Response to #Reviewer 4

The manuscript provides a novel large dataset of 52477 trait measurements on 4291 species for eight relevant traits from 1541 sites across China, compiled from existing datasets and an extensive literature search. Based on these trait data, the authors use environmental drivers, satellite-derived vegetation indices and plant functional type association and abundance to derive high-resolution maps (1km x 1km) across China for these traits. The authors evaluate the maps.

The trait measurements and maps presented fit the scope of the journal.

[Response]: Thanks so much for your encouragement and positive comments on our work. We have carefully addressed the suggestions in the revision, and detailed revisions and responses are listed below. In addition, we have used tracks to highlight the revisions in the revised manuscript.

I have one major and a few minor comments.

1. My major comment: I was not able to completely follow the up-scaling workflow from the leaf-level data to the gridded maps. A figure indicating the different resources and steps might help.

[Response]: Thanks for your constructive suggestion. We have added a methodological workflow for spatial mapping of plant functional traits in China as Figure 1 in the revised manuscript. In addition, we have also added "section 2.1 Overview" to explain the steps of spatial mapping of plant functional traits in the section Methods and Materials (see Lines 119–132 in the revised manuscript).

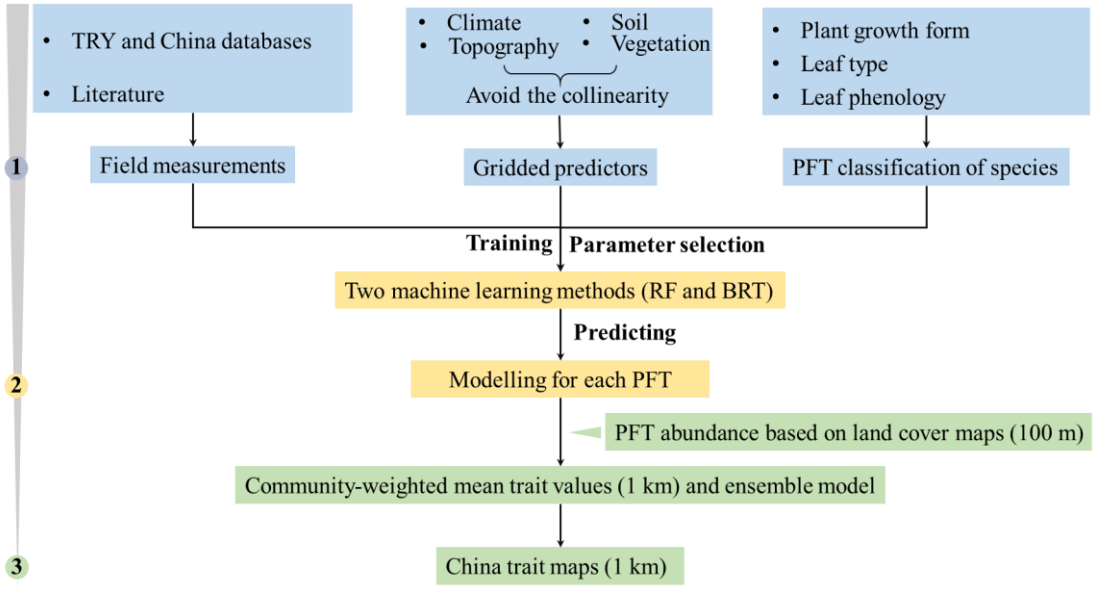

Figure 1. Methodological workflow for spatial mapping of plant functional traits. Trait

mapping is performed in three steps. Step 1: in-situ field measurement of plant functional traits, PFT classification of plant species and gridded predictors were collected. Step 2: two machine learning methods were used to predict trait values by training the field measurements and predictors for each PFT. Step 3: spatialization of trait maps by calculating the abundance of each PFT using 100 m land cover map and predicted trait values within 1 km grid cells. PFT, plant functional type; RF, random forest; BRT, boosted regression trees.

Minor comments:

2. The maps should not be called 'data', as they are rather data products. I would suggest just calling them 'maps'.

[Response]: Thanks for your nice suggestion. We have changed the ‘dataset’ to ‘maps’ in the revised manuscript.

3. Line 67: probably the PROSPECT model (not PROPECT).

[Response]: We have corrected PROPECT model to PROSPECT model in the revised manuscript (See Line 70).

4. Line 131: The measurement date or/and time are not provided with the leaf level data.

[Response]: We have added the trait measurement date or/and time into the original dataset when the measurement time has been reported in the literature and public database. However, 45 literatures and three databases from TRY did not provided the measurement time. Please see the updated dataset used in this study at the figshare link: https://figshare.com/s/c527c12d310cb8156ed2.

5. Figure 4: I do not understand the values of the density axes.

[Response]: Density curve is also called as probability density curve, which usually used as a probability density function for continuous variables. The x axis represents of the density curve is the random value of a variable, and the y axis (density axes) is the probability density of this random value.

6. For vegetation modelling it would be excellent to additionally provide a separate map for each PFT per trait.

[Response]: Thanks for your suggestion. We have provided the separate map of each PFT per trait as Figure B1 in Appendix B.

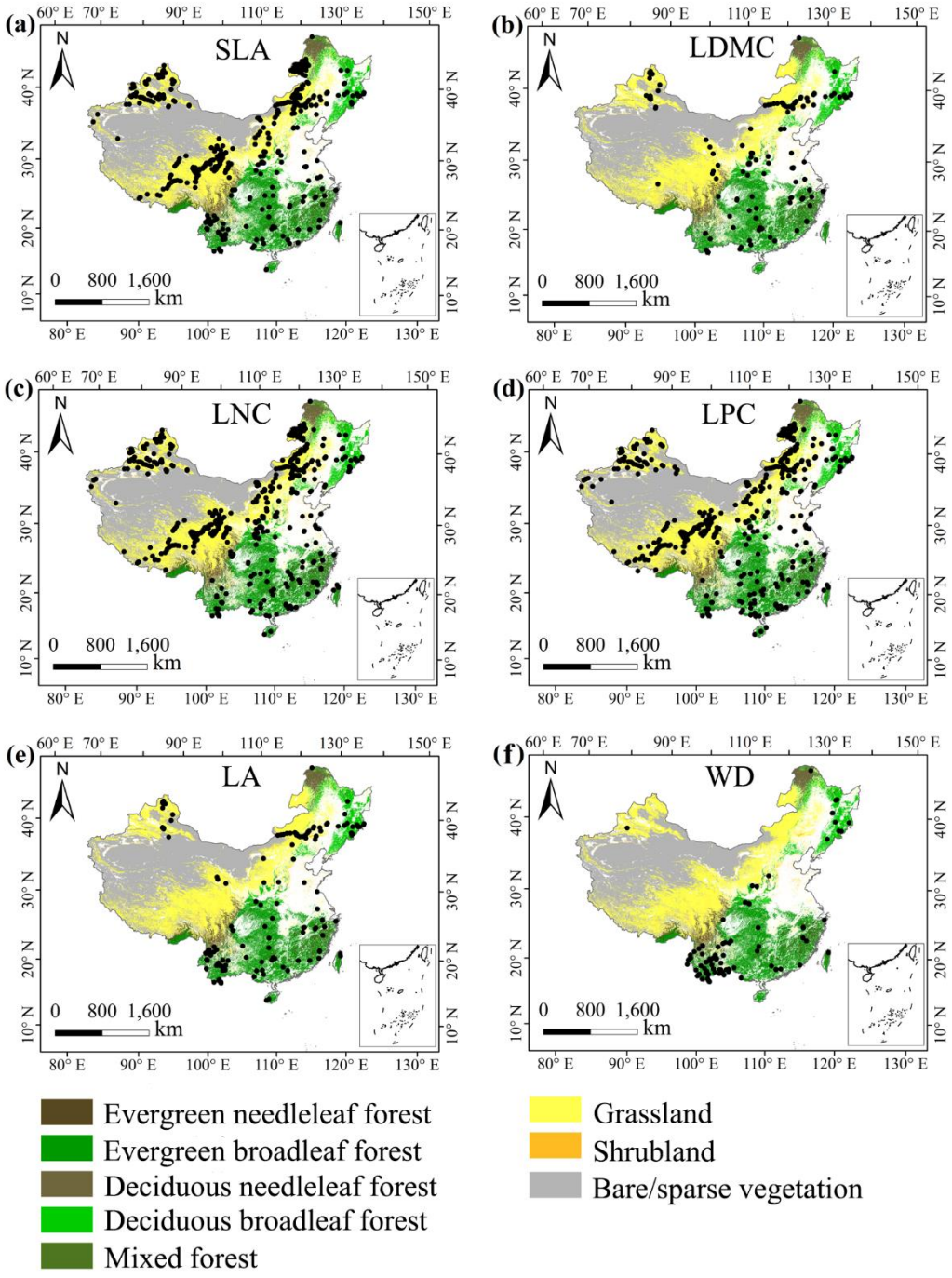

Figure B1. The distribution of sampling site of each plant functional traits across China. The black dots represented the locations of trait observations.