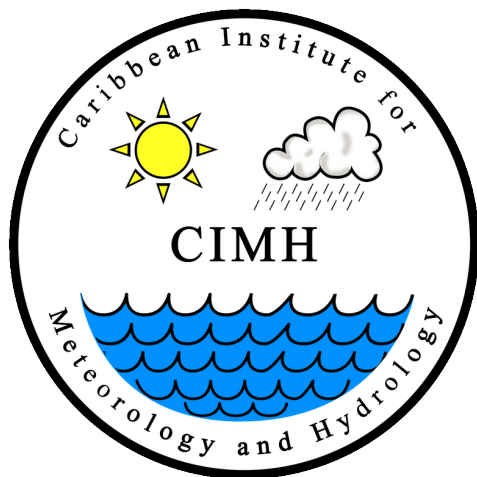


# Climate Services in the Tropical Americas



## The Caribbean Regional Climate Centre at CIMH:

*Enhancing climate risk management and early warning in the Caribbean*

## Dr. Cédric VAN MEERBEECK

<i>Climatologist / Senior Lecturer</i>	–	CIMH ( <a href="mailto:cmeerbeeck@cimh.edu.bb">cmeerbeeck@cimh.edu.bb</a> )
<i>Co-lead</i>	–	North & Central America & Caribbean Expert Team on Climate Services (WMO RA IV ET-CLI)



Sub-Commission for the Caribbean and Adjacent Regions

Subcomisión para el Caribe y Regiones Adyacentes

### SC-IOCARIBE-XVIII Technical Science Meeting and Dialogue: “A Warming Ocean”

22 April 2025, 11.00 – 16.30 a.m (Brasilia time)

# Why monitoring & predicting climate as a service?

“a **climate service** is the provision of **climate information** for use in **decision-making.**”

(Hewitt and Stone, 2021)

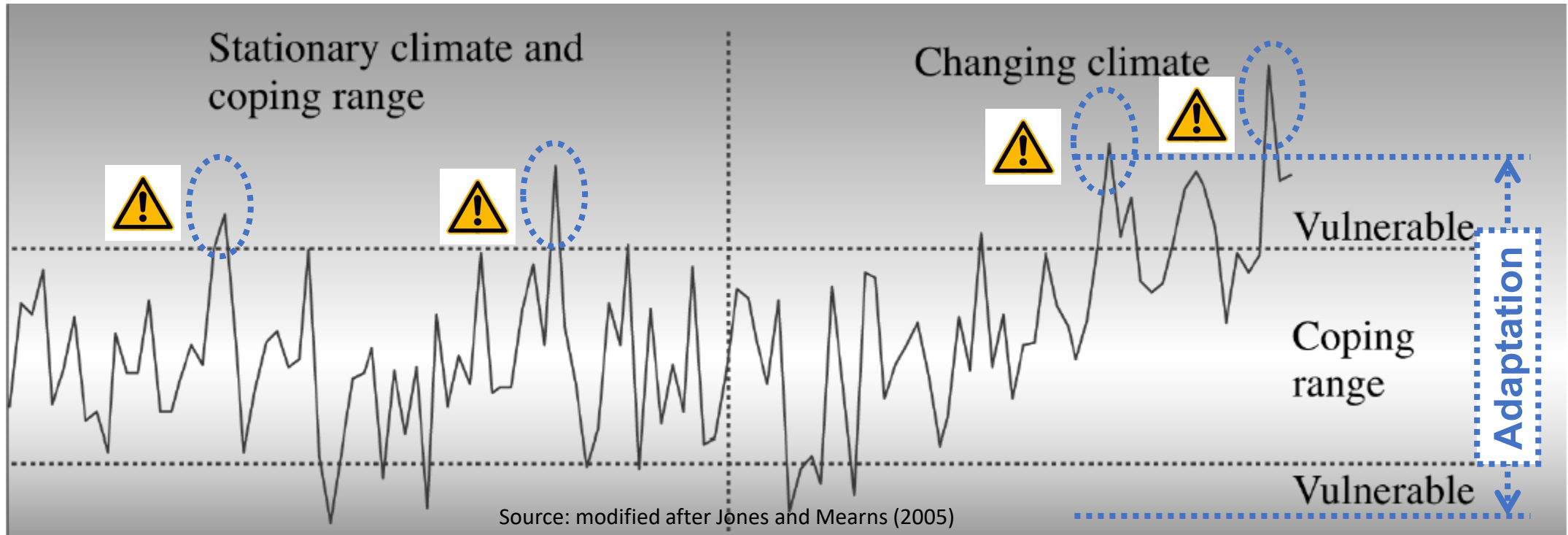


The information is geared to:

- **build resilience** to climate hazards
- **take advantage** of favourable climate conditions

# CLIMATE RISK

What is it? How can early warning information help?



- **Climate risk** arises when **climate conditions** become **extreme** to the point that they exceed our coping range, i.e. they become **hazardous**.
- Climate change **adaptation** is a **long-term risk reduction** strategy aimed at extending our coping range.
- Climate **early warning information** (incl. monitoring & prediction) can help us **prepare** for the risk posed by impending hazards.

# Timescales of Climate Information for Planning and Early Warning

**What's on  
the horizon?**

**DECADES  
TO YEARS  
AHEAD**

**Long-term planning/  
Adaptation**

**What's next?**

**AHEAD OF  
THE SEASON**

**ALERTING  
THROUGHOUT  
THE SEASON**

**Early Warning for Preparedness,  
Alerting & Response**

**UPDATE  
ALERTS  
ON DAILY  
BASIS**

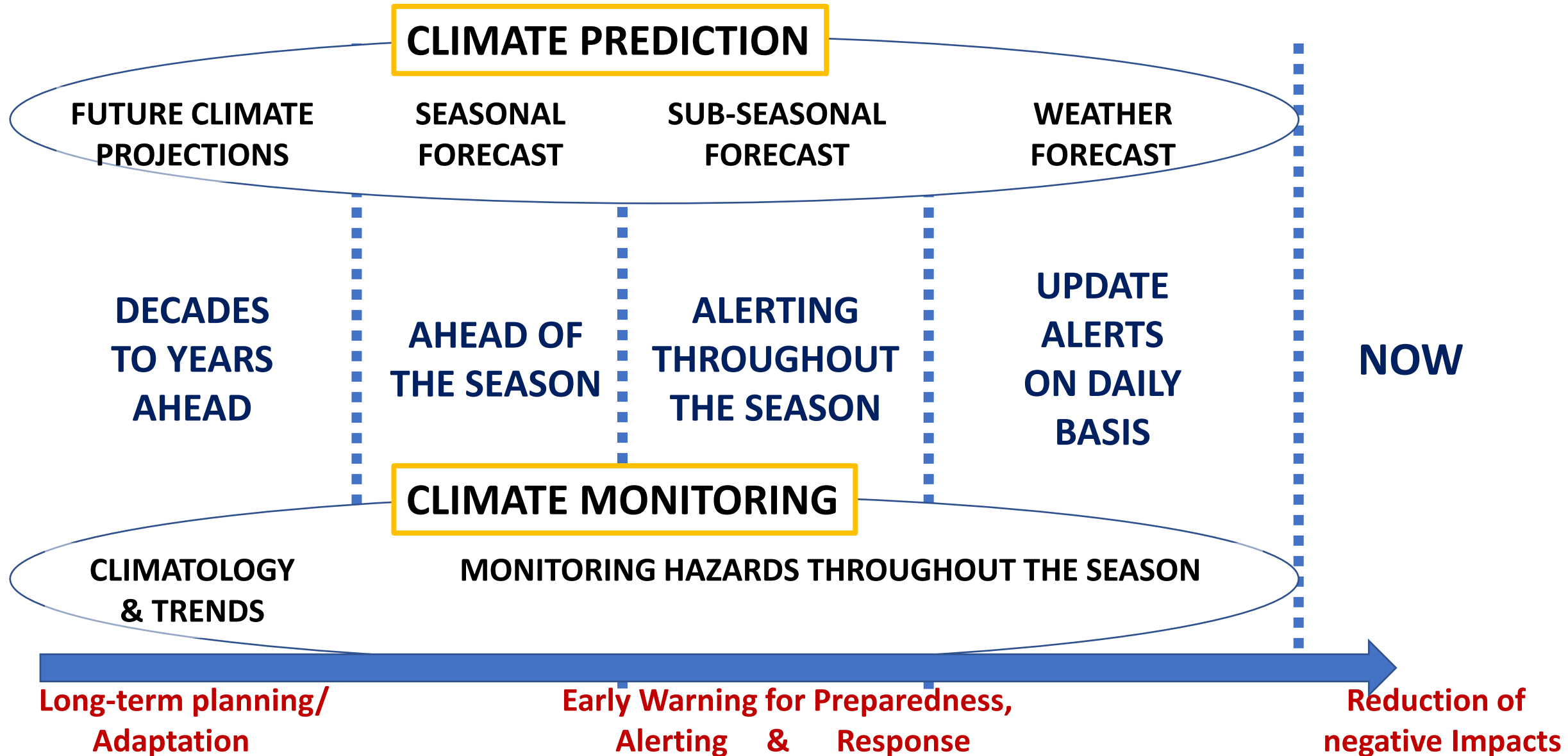
**Happening  
now!**

**NOW**

**Reduction of  
negative Impacts**



# Timescales of Climate Information for Planning and Early Warning



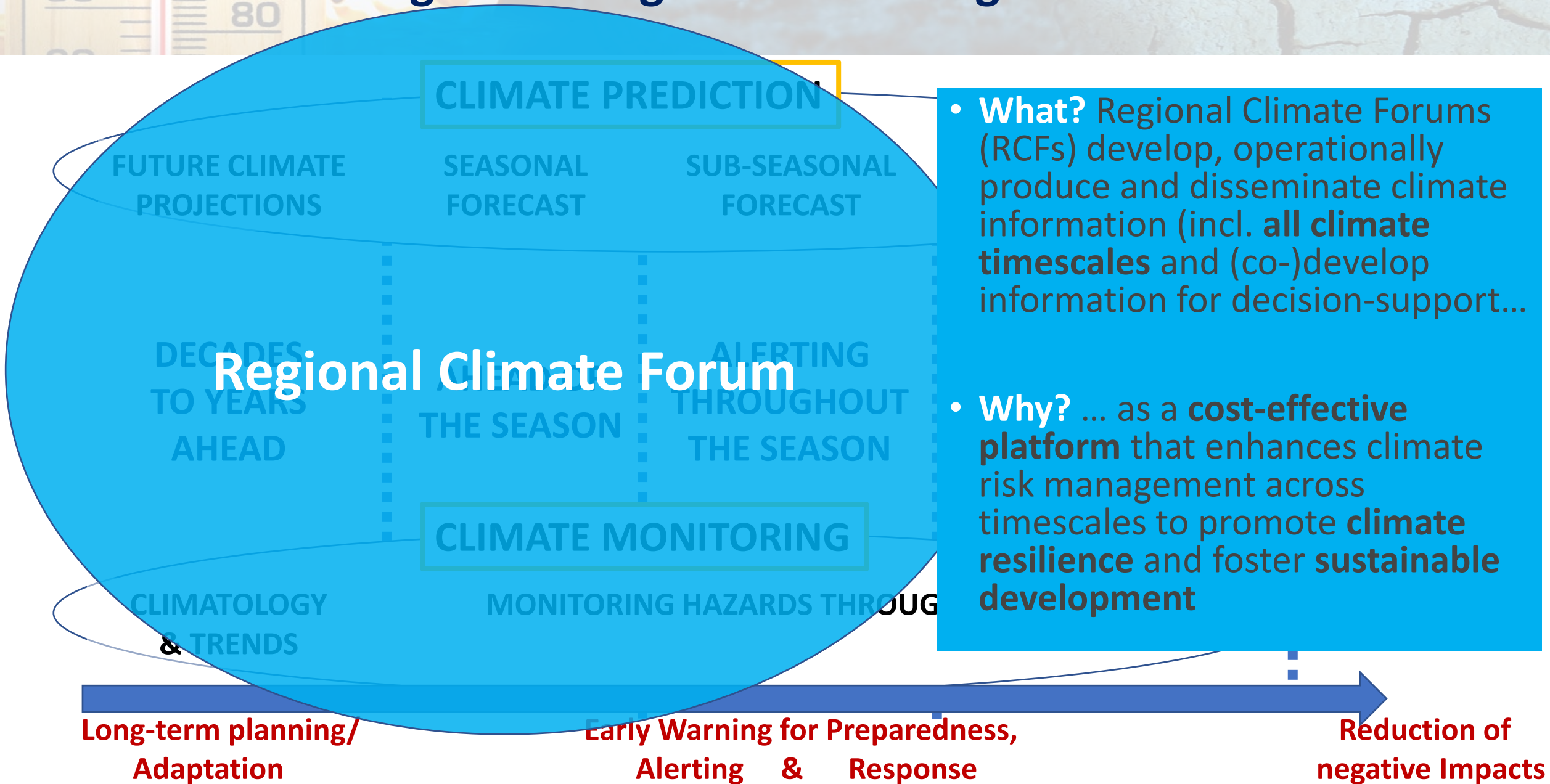
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**Supporting regional  
structures of the World  
Meteorological  
Organization (WMO) in the  
Americas**

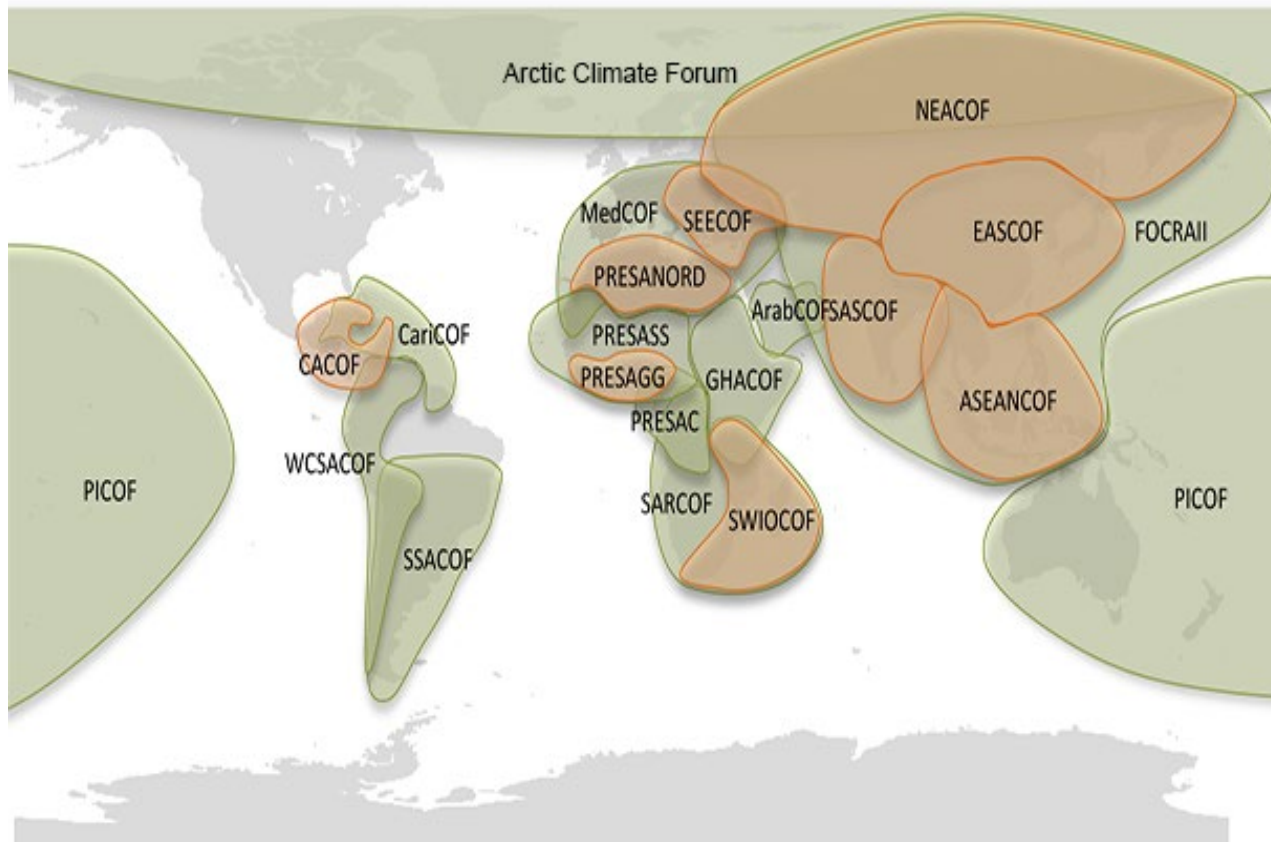




# User Interfacing at the Regional Level: Regional Climate Forums



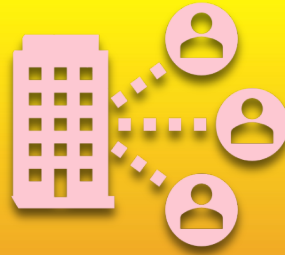
# Regional Climate (Outlook) Forums in the Americas



- ▶ Arctic Climate Forum (ACF)  
<https://arctic-rcc.org/acf>
- ▶ Foro del clima de América Central (FCAC/CACOF)  
[https://www.sica.int/iniciativas/clima\\_san](https://www.sica.int/iniciativas/clima_san)
- ▶ Caribbean Climate Outlook Forum (CariCOF)  
<https://rcc.cimh.edu.bb/caricof/>
- ▶ Western Coast of South America Climate Outlook Forum (WCSACOF)  
<https://ciifen.org/foros-climaticos-regionales/>
- ▶ Southern South American Climate Outlook Forum (SSACOF)  
[https://www.crc-sas.org/en/prevision\\_foro.php](https://www.crc-sas.org/en/prevision_foro.php)
- ▶ more info on RCOFs at:  
<https://public.wmo.int/en/our-mandate/climate/regional-climate-outlook-products>



# The Role of WMO-designated Regional Climate Centres (RCCs)



## Coordination

R & D +  
operation of  
regional **early  
warning**  
information  
systems

**User interface**  
platforms



## Capacity building

NMHSs by  
provision of  
climate **data,**  
**tools, products**  
& **training**

Awareness &  
education of  
**sectors & public**



## Catalysing

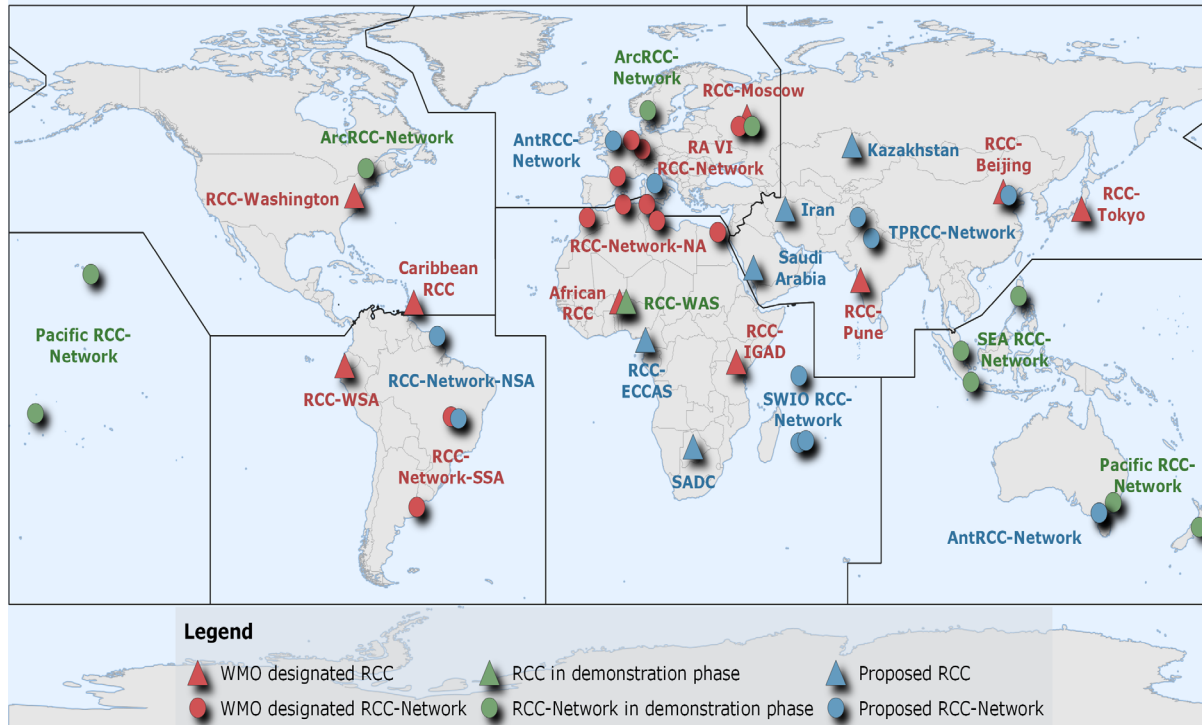
**Co-development**  
& **co-production**  
of climate  
services

**Data &  
information flow**  
from GPCs to  
NMHSs



Not certain I completely follow the middle panel

# Regional Climate Centres in the Americas



## ► Designated RCCs/RCC Networks

- Regional Climate Center Washington (**RCC-Washington**)  
<https://usregionalclimatecenter.noaa.gov/>
- Caribbean Regional Climate Centre (**Caribbean RCC**)  
<https://rcc.cimh.edu.bb/>
- Centro Regional del Clima para el Oeste de Sudamérica (**RCC-WSA**)  
<https://crc-osa.ciifen.org/>
- Centro Regional del Clima para el Sur de América del Sur (**RCC-Network-SSA**)  
<https://www.crc-sas.org/es/>

## ► RCCs/RCC Networks *in demonstration phase*

- Arctic Regional Climate Center Network (**ArcRCC-Network**) *in demonstration phase*  
<https://arctic-rcc.org/>



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**Examples of climate  
services provided or  
brokered by the Caribbean  
RCC to our partners in  
support of ocean  
governance**

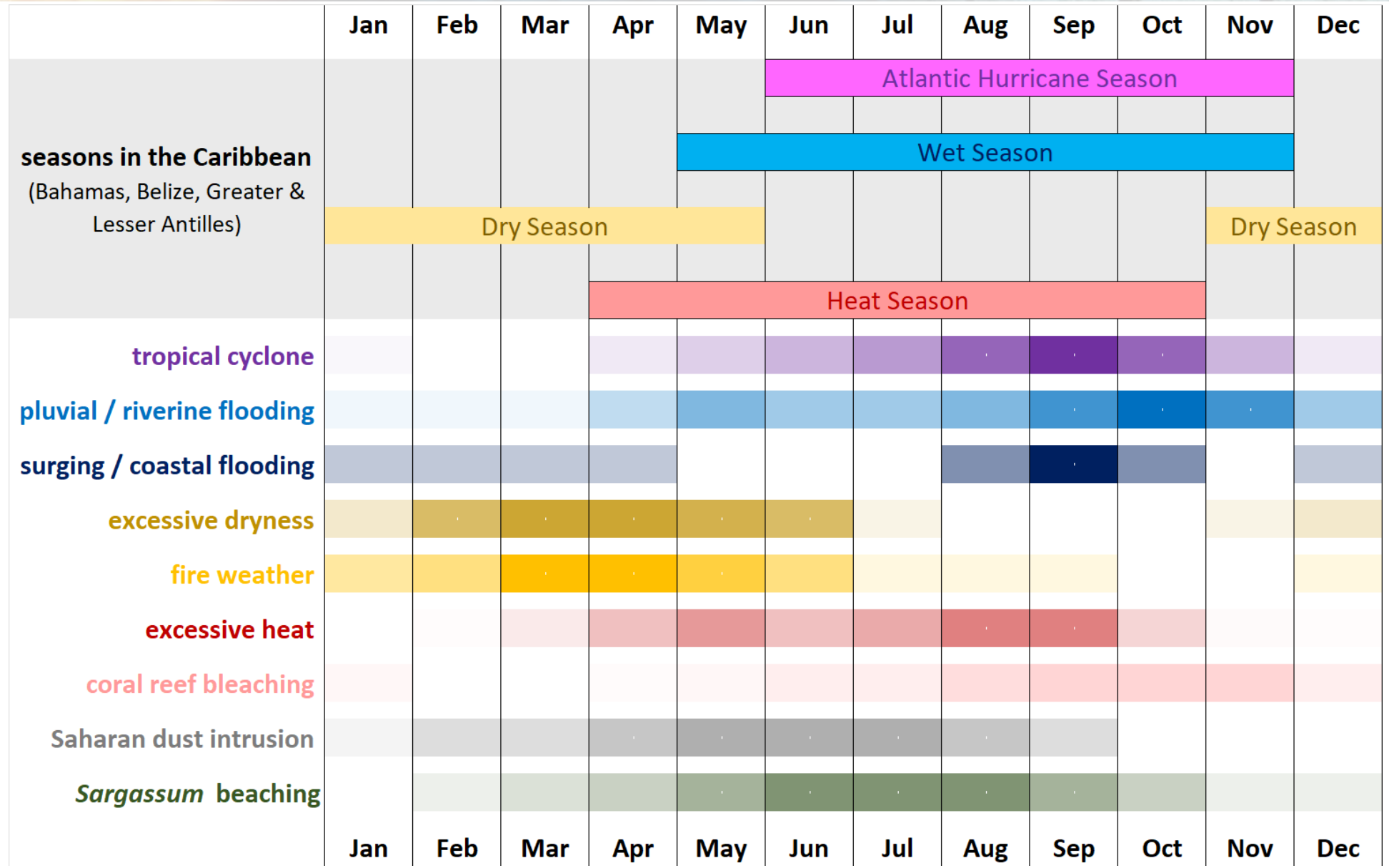




# Risk knowledge – Climatological seasonality of hazards

(see the inserted arrow)

hazard frequency ↑

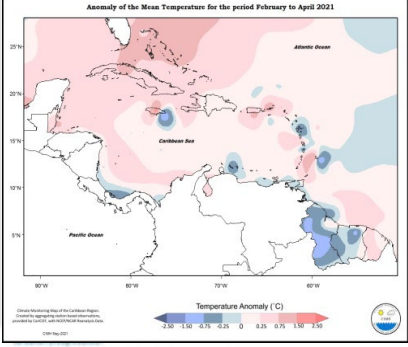
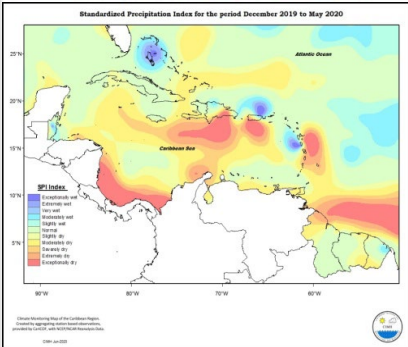
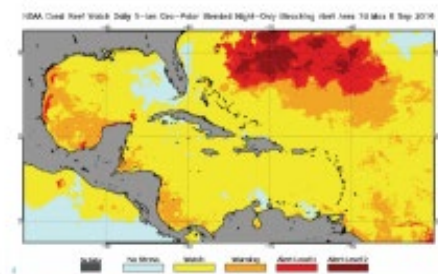


tropical cyclone activity  
fire weather  
Saharan dust intrusion

extreme rainfall / flooding  
excessive heat  
Sargassum beaching

excessive dryness  
coral reef bleaching  
coastal flooding

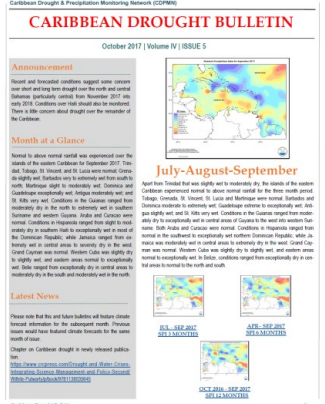
CLIMATE MONITORING



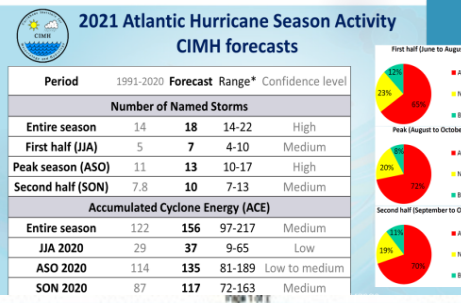
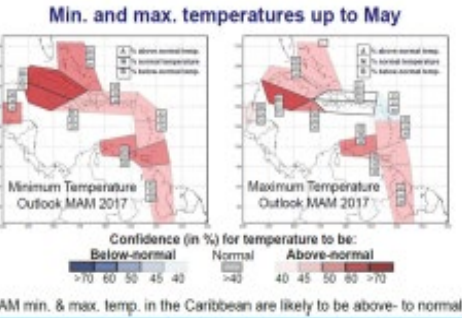
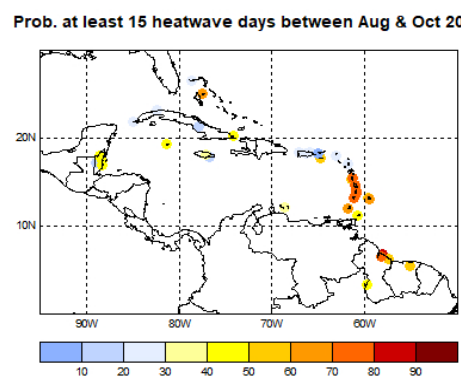
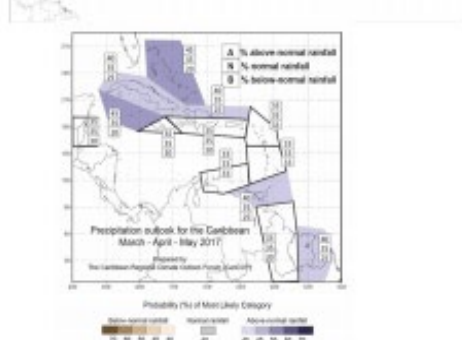
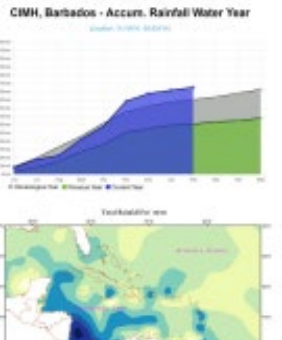
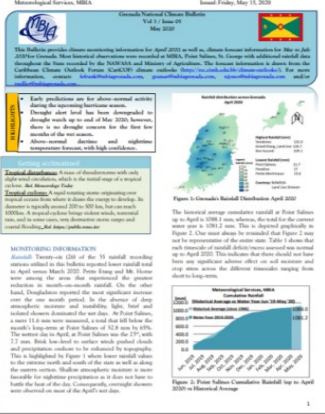
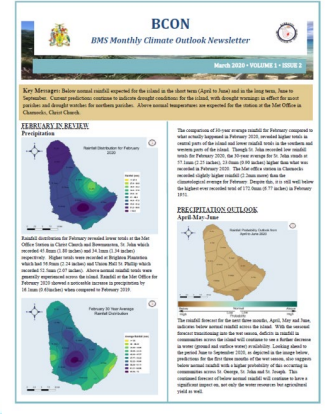
Alert Level	Interpretation
No Stress	No Thermal Stress
Watch	Low-level thermal stress
Warning	Thermal stress is accumulating
Alert level 1	Bleaching expected
Alert level 2	Widespread bleaching and some mortality expected



REGIONAL BULLETINS



NATIONAL BULLETINS

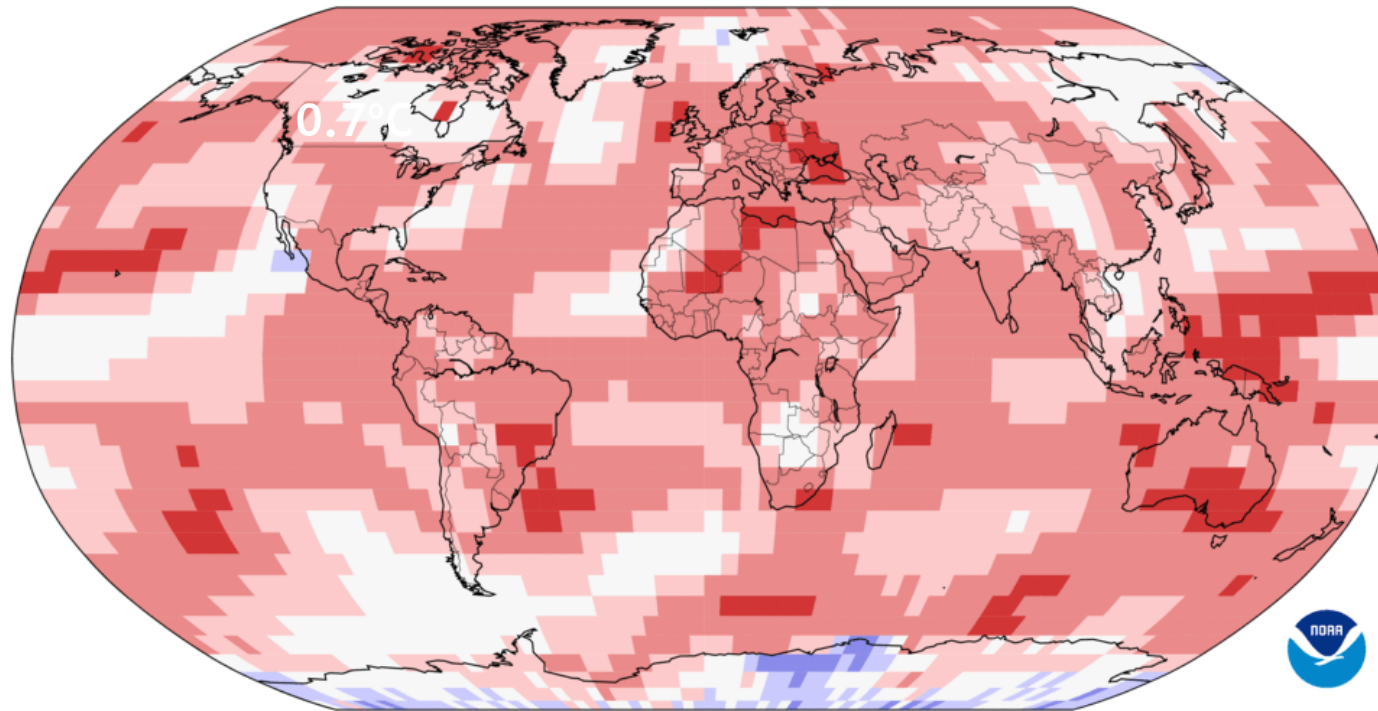


Through partnerships (*mainly with NOAA*), the Caribbean RCC monitors ocean temperature / heat content in the Atlantic and Pacific, which drives our climate variability and fuels extremes

### Land & Ocean Temperature Percentiles Mar 2025

NOAA's National Centers for Environmental Information

Data Source: NOAA GlobalTemp v6.0.0-20250406



Record Coldest

Much Cooler than Average

Cooler than Average

Near Average

Warmer than Average

Much Warmer than Average

Record Warmest

### Tropical Atlantic:

Right now:  
**unusually warm**

This summer:  
**unusually warm**

### Tropical Pacific:

Right now:  
**LA NIÑA faded**

This summer:  
**likely ENSO neutral**



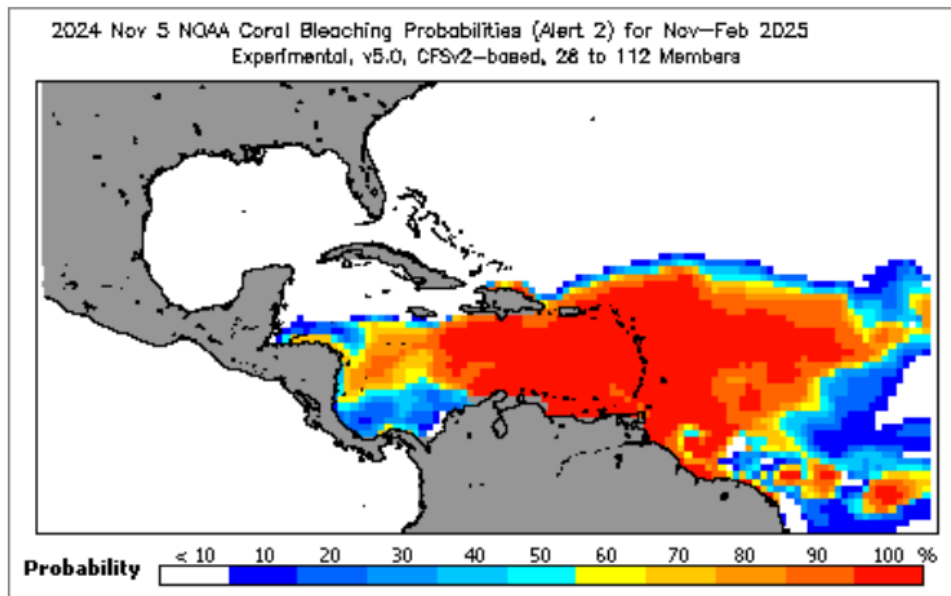
RICOF  
N CLIMATE OUTLOOK FORUM



In partnership with the Global Coral Reef Watch, the Caribbean RCC issues the **Caribbean Coral Reef Watch Bulletin** every month when SSTs are warm enough to impose heat stress on our reefs.

## Caribbean Outlook (Nov. 2024 - Feb. 2025)

- ▶ The 4-Month Probabilistic Outlook of November 5 predicts, with a high probability, that heat stress will continue to exceed Alert Level 2 in the central and eastern Caribbean basin, into November, and late December for the southeastern portion of the basin.

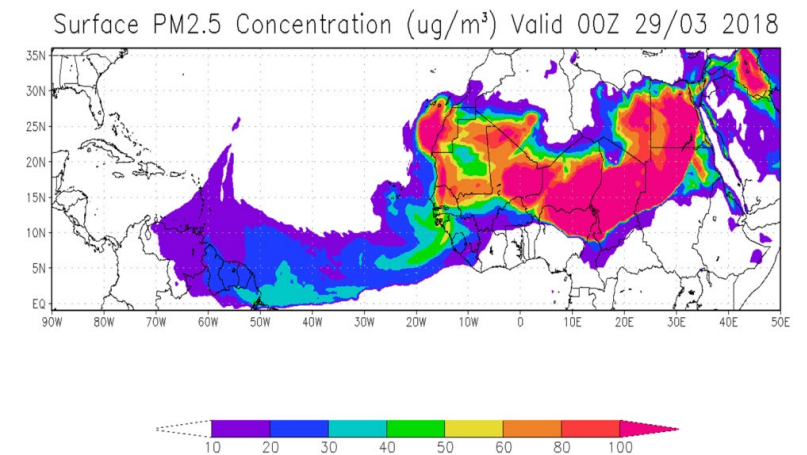
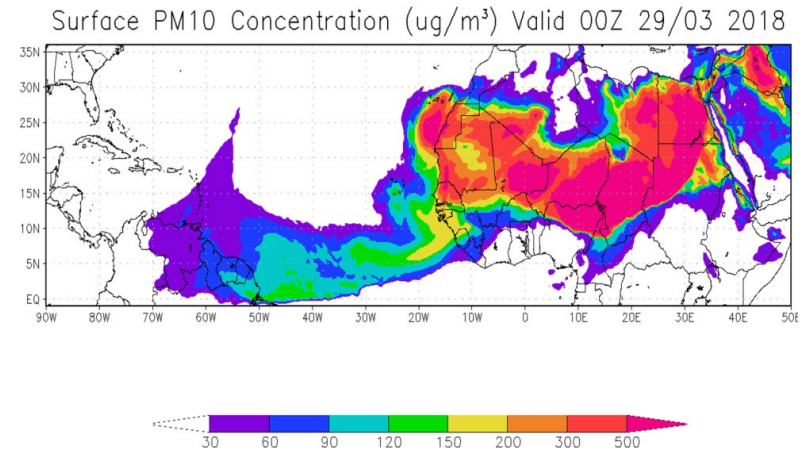


## *Caribbean Bleaching Outlook*

As of November 5, 2024, NOAA CRW's 4-Month Coral Bleaching Outlook (90% probability) indicates that Alert Level 2 and higher heat stress, already encompassing most of the basin, will begin to dissipate in the next 1-4 weeks and will continue this trend. The high heat stress will remain in mostly southern areas into early December, before dissipating completely in January. NOTE: alerts are not uniform across the basin.

# Dust and Air Quality Forecasting for the Caribbean

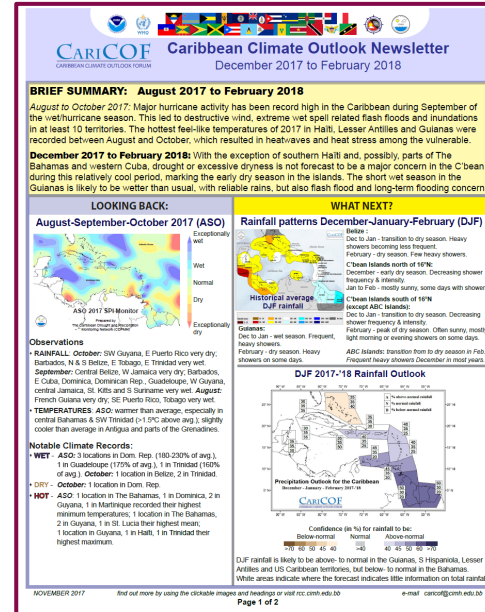
- Saharan dust incursions affect our oceans and seas:
  - fertilization of the surface waters,
  - oceanic heat accumulation,
  - wind-driven current speeds,
  - SSTs and SSS (incl. through changes in vertical mixing, solar radiation, evaporation/precipitation rates)
- CIMH - WMO Sand & Dust Storm Warning Advisory & Assessment System (SDS-WAS) Pan-American Regional Center



In principle, you could also add volcanic ash although it is a much less frequent occurrence ... we have figures that I can share from the modeling for La Soufriere

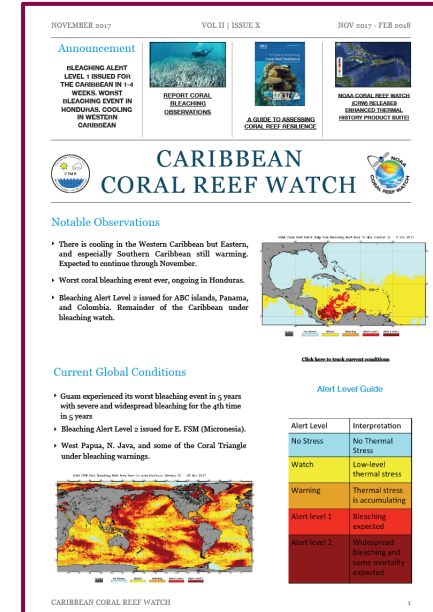
# Keep yourself updated !!

Our bulletins aim to offer digestible overviews of recent and forecasted climate conditions and their implications for the Caribbean



## CariCOF Climate Outlook Newsletter

<http://rcc.cimh.edu.bb/long-range-forecasts/caricof-climate-outlooks/caribbean-climate-outlook-newsletter/>



## Caribbean Coral Reef Watch

<http://rcc.cimh.edu.bb/climate-bulletins/coral-reef-watch/>

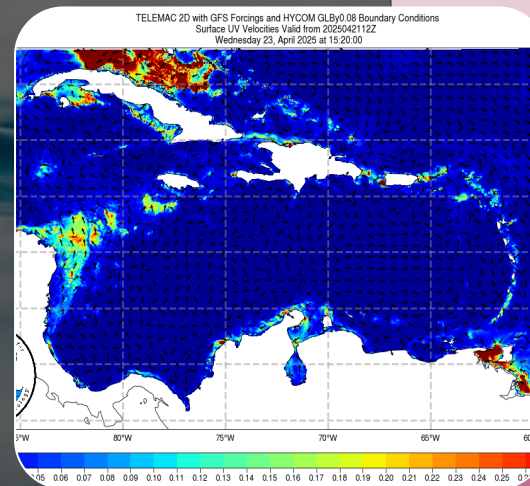
Feel free to highlight other products we can build with the marine community including the fisheries community



# Coming up next from CIMH: Integrating Marine Forecasting products into Climate Services

Caribbean  
Regional Climate  
Centre

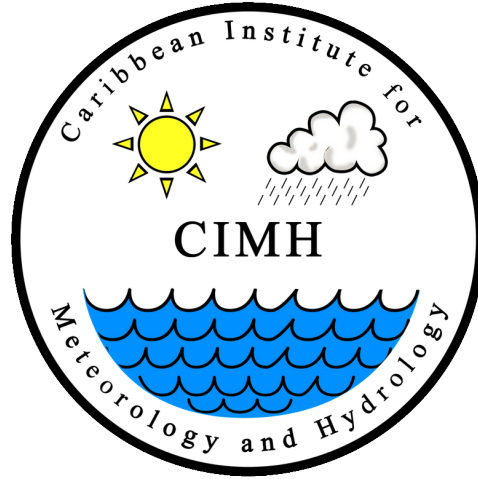
Marine  
Forecasting  
Support Centre



Forecasts of

- Sea Surface Height / Free Surface (HYCOM/Telemac2D)
- Ocean Current UV speed
- SST, SSS
- Significant Wave Height (WaveWatch3)
- etc.

CIMH welcomes ideas & requests for products & services delivery / brokerage



**For climate monitoring information, climate outlooks and climate bulletins pertaining to the Caribbean, please visit:**

**[rcc.cimh.edu.bb](http://rcc.cimh.edu.bb)**

**Additional early warning tools for the Caribbean are found at [www.cimh.edu.bb](http://www.cimh.edu.bb)**

***Thank you***