

SWFDP-SA: Progress and Phase 4 Concepts

Eugene Poolman

RSMC Pretoria

DEVELOPMENT OF REGIONAL EARLY WARNING SYSTEMS

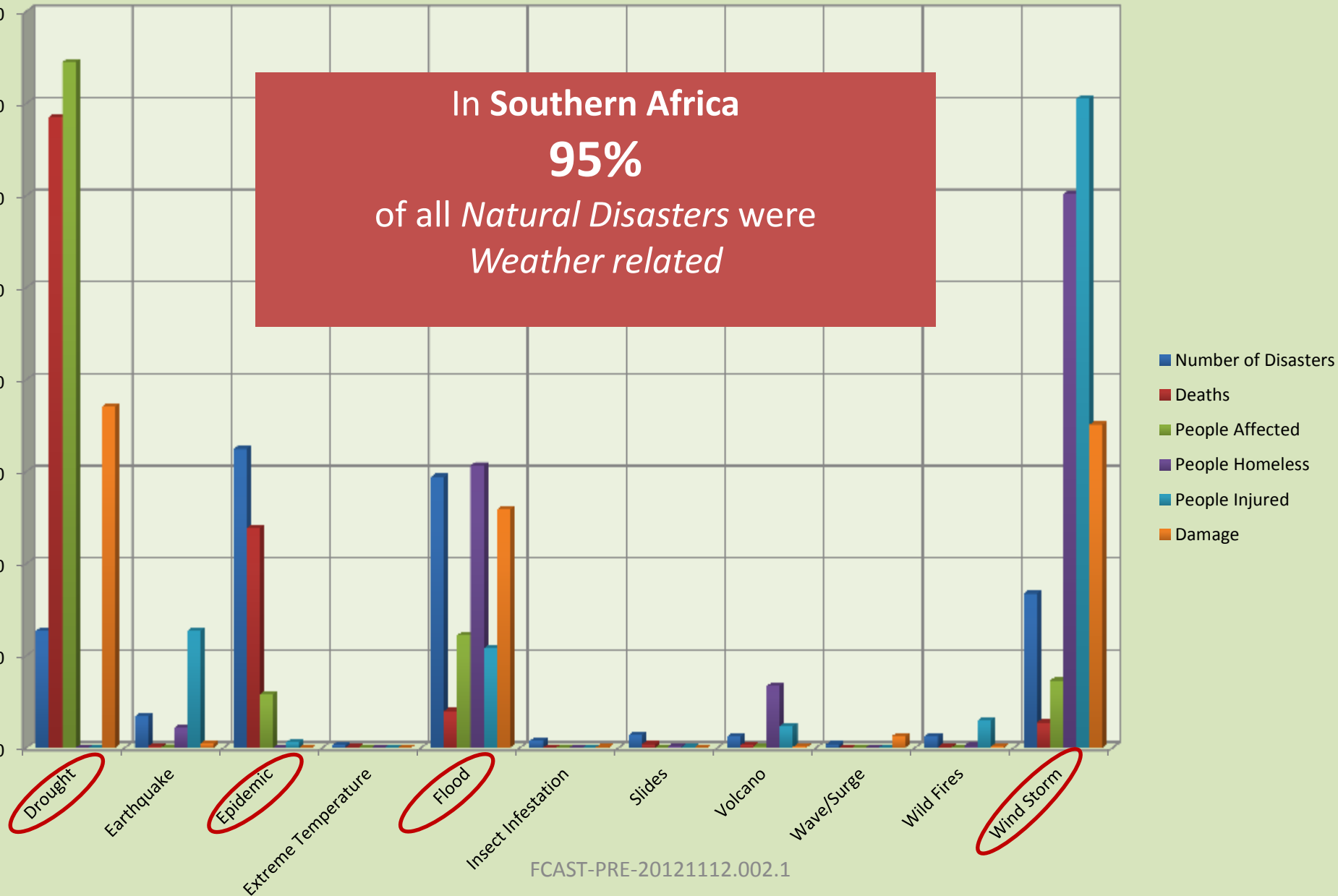
Adaptation through Enhanced Early Warning Systems

- The IPCC Special Report on Managing the Risks of Extreme Events and Disasters (Nov 2011), stating:
 - *“A changing climate leads to changes in the **frequency, intensity, spatial extent, duration and timing** of extreme weather and climate events, and can result in **unprecedented extreme weather and climate events**”*
 - *Developing countries are more at risk*
 - *“It is likely that the frequency of heavy precipitation....will increase in the 21st century...”*
- This calls for EWS even at the shortest timescales, tailored to local levels, because that is where the impact of increased number of disasters will be felt most strongly

% IMPACT OF NATURAL DISASTERS ON SOUTHERN AFRICA: 1920-2008

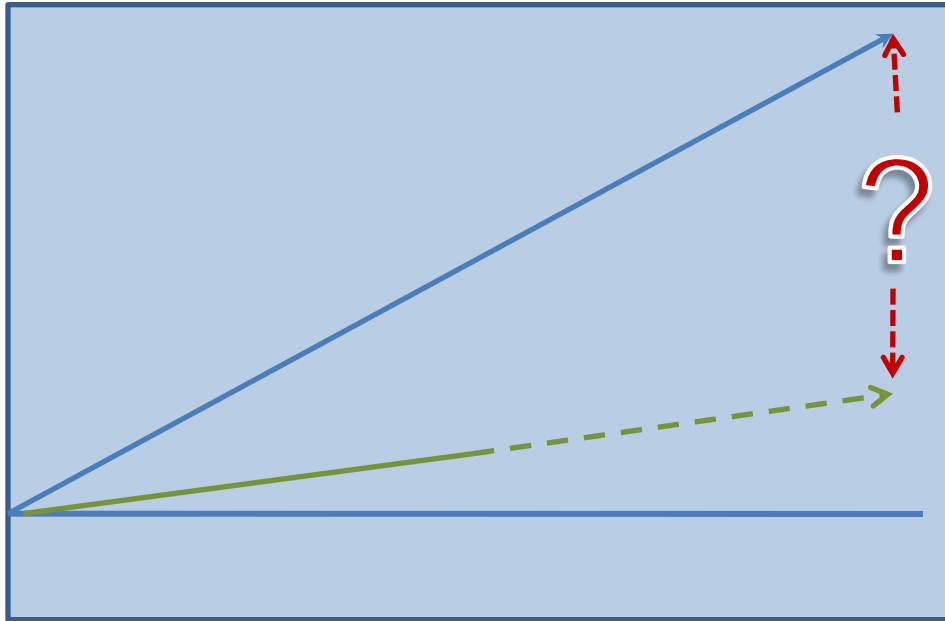
(Source: CRED)

In Southern Africa
95%
of all *Natural Disasters* were
Weather related

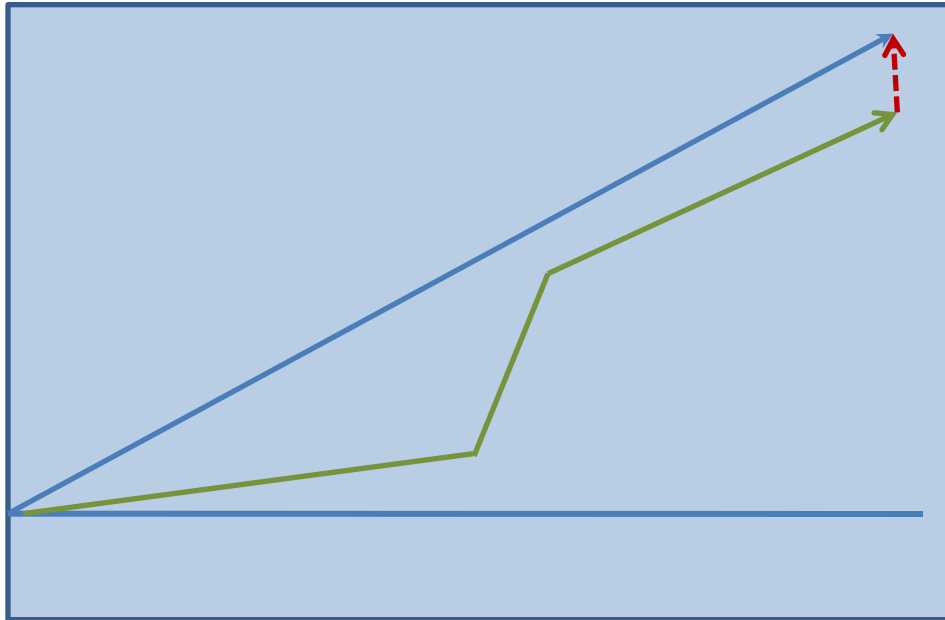


Enhancing the EWS in Southern Africa

- 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



Enhancing the EWS in Southern Africa



- 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*
- *Hence, the need for Regional EWSs*

Progress in the Development of Regional EWS in Southern Africa

SARCOF: Consolidated seasonal climate forecasts in September on the likelihood of above / below normal rain for the coming summer season over SADC

6 months

Late 1990's

Progress in the Development of Regional EWS in Southern Africa

SARCOF: Consolidated seasonal climate forecasts in September on the likelihood of above / below normal rain for the coming summer season over SADC

6 months

SWFDP: Enhancing capacity in NMSs to issue severe weather warnings for the next 5 days

Days

Late 1990's

2006

Progress in the Development of Regional EWS in Southern Africa

SARCOF: Consolidated seasonal climate forecasts in September on the likelihood of above / below normal rain for the coming summer season over SADC

6 months

SWFDP: Enhancing capacity in NMSs to issue severe weather warnings for the next 5 days

Days

SARFFG: Developing technology for flash flood warnings

Few Hours

Late 1990's

2006

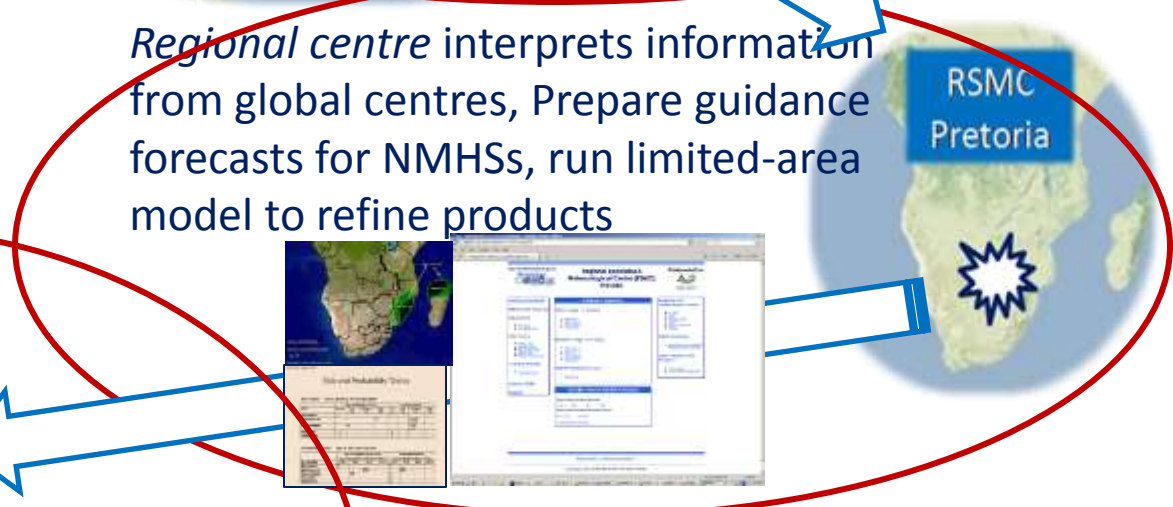
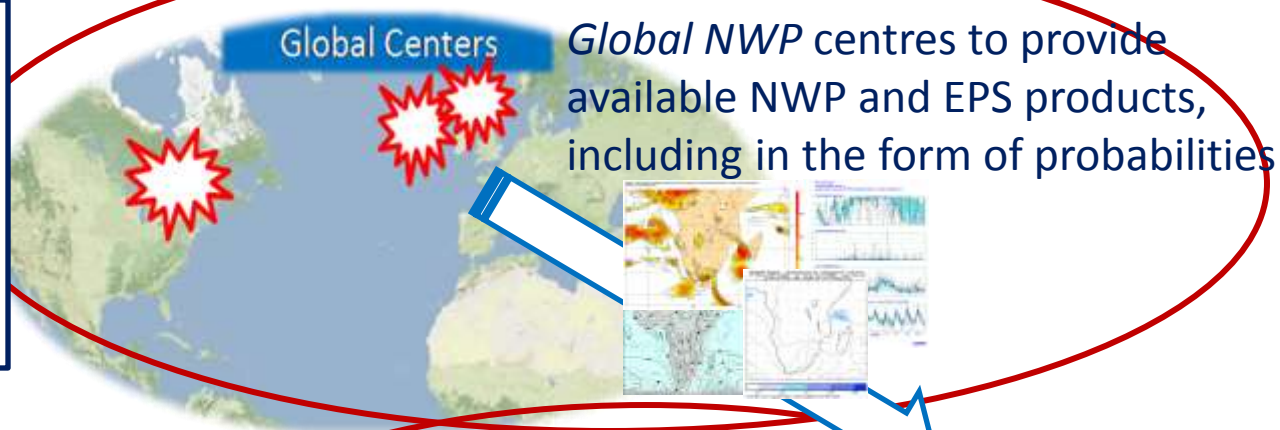
2012/2013

SWFDP-SA: OVERVIEW

Aim of the WMO SWFDP Program

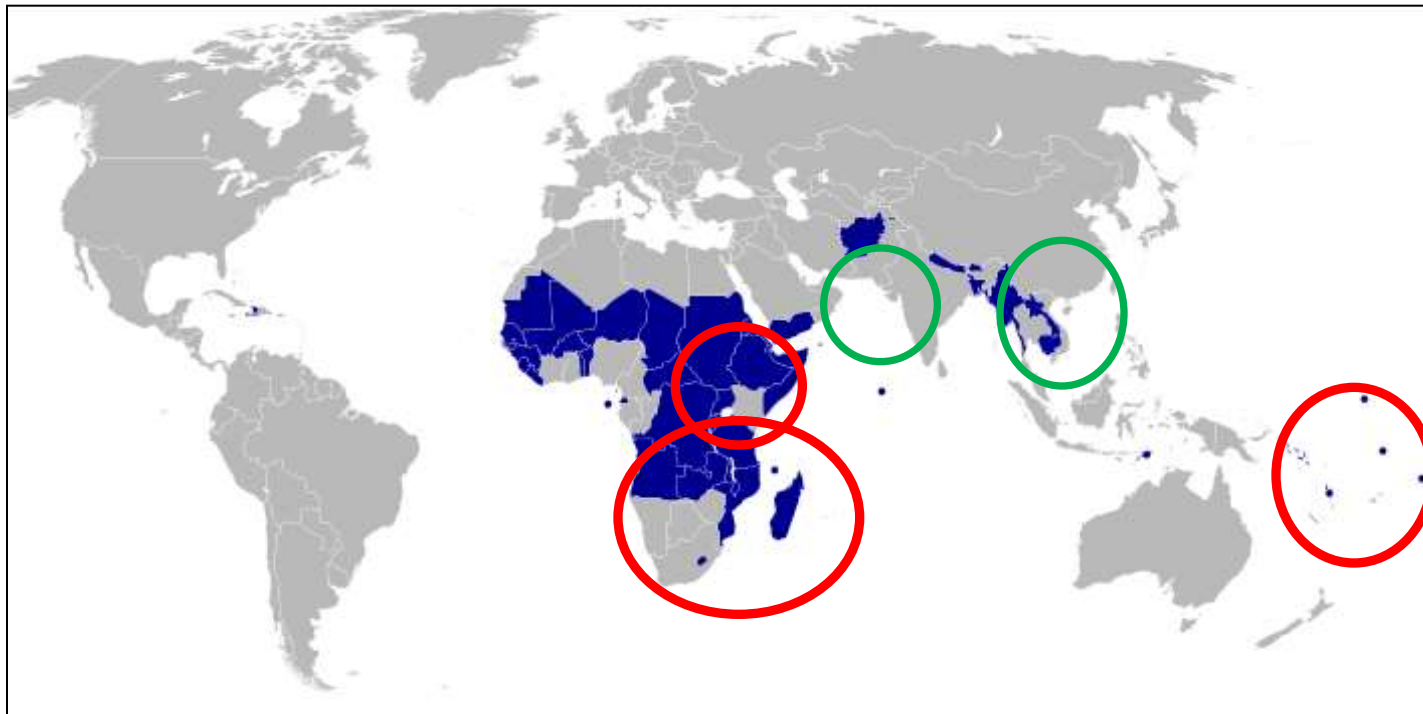
- To improve ability of National Meteorological Services (NMSs) to forecast severe weather events for the next 5 days using existing technology – to close the technology gap
- To improve interaction of NMSs with Disaster Management Agencies
- SWFDP is about *enhancing delivery of warning services as adaptation against a likely increase of disasters due to climate change and socio-economic vulnerabilities*

SWFDP Cascading Process



International Impact of SWFDP

- The SWFDP concept is now also implemented by WMO in the Southern Pacific islands and East Africa, and WMO is targeting at least 2 new regions, all based on the success in Southern Africa



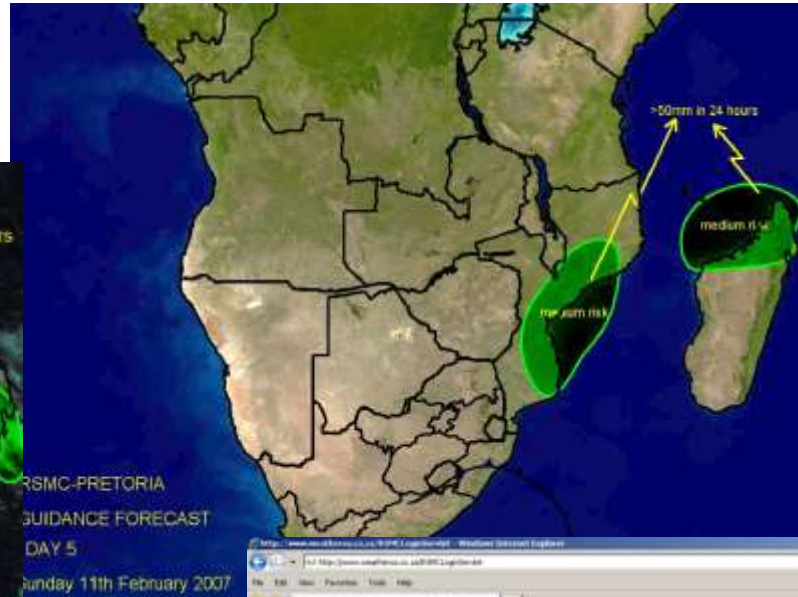
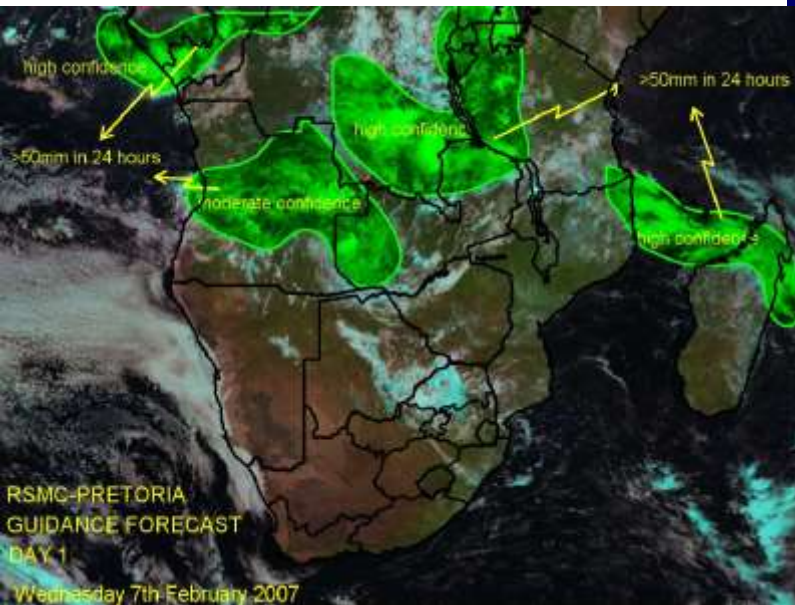
Evolution of the SWFDP-SA Project

- Phase 1: July 2006 – Oct 2006
 - started with a planning meeting in Aug 2006 in Pretoria, South Africa, followed by the first regional training session in November 2006 in Pretoria, South Africa
- Phase 2: Nov 2006 – Nov 2007
 - The demonstration phase based on 5 NMCs, RSMC, 3 Global Centres
- Phase 3: Dec 2007 – Dec 2011
 - MASA requested WMO to roll SWFDP out to the entire region, based on the successes of the demonstration phase
 - The SWFDP activities was rolled out to all 16 Southern African countries

Evolution of the SWFDP-SA Project: Phase 4

- Phase 4: Jan 2012 - ?
 - Long-term sustainability and continuous development phase
 - SWFDP-SA oversight has been transferred from WMO to MASA
 - Embracing other warning system into the basic framework established by SWFDP – flash flooding through SARFFG, etc.
- Recognized that some countries need more help to fully benefit from SWFDP = specific efforts will continue to support those countries
- SWFDP developed a framework for collaboration among NMSs, and with their disaster management structures and media to be used by other programmes

Examples of SWFDP Guidance Products from RSMC Pretoria



World Meteorological Organization
Regional Specialised Meteorological Center (RSMC) Pretoria
Designated to South African Weather Service

Sustenance Products
WWP & EPS Products
Regional Models
Global Products
Training Website
CONTACT RSMC

Guidance Products
Silver range (1-3 Days)
Medium range (3-5 Days)
SWFDP Evaluation Forms
CONTACT RSMC

Satellite-based Rainfall Estimates
Hydro-Estimator Rainfall Totals
Hydro-Estimator Rainfall Totals De-Season

Regional and International Centers
SADC Countries
Other Services and Products

RSMC Pretoria / Contact the Webmaster /
Copyright © 2007 © Weather Service. All rights reserved.

Risk and Probability Tables

Risk Tables: DAY 1: Sunday 7th January 2007

RISK	HEAVY PRECIPITATION (exceeding threshold 50 mm/8hrs)				STRONG WINDS (exceeding threshold 20 kts)			
	No risk	Low risk	Medium risk	High risk	No risk	Low risk	Medium risk	High risk
Botswana	X				X			
Madagascar				W			Cent W Coast	Cent coast
Mozambique		NE						
Tanzania	X				X			
Zimbabwe	X				X			

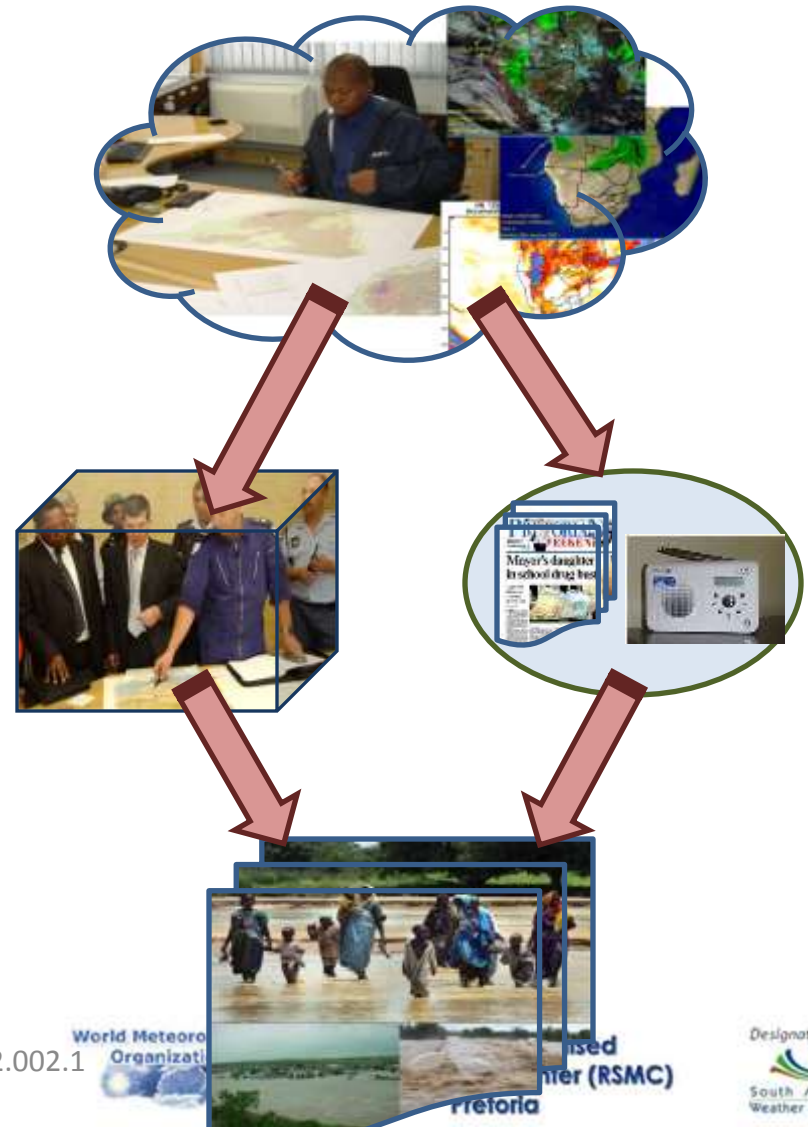
Probability Tables: DAY 3: 09th January 2007

Probability	HEAVY PRECIPITATION (exceeding threshold 50 mm/8hrs)				STRONG WINDS (exceeding threshold 20 kts)			
	<10%	30%	60%	>80%	<10%	30%	60%	>80%
Botswana	X				X			
Madagascar				NW			NW	
Mozambique		NE			X			
Tanzania	X				X			
Zimbabwe	X				X			

FCAST-PRE-20121112.002.1

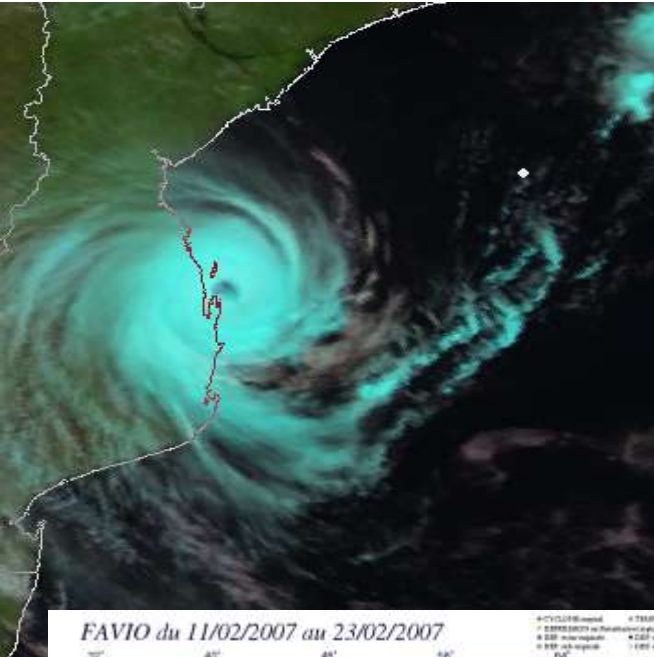
Warnings from National Meteorological Services

- NMSs evaluate model products supported by RSMC guidance products
- Issue warnings if needed against their own in-country criteria for severe weather
- Provide disaster management with up to 5 days lead-time of expected major hazards
- Coordinate with media for end-user dissemination



Example: Tropical Cyclone Favio

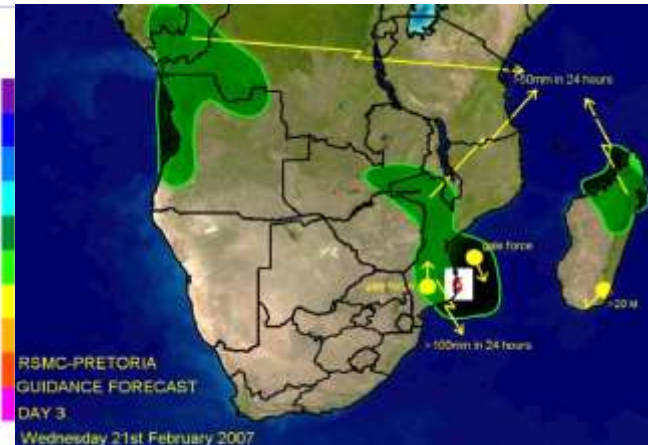
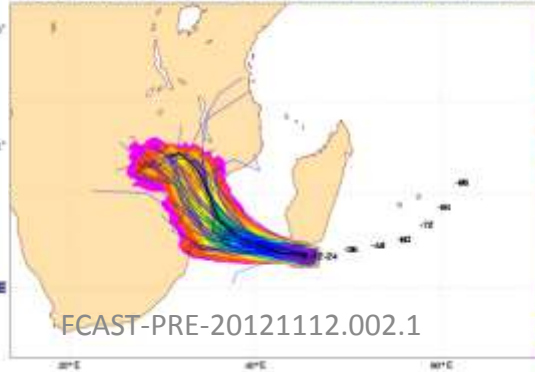
20-24 Feb 2007



- TC Favio caused widespread damage over Mozambique and Zimbabwe
- The consistency of model forecasts provided confidence to RSMC Pretoria to issue guidance to NMCs on potential landfall and movement 5 days in advance
- The model forecast proved to be quite accurate with landfall at Vilancoulos, moving to Eastern Zimbabwe



20070219 12 UTC
Probability that FAVIO will pass within 120km radius during the next 120 hours
tracks: black=OPER, green=CTRL, blue=EPS numbers: observed positions at t+ h



Impact of Tropical Cyclone Favio

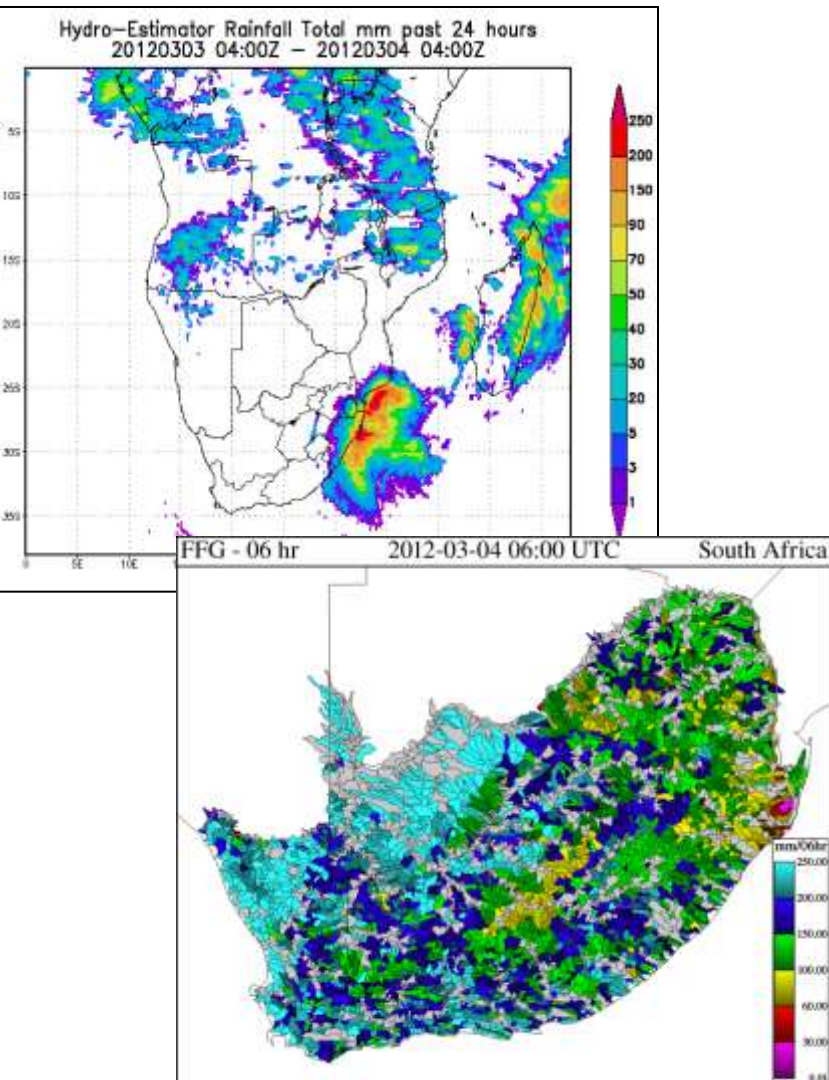


- In both Mozambique and Zimbabwe the NMCs agreed with the guidance products and issued warnings up to 5 days in advance to disaster management departments
- Both countries responded early:
 - Provinces were put on alert levels 2 - 3 days in advance
 - The public responded well and major loss of life were prevented



Tropical Cyclone IRINA- 4 March 2012

Example of collaboration in SWFDP between forecasters of RSMC Pretoria and the NMSs of Swaziland and Mozambique



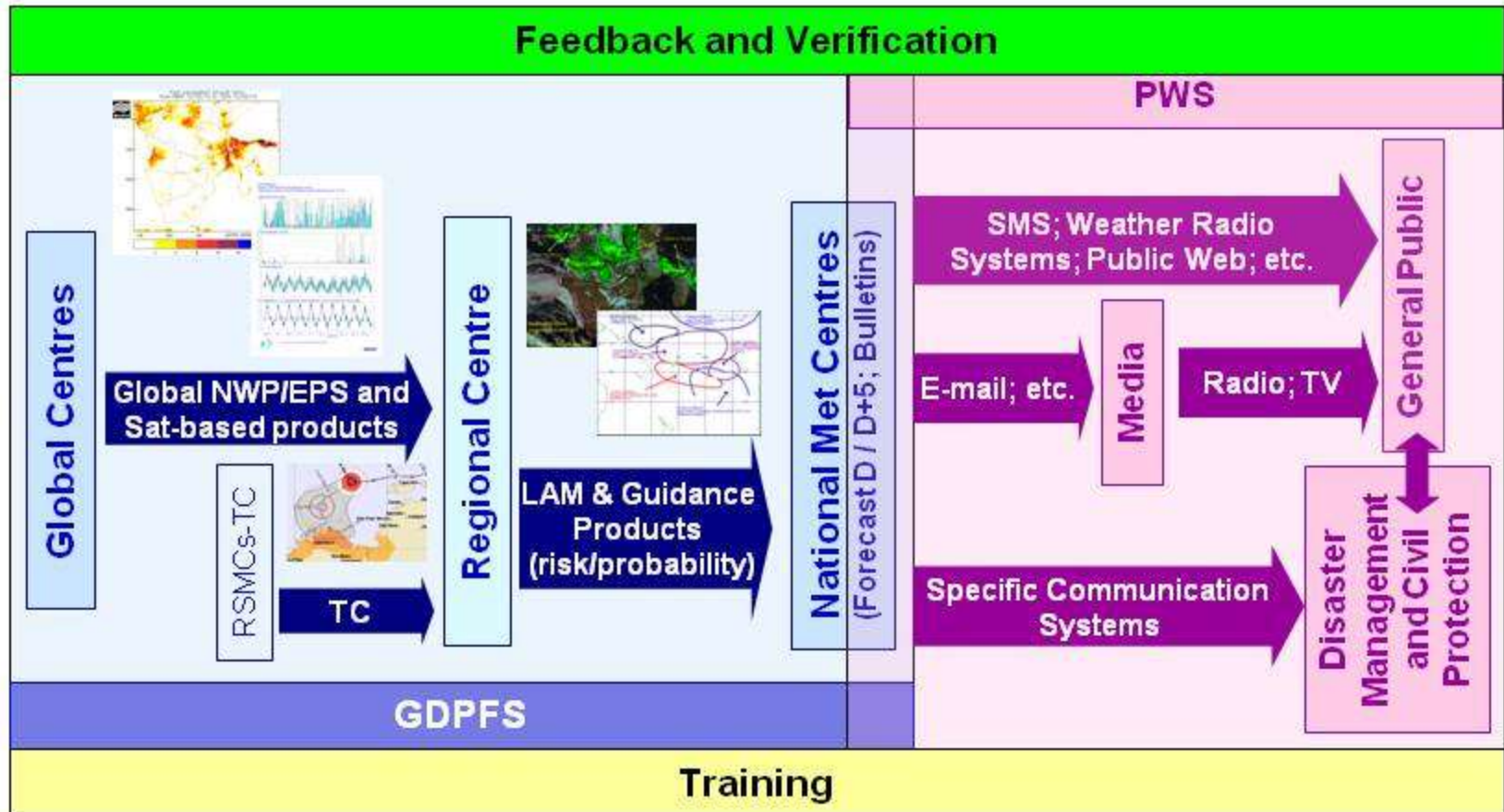
- RSMC-Pretoria issued guidance forecasts for potential impact around northern KZN, Swaziland, Maputo region
- NMSs of Swaziland and Mozambique were in regular contact via email on the progress and uncertainty of the landfall
- Disaster Management centres of the 3 countries were kept up to date by their NMSs

SWFDP: PHASE 4 CONCEPTS AND IMPACT ON SOUTHERN AFRICA



Severe Weather Forecasting Demonstration Project (SWFDP) main components

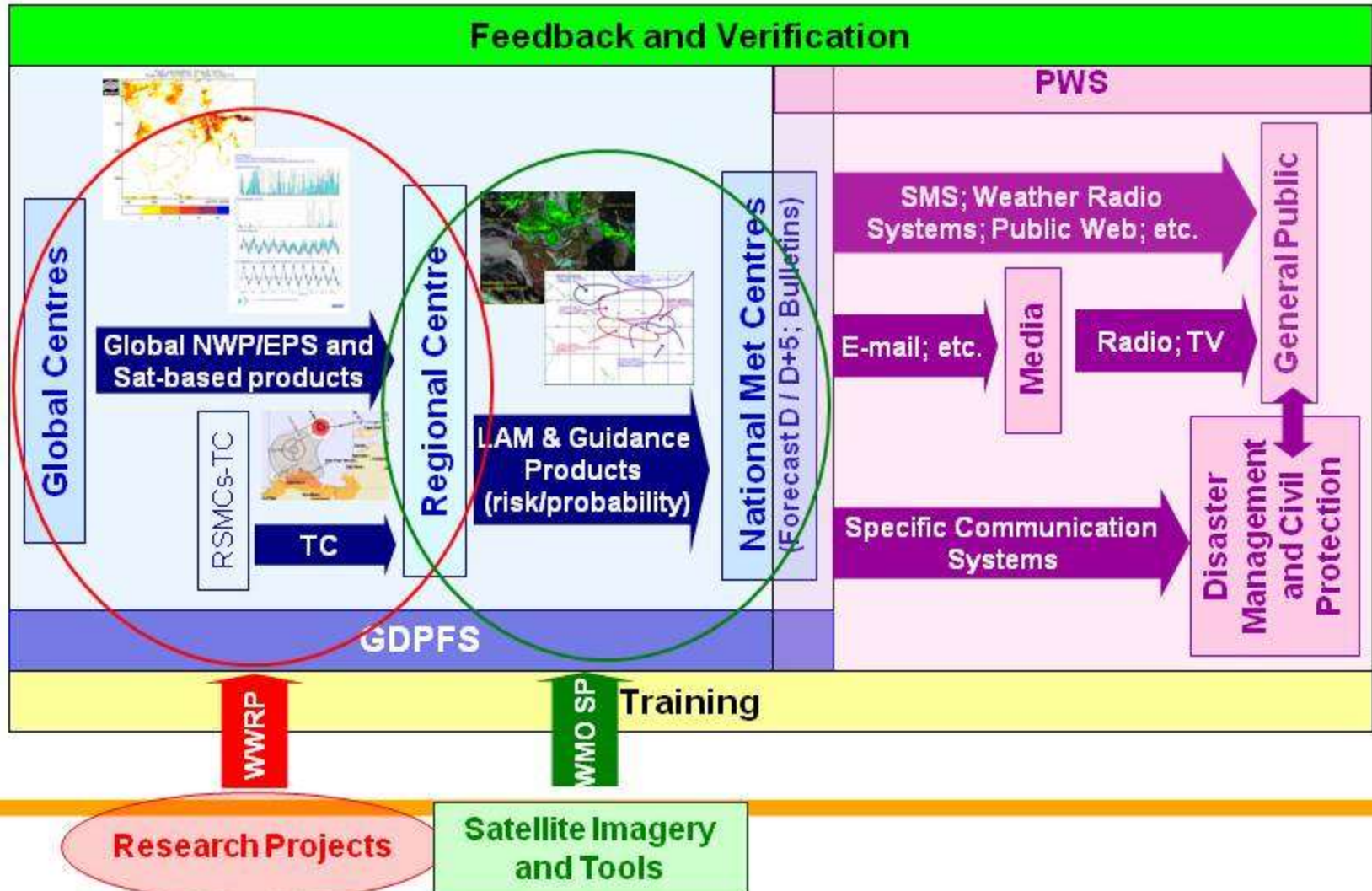
Phases 1 and 2





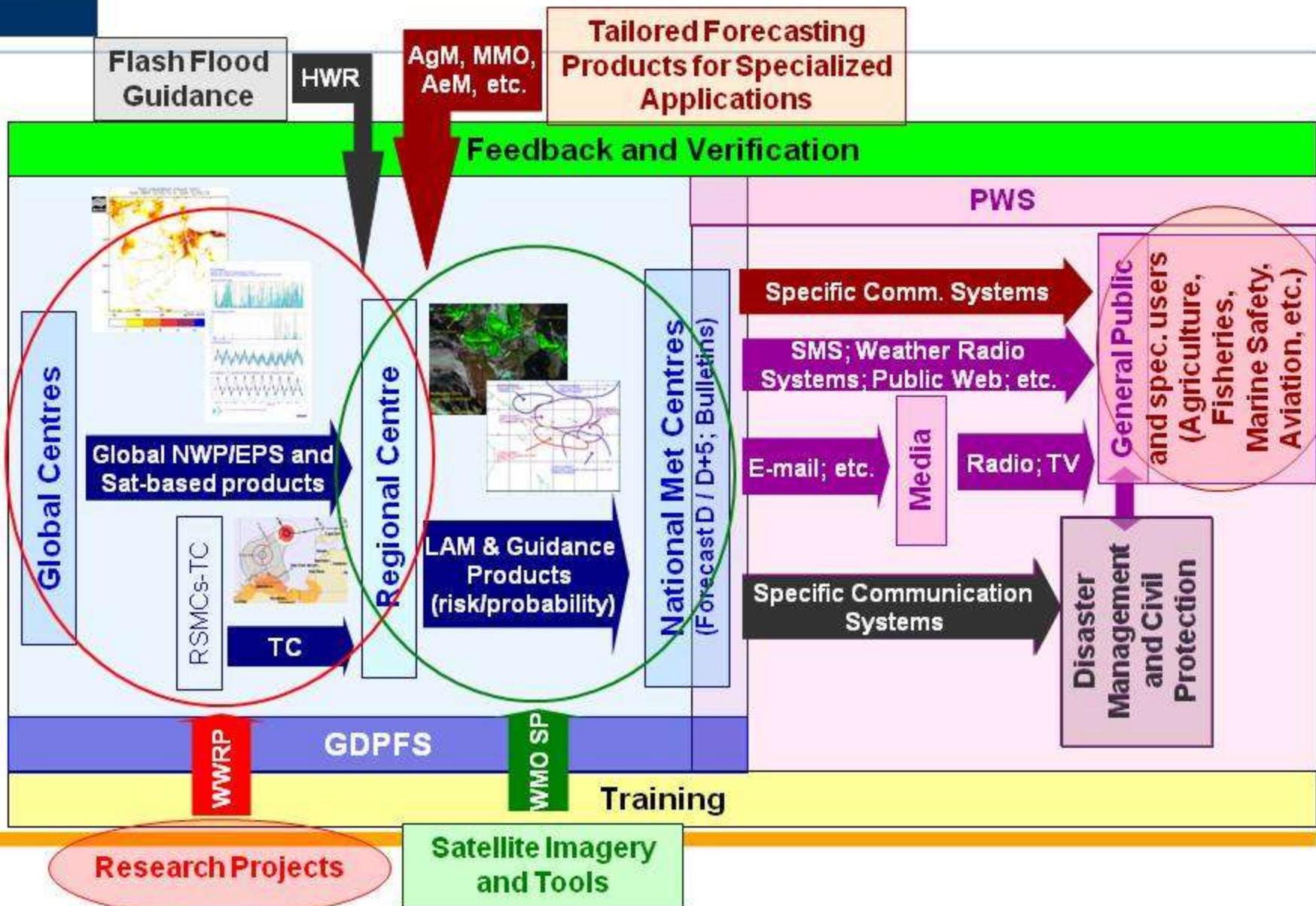
Severe Weather Forecasting Demonstration Project (SWFDP) main components

Phase 3 (more countries, more severe weather hazards)





Phase 4 – sustainability and development



Successes and Challenges of SWFDP

- SWFDP was generally successful in building the forecasting capacity and improving warnings services in many countries, because:
 - ✓ Of its simplicity and operational focus (NMSs only needed internet)
 - ✓ It built capacity that could be immediately used in an operational environment by all countries involved
- It opened channels between weather forecasters and disaster managers in countries where they did not exist in the past
- It highlighted the challenges in effective warning dissemination to end-users, and with disaster management structures
- Highlighted the need for enhancing in-country public responsiveness through public awareness campaigns

Impact of Phase 4 on SWFDP-SA

- Future sustainability is uppermost
- Management moved from WMO to MASA
- WMO still requires general reporting from the region to assess if there is a need for specific support activities
- The strong SWFDP “brand” in WMO circles can still be used and should benefit the region as other activities are linking up with the SWFDP programme: we will not miss on new developments provided to SWFDP subprojects
- Further development and expansion to other hazards or sectors should be done

Future Challenges: internal

- Disaster management collaboration in various countries still need to be strengthened
- Application at local level to be improved: dissemination and end-user response
- Enhancement of communication bandwidth is essential
- Support of countries lagging behind is high priority
- Important to develop a seamless warning system from seasonal (SARCOF) to daily (SWFDP) to hourly (SARFFG) providing useful end-user products
- Some applications into new sectors envisaged:
 - Hydromet applications
 - Agromet applications
 - Coastal inundation issues

Future Challenges: external

- To continue realize the benefits of SWFDP sub-programmes will require:
 - Continuing collaboration between the Global Centres, RSMCs and NMSs
 - Specialized products of Global Centres are crucial for the cascading forecast system to work
 - Continuous development through new opportunities
 - Links to R&D activities such as TIGGE, and the new WMO research projects replacing THORPEX
 - Ensuring future sustainability, particularly for training activities, technical team meetings, support with outreach activities

But, above all...

The structure of cascading of info to support EWS has been developed and implemented over an extensive period:

It is now up to each NMS to use this opportunity to develop their services, this last mile is their own responsibility, global and regional centres can go only so far...

What is your NMS doing with this opportunity??

Questions?