# DEKADAL TECHNICAL NOTE
# DEKAD 1
# JUNE, 2020 AND FORECAST WEEK 1 AND 2

Drafted by: Hubert KABENGELA
Reviewed and revised by:
Edited by: Hubert KABENGELA
Presented by:

# OUTLINE

- Dekadal average precipitation in percent of average
- Past four weeks SST anomalies
- Last month SST anomalies
- Past four weeks and month velocity potential, TPW anomalies with MJO, Kelvin and Rossby wave overlaid on global maps (850 et 200)
- Past 4 weeks precipitable water and outlooks
- Hovmoller diagram of velocity potential, anomalies for 5N-5S , 15N-15S with waves overlay including outlooks
- Ecmwf mjo forecast
- Hovmoller diagram for TPW and OLR with waves overlaid including outlook
- Past 3 weeks olr anomalies
- Past 4 weeks velocity potential and month stream function anomalies with MJO, kelvin and rossby wave overlaid on global maps 850 hpa Mean Sea Level Presssure ( dekadal climatology, dekadal mean and anomaly overlayed)

# OUTLINE

- Observed mlsp for the recent 10 day period with anomalies superimposed on the left and climatology of mslp for the past 10 day period
- Geopotential height 500 hpa
- ITD, CAB, ITCZ dekad 1 of november 2019
- Wind anomalies for the recent 10 day period 850 and 700 hpa
- Relative humidity recent 10 days anomalies, climatology 850 for dekad 1 of November 2019
- Relative humidity recent 10 days anomalies, climatology 700 for dekad 1 of november 2019
- Ir image and Velocity Potential anomaly
- Extremes events table recorded during the dekad in Africa and socio economic impacts
- Precipitation forecasts from ECMWF for week 1 & 2

# OUTLINE

- MJO forecast
- Wind anomaly forecast from GFS
- Week 1 AT 700 hPa relative vorticity forecast from cfs ecmwf
- Week 1 AT 700 hPa divergence wind forecast ecmwf
- Monthly forecast from WMO lead centre single ensemble and multimodel
- Precipitation and anomaly forecast
- S2S products from the hazard center of university of california at SANTA BARBARA
- Precipitation probability forecast SUBX
- Climatology of precipitations for upcoming week 1 and 2

# ESTIMATE CUMULATIVE PRECIPITATION IN PERCENT OF AVERAGE FOR DEKAD 1 JUNE 2020

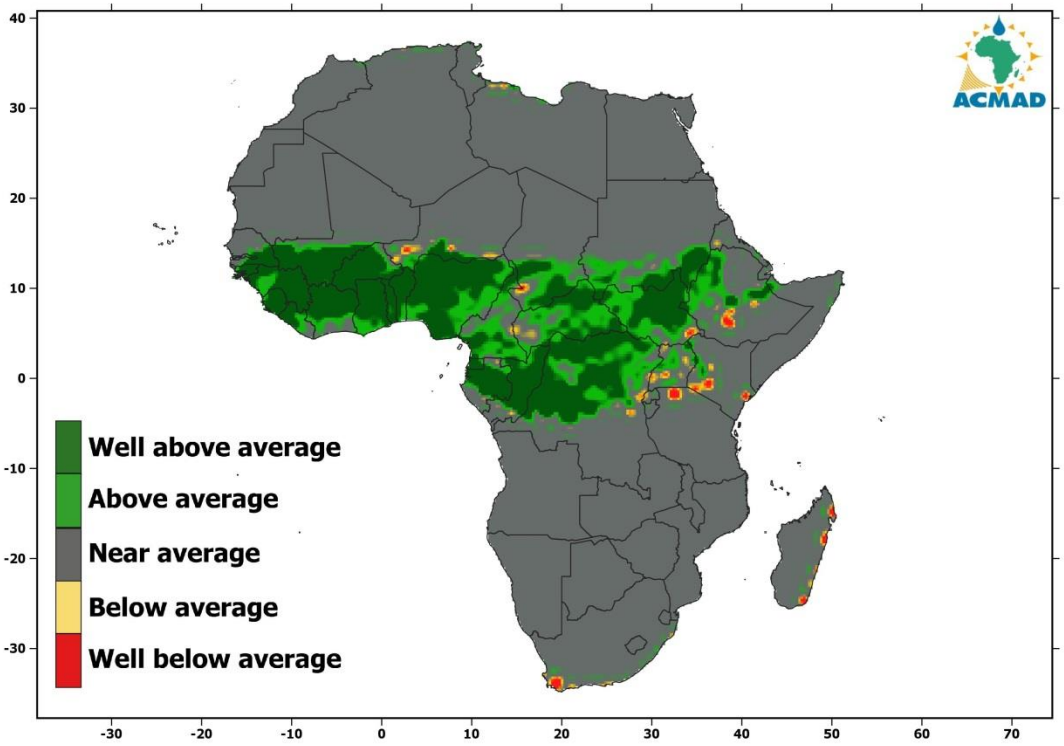
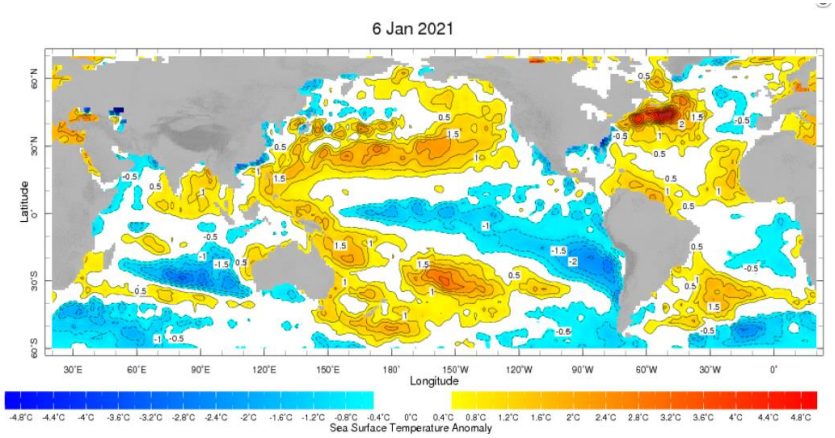



**Figure 1**: **This map displays decadal average precipitation in percent of average**
**The figure show well above to above average précipitation prevailed over most parts the central and southern West African Countries, Central Africa and Eastern Africa and northern Algeria during the third of April 2020**

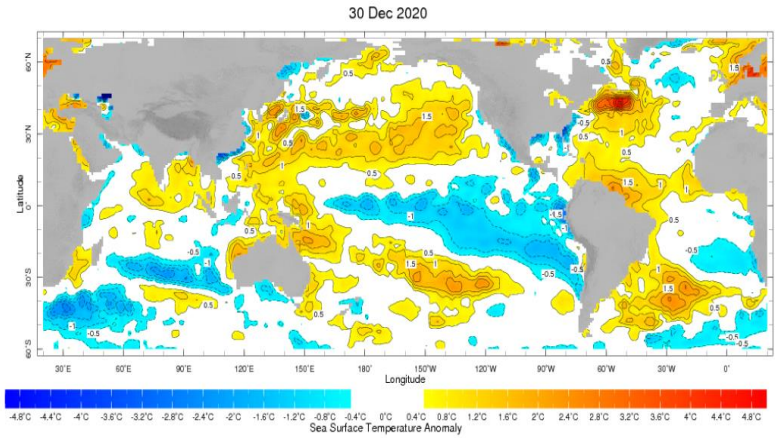
**Data** : SOURCES/.NOAA/.NCEP/.CPC/.FEWS/.Africa/.DAILY/.ARC2/.daily/.est_prcp/X/-20/0.5/70/GRID/Y/-40/0.5/40/GRID/T/%2821-31%20Jul%202014%20%29RANGE/T/SUM/

# Weekly Sea Surface Temperature Anomaly

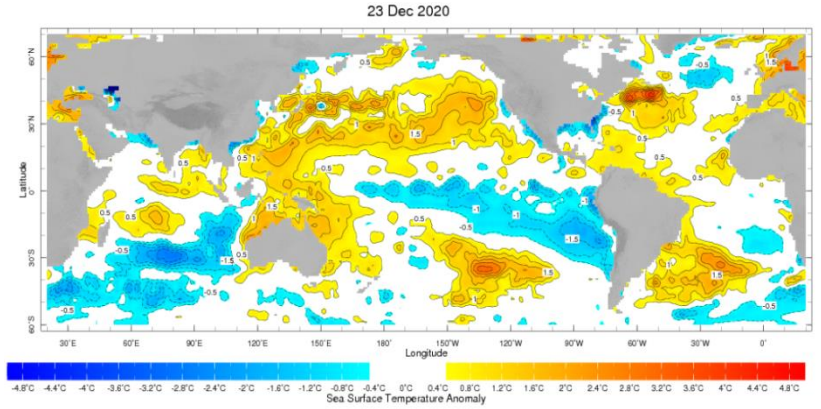
03-9 January 2021




27 Dec 2020-02 Jan 2021




20-26 December 2020




19-19 Dcember 2020

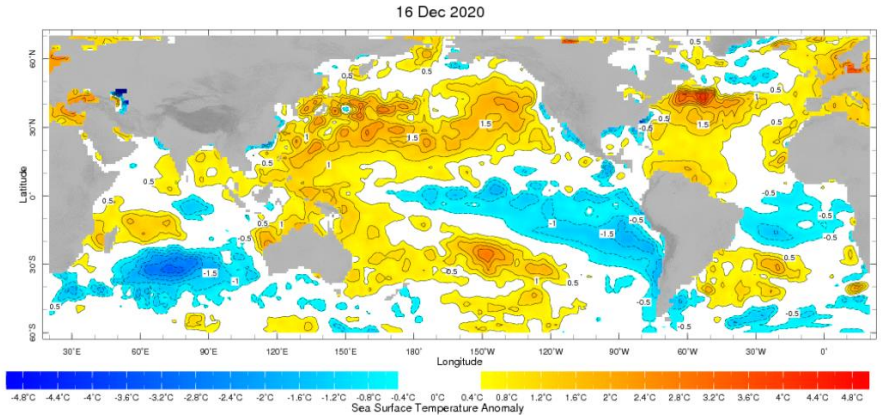



**Figure3a, b, c and c: Maps A,B,C and D display weekly sea surface temperature anomalies for the globe, the warming conditions dominate the Pacific equation, Atlantic, and Indian during the three last weeks and the recent week waming conditions decreased over all this regions.**

*:* http://iridl.ldeo.columbia.edu/maproom/Global/Ocean_Temp/Weekly_Anomaly.html?

# LAST MONTH SST OBSERVED

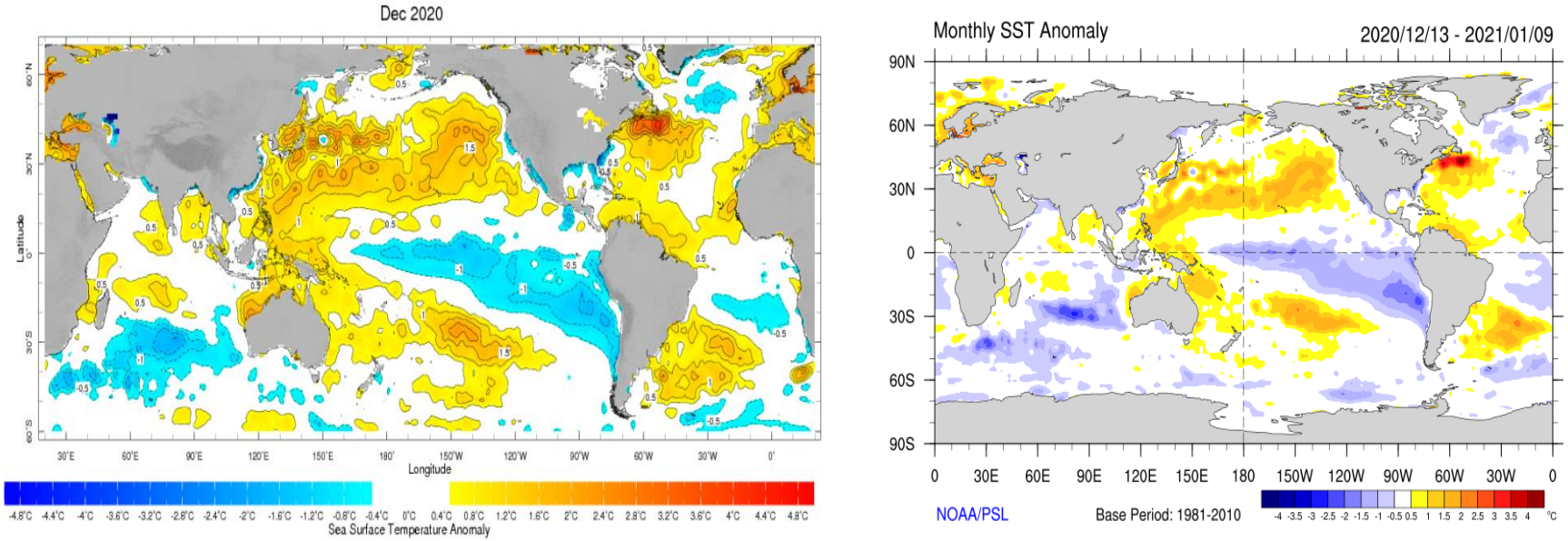



***Figure 4 : This map displays monthly sea surface temperature anomalies for the globe***.

*During December 2020 and last 30 days, the cooling persisted over western Equatorial Pacific, Tropical South Atlantic, and South-Western Indian Ocean,. Source:* http://iridl.ldeo.columbia.edu/maproom/Global/Ocean_Temp/Anomaly.html. Accessed 15/01/2021.

https://www.esrl.noaa.gov/psd/map/clim/sst.shtml

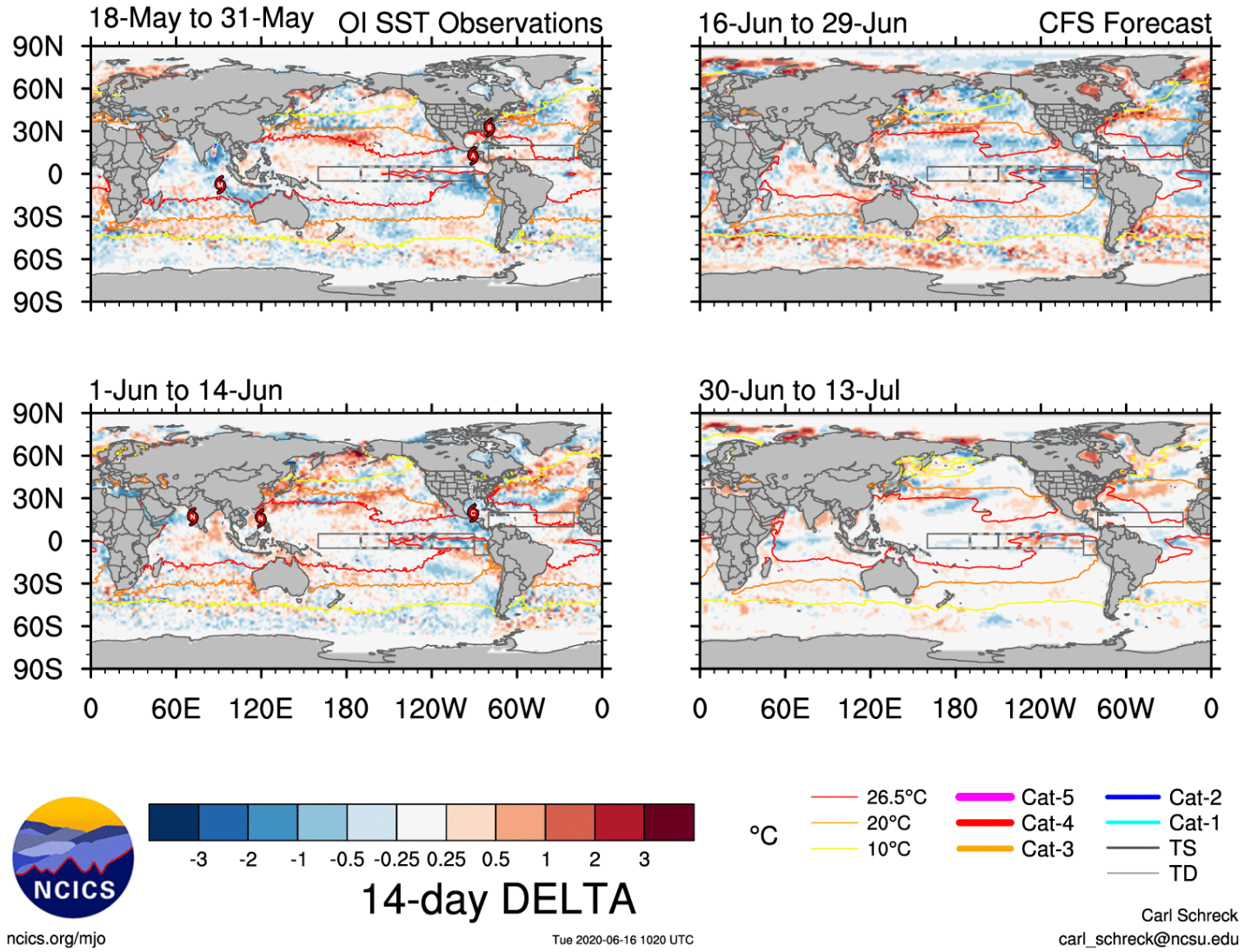
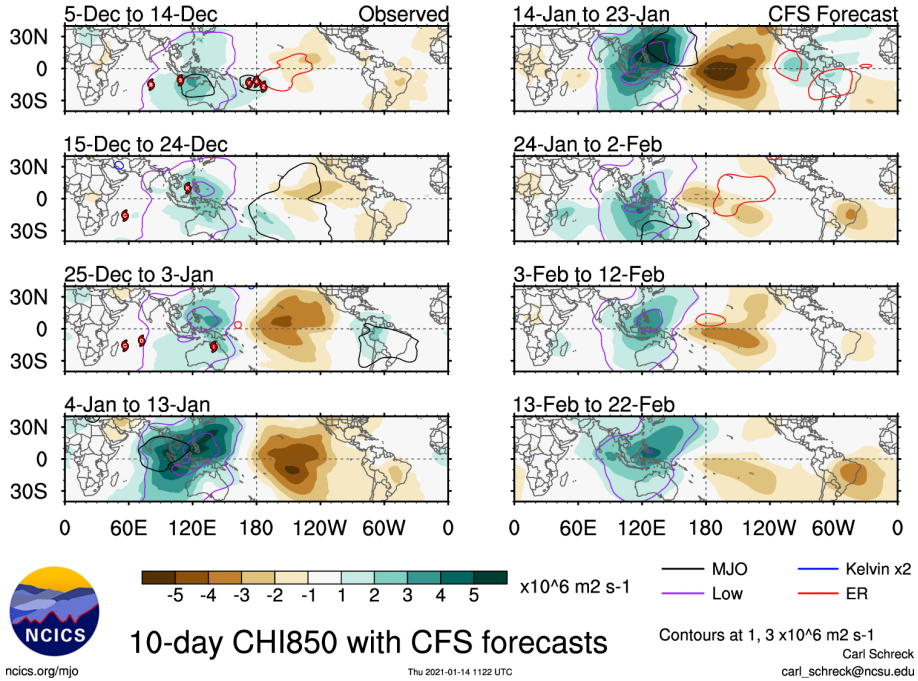



**Figure 5: Sea Surface Temperature and FCST for two week**

https://ncics.org/pub/mjo/v2/sst/global.delta.21.png

# PAST FOUR WEEK AND MONTH VELOCITY POTENTIAL, TPW ANOMALIES WITH MJO, KELVIN AND ROSSBY WAVE OVERLAID ON GLOBAL MAPS 850 ET 200



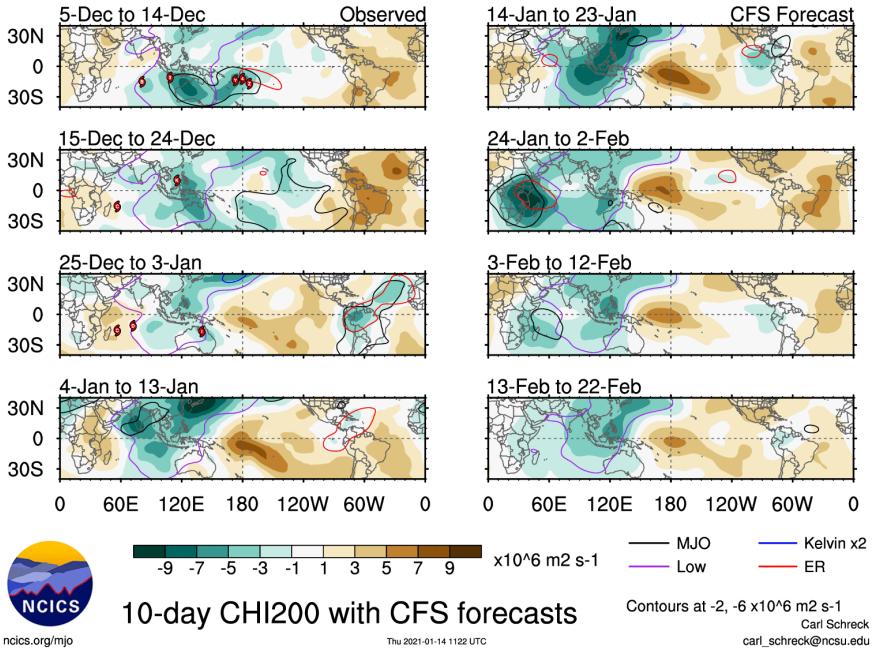




**Figure 6a and b: past four week and month velocity potential W**

https://ncics.org/pub/mjo/v2/map/chi850.cfs.all.global.7.png

https://ncics.org/pub/mjo/v2/map/chi200.cfs.all.global.7.png

https://ncics.org/portfolio/monitor/mjo/

# PAST 4 WEEKS PRECIPITABLE WATER AND OUTLOOKS

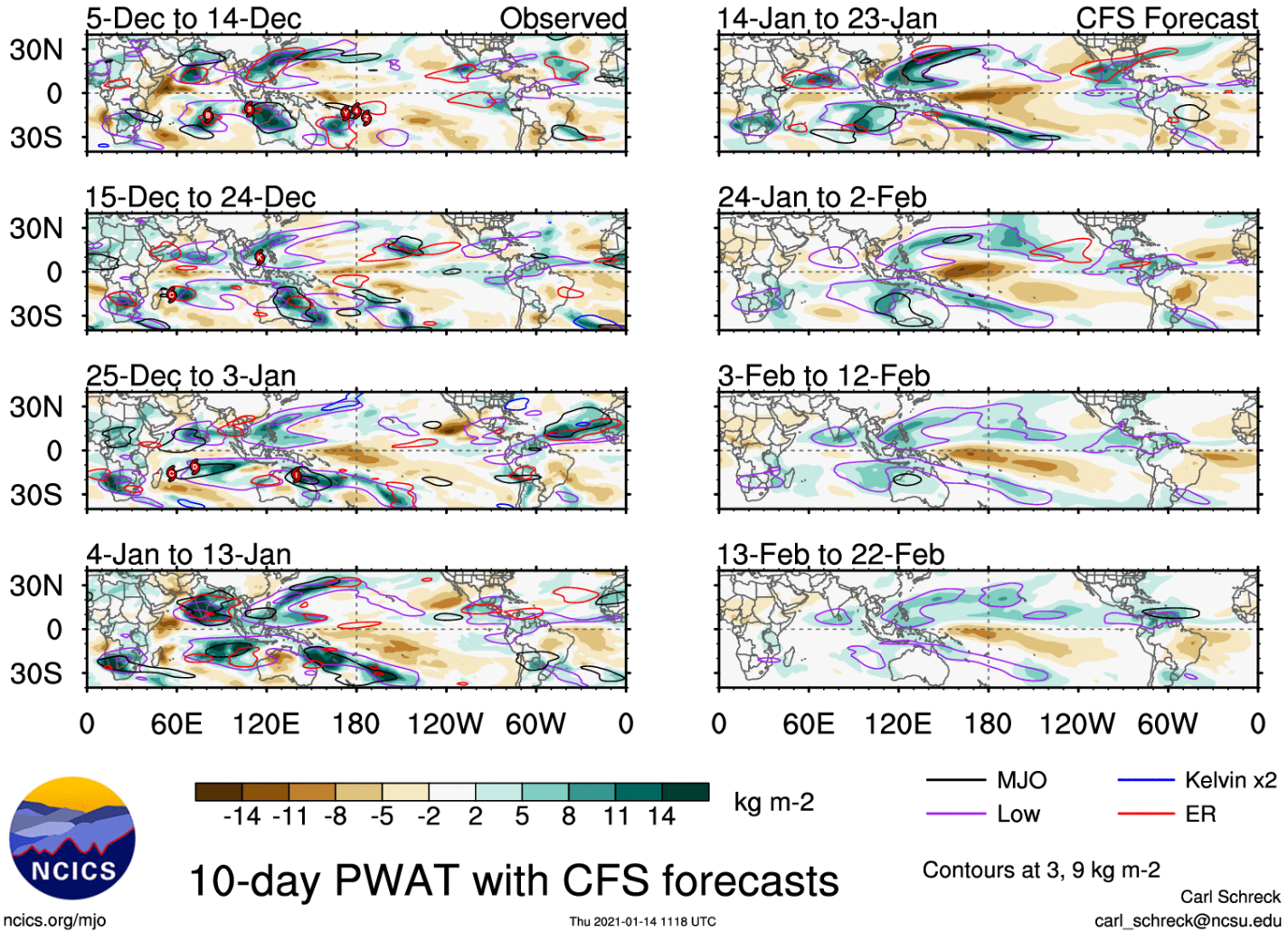
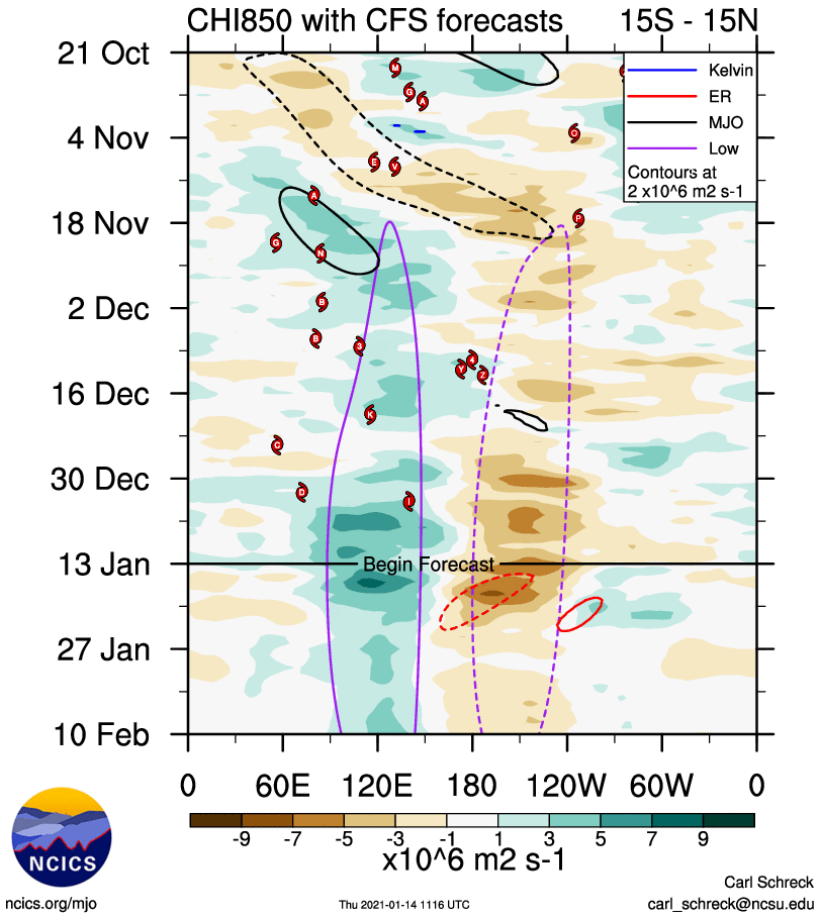



Figure 7: **past 4 weeks precipitable water and outlooks**

https://ncics.org/pub/mjo/v2/map/pwat.cfs.all.global.7.png

https://ncics.org/portfolio/monitor/mjo

# HOVMOLLER DIAGRAM OF VELOCITY POTENTIAL, ANOMALIES FOR 15N-15S WITH WAVES OVERLAY INCLUDING OUTLOOKS



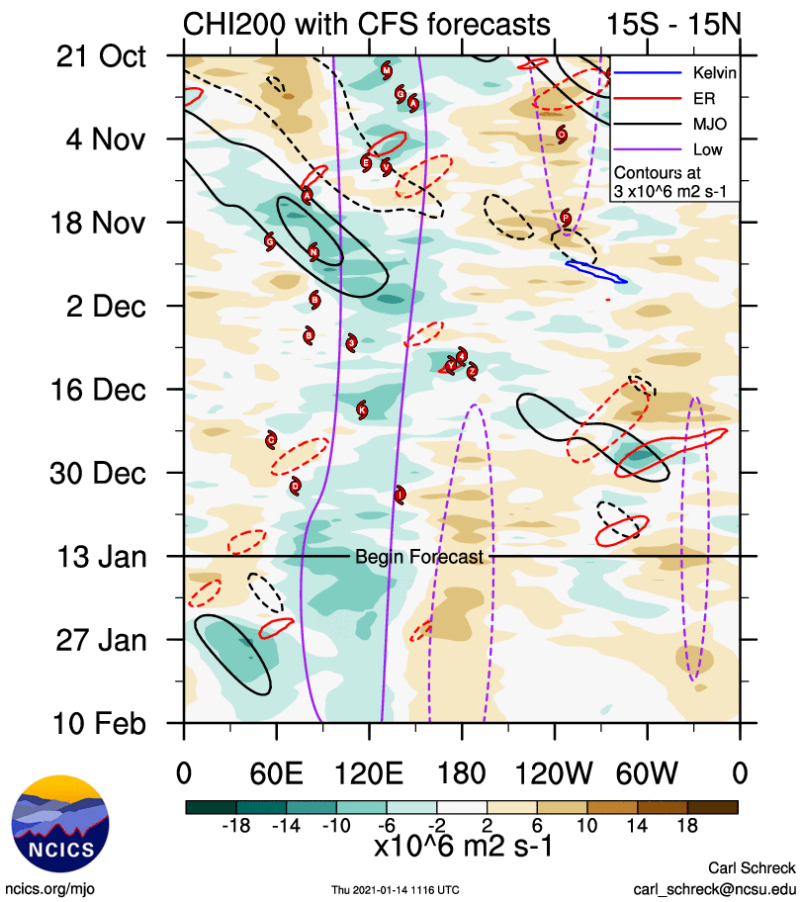
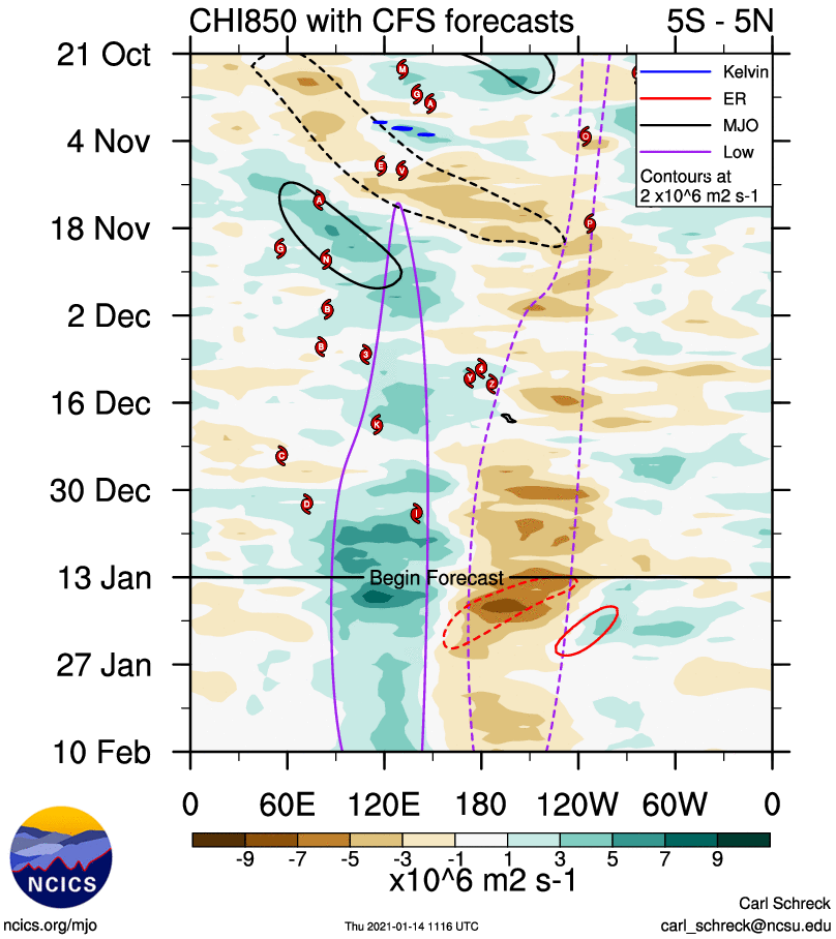




**Figure 8: anomalies for 15n-15s with waves overlay including outlooks**

https://ncics.org/pub/mjo/v2/hov/chi200.cfs.eqtr.png
https://ncics.org/pub/mjo/v2/hov/chi850.cfs.wide.png

https://ncics.org/portfolio/monitor/mjo/

# HOVMOLLER DIAGRAM OF VELOCITY POTENTIAL, ANOMALIES FOR 5S-5N WITH WAVES OVERLAY INCLUDING OUTLOOKS



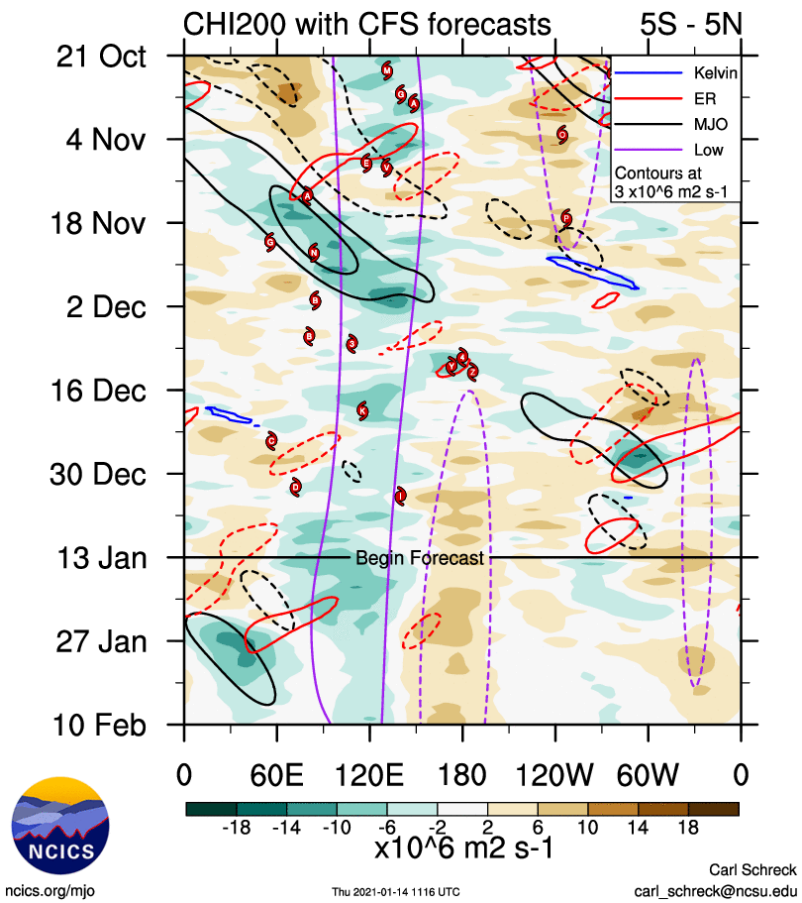
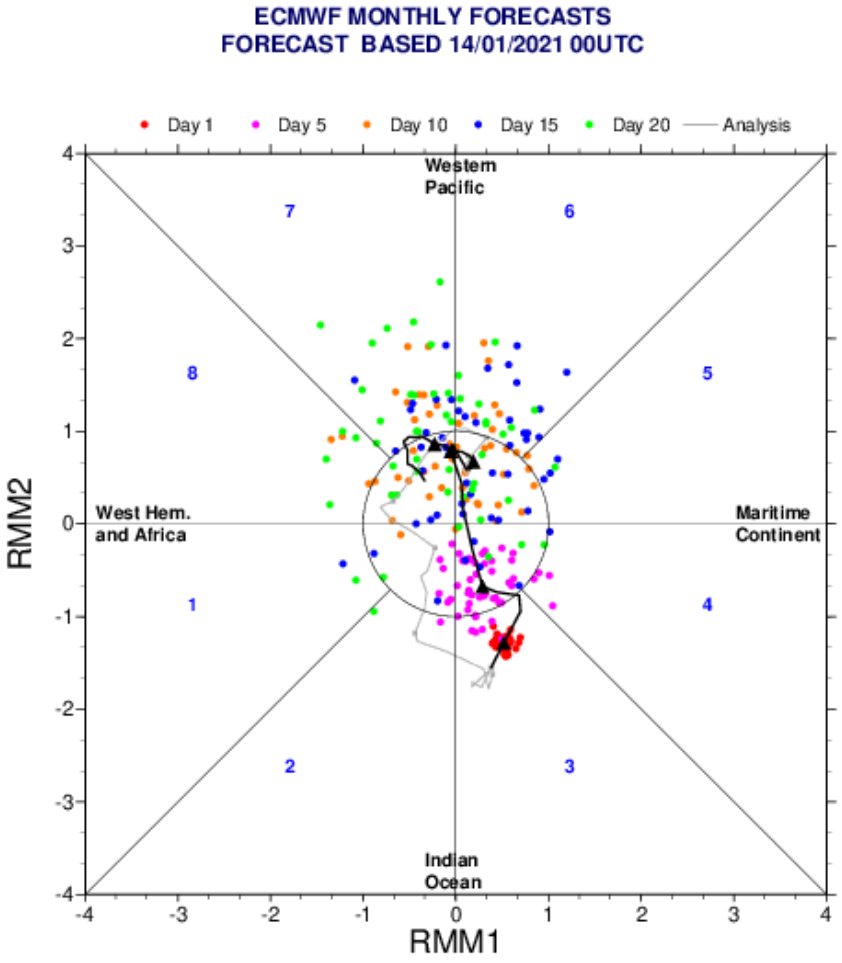




**Figure 9: anomalies for 15n-5s with waves overlay including outlooks**

https://ncics.org/pub/mjo/v2/hov/chi200.cfs.south.png
https://ncics.org/pub/mjo/v2/hov/chi850.cfs.south.png

# ECMWF MJO FORECAST



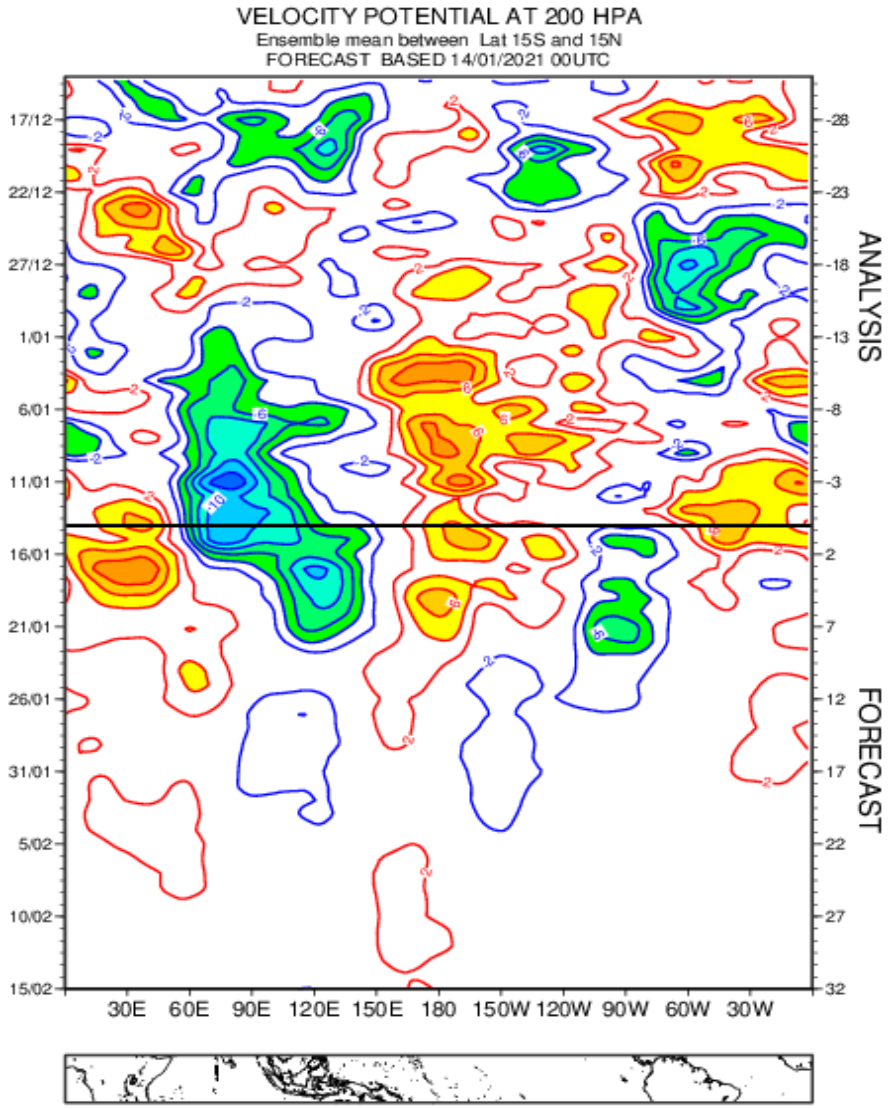




Figure 10a and b: **ECMWF MJO FORECAST**

https://www.ecmwf.int/en/forecasts/charts/catalogue/mofc_multi_mjo_family_index?facets=undefined&time=2019080500,0,2019080500

https://www.ecmwf.int/en/forecasts/charts/catalogue/mofc_multi_mjo_family_time_longitudes?facets=undefined&time=2019112500,0,2019112500

# PAST 3 WEEKS OLR ANOMALIES

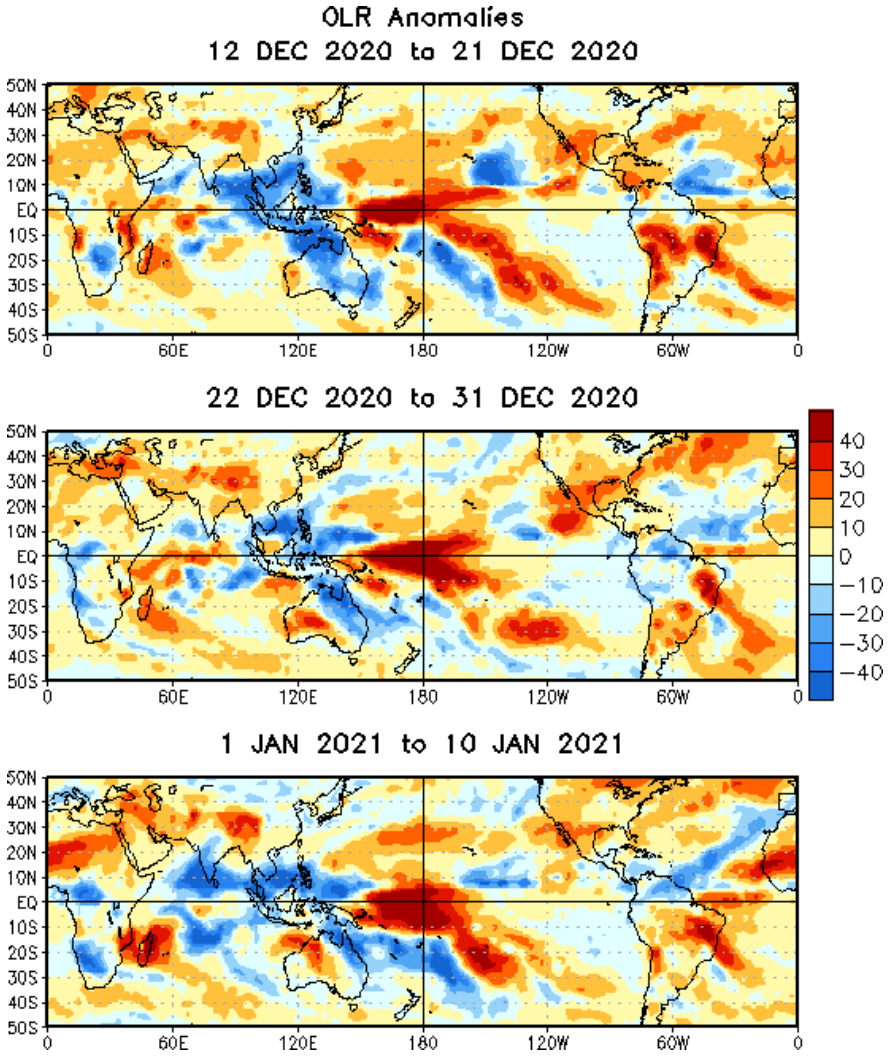



Figure 11: PAST 3 WEEKS OLR ANOMALIES

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/olra_last30days-3plots.gif

# PAST 4 WEEKS VELOCITY POTENTIAL AND MONTH STREAM FUNCTION ANOMALIES WITH MJO, KELVIN AND ROSSBY WAVE OVERLAID ON GLOBAL MAPS 850 hPa

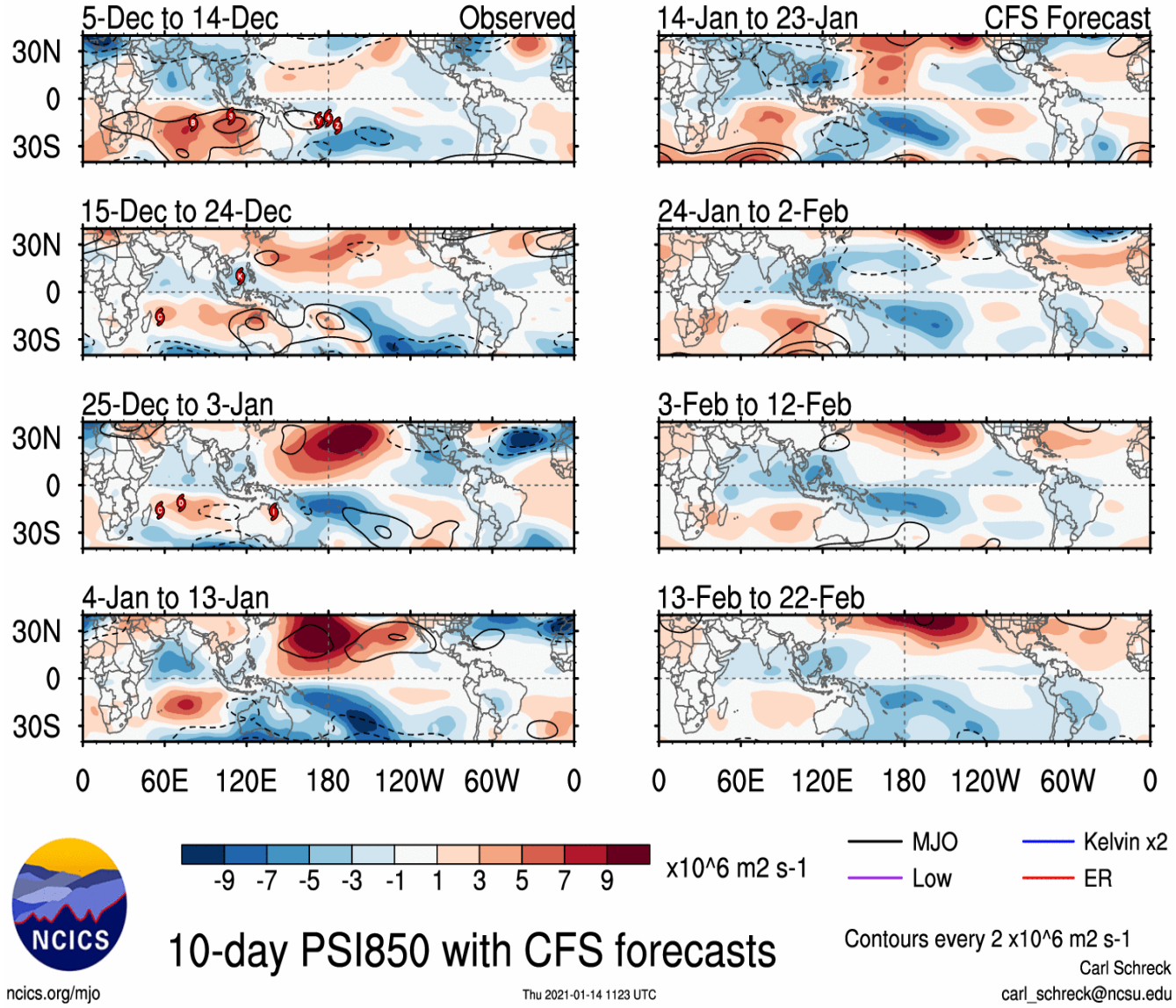



Figure 12: PAST 4 WEEKS VELOCITY POTENTIAL

https://ncics.org/pub/mjo/v2/map/psi850.cfs.mjo.global.10.png

# OBSERVED MLSP FOR THE RECENT 10 DAY PERIOD WITH ANOMALIES SUPERIMPOSED ON THE LEFT AND CLIMATOLOGY OF MSLP FOR THE PAST 10 DAY PERIOD

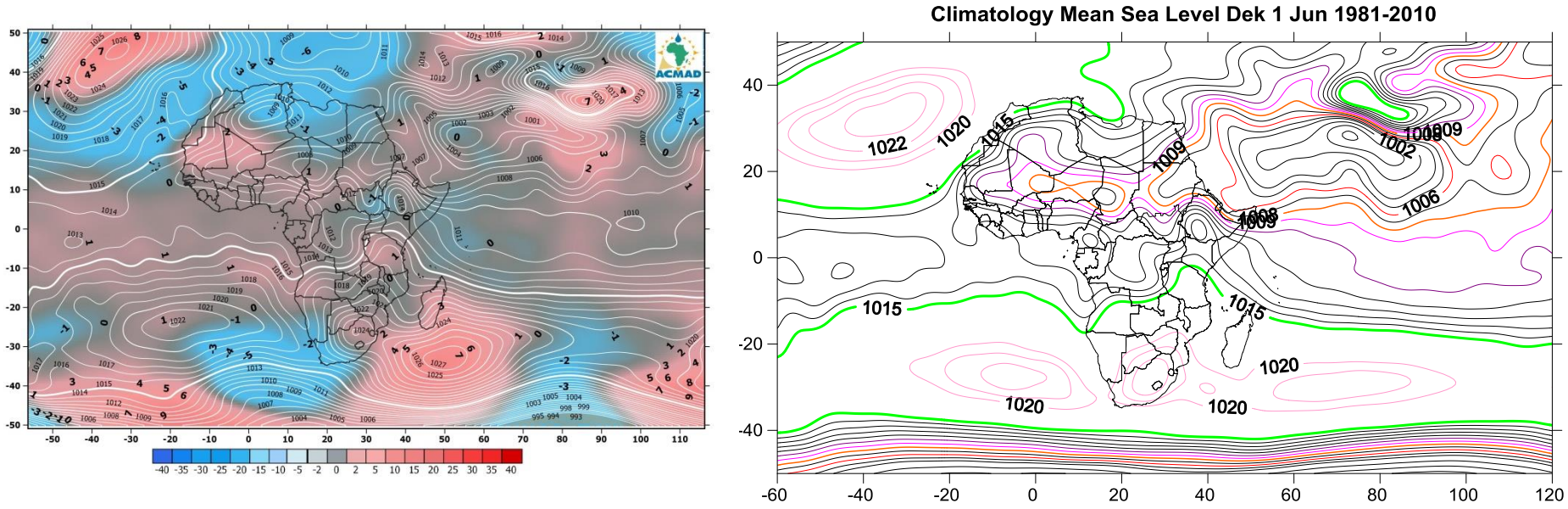
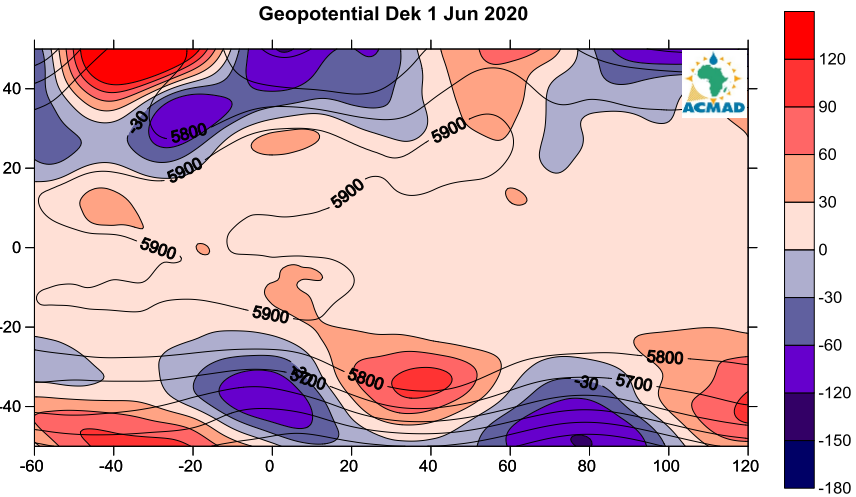



**Figure 13: MSLP obs-anom and MSLP-climatology**

**Data source:** http://iridl.ldeo.columbia.edu/expert/SOURCES/.NOAA/.NCEP-NCAR/.CDAS-1/.DAILY/.Intrinsic/.MSL/.pressure

# GEOPOTENTIAL HEIGHT 500 HPA



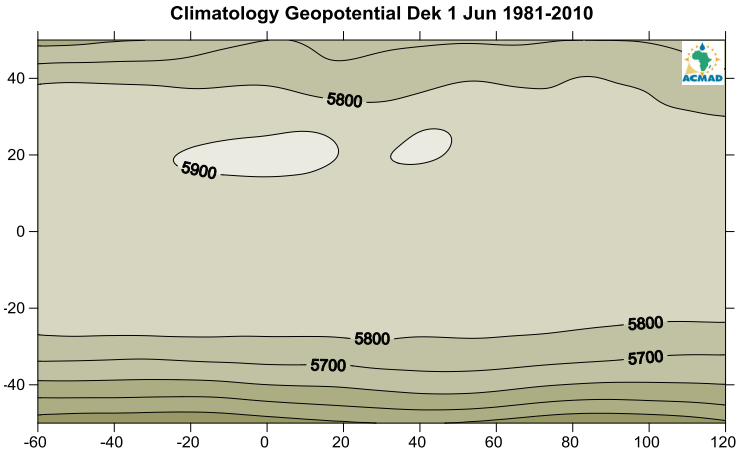




**Figure 14**: **Geopotential Height 500 hPa**

# ITD, CAB, ITCZ  DEKAD 1 OF FEBRUARY 2020

**Figure 14:  Wind Cards**

# WIND ANOMALIES FOR THE RECENT 10 DAY PERIOD 850 AND 700 hPa

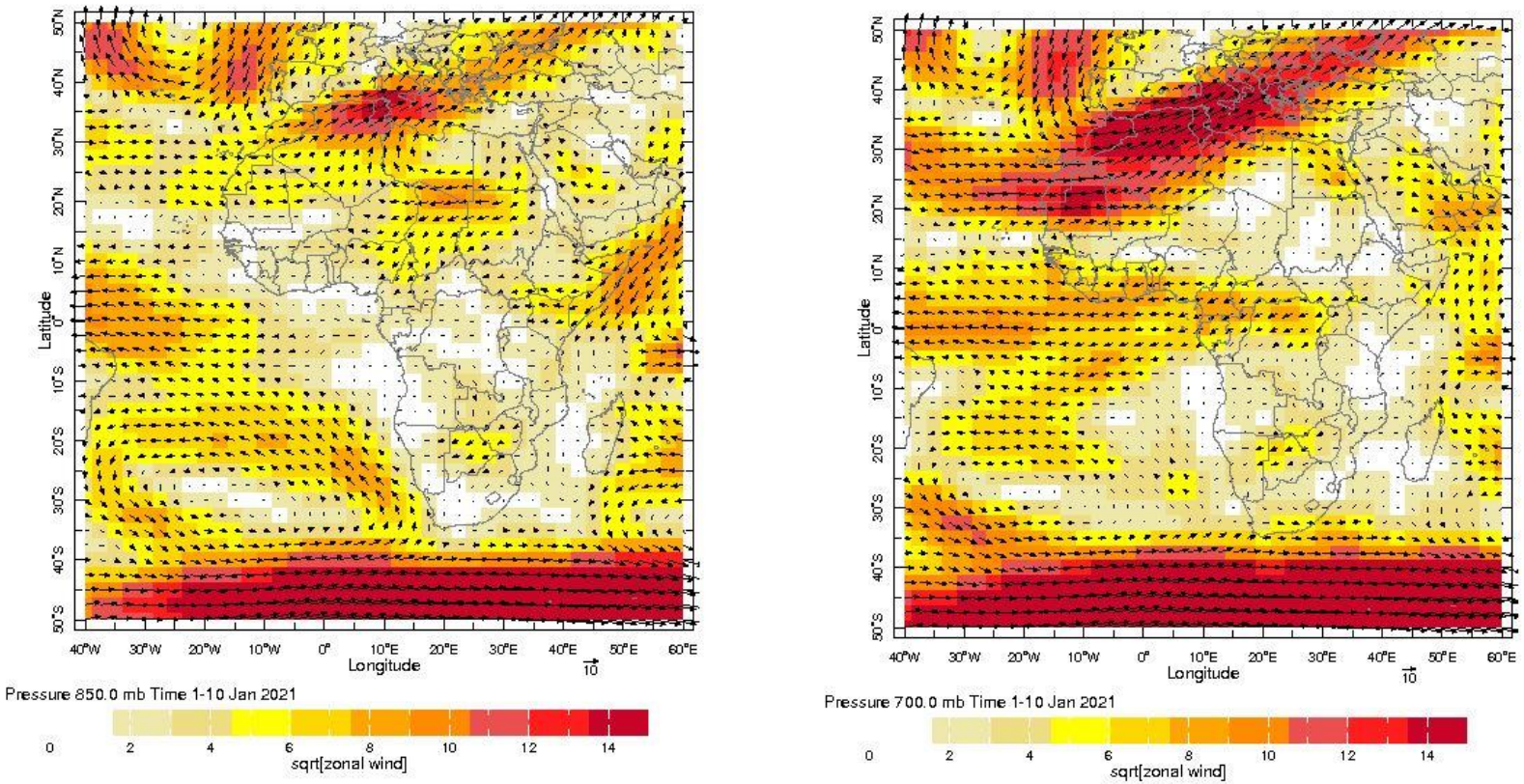
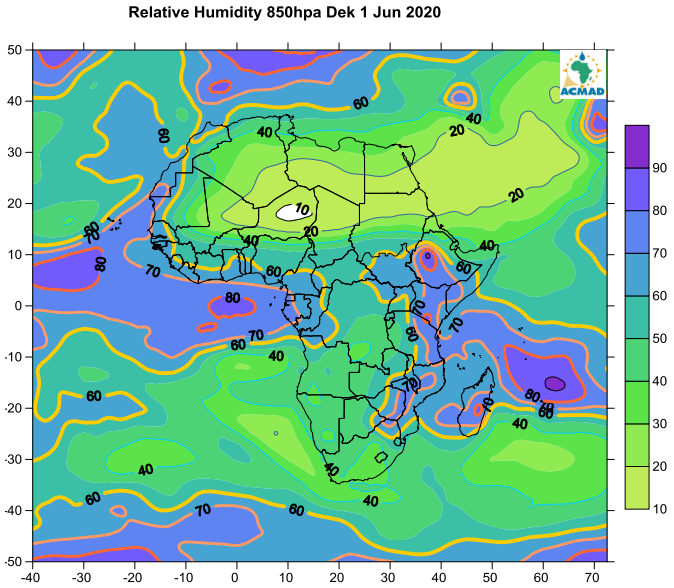
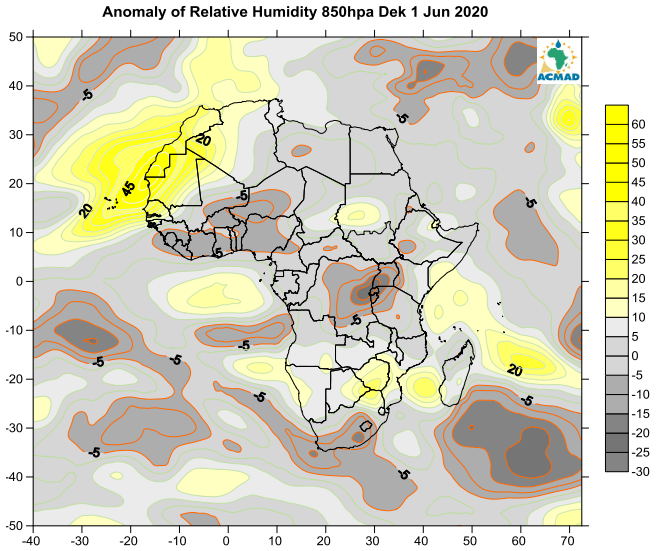



**Figure 15: Wind anomalies for 850 and 700hPa**

For the wind anomalies for the 850 moderate intensities were observed, over northern southern Morocco, Algeria, Libya, Tunisia and Egypt and werstely Mauritania . The rest of Continent, a weak winds was observed, and for the 700, The figure indicates a moderate to strong westerly wind over northern parts of North Africa, Central Africa region and southern parts of Southern Africa region.

# RELATIVE HUMIDITY RECENT 10 DAYS ANOMALIES, CLIMATOLOGY 850 FOR DEKAD 1 OF JUN 2020



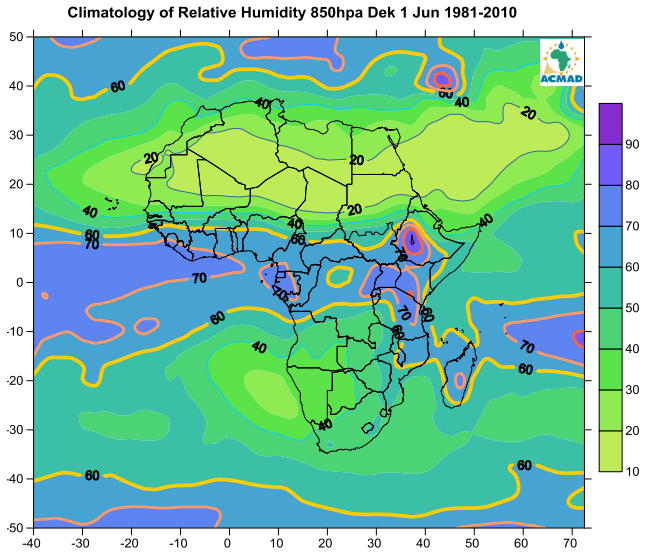
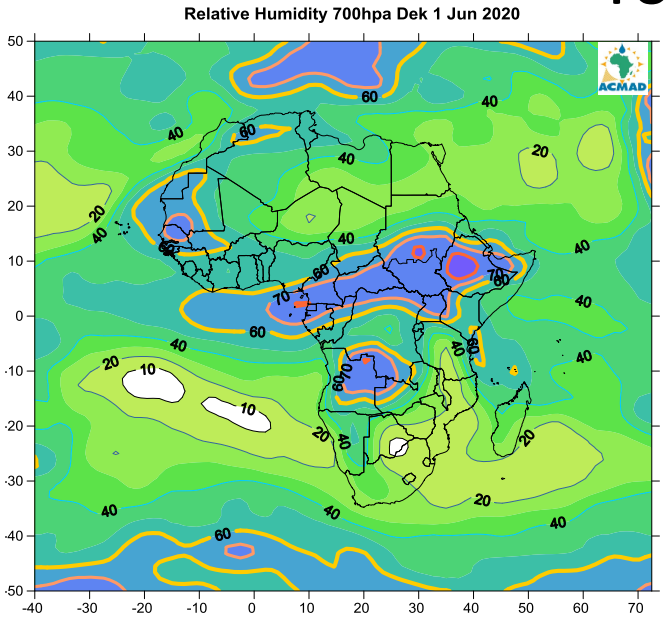
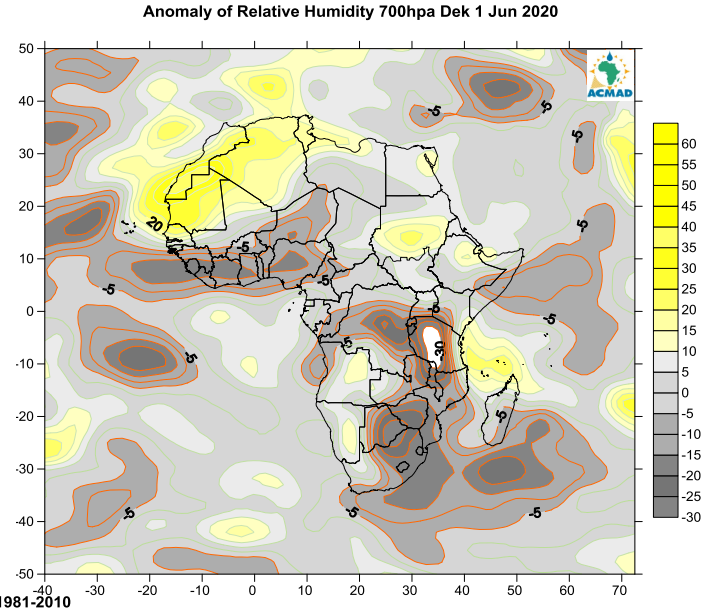




**Figure 16a, b and : Relative humidity, Anomaly and climatology cards**

http://iridl.ldeo.columbia.edu/expert/SOURCES/.NOAA/.NCEP-NCAR/.CDAS-1/.DAILY/.Intrinsic/.PressureLevel/.rhum

# RELATIVE HUMIDITY RECENT 10 DAYS ANOMALIES, CLIMATOLOGY 700 FOR DEKAD 1 OF JUNE 2020



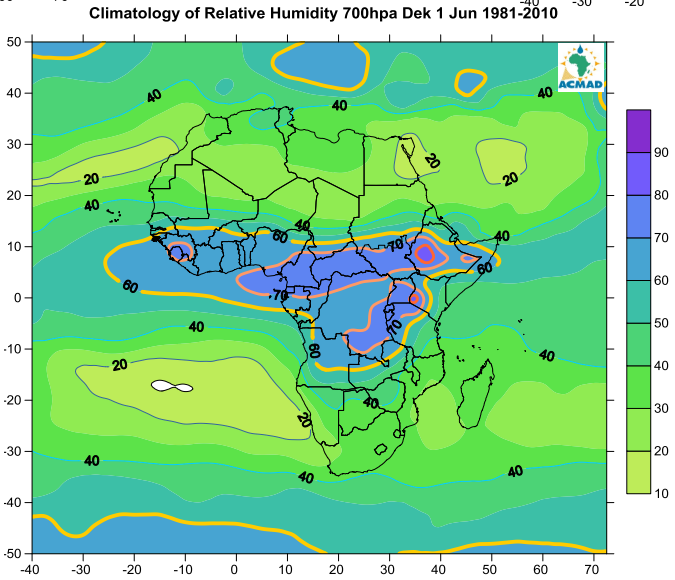




**Figure 17a, b and : Relative humidity, Anomaly and climatology cards**

http://iridl.ldeo.columbia.edu/expert/SOURCES/.NOAA/.NCEP-NCAR/.CDAS-1/.DAILY/.Intrinsic/.PressureLevel/.rhum

# IR IMAGE AND VELOCITY POTENTIAL ANOMALY

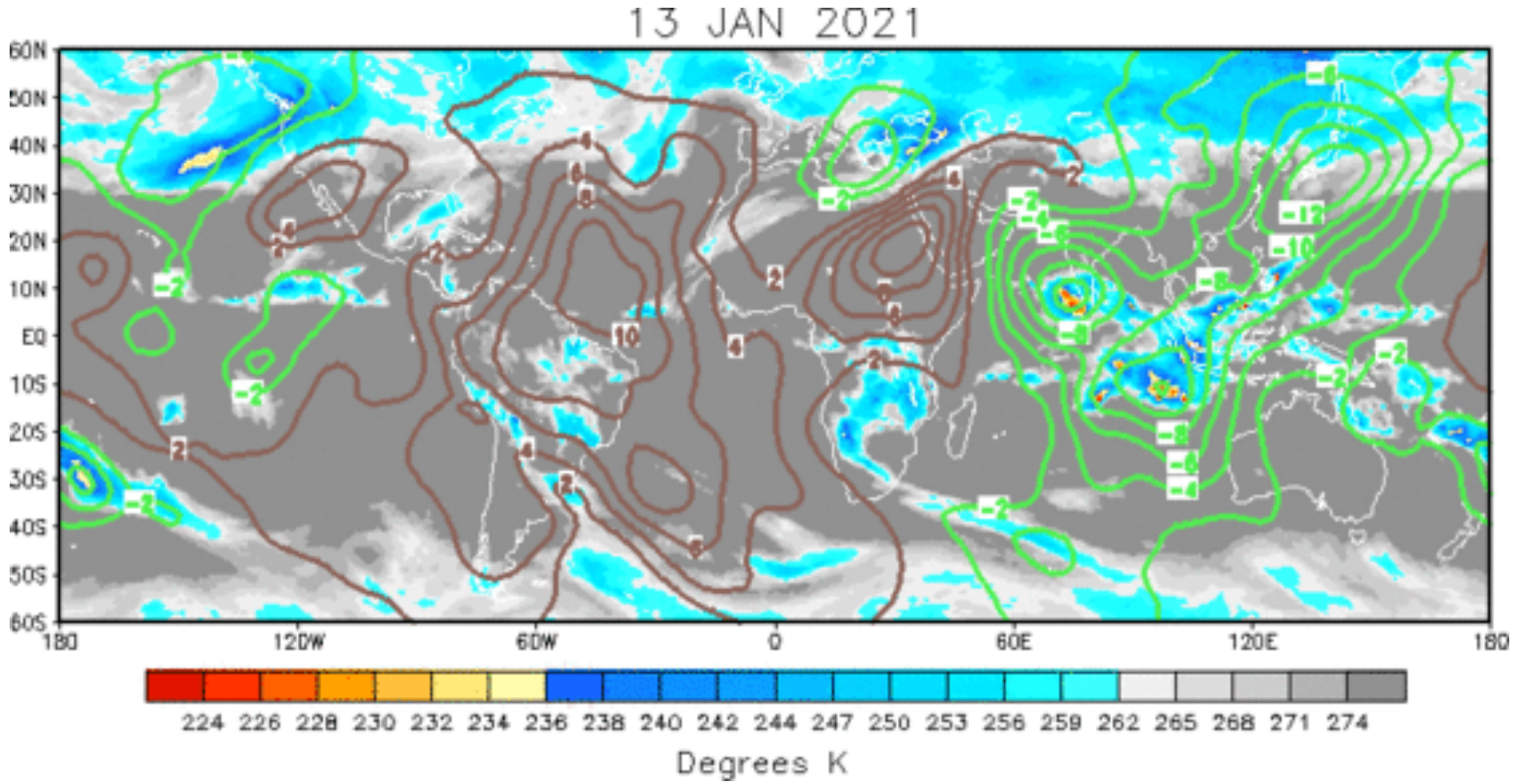


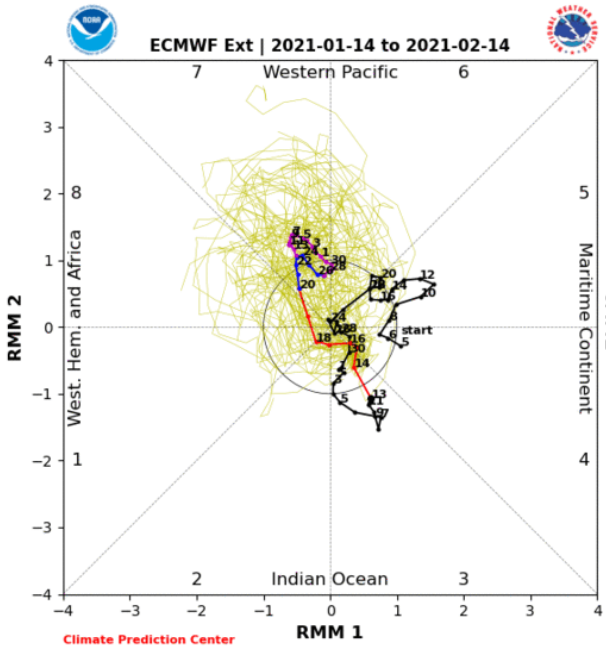

**Figure 18: IR image and velocity potential anomaly**

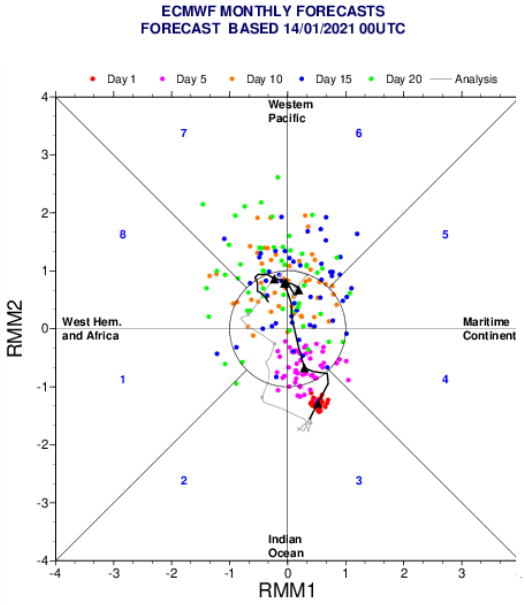
https://www.cpc.ncep.noaa.gov/products/precip/CWlink/ir_anim_monthly.shtml

# EXTREMES EVENTS TABLE RECORDED DURING THE DEKAD 2 OF MARCH 2020 IN AFRICA AND SOCIO ECONOMIC IMPACTS

| Category of observed extreme weather or climate event/Type de phénomène | | Physical Characteristics | | | | | Socio-economic impacts | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Date of the occurrence of the event/date | Location /position | Geographical extent/étendue | Severity | Duration/intensité | Casualties /dégats | Economic losses/pertes | sources of information | Other impacts /autres impacts | |
| | 18-Mar-20 | Tanzania | | sévère | floods | | several houses and farms were washed away by the floods | floodlist.com | | |
| Rainfall / floods | 18-Mar-20 | Angola | | Sévère | floods | | several houses were completely destroyed and others damaged. | floodlist.com | | |
| Drought/sécheresse | 13-Mar-20 | Egypt | | | lightning strikes and flooding | 5 death | | floodlist.com | | |
| Drought/sécheresse | 11-Mar-20 | Zambia | | | fllods | | | floodlist.com | | |
| Others/autres….. | 11-Mar-20 | Burundi | | Sévére | weather | 1 death | several people have been affected, some displaced, homes destroyed and others damaged. | floodlist.com | | |
| | 11-Mar-20 | Rwanda | | | Heavy rain | 2 death | | floodlist.com | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

# MJO MONITORING AND FORECASTS FRO ECWF, NCEP, UK MET OFFICE … FROM MJO WORKING GROUP WEBSITE



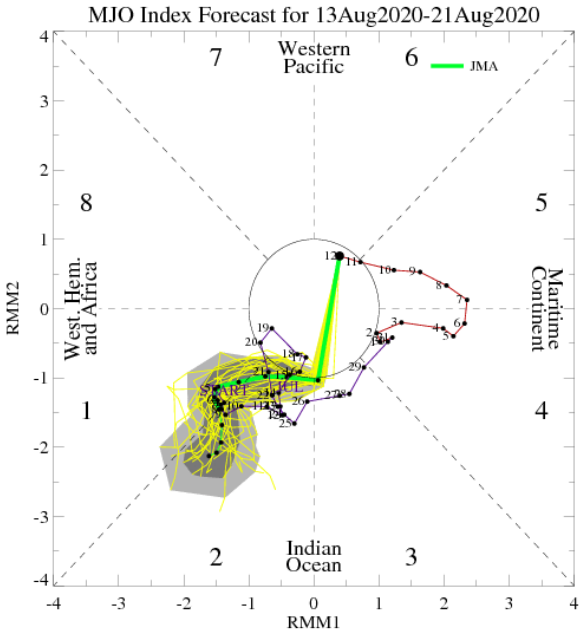




**Figure 19:FORECASTS FRO ECWF, NCEP, UK MET OFFICE**

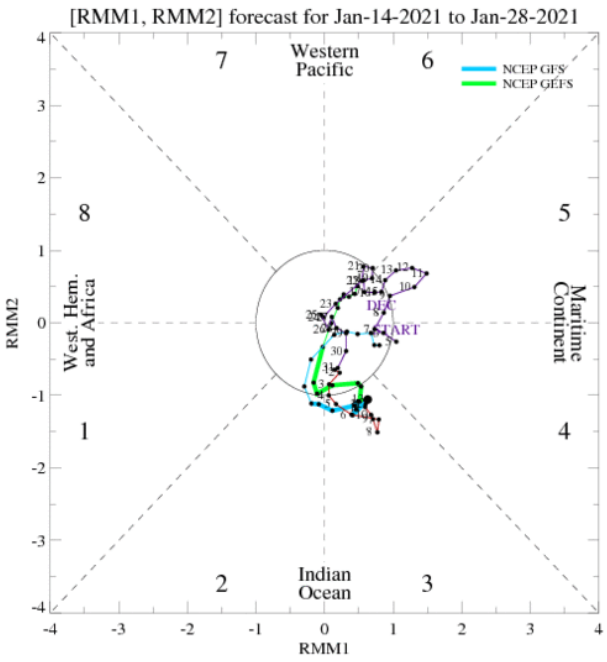
https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/emon.shtml

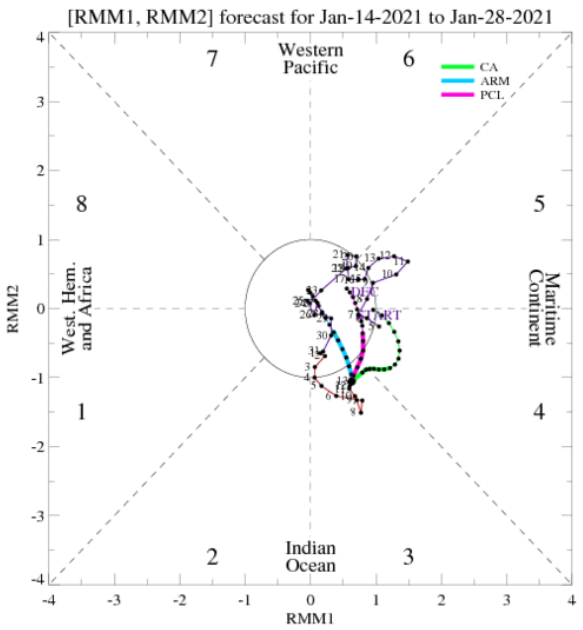
https://www.ecmwf.int/en/forecasts/charts/catalogue/mofc_multi_mjo_family_index?facets=undefined&time=2019081500,0,2019081500

https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/jman.shtml

# WEEKLY FORECAST

# MJO FORECAST



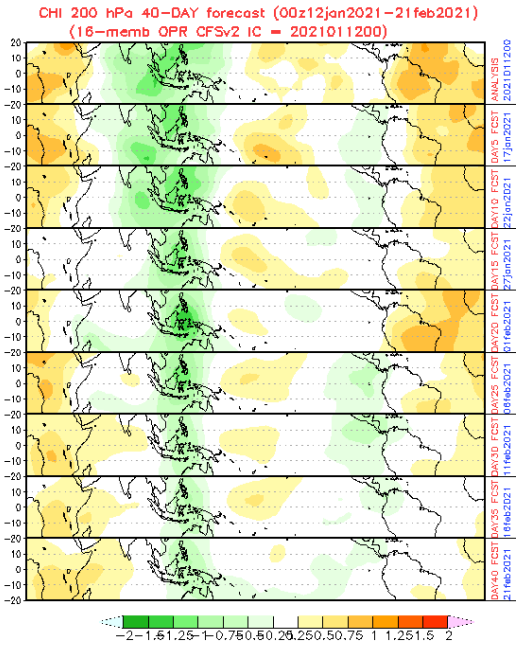



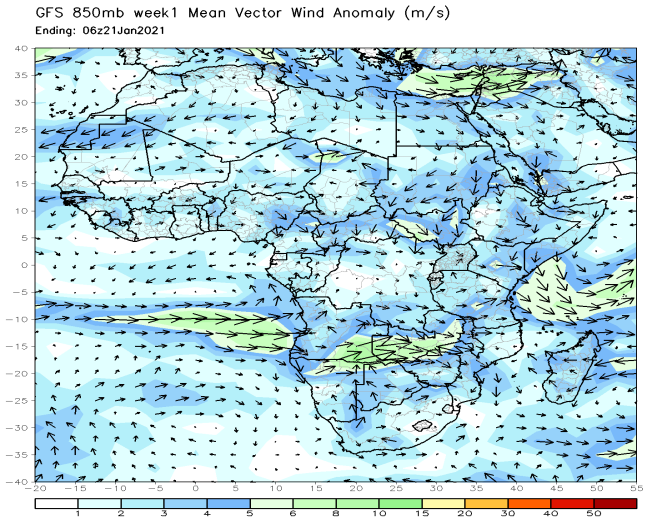

**Figure 20: Mjo forecast**

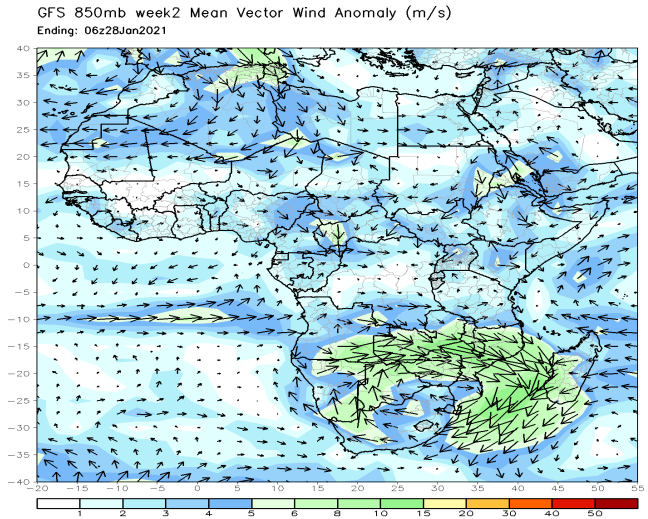
https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/foroper.shtml

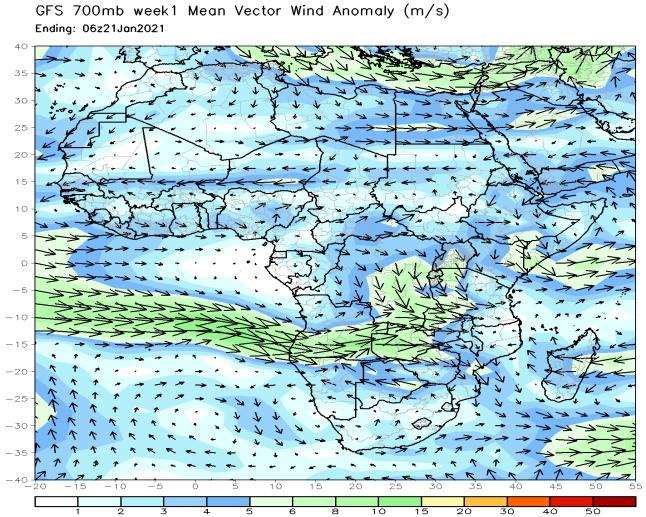
https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/forca.shtml

https://www.cpc.ncep.noaa.gov/products/people/wd52qz/mjo/chi/cfs.gif

# WIND ANOMALY FORECAST FROM GFS



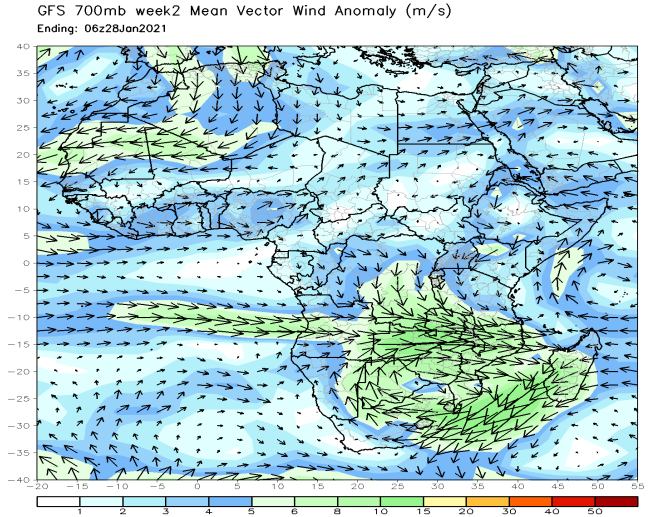
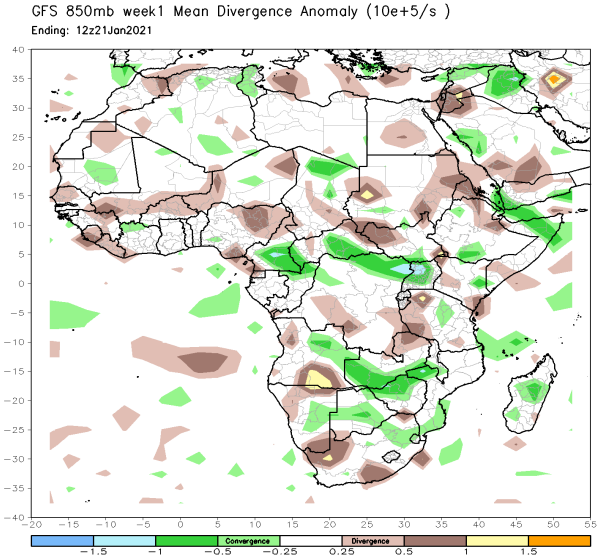



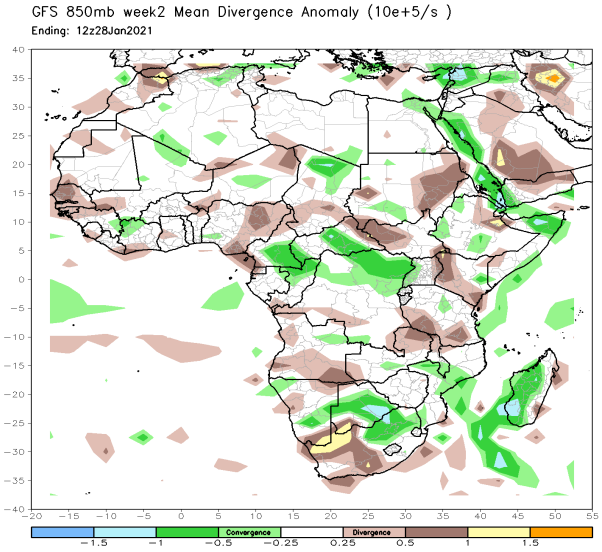

**Figure 21 : Forecast from GFS**

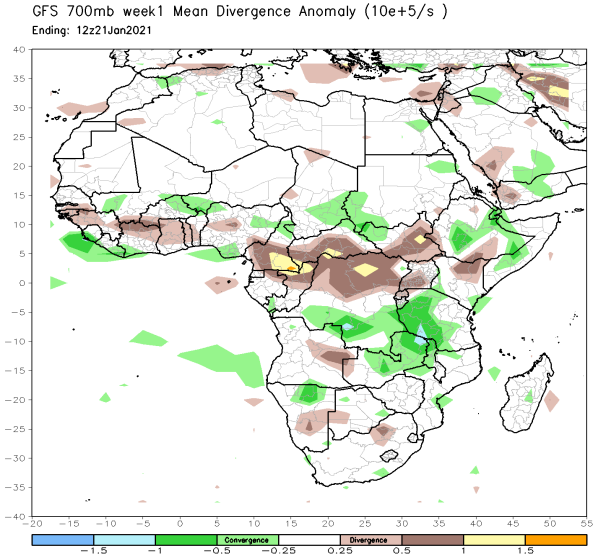
https://www.cpc.ncep.noaa.gov/products/international/africa/africa.shtml

http://www.cpc.noaa.gov/products/international/gfs/gfs_week1_af_850wind_anom.gif

# GFS DIVERGENCE FORECAST



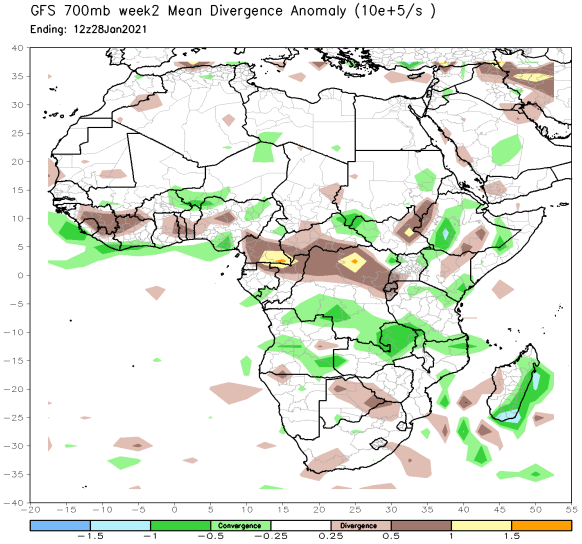




**Figure 22 : Gfs divergence forecast,** For the forecast of the divergent wind, for the first week at the 850 the wind is converging over the whole area of Africa as well as the 700

https://www.cpc.ncep.noaa.gov/products/international/africa/africa.shtml

http://www.cpc.noaa.gov/products/international/gfs/gfs_week1_af_700divg_anom.gif

# WEEK 1 (15 – 19 Jan) AT 700 hPa RELATIVE VORTICITY FORECAST FROM CFS ECMWF

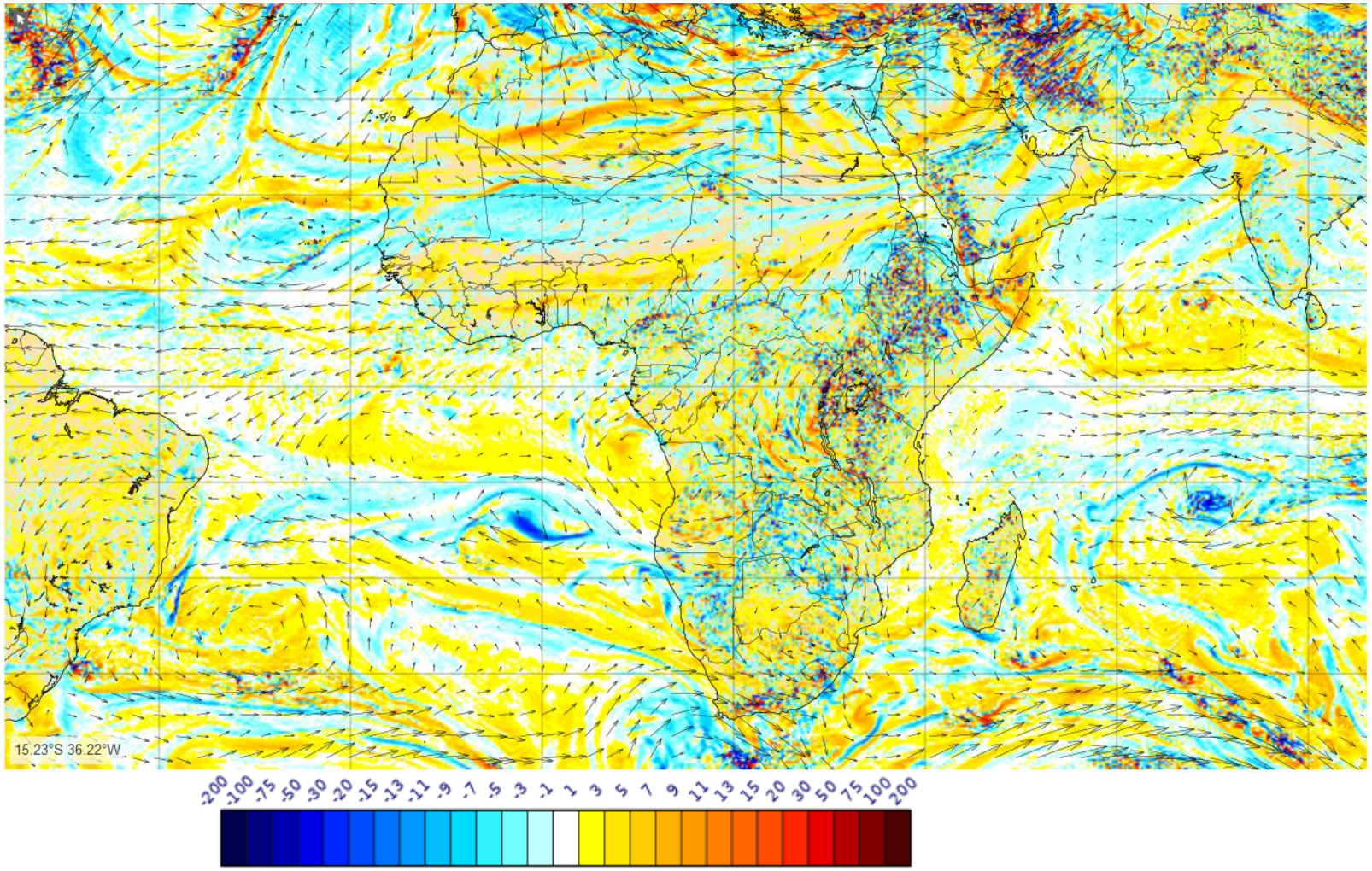



**Figure 23: Relative vorticity forecast from cfs ECMWF,**
For the forecast we see that there is an intense forecast in Kenya, Tanzania, Namibia, and South Arica

https://www.ecmwf.int/en/forecasts/charts/catalogue/medium-rv-div-uv?facets=undefined&time=2019102300,144,2019102900&projection=africa&layer_name=rv_custom

# WEEK 1 (15 – 19 Jan) AT 700 hPa DIVERGENCE WIND FORECAST ECMWF

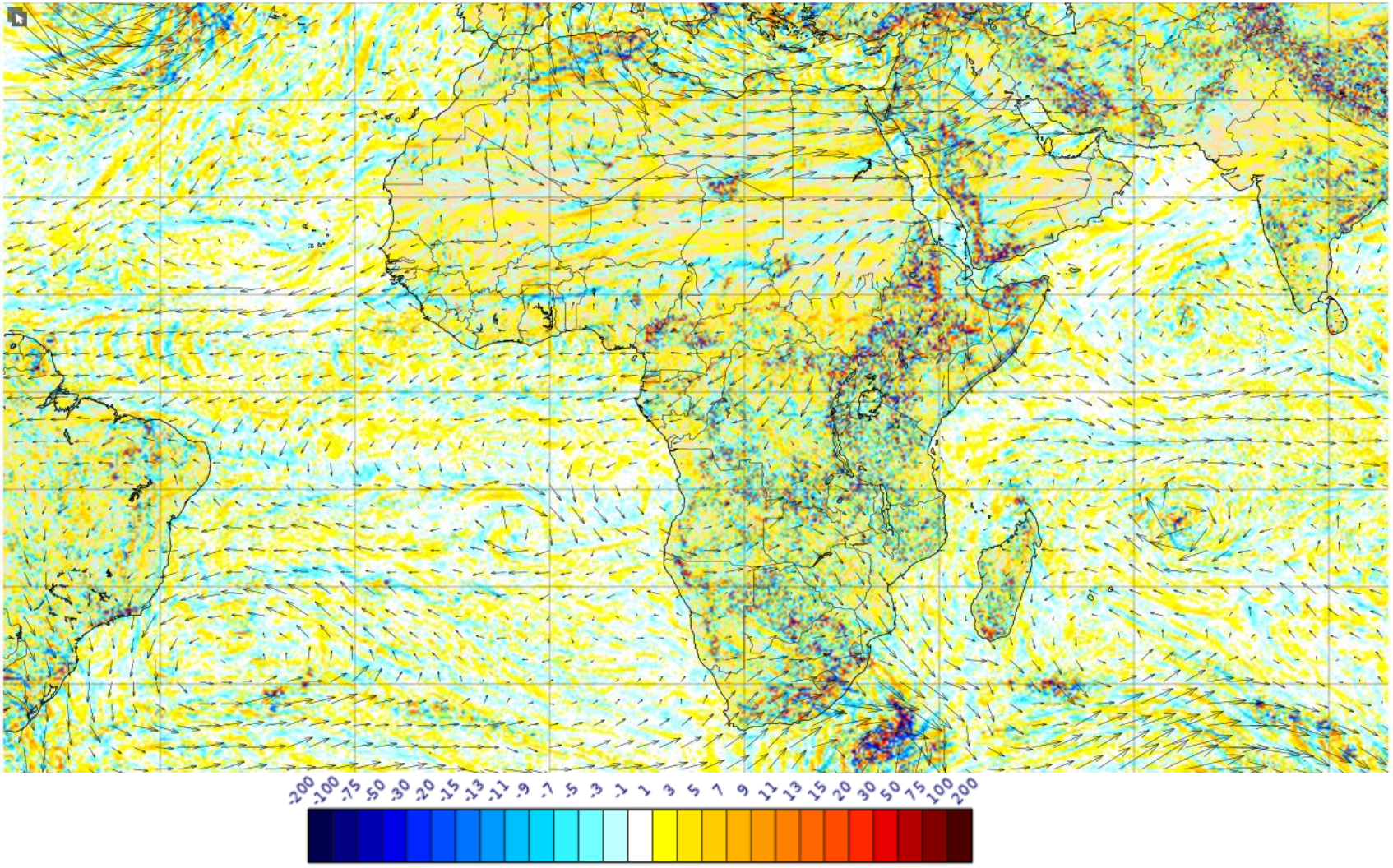



**Figure 24: Divergence Wind forecast ECMWF**
Always for the first week the wind is divergent

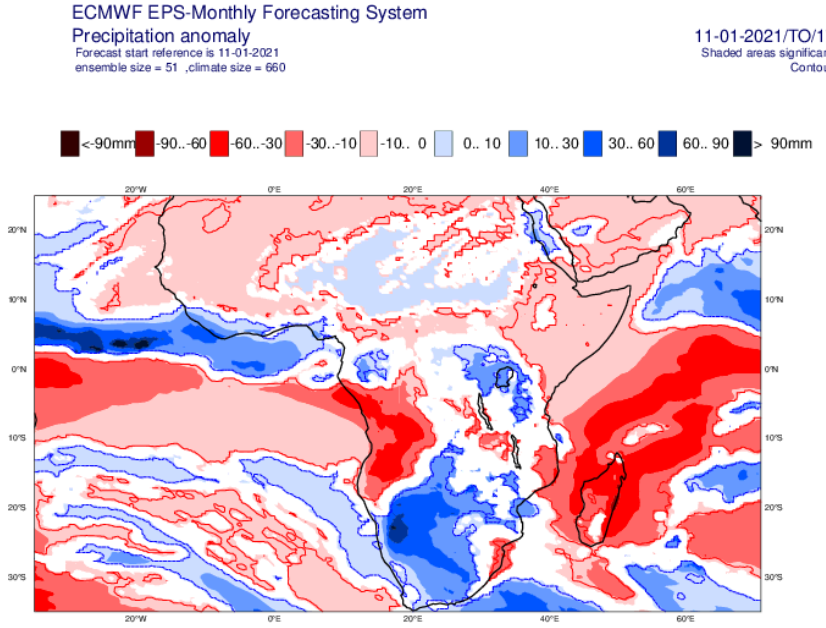
https://www.ecmwf.int/en/forecasts/charts/catalogue/medium-rv-div-uv?facets=undefined&time=2019102300,144,2019102900&projection=africa&layer_name=div_custom

# MONTHLY FORECAST FROM WMO LEAD CENTRE SINGLE ENSEMBLE AND MULTIMODEL

**Figure 25: Monthly forecast**
The LOMM-level model set tells us that part of the Africa region will have higher than normal rainfall.

https://www.wmolc.org/seasonPmmeUI/view?winName=PlotView1566209968309

# PRECIPITATION FORECASTS FROM ECMWF FOR WEEK 1 & 2



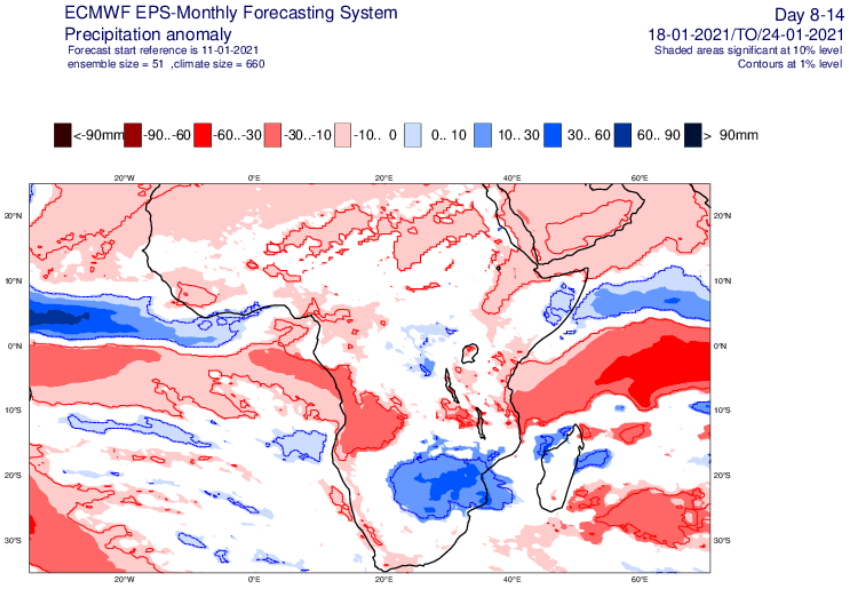
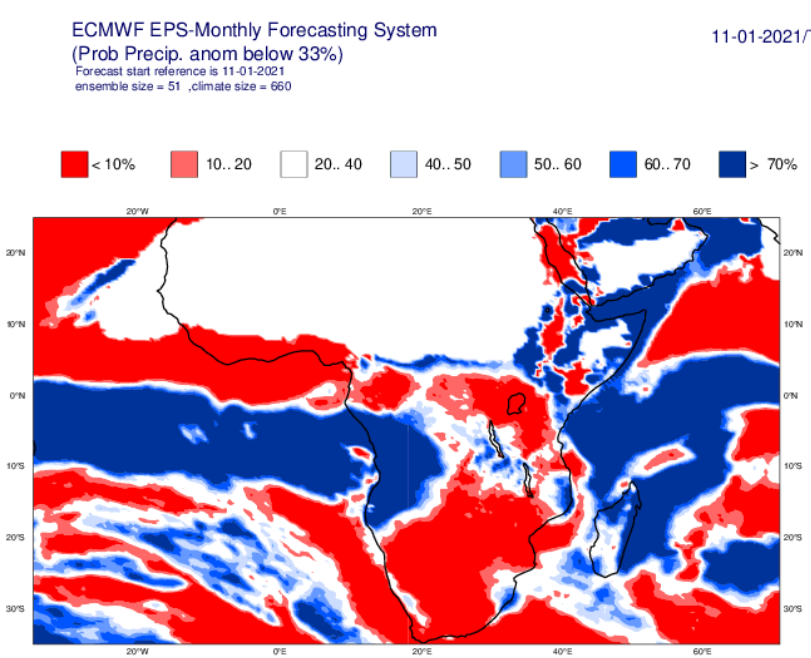




**Figure 26: Precipitation forecast**

https://www.ecmwf.int/en/forecasts/charts/catalogue/mofc_multi_anomaly?facets=undefined&time=2019081500,408,2019090100&parameter=precipitation&area=Global

# PROBABILITY PRECIPITATION FORECASTS FROM ECMWF FOR WEEK 1: Tercile 33 & 66



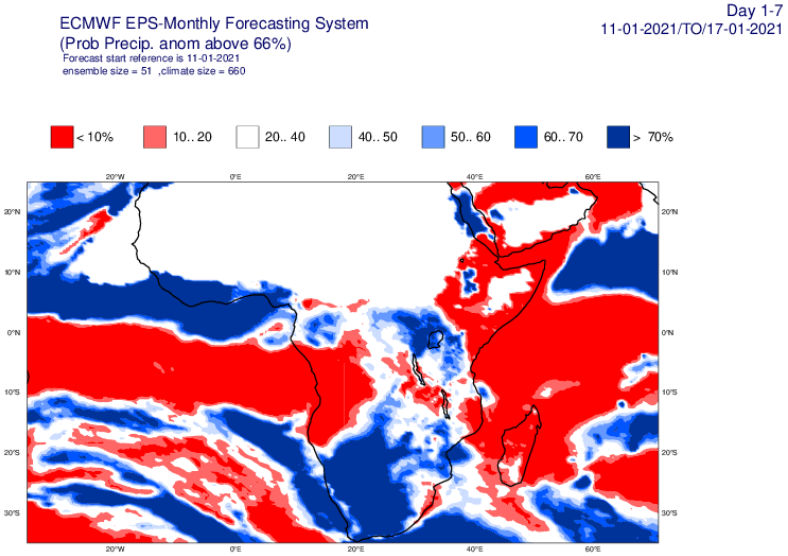
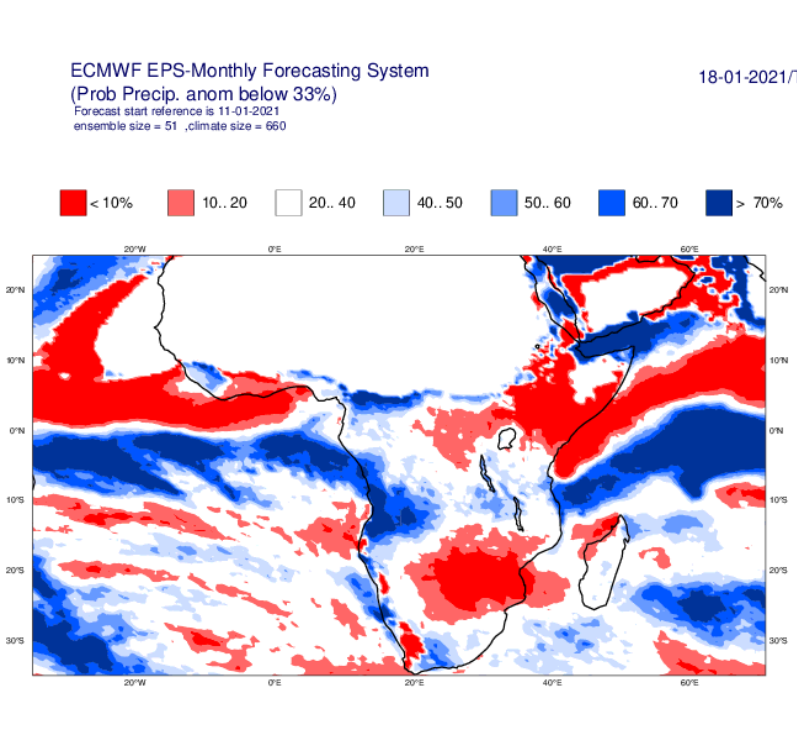




**Figure 27: Monthly forecasting system**

https://www.ecmwf.int/en/forecasts/charts/catalogue/mofc_multi_anomaly?facets=undefined&time=2019112100,408,2019120800&parameter=precipitation&area=Global

# PROBABILITY PRECIPITATION FORECASTS FROM ECMWF FOR WEEK 2: Tercile 33 & 66



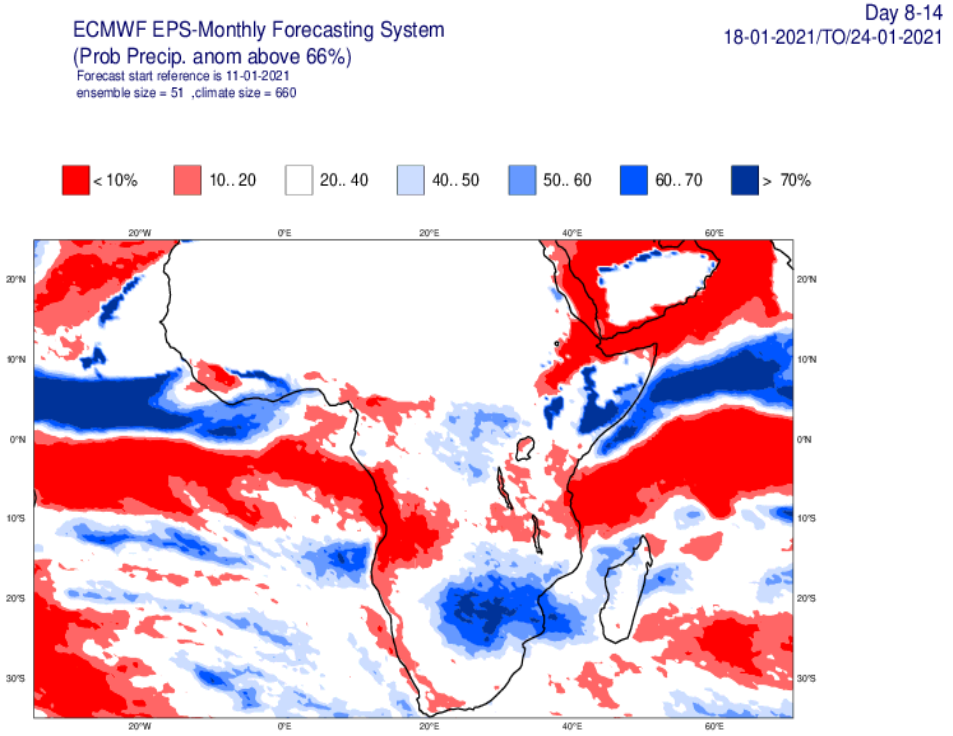
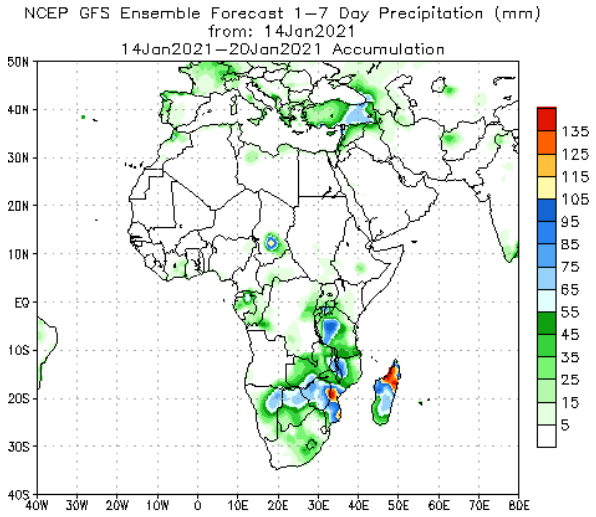
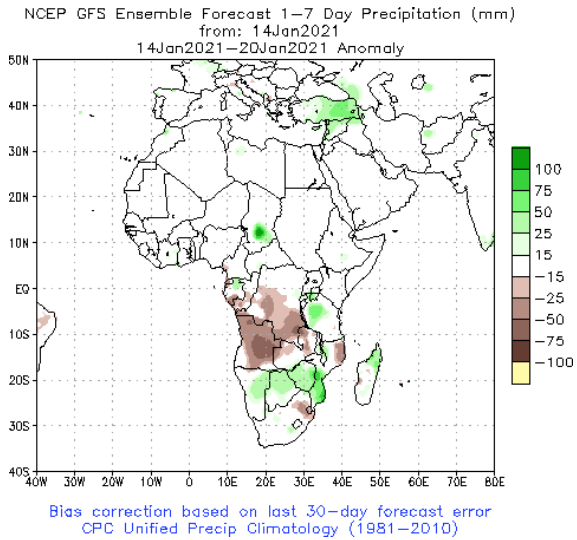



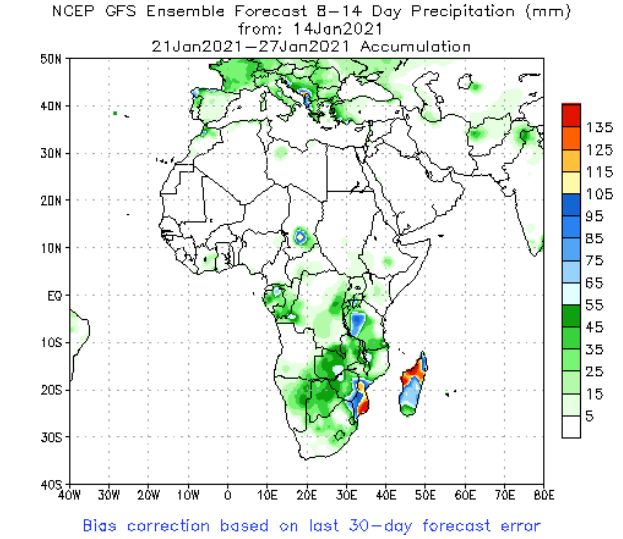

**Figure 27: Monthly forecasting system**

https://www.ecmwf.int/en/forecasts/charts/catalogue/mofc_multi_anomaly?facets=undefined&time=2019112100,408,2019120800&parameter=precipitation&area=Global

# PRECIPITATION AND ANOMALY FORECAST



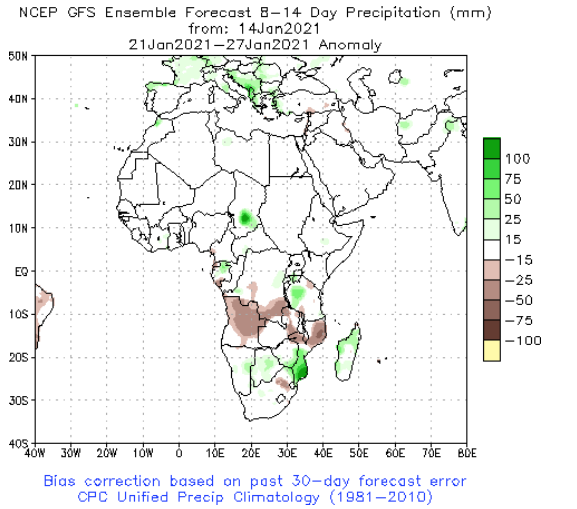



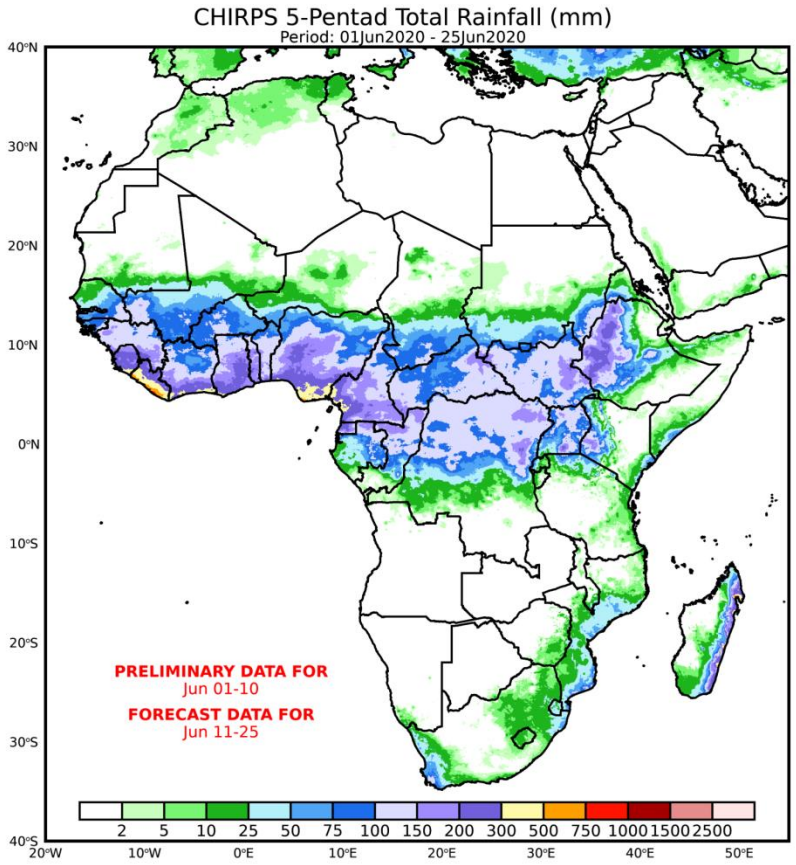

**Figure 28: Précipitation and Anomaly forecast**

**Precipitation of anomalies for the first week will generate more precipitation at the level of East Africa when we look at the level of the anomaly finds that this area is always in surplus.**

https://www.cpc.ncep.noaa.gov/products/Global_Monsoons/African_Monsoons/gfs_model.shtml

http://www.cpc.ncep.noaa.gov/products/people/wwang/gfs_precip/gfs_wk1.gif

# S2S PRODUCTS FROM THE HAZARD CENTER OF UNIVERSITY OF CALIFORNIA AT SANTA BARBARA



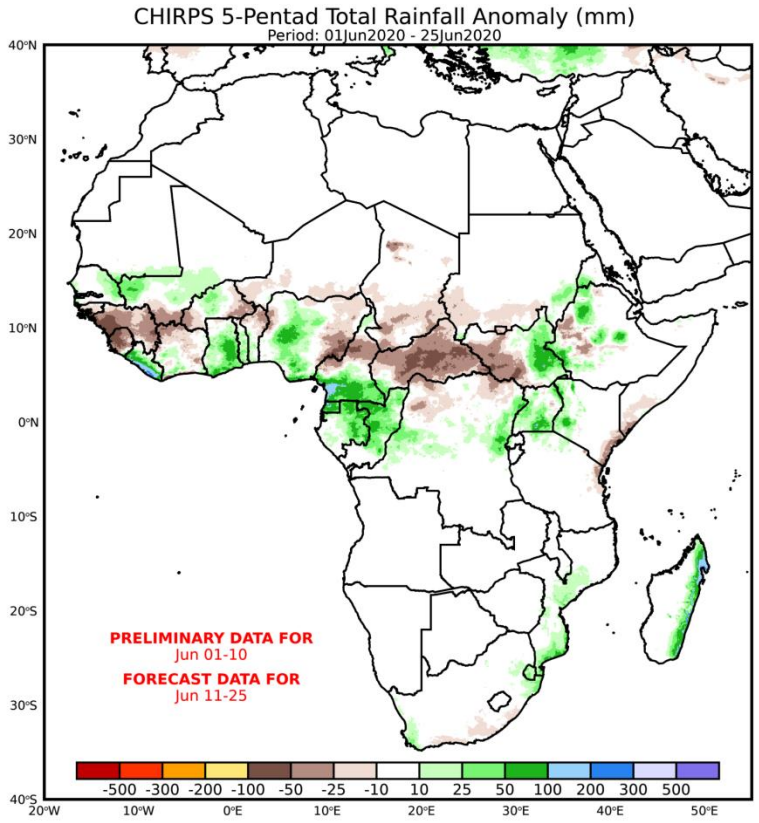




**Figure 29: S2S Forecast data**

The Santa Barbara model shows us that there is more intense rainfall in East Africa The anomaly effectively defines precipitation for this area.

http://ewxtest.chc.ucsb.edu/images/CHC_latest/CHCEE/Africa/TotalPrecip_05PentAccum_Current.png

http://ewxtest.chc.ucsb.edu/images/CHC_latest/CHCEE/Africa/Anomaly_05PentAccum_Current.png

# PRECIPITATION PROBABILITY FORECAST subx

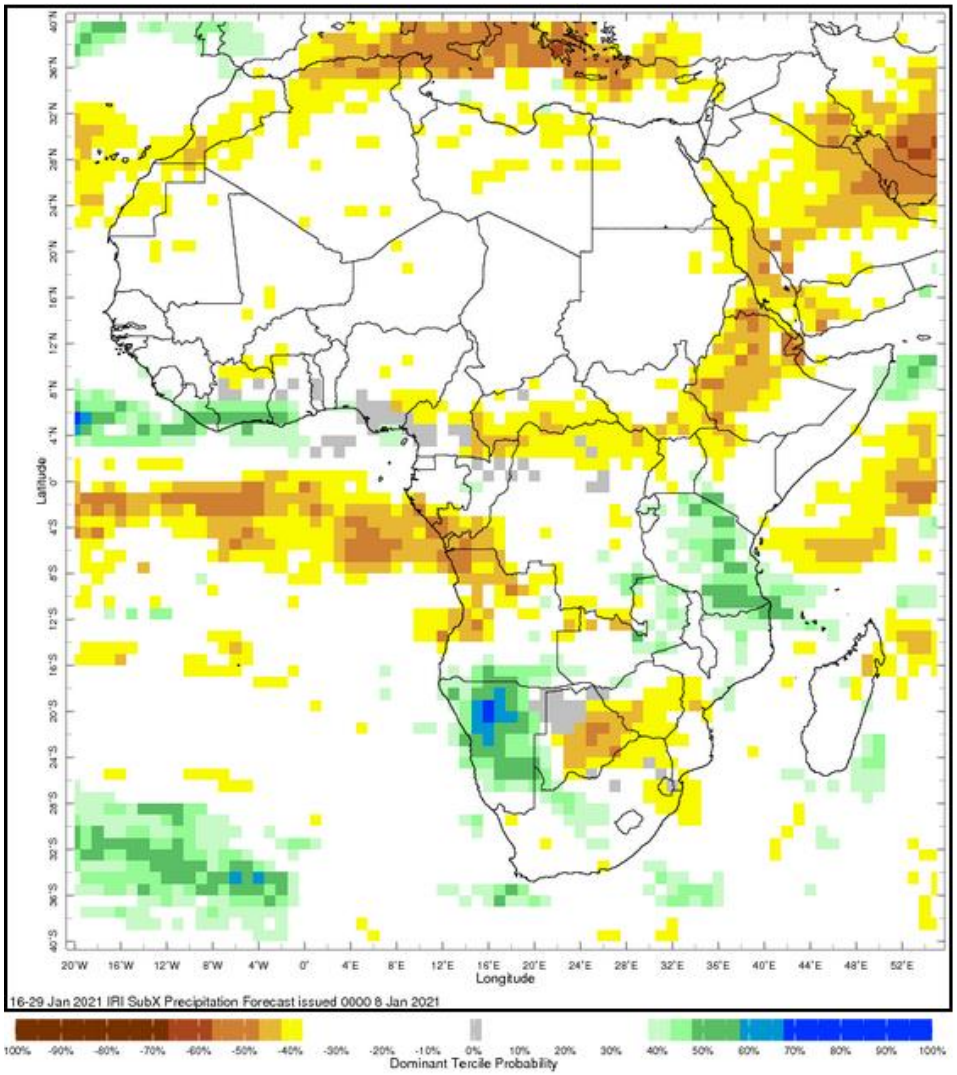
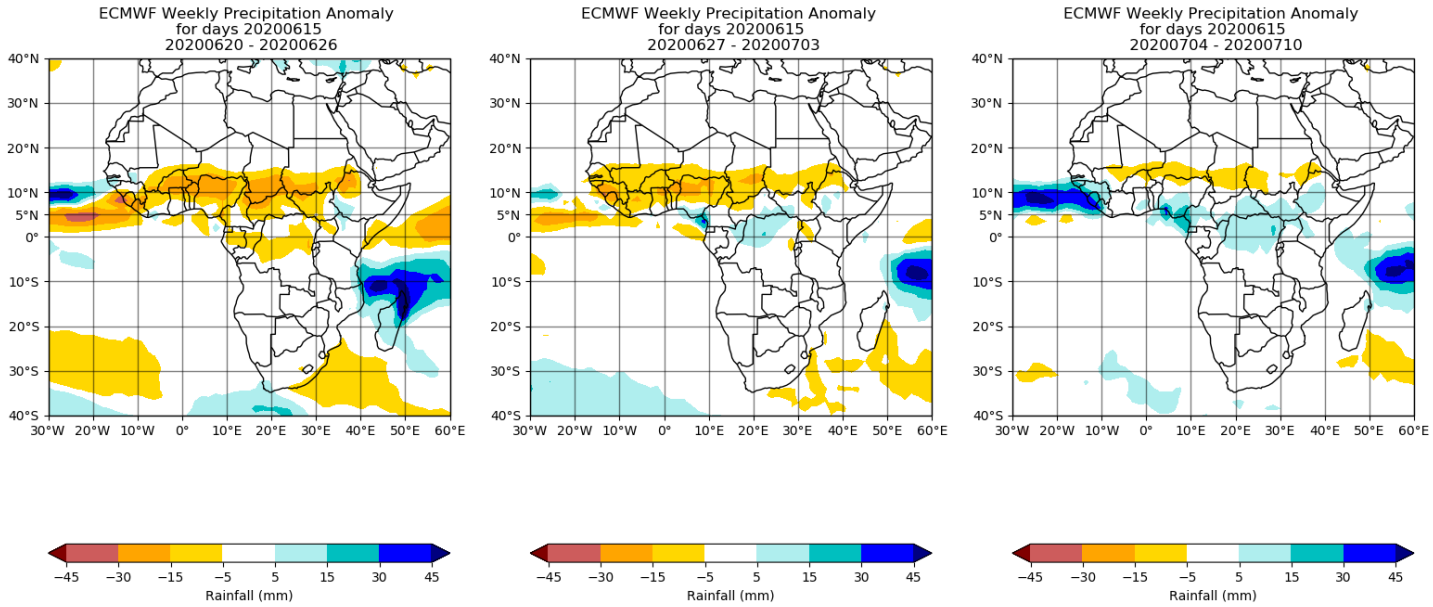



**Figure 31: Precipation forecast subx**

For the forecast model, this model defines nearly 50% of rain observed in southern Sudan Kenya Rwanda and Burundi**.**

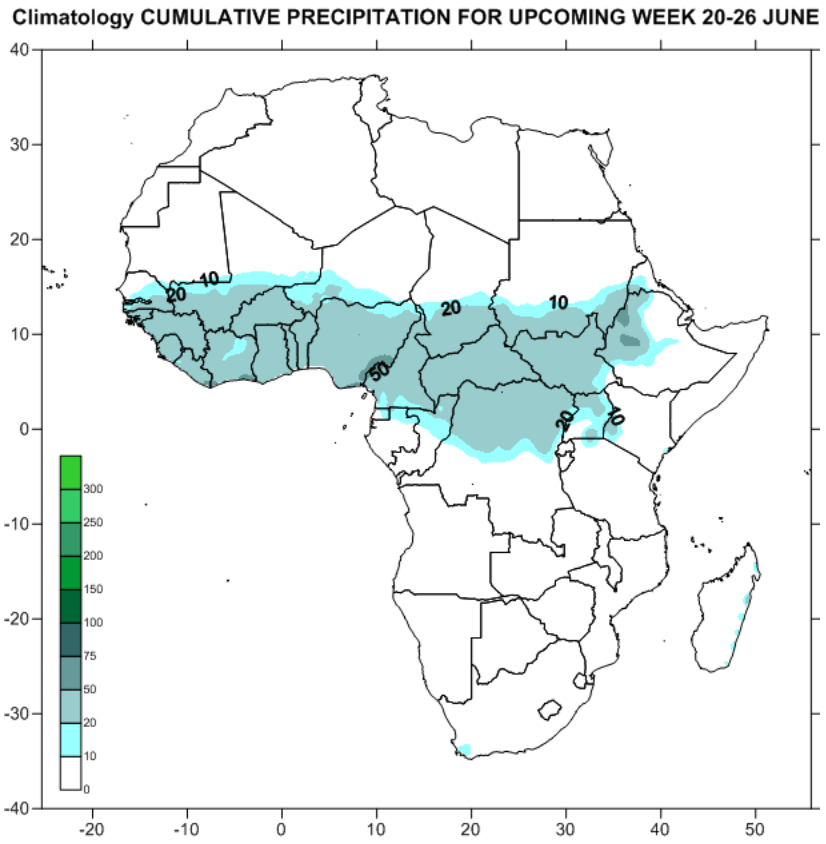
https://iridl.ldeo.columbia.edu/maproom/Global/ForecastsS2S/precip_subx.html?Set-Language=en&bbox=bb%3A-20%3A-40%3A55%3A40%3Abb&S=0000%201%20Nov%202019&region=bb%3A-20%3A-40%3A55%3A40%3Abb

# PRECIPITATION PROBABILITY FORECAST S2S ()




https://iridl.ldeo.columbia.edu/maproom/Global/ForecastsS2S/precip_s2s.html?Set-Language=en&bbox=bb%3A-20%3A-40%3A55%3A40%3Abb&S=0000%2029%20Aug%202019&region=bb%3A-20%3A-40%3A55%3A40%3Abb

# CLIMATOLOGY OF PRECIPITATIONS FOR UPCOMING WEEK 1 AND 2



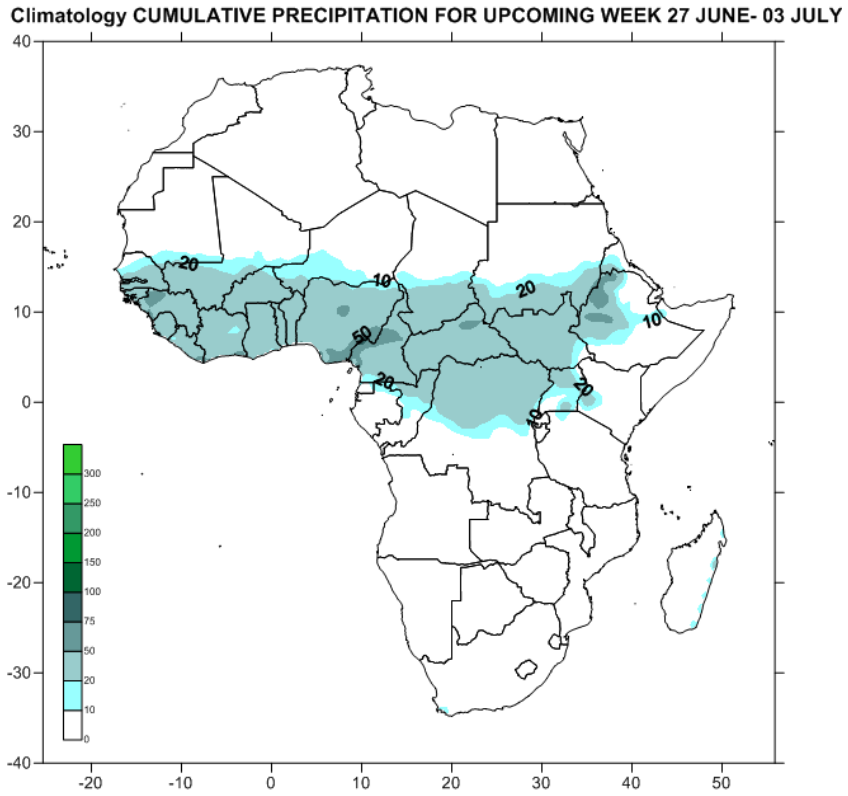




**Figure 32: Climatology of Precipation**

# PRECIPITATION FORECAST ANALYSIS

**FORECAST WEEK1 18-25 May_2020**

**FORECAST WEEK2 25 -31 May_2020**

**Figure 33: Precipation forecast Analysis**