

## Revision Notes, egusphere-2025-3146

Dear Editor and Reviewers,

We would like to express our sincere gratitude for your time and thoughtful comments on our manuscript, "**Rapid Flood Mapping from Aerial Imagery Using Fine-Tuned SAM and ResNet-Backboned U-Net.**" Your insightful feedback has been extremely valuable in helping us improve the clarity, strength, and overall quality of our work.

We have carefully considered all suggestions and addressed them point-by-point in the revised manuscript. For your reference, we have highlighted our responses to your comments in green. We believe these revisions have significantly strengthened the manuscript and we are confident that it is now ready for further consideration.

Thank you again for your valuable contribution to this process. We look forward to your feedback on the revised manuscript.

**The author's reply to the comments is highlighted in green.**

Comments	Responses
The research is well designed and written. It contributes to the development of a strong and user-friendly AI tool that can provide quick and effective support in flood-affected areas where urgent assistance is needed, without requiring harmonized or standardized procedures for image collection from different sources. As a limitation of the research, I believe it would be valuable to suggest including the geolocation of the final flood map to facilitate relief efforts.	Thank you for your careful reading and constructive suggestion. We fully agree that adding geolocation to the final flood maps would substantially increase the usefulness of the system for emergency responders and for insurance loss assessment. We would like to clarify that the dataset used in this study consisted of 290 aerial images and their corresponding manually created masks provided by a third party; these images did not include GPS/INS metadata or any georeferenceable files (e.g., GeoTIFF, orthophotos). Because the original dataset lacks precise location information, it was not possible to produce geolocated outputs in this work. We have now explicitly stated this limitation in the revised manuscript and added a short “future work” plan that describes practical approaches (e.g., collecting GNSS/RTK-enabled UAV imagery, using ground control points and photogrammetric orthorectification, or aligning masks to georeferenced basemaps) to enable georeferenced flood maps in follow-up studies. We appreciate the suggestion and will prioritize geolocation in our future data

	collection and system development so that the model outputs can be directly used for field operations and addressing location-specific help requests (Please see lines 422-425).
Furthermore, the reasons behind the superiority of SAM-Points should be discussed. Compared to other methods, this approach appears to be more effective in distinguishing bare soil from flooded areas.	Thank you for raising this important point. We agree that further clarification is necessary. In our study, the superior performance of SAM with point prompts over bounding box prompts can be explained by several dataset-specific characteristics. First, in flood imagery, water often extends across the entire scene with highly irregular and amorphous boundaries. Bounding boxes in such cases tend to cover almost the whole image and thus provide little discriminative information to the model, sometimes even introducing ambiguity between flooded and non-flooded regions. By contrast, multiple dispersed point prompts explicitly highlight localized regions within the flood extent and along its boundary, which allows SAM to capture fine-grained differences more effectively (as previously mentioned in the manuscript). Second, flood boundaries are less sharply defined compared to other object segmentation tasks, and point prompts serve as stronger anchors for delineating these diffuse regions. Together with our automatic prompt generation strategy (which ensured dispersed placement of points within flooded areas), these factors explain why SAM-Points outperformed SAM-Bbox in this context. We have revised the manuscript to emphasize these aspects more clearly (Please see lines 307-309).