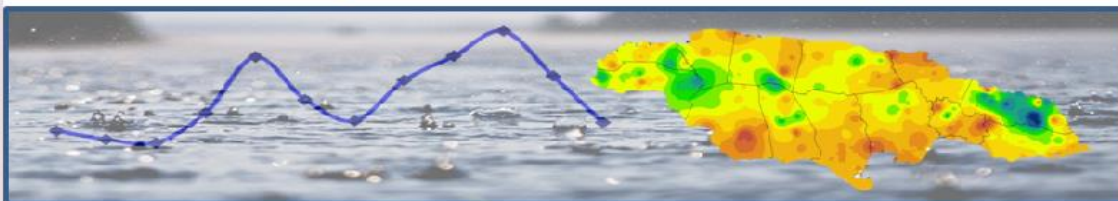




# Monthly Rainfall Summary



October 2018

## Introduction

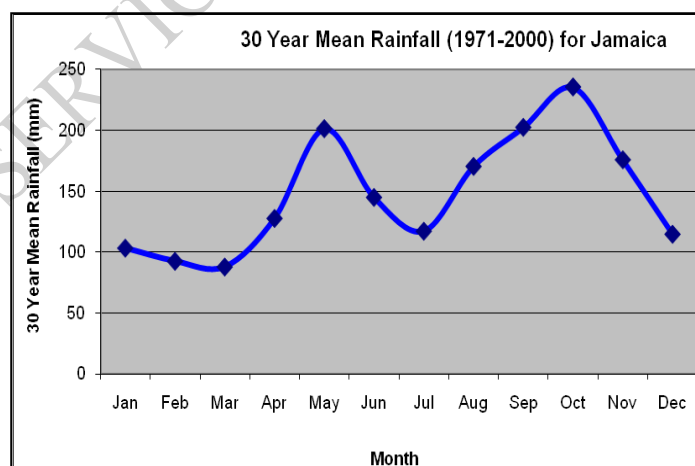
This rainfall summary is prepared by the Climate Branch of the Meteorological Service, Jamaica (MSJ). The MSJ maintains a network of rainfall stations located in every parish across the island. Rainfall is usually read at 7:00 a.m. and reported for the previous 24 hours. These readings are done by a cadre of paid but mainly voluntary dedicated observers.

## General

Jamaica's bimodal rainfall pattern consists of two peak periods with higher values of rainfall and corresponding periods of lower rainfall. The primary peak occurs in October and the secondary peak in May. The lowest amounts are at a minimum during the period February to March and the month of July. This is based on long-term reports but deviations from this pattern do occur year to year.

A comparison of the old 30-year mean (1951-1980) with the 1971-2000 mean by the MSJ has shown that the island's rainfall patterns and values have not changed significantly for the current thirty-year (1971-2000) period. The main changes noted are

that of wetter dry periods and drier wet periods. This has however not affected the overall rainfall pattern for the island as seen in Figure 1 below.



**Figure 1: Precipitation Pattern from 1971-2000 for Jamaica.**

Prepared by the  
Climate Branch  
Meteorological Service, Jamaica  
65 ¾ Half Way Tree Road  
Kingston 10  
Telephone: (876) 929-3700/3706  
Email: [datarequest@metservice.gov.jm](mailto:datarequest@metservice.gov.jm)

## HIGHLIGHTS FOR OCTOBER

- Ten of 13 parishes received below-normal rainfall.
- One parish recorded meteorological drought.
- Above-normal rainfall is forecast for the island, for November to January.
- Above-normal temperatures are forecast for the next 3 months

Parish Mean Rainfall and Comparison with 30-yr Averages							
		OCT	OCT	OCT	% OF 30 YR NORMAL		
				30 YR NORMAL (1971- 2000)	2018	2018	2018
Parishes	KEY	2018	2017		AUG	SEP	OCT
Hanover	HAN	165	212	300	81	74	55
Westmoreland	WES	228	224	254	109	110	90
Manchester	MAN	235	170	257	59	49	92
St. Elizabeth	STE	214	242	263	54	89	82
Clarendon	CLA	221	294	209	34	66	106
St. Catherine	STC	220	292	188	126	120	117
Trelawny	TRE	153	137	160	109	137	95
St. James	STJ	133	183	200	53	69	67
St. Ann	STA	141	154	169	61	126	83
St. Mary	STM	149	132	170	23	60	87
Portland	POR	317	403	361	62	102	88
St. Thomas	STT	407	368	287	23	54	142
Kgn. & St. And.	KSA	121	180	241	32	65	50
Jamaica	JAM	208	230	235	66	84	88

Table 1: Parish Mean Rainfall and Comparison with 30-yr Averages

## Rainfall Assessment

For October 2018, ten of thirteen parishes<sup>1</sup> recorded below-normal rainfall, while the other three parishes recorded above-normal rainfall. There were eight parishes that received less rainfall in October 2018 when compared to October 2017. Six of these parishes also recorded below-normal rainfall in October 2018. Clarendon and St. Catherine recorded above-normal rainfall in October but, received less rainfall for the month when compared to one year ago. St. Thomas was the only parish to record above-normal rainfall in October 2018, as well as received more rainfall for the month, when compared October 2017.

St. Catherine was the only parish to record 3 consecutive months of above-normal rainfall.

The percentages of mean rainfall in October (traditionally the wettest month) were higher for 4 parishes; Manchester, Clarendon, St. Mary and St. Thomas, when compared to those of September and lower for the other 9 parishes. Overall, the island's average rainfall for October was 208 mm, which was 22 mm less than that received one year ago, and which corresponds to 88% of the 30-year (1971-2000) mean monthly value. The island generally, as well as, three (3) parishes namely, Clarendon, St. Mary and St. Thomas have recorded 3 consecutive months of increasing rainfall percentages; while, Hanover and St. Catherine have recorded 3 consecutive months decreasing rainfall percentages. Across the island, the parish percentages of the 30-year monthly means ranged from 50% for KSA to 142% for St. Thomas.

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<sup>1</sup> Note that Kingston and St. Andrew (KSA) are combined and reported as one parish.

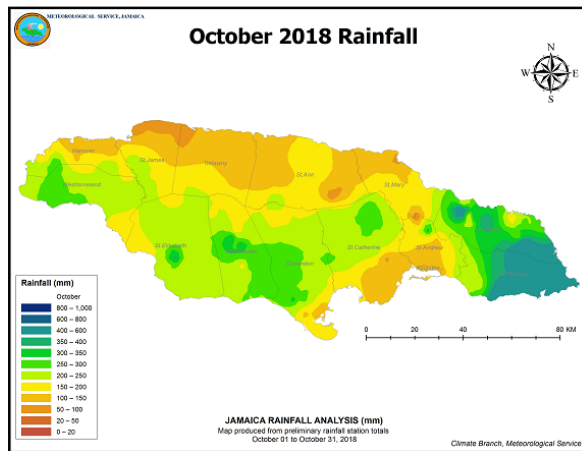


Fig.2. Distribution of Jamaica's Rainfall for October 2018

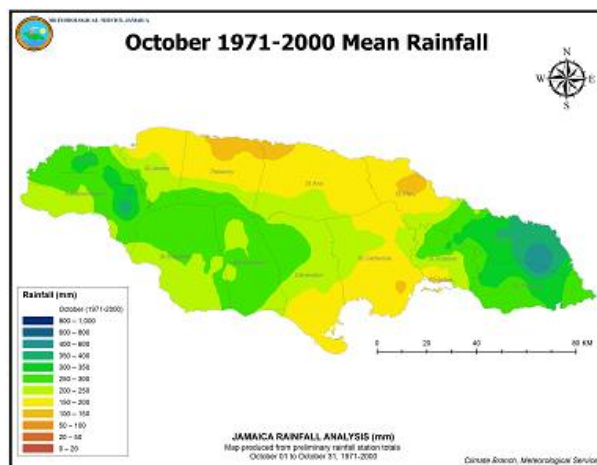


Fig.3. Thirty-year (1971-2000) Mean Island Rainfall for October

## Drought Conditions

### Meteorological Drought Methodology and Index

The Standardized Precipitation Index (SPI), developed by T.B. McNeen, 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 ranging from 1-month to 12-months. This temporal flexibility allows the SPI to be useful in both short-term meteorological, agricultural and long-term hydrological applications by providing early warning of drought and for making assessments on the severity of a drought.

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.

Droughts are regional in extent and each region has specific climatic characteristics<sup>2</sup>. 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 MSJ calculates an observed SPI (see Table 2) using a 2-month time interval and reports on drought conditions using 2 bi-monthly intervals.

### Parish Standard Precipitation Index (SPI) Assessment

<b>Observed SPI for July to October 2018</b>			
<b>Parishes</b>	<b>Jul/Aug</b>	<b>Aug/Sep</b>	<b>Sep/Oct</b>
<b>Hanover</b>	<b>-1.36</b>	<b>-1.27</b>	<b>-1.43</b>
<b>Westmoreland</b>	<b>-0.26</b>	<b>0.77</b>	<b>0.30</b>
<b>Manchester</b>	<b>-1.05</b>	<b>-1.39</b>	<b>-0.88</b>
<b>St. Elizabeth</b>	<b>-1.31</b>	<b>-0.26</b>	<b>-0.04</b>
<b>Clarendon</b>	<b>-1.35</b>	<b>-0.69</b>	<b>0.16</b>
<b>St. Catherine</b>	<b>-0.18</b>	<b>0.20</b>	<b>0.29</b>
<b>Trelawny</b>	<b>-0.15</b>	<b>0.45</b>	<b>0.44</b>
<b>St. James</b>	<b>-1.68</b>	<b>-1.68</b>	<b>-1.58</b>
<b>St. Ann</b>	<b>-1.25</b>	<b>-0.85</b>	<b>-0.56</b>
<b>St. Mary</b>	<b>-1.40</b>	<b>-0.99</b>	<b>-0.28</b>
<b>Portland</b>	<b>-1.22</b>	<b>-0.39</b>	<b>-0.06</b>
<b>St. Thomas</b>	<b>-1.53</b>	<b>-1.32</b>	<b>0.50</b>
<b>Kingston &amp; St. Andrew</b>	<b>-1.18</b>	<b>-1.44</b>	<b>-0.92</b>

**Table 2: Parish SPI for July to October 2018**

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

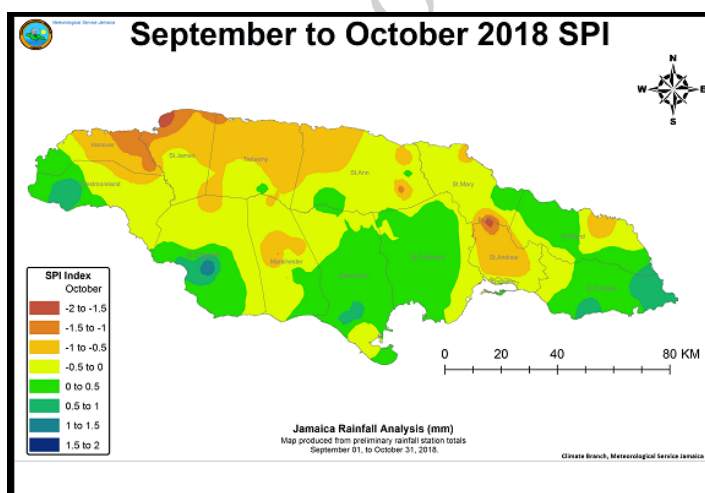
**Table 3: Severity Classes of the SPI**

<sup>2</sup> World Meteorological Organization, 2012: *Standardized Precipitation Index User Guide* (M. Svoboda, M. Hayes and D. Wood). (WMO-No. 1090), Geneva.

## SPI Discussion

Based on the latest SPI figures for September/October, Hanover was the only parish to have recorded drier conditions when comparing the last 2 bi-monthly periods. In fact, the parish's rankings have been fluctuating between moderately dry and severely dry. Also for the September/October period, there were four (4) other parishes recording SPI values which equates to rankings ranging from abnormally dry to severely dry conditions. Of these 4 parishes St. James has recorded meteorological drought conditions based on the criteria above, with a ranking of severely dry condition. The parish has also recorded the lowest SPI value for a 5<sup>th</sup> consecutive bi-monthly period. Manchester and Kingston & St. Andrew (KSA) have both recorded moderately dry conditions and St. Ann has recorded abnormally dry conditions. While 10 of 13 parishes have shown increases in their SPI values, St. Thomas has recorded the largest increase in its value (+1.82) when comparing the last 2 bi-monthly periods; with the parish's rankings moving from severely dry to near-normal (wet) conditions; a change of four severity classes. Clarendon also recorded a significant increase in its SPI value (+0.85) with the parish's rankings moving from abnormally dry to near-normal (wet) conditions. St. Elizabeth, St. Mary and Portland were the other parishes recording rankings in the dry category, with all three parishes recording near-normal (dry) conditions.

The remaining 3 parishes, Westmoreland, St. Catherine and Trelawny recorded near-normal (wet) conditions.



**Fig.4. SPI Analysis for September-October 2018**

**Precipitation and Temperature Outlook: November 2018 to January 2019**

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

Table 4 below, shows the precipitation outlook for selected stations across Jamaica as analysed by the Climate Predictability Tool. For the November 2018 to January 2019 period; all seventeen (17) selected stations are indicating higher probabilities for above-normal rainfall.

METEOROLOGICAL SERVICE, JAMAICA

Stations	Parishes	Below (B) %	Normal (N) %	Above (A)%
Beckford Kraal	Clarendon	20	30	50
Mount Peto	Hanover	25	30	45
Manley Airport	Kingston	30	30	40
Lawrence Tavern	Kingston	30	30	40
Suttons	Manchester	25	30	45
Shirley Castle	Portland	30	30	40
Cave Valley	St. Ann	25	30	45
Tulloch Estate	St. Catherine	25	30	45
Worthy Park	St. Catherine	25	30	45
Y.S. Estate	St. Elizabeth	25	30	45
Potsdam	St. Elizabeth	20	30	50
Sangster	St. James	20	30	50
Serge Island	St. Thomas	20	30	50
Hampstead	St. Mary	10	30	60
Orange Valley	Trelawny	20	30	50
Savanna-La-Mar	Westmoreland	30	30	40
Frome	Westmoreland	25	30	45
<b>Key</b>				
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 November 2018 to January 2019**

### Forecast Verification

For the same period last year, November 2017-January 2018, the models performed generally well, with accuracy in the range of 47-73 percentage points. The initial forecast indicated that rainfall was likely to be near-normal for the period. Preliminary findings indicated that most stations recorded near-normal to above-normal rainfall amounts during the period.



## Summary

Ten of 13 parishes recorded rainfall amounts that were below their respective 30-year (1971-2000) monthly means.

Overall, Jamaica recorded 88% of its normal monthly rainfall in October. For the month, **Hanover, Manchester, St. Elizabeth, Trelawny, St. James, St. Ann, St. Mary Portland and KSA** were the parishes that received more than 50% but, less than 100% of their 30-year monthly means. **Clarendon, St. Catherine and St. Thomas** were the parishes receiving more than 100% of their mean monthly rainfall.

**St. James** was the only parish that recorded meteorological drought conditions during the last 2 bi-monthly periods. **Hanover** has however, fluctuated between the moderately dry and severely dry categories over the last 3 bi-monthly periods and just above the drought classification.

The projection over the next 3 months (November to January), which marks the transition from the wet season into the early months of the dry season, is for above-normal rainfall across the island. Should this forecast materialize, it would continue the trend of the recent rains in reducing the dry conditions that were being experienced across the island and provide much needed sources of water during the traditional dry season.