



High resolution operational air quality forecast for Poland and Central Europe with the GEM-AQ model – EcoForecast System

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The air quality forecast is an important component of the environmental assessment system. The "Clean Air for Europe" (CAFE) Directive 2008/50/EC stipulates a need for numerical modelling in order to support public information services to interpret measurements of pollutants concentrations and to prepare and evaluate air quality plans. Most European countries have developed model-based air quality modelling and information services.

We will present the design strategy, development and implementation of a regional high resolution forecasting system that was implemented in Poland. The new national high resolution air quality forecasting system has evolved from a semi-operational chemical weather system EcoForecast.EU which is based on the GEM-AQ model (Kaminski et al., 2008).

GEM-AQ is a comprehensive chemical weather model where air quality processes (chemistry and aerosols), troposphere and stratospheric chemistry are implemented on-line in the operational weather prediction model, the Global Environmental Multiscale (GEM) model (Cote et al, 1998), developed at Environment Canada. For these applications, the model is run on a global variable resolution grid with horizontal spacing of 15 km over Europe. In the vertical there are 28 hybrid levels, with the top at 10 hPa. A high resolution nested forecast at 5 km resolution over Poland (and surrounding countries) was implemented in December 2012. The forecast is published once a day at www.EcoForecast.EU. The air quality forecast is presented for ozone, nitrogen dioxide, sulphur dioxide, carbon monoxide, PM10 and PM2.5 as maps of daily maxima and daily averages.

We will present results from the on-going model evaluation study over Central Europe (2010-2012). Modelling results were evaluated and compared with available observation of ozone and primary pollutants from air quality monitoring stations and from meteorological synoptic stations. Ozone exposure indices, as defined in the CAFE Directive, will be shown for the high resolution regional configuration.