EMS Annual Meeting Abstracts
Vol. 12, EMS2015-507, 2015
15th EMS / 12th ECAM
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5-year evaluation of Ecoforecast.eu - air quality forecasting system for Poland

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EcoForecast.eu (Ekoprognoza.pl) an air quality prediction system has been operational since 2009. The main objective is an air quality forecast over central Europe and Poland, where GEM-AQ, a global multiscale chemical weather model is used as a computational tool. The service has been developed and maintained by the EcoForecast Foundation in cooperation with Warsaw University of technology Faculty of Environmental Engineering.

A forecast for central Europe and Poland is done on a daily basis with a 3-day time horizon. The modelling domain is defined on a global variable grid with ∼15km (0.135°) resolution over Europe, and uniform resolution of ∼5 km (0.05o) over Poland.

The range of forecast covers calculations of meteorology, four gaseous species (O_3, SO_2, NO_2, CO) and particulate matter (PM10 and PM2.5). Forecast results of primary pollutants are used for air quality index calculations. All results are presented as maps of pollution over specific areas and then published on a web page.

We will present methodology, modelling results and comparison with 8 air quality monitoring stations and selected synoptic observations for 5 years of consecutive forecasts. Modelling results are used to inform the public of air pollution levels in Poland and often to warn about thresholds exceedenses. For example: in the Malopolska Voivodship there were over 100 warnings only for PM10 thresholds in 2013. Forecasts comparison with weather and air quality observations shows good agreement. Correlation for temperature is above 0.9, for wind speed is 0.7, for ozone is 0.6-0.7 and for PM10 is 0.5-0.6 .