

## ***Interactive comment on “ChinaCropPhen1km: A high-resolution crop phenological dataset for three staple crops in China during 2000–2015 based on LAI products” by Yuchuan Luo et al.***

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Thanks for your careful reviewing and all constructive comments on our manuscript. We have taken all your comments into account and responded positively to qualify our manuscript for a potential publication in the journal. The reviewer’s comments are marked in black color, while our detailed responses in blue. Accurate crop phenological dataset at the large regional scale is of great importance to various agricultural applications. This paper established the ChinaCropPhen1km, which consists of high-resolution gridded-phenology product for three major staple crops of China, i.e., wheat, maize, rice. Several comments for this paper are listed as follows. 1) As the authors

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pointed out, the study area of this study (i.e., the China mainland) possesses complex environments and crop planting patterns, diverse cropping intensity and cultivation habits. Therefore, according to previous studies, I suggest the practice of separating the whole study area into sub agro-climatic zones, and establishing model for each crop type from each zone, might further improve the model's performance and dataset accuracy. Response: Thank you a lot for the insightful suggestion. We greatly agree with you that the studied area division is vital for detecting accurately crop phenology owing to the complex environments and crop planting patterns, diverse cropping intensity and cultivation habits in the study area. Actually, we separated the whole studied area into different provincial administrative units, which is more specific than agricultural zones. Especially, for provinces with large heterogeneity in crop planting patterns, such as Shaanxi, Shanxi and Hebei province where spring-sown crops are planted in the north and summer-sown crops in the south due to the different agroclimatic characteristics, we divided them into two parts based on agroclimatic regionalization to detect phenology for each crop type (as shown in Fig.1). Given the large spatial extent of the study area, we believe that the method of studied area division used in our study is more specific and reasonable than what you have suggested. Reference: Zhao, J., Yang, X., & Sun, S. (2018). Constraints on maize yield and yield stability in the main cropping regions in China. *European Journal of Agronomy*, 106-115. 2) Another issue is that how the authors determine the spatial distribution of each crop type. Any crop mask have been used in your study? Response: Yes, we did use crop mask for identifying the spatial distribution of each crop type. In this study, we first selected the cultivated-land layer derived from the 1-km National Land Cover Dataset (NLCD) of China as cropland masks. Then, we identified the inflection and maximum points of LAI time-series for each cropland grid as indicators of corresponding key phenological stages (as mentioned in Section 2.3.3) for each crop within the restricted time windows based on the observations around the nearest AMS. Finally, we regarded the grids with three indicators during the time windows as crop-cultivated grids for each crop. Specifically, we detected the key phenological dates for dryland crops (i.e., maize and wheat) and

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paddy rice, which were restricted on the dry land and paddy field layer derived from the NLCD, respectively. Reference: Chen, Y., Zhang, Z., & Tao, F. (2018). Improving regional winter wheat yield estimation through assimilation of phenology and leaf area index from remote sensing data. *European Journal of Agronomy*, 163-173.

Fig.1: Spatial patterns of annual averages of three key phenological dates during 2000~2015 for rice (a), wheat (b), and maize (c). 3) Besides, the uncertainty of the developed dataset should be further discussed. As the proposed dataset are based on the GLASS LAI, it is suggested that the accuracy of GLASS LAI should also be provided. And the authors had better analyze the impact of the uncertainties of GLASS LAI on ChinaCropPhen1km. Response: Thanks very much for your constructive comment. We have followed you to insert relevant contents into our manuscript (highlighted in "Track Changes" as suggested in the revised manuscript). 1. In the Data and methods (Section 2.2.1), the accuracy of GLASS LAI has been provided from Line 78 to 80 in the revised manuscript. 2. In the Results and Discussion (Section 3.5), we added one paragraph (from Line 296 to 316 in the revised manuscript) for discussing the uncertainties in the study.

Please also note the supplement to this comment:

<https://www.earth-syst-sci-data-discuss.net/essd-2019-110/essd-2019-110-AC1-supplement.pdf>

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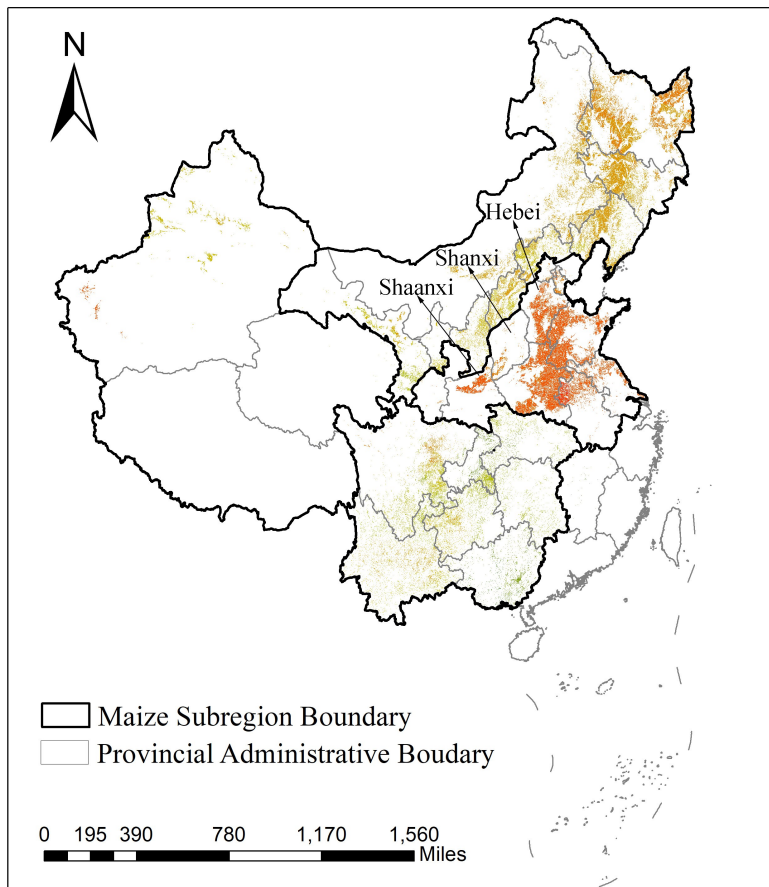


Fig. 1.