

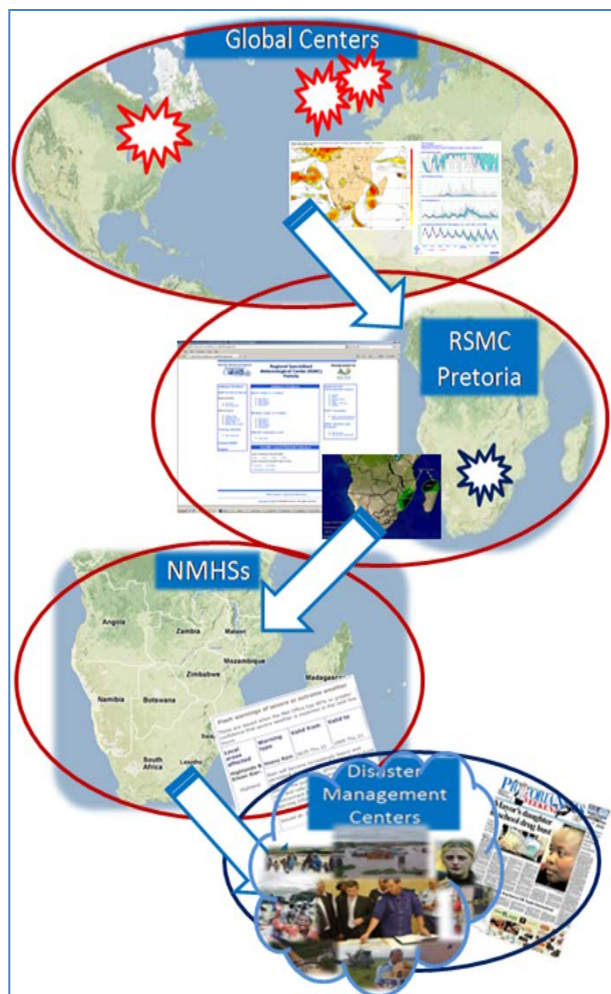
# ***SWFDP-SA: Progress and Phase 4 Concepts***

*Eugene Poolman*

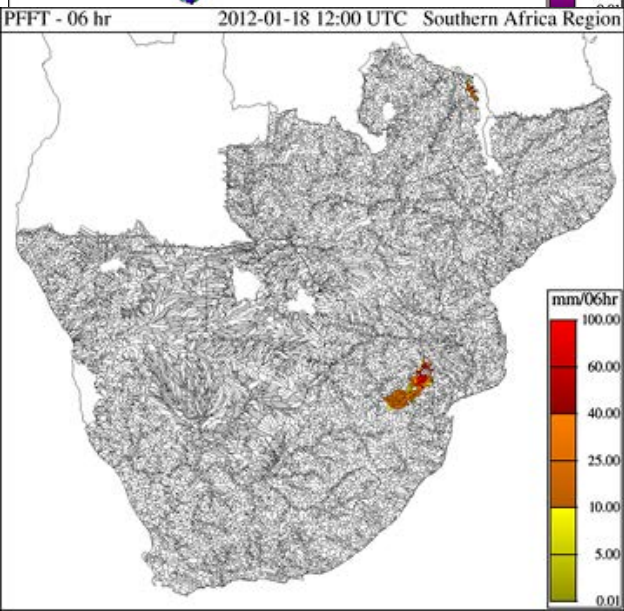
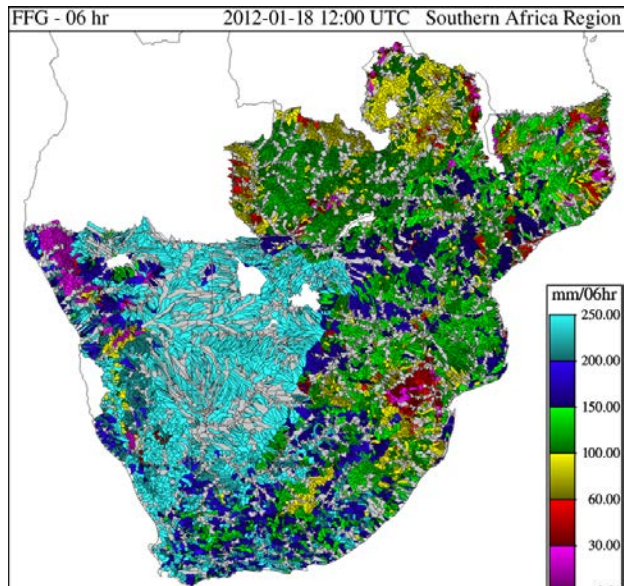
*RSMC Pretoria*

# WMO's SWFDP in Southern Africa (Severe Weather Forecasting Demonstration Project)

- Aim: To improve ability of National Meteorological Services (NMSs) in SADC to forecast severe weather events for the next 5 days using existing technology – to close the technology gap
- Started with demonstration in 2007, now operational
- SADC example now also in 4 other regions globally
- Principle of “Cascading of Information”
  - From Global Centres (provide specialized forecasts)
  - To **RSMC Pretoria** (issue via RSMC website to NMSs)
    - guidance forecasts of potential severe weather for next 5 days, every day,
    - UM and satellite products)
  - To 16 National Meteorological Services (Issue national warnings with up to 5 days lead time using guidance)
- Underpinned by annual training at RSMC Pretoria
- No complex technology required at NMSs – PC with internet



# WMO's SARFFG (Southern African Regional Flash Flood Guidance)



- Aim: to improve flash flood warnings to disaster management and the public in SADC
- Implemented in Feb 2014, also in 6 other regions globally
- “Cascading of Information”
  - **RSMC Pretoria:**
    - Runs SARFFG modelling system 4 x daily to calculate potential for flash floods over 20,000 river basins in SADC
    - Issue guidance forecast daily (coming soon)
  - NMSs access products through internet from RSMC Pretoria, issue flash flood warnings if necessary
- Annual training at RSMC Pretoria
- First system providing this type of hydro-meteorological information operationally to developing countries in SADC

# Development of the SWFDP-SA Project: Phase 4

- Phase 4: Jan 2012 - ?
  - Long-term sustainability and continuous development phase
  - Further development and expansion to other hazards or sectors should be done
- Future sustainability of REWS is crucial
- WMO Twinning Project to integrate SWFDP activities with SARFFG
  - End-to-end
  - Technical and forecasting practices – link between forecasting and FFGS
  - Disaster management collaboration
  - Capacity building

# Recent Developments

## NWP

- Unified Model 12km replaced by a 4km version covering SADC (April 2014)

## NOWCASTING

- Added RDT (Rapidly Developing Thunderstorms) on a Google Earth background – allow zooming and id of more detail
- Forecasts of Lightning Threat Index,
- Hail forecasts
- Convective Rain Rate (CRR)

## CAPACITY BUILDING

- Combined SARFFG and SWFDP training in Nov 2015 and 2016



# Regional Specialised Meteorological Center (RSMC) Pretoria



# RSMC Pretoria web portal used by 16 SADC NMSs

- Ensemble Prediction Systems from various global centres used for 5-day severe weather outlook
- Limited area models from RSMC Pretoria and RSMC La Reunion provide deterministic forecasts
- MSG Satellite based nowcasting products used for nowcasting

## Guidance Products

### NWP & EPS Products

#### Regional Models

- [UM SA12](#)
- [Madin La Reunion](#)
- [Met Office: Africa Web Viewer](#)
- [UM SA1 00 UTC](#)
- [UM SA1 12 UTC](#)

#### Global Products

- [NOAA: GFS](#)
- [ECMWF: EPS](#)
- [Met Office: EPS](#)
- [NOAA: EPS](#)
- [SAWS: EPS \(NOAA\)](#)

### Training Website

- [Met-eLearning](#)

### SWFDP Training Nov 2012

- [GDPFS](#)
- [PWS](#)

### SWFDP Training Nov 2013

- [GDPFS](#)
- [PWS](#)

### SWFDP Training Nov 2014

- [GDPFS](#)
- [PWS](#)

### SWFDP Training Nov 2015

- [GDPFS](#)
- [PWS](#)

### SWFDP Training Nov 2016

## Guidance Products

### Short-range (1-2 Days)

- [Map Day 1](#)
- [Map Day 2](#)
- [Risk Tables](#)
- [Discussion](#)

### Medium-range (3-5 Days)

- [Map Day 3](#)
- [Map Day 4](#)
- [Map Day 5](#)
- [Prob Tables](#)
- [Discussion](#)

### SWFDP Evaluation Form

- [Click Here](#)

## Nowcasting Products

### Satellite-Based Rainfall

#### Hydro-Estimator Rainfall Totals

- [1hr](#)
- [3hr](#)
- [6hr](#)
- [24hr](#)

#### Hydro-Estimator Rainfall Totals In Days

- [10 Days](#)
- [30 Days](#)
- [Archive](#)
- [Description of Product](#)

#### Hail Forecasts from UM SA12

- [10 UTC](#)
- [12 UTC](#)
- [14 UTC](#)

#### Lightning information

- [Forecast Today](#)
- [Forecast Tomorrow](#)

### Convective Thunderstorm Forecasts

#### Probability of Convective Thunderstorms

- [CII](#)
- [Description of Product](#)

#### Rapidly Developing Thunderstorms

- [RDT SADC](#)
- [Description of Product](#)
- [RDT SA](#)
- [RDT Google Maps](#)

#### Convective Rainfall Rate (CRR)

- [CRR](#)
- [Description of Product](#)

#### Hydro-estimator Storm Tracks

- [SADC](#)
- [SADC NW](#)
- [SADC NE](#)
- [SADC SW](#)
- [SADC SE](#)
- [Madagascar](#)
- [South Africa](#)

## Flash Flood Guidance

- [SARFTG Portal](#)

## Regional and International Centers

- [ECMWF](#)
- [NCEP](#)
- [UK Met Office](#)
- [WMO](#)
- [RSMC - Reunion](#)
- [ACMAD](#)

## SADC Countries

- [SADC Countries National Meteorological Services](#)

## Other Services and Products

- [Short-range](#)
- [Long-range \(Seasonal\)](#)

# Nowcasting Products

## Satellite-Based Rainfall

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- [1hr](#)
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### Rapidly Developing Thunderstorms

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- [Description of Product](#)
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- [RDT Google Maps](#)

### Convective Rainfall Rate (CRR)

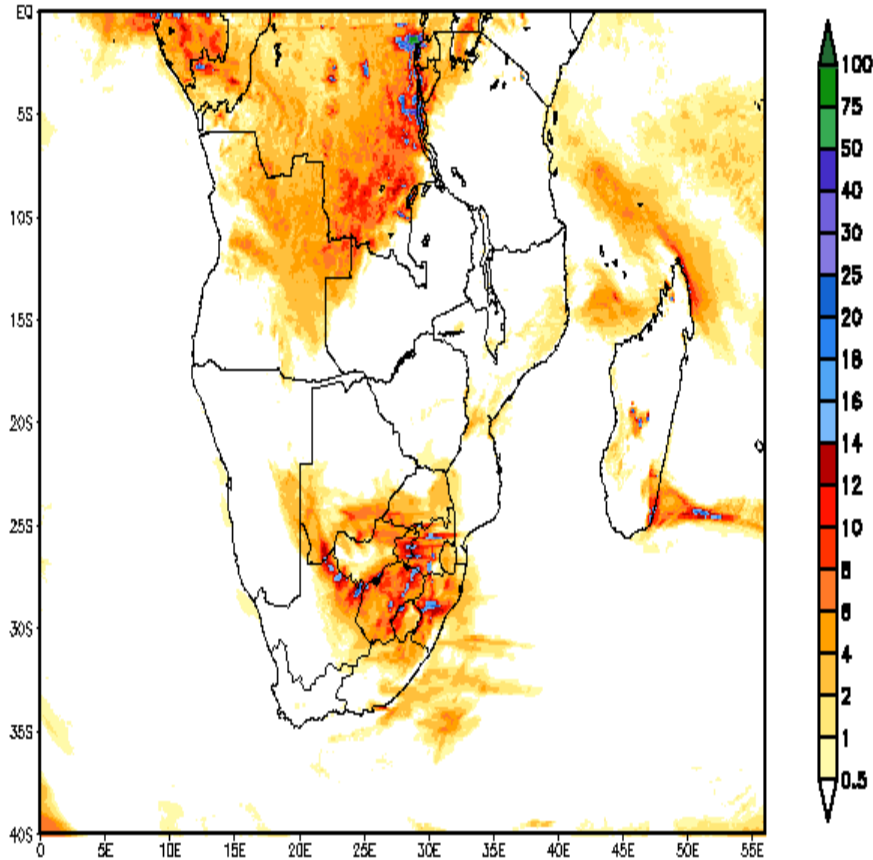
- [CRR](#)
- [Description of Product](#)

### Hydro-estimator Storm Tracks SADC

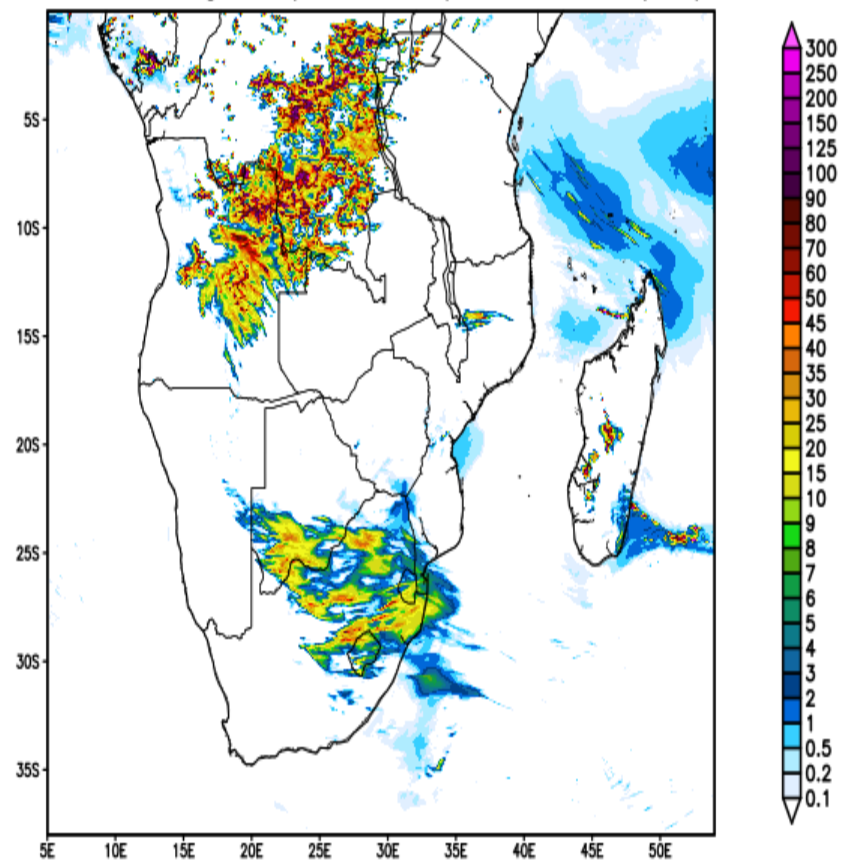
- [SADC NW](#)
- [SADC NE](#)
- [SADC SW](#)
- [SADC SE](#)
- [Madagascar](#)
- [South Africa](#)

- Convective instability Index
- Rapidly Developing thunderstorms
- Convective Rainfall Rate
- Hail Forecasts
- Lightning Forecasts

UM 12km horizontal resolution  
Accumulating Precipitation for past 24 hours (mm)



UM 4km horizontal resolution - SA4 Run:  
Accumulating Precipitation for past 24 hours (mm)



Total precipitation of 01Z to 24Z, 19 OCT - Initiated 00Z 19 OCT 2016

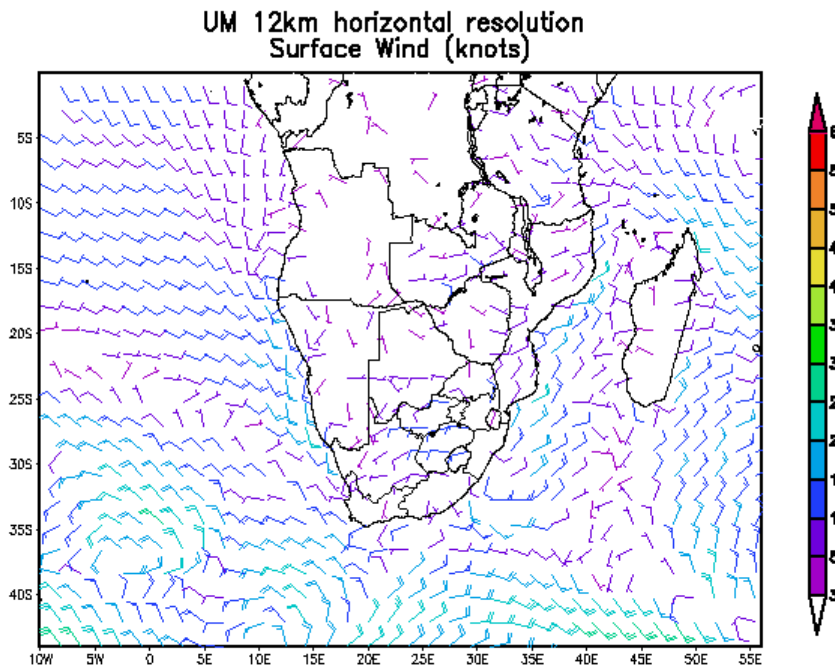
Total precipitation of 00Z to 24Z, 19 OCT - Initiated 00Z 19 OCT 2016

## Day 1 24-hr total rain forecast



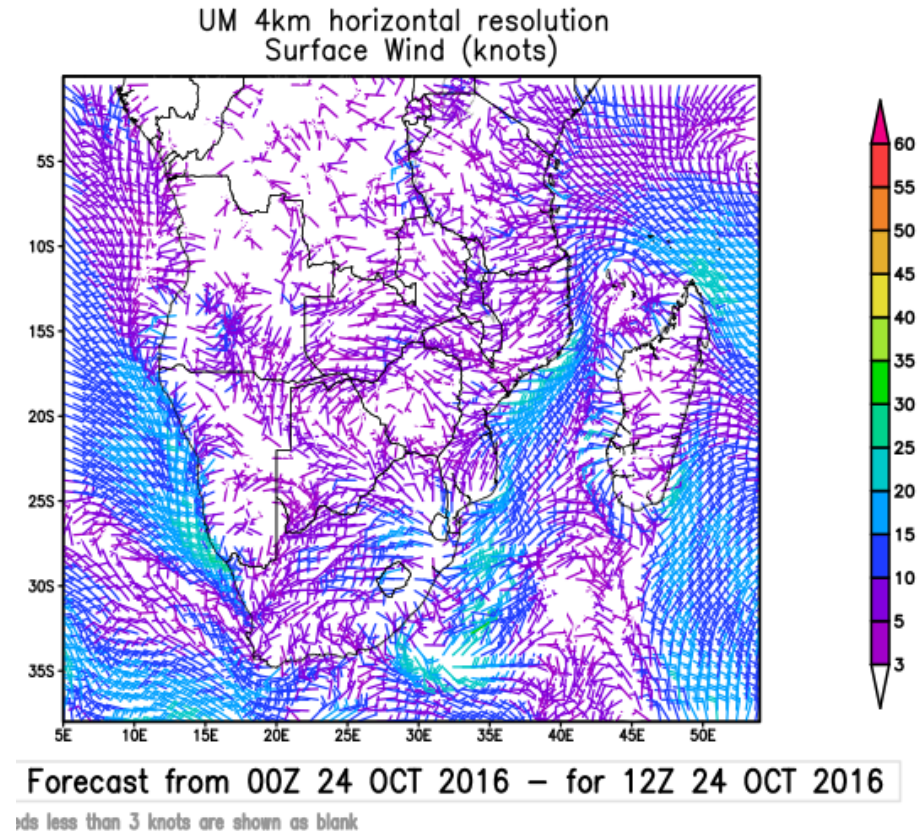
# Mon 24<sup>th</sup> October 2016

## 1200UTC winds

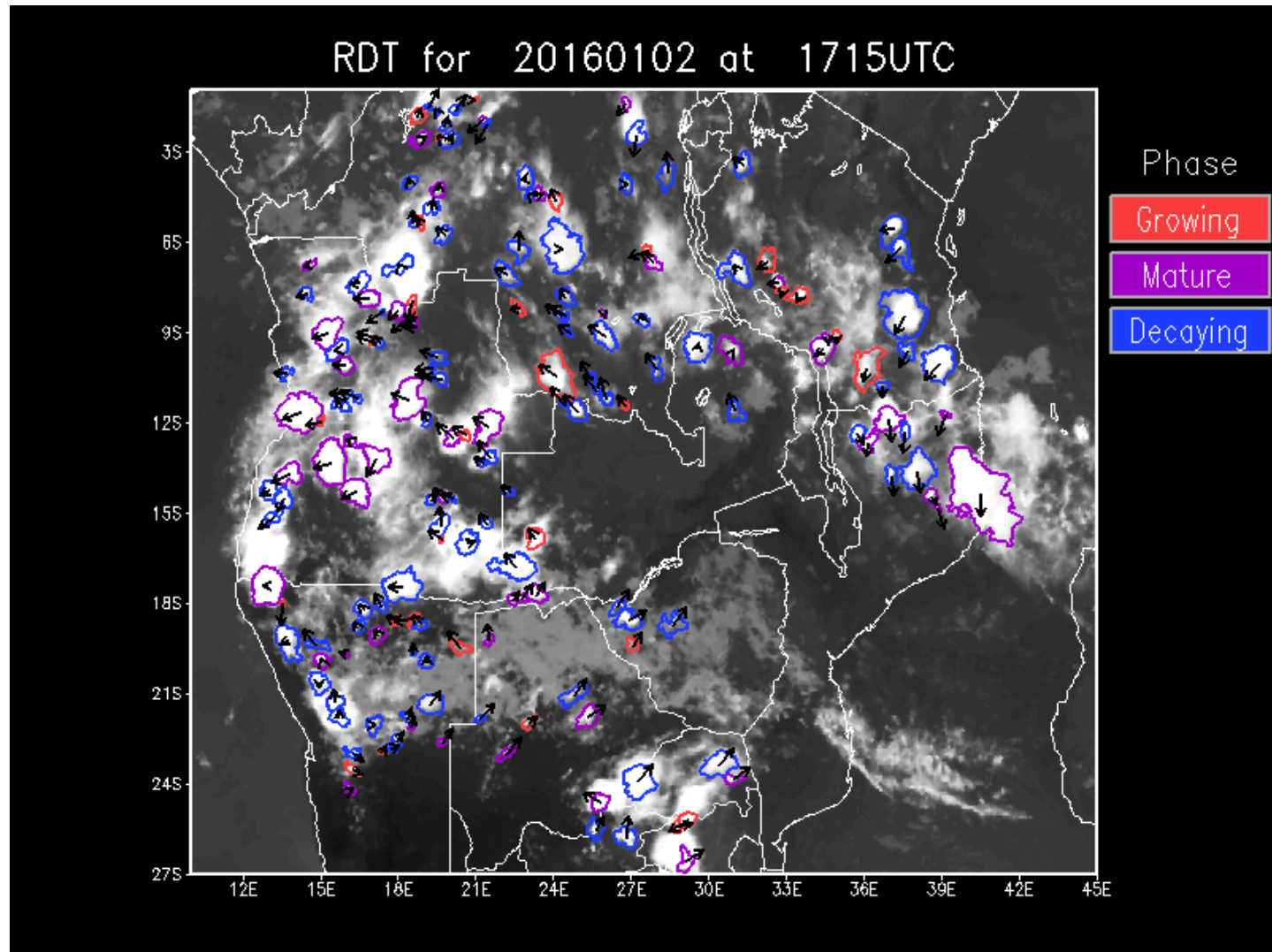


12hr Forecast from 00Z 24 OCT 2016 – for 12Z 24 OCT 2016

Speeds less than 3 knots are shown as blank



# Rapidly developing Thunderstorms (RDT)



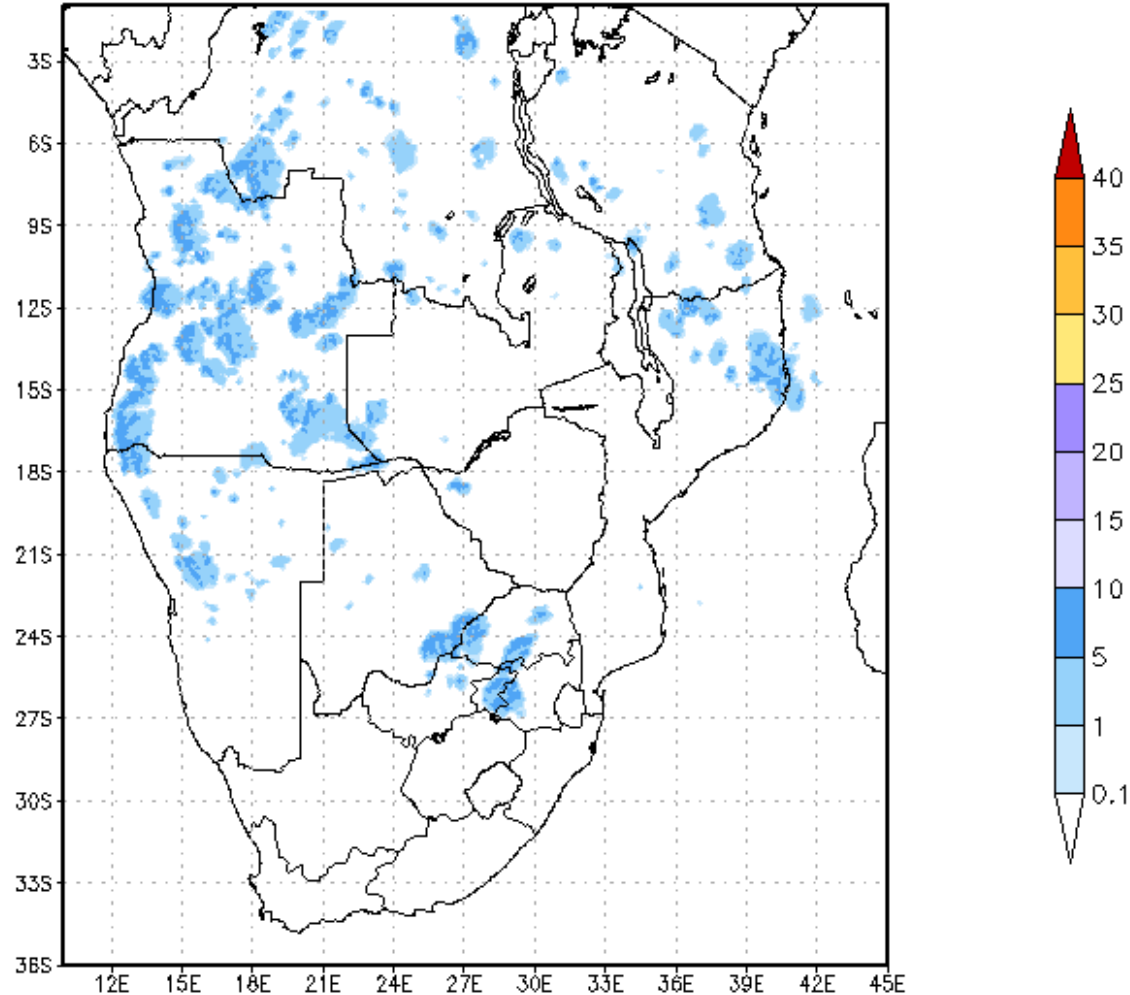
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Meteorological Center (RSMC)  
Pretoria

# Convective Rainfall Rate (CRR)

CRR (mm/hour) on 20160102 for 1715



# Hail Forecast

Hail size (With Rainfall Filter)

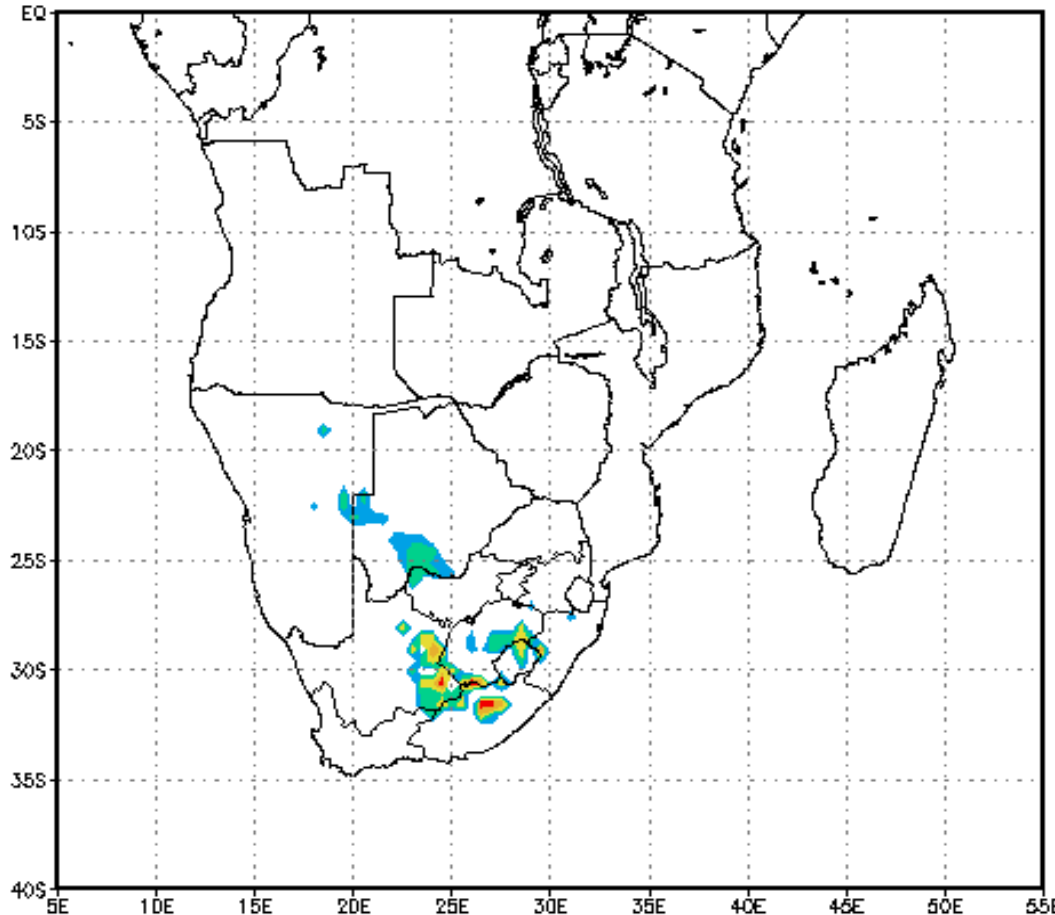
Date: 20121112:12

LEGEND



Don't have a nice example of a Hail forecast over SADC or any observation to compare it with...

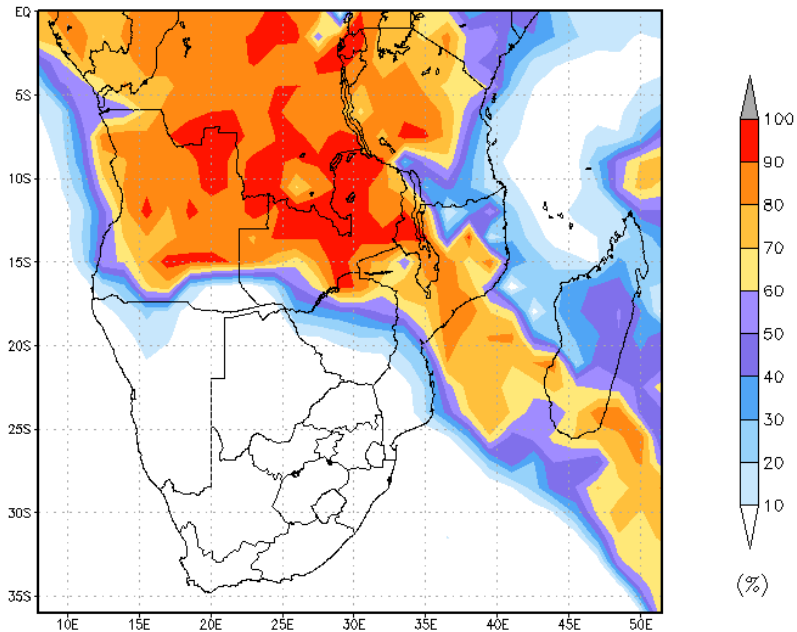
xaant



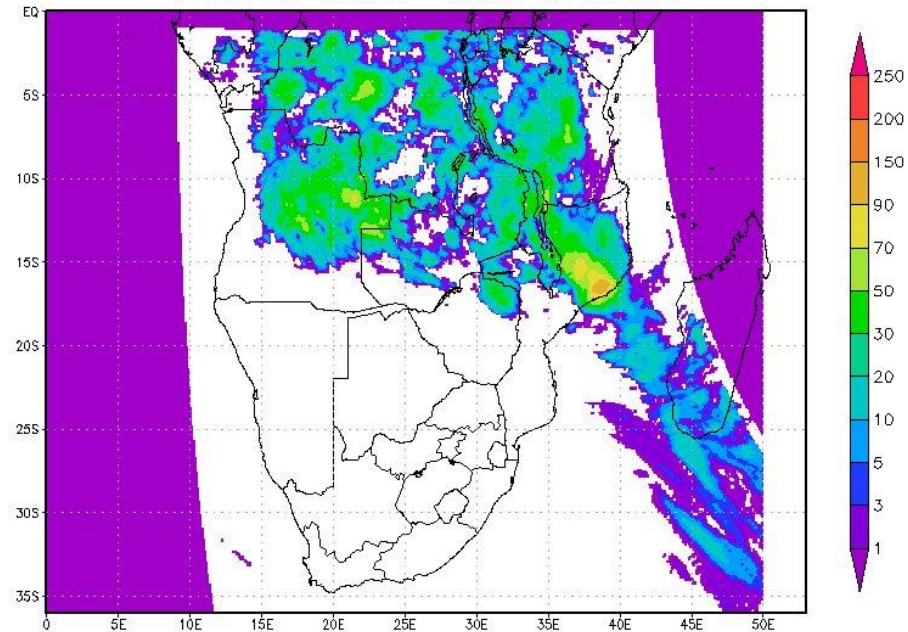
# Lightning Threat Index

## Lightning Threat Index compared to Convective Rainfall Rate

Lightning Threat Index – Probability of lightning occurrence  
for 20151103 between 0700–2200 UTC



CRR Total for past 24 hours (mm)  
20151103 06:00Z – 20151104 06:00Z



# Questions?