SWIOCOF - TC
- Methodological issues -

Météo France – Direction Interrégionale Océan Indien

RSMC La Réunion

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Regional Outlook Forum for South-West Indian Ocean countries

28 October 2021

- WebConference -

What is a TC seasonal outlook

➔ A description of the general characteristics of the forthcoming TC season.

➔ Our approach focuses on :
  ➔ TC activity (ACE, TS/TC number, TS/TC days ...)
  ➔ Preferred genesis location
  ➔ Track typology

➔ Required:

  ➔ A better knowledge of what explains TC interannual variability over SWIO

What a TC seasonal outlook is not ?

➔ A forecast of TC impact for a specific region or island

➔ A way to reduce my preparedness if the season is forecasted to be below normal activity.
One only can be a disaster! (many examples worlwide of a single dreadful TC during a season with below normal activity)

Methodology

➔ **Statistical** approach to link the interannual variability of some of the large scale parameters to key features of a TC season (use of SEAFORDS for composite and canonical correlation analyses).

➔ **Choice of the best predictors** : SST, Zonal wind at different vertical levels (U850 lower level, U500 mid level, U200 high level), climate drivers identification.

➢ **Needed data** *:*
  - ➢ *Large scale :* forecast anomalies from several Seasonal Forecast global models (SEAS5, MF7, NCEP, UKMO available on COPERNICUS portal)
  - ➢ *Historical data for the TC activity of the SWIO basin (RSMC bestrack database) :* track density, ACE, number of systems, genesis location, tracks typology...
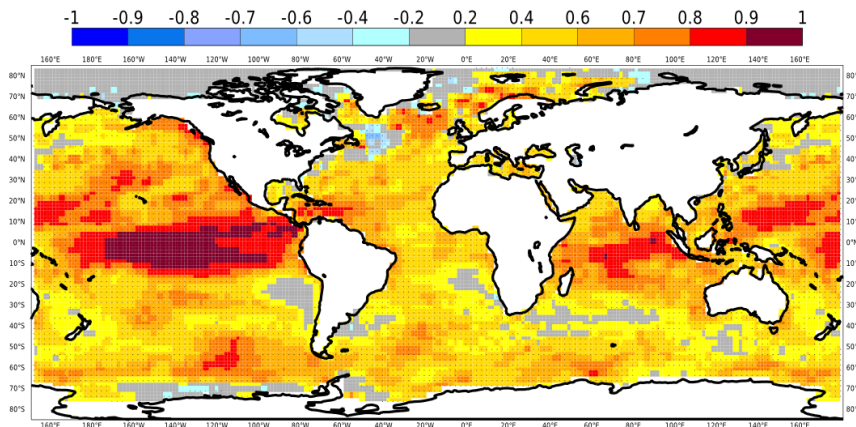
Predictability issue

Need to assess the uncertainty

➢ Chaotic nature of TC activity (fast changes in track and intensity depending on the current synoptical background, influence of infra-seasonal oscillations...)

➢ Statistical robustness can be low because of the small size of observation historical sample

➢ Skills of the Global Climate Models drop when moving towards the subtropics and the mid-latitutes
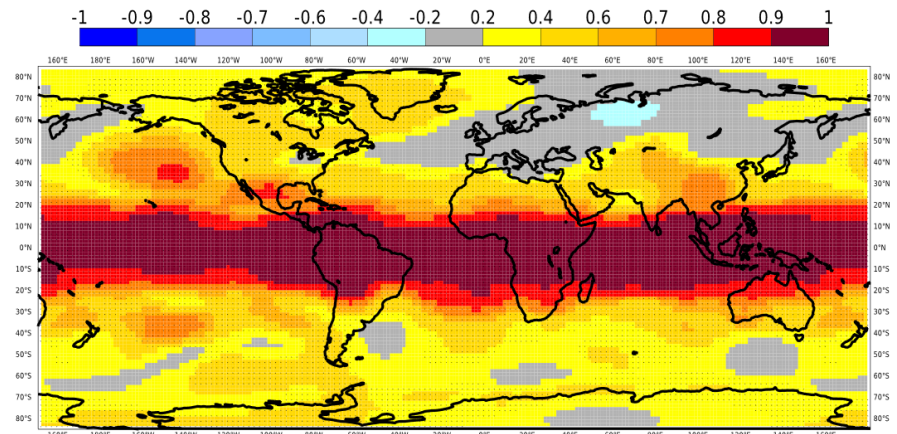
Anomaly correlation for SEAS5 (ECMWF model)

Sea Surface Temperature

500 hPa geopotential height

Methodology

➔ **Need to consider :**

- ➢ a panel of models (COPERNICUS C3S consensus → contribution from 7 GPCs)
- ➢ different statistical approaches (analogs, composite analyses, CCA...)
- ➢ as many predictors as possible (SST but not only) but also different predictands in order to better characterize the TC activity (not only the number of storm and cyclones
- ➢ consider dynamical products : ECMWF products based on a tracking of TC in the predicted meteorological fields

- IMPORTANT TO CROSS INFORMATION IN ORDER TO ASSESS THE PREDICTABILITY AND ROBUSTNESS OF THE MESSAGE

- BRING OUT KEY MESSAGES THAT ARE USEFUL FOR STAKEHOLDERS

Verification from last year prediction

What was predicted :

➢ 9-12 named systems, 5-7 reaching TC intensity
➢ Enhanced likelyhood of genesis east of 70E
➢ Zonal to parabolic tracks
➢ Normal to above normal activity west of 70E

What happened :

➢ 12 named systems, 7 reaching TC intensity
➢ 7 genesis east of 70E (60%)
➢ Zonal to parabolic tracks until January.

➢ Very poor activity near Mascarene Islands, two landfalls on the east coast of Madagascar and Mozambique (Chalane and Eloise), one landfall on the west coast of Madagascar (Iman).

activité cyclonique de la saison 2020-2021

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ALICIA 2020RE0BONGOYOHALANE2020RE05 DANILO ELOISE JOSHUA2020RE09 FARAJI
GUAMBE MARIAN HABANA IMAN 2020RE15 JOBO

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ALICIA
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RE05
RE09
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CHABANE
HABANA
ELOISE
IMAN
GUAMBE

2021 Oct 11 12S128

StormType: ——1 Zp ——2 Zp/PT/DT ——3 TTM/FTT ——4 CT/CTI/CTTI ——7 Dsub ——5 Dpost/Dextra ——6 seComblant ——8 surTerre ——9 non défini