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Hydrology and Earth System Sciences Discussions

Interactive comment on "Guidelines for depth data collection in rivers when applying interpolation techniques (kriging) for river restoration" *by* M. Rivas-Casado et al.

Anonymous Referee #2

Received and published: 19 October 2007

General Comments

This submission is presented as a 'methods' paper, but really it's an analysis paper. It describes the use of geostastical techniques to assess sampling strategies for monitoring river depth before and after restoration efforts. This effort is significant because questions of space and time scales continue to provide challenges to the hydrology community. The authors provide a thorough examination of different spatial sampling strategies for providing robust estimates of river depth. However, the manuscript is severely lacking in its Introduction and Conclusions, and contains no Discussion.

This deficiency left me wondering what the real significance of this work is. Does the methodology presented here represent a significant improvement to current practices, or is it simply an academic exercise? Furthermore, I found the presentation of the temporal analysis to be confusing and undeveloped (what was the point of it?). Other results were not fully explained and too much information that was never discussed was included in the methods and tables. Finally, the organization and writing can be improved.

In my opinion, this manuscript is too difficult to read and interpret in its current form, thus limiting its impact and relevance. However, it can and should be published after some extensive revisions as suggested below.

Specific comments

using the review questions requested by the editors as a guide...

1) Does the paper address relevant scientific questions within the scope of HESS?

Yes. The topic of appropriate spatial and temporal sampling strategies is highly relevant for the hydrological sciences.

2) Does the paper present novel concepts, ideas, tools, or data? The application of geostatistical techniques to hydrological studies has been carried out before (should be acknowledged in the introduction), but, to my

knowledge, the authors' application and purpose was novel.

3) Are substantial conclusions reached?

Some substantial conclusions are reached (for example fist and second para. of Section 5). However...

p1081, lines 25-28: is replication of measurement locations important? (for example, how does this effect the time variability issue) p1082, lines 1-12: where are these tables referred to? Is one high density survey always required to assess the "hydromopholog-

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ical uniformity and

continuity"? What should be the data density of this initial survey?

4) Are the scientific methods and assumptions valid and clearly outlined?

I'm not sure about the validity of the spectral analysis or the temporal pattern analysis for different reasons. The spectral analysis didn't provide seem to have a point associated with it. The temporal pattern analysis was a comparison between two discharges in one river. Not enough data to establish a temporal patter.

5) Are the results sufficient to support the interpretations and conclusions?

Not really. This paper could really use a Discussion section to elaborate on some of the results.

6) Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of

results)?

yes

7) Do the authors give proper credit to related work and clearly indicate their own new/original contribution?

No. The authors state that "little work has been carried out" to address key monitoring issues. Then it should be straightforward to sum up what has been

done in the Introduction. I find it hard to believe that nobody has considered what variables to monitor and at what spatial and temporal scales. What are

the current protocols and/or practices and why are they deficient?

Have geospatial techniques been applied to river depth before? Or any river parameters? (Yes)

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8) Does the title clearly reflect the contents of the paper?

The only guideline really presented here is that random grids should be used over transects or regular grids. This is really about a comparison of sampling strategies and an application of geostastical techniques to uncover patterns.

9) Does the abstract provide a concise and complete summary?

Clear guidelines were not presented, as promised by the title and the abstract.

10) Is the overall presentation well structured and clear?

No.

The authors must decide if the audience is broad (not all familiar with kriging) or narrow. If a broad audience is desirable, the authors must be careful

about including terminology or parameters that are not defined/explained. For example, azimuth and azimuth tolerance, objective (e.g. Table 2 and Fig. 2),

nugget, sill, range. The significance of these parameters should be made clear.

In the Section 3.1 and 3.2, there are long lists of parameters and statistics that were computed and compared, but most are never mentioned again in the text. The analyses and parameters that are important should be highlighted to give the reader a guide for later sections.

To what is the p-value (p. 1070, lines 18-19 and Fig. 3) referring to?

The relationship between the spectral analysis and the rest of the paper is never defined. What is the significance of the spatial repetition and how does this help define the sampling strategy? What is the significance of spatial repetition differences amongst rivers?

Where's the Discussion section. This would be a good place to elaborate on some of the findings and define the broader implications of those findings.

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Can temporal patterns really be discerned from two only two snapshots in time? Also, in Section 4.4, I don't really follow the logic and structure of the last paragraph. Are Fig. 5 and Table 6 supposed to show the same information (as the text implies?). How are the means in Fig. 5 and Table 6 different?

11) Is the language fluent and precise?

I'm not so sure that "scale" can be differentiated from "time" and "space" as an independent variable. p 1072, line 9: Is the channel simulated or is it artificial? I read simulated as "computer simulated". p 1079, lines 5-7: I don't understand this sentence and its relation to Fig 2 or Table 2.

12) Are mathematical formulae, symbols, abbreviations, and units correctly defined and used?

Equation (4) units are not indicated...do they cancel out correctly to yield L in m?

13) Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated?

Information in Table 2 can be included in Fig. 2. What is "objective"? What is the significance of the range, sill and nugget? They're never discussed in the text.

Table 3: Should "cycle" be "frequency". Can be combined with Fig. 4.

What is the vertical line on Fig. 4 indicating?

What is the point of showing all the parameters listed in Table 5 (never discussed in the text).

In Fig. 3, the eye is drawn immediately to the excursion in the Leigh Q90 line in the upper panel. What is the cause? Also, it's difficult to distiguish the symbols in the pdf copy I downloaded.

Fig. 4 shows four peaks, text indicates three peaks (p. 1080 line 10).

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Interactive Comment

14) Are the number and quality of references appropriate?

NO!

15) Is the amount and quality of supplementary material appropriate?

N/A

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 1069, 2007.