



AGROMET BULLETIN



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HIGHLIGHTS

- ✚ Selected stations in seven parishes received below-normal rainfall in September.
- ✚ Four stations recorded SPI values of less than -1.30 which suggest drought conditions.
- ✚ Near-normal rainfall is forecast for Jamaica for October through December.
- ✚ Above-normal temperatures are forecast for the next 3 months.

Weather Summary September 2018

In September, the daily weather was dominated by Troughs. Weather conditions over sections of the island were impacted by the remnants of Tropical Storm Isaac from September 16 to 18, that resulted in some localized flash flooding.

During the month, Sangster International Airport (SIA) in the northwest recorded 30.3 mm of rainfall, while Norman Manley International Airport (NMIA) in the southeast recorded 102.5 mm of rainfall. SIA received about 23% of its 30-year mean monthly rainfall, while NMIA received about 71% of its 30-year mean monthly rainfall. There were five (5) rain days recorded for both SIA and NMIA, while monthly means are sixteen (16) and nine (9) rain days respectively.

The highest maximum temperature recorded for SIA was 35.2°C on September 21. This value makes it the 2nd highest temperature recorded at the station in September since 1992, behind the 36.2 °C set two years ago. Meanwhile, NMIA recorded a highest maximum temperature of 35.1°C on September 20. This year's value, along with that of 2009 are both ranked 4th, in the list of highest maximum temperatures recorded at the station since September 1992. The post-1992 record of 35.8°C was set in 2005.



Standardized Precipitation Index (SPI)

The Standardized Precipitation Index (SPI), developed by T.B. McKee, N.J. Doesken, and J. Kleist in 1993, is a tool used to monitor drought conditions based on precipitation. The SPI can be used to monitor conditions on a variety of time scales namely 1-month, 3-month, 6-month, 9-month and 12-month periods. This temporal flexibility allows the SPI to be useful in both short-term agricultural and long-term hydrological applications by providing early warning of drought and for making assessments on the severity of a drought. *There are also many different methodologies for monitoring drought. Droughts are regional in extent and each region has specific climatic characteristics¹.* For the Caribbean, a drought event occurs any time the SPI is continuously negative and reaches an intensity of -0.80 or less during the dry season or -1.30 or less in the wet season. The Meteorological Service, Jamaica (MSJ) calculates an observed SPI (see Table 1 and Figure 1) and a forecast SPI (see Figure 2) using a 3-month and 6-month time interval, respectively.

Drought is defined as a long period of weather without rain (Heinemann English Dictionary). The more precise definitions for specific areas of concern that are most commonly used are:

- ❑ *Agricultural drought* – a period when soil moisture is inadequate to meet the demands for crops to initiate and sustain plant growth.
- ❑ *Hydrological drought* – period of below average or normal stream-flow and/or depleted reservoir storage
- ❑ *Meteorological drought* – a period of well-below normal precipitation (rainfall) that spans from a few months to a few years.

¹ World Meteorological Organization, 2012: *Standardized Precipitation Index User Guide* (M. Svoboda, M. Hayes and D. Wood). (WMO-No. 1090), Geneva.



Parish	Station	September Rainfall Total (mm)	Percent of 30-year Mean (%)	Observed SPI for Jun-Jul-Aug	Observed SPI for Jul-Aug-Sep
Hanover	Mount Peto	368	99	-0.97	-0.65
Westmoreland	Savanna-La-Mar	162	73	-0.20	0.06
Westmoreland	Frome	232	96	-1.11	-0.91
Manchester	Sutton	62	26	No SPI values due to unavailability of rainfall data for June.	-1.72
St. Elizabeth	Y.S. Estates	283	110	-0.36	-0.42
St. Elizabeth	Potsdam	35	26	-1.56	-0.45
Clarendon	Beckford Kraal	125	62	-2.05	-1.77
St. Catherine	Tulloch	377	161	-0.27	0.40
St. Catherine	Worthy Park	208	110	0.07	0.31
Trelawny	Orange Valley	201	194	-2.69	0.19
St. James	Sangster Airport	30	23	-2.93	-2.69
St. Ann	Cave Valley	227	178	-0.33	0.20
St. Mary	Hampstead	29	31	-1.74	0.15
Portland	Shirley Castle	295	151	-2.39	-0.57
St. Thomas	Serge Island	180	69	-1.20	-0.70
KSA	Lawrence Tavern	128	64	-1.74	-1.46
KSA	Palisadoes	103	71	-2.61	-0.92

Table 1: Observed SPI for Selected Stations across Jamaica during the June-September period.

SPI Value	Category	SPI Value	Category
0.00 to -0.50	Near Normal (Dry)	0.00 to 0.50	Near Normal (Wet)
-0.51 to -0.79	Abnormally Dry	0.51 to 0.79	Abnormally Wet
-0.80 to -1.29	Moderately Dry	0.80 to 1.29	Moderately Wet
-1.30 to -1.59	Severely Dry	1.30 to 1.59	Severely Wet
-1.60 to -1.99	Extremely Dry	1.60 to 1.99	Extremely Wet
-2.00 or less	Exceptionally Dry	2.00 or more	Exceptionally Wet

Table 2: Severity Classes of the SPI



Standardized Precipitation Index Discussion

Based on the SPI figures for the July-September period, eleven of the fifteen reporting stations across the island had rankings ranging from exceptionally dry to near-normal (dry); the other six stations had ranking of near-normal (wet). A comparison of the July-September period with that for the June-August period showed that, fifteen stations recorded improvements in their SPI figures, one station recorded a deterioration in its SPI value and the remaining station did not have a SPI value for the June-August period for a comparison to be made.

The comparison of the SPI figures for Jul-Sep with those for Jun-Aug shows the following:

- Conditions at Sangster were still exceptionally dry.
- Conditions were not as dry at the following stations as indicated by their current rankings: Beckford Kraal with extremely dry; Lawrence Tavern with severely dry; Palisadoes & Frome both with moderately dry conditions and Mount Peto, Shirley Castle and Serge Island all with abnormally dry rankings.
- Near-normal (dry) rankings were experienced by Y.S. Estates and Potsdam. In the case of Y.S. Estates it was the only station to record a marginal decrease in its SPI value.
- Conditions at Hampstead experienced a complete reversal, moving from an extremely dry ranking to a ranking of near-normal (wet), a change of 5 severity classes.
- Near-normal (wet) conditions were also experienced at Savanna-La-Mar, Tulloch, Worthy Park, Orange Valley and Cave Valley.

In September, selected stations in seven parishes namely, Westmoreland, Manchester, Clarendon, KSA, St. Thomas, St. Mary and St. James received below-normal rainfall. The stations in Hanover, St. Catherine, Trelawny, St. Ann and Portland recorded normal or above-normal rainfall. For St. Elizabeth the station in the north (Y.S. Estates) recorded above-normal rainfall while, the station in the south (Potsdam) recorded below-normal rainfall. From analyses (see figure 1) some level of wetness was noticeable over sections of St. Ann, St. Mary, St. Catherine, Clarendon and to a lesser extent St. Elizabeth. Extreme dryness was observed over sections St. James and into Trelawny, along with sections of Manchester and KSA. It suggests that sections of these parishes were experiencing some levels of drought. Varying levels of dryness were observed over Portland, St. Thomas, Westmoreland, and Hanover.



See Figure 1 below for the graphic representation of observed SPI values for the July-August-September period.

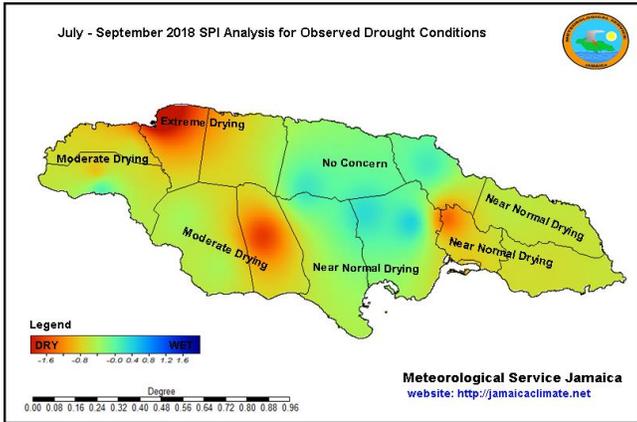


Figure 1: July – September 2018 SPI Analysis for Observed Conditions

The forecast through December, indicates that the island should receive near-normal rainfall, with the possibility of a reduction in areas which experienced dryness, especially those in farming communities across several parishes.

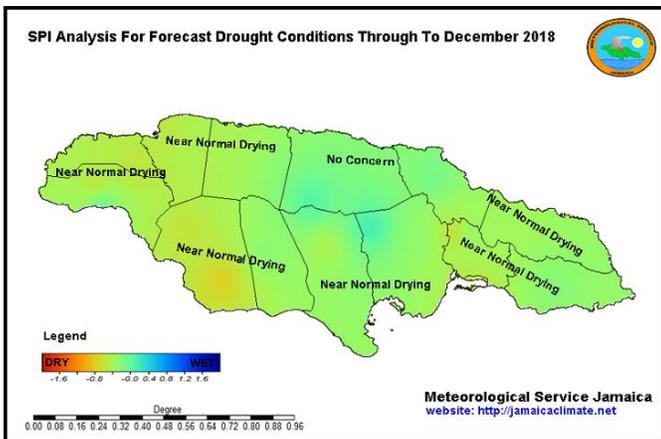


Figure 2: Forecast Drought Conditions through to December 2018



Seasonal Forecast – October to December 2018

The MSJ makes seasonal climate forecasts using the Climate Predictability Tool (CPT). The CPT was developed by the International Research Institute for Climate and Society (IRI) in order to create and communicate seasonal forecasts that address the needs of different user groups.

For the next three months (October/November/December), which mark the transition from the wet season to the start of the dry season, the forecast models are indicating that Jamaica should receive near-normal rainfall. The forecast is for above-normal temperatures over the same period.

	% Below (B)	% Normal (N)	% Above (A)
Jamaica Rainfall Outlook	33	34	33
Jamaica Temperature Outlook	10	30	60
Key A: Above-normal rainfall means greater than 66 percentile of the rank data N: Near-normal rainfall means between 33 and 66 percentile of the rank data B: Below-normal rainfall means below 33 percentile of the rank data			

Table 3: Jamaica Rainfall and Temperature Probability for October to December 2018.

Table 4 below, shows the precipitation outlook for selected stations across Jamaica as analysed by the Climate Predictability Tool. For the October-December 2018 period, two (2) of seventeen (17) stations are indicating higher probabilities for below-normal rainfall; nine (9) stations showing higher probabilities of normal rainfall and the other six (6) stations with higher probabilities of above-normal rainfall. Also, it is noted that the stations with normal or below-normal rainfall projections were largely in southern parishes, while those in northern parishes had predictions of above-normal rainfall, with the exception of St. Thomas,.



Stations	Parishes	Below (B) %	Normal (N) %	Above (A)%
Beckford Kraal	Clarendon	30	40	30
Mount Peto	Hanover	30	20	50
Palisadoes	Kingston	30	40	30
Lawrence Tavern	Kingston	33	34	33
Suttons	Manchester	25	40	35
Shirley Castle	Portland	30	40	30
Cave Valley	St. Ann	35	20	45
Tulloch Estate	St. Catherine	33	34	33
Worthy Park	St. Catherine	33	34	33
Y.S. Estate	St. Elizabeth	33	34	33
Potsdam	St. Elizabeth	40	30	30
Sangster Airport	St. James	25	35	40
Serge Island	St. Thomas	30	20	50
Hampstead	St. Mary	25	35	40
Orange Valley	Trelawny	25	35	40
Savanna-La-Mar	Westmoreland	40	35	25
Frome	Westmoreland	33	34	33

Key
A: Above-normal rainfall means greater than 66 percentile of the rank data
N: Near-normal rainfall means between 33 and 66 percentile of the rank data
B: Below-normal rainfall means below 33 percentile of the rank data

Table 4: Precipitation Outlook for Selected Stations for October to December 2018.



Summary and Expected Agricultural Impacts

Selected stations in Westmoreland, Manchester, Clarendon, KSA, St. Thomas, St. Mary and St. James received below-normal rainfall in September, Varying levels of dryness was evident over several parishes, with extremely dry conditions observed in sections St. James, Trelawny, Manchester and KSA. This suggests that sections of these four parishes were experiencing drought conditions.

Stations in Hanover, St. Catherine, Trelawny, St. Ann and Portland received normal or above-normal rainfall which would have been welcomed by farming communities in sections of those parishes. Some levels of wetness were observed over St. Ann, St. Mary, St. Catherine, Clarendon and St. Elizabeth.

Should the forecast of near-normal rainfall over the October-December period materializes, this could bring more relief from the very dry conditions being experienced, particularly in farming communities depending on rains for crop irrigation across the island. However, for those stations with forecasts for above-normal rainfall and in particular St. James and Trelawny, they could benefit in getting some relief from the very dry conditions that have been experienced.

Despite the forecasts, irrigation for farming communities, as well as, provision of water for other users, should be continued, especially in those parishes still experiencing very dry conditions. This is to lessen the negative impacts on crops and livestock, until more rains arrive.

The forecast for above-normal temperatures may be cause for concern at a time when, some relief from the heat stress being experienced, was being anticipated.

Of note, is the Meteorological Service's inability to determine the true impact of the drought conditions in some farming communities across the island due to the inadequacy of data collection instruments in some areas.

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Conditions could, therefore, be more severe in some farming communities, which could have resulted not only from deficits in rainfall amounts (meteorological drought) but other factors as well.

Close monitoring of conditions and dissemination of advisories will continue as necessary.