



CARIBBEAN METEOROLOGICAL ORGANIZATION

CARIBBEAN METEOROLOGICAL COUNCIL
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PROJECT UPDATES AND PROPOSALS

(Submitted by the Coordinating Director)

Background

1. Council will recall that the Caribbean Meteorological Organization Headquarters Unit (CMO HQ) has been advancing several initiatives aimed at strengthening Member States' capacity to deliver effective weather, water, climate, and early warning services, namely the:

- (i) **Climate Risk and Early Warning Systems (CREWS) Caribbean Project** Phase 2 (CREWS Caribbean 2.0);
- (ii) **Green Climate Fund (GCF) Simplified Approval Process (SAP) for CREWS** Scaling up Hydrometeorological and Multi-Hazard Early Warning Systems in Belize and Trinidad and Tobago Project;
- (iii) **Quality Management Systems** implementation;
- (iv) **The International Relations of Tropical Storms in the Caribbean**; and
- (v) Advancing Alternative Energy Education within the Ministry of Education CSEC and CAPE Science and Mathematics Syllabi at the *Sixty-Seventh Session of the Caribbean Meteorological Council* (CMC67, Tortola, Virgin Islands, November 2024).

2. Council is reminded that *CREWS Caribbean 2.0* focuses on achieving the UN-mandated 'Early Warnings for All' Initiative (EW4ALL), and extends to March 2027. An approved budget of US\$7 million was allocated to the Caribbean region to strengthen MHEWS Governance, improve disaster risk knowledge, strengthen National Meteorological and Hydrometeorological Service (NMHS) and National Disaster Risk Management Office (NDRMO) capacities, support warning dissemination and communication, and develop inclusive and gender-responsive approaches in the development of Early Warning Systems (EWS).

3. At its 67th Session, Council was informed that the CMO HQ entered into an Implementing Arrangement (IA) with the **World Meteorological Organization** (WMO) in November 2024 to support Member States and NMHSs through the:

- (i) Development or adjustment of Standard Operating Procedures (SOPs) between National Meteorological and Hydrometeorological Services (NMHSs) and National Disaster Risk Management Offices (NDRMOs);
- (ii) Development of National Strategic Plans and Frameworks for Weather, Water, and Climate Services;

- (iii) Regional and National Severe Weather Forecasting workshops;
- (iv) Familiarization missions for operational forecasters on a limited basis;
- (v) Development of capacities for lightning detection and awareness building;
- (vi) Capacity-development in the WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS) 2.0;
- (vii) Regional and National workshops to strengthen collaboration and mutual understanding among NMHSs, NDRMOs, and the Media; and
- (viii) National Common Alerting Protocol (CAP) Implementation Workshops.

4. Council is also reminded that the CMO HQ is working with the Caribbean Development Bank (CDB) to upgrade CMO Doppler Weather Radars in Belize and Trinidad and Tobago and strengthen regional MHEWS, with grant funding from the GCF Simplified Approval Process (SAP) and the new *Scaling Up Framework* of the GCF CREWS Initiative. This modality fast-tracks access to a maximum of USD 25 million for EWS and is only available to the CMO since the organization has completed previous CREWS projects.

5. At its 67th Session, Council was informed that this project intends to leverage **USD 24,930,167** in grant funding to deliver outputs and activities to the direct benefit of Belize and Trinidad and Tobago, and indirectly to the entire Caribbean region through the attainment of the following outcomes and co-benefits:

- (i) *Outcome 1:* Strengthened Multi-Hazard Early Warning Systems (MHEWS) governance on national levels
- (ii) *Outcome 2:* Improved disaster risk knowledge on regional, national and community levels
Co-benefit 1: Increased access to education
- (iii) *Outcome 3:* Strengthened National Meteorological and Hydrological Services (NMHS) provision, detection, observation, monitoring, analysing, forecasting and warning of hazards
- (iv) *Outcome 4:* Strengthened early warning communication, and preparedness and response capabilities in beneficiary countries
Co-benefit 2: Greater gender equality.

6. Council was made aware of the expected benefits to their NMHSs, particularly in the operationalization and institutionalization of Impact-based Forecasting (IBF) and Multi-Hazard Early Warning Systems (MHEWS), implementation of high-resolution Numerical Weather Prediction Models, upgrading of Doppler Weather Radar Systems, modernization of Information and Communication Technology (ICT) systems for forecasting, early warning, and alerting, implementation of Quality Management Systems, strengthening of communication systems, and development and building of NMHS staff capacity in MHEWS, observations, analysis, and forecasting.

7. At its 63rd Session (CMC63, Grand Cayman, November 2022), Council was reminded of the *International Civil Aviation Organization* (ICAO) requirement for all meteorological service providers to implement a Quality Management System (QMS), which also supports the pursuit of cost recovery for meteorological services to international air navigation. In response, the Council instructed the CMO Headquarters to initiate a structured programme of actions, beginning with baseline assessments of Member States' QMS status and progressing toward the development of a regional project to facilitate QMS certification. The Council was subsequently updated on the findings of the regional baseline assessment survey at CMC65, and on ongoing efforts to develop a project proposal and secure grant funding at CMC66.

8. Council was subsequently updated at CMC67 that the CMO HQ will pursue funding opportunities to support the execution of training for NMHS leadership, certification training for NMHS personnel to become QMS Lead Auditors, the assessment of existing QMS documentation and development of model versions, and hosting a regional workshop to adapt model documentation to national and operational contexts, as well as develop a regional QMS audit strategy and plan.

9. At CMC67, Council was informed of a research project entitled “*The International Relations of Tropical Storms in the Caribbean*” jointly undertaken by King’s College London (KCL) and The University of the West Indies (UWI), and funded by the UK Economic and Social Research Council. The Coordinating Director, Dr. Arlene Laing, serves on the project’s Advisory Board, alongside Professor Mark Berkhout (KCL), Professor Michael Taylor (UWI), and Professor Amanda Lynch (WMO Research Board Chair). The project is led by Dr. Michelsen, Associate Dean in the Faculty of Social Science and Public Policy at KCL, with Dr. Haughton, Head of the Department of Government at UWI, serving as Co-lead.

10. At the same session, Council noted that the CMO Headquarters received a request from the Faculty of Science and Technology (FST) at The University of the West Indies, St. Augustine Campus, to partner on an initiative aimed at advancing alternative energy education within the Ministry of Education’s CSEC and CAPE Science and Mathematics syllabi. The FST, which has also invited the Ministry of Education and the Trinidad and Tobago Meteorological Service to collaborate, was preparing a funding application to the Trinidad and Tobago Green Fund (National Environmental Fund) for the acquisition and installation of meteorological stations across the country. The initiative aims to embed alternative energy topics within the CAPE and CSEC Mathematics and Science curricula, fostering early awareness and capacity building in sustainable energy and environmental sciences.

11. At the 68th Session, CMO HQ provided Council with updates on progress made on CREWS Caribbean 2.0, the International Relations of Tropical Storms in the Caribbean, and informed Council of a CREWS Accelerated Support Window (ASW) proposal on satellite data and radar capacity development.

12. For CREWS Caribbean 2.0, several activities were initiated, namely the development of SOPs between NMHSs and NDRMOs and the adoption of a unified approach by the CMO HQ and Caribbean Disaster Emergency Management Agency (CDEMA), and the completion of a survey to assess the status of existing SOPs; the commencement of discussions with the WMO on the training of trainers in WMO Information Systems (WIS) 2.0 and WMO Integrated Global Observing System (WIGOS), resulting in the preparation of a draft concept note; and the planning and concept development for a regional workshop to strengthen collaboration among NMHSs, NDRMOs, and the Media.

13. Implementation continued for the development of National Strategic Plans and Frameworks for Weather, Water, and Climate Services, with the CMO HQ having developed and issued a call for Expressions of Interest to provide consultancy services; support for the first Severe Weather Forecasting Programme – Caribbean (SWFP-C) operational workshop held on 21-23 July 2025 organized by the Caribbean Institute for Meteorology and Hydrology (CIMH), the expansion of the SWFP Domain to all Caribbean islands, updating of the SWFP Operational Plan, testing of excessive heat alerts, development of the 2025-2026 training plan, and initial planning for Familiarization Missions for SWFP Focal Points; the successful 2025 Caribbean Lightning Safety Awareness Contest, with winners from Belize, Jamaica, the Bahamas, Dominica, and Trinidad and Tobago; and the planning and development of a draft concept for a regional workshop to strengthen collaboration among NMHSs, NDRMOs, and the Media.

14. At the same Session, Council was informed of the successful completion of National training workshops in Common Alerting Protocol (CAP) for Grenada, Dominica, and Saint Lucia, and the provision of financial support to Grenada and Saint Vincent and the Grenadines to participate in the 47th Session of the WMO RA IV Hurricane Committee (HC-47).

15. On the International Relations of Tropical Storms in the Caribbean, Council was informed that King's College London was represented at HC-47 by Dr. Carlos Zepeda as part of the British Caribbean Territories (BCT) delegation. Attendance at the meeting, enabled several interviews to be conducted with forecasters and other persons involved in the WMO Hurricane Committee. Subsequently, a workshop titled '*Weather Politics and Security in the Caribbean*' was held in Jamaica on 19-21 May 2025 under the local leadership of The UWI (Mona).

16. On the CREWS Accelerated Support Window (ASW) proposal on satellite data and radar capacity development, Council was informed of actions taken by CMO HQ respond to an urgent request from Belize to obtain factory training on radar operations and maintenance from the manufacturer. This was necessary to ensure operational continuity of their radar system during the hurricane season. Council was advised that the CMO HQ advocated for the identification of a funding source with the WMO Project Officers responsible for CREWS Caribbean 2.0, and worked with them to incorporate this training into an ASW proposal being developed to strengthen early warning systems capacity through improved satellite data utilization. The proposal was eventually submitted for consideration.

Actions Emanating from Previous Sessions

17. At the previous Annual Session (CMC67) and subsequently at the mid-year Session of Council (CMC68) held in August 2025, Council has noted CMO HQ's updates on the development of projects and activities to strengthen NMHS operational and management capacity, early warning systems, and consequently, climate adaptation and sustainable development in CMO Member States, and its partnership with the University of the West Indies and King's College London, encouraging Members to participate in the study on the International Relations of Tropical Cyclones in the Caribbean. Council has also supported the CMO HQ in the implementation of activities under the CREWS Caribbean 2.0 and the pursuit of grant funding to support the implementation of Quality Management Systems for NMHSs. Council also endorsed the CMO HQ's efforts to develop and implement the GCF-SAP-CREWS Scaling Up Project, including Doppler Weather Radar upgrades and strengthening MHEWS in Belize and Trinidad and Tobago.

Updates on Projects and Proposals

18. This report continues the process of providing regular and consistent updates to the Council on the current status and ongoing progress of projects and activities which the CMO HQ intends to deliver on behalf of Member States.

a) CREWS Caribbean 2.0: Strengthening Hydro-Meteorological and Early Warning Services in the Caribbean

19. Council is reminded that, following the successful completion of the CAP workshops in Grenada, Dominica, and Saint Lucia in January-February 2025, there has been noteworthy progress in advancing the remaining activities under the WMO-CMO IA. Over the past months, substantial effort has been dedicated to activity development, planning, and conceptualization, particularly for those initiatives requiring collaboration with third-party partners such as the United Nations Office for Disaster Risk Reduction (UNDRR), the Caribbean Broadcasting Union (CBU), and the Caribbean Disaster Emergency Management Agency (CDEMA). Updates on each activity are provided below.

(i) Development or adjustment of Standard Operating Procedures between NMHSs and NDRMOs

- i. As mentioned above, a draft survey was issued to assess the status of existing SOPs developed under CREWS Caribbean 1.0. The survey was issued to NMHSs & NDRMOs in previous beneficiary countries, both direct and indirect. Ten (10) responses were received from NMHSs. No responses were received from NDRMOs. Of the ten (10), only three (3) NMHS were aware of the existence of any SOP with their NDRMO national counterpart, and the majority (7) were not aware of SOPs developed under CREWS Caribbean 1.0. In terms of challenges identified, the most frequently cited reason preventing full SOP implementation was a lack of understanding or awareness of the issue, followed by limited resources or time. The most frequent recommendations were regular meetings between the NMHS & NDRMO on the matter, practical exercises and testing of SOPs, and a clearer draft SOP and revisions. These results suggest nationally-focused and targeted approach should be taken by CDEMA and the CMO HQ to coordinate this activity.
- ii. Council is advised that CDEMA hired a CREWS Project Officer who was onboarded in August 2025 but resigned in September 2025. This staffing change has significantly impacted CDEMA's ability to execute project activities according to the expected schedule. In addition, CDEMA's limited human resources are currently engaged in coordinating the regional response and recovery efforts in Jamaica following the severe impacts of Hurricane Melissa. Consequently, it is anticipated that this and other collaborative activities will be advanced further in 2026, utilizing existing resources unless otherwise directed by CDEMA.

(ii) Development of National Strategic Plans and Frameworks for Weather, Water, and Climate Services

- i. Council should recall that the CMO HQ issued a public call for Expressions of Interest to provide consultancy services to deliver National Strategic Plans (NSPs) and Frameworks for Weather, Water, and Climate Services (FWWCS) for Antigua & Barbuda, Belize, Saint Lucia, St Kitts and Nevis, and Trinidad and Tobago. The CMO HQ has signed Ms Yvette Ramos as the said consultant, effective 31 October 2025.
- ii. With the approval of the Government of Saint Lucia through the Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal, the CMO HQ and the Saint Lucia Meteorological Service (SLMS) have organized the first National Stakeholder Consultation scheduled for 24 November 2025 in Castries.
- iii. Letters will be issued to all remaining beneficiary country Governments requesting their approval and support for the development of NSPs and FWWCSs, with complementary Action Plans. Consultations and strategic plan and framework preparation will continue through 2026.

(iii) Severe Weather Forecasting and Severe Weather Forecasting Programme-Caribbean (SWFP-C)

- i. Regional and National Severe Weather Forecasting workshops - Council should recall that the CMO HQ provided financial support for the first SWFP regional operational workshop hosted by the CIMH in July 2025. The CMO HQ and CIMH are committed to developing a concept and hosting an in-person training workshop for SWFP-C Focal Points in early to mid-2026. CMO HQ is

also considering supporting a third workshop on quality management for severe weather forecasting.

- ii. Familiarization missions for operational forecasters - Council is advised that the CMO Headquarters, Meteo-France, and the CIMH jointly organized an attachment for the Antigua and Barbuda Meteorological Service (ABMS) SWFP-C Focal Point at the SWFP-C Regional Forecast Support Facility (RFSF) in Martinique from 12–14 November 2025. This initiative intended to strengthen ABMS' severe weather forecasting capacity, given its significant responsibility for issuing severe weather warnings on behalf of neighbouring countries.
- iii. Additional familiarization missions are planned for 2026 for ABMS operational forecasters to visit Anguilla, the British Virgin Islands, Montserrat, and St. Kitts and Nevis, further supporting ABMS in meeting its obligations under *Resolution 1 of the Caribbean Meteorological Council (2011) "Regional Arrangements for Meteorological Forecast and Warning Services among CMO Member States"*.
- iv. Council is further advised that familiarization missions represent only a small component of the overall grant, having been included in CREWS Caribbean 2.0 as a pilot activity to assess the value and effectiveness of this form of capacity development. As such, documenting and reporting the impact of these missions, particularly on the quality of severe weather forecasts issued for neighbouring countries, will be essential.
- v. Council should note that the CMO HQ and WMO have commenced planning the next in-person SWFP-C Regional Sub-programme Management Team (RSMT) Meeting, to be held in conjunction with the *48th Session of the WMO RA IV Hurricane Committee* in Cancun, Mexico. Financial and air travel support will be provided for the participation of the RSMT members with limited grant funding from CREWS Caribbean 2.0.

(iv) Development of capacities for lightning detection and awareness building

- i. Council is reminded of the successful implementation of the 2025 Caribbean Lightning Safety Awareness Contest, which awarded Lightning Sensors and Automatic Weather Systems (AWSs) to winning schools in Jamaica and Trinidad and Tobago, along with AWSs designated for schools in the Bahamas, Belize, and Dominica. CMO Headquarters is pleased to inform the Council that the AWS units for the Bahamas, Belize, and Dominica have been shipped, with deliveries expected between 20-25 November 2025.
- ii. Council is advised that the delivery of the lightning sensors requires both a site assessment and the signing of a sensor hosting agreement between the selected school and AccuWeather, the sponsor of the equipment prizes. The Trinidad and Tobago Meteorological Service completed the site assessment for the winning school in Trinidad, while the assessment in Jamaica has been delayed due to the passage of Hurricane Melissa. The sensor hosting agreement is currently under review by Manzanilla Secondary School, Trinidad, the winner of the 12-18 age category. Delivery of the lightning sensors is anticipated in Q1 2026, and the sensors will form part of the proposed CMO Lightning Detection Network.
- iii. Council is also advised that CMO HQ initiated discussions with the University of Sao Paulo, which operates the STARNET lightning network across South America, and The University of the West Indies, St Augustine, Department of Electrical Engineering. The University of Sao Paulo has a long-established programme of education and training in lightning sensor technology and

analysis. It is envisioned that the CMO will support an internship with CREWS funding, whereby a UWI student would be hosted at the University of Sao Paulo to learn how to build low-cost sensors and to analyse the data as part of expanding lightning detection and monitoring capacity in the Caribbean. In this manner, the CMO will be building expertise within the Caribbean, rather than simply purchasing instruments, products and services from elsewhere.

(v) Capacity-development in the WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS) 2.0

- i. Council would recall that the CMO and WMO started discussions on the training of trainers in WIS 2.0 and WIGOS. Council is informed that during August-October 2025, the CMO HQ contributed to the development of a concept note for the hosting of a WIGOS and Regional Basic Observing Network (RBON) workshop to be held in Costa Rica in February 2026. In November, the CMO HQ & WMO agreed to work together and utilize CREWS Caribbean 2.0 grant funding to support the participation of Regional WIGOS Centre (RWC) staff and WMO Data Quality Monitoring System (WDQMS) National Focal Points in person. The CMO also provided inputs to the invitation letters, which were issued on 14 November 2025.
- ii. Council is asked to encourage Member State NMHSs to respond promptly to the requests for nominees and consider self-funding where possible.

(vi) Regional and National workshops to strengthen collaboration and mutual understanding among NMHSs, NDRMOs, and the Media

- i. The CMO, WMO, UNDRR, and the Caribbean Broadcasting Union (CBU) have been working collaboratively to organize a regional workshop aimed at enhancing knowledge exchange and mutual understanding among NMHSs, NDRMOs, and the Media, with a focus on improving MHEWS communications. To maximize participation from CARICOM, CMO, and CDEMA Member/Participating States, the CMO and WMO have agreed to pool financial resources from the regional workshop and national trainings, and support pilot trainings in one or two Countries. The regional workshop is scheduled to take place from 20-21 January 2026 in Port of Spain, Trinidad and Tobago.
- ii. The CMO HQ and Varysian Limited have agreed to host an AI and Meteorological Innovation Workshop on 22-23 January 2026, immediately following the communications-related workshop. WMO and UNDRR will cover flights and daily subsistence allowance (DSA) for participants attending the communications workshop, while Varysian will provide DSA to support participation in the AI workshop.
- iii. Council is asked to note that invitation letters have been issued by the CMO, UNDRR, and the CBU to NMHSs, NDRMOs, and State Media, respectively, requesting the nomination of one representative per sector. While participation by at least two meteorologists per NMHS would be ideal, current budget constraints do not allow for this. Council is further asked to note that, as flights are being funded under the communications-related workshop, WMO and UNDRR will support either participation in both workshops or participation in the communications workshop only, based on the nominations and requests for support received. The deadline for nominations is 21 November 2025.

(vii) Belize radar operations training and repair

- i. On the CREWS Accelerated Support Window (ASW) proposal on satellite data and radar capacity development, Council is informed that the timeframe for obtaining approval of the ASW proposal and Belize's urgent need for radar operations and maintenance training did not match up. Compounding that threat, Belize experienced a sudden breakdown of its national weather radar during the peak of the 2025 hurricane season, placing its real-time monitoring and warning capability at significant risk.
- ii. CMO HQ is pleased to inform Council that it worked closely with the WMO Project Officers for CREWS Caribbean 2.0 to identify a funding avenue through CREWS Caribbean 2.0 in response to Belize's request for support.
- iii. Through this joint effort, an urgent training mission was organized from 6-10 October 2025 in Belize, during which a Leonardo Germany GmbH specialist provided intensive, hands-on guidance to five technicians of the National Meteorological Service of Belize. Over the course of the week, the team successfully diagnosed and repaired the radar, restoring full operational functionality while also significantly strengthening national capacity in calibration and preventive maintenance. This rapid intervention ensured uninterrupted radar surveillance at a critical time and reinforced both Belize's resilience and regional early warning capabilities.
- iv. Council is asked to note the continued partnership between the CMO and WMO through CREWS Caribbean 2.0 and the demonstration of how both organizations co-operate on behalf of Members. Council is also asked to note that this intervention was covered in the WMO's [Project Updates Newsletter](#).

b) GCF-SAP-CREWS Scaling up Hydrometeorological and Multi-hazard Early Warning Systems in Belize and Trinidad and Tobago Project

20. Council is informed that, at the 43rd meeting of the Board of the **Green Climate Fund (GCF)**, 27-30 October 2025, the proposal by CMO was presented by the **Caribbean Development Bank (CDB)**, a GCF Accredited Entity. The GCF approved **USD 24 million** to scale up multi-hazard early warning systems in Belize and Trinidad and Tobago, which is the second proposal to be advanced under the GCF-SAP-CREWS Scaling up Framework.

21. This project will significantly strengthen the NMHSs of Belize and Trinidad and Tobago, and redound to the benefit of the wider Caribbean by building the institutional, technical and operational foundations required for modern, impact-based MHEWS. The strengthened EWS will enhance resilience to climate-related hazards, reduce damage and loss, improve hazard response times, and reduce the socioeconomic impacts, especially for vulnerable communities. The aim is to directly benefit 1.2 million people across both countries, with indirect benefits for another 0.3 million.

22. Key activities of the project include upgrading radars (covered under Agenda Item 10) and forecasting facilities, developing impact-based forecasting (IBF) systems, enhancing institutional capacity for disaster risk reduction, and integrating climate information services across sectors. The project also aims to improve collaboration between national and regional stakeholders and enhance communication to vulnerable populations.

23. The **Annex** has further information on the innovative reforms, system upgrades, capacity building, and institutional strengthening activities that will be implemented for the NMHSs and National Disaster Risk Management Organizations, core partners in early warning systems of Belize and Trinidad and Tobago.

c) Quality Management Systems (QMS) Implementation

24. Building on Council's previous guidance on the implementation of QMS at CMC63 and its support of CMO HQ's pursuit of grant funding opportunities to support Member State NMHS' implementation of QMS at CMC67, Council is asked to note that the CMO HQ has continued to advance activities aimed at strengthening leadership, operational, and technical capacities essential for QMS compliance and certification. These efforts are designed to complement the regional programme of actions endorsed by the Council, including baseline assessments, development of model QMS documentation, and the formulation of a regional audit strategy.

25. Council is informed of ongoing preparations for the *WMO Training on Leadership and Management of NMHSs in RA III and RA IV*, to be held 1-5 December 2025 in Port of Spain in collaboration with the CMO Headquarters. This training is being funded through the WMO Voluntary Co-operation Programme (VCP) request prepared and submitted by the CMO HQ. It targets senior NMHS leadership and covers strategic planning, governance, resource management, and the use of emerging technologies, core competencies that underpin the effective implementation, maintenance, and continual improvement of Quality Management Systems (QMS).

26. The Council is also informed of another VCP request being refined to support the provision of certification training for NMHS personnel in QMS auditing. The CMO HQ prepared and submitted a draft proposal for consideration under a new Canadian funding opportunity. Positive preliminary feedback has been received, and additional funding is being pursued under CREWS Caribbean 2.0 to develop a hybrid QMS-Severe Weather Forecasting training workshop and scale up participation. The proposed workshop would strengthen forecast processes, verification practices, and consistency across the region, thereby directly contributing to improved forecasting capacity. It would also scale up *International Civil Aviation Organization* (ICAO) regional efforts to harmonize and integrate safety oversight and quality management frameworks in the North America, Central America, and Caribbean Region.

d) The International Relations of Tropical Storms in the Caribbean

27. Council is informed that in September 2025, the research team presented their initial findings and planned activities for 2026 and 2027 to the WMO Research Board Task Team on Early Warnings for All. The UWI lead investigator also interviewed the Coordinating Director on the operational aspects of the Hurricane Committee and the CMO regional forecasting arrangements.

28. Council is reminded that from inception, the project sought to engage directly with experts in the CMO community and to understand CMO and WMO international relations as documented and in practice. To that end, the research team will be participating in the 69th Council session as observers and will present their study to the 2025 Annual Meeting of the Directors of Meteorological Services.

29. Council is advised that the research team will conduct face-to-face interviews with the Directors of National Meteorological Services, which are aimed at identifying factors about the cooperation challenges and opportunities that those working with the CMO see as most salient

around tropical storms and hurricanes. This phase of the research will support the following outcomes:

- A **regional workshop and policy report** exploring the needs and challenges faced by Caribbean meteorologists in strengthening cooperation.
- A set of **policy recommendations** developed in collaboration with the **World Meteorological Organization (WMO)**.
- Greater **visibility of the vital role played by the CMO** in regional and global meteorological governance.

e) Advancing Alternative Energy Education within the Ministry of Education CSEC and CAPE Science and Mathematics Syllabi

30. The Council is informed that this project remains in the development stage. The collaborators will need to engage with the new officials in the Ministry of Education since the government has changed.

ACTION PROPOSED TO COUNCIL

31. The Council is invited to:

(i) Note:

- a. Updates on the development of projects and proposals, and their implementation to strengthen NMHS operational and management capacity, early warning systems, and consequently, climate adaptation and sustainable development in Member States.
- b. That activities being implemented in conjunction with the Caribbean Disaster Emergency Management Agency (CDEMA) will have to be rescheduled in response to the departure of the CREWS Caribbean 2.0 Project Officer and the regional response to Hurricane Melissa's devastating impact on Jamaica.

(ii) Note the approval of the CMO project, "*Scaling up Hydrometeorological and Multi-hazard Early Warning Systems in Belize and Trinidad and Tobago*", by the Green Climate Fund (GCF).

(iii) Recognize the significance of the approval of the GCF project for strengthening National Meteorological Services and early warning systems in Belize, Trinidad & Tobago, and the wider Caribbean.

(iv) Approve the CMO Headquarters Unit as the Executing Entity for the GCF project, "*Scaling up Hydrometeorological and Multi-hazard Early Warning Systems in Belize and Trinidad and Tobago*", to be implemented on behalf of the CMO, with oversight by the Caribbean Development Bank as the Accredited Entity of the GCF.

(v) Support the CMO Headquarters Unit in:

- a. Regional collaboration for radar data sharing, capacity development, and adoption of best practices in operational early warning services across CMO Members.
- b. Communication of the GCF project objectives to stakeholders, partners, and the public to enhance awareness and buy-in.

- (vi) **Support** the CMO Headquarters Unit in the pursuit of grant funding to support Member States' implementation of Quality Management Systems for their National Meteorological and Hydrometeorological Services, and the participation of NMHS personnel in these trainings.
- (vii) **Encourage** Members to respond in a timely manner to requests for nominees to participate in workshops and other activities being implemented by the CMO Headquarters Unit in support of CMO Member states.

CMO Headquarters
November 2025

ANNEX

Summary of Activities of the CMO Green Climate Fund Project

Title: Scaling up of Caribbean Hydrometeorological and Multi-hazard Early Warning Services in Belize and Trinidad and Tobago

- **Develop a new National MHEWS Policy in Belize and prepare MHEWS policy implementation plans for national and sub-national levels** in both countries to establish fully integrated, Impact-Based Multi-Hazard Early Warning System (IBF-MHEWS) frameworks. This activity will fill critical policy and operational gaps, creating, for Belize, its first national MHEWS policy and implementation plan, and for Trinidad and Tobago, a strengthened and climate-informed expansion of its draft policy.
- **Draft and present for adoption National Meteorological Legislations and Policies**, with the goal of establishing robust legal and policy frameworks that formally define the mandates, roles, and coordination mechanisms of the National Meteorological Services in Belize and Trinidad and Tobago. This will enable authoritative weather and climate services, support sustainable financing, strengthen inter-agency collaboration, and fill long-standing governance gaps essential for early-warning decision-making.
- **Strengthen National Framework for Climate Services (NFCS), including support and enhancement of Bi-Annual National Climate Outlook Forums Hydrological Outlook Forums in Belize and Trinidad and Tobago** that institutionalize co-produced, user-driven climate information and embed climate services into national planning to enable systematic, sector-specific uptake of climate information and strengthen national adaptation and decision-making across key climate-sensitive sectors.
- **Develop sustainable financial sustainability plans and business models for weather, water, and climate services in Belize and Trinidad and Tobago** that will secure long-term sustainability of the NMHSs by establishing financially viable business models, enabling cost-recovery frameworks, diversifying funding sources, and strengthening public-private engagement.
- **Establish and operationalize impact-based forecasting (IBF) and warning systems in both countries for land and marine hazards** that will equip Belize and Trinidad and Tobago with modern tools, data systems, training, and forecasting capabilities that transform warnings from hazard-focused to impact-focused.
- **Develop and strengthen weather and climate information services, early warning systems, and sector-specific forecasting tools, supported by web-based decision-support platforms** that will close critical data, forecasting, interpretation, and collaboration gaps, and establish tailored, actionable, sector-specific climate information and decision-support systems, including upgrading and certifying the NMHS's Quality Management Systems.
- **Provide ICT infrastructure and upgrades to support impact-based forecasting and to enhance situational awareness in both NMHSs** that will modernize and expand the ICT backbone required for real-time, impact-based forecasting by equipping both countries with secure, resilient communication, visualization, and network systems that strengthen situational awareness and ensure continuous data flow.

- **Expansion of the flood monitoring and forecasting system in Belize to strengthen delivery of MHEW products and services and expansion of coastal inundation and storm surge warning systems and provision of training to build on flood forecasting and modelling** that will significantly enhance Belize's ability to anticipate and respond to flood and coastal inundation hazards by upgrading modelling systems, restoring real-time hydrological monitoring networks, integrating flood forecasts into national warning systems, and equipping vulnerable coastal communities with alerting tools and training.
- **Develop and implement advanced NWP systems at the Belize and Trinidad and Tobago NMHS supported by capacity building and infrastructure enhancement** that will establish nationally owned, high-resolution numerical weather prediction capabilities in both countries, thus overcoming dependence on external models, improving forecast precision at local scales, modernizing modelling infrastructure, and building sustained technical capacity to generate, verify, and apply advanced forecasts essential for climate-resilient planning and early warning.
- **Modernize the NMHS information systems and improve communication and dissemination of climate and weather information in Belize and Trinidad and Tobago**, including modern forecaster workstations, weather forecasting and modelling visualization software, **AI-driven analytics**, telemetry real-time data collection, high-performance computer servers, increased bandwidth at the forecast centers, increased data storage capacity, upgraded weather mobile app, and satellite phones.
- **Upgrade and modernize the national meteorological network of Trinidad and Tobago to WMO standards**, and enhance data integration and ICT systems, and build technical capacity by refurbishing and upgrading the existing network of stations, recommissioning 12 AWS and 2 AWOS, procuring equipment to be used for calibration, and installing a hydrogen generator to provide redundancy for upper air observations.
- **Implement and integrate automated NMHS Common Alerting Protocol (CAP) in both countries** by establishing fully automated, standardized alerting processes across the NMHSs and disaster management agencies, strengthening the speed, clarity, and consistency of early warnings and ensuring that authoritative alerts reach communities and sectors in real time.
- **Strengthen and increase scientific knowledge, capability, and research output on climate extremes and climate-related sectoral impacts in Trinidad and Tobago** by generating locally relevant downscaled projections and equipping the NMHS with the capacity to produce and apply advanced climate information for sectoral adaptation planning at the appropriate scale to support decision-making, to be carried out jointly with the University of the West Indies.
- **Integrate climate considerations into sector decision-making through capacity building and training on climate information services in Trinidad and Tobago** to increase climate data expertise in climate-sensitive sectors by developing a climate-sensitive sector action and communication plan.
- **Conduct baseline assessments of human, technical, and socio-economic capacities for enhancing climate services and early warnings for hydrometeorological hazards in climate-sensitive sectors in Trinidad and Tobago** to demonstrate the socio-economic

benefits both public and private derive from weather and climate warnings and services so there is greater understanding of the benefits and value added from meteorological services.

- **Develop a school programme (non-curricular) for primary and secondary schools to strengthen preparedness & response capabilities in Trinidad and Tobago.** The activity will focus on integrating a program on weather, climate and disaster risk education as part of schools in Trinidad and Tobago's non-curricula activities to foster awareness and deeper understanding of climate-related risks within the school's immediate environment.