

## ***Interactive comment on “Long-range forecasting of intermittent streamflow” by F. F. van Ogtrop et al.***

**F. F. van Ogtrop et al.**

floris.vanogtrop@sydney.edu.au

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Thank you Dr. Post for your comments. The comments regarding IQQM are indeed warranted. However, due to the sensitive nature of water extraction data in the region, this is the only data we could access which factors in water extractions in the region. Looking at the naturalised data does indeed reveal over estimation of flow, particularly low flow. Hence, we use a dummy time variable to capture the non-stationarity as a result of extraction. There are problems associates with this too. For example if the effect of time is a monotonic decreasing function then it would suggest forever increasing extraction which is not possible. This assumption of linearity is relaxed in the case of GAMs. However, there will still be periods where the forecasts will perform

C2230

less well which will be associated with points of inflection in the relationship such as when extraction stops increasing and levels out or as a result of a government buy back. In the case where this data is available it can certainly be factored into the model using a variable to represent extraction rate. In this case we focus on the methodology for long-range forecasting and we have indeed moved to shorter and medium term ranges. In particular we are focusing on adding additional covariates which allow us to account for antecedent catchment conditions in the catchments of interest which are particularly important in the case of streamflow. We did test the importance of antecedent conditions at longer time scales by incorporating a variable representing maximum monthly dryspell lengths and temperature. However, as would be expected, there is no significant influence of these paramaters at these longer time scales. We have included the Time term in other models and found that it was only significant and decreasing for the Balonne. This would suggest that for this short period that all of the other gauging stations would be trend stationary after accounting for seasonality and SST. Interestingly, we have also used this methodology in change detection, for example as the result of bushfire on catchment yield, and found it particularly useful. It is particularly useful for identifying shifts and trends in hydrological datasets. More to come!

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