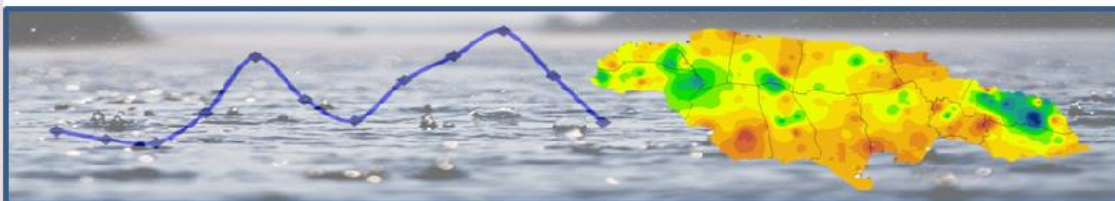




Monthly Rainfall Summary



November 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.

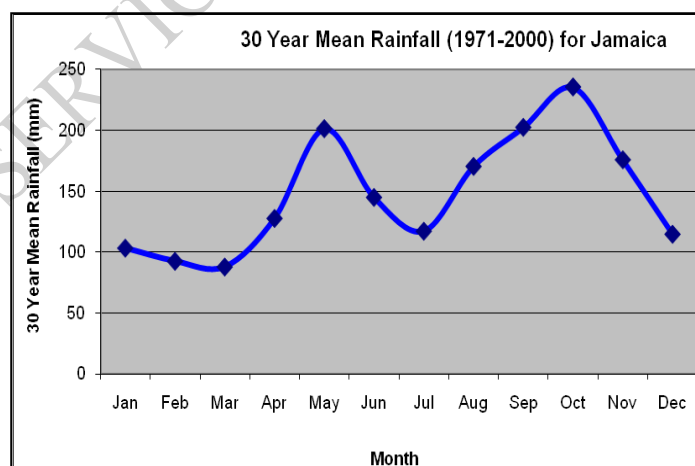


Figure 1: Precipitation Pattern from 1971-2000 for Jamaica.

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HIGHLIGHTS FOR NOVEMBER

- Ten of 13 parishes received below-normal rainfall.
- One parish recorded meteorological drought.
- Below-normal to near-normal rainfall is forecast for the island, for December to February.
- Above-normal but, comfortable temperatures are forecast for the next 3 months

Parish Mean Rainfall and Comparison with 30-yr Averages							
Parishes	KEY	NOV	NOV	NOV	% OF 30 YR NORMAL		
		2018	2017	30 YR NORMAL (1971-2000)	2018	2018	2018
					SEP	OCT	NOV
Hanover	HAN	86	150	141	74	51	61
Westmoreland	WES	151	154	136	103	84	111
Manchester	MAN	134	137	141	46	92	95
St. Elizabeth	STE	179	170	124	89	82	144
Clarendon	CLA	43	249	111	66	106	38
St. Catherine	STC	86	133	115	119	117	75
Trelawny	TRE	147	123	121	137	95	121
St. James	STJ	100	207	114	69	67	88
St. Ann	STA	75	235	168	127	83	44
St. Mary	STM	100	296	260	60	87	39
Portland	POR	279	684	475	106	88	59
St. Thomas	STT	77	339	217	54	142	35
Kingston & St. Andrew	KSA	55	136	160	65	54	34
Jamaica	JAM	116	231	176	83	88	66

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

Rainfall Assessment

For November 2018, ten of thirteen parishes¹ recorded below-normal rainfall, as well as, received less rainfall in November 2018 when compared to November 2017. The other three parishes, Westmoreland, St. Elizabeth and Trelawny recorded above-normal rainfall in November 2018, however two of these parishes (St. Elizabeth and Trelawny) recorded more rainfall this November, when compared to November last year. Westmoreland recorded above-normal rainfall in November 2018 but, received less rainfall when compared to one year ago. The percentages of mean rainfall in November were higher for 5 parishes; Westmoreland, Manchester, St. Elizabeth, Trelawny and St. James, when compared to those of October and lower for the other 8 parishes. Manchester was the only parish to record 3 consecutive months of increasing rainfall percentages, while St. Catherine, KSA, Portland and St. Ann recorded 3 consecutive months of decreasing rainfall percentages.

Overall, the island's average rainfall for November was 116 mm, which represents 50% of that which was received one year ago. The 116 mm received corresponds to 66% of the 30-year (1971-2000) mean monthly value. Across the island, the parish percentages of the 30-year monthly means ranged from 34% for KSA to 144% for St. Elizabeth.

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

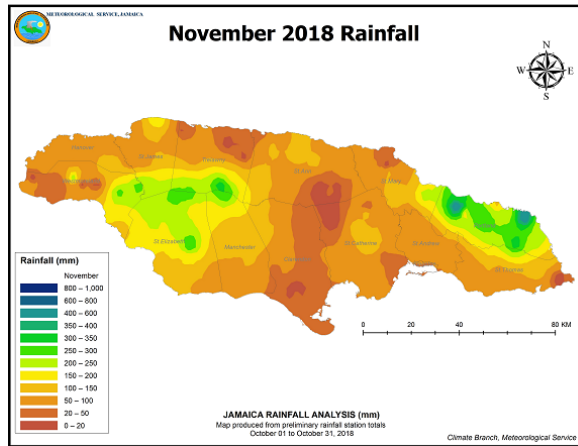


Fig.2. Distribution of Jamaica's Rainfall for November 2018

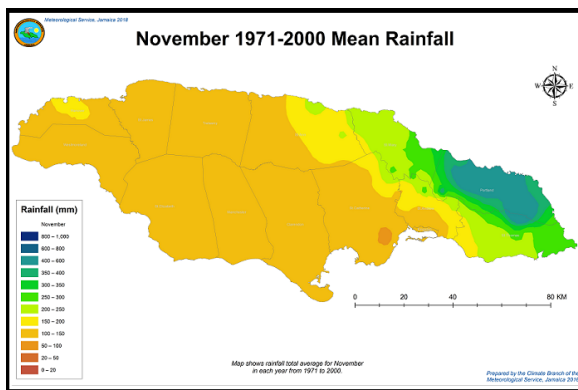


Fig.3. Thirty-year (1971-2000) Mean Island Rainfall for November

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 characteristics². For the Caribbean, a drought event occurs any time the SPI is continuously negative and reaches an intensity of -0.80 (moderately dry) or less during the dry season or -1.30 (severely dry) 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

Observed SPI for August to November 2018			
Parishes	Aug/Sep	Sep/Oct	Oct/Nov
Hanover	-1.32	-1.61	-1.50
Westmoreland	0.63	0.03	0.11
Manchester	-1.39	-0.88	-0.01
St. Elizabeth	-0.26	-0.07	0.43
Clarendon	-0.69	0.16	0.07
St. Catherine	0.19	0.27	0.19
Trelawny	0.45	0.23	0.33
St. James	-1.68	-1.58	-0.73
St. Ann	-0.85	-0.56	-0.86
St. Mary	-0.99	-0.28	-0.76
Portland	-0.39	-0.06	-0.70
St. Thomas	-1.32	0.50	0.44
Kingston & St. Andrew	-1.44	-0.87	-0.90

Table 2: Parish SPI for August to November 2018

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 3: Severity Classes of the SPI

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

SPI Discussion

For the October/November period, there were 7 of 13 parishes which recorded decreases in their SPI values, while the remaining 6 parishes recorded increases in their SPI values, in comparison to the previous bi-monthly period (Sep/Oct); Portland recorded the largest decrease in SPI value (-0.64). Of the parishes recording increases in their SPI values for this bi-monthly period, Manchester (+0.87) and St. James (+0.85) were the leading two parishes which recorded significant movements, increasing in three consecutive bi-monthly periods.

There were six (6) parishes recording SPI values which equates to rankings ranging from abnormally dry to severely dry conditions. Of these 6 parishes Hanover recorded meteorological drought conditions based on the criteria above, with a ranking of severely dry for this bi-monthly period. Based on updated data, the parish has also recorded the lowest SPI value for a 2nd consecutive bi-monthly period. St. James which recorded drought conditions for the Sep/Oct bi-monthly period, was above drought conditions for this period, with the parish's ranking moving from severely dry to abnormally dry. Also recording abnormally dry conditions were St. Mary, Portland and KSA, while, St. Ann recorded moderately dry conditions. A 7th parish, Manchester, saw its ranking improve from moderately dry to near-normal (dry) conditions.

The remaining six (6) parishes recorded positive SPI values, with all having rankings in the near-normal (wet) category. Except for St. Elizabeth, where the parish's ranking moved from near-normal (dry) to near-normal (wet), the other 5 parishes namely, Westmoreland, Clarendon, St. Catherine, Trelawny and St. Thomas all had rankings that remained unchanged.

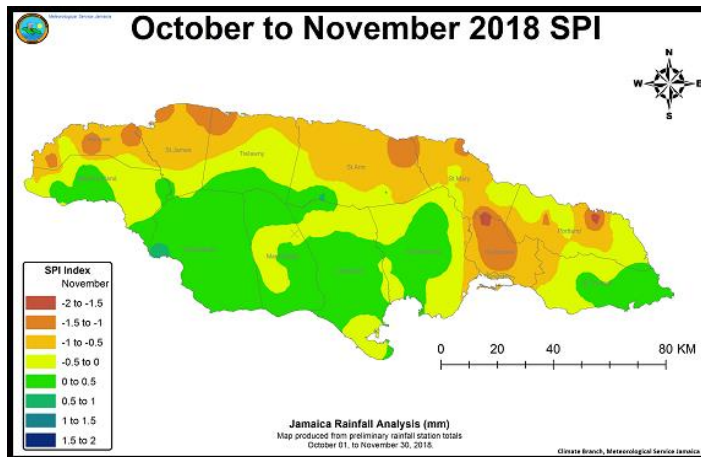


Fig.4. SPI Analysis for October-November 2018

Precipitation and Temperature Outlook: December 2018 to February 2019

For the next three months (December/January/February), which mark the early part of the dry season, the forecast models are indicating that Jamaica should receive below-normal to near-normal rainfall. The forecast is for above-normal but, comfortable 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 December 2018 to February 2019 period, four of the selected 17 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
Manley Airport	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	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

Forecast Verification

For the same period last year, December 2017-February 2018, the models performed generally well, with accuracy in the range of 50-80 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 during November, with Manchester recording 3 consecutive months of decreasing rainfall percentages.

Overall, Jamaica recorded 66% of its normal monthly rainfall in November. For the month, **Clarendon, St. Ann, St. Mary, St. Thomas** and **KSA** were the parishes that received 50% or less of their 30-year mean monthly rainfall; **Hanover, Manchester, St. Catherine, St. James and Portland** were the parishes that received more than 50% but, 100% or less of their 30-year monthly means; while, **Westmoreland, St. Elizabeth and Trelawny** were the parishes receiving more than 100% of their mean monthly rainfall.

Hanover was the only parish that recorded meteorological drought conditions, while, **St. James** which recorded meteorological drought during the last 2 bi-monthly periods, was above the drought classification in the Oct/Nov period.

The projection over the next 3 months (December to February), which marks the early months of the dry season, is for a greater likelihood of below-normal to near-normal rainfall across the island. The bias in the forecast however, is for eastern and some central parishes to receive more rainfall (percentage-wise) than western parishes. Should this happen, it could bring some relief to those areas still experiencing dry conditions, especially those on the north side of the island, during the early months of the traditional dry season.