Interactive comment on "Rainfall erosivity factor in the Czech Republic and its Uncertainty" *by* M. Hanel et al.

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We thank for practically oriented comments. The point-by-point response is included bellow. In response to comments we replaced one figure and modified the manuscript at several places. In addition, we now include supplement providing detailed information on the considered data. The modified manuscript is attached.

More specific remarks:

1) I find it impossible to recalculate any of the results obtained due to the complete lack of parameter values for the different equations tested; I suggest to add a table with parameter values whenever possible

We agree, that for practical purposes, it is useful to provide parameters allowing for

estimation of R-factor. However, in our opinion, it is sufficient to include estimated parameters for the best interpolation model (GLS_E) only, since it is in general preferred over the other models. Note also, that the parameter matrices for some other models are huge and their practical implementation would be rather difficult. The estimated parameters for the best interpolation model (GLS_E) are now included in the revised manuscript (Sect. 4.2).

2) Detailed information on input data is missing (station name, exact period of recording, details about covariate values.. . .) in addition a table with information on R-factor characteristics (mean R-factor) of the stations is missing, this may already be included into the table of input information - please provide; I am aware that these details will need about two pages of the manuscript, however without this information, the manuscript lacks much of detail.

We believe, that such table is too large to fit in the manuscript. However, we agree that such detailed information might be interesting/useful for some readers. Therefore we extended the manuscript with a supplement providing this information (station identificator, name, coordinates, altitude, covariate values, the at-site R factor and the number of missing/unreliable years within the considered period 1989-2003).

3) Please reconsider the number of digits you are using to describe results. Given the fact that you are dealing with confidence intervals in the range of $\pm$ 10 (minimum) it does not make sense to provide R-factors with 2 digits after the decimal. See for instance page 12, line 7 or Table 1. Please reconsider throughout the whole manuscript.

In response to anonymous referee #1 we already modified units in which the R-factor is presented in the manuscript. We agree that it is sufficient to provide rounded R-factor values. This was checked throughout the manuscript.

4) For practical purposes (a useful application of the USLE) it will be necessary to provide at least monthly R factors, because they are needed as input into the

USLE management factor. I understand that it might beyond the scope of this paper, however I would strongly suggest to provide these data in the future.

We understand this point, but it is indeed out of the scope of this paper to consider monthly R-factor values. Please note, that for instance it might be good to purchase the covariate values (gridded data) for individual months. To increase a potential practical impact of our study, however, we at least provide a typical seasonal distribution of the erosivity index in the modified manuscript (see Sect. 4.1).

5) I am missing some information about stationarity of the data used for the study. Can you provide some information here?

The erosivity index shows no clear trend in the considered period (1989-2003). This is now noted in Sect. 2.2 (also as a reaction to anonymous referee #2).

6) Page 2, line 29: It is interesting to note that, while the mean R-factor values of maps based on a European dataset (Panagos et al., 2015) are quite similar to those derived in this manuscript, their range is much smaller. For the extreme case of an R factor of 152 (recorded at one site in Czech Republic) this would practically increase a soil loss according to some USLE approach for >100%.

Thank you for this point. It is true, indeed, that the range of R-factor values for the Czech Republic is narrower in the map provided by Panagos (2015) - further denoted PNGS2015 - compared to our results. This is likely due to different (and smaller) number and location of stations used for derivation of the maps. The range of the R-factor values for the Czech Republic from PNGS2015 is ca <340 - 900 [MJ ha-1 mm h-1]. After correction for temporal resolution (conversion from 30 min to 10 min, also provided in PNGS2015) it becomes ca <414 - 1097 [MJ ha-1 mm h-1]. While the maximum at-site R-factor is 1520 [MJ ha-1 mm h-1] (O1RASK01), the second largest at-site R-factor only slightly exceeds 1100 [MJ ha-1 mm h-1], corresponding well with the maximum from PNGS2015.

Note that the R-factor map, when derived without the O1RASK01 station, is very similar to the map presented in the manuscript - the maximum, mean and spatial distribution of R-factor changes only very slightly, suggesting our model is rather robust. We added a note on this. In addition, in response to comment #8 we modified Fig.3, showing now also R-factor maps based on different sets of stations.

7) Page 4, line 25: Is the gridded information data set using the same time period as the station specific data set? Please provide this information.

Yes, the period considered for the derivation of the gridded data is the same as for the station data. It is now stated explicitly in the manuscript (see Sect. 2.3).

8) Figure 3: This Figure does not provide useful information at present – either rework for a better graphical representation or skip

The figure was modified - we decreased the number of panels. The four displayed maps now show the estimated R-factor according to the "best" model (GLS$_E$) fitted on full set of 96 stations. Other 3 panels demonstrate the effect of excluding stations with large R-factor values, responding to comment #6.

9) Figure 7: . . .. only those below 600 m (dashed).

Thank you for spotting this error. It is now corrected.

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/hess-2016-158/hess-2016-158-AC3-supplement.zip