

SATELLITE OBSERVATIONS OF TROPICAL CYCLONE 'BONITA' OF JANUARY 1996

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This case study is representation of the application of remote sensed data in monitoring and tracking the typical cycle of a tropical cyclone. Because of its geographical position, Zambia (Lat 08-18 degree south and Long 22-34 degrees East) is not very vulnerable to Tropical cyclones but to floods, drought and severe summer thunderstorms associated with regular heavy rainfall. However in 1996 tropical cyclone 'Bonita' was monitored and tracked from the warm waters of Mozambique Channel in the Indian Ocean until it dissipated over the cool water of the Atlantic Ocean in Angola. Tropical cyclone "Bonita" started, as an area of disturbance over the Indian Ocean on Saturday 6th January 1996. This disturbance was in the form of a weak low. After developing into a strong vortex east of Madagascar on 9th January, Bonita moved north-westward to northern and then central Madagascar on 10th and 11th respectively. By 12th January the Cyclone moved to west coast of the island where it developed into a full-fledged tropical cyclone over the warm waters of the Mozambique Channel. Figures 1 and 2 show the Meteosat visible and infrared images for 1200utc on 13th and 16th January, with the surface isobaric and 700hpa streamline patterns superimposed respectively. By Monday 15th January, the Tropical Cyclone was gradually being downgraded into a tropical storm over Eastern Zimbabwe. On Tuesday 16th January "Bonita" was over Northern Zimbabwe after taking a North-westerly track. Both the visible and infrared images show a cloudy to overcast situation with rainfall in many parts of Zambia. On the surface chart was a well marked broad trough from western Zambia, extending to the centre of the storm over Zimbabwe which had by this time merged with the Angola Depression, up to the coastal areas of Mozambique and northern Madagascar. Sustained unseasonably strong winds, though nowhere near tropical cyclone strength (15-20 knots compared to less than 2 knots which is the normal for this time of year) were experienced throughout the 16th over most stations in the southern, central and western parts of Zambia. Such wind speeds at this time of the year can be damaging to the standing maize crop. The heaviest Twenty-four hours falls of rain occurred on this day at many Zambian stations: Choma 134mm, Senanga 104 mm, Magoye 66 mm, Mongu 63 mm. Zambia normally receives about 5 per cent of the total seasonal rainfall during the 7-day period 12-18 January (based on the 1961-90 normal period). Over the same period of the 1995/96 season, the contribution to seasonal rainfall was substantial (18-20 per cent) in parts of Central, Southern and Western provinces, but marginally above or below the normal contribution over the rest of Zambia. On Wednesday 17th January, "Bonita" had weakened further. This episode provides an interesting laboratory demonstration of how geoinformation technologies can be used to monitor and track the development, movement and dissipation of cyclones, and therefore prevent an imminent disaster.

Date/Time(UTC)	Position (Lat./ Long)	Intensity	Other characteristics
090600	81753	Depression	
100600	81449	Tropical Storm	
110600	81848	Severe Tropical Storm	
120600	81843	Cyclone	170km/hr
130600	81840	Cyclone	Defined "Eye"
140600	81936	Severe Tropical Storm	
150600	81932	Tropical Storm	
160600	81730	Depression	
170600	81620	Weak Depression	

Table 1. Daily movement trend of the Storm as reflected by the 0600UTC Meteosat images.

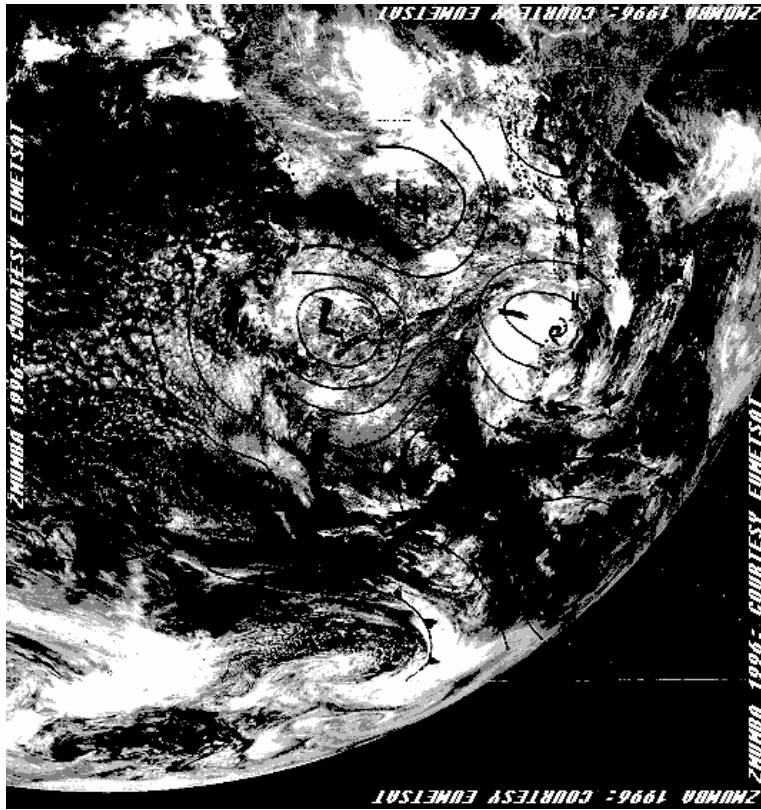


Figure 1. Meteosat VIS Image at 1200 UTC on 13 Jan.1996

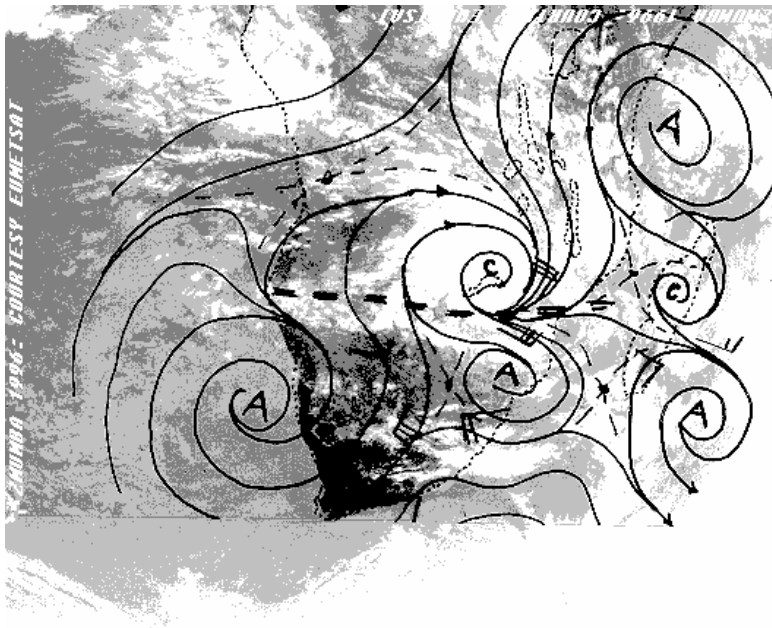


Figure 2. Meteosat IR image at 1200 UTC on 16 Jan. 1996