



Stream flow Bulletin – August 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 all 9 parishes recorded rainfall amounts below their respective 30-year means with values ranging from 52% to 96% for August. It further reported that all parishes experienced wetness ranging from near-normal to exceptionally, therefore, there was no report of meteorological drought conditions. The precipitation **forecasts** by the MSJ and CariCOF for September **2024** is for 15-60% - above-normal probabilities. There is also the probability of up to 70% above normal precipitation in some parishes.

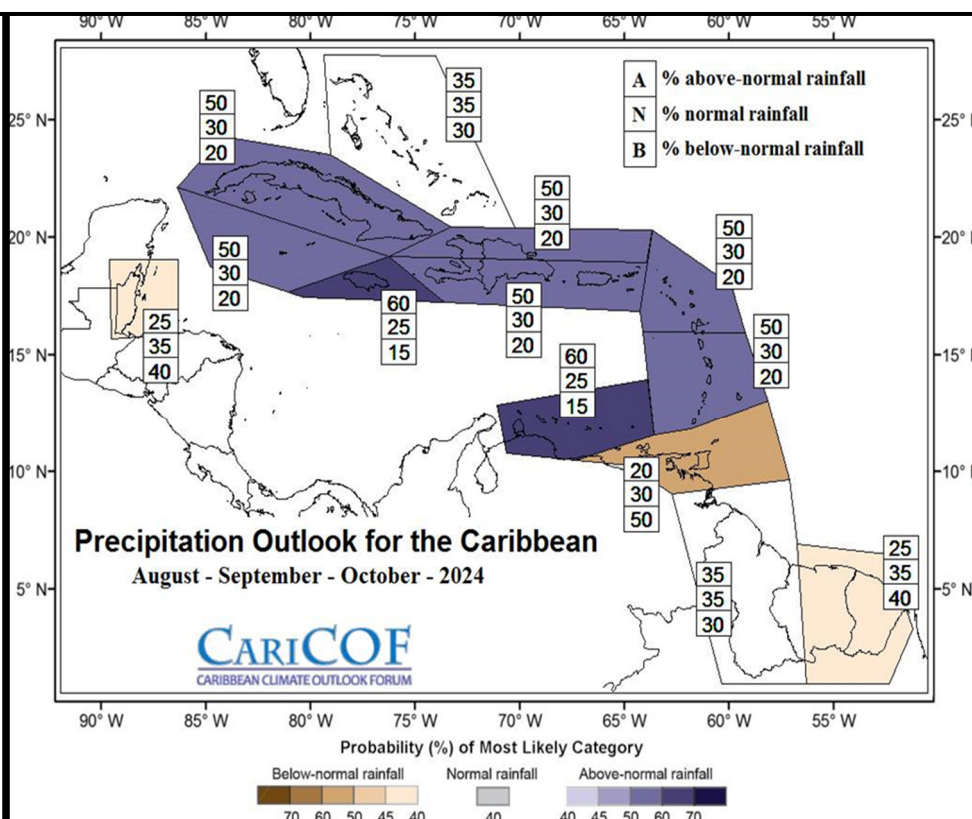
Precipitation

Outlook

August 2024— October 2024

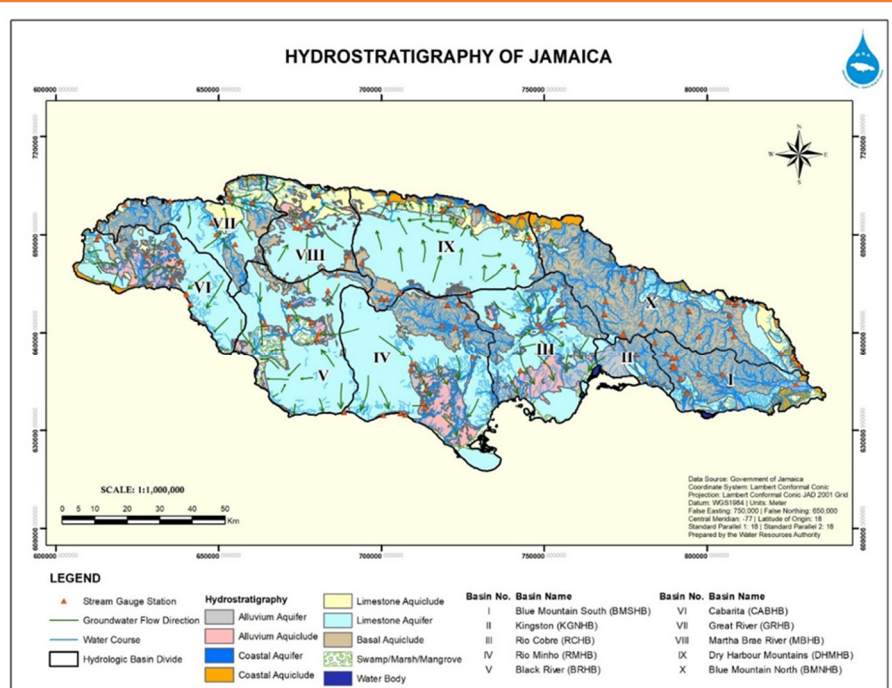
The diagram shows the July 2024 to September 2024 precipitation outlook for the Caribbean. The forecast is for Jamaica to receive below – normal rainfall amounts for the period.

Source: Caribbean Climate Outlook Forum



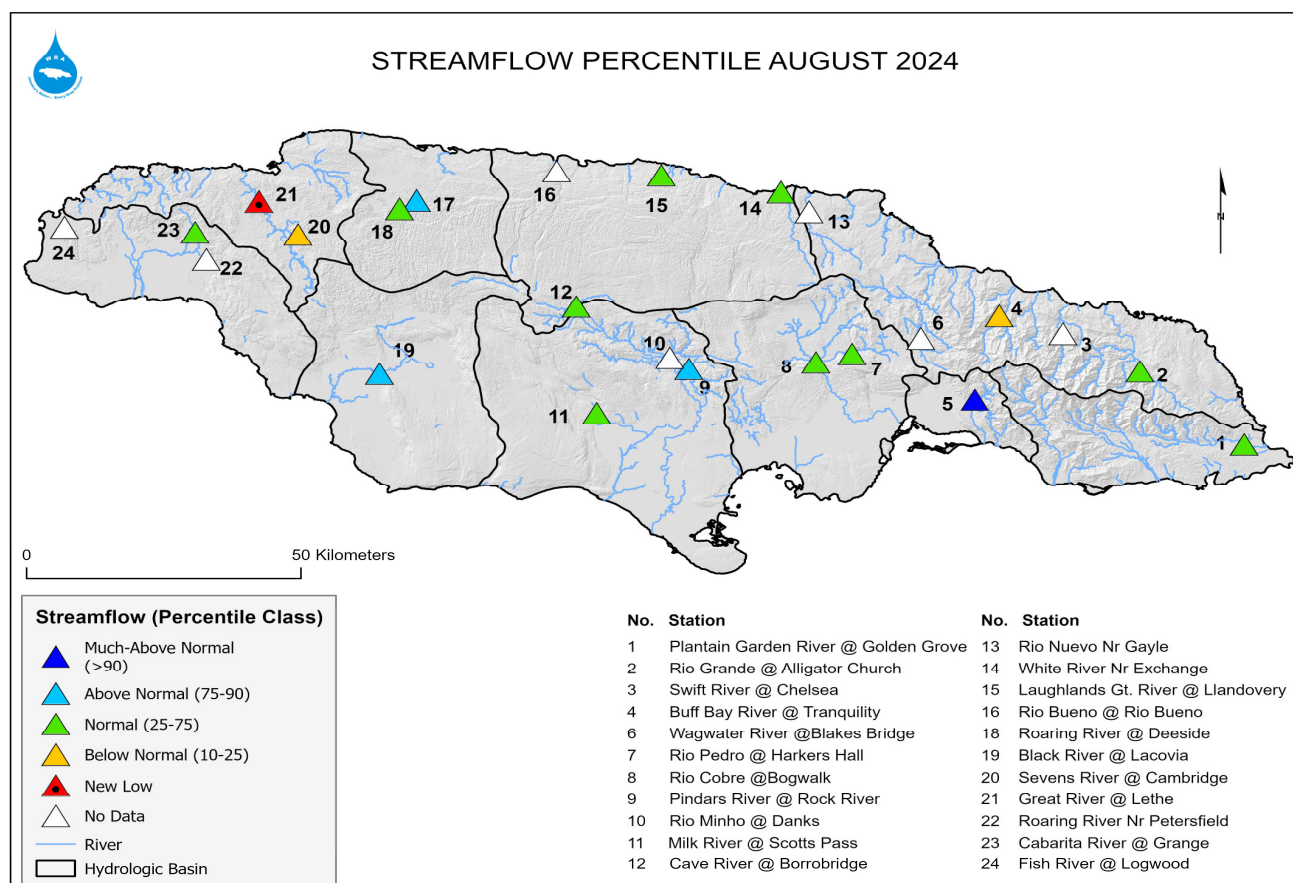
Jamaica Hydrologic Basins and Hydrostratigraphy

The map shows Jamaica Hydrologic Basins and Hydrogeologic Units (Hydrostratigraphy). Basins X, II, I and the Central Inliers which straddle both Basins IX and IV consist of Volcanoclastic rocks which comprise the Basal Aquicludes, while Basins IX, IV, III, VIII, VII and VI are predominantly limestone aquifers.



Situation analysis

The hydrological conditions remained relative stable in August in the majority of the Hydrologic Basins. The Great River at Lethe, St. James, recorded a new low for the month of August while the Sevens River at Cambridge (a tributary of the Great River) recorded much-below normal average. The Buff Bay River at Tranquility in the Blue Mountain North Hydrologic Basins, recorded flow averages below the normal percentile. Rivers in the other Hydrologic Basins recorded averages in the normal to much-above normal percentiles. This is in keeping with the above-normal rainfall amounts for most parishes as reported by the MSJ. (Please see the diagram below)



Further Analysis

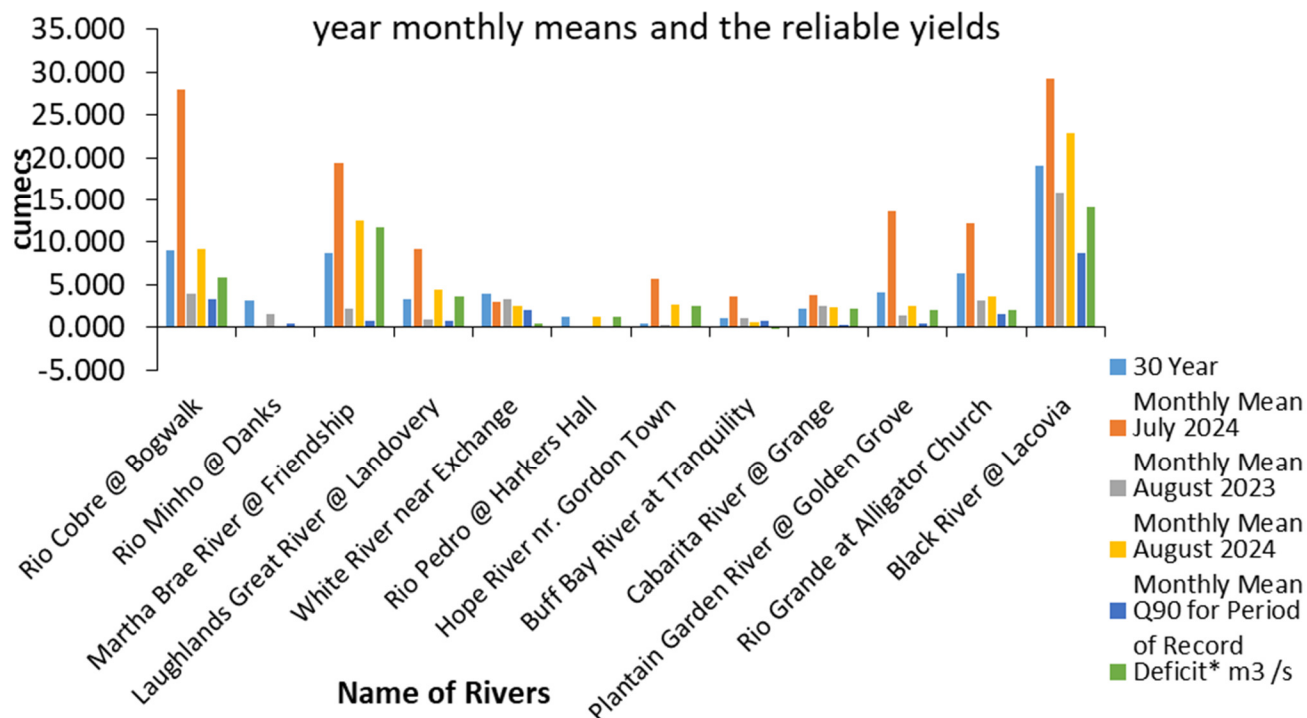
Flow averages recorded for August 2024 were greater in 8 rivers when compared with August 2023 ranging from 116% (Rio Grande at Alligator Church) to 871% (Hope River near Gordon Town). The White River near Exchange, St. Ann, the Buff Bay River at Tranquility, Portland and the Cabarita River at Grange, recorded less flows, while there was absent data for the Rio Minho at Danks. When compared with July 2024 averages, 10 rivers recorded less flows in August ranging from 0.398m³/s (White River at Exchange, St. Ann) to 18.77m³/s (Rio Cobre at Bog Walk), that is 9,084,137 to 428,415,200 gallons/day less flow respectively. Seven rivers recorded greater average flows in August ranging from 102% (Rio Cobre at Bogwalk) to 522% (Hope River near Gordon Town) when compared to the respective 30—year monthly means. The Buff Bay River at Tranquility recorded flow deficit in August. (The negative value for the Rio Minho at Dank is as a result of absent data)

Comparison of monthly mean of August 2024 to the 30 year monthly mean and the Q90

Name of River	Parish	30 Year Monthly Mean	July 2024 Monthly Mean	August 2023 Monthly Mean	August 2024 Monthly Mean	Q90 for Period of Record	Deficit* m ³ /s
Rio Cobre @ Bogwalk	St. Catherine	9.010	27.94	3.99	9.17	3.371	5.799
Rio Minho @ Danks	Clarendon	3.110	No data	1.63		0.518	-0.518
Martha Brae River @ Friendship	Trelawny	8.770	19.358	2.149	12.503	0.835	11.668
Laughlands Great River @ Landoverly	St. Ann	3.346	9.199	0.975	4.381	0.732	3.649
White River near Exchange	St. Ann	3.888	2.955	3.279	2.551	2.089	0.462
Rio Pedro @ Harkers Hall	St. Catherine	1.188	No Data	0	1.283	0.093	1.19
Hope River nr. Gordon Town	Kingston	0.520	5.733	0.312	2.716	0.171	2.545
Buff Bay River at Tranquility	Portland	1.026	3.694	1.087	0.599	0.703	-0.104
Cabarita River @ Grange	Westmoreland	2.160	3.821	2.486	2.345	0.21	2.135
Plantain Garden River @ Golden Grove	St. Thomas	4.181	13.589	1.342	2.568	0.477	2.091
Rio Grande at Alligator Church	Portland	6.260	12.258	3.129	3.644	1.547	2.097
Black River @ Lacovia	St. Elizabeth	19.069	29.304	15.847	22.843	8.76	14.083

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

Comparison of the August 2024, August 2023, July 2024, the 30-year monthly means and the reliable yields



Graphical representation of the comparisons shown in the table.

Discussion

Analysis of the hydrologic data for August 2024 showed increase flows volumes in 67% of rivers which were analysed, when compared with the same period of 2023. Additionally, 83% recorded less flows than the July 2024 averages. Regarding the 30—year monthly mean flows, 7 of the 12 rivers recorded greater flow averages than their respective 30—year normal. There was one record of flow deficit for August 2024.

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

According to CariCOF Drought Outlook and the Caribbean Climate Outlook, Jamaica may experience higher than usual rainfall probabilities of 40 to 70% for July to September 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 September, 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 September 2024 will be greater than the respective 30—years monthly means in most cases and greater than those of August 2024 averages as Jamaica continue to advance into the hurricane season and with the prediction of higher than normal rainfall.

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

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