

Interactive comment on “An evaluation of the importance of spatial resolution in global climate and hydrological models based on the Rhine and Mississippi basins” by Imme Benedict et al.

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In RC2 and RC3, the referees touch on an important question: is it meaningful to increase the resolution of a hydrological model if we do not know whether it represents the relevant processes adequately? It is unfortunate, but at the same time revealing that this question only arose after the recognition that increasing model resolution did not lead to improved streamflow simulations (RC3). At the same time, there is strong advocacy in the scientific community to use growing computational capabilities to increase model resolution. From this perspective, this study could be seen as a reminder that increasing model resolution is not meaningful if the model does not represent the

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governing processes at the target resolution. The key question is how to test if a model does represent the relevant processes adequately. Both referees point out that an increase in hydrological model resolution likely requires changes in parameterizations and/or process representations. I wonder how many other studies have neglected this fact and what are the definitive lessons that can be learnt from the present study.

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