South West Indian Ocean region

ACCOF-16

Laurent LABBE (Météo France Regional Center for Indian Ocean)

La Réunion - 8/04/2024

Content

1 – Verification of 2023/11 forecast for DJF

2 – 2024/03 forecast for AMJ & MJJ

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# 1 – DJF 2023 forecast verification

In this section we present the verification of the forecast issued in november 2023 for the next quarter (DJF 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 ;
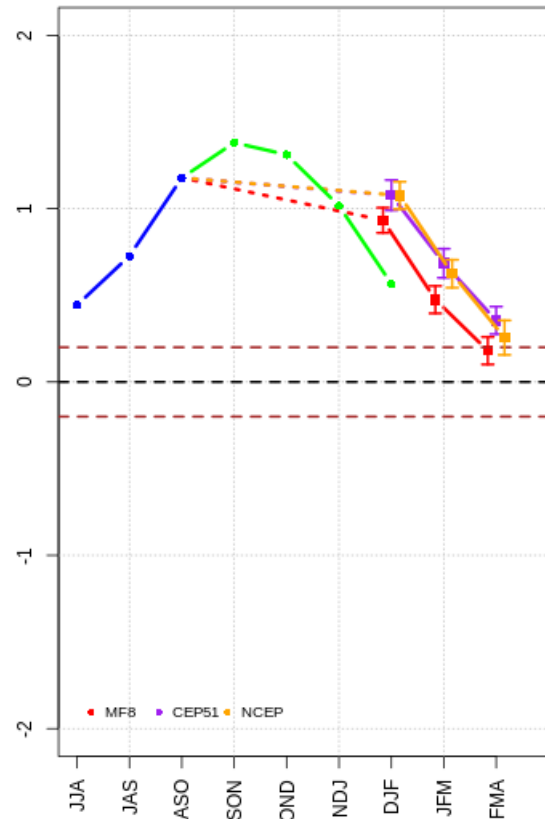
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1 – DJF 2023 forecast verification

November 2023 forecast and verification of oceanic indices
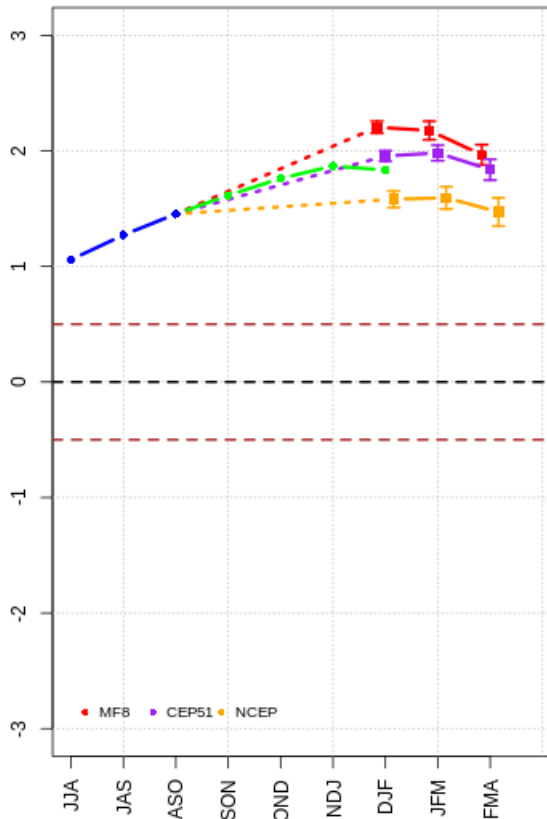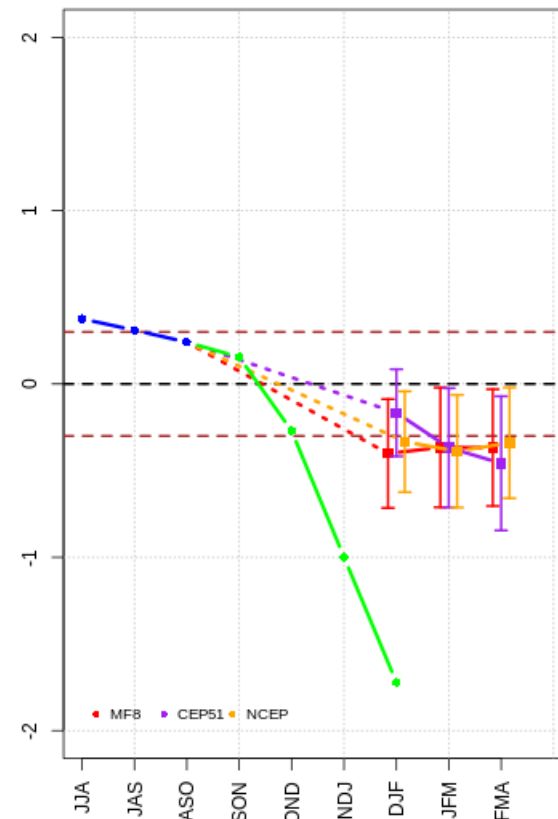

ENSO extremum of positive phase correctly predicted

IOD decreasing positive phase correctly predicted overall – decrease underestimated

SIOD negative phase *uncorrectly* predicted

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1 – DJF 2023 forecast verification

November 2023 forecast and verification of GCM parameters
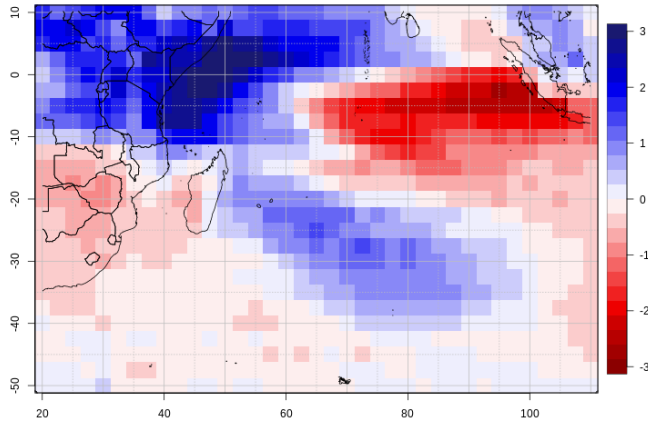
MME Forecast for : SST, Rainfall, Wind 850
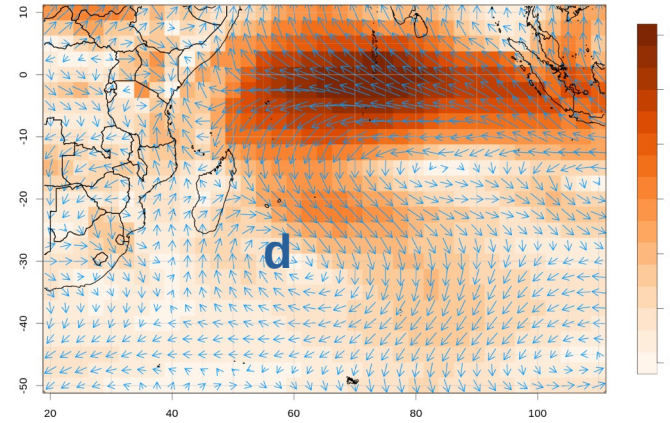

Forecast Mix GCM SSTglobal - DJF2023-lt1
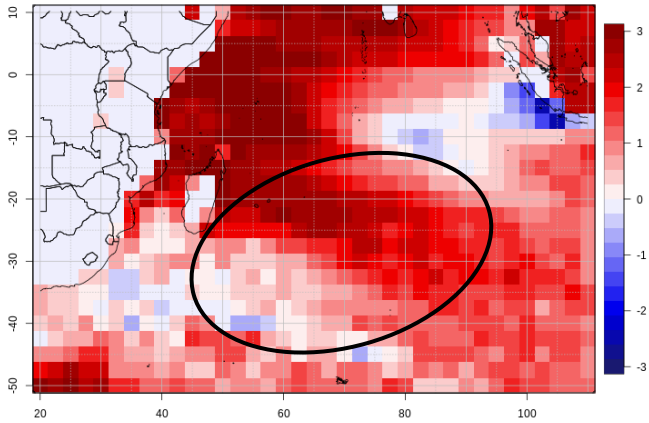
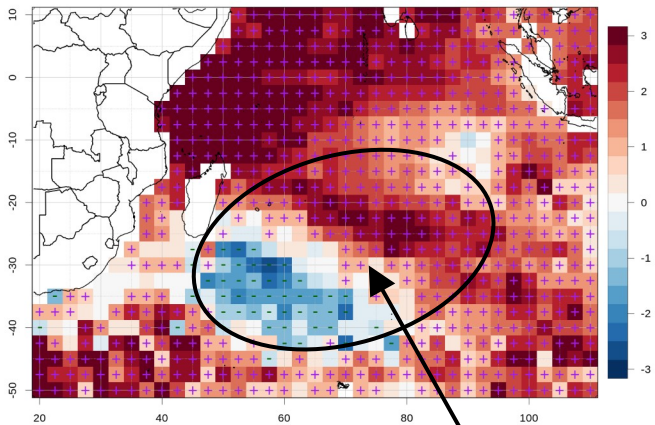CEP51.MF8.NCEP

Forecast Mix GCM PRECglobal - DJF2023-lt1

CEP51.MF8.NCEP

Forecast Mix GCM U850global - DJF2023-lt1
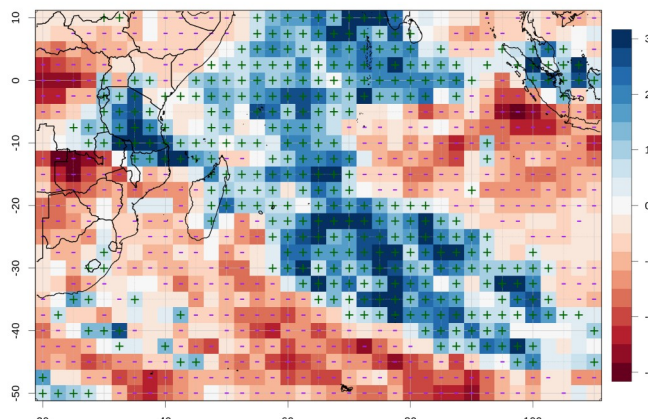
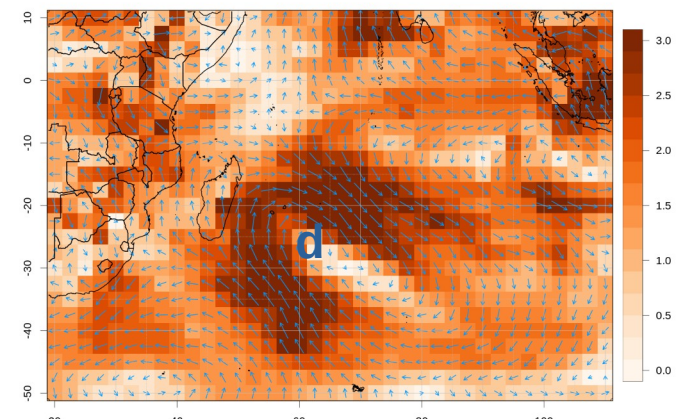CEP51.MF8.NCEP

ERA5 SST Std. Anom. : DJF 2023

Ref: 1993-2016

ERA5 PREC Std. Anom. : DJF 2023

Ref: 1993-2016

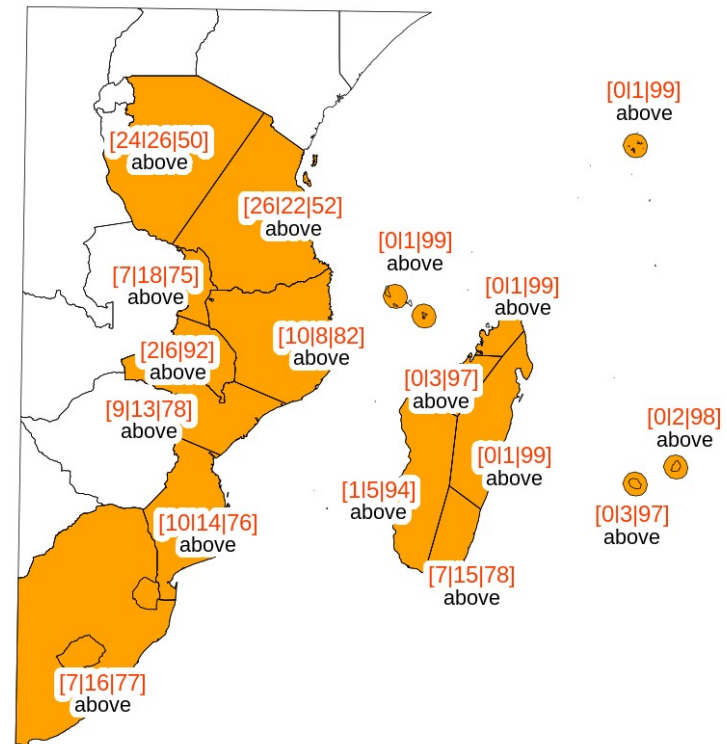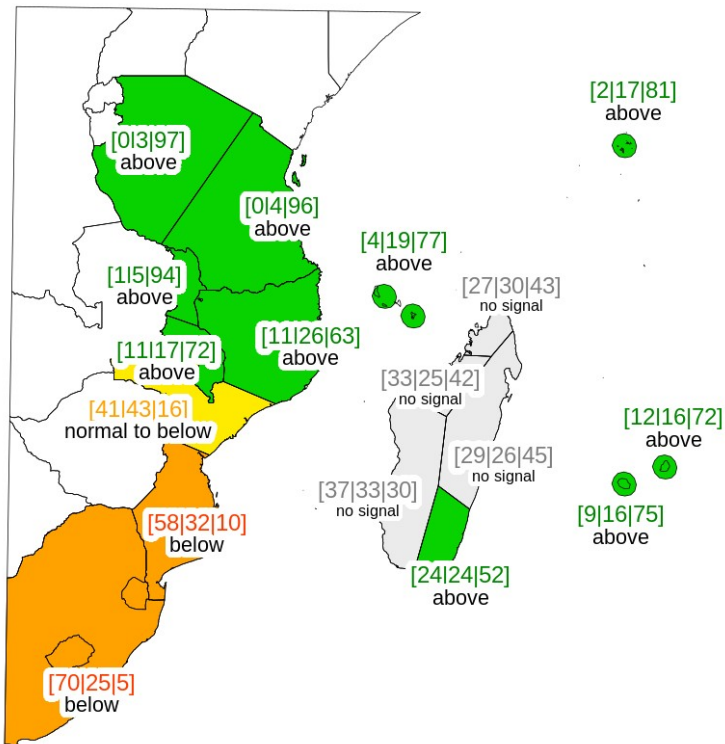ERA5 850hPa Wind anomaly : DJF

Ref: 1993-2016

SIOD

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1 – DJF 2023 forecast verification

Objective Rainfall and Temperature forecast issued in November 2023

Rainfall Seasonal forecast - DJF 2023 - lt 1

Temperature Seasonal forecast - DJF 2023 - lt 1
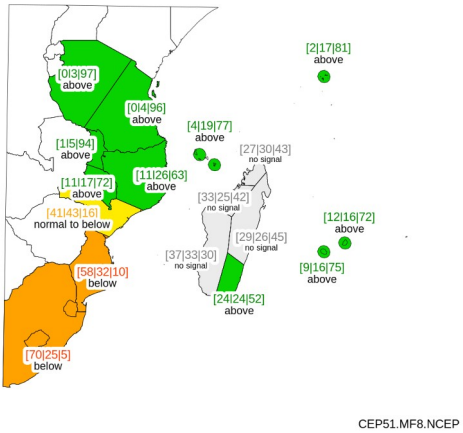

CEP51.MF8.NCEP

CEP51.MF8.NCEP

Forecast based on :

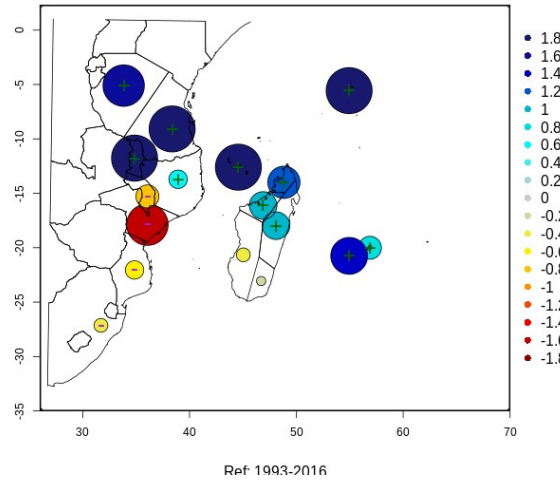Statistical adaptation of GCM output
at regional scale

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

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1 – DJF 2023 forecast verification

Forecast

Observed anomalies
(verification Dataset ERA5)

RPSS score
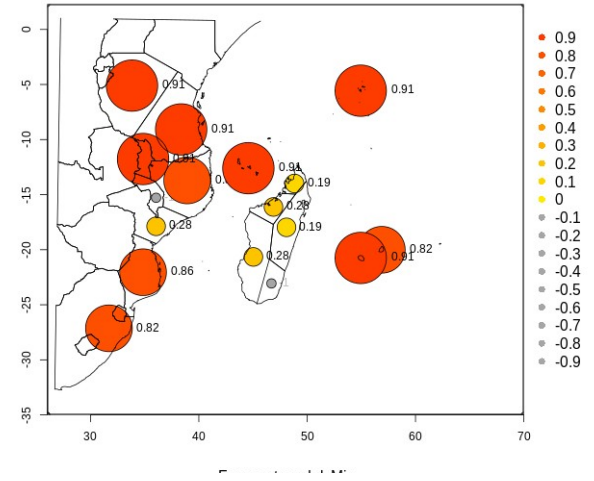
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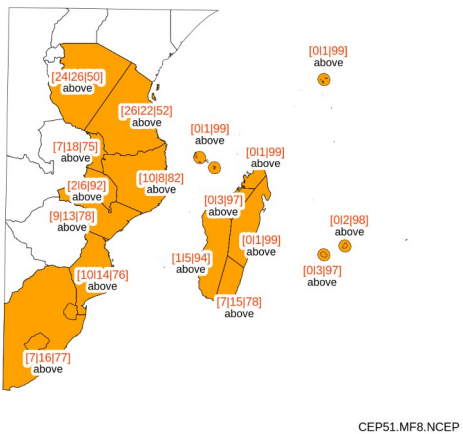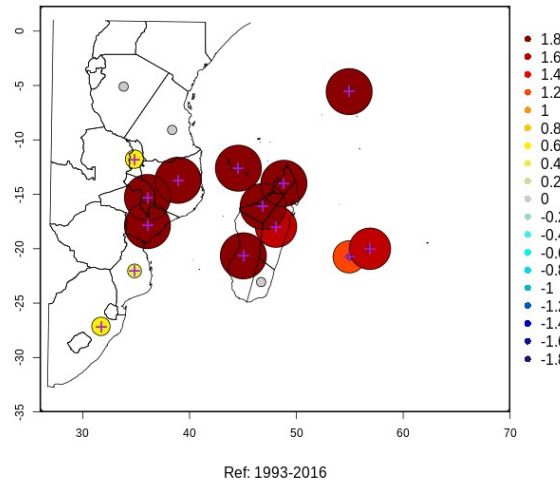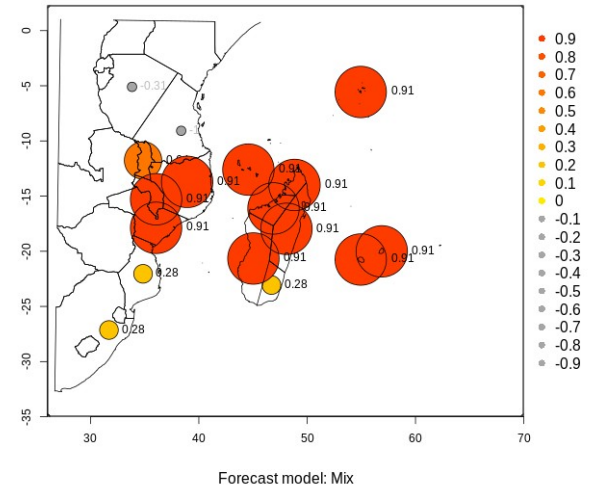
2 - Objective forecast (AMJ & MJJ 2024)

In this section we present the objective forecasts from start month : March 2024, for leadtimes 1 (AMJ) and 2 (MJJ)

- 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
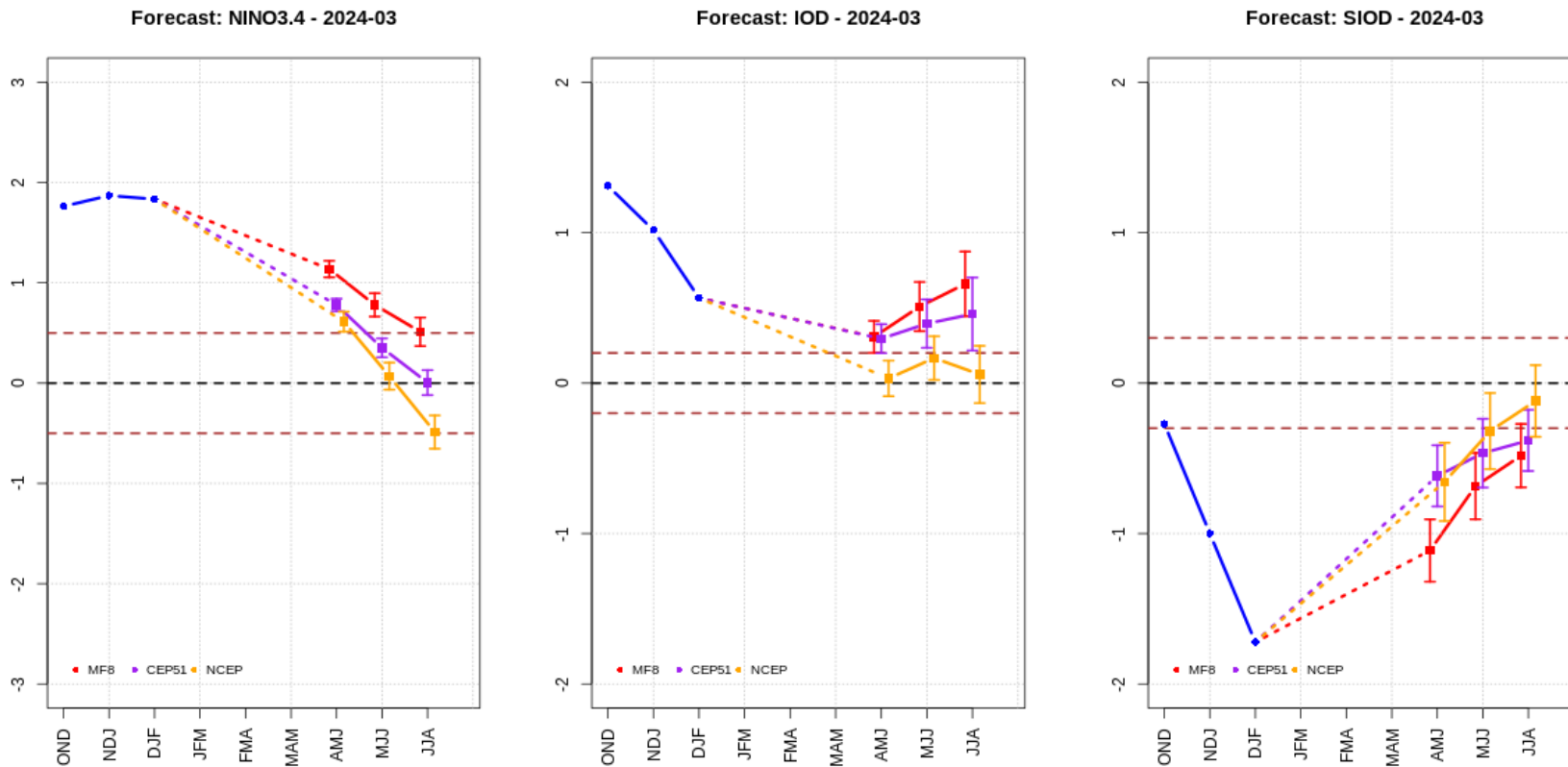
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2 - Objective forecast (AMJ & MJJ 2024)

Large scale drivers context :

ENSO : Decreasing El Nino phase, expcted to be near neutral

IOD : Decreasing positive phase – expected to be near neutral

SIOD : Decreasing negative phase – expected to be still slightly negative – NB : At this time the SIOD is already observed in a neutral phase !
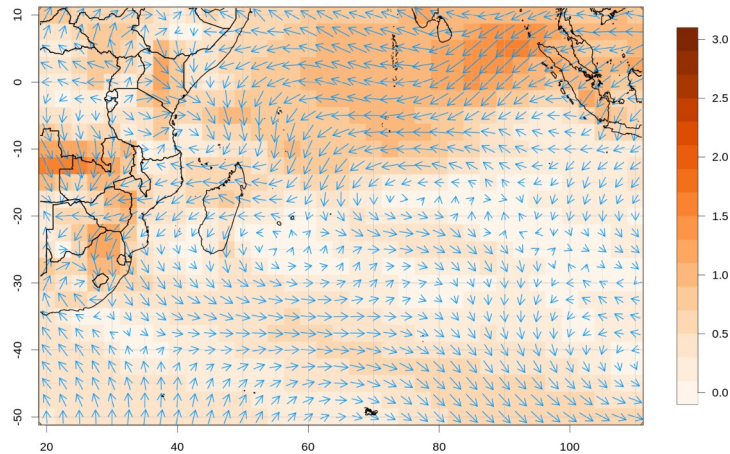

Large scale drivers should not be very active – The impact on atmospheric circulation should be limited to inertia associated to past ElNino and negative SIOD

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2 - Objective forecast (AMJ & MJJ 2024)

Large scale synthesis maps from MF, ECMWF, NCEP GCMs: Base march 2024 - AMJ
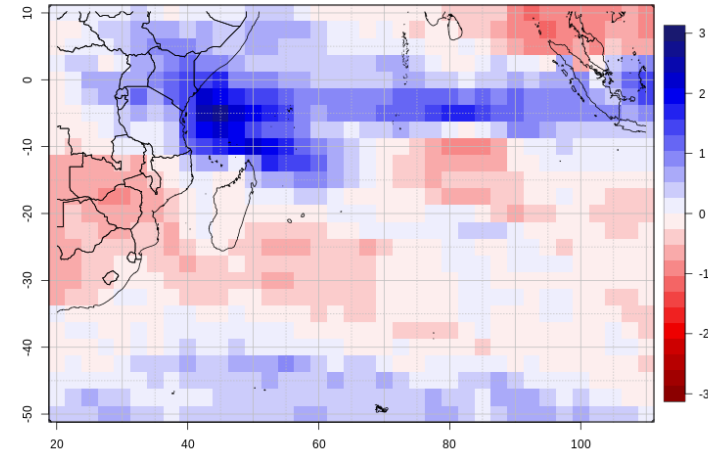
Wind 850

Forecast Mix GCM U850global - AMJ2024-lt1
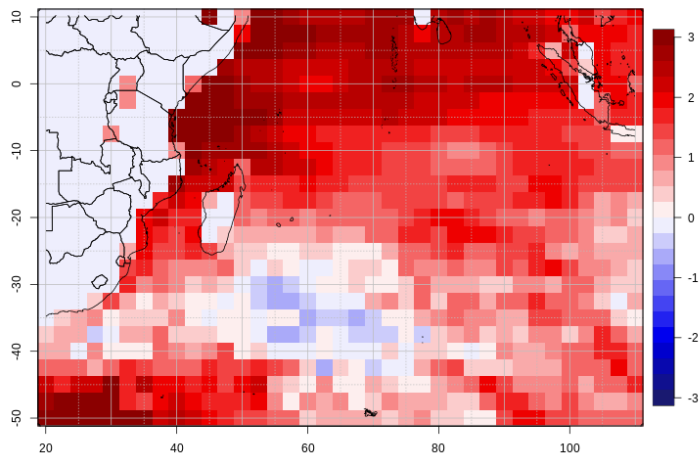

CEP51.MF8.NCEP

Rainfall

Forecast Mix GCM PRECglobal - AMJ2024-lt1

CEP51.MF8.NCEP

SST

Forecast Mix GCM SSTglobal - AMJ2024-lt1

CEP51.MF8.NCEP

MSLP

Forecast Mix GCM PMERglobal - AMJ2024-lt1

CEP51.MF8.NCEP

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2 - Objective forecast (AMJ & MJJ 2024)

Large scale synthesis maps from MF, ECMWF, NCEP GCMs: Base march 2024 - MJJ

Wind 850   Forecast Mix GCM U850global - MJJ2024-lt2

CEP51.MF8.NCEP

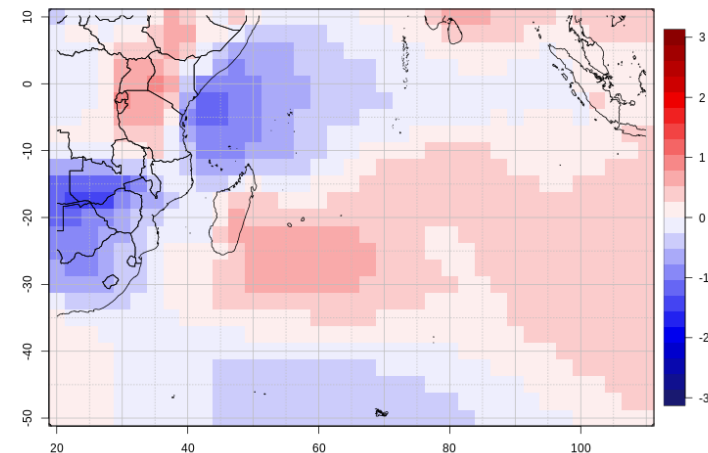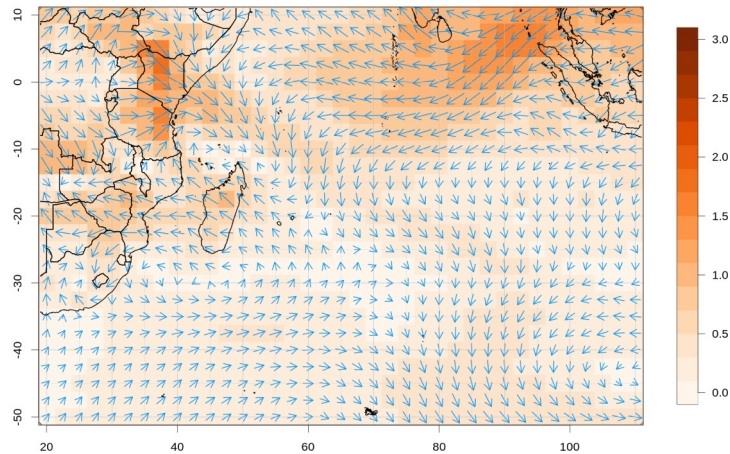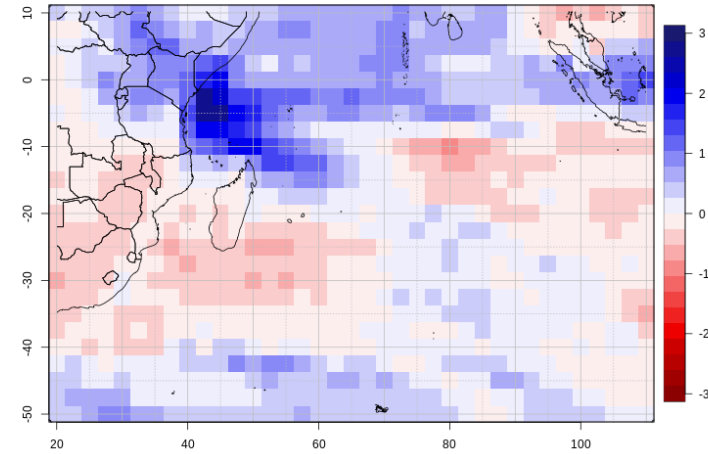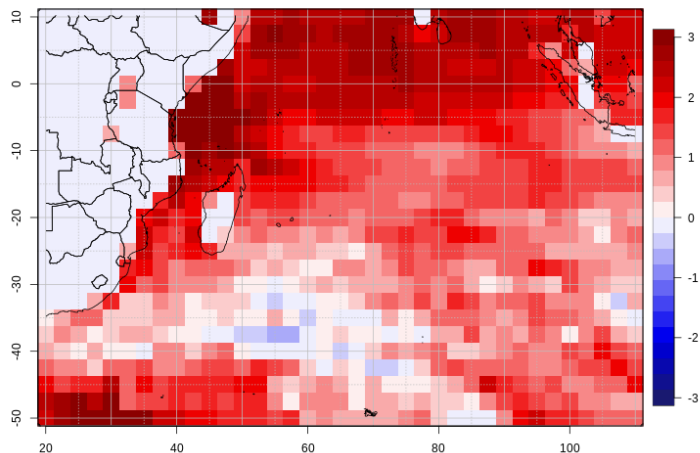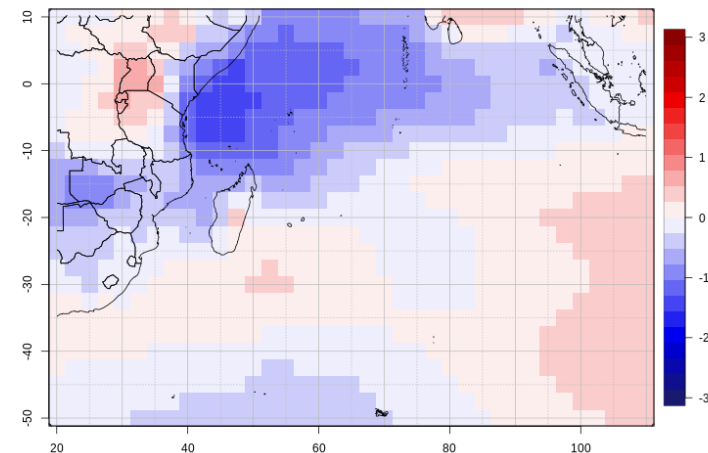**Rainfall**   Forecast Mix GCM PRECglobal - MJJ2024-lt2

CEP51.MF8.NCEP

SST   Forecast Mix GCM SSTglobal - MJJ2024-lt2

CEP51.MF8.NCEP

MSLP   Forecast Mix GCM PMERglobal - MJJ2024-lt2

CEP51.MF8.NCEP

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2 - Objective forecast (AMJ & MJJ 2024)

Rainfall Seasonal forecast - AMJ 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)

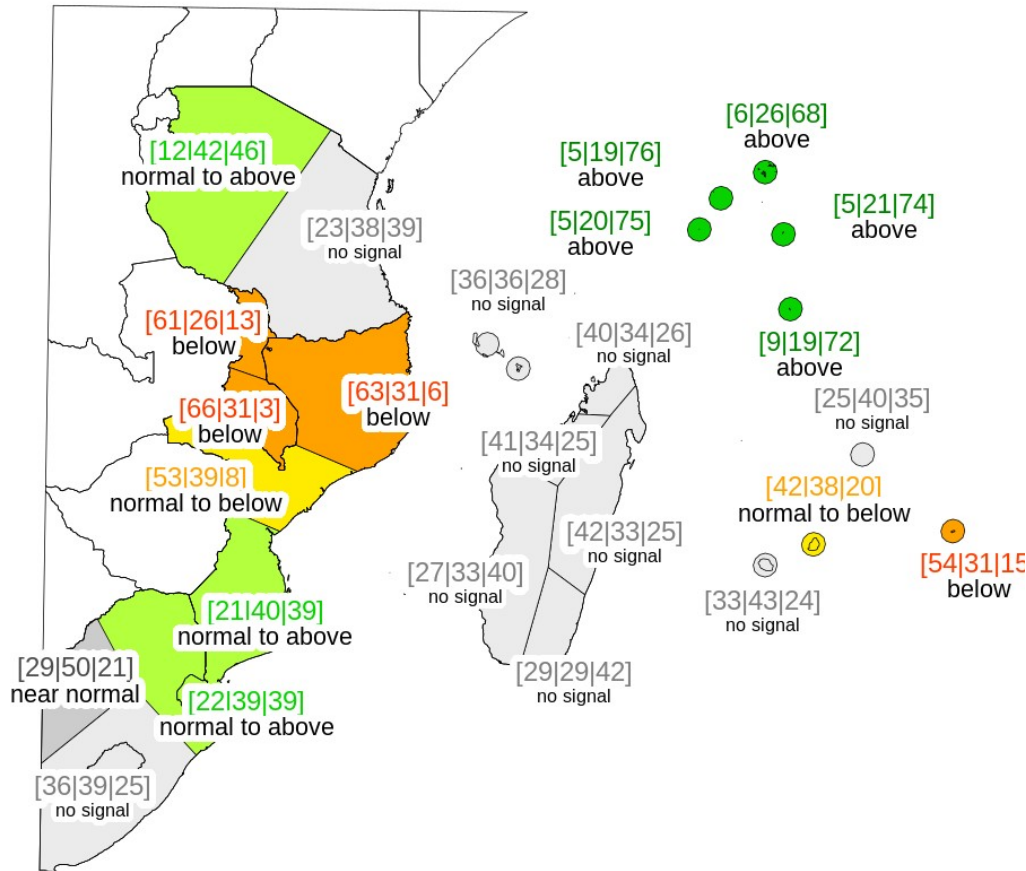Confidence index: (CEP51.MF8.NCEP) RR AMJ lt 1

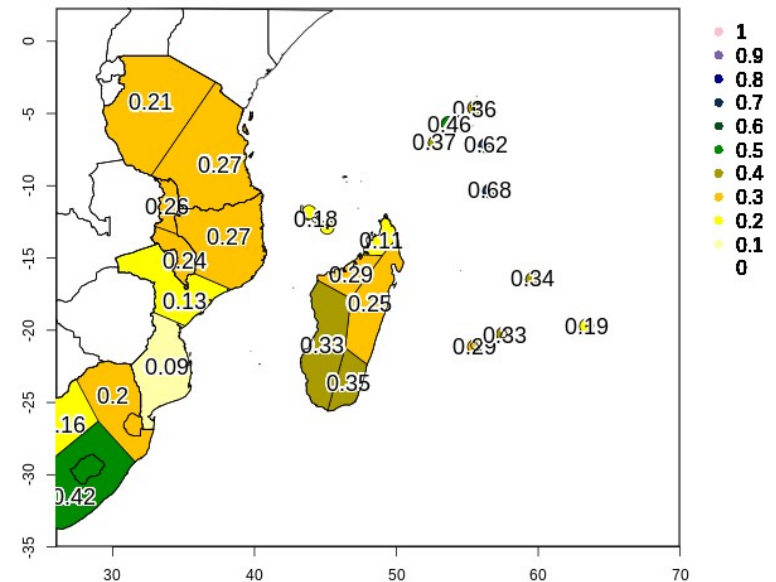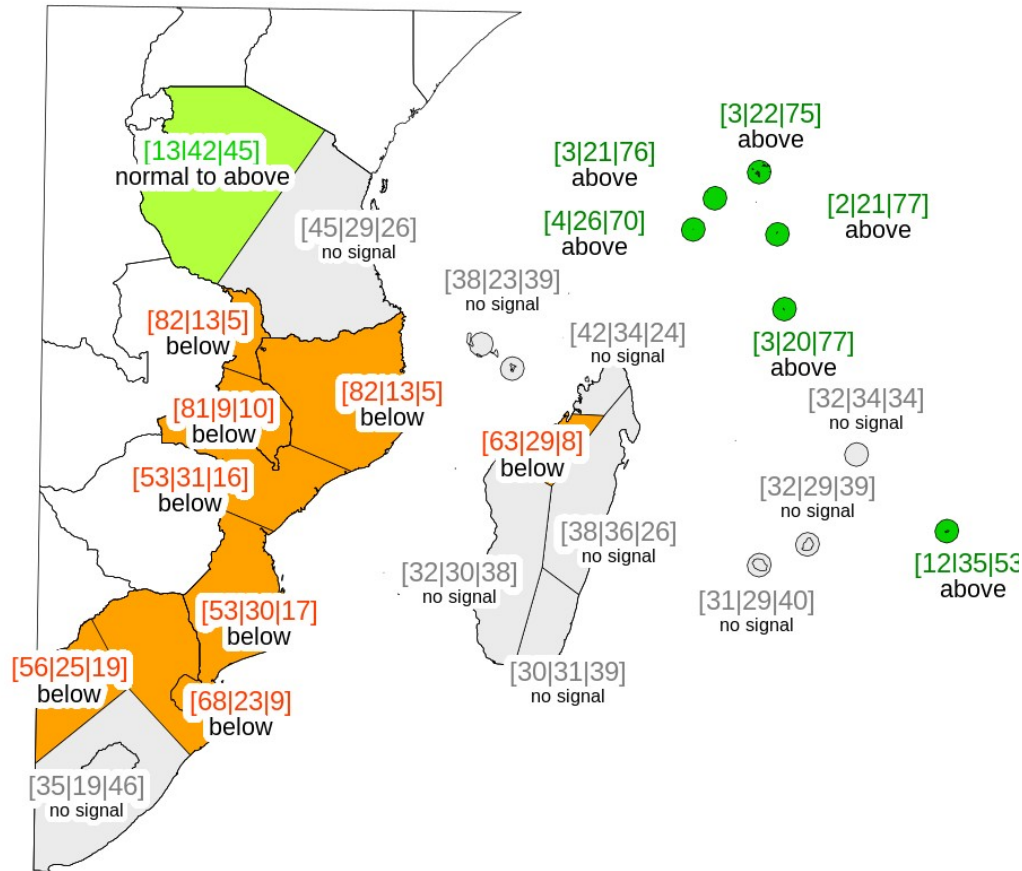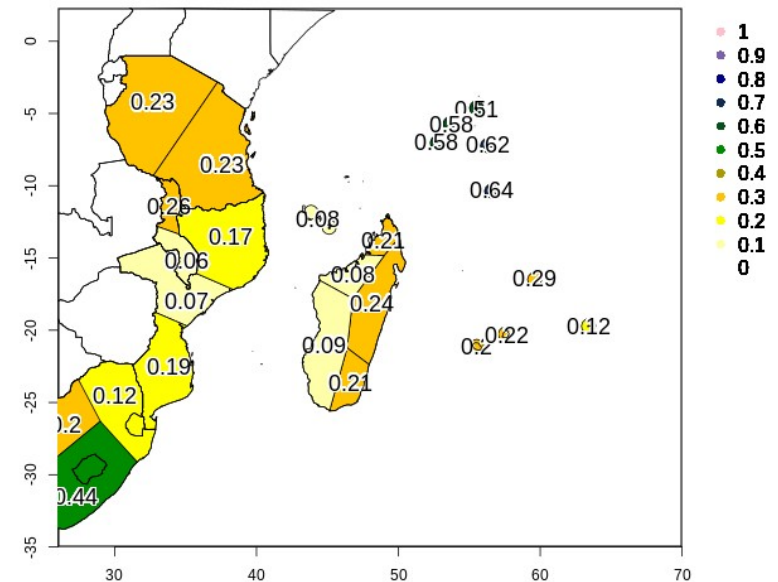CEP51.MF8.NCEP

2 - Objective forecast (AMJ & MJJ 2024)

Rainfall Seasonal forecast - MJJ 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 (AMJ & MJJ 2024)

Assessment of a confidence level associated to rainfall forecast :

Hindcast (24 years) for 3 GCM (NCEP, ECMWF, MF8) ran over the SWIO region
for AMJ (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	122	71 %
- Nb negative anomalies (Normal to below normal / Below normal) :	259	161	62 %

- Nb missed Above normal cases : 39 / 200 = 20 %

- Nb missed Below normal cases : 67 / 189 = 35 %

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2 - Objective forecast (AMJ & MJJ 2024)

Objective Temperature forecast issued in March 2024 for lt1 and lt2

Temperature Seasonal forecast - AMJ 2024 - lt 1

Temperature Seasonal forecast - MJJ 2024 - lt 2

CEP51.MF8.NCEP

CEP51.MF8.NCEP

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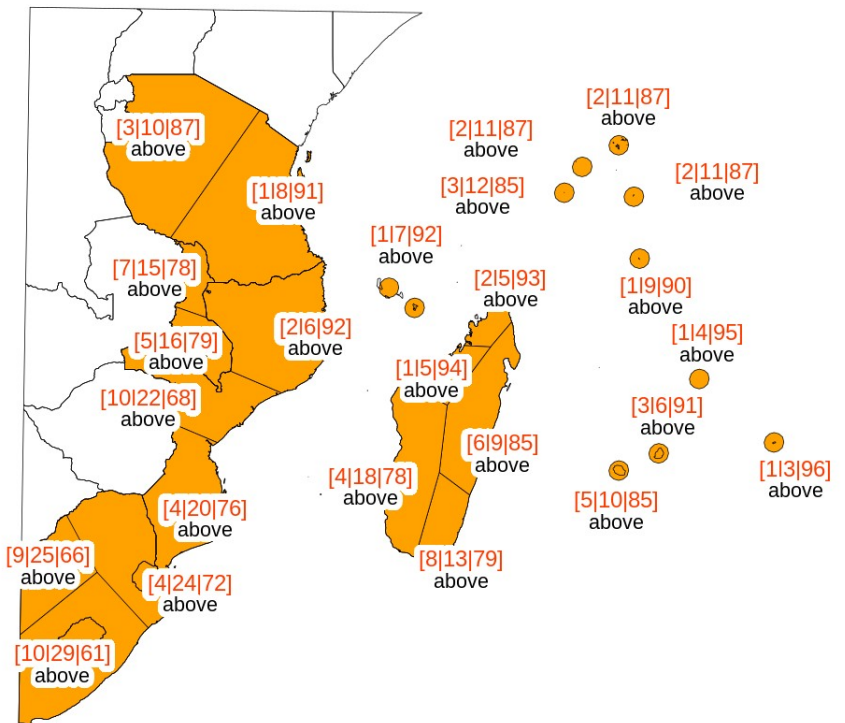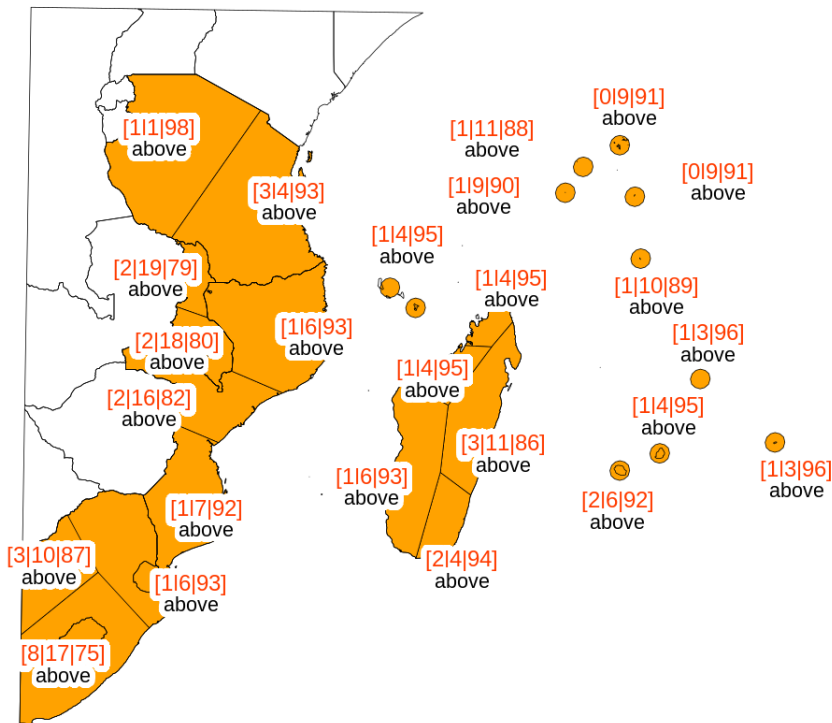
Thank you for your attention

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