

Comment on **essd-2021-285**

Anonymous Referee #2

Referee comment on "GISD30: global 30 m impervious-surface dynamic dataset from 1985 to 2020 using time-series Landsat imagery on the Google Earth Engine platform" by Xiao Zhang et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-285-RC2>, 2022

In this manuscript, the authors produced a global 30 m impervious surface dynamic dataset from 1985 to 2020 using the spectral generalization method and time-series Landsat imagery on GEE, and cross-compared the dataset with four existing global 30 m impervious surface products. The manuscript is well arranged, and the logic is clear. Even so, there are still some modifications need to be finished before it accepted. The following are the questions and some mistakes in this manuscript.

- Line 130: What is the size of the areas where these data are missing? Whether the assumption that their land cover types remain unchanged will affect the accuracy of the final classification results.
- Line 132: What do these numbers in the legend of Figure 1 mean? Do they represent the number of scenes in the images from different years? Why do not marked in the legend of the figure?
- Lines 161~165: I do not understand this part of the text. What do you mean like 'the location of each validation sample in rural areas was moved to the center of the impervious object' With such a large sample set, how did you identify the validation sample in rural areas?
- Lines 356~357: 'we categorized the time-series impervious surface dynamic into 9 independent strata, including: pervious surfaces, impervious surfaces before 1985, and expanded impervious surfaces during 1990-1995, 1995-2000, 2000-2005, 2005-2010, and 2015-2020.' Whether 1985-1990 and 2010-2015 are missing from the presentation.
- Line 364: 'Further, we selected three types of cities (mega-cities, tropical cities and arid cities)...' Why choose these three types of cities to reveal the spatiotemporal dynamic.
- English writing needs to be further improved; some sentences are too long to affect the understanding of the article. The sentences can be broken down. e.g.: Lines 123~127, 127~131...
- Line 22: '... similar to in ...' should be 'similar to'?
- Line 146: '...normalized difference water index (NDWI) and NDWI...' should be 'NDVI'?