

RSMC Melbourne report of activities for 2017

Executive Summary

Primary activities for 2017 were the monthly tests conducted for scenarios over Canada, the United States, Brazil and Australia and the IAEA quarterly tests for scenarios over the United States (February), Hungary (ConvEx-3 June), and Malaysia (August, as lead centre). The Provisional Technical Secretariat (PTS) of the Comprehensive Test Ban Treaty Organization (CTBTO) made 3 requests for inverse modelling support throughout the year.

1. Introduction

The National Operations Centre (NOC) of the Australian Bureau of Meteorology is designated by the WMO as the Melbourne Regional Specialized Meteorological Centre (RSMC) with the specialization to provide atmospheric transport model products for environmental emergency response. The region of responsibility is WMO Regional Association (RA) V, which includes the countries: Australia, Brunei Darussalam, Fiji, Indonesia, Malaysia, New Zealand, Papua New Guinea, Philippines and Singapore. RSMCs Washington and Montréal also respond jointly in support of RSMC Melbourne in case of an event in WMO RA-V until a second RSMC can be designated for this region. In addition to emergency response, RSMC Melbourne contributes global inverse modelling support to the CTBTO's verification system.

2. Operational Contact Information

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3. Responses and information on dissemination of products

i. Dissemination of products

Transport model graphical products and joint statements are posted to secure joint web pages, and faxed to relevant RSMCs and NMHSs. For examples of the graphical products, see Annex 4 of WMO, 2015. In addition to the other RSMCs, the following RA-V member countries' NMHSs are in our email and fax lists: Brunei Darussalam, Fiji, Indonesia, Malaysia, New Zealand, Papua New Guinea, Philippines, and Singapore.

ii. Response to requests by CTBTO-PTS

A total of 3 requests for support were received from the Provisional Technical Secretariat of the Comprehensive Test Ban Treaty Organization during 2017. In all cases, the products were supplied to CTBTO within the allowed time limit.

4. Routine operations

Monthly Test:

RSMCs Melbourne, Montréal and Washington held a joint exercise on the third Tuesday of every month. In addition, RSMC Melbourne participated in three IAEA-initiated exercises during the year, one in which RSMC Melbourne was lead with support from RSMC Montréal and RSMC Washington. The table below shows the list of tests held in 2017.

Once the model products are posted to the common web pages, an email is sent in English to the relevant RSMCs, the NMHS contact points in WMO RA-V, the IAEA and WMO. The email contains login information to retrieve the RSMC products from the common web pages.

Month	Source Location	Initiated By	RSMC providing joint statement
January	Angra NPP, Brazil	Washington	Montreal
February	Fermi-2 NPP USA	IAEA	Montreal
March	Pt Lepreau NPP, New Brunswick Canada	Montreal	Washington
April	Lucas Heights, Australia	Melbourne	Melbourne
May	Grand Gulf NPP, , Mississippi, USA	Washington	Montreal
June 21 -22	PAKS NPP, Hungary	IAEA	Exeter/Toulouse
July	Darlington NPP, Ontario, Canada	Montreal	Washington
August	Puspati, Malaysia	IAEA	Melbourne
September	Lucas Heights, Australia	Melbourne	Melbourne
October	Enrico Fermi NPP, , USA	Washington	Montreal
November	WMO RAI	IAEA	Cancelled
December	Pt Lepreau NPP, New Brunswick Canada	Montreal	Washington

5. Lessons learned and significant operational or technical changes:

- This year has seen a number of changes in both personnel and operational arrangements. The routine monthly RSMC tests continue to be invaluable for assisting our operational staff to gain and maintain familiarity with the procedures for responding to requests for support. Identification and rectification of any problems in scripts or in the uploading of data to the various ftp sites, is another important factor for participating in the monthly test series.

The participation of other RSMCs in these exercises is welcomed and encouraged.

RSMC Melbourne's global NWP model, ACCESS-G, currently has a N512 (~25km) horizontal resolution. Vertical resolution remains unchanged at 70 levels. The next update to this model is planned for Q4 2018

- An upgrade to RSMC Melbourne's city-based ACCESS-C systems from 0.036° (approximately 4km horizontal resolution) to 0.0135° (approximately 1.5km horizontal resolution) was eventually completed in Q4 2017
The regional ACCESS-R NWP model is unchanged since the April 2016 update The horizontal resolution is 0.11 degrees (~12km) with 70 vertical levels.

6. Operational issues and challenges:

During 2017 RSMC Melbourne continued to adjust to the IT paradigm introduced in 2016. A number of new staff were exposed to Environmental Emergency Response (EER) for the first time, which revealed a few shortcomings in our training materials. These are being addressed.

7. Summary and status of the operational atmospheric transport and dispersion models

RSMC Melbourne's operational EER system is currently based on version 4.9 (revision 804) of the Hybrid Single-Particle Lagrangian Integrated Trajectories (HYSPLIT) model, developed by Roland Draxler at the NOAA Air Resources Laboratory. HYSPLIT is driven by meteorological input from the various "ACCESS" operational numerical weather prediction systems run in the Bureau of Meteorology. The system is available for running on demand and produces forecast trajectories, concentrations (or exposures) and depositions for nuclear accident, volcanic ash, smoke and other episodes. For most initial responses to requests for nuclear EER products the input to HYSPLIT is provided by global ACCESS-G system, the current horizontal resolution of which is N512 (approximately 25km horizontal resolution) with 70 vertical levels.

8. Plans for 2018:

- APS3 updates to global and regional NWP models are expected in Q4 2018.
- As part of the APS3 updates the Cray XC-40 will be upgraded
- Update training, our new operational paradigm has increased the number of staff who require training in EER operations

References:

WMO, 2015: Documentation on RSMC Support for Environmental Emergency Response. WMO-TD/No.778. Available online at <http://www.wmo.int/pages/prog/www/DPFSERA/td778.html>