Contribution ID: **9** Type: **not specified**

Big Data in Meteorology

Tuesday 28 May 2013 14:00 (20 minutes)

This presentation will describe the current situation of numerical weather prediction, the challenges and the opportunities which result from the goal to produce even better weather forecasts for
even longer times. Factors affecting the accuracy of numerical weather prediction models include the density and quality of
observations used as input to the models along with deficiencies in the models themselves. Extremely small errors in temperature, winds, or other initial inputs given to numerical weather prediction models will amplify and double after a couple of days. This makes it nearly impossible to seriously predict the state of the atmosphere for a period longer than two weeks. Furthermore, existing observation networks have poor coverage in some regions or over large bodies of
water such as the Pacific Ocean, which introduces uncertainty into the true initial state of the atmosphere. Therefore more and more sensor data from weather satellites are used for numerical weather prediction.

On one hand, the increasing power of supercomputers makes it possible to feed numerical forecast models with more and more input data. On the other hand, this results in the production of more and more output data due to a higher spatial and temporal resolution of the models, longer forecast periods, as well as new algorithms and
computation methods. For example, the ensemble forecasting method involves analyzing multiple forecasts created with an individual forecast model by using different physical parametrisations or varying initial conditions. This results to the creation of big data amounts.

The ICON (ICOsahedral Non-hydrostatic) model is one of DWD's numerical weather prediction models which currently runs 4 times a day. It computes a global forecast on a 20km grid. The output size of one model run is greater than 135 GB. In 2015 the spatial resolution of this model will be changed from a 20km grid to a 10km grid. Hence, the model output will be 4 times bigger. The ICON model will then produce more than 2 TB geospatial data per day. Whether this data could be efficiently used for the creation of new products depends on the existence of adequate tools and techniques for managing and analyzing big geospatial data.

Author: Dr SEIB, Jürgen (Deutscher Wetterdienst)

Presenter: Dr SEIB, Jürgen (Deutscher Wetterdienst)

Session Classification: Earth Science - Big Data Analytics