

Interactive comment on “Depth-to-Bedrock Map of China at a Spatial Resolution of 100 Meters” by Fapeng Yan et al.

Anonymous Referee #2

Received and published: 23 October 2018

(1) The resolution of the produced DTB map should be much coarser than 100m. The authors declared that its spatial resolution is 100m. But I notice that most environmental variables used in the models are at 1km resolution. Fig5 clearly shows contributions of the used variables to the DTB model prediction. The first four covariates are the dominant contributors to the DTB prediction, and they are TWI, landform units, openness index and slope all at a 1km resolution. Two variables including 100m elevation and 30m land cover are only minor contributors to the prediction. In addition to the two variables, all other variables used in the prediction are at 1km resolution. So, it is not appropriate to say the resolution of the DTB map arrives 100m.

(2) For the list of covariates in the supplement file, I notice that although over 130 covariates (too many) were considered, only a small part of these covariates have

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true contribution to the final predictions. It is not necessary to list so many useless covariates. I suggest the authors only list the covariates showed in Fig5 or a little more. The advantage of a brief list would be easy to convey our readers a clear and brief knowledge or understanding on the relationship of the DTB and its covariates. Besides, quite a few of the covariates in the list have high correlation. Removing redundant variables would simplify the models and reduce the computation. In addition, some of the covariates may have data quality and consistency problem. For example, the layer of Landsat TM band3(red) of year 2000 was produced by mosaicing many scenes of TM images of different months and seasons in the year of 2000. The inconsistency would introduce error to prediction.

(3) The method framework of the prediction is almost the same to Shangguan et al. (2017) and Hengl et al (2017?). It would be good to clearly refer to these previous work in the method part and the figure3.

(4) The authors used RF and GBT models to produce a map of DTB but used another model 'quantile regression forest' to estimate uncertainty of the DTB map. This is not consistent. The problem is that the resulting uncertainty estimation may not actually reflect true uncertainty of the DTB map.

(5) Line52-57: two problems in these words: 1) In soil survey, when soil thickness is greater than 2m but the observed depth is less than 2m, the surveyors never record the soil thickness as a value lower than 2m BUT record it as a censored data '>2m'. This is standard recording in soil surveys. 2) The reason why soil survey generally does not reach bedrock for some very thick soils is NOT the equipment and technological constraints. This should come to the purpose of soil survey, it is just not necessary to reach bedrock. The depth of 2 meter is enough for surveyors to identify soil types and properties.