Dear Editor and Reviewer:

Thanks for your careful reviewing our manuscript. Those comments are all valuable and helpful for revising and improving our researches. We have studied comments carefully and have made a correction which we hope meets with approval. We will consider updating this dataset regularly in the future. The point-to-point responses to your comments are listed below in blue.

General Comments

Point 1: The authors have done a lot of verification work, and the results show that the accuracy of the rapeseed map is reasonable. I noticed that there is a land cover map of France with a spatial resolution of 10 m on Theia (https://www.theia-land.fr/en/2018-land-cover-product/). I hope that the author will compare their results with the French land cover map at the pixel-level comparison in their revised manuscript. Also, the comparisons between FAO's statistics and existing products will largely confirm the robustness and improvement of their study. Although the workload may be heavy, it is helpful to evaluate the accuracy of the rapeseed map more comprehensively.

Response:

1) We greatly appreciate the helpful suggestion and positive comment. We have compared our rapeseed maps with the Land Cover Map of France (LCMF) at the pixel level in 2018. The verification method can be found in Section 2.4 in the revised manuscript. The confusion matrices show that the producer’s accuracy (PA), user’s accuracy (UA), and F1 score (F1) are 0.70, 0.97, and 0.81, respectively (Table R1).

Table R1 The comparison of rapeseed (pixels) in France in 2018, with rows from reference classification, while columns from our derived map.

Existing products		Non-rapeseed	Rapeseed	Total	PA	UA	F1
LCMF 2018 (France)	Non-rapeseed	82606784	5545926	274324984	0.70	0.97	0.81
	Rapeseed		191718200				
	Total		197264126				

Also, the results showed relatively good consistent distributions between our rapeseed maps and the LCMF (Figure R1). The yellow grids mean they are identified as rapeseed areas both by our method and LCMF datasets.

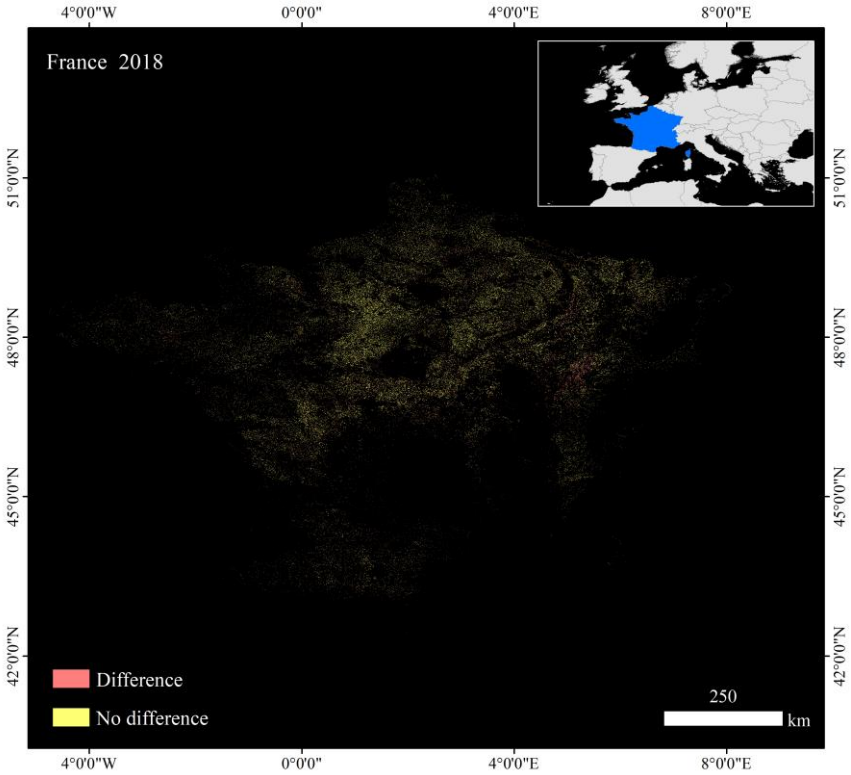

Figure R1. Spatial comparison between rapeseed classifications obtained by our method and land cover map of France in 2018.

2) We compared the rapeseed areas from different data sources (FAO statistics, existing products, and our rapeseed maps). Fig. R2 shows that the rapeseed areas calculated from our maps are consistently more comparable to FAO statistics than those from existing products.

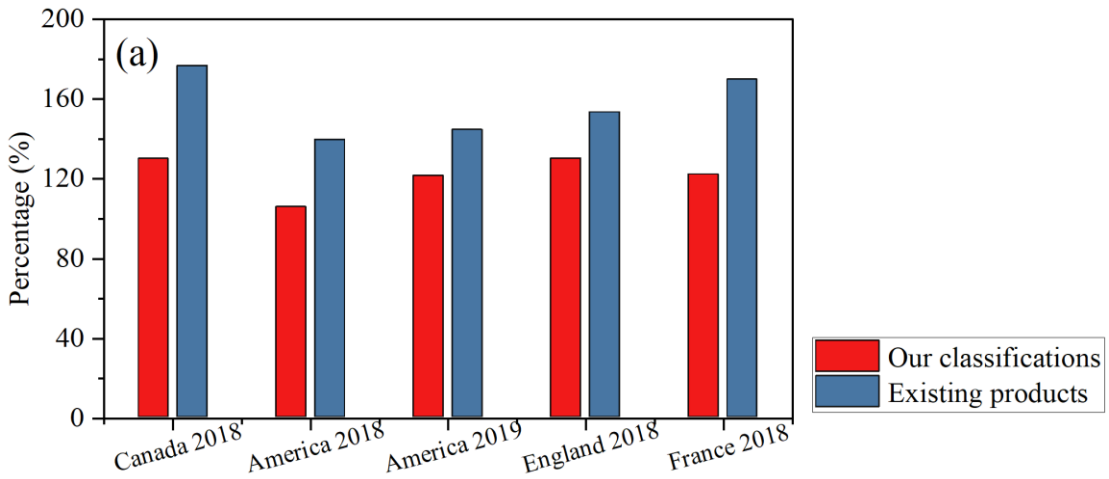

Figure R2. Validation results of the classifications. (a) The percentage of the rapeseed area of the existing products and classification results in the FAO statistics.

3) Also, we have added the above comparison results (data sources, Figures, and text description) in the revised manuscript. For more details, please see lines 13, 131-133, 290, 303, 331-340, 358-359, and Table 1 in the revised manuscript and lines 20-24, 91-93 in the revised attachment.

Point 2: I suggest that the authors revise the title, showing clearly the name of their data. For example, 'The RapeseedMap10 database: a map of rapeseed with10m-spatial resolution based on multi-source data'.

Response: Thank you a lot for the insightful suggestion. We have revised the title' The RapeseedMap10 database: annual maps of rapeseed at a spatial resolution of 10 m based on multi-source data'

Point 3: The introduction should add content about crop rotation.

Response: Thank you for your careful comments. We have added some relevant content in the Introduction section. “Also, crop rotation is beneficial to the management of pests and diseases in crop production (Harker et al., 2015; Liu et al., 2018a). Previous studies have shown that crop rotation is one of the main causes of yield change in rapeseed production (Harker et al., 2015; Ren et al., 2015). The physical and chemical properties of the soil will change during crop rotation, and these changes will affect rapeseed growth (Ren et al., 2015). Most of the current studies are limited to field observations (Peng et al., 2015). The spatial distribution information of rapeseed rotation in different regions is still not clear due to the lack of high-resolution rapeseed maps. It is necessary to explore the rapeseed rotation for cultivation and management.”

Please see the details in Section 1 (lines 75-80), which have been inserted some descriptions about crop rotation.

Point 4: Should include some quantitative results into their conclusion.

Response: Many thanks for your careful check. We have extended the conclusion with some quantitative results in Section 6. For more details, please see lines 446-448 in the conclusion.

Specific comments

Point 5: Line 58: “Fortunately” > not a good way of academic writing.

Response: We have deleted the word “Fortunately”. Also, we have checked the whole manuscript.

Point 6: I suggest that the authors consider putting the confusion matrix of Table 2 in the attachment, and present the accuracy indicators (PA, UA, and F1) more intuitively in the form of graphs.

Response: Thank you a lot for the insightful suggestions. We added a bar graph that presents the accuracy indicators in the revised manuscript (line 336). Figure R3 shows that the UA, PA, and F1 varied by country, with PA of 0.70–0.80, UA of 0.93–0.97, and F1 of 0.81–0.86. The rapeseed areas obtained by us accounted for around 71% of 2018 CDL, 71% of 2018 ACI, and 80% of 2018 CROME, and 70% of 2018 LCMF, and 79% of 2019 CDL. For more details, please see lines 330-340 in the revised manuscript.

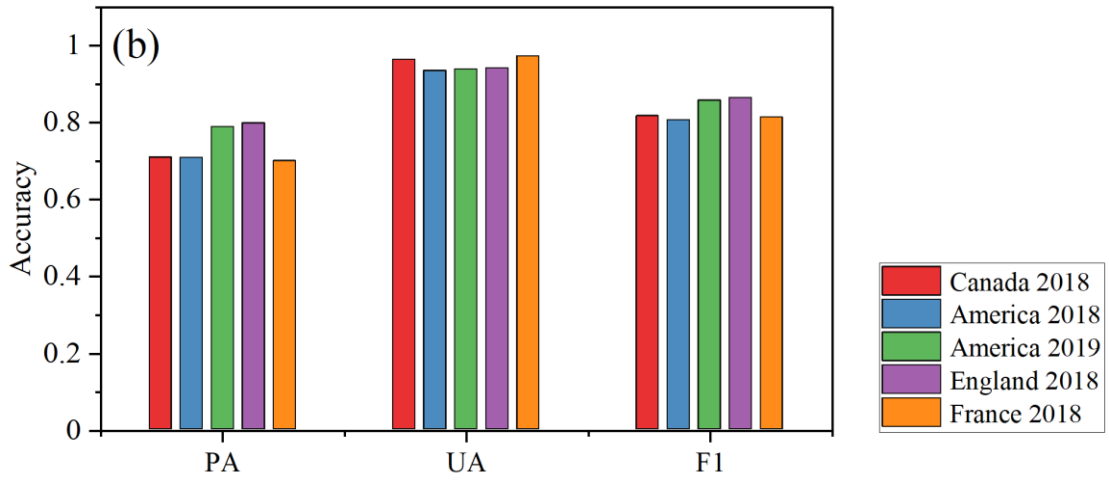

Figure R3. Validation results of the classifications. The user’s accuracy (UA), producer’s accuracy (PA), and F1 score (F1) of classifications in four countries (Canada, America, England, and France). The existing products were used as reference data.

Point 7: Add the names of the 33 countries to the caption of Figure 1.

Response: Many thanks for your careful check. We added the names of the 33 countries to the caption of Figure 1. For more details, please see lines 102-106 in the revised manuscript.

Point 8: Consider removing the color bar on the bottom of Figure 2e.

Response: We deleted the color bar at bottom of Figure 2e. For more details, please see line 196 in the revised manuscript.

Point 9: The caption and vertical axis label of Figure 3d are not clearly described, need more details.

Response: Thanks for your careful review. We have modified the vertical axis label of Figure 3d in the manuscript. Also, we have added some relevant content in the caption. Please see lines 229-231 in the revised manuscript for more details.

Point 10: “n” and “connected domain” are not defined in Figure 5, more details needed.

Response:

Thanks a lot for the insightful suggestion.

1) “n” represents the number of images. We have modified the picture and added the description of the meaning of n. Please see line 285 in the revised manuscript for more details.

2) We have modified "connected domain" to "connected components". In this study, we used 8-connected rules, which means that the edges or corners of the pixels are connected. If two adjacent pixels are connected, they are part of the same object

(https://www.mathworks.com/help/images/ref/bwareaopen.html). The bwareaopen function in MATLAB 2020b software was used to remove the objects which are less than the threshold. Also, we have added some relevant content in Section 2.3.4. Please see lines 279-284 in the revised manuscript for more details.

Point 11: "others" in figure 6 is not clearly understood for me, need more details.

Response: We have modified the picture and added more description in the caption of the figure. Please see lines 327-329 in the revised manuscript for more details.

Point 12: The authors should give more explanations why the class ⩾2 meaning for a crop rotation in the manuscript. I guess it might be explained by the changes of more than twice at the same pixel can be observed in their study.

Response: Many thanks for your careful check. We have added some relevant content in Section 4.1. Please see lines 391-392 in the revised manuscript for more details.

Point 13: Line 370: "the algorithm does not need training sample data... " should be revised to "the algorithm does not need a large number of training samples."

Response: We have modified the sentence (Line 409).

Point 14: It would be better to replace "… ranged from 0.84 to 0.92…" with "… ranged 0.84-0.92…"

Response: We have modified the sentence (Line 448).

Point 15: "…such as climate and temperature…", remove "and temperature"

Response: We have removed "and temperature" in the sentence. Please see line 99 in the revised manuscript for more details.

Point 16: "The rapeseed parcels without high-quality available time-series imagery…"

Response: We have modified the sentence (Line 210).

Point 17: revise "a latitude of 45~56°N" to "latitudes of 45~56°N", The same for others throughout the manuscript.

Response: We have modified the sentence (Lines 308, 375, 377). Also, we have checked the whole manuscript.