

## ***Interactive comment on “Drought identification in the Eastern Baltic region using NDVI” by Egidijus Rimkus et al.***

### **Anonymous Referee #1**

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In this article, relationships between the Normalized Difference Vegetation Index (NDVI) measured from satellites and drought in the Eastern Baltic region. The topic is interesting and of practical importance. The paper is well prepared and I have no large critical problems. But I have a number of specific remarks for correcting and improving the text. I'll answer to the general questions of the journal and then I'll make my more detail comments and suggestions. 1. Does the paper address relevant scientific questions within the scope of ESD? Yes. 2. Does the paper present novel concepts, ideas, tools, or data? Yes. 3. Are substantial conclusions reached? Yes. 4. Are the scientific methods and assumptions valid and clearly outlined? Yes. 5. Are the results sufficient to support the interpretations and conclusions? Yes. 6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes. 7. Do the authors give proper

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credit to related work and clearly indicate their own new/original contribution? Yes. 8. Does the title clearly reflect the contents of the paper? Partly. There is mentioned only NDVI but not VCI. 9. Does the abstract provide a concise and complete summary? Partly. Results from the section 3.2 were not presented. 10. Is the overall presentation well structured and clear? The use of the VCI is not well presented in the abstract, introduction and methods. 11. Is the language fluent and precise? Could be improved. 12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes. 13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? No. 14. Are the number and quality of references appropriate? Yes. 15. Is the amount and quality of supplementary material appropriate? Yes.

Remarks and suggestions 1. The abstract is too general. I would like to see more concrete results of the study in the abstract. 2. Page 1 line 29. There is written “Remote sensing of the vegetation condition is based on the fact that healthy plants have more chlorophyll and therefore absorb more visible and reflect more infrared radiation (Myeni et al., 1995)”. Plants reflect short-wave radiation and emit infrared radiation. I assume that here should be “... and emit more infrared radiation”. 3. Page 2 line 39. I suggest that vegetation response here not to climatic impacts but to different meteorological conditions each year. 4. In fact, the NDVI describes the greenness of the underlying surface. Is the term “greenness” used in this context and could it be used in this article? 5. I suggest more extended overview of the literature on climatological studies of droughts in the study region in the introduction. 6. Page 3 line 71. I suggest more exact definition of the study area. It does not cover the whole territory between 53-60 N and 20-30 E. Could it be identified as Estonia, Latvia, Lithuania and northeastern Poland? There is a contradiction between Figure 1 and other maps. In the first case, only these countries are shown on the map while in the second case, all land areas in the domain have been used. Can you explain this difference in the definition of the study region? 7. Page 3 line 79. The end of the study period is not shown (from 1981 to the present). What is the last year? 8. Page

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3 lines 85-86. Week numbers are usually not used in the everyday life. Therefore, it is not informative to use week numbers from the beginning of a year. The use of dates is more useful in my mind. 9. Page 4 Line 99. What is mean average daily air temperature? Is it simply daily mean temperature? 10. Page 4 pages 100-102. The beginning and the end of the active growing season varies significantly over the study region in dependence of latitude. It could be emphasise in the text. These dates are very variable also from year to year. 11. Figure 1. It is very strange that the territory of Estonia and major part of Latvia is described only by broad-leaved forest. There are no cells from coniferous forest and arable land. This selection of cells does not represent adequately the vegetation types in that region. It should be explained somehow why these cells were selected. Here are also problems related to the CORINE land cover data. In the figure caption the CORINE data should be mentioned. 12. It is not clear how the VCI values were calculated in this study. It should be described because they are used in this study. 13. Page 6 line 152. It is interesting to know when the week 25 takes place. I am not sure that the large values are more common in the northern part of the domain (Figure 2). Lower values are in the southern part but in the other regions there are not such territorial differences. 14. Figure 3 is too small that it will be difficult to understand. Why NDVI is much lower in case of coniferous forest? 15. Page 7 line 182. I think that it is not always so a late start of vegetation leads to a late end. 16. There is confusion in the section 3.2. Earlier the majority of the text was related to the use of NDVI data. But here VCI is analysed. I suggest the VCI should be more mentioned also in to abstract, introduction and methods description. 17. Page 11 lines 246-247. Usually, the growing season is defined when the daily mean temperature is permanently higher  $+5^{\circ}\text{C}$ . In that case, it starts much earlier than the end of April. In this study, an active growing season i.e. the  $+10^{\circ}\text{C}$  limit is used. These two terms should not be mixed. 18. I recommend writing of a separate section of conclusions where the main results of this study have been emphasized.

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