Reviewer 1 comments:

We thank the reviewer for the very positive assessment of our manuscript and for highlighting the value of synthesizing the challenges and opportunities surrounding post-disturbance forest soil monitoring using remote sensing into a single evidence map. We also appreciate the reviewer's encouraging remarks regarding the concluding discussion on disturbance prevention and the future roles of AI and emerging sensing technologies.

We have corrected the minor editorial issue identified by the reviewer (the extra space before the period in the original submission). No further changes were requested by Reviewer 1.

Reviewer 2 comments:

1. Clarify overlap with Latterini et al. (2025) and distinction from prior reviews.

We thank the reviewer for highlighting Latterini et al. (2025). This review was published after our original literature search and screening period (25–26 February 2025) and therefore could not have been included in the formal evidence-map dataset defined in our Methods. We have nevertheless incorporated it as a narrative citation in the revised manuscript to clarify the distinction between that harvesting/operations-focused synthesis and our broader cross-disturbance evidence map of post-disturbance forest soil monitoring. Specifically, we now cite Latterini et al. (2025) in the Introduction when situating our study relative to prior syntheses, and in selected Discussion sections where overlap is most direct (harvesting-related structural sensing, scale trade-offs, and future AI/data-fusion directions) (additions highlighted in yellow; pages 5, 23, 37, 44).

Commented [JL1]: I would add the page numbers just to facilitate even more the life of the associate editor and reviewer 2 (if the editor decides to send it back to rev2, which is not so sure).

We also revised the Discussion to reduce direct overlap with the operational forestry scope of Latterini et al. (2025) by removing the former discussion subsection that overlapped most directly with forest-operations planning and decision-support applications. As revised, our

manuscript is now framed more explicitly around a cross-disturbance evidence map of post-disturbance forest soil degradation, organized using a disturbance–threat–indicator framework, rather than as a review of remote sensing for harvesting operations per se.

2. Distinguish disturbance indicators, surface proxies, and direct soil degradation metrics.

We thank the reviewer for emphasizing the need to distinguish disturbance indicators, surface-condition proxies, and direct soil degradation metrics. This distinction was already embedded in our manuscript's disturbance–threat–indicator framing, including the classification of observability as direct, proxy-based, or limited, the observability matrix in Table 1, and the discussion of threat–indicator mismatch for wildfire and harvesting in Section 4.2. These sections already distinguish between (for example) directly observable surface deformation, proxy-observable indicators such as rut geometry or roughness, and field-dependent subsurface metrics such as bulk density, porosity, and hydraulic conductivity.

However, we agree that this logic needed to be reflected more consistently throughout the manuscript. We therefore revised the Abstract, Introduction, and Conclusion to moderate stronger wording and better align with the observability framework already developed in the Discussion (changes/additions highlighted in pink; pages 2, 5-6, 24, 45-46). We also added an explicit methodological limitation at the end of Methods 2.4 (highlighted in green; p. 9), clarifying that this structured evidence map characterizes evidence availability and observability patterns, but does not include a formal critical appraisal of study quality, validation strength, uncertainty, or transferability across regions and forest types.

3. Claims regarding operational readiness / reporting robustness are too strong for an evidence map.

We agree that some wording in the previous version could be interpreted as stronger than warranted for an evidence map. In response, we added a methodological limitation statement to Section 2.4 (highlighted in green; p. 9), explicitly stating that the synthesis was designed to characterize the scope, distribution, and methodological patterns of the literature, and that it should not be interpreted as a ranked assessment of operational readiness or reporting robustness. We also moderated language in the Abstract, Introduction, and Conclusion so that

the manuscript now refers more cautiously to indicators that show the clearest observability pathways and strongest evidence base, rather than implying a formal determination of what is most “defensible” or “reporting-ready” (changes/additions highlighted in pink; pages 2, 5-6, 24, 45-46).

These revisions preserve the manuscript’s relevance to emerging reporting needs while making clearer that the contribution of this evidence map is to identify where remote sensing is most consistently informative, where it remains proxy-based, and where field validation remains essential.

4. Review suggested studies that were missed from the evidence base.

We thank the reviewer for identifying additional studies that they considered potentially relevant to the evidence base. In response, we screened the reviewer-suggested papers against the eligibility criteria used in the original evidence-map workflow. This screening showed that the suggested studies fell into several distinct categories. One study (Affek et al., 2017) was already included in the formal evidence base. To improve transparency and help avoid confusion between studies cited in the main manuscript text and those included in the mapped evidence base, we added an explicit statement in Section 3.1.1 (highlighted in blue; p. 10) indicating that a complete list of studies included in the final evidence base is provided in the Appendix (Table A3; pages 53-61). Three studies (Abdi et al., 2022; Wedeux et al., 2020; Mikita et al., 2022) did not meet the eligibility criteria because, although they used remote sensing in forest-related contexts, they did not establish the required direct or indirect link between RS products and soil degradation indicators, or were focused on road/trail/biomass-related outcomes rather than post-disturbance soil degradation itself. Two studies (Osei Forkuo et al., 2025; Latterini et al., 2025b) appeared relevant but fell outside the practical capture of the original formal search workflow, which was conducted on the 25th and 26th February, 2025. Finally, three studies (Starke et al., 2020; Forkuo and Borz, 2023; Lovrinčević et al., 2024) appeared potentially eligible but were not retrieved by the original documented search process.

Because this manuscript reports a structured evidence map, we chose not to retroactively insert studies through an undocumented post hoc pathway. The evidence base is defined by the

documented search strategy, screening workflow, and snowball-search process described in the Methods, and reproducibility depends on maintaining a transparent and traceable chain of study inclusion. If the same documented workflow were repeated, it should yield the same evidence map; therefore, adding newly identified studies outside that workflow would not constitute a simple correction to the existing map, but rather a deviation from the original reproducible process. “These suggested studies, although some appeared potentially eligible, were identified outside that documented workflow, and as such we considered it more rigorous to report them transparently in the response rather than to incorporate them ad hoc into the formal evidence base for this revision.