

Earth Syst. Sci. Data Discuss., referee comment RC1
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Comment on **essd-2021-202**

Anonymous Referee #1

Referee comment on "Implementation of the CCDC algorithm to produce the LCMAP Collection 1.0 annual land surface change product" by George Z. Xian et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-202-RC1>, 2021

This manuscript introduced a new land cover and land surface change dataset created by the Land Change Monitoring, Assessment, and Projection (LCMAP) program over CONUS. The authors presented a novel approach to implement the CCDC algorithm to produce the LCMAP product. The LCMAP land cover products were validated using a collection of 25,000 samples, giving an overall agreement of 82.5%. such dataset is an important contribution to for land resource management. A minor revision suggestion may be given from my side.

Some comments were listed bellowing.

L47-48: To our knowledge, this is the first set of published 30 m annual land cover and land cover change datasets that span from the 1980s to the present for the United States. This sentence should be revised because a recently paper was not referred in this manuscript. Prof. Gong's team produced the first 30m global annual to seasonal land cover maps for 1985–2020, which covered the study area and temporal extent of LCMAP.

Liu, H., Gong, P., Wang, J., Wang, X., Ning, G., & Xu, B. (2021). Production of global daily seamless data cubes and quantification of global land cover change from 1985 to 2020-iMap World 1.0. *Remote Sensing of Environment*, 258, 112364.

L293: 3.4 Land cover classification. It is better to add a land-cover classification flowchart and the corresponding explanations here.

L329-333: How many bands and features were used in total? Why the 'intercept' parameter was discarded? What is the contribution of brightness temperature bands?

L366-368: QA/QC is extremely important for the validation dataset. How many interpreters are assigned for each sample? More details should be given for the QA/QC processing, not just a reference (Pengra et al., 2020a).

L524-526: Indeed, the mapping error of NLCD could potentially be carried over to the training samples. How does it affect the classification accuracy of the LCMAP dataset? Two references can benefit this concern (Fig.1 in Gong et al., 2019; Fig. 10 in Zhang et al., 2021).

Gong, P., Liu, H., Zhang, M., Li, C., Wang, J., Huang, H., Clinton, N., Ji, L., Li, W., Bai, Y., Chen, B., Xu, B., Zhu, Z., Yuan, C., Ping Suen, H., Guo, J., Xu, N., Li, W., Zhao, Y., Yang, J., Yu, C., Wang, X., Fu, H., Yu, L., Dronova, I., Hui, F., Cheng, X., Shi, X., Xiao, F., Liu, Q., and Song, L.: Stable classification with limited sample: transferring a 30m resolution sample set collected in 2015 to mapping 10m resolution global land cover in 2017, *Sci. Bull.*, 64, 370–373, <https://doi.org/10.1016/j.scib.2019.03.002>, 2019.

Zhang, X., Liu, L., Chen, X., Gao, Y., Xie, S., and Mi, J.: 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>, 2021.

L488-489 The LCMAP product suite includes five land cover change and five land surface change science products. There is no link to the corresponding parts in the Supplementary Material. Please check throughout to link the supplementary file with the main manuscript.