



# **C A R I B B E A N M E T E O R O L O G I C A L O R G A N I Z A T I O N**

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## **REPORT OF THE ANNUAL MEETING OF DIRECTORS OF METEOROLOGICAL SERVICES**

Belize City, BELIZE

11 NOVEMBER 2015



## **INTRODUCTION**

1.1 At the kind invitation of the Government of Belize, the 2015 Meeting of Directors of Meteorological Services was held at the Radisson Hotel, Belize City, Belize on 11 November 2015 under the Chairmanship of Mr Tyrone Sutherland, Coordinating Director of the Caribbean Meteorological Organization (CMO).

1.2 The Meeting fixed its hours of work and determined the order in which it would conduct its business.

1.3 The Agenda adopted by the Meeting is attached as **ANNEX I** and the list of participants and observers attending the Meeting is attached **ANNEX II** to this Report.

## **STATUS OF ACTIONS FROM THE PREVIOUS MEETING**

(Agenda Item 2)

2.1 The CMO Headquarters produced a single document containing an **Action Sheet** that allowed the Meeting to follow-up on the actions taken to implement the decisions of its previous meeting, and to discuss any further actions if required.

2.2 In this regard, a summary of the decisions of DMS2014 (Jamaica, 2014) was prepared by the CMO Headquarters. The Science and Technology Officer gave the status of actions taken to implement the decisions to the Meeting.

2.3 There were two items which were stressed and it was indicated that these items would be dealt with under Agenda Items 8 and 5 respectively. These items were:

1. DMS2014 Item 4 – Operational Matters: - New Registers for the recording of observations must be developed for aeronautical and synoptic observations;
2. DMS2014 Item 4 – Operational Matters: - Meteorological Services must provide evidence that they meet the five milestones in paragraph 4.13 of the DMS2014 Report, if they do not comply with ICAO's Recommended Practice for obtaining certification in accordance with the ISO 9001 Standard.

Paragraph 4.13 of the DMS 2014 Report states:

Further, the Sixty-fifth meeting of the WMO Executive Council (Geneva, 15-23 May 2013) was informed of an agreement in principle between the relevant WMO and ICAO Secretariats that Member States not complying with the Recommended Practice for obtaining certification in accordance with the ISO 9001 Standard should, as a minimum, provide evidence of having achieved the following milestones:

- a) Evidence of a contractual arrangement between the Meteorological Authority and Service Provider with clearly established responsibilities;
- b) Availability of quality policy, quality manual and complete set of work instructions/process descriptions at all workplaces, and routine use of these documents by staff;
- c) Documented evidence of user consultation and feedback (publications, questionnaires, records of user meetings, actions stemming from these);
- d) Evidence of corrective and preventive action processes; and
- e) An internal audit plan, audit reports and documented follow-up decided by a Management Review meeting.

## TRAINING (Agenda Item 3)

3.1 The Principal of the Caribbean Institute for Meteorology and Hydrology made a presentation to the Meeting titled "*Report on Education and Competency*" which was prepared by Ms Kathy-Ann Caesar. The presentation highlighted an alarming and growing trend of sub-par performances by students at all levels of the Meteorology programme. Students were failing courses, especially first year Calculus, at the Cave Hill Campus of the University of the West Indies (UWI).

3.2 CIMH was recommending that Member States act to ensure that their candidates are well prepared before arriving at CIMH and UWI. It was expected that this would allow the Services to receive a return on their investment in their human capital. To address the problem, CIMH proposed to the Meeting that, notwithstanding the actions of the Member States as recommended, it would conduct a Mathematics test prior to the start of the courses. This would show if counselling or tutoring may be required.

3.3 CIMH further proposed to change the pass mark for the core and supporting courses to 50% and the pass mark for the competency courses to 60%. Re-sitting would only be allowed if the student received a grade in the range of 45-49% in the exam and, regardless of the passing mark achieved in the re-sit, the student would only receive a PASS for the course. If the student received a grade of less than 45% in the first exam, it was deemed to be a FAIL.

3.4 The Meeting also noted that if a student passed the course with low passing grades, CIMH requires that the internship or on-the-job part of the course be extended and after the extended period of training, a portfolio of the student's work be submitted to CIMH for certification.

3.5 The Meeting noted that the *Aeronautical Continuing Professional Development Course* (AeroCPD) would be offered in 2016. However, the modules would be shorter and more targeted. The Operational Aeronautical Forecasting Course (OAF) would be offered in 2017. It was expected that this course would be open to Meteorologists only and the course size would be restricted to five (5) students only. Candidates who earn an 'Incomplete' should have an extended internship or on-the-job training and a portfolio of their work must be submitted before being certified.

3.6 To assist Meteorological Services, the WMO Commission for Aeronautical Meteorology (CAeM) *Expert Team on Education, Training and Competency* (ET/ETC) was pleased to provide a flow chart on the BIP-M compliance process. The flow chart would be available at <http://www.caem.wmo.int/moodle/course/view.php?id=7>.

3.7 The Meeting was informed that the *Virtual Laboratory for Training and Education in Satellite Meteorology* (VLab), established by WMO and the *Coordination Group for Meteorological Satellites* (CGMS), would be conducting an Event Week during the period 16-20 November 2015 of the theme "*Preparing for the Next Generation of Satellites.*" It would comprise a selection of online sessions with international presenters. Information on the eleven (11) online sessions of the Event was available at <http://www.wmo-sat.info/vlab/next-generation-of-satellites/>.

3.8 The Principal indicated there were intentions to migrate the Management course at the CIMH to be an online course. The UK Met Office had offered to the CIMH, its own Management course for review and use, if it was related to the Management course offered by CIMH.

3.9 The Meeting was informed that due to the field work in the Hydrology courses, despite due care and attention, accidents may happen and it was imperative that the students be adequately insured. There was a demand for CIMH online Hydrology courses worldwide. The Higher Technician Hydrology course would be offered in summer 2016. Meteorological Services were advised to let CIMH know early if they required the course.

## **OPERATIONAL MATTERS**

(Agenda Item 4)

4.1 The Meeting was made aware of a number of matters which were particularly related to the operations and the services delivered by Meteorological Services in the Caribbean.

### **(a) WMO Annual Global Monitoring**

4.2 The Meeting noted that some National Meteorological Services (NMS) of CMO Member States that have stations in the WMO **Regional Basic Synoptic Network (RBSN)** did not participate in WMO's 2015 Annual Global Monitoring (AGM) exercise, which monitors the data disseminated over the Global Telecommunication Service (GTS). There are ten (10) CMO Member States with RBSN stations; namely, Antigua and Barbuda, Barbados, Belize, the Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Saint Lucia and Trinidad and Tobago. A perusal of the 2015 monitoring folder on WMO's ftp server at [ftp://ftp.wmo.int/GTS\\_monitoring/AGM/To\\_WMO/201510/](ftp://ftp.wmo.int/GTS_monitoring/AGM/To_WMO/201510/) on 11 November, where digital results were posted, indicated that only Dominica, Jamaica and Trinidad and Tobago had posted results at that time.

4.3 The Meeting was also presented with the results of the 2014 AGM from WMO's data archive. The results which were presented for the monitoring of SYNOP, TEMP and CLIMAT code forms reflected, for the most part, the reports from the GTS *Regional Telecommunication Hubs (RTH)* and *Main Telecommunication Network (MTN)* Centres. The results showed that for the SYNOP code from the fourteen offices reporting from the Member States, ten (10) were within the 90-100% range, which was an improvement from the previous year's results, while the rest were in the 45-90% range.

4.4 The upper-air station in Kingston Jamaica was deemed to be silent. No CLIMAT reports from the Cayman Islands and Guyana were received during the AGM period in 2014 and they were deemed to be silent.

### **(b) Satellite Matters**

4.5 The Meeting was informed about Geostationary Operational Environmental Satellite - R Series (GOES-R), the next generation of geosynchronous environmental satellites, which would provide atmospheric and surface measurements of the Earth's Western Hemisphere for weather forecasting, severe storm tracking, space weather monitoring and meteorological research.

4.6 The GOES-R series would mark a technological advance in geostationary observations. Compared to the current GOES system, the advanced instruments and data processing would provide:

- Three times more spectral information
- Four times greater spatial resolution
- Five times faster coverage
- Real-time mapping of total lightning activity
- Increased thunderstorm and tornado warning lead time
- Improved hurricane track and intensity forecasts
- Improved monitoring of solar x-ray flux
- Improved monitoring of solar flares and coronal mass ejections
- Improved geomagnetic storm forecasting.

4.7 GOES-R, the first in the series, was due to be launched in October 2016, about six months later than originally planned. This meant that the aging GOES-13 would remain in service as GOES East a bit longer. Data from the GOES-R satellite would be available via GOES Rebroadcast (GRB). Testing and calibration of the satellite would take approximately one year before the satellite was activated. During the testing and calibration phase, the satellite would be located at 89.5°W longitude. However, whether GOES-R would become GOES East (75°W) or GOES West (137°W) was still to be decided. The latter is a shift from current GOES West position at 135°W in order to eliminate conflicts with other satellite systems.

4.8 The Meeting was provided with three pathways to get satellite imagery post the launch of GOES – R, which were:

1. Via the Internet;
2. Imagery via GEONETCast-Americas;
3. Direct readout from the GRB.

The cost of the GRB and GEONETCast-Americas systems were discussed and the Meeting was informed that Meteorological Services could use cost recovery from providing services to the aviation community to fund the cost of a satellite receiving system. Services which may decide to access imagery via the Internet would have to take the latency of the imagery into consideration.

### (c) The Observing System Capability Analysis and Review (OSCAR) Tool

4.9 The Meeting was informed that, as a major contribution to the *WMO Integrated Global Observing System* (WIGOS), a data inventory and tool on user requirements and observing system capabilities was created and maintained by the Meteorological Service of Switzerland (MeteoSwiss) for WMO. This tool was referred to as the *Observing Systems Capabilities Analysis and Review* tool – (OSCAR). The primary aim of OSCAR was to determine the extent to which the global observing systems relevant to WIGOS, comprised of the surface- and space-based observing systems, meet user requirements for observations.

4.10 OSCAR was designed to address two fundamental requirements which allow for the maintenance and accessibility of information on (i) technology-free user requirements for observation of geophysical variables for all application areas; and, (ii) observing systems capabilities for global observing systems relevant to WIGOS (both surface-based and space-based).

4.11 There were two fundamental requirements of OSCAR/Surface:

1. To provide for the entry, storage, maintenance and retrieval of all historical, current and future metadata associated with *WMO Publication No. 9, Volume A, Observing Stations* and *WMO Catalogue of Radiosondes*.
2. To contribute to the process of carrying out the Rolling Review of Requirements for the surface-based systems relevant to WIGOS, this shall include both land-based and ocean-based observing systems capabilities.

4.12 The Meeting was informed that OSCAR/Surface would be operational by the end of 2015. It was intended that the transition from *WMO Publication No. 9, Volume A, Observing Stations* to OSCAR/Surface would be completed by 2017 and it would be the source of all capabilities and mandatory metadata by 2018. It was intended that after the transition was completed, *WMO Publication No. 9, Volume A, Observing Stations*, would officially cease to exist and related procedures used to maintain station information would be discontinued.

**(d) WIS Registration and the Provision of Metadata**

4.13 The Meeting was reminded that the Permanent Representatives of WMO Member States received correspondence dated 10 February 2012 on the subject "*Making the WMO Information System Operational*" which requested, inter alia, that the Permanent Representatives take action on the following matters:

1. Nomination of Principal Global Information System Centre (GISC);
2. Identification of a WIS Focal Point;
3. Registration with a GISC for management of WIS discovery metadata.

The Permanent Representatives were required to provide a written response to WMO with respect to the actions taken to the matters itemized above.

4.14 The RA IV Task Team on Regional WIS/WIGOS Implementation used the nominations provided by the Permanent Representatives to invite Meteorological Services to nominate a participant to attend a workshop of the creation of WIS Metadata and the updating of metadata records held at GISC Washington. The workshop, which was limited in participants due to funding, was held at the Caribbean Institute for Meteorology and Hydrology from 11-13 August 2015.

4.15 The Meeting was informed that participants of the workshop were introduced to the GISC Washington portal, which enabled the user to perform discovery, access and recovery of meteorological information through the metadata which was stored at the GISC. The portal was located at: <http://giscportal.washington.weather.gov/openwis-user-portal/srv/en/main.home>. The metadata records that were used were generated from the country records available in *WMO NO. 9, Volume C1 - Weather Reporting*; but these records were incomplete since crucial information pertaining to ownership of the information and how it could be access, was not available in the publication.

4.16 Furthermore, investigation of the metadata generated indicated other errors. A list of all WMO headers used by WMO Members in RA IV, as maintained by RTH Washington, was generated and circulated for Members to review and revise where necessary. To assist GISC Washington in removing the errors which may be contained in the WMO headers associated with a country, all National Meteorological Services in RA IV were provided with a form to register with the Telecommunications Operations Center of RTH Washington. Once registered, National Meteorological Services would be able to review and revise, where necessary, the WMO headers associated with their country directly on the RTH's database.

4.17 The Meeting was informed that, unless the correct metadata resided on a GISC, there would be no data discovery, access and retrieval. WIS had been designed for users to first access a GISC to ascertain data availability, data frequency, ownership and limit on its use, before data was retrieved and used. Meteorological Services were urged to ensure that the metadata associated with the products which they create was accurate and up-to-date.

4.18 The Director of the Antigua and Barbuda Meteorological Service noted the high cost of the direct readout satellite receiving systems and suggested that the smaller Services in the Caribbean may have to purchase the less expensive systems, in the first instance, in order that satellite imagery would be available. Further, the Director enquired as to whether the WIS metadata will be available in OSCAR. The Meeting was informed that the metadata needed for WIS was different to the metadata needed for WIGOS. Some of the WIS metadata was available in *WMO No. 9 Volume C1 –Weather Reporting* and it consisted of the WMO header, the Service which owned the data, how to access the data, limitations on the use of the data, etc. However, the WIGOS metadata was associated with WMO No. 9 Volume A- Observing Stations and it consisted of information such as the latitude and longitude of the station, the height above mean sea level, hours of operations, etc.

## **OUTCOME/HIGHLIGHTS OF THE SEVENTEENTH WMO CONGRESS**

(Agenda Item 5)

5.1 The Meeting was made aware of a number of matters that were discussed at the Seventeenth WMO Congress, held in Geneva, Switzerland from 25 May to 12 June 2015. Four of the nine CMO Member countries that are also Members of the WMO were represented for all or part of the Congress. These are Barbados, the British Caribbean Territories, Jamaica and Trinidad and Tobago.

### **A Election of Officers**

5.2 The President and Vice Presidents were returned to office unopposed. However, there were four candidates for the post of Secretary-General since the incumbent, Mr Michel Jarraud, had completed the maximum three (3) terms. **Prof. Petteri Taalas** of Finland was appointed Secretary-General after four (4) rounds of voting. The officers who had been elected to serve the Organization for the period 2016-2019 were:

- |   |   |                       |
|---|---|-----------------------|
| 1. Prof. Petteri Taalas (Finland)       | - | Sectary-General       |
| 2. Mr David Grimes (Canada)             | - | President             |
| 3. Dr Antonio Divino Moura (Brazil)     | - | First Vice President  |
| 4. Prof. Mieczyslaw S. Ostojki (Poland) | - | Second Vice President |
| 5. Mr Abdalah Mokssit (Morocco)         | - | Third Vice President. |



## B. Key Priorities 2016-2019

5.3 The WMO Strategic Plan, which sets the direction and priorities to guide the activities of Members and all WMO constituent bodies, to enable all Members to improve their core information, products and services, maintain necessary infrastructures, and to directly benefit from advancements in science and technology, was agreed to by Congress. The Plan emphasized the **key priorities** to advance the realization of the eight expected results, which outline the benefits and improvements to the capacity of all Members. The key priorities are:

1. Improve the accuracy and effectiveness of impact-based forecasts and multi-hazard early warnings of high impact meteorological, hydrological and related environmental hazards from the tropics to the poles;
2. Implement climate services under the Global Framework for Climate Services (GFCS);
3. Strengthen the global observing systems through the implementation of the WMO Integrated Global Observing System (WIGOS);
4. Improve the ability of NMHSs to provide sustainable, high quality services in support to safety, efficiency and regularity of the air traffic management worldwide;
5. Improve operational meteorological and hydrological monitoring, prediction and services in polar, high mountain regions;
6. Enhance the capacity of National Meteorological and Hydrological Services (NMHSs) to deliver on their mission; and
7. Improve efficiency and effectiveness of WMO through adopting continuous improvement measures and recommendations based on a strategic review of WMO structures, operating arrangements and budgeting practices.

## C. Improving Service Quality and Service Delivery

5.4 It was recalled that the **WMO Strategic Plan** for the period 2016-2019 had recognized “Improved service quality and service delivery” as an Expected Result for the Organization. This Expected Result was aimed at improving the operational, end-to-end framework for NMHSs to translate leading-edge science into information that is actionable and easy to interpret by different sectors of society. The Plan highlighted the fact that it was through effective and timely delivery of services, that users derive a high level of return on NMHSs’ investment in basic infrastructure and that nations derive a high level of return on their investments in NMHSs.

5.5 Congress recognized *Service Delivery* as the core business of NMHSs, that is, providing essential meteorological, hydrological and related environmental services and information to communities, for the purpose of saving lives and livelihoods, and for improving the quality of life, as well as enhancing national economies. Members were strongly encouraged to implement the Strategy, using the Implementation Plan, with a view to improving the quality and delivery of the services they provide to the public.

## **Aeronautical Meteorology**

5.6 Congress recognized that the application of meteorology to aviation would become ever more important in the next 10 to 15 years, during which time substantial changes would happen in all areas of air navigation services, in response to the significant growth of air traffic, rigorous requirements for reducing environmental impacts of aviation, and the need to increase efficiency of air traffic operations whilst maintaining the highest standards of flight safety.

### **Progress in the implementation of QMS**

5.7 It was recalled that, as of 15 November 2012, the Quality Management System (QMS) requirement became a standard practice, supplemented by a set of recommendations on the conformity of the QMS with the International Organization for Standardization (ISO) 9000 series of quality assurance standards. The implementation of QMS for aeronautical meteorological services was a good showcase of a well-guided and closely monitored implementation of the WMO technical regulations, supported by appropriate capacity development actions.

5.8 It recognized that the QMS brought tangible benefits to the NMHSs through optimized processes and procedures, accountability and continuous improvement culture and it was further noted that the ISO 9000 certification required a continuous resource-consuming maintenance effort, through regular checks and re-certification audits. In this regard, Congress emphasized the link between the sustainability of the QMS and the cost recovery, in particular, for the developing and least developed countries.

5.9 It was noted there were still a number of WMO Members that had been unable to reach the required level of compliance with the QMS requirements. Such a situation was classified as a serious deficiency against the ICAO requirements. Congress reaffirmed its strong encouragement to all Members to complete and sustain the QMS for the provision of meteorological service to aviation and requested the Secretary-General, supported by the Commission for Aeronautical Meteorology (CAeM), to continue to provide assistance to the Members in need.

### **Implementation of competency standards**

5.10 It was recalled that the required competency of aeronautical meteorological personnel (AMP), comprising aeronautical meteorological forecasters (AMF) and aeronautical meteorological observers (AMO), became standard practices as of 1 December 2013. Consequently, all Member States were expected to undertake the necessary measures to ensure compliance with those standards and inform the WMO Secretariat thereof. All Members which had not completed their competency assessment programmes for the AMP, were urged to do so as soon as possible and to report to the Secretariat on the achieved level of compliance. Such programmes should be an integral part of a continuous career development process to ensure that operational aeronautical meteorological personnel remain fully competent and able to demonstrate compliance with user demands for quality and performance of the service.

5.11 The **Manager of the Grenada Meteorological Service** enquired whether they should have communicated with the CMO, the state of their compliance with regards to the implementation of competency standards, since Grenada was not a Member of WMO. The Chairman indicated that Grenada and all other non-WMO Member States should write to CMO on their compliance and this would be communicated to WMO.

Qualification standards

5.12 Congress recalled that the qualification requirements for AMF would become a standard practice on 1 December 2016. Consequently, Member States would be required to ensure that the level of qualification of the operational AMF personnel followed the WMO qualification standard, i.e., to be compliant with the relevant sections of the Basic Instruction Package for Meteorologist (BIP-M), and to inform the WMO Secretariat thereof.

5.13 Members should initiate preparation for compliance with the qualification requirements in due time in order to avoid a big lag between the applicability date and actual implementation. Such preparation would require an assessment of the qualification records of existing operational AMF, job descriptions, and consultation with relevant educational institutions to ensure the conformity of their curricula and training programmes with the WMO BIP-M. In instances of identified gaps in the qualification of existing AMF personnel, Members should arrange for appropriate training, where necessary in consultation with the relevant training institutions.

MET deficiencies, and cost recovery issues

5.14 It was noted that a new approach to overcome the limited capabilities of some Members to provide effective SIGMET service was discussed by the *Conjoint ICAO/WMO MET Divisional Meeting* (Montreal 2014) and a proposal for a regionalization of the SIGMET provision was to be further developed.

5.15 Congress noted that lack of adequate cost-recovery for the provision of meteorological service to aviation continued to be an issue for many Member States. Congress appreciated that several projects, funded by the WMO Voluntary Contribution Programme (VCP), had been carried in an attempt to promote the best practices in cost recovery and to establish the needed national agreement between the stakeholders, following the relevant ICAO and WMO guidance. It was expected that more requests for such projects would be coming from Members in the near future. Development of an appropriate cost recovery mechanism for those Members with low traffic volumes, with due consideration of the specifics of the flight operations, should also be considered.

**Public Weather Services**

5.16 The WMO Congress emphasized that the core business of NMHSs was to serve the public good by providing essential and reliable weather, climate and related environmental information to the community at large. It was primarily through the timely and effective delivery of Public Weather Service (PWS) that governments recognized the value of NMHSs and realized a high level of return on their investments in NMHSs.

Challenges and Opportunities for PWS delivery

5.17 It was acknowledged that advances in technology and communications had revolutionized the way environmental information was being collected, integrated, disseminated and shared. These advances had pushed the expectations of users to such levels that they expected the information to be delivered to them when they want it, where they want it, and in their preferred formats, customized to their needs. The proliferation of weather information from various sources on the internet, media and social networks also posed significant challenges to the NMHSs in delivering consistent authoritative forecast and warning messages to the public, especially during extreme weather situations. To respond to these expectations, a number of NMHSs had already moved to multi-channel delivery methods, using interactive push technologies and customized services and it was expected that more would follow.

5.18 The **Director-General** of the **Cayman Islands National Weather Service** (CINWS) informed the Meeting about the software application (app), which was created as part of the Cayman Islands Weather Radar Project Visibility Plan to provide information, including radar imagery, to the people of the Cayman Islands. It was noted that in general, the Cayman Islands public gave mixed reviews of the app and it was, at the time, being updated for reflect the needs of the users. The **Chairman** noted that even in larger countries, such apps have to be continuously updated for them to meet the user needs.

5.19 The **Director** of the **Jamaica Meteorological Service** noted the increasing set of new international standards which National Meteorological Services needed to implement. The Director stated that at the national level, the standards were not always understood or implemented in a cohesive fashion. Therefore, it was suggested that a technical team be formed to assist all of the Meteorological and Hydrological Services of CMO Member States in order that they can be compliant with the required standards.

5.20 The **Director** of the **Antigua and Barbuda Meteorological Service** enquired as to whether WMO could assist Services by writing to their respective Governments to indicate the need for the necessary funding so that required standards may be achieved, since there appeared to be a disconnect between the Service meeting the required standards and the provision of the necessary funds at the national level. The **Chairman** indicated that a country's Permanent Representative with the WMO is the Secretary-General point of contact within a country on technical matters, so that it would be up to the Permanent Representative to take such issues to the relevant government levels.

5.21 The **Chief Meteorologist** of the **Belize Meteorological Service** suggested that the CMO should provide more assistance to National Meteorological Services in order that they become compliant with QMS requirements. It was suggested that the CMO should better coordinate to have the Services which are further ahead in QMS implementation assist those which were behind. In this regard, the Director of the Jamaica Meteorological Service offered to assist other Services in the implementation of QMS.

**THE IMPACTS OF WEATHER DURING 2015**  
(Agenda Item 6)

6.1 The Directors of Meteorological Services provided the impacts of weather on their countries during 2015.

6.2 All of the Heads on Meteorological Services noted that there was below normal rainfall for most of the year which led to widespread **drought** conditions. Jamaica indicated that it had been impacted by a drought starting during 2014, which continued through 2015. The severe **drought** caused the Government of **St. Kitts and Nevis** to cease the sale of water to the cruise ships that visited the islands.

6.3 **Grenada** indicated that January 2015 was very wet. Thereafter, the country dried out and a **meteorological drought** ensued, near normal rainfall returned in October and thus far in November the rainfall has exceeded the average. There was one death which was attributed to the excessive rainfall. This rainfall weakened a wall, which fell on a car causing the fatality.

6.4 **Guyana** reported **flooding** on at least four occasions during 2015, starting on 19 February in Georgetown and environs. On 31 May, there was significant rainfall which led to flooding and on 18 June there was another flood event. On 15-16 July, there was significant rainfall starting near 2100UTC that continued overnight and also led to flooding. The timing and severity of the rainfall caused the cancellation of the T20 cricket match between the Guyana Amazon Warriors and the Jamaican Tallawahs.

6.5 **Tropical Storm Erika** affected **Dominica** on the morning of 27 August 2015. There were no tropical storm winds associated with the passage of Erika, but there was very heavy rainfall for about 5 hours. This produced 10 to 12 inches (250 to 305 millimetres) of rainfall, which led to massive **flooding, landslides** and approximately **30 deaths**. Erika also produced **lightning** which struck and destroyed an anemometer in **Montserrat**.

6.6 **Saint Lucia** experienced excessive rainfall on 21 September 2015, in which the Meteorological Office at the Hewanorra International Airport recorded 97.8mm of rainfall that led to localized flooding. There was a 3½ hour rainfall event on 7 November that affected the entire island, but more intensely over the northern and western parts. This caused major **flooding** and **landslides** in many parts of the island with one fatality.

6.7 **Belize** experienced excessive rainfall from 14 to 20 October, during which in excess of 700mm of rainfall fell in northern parts of the country over a five-day period. This led to widespread **flooding** in Belize City and other municipalities.

6.8 In **St. Vincent and the Grenadines**, there was above normal rainfall for the first four months of the year, as measured at the E. T. Joshua Airport. Thereafter, the rainfall was below normal. The passage of Tropical Storm Erika well to the north caused some gusty winds and rainfall with one house losing its roof.

## **PRESENTATION**

### **Enabling National Meteorological Services to issue CAP (Common Alerting Protocol) alerts via The Weather Company's Local Alert Platform**

(Agenda Item 7)

7.1 **Mr Jason Geer**, Director of Product Management in *The Weather Company*, gave a presentation entitled "*Enabling National Meteorological Services to issue CAP (Common Alerting Protocol) alerts via The Weather Company's Local Alert Platform.*" The WMO and the Hong Kong Observatory had partnered to create a website which contained the Alerting Authority, listed by WMO Member or Organization, that issue CAP alerts.

7.2 The Common Alerting Protocol (CAP) is an international standard format for emergency alerting and public warning. It was designed for "all-hazards", related to weather events, earthquakes, tsunamis, volcanoes, public health, power outages, and many other emergencies. CAP was also designed for "all-media", including communications media ranging from sirens to cell phones, faxes, radio, television, and various digital communication networks based on the Internet.

7.3 To implement CAP, a Meteorological Service would require an Internet server and telecommunication equipment for the dissemination of the alerts to users. The Weather Company had partnered with WMO to use the alerts provided by the Alerting Authorities' websites which were then compiled in The Weather Company's cloud storage. From the cloud storage, the alerts would be sent to an alert hub which was being created by the United States National Weather Service on behalf of WMO and to which users could subscribe to receive alerts.

7.4 The service provided by The Weather Company not only uses the alerts from an Alerting Authority's website, but can also take alerts from the SmartAlert system developed by the Finnish Meteorological Institute (FMI) and it could be configured to receive alerts of national propriety types.

7.5 The Meeting was also informed that the service provided by The Weather Company was free of charge, and those CMO Members which were not Members of WMO could still have access to the service.

## **OTHER MATTERS**

(Agenda Item 8)

8.1 **Mr Keithley Meade**, Director of the Antigua and Barbuda Meteorological Service, provided an overview of the SmartAlert system that had been recently installed in Antigua and Jamaica. The system displayed four different colour-coded levels of alerts on a Google Earth map. Mr Meade demonstrated the map with colour-coded alerts over Antigua and Barbuda indicating the zooming features and the alert in text format.

8.2 It was stated that the SmartAlert system would be used to provide alerts to the Leeward Islands and the British Virgin Islands.

*Kick 'em Jenny Heightened Alert*

8.3 **Mr Hubert Whyte**, Manager of the Grenada Meteorological Service, stated that on 25 July 2015, officials at the Maurice Bishop International Airport (MBIA) received reports of telecommunication outages at several key Air Traffic Management Agencies, including Internet access. The previous day, the MBIA was informed that *Kick 'em Jenny*, a submarine volcano located 8 km north of Grenada, had heightened activity which resulted in the collapse of its dome, which then reduced the threat of a tsunami, although the public was worried about that possibility.

8.4 Mr Whyte indicated that it was possible that the dome collapse and/or other the volcanic activity could have damaged the undersea cable which was used by one of the two telecommunication companies in Grenada for regional and international telecommunications. Therefore, there was the possibility that during an undersea volcanic event in the future, such telecommunications could be lost as both companies were due to be merged.

*Observation Registers*

8.5 **Mr Glendell De Souza**, Science and Technology Officer of the Caribbean Meteorological Organization, reminded the Meeting that in 2014 the meteorological code form SYNOP had been discontinued and that the METAR, SPECI, TAF and SIGMET code forms were due to be discontinued. Therefore, the Meteorological Services needed to prepare for new observational registers. He stated that during 2014, both Jamaica and Cayman Islands enquired about the format of the new registers and Jamaica specifically asked if electronic registers were allowed. Various meteorological publications were searched and there are no rules against the use of electronic registers.

8.6 The **Director** of Airports in **St. Vincent and the Grenadines** indicated that according to that country's laws, the observation records must be written. The Principal of the CIMH indicated that there were both paper and electronic registers available and both provided the ability for a signature and date to provide legal status. He indicated that, at the time, CIMH provided an app for the recoding of observed meteorological elements and it automatically quality-controlled the observed element, thereby eliminating errors due to transcribing. This matter would be reviewed during the next year.

8.7 After all other matters were discussed, the Meeting ended about 6:00PM.

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# CARIBBEAN METEOROLOGICAL ORGANIZATION

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## ANNUAL MEETING OF DIRECTORS OF METEOROLOGICAL SERVICES

Belize City, BELIZE, 11 NOVEMBER 2015

### AGENDA

1. INTRODUCTION AND ADOPTION OF AGENDA
  2. STATUS OF ACTIONS FROM THE PREVIOUS MEETING
  3. TRAINING
  4. OPERATIONAL MATTERS
    - (a) WMO Annual Global Monitoring
    - (b) Satellite Matters
    - (c) The Observing System Capability Analysis and Review (OSCAR) Tool
    - (d) WIS Registration and the Provision of Metadata
  5. OUTCOME/HIGHLIGHTS OF THE SEVENTEENTH WMO CONGRESS
  6. THE IMPACTS OF WEATHER DURING 2015
  7. PRESENTATION

Enabling National Meteorological Services to issue CAP (Common Alerting Protocol) alerts via The Weather Company's Local Alert Platform
  8. OTHER MATTERS

SmartMet Alert

Kick 'em Jenny Heightened Activity

Observation Registers for use Post 2016
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**ANNUAL MEETING OF THE DIRECTORS OF METEOROLOGICAL SERVICES**

**BELIZE CITY, BELIZE**

**11<sup>TH</sup> NOVEMBER 2015**

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