

**COORDINATION WITH OTHER ACTIVITIES OF
THE WMO TROPICAL CYCLONE PROGRAMME**

(Submitted by the WMO Secretariat)

Summary and Purpose of Document

This document provides information on activities carried out under the WMO Tropical Cyclone Programme (TCP) during the inter-sessional period after the forty-eighth session to assist the Committee in its consideration of coordination within the TCP. TCP's collaborations with its partner programmes of WMO will also be presented. (see Appendix).

ACTION PROPOSED

The Committee is invited to:

- (a) Review the activities carried out under the TCP since its forty-eighth Session (Honolulu, Hawaii, USA, 22 - 26 February 2016) and the proposals for the future, which are indicated in Appendix to this document or otherwise reported to the session; and,
 - (b) Consider what further measures, if any, may be taken to strengthen coordination between its own activities and those conducted under other parts of the TCP.
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Appendices:

- A: Activities carried out under the TCP since its forty-eighth session
- B: Draft texts for inclusion in the final report of the session

ACTIVITIES CARRIED OUT UNDER THE TROPICAL CYCLONE PROGRAM SINCE ITS FIFTEENTH SESSION

1. INTRODUCTION

1.1 The WMO Tropical Cyclone Programme carries out its activities in accordance with decisions/resolutions by Congress and Executive Council and Regional Associations. The resolutions and decisions at the recent Congress (Cg-17) with particular relevance to the Programme may be found in the ANNEX I: 1) Tropical Cyclone Coordination and Services (Paragraphs from 3.1.63-3.1.99 of the Abridged final report with resolutions of the Seventeenth World Meteorological Congress (Cg-17), Geneva, 25 May–12 June 2015 (WMO-No. 1157).

1.2 The 68th session of the WMO Executive Council (EC-68) consolidated the decisions by the 17th Congress regarding full coverage of early warning system to all Members prone to tropical cyclones (Decision 11 of EC-68), and development of impact-based forecasting and warning products under the initiative of TC RSMCs/TCWCs (Decision 10 of EC-68). The decisions 10 and 11 may be found in the ANNEX I: 2) Abridged final report with resolutions and decisions of the EC-68.

1.3 The sixteenth Session of Regional Association II (RA II-16) (12–16 February 2017, Abu Dhabi, United Arab Emirates) made a decision to enhance the capacity and competencies of the NMHSs RA II Members prone to tropical cyclones in their tropical cyclone forecasting and warnings through the following two primary aspects:

- providing training opportunities to forecasters from those RA II Members through the existing training programmes under the WMO Tropical Cyclone Programme and Education and Training Programme;
- calling for satellite operators of the Members who signed the Memorandum on AOMSUC (Asia-Oceania Meteorological Satellite Users Conference) to devise to coordinate to establish an appropriate protocol under which Members can request event-driven rapid-scanning satellite data covering their national area of interest for Disaster Risk Reduction in accordance with the concept of the Jakarta Declaration, and requesting the Members who signed the Memorandum on AOMSUC to foster cooperation among satellite operators and users in the Region to improve regional capacity in exploiting satellite data for Disaster Risk Reduction

2. PROGRAMME IMPLEMENTATION

2.1 The TCP Programme was implemented in two components: a general component concerned with collective issues such as methodology and transfer of technology, and a regional component devoted to the activities of the five regional tropical cyclone bodies.

2.2 A list of the events organized or co-sponsored under the Programme during the period from March 2016 is given in ANNEX II.

3. COOPERATION WITH OTHER ORGANIZATIONS

3.1 There has been close cooperation and collaboration with the Economic and Social Commission for Asia and the Pacific (ESCAP), the International Strategy for Disaster Reduction (ISDR) Secretariat, International Civil Aviation Organization (ICAO), Japan International Cooperation Agency (JICA), International Federation of Red Cross and Red Crescent (IFRC) and Secretariat of the Pacific Regional Environment Programme (SPREP) on a variety of matters of common concern. The main items include ESCAP's co-sponsorship of the Typhoon Committee and the Panel on Tropical Cyclones, as well as the ISDR Secretariat in the context of the DRR of TCP.

3.2 As part of the cooperation between WMO and the International Civil Aviation Organization (ICAO), Tropical Cyclones Regional Specialized Meteorological Centres (TCRSMCs) and one Tropical Cyclone Warning Centre (TCWC) are designated as ICAO Tropical Cyclone Advisory Centres (TCAC) by ICAO Regional Air Navigation Agreements. Those TCACs listed below

provide specialized tropical cyclone warning services for the aviation community:

RSMC/TCWC

Darwin (Australia)
 Honolulu (USA)
 La Réunion (France)
 Miami (USA)
 Nadi (Fiji)
 New Delhi (India)
 Tokyo (Japan)

Area(s) of responsibility

South-eastern Indian Ocean, South-western Pacific Ocean
 Central North Pacific
 South-western Indian Ocean
 North Atlantic, Caribbean, Eastern North Pacific
 Southern Pacific
 Bay of Bengal and the Arabian Sea
 Western North Pacific, including the South China Sea

4. ACTIONS FOR 2017 AND BEYOND

4.1 Major activities of TCP planned for 2017 in the global and regional components are set out below in summary form:

General component:

a) Training and Capacity Development

- Enhancement of the collaboration with other WMO Programmes in implementing TC training courses and workshops.

b) Support to Operational Forecasting

- Maintaining the Tropical Cyclone Forecaster Web Site with the support of Hong Kong, China.
- Maintaining reformatting the Global Guide to Tropical Cyclone Forecasts. The web version of the Guide will be reformatted and printable version (in PDF format) will be available for download before May 2017.

c) Application of Research and Development (R&D)

- Implementation of the TCP/WWRP joint projects;
 - North Western Pacific Tropical Cyclone Ensemble Forecast Project (NWP-TCEFP) including its extension to North Indian Ocean Typhoon Landfall Forecast Demonstration Project (TLFDP)
 - Summary of the 2nd phase and extension to the 3rd phase of TLFDP in Typhoon Committee region, including EXOTICA.
- Organizing 4th International Workshop on tropical Cyclone Landfall Processes (Jointly with WWRP, November 2017 and venue to be determined).

d) Global Coordination

- Development of Tropical Cyclone forecaster competency.
- Development of impact-based tropical cyclone forecasting and warning products.

e) Further development and establishment of Storm Surge Watch Scheme.

Regional component:

- a) 49th session of the ESCAP/WMO Typhoon Committee (Japan, 20-24 February 2017)
- b) 39th session of RA IV Hurricane Committee (San Jose, Costa Rica, 23-26 March 2017)
- c) RA IV Workshop on Hurricane Forecasting and Warnings and PWS (Miami, Florida, USA, 27 February–10 March 2017)

- d) 44th session of the WMO/ESCAP Panel on Tropical Cyclones (venue and dates to be determined)
- e) 22nd session of the RA I Tropical Cyclone Committee for the South Pacific and Southeast Indian Ocean (Seychelles, September 2017)
- f) Forecaster Attachment Trainings in RSMC New Delhi, RSMC Tokyo and Indian Institute of Technology Delhi, RSMC Miami, and RSMC La Reunion (dates to be determined).

4.2 In more general terms:

- Activities for the implementation of the Tropical Cyclone Programme section of the WMO Strategic Plan;
- Continued activities for the implementation of the Regional Cooperation Programmes, Technical Plans and other work programmes of the regional tropical cyclone bodies;
- Actions following decisions made by the Seventeenth WMO Congress (Cg-17), the Executive Council, the Regional Associations concerned and the regional tropical cyclone bodies.

TROPICAL CYCLONE COORDINATION AND SERVICES

1) Tropical Cyclone Coordination and Services (Paragraphs from 3.1.63-3.1.99 of the Abridged final report with resolutions of the Seventeenth World Meteorological Congress (Cg-17), Geneva, 25 May–12 June 2015 (WMO-No. 1157)

Downloadable at: http://library.wmo.int/pmb_ged/wmo_1157_en.pdf

2) Abridged final report with resolutions and decisions of the 68th session of the Executive Council (EC-68), Geneva, 15 – 24 June 2016 (WMO-No. 1168)

Downloadable at : http://library.wmo.int/opac/doc_num.php?explnum_id=3166

ANNEX II

TCP EVENTS DURING THE INTERSESSIONAL PERIOD

During the inter-sessional period from March 2016, the following events were organized or co-sponsored under the Tropical Cyclone Programme:

Please refer to <https://www.wmo.int/pages/prog/www/tcp/Activities.html>

APPENDIX B
DRAFT TEXT FOR INCLUSION IN THE FINAL REPORT OF THE SESSION

1. The Committee was presented by WMO representative about activities under, and those requiring coordination through, TCP. It appreciated the comprehensive presentation, and thanked WMO support to endeavours of the Committee.

2 The Committee was informed by the WMO Secretariat that the 17th WMO Congress endorsed/approved the TCP Programme to arrange and take necessary actions particularly for the following:

- to expand and consolidate further the regionally coordinated systems to cover all Members prone to tropical cyclones;
- to enhance the capacities of Members to provide more accurate forecasting and warning services which are impact-based and in multi-hazard approach (which was also a decision of EC-66);
- to improve forecasting and warning capabilities of Members through advances in sciences and technologies, and capacity development; and
- to reduce damage and loss of lives through the above institutionalized activities and arrangements, and in step with the developmental goals of the Sendai Framework.

3. The Committee was further informed by the WMO Secretariat about decisions made by the 68th session of WMO Executive Council (EC-68). Under the initiative of the Tropical Cyclone Regional Specialized Meteorological Centres (RSMC)/TCWC, and in collaboration with Members with experience in impact-based tropical cyclone forecast and warning services, new products be developed and corresponding training opportunities be provided to assist Members in accelerating their implementation of impact-based tropical cyclone forecasts and warnings (Decision 10).

4. The Committee was informed that the sixteenth Session of Regional Association II (RA II-16) (12–16 February 2017, Abu Dhabi, United Arab Emirates) made a decision to enhance the capacity and competencies of the NMHSs RA II Members prone to tropical cyclones in their tropical cyclone forecasting and warnings through the following two primary aspects:

- providing training opportunities to forecasters from those RA II Members through the existing training programmes under the WMO Tropical Cyclone Programme and Education and Training Programme;
- calling for satellite operators of the Members who signed the Memorandum on AOMSUC (Asia-Oceania Meteorological Satellite Users Conference) to devise to coordinate to establish an appropriate protocol under which Members can request event-driven rapid-scanning satellite data covering their national area of interest for Disaster Risk Reduction in accordance with the concept of the Jakarta Declaration, and requesting the Members who signed the Memorandum on AOMSUC to foster cooperation among satellite operators and users in the Region to improve regional capacity in exploiting satellite data for Disaster Risk Reduction.

5. The Committee was informed that TCP activities during the inter-sessional period were mainly focused on following aspects:

- Training and Capacity Development
- Support to Operational Forecasting
- Global and Regional Coordination of Forecasting Services
- Storm Surge Services

6. The Committee was informed that the scope of activities of the regional Tropical Cyclone Committees had been expanded through involvement with the WMO's cross-cutting projects such as the Severe Weather Forecasting Demonstration Project (SWFDP), Coastal Inundation Forecasting Demonstration Project (CIFDP) and Disaster Risk Reduction projects for

Early Warning Systems in Regions I, II, IV and V. Those Committees' annual/biennial sessions serve as venues for information sharing for the projects and their technical plans have incorporated collaborative actions with those projects. Wider cross-cutting project coverage is further needed to reach all the Member countries of the regional TC committees. In addition, a synergistic relationship with other UN agencies and international/regional entities has also been developed.

7. The Committee was informed that the web version of Global Guide to Tropical Cyclone Forecasts was reformatted, and printable version (in PDF format) will be available for download before May 2017

8. The Committee was informed that collaborative efforts were made by the TCP and WWRP for promoting application of research outcomes to operational forecasting within the framework of the Typhoon Committee to implement the Typhoon Landfall Forecast Demonstration Project (TLFDP) including EXOTICCA (Experiment on Typhoon Intensity Change in the Coastal A). The project was also endorsed by the WMO Working Group on Tropical Meteorological Research for extension until 2018. The project was aimed at enhancing the timeliness and accuracy of typhoon forecasts, particularly during the landfall process, with focus on the verification of TC forecast guidance produced in the Typhoon Committee region to assess the currently available forecast techniques.