# The WMO RCC - Washington

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**Climate Prediction Center**
**National Oceanic and Atmospheric Administration**

# About RCC – Washington

**Implementation:**
Single Multifunctional RCC

**Coordinating Institutions:**
NWS/NCEP/CPC, CPO, NCEI, GFDL
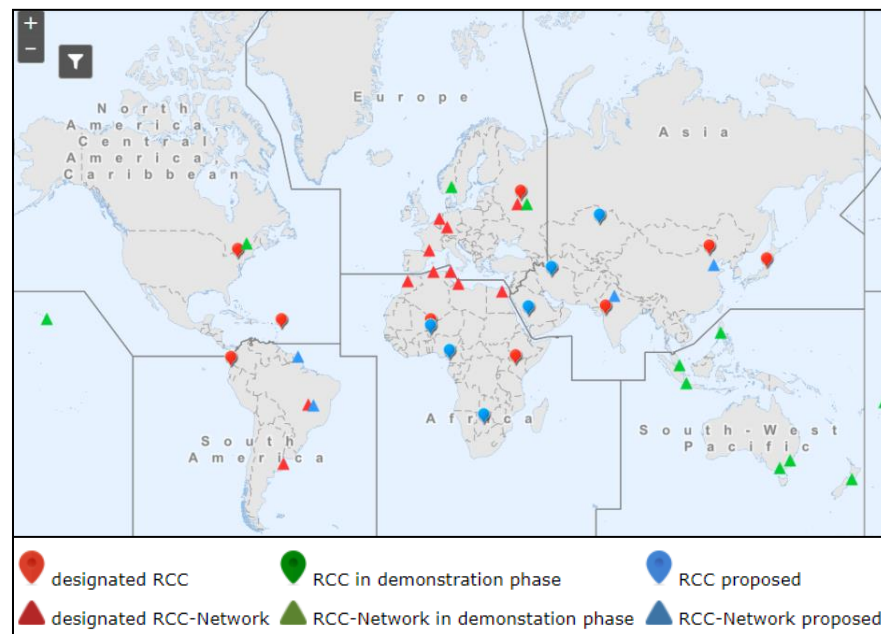
**Governance**: Advisory Committee

**Funding:** NOAA and USAID

**Demonstration Phase:** 2017

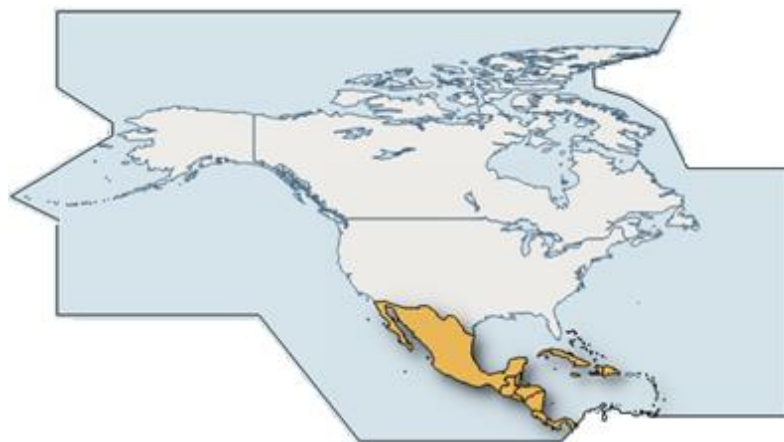**Status**: Designated RCC during the Cg-18, in June 2019



*WMO RCC-Washington*



*WMO RCC and RCC-Network implementation*

**Domain:**
***Greater RA-IV*** *with emphasis on the* ***Lesser RA-IV*** *(Caribbean, Central America and Mexico)*

# Products and Services



**http://usregionalclimatecenter.noaa.gov/**

*Providing access to weather and climate information to the WMO RA-IV Region and contributing to capacity development to improve climate services.*

## National Weather Service — Climate Prediction Center

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USRCC Home

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Lesser RA IV
Greater RA IV

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

### WMO United States of America Regional Climate Centre

The WMO United States of America Regional Climate Centre (USRCC) is a centre of excellence that generates and delivers regional products, including long-range forecasts that support climate activities at regional and national scales, and thereby strengthen capacity of WMO Members in the Regional Association IV (North America, Central America and the Caribbean), with a special emphasis on the Caribbean, Central America and Mexico to deliver the best climate services to national users.

*The WMO USRCC provides climate services to the WMO Members in the RA IV, with a special focus on the Caribbean, Central America and Mexico.*

| **Seasonal Forecasting** | **Data Services** |
| **Climate Monitoring** | **Training** |

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USRCC Home > Products for the Caribbean, Central America and Mexico

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### Products for the Caribbean, Central America and Mexico

The USRCC generates and distributes various climate products and services, especially for the subregion encompassing the Caribbean, Central America and Mexico. It fulfils the mandatory functions in the following domains of activities to meet the specific requirements of the lower RA IV region:

**Subseasonal to seasonal forecasting**
Regional tailored products and verification of RCC quantitative long-range forecasts products

**Data services**
Quality controlled global, regional climate datasets and national databases in support of operational long-range forecasts and climate monitoring

**Climate monitoring**
Analysis of climate variability and extremes, monitoring of the present state of the ocean-land-atmosphere system

**Training**
Information on methodologies and products specifications for mandatory RCC products and guidance on their interpretation and use

*The USRCC provides climate products and services dedicated to the lower RA IV area.*

# Monthly and Seasonal Forecasting
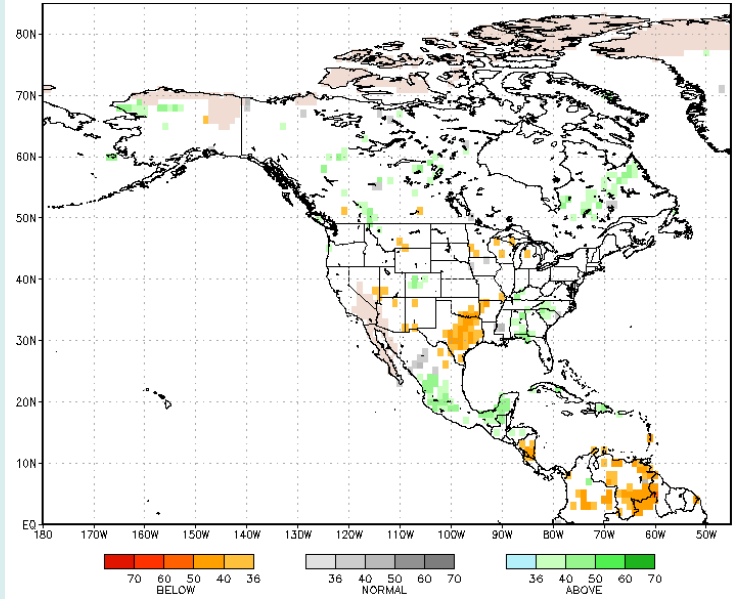
**Variables:** SST, P, and 2mT

**Forecasts:** deterministic and probabilistic
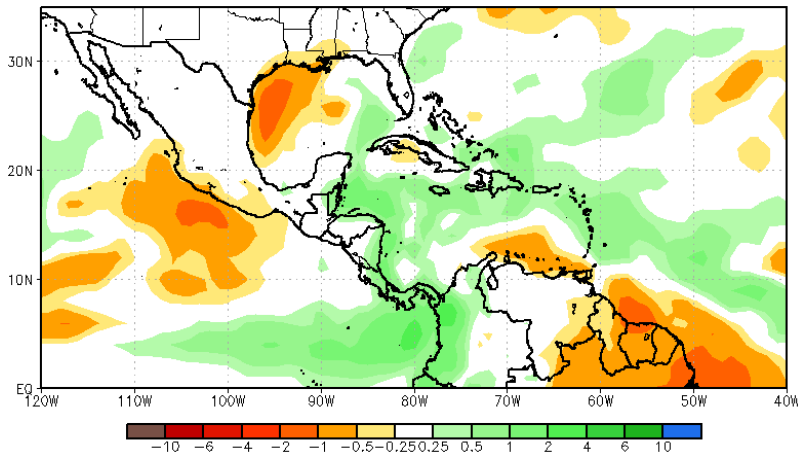
**Lead-time**: 0 to 4 months

**Models**: North American Multi-Model Ensemble

**Domain**: Greater RA IV and Lesser RA IV

**Updates**: Monthly



*NMME precipitation probabilistic forecast
for October 2019 (IC: September 2019)*



*NCEP CFSv2 precipitation anomaly forecast
for November 2019 – January 2020 (IC: Sep 2019)*

## Approach

- Bias correction

- Calibration probability anomaly correlation
  → 3-category probabilistic forecasts

# Monthly and Seasonal Forecast Verifications

**Verification Metrics**:

- Heidke Skill Score (2012 – 2018)

- Ranked Probability Skill Score (2012 – 2018)

**Models**:

- Individual models

- Ensemble Mean

*RPSS, NMME T, Oct, Sep IC*



*Verification Page*



*HSS NMME, P, JAS, June IC*

# Sub-Seasonal Forecasting
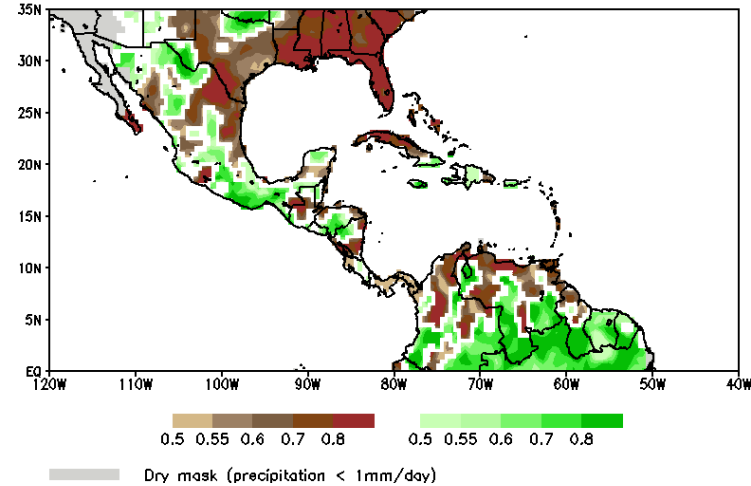
**Variables:** SST, P, 2mT, Winds, Heat Waves

**Forecasts:** deterministic and probabilistic

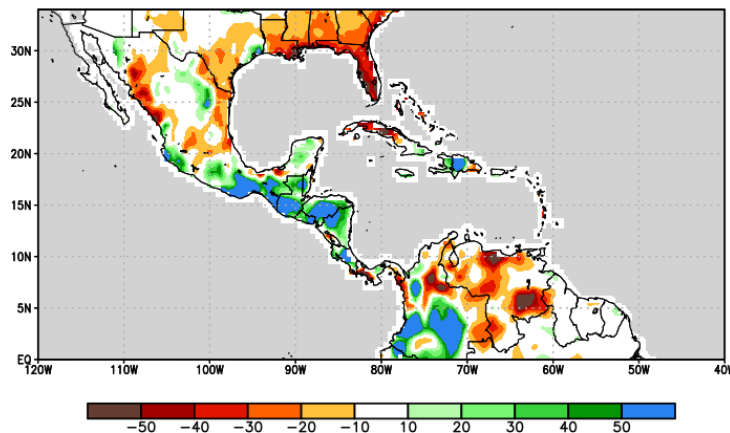**Lead-time**: 0 for Week-1; 7 days for Week-2

**Models**: NCEP GFS and CFSv2

**Domain**: Lesser RA IV

**Updates**: Daily



*NCEP GEFS calibrated week-2 P Forecast*



*NCEP GEFS bias corrected week-2 P Forecast*

## Approach

- Bias correction and non bias correction

- Calibration: Ensemble Regression
  → 2-category probabilistic forecasts
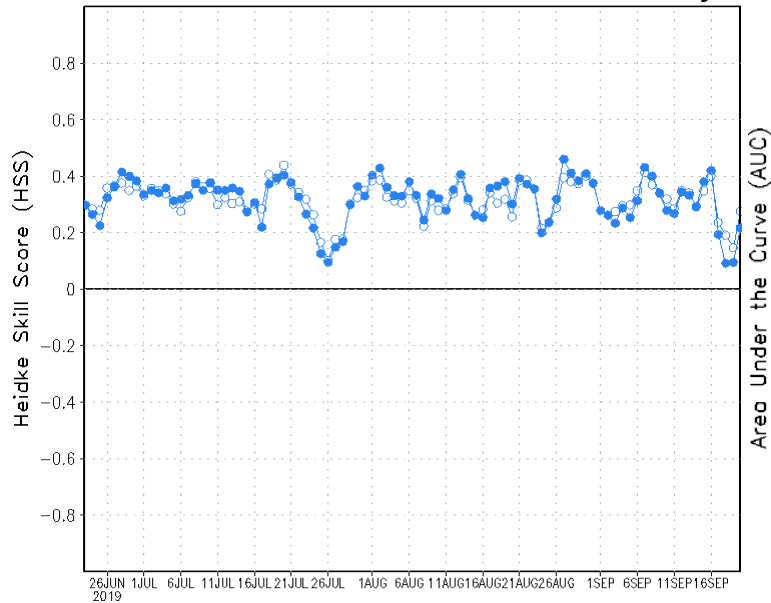
# Sub-Seasonal Forecast
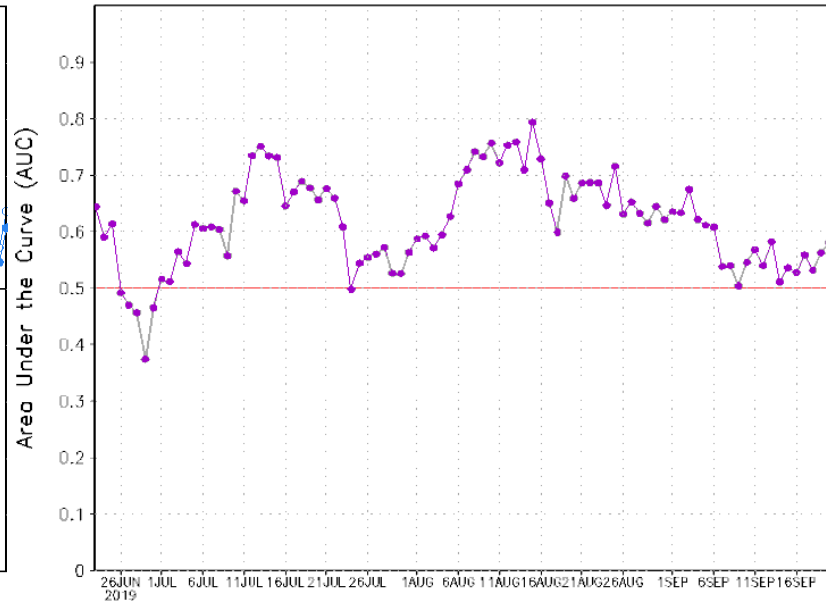## Verifications

**Verification Metrics**:

- Heidke Skill Score (past 90 days)

- Area Under the ROC Curve (past 90 days)

**Model**: NCEP GEFS



*HSS, Week-1 P Forecasts, last 90 days*

*AU ROC Curve for week-1 HW forecast*

# Climate Monitoring – Graphics
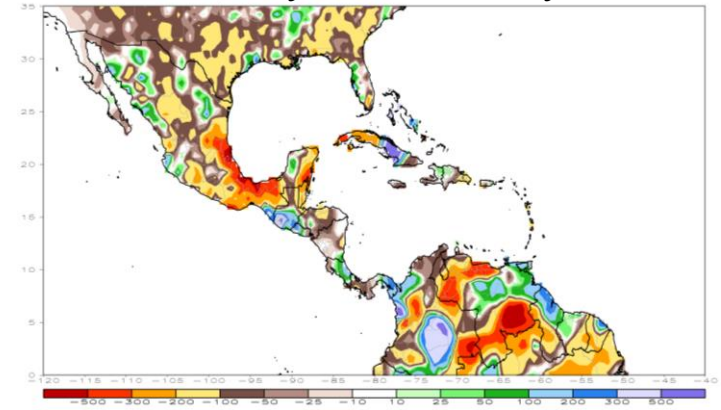
## Products: Graphics and bulletins

**Gridded Data**

- CPC gridded 2mT

- CPC unified gauge analysis: P

- CDAS analysis: Variable parameters

- NOAA ERSSTv5 and OISST Analysis: SST
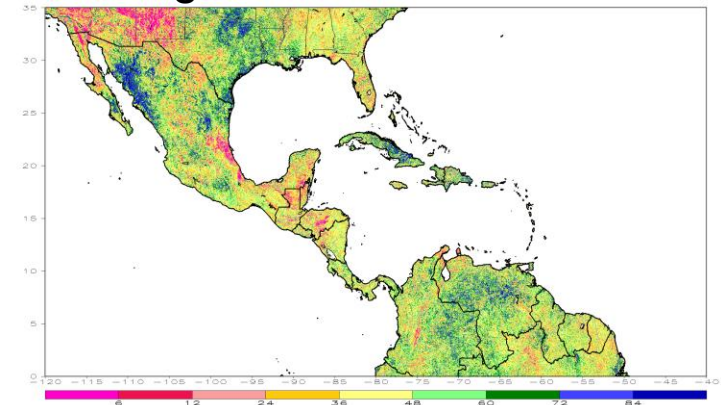
**GTS Station Reports:** P, 2mT

**Satellite Estimates:**

- CMORPH P

- Number of rain days

- Maximum consecutive number of dry/wet days

- Land cover: VHI, NDVI

P Analysis – 90 day



Vegetation Health Index

# Climate Monitoring – Bulletins

## Monthly Diagnostics Bulletin

August 2019

### Monthly Diagnostics of Climate Events for the USRCC Region

#### (i) Temperature

During the month of August, mean maximum temperatures were slightly warmer than normal in Hispaniola. Much of Hispaniola recorded small positive maximum temperature anomalies of 1-2°C (**Fig. 1**) and slightly higher in northern Dominican Republic. The remainder of the Caribbean Islands recorded near-average maximum temperatures. Meanwhile, minimum temperatures through the entirety of the Caribbean region were very close to average (**Fig. 2**).

In Mexico, maximum temperatures were widely warmer than normal, with the exception of a small patch of cooler temperatures in Jalisco state. Positive anomalies ranged from 1°C to 4°C with local areas observing 4-6°C anomalies (**Fig. 1**). Elsewhere, similar positive anomalies of 1-4°C were observed through much of Central America, with closer to normal temperatures in the south. Minimum temperatures were above average by as much as 6°C in
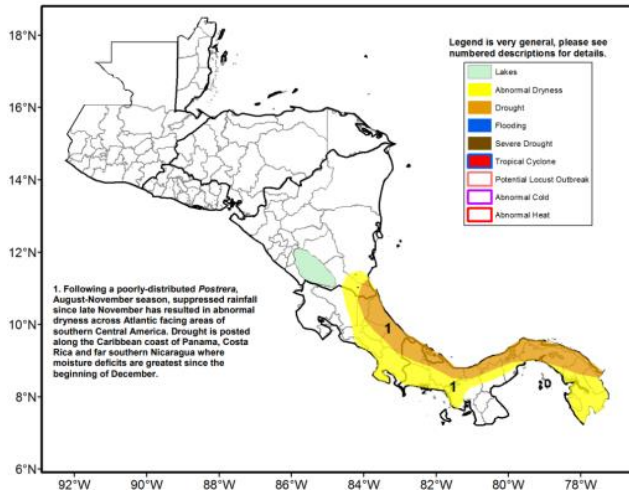
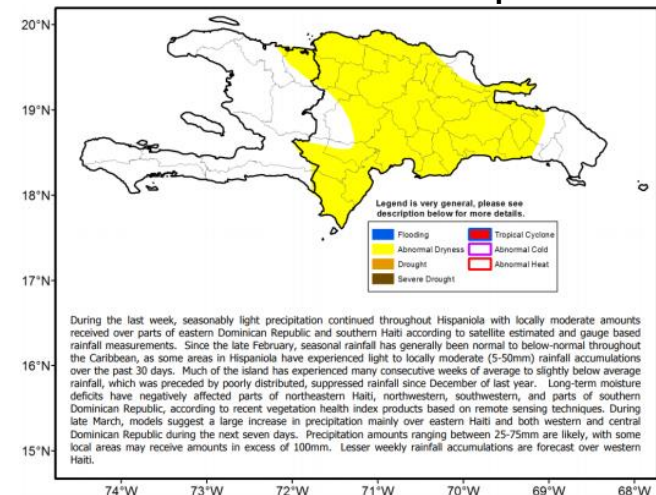## Weekly Climate Updates



**Rainfall Patterns: Last 7 Days**
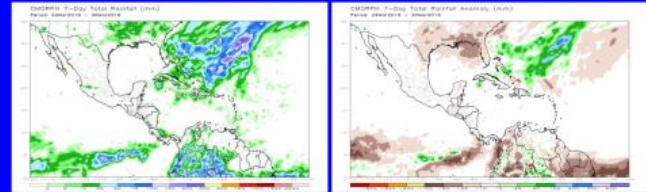
During the past 7 days, local areas of Mexico (Jalisco and Michoacán States), western Nicaragua, parts of Cuba, The Bahamas and northern Dominican Republic experienced above-average rainfall, with moisture surpluses of over 10 mm (more than 120% of normal rainfall).

Many areas in Mexico (Coahuila, Nuevo Leon, Tamaulipas, Veracruz, Hidalgo, Mexico, Puebla, Tlaxcala, Chiapas, Tabasco, Campeche, Quintana Roo and Yucatan States), western Belize, portions of Guatemala, southwestern Costa Rica, parts of Panama, extreme northern and southern parts of The Bahamas and portions of Hispaniola experienced below-average rainfall, with rainfall deficits of over 10 mm (less than 25% of normal rainfall).

## Hazard Outlook – C. America



1. Following a poorly-distributed *Postrera*, August-November season, suppressed rainfall since late November has resulted in abnormal dryness across Atlantic facing areas of southern Central America. Drought is posted along the Caribbean coast of Panama, Costa Rica and far southern Nicaragua where moisture deficits are greatest since the beginning of December.

## Hazard Outlook – Hispaniola



During the last week, seasonally light precipitation continued throughout Hispaniola with locally moderate amounts received over parts of eastern Dominican Republic and southern Haiti according to satellite estimated and gauge based rainfall measurements. Since the late February, seasonal rainfall has generally been normal to below-normal throughout the Caribbean, as some areas in Hispaniola have experienced light to locally moderate (5-50mm) rainfall accumulations over the past 30 days. Much of the island has experienced many consecutive weeks of average to slightly below average rainfall, which was preceded by poorly distributed, suppressed rainfall since December of last year. Long-term moisture deficits have negatively affected parts of northeastern Haiti, northwestern, southwestern, and parts of southern Dominican Republic, according to recent vegetation health index products based on remote sensing techniques. During late March, models suggest a large increase in precipitation mainly over eastern Haiti and both western and central Dominican Republic during the next seven days. Precipitation amounts ranging between 25-75mm are likely, with some local areas may receive amounts in excess of 100mm. Lesser weekly rainfall accumulations are forecast over western Haiti.

# Data Services

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USA.gov

## Data Services

**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 in netCDF format or in binary format**

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

**Surface Air Temperature Reanalysis in netCDF format**

- Spatial resolution: 0.5 deg lat/lon
- Temporal resolution: daily, 1948 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], 40-100 cm underground volumetric soil moisture [fraction]
- Temporal resolution: daily for the past two months

**Sub-seasonal forecast data**

- GEFS reforecast data in GRIB2 format [FTP]
- Web interface to select particular fields, date ranges and domains from the GEFS reforecasts
- CFSv2 data

**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]**

- Temporal Resolution:
  - Six-hourly, daily, monthly, seasonal

- Historical Record: 30 + years

  - Gridded data:
  - P & T analysis
  - Reanalysis
  - Forecasts & Hindcasts

- Station Data:

# Training



- NCEP Residency Training

- NOAA – USAID Training Series

- CACOF and CariCOF

- Online resources
  - Forecast Requirements
  - QGIS Tutorials
  - ENSO & MJO Tutorials
  - Data

# Future Development

- Expand the regional hazards outlooks to include the all of the Lesser RA-IV Region

- Work on the onset and cessation of the rainfall season

- Work collaborative with regional partners to advance climate and health agenda: heat waves; infectious diseases

- Develop online training materials

*Thank you.*