

Report of WMO/GAW activities to the Steering Body of the EMEP programme, agenda item 8, 38th Session, 15-17 September 2014

This document highlights some events and activities within the WMO/GAW Programme which are of relevance to EMEP.

The Global Atmosphere Watch Programme 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 an important contributor to GAW.

1. Joint activities with EMEP experts

Several steps were made to improve collaboration between the GAW Programme and EMEP during past year.

- Trend analysis is among important activities within EMEP Task Force for Measurements and Modeling. Analysis of observational data sets accompanied by model runs can serve as an independent tool for verification of emission reductions. To ensure the most comprehensive data sets are used for analysis European GAW community was invited to TFMM annual meeting in Bologna, Italy. Experts working at the European GAW stations shared information on available observations and experience in performing trend analysis. Collaboration on trend analysis will continue further during the special workshop planned in November 2014.
- EMEP experts were involved in the GAWTEC training session on precipitation chemistry held in May 2014. This was the first training session in the GAW Programme where applications of precipitation chemistry measurements and related environmental problems were introduced by members of EMEP community.

2. WMO and GAW Constituent bodies meetings

Since previous EMEP Steering Body Session several important events that will shape the GAW Programme in the future have taken place.

- 1) The WMO Commission for Atmospheric Sciences held its Session in Antalya, Turkey on 18-26 November 2013. This session defined CAS priorities for the next 10 years. Those priorities include high impact weather and its socio-economic effects in the context of global change; water aspects, including modeling and predicting the water cycle for improved disaster risk reduction and resource management; Integrated Global Greenhouse Gas Information System(IG3IS); aerosols research, including impacts of aerosols

on air quality, weather and climate; urbanization, namely research and services for megacities and large urban complexes; and evolving technologies and their impact on science and its use. The GAW Programme is involved in implementation of several highlighted priorities.

- 2) CAS Management Group met in Geneva on 23-25 April 2014 and discussed the ways to implement CAS priority activities. It required an implementation plan for IG3IS with a long-term strategy and short-term goals be developed by GAW. It also required through GAW, to push the observational capability of aerosols and aerosol properties on a global scale and to ensure that the downstream requirements (atmospheric composition/health, NWP, climate) dictate the specification of observed properties. CAS Management Group further required Environmental Pollution and Atmospheric Chemistry Scientific Steering Committee (EPAC SSC) define applications areas for the GAW Programme.
- 3) EPAC SSC met in Geneva, Switzerland on 10-12 June 2014. SSC formulated possible application areas, reviewed the GAW structure as to its usefulness and relevance to the demands from services and different application areas and initiated development of the GAW implementation plan for the next financial period.

3. Anniversary of the GAW Programme

The GAW Programme celebrates its 25th anniversary at the IGAC meeting in Natal, Brazil on 22-26 September 2014. A special brochure was prepared and published prior to the meeting highlighting achievements of GAW since its establishment. This brochure is available on the GAW web page.

4. GAW observational network development

Some developments took place in the GAW observational network in Europe. During past year two stations from United Kingdom and two stations from Spain joined the GAW Programme as GAW Regional stations. The European GAW Regional station Puy de Dome (France) was upgraded to GAW Global station status.

5. Air pollution and weather and climate research

Implementing the EMEP strategy and addressing WMO priority areas require more attention to be put on interaction between air pollution and weather and climate. This assigns a substantial role to the modeling approaches. In this context I would like to mention the 5th International Workshop on Air Quality Forecasting (IWAQFR), which was held in Santiago, Chile on 8-10 October 2013. Importance of integration between weather forecasting community and

air quality forecasting community was further highlighted at the first World Weather Open Science Conference (WWOSC-2014) that took place in Montreal, Canada on 16-21 August 2014 (<http://wwosc2014.org/>) and included the 6th IWAQFR meeting. The conference brought together the entire weather science and user communities for the first time to review the state-of-the-art and map out the scientific frontiers for the next decade and more. A number of white papers are being prepared to follow up conference discussions.

6. GAW Technical meetings

Several meetings held past year made preparation step to the next ozone assessment. Those included 9th Meeting of the Ozone Research Managers of the Parties to the Vienna Convention for the Protection of the Ozone Layer held in Geneva, Switzerland on 14-16 May 2014 and a review meeting for the WMO/UNEP Scientific Assessment of Ozone Depletion held in Les Diablerets, Switzerland on 23-27 June 2014. A number of European countries have contributed materials to these meetings.

The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) met in Malmoe, Sweden on 1-4 September 2014. GAW community collaborates with the Working Group (WG) 38 that addresses deposition of nutrients to the oceans. WG 38 delivered several peer-reviewed publications during the past year. The group will develop possible new activities related to the atmospheric input of chemicals to the ocean and the atmosphere-ocean interactions in collaboration with several GAW Scientific Advisory Groups (Precipitation Chemistry, Reactive Gases, and possibly others).

7. GAW publications

A number of reports and papers were published by the GAW Programme and GAW expert teams last year and many of them could be of interest for EMEP.

- 1) Scientific Advisory Group for Precipitation Chemistry published "A global assessment of precipitation chemistry and deposition of sulfur, nitrogen, sea salt, base cations, organic acids, acidity and pH, and phosphorus" in Atmospheric Environment journal in August 2014. This global assessment was produced by an international team of 21 scientists from 14 countries and was designed to provide the international science and policy communities with the best available data and information on regionally-representative precipitation chemistry and atmospheric deposition. Data from 533 measurement stations worldwide were included in the assessment. The data compiled and used for this assessment represent the highest quality and most extensive data that could be obtained for this purpose. The dataset

used in this assessment is available for downloading from the World Data Centre for Precipitation Chemistry (wdcpd.org).

- 2) The GAW report No. 213 “17th WMO/IAEA Meeting on Carbon Dioxide, Other Greenhouse Gases and Related Tracers Measurement Techniques (GGMT-2013), Beijing, China, 10-13 June 2013” was published in July 2014. It contains recommendations on the network compatibility and on quality assurance for the greenhouse gas measurements in the GAW Programme. Those recommendations are applicable to greenhouse gas measurements within EMEP.
- 3) Two reports were published related to UV measurements, including “Standard Operating Procedures (SOPs) for Spectral Instruments Measuring Spectral Solar Ultraviolet Irradiance” (GAW Report No. 212) and joint report with the International Commission on Illumination “Rationalizing Nomenclature for UV Doses and Effects on Humans (CIE209:2014/GAW Report No. 211).
- 4) Another important publication is WMO Greenhouse Gas Bulletin, which was published this year in September. Earlier release of the bulletin is due to the Climate Summit, organized by UN Secretary General on 23 September 2014 in New York. 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.

All GAW reports are available for download at the GAW web page (under section “GAW Reports”).

8. GAW Quality Assurance system

The Quality Assurance of observations is among the priorities in the GAW Programme. The Central Facilities supported by National Partners play an important role in quality assurance 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. A new World Calibration Center for NO_x in Julich, Germany was assigned during past year.

9. Capacity development

Capacity development remains one of the key priorities within WMO. GAW supported several European training events, including the 22nd session of ERCA (European Course on Atmospheres), that took place in Grenoble,

France from 8 January to 7 February 2014, ACCENT-Plus Summer School "Drivers, Feedbacks and Impacts in Air Quality and Climate Change", that took place in Urbino, Italy on 22-29 June 2014, EuMetChem COST/WMO training school "Integrated Modelling of Meteorological and Chemical Transport Processes/Impact of Chemical Weather on Numerical Weather Prediction and Climate Modelling" that took place in Averiro, Portugal on 6-11 July 2014. Support of those training events is beneficial both for EMEP community and for the GAW Programme.

The GAW Training and Education Centre, GAWTEC, hosted by Germany, continues to give two two-week courses annually for station personnel. In the 26 courses held since 2001, about 280 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.

10. Conclusion

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