NWC SAF User's Workshop 2025

Use of weather tools to analyze weather case studies CASE STUDY

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Tools that are aids to case studies

- Looking at the kind of weather that had affected a specific area, specific tools can be used to arrive at how the weather evolved
- Use satellite images such as the Airmass RGB which could show the type of air mass that could have influenced the weather pattern for a particular even
- NWCSAF products like the Adaguc Viewer becomes a very important tool to give a narrative of what could have been expected, you use features such as Convective Initiation, Precipitation likelihood, Convective rainfall rate
- In an event that a storm had ravaged a given area, you would at satellite channels like: Convection RGB that would guide as to how a development could have occurred.

Tools that are aids to case studies Cont'd

- Cloud phase and cloud type
- Observation and historical data quite essential
- Precipitation likelihood, Convective rainfall rate
- In an event that a storm had ravaged a given area, you would at satellite channels like: Convection RGB that would guide as to how a development could have occurred.

Example of a case study of flooding in Mpulungu district in Zambia

- The event I would talk about is a flooding that occurred in Mpulungu district in the Northern Province of Zambia
- The district lies in the Northern province of the Country and on the shores of Lake Tanganyika.
- The Country was affected by the effect of El Nino during the 2023/2024 season.
- Mpulungu district received a seasonal record high rainfall 2025.9mm during the 2023/2024 rainy season
- In the month of January 2024, rainfall amount of 525.1mm was recorded

Example of a case study of flooding in Mpulungu district in Zambia Cont'd

- One notable event was the amount of 24 hour rainfall of 107.1mm that was recorded on 21st January 2024
- Mpulungu has a mountainous terrain and rain that fall has a funneling effect. Rain falls on highland usually collects on low land creating a flooding effect and also drains water into Lake Tanganyika.
- Social impacts included flooding

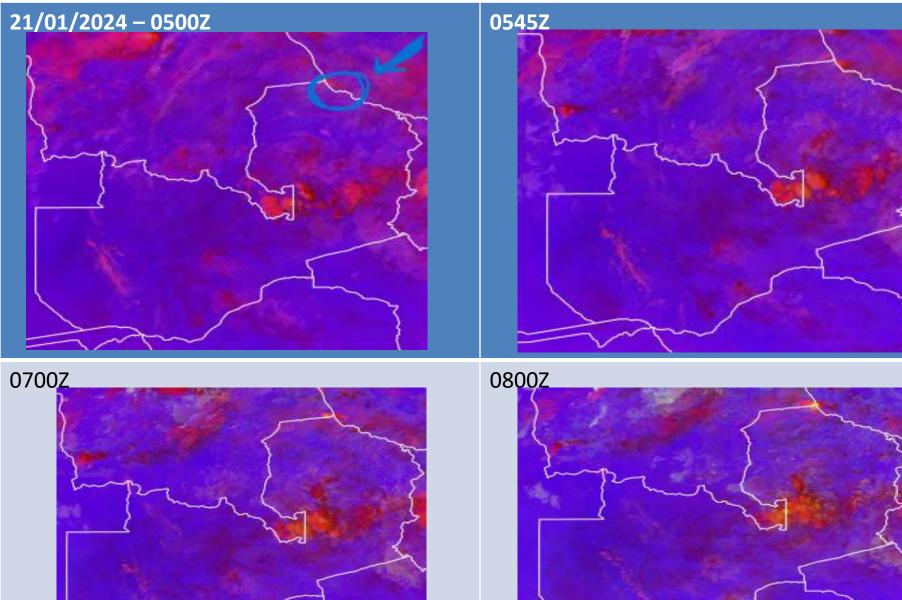
Example of a case study of flooding in Mpulungu district in Zambia Cont'd

- Area of land claimed by the lake was a distance of 30meters.
- Some buildings were submerged
- Other buildings crumbled down

Data Collection

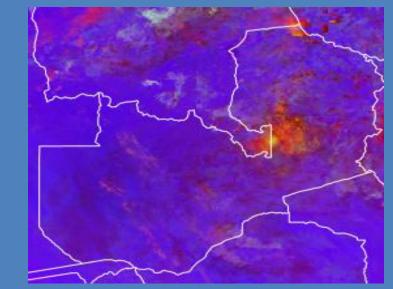
- Data source for analyzing an event leading to the high rainfall fell on 21st January was the satellite images mainly the convection RGB and the Rapid Developing Thunderstorms
- Other data sources for precipitation is from the meteorological rainfall register for the district

Satellite information

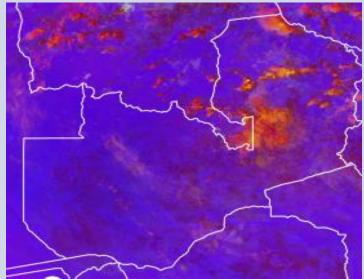


Satellite Information Cont'd

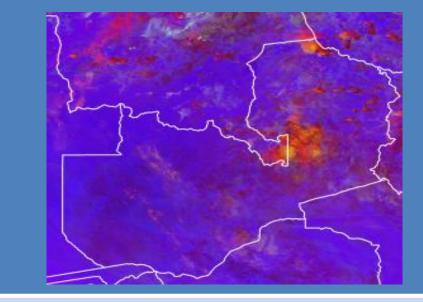
0900Z



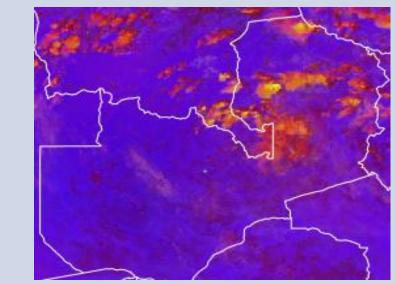
1045Z



0945Z



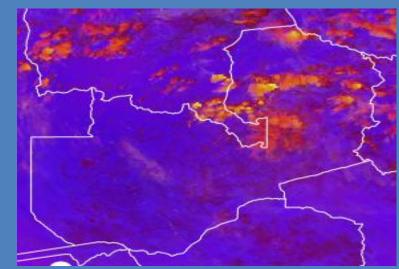
1145Z



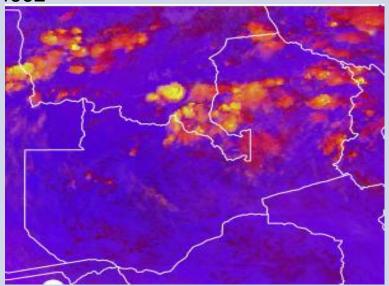
Satellite Information Cont'd

1345Z

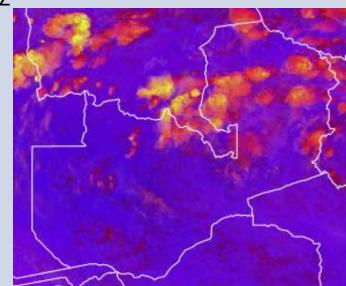
1200Z



1400Z



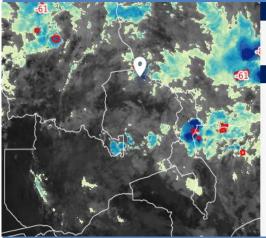




RDT Satellite Information

0700Z

21 Jan 0500Z



v.

Lon: 30.892

Point Information

Lat: -8.754

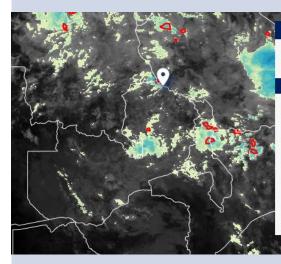
Rapidly Developing Thunderstorms - MSG - 0 ... 💙

Cooling rate: 0.05 °C/min ∆T overshooting top vs tropopause: N/A Pressure at Cloud Top: 182 hPa Direction of motion: 8 * Speed of motion: 52.28 km/h Life phase: Mature Average BT: -52.31 °C Max CRR: 10.8 mm/h Duration: 105 minutes



Point Information Lon: 31.200 Lat: -8.578 Rapidly Developing Thunderstorms - MSG - 0 ... 💙 Acquisition timestamp: 2024-01-21 07:00 Minimum BT: -52.38 °C Cooling rate: -0.38 °C/min ∆T overshooting top vs tropopause: N/A Pressure at Cloud Top: 185 hPa Direction of motion: 142 * Speed of motion: 9.61 km/h Life phase: Growing Average BT: -49.82 °C Max CRR: 2.6 mm/h Duration: 30 minutes

0800Z



Point Information Lon: 31.200 Lat: -8.578 Rapidly Developing Thunderstorms - MSG - 0 ... 🗸 Acquisition timestamp: 2024-01-21 08:00 Minimum BT: -74.56 °C Cooling rate: 0.14 °C/min ∆T overshooting top vs tropopause: N/A Pressure at Cloud Top: 133 hPa Direction of motion: 311 ° Speed of motion: 7.63 km/h

Life phase: Decaying Average BT: -70.22 °C Max CRR: 41.9 mm/h

Duration: 90 minutes

0900Z



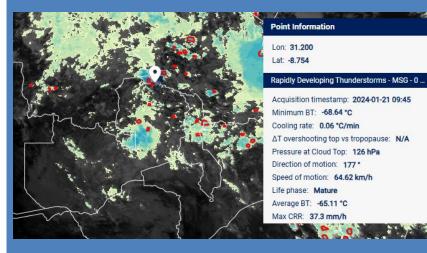
Point Information Lon: 31.200 Lat: -8.578 Rapidly Developing Thunderstorms - MSG - 0 ... 🗸 Acquisition timestamp: 2024-01-21 09:00 Minimum BT: -65.53 °C Cooling rate: 0.14 °C/min ∆T overshooting top vs tropopause: N/A

Pressure at Cloud Top: 138 hPa Direction of motion: 204 * Speed of motion: 1.81 km/h Life phase: Decaving Average BT: -61 °C

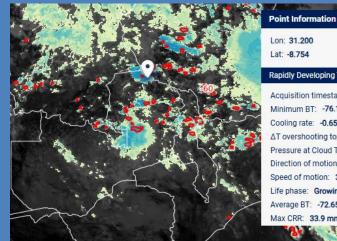
Max CRR: 45.1 mm/h

RDT Satellite Information Cont'd

0945Z

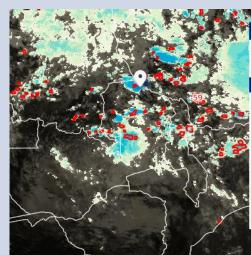


1045Z



Lon: 31.200 Lat: -8.754 Rapidly Developing Thunderstorms - MSG - 0 ... 💙 Acquisition timestamp: 2024-01-21 10:45 Minimum BT: -76.17 °C Cooling rate: -0.65 °C/min ∆T overshooting top vs tropopause: N/A Pressure at Cloud Top: 118 hPa Direction of motion: 166 * Speed of motion: 30 km/h Life phase: Growing Average BT: -72.65 °C Max CRR: 33.9 mm/h

1100Z



Point Information

P 0

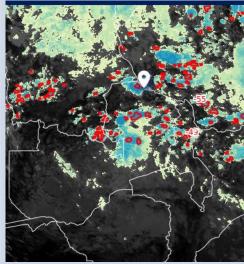
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Lon: 31.200 Lat: -8.754

Rapidly Developing Thunderstorms - MSG - 0 ... 💙

Acquisition timestamp: 2024-01-21 11:00 Minimum BT: -75.63 °C Cooling rate: 0.04 *C/min ∆T overshooting top vs tropopause: N/A Pressure at Cloud Top: 100 hPa Direction of motion: 146 * Speed of motion: 35.72 km/h Life phase: Mature Average BT: -72.02 °C Max CRR: 46.3 mm/h

1145Z



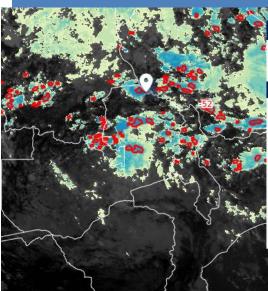
Point Information Lon: 31.200

Lat: -8.754

Rapidly Developing Thunderstorms - MSG - 0 ... 💙 uisition timestamp. 2024-01-21 113 Minimum BT: -74.03 °C Cooling rate: 0.1 °C/min ∆T overshooting top vs tropopause: N/A Pressure at Cloud Top: 124 hPa Direction of motion: 93 * Speed of motion: 37.28 km/h Life phase: Triggering_from_split Average BT: -70.52 °C Max CRR: 48.5 mm/h Duration: 0 minutes

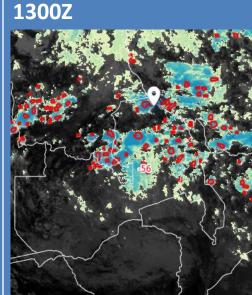
RDT Satellite Information Cont'd

1200Z





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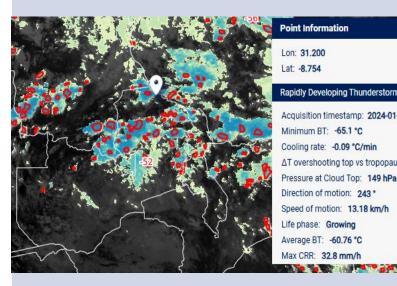
Lon: 31,200 Lat: -8.754 Rapidly Developing Thunderstorms - MSG - 0 ... 💙 Acquisition timestamp: 2024-01-21 13:00 Minimum BT: -66.84 °C Cooling rate: 0.0 °C/min ∆T overshooting top vs tropopause: N/A Pressure at Cloud Top: 144 hPa Direction of motion: 332 * Speed of motion: 26.11 km/h Life phase: Growing Average BT: -62.09 °C

Point Information

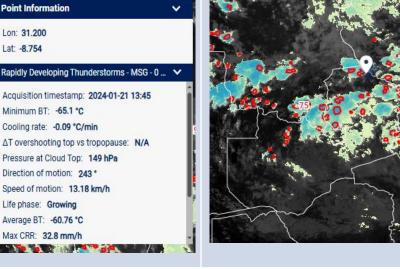
Max CRR: 45.6 mm/h

Duration: 270 min

1345Z



1500Z



V	Point Information	*
	Lon: 31.200	
100	Lat: -8.754	
	Rapidly Developing Thunderstorms - MSG - 0	~
i.	Acquisition timestamp: 2024-01-21 15:00	
	Minimum BT: -55.8 °C	
	Cooling rate: 0.22 °C/min	
-	∆T overshooting top vs tropopause: N/A	
0	Pressure at Cloud Top: 178 hPa	
100	Direction of motion: 276 *	
	Speed of motion: 26.87 km/h	
	Life phase: Decaying	
1	Average BT: -51.44 °C	
	Max CRR: 9.7 mm/h	

Flooded areas

Pendulum Transport Company

Great Lake Lodge





Village hoses





Flooded areas







Conclusion

- NWC SAF products are essential to use when doing case studies
- Satellite images are essential when tracking the development of a weather even that occurred
- The 2023/2024 season recorded the record high amount of rainfall for the district of Mpulungu
- Most precipitation in the district occur following a convective development
- This fall triggered flooding on some places as some significant falls had occurred prior to that date
- The funneling effect of the terrain of the district contributed to flooding of in some villages
- Rise in water level over Lake Tanganyika

END OF PRESENTATION

THANKS FOR YOUR ATTENTION