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Towards European-scale Air Quality operational services for GMES Atmosphere

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Basing upon the experience gained in national operational or pre-operational air quality forecasting activities, as for instance Prév'Air in France or EURAD in Germany, a range of European scale services have been developing in the context of the EU-funded project GEMS (6th FP) and are now brought a step further in the new project MACC (7th FP).

Within the GEMS project, analyses, hindcasts and forecasts from a range of state-of-the-art Regional Air Quality models have been performed on a quasi-operational daily basis since the beginning of 2008. The models cover Europe with horizontal resolutions ranging from 0.2° to 0.5°, and rely on ECMWF operational meteorological forecasts as well as on GEMS global "chemical weather" data, in the form of chemical boundary conditions for key medium to long-lived trace gases and aerosols. They also all consider the same high-resolution (∼8km) anthropogenic and biogenic emissions inventories, developed by TNO (The Netherlands) and NKUA (Greece). Access in quasi Near-Real-Time to AQ monitoring data has been obtained for over 15 European countries through fruitful collaborations with national and regional monitoring agencies. This has provided an interesting context, unprecedented to such an extent, to jointly monitor the performances of regional Air Quality forecasts, assess uncertainties and elaborate ensemble products that build upon the models' spread and their respective skills (both in average and for the few days preceding each forecast). Also a hindcast run covering the whole year of 2003 and using chemical boundaries from GEMS global re-analysis of tropospheric reactive gases has been performed and studied. This year 2003 was indeed marked by several episodes in spring and summer (heat wave) with strong health impacts due (at least in part) to bad Air Quality. The GEMS project has ended in May 2009 and the MACC project has started. Within MACC, a stronger emphasis is put on the use of chemical data assimilation and on the development of services in support to European policies and assessments. Also, a wider range of forecast products will be developed, specially concerning pollens.

We will present highlights of GEMS scientific results and an outlook on some new MACC activities, that pave the way for establishing the tools and methods that underpin the future operational GMES Atmospheric Service.