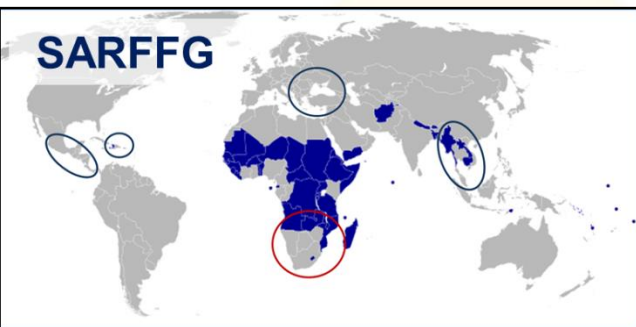
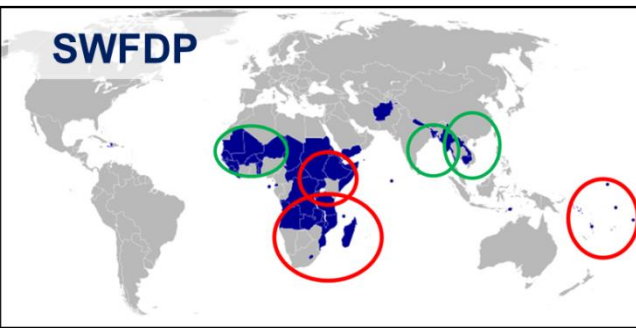


WMO Project on Twinning SARFFG & SWFDP-SA

Eugene Poolman
South African Weather Service

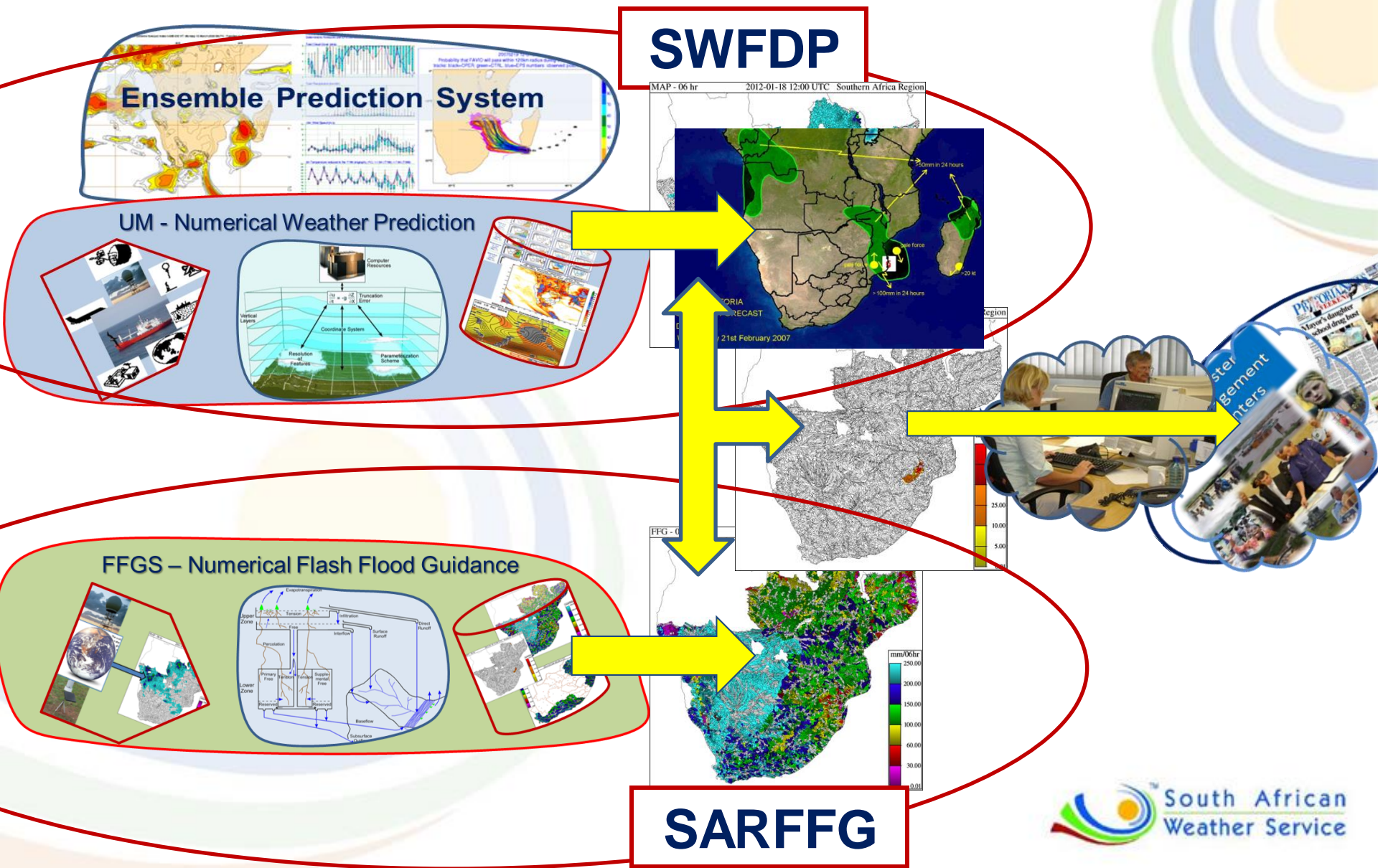
SWFDP vs SARFFG



- SWFDP since 2007
 - Backbone is the cascading of EPS, NWP, Sat Nowcasting forecasting products on internet
 - From Global to RSMC to NMSs to DMAs
 - Forecast for next 5 days, every day
- SARFFG since 2014
 - Model server at RSMC, flash flood guidance products to NMHSs via internet
 - Nowcast for next 6 hours

1. WMO Twinning Project:

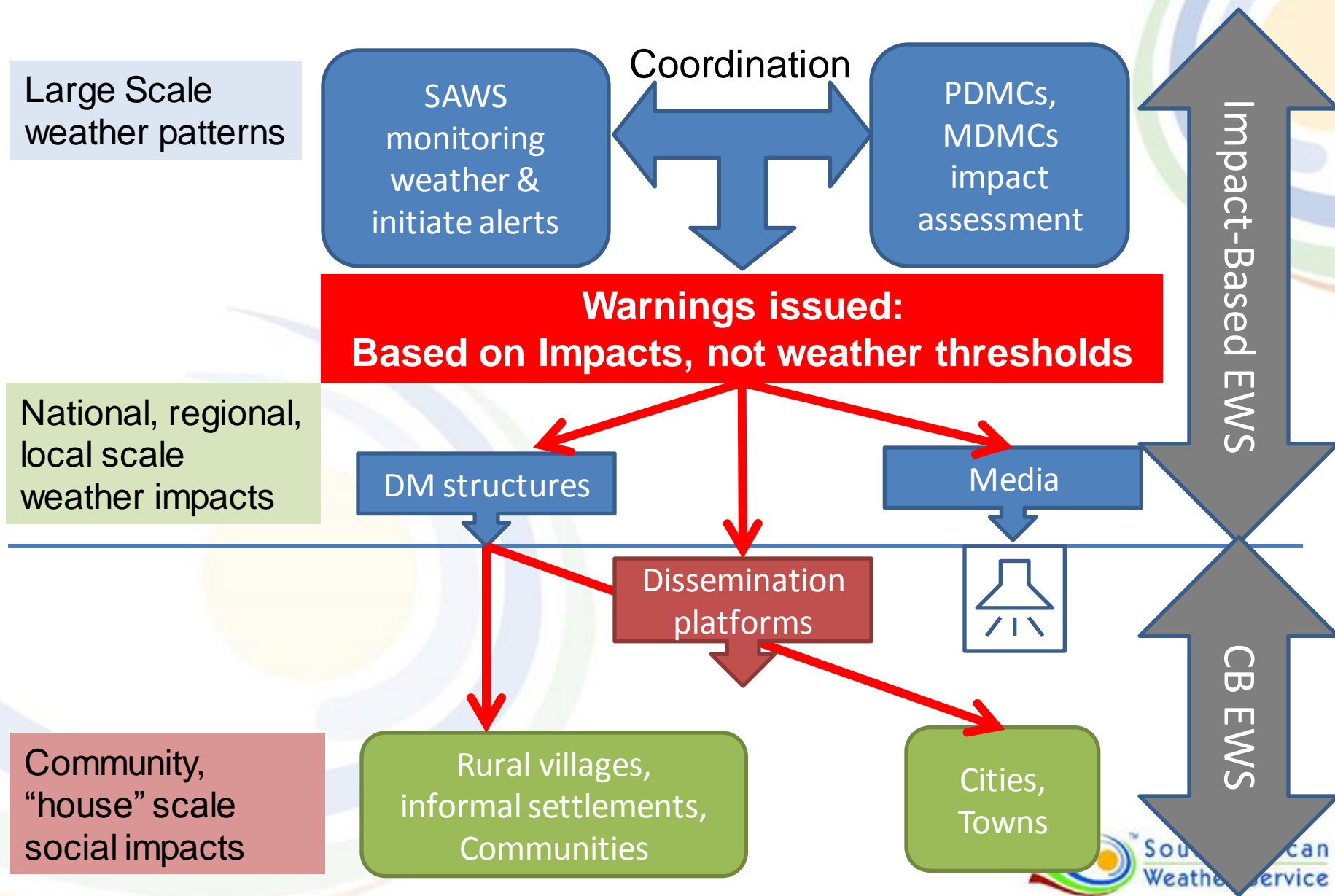
Integrated SWFDP-SARFFG Forecasting System



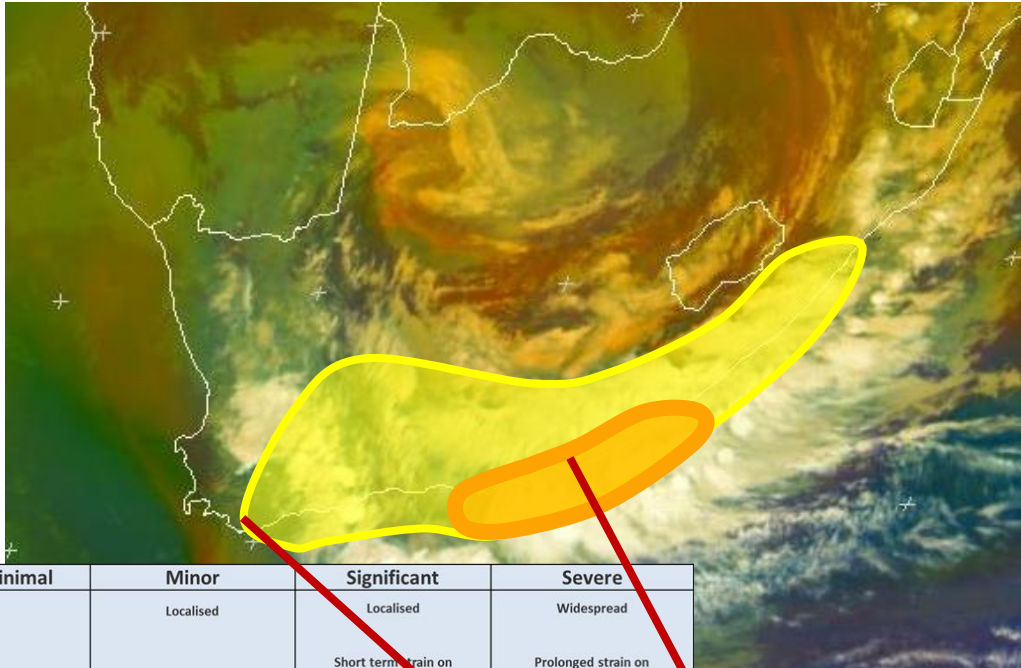
Twinning Project Developments

- SARFFG Forecaster Interface enhancements
 - providing Google type detail including vulnerability detail (roads, cities, etc.)
 - On-demand FFG-grams at any basin
- Multiple NWP streams for 5 models
 - Compare rainfall fcasts with FFG “ensemble” flash flood threat
 - Combining SWFDP rainfall guidance fields as a “model stream” to provide forecaster-interpreted
- Extending forecast period to 12 and 24 hours using NWP in planning
- River flooding to be tested in the region

2. Moving from “What weather will *be*” to “What weather will *do*”



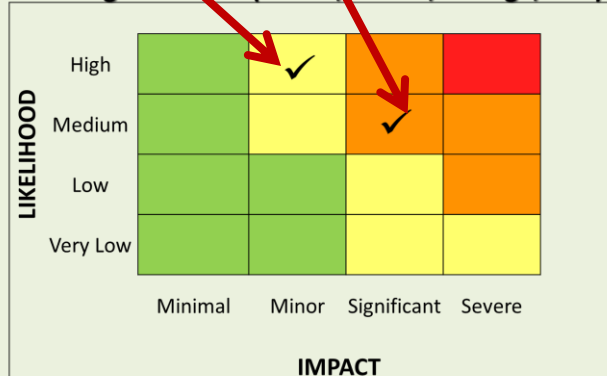
Testing Impact-based EWS linked with flooding



Minimal	Minor	Significant	Severe
Business as usual	Localised Business as usual	Localised Short term strain on emergency personnel	Widespread Prolonged strain on emergency personnel
<ul style="list-style-type: none"> Some Pooling of water on roads Day to day activities not disturbed Wet roads Minimal traffic congestion 	<ul style="list-style-type: none"> Localised flooding of susceptible roads, low-lying areas and bridges Localised and short term disruption to municipal services (water, electricity) Major roads affected but can be used, increased travel times Minor motor vehicle accidents due to slippery roads Closure of roads crossing low water bridges 	<ul style="list-style-type: none"> Flooding of roads and settlements (<i>formal and informal</i>) Disruption to municipal services (water, electricity) Major disruption of traffic flow due to major roads being flooded or closed Possible damage to and bridges Danger to life (fast flowing streams / deep water) Some communities temporarily not accessible/cut-off Displacement of affected communities Damage to property infrastructure and livelihood 	<ul style="list-style-type: none"> Widespread flooding of roads and settlements Widespread, prolonged disruption to municipal services (water, electricity) Widespread transport routes and travel services severely affected Major roads and bridges

Rain Impact Table

Warning Risk Level (Green, Yellow, Orange, Red)



- NOT *weather threshold* based (50mm in 24hrs), but *impact level* based
- Impacts developed by Disaster Management based on vulnerability
- Impacts from rain include roads flooded, bridges damaged, villages flooded evacuation, etc.
- Forecaster coordination with disaster management tested
- Different warnings require a different response from disaster management depending on its *impact* and *likelihood* levels
- FFGS systems ideally suited for providing guidance

20-23 Feb 2017 Gauteng Heavy Rain Event

Date Issued:	20-Feb-17
Date Valid:	20 Feb 2017 to 22 Feb 2017
Time Valid:	08h00 20 Feb to 23h00 22 Feb
Warning (SMS)	ORANGE WARNING OF RAIN
	5. Be prepared for some moderate level disruption to normal daily life in Gauteng.
Discussion (Email and Website)	Rainfall already occurring across Gauteng with decent rainfall amounts already measured in places, however models are indicating rainfall to subside slightly for the remainder of the today with the bulk of rain coming in overnight and especially tomorrow during peak hour morning traffic. There is an indication that more than 100 mm is possible in places tomorrow (Tue). Heavy rainfall could persist over Gauteng on Wednesday, especially over the northern parts (COT). Areas that are prone to flooding need to be closely monitored over this period.
	Please be aware that flooding of roads and settlements (formal and informal) are possible, disruption of municipal services, major traffic flow problems (disruptions) because of flooded roads and significant reduced visibility due to rainfall, possible damages to roads and bridges due to flooding, possible danger to life (due to fast flowing streams and rivers), some communities could be displaced.

Likelihood	High				
	Medium			5	
	Low				
	Very Low				
		Minimal	Minor	Significant	Severe
		Impacts			

Date Issued:	22-Feb-17
Date Valid:	22 Feb 2017 to 23 Feb 2017
Time Valid:	11h00 22 Feb to 23h00 23 Feb
Warning (SMS)	YELLOW WARNING OF RAIN
	1. Be aware that some low level disruption looks likely to occur over Gauteng
Discussion (Email and Website)	High rainfall amounts have already been recorded across Gauteng and therefore the ground should be saturated due to these high amounts. The areas that are prone to flooding have already reported flooding and any further rainfall (even amounts that are not particularly high) could cause those same areas to flood again. There is a higher likelihood of minor impacts occurring over the City of Tshwane due to the bulk of the rain expected to occur over this area.
	Please be aware that localised flooding of susceptible roads and settlements, low-lying areas and bridges is possible. Major roads will be affected, but can still be used with an increase in travel times. Roads crossing low water bridges could possibly need to be closed.

Likelihood	High				
	Medium			1	
	Low				
	Very Low				
		Minimal	Minor	Significant	Severe
		Impacts			

- A heavy rain event linked to Ex-TC Dineo caused heavy rain over central SA.
- Flooding widely reported, also Gauteng
- This event raised the Vaal dam from 65% to 85% in 3 days

Road	Area
Witkoppen Road	Douglasdale, Paulshof
Roosevelt Road	Alexandra
John Voster, Rabie	Centurion
Low bridge over Apies River	Capital Park
Atteridgeville flooded	
Brook Ave, River Club and River Road	Bryanston
Old Pretoria and Olifants	Midrand
Smit Street	Braamfontein
R24	Eastrand
Town road closed Barrage	Vanderbijlpark, Emfuleni
Frikkie Meyer	Vanderbijlpark, Emfuleni
Golf road	Vereeniging, Emfuleni
Union road	Vereeniging, Emfuleni
Pierneef road	Midvaal

