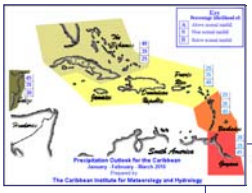
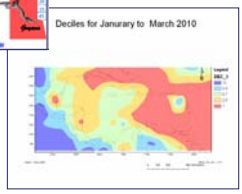
Rainfall and Agriculture

Drought and Dry Spells

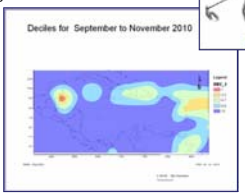
Excessive Rainfall and Flooding

Rainfall extremes are often responsible for crop and livestock losses. However, the Caribbean Institute for Meteorology and Hydrology (CIMH) monitors rainfall activity across the Caribbean Basin through the Caribbean Drought and Precipitation Monitoring Network (CDPMN). At the Caribbean basin scale two indices are currently being applied – the Standardised Precipitation Index (SPI) and Deciles (made popular by Australian climatologists). Initially developed to monitor drought, the CDPMN also provides information on periods of excessive rainfall. During the year 2010, both extremes in rainfall were experienced with only a very short period of normal rainfall separating them (first drought, then excessive rainfall). CIMH also provides seasonal tercile probability forecasts that indicates the likelihood of three month periods being normal, above normal or below normal with respect to rainfall amounts. Together, these two products provide useful information for medium term decision-making in agriculture and water resources management as witnessed during the 2009 and 2010.





Decile Classifications	
Decile 10: highest 10 %	Very much above average
Deciles 8-9: next highest 20%	Above normal
Deciles 4-7: middle 40%	Normal
Deciles 2-3: next lowest 20%	Below normal
Decile 1: lowest 10%	Very much below normal



Impacts of 2009 – 2010 drought

Crops and livestock

- President of Guyana allocated US $1.3 million to bring relief to farmers of Region 2, costing government US $16,000.00 per day to operate pumps and conduct other works in this region.
- Farmers became so desperate that they were forced to pump salt water to about 150 acres of rice lands knowing the grave consequences of such actions
- Banana exports n Dominica was approximately 43% lower in first 11 weeks of 2010
- In St. Vincent and the Grenadines, agricultural production was reduced to 20% . The resilient farms were the ones that utilised greenhouse facilities and irrigation systems.
- In Antigua and Barbuda, where the 2010 onion crop was expected to be about 500,000 kg, 25 percent of it was lost, whilst about 30 percent of the Tomato crop which was estimated to total 250,000kg was lost
- In Trinidad disease of cattle

Food Prices

-In St. Vincent and the Grenadines, prices of tomatoes were $2.35 per pound in February. In March the prices rose to $6.00 per pound.

- Trinidad and Tobago expressed concerns over rising inflation rates with a significant food prices component. Food prices increased 6.9 % in March compared with 6.3 % in February and 2.7 % in January. An increase in the price of fruit in March 2010 by 60.8 per cent
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Bush Fires

-The same scarce commodity – water – has then to be used to reduce the risks to limb and property

-In Dominica, attended to 160 fires (mainly bush fires) for the 1st quarter of 2010, which was more than for the entire year 2009, which was about 103

-150% increase in the amount of bush fires reported

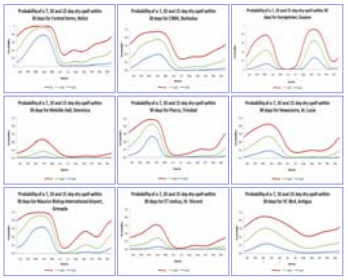
- In St. Vincent and the Grenadines, seven different farms reported the destruction of at least two acres of crops.

Land degradation

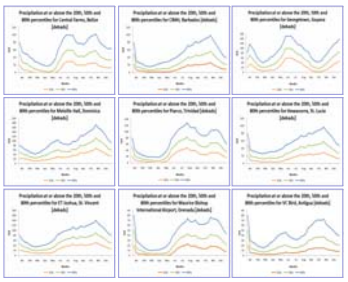
– flooding and landslides after drought, particularly where there was denudation of slopes from fires can be a concern

St Augustine						
Month	Correlations			Significance Levels		
	0mth	3mth	6mth	0mth	3mth	6mth
January	0.034	-0.005	0.322	0.484	0.024	0.105
February	0.063	0.096	-0.031	0.204	<0.001	0.217
March	0.282	0.034	0.231	0.003	0.009	0.007
April	0.221	0.099	-0.005	0.793	0.049	0.005
May	0.193	0.291	0.136	0.04	0.134	0.027
June	0.367	0.221	0.034	0.901	0.017	0.074
July	0.104	-0.063	0.101	0.219	0.072	0.044
August	0.262	0.340	0.285	0.033	0.376	0.05
September	-0.088	0.080	0.207	0.155	0.032	0.449
October	0.186	0.276	0.209	0.011	<0.001	0.002
November	-0.04	-0.065	0.373	0.367	0.007	0.134
December	0.121	0.180	0.155	0.001	0.003	0.011

The El Nino/Southern Oscillation (ENSO) is one of the major climate drivers in the Caribbean. The El Nino phase played a role in the 2009-2010 drought, but the La Nina phase was influential in causing the excessive rainfall during the second half of 2010 and into 2011. The adjacent table shows the correlation between the Southern Oscillation Index (SOI) and various lag times of the Standardised Precipitation Index (SPI) at St. Augustine, Trinidad.



Rainfall monitoring and forecasting information is used for soil moisture management. When combined with soil moisture capacity and evapotranspiration information, it can aid in irrigation scheduling and quantities.



Other information useful in long term agricultural planning include the probabilities of dry spells of varying lengths; the probability of specific rainfall thresholds; and rainfall amounts of varying degrees of reliability (as seen adjacent using the 20th, 50th and 80th percentiles.

Partners

National Meteorological and Hydrological Services (NMHSs) of
Antigua and Barbuda, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Lucia, St Vincent and the Grenadines and Trinidad and Tobago
The Caribbean Agricultural Research and Development Institute (CARDI)
World Meteorological Organization (WMO)

Co-ordinated By

The Caribbean Institute for Meteorology and Hydrology

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