

National Monitoring

Anthony Moore (CIMH)

Caribbean Basin Monitoring

Mainly Sea Surface

Use of Precipitation Indices

Country Level Monitoring

Can combine non precipitation data

Soil Moisture

Stream Flow

Reservoir levels

Vegetation

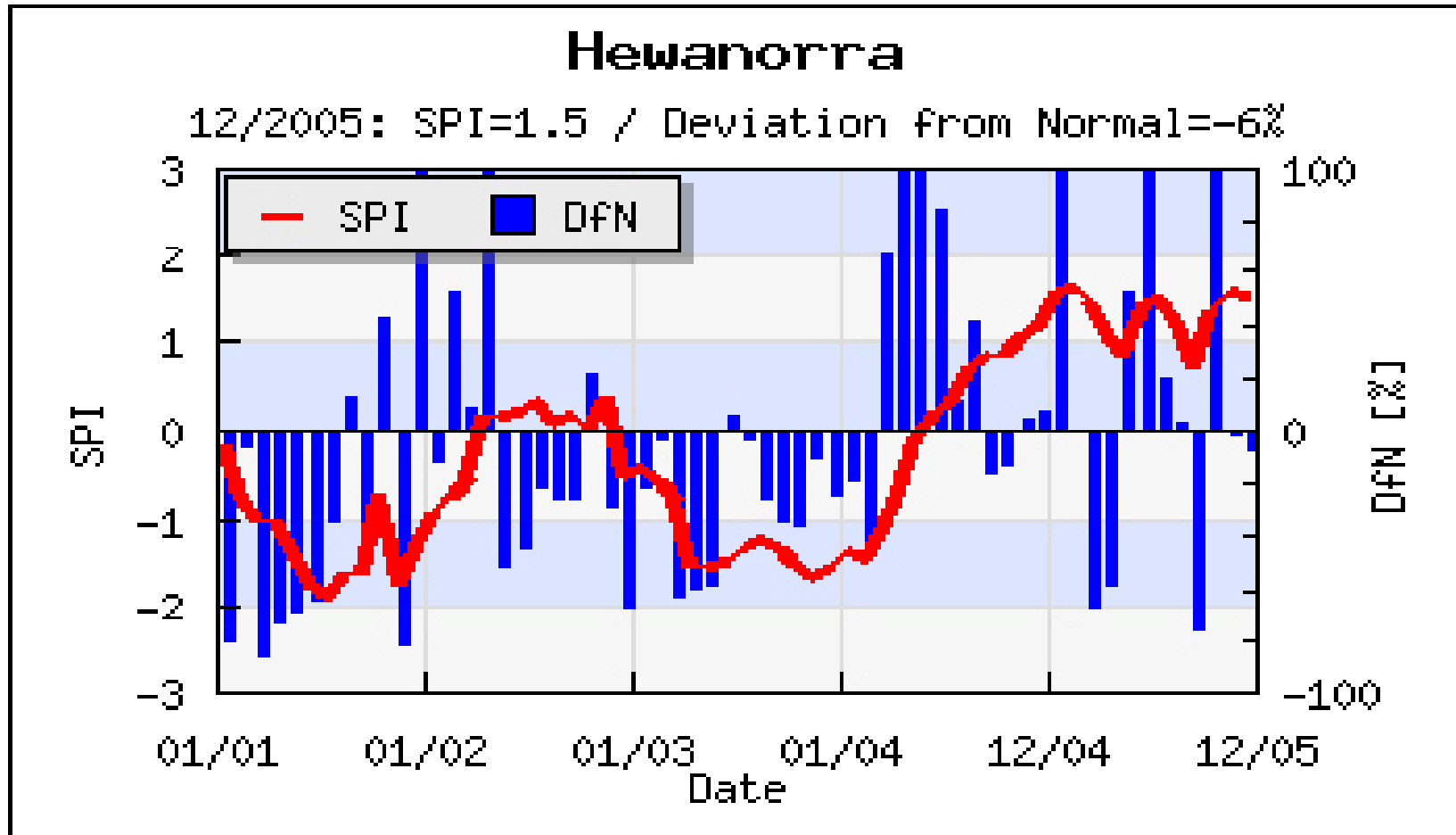
Cooperation with
Institute of Earth Sciences
Professional School of Southern Switzerland
(SUPSI)

- Climate change in the Caribbean –
Development of monitoring tools for water
resources
- Caribbean Water Monitor: Small Island
States, Water Resources and Climate
Change
- FEASIBILITY STUDY

The Project

- Four nations chosen initially
- St. Kitts and Nevis, Antigua and Barbuda, **Barbados**, Trinidad and Tobago
- Will select any two of the four nations
- Collection, validation and analysis of historical data
- Application of Water Resources Indices

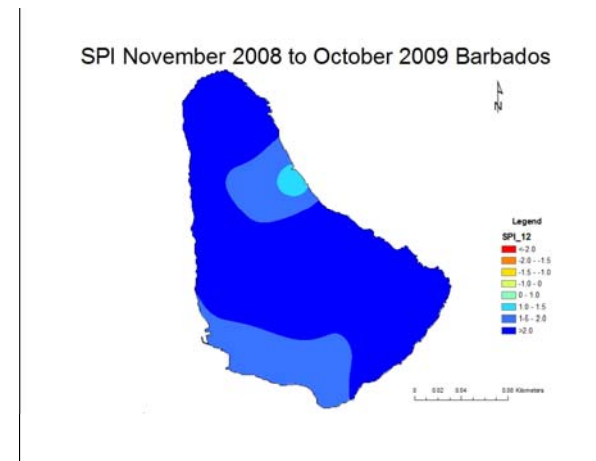
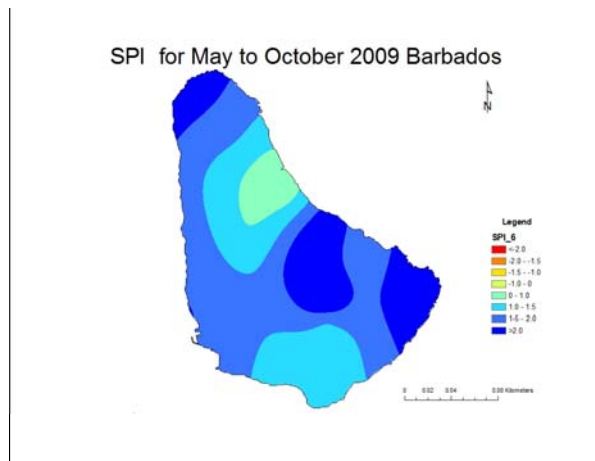
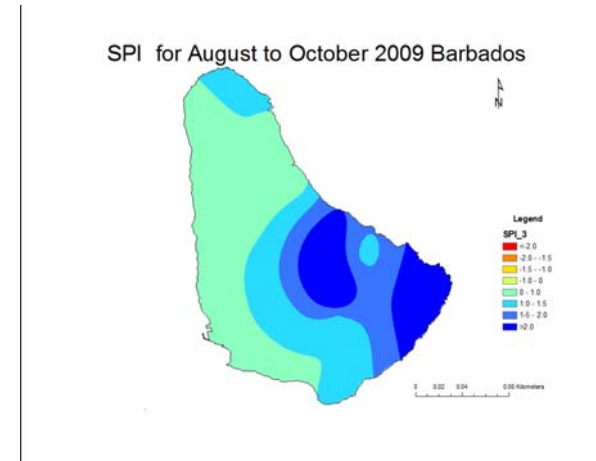
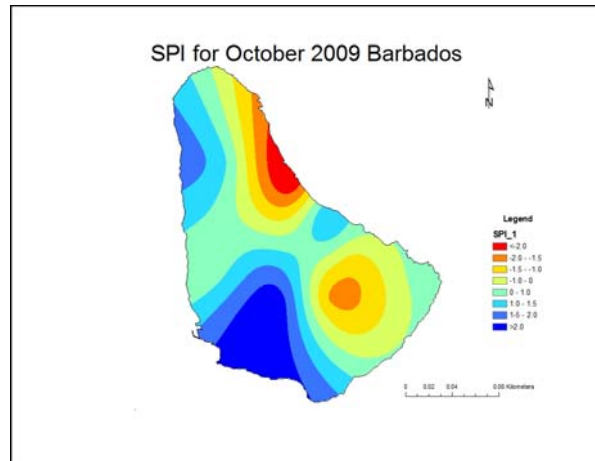
St Lucia



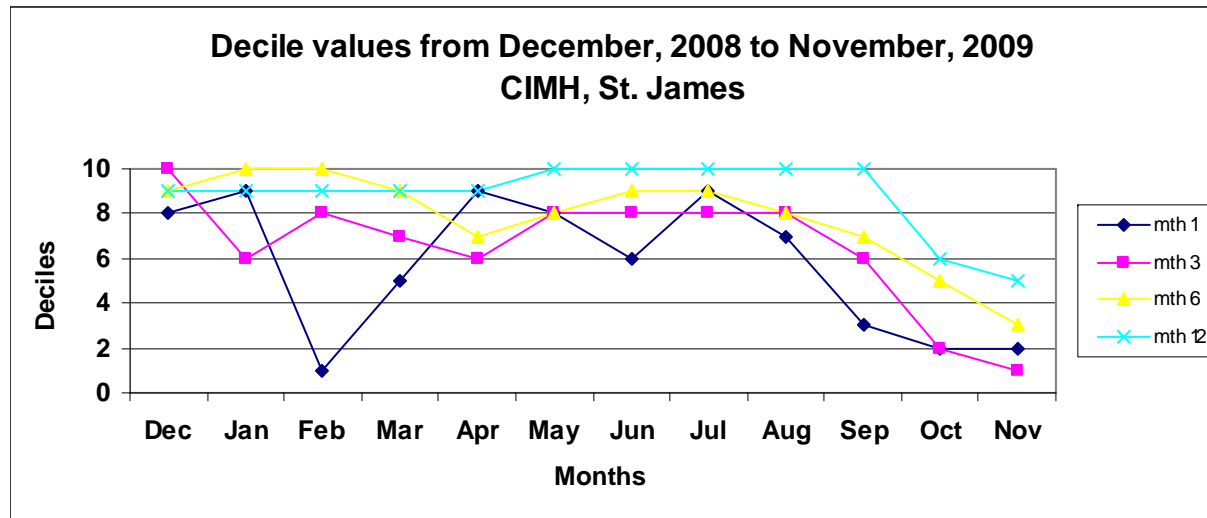
Meteorological drought indicators

- Deciles of precipitation
- Precipitation departures from normal
- Palmer drought severity index (PDSI)
- Standardized precipitation index (SPI)

SPI October 2009



Decile graph



Palmer Drought Severity Index

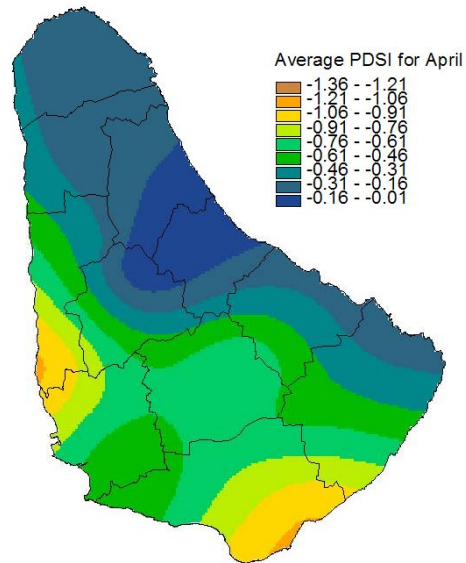
- Responds to weather conditions that have been abnormally wet or abnormally dry
- Based on precipitation, temperature and available water content (AWC)
- All basic terms of the water balance equation can be determined, evaporation, soil recharge, runoff and moisture loss from surface layer

PDSI Classifications

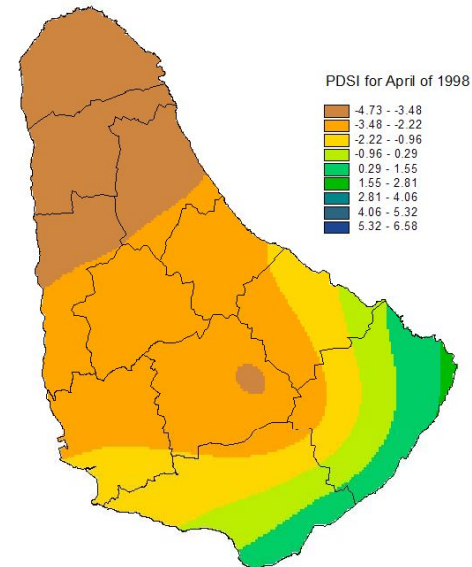
4.0 or more	Extremely wet		-0.5 to -0.99	Incipient dry spell
3.0 to 3.99	Very wet		-1.0 to -1.99	Mild drought
2.0 to 2.99	Moderately wet		-2.0 to -2.99	Moderate drought
1.0 to 1.99	Slightly wet		-3.0 to -3.99	Severe drought
0.5 to 0.99	Incipient wet spell		-4.0 or less	Extreme drought
0.49 to -0.49	Near normal			

Source: <http://drought.unl.edu/whatis/indices.htm#cmi>

(a)



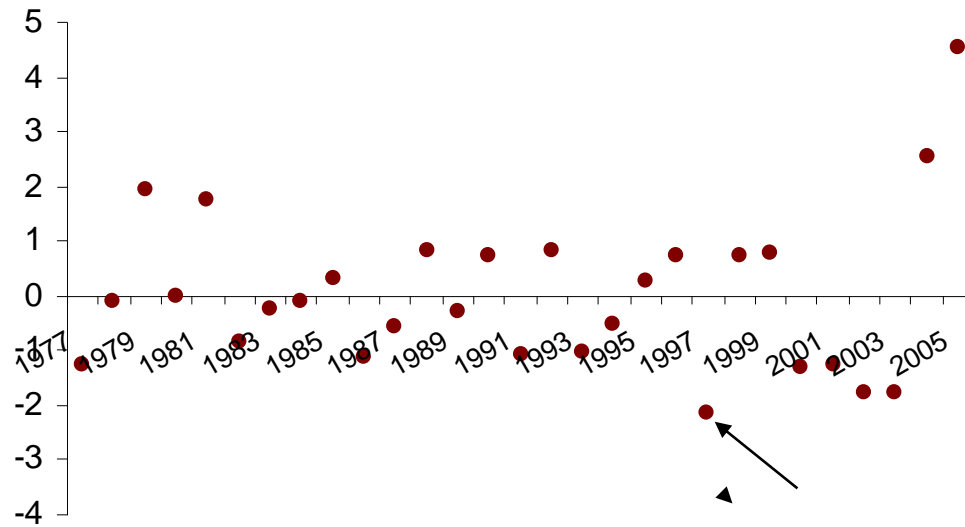
(b)



(a) Mean PDSI values for April and (b) PDSI for April 1998

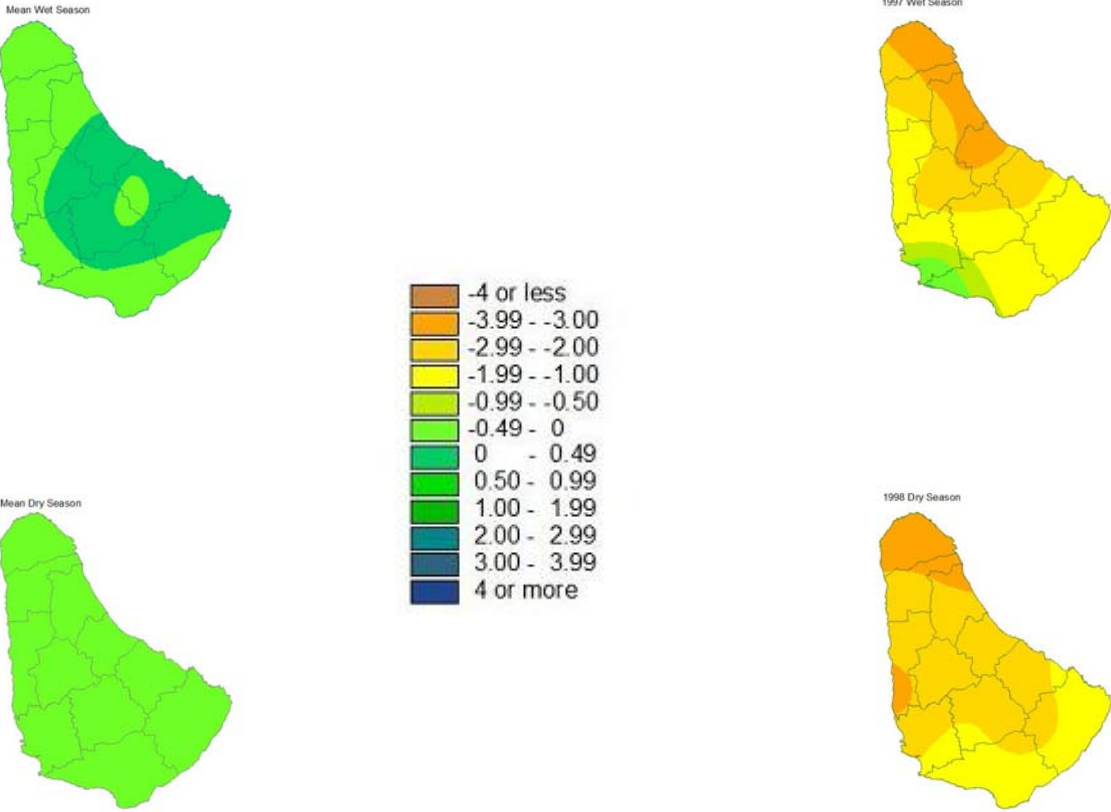
Note the lower PDSI values in the El Niño year, 1998.

PDSI Series during the Wet Season



Note the wet season monthly average for 1998, an El Niño year. It suggests a moderate agricultural drought - in the wet season!

Mean and 1997 Wet Season PDSI maps (top) and Mean and 1998 Dry season PDSI maps (bottom) for Barbados.



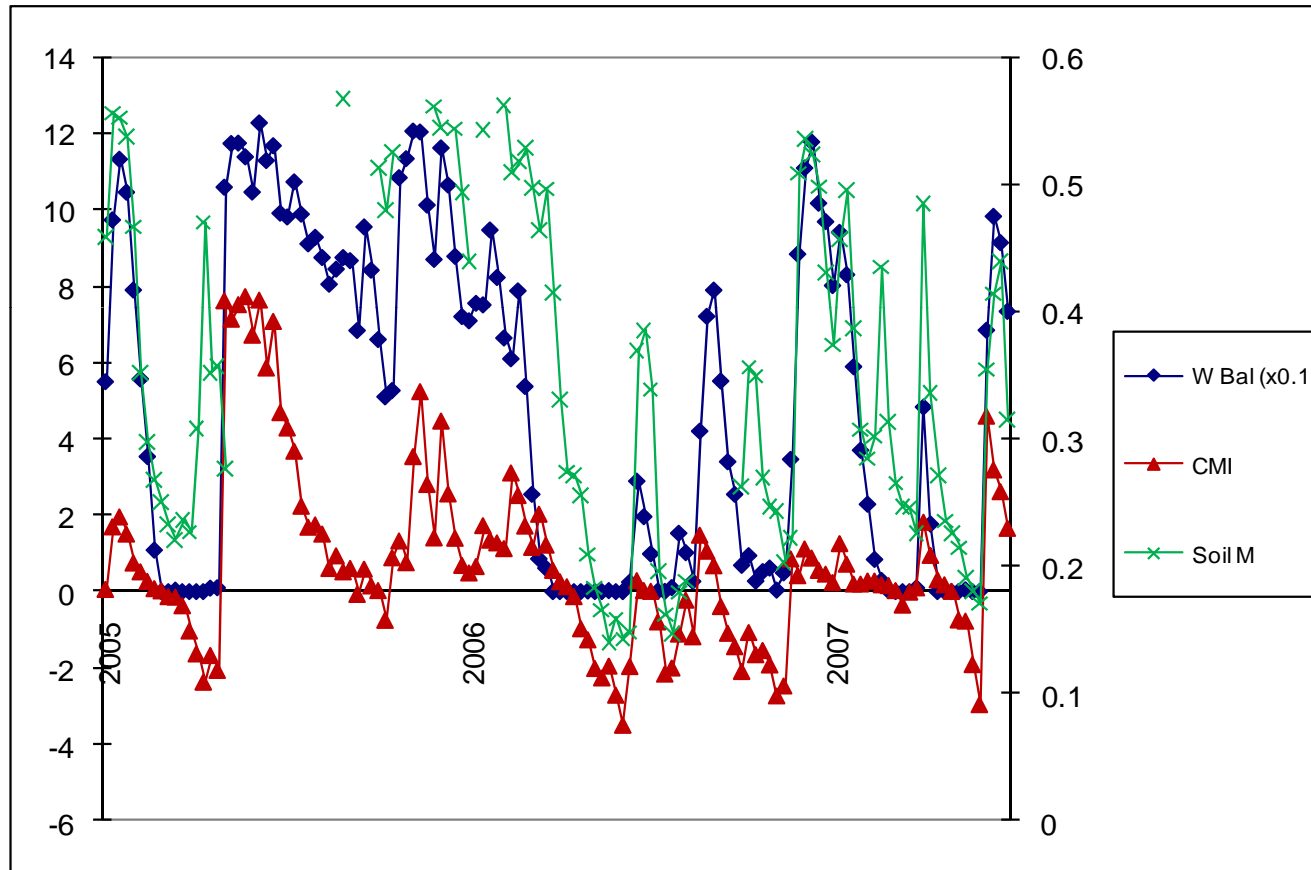
Agricultural drought indicators

- Aridity index
- Moisture adequacy index
- Crop moisture index
- Crop water stress index

Crop Moisture Index

- Uses a meteorological approach to evaluate short term moisture conditions across major crop producing regions
- Identifies potential agricultural drought
- Not a good long term drought monitoring tool

CMI Appropriate for Agricultural Drought?



Time series of agricultural drought indicators from January 2005 to June 2007.

Hydrological drought indicators

- Standardized water level index
- Surface water supply index
- Reclamation drought index

THANK YOU