The United States of America Regional Climate Centre (USRCC)

WMO International Workshop on Global Review of RCC Operations

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WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

Background

Form of implementation: single multifunctional RCC

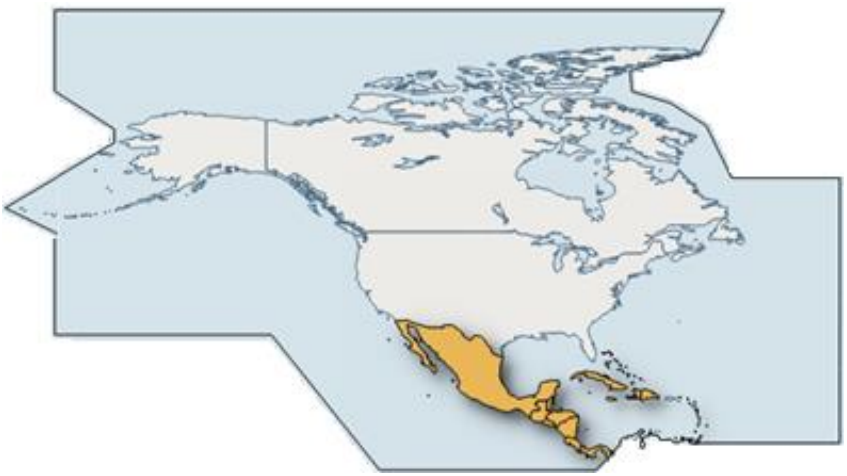
Coordinating institutions: NWS/NCEP/CPC, CPO, NCEI, GFDL, etc.

Governance: USRCC Advisory Committee

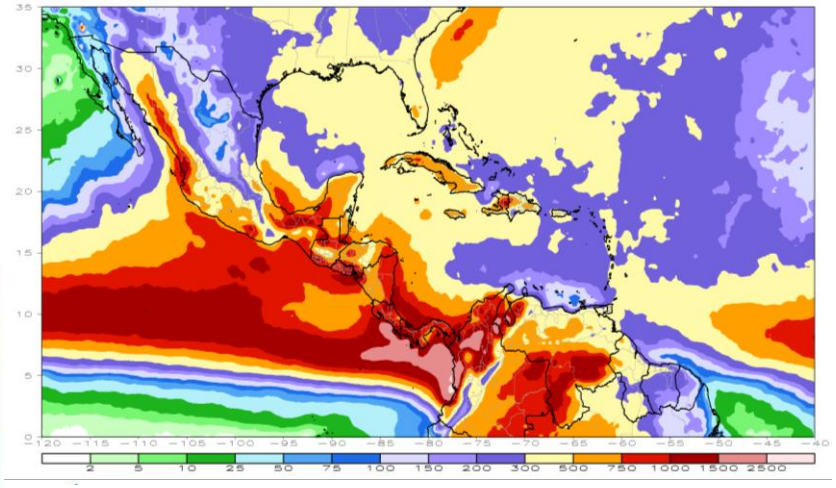
Funding: NOAA/NWS and USAID/OFDA

Operations commenced: in 2017

Status: in demonstration phase since 1st August 2018



USRCC domain of interest



CMORPH August-November Climatological Rainfall (mm)

Spatial domain of operations: the entire WMO RA IV, with a special emphasis on the Caribbean, Central America and Mexico

Major forcings on the regional climate: MJO, ENSO, Atlantic SST variability, PDO

Main seasons: all seasons

Parameters: precipitation, 2m air temperature, SSTs, wind, etc.

RCC operational schedule: daily updates

RCC Operations: Mandatory Functions

Operational Data Services

Data are made available through the USRCC website. **All NOAA data are submitted to standard quality control.**

- several variables, such precipitation, temperature, soil moisture, snow depth, etc.
- various types of data (station data, gridded data, reanalysis, forecasts, hindcasts, etc.)
- for different temporal resolution (6-hourly, daily, monthly and seasonal)
- some records dated back to 1979

WMO RA IV
Lower RA IV
Greater RA IV

OTHER RESOURCES
CPC ENSO
CPC ENSO Diagnostics
CPC MJO
Weekly MJO Update
Drought monitor
NOAA Atlantic Seasonal Hurricane Outlook

USA.gov

Data Services

At global level

CPC Unified Gauge-Based Analysis of Global Daily Precipitation [FTP]

- Spatial resolution: 0.5 deg lat/lon, Global land
- Temporal resolution: daily, January 1979 to present
  - 1979 - 2005: Retrospective version (30K+ gauges)
  - 2006 - present: Real-time version (~17K gauges)

CPC Global Land Surface Air Temperature Analysis [FTP]

- Spatial resolution: 0.5 deg lat/lon
- Temporal resolution: monthly means, 1979 to present

Selected Global Forecasts System Parameters in GIS Format [FTP]

- Variables: precipitation, maximum temperature, minimum temperature, snow depth, 0-10 cm underground volumetric soil moisture [fraction], 10-40 cm underground volumetric soil moisture [fraction], 40-100 cm underground volumetric soil moisture [fraction], 100-200 cm underground volumetric soil moisture [fraction]
- Temporal resolution: daily for the past two months

NCEP Reanalysis 1 Data [FTP]

- Spatial coverage: 2.5 deg lat/lon
- Temporal resolution: 6-hourly, daily, monthly, from January 1948 to present

NCEP Reanalysis 2 Data [FTP]

- Spatial coverage: 2.5 deg lat/lon
- Temporal resolution: 6-hourly, monthly, period of record 1979-2006

NCEP Global Data Assimilation System Data [GDAS webpage]

NCEP Global Ensemble Forecasts System Model Output Data [NCEP products inventory]

NCEP Model Data [NOMADS webpage]

Data and products can be provided upon request

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RCC Operations: Mandatory Functions

Climate Monitoring

The USRCC provides access to real-time regionalized monitoring products, focusing on the Caribbean, Central America and Mexico.

Gridded Data

CPC gridded global temperature: 2m air temperature *(mean, max. min., anomaly)*
CDAS analysis: Winds at different levels *(total, anomalies)*
CPC unified gauge analysis: Precipitation *(total, climatology, anomalies, percent of normal)*
CPC SST analysis: SSTs *(total, anomaly, previous anomaly, weekly tendency)*

Station Reports

GTS station reports: - Precipitation *(reported, anomalies, percent of normal)*
- 2m air temperature *(maximum, minimum, anomalies)*

Satellite Estimates

CMORPH: - Precipitation *(total, climatology, anomaly, percent of normal, grid point time series)*
- Total number of rain days *(total, anomaly)*
- Maximum consecutive number of dry days

Infrared satellite imagery: Last 48h infrared temperature
Land cover: - Vegetation Health Index *(total estimates, previous estimates, weekly tendency anomaly)*
- Normalized Difference Vegetation Index *(total, anomalies, last weeks anomaly, weekly tendency anomaly)*

→ **All these above products are under the form of maps that are publicly available and are updated on a daily basis**

Bulletins

Weekly and monthly bulletins: Current status and recent evolution of the climate in the Caribbean, Central America and Mexico

RCC Operations: Mandatory Functions

Long-Range Forecasting

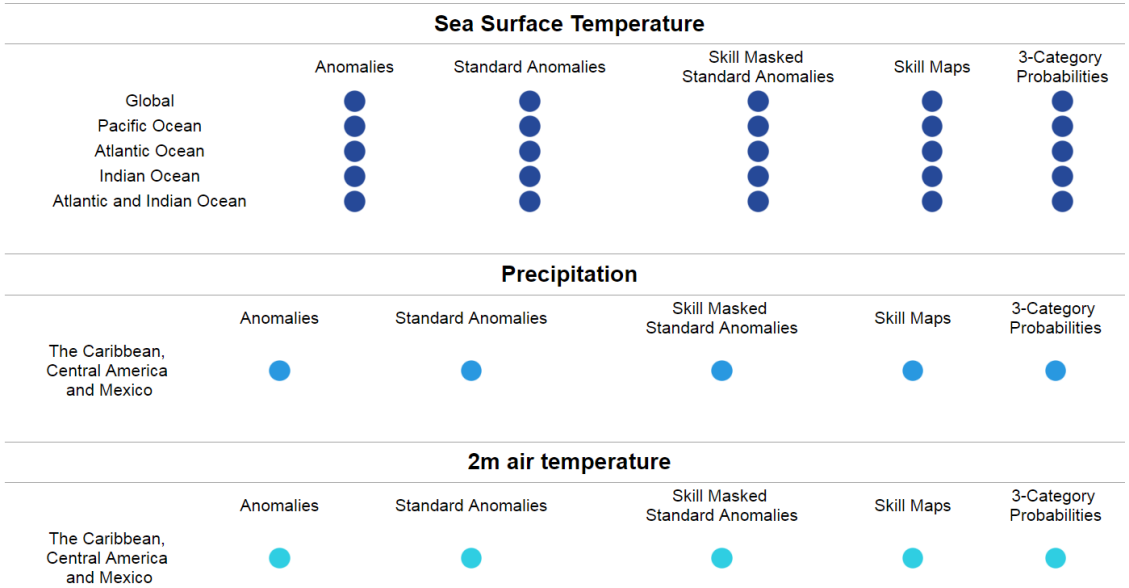
Seasonal forecasts

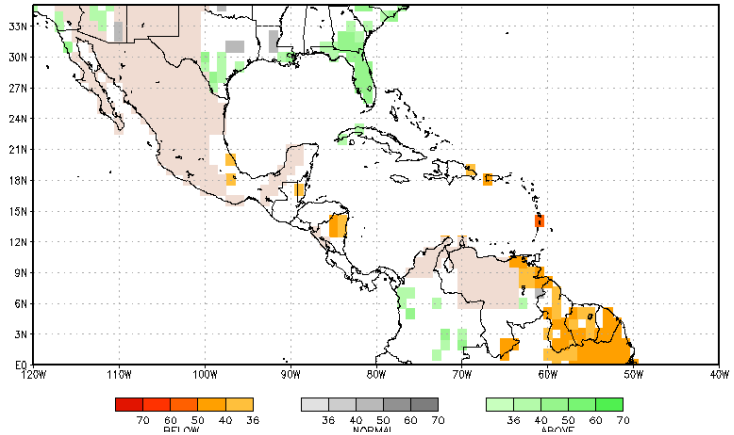
Models: 7 GCMs and the ensemble mean

Frequency: monthly

Lead time: from 1 to 5 month

Variables: SSTs, precipitation and 2m air temperature





NMME Precipitation Probabilistic Forecasts for January-March 2019 (IC: October)

Approach for seasonal forecasting

- Bias corrected deterministic forecasts
  → anomaly and standard anomaly forecasts
- Calibrated probabilistic forecasts using the probability anomaly correlation
  → 3-category probabilistic forecasts

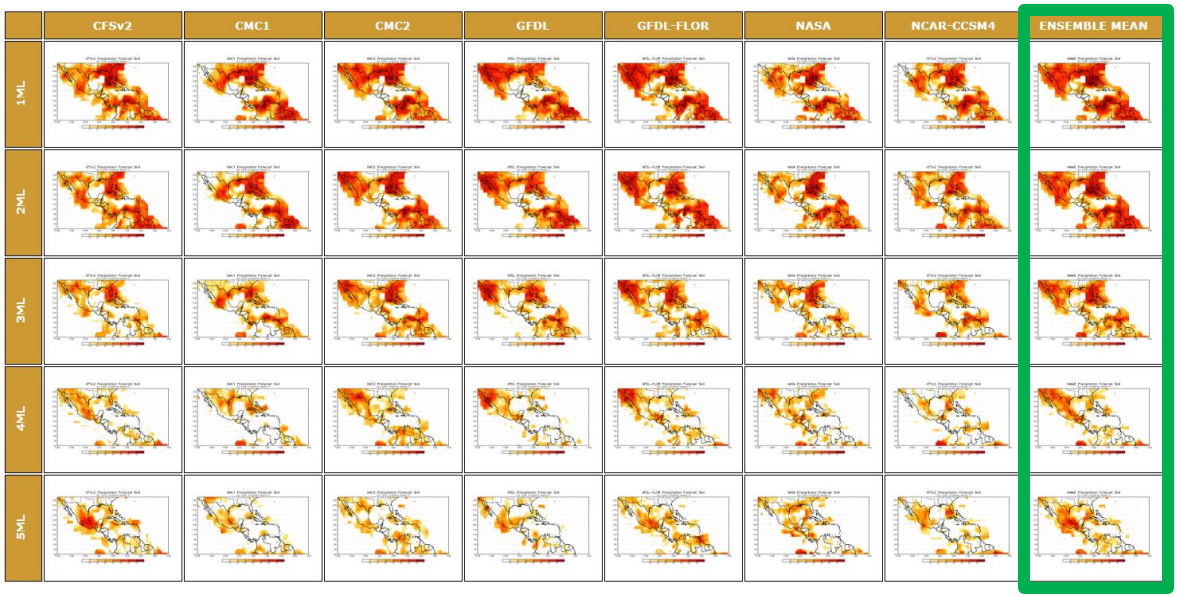
RCC Operations: Mandatory Functions

Long-Range Forecasting

Seasonal Skill Maps

7 GCMs and the ensemble mean

Verification metrics: anomaly correlation

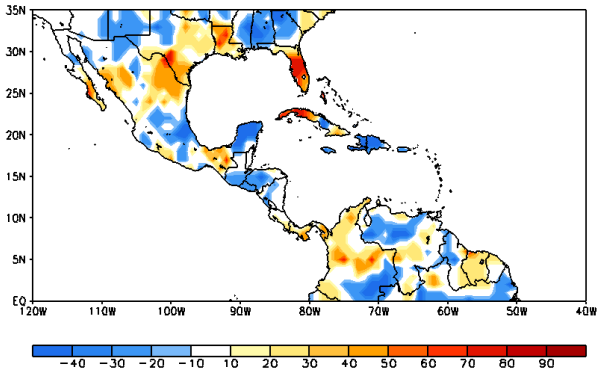


Historical verification of seasonal NMME forecasts (2012-2017)

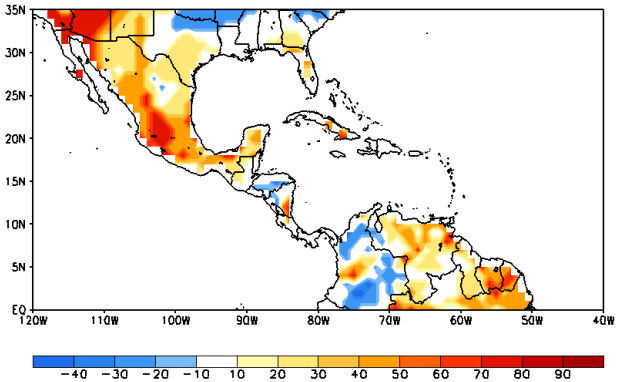
NMME precipitation and temperature

Verification metrics: HSS

Not yet available online



HSS for Jan-Mar Precipitation (IC: Nov)



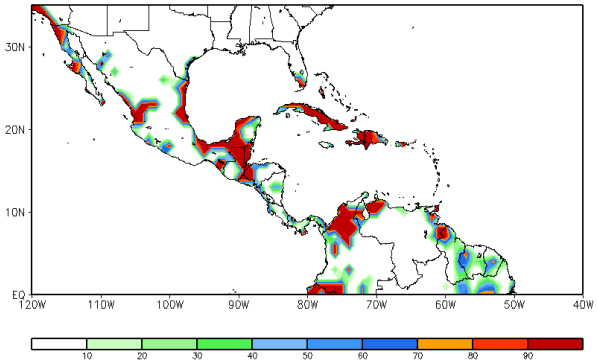
HSS for Jan-Mar temperature (IC: Nov)

RCC Operations: Mandatory Functions

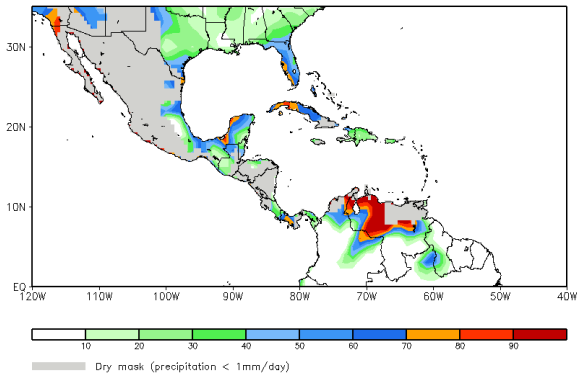
Training/Guidance in the use of RCC products

The USRCC provides:

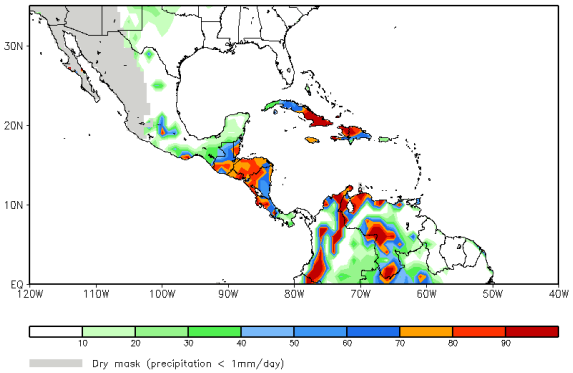
- support to RCOFs in Central America (CACOF) and the Caribbean (CariCOF)
- support to pre-CariCOF training session
- experimental forecast products tailored to user needs
- training workshops for the interpretation and use of USRCC data and products (plan for 2019)



Experimental heat wave forecast



Experimental dry spell forecast



Experimental wet spell forecast

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Role in Activities of RCOFs

Data and product provider

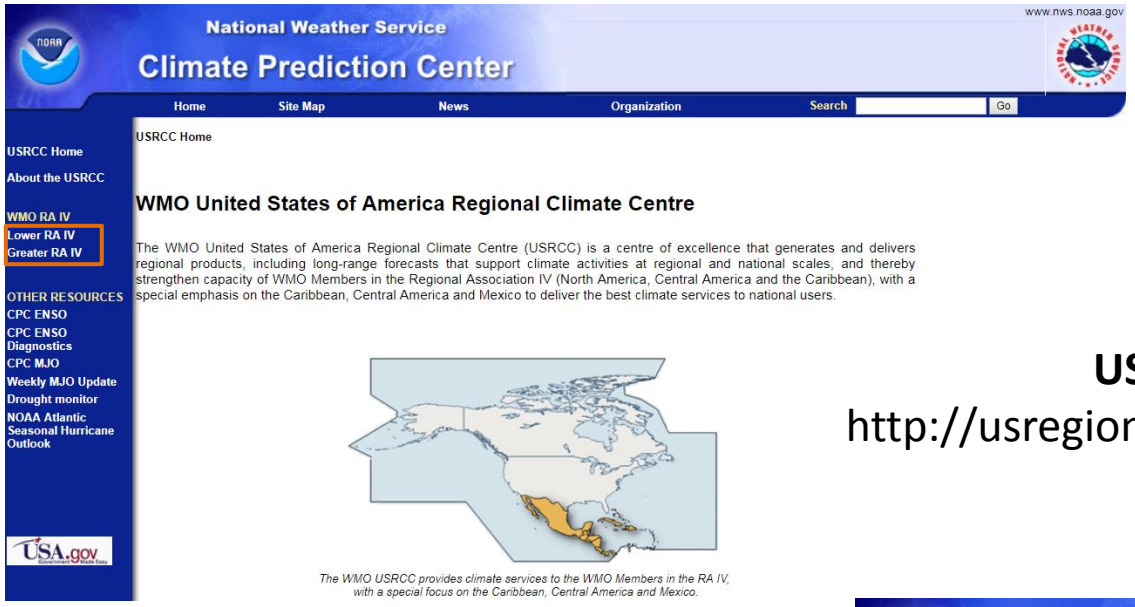
- The USRCC provides monthly and seasonal NMME forecasts and hindcasts data (in binary format and in IRI/CPT format) that can be used as guidance for regional and sub-regional forecasts.

Capacity building

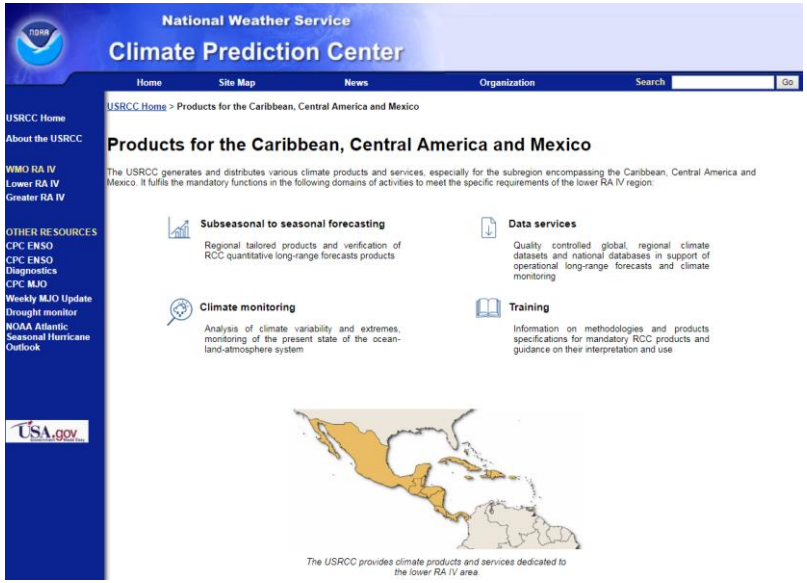
- CPC International Training Desks
- Pre-CariCOF training sessions
- Off site training workshops for RA IV area

USRCC Web Portal

Access to products



USRCC website:
http://usregionalclimatecenter.noaa.gov/



- Only the *Lower RA IV* section is populated with products
- Plan to populate the *Greater RA IV* section
- Data and products organized according to the mandatory functions

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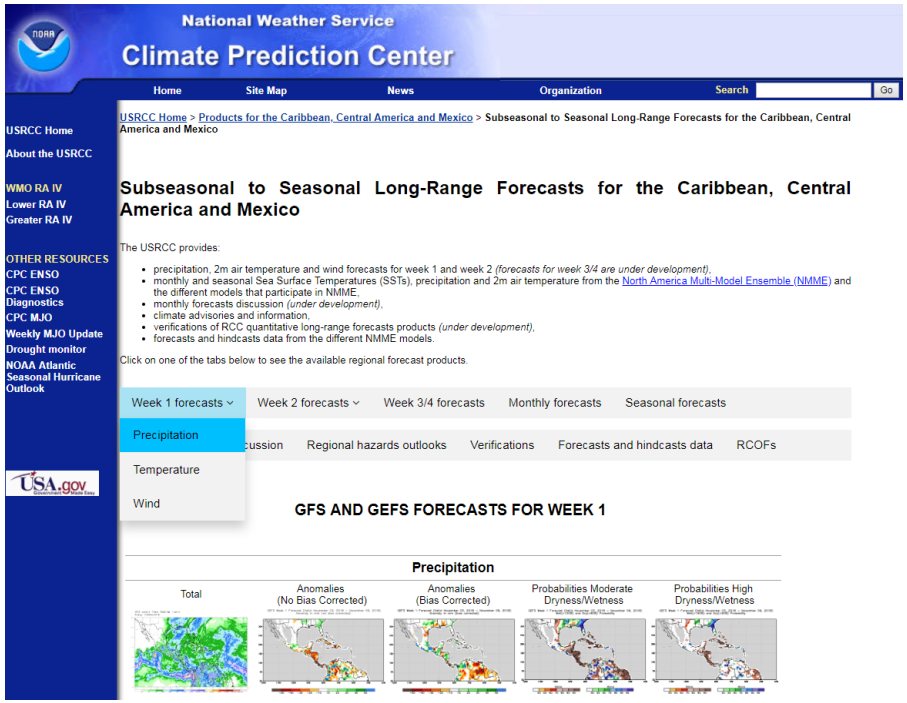
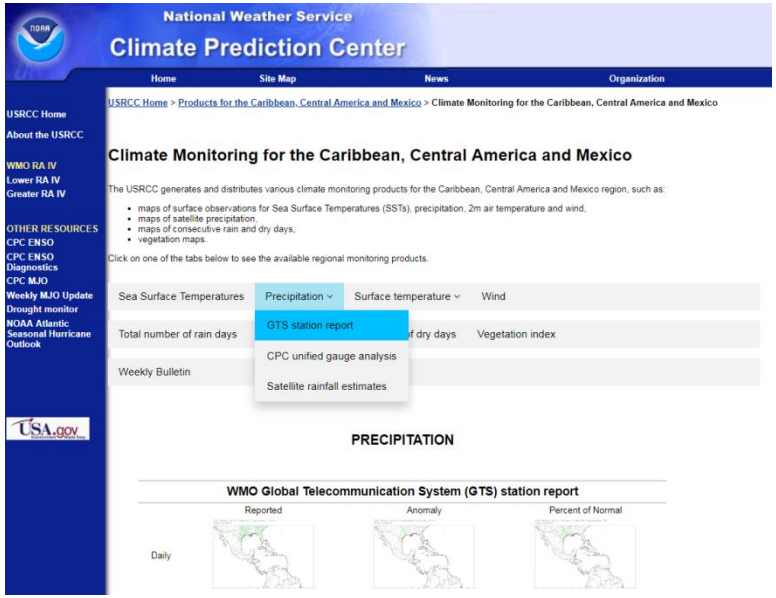
USRCC Web Portal



Automation of products for minimal dependence on human resources

S2S Forecasting

Forecast products organized according to the time scale and the variable



Climate Monitoring

Monitoring products organized according to the variable and the type of data

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SWOT Analysis

Strengths

- Access to a significant volume of weather and climate data from the different NOAA Line Offices
- Data freely available without any restriction or fee

Opportunities

- Interact with focal points of RCOFs and stakeholders during RCOF sessions to identify their needs and requirements
- Strengthen partnerships with the RCC Caribbean and start building relationships with the Artic Polar RCC-Network and the Pacific RCC-Network

Weaknesses

- Language barrier with Spanish speaking countries
- Need human resources to address some research needs

Threats

N/A

Way Forward

- Operational production of all USRCC weather and climate information
- Research and development to feed into operations
  - Tailored sub-seasonal forecasting (heat wave day, dry spell and wet spell forecasts) and verifications
  - Expansion of regional hazard outlooks
  - Advanced warning of onset and cessation of the rainy season
  - Climate information for emerging infectious diseases
- Training workshops

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Thank you

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