AGROMET BULLETIN

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HIGHLIGHTS

- **Selected stations in eight parishes received below-normal rainfall in November.**
- **Drier conditions were noticeable especially on the north side of the island.**
- **Below-normal to near-normal rainfall is forecast for Jamaica for December through February.**
- **Seasonally comfortable temperatures are forecast for the next 3 months.**

Weather Summary November 2018

During November, the weather was dominated mainly by Troughs. A few of these Troughs at times produced isolated heavy showers however, no severe weather was report across the island.

During the month, Sangster International Airport (SIA) in the island's northwest recorded 53.2 mm of rainfall, while, Norman Manley International Airport (NMIA) in the southeast recorded 39.7 mm of rainfall. SIA received about 52% of its 30-year mean monthly rainfall, while NMIA received about 47% of its 30-year mean monthly rainfall. There were six (6) rain days recorded for both SIA and NMIA.

The highest maximum temperature recorded for SIA was 33.6 °C on November 3. This year's value is ranked 2nd in the list of highest monthly maximum temperatures, recorded in November at the station since 1992. Meanwhile, NMIA recorded 33.1°C on the November 2 & 12. This year's value along with that for 1999 are both ranked 13th as a highest monthly maximum temperature recorded at the station in November. The post-1992 record of 35.2 °C was set in 2000.

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 characteristics*[1]**.** 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 Figure1) and a forecast SPI (see Figure 2) using a 3-month and 6-month time intervals, 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	November Rainfall Total (mm)	Percent of 30-year Mean (%)	Observed SPI for Aug-Sep-Oct	Observed SPI for Sep-Oct-Nov
Hanover	Mount Peto	151	121	-0.59	-0.41
Westmoreland	Savanna-La-Mar	101	74	0.75	0.08
Westmoreland	Frome	251	194	-0.61	0.27
Manchester	Sutton	107	80	-1.28	-1.33
St. Elizabeth	Y.S. Estates	227	143	-0.02	0.21
St. Elizabeth	Potsdam	147	141	-0.13	0.41
Clarendon	Beckford Kraal	No data	No data	No SPI value due to unavailability of rainfall data for 3 months	
St. Catherine	Tulloch	102	66	0.76	0.56
St. Catherine	Worthy Park	62	54	0.13	-0.48
Trelawny	Orange Valley	11	9	No SPI value due to unavailability of rainfall data for October.	
St. James	Sangster Airport	53	52	-0.30	-2.22
St. Ann	Cave Valley	127	105	0.56	0.68
St. Mary	Hampstead	116	49	0.31	0.05
Portland	Shirley Castle	147	24	-0.81	-1.12
St. Thomas	Serge Island	87	39	0.19	0.27
KSA	Lawrence Tavern	No data	No data	-0.92	No SPI value due to unavailability of rainfall data for November
KSA	Palisadoes	40	47	-1.02	-0.72

Table 1: Observed SPI for Selected Stations across Jamaica during the August-November 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 September-November period, six of the seventeen reporting stations across the island had rankings ranging from near-normal (dry) to exceptionally dry; another eight reporting stations had modest rankings from near-normal (wet) to abnormally wet, while the remaining three stations did not have SPI values for the September-November period for classifications to be made. A comparison of the September-November period with that for the August-October period showed that, seven stations recorded improvements in their SPI figures and another seven stations recorded deteriorations in their SPI values.

The comparison of the SPI figures for Sep-Nov with those for Aug-Oct shows the following:

- Conditions deteriorated significantly at Sangster Airport with the ranking moving from near-normal (dry) to exceptionally dry; a change of 5 severity classes, the largest change in SPI value and also the most severely negative ranking.
- With only a minor decrease in the station's SPI value, the ranking at Sutton moved from moderately dry to severely dry and marginally above drought classification. Meanwhile conditions at Shirley Castle were still moderately dry, despite a bigger decrease in the station's SPI value, when compared to that of Sutton.
- Conditions were not as dry at the following stations as indicated by their current rankings: Palisadoes with abnormally dry and Mount Peto with near-normal (dry) conditions.
- Worthy Park also recorded a decrease in its SPI value with the station's ranking moving from near-normal (wet) to near-normal (dry).
- Conditions at Frome showed improvement with the station's ranking moving from abnormally dry to near-normal (wet). This is a change of 2 severity classes.
- Conditions were still abnormally wet at both Cave Valley and Tulloch. In the case of the former there was an increase in the station's SPI value, while for the latter station there was a decrease in its SPI value.
- At Savanna-La-Mar conditions were not as wet with the station's ranking moving from abnormally wet to near-normal (wet).
- At the remaining 4 stations; Y.S. Estates, Potsdam, Hampstead and Serge Island conditions were all in the near-normal (wet) category.

In November, selected stations in eight parishes namely, Manchester, St. Catherine, Trelawny, St. James, St. Mary, Portland St. Thomas and KSA received below-normal rainfall. The stations in Hanover, St. Elizabeth and St. Ann recorded above-normal rainfall. For Westmoreland the station in the north (Frome) recorded above-normal rainfall while; the station in the south (Savanna-La-Mar) recorded below-normal rainfall.

From analyses (see figure 1) varying levels of dryness were noticeable over sections of northern parishes, and especially over northern St. James where there was severe drying. Sections of Manchester and KSA on the island's southern side also experienced some levels of dryness. Levels of wetness were noticeable over inland areas of southeastern Trelawny into southwestern St. Ann, as well as, northern areas of St. Catherine. Some wetness was also observed over St. Elizabeth and western sections of Westmoreland.

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

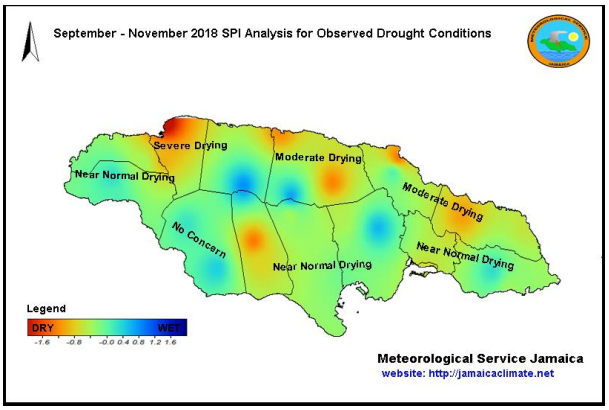

Figure 1: September – November 2018 SPI Analysis for Observed Conditions

The forecast through February 2019 (table 3), indicates that the island should receive below-normal to near-normal rainfall. Figure 2 indicates that there is the possibility of some reduction in the number of areas which were experiencing dry conditions; especially for those farming communities across St. Mary, Portland, St. Thomas and KSA. In contrast drier conditions could affect sections of Hanover, Westmoreland and the bread-basket parish of St. Elizabeth.

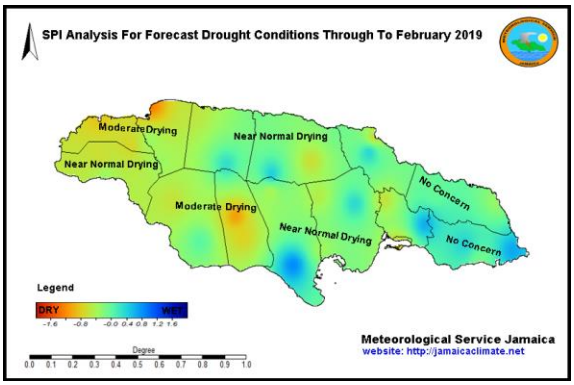

Figure 2: Forecast Drought Conditions through to February 2019

Seasonal Forecast – December 2018 to February 2019

The MSJ makes seasonal climate forecasts using the Climate Predictability Tool (CPT), 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 (December/January/February), which mark the start of the dry season, the forecast models are indicating that Jamaica is likely to receive below-normal to near-normal rainfall. The forecast is for above-normal temperatures over the same period, however these should be comfortable.

	% Below (B)	% Normal (N)	% Above (A)
Jamaica Rainfall Outlook	35	35	30
Jamaica Temperature Outlook	25	35	40

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 December 2018 to February 2019.

Table 4 below, shows the precipitation outlook for selected stations across Jamaica as analysed by the CPT. For the December 2018 to February 2019 period, 4 of seventeen (17) selected stations are indicating higher

probabilities for below-normal rainfall; another 12 selected stations are indicating higher probabilities for normal rainfall and one station is indicating higher probability for above-normal rainfall..

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

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 December 2018 to February 2019.

Summary and Expected Agricultural Impacts

Selected stations in Manchester, St. Catherine, Trelawny, St. James, St. Mary, Portland, St. Thomas and KSA received below-normal rainfall in November. Varying levels of dryness were evident over several parishes, especially on the north side of the island, with severely dry conditions being observed in St. James.

Selected stations in Hanover, St. Elizabeth and St. Ann received above-normal rainfall which would have been welcomed by farming communities in sections of those parishes and especially in St. Elizabeth.

The forecast of below-normal to near-normal rainfall across the island over the December-February period could prove to be an interesting one. For farming communities in eastern parishes they could experience a reduction in the extent of the dry conditions being experienced resulting from near-normal rainfall. In contrast, areas across Hanover, Westmoreland and St. Elizabeth in the west could experience drier conditions, resulting from below-normal rainfall. This scenario would not be welcome in farming communities dependent on rains for crop irrigation, as well as, for other water users during the traditional dry season.

Therefore, close monitoring of conditions and dissemination of advisories will continue as usual.

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