

**Letaba Estates Dam Situation:  
5-6 March 2014  
Tzaneen, South Africa**

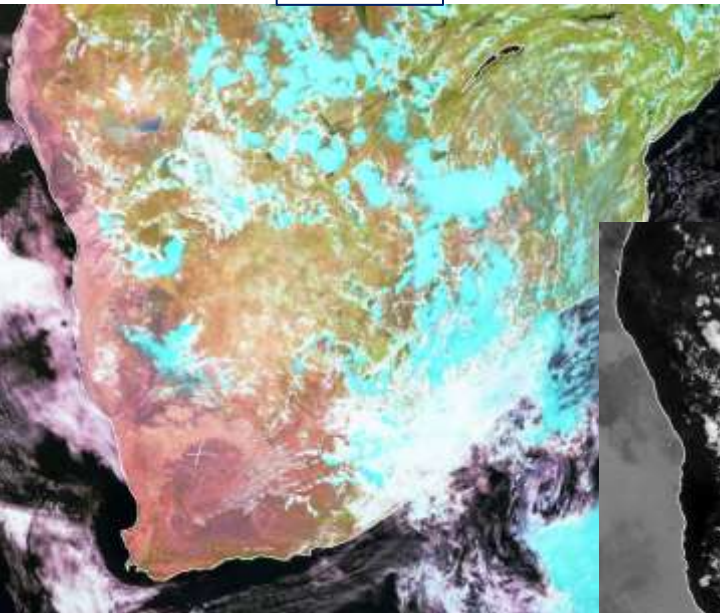
**Eugene Poolman  
South African Weather Service**

# Background

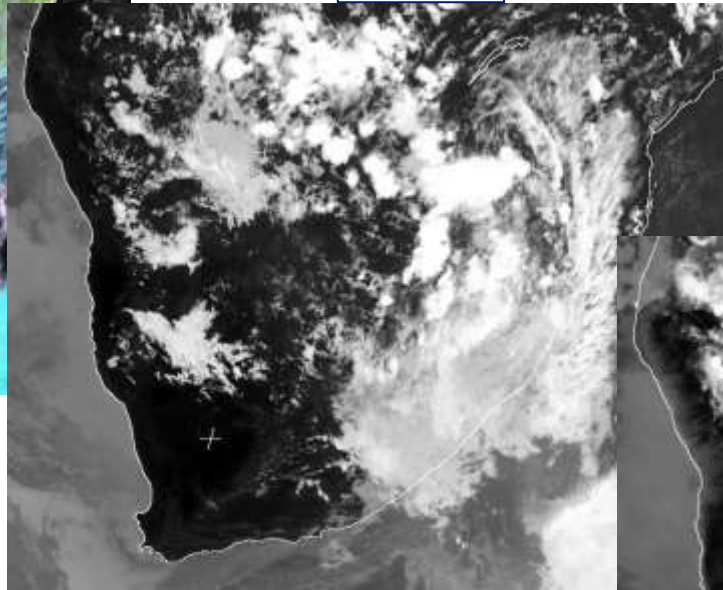
- Heavy rain fell over the Limpopo Province on 5 March due to a tropical weather system
- Rivers and streams near the town of Tzaneen was quite full
- The Letaba Estates dam were overtopping, and there were concerns of a possible collapse
- This could endanger a hospital downstream with about 600 patients, as well as a special school
- Disaster Management (lead by Hannes Steyn) called a JOC and attended by the SAWS forecaster (Rudzani)
- Question: Should they evacuate it or not (depending on more heavy rain and possible flooding)?

# The Weather situation: MSG 5 March 2014

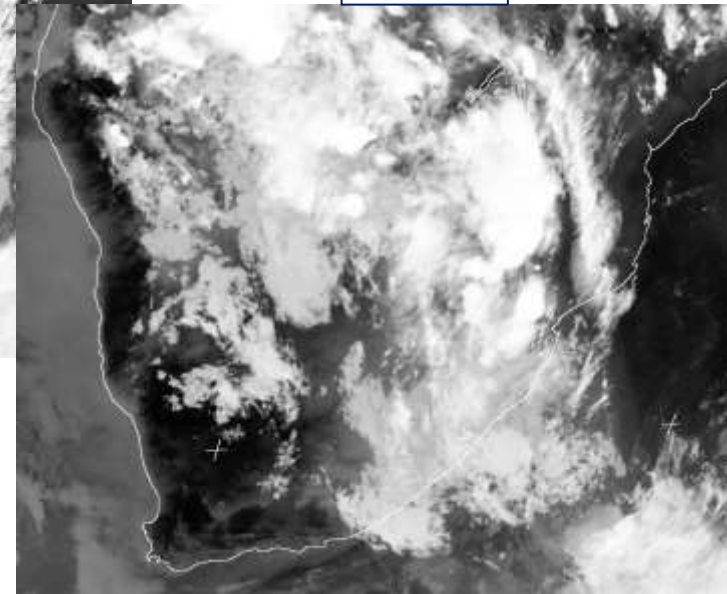
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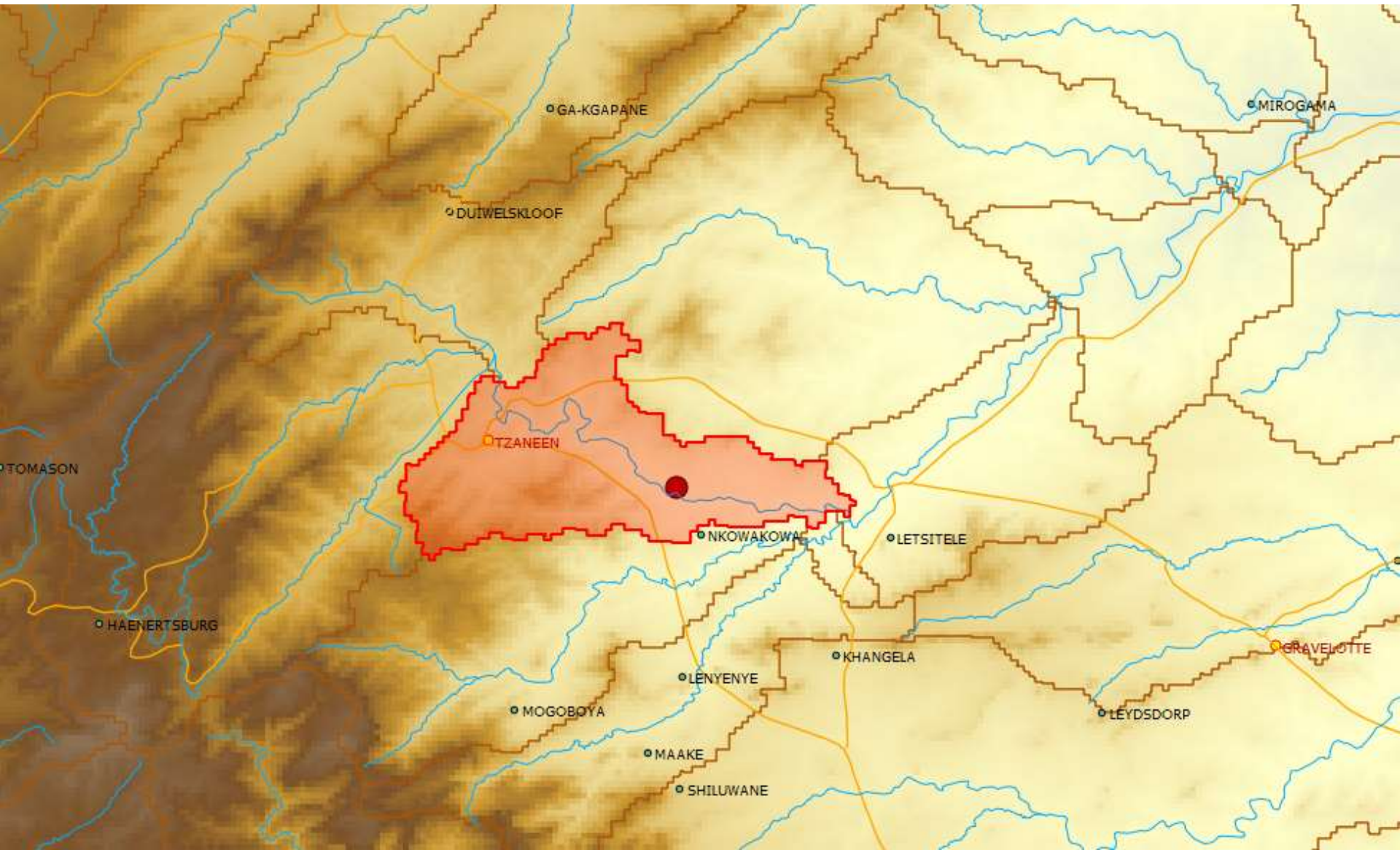
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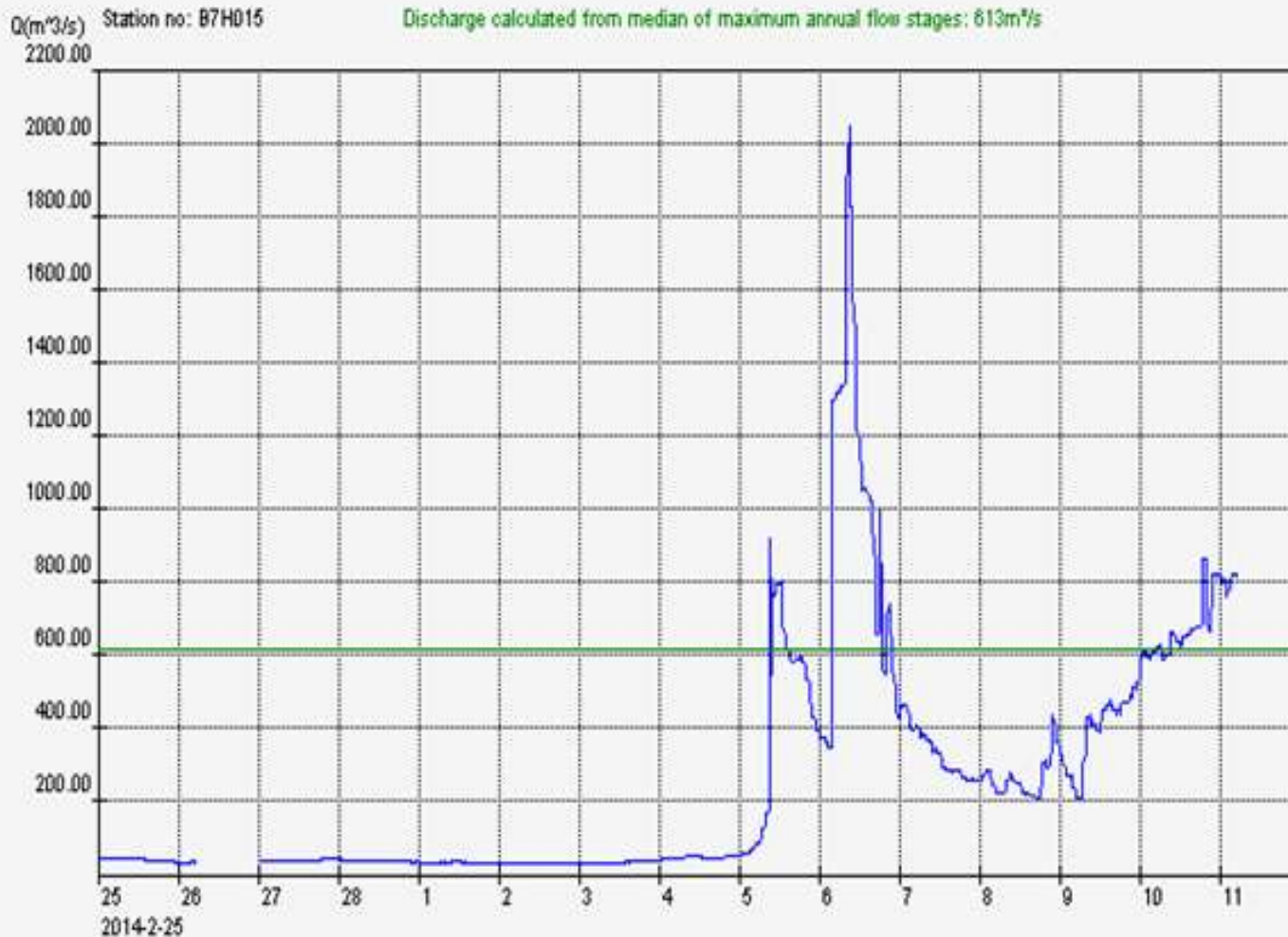
18:00

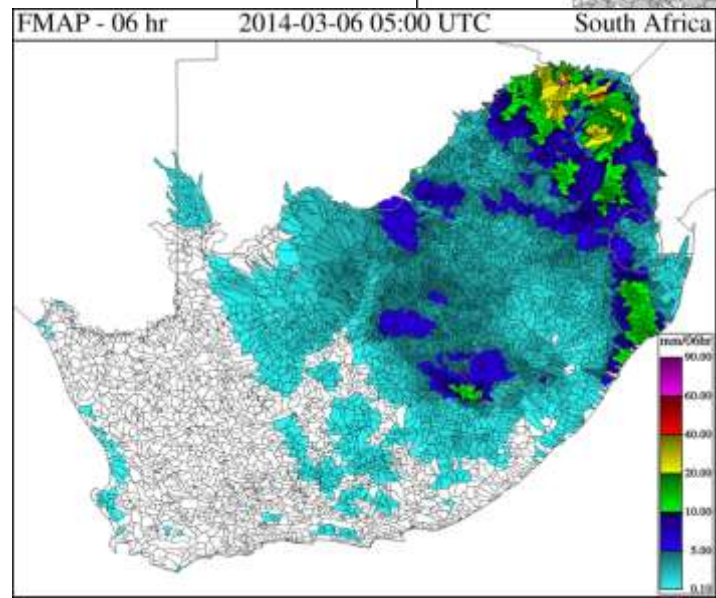
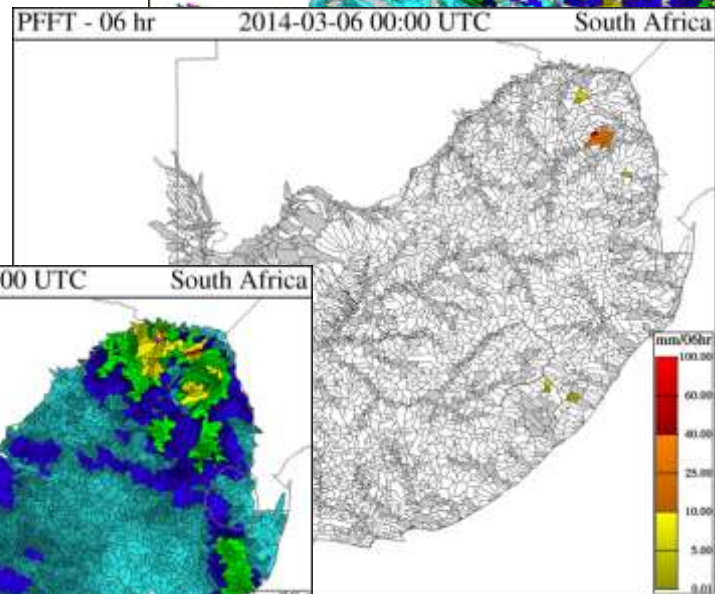
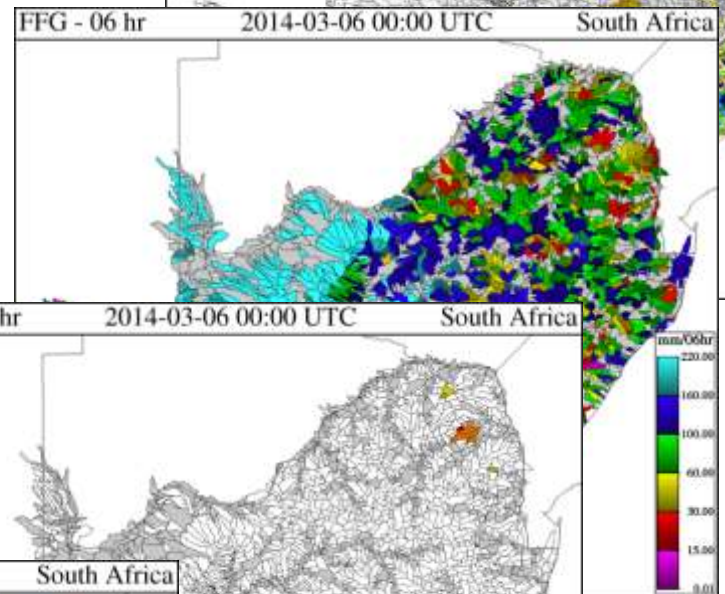
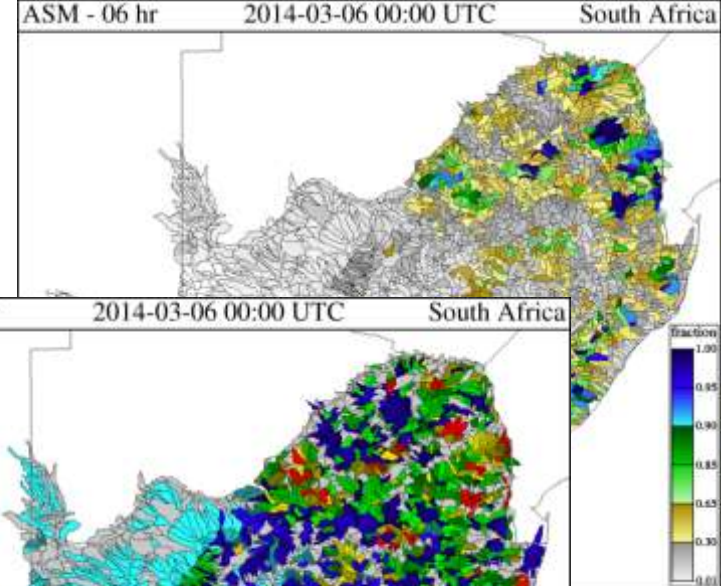
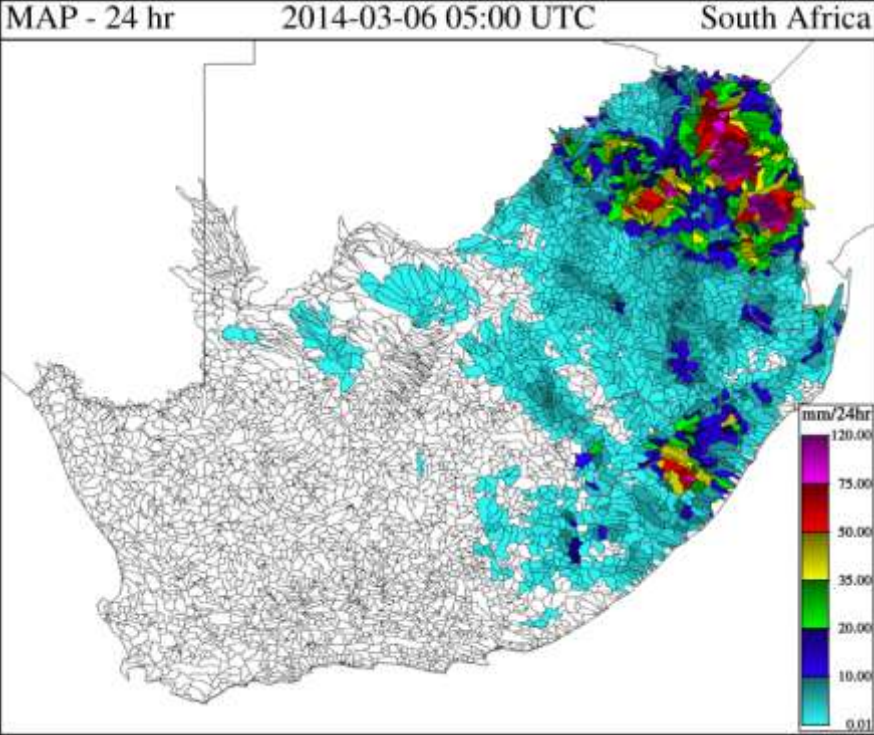


# Letaba Estates Dam in the SARFFG Basin 2002302688

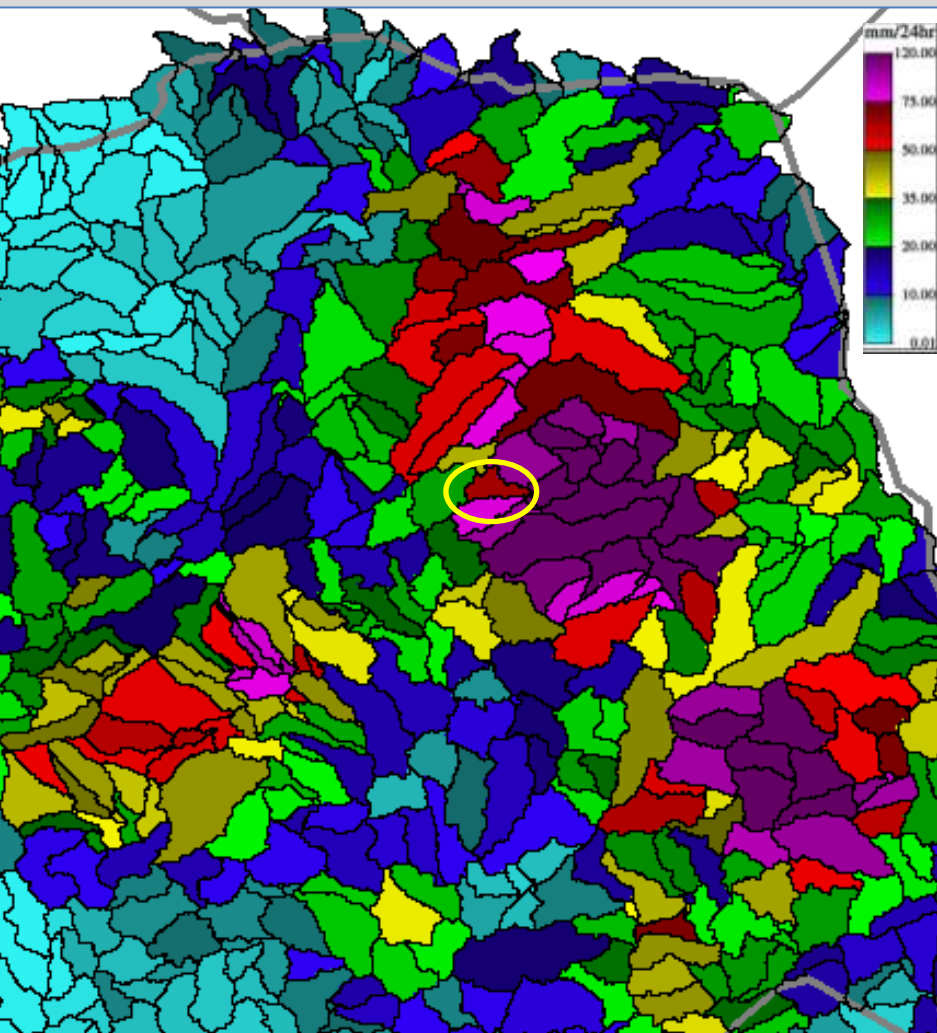


# Olifants River near Phalaborwa

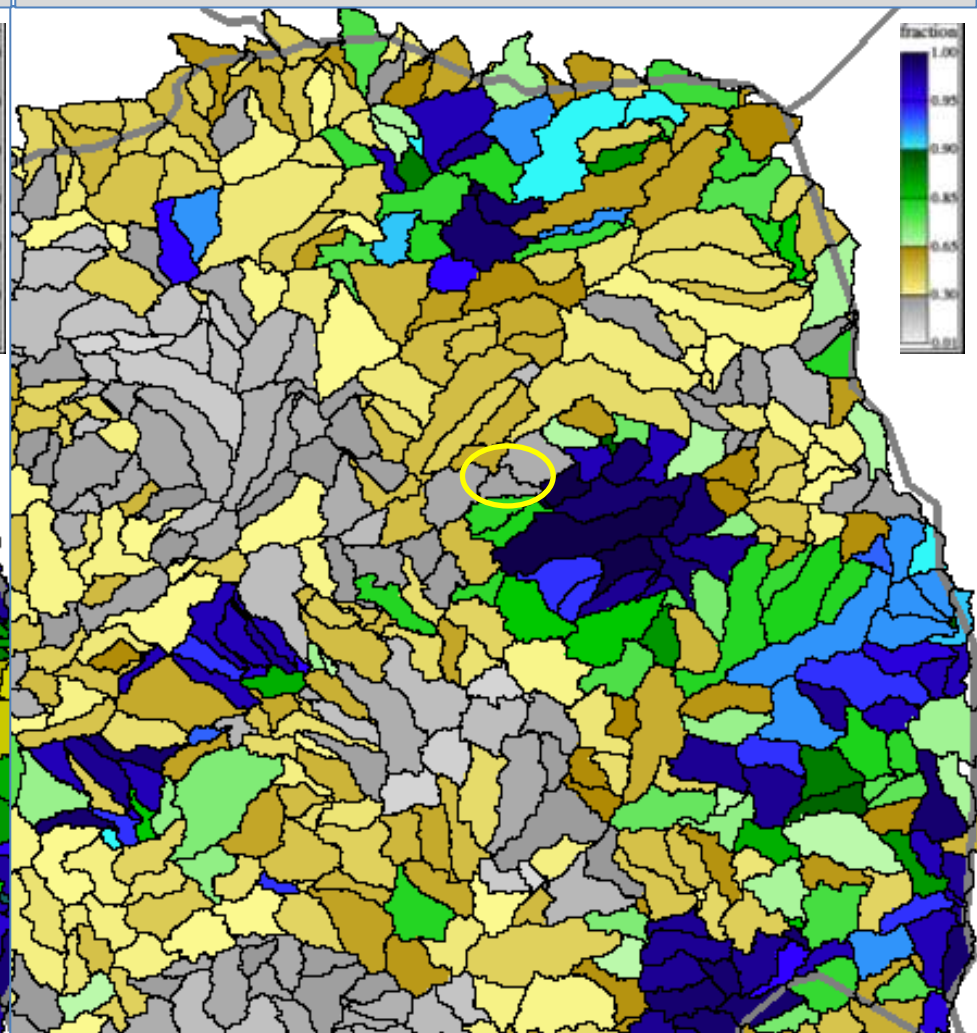




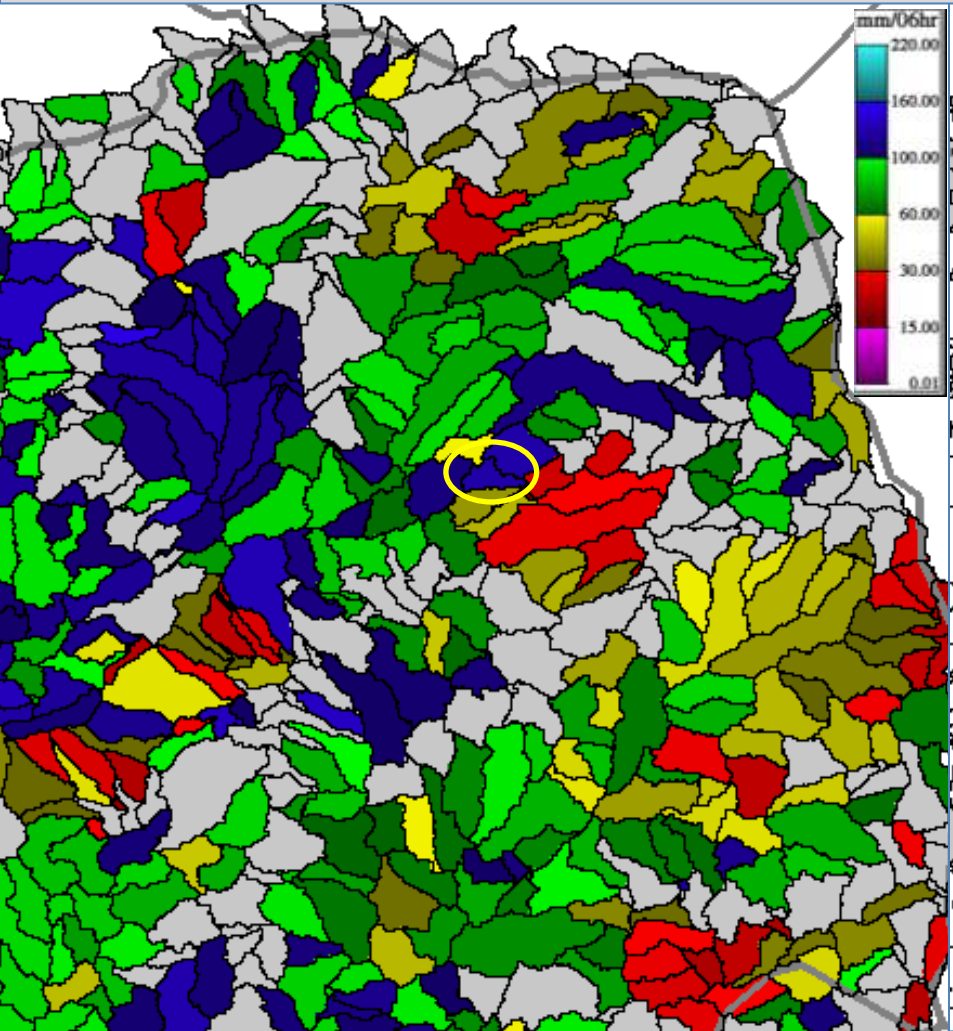
MAP = 24 hour rainfall till 2014030607



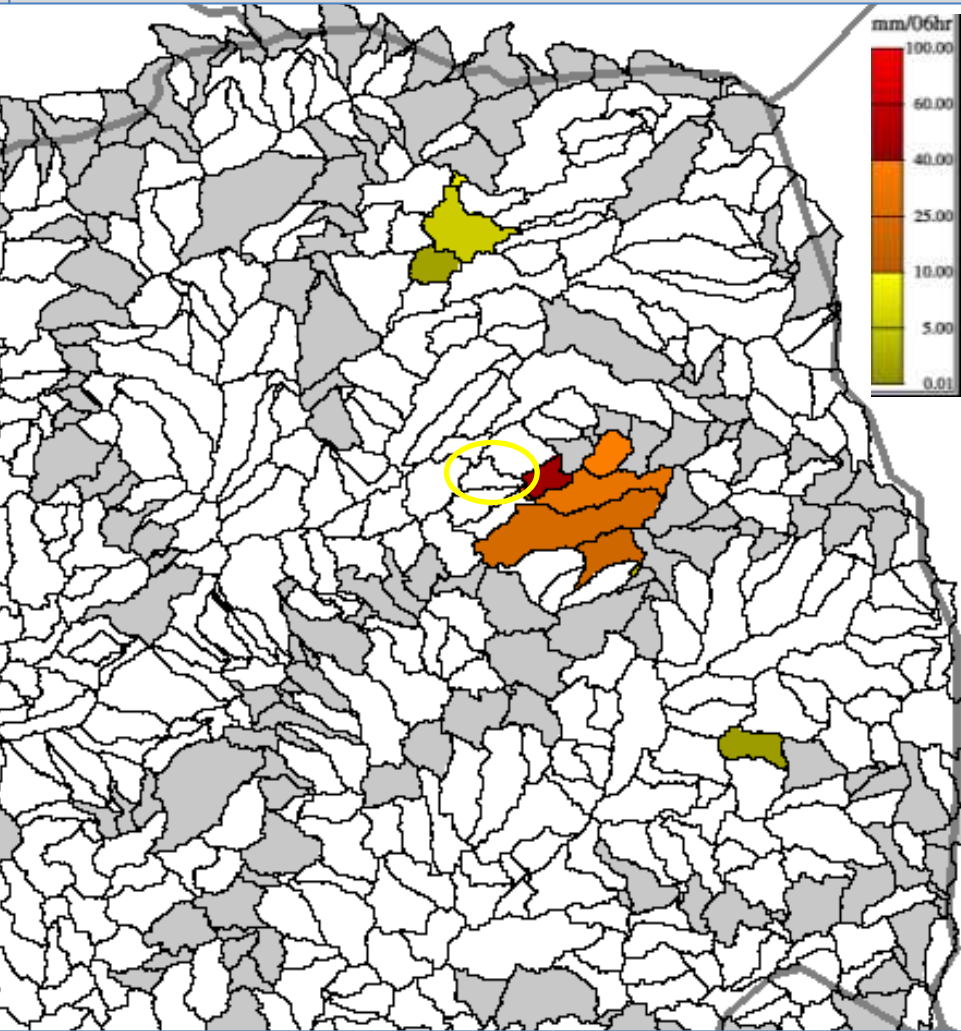
ASM = Soil moisture fraction on 2014030600



FFG = Amount of rain needed on 2014030600

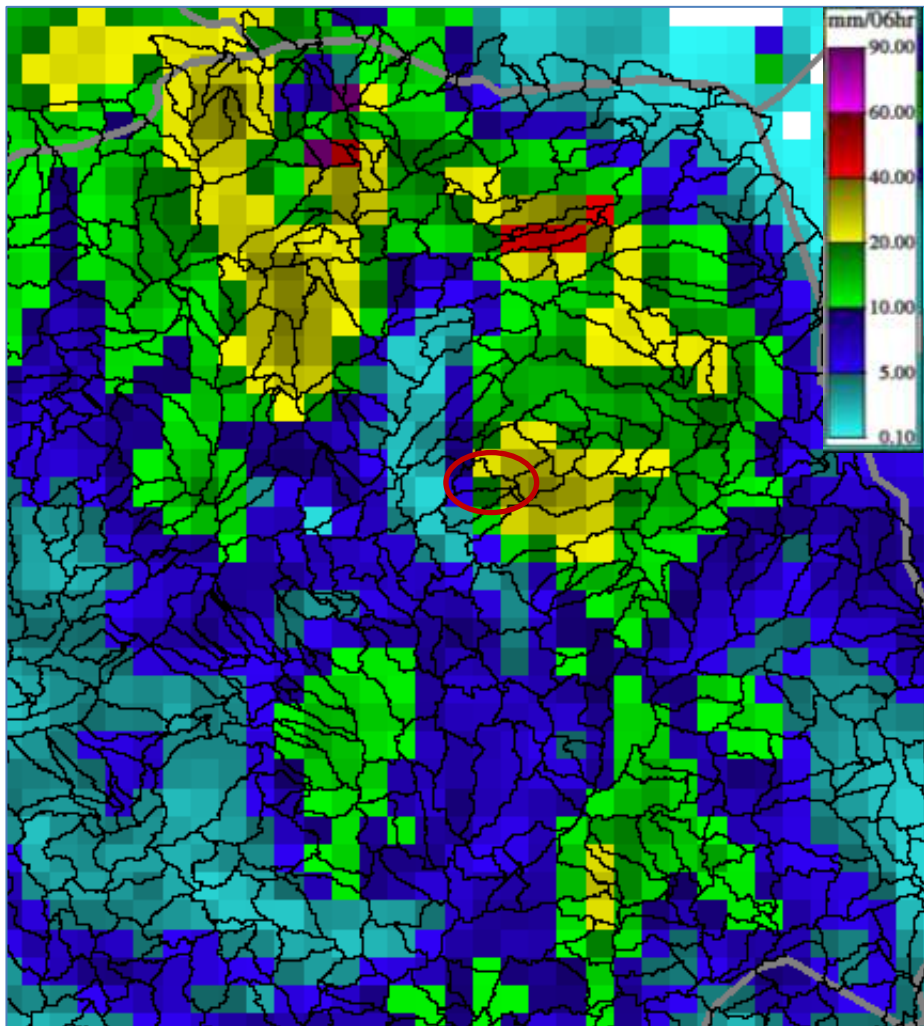


FFT = Flash flood threat on 2014030600

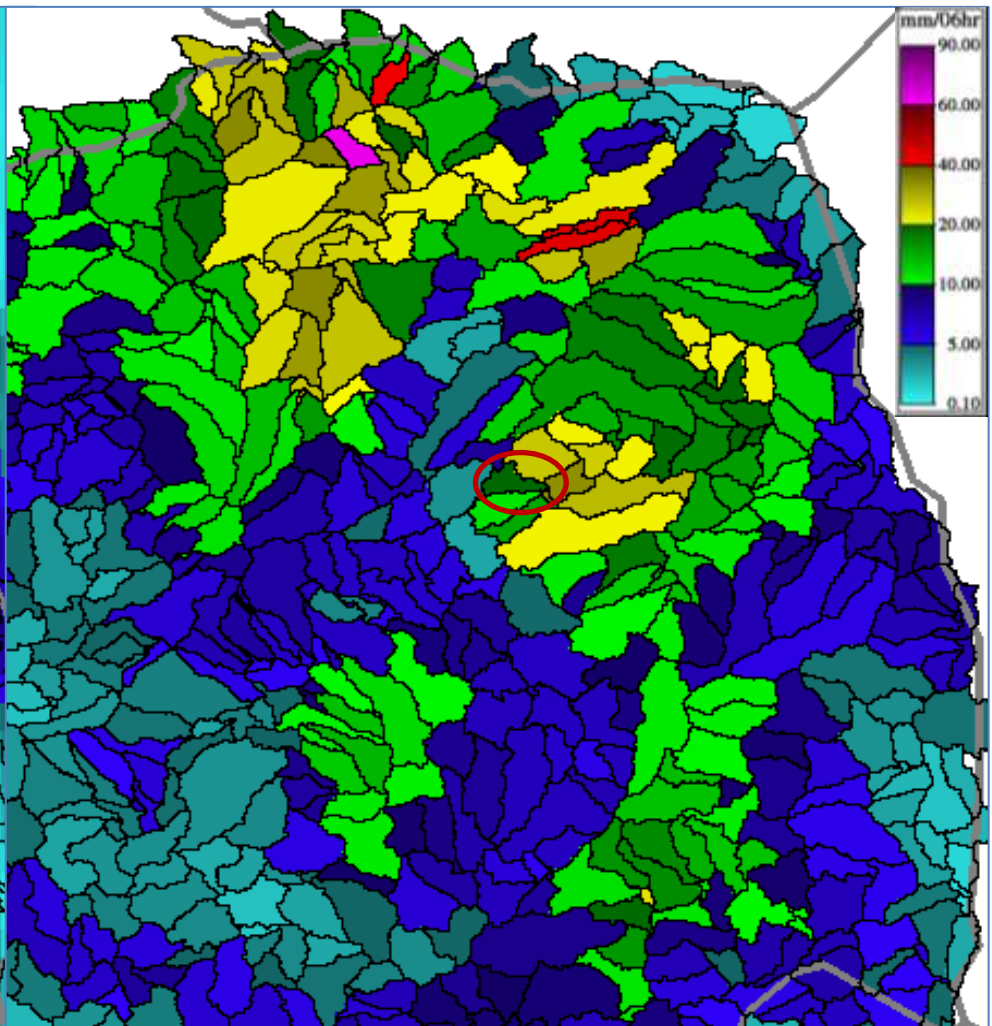




6hr NWP rain forecast from on 2014030607



FMAP = 6hr NWP basin rain fcst on 2014030607



Hi Rudzani,

Please find attached an analysis I quickly did on the Letaba Estates dam – I am not sure what the situation is, but according to the regional FFG that we just made operationally available, it is clear there is quite a risky situation. I did the analysis in powerpoint because it was easier for me, but the intention is not to discuss the images with the disaster managers – they are too complex. The important issues for them are described in slide 1, and repeated here:

Letaba Estates Dam:

Regional flash flood guidance (SARFFG) analysis:

- Up to 07:00 SAST on 6 March 2014 between 30 and 70mm rain fell over the three basins in and upstream of the dam, much more downstream (NB: basin AVERAGE rain, i.e. it could be more at individual rain gauges, and is measured by satellite)
- The basins downstream of the dam should be almost saturated i.t.o. soil moisture, increasing the danger of flooding should more rain fall or the dam overflow.
- About 30 mm of rain is needed in the next 6 hours to cause potential flooding in the basins downstream.
- The expected rain in the next 6 hours in the basins are in the order of 20 to 40 mm according to the NWP
- Summary: The situation is clearly quite dangerous, and more rain in the area can cause flooding problems
- Suggestion: monitor the rain occurrence and forecast continuously for potential flooding over next few days into the weekend

NB: This is an analysis of the SARFFG model, no information from the ground was available, please let me know if it is quite different.

Regards  
Eugene

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## Regional flash flood guidance (SARFFG) analysis

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Thank you very much Eugene, this will help a lot.

The risk here is that if the dam burst/collapse or rather significantly overflow, there is a hospital which has over 600 patients on the downside of the dam and that will be severely affected. I told Hannes that we still expect more rain within the next few days perhaps up to Tuesday even though it might give some relief breaks in between, however the dilemma is whether to advice the hospital to evacuate but such will be a tedious exercise and also come with many risks, of course they will have to apply their disaster plan on the other hand inaction might as well come with greater consequences.

What would be your advice based on this information,

Regards  
Rudzani

Hi Rudzani,

It is impossible for me without being there to say what should be done – I assume the hospital is close to the river. At least it seems to me they should be on high alert close to the hospital, with someone monitoring the dam itself and warning those at the hospital if something happens. But it is Hannes's call. It appears that today has a good chance for more significant rain, according to the forecasters, and according to the SARFFG model the situation is risky if that happens – it needs to be corroborated with ground info from the basins and the weather. You will have to be on standby to them!

Regards  
Eugene

Hi Eugene and Kevin

Thanks for the information, it was very useful.

The good news is that they have succeeded in releasing the pressure on the dam which significantly reduce the risk to the hospital and the disabled school which were on the direct path of the dam if it burst, it was quite a scary situation but with the close working cooperation between the disaster management and the hospital management whilst SAWS provided regular weather updates the situation has been restored back to near normal operation. We will await the formal report from the engineers on the situational assessment. The hospital was prepared to perform a well control evacuation since they were already affected by floods in some of their wards and they conducted internal evacuation from the affected wards to other wards from within.

Best regards

Rudzani



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Municipal Manager*

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## *REPORT*

### **LETABA ESTATE DAM**

- ✓ It was reported that there is possible Dam burst of Letaba Estate Dam next to Letaba Hospital and Letaba Special School on the 06<sup>th</sup> of March 2014.
- ✓ Regional flash flood guidance (SARFFG) analysis: Up to 07:00 SAST on 6 March 2014 between 30 and 70mm rain fell over the three basins in and upstream of the dam, much more downstream (NB: basin AVERAGE rain, i.e. it could be more at individual rain gauges, and is measured by satellite). The basins downstream of the dam should be almost saturated i.t.o. soil moisture; increasing the danger of flooding should more rain fell or the dam overflow.
- ✓ An urgent meeting was arranged for first responders to meet at Letaba Hospital, planning already took place and the danger is now eliminated. Further investigations will be done by Engineers to ensure that the dam is now safe, specifically looking at the safety of Letaba Hospital, Letaba Special School and the surrounding areas.

# Summary

- Real life situation
- Forecaster went on site to provide support to the JOC
- Additional information provided from National Forecasting Centre
- Disaster management used the information in their decision making
- Disaster management relied on the support of the forecaster on site
- Luckily the dangerous situation was averted in this case



Questions?