

Interactive comment on “Conditioning Ensemble Streamflow Prediction with the North Atlantic Oscillation improves skill at longer lead times” by Seán Donegan et al.

Anonymous Referee #2

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This paper has presented an investigation of ensemble streamflow prediction (ESP) for 46 catchments in Ireland. The GR4J model is employed to formulate the rainfall-runoff relationship and perform streamflow forecasting. The forecast skill is evaluated and then related to a range of catchment attributes, e.g., base flow index, flashiness index, and runoff ratio. The results show that skillful forecasts are generated using ESP and that the skill can be attributed to catchment attributes and North Atlantic Oscillation (NAO). Overall, the paper is well-written with the methods and results clearly presented.

There are a few comments for further improvements of the paper.

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First, reliability is an important feature of ensemble forecasts. Specifically, reliability indicates the agreement between forecast probability and mean observed frequency. For streamflow forecasting, attention is usually paid to high- and low-flow events. Therefore, it would be meaningful to show whether ensemble forecasts generated by ESP yield reliable probabilistic forecasts of high- and low-flow events at different lead times. For more information on forecast reliability, please refer to <https://www.cawcr.gov.au/projects/verification/#:~:text=If%20we%20take%20the%20term,the%20quality%20of%20a%20>

Second, there recently is an interesting paper on the influence of NAO on flooding and drought over Europe (Changes in North Atlantic atmospheric circulation in a warmer climate favor winter flooding and summer drought over Europe, E Rousi, F Selten, S Rahmstorf, D Coumou, Journal of Climate, 2020). This paper can offer some climatological insights when relating forecast skill to NAO.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2020-604>, 2020.

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