The goal of the study is to determine if wine must quality can be used to obtain useful information on summer temperature in Europe over the past centuries. This is highly relevant as uncertainties remain on past climate variations during this period and new high-quality reconstructions are welcome. The paper describes well the basis of the link between must quality and climate, the available long series and make a strong case on the interest of wine must quality as a proxy of past summer conditions. I thus recommend the publication of this study after some minor changes as detailed below.

General point

1/ In the majority of studies devoted to new records covering the past centuries, a reconstruction of a physical variable (like for instance here summer temperature) is proposed and validated against modern observations. This is not explicitly the case here. The dependence of the must quality on temperature and precipitation is discussed (e.g. Table 7) but this is not used to provide a reconstruction. think the authors should justify this choice and explain why they decide not to show such a reconstruction**.**

This important issue might be discussed at the beginning of chapter 3 "Methods": We propose the following text: "A validation of the data against modern climate observations was not attempted because the data on wine must quality between 1881 and 1989 are of lower quality that those between 1751 and 1880 (Table 4). Starting in 1990 the quality values are no longer meaningful in terms of climate history because of a substantial quality improvement. In the field of climate reconstruction, data assimilation methods (or other inverse methods) are increasingly used, and these methods require a forward model such as the statistical model presented in this paper. The inversion approaches range from simple Bayesian methods such as weighted analogs sampled from climate model simulations (Reichen et al., 2022) to off-line Ensemble Kalman Filters (Valler et al., 2022). The series shown can be used in any of these approaches, together with other series, to obtain a climate reconstruction. We will give more explanations on this in the revised manuscript.

The correlations of must quality with tree ring MXD do not show a clear pattern. They are generally lower prior to 1880 and at the same level between 1881 and 1989, without being able to provide any justification for this. The correlation of mean quality with GHD is considerably lower between 1881 and 1989 than in the two preceding time periods, while the correlation of GHD+ with tree ring MXD is at the same level.

This points to inaccurate assessment of vine must quality due to low quality in face of the breakdown of the harvest amount which in Switzerland coincided with a period of transition from expert evaluation to density measurement. For Luxembourg where the transition took place starting in the mid nineteenth century, correlations are higher (not shown).

Specific points

1/ Table 4 provides the correlation of must quality and GHD +, tree ring MXD and GHD+ but surprisingly to me not Tree Ring MXD and must quality. Is there a reason for this choice? As

must quality is the topic of this paper, this would have been instructive to see how the series compares to the one of tree ring MXD and if this agreement is higher or lower than between Tree Ring MXD and GHD+.

The correlation of wine must quality and Tree Ring MXD was included in Table 4. We propose the following interpretation: "The correlation of must quality with tree ring MXD do not show a clear pattern. It is generally lower prior to 1880 and remains at the same level between 1881 and 1989. No interpretation is provided for this. The correlation of mean quality with GHD+ is lower between 1881 and 1989 than in the two preceding time periods, while the correlation of GHD+ with tree ring MXD is at the same level. This points to inaccurate assessment of vine must quality due to low quality in face of the breakdown of the harvest amount which in Switzerland coincided with a long period of transition from expert evaluation to density measurement. For Luxembourg where the transition took place starting in the mid nineteenth century, correlations are higher (not shown)."

2/ Line 217 and 225. I have not understood to what refer the 'small number of cases per year' and the 'low case numbers'. If the series are annual, each year has just one number for me. Is this due to missing years? Is it related to the small number of sources for this period (table 1)?

The term cases is misleading in this context. We will replace it by "observations".

3/ Title of section 4: I would not use 'The climate model' because it is a statistical model of wine quality that is presented, not a climate model, even if it uses meteorological variables.-

We will us "statistical model" throughout the paper.

4/ Line 272. Is there a reason why precipitation in April and August are important and not the other months? Were the other months well below the selection criteria or were they close to be accepted by the backward selection**?**

The other months were below the selection criteria. The two months are far apart such that the influences are likely different.

5/ Line 287. When the 'same regression model' is mentioned for GHD, I guess it means the same meteorological variables but it has been recalibrated for GHD. The much higher explained variance for the verification period suggests that the behavior of this record is more stable in time than the one of must quality.

Yes, a model with the same variables was calibrated against GHD. We will be more precise and will add additional discussion.

6/ For figure 5, 5 years of high must quality and 5 years of low quality seems a small sample to me. Are the conclusions robust if a larger number of years is selected?

The years were selected according to specific thresholds. A slight increase in the threshold would greatly increase the number of cases thus weakening the robustness of the conclusion.

7/ Line 298. I guess 19 and 20 refers to the number of days. I would add the information explicitly.-

the text is on p.199. We will modify the text accordingly

8/ Figure 6 presents the same series as figure 4 if I am right but with a different caption. This could introduce confusion. I would include ll the information for figure 4 and then explain in figure 6 that the same time series is shown.-

-accepted

9/ Lines 321-322. Is there a source or reference for those nicknames?

Müller 1953

10/ Line 343. The information on the size of grape harvest seems a bit out of context here. It is required to have a longer discussion, including ideally references so that the reader could have an idea of the potential of this variable for climate reconstructions.-

This issue will be tackled in a subsequent article-. A longer discussion would indeed be out of context.

Another issue:
Do you agree that we approximately include your general evaluation in the abstract:

“This is highly relevant as uncertainties remain on past climate variations during this period and new high-quality reconstructions are welcome.”