

Comment on **essd-2022-250**

TC Chakraborty (Referee)

Referee comment on "Contemporary (2016–2020) land cover across major proglacial regions in West Antarctica and the McMurdo Dry Valleys" by Christopher D. Stringer et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-250-RC2>, 2022

Summary: In the study titled "Contemporary (2016–2020) land cover across West Antarctica and the McMurdo Dry Valleys", the authors use k-means unsupervised clustering to classify 6 proglacial regions in Antarctica using Landsat images. While I appreciate the motivation behind the study, the analysis done is simplistic and does not address the motivation sufficiently. As such, I would suggest rejection at this stage with the potential for resubmission after significant revision.

Major Comments:

- The authors argue that since the Antarctic is changing faster than other land surfaces, there is a need for land cover datasets specific to Antarctica. So, they choose 6 regions and use Landsat image between 2016-2020 to do this classification. The bands chosen are such that the classification could be expanded to include earlier years in the future. However, they only provide a static map using these limited years of observations. The study would be much more complete if they provided the land cover maps from 1976 to 2020. Otherwise, the work seems preliminary to the point that there would be no use of this dataset till the annually varying dataset is released.
- The changes in land cover in Antarctica has significant seasonal components that is impacted by ENSO oscillations and other factors. As such, I am unsure how useful an annual land cover map is for analysis of ice cover loss.
- The 6 regions represent a tiny fraction of Antarctica; and as such, the study does not really address the main motivation of the work, which is the need for a continental scale land cover dataset for Antarctica.
- K-means is a really simple method and the field has advanced in terms of classification methods. More importantly, since they already use finer resolution labelled data for validation, it would be much more useful to use supervised learning, which generally performs better than unsupervised methods.
- Why were the number of clusters chosen through trial and error instead of using commonly used elbow methods?
- There are missing figures.