

## ***Interactive comment on “Modelling anomalies in the spring and autumn land surface phenology of the European forest” by V. F. Rodriguez-Galiano et al.***

### **Anonymous Referee #1**

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The study contributed by Rodriguez-Galiano et al uses machine learning approach to model anomalies of spring and autumn phenology of the European forest, and ranking the relative importance of the pre-selected climate factors. This is sort of a new approach, comparing to the most commonly used Growing Degree Days approach, so it is useful and may be of interest to some people. However, I have been feeling many key information are missing, which weaken the quality of the manuscript. I would recommend a substantial revision before the official publication.

The most unclear part is on the methods. (1) I know the study region is the European Forest; but could the authors provide a map showing the study domain? (2) MTCI data covers 2002-2012; daily temperature and precipitation data covers 2002-2011;

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but I don't find any information of the temporal coverage of the SIS data. Could you clarify it? So is the study period 2002-2011? (3) How were the MTCI Phenology dates were derived? And what's the accuracy of it? I know the authors have mentioned something in the paragraph of 20, but a few more details should be added. (4) The section 2.3 is very hard to follow. For example, how should I understand "The different climatic measures were computed based on the 30 and 90 days previous to the Julian date" ? How do the authors get "31 and 27 predictor-related measures" ? And what are they? I suggest you first present what climate predictors are used, then you can introduce how the climate predictors are calculated for spring and autumn phenology respectively. Figure 1 is hard to read, too. I guess (not sure) it might be better to split Figure 1 into 2 sub-figures. One shows how the climate predictors are calculated and the second shows the big picture of the study. Also, the image quality of Figure 1 should be improved. (5) Most of the first paragraph on the details of model application should be moved into Methods. (6) R2 is not enough for validating your methods. RMSE, Bias should be included in the statistics. (7) Table 1 and 2 are hard to follow. The authors must provide the full names of the acronyms. (8) Lines 29-31: what are the simplified models? (9) Line 34: is the "daily temperature" here the mean daily temperature in the preceding days (how many?)? (10) I think a comparison between the performances of the "traditional GDD approach" and the machine learning approach will be very useful in this paper. (11) Figure 2: what is the x-axis? (number of climatic drivers? If yes, what are they?)

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