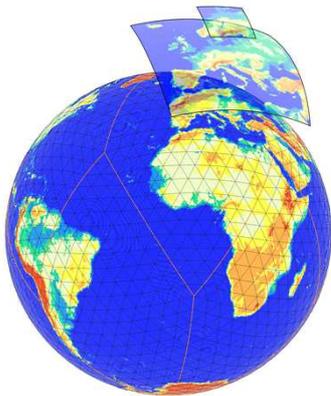


The NWP-System of DWD - Current state and development -

Autumn 2014 Deterministic



Models and data assimilation

The model chain of DWD comprises three models, namely the global model **GME** (grid spacing 20 km, 60 layers and 88 million grid points), the regional model for Europe **COSMO-EU** (grid spacing 7 km, 40 layers and 17 million grid points) and the regional model for Germany **COSMO-DE** (grid spacing 2.8 km, 50 layers and 10 million grid points).

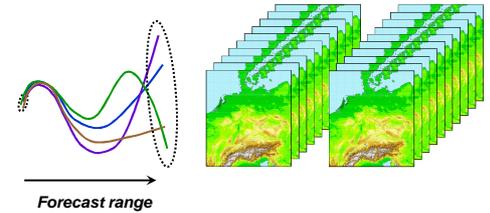
The global data assimilation of atmospheric variables is based on a three-dimensional variational scheme. Each day about 1.4 million observations are assimilated, e.g. MW sounders AMSU-A, ATMS and the IR sounders HIRS and IASI. Clear sky temperature-sensitive channels over the oceans are used..

Additionally there are analysis schemes for sea surface temperature, snow cover and soil moisture.

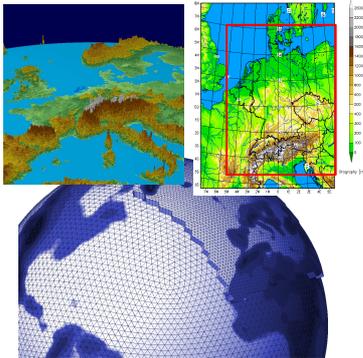
The regional data assimilation is based on an observation nudging-scheme which takes also high resolution radar data for Germany and Europe via latent heat nudging into account.

Probabilistic / Ensemble

Ensemble Prediction System **COSMO-DE-EPS**
Grid spacing 2.8 km and 50 layers
20 members
27-h forecasts based on 00, 03, ..., 21 UTC analyses



Autumn 2015 Deterministic



Models and data assimilation

The model chain of DWD comprises **two** models, namely the global model **ICON** (grid spacing 13 km, 90 layers globally and **grid spacing 6.5 km, 60 layers for Europe** and 265 (29 for Europe) million grid points) and the regional model for Germany **COSMO-DE** (grid spacing **2.2 km, 65 layers** and 30 million grid points).

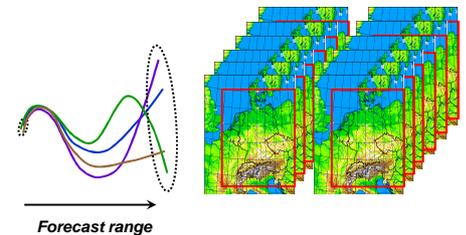
The global data assimilation of atmospheric variables is based on a three-dimensional variational scheme. Each day about **3.0 million observations** are assimilated, e.g. MW sounders AMSU-A, ATMS and the IR sounders HIRS and IASI. Temperature- and **humidity-sensitive** clear sky channels over the oceans and **land** as well as **GNSS zenith total delay data** are used..

Additionally there are analysis schemes for sea surface temperature, snow cover and soil moisture.

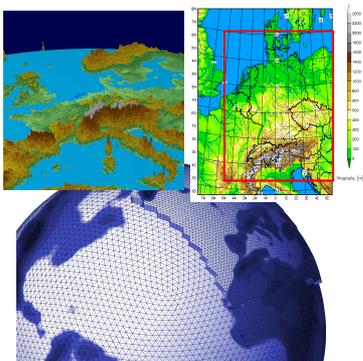
The regional data assimilation is based on an observation nudging-scheme which takes also high resolution radar data for Germany and Europe via latent heat nudging into account.

Probabilistic / Ensemble

Ensemble Prediction System **COSMO-DE-EPS**
Grid spacing 2.2 km and 65 layers
40 members
27-h forecasts based on 00, 06, ..., 21 UTC analyses
45-h forecasts based on 03 UTC analysis



Autumn 2016 Deterministic



Models and data assimilation

The model chain of DWD comprises two models, namely the global model **ICON** (grid spacing 13 km, 90 layers globally and grid spacing 6.5 km, 60 layers for Europe and 265 (29 for Europe) million grid points) and the regional model for Germany **COSMO-DE** (grid spacing 2.2 km, 65 layers and 30 million grid points).

The global data assimilation of atmospheric variables is based on a **hybrid scheme** consisting of an **ensemble transform Kalman filter (ETKF)** and a three-dimensional variational scheme. Each day about **5 to 6 million observations** are assimilated, e.g. MW / IR sounders in all-sky (**cloudy**) conditions.

Additionally there are analysis schemes for sea surface temperature, snow cover and soil moisture.

The regional data assimilation is based on an **localized ensemble transform Kalman filter (LETKF)** which takes also high resolution radar data for Germany and Europe via latent heat nudging into account as well as **SEVIRI satellite data** and **GNSS slant delay data** over Germany.

Probabilistic / Ensemble

Ensemble Prediction System **COSMO-DE-EPS**
Grid spacing 2.2 km and 65 layers
40 members
27-h forecasts based on 00, 06, ..., 21 UTC analyses
45-h forecasts based on 03 UTC analysis

