



The 2022 Dry Season Caribbean Regional Climate Outlook Forum (CariCOF)

Christ Church, Barbados

November 24th and 25th

Report

Collaborators:





Stakeholder Meeting (November 24th)

1.0 Introduction

The stakeholder meeting started off with an official welcome to all participants by Mr Adrian Trotman, Chief of Applied Meteorology and Climatology and Head of the Caribbean Regional Climate Centre (Caribbean RCC) at The Caribbean Institute for Meteorology and Hydrology (CIMH). This greeting was made on behalf the Principal, Dr David Farrell, who could not attend. He commented on the fact that we are once again able to have our face-to-face meetings as he hoped for a continuation of this for many years to come.

This was followed by a greeting by the Deputy Director of the Barbados Meteorological Service, Mr. Brian Murray, who also welcomed stakeholders and participants from the various sectors and meteorological services. He mentioned that there were 14 named tropical cyclones for the year, and there were impacts from the passage of the Inter-Tropical Convergence zone (ITCZ). With this fact, Mr. Murray emphasized the importance of discussions, which aid in the planning and preparedness for these events. He also encouraged the continuation for the hosting of forums in the various countries in the region who already do so, as their participation is important when it comes to decision making.

A list of participants can be viewed in [Appendix I](#).

2.0 Presentations

2.1 Dry Season Climatology of the Caribbean and Review of the 2022 Conditions in the Caribbean – Mrs. Shontelle Stoute, Technical Officer (CIMH)

Mrs. Shontelle Stoute of the CIMH provided an overview of the typical dry season which runs approximately from December to May, varying across the region. Mrs Stoute also replayed the experiences of the 2021/2022 Dry season. She spoke about the climate triggers of the Caribbean dry season and the characteristics such as cooler sea surface temperatures which result in a decrease of

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thunderstorm activity. It was mentioned that the heart of the dry season is identified as February to April, but it is important to note that this period does not exempt the region from tropical cyclones as there have been occurrences in the past.

Various graphs were then shown depicting the annual rainfall across the region. Rainfall activity is normally reduced between December and April but varying across the region. With respect to temperatures the variation is very small from month to month with the lower temperatures occurring during the dry season.

Drought continued to be an issue for some territories in the previous Dry Season. In Puerto Rico it was reported that in the beginning of 2022, conditions started to deteriorate therefore voluntary water restrictions were put in place. In the US Virgin Islands outdoor burning was banned and Antigua entered 2022 with record breaking dry periods.

In contrast, flooding was an issue as widespread flooding was reported in the Guianas in May 2022 which impacted the availability of vegetables, resulting in soaring prices. Suriname was also affected by flooding in March, as well as Saint Lucia, Dominica, Trinidad and Tobago.

In terms of the 2022 Hurricane season, it was pointed out that though not officially ended, the region had already experienced 14 named storms.

2.2 2022/2023 Dry Season Forecast – Ms. Danielle Nurse, Barbados Meteorological Service

Ms. Danielle Nurse presented the 2022 to 2023 Dry Season Forecast. The summary of the 2022/2023 Dry Season Forecast was as follows:

1. Recently:
 - Excessive rains in parts of Guyana, St. Lucia, Dominica, and Trinidad and Tobago. Some heat stress in September across the region.
2. The 2022-23 Dry Season Outlook:
 - *December to February*: Slow decrease in rainfall, wet days & wet spells / increase in dry spells, (early dry season) no heatwaves.

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- *March to May*: Drought possible in Belize, Cuba, and Puerto Rico, frequent dry spells, (late dry season) heat stress from April/May, flooding rains more likely from April/May.
- Potential for flooding/flash floods and related hazards: still moderate in December in the Caribbean Islands and Belize, high until early-February in the Guianas; high in May in the Guianas; becoming moderate in April (Greater Antilles) or May (elsewhere).
- Prepare for: Floods and cascading hazards early on in the season, and heat stress in humans and in animals from April or May.

During the question and answer period, Dr. Cedric Van Meerbeeck spoke about the unexpected flooding event which occurred on Christmas eve in 2013, whereby he reminded participants of the importance of not letting your guard down. He then drew our attention to the quality of the forecasts in terms of how much it can be trusted, he stated that there is predictability beyond timescales and that we need to have the least amount of uncertainty in the forecasts, hence increasing value.

2.3 ClimSA Project – Sherri Frederick, CIMH

Ms. Sherri Frederick of the CIMH presented on the INTRA-ACP Climate Services and Related Applications (ClimSA) Caribbean Programme, for which she is Programme Manager. Currently there are various activities, such as the Participatory Integrated Climate Services for Agriculture (PICSA), being undertaken by the CIMH. She also mentioned the importance of securing the provision of climate services, support for the National Climate Forum (NCOF), upgrading and updating the tools being used by CIMH and the region, the impact of CariCOF and how people are using the climate services.

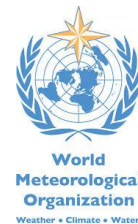
2.4 Global Climate Change Alliance (GCCA+) - Mr. Adrian Trotman, CIMH

Mr. Adrian Trotman presented on Enhancing Climate Resilience in CARIFORUM Countries project that is being implemented by the CIMH and executed by the CCCCC (Caribbean Community Climate Change Centre). The objectives are to

1. Enhance the climate observational and monitoring networks in the CARIFORUM for improved sectoral and development planning.

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2. Enhance the Caribbean's climate resilient water infrastructure.
3. Elaborate a capacity building, education and outreach programme.
4. Elaborate a Climate Risk Management Framework in CARIFORUM Member States evidenced by a minimum of 200 practitioners trained in CCORAL

Mr. Trotman also stated that there will be some focus on pest and disease monitoring and forecasting and irrigation management.

2.5 Partnership to Address Climate Crisis (PACC) 2030 – Mrs. Shanna Combley, NOAA and Mr. Adrian Trotman, CIMH

The presenters spoke about the relationship between NOAA (National Oceanic and Atmospheric Administration) and the CIMH. Participants were also informed of the upcoming workshop that will help to guide future support for the region in enhancing its climate services and building climate resilience. All of this part of the programme on US Caribbean Partnership to Address the Climate Crisis (PACC 2030).

2.6 Linking Extreme Rainfall to Flash Flood Occurrence – Dr. Simon Mason (IRI), Dr. Cedric Van Meerbeeck (CIMH)

Dr. Mason presented on linking extreme rainfall to flash flood occurrences. He stated that flooding is the most frequent and widespread natural disaster. One of the deadliest floods on historical records occurred at Yellow River in China, 1931 killing as many as 4 million people. Different types of floods were also identified such as coastal flooding (associated with high tides, sea level rise and storm surges), tsunamis (occurring approximately once every 50 years, particularly in northeastern areas of the Caribbean), riverine flooding (associated with prolonged and extensive rain, snow melt, river blockage due to fallen vegetation and landslips) and the most dangerous of all, the flash flood (associated with a combination of power and speed). Flash floods occur in places where runoff is rapid such as steep slopes, dam bursts, glacial lake outburst, and where there is concrete, asphalt and other urban surfaces. A forecast for intense rainfall can possibly result in a flash flood in these places. Dr. Mason then emphasized the importance of acknowledging the different types of floods since the causes are different and that disaggregation is important for classification. He then went on

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to state that flash flood forecasting has improved because of expanded monitoring, dataset consolidation as well as improved model resolution.

Cedric Van Meerbeek focused on adaptation where he stated the importance of looking at climatic norms which indicate when in the year it is likely to experience flash floods, hence the need to focus on early warning information for preparedness and response. He emphasized the importance of looking at timescales of climate information for planning and early warning, decades to years ahead of the season, alerting throughout the season as well as alerts on a daily basis. The importance of climate monitoring was also mentioned and shown that it requires information on the climatology and trends of a location or region, as well as monitoring hazards throughout the season. Dr. Van Meerbeek then asked whether regular rainfall or intense rainfall is to be expected in the upcoming months, and then went on to ask what is extreme rainfall. Some examples of extreme events in the Caribbean forecasted by the CIMH were then given, whereby he noted that 7- and 15-day dry spells are forecasted. It was pointed out that drought can be defined by Standard Precipitation Indices (SPI) for 6- and 12- month scales. In terms of extreme rainfall, he explained that these are defined as the 80th percentile of wet spells on a 7-day rolling period; very wet spells as the 90th percentile of a 7-day rolling period and extreme wet spells as the 99th percentile of a 7-day rolling period. It was also noted that the Caribbean Climate Impacts Database (CID) houses 9000+ reported impacts in the Caribbean. The question as to whether 3-day extreme wet spells are really the best rainfall proxy for island-wide flash flood occurrence was then asked, as well as which minimum threshold for one day excessive rainfall is really the best rainfall proxy. He concluded that science has become better at predicting such things and focus should therefore be on development and training to build the capacity of water and related sectors in decision making using the climate information.

2.7 CARISAM – Shontelle Stoute, CIMH

Mrs. Shontelle Stoute, along with Mr. Abraham Searles (Intern, CIMH) gave an update on the enhanced Caribbean Society for Agricultural Meteorology (CariSAM) portal. It was pointed out that CariSAM was developed to be utilised primarily by meteorologist, climatologist and agriculturalists for the purpose of information sharing. Its functionalities include a data centre, a discussion forum, a source for tailored products and an online training centre. It was also mentioned that a new feature - a video summary - of each month’s bulletin will be made available.

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2.8 Crop Water Demand Forecast for The Agricultural Sector – Mrs. Shontelle Stoute (CIMH) and Mrs. Janice Reed (Intern, CIMH)

Mrs. Stoute, with the assistance of Mrs. Janice Reid, presented an experimental crop water demand forecast for the agricultural Sector. Why a demand forecast? It aids in decision making ahead of the season, allowing for planning in preparation for the next season, by indicating the likelihood of a crop receiving the amount of water required for optimum growth and production.

The experimental forecast was presented for a few territories across the region and participants were invited to place themselves in the shoes of the farmer to make a decision for planting for the season of focus.

For a robust crop water demand forecast p information on crop water requirements and typical cropping season is required as well as rainfall data across the country.

3.0 Interactive Session – Sectoral Implications and Interpreting Seasonal Forecasts

Three breakout groups were formed for this interactive session to discuss the implications of the forecast to their sectors. The results of the discussion are captured below:

Water Sector

- It was mentioned that this sector encounters issues with regards to over pumping in the dry season as this affects the ecosystem as well as the water supply.
- In the Guianas there is an issue with trucking water to various areas due to landslides.
- Sanitation issues and the contamination of water
- Water restrictions during the dry season with some sectors benefiting more than others during these times.

Agriculture

It was mentioned that a forecast issued wetter than usual for the dry season will affect certain crops which cannot handle over-saturated soils. Some other discussion points mentioned were:

- Delays in land preparation activities for farmers

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- Infrastructure damage to farm roads.
- Maintain the cleaning of drains
- Protect livestock from flooding in areas prone to floods
- An implication for insurance due to loss of crops and livestock
- Farmers and retailers are equally affected by shortfalls in crop production
- Storage for animal feeds
- An increase in bush fires during the dry season

Mixed Group

This discussion group comprised of participants from the energy, Tourism and health sectors. Some of the points mentioned were,

- The Energy Sector indicated that power lines were affected due to flooding hence resulting in power outages
- The Health and Tourism sector reported an uptake in diseases such as dengue and leptospirosis due to flooding and a focus on community engagement to reduce breeding sites for mosquitoes.
- The Tourism Sector spoke about decreased episodes of heat stress due to increased hydration

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Stakeholder Meeting (November 25th)

4.0 Presentations

4.1 Strengthening National Frameworks for Climate services – Dr. Roché Mahon (Social Scientist, CIMH)

Dr. Mahon reviewed the challenges and opportunities experienced providing climate services in the Caribbean at regional and national levels. Dr. Mahon started off by stating that climate change projections suggest that climate events will likely continue to incur losses in the range of billions of US dollars going forward. She stressed that climate early warning information presents an opportunity to integrate the suite of monitoring and forecast products that CIMH and its network of Met Services routinely produces into the operating contexts of Caribbean States to support resilience. This is because many of these climate information products provide practitioners with information that helps them to become aware of recent and expected climatic conditions and their potential impacts throughout the Caribbean. Dr. Mahon highlighted the progress that the Caribbean climate services community has been able to make in building out a regional framework for climate services comprised of four components that have been working well to date. These include: 1) a regional consortium of climate and sectoral partners for the development of Caribbean climate services; 2) the Sectoral EWISACTs Regional Roadmap and Plan of Action 2020-2030 - a long-term regional road map and plan of action for joint work between the met community and sectors; 3) the CariCOF which is a key User Interface Platform for the Caribbean region; and 4) coproduced sector specific climate information products for three climate sensitive sectors, namely the Caribbean Agroclimatic, Health Climatic and Tourism Climatic Bulletins coproduced with CARDI, CARPHA, PAHO, CTO and CHTA. Dr Mahon emphasised that going forward, the region should continue to downscale these 4 core elements to the national level in the form of: 1) National Committee for Climate Services; 2) National Roadmap and Plan of Action for Climate Services; 3) National Climate Outlook Forum or NCOF; and 4) sector-specific bulletins like the Caribbean Agro, Health and Tourism Climatic Bulletins would be replicated in some way at the national level either as stand-alone bulletins or alternatively as a lighter effort in the form of sector specific messages in a national climate bulletin.

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4.2 National Strategic Plan and Framework for Weather, Water and Climate Services – Arlene Laing (Coordinating Director, CMO HQ)

Dr. Laing spoke about building resilience to high impact hydrometeorological events as well as the importance of strengthening regional and national systems to support that resilience building. Also mentioned was the fact that the World Meteorological Organisation (WMO) and the Caribbean Meteorological Organisation (CMO) both collaborate on projects with the CIMH and it was stressed that there is a need to make sure that plans are aligned with what is going on in the specific countries. This will require reviews of recently developed action plans with stakeholders and the meteorological services, with some focus on the roles of various institutions in the production, provision and application of weather, water and Climate services in each country which will include relevant, useful and usable early warning information.

4.3 Regional Framework for Weather and Climate Services (RFWCS) and National Framework for Weather and Climate Services (NFWCS) Guidelines – Filipe Lúcio (WMO)

In his address, Mr. Lucio mentioned the importance of establishing a National Framework for Climate Services as a coordinating mechanism to facilitate the interaction of all the stakeholders in the climate services value chain with a view to enable co-design and co-development of actionable tailored climate services. Stakeholders would include climate information providers and users, researchers and decision and policy makers. Such interaction can support the delivery or enhancement of actionable early warning information to the users such as agriculturalists and farmers.

4.4 Options for National Committees for Climate Services: Progress, Current Status and Future Challenges – Dr. Roché Mahon (CIMH), Jodi-Ann Petrie (CIMH), Gerard Tamar (Grenada Meteorological Service), Shanea Young (National Meteorological Service of Belize), Komalchand Dhiram (Guyana Hydrometeorological Service)

Dr. Mahon started this session with research insights presenting a clear case for strengthening national frameworks for climate services. For example, research in the Caribbean shows that Met Services outperform other major potential providers of climate information in the Caribbean on user interaction. They also outperform all other sources of climate information, for all categories of climate information which makes clear that the Met Service is arguably the agency at the national

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level that is best suited to deliver climate services. This evidence suggests that not only is the national context one of the most impactful levels of investment when it comes to this agenda, the role of the Met Service at this level is also impactful.

Dr. Mahon handed over to Ms. Jodi-Anne Petrie who made the case for national investment in each of 4 components highlighted earlier in Dr. Mahon's presentation. Importantly, this session showcased the experience of 4 Met Services who have managed to successfully implement the 4 components in whole or in part to promote learning on the value of building out these components, as well as Met Service challenges and successes in doing so. Various examples of national level climate services activity, were presented by staff of National Meteorological Services from across the region, including Saint Lucia Met on a National Committee for Climate Services, Belize Met on convening National Climate Outlook Forums, Grenada Met on developing the Grenada National Roadmap for Climate Services and Guyana Hydro-Met on the operational development and delivery of a National level Agro-met bulletin.

4.5 Focus Group Discussion: Exploring Options for Strengthening National Frameworks for Climate Services

Focus group discussion research was conducted post lunch. This session provided a forum for sector stakeholders and climate service providers to brainstorm around the advancement of National Frameworks for Climate Services. Stakeholders were divided into 5 sectoral focus groups comprised of 10-12 participants each. Meteorologists/climatologists are asked to join the sectoral groups. Research questions assessed challenges and opportunities on key components of a National Framework for Climate Services. At the end of the exercise, groups reported a summary of their discussion to plenary.

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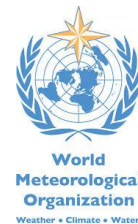


Appendix I: List of Participants

| Meteorological Offices | | | | |
|------------------------|-----------------|------------|---|------|
| Organisation | Last Name | First Name | Email contact | |
| Antigua | Paige | Orvin | odepaige@yahoo.com | |
| Aruba | Irausquin | Lothar | lothar.irusquin@meteo.aw | |
| Barbados | Nurse | Danielle | danielle.nurse@barbados.gov.bb | |
| Belize | Young | Shanea | syoung@nms.gov.bz | |
| Cayman Islands | Porter | Avalon | Avalon.porter@gov.ky | |
| Dominica | Bryan | Ashar | asharb@gmail.com | |
| Dominican Rep | Matos | Miriam | mimat19@hotmail.com | |
| Grenada | Tamar | Gerard | gtamar@gaa.gd , gerritames@yahoo.com | |
| Guyana | Dhiram | Komalchand | kdhiram2015@gmail.com | |
| Jamaica | Moody | Ronald | r.moody@metervice.gov.jm | |
| Martinique | Perquin | Emily | emily.perquin@meteo.fr | |
| Puerto Rico | Martinez | Odalys | odalys.martinez@noaa.gov | zoom |
| St. Kitts | Benjamin | Vincere | vincere.benjamin@scaspa.com | |
| St. Lucia | Francis | Eugenie | mistyyyy@hotmail.com | |
| St. Maarten | Etienne-Leblanc | Sheryl | Sheryl.Etienne-Leblanc@sintmaartengov.org | |
| St. Vincent | Neverson-Jack | Desiree | desneverson@gmail.com | |
| Suriname | Samuel | Dwight | dwrightsamuel82@gmail.com | |
| Trinidad | Ramgoolam | Arnold | noldo_tnt@yahoo.com | |
| UWI - CSGM | Williams | Matthew | matt4pod@gmail.com | |
| Trainer | Mason | Simon | simon@iri.columbia.edu | |
| NOAA | Segele | Zewdu | zewdu.segele@noaa.gov | |
| NOAA | Recalde | Cristina | cristina.recalde@noaa.gov | |
| CIMH | Trotman | Adrian | | |
| CIMH | vanMeerbeek | Cedric | | |
| CIMH | Allen | Teddy | | |
| CIMH | Stoute | Shontelle | | |

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| Meteorological Offices | | | | |
|------------------------|-------------|------------|---------------|--|
| Organisation | Last Name | First Name | Email contact | |
| CIMH | Kirton-Reed | Lisa | | |
| CIMH | Applewhaite | Andrea | | |
| CIMH | Farrell | David | | |
| CIMH | Mahon | Roche | | |
| CIMH | Petrie | Jodi-Ann | | |
| CIMH | Combley | Shanna | | |
| CIMH | Reid | Janice | | |
| CIMH | Phillip | Ryan | | |
| UoR | Di Napoli | Claudia | | |
| CIMH | Edwards | Tajay | | |
| CIMH | Lowe | Daison | | |
| Jamaica | Saddler | Ainsworth | | |
| CIMH | Reyes | Ashford | | |

| EWISACTs | | | | |
|--------------|----------------|------------|--|------|
| Organisation | Last Name | First Name | Email contact | |
| CARDI | Flemming | Kistian | kflemming@cardi.org | |
| CARPHA | Boodram | Laura Lee | boodrala@carpha.org | |
| CARICOM | Sabir | Kareem | kareem.sabir@caricom.org | |
| CCCCC | Jones | Albert | ajones@caribbeanclimate.bz | |
| CHTA | Duffy | Loreto | loretoduffy@gmail.com | |
| CMO | Anderson | Haley | handerson@cmo.org.tt | zoom |
| CSGM | Clarke | Leonardo | leonardo.clarke02@uwimona.edu.jm | |
| CWWA | Maharaj-Jagdip | Anuradha | amaharaj@cwwa.net | |
| AACARI | Browne | Claude | jugobrowne@gmail.com | |
| OECS | Isaac | Cornelius | cornelius.isaac@oecs.int | |

Collaborators:





| | | | | |
|---------------|-----------|---------|--|--|
| CCREEE | Whyte | Felicia | felicia@ccreee.org | |
| CTO | Charles | Amanda | acharles@caribtourism.com | |
| CDEMA | Greenidge | Nicole | nicole.greenidge@cdema.org | |
| GWP-C | Lewis | Simone | simone.lewis@gwp-caribbean.org | |

Stakeholders

| Organisation | Last Name | First Name | Email contact | |
|--------------|---------------|------------|--|------|
| Anguilla | Thomas | Twayna | twaynathomas@yahoo.com | |
| Anguilla | Scarbrough | Jaleel | jscarb95@hotmail.com | |
| Mont | Skerritt | Arlen | skerrittea@gov.ms | |
| TCI | Henfield | Tiffany | tiffanyhenfield@tciairports.tc | |
| Jam Agri | Webb-Lawrence | Francine | francine.lawrence@rada.gov.jm | zoom |
| Jam Agri | Shaw | Winston | winston.shaw@rada.gov.jm | zoom |
| SLU Agri | JnBaptiste | Kemuel | ddas@govt.lc | |
| Gda Agri | Fletcher | Kenton | kenflet@hotmail.com | |
| Ant Agri | Freeland | Marcelle | Marcelle.Freeland@ab.gov.ag | |
| Guy Water | Franklin | Angela | angelaf@gwi.gy | |
| Jam Water | Chambers | Kevin | kchambers@wra.gov.jm | |
| Dom Water | Laville | Edmund | e.laville@dowasco.dm | |
| St.V Water | Ballantyne | Danroy | danroyballantyne@hotmail.com | |
| St.K Water | Hanley | Chantal | chantal.hanley@gov.kn | zoom |
| CMC | Chance | Kenton | kentonxtchance@gmail.com | |
| BWA | Paul | Jaime | Jaime.Paul@bwa.gov.bb | |
| BWA | Greaves | Jatobi | Jatobi.greaves@bwa.gov.bb | |
| BWA | Rock | Michala | Michala.rock@bwa.gov.bb | |
| BWA | Waterman | Jalisa | Jalisa.waterman@bwa.gov.bb | |
| Finance | Griffith | Ronnie | Ronnie.Griffith@barbados.gov.bb | |
| Agriculture | Sealy | Leslie | leslie.sealy@badmc.org | |
| CYEN | Belle | Keisha-Ann | keisha-ann.belle@cyen.org | |
| CIMH | Maloney | Kareem | kmaloney@cimh.edu.bb | |

Collaborators:





| | | | | |
|-------------|---------|-----------|--|--|
| CIMH | Searles | Abraham | asearles@cimh.edu.bb | |
| IICA | Sealy | Shontelle | shontelle.sealy@iica.int | |

Collaborators:

