



BARBODN



BMS MONTHLY CLIMATE OUTLOOK NEWSLETTER

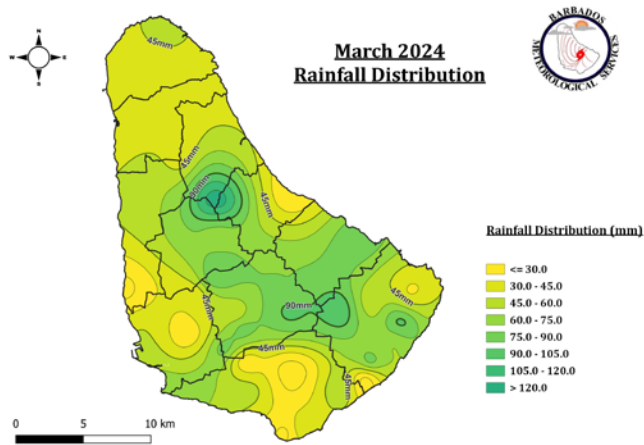
March, 2024 | Issue No.50

Key Messages: Near-average to above-average rainfall is expected for the remainder of the dry season into the Wet Season. An **Agricultural Drought and Hydrological Drought Watches remain in place for April**. Above-normal temperatures are projected until September 2024. A transition into the annual heat season is expected around April and an increase in the instances of heat ailments is likely as the heat season evolves. El Niño conditions are present and are expected to transition into La Niña during the Rainy/ Hurricane season.

MARCH IN REVIEW

Precipitation

Figure 1: March Rainfall Distribution



The month of March totaled 58.9mm of rainfall which is 20mm higher than the climatological average for Charnocks Christ Church. Rainfall accumulations for March were centered around 6 rain days for which one day alone made up more than half the rainfall recorded for the month. Thus, the dry season continues to be felt across Barbados with drought-like conditions being observed in the agricultural sector. Throughout the month, the Atlantic High-pressure system was responsible for much of these dry conditions. It should be noted however that the central districts of Barbados received higher rainfall accumulations due to topography. During the 6 rain days, a low-level shear line, perturbations within the easterly flow, localized showers and the Atlantic ridge provided these showers. On the 2nd, the Atlantic ridge was dominant, however, 2.1mm of rainfall was measured here at Charnocks, Christ Church as low-level cloud patches moved across the island. A low-level shear line on the 3rd and 4th accounted for over 75% of the rainfall accumulations for the month of March with

44.4mm. Similarly, much of the island recorded in excess of 25mm during this two-day time frame. On the 10th, low-level perturbations within the easterly flow produced 2.9mm with higher accumulations around half of an inch of rain recorded in St. Joseph and St. John districts. The Atlantic ridge dominated the remainder of the month until the 27th of the month where a westward moving low-level trough eroded the pressure gradient which resulted in a light wind regime. Subsequently, light winds with and upper-level trough created suitable conditions for localized activity. Although rainfall accumulations at Charnocks were low, the central and northern districts of Barbados were not as they were placed under flash-flood watches. Ending off the month, rainfall totals ranged between 10 to 20mm each day from the 27th to the 30th of March.

In addition to weather events, a small craft advisory was issued on the 18th to the 19th due to above normal easterly swells.

Temperature

Figure 2: March Maximum Temperature Distribution

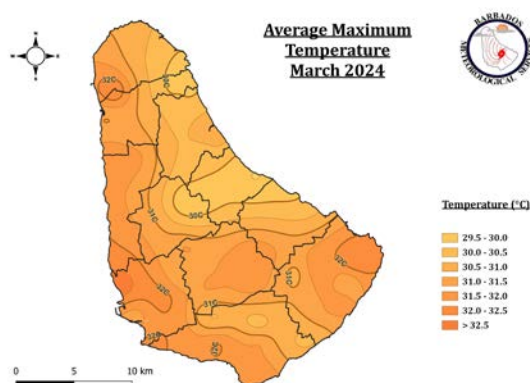
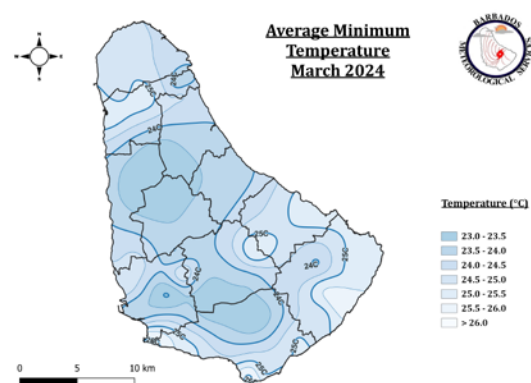


Figure 3: March Minimum Temperature Distribution



March 2024 continued the trend on above normal temperatures observed since June 2023 with the mean (maximum) temperature for the month at Charnocks being 0.8°C higher than average at 29.7°C. The mean (minimum) temperature was 1.6°C higher than the climatological average of 23.4°C. These warm temperatures were also apparent at weather stations across the island where maximum and minimum temperature across the island were (29.3°C – 33.4°C and 20.9°C – 24.8°C, respectively). Seven stations recording maximum temperatures which peaked above 32°C



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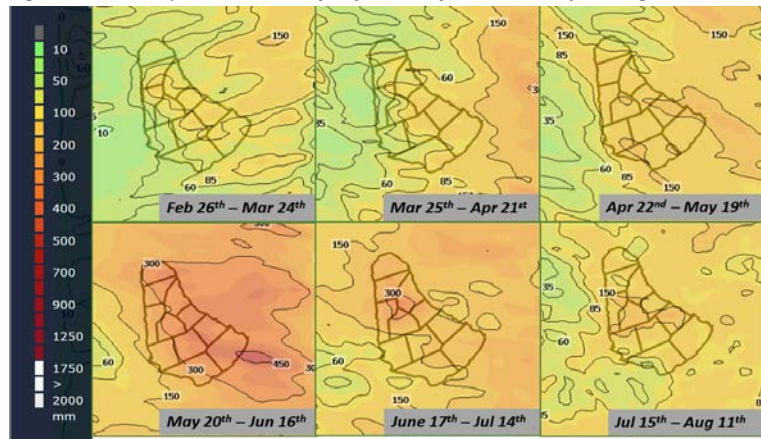


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PRECIPITATION OUTLOOK

Figure 4: BMS Experimental rainfall forecast from February to August 2024



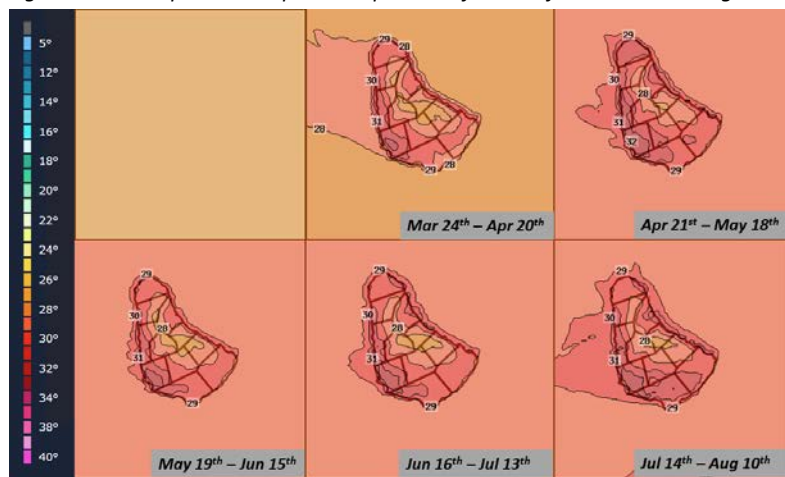
Near-average to above-average rainfall accumulations are projected until July and slightly below to above average is the projection for August; although the projection for April is lower in this model run. The MJJ rainfall projection is in keeping with the projection of a transition into La Niña conditions and the persistence of the warmer-than-normal Atlantic SSTs. The decrease in the rainfall projection for August may be indicative of the mid-summer drought period. The table below shows the projected rainfall accumulations and the deviation from the climatological average at Charnocks.

Table 1: Rainfall Projections for April to August 2024

Month	Projections (mm)	Deviation from 30-yr Average at Charnocks
April	50-150	Near to Above Average
May	100-200	Above Average
June	150-250	Above Average
July	150-250	Above Average
August	125-200	Slightly below to Above Average

TEMPERATURE OUTLOOK

Figure 5: BMS Experimental peak temperature forecast from March to August 2024



The warmer than normal Atlantic SSTs are projected to persist through the entire period, thus the probabilistic temperature forecast (Table 2), continues to indicate a high probability for above-normal minimum, maximum and mean temperatures until September 2024. A transition into the heat season is expected in April. Predictions from BMS experimental WRF (Figure 5) show a similar trend with, peak temperatures around 28°C/29°C for rural districts, while urban and southwestern districts are forecast to peak between 31°C/32°C until June. Thereafter, temperatures across western, southwestern and urban districts will rise and peak between 32°C and 34°C. Temperatures across rural districts should begin to rise around June, with temperatures between 29°C and 31°C.

Table 2: Temperature Outlook for April to September 2024

Temperature	Season	Forecast Probability (%)		
		Below	Normal	Above
Minimum Temperature	AMJ	14	17	69
	JAS	15	22	63
Maximum Temperature	AMJ	7	13	80
	JAS	9	12	79
Mean Temperature	AMJ	3	12	85
	JAS	13	21	66

DROUGHT OUTLOOK

Given that low rainfall accumulations were observed across the island in January through to March the **Agricultural Drought Watch will remain in effect for April**, despite the prediction of near to above normal accumulations, model guidance currently heavier precipitation towards the end of the month. Rainfall accumulations are still expected to rise during May and into the wet season and the drought alert level will likely be adjusted downwards in the longer term. The Barbados Water Authority has reported that water levels are decreasing but remain at the levels typical for the dry season. Therefore, a Hydrological Drought Watch remains in place for April and a Drought Warning will possibly be issued for May and June. Members of the public are urged to conserve water, regardless of the drought alert level. Below is a table of the drought alert levels based on the rainfall accumulation predictions model predictions (Figure 4) and the outlook of the dominant climatic factors.

6 Month Agricultural Drought Outlook

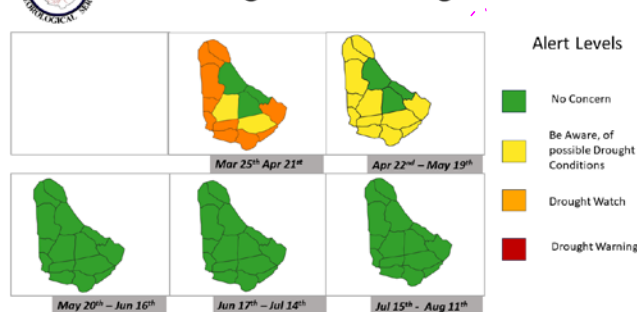


Figure 6: Drought Outlook (based on rainfall projections)

Table 3: Drought Outlooks for April to August 2024

MONTH	AGRICULTURAL	HYDROLOGICAL
APRIL	Drought Watch	Drought Watch
MAY	Be Aware	Drought Warning
JUNE	No Concern	Drought Warning
JULY	No Concern	Drought Watch
AUGUST	No Concern	Drought Watch



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Agricultural Drought Watch

Responses to the predicted Drought Alert Level.

Key Messages:

- *Keep Updated*
- *Protect Resources*
- *Update and ratify Management Plans*
- *Implement Irrigation Plans*
- *Monitor and Repair Infrastructure*

- ✓ *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 Watch

Responses to the predicted Drought Alert Level.

Key Messages:

- *Keep Updated.*
- *Protect Resources and conserve water*
- *Implement Management Plans*
- *Response training*
- *Monitor and Repair 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 Season April to September 2024

What do these forecasts mean for Barbados?

- Inadequate soil moisture at times for certain crops, in the short term.
- Employ rainwater harvesting techniques for rain feed crops.
- Use irrigation systems to ensure the best crop yield, in the short term.
- Continued depletion of reservoir/aquifer levels as the dry season progresses.
- Protect resources and conserve water.
- Increased likelihood of flooding during intense rainfall events from as early as April.
- Warmer temperatures and a transition into the heat season.
- Increasing instances of heat ailments as the heat season evolves.
- Keep updated.

CLIMATE OUTLOOK

The dry season is characterised by cooler, more comfortable temperatures and a decrease in rainfall. The wet season is characterised by warmer temperatures and an increase in rainfall. On a climatological scale, the El Niño Southern Oscillation (ENSO) and above normal sea surface temperatures (SSTs) across the tropical Atlantic Ocean will continue to influence temperature and rainfall across the island.

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

Equatorial sea surface temperatures (SSTs) are still above normal across the central and eastern Pacific Ocean with El Niño conditions currently being observed.

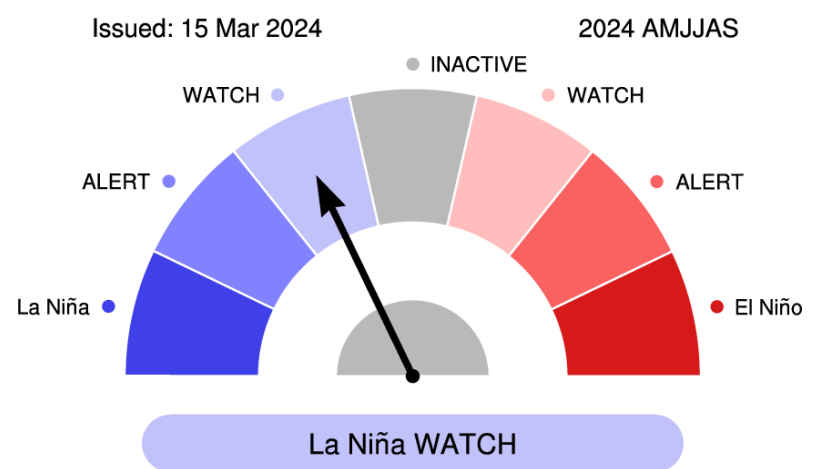
What's the Outlook?

A transition to ENSO-neutral is still anticipated by April – June. Most models are still indicating a transition to La Niña around July-September 2024.

Impact to the Late Dry Season/ Early Wet Season

A transition out of El Niño conditions usually favors a wetter late dry season and an early start to the wet season. La Niña usually favours an increase in rainfall across Barbados.

ENSO Alert System



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(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) into the wet season, at least for the Atlantic Ocean. Across the central Pacific, SSTs remain above normal, consistent with an El Niño atmosphere. Those anomalies are forecast to gradually decrease by April – May– June which is in line with a potential transition to ENSO neutral conditions. The anomalies are still expected to decrease, SSTs are expected to become below normal with a La Niña atmosphere. Across much of the tropical Atlantic, SSTs are forecast to remain above normal by 0.6°C - 1°C through July – August –September.

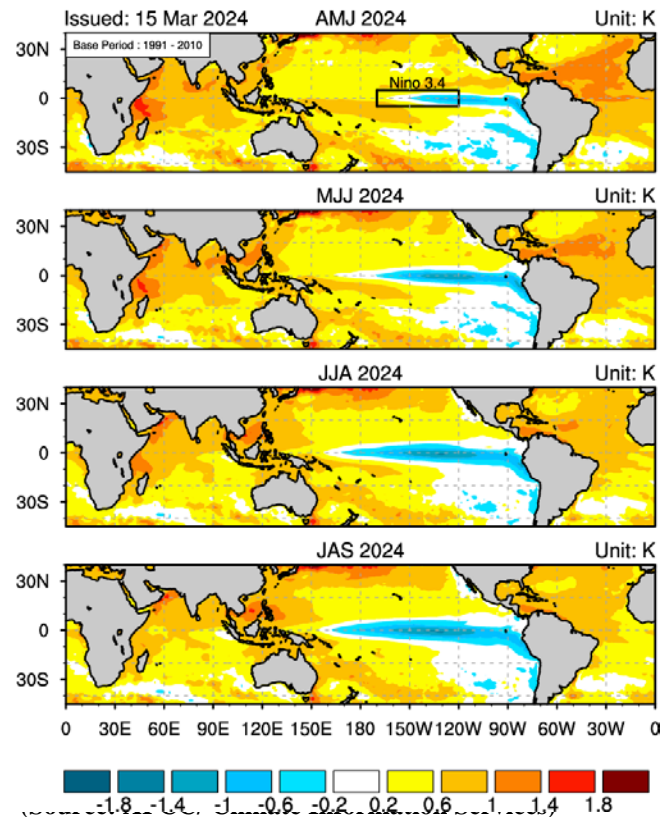
Impact on Rainfall

Warmer than normal SSTs may favour increased rainfall across the island and an early start to the wet season.

Impact on Temperatures

Warmer than normal SSTs will likely cause warmer than normal temperatures and an early start to the heat season. Temperatures will become uncomfortable during the day and night and the risk of heat-related illness will increase as the heat season evolves.

SST Anomaly for AMJ-JAS 2024



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