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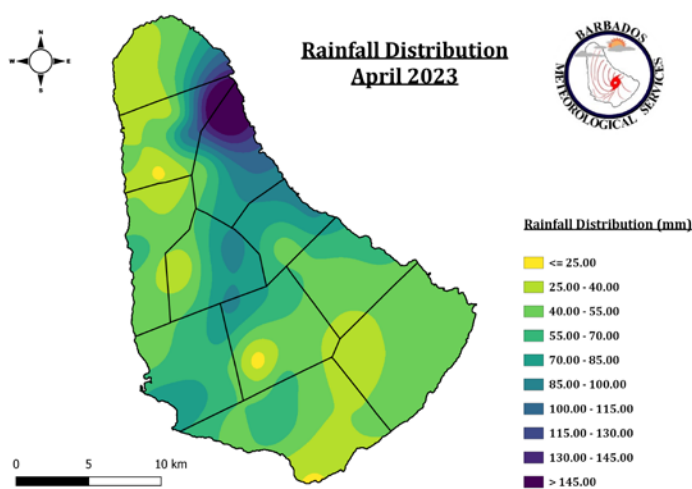
BMS MONTHLY CLIMATE OUTLOOK NEWSLETTER

April, 2023 | Issue No.39

Key Messages: Average to slightly above rainfall is expected until the end of August, with below-average rainfall possible thereafter. **Hydrological and Agricultural Drought Warnings remain in effect.** The **Heat Season** is evolving, particularly on western coast and warmer temperatures are expected during the next six months. ENSO-neutral conditions are projected to transition to a weak El Niño by May – July 2023.

APRIL IN REVIEW

Precipitation



There were combinations of surface to low level and deep layered Ridges for most of the month of April, resulting in warm, dry days, as well as a few slightly rainy days. A surface to low level trough affected the island from the 23rd to the 25th, with surface to low level instability from the 26th to the 28th. This period accumulated 36mm of rainfall over the 5 days. As a result of the heavy rainfall, the BMS issued a Flash Flood Warning on the 23rd and Flash Flood Watch for the Northern districts on the 24th. Rainfall accumulations across the island ranged from 21.3mm at Constant, St. George to 179.8mm at Mount, St. Andrew. Due to a mixture of low-level instability, weak to low level troughs and a weak shear line, there were 14 rain days at Charnocks resulting in 41.6mm of rainfall being recorded, with majority of the rainfall recorded during the overnight periods (6pm to 6am).

There was slight dust haze for 11 days. Winds were generally easterly at 16 to 19kt, however, winds were east southeasterly with speeds at 5kt and less from the 26th to the 28th. Sea conditions remained moderate in open water with swells ranging 1.5-2.5m (5-8ft) for most of the month, decreasing to smooth to moderate during the latter days.

Figure 1: April Rainfall Distribution

Temperature

Figure 2: April Maximum Temperature Distribution

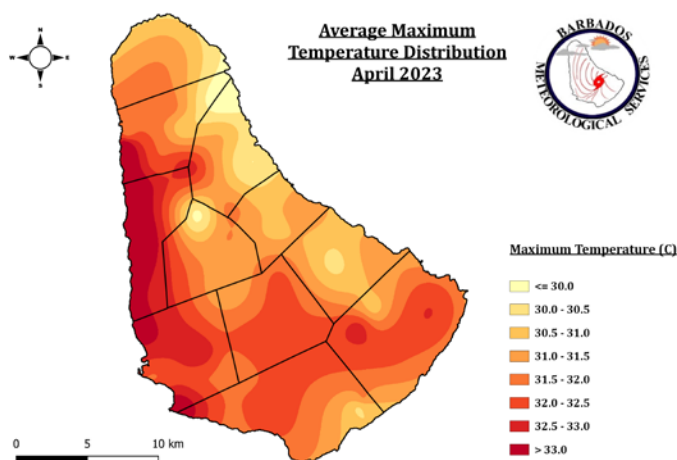
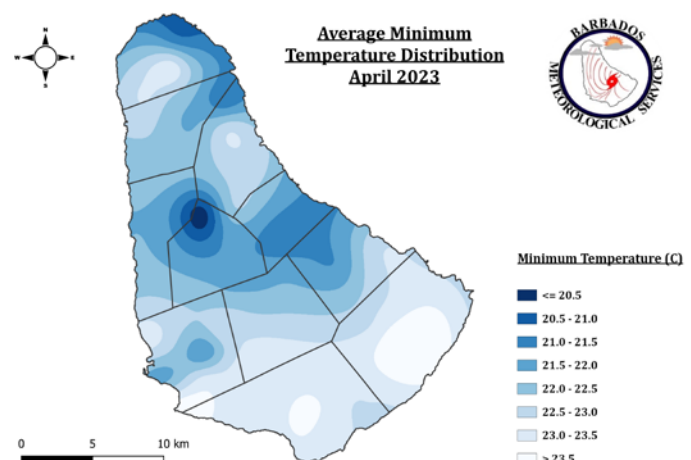


Figure 3: April Minimum Temperature Distribution



BMS 3DPAWS stations recorded maximum temperatures between 30.9°C and 33.8°C across the island, with the highest temperature being recorded at Holetown, St. James on the 29th. Minimum temperatures ranged between 22.1°C and 23.9°C with the coolest temperature recorded at Pleasant Hall and Speighstown St. Peter on the 16th and 24th respectively. At the BMS station in Charnocks, the maximum temperature recorded was 30.5°C on the 21st, which is 0.2°C less than climatological average, with a minimum of 22.8°C on the 8th which is 1.4°C less than the climatological average for this station. The average maximum temperature was 29.1°C and the average minimum temperature was 23.9°C which were 1.1°C and 0.3°C cooler than the climatological values respectively.



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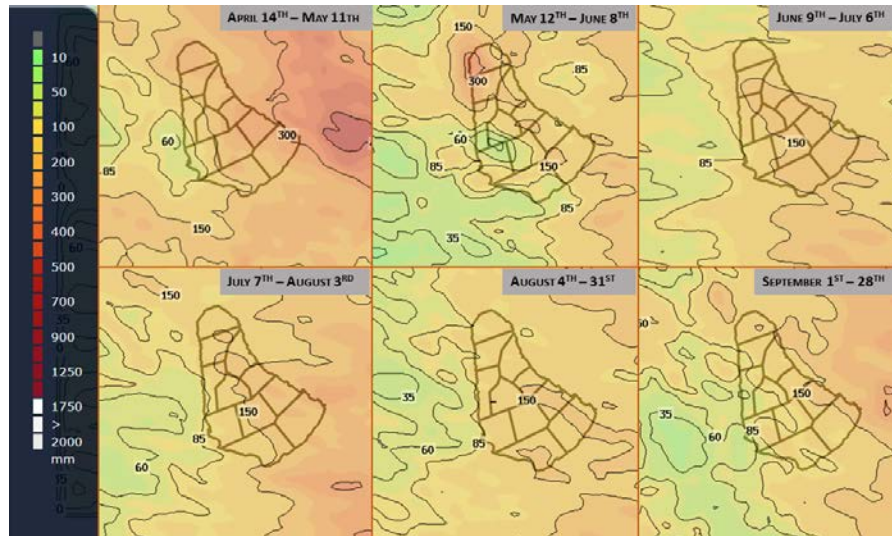


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PRECIPITATION OUTLOOK

Figure 4: BMS Experimental rainfall forecast from May to September 2023



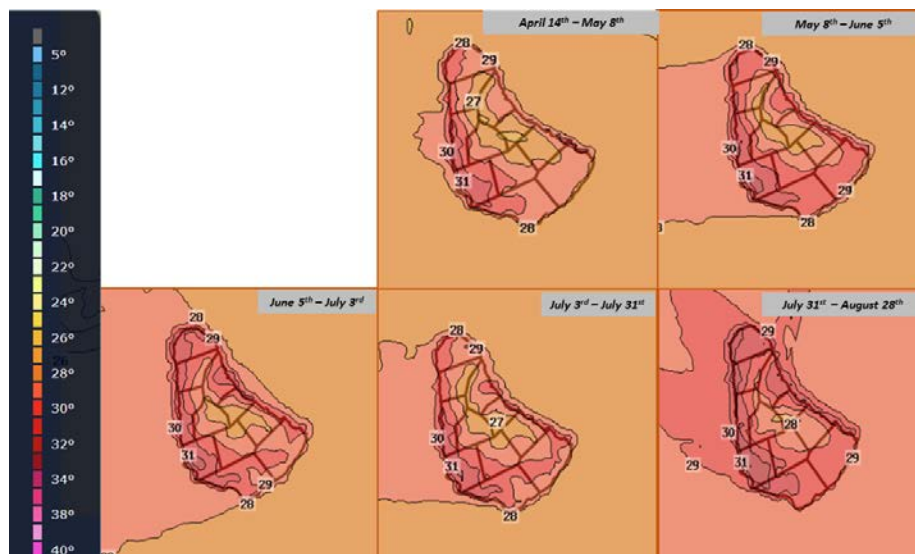
The BMS experimental high-resolution WRF Climate model prediction indicates that slightly above-average to average rainfall accumulations is expected across the island for the rest of May through August. Current model guidance suggests September rainfall will be trending in a downward direction with reduced rainfall accumulations. The table below shows the projected rainfall accumulations and the deviation from the climatological average at Charnocks.

Table 1: Rainfall Projections for May to September 2023

Month	Projections (mm)	% Deviation from 30-yr Average at Charnocks
May	60-150	13% Above
June	85-150	33% Above
July	85-150	19% Above
August	85-150	~Average
September	60-150	47% Below

TEMPERATURE OUTLOOK

Figure 5: BMS WRF Forecast maximum temperatures from May to September 2023



The probabilistic temperature forecast (Table 2) for Charnocks, Christ Church indicates a higher probability for below-normal minimum, maximum and mean temperatures from May to July. However, the forecast indicates high probabilities for above-normal minimum, maximum and mean temperatures through the end of October. Predictions from BMS experimental WRF (Figure 5) for May to August, project peak temperatures around 28°C for rural districts, while urban, southwestern and coastal districts should peak between 31°C and 32°C. By September, peak temperatures will range between 29°C and 32°C with isolated areas, particularly across western, southwestern and urban districts peaking between 32°C and 35°C.

Table 2: Short and Long-term Temperature Outlook for May to October 2023

Temperature ° C	Season	Forecast Probability%		
		Below	Normal	Above
Minimum Temperature	MJJ	43	24	32
	ASO	29	29	42
Maximum Temperature	MJJ	40	30	30
	ASO	37	23	40
Mean Temperature	MJJ	45	26	29
	ASO	26	28	46

DROUGHT OUTLOOK

Current rainfall projections suggest slightly above average rainfall as we transition into the wet season, despite this positive outlook, below normal rainfall accumulations have been recorded at our Charnocks station and across southern parishes thus far for the year. This possible increase rainfall is not expected to be enough to alleviate existing drought conditions and therefore the **Hydrological and Agricultural drought warnings will remain in effect**. Below is a table of the alert levels based on the rainfall accumulation predictions from BMS experimental high-resolution WRF climate model (Figure 4).

Table 3: Drought Outlooks May to September 2023

MONTH	AGRICULTURAL	HYDROLOGICAL
MAY 2023	Drought Warning	Drought Warning
JUNE 2023	Drought Watch	Drought Warning
JULY 2023	Drought Watch	Drought Warning
AUGUST 2023	Drought Watch	Drought Warning
SEPTEMBER 2023	Drought Watch	Drought Warning



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Agricultural Drought Warning

Responses to the predicted Drought Alert Level.

Key Messages:

- Protect Resources
- Utilize irrigation systems
- Report Impacts

- ✓ Continue to monitor for updates from the Barbados Water Authority and Ministry of Agriculture and Food Security.
- ✓ Continue to monitor the BMS Climate Outlook for monthly updates.

Hydrological Drought Warning

Responses to the predicted Drought Alert Level.

Key Messages:

- 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 May to September 2023

What do these forecasts mean for Barbados?

- Employ rainwater harvesting techniques for rain feed crops, particularly across the south of the island.
- There is inadequate soil moisture for certain crops
- It is recommended to have an irrigation plan and systems in place to ensure the best crop yield.
- A reduction in the reservoir/aquifer levels.
- Conserve water.
- Increase demand for cooling on warmer days.
- Heat stress in animals during hot periods.

ENSO (El Nino Southern Oscillation) TRENDS

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 Nina and the warm phase, El Nino. La Nina conditions usually results in higher rainfall for Barbados. El Nino 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

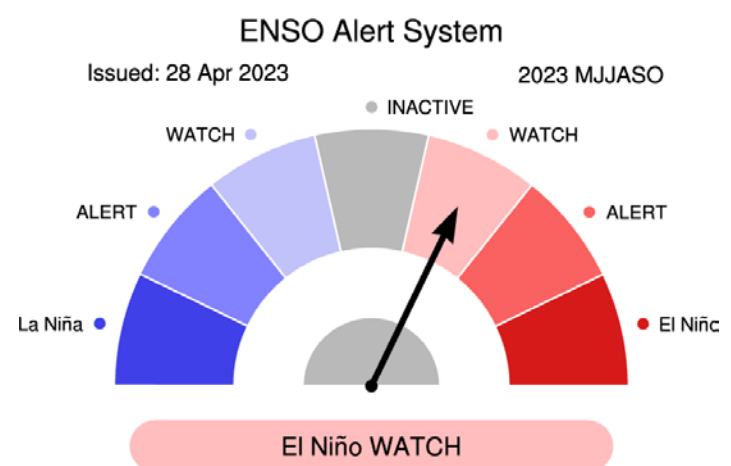
Over the last month, above-average sea surface temperatures (SSTs) became more prominent in the western and far eastern equatorial Pacific Ocean as a result equatorial sea surface temperatures (SSTs) are near to above normal across most of the Pacific Ocean.

What's the Outlook?

ENSO neutral is expected to persist through northern Hemisphere spring after which there is a 62% chance of a transition to El Niño by May to July 2023. Probabilistic forecasts indicate a weak El Niño by that time.

Impact to the Dry Season

ENSO neutral conditions favor a decrease in rainfall across Barbados.



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(Source: APCC/ Climate Information Services)

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