



**The Caribbean Regional Climate Outlook Forum (CariCOF)  
Philipsburg, St. Maarten  
May 23 – 24, 2019**

**Report**

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Collaborators:





## 1. Introduction

Regional Climate Outlook Forums (RCOFs), promoted by the World Meteorological Organization (WMO), are active in several parts of the world. These RCOFs are critical for the development and effectiveness of early warning systems as they provide real-time seasonal climate forecasts and interpretation across relevant time and spatial scales. The Caribbean Climate Outlook Forum (CariCOF) is a significant step towards providing relevant and necessary climate services for over 25 Caribbean states and territories.

Since the 2012 CariCOF, the Caribbean Institute for Meteorology and Hydrology (CIMH) has been coordinating climate forecasting activities leading to a consistently growing body of climate forecasters who (i) contribute to the monthly production of consensus-based seasonal climate outlooks and (ii) engage with the user community, both nationally and regionally to facilitate awareness-building within climate sensitive sectors. At the 2012 CariCOF, it was also agreed that the bi-annual hosting of such forums, roving across the region, just prior to the beginning of the wet and dry seasons in the Caribbean, be pursued. Access the 2019 CariCOF Wet/Hurricane Season Concept note at <https://rcc.cimh.edu.bb/files/2019/05/Concept-Note.pdf>.

In collaboration with the WMO, through the Climate Risk and Early Warning Systems (CREWS) the 2019 Wet/Hurricane Season CariCOF took place from 23<sup>rd</sup> – 24<sup>th</sup> May in Philipsburg, St. Maarten. This forum was preceded by training for meteorologists and climatologists from across the region in the art of climate forecasting. The focus of this forum, apart from the delivery of the forecasts, was on hurricane activity. Capacity building in the disaster management fraternity and regional organizations in understanding, interpreting and applying climate-related forecasts, including sub-seasonal (1-2 weeks) and one month was also featured in this forum. Also, the development of a regional Roadmap and Plan of Action (RPA), orchestrated by the Regional Sectoral Early Warning Information Systems across Climate Timescales (EWISACTs) Coordination Partners, was also addressed. Access the 2019 CariCOF Wet/Hurricane Season Forum agenda at <https://rcc.cimh.edu.bb/files/2019/05/CariCOF-Agenda.pdf>.

### 1.2 Participants

Participants to the workshop were from National Meteorological and Hydrological Services (NMHSs) across the Caribbean, National Disaster Management Organisations (NDMOOs), the CIMH, international trainers, stakeholders from both St. Maarten and regional organisations representing climate sensitive sectors, academia and political mechanisms (see [Appendix I](#)).

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## 2. Pre-CariCOF Training

The pre-training preceding the 2019 Wet/Hurricane Season forum focused on forecasting the potential of flash flood that can also lead to landslides, through quantifying the relationship between extreme wet spell and floods at the national level. Participants were taken through exercises on the calculation of extreme wet spells and quantifying the relationship between extreme wet spell and flash flood occurrences.

Participants were also given a briefing regarding the new functionalities of the Climate Predictability Tool (CPT) before preparation of the 2019 Wet/Hurricane Season Outlook for presentation to the stakeholders.

Dr. Roché Mahon of the CIMH also gave a presentation on monitoring NMHSs climate service delivery. The agenda can be accessed at <https://rcc.cimh.edu.bb/files/2019/05/Training-Agenda.pdf>. A report of this training can be accessed at [https://rcc.cimh.edu.bb/files/2019/10/2019\\_Wet-Hurricane\\_Season\\_Training\\_Workshop\\_Report.pdf](https://rcc.cimh.edu.bb/files/2019/10/2019_Wet-Hurricane_Season_Training_Workshop_Report.pdf).

## 3. CariCOF Forum Presentations – Day 1

### 3.1 Welcome Remarks

#### 3.1.1 Mr. Joseph Isaac (Meteorological Department, St. Maarten)

In giving his welcome remarks, Mr. Joseph Isaac, Director of the St Maarten Meteorological department, expressed his anticipation in hearing the wet/hurricane season outlook. Mr. Isaac also acknowledged the presence of the media and highlighted the importance for scientists to work together with the media to get information to those who need it so that they can make more informed decisions.

#### 3.1.2 Hon. Stuart A. Johnson (Minister of Tourism, Economic Affairs, Air Traffic and Telecommunication)

The Honourable Minister of Tourism, Economic affairs, Air Traffic and Telecommunications, Mr. Stuart A. Johnson, in the feature address made mention of the drop in water level in the Panama Canal that is posing a challenge to ships, as the previously concluded dry season was the driest season in recording history for the canal. The Minister lamented over the dire need for rainfall in his country, St. Maarten, as they have been battling harsh dry conditions. To this end, he remarked that

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he was delighted to have the support of the Caribbean National Meteorological Services and the CIMH, and thanked them for building capacity throughout the region.

The Hon. Mr. Johnson further spoke about the importance of monitoring, and early warning systems as they help protect the most vulnerable. Any early warning system must include guidelines and solutions to warn the populace. He had also been made aware of the current CariCOF newsletters and bulletins and was pleased to mention that St. Maarten's own newsletter was developed at CariCOF.

The Minister urged participants to be mindful of their own ecological footprint. Hurricane Irma (2017) was the worst disaster for St. Maarten and it has taught the people to be appreciative and to think about innovations and preparations. One cannot prevent a natural disaster, but one can improve the survival rate – one goal here is to ensure that there are stable means of communication after a natural disaster.

### **3.2 Wet/Hurricane Season Climatology of the Caribbean and Review of the 2018 Wet Season of the Caribbean, Mrs. Shontelle Stoute (CIMH) and Mr. Kenneth Kerr (Trinidad and Tobago Meteorological Service)**

The first technical presentation of the day was made by Mrs. Shontelle Stoute of CIMH, in collaboration with Mr. Kenneth Kerr of the Trinidad and Tobago Meteorological Service. In this presentation Mrs. Stoute gave an overview of the characteristics of the wet/hurricane season. The wet/hurricane season usually begins May/June and ends in November/December. The exceptions of this are, the Guianas where there are two wet and two dry seasons and the ABC Islands that are predominantly dry throughout most of the year with a short wet season of 3-4 months. The northward migration of the Inter-Tropical Convergence Zone (ITCZ), the northward migration of the sub-tropical high pressure (Bermuda Azores High), Sea Surface Temperatures (SSTs), and the migration of tropical waves and other disturbances are the factors which influence the wet/hurricane season.

A map showing the seasonal rainfall patterns across the region for the 3 months was displayed as well a map showing the variation of monthly rainfall totals. Temperature maps were also previewed, noting that there is little variation with the monthly temperatures as compared with rainfall. With respect to hurricane activity, it was highlighted that for the fourth consecutive year, 2018 was another record season with hurricane activity before the official June 1<sup>st</sup> start.

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One of the highlights of the 2018 wet/hurricane season was delivered by Mr. Kenneth Kerr. Mr. Kerr presented the flooding experience in Trinidad and Tobago, which occurred in October 2018. He referred to this flood as “The Mother of all Floods”. Record rainfall and river levels gave rise to flooding that displaced many, and damaged crops and property. A number of communities became marooned, and inundated. Some reverted to the rooftops of their homes, as rainfall accumulations amounted from 4 to 6 inches within a 4 hour period. Fortunately, no lives were lost.

### **3.3 Wet/Hurricane Season Climate Outlook (rainfall, temperature, wet days/wet spells, drought, dry spells, heat waves, coral bleaching outlook, Atlantic hurricane activity forecast)**

Mrs. Sheryl Etienne Leblanc, of the Meteorological Department St. Maarten presented the much anticipated delivery of the 2019 wet/hurricane season climate forecast. Following is a summary of the key messages.

*June to August is expected to be drier or close to the usual.*

*Hurricane season activity is unlikely to be very active.*

*September to November is expected to be drier than usual from the Windward Islands southward.*

*Heat-stress levels are likely to be higher than the previous year. Heat is usually intense between August and October, including heatwaves.*

*Prepare for hurricanes, flash floods, heat stress, and drought (in some locations).*

### **3.4 Hurricane Irma: the St. Maarten Experience (Mr. Joseph Isaac, Meteorological Department St. Maarten)**

Mr. Joseph Isaac, Director of the Meteorological Department St. Maarten, recapped the St. Maarten experience of Hurricane Irma. As Hurricane Irma approached the country, model predictions confirmed a sure impact and any chance of escaping was very slim. This category five hurricane made a direct hit and left a trail of destruction across the country. Many buildings (concrete structures) were compromised, including the airport. The Dutch side of the island of Saint Martin saw damage that was estimated around one billion U.S. dollars. Almost nothing was spared in this hurricane – even meteorological data was compromised with the passage of Irma.

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### 3.5 2019 Atlantic Hurricane Season in Focus (Dr. Cedric Van Meerbeeck, CIMH)

In a presentation of the upcoming June to November Atlantic hurricane season outlook, Dr Cedric Van Meerbeeck of the CIMH noted that the information was a compilation of forecasts and not one produced by the CIMH. For the Atlantic hurricane season, the Colorado State University predicts 10 to 16 named storms with 3 to 7 becoming hurricanes and 1 to 3 major hurricanes. However, a slightly below-average probability for major hurricane (category 3 or higher) landfall is predicted in the Caribbean. The 2019 hurricane season is likely to experience Accumulated Cyclone Energy (ACE) of around 80. This is far below what was observed in the 2017 hurricane season. He also noted that updates to the Hurricane Season activity outlooks are generally most accurate by August, so he advised the audience to remain up to date with the latest outlook.

### 3.6 Awareness Building/Interactive Exercise – Seasonal Forecasts

Participants were invited to an interactive session where they role played for the following activity:

The 2019 wet/hurricane season looks like it may pose some challenges and opportunities in our region. You have been assigned by your Minister/Director to work with your Government Information Service/Communications Department to develop messages around climate conditions and associated impacts.

Some of the messages constructed by the stakeholders included:

- Strengthen existing sanitation and storage
- Fix leaks
- Conserve water; use water efficiently
- Reduce non-essential irrigation
- Utilize drip irrigation
- Harvest rain for non-domestic purposes and follow national guidelines
- Make sure you have water to keep hydrated
- Cease outdoor fires
- Reduce cash cropping

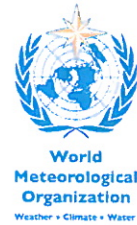
### 3.7 Sub-seasonal and Monthly Forecasts (Sarah Diouf, NOAA and Dr. Cedric Van Meerbeeck, CIMH)

In a discussion of sub-seasonal forecasts, Ms Sarah Diouf of the National Oceanic and Atmospheric Administration (NOAA) characterised a sub-seasonal forecast as a long-term climate forecast with a

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lead-time ranging from one week to one month. This time scale is one which better suits a probabilistic forecast – this conveys the uncertainty in the forecasts and indicates the chance or likelihood for an event to occur. Ms. Diouf showcased an array of sub-seasonal and monthly forecasts developed by the United States of America Regional Climate Centre (RCC-Washington). She noted also that sub-seasonal forecasts have the potential to improve the management of risks from climate related hazards.

Dr Cedric Van Meerbeeck of CIMH, displayed a graph that delineated the timing of the annual Heat Season in different portions of the Caribbean as based on the historical average number of heatwave days per month. Region-wide, the Heat Season lasts from May to October with a peak around August and September. He further showed the monthly forecasts for heatwaves running from June to November, highlighting that this year will very likely see more heatwave days than 2017 and 2018, hence increasing heat stress. He noted that when it is humid (as is with this season), cooling is not as effective, hence we feel hotter.

### **3.8 Awareness Building/Interactive Exercise – Implications of Sub-Seasonal and Monthly Forecasts**

Participants were invited to discuss the implications of a sub-seasonal and monthly forecasts. One group stressed the need to harvest water, also drawing awareness to the fact that there are restrictions in some countries as to the way this water is put to use. Other participants suggested that houses should be painted in lighter colours and air-condition condensers need to be placed in the right locations of the homes.

### **3.9 From Weather to Sub-Seasonal to Seasonal: Putting them all together in one decision-making framework (Simon Mason, IRI)**

Dr. Simon Mason of the IRI in his presentation focused on forecasts which allowed for the adequate planning of events. One can still make plans even with imperfect forecasts. For example, a short to medium range weather forecast can assist in pesticide application, pest management, irrigation scheduling, harvest timing, or even fertilizer application. A long-range weather to seasonal forecast can assist with fertilizer planning, land allocation or even the selection of crop cultivars. These seasonal forecasts give generic warning of possible hazards (or opportunities) whereas the sub-seasonal forecast provides early warning of a specific possible hazard and the weather forecast provides early warning of a specific likely hazard. A more comprehensive decision support system can be gained by the amalgamation of these various timescales (Figure 1).

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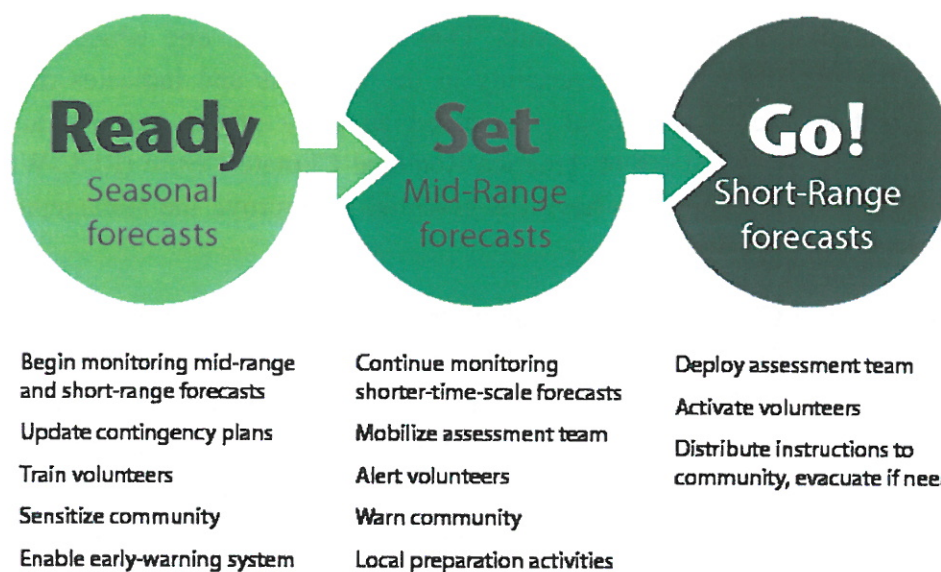


Figure 1: Ready-Set-Go Framework

### 3.10 Extreme Wet Spells and Flash Flood Potential (Dr. Cedric Van Meerbeeck, CIMH and Dr. Teddy Allen, CIMH)

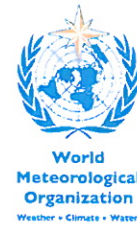
Dr. Cedric Van Meerbeeck and Dr. Teddy Allen of CIMH explored the possibility of utilising extreme wet spell outlooks as a quantitative proxy for flash flood potential in the upcoming weeks and months. At present, qualitative information is provided for flood potential within the monthly CariCOF extreme wet spells outlooks. In order to produce a simple quantitative flash flood prediction model there must be a good understanding of extreme rainfall and monitoring of the drivers of extreme rainfall; a dense network of weather stations along with a long record of daily rainfall; and a complete flash flood occurrence dataset.

The findings of the recent pre-training workshop with meteorologists and climatologists on extreme wet spells and flash flood were reported.

- A reported flood dataset of less than 30 recorded dates is too small to complete the statistical analysis.
- There was a hit rate average of 63 per cent, indicating a strong relationship between extreme wet spells and flash floods.

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- For six territories with 29 records or more, hit rates varied between 31 per cent and 91 per cent, confirming the need to optimise the threshold for extreme wet spells at the national level.
- Calculated hit rates<sup>1</sup> underestimate the real strength of the relationship due to incompleteness of reported flood records.

Going forward, the aim is to develop the capacity of Caribbean National Meteorological and Hydrological Services and the CIMH to provide forecasts of flash flood potential at the sub-seasonal to seasonal timescale. The next steps would therefore be:

- To complete the quantification of the relationship between extreme wet spells and flash floods in select Caribbean territories.
- To investigate the predictability of extreme wet spells in the Caribbean at weather to seasonal timescales.
- To develop a forecast modelling framework for operational flash flood potential forecasts at sub-seasonal to seasonal timescale.

## 4. CariCOF Forum Presentations - Day 2

### 4.1 Early Warning Information Systems Across Climate Time-Scales – EWISACTS (Dr. Roché Mahon, CIMH)

Dr. Roché Mahon, Social Scientist at CIMH reported on progress made on the development of the Sectoral Early Warning Information Systems across Climate Timescales (EWISACTs) portfolio for the period December 2018-May 2019. Main achievements for the period included:

- A Glossary of Technical Terms was added to the Sectoral EWISACTs webpage ([rcc.cimh.edu.bb/ewisacts](http://rcc.cimh.edu.bb/ewisacts));
- Updates to the Caribbean Climate Impacts Database – specifically, cleaning of the over 9000 climate-related impacts, as well as, the development of a conceptual framework for impacts measurement for the Caribbean;
- Research and publications:

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<sup>1</sup> A “hit” is defined as an occasion where there was an extreme wet spell at one or more weather station coinciding with a flood event. A “miss” is defined as the occasion where there was no extreme wet spell but there was a flooding event. A “false alarm” is defined as the occasion where there was an extreme wet spell but no flooding event.

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### Health-Climate:

Published:

- Trotman A, Mahon R, Shumake-Guillemot J, Lowe R, Stewart-Ibarra AM. 2018. Strengthening climate services for the health sector in the Caribbean. *WMO Bulletin* 67 (2)
- Stewart-Ibarra AM, Romero M, Hinds AQJ, Lowe R, Mahon R, Rollock L, St. Ville S, Ryan SJ, Trotman A, Borbor-Cordova MJ. 2019. Co-developing climate services for public health: stakeholder needs and perceptions for the prevention and control of *Aedes*-transmitted diseases in the Caribbean. Available on: <https://www.biorxiv.org/content/10.1101/587188v1>



### Tourism-Climate:

- Support to CTO with Research Consultancy technical outputs under ACP-EU NDRM:
  - Regional Sustainable Tourism Policy
  - Risk Management Guide for the Caribbean Tourism Sector
  - Climate-driven spatio-temporal modelling framework for Caribbean tourism

### Social science:

Published:

- Mahon, R., Greene, C., Cox, S.-A., Guido, Z., Gerlak, A. K., Petrie, J.-A., et al. (2019). Fit for purpose? Transforming National Meteorological and Hydrological Services into National Climate Service Centers. *Climate Services*, 13, 14-23. <https://doi.org/10.1016/j.cliser.2019.01.002>
- Mahon, R., Farrell, D., Cox, S.-A., Trotman, A., Van Meerbeeck, C. J., & Barnwell, G. (2018). Climate Services and Caribbean Resilience: A Historical Perspective. *Social and Economic Studies*, 67(2&3), 239-260. <https://www.mona.uwi.edu/ses/article/145>

Under development:

- Trotman, A, Mahon R and Van Meerbeeck, CJ. Chapter 8, State of Caribbean Climate Report, "Adding value to climate information through services"

### Climate science:

Under development:

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- Van Meerbeeck, CJ, Trotman, A, Mahon R. Chapter 6, State of Caribbean Climate Report, "Climate Extremes and Early Warning: From excessive rainfall and flooding to drought, heat and hurricanes"

Much of the focus of the second day of the CariCOF was on the continued development of the Sectoral EWISACTs Roadmap and Plan of Action (RPA) – an 11 year Roadmap that will guide the implementation of a coordinated, multi-sectoral climate services portfolio for the period 2020-2030. This RPA is being orchestrated by the Regional Consortium of Sectoral Early Warning Information Systems across Climate Timescales (EWISACTs) Coordination Partners, chaired by the CIMH. The current status of the RPA was first presented by Dr. Mahon who emphasized that this was a particularly exciting point in the RPA's development since it was the first time that the CariCOF would review a relatively mature draft of the RPA. The RPA is critical since it seeks to address several gaps on both the end-user and provider sides of the capacity spectrum across the five pillars<sup>2</sup> of the Global Framework for Climate Services. Dr. Mahon's presentation was followed by focus group deliberations led by Consortium members and supported by CIMH staff which focused on harvesting national level stakeholder input to enhance the updated working draft of the Climate Services RPA for the Caribbean that emerged from the 6th Consortium Meeting convened on May 21-22, 2019. Participants were encouraged to give their input with respect to the logical flow and feasibility of the performance indicators and targets proposed for each output of the RPA under the five GFCS pillars. Rapporteurs for each focus group then submitted the group's collective suggestions to Dr. Mahon for integration into the working draft of the RPA.

#### 4.2 Advancing Sector-Specific Climate Information at the National Level (Jodi-Ann Petrie, CIMH)

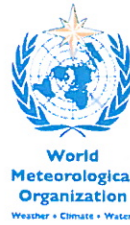
Miss Jodi-Ann Petrie, Technical Officer 1 at CIMH, gave her presentation titled "Advancing Climate Information at the National Level". In her presentation, Miss Petrie noted that CIMH has been partnering with the University of the West Indies to consolidate and expand regional climate network and global platform linkages through the Investment Plan for the Caribbean Regional Track of the Pilot Program for Climate Resilience (PPCR) process. The objective of the partnership was to *"strengthen regional and national structures and mechanisms for the delivery of climate products*

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<sup>2</sup> 1) Observations and Monitoring; 2) Research, Modelling and Prediction; 3) Climate Services Information System; 4) User Interface Platform; and 5) Capacity Development.

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*and services at the national level through enhancements to the regional climate data monitoring networks, and complementary linkages with global climate information centers/platforms”.*

Miss Petrie noted that the national consultations that were held in the PPCR countries (Grenada, St. Lucia, St. Vincent and the Grenadines, Jamaica) charted the way for the development/advancement of national climate bulletins. From the consultations some insights were revealed for the national climate bulletin development process. It was confirmed that the capacity for packaging climate information varied across countries; some Met Services had the climate information but they were not packaging it in the form of a bulletin for their user community. For the smaller Met Services they had to start at a more fundamental level which would mean the development of idealized bulletin templates to guide and catalyze the packaging of operational climate information at the national level and the Met Services needed the support of the sectors in order to successfully deliver the climate and sector specific bulletins.

Miss Petrie introduced the participatory bulletin development process where idealized templates and template guidance documents (guidance on possible content/layout for the bulletin) were developed and tested at the CariCOF, and further revised based on feedback received. Miss Petrie noted that the templates were requested by a number of Met Services and that work has begun with the help of the PPCR to professionally develop climate and climate “all-in-one” bulletin templates. Miss Petrie revealed the draft of the templates assuring that as soon as the designer was through with the design, they would be shared with the Met Services who would have requested it. In closing Miss Petrie noted that the next steps were to support the development and operationalization of national climate and sector-specific bulletins in the PPCR countries namely, Grenada, St. Lucia, St. Vincent and the Grenadines, Jamaica.

#### **4.3 Forecasting hazards, averting disasters: Opportunities and challenges for forecast-based early action in the Caribbean (Lena Weingartner, ODI/FRC)**

Ms. Lena Weingartner of the Overseas Development Institute (ODI) in her presentation focused on forecast-based early action (FbA). FbA is necessary to (i) changing disaster trajectories by mitigating expected impacts (ii) reducing costs and human suffering by shifting timelines for humanitarian action from response to preparedness and prepositioning for early response (Figure 2).

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Without early action



With early action

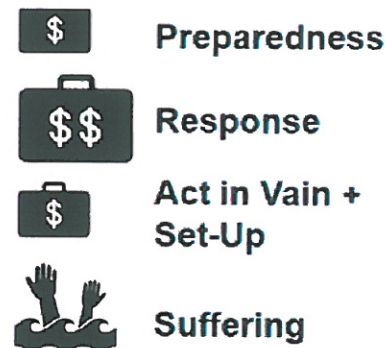


Figure 2: Early warning vs. no early warning

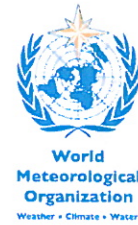
An FbA comprises of forecasting, decision-making and triggers; timing and planning actions; financing FbA; and mechanisms for delivering FbA. In a move from forecasting hazards to forecasting impacts for FbA exposure, vulnerability and historical impacts are considered along with the hazard data.

#### 4.4 The Caribbean Climate Impacts Monitoring Network: A Proposal (Dr. Roché Mahon, CIMH)

Dr. Mahon began her presentation by stating that the proposal around a Caribbean Climate Impacts Monitoring Network (CCIMN) was a new idea but one that has special significance in the context of the Caribbean. She highlighted that the Caribbean is one of the most climate-sensitive and disaster prone regions in the world with regional statistics showing that weather and climate-related events in the Caribbean are associated with more economic damage and loss than other types of natural hazards. Thus, if the Caribbean can develop early warning products that not only give a forecast of the likelihood of a particular hazard, but also goes a bit further in terms of forecasting the potential impact that the climate hazard may have on our sectors and communities, then the region should work towards that. To be successful in doing this, the CIMH would need the support of the sectors in collating historical, as well as, future data on how climate was affecting them.

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Dr. Mahon noted that one of the current barriers to transitioning to impacts-based forecasting for climate and for climate-sensitive sectors is the inadequacy of climate impacts data. That inadequacy was one of the key reasons why CIMH invested in developing the CCID in collaboration with the DRM community some years ago. That effort collated just over 2500 impacts records currently available on the online platform. More recently, the CIMH has again invested in the harvesting and collation of climate impacts. We now have an augmented CID dataset with over 9400 climate impacts in tabular form in a Google sheets repository. However, there are indications of data gaps. For example, some countries appear to be better represented than others, while some sectors are better represented than others. She then tabled the proposal around the establishment of a Caribbean Climate Impacts Monitoring Network as a new mechanism to help address these gaps. The recommended purpose of the CCIMN would be to operationally collate climate-related impacts harvested at the national level for reporting at the regional level. The CCIMN would potentially be jointly coordinated at the regional level by the CIMH and the CDEMA in collaboration with each organisation's network of Met Offices and National Disaster Management Offices. Possible outputs of the Network would be:

1. A new quarterly DRM specific Bulletin:  
Each quarter, the summary results of climate impacts across the Caribbean for the last quarter can be presented in tabular, map and multi-media form. Additional spatio- temporal analysis of interesting impacts-related results could also be showcased;
2. Quarterly impact observations collated by the Network can be input into the CID and/or Dewetra. In this way, we operationalize a method for keeping the impacts related content of the CID and/or Dewetra up-to-date.

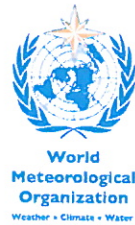
Dr. Mahon noted that the 2019 Wet/Hurricane Season CariCOF attendees made up of mainly DRM and Met Service representatives were a perfect test bed for the CCIMN idea since both communities were to varying extents interested in the problem of climate impacts. The meeting was then divided into three focus groups to discuss impacts reporting at national and sectoral levels. Each group participant was asked to provide their experience around the following:

- Please describe the current impacts reporting **process** for your sector/organisation (if any).
- What are the **challenges** to reporting climate and/or disaster impacts?
- What are the **enablers** to reporting climate and/or disaster impacts?

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- Are there any **future plans** for strengthening impacts reporting at the sectoral and/or national level?
- How would you **improve the CCIMN concept**? Any suggestions/recommendations?

Rapporteurs for each focus group submitted the group's collective suggestions to Dr. Mahon for further consideration.

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Collaborators:





## Appendix I: Participant List

Country/Affiliation	Last Name	First Name	Country/Affiliation	Last Name	First Name
AACARI	Browne	Claude	CCCC	Jones	Albert
Anguilla	Jennings	Jeffrey	CCREEE	Jackson	Gary
Anguilla	Fleming	Sharmer	CHTA	Duffy-Mayers	Loreto
Antigua	Paige	Orvin	CIMH	Trotman	Adrian
Antigua	Guishard	Alvah	CIMH	Van Meerbeeck	Cedric
Aruba	Irausquin	Lothar	CIMH	Stoute	Shontelle
Bahamas	King	Arnold	CIMH	Allen	Teddy
Barbados	McGeary	Wayne	CIMH	Kirton-Reed	Lisa
Barbados	Johnson	Joyann	CIMH	Applewhaite	Andrea
Belize	Gordon	Ronald	CIMH	Mahon	Roche
BVI	Castro	Miguel	CIMH	Petrie	Jodi-Ann
BVI	Adolphus	Jacob	CMC	Chance	Kenton
CARDI	Flemming	Kistian	CMO	DeSouza	Glendell
CARICOM	Sabir	Kareem	Communications, St. Maarten	Peterson	Cedric
CARPHA	Clauzel	Shermaine	CSGM	Whyte	Felicia
Cayman Islands	Porter	Avalon	Curacao	Werelmann	Frans

Collaborators:







Country/Affiliation	Last Name	First Name	Country/Affiliation	Last Name	First Name
CWWA	Daley	Timmy	Ministry of Tourism, St. Maarten	Duncan	Ludmilla
Dominica	Carette Joseph	Annie	Montserrat	Skerritt	Arlen
Dominica	Pascal	Fitzroy	OECS	Isaac	Cornelius
Dominican Rep	Matos	Miriam	PAHO	Vlugman	Adrianus
Grenada	Tamar	Gerard	Red Cross Climate Centre	Weingartner	Lena
Guyana	Dhiram	Komalchand	St. Kitts	Barry	Gassano
Guyana	Samaroo	Kelvin	St. Kitts	Jeffers	Cheryl
GWP-C	Lewis	Simone	St. Lucia	Saltibus	Vigil
IRI	Mason	Simon	St. Lucia	Medard	Maria
Jamaica	Brown	Glenroy	St. Maarten Met Service	Etienne-LeBlanc	Sheryl
Martinique	Legoutte	Philippe	St. Maarten Met Service	Connor	Desiree
Ministry of Health, St. Maarten	Arnell	Fenna	St. Maarten Statistics Department	Grant	Jason
Ministry of Health, St. Maarten	Troost	Margje	St. Vincent	McDonald	Joan
Ministry of Housing, St. Maarten	Buncamper	Claudius	St. Vincent	Stoddard	Kenson
Ministry of Tourism, St. Maarten	Noel	Lisa	Suriname	Mitro	Sukarni

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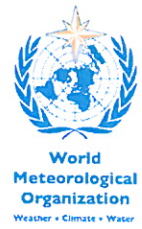


Country/Affiliation	Last Name	First Name
TCI	Henfield	Tiffany
Trinidad	Mackie	Gerard
Trinidad	Kerr	Kenneth
UWI	Charlton	Candice
WMO	Gomez	Frederico
WMO/NOAA	Diouf	Sarah

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