

**2022 Wet/Atlantic Hurricane Season**

**CariCOF Report**

**May 27<sup>th</sup>, 30<sup>th</sup>, 31<sup>st</sup> (Virtual)**

## 1.0 Day 2 / May 27<sup>th</sup>

### 1.1 Introduction

The 2022 Wet/Hurricane Season Caribbean Climate Outlook Forum (CariCOF) began with an official greeting to all participants by Mr Adrian Trotman, Head of the Caribbean Regional Climate Centre, (Caribbean RCC) of The Caribbean Institute for Meteorology and Hydrology (CIMH).

This was immediately followed by welcome remarks from Dr David Farrell, Principal of The CIMH. Dr Farrell stated that he is hoping for this to be the last online forum and partners can return to face to face activities. He expressed his gratitude to the various partners and organisations that support CariCOF and stated that he is hoping for continued support for face to face meetings. He spoke about the significant flooding in the Guianas whereas in other cases, there were others in the region dealing with drought and the fact that the CIMH is working with CDEMA to help produce forecasts. He also mentioned the fact that there are significant amounts of Sahara dust which is of great concern to the Health sector as well as impacts from significant amounts of Sargassum Seaweed expected in the region. He concluded by encouraging all participants to focus on preparedness for the season as well as adaptation, hoping for a manageable season and thanking everyone for their participation.

### 1.2 Presentations:

#### 1.2.1 Wet/Hurricane Season Climatology (Mrs Shontelle Stoute, Technical Officer, CIMH)

Mrs Stoute captured the attention of the participants with a review of the recent drought impacts which affected the region. Reference was made to Antigua during the year 2021, whereby it was pointed out that Mr Dale Destin documented month by month the variability of rainfall, where it fell below normal most of the time. For Antigua, it was a record breaking year, whereby Meteorological drought was upgraded to a serious intensity by the end of May rendering the island's lone surface water catchment totally dry and thus having to resort to desalinated water for potable use.

Mrs Stoute then turned our attention to the drought impacts in Puerto Rico and the U.S. Virgin Islands. Reference was made to the Intergovernmental Panel on Climate Change (IPCC) report from 2021, which indicated that drought continued to worsen until April 2022, hence Puerto Rico experienced abnormally dry to moderate drought conditions and 2021 was described as a hot and dry year with cracked soils and vegetation loss. It was pointed out that St Croix was hit the hardest as rainfall was sporadic. When it rained it evaporated quickly due to high winds.

A review of the 2021 Hurricane season was given, highlighting that there were 21 named storms of which 5 rapidly intensified, with 7 hurricanes and 4 major hurricanes.

## **How Wet or Dry was the 2021 Season?**

Mrs Stoute addressed the question with reference to the Standardised Precipitation Index maps (SPI) which are produced monthly at the CIMH. These maps give an idea as to what the departure from the normal is like. The year 2021 showed dry to extremely dry conditions throughout. Also pointed out is that normally during the second half of the wet season we look to replenish the reservoirs, however, we saw extreme drying which generally cause problems when moving into the dry season.

## **How Hot / Cool was 2021?**

In terms of temperatures, it was stated that it was generally warmer than normal for most places with the exception of eastern Jamaica and the Dominican Republic.

## **Current State of the Climate**

In terms of how dry? The most recent Standardised Precipitation Index Maps (SPI) were again referenced for April 2022, which showed that April was normal to above normal for several places. It was pointed out that the three month SPI map looks at the status of soil moisture and the six month map looks at the status across surface ponds.

Mrs Stoute then went on to look at the rainfall accumulation graphs produced in the Caribbean Outlook Generator (CAROGEN) for various parts of the region including Antigua, Belize, Barbados and Trinidad. It was seen that rainfall accumulations for Antigua were significantly low as compared to normal, whereas rainfall accumulations for Trinidad, Barbados and Belize were normal.

It was shown that for April 2022, generally cooler conditions were experienced across the eastern Caribbean, however, it was warmer in the Greater Antilles.

It was concluded that what usually happens during the Caribbean wet season (May/ June to November) coincides with the hurricane season as well as with the Caribbean heat season (April/ May to October), noting that the hurricane season peaks around September 10th. The season in the Guianas is bimodal; however, the interior of the Guianas has one season from May to August.

### **1.2.2 Forecast for the 2022 Wet/Hurricane Season (Dr Teddy Allen, Assistant Climatologist, CIMH and Mr. Adrian Trotman, Head Caribbean RCC, CIMH)**

Dr Allen turned attention to the sea surface temperatures (SSTs), pointing out that the ocean contains a lot of heat and as temperatures in the oceans fluctuate, rainfall patterns will also fluctuate. He stated that persistent unusually warm SSTs across most of the Caribbean and Sub tropical north boosts heat, humidity and hurricane season activity. Also mentioned was the fact that a persistent weak La Nina throughout the wet/ Hurricane season boosts rainfall, hurricane season activity and potential flooding, but tempers heat.

### **How wet will the next three to six months be?**

The forecast for June to August was assessed and it was shown that conditions were projected to be at least as wet as usual in Jamaica, Puerto Rico and throughout the Guianas. The forecast for the period September to November showed that Jamaica, Hispaniola and areas eastward may end up wetter than usual, with flood potential from increasingly frequent spells of heavy rainfall. Dr Allen pointed out that the period June to August usually has three to six wet spells, with the ABC Islands having up to three.

### **How hot will the next three to six months be?**

Dr Allen then turned our attention to the temperatures, whereby he assessed the maps which showed Climatology, indicating that they weren't any strong signals seen at that point. It was forecasted that night time (min) temperatures and day time (max) temperatures were expected to be warmer throughout the season, coinciding with the Caribbean Heat Season with daytime temperatures warmer than usual. Dr Allen concluded by looking at what to expect in terms of heat waves for the period July to September, whereby he indicated that the potential for the period is expected to be slight to moderate.

### **The Atlantic Hurricane Season**

Mr Adrian Trotman asked the question "How active will it be?" then proceeded to take a look at the Hurricane Season Forecast for 2022. He pointed out that nineteen named storms, nine hurricanes and four major hurricanes were forecasted, lower than the occurrence in the extreme year back in 2020. The participant's attention was then directed towards Caribbean landfall probabilities whereby Mr. Trotman stated that there is a 60 per cent probability for at least one major hurricane, (i.e. category 3 to 5) tracking into the Caribbean. He stated that the number of major hurricanes have increased by 60 per cent when compared to the period 1961 to 1990.

### **What changes to bear in mind?**

It was mentioned that WMO no longer uses the Greek alphabet and that there is now a supplementary list. In terms of temperatures within the period June to August, heat discomfort will increase towards August, with heat stress peaking during heat waves, whereas the period September to November drought is expected to be less of a concern throughout the region with strong tropical Cyclone activity concluding.

### **1.3 Media Involvement**

A brief session with the media involving Ms Shireen Cuthbert, former communication specialist at the CIMH and Ms Linda Straker of the CMC Grenada took place whereby more clarity was sought with regards to the specific outlooks for southern areas like Grenada and St Vincent.

## 1.4 Breakout Groups Discussions

### 1.4.1 Agriculture

#### **Implications of the Early wet/Hurricane season June to August 2022 Forecast**

- The Ministry of Agriculture in St Vincent and the Grenadines reported a period of drought whereby water rationing was put in place, noting that it is a challenge with respect to soil moisture recharge.
- It was reported from Guyana's Hydrometeorological service that harvesting of crops and the transportation of livestock to higher grounds would be a challenge, due to a lack of paved roads.

#### **Implications of the Late Wet/ Hurricane season September to November 2022 Forecast**

- The Ministry of Agriculture St Vincent reported loss of their annual crops such as bananas and plantains, however, no loss of equipment in terms of destruction.
- Damage to farm sheds due to wind damage and / or landslides
- Prolonged periods of extreme heat can lead to a significant reduction in egg production.
- The relaying of timely information to the farmers
- Ensuring that drainage systems are properly set up to ensure the free flow of water
- The installation of hurricane clips for stabilisation of roof tops

## 2.0 Day 3 / May 30<sup>th</sup>

### 2.1 Introductions

Mr Adrian Trotman, Head of the Caribbean RCC of The CIMH gave a brief introduction to the session which primarily involved the Meteorological services.

This was followed by an introduction from Ms Shanna Combley from the National Oceanic and Atmospheric Administration (NOAA), who greeted all participants indicating that it was her first CariCOF meeting.

Dr Teddy Allen, Assistant Climatologist at the CIMH then extended a warm welcome to all, whereby he gave a brief insight of the Climatological products such as the Outlooks which are produced monthly.

### 2.2 Interactive Poll session

Ms Shanna Combley then engaged participants in an active questions and answer segment, whereby various questions involving the Climate Outlook Newsletter were presented. This was in an effort to garner feedback to any likes or even dislikes with regards to the layout of the information presented, requesting constructive suggestions for any amendments.

### 2.3 Presentations

#### 2.3.1 Seasonal Rainfall Outlooks for the Caribbean - Christine Recalde (Climate Prediction Centre, CPC)

Ms Recalde started by looking at the state of the Global Climate with reference to the global forecasts. It was pointed out that La Nina conditions continued during April 2022 and below normal SSTs prevailed across the Tropical Pacific. She proceeded to show a summary of the state of the atmosphere in terms of sea level pressure anomalies, Darwin Sol, Zonal wind index, OLR Index, among others. Some of these atmospheric variables are taken into consideration to determine the state of the atmosphere. Ms Recalde indicated that the OLR index showed positive values which implied that some places had less rainfall than normal. This was followed by a look at the current state of the global ocean over the last 4 weeks, whereby it was shown that SSTs were above normal over the Indian Ocean during that time, however SST anomalies were negative in the eastern Indian Ocean. Ms Recalde then went on to look at the atmospheric conditions in terms of long wave radiation which is a proxy for rainfall as well as low level and upper level wind anomalies. The NMME model forecasts were then assessed from May 1<sup>st</sup> to 8<sup>th</sup>, whereby the model forecast suggested below normal SST in the equatorial Pacific Ocean. The El Nino Southern Oscillation (ENSO) forecast probabilities for each season was then shown and La Nina showed the highest probabilities, followed by neutral conditions, whereas El Nino showed the lowest probabilities. The types of data and methodology used in making these analyses were also pointed out, for example, CPC land only gridded rainfall data, ERSSTv5 as well as NMME model outputs. In terms of methodology, NMME calibrated forecasts were used; CCA (Canonical Correlation analysis) forced with both NMME predicted SST (Sea Surface

Temperatures) and rainfall. In summary Ms Recalde concluded that La Nina state prevails and is likely to continue through the Northern Hemisphere summer, also in the following seasons, August to October and September to November rainfall prediction shows higher probability for below rainfall in most of the Caribbean.

## 3.0 Day 4 / May 31<sup>st</sup>

### *Assessment of the Caribbean Climate services continued*

#### 3.1 Introduction

Mr Adrian Trotman head of the Caribbean RCC of The CIMH gave the official welcome to participants of the user and provider working session, as continued assessment of climate services were undertaken by the various sectors.

#### 3.2 Opening Remarks

Dr David Farrell, Principal of the CIMH greeted participants on the final day of the CariCOF meeting. He stated that the main objective is to find out what information is available when it comes to making decisions while ensuring that necessary information is being communicated so that informed decisions can be made. He highlighted that we need to recognise the impacts that Covid-19 had on the CariCOF situation resulting in disadvantages such as having to resort to the online environment, further stating that he is hoping for near future face to face involvement. He then went on to briefly look at the main concerns of some of the sectors, for example he stated that the water sector would be concerned as to the amount of rain they would receive and what the deficit would be like. He also pointed out that the disaster risk reduction sector is very important to the Wet Season CariCOF when it comes to impact and the level of preparedness.

#### 3.3 Presentation

##### 3.3.1 Thinking About Present Utility and Future Improvement of Climate information - Dr Roche Mahon (Social Scientist, CIMH)

Dr Mahon gave a brief presentation whereby she highlighted that the primary focus of the meeting is geared towards the building of products. She went on to ask two questions:

1. How is Climate information applied in decision making?
2. How can we improve these products, tailoring to user needs?

The two questions being later addressed in a Mentimetre segment

##### 3.3.2 Regional and National Climate Products (Mr. Adrian Trotman, CIMH)

Mr Trotman focused our attention on Climate Monitoring products, whereby he reminded all participants that it is important to bear in mind that drought creeps up on us. He looked at the rainfall deficit across the region as well as monitored heat and temperatures as they are warmer than normal at times. It was emphasised that when making analyses we need to look back as far as the previous 12 months and not just at the previous month taking the anomalies into consideration as they are important. He stressed that climate helps us to determine what can happen in our sectors and the fact that we need to look at what happens when occurrences are outside of the norm.



Mr Trotman also looked at the accumulated rainfall over a period of time for various places such as Belize, Antigua and it was seen that the values were lower than expected.

With respect to temperatures, it was observed that the eastern Caribbean was cooler than normal, whereas other areas were warmer. Again, he stressed that looking at the past helps us to understand what we are accustomed to and helps us to see what we are moving into as yields are affected by these changes.

### 3.4 Mentimetre Segment (Dr Roche Mahon and Ms Jodi-Ann Petrie, CIMH)

In this segment a few questions were asked, and responses were noted:

1. What sector do you represent?

Responses:

Representation came from the Agricultural, water, Disaster Risk management, Health Tourism and Meteorological services.

2. What regional Climate information do you currently use to make strategic and / or operational decisions ?

Responses:

Products used are the SPI monitor, mean temperature anomalies, The Caribbean Drought Bulletin, CariCOF Precipitation Outlook, CariCOF temperature Outlook, etc...

3. What National Climate information do you currently use?

Response:

The National Weather Meteorological Bulletin

4. Can the current suite of Climate information (Regional and / or National) be improved?

Response:

Yes

**Agriculture and water group Session, Mrs Shontelle Stoute and Mrs Lisa Kirton-Reed (CIMH)**

**Discussion Questions**

1. Can you think of good examples that demonstrate the utility of climate information in your experience? How well have the products worked?
  - Use of the climate information to help farmers is based on the project being carried out.
  - Used in both the water and agricultural sectors
  - Water resources in Trinidad utilise rainfall forecasts on a monthly basis to conduct monthly reservoir projections used to determine how much water should be produced daily.
  - Antigua utilises the drought bulletin
  
2. Are there any challenges encountered using Climate information? How have these challenges impacted your use of Climate information?
  - Resolution and biases interpretation of forecasts where the topography is
  - Negative feedback from end users who said that the forecasted rainfall doesn't take place in their location.
  - The National forecast says one thing and the regional forecast differs.
  - CIMH projections differ from the National Outlooks.
  
3. What recommendations do you have for what should be the next generation of climate information product or products?
  - The development of an APP was suggested
  
4. What recommendations do you have for building or strengthening a collaboration between your sector and climate information providers such as your Met services or CIMH?
  - Visits from the CIMH and Met services

- Visits to farmers by the Climate information providers to see how the weather affected them after a flood/drought situation.

- Meetings with other sectors e.g. Health, Tourism, whereby the different products are explained.

- A need for more local meetings to be organised

- Visits once a year to explain the benefits of products to the users

5. Is there anything else regarding the use and /or utility of climate information and recommendations for improvement that we have not discussed that would be important for us to know?

- People need to be informed in terms of how to apply the data

- Clearer directives needed as to how to find the information on the website.