

We are highly appreciated for your constructive comments and suggestions on our manuscript. Those comments and suggestions are valuable and helpful for revising and improving our article, as well as inspiring our research. We have carefully reviewed the comments and have revised the manuscript accordingly. Our responses are given in a point-by-point manner below and **BLUE** fonts. Please find our detailed responses below to all these comments/suggestions and thank you again for everything you have contributed.

RC2

This study demonstrated a global irrigation dataset with 100 meters using irrigation performance during drought stress, which is a brand-new way to detect irrigated and non-irrigated cropland. Furthermore, this MS finishes mapping the global central pivot irrigation system using the Deep Learning method. Also, it is interesting to detect special irrigation methods using deep learning methods. Overall, the MS was well-written and designed for readers. But there were still some concerns before this MS was accepted:

Response: Thanks for your positive comments.

Major concerns:

1. About the resolution: In section 2.1 some coarse data was described as input data, but the final resolution of the irrigation map is 100 meters, so this will mislead some readers on how to produce a 100-meter irrigation map using 500-meter data.

Response: Thanks for your comments. The evapotranspiration, precipitation product with 500-meter resolution was used to determine the driest months within each IMZ. And the time period was used to detect irrigation performance and detect irrigated cropland. In each IMZ, 30meter NDVI data was used as major input. Then to avoid effect fallow land and crop rotation, we calculate the irrigation proportion within 100meters.

We also added this statement in the body text.

2. About the IMZs: You mention that “65 MRUS in Cropwatch served as the basis for further division of global cropland into 110 irrigation mapping zones (IMZs)”, what is the principle for further dividing these zones? Are these zones available or not?

Response: Thanks for your comments. We further divided 65 zones into 110 based on arid indices, water availability, soil types, and landforms. This data is publicly available on the CropWatch website or you can contact us via email.

3. About accuracy assessment: you collect many field points using the GVG app. How to distinguish irrigation field points during the field survey?

Response: Thanks for your constructive suggestions. Although it is not easy to identify irrigated cropland on satellite data, irrigation cropland could be identified accurate in field according to irrigation infrastructure, crop type and crop health condition. Even you cannot distinguish them following above characteristics, you could ask local farmer, who will answer this question with hesitate.

- Irrigation infrastructure, some obvious feature was easy to identify, such as canner, irrigation plump and central pivot irrigation system. We display serval photos for this case as below:

	
<p>Irrigation cannel in Xinjiang</p>	<p>Drip irrigation in Hebei province</p>
	
<p>Irrigation pump</p>	<p>Central pivot irrigation system</p>

- Usually, irrigated was applied for certain crop types, such as winter wheat in North China Plain, Cotton in Xinjiang and vegetable and tomatoes in most province, et.al.
- Last but not least, irrigated crops usually appear greener and lush compared with near crops.

4. The irrigation map and GCPIS were identified using two ways (irrigation performance and DL), but some figures make me confused to display these two results.

Response: Thanks for your valuable comments, we have changed the display manner in the MS for Figure1, 6, 16.

Minor revision:

1. The preprocess of NDVI data in Line 160 should be further explained.

Response: Thanks for your suggestion. We added more explanations in the text to describe the preprocessing to NDVI data.

2. You could list some detailed maps of global CPIS in Figure 6 to make the global CPIS map clearer.

Response: Thanks for your suggestion, we added the detail map of CPIS in Figure6.

3. In Figure 16 it will be significant if the satellite images were added to give the reader a basis for their judgment.

Response: Thanks for your suggestion. We have revised the figure accordingly. Please see the revised one:

4. IMZ was not so readable in Figure 1.

Response: Thanks for your comment, we have separate figure one as two to make the element such as IMZ boundary clearer.

5. The English should be further polished and improved.

Response: Thanks for your suggestion, we have polished our MS and the certification is shown as below.



Editing Certificate

This document certifies that the manuscript

GMIE-100: A global maximum irrigation extent and irrigation type dataset derived via irrigation performance during drought stress and machine learning methods

prepared by the authors

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