Report from the 10th Meeting of the Ozone Research Managers of the Parties to the Vienna Convention for the Protection of the Ozone Layer

Kenneth W. Jucks (NASA HQ; USA)
Gerrie Coetzee (SAWS; South Africa)
Co-Chairs, 10th ORM Meeting
10th ORM Meeting Report & Recommendations

Background

• The 10th Meeting of Ozone Research Managers of the Parties to the Vienna Convention was held in Geneva (28-30 March, 2017) in accordance with COP decisions I/6 and III/8.

• The ORM Reports and WMO-UNEP Scientific Assessments are required under the Vienna Convention and Montreal Protocol respectively and have complementary but different purposes:
  – Science Assessments enable the Parties to evaluate control measures under the Montreal Protocol and are communication devices between the research community and decision makers.
  – Assessments neither provide policy recommendations nor are they research planning documents. However, they provide input for both.
  – ORM Reports, on the other hand, address research and monitoring needs in light of scientific understanding provided by the Assessments and do make specific recommendations regarding international actions for improved research coordination and networking.
Implementation

• Agenda Items for the 10th ORM Meeting
  – Issues pertinent to the Vienna Convention
    • Review of recommendations from the 2014 9th ORM Meeting
    • Review of activities under the Vienna Convention Trust Fund
  – Presentations on the state of the ozone layer and its interactions with climate change
  – Updates on international research and monitoring programs
  – Satellite research and monitoring programs (present & future)
  – National and regional reports on ozone research / monitoring
  – Formulation of needs and recommendations structured around six areas (Overarching Goals, Research Needs, Systematic Observations, Data Archiving and Stewardship, Capacity Building, and the Vienna Convention Trust Fund)
The full 10th ORM Meeting Report is available as
Document web site for 11th COP/29th MOP


• A more comprehensive discussion of the presentations and recommendations
  • (presented here are highlights of recommendations),
• A framework summary of the current state of research / understanding and implementation for each area, and
• Specific accomplishments in each area addressing the 9th ORM Recommendations
The 10th ORM Recommendations Were Formulated within the Framework of Four Overarching Goals

Developed within the background of the 2014 and new emphases of the 2018 Scientific Assessment of Ozone Depletion

- Improve the understanding and accuracy of future projections of global ozone amounts.
- Maintain and enhance existing observation capabilities for climate and ozone layer variables.
- Continue and enhance the Trust Fund for Financing Activities on Research and Systematic Observations Relevant to the Vienna Convention to better support the above goals.
- Dedicate to build capacity to meet the above goals.
Research Needs

• Understanding the complex coupling of ozone, atmospheric chemistry, transport, and climate changes remains a high priority.
  – The combined changed in ODSs and other GHGs will affect ozone in coupled, yet with different means.
  – Changes in stratospheric circulation (like Brewer Dobson circulation and the Quasi-Biennial Oscillation must be better understood, especially in the tropics which will be less affected by reductions in ODSs.
  – Ozone changes have shown to be critical in Climate Model projections. Such interactions are important for better ozone and UV projections in a changing climate.
Research Needs (2)

• Improved understanding the emissions and distribution of both short and long lived ODSs and GHGs is needed to better understand changes in ozone.
  – Recent CCl$_4$ report produced important results, with some uncertainties that should and can be reduced.
  – Methyl Bromide emissions and lifetimes are still uncertain.
  – Ozone changes have shown to be critical in Climate Model projections. Such interactions are important for better ozone projections in a changing climate.
  – The successful reduction of Methyl Chloroform has created a research problem for inferring global OH, making it difficult to better understand the lifetimes of short lived ODSs and CH$_4$. An appropriate replacement for this research is needed.
Systematic Observations

Which are required to meet the research needs

- Satellite observations of key trace gases in the stratosphere to compliment the new and expiring limb viewing observations of ozone are needed to separate the changes in ozone from reduced ODSs from climate-driven changes in atmospheric transport.

- The steady decrease in the number of stations, especially for profile measurement capabilities, is endangering the unambiguous determination of trends and the capturing of unexpected events, as well as our ability to validate satellite data records.

- Where scientific needs are clearly identified, regular, long-term monitoring should be restored, and, in some cases, expanded. Key regions are those of troposphere-stratosphere exchange, such as Monsoon regions, Southeast Asia, the maritime continent, and the Himalayas and Central Asia mountainous regions. Measurements also should be targeted to data-poor areas like South America, Africa, and Asia, and in the inter-tropical region for accurate detection of BDC changes and other transport phenomena.
Systematic Observations (2)

• The community should continue the implementation of new and cost-effective instruments for ozone and trace gases, as well as data analysis protocols. This includes further progression with network harmonisation. Examples include the European Brewer Network (EUBrewNet), Pandora, DOAS / Système d’Analyse par Observation Zénithale (SAOZ), Air-Core, etc. Current regional harmonisation initiatives should be expanded to global partners, e.g. Indian ozonesondes could be included in WMO’s O3S-DQA.

• As most of the concentrations of ODSs are declining, other source gases, especially $\text{N}_2\text{O}$, $\text{CH}_4$, and water vapour, are becoming more important for their impacts on the ozone layer and climate change. Increased efforts to monitor vertical profiles of these gases through the troposphere and stratosphere, understand their changing fluxes, and better assess their impacts will be required.

• Mechanisms should be set up to give appropriate recognition to data providers, and to exchange findings and feedback on data quality. For example, the contribution of individual stations or networks to satellite validation could be acknowledged by an exchange of letters between space agencies and observational stations.
Data Archiving and Stewardship
Archiving without Accompanying Stewardship is Unacceptable

• The Delegates re-emphasize the past Recommendation regarding the continuing need to develop robust automated data submission with centralised and standard processing wherever feasible, and QA schemes to ensure timely – or even NRT – submission, to the appropriate data centres.

• There is a continuing need to allocate resources to digitise historical data for ozone and related species, as well as for ancillary data (e.g. laboratory spectroscopic data, station information, etc.), where available and before the information gets lost, in order to include the data in modern database systems.
Capacity Building

• Identify the needs of individual countries, and improve communication within regions to better serve and support those needs. Before any education and training can be offered, there first needs to be an understanding of the level of knowledge, training, instrumentation, and support in local communities.

• Provide training opportunities for local station operators in developing countries as well as fellowships to support scientific development of students.

• Maintain the quality of the global ozone-observing system through the continuation and expansion of regular calibrations and intercomparison campaigns.

• WMO and the Ozone Secretariat to facilitate bridging the gap between different communities. Collaboration between Ozone Officers and National Meteorological Agencies should be enhanced. This should occur under the guidance of the Trust Fund Advisory Committee, to allow continued and enhanced scientific capacity among all parties of the Montreal Protocol.
Capacity Building in relation to the Vienna Convention Trust Fund

• Most of the findings regarding Capacity Building can be significantly enhanced by an enhanced Trust Fund.

• Many of the regions of the planet that are recommended for increased observations, and clearly in areas of scientific need, are also regions that can benefit greatly from an enhanced Trust Fund.

• Many current observational network programs have connections in countries that have received past Trust Fund support and/or are requesting future support. These connections help to ensure that the Trust Fund investments provide fruitful results both for the recipients and for the breadth of observations needed to advance Ozone research.
In conclusion, the 10th ORM Meeting Co-Chairs would like to express our thanks to

• The Government of Canada for their kindness and hospitality in hosting this meeting, and to the UNEP Ozone Secretariat for its excellent organizational efforts,
• The WMO and the UNEP Ozone Secretariat for arranging a highly successful and informative 10th ORM Meeting and for inviting us to present this summary,
• The many international delegates and scientific experts who gave generously of their time to ensure the success of the 10th ORM Meeting, especially for their efforts in helping to craft the meeting report and its recommendations, and
• To all of you for taking on the responsibilities of attending and participating in this week’s events in Montreal.