Caribbean Climate Outlook Forum (CariCOF) Products and Procedures

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CARIBBEAN INSTITUTE FOR METEOROLOGY AND HYDROLOGY

First WMO Workshop on Operational Climate Prediction

7-9 November, 2015

Pune, India

The Caribbean Institute for Meteorology and Hydrology: MANDATE

"... to assist in improving and developing the Meteorological and Hydrological Services as well as providing the awareness of the benefits of Meteorology and Hydrology for the economic well-being of the CIMH member states. This is ***achieved through training, research, investigations and the provision of related specialized services and advice***".

Functions of the Caribbean Institute for Meteorology & Hydrology

- WMO Regional Training Centre – meteorology, hydrology and associated sciences
- Operate as a centre of research in meteorology, hydrology and associated sciences
- Regional Climate Data Centre - Data collection, storage, & dissemination
- Regional Instrument Centre – Develop, maintain, repair, and calibrate meteorological & hydrological instruments
- Regional Centre of Excellence for Satellite Meteorology
- More recently Caribbean Centre for Climate and Environmental Simulations
- Advisor to regional governments on matters related to meteorology, climate & hydrology
- Provide specialized services to industry
- WMO Regional Climate Centre (Demonstration Phase) – a natural extension in function rcc.cimh.edu.bb

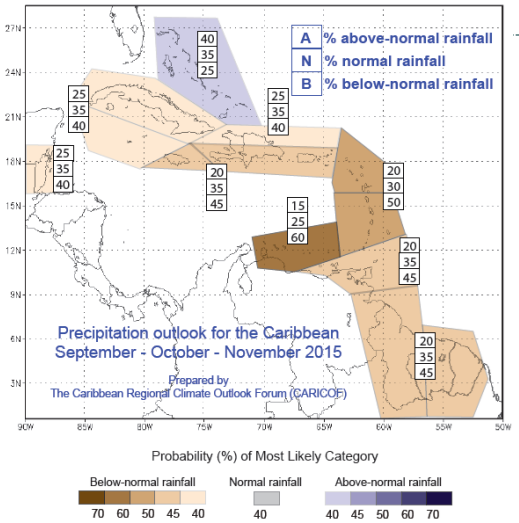
An arm of the Caribbean Meteorological Organisation (CMO) and an organisation of the Caribbean Community (CARICOM)

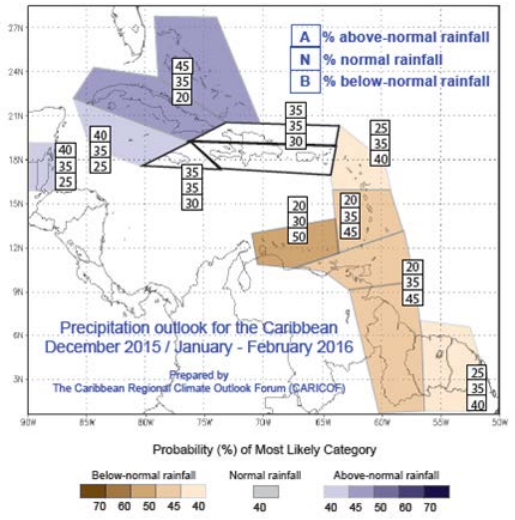
Sixteen Member States

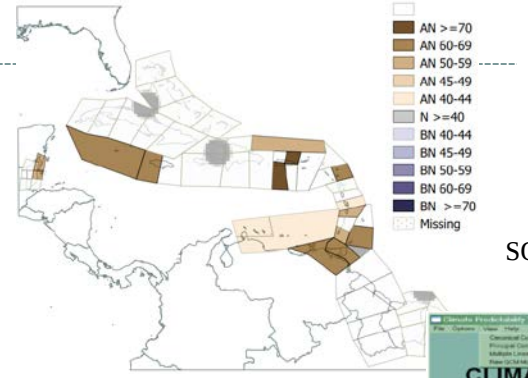
Caribbean Meteorological Organization Member States

Long-Range Forecasts – Consensus-based

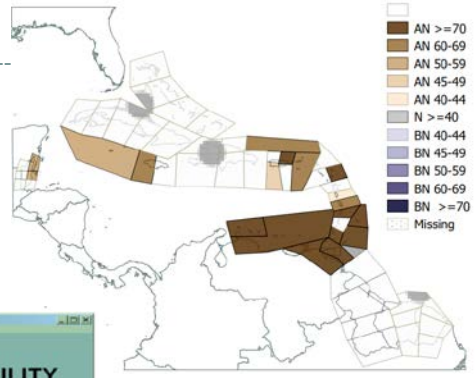
Through the CariCOF- forum of meteorologists/climatologists

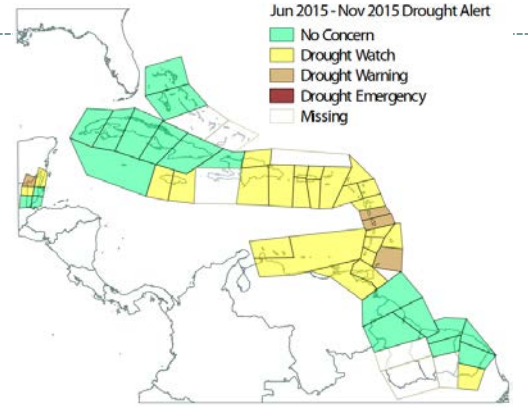


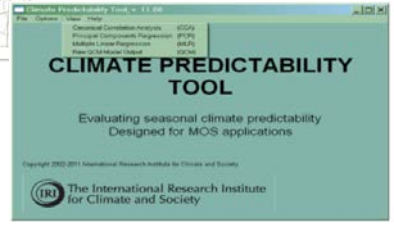


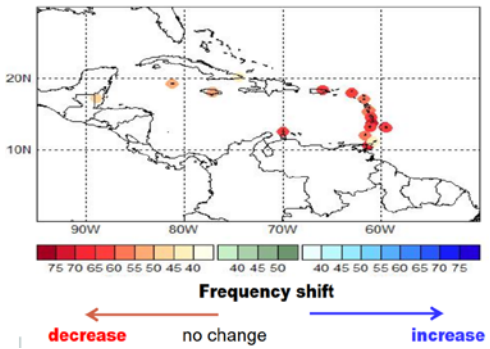


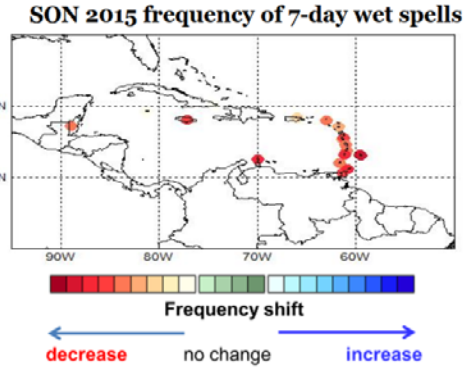
Max Temp
SON; DJF 2015



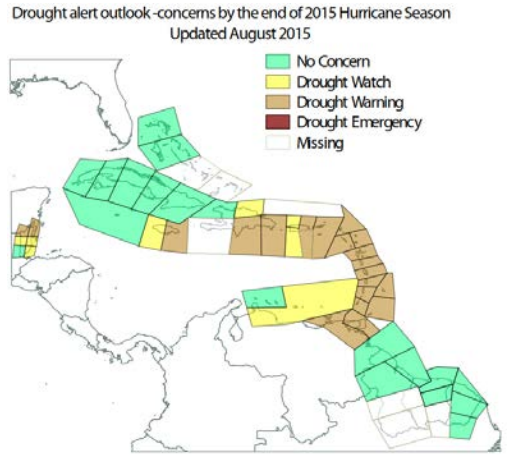


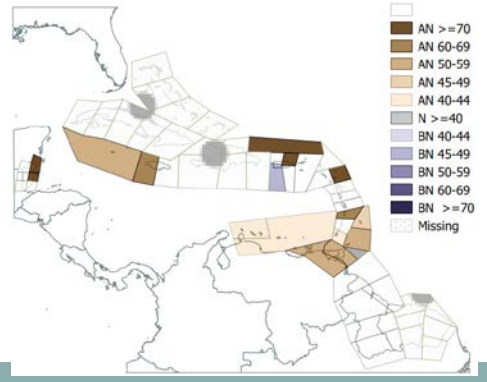




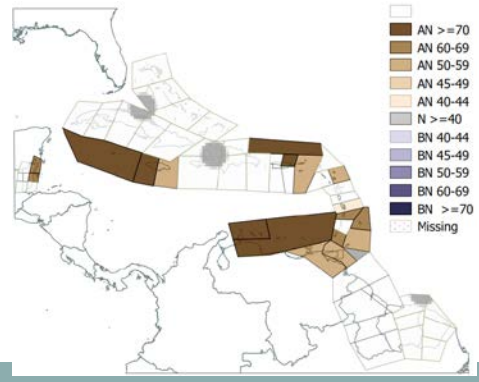


Future
Heat Waves
Flood Potential
Outlooks
Dynamic Model(s)





Min Temp
SON; DJF 2015



CCA experiments (at end of August)

example from zero month lead time

1) Predictor is observed SST over the tropical Atlantic and Pacific over July (data source: NOAA ERSSTv3b, obtained from the IRI data library)
2) Predictor is observed SST over the tropical North Atlantic over July
3) Predictor is predicted SST over the tropical Atlantic and Pacific over SON (data source: NOAA CPC CFSv2 , July initialisation)
4) Predictor is predicted SST over the tropical North Atlantic
5) Predictor is predicted rainfall totals over the Caribbean (data source: ECHAM4.5 ensemble24, obtained from the IRI data library)

example from three month lead time

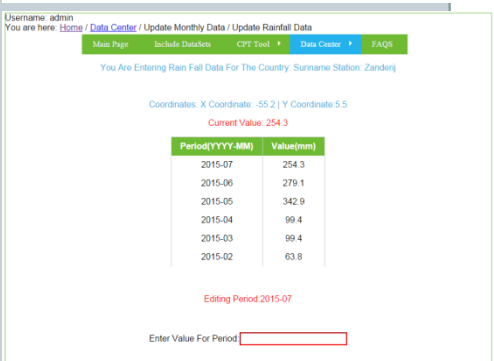
1) Predictor is observed SST over the tropical Atlantic and Pacific over Aug(data source: NOAA ERSSTv3b, obtained from theIRI data library)
2) Predictor is predicted SST over the tropical Atlantic and Pacific over JFM (data source: NOAA CPCFSv2,Sep(initialisation)

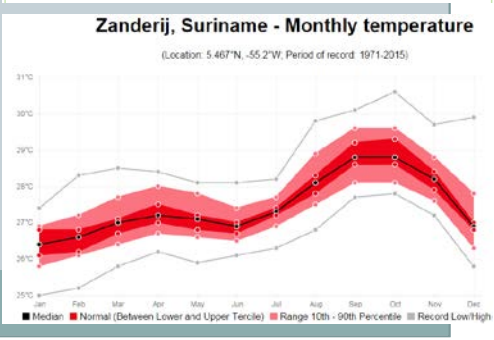
Besides the major control of ENSO (here represented by Pacific tropical SST anomalies) and tropical north Atlantic SSTs on Caribbean rainfall variability, these experiments take the contrast between Pacific and Caribbean/trop. N Atlantic SSTs into account, as those factors are regarded as the most important drivers of rainfall throughout the Caribbean. With CAROGEN more experiements possible, particularly for 3 month lead.

Automation of CariCOF monthly seasonal outlooks

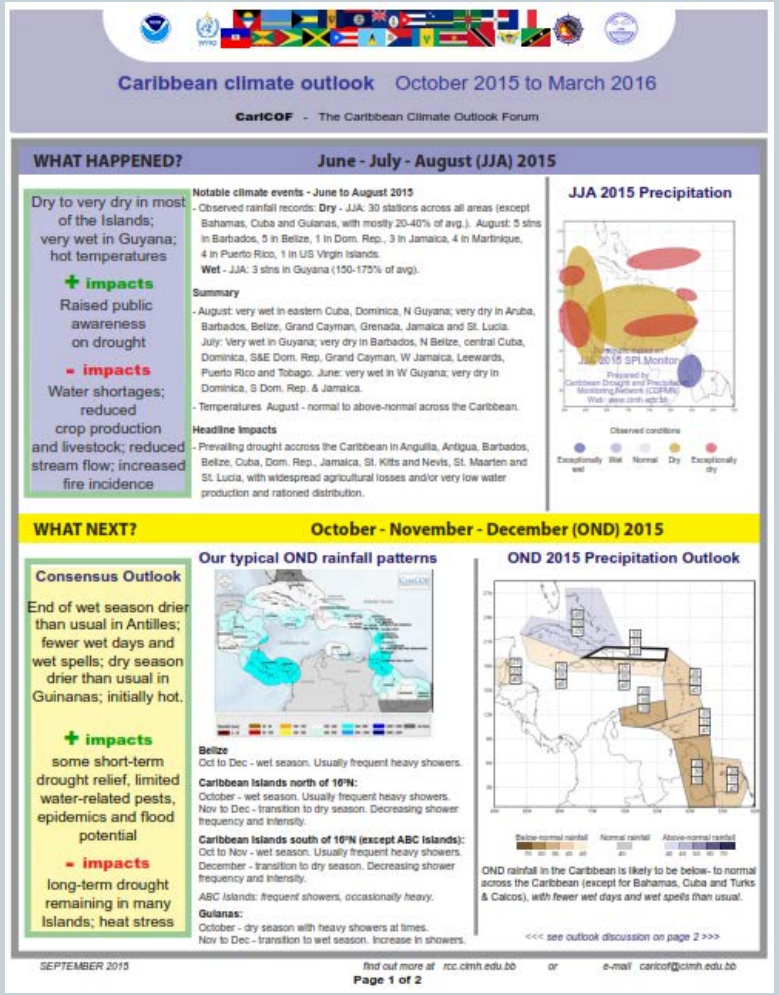
CariCOF Outlook Generator - CAROGEN

- Web based software which requires login details.
- A means of efficiently submitting monthly CariCOF climate data.
- Houses CariCOF climate data in an online centralised database which can be queried for climate information or graphs.
- Allows for the efficient means of generating and delivering CariCOF (regional) climate outlooks and, the national climate outlooks among the CariCOF participating countries.
- Allows online submission of ensembles of CCA experiments to be processed with predefined predictor sets in the Climate Predictability Tool (CPT) Linux version.
- Maps ensemble mean of CariCOF regional forecasts where station output is aggregated into a fixed set of adjoined polygons.





CariCOF Newsletter



Caribbean climate outlook October 2015 to March 2016

CariCOF - The Caribbean Climate Outlook Forum

WHAT HAPPENED? June - July - August (JJA) 2015

Dry to very dry in most of the Islands; very wet in Guyana; hot temperatures

+ impacts
Raised public awareness on drought

- impacts
Water shortages; reduced crop production and livestock; reduced stream flow; increased fire incidence

Notable climate events - June to August 2015
- Observed rainfall records: **Dry** - JJA: 30 stations across all areas (except Bahamas, Cuba and Guianas, with mostly 20-40% of avg.). August: 5 stns in Barbados, 5 in Belize, 1 in Dom. Rep., 3 in Jamaica, 4 in Martinique, 4 in Puerto Rico, 1 in US Virgin Islands.
Wet - JJA: 3 stns in Guyana (150-175% of avg).

Summary
- August: very wet in eastern Cuba, Dominica, N Guyana; very dry in Aruba, Barbados, Belize, Grand Cayman, Grenada, Jamaica and St. Lucia.
July: Very wet in Guyana; very dry in Barbados, N Belize, central Cuba, Dominica, S&E Dom. Rep, Grand Cayman, W Jamaica, Leewards, Puerto Rico and Tobago. *June*: very wet in W Guyana; very dry in Dominica, S Dom. Rep. & Jamaica.
- Temperatures August - normal to above-normal across the Caribbean.

Headline Impacts
- Prevailing drought accross the Caribbean in Anguilla, Antigua, Barbados, Belize, Cuba, Dom. Rep., Jamaica, St. Kitts and Nevis, St. Maarten and St. Lucia, with widespread agricultural losses and/or very low water production and rationed distribution.

JJA 2015 Precipitation

WHAT NEXT? October - November - December (OND) 2015

Consensus Outlook

End of wet season drier than usual in Antilles; fewer wet days and wet spells; dry season drier than usual in Guinanas; initially hot.

+ impacts
some short-term drought relief, limited water-related pests, epidemics and flood potential

- impacts
long-term drought remaining in many Islands; heat stress

Our typical OND rainfall patterns

Belize
Oct to Dec - wet season. Usually frequent heavy showers.

Caribbean Islands north of 16°N:
October - wet season. Usually frequent heavy showers.
Nov to Dec - transition to dry season. Decreasing shower frequency and intensity.

Caribbean Islands south of 16°N (except ABC Islands):
Oct to Nov - wet season. Usually frequent heavy showers.
December - transition to dry season. Decreasing shower frequency and intensity.

ABC Islands: frequent showers, occasionally heavy.

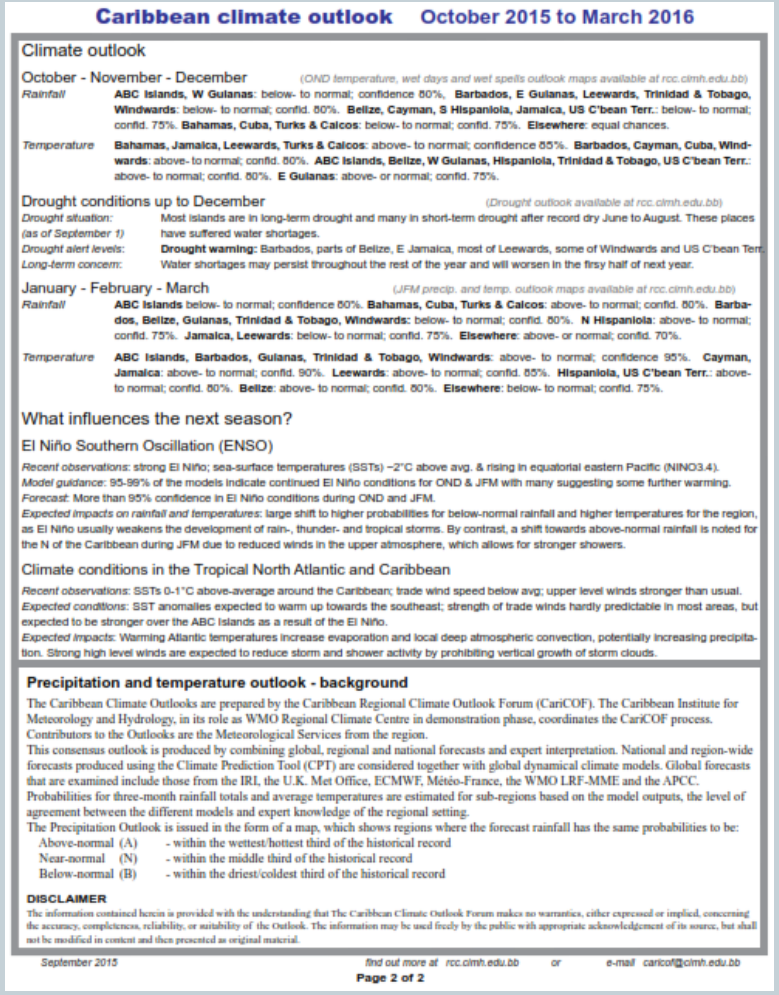
Guianas:
October - dry season with heavy showers at times.
Nov to Dec - transition to wet season. Increase in showers.

OND 2015 Precipitation Outlook

OND rainfall in the Caribbean is likely to be below- to normal across the Caribbean (except for Bahamas, Cuba and Turks & Calcos), *with fewer wet days and wet spells than usual.*

<<< see outlook discussion on page 2 >>>

Updated Monthly



Caribbean climate outlook October 2015 to March 2016

Climate outlook

October - November - December *(OND temperature, wet days and wet spells outlook maps available at rcc.cimh.edu.bb)*

Rainfall: **ABC Islands, W Guianas**: below- to normal; confidence 60%. **Barbados, E Guianas, Leewards, Trinidad & Tobago, Windwards**: below- to normal; confid. 60%. **Belize, Cayman, S Hispaniola, Jamaica, US C'bean Terr.**: below- to normal; confid. 75%. **Bahamas, Cuba, Turks & Calcos**: below- to normal; confid. 75%. **Elsewhere**: equal chances.

Temperature: **Bahamas, Jamaica, Leewards, Turks & Calcos**: above- to normal; confidence 65%. **Barbados, Cayman, Cuba, Windwards**: above- to normal; confid. 60%. **ABC Islands, Belize, W Guianas, Hispaniola, Trinidad & Tobago, US C'bean Terr.**: above- to normal; confid. 60%. **E Guianas**: above- or normal; confid. 75%.

Drought conditions up to December *(Drought outlook available at rcc.cimh.edu.bb)*

Drought situation (as of September 1): Most Islands are in long-term drought and many in short-term drought after record dry June to August. These places have suffered water shortages.

Drought alert levels: **Drought warning:** Barbados, parts of Belize, E Jamaica, most of Leewards, some of Windwards and US C'bean Terr.

Long-term concern: Water shortages may persist throughout the rest of the year and will worsen in the firsy half of next year.

January - February - March *(JFM precip. and temp. outlook maps available at rcc.cimh.edu.bb)*

Rainfall: **ABC Islands** below- to normal; confidence 60%. **Bahamas, Cuba, Turks & Calcos**: above- to normal; confid. 60%. **Barbados, Belize, Guianas, Trinidad & Tobago, Windwards:** below- to normal; confid. 60%. **N Hispaniola**: above- to normal; confid. 75%. **Jamaica, Leewards**: below- to normal; confid. 75%. **Elsewhere**: above- or normal; confid. 70%.

Temperature: **ABC Islands, Barbados, Guianas, Trinidad & Tobago, Windwards**: above- to normal; confidence 95%. **Cayman, Jamaica**: above- to normal; confid. 90%. **Leewards**: above- to normal; confid. 65%. **Hispaniola, US C'bean Terr.**: above- to normal; confid. 60%. **Belize**: above- to normal; confid. 60%. **Elsewhere**: below- to normal; confid. 75%.

What influences the next season?

El Niño Southern Oscillation (ENSO)

Recent observations: strong El Niño; sea-surface temperatures (SSTs) ~2°C above avg. & rising in equatorial eastern Pacific (NINO3.4).
Model guidance: 95-99% of the models indicate continued El Niño conditions for OND & JFM with many suggesting some further warming.
Forecast: More than 95% confidence in El Niño conditions during OND and JFM.
Expected impacts on rainfall and temperatures: large shift to higher probabilities for below-normal rainfall and higher temperatures for the region, as El Niño usually weakens the development of rain-, thunder- and tropical storms. By contrast, a shift towards above-normal rainfall is noted for the N of the Caribbean during JFM due to reduced winds in the upper atmosphere, which allows for stronger showers.

Climate conditions in the Tropical North Atlantic and Caribbean

Recent observations: SSTs 0-1°C above-average around the Caribbean; trade wind speed below avg; upper level winds stronger than usual.
Expected conditions: SST anomalies expected to warm up towards the southeast; strength of trade winds hardly predictable in most areas, but expected to be stronger over the ABC Islands as a result of the El Niño.
Expected impacts: Warming Atlantic temperatures increase evaporation and local deep atmospheric convection, potentially increasing precipitation. Strong high level winds are expected to reduce storm and shower activity by prohibiting vertical growth of storm clouds.

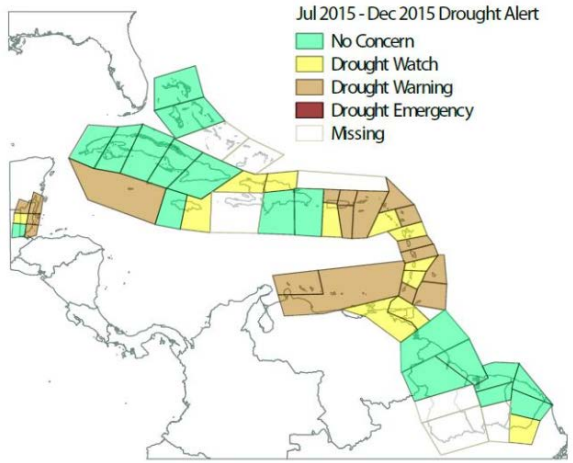
Precipitation and temperature outlook - background

The Caribbean Climate Outlooks are prepared by the Caribbean Regional Climate Outlook Forum (CariCOF). The Caribbean Institute for Meteorology and Hydrology, in its role as WMO Regional Climate Centre in demonstration phase, coordinates the CariCOF process. Contributors to the Outlooks are the Meteorological Services from the region.
This consensus outlook is produced by combining global, regional and national forecasts and expert interpretation. National and region-wide forecasts produced using the Climate Prediction Tool (CPT) are considered together with global dynamical climate models. Global forecasts that are examined include those from the IRI, the U.K. Met Office, ECMWF, Météo-France, the WMO LRF-MME and the APCC.
Probabilities for three-month rainfall totals and average temperatures are estimated for sub-regions based on the model outputs, the level of agreement between the different models and expert knowledge of the regional setting.
The Precipitation Outlook is issued in the form of a map, which shows regions where the forecast rainfall has the same probabilities to be:

Above-normal (A)	- within the wettest/hottest third of the historical record
Near-normal (N)	- within the middle third of the historical record
Below-normal (B)	- within the driest/coldest third of the historical record

DISCLAIMER

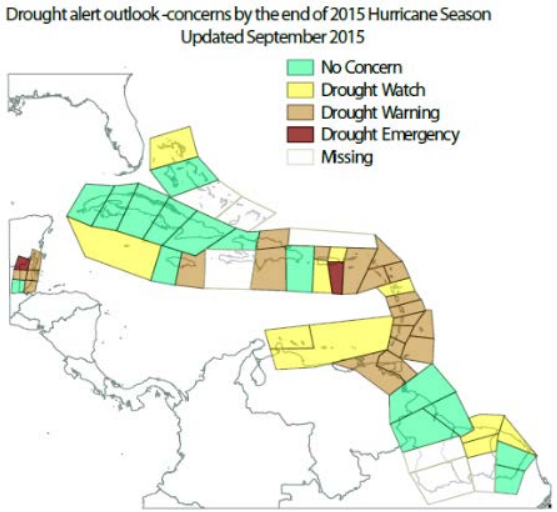
Tailoring – from rainfall to a drought alerting system Supporting Disaster Risk Management



Drought alert maps

Part persistence, part forecast

Short Term Drought Based on SPI 6 month



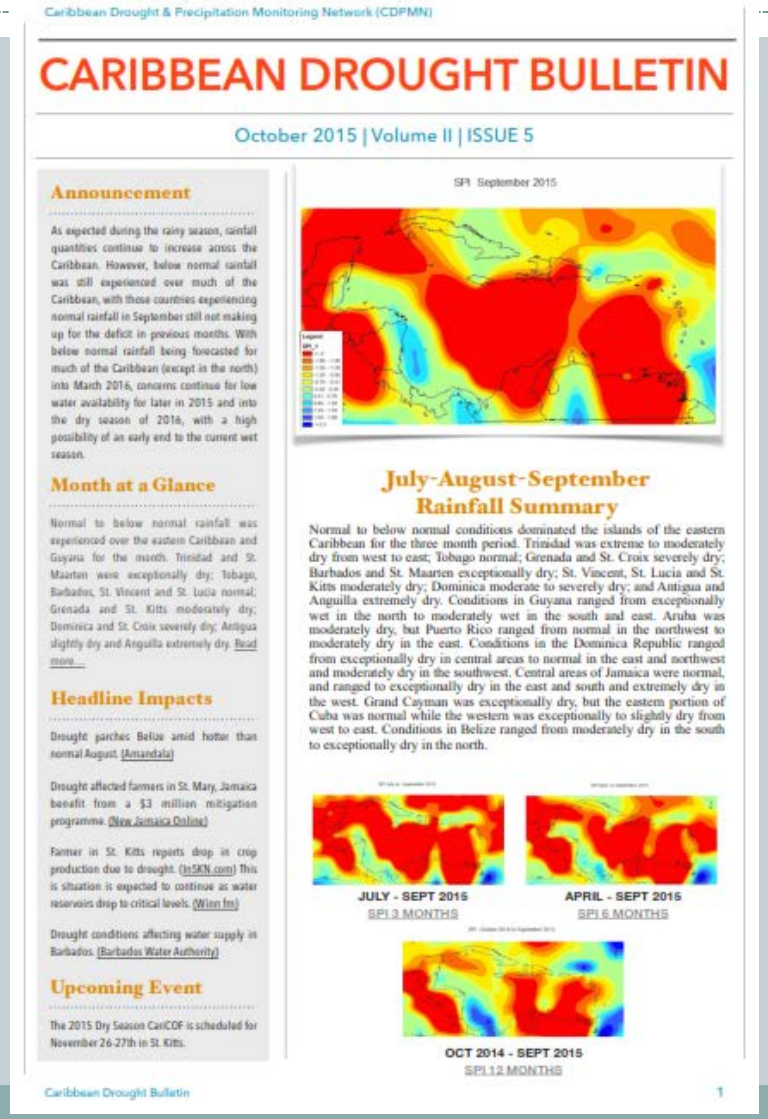
Long Term Drought at end of Wet/Huricane Season based on SPI 12 Month

ALERT LEVEL	MEANING	ACTION LEVEL
NO CONCERN	No drought concern	✓ **monitor resources** ✓ update and ratify management plans ✓ public awareness campaigns ✓ upgrade infrastructure
DROUGHT WATCH	Drought possible	✓ **keep updated** ✓ protect resources and conserve water ✓ implement management plans ✓ response training ✓ monitor and repair infrastructure
DROUGHT WARNING	Drought evolving	✓ **protect resources** ✓ conserve and recycle water ✓ implement management plans ✓ release public service announcements ✓ last minute infrastructural repairs and upgrades ✓ report impacts
DROUGHT EMERGENCY	Drought of immediate concern	✓ **release public service announcements** ✓ implement management and response plans ✓ enforce water restrictions and recycling ✓ enforce resource protection ✓ repair infrastructure ✓ report impacts

Activity began as a collaboration between CariCOF, CACOF and IRI

Also widely used by water resources managers and agriculturists

Drought Bulletin



Caribbean Drought & Precipitation Monitoring Network (CDPMN)

CARIBBEAN DROUGHT BULLETIN

October 2015 | Volume II | ISSUE 5

Announcement

As expected during the rainy season, rainfall quantities continue to increase across the Caribbean. However, below normal rainfall was still experienced over much of the Caribbean, with those countries experiencing normal rainfall in September still not making up for the deficit in previous months. With below normal rainfall being forecasted for much of the Caribbean (except in the north) into March 2016, concerns continue for low water availability for later in 2015 and into the dry season of 2016, with a high possibility of an early end to the current wet season.

Month at a Glance

Normal to below normal rainfall was experienced over the eastern Caribbean and Guyana for the month. Trinidad and St. Maarten were exceptionally dry; Tobago, Barbados, St. Vincent and St. Lucia normal; Grenada and St. Kitts moderately dry; Dominica and St. Croix severely dry; Antigua slightly dry and Anguilla extremely dry. Read more...

Headline Impacts

Drought parches Belize amid hotter than normal August. (Amandala)

Drought affected farmers in St. Mary, Jamaica benefit from a $3 million mitigation programme. (New Jamaica Online)

Farmer in St. Kitts reports drop in crop production due to drought. (InSKN.com) This is situation is expected to continue as water reservoirs drop to critical levels. (Winn fm)

Drought conditions affecting water supply in Barbados. (Barbados Water Authority)

Upcoming Event

The 2015 Dry Season CariCOF is scheduled for November 26-27th in St. Kitts.

SPI September 2015

July-August-September Rainfall Summary

Normal to below normal conditions dominated the islands of the eastern Caribbean for the three month period. Trinidad was extreme to moderately dry from west to east; Tobago normal; Grenada and St. Croix severely dry; Barbados and St. Maarten exceptionally dry; St. Vincent, St. Lucia and St. Kitts moderately dry; Dominica moderate to severely dry; and Antigua and Anguilla extremely dry. Conditions in Guyana ranged from exceptionally wet in the north to moderately wet in the south and east. Aruba was moderately dry, but Puerto Rico ranged from normal in the northwest to moderately dry in the east. Conditions in the Dominica Republic ranged from exceptionally dry in central areas to normal in the east and northwest and moderately dry in the southwest. Central areas of Jamaica were normal, and ranged to exceptionally dry in the east and south and extremely dry in the west. Grand Cayman was exceptionally dry, but the eastern portion of Cuba was normal while the western was exceptionally to slightly dry from west to east. Conditions in Belize ranged from moderately dry in the south to exceptionally dry in the north.

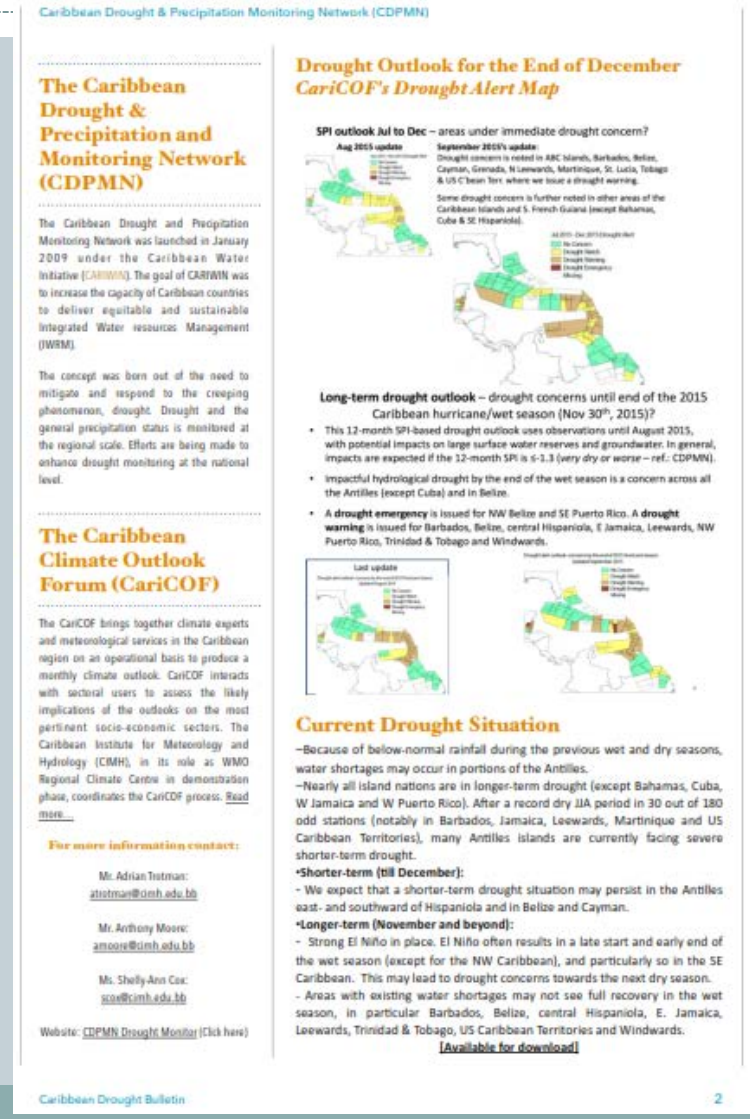
JULY - SEPT 2015
SPI 3 MONTHS

APRIL - SEPT 2015
SPI 6 MONTHS

OCT 2014 - SEPT 2015
SPI 12 MONTHS

Caribbean Drought Bulletin 1

Monitoring, outlook and alert information. Monitoring information for 1, 3, 6, 12 month SPI. Updated monthly. Also recent drought impacts information.



Caribbean Drought & Precipitation Monitoring Network (CDPMN)

The Caribbean Drought & Precipitation and Monitoring Network (CDPMN)

The Caribbean Drought and Precipitation Monitoring Network was launched in January 2009 under the Caribbean Water Initiative (CARIWIN). The goal of CARIWIN was to increase the capacity of Caribbean countries to deliver equitable and sustainable Integrated Water resources Management (IWRM).

The concept was born out of the need to mitigate and respond to the creeping phenomenon, drought. Drought and the general precipitation status is monitored at the regional scale. Efforts are being made to enhance drought monitoring at the national level.

The Caribbean Climate Outlook Forum (CariCOF)

The CariCOF brings together climate experts and meteorological services in the Caribbean region on an operational basis to produce a monthly climate outlook. CariCOF interacts with sectoral users to assess the likely implications of the outlooks on the most pertinent socio-economic sectors. The Caribbean Institute for Meteorology and Hydrology (CIMH), in its role as WMO Regional Climate Centre in demonstration phase, coordinates the CariCOF process. Read more...

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Website: CDPMN Drought Monitor (Click here)

Drought Outlook for the End of December
CariCOF's Drought Alert Map

SPI outlook Jul to Dec – areas under immediate drought concern?

Aug 2015 update

September 2015's update:
Drought concern is noted in ABC Islands, Barbados, Belize, Cayman, Grenada, N Leewards, Martinique, St. Lucia, Tobago & US C'bean Terr. where we issue a drought warning.

Some drought concern is further noted in other areas of the Caribbean Islands and S. French Guiana (except Bahamas, Cuba & SE Hispaniola).

Long-term drought outlook – drought concerns until end of the 2015 Caribbean hurricane/wet season (Nov 30th, 2015)?

- This 12-month SPI-based drought outlook uses observations until August 2015, with potential impacts on large surface water reserves and groundwater. In general, impacts are expected if the 12-month SPI is ≤-1.3 (very dry or worse – ref.: CDPMN).
- Impactful hydrological drought by the end of the wet season is a concern across all the Antilles (except Cuba) and in Belize.
- A **drought emergency** is issued for NW Belize and SE Puerto Rico. A **drought warning** is issued for Barbados, Belize, central Hispaniola, E Jamaica, Leewards, NW Puerto Rico, Trinidad & Tobago and Windwards.

Last update

Current Drought Situation

–Because of below-normal rainfall during the previous wet and dry seasons, water shortages may occur in portions of the Antilles.
–Nearly all island nations are in longer-term drought (except Bahamas, Cuba, W Jamaica and W Puerto Rico). After a record dry JJA period in 30 out of 180 odd stations (notably in Barbados, Jamaica, Leewards, Martinique and US Caribbean Territories), many Antilles islands are currently facing severe shorter-term drought.

•Shorter-term (till December):
- We expect that a shorter-term drought situation may persist in the Antilles east- and southward of Hispaniola and in Belize and Cayman.

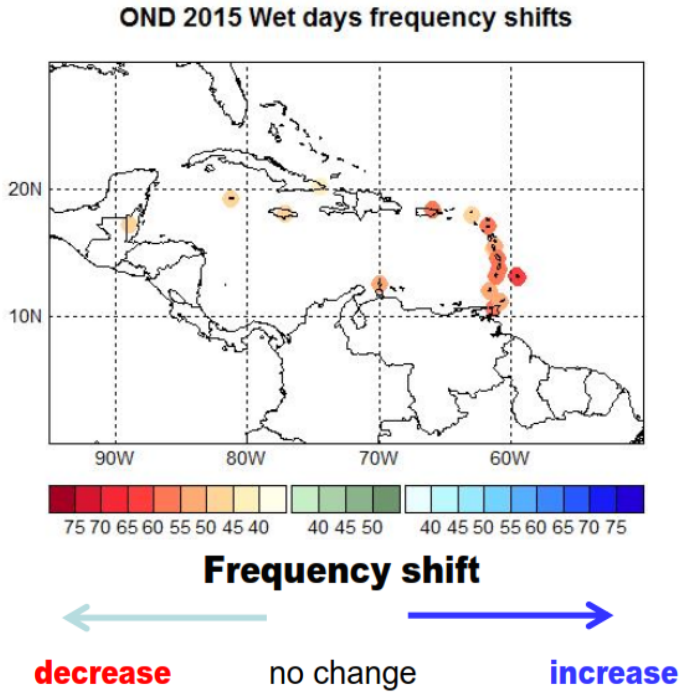
•Longer-term (November and beyond):
- Strong El Niño in place. El Niño often results in a late start and early end of the wet season (except for the NW Caribbean), and particularly so in the SE Caribbean. This may lead to drought concerns towards the next dry season.
- Areas with existing water shortages may not see full recovery in the wet season, in particular Barbados, Belize, central Hispaniola, E. Jamaica, Leewards, Trinidad & Tobago, US Caribbean Territories and Windwards.

[Available for download]

Caribbean Drought Bulletin 2

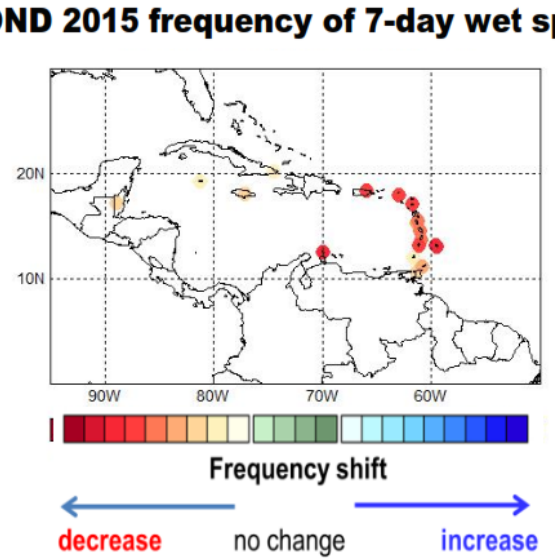
Extreme rainfall events within the season

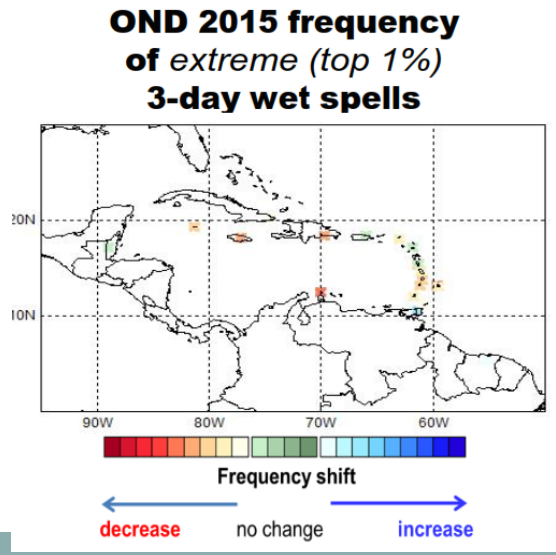
Well received by water resources managers



Still Experimental
But now more satisfied so thinking about look of final product

The basis for a flood potential outlook. As like the drought alert the use of rainfall being tailored.





The same methodology currently being investigated to look at hot spells (heat waves) with many applications (health, animal husbandry). Also dry spells with application to agriculture.

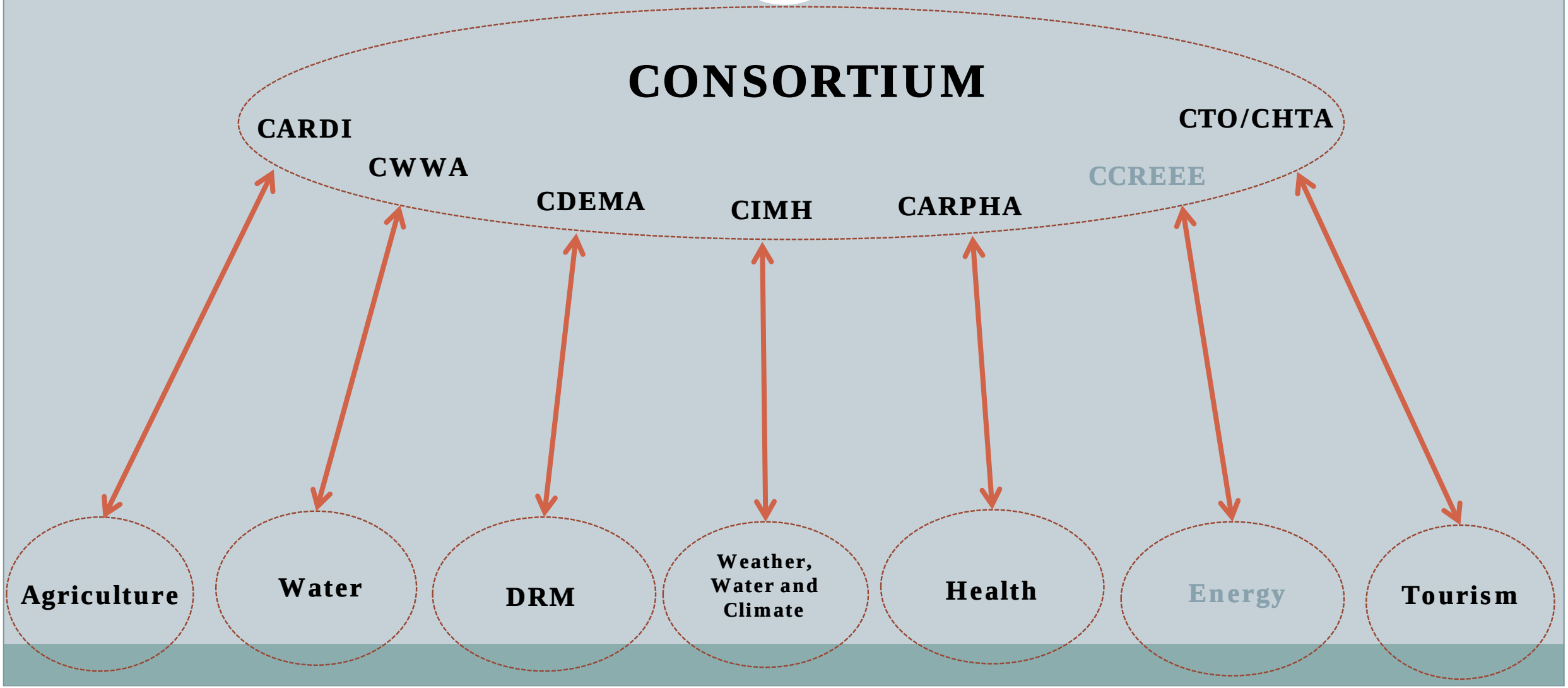
CariCOF Procedures

- Collection of predictor and predictand datasets for ingestion into statistical regression models (canonical correlation analysis (CCA)). Predictand sets collected from and sent shared with the region's NMHS's.
- Running of ensembles of CCA experiments in CPT using different predictor sets, including recently observed ERSSTs as well as model predictions for SSTs, SATs and PPN from several GPCs.
- Map ensemble mean regional forecasts where station output is further aggregated into a fixed set of adjoined polygons.
- Collection of national experiments applying a strict protocol of predictor and parameter sets for the experiments run in CPT.
- Collating national experiments onto the regional ensemble mean forecasts as a means of objective consensus.

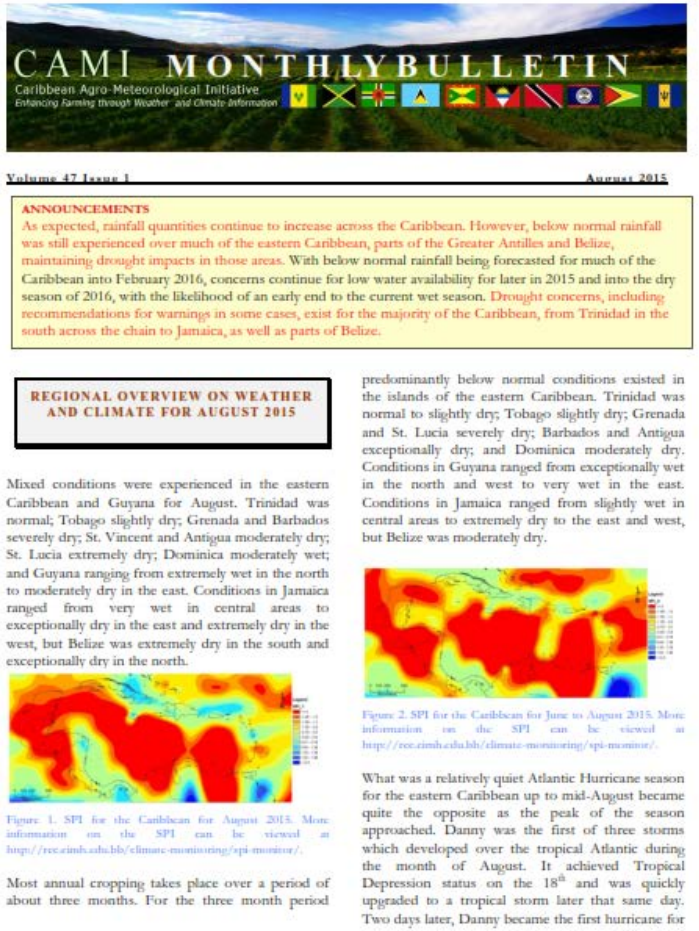
CariCOF Procedures

- Drafting of a consensus map with adjoined polygons coloured by probability of most likely category and with tercile-based category probabilities assigned per polygon.
- Reporting on all experiments, input maps, other (tailored) seasonal outlooks and outlook products, relevant climate monitoring products, GPC guidance and forecasts, as well as seasonal PPN climatologies and incorporation into a technical outlook presentation.
- Uptake of recent climate and climate impacts monitoring information, outlook information and guidance on the state of the drivers of regional climate variability into a draft climate outlook bulletin.
- Circulation of draft outlook maps, technical outlook presentation and draft bulletin among NMHS's and other participating climate scientists for consensus and approval.
- Finalisation of consensus outlook maps, other (tailored) outlook products (including drought alerts and extreme precipitation outlooks) and the bulletin, and disseminate to all RCOF stakeholders.

The Consortium of Regional Sectoral EWISACTs Targetting the Predictions



Other Sector-targeted Packaging



CAMI MONTHLY BULLETIN

Caribbean Agro-Meteorological Initiative

Enhancing Farming through Weather and Climate Information

Volume 47 Issue 1 August 2015

ANNOUNCEMENTS

As expected, rainfall quantities continue to increase across the Caribbean. However, below normal rainfall was still experienced over much of the eastern Caribbean, parts of the Greater Antilles and Belize, maintaining drought impacts in those areas. With below normal rainfall being forecasted for much of the Caribbean into February 2016, concerns continue for low water availability for later in 2015 and into the dry season of 2016, with the likelihood of an early end to the current wet season. Drought concerns, including recommendations for warnings in some cases, exist for the majority of the Caribbean, from Trinidad in the south across the chain to Jamaica, as well as parts of Belize.

REGIONAL OVERVIEW ON WEATHER AND CLIMATE FOR AUGUST 2015

Mixed conditions were experienced in the eastern Caribbean and Guyana for August. Trinidad was normal; Tobago slightly dry; Grenada and Barbados severely dry; St. Vincent and Antigua moderately dry; St. Lucia extremely dry; Dominica moderately wet; and Guyana ranging from extremely wet in the north to moderately dry in the east. Conditions in Jamaica ranged from very wet in central areas to exceptionally dry in the east and extremely dry in the west, but Belize was extremely dry in the south and exceptionally dry in the north.

Figure 1. SPI for the Caribbean for August 2015. More information on the SPI can be viewed at http://ree.cimh.edu.bb/climate-monitoring/spi-monitor/.

Most annual cropping takes place over a period of about three months. For the three month period predominantly below normal conditions existed in the islands of the eastern Caribbean. Trinidad was normal to slightly dry; Tobago slightly dry; Grenada and St. Lucia severely dry; Barbados and Antigua exceptionally dry; and Dominica moderately dry. Conditions in Guyana ranged from exceptionally wet in the north and west to very wet in the east. Conditions in Jamaica ranged from slightly wet in central areas to extremely dry to the east and west, but Belize was moderately dry.

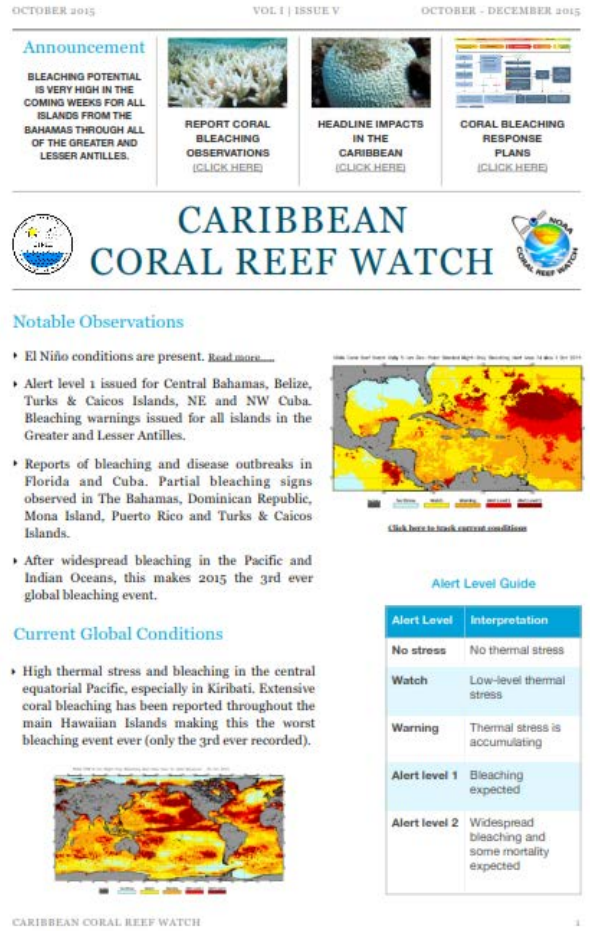
Figure 2. SPI for the Caribbean for June to August 2015. More information on the SPI can be viewed at http://ree.cimh.edu.bb/climate-monitoring/spi-monitor/.

What was a relatively quiet Atlantic Hurricane season for the eastern Caribbean up to mid-August became quite the opposite as the peak of the season approached. Danny was the first of three storms which developed over the tropical Atlantic during the month of August. It achieved Tropical Depression status on the 18th and was quickly upgraded to a tropical storm later that same day. Two days later, Danny became the first hurricane for

Regional Agroclimatic Bulletin

Commenced under the Caribbean Agromet Initiative (CAMI) and updated monthly. Will be changed to Caribbean Society for Agricultural Meteorology (CariSAM) in early 2016 – with interactive web portal for engaging, dialogue and sharing

Commenced at May 2015 CariCOF for wet/hurricane season in St. Lucia. Not to be published during cool season. Updated monthly. Coral reef managers, tourism, divers, fisheries



OCTOBER 2015 VOL I | ISSUE V OCTOBER - DECEMBER 2015

Announcement

BLEACHING POTENTIAL IS VERY HIGH IN THE COMING WEEKS FOR ALL ISLANDS FROM THE BAHAMAS THROUGH ALL OF THE GREATER AND LESSER ANTILLES.

REPORT CORAL BLEACHING OBSERVATIONS (CLICK HERE)

HEADLINE IMPACTS IN THE CARIBBEAN (CLICK HERE)

CORAL BLEACHING RESPONSE PLANS (CLICK HERE)

CARIBBEAN CORAL REEF WATCH

Notable Observations

- El Niño conditions are present. Read more.....
- Alert level 1 issued for Central Bahamas, Belize, Turks & Caicos Islands, NE and NW Cuba. Bleaching warnings issued for all islands in the Greater and Lesser Antilles.
- Reports of bleaching and disease outbreaks in Florida and Cuba. Partial bleaching signs observed in The Bahamas, Dominican Republic, Mona Island, Puerto Rico and Turks & Caicos Islands.
- After widespread bleaching in the Pacific and Indian Oceans, this makes 2015 the 3rd ever global bleaching event.

Click here to track current conditions

Alert Level Guide

Alert Level	Interpretation
No stress	No thermal stress
Watch	Low-level thermal stress
Warning	Thermal stress is accumulating
Alert level 1	Bleaching expected
Alert level 2	Widespread bleaching and some mortality expected

Current Global Conditions

- High thermal stress and bleaching in the central equatorial Pacific, especially in Kiribati. Extensive coral bleaching has been reported throughout the main Hawaiian Islands making this the worst bleaching event ever (only the 3rd ever recorded).

CARIBBEAN CORAL REEF WATCH 1

Regional Coral Reef Watch

Thank you