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Interactive comment on "Development of a monthly to seasonal forecast framework tailored to inland waterway transport in Central Europe" *by* Dennis Meißner et al.

Anonymous Referee #2

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Review of the manuscript "Development of a monthly to seasonal forecast framework tailored to inland waterway transport in Central Europe" by Meissner et al. This study aims at assessing the quality of the dynamical and statistical forecasts of low flow in Europe and more specifically the monthly value of the lowest flow during 7 consecutive days. This work is relevant to the journal, well written with robust and scientific evaluations. Moreover, the results bring innovative and interesting results. Nevertheless some points need to be clarified/modified in order to improve its quality and to be more understandable.

Major comments:

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Discussion paper

- MoNM7Q is used to define the low flows each month. So the authors focus on 1 value/month. What about longer flow deficits or if several low flows occur during the same month?
- The stability correlation map is not clear. How the correlation is calculated. If this procedure aims at identifying predictors that should be calculated with a lag (monthly mean SST vs. streamflow month +1). This is not mentioned.
- Seasonal S4 in an ensemble forecast whereas the statistical forecast is not (as I understand). It is difficult to compare. For instance, in the last section (case study). How the S4-driven forecast is defined in Fig. 12, 13, 14. It should be represented as a 'spaghetti plot' of boxplots. If the authors use a specific member, the median for instance, did they test different definitions before to be sure that was the most accurate?
- Some forecast assessment are not well calculated. For instance P13L6, the score of the ensemble is calculated by averaging the score of each individual member. The purpose of an ensemble forecast is not to generate good forecasts of each member.
- In Results and Fig. 7, 8, and 11, it is not clear how the authors deal with ensemble forecasts. Which member is used and why? In the same part, most of the scores assess the capacity of the forecasts to represent the intra-seasonal variabilities not necessary the prediction of extreme events (MoNM7Q exits every month and is not necessarily climatologically low). Some assessment should be done focusing on dichotomous forecast of extreme events.
- A combined product, which uses both statistical and dynamical approaches as an ensemble, should be tested here to see what is benefit of using this advanced, and maybe the most accurate, method for the users.

Minor comments:

P3l20: be careful order different to those in the abstract.

P4l25-26: reference needed, please refer to Fig. 2 right panels here.

Fig. 2: Quality of the images should be improved

Table 1: Definition of the low flows not clear here.

P6l14: Which version of EOBS?

P6l30: Is there an influence of the member size differences?

First paragraph P7: the method to bias correct the data is not explained and should be clarified. It is not clear if the authors used daily or monthly data (I suppose daily).

Table 2: E-OBS is not global, it is over Europe.

Last paragraph p8 and Fig. 3: Which lead time of the forecasts? What do the boxplots and the outliers represent (inter annual variability)? R and NSE are calculated for the entire period or just for the climatology curves?

P9l19: Sorry, it is a bit confusing, the 'measured discharges at the forecasting gauges' is an observation, right?

P9l20: 'based', do you mean driven by?

P11L7: ‘climate and hydro-meteorological variables as predictors instead of climate indices.’ Not clear, what do the authors call climate indices here.

P12L12: A reference is missing!

P12L14: MoNM7Q

P12L25: The skill score is not necessary well defined since it tends to dump the scores when the reference is low. What are the reasons of this choice?

P15l18: The limitation is only over Central Europe?

Fig. 6: I am very impressed by some scores depending the months. For instance, the same skill score provided by S4 with 4-month lead time in March and 1-month lead time in August.

Figure 7: In the caption, next month or current month (1 month lead time)?

Figure 8: Why there is only 4 months here? 3-month moving windows should be used.

Figure 11: In November, S4 has less member, is it correct than June and September, is it correct?

Conclusion: No new results in this section (Tab. 3)

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