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

REPORT OF THE

ANNUAL MEETING OF DIRECTORS OF METEOROLOGICAL SERVICES

George Town, GRAND CAYMAN

20 NOVEMBER 2010

INTRODUCTION

1.1 At the kind invitation of the Government of the Cayman Islands, the 2010 Meeting of Directors of Meteorological Services was held at the Grand Cayman Marriott Beach Resort George Town, Grand Cayman on Saturday 20th November 2010 under the Chairmanship of Mr Tyrone Sutherland, Coordinating Director of the Caribbean Meteorological Organization (CMO).

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

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

THE IMPACTS OF WEATHER DURING 2010

(Agenda Item 2)

2.1 The Directors of Meteorological Services provided the impacts of weather on their countries during 2010. It was highlighted that for quite a few countries that the drought or drought-like condition which they experienced during the first quarter of 2010 had its origins during what should have been their rainy season of 2009.

2.2 During the first quarter of 2010, **drought or drought-like** conditions were experienced in **Guyana**, **Trinidad and Tobago**, **Grenada and its Dependencies**, **Barbados**, **St. Vincent and the Grenadines**, **Dominica**, **Saint Lucia**, **St. Kitts and Nevis**, **Jamaica and Belize**. The drought reduced the yield of root and short term crops and fruit trees. The accompanying heat caused stress to livestock, which was exacerbated by the decrease in surface water through greater evaporation and an increased demand for human consumption.

2.3 For the countries which experienced drought or drought-like conditions, relief from the drought occurred during mid-April 2010 with the early onset of the rainy season. The rainfall was intense and this caused **flooding** and **landslides**. **Guyana**, **Trinidad and Tobago**, **Barbados**, **St. Vincent**, **Dominica**, **Saint. Lucia**, **Jamaica** and **Belize** experienced flooding episodes from non-cyclonic events. There were two deaths in Trinidad associated with the flooding and landslides. **Guyana** also experienced **coastal flooding** associated with higher than normal “spring” tides.

2.4 The region was not spared the ravages of tropical cyclones during the hurricane season. Member States were threatened by nine named cyclones, of which seven became hurricanes and two intensified into major hurricanes. The hurricanes were Alex, Earl, Karl, Otto, Paula, Richard and Tomas, with Earl and Karl intensifying into a major hurricane (category 3 or higher). Matthew and Nicole remained tropical storms.

2.5 ***Hurricane Alex*** developed from a broad area of low pressure centered between the eastern tip of Honduras and Jamaica on 25th June. Alex made landfall in northern **Belize** on 26th June at approximately 2145 local time. Belize received between 70 to 227mm of rainfall from the passage on Alex between 25-27 June. The rainfall did produce moderate flooding but minimal damage and it caused no fatalities.

2.6 A tropical wave gradually intensified into Tropical Storm ***Earl*** approximately 750Km to the west southwest of the Cape Verde Islands on 25th August. **Earl** continued moving towards slightly north of west until the centre passed approximately 42km to the north of Anguilla on 30th August as a *category 3* ***hurricane*** and the centre passed within 31km on Anegada, British Virgin Islands later that day as a *category 4 hurricane*. In **Anguilla**, 112.mm was measured at the Clayton J. Lloyd International Airport during the passage of Earl. High winds and excessive rainfall caused damage to homes, hotels, private and public buildings. More than twenty-five houses were damaged and three (3) houses were destroyed. Damage occurred to three hotels in both the north and south of the island. In **Anegada**, there was damage to boats and jetties associated with Earl's passage.

2.7 A convergence band from **Earl** also affected **Montserrat** on 29th August while the centre of the hurricane was approximately 320km to the northeast of the island. Thunderstorms embedded within the convergence band intensified during the late afternoon and into the night. The maximum gust measured at John A Osborne Airport (J.A.O) was 40kt, while the rainfall measured between 1800UTC and 1200UTC on August 30 was 300.8mm. The runoff from intense rainfall overwhelmed the drainage systems. There was island-wide flooding and landslides in the Woodlands area. Earl also produced strong with waves estimated between 8 to 10 feet which battered the exposed coastline.

2.8 An area of cloudiness in the in the Caribbean Sea associated with a tropical wave intensified in ***Tropical Storm Matthew*** on 23rd September. The centre of **Mathew** made landfall on the coast of Nicaragua on 24th September and emerged in the Gulf of Honduras at 1200UTC on 25th September. The centre of Matthew made landfall to the south of Harvest Cay on the coast of **Belize**. Rainfall was measured between 85 to 150mm for the period 24-25 September associated with Matthew. The flooding which ensued from the rainfall caused some damage to the rice crop and the National Emergency Management Office (NEMO), as a precautionary measure, evacuated people from three villages in southern Belize.

2.9 An area of low pressure which was meandering across the western Caribbean Sea before looping to the south of Grand Cayman became Tropical Storm ***Richard*** on 21st October. Richard started to move towards the south at first, but then slowly turned towards the west and intensified. **Richard** made landfall on the coast of **Belize** as a *category 1 hurricane,* about 20 miles to the south of Belize City at approximately 0015UTC on 25th October. More than 4600 persons were evacuated from the path of the hurricane. Richard produced rainfall in excess of 145mm in places and a storm surge in excess of 4ft near Belize City. Both the agriculture and housing sustained damage, with 831 homes being either damaged or destroyed. The total cost of destruction is estimated at US $38 million.

2.10 An intense tropical wave was upgraded to Tropical Storm ***Tomas*** at 1830UTC on 29th October after investigation by a reconnaissance aircraft, with its centre approximately 460km to the east of Trinidad. Tomas continued its intensification as it moved towards the northwest. The centre of tropical storm **Tomas** clipped the western parts of **Barbados** between 1100 to 1400UTC on 30th October. The highest wind speed measured during the passage of Tomas over Barbados was 46kt, with gusts reaching 91kt. The Meteorological Service measured 293.5mm during the three-day period they were affected by Tomas, which led to widespread flooding. A preliminary assessment indicated that approximately 1000 houses were damaged. Many areas in the island were without power and potable water.

2.11 The centre of **Tomas** went on to make a direct impact on **St. Vincent** at 1600UTC, by which time it had intensified to a *category 1* ***hurricane***. It caused significant damage to agriculture, housing, communication equipment and general infrastructure throughout the island, with the northern third of the island receiving the worst damage. Agriculture was the hardest hit; the banana industry in particular was almost completely devastated, with over ninety-five (95%) of all fields being flattened. Plantains suffered a similar fate, with a huge percentage of trees destroyed as well. Significant numbers of fruit trees were also uprooted, blown over or severely damaged. The total estimated cost of damages to the agricultural sector was put at EC $67 million. The housing stock also took a battering and in the north-east of the island, over 90% of the houses and buildings were damaged.

2.12 **Saint. Lucia** received the most damage from ***Hurricane Tomas*** during its passage through the Windward Islands. While the eye of Tomas was impacting on St. Vincent, the cyclone slowed its forward movement through the islands and that caused Saint. Lucia to receive rainfall in excess of 500mm. At the Hewanorra International Airport, 593.1mm of rainfall was measured for the 24-hour period ending at 1200UTC on 31st October, whereas for the same period, rainfall measured at the George F.L. Charles Airport was 533.3mm. The highest sustained wind speed measured over the islands was 77kt, with gusts reaching 86kt. Tomas caused massive damage to the housing stock, agriculture, and infrastructure, especially the road network, primarily as a result of the amount of rainfall the islands received, which led to widespread flooding and many landslides. There were ***eight confirmed deaths*** from the passage of Hurricane Tomas, although there were still some persons missing, presumed dead.

2.13 There were two other cyclones which brought rainfall to two CMO Member States although the cyclones were in the formative stage at the time. An area of cloudiness which would eventually be named Tropical Storm ***Nicole*** centered hundreds of miles to the west of **Jamaica** produced torrential rainfall, which caused massive flooding and ***14 deaths.*** An area of cloudiness which would later become Sub-Tropical Storm ***Otto*** produced torrential rainfall in excess of 429mm over the **British Virgin Islands** during the four-day period from 4-7 October. This caused severe flooding, landslides, rock falls and downed trees.

2.14 Concern was expressed about the timing of the naming of Tomas at 2100UTC when the system was within 24-hours of the Windward Islands. Although most countries were alerting their nationals to the possibility of torrential rainfall associated with a tropical wave, nationals for the most part were not ready for Tomas. Tomas impacted on Barbados 14-hours after it was named. The Meeting expressed the view that their concerns should be brought to the attention of the WMO RA IV Hurricane Committee.

2.15 The Meeting noted that most of the damage from tropical cyclones was associated with hydro-meteorological factors and not caused by the wind speed during the 2010 Atlantic hurricane season. This is an area in which the Meteorological and Hydrometeorological Services can model to advise national development policy.

2.16 It also noted during post-event reviews in some countries that the Meteorological Services and National Disaster Agency discussed the need to ensure that the forecast time for the onset of the event or elements of the event and the actual onset should be close as possible, so that if the onset of the event would be delayed, then new advisories should be issued for the new forecast onset.

STATUS OF ACTIONS FROM THE PREVIOUS MEETING
(Agenda Item 3)

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

3.2 In this regard, a summary of the decisions of DMS2009 (BVI, 2009) was prepared by the CMO Headquarters. The Science and Technology Officer gave the status of actions taken to implement these decisions to the Meeting.

TRAINING
(Agenda Item 4)

4.1 The Principal of the Caribbean Institute for Meteorology and Hydrology (CIMH) informed the Meeting about the following proposed definition of a WMO Meteorologist, a WMO Meteorological Technician, a WMO Hydrologist and a WMO Hydrological Technician:

- WMO Meteorologist – a person who has successfully completed the Basic Instruction Package for Meteorologists (BIP-M) requirements.
- WMO Meteorological Technician – a person who has successfully completed the Basic Instruction Package for Meteorological Technicians (BIP-MT) requirements.
- WMO Hydrologist – a person who has successfully completed the Basic Information Package for Hydrologists (BIP-H) requirements.
- WMO Hydrological Technician – a person who has successfully completed the Basic Information Package for Hydrological Technicians (BIP-HT) requirements.

4.2 In conjunction with the proposed definition of a WMO Meteorologist and a WMO Meteorological Technician, a competence assessment toolkit would be developed to assist Meteorological Services ensure that their personnel continue to qualify as a WMO Meteorologist and a WMO Meteorological Technician. The toolkit would be based on a three-tier competency as follows:

1. **Top Level**: - WMO 49 Vol 1 Standards
2. **Second level**: - Describe and elaborate on the standards e.g.
    - For each top-level competence, there is a:
        - Competence description
        - Performance criteria
3. **National Competencies**: - Use the second level to suit the national situation

4.3 The WMO Commission for Aeronautical Meteorology (CAeM) Task Team on the Competency Assessment Toolkit has prepared the first version of the toolkit. It contains guidance on:

- Experiential questions
- Test questions
- Direct observation
- Classroom or paper simulation
- Case study

4.4 Mr Shakeer Baig of the Trinidad and Tobago Meteorological Service and Ms Kathy-Ann Caesar of the CIMH are the two persons who have lead responsibility on this matter in the region for the CMO Member States. The toolkit can be accessed at **http://forum.14.caem.wmo.int/post14web/**.

4.5 CIMH and the UCAR/NWS Cooperative Program for Operational Meteorology, Education and Training (COMET) are collaborating in an effort to provide online distance learning courses to support professional development activities in the areas of (i) use and interpretation of numerical weather products, (ii) satellite usage in operational forecasting and (iii) radar meteorology. A survey questionnaire will be issued by Ms Caesar before the end of 2010 to the Directors of Meteorological Services to ascertain their areas of interest in the courses which would be offered online.

4.6 The Principal reminded the Meeting that through the assistance CIMH was providing to the Caribbean Catastrophe Risk Insurance Facility (CCRIF), funding was available for various scholarships. However, he suggested that all other avenues for scholarships should be exhausted before an approach is made for a CCRIF scholarship since CCRIF, like the Caribbean Disaster Emergency Management Agency (CDEMA) which also funds scholarships, has specific areas of focus.

4.7 The Directors were exhorted by the Principal to ensure that they adhere to the registration deadlines for the enrollment of students for the courses offered by the Institute. This would minimize course cancellations due to insufficient students. The information on the courses offered and the registration forms can be found on the Institute's website at **http://www.cimh.edu.bb**.

CMO OPERATIONAL METEOROLOGY ADVISORY GROUP (COMAG)

(Agenda Item 5)

5.1 The Meeting was reminded the decisions of the 2009 Meeting of Directors of Meteorological Service, held in Tortola, British Virgin Islands on 7th November. The Meeting:

(i) **Decided** that the CIMH should complete the TAF verification scheme as early as possible in 2010;

(ii) **Also decided** that the verification of the TAFs will be undertaken in each Meteorological Service with the support of the CIMH;

(iii) **Commended** Mr Meade (Antigua and Barbuda) and the Principal of the CIMH for the offer of their assistance to rollout the verification software to each Meteorological Service in 2010;

(iv) **Requested** the Coordinating Director to inform WMO and ICAO of the verification scheme, once it became operational.

5.2 In fulfillment of the charge of the Meeting, Mr Keithley Meade, Director of the Antigua and Barbuda Meteorological Service, provided the Caribbean Meteorological Organization with **TAF_Helper,** which is a program he created as an interface for the users who are typing an aerodrome forecast (TAF) for transmission, to ensure that the TAF which is disseminated conforms to the WMO code.

5.3 Simultaneously, CIMH completed the creation of the help files and wrapping the disparate programs verification into one package. After TAF_Helper was beta tested (a level of software usability testing), it was bundled with the TAF verification program, which was distributed through CIMH's secured ftp server to each Meteorological Service that requested the verification software since the beginning of June 2010.

5.4 The entire package was beta tested during the period from June to the end of September by each Meteorological Service which downloaded the package. CIMH has received no major reports of problems with the program during the beta testing phase.

5.5 The Meeting was reminded that the International Civil Aviation Organization (ICAO), in its publication Annex 3 to the Convention on International Civil Aviation, introduced the use of an International Standards Organization (ISO) 9000 certified Quality Management System (QMS) for aviation as a recommended practice in November 2003.

5.6 All Members States of the Caribbean Meteorological Organization have been required to have a functional and certified QMS from **November 2010**, when ICAO's recommendation would become a requirement. The quality management system must include verification and validation procedures. However, recognizing that many countries around the world, particularly the developing ones, had difficulties meeting the November 2010 deadline, ICAO declared **November 2012** as the new applicable date for the implementation of a recognized QMS in the provision of meteorological services to international civil aviation. Hence the National Meteorological Services must quickly implement a QMS and demonstrate that they can perform verification of all aeronautical forecasts by the new date of November 2012.

THE CMO RADAR PROJECT – THE FUTURE

(Agenda Item 6)

6.1 The Meeting was reminded of the Regional Radar Project which was funded by the European Commission with a budget of 13.2 million Euros. The Proj**ect constructed and installe**d **four** new digital weather radars in the Caribbean to replace an old and obsolete radar network installed by the CMO. It was intended to link the new radars with others already in place to form a modern network of nine radars as part of the Caribbean Early Warning System for severe weather conditions.

6.2 CARIFORUM signed a Memoranda of Understanding with the Governments of Barbados, Belize, Guyana and Trinidad and Tobago, which clearly defined the deliverables by each party to the Radar Project. The Memoranda clearly articulated a set of data sharing principles which would ensure that there were socio-economic benefits not only to the radar host countries but to all the countries bordering the Caribbean Sea and in some cases the Gulf of Mexico.

6.3 The data sharing principles which were agreed to are as follows:

1. To ensure that data from the Radar Station are made readily available to the public via electronic or other appropriate media during normal and inclement weather conditions;
2. To make data from the Radar Station available to special users of this type of information within each country. These users include national disaster preparedness/emergency management agencies and the media, and sectors such as civil aviation, fishing and marine services, tourism, construction, utilities, onshore and offshore industries, forestry, agriculture, water resources management and academia;
3. The provision of data from the Radar Stations would be undertaken by each National Meteorological Service (NMS) under terms and conditions and using mechanisms as deemed appropriate by the NMS;
4. To make selected "real-time" data from the Radar Stations available to other regional Meteorological Services, under the general guidelines of the CMO and in keeping with the requirements of the WMO. This will include provision of data for the regional composite radar image system at the Météo-France facility in Martinique (SRMA) and the provision of data to the National Hurricane Center of the USA.

6.4 Notwithstanding the agreements which are in place, the Meeting noted that the general public did not have easy access to products from two of the radars and one of radar host countries did not have a website available to display any products to the public, which caused some amount of fallout in the public domain. Further, only one Meteorological Service had radar imagery on FTP server for sharing with the meteorological community.

6.5 The Meeting noted that, at times, radar data from Barbados and Trinidad have been included into the mosaic; however, no radar data from any of the Meteorological Services were at the time transmitted to Météo-France in Martinique. While this may be in part due to the change to a allow the data to be transmitted to Martinique strictly through the Global Telecommunication System (GTS), part of the problem appeared to be that the creation of the mosaic had low priority within radar host countries. Hence the resent mosaic has limited value to the non-radar host countries.

6.6 The Meeting was reminded that each radar host Meteorological Service had been provided with the spares and equipment for the radar which were considered important and necessary to have close at hand. Further, the CIMH in Barbados operates the Central Stores facility where a larger amount of spares and test equipment are stored. It is imperative that the radar supplier replaces all consumed spares, since each radar had a three year warranty from the date of site acceptance, as shown in the table below. Therefore, the radar host countries must have a proactive approach to maintenance and stores replacement.

Warranty Period		
Country	**Start**	**End**
Barbados	13 Nov 2008	13 Nov 2011
Belize	27 Feb 2009	27 Feb 2012
Guyana	17 Jul 2009	17 Jul 2012
Trinidad and Tobago	6 Nov 2008	6 Nov 2011

6.7 Although no country had completely fulfilled its agreement with CARIFORUM in respect of data sharing, the Meeting agreed that the creation of the radar mosaic should have high priority due to its positive impact on early warning systems in neighbouring countries. At the same time, it was also agreed that the radar countries should ensure that their websites have the ability to provide still and looping images for the general public.

6.8 Further, the CMO Headquarters pointed to the importance of the activation of the committees to manage that radar data which must be shared to the mosaic, and to network the knowledge of the technicians in maintaining the radars. It was pointed out that these committees cannot be established until radar data is routinely being transmitted from the meteorological services in the radar host countries to Martinique for the radar mosaic. In addition, a methodology must be established for managing the Central Stores Facility at CIMH in Barbados, where each radar host country can have easy access to the spares, which must include a proper method of accountability to ensure that the stores are replaced.

OPERATIONAL MATTERS

(Agenda Item 7)

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

(a) WMO Annual Global Monitoring

7.2 The Meeting noted that many Meteorological Services of the Member States, which have stations in the Regional Basic Synoptic Network (RBSN), did not participate in the World Meteorological Organization (WMO) Annual Global Monitoring (AGM), which monitors the data disseminated over the Global Telecommunication Service (GTS). These Meteorological Services were urged to participate in the AGM.

7.3 The Meeting was also presented with the consolidated results of the monitoring which took place during 2008 and 2009. The results showed that the Regional Telecommunication Hub (RTH) in Washington received less than 50% of the observations on average from Barbados, Belize, Dominica and St. Lucia during 2008. During 2009, the RTH received less than 50% of the observations from Belize and Guyana. This monitoring was conducted and analyzed by the RTH during the first month of every quarter. The National Meteorological and Hydrological Services were urged to investigate the cases and to seek solutions.

7.4 Perusal of the updated list of CMO Member stations in the RBSN and the Regional Basic Climate Network (RBCN) indicated that the data for some stations listed was very much out of date. Such errors impact negatively on any monitoring exercise. Directors of Meteorological Services were advised to review the information for their station and to inform WMO of the changes in the RBSN and RBCN stations for their countries as soon as possible. WMO published the number of silent stations for which no reports have been received during the monitoring period. According to the latest report, there are four (4) silent stations in Guyana and one (1) in Belize.

(b) Migration to BUFR Code Form

7.5 The Meeting recalled that the Migration Plan to binary code forms of the World Meteorological Organization (WMO) calls for the migration of the SYNOP, TEMP, PILOT and CLIMAT code forms to BUFR, to be completed by November 2010. Further, the operational exchange of aviation code forms had been set to start from November 2008 and migration of these code forms to BUFR were scheduled to be completed in November 2016.

7.6 The Meetings was reminded that during its deliberation in 2008, information was provided on the methodology to be used to install the BUFR software created by the European Centre for Medium-Range Weather Forecasts (ECMWF) on computers which use the Windows and Linux operating systems.

7.7 To assist countries in the migration to BUFR, ECMWF had offered two versions of its BUFR encoding/decoding software. Version 350 to 360 can use a graphical user interface for the manual input of observed elements, whereas from version 383 onwards, the software allows the user to convert from the FM 12 SYNOP code form directly into FM 94 BUFR. The software was available at **http://www.ecmwf.int/products/data/software/bufr.html**.

7.8 It was noted that in November 2009, WMO requested information on national migration plans and any information on the difficulties experienced. Only 46 countries indicated that they will be in a position to send and receive data in Table Driven Code Forms (TDCF) and 20 countries indicated that they expected to be available to send and receive TDCF after November 2010. The WMO Inter-Programme Expert Team on Data Representation and Codes (IPET-DRC) decided that these target dates should not be revised, in order to continue to stress the urgency of migration and also provide recognition of the 20% of Members States who would meet the target.

(c) Significant Weather for Aviation - SIGMET

7.9 The Meeting discussed the fact that the Meteorological Watch Office (MWO) in a contracting State of the International Civil Aviation Organization (ICAO), which have an associated Flight Information Region (FIR), must issue significant weather for aviation (SIGMET). SIGMET contains information concerning the occurrence, or expected occurrence, of specified en-route weather phenomena which may affect the safety of aircraft operations.

7.10 It was pointed out that Guyana, Jamaica and Trinidad and Tobago are the Member States of the CMO that are responsible for Flight Information Regions (FIR). However, in checks by ICAO and the CMO Headquarters during 2010, it seemed that only one Member State had been routinely issuing SIGMETs in accordance with the regulations as stated in Annex 3. It was pointed out that in July 2010, SIGMET messages from one other Member State began to appear on the required international circuits but the issuance was infrequent,

while CMO has been unable to find any SIGMETs issued by the final Member State until later in the year. In addition, it was observed that, in some cases, there were errors in part of the information contained in the SIGMET. The three Member States were urged to review their practices and ensure that they conform to the SIGMET template contained in Annex 3.

7.11 The Meeting was reminded that problems with either the issuance, dissemination and/or formatting of SIGMET has existed in many regions of the world and the aviation industry has expressed concern in this regard. In an effort to assist its Contracting States to fulfill their mandate, ICAO has proposed an arrangement for a trial to be conducted by one or two regional centres to issue SIGMET advisories, in an effort to assist MWOs.

7.12 Notwithstanding the issuance of the advisory by the regional centre(s) during the trial, action by the aviation community can only occur on the issuance of SIGMETs by the official MWOs. Hence, it was quite possible that if any MWO cannot fulfil its mandate to issue SIGMETs, that responsibility could be given to either another MWO or a regional centre.

7.13 Since an ICAO Contracting State receives fees from all aircrafts that pass over its Flight Information Region, the removal of the responsibility for the issuance of SIGMETs from any MWO will have an economic impact, especially on Small Island Developing States (SIDS). A percentage of that fee is for meteorological services provided and ICAO has recommended that funds for the provision of meteorological services but used to further enhance these services.

(d) The World Area Forecast System (WAFS) Internet File Service (WIFS)

7.14 The Meeting was informed that the United States National Weather Service (NWS) Aviation Weather Center (AWC) had determined that World Area Forecast System (WAFS) Internet File Service (WIFS) would be a highly reliable Internet source of meteorological products. WIFS would provide for timely delivery of critical aviation-related weather information, to support air traffic management, flight operations and regional meteorological telecommunications between the United States and nations in the Caribbean and Central America. Further, ICAO, in Amendment 75 to Annex 3, recognized the use of the Internet to access aviation weather data in support of flight planning. WIFS would provide this capability and serve as a back-up of the International Satellite Communications System (ISCS).

7.15 This service shall be password protected and available to all authorized customers. On approval of the User State by the Federal Aviation Administration (FAA), the AWC would issue a user name and password for access to the data.

7.16 The Meeting noted that WIFS would be available to all current ISCS users, and future users whose primary WAFS provider was designated as the Washington WAFC. Log files would be kept, which would monitor the usage of the WIFS, as required by Per Qualified Internet Communication Provider (QICP). The log files would contain the user's ID and what data they accessed. Further, the users of WIFS were encouraged to use the Gnu "Wget" software to access the data.

7.17 Importantly, the Meeting was informed that the dissemination of WAFS products via the ISCS by FAA would be discontinued on 30th June 2012 and that countries receiving WAFS products via the ISCS were required to transition their workstations no later than 30th March 2012.

(e) Areas of Responsibility – Forecasts, Watches and Warnings

7.18 The Meteorological Services of Member States of the CMO fall into one of two technical categories, even though at varying degrees of sophistication.

(a) Weather Forecast and Warning Offices;
(b) Aeronautical Meteorological Offices.

7.19 A meeting of the Directors of Meteorological Services recommended to the fourteenth session of the Caribbean Meteorological Council in Antigua in October 1974, which agreed with the recommendation, that Trinidad and Tobago would issue warnings for Grenada; Barbados for Saint Lucia and St. Vincent; and Antigua for Dominica, St. Kitts/Nevis/Anguilla and Montserrat. At that time, Jamaica was responsible for the Cayman Islands.

7.20 There were modifications to that responsibility during the intervening period and at present, Trinidad and Tobago issues cyclone warnings for Grenada, Barbados issues weather forecasts, terminal aerodrome forecasts, severe and cyclone warnings for St. Vincent and Dominica. Antigua and Barbuda issues weather forecasts, terminal aerodrome forecasts, flood, rough seas, severe and cyclone warnings for Anguilla, Montserrat, the British Virgin Islands and St. Kitts/Nevis. However, up to 2010, they did not issue terminal aerodrome forecasts for St. Kitts, but only for Nevis. The Bahamas issues weather forecasts, terminal aerodrome forecasts, severe and cyclone warnings for the Turks and Caicos Islands.

7:21 The **Head of the Grenada Meteorological Service** indicated that his Service had staff accessing training which would increase the number of forecasters on their establishment in the near future. By 2015, the Service expects to be able to operate a 24-hour shift system and thereafter they would like to revisit the agreement which has the Trinidad and Tobago Meteorological Service issuing watches and warning for tropical cyclones for Grenada.

7.22 The **Director of Airports** in St. Vincent and the Grenadines indicated that, at this time, there was no need to change the system which is stated in paragraph 7.20. However, it was noted that there were problems in receiving information from Barbados at times especially in the impact of Hurricane Tomas on St. Vincent. The **Head of the Dominica Meteorological Service** also wanted to keep the present system, whereby the Barbados Meteorological Service was responsible for the issuance of weather forecasts, terminal aerodrome forecasts, severe and cyclone warnings to continue. The resulting discussions revealed that the problems articulated by the Directors can be rectified by all parties.

7.23 Although the Director of the Antigua and Barbuda Meteorological Service was unable to be present at the Meeting, the **Representatives of Anguilla**, **Montserra**t, **St. Kitts and Nevis**, and the **British Virgin Islands**, indicated that there was no need to change the system which gave the Antigua and Barbuda Meteorological Service the responsibility for forecasts and warnings as stated in paragraph 7.20. However, it was stated that there was a need to formalize the forecasts and warnings services by all parties and to have the required information included in their respective standard operating practices.

SCIENTIFIC TOPIC
(Agenda Item 8)

Topic:

The Theoretical and Statistical Relationship between El Niño and Rainfall in Trinidad and Tobago: Exploring a wetter and earlier onset to the rainfall season in El Nino decline years and a drier than normal late rainfall and dry season during El Nino onset years

8.1 ***Mr Kenneth Kerr***, Meteorologist in the Trinidad and Tobago Meteorological Service, gave a presentation on the relationship between El Niño and the rainfall in Trinidad and Tobago. Trinidad and Tobago rainfall pattern shows high variability but can be best described as bimodal with a major peak in July and a secondary peak in November; this allows for a convenient division of the rainfall season into an early and late mode. The El Niño phenomenon has a strong impact on local climate variability through strong teleconnections such as a drier than normal dry season in Trinidad and Tobago.

8.2 The presentation showed that El Niño affects Trinidad and Tobago rainfall in two signals which are separate and apart from the signal of drier than normal dry season. The presentation first looked at the theoretical perspectives through which El Nino affects Trinidad and Tobago rainfall, then sought to establish a statistically significant correlation between El Niño and rainfall patterns by fitting a Pearson's correlation model to the data. Sixty years of rainfall data for Piarco was analyzed in association and the Southern Oscillation Index (SOI) was used to determine the occurrence of an El Niño event for the same period.

8.3 He found two statistical associations. First, there existed a statistically significant positive correlation between El Niño and below normal rainfall for the second mode of the rainfall season at Piarco. Secondly, there was also a statistically significant negative correlation between SOI of the months during which El Niño peaks and the rainfall amounts for the early months of the rainfall season during El Niño decline. He found that there was a tendency to have a wetter and earlier onset (May) to the rainfall season during the year of an El Niño decline at Piarco and a drier than normal late season rainfall amounts during El Nino onset.

OUTCOME/HIGHLIGHTS OF THE FOURTEENTH SESSION OF THE WMO COMMISSION FOR AERONAUTICAL METEOROLOGY
(Agenda Item 9)

9.1 The Meeting was made aware of a number of matters which were discussed at the fourteenth session of the WMO Commission for Aeronautical Meteorological (CAeM), which could affect the service delivery to the aviation community by Meteorological Services in the Caribbean.

ICAO AMENDEMENT

(a) Competency

9.2 The ICAO requirement (paragraph 2.2.2. in Amendment 75 to Annex 3) to implement a Quality Management System (QMS) by November 2010 means, among other actions, that **every** National Meteorological Service (NMS) supplying aviation observations or aviation forecasts and warnings would need to be able to show that by November 2013 that their staff meet the required competencies.

(b) Quality Management Service

9.3 Amendment 75 of ICAO Annex 3 indicates that the implementation of a recognized Quality Management System shall be a requirement at the level of Standard, i.e. the highest level of stringency in ICAO terminology, by November 2012. The implementation of the QMS this would be verified during the Safety Oversight Audits of ICAO.

9.4 The implementation of a Quality Management System, while necessarily requiring considerable effort and resources both in terms of staff time and expenditure, is regarded as a fully recoverable cost and could be included in the charges levied from aviation by Members. While cost recovery may be difficult in practice, this new requirement would provide a good reason to reconsider the benefits of a properly negotiated and agreed cost recovery mechanism for services to aviation based on accounting guidance to be found in ICAO and WMO Guidance and Manuals (WMO - No. 904, ICAO Doc. 9161).

NEW DEVELOPMENTS IN AERONAUTICAL METEOROLOGY

(a) Meteorological Services in the Terminal Area

9.5 At a meeting of the Expert Team on New Terminal Forecast in Montreal in 2007, it was agreed that a subset of weather elements needed to be prioritized and offered to the Aerodrome Meteorological Observation and Forecast Study Group ad hoc group, as a starting point from the initial all-encompassing list of weather elements identified as having an impact on capacity and safety in the wider terminal area. The Team agreed this subset, or "Threshold" capability, would include convection, low ceilings/visibility, winter weather, and wind information (including both surface winds at the aerodrome and profiles along the approach paths) and to target the 2013 time-period.

9.6 It was agreed that this prototype should be seen as a product intended for aerodromes with high traffic density only. Countries with low or medium traffic loads would not be expected to implement such a product initially. The Commission suggested countries with low or medium traffic loads should maintain close liaison with the group through their regional representatives on the CAeM Management Group, as there may be a need to provide briefings and consultation based on this forecast to air crews and operators serving other destinations.

(b) Next Generation Air Transportation System (NextGen)

9.7 The Next Generation Air Transportation System (NextGen) is an initiative mandated by the United States Congress to modernize the US air transportation system to increase capacity and reliability, improve safety and security, and minimize the environmental impact of aviation. Accomplishing that goal would require a mix of revolutionary and evolutionary methods to satisfy the need for sweeping improvements to the system. These improvements to the air transportation system would be achieved by applying advances in space-based navigation and integrated surveillance, digital communications, layered adaptive security, weather integrated into decision-making, advanced automation of Air Traffic Management, and net-centric information access for operations.

9.8 A key component of the NextGen weather concept is a 4-dimensional weather data cube referred to as the "4-D Cube," which was envisioned as a virtual repository of weather data and products, whether produced by meteorologists or through automated algorithms. A subset of that weather data and information would form the common weather picture called the "Single Authoritative Source" (SAS) for ATM decision making. The SAS would contain largely gridded and geo-referenced data and would be available to all users of US airspace.

(c). Single European Sky ATM Research project (SESAR)

9.9 In Western Europe, the European Commission has been promoting the Single European Sky ATM Research project (SESAR) which would introduce completely new concepts to managing the increasing air traffic. That project is similar to the US NextGen project.

9.10 The implementation of the Single European Sky regulations in the European Union remains the major driving force for the provision of meteorological service to air navigation. According to the Single European Sky regulations, the providers of the meteorological services to air navigation in the European Union (EU MET-SP) have to be SES certified by a national Supervisory Authority as being compliant with the Single Sky regulations

OTHER MATTERS

(Agenda Item 10)

10.1 Mr Adrian Trotman, Agrometeorologist at the CIMH, briefed the Meeting on a number of matters concerning agrometeorology and climatology that the Institute was involved in and which were of special interest to Member States of the CMO.

(a) Training in Statistics in Applied Climatology

10.2 Participants of the rainfall analysis training of the Caribbean AgroMeteorological Initiative (CAMI) indicated a wish for a more in-depth study of statistics and use of the two major statistical packages from the training (INSTAT and GENSTAT). Through discussions with the Caribbean Community Climate Change Centre (CCCCC), funds have been made available through cooperation between CCCCC and the United Nations Institute for Training and Research (UNITAR) to commence a training programme in collaboration with CIMH and the University of Reading (UoR) UK in Statistics in Applied Climatology (SIAC) for the Caribbean.

10.3 UoR has split this course into an e-course (e-SIAC, the more basic aspect of the course) and a face to face course (f-SIAC) held in the developing region. There are e-SIAC graduates from the region – St. Vincent and the Grenadines, Dominica, Trinidad and Tobago and Belize. Through the CCCCC/UNITAR cooperation, the funding was secured for the e-SIAC to begin during the last week in January 2010. In collaboration with the UK Met Office, CIMH and CCCCC are seeking further funding to facilitate the funding of the f-SIAC as soon as possible afterwards

10.4 For the e-SIAC, CCCCC would fund one person from each CMO and CARICOM member state to participate. A time-line for the First SIAC programme follows:

Scouting of potential candidates and submission of contact information: by December 2010;
Completion of Administrative activity: 3 – 7 January, 2011;
Orientation: 17 January 2011;
Start of formal training: 31 January, 2011;
End of course: 29 April, 2011

e-SIAC (http://www.reading.ac.uk/ssc/courses/siac/)

It was proposed to commence the f-SIAC course in June 2011 for a period of2 to 3 weeks.

(b) Agricultural Risk Insurance Training

10.5 In collaboration with the World Bank (WB), this training uses the Index/Parameterization approach which is used by the Caribbean Catastrophe Risk Insurance Facility (CCRIF), but with special application to the agricultural industry. Funding would be provided by the WB with a series of one week training workshops for the Caribbean. Course module material has been developed by the WB with on-line access for participants and trainers.

10.6 The use of statistical approaches for agricultural insurance compliments the training of the SIAC programme by providing Meteorological Services with an increase capacity to analyze statistically for climatological purposes. As the global community focuses more heavily on Climate Services, this programme, along with the SIAC, helps to prepare National Meteorological Services to address the challenges of increasing demand for climate products, information and advice. The WB would be launching its Global programme in December 2010, with the anticipation of a Caribbean regional launch in the second half of 2011. The WB has suggested that the compliment of trainees should include Meteorological Services, Insurance Commissions, Insurance Companies, Banks, Agri-businessmen, and Hydrological Services

(c) –Re-establishment of the Caribbean Regional Climate Outlook Forum

10.7 In June 2010, participants from the Meteorological Services of CMO Member States and scientists from a number of sectors joined with international agencies to re-establish a forum launched in 1998 for the development of seasonal climate products.

10.8 The United States geological Survey (USGS) in collaboration with the National Oceanic and Atmospheric Administration (NOAA) and CIMH, submitted a proposal for US 20,000 to the Government of the United States to assist in training CIMH staff in satellite techniques for rainfall monitoring to supplement existing reliable land based stations, as well as for a training exercise to kick-start the practical work of the forum. The Spanish, French and Dutch speaking states were expected to participate and collaborate in the forum.

(d) World Agro-Meteorological Information System (WAMIS) – the Second Generation

10.9 The World Meteorological Organization (WMO) hosts a portal for the upload of agrometeorological information from across the globe (www.wamis.org). WMO, in collaboration with the United States Department of Agriculture (USDA), George Mason University, Seoul National University, National Centre for Atmospheric Research (NCAR) of the USA (among others) were in the process of re-developing the portal with what it calls the Second Generation WAMIS. WMO has proposed to use the CAMI project as one of its pilots for the new WAMIS.

10.10 Through CAMI, a number of climatological rainfall and temperature products were being developed at CIMH. In the first half of 2011, a workshop would be convened under the CAMI project, to train Meteorological Service, Caribbean Agricultural Research and Development Institute (CARDI) and CIMH personnel in developing bulletins and newsletters for information for the agricultural community. The hope is that such information, along with the previously mentioned climatological products, will form part of the WAMIS pilot.

(e) Rescue of Meteorological and Hydrological Data and Development of a Comprehensive Data Management System

10.11 Under the CAMI project, which follows the protocols within a past WMO data rescue pilot project, emphasis was placed on collecting, recovering and capturing hard copy and electronic data, particularly in agricultural areas. It was expected that some of this data, along with already available data, would be used in the varying aspects of the Action.

10.12 Since (i) the CAMI Data Rescue covers only 10 of the 16 CMO member states and (ii) not all data was expected to be rescued in the ten CAMI countries, CIMH has continued to pursue the capture of as much climatological data as possible. CIMH has been in discussions with a donor agency to address these two deficiencies. Once approved, the project would also address the capture of hydrological data and embrace all aspects of database management and data dissemination. The activities within the Action would include:

- Locating existing electronic data and hard copy data;
- Designing and developing a data capture and archiving system;
- Capturing hard and imaging hard copy data;
- Incorporating imaged and electronic data into CIMH database;
- Developing common procedures for data management within data collection agencies and for transfer between agencies and CIMH;
- Developing a self financing mechanism to sustain the system;
- Designing a framework to enhanced accessibility to the data and that facilitates cost effective and rapid distribution of data;
- Developing institutional policies regarding dissemination of data;
- Acquisition and installation of hardware and software to support accessibility and dissemination and security.

10.13 To facilitate this activity, Commitment Letters of Cooperation were requested from all Meteorological Services of CMO Member States. To date not all countries have responded. However, CIMH awaits some indication of commitment from the remaining countries.

ANNUAL MEETING OF DIRECTORS OF METEOROLOGICAL SERVICES
GEORGE TOWN, CAYMAN ISLANDS
20TH NOVEMBER, 2010

LIST OF DELEGATES

ANGUILLA

Ms Helen Tonge - Senior Air Traffic Controller
Anguilla Air and Sea Ports Authority
Ministry of Infrastructure, Communication, Utilities and Housing
Clayton J. Lloyd International Airport
Wallblake Estate
Tel: 264 497 2384
Fax: 264 497 5348
E-mail: **htungo<at>yahoo.co.uk**

BARBADOS

Mr Hampden Lovell - Director
Barbados Meteorological Services
Building #4 Grantley Adams Industrial Park
Seawell, Christ Church
Tel: 246 428 0910
Fax: 246 428 1676
E-mail: **hlovell<at>barbados.gov.bb**

BELIZE

Mr Dennis Gonguez - Director/Chief Meteorologist
National Meteorological Service of Belize
Ministry of Natural Resources and the Environment
Philip Goldson International Airport
Ladyville
Tel: 501 225 2012
Fax: 501 225 2101
E-mail: **dennis_gonguez<at>yahoo.com**

BRITISH VIRGIN ISLANDS

Mr Denniston Fraser - Managing Director
BVI Airports Authority Limited
PO Box 4416, Road Town, Tortola
Tel: 284 852 9000
Fax: 284 852 9045
E-mail: **dfraser<at>bviaa.com**

Ms Lydia Rubaine - Senior Air Traffic Control Officer
BVI Airports Authority Limited
Ministry of Communication and Works
PO Box 4416, Road Town, Tortola, VG1110
Phone: 284 852 9000
Fax: 284 852 9045
E-mail: **lrubaine<at>bviaa.com**

CAYMAN ISLANDS

Mr Fred Sambula - Director General
Cayman Islands National Weather Service
Ministry District Administration, Works, Lands and Agriculture
Government Administration Building
Elgin Avenue, Grand Cayman
Tel: 345 945 5773
Fax: 345 945 5773
E-mail: **fred.sambula<at>caymanairports.com**
fred.sambula<at>gov.ky

Mr John Tibbetts - Chief Meteorologist
Cayman Islands National Weather Service
Ministry District Administration, Works, Lands and Agriculture
Government Administration Building
Elgin Avenue, Grand Cayman
Tel: 345 945 5773
Fax: 345 945 5773
E-mail: **john.tibbetts<at>caymanairports.com**
john.tibbetts<at>gov.ky

CAYMAN ISLANDS CONT'D

Mr Avalon Porter - Meteorologist I
Cayman Islands National Weather Service
Ministry District Administration, Works, Lands and Agriculture
Government Administration Building
Elgin Avenue, Grand Cayman
Tel: 345 949 4528
Fax: 345 945 5773
E-mail: **avalon.porter<at>gov.ky**

Mr Kerry Powery - Meteorologist I
Cayman Islands National Weather Service
Ministry District Administration, Works, Lands and Agriculture
Government Administration Building
Elgin Avenue, Grand Cayman
Tel: 345 949 4528
Fax: 345 945 5773
E-mail: **kerry.powery<at>gov.ky**

Mr Allan Ebanks - Meteorologist II
Cayman Islands National Weather Service
Ministry District Administration, Works, Lands and Agriculture
Government Administration Building
Elgin Avenue, Grand Cayman
Tel: 345 949 4528
Fax: 345 945 5773
E-mail: **allan.ebanks<at>gov.ky**

DOMINICA

Mrs Sheryl Etienne-Leblanc - Senior Meteorological Officer (Ag)
Dominica Meteorological Service
Ministry of Public Works, Energy and Ports
Government Headquarters
Roseau
Tel: 767 449 1990
Fax: 767 449 2020
E-mail: **metoffice<at>cwdom.dm**

GRENADA

Mr John H Peters - Meteorology Manager
Grenada Airports Authority
Ministry of Civil Aviation and Tourism
Maurice Bishop International Airport
Point Salines, St. George's
Tel.: 473 444 4142/473 534 5206
Fax: 473 444 1574
E-mail: **jhpet<at>hotmail.com**
jpeters<at>mbiagrenada.com

GUYANA

Mr Garvin Cummings - Specialist Hydrologist (Ag)
Hydrometeorological Service
Ministry of Agriculture
18 Brickdam, Stabroek
Georgetown
Tel: 592 225 4247
Fax: 592 226 1460
E-mail: **garvincummings<at>yahoo.com**

JAMAICA

Mr Evan Thompson - Weather Branch Head
Meteorological Service
Office of the Prime Minister
65 ¾ Half Way Tree Road
Kingston 10
Tel: 876 929 3695
Fax: 876 960 8989
E-mail: **metservice.wbh<at>jamweb.net**

MONTSERRAT

Mr Alan Barnett - Airport Manager
John A Osborne Airport
Ministry of Communications and Works
PO Box 344, Gerald's
Tel: 664 491 6218
Fax: 664 491 7688
E-mail: **airport<at>gov.ms**
abarnetcda<at>aol.com

MONTSERRAT CONT'D

Mr Steve Ryan - Operations Manager ATC/Met (Ag)
John A Osborne Airport
Ministry of Communications and Works
PO Box 344, Gerald's
Tel: 664 491 6218
Fax: 664 491 7688
E-mail: **airport<at>gov.ms**

ST KITTS AND NEVIS

Mr Delver Martin - Meteorological Officer
St. Christopher Air and Sea Ports Authority
Ministry of Tourism and International Transport
R.L. Bradshaw International Airport
Golden Rock
Tel: 869 465 2749
Fax: 869 465 9122
E-mail: **skbmetof<at>sisterisles.kn**
delver.martin<at>scaspa.com

SAINT LUCIA

Mr Thomas Auguste - Director
St Lucia Meteorological Services
Ministry of Communications, Works, Transport and Public Utilities
Union
Castries
Tel: 758 450 1210
Fax: 758 453 2769
E-mail: **tauguste<at>gosl.gov.lc**

ST VINCENT AND THE GRENADINES

Mrs Corsel Robertson - Director of Airports
Airports Department
Ministry of National Security
Administrative Complex
Kingstown
Tel: 784 458 4011
Fax: 784 458 4786
E-mail: **etjoshua<at>vincysurf.com**

TRINIDAD AND TOBAGO

Mr Emmanuel Moolchan - Director
Ministry of Public Utilities
Trinidad and Tobago Meteorological Services
c/o Piarco International Airport
Tel: 868 669 5465
Fax: 868 669 4009
E-mail: **dirmet<at>tstt.net.tt**
e_moolchan<at>hotmail.com

Mr Kenneth Kerr - Meteorologist II
Ministry of Public Utilities
Trinidad and Tobago Meteorological Services
c/o Piarco International Airport
Tel: 868 669 5465
Fax: 868 669 4727
E-mail: **k_kerr45<at>hotmail.com**

TURKS AND CAICOS ISLANDS

Mr Kendre Wilson - Meteorological Officer
Turks and Caicos Islands Airports Authority
Juba Sound, Providenciales
Tel: 649 946 4420
Fax: 649 941 5996
E-mail: **kendrewilson<at>hotmail.com**
kendrewilson<at>tciairports.com

INSTITUTIONS/ORGANIZATIONS

CARIBBEAN METEOROLOGICAL ORGANIZATION

Mr Tyrone Sutherland - Coordinating Director
#27 O'Connor Street, Woodbrook
PO Box 461, Port of Spain
Trinidad and Tobago
Tel: 868 622 4711
Fax: 868 622 0277
E-mail: **TSutherland<at>cmo.org.tt**

Mr Glendell De Souza - Science and Technology Officer
#27 O'Connor Street, Woodbrook
PO Box 461, Port of Spain
Trinidad and Tobago
Tel: 868 622 4711
Fax: 868 622 0277
E-mail: **GDe_Souza<at>cmo.org.tt**

Ms Lynn Nimblett - Administrative Officer
#27 O'Connor Street, Woodbrook
PO Box 461, Port of Spain
Trinidad and Tobago
Tel: 868 622 4711
Fax: 868 622 0277
E-mail: **LNimblett<at>cmo.org.tt**

Ms Beverly Patterson-Roberts - Secretary
#27 O'Connor Street, Woodbrook
P.O. Box 461, Port of Spain
Trinidad and Tobago
Tel: 868 622 4711
Fax: 868 622 0277
E-mail: **BPatterson<at>cmo.org.tt**

CARIBBEAN INSTITUTE FOR METEOROLOGY AND HYDROLOGY

Dr David Farrell - Principal
Caribbean Institute for Meteorology and Hydrology
Husbands, St James
Barbados
Tel: 246 425 1362
Fax: 246 424 4733
E-mail: **dfarrell<at>cimh.edu.bb**

CARIBBEAN INSTITUTE FOR METEOROLOGY AND HYDROLOGY CONT'D

Mr Adrian Trotman - Chief – Applied Meteorology & Climatology (Ag)
Caribbean Institute for Meteorology and Hydrology
Husbands, St James
Barbados
Tel: 246 425 1362
Fax: 246 424 4733
E-mail: **atrotman<at>cimh.edu.bb**

WORLD METEOROLOGICAL ORGANIZATION

Mr Hugo Hidalgo - Programme Officer
World Meteorological Organization
PO Box 7-3350-1000 San José
Costa Rica
Tel: 506 2258 2370
Fax: 506 2256 8240
E-mail: **hhidalgo<at>wmo.int**

BERMUDA WEATHER SERVICE

Mr Mark Guishard - Director
Bermuda Weather Service
Bas-Serco Ltd.
St Georges GE BX
Tel: 441 293 5067 Ext 400
Fax: 441 293 6658
E-mail: **mguishard<at>bas-serco.bm**

HAZARD MANAGEMENT CAYMAN ISLANDS

Mr Omar Afflick - Deputy Director
Ministry of Internal and External Affairs
Cayman Corporate Centre
12 Hospital Road, Georgetown
Grand Cayman KY1-1003
Tel: 345 945 4624/345 526 1580
Fax: 345 946 5020
E-mail: **omar.afflick<at>gov.ky**

HAZARD MANAGEMENT CAYMAN ISLANDS CONT'D

Mr Simon Boxall - Public Information Officer
Ministry of Internal and External Affairs
Cayman Corporate Centre
12 Hospital Road, Georgetown
Grand Cayman KY1-1003
Tel: 345 945 4624
Fax: 345 946 5020
E-mail: **simon.boxall<at>gov.ky**

OBSERVER

Mr Chester Layne - Consultant
Tel: 246 423 6738
Fax:
E-mail: **cheranlay<at>gmail.com**

Ms Margarita Leonard - GM/Civil Engineer
Lauriston Lewis Associates Ltd.
14 Picton Street
Newtown, Port of Spain
Tel: 868 622 7205
Fax: 868 622 9032
E-mail: **mleonard<at>llaltd.com**

SUPPORT STAFF

Ms Shakira Gregory - Administrative Manager
Cayman Islands National Weather Service
Ministry of District Administration, Works, Lands and Agriculture
Government Administration Building
71 Elgin Ave, Georgetown, Grand Cayman
Cayman Islands
Tel: 345 945 5773
Fax:
E-mail: **shakira.gregoroy<at>gov.ky**

SUPPORT STAFF CONT'D

Mr Wintroy Randal - Audio Video Technician
Cayman Islands National Weather Service
Ministry of District Administration, Works, Lands and Agriculture
Government Administration Building
71 Elgin Ave, Georgetown, Grand Cayman
Cayman Islands
Tel: 345 945 5773
Fax:
E-mail: **wintroy.randal<at>gov.ky**

_____

CARIBBEAN METEOROLOGICAL ORGANIZATION

ANNUAL MEETING OF DIRECTORS OF METEOROLOGICAL SERVICES
George Town, Grand Cayman, CAYMAN ISLANDS - 20 NOVEMBER 2010

AGENDA

1. INTRODUCTION AND ADOPTION OF AGENDA
2. THE IMPACTS OF WEATHER DURING 2010
3. STATUS OF ACTIONS FROM THE PREVIOUS MEETING
4. TRAINING
5. CMO OPERATIONAL METEOROLOGY ADVISORY GROUP (COMAG)
6. THE CMO RADAR PROJECT – THE FUTURE
7. OPERATIONAL MATTERS
   - (a) WMO Annual Global Monitoring
   - (b) Migration to BUFR Code Form
   - (c) Significant Weather for Aviation - SIGMETs
   - (d) Areas of Responsibility – Forecasts, Watches and Warnings
   - (e) The World Area Forecast System (WAFS) Internet File Service (WIFS)
8. SCIENTIFIC TOPIC.
9. OUTCOME/HIGHLIGHTS OF THE FOURTEENTH SESSION OF THE WMO COMMISSION FOR AERONAUTICAL METEOROLOGY
10. OTHER MATTERS

_____