Caribbean Drought and Precipitation Monitoring Network (CDPMN)

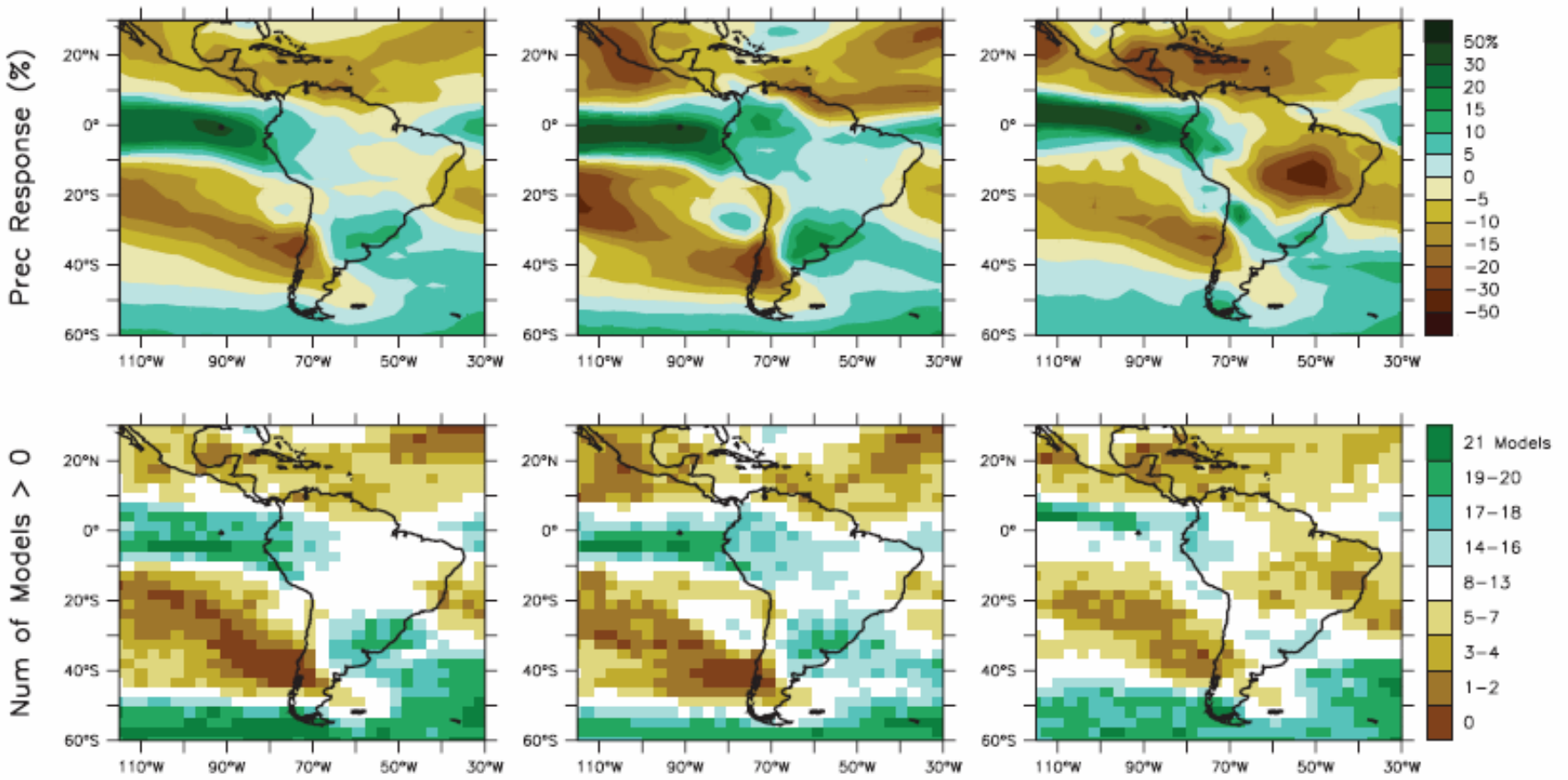
http://www.mcgill.ca/cariwin/2008/cdpmn/

http://www.cimh.edu.bb/precipindex.html

The Caribbean Drought and Precipitation Monitoring Network:

Creating a culture of rainfall monitoring to combat the negative impacts of climate extremes and future climate change

Projected rainfall Decrease by 2099
Major cause for concern



Top row: Fractional change in precipitation DJF and JJA between 1980 to 1999 and 2080 to 2099, averaged over 21 models .
Bottom row: number of models out of 21 that project increases in precipitation.

IPCC, 2007: WG2-AR4


Bryan Mackintosh Jan20th 2005

Caribbean Drought and Precipitation Monitoring Network (CDPMN)

http://www.mcgill.ca/cariwin/2008/cdpmn/

http://www.cimh.edu.bb/precipindex.html

Caribbean Water Initiative (CARIWIN)

- Launched in February 2007
- Implemented jointly by McGill University, CIMH and 3 partner countries (Grenada, Jamaica, Guyana)
- Goal of CARIWIN is to increase the capacity of the Caribbean countries to deliver equitable and sustainable IWRM by
  - Improving the capacity to meet water management needs
  - Integrating IWRM approaches into CIMH
  - Build national capacities of meteorology and hydrology
- CDPMN launched under CARIWIN in January 2009
- CDPMN expected to be fully operational by 2010

http://www.mcgill.ca/cariwin/

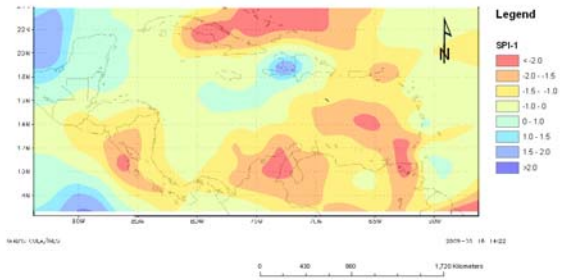
CDPMN on two scales

- Caribbean Basin Monitoring
- Country-level Monitoring

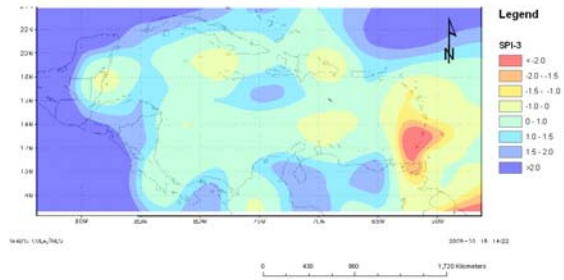
- Precipitation status monitored using a number of indices
- Final precipitation status determined, by consensus, by a network of persons from different sectors, institutions and communities embracing the diversity in definitions and impacts of drought
- Short term and seasonal rainfall forecasts to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

Caribean Basin Monitoring
Caribbean SPI

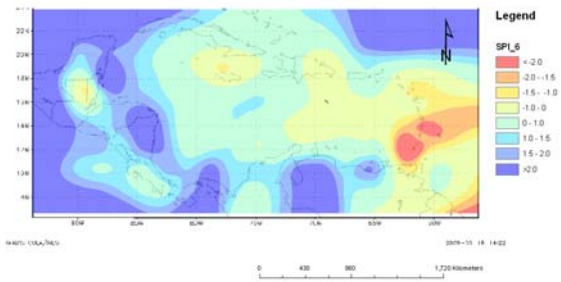
SPI for Janurary 2010



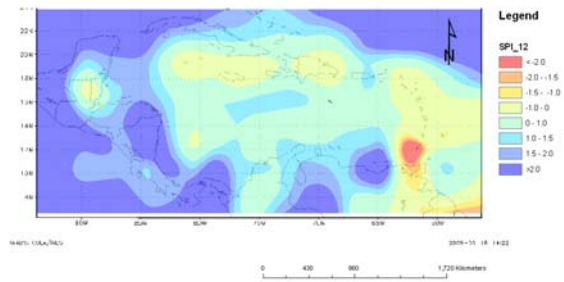
SPI for November 2009 to Janurary 2010



SPI for August 2009 to Janurary 2010

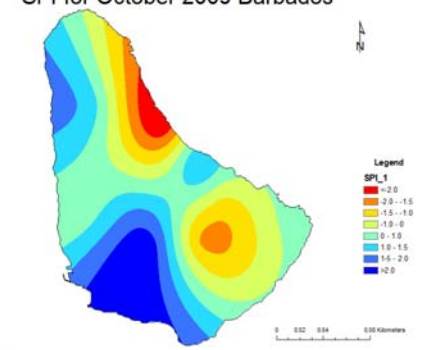


SPI for February 2009 to Janurary 2010

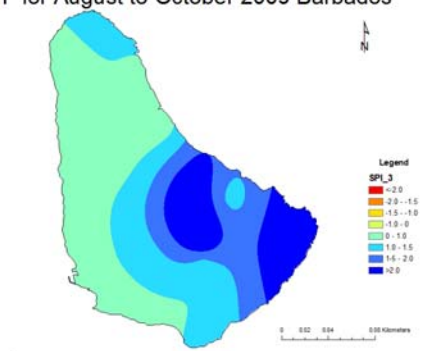


Country Level Monitoring Example from Barbados

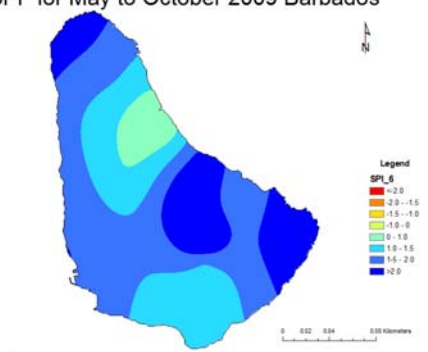
SPI for October 2009 Barbados



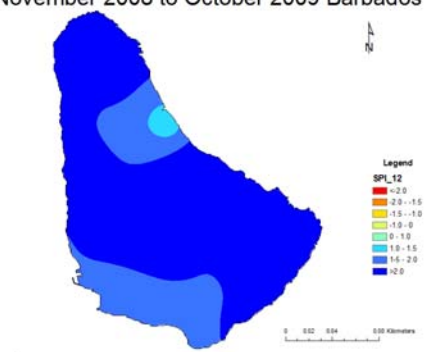
SPI for August to October 2009 Barbados



SPI for May to October 2009 Barbados



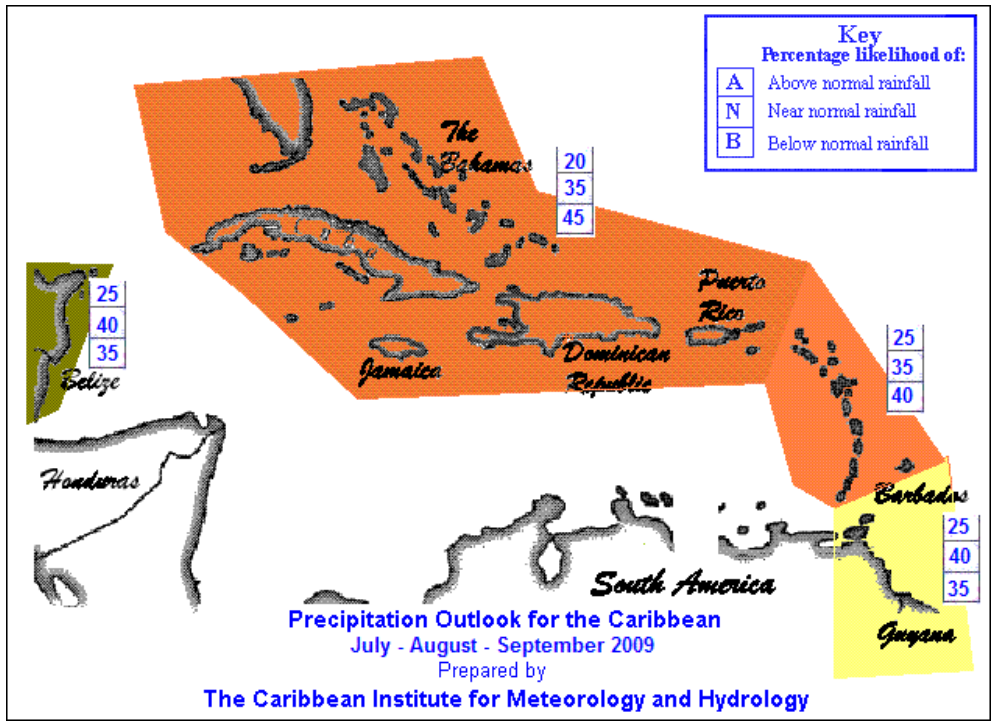
SPI November 2008 to October 2009 Barbados



CDPMN – Being put to the test

- In January 2010 specific drought alerts were issued for Barbados and Grenada with general alert for the southern portion of the eastern Caribbean
- http://www.cimh.edu.bb/bdsalert.pdf
- http://www.cimh.edu.bb/gndalert.pdf

Prediction using Precipitation Outlook for the Caribbean?



Final PO output based on data from several models.

Drought prediction and alerts based on the final output – the PO.

http://www.cimh.edu.bb/curprecip.htm

Outcomes of the CDPMN

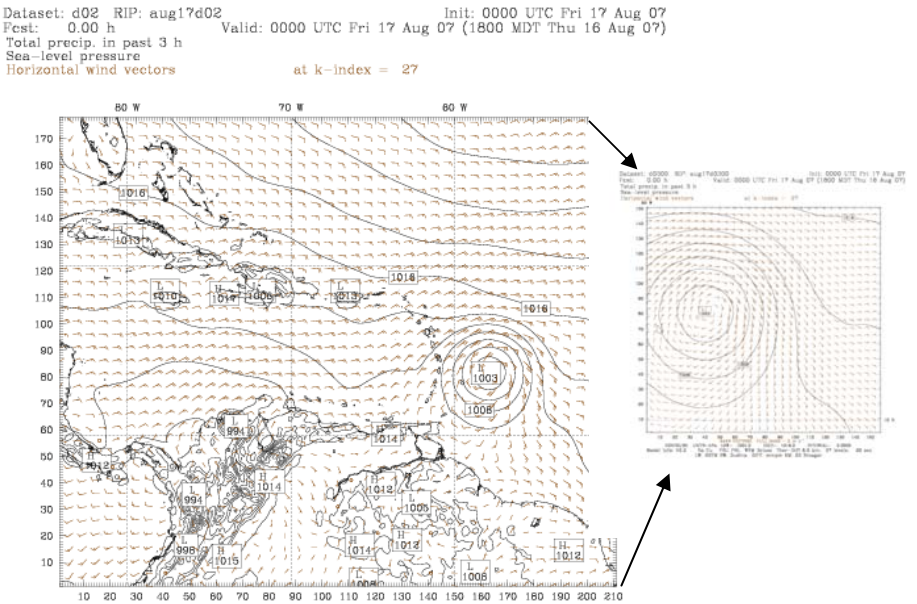
1. Through the hydrometric stations and sensor data, monitor hydrological indicators, climate indicators...
2. Trend analyses of rainfall and temperature
3. Projection of future status (using precipitation forecasts and drought indices
4. Early warning information through CIMH website and networking with key agencies, governments
5. Build adaptation and response strategies to drought and flooding events – collaboration with a network of communities, researchers and decision makers
6. Developing robust drought and flood plans

…**All toward MANAGING RISK**

Improved Flood Forecasting for the Caribbean
Objective

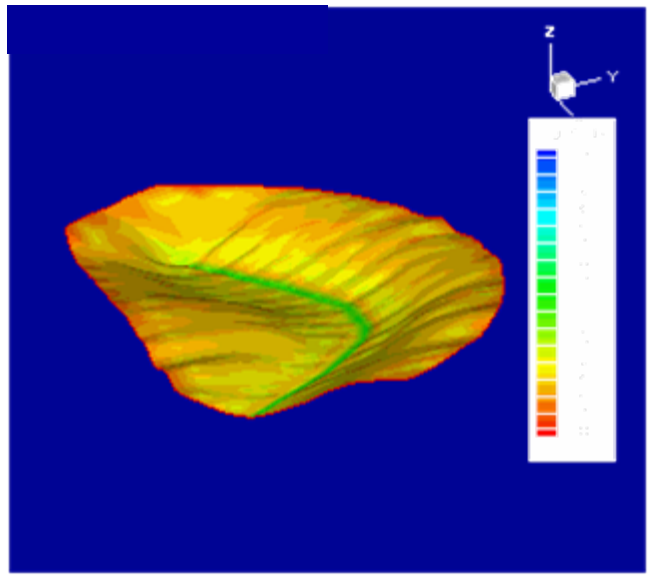
- Integrate precipitation forecasts into a hydrological model
  - Provides an early flood warning system before the precipitation event
  - Leads times of at least two days
  - Forecast updates (weather radar)
  - Water depths simulated throughout catchment
  - Flood extents delineated

The models



Weather Research Forecasting model

- Outputs: atmospheric variables at all levels of the troposphere; the state of the atmosphere at different times in the future
- Forecasting tool:
  - Provides simulations on different spatial scales
  - Real-time forecasting out a fortnight
  - Can be altered to better represent the tropical atmosphere
  - Regional climate scenarios



HydroGeoSphere (Hydrological Model)

- Outputs: Water depths; SW/GW flows; GW saturations; Concentrations
- Water resources management tool
  - Flood forecasting
  - Simulate impact of contaminant transport
  - Simulate climate change scenarios scenarios
  - Real time monitoring