

Response to reviewer: the original reviewer comments are in italic and dark red, while the authors' replies are in black, with highlights in bold.

Dear authors,

Thank you for submitting this interesting manuscript on predicting the risk of individual tree fall along powerlines.

While the current results (in terms of accuracy) may not yet support immediate practical implementation, I believe your work makes a valuable contribution to the ongoing development of methods in this highly relevant field.

You have clearly highlighted and discussed the limitations of your study, which helps clarify the significance of your contribution for fellow researchers.

Overall, the manuscript is well written and well structured. I suggest that you could further improve the Materials and Methods section by including figures that illustrate your approach in greater detail.

Kind regards.

We thank the reviewer for their time reviewing our manuscript. We have created a new figure for the Materials and Methods section to illustrate the entire approach and process in a bit more detail. This figure was presented in the first author comment AC1, 2nd March 2026. Furthermore, we will include another figure, to describe the crown offset methodology in the Appendices of the revised manuscript. This second figure was

presented in the co-author comment CC1, 3rd March 2026. For review, the two figures are shown in this final author comment below:

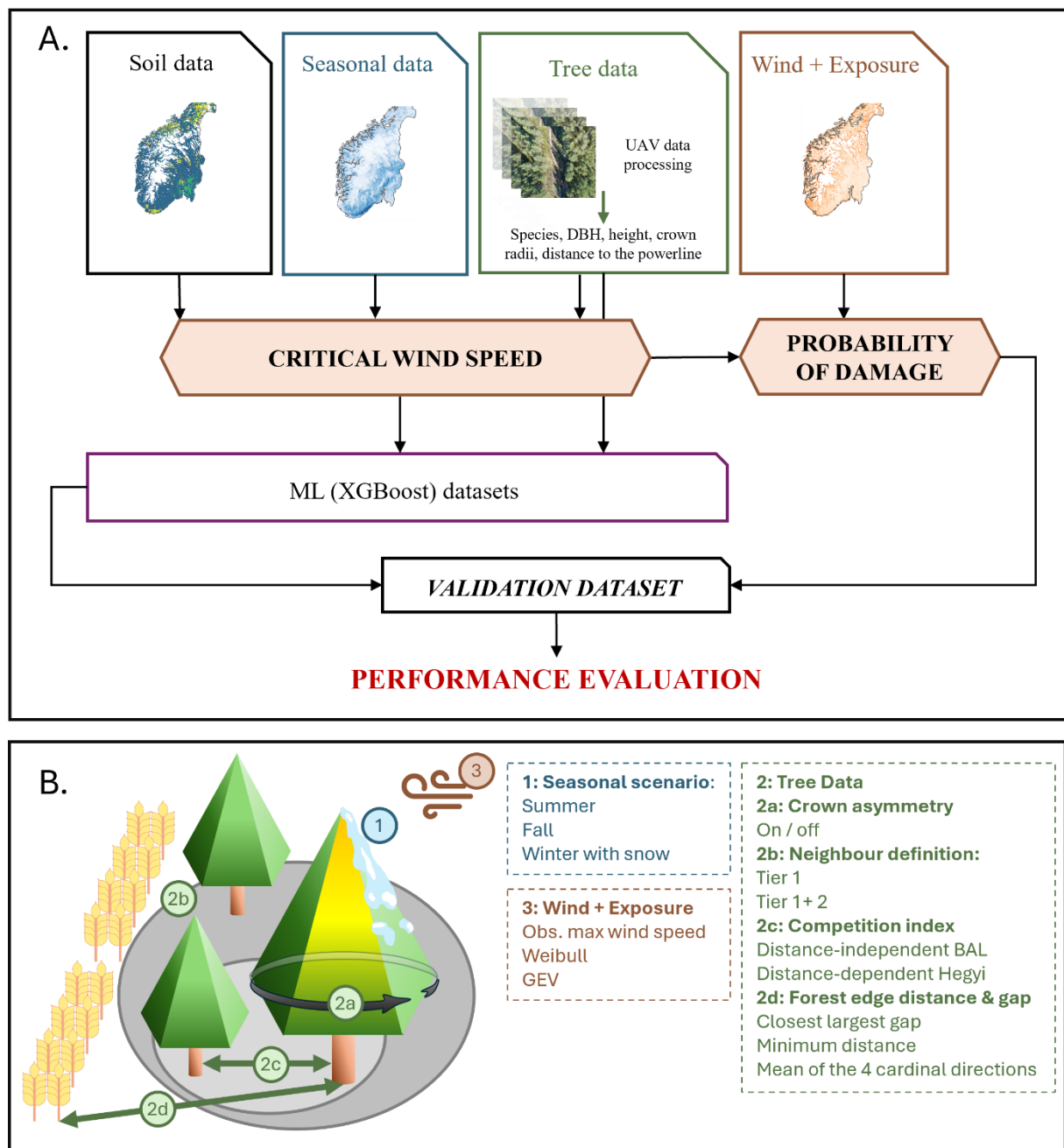
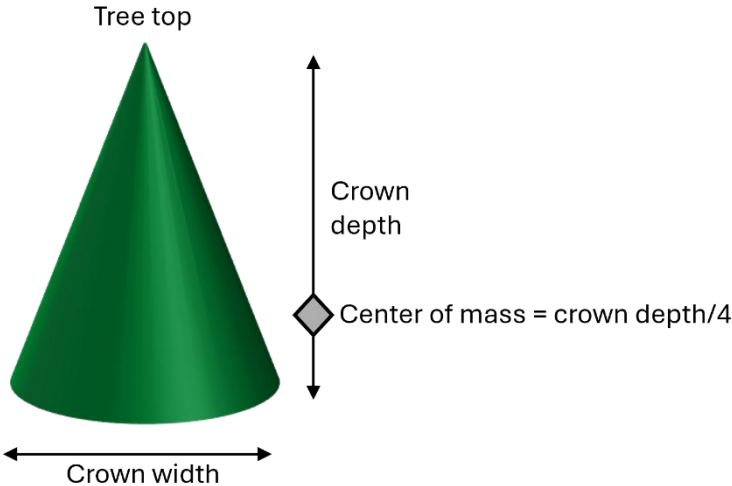


Figure 2. Methodological approach used in the study. Box A: The input data (Soil data, Seasonal data, Tree data and Wind + Exposure) are processed and fed into ForestGales to obtain the Critical Wind Speed and subsequently the Probability of Damage. In addition, the input datasets and the Critical Wind Speed datasets are used in a machine learning (ML) algorithm (XGBoost). The ForestGales calculated probability of damage and the machine learning datasets are evaluated against a validation dataset - the recorded tree falls along powerlines during the winter 2020-2021 to assess the performance of the two methods. Box B: Graphical representation of the different model options considered in the study split into three categories: 1. the Seasonal Scenario used (section 2.3.1 in the text), 2. the Tree Data processing (section 2.1.2 in the text) and 3. the use of the Wind and Exposure data (section 2.2 & 2.3.2 in the text).

The text in the manuscript would be altered to this new version lines 270: **“The distance to the edge of the forest and the associated forest gap size were calculated during**

the data processing step in four directions (see section 2.1.1). Three alternatives were retained when calculating the CWS: i. the “closest largest gap” was defined using the linear optimizer function of the lpSolve package in R (Berkelaar, 2024), ii. the “minimum” was simply the closest forest edge and iii. the “mean” the average of the distances to and size of the non-forested gaps in the four considered directions (to and from the powerline, and along the powerline direction).”

A. ForestGales default crown shape = right circular cone



B. New crown shape = oblique elliptical cone – irregular cone

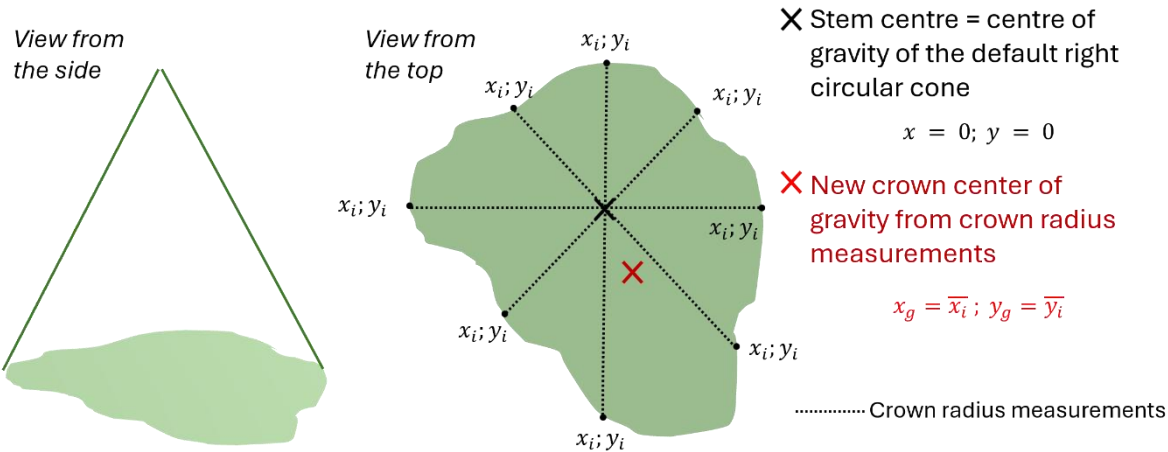


Figure A 1. Description of the changes made in the assumed crown shape in the ForestGALES model to implement a crown center of gravity offset. A: the default crown shape in ForestGALES, a right circular cone. B: the new crown shape to account for an offset in the crown center of gravity – an irregular cone, where the new position of the crown center of gravity is derived from the positions of 8 points at the edge of the crown perimeter. These points were used to obtain the crown radius / diameter measurements from the LiDAR data in the 8 cardinal directions. Under the new crown shape scenario, the assumption that the crown center of mass is at ¼ height of the crown depth still holds.

This figure would be placed in the Appendix A, under the sub-section A.1.2 Displacement of the crown centre of gravity under asymmetry.