The manuscript used 5-min and daily data from northern Germany to evaluate the accuracy of 4 different methods to estimate the rainfall erosivity (R) for sites where high temporal resolution rainfall data are not available. The manuscript is structured well, and mostly readable. The authors should be commended for being thorough and rigorous in their data analysis.

Presentation is ok, English expressions need attention to improve the quality of the manuscript. I have edited the abstract for the authors. Similar effort is probably needed throughout the manuscript, especially with respect to the tense. When we describe what we did, we need to use the past tense. Use the present when we cite other people's work, especially their observations and conclusions, because they have been published and, in a sense, made permanent.

Specific comments

Fig. 1 – Poor quality. No longitude/latitude, no scale. So not all stations are located in Lower Saxony.

Fig. 3 – Use 'Computed R' for the first dashed box top left?

Fig. 4 – Y-axis. If there is no scale, what is the point of having the unit?

Ditto Fig. 5

Line 38 - ha^{-1} h^{-1}

Line 57 – What do you mean by 'high frequency'?

Around Line 60

To use the USLE/RUSLE, the following is needed: the R value, and monthly or half-monthly distribution of erosivity, and 10-year event EI30 values. While storm event characteristics are relevant, they are not needed, strictly speaking. Re-define and specify the research objectives. If event EI30 is included, some of the 4 methods are automatically disqualified. In other words, it is necessary to clearly define what aspect(s) of the rainfall erosivity to be estimated and the methods that can be used for that estimate.

Around Line 75

Fig. 1 indicates that stations outside of Lower Saxony were also included in the study. It is better to define the study area using latitude and longitude boundary to include Lower Saxony within that boundary.

10-year could normally be short for computing the R factor values. What is the interannual variability of annual precipitation and annual EI30 values among the recording stations with 5-min data?

Line 107

I understand that ',' is used for decimal places in many European countries. Not sure about the journal policy on this. I'd like to see the authors use 0.29, 0.72 etc as they appear in the original reference cited by the authors for an international readership.

Around Line 125

The authors include many covariables for EDK. May I suggest author include the mean annual precipitation (P) as one of the additional variables in Equation (5) because P is widely and reliably available and we the P and R are well related around the world listed below.

Renard, K. G., & Freimund, J. R. (1994). Using monthly precipitation data to estimate the *R*-factor in the revised USLE. *J. Hydrol., 157*(1-4), 287-306.
Yu, B., & Rosewell, C. J. (1996). A robust estimator of the *R*-factor for the Universal Soil Loss Equation. *Trans. ASAE, 39*(2), 559-561.
Zhu, Z., & Yu, B., (2015). Validation of rainfall erosivity estimators for mainland China, *Trans. ASABE*, 58(1), 61-71.

Around Line 155

How many parameters to be calibrated using observations for ARM? Do the parameters vary monthly or seasonally? How were parameter values estimated?

Line 18 – Linear transformation. How was this achieved? Did you have to extrapolate from 15-min and 7.5-min down to 5-min?

Again, how many parameters involved in the disaggregation method, how were they estimated, i.e. method of estimation?

Around 175

EDK was used to spatially interpolate the R factor. Why was this not used with covariables to interpolate daily rainfall amount before disaggregation?

Reference:

Line 194
'18 stations with the longest' record length: How long were they in number of years? Compute annual EI30 values to shed light on its underlying interannual variability to provide some empirical support for selecting 20% as a criterion to define a 'stable' estimate.

Result section

The result in relation to R is fine, but there is a need to justify the way erosive events were selected and aspects of these events were defined. Again, if the intent of the manuscript is to prepare the best possible input for the USLE/RUSLE, one needs to use events as defined in the USLE/RUSLE (Renard et al. 1997). If one selects events mostly for the sake of testing and comparing different rainfall interpolation approaches, it is useful to spell this out as one of the distinct research objectives.

Conclusions

No. 1 Again, one questions whether we need to have the number of erosive events and event duration for the USLE/RUSLE. This depends on the research objectives. If we focus on event-level EI30 values, and other aspects, it is not even fair to include the Direct-R in the comparison.

No. 5 This needs to be assessed in the context of the underlying interannual variability of EI30 values for the region.

Abstract with track change as an example:

Rainfall erosivity values are required for ~~The assessment of rainfall erosivity is one of the main inputs in determining~~ soil erosion prediction. To calculate the mean annual rainfall erosivity (R), long-term high-resolution observed rainfall data~~time series~~ are required, which are often not available. To ~~15~~ overcome the issue of~~ limited~~ data availability in space, four methods were~~are~~ employed and evaluated: ~~the~~ direct regionalisation of R, ~~the~~ regionalisation of 5-~~-~~min~~ute~~ rainfall, ~~the~~ disaggregation of daily rainfall into 5-~~-~~min~~ute~~ timesteps, and ~~the~~ use of a regionalised stochastic rainfall model. In addition, the minimum record~~time series~~ length necessary to adequately estimate R was~~is~~ investigated for~~. The impact of station density is considered for~~ each of the 4 methods. The study was~~is~~ carried out using 159 recording and 150 nonrecording ~~(~~daily~~)~~ rainfall stations in the federal state of Lower Saxony, Germany. Results show that the direct ~~r~~regionalisation~~ 20~~ of the mean annual erosivity is ~~leads to~~ the best~~ results~~ in terms of relative bias and relative root mean square error (RMSE). This is
followed by the regionalisation of the 5-~~-~~min~~ute~~ rainfall data, which yields better results than the rainfall generation models,
namely an alternating renewal model (ARM) and a multiplicative cascade model~~ (Disagg)~~. However, a key advantage of using

regionalised rainfall models is the capacity to -generatecion of rainfall time series that can be used for the estimation of the erosive event
characteristics, which is not possible withthrough the direct regionalisation of R. Using the stochastic ARM, it can be shown that
25 in most cases more than 60 years of data is needed in most cases in order to reachobtain a stable estimate of the annual rainfall erosivity. Estimation
of soil erosion based on only 5 or 10 years of data can lead to uncertain R values. Such short time series are often used when
regionalisation is applied. Moreover, it was also found that temporal resolution of measuring device has a significant effect on the
rainfall erosivity and coarser data resolution can lead to high relative bias.