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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Forecasters priorities for improving probabilistic flood forecasts" *by* F. Wetterhall et al.

Dr Wetterhall

fredrik.wetterhall@ecmwf.int

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First of all, thanks Massimiliano for pointing us to the BAMS publication, we will incorporate that.

Regarding "gut feeling" I agree that it would be very interesting albeit difficult to try to measure this in terms of skill, especially since this is a common practice in many operational forecasting centres. There can even be an internal competition as who gives the better forecasts, and how you interpret the situation can sometimes be a "secret of the trade". The drawback is obviously that the rules-of-thumb on which you base warnings are often not documented and not transparent. There can be rules and guidelines on how you should interpret the forecast and issue a warning, as in the case

of the EFAS system, but they are never perfect and there is always a need for some degree of human interpretation in the case of issuing a warning. It is therefore a scope to assess how much skill can be attributed to a good decision support system, and how much value is added by the forecaster, and this goes for both deterministic and probabilistic forecasting.

A pitfall of the "gut feeling" forecasting approach is to rely too much on your experience in all cases. For example, if you would know that your forecasting system most often predicted a too early say spring flood due to snow, you would weigh this information into your decision. However, if this bias is somewhat rectified in the model (or there is a case of very anomalous weather) your forecast would fail. This can of course be avoided by carefully informing your forecasters on improvements so "gut feeling" skill knowledge can be updated.

In the case of anomalous weather, the information that it is unusual/difficult can itself improve the forecast skill. Probabilistic forecasts can potentially provide some guidance in uncertain situations through the ensemble spread, but there are situations where the model just goes wrong. One such example was the spring flood in Sweden and Norway 2009/2010. It was a winter with the highest negative NAO index on record. Negative NAO means cold winters but also very weak westerly winds, which in turn caused a very anomalous distribution of the snow pack. The hydrological models were not calibrated for this situation and performed much worse than normal. By identifying situations where the forecasts fails can perhaps not improve your forecast skill, but at least provide extra information on when to trust your forecast and when not to trust it. A forecaster can then try to find ways to add more information (for example extra field measurements) to help your system and therefore provide a better forecast.

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