



REPORT OF THE SIXTY-THIRD MEETING OF THE CARIBBEAN METEOROLOGICAL COUNCIL



CHAIRPERSON:

The Premier and Honourable Minister
Wayne Panton, Ministry of Sustainability
and Climate Resilience of **Cayman Islands**

VENUE AND DATE:

George Town, Grand Cayman
CAYMAN ISLANDS
24-25 NOVEMBER 2022

1 OPENING OF THE SESSION AND ELECTION OF CHAIRPERSON

1.1. The Sixty-third Session of the Caribbean Meteorological Council was hosted by the Government of the Cayman Islands in George Town, Grand Cayman, Cayman Islands on 24-25 November 2022. The Caribbean Meteorological Council is the Governing and policy-making body of the Caribbean Meteorological Organization (CMO).

1.2. **Ms Jennifer Ahearn**, Chief Officer, Ministry of Sustainability and Climate Resilience, commenced the Opening Session of the Meeting, by extending words of welcome, after which the Invocation and the singing of the National Anthem and Song were offered by Miss Teen Cayman Islands.

1.3. **Dr Arlene Laing**, Coordinating Director of the CMO, thanked the Government of Cayman Islands for hosting and welcomed all participants to the Council Session. Dr Laing then outlined the history of the Caribbean Meteorological Organization, and its role in the fostering of scientific and technical cooperation among the Member States and regional institutions, which helps to build resilience to extreme weather, climate change, and other hazards. She highlighted the National Meteorological and Hydrometeorological Services (NMHSs) of CMO Member States as vital services whose primary mission is to save lives, livelihoods, and property, and who are key to the implementation of the *Early Warnings for All* in five years, which is a call to Action by the UN Secretary-General Mr Antonio Guterres as a climate adaptation mechanism. NMHSs also add value to the economies of the region and help the public and private sectors to make better decisions. She illustrated the weather, climate, and water prediction value chain and the role of Caribbean hydro-meteorological institutions and their benefit to societal decisions.

1.4. **Prof Petteri Taalas**, WMO Secretary-General, provided a video message in which he congratulated the Council on its 63rd Session. He informed of several initiatives arising from the WMO in 2022. Professor Taalas gave insight into the 27th Meeting of the United Nations Conference of the Parties (COP27) Meeting and the Early Warnings for All Executive Action Plan launched by WMO for climate adaptation. Additionally, he noted the *Global Basic Observation Network* (GBON), to enhance early warning services, creation of new finance mechanisms to support Small Island Developing States (SIDS), the SOFF, and approval of new regional activities for the development of better service capabilities. Prof. Taalas ended by expressing his gratitude and willingness to provide continued support to the CMO, mentioning several new initiatives for the year 2023.

1.5. **Ambassador Dr Carla Barnett**, Secretary-General (SG) of the Caribbean Community (CARICOM) Secretariat, delivered remarks on behalf of CARICOM. Dr Barnett acknowledged the CMO as one of the earliest institutions of CARICOM and its importance to multi-sectoral development. She mentioned issues arising out of the COP27 and its effect on Small Island Developing States (SIDS). She spoke positively of the development of meteorological strategic plans among eight (8) Caribbean countries and stressed the need to implement these in the wider national plans. The SG emphasized the need for continued investment into meteorology to facilitate a multi-sectoral risk resilient future. Data generated should be treated as a public good and freely shared. Dr Barnett concluded her address by congratulating the CMO on the contributions made to environmental resilience and sustainable development in CARICOM and its active pursuit in enhancing coordination based on several international treaties and framework. Special mention was made of the WMO being a continued ally to the region. Dr Barnett thanked meteorological practitioners and all others associates in the field for their great service to the Caribbean.

1.6. The feature address was delivered by **the Premier and Honourable Minister Wayne Panton**, Minister of Sustainability and Climate Resilience. The Honourable Minister informed of the

devastating effects of extreme weather and climate in the Caribbean and the essential role of National Meteorological Services in the building of resilience to climate change.

1.7. The Honourable Minister thanked CMO for the notable work being done within the Caribbean.

1.8. The Meeting elected **The Honourable, Wayne Panton**, Premier and Minister of Sustainability and Climate Resiliency as the **Chair of the Caribbean Meteorological Council** for its 63rd session and the intersessional period until the next annual meeting of the Council.

1.9. After the feature address **PS Deborah Payne**, Permanent Secretary, Ministry of Home Affairs and Information, Barbados, delivered the Vote of Thanks to all speakers, noting the importance of the science of hydrometeorology to sustainable human development and by extension the Caribbean. She ended by thanking the speakers, particularly the Secretary-General of WMO for noting the importance of *Early Warnings for All*, the Secretary-General of CARICOM, and the Honourable Premier and Minister. She thanked all invited guests and delegates for joining the opening of the 63rd Council Session.

1.10. With the Premier having other obligations, the remainder of the Session was chaired by **Chief Officer Jenifer Ahearn**, Ministry of Sustainability and Climate Resiliency.

2 ADOPTION OF AGENDA AND PROCEDURAL MATTERS

2.1 The Agenda adopted by the Meeting is shown in **ANNEX I** of this Report. The Meeting fixed its hours of work and determined the order in which it would conduct its business. The list of Delegates attending the Meeting is attached as **ANNEX II** to this Report.

3 CMO EXECUTIVE REPORTS

3(a) Coordinating Director's Report

3.1 The Coordinating Director reported on the activities and issues concerning the CMO Headquarters Unit since the previous session of the Council. The Council noted and discussed these activities and issues, particularly the follow-up to the World Meteorological Organization (WMO) Executive Council session, as it related to the Caribbean region, in general, and CMO Member States, in particular. The most pressing issue noted was the *Early Warnings for All* UN Global Initiative. Also noted were other contributions to disaster risk reduction, Member States to implement the *WMO Integrated Global Observing System (WIGOS)*, including the *Global Basic Observation Network (GBON)* and the *Systematic Observations Financing Facility (SOFF)*, which will allow Caribbean SIDs to be able to implement and sustain their contribution to GBON.

3.2 Council was asked to note that, the Coordinating Director co-authored the WMO White paper, *"Future of National Meteorological or Hydrometeorological Services: Evolving Roles and Responsibilities"*, which has key messages for all stakeholders concerning decisions on institutional, technological and operational changes.

3.3 The Council briefly reviewed the impacts of weather and other natural hazards in the region in 2022. It noted that the active hurricane season, which, while not as devastating to the region as 2020, had some high-impact systems, including Major Hurricanes Fiona in Turks and Caicos and Ian in Jamaica and Cayman Islands, as well as Hurricanes Julia and Lisa in Belize. The overall result was the displacement of thousands of households, destruction of 100s of homes, and 100 USD worth of damage from storm surge, heavy rain, flooding, strong winds, and landslides. In this

regard, the Coordinating Director noted the excellent warnings issued by the affected Meteorological Services, which helped to save lives and safeguard property.

3.4 The Council noted other types of high-impact weather and climate events of 2022 including the historical floods in Guyana and damaging floods in Saint Lucia during November and Trinidad and Tobago during October. Furthermore, Council was asked to note episodes of poor air quality and visibility due to Sahara dust outbreaks.

3.5 Council discussed and took note of the multiple hazards that affected the Caribbean during 2022. Council was reminded of the critical role of cooperation and coordination across sectors for multi-hazard early warning, especially for the compounding effect of hydrometeorological on geological hazards. Council was informed of the role of the Headquarters liaising with international organizations on behalf of Member States, to aid in early warnings for the multiple hazards that affected the region during 2022. That included organizing of a special session on social and behavioural sciences at the 44th *Hurricane Committee*, particularly focused on dissemination and communication of early warnings.

3.6 Given the tremendous efforts of National Meteorological Services in ensuring effective impact-based forecasting and multi-hazard early warnings for the Caribbean during 2021, the Coordinating Director initiated activities to showcase these extraordinary efforts. Specifically, the Coordinating Director collaborated with the Directors of affected CMO Member States and the Headquarters Unit to present their work to the 102nd Annual Meeting of the *American Meteorological Society* (AMS), which was held 23-27 January 2022, and the *first Weather and Society Conference of the WMO World Weather Research Programme*, held virtually 28 February–11 March 2022. Council noted that these presentations were well-received.

3.7 Council noted that the CMO Headquarters through an agreement with the WMO was supporting National Meteorological and Hydrometeorological Services developed model meteorological legislation and policy that was endorsed by Member States in June 2021. Council noted that eight member States have been receiving support to adapt the model legislation for their national meteorological services including defining their roles and responsibilities, the extent of their authority, their organizational structure, and funding mechanisms. The Organization of Eastern Caribbean States (OECS) provided assistance and review oversight of the project deliverables. The development of meteorological legislation is supported by the WMO *Climate Risk and Early Warning Systems (CREWS) Caribbean* project for the period 2020-2022.

3.8 Council noted the CMO Headquarters support for strengthening the capacity at the national level, by collaborating with the WMO CREWS Caribbean Project to develop Strategic Plans, National Frameworks for Weather, Water, and Climate Services, and complementary Action Plans for the National Meteorological Services in eight Member States and the expansion to two more for 2022.

3.9 It was also noted by Council that the CMO Headquarters contributed to the development of a *Strategic Roadmap for Multi-Hazard Early Warning Systems in the Caribbean 2020-2023*, through the CREWS Caribbean Project, and have been contributing to the Priority Activities, including as lead coordinator on the development of a multi-sensor precipitation grid over the Eastern Caribbean with the Barbados weather radar as one of the primary data sources. The project includes CIMH, as the technical lead, and the National Meteorological Services of Barbados, Saint Lucia, and St Vincent and the Grenadines.

3.10 Council noted that the Coordinating Director, the Permanent Representative of the British Caribbean Territories with WMO, led a delegation of six experts to the Second Sessions of the *WMO Services Commission*, (SERCOM-2, 17-21 October 2022) and two experts to the *WMO*

Infrastructure Commission (INFCOM-2, 24-28 October 2022), who attended the Session virtually. In preparation for the Commissions, the Coordinating Director provided information about the session and links to the various decision documents, to the Governments of the WMO Members of CMO Member States and encouraged the participation of their Permanent Representatives and Hydrological Advisers in the Commissions. Council was asked to note that two Members are not compliant with WMO General Regulation 6, with regard to the formalizing of their Permanent Representative with WMO. Council **urged** to WMO Members to formalize their Permanent Representatives and Hydrological Advisers with WMO.

3.11 The Council noted the CMO Headquarters participation in the 75th Session of the **WMO Executive Council** in Geneva, and the implications of the decisions of the Executive Council for CMO Member States, including the implementation of the UN *Early Warnings for All*, *WMO Integrated Global Observing System* (WIGOS) and the *Global Basic Observation Network* (GBON) and preparations for the 19th World Meteorological Congress.

3.12 Council noted that the Coordinating Director, as the RA IV representative on the WMO Research Board was the lead author for the Concept Note on research “*Innovation in Regions*”; liaised with regional institutions and WMO Research Programmes; and will be helping to organize workshops to demonstrate good practices in transitioning research into services.

3.13 Council recalled many activities of the CMO Headquarters and CIMH aimed at regional implementation of global programmes and initiatives, particularly those initiated by the WMO as they relate to the Caribbean region, in general, and CMO Member States, in particular. Among these is support for WMO regional activities related to the *WMO Integrated Global Observing System* (WIGOS).

3.14 Council noted that the CMO Headquarters and the Trinidad and Tobago Meteorological Services have been working with Canada, USA, and Costa Rica to develop a Regional WIGOS Centre (RWC) in WMO RA IV. Council was informed that the RWC will monitor and evaluate the availability, timeliness, and quality of observation data, with the CMO HQ and TTMS covering the English-speaking Caribbean, and that an RWC workshop would be held in December 2022 in Costa Rica.

3.15 Council noted the progress of CMO Headquarters work with the Turks and Caicos Island (TCI) Airport Authority on the development of their National Meteorological Service, including: assistance with a RoadMap for long-term development, a workplan for 2022-2023, guidance on human and technical capacity building, and a strategic plan being developed with funding from CREWS.

3.16 Council was informed that the Coordinating Director chaired the *Ministry of Public Utilities “Trinidad and Tobago Meteorological Service Transformation Committee”*, which was tasked with developing a legal framework for the transformation of the TTMS, following a review of its Strategic Development Plan 2015-2024, operations, human resources, public weather services, and observation network. The Committee’s report, presented to the Ministry in February 2022, provided guidance for the operations, human and technical resource development, as well as options for the legal framework of the TTMS.

3.17 Council was informed of various activities undertaken by the CMO Headquarters in support of the regional and global water agenda, including the organization of a third symposium on hydro-meteorology; active participation in various forums of the *Global Water Partnership–Caribbean* (GWP-C), including their Stakeholder Consultations on development of a *Regional Action Framework for Integrated Water Resources Management* (IWRM) for the CARICOM Region.

3.18 Due to the recognition of the paramount role of the ocean in the sustainable development of Small Island Developing States (SIDS), Council noted that the Coordinating Director, *Dr Arlene Laing*, was invited to present at the *UNESCO-IOC UN Decade for a Safe Ocean Laboratory* and the *UN Ocean Conference*.

3.19 In addition, Council noted that CMO Headquarters facilitated the participation of forecasters from the Cayman Islands, Grenada, and Turks and Caicos Islands in the WMO Course on Marine Services for English-speaking Caribbean Island Nations – Phase 1. It was further noted that the delivery of this course was a culmination of cooperation between WMO and CMO Headquarters that began in 2019 and involved CMO engaging with the Caribbean maritime community and developing better understanding of marine customer needs.

3.20 Council noted various other activities related to weather and climate resilience and disaster risk reduction organized by the CMO Headquarters in 2022, including “Partnerships for Weather, Water, and Climate Services to Increase Resilience” in Port of Spain in May 2022, with special guest, *Mr Rodney Martinez Guingla*, WMO Representative for RA IV and stakeholder organizations headquartered in Trinidad and Tobago. The meeting brought together experts from the media, hydrology, public health, disaster risk reduction, coastal and marine, and academic sectors and focused on partnerships for weather, climate, and water services; early warnings; and resilience building to extreme weather and climate and proposed areas of collaboration and cooperation.

3.21 Council noted that the Coordinating Director continued to promote regional activities as (i) a keynote speaker for the World Broadcasting Union/UNDRR workshop on “Media Saving Lives”; (ii) a chair for “Strengthening Multi-Hazard Early Warning Systems in Latin America and the Caribbean”, a panel of the launch of the WMO *State of the Climate in Latin America and the Caribbean 2021*; an invited speaker to the WMO Technical Conference on Early Warnings for All, 22 October.

3.22 Council noted that the CMO Headquarters broke new ground as a collaborator for a Side Event at the 27th Conference of Parties (COP27) of the United Nations Framework Convention on Climate Change (UNFCCC). Council was reminded that CMO is an admitted Intergovernmental Organization (IGO) of the UNFCCC. CMO collaborated with the *Climate Risk Early Warning Systems (CREWS)* Secretariat and the WMO for an event on “*Mitigating Climate Risk and Enhancing Resilience: Towards Early Warnings for All*” on 11 November 2022.

3.23 CMO further noted that the Coordinating Director represented CMO as a speaker in four other events at COP27, including: “Environmental Monitoring for Loss and Damage: Early Warning Systems and Impact Attribution Capacity in the Caribbean SIDS”, organized by the CARICOM Secretariat; “Public-Private approaches in response to the Early Warnings for All initiative”; “Scaling-up early warning and early action through comprehensive disaster and climate risk management”; and “Early Warning Systems and the impact of the Canada CREWS Project”.

3.24 Council recalled that a major responsibility for the CMO Headquarters with regard to DRR is the Severe Weather Forecast Programme (SWFP) Eastern Caribbean, which focuses on severe weather (heavy rain, strong winds, rough seas/swells) that can occur at any time of year. The Regional Subprogramme Management Team is co-chaired by *Météo-France-Martinique* and CMO Headquarters and supported by CIMH. The SWFP Eastern Caribbean is in pre-operational test phase, with global and regional model forecast guidance provided by the *Regional Forecast Support Facility (RFSF)*–Martinique. In April 2022, the Coordinating Director and *Météo-France* Co-Chair reported on SWFP activities to the 44th Hurricane Committee and in June 2022, the Coordinating Director and her advisers met with the Director of *Météo-France*, in Geneva, to review collaborative activities, in accordance with the formal *Working Arrangements* between CMO and *Météo-France*.

3.25 Council noted that CMO Headquarters continued to advance disaster risk reduction in cooperation and coordination with Caribbean Disaster and Emergency Management Agency (CDEMA), CIMH, and other regional institutions. Through the Regional Early Warning System Consortium led by CDEMA, CMO HQ aided in the development of a Multi-Hazard Early Warning System Checklist. Additionally, the Coordinating Director has been serving on the Steering Committee of a project by WMO and CDEMA to strengthen operational arrangements between National Disaster Organizations and National Meteorological and Hydrological Services.

3.26 Council noted that the CMO Headquarters participated in various CARICOM activities including: the 103rd Special Meeting of the *Council for Trade and Economic Development (COTED) - Environment and Sustainable Development*, in June 2002 and the CARICOM Digital Skills meeting in August. It was further noted that CMO Headquarters continued to share with the CARICOM Secretariat, the related activities and decisions of the WMO and its Members that were of regional interest. Those included the *Early Warning for All Executive Action Plan 2023-2027; Water and Climate Coalition*; the *Global Basic Observation Network (GBON)*, which is vital for weather forecasting and climate services; and the *Systematic Observation Finance Facility (SOFF)*, intended to support least developed countries with sustaining their basic observation network and international data exchange via the WMO Unified Data Policy.

3.27 Council further noted that the CMO Headquarters contributed to the development of the CARIFORUM Post-Cotonou Regional Programming, by providing reviews of the draft programming and participating in the CARIFORUM regional consultation meetings, and continued to provide input to the Caribbean Community Secretariat Strategic Planning. The Finance and Administrative Officer continues to serve on the CARICOM RBM Leadership Group and the Finance Committee of the Caribbean Community Administrative Tribunal (CCAT).

3.28 The Coordinator Director's report to Council also provided an update on the Status of the Strategic Priorities of the Headquarters Unit, including Key Performance Indicators. Council noted that these activities are helping to achieve the intermediate outcomes under each Strategic Goal; the upgrading of National Meteorological Services; enhancement of early warning systems and disaster risk reduction; support for the implementation of the WMO Integrated Global Observation System (WIGOS); contributions to establishing regional priorities for operationally-directed research, marine meteorology and ocean services; contributions to the development of the WMO Unified Data Policy, and the framework for the Global Basic Observation Network, among other activities.

3.29 Council noted and discussed the increase in the level of financial contributions received from Member States, which was up to 77% by 15 October and, since November up to 83% compared with 30% by 15 October 2021, reflecting the economic impacts of the pandemic. Only, six Member States made their full contribution by 15 October. Council was asked to note that the timing of the Activities to support the development of Member States had to be delayed or curtailed because of the lack of support to the CMO HQ budget.

3.30 Council was informed that in October 2022, the Science and Technology Officer (STO), **Mr Glendell De Souza**, retired, after serving with great dedication as a pioneer in the position since 2005. His successor is **Mr Kenneth Kerr**, who was chosen by a Selection Committee, after an extensive search. There was a one-time cost to the budget of the Headquarters of the STO succession for the overlap period of the incumbent and the Science and Technology Officer Designate.

3.31 Council was also reminded that the CMO Headquarters had hired **Mr Haley Anderson** as its Project Development Officer, a position that had been approved by the 59th CMC (Anguilla, 2019), as reported to the mid-year 62nd CMC.

3.32 Council was reminded that the CMO Headquarters is supporting the CIMH in its implementation of the Intra-ACP Climate Services and Related Applications (ClimSA) Programme on behalf of the CMO.

3.33 The Coordinating Director briefed the Council on some of the scientific, technical and training events in which technical staff of the CIMH and the National Meteorological and Hydrometeorological Services participated and the Headquarters facilitated. Council noted that the schedule of activities undertaken by the CMO Headquarters had been relatively heavy, as meetings were transitioning back to in-person or hybrid.

3.34 **The Council:**

- (i) **Noted** the activities and issues concerning the CMO Headquarters in 2022, in particular, the implementation of legal mandates and strategic plans in Member States, the response of the CMO Headquarters Unit to the multiple hazards of COVID-19 pandemic, and hydro-meteorological hazards, the engagement with disaster risk reduction and the hydrology community, as well as those issues concerning the wider Caribbean Community;
- (ii) **Discussed** the impact of the 2022 hurricane season, other high impact weather on the region and, in particular, the impact on CMO Member States;
- (iii) **Noted** the progress on the CMO Headquarters Strategic Plan 2020-2023.

3(b) CIMH Principal's Report

3.35 The Principal made a presentation to the Council on the activities of the *Caribbean Institute for Meteorology and Hydrology* (CIMH), (available for download at <https://owncloud.cimh.edu.bb/index.php/s/9B1yLgiwDr2ydQn/download>). The presentation was a condensed version of the report delivered to the CIMH Board of Governors.

3.36 The report outlined the:

- The technical accomplishments of the CIMH and their regional and global impacts;
- The CIMH's significant contributions to global and regional capacity development;
- The CIMH's achievements in the area of resource mobilization and project development;
- The fiscal challenges facing CIMH;
- New initiatives including the development of a new centre within the CIMH;
- The Institute's draft strategic plan for the period 2020 – 2024.

3.37 The Council held a moment of silence to honour the memory Mr Geoffrey Rudder, who passed away on 29 June 2022. Mr Rudder served as the Principal of the Caribbean Meteorological Institute from 1971-1983 and was honoured in 2013 with the naming of the CIMH Instruments Building as the "Rudder Wing". He was an advocate for the establishment of the Institute and for its designation as a WMO Regional Training Centre. He subsequently worked for the WMO Secretariat in the Education Training and Research Division from 1983–1996 and was the Chief of Scholarship and Fellowships.

3.38 Council also remembered Mr Cuthbert "Bernard" Dorson, commonly known as "Dorson", the former Storekeeper/Driver of CIMH, who passed away on 6 September 2022. Dorson was remembered as a friend of many at CIMH and in the CMO community and was often the first person from CIMH whom new students met as their driver from the airport.

3.39 Council was asked to note the bestowing of the Biden Presidential Distinguished Award (Highest Rank) to Dr Roger Pulwarty, Senior Scientist, US National Oceanographic and Atmospheric

Administration Physical Science Laboratory. Dr Pulwarty, a native of Trinidad and Tobago, has been nationally and internationally recognized as a role model in bringing science to the table to inform decision-making through his outstanding contributions to climate science, disaster response, preparedness, and risk reduction. He has continued to be a valuable partner and liaison to the CIMH over many years.

3.40 Council was informed that CIMH will be returning to teaching in-person as online teaching had been very challenging for a number of reasons, including an incidence of cheating that had to be formally reviewed and led to the expulsion of the students from the relevant course.

3.41 The Principal noted that subventions received during the reporting period of January 1 through September 30, 2022 were better than for the corresponding period in 2021 and 2020.

3.42 The Principal reminded the Council of the evolving functions of the CIMH which includes (i) Training – WMO Regional Training Centre (RTC) and coordinator of the Bachelor of Science (BSc) in Meteorology programme at The University of the West Indies, (ii) regional centre for research and development in the areas of meteorology, climatology and hydrology/water resources management; (iii) WMO Regional Instrument Centre that supports instrument procurement, maintenance and calibration, observation network design and deployment, (iv) Regional Climate Data Centre responsible for climate data collection, quality assurance, archiving and dissemination, (v) WMO designated Regional Climate Centre (RCC) for the Caribbean responsible for coordinating the implementation of the Global Framework for Climate Services (GFCS) in the region, (vi) Caribbean Centre for Climate and Environmental Simulations (CCCES) which produces among other things daily high-resolution numerical prediction products that support weather, Sahara Dust, volcanic ash and wave forecasts for the region and (vii) the Pan American Node of the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) and a Regional Marine Forecast Support Centre (RMFCS), which takes advantage of some of the resources already present at the CIMH.

3.43 Council was informed of the key achievements and challenges of the CIMH during 2022. The report identified emerging training, research and business opportunities that the CIMH was pursuing to (i) improve the quantity and quality of products and services it delivers to stakeholders including the National Meteorological and Hydrological Services (NMHSs), WMO, United Nations Development Program (UNDP), World Bank Group, Caribbean Development Bank (CDB), Caribbean Disaster Emergency and Management Agency (CDEMA), Caribbean Public Health Agency (CARPHA), Caribbean Center for Renewable Energy and Energy Efficiency (CCREEE), Caribbean Agricultural Research and Development Institute (CARDI) and the Caribbean Tourism Organization (CTO) among others and (ii) enhance revenue generation at CIMH to alleviate the impacts on the work programme of the annual shortfalls in subventions.

3.44 Council noted that the CIMH continued to make significant contributions to the Caribbean and internationally in the areas of disaster risk reduction, water resources management, health, energy, agriculture, and tourism. These contributions were accomplished through CIMH's training, education, innovation, research & development initiatives that have been built through regional and international collaborations.

3.45 Council was informed of CIMH's increasing engagement with US agencies and institutions. The Principal reported that CIMH was named in US-Caribbean *Partnership to Address the Climate Crisis 2030* (PACC 2030) launched by the Vice President of the United States of America, as one of the Caribbean partners that the US envisions engaging with on climate adaptation. PACC-2030 report on climate and energy resilience (<https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/quick-wins-for-pacc2030/>), aims to find quick access to financing for CARICOM countries to invest in climate and energy resilience; involve and increase the role of the US private

sector in PACC2030's implementation; ensure that the expertise and technologies brought to the region by the framework are taught, and not just given.

3.46 The Principal also reported on visits to CIMH of Mr. Brian Nichols, the US Assistant Secretary of State for Western Hemisphere on 26 May 2022 and Ms. Neneh Diallo NDiallo, USAID's Chief Diversity Officer, on 15 July 2022; and discussions held with US Representative Barbara Lee and other Congressional Black Caucus members visiting Barbados in April 2022.

3.47 The Principal reminded the Council of the Memorandum of Understanding (MoU) signed between the US National Oceanographic and Atmospheric Administration (NOAA) and the CIMH in June 2021. A subsequent visit to the NOAA Administrator, Dr Rick Spinard, by the Principal and senior staff of CIMH in October 2022. Discussions during the visit focused on opportunities through PACC-2030, including a regional workshop on climate services planned for Barbados in April 2023; engagement of CIMH scientists with Hurricane Hunter Operations; sharing of data and knowledge exchange in marine science and environmental modeling; and hydrological modeling for flood forecasting and water resource management. Through the MoU, NOAA will provide, via the CIMH, 30 GEONETCast receivers for the Caribbean and Central America.

3.48 Council was also reminded of the MoU signed between the CIMH and the US Geological Survey (USGS). The performance period in the draft MoU is ten (10) years. As with the NOAA MoU, no financial commitments or obligations are included in the draft MoU.

3.49 The Principal informed the Council of CIMH's participation in the previously described CREWS programme which is jointly implemented by World Bank Group/GFDRR, the WMO and the United Nations Disaster Risk Reduction (UNDRR) with key regional partners CIMH, CMO Headquarters Unit and CDEMA. Council was informed that the World Bank Group had contracted the CIMH (USD 50,000) to support aspects of the programme: (i) Review of the latest draft of the Regional Roadmap under preparation; (ii) Support regional activities for the preparation and implementation of Priority Activity (PA) "Development of a Multi-sensor Precipitation Grid"; (iii) Support regional technical leadership and coordination for the preparation and implementation of PA "Support the Transition to Impact-Based Forecasting".

3.50 Council was also informed that the CIMH was also benefiting from financial support (USD 225,000) under the WMO component of the CREWS programme, including funds to support the Caribbean Climate Outlook Forums (CariCOF).

3.51 Council was reminded of status of the five-year Intra-ACP [African, Caribbean, Pacific Group of States] Climate Services and Related Applications (ClimSA) project, which aims to improve the production, access to and use of climate information, services and applications for decision makers, with a contract value at EUR 9 million. Council was further reminded that it had been agreed that the CIMH would function as the implementing and executing agency for the regional programme, which, while targeting three Member States (under Health, Water, and Agriculture), would transfer know-how and benefit to others in the region.

3.52 The Council was reminded of the USAID Strengthening Disaster and Climate Resilience (SDCR) In the Eastern and Southern Caribbean Project. Council was informed of the outstanding activities under the programme, in particular, the 9-month Caribbean Youth Livelihoods Internship Programme (CYLIP), developed by the CIMH, which received USD 50,000 in funding. CYLIP was CIMH's attempt to, in part, to address youth unemployment by fostering innovative entrepreneurship programmes in the earth and atmospheric sciences and related disciplines. Participants in the programme are recent graduates from economically disadvantaged communities.

3.53 Council was reminded of CIMH's collaboration with the International Atomic Energy Agency (IAEA) on collaboration in water resources management and isotope hydrology, including support for Tritium monitoring in rainwater collected across the region. An in-person course was funded by IAEA in Saint Vincent and the Grenadines, 11 - 15 July 2022.

3.54 Council was informed of CIMH's continued support of the various WMO programmes; approximately 8 members of staff currently sit on WMO Expert Committees, representing the British Caribbean Territories (BCT), with Ms. Kathy-Ann Caesar currently Co-Lead of the Expert Team on Education, Training and Competency. The CIMH continue to host and maintain the WMO Global Campus Training Events Calendar, which was designed and built by the CIMH. CIMH contributed to the authorship of the *State of the Climate in Latin America and the Caribbean 2021*.

3.55 The Principal reported on the continued benefits of the international EUREC⁴A field campaign conducted east of the Caribbean islands during January-February 2020. CIMH was a co-developer of the international field campaign. The Principal highlighted a recent publication of a journal article by interns from the CIMH, related to the experiment.

3.56 Council was informed of the status of the CIMH training programme. It was noted that several challenges faced, in particular (i) many students appear not mentally ready for online learning; (ii) some students lack the resources to effectively participate in online learning; and (iii) some Services continue to utilize students even though they are supposed to be on study leave. The Principal noted that the Hydrology programme continues to see low enrollment.

3.57 The Principal informed the Council that the Regional Climate Center continued (i) to deliver quality products and services to the region and (ii) to identify ways to enhance the usability of its products and services to sector practitioners. Council was informed that the Caribbean Climate Outlook Forums continued to attract significant participation.

3.58 The Council was informed of the significant contributions the CIMH made to disaster risk reduction efforts across the Caribbean in 2022.

3.59 Council was informed of new and emerging global and regional activities of CIMH, including SERVIR Amazonia training in Barbados, which is supported by the International Center for Tropical Agriculture (CIAT). Other activities include meeting with the Taiwan mission in Saint Lucia around areas of technical cooperation and ongoing support to maintain and sustain its climate monitoring investment in the country;

3.60 Council was further reminded that it was Member States contribution that funded the CIMH. Although Members expectation should be adjusted based on the subventions that were received, however, that was not the case. CIMH met Members expectations by conducting low risk commercial consultancies, utilization of project overheads to support operations, funding received from the University of the West Indies and Cave Hill Campus for training provided. However, there were emerging challenges to these financial operations, which include:

- A need to strengthen fiduciary systems to meet international development standards;
- Staffing needs and organizational structure would have to be addressed to match the increasing opportunities;
- Addressing the infrastructural needs in the post-COVID-19 world.

3.61 **The Council**

Noted the Principal's Report.

3(c) The CIMH's Board of Governors Report

3.62 The Chairperson of the CIMH Board of Governors (BoG) presented to the Council, the following decision that was made at the 59th Meeting of the Board, which took place on 21-22 November 2022.

- (i) The BOG **agreed** that:
 - a. the HR Committee should examine the matter of the recruitment Deputy Principal and report back to the BOG.

With reference to Document 4.1 – BWU/CIMH matters:

- (ii) The BOG **agreed** that
 - a. the matter of staff loans should be referred to the HR Committee and the Principal for further discussion and recommendations.
 - b. the CIMH negotiation team should meet with the BWU and discuss the matter of additional security officers for the institute.

With reference to Document 4.6 – Statement of the Accounts:

- (i) The BOG **agreed** to:
 - a. the establishment of a Finance Committee to assist with the analysis of the audited financial statements, and to provide a report to the BOG. This Committee would comprise persons within the CMO Member States who possess the requisite expertise. The Member States that voted for the establishment of the Committee were Antigua and Barbuda, Barbados, Belize, the Cayman Islands, Grenada, Jamaica, St Kitts and Nevis and Trinidad and Tobago.
 - b. the establishment of an ad-hoc Finance Committee to review the audited financial statements for FY2021. The ad-hoc Finance Committee will comprise Member States: Belize, the Cayman Islands, and Grenada; and
 - c. that the ad hoc Committee should revert to the BOG before the end of December 31, 2022 on a decision whether to accept/not accept the audited financial statements for FY2021.

With reference to Document 4.7 – Staffing Matters:

- (i) The BOG **agreed** to defer discussion on staffing matters and arrange a special meeting to discuss the document (4.7) on December 01, 2022 via Zoom.

With reference to Document 5.1 – Estimates of Expenditure for the Financial Year 2023:

- (i) The BOG **agreed** to the Estimates of Expenditure of **USD X,XXX,XXX (BBD X,XXX,XXX)**, which is an increase of 1.1 percent relative to the Estimates for FY2022, to be presented to the Council.

With reference to Agenda Item 6 – Strategic Plan 2020 – 2024

- (i) The BOG **agreed** to accept the CIMH Strategic Plan 2020 – 2024

With reference to Any Other Business:

- (ii) The BOG **agreed**
 - a. to the contract for services of a Marketing Specialist to be paid from revenue earned by the CIMH; and

- b. that the Principal should submit three options for the funding of a Content Manager for the website for the Institute.

3.63 **The Council**

Noted the decisions emanating from 59th Meeting of the Board of Governors.

4 STATUS OF ACTION FROM THE PREVIOUS SESSION

4.1 Following every session of the Council, the CMO Headquarters produces a single document containing an Action Sheet that allows the Council to follow-up on the actions taken on the decisions of its previous session, and to discuss any further actions if required. A summary of the decisions of CMC61 (Virtual) was presented to Council, giving the status of actions taken to implement these decisions of Council, and indicating areas where action as proposed had not materialized.

4.2 Council was informed of decisions from the previous meeting that would be reported on in this Session. For CMC61, The Human Resources-related CMC61 Action Items 12.2 and 12.2 were reported under “Other Matters”, CMC63 Agenda Item 12.

4.3 **The Council:**

- (i) **Noted** the Status of Actions from CMC61.

5 SPECIAL WMO ISSUES

5(a) Outcomes/Highlights of 75TH Session of the WMO Executive Council

5.1 Council noted that the Coordinating Director, *Dr Arlene Laing*, an elected Member of the Executive Council, led a strong delegation to the 75th Executive Council on 20-24 June, comprising *Mr Glendell De Souza* and *Mr Kenneth Kerr* of the CMO Headquarters in Geneva and *Dr David Farrell*, Principal of the CIMH, online. The involvement of this team, along with President of RA IV, *Mr Evan Thompson*, increased the regional input to the session and facilitated the critical follow-up actions to prepare our region for the 19th Congress in 2023. Council also noted that *Dr Arlene Laing* has been a Member of the Committee for the WMO Research Award for Young Scientists since 2019. Council was asked to encourage nominations of young Caribbean scientists to help advance and promote regional research and development.

5.2 At the 74th Executive Council, the Coordinating Director was asked to serve on the *EC Task Force on the Evaluation of the WMO Reform*; a Task Force chaired by the President of the WMO. The Task Force was completing its recommendations, to be reported to 76th Executive Council and the 19th World Meteorological Congress.

5(b) WMO Integrated Global Observing System – Initial Operational Phase

5.3 The Council recalled that for the last several years, significant discussions have been held on the *WMO Integrated Global Observing System (WIGOS)*. WIGOS is an all-encompassing approach to the improvement and evolution of WMO’s global observing systems, which was needed in all countries to consolidate progress in meteorological research, numerical modelling, and computer and communication technologies. Closely tied to WIGOS was the implementation of the *WMO Information System (WIS)*. WIGOS, together with WIS, form the basis for the provision of

accurate, reliable and timely weather, climate, water and related environmental observations and products by all Members and WMO Programmes, which would lead to improved service delivery. Both WIGOS and WIS are very essential to all technical and scientific activities of Meteorological Services in the Caribbean and worldwide.

5.4 The Council noted that WIGOS became operational in 2020 and that, as with all Member States of WMO, CMO Member States should be in full preparation for implementation. The goal was for all Member States and their partners to benefit from a fully operational system. Council noted that the focus was on getting the Meteorological and Hydrometeorological Services of CMO Member States ready in the first instance, while efforts continue to bring partner institutions and organizations on board as contributors to WIGOS.

5.5 As decided by the 73rd WMO Executive Council, Member States are to adopt the updated *Guide to the WMO Integrated Global Observing System* (WMO-No. 1165), with effect from 1st October 2021. WMO recognized that significant capability gaps and other challenges remain. Those would need to be addressed during the strategic period 2020-2023, in order for the system to fully serve all WMO application areas and help Members exploit the full potential of partnership agreements. The highest priorities for WIGOS during this period would be:

- 1) National WIGOS implementation, including necessary capacity development, partnership agreements and integration of observing systems for all application areas;
- 2) Fostering a culture of **compliance** with the WIGOS technical regulations;
- 3) Implementation of the Global Basic Observing Network (GBON) and the Regional Basic Observing Networks (RBON);
- 4) Operational deployment of the WIGOS Data Quality Monitoring System (WDQMS);
- 5) Operational implementation of Regional WIGOS Centres (RWC);
- 6) Further development of the Observing Systems Capability Analysis and Review (OSCAR) databases.

5.6 Council was reminded that National Meteorological Services (NMS) are required to develop a **National WIGOS Implementation Plan** (N-WIP)—to describe how the NMS would partner with other national entities to create a comprehensive strategy for the implementation of a national observing system, to collect, manage and store meteorological, hydrological, and other relevant data. Council noted that the CMO Headquarters provided NMSs with a self-assessment template for the identification of gaps in their observing systems and examples of completed assessment to assist in the completion of their assessment. Further, NMSs of Members States that were not Members of WMO were provided with a form for the input of their data, which was required for the updating of their observational metadata which is stored on the WMO metadata database called Observing Systems Capability Analysis and Review (OSCAR)/Surface. The updating of the database was a requirement of establishing their N-WIP. Council **urged Member States to support their NMS in the development of a National WIGOS Implementation Plan** by facilitating and enabling the necessary data policies and partnerships to integrate information about data related to weather, climate, and water and the environment.

5.7 The Council recalled discussions of the concept of *Regional WIGOS Centres* (RWCs), as a vital part of the implementation of WIGOS. RWCs provide regional coordination, technical guidance, assistance and advice to Members and partner organizations through regional WIGOS performance monitoring and incident management. A Virtual **Regional WIGOS Centre** in Regional Association IV (North America, Central America and the Caribbean) (RA IV), was approved, as a collaborative effort of the United States National Weather Service, Environment Canada, the CMO Headquarters Unit, and the Trinidad and Tobago Meteorological Service, and endorsed by the RA IV Management Group in January 2020. The RWC functions are to monitor and evaluate the availability, timeliness, and quality of observation data, where the CMO HQ and TTMS would cover

the English-speaking Caribbean. A workshop on Regional WIGOS Centres was scheduled for RA IV on 12-15 December 2022.

5 (c) The Global Framework for Climate Services (GFCS)

5.8 Council recalled that the **Global Framework for Climate Services (GFCS)**, a UN-led initiative spearheaded by WMO, was being implemented throughout the world to guide the development and application of science-based climate information and services in support of decision-making at national, regional, and global levels. Via Resolution 20 (Cg18), the governing structure for the GFCS was changed to the *Climate Coordination Panel (CCP)* which reports to the WMO Executive Council. The CCP includes the following: (i) Subgroup on the WMO contribution to the GFCS, (ii) Subgroup on climate policy and (iii) GFCS Partners Advisory Committee (PAC), the mechanism for stakeholder engagement in GFCS.

5.9 The priority areas for the GFCS are (i) agriculture and food security (ii) disaster risk reduction, (iii) energy (iv) health and (v) water. Implementation of the GFCS was through eight (8) global projects, many with an emphasis on developing countries and Small Island Developing States. In this regard, several of the GFCS Projects involve the CIMH, which was implementing the five GFCS pillars plus other sectors of importance, such as tourism, at the regional level. One such project is the *ACP-EU Climate Services and Related Applications (ClimSA)* that the CIMH was implementing on behalf of the CMO. That project would benefit a number of CMO Member States through the development of National Frameworks for Climate Services. The CMO Headquarters was supporting the CIMH in this project.

5.10 The Council also recalled that, through a WMO-CMO Implementing Arrangement, *National Frameworks for Weather, Water, and Climate Services* and *complementary Action Plans* are included *Strategic Plans* for the National Meteorological and Hydrometeorological Services of eight beneficiary CMO Member States implemented by CMO Headquarters. For 2022, two more Strategic Plans are being implemented by CMO Headquarters (presented under Agenda Item 11). Implementation of this project was supported by CIMH to ensure compatibility and complementarity in Member States in which they are developing National Frameworks for Climate Services.

5 (d) Issues emerging from WMO Technical Commissions and Research Board in 2022

5.11 The Council noted that Second Session of the **Commission for Weather, Climate, Water and related Environmental Services and Applications** (Services Commission, SERCOM-2) was held during 17-21 October 2022. The Coordinating Director, *Dr Arlene Laing*, led the British Caribbean Territories (BCT) delegation, which included *Mr Kenneth Kerr*, *Mr John Tibbetts* (Cayman Islands), *Ms Kathy-Ann Caesar*, *Dr Cedric Van MeerBeeck* (CIMH), and *Mr Haley Anderson* (CMO Headquarters).

5.12 The Council was **strongly urged** to pay careful attention to the *Executive Action Plan* to achieve the **UN Global Early Warning for all Initiative** that was presented and approved by SERCOM-2 (**Annex V**). Specifically, Members were urged to note that **US \$3.1 Billion** has been identified as necessary **to accomplish the Early Warnings for All initiative**, distributed among the four pillars of Early Warning Systems. **The largest allocation, US \$1.18 Billion, is under Pillar 2 – Observations and Forecasting**, which is the **responsibility of National Meteorological and Hydrometeorological Services**. It was noted by the Coordinating Director that this funding will be distributed via programmes such as the *Climate Risk and Early Warning Systems (CREWS)* and the *Green Climate Fund (GCF)*. Therefore, Members were urged to develop governance, budgetary,

and other mechanisms so that they will be able to access this funding to ensure that they can effectively contribute to early warning systems.

5.13 Council was informed by the Coordinating Director of the collaboration between GCF and CREWS to fast-track projects where there has been success in the implementation of projects through CREWS. It is hoped that CMO will be able to access this new track for funding, having been successful in implementing its projects through the CREWS Caribbean Project.

5.14 The decisions of SERCOM-2 of interest to CMO Members were shared with the Council under Item 5 (CMC63 Doc 5).

5.15 The Council was informed that *Dr Arlene Laing* and *Mr Kenneth Kerr* represented the British Caribbean Territories (BCT) in the Second session of the **Commission for Observation, Infrastructure and Information Systems** (INFCOM-2) on 24-28 October 2022. After lengthy discussion, the session approved draft amendments to the *WMO Technical Regulations, Volume I - General Meteorological Standards and Recommended Practices* (WMO-No. 49); ...

5.16 The Council was informed of the **new Climate Normals for 1991-2020**, recommended for collection and publication by INFCOM. CMO Headquarters facilitated the participation of National Meteorological Services in WMO Training on *Climatological Standard Normals*. National Meteorological Services of CMO Members States are **urged** to:

- 1) Start calculating and publishing 1991-2020 Climatological Standard Normals nationally as soon as possible with the aim of completion of the Global climate normals (CLINO) (WMO-No. 847), ideally not later than end of 2023;
- 2) Launch a broad communication campaign to promote the updated Climatological Standard Normals and to clearly communicate Normals' update implications to NMHS internal and external users as well as the general public;
- 3) Contribute to the WMO collection of Climatological Standard Normals 1991-2020.

5.17 The Council was asked to note that the **WMO Research Board** (RB) met in September 2022 to discuss and review the Terms of Reference of the Research Board, WMO Research Programme activities, the status of RB Concept Notes on research goals, and a *WMO World Climate Research Programme (WCRP) Open Science Conference* being planned for 2023. Council was reminded that the Coordinating Director, *Dr Arlene Laing*, is a member of the WMO Research Board representing RA IV (North America, Central America, and the Caribbean).

5.18 The Council was asked to note that the **Research Board** has developed Concept Notes that articulate high-level scientific priorities and key activities needed in a manner that was attractive and accessible to the broad scientific community and to partners who were not familiar with WMO. The *Science for Services* Concept was the overarching umbrella for the other concept notes. Council noted that *Dr Arlene Laing* led the Concept Note on "*Innovation in Regions*". During 2022, Concept Notes on "*Exascale Computing and Data Handling and Artificial Intelligence*" and a "*Hydrology Research Strategy for the WMO*" were finalized and will be published as official documents of WMO.

5 (e) Disaster Risk Reduction and Regional Severe Weather Forecasts and Warning Systems

TROPICAL CYCLONE PROGRAMME

5.19 Council recognized that activities within the WMO *Tropical Cyclone Programme* (TCP) were among the most important to the Caribbean and other tropical basins, with the most critical regional activity being the WMO *Hurricane Committee*, serving the *North Atlantic and Caribbean Basin*. The Hurricane Committee has at its core, *the US National Hurricane Center*, which was one of WMO's

primary *Regional Specialized Meteorological Centres* (RSMCs) for tropical cyclones. Most Meteorological Services in CMO Member States are represented on the Hurricane Committee which, along with the relevant regional and national disaster management community, work continuously towards the reduction of disaster risks by tropical cyclones, particularly in terms of loss of lives.

5.20 Council noted that the **44th Hurricane Committee** met via videoconference on 25-28 April 2022, included a review of the 2021 Hurricane Season and its impacts, which had the additional challenges presented by the COVID-19 pandemic. The Operational Plan was updated for 2022.

5.21 The Council noted the forecast successes, challenges, and statistics of the 2021 season, presented by Mr Dan Brown, RSMC/NHC.

5.22 The Hurricane Committee's Technical Plan was updated. The report of the Hurricane Committee provided information on programmatic elements, such as the upper air observation network and training. High-resolution storm surge modeling developed through the *Coastal Inundation Forecast Initiative* (CIFI), operational in Dominican Republic and Haiti in 2019, was expanded to the Yucatan and Belize and the Bahamas, in collaboration with the USAID and National Weather Service (NWS) International Affairs.

5.23 The **Council**:

- (i) **Noted** the decisions of the 75th session of the Executive Council (EC)
- (ii) **Encouraged** WMO Member States to be prepared to take advantage of resources available through the funding mechanisms available to support ***Early Warnings for All***
- (iii) **Noted** the activities of the WMO Commissions and Research Board
- (iv) **Urged** WMO Members to nominate experts to RA IV subsidiary bodies and the WMO Expert database to expand Member participation in WMO constituent bodies.
- (v) **Urged** CMO Member States to ensure that their NMHSs complete activities for the Operational Phase of WIGOS, which began in 2020;
- (vi) **Noted** the activities on the proposed *Virtual Regional WIGOS Centre* (RWC) as a collaboration among the US, Canada, CMO Headquarters and the Trinidad and Tobago Meteorological Service;
- (vii) **Continued** its strong support for the *Global Framework for Climate Services* and to **urge** Member States to actively participate in GFCS projects and activities;
- (viii) **Noted** and **supported** the important work of the regional Hurricane Committee

6 FINANCIAL REPORTS

6(a) Status of Refundable Balance

6.1 The Council was reminded that the annual contribution to the WMO due from the British Caribbean Territories (BCT) is paid by the CMO Headquarters (CMO HQ) on behalf of the British Government. This contribution is included in the annual budget of the CMO Headquarters and hence, in the individual CMO Member State's contribution to the CMO Headquarters. By long standing agreement, the full contribution due to the CMO HQ by the BCT Members, as well as a percentage (73%) of the BCT's contribution to the WMO, is refunded to the CMO HQ by the UK Department of Transport upon submission of an invoice with the accompanying annual audited Financial Statements of the CMO HQ. This amount, in turn, is refunded to the Member States that are also Member States and/or Member Territories of the WMO.

6.2 The basis for apportioning the amount refunded by the UK Department of Transport was revised in 2018. Under this new method non-BCT Members are refunded the full amount included in their annual contribution to the CMO HQ while the five BCT Members bear the percentage (27%) that is not refunded.

6.3 By Members' consent, these funds are held by the CMO HQ Unit to assist Members in attending important Meteorological/Hydro-meteorological Meetings, participating in training opportunities and purchasing spares.

6.4 Apportionment of any refund received from the British Government was based on the assumption that all Member States are meeting their annual contributions to CMO on a regular basis. In reality, however, some Member States were in arrears of contributions to the CMO Headquarters. Therefore, although the Refundable Balance reports the amount available to the Member State, access to draw-down was linked to their financial status with the Organization and may be restricted.

6.5 At the 60th session of the Council (2020), it was agreed that a Member State in arrears of contribution to the CMO HQ shall, after meeting its full contribution for two successive years, have access to the amount credited to its Refundable Balance account for the first of these years. Access to successive years' refundable balances shall be dependent on liquidating the arrears due for additional years.

6.6 In keeping with a decision made during the 47th session of the Council (St Vincent and the Grenadines, 2007), each session of the Council is provided with both the current status of the Refundable Balances held at the CMO HQ on behalf of CMO Member States, as well as, the amount available for draw-down by each Member State.

6.7 The current status of the Refundable Balances held at the CMO Headquarters behalf of CMO Member States at 15 October 2022, as well as, the amount available for drawdown based on the decision taken at CMC60 is shown below:

BRITISH CARIBBEAN TERRITORIES	USD * BALANCE	USD AVAILABLE FOR USE	FINANCIAL STATUS	COMMENT
Anguilla	32,622	32,622	Current	
BVI	31,857	31,857	In Arrears	2021 & 2022 O/S
Cayman Islands	50,834	50,834	In Arrears	2022 O/S
Montserrat	23,921	23,921	Current	
Turks and Caicos Islands	43,867	43,867	Current	
	183,101	183,101		
<u>CMO MEMBERS OF WMO</u>				
Antigua & Barbuda	4,897	-	In Arrears	2020, 2021 & 2022 O/S in addition to 10 years short payments
Barbados	11,547	11,547	Current	
Belize	2,148	2,148	In Arrears	2021 and 2022 O/S
Dominica	3,710	1,156	In Arrears	2021 and 2022 O/S in addition to 13 years (2002-2014) non payment
Guyana	4,577	4,577	Current	
Jamaica	43,052	43,052	Current	
Saint Lucia	4,539	4,539	Current	
Trinidad and Tobago	1,327	1,327	Current	
	75,797	68,346		
TOTAL	258,898	251,447		

* USD equivalent calculated at prevailing rate of exchange at 15 October 2022

6.8 The Council

Noted the status of the Refundable Balances Account based on the decision taken at CMC60 with respect to availability of funds for drawdown by Members States in arrears of contribution to the CMO HQ.

6(b) CMO HQ - Auditor's Report

6.9 The financial statements of the CMO HQ are audited by the Auditor General's Department of Trinidad and Tobago.

6.10 The Council

- (i) **Reviewed** and accepted the audited financial statements for 2021;
- (ii) **Reaffirmed** the continued use of the Auditor General's Department of Trinidad and Tobago for the provision of audit services for the Headquarters of the CMO as provided by the Government of Trinidad and Tobago for the audit in 2022;
- (iii) **Decided** that the ad-hoc Finance Committee that formed to review the CIMH audited financial statements for 2021 would be asked to review the CMO Headquarters Unit audited financial statements for 2021 and report to Council.

6(c)-1 CMO HQ - Statement of Contributions and Arrears

6.11 The *Caribbean Meteorological Council* (CMC), as the Governing Body of the Caribbean Meteorological Organization (CMO), is responsible for approving the budgets of both organs of the CMO, namely the *Headquarters Unit* (CMO HQ) and the *Caribbean Institute for Meteorology and Hydrology* (CIMH). Once approved, it is hoped that all Member States would honour their commitment to meet their annual contributions towards these budgets in a timely manner.

6.12 Annual contributions received from Member States, and more importantly, the timing of these contributions, have shown marked improvement in 2022. Table 1 below, summarizes contributions received over the last five (5) years.

	Full Year 2018	Full Year 2019	Full Year 2020	Full Year 2021	YTD 15 OCT 2022
ANNUAL COLLECTIONS:					
- % of Current Assessed Contributions Collected	68%	74%	53%	75%	77%
- % of Arrears Collected	12%	21%	86%	39%	21%
COLLECTIONS TOWARDS CURRENT CONTRIBUTIONS					
- # of Members making FULL contribution	10	12	8	8	9
- # of Members making PARTIAL contribution	1	1	1	0	1
- # of Members making NO contribution	5	3	7	8	6
COLLECTIONS TOWARDS ARREARS					
- # of Members paying arrears IN FULL	2	6	3	3	4
- # of Members paying arrears IN PART	2	0	0	2	2
- # of Members making NO PAYMENT	3	2	2	5	3

TABLE 1: SUMMARY OF CONTRIBUTIONS RECEIVED FROM 2018 TO 2022

6.13 Short payment and non-payment of contributions by Member States may delay the implementation of activities planned for the CMO HQ which are aimed at strengthening the resilience of Member States to the socio-economic impacts of environmental factors.

6.14 The Council

- (i) **Examined and discussed** the detailed Statement of Contributions and Arrears to the CMO Headquarters at 15 October 2022.
- (ii) **Invited** Members to **propose** measures to be taken to liquidate portions of the arrears outstanding to the CMO Headquarters.

6(c)-2 CIMH - Statement of Contributions and Arrears

6.7 The Council was provided with a report from the CIMH on the subvention which were received as at 30th September 2022, the end of its reporting period. CIMH received only 36% of its approved Estimates of Expenditure by 30th September. For the same period in 2021, 52% of contributions were received.

6.8 It was noted that CIMH continues to provide full service to all Member States regardless of the position of their indebtedness to the Institute. However, the non-payment of subventions and arrears limits the ability CIMH to service the needs of Member States as well as the needs of the international community.

6.9 Council deliberated the matter of longstanding arrears and strategies for settling the arrears. It was noted that some Members continue to demonstrate a lack of urgency in addressing their indebtedness and staying current with their subventions. Members discussed how to assess the efforts of Members to meet obligations. One suggestion was to find some method by which arrears could be settled in the currency of the Member States; how CIMH could derive benefit from other services that could be offered in the Member States in question.

6.10 Council was urged to assess and determine how much of the outstanding debt, if not all, is receivable and agree to a schedule to have debts settled within a specific period. The Principal cited the example of Grenada with which CIMH worked out a seven-year plan for clearing arrears, whereby extra payments were made on a regular basis.

6.11 **The Council**

- (i) **Noted** the important role that CIMH is playing in climate adaptation and disaster risk reduction across the region; and the negative impacts that poor funding can have on activities that were critical to the sustainable development of Member States;
- (ii) **Discussed** how to have the debts settled.
- (iii) **Encouraged** Members with arrears to make a plan to liquidate their arrears over a specified period
- (iv) **Requested** the ad-hoc Finance Committee to consider solutions for clearing arrears and report to Council.

7 SPECIAL CMO ISSUES

7(a) Review of Caribbean Community (CARICOM) Institutions

7.1 Council recalled that CARICOM would conduct a review of its Community Institutions to determine their efficacy and to make them "fit for purpose", as notified by the Coordinating Director and Principal of CIMH during Intersessional Meeting No 1 of the 61st Council, held virtually on 1 February 2022. The Review has the following objectives and purpose:

1. Overall Objective: To determine the efficacy of Community Institutions and obtain actionable, and timely recommendations which will enable CARICOM to streamline its institutions, making them 'Fit for Purpose', able to deliver equitable and gender-sensitive services to the Member States; to improve the oversight of Community Institutions by the Community through the rationalisation of their functions, resources, structures and governance arrangements, and to improve effectiveness and efficiency.
2. Purpose: To improve the efficiency and effectiveness of the 17 Community Institutions.

7.2 Council further noted that, per the Agreement for the Establishment of the CMO, the CIMH is an Organ of the CMO and operates under the legal and governance structure of the CMO, while the *Revised Treaty of Chaguaramas* (RTC) lists both the CMO and the CIMH as regional institutions. After an initial joint meeting on 3 March 2022, the consultants interacted separately with CMO Headquarters Unit and CIMH. However, CMO Headquarters Unit and CIMH later exchanged their responses to the Consultants' first preliminary report, clarifying and expanding on information presented in each respective report.

7.3 Council noted that the CMO Headquarters Unit provided information to the consultants via responses to questionnaires, provisions of many documents and reports; participation in several consultation meetings and responding to the preliminary reports from the Review.

7.4 Council also noted that a second preliminary report had favourable preliminary observations:

“CMO performs a key role in coordinating regional meteorological services, implementing programmes and projects, supporting capacity building of National Meteorological Services, and representing the Caribbean Region in global meteorological and civil aviation fora. CMO enjoys a favorable reputation in the global meteorological community, with ongoing relations with other CARICOM institutions, the WMO, and ICAO. CMO’s strategic direction is supported by its strategic plan which is aligned with CARICOM’s strategic plan. Its technical focus has been on meteorology, however there is scope for further integration of support for hydrology capacity building.

Among the challenges identified for CMO is the apparent ambiguity regarding the relationship between the CMO and the CIMH, which stems from the inclusion of both the CMO and CIMH as separate Institutions under Article 21 of the RTC, even though the latter is an organ of the former.

A good net income outturn has ensued over the review period. Realizing the flow of MS contributions, given the reliance on this source, is the main threat to CMO’s ability to pursue strategic goals sustainably, and assure its long-term solvency. CMO has built up good capital adequacy with its accumulated surplus representing over 65 months of overheads. However, its financial capacity remains challenging, given lagging contributions. Impairment provision accounts for one year of contributions, good relative to other Cis. A progressive capital growth trajectory is noted; its continuity would further build adequacy.”

7.5 Council was informed that consultations with stakeholders has been continuing since September, including a survey request to officers of the CMO Headquarters.

7(b) 50th Anniversary of the Agreement to Establish the CMO

7.6 Council was reminded that October 2023 will mark the 50th Anniversary of the establishment of the CMO. Council will be pleased to learn that Trinidad and Tobago, the Host Country of the CMO Headquarters, has expressed its desire to host the Council for its Annual Session in 2023, concurrent with the 50th anniversary of the Agreement to establish the CMO. To celebrate this milestone anniversary, CMO Headquarters intends to establish a coordinating committee. Member States were requested to nominate a focal point to the committee, who will be the national contact for long-standing and retired members of the CMO community.

7(c) CMO Headquarters Staff Terminal Benefit Fund Trustee

7.7 Council recalled that, due to the small size of the staff complement, the Headquarters Unit does not have a staff pension fund, but instead operates a Headquarters *Staff Terminal Benefit Fund*. The Fund, which was established in 1995, requires three Trustees as signatories (CMC63, Doc 7, Annex I). Since inception, the first two have been the Coordinating Director and the Administrative Officer, while, for convenience and expediency, the third Trustee has been the Director of the Trinidad and Tobago Meteorological Service, with approval from the parent Ministry. However, since the retirement of the former Director of the TTMS in 2018, the third Trustee position has been vacant. During the 61st CMC Session (Guyana, Virtual Platform), the delegate from **Jamaica** offered to serve, pending approval by the parent Ministry. Nevertheless, the position remains open. Council was asked to discuss and resolve the matter, as the current status is delaying the required registration of the Fund as a Pension Plan within Trinidad and Tobago.

7.8 After a brief discussion, Council decided to nominate the *Principal of CIMH* to serve as the third Trustee.

7(c) Arrangements for Meteorological Forecast and Warning Services among CMO Member States

7.9 The Council held an extensive discussion on the recommendation of the committee assigned to review modification of the agreements for forecast and warning responsibilities of National Meteorological and Hydrometeorological Services (NMHS) of the CMO Member States in the north-eastern Caribbean. Since the inception of the CMO in 1973, the Council agreed on the responsibilities of the NMHS of the States with Forecast and Warning Offices for those States without such offices. The arrangements have been modified in the intervening years but the fundamental premise of major cooperation and collaboration among all nations, on which the CMO was established, remains. The 50th session of the Council re-formalized the forecast and warning arrangements. The 51st Session of the Council reiterated Resolution 2 of the 50th Session of Council and reconsolidated the interface between its own arrangements and those of the WMO-led Regional Hurricane Operational Plan.

7.10 Council recalled that questions were raised by the Antigua and Barbuda Meteorological Service about the formalities of the process and related costs for the services provided. So, Council agreed to form a committee to review and discuss cost recovery as a part of regional forecasting arrangements and make a recommendation to the Council. The Committee met on 25th February 2022 and elected Guyana and Belize to serve as Co-Chairs. The Committee expressed the view that the Antigua and Barbuda Meteorological Service should be having discussions with the respective Civil Aviation Authority of the four States to whom they provide services, instead of the various Meteorological Services, since the Civil Aviation Authorities are end users. The committee presented the following draft recommendations for Council to consider:

- Encourage CMO Member States to develop a cost recovery mechanism at the national-level as a means of sustaining aviation meteorological services
- Support the Meteorological Services in lobbying the relevant authorities in their national government for cost recovery;
- Reaffirm the spirit of cooperation among Member States, reiterating the resolutions taken at CMC 50/51;
- Commit the Council and the CMO Headquarters to providing support to Member States in their bid for cost recovery, inter-regionally.
- Determine who the actual partners are in the negotiation. The Meteorological Services should not be the negotiator. End users (immediate stakeholders) should be included in the discussion of cost recovery as they would be the most affected.
- Develop a regional formulation for a cost-recovery that would apply across CMO Member States, not only for a specific set of arrangements between States.

7.11 The Council was reminded that ICAO requires that all meteorological services providers implement a quality management system (QMS) and that, prior to implementing cost recovery for aeronautical meteorological services, a QMS must be implemented.

7.12 Council also noted recent developments since the Committee meeting in February 2022. Under the auspices of the UK Department for Transport, proposals have been invited from meteorological service providers in the region, including the Antigua and Barbuda Meteorological Services (ABMS), to provide services to aviation in Anguilla, British Virgin Islands, and Montserrat, under a formal arrangement. It was reminded that the lack of a formal arrangement is contrary to the

requirements of the International Civil Aviation Organization (ICAO) Annex 3, and the matter has been outstanding for more than two years now.

7.13 The Coordinating Director asked if Antigua and Barbuda could respond to the request for proposals, given the requirements for QMS implementation and cost recovery. The delegate from Antigua and Barbuda indicated that his ministry was planning to form a committee to estimate the costs of the services.

7.14 Cayman Islands noted that the recommendations were generic and did not specifically address the matter of cost recovery across borders, which is the particular situation that would be involved in cost recovery for services provided by Antigua and Barbuda. The Principal of CIMH wondered if cross border agreements for cost recovery would need someone to audit the process so that, for example, if a percentage cost is agreed, the transaction amounts can be ascertained. At the meeting in February, it had been asked if there could there be a role for a regional entity such as the Eastern Caribbean Central Bank, if there is an eventual cost-recovery mechanism agreement.

7.15 Antigua and Barbuda stated that it would continue to provide services its neighbours in accordance with the CMO Resolution 1, while a resolution is sought. The delegate from Antigua and Barbuda noted that a Letter of Agreement for the provision of services to aviation in the neighbouring States had been submitted to its Cabinet and to the respective States to whom they currently provide services. Antigua and Barbuda noted that no costs are in the Letter of Agreement, but there is discussion of cost recovery being considered for the future. The delegate from Montserrat informed Council that his Service was advised not to sign the Letter of Agreement.

7.16 The Coordinating Director noted that there was a possibility that some other entity could propose to offer the services to aviation in Anguilla, BVI, and Montserrat, as the UK Department of Transport is preparing for ICAO audit of its overseas territories.

7.17 Council recalled the Statement issued by CMC58 (St Kitts and Nevis, 2018) with respect to QMS and the Eastern Caribbean Civil Aviation Authority's (ECCAA's) mandate with ABMS and other meteorological services in the OECS region, for the oversight of meteorological services to aviation ([CMC58 report, Annex III](#)). The statement requested ECCAA, *"to give priority to providing oversight and expanding regulatory support (even through outsourcing) to Quality Management Systems in the Meteorological Services of the various States in the OECS region"*.

7.18 The representative from ECCAA was an observer to the meeting and was asked if there was a role for ECCAA in cross-border cost recovery for services to aviation. He informed the meeting that ECCAA has no oversight with regard to financial agreement between the States. They do not look into the financing of meteorological services. It is for the providers of the service to determine cost. In response to a question from the Coordinating Director regarding provision of oversight for QMS, he noted that ECCCA can look at service provision, quality of service provision, or compliance with international standards. They have oversight of Civil Aviation Authorities in six Member States and are supportive of collaboration between states.

7.19 Council was also informed that Barbados continues to provide daily forecasts, while local forecasters in the receiving countries conduct their local briefings and make adjustments of the forecast during the day as needed; with Barbados on standby to support, as necessary. The current test phase started in 2020 with guidance from CMO Headquarters.

7.20 Council was reminded that revision of regional arrangements has implications beyond the Antigua and Barbuda Meteorological Service. The delegate from Barbados noted that the Barbados Meteorological Service is not doing cost recovery for services provided to Dominica and St Vincent

and the Grenadines. They have been working with those two countries to develop their own forecast and warning capability and the CMO Headquarters has been advising those CMO Member States on developing the capacity to deliver those services locally.

7.21 Council recalled that Barbados Meteorological Services provides forecast and warnings for Dominica and St Vincent and the Grenadines by agreement with CMO and the WMO Hurricane Committee (CMC51, Resolution 1).

7.22 Council was informed of difficulties encountered with the issuance and cessation of watches and warnings in Dominica, as their internal official processes for approval of warnings or end of warnings have delayed the issuance of watches and warnings in a timely manner. In one instance it took eight hours (8) for approval to be received, which created great risk to the population during that period of delay. The resulting delays reflected poorly on the Barbados Meteorological Service (BMS). It was noted that the BMS has a good working relationship with the Dominica Meteorological Service and the Meteorological Service of St Vincent and the Grenadines.

7.23 As a result of the ongoing problems with the issuance and cessation of warnings for Dominica, Council was informed that Barbados intends to request a change in the wording of the watches and warnings for tropical cyclones that are issued by the WMO Regional Specialized Meteorological Center/US National Hurricane Center. Therefore, for example, where the text would normally state that "*The Government of Barbados has issued a Tropical Storm Watch for Dominica*", the text would be changed to state "*The Government of Dominica has issued a Tropical Storm Watch for Dominica*".

7.24 Council acknowledged the difficulties encountered by the Barbados Meteorological Service in carrying out its service to neighbouring Member States. It was noted that relevant line Ministers needs to be involved in this process in order to resolve this matter and CMO Headquarters was asked to facilitate discussions with senior officials of the governments involved.

7.25 **The Council**

- (i) **Noted** the Review of Caribbean Community Institutions and the preliminary observations of the Review
- (ii) **Requested** Members to nominate a national focal point for the 50th Anniversary Coordination Committee
- (iii) **Nominated** the Principal of the Caribbean Institute for Meteorology and Hydrology to serve as the third Trustee for the CMO Headquarters Staff Terminal Benefit Fund
- (iv) **Noted** the recommendations of the Committee with regard to the regional forecast and warning arrangements and cost recovery and **agreed** to defer a decision until an interim meeting of the Council.
- (v) **Noted** the intent of Barbados to request a change in the wording of the text of the watches and warnings for tropical cyclones to reflect that the government of Dominica is issuing watches and warnings for Dominica.
- (vi) **Requested** that the CMO Headquarters facilitate discussions among the senior officials of Barbados and the Member States for which it provides

forecasts and warnings and to attempt to resolve the matters related to the issuance of watches and warnings for tropical cyclones.

8 CMO BUDGETS (HEADQUARTERS UNIT, CRN AND RADAR, CIMH)

8(a) CMO HQ - Estimates of Expenditure for 2023

8.1 Budget estimates of the operating costs for the CMO Headquarters Unit (CMO HQ) and contributions to the Caribbean Rawinsonde and Radar Networks (CRN) for 2023 were presented to the Council for examination and approval.

8.2 The total estimate for 2023, upon which **the contributions from Member States are based**, is **TTD X,XXX,XXX**, or the equivalent of **USD XXX,XXX**. This represents an overall decrease of 11.0% in comparison to the approved budget for 2022.

8.3 Closed borders, travel restrictions and other lockdowns imposed due to the COVID-19 pandemic drove innovation and increased use of technology to achieve objectives which resulted in savings in 2021 as confirmed by the audited financial statements of the CMO HQ for income year 2021 (CMC61 Doc.6b). A proposal to utilise the savings in 2021 to offer a rebate to Member States was presented to Council for approval.

8.4 The Council

- (i) **Approved** the budget of **TTD X,XXX,XXX** or the equivalent of **USD XXX,XXX** as detailed in **ANNEX III**, with Member contributions as indicated in **ANNEX IV**;
- (ii) **Approved** a rebate of **TTD 400,000** from unspent funds approved for 2021 which should be assigned to Member States on the same basis as the contribution formula effective in 2021. The rebate may be utilised in 2023 by those Member States that have already met the full contribution for 2021. Members in arrears may only utilise the rebate upon liquidating the contributions due for 2021.
- (iii) **Urged** Members to give priority to meeting annual contributions on a timelier basis, and to make every effort to liquidate arrears to the Organization;
- (iv) **Reminded** Members that when forwarding their contributions to CMO Headquarters by bank transfers, to deposit funds into the account noted on the invoice;
- (v) **Also Urged** Members to inform the CMO Headquarters of their transfer of funds, including the date, amount and currency, in order to address difficulties in properly identifying the origin of funds within the banking system.

8(b) CIMH - Estimates of Expenditure for 2023

8.5 The Estimates of Expenditure of the Caribbean Institute for Meteorology and Hydrology (CIMH) for Fiscal Year 2023 (FY2023) were presented for examination and approval by the Council after a detailed consideration by the Board of Governors (BoG) of the CIMH. The estimates cover the finances required to allow the Institute to effectively fulfill its mandate to the region. Significant reductions to the Institute's Estimates of Expenditure may negatively impact planned and ongoing activities.

8.6 The Estimates for 2023 show an increase of 1.1 % relative to the Estimates approved for fiscal 2022. The total expected expenditure for fiscal 2022 is BBD X,XXX,XXX or USD X,XXX,XXX. The US equivalent was also presented in keeping with the request of the 55th Session of Council requested that invoices for contributions by Member States be sent only in United States dollars

8.7 The Council

- (i) **Approved** the budget of **BBD X,XXX,XXX**, equivalent to **USD X,XXX,XXX**;
- (ii) **Urged** Members to give priority to meeting annual contributions, as well as liquidating any arrears of contribution due to the CIMH;
- (iii) **Also Urged** Members to inform the CIMH of their transfers of funds, including the amount and date.

9 MEETING OF DIRECTORS OF METEOROLOGICAL SERVICES

9.1 The Caribbean Meteorological Council considered the Report of the Annual Meeting of Directors of Meteorological Services, held on 23 November 2022, presented by *Mr Kenneth Kerr*, Science and Technology Officer of the CMO Headquarters. The Report provided the Council with a summary of the deliberations and recommendations of the Directors on a wide range of technical and scientific topics, which would have an impact on future costs, policy decisions, training opportunities and service delivery. The following two items were drawn to the attention of Council.

1. **Status of Actions from the Previous Meeting**

There was one action item, which required the Science and Technology Officer to develop software which can be used by the Meteorological Services of CMO Member States, in the encoding of aeronautical meteorological information in ICAO Meteorological Information Exchange Model (IWXXM) format. This requirement of the International Civil Aviation Organization (ICAO) has implications on international air transport within the Caribbean. Directors were informed that the software development was completed, tested against WMO schemas and was accepted. The software was sent to Member countries on February 28, 2022. Trial of the software was done by St Maarten and Trinidad and Tobago and RTH Washington accepted the messages.

2. **Operational Matters**

Binary Universal Form for the Representation of meteorological data (BUFR) Migration: WMO recommends that global exchange of observations be done in the Binary Universal Form for the Representation of meteorological data (BUFR). As of October 31, 2022, **only two (2) CMO Member States were reporting their surface observations in BUFR**, based on international monitoring maps. The following actions were recommended to enable Members to migrate to BUFR:

- Establish a migration strategy, including installation of available BUFR software with the goal that BUFR reports are generated directly from measured data where possible, instead of by converting/reformatting TAC reports;
- Strengthen and establish Members working relationships with other Members who have already implemented BUFR capability with a view towards getting assistance for implementing BUFR;
- Make sure all surface observation reporting is made available in BUFR format, in full compliance with WMO Manual on Codes;

- Establish parallel dissemination of TAC and BUFR as soon as possible, but only after providing all NWP centers with advanced warning;
- Undertake BUFR training for staff to facilitate the completion of migration activities.

Transition To ICAO Meteorological Information Exchange Model (IWXXM): - ICAO Meteorological Information Exchange Model (IWXXM) became a standard in the WMO Manual on Codes on November 15, 2021. This amendment mandates all Members to use IWXXM for the provision of information regarding observations and forecasts, and reports. Directors were urged to download and implement the **CMO-provided software** for the exchange of aviation meteorological information in IWXXM format and to identify a Focal Point with responsibility for IWXXM transition within their NMHS. Directors were also encouraged to strengthen working relationships with Members who have already implemented IWXXM capability.

WIGOS, OSCAR/Surface, WDAQMS Status: Directors were reminded that NMHSs are required, to implement and operate their observing systems in accordance with WMO standards and recommendations. Directors were also reminded that the initial WIGOS Operational Phase spans the period 2020-2023.

Implementation of Quality Management Systems for Aviation Weather Services Provision: Directors discussed at length the status of the implementation of Quality Management Systems (QMS) for the provision of aviation weather services in the line with the requirement by the WMO and the International Civil Aviation Organization (ICAO). Council was informed that large part of the discussion was on the barriers hindering successful QMS implementation and certification and the implications for Member States and the region as a whole. The recurring obstacles in the discussion was lack of resources, including financial constraints, lack of understanding and support by management, unavailability of trained QMS personnel/companies, and high cost of QMS certification.

Council was made aware that **noncompliance** in the implementation of ISO 9001:2015 QMS standard, which provides quality assurance of the process and procedures that produce the data and information needed by airlines; **jeopardizes the ability of the Member NMHSs to provide trusted information** and can ultimately affect the **future operations of the region's NMHSs if international airlines resort to alternative weather providers**. More directly, noncompliance will affect the category status of Member States airports and their ability to receive many international airlines and this will impact revenue generation. Council was informed that the **negative ramifications will undeniably affect cash inflows of airports**, civil aviation authorities, airlines, the aviation sector as a whole, and by extension **tourism, trade, transportation and economic sustainability** of the region. Government intervention and support is required.

9.2 The Council

- (i) **Discussed** and **accepted** that CMO Headquarters should embark on a process to incorporate a programme of actions, including baseline assessments of Member States QMS status, that leads to a regional project to facilitate QMS certification of members in the shortest possible time.
- (ii) **Requested** that, in line with action item (i), the CMO Headquarters should conduct a survey to map the status of the implementation of QMS for aviation weather services among Member States to determine their level of certification and implementation.

10 CMO WEATHER RADAR NETWORK

OPERATIONAL STATUS

10.1 Council was reminded of the operational environment of the CMO Weather Radar Network (CWRN), and the value of the radar network as critical infrastructure for weather monitoring, forecasts, and warnings in the Caribbean, including heavy rainfall, severe weather, and volcanic ash, which benefit sectors such as disaster risk reduction, aviation, agriculture, water resource management, etc. Also noted was the increasing value of the radar network in a warming Caribbean climate that is expected to experience more intense thunderstorm systems with warmer seas, with radars as a primary means of detecting and warning on rapidly evolving severe weather.

10.2 Council recalled that the CWRN is comprised of radars in Barbados, Belize, Grand Cayman, Guyana, Jamaica, and Trinidad. During November 2021 to October 2022, four of the radars (in Barbados, Belize, Cayman, and Guyana) functioned reasonably well. The Barbados radar was upgraded to a LEONARDO Germany Dual Polarization radar system, including replacing all radar hardware and software, and installing a new radar dome. The Guyana radar is in generally very good conditions. Guyana performs maintenance activities on a weekly basis but had a few radar outages reported (less than 24hrs), as a result of power issues and not with the radar itself. In Belize the radar worked almost continually, except for radar outages during scheduled maintenance and four (4) radar outages due to prolonged power outages and failure of the standby generator, which was eventually replaced with a new standby generator. The Cayman Islands radar experienced prolonged outage from October 2021 to August 2022 due to a faulty transformer. The radar returned to operational status with assistance from visiting LEONARDO Germany technicians. The CMO Headquarters continued to facilitate the purchase of parts using funds available to Members from the CMO Radar and Rawinsonde accounts, when requested.

10.3 The Trinidad and Tobago radar outage continued for a second year. Spare parts for troubleshooting were purchased, which advanced the troubleshooting process. Now, special external expertise is required to return the radar to operational status. LEONARDO engineer visited in March 2022 and recommended the purchase of additional spares to get the radar operational. Two (2) LEONARDO Engineers are expected to visit during the first quarter of 2023. An ongoing project aims to completely refurbish the existing radar tower and associated building infrastructure, together with the backup generator and other supporting equipment. Work is expected to commence by the end of December 2022.

10.4 Jamaica's new dual-polarized Doppler weather radar, funded under the Pilot Program for Climate Resilience (PPCR), passed the operational tests in December 2021 and six (6) meteorologists and three (3) instrument technicians received training on the new radar software and operations. The radar was set to be commissioned in later March, however on 9 March 2022, a major mechanical and structural defect occurred. The manufacturer investigated and was reported as committed to repairing the system by December 2022.

ADDITIONAL RADARS

10.5 Council was informed that the Tobago Meteorological Service Division (MSD) installed an EEC Ranger X-Band dual-polarization radar with a scan radius of 150km. Radar images currently not available for public access. Tobago MSD has a preventive maintenance schedule, but is challenged with adequate technical staff. Council recalled that in October 2021, Saint Lucia installed an X-band weather radar with radius of 120km. Council was informed that the radar worked for approximately three (3) months then encountered technical and mechanical issues that remain unresolved. Additional issues have developed and the Member is challenged in resolving the issues due to limited resources and expertise. The supplier has been engaged and promised an operational radar by the end of 2022. Council was also informed that Sint Maarten/St Martin installed a new

dual-polarization C-Band radar with a radius of 400km, funded under the European Territorial Cooperation policy/Interreg Caribbean Cooperation Program. The radar is currently undergoing operational testing. Council was asked to note that the new radars' overlap with neighbouring radars will ensure redundancy in case of any outages.

RADAR EXPERTISE, CAPACITY CHALLENGES, & ANNUAL OPERATING COST

10.6 Council was asked to note that knowledge and techniques on radar utilization, radar optimization, radar data mining, and interoperability are emerging niches but many challenges remain concerning the maintenance of the CMO radar network. The biggest challenge for Members with radars is sustaining the financial and technical resource commitment necessary for the continued maintenance and development of their radar programme. Preventative and corrective maintenance is a necessity, even though all radars will fail at some point in time, and the reasons for failure are often not related to the radar itself, but to associated infrastructure, such as power reliability, air conditioning failure, and telecommunications issues. Additionally, staff trained in radar operations will be attractive to other industries. Thus, retention of highly qualified staff will continue to be a challenge, and impact the operational cost.

CMO OPERATIONAL RADAR WORKING GROUP (CORG)

10.7 Council recalled that the *CMO Operational Radar Group (CORG)* was approved by CMC59 (Anguilla, 2019) as a mechanism for collaboration and exchange of knowledge and expertise on radar maintenance matters. The CORG is facilitating a consultative process for radar technicians and related Information Technology (IT) personnel to share experiences and technical information for the benefit of the region. The knowledge exchanged will assist our Member States that host these systems with radar management, preventative and other maintenance issues and in turn minimize radar down-time and keep network operations at an optimal level. Further, the National Meteorological and Hydrometeorological Services should be in a better position to meet their current and future national and regional obligations with regard to the provision of radar data.

10.8 Council noted that the first CORG meeting was held in June 2022, with fifteen (15) participants in attendance from Member States with weather radars, CMO Headquarters, and CIMH. After reviewing the CORG Terms of Reference, the meeting featured presentations on the upgrade of the Barbados radar to dual-polarization and an overview of weather radar principles, operations and maintenance. The Working Group agreed that there will be two Co-Chairs. Participants were invited to share their CVs with everyone. Subsequently, four (4) CVs were shared. Based on suggestions that the Co-Chairs must have technical experience in radar maintenance and operations, **Mr Brian Murray** of the Barbados Meteorological Service and **Mr Ian Persad** of the Trinidad and Tobago Meteorological Service were nominated as co-Chairs. The second meeting of the CORG was scheduled for December 2022.

NATIONAL FOCAL POINTS FOR WEATHER RADAR METADATA

10.9 Council was made aware that Members of CMO with radars are required to follow WMO recommendations on radar operations, adopt WIGOS and WIS standards, and make their data and metadata available through WMO Information System. WMO recommends that all WMO Members, either operating or intending to operate weather radar systems in support of the World Weather Watch Programme, should nominate a National Focal Point (NFP) for Weather Radar Metadata with responsibility for seeding and maintaining the weather radar metadata within the WMO Radar Database (WRD). The list of NFPs Weather Radar Metadata on the WMO Community Platform database shows only British Caribbean Territories, Jamaica, Belize and Trinidad and Tobago. Other Members were urged to nominate their NFP.

TECHNICAL STUDY OF CMO RADARS

10.10 Council was reminded that the CMO Headquarters had been collaborating with World Bank CREWS and a consultant, *Dr. R. Jeffrey Keeler*, on a technical study, which reviewed four (4) of the weather radars on the CWRN, namely Barbados, Belize, Guyana, and Trinidad and Tobago. The study focused on upgrading radars to dual-polarization, assessed potential for dual-polarization upgrade, ability to withstand strong hurricane-driven winds and lightning strikes and functionality and data availability for their respective meteorological services. The consultant visited the four (4) sites and submitted his final report to CMO and the World Bank.

PLANS TO UPGRADE RADARS TO DUAL POLARIZATION

10.11 Council was informed that apart from Barbados and Jamaica, most of the CMO radar infrastructure are beyond 12 years, approaching operational lifespan, and in need of an upgrade. Council was reminded that the CMO has been working with the Caribbean Development Bank (CDB) on proposal development to get funding from the CDB and other developmental partners to upgrade the radars and further strengthen the region's EWS and climate risk management. Radars can operate for in-excess of 15 years and cost estimates indicate that the ongoing life-cycle costs of the radar and the radar program are many times that of the initial capital costs. In this regard, the CMO has been approaching funding agencies to support not only the initial cost of the radar network upgrade but to also help to develop plans for how to fund ongoing maintenance over the expected lifetime of the radars.

10.12 Council noted that the proposed upgrading of the radars included capacity-development in radar operations for sustainability, which will need to be complemented by similar efforts in IT, to improve access to, and for effective manipulation and utilization of radar data. Building capacity involves:

- (a) Assisting radar host Members in implementation, operation, and management of existing and emerging radar systems;
- (b) Filling the existing gaps in radar operation and maintenance of Members' radar observing systems, including both the infrastructure and human capacity development;
- (c) Enabling technology transfer, technical assistance, and decision-support tools and innovations to optimize use of available and future radar data.

OPERATIONS OF THE REGIONAL RADAR COMPOSITE AND OTHER REGIONAL AND INTERNATIONAL OBLIGATIONS

10.13 The Council recalled that in recent years, the Barbados Meteorological Service (BMS) has made great efforts to create Caribbean radar composite maps, which follows operational obligations contained in the CMO Radar Network Project MOU's Article 6, subsection 6.8, "The Government agrees to participate in the creation of a regional Radar Composite System and Service" that mandates international exchange of radar data within CMO Radar Network. Council also recalled that there were two regional radar composites in operation. The first was the composite system generated at the French Meteorological Service (Météo-France) Centre in Martinique, which was developed through an agreement between Météo-France and the CMO. The second composite was developed separately by the Barbados Meteorological Service. From a practical point-of-view, the Barbados-generated composite was more widely used composite regionally, including by the US National Hurricane Center in Miami and other Caribbean States.

10.14 Council was reminded of three cooperation statements in the MoUs that CMO Radar Host Members committed to for the EU-funded CMO radar project, related to the sustainability of the national radars and the radar composite, are:

- *At the regional level, the data and images generated by all the Radar Stations will be collected and integrated into real-time composite radar images and made available to the NMHSs of all CMO Member States, as well as non-CMO States in the region.*
- *The CMO is also charged with the responsibility of monitoring the technical and operational aspects of the Radar Stations after commissioning to ensure that the overall short- and long-term objectives of the Project are realized.*
- *The CMO will guide its Member States on future application programmes and system upgrades for the radar systems.*

10.15 Council was also reminded of previous discussions, that a core problem with the current composite arrangement is that there is no formal arrangement. At CMC61 (Virtual Platform, 2021), it was reiterated that many users of regional radar data require access to observations from multiple radars simultaneously and value the composite. Council was asked to request Barbados to create a formal arrangement or long-term commitment by Barbados concerning the generation of the Caribbean radar composite maps.

10.16 Barbados reported to Council that the BMS has contracted its software development to an external firm, including the radar composite, thereby assuring its long-term sustainability (i.e., no longer relying on a single person).

10.17 Council was reminded that through the CREWS Caribbean Project, the CMO Headquarters has been coordinating the development of a Gridded Precipitation dataset comprised of radar, rain gauges, and satellite-estimated precipitation. The project was implemented by the World Bank, through a contract with the Centro Internazionale in Monitoraggio Ambientale (CIMA) Foundation. The resulting dataset, being prototyped over the Eastern Caribbean, is expected to be a valuable regional resource for early warning systems, climate monitoring, risk analysis for flooding, and water resource management.

10.18 Council was reminded that the CMO Radar Network has considerable potential for climate risk analysis and other scientific applications. Approaches for better utilizing of Caribbean radars and archived data, including setting up easy access to the full data archives; more usage would increase benefit to the region. For example, an archive of high-resolution radar rainfall estimates was valuable for understanding rainfall variability on the scale of small watersheds and provides improved flash flood guidance and knowledge of climatological extremes. Due to climate change, the Caribbean was expected to experience high variability in precipitation and radar information would offer guidance on the “new normal” for setting infrastructure standards and other necessary adaptation. An archived dataset with the combined point accuracy of rain gauge data and the superior resolution of the full radar data would be a valuable regional resource.

10.19 **The Council**

- (i) **Noted** the status of weather radars in the CMO Member States, and the potential for expansion of the network of radars when newly installed radars become operational.
- (ii) **Further noted** that, human and financial resources will be needed to sustain the CMO weather radar network and that Members should place greater emphasis on ensuring those resources.
- (iii) **Urged** Members to commit to sustainable funding and budgetary allocations for radar preventative and corrective radar maintenance and enhancement programs.

- (iv) **Noted** the formal establishment of the CMO Operational Radar Group (CORG), and its recent and planned activities, and **encourage** Members with radars to actively participate in the CORG.
- (v) **Supported** the CMO's efforts to upgrade the remaining radars to dual polarization status and acquire such funding that includes capacity development and sustainable inventories of spare parts for repair and maintenance.
- (vi) **Further supported** and **encouraged** targeted radar expertise and capacity development at Members NMHSs, including radar-related IT expertise and capacity development and hiring.
- (vii) **Urged** CMO Members with radars to engage in training multiple persons in radar technology, operations, and maintenance at the same time.
- (viii) **Further urged** CMO members with radars to adhere to the Memoranda of Understandings (MoUs) for Weather Radar Network Warning System in the Caribbean Region and consult with the CMO on radar enhancement programmes.
- (ix) **Encouraged** the Barbados Meteorological Services to develop and commit to formal arrangements for submitting composite radar data in line with the WMO WIGOS guidelines and WMO Unified data policy; having noted its efforts to ensure sustainability of the software that supports the composite.
- (x) **Discussed** and **provided feedback** and **guidance** to the CMO Headquarters on how to improve and extend the life expectancy of the CMO Weather Radar Network.

11 OTHER PROJECT UPDATES AND PROPOSALS

11.1. Council recalled the CMO Strategic Plan 2020-2023 which identified four (4) regional priorities that enhance disaster preparedness and reduce loss of life, property, and livelihoods, support climate-smart decision-making and resilience, support strengthening and maintaining observation networks and information services, and enhance socioeconomic and national security value of weather, climate, hydrological and related environmental services. Council noted that the CMO Headquarters continued the implementation of projects reported on at CMC61, and initiated new projects and proposals aligned to the Strategic Plan, and in support of the “Early Warnings for All” mandate given to the WMO by the UN Secretary-General on World Meteorological Day, 23 March 2022.

11(a) WMO Severe Weather Forecasting Programme (SWFP)

11.2. Council recognized the need to improve the early weather warning system, particularly for episodes of severe weather that may not be the result of a tropical cyclone and could occur at any time of year. In November 2015, Council endorsed a proposal by CMO and partners to implement a *WMO Severe Weather Forecast Demonstration Project* (SWFDP) in parts of the Caribbean, with an aim, among others, to foster greater collaboration among National Meteorological Services and Disaster Management Agencies. Since that time, significant strides have been made towards the implementation of what has been designated by the 18th WMO Congress as the **Severe Weather Forecasting Programme** (SWFP) - **Eastern Caribbean** (SWFP-EC). The WMO Secretariat, *Météo-France*, the CMO Headquarters, and the CIMH, have been collaborating to develop the SWFP-EC into an operational programme.

11.3. The Regional WMO Management structure established the *Regional Sub-programme Management Team* (RSMT) for the development and implementation of the SWFP. The

Coordinating Director co-chairs the RSMT with an expert from France. Other CMO representatives on the RSMT include Ms Kathy-Ann Caesar of the CIMH and Mr Dale Destin, Director (Ag) of the Antigua and Barbuda Meteorological Service. It was recalled that the WMO Severe Weather Forecasting Programme was being developed along the following lines:

- (i) The SWFP would cover all the islands from Trinidad in the south to Puerto Rico in the North, to Dominican Republic and Haiti in the West;
- (ii) The Météo-France Centre in Martinique would serve as the *Regional Forecast Support Facility* (RFSF) for the Project;
- (iii) The CIMH would provide technical support for the SWFP.

11.4. Council was informed that the SWFP-EC is now in its pre-operational Demonstration phase, initiated in 2019, with global and regional model forecast guidance being used to monitor potential severe weather by the *Regional Forecast Support Facility* (RFSF–Martinique). All National Meteorological Services in the project domain have access to the Extranet of the RFSF, which became operational, 24/7, in 2019.

11.5. Council noted that in December 2021, the *Management Team* met virtually to examine progress made at the *Regional Forecast Support Facility* (Météo-France Martinique), including the Extranet, new data/product for sharing, to produce severe weather guidance, and to ensure real-time coordination.

11.6. Council further noted that the Coordinating Director, *Dr Arlene Laing*, and *Mr Jean-Noel Degrace* of Météo-France reported to the *44th Hurricane Committee* on recent activities of the SWFP-EC, including (i) new products available for forecasting severe weather, (iv) a draft operational plan for severe weather; and (v) the coordination with related projects that are being implemented in the Caribbean, including the International Weather Ready Nations (WRN), Flash Flood Guidance System (FFGS), and Coastal Inundation and Forecast Initiative (CIFI).

11.7. Council was informed that 20 forecasters were trained during a *Severe Weather Forecasting Programme-Eastern Caribbean & Hurricane Forecaster Competency Virtual Workshop* for 8-12 November 2021, led by *Ms Kathy-Ann Caesar (CIMH)*, in collaboration with Météo-France, CMO Headquarters, the US National Hurricane Center, and the University of Leeds.

11.8. Council was reminded that in 2021, the CMO Headquarters intern, *Ms Vikki Lee*, supported by the CCRIF-SPC (Caribbean Catastrophic Risk Insurance Facility) internship programme, developed a draft *Severe Weather Operational Plan*, modelled after the WMO RA IV Hurricane Operational Plan. The intern presented the full draft plan to the Management Team on 14 December 2021.

11.9. Council recalled that the WMO Expert Group on the SWFP identified the *Caribbean Meteorological Organization (CMO)*, through its Headquarters and CIMH, as the regional entity to support the SWFP in the operational phase.

11.10. Council was informed of plans for the period 2022-2023 which include workshops planned for December 2022 and February 2023, the availability of a new high-resolution ensemble AROME weather model, planned workshop on the use of the SWFP-EC Extranet, Communication and Public Weather Service, the development of a severe weather case study catalogue, and forecaster exchange and attachment at RFSF-Martinique.

11.11. Council was asked to note that the CMO HQ conducted a Strategic Plan Performance Monitoring Survey and found that there was a steady increase in the number of Members participating in the SWFP-EC, however the training of forecasters has stalled. Directors were encouraged to nominate forecasters to participate in upcoming training workshops.

11(b) CREWS Caribbean: Strengthening Hydro-Meteorological and Early Warning Services in the Caribbean

11.12. Council recalled the presentations from Council Sessions since 2018 about the *Climate Risk and Early Warning System* (CREWS) Caribbean Project, co-funded by the CREWS Initiative, and *Environment and Climate Change Canada* (ECCC). The aim of the CREWS-Caribbean project was to strengthen and streamline regional and national systems and capacity related to weather forecasting, hydrological services, multi-hazard, impact-based warnings and service delivery for enhanced decision-making in CARICOM countries.

11.13. The implementing partners are the WMO, the *Global Facility for Disaster Reduction and Recovery* (GFDRR), the *United Nations Office for Disaster Risk Reduction* (UNDRR), and the *World Bank Group* (WBG). The primary regional implementing partners were the Caribbean Disaster and Emergency Management Agency (CDEMA), CIMH, and CMO Headquarters Unit. The Project has three components:

- Component (1) - Development of regional strategy for EWS;
- Component (2) - Institutional Strengthening and streamlining of early warning and hydro-meteorological services; and
- Component (3) - Support for Piloting High Priority National Activities.

11.14. Council was reminded that under Component 1, the CMO HQ contributed to the development of the “*Strategic Roadmap for Advancing Multi-Hazard Early Warning Systems in the Caribbean 2020-2030*” as a member of the Regional Early Warning Systems (REWS) Consortium. The REWS Consortium, led by CDEMA, finalized the Strategic Roadmap in September 2022.

11.15. In 2020, CMO Headquarters and the WMO signed an Implementing Agreement (IA) for the partial delivery of CREWS-Caribbean Project Component (2) with a project entitled, *Building Resilience to High-Impact Hydro-meteorological Events through Strengthening MHEWS in Small Island Developing States (SIDS) in the Caribbean*. The project had been supporting activities described below, implemented by the CMO HQ, with funding of \$263,000 USD, which was supplemented by an additional \$68,870 per a second IA signed in June 2022 and amended in August 2022. This allowed for an expansion of the project to more Member States.

11.16. Meteorological Legislation and Policy: Model Meteorological Bill and Policy for National Meteorological Services in the English-speaking CARICOM Member States, were developed by a legal consultant and endorsed by CMO Member States on 2 June 2021. Subsequently, eight (8) National Bills and Policies were adapted by Anguilla, Antigua & Barbuda, Belize, Grenada, Jamaica, St Kitts & Nevis, Saint Lucia, and St Vincent & the Grenadines. Through a new IA the adaptation of one (1) additional Bill for Barbados was initiated in September 2022. Policy directions were received from the **Honourable Wilfred Abrahams**, Minister of Home Affairs and Information on the future organizational and legal framework for the Barbados Meteorological Service (BMS). The first draft of the National Meteorological Bill has been prepared after initial consultations with the Barbados Meteorological Service (BMS) and key stakeholders. A revised draft is being prepared for validation.

11.17. Council was informed that the Strategic Plan Performance Monitoring Survey found that only four (4) Member States reporting being in possession of a legal basis for their operation, and asked to note that **there remains an urgent need for most CMO Member States to develop and implement their governance framework.**

11.18. National Strategic Plans and Framework for Weather, Water, and Climate Services: Council was reminded that at CMC 61 it was informed of the delivery of eight (8) *National Strategic Plans* (NSPs) and *Frameworks for Weather, Water and Climate Services* (FWWCS), with complementary *Action Plans* (APs). The beneficiaries were Anguilla, Antigua & Barbuda, Dominica, Grenada, Guyana, Jamaica, St Kitts & Nevis, and St Vincent & the Grenadines. Council was informed that through a new IA with the WMO the CMO HQ initiated the development of two (2) new NSPs, FWWCSSs, and APs for the benefit of the Turks and Caicos Islands and the Cayman Islands. First drafts were prepared for the Turks and Caicos Islands, whereas the Cayman Islands intervention has just completed the inception phase.

11.19. Council was informed that the Strategic Plan Monitoring Survey found that twelve (12) Member States possessed Strategic Plans, which should increase to thirteen (13) with the completion of the Turks and Caicos Islands NSP. However, there remains a need for the remaining territories (Saint Lucia, Montserrat, and the British Virgin Islands) to develop their strategic frameworks. NMHSs who were approaching the mid-point or end of the strategic planning cycles were also encouraged to conduct reviews of their NSPs to ensure they remain appropriate, and ensure their plans are being utilized in their national development.

11.20. Council noted that four priority activities were proposed under Component (3) of the CREWS Caribbean Project to be implemented by various regional organizations including CIMH, CDEMA, CMO Headquarters, Météo-France, Caribbean Telecommunication Union (CTU), among others:

- Priority activity 1: Development of a Multi-sensor Precipitation Grid
- Priority activity 2: Support the Transition to Impact-Based Forecasting
- Priority activity 3: Development of a Regional Emergency Alert System
- Priority activity 4: Integrated Approach to Flooding

11.21. Council recalled that CMO Headquarters is coordinating activities under Priority Activity 1, the development of a multi-sensor precipitation grid over the Eastern Caribbean. Council noted that CMO HQ also helped organize a seven-part webinar series on Impact-Based Forecasting and Warnings under Priority activity 2. CMO HQ also provided input to a feasibility study for a regional early alert warning system under Priority 3, while Priority Activity 4 will benefit from the success of the Multi-Sensor Precipitation Grid. These activities are supported by a grant of US\$50,000 from the World Bank.

11.22. Multi-Sensor Precipitation Grid: Council was reminded that the development of the Multi-Sensor Precipitation Grid is being implemented by the World Bank through a contract with the Centro Internazionale in Monitoraggio Ambientale (CIMA) Research Foundation. The prototype precipitation grid has the Barbados weather radar as a primary data source that is integrated with satellite derived rainfall estimates and rain gauge data from islands within the radar range. The goal of Priority Activity 1 is to utilize the Caribbean Weather Radar Network to prepare a regional precipitation grid that is useful to Flash Flood Guidance Systems (FFGS), disaster management, water resources management, agriculture, energy and other sectors that increasingly demand more accurate and timely access to rainfall information.

11.23. Council was informed that the CIMA Foundation developed the web-based platform for the Precipitation Grid and held a demonstration workshop in July 2022 for potential users. The system has been operational since September 2022 and a set of three User Training Workshops were provided by the CIMA Foundation and coordinated by the CMO HQ and CIMH in late October to early November 2022.

11(c) EUREC⁴A-UK-CMO Caribbean Weather Forecasting Initiative

11.24. Council recalled that the University of Leeds and CMO Headquarters, implemented a *Caribbean Weather Forecasting Initiative* in support of *EUREC⁴A-ATOMIC*, an international field study led by institutions from France, Germany along with the CIMH. The Forecasting Initiative was supported by a grant from the Natural Environment Research Council (NERC), United Kingdom, and the WMO Climate Risk and Early Warning Systems (CREWS) Caribbean Project. The project was partially funded through an agreement between WMO and CMO Headquarters Unit, as it supported the Severe Weather Forecasting Programme (SWFP) in the Eastern Caribbean.

11.25. Council noted the benefits of the Initiative to the National Meteorological Services of CMO Member States, whose forecasters gained enhanced capability in numerical weather prediction, understanding dry season weather and localized storms, through training workshops and a forecast "test-bed". Council was informed that two workshops will be held in support of the Forecasting Initiative: one in December 2022, led by NOAA and CIMH, with support from CMO HQ and University of Leeds. The first workshop on use of satellite products, included the satellite aspects of the same case studies to be examined in terms of numerical model prediction in a second workshop in February 2023, led by the University of Leeds and CMO Headquarters, with support from CIMH.

11(d) SERVIR-Amazonia

11.26. Council was informed that the CMO Headquarters was engaged by a team from the *International Center for Tropical Agriculture (CIAT)* and Alliance of Bioversity, leaders of the *SERVIR-Amazonia* development initiative, during a country visit in April 2022. Subsequently, the CMO Headquarters and CIAT hosted a User Needs Workshop on 24 August 2022, welcoming twenty-one (21) participants from thirteen (13) Trinidad and Tobago institutions at the CMO Headquarters and at the Crown Point Meteorological Office.

11.27. CIAT and CMO Headquarters co-developed a training agenda for twelve (12) capacity-building sessions to be held during January-April 2023 using a mix of in-person and hybrid modes. In-person sessions will be hosted at the CMO Headquarters. In October 2022 the CMO initiated a Sub Award contract for US\$22,480 with the CIAT, with the CMO Headquarters responsible for providing advice on cultural, political, economic and technical matters, scientific and technical support, logistical and administrative support for workshops, training, travel, lodging, communications coverage, and coordination with *SERVIR-Amazonia* representatives on the organization and implementation of programme activities.

11(e) Hydromet Caribbean 2023: Third Symposium on Operational Hydro-Meteorology

11.28. Council recalled that two Hydromet Caribbean Symposia were held in 2019 and 2020 (virtually) with much success. The 2019 symposium focused on data, sharing ideas and seeking solutions to operational issues, while the second focused on the integration of operational hydrology and meteorology in the Caribbean context. Council noted the value of CMO Headquarters' actions to ensure that the outcomes of both symposia served as inputs to key regional and international meteorological and hydrological policies and strategies being developed by the WMO and other partners. Council was also informed that a third symposium is being planned for January 2023 in Jamaica, with emphasis on establishing partnerships to support "Early warnings for all in five years", looking at challenges, and possible solutions.

11(f) Lightning Detection System and Lightning Safety Awareness

11.29. Council recalled that the CMO Headquarters indicated an interest in establishing a ground-based Lightning Detection System in the region in partnership with the Meteorological Service of France (Météo-France). Since Council approved the initiation of the project the CMO Headquarters

has been seeking funding to purchase and install the equipment, after which it will be owned and operated by the CMO for the benefit of all CMO Member States and the region in general.

11.30. Council was informed of the continued efforts of the CMO Headquarters to ensure that lightning is included in disaster risk reduction, and that the UNDRR has identified lightning detection as a priority for the next phase of CREWS projects in the region. Council was reminded of lightning-related deaths that occurred in 2020, which prompted a peer-reviewed study of “*Jamaica lightning occurrence, damage and causalities*” co-authored by Mr Ron Holle, Dr. Arlene Laing, Mr John Cramer, and Mr Evan Thompson of Jamaica. This study was presented by Mr Holle at the 36th International Conference on Lightning Protection, October 2022 in Cape Town, South Africa and recommended as a prototype. Dr. Laing will present on the same topic at the Annual Meeting of the American Meteorological Society in January 2023.

11(g) Technical Study of Radar Network covering CARICOM Countries

11.31. Council was informed of regional activities undertaken by the CMO Headquarters in support of proposals to upgrade the CMO Radar Network. Through the CREWS Initiative Dr R. Jeff Keeler was hired by the World Bank to conduct a technical study of the Caribbean Radar Network in collaboration with CMO Headquarters. The CMO Headquarters provided inputs to the Terms of Reference for the consultancy and organized Dr Keeler’s visits to radar host countries and reviewed preliminary versions of the report. The study will guide proposals to upgrade the radar network, being developed with the support of the Caribbean Development Bank (CDB).

11(g) Upgrading of CMO Radars

11.32. Council was asked to reference CMC63 Doc 10, which outlined the activities being undertaken by the CMO Headquarters and CDB towards upgrading the CMO Weather Radars to improve early warnings and build resilience to extreme weather in a changing climate, through capacity building and sustainable investment.

11.33. The Council:

- (i) **Noted** the continued efforts of the CMO Headquarters Unit to advance the implementation of the CMO Strategic Plan 2020-2023 through the projects described;
- (ii) **Noted** the progress made in developing regional Early Warning capacity through the strengthening of the WMO Severe Weather Forecasting Programme (SWFP) Eastern Caribbean; and **strongly supported** regional participation in its implementation;
- (iii) **Also noted** and **strongly supported** developments regarding the CREWS-Caribbean project to develop the Strategic Plans and National Frameworks for Weather, Water, Climate and Ocean Services for the Turks and Caicos Islands and the Cayman Islands.
- (iv) **Noted** the ongoing drive to advance the adaptation of model meteorological legislation and policy frameworks in CMO Member States through a recently started intervention in Barbados;
- (v) **Further noted** the operational status of the Multi-Sensor Precipitation Grid over the Eastern Caribbean and the successful conduct of demonstration and user training workshops between July and November 2022 in support of water sensitive sectors;
- (vi) **Also noted** the continuation of collaborative weather forecasting initiative workshops under the EUREC4A-UK/CMO Caribbean Weather Forecasting

- Initiative to build regional capacity through knowledge exchange and collaboration with international researchers;
- (vii) **Noted** the successful completion of a User Needs Workshop and the commencement of training in the forecasting of extreme hydrological events and the monitoring of mangrove ecosystems under the SERVIR-Amazonia programme;
 - (viii) **Noted** the ongoing planning for a third operational hydro-meteorology symposium for Directors of National Meteorological Services and other key stakeholders; and
 - (ix) **Also noted** the successful activities in connection with advocacy and research for lightning safety awareness as part of disaster risk reduction, and **supported** the exploration of an operational ground-based lightning detection system.
 - (x) **Recognized** the mandate given on World Meteorological Day, 23 March 2022, by the United Nations Secretary-General to implement "**Early Warnings for All**" in five years; and the importance of enabling governance, strategic, and institutional frameworks for the development and strengthening of Multi-Hazard Early Warning Systems, and the long-term sustainable development of CMO Member States;
 - (xi) **Also recognized** that as of September 2022 only four (4) out of sixteen (16) CMO Member States reported being in possession of a legal basis for their operation;
 - (xii) **Further recognized** that while twelve (12) National Meteorological and Hydrological Services (NMHSs) report being in possession of valid strategic plans, they should be reviewed and updated for appropriateness; and that three (3) NMHSs remain without valid strategic plans and institutional frameworks; and
 - (xiii) **Urged** Members to adapt the Model Meteorological Bill and Policy to their national circumstances to provide a legislative framework for Multi-Hazard Early Warning Systems and the long-term sustainable development of their country/territory;
 - (xiv) **Also urged** Members to review existing National Strategic Plans and Frameworks for Weather, Water and Climate Services for National Meteorological and Hydrometeorological Services approaching the mid-term or end of their strategic planning cycle;
 - (xv) Members without an approved strategic and institutional framework, to develop National Strategic Plans and Frameworks for Weather, Water and Climate Services for National Meteorological Services;
 - (xvi) **Urged Members to** utilize the SWFP Regional Forecast Support Facility Extranet and participate in training in the WMO Severe Weather Forecasting Programme Eastern Caribbean.

12 OTHER MATTERS

12(a) Human Resources Committee

12.1 The Council discussed the matter of retroactive payments in relations to the CIMH Principal's terms of employment in an in-camera session. The update from the HR Committee was presented

by the Chair of the HR Committee, *PS Deborah Payne* (Barbados). Other members of the HR Committee are *PS Hudson Nedd* (St Vincent and the Grenadines), and *Mr Shakeer Baig* (Trinidad and Tobago).

12.2 Council was asked to recall and refer to previous reports of the Council and the HR Committee on the matter (CMC59, CMC60, CMC61, and CMC62).

12.3 The HR Committee presented to the Council, the three options considered, the independent expert advice, including external auditors, and the outcomes of discussions with the Principal. The HR Committee recommended that Council approve the second of the three options as the final settlement to address the issue.

12.4 Council expressed its gratitude to the HR Committee for its hard work in bringing the matter to a resolution, and commended, in particular, the leadership of the Chair of the HR Committee.

12.5 The Council:

- (i) **Accepted** the report and recommendation of the HR Committee.

12(b) Signing of Contracts by the Principal of CIMH

12.6 Council recalled that the Principal of CIMH raised the question to the 61st Council about the ability of the Principal of the CIMH to sign contracts on behalf of the CIMH. This question arose because the European Union (EU), preferred that their contracts be signed with the CMO. For the CMO, the Council is the final authority for the conclusion of agreements on behalf of the Organization. According to Article 9 in the Agreement for establishment of the CMO, Council may delegate this authority in any particular case. For the EU Intra-ACP ClimSA project, the Chair of the 59th Council delegated Dr Farrell to sign the contract on behalf of CMO. Dr Farrell was seeking a letter or similar documentation that would provide permission for the CIMH Principal to sign projects on behalf of CIMH. Because of the obligatory implications for the CMO, Council decided to convene a special Committee to review the request and make a recommendation to Council.

12.7 Council was reminded that it was determined that, given the nature of the request, that the Committee would be comprised of persons with suitable experience in finance and administration. The Council approved *PS Deborah Payne* (Barbados), Chair of the CIMH Board of Governors, volunteered to lead the Committee, with other members being *PS Delma Nedd* (Guyana), and *PS Nicolette Duke* (Trinidad and Tobago), and *PS Hudson Nedd* (St Vincent and the Grenadines).

12.8 Council was referred to the Final Report of the mid-year 62nd Council Session that was provided to Council prior to the 63rd Session and made available on the meeting website. The report noted that the special Committee of Permanent Secretaries had recommended the formation of a "*Select Committee*" for the review of contracts and provided Terms of Reference for the Committee. The "Select Committee" would be nominated from the membership of Council, comprising persons with the following expertise:

- a. Legal
- b. Financial
- c. Contract administration

12.9 The 63rd Council received the final report and recommendations of the special Committee and deliberated on specific aspects of the Committee's recommendation. Council raised questions about current internal procedures for review of CIMH contracts and whether contracts are reviewed by legal experts.

12.10 Council clarified that the legal expert on the “*Select Committee*” would provide a holistic review of contracts for any legal implications for CMO arising from the contract. That person would be a third person to review the contract, along with the finance and contract administration; but to provide high-level legal insight but not to provide professional legal advice because of the associated liability. The expected work load of the Select Committee on an annual basis was also discussed. Above 10 million USD, the contract would go to the Chair and the *Select Committee* would be available to support the Chair.

12.11 Council was informed that CIMH purchases liability and indemnity insurance annually. Council recommended that the level of liability insurance be raised to match the threshold and the risk associated with the contract.

12.12 Council recalled that the 59th Meeting of the Board of Governors, held on 21-22 November 2022, had recommended the formation of a Finance Committee to review the audited Financial Statements of CIMH. This would be a separate from the Select Committee to review contracts.

12.13 The special Committee recommended that the Principal be allowed to sign contracts up to \$5million USD, with the caveat that the Principal gets the necessary legal guidance, and also to increase the liability insurance to match the threshold of the contract. Council agreed that the Principal would write to the Chair of the Council to inform of the contract and the procedures.

12.14 Council requested that a request for nominees would be made for membership of the Select Committee

12.15 **The Council**

- (i) **Accepted** the report of the special Committee and **noted** the recommendations of the special Committee
- (ii) **Decided** that the Principal of CIMH be allowed to sign contracts up to \$5 million USD, provided that the Principal gets the necessary legal guidance and purchases the necessary liability insurance.
- (iii) **Decided** that a *Select Committee* would be identified to review contracts between \$5-10 million USD and serve for a fixed term.
- (iv) **Decided** that contracts above \$10 million would be referred to the Council.
- (v) **Requested** that a call for nominees be made for membership of the *Select Committee* for review of CIMH contracts.
- (vi) **Requested** the Principal to have the current CIMH contract vetted by the legal advisor and established as a standard contract template and that legal advice would be sought for any contract that is not of that form.
- (vii) **Requested** that CIMH will seek legal advice on non-CIMH originating contracts.
- (viii) **Recommend** that the CIMH legal adviser would advise on the level of liability insurance need for contracts.
- (ix) **Requested** that the Principal notify the Chair of the Council of the legal advice and that any liability insurance exceeding the current coverage would be purchased.

12(d) **Any other business**

12.16 **The Council**

- (i) **Decided** to approve the Draft CMC63 report, after reviewing the report as an in-session document.

13 DATE AND VENUE OF CMC64 (2023)

13.1 Council invited Member States to indicate their willingness to host the next sessions of the CMC. Trinidad and Tobago confirmed their willingness to host the CMC and Related Meetings in 2023, concurrent with the 50th Anniversary of the establishment of the CMC. Members that have not hosted in recent times were invited to seek authorization to host, and to extend an invitation to the Council for the meetings in 2024.

13.2 **The Council**

- (i) **Accepted** the generous offer of the Republic of Trinidad and Tobago to host the Annual CMC and related meetings in 2023.

Close of Meeting

13.3 There being no other business, the Meeting ended at 12:55 EST with an exchange of courtesies.

14 PROVISIONAL AGENDA

1. OPENING OF SESSION AND ELECTION OF CHAIRMAN
2. ADOPTION OF AGENDA AND PROCEDURAL MATTERS
3. CMO EXECUTIVE REPORTS
 - (a) Coordinating Director's Report
 - (b) CIMH Principal's Report
 - (c) CIMH Board of Governors' Report
4. STATUS OF ACTIONS FROM PREVIOUS SESSION
5. SPECIAL WMO ISSUES
 - (a) Outcomes/Highlights of the 2022 Executive Council (EC) of the World Meteorological Organization (WMO)
 - (b) WMO Integrated Global Observing System – Initial Operational Phase
 - (c) The Global Framework for Climate Services (GFCS)
 - (d) Issues emerging from WMO Technical Commissions and Research Board sessions in 2022
 - (e) Disaster Risk Reduction and Regional Severe Weather Forecasts and Warning Systems
 - Tropical Cyclone Programme
 - Regional Coordination and Early Warning Systems
 - (f) World Meteorological Congress 2023
6. FINANCIAL REPORTS
 - (a) Status of Refundable Balances
 - (b) CMO HQ - Auditor's Report
 - (c) Statement of Contributions and Arrears (CMO HQ & CIMH)
7. SPECIAL CMO ISSUES
 - (a) Review of Caribbean Community (CARICOM) Institutions
 - (b) 50th Anniversary of the Agreement of Establishment of the CMO
 - (c) CMO Headquarters Staff Terminal Benefit Fund
 - (d) Arrangements for Meteorological Forecast and Warning Services among CMO Member States

8. CMO BUDGETS (Headquarters Unit, CRN and Radar, CIMH)
 - (a) CMOHQ Budget Estimates for 2023
 - (b) CIMH Budget Estimates for 2023
 9. ANNUAL MEETING OF THE DIRECTORS OF METEOROLOGICAL SERVICES
 10. CMO WEATHER RADAR NETWORK
 11. OTHER PROJECT UPDATES AND PROPOSALS
 - (a) Severe Weather Forecast Programme (SWFP)
 - (b) Climate Risk and Early Warning Systems (CREWS)
 - (c) SERVIR-Amazonia Caribbean Programme
 - (d) Caribbean Weather Forecasting Initiative, EUREC4A-SWFP
 - (e) Lightning Detection
 12. OTHER MATTERS
 - (a) Human Resources
 - (b) Grant of Signature Authority to the Principal, CIMH
 - (c) Any other matters
 13. DATE AND VENUE OF FUTURE CMC SESSIONS
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ANNUAL MEETING OF THE CARIBBEAN METEOROLOGICAL COUNCIL

24th – 25th NOVEMBER 2022

CMC63

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HEADQUARTERS UNIT ESTIMATES 2023

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REGIONAL CONTRIBUTION TO CMO HEADQUARTERS AND CIMH BUDGETS -
2023

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UN GLOBAL EARLY WARNINGS/ADAPTATION INITIATIVE

GENERAL CONSIDERATIONS

1. The United Nations Secretary-General made an announcement on the occasion of [World Meteorological Day 2022](#) (23 March 2022) that the United Nations will spearhead a new action to ensure every person on Earth is protected by early warning systems (Early Warnings For ALL – EW4A) within five years and the call on the World Meteorological Organization (WMO) to lead this effort and present an action plan to achieve this goal at the twenty-seventh session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC/COP27).
2. The G7 Foreign Ministers issued a statement on Strengthening Anticipatory Action in Humanitarian Assistance explicitly that “We furthermore welcome and support the UN Secretary-General’s target to have within the next five years, everyone on Earth protected by early warning systems against increasingly extreme weather and climate change”.
3. On this basis, the Executive Council, in its [Resolution 3 \(EC-75\)](#) – UN Early Warnings/Adaptation Initiative, requested the Services Commission, in consultation with other WMO bodies and with the support of the Secretariat, to develop an initial action plan to respond to the UN Early Warning/Climate Adaptation Initiative.
4. The fundamental role of National Meteorological and Hydrological Services (NMHSs) as the official and authoritative providers of early warnings for hydrometeorological hazards should be emphasized as well as the unique coordination role played by WMO in this regard and also for related environmental hazards in the context of the United Nations system.
5. The vision of the [WMO Strategic Plan 2020–2023 \(WMO-No. 1225\)](#), that “by 2030, we see a world where all nations, especially the most vulnerable, are more resilient to the socioeconomic consequences of extreme weather, climate, water and other environmental events; and underpin their sustainable development through the best possible services, whether over land, at sea or in the air”. And the associated strategic objective to “Strengthen national multi-hazard early warning/alert systems and extend reach to better enable effective responses to the associated risks”.
6. It should be recognized that foundational elements exist based on which to pursue the global early warning goal, such as the WMO Integrated Global Observing System (WIGOS), the WMO Information System (WIS) and the Global Data Processing and Forecasting System (GDPFS), the WMO Coordination Mechanism (WCM), the [Global Multi-hazard Alert System \(GMAS\)](#), the [Climate Risk and Early Warning Systems initiative \(CREWS\)](#), the Global Basic Observing Network (GBON), the [Systematic Observation Financial Facility \(SOFF\)](#), investments in hydrological infrastructure, developments in multi-hazard and impact-based early warning services, implementation of the WMO Vision and Strategy for Hydrology and its associated Plan of Action including flood and drought early warning initiatives, the [Water and Climate Coalition](#), the [Alliance for Hydromet Development](#) and other partnerships with the World Bank, the Green Climate Fund (GCF), the United Nations Development Programme (UNDP), the private sector and other entities.

Based on the above, the Commission is invited to adopt Draft Resolution 5.6(1)/1 (SERCOM-2).

15 DRAFT RESOLUTION

Draft Resolution 5.6(1)/1 (SERCOM-2)

UN GLOBAL EARLY WARNINGS/ADAPTATION INITIATIVE

THE COMMISSION FOR WEATHER, CLIMATE, WATER AND RELATED ENVIRONMENTAL SERVICES AND APPLICATIONS,

Recalling [Resolution 3 \(EC-75\)](#) – UN Early Warnings/Adaptation Initiative,

Having considered the announcement of the United Nations Secretary-General calling on WMO to lead efforts to ensure that every person on Earth is protected by early warning systems within five years,

Takes note of the successful WMO/UN Climate Action Team/Government of Egypt UN Early Warning/Climate Adaptation Initiative round table meeting in Egypt on 5 and 6 September 2022,

Recognizing that the UN Early Warnings/Adaptation Initiative, now renamed the Early Warnings for All: the UN Global Early Warning Initiative for the Implementation of Climate Adaptation, will require the commitment of all governments and the collective and collaborative support of a range of stakeholders including development partners, funding agencies and the academic and private sectors,

Reaffirming that the Management Group of each technical commission shall be responsible for the oversight of the development, maintenance and prioritization of the Commission's Work and Operating Plans, supporting structures and related resource needs as well as the coordination of the Commission's response to requests from Congress and the Executive Council relevant to the Commission,

Requests the president of the Services Commission to take immediate action to advance preparations for the practical implementation of the challenge by, but not limited to:

- (1) Involving Members and their mandated early warning authorities in their roles as providers of early warning services, as well as beneficiaries of the Early Warnings for All initiative;
- (2) Mapping partnerships with other organisations from public and private sectors as well as academia;
- (3) Engaging with, and learning from, existing WMO programmes and initiatives, and those of other organizations, to leverage synergies and avoid duplication of efforts;
- (4) Gathering evidence to iteratively define success factors; and
- (5) Continuously prepare and disseminate information materials to keep Members apprised [Secretariat] of activities and current challenges, and to support resource mobilization efforts.

Requests the management group of the Services Commission to work in close coordination with the management group of the Infrastructure Commission and with the Research Board, regional associations and other relevant bodies on the further development of the technical, scientific and technological elements which take into account the Initial Early Warnings for All Action Plan, drafted by the WMO Secretary-General, [*New Zealand*] to be communicated at UNFCCC COP-27 [*Poland*];

Further requests [*Czech Republic*] the president of the Services Commission to use the outcomes of this work to inform a recommendation to EC-76 relating to the priority activities, proposed subsidiary body structures and supporting partnerships necessary, to foster the successful implementation of the four pillars of people-centred Multi-Hazard Early Warning Systems: risk knowledge and management, observations and forecasting, preparedness to respond and warning dissemination and communication with a particular focus on the most vulnerable countries/territories [*Australia*], as key elements of the Early Warnings for All Action Plan;

Invites the Secretary-General of WMO to provide the necessary resources to *[P/SERCOM]* support these efforts.