ASMET African Satellite Meteorology Education and Training

South African Weather Service

# Identifying convection, fog/low clouds and dust

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ASMET

# In this presentation:

1. By the end of this lesson, we should know how to identify convection, fog/stratiform clouds and dust using satellite imagery:
2. That will be achieved by looking at:
   - Single channels
   - RGBs

3. What to look for on satellite:

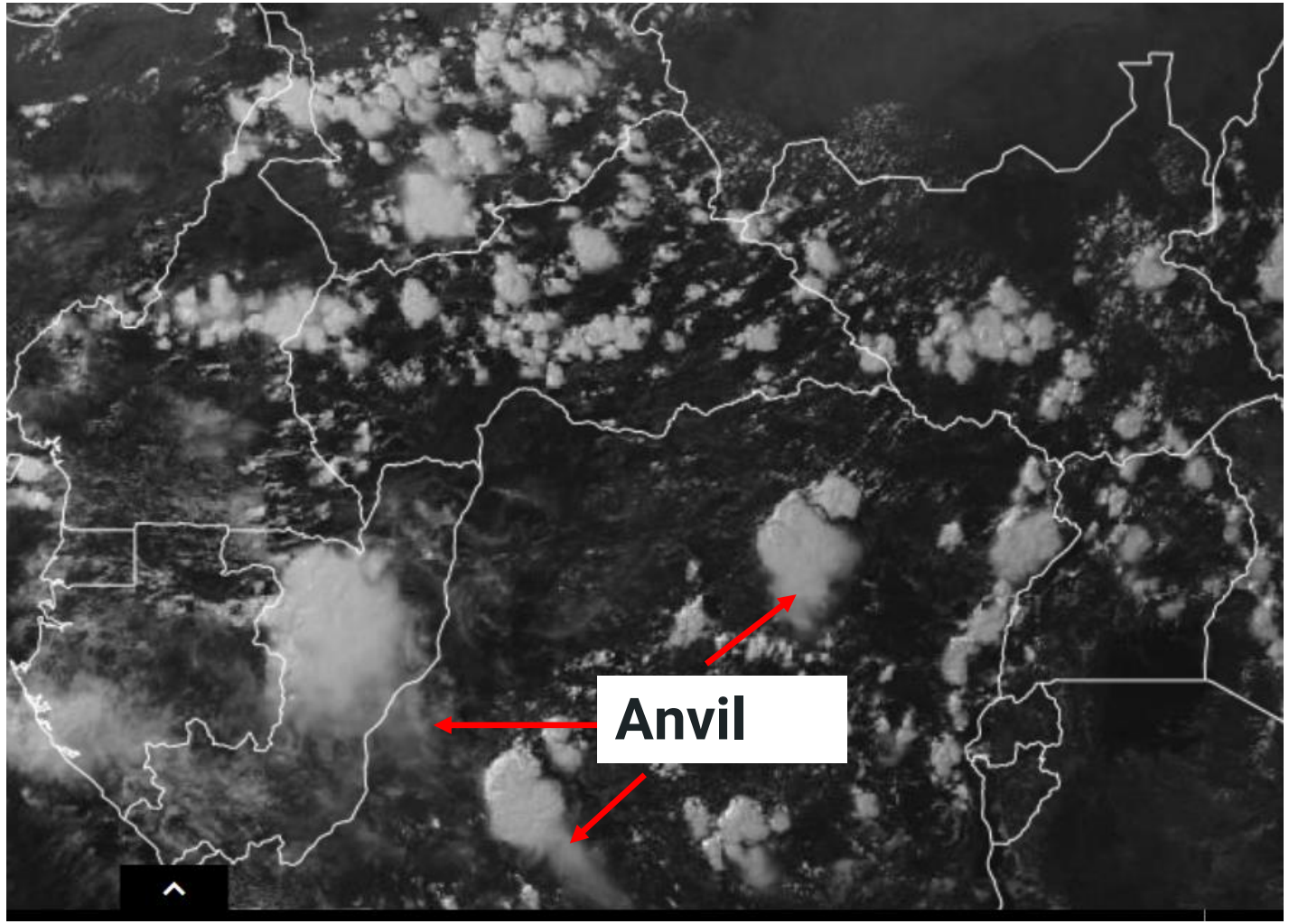
- Texture
- Shape
- Thickness
- Temperature

# Monitoring Convective Clouds on Satellite Imagery

- **Single channels**
  - Visible channels 1 (VIS 0.6)
  - Channel 12 (Hires VIS)
  - Infrared channel 9 ( IR 10.8)

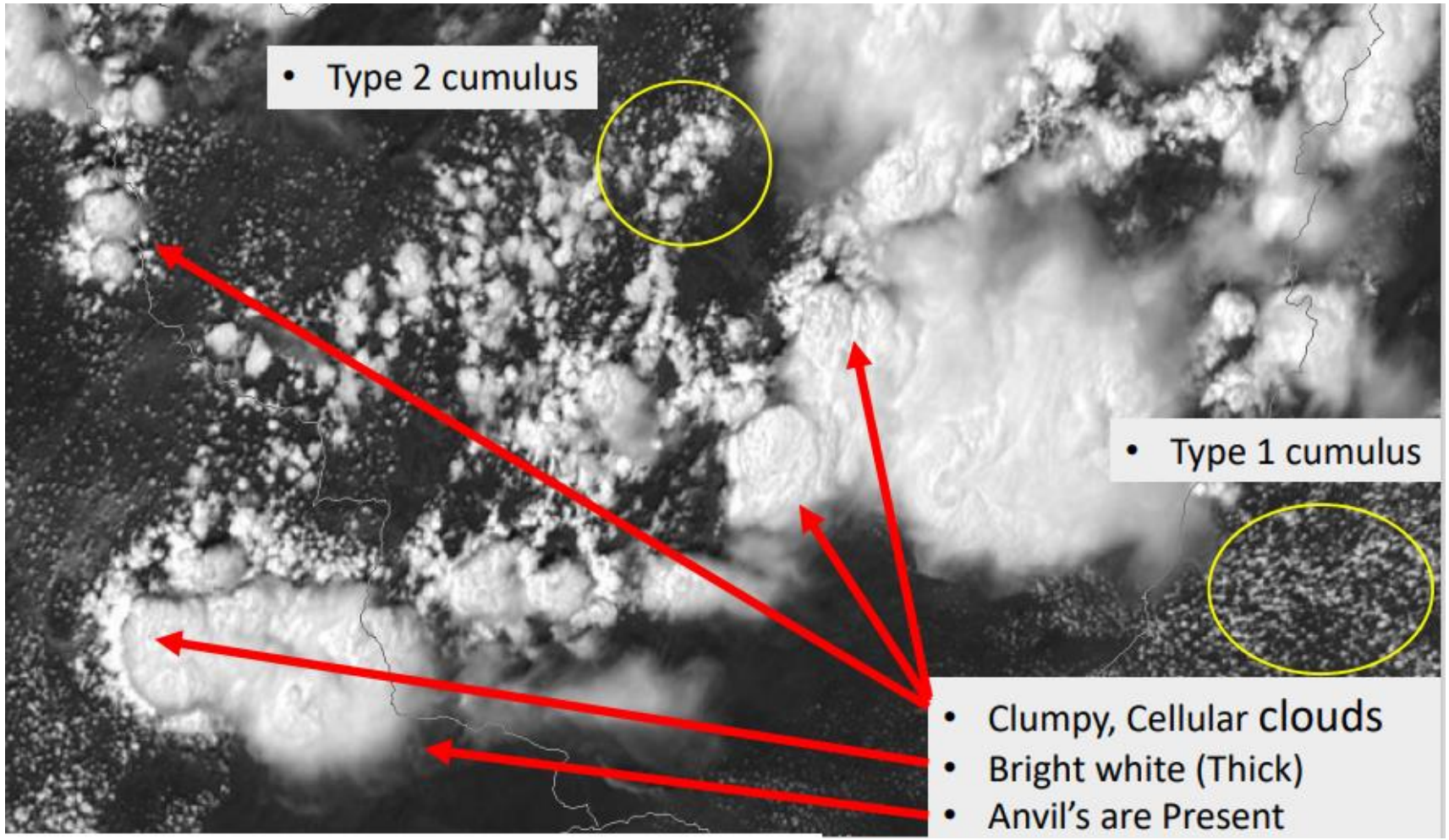
- **RGBs**
  - Day Natural Colours
  - Day Microphysics
  - Night Microphysics
  - Convective storms
  - Hires cloud enhanced
  - Dust RGB

# Monitoring convection on VIS 0.6

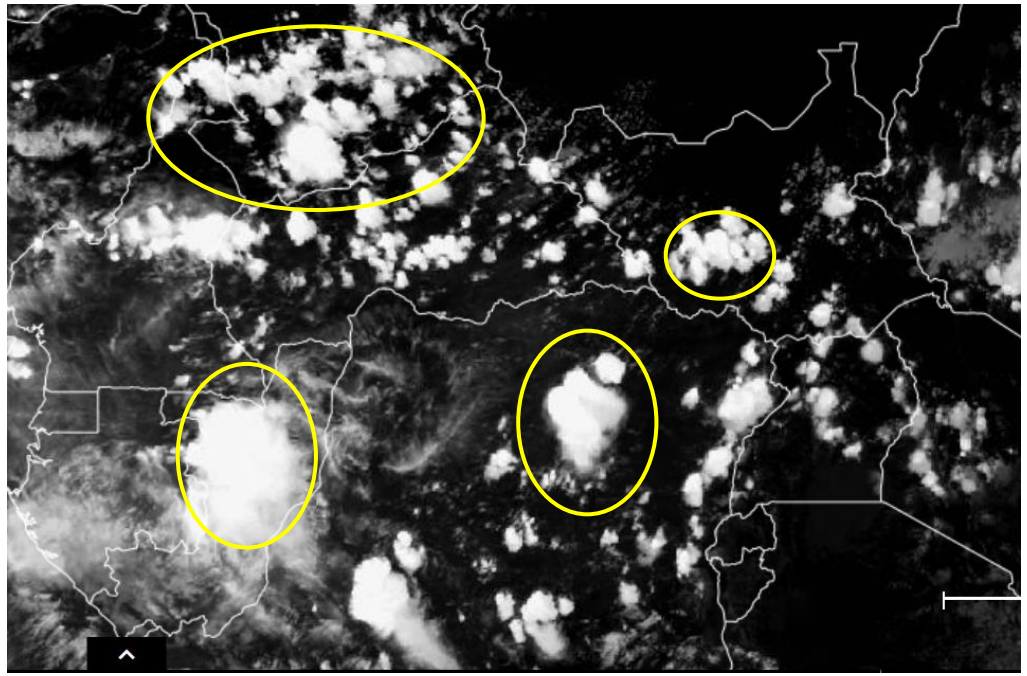


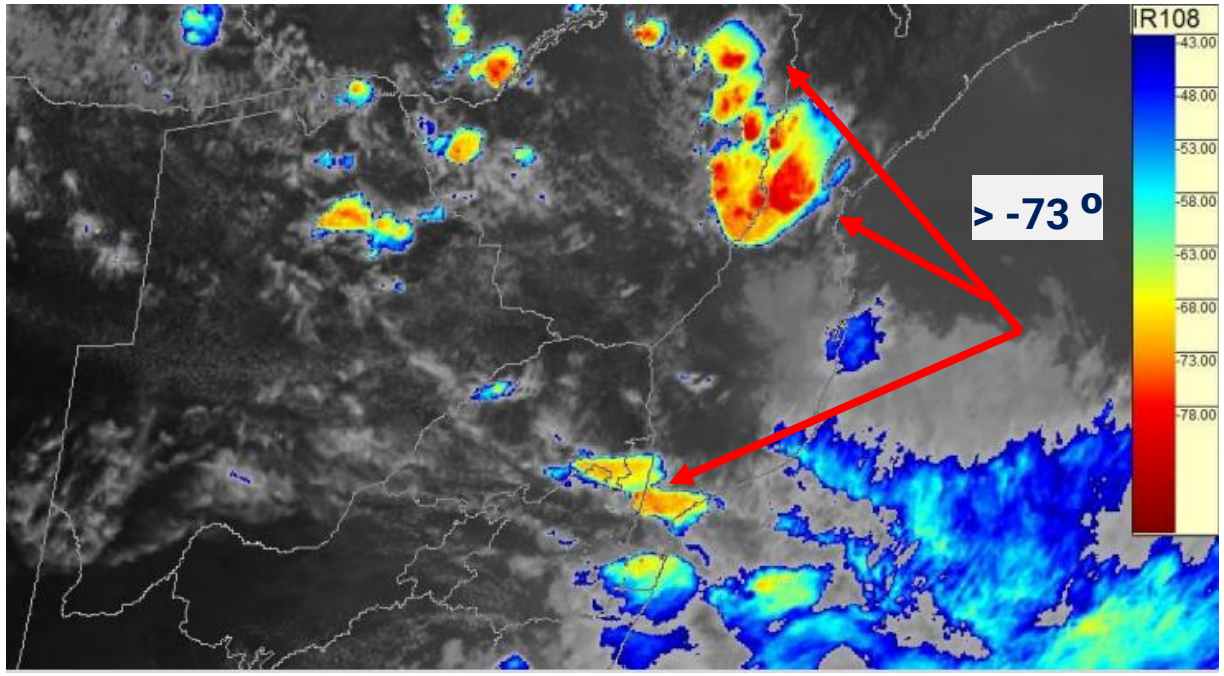

- For day time use only
- Bright white (thick), clumpy, cellular, irregular
- May contain anvil
- Land appears a darker shade of grey

# High resolution VIS (HIRES VIS)



# IR 10.8






- We look at cloud top temperatures – bright white clouds
- Convection appears cellular (or clumpy)
- May have anvils as well
- Land appears very dark

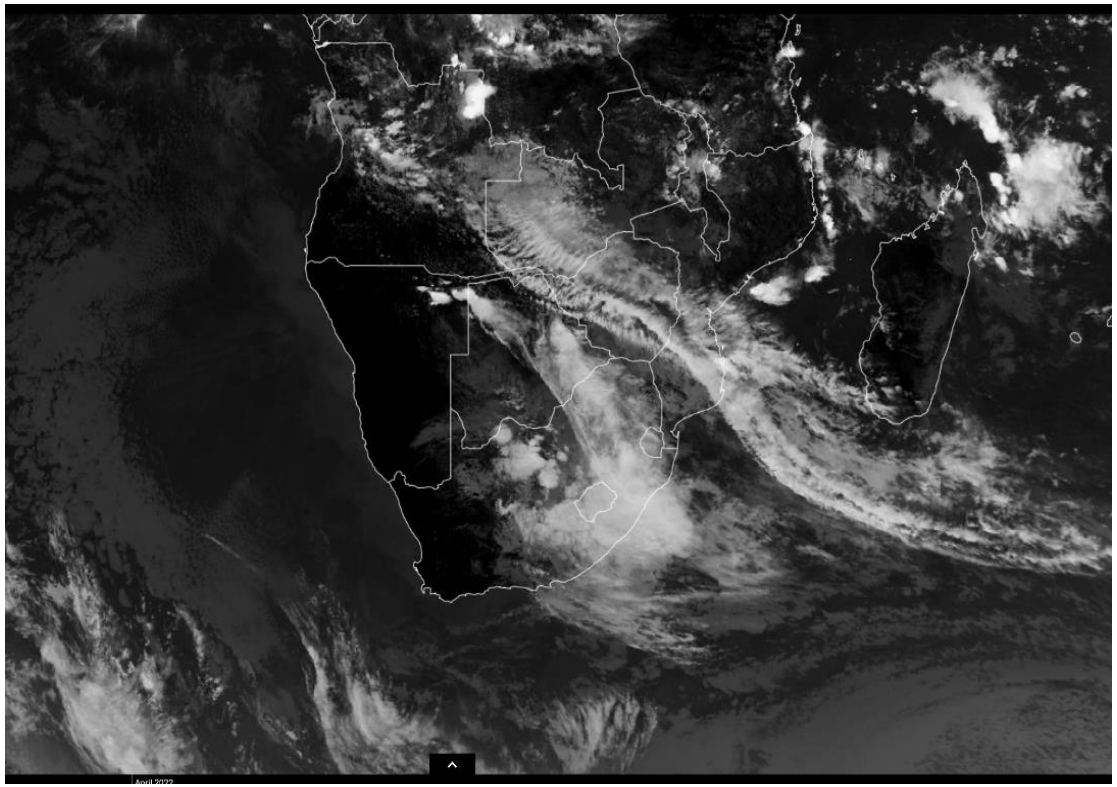
# VIS 0.6 vs IR 10.8

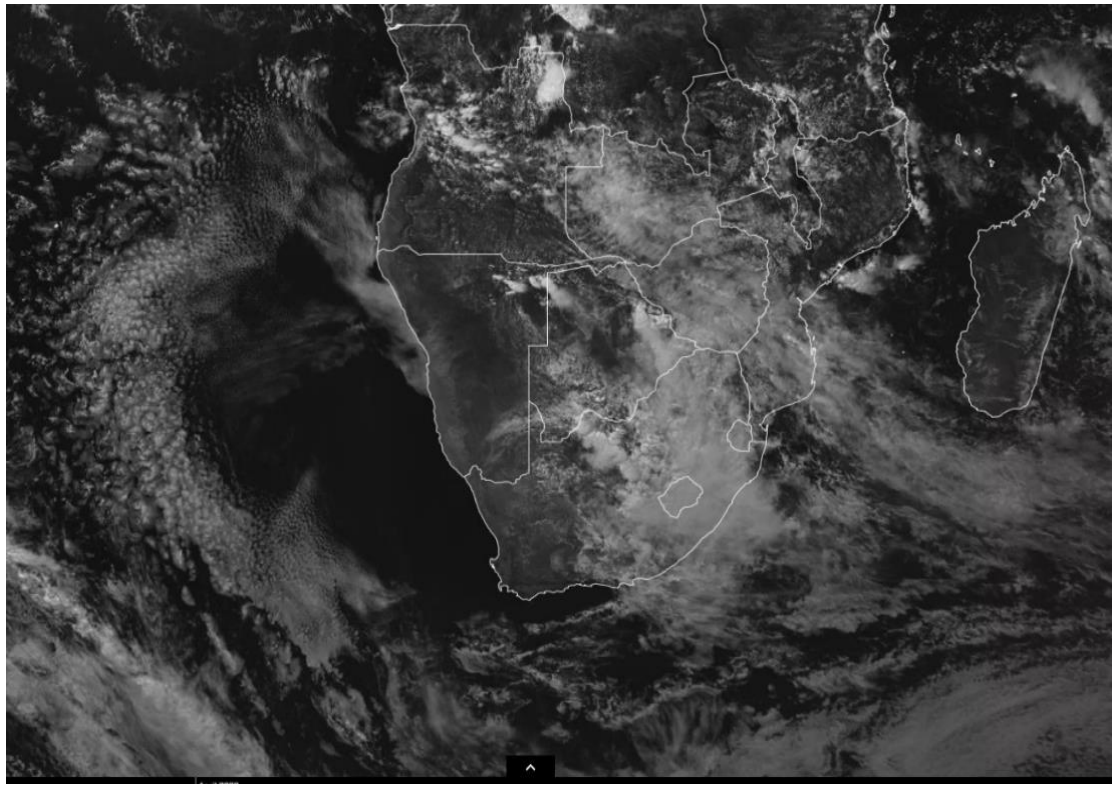
- Question:

1. Use your annotations to indicate:

- the VIS and IR image between the following images.
- Indicate areas of convection.

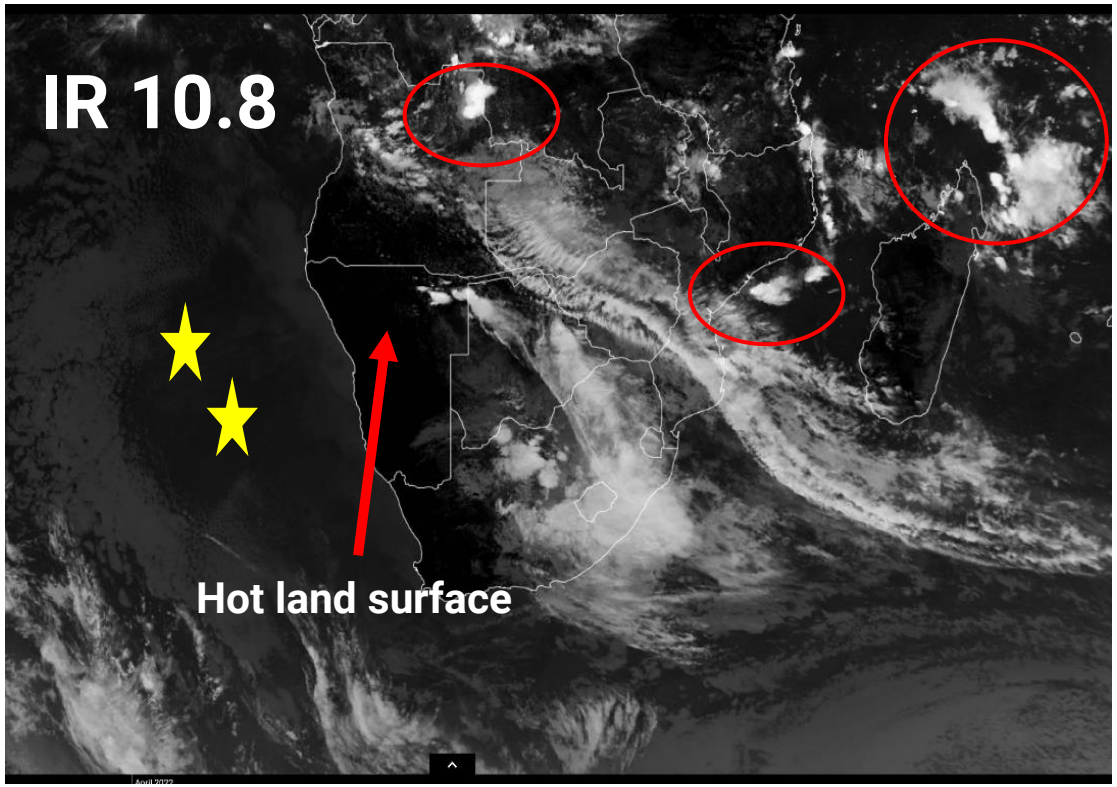
# IR10.8 and VIS0.6

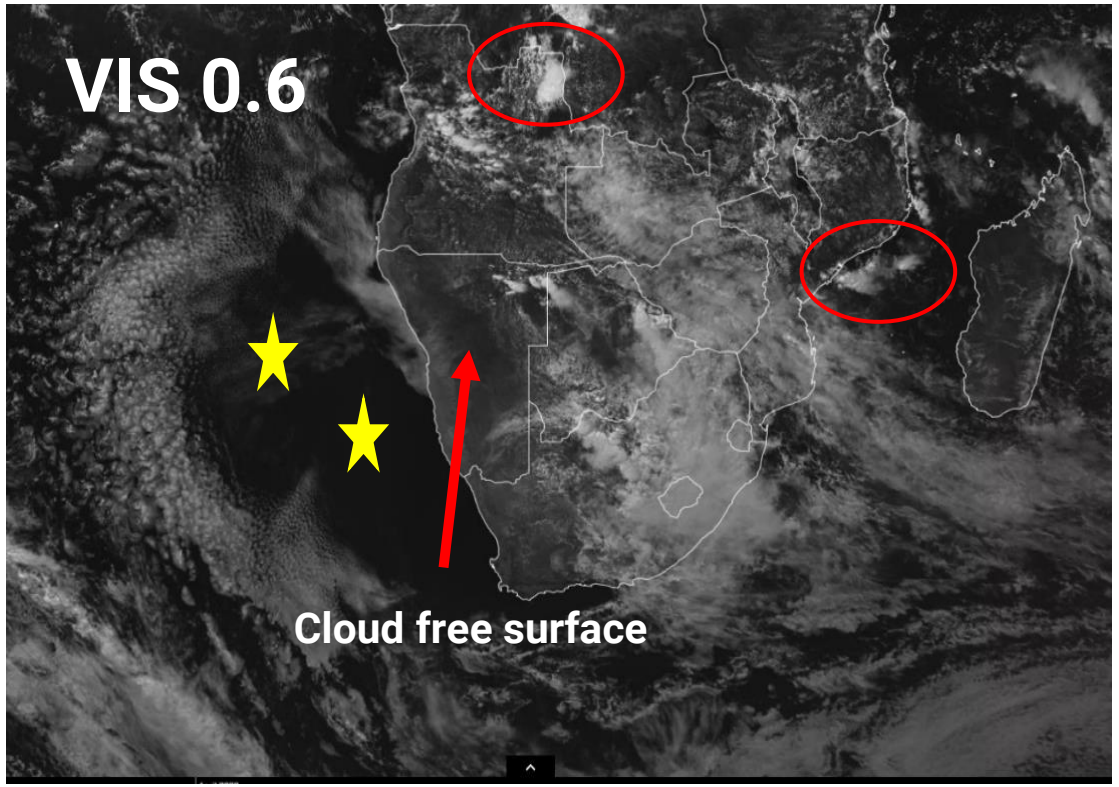




# COL – IR10.8 and VIS0.6

## Solution:

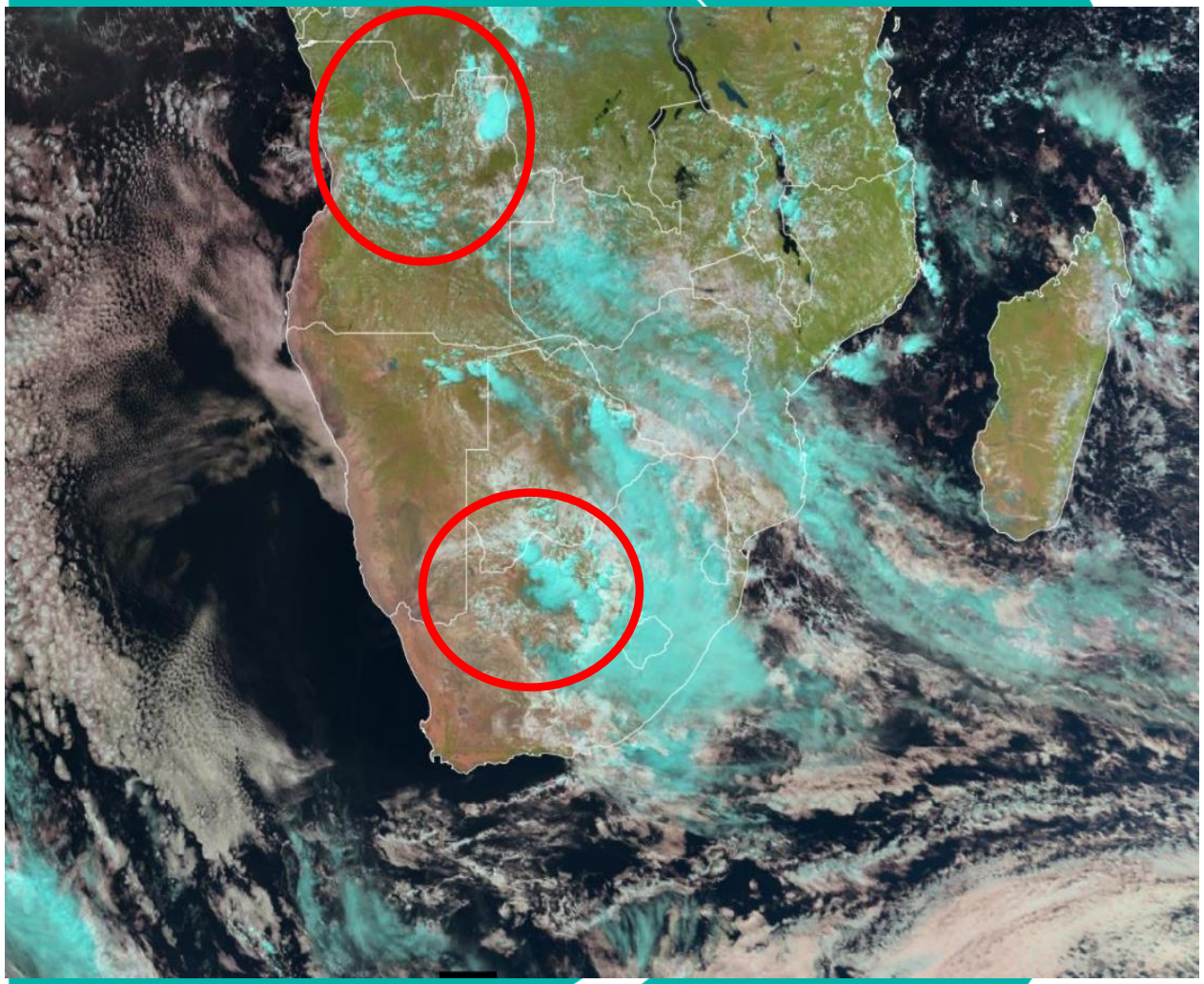


# Monitoring convective clouds using RGBs

- Day Natural Colours
- Day Microphysics
- Night Microphysics
- Convective storms
- HIRES cloud enhanced

# Day Natural colours

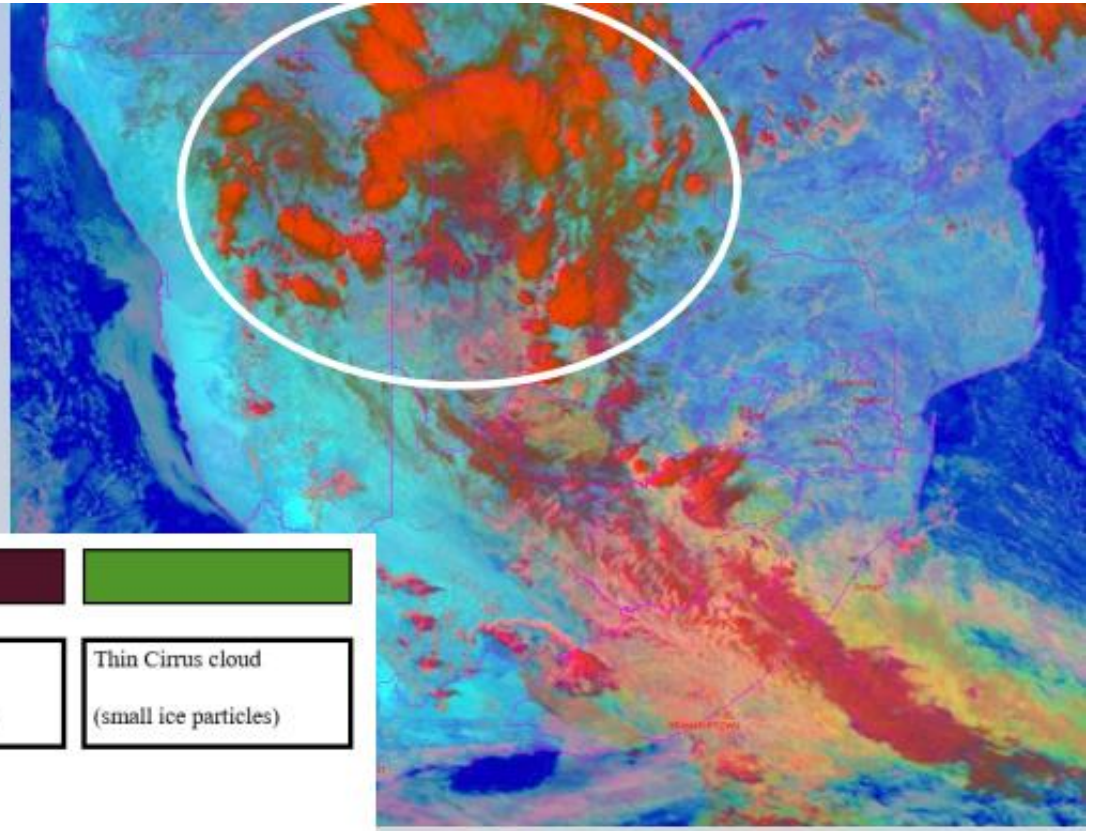


Convection:

- Cyan clouds represents thick ice clouds = storms
- Cellular and clumpy/irregular in shape
- For daytime use only*

# Day Microphysics RGB

- Redder = large ice particles (mature storms)
- More yellow = small ice particles (new development)
- NB shape, text etc. still applies

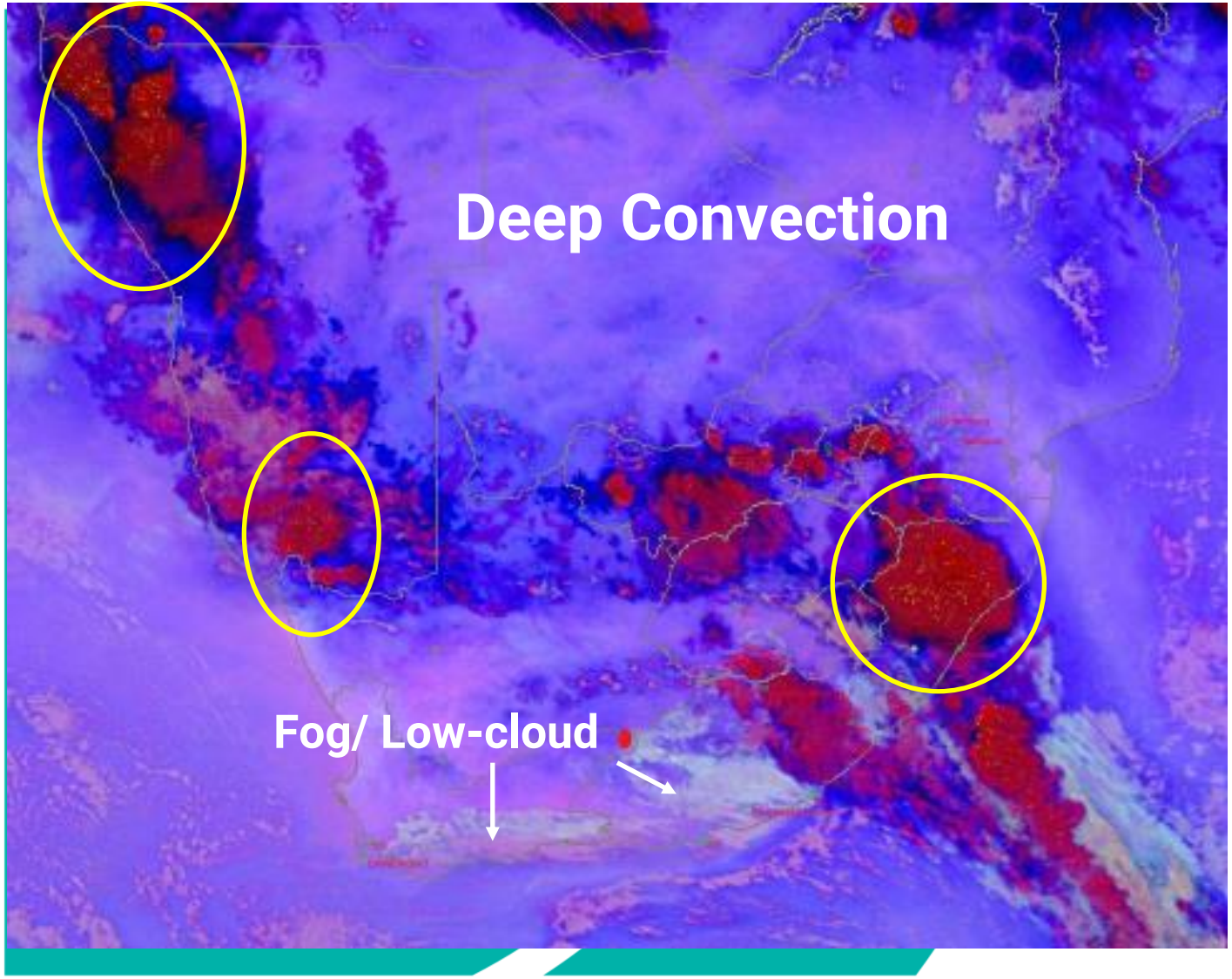


| eep precipitating cloud recip. not necessarily eaching the ground)<br><br>bright, thick<br>large ice particles<br>cold cloud | Deep precipitating cloud (Cb cloud with strong updrafts and severe weather)*<br><br>- bright, thick<br>- small ice particles<br>- cold cloud<br><br>*or thick, high-level lee cloudiness with small ice particles | Thin Cirrus cloud<br><br>(large ice particles) | Thin Cirrus cloud<br><br>(small ice particles) |
|---|---|---|---|

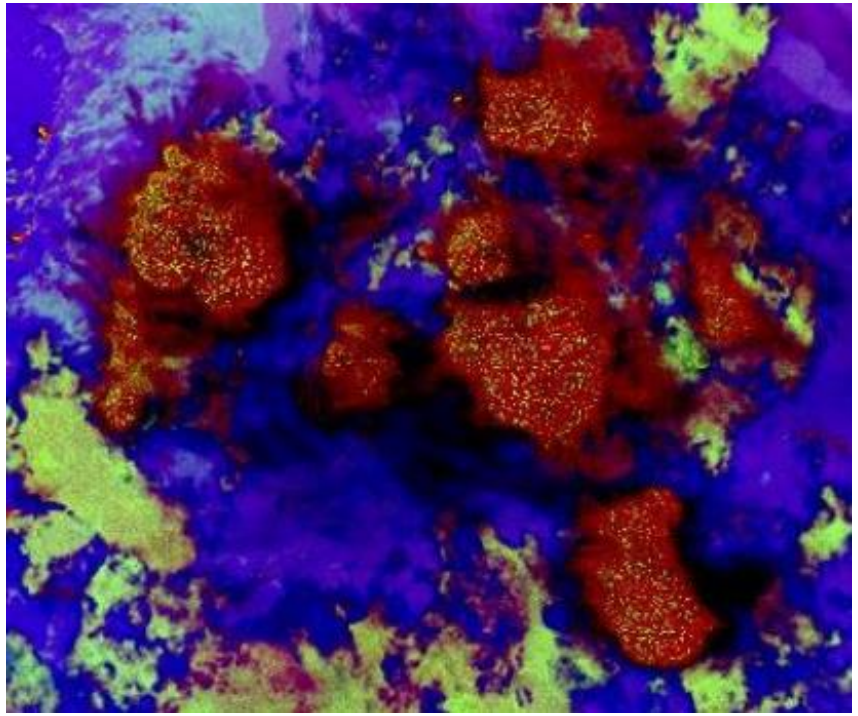
| Ocean | Veg. Land | Fires / Desert | Snow |
|---|---|---|---|

- Anvil – green or brown (depends on particle size)

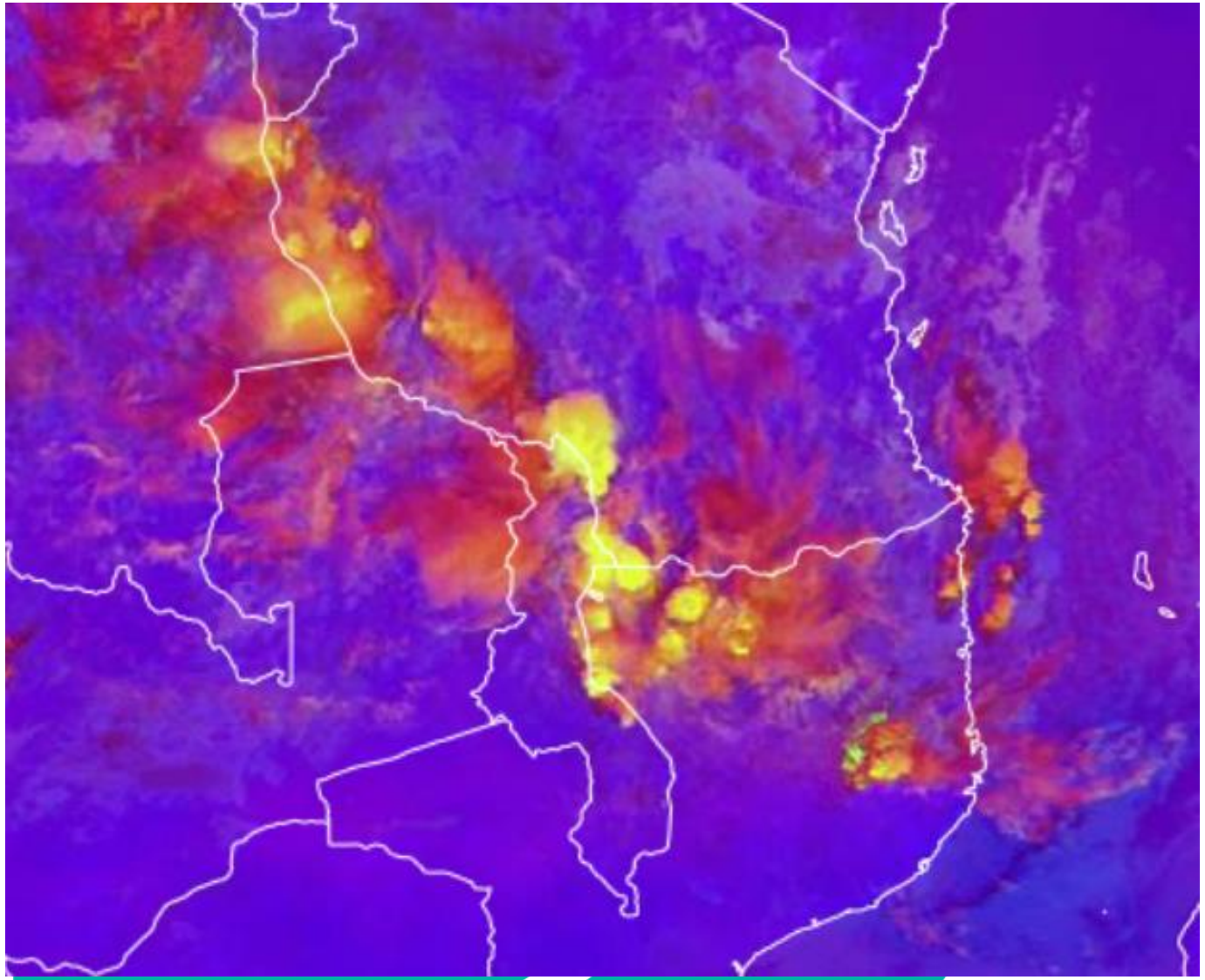
# Night Microphysics RGB




Convection:



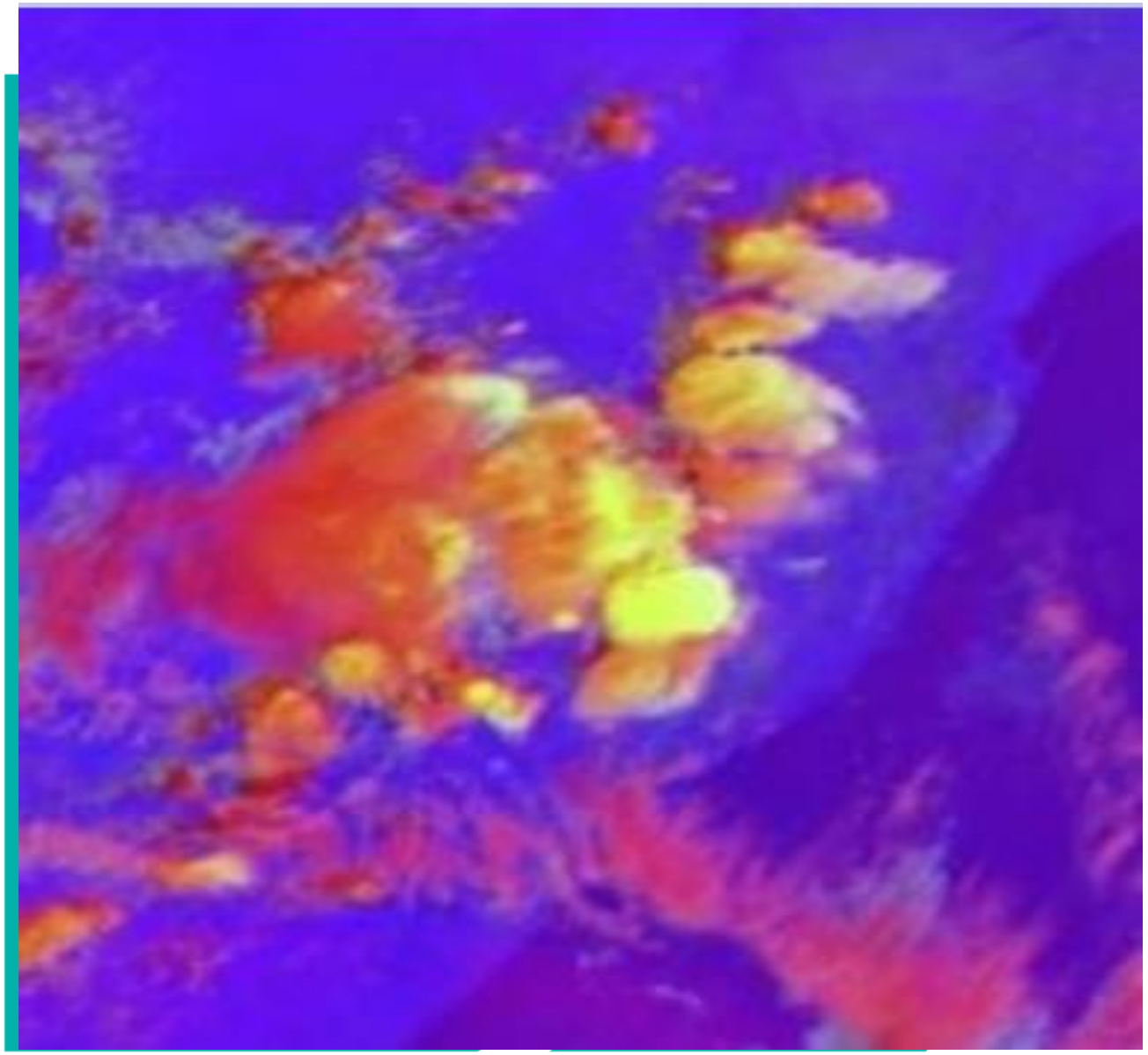
# Convective storms RGB



Convection:

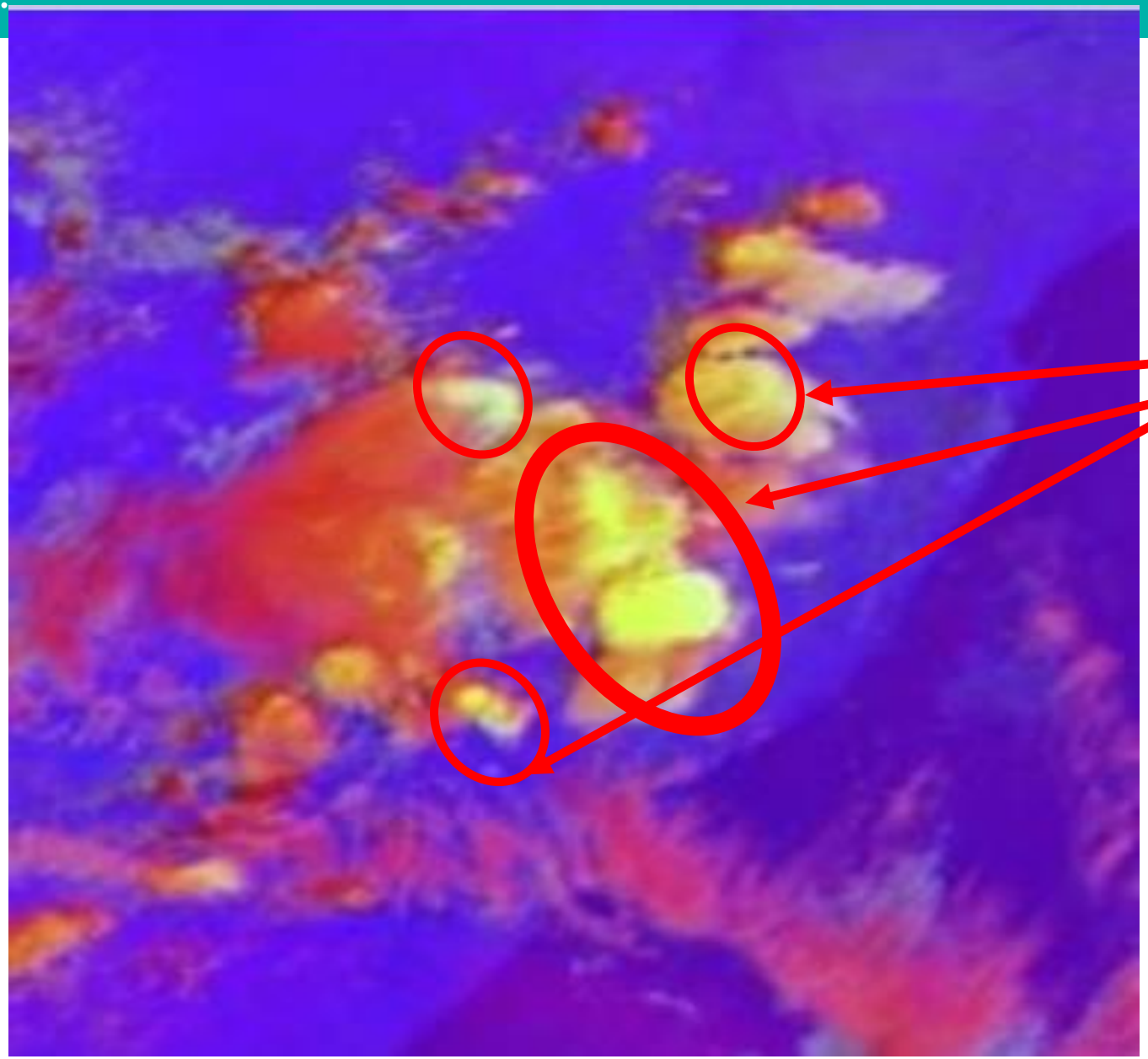
- Bright yellow = small ice particles
- Red/orange = large ice particles

# Question:



1. Indicate clouds with small ice particles.
2. Indicate active storms.

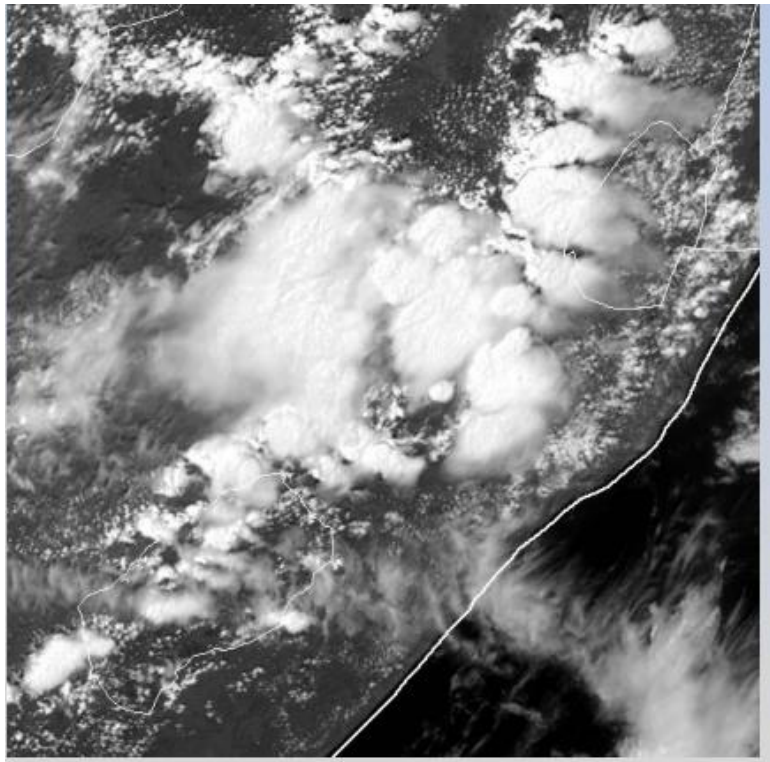
# Solution:



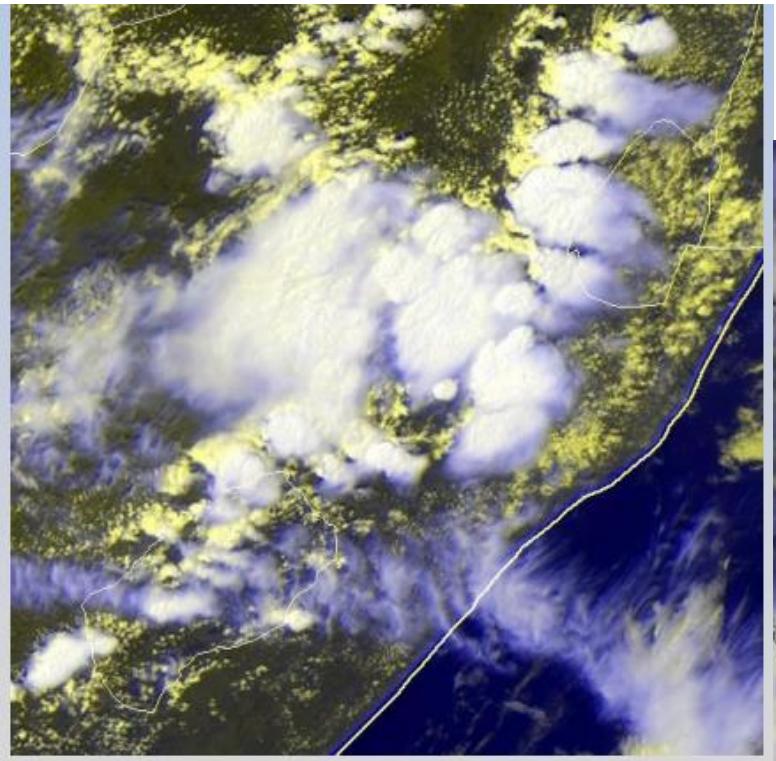
Small ice particles

And active storms

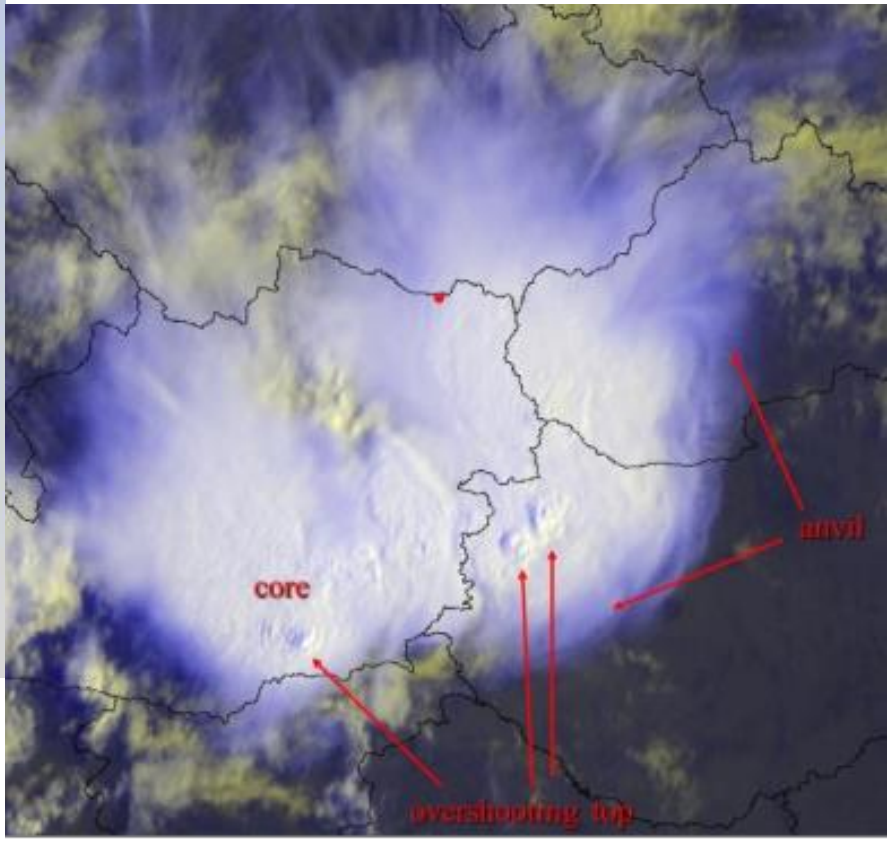
# HIRES vs High resolution cloud enhanced



Channel 12 (HRV)



RGB HRV, HRV, IR10.8i

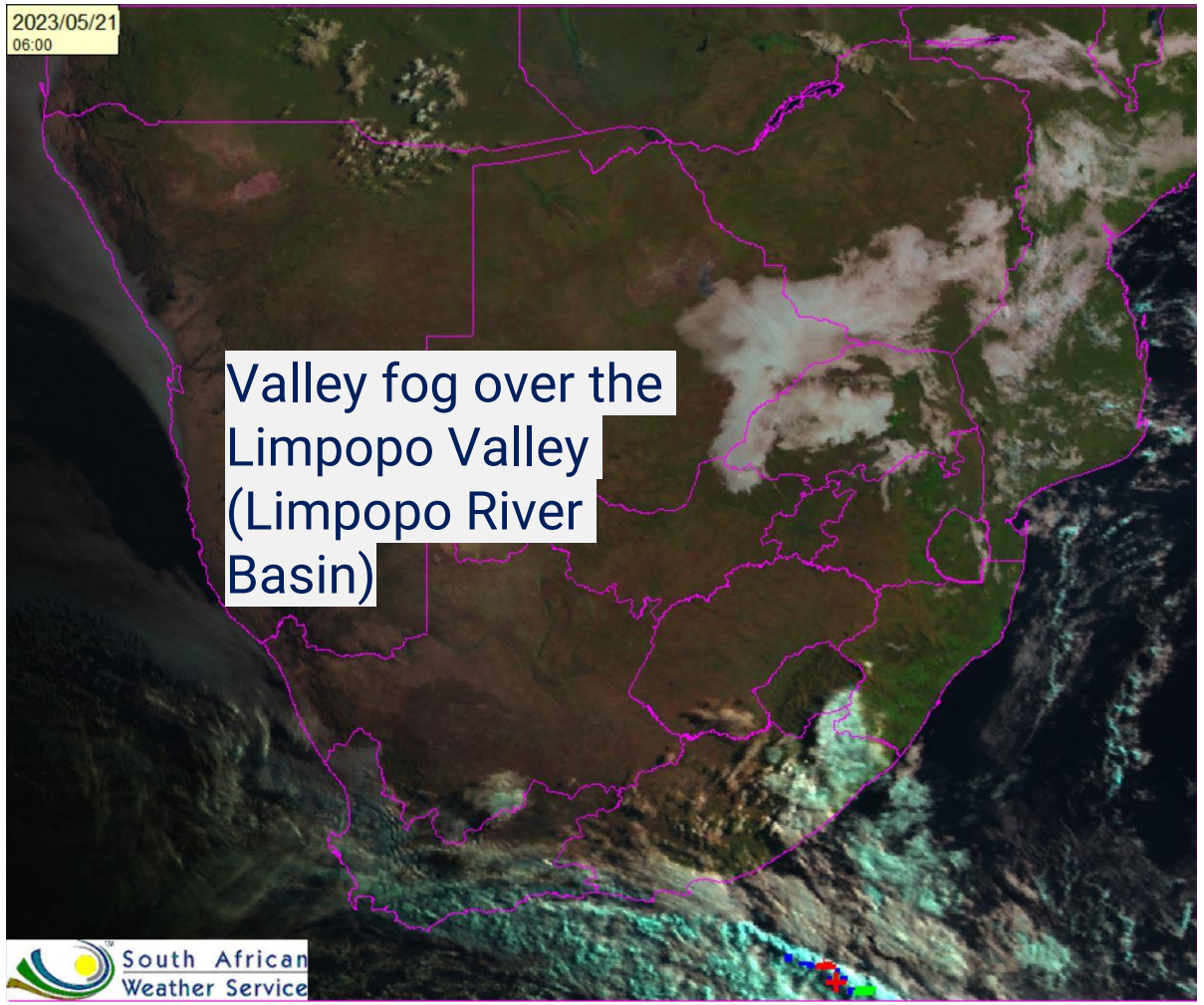



SEVIRI HRV Cloud RGB for 29 June 2006, 08:40 UTC

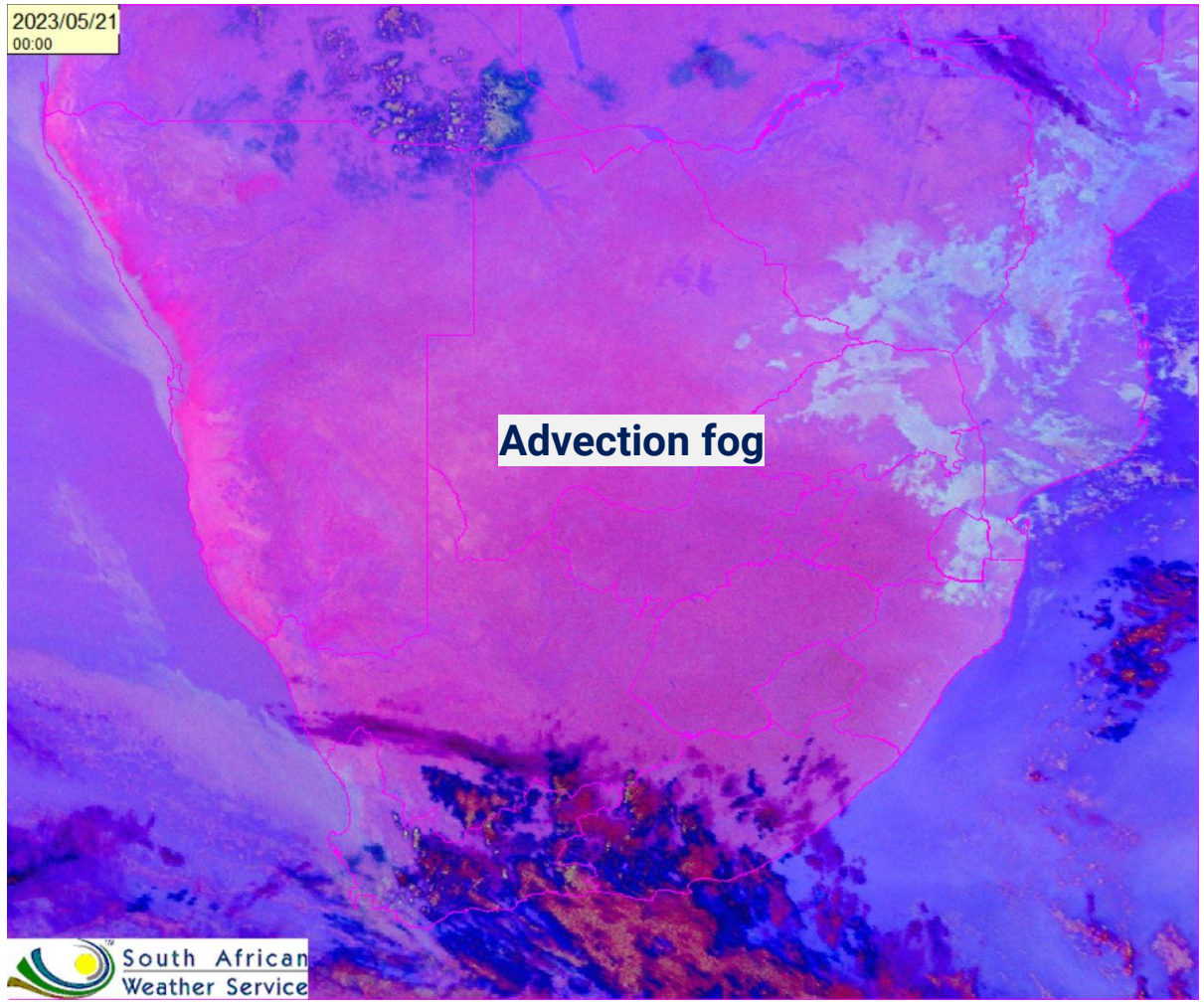
# Identifying fog and stratus using Satellite imagery

# Fog and/or Stratiform clouds

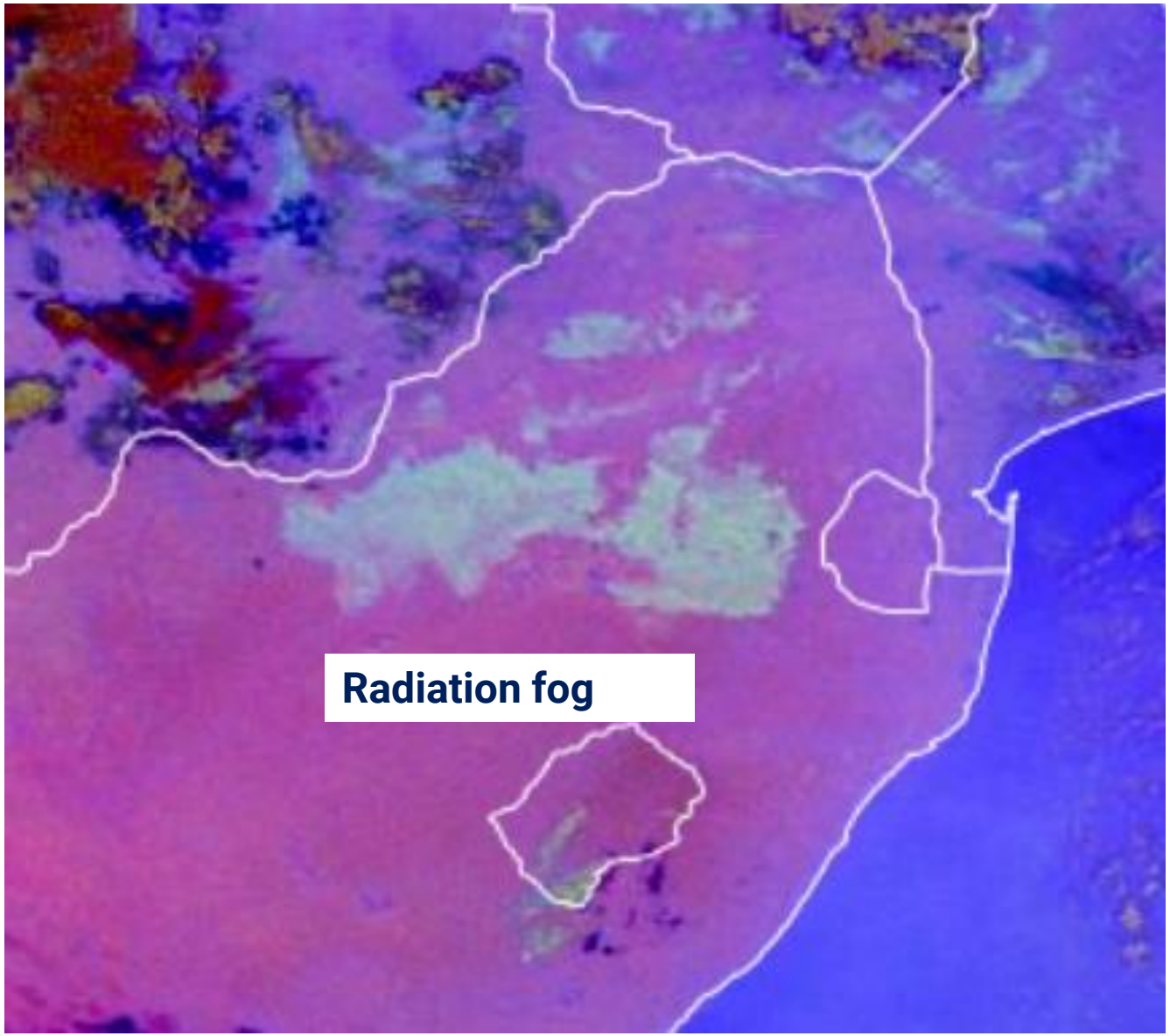
Day Natural Colours RGB




Fog RGB



# Radiation Fog



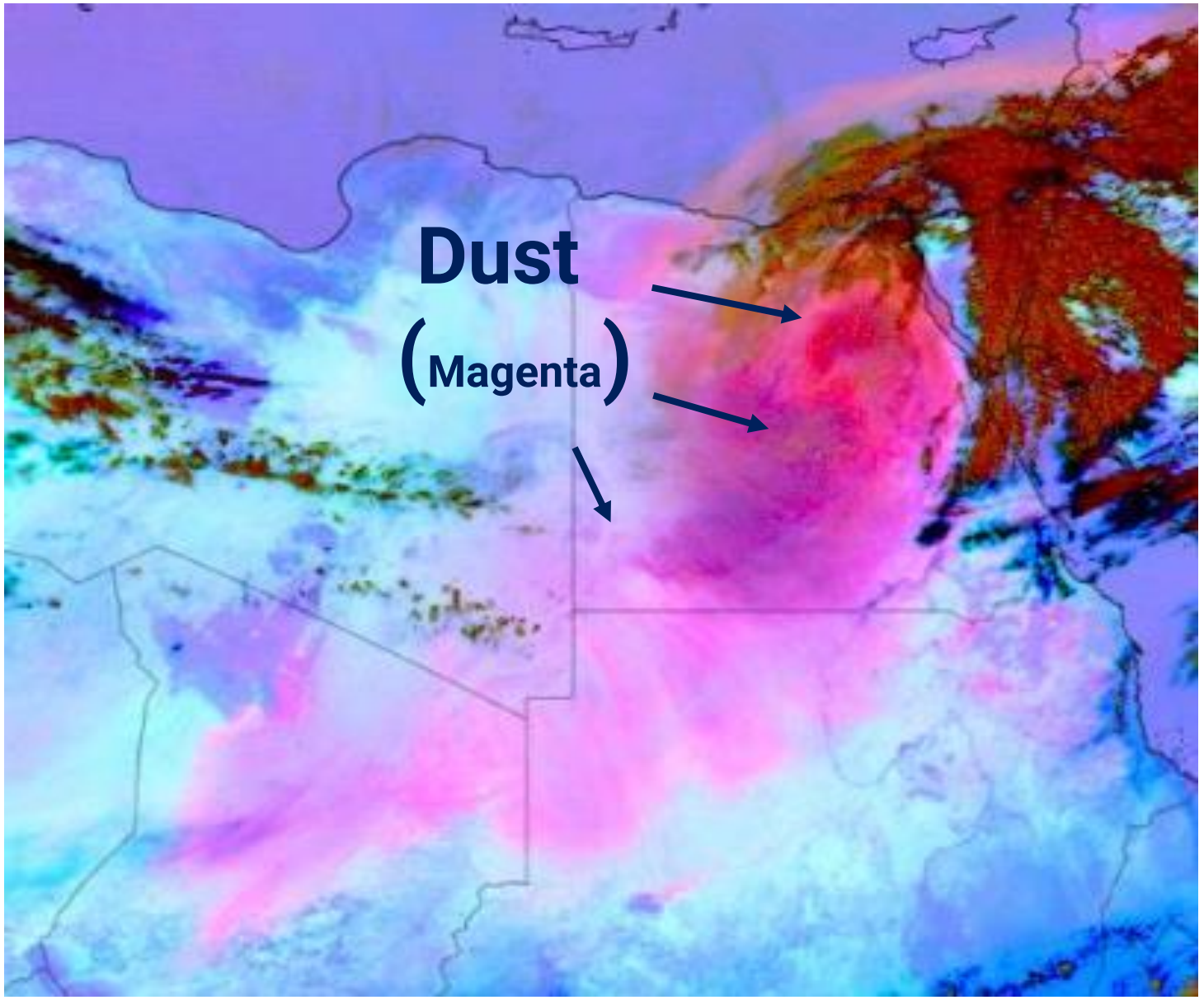
# Dust detection: Dust RGB guide

Composition:

IR12.0–IR10.8

IR10.8–IR8.7

IR10.8



# Other uses of the Dust RGB

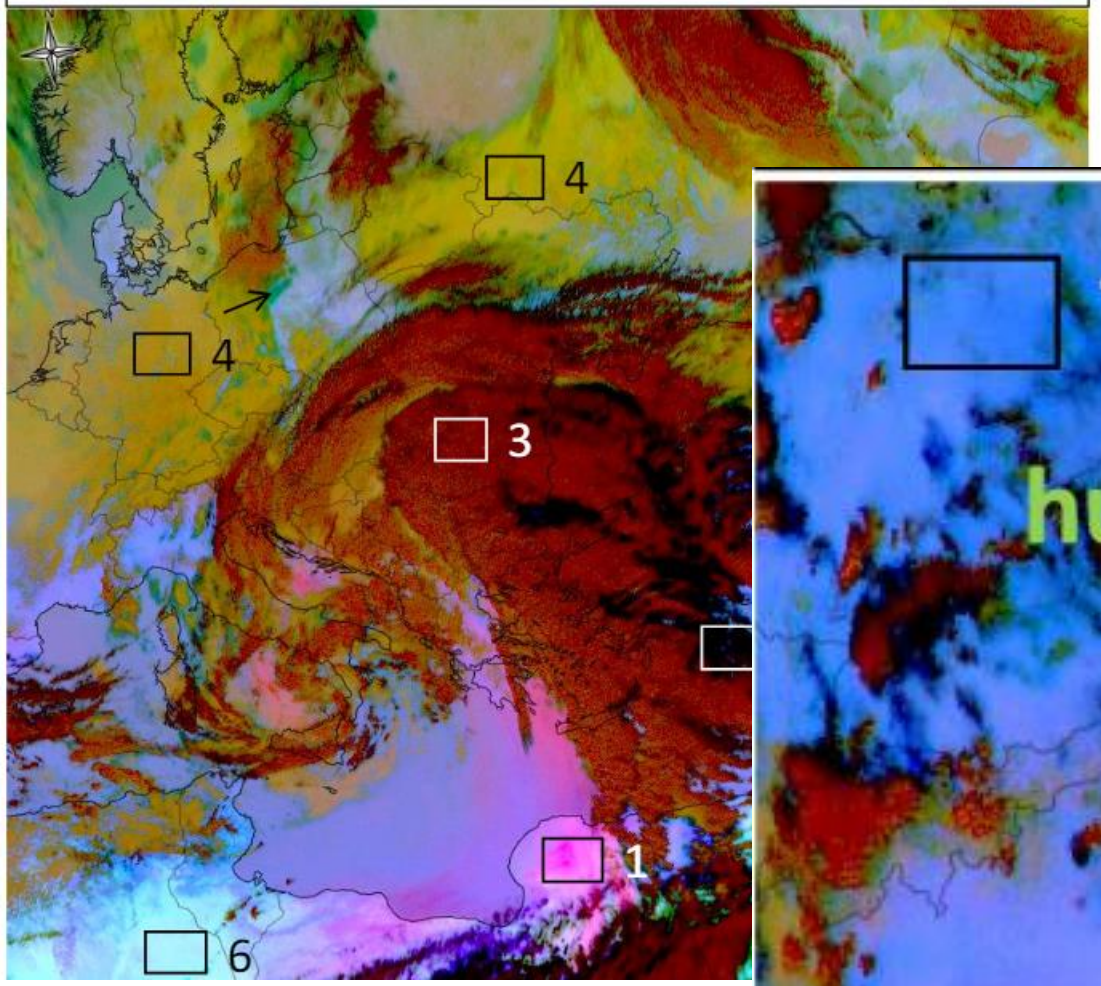
## Colour Interpretation

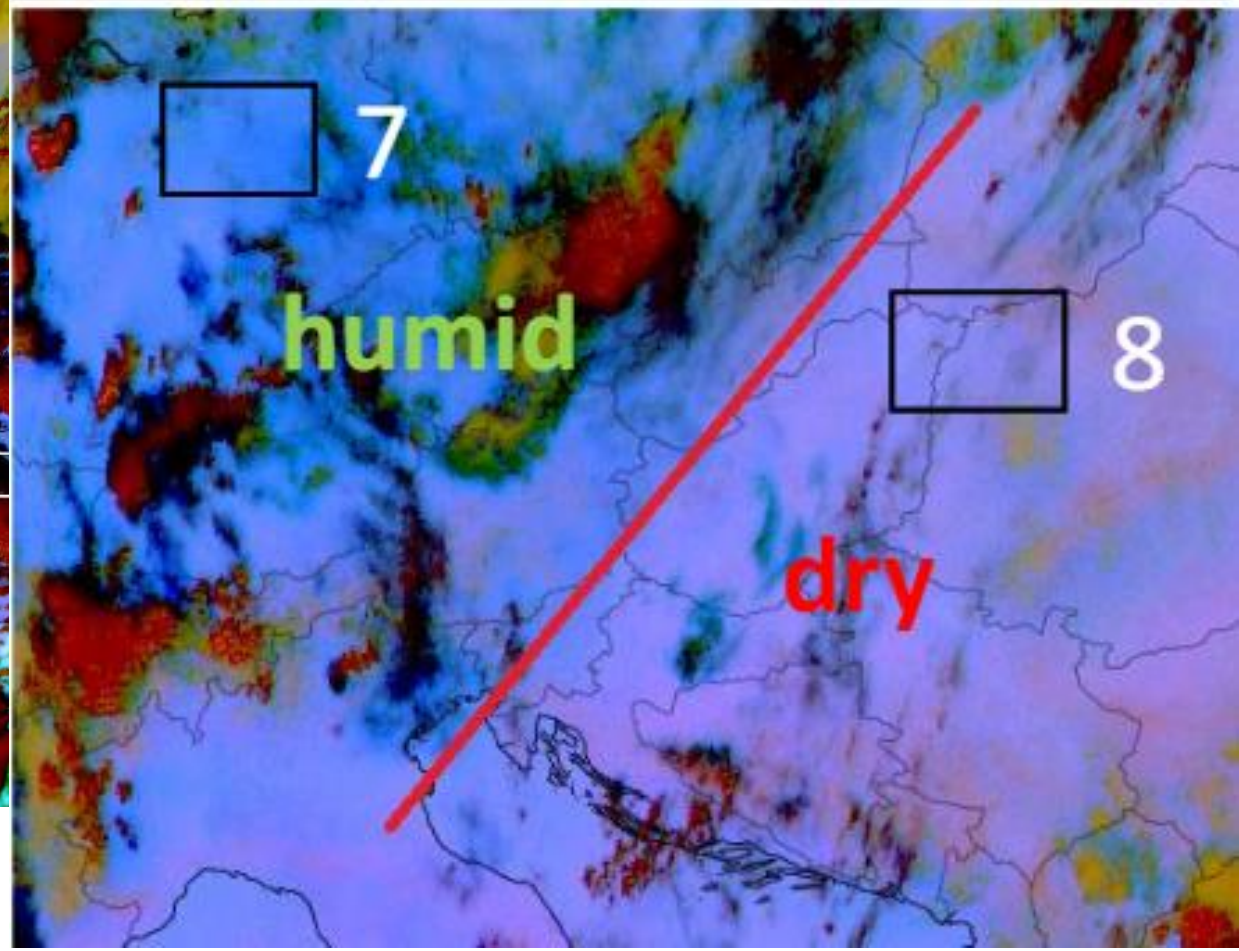
| | |
|---|---|
| 1 | Dust or ash clouds. The colour of dust clouds varies from pink to violet, ash clouds are more reddish. |
| 2 | Cirrus clouds with no clouds below are black or dark blue. |
| 3 | Thick, high and cold ice clouds. |
| 4 | Thick mid-level clouds. Thin mid-level clouds appear green (black arrow). |
| 5 | Thin cirrus clouds over deserts appear green. |
| 6 | Hot sandy deserts, dry air mass.* |
| 7 | Humid air in lower levels.* (~ 700 hPa) |
| 8 | Dry air in lower levels.* |

** Colours can vary considerably depending on surface temperature.*

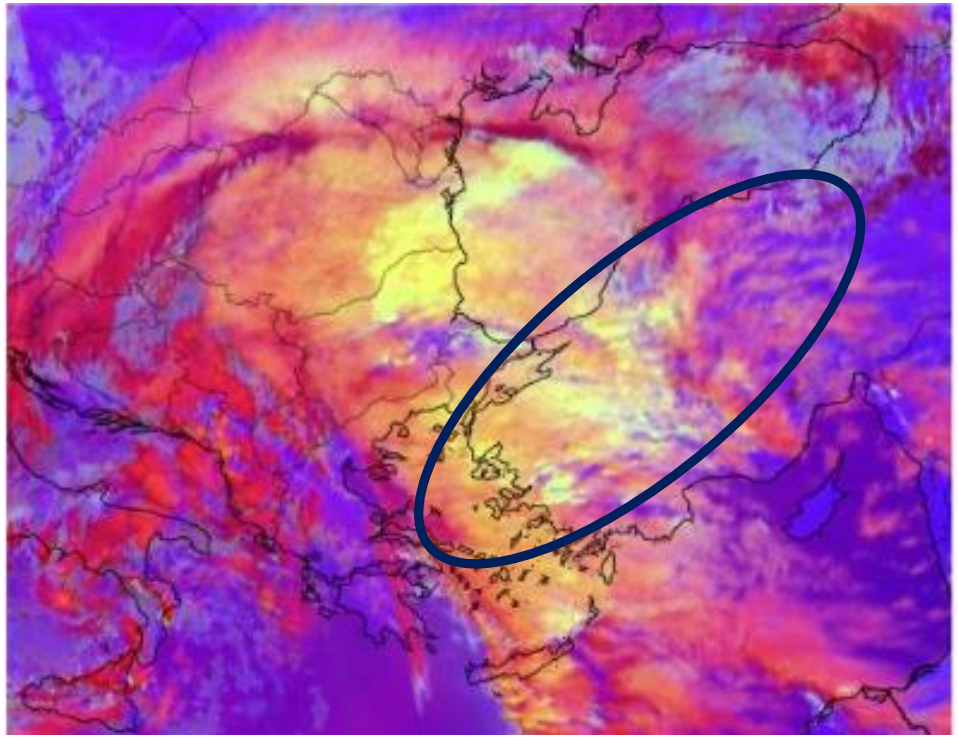
**Dust RGB image, 29 May 2017, 18:00 UTC**

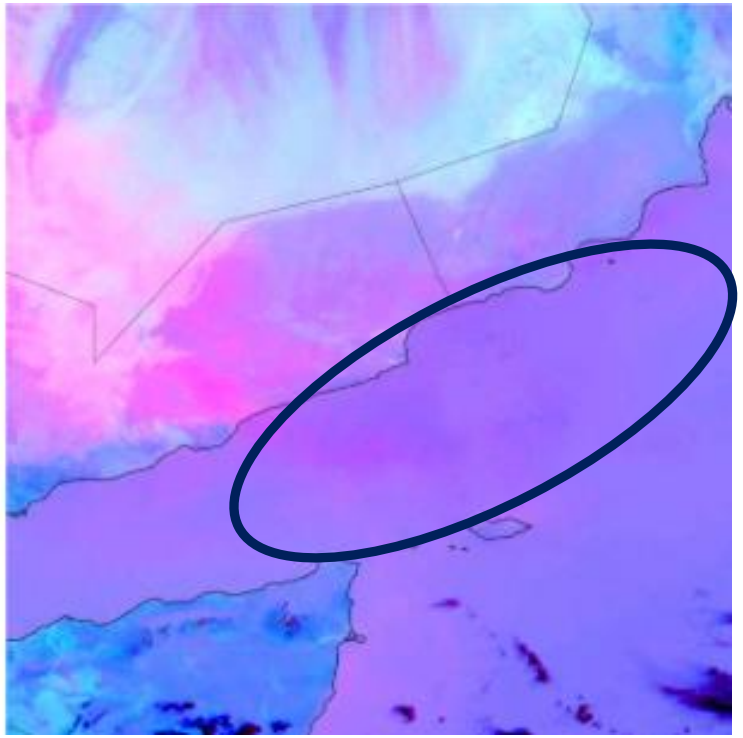

**SEVIRI Dust RGB, 23 March 2016, 12:00 UTC**



# Comparison to other products:





# That’s all…. Thank you