

## Remarks to the Editor

The expertise of the present Reviewer is mainly in the field of historical floods having occurred in past centuries. He is less familiar with documentary data and the published literature on FFs (= Flash Floods) of the present 21<sup>st</sup> century period. This Reviewer appreciated that the authors of the present submitted manuscript have used the exhaustive data collection made available in the IT-era. The lead author, prof. Dr. Rudolf Brázdil is a world-known expert in historical floods and has published numerous papers in this context.

This Reviewer is a non-paid consultant of the Royal Meteorological Institute of Belgium (RMIB) at Brussels, Belgium. He has published extensively on hydrological catchment modeling, probability distributions of rainfall depths, historical climatology and hydrology.

## Review Procedure

All co-authors are members of scientific institutions (Masaryk University, Global Change Research Institute of the Czech Academy of Sciences, Masaryk Water Research Institute, Czech Hydrometeorological Institute) located at Brno, Moravia, Czech Republic what indicates a strong coherence in their research activities and in producing the manuscript under review.

**RESPONSE:** We would like to thank Dr. G. Demarée for evaluation of our paper and raising several critical comments, which we are trying to answer below.

The extensive data base used in this manuscript challenges the scarcity of ready-available information of FFs which are typically events presenting a limited spatiotemporal context. First of all, the printed newspaper *Právo*, the main national newspaper, and the online *Novinky.cz*, were scanned. Did local publications mainly dealing with advertising and providing local events were also taken into account?

**RESPONSE:** In *Právo* and other main newspapers are usually also some pages concerning of events of particular regions. Moreover, some other newspapers used in this manuscript for data mining (e.g., *Rovnost*) have rather local focus. Moreover, on the internet we found information of many local events (on the level of individual settlements) or even information of local newspapers. But as we mentioned in Sect. 5.1, “Although our database represents the best estimate of FF occurrences across the CR, we must be aware of possible uncertainties, especially in reporting events with small or negligible damage, which could remain unnoticed.”

What was the proportion of newspaper data, internet sources, CHMI Reports, professional papers and Other Data Sources? Are there events mentioned in several of these sources at the same time?

**RESPONSE:** Presented order of FF data sources in the manuscript express also their decreasing quantity, where newspaper and internet version of related newspaper clearly prevailed. Because several events were covered by different sources, quantification of their proportions would not bring any important information for the reader. Despite this, we give some raw data for the referee: For FFEs in the database, 1058 sources appeared repeatedly and 470 uniquely. Each FFE was described from one to seven sources: one source 36% (181), two 35% (177), three 16% (78), four 9% (44), five 3% (15), six 1% (4) and seven 0.5% (2). From these sources *Právo* represented 36%, *Novinky* 26%, CHMI data 9%, *idnes.cz* 7%, *deník.cz* 4%, etc.

Other Data sources were represented by auxiliary meteorological data, which were used for other analyses (precipitation, circulation types).

What are the minor case letters *a* (Rozhovice) and *b* (Nový Jičín) in Figure 1?

**RESPONSE:** Small letters were used to identify small watercourses as mentioned in the figure caption: “Watercourses: a – Dubanka, b – Jičínka, c – Rychnovský potok.” Rozhovice is locality with number 19. The use of different symbols was needed to localize small places/watercourses in the scale of the whole Czech Republic.

Although the frontier region of Šumava Mountains contains many FFs, none is mentioned in figure 1 – is it a coincidence?

**RESPONSE:** Figure 1 includes only places, watercourses and geomorphological units mentioned directly by their names in the text itself. Although many FFs occurred in the Šumava Mts. region as the referee wrote (see e.g. Figures 2c, 3b, 6), no place or watercourse was mentioned namely in the text.

In the database of Flash Floods (section 3.1) the item ‘elevation (in meter above sea level)’ was not selected. However, it might not have any interest as events happened maybe mostly in hilly areas. Maybe this factor might show up in the annual totals of FFs in the administrative regions of the CR (see Figure 8).

**RESPONSE:** Elevation was not explicitly considered in database (Sect. 3.1), because of difficulty to attribute it to any particular object (settlement – to every mentioned, which part of settlement? watercourse – which part of the stream? damaged objects? etc.). It would be extremely difficult to add elevation to administrative regions – mean elevation, elevation of affected places ...? As we say on line 246, “FFEs predominantly occur at the foothills” of mountains, where for concentrated runoff are among the key factors rather “average slope, and relief fragmentation” (line 250). On the other hand, we are aware that the physiographic parameters including elevation are important in terms of runoff generation, which was also shown by Faturová et al. (2024 – see manuscript references). In our following work, there will be a focus on a more detailed study of the physiographic parameters of some of those catchments from the FF database (with higher values of unit peak discharge).

This Reviewer would suggest to include the abbreviation FFD in the legend of Figure 2 as was already done with the abbreviation FFE: ... and flash flood days (FFDs); ...

**RESPONSE:** Changed as requested: “and flash flood days (FFDs);”

The probability distributions of the FFEs and FFDs in the summer half-year seem to be Gaussian.

**RESPONSE:** May be yes, but we did not test it, because as we believe this information is not so important for this manuscript.

Line 470: Is there a hydrometeorological reason why the flood formation predominantly occurs in the late evening and in the night? Most probable the temporal occurrence of ‘thunderstorms’ are a basic argument (seen section 4.2.1).

**RESPONSE:** We added related information to the following part of the sentence: “... predominantly occurs in the late evening and night hours (following a usual time of the thunderstorm occurrence), directly measuring ...”

Significant FFEs (see section 4.4): no remarks

**RESPONSE:** Thank you.

Statistical evaluation of deadly events during FFEs is difficult as the reference periods are very different. Some reference periods even include the late 19<sup>th</sup> century which might even question their data base collection techniques. Strictly speaking the rates in a broader

geographical context are only comparable on the time frame of the present data base. However, previous studies by Brázdil, the lead-author, using similar data collection techniques and methodology show clearly no significant change in fatality rates over time in the Czech Republic.

**RESPONSE:** We are aware of the problem of comparing fatalities for different periods, territories and definitions of FFs. However, our aim was to present not only data from the CR based on preceding studies (which are the best comparable), but rather show different spatiotemporal scales and results of studies dealing with the same topic in many other countries.

**Conclusion:** This manuscript is clear, well written and has a large exhaustive reference list dealing with FFs. The authors were very successful in exploiting the data bases mentioned in section 2 '*Data*' in the context of FFE and FFD-related occurrences. Finally, it might be suggested to the authors in a potential future paper to extend the results of the present manuscript dealing with FFs in the Czech Republic in the reference period 2001-2023 to earlier periods.

**RESPONSE:** Thank for your suggestion. In our study we tried present the first complex analysis of FFs in the Czech Republic in a broader view for the period well covered by different types of data. We already collected a lot of FF information before 2001 and we have been collecting continuously also data from 2024, i.e. there is a hope for an important future extension of the database used for the recent study.

This Reviewer suggests publication as it stands leaving the authors, if they wish, taking care of the few minor suggestions and remarks mentioned by this Reviewer.

**RESPONSE:** Thank you very much.