BCON

BMS MONTHLY CLIMATE OUTLOOK NEWSLETTER

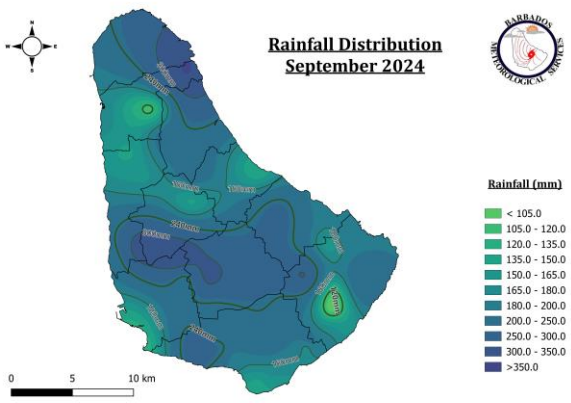
September 2024|Issue No.56

Key Messages: Near-average to above-average rainfall is expected for the remainder of the wet season and into the early dry season, at least for Charnocks. **Intense rainfall** events will continue to result in **flash flooding and persons should continue closely monitoring BMS forecasts**. Given the forecast, there is no concern for Agricultural or Hydrological droughts. **Above-normal temperatures** are projected until the **Heat Season** ends around late October/ early November and persons should continue following the recommendations provided by the Ministry of Health and Wellness. Pacific sea surface temperatures are continuing to cool and a transition into a weak La Niña is expected within the next few months.

SEPTEMBER IN REVIEW

Precipitation

Figure 1: September Rainfall Distribution



Typical for this part of the rainy season, rainfall accumulations across the island during September resulted from localized activity, tropical waves, troughs and shear lines. Multiple flash flood watches and warnings as well as severe thunderstorm watches and warnings were issued this month. This resulted in 177.5mm of rainfall recorded here at Charnocks, which was 14.9mm more than the climatological average of 162.6mm and occurred across 16 rain days. This is the third consecutive month where the climatological average for rainfall was exceeded. Rainfall accumulations at automatic weather stations across the island ranged from 96.8mm to 343.2mm, with the most significant rainfall accumulations across parts of St. Lucy, St. Peter and St. Andrew as well as parts of St. George, St. Thomas and St. James, as seen in Figure 1.

Localized rainfall was responsible for the most significant rainfall accumulations, particularly on 19th where 40.0mm - 125.0mm fell over St. Lucy, St. Peter and St. Andrew. BMS lighting detectors showed peak lighting strikes between 250 to 260 stikes within fifteen minutes on that day. Unfortunately for the northern sections of the island, localised showers developed once more on the afternoon of the 26th with radar rainfall accumulations ranging between 25mm to 100mm in sections of St. Lucy and St. Peter with 29.0 - 32.6mm recorded in St. Andrew.

Temperature

Figure 2: September Average Temperature Distribution

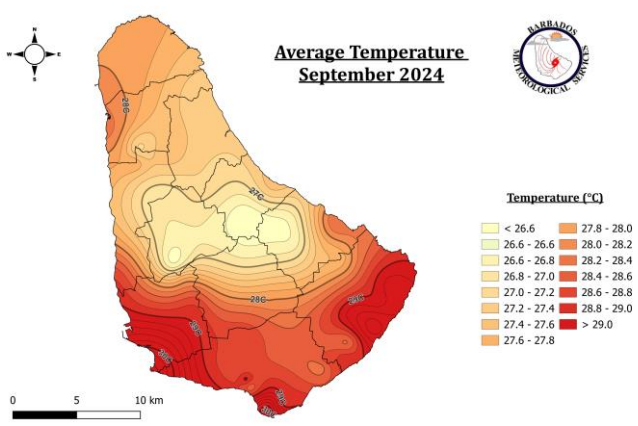
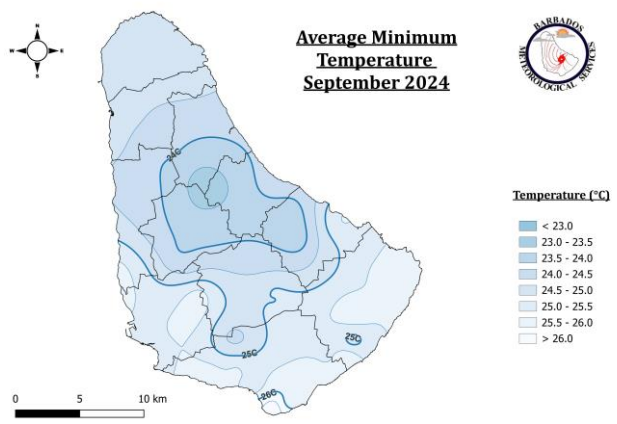


Figure 3: September Minimum Temperature Distribution



Typical for the heart of the Heat season, Barbados continued to experience high temperatures, with the BMS network of automatic weather stations consistently recording elevated daytime and nighttime temperatures for September. Across the island, average air temperatures ranged between 26.4°C and 30.3°C, with the highest temperatures across southern districts, as seen in Figure 2. The BMS station in Charnocks, Christ Church, recorded an average air temperature of 28.3°C. This figure exceeded the climatological average air temperature for September (27.9°C) only by 0.4°C. Meanwhile, average minimum temperatures ranged between 23.2°C and 26.7°C, with the warmest temperatures also observed across the southern section of the island as seen in Figure 3. An average minimum temperature of 25.8°C was recorded at the BMS station, exceeding the climatological record of 24.8°C by 1°C.

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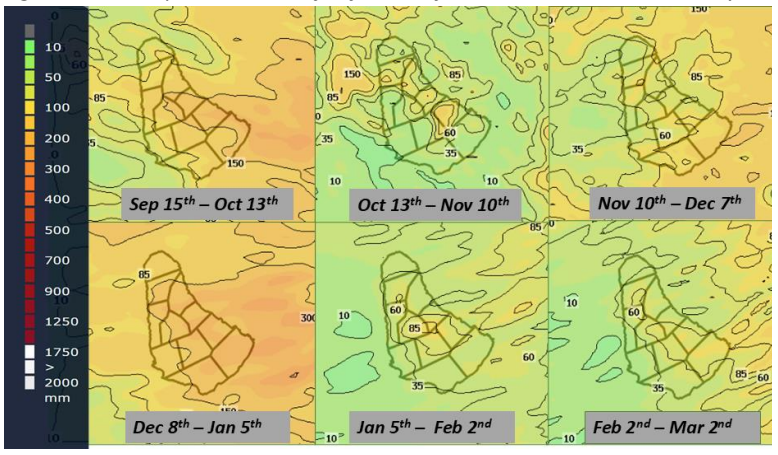
PRECIPITATION OUTLOOK

Figure 4: BMS Experimental rainfall forecast from October 2024 to February 2025



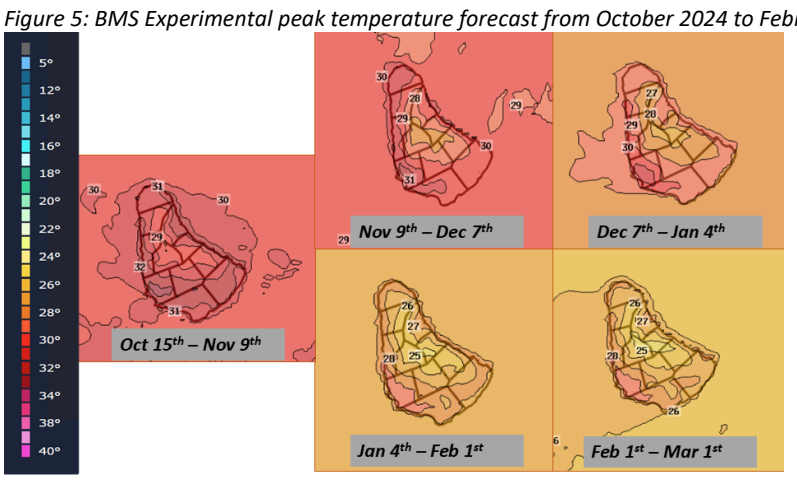
The BMS model data (figure 4) indicates that localized rainfall events may be dominant during the early part of October, a pattern that is typical during the passage of tropical cyclones well north of this island. From the latter part of October and into the early dry season, larger-scale synoptic features should drive more widespread rainfall events. However, a low bias in the rainfall accumulations has been observed in the last few runs and the official rainfall forecast have been adjusted upwards. Given the persistence of the warmer than normal Atlantic SSTs and the expected transition to La Niña, rainfall accumulations should be near-average to above-average (see table 1) for the remainder of the rainy season and into the early dry season. Typical for the late wet season, rainfall events will likely continue to be intense in nature which will result in periods of flash flooding. Persons are urged to continue monitoring daily weather as well as seasonal rainfall forecasts for updates.

Table 1: Rainfall Projections for October 2024 to February 2025

Month	Projections (mm)	Deviation from 30-yr Average at Charnocks
October	150-300	Near to above-average
November	150-300	Near to above-average
December	150-300	Above average
January 2025	50-100	Near to above-average
February 2025	50-100	Above average

TEMPERATURE OUTLOOK

Figure 5: BMS Experimental peak temperature forecast from October 2024 to February 2025



Probabilistic and dynamic model forecasts continue to project above-normal minimum, maximum and mean temperatures. Based on BMS experimental WRF model (figure 5), daytime temperatures should peak between 30°C and 32°C across rural districts, while urban, coastal and southwestern districts are expected to peak between 32°C and 35°C until late October/ early November, the anticipated end to the Heat Season. Additionally apparent temperatures (feels-like temperatures) are likely to range between 40°C and 50°C and recurrent instances of heat stress should be anticipated. Thereafter, a transition into the cooler months should result in decreased instances for heat stress. Daytime temperatures should peak between 29°C and 31°C and between 28°C and 30°C from late November and January respectively.

Table 2: Temperature Outlook for October 2024 to February 2025

Temperature	Season	Forecast Probability (%)		
		Below	Normal	Above
Minimum Temperature	**OND**	13	22	65
	JFM	25	11	64
Maximum Temperature	**OND**	6	19	75
	JFM	25	30	45
Mean Temperature	**OND**	10	15	75
	JFM	7	19	74

DROUGHT OUTLOOK

Rainfall across Barbados is expected to be localized in nature atleast for the early part of October however, BMS experimental WRF model indicates rainfall accumulations across Barbados to be near to above average for the remainder of the wet season and into the early dry season therefore, there is no concern for agricultural drought**.** Persons in the agriculture sector are urged to continue monitoring the Ministry of Agriculture, Food and Nutritional Security and the BMS for updates to the seasonal forecast. Given the seasonal forecast for average to above average rainfall, there is no concern for Hydrological Drought. However, members of the public are urged to take responsibility and continue to conserve water, regardless of the drought alert level and to continue monitoring the BWA and the BMS for updates. Below is a table of the forecast drought alert levels based on the forecast rainfall accumulations (Table 1) and the outlook of the dominant climatic factors.

Table 3: Drought Outlooks for October 2024 to February 2025

MONTH	AGRICULTURAL	HYDROLOGICAL
OCTOBER	No Concern	No Concern
NOVEMBER	No Concern	No Concern
DECEMBER	No Concern	No Concern
JANUARY 2025	No Concern	No Concern
FEBRUARY 2025	No Concern	No Concern

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Agricultural Drought: No Concern

Responses to the predicted Drought Alert Level.

Key Messages:

- *Monitor resources.*
- *Upgrade infrastructure*
- *Update and ratify irrigation plans.*

✓ ***Continue to monitor for updates from the Barbados Water Authority and Ministry of Agriculture, Food and Nutritional Security.***

✓ ***Continue to monitor the BMS Climate Outlook for monthly updates.***

Hydrological Drought: No Concern

Responses to the predicted Drought Alert Level.

Key Messages:

- *Monitor resources and continue to conserve water.*
- *Update and ratify management plans.*
- *Upgrade infrastructure*

✓ ***Continue to monitor for updates from the Barbados Water Authority.***

✓ ***Continue to monitor the BMS Climate Outlook for monthly updates.***

Likely Impacts for the October 2024 to February 2025 Period

What do these forecasts mean for Barbados?

- Recharge in reservoir/ aquifer levels.
- Conserve water.
- Continued flash-flooding events during periods of intense rainfall.
- High soil moisture content and saturation during excess rainfall even.
- Periods of intense heat with increased demand for cooling and hydration, until late October/ early November.
- Persons should continue to adhere to the guidance from the Ministry of Health and Wellness and your primary healthcare provider during periods of intense heat.
- Heat stress in farm animals and other pets until late October/ early November.
- Increased instances of mosquito and other vector-borne diseases, during the late wet season and early dry season.
- Keep updated with daily weather as well as seasonal forecast issued by the BMS.

CLIMATE OUTLOOK

ENSO (El Niño Southern Oscillation)

ENSO is the interaction between the ocean and atmosphere in the equatorial Pacific which results in periodic departures from the expected sea surface temperatures. There are two phases of ENSO, the cold phase of sea surface temperatures, La Niña and the warm phase, El Niño. La Niña conditions usually results in higher rainfall for Barbados. El Niño conditions usually result in lower rainfall for the island. Neutral conditions which are close to average or what is normally expected. These are the general conditions associated with each phase however, there are other factors which influence the rainfall patterns across Barbados which may result in a deviation from the norm.

Current state

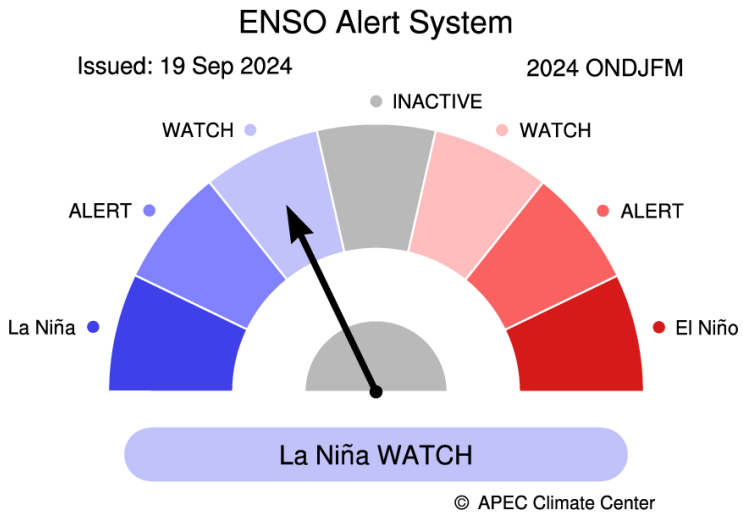
Near- to below-average sea surface temperatures (SSTs) persisted across the eastern and central equatorial Pacific Ocean.

What's the Outlook?

There is a 70% chance that a weak La Niña will emerge during SON, which should persist into the Northern Hemisphere winter 2025.

Impact to the Wet Season

A transition into La Niña usually favours an increase in rainfall across Barbados and increased tropical cyclone activity in the Atlantic Basin.



(Source: APCC/ Climate Information Services)

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CLIMATE OUTLOOK

Sea Surface Temperatures (SSTs)

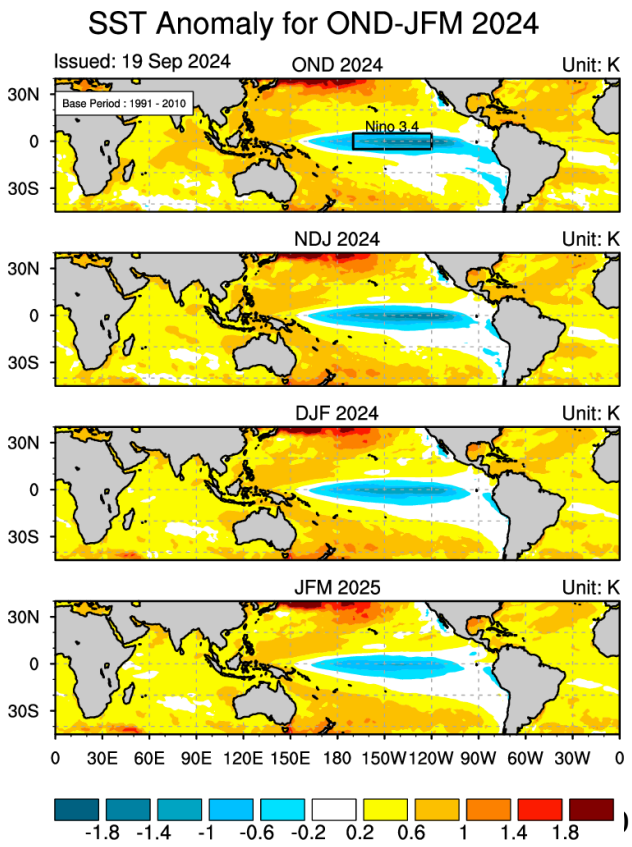
The Multi-Model Ensemble continues to forecast above-normal sea surface temperatures (SSTs) across the tropical Atlantic through to February 2025. Across much of the tropical Atlantic, SSTs are forecast to remain above normal by 0.2°C - 1°C through January – February- March. Across the eastern equatorial Pacific, SSTs are average to below-average, consistent with a neutral ENSO atmosphere transitioning to weak La Niña. The anomalies across the equatorial Pacific are expected to further decrease to a moderate La Niña.

Impact on Rainfall

Warmer than normal SSTs may favour increased rainfall characterized by intense rainfall events which may result in flash flooding across the island.

Impact on Temperatures

Warmer than normal SSTs across the tropical Atlantic will cause warmer than normal temperatures to persist through an intense heat season. Temperatures will continue to be uncomfortable during the day and night and the risk of heat-related illness will continue to increase as the heat season continues to evolve.



2024 ATLANTIC HURRICANE SEASON OUTLOOK

Mid-season forecasts for the 2024 Atlantic Hurricane season from Colorado State University, Tropical Storm Risk and the National Oceanic and Atmospheric Administration, continue to predict a "hyper-" active Hurricane Season this year; among others, significant factors influencing activity the persistently warm Sea Surface Temperatures (SSTs) and the transition to La Nina conditions which is favourable to Tropical Cyclone development. This year Mr. Sabu Best developed a hybrid statistical and deterministic product to predict the activity in the Eastern Atlantic (bounded by 10°W – 65°W, 5°N – 20°N).

	Atlantic Basin Climatology (1991-2020)	Cumulative Forecast Ranges for 2024 Season	Cumulative Mid-Season Forecast Ranges for 2024 Season	BMS 2024 Eastern Atlantic Outlook	Observed Tropical Cyclones in the Atlantic (30 Sep)	Observed Tropical Cyclones in the Eastern Atlantic (30 Sep)
Named Tropical Storms	14	20-25	17-24	5-9	11	2
Hurricanes	7	9-13	8-13	2-6	5	2
Major Hurricanes (Category 3+)	3	4-7	4-7	1-3	3	1

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