Evaluation of different categories of forecast errors

Linus Magnusson (ECMWF, Reading, UK)

Abstract:
Forecast evaluation is an essential part of the work at numerical weather prediction centers. The evaluation serves several purposes such as documenting forecast improvements over years, informing about the usefulness of the forecasts, verify new model versions and find aspects that needs to be improved in the future. For most of these purposes, it is beneficial to understand the characteristics of the forecast errors. In this presentation I will discuss one possible categorization of errors.

Forecast errors can at a first stage be divided into systematic (bias) and non-systematic (random errors). Systematic errors can be divided into fast-growing biases that are present in very short forecasts and growing biases during the forecasts. Additionally, forecasts errors are coming from representativeness errors between a model grid box and a point measurement. Finally, forecast errors can also be introduced in the process of communicating the forecast to the user, mainly in terms of information reduction. While making this division of errors, the situation dependence needs to be considered as well.

In this presentation I will give examples of the different kinds of errors and how to approach them in model development and when using the forecasts.