



Stream flow Bulletin – June 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 11 parishes recorded rainfall amounts above their respective 30-year means with values ranging from 105% to 206% for June. It further reported that 9 parishes experienced varying levels of wetness ranging from near-normal to moderately wet while 4 parishes recorded dry conditions which ranged from near-normal to abnormally dry. There was no report of meteorological drought conditions. The precipitation **forecasts** by the MSJ and CariCOF for July 2024 is for 25-40% - below-normal, 40-45% - normal and 40-50% - above-normal probabilities. There is also the probability of up to 70% above normal precipitation in some parishes.

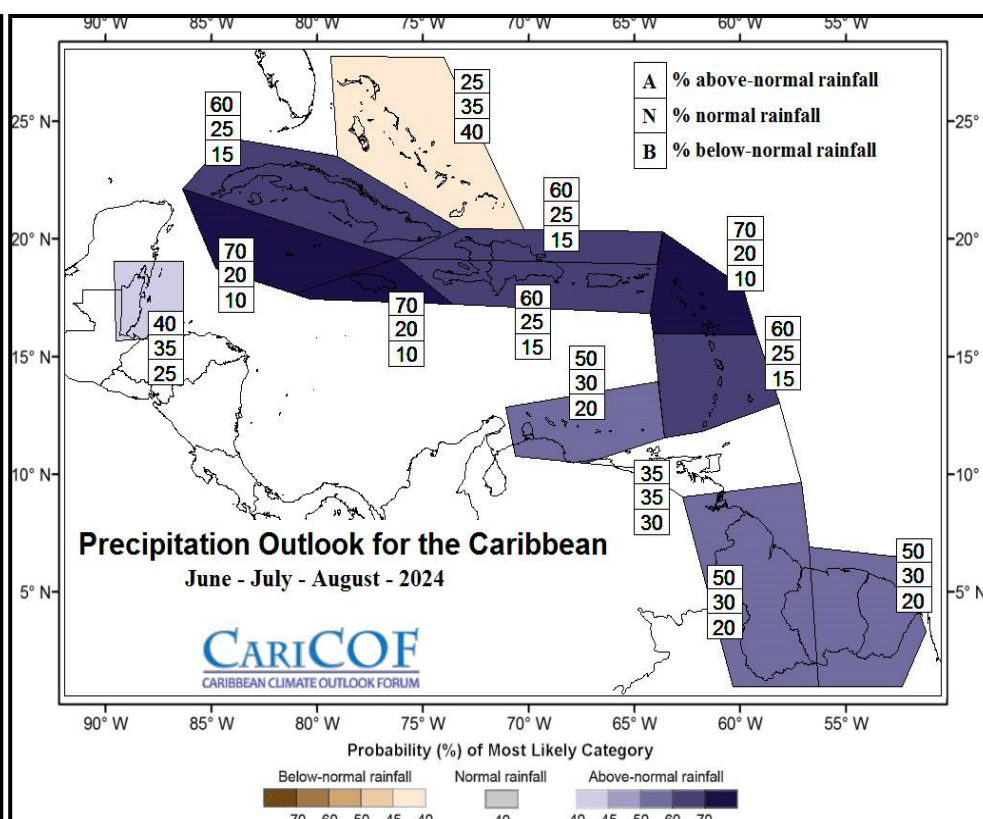
Precipitation

Outlook

June 2024— August 2024

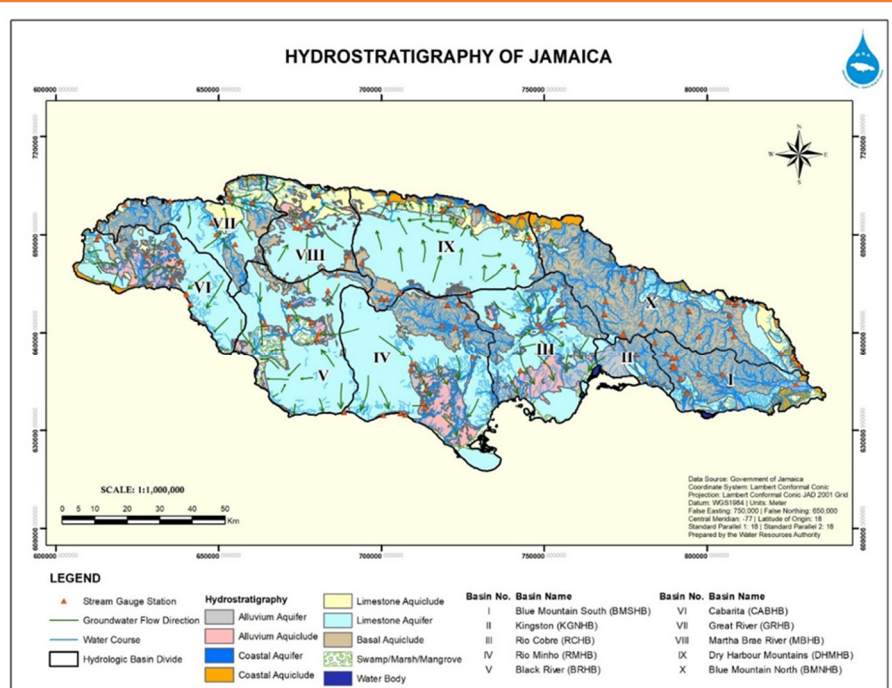
The diagram shows the June 2024 to August 2024 precipitation outlook for the Caribbean. The forecast is for Jamaica to receive below-normal rainfall amounts for the period.

Source: Caribbean Climate Outlook Forum



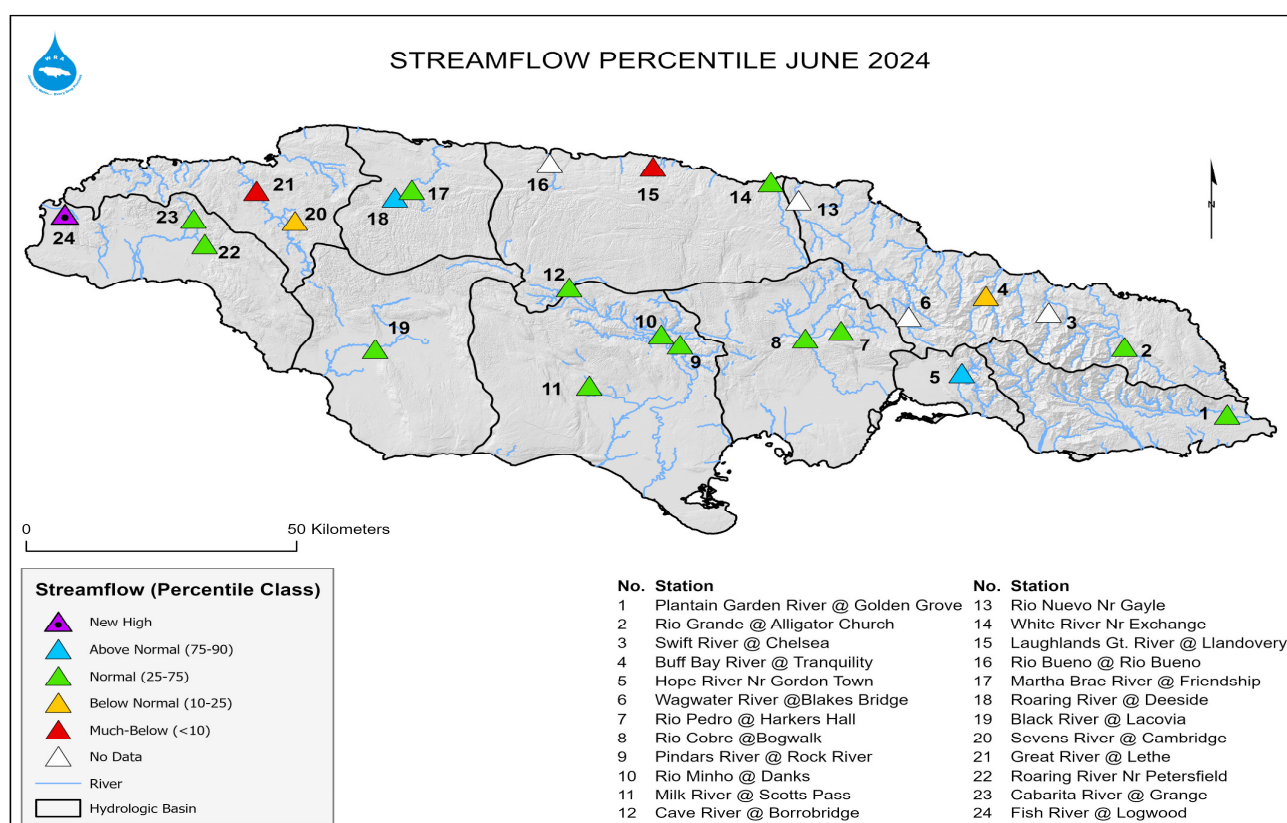
Jamaica Hydrologic Basins and Hydrostratigraphy

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 improved in June in most Hydrologic Basins as the island experienced an increased in rainfall. Flows recorded for the majority of rivers were within the normal range (25 to 75 percentile). Two rivers namely; the Roaring River at Deeside and the Hope River near Gordon Town recorded above-normal average flows (above 90 percentile), while the Fish River at Logwood recorded a new high for June. The Great River at Lethe, St. James and Laughlands Great River, St. Ann, recorded average flows for June of much-below normal (less than 10 percentile). (Please see the diagram below)



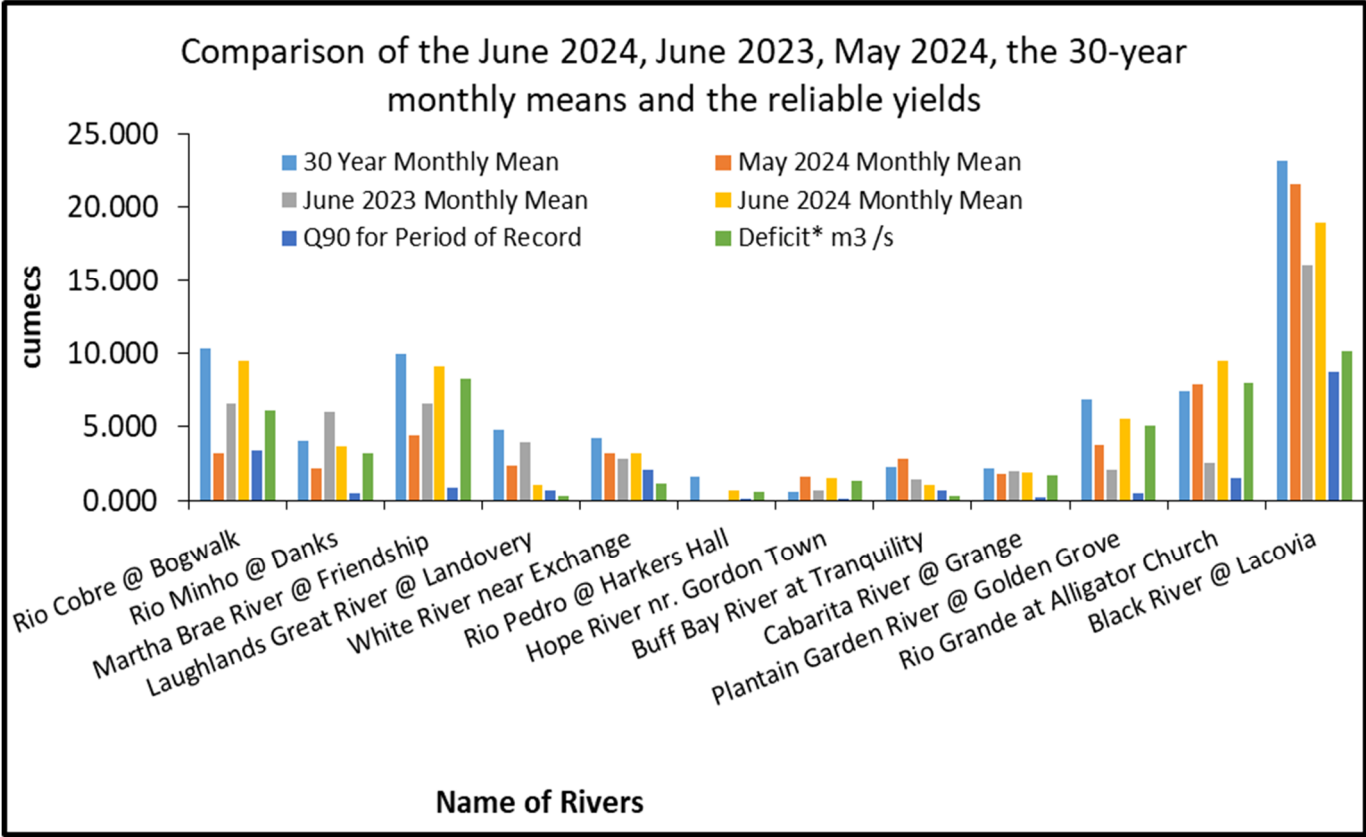
Further Analysis

Flow averages recorded for June 2024 were greater in 9 rivers when compared to June 2023, ranging from 116% to 371%. When compared with May 2024 averages, seven rivers recorded greater flows for June ranging from 0.079m³/s to 6.26m³/s (1,803,133 to 142,881,200 gallons/day) more flow. Ten rivers recorded less average flows in June ranging from 21% to 92% when compared with the respective 30—year monthly means. There was no report of flow deficit for June as all the rivers recorded higher averages than their respective Q90s.

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

Comparison of monthly mean of June 2024 to the 30 year monthly mean and the Q90							
Name of River	Parish	30 Year Monthly Mean	May 2024 Monthly Mean	June 2023 Monthly Mean	June 2024 Monthly Mean	Q90 for Period of Record	Deficit* m3 /s
Rio Cobre @ Bogwalk	St. Catherine	10.317	3.23	6.57	9.49	3.371	6.119
Rio Minho @ Danks	Clarendon	4.090	2.15	6	3.73	0.518	3.212
Martha Brae River @ Friendship	Trelawny	9.991	4.474	6.552	9.14	0.835	8.305
Laughlands Great River @ Landoverly	St. Ann	4.822	2.386	3.92	1.018	0.732	0.286
White River near Exchange	St. Ann	4.214	3.242	2.796	3.233	2.089	1.144
Rio Pedro @ Harkers Hall	St. Catherine	1.596	0	0	0.701	0.093	0.608
Hope River nr. Gordon Town	Kingston	0.591	1.615	0.733	1.516	0.171	1.345
Buff Bay River at Tranquility	Portland	2.283	2.832	1.44	1.05	0.703	0.347
Cabarita River @ Grange	Westmoreland	2.200	1.806	2.004	1.885	0.21	1.675
Plantain Garden River @ Golden Grove	St. Thomas	6.914	3.75	2.091	5.558	0.477	5.081
Rio Grande at Alligator Church	Portland	7.399	7.9	2.57	9.54	1.547	7.993
Black River @ Lacovia	St. Elizabeth	23.209	21.567	16.09	18.939	8.76	10.179

* 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 June 2024 showed decreased flow volumes in 75% of rivers which were analysed, when compared with the same period of 2023. Additionally, greater flows were recorded for June 2024 in 58% of the rivers when compared to May 2024, this is an increase of 26% over the period April to May 2024. Regarding the 30—year monthly mean flows, 10 of the 12 rivers recorded less flow averages than their respective 30—year normal. There were two reports of flow deficit for June 2024.

The flow trends largely corresponds with the forecasts from the Caribbean Climate Outlook of below to above-normal rainfall conditions across Jamaica for June 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 forecast, it is expected that rivers in the 10 Hydrologic Basins will continue to experience normal to above normal flow conditions for July to 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 July 2024 will be greater than the respective 30—years monthly means in most cases and greater than those of June 2024 averages as Jamaica advances into the hurricane season.

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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