

# IRI and S2S Updates

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IRI, Columbia University

**Report to WGSIP19, Exeter, Oct 10, 2017**

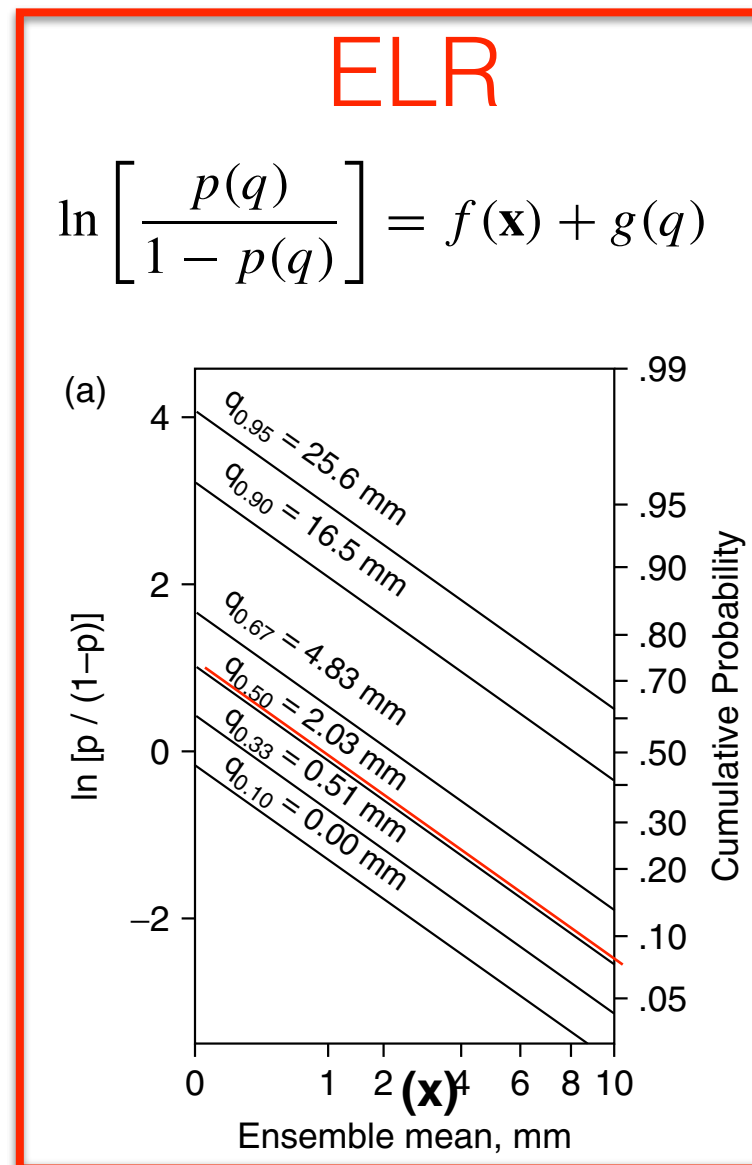
# Outline

1. IRI's new NMME-based seasonal forecast system
2. GPC Portal at ICPAC in Nairobi
3. S2S and SubX databases in IRI Data Library
4. Calibrated MME subseasonal probabilistic forecast development

# Forecast re-calibration with Extended logistic regression (ELR)

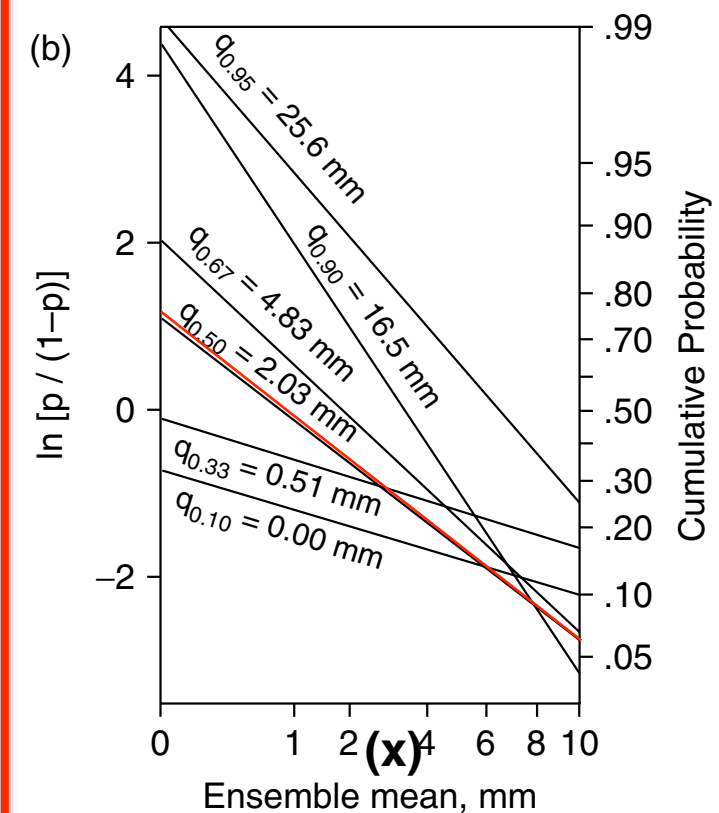
GFS Day 6–10  
Precip Forecast for  
Minneapolis  
28 Nov – 2 Dec  
2001

Wilks (2009)



Logistic regression

$$\ln \left[ \frac{p}{1 - p} \right] = f(\mathbf{x})$$



*Applied at each grid point, using forecast ensemble mean.*

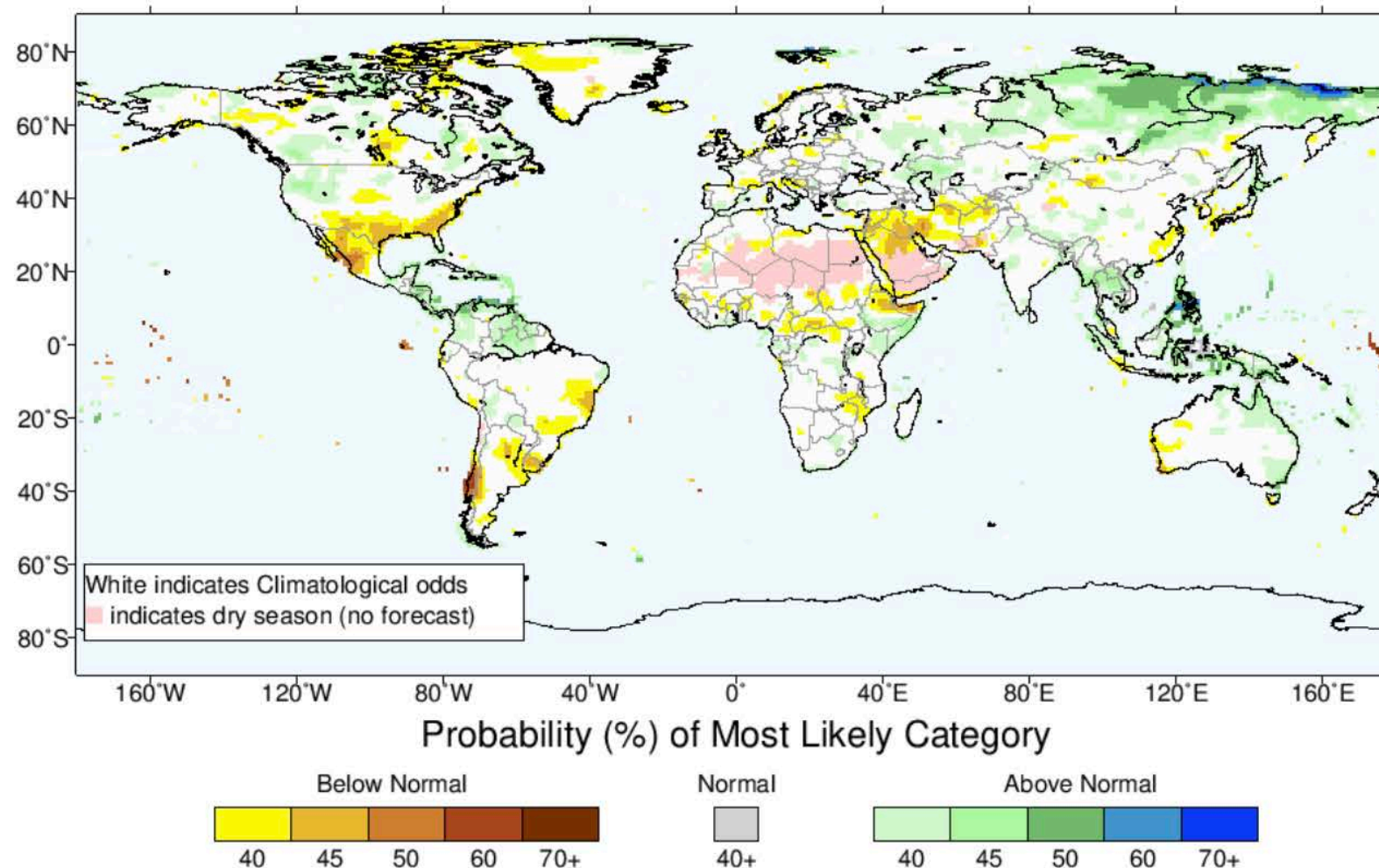
# IRI's New Seasonal Forecasts

Please refer to our [licensing agreement](#) for permission to use any IRI forecast material.

## Seasonal Climate Forecast

Region: Global Type: Precip Issue Year: 2017 Issue Month: September Leads: OND17

### IRI Multi-Model Probability Forecast for Precipitation for October–November–December 2017, Issued September 2017



## Overview

Starting in April 2017, the IRI probabilistic seasonal climate forecast product is based on a re-calibration of model output from the [U.S. National Oceanographic and Atmospheric Administration \(NOAA's North American Multi-Model Ensemble Project \(NMME\)\)](#).

This includes the ensemble seasonal prediction systems of [NOAA's National Centers for Environmental Prediction](#), Environment and Climate Change Canada, [NOAA/Geophysical Fluid Dynamics Laboratory](#), [NASA](#), [NCAR](#) and COLA/University of Miami. The output from each NMME model is re-calibrated prior to multi-model ensembling to form reliable probability forecasts. The forecasts are now presented on a 1-degree latitude-longitude grid.

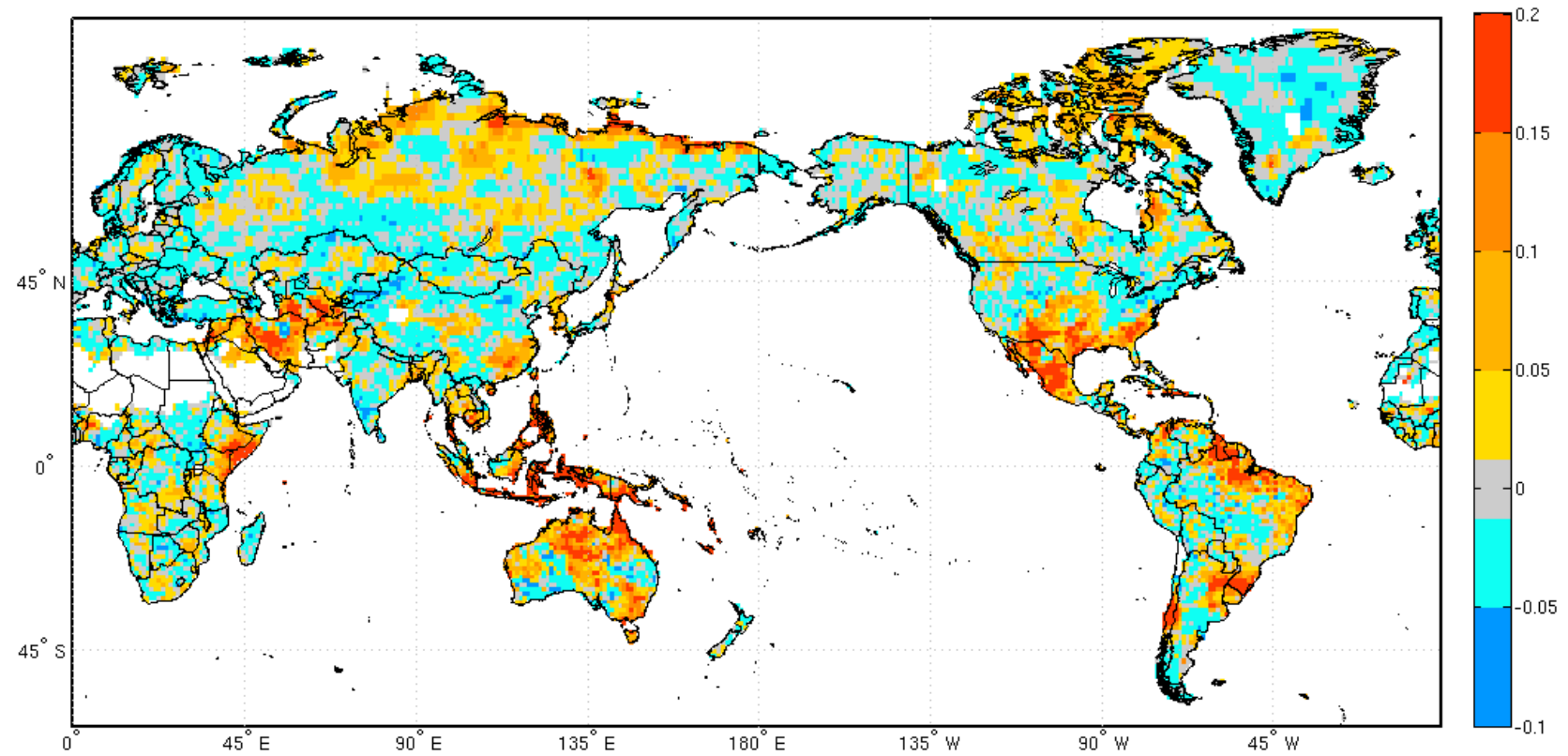
**Disclaimer:** *The IRI seasonal forecast is a research product. Please see the NOAA CPC forecast for the official seasonal forecast over the U.S. Please consult your country's national meteorological service for the official forecast for your country.*

Please see the 'Discussion' item for an overview of the individual forecasts.

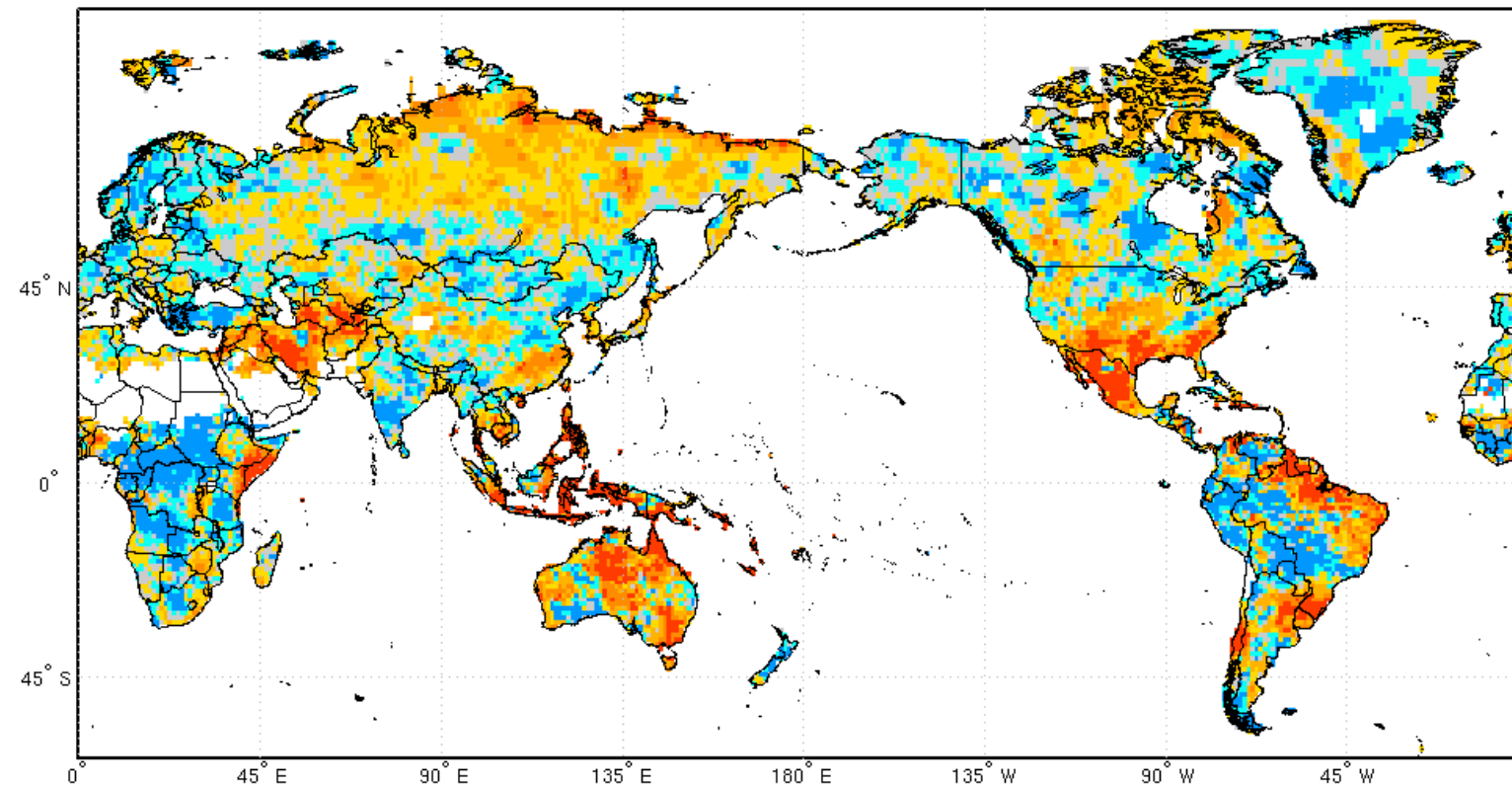


# RPSS Skill of OND Lead 1 Precip

Regression

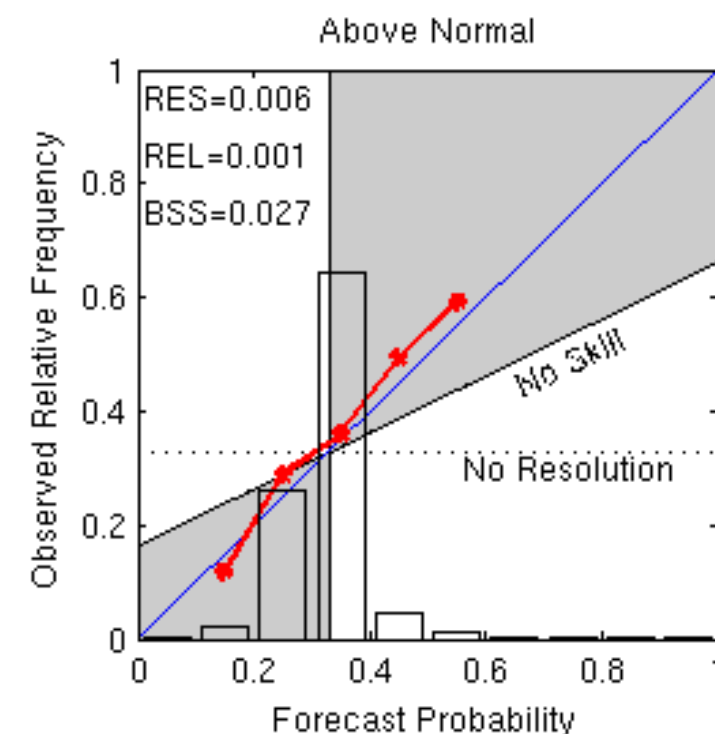
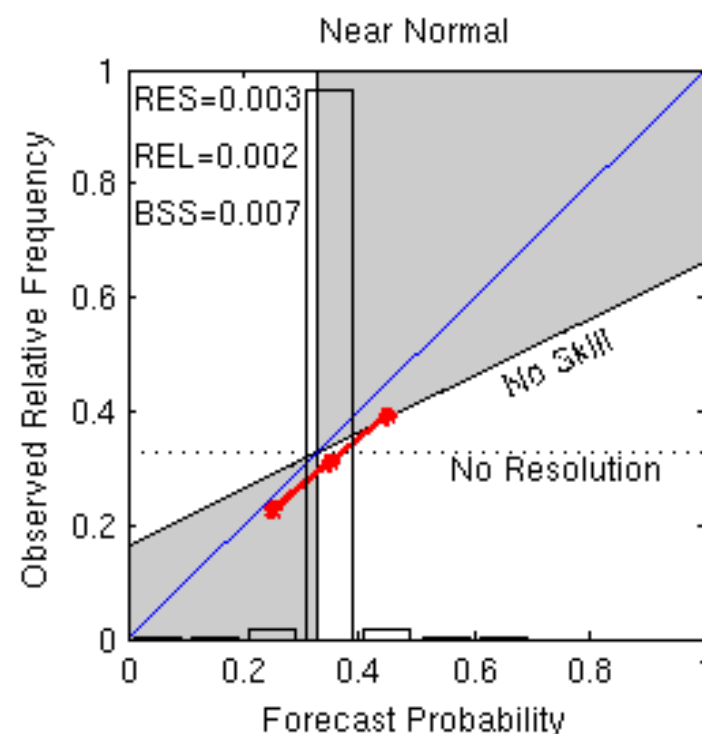
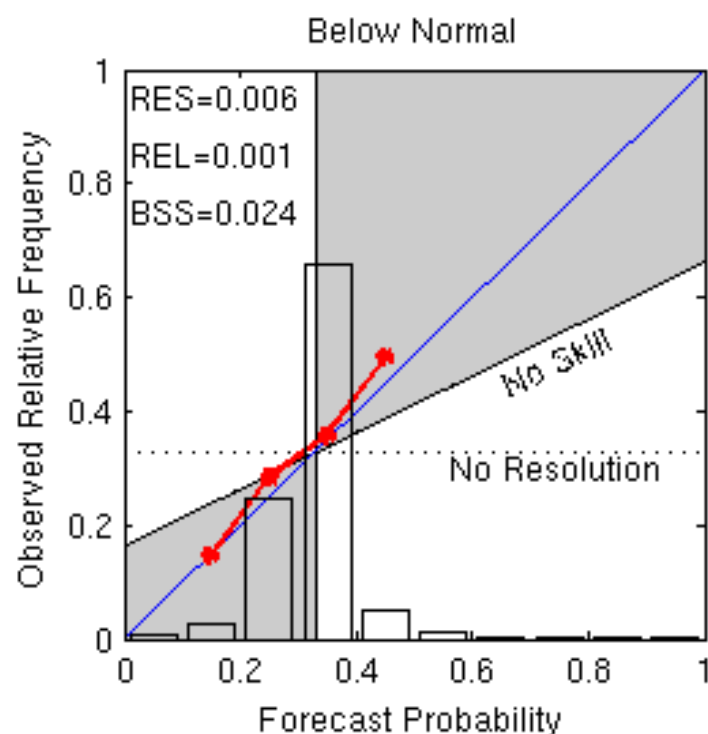


Counting

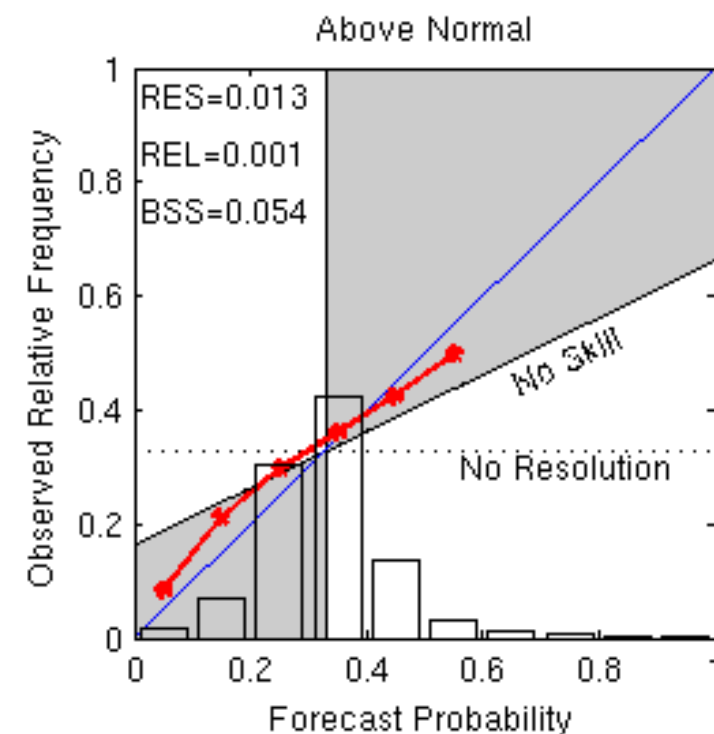
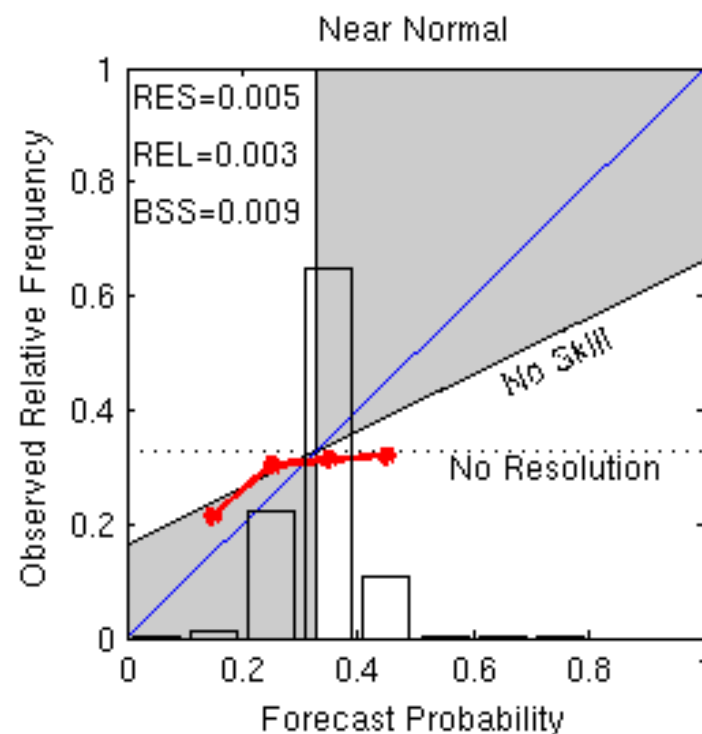
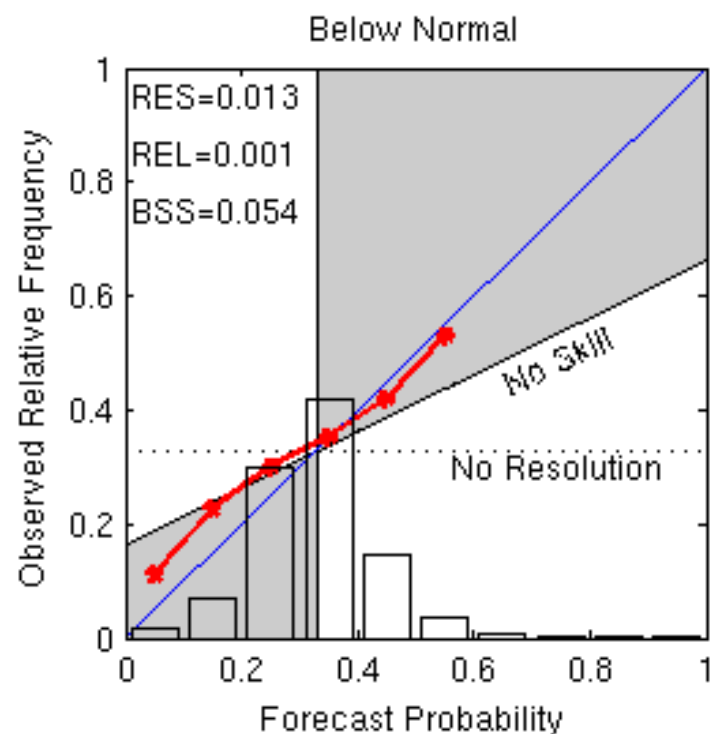


# Reliability of OND Lead 1 Precip

Regression

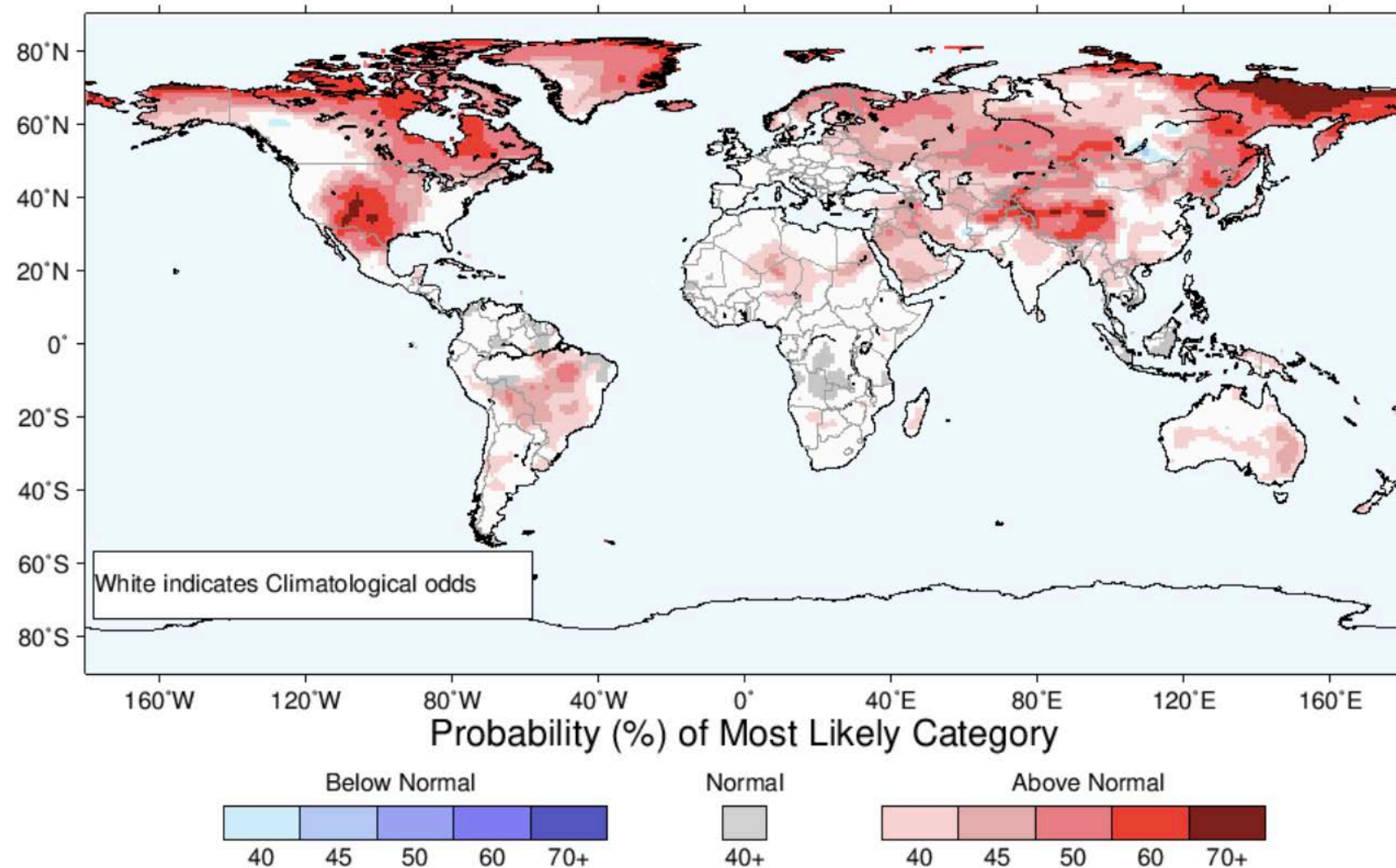


Counting



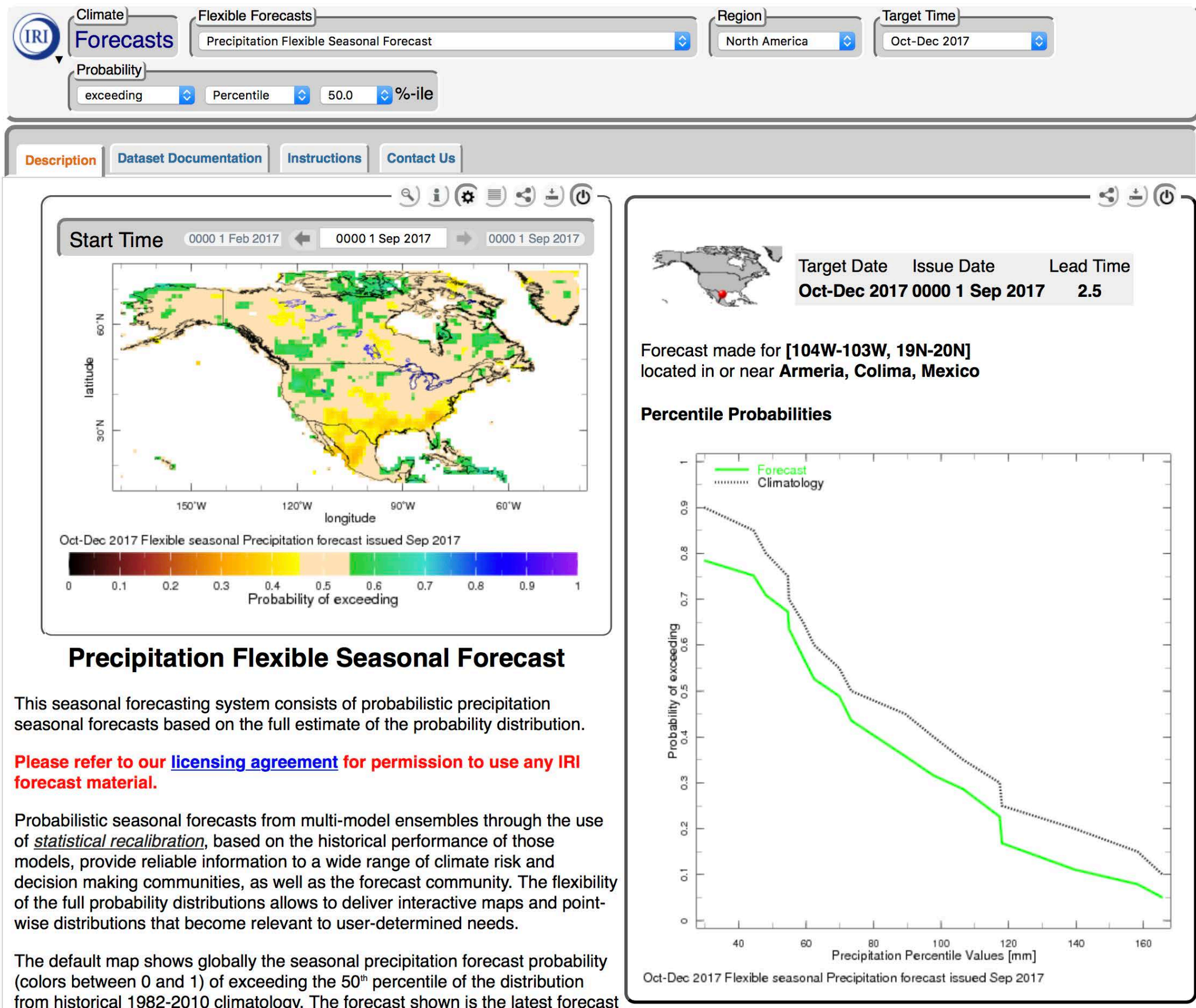
# Temperature

IRI Multi-Model Probability Forecast for Temperature for  
October–November–December 2017, Issued September 2017





# Flexible Format Maproom





# GPC Portal at ICPAC in Nairobi

197.254.113.170

ICPAC Climate Data Library Portal

## SCIPEA Climate Data Portal (ICPAC Site)

Strengthening Climate Information Partnerships - East Africa is a UKaid-funded project of the WISER programme (Weather and climate Information and SERvices for Africa).

**SCIPEA** aims to strengthen partnerships between organisations involved in production, use, research and training activities regarding seasonal climate forecast information, toward increased capacity for national/regional early warning and effective early actions. SCIPEA is led by the Met Office (UK), together with the IRI, the IGAD Climate Prediction and Applications Centre (ICPAC), and national meteorological services and universities/training and other centres from Ethiopia, Kenya, Tanzania and Uganda.

### Model Datasets

- [GPC Montreal CMC1-CanCM3](#)
- [GPC Montreal CMC2-CanCM4](#)
- [GPC Washington](#)
- [NASA](#)
- [COLA](#)
- [CCSM4](#)

### Observation Datasets

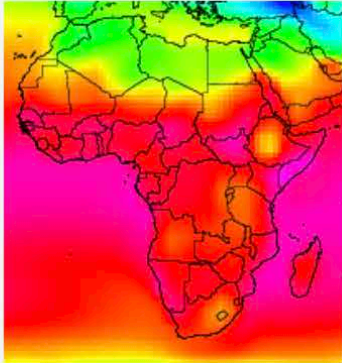
- [CAMS OPI Precipitation](#)
- [GHCN CAMS Temperature](#)
- [ERSST Sea Surface Temperature](#)
- [Reanalysis Mean Sea Level Pressure](#)

ForecastsObservations

## Forecasts

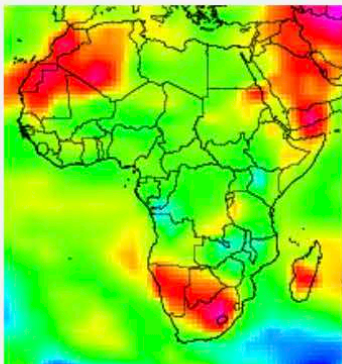
### GCM Forecast Climatology

These maps display climatological values of forecast 2-meter temperature, sea surface temperature, and precipitation at multiple leads and start times during the year for a selection of climate models. The climatological base period is 1982-2010 for CFSv2 and 1981-2010 for CMC1 and CMC2.



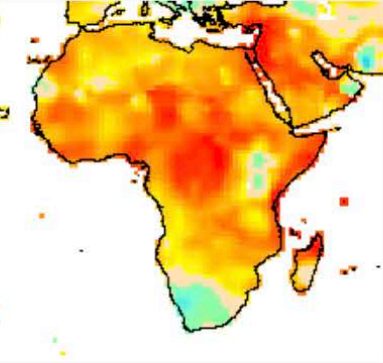
### GCM Forecast Anomaly

These maps display anomaly values of forecast 2-meter temperature, sea surface temperature, and precipitation at multiple leads for a selection of climate models. The climatological base period is 1982-2010 for CFSv2 and 1981-2010 for CMC1 and CMC2.














### Forecast Anomaly Correlation

These maps display anomaly correlations between hindcasts of 2-meter temperature, sea surface temperature, and precipitation and observed values of the same variables at multiple leads for a selection of climate models. The range of years over which the correlation is calculated is 1982-2010 for CFSv2 and 1981-2010 for CMC1 and CMC2.



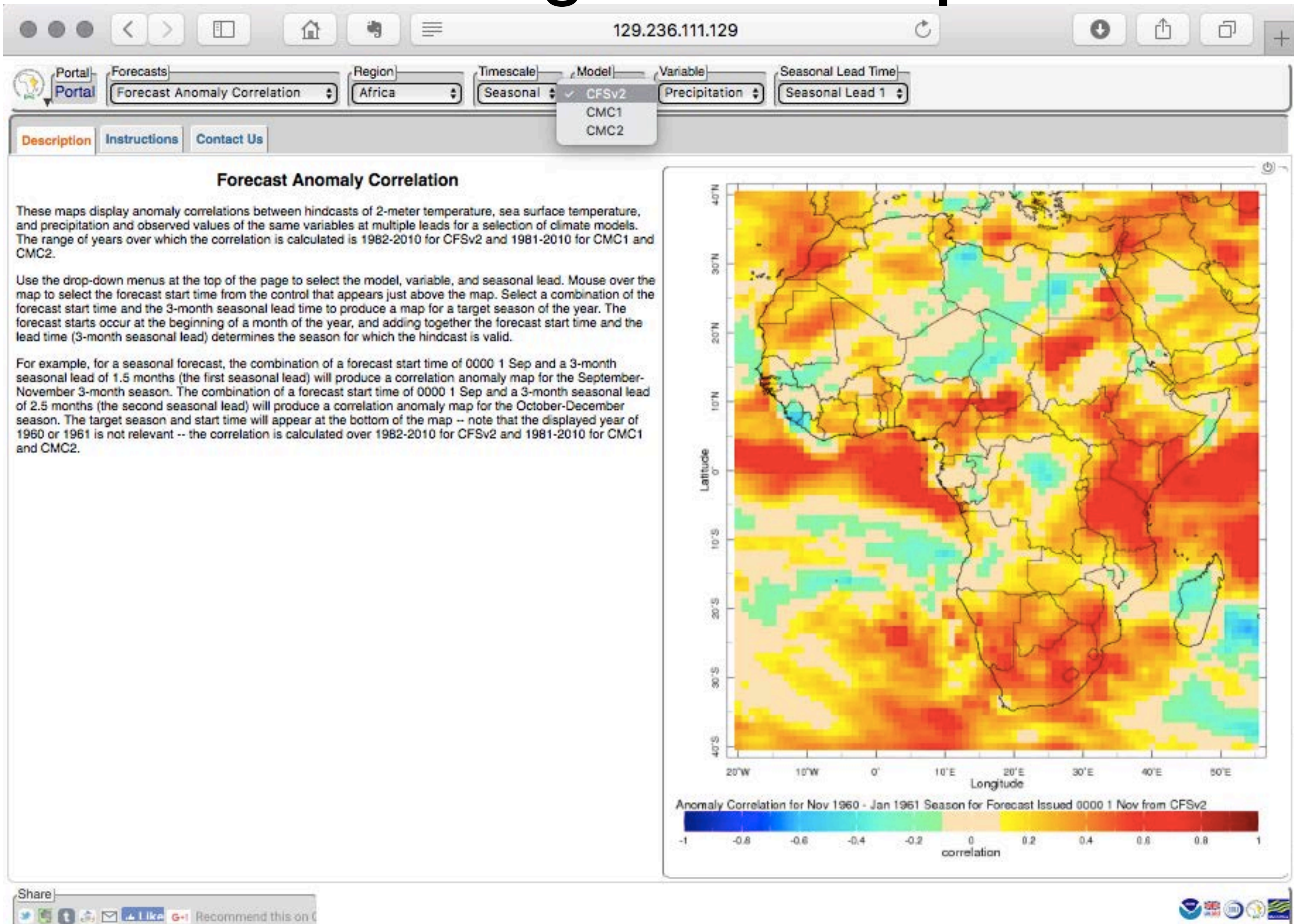
Share

 Like 0 





# Forecast Diagnostics Maproom











# CLIMATE PROGRAM OFFICE

ADVANCING SCIENTIFIC UNDERSTANDING OF CLIMATE,  
IMPROVING SOCIETY'S ABILITY TO PLAN AND RESPOND

MENU



## Newly released model forecasts could help advance NOAA's week 3-4 outlooks

17 August 2017

Number of views: 4

Predicting the weather 3 to 4 weeks from now is extremely challenging, yet many critical decisions affecting communities and economies must be made at this lead time. However, model forecasts available for the first time this week could help NOAA's operational Climate Prediction Center (CPC) significantly improve its week 3-4



# SubX Data in IRI Data Library

<http://iridl.ldeo.columbia.edu/SOURCES/.Models/.SubX/>

Description

Expert Mode



Data Library

Models SubX EMC GEFS forecast pr

X

0.5W - 0.5W

Y

90.5S - 90.5N

S

30 Jun 2017 - 3 Oct 2017

Language

english

L

[0.5 34.5] days

M

0 - 20

Description

Views

Data Filters

Data Selection

Data Files

Data Tables

Expert Mode

served from [IRI/LDEO Climate Data Library](http://iridl.ldeo.columbia.edu/)

SOURCES

Models

SubX

EMC

GEFS

forecast

pr

## Models SubX EMC GEFS forecast pr: Total Precipitation data

EMC GEFS forecast pr Total Precipitation from Models SubX: Subseasonal Experiment (SubX).

### Independent Variables (Grids)

Lead (forecast\_period)

grid: /L (days) ordered (0.5 days) to (34.5 days) by 1.0 N= 35 pts :grid

Ensemble Member (realization)

grid: /M (ids) ordered (0) to (20) by 1.0 N= 21 pts :grid

Start Time (forecast\_reference\_time)

grid: /S (days since 1960-01-01) ordered (0000 30 Jun 2017) to (0000 4 Oct 2017) by 1.0 N= 97 pts :grid

Longitude (longitude)

grid: /X (degree\_east) pe

Latitude (latitude)

grid: /Y (degree\_north) or

Models SubX EMC GEFS forecast Total  
Precipitation

0.5W -  
0.5W

90.5S -  
90.5N

30 Jun 2017 - 3 Oct  
2017

[0.5 34.5]  
days

0 -  
20

WGS  
84

Start Time:

0000 4 Oct 2017

0000 3 Oct 2017

Lead:

0.5

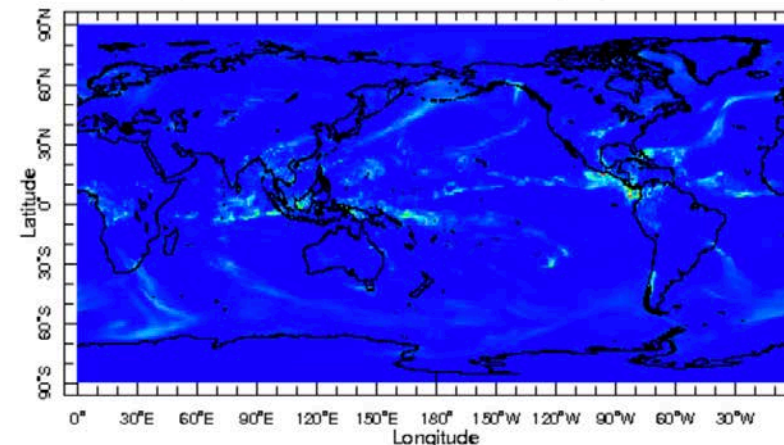
1.5

Ensemble Member:

0

1

90N



90S

Start Time 0000 4 Oct 2017 Lead 0.5 days Ensemble Member 0

0.5W

0.5W

0.0

0.002931

Longitude

Latitude

draw coasts

colors

## Models SubX

Models SubX: Subseasonal Experiment (SubX)

## Documents

[overview](#)

an out

[CTB](#)

NOAA

[SubX Project](#) SubX

## Datasets and variables

[ECCC](#)

Models SubX ECCC[GEM ]

[EMC](#)

Models SubX EMC[GEFS ]

[ESRL](#)

Models SubX ESRL[FIMr1p ]

[GMAO](#)

Models SubX GMAO[GEOS ]

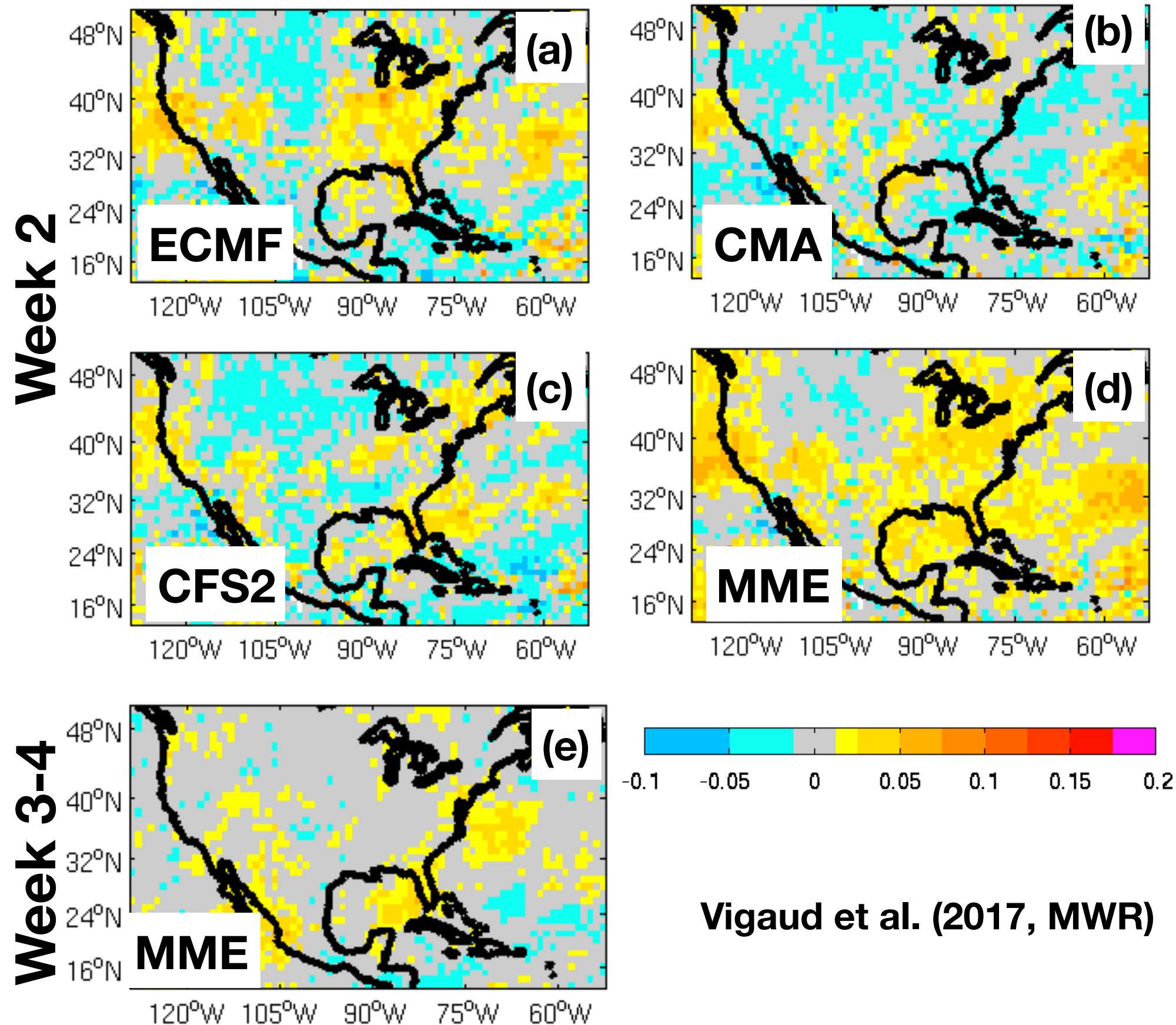
[NRL](#)

Models SubX NRL[NESM ]

[RSMAS](#)

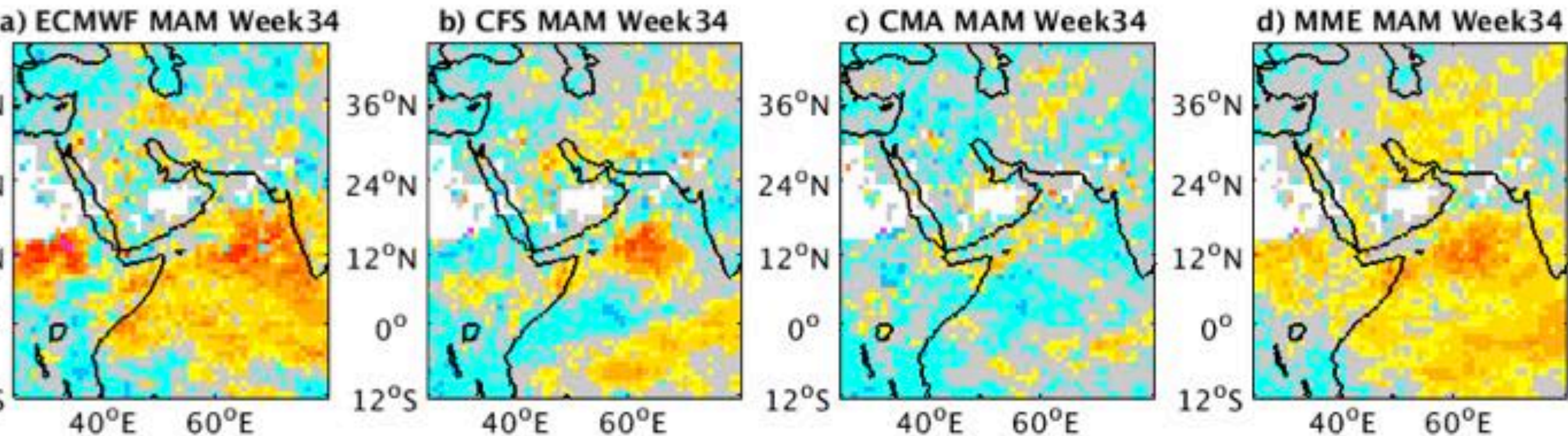
Models SubX RSMAS[CCSM ]

# Precipitation RPSS Skill for JFM Starts



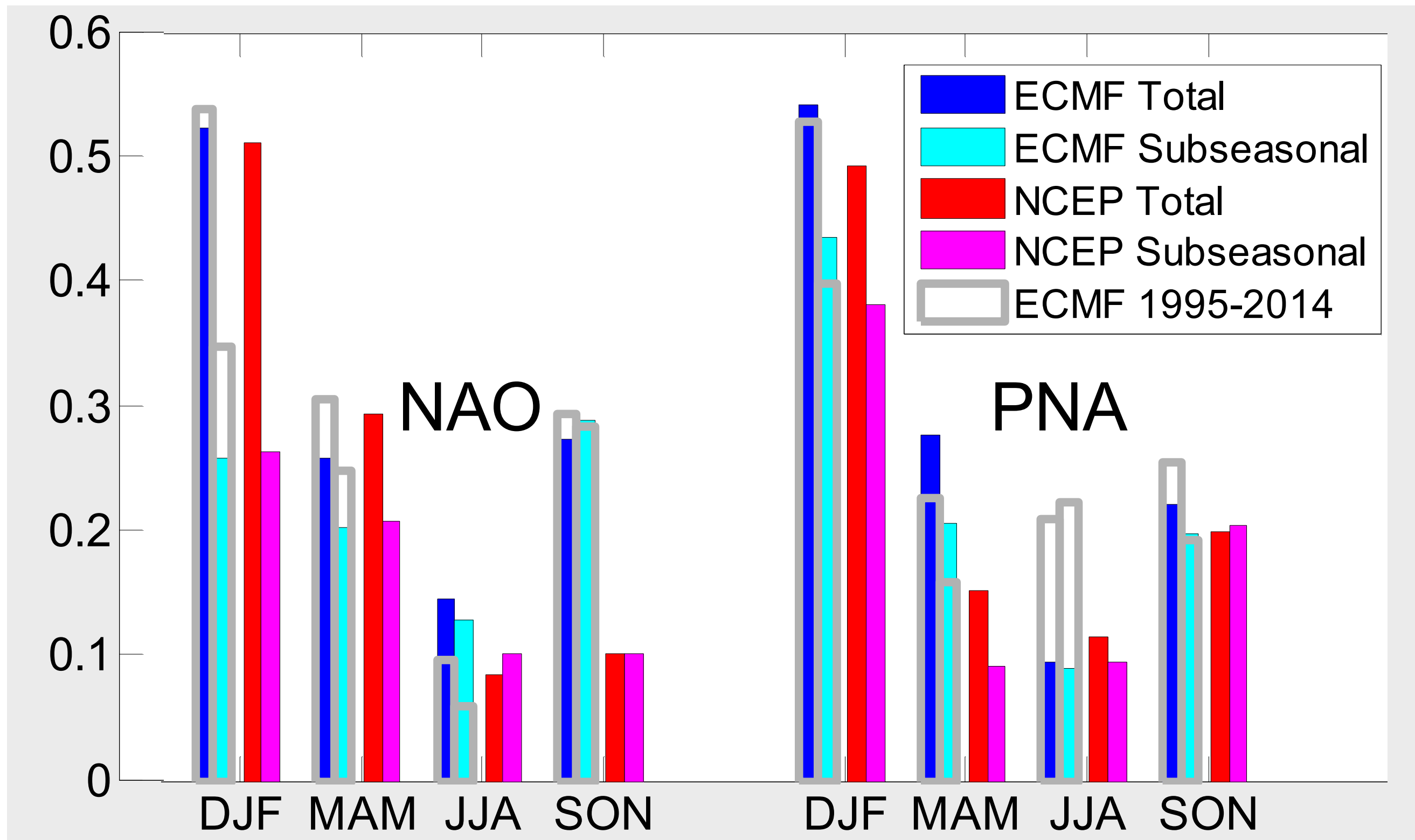


# Precipitation RPSS in MAM Over E Africa & SW Asia



N. Vigaud

# Week 3+4 Anomaly Correlation Skill



*Skill mostly in DJF; mostly subseasonal in PNA; interannual in NAO*

**L. Wang**

# Summary

- IRI New NMME-based seasonal forecasts, since April 2017, calibrated using extended logistic regression
- GPC Portal at installed at ICPAC in Nairobi, based on IRI Data Library
- S2S and SubX databases are both now in IRI Data Library
- Calibrated MME subseasonal probabilistic forecast of precipitation:
  - poor skill beyond week 2 over U.S.
  - encouraging skill over E Africa at weeks 3+4 in MAM over E Africa
  - good week 3-4 skill in NAO & PNA indices