

# Establishing Caribbean Drought Early Warning Information Systems (DEWIS)

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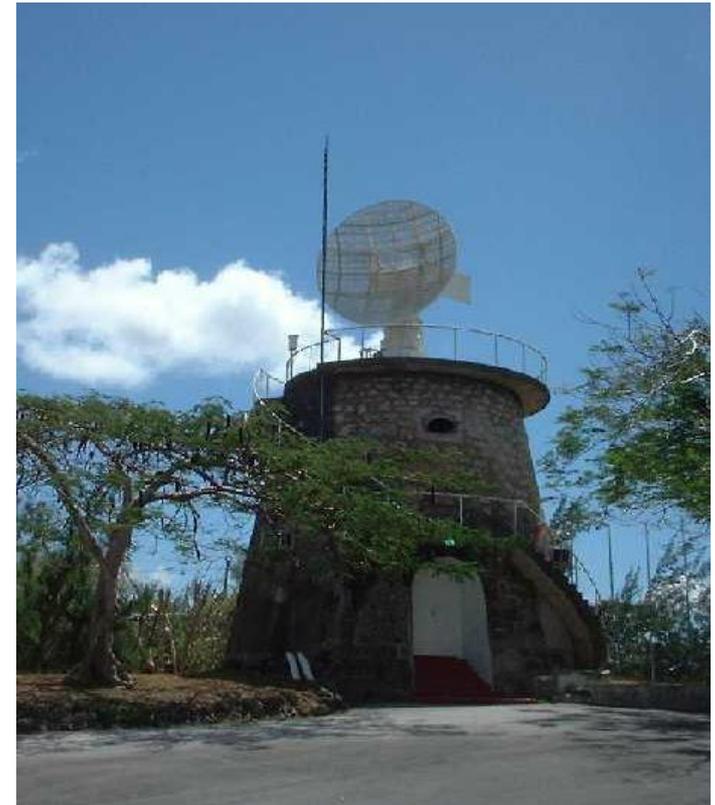
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US Drought Monitor Meeting  
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16-18 April, 2013

# Caribbean Institute for Meteorology and Hydrology

## PRIMARY FUNCTIONS

- Train various categories of meteorological and hydrological personnel
- Operate as a centre of research in meteorology, hydrology and associated sciences
- Data collection, storage, & dissemination
- Maintain, repair, and calibrate meteorological & hydrological instruments
- Advise regional governments on matters related to meteorology & hydrology
- Provide consulting services to industry



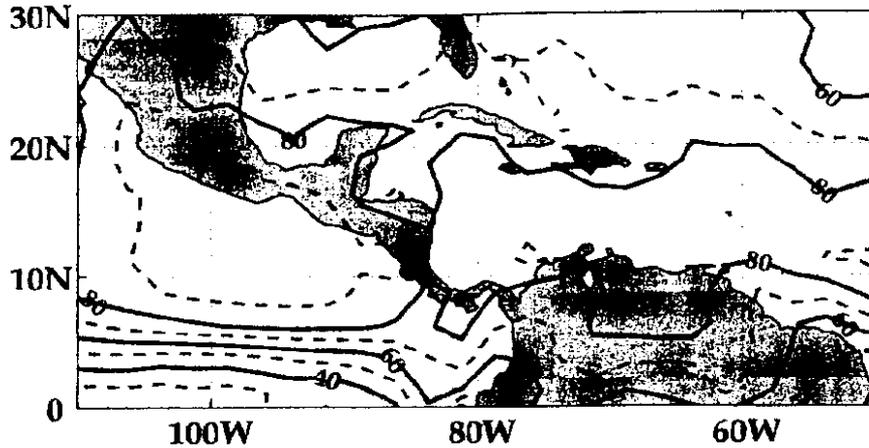
An arm of the  
Caribbean Meteorological  
Organisation

# Rainfall in the Caribbean

- Characterized by a wet and a dry season...
- ...except Guyana to the north with two wet and two dry seasons associated with ITCZ
- At least 70 to over 80 % of the rainfall occurs during the wet season
- Large seasonal, interannual and inter-decadal variability...
- ...associated with ENSO, SST anomalies and NAO
- Rainfall also cyclical – 50 to 60 years

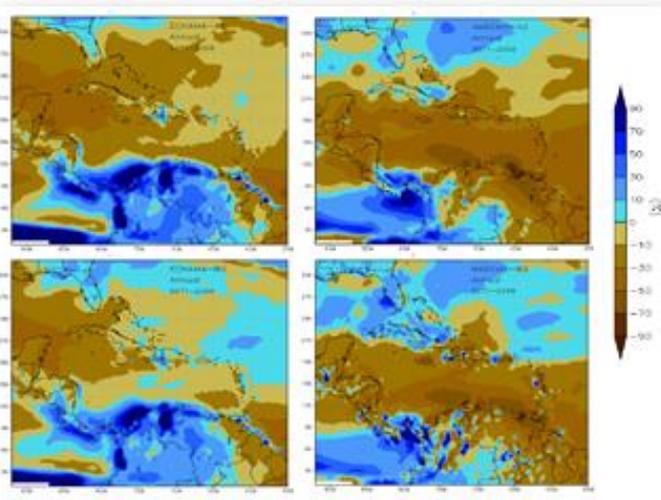
# Why concerns over drought?

Wet Season Rainfall (% of Annual Total)



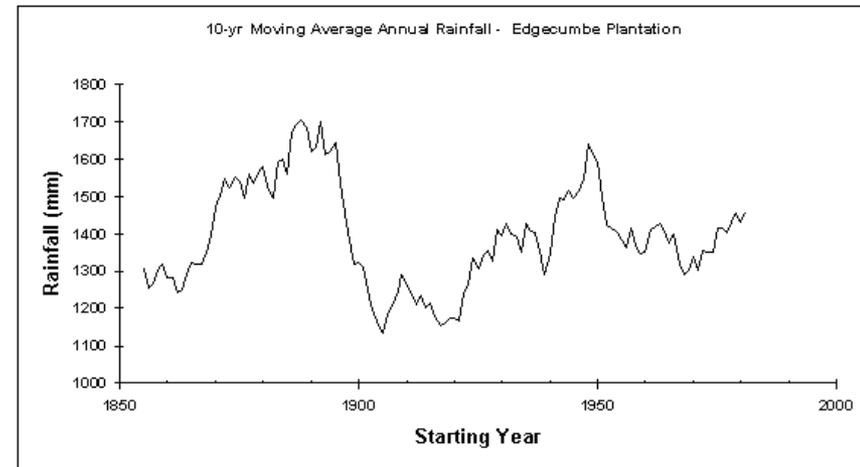
Wet season rainfall as a percentage of annual rainfall (Enfield and Alfaro, 1999).

## Seasonal Impacts



General tendency for drying (main Caribbean basin) by end of the century. Drying between 25% and 30% Possibly wetter far north Caribbean NDJ and FMA. Drying exceeds natural variability June-October – wet season dryer!

Mean changes in the annual rainfall for 2071-2099 with respect to 1961-1989, as simulated by PRECIS\_ECH and PRECIS\_Hed for SRESA2 and SRESB2. CSGM



Moving 10 year averages of rainfall at Edgecumbe, Barbados (Burton 1995).

Impacts potentially more severe during drier phases.

Future dryer regime likely to increase frequency of drought episodes

## Response

# Caribbean Drought and Precipitation Monitoring Network (CDPMN)

- CDPMN launched under Caribbean Water Initiative CARIWIN in January 2009 expected to be fully operational by the end of 2010
- Goal of CARIWIN is to increase the capacity of the Caribbean countries to deliver equitable and sustainable IWRM by
- Implemented jointly by McGill University, CIMH and 3 partner countries (Grenada, Jamaica, Guyana)
- Region was facing drought during latter part of 2009 rainy season due to El Niño – Just months after launch.
- CPDMN – mobilised to provide information and advice to regional governments.

# CDPMN on two scales

- Caribbean Basin Monitoring
- Country-level Monitoring

- **Precipitation status monitored** using a number of indices
- **Final precipitation status determined, by consensus**, by a network of persons from different sectors, institutions and communities embracing the diversity in definitions and impacts of drought
- **Short term and seasonal rainfall forecasts** to provide a projection of future drought (1 - 6 months possible)

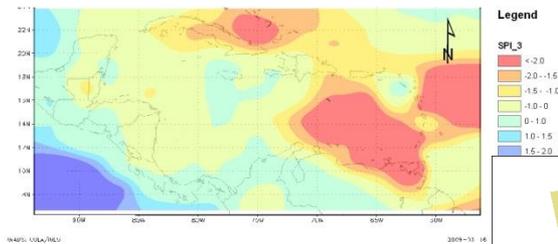
Follow the leader?

USDM

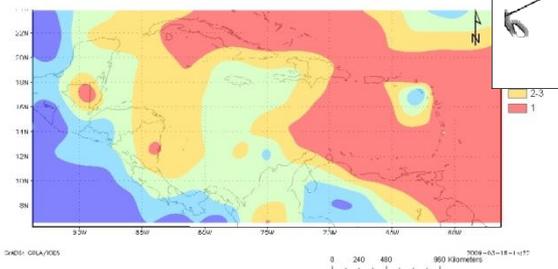
# Caribbean Basin Monitoring

## Caribbean SPI and Deciles

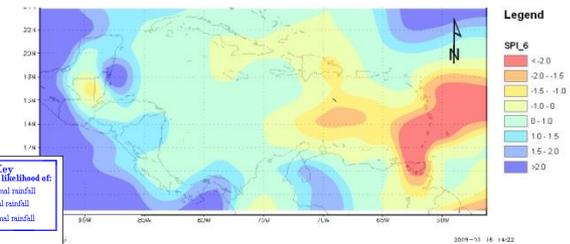
SPI for January to March 2010



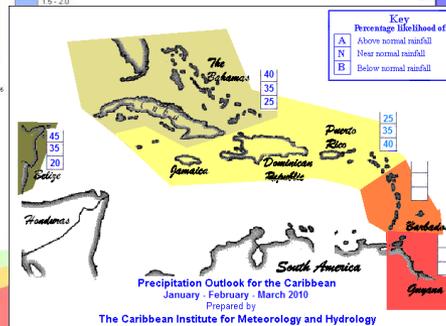
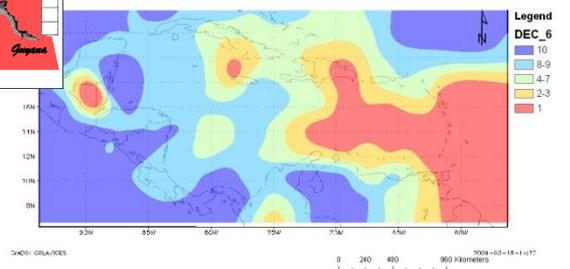
Deciles for January to March 2010



SPI for October 2009 to March 2010



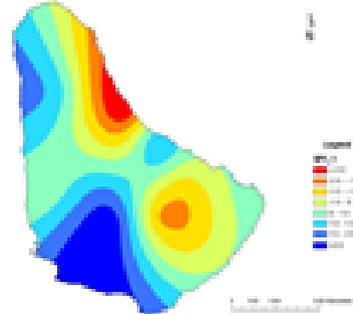
Deciles for October 2009 to March 2010



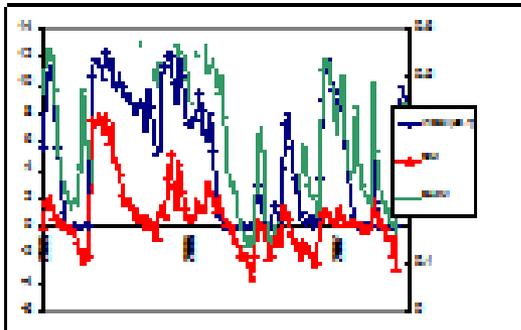
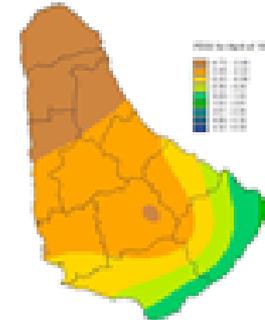
Region dominated by seas surface so rainfall monitoring at this scale

# Country Level Monitoring Examples

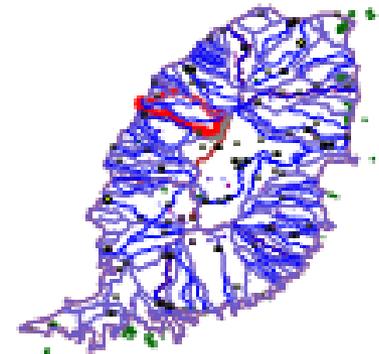
SPI for October 2009 Barbados



Palmer Drought Severity Index, April 1998



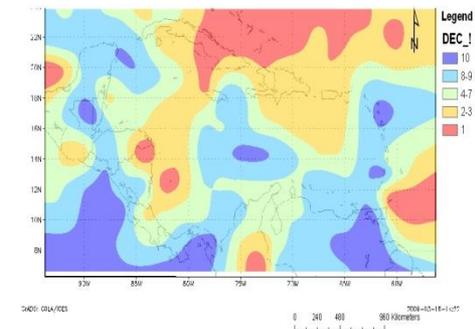
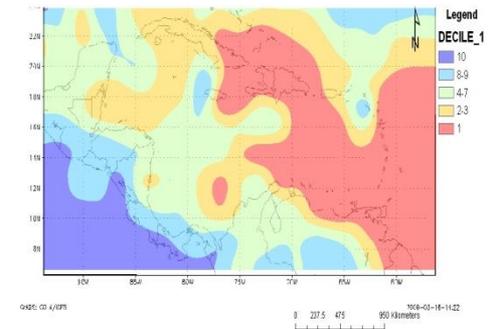
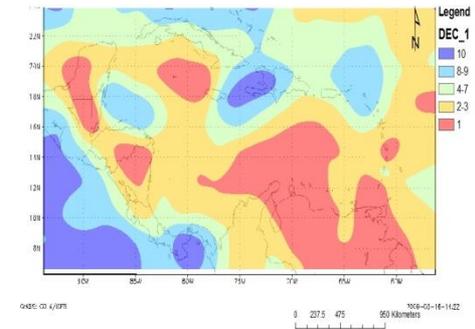
Time series of agricultural drought indicators from January 2006 to June 2007



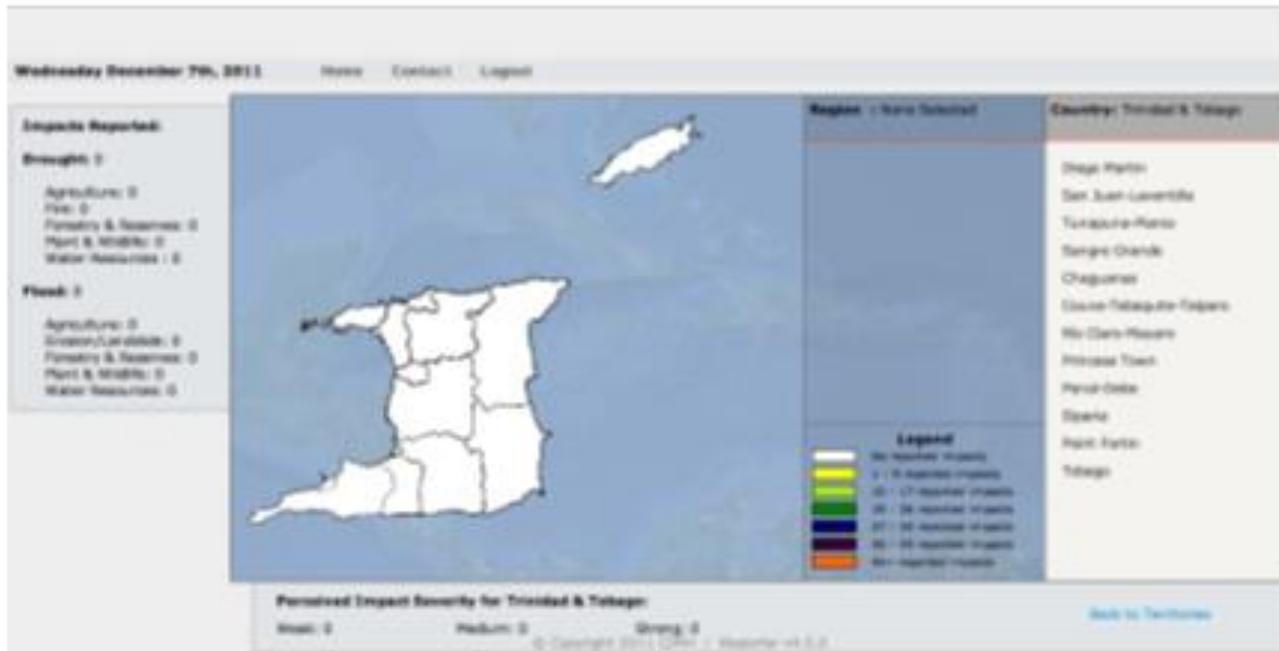
Flow Measurements

# 2009-2010 Drought

- Began during the 2009 rainy season (in particular the month of October)
- Stations in Trinidad, Grenada, St. Vincent, Barbados, St. Lucia, Dominica Jamaica, recorded their lowest ever February rainfall totals
- Stations in Anguilla, Grenada, Trinidad, Dominica and St. Vincent recorded their lowest ever 3 month (January to March)
- Stations recorded their lowest six month (October 2009 to March 2010) totals. These included stations in Tobago, Grenada, Barbados, St. Vincent, St. Lucia and Guyana
- Over 24 years of record at Point Saline Airport in Grenada, 2009 lowest annual total



# Rainfall Impact Reporter Example from Trinidad



**Follow the Leader?  
NIDIS**



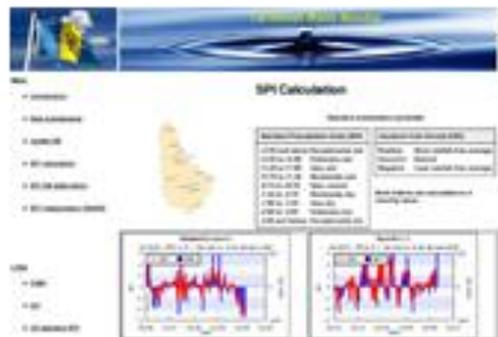
# CARICOM/Brazil programme in DRR

## Drought

- Implemented by CIMH
- Pilot Countries: Grenada, St. Lucia, Jamaica
- Training in drought monitoring and planning (assisted by NDMC)
- Provision of monitoring instruments (illustrative)
- Upgrade of CWM
- Draft Implementation plans for DEWIS (to Cabinet)...
- In the context of a Drought Management framework



# Caribbean Water Monitor



Tool created calculates SPI and Deviation from Normal for any station and time period in its data base. These are automatically graphed.

SPI is also mapped using the open access GIS software Grass. Some tweaking of the software still to be done.



# Framework for National Drought Management

Focus on Drought Early Warning & Information Systems

