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Discussions



# *Interactive comment on* "A comparison of interpolation methods on the basis of data obtained from a bathymetric survey of Lake Vrana, Croatia" *by* A. Šiljeg et al.

**Anonymous Referee #1**

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This work conducted a complete bathymetric survey on Lake Vrana, and produced the contour map of this lake as well as calculated its surface area and volume. In addition, the authors compared the efficiency of 16 different interpolation methods to discover the most appropriate one. This work was done in a very detailed way, and nice results were obtained finally. It should have some merits to the similar studies in the future. However, from the structure of the entire text, presentation of the results and many other aspects, I felt this paper was far not enough good to be considered to publish in HESS. Some specific comments listed as follows: 1. The paper is in a bad organization of the text, some parts are redundant and meaningless to a scientific paper.



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Section 2.1 could be largely condensed by cutting most of the paragraph, just to show the catchment setting, simple description of the equipment and data compilation. 2. Too many unnecessary figures used in the paper. Fig.1, 2, 3, 7 are not really useful in a scientific paper. However, a complete map of the whole catchment of this lake was not presented. As "the waters of lake Vrana are a specific and complex system" and the lake is characterized by several features, why not show all these components and their relations within the drainage by using an composite map? 3. This lake is a large, shallow lake with relatively high fluctuation of annual lake level (∼193cm) and high percentage coverage of aquatic vegetation. In this case, it is almost not possible to obtain precise bathymetric data. Also, the surface area and volume are always changeable during different seasons, what is the real meaning to do such precise calculation? It could be useful in lake management, but not really worthful in scientific research. 4. I could not find the substantial value of the comparison of 16 different interpolation methods. 5. There is several presentation of the lake area of the lake but obviously they are not consistent. In P.6 L.5-10, the entire area of the catchment is 29865; P.10 L.10-15, northern part of the lake is 14351; P.22 L.10-15, the surface area of the lake is 29865; P.33 table 6, the surface area is 30.815 (all the aboved data are in a unit of square kilometer). However, in table 7, ha is used instead of square kilometer. All these things are quite confused and obviously some of them must be wrong. 6. When the authors talked about water level changes of this lake, they used "cm" and "mnm" to show the fluctuation within a year (P.18 L.0-15 and Table 6). However, what is the relation between "cm" and "mnm"? What does the "mnm" mean? Actually, as the authors pointed out, the lake level is changeable with large annual oscillation, how could you get the water level with such a precision (e.g., 0.003mnm, in the table it was 0.03mnm)? Do you think it is really meaningful? 7. As the authors pointed out, 4.6 % of the lake's surface area is covered in dense vegetation, please indicate how to calculate and better to show where the 4.6 % of vegetation covered areas are located in this lake. 8. In table 1, 2, 4 and Fig.8, 11, abbreviation was used to describe the interpolation methods, these are meaningless for the readers. The authors must give



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their whole name and even interpret them simply. 9. In fig.8 and 15, the bathymetric maps were not shown enough explicitly. Contour maps with isolines of water depth could be better. 10. There are so many interpolation methods were used in this study, however, they were not fully introduced. The most important one could be “ordinary cokriging”, but several times the other terms were mentioned, e.g., “ordinary kriging”, “simple kriging”, “simple cokriging”. Are they different methods or similar? The authors need to specify them in detail to clarify each method.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 13931, 2014.