AGROMET BULLETIN

Volume 6. No. 12 | December 2018

HIGHLIGHTS

- **Selected stations in nine parishes received below-normal rainfall in December.**
- **Sections of northern parishes continue to experience very dry conditions.**
- **Above-normal rainfall is forecast for Jamaica for January through March.**
- **Seasonally comfortable temperatures are forecast for the next 3 months.**

Weather Summary December 2018

During December, the daily weather was dominated by both High Pressure Ridges and Stationary Fronts.

During the month, Sangster International Airport (SIA) in the island's northwest recorded 65.6 mm of rainfall, while Norman Manley International Airport (NMIA) in the southeast, recorded 29.3 mm of rainfall. SIA received about 69 % of its 30-year mean monthly rainfall, while NMIA received about 97% of its 30-year mean monthly rainfall. There were five (5) rain days recorded for SIA while, NMIA recorded 4 rain days.

The highest maximum temperature recorded for SIA was 33.2 °C on December 10. This value exceeds the 20-year average of 31.8 °C. This year's value is ranked 2nd in the list of highest maximum temperatures recorded in December at the station since 1992. The record of 34.0 °C was set in 2015. Meanwhile, NMIA recorded a highest maximum temperature of 33.0 °C on December 6. This year's value along with that for 2008, are both ranked 9th as a highest monthly maximum temperature recorded at the station in December. The post 1992 record of 34.5 °C was set in 2006.

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 negative for at least two consecutive months and reaches an intensity of -0.80 or less from November to April, or -1.30 or less from May to October. 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	December Rainfall Total (mm)	Percent of 30-year Mean (%)	Observed SPI for Sep-Oct-Nov	Observed SPI for Oct-Nov-Dec
Hanover	Mount Peto	29	31	-0.41	-0.53
Westmoreland	Savanna-La-Mar	73	92	0.08	0.50
Westmoreland	Frome	38	53	0.27	0.37
Manchester	Sutton	44	78	-1.33	-0.76
St. Elizabeth	Y.S. Estates	No data	No data	0.21	No SPI value due to unavailability of rainfall data for December
St. Elizabeth	Potsdam	112	191	0.41	0.64
Clarendon	Frankfield	64	106	-0.39	-0.09
St. Catherine	Tulloch	83	94	0.56	-0.10
St. Catherine	Worthy Park	76	95	-0.48	-0.49
Trelawny	Orange Valley	87	77	1.58	0.90
St. James	Sangster Airport	66	69	-2.22	-1.43
St. Ann	Cave Valley	87	128	0.68	0.77
St. Mary	Hampstead	75	40	0.05	-0.85
Portland	Shirley Castle	173	34	-1.12	-1.83
St. Thomas	Serge Island	188	183	0.27	0.64
KSA	Lawrence Tavern	56	88	-0.94	-0.65
KSA	Palisadoes	29	97	-0.72	-0.72

Table 1: Observed SPI for Selected Stations across Jamaica during the September-December 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 October-December period, 10 of the seventeen reporting stations across the island had rankings ranging from near-normal (dry) to extremely dry; another eight reporting stations had modest rankings from near-normal (wet) to abnormally wet, while there was one station which did not have a SPI value for the October-December period for a classification to be made. A comparison of the October-December period with that for the September-November period showed that, nine stations recorded improvements in their SPI figures, another six stations recorded deteriorations in their SPI values and one station had no change in its SPI value.

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

- Conditions deteriorated significantly at Hampstead, with the station's ranking moving from near-normal (wet) to moderately dry; a change of 3 severity classes and the largest change in SPI value.
- Conditions at Shirley Castle became drier with the ranking moving from moderately dry to extremely dry and also, the most severely negative ranking. The station was marginally below the drought classification.
- Tulloch recorded a decrease in its SPI value moving from abnormally wet to near-normal (dry).
- Despite increases in their SPI values, the conditions at Sutton and Sangster were still dry, with rankings of abnormally dry and severely dry respectively. In the case of Sangster the station achieved the drought classification.
- Conditions remained dry at the following stations Mount Peto, Lawrence Tavern and Palisadoes where, all 3 stations had abnormally dry classifications. Meanwhile, Frankfield and Worthy Park had rankings of near-normal (dry).
- Despite a decrease in its SPI value, conditions at Orange Valley were still wet as indicated by the current moderately wet ranking.
- At Potsdam, Cave Valley and Serge Island conditions became wetter, with all 3 stations having rankings in the abnormally wet classification.
- For Savanna-La-Mar and Frome there were no changes in their rankings, with both stations still recording near-normal (wet) conditions.

In December, selected stations in nine parishes namely, Hanover, Westmoreland, Manchester, St. Catherine, Trelawny, St. James, St. Mary, Portland and KSA received below-normal rainfall. The selected stations in St. Elizabeth, Clarendon, St. Ann and St. Thomas recorded above-normal rainfall.

From analyses (see figure 1) varying levels of dryness were noticeable over sections of northern parishes, and especially over western Portland extending across St. Mary and into sections of St. Ann; northern St. James and sections of Hanover. For some southern parishes conditions were not as dry, as shown in sections of Manchester, Clarendon, St. Catherine and KSA. Mild levels of wetness were noticeable over some areas of Westmoreland, St. Elizabeth, Trelawny and St. Thomas.

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

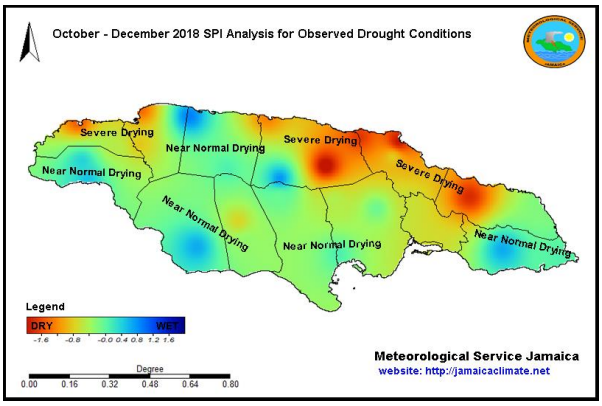

Figure 1: October- December 2018 SPI Analysis for Observed Conditions

The forecast through March 2019 (table 3), indicates that the island should receive above-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 Portland, St. Mary, St. Ann and Hanover

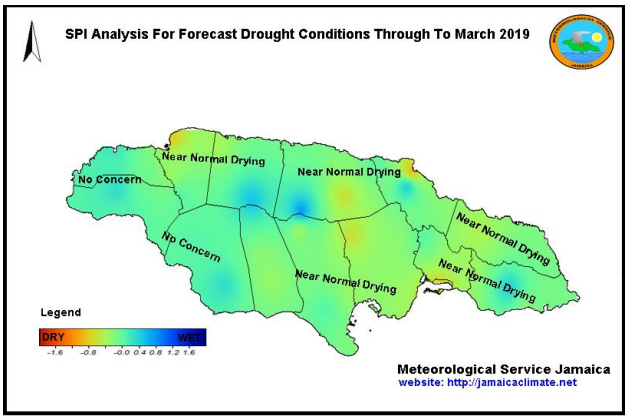

Figure 2: Forecast Drought Conditions through to March 2019

Seasonal Forecast – January to March 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 (January/February/March), which mark the main part of the dry season, the forecast models are indicating that Jamaica is likely to receive above-normal rainfall. The forecast is for above-normal but, comfortable temperatures over the same period. .

	% Below (B)	% Normal (N)	% Above (A)
Jamaica Rainfall Outlook	30	30	40
Jamaica Temperature Outlook	25	30	45

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 January to March 2019.

Table 4 below; shows the precipitation outlook for selected stations across Jamaica as analysed by the Climate Predictability Tool. For the January to March 2019 period, two of the selected 17 stations are indicating higher

probabilities for below-normal rainfall; another four selected stations are indicating higher probabilities for normal rainfall and 11 stations are indicating higher probabilities for above-normal rainfall.

Stations	Parishes	Below (B) %	Normal (N) %	Above (A)%
Frankfield	Clarendon	20	35	45
Mount Peto	Hanover	25	35	40
Manley Airport	Kingston	30	30	40
Lawrence Tavern	Kingston	33	34	33
Suttons	Manchester	10	20	70
Shirley Castle	Portland	30	30	40
Cave Valley	St. Ann	20	30	50
Tulloch Estate	St. Catherine	45	30	25
Worthy Park	St. Catherine	50	30	20
Y.S. Estate	St. Elizabeth	20	30	50
Potsdam	St. Elizabeth	20	30	50
Sangster	St. James	33	34	33
Serge Island	St. Thomas	33	34	33
Hampstead	St. Mary	20	20	60
Orange Valley	Trelawny	20	35	45
Savanna-La-Mar	Westmoreland	33	34	33
Frome	Westmoreland	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 4: Precipitation Outlook for Selected Stations for January to March 2019.

Summary and Expected Agricultural Impacts

Selected stations in Hanover, Westmoreland, Manchester, St. Catherine, Trelawny, St. James, St. Mary, Portland and KSA received below-normal rainfall in December. Varying levels of dryness were evident over several parishes, especially on the north side of the island, with very dry conditions being observed in Portland, St. Mary, St. Ann and to a lesser extent St. James and Hanover.

For Sangster in St. James the station was experiencing drought condition while, Shirley Castle in Portland was marginally below having a drought declared.

Selected stations in St. Elizabeth, Clarendon, St. Ann and St. Thomas received above-normal rainfall, which would have brought some relief in farming communities in sections of those parishes and especially in St. Elizabeth.

The forecast of above-normal rainfall across the island from January to March, which is the main part of the dry season, would certainly be anticipated especially in farming communities. Should the forecast materializes then, these rain dependent farming areas across the island and especially those in northern parishes experiencing very dry conditions, could get some relief from the dryness, during the traditional dry season.

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

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