



**The 2024 Wet Season Caribbean Regional
Climate Outlook Forum
(CariCOF)
Georgetown, Guyana
Stakeholder Forum
Final Report
May 23rd to May 24th, 2024**



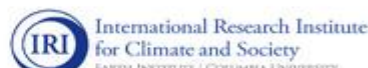


1.0 Background

The Caribbean wet/hurricane season has implications for disaster risk management, with perennial threats from tropical cyclones (tropical depressions and storms, and hurricanes), floods, landslides and increasingly, heat. There is heightened interest for this particular wet/hurricane season CariCOF (Caribbean Climate Outlook Forum) as the season is expected to be one of climate extremes in the Caribbean basin, particularly related to heat (both ambient and marine), the number and strength of tropical cyclones and flood potential. It is customary to have significant participation from practitioners from national disaster management organizations in the Caribbean for this season's CariCOF.

In collaboration with partners from the European Union, the Organization of African, Caribbean and Pacific States (OACPS), the Department of State of the USA, the National Oceanic and Atmospheric Administration (NOAA) of the USA, and the Columbia Climate School International Research Institute (IRI) for Climate and Society, Columbia University, the 2024 Wet/Hurricane Season CariCOF was scheduled for 21st to 24th May in Georgetown, Guyana. The Stakeholder Forum was held on the 23rd and 24th May featuring 5 main sections:

1. The delivery of the forecasts for the season (which includes rainfall and temperature forecasts, as well as forecasts of drought and dry spells that limit water availability, wet days, wet spells, extremely wet days and extreme wet spells that provide insight into the potential for flooding), the Atlantic Hurricane Season activity, heatwaves at both seasonal and sub-seasonal (weekly forecasts from 2 to 4 weeks in advance) and coral reef watch.
2. Multi-hazard Tournament – a fun and engaging way of collectively responding to the 2024 Wet/Hurricane season forecasted climate conditions reflecting, as closely as possible, real decision-making processes, amongst competing teams.
3. Focus on heat forecast information at the seasonal to sub-seasonal timescales. Sub-seasonal heat information to follow the approach adopted for sub-seasonal forecasting of excessive rainfall and dry days developed in 2023 and showcased at the 2023 Dry Season CariCOF in Dominica.
4. Evaluating the impact of CariCOF and its climate products on the decision- and policy-making landscapes in support of risk reduction in our climate sensitive socio-economic sectors in the Caribbean. Ten years after the first evaluation of CariCOF, led by a team from the University of Arizona, an assessment of the advances since 2014 and gaps still to be covered, if any, began.
5. Led by the Climate Studies Group Mona, UWI and INSMET Cuba, tools in the CLIEn'T (Caribbean Climate Information Education and Tools) platform would be showcased. CLIEn'T is a web-based platform which offers climate products, risk assessment tools and simulations.





The full concept note can be accessed [here](#). The 2024 Wet/Hurricane season agenda and participant list can be found in [Appendix I](#) and [Appendix II](#) respectively.

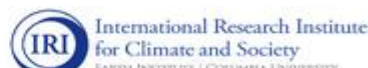
Day 1, May 23rd

2.0 Introduction

The meeting started with welcome remarks by Mr. Adrian Trotman, Head of the Caribbean Regional Climate Centre (RCC) and Chief of Applied Meteorology and Climatology at the Caribbean Institute for Meteorology and Hydrology (CIMH) who also extended greetings on behalf of the Principal, Dr David Farrell. Mr. Trotman indicated that the wet season and hurricane season are not the only seasons of concern, noting that we also have a dry season, which offers a challenge with regards to water deficits. He mentioned the impact of COVID, which caused some CariCOF meetings to be held virtually. In total, 23 CariCOF meetings have been held to date. He recalled that the first CariCOF hosted in Guyana was in 2017, during the dry season, noting that northern Guyana, where most of its population resides, experiences two wet and two dry seasons, with the wet season just beginning. He mentioned the various sectors represented at the meeting that are particularly climate sensitive such as, Health, Disaster Risk Management and Tourism, among others. Mr. Trotman also emphasized the importance of supporting these sectors with climate-related information given their heightened sensitivity to climate conditions (e.g. Tourism). It was pointed out that special attention needs to be paid to seasonal forecasts, as it could be an especially eventful period, and urged disaster risk managers to remain vigilant. Delivering accurate forecasts, he noted, remains a crucial component. Mr. Trotman raised several questions, asking: What does the season present for us? How do we respond? What measures do we take to address the challenges? He also mentioned the Multi-Hazard Tournament to follow later in the morning session, which will focus on decision making based on the wet season forecasted conditions. In addition to the extreme rainfall, Mr. Trotman pointed out other challenges, including heat, and asked what steps could be taken to mitigate its impacts. He also highlighted the need to monitor other hazards like Saharan dust episodes. In his conclusion, he remarked that what is expected is not always what happens, underscoring the importance of being prepared for any eventuality.

2.1 Featured remarks

Dr Garvin Cummins welcomed all, then introduced the Honorable Minister of Agriculture, Mr. Zulfikar Mustapha. Mr. Mustapha welcomed participants to Guyana then proceeded to say that climate change is real, stating that people are dependent on forecasts, stating that there is a great need to predict the weather with a measure of accuracy. He stated that climate change is affecting the entire world, and farmers depend on accurate weather, therefore we need to focus on how to serve the ordinary men and women who work during the day and night. He stated that there is a need to put responsive systems in place to disseminate information to the ordinary person and we shouldn't remain in the office assuming that this information is being received. He stressed on the point that the government must make budgetary allocations to this important industry with steep increases in the budgets seen. He also mentioned the need to drain excessive rainfall out of certain areas, for example where there is housing, by building canals to drain water. It is therefore important to make the necessary resources available. There is now a political will to solve the climate crisis, and Government is open to recommendations





3.0 Day 1 Presentations

3.1 Wet/ Hurricane Season Climatology of the Caribbean and review of recent impacts In the Caribbean, by Mrs. Shontelle Stoute, CIMH

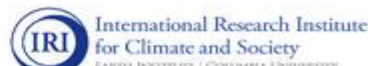
Mrs. Stoute emphasized that the purpose of the presentation was to help everyone understand “the story” - understand what the norm is for the season which sets the context for what is being forecasted. She highlighted the importance of knowing what is typically expected for the season and reflecting on recent occurrences leading up to the season as the recent past influences the resulting impact of the upcoming conditions.

Mrs. Stoute explained that the Caribbean wet season, which generally runs from May/June to November with a wetter second half, largely coincides with both the Atlantic Hurricane Season and the Caribbean Heat Season (May to October). Tropical cyclone activity during the Hurricane Season typically peaks in September, while the peak of the Heat Season, characterized by a peak in the frequency of heatwave days varies depending on location. She noted that coastal Guyana usually experiences heat peaks around October. She also discussed factors that contribute to the development of tropical cyclones such as the Inter-Tropical Convergence Zone (ITCZ), rising Sea Surface Temperatures (SSTs) and the migration of tropical waves.

Mrs. Stoute then presented maps depicting 3-month rainfall totals during the first half (June to August) of the season and the second half (September to November), illustrating seasonal patterns across the region. She mentioned that the second half of the wet season, which is generally wetter than the first half in the Caribbean Islands, is critical for water supply replenishment. In terms of the heat, peaks were generally observed in August/September across many territories.

Looking back at the 2023 Wet/Hurricane Season, she noted that temperatures across the region were higher than usual. She also pointed out that the daily surface air temperatures for 2024 are already higher than for the same period in 2023. Rainfall accumulations across the region were also assessed, with Guyana, Dominica, Jamaica and Belize showing well below normal accumulations for the period December 2023 to April 2024. With respect to temperatures, notably, the previous season experienced temperatures of up to 1.5 degrees Celsius above average across the eastern Caribbean and Guyana. She reported that drought affected areas like St. Kitts and Nevis, Cuba, Jamaica, Puerto Rico (US Virgin Islands) and Suriname. She further reported that, during what is typically the first half of the Wet Season, in 2023 farmers in Jamaica were significantly impacted by prolonged drought and rising temperatures, with the temperatures further exacerbating the drought conditions. By March 2024, farmers in Suriname were also reporting widespread reduction in crop yields - in some areas by more than 25 percent. At the same time, the Water and Sewerage Authority (WASA) in Trinidad and Tobago were reporting the worst drought in years.

In her concluding remarks, she reiterated that the intense heat is currently a hot topic locally, regionally and globally, and that it poses several threats to society, particularly related to health. She emphasised the importance of recognizing signs of heat stress and taking protective measures, especially for children. Mrs. Stoute recommended installing air conditioning units and seeking out cooler locations, whenever possible to stay cool.





3.2 The Climate Outlook for 2024 a year of extremes!?! (Komalchand Dhiram, Hydrometeorological Services, Guyana)

Mr. Komalchand Dhiram, (Hydromet Services, Guyana), in the delivery of the 2024 Wet/Hurricane Season Outlook, re-emphasized that 2024 is expected to be a year of climate extremes. He began by reviewing the climatological seasonality of hazards, identifying key periods like the Atlantic Hurricane Season, alongside the Caribbean Wet, Dry and Heat Seasons - noting hazards can occur all year round. He further noted hazards associated with these periods such as tropical cyclones, flooding, heat waves, bushfires and drought.

Mr. Dhiram presented a global map illustrating regions of record warm temperatures. He explained that we are transitioning from an El Niño phase into a La Niña phase. In comparison to the year 2010, there was a similar shift from El Niño to La Niña leading to warm conditions, a hyperactive hurricane season and wet conditions.

He posed a question, “What do we know?” and answered by stating that we do know that we are transitioning to a La Niña. Additionally, there is record warm North Atlantic SSTs. He, however, mentioned that the Saharan Air Layer (SAL) incursions are expected to suppress shower and storm activity. During Saharan dust episodes, prolonged, record-breaking heat is anticipated. It should be noted, however, that SAL incursion would diminish significantly around August.

He reported that most of the Caribbean is most likely to experience intense, near-record nighttime and daytime heat with rising humidity levels from June through September. Without frequent incursion of the SAL, an intense start to the Hurricane and Wet Seasons are expected, with a season that is likely to experience greater frequency of flash floods. With frequent incursions, the activity is likely delayed – this can extend droughts where they are already being experienced – or more erratic. He also reported that the forecast suggests at least 50 heat wave days in Barbados and The Bahamas for the period June to August (i.e., more than half of this 3-month period would be spent in heatwaves). With incursions of SAL, heat could be further exacerbated.

A summary of the outlook of the season follows, with influences of both scenarios (i) without frequent incursions of SAL – Scenario A and (ii) with frequent incursions of SAL – Scenario B:

Scenario A – without frequent incursions of SAL

Region-wide intense Heat Season:

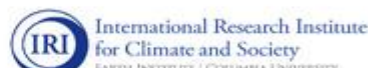
- considerably higher than usual night- and daytime temperatures.
- frequent/persistent and intense heatwaves.
- potential for intense marine heatwaves triggering a mass coral bleaching event starting around August.

Progressive drought alleviation from May, esp. in southern Caribbean & Guianas

- accelerated recharge rate in surface water reservoirs and rivers
- fast decrease in wildfire potential

Potentially explosive start of the wet season in May in some areas

- high to extremely high potential for flooding, flash floods, cascading hazards & impacts (except ABC Islands).
- environmental conditions conducive to moisture-related pests.





Hyperactive 2024 Atlantic Hurricane Season

- historical activity in similar years (2010, 2013, 2020 & 2023)
- 23-29 tropical storms
- 11-13 hurricanes
- 5-7 major hurricanes
- 66% chance of at least 1 major hurricane tracking through the Caribbean

Scenario B – with frequent incursions of SAL – differs from Scenario A in the following ways

Heat Season

- potentially record-breaking humid heat
- prolonged duration of intense marine heatwaves

Drought conditions

- more dry spells & worsening drought
- slow decrease in wildfire potential

Wet Season

- erratic, intense wet spells through July

Hurricane Season

- muted/erratic tropical cyclone activity before mid-August

4.0 Open Discussion on the seasonal Forecast

Dr. Cedric Van Meerbeeck, (Climatologist, CIMH) addressed several questions from participants concerning the record warm temperatures. He explained that higher concentrations of dust in the atmosphere typically lead to suppressed hurricane activity, but can enhance and extend the dry conditions, and intensify the Heat Season, particularly the first half of the season.

Mr. Trotman emphasized the significant health impacts of Saharan dust, noting that it has been linked to particularly an increase in asthma cases, even later in life. He urged the health sector to prioritize this issue.

5.0 Wet/ Hurricane season CariCOF Multi-Hazard Tournament, (Dr. Roché Mahon, Jodi-Ann Petrie, CIMH)

Dr. Roché Mahon, Social Scientist at CIMH provided an overview of what to expect during the upcoming Multi-Hazard Tournament. She explained that the objective of the tournament is to allow participants to simulate real-life situations based on the suite of newly released Wet Season forecasts, recent climate monitoring information as well as historical data for a fictitious tri-island state of Carib Isles, and its two smaller islands of St. Allen and St. Kirton by applying climate risk information in national and cross-sectoral planning. The exercise offers a fun and engaging way to learn (interpreting and utilizing climate products) while tackling climate-related challenges.

Teams were tasked to develop a cross-sectoral climate risk management plan with a budget of USD 2 million. This plan will focus on early warning strategies for both the early (JJA) and late (SON) phases of the 2024 wet/hurricane season. Teams were thereafter asked to simulate a presentation of the CRM plan to the Carib Isles Ministerial Council and the nation in a televised broadcast later that day.

Five teams were formed, and participants engaged in discussions to develop their action plans based on the historical climate data, climate monitoring and climate forecasts provided. Each team was tasked with



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nominating a spokesperson, a budget keeper and a timekeeper. All participants were required to actively participate in the formulation of the team's plan, as well as to ensure that their teams complete the required tasks.

The responses from the teams can be accessed in [Appendix III](#).

Day 2, May 24th

6.0 Day 2 Presentations

6.1 Heat Indices for early Warning (Dr. Simon Mason, IRI)

Dr. Mason reported that the WMO is taking the issue of emerging heat risk very seriously, particularly as health risks, including mortality, related to heat exposure increase. He further reported that mortality increases rapidly as temperatures exceed a local optimum that is defined by climatology of the location. He explained that excess heat is defined in relation to local and annual climatology – what is extreme for persons in one location may not be extreme for persons living in another location. He also made a distinction between extreme heat during the warmest time of the year and warmer conditions during the coolest time of the year, which he called warm spells. He also formally defined a heatwave as the local, cumulative excess heat during a sequence of unusually hot days and nights. Dr. Mason pointed out that insufficient night-time cooling means there is little relief from the excessive heat during the day – this he referred to as sustained heat.

Dr. Mason outlined the type of health outcomes when there is dry heat and humid heat. One example is that in dry heat our bodies sweat allows us to cool, but one can dehydrate much quicker; on the other hand, sweating is less effective in humid heat, and this can more readily result in heat exhaustion and stroke.

Dr. Mason elaborated on several measures of extreme heat:

- Temperature indicators - A single variable representing temperature
- Thermal indices - Multiple variables including temperature and humidity, but can also include solar radiation, ventilation – (a function of wind-speed, clothing) and level of activity)
- Heatwave intensity indices - Multiple meteorological variables – effort is to convert heatwaves into some level of severity
- Metrics - Individual heatwave properties

He posed the question “What affects how hot the air feels?” and explained that the higher the relative humidity the hotter it feels at a particular temperature. Dr. Mason also suggested that the minimum temperature (reflection of the conditions at night) is a good proxy for relative humidity (which may not be as readily available).





6.2 Climate Services for heat early warning in the Caribbean (Dr. Cedric Van Meerbeeck, CIMH)

Dr. Van Meerbeeck stated that there is already a warming trend in the Organization of Eastern Caribbean States (OECS) region, and this trend is projected to continue. It was emphasized that we need to reduce climate risks, including heat. He spoke about the benefits of having access to climate early warning information which allows one to better prepare and adapt to these hazards. The importance of disseminating outlooks and bulletins, as is the case with the CariCOF information, was also emphasized as they as individuals, groups and sectors can prepare for the upcoming season that would reduce risks.

Dr. Van Meerbeeck reiterated the expectation for extreme heat over the period May to November 2024, continuing from as far back as June/July 2023 when the ongoing record warm period started. Dr. Van Meerbeeck gave four reasons for the very warm conditions:

- The global warming trend compounded by El Niño, the eruption of an underwater volcano in Tonga (which ejected massive amounts of water vapour into the atmosphere and temporarily increased the greenhouse effect), and restrictions on ocean vessel emissions which reduced sunlight-reflecting sulphate aerosol concentrations in the atmosphere
- This combination of conditions resulted in a warmer, drier atmosphere and reduced air pollution from ocean vessels since 2022
- North Atlantic Ocean warms up even more in 2023 (and 2024) because of slacker winds and less sunlight-reflecting Saharan dust
- In the Eastern Caribbean, El Niño means there were fewer showers that bring cooling resulting in more sunshine warming the sea surface around the islands.

In terms of public health, he highlighted that the impacts of heat have been felt in all areas, including agriculture and tourism. It was pointed out that the Caribbean has a Cool Season and a Heat Season, and we were in the middle of the Caribbean Heat Season. He then asked the questions “When will extreme heat affect us most?” and “when will we get a break from it?” whereby he stated that answering these questions requires research, development and training. Dr. Van Meerbeeck reported that, in partnership with the IRI of Columbia University, research will be conducted on the forecasting of extreme heat at the sub-seasonal time scale, i.e., for the next 2-4 weeks.

6.3 Sub-Seasonal Forecast of Rainfall Extremes and Heat (Dr. Wazita Scott, CIMH)

In her presentation, Dr. Scott explained that, generally, sub-seasonal forecasts are weekly averages, for the next week and the two weeks after that. Attention was then turned to extreme heat days with excessive heat day forecast for the period May 29th, 2024 to June 4th, 2024 shown. One product illustrated the number of nights warmer than 26°C – this ranging from 1 to 3 nights across the Caribbean. Another product showcased indicated that the number of days warmer than 31°C ranged from 2 to 7 days for the region. The next period assessed for the excessive heat day forecast was for the period June 5th to June 18th, where the number of nights warmer than 26°C ranged from 1 to 11 nights and the number of days warmer than 31°C ranged from approximately 4 to 13 days across the Caribbean.

Dr Scott proceeded to look at rainfall extremes where rainfall totals for the period May 29th, 2024, to June 4th, 2024 ranged from 25 to over 225 mm across the region. Another product reviewed was for the probability of exceeding 100 mm over the 7-day period. Most locations were forecasted to have very low probabilities, though a few parts of Guyana were highly likely to exceed 100mm during that period. The chance of having at least one excessively wet day was also considered, with an excessively wet day being



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defined as any day with rainfall of at least 30 mm. Chances ranged from 10 to 50 % for the region for the period May 29th, 2024 to June 4th, 2024 and 10 to 60 % for the period June 5th to June 18th.

6.4 Hydrometeorological instrumentation in the Caribbean (Sergio Fernandez, OTT Hydromet)

Mr. Fernandez stated that the OTT Hydromet is an organization that provides comprehensive hydrological and meteorological solutions, designed to monitor the environment and protect human lives. The organization provides valuable insights into weather and water measuring the world’s water cycle and surface water. Measurements of saltwater intrusion as well as water levels in lakes and canals are done, safeguarding the world’s most vital resources, with the company’s focus being on monitoring water quality and treatments. He spoke about the competencies of his project team members stating that the integrated systems take all of the software and convert it into a turnkey for customers, supporting the entire value chain. He stated that the OTT Hydromet in the Caribbean provides many installations of hydrology instruments across the Caribbean with Customers such as CIMH, OECS, CCCCC, WMO, USAID and meteorological services in the Caribbean. Mention was made of their assistance to various projects across the region such as their involvement with the ClimSA project in Jamaica and Dominica which is currently under execution as well as providing assistance to Dominica with an Agrometeorological station as well as to the Barbados Water Authority with regards to measuring saltwater intrusion. Other projects being implemented are the Disaster Vulnerability Reduction Project in Grenada and in Saint Lucia with about 20 stations using line of sight technology, as well as a flood warning system in Riviere Grise and Riviere Blade in Haiti, just to name a few. He concluded by stating that in Barbados there are capacity building activities, comprising of symposiums for advanced users, which are annual events open to customers worldwide.

6.5 The Climate Information Education and tools (CliEn’T) portal-Accessing Climate Products and risk assessment tools (Dr. Tannecia Stephenson, CSGM, UWI & Arnoldo Bezanilla, INSMET, Cuba)

Dr Bezanilla introduced the Climate Information Education and Tools (CliEn’T) portal. He explained that the portal simulates future conditions and circumstances using three models:

1. Caribbean Assessment of Regional Drought (CARIDRO) uses the Standardised Precipitation Index (SPI) and the Standardised Precipitation Evapotranspiration Index (SPEI) to simulate the intensity, duration and frequency of future droughts.
2. SMASH is a Tropical Cyclone model that can simulate future storms – track, strength, rainfall. Its baseline data is from the period 1988 to 2022.
3. Dice simulates climate extremes using WMO recommended indices established by its Expert Team on Sector-Specific Indices (SCI). (Extreme Indices Calculator are all in the CliEN’T portal. Needs the necessary climatic data input – historical and future data.

Dr. Stephenson emphasized the importance of partnerships in successfully developing a tool like CliEn’T. It involved not only climate scientists, but also agriculturists, water specialists, and regional organisations such as the Caribbean Community Climate Change Centre (CCCCC). She spoke about the importance of having face to face conversations with farmers to gather information with regards to their concerns,



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information such as how Climate Change will affect crop yield in the future.

She then moved on to explain how the CliEn'T tool can be used. Output from this tool can be ingested into sector models to simulate potential impacts of drought, tropical cyclones and other climate extremes. For example, farmers may want to know when to plant in the future in general, or how yield would be affected in the future. She outlined how models like DSSAT¹ can use output to simulate future yields. One analysis showed that the lands would decrease in productivity in the future - farmers would not be achieving the maximum crop and livestock yields possible, and animal fodder would likely decrease in quantity and quality. With regards to drought, the CARIDRO managed to simulate the 2009/2010 well, with the tool further showing that such droughts will be more prevalent in the future. This has implications for future water resources. Users can also simulate river discharge for some insight into how a particular river can be impacted by tropical cyclones in coming decades.

7.0 Evaluation of CariCOF

This session was conducted by representatives from the University of Arizona (UA) and the CIMH with the main objective of obtaining feedback from the various participants as to their various opinions with regards to the progress of the Caribbean Regional Climate Outlook Forum (CariCOF) meetings and its products and services. For this segment of the evaluation two groups were formed, and several questions from a previous evaluation nearly a decade earlier were revisited, to be able to gauge any benefits and successes achieved over the years, as well as make any recommendations for improvements as necessary. Outside of this session, participants sat for one-on-one interviews with UA team members to continue the evaluation.

8.0 Results from MHT, Summary and Close Out

The last session of the meeting commenced with the results of the Multi-Hazard Tournament which took place on the previous day, with the winning group (Group 1) being announced and its members presented with their winners' tokens.

After this, Mr. Trotman, in his closing remarks, gave participants some insight into the future of CariCOF. He referred to the inclusion of information and activity surrounding the climate change timescale (multi decadal) being included more often in CariCOF ever since the 2023 Wet/Hurricane Season CariCOF. This was made possible with the support of the Climate Studies Group Mona, University of the West Indies. Mr. Trotman also reminded national stakeholders that their meteorological services are there to provide them assistance with climate products and services, and it is not necessary for them to rely (solely) on CIMH/RCC. He encouraged the participants from the meteorological services to continue to make themselves available to play that supporting role to the national disaster management agencies and national and local users of climate information and services in general. He also stated that, with many media houses visiting throughout the staging of the forum, he is looking forward to another media training, building on the one held at CariCOF in St. Vincent and the Grenadines in 2017. This helps climate services providers with the messages to the public.

Mr. Trotman once again thanked the CIMH staff, those who presented or led sessions, and those behind the scenes, for their hard work and efforts, enabling yet another productive meeting. He also thanked presenters from partner agencies, including Dr. Mason from Columbia University, Dr. Guido and his team from the University of Arizona, Dr. Stephenson (Climate Studies Group, Mona), Dr. Bezanilla (INSMET, Cuba). He also thanked all the participants who made the event a success.

¹ Decision Support System for Agrotechnology Transfer (DSSAT)





Appendix I: Agenda

The 2024 Wet/Hurricane Season Caribbean Climate Outlook Forum (CariCOF) Stakeholder Forum Georgetown, Guyana May 23rd – 24th, 2024

AGENDA

DAY 1

| TIME | SESSION | PRESENTER/FACILITATOR |
|-------------|--|--|
| 0900 - 0940 | Welcome and Featured Remarks | Mr. Adrian Trotman, CIMH Dr. Garvin Cummings, Director Hydromet Guyana EU Delegation, TBD Hon. Zulfikar Mustapha, Minister of Agriculture |
| 0940 - 1000 | Wet/hurricane Season Climatology of the Caribbean & Review of recent Impacts in the Caribbean | Shontelle Stoute, CIMH |
| 1000 - 1025 | Wet/hurricane Season Climate Outlook (rainfall, temperature, wet days/wet spells, drought, dry spells, hurricane, coral reef, sargassum) | Hydromet, Guyana CIMH |
| 1025 - 1035 | Open discussion on the Seasonal Forecast | |
| 1035 - 1100 | COFFEE BREAK | |
| 1100 - 1230 | Multi-Hazard Tournament – Wet/Hurricane | Roche Mahon, Jodi-Ann Petrie, CIMH/ All |
| 1230- 1330 | LUNCH | |
| 1330 - 1445 | Multi-Hazard Tournament – Wet/Hurricane | Roche Mahon, Jodi-Ann Petrie, CIMH/ All |
| 1445 - 1500 | COFFEE BREAK | |
| 1500 - 1555 | Multi-Hazard Tournament – Wet/Hurricane Report by Groups | Roche Mahon, Jodi-Ann Petrie, CIMH/ All |
| 1555 - 1600 | Close of Day 1 | Adrian Trotman, CIMH |





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AGENDA

DAY 2

| TIME | SESSION | PRESENTER/FACILITATOR |
|--------------|---|---|
| 0900 – 0910 | Welcome & Recap of Day 1 | Lisa Kirton-Reed, CIMH |
| 0910 – 0930 | Towards seasonal and sub-seasonal prediction of heat stress – current operations and development under ClimSA | Cedric Van-Meerbeeck, CIMH Simon Mason, IRI |
| 0930 – 0950 | Sub-seasonal forecasts of rainfall extremes and heat | Wazita Scott, Cedric Van-Meerbeeck, CIMH |
| 0950 – 1000 | Q&A | All |
| 1000 - 1030 | Hydrometeorological Instrumentation in the Caribbean | OTT |
| 1030 – 10:45 | COFFEE BREAK | |
| 1045 – 1230 | Evaluation of CariCOF | University of Arizona/CIMH |
| 1230 – 1330 | LUNCH | |
| 1330 – 1445 | The Climate Information Education and Tools (CLIEn'T) Portal – Accessing climate products and risk assessment tools | Tannecia Stephenson, CSGM, UWI Arnoldo Bezanilla, INSMET, Cuba |
| 1445 – 1500 | COFFEE BREAK | |
| 1500 - 1545 | The Climate Information Education and Tools (CLIEn'T) Portal – Accessing climate products and risk assessment tools | Tannecia Stephenson, CSGM, UWI Arnoldo Bezanilla, INSMET, Cuba |
| 1545 –1600 | Results from MHT, Summary and Close-out | CIMH |





Appendix II: Participant List

| Meteorological Offices | | | | |
|------------------------|----------------|-----------------|------------|--|
| | Organisation | Last Name | First Name | Email contact |
| 1 | Antigua | Humphreys | Charissa | charissa.humphreys@gmail.com |
| 2 | Aruba | Irausquin | Lothar | lothar.irausquin@meteo.aw |
| 3 | Bahamas | Tynes | Trinard | TRINARDTYNES@BAHAMAS.GOV.BS |
| 4 | Barbados | Nurse | Danielle | Danielle.Nurse@barbados.gov.bb |
| 5 | Belize | Young | Shanea | syoung@nms.gov.bz |
| 6 | Cayman Islands | Forbes | Kerrie | Kerrie.Forbes@gov.ky |
| 7 | Cuba | Garcia | Idelmis | idelmisggt@gmail.com |
| 8 | Curacao | Constancia | Endy | endy.constancia@meteo.cw |
| 9 | Dominica | Carrette-Joseph | Annie | ac_joseph@outlook.com |
| 10 | Dominican Rep | Matos | Miriam | mimat19@hotmail.com |
| 11 | Grenada | Miller | Trisha | tmiller@gaa.gd |
| 12 | Guyana | Dhiram | Komalchand | kdhiram2015@gmail.com |
| 13 | Jamaica | Hibbert | Nikeisha | n.hibbert@metservice.gov.jm |
| 14 | Martinique | Legoutté | Philippe | philippe.legoutte@meteo.fr |
| 15 | St. Kitts | Benjamin | Vincere | vincere.benjamin@scaspa.com |
| 16 | St. Lucia | Saltibus | Vigil | vigilsaltibus@gmail.com |
| 17 | St. Maarten | Etienne-Leblanc | Sheryl | Sheryl.Etienne-Leblanc@sintmaartengov.org |
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Appendix III: Multi-Hazard Tournament Team Responses

Team 1

In their presentation, reference was made to the temperature and precipitation outlook maps provided, showing how they aided in their decision making with regards to temperature analysis and flash flood forecasting. This was done with the primary objective of putting measures in place and determine risks. They also pointed out that certain areas were water stressed and that saline intrusion was an issue, hence there is a need for closer attention to be paid to agriculture as well as vector borne diseases. It was determined that there is a need for investment in a desalination plant, as well as to make use of solar energy and pumps. The importance of looking at early warning systems to aid in the provision of emergency response also mentioned.

Team 2

It was mentioned that above normal rainfall was expected resulting in a dengue outbreak, along with heat stress on poultry, resulting in an increased demand for cooling systems. Various innovative measures were suggested such as barging water, increased water storage facilities, the building of a reservoir and the construction of dams. It was also suggested that a program should be launched to deal with the cleanup of drains.

Team 3

It was reported that many challenges were faced, and decisions were made based on the CariCOF Outlooks, specifically referencing the hurricane season and the heat season. They spoke about the situations with excessive heat, which resulted in heat related illnesses, as well as agricultural drought, crop failure and compromised water quality. A request was made for data as well as for the placement of automatic weather stations in certain locations. A breakdown of the budget was also given, and a request was made for farmers and fisher folk to be assisted with the development of adaptation measures, in order that they will be self-sustainable.

Team 4

A proposal was made by the group for the development of early warning systems in terms of outlooks used to forecast at least 30 heatwave days. Mention was made about a broken down Desalination plant, resulting in a lack of water which resulted in livestock and agriculture being affected. It was also noted that there was use of pesticides with the expectation of increased dengue. Concerns were raised about reservoir levels being impacted by excess rainfall and the rate of evaporation due to increased heat. The barging of water was also mentioned if supplies are insufficient along with the purchasing of low cost





cooling options.

Team 5

In their presentation they utilized the rainfall accumulations maps to point out that a slight to moderately dry conditions were being experienced. Mention was made with regards to health in terms of vector borne diseases and the issues being experienced with the Saharan Dust. They spoke about the importance of putting things in place to improve the water supply. It was stressed that it is very important for the public to be made aware of the climatology of the areas and the high temperatures expected, and in the case of agriculture greater assistance to farmers is needed.

