How to present prognostic - probabilistic data in a convincing and reliable way

Emergency Manager

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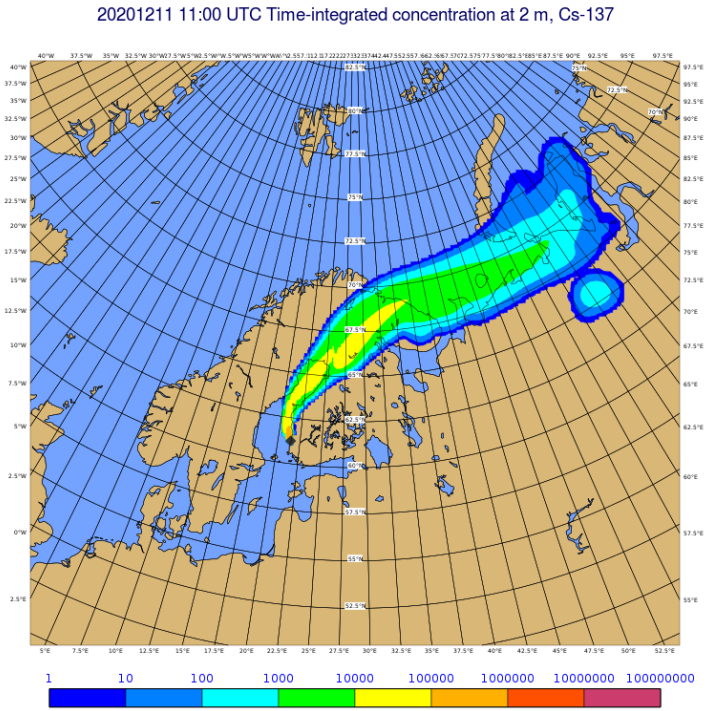
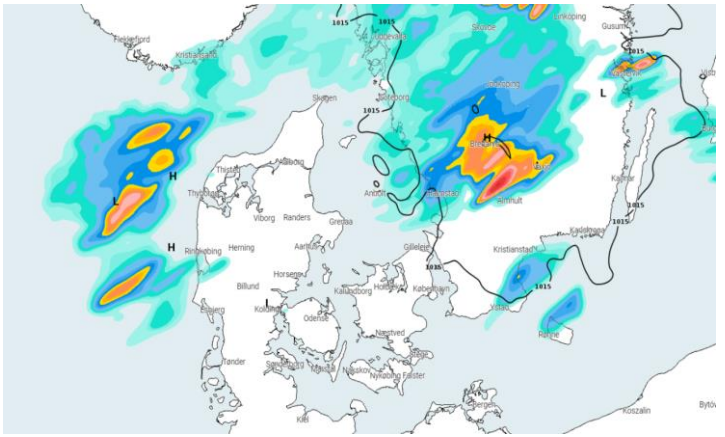
- Traditional plots of forecasts
- The use of probabilistic forecasts as a tool to estimate and present uncertainty
    1. Overview of ensemble members
    2. Geographical uncertainty
    3. Uncertainty in the values and special points of interest
    4. Closer study of uncertainty

Traditional plot of values
(hidden uncertainty)

Data from one deterministic model

- Users are used to simple plots
- It is easy to see affected areas
- The plot leave the user with the problem if the plume is over a part of the user's area of responsibility
- No information about the uncertainty – the forecaster has to apply this information



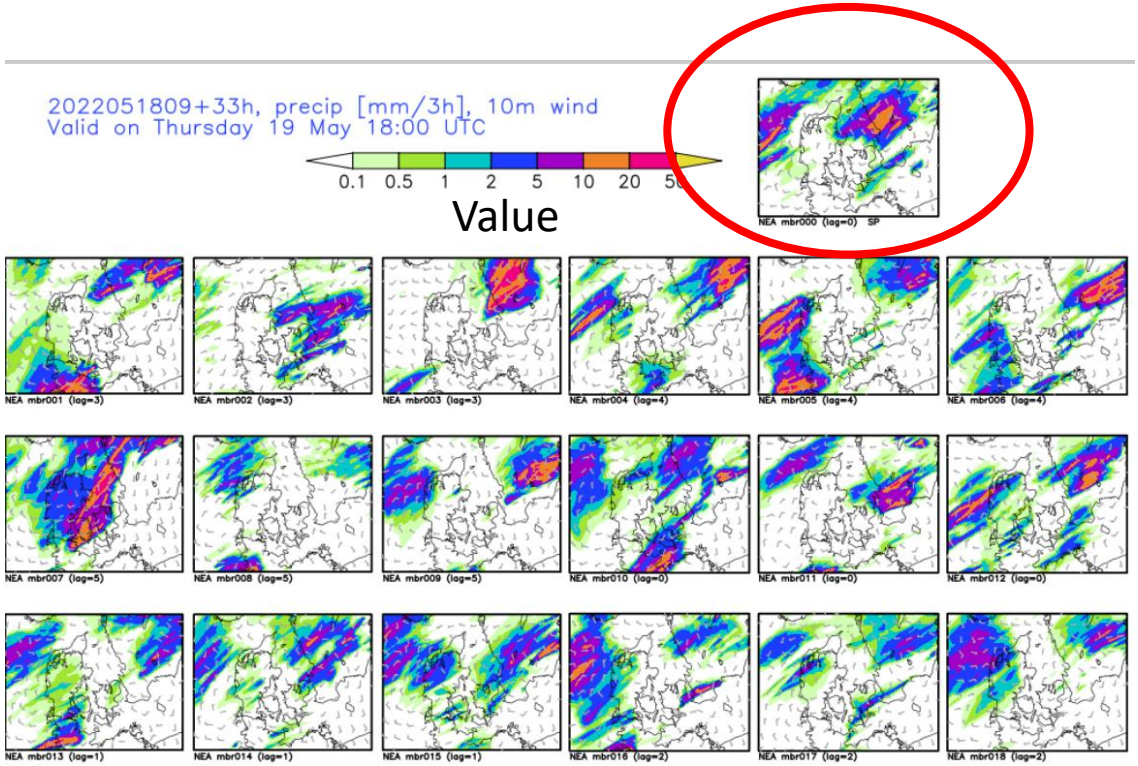


Ensemble forecasts

Data from ensemble forecasts

- first step examine the ensemble members

- Use of model output from several different models
- Use of model output from pertubated version of the model
- Use of model output from different modelruns (+12h; +18h…)



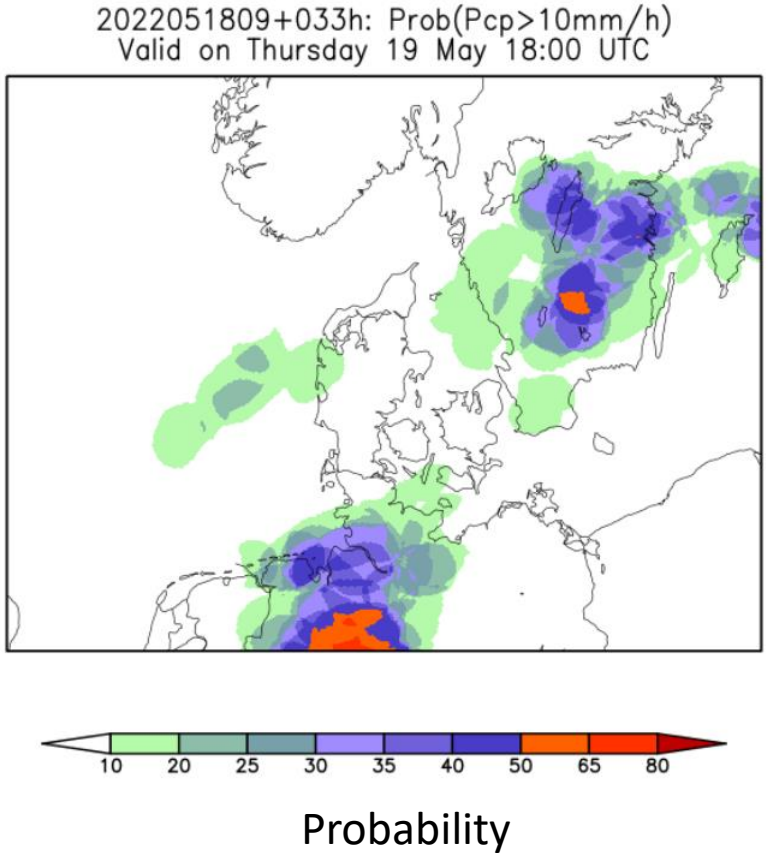
Probabilistic forecasts
(specific criteria)

Data from ensemble members

- second step

- It is possible for user to see the uncertainty on the geographical distribution
- The probabilistic forecasts create a better basis for the judgement and decision making for an area.
- It is not possible to values

Criteria



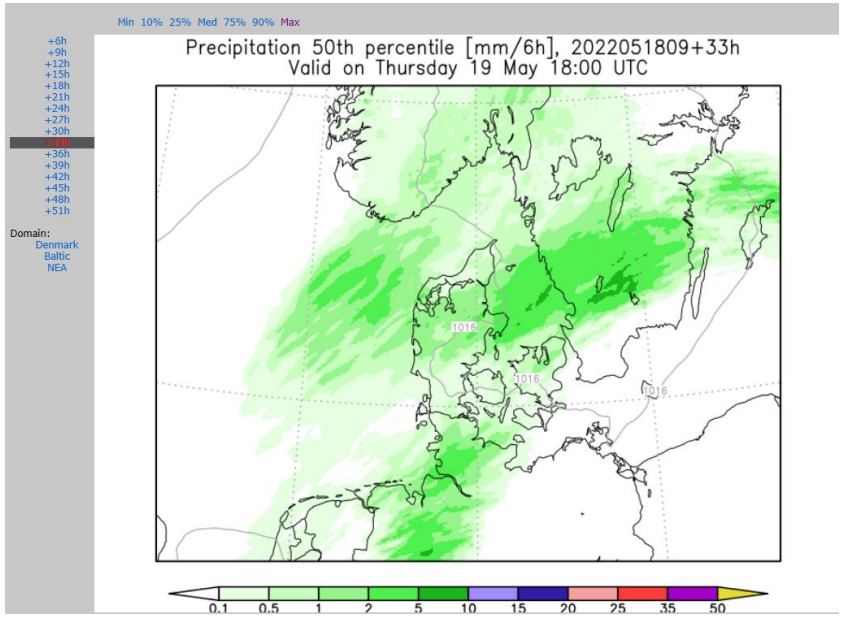
Probability

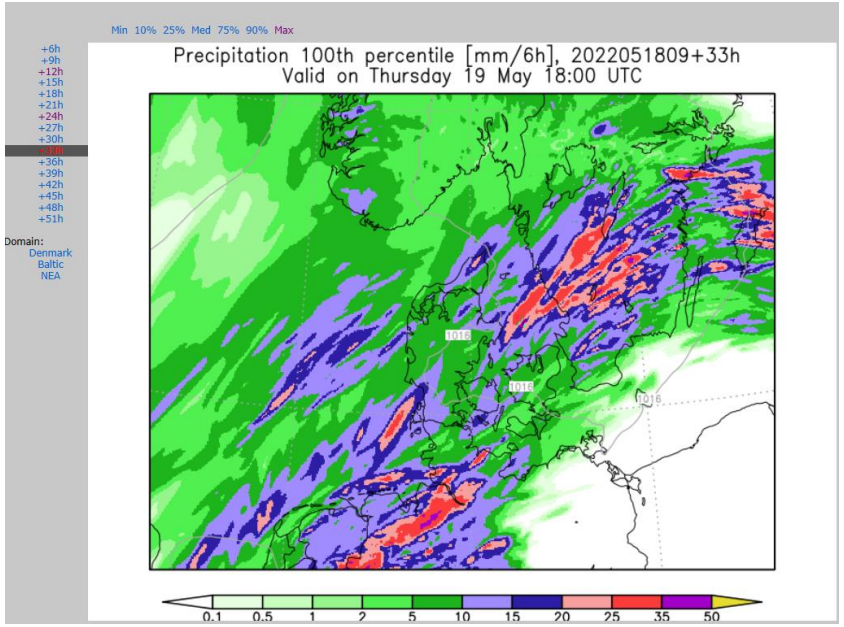
Probabilistic forecasts (percentile)

Data from ensemble members

-third step

- It is not easy for the users to estimate the uncertainty of the values but it is possible.
- A good way is to look at the maps and find the points of interest in the area



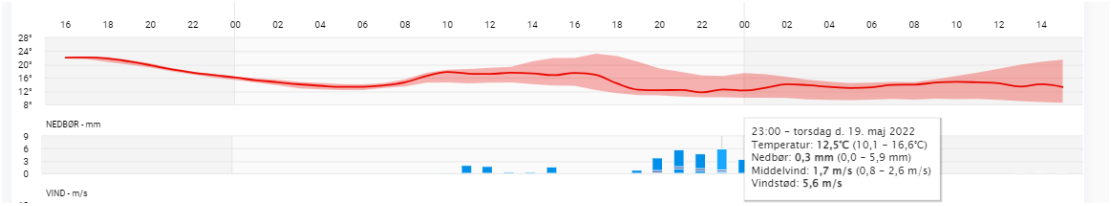


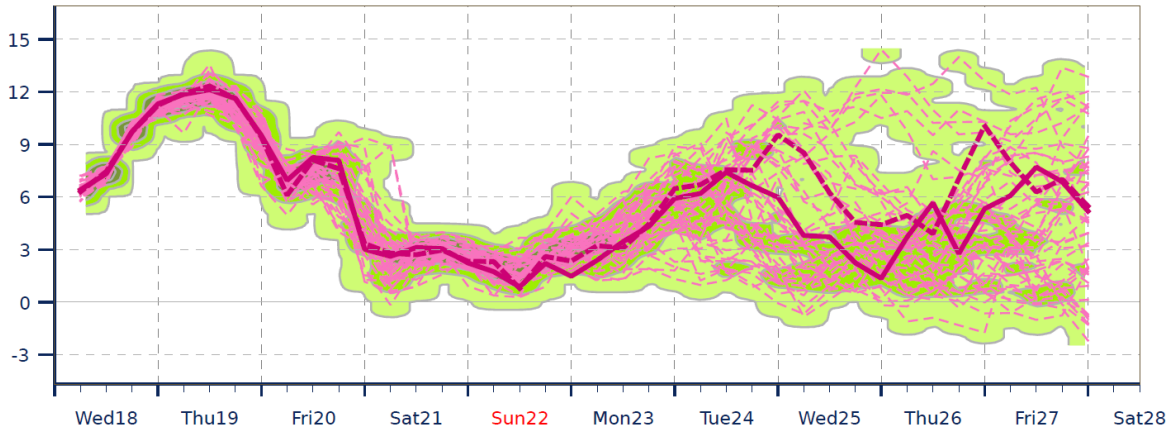
Probabilistic forecasts
(point of interest)

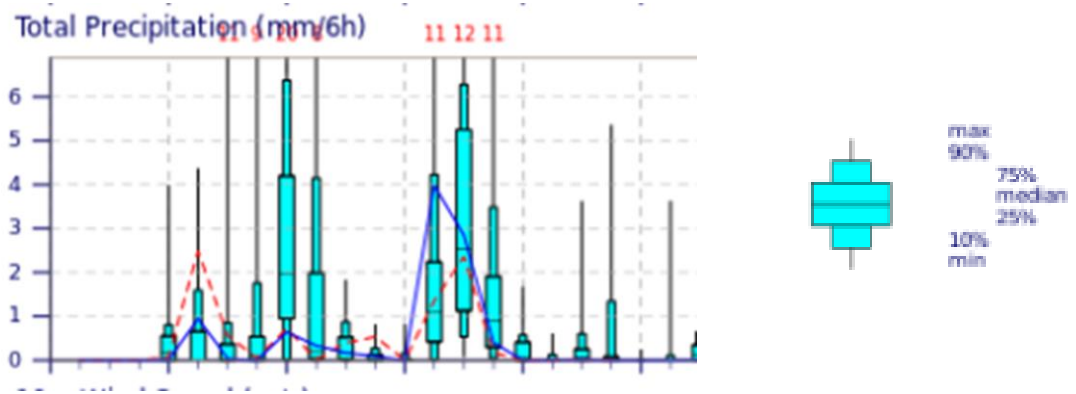
Data from ensemble members

- fourth step

- Looking at a specific point of interest is more easy to see the uncertainty
- It is possible to sea the mean values and the maximum values
- It is possible to get a overview of the time







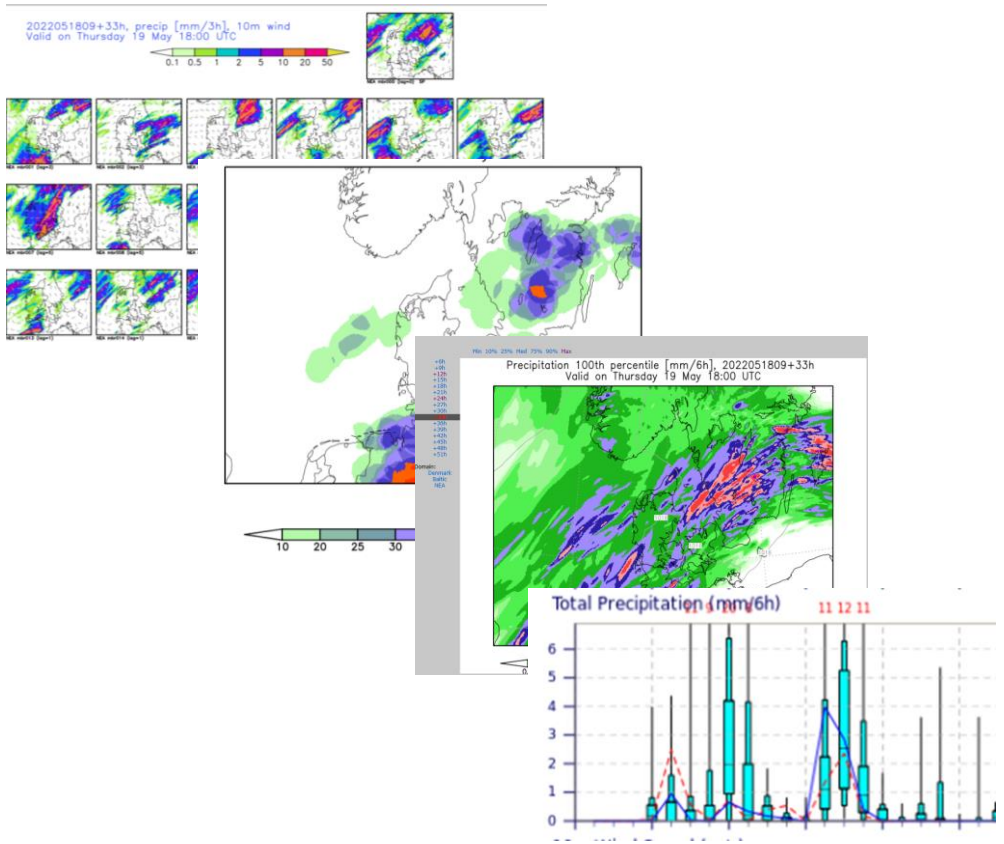
Prognostic - probabilistic data in a convincing and reliable way

Uncertainty is often on many different parameters and not everything can be illustrated in the same plot.

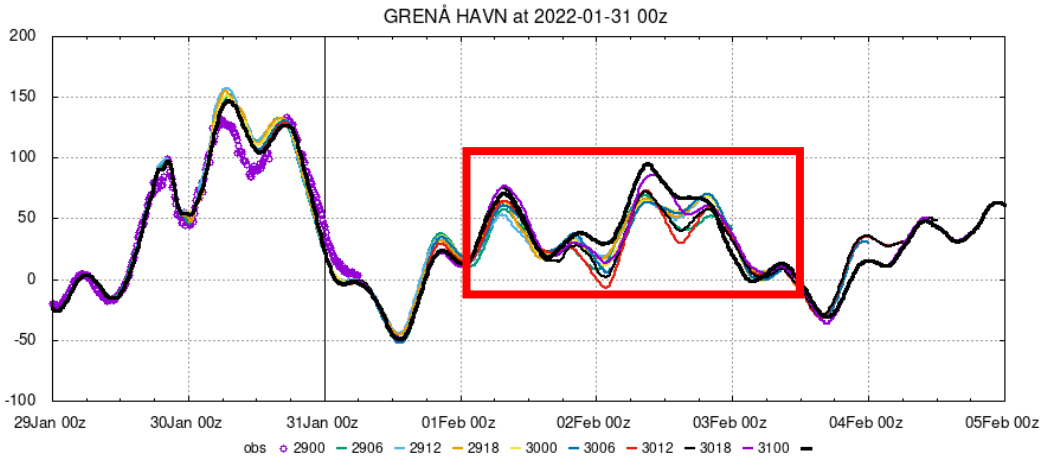
Often it is necessary to lock some of the parameters, with the result that only uncertainty within a few parameters is shown in the visualization

Four steps to get understanding of meteorological uncertainty

1. Examine the ensemble members
2. Examine the geographical uncertainty
3. Look at the values and find special points of interest
4. Examine the uncertainty in the point of interest



Questions?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