

Rainfall data on Tropical Storm Erika, 26th to 27th August, 2015



CLIMATE SECTION

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TROPICAL STORM ERIKA

This report was compiled by the Dominica Meteorological Service (DMS) to analyse data recorded during the passage of Tropical Storm Erika across the Lesser Antilles, August 26th to 27th, 2015. Erika became the fifth tropical storm of the 2015 hurricane season on August 25th at 00UTC/ 20LST.

No official tropical storm warning was issued for Dominica by the National Hurricane Centre (NHC) as the centre of Erika was expected to pass well north of the island. Locally, warnings were issued by the DMS advising for extreme caution to be observed particularly in areas prone to flooding, landslides and falling rocks as rainfall amounts of up to 6inches were expected. At 2am on the 27th, Erika was moving westward at about 26km/h with sustained winds near 75 km/h (NHC).

Instability associated with the approaching storm began affecting the island on the 26th with showers and thunderstorms. During the early hours of the 27th, Erika's centre passed north of Guadeloupe (fig 1); however, heavy rainfall and thunderstorms were located in the south and east of the system (fig 3). Climatologically, the heaviest rainfall and thunderstorm activities are located in the north-east quadrant of storms. These violent showers moved over Dominica resulting in loss of life and damage to infrastructure, due to widespread flooding, landslides and mudslides. Lightning data from UKMET long range network indicated lightning strikes all over the island between 2am and 10am (Meteofrance). Communities in the extreme north of the Dominica were not impacted as severely as others (fig 4).



Figure 1 Tropical Storm Erika's track through the Caribbean (Weather.com)

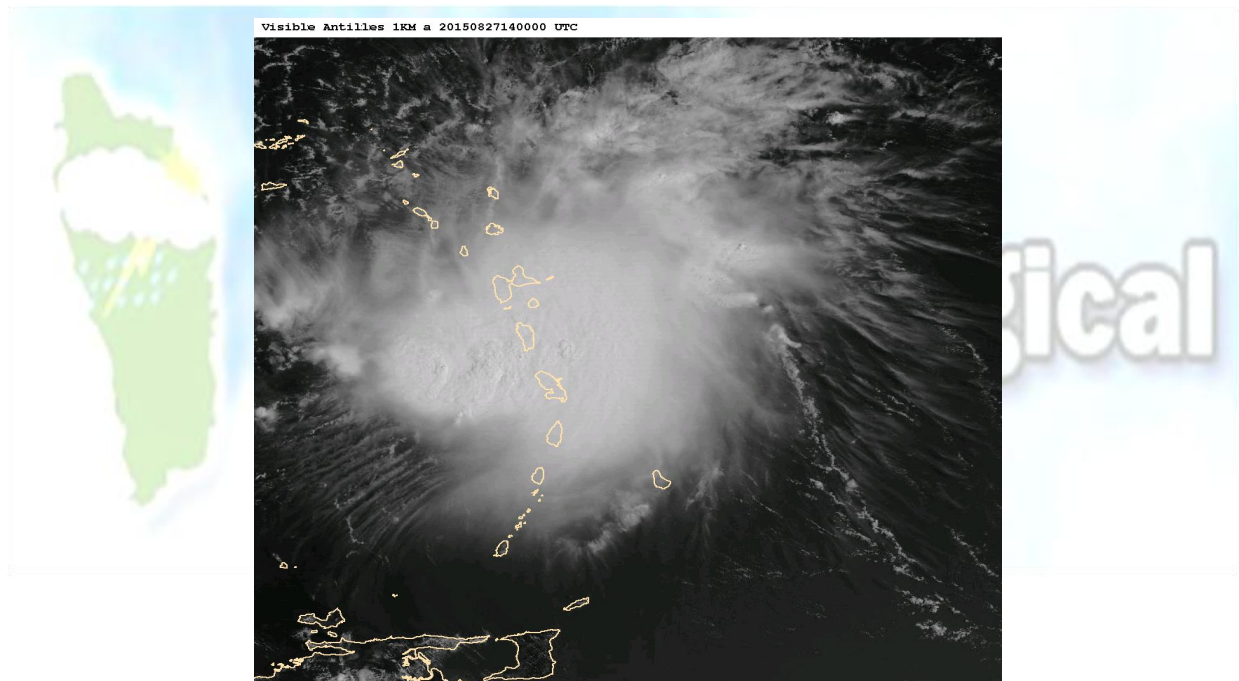
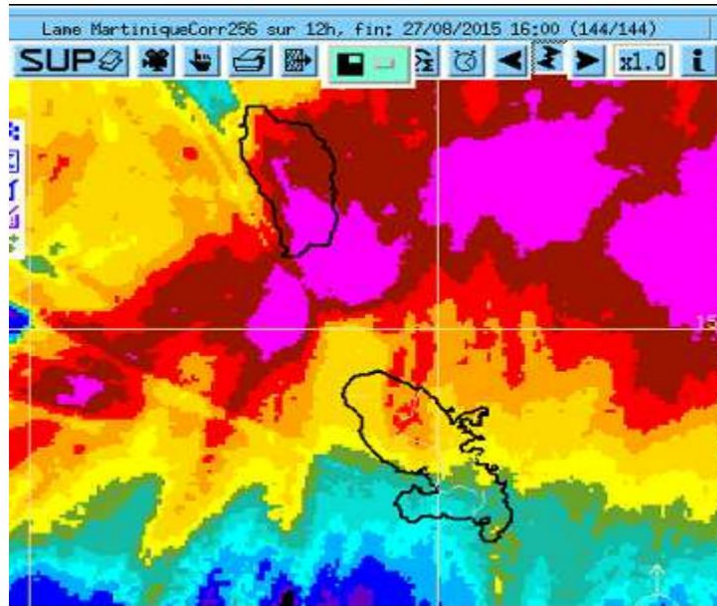


Figure 2 Visible satellite of Erika moving across the Lesser Antilles (RAMDIS online)



Lame d'eau sur 12h montrant les cumuls atteints (200 à 250mm) sur la Dominique entre 04 et 16UTC le 27 août au passage d'ERIKA.

Figure 3 Rainfall accumulations between midnight and noon, August 27th, 2015 (Meteofrance)

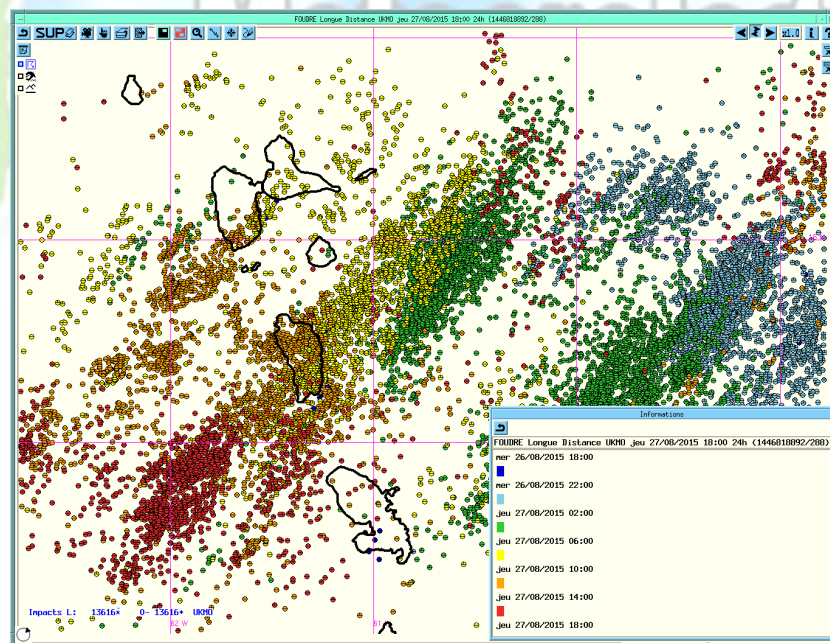


Figure 4 Accumulated lightning strikes from 2pm 26th to 2pm 27th, August 2015 (Meteofrance). Each color represents a 4hr interval.

STATION DATA

Rainfall from nine automatic weather stations (AWSs) was used to analyse rainfall amounts during tropical storm Erika.

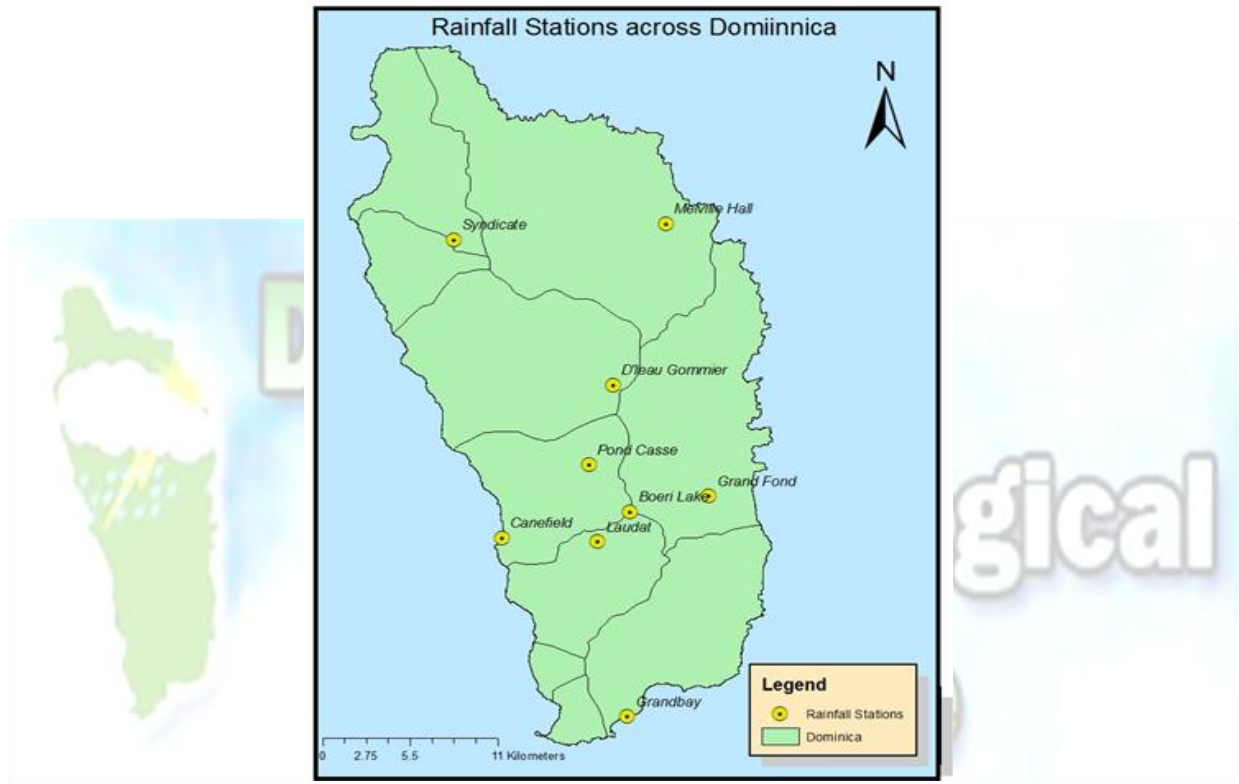


Figure 5 Map showing rainfall stations used in analysis (DMS)

Over the two day period, rainfall amounts were highest in the interior and southeast portions of the island up to 500mm/ 20in while those along the coast rainfall averaged approximately 300mm/ 12in. From the 26th to 27th an average of 452.8mm/ 17.83in of rainfall were recorded. Of this amount at least 400mm/ 15.75in was recorded during a 12hour period from 2am to 2pm on the 27th.

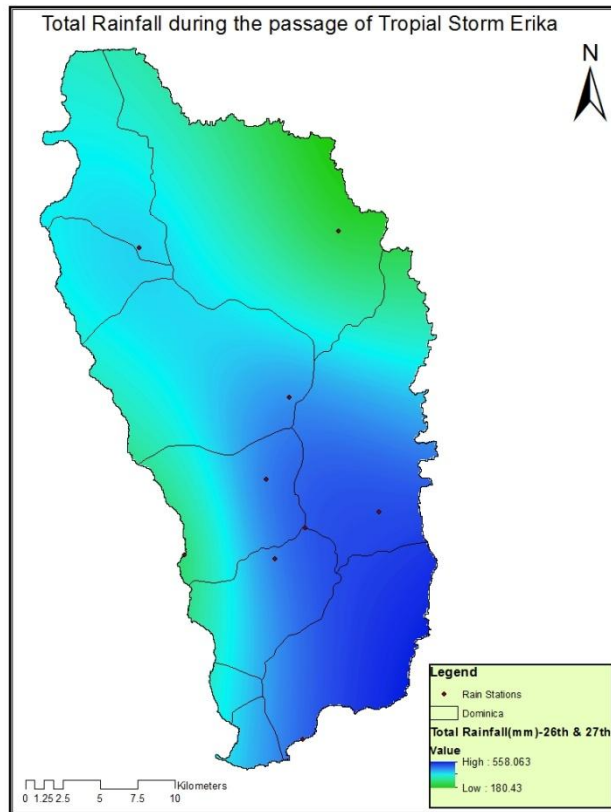


Figure 6 Rainfall accumulation from the 26th to 27th August, 2015 (DMS)

The showers leading to the events of the morning of 27th August began from about 2am with intensities increasing rapidly from about 3am to 4am. The showers were at highest intensities between 4am and 9am, though there were localized amounts of maximum intensity outside of this period. This highest hourly amount recorded was 122.6mm/ 4.73in at Grand Fond between 5am and 6am. Average hourly rainfall was 35.8mm/ 1.41in per hour. The most intense rainfall period was between 5am and 6am averaging 92.3mm/ 3.63in.

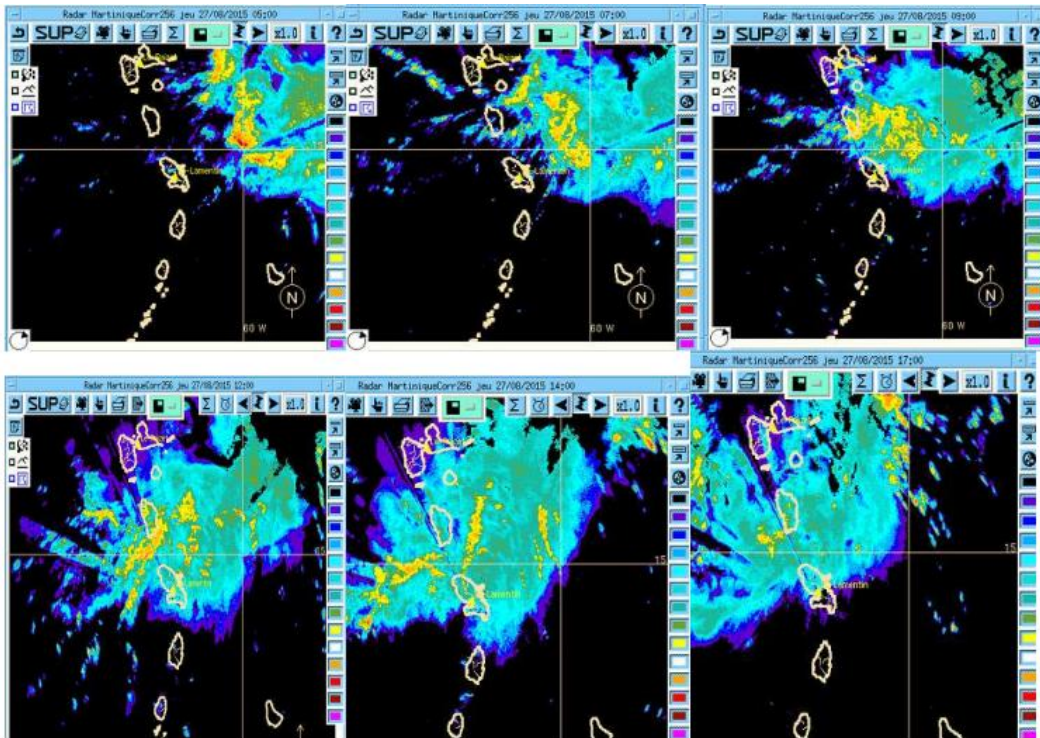


Image radar des précipitations liées au passage de ERIKA entre 01UTC et 17UTC le 27 août sur le Nord de l'arc antillais.

Figure 7 Radar from Météofrance, Tropical Storm Erika, 2am to 1pm, August 27th 2015

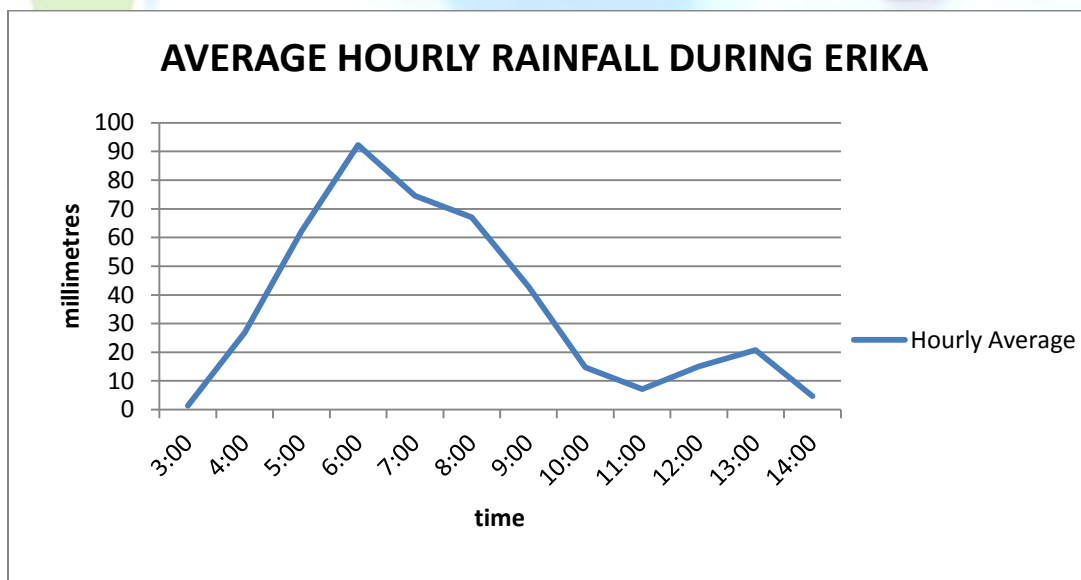


Figure 8 Average hourly rainfall

APPENDIX

Cover: flooded parking lot at Douglas-Charles Airport

Data tables

Date	Syndicate	Douglas-Charles	D'leau Gommier	Pond Cassé	Canefield	Boeri Lake	Laudat	Grand Fond	Grand Bay
26	247.4	150.9	329.2	382.4	195.6	395.6	380.4	386.8	317.8
27	150.2	74.3	120.8	86.8	81	106.8	84.6	129.0	173
Sum	397.6	225.2	450	469.2	276.6	502.4	465	515.8	490.8

Figure 9 Daily rainfall amounts during Erika, 26th-27th August, 2015

Time	Syndicate	Douglas-Charles	D'leau Gommier	Pond Casse	Canefield AWS SIDS	Boeri Lake	Laudat	Grandfond	Grandbay	Hourly Average
3:00	2.6	0	0.4	0	0.5	0.6	2	0	6	1.4
4:00	3.8	8.1	6.3	27.4	13.8	49.2	50.4	14.2	27.2	26.9
5:00	39	49.3	45.4	66.6	16	83.6	85.4	88	50	62.1
6:00	42	33.1	85.5	104.6	41.3	105.8	91.6	122.6	94.6	92.3
7:00	73.6	22	104	96.2	56.6	67	72.2	58.8	66.8	74.5
8:00	77.2	31.1	79.9	62.8	58	59.4	60	83.4	65.6	67.0
9:00	74.8	45.5	43.2	20.4	23.6	35.6	24.8	61.8	90.8	42.9
10:00	22.4	6	4.7	11.8	19.1	9.2	16.6	17.4	24	14.7
11:00	28.2	9.5	8.5	7.4	5.5	6.8	5.4	6.4	9.8	7.1
12:00	12.6	12.9	15.7	8.4	10.9	15	9.8	20.6	25.2	15.1
13:00	8.6	0.2	27.3	19	19.2	26.4	19.4	16.4	17.6	20.8
14:00	3.4	0.2	10.9	4.2	2.7	5.6	2.2	4	3.4	4.7
										35.8
Sum	388.2	217.9	431.8	428.8	267.2	464.2	439.8	493.6	481.0	401.4

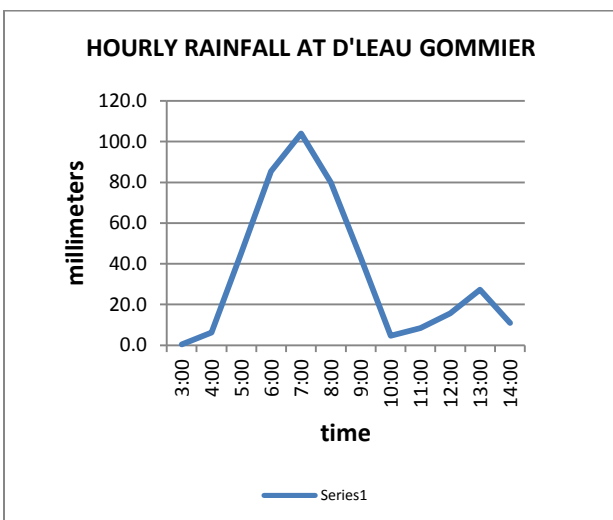
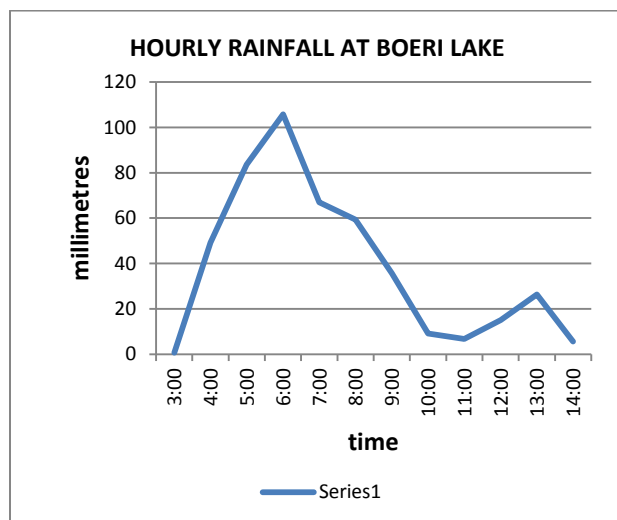
Table 1 Hourly rainfall, 2am to 2pm, 27th August, 2015

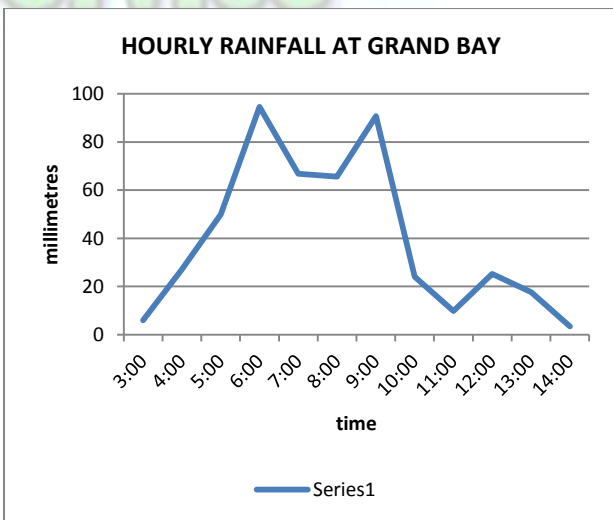
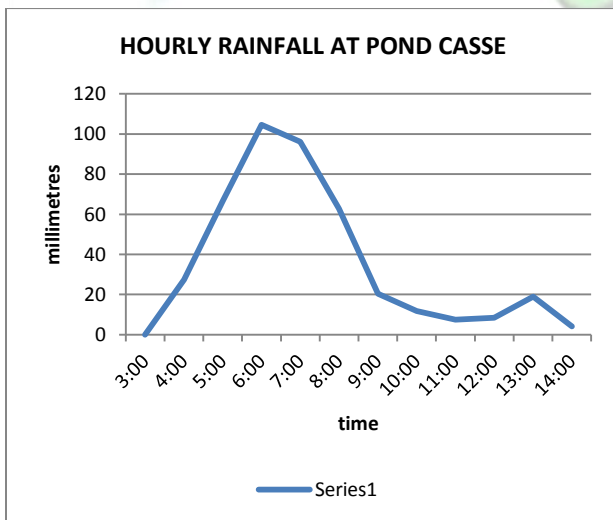
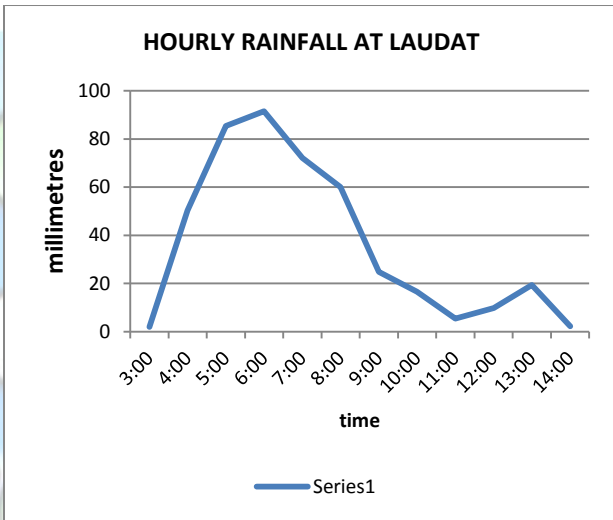
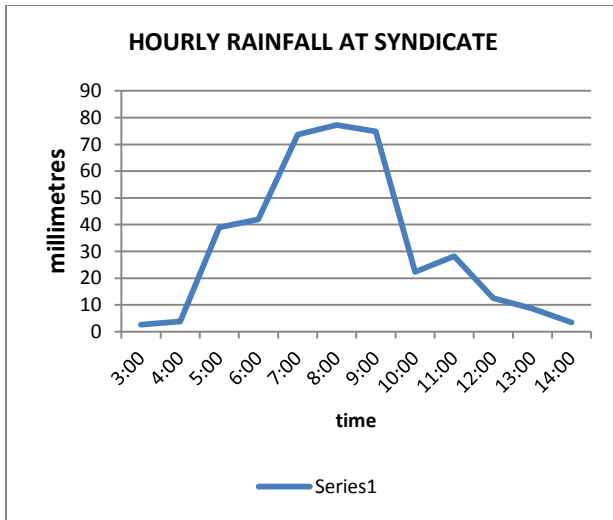
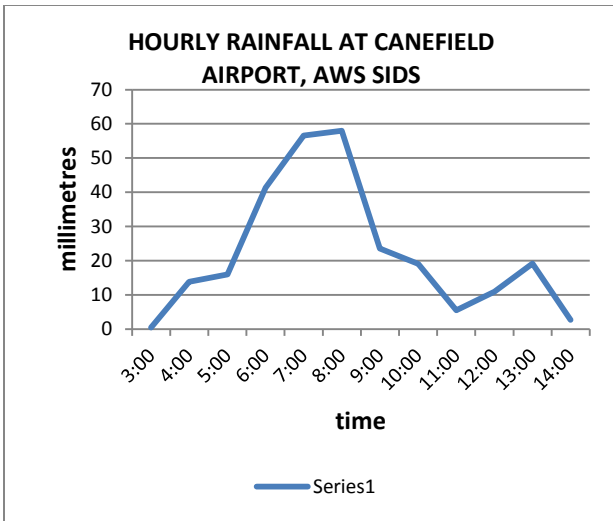
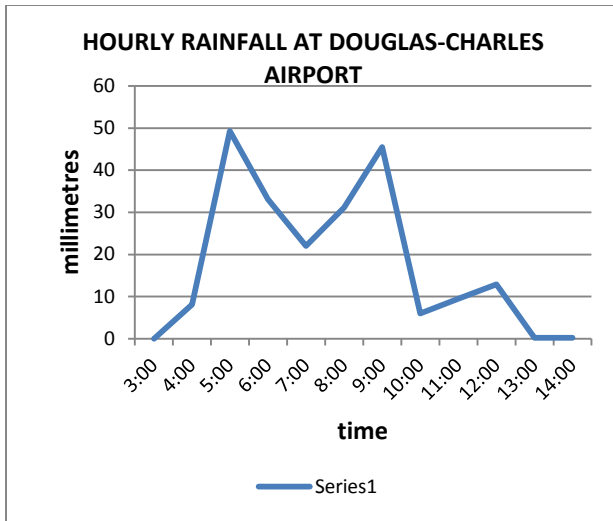
Station	Date	8pm-8am	8am-2pm	2pm-8pm
Syndicate	26	239.4		
	27		150.0	0.2
Canefield AWS SIDS	26	186.2		
	27		81.0	0.0
D'leau Gommier	26	322.6		
	27		110.3	1.9
Douglas-Charles	26	147.8		
	27		74.3	0.0
Boeri Lake	26	367.0		
	27		98.6	2.2
Laudat	26	362.8		
	27		78.2	0.0
Pond Casse	26	357.8		
	27		71.2	0.2
Grandbay	26	310.6		
	27		170.8	0.4
Grand Fond	26	367.2		
	27		126.6	1.0

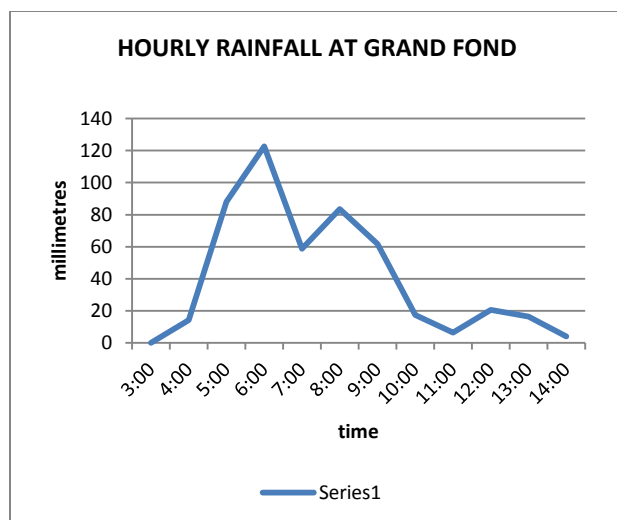
Table 2 6 and 12 hourly rainfall during Tropical Storm Erika

Rainfall graphs from nine selected rainfall stations around Dominica,

2am to 2pm, 27th August 2015







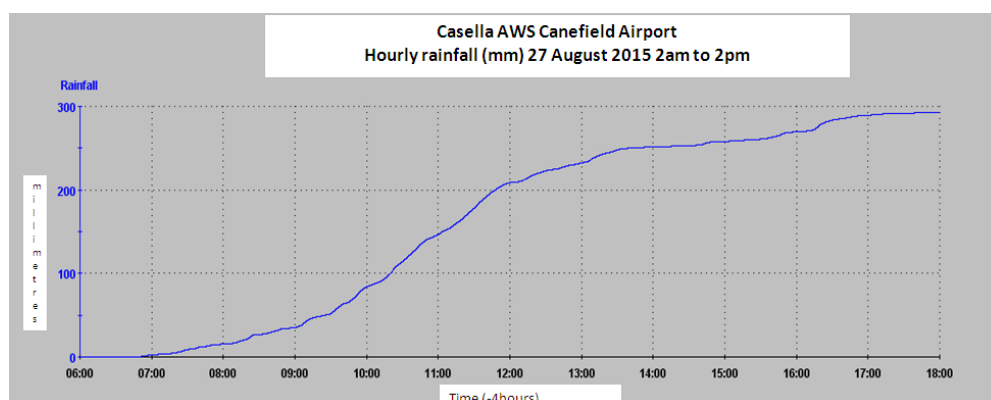
CANEFIELD AIRPORT (additional data)

Observed rainfall

Date	Total	8pm-8am	8am-2pm	2pm-8pm
26	238.7	224.5		
27	96.3		96.1	trace

AWS Casella

Time	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00
Rainfall	2.4	12.4	19.4	46.6	59.8	57.6	23	17.4	6.4	11	19.4	2.2



SOURCES

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