

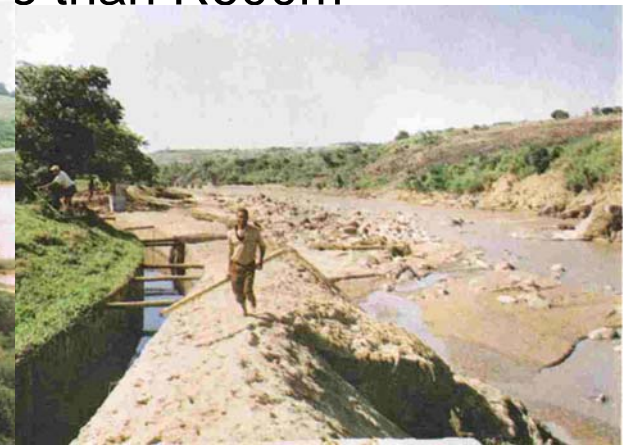
Overview of Early Warning Systems and the role of National Meteorological and Hydrological Services

South Africa

Second Experts' Symposium on
Multi-Hazard Early Warning Systems
With focus on the Role of National Meteorological and Hydrological Services
5-7 May 2009, Toulouse, France

Background of the establishment of EWS in South Africa

- Sept 1987: A cut-off low caused one of the worst flooding events over KwaZulu-Natal
- SAWS issued warnings 4 days in advance to the media and Department of Water Affairs (DWA)
- DWA issued flood warnings, and none of the large dams suffered damage
- But: at the time Civil Defense focused only on post-disaster response
 - Many people did not hear the warnings in time
 - There were more than 300 deaths damage more than R600m



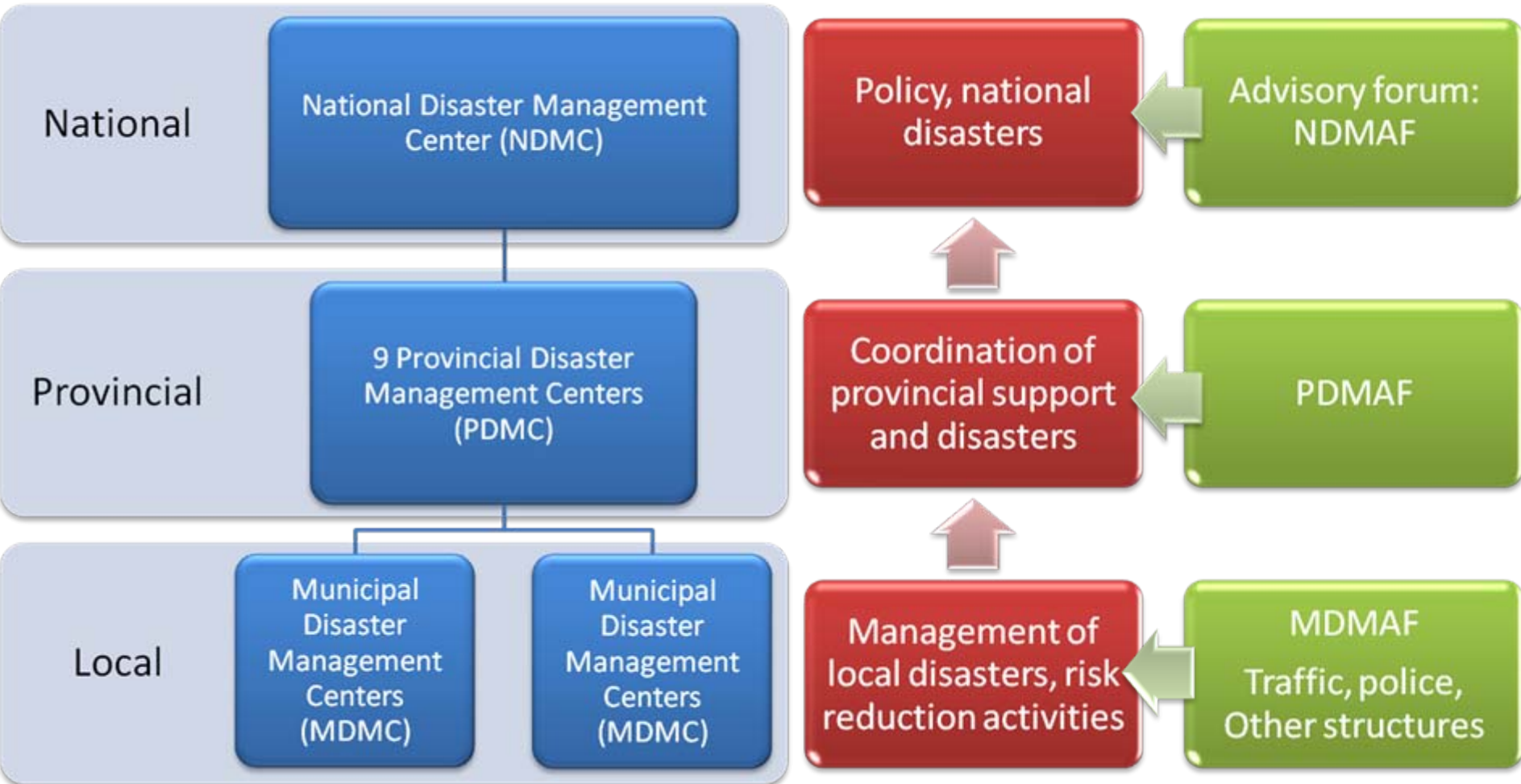
- The Disaster Management Act of 2002 reorganized disaster management structures dramatically, and induced the culture of preparedness and mitigation
- Since then EWS in South Africa became recognized as a proactive component of DRR
- The EWS was adapted to take advantage of the environment
- Today:
 - SAWS is recognized as an important partner in DRR
 - The Meteorological EWS is highly regarded by disaster managers
 - SAWS personnel are involved in many DRR activities and structures
- MoU between SAWS and NDMC (National Disaster Management Center) led to various joint projects



Governance and Institutional arrangements

- SAWS Act of 2001 declared SAWS as the sole provider of weather related warnings, entrenched EWS as its prime mandate
- State-of-the-art Disaster Management Act of 2002 defined a new DRR paradigm for South Africa
 - Introduced also proactive preparedness and mitigation activities
 - Defined a well structured disaster management system
 - Clearly defined disaster management activities and roles of stakeholders like SAWS, etc.
 - Effectively established the career of “disaster manager”
- Disaster Management Framework of 2004 set the scene for implementing the DM Act

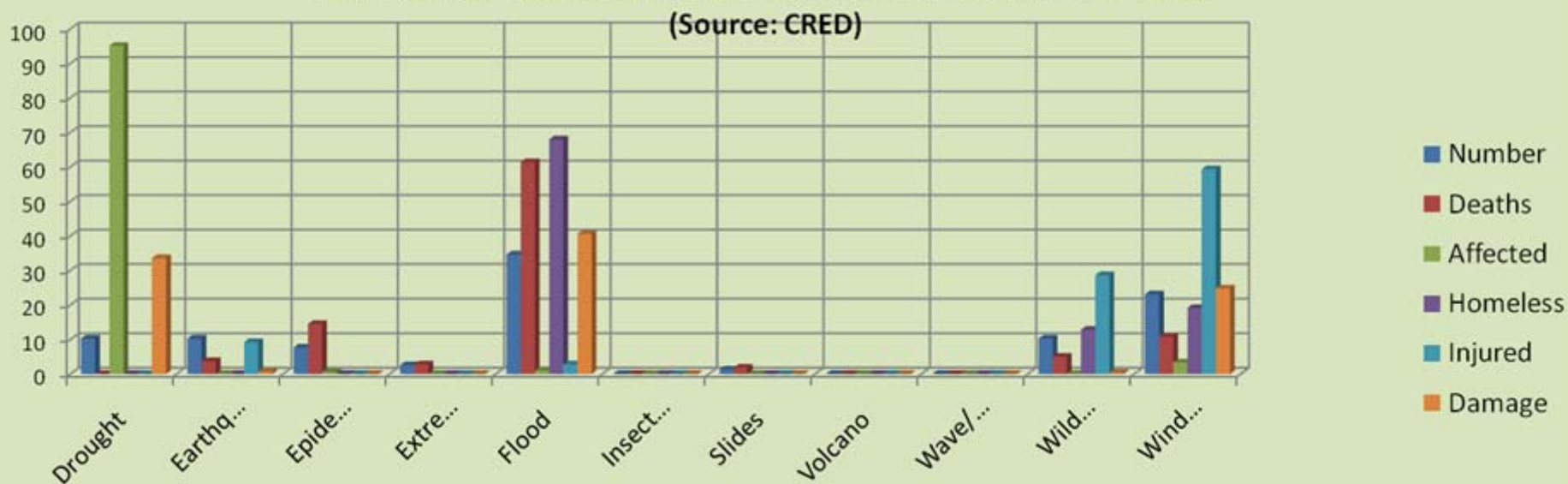
Interministerial Disaster Management Committee (IDMC)



Hazard monitoring, forecasting and mandates for warning development

- From CRED data 90% of disasters in South Africa are weather related
- Droughts, floods, wildfires and windstorms are the most prominent weather related disasters in South Africa
- There has been a persistent rise in adverse impacts of these disasters, particularly flooding, wildfires and windstorms

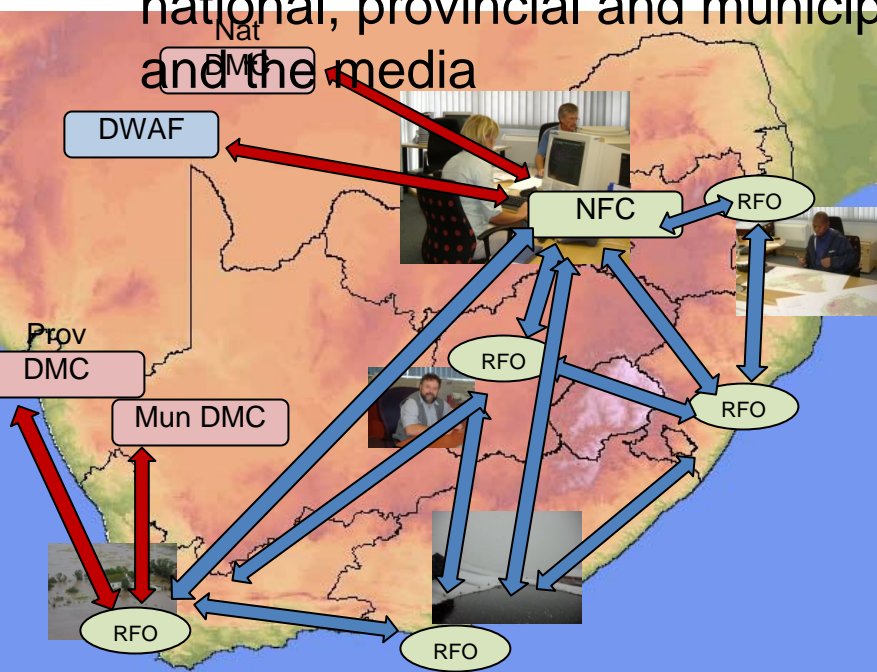
IMPACT OF DISASTERS ON SOUTH AFRICA: 1920-2008



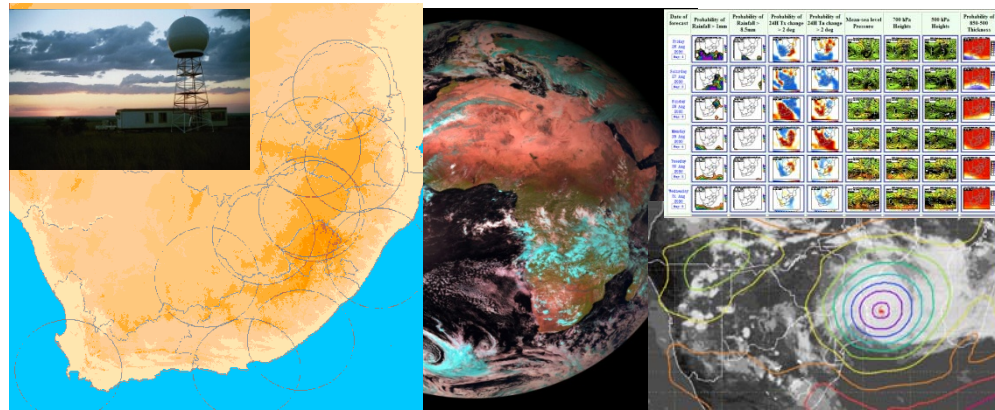
- Type 1 hazards:
 - SAWS Act determines SAWS sole the provider of weather related warnings
- Type 2 hazards:
 - Hydrology separate from SAWS with Dept of Water Affairs and Forestry (DWAF), agreement that:
 - SAWS responsible for flash flood warnings (<6 hours)
 - SAWS delegated responsibility for wildfire warnings, by DWAF according to Veldtfire Act
- Type 3 hazards:
 - SAWS provide heavy rainfall info to DWAF who is responsible for river flood warnings (> 6 hours)
 - SAWS provide dissemination channels to Council of Geosciences who is responsible for tsunami warnings and geological warnings

Development of understandable, authoritative, recognizable and timely warnings

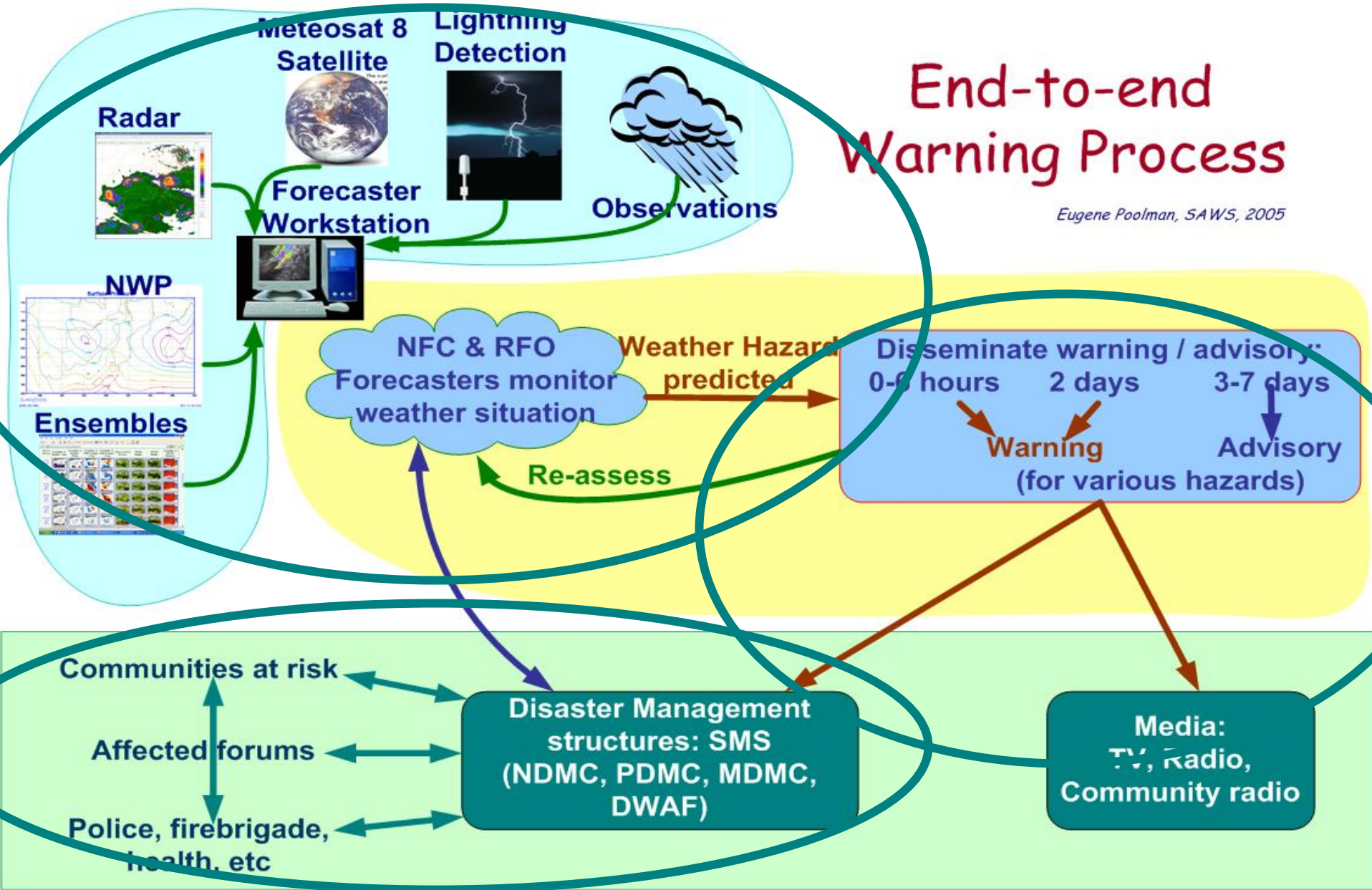
- SAWS monitors radar, satellite, NWP and ensemble NWP systems assessing potential hazards up to 5 days ahead:
 - ✓ *Advisories* are issued by NFC up to 5 days ahead of potential threats – *Heads Up!*
 - ✓ *Warnings* are issued by RFOs (& NFC for larger events) for the next 24 hours when risk is high or hazards is imminent or occurring
- National and regional forecasting offices liaise directly with relevant national, provincial and municipal disaster management centre, DWAF and the media



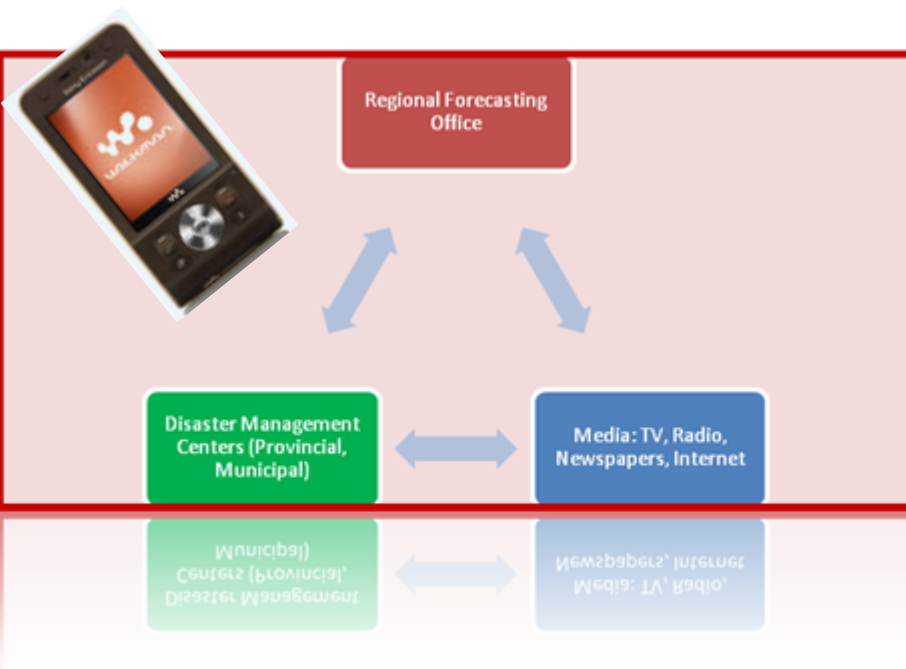
prior, during and after event



The Early Warning System in SA



Warning dissemination mechanism

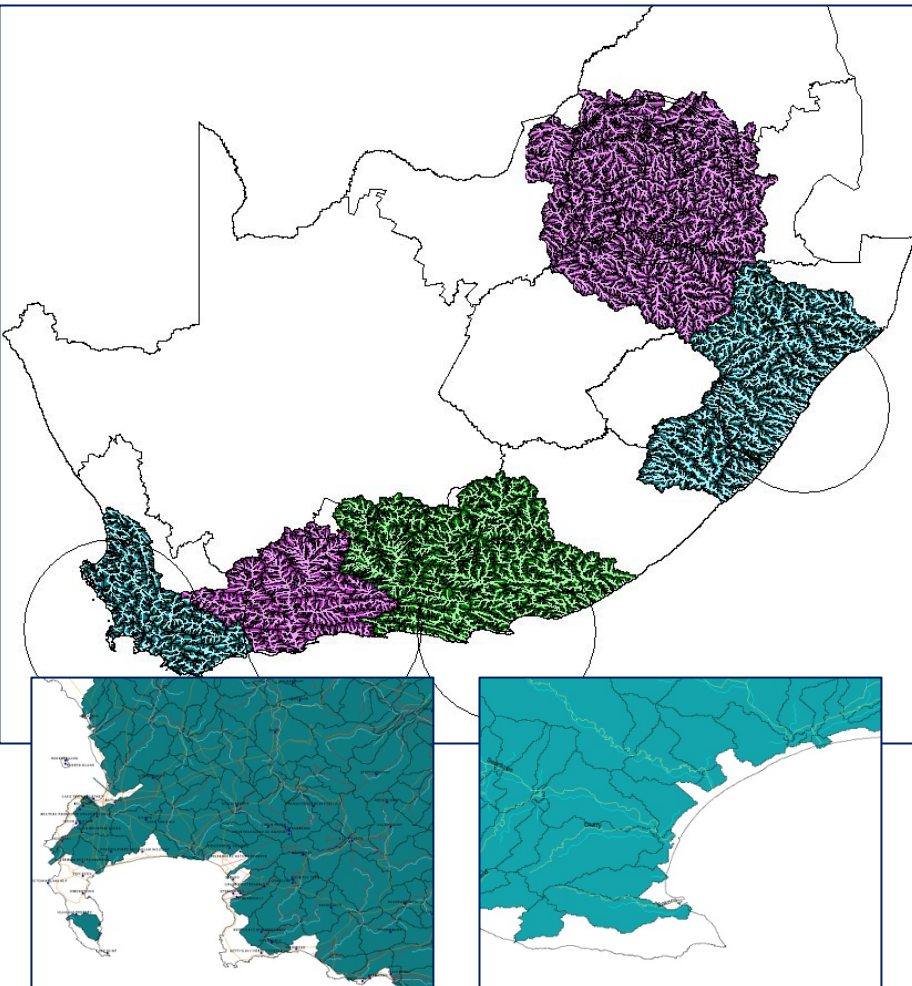


- To Disaster Management Centers prior and during event:
 - Internet and email
 - Cell phone: SMS
 - Direct communication using telephone
- To general public and communities at risk:
 - Media, including TV, internet, newspapers, radio, community radio
 - Via local disaster managers

Improvement of overall operational framework of EWS

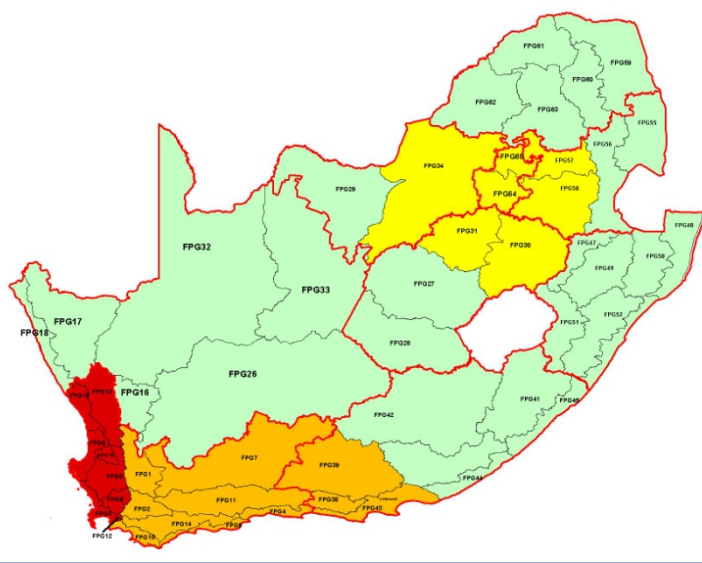
- INEWS (Integrated National EWS, or MHEWS) defined to integrate all EW into a single framework, including meteorological, hydrological, related health hazards, and geological hazards
- MOU between NDMC and SAWS coordinating relations and cooperation, including joint projects:
 - Project: South African Flash Flood Guidance system under development
 - Project: Implementing new EW alert categories (advisory, *watch*, warning) and public awareness campaign
- National early warning task teams from National Disaster Management Advisory Forum

Project : SAFFG - South African Flash Flood Guidance System



- Improve flash flood warnings in prone regions
- Funded by NDMC
- Implementation by SAWS
- Target date May 2010

Project: INEWS Phase 1: Enhancing Severe Weather Warning System



<i>Advisory</i>	<i>Watch</i>	<i>Warning</i>
Be Aware!	Be Prepared!	Take Action!
Early warning of potential hazardous weather	Weather conditions are likely to deteriorate to hazardous levels	Hazard is already occurring somewhere or is about to occur with a very high confidence
2 to 6 days	1 to 3 day	next 24 hours

- Implementation of new alert categories:
 - Advisory (2-6 days lead-time)
 - Watch (1-3 days)
 - Warning (24 hours)
- Standardization of message content
- Training of disaster managers
- Public awareness raising
- Centralized warning database

Examples of events where the EWS has led to improvements in preparedness and prevention

- **Bredasdorp floods, April 2005:**
 - a severe weather system caused widespread flood damage on the Cape South Coast
 - Cut off: Waenhuiskrans, Struisbaai, Elim, Napier



- Disaster management situation:
 - Lessons from the Montagu-floods of March 2003 in institutional coordination and communication of warnings to communities at risk
- Advisories & warnings issued with 3-day lead-time by SAWS
- Improved disaster management reaction to warnings
 - JOC activated on 10th (Overberg DM, Municipality, Air Force, SAPD, etc) responsible for evacuation, search & rescue and relief operations
 - Good coordination & two-way communications
- Challenge
 - Need for more specific warnings of flood prone areas
 - Warnings still did not reach communities at risk effectively

Role of the SAWS in the EWS

- Risk knowledge:
 - SAWS provide hazard information from climate database and general hazards analysis
 - Participate in post-event assessments on meetings
- Monitoring and warning:
 - Monitoring potential general, maritime and aviation meteorological hazards using various technology
 - Issuing advisories and warnings of likely threats 24/7
- Warning dissemination:
 - Dissemination to disaster management structures, public and communities at risk
- Response activities:
 - Provide information for response actions by disaster management structures during and after events

Overall lessons learnt and future steps for improving the system

- Recognize most difficult part of early warnings is:
 - Effective communication of warnings and
 - Effective community awareness
- Very important that a close partnership develops between forecasters and disaster managers – attend their meetings
- Need to distinguish between different warning needs of:
 - Developed cities
 - Rural communities and villages
- Regional collaboration in EWS (like Southern African countries in SWFDP) crucial for national warnings
- Need for regional coordination guidelines between countries, and with regional and international emergency management structures

THANK YOU
Let me stop right here...

