How is uncertainty represented best to reduce complexity or cognitive cost in high-impact events.

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Within the forecasters community, it is a common approach to make use of meteorological « conceptual models » to synthetise weather situation key processes. These "models" come along with general physical rules that can help, to understand options, particularly in a high-impact situation with low predictability. At the beginning, it helps to build an appropriate scenario in the decision-process.

Forecasting uncertainty is most of the time considered through a "multi-model" approach, taking into account synoptic and convective scale model outputs, to hightlight the main patterns of uncertainty sources. This subset of model solutions is often called « poor-man-ensemble ». Ensembles provide plenty of relevant information : not only classical probabilities, quantiles, meteograms, but also more subjective visualisations like post-stamps or spaghetti, easy to interpret for forecasters. In the end, all of these informations are mixed to produce or to design mentally the most likely scenario.

Forecasters experience includes a kind of a subjective pseudo climatology, where each one can find references, making use of analogs to understand the meteorological context, the behaviour of the numerical systems in terms of systematic errors, but also to overcome the consequences linked with vulnerability, or to learn from the reaction of our different end-users facing uncertainty. Especially with civil protection, forecasters get trained to develop practical strategies in strong uncertainty contexts.

Within an operational forecasting team, real-time decisions can be affected by high stress levels, as well as collective or individual cognitive biases in uncertainty interpretation. We give here some illustrations from past high impact forecasting situations.