

The reviewed article presents a four-hundred-year reconstruction of the summer vapour pressure deficit (VPD) in the European area. For this purpose, it uses data from previously published research, including the outcomes of two large European projects ISONET and MILLENNIUM.

The research presented has a clear objective, the implementation of which is presented in the following chapters of the reviewed work. The significance of the research undertaken is discussed first. VPD affects the development and growth of plants and thus the life of entire ecosystems. Moreover, the VPD index is an indicator that can be applied to assess the forest mortality, drought occurrence, crop production, and wildfire incidence. However, the measurement data of VPD have a very short time range. Therefore, proxies are needed to analyze VPD changes in a long-term context. In this article, the measurements of stable oxygen isotope content in cellulose extracted from wood (within individual annual growth-rings) were employed. The data used came from different sites located in Europe, allowing changes in VPD to be traced both over 400 years and across the continent.

In order to reconstruct VPD using proxies, a suitable mathematical model have been developed and then validated. Statistical verification of this model was also presented. The results showed the correctness of the reconstruction performed. On the basis of obtained effects it was possible to relate the contemporary upward trend observed in VPD values into a long-term perspective. Moreover, during conducted research three areas differing in magnitude and in course of VPD values over time were also distinguished: Central Europe, Northern Europe and Mediterranean. The received results were then compared with earlier reconstructions of other meteorological parameters carried out for the last 400 years for European areas. In addition, they were confronted with historical record. New data correlated well with both the earlier reconstructions of temperature, precipitation and Palmer Drought Severity Index, and also showed a high degree of correspondence with the historical evidence.

The reconstruction carried out was based on a large set of measurement data, covering a long period of time and having a large territorial range, was well conducted in terms of the statistical methods used, and was then placed in the context of historical data, and compared with other available reconstructions of climatic parameters.

The work is of great value and tackles a hitherto underexplored scientific problem. The structure of the manuscript is correct, the individual chapters contain a detailed presentation of the material, the research methods utilised, an extensive discussion of the results and a comparison with previously published research data. Both the aims and conclusions are clearly formulated. The results of the presented research constitute a large package of new data that can be used in the future in various fields of science.

I evaluate the work very positively, the only weakness being the figures, the size of which is not always appropriate and does not allow for a comfortable reading of the data presented. I have included the rest of the minor editorial comments in the text of the manuscript (please check that the text highlighted is definitely correct).

We want to thank the reviewer their very positive comments on our work, for the appreciation/suggestions/comments/feedback that will help us improve our manuscript, and for taking the time to read and review our paper.

We will carefully address all suggestions from the attach file and the different technical annotations proposed.