

Author responses to Reviewer 2 of egusphere-2025-1534

In response to Reviewer 2's valuable comments, we improved the clarity, consistency, and transparency of the manuscript and supplementary material (hereafter SM). Specifically, we (i) clarified the definitions, numbering, and selection criteria of the best-performing scenarios and corrected figure annotations accordingly (Figs. 3 and 4); (ii) explicitly referenced the comparison of ForClim 4.1 and 4.2 in the text ([lines 454–458](#), Fig. S 3.3.6); (iii) performed and described a local sensitivity analysis of key parameters ($kDrSc$ and P_{bark}) to quantify model robustness (new SM section 3.3.7); and (iv) harmonized equation order, figure legends, and numerical precision throughout the manuscript.

These adjustments enhance the manuscript's readability and ensure consistency between text, figures, and supplementary materials.

RC2

Marano and colleagues present a new version of a Dynamic Vegetation Model (DVM), namely ForClim. In the presented version 4.2 of ForClim (ForClim 4.2), the authors aim to improve the simulation of drought-induced mortality of Norway spruce and European beech. In particular, the authors implement a scheme accounting for predisposing, inciting, and contributing factors. The addition of these schemes results in a more accurate representation of the observed mortality during the 2018-2022 drought period. Although the manuscript is well-written and presents interesting results, some clarifications are needed before publication, as listed below.

General Comments

It would be informative to include a comparison of the same selected scenarios (76 and 90) with and without the bark beetle submodel within the main text. The addition of this comparison would provide the reader with a direct visualisation of the model enhancement gained in ForClim 4.2 compared to ForClim 4.1.

Author response: The two model versions comparisons, namely ForClim version 4.1 (no bark beetle module) and version 4.2 (with bark beetle module) were already contained in the submitted manuscript. In the revision however, we referred more explicitly to Figure S 3.3.6 in SM ([lines 454-458](#), main manuscript). We decided to place the figure showing the simulations conducted with v.4.1 in the supplementary material, and not in the main MS, to avoid content overload.

Besides, the authors do not perform tuning of the used parameters since they want to emphasise the improvement provided by adding predisposing, inciting, and contributing factors within the model. However, it would be beneficial for the reader to know how much ForClim respond to changes in the new parameters.

Author response: We agree that further insights into model sensitivity to the new parameters would be useful. Note that in response to the requests by RC1, we have undertaken a local sensitivity analysis to substantiate our choice of parameter values. Results can be found in Table S 3.3.7 in the Supplementary Material 1.

Specific Comments

Eq 6-8: put in the same order as the introducing list: MAE, RMSE, and adjusted R^2

Author response: Done

Line 325: Scenarios 84 and 90 are the top-ranked ones. How are they defined, and how do these two specific scenarios differ from the others? How does the numbering of scenarios work in Figure 2? In Figure 3A, which red box is scenario 84? And which is scenario 90?

Author response: We thank the reviewer for pointing out the need for clarification. The two best performing scenarios correspond to two top-performing combinations of soil water holding capacity parameters (AWC_{mean} , AWC_{min}) as shown in Figure 3A and 4A (highlighted with red boxes). The scenario numbering follows the internal index used in the parameter grid search (see Table S 2.1 in SM). We added these definitions and scenario labels directly to the figure captions 3 and 4 for clarity. We also clarified in both figure captions which box stands for which scenario.

Lines 324-328: Two significant digits are enough in percentage numbers.

Author response: Done, corrected across all manuscript.

Line 372: As in the previous comment, what are the features of the selected scenarios compared to the others? How does the numbering of scenarios work in Figure 2? In Figure 4A, which red box is scenario 76? And which is scenario 90?

Author response: See our response to the comment on l. 325.

Lines 370-377: Two significant digits are enough in percentage numbers.

Author response: Done, , corrected across all manuscript.

Figure 3A and 4A: In both cases, scenario 90 is selected. However, figures 3A and 4A do not share the position of any red box. Figure 3A displays red boxes in row 1, columns 8 and 11; Figure 4A shows red boxes in row 1 column 9, and row 2 column 7. Check the red boxes in both figures.

Author response: Thanks to the reviewer's feedback we adjusted the wrong attribution of best selected scenarios to the corresponding box; we apologize for the oversight.