

## **Forecasting severe weather events, more than 24 hours ahead, at METEO FRANCE: An operational trial**

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For the short range, typically 24 hours ahead, severe weather forecast procedures have been in effect for a long time. The French “vigilance” watch map celebrates its tenth anniversary in 2011. It puts in concrete form the first mission of METEO FRANCE in the domain of protection of people and goods, and has proved generally successful. Improvements in numerical weather prediction during recent years, now enable a focus on forecasting dangerous weather phenomena at longer ranges (e.g. within the Medium Range) and beyond the requirements for triggering a “vigilance” warning. However, this can not be just a simple extension of the validity of the vigilance watch map, because uncertainty generally quickly increases with the forecast range and makes a deterministic approach difficult.

A systematic production, experienced on a daily basis since December 2004 at the national forecasting service of METEO FRANCE has tried to forecast the risk of occurrence of dangerous phenomena (violent winds, heavy rain, violent thunderstorms, snow/ice) that might reach orange or red warning levels of “vigilance”, several days ahead.

Every morning, a risk index has been assessed by the forecasters, based on their study of deterministic models, numerous EPS products, for a given day from D+2 until D+7, and over given geographical areas of France. The index has been selected from no risk, unlikely, likely, certain. After choosing a reference or “truth” data (the colour of “vigilance” actually issued at the considered scale), accuracy and skill of the forecast has been shown. Then the idea has been to provide, in real time, the probabilities corresponding to the reliability of the chosen index taking into account the phenomenon, the samples representativeness and the discrimination between indexes.

Since March 2010, encouraging results have allowed us to propose institutional partners of METEO FRANCE a forecast of the risk of occurrence of these phenomena in terms of probabilities at the scale of the administrative French regions for D+2 and D+3.

First feed-back from the users is interesting, but shows that probabilities must be correctly interpreted. In fact, one still thinks that a probability of 50% corresponds to the toss of a coin, whereas it is significantly high when the climatological frequency of the phenomenon is low. Furthermore, decision makers have to learn how to make best use of this new type of information.