

Response to Referee Comment

Submission ID: egusphere-2026-1545

Submission Title: Application of radar remote sensing for cyclone damage mapping in Bangladesh: A coherence-based approach

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Dear Sir,

Thank you for the constructive and detailed feedback on our manuscript, and for the time taken to evaluate our work. The comments were extremely helpful in identifying areas where the methodology, validation, and discussion needed to be clarified and strengthened, and we believe the manuscript has improved considerably as a result. We have carefully considered and addressed all comments, and the manuscript has been revised accordingly. Below, we provide point-by-point responses (C and R denote comment and reply, respectively) to each of the reviewer's comments

C0:

The authors have addressed most of the previous comments and substantially improved the manuscript. However, the following minor issues should still be addressed.

R0:

We sincerely thank the reviewer for the feedback confirming that the manuscript has been substantially improved. We have also addressed each of the remaining minor comments below.

C1:

Threshold selection: Please report the actual coherence threshold values used for each cyclone and briefly describe the sensitivity-analysis results.

R1:

Thank you very much for this helpful comment. We have revised Section 3.3.2 to report the cyclone-specific coherence thresholds used in the analysis and added a brief sensitivity assessment based on $\pm 10\%$ variation around each threshold. The results showed the expected response: lower thresholds produced larger mapped disturbance areas, and higher thresholds produced smaller areas. The principal spatial patterns remained consistent, although some events were more sensitive than others. These revisions have been incorporated into the manuscript and summarized in Table 2.

C2:

Discussion: Please reduce repetition, particularly between Section 5 and Section 5.1, and strengthen the broader implications and transferability of the findings.

R2:

Thank you for this helpful suggestion. We have revised the Discussion to reduce repetition between Sections 5 and 5.1 and to better distinguish the overall interpretation of the findings from the event-specific comparison with inundation. Section 5 now focuses on the main findings, the factors influencing coherence loss, and the broader implications of the approach, while Section 5.1 focuses on the relationship between coherence-derived surface disturbance and inundation across the cyclone events. We have also expanded the discussion of the broader applicability and transferability of the method. In particular, we clarify that while the multi-temporal coherence framework can provide a rapid, cloud-independent, and scalable first-order assessment of cyclone impacts, the thresholds and classification parameters used here should not be directly transferred to other regions. Differences

in land cover, vegetation dynamics, imaging geometry, cyclone characteristics, temporal baselines, and image acquisition timing can affect coherence response.

C3:

Language: A thorough proofreading is still required to correct grammatical errors, duplicated words, and editing artifacts.

R3:

Thank you for pointing this out. We have carried out a full, line-by-line language edit of the manuscript in response. We identified the source of several of the artifacts noted by the reviewer from the earlier revision round and performed a complete proofreading pass on the resulting text, including correction of grammatical errors, removal of duplicated words, phrases, and sentences, residual editing artifacts, inconsistent citation formatting, and standardization of terminology and capitalization throughout the manuscript.

C4:

Terminology: Please use coherence loss, decorrelation, surface disturbance, and cyclone damage consistently and clearly distinguish their meanings.

R4:

We thank the reviewer for this important comment and have carefully revised the manuscript to ensure consistent and conceptually distinct use of the terms coherence loss, decorrelation, surface disturbance, and cyclone damage throughout the manuscript. We are now using coherence loss to refer to the measured reduction in interferometric coherence between SAR acquisitions. Decorrelation is used to describe the corresponding reduction in radar-signal similarity/correlation and is primarily used when discussing the interferometric response or the underlying mechanism. Surface disturbance refers to the physical or environmental changes that may produce coherence loss, including inundation, vegetation disturbance, structural changes, erosion, sediment redistribution, and related surface changes.

We have revised the terminology particularly in Sections,

- 3.3–3.3.3 (Coherence-based Surface-Disturbance Assessment and Damage Mapping),
- 4.1–4.7 (Results),
- 5–5.1 (Discussion), and
- 6 (Conclusion and Recommendations)

We also clarified statements where coherence loss was previously described directly as “damage” or “disturbance,” so that the interpretation follows the sequence

Coherence Loss → Inferred Surface Disturbance → Cyclone-Damage Assessment.

The comparison between coherence-derived disturbance and inundation has been revised to emphasize that coherence loss is not exclusively a measure of flooding. The manuscript now explicitly recognizes that coherence loss may arise from multiple cyclone-related processes, including inundation, vegetation disturbance, structural damage, erosion, and other surface changes. These revisions have improved the conceptual consistency of the manuscript and clarify the differences.

C5:

Figures: Please ensure that labels and legends, particularly in Figures 4 and 5, are sufficiently large and readable.

R5:

Thank you for this valuable comment. We have revised Figures 4 and 5 to improve their overall readability. In particular, the font sizes of figure labels, legends, annotations, and other graphical elements have been increased in the final manuscript.

C6:

References: Please check and standardize all references according to the journal's required format.

R6:

We have carefully checked the reference list and standardized the references and in-text citations according to the journal's required format.

We appreciate your guidance and look forward to the next steps in the review process.