a typo, please change it to “farm track”.

14. Page 17, Line 69: please change “NLCD” to “NLCD 2016” as we used the National Land Cover Database 2016 (NLCD 2016) in this study.

15. Page 17, Line 85: “85.4%” is a typo, please change it to “84.5%” which was correctly list in

Table S8:

Table S8. Comparison of mapping accuracy for the GLC-2015 and NLCD 2016 via patch-based samples.

		Cropland	Forest	Grassland	Shrubland	Wetland	Water bodies	Impervious surfaces	Bare land	OA (Kappa coefficient)
GLC-2015	PA	0.924	0.514	0.788	0.905	0.024	0.911	0.747	0.691	0.845
	UA	0.873	0.718	0.840	0.916	0.019	0.916	0.686	0.683	(0.787)
NLCD 2016	PA	0.871	0.369	0.787	0.686	0.054	0.906	0.796	0.676	0.769
	UA	0.879	0.809	0.788	0.847	0.001	0.913	0.395	0.361	(0.690)

16. Page 17, Line 76 and 104: please change “NCLD” to “NLCD”.

17. Page 21: We are sorry that we neglected the degree symbol of longitude in the label of Fig.14 (marked by red in the following figure). We have enclosed the revised Fig.14 with the email, please kindly update it.

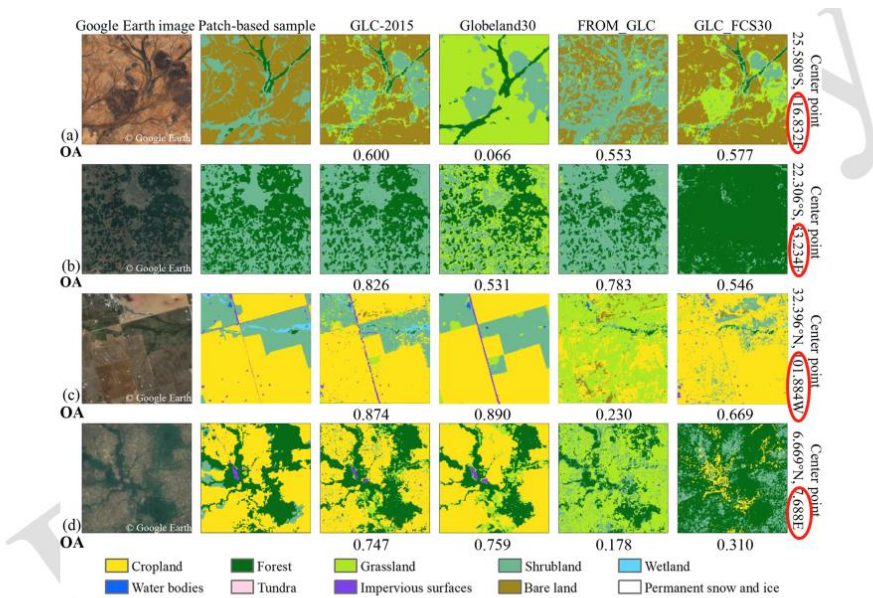


Figure 14. Visual comparison between the GLC-2015 map and three other products based on 5 km × 5 km patch-based samples and Google Earth images for four areas of high inconsistency (a–d). The OA for each product was calculated by the corresponding patch-based sample.

18. Page 22, Line 9-10: The sentence “However, the GLC-2015 map surpassed other products the areas with different agreements in inconsistency” is an ambiguous expression. Please kindly change it to “However, the GLC-2015 map surpassed other products particularly in highly inconsistent areas”.

19. Page 22, Line 103: “34117” is a typo, please change it to “34711”. The total number of the global point-based samples for accuracy assessment on the GLC-2015 is 34711, as listed in the Abstract and Table 3 (please see the following figures).

expected to be assigned the land cover class that contributes to achieving a higher accuracy. We assessed our product separately with 34711 global point-based samples and 201 global patch-based samples. Results show

Table 3. The confusion matrix for the GLC-2015 map based on the global point-based samples.

	Cropland	Forest	Grassland	Shrubland	Wetland	Water bodies	Tundra	Impervious surfaces	Bare land	Permanent snow and ice	Total	PA
Cropland	3623	387	356	61	27	48	2	71	81	0	4656	0.778
Forest	155	8813	186	141	232	16	43	43	53	3	9685	0.910
Grassland	10	337	1920	19	24	13	47	36	184	9	2599	0.739
Shrubland	155	438	656	1469	39	29	70	78	442	4	3380	0.435
Wetland	47	287	82	14	1067	64	22	18	110	4	1715	0.622
Water bodies	27	90	15	1	73	1936	17	10	44	3	2216	0.874
Tundra	1	242	119	6	29	19	1411	2	269	17	2115	0.667
Impervious surfaces	74	41	11	3	8	11	1	1295	45	0	1489	0.870
Bare land	36	59	237	32	44	91	55	60	4909	38	5561	0.883
Permanent snow and ice	0	11	8	0	4	18	13	1	86	1154	1295	0.891
Total	4128	10705	3590	1746	1547	2245	1681	1614	6223	1232	34711	
UA	0.878	0.823	0.535	0.841	0.690	0.862	0.839	0.802	0.789	0.937		
OA						0.795						
Kappa						0.757						

20. We would like to add two funding sources to this paper, and the complete financial support is:

“This research has been supported by the National Key Research and Development Program of China (grant no. 2022YFB3903402), the National Science Fund for Distinguished Young Scholars (grant no. 42225107), the National Natural Science Foundation of China (grant nos. 42001326 and 42171409), the Natural Science Foundation of Guangdong Province of China (grant no.2022A1515012207), and the Basic and Applied Basic Research Project of Guangzhou Science and Technology Planning (grant no. 202201011539).”

21. One of the references is missing from the reference list. The missing reference is:

Bunting, P., Rosenqvist, A., Lucas, R. M., Rebelo, L.-M., Hilarides, L., Thomas, N., Hardy, A., Itoh, T., Shimada, M., and Finlayson, C. M.: The Global Mangrove Watch-A new 2010 global baseline of mangrove extent, *Remote Sens.*, 10, 1669, <https://doi.org/10.3390/rs10101669>, 2018.

Please kindly add this reference to the manuscript.

22. We are sorry for that we have inserted two identical references in the reference list (**Page 25, Line 41-50**), as shown in the following:

- Liu, X., Huang, Y., Xu, X., Li, X., Li, X., Ciais, P., Lin, P., Gong, K., Ziegler, A. D., and Chen, A.: High-spatiotemporal-resolution mapping of global urban change from 1985 to 2015, *Nature Sustain.*, 3, 564–570, 2020a.
- ⁴⁵ Liu, X., Huang, Y., Xu, X., Li, X., Li, X., Ciais, P., Lin, P., Gong, K., Ziegler, A. D., Chen, A., Gong, P., Chen, J., Hu, G., Chen, Y., Wang, S., Wu, Q., Huang, K., Estes, L., and Zeng, Z.: High-spatiotemporal-resolution mapping of global urban change from 1985 to 2015, *Nature Sustain.*, 3, 564–570, <https://doi.org/10.1038/s41893-020-0521-x>, 2020b.
- ⁵⁰

Please kindly merged them into one, that is:

Liu, X., Huang, Y., Xu, X., Li, X., Li, X., Ciais, P., Lin, P., Gong, K., Ziegler, A. D., Chen, A., Gong, P., Chen, J., Hu, G., Chen, Y., Wang, S., Wu, Q., Huang, K., Estes, L., and Zeng, Z.: High-spatiotemporal-resolution mapping of global urban change from 1985 to 2015, *Nat. Sustain.*, 3, 564–570, <https://doi.org/10.1038/s41893-020-0521-x>, 2020.