

Interactive comment on “Isoscape of precipitation amount-weighted annual mean tritium (${}^3\text{H}$) activity from 1976 to 2017 for the Adriatic-Pannonian region” by Zoltán Kern et al.

Anonymous Referee #1

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The manuscript describes a high-resolution gridded dataset for tritium in precipitation across the Adriatic-Pannonia region in Europe. I am not familiar with the applications of tritium for hydrology, my expertise is on geostatistical methods for hydrological sciences.

The objective of the work is clearly stated in the abstract and in the introduction. Material and methods are described in detail in section 2. The data sources used are properly reported. Standard statistical techniques, such as ordinary kriging, have been used for spatial analysis. Pros and cons of the applied statistical methods are discussed in detail, especially in connection with the scarcity of data available. Section 3

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described the gridded dataset. Section 4 contains the evaluation: the regional dataset has been compared with global ones, the benefits are clearly highlighted; a validation against independent measurements is also included (see Fig.5). All the presented results support the conclusions of the authors presented in section 5.

The contribution of this study for regional hydrological applications is valuable, since the uniqueness of such a reference and up-to-date dataset. Given the limited amount of stations available, the creation of a gridded dataset is totally justified and can provide useful data where no direct measurements are available. The statistical analysis is, as far as I can judge, without major flaws. The presentation of the manuscript is clear and concise.

In conclusion, the study is valuable. My advice to the editor is to publish the manuscript after minor adjustments to the text. Specific comments follow.

Comments:

- Why use such a high-resolution 1x1 km grid when the planar distances (Fig.3) are hundreds of kilometers? By using this grid, the authors implicitly persuade the users that the information is available on a very local scale. This is not the case. The authors need to (1) justify their choice of a 1x1 km grid; (2) explicitly state that their gridded dataset is suitable for the representation of variations in the field over much larger spatial scales than the grid spacing.
- The authors apply kriging without showing that the input data satisfies the prerequisites for a direct application of ordinary kriging. However, the validation shows that the output is useful and -in a sense- this justifies the application of kriging. My question for you is: have you considered other statistical interpolation methods? What is the reason that made you choose kriging?
- Figure 3. This is perhaps the core result of the paper and I like very much the way the authors present it. However, the blue shades in the colour scale are by

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far not optimal in representing the fields. Please present your main results in a way that the readers can fully appreciate them.

Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2019-244>,
2020.

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