

Response to Reviewer 1 (RC1)

We thank the reviewer for taking the time to comment on our paper, and appreciate the positive comments on the comprehensive data, development of methods and approach, and organisation of the manuscript. Please find our responses to each point below.

Reviewer Comment 1:

L162: The statement that “global total burned area (BA) and emissions are decreasing” may need some clarification. While global burned area has shown a clear declining trend, global fire emissions have remained relatively stable, with previous studies reporting only a statistically non-significant decreasing trend (e.g., Zheng et al., 2021). I suggest distinguishing these contrasting trends, which may also better support the following discussion of increasingly severe regional fire impacts (e.g., increasing forest fire activity).

Thank you for this important comment. We agree that we can make the point more clearly that emissions are not showing as strong a decreasing trend as burned area. We have revised the text accordingly:

~~Research is showing that while global total burned area (BA) and emissions are decreasing, regional impacts are becoming more severe. Fires are moving into extratropical carbon rich forests and peatland areas (Jones et al., 2024a; Zheng et al., 2021), and extreme heat and drought are driving abnormally intense fires across Mediterranean biomes (Ghasemiazma et al., 2026). While global total burned area (BA) is decreasing, both BA and fire emissions are rising in extratropical carbon-rich forests and peatlands (Jones et al., 2024a; Zheng et al., 2021). Meanwhile, fire intensity is also rising globally and abnormally intense fires across Mediterranean biomes have been linked to extreme heat and drought (Cunningham et al., 2024; Ghasemiazma et al., 2026).~~

Reviewer Comment 2:

L384–386: If I understand correctly, the GFED5 fire emissions used in this study consist of two components: the standard GFED5 record through 2022 and GFED5-NRT (Chen et al., 2026) for 2023–2026. Although GFED5-NRT relies on different data sources and methodological approaches to extend the historical record, it has been shown to be broadly consistent with the standard GFED5 product. I suggest explicitly clarifying these two components and their respective temporal coverage so that readers can clearly understand the composition of the GFED5 emission record used in this study.

We fully agree, and we have added clarifications as follows:

The first substantial change to our input data was the replacement of the Global Fire Emissions Database (GFED) version 4.1s (GFED4.1s, van der Werf et al., 2017; as used in Kelley et al., 2025) carbon emissions with GFED5 (van der Werf et al., 2025; Chen et al., 2026a). Our emissions record combines standard GFED5 estimates through 2022 with the GFED5 near-real-time extension (GFED5NRT; Chen et al., 2026a) from 2023 to 2026. GFED5 substantially revises GFED4s by using a larger, better-constrained BA estimate, though at a relatively coarse resolution of 0.25° (Chen et al., 2023). It captures more small and agricultural fires than GFED4s and MCD64A1, and major updates from GFED4.1s include a 500 m fuel-consumption model aggregated to 0.25° and updated emission factors (Binte Shahid et al., 2024), including dynamic savanna emission factors (Vernooij et al., 2023). GFED5 generally gives higher carbon emissions than GFED4s, globally amounting to a 65% uplift in total emitted carbon. However, the uplift is uneven, with especially large increases in fragmented or human-dominated regions such as Southeast Asia, Europe and Central America, while equatorial Asia decreases slightly because of recalibrated peat-fire emissions in GFED5 (van der Werf et al., 2025). For the period 2023-2026, our emissions record uses the GFED5 near-real-time extension (GFED5NRT; Chen et al., 2026a). GFED5NRT extends the record using VIIRS active-fire observations, converting active-fire counts to burned area using biome- and region-specific effective-fire-area relationships calibrated against standard GFED5, and estimating emissions using corresponding GFED5-derived fuel-consumption relationships. Although this differs from the full GFED5 methodology, evaluation over the overlapping period shows that GFED5NRT broadly reproduces GFED5 spatial patterns, seasonal cycles and interannual variability.

Reviewer Comment 3:

L3012–3021: One potential direction for future editions of the State of Wildfires Report could be to complement the long-term climate projections with a near-term outlook for the upcoming fire season. Given the annual nature of the report, it may be valuable to explore whether probabilistic forecasts of wildfire activity (e.g., burned area or the likelihood of above-normal fire activity) could be provided for the following fire season. If feasible, this could be an interesting avenue to consider in future editions, potentially further enhancing the practical value of the report for preparedness and early warning.

Thank you for this suggestion. In previous reports, we have indeed published a near-term outlook and we agree that it can be of interest to our readers. Unfortunately, this has been logistically challenging given our commitment to the peer review process, with the time from submission to publication often closely matching the period over which forecasts are most reliable (e.g. up to 2-3 months). Hence, upon publication the forecast became outdated. It was on this basis that we took the decision to remove this analysis in this edition of the report, but we intend to find alternative ways of publishing near-term forecasts stemming from published methods (e.g. Di Giuseppe et al., 2025), including through our website. This would allow outlooks to be updated as new forecast information becomes available, independently of the report's publication cycle, while maintaining a clear link to the peer-reviewed methodology and communicating forecast uncertainty and limitations.

In addition to the reviewer comments addressed above, we have made a few minor updates including co-author affiliations that have changed in the last 2 months during the review period. Additionally, the underlying HadGEM3-A dataset used in parts of the analysis has been updated to include additional ensemble members that became available in the last 2 months during the review period. We therefore incorporated these members and re-ran the analysis. This resulted in minor quantitative changes to the HadGEM3-A FWI attribution estimates and associated figures for the focal regions, but did not affect the interpretation or conclusions of the study. The revised text and figures have been marked in the manuscript. During this update, we also identified and corrected an issue in the processing of the cumulative dry-days metric used in the burned-area attribution analysis, whereby gaps in some ensemble time series artificially reset the cumulative dry-day count. This correction produced revised burned-area attribution estimates, most notably in Northwest Iberia. This change primarily affects the central estimate for burned-area attribution results; associated uncertainty ranges and likelihood assessments changed little, and projections remain unchanged, and the study's overall interpretation and conclusions remain unchanged.