

Reviewer 2 – Prof. Heinz Wanner:

We would like to thank the reviewer for many valuable comments:

The authors do not discuss dynamic aspects. It is recommended to do so in a future paper. It would be interesting to study the weather types and their dynamics being responsible for the modern drought events, and to ask e.g. the question whether or not the state of the adjacent moisture sources (e.g. the sea surface temperatures of the North Atlantic Ocean) can explain a significant amount of drought variability.

Response:

The study of dynamic aspects of the Czech droughts was not between aims of this publication and looking on long-term period covered it would be rather complicated going further to the past. But it was partly dealt with already in the paper by

Brázdil, R., Trnka, M., Dobrovolný, P., Chromá, K., Hlavinka, P., Žalud, Z. (2009): Variability of droughts in the Czech Republic, 1881–2006. *Theoretical and Applied Climatology*, 97, 3–4, 297–315,

looking on synoptic climatology of droughts (changes in the occurrence of weather types according to classification of the Czech Hydrometeorological Institute, principal component analysis of SLP) for extremely and severely dry months. We did not try to study this topic in direction as proposed by reviewer (e.g. SST in the North Atlantic Ocean) but we keep it as an important and motivating comment for future studies. We are preparing a paper related to droughts in the instrumental periods where the dynamic aspects will be examined in detail as sufficient data for such analysis are available through most of the instrumental period.

We included some explanations to Section 6 at the end of the first paragraph as:

“The current paper does not include dynamic aspects of Czech droughts. Such an analysis for the entire period covered in this study would be very difficult. Moreover, Brázdil et al. (2009) discuss the synoptic climatology of droughts based on changes in the occurrence of daily weather types according to the Czech Hydrometeorological Institute classification (Katalog, 1967, 1972) and principal component analysis of sea-level pressure in the Atlantic-European area for extreme and severe droughts in 1881–2006.”

Page 2435, line 9: I regret that Figure 5 is not discussed in more detail, despite of the length of the paper, because the modern data allow drawing possible conclusions about dynamic aspects of drought formation.

Response:

As for dynamic aspects of drought formation see our previous comment. With respect to the whole concept of the paper, we see more important discussion on the decadal than on the annual level. Fig. 5 is used for readers who are interested in some particular years. Moreover, some of years with N-year droughts are mentioned in several other paragraphs (see e.g. last paragraph in Section 4.2 or the first paragraph in Section 4.3).

Concerning the uncertainties during the documentary period: I agree Figure 8 offers one opportunity for the estimation of the uncertainties during the instrumental period. What about the period with documentary data? Would it not make sense to develop a statistical uncertainty measure, e.g., to calculate a measure representing data quality, expected data frequency, and the spatial distribution of the data? Even it is very difficult this would possibly offer an opportunity to enlarge the length of the time series?

Response:

The problem is that it is nearly impossible to fulfil this request. As the reviewer knows very well the nature of documentary evidence, this changes great deal in space and time. There are hundreds to thousands of data which we had to analyse and interpret to obtain information we presented. For example, to provide information about number of sources would not bring too much because key role is played by quality of information. In other words, one contemporary and precise source can be more valid for index construction than several lower-value sources. Moreover, examples of data used we described in Section 2.1. We believe that from described examples follows evidence which was available for interpretation of dry months. Taking in account troubles described above we used only qualitative description and we put a great attention to discussion of possible uncertainties in this data.

Section 5.1.3., page 2443 and Figure 9: In this section you mention the importance of the pressure systems, but then you present one example with the anomalies of only one year. Would it not make more sense to present a map with the spatial representation of the coefficient of variation (CV) e.g., during the period with best instrumental measurements?

Response:

The figure of variations coefficients of April-September precipitation totals in 1961-2010 is included as Fig. 9b:

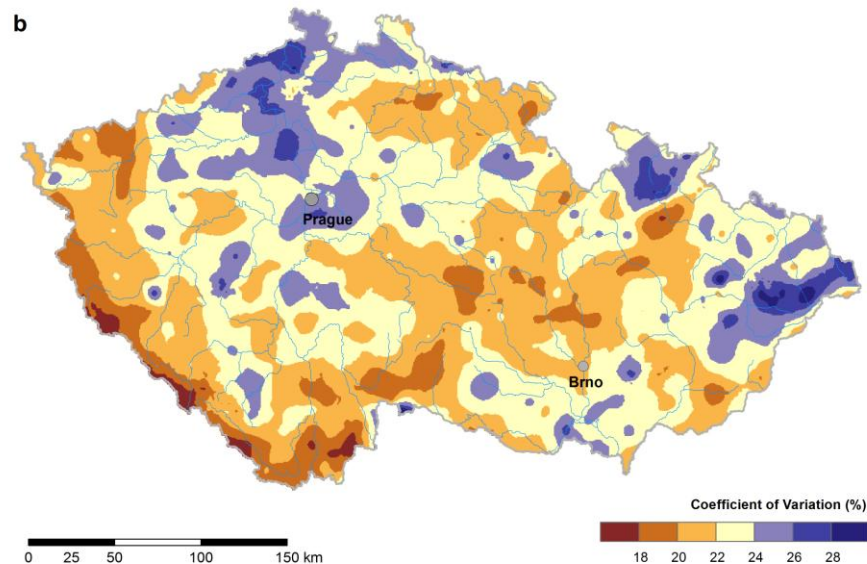


Fig. 9. b) variability of April–September precipitation totals in the Czech Republic in 1961–2010 expressed by coefficients of variation

With respect to Fig. 9b, the new paragraph in Section 5.1.3 is added:

“In order better to demonstrate spatial precipitation variability in the Czech Republic, coefficients of variation in homogenised series of April–September precipitation totals for 787 rain-gauge stations in the 1961–2010 period were calculated (Fig. 9b). These fluctuate between 16.9% (Nová Pec station) and 31.9% (Šance). The highest variability is typical of the central parts of Bohemia extending up to the north-west border with Germany, and for a part of southern Moravia stretching further to the north and north-east. While the areas of highest variability in Bohemia

tend to be limited to lower positions, they appear mainly in more mountainous locations in the eastern part of the Czech Republic. The generally spotty character of the field may be attributed to the spatially variable character of convective precipitation in the summer half-year.”

Page 2427, line 5: You just cite Brázdil. Why not a few other important papers?

Response:

Papers of Brázdil et al. were used because of their state-of-the-art or reviewing character starting from definitions of the field, data, methods, research achievements and recommendations to community. As for historical climatology, we complemented several other papers like Pfister (2001), de Kraker (2006), Kiss (2009) or Mauelshagen (2010). As for historical hydrology, we do not know about any other papers of this state-of-the-art-character as two mentioned (some papers are dealing only with particular catchments or rivers analysing concrete flood chronologies or particular floodings).

Page 2428, line 20: Write “prepares”

Response:

Not accepted, wrong in English.

Page 2429, line 5: What means “had travel”?

Response:

We believe that this is correct: the people had travel (go) several miles for water.

Page 2429, line 22: Write “removes”

Response:

Not accepted, wrong in English.

Page 2431, line 1: Write “A(n) SPEI”

Response:

Not accepted: if the spelling is “es, pee, ee, ia” then it is “An”.

Page 2446, line 16: Write “values”

Response:

Corrected as requested.

Page 2449, line 21: Write “presents”

Response:

Corrected as requested.

I am not a native English speaker but I have the impression that, in several cases, you missed the articles prior to a noun or a time period, e.g. on page 2447, line 4: Similarly, the reconstructed.

Response:

Line 4: corrected as requested.

The first reviewer, Dr. Dennis Wheeler, as a native, had not any comments to the English style. The native speaker Tony Long mentioned in acknowledgements of this article is working for us already for several years – never happened there would be any comment to his English, i.e. we do not know what should be corrected.