

## Rainfall erosivity in Fukushima Dai-ichi by Laceby et al.

This is an interesting study as it combines the Rainfall erosivity with the effects of nuclear accident in Fukushima. It is a smart idea to combine the rainfall erosivity with other indicators or threats (e.g. contamination). However, there are a number of issues that authors should address before gets published. The most important issues that should be adjusted are:

- Authors should somehow underline in the conclusions that Rainfall erosivity is an important indicator to determine the climatic vulnerability of a region (also from soil loss point of view) and future power plants design (or even maintenance) should take into account this indicator.
- L66-67: Rainfall erosivity takes also into account rainfall amount and rainfall frequency (plus the duration and intensity which have been underlined by authors).
- L76-L78: “global application”: The study of Oliveira was done at national level (Brazil) and the study of Fienner at local level (in a province of Germany). The study of Vrieling was done with a different methodology than the one proposed by authors. Instead, at continental scale, authors should include the recent study of rainfall erosivity in Europe (Panagos et al 2015). This was done with the same methodology as here and was included in the first manuscript (while it was surprisingly deleted in this revised version).
- Equations 2: the 0 on the top is a mistake. Please revise it.
- The impact of snow in R-factor: This is true also in European applications. See the insignificant impact of snow in R-factor estimation in Switzerland (Meusburger et al., 2012).
- 2.4 title to be changed as “*R-factor spatial interpolation*”
- The use of WorldClim datasets as covariates for the rainfall erosivity is very similar to the application in Europe (Panagos et al., 2015) which was neglected by authors. Moreover, authors should be more precise regarding the temperature: Mean? Maximum? Minimum?
- Congratulations for the use of GAM which is also recommended in spatial interpolation on a monthly basis.
- L229-238: Is the annual the sum of monthly? If not, which is the difference if you sum your 12 monthly layers compared to the total erosivity (modelled per se). Did you impose any restrictions in order to have the best sum? What you have done with outliers? Moreover, authors should discuss if the prediction at monthly temporal resolution has higher uncertainty than the prediction of annual R-factor
- In section 3.1 and 4.1 you could even refer more (in text) in figure 4. This is not so much analyzed in the text.
- L277-283: “highest mean annual maximum daily precipitation” is not a term. I understand the meaning but it is not an appropriate term. On L283, delete ‘average’.
- 3.2 Header: Delete “Spatial” . The sub-chapter refers to temporal variability.
- Sections 3.2 and section 3.3 should be distinguished easier. Find a better title for 3.3
- L303: “deviance” is not appropriate term. I would propose “variance”
- 3.3 Section and relevant table 2: Authors should discuss the fact that  $R^2$  is lower in the most erosive months where you have high un-predictable rainstorms. The prediction is much more difficult in months with very few –high erosive events
- L356: The name of Typhoons (or can you please define a Typhon for this region)?

- Section 4.2 and L385-L386: The sentence is very generic, you can specify it regarding spatio-temporal variability of R-factor. Since your article has been submitted in 2015, you are not aware of the 2 studies which have published spatial and temporal rainfall erosivity at national scale in Greece (Panagos et al, 2016, Catena) and Italy (Borrelli et al., 2016, Int. Journal of Digital Earth).
- section 4.3: there are more studies that should be cited as relevant to the influence of Typhons in rainfall erosivity: Brazil (Oliveira et al., 2012, Catena) and Colombian andes (Hoyos et al., 2005, Journal of Hydrology) .
- Section 4.4 is very interesting. The R-factor in Ukraine provided by Larionov (1993) is following the same methodology and same temporal resolution like yours?

Minor issues that should also be addresses:

- Results:
- Discussion:  
Please delete the “:”
- L326  $\Delta AIC$ : please explain in the text what is about? I have seen in the table but not in the text
- L344 “easternmost “ . I suppose it is a grammatical mistake.
- L401: JMA. Please specify...
- Table 1: Attention to the MJ mm-1 ha-1 h-1 yr-1. It should be MJ mm ha-1 h-1 yr-1
- Table 2: Deviance is not appropriate term.
- Fig. 1: What the stations 47595, 47592...represent? For FDNPP , please use a different more visible symbol.
- Figure 8: MJ/mm/ha/h/month is not appropriate in the legend. Please correct.
- Figure 8: Cs activities is not appropriate (in the caption)