



# **The Barbados In-Country Workshop: Mapping Provider Capacity and User Needs for Climate Services**

## **Workshop Report**

Caribbean Institute for Meteorology and Hydrology (CIMH)  
Husbands, St. James  
Barbados

November 20, 2015

Prepared by:

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## **1.0 BACKGROUND**

Addressing climate change and increasing climate variability have been made regional and national priorities by the Heads of Government of the Caribbean Community (CARICOM). Climate variability and change, as exemplified by extreme weather and climate events, such as droughts, floods and tropical cyclones, continue to pose significant risks for the Caribbean region. These make the development of climate early warning information systems critical components of preparedness, risk reduction and adaptation. Appropriate climate services, tailored to the Caribbean islands, will rely on such early warning information systems if the goals of supporting adaptation and disaster risk reduction are to be realised.

As part of an international effort to establish the systematic development and delivery of climate services in the Caribbean, the World Meteorological Organization (WMO) has secured generous funding from the American People, through the United States Agency for International Development (USAID) to implement activities that enhance the capacities of the Caribbean Institute for Meteorology and Hydrology (CIMH) and National Meteorological and Hydrological Services (NMHS) to deliver high quality, user oriented climate early warning information products and services to six climate-sensitive sectors in the Caribbean.

This work is critical since the main drivers of socio-economic development of Caribbean States remain highly sensitive to climate. Sector-specific climate information at appropriate spatial and temporal scales can be particularly helpful to anticipate, prepare for and respond to climate-related risks and opportunities. In fact, sectoral Early Warning Information Systems across Climate Timescales (EWISACTs) can be of great value because they can provide early warning of potential impacting climatic events that may have implications for a wide range of climate-sensitive sectoral decisions.

## **2.0 INTRODUCTION**

The first in a five-country Workshop series to map user needs for climate information and services in the Agriculture, Water, Health, Disaster Risk Management, Energy and Tourism sectors, as well as, to further baseline national institutional capacity to deliver climate services to these sectors was convened in Barbados on November 20, 2015.

The Barbados In-Country Workshop to map provider capacity and user needs for climate services was co-hosted by the Barbados Meteorological Services and the Caribbean Institute for Meteorology and Hydrology (CIMH). This meeting provided an opportunity for cross-sectoral dialogue between the Barbados Meteorological Service (BMS) and national stakeholders from climate-sensitive sectors. It also advanced discussions around the formation of a national governance mechanism for the provision of climate services (see Appendix I). The meeting was held at the CIMH Campus, St. James, Barbados. In attendance were representatives from various sectors including agriculture and food security, water, tourism, disaster risk management and energy (see Appendix II).

The objectives of this Workshop were to:

1. Familiarise country representatives with the Caribbean's programmatic approach to the design, development and delivery of user oriented climate information;
2. Share the preliminary results of an assessment of provider capacity for the delivery of climate services in Barbados and the wider Caribbean;
3. Assess sectoral needs in Barbados for climate information and services;
4. Discuss national perspectives on early warning and response to the potential impacts of El Niño 2015-2016; and
5. Begin to strategise for the formation of a National Sectoral Early Warning Information Systems across Climate Timescales (EWISACTs) Committee (NSEC).

### **3.0 WELCOME AND OPENING REMARKS**

Mr. Adrian Trotman, Chief of the Applied Meteorology/Climatology Section and Agrometeorologist at CIMH, gave a warm welcome to the participants. He emphasised the importance of having early warning information systems in place to deal with climate at various timescales (weather, variability and change). The goal of these systems would be to communicate the likely impacts of climate across sectors and provide information that can be used in operational and strategic planning.

Mr. Trotman offered apologies on behalf of the Principal of CIMH, Dr David Farrell who was attending an important El Niño related meeting abroad. Mr. Trotman also made mention of the on-going strong El Niño event, giving rise to drought across the region and stated that scientists are suggesting that this El Niño will be followed by an equally strong La Niña (associated by intense and increased hurricane activity, as well as, above normal rainfall across the region).

In his opening remarks, Mr Hampden Lovell, Director of the Barbados Meteorological Services, acknowledged the main contributors to the Workshop namely, Mr Adrian Trotman, Dr Rochè Mahon, Ms Sonia Nurse, and Dr. Cedric Van Meerbeeck. He stated that the interaction between participants at the workshop is crucial and he hopes to benefit from their expertise. Mr. Lovell reiterated the objectives of the workshop before expressing his confidence that the following sessions would be productive.

Meeting attendees were invited to participate in an ice-breaker where they had to opportunity to introduce themselves and share a climate event likely to impact their sector and the risk associated with such an event (see Appendix III for a summary of these events and risks).

## **4.0 Session I: International, Regional and National Context of Climate Services**

### **The Global Framework for Climate Services (GFCS) and the Caribbean Regional Climate Centre (RCC) approach to the delivery of user-oriented climate information, products and services - Dr. Cédric Van Meerbeeck**

Dr. Cédric Van Meerbeeck, Climatologist at CIMH, in his presentation highlighted world-wide concerns due to climate. These include, disease, crop loss, flooding and population displacement. These factors pose risks which differ depending on the local context. He continued by providing a definition for Climate Risk Management (CRM) as *“A systematic and coordinated process in which climate information is used to reduce the risk associated with variability and change and to take advantage of opportunities.”*

Dr. Van Meerbeeck gave an overview of the Global Framework for Climate Services (GFCS). He highlighted the Five Pillars of the GFCS: (1) User Interface Platform, where discussion takes place to identify and solve problems from data stored in, (2) Climate Services Information Systems, which were collated via, (3) Observations and Monitoring, as well as, (4) Research, Modelling and Prediction. He stated that Pillar (5), Capacity Development, was meant to be the foundation of the GFCS implementation plan that linked and supported the four other pillars to provide climate information and services from months, years and decades to solve problems from the global scale to local and community level. Dr. Van Meerbeeck pointed out that a major challenge in providing climate services was in translating what is a good climate outlook output from the science side to user information for appropriate sectoral decision-makers. He stated that the delivery of information needs to be tailored to a sector and should include likely impacts and information on how to respond. Dr. Van Meerbeeck then highlighted climate information and products generated at the CIMH.

### **Service Delivery of Barbados Meteorological Services: Past, Present and Future - Mr. Hampden Lovell**

In his presentation, Mr. Lovell outlined the history of the Barbados Meteorological Service and how it has transitioned throughout the years. The BMS was established in 1941 at Seawell, Christ Church Barbados and became an independent forecasting office in January 1963. Daily routines of the Meteorological Observers, Meteorologists and Senior Meteorologists involve taking observations and data collection, which is shared with aviation as well as the World Meteorological Organization, WMO, data bank. The tracking of weather systems has since evolved with the introduction of enhanced radar images.

## **Discussion**

A question was posed to the BMS regarding the measurement of rainfall, whether it was done solely at the airport.

Response: No, there are weather stations across the island.

## **5.0 Session II: Sectoral Applications of Climate Information Products and Services**

### **CIMH Early Warning Information Products: An Overview (with examples of regional and national level use) – Dr. Cédric Van Meerbeeck, CIMH**

Dr. Van Meerbeeck introduced the range of climate products issued by the CIMH and their usefulness to specific audiences. He highlighted the CIMH product range including: Communication Products (CariCOF Caribbean Climate Outlook Newsletter, Agroclimatic Bulletins); Technical Tools (Monthly Weather Summaries, Caribbean Climate Database, Caribbean DEWETRA Platform); and Technical Products (CariCOF Drought Alert Outlook, CariCOF Wet Days and Wet Spells Outlook). Van Meerbeeck then presented on the sectoral application of climate products and services and called for more users to be innovative in assessing their needs and for the climate products issued to be relevant.

Dr. Van Meerbeeck then presented on the sectoral application of climate products and services and called for more users to be innovative in assessing their needs and for the climate products issued to be relevant.

In his presentation, Dr. Van Meerbeeck further highlighted that currently there is an El Niño, which gives rise to an increased risk of coral bleaching as well as drought conditions across the region. There has already been some localized bleaching but not as severe as 2010 or 2005. Given that these events can be monitored and predicted, early warning information can be useful for sectoral planning.

The present early warning information offered by CIMH, although not tailored to specific sectoral operating contexts can still be of use. Dr. Van Meerbeeck commented that Barbados is presently in its record driest year so far, even though it doesn't seem that way visually. The wet season did not produce as much water as normal, and going into a dry season with limited water reserves and increased evaporation rates, would be challenging (especially for high demanding sectors). If the water resources are not managed properly then the country could end up with a water crisis. Countries such as Antigua, Puerto Rico and Jamaica have already been facing water crises.

## **The Use of Climate Early Warning Information in the Agriculture and Water Sectors – Leslie Brereton, Ministry of Agriculture (Barbados)**

Mr. Brereton opened his presentation by giving an outline of the distribution of water in Barbados by the Barbados Agricultural Development and Marketing Corporation (BADMC). Currently, there are fourteen irrigation districts with seventeen wells in operation supplying 641 farmers. In September of this year, all seventeen wells had to be closed for a period of time due to low water levels. This gave rise to severe crop loss for some farmers.

He also stated that Barbados is classified as a water scarce nation with a wet season from June to November and a dry season from December to May. However, this seasonal pattern has not been observed in recent times with more rainfall being recorded in the dry season and less in the wet season. Barbados is considered as a very high net food import country, which is in excess of \$325 million USD per year. As a result, agriculture in Barbados needs restructuring with a focus on what is happening with the climate. The current drought conditions pose a dilemma with not only crop loss for farmers but also low production. For example, farmers usually plant cotton in August but due to low rainfall this year planting began at the end of October, which may produce lower yields.

### **Discussion**

Mr. Brereton posed the question of the country having a drought mitigation plan to the BWA.

Response (Ms. Jamie Paul, BWA): BWA has a manager's plan which speaks to how they relate to the public.

Question (Mr. Steve Daniel, Ministry of Health): Do we need a drought plan or a long term comprehensive, sustainable plan?

Response (Mr. Adrian Trotman, CIMH): Any water resources management plan should include a drought plan. We should write a policy which would drive a plan to cover sectors.

## **6.0 Session III: El Niño and Early Warning**

### **El Niño Past and Present: National Implications – Ms. Sonia Nurse, BMS**

The El Niño Southern Oscillation (ENSO) is a phenomenon associated with the variations in sea surface temperatures in the tropical eastern Pacific Ocean and in air surface pressure in the tropical western Pacific. There are three types of ENSO phases which include the El Niño, La Niña, and neutral phase. During an El Niño phase, sea surface temperatures across the equatorial Eastern Pacific are warmer than usual, giving rise to drought conditions, as well as fewer hurricanes, across most of the Caribbean region. With the present El Niño phase, hurricane activity across the region has been suppressed. However, the number of named storms for the 2015 Atlantic hurricane season (12) has been higher than average (7) for an El

Niño year. In 2009-2010 the Caribbean region faced one of its worst droughts in decades and this was attributed to El Niño, which was then followed by a relatively strong La Niña event. Other implications from the El Niño phase include coral bleaching, which is not expected to be severe this year. This present El Niño is rivalling that of 1997-1998 where, currently, 2014-2015 daily maximum temperatures are in close resemblance. However, 2015 rainfall at Grantley Adams International Airport has been significantly less than its 30-year average from May to October (Barbados' wet season).

## **7.0 Session IV: Baseline Provider Capacity and User Needs**

### **Towards Baseline User Needs for Climate Services in the Caribbean: Preliminary results from a survey of 2015 Wet Season CariCOF Participants – Dr. Roché Mahon, Post-Doctoral Researcher, CIMH**

In her introductory remarks, Dr. Roché Mahon noted that knowledge regarding enduser needs is not presently empirically robust and there are insufficient baselines to inform product tailoring and development for climate sensitive sectors. Dr. Mahon then facilitated participants to complete the Caribbean Climate Services User Baseline Survey. Eleven (11) questionnaires were completed during this session.

## **8.0 Session V: Way Forward**

Dr. Roché Mahon facilitated participants in a discussion on the options and opportunities for national governance of the climate services agenda in Barbados. In her brief introductory presentation, she highlighted that the goal of working towards the early establishment of a representative stakeholder governance mechanism was to foster joint provider and user ownership of the climate services process. She identified 3 possible governance mechanisms for participants to further consider:

- Option 1: National Climate Change Committee (NCCC)
- Option 2: National Disaster Management Committee (NDMC)
- Option 3: National Sectoral EWISACTs Committee (NSEC)

The Ministry of Environment and Drainage and Department of Emergency Management representatives were invited to speak about the mechanisms currently in place in their organizations.

*Mr. Rickardo Ward (Ministry of Environment and Drainage) speaking on the National Climate Change Committee (NCCC):*

- The need for a committee came about from a very simple idea, which then brought key stakeholders together for which climate change had impacts. These stakeholders included, Ministry of Environment and Drainage; representative from the Prime Minister's Office; Ministry of Finance; Ministry of Agriculture; Ministry of Health; Ministry of Transport and Works; Ministry of Tourism; Ministry of Home Affairs; Disaster Emergency Management; representative from a community based Non-Governmental Organization; representative from UWI; and a representative from the business sector. Efforts were also made to include a representative from the Bureau of Gender Affairs.
- The Committee has tried, unsuccessfully, to have meetings quarterly due to capacity, as demand outweighed available resources. Meetings, however were to examine national, regional and international happenings.
- A draft Climate Change Policy has been generated and would include intentions to produce an annual report in an effort to increase and improve resilience.
- The main factor for the NCCC would be to identify the key institution to be at the helm and the Ministry would provide the necessary support. Having such a task left to the Ministry would not attract the level of dedication necessary.

*Ms. Danielle Skeete (Department of Emergency Management, DEM):*

- The National Disaster Management Council meets at least twice annually and is chaired by the Ministry of Home Affairs with its members.
- There is room for those fit to provide functions in mitigation etc. (such as the Ministry sees fit).
- With respect to a governance mechanism for climate services, it would have to sit under the technical committee.

## **Discussion**

Question to the participants: How can we coordinate at a national level?

Response (Rickardo Ward, Ministry of Environment and Drainage): The NSEC could sit under the DEM.

Question to BMS: Are you willing to take on the responsibility of gathering and disseminating information to sectors?

Response (Sonia Nurse, BMS): We have no problem with the task as long as there is a sub-committee established. Whether the BMS would lead the process of the NSEC cannot be answered at this point.



Suggestions from Ricardo Ward:

- Why not have a standing agenda item, to deal with the issue of climate change?
- Publish key things in the newspaper
- Have a meeting such as this with the media to harness their support in getting out information to the public?
- If we reach a stage where the idea is put out constantly in a public forum it will gain attention.

Response (Adrian Trotman):

- Get a space on the NCCC to deliver a forecast to the committee. It would be good to obtain a sub-committee in the NCCC that would spark discussion and move from there. It is not necessary to introduce a third committee (NSEC).
- The issue arises when the information becomes personalized rather than institutionalized.

The final consensus was to explore the option of having a climate service set up under the NCCC.

Participants agreed that a follow-up meeting to further explore and discuss such an arrangement should be pursued.

## **9.0 Closing Remarks**

Ms. Sonia Nurse and Mr. Adrian Trotman gave closing remarks.

Ms. Nurse remarked that she was pleased at the level of participation of the audience. She expressed her thanks to the CIMH for their continued support. She also thanked the staff of BMS for their assistance in making the meeting a success.

Mr. Trotman expressed the commitment of the CIMH to continue to work with the BMS and its national stakeholders to continue to develop climate services for the benefit of Barbados.

# Appendix I: Meeting Agenda



**In collaboration with the Barbados Meteorological Services**  
present  
**The Barbados In-Country Workshop:**  
**Mapping provider capacity and user needs for climate services**

**Friday November 20, 2015**  
**Caribbean Institute for Meteorology and Hydrology (CIMH)**  
**Husbands, St. James, Barbados**

## **Meeting Agenda**

### **Meeting Objectives:**

1. Familiarise country representatives with the Caribbean's programmatic approach to the design, development and delivery of user oriented climate information;
2. Share the preliminary results of an assessment of provider capacity for the delivery of climate services in Barbados and the wider Caribbean;
3. Assess sectoral needs in Barbados for climate information and services;
4. Discuss national perspectives on early warning and response to the potential impacts of El Niño 2015-2016; and
5. Begin to strategise for the formation of a National Sectoral Early Warning Information Systems Across Climate Timescales (EWISACTs) Committee (NSEC).

TIME	SESSION		RESOURCE AGENCY/PERSON
8:30 – 9:00	Arrival and registration		
9:00 – 9:05	Welcome remarks		Mr. Hampden Lovell, BMS
9:05 – 9:15	Introduction of participants/Icebreaker		BMS and CIMH
9:15 – 9:30	<b>Session 1</b> International, regional and national context of climate services	The GFCS and the Caribbean RCC approach to the delivery of user-oriented climate information, products and services	Dr. Cédric Van Meerbeeck, CIMH
9:30 - 9:50		Service Delivery of Barbados Meteorological Services: Past, Present and Future	Mr. Hampden Lovell, BMS
9:50 – 10:00		Discussion	
10:00 - 10:20	<b>Session 2</b> Sectoral applications of CIMH's Climate Information Products and Services	CIMH Early Warning Information Products: An Overview (with examples of regional and national level use)	Dr. Cédric Van Meerbeeck, CIMH
10:20 – 10:35		The Use of Climate Early Warning Information in the Agriculture and Water Sectors	Mr. Leslie Brereton, Ministry of Agriculture
10:35 – 10:50	<b>Coffee break</b>		
10:50 – 11:05	<b>Session 3</b> El Niño and Early Warning	El Niño Past and Present - National Implications	Ms. Sonia Nurse, BMS

11:05 – 12:05		Discussion on on-going and expected climate impacts (such as drought and coral bleaching)	
12:05 – 1:05	<b>Lunch</b>		
1:05 – 1:20	<b>Session 4</b> Baselining provider capacity and user needs	Provider Capacity to deliver climate services in the Caribbean: A Preliminary Baseline Assessment	Dr. Roché Mahon, CIMH
1:20 – 1:30		on	
15		g User Needs Data Collection	
30		Baselining User Needs for Services in the Caribbean: ary results from a survey of Wet Season CariCOF hts	Dr. Roché Mahon, CIMH
40		on	
55		<b>Coffee break</b>	
25	<b>Session 5</b> Way Forward	Discussion: Formation of National Sectoral EWISACTs Committee (NSEC)	
35		Close	BMS and CIMH

# Appendix II: Attendee List

	NAME		ORGANIZATION	E-MAIL	Telephone
1	BELLE	Gina	Ministry of Environment and Drainage	<a href="mailto:gina.belle@barbados.gov.bb">gina.belle@barbados.gov.bb</a>	622-1601 Ext 1636
2	BEST	Claire	Division of Energy	<a href="mailto:cbest@energy.gov.bb">cbest@energy.gov.bb</a>	434-2500
3	BRERETON	Leslie	Barbados Agricultural Development and Marketing Cooperation	<a href="mailto:lesliestjbrereton@yahoo.com">lesliestjbrereton@yahoo.com</a> / <a href="mailto:leslie.brereton@badmc.org">leslie.brereton@badmc.org</a>	428-0250
4	DANIEL	Steve	Ministry of Health	<a href="mailto:steve.daniel@health.gov.bb">steve.daniel@health.gov.bb</a>	
5	HINDS	Damien	Inter-American Institute for Cooperation on Agriculture	<a href="mailto:damien.hinds@iica.int">damien.hinds@iica.int</a>	271-9210 / 1 / 2
6	HUTCHINSON	Terry	Coastal Zone Management Unit	<a href="mailto:thutchinson@coastal.gov.bb">thutchinson@coastal.gov.bb</a>	622-1610
7	JOHNSON	Joy-Anne	Department of Emergency Management	<a href="mailto:deminfo@barbados.gov.bb">deminfo@barbados.gov.bb</a>	438-7575
8	LAYNE	Davina	Caribbean Tourism Organization	<a href="mailto:layned@caribtourism.com">layned@caribtourism.com</a>	427-5242
9	LOVELL	Hampden	Barbados Meteorological Service	<a href="mailto:hampden.lovell@barbados.gov.bb">hampden.lovell@barbados.gov.bb</a>	428-0910
10	MAHON	Roché	Caribbean Institute for Meteorology and Hydrology	<a href="mailto:rmahon@cimh.edu.bb">rmahon@cimh.edu.bb</a>	425-1362 / 3 / 5
11	MURRAY	Brian	Barbados Meteorological Service	<a href="mailto:brian.murray@barbados.gov.bb">brian.murray@barbados.gov.bb</a>	428-7101 Ext 4106, 4110
12	NURSE	Sonia	Barbados Meteorological Service	<a href="mailto:sonia.nurse@barbados.gov.bb">sonia.nurse@barbados.gov.bb</a>	418-0818 / 418-4100
13	PAUL	Jaime	Barbados Water Authority	<a href="mailto:jaime.paul@bwa.bb">jaime.paul@bwa.bb</a>	434-4220

14	PIERRE	Donna	Caribbean Disaster and Emergency Management Agency	<a href="mailto:donna.pierre@cdema.org">donna.pierre@cdema.org</a>	434-4880 / 247-6859
16	SKEETE	Danielle	Department of Emergency Management	<a href="mailto:danielle.skeete@barbados.gov.bb">danielle.skeete@barbados.gov.bb</a>	467-9363
17	SMITH	Sean	Caribbean Tourism Organization	<a href="mailto:ssmith@caribtourism.com">ssmith@caribtourism.com</a>	438-7575
18	STOUTE	Shontelle	Caribbean Institute for Meteorology and Hydrology	<a href="mailto:ssoute@cimh.edu.bb">sstoute@cimh.edu.bb</a>	427-5242
19	TAYLOR	Jessica	Ministry of International Transport	<a href="mailto:jessica.taylor@barbados.gov.bb">jessica.taylor@barbados.gov.bb</a>	425-1362 / 425-1363
20	TROTMAN	Adrian	Caribbean Institute for Meteorology and Hydrology	<a href="mailto:atrotman@cimh.edu.bb">atrotman@cimh.edu.bb</a>	625-2311
21	VAN MEERBEECK	Cédric	Caribbean Institute for Meteorology and Hydrology	<a href="mailto:cmeerbeeck@cimh.edu.bb">cmeerbeeck@cimh.edu.bb</a>	425-1362 / 3 / 5
22	WARD	Rickardo	Ministry of Environment and Drainage	<a href="mailto:rickardo.ward@barbados.gov.bb">rickardo.ward@barbados.gov.bb</a>	425-1362 / 425-1363
23		Charleston	Ministry of Agriculture		622-1601 Ext 1627

## Appendix III: Summary of Climate Events and Risks

Name/Org.	Green Card	Brown Card
Charleston Lucas	Water storage facilities	Failed crops, drought
Steve Daniel, MOH		Diseases e.g malaria, dengue, gastroenteritis
Ricardo Waldron, MOE	Available data to be provided in a timely manner	Lack of preparedness
Claire Best, Division of Energy	Photovoltaic solar panels, awareness of greenhouse gases	Costs of initial setup of renewable energy
Terry Hutchinson	Improved planning considerations, aqua farming	Sea level rise, coral bleaching
Shawn Smith, Caribbean Tourism Organisation CTO	Better education on flood events	flooding
Joyann Johnson	Install early warning systems	Flooding
Gina Belle	Education of the public	Saline intrusion
Jamie Paul	Replenishment of aquifers, reduction of salt water intrusion	Ground water pollution
Devina Layne(CTO)		Drought, limited water resources.
Jessica Taylor	Education of the public on littering, use of pesticides, boats in need of holding tanks	Flooding, negative impact on the tourist sector re boating