

Interactive comment on “The BernClim plant phenological data set from the Canton of Bern (Switzerland) 1970–2018” by This Rutishauser et al.

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Anonymous Referee #2 Good product. See small list of corrections and questions in supplement. Please also note the supplement to this comment: <https://www.earth-syst-sci-data-discuss.net/essd-2019-101/essd-2019-101-RC2-supplement.pdf> Review ESSD-2019-101, Bern phenology data set Thanks to authors for removing data access barriers. Data now downloads easily, looks very clean. Confirm 7414 data records.

We appreciate the remarks and suggestions from referee #2 to our manuscript. Please find below our replies. All changes are included in the revised version of the

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manuscript.

Page 2 line 56: “suggest that the data different data sources are complementary” Something wrong with text here. You mean ‘data from different sources’ or instead ‘the different data sources’? corrected

Page 4 line 109 (and Figures 4 and 5): daily data for fog and snow using these forms but those data not included in this data product? A bit confusing to read about daily winter data while not knowing how or where archived and how accessed. Authors do not need to show those data, but if they take the trouble to mention the daily observations and to show the forms, readers should learn at least how to access those data? We rephrased the section to “All original observation sheets of plant, snow and fog observations are archived at the University of Bern. During ongoing data rescue a large fraction has been photographed. To date, only plant observations have been digitized and controlled for publication.”

Page 4 line 121: “Each series was standardized” What does ‘standardized mean in this context? This refers to the assembly of stations by coordinates into a shared zip code? Or this means that each series underwent the 6 QC steps listed soon after? Some clarification, s.v.p. Thanks for the remark. We replaced “Each series was standardised.” with “The first four tests use absolute dates, test five is based on standardised series while for test six, for a given year, the standardised dates from all series were re-standardized.” Standardisation always refers to the time series at an observation site and does not mean the assemblage of several site series into one combined series.

Page 5 line 130: Again this word “standardized” now referring to DoY values. “standardized dates were restandardized”. What does this mean? We replaced “restandardized” with “scaled” to clarify the retransformation to days of year.

Page 6 line 178 to 182, discussion of future monitoring. Note the word “could” on line 178! As observers (and, in some cases, trees) age out of the survey, will this record cease? Figure 7 suggests that those other networks will not retain the high spatial

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resolution of the Bern data? We added more information about the question raised in the manuscript. "In the future, the data series could be continued and merged with citizen science data and platforms such as PhaenoNet and OpenNature (Lehmann et al. 2018). As methodologies evolved, the integration of high resolution data sets in space are more easily combined with longterm data as the BernClim observations."

Line 179: here reader finds that winter data awaits analysis. That data not otherwise available? Analysis by whom, and when expected? There are no specific plans nor deadlines foreseen at the moment. Please see the answer to Page 4 line 109 above for more details.

Line 180: how would 50% blossom data prove relevant to leaf area or NDVI? Do the authors have specific examples? Not clear to this reviewer? We added the following changes to the revised manuscript. "As indicated by Rutishauser et al (2007) and Stöckli et al (2008), the data have the potential to locally extend satellite data back to 1970, and they have the potential to study biological processes on the local level with continuous evidence over five decades."

Figure 1: even though I know the region, the various subtle greyscale and sizes of dots on a grey background confuse this reader. Get the figure in colour, or change some symbol shapes (diamonds, stars) to better distinguish station types? Need a bold outline of canton Bern! If no page charges, and therefore no colour penalty, why not use a color background? Many exist. We adapted Figure 1 in the revised manuscript.

Figure 2: this reader admires observer persistence and the long continuity of these records. But at some point the data become so few that they cease to provide a valid spatial representation. At what point? I believe others have addressed this question of minimum spatial requirements? Thank you for the remark. Minimum spatial requirements with respect to spatial representation have been addressed for many variables. We have decided not to perform quantitative analyses and refer to the in-depth analyses by Güsewell et al (2018) for the Swiss Phenology Network SPN.

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They find that phenological variation across Switzerland is determined by altitude, large-scale spatial trends and local deviations (e.g. due to variation among individual plants and observation error), whereas small-scale spatial dependence (correlation of neighbouring stations) is weak. Güsewell et al state that the number of stations currently included in the SPN is sufficient for precise estimates of mean onset dates of each phenophase, of long-term trends and of responses to temperature for the entire country and for three altitudinal layers. Finally, Güsewell et al. conclude that the quality of the responses of plant phenology to climatic factors and to predict changes associated with future climate warming depend critically on the quality of the underlying data. Güsewell S, Pietragalla B, Gehrig R and Furrer R: 2018, Representativeness of stations and reliability of data in the Swiss Phenology Network, Technical Report MeteoSwiss, 267, 100 pp. <https://www.meteoschweiz.admin.ch/home/service-und-publikationen/publikationen.subpage.html/de/data/publications/2018/6/representativeness-of-stations-and-reliability-of-data-in-the-swiss-phenology-network.html>

Figure 6: Presumably the bold black line represents these data? If so, designate in the figure legend. The inhomogeneity emerges when these data begin to show consistent later DoY date than all other five reference sites? The authors do not share nor propose an explanation for this inhomogeneity? Because I find location Wyssachen many times in the common beech data subset, I can not tell whether the authors flagged and removed this particular time series or retained it? We adapted the figure caption as the reviewer suggests. Figure 6 is shown to illustrate the inhomogeneity testing in the present study. We have not analysed the case studies with respect to explanations for each inhomogeneity arising.

Figure 7: the colour scale shown with reference to circle data also applies to diamonds? If so, this figure confirms the 40-day advancement mentioned on page 5, line 158? Yes. Colour scale is now moved within the figure to reduce confusions. As pointed out, this figure confirms a shift of more than one month for hazel flowering within the past 50-year period. Note that the flowering of hazel is very sensitive to temperature forcing .

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Thus, the change shown in the figure not only shows longterm temperature changes but also interannual variability.

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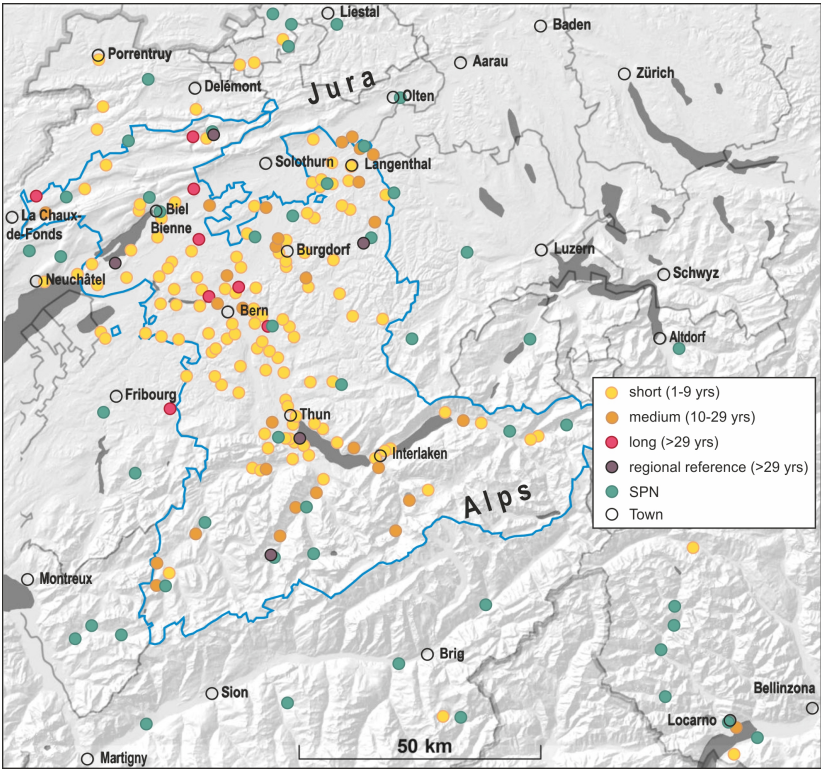


Fig. 1.

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