

Response

Q1. Line 67: There is a period before the citation and another one after it. Please pay attention to this detail error.

Thank you for pointing out this detail error. We apologize for the oversight regarding the duplicate periods before and after the citation in Line 67. This has now been corrected in the revised manuscript. We appreciate your careful review and valuable feedback, which has helped improve the quality of our paper.

Q2. Line 143: The authors should consider including the geographical coordinates (longitude and latitude) of the monitoring stations in Table 1. Providing this spatial reference would significantly enhance the study's reproducibility and facilitate comparative analyses with other datasets.

We have now included the geographical coordinates (longitude and latitude) of the monitoring stations in Table 1, as recommended. This addition enhances the study's reproducibility and facilitates comparative analyses with other datasets.

Q3. Line 147 and 150: It is recommended to change the last third of the sentence to: "The last third of the long-term series data from the ALF, CBF, and QYF stations were used for forest model validation. Similarly, the last third of the data from DLG, DXG, and HBG stations were used for grassland model validation, and the last third of the data from JZA and YCA stations were used for cropland model validation."

We appreciate your suggestion to improve the clarity of the sentence. Following your recommendation, we have revised the sentence to: "The last third of the long-term series data from the ALF, CBF, and QYF stations were used for forest model validation. Similarly, the last third of the data from DLG, DXG, and HBG stations were used for grassland model validation, and the last third of the data from JZA and YCA stations were used for cropland model validation."

Q4. Line 156: It is recommended to change "However, some sites have no ER data" to "some sites lacked ER data."

We have revised the sentence to: "some sites lacked ER data," as suggested, to improve conciseness and clarity.

Q5. Line 216 and 219: (C. Wang et al., 2021) should be (Wang et al., 2021).

We apologize for the citation format error. The citation has been corrected to (Wang et al., 2021) in Lines 216 and 219, as per your recommendation.

Q6. Line 241: The table title does not have a period at the end.

Thank you for catching this oversight. We have added a period at the end of the table title in Line 241 to ensure proper formatting.

Q7. Line 256-259: All equations should be centered in the text, with equation numbers placed on the right margin enclosed in parentheses.

We appreciate your attention to detail. All equations have now been centered in the text, and equation numbers have been placed on the right margin enclosed in parentheses, as recommended.

Q8. Line 272: The manuscript exhibits inconsistent punctuation formatting patterns that require standardization.

Thank you for highlighting this issue. We have carefully reviewed the manuscript and standardized the punctuation formatting patterns to ensure consistency throughout the text.

Q9. In Figures 4, 8, and 12: The y-axis labels appear to be incorrect. Shouldn't they be 8-day, 16-day, and monthly, respectively?

Thank you for your careful review. We have corrected the y-axis labels in Figures 4, 8, and 12 to '8-day,' '16-day,' and 'monthly,' as suggested.

Q10. Line 430, 452, and 545: The 2 in R^2 is not formatted as a superscript.

Thank you for pointing out this formatting issue. We have corrected the superscript formatting for R^2 in Lines 430, 452, and 545.

Q11. Why are separate models constructed for forest, grassland, and cropland ecosystems instead of developing a single unified model?

Thank you for your insightful question. Separate models were developed for forest, grassland, and cropland ecosystems due to the substantial differences in their biophysical characteristics, vegetation dynamics, and environmental responses. A single unified model would struggle to accurately capture these ecosystem-specific variations, potentially leading to reduced predictive accuracy and applicability.

In our study, we found distinct differences in the key factors influencing GPP across ecosystems. In forest ecosystems, EVI performed best among vegetation indices, while LSWI was the most effective moisture index. However, moisture indices had relatively low overall importance compared to other variables. In grassland ecosystems, EVI, NDVI, and LAI exhibited similar performance, with LSWI emerging as the most influential moisture index. In contrast, cropland ecosystems were characterized by LAI as the most important vegetation index, while moisture indices played a crucial role, ranking just behind temperature and vegetation indices. Notably, the primary moisture factor affecting GPP simulation in croplands was LSWI, followed by PDSI, with EF contributing the least.

Given these ecosystem-specific variations, using a single model would risk oversimplifying the complex interactions between environmental factors and vegetation responses. By constructing separate models, we ensure that each ecosystem's unique characteristics are properly represented, thereby enhancing the robustness, accuracy, and ecological relevance of our findings.