The manuscripts presents a quite detailed investigation of two sediment cores from one site in the Bernese Alps with the aim to reconstruct the frequency of floods over the past 2000 years. This record is compared to other reconstructions of summer temperature and precipitation in this region, with atmospheric circulation indices, mainly the Summer North Atlantic Oscillation, and with proxies of past solar activity.

The main conclusion is that flood frequency in this region has been strongly affected by the anthropogenic reshaping of the landscape, but that it also shows relationship with climate forcing. Coolr winters, with higher snow accumulation, and phases of stronger meridional pressure gradient in summer, are linked with a higher frequency of flooding.

I am not particularly an expert on the interpretation of this type of proxies records, and thus my comments will mainly directed at the interpretation of the time series and the claimed linked with the other climatic proxy records. In my opinion, the interpretation of this link is strongly based on previous studies - which also claimed to have found relationships with solar activity and the index of the Summer North Atlantic Oscillation. However,the evidence provided here for this link, though suggestive, seems from the technical point of view weak. I am aware that in the literature of sediment records one can find many examples of 'wiggle matching' to support relationship between many different types of records, and in this regard this manuscript is not worse than what can be read in other studies, but I would appreciate if some of the strong claims done in this manuscript could be more strongly supported. I think that the data basis, though fragmentary as it is often, would allow for a more quantitative assessment of those links.

Other than that I found that the manuscript is in general terms well written and the figures are well presented.

My main concern can be summarized by the interpretation of the results presented in Figure 5 and Figure 8. The main text asserts that there is a clear correlation between the records of Total Solar Irradiance, summer temperature reconstructed from tree rings and summer precipitation. However, no quantitative estimations of these correlations are given, and by eyeballing I would clearly disagree that there is any link between TSI , and summer temperature and the record of flood frequency. I can see a relationship between flood frequency and reconstructed precipitation, but not with the other climate records.

For instance, let us focus on Figure 8. This figure shows the 40-year low-pass filter record of Total Solar Irradiance, the 11-year low-pass filtered record of summer temperature and precipitation, and the sedimentary paleoflood record. Why is the time filtering different (the TSI data are available also at decadal time scale) ? what is the time filtering of the paleo flood record ? what is the resolution and dating uncertainty of the original paleoflood record. I could not find this last piece of information in the manuscript, (I may have missed it), but I think that its should be stated in a prominent place in section 4.2 in a way that is also intelligible also for experts in other types of proxies and even climate modellers-. This point is particular important because the claimed correlation with other climate indices critically depend on the dating and its uncertainties.

I cannot see e real correspondence between TSI a) and plain floods: the minimum in TSI around 1480 occurs later than the corresponding minimum in the flood record; the flood maximum around 1580 (one of the highest maxima in this record) corresponds to lower than normal TSI; the Late Maunder Minimum in TSI around 1700 corresponds to a normal flood frequency. There are some peaks to agree in both records, like the Dalton Minimum around 1820 , but even in these case, TSI presents one single minimum, whereas the flood record actually presents a double minimum more reminiscent of the early 19th century volcanic forcing.

Comparing the flood record with the reconstructed summer temperature (b) in this figure, the agreement in my view is still worse: the cooler temperatures in the LIA do not correspond to higher or lower flood frequency, but rather this period is hovering over normal flood frequency. The recent warming seen in the instrumental and reconstructed temperatures does not correspond to any increase

or decrease of flood frequency. The period from 1300 until 1550 contains the strongest maxima and minima of flood activity and yet the reconstructed temperature was flat. Can these mismatches be explained by uncertainties in the reconstructions of temperature ?

I would strongly recommend to quantify these claimed correlations with series that have been smoothed in a similar way . I may be wrong but I think that the correlation between these records will be quite low. Also, the spectral analysis of these records, whereas suggestive of a a causal link, is certainly not sufficient to claim it. First, the uncertainty in the estimated periods is large, in particular for the longer periodicities, so that for periodicities of the order of 100 years, almost everything can be claimed to match. Secondly, do the phases of these periodicities also agree ? This latter point could be addressed by estimating the cross-spectra or more simply by the correlation. It is not expected that there may be a lag between TSI and flood frequency, since temperature proxies do show a simultaneous response to TSI and volcanic forcing.

Figure 5 presents in my view similar problems. Why does the matching between maxima and minima requires modifying the timescale of the sediment record ? Again, which is the dating uncertainty and which is the approximate time resolution of the flood record . Even allowing for some leeway to re-date the maxima and minima, there are clearly sustained periods of lower and higher values of the deltaO18 record that do not match the flood record. For instance between 1700 and 1800 BP, the low-frequency variability of both records is opposite. This happens in many other extended periods.

A third important concerned is related to the explanations of the link between the flood activity and the Summer North Atlantic Oscillation. This explanation can also be found in other cited manuscripts, like Peña et al. I think it make sense dynamically, but the I also think that the authors are overseeing substantial uncertainties in those reconstruction of atmospheric circulation. Luterbacher et al. state that the SLP reconstructions are skilful in the winter season and that previously to 1700 AD the skill for the summer season is 'lower'. This also makes sense dynamically, since the atmospheric circulation in summer has a smaller scale character- for instance the leading PC in this season explain less variance than in wintertime . Also, previously to around 1700, the set of proxies used for the SLP reconstruction do not contain early instrumental records, but only temperature and precipitation proxies. This poses the problem that any comparison between say flood activity and reconstructed SLP bears the risk of circularity - precipitation proxies explaining precipitation proxies - and it is not guaranteed that this purported relationship is really due to a real dynamical mechanism. An additional point is that temperature proxies do not necessarily record atmospheric circulation anomalies when interpreted at long time scales. The external forcing , like TSI, is different, and so we may have say colder winters caused by lower TSI without any change per se in the NAO. We have to bear in mind that climate model results do not indicate any discernible influence of external forcing on atmospheric circulation over the past millennium , apart from the possible effect of strong tropical volcanic eruptions.

I am aware that it is not easy to disentangle all these links, but I would welcome if these caveats were critically acknowledged and that the SLP and temperature reconstructed were not simply taken as given and used uncritically.