

Stream flow Bulletin – October 2024

Introduction

This stream flow bulletin examines the flows within 12 major rivers in Jamaica’s 10 Hydrologic Basins. It assesses the rivers responses to rainfall conditions , and the impact of dry and wet seasons on flow dynamics. The Bulletin uses the monthly Rainfall Summary from the Meteorological Services of Jamaica and the Caribbean Climate Outlook Forum (CariCOF) Drought Outlook and the Caribbean Climate Outlook Newsletter for predicted climatic information.

Climatic Outlook

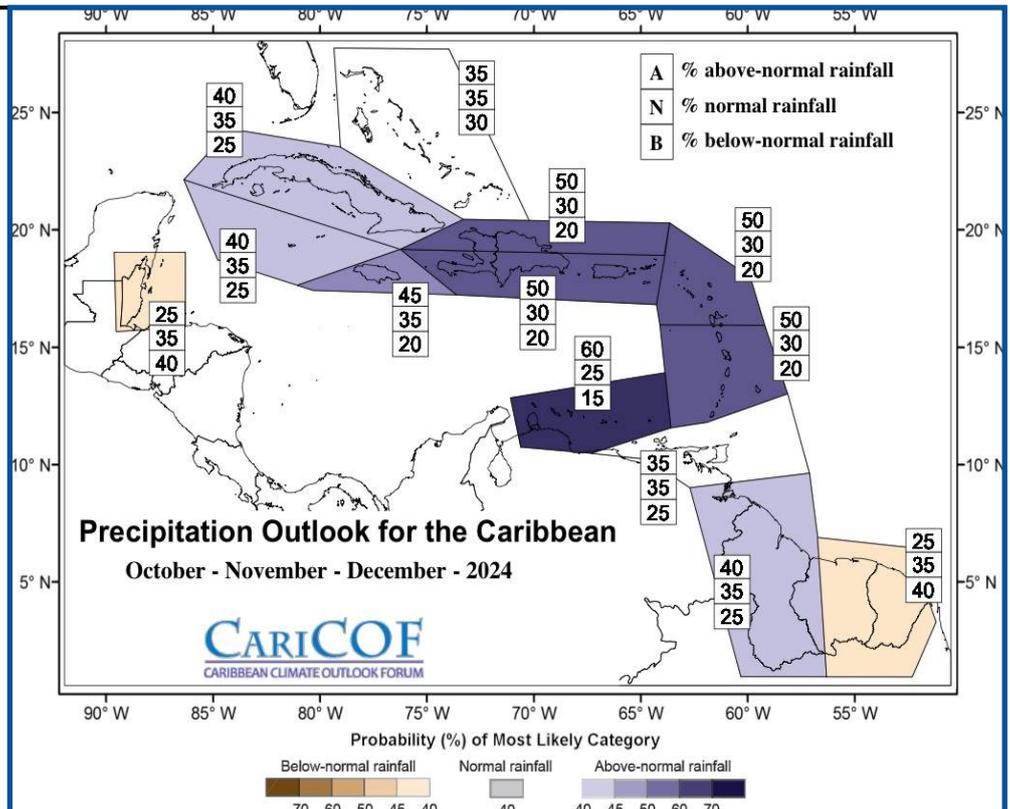
The Meteorological Service of Jamaica (MSJ) has reported that 10 parishes recorded rainfall amounts below their respective 30-year means with values ranging from 48% to 91% for October. It further reported that 8 parishes experienced wetness ranging from near-normal to extremely wet and 5 experienced mild dryness. There was no report of meteorological drought conditions for any of the parishes. The precipitation **forecasts** by the MSJ and for November 2024 is for 20-70% lower than-normal probabilities for sections of St. Catherine and Clarendon, while there is also the probability of 40-60% above-normal precipitation for Manchester, St. Ann and Trelawny.

Precipitation Outlook

October—December 2024

The diagram shows the October to December 2024 precipitation outlook for the Caribbean . The forecast is for Jamaica to receive below –normal rainfall amounts for the period.

Source: *Caribbean Climate Outlook Forum*



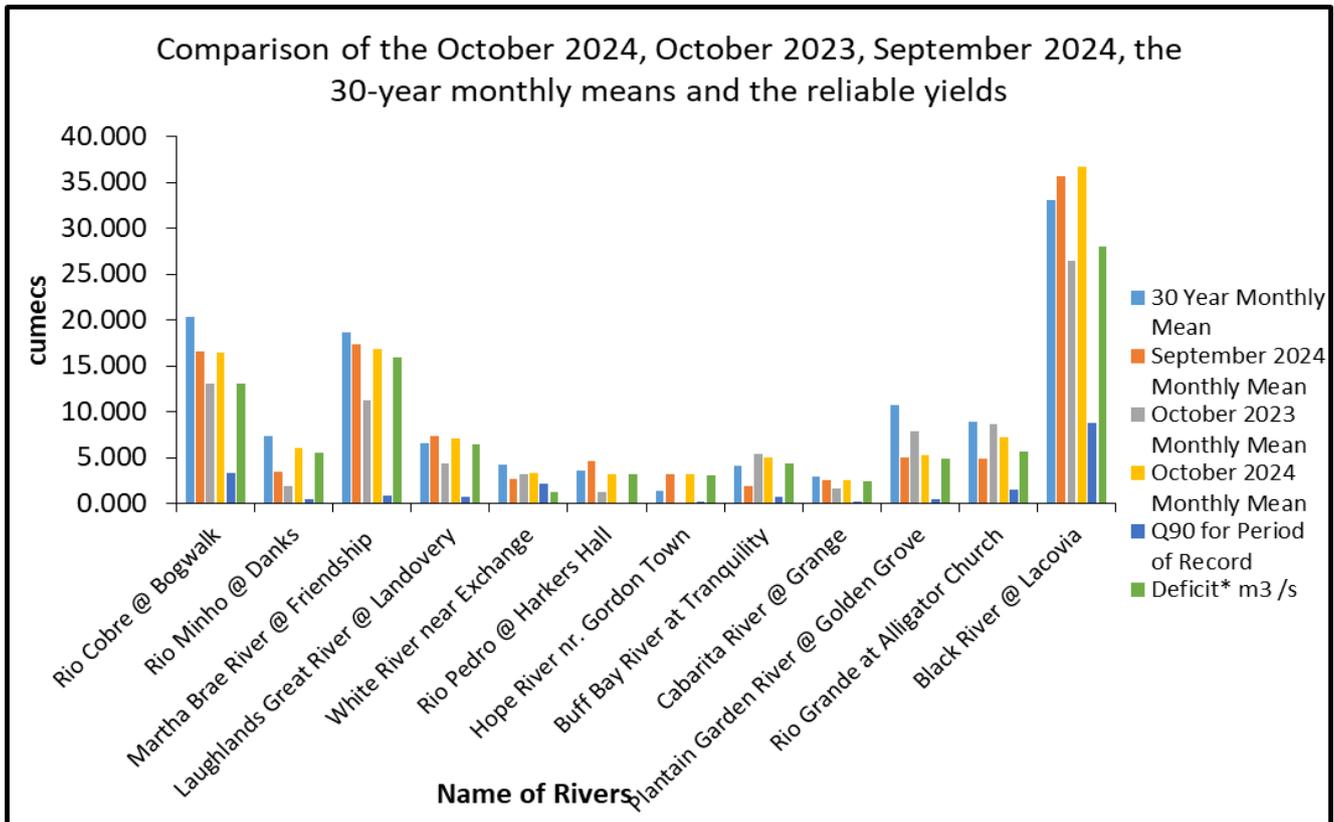
Further Analysis

Flow averages recorded for October 2024 were greater in 8 rivers when compared with October 2023 ranging from 106% (White River at Exchange) to 319% (Rio Minho at Danks). When compared with September 2024 averages, 7 rivers recorded greater flows in October ranging from 0.062m³/s or 1,415,117 gal/dy (Hope River near Gordon Town) to 3.095m³/s or 7.064172 x 10⁷ gal/dy (Buff Bay River at Tranquility) more flow. Eight rivers recorded lower average flows in October ranging from 70% (Rio Pedro near Harkers Hall) to 97% (Martha Brae at Friendship) when compared to the respective 30—year monthly means. There was no instance of flow deficit in October.

The table below show flows by volume in cubic metres per second.

Comparison of monthly mean of October 2024 to the 30 year monthly mean and the Q90							
Name of River	Parish	30 Year Monthly Mean	September 2024 Monthly Mean	October 2023 Monthly Mean	October 2024 Monthly Mean	Q90 for Period of Record	Deficit* m ³ /s
Rio Cobre @ Bogwalk	St. Catherine	20.340	16.508	13.05	16.477	3.371	13.106
Rio Minho @ Danks	Clarendon	7.300	3.50	1.91	6.09	0.518	5.571
Martha Brae River @ Friendship	Trelawny	18.680	17.374	11.291	16.783	0.835	15.948
Laughlands Great River @ Landoverly	St. Ann	6.553	7.359	4.306	7.147	0.732	6.415
White River near Exchange	St. Ann	4.170	2.621	3.175	3.357	2.089	1.268
Rio Pedro @ Harkers Hall	St. Catherine	3.605	4.59	1.25	3.219	0.093	3.126
Hope River nr. Gordon Town	Kingston	1.410	3.183		3.245	0.171	3.074
Buff Bay River at Tranquility	Portland	4.060	1.93	5.379	5.025	0.703	4.322
Cabarita River @ Grange	Westmoreland	2.900	2.561	1.6	2.561	0.21	2.351
Plantain Garden River @ Golden Grove	St. Thomas	10.700	5.004	7.913	5.321	0.477	4.844
Rio Grande at Alligator Church	Portland	8.920	4.92	8.638	7.181	1.547	5.634
Black River @ Lacovia	St. Elizabeth	33.043	35.61	26.49	36.687	8.76	27.927

* Deficits are denoted by a negative value (Deficit = Monthly Mean - Q90)



Graphical representation of the comparisons shown in the table.

Discussion

Analysis of the hydrologic data for October 2024 showed greater flow volumes in 66.7% of rivers which were analysed, when compared with the same period of 2023. Additionally, seven rivers recorded greater flows than the September 2024 averages. Regarding the 30—year monthly mean flows, 8 of the 12 rivers recorded less flow averages than their respective 30—year normal. There was no record of flow deficit for October 2024.

The flow trends largely correspond with the forecasts from the Caribbean Climate Outlook of normal rainfall conditions across Jamaica for October 2024.

According to CariCOF Drought Outlook and the Caribbean Climate Outlook, Jamaica may experience higher than usual rainfall probabilities of 40 to 70% for October to December along with above normal temperatures. Based on these forecasts, it is expected that rivers in the 10 Hydrologic Basins will continue to experience normal to above-normal flow conditions in November, and greater than the respective reliable yields in most, if not, in all instances (especially in rivers that are aquifer fed). It is expected that average flows for November 2024 will be greater than the respective 30—years monthly means in approximately 50% to 60% of the rivers and greater than those of October 2024 averages with the prediction of higher than normal rainfall for most parishes.

Definition of Terms

Hydrological Drought—This is a hydrological extreme that manifests in abnormally low stream flows, levels in ponds and lakes, reservoirs and groundwater. Hydrological droughts occurs after many months of meteorological drought, that is, extended period of below normal rainfall.

Q90—Q90 or reliable yield, is a statistical low flow index that represents flows that either exceeds or occur 90% of the time. It assists in determining the resource availability during periods of drought.

Percentile—A percentile is a value on a scale of 100 that indicates the percent sample distribution (in this case a particular flow) that is equal to or below it. For example, stream flows in this calendar month at the 90th percentile are equal to or greater than 90 percent of the stream flows which have been recorded in the calendar month for the extent of the station.

Percentiles above 90 are considered Much-Above Normal,

Percentiles between 75 and 90 are considered Above Normal,

Percentiles between 25 and 75 are considered Normal,

Percentiles between 10 and 25 are considered Below Normal, and

Percentiles below 10 are considered Much-Below Normal.

Stream gauging station— Gauging stations are facilities use to automatically monitor streams, or other water bodies.

To convert from m³/s to gal/day: - $m^3/s \times 86400 \text{ s/day} \times 264.1721 \text{ gals}$ (where m³ = cubic meters, s = seconds and gal = U.S. gallons).

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