THE SWFDP: IMPROVING SEVERE WEATHER WARNINGS IN SOUTHERN AFRICA

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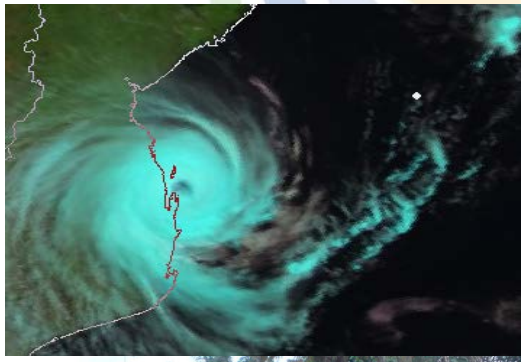
Legacy of Tropical Cyclones Eline (2000) and Favio (2007)

(both equivalent to Cat 4 hurricanes ~220 km/h winds)

- TC Eline 2000 Mozambique:
  - 700 deaths, 4.5 million people affected
  - Devastated Mozambique
  - Massive international rescue and support
- TC Favio 2007 Mozambique and Zimbabwe:
  - 29 deaths, 285000 affected in Mozambique
- Since Eline in 2000 there was a dramatic improvement in the entire DRR system in SADC
- This included the development of the SWFDP, or Severe Weather Forecasting Demonstration Project



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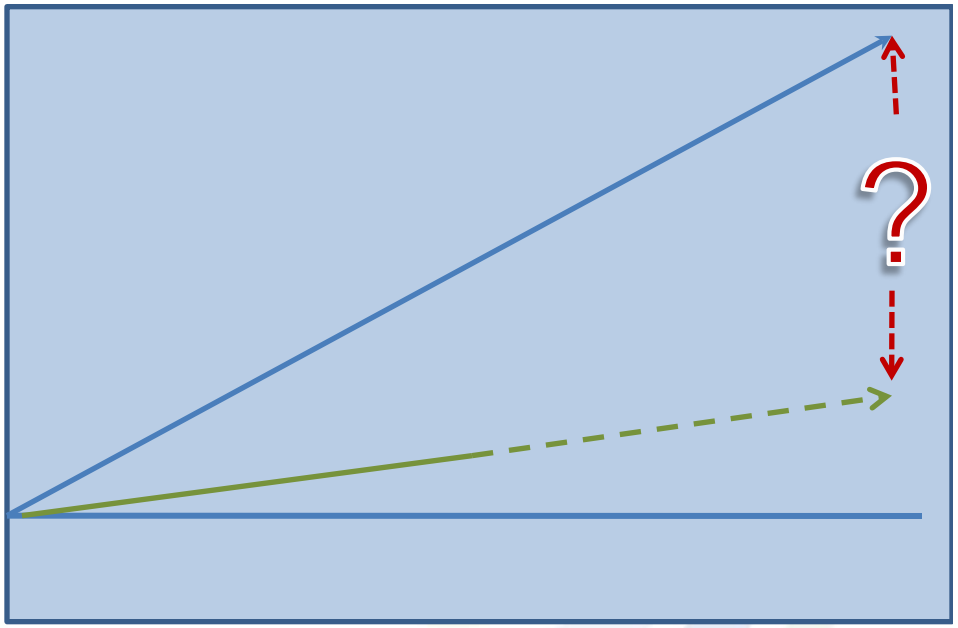
Challenging the technological gap of Developing Countries



- Dramatic developments in weather forecasting science over the past decades
- Increasing gap in developing countries of application of modern forecasting technology (NWP, EPS) in early warnings

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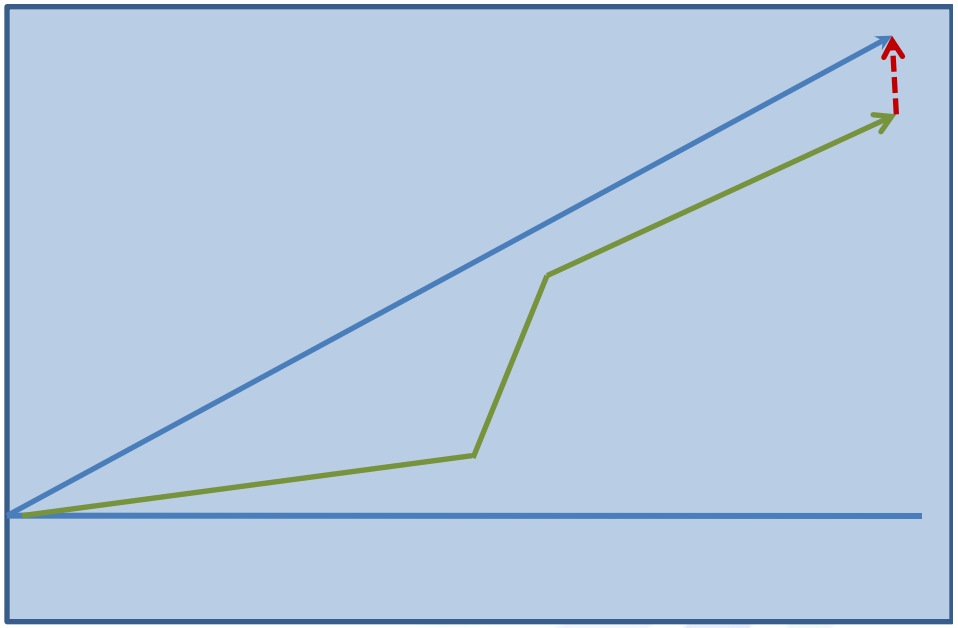

- Dramatic developments in weather forecasting science over the past decades
- Increasing gap in developing countries of application of modern forecasting technology (NWP, EPS) in early warnings
- *There is a need to support developing countries to close this gap*
- *WMO's Severe Weather Forecasting Demonstration Project (SWFDP)*

Aim of the WMO SWFDP Program

- WMO program to improve ability of National Meteorological Services (NMSs) in developing countries to forecast severe weather events for the next 5 days using *existing* technology – to close the technology gap
- To improve coordination of NMSs with Disaster Management Agencies and the media
- SWFDP is about *enhancing delivery of warning services as adaptation against a likely increase of disasters due to climate change and socio-economic vulnerabilities*
- Tested from 2007 in Southern Africa, then rolled out to other regions

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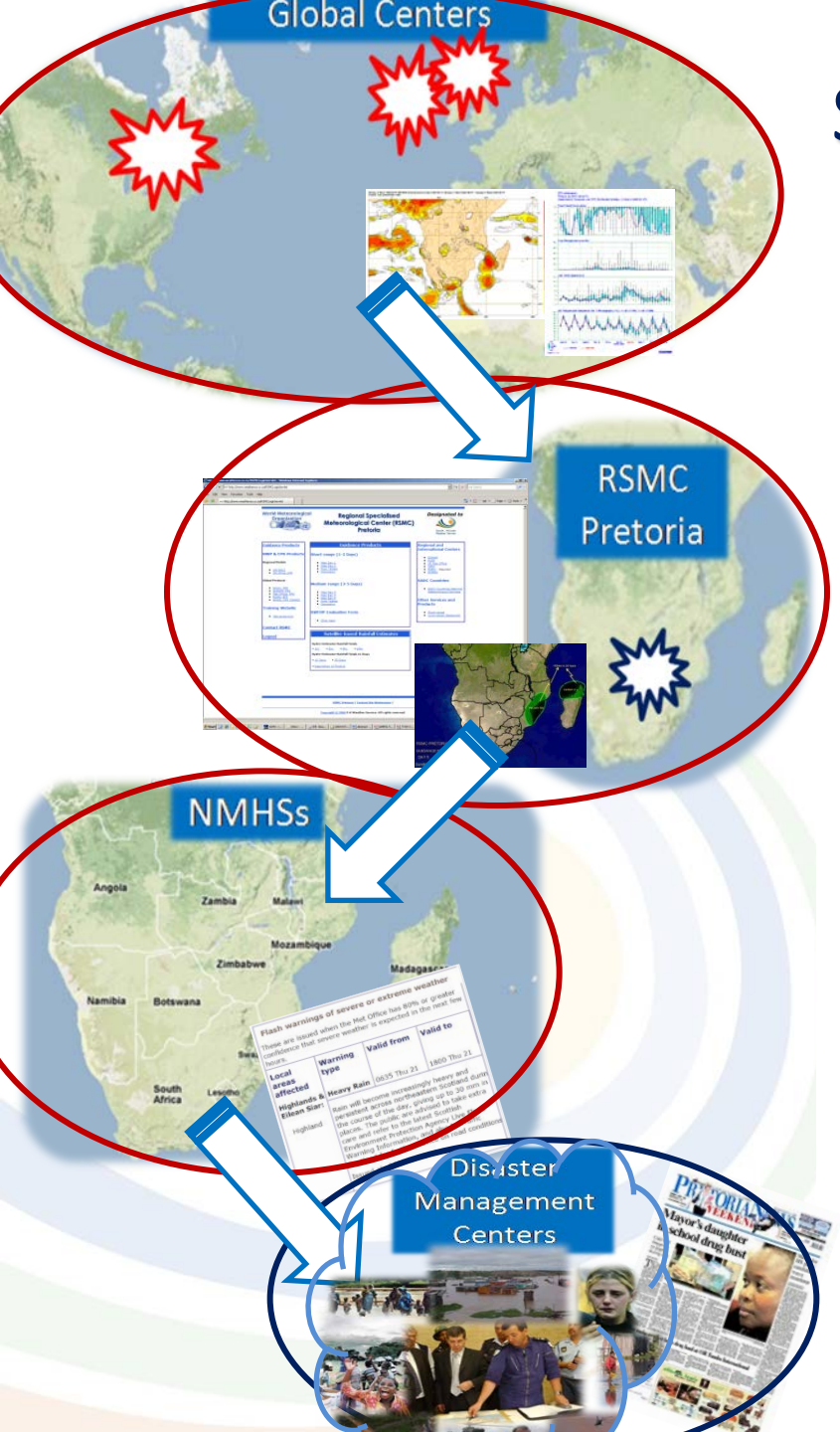
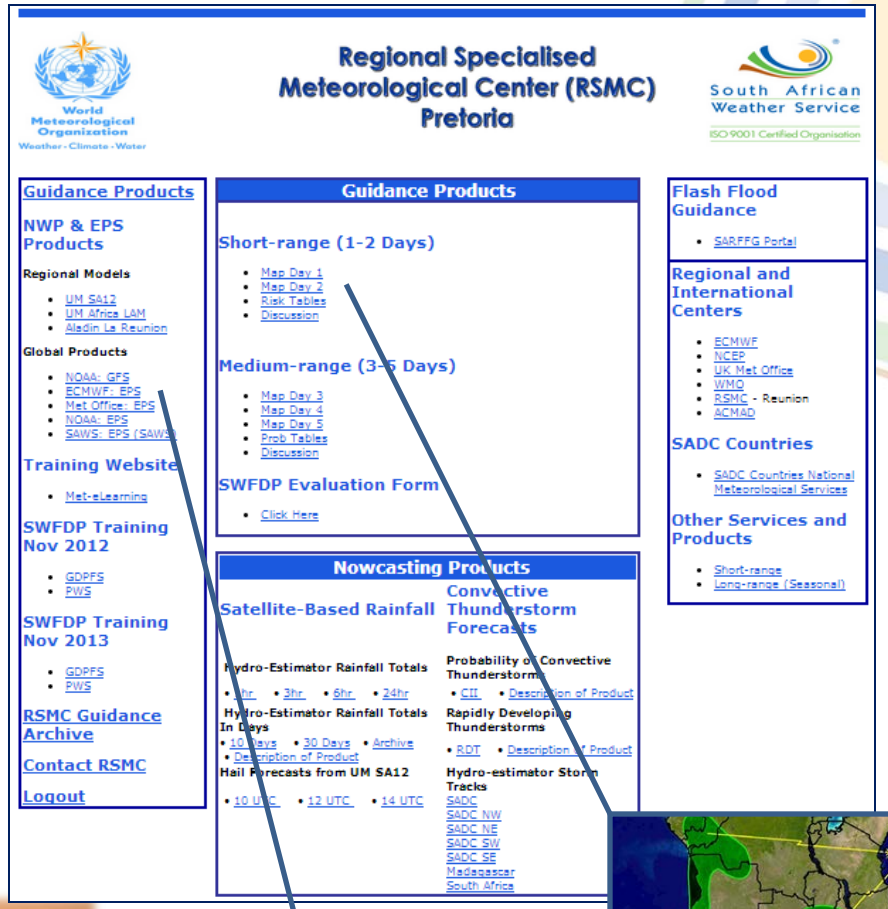


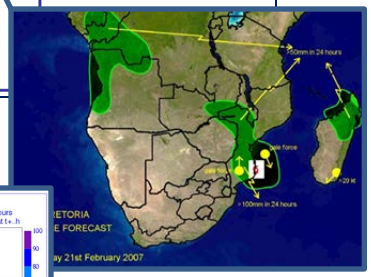
SWFDP Framework backbone: "Cascading of Information"

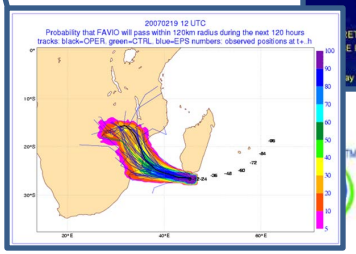
- Global Centres
  - Provide specialized forecast products
- Regional centre (RSMC Pretoria)
  - Provide these products to NMSs through a dedicated web page
  - Provide guidance forecasts of potential severe weather for next 5 days, every day
- 16 National Meteorological Services
  - Assess the products and guidance
  - Issue national warnings with up to 5 days lead time
- Underpinned by regular training
- No complex technology required

Enhanced National EWS from SWFDP

- NMS require only a computer (PC) and internet
- NMS evaluate model products supported by RSMC guidance products
- Issue warnings if needed against their own in-country criteria for severe weather
- Collaborate with Disaster Management in JOCs prior and during events
- Media Liaison
- Adapted warning information products supporting user decision-making systems







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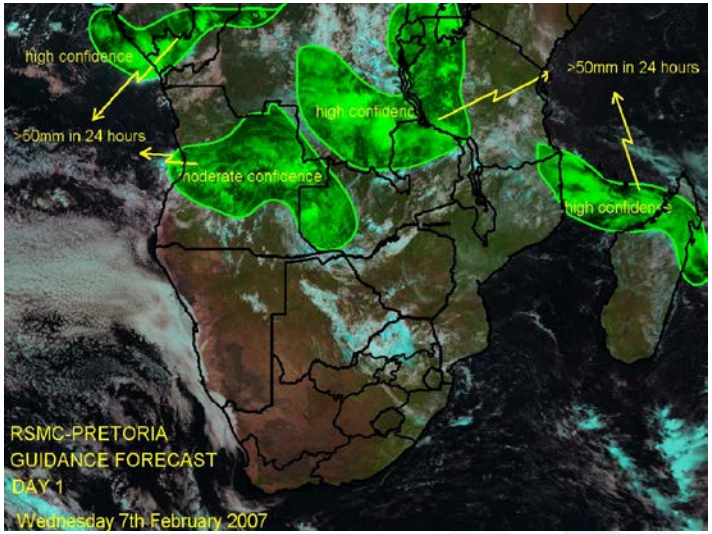
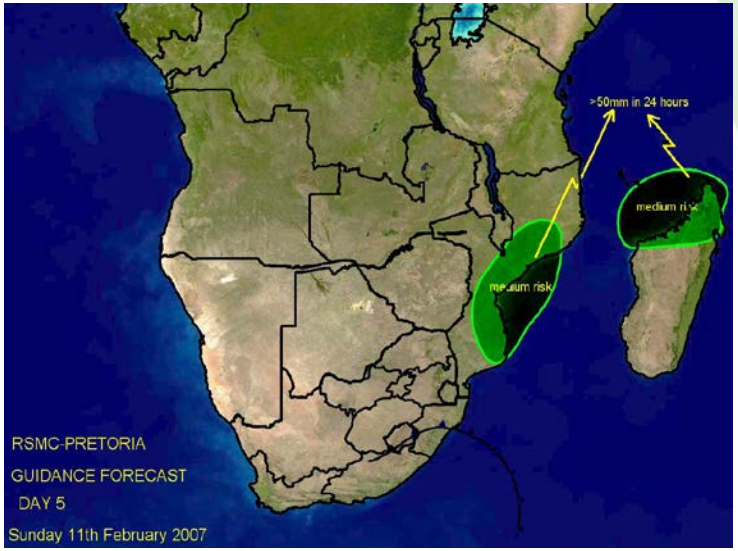
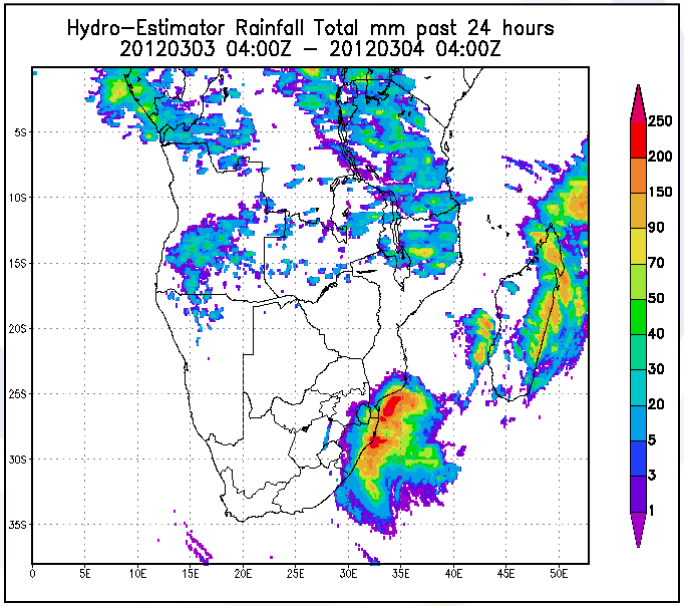
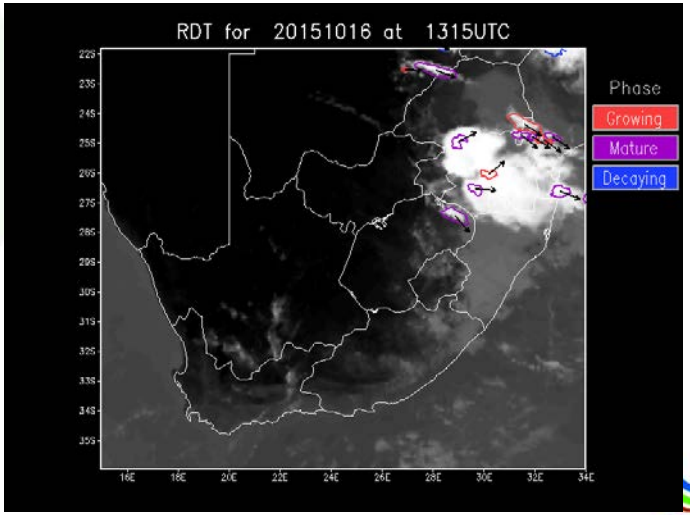
Examples of SWFDP Products from RSMC Pretoria









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Comments on the Outcomes of SWFDP

- SWFDP strengths are:
  - ✓ Its simplicity, few hazards, no complex equipment - NMSs only needed internet
  - ✓ Highly operational focus – support NMSs exactly where they need it for improved services
  - ✓ It had direct benefit and participation of each NMS
  - ✓ Definitive improvement in the capability of forecasters
  - ✓ It built capacity that could be immediately used in an operational environment by all countries involved
  - ✓ Improvement of warning lead-time and coordination with disaster management and the media
- It provided direct benefit to the users – disaster management, media and public

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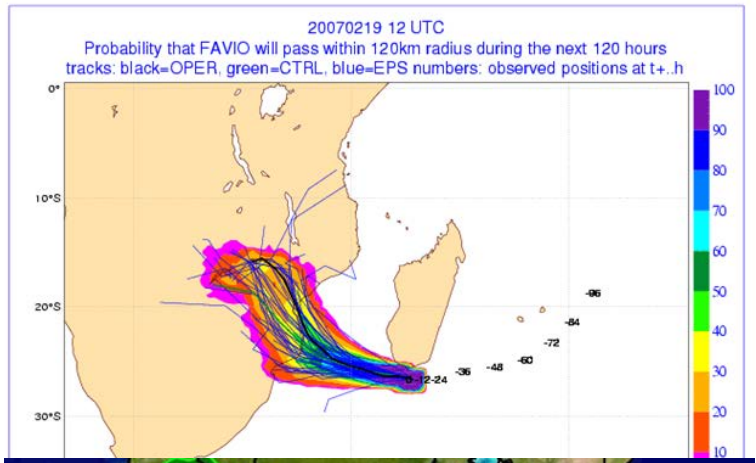
Back to TC Eline and Favio: SWFDP contribution

- RSMC and INAM collaborated to provide guidance from EPS and NWP 5 days in advance
- Disaster management responses due to SWFDP
  - Both NMSs of Mozambique and Zimbabwe issued warnings 5 days in advance to Disaster Management
  - In Mozambique: Provinces were put on alert levels 2 - 3 days in advance, The public responded well and major loss of live were prevented
  - In Zimbabwe: Public received early warnings by radio, TV and newspapers 5 days in advance



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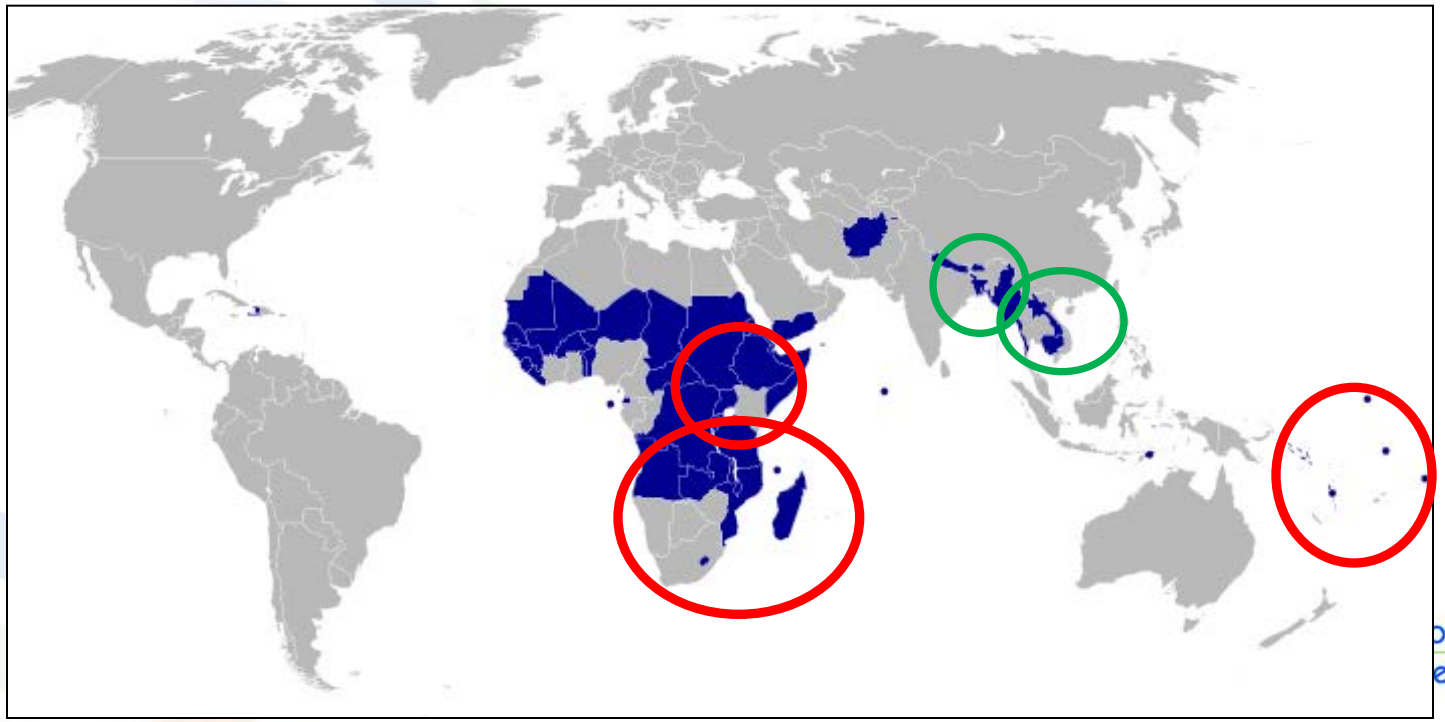
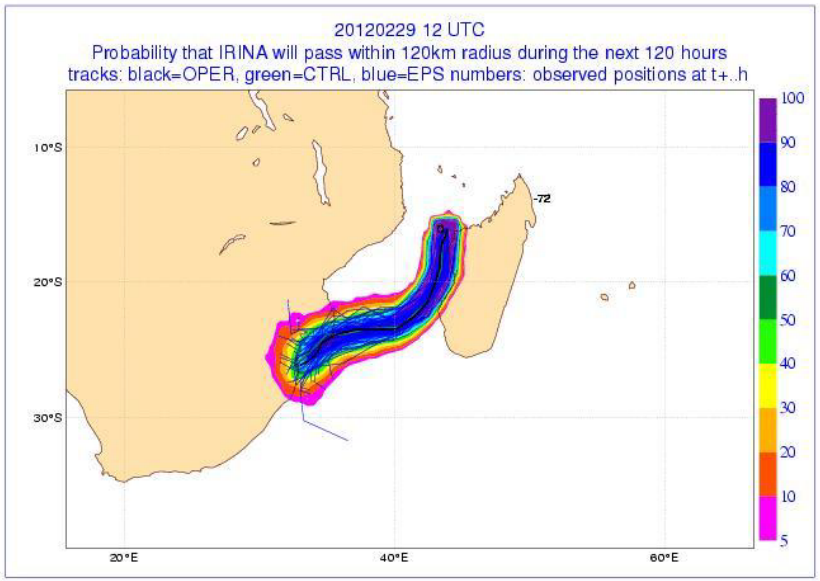
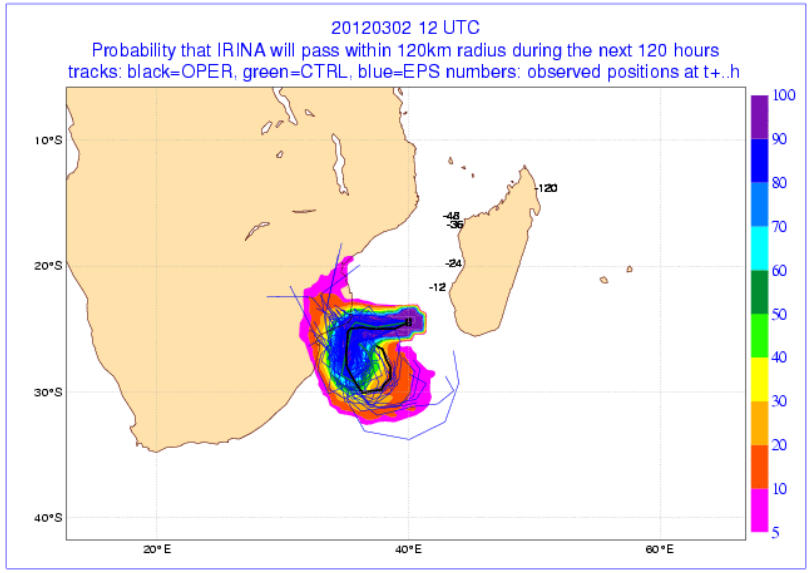
Global Program of SWFDP

- Based on the success of SWFDP Southern Africa:
  SWFDP concept is implemented in the Southern Pacific islands and East Africa, and WMO is targeting at least 2 new regions
- The question is asked: "What is the quantitative benefit of SWFDP?"
- We do not know…….we need to know!



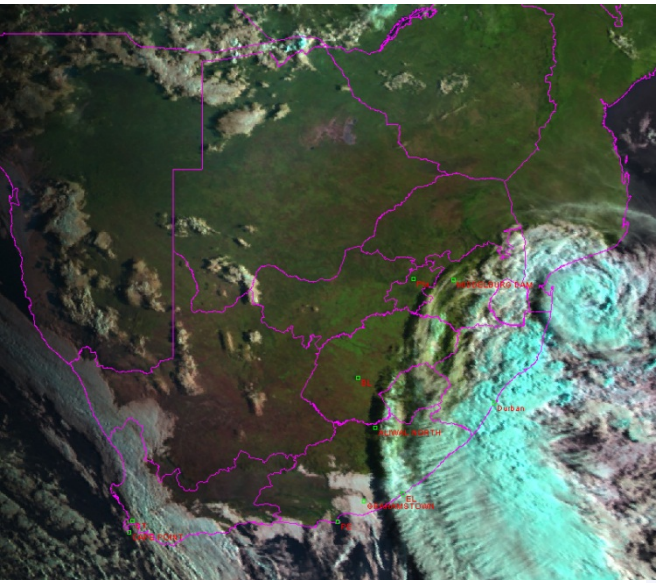
Case Study: Tropical Cyclone IRINA 4 March 2012

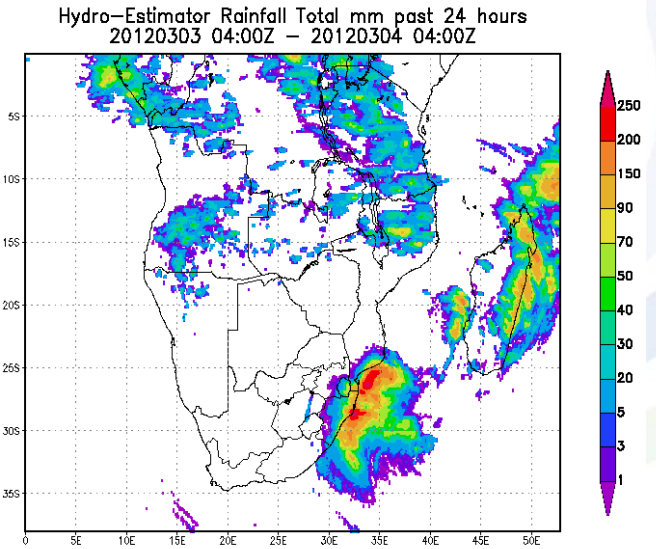




- On 1 March TC Irina was projected to hit southern Mozambique, NE parts of South Africa and Swaziland.
- These were the areas which were hit by “Dando” less than 2 months before with severe flooding.
- Highly unpredictable even by NWP, resulted in exemplar forecast coordination between the 3 countries
- Eventually 4 fishermen died at sea off Maputo, and at least 3 people in southern Mozambique, widespread damage

Irina continued…..





- The initial communication was by email from RSMC Pretoria on 01st March 2012 to both INAM and SWAZIMET
- Follow-up discussions followed over next few days between the 2 NMS's and RSMC Pretoria via emails and a number of telephone calls
- Disaster management authorities in all 3 countries were alerted by their NMSs
- Regular updates to Disaster Management and Media during Irina was crucial as the forecast track kept changing at short notice
- Excellent example of the successful functioning of regional early warning communication chain established through SWFDP

Evaluation

- TC Favio showed the technical enhancement of the EWS due to SWFDP
- TC Irina show the enhanced improvement of inter-institutional collaboration between countries in the face of disaster
- This collaboration lead to improved combined warnings and readiness off the DRR structures in all 3 countries
- SWFDP resulted in better coordination and agreement on the expected landfall and impact

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Summary

- SWFDP has been successful in reducing the technological gap between developing and developed countries in terms of forecasting technology
- Through SWFDP the NMSs has been able to increase their lead time and accuracy of forecasts and warnings
- The collaboration between forecasters in disaster managers in these countries has improved significantly
- In general, on average, SWFDP lead to an improved regional EWS with significant national benefits to both NMSs and users
- SWFDP has become a significant brand in the WMO circles, proving to be a low cost, high impact mechanism to transfer technology to operational forecasting in developing regions

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Pay tribute to the vision and dedication of
Peter Chen of WMO,
the leadership of the SWFDP Steering Group,
and the support of WMO

Thank you

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