Report on the WMO activities relevant to the EMEP programme.
EMEP Steering Body, 36th Session, 17-19 September 2012
Agenda item 8

1. *Observations*

The Global Atmosphere Watch Programme (www.wmo.int/gaw) of the World Meteorological Organization is a global international programme with an emphasis on the atmospheric composition and many of the parameters addressed within GAW are also topics of EMEP. In Europe EMEP is a core network contributing to GAW.

Substantial progress has been made in the improvement of quality of European observations though ACTRIS (**A**erosols, **C**louds, and **T**race gases **R**esearch **I**nfra**S**tructure Network) research infrastructure. GAW/EMEP stations are involved in development and testing of the measurement techniques, inter-comparison campaign and participated this summer in EMEP intensive measurement period.

2. *Related meetings*

Last year WMO/GAW organized and supported several technical workshops which are of relevance to EMEP:

- The 10th AEROCOM Workshop (http://sprintars.riam.kyushu-u.ac.jp/aerocom2011/Home.html) was hold in Fukuoka, Japan on 3-6 October 2011 and was followed by the meeting of the Scientific Advisory Group for Aerosols. Review of the emission data sets used for simulations, aerosols detection using satellite platforms and limitations of the current projects were discussed at the meeting as well as direct and indirect effects of the aerosols on the radiation and use of estimated radiative forcing in the preparation of the 5th IPCC Assessment report. Dedicated session was addressed to Black Carbon (BC).

In this context it is worth mentioning that NILU hosts the World Data Center for Aerosols (http://www.gaw-wdca.org/), whose data were used for the comparison with the simulations.

- The international Network for the Detection of Atmospheric Composition Change (NDACC) held the annual meeting on 7-12 November 2011 (http://www.ndsc.ncep.noaa.gov/hotnews/#Symposium) that included the 20th anniversary conference at Île de la Réunion. Several European remote sensing stations contribute to NDACC and were reporting at the meeting.

- International Cooperative for Aerosol Prediction (ICAP, http://bobcat.aero.und.edu/jzhang/ICAP/) 4th Workshop: Aerosol Emission and Removal Processes was held in Frascati, Italy on 14 – 17 May 2012. This meeting discussed the issues and recent advances in the description of aerosol processes related to production and removal. The most attention was on the discussions on the better representation of the emissions and/or to the parameterizations related to aerosol sinks (wet deposition, sedimentation, aqueous chemistry, etc.).

- The International Ozone Commission held the 2012 Quadrennial Ozone Symposium (http://www.cmos.ca/QOS2012/) on 26-31 August 2012 in Toronto, Canada. The Symposium covered a wide range of ozone related topics, including observations and analysis of total, stratospheric and tropospheric ozone, ozone chemistry, ozone-climate interactions and ozone modeling. In addition to presentations on the mentioned topics there was also emphasis on merged data sets and discussions on the problem of closure of stations.

- In September 2012 the fourth GAW expert meeting on the global observations of VOCs took place in York, UK (*check GAW web page for agenda and presentations*). It evaluated the progress in the development of the global VOCs observations, reviewed data quality objectives and discussed the recommendations on the measurement techniques and quality assurance system for high quality VOCs observations. Progress in the development of the

gas standards was discussed and several new Central Calibration Laboratories were assigned. The new assigned WMO standards and scales are relevant to the VOC observations in EMEP.

- 39th GESAMP Annual meeting (http://www.gesamp.org/gesamp-session-39) took place on 15-20 April 2012 in New York, USA. GESAMP confirmed that the future focus of the programme will be on the impact of the atmospheric deposition of anthropogenic nitrogen to the ocean. The first workshop on the subject will be held in University of East Anglia in Norwich, United Kingdom, from 11-14 February 2013 and will discuss how to provide a much more accurate estimate of the impact of atmospheric anthropogenic nitrogen deposition on the production of additional nitrous oxide in the ocean and its subsequent emission to the atmosphere.

- 15th GEIA Conference *Emissions to Address Science and Policy Needs* (http://www.geiacenter.org/workshops/current/wkshpOverview.htm) took place on 11-13 June 2012 in Toulouse, France. WMO proposed a 10-km global data base on mineral composition of arid soils, used as input to mineral dust transport models to be included as one of GEIA Ancillary Datasets. The database is developed within the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) and the WMO-led GESAMP project "The Atmospheric Input of Chemicals to the Ocean".

3. Publications

A number of reports were published by the GAW Programme last year and many of then could be of interest for EMEP.
1) Joint Group of Experts on the Scientific Aspects of Marine Enviromental Protection (GESAMP) published in summer 2012 the report "The Atmospheric Input of Chemicals to the Ocean" (http://www.wmo.int/pages/prog/arep/gaw/documents/Final_GAW_203_web.pdf). This report assesses the impact of different atmospheric constituents on the state of the ocean (like ocean productivity or seawater pH) utilising global data on deposition and model simulations. One of the important report recommendations is that further reductions of the emissions of the strong acid precursors SO_2 and NOx from shipping and land-based sources should be done so as to improve air quality both locally and regionally, but such reductions will probably have little effect on the pH of seawater. In particular the report calls an attention on the necessary development of the global reliable observations of atmospheric deposition.

2) Two meeting reports and proceedings were published, including report of the workshop on Modelling and Observing the Impacts of Dust Transport/Deposition on Marine Productivity, (Sliema, Malta, 7-9 March 2011, GAW report No. 202, http://www.wmo.int/pages/prog/arep/gaw/documents/FINAL_GAW_202_web.pdf) and report of the Second Tropospheric Ozone Workshop - Tropospheric Ozone Changes: observations, state of understanding and model performances (Météo France, Toulouse, France, 11-13 April 2011, GAW Report No.199, http://www.wmo.int/pages/prog/arep/gaw/documents/GAW_199_14_Oct_web.pdf).

3) WMO/GAW Standard Operating Procedures for In-situ Measurements of Aerosol Mass Concentration, Light Scattering and Light Absorption, (Edited by John A. Ogren) were published in October 2011 as GAW Report No. 200
(http://www.wmo.int/pages/prog/arep/gaw/documents/FINAL_GAW_200_web.pdf).

4) Another important publication is WMO Greenhouse Gas Bulletin, which is published annually in November. Extension of the EMEP monitoring strategy to cover greenhouse observations in Europe helps to get a comprehensive picture on the GHG in the region and contribute with a data to the estimate of the global averages used in the bulletin preparation. Last Bulletin was published in November 2011 and highlighted the role of N_2O (http://www.wmo.int/pages/prog/arep/gaw/ghg/GHGbulletin.html).

5) The WMO/IGAC report on Impacts of Megacities on Air Pollution and Climate, GAW Report No 205, is now available on the GAW publications website for one month review before printing. (http://www.wmo.int/pages/prog/arep/gaw/documents/GAW_205_DRAFT_13_SEPT.pdf)

4. Near-Real-Time Data Delivery

To a large extent consistent with EMEP long-term plans for near-real-time atmospheric composition data exchange, WMO is working on a pilot project for establishing NRT exchange of ozone and aerosol data through the WMO Information System (WIS) system. The GAW Programme continues collaboration in this direction with the sub-project on reactive gases of the European FP7 project MACC.

To help GAW station in NRT implementation GAW report No.193: "Guidelines for Reporting Total Ozone Data in Near Rea Time" (http://www.wmo.int/pages/prog/arep/gaw/documents/FINAL_GAW_193.pdf) is published on the GAW web site.
-These routines will be tested out at Antarctic stations first, in conjunction with the WMO Antarctic Ozone Bulletins, starting August 2012.
- A letter has been sent to the PRs of NMHSs with stations in or near Antarctica, asking for total ozone data to be submitted to the GTS/WIS in NRT.

AOD data from Precision Filter Radiometers are available in NRT (24h delay) from the WMO/GAW World Data Centre for Aerosols (WDCA), hosted at NILU, Norway. 24 stations deliver data in NRT.

5. Quality Assurance

The Quality Assurance of observations is among the priorities in the WMO/GAW Programme. The Central Facilities, including Central Calibration Laboratories, World and Regional Calibration Centers and Data Centers are supported by National Partners and play an important role in QA/AC system. For all groups of the GAW variables a number of Central Facilities are situated in Europe and supported by National Hydrometeorological Services, Environmental Agencies and Research Institutes. These institutions provide services both to the EMEP programme and to GAW.

In this context it is important to note the extending collaboration between WMO and BIPM. Practical implementation of such collaboration was organizations of the 26th meeting of the CCQM – Gas Analysis Working Group (GAWG) in NOAA, Boulder, USA in September 2011. At the meeting a number of BIPM key comparisons were discussed. Several GAW Central Facilities are entitled to take part in these key comparisons in the framework of the WMO-BIPM Mutual Recognition Arrangement (MRA).

6. Air pollution and climate

Implementation of the new EMEP strategy supposes an increase of attention on interaction between air pollution and climate and assigns a substantial role to the modeling approaches. In this context I would like to mention a workshop co-sponsored by WMO, namely the 3rd International Workshop on Air Quality Forecasting Research (IWAQFR) that took place on 29 November – 1 December, 2011 in Washington and discussed science issues and advancements related to air quality forecasting (http://www.arl.noaa.gov/IWAQFR_home.php).

WMO is hosting the 4th International Workshop on Air Quality Forecasting (IWAQFR) in Geneva on 12-14 December 2012. Abstract submission ends 30 September, should you know of interested persons (contact Liisa Jalkanen, LJalkanen@wmo.int).

The experience of the GAW Programme on the greenhouse gas measurements, one of the programme pillars with a very long experience, is highly valuable for the implementation of the new EMEP monitoring strategy. GAW regularly reviews the data quality objectives and measurement techniques for greenhouse gases at the joint WMO/IEAE expert meeting. The 16th WMO/IAEA Meeting on Carbon Dioxide, Other Greenhouse Gases, and Related Measurement Techniques

took place in Wellington, New Zealand on 25-28 October 2011 (http://www.niwa.co.nz/our-science/atmosphere/ggmt-2011).

7. Capacity building

Capacity building remain one of the key priorities within WMO. In this context I would like to infrom the meeting of two activities. The 2nd Training Course on WMO SDS-WAS (satellite and ground observation and modeling of atmospheric dust) was hold in Antalya, Turkey on 21-25 November 2011. It was organized by the World Meteorological Organization (WMO), EUMETSAT and the Turkish State Meteorological Service (TSMS) with the collaboration of the Spanish State Meteorological Agency (AEMET) and the Barcelona Supercomputing Center (BSC-CNS). It is coordinated by the Regional Center for Northern Africa, Middle East and Europe of the WMO SDS-WAS programme.

The GAW Training and Education Centre, GAWTEC (www.gawtec.de), hosted by Germany, continues to give two two-week courses annually for station personnel. In the 22 courses held since 2001, about 250 were trained on atmospheric chemical and related physical observations with a large percent of participants from Europe. As many of the participants are also involved with EMEP, this training is also beneficial to you and it strengthens the network of station personnel globally.

8. Other activities

WMO co-chairs the EMEP Task Force on Measurements and Modeling, TFMM and collaborates with TF HTAP.

WMO will hold the first in the history extraordinary Congress from 29 to 31 October 2012 in Geneva. The item to be discussed is the Global Framework for Climate Services (GFCS) which has also been one of the major items in the Secretariat. GAW has worked on two Annexes, on Research and on Observations and Monitoring. In this connexion, we are also publishing an Atlas on Climate and Health together with WHO.

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