



DEKADAL TECHNICAL NOTE FOR THIRD DEKAD OF MAY, 2022 AND PRECIPITATION FORECAST FOR WEEK 1 AND 2

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Edited by: Sunshine GAMEDZE, Pierre KAMSU

Content of the Technical Note

1. Monitoring Climate Element

- Percent of precipitation
- Temporal variation of precipitation
- Precipitation Onset (Observed and Projected)
- Dekadal OLR anomaly
- MSLP anomaly
- Wind anomaly at 850 and 700 hPa
- Relative Humidity anomaly

2. Global Driver Review and Assessment

- Weekly and monthly SST anomaly assessment
- Current Velocity Potential at 200hPa
- Current MJO Status and Forecast
- Weekly PWAT observed and outlook
- Dekadal velocity potential with MJO, Kelvin and Rossby Wave
- Dekadal Stream Function with MJO, Kelvin and Rossby Wave

3. Model Guidance for Weekly Climate outlook

- Weekly wind anomaly and divergent forecast
- Weekly NCEP/GFS bias corrected ensemble forecast
- GEFS weekly precip exceedance forecast
- Weekly Precip Forecast from ECMWF (Anom and Prob.)
- Monthly tercile prob precip anomaly forecast
- IRI SubX precip forecast
- Two week climatology
- Two weeks precip forecast

1. Monitoring Climate Element

Estimated Cumulative Precipitation in % of average for the last Dekad

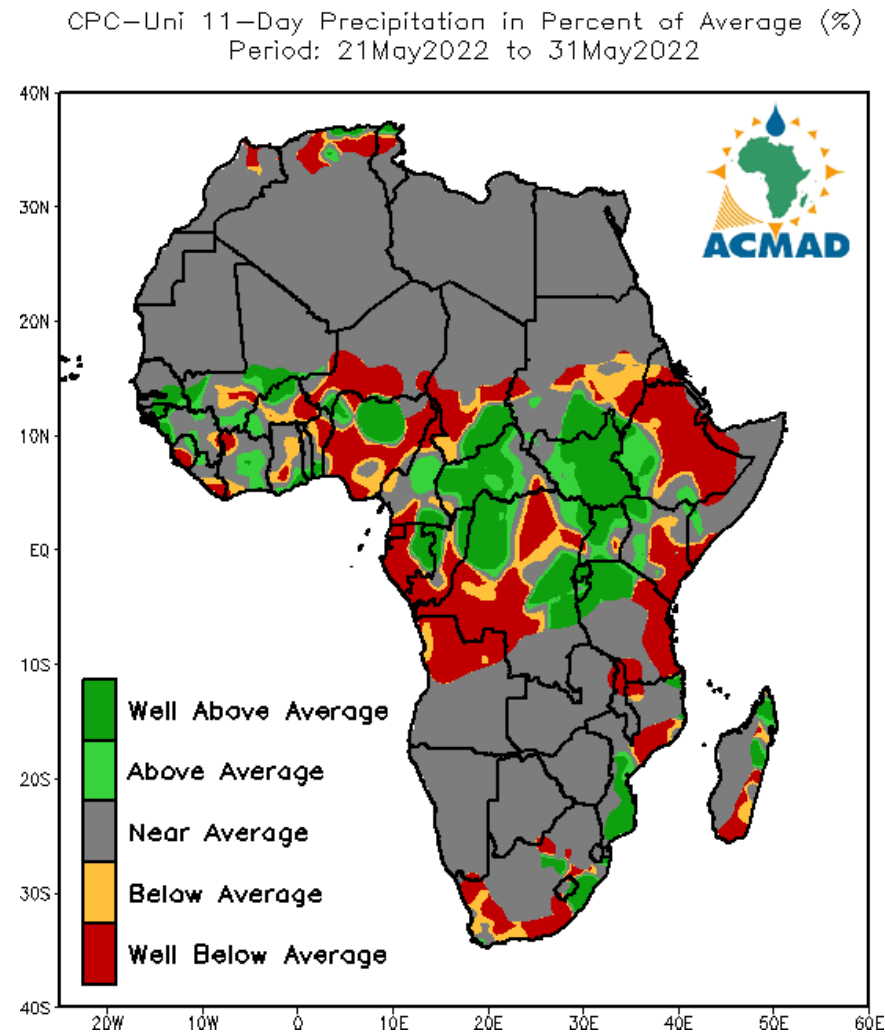


Figure 1: This map displays decadal average precipitation in percent of average

Temporal and Spatial Change of % of Average Precip for the Last Four Dekads

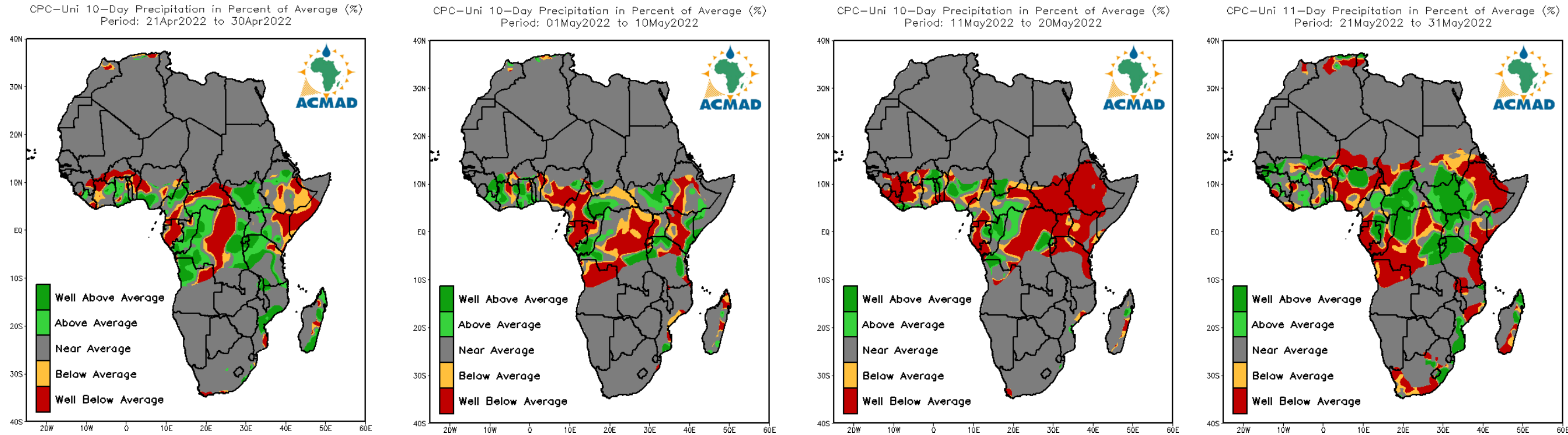
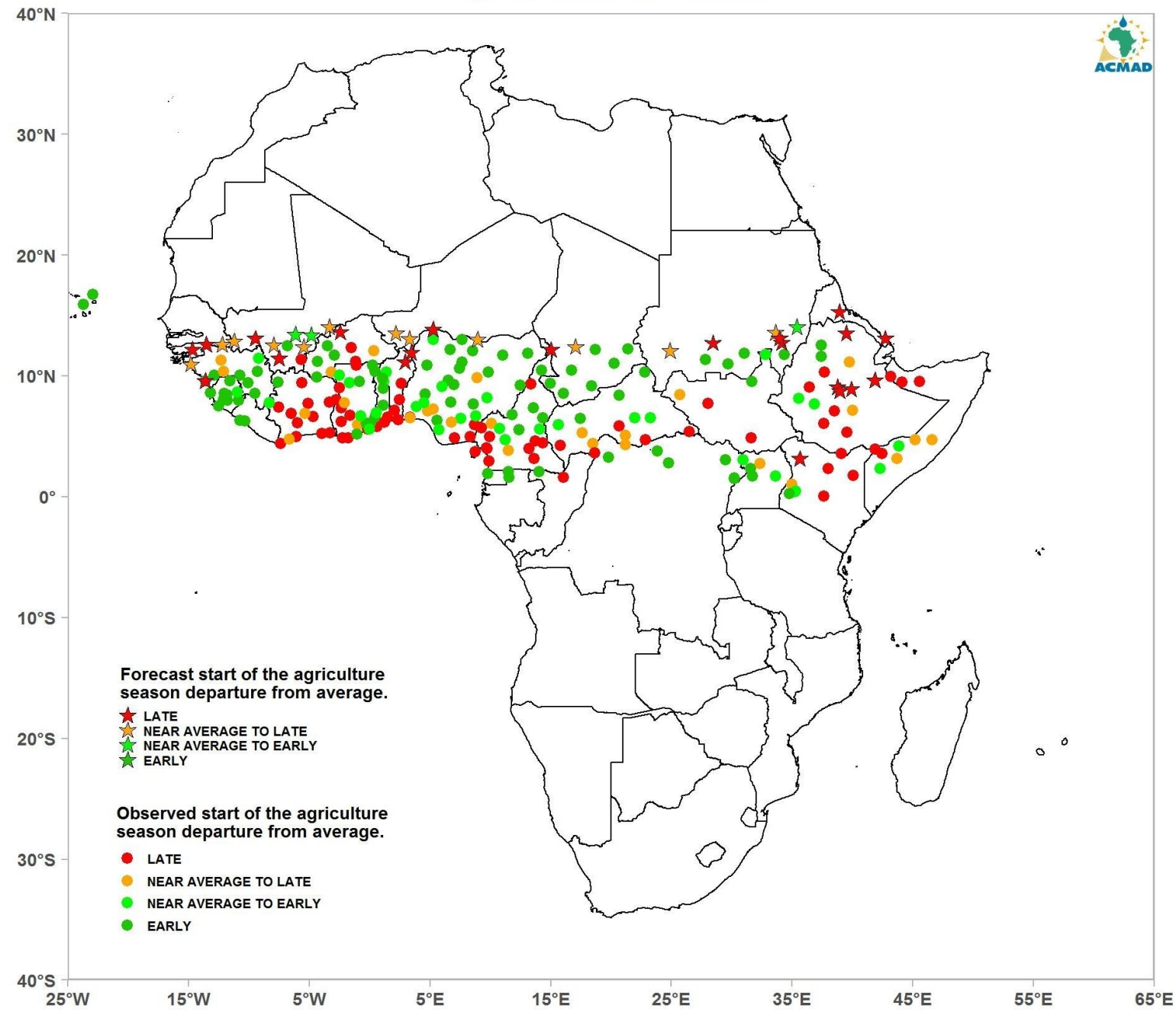


Figure 2: This maps display decadal average precipitation in percent of average

MONITORING OF OBSERVED ANOMALIES ON THE START OF THE AGRICULTURE SEASON AND OUTLOOK.

MONITORING PERIOD: JANUARY-MAY 2022.
OUTLOOK VALIDITY PERIOD: MAY 26 TO JUNE 09 2022 .
DATE OF ISSUE: MAY-26-2022.



PAST 3 DEKADS OLR ANOMALIES

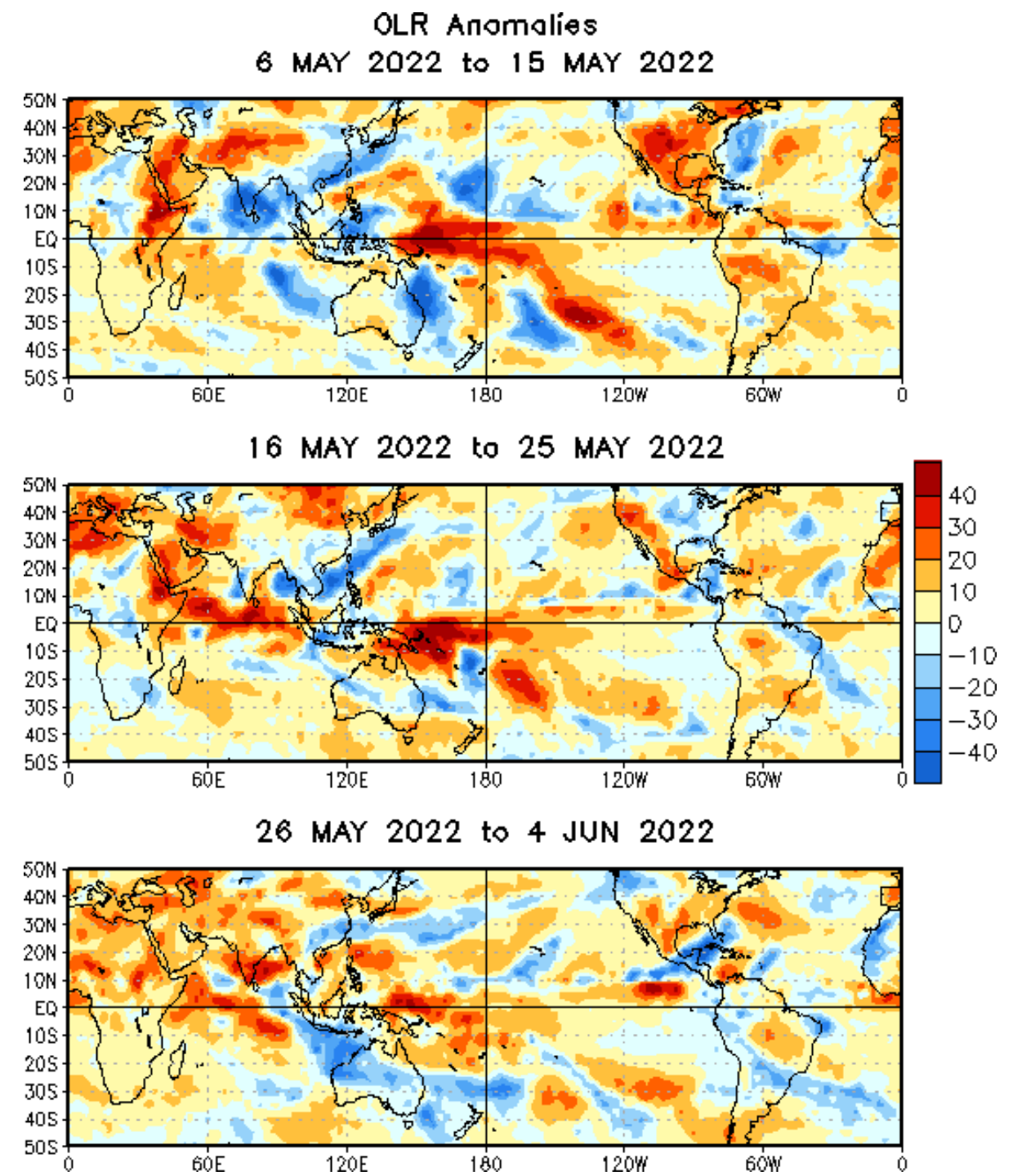


Figure 4: Past 3 weeks OLR anomalies

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

Mean Sea Level Pressure (MSLP) Anomalies for the last Dekad

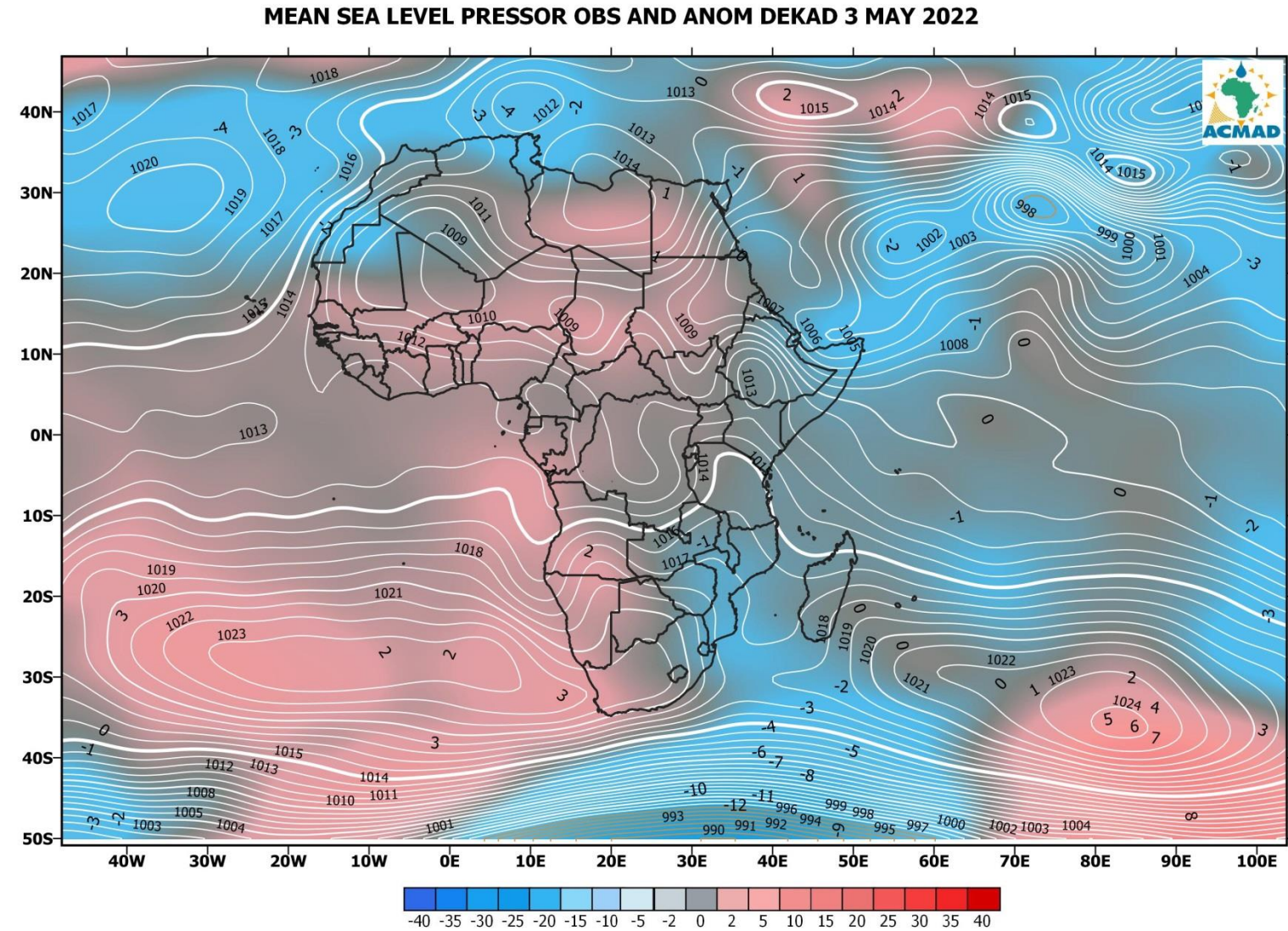


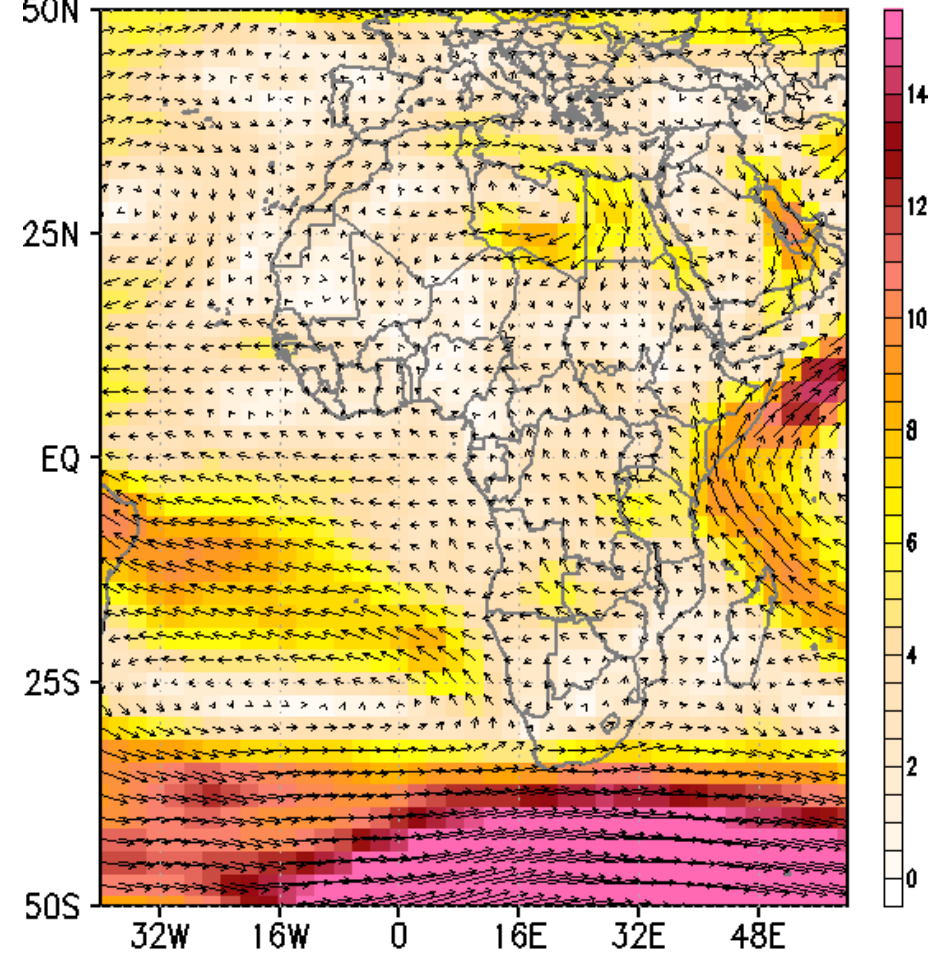
Figure 5: MSLP observation versus anomaly

Data source:

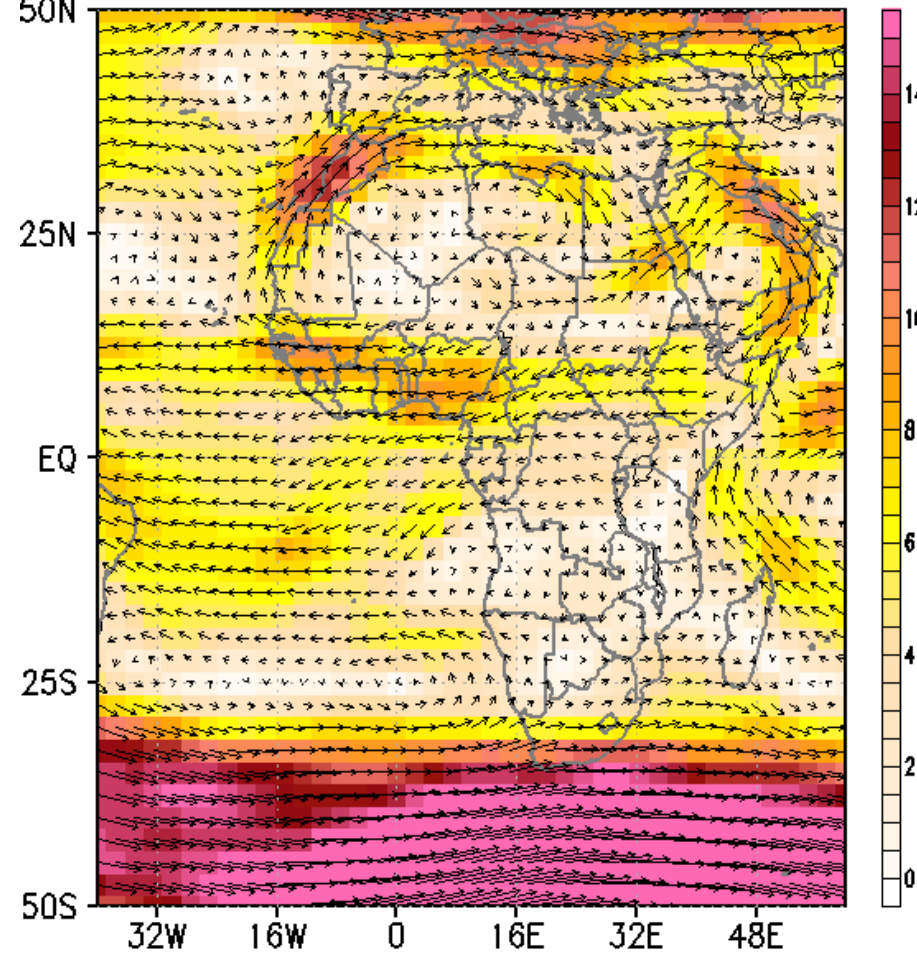
<http://iridl.ldeo.columbia.edu/expert/SOURCES/.NOAA/.NCEP-.NCAR/.CDAS-1/.DAILY/.Intrinsic/.MSL/.pressure>

Wind Anomalies for the last Dekad @ 850hpa, 700hpa and 200hPa

850hPa Wind for the Dekad: 21–31 May 2022



700hPa Wind for the Dekad: 21–31 May 2022



200hPa Wind for the Dekad: 21–31 May 2022

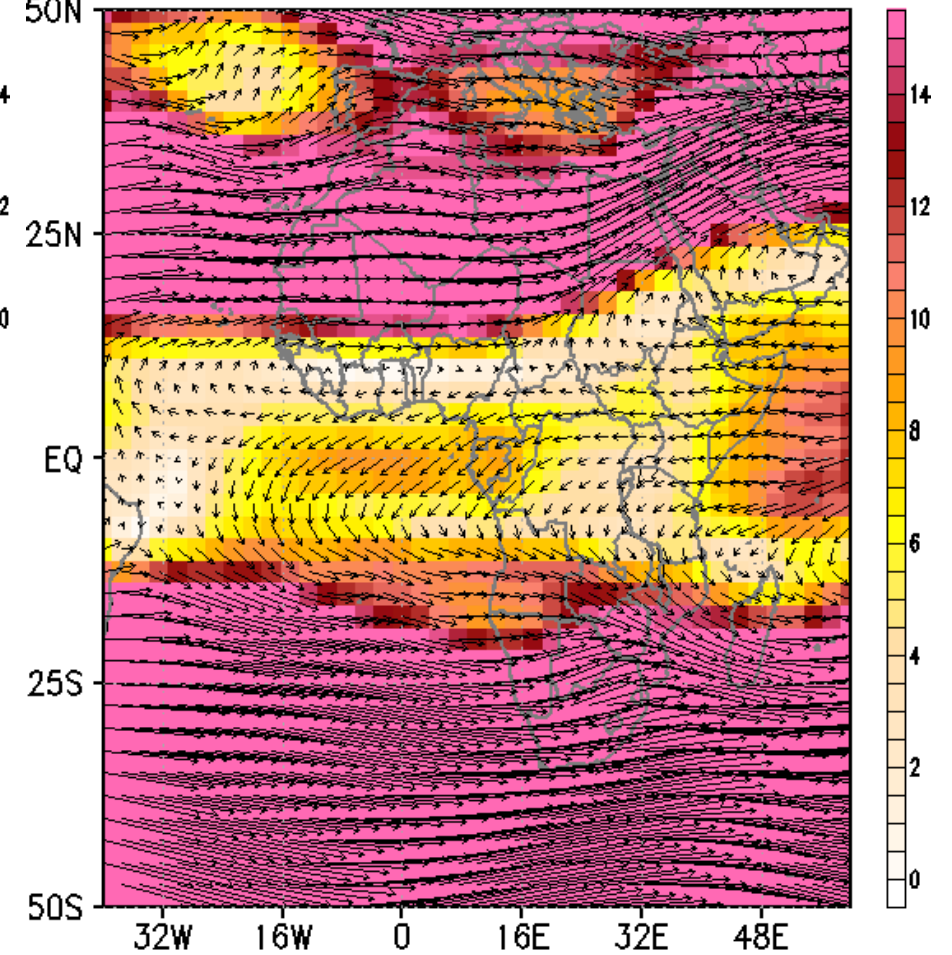


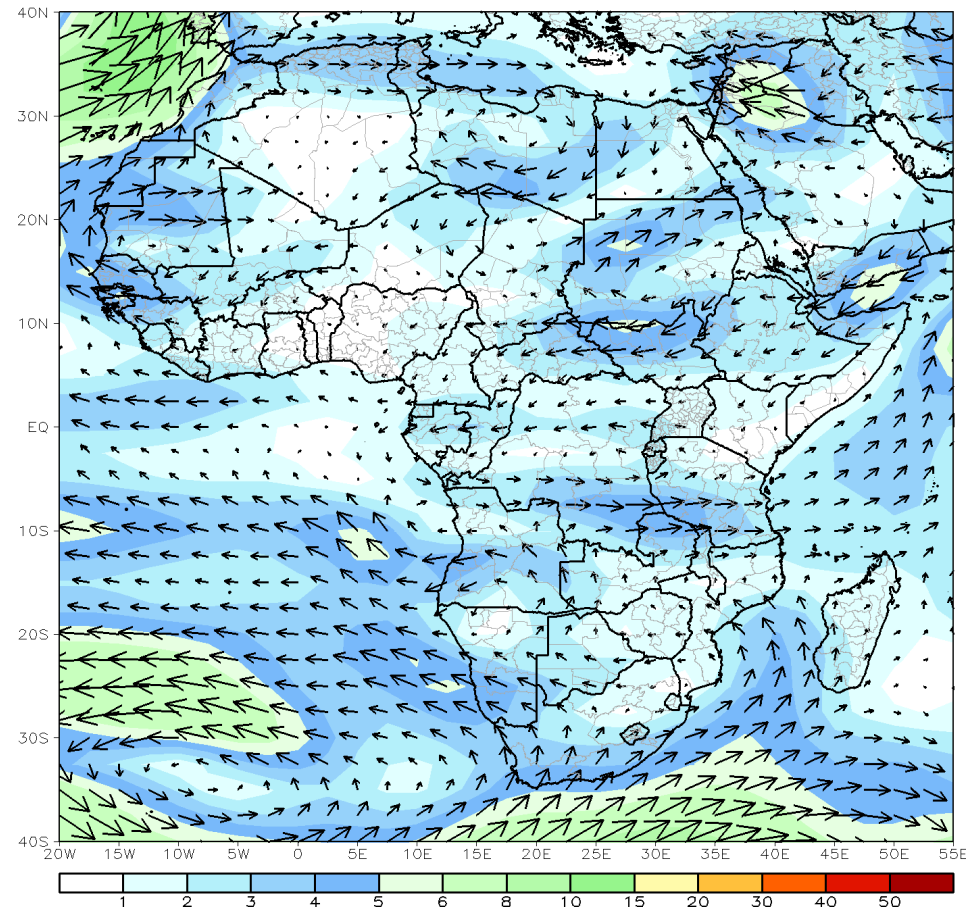
Figure 6: Wind anomalies for 850hpa and 700hPa

9def/long_name/%28Vitesse%29def/windspeed_colors/DATA/0/15/RANGE/u/v/X/Y/fig:/colors/vectors/grey/countries_gaz/:fig//plotaxislength/432/psdef//plotborder/72/psdef//XOVY/null/psdef/

Wind Anomalies for the last 7 day period 850hpa, 700hpa and 200hpa

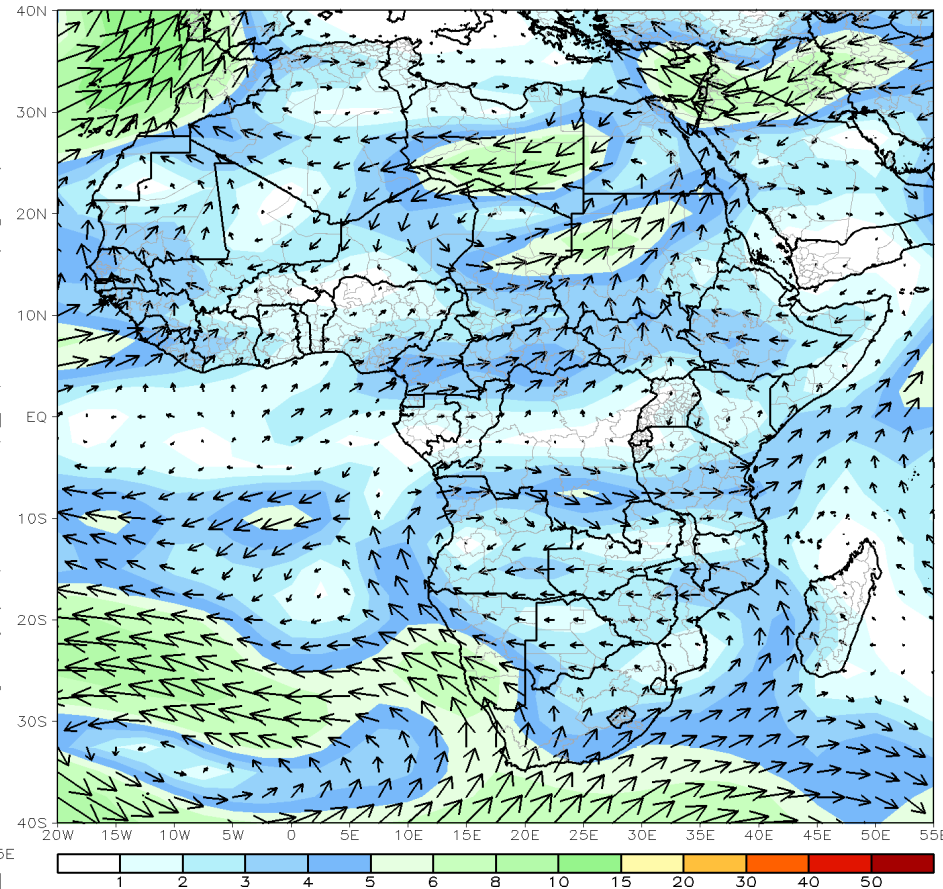
CDAS 850mb 7-Day Mean Vector Wind Anomaly (m/s)

Period: 27May2022 - 02Jun2022



CDAS 700mb 7-Day Mean Vector Wind Anomaly (m/s)

Period: 27May2022 - 02Jun2022



CDAS 200mb 7-Day Mean Vector Wind Anomaly (m/s)

Period: 27May2022 - 02Jun2022

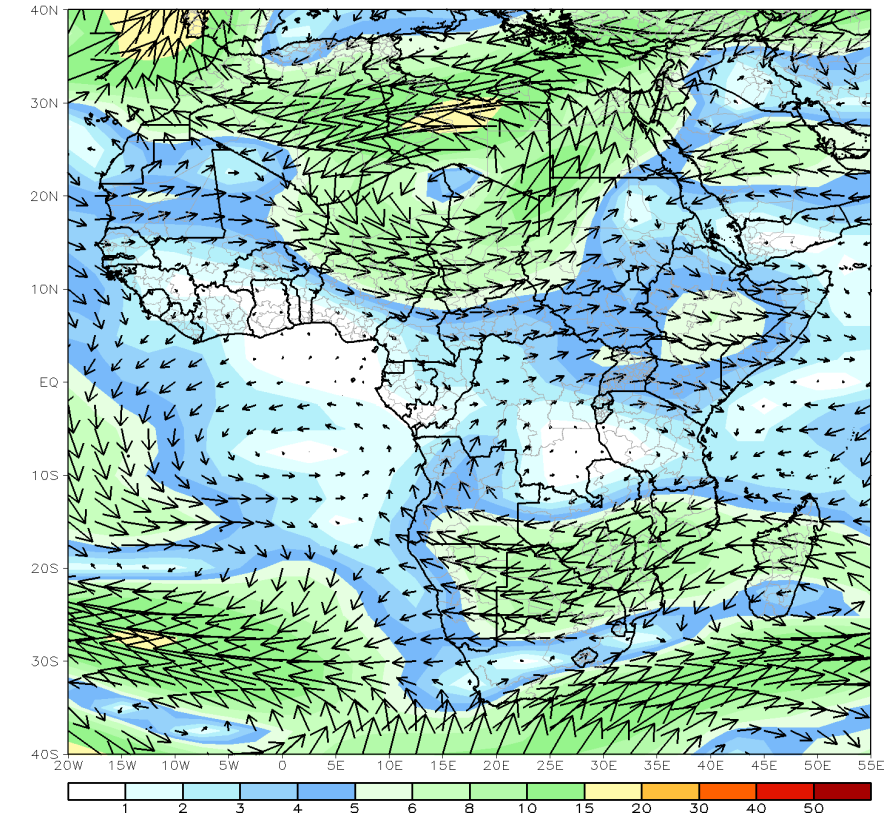


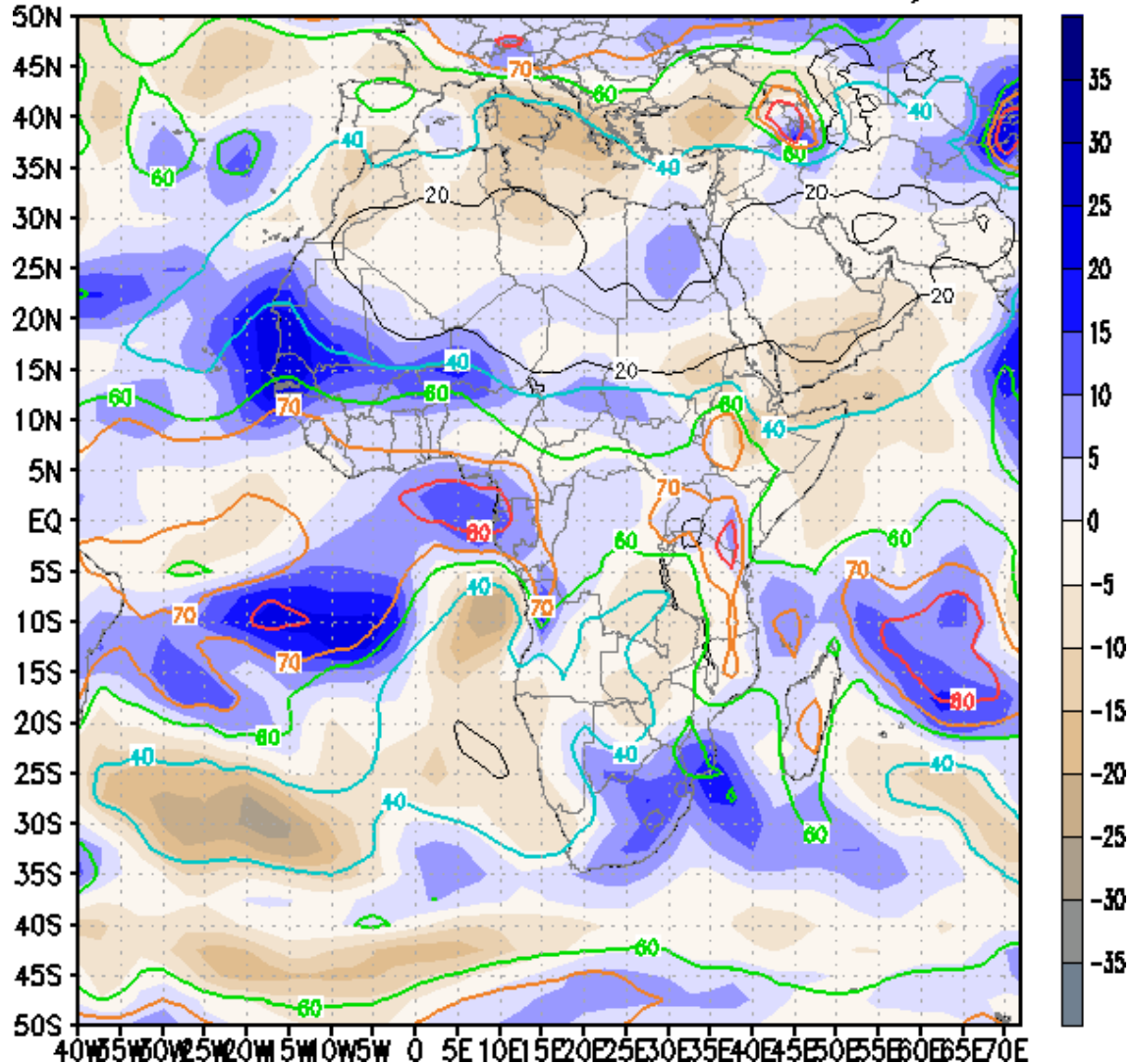
Figure 7: Wind anomalies for 850hpa, 700hPa and 200hpa

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

[Climate Prediction Center - African Desk: SWFDP GFS FORECASTS \(noaa.gov\)](https://www.cpc.ncep.noaa.gov/products/international/africa/africa.shtml)

Relative Humidity (RH) Anomalies at 850hpa and 700hpa for the last Dekad

RHum 850hPa Anom. Dekad: 21–31 May 2022



RHum 700hPa Anom. Dekad: 21–31 May 2022

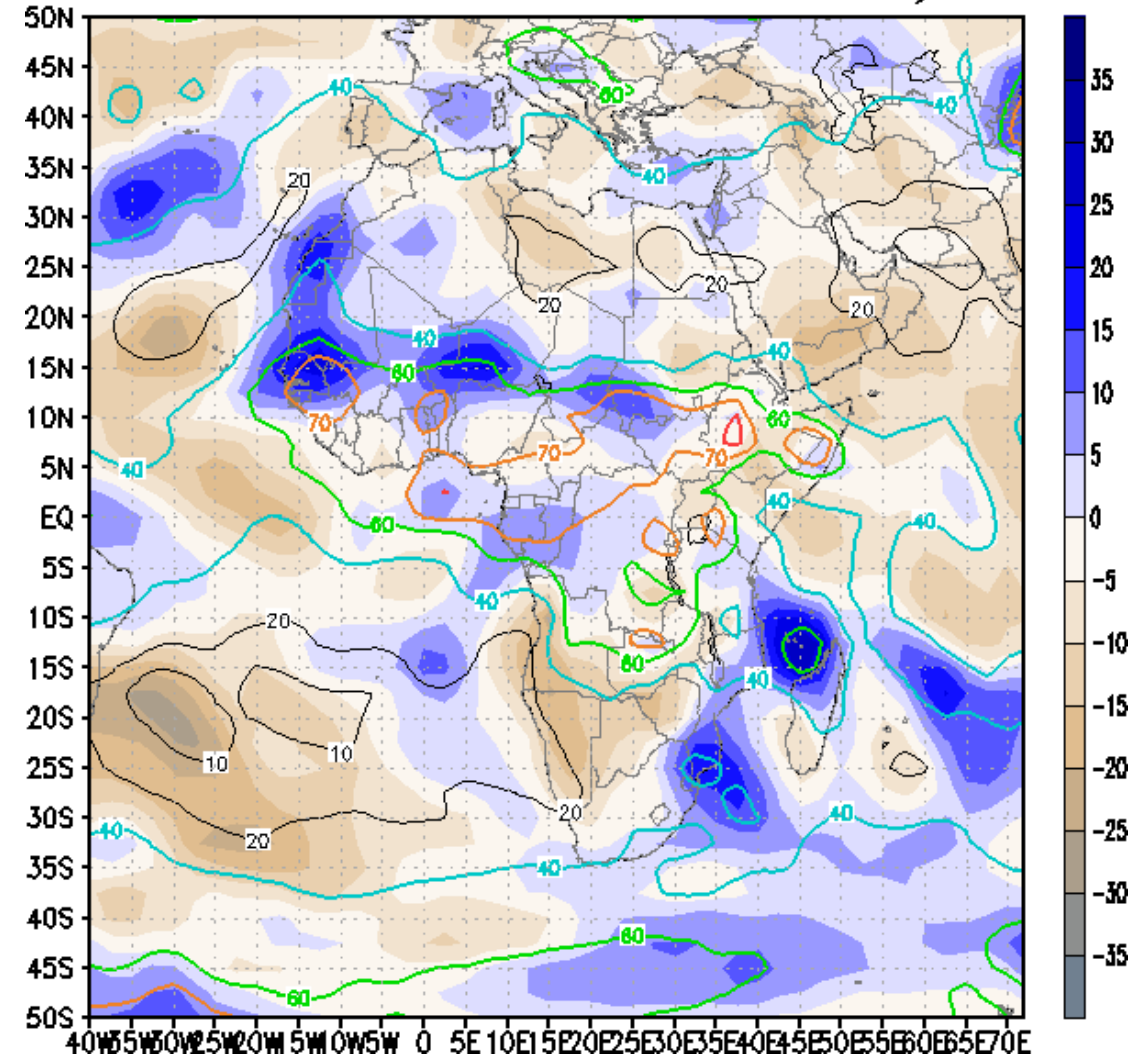
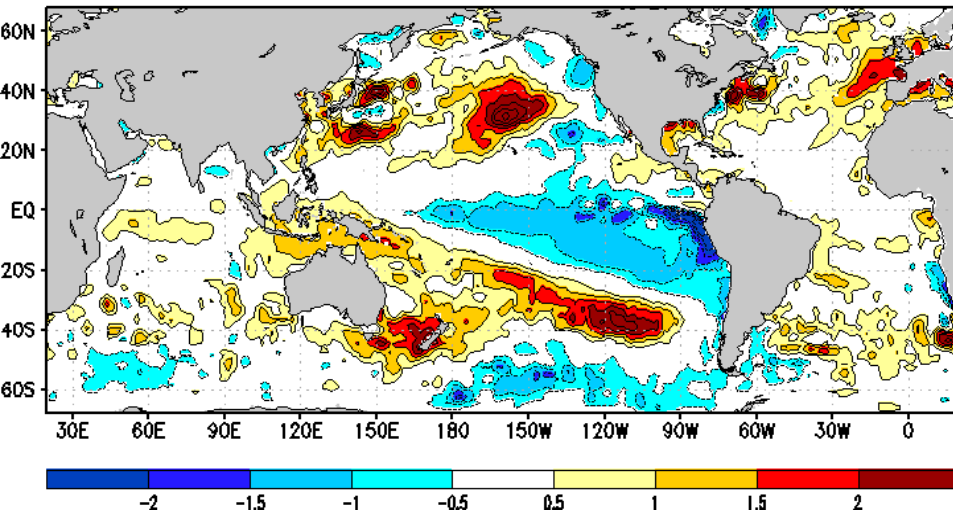


Figure 8: Relative Humidity Anomaly at 850hPa (left) and 700hPa (right)

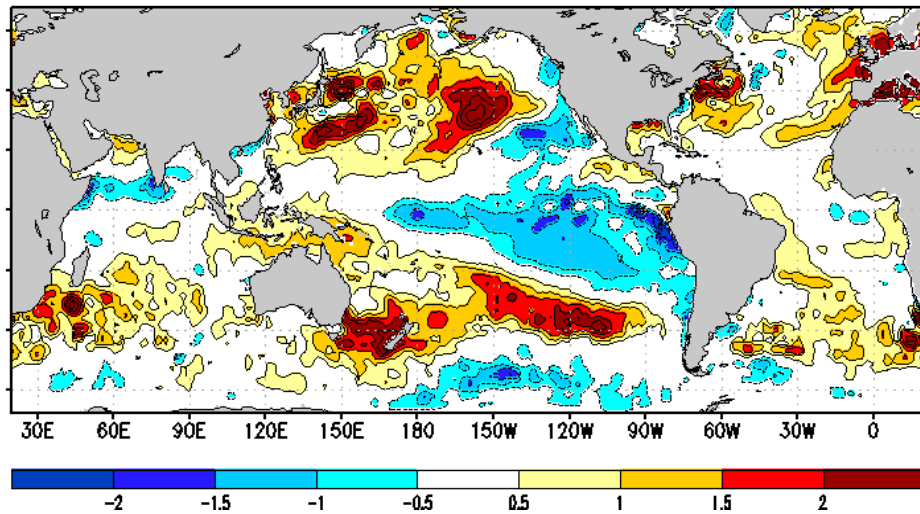
1. Monitoring Climate Element
2. Global Driver Review and Assessment
 - a. SST
 - b. MJO and other Equatorial Waves

Weekly Sea Surface Temperature Anomaly

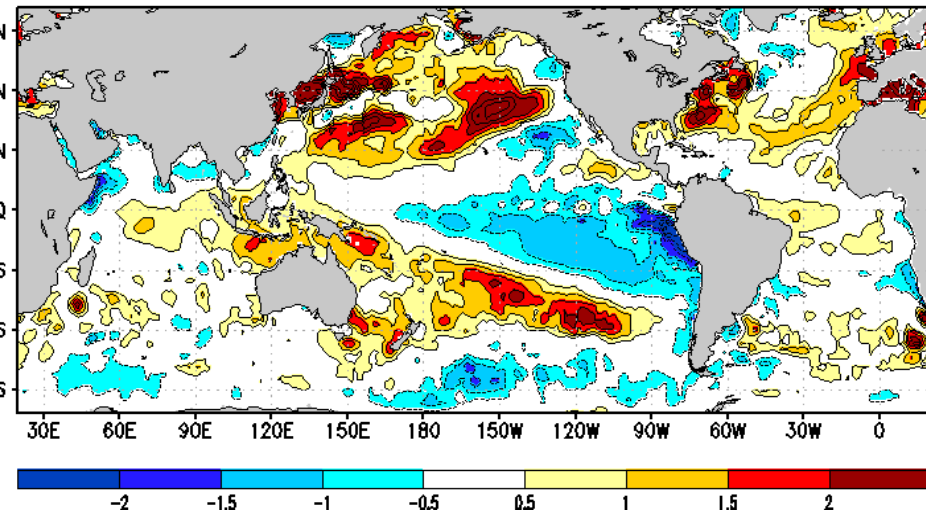
SST Anom. for the Week From 08May2022 to 14May2022



SST Anom. for the Week From 15May2022 to 21May2022



SST Anom. for the Week From 22May2022 to 28May2022



These maps display weekly sea surface temperature anomalies over the globe, and they depict mostly normal to cooling conditions over the equatorial Pacific with warming observed over northern Atlantic, Gulf of Guinea while neutral to cooling ssts are observed over the south-western Indian ocean.

SST Anom. for the Week From 29May2022 to 04Jun2022

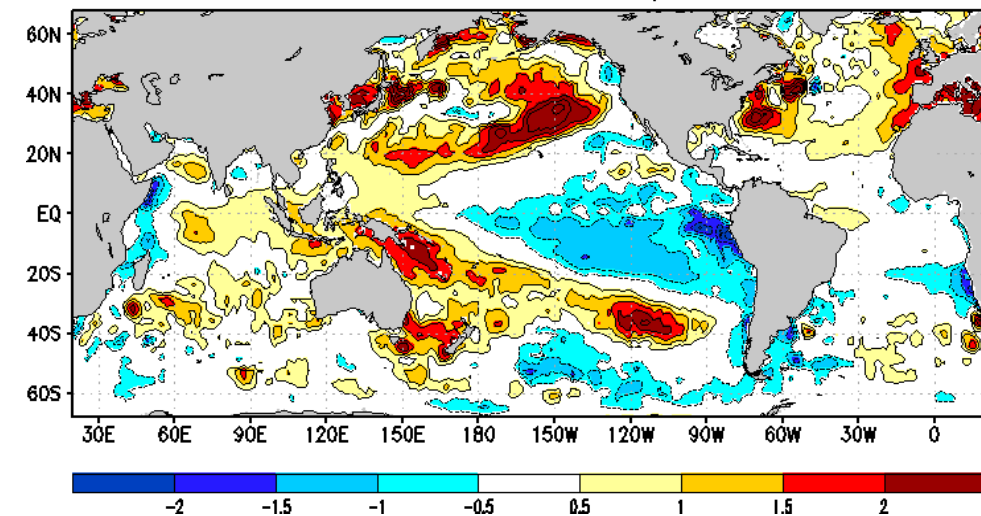


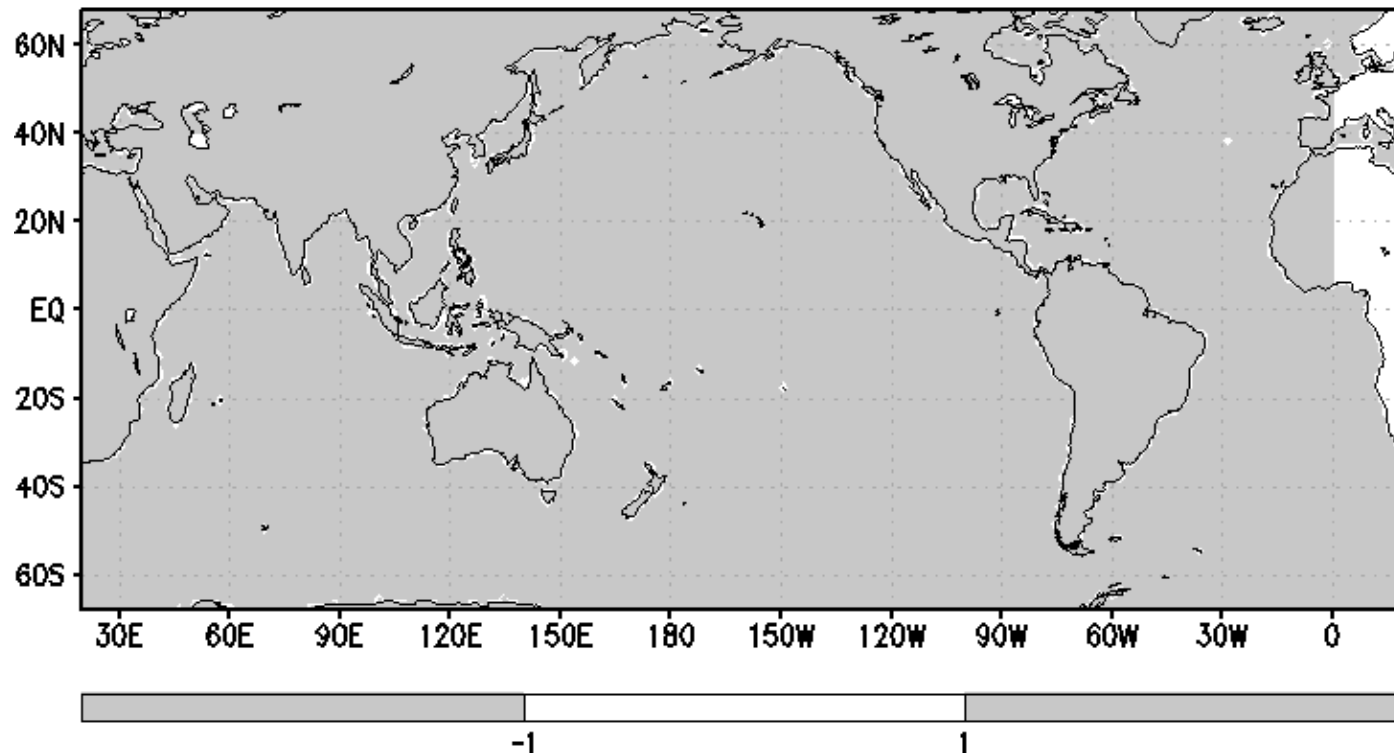
Figure 9: Maps display weekly sea surface temperature anomalies over the globe for last four weeks

<https://psl.noaa.gov/map/clim/sst.shtml>

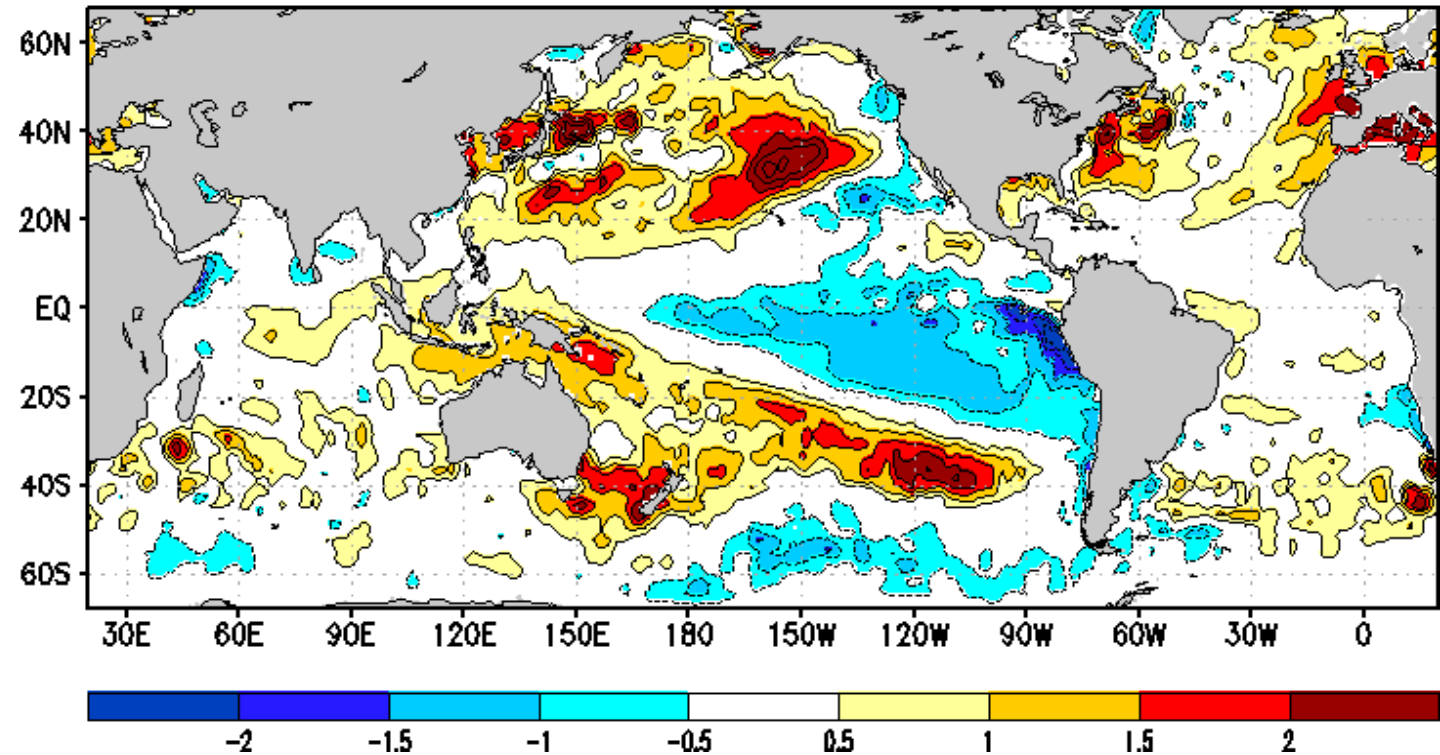
http://iridl.ldeo.columbia.edu/maproom/Global/Ocean_Temp/Weekly_Anomaly.html?

Last Month's Sea Surface Temperatures (SST) Observed

SST Anom. for May2022



SST Anom. for the Week From 08May2022 to 04Jun2022



During 20th of Sep to 23rd Oct 2021, the cooling persisted over eastern Equatorial Pacific, and the Western Indian Ocean, whereas the Gulf of Guinea in the South Atlantic, and western pacific continue in warming situation.

Figure 10 : Maps display monthly sea surface temperature anomalies over the globe.

<https://psl.noaa.gov/map/clim/sst.shtml>

http://iridl.ldeo.columbia.edu/maproom/Global/Ocean_Temp/Anomaly.html

SST OBS AND FCST FOR TWO WEEKS

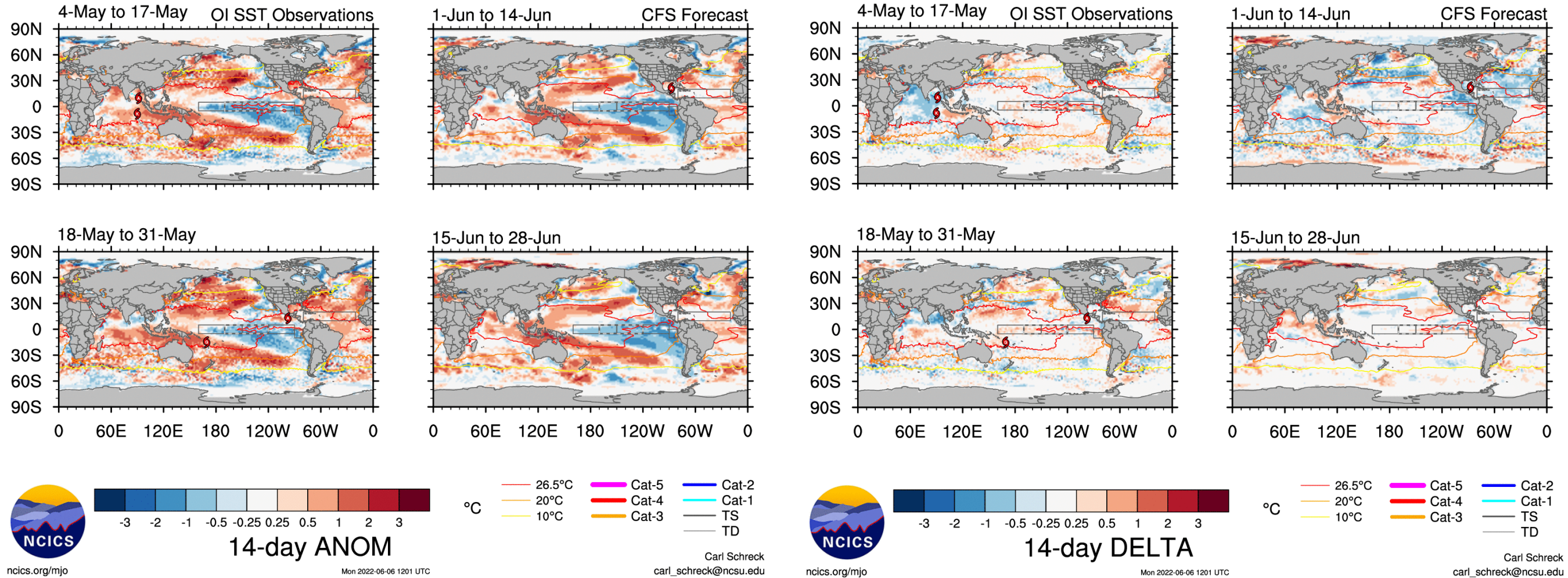


Figure 11: Sea Surface Temperature and FCST for two week

<https://ncics.org/pub/mjo/v2/sst/global.anom.14.png>
<https://ncics.org/pub/mjo/v2/sst/global.delta.14.png>

3-Days Infra-Red (IR) 200hpa and Velocity Potential Anomaly

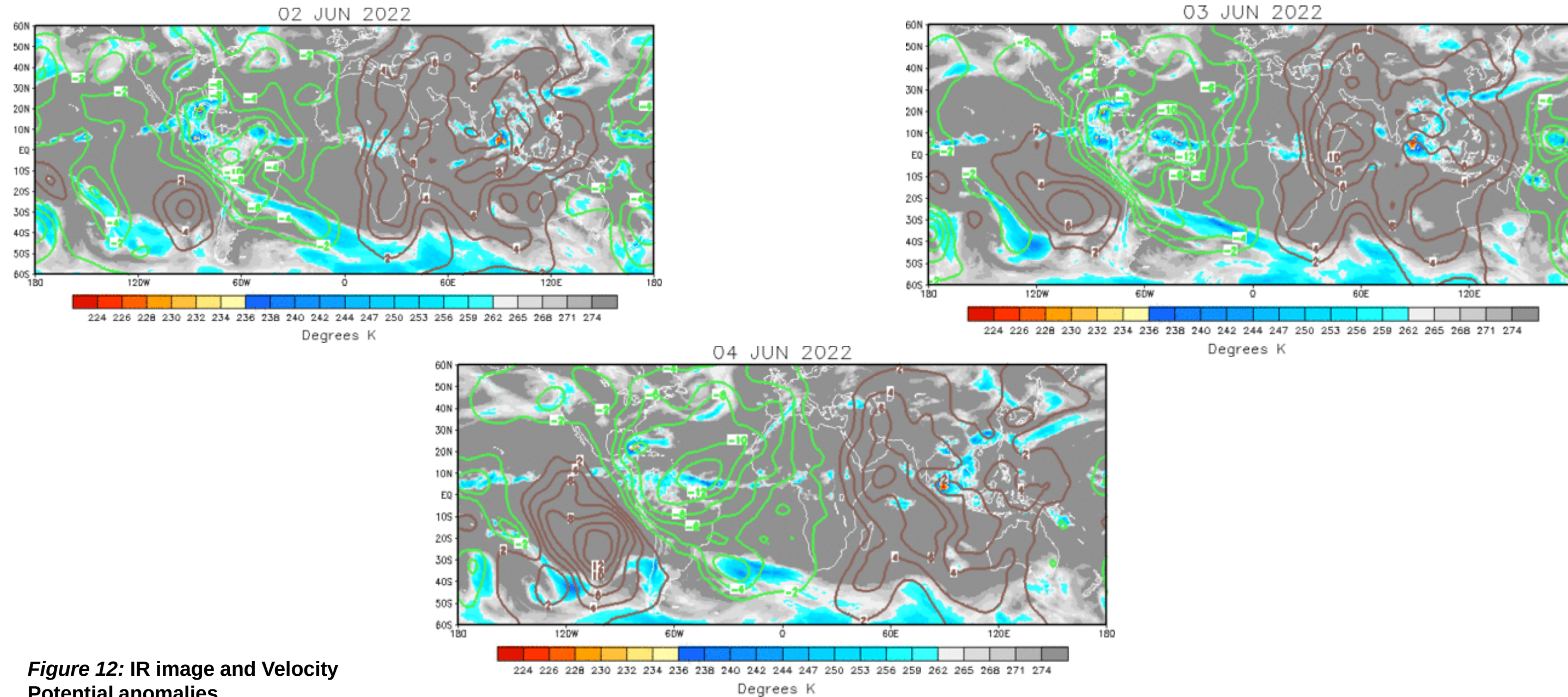


Figure 12: IR image and Velocity Potential anomalies

ECMWF Madden-Julian-Oscillation (MJO) Forecast

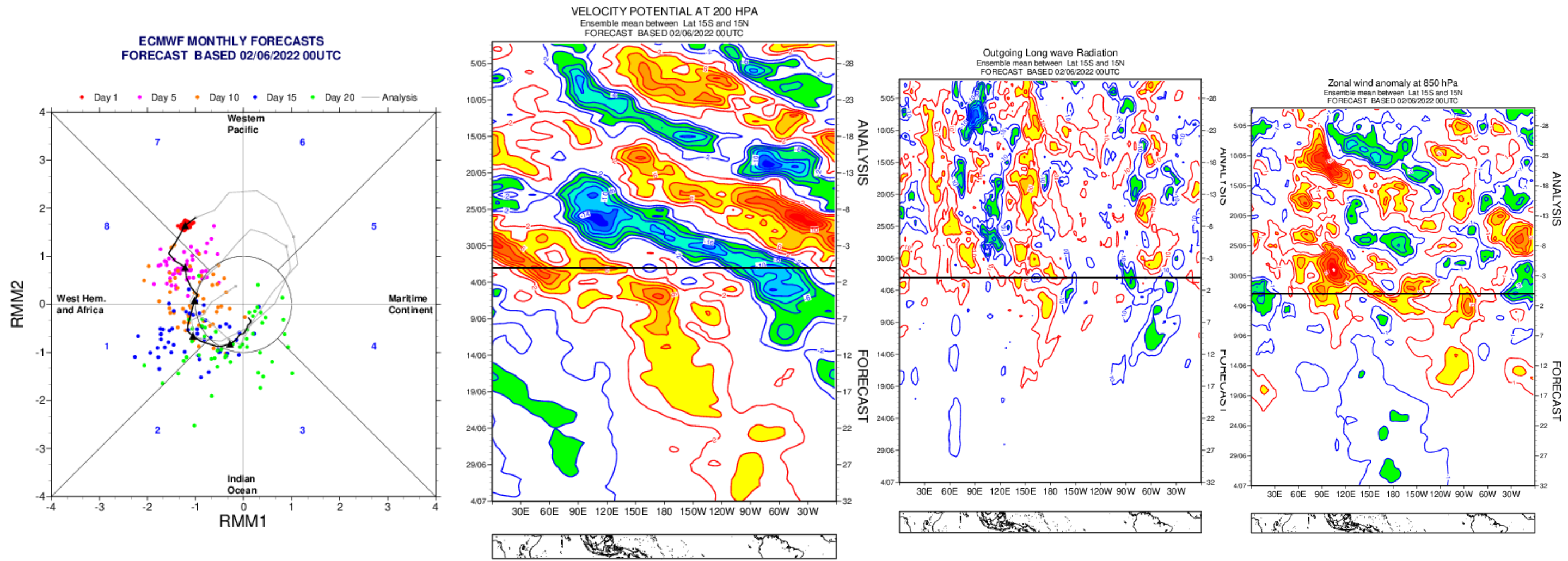


Figure 13: ECMWF MJO Forecast

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

MJO monitoring and forecasts for ECMWF, NCEP and UK Met Office from MJO working group website

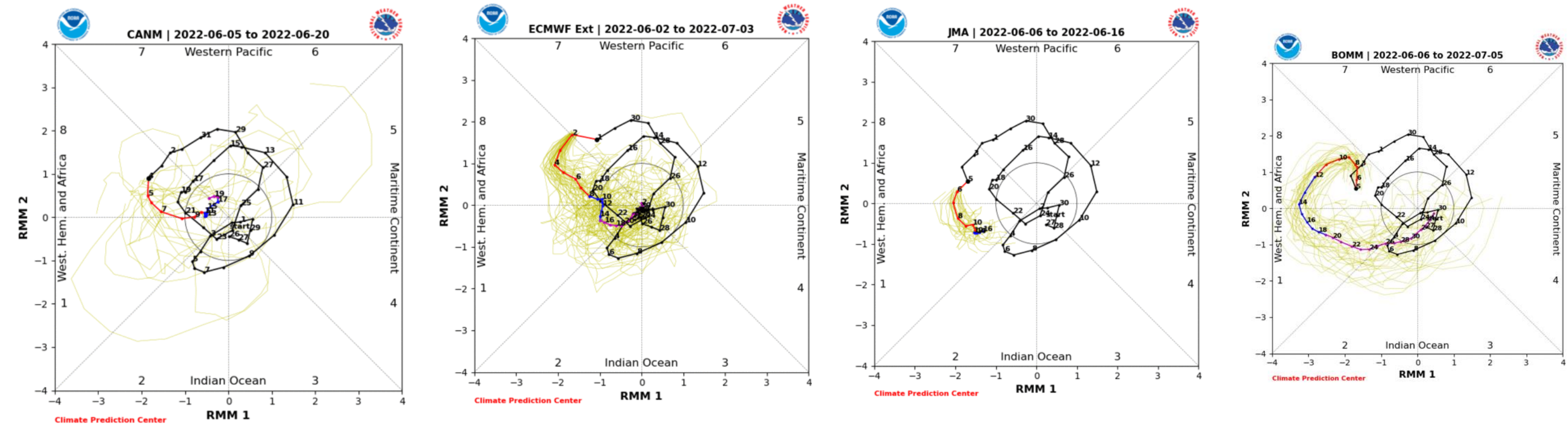


Figure 14: Forecasts for ECMWF, NCEP and UK Met Office

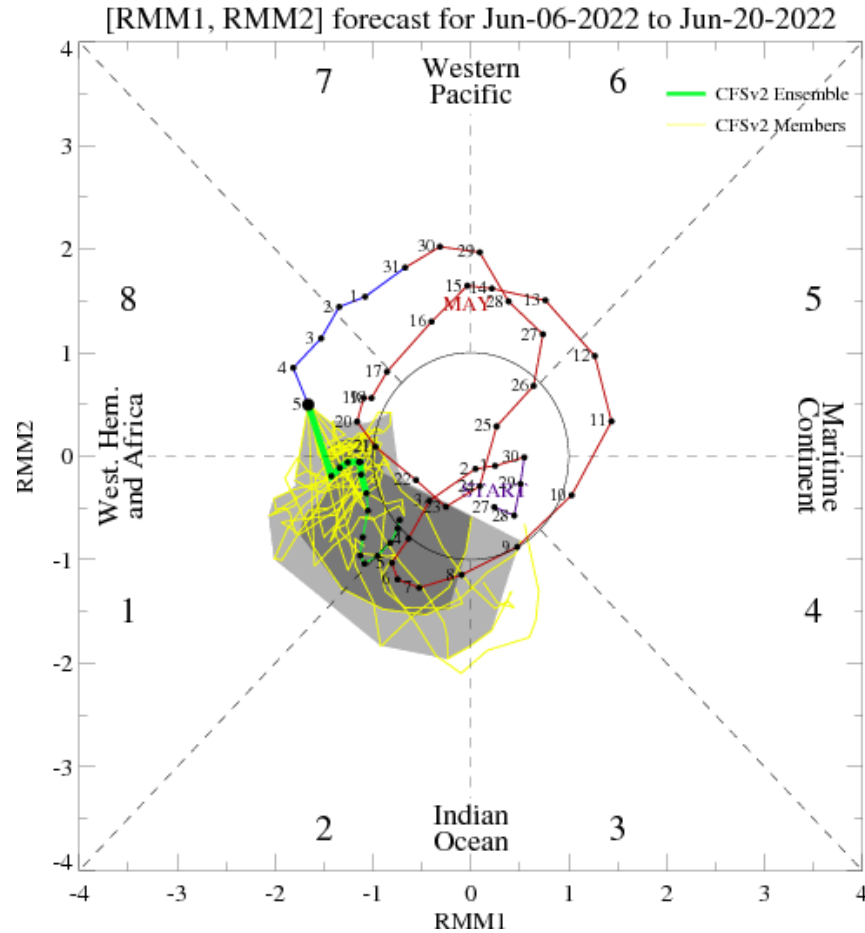
<https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/CLIVAR/emon.shtml>

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

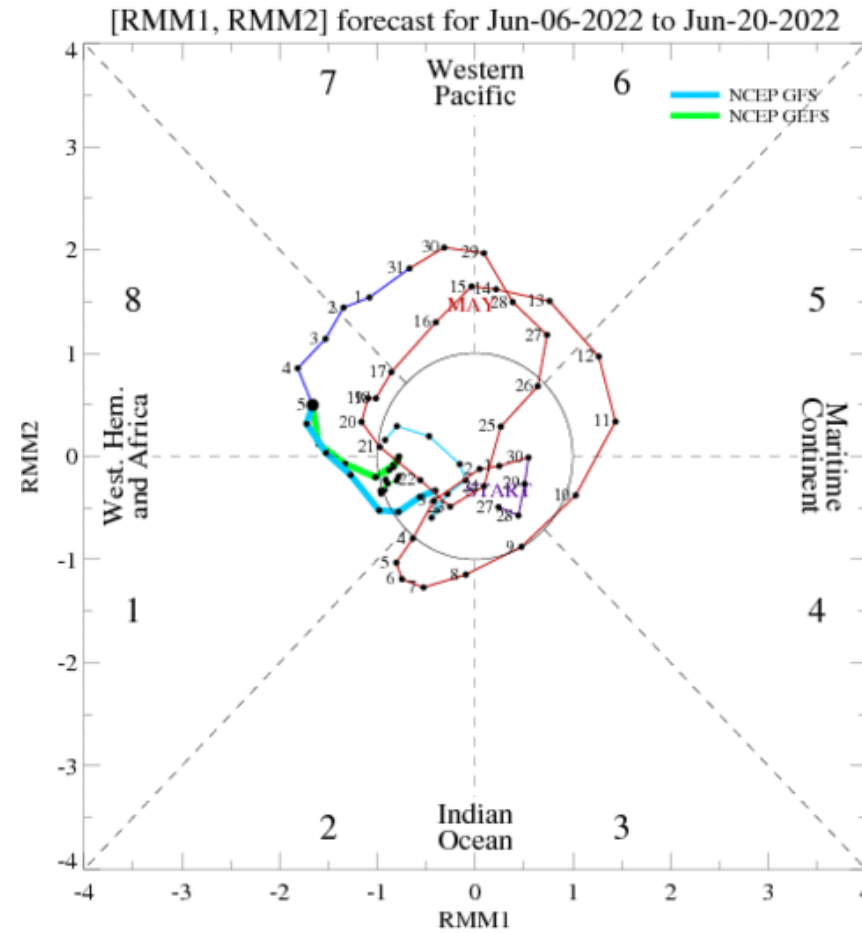
https://www.ecmwf.int/en/forecasts/charts/catalogue/mofc_multi_mjo_family_index?facets=undefined&time=2019081500,0,2019081500

MJO FORECAST

Ensemble GFS Phase Diagram



Operational GFS Phase Diagram



Statistical GFS Phase Diagram

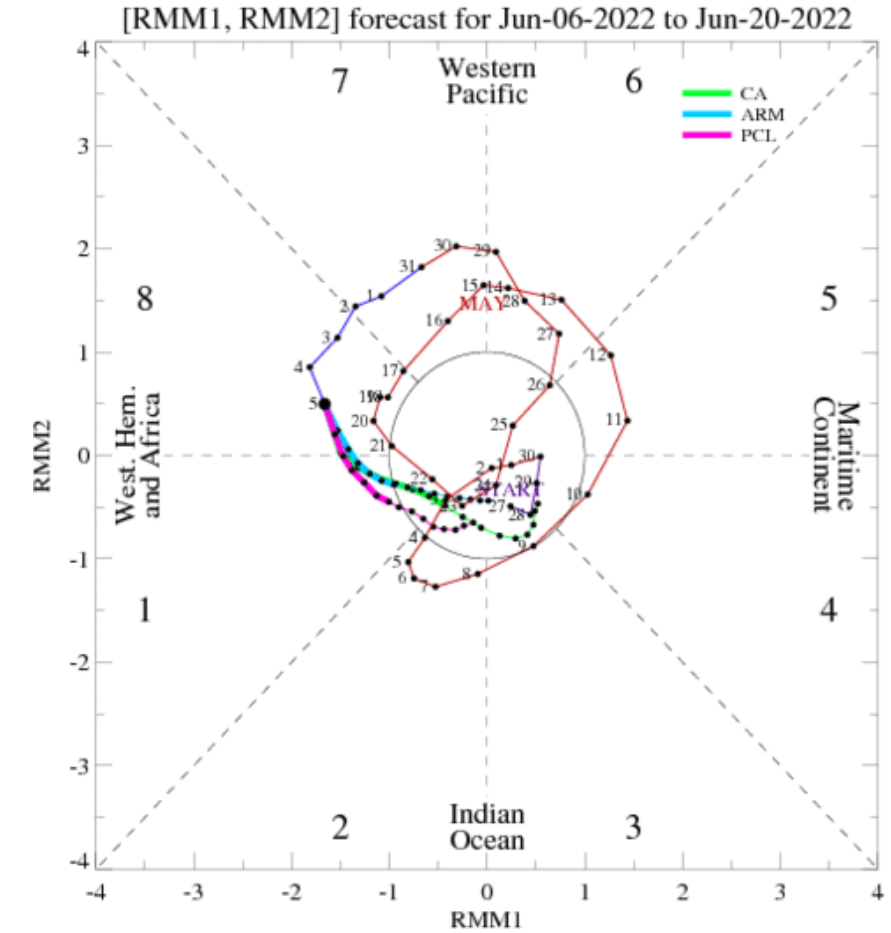
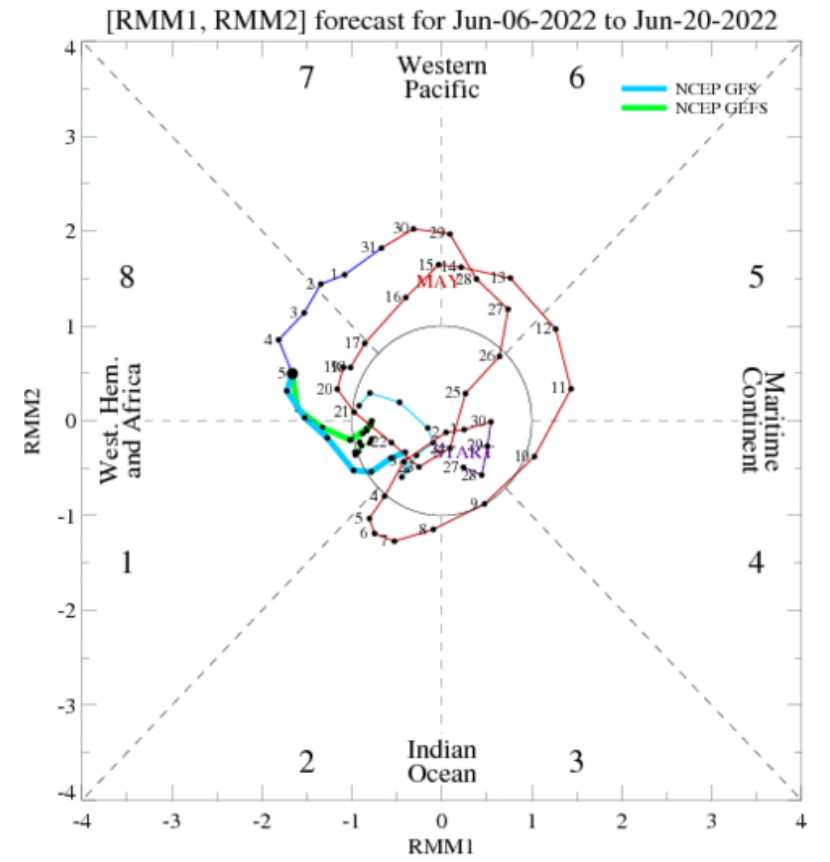


Figure 15: MJO forecast

<https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/foregfs.shtml>

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

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



The EWP, NCEP/GFS and CFSv2 models Predicting the MJO 40 day Forecast

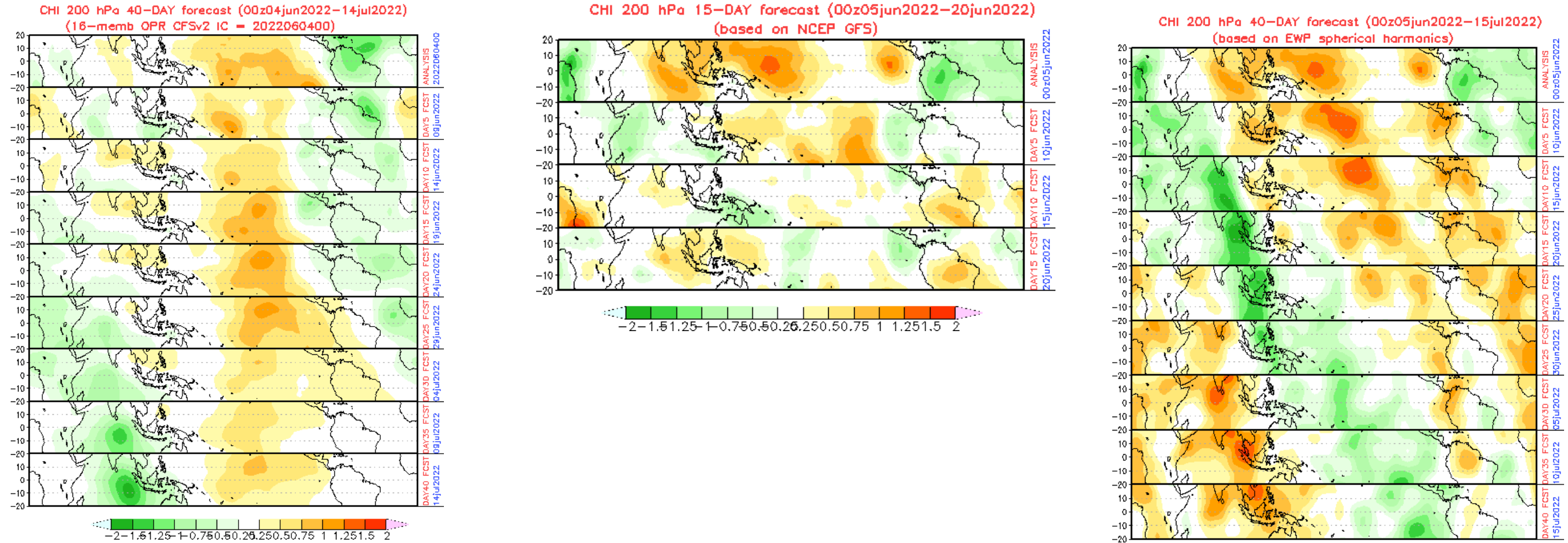


Figure 16: MJO forecast

<https://www.cpc.ncep.noaa.gov/products/people/wd52qz/mjo/chi/ewp.gif>

<https://www.cpc.ncep.noaa.gov/products/people/wd52qz/mjo/chi/gfs.gif>

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

Past 4 Weeks Precipitable Water and Outlooks for Africa and Globally

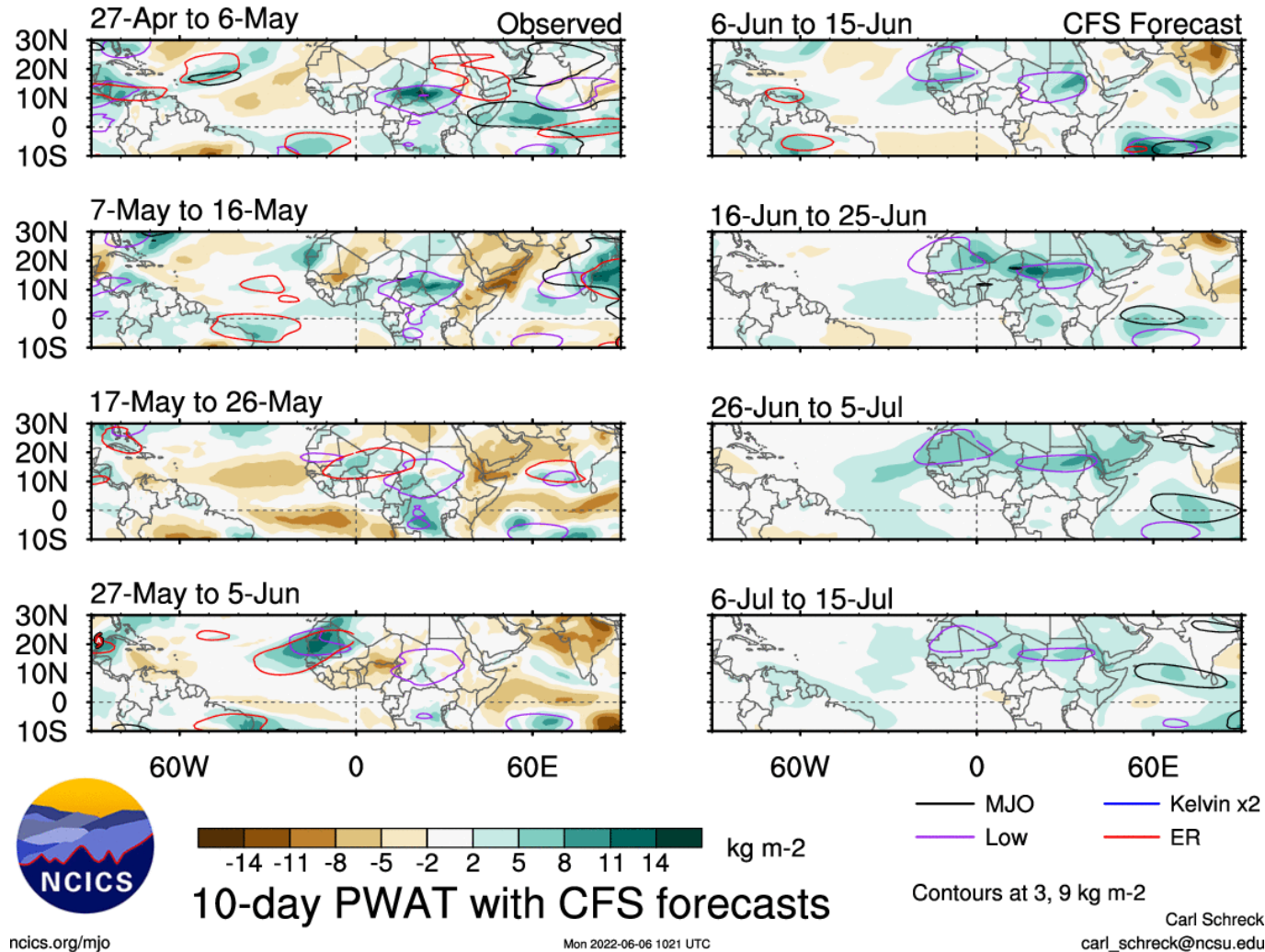


Figure 7a: Africa

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

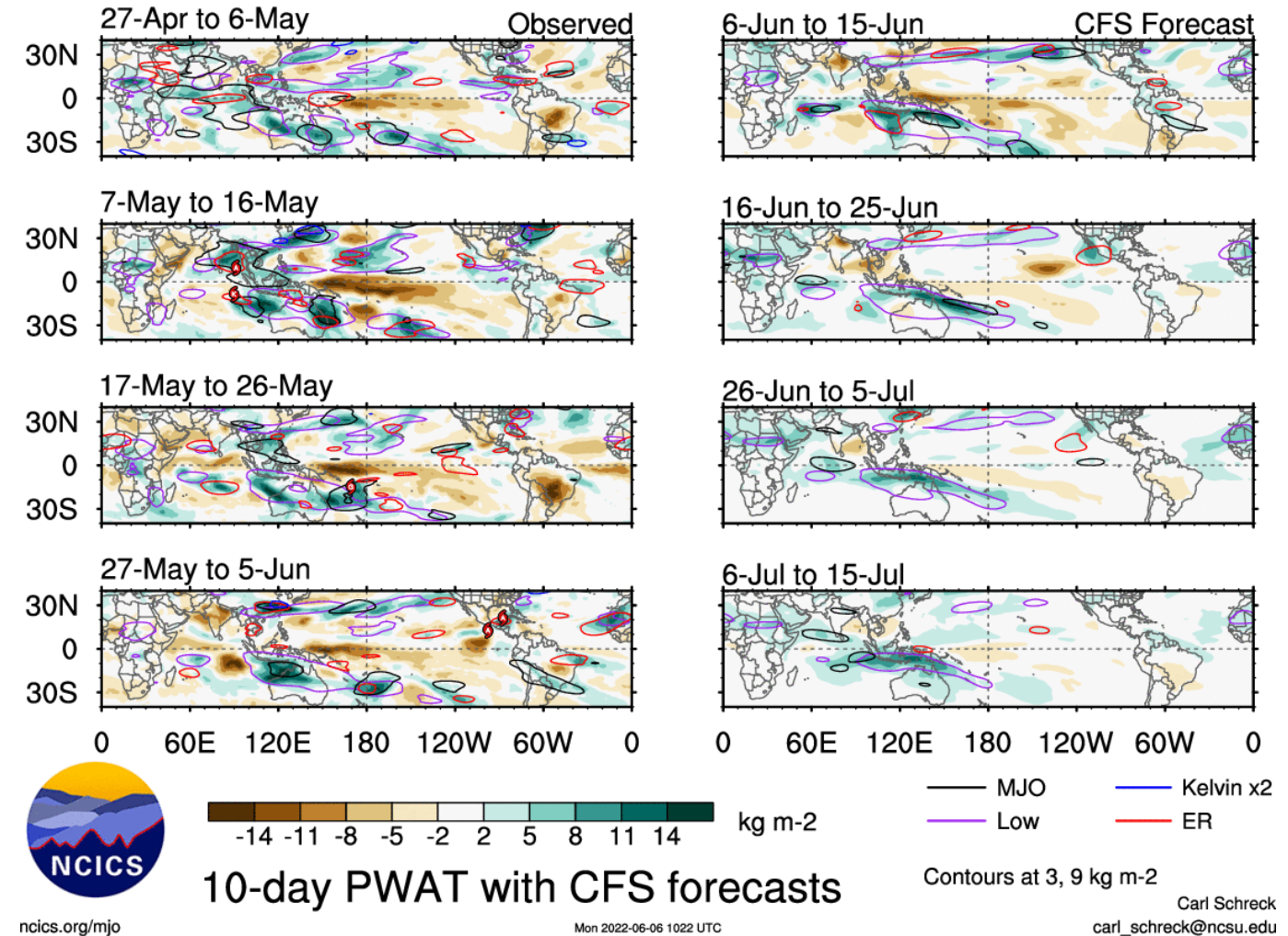


Figure 7b: Global

Figure 17: Past four week Precipitable Water and Outlooks

<https://ncics.org/pub/mjo/v2/map/pwat.cfs.all.Africa.10.png>

<https://ncics.org/pub/mjo/v2/map/pwat.cfs.all.global.10.png>

Past Four Weeks Velocity Potential with MJO, Kelvin and Rossby Wave overlaid on Global Maps at 850mb and 200mb

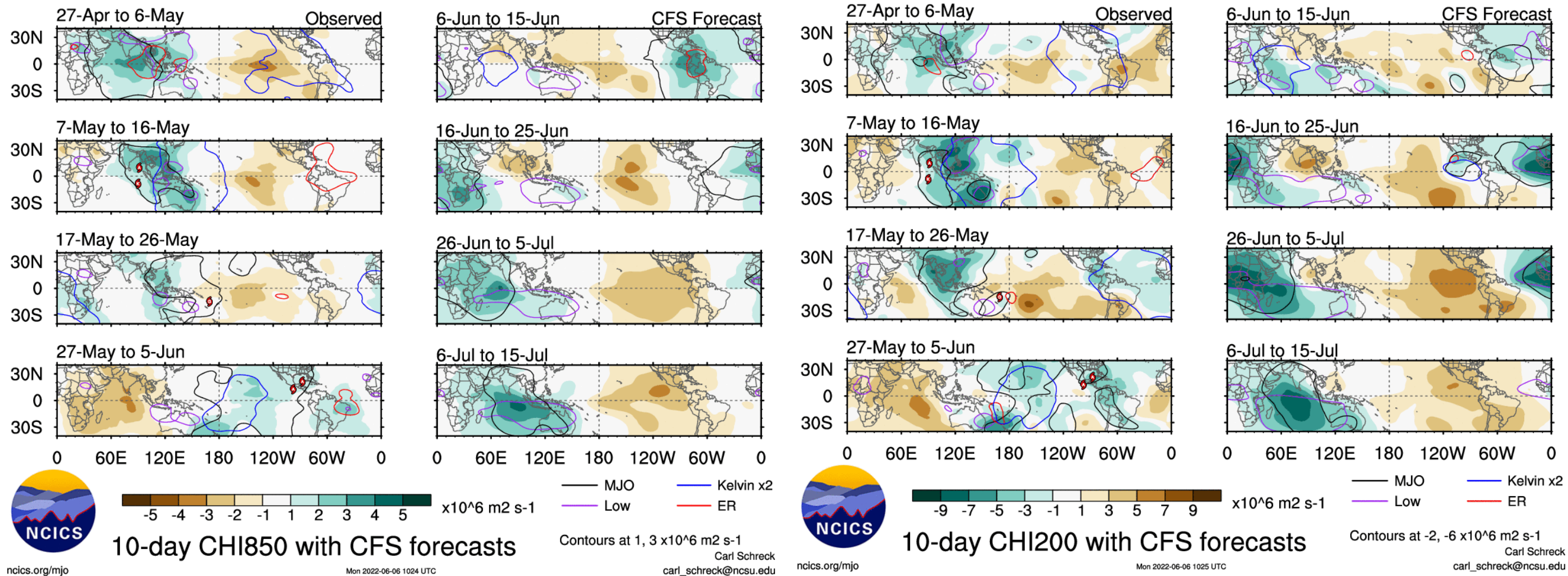


Figure 18a and b: Past four week and month velocity potential

<https://ncics.org/pub/mjo/v2/map/chi850.cfs.all.global.10.png>

<https://ncics.org/pub/mjo/v2/map/chi200.cfs.all.global.10.png>

Past Four Weeks Velocity Potential with MJO, Kelvin and Rossby Wave overlaid on Africa

Maps at 850mb and 200mb

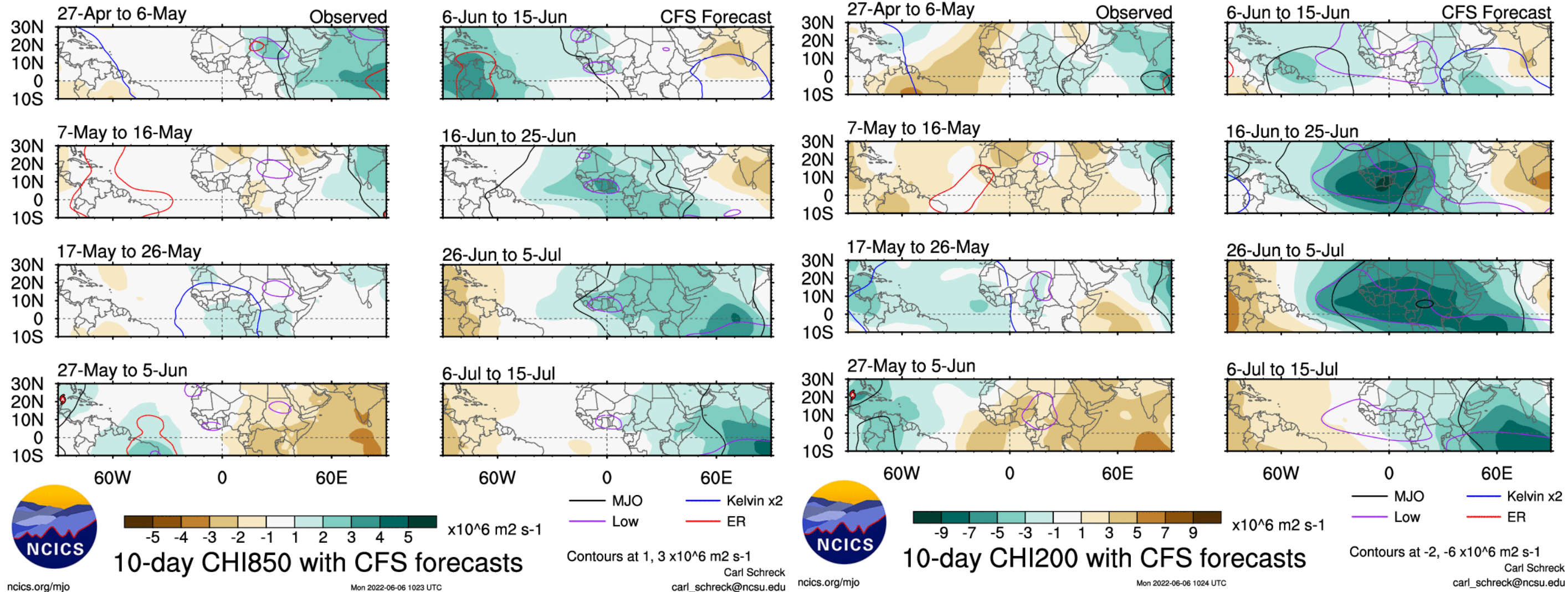


Figure 19a and b: Past four week and month velocity potential

<https://ncics.org/pub/mjo/v2/map/chi850.cfs.all.africa.10.png>

<https://ncics.org/pub/mjo/v2/map/chi200.cfs.all.africa.10.png>

Hovmoller diagram of Velocity Potential, Anomalies for 15N-15S with Waves overlay including Outlook

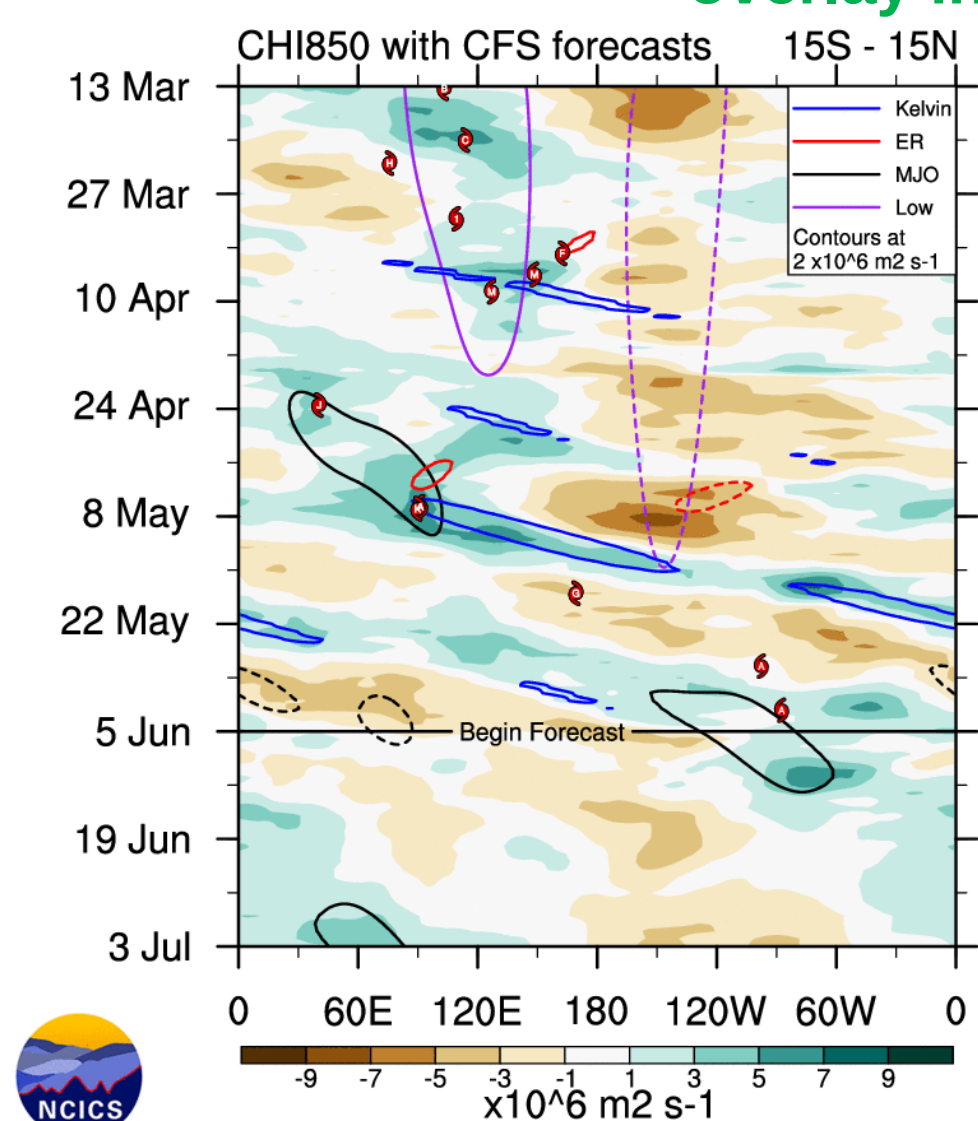
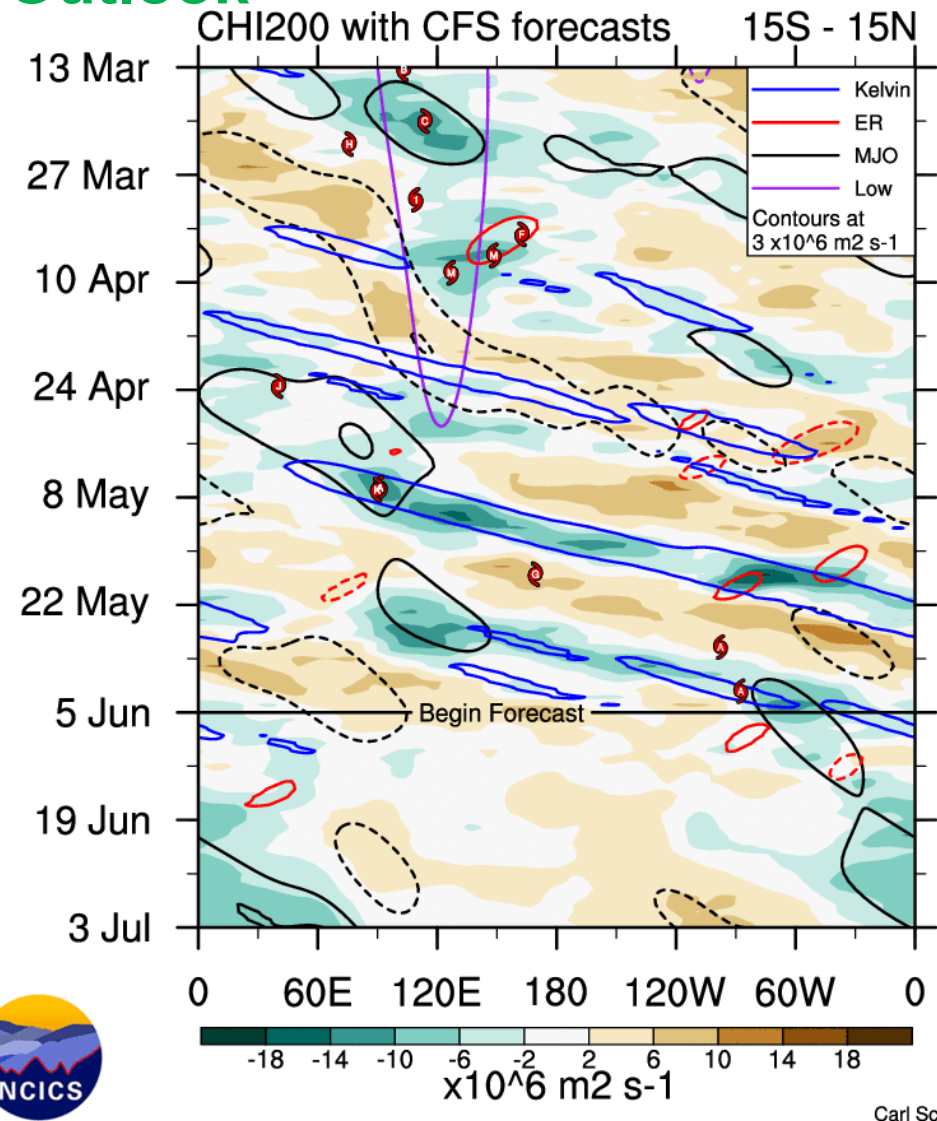
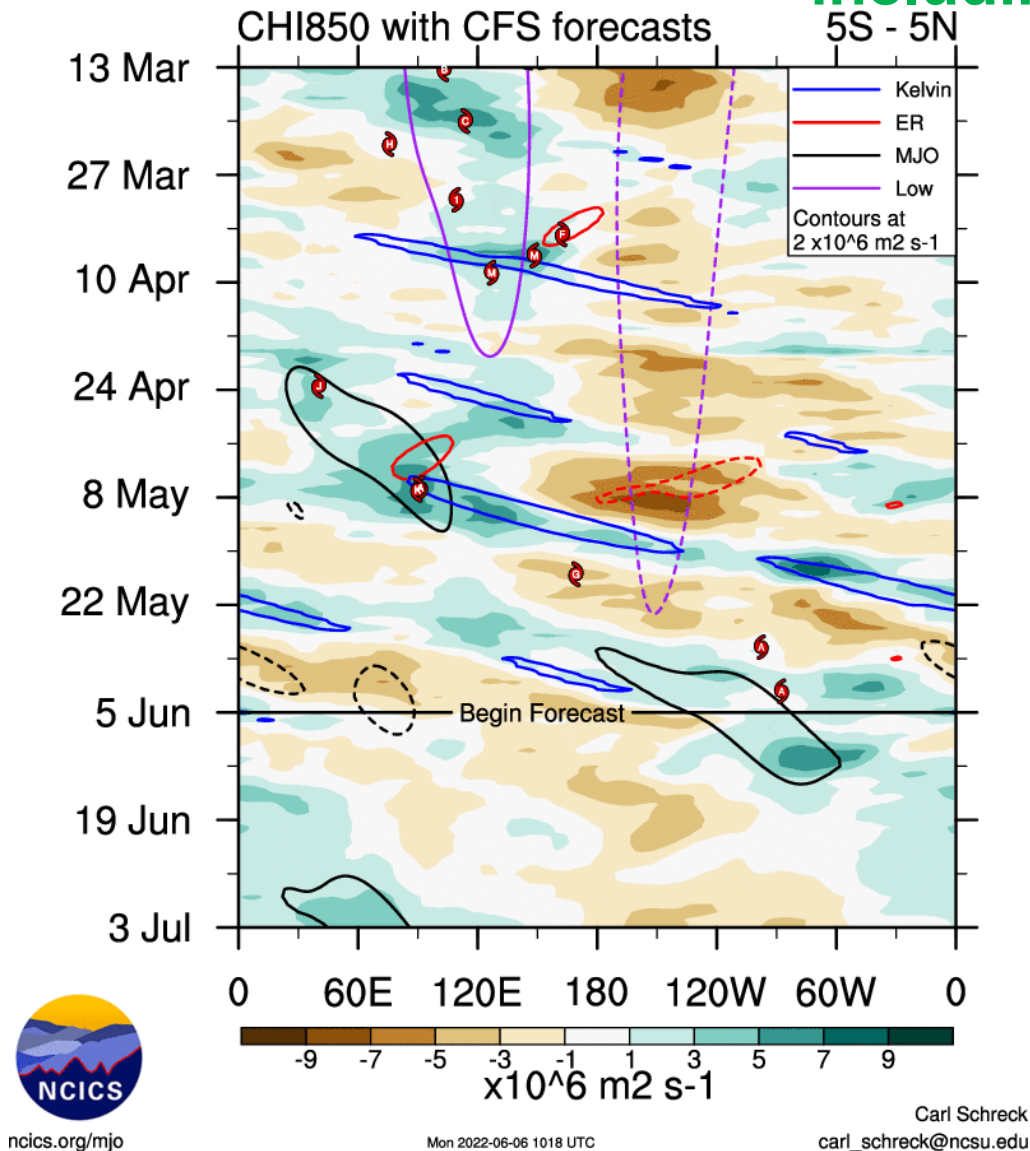
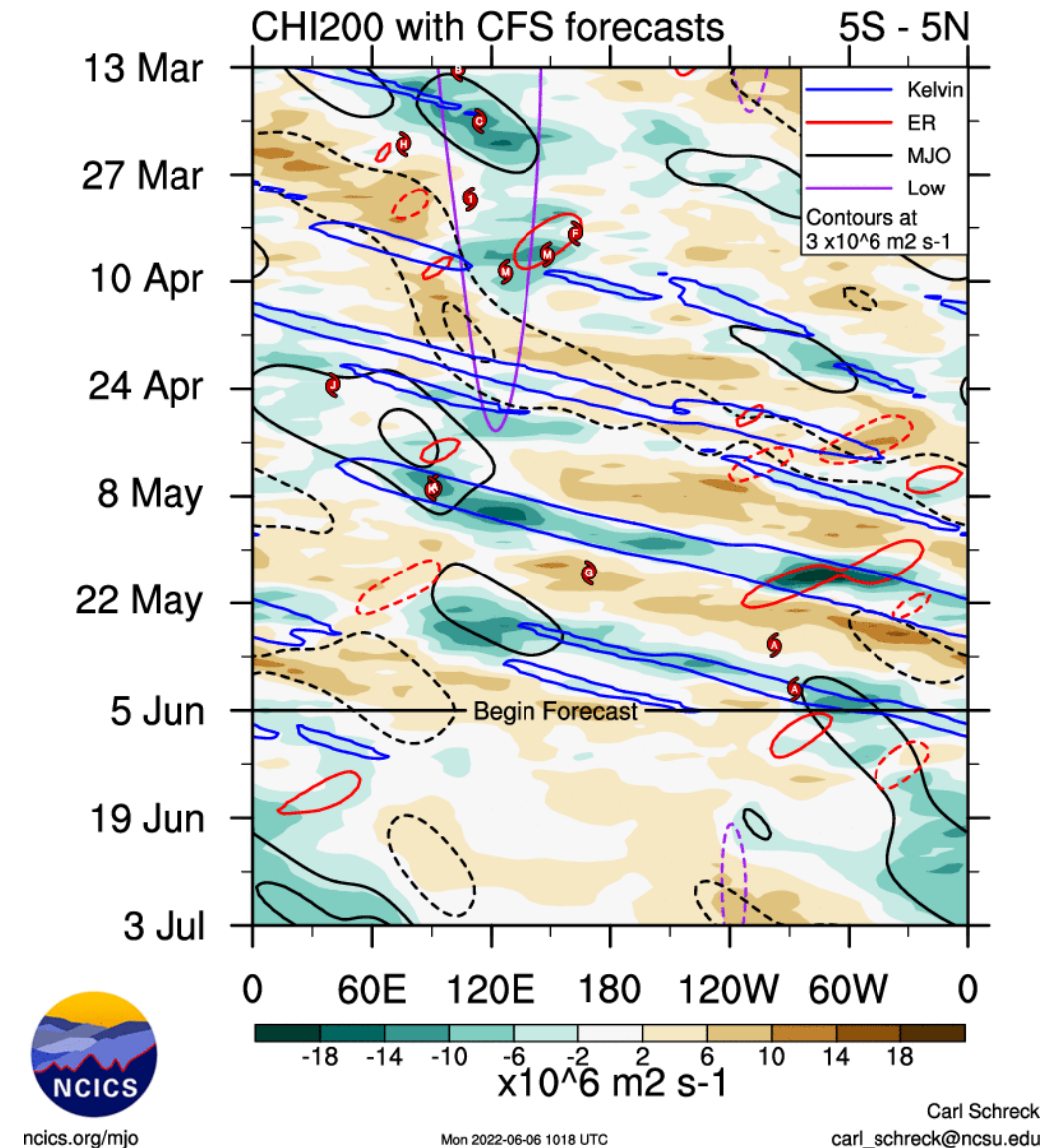


Figure 20: Anomalies for 15n-15s with waves overlay including outlooks

<https://ncics.org/pub/mjo/v2/hov/chi850.cfs.wide.png>

<https://ncics.org/pub/mjo/v2/hov/chi200.cfs.wide.png>

Hovmoller diagram of Velocity Potential, anomalies for 5n-5s with waves overlay including outlooks

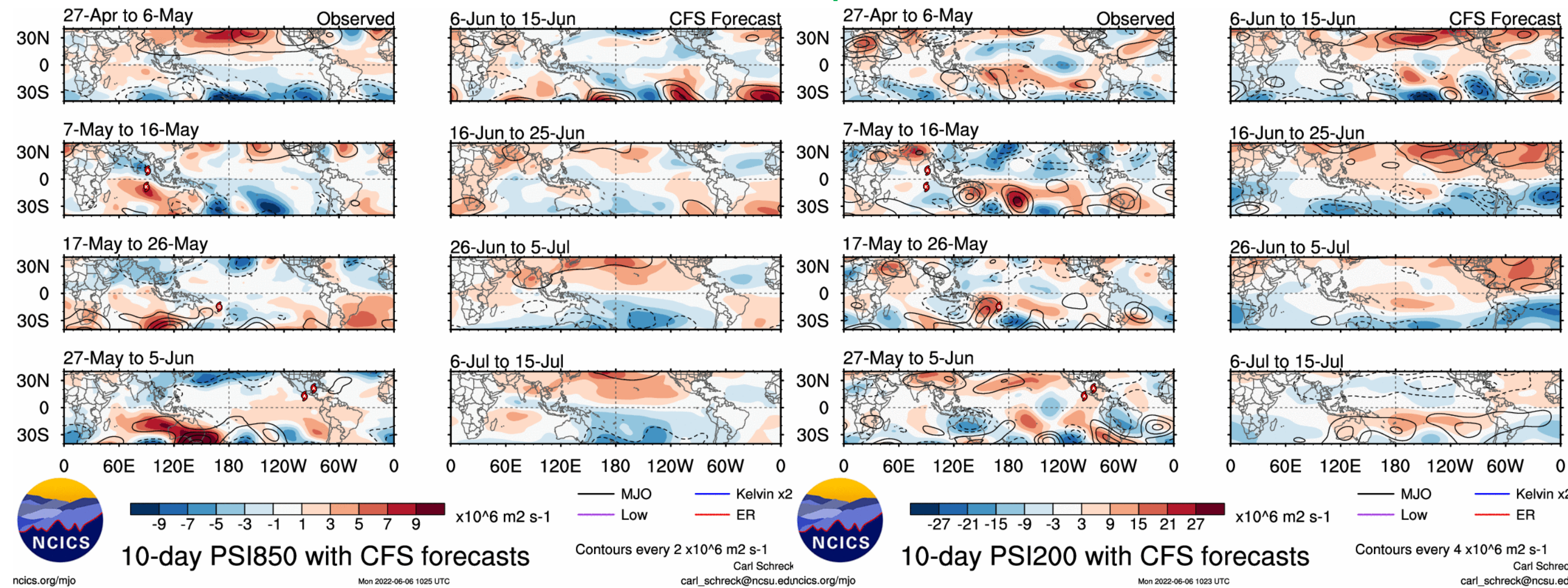


<https://ncics.org/pub/mjo/v2/hov/chi850.cfs.eqtr.png>

<https://ncics.org/pub/mjo/v2/hov/chi200.cfs.eqtr.png>

Figure 21: Anomalies for 5N-5S with waves overlay including outlooks

Past 4 Weeks Stream Function Anomalies with MJO, Kelvin and Rossby wave overlaid on Global Maps 850hpa and 200hpa



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

<https://ncics.org/pub/mjo/v2/map/psi200.cfs.mjo.global.10.png>

Figure 22: Past 4 weeks stream function anomalies with MJO, Kelvin & Rossby wave on Global Maps

Past 4 weeks Stream Function Anomalies with MJO, Kelvin and Rossby wave overlaid on Africa Maps 850hpa and 200hpa

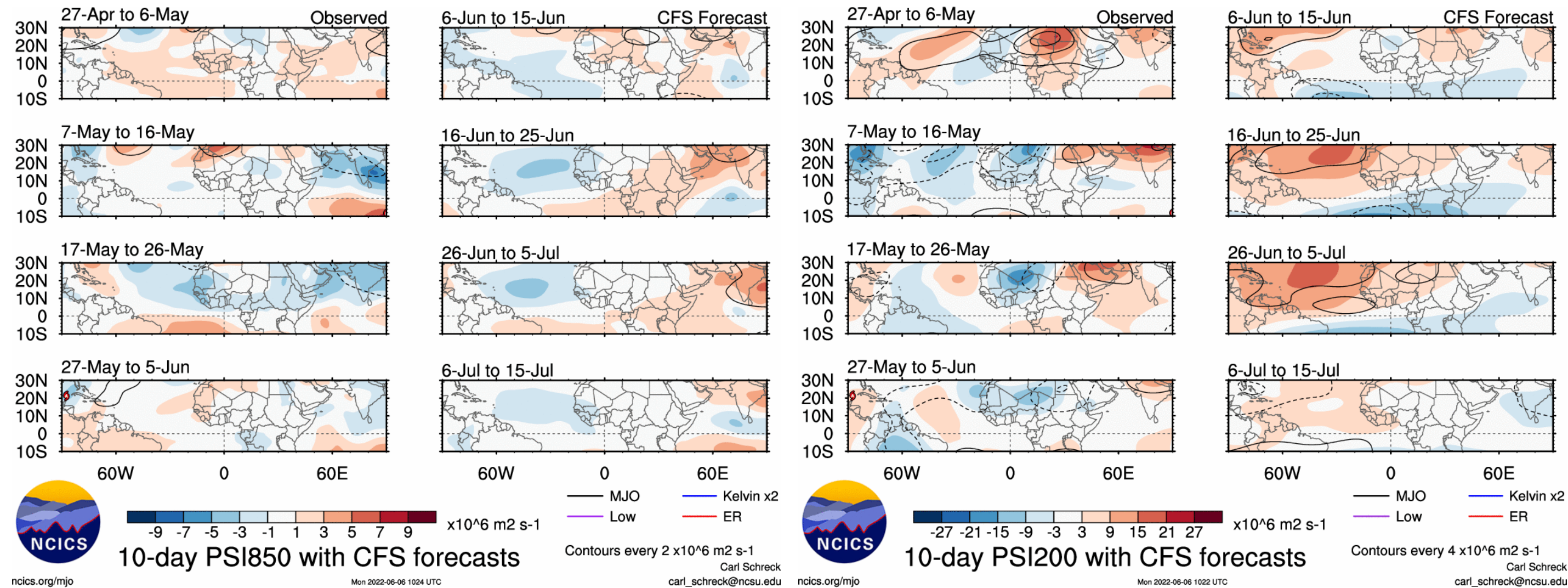


Figure 23: Past 4 weeks stream function anomalies with MJO, Kelvin & Rossby wave on Africa maps

<https://ncics.org/pub/mjo/v2/map/psi850.cfs.mjo.africa.10.png>

<https://ncics.org/pub/mjo/v2/map/psi200.cfs.mjo.africa.10.png>

1. Monitoring Climate Element
2. Global Driver Review and Assessment
3. Model Guidance for Weekly Climate outlook

Wind Anomaly and Divergence Forecast from GFS week1

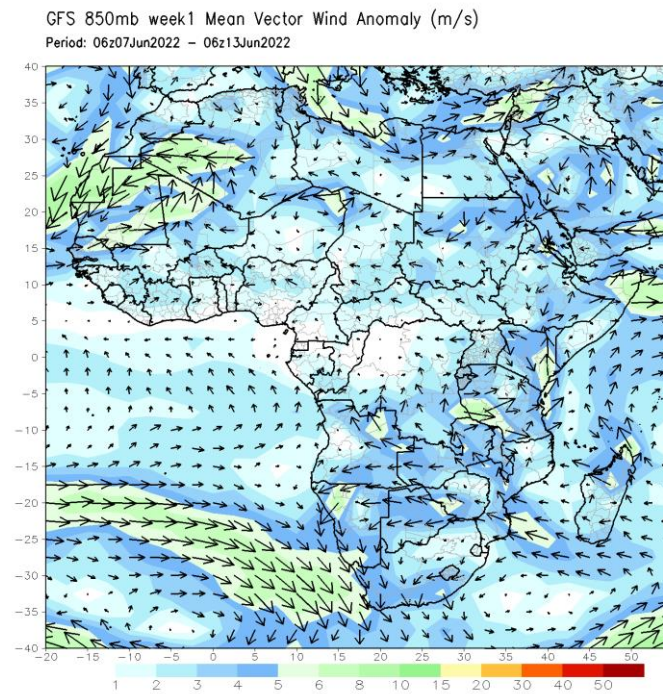
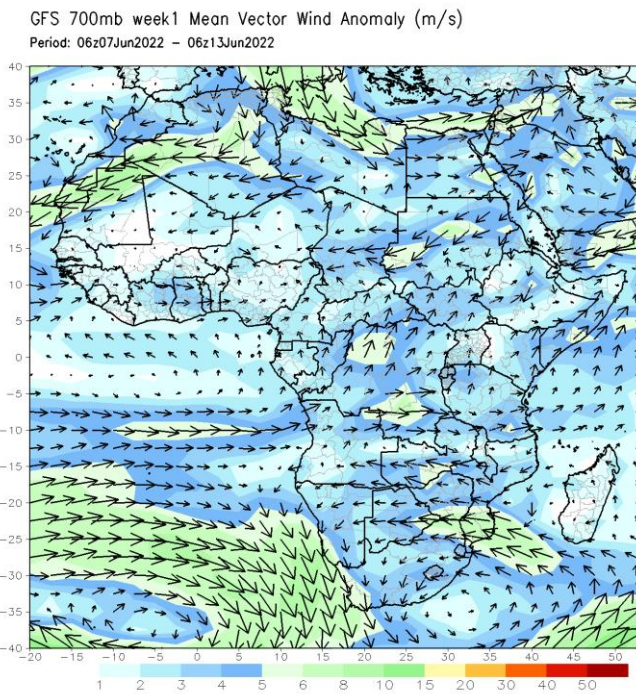
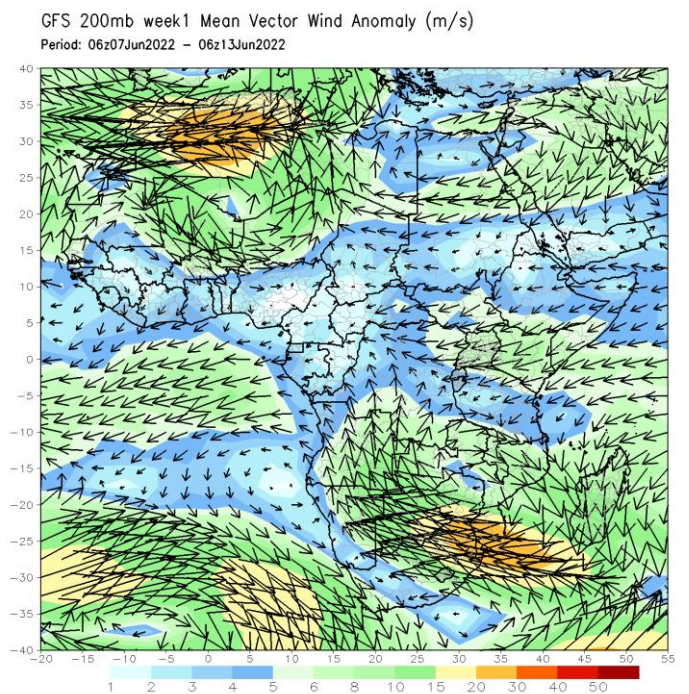
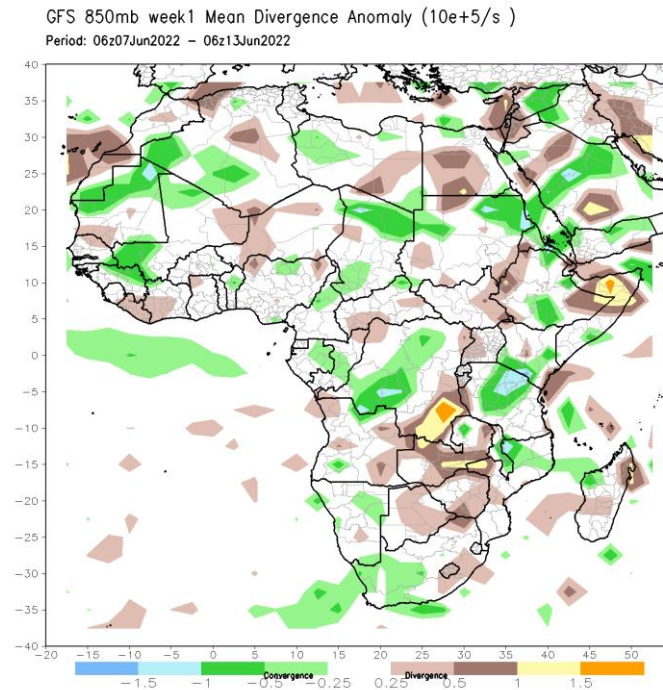
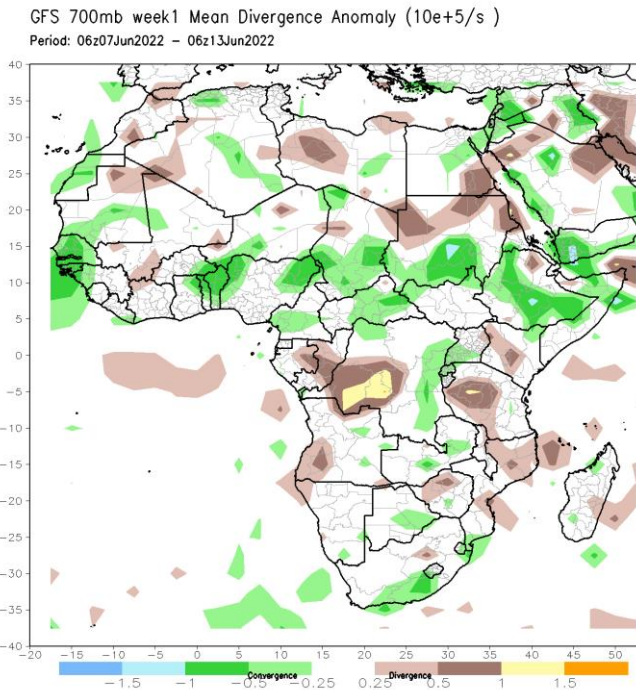
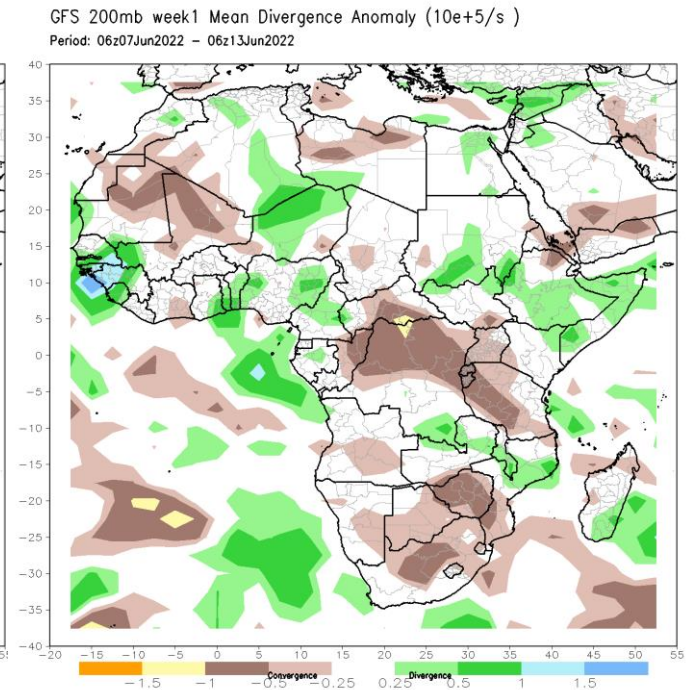


Figure 24 : Forecast from GFS

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

African Precipitation NCEP/GFS Bias-Corrected Precipitation and Anomaly Forecasts for week 1

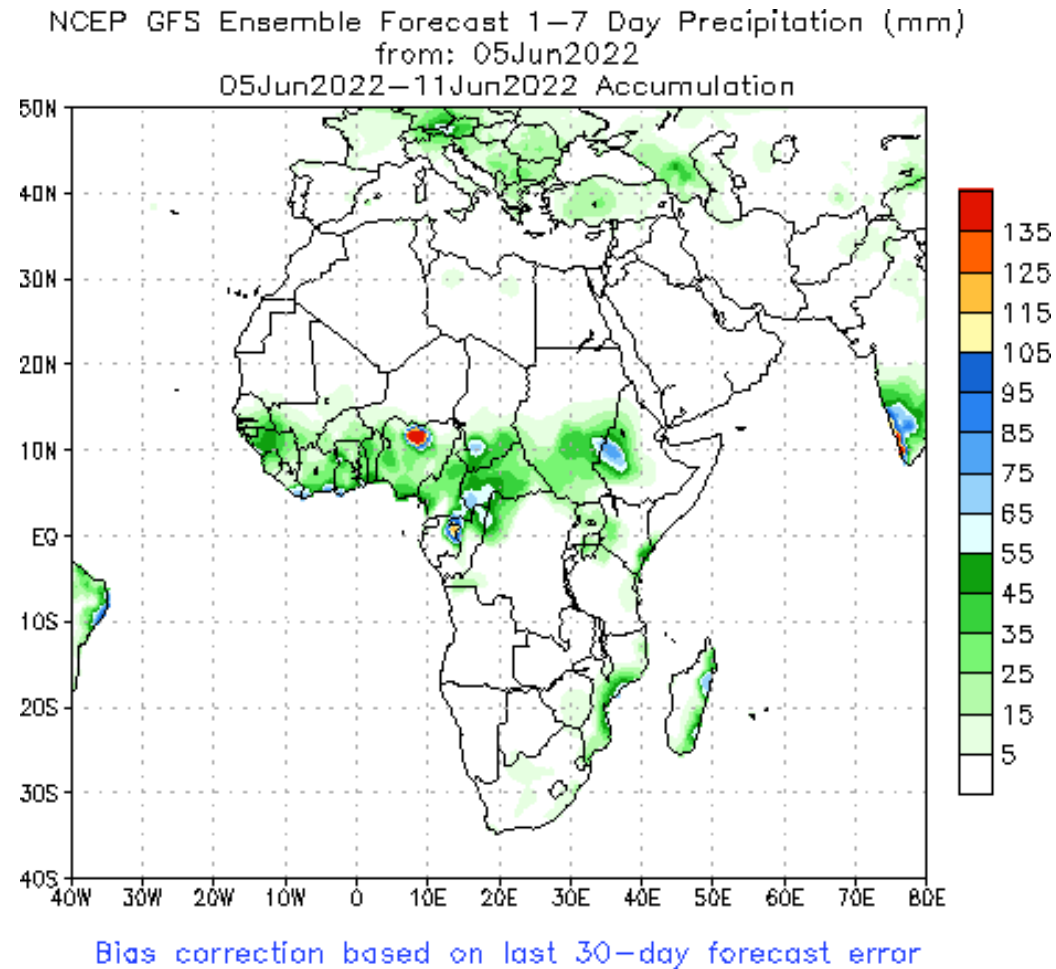
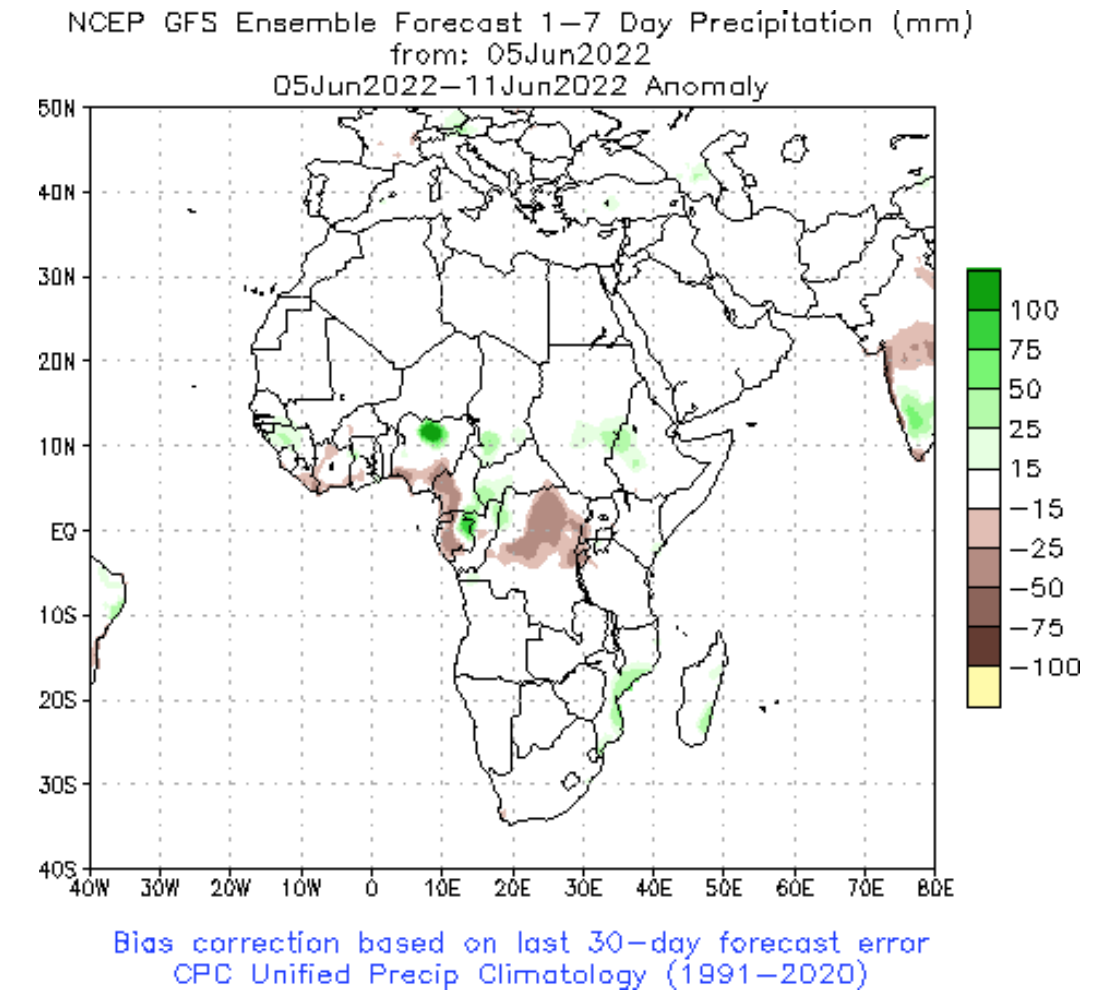


Figure 26: NCEP/GFS Précipitation and Anomaly forecast.

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

Precip $\geq$ 25mm

Precip $\geq$ 50mm

Precip $\geq$ 75mm

Precip $\geq$ 100mm

Week-1 Precipitation
Probability of Exceedance:
Forecast and Climo

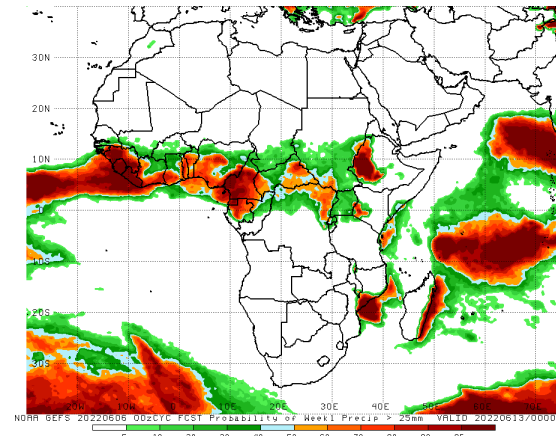
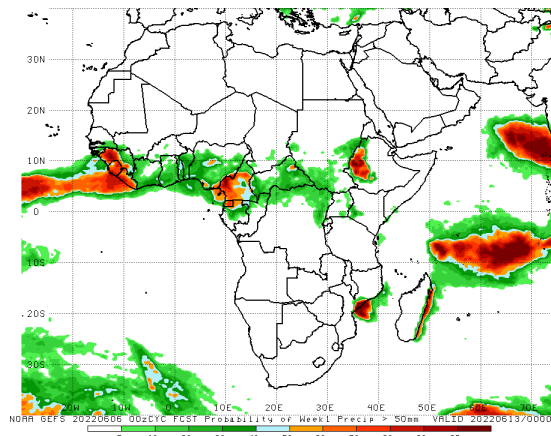
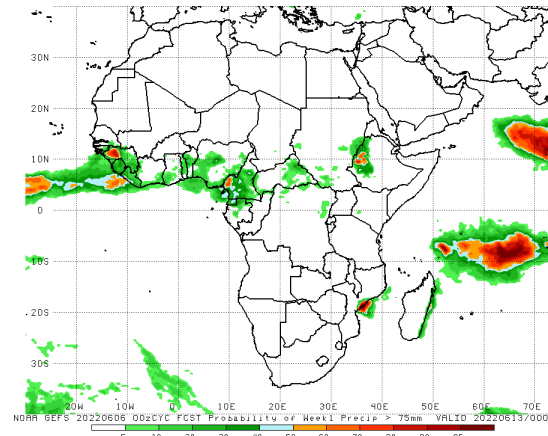
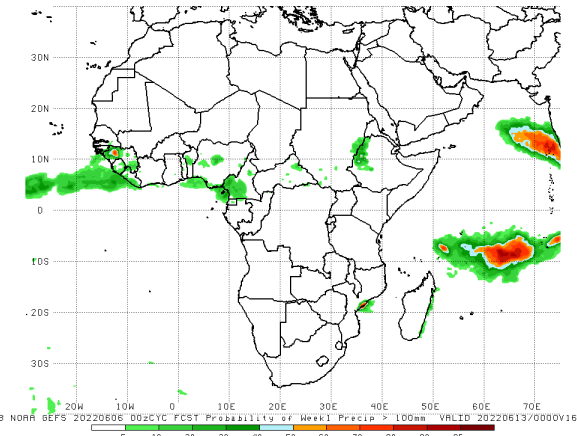
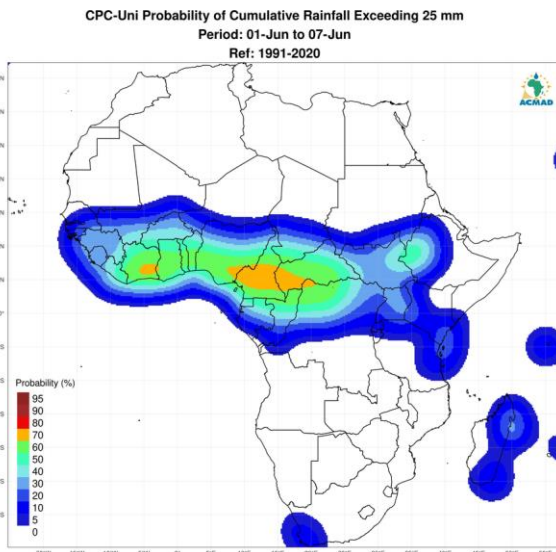
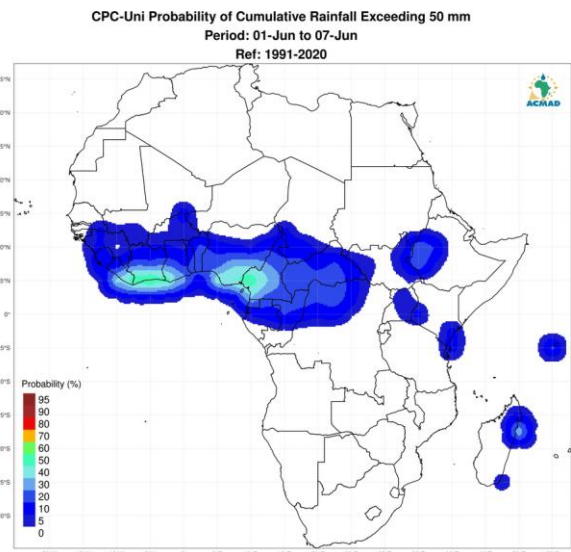
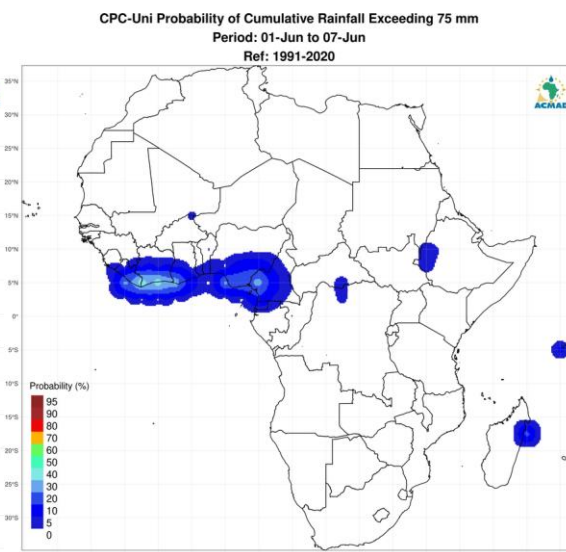
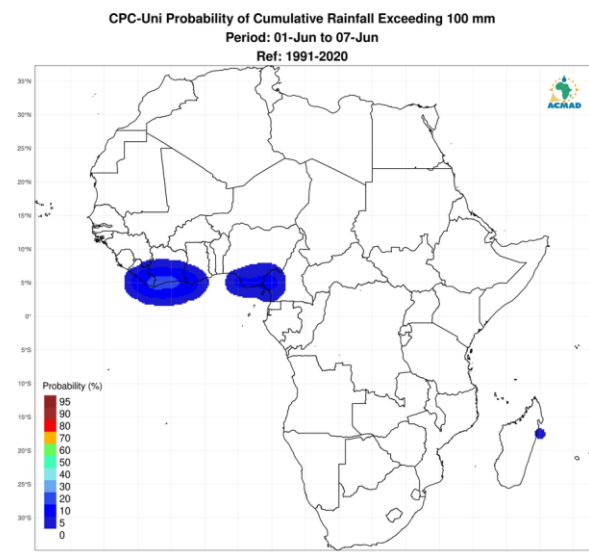


Figure 27: Week1 Precipitation Total Exceedance Probabilities

https://www.cpc.ncep.noaa.gov/products/international/cpci/data/00/gefs_wk1_precip25mm_prob_africa.html

https://www.cpc.ncep.noaa.gov/products/international/cpci/data/00/gefs_wk1_precip50mm_prob_africa.html

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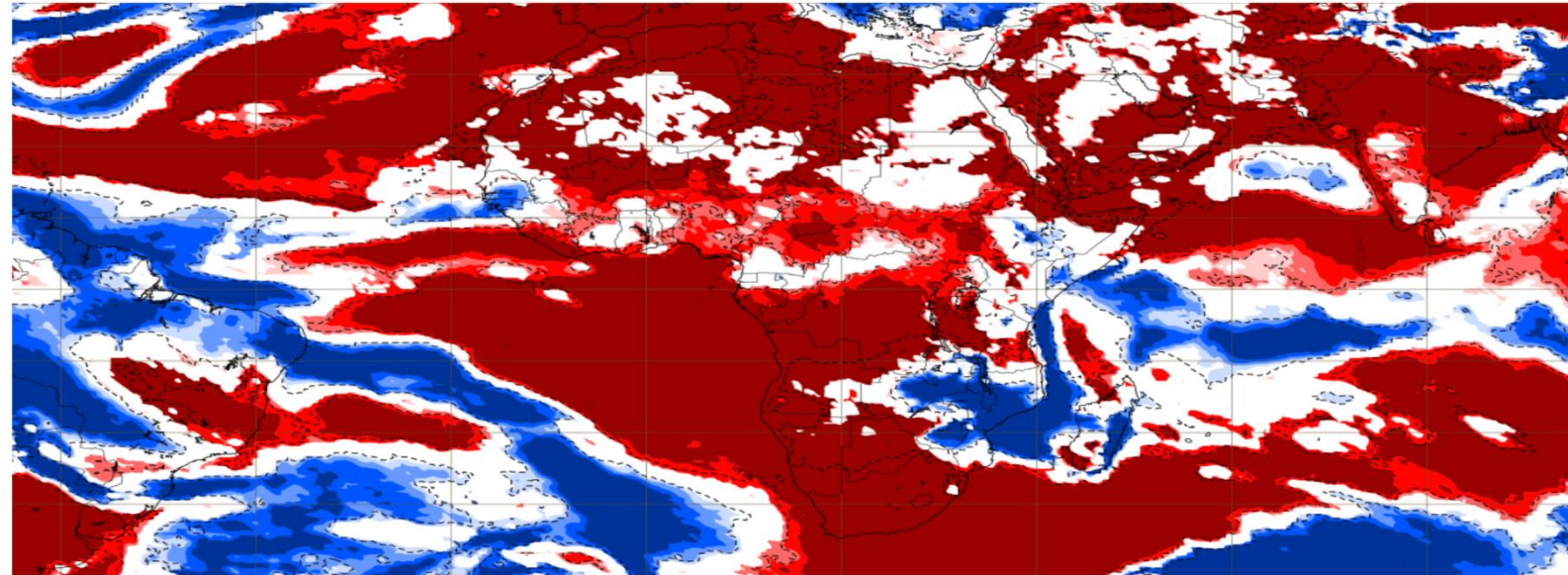
https://www.cpc.ncep.noaa.gov/products/international/cpci/data/00/gefs_wk1_precip100mm_prob_africa.html

http://154.66.220.45:8080/thredds/catalog/ACMAD/CDD/climatemonitoringservice/Probability_of_Exceedance/Weekly/Current/catalog.html

Precipitation Anomaly Forecasts from ECMWF for week 1

Precipitation: Probability of weekly anomaly > 0

Base time: Mon 06 Jun 2022 Valid time: Mon 06 Jun 2022 - Mon 13 Jun 2022 (+168h) Area : Africa



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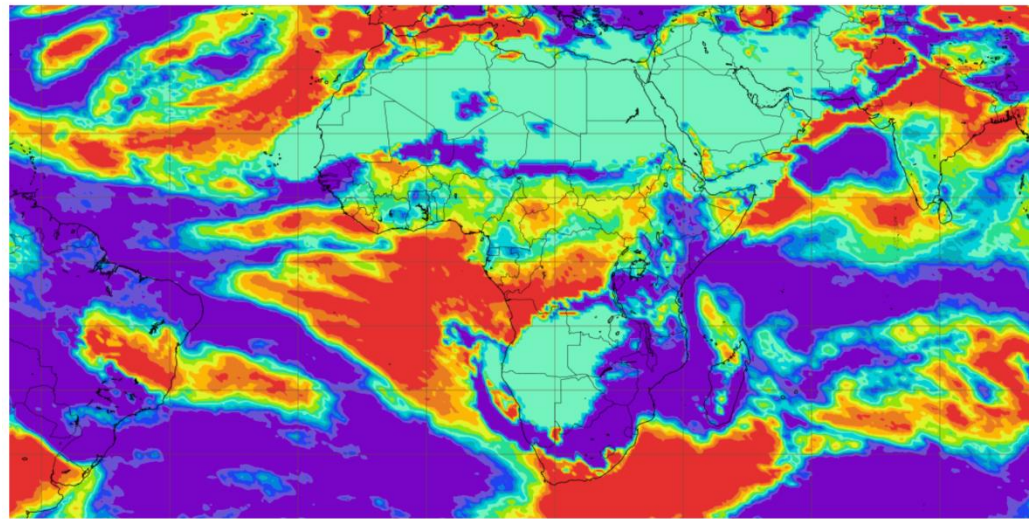


https://www.ecmwf.int/en/forecasts/charts/catalogue/mofc_multi_anomaly?facets=undefined&time=2019081500,408,2019090100&parameter=precipitation&area=Global

Probability Precipitation Forecasts from ECMWF for week 1 : weekly tercile lower and upper

Precipitation: Probability distribution

Base time: Mon 06 Jun 2022 Valid time: Mon 06 Jun 2022 - Mon 13 Jun 2022 (+168h) Distribution group : Lower Tercile
Area : Africa



Extended range: precipitation probability dist. at quantile: Lower tercile (%)

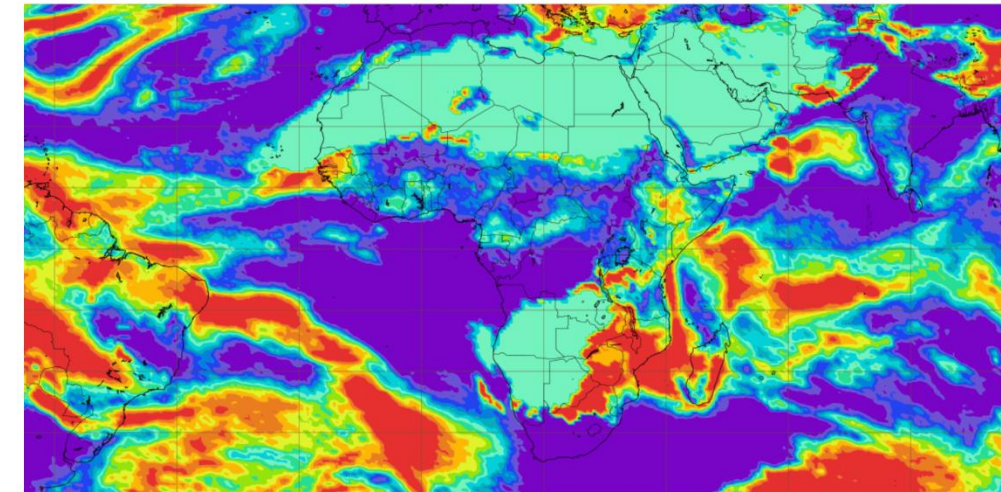
Quantile (%)	0	5	10	15	20	25	33	40	50	60	70	80	90	95	100
Color	Purple	Dark Blue	Blue	Light Blue	Cyan	Green	Yellow-Green	Yellow	Orange	Red-Orange	Red	Dark Red	Brown	Dark Brown	Black

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Precipitation: Probability distribution

Base time: Mon 06 Jun 2022 Valid time: Mon 06 Jun 2022 - Mon 13 Jun 2022 (+168h) Distribution group : Upper tercile
Area : Africa



Extended range: precipitation probability dist. at quantile: Upper tercile (%)

Quantile (%)	0	5	10	15	20	25	33	40	50	60	70	80	90	95	100
Color	Purple	Dark Blue	Blue	Light Blue	Cyan	Green	Yellow-Green	Yellow	Orange	Red-Orange	Red	Dark Red	Brown	Dark Brown	Black

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Figure 29: Weekly tercile probability forecast below 33%

https://www.ecmwf.int/en/forecasts/charts/catalogue/mofc_multi_tercile?facets=undefined&time=2021110100,312,2021111400&parameter=precipitation&tercile=1&area=Africa

Wind Anomaly and Divergence Forecast from GFS week2

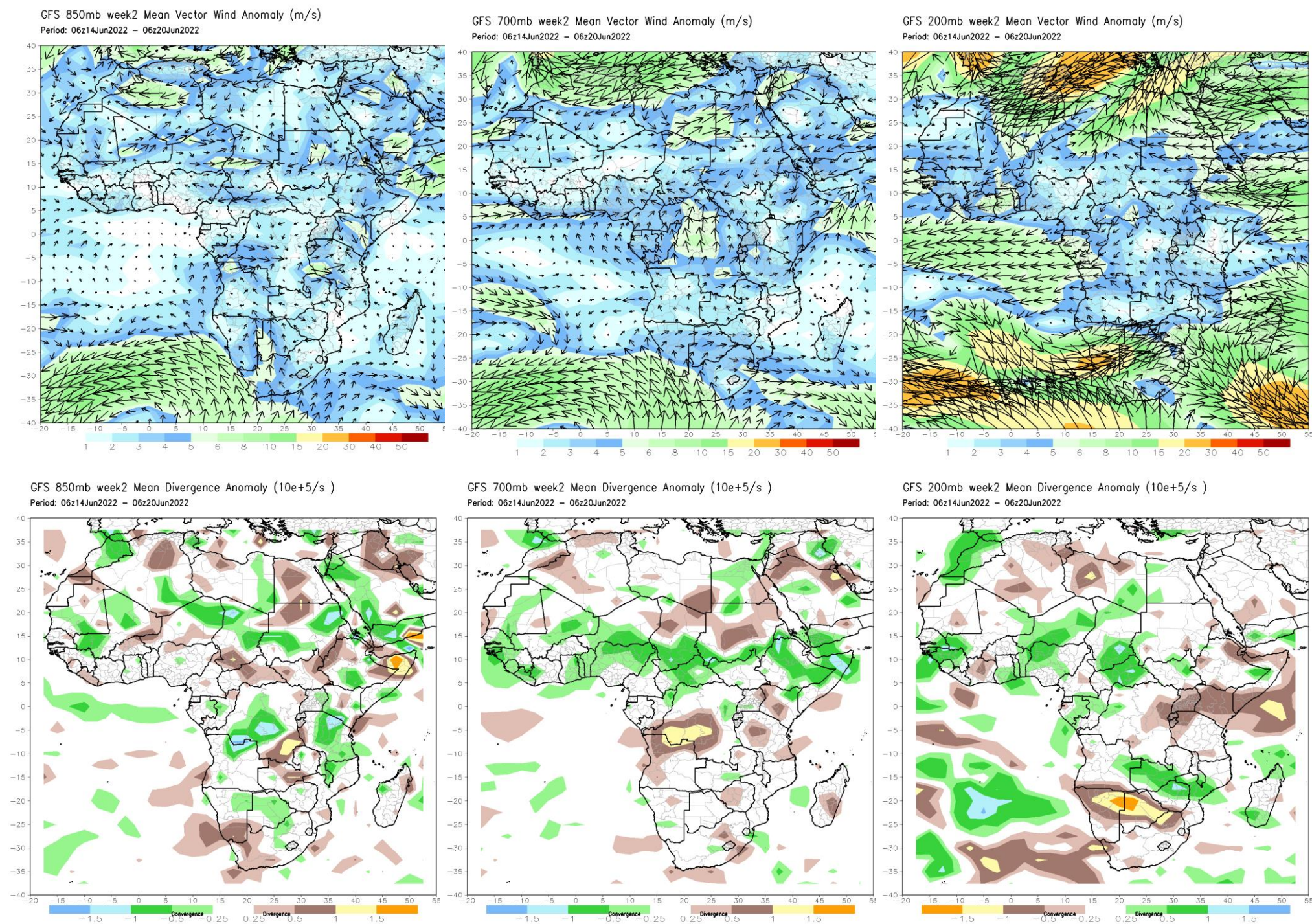
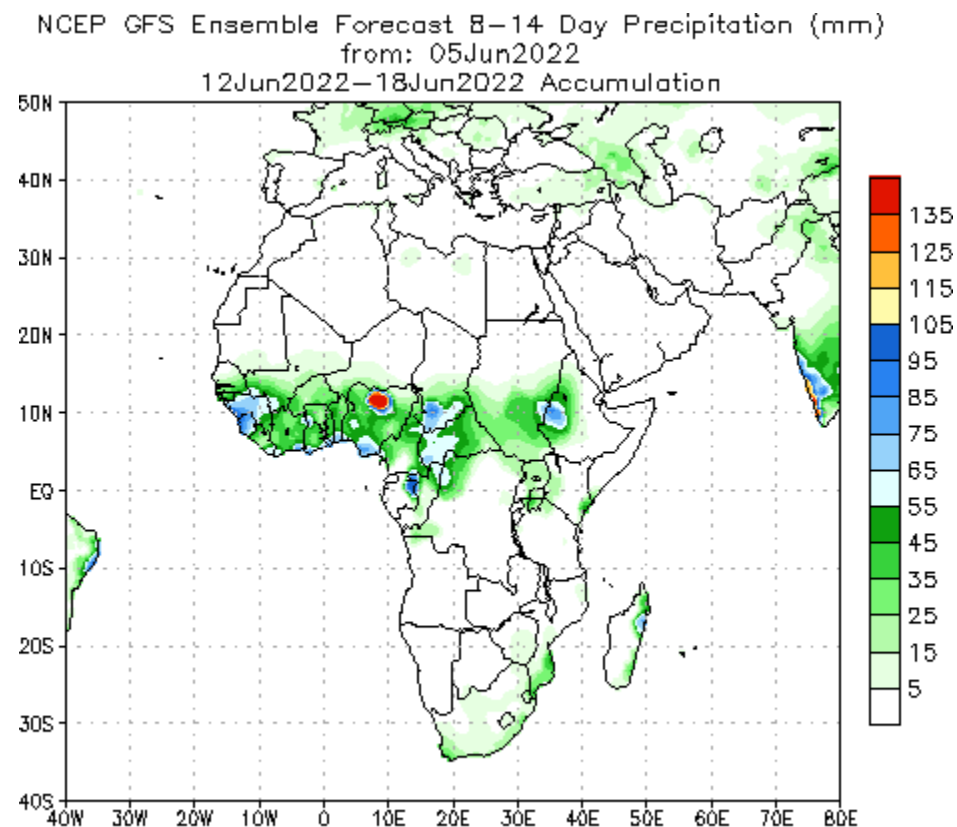
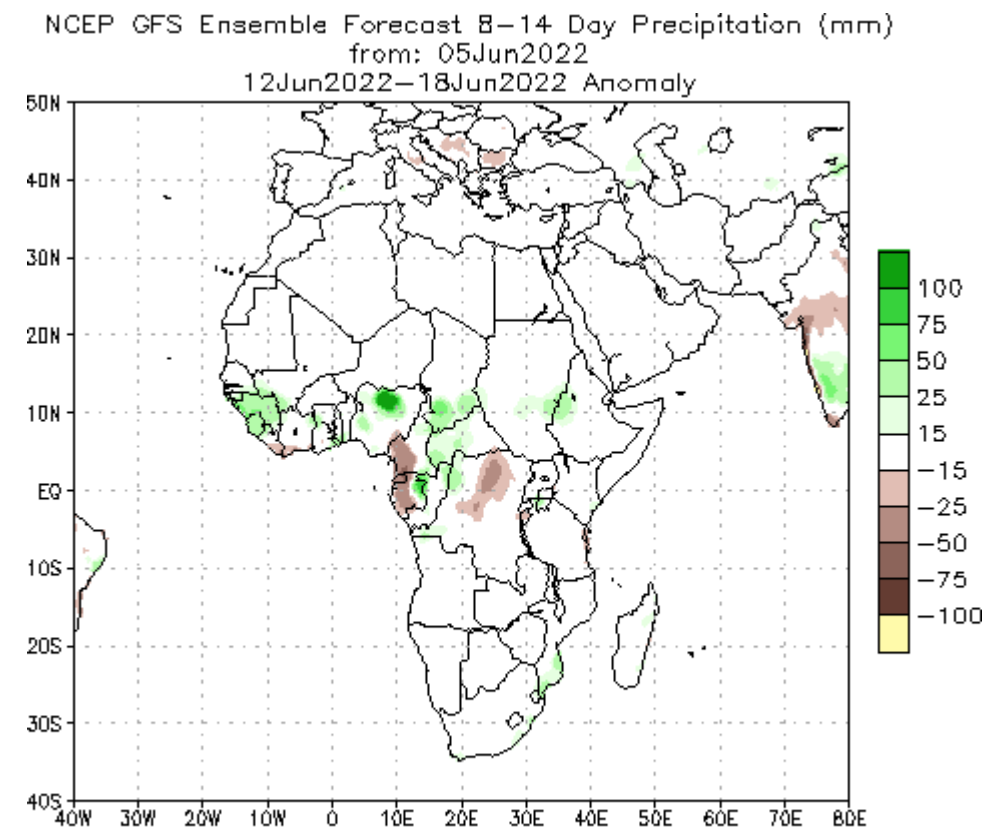


Figure 30: GFS divergence forecast
<https://www.cpc.ncep.noaa.gov/products/inter-national/africa/africa.shtml>

African Precipitation NCEP/GFS Bias-Corrected precipitation and anomaly forecasts for week 2



Bias correction based on last 30-day forecast error



Bias correction based on past 30-day forecast error
CPC Unified Precip Climatology (1991–2020)

Figure 31: Précipitation and Anomaly forecast

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

Precip $\geq$ 25mm

Precip $\geq$ 50mm

Precip $\geq$ 75mm

Precip $\geq$ 100mm

Week-2 Precipitation
Probability of Exceedance:
Forecast and Climo

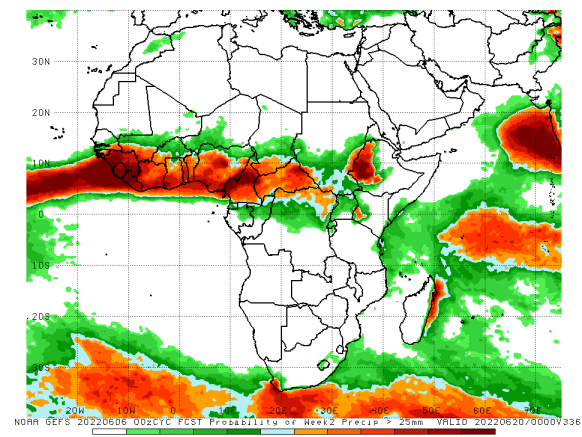
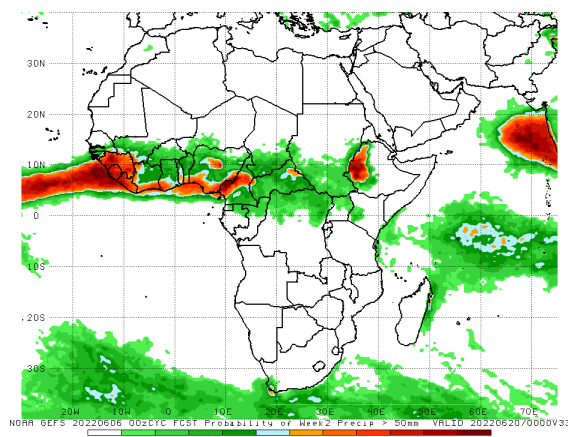
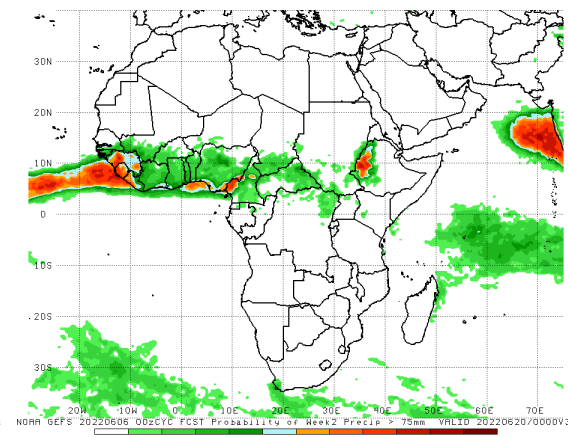
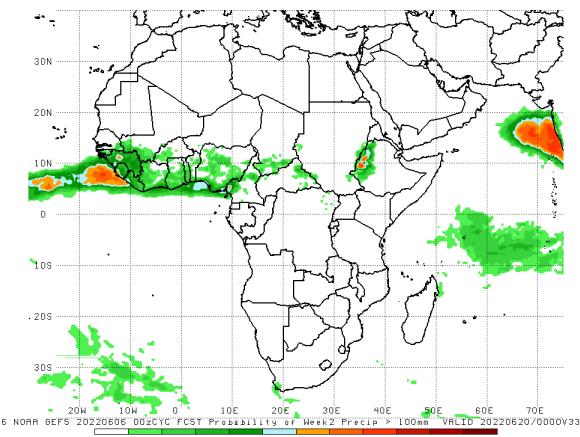
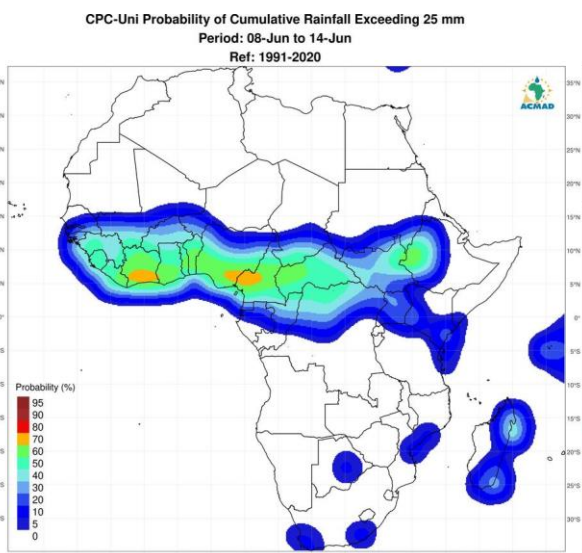
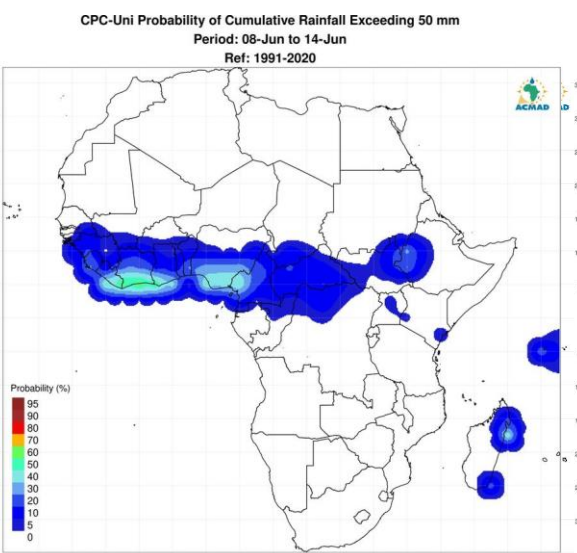
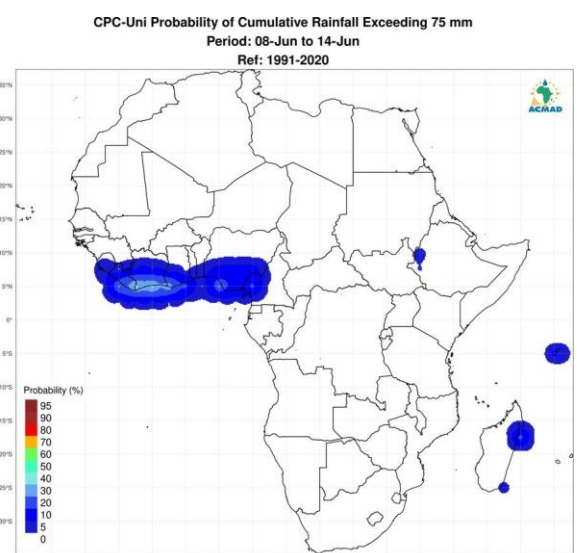
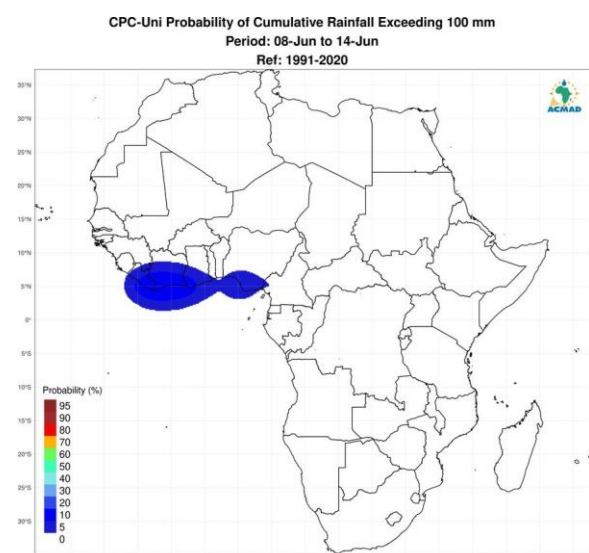


Figure 32: Week2 Precipitation Total Exceedance Probabilities

https://www.cpc.ncep.noaa.gov/products/international/cpci/data/00/gefs_wk1_precip25mm_prob_africa.html

https://www.cpc.ncep.noaa.gov/products/international/cpci/data/00/gefs_wk1_precip50mm_prob_africa.html

https://www.cpc.ncep.noaa.gov/products/international/cpci/data/00/gefs_wk1_precip75mm_prob_africa.html

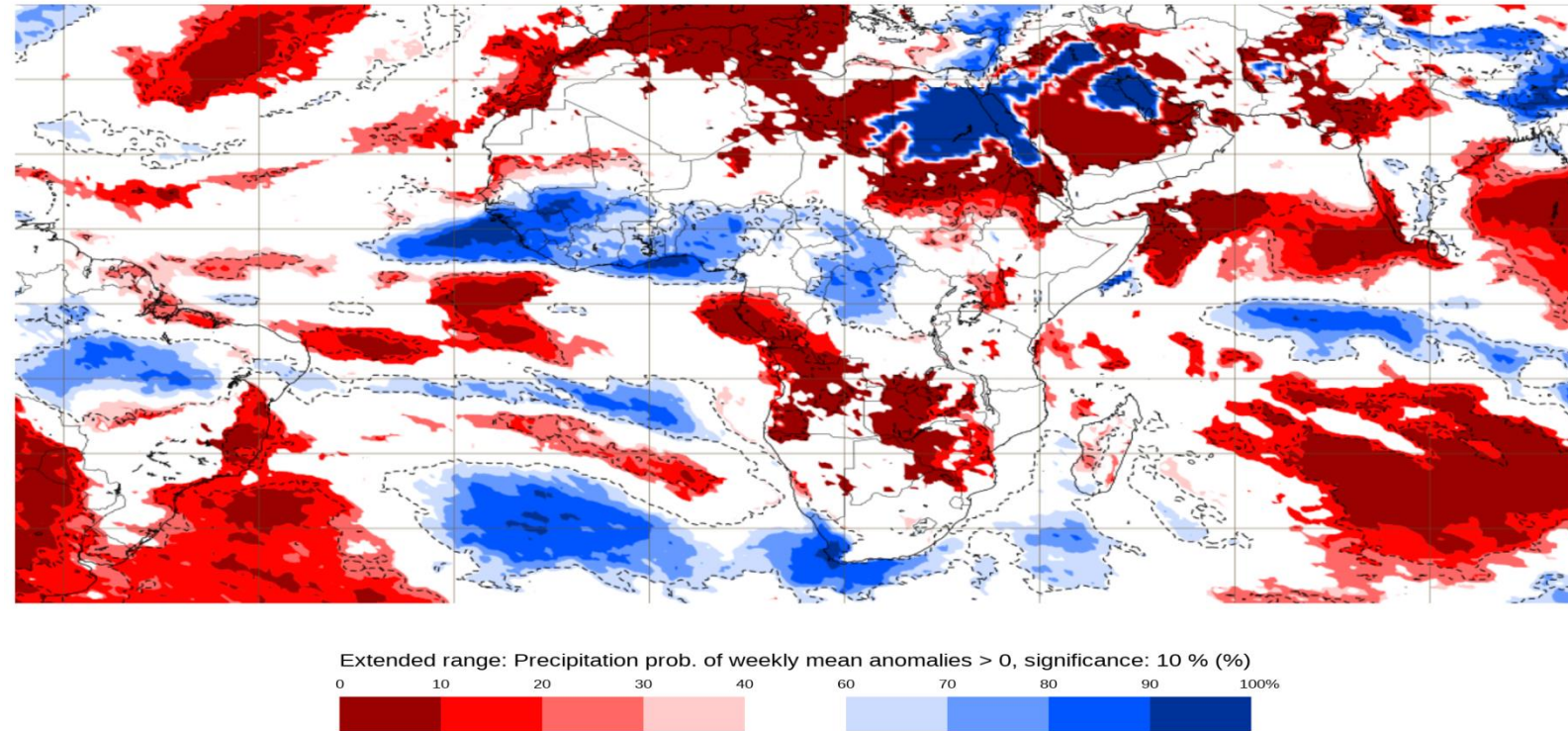
https://www.cpc.ncep.noaa.gov/products/international/cpci/data/00/gefs_wk1_precip100mm_prob_africa.html

http://154.66.220.45:8080/thredds/catalog/ACMAD/CDD/climatemonitoringservice/Probability_of_Exceedance/Weekly/Current/catalog.html

Precipitation Anomaly Forecasts from ECMWF for week 2

Precipitation: Probability of weekly anomaly > 0

Base time: Mon 06 Jun 2022 Valid time: Mon 13 Jun 2022 - Mon 20 Jun 2022 (+336h) Area : Africa



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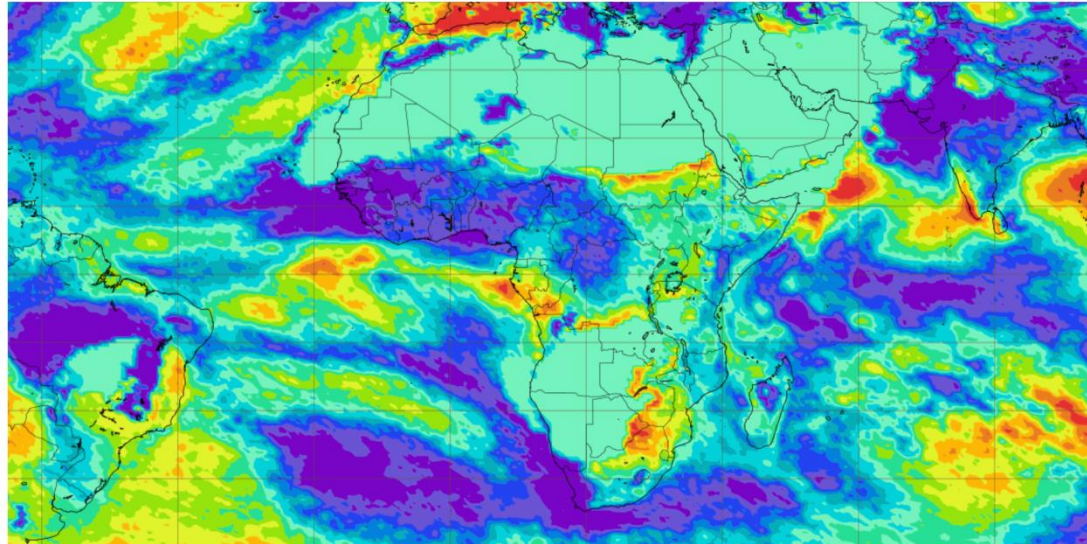
Figure 33: Monthly Precipitation Anomaly
forecast from ECMWF

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 2 : weekly tercile lower and upper

Precipitation: Probability distribution

Base time: Mon 06 Jun 2022 Valid time: Mon 13 Jun 2022 - Mon 20 Jun 2022 (+336h) Distribution group : Lower Tercile
Area : Africa



Extended range: precipitation probability dist. at quantile: Lower tercile (%)

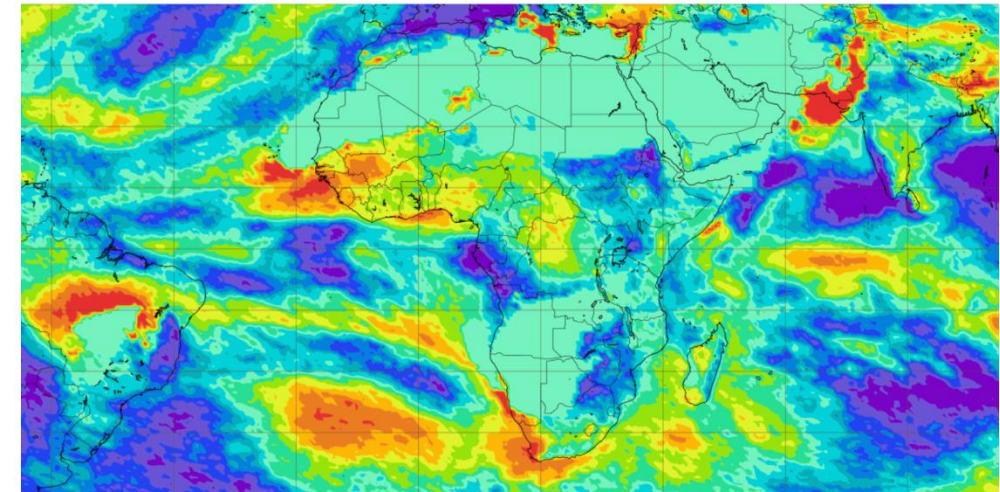
0	5	10	15	20	25	33	40	50	60	70	80	90	100
0	5	10	15	20	25	33	40	50	60	70	80	90	100

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Precipitation: Probability distribution

Base time: Mon 06 Jun 2022 Valid time: Mon 13 Jun 2022 - Mon 20 Jun 2022 (+336h) Distribution group : Upper tercile
Area : Africa



Extended range: precipitation probability dist. at quantile: Upper tercile (%)

0	5	10	15	20	25	33	40	50	60	70	80	90	100
0	5	10	15	20	25	33	40	50	60	70	80	90	100

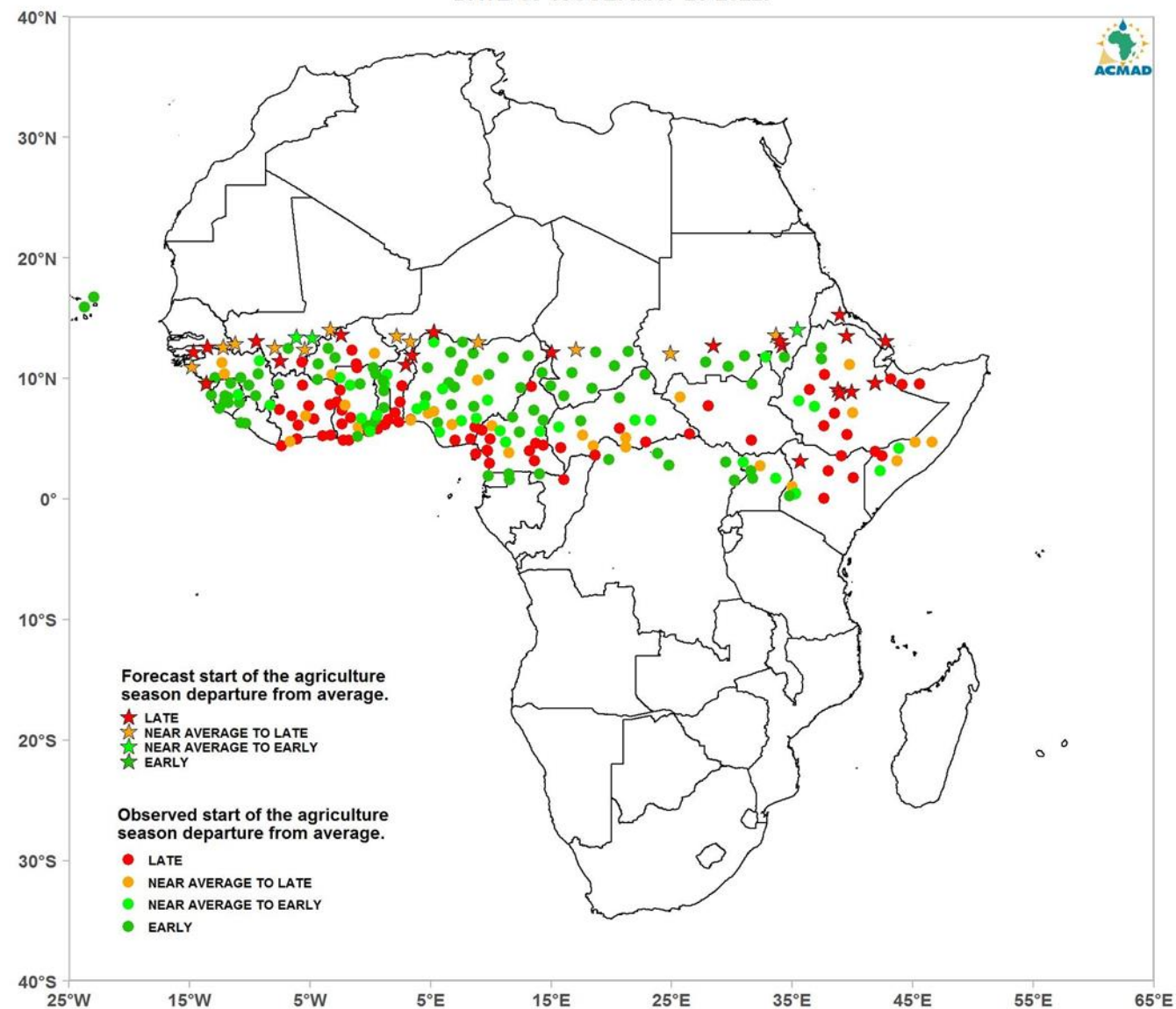
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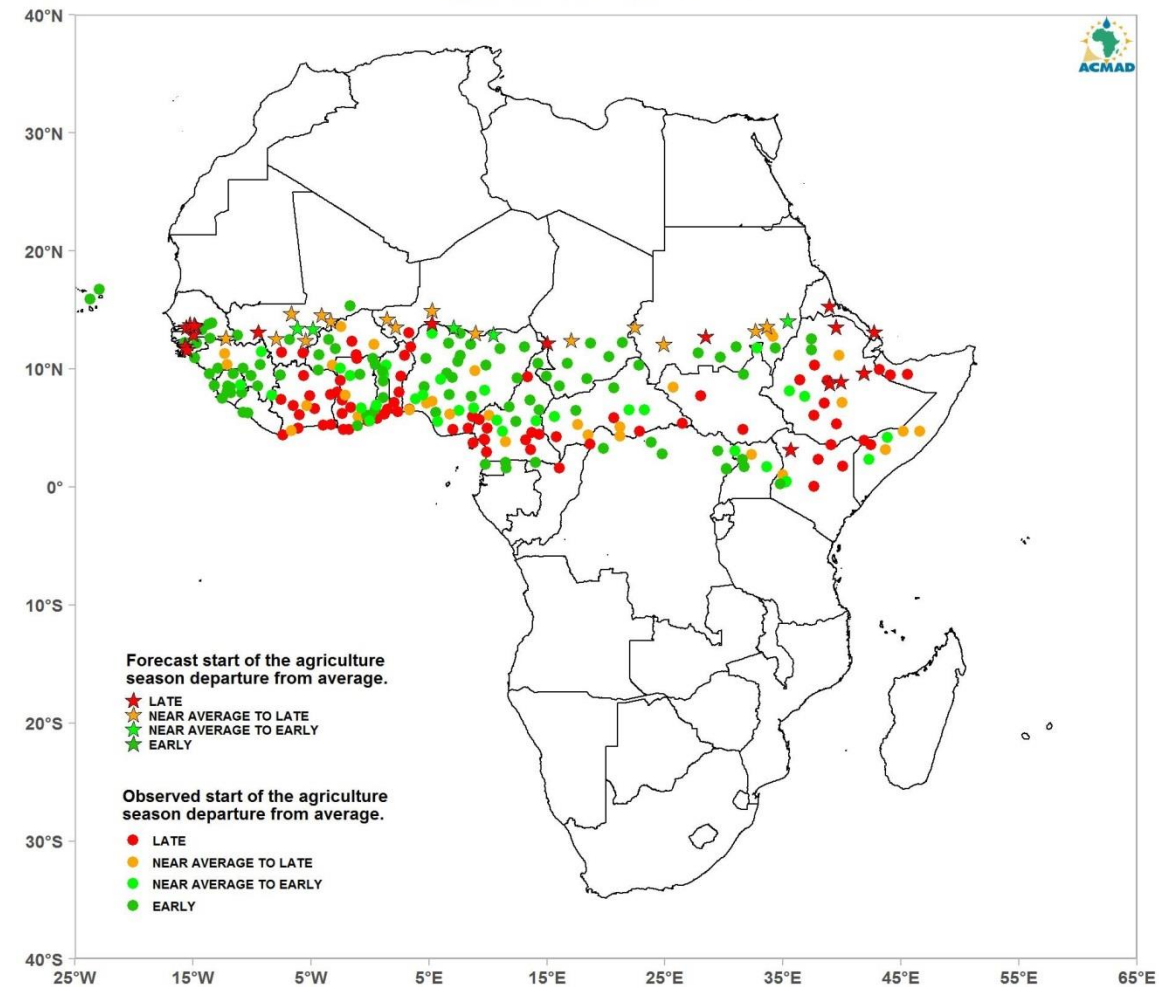
Figure 34: Weekly tercile probability forecast below 33%

https://www.ecmwf.int/en/forecasts/charts/catalogue/mofc_multi_tercile?facets=undefined&time=2021110100,312,2021111400&parameter=precipitation&tercile=1&area=Africa

MONITORING OF OBSERVED ANOMALIES ON THE START OF THE AGRICULTURE SEASON AND OUTLOOK.
 MONITORING PERIOD: JANUARY-MAY 2022.
 OUTLOOK VALIDITY PERIOD: MAY 26 TO JUNE 09 2022 .
 DATE OF ISSUE: MAY-26-2022.



MONITORING OF OBSERVED ANOMALIES ON THE START OF THE AGRICULTURE SEASON AND OUTLOOK.
 MONITORING PERIOD: JANUARY-JUNE 2022.
 OUTLOOK VALIDITY PERIOD: JUNE 07 TO JUNE 21 2022 .
 DATE OF ISSUE: JUNE-07-2022.



CLIMATOLOGY OF PRECIPITATIONS FOR UPCOMING 2 WEEKS

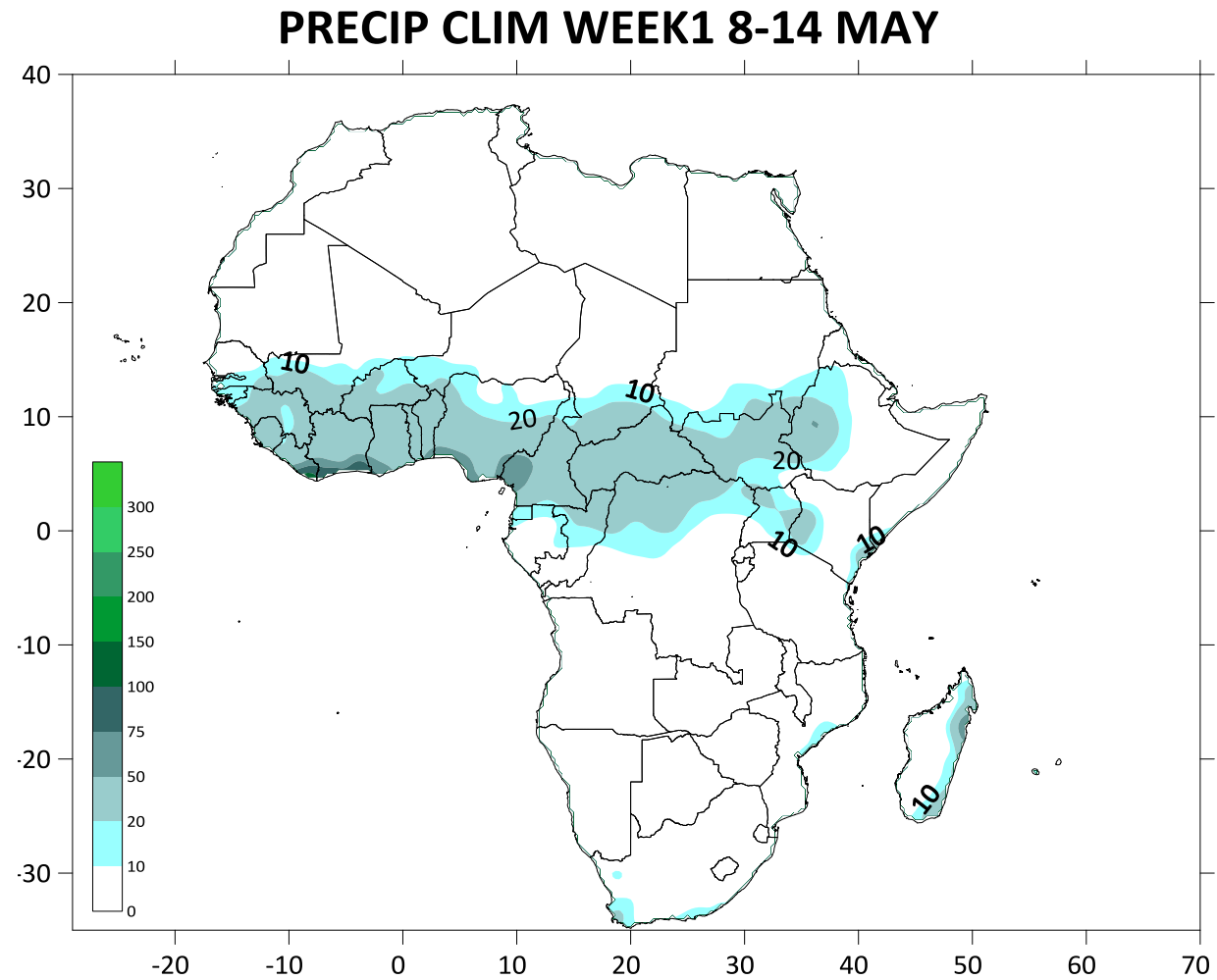
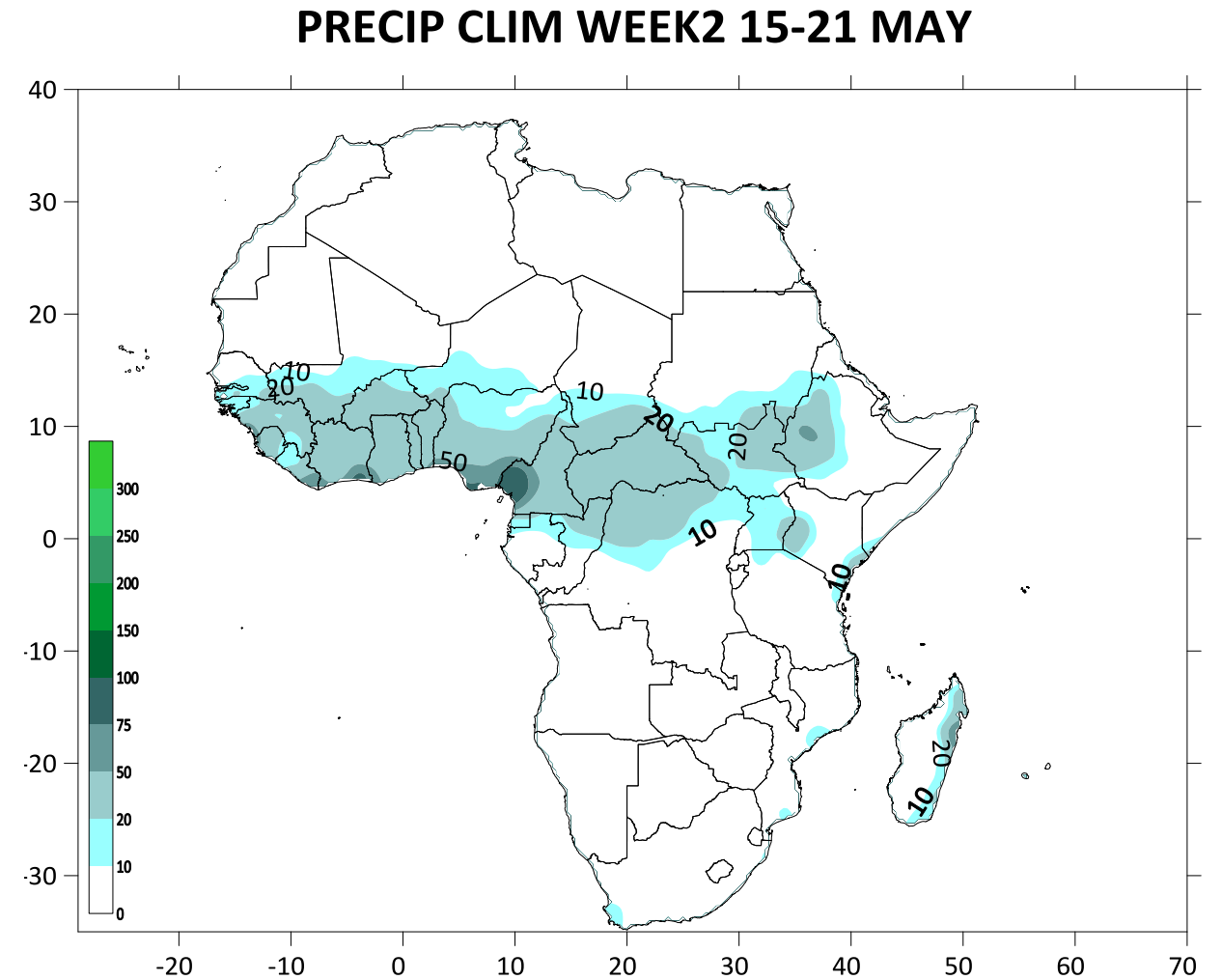
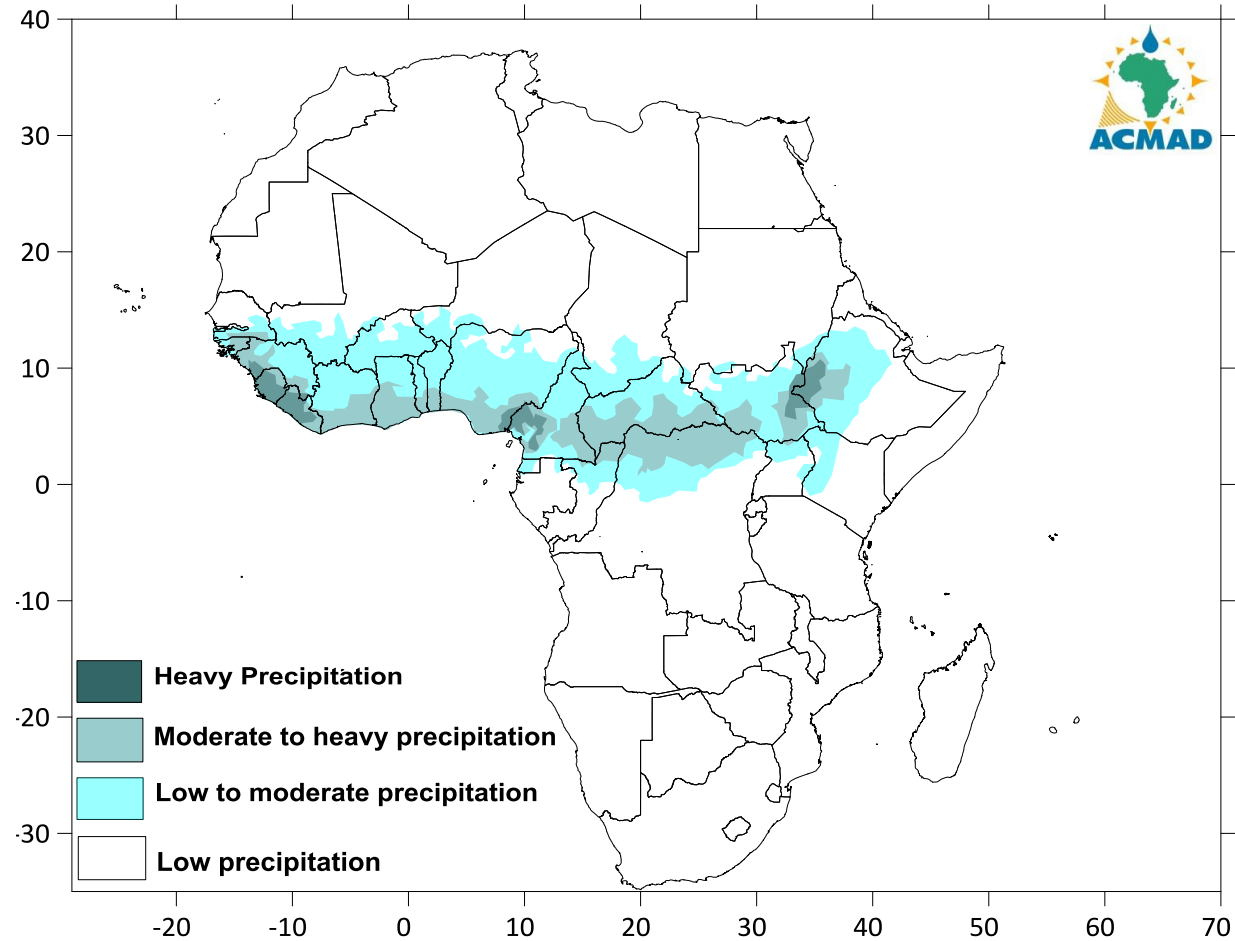


Figure 38: Climatology of Precipitation for week-1(left panel) and week-2 (right panel)

PRECIPITATIONS FORECAST FOR THE UPCOMING TWO WEEKS

PRECIPITATION FORECAST FOR WEEK 1 FROM 8 TO 14 MAY 2022



PRECIPITATION FORECAST FOR WEEK 1 FROM 15 TO 21 MAY 2022

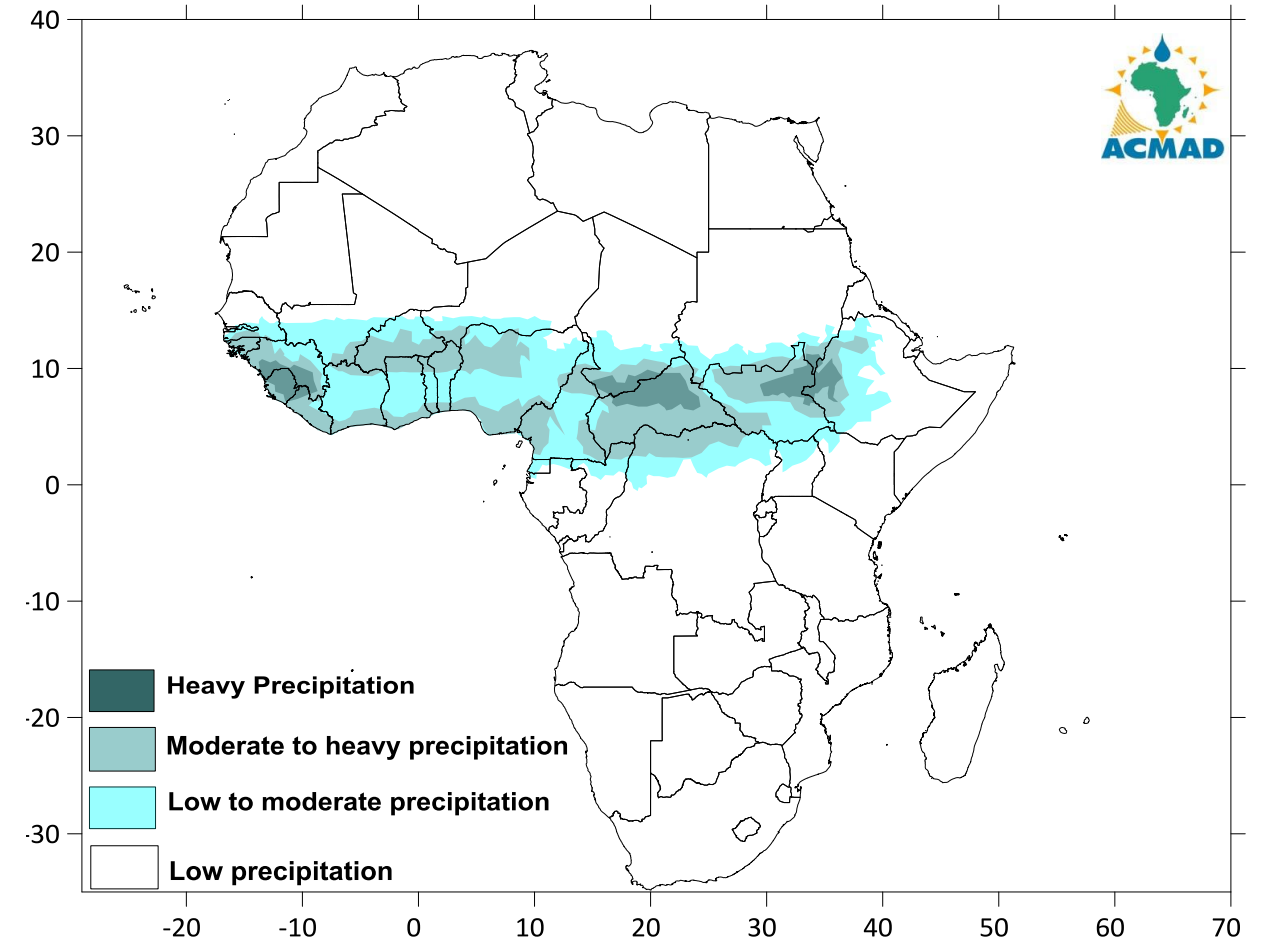


Figure 39: Precipitation Outlook for week-1(left panel) and week-2 (right panel)