

Interactive comment on “Rainfall and streamflow sensor network design: a review of applications, classification, and a proposed framework” by Juan Carlos Chacon-Hurtado et al.

Anonymous Referee #1

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The authors present an overall picture on hydrometric network design methods and approaches to increase or reduce sensor density using different methods e.g. expert opinions and hydrologic models. They also classify these methods and present an optimal network design using complementary rainfall-runoff model performance. The use of hydrologic model makes sense as the products of the sensors are usually used by the hydrologic models. This review paper addresses an interesting topic. However, the presentation of the cases needs some more details on country scale applications as listed below. What are the practices in very densely monitored countries (e.g. Germany) and data scarce ones (e.g. Poland, Spain and Turkey). Also what is the optimum level of network density.

C1

Overall, major revision is recommended for the the manuscript.

Specific Comments:

1. Title: Rainfall and streamflow sensor network design: a review of applications, classification, and a proposed framework

Recommended title: Review of precipitation and streamflow sensor network design methods from hydrologic modeling perspective

2. Section/subsection titles should be reorganized in a clear way. For example subsection 3.3.2 Methods based on expert judgement and 3.3 Methods based on expert recommendations are similar and confusing.

3. In most of the European countries (e.g. Denmark and Germany) or even in USGS, the number of rainfall/streamflow sensors/stations is decreasing due to maintenance costs and use of radar data. I would expect to read some more insight on specific examples about sensor density and the country based approaches. Compare, for example, Spain/Poland and Germany from network density aspect to indicate an optimum approach. Now the content is very technical and dry for the reader.

4. I couldn't find an answer on network density regulations at European scale. The reader can be curious if the number of monitoring sensors are arranged by some directives/regulations in EU e.g. Water Framework Directive etc. These aspects could make the content more fruitful then the current very technical classifications.

HESS REVIEW CHECK-LIST

1. Does the paper address relevant scientific questions within the scope of HESS? Yes, this is a review paper on sensor network design methods. I would, however, expect more insight on the general trend in reducing the number of the sensors in the world due to maintaining expenses. A particular example from Germany or another highly dense network country could be presented to the audience with more details. 2. Does the paper present novel concepts, ideas, tools, or data?

C2

Yes, this is an extensive review on new design ideas, methods and concepts. 3. Are substantial conclusions reached?

Yes, especially inclusion of the hydrological models for network design is one of the important conclusions. 4. Are the scientific methods and assumptions valid and clearly outlined?

Yes, the authors explained the methods clearly. 5. Are the results sufficient to support the interpretations and conclusions?

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

This is a review paper. 7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution?

Yes 8. Does the title clearly reflect the contents of the paper?

Yes 9. Does the abstract provide a concise and complete summary?

Yes 10. Is the overall presentation well structured and clear?

Yes but sub-titles should be better organized. 11. Is the language fluent and precise?

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

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

No 14. Are the number and quality of references appropriate?

Yes, enough 15. Is the amount and quality of supplementary material appropriate?

N/A

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