South West Indian Ocean region

ACCOF-15

Laurent LABBE (Météo France Regional Center for Indian Ocean)

La Réunion - 9/02/2024

Content

1 – Verification of 2023/09 forecast for OND

2 – 2024/01 forecast for FMA & MAM

1 – OND 2023 forecast verification

In this section we present the verification of the forecast issued in september 2023 for the next quarter (OND 2023)

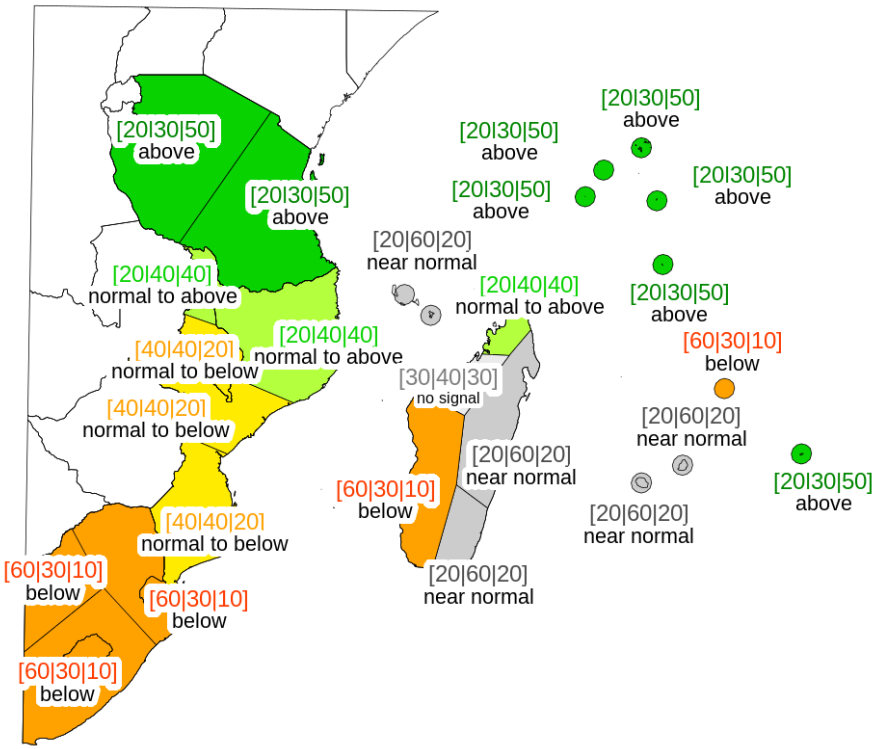
- First we recall the forecast produced at that time : It consist in the mixing of the statistical adaptation from 3 GCM (ECMWF, MF, NCEP)

- Then this forecast is compared to the corresponding verification data (Reference dataset for the region created from ERA5 reanalysis). The RPSS score issued from this comparison is also presented ;

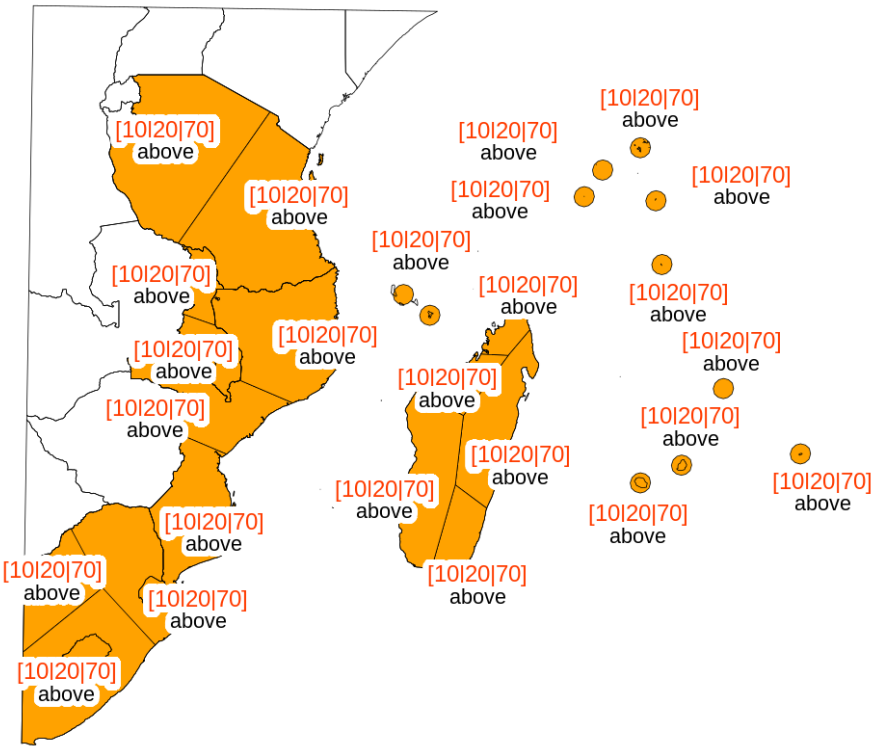
1 – OND 2023 forecast verification

Objective Rainfall and Temperature forecast issued in September 2023

Rainfall Seasonal forecast - OND 2023



Temperature Seasonal forecast - OND 2023



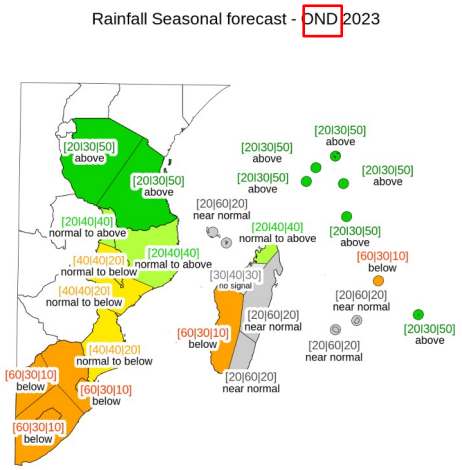
Forecast based on :

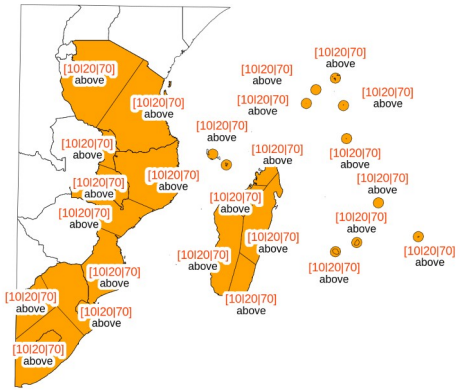
Statistical adaptation of GCM output
at regional scale

NB : reference local dataset made of ERA5 data averaged over zones

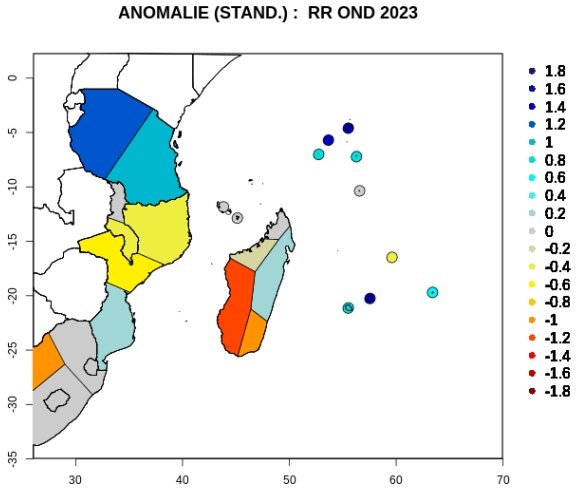
1 – OND 2023 forecast verification

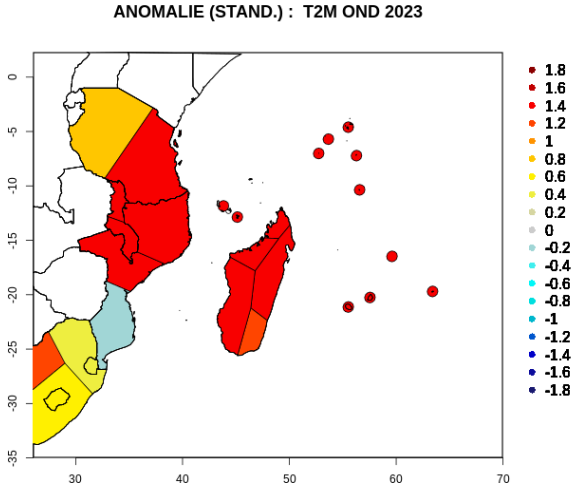
Forecast



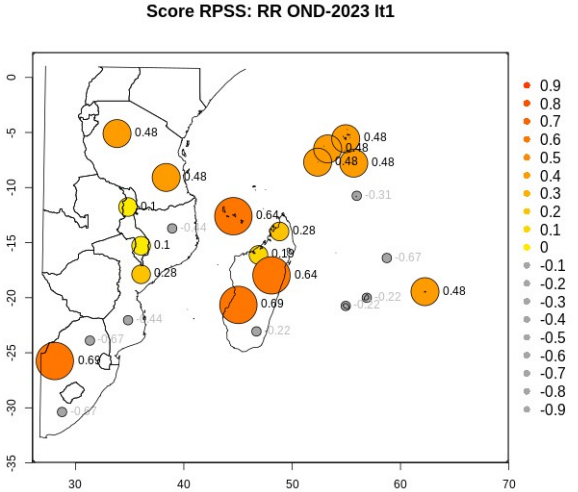


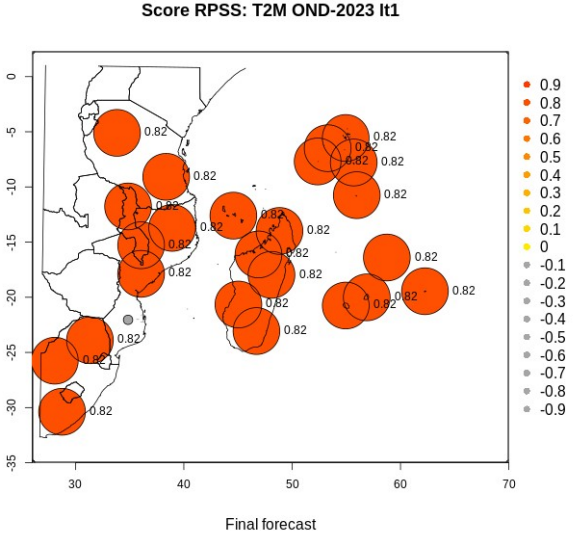
Observed anomalies
(verification Dataset ERA5)





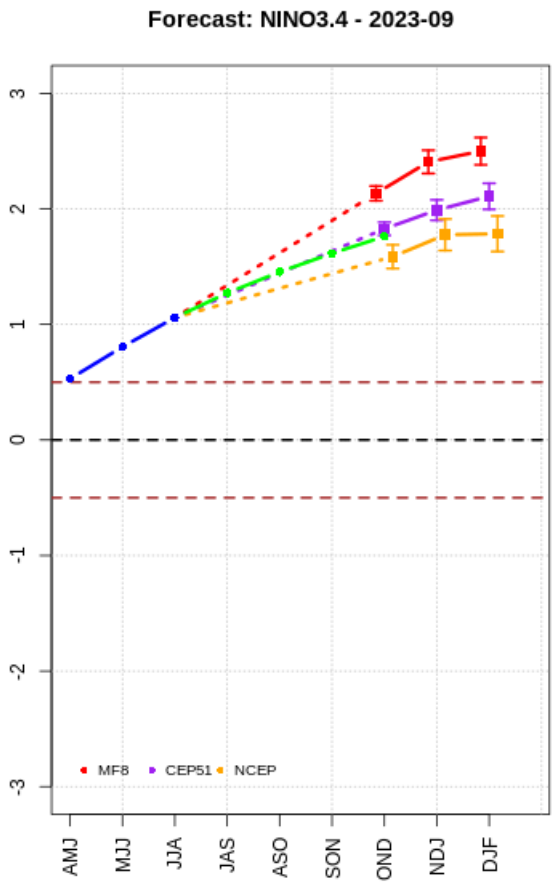
RPSS score

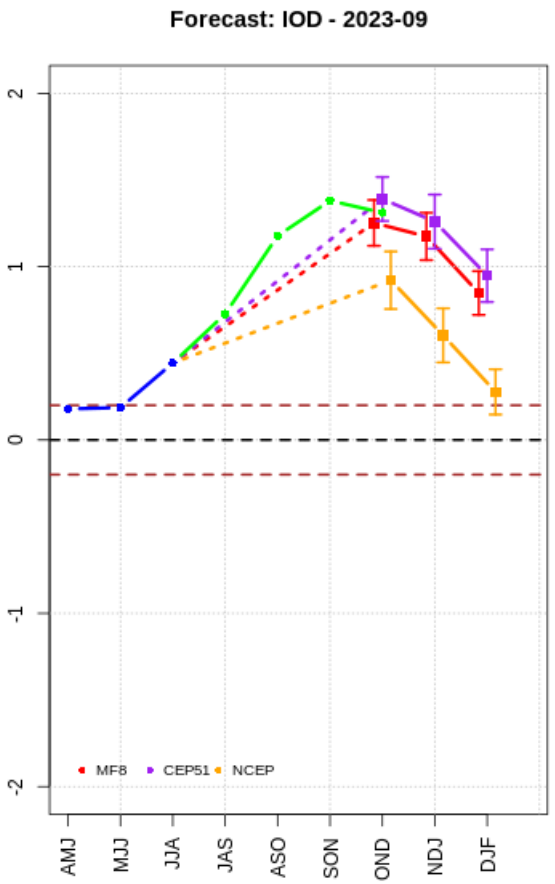


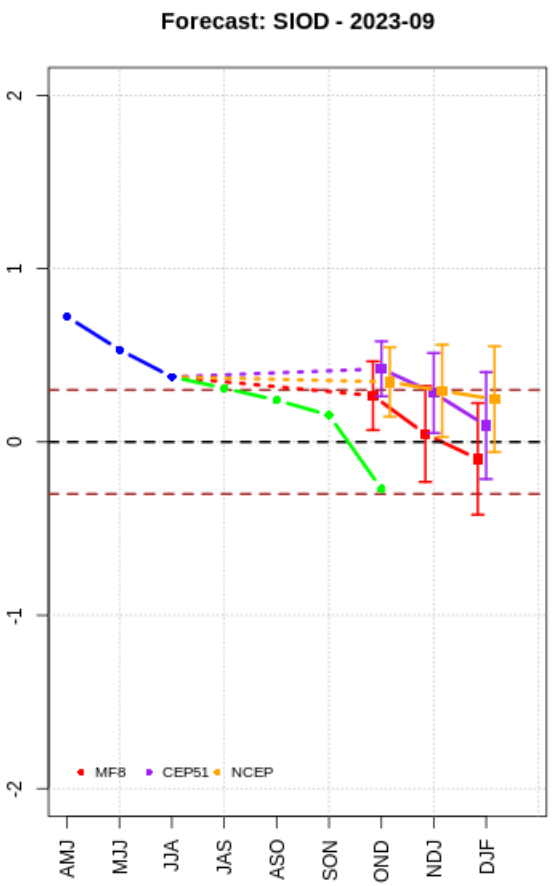


1 – OND 2023 forecast verification

Forecast and verification of oceanic indices started on september 2023







2 - Objective forecast (FMA & MAM 2024)

In this section we present the objective forecasts from start month : January 2024, for leadtimes 1 (FMA) and 2 (MAM)

- First the current and predicted state of climate indices are displayed

- Second the expected Large scale situation over the region is discussed from the GCM forecasts

- Then the forecast produced with the SEAFORDS tool is showed for each leadtime
  - It is a synthesis of statistical adaptation of 3 GCM (ECMWF, MF, NCEP)
  - The « No signal » result mans that no specific scenario can be determined. It is generally associated with low score for the model or a too large dispersion of the members.
  - The confidence index of the large-scale parameters provided by the GCMs as inputs for the statistical model, are displayed. They consist of correlation score computed over the Hindcast period

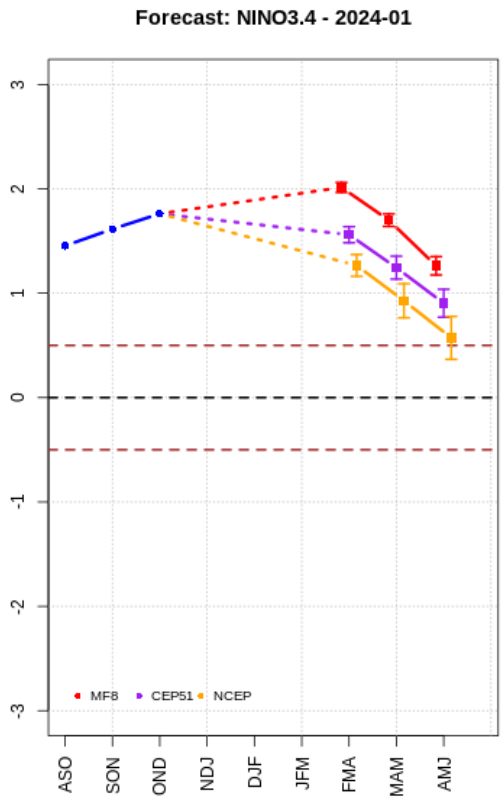
2 - Objective forecast (FMA & MAM 2024)

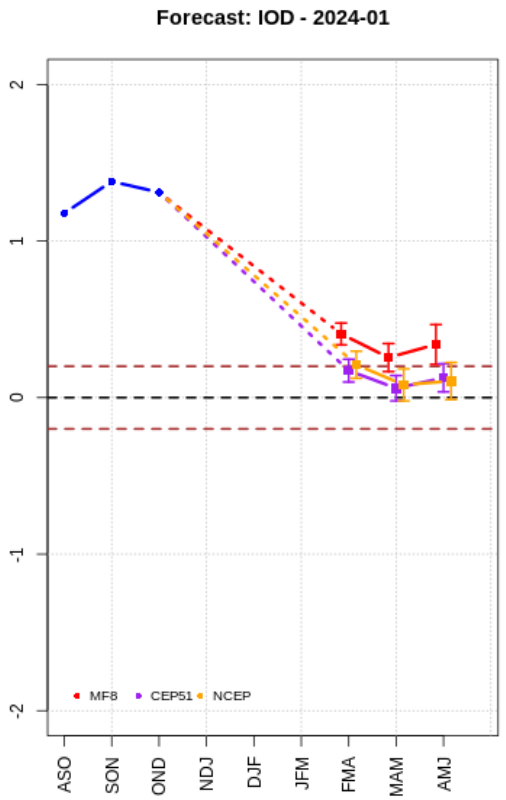
Large scale drivers context :

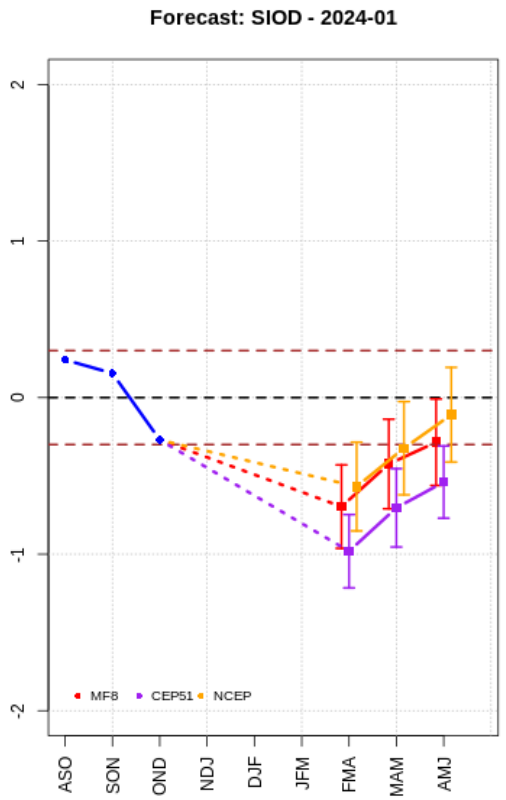
ENSO : Decreasing El Nino phase, yet still positive

IOD : Decreasing positive phase – expected to be neutral

SIOD : presently in neutral phase but rapidly decreasing – expected to become negative



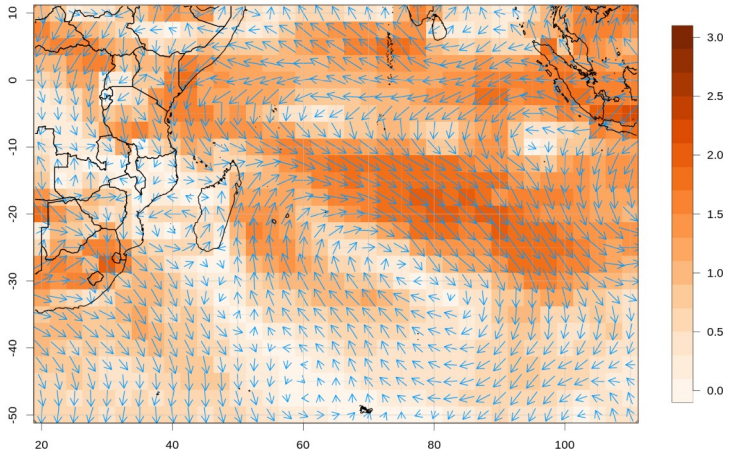




2 - Objective forecast (FMA & MAM 2024)

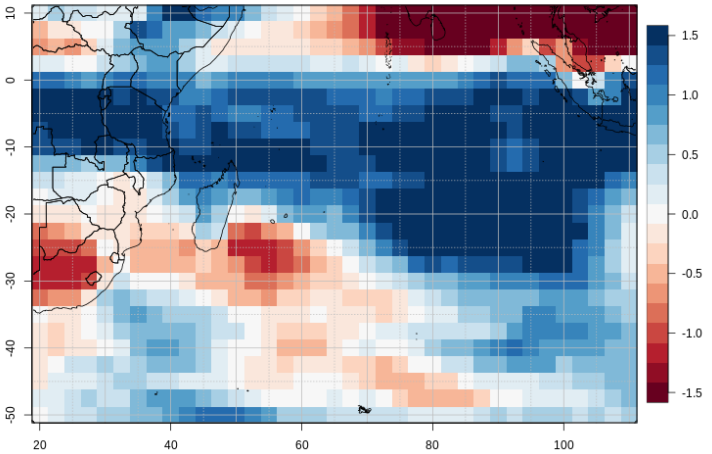
Large scale composite maps fr FMA: ENSO+ (El Nino)

ERA5 850hPa WIND ANO. : FMA NINO3.4pos



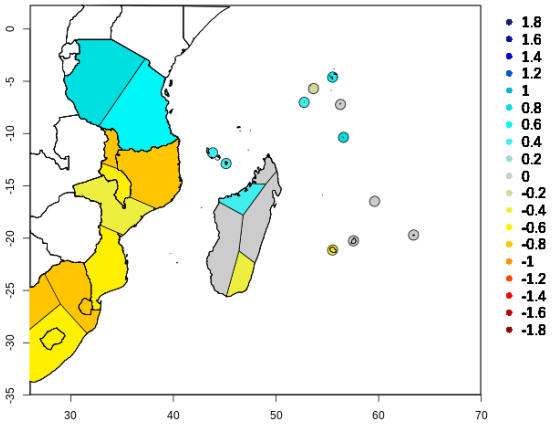
1983 - 1992 - 1998 - 2016

ERA5 STAND. ANO. : TCWV FMA NINO3.4pos



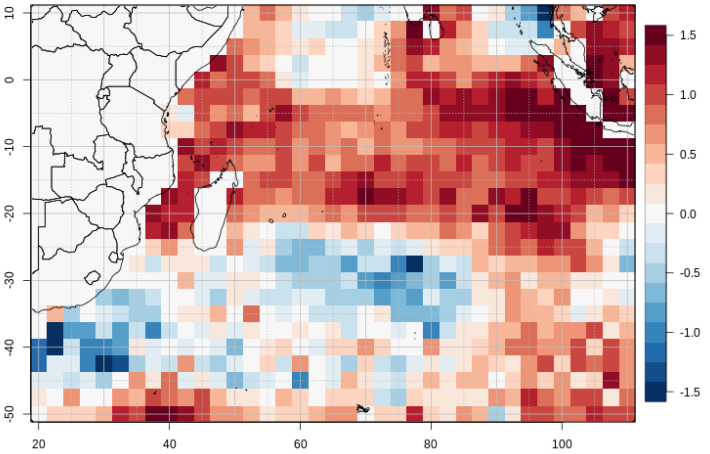
1983 - 1992 - 1998 - 2016

STD. ANO. (Avg): RR FMA NINO3.4pos



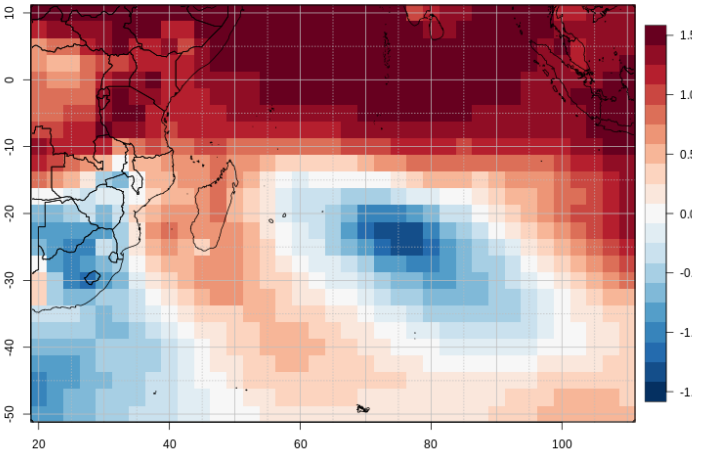
1983 - 1992 - 1998 - 2016

ERA5 STAND. ANO. : SST FMA NINO3.4pos



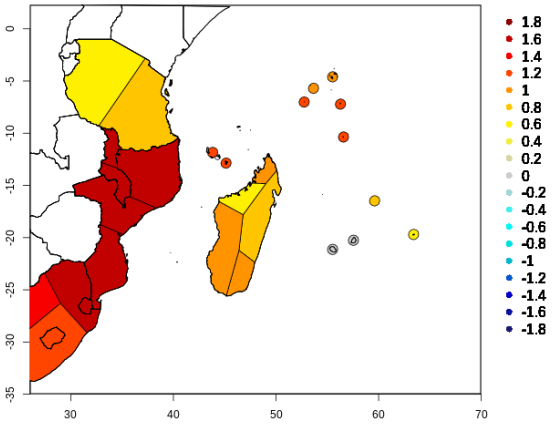
1983 - 1992 - 1998 - 2016

ERA5 STAND. ANO. : PMER FMA NINO3.4pos



1983 - 1992 - 1998 - 2016

STD. ANO. (Avg): T2M FMA NINO3.4pos

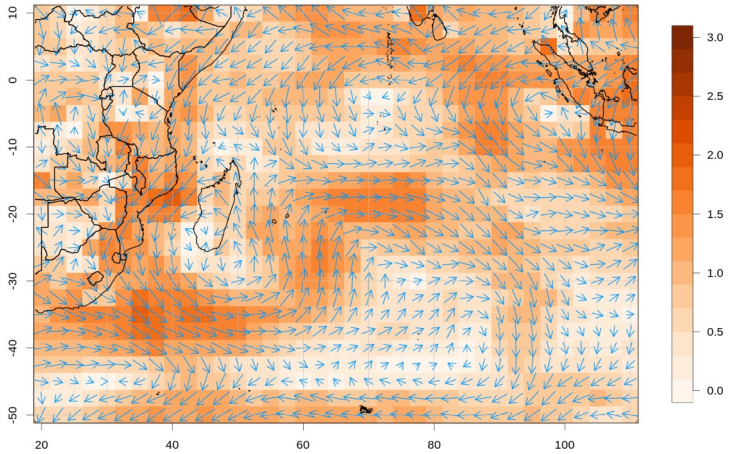


1983 - 1992 - 1998 - 2016

2 - Objective forecast (FMA & MAM 2024)

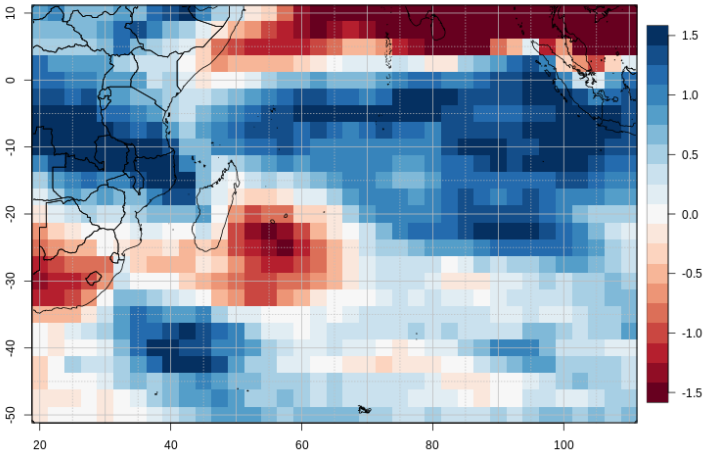
Large scale composite maps fr MAM: ENSO+ (El Nino)

ERA5 850hPa WIND ANO. : MAM NINO3.4pos



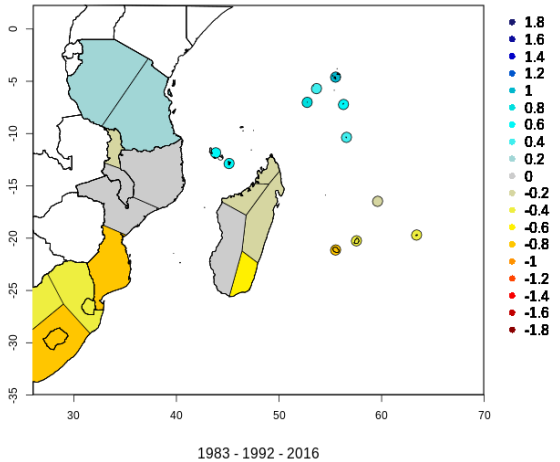
1983 - 1992 - 2016

ERA5 STAND. ANO. : TCWV MAM NINO3.4pos



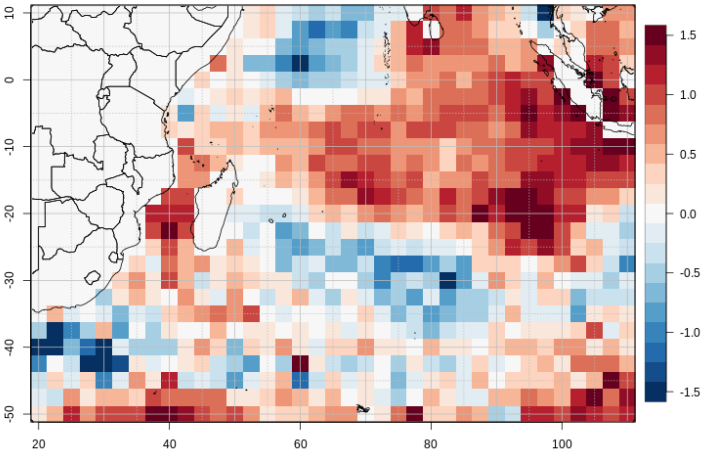
1983 - 1992 - 2016

STD. ANO. (Avg): RR MAM NINO3.4pos



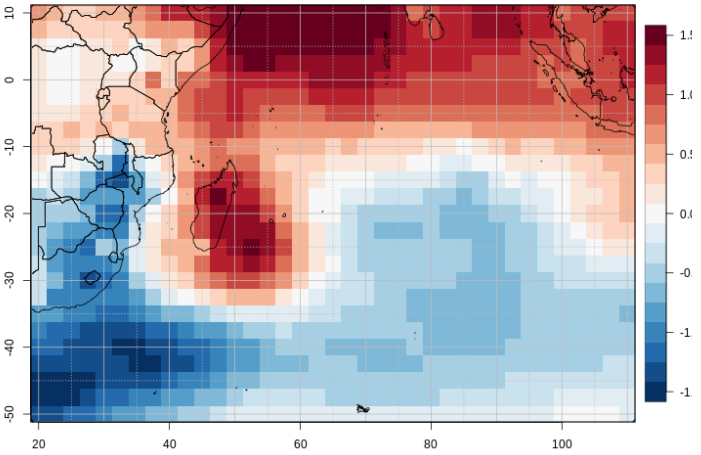
1983 - 1992 - 2016

ERA5 STAND. ANO. : SST MAM NINO3.4pos



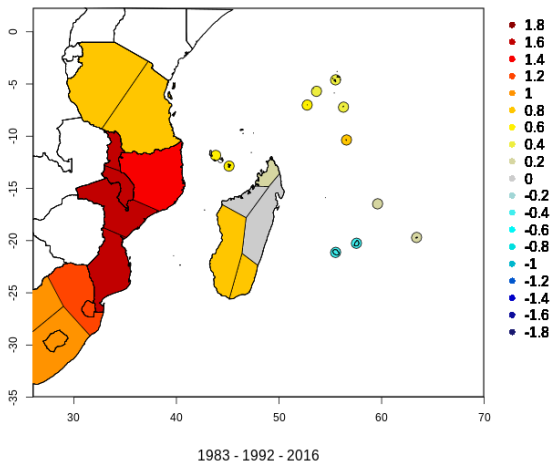
1983 - 1992 - 2016

ERA5 STAND. ANO. : PMER MAM NINO3.4pos



1983 - 1992 - 2016

STD. ANO. (Avg): T2M MAM NINO3.4pos

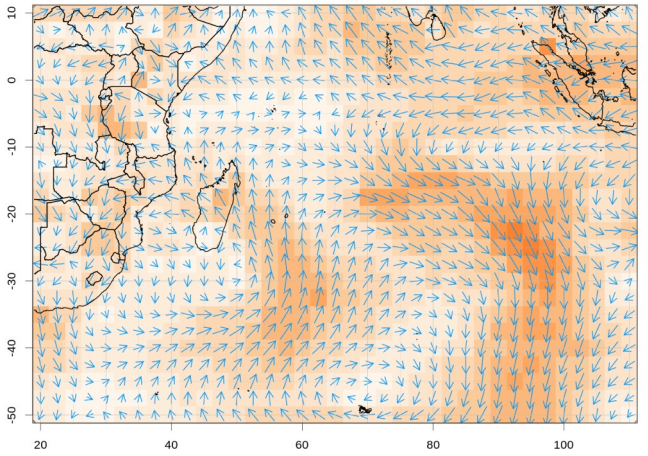


1983 - 1992 - 2016

2 - Objective forecast (FMA & MAM 2024)

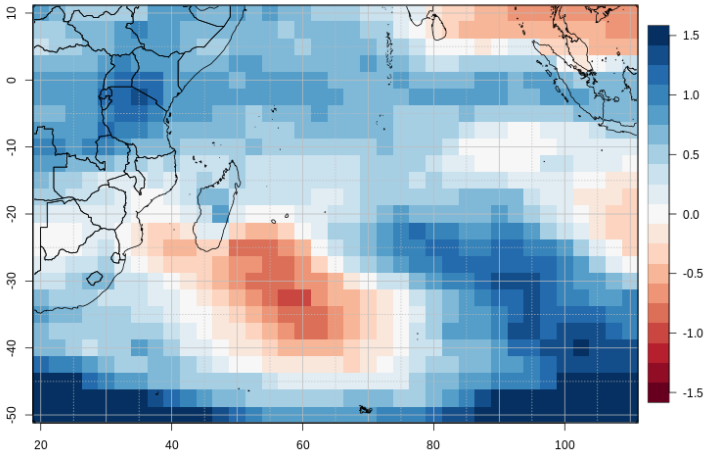
Large scale composite maps for FMA: SIOD-

ERA5 850hPa WIND ANO. : FMA SIODneg



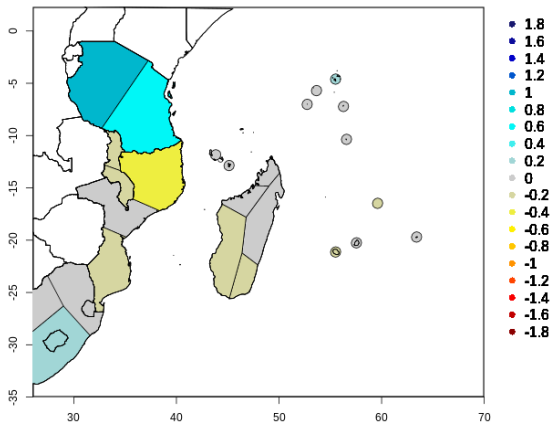
1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2010 - 2016 - 2020

ERA5 STAND. ANO. : TCWV FMA SIODneg



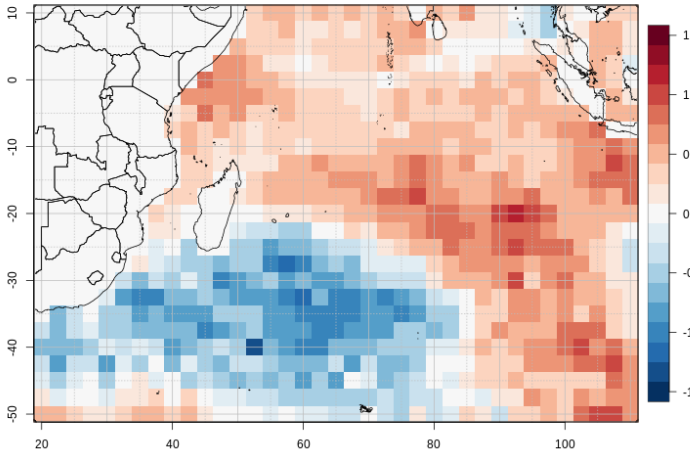
1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2010 - 2016 - 2020

STD. ANO. (Avg): RR FMA SIODneg



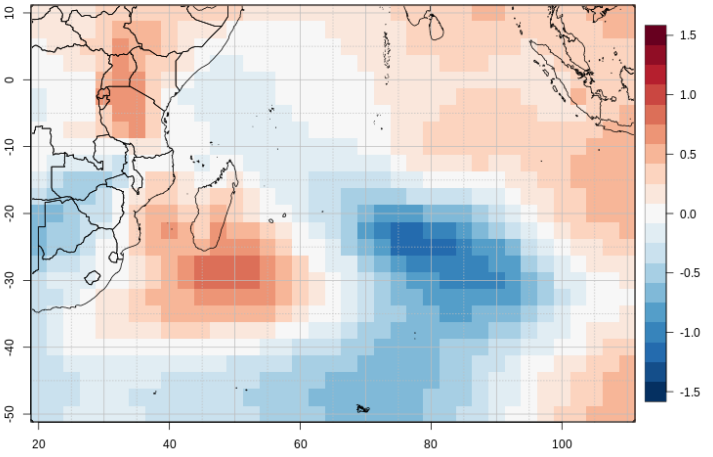
1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2010 - 2016 - 2020

ERA5 STAND. ANO. : SST FMA SIODneg



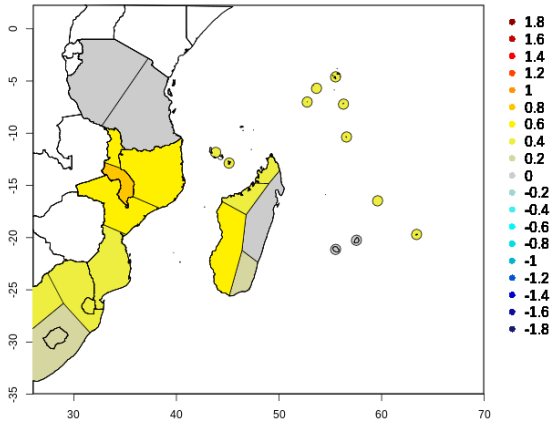
1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2010 - 2016 - 2020

ERA5 STAND. ANO. : PMER FMA SIODneg



1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2010 - 2016 - 2020

STD. ANO. (Avg): T2M FMA SIODneg

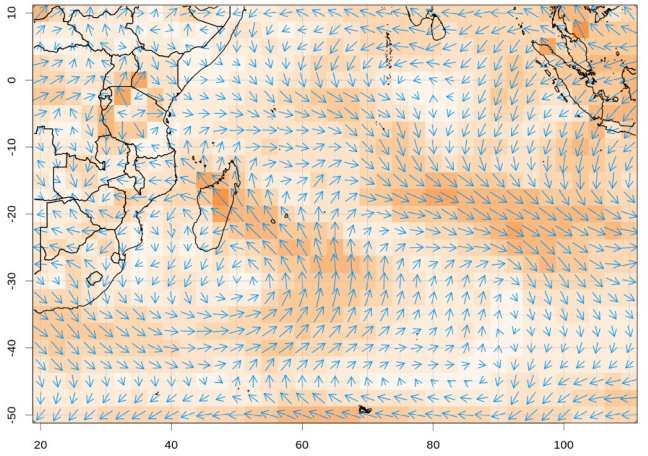


1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2010 - 2016 - 2020

2 - Objective forecast (FMA & MAM 2024)

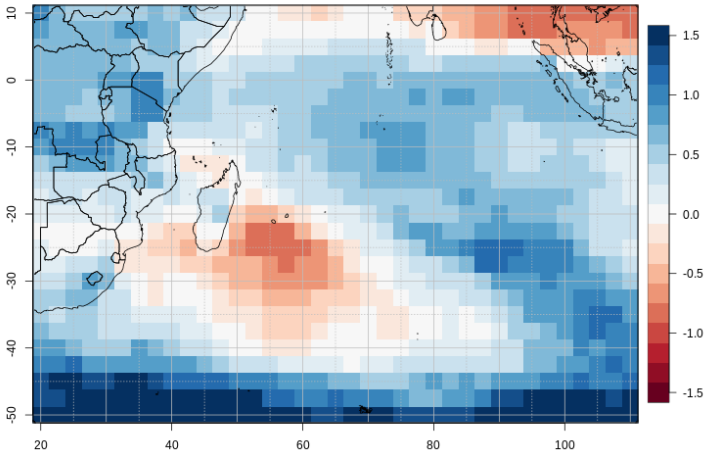
Large scale composite maps for FMA: SIOD-

ERA5 850hPa WIND ANO. : MAM SIODneg



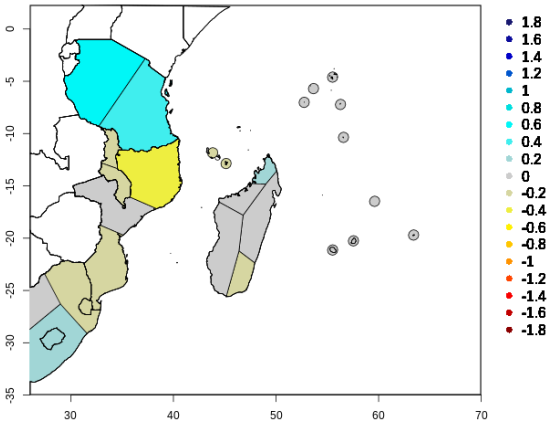
1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2016 - 2020

ERA5 STAND. ANO. : TCWV MAM SIODneg



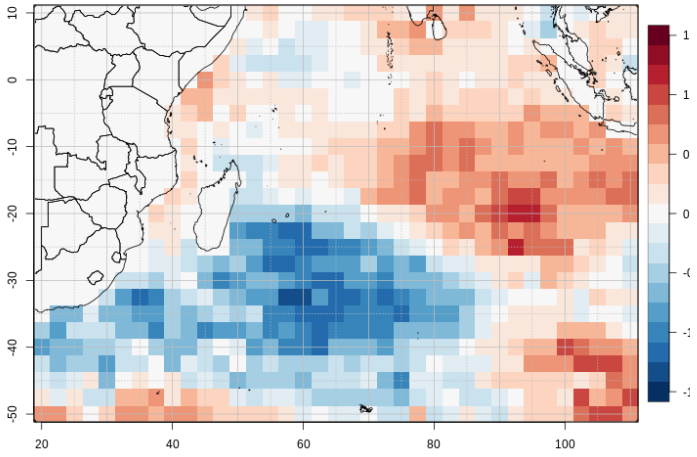
1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2016 - 2020

STD. ANO. (Avg): RR MAM SIODneg



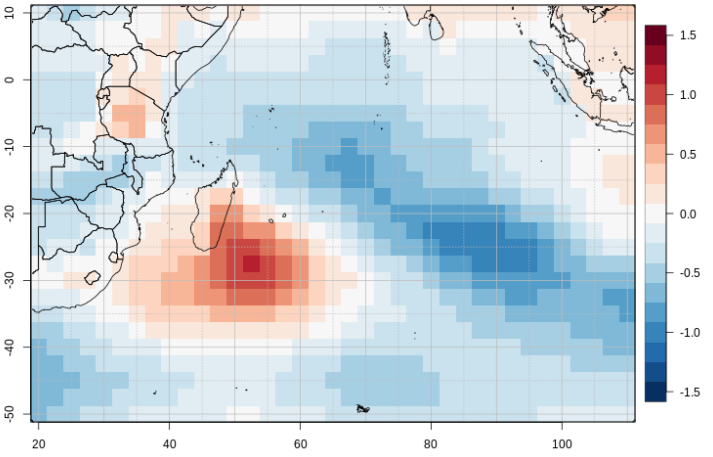
1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2016 - 2020

ERA5 STAND. ANO. : SST MAM SIODneg



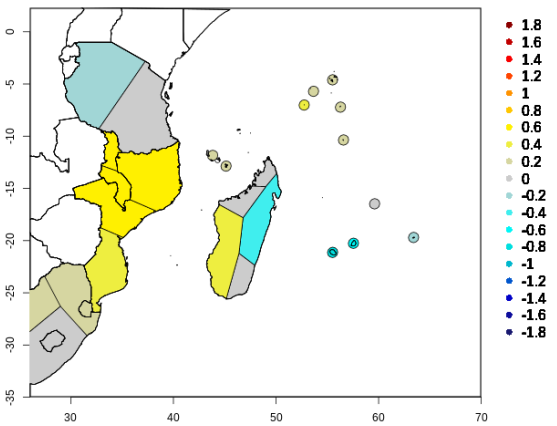
1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2016 - 2020

ERA5 STAND. ANO. : PMER MAM SIODneg



1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2016 - 2020

STD. ANO. (Avg): T2M MAM SIODneg

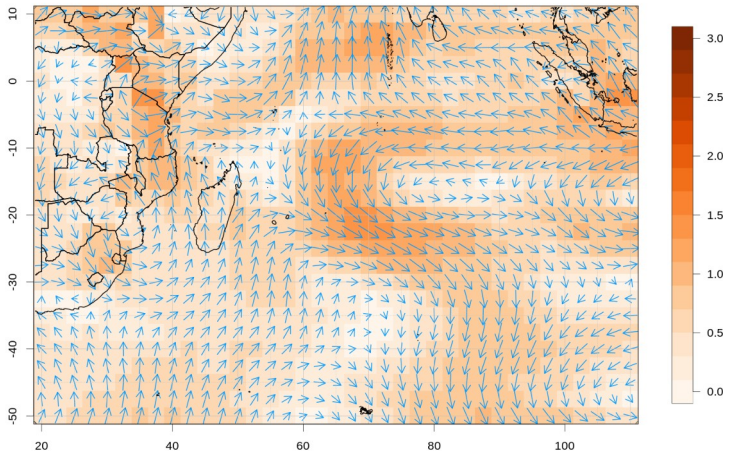


1984 - 1988 - 1992 - 1995 - 1996 - 1998 - 2002 - 2016 - 2020

2 - Objective forecast (FMA & MAM 2024)

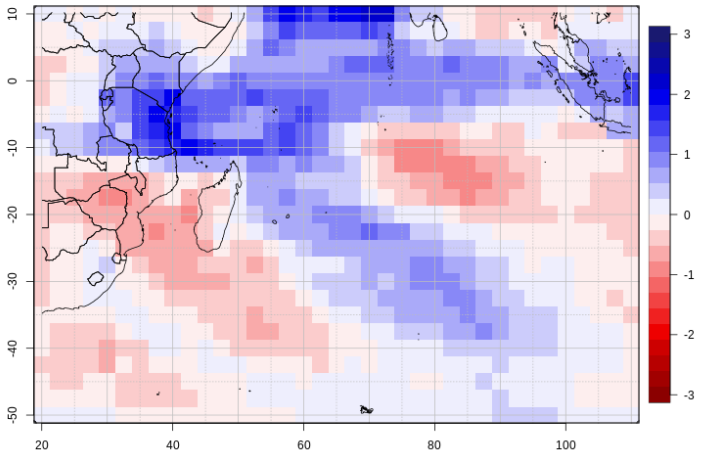
Large scale synthesis maps from MF, ECMWF, NCEP GCMs: Base january 2024 - FMA

Forecast Mix GCM U850global - FMA2024-lt1



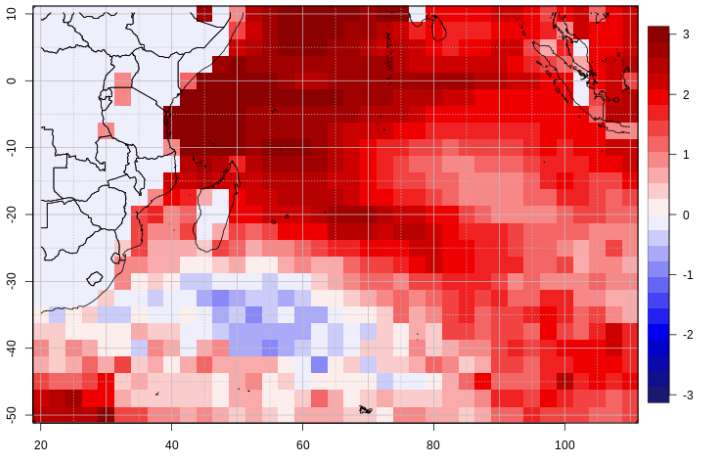
CEP51.MF8.NCEP

Forecast Mix GCM PRECglobal - FMA2024-lt1



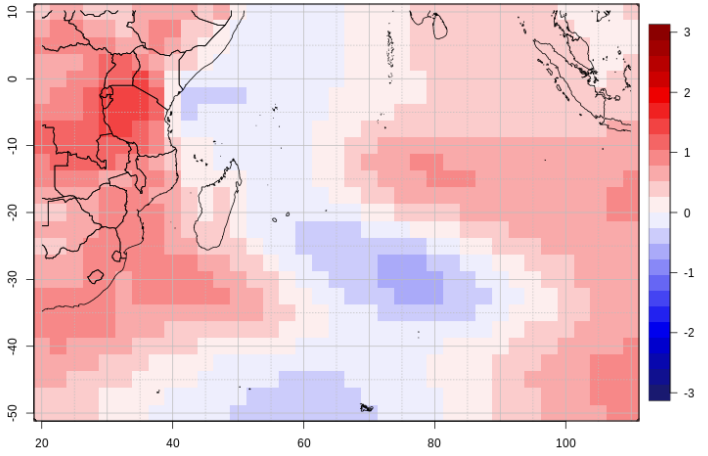
CEP51.MF8.NCEP

Forecast Mix GCM SSTglobal - FMA2024-lt1



CEP51.MF8.NCEP

Forecast Mix GCM PMERglobal - FMA2024-lt1

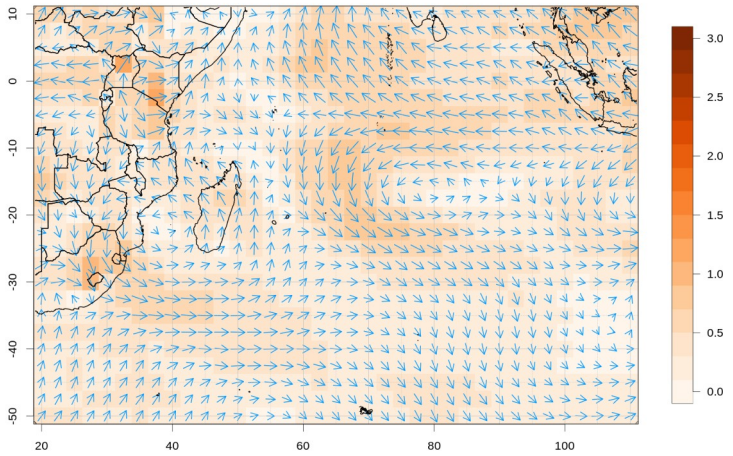


CEP51.MF8.NCEP

2 - Objective forecast (FMA & MAM 2024)

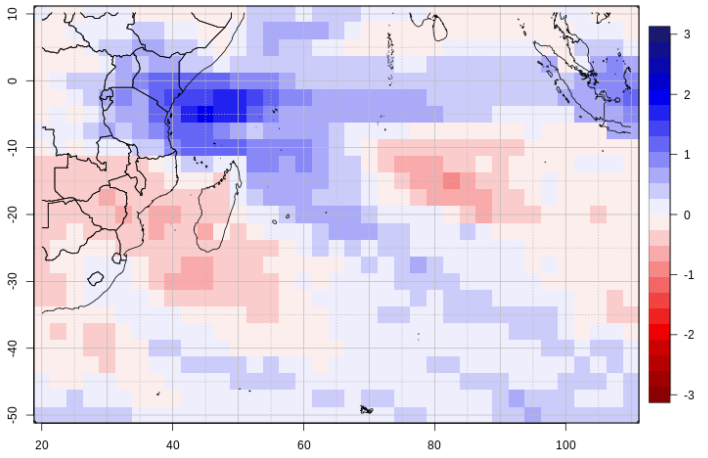
Large scale synthesis maps from MF, ECMWF, NCEP GCMs: Base january 2024 - MAM

Forecast Mix GCM U850global - MAM2024-lt2



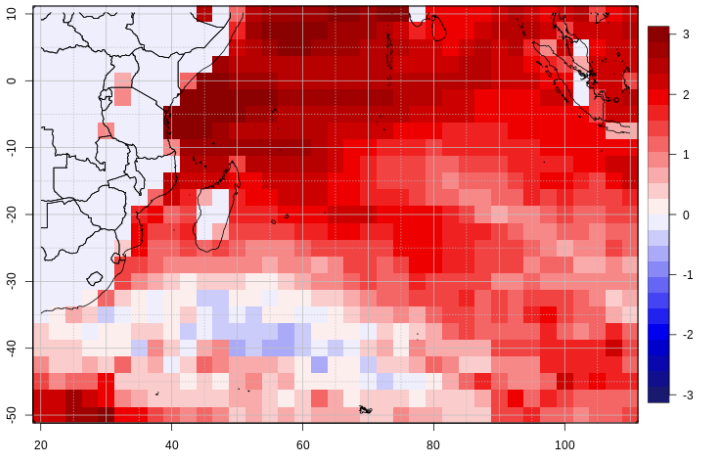
CEP51.MF8.NCEP

Forecast Mix GCM PRECglobal - MAM2024-lt2



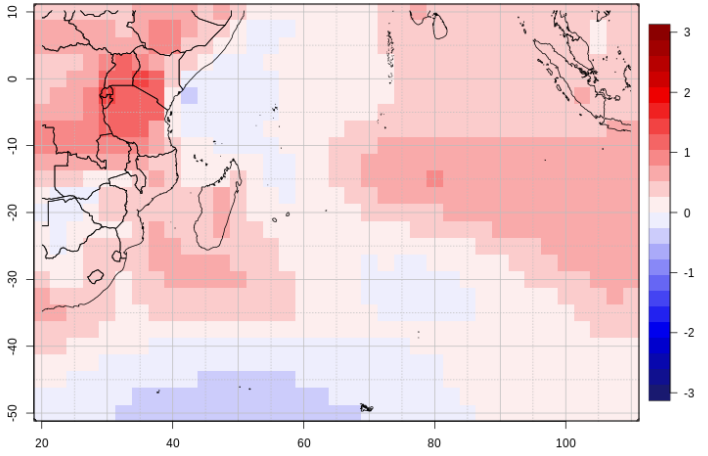
CEP51.MF8.NCEP

Forecast Mix GCM SSTglobal - MAM2024-lt2



CEP51.MF8.NCEP

Forecast Mix GCM PMERglobal - MAM2024-lt2

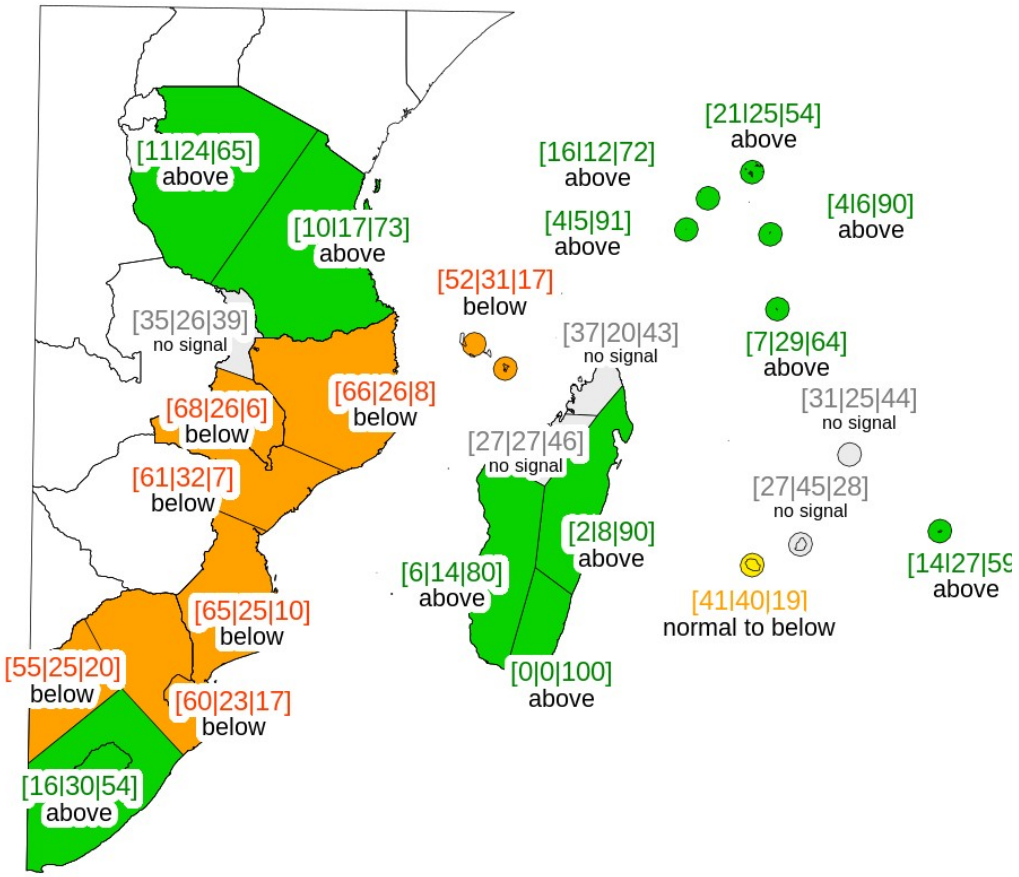


CEP51.MF8.NCEP

2 - Objective forecast (FMA & MAM 2024)

Rainfall Seasonal forecast - FMA 2024 - lt 1

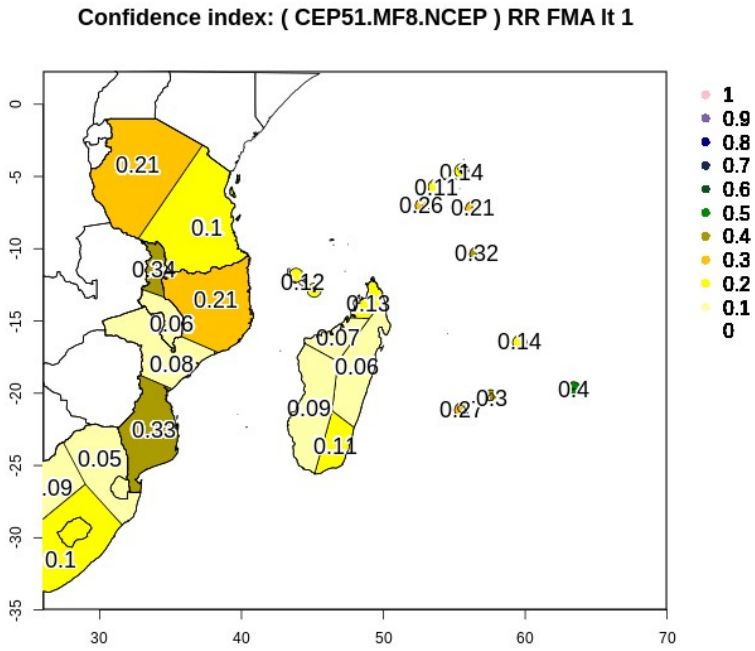
Objective Rainfall forecast issued in January 2024



Forecast based on :

Statistical adaptation of GCM output at regional scale

>>> MME (MF + ECMWF + NCEP)

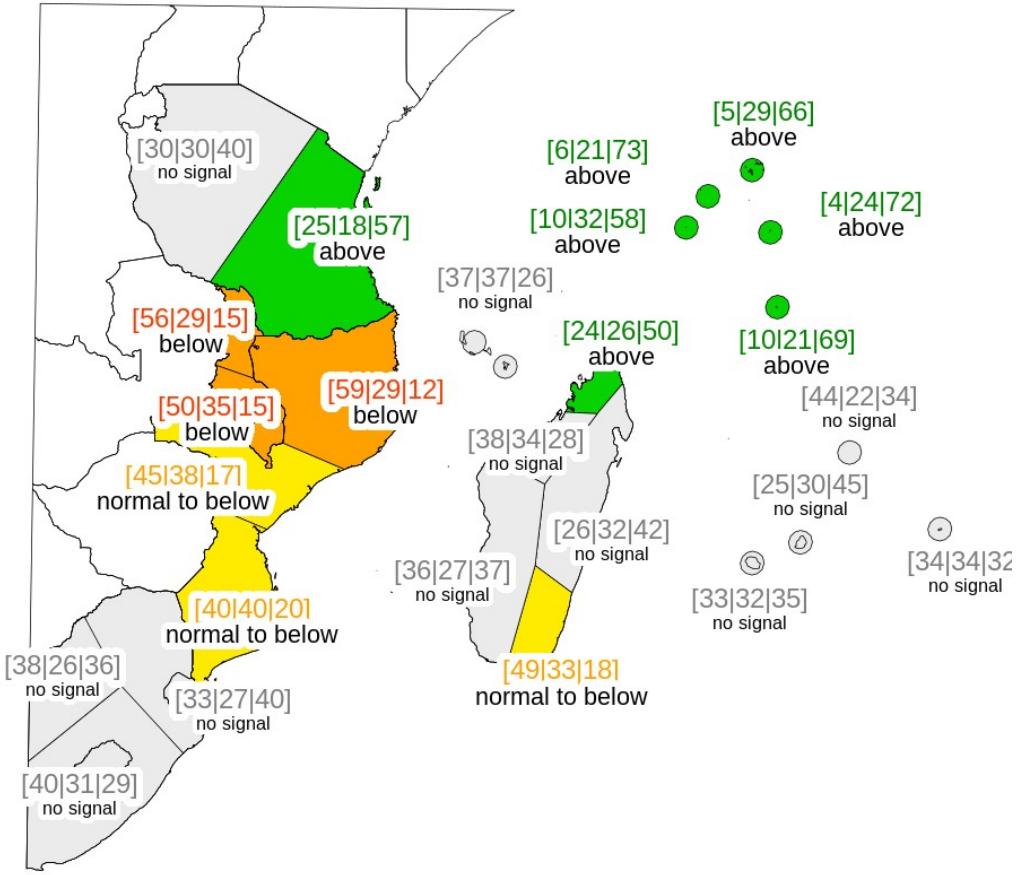


CEP51.MF8.NCEP

2 - Objective forecast (FMA & MAM 2024)

Rainfall Seasonal forecast - MAM 2024 - lt 2

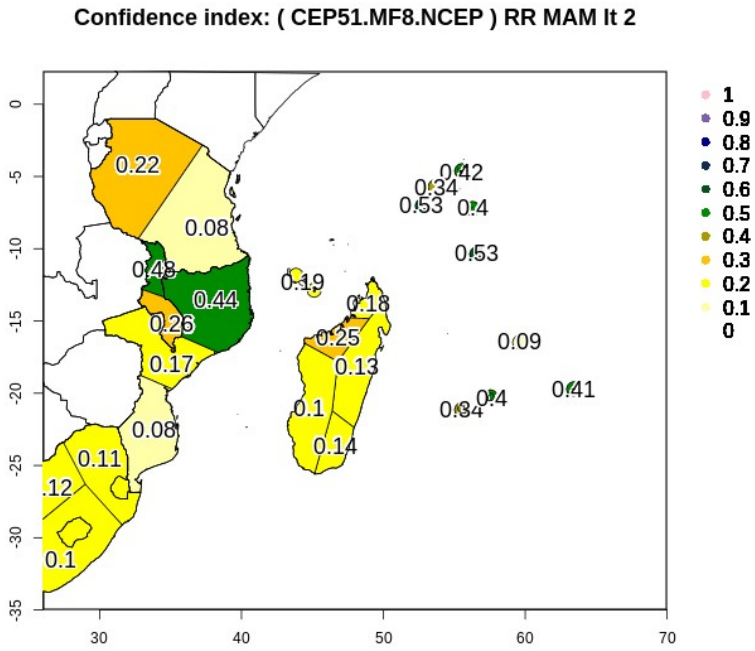
Objective Rainfall forecast issued in January 2024



Forecast based on :

Statistical adaptation of GCM output at regional scale

>>> MME (MF + ECMWF + NCEP)



CEP51.MF8.NCEP

2 - Objective forecast (FMA & MAM 2024)

Assessment of a confidence level associated to rainfall forecast :

Hindcast (24 years) for 3 GCM (NCEP, ECMWF, MF8) ran over the SWIO region (SWIO2) for FMA (lt1) season.
> Production of 24 rainfall forecasts.
> Verification of the forecasts by comparison with de reference dataset (ERA5)

FMA Global statistics for the region (25 zones):

	FCST	**OBS**	
- Nb positive anomalies (Normal to above normal / Above normal) :	172	111	64 %
- Nb negative anomalies (Normal to below normal / Below normal) :	171	104	61 %

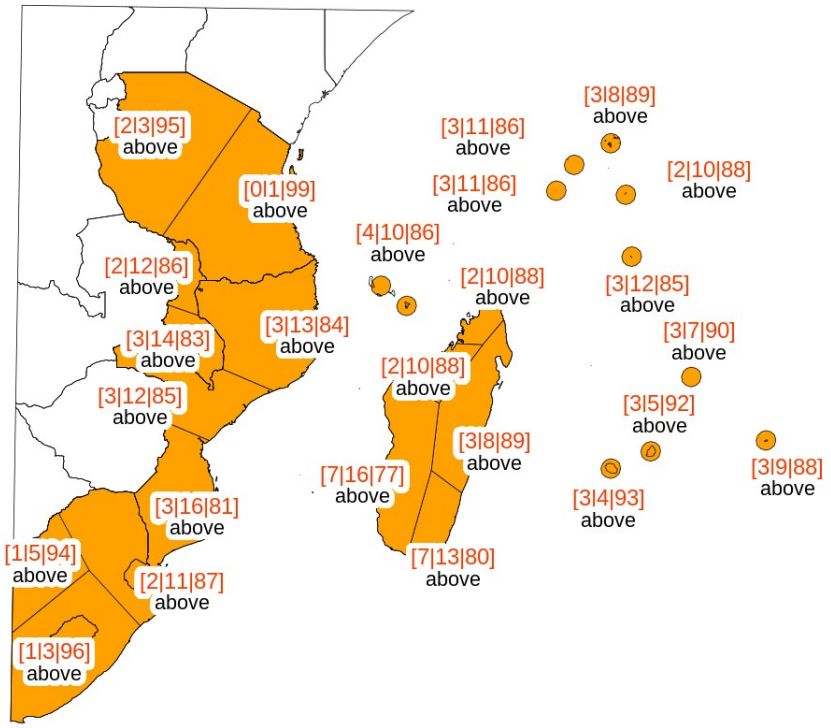
- Nb missed Above normal cases : 55 / 159 = 35 %

- Nb missed Below normal cases : 47 / 158 = 30 %

2 - Objective forecast (FMA & MAM 2024)

Objective Temperature forecast issued in January 2024 for lt1 and lt2

Temperature Seasonal forecast - FMA 2024 - lt 1



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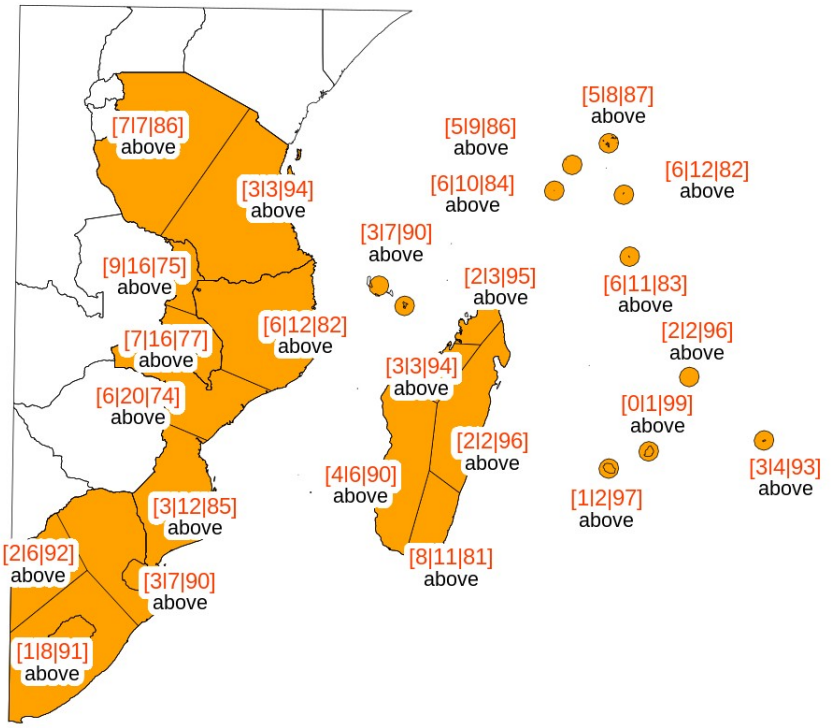
Temperature Seasonal forecast - MAM 2024 - lt 2



CEP51.MF8.NCEP


Thank you for your attention
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