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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "FLOPROS: an evolving global database of flood protection standards" *by* P. Scussolini et al.

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This article proposes a framework which builds up a database of river and coastal flood protections at global scale. Due to the scarcity of information and the difficulty in retrieving those data, the authors propose a multi-layer approach which gives priority to reported information on existing flood protections, followed by policy indications, and ending with a modeling approach to fill the data where missing. This latter appears to be the most populated one, according to Figure 3, hence some questions might arise on the validity of the product. However, a validation study was performed and shown in the article to support the methods. In addition, to my knowledge this work represents the first example of global flood defences published in the scientific literature, hence it is of considerable interest for the scientific and practitioner community dealing with

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flood risk assessment on large scales.

The article is generally well written. The methods are sound and pertinent, though I recommend few additions to clarify parts of the methodology (see specific comments below). Overall the article surely deserves to be published in NHESS, provided that the few comments below are adequately addressed. Specific attention should be given to my last three comments on Figures 4, 5 and 6.

Specific Comments

P 7276 L 11-16: I suggest rephrasing this part first defining the content of the three layers and then addressing the use of the Policy and Model layer to increase the spatial coverage.

P 7277 L 15-16: Please note that the approach used at the JRC described by Rojas et al. (2013) has undergone considerable scientific and technological advances. The updated version was recently published in an article by Alfieri et al. (2015).

P 7279 L 14-21: My suggestion is to keep track of the upgrades (or potential degradation) of flood protections, together with the year of change. In this way different global protection layers could be produced corresponding to different years, thus enabling continuous risk assessment simulations over several years which account for improved protections, commonly occurring after major flood events.

P 7282 L 7: Suggested: remove “at least”.

P 7282 L 15 to P 7283 L 2: I think this text should be shortened or removed as it creates some confusion. While reading, it generates several questions on assumptions and underlying datasets (e.g., the 2 and 1000 years limit, EAD, potential flooded area). Then the reader realizes that the same procedure is written with all the details in the following part of the text (p 7283). I suggest describing the procedure just once.

P 7284 L 7-8: I suggest adding a short description mentioning the key points of the return period and of the annual exceedance probability method. I currently cannot find

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it in the text.

P 7284 L 11: Table 5 do not exist. Do you mean Table S1 of the Supplement?

Figure 3: If I understand well, the model layer should be able to fill any gap of data which is not already provided by the Design and Policy layers. Yet, I still see in Fig.3 some empty area (e.g., in Denmark, Italy, Bulgaria, northern Africa). Why were those areas left without a protection value?

P 7285 L 6: “out of”

P 7288 L 26: Suggested: remove “there”. Please check the entire sentence, currently not easily readable.

P 7293 L 6: “on” or similar preposition is missing at the start of the line.

Table 4: Footnote #1 states 9 comparisons, while the table itself and Fig. 4 only show 8. Please check.

Figure 4 and Figure S1: I don’t understand why these figures show log(1/PS) instead of simply log(PS). In case of the latter option the y-axis would be upside down as compared to the current version, with the advantage that larger numbers would mean higher protection standards. Absolute values would be the same as now, given that log(1/PS)= -log(PS). Same comment for Figures 5 and 6. In addition, in the legend it’s difficult to see any difference between the max and min value, hence these two could be grouped into just one item.

Figure 5 and P 7289 L 1-18: Besides testing the linear correlation between the two sets of samples, it would be interesting to test the overall skill of the two layers in terms of multiplicative bias, such as with the Root Mean Square Factor (RMSF). This would also address the issue of poor statistical significance mentioned on P 7289 L 13, due to a small sample.

Figure 6 and its discussion on P 7293 takes an almost negligible portion of the arti-

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cle. I suggest expanding this part with some additional detail to understand better the variables analyzed. Also, a more in-depth discussion of the results would improve the interpretation of the data.

References

Alfieri, L., Feyen, L., Dottori, F. and Bianchi, A.: Ensemble flood risk assessment in Europe under high end climate scenarios, Global Environmental Change, 35, 199–212, doi:10.1016/j.gloenvcha.2015.09.004, 2015.

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