RSMC La Réunion
Tropical Cyclone Centre
for the South-West Indian

METEO FRANCE

Réunion Island, 15 November 2016

<u>Subject</u> : Introducing a new graphical product supplied by RSMC La Reunion called : "Cyclogenesis risk prognosis map for the South-West Indian Ocean".

As regards tropical storms, the prediction of their formation (or cyclogenesis) is most probably the field where the numerical weather models have demonstrated the most remarkable improvements during the last decade with occasionally some outstanding achievements, like anticipating a cyclogenesis 8 to 10 days before it actually took place, while there was of course absolutely no harbinger sign of its future occurrence, in particular on the satellite imagery.

Both the non-detections (e.g. the missed events - cyclogeneses that occurred without having been predicted by the numerical models) and false alarms (e.g. the generation of spurious vortices that never materialized into reality), which were still fairly frequent in the early 2000s for the latter, have now become quite rare.

While the primary mission of the La Reunion RSMC/Tropical cyclones is to monitor the tropical systems already formed or in the process of formation and to forecast their evolution, anticipating the cyclogeneses is also part of its role. A function that can become crucial whenever a storm develops rapidly after genesis while right afterwards affecting a land. To be able to predict such a risk, prior to even the emergence of the storm, is definitely an information of utmost importance which gives full meaning to the concept of "early warning system".

Until now, RSMC La Reunion assumed this role of cyclogenesis watch and forecast through its so called "Bulletin for cyclonic activity and significant tropical weather in the Southwest Indian Ocean", a daily advisory also delivered in French and at the end of which a prognosis for the likelihood of a cyclogenesis to occur in the ensuing 5 days is provided (through the assessed probability of tropical depression formation).

From now on, this technical text bulletin, that could appear somewhat indigestible for some readers, will be supplemented by a graphical product that will visually synthesize the essential information about the likelihood of cyclogenesis for the next 5 days, as assessed from the expertise of the duty tropical cyclone forecaster at the RSMC, thereby rendering this information more accessible and more telling. This "Cyclogenesis risk prognosis map" will be delivered on the different websites hosted by Meteo-France La Reunion.

One important point to take note of is the change made to the criteria considered for the cyclogenesis assessment : from now on the risk considered is that of the formation of a tropical storm over the next five days (instead of the formation of a tropical depression).

The risk of genesis is determined both chronologically and in terms of the likelihood of occurrence. Chronologically, we discriminate between a cyclogenesis at short range (0-2 days), for which the targeted area where cyclogenesis is expected to take place will appear within a solid contour, and a cyclogenesis at medium range (2-5 days), for which the targeted area where cyclogenesis is expected to take place will appear within a dashed contour.

RSMC la Réunion

rsmc_tcc.la_reunion@meteo.fr

The level of risk is indicated via the choice of the fill-colour of the contour. In a typical colour code, red filling will correspond to an important likelihood of occurrence of genesis (probability above 50%); orange filling will correspond to a moderate level of likelihood of genesis occurrence (probability between 30 and 50%); yellow filling will correspond to a low probability of genesis occurrence (probability below 30%). Knowing that the risk level is the prevailing parameter compared to chronology (which means that in the common case of a low risk of genesis within the coming 48h, increasing to high at medium range, the map will feature a dashed contour with red colour filling).

Optionally, an arrow will be drawn, indicating the expected moving direction for the anticipated tropical storm to develop.

RSMC La Réunion
Tropical Cyclone Centre
for the South-West Indian

METEO FRANCE

ANNEX

Additional information about the technical specifications of the graphical product of Cyclogenesis risk prognosis map.

Zoning, chronological stratification and depiction of the level of risk : a contour is drawn around the geographical area where the cyclogenesis is considered to be likely to effectively take place. In order to discriminate between short range risk (over the next 48h) and medium range risk (48h to 120h time window), the contour will be drawn in solid line or dashed line respectively. A “simplified” three levels scale of risk has been chosen, coherently with the text of the “Bulletin for cyclonic activity and significant tropical weather in the Southwest Indian Ocean”: low risk (probability below 30%), moderate risk (probability between 30 and 50%), important risk (probability above 50%). A classic colour code is associated to those three levels: yellow, orange and red, respectively. If a choice is required for the related time period (over the next 48h or 2-5 days), the RSMC tropical cyclone forecaster opts for the time period associated to the highest probability.

Related low : In the situation where a low linked to a suspect area has already been identified (and is as such explicitly mentioned in the text of the “Bulletin for cyclonic activity and significant tropical weather in the Southwest Indian Ocean”), it will appear on the map via an “X” drawn at its current location with an associated number (1, 2 or exceptionally 3, depending on the number of suspect areas monitored) that will also be plotted inside the contour of the related cyclogenesis area to make the link. If there is no risk of confusion when linking a cyclogenesis area and the related initial low (single cyclogenesis area for instance or large enough geographical separation), the number will be omitted. To remain coherent, as soon as a number has been assigned for the link between a cyclogenesis area and its initial low, this number will be retained unchanged as long as the suspect area remains on the cyclogenesis map (N.B.: as soon as an individual standard bulletin has been issued to deal with a system now in genesis phase, it will disappear from the cyclogenesis map, now being followed on the map for “active systems”).

Future motion (optional) : An additional information that can have great value in some cases is the future motion looked ahead for the potential tropical storm to develop. In the situation where the tropical cyclone forecaster has enough confidence on this expected future motion, he will draw an arrow linked to the cyclogenesis area indicating the corresponding direction of movement (otherwise the arrow will be omitted). This indication of the future motion essentially focuses on the expected motion after the time the system has achieved to develop into a tropical storm, and as such may provide an outlook beyond the 5 days range.

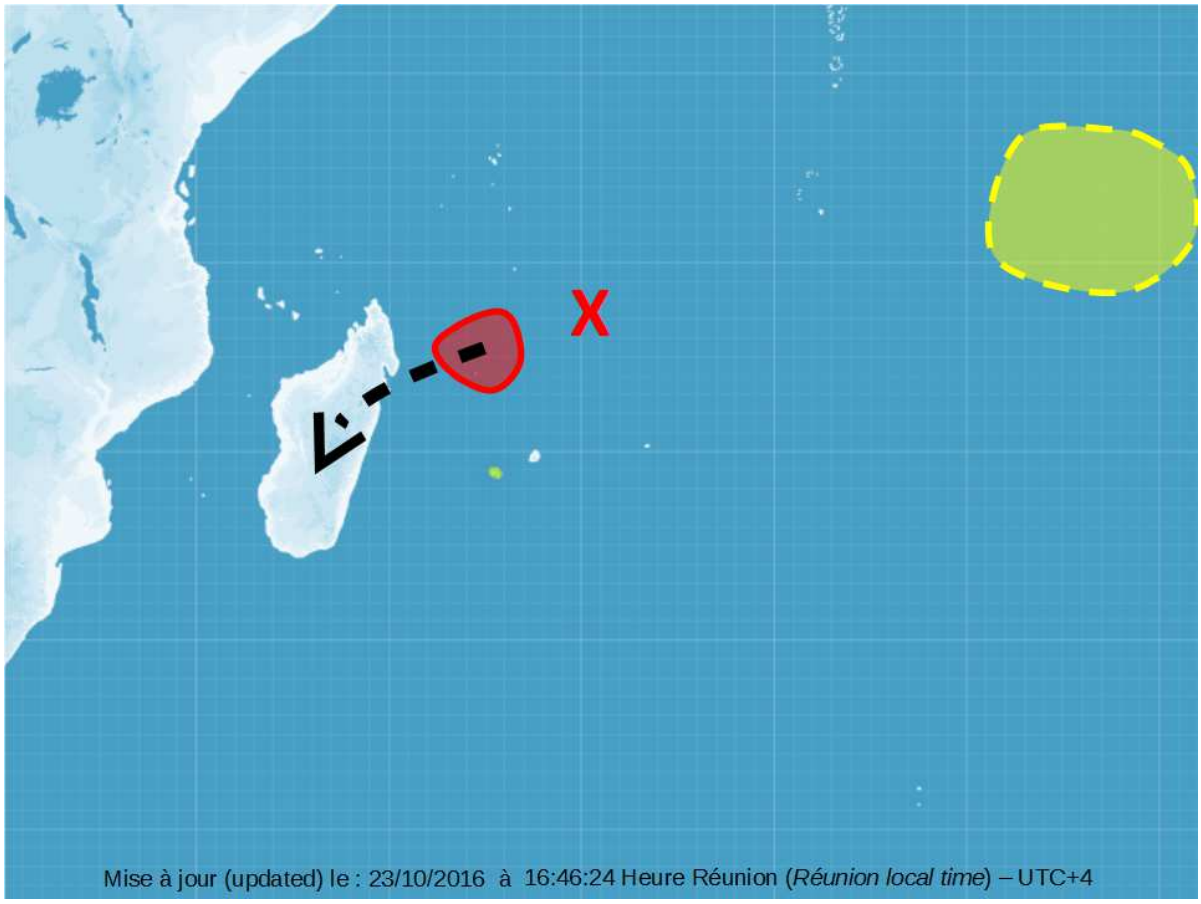
Dissemination time : The Cyclogenesis risk prognosis map is updated daily before 12 utc.

RSMC la Réunion

rsmc_tcc.la_reunion@meteo.fr

RSMC La Réunion
Tropical Cyclone Centre
for the South-West Indian

METEO FRANCE



Example of a cyclogenesis risk prognosis map with two suspect areas existing

RSMC la Réunion

rsmc_tcc.la_reunion@meteo.fr