CLIMATE MONITORING AND PREDICTION SERVICES FOR CLIMATE RISK MANAGEMENT IN THE CARIBBEAN

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CLIMATE SERVICES *catalyse* CLIMATE RISK MANAGEMENT

The most useful type of climate information is tailored to user needs.

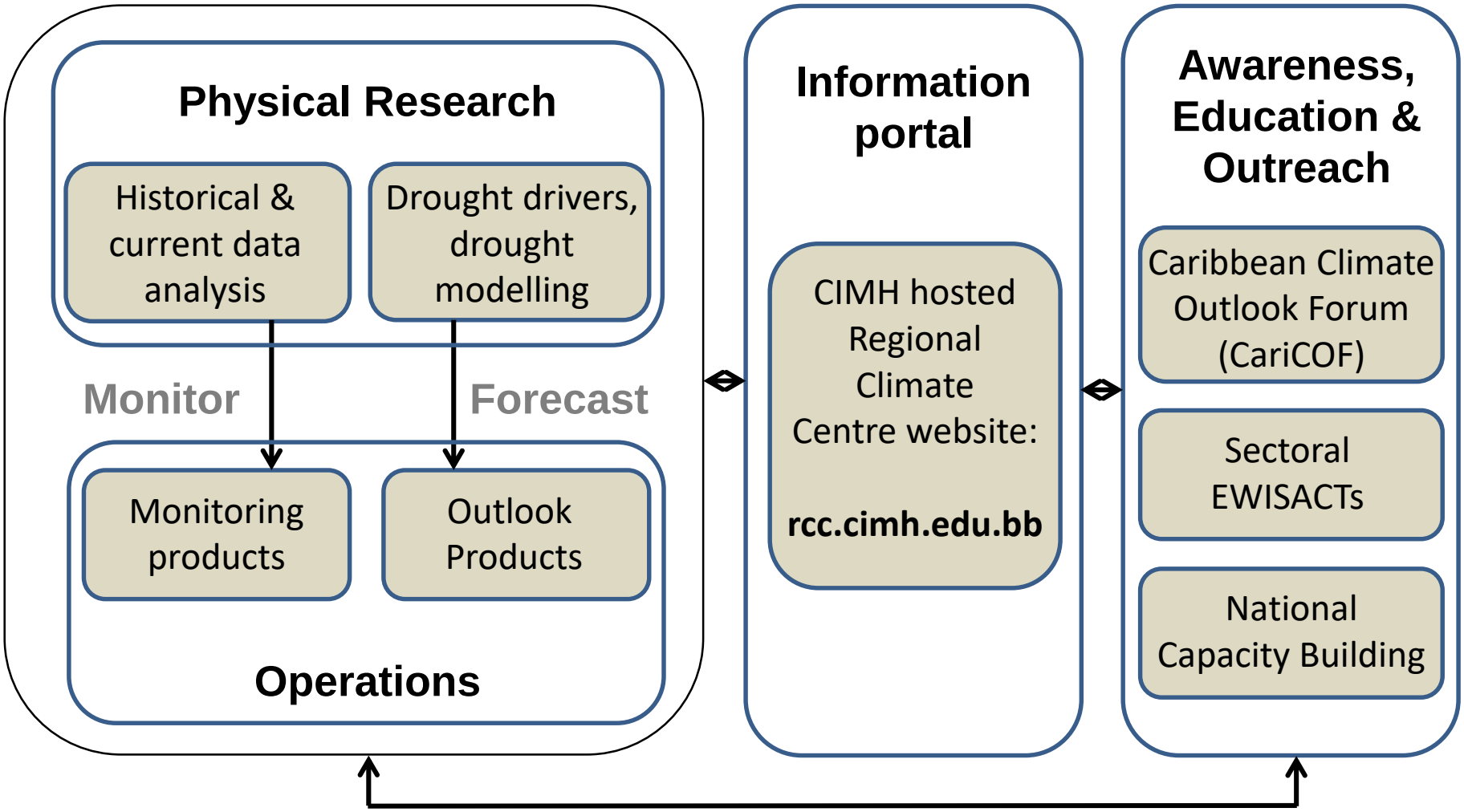
- ***Climate services*** involve the preparation and delivery of climate information to meet users' needs (WMO, 2011).

- Climate services adds value to generic climate information by **blending climate knowledge with sector-specific knowledge** into user-oriented climate services (WMO 2018).

- Climate services catalyse ***climate risk management*** : "a systematic and coordinated process in which **climate information is used to reduce the risks associated with climate variability and change**, and to take advantage of opportunities, in order to improve the resilience of social, economic and environmental systems" (Martínez et al. 2012).

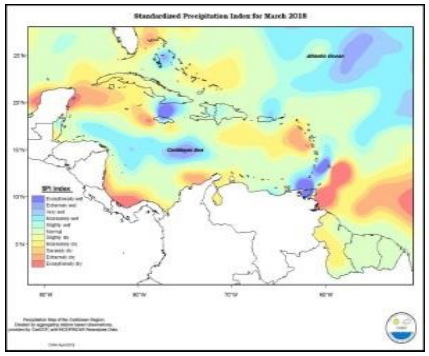
DROUGHT EARLY WARNING

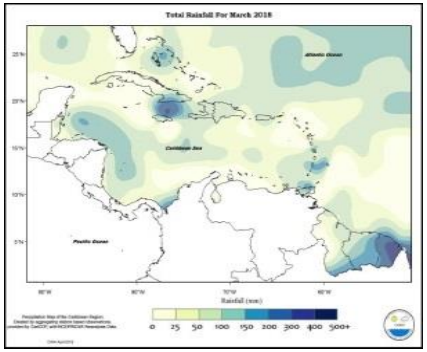
CIMH coordinated regional Drought Early Warning Information System

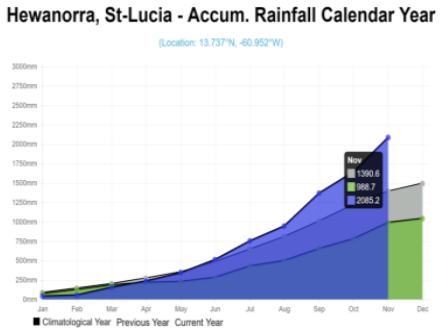


DROUGHT EARLY WARNING

CDPMN – Drought and precipitation monitoring & prediction



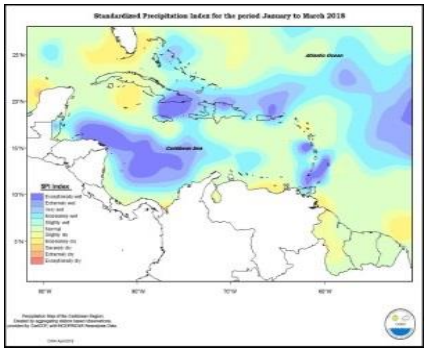


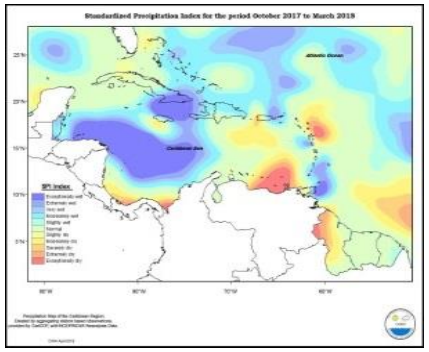


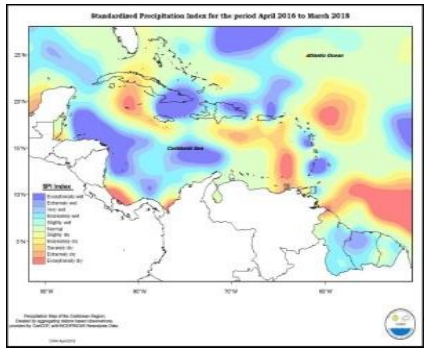
The **Caribbean Drought and Precipitation Monitoring Network** (CDPMN) has been delivering drought monitoring and prediction information since 2010.

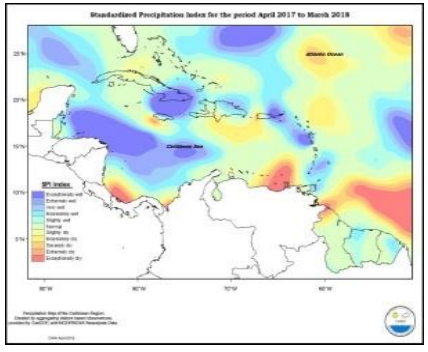
Drought affects different parts of our economy at different timescales, and is particularly harsh on agriculture.

➔ CDPMN provides **drought monitoring information at 1-, 3-, 6-, 12- & 24-month timescales** each month to assess meteorological, agricultural, hydrological and socio-economic drought.



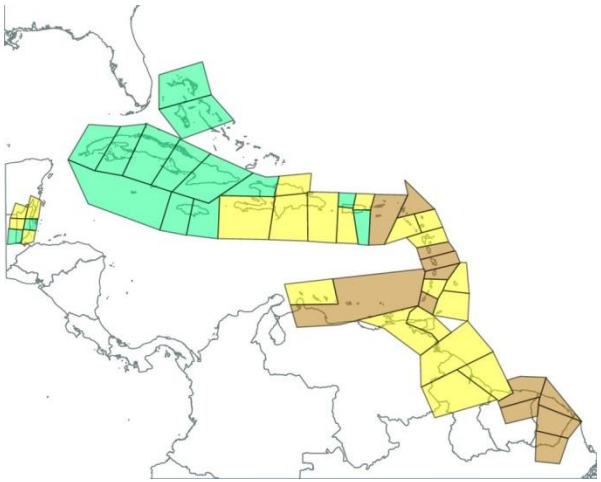






DROUGHT EARLY WARNING

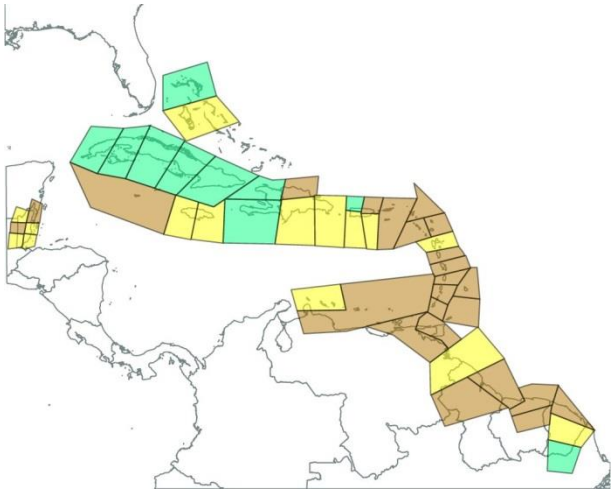
CariCOF Drought outlooks – hazard-specific seasonal forecasts



Short term drought alert levels by the end of July 2019
(covering Feb. to Jul. 2019)

Suggested alert level

- No Concern
- Drought Watch
- Drought Warning
- Drought Emergency
- Missing



Long term drought alert levels by the end of the 2019 dry season
(covering Jun. 2018 to May 2019)

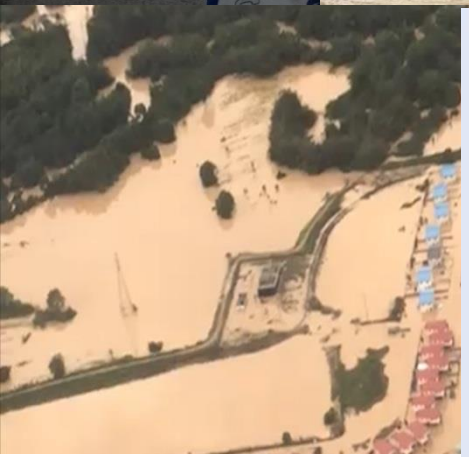
- Current drought situation (up to the end of December 2018): *(more information here)*
  - Portions of The Bahamas, Barbados, Belize, Cayman Isl., Guadeloupe, coastal Guyana, Hispaniola, Jamaica, Martinique, St. Barth's, Trinidad and the US C'bean Territories have seen shorter term drought developing.
  - Moderate long term drought is seen in much of Antilles, with even severe to extreme droughts in small pockets of Guadeloupe, Hispaniola and Martinique, but with the notable exception of Cuba.
- Shorter term drought situation (by the end of April 2019):
  - Shorter term drought is evolving in the ABC Islands, Barbados, Grenada, Trinidad & Tobago.
  - Shorter term drought might possibly develop in Antigua, southern and central Belize, Cayman, N & S French Guiana, Guyana, Hispaniola, Martinique, NE Puerto Rico, St. Kitts, St. Vincent, Suriname.
- Long term drought situation (by the end of May 2019):
  - A weak El Niño is expected to contribute to reduced rainfall up until April.
  - Long term drought is evolving in Antigua, Cayman, NW Cuba, N Dominican Rep., Grenada, Martinique, NE Puerto Rico, Tobago.
  - Long term drought might possibly develop in most other areas in the region.

** We advise all stakeholders to keep monitoring drought and look for our monthly updates.**

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

FLASH FLOODS

A frequent, destructive and PREDICTABLE impact of extreme wet spells



TS Erika triggered flash floods and landslides in Dominica August 2015 ➔➔➔

Sources: Barbados Today; Rosalind Blenman (Barbados Met Service, Desiree Neverson SVG Met Office; https://www.cnc3.co.tt/press-release/rowley-national-disaster; https://reliefweb.int/report/trinidad-and-tobago/trinidad-and-tobago-floods-flash-note-no-01-24-october-2018

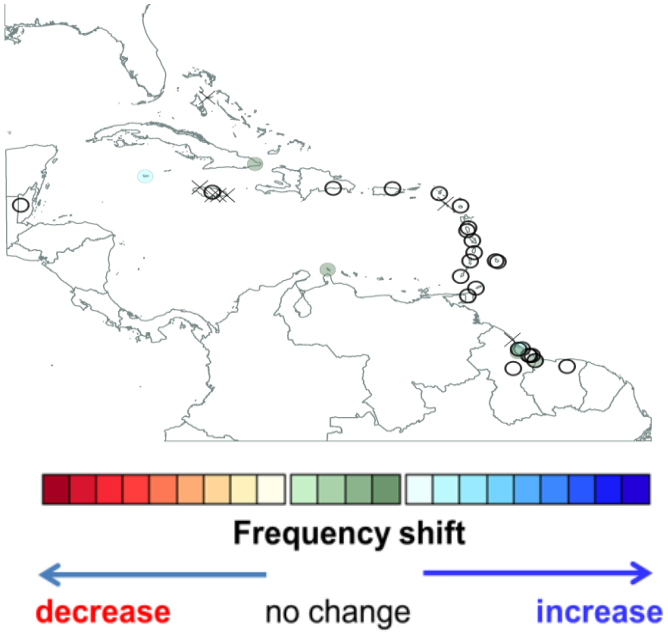
FLASH FLOODS

CariCOF Seasonal prediction information on extreme wet spells

Tropical Storm Kirk (27-28 Sept. 2018) led to near-record rainfall in Barbados, triggering widespread flash flooding.

Image credit: NOAA

The Jul.-Aug.-Sep. 2018 seasonal forecast suggested:



USUALLY: Up to 1 extreme wet spells between July and September, the peak season.

FORECAST: usual number of extreme wet spells.

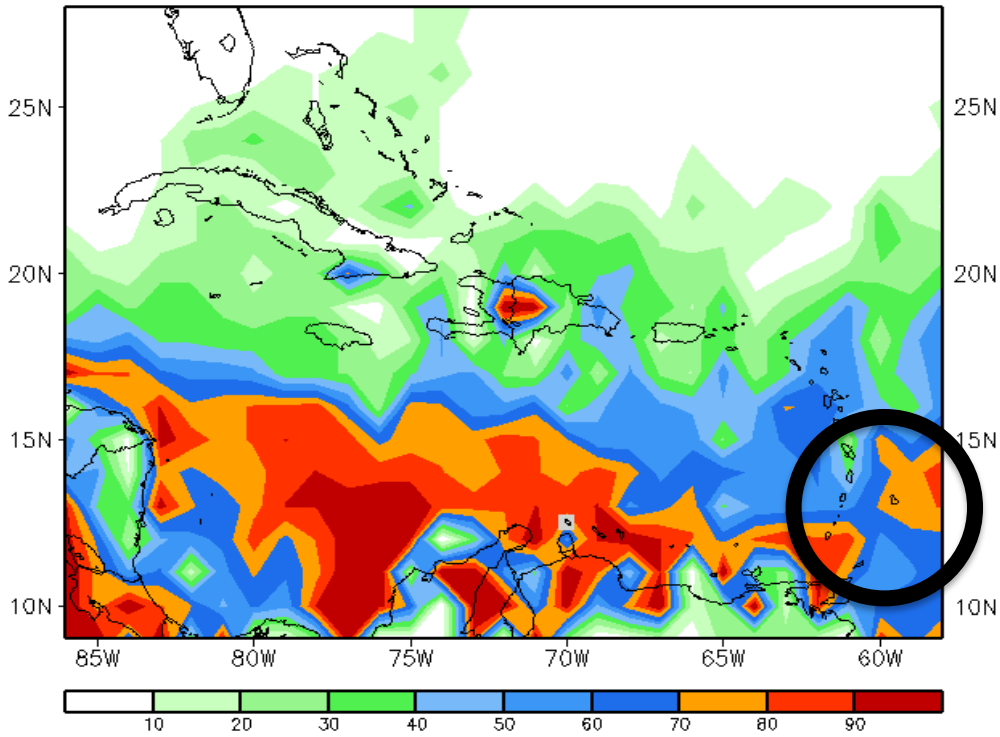
IMPLICATION:

Flash flood potential is becoming a concern across the region.

FLASH FLOODS

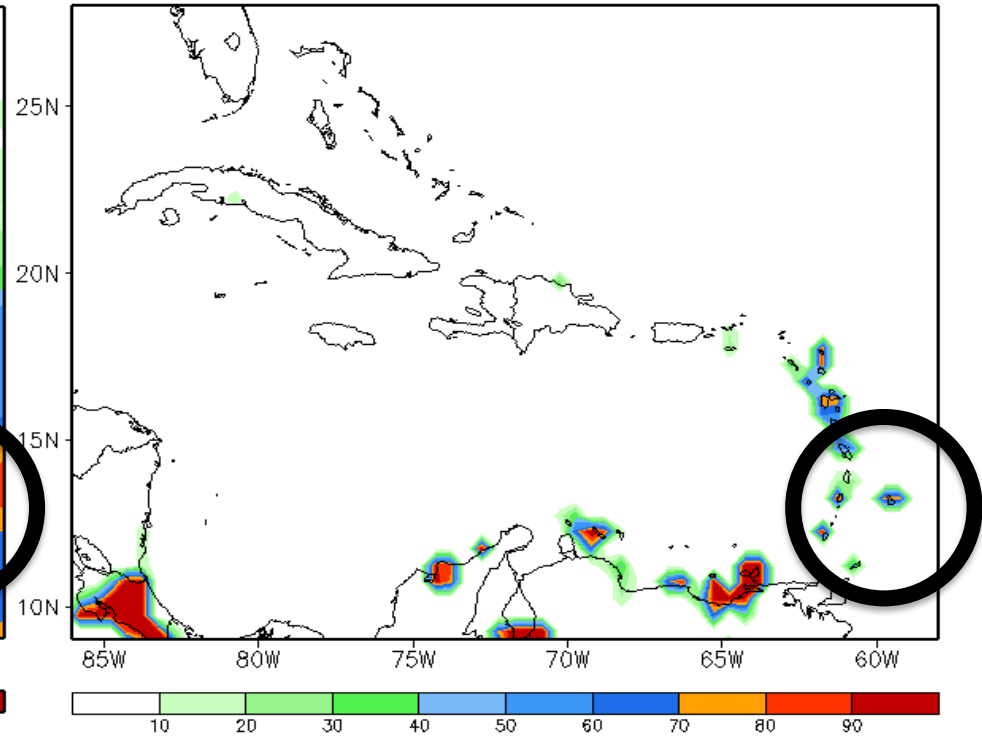
Augmenting early warning with mid- and short-range forecasts – TS Kirk 2018

MID-RANGE (1 week lead time)
forecast for 24 – 30 Sep. 2018



Increased chance for extreme rainfall over Barbados in the following week.

SHORT-RANGE (1 day lead time)
Forecast for 26 – 28 Sep. 2018



>70% chance for an extreme wet spell in Barbados over the next 3 days.

Credit: US Regional Climate Centre (*in demonstration phase*) at NOAA

CLIMATE PREDICTION SERVICES *for* CLIMATE RISK MANAGEMENT AT MULTIPLE TIMESCALES

Begin monitoring mid-range and short-range forecasts

Update contingency plans

Train volunteers

Sensitize community

Enable early-warning system

Continue monitoring shorter-time-scale forecasts

Mobilize assessment team

Alert volunteers

Warn community

Local preparation activities

Deploy assessment team

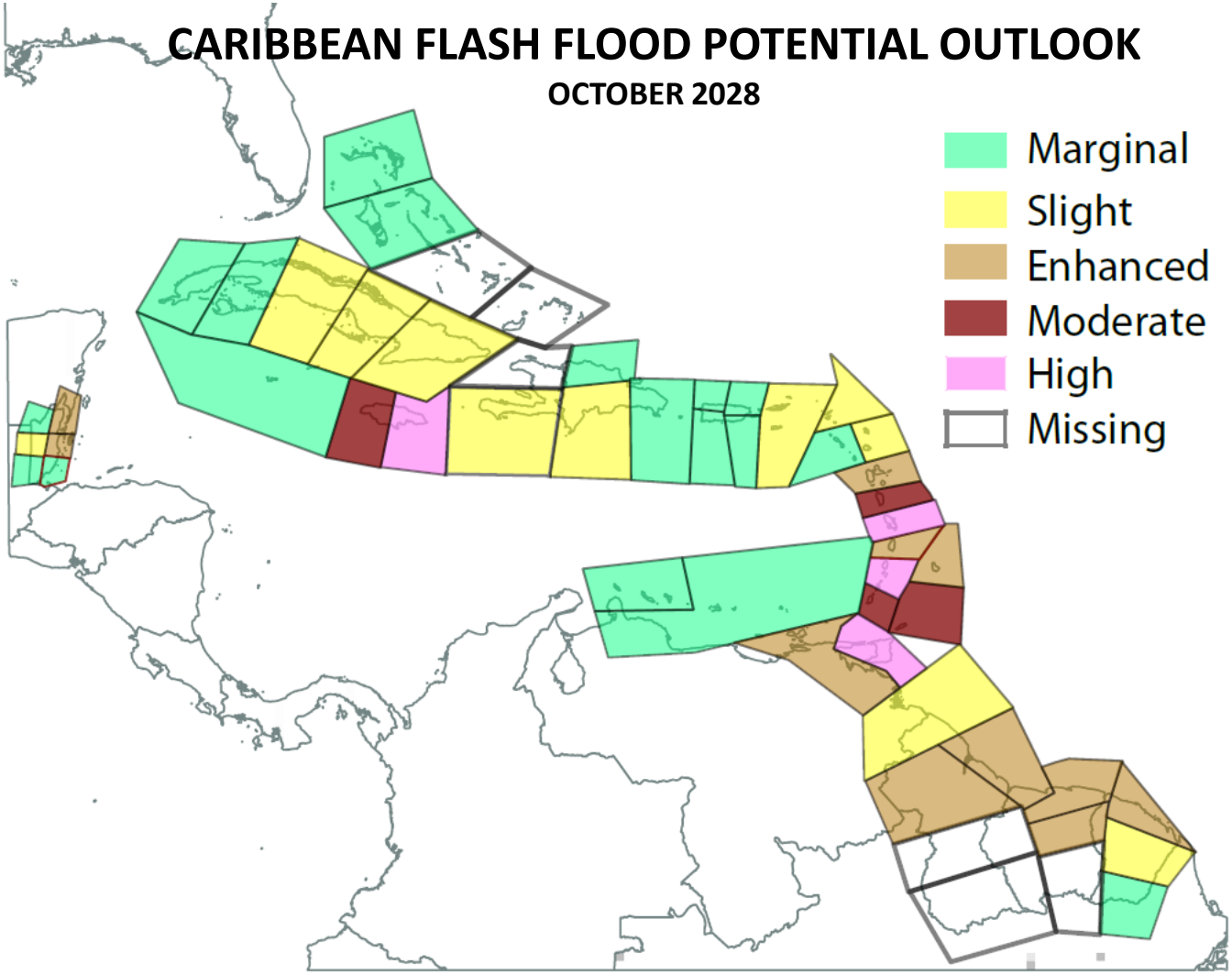
Activate volunteers

Distribute instructions to community, evacuate if needed

Credit: Simon Mason, International Research Institute for Climate and Society

FLASH FLOODS

Towards a next generation of tailored forecasts



flash flood potential = hydro-meteorological factor of flash flood risk

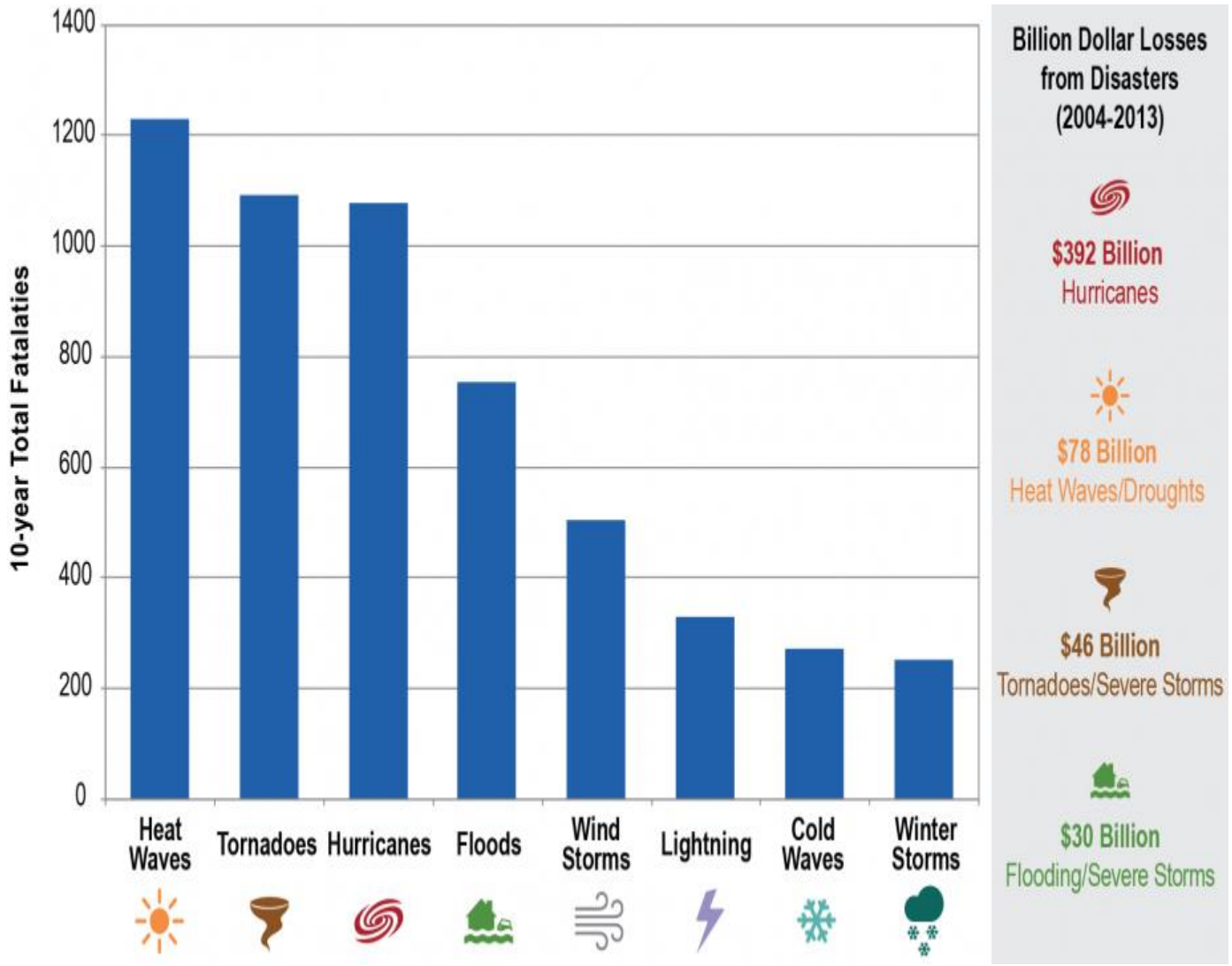
(closely linked to widespread flash flood occurrence)

Thank you

rcc.cimh.edu.bb

EXTREME TEMPERATURE AND HEATWAVES

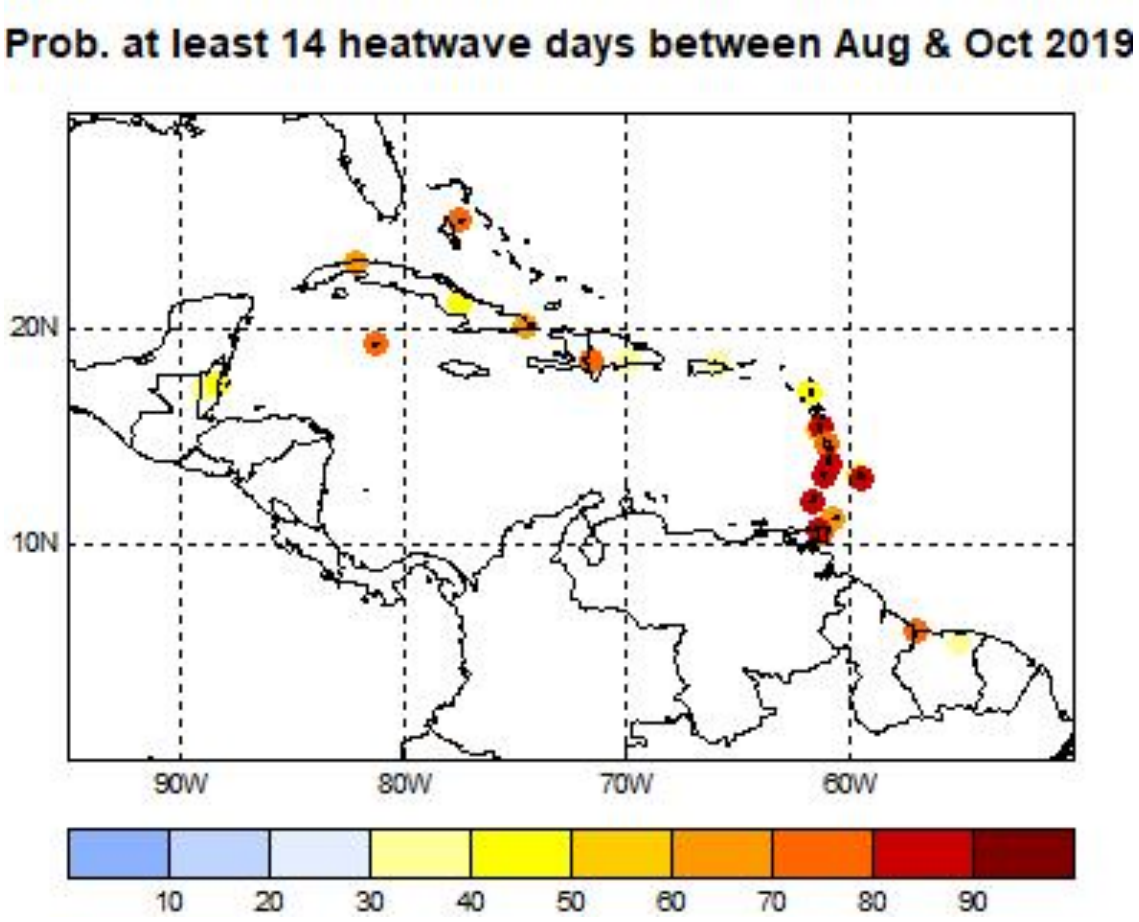
Heatwaves: the silent killer



EXTREME TEMPERATURE AND HEATWAVES

Heatwave frequency forecasts – seasonal early warning for heat stress

What's the chance of having at least … heatwave days from August to October 2019?



FORECAST:

More than 90% chance of having at least 14 heatwave days in Barbados, Trinidad and the Windward Islands. 40-80% in other places.

IMPLICATION:

heat stress will peak between August and October, and very likely exceed that of 2017 and 2018.