

Comment on **essd-2022-210**

Anonymous Referee #2

Referee comment on "A 250-m annual alpine grassland AGB dataset over the Qinghai-Tibet Plateau (2000–2019) in China based on in situ measurements, UAV photos, and MODIS data" by Huifang Zhang et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-210-RC2>, 2022

This paper developed a new annual 250-m grided AGB dataset from 2000 to 2019 over the Qinghai-Tibetan Plateau by using ground in-situ measurements, multi-years UAV images and MODIS datasets. UAV images were used as the bridge to overcome scale mismatches between ground samples and coarse MODIS satellite pixel scales. Many efforts have been devoted on UAV observation works as well as field sample works at large region scales. In general, I think this is a good paper and is within the scope of ESSD. I have a few comments for authors' consideration.

1. In table 1, the acquisition times of UAV sampling and field sampling of AGB in 2019 were mainly in the growth season and therefore the UAV estimations of AGB also in this season. However, the MODIS pixel level vegetation indices were composited by MVC method which can reflect the best grown condition in the whole year. Aboveground biomass may still be available for several months after sampling. The temporal mismatches between field work and MODIS composites may lead to estimation errors.
2. In section 2.3.2, the BELT flying mode were used for three GRID routes and four ground sampling quadrats were sampled in the BELT routes. However, in the Figure 2 and Section 2.5, how were the BELT images at 2-m height used was not introduced. It seems only 20-m UAV images were used for development of UAV estimation model.
3. For one MODIS pixel, it seems more than 16 UAV images at 20-m height are needed to cover the whole pixel. I'm not quite understanding the GRID, RECTANGLE and BELT flight modes. Does it mean the UAV only take pictures in the waypoints and there are gaps among those pictures? The authors can explain more about how it works as traditionally we will make overlaps among pictures.

4. Page 18, line 324, "The reason was that the GIRD mode could obtain 16 photos in the MODIS pixel at a time, while the RECTANGLE mode could only take 12 photos". Figure A1(b) should be cited to explain the RECTANGLE model.

5. Page 22, line 407, "AGB_2000.tif represents this TIFF file describing the alpine grassland AGB condition of QTP in 2005" should be in 2000.