

Southern Africa-Indian Ocean (SA-IO) Disaster Preparedness ECHO and Partners Workshop

Tropical cyclone and severe weather forecasting in Southern Africa and Indian Ocean supporting anticipatory action



WMO OMM

World Meteorological Organization
Organisation météorologique mondiale

Cyrille Honoré, Director, DRR and public services Branch, WMO

Early warning/climate adaptation initiative for COP-27

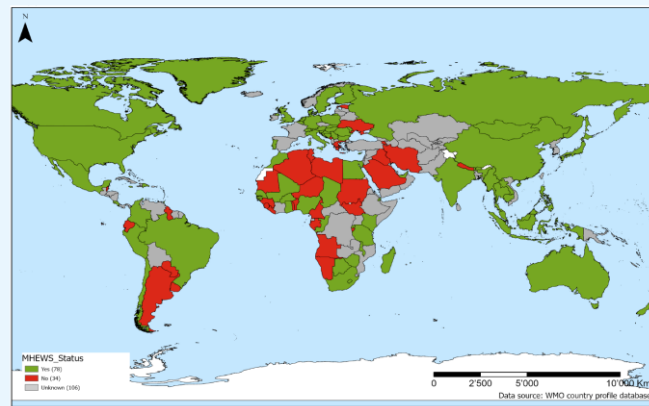
"Today I announce the United Nations will spearhead new action to ensure every person on Earth is protected by early warning systems within five years.

I have asked the World Meteorological Organization to lead this effort and to present an action plan to achieve this goal at the next UN climate conference, later this year in Egypt."

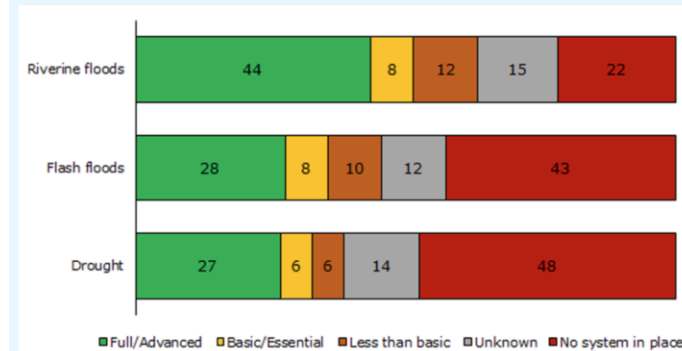
António Guterres, Secretary-General of the United Nations, 23rd March 2022



Global Status of Early Warning System Coverage



Capacities are particularly lacking for the creation of drought and flash flood warnings, despite these hazards being the deadliest and most costly events, respectively, after storms (1970-2019).



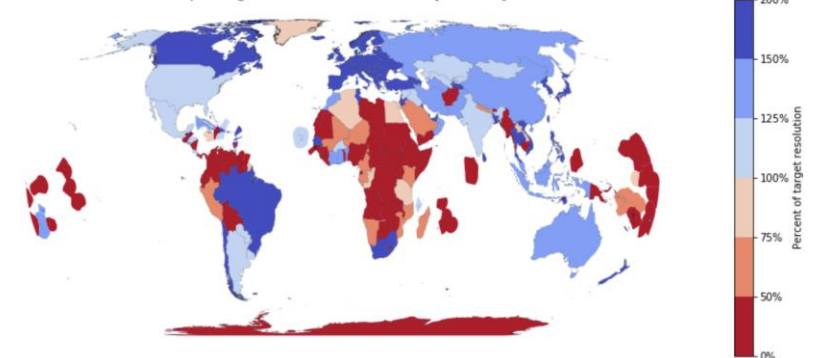
53% of Members have no basic flash flood warning system

54% of Members have no basic drought warning system

Priority areas :

- (1) Earth system observations and monitoring,
- (2) Predictive and warning capabilities,
- (3) Coordinated communication for anticipatory action,

Surface Reporting Horizontal Resolution by Country and EEZ



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WMO Designated GDPFS Centers in Africa

13

centres/networks

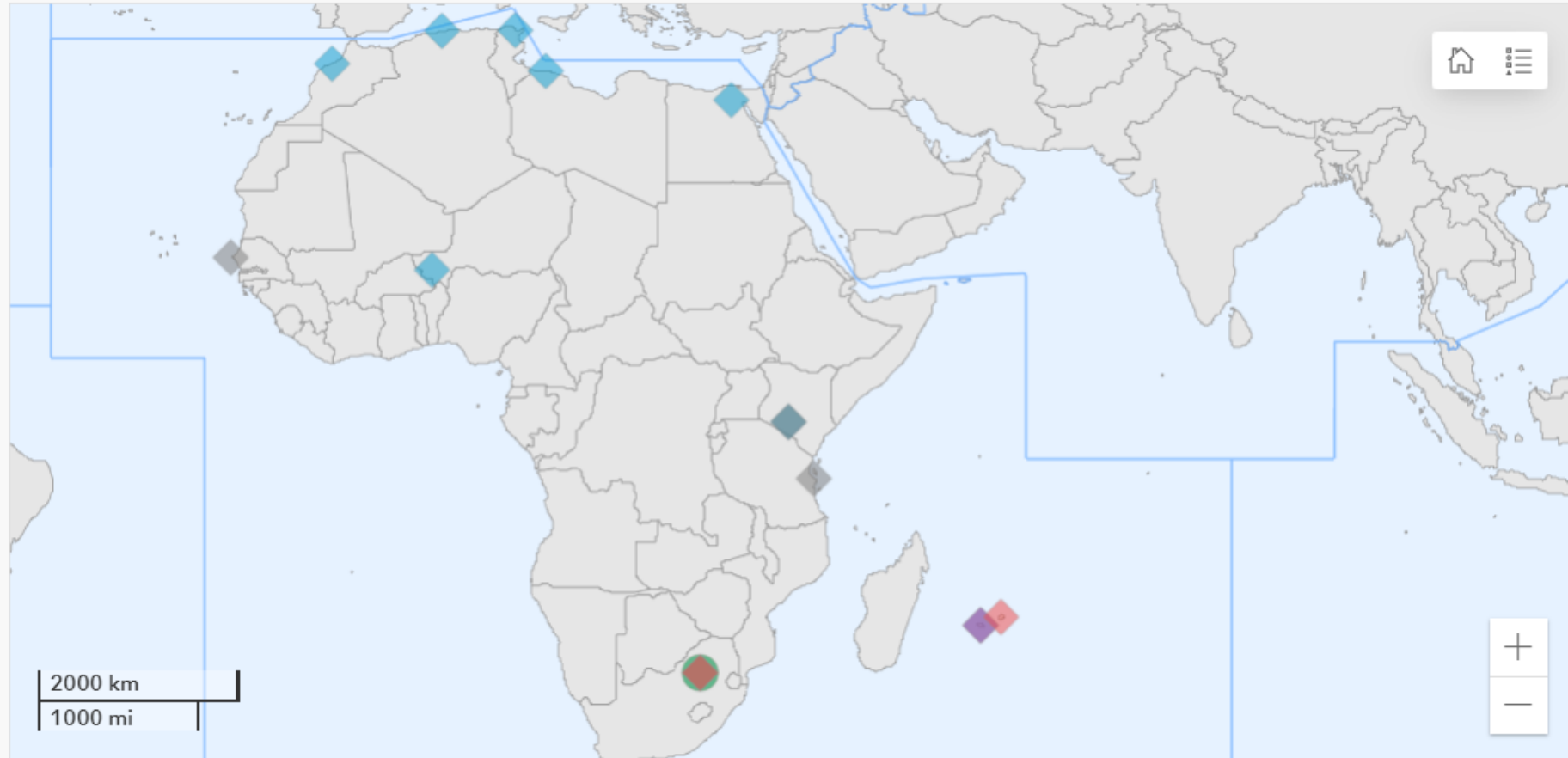
6

activities



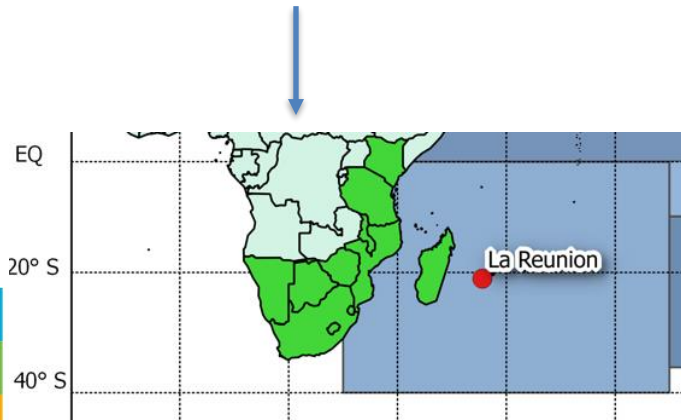
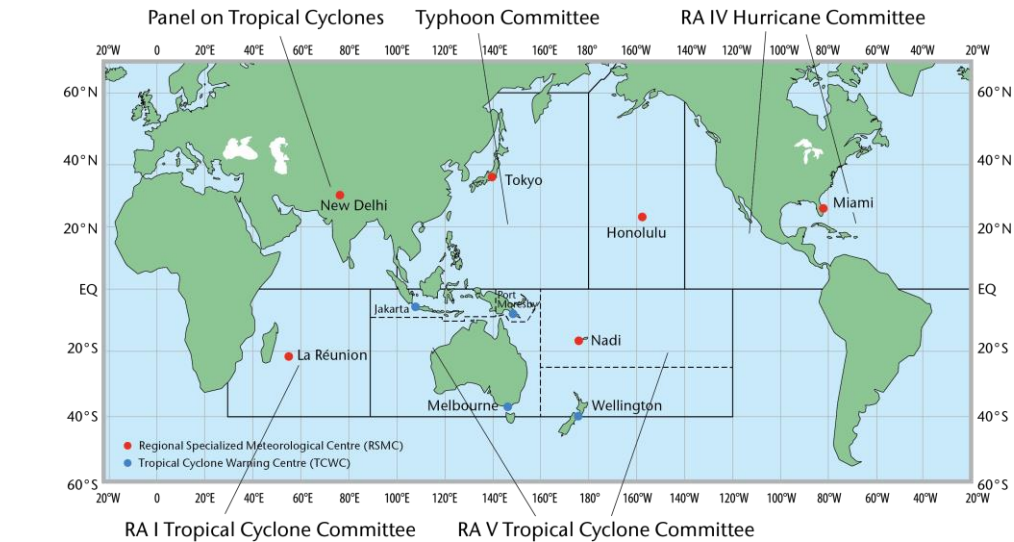
RA I 13

RA I 13



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WMO Tropical Cyclone Programme



1. Botswana - 1994
2. Comoros - 1973
3. Eswatini 1986
4. France - 1973
5. Kenya - 2007
6. Lesotho - 1998
7. Madagascar - 1973
8. Malawi - 1973
9. Mauritius - 1973
10. Mozambique - 1978
11. Namibia - 2007
12. Seychelles - 1978
13. South Africa 1994
14. U.R. of Tanzania - 1973
15. Zimbabwe - 1986

WMO African Region (RA I) Tropical Cyclone Committee (TCC)

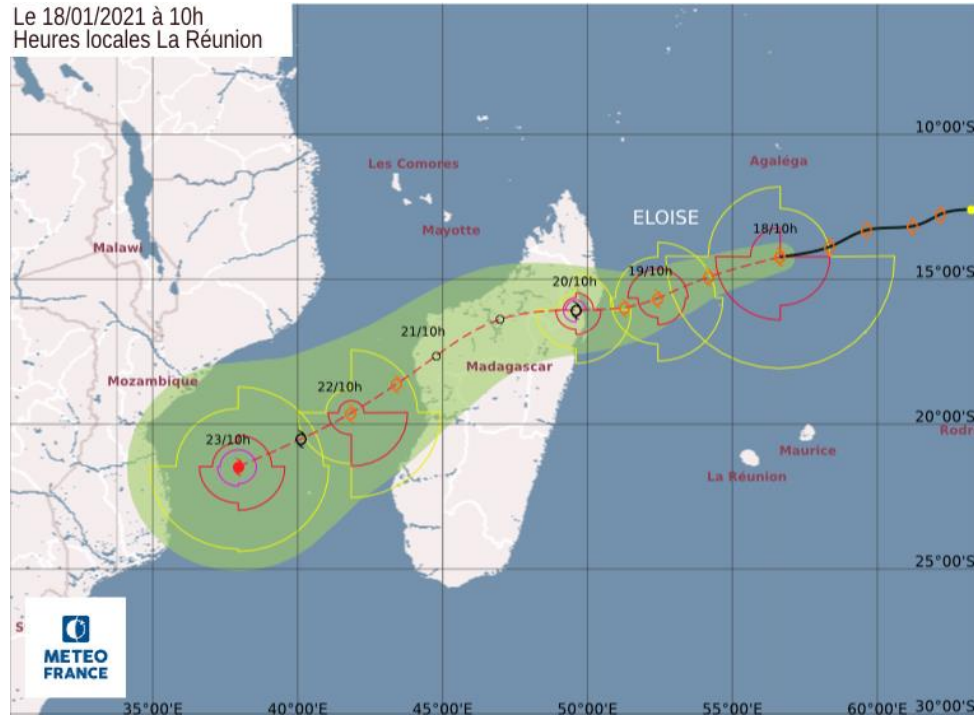
- 15 Members
- Established in 1973
- WMO mandated center for Tropical Cyclone forecasting, including marine-related hazards: Tropical cyclone Center La Reunion hosted by Meteo-France. Designated in 1993.
- Operational Plan
 - Defines the observing, forecasting and warning responsibilities of all cooperating Members.
 - Demonstrates the benefit of the high level of regional cooperation achieved.
 - Core business of TCC session is to strengthen and update this Operational Plan



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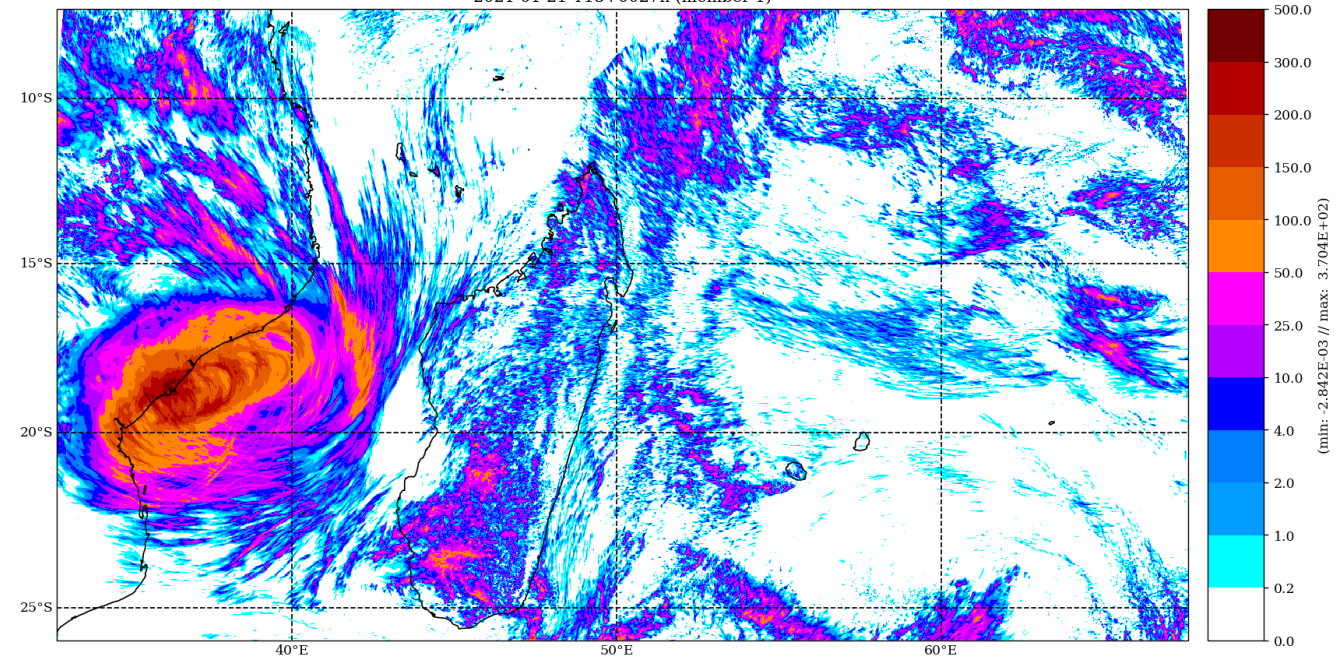
RSMC La Reunion product examples

Le 18/01/2021 à 10h
Heures locales La Réunion



Multi-model statistical adaptation for wind radii
(ECMWF/GFS), TC Eloise, January 2021

Field of rr24
2021-01-21-T18+0027h (member 1)



Accumulated rainfall forecast for TC ELOISE (January 2021)
extracted from new 1.3 km resolution upgraded convection-
resolving AROME Indian Ocean model

SWFP-Southern Africa

(operational in 2012)

Benefitting Countries (16):

Angola, Botswana, Democratic Republic of the Congo, Malawi, Mauritius, Madagascar, Mozambique, Namibia, Lesotho, Seychelles, South Africa, Eswatini, Tanzania, Zambia, Zimbabwe, Comoros

Contributing Global Centres:

WMC ECMWF, WMC Exeter, WMC Washington

Contributing Regional Centres:

- RSMC-SWC Pretoria (for severe weather forecast guidance)
- RSMC-TC La Reunion (for TC forecast support and guidance)

Development partners/donors:

- CREWS-SWIO project 2021-2024
- USAID/OFDA funds during 2014-2016 (for twining of SWFP & FFGS in South Africa)
- Norwegian funds up to 2014



Regional Specialized Meteorological Center(RSMC) Pretoria



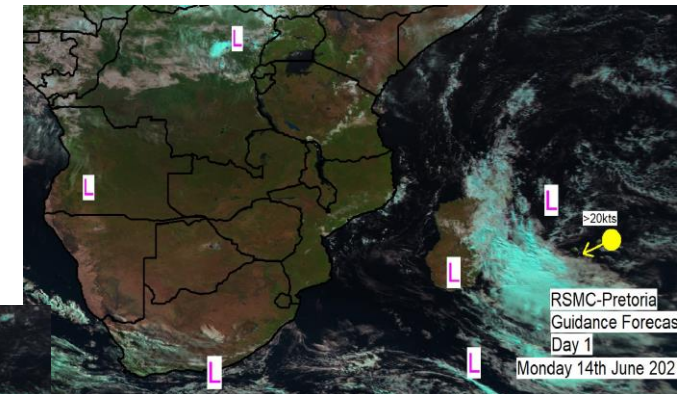
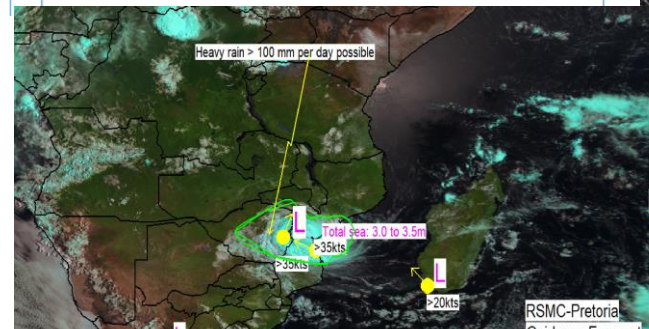
Guidance Products
NWP & EPS Products Regional Models <ul style="list-style-type: none"> • UM SA4 00 UTC • UM SA4 12 UTC • Arome La Reunion • Met Office: Africa Web Viewer Global Products <ul style="list-style-type: none"> • NOAA • ECMWF: EPS • Met Office: EPS • SAWS: EPS (NOAA) Training Website <ul style="list-style-type: none"> • Met-eLearning SWFDP Training Nov 2012 <ul style="list-style-type: none"> • GDPFS • PWS SWFDP Training Nov 2013 <ul style="list-style-type: none"> • GDPFS • PWS SWFDP Training Nov 2014 <ul style="list-style-type: none"> • GDPFS • PWS SWFDP Training Nov 2015 <ul style="list-style-type: none"> • GDPFS • PWS SWFDP Training Nov 2017 <ul style="list-style-type: none"> • SARFFG • GDPFS • PWS

Guidance Products
Short-range (1-2 Days) <ul style="list-style-type: none"> • Map Day 1 • Map Day 2 • Risk Tables • Discussion Medium-range (3-5 Days) <ul style="list-style-type: none"> • Map Day 3 • Map Day 4 • Map Day 5 • Prob Tables • Discussion SWFDP Evaluation Form <ul style="list-style-type: none"> • Click Here

Nowcasting Products
Satellite-Based Rainfall <ul style="list-style-type: none"> Hydro-Estimator Rainfall Totals <ul style="list-style-type: none"> • 1hr • 3hr • 6hr • 24hr Hydro-Estimator Rainfall Totals In Days <ul style="list-style-type: none"> • 10 Days • 30 Days • Archive Hail Forecasts from UH SA12 <ul style="list-style-type: none"> • 10 UTC • 12 UTC • 14 UTC Lightning Information <ul style="list-style-type: none"> • Forecast Today • Forecast Tomorrow Convective Thunderstorm Forecasts <ul style="list-style-type: none"> Probability of Convective Thunderstorms <ul style="list-style-type: none"> • CTL • Description of Product Rapidly Developing Thunderstorms <ul style="list-style-type: none"> • ROT SADC • Description of Product • ROT SA • ROT Google Maps Convective Rainfall Rate (CRR) • CRR • Description of Product Hydro-estimator Storm Tracks <ul style="list-style-type: none"> SADC SADC NW SADC NE SADC SW SADC SE Madagascar South Africa

Guidance Products
Flash Flood Guidance <ul style="list-style-type: none"> • SARFFG Portal Regional and International Centers <ul style="list-style-type: none"> • ECMWF • NCEP • UK Met Office • WMO • RSMC - Reunion • ACMAD SADC Countries <ul style="list-style-type: none"> • SADC Countries National Meteorological Services Other Services and Products <ul style="list-style-type: none"> • Short-range • Long-range (Seasonal)

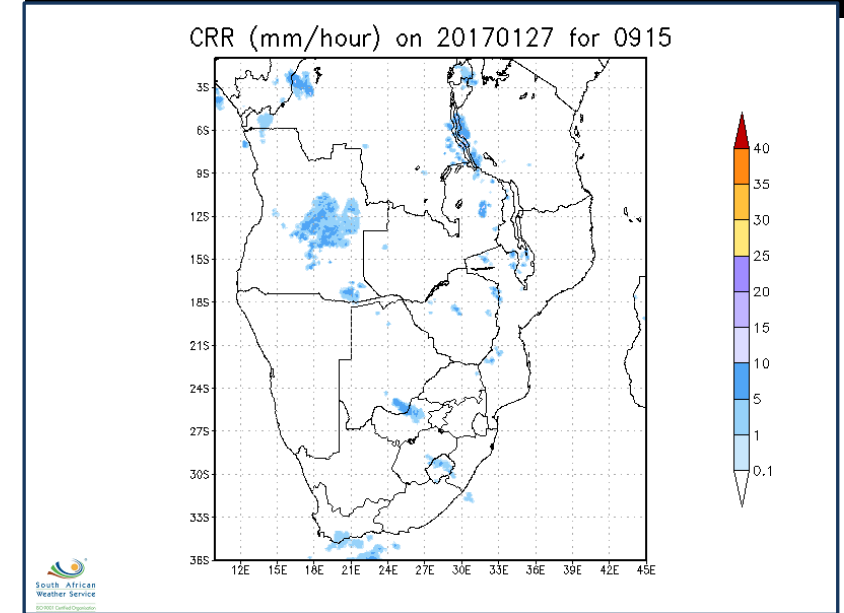
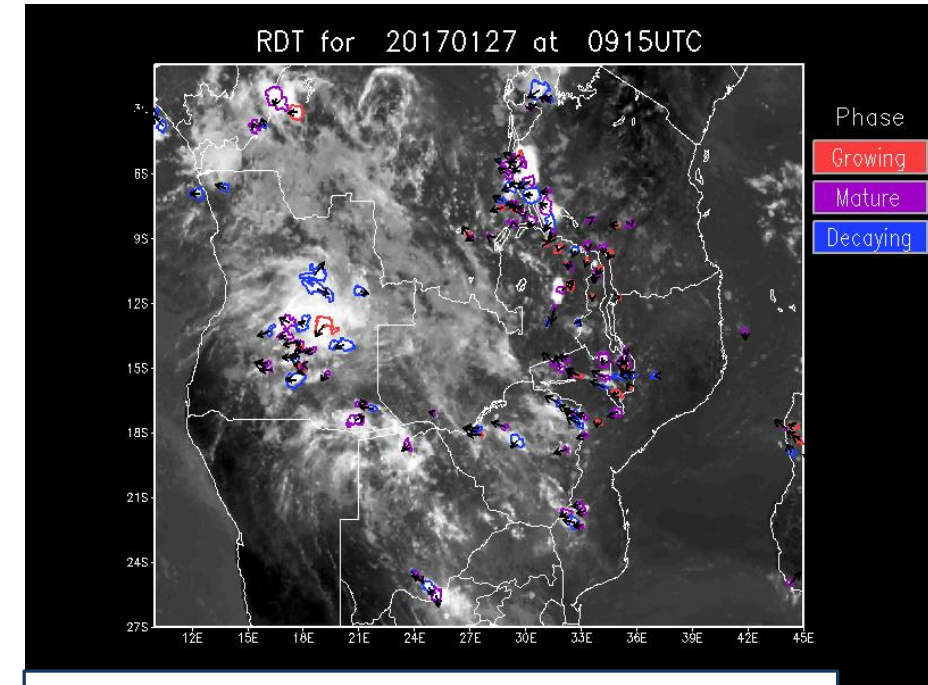
Twinning of SWFP-South Africa and SARFFGS during 2014-2016 through USAID funds



RSMC-SWF Pretoria Activities for 2021 onwards (SWFP-Southern Africa)

- As part of a CREWS-SWIO project, a draft Implementing Arrangements between WMO and SAWS is in review process to support following SWFP activities during 2022-2024:
 - Development of new tools for production of graphical guidance product at RSMC Pretoria
 - RSMC Pretoria web portal enhancement
 - Expansion of the nowcasting products footprint on RSMC Pretoria website to include the countries currently not covered (e.g. Rapidly developing thunderstorm (RDT), Convective rainfall rate (CRR) etc.)

- SWFP-Southern Africa Training Workshop (ONLINE) planned in Q4 2022,



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Enhancing Early Warning Decision Support Systems

- Impact-based Forecasting and Warning Services (IBFWS)

Historically, NMHSs have featured forecasting of the weather as central to their mission.

Weather forecasts and warnings

what the
weather **will be**



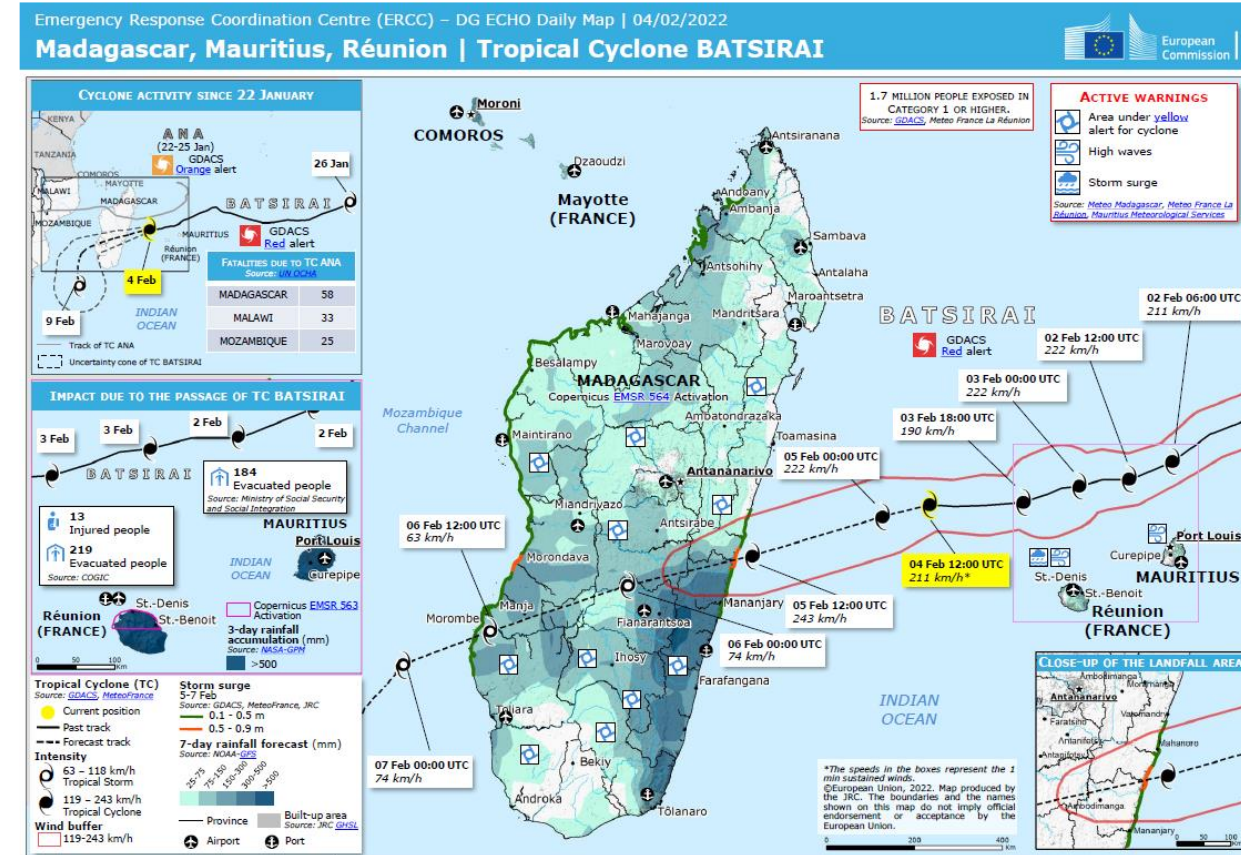
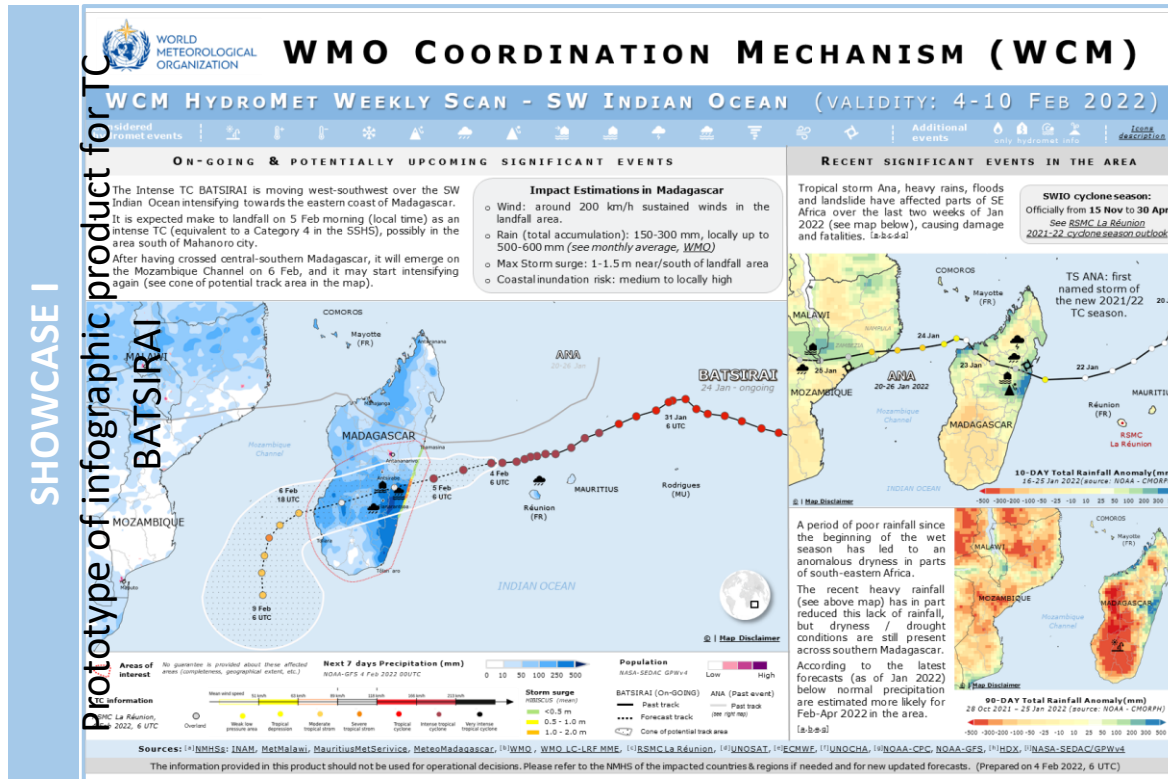
what the
weather **will do**



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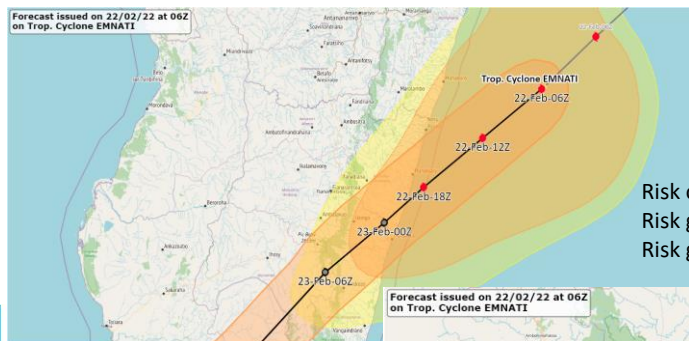
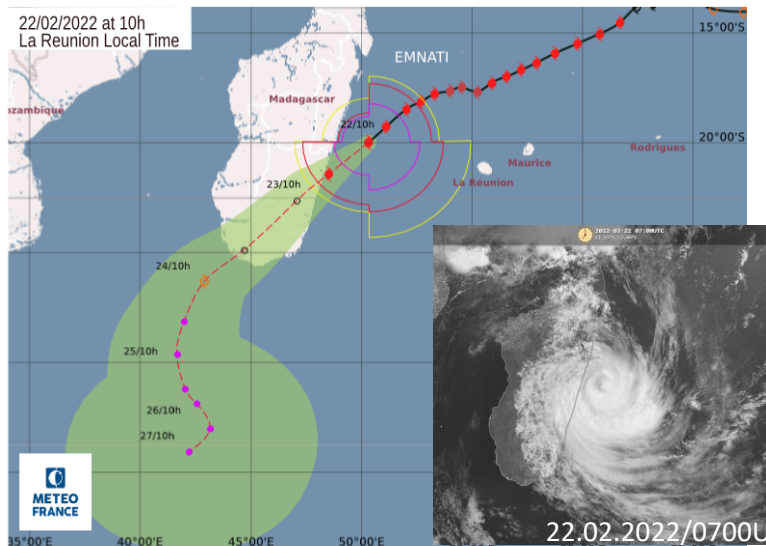
Situational analysis : typical examples

Estimation of people at risk
references to antecedent conditions
Multiple sources used

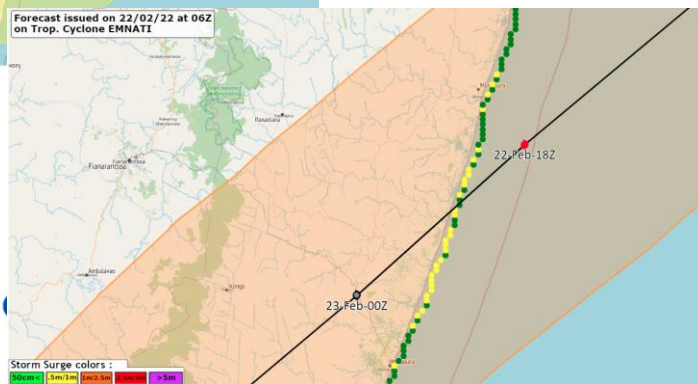


Example – TC Emnati – February 2022

Regional guidance

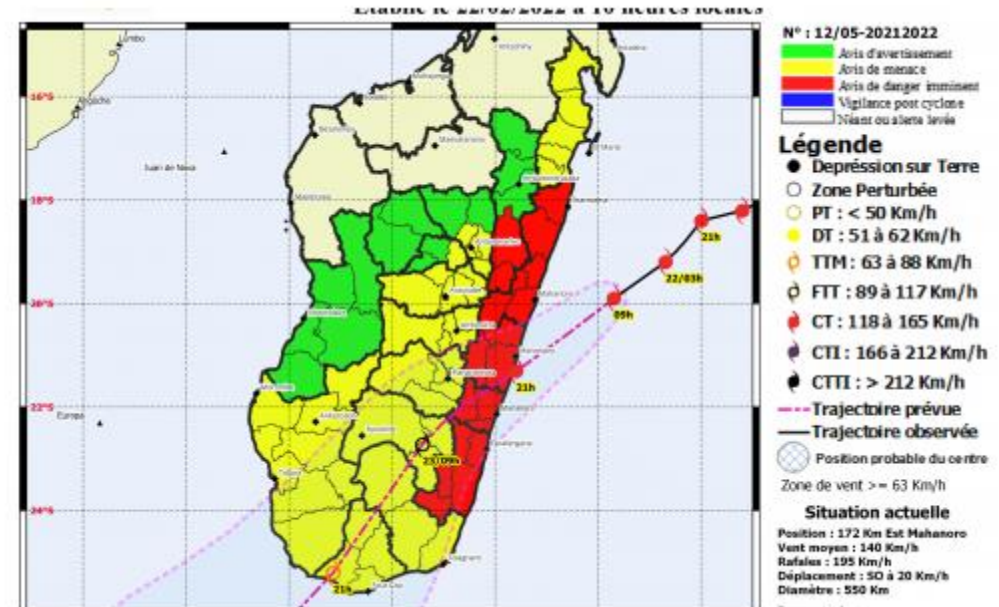


Risk of direct impact: red
Risk gust > 125 km/h (50%): orange
Risk gust > 125 km/h (20%): yellow



National warning

<http://www.meteomadagascar.mg/>



Regular analysis provided to both Government and Humanitarian stakeholders

CAP Warnings Issued



Latest alerts from Operational Meteorology

Intense Tropical Cyclone BATSIRAI (Thu, 03 Feb 2022 09:56:35 +0000)

Intense Tropical Cyclone BATSIRAI is now located at 651 Km East-South-East of Ambila Lemaitso (Madagascar). Average wind speed has temporarily decreased to 165 Km/h with gust up to 235 Km/h. It continues to move West-South-westward at around 07 Km/h. This system is expected to hit directly the eastern part of the Country on Saturday 05 February 2022 later in the morning as a dangerous cyclone.

Intense Tropical Cyclone BATSIRAI (Wed, 02 Feb 2022 14:20:58 +0000)

Intense Tropical Cyclone BATSIRAI is now located at 840 Km East of Ambila Lemaitso (Madagascar). Average wind speed is estimated to 195 Km/h with gust up to 275 Km/h. It continues to move West-South-westward at around 17 Km/h. This system is expected to hit directly the eastern part of the Country on Saturday 05 February 2022 in the morning as a dangerous cyclone.

Tropical Cyclone BATSIRAI (Tue, 01 Feb 2022 08:34:00 +0000)

Tropical Cyclone BATSIRAI is now located at 1264 Km East of St Marie Island (Madagascar). Average wind speed is estimated to 140 Km/h with gust 195 Km/h. It is moving South-westward at around 18 Km/h. This system is expected to hit directly the eastern part of the Country later this week (05 February 2022).



WMO



Register of WMO Members Alerting Authorities [[home](#)]

- Aggregates Authoritative Sources/Authorities - organizations officially authorized to issue alerts, with their relevant URLs
- Maintained by national **Editors** of the WMO Register of Alerting Authorities.
 - Only the Permanent Representative (PR) can nominate the **Editor**.
 - Only the **Editor** has the authority to edit the Register.
- By implementing CAP, the Internet can be leveraged to get warnings to people at risk when required.



The Common Alerting Protocol (CAP)

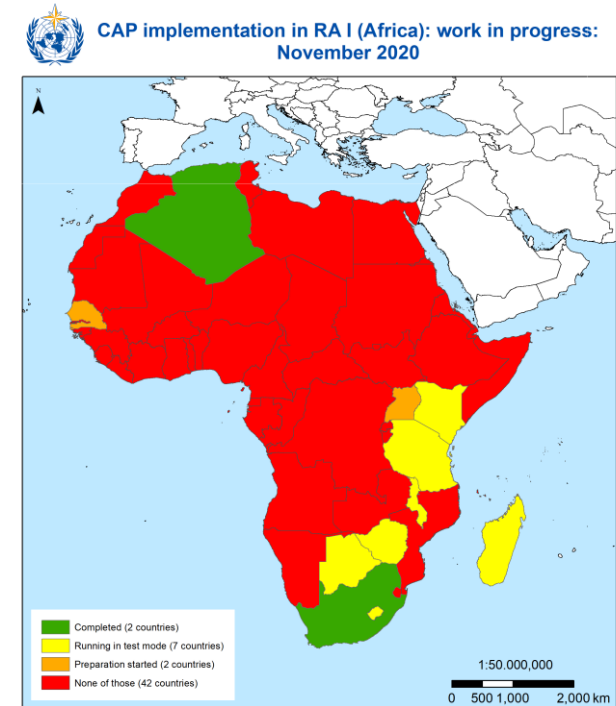
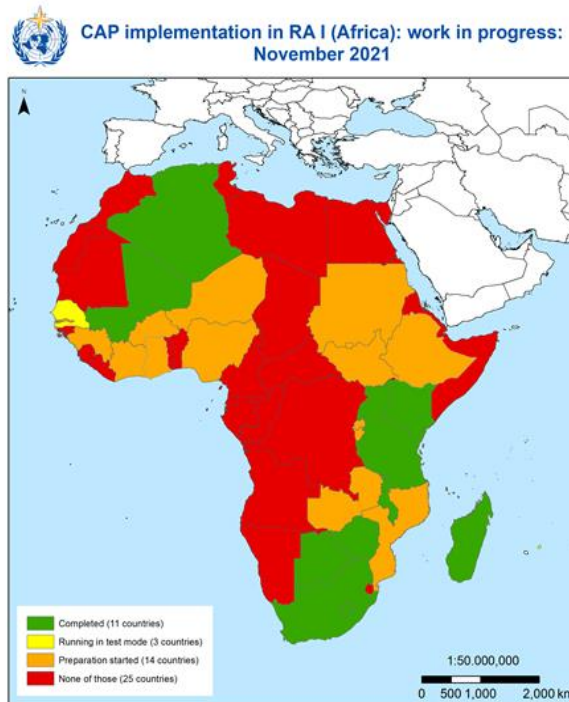
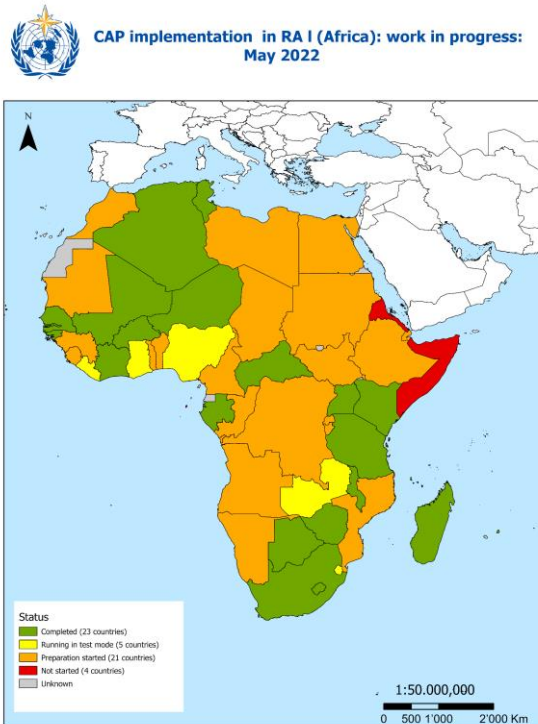
- CAP provides consistency over multiple channels, allowing exact corroboration of alert information.
- CAP is a digital message format compatible with all kinds of existing and emerging systems--data networks as well as broadcast radio and TV.
- CAP is useful for multilingual communication.



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RA I CAP fast-tracking Progress

- In close collaboration with the WMO, Members with CAP operationalized are assisting other Members with implementation.



Algeria, Botswana, Burkina Faso, Central African Republic, Comoros, Côte d'Ivoire, Gabon, Gambia, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritius, Niger, Senegal, Seychelles, South Africa, Tunisia, Uganda, United Republic of Tanzania, Zimbabwe



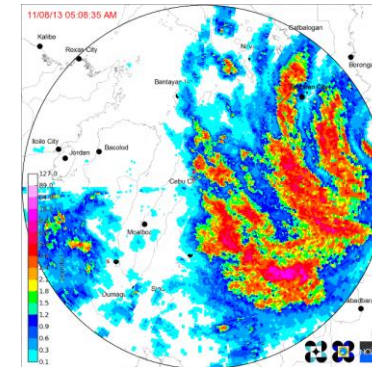
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A possible connection with WMO Coordination Mechanism ?

**Regular
assistance for
particularly
vulnerable
communities**



**Emergency
assistance in
response to
specific requests**



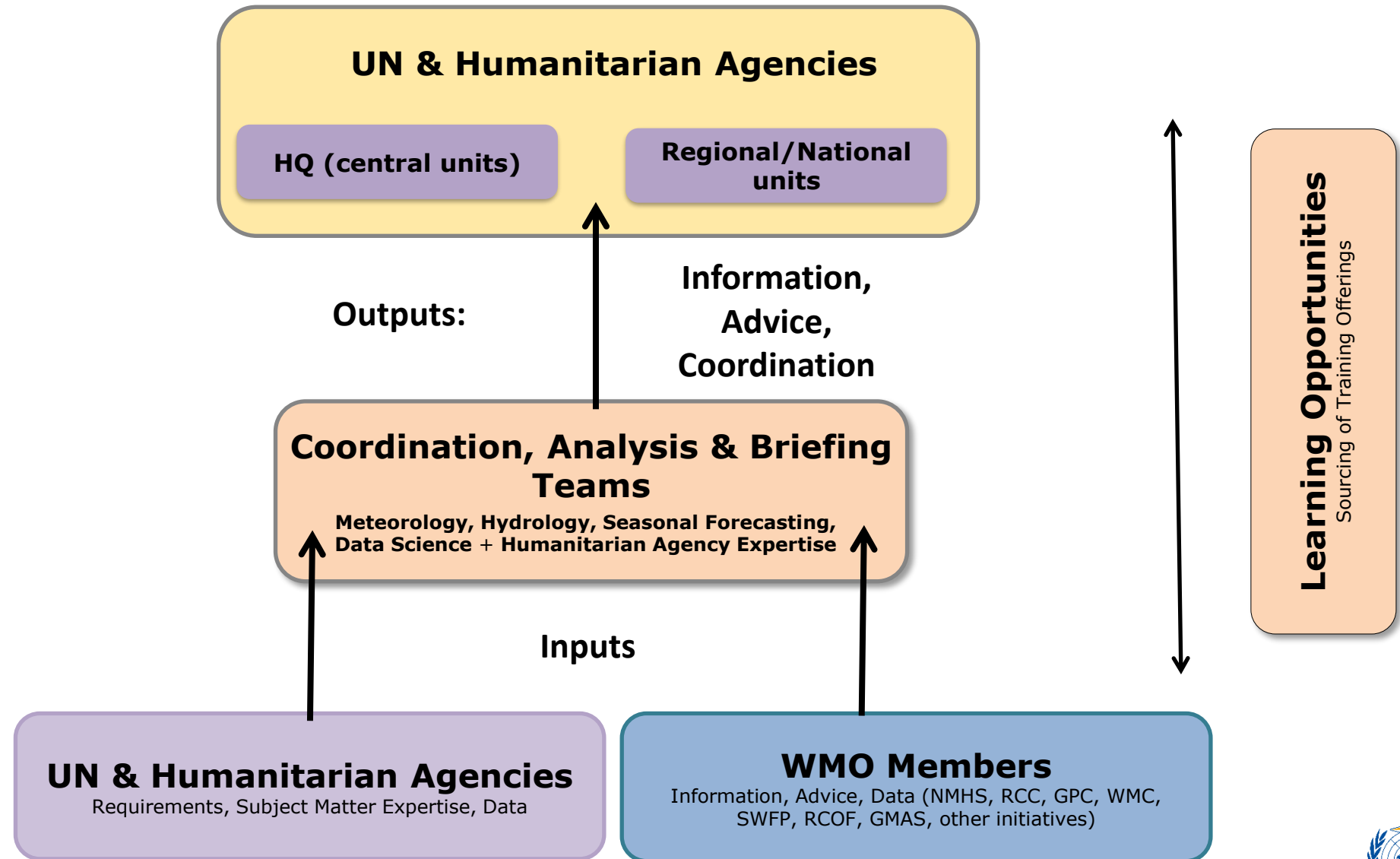
WCM

**Proactive services to
raise awareness and
facilitate anticipation
of hazardous situations**



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Proposed Structure of the WCM :



WMO OMM



Thank you
Asante sana
Obrigado
Merci



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World Meteorological Organization
Organisation météorologique mondiale



Early Warnings for All Initiative Registration of Interest



Early Warning Systems are a proven effective and feasible adaptation measure providing almost a tenfold return on investment, and enhance the benefits of other adaptation measures when combined.

The World Meteorological Organization (WMO) has been asked by António Guterres, Secretary-General of the United Nations, to spearhead a global UN initiative to meet the goal of every person on Earth being protected by early warning systems within five years, building on existing partnerships and contributing to the global climate adaptation agenda. Secretary-General Guterres has asked WMO to present an action plan to achieve this goal at the next UN climate conference, later this year in Egypt.

Registration link:

https://forms.office.com/pages/responsepage.aspx?id=VL6m6odGxECYJ8BEvY6NPPhtLo-iLktGI_6UY7QkjqpURUhTVzZQRUFXWDQ4UU9NWjU0TkNYWFLSS4u