



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

REPORT OF THE ANNUAL MEETING OF DIRECTORS OF METEOROLOGICAL SERVICES

VIRTUAL MEETING

18 NOVEMBER 2020

INTRODUCTION

1.1 The Meeting of Directors of Meteorological Services occurred virtually on November 18th 2020 under the Chairmanship of Dr Arlene Laing, 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 as **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 DMS2019 (Anguilla) was prepared by the CMO Headquarters. The Science and Technology Officer gave the status of actions taken to implement the decisions to the Meeting.

TRAINING

(Agenda Item 3)

3.1 Ms Kathy-Ann Caesar, Chief Meteorologist, Caribbean Institute for Meteorology and Hydrology (CIMH) gave a presentation on the Meteorological Training offered at the Institute. The presentation provided information on the new course structure to fulfil the matriculation requirements for a Bachelor of Science major in Meteorology at the Cave Hill Campus of the University of the West Indies, the COVID-19 experience at CIMH, and the development of a new Senior-level Meteorological Technicians (SLMT) Course, which had to satisfy the needs of the training needs of the Meteorological Service of Member States, the requirements of the World Meteorological Organization (WMO) Basic Instruction Package – Meteorological Technician (BIP-MT), the staff health requirements.

3.2 In the development of the new SLMT course, the Meeting was reminded that there was a need to:

- Maintain the training standards, which included:
 - Preservation of the curriculum as recommended by WMO Guidelines No. 1083;
 - The SLMT candidates must meet the [WMO Competency Standards for Aeronautical forecasters](#);
 - 'quality of education'- CIMH has had a long history of exceeding WMO recommended standards for training.
- Build around teaching schedule of the Cave Hill Campus of University of the West Indies,
 - The UWI schedule is a firm commitment of the CIMH ;it is not flexible;

- There is only a limited number of academic staff for the teaching of meteorology.
- Timing and seasonality of the course:
 - The 18 months SLMT is only 15 months of teaching, there is approximately 3 months break between the semesters;
 - The basic forecasting exercises are best conducted in July (i.e. the rainy season) in order practice and maintain competency.

Matriculation Requirements for a Bachelor of Science Major in Meteorology

3.2 The Basic Instruction Package – Meteorologist (BIP-M) in terms of learnings requires that the following subject matter be taught:

- **Physical Meteorology**
including air quality and observing technology.
- **Dynamic Meteorology**
including Numerical Weather Prediction (NWP).
- **Synoptic Meteorology**
including mesoscale meteorology and weather prediction.
- **Climatology**
including both the traditional statistical description and the modern dynamical study and interpretation of the climate, as well as climate prediction; **and**
- **Tropical Meteorology:** for Meteorologist who work in the tropics

COVID-19 experience at CIMH

3.3 In March, everything including teaching was dominated by effects of the COVID-19 pandemic. As Barbados shutdown and the Institute closed face-to-face training, the CIMH lecturers at every level quickly transitioned to online training while dealing with personal adjustments brought on by the pandemic. All lectures had to be converted to PowerPoint presentations. There was also the need to engage with the **myCIMH Moodle** platform, converting a home space to a teaching space, all while dealing with family issues. Years of conducting classes online made the process easier.

3.4 Like training institutions worldwide, COVID-19 has invariably changed the methods of teaching and virtual training will be part of the methodology of teaching at CIMH. It must be noted that the CIMH curriculum was heavily practical and it was challenging in a virtual format. It forced the lecturers to be innovative and utilize technology to convey the knowledge. However, it was clear that to ensure the required competencies, practical classes and class assessments needed to be conducted in face-to-face fora.

3.5 One particularly important result of the COVID-19 experience was lecturer fatigue. Lecturers had to rework their teaching methodology. Once classes started there were issues with bandwidth, the inability to navigate various online platforms, problems uploading and downloading files and even typing. This was compounded by computer fatigue. Students and lecturers complained of headaches, shoulder and neck pains and eye strains. There were instances where students were purposely distracted during the classes, some either chatting on their phones or in some cases watching movies during lectures. Cheating and plagiarism were major issues. A few students were cited for assessments irregularities during the UWI final assessments and brought up for further investigations. Noted also, during the shutdown in Barbados, lecturers were juggling family and shopping schedules. There were instances where ELMT classes had to be scheduled in the early evening to accommodate both students and staff.

The New SLMT Proposal - Blended Course over an 18-month period.

3.6 The experiences of 2020 COVID-19 pandemic and the transition to virtual training provided a good foundation to propose modifications to the SLMT course scheduled to start in 2022. The new SLMT Proposal for the new SLMT course would be a blended course over an 18-month period. The new course will still cover a period of 18 months and will be essentially in three parts.

- **Pre-assessment** – September to December 2021: - This would be a COMET Bridging Course in Mathematics and Physics. It would be self-paced and the participants **must pass the Pre-assessment exam.**
- **Virtual Section** – January to July 2022: - This would be synchronous virtual classes; the participants **must have a passing grade** to move forward.
- **Face to Face Section** – September 2022 to July 2023: - Participants on site at CIMH; including Forecast Office Simulation.

3.7 The course structure would be:

- Pre-assessment
 - Mathematic syllabus – Basic CSEC Mathematics
 - Physics Syllabus – Basic Physics – CSEC Physics
- Virtual Section:
 - Session 1 – January to March**
 - Subject: Mathematics - Pre calculus to Calculus 1, Physics, Introduction to Meteorology and Analysis, Oceanography and GIS.
 - Session 2 – April to July**
 - Subjects – Mathematics - Calculus 1 to Calculus 2, Atmospheric Thermodynamics, Dynamic 1, Synoptic 1 and Satellite Meteorology.
- Face to Face Section
 - Session 3 – September to December**
 - Subjects – Mathematics - Calculus 2 to Differential Equations, Cloud Physics, Synoptic 2, Dynamics 2
 - Session 4 – January to March**
 - Subject – Tropical Meteorology, Radiation, Advanced Weather Analysis, Statistics, Climatology
 - Session 5 – April to July**
 - Subjects – Radar Meteorology, Hydro Meteorology, Aeronautical Meteorology, Forecast Office Simulation

3.8 The proposed new structure attempts to ensure more successful SLMT candidates by addressing gaps in background knowledge of Mathematics and Physics through the Pre-Assessment part of the SLMT course. Consequently, this would address the foundation subjects. Secondly, by maintaining the 15-month teaching period, there is no threat to reducing or rushing the standard curriculum. Finally, with the face to face component now reduced to 11 months, from September (even year) to July (odd year), the cost to National Meteorological Services should be significantly decreased.

3.9 The National Meteorological and Hydrological Services (NMSs) would have a large role to play in the preparation of their SLMT candidates. CIMH requested that the National Meteorological Service appoint a **Training Liaison Officer**. The duties of the Liaison Officer are:

- To ensure communication between CIMH and the SLMT candidates;
- To track the performance of the SLMT candidates;
- To provide in-country guidance in collaboration with CIMH, to the candidates where necessary; and
- To ensure the security of assessments.

3.10 To assure the security of course assessments, the Officer would require a secure room for assessments and the CIMH designated Final Assessment Week. The Meeting was informed that during the period of virtual training, the candidates are considered to be engaged in SLMT training and not available for operational duties

3.11 While there seemed to be general acceptance of the proposed structure, the **Assistant Director, Trinidad and Tobago Meteorological Service** insisted the proposed structure did not meet the needs of the Trinidad and Tobago Meteorological training requirements out to 2022. The Meeting was informed that the Trinidad and Tobago Meteorological Service succession plan post 2022 budgeted only for a twelve (12) month training course at the CIMH and on-the-job training at Piarco for a further six (6) months of the total eighteen (18) months for the training of its SLMT candidates. The **Principal, CIMH** reminded the Meeting that the proposed course was just the first iteration of the course and adjustments would be made to later iterations of the course based on the outcomes of the previous SLMTs. However, due to time constraints it was agreed that a committee will be convened to review and develop the SLMT course. The Committee would comprise of a person from CIMH, the CMO Headquarters Unit and Directors who so desire.

OPERATIONAL MATTERS

(Agenda Item 4)

A. WMO Annual Global Monitoring

4.1 The Meeting was reminded that some Meteorological Services of the Member States with stations in the Regional Basic Synoptic Network (RBSN) did not participate in the World Meteorological Organization (WMO) Annual Global Monitoring (AGM), which monitors the data disseminated over the Global Telecommunication Service (GTS). There are ten (10) Member States of the Caribbean Meteorological Organization whose National Meteorological Service (NMS) are RBSN stations. These are Antigua and Barbuda, Barbados, Belize, the Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Saint Lucia and Trinidad and Tobago.

4.2 The Meeting was also presented with the results of the 2019 AGM from WMO's data archive at ftp://ftp.wmo.int/GTS_monitoring/AGM/To_WMO/201910, which showed that Barbados, the Cayman Islands, Jamaica and Trinidad and Tobago had submitted results of their monitoring for the AGM in 2019. The results which were presented for the monitoring of SYNOP and TEMP reflected reports from the RTH and Main Telecommunication Network (MTN) centres. It was highlighted that for the SYNOP code from the thirteen (13) offices reporting from the Member States, four (4) were within the 90-100% range, and nine (9) were in the 45-90% range.

4.3 All of the upper-air stations were within the 90-100% range. WMO posted no results of the CLIMAT reports on its website. Hence, it could not be ascertained if reports were received from the stations which were reported as silent to the 2019 Meeting of the Directors of Meteorological Services. It was recommended that the Meteorological Services work with the Science and Technology Officer, CMO Headquarters to have the RSBN and RBCN issues resolved.

B. WIGOS Implementation

4.4 The Meeting was reminded that WMO Integrated Global Observing System (WIGOS) matters have been under discussion from 2015 to 2019 and WMO had mandated that all meteorological services should be WIGOS ready by the start of WMO Congress in 2019, which was the pre-operational phase of WIGOS Implementation.

4.5 WIGOS became operational from January 2020, and for meteorological services to operationalized WIGOS, the following prerequisites had to be implemented:

- (a) OSCAR/Surface: completed WIGOS metadata of all observing stations across all WIGOS components for which observations are exchanged internationally;
- (b) WIGOS metadata: compliance achieved;
- (c) WIGOS Station Identifiers: implemented;
- (d) WIGOS Data Quality Monitoring System (WDQMS): national process for acting on quality problem information received from the WDQMS in place;
- (e) Embracing all NMHS-operated observing systems and willing partners;
- (f) National WIGOS governance, coordination and implementation mechanisms established;
- (g) Nomination of national WIGOS focal points and OSCAR focal points completed.

4.6 The Meeting noted that most of meteorological services of CMO Members States had not implemented the prerequisites to operationalize WIGOS. Further, the Meeting was informed that the problem of silent stations was noted in the reports of the Annual Global Monitoring, by the Main Telecommunication Network could be as a result the type of dissemination associated with the meteorological observed elements in the metadata of the stations in OSCAR/Surface. The Science and Technology offered to Meteorological Services assistance in updating their metadata in OSCAR/Surface upon request. The initial data which is needed for updating their metadata records is provided in **Annex III**.

C. ICAO Meteorological Information Exchange Model (IWXXM)

4.7 The Meeting recalled that at its 2018 and 2019 meetings there was discussion on the ICAO Meteorological Information Exchange Model (IWXXM) as a data format for reporting aeronautical meteorological information in XML/GML. It further recalled that as at 5 November 2020 all aeronautical observations, forecasts, significant weather alerts, forecasts and volcanic ash advisories must be transmitted be transmitted in IWXXM format.

4.8 Further, the WMO headers in the form of **T₁T₂A₁A₂ii CCCC** for the aviation observations, forecasts and warnings in IWXXM format are different than the traditional headers. The new WMO headers for aviation information in XML format and WMO published the tables necessary for the creation of the new headers on its website at [https://www.wmo.int/pages/prog/www/ois/Operational Information/Publications/WMO 386/AHL symbols/TableDefinitions.html](https://www.wmo.int/pages/prog/www/ois/Operational%20Information/Publications/WMO%20386/AHLsymbols/TableDefinitions.html)

4.9 The Meeting was informed that there is a free translation tool for converting traditional alphanumeric code form of METAR, SPECI, TAF, etc. to IWXXM which was available at <https://github.com/wmo-im/iwxxm-translation>. The tool is expected to translate exactly, with the exceptions of whitespace and newlines differences. This repository has been provided by the WMO Task Team for Aviation XML (TT-AvXML) as a convenience for IWXXM developers, but the contents are not reviewed for correctness by TT-AvXML and has no official status in WMO or ICAO.

IMPACTS OF WEATHER DURING 2020

(Agenda Item 5)

5.1 During 2020, the socio-economic impact of weather and related issues created significant losses for some of CMO Members States. The Meteorological Services reported on droughts, floods with concomitant landslides, the threat of tropical cyclone impact on the Member States which were added to the COVID-19 pandemic which started to affect countries from early March.

5.2 The rainfall deficit which was experienced by Member States during 2019 continued into the dry season of 2020, from Guyana in the south, northward to Anguilla and the British Virgin Islands and westward to Jamaica, the Cayman Islands and Belize. In some Member States the deficit was so severe that a **drought** was declared. **Saint Lucia** issued a drought warning in April, **Jamaica** also reported on the drought affecting agriculture, farming and there was insufficient water for households. The drought conditions in Jamaica caused bush fire to ravage the island. In **Belize**, the meteorological service issued a drought warning and the dry conditions caused the Sapote Lagoon to completely dry up¹.

5.3 The countries were also impacted by **gale force winds** and **rough seas** as reported in **Grenada and its dependencies** and **St Vincent and the Grenadines**. Almost all Member States were affected by a dense **Saharan dust layer** in June. Both **Grenada** and **Saint Lucia** issued a **dense dust haze warning**. Although none of the Meteorological Services reported the issuance of warnings, the dust event affected all of the Eastern Caribbean Islands and westward to Jamaica and the Cayman Islands.

5.4 After the drier than normal dry season within the Caribbean and the early months of the wet season, once the rains came no Member State was spared floods and although all experienced flooding there were differences in the severity, duration and effects. **Barbados** felt the effects of its first **flood** in July from rainfall associated with the passage of Tropical Storm Isaias. Localized flooding occurred in September and November and in October the flooding was caused by the passage of a tropical wave.

¹ <https://amandala.com.bz/news/national-met-service-says-drought-likely-for-2020-rainy-season/#:~:text=BELIZE%20CITY%2C%20Mon.,across%20much%20of%20the%20country.%E2%80%9D>

5.5 **Tropical Storm Gonzalo** produced **flooding in Trinidad and Tobago, Grenada and its dependencies and St Vincent and the Grenadines** in late July. The Grenadine islands of Canouan and Union Island reported flooding and strong winds from the passage of Gonzalo. **Grenada** also experienced a **strong wind event** in June from the combination of the passage of a tropical wave and the inter-tropical convergence zone (ITCZ) which produced a **micro-burst**. A wind gust was measured at 59 kt (109 kph) from the event; the micro-burst damaged roofs and a car's windshield. On 18th August there was another **strong wind event** and the gust was measured at 52 kt (96 kmph), which downed tree and power lines. In early October, there were two significant flood events in Grenada and there was another during the period 31st October to 1st November 2020.

5.6 **St Vincent and the Grenadines** experienced **flooding and landslides** associated with the passage of a tropical wave on 1st October 2020. A station at Majorca (in the north of St Vincent) measured 119.3mm of rainfall. A trough, on 5th October 2020, produced an estimated 50-100mm of rainfall over northern St Vincent which mainly damaged retaining walls. **Rainfall and strong winds** were experienced from 29th October to 1st November 2020, the weather was associated with the passage of a tropical wave, which eventually became tropical storm Eta. Tropical storm Eta damaged one hundred and sixty (160) houses and destroyed a further twenty (20). The station in Majorca recorded 310.3mm of rainfall and at the Argyle airport, on the southern coast of St Vincent, a gust of 38 kt (70kmph) was measured. Unfortunately, a rainfall event caused by the interaction of a tropical wave and amid to upper-level trough from 14th-16th November 2020 caused fast flowing rivers whose currents swept **away a child and caused death**. Additionally, **one death** occurred in **Barbados** associated with this event; one man was swept away in the rapidly rising floodwaters on 14th October.

5.7 After the drought of the dry season in **Jamaica**, the communities of Clarendon and Manchester experienced a **hail storm** on 8th August² and on 8th September **two (2) persons** in the community of St Elizabeth were **killed by lightning**. In October, **Jamaica** experienced **significant rainfall** associated with the **passage of Hurricane Delta to the south** of Jamaica. The rainfall caused flooding resulting in landslides. There were two deaths associated with the landslides, significant crop losses and damage to homes, roads and other infrastructure. The Trinidad and Tobago Meteorological Service³ confirmed reports of **Trinidad** experiencing a **hail storm** on 8th September.

The **Cayman Islands** issued **tropical storm watches and warnings** on four occasions for the passage of **Tropical Storms Marco, Nana and Eta and Hurricane Zeta**. The center of Marco passed 353 km to the southwest of Grand Cayman on 21st August. Grand Cayman measured 25.2mm of rainfall and a maximum wind of 25 kt (46 kmph). The center of Nana passed 253 km to the south of Grand Cayman on 2nd September and 25.2mm of rainfall was measured on Grand Cayman. The center of **Zeta** passed the closest to the Cayman Islands at 187 km to the southwest of Grand Cayman 24th October. The Cayman Islands National Weather Service also issued marine and flood warnings associated with the passage of Zeta. The islands measured 42.8mm of rainfall and 5 to 7-foot seas. Zeta caused coastal inundation in George Town on Grand Cayman. Tropical Storm warnings were issued for **Tropical Storm Eta** on 6th November, which were discontinued on 7th November. Eta produced excessive rainfall over Grand Cayman with measurement of 250.7mm and measured wind speed of 32 kt (59 kmph). However, radar measurements suggest that the wind speeds were in the 50-55 kt (93-102 kmph) range around Grand Cayman.

² <https://www.facebook.com/gleanerjamaica/videos/hail-hits-manchester-communities/584941418841067/>

³ <https://newsday.co.tt/2020/09/09/hail-falls-in-central/>

OTHER MATTERS
(Agenda Item 6)

Responses to COVID-19 Pandemic

6.1 The corona virus started to affect Member States in March and initially there were varied responses by what was eventually named the COVID-19 pandemic. All of the Meteorological Services had responses which ensured a continuity of operations ensuring that staff members would be safe in the work environment.

6.2 Some of the responses to the continuity of operations were:

- A change of working hours;
- The establishment of safety protocols;
- The issue of personal protective equipment;
- The placement of signage on the protocols to ensure safety.

6.3 However the Services had to provide advice to policymakers on:

- Droughts/water deficits and the need for the populace to wash hands frequently per COVID-19 safety protocols;
 - Hot day forecast and air-condition use within building per COVID-19 safety protocols;
 - Extreme rainfall events and tropical storm warning requirements for sheltering against COVID-19 protocols of avoid crowding.
 - Prolonged rainfall events and the increased mosquito population given that several vector-borne diseases are endemic to the region such as dengue and yellow fever.
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AGENDA

1. INTRODUCTION AND ADOPTION OF AGENDA
 2. STATUS OF ACTIONS FROM THE PREVIOUS MEETING
 3. TRAINING
 4. OPERATIONAL MATTERS
 - (a) Annual Global Monitoring
 - (b) WIGOS Implementation
 - (c) ICAO Meteorological Information Exchange Model (IWXXM)
 5. The IMPACTS OF WEATHER DURING 2020
 6. OTHER MATTERS
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**ANNUAL MEETING OF DIRECTORS OF METEOROLOGICAL SERVICES
VIRTUAL MEETING**

18th NOVEMBER 2020

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WIGOS Station Metadata

Name:

Station alias:

Date established:

Date closed:

Declared reporting status:

Calculated reporting status:

Station type:

WIGOS Station Identifier(s):

WMO Region

Country / Territory:

Coordinates:

Time zone:

Supervising organization:

Station URL:

Other link (URL):

Site description:

Climate zone:

Predominant surface cover:

Surface roughness:

Topography or bathymetry:

Population in 10km / 50km (in thousands):

Station / platform event logbook:
