

12 April 2022

## **Extreme rainfall and widespread flooding overnight: KwaZulu-Natal and parts of Eastern Cape**

**Following a weekend of widespread rainfall over much of the country this past weekend, the cut-off low system responsible for the inclement weather began moving eastwards over KwaZulu-Natal and the Eastern Cape overnight. Whilst impact-based warnings were indeed issued in a timely manner by the South African Weather Service (SAWS), it appears that the exceptionally heavy rainfall overnight and this morning exceeded even the expectations of the southern African meteorological community at large.**

At 16h00 yesterday, a Level 5 warning was issued for the coast and adjacent interior of KwaZulu-Natal. This was subsequently escalated to a Level 8 warning at 20h00 last night. *However, following reports of further impacts and persistent, heavy rainfall, SAWS has now upgraded the heavy rain warning to an Orange Level 9 for the remainder of today* (for further details regarding today's warning, please refer to the detailed warning messaging later in this media release).

Overnight rainfall reports from KwaZulu-Natal have underscored the particularly heavy and extreme nature of the rainfall, with some 24-hour falls exceeding 200 mm. More noteworthy, is that a few stations even reported 300 mm or more! A selection of the highest overnight rainfall measured in KwaZulu-Natal includes King Shaka International Airport (225 mm), Margate (311 mm), Mount Edgecombe (307 mm), Port Edward (188 mm) as well as Virginia airport (Durban north) with 304 mm. Such rainfall is of the order of values normally associated with tropical cyclones; however, SAWS must strongly emphasise that this system is not tropical in nature, nor is it a tropical cyclone.

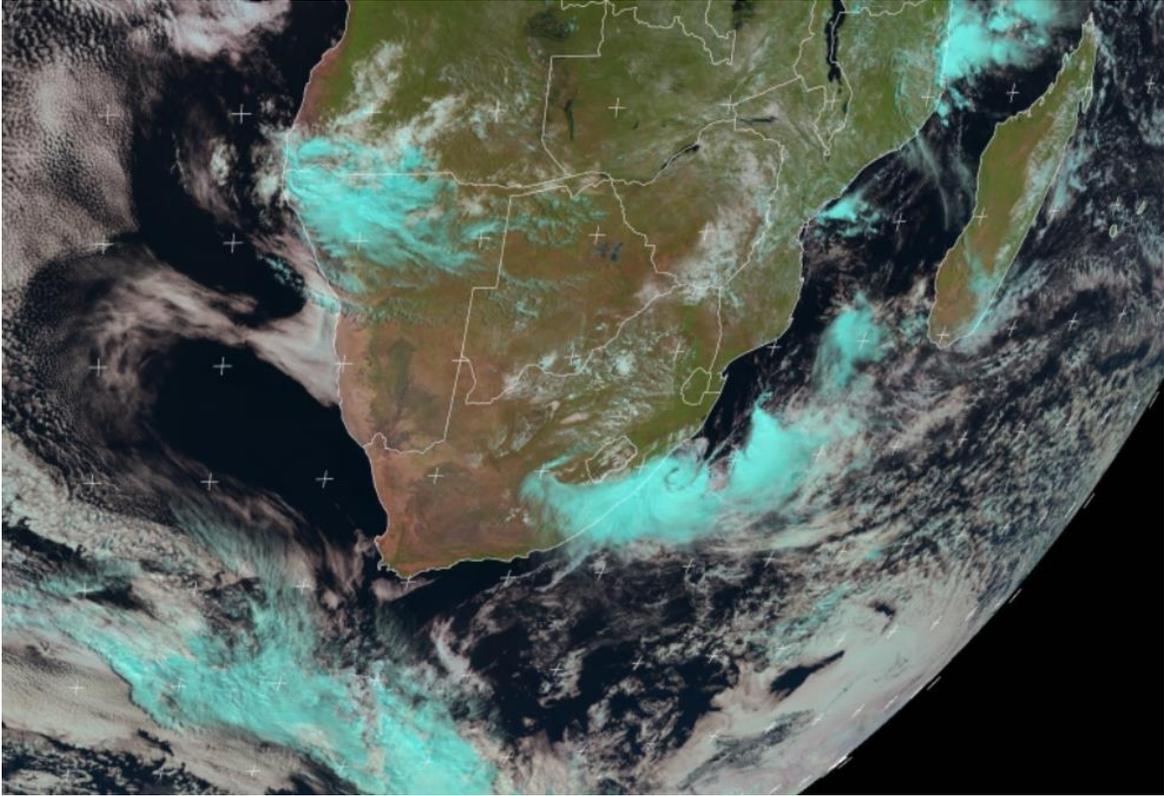
**What was the reason for the heavy rain?** In short, as alluded to earlier, a cut-off low in the upper reaches of the troposphere is currently moving seawards, off the eastern coast of South Africa. Cut-off lows are associated with widespread instability in the atmosphere, which can promote periods of prolonged rainfall, as witnessed over many of the interior provinces of South Africa at the weekend. For KwaZulu-Natal however, the effect of the cut-off low system has been

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markedly enhanced by the presence of sustained low-level maritime air which has been fed in from the southern Indian ocean, thus driving the system to produce more rainfall. Moreover, the original source of the maritime air was from warmer, sub-tropical parts of the ocean, with a greater capacity to transport moisture, an essential ingredient of any rain-producing system.



**Figure 1:** Meteosat RGB composite image at 11h00SAST 12 April 2022, clearly indicating the cyclonic swirl of deep convective cloud, associated with heavy rain, just off the southern coastline KwaZulu-Natal. Source: Eumetsat, © 2022.

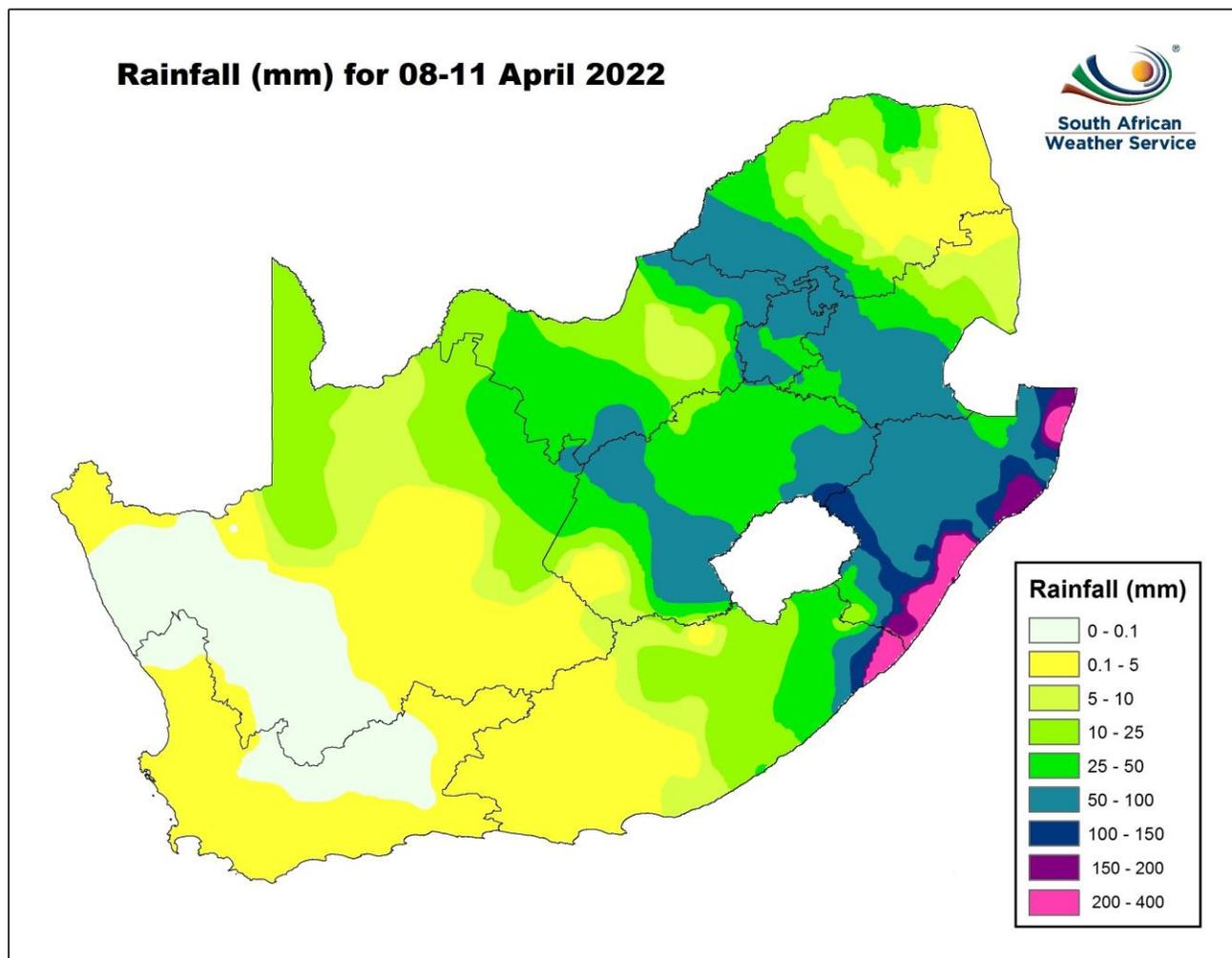
**What Impact-based warnings issued by SAWS are valid for the remainder of today (Tuesday 12 April 2022)?**

**IMPACT-BASED WARNINGS:**

A. **Orange level 9 warning** for disruptive rainfall leading to widespread flooding of settlements, schools, roads, bridges, sinkholes, mudslides, soil erosion and major disruption of traffic is expected over the extreme south-eastern parts of KwaZulu-Natal.

B. **Yellow level 4 warning** for disruptive rainfall leading to flooding of roads, settlements, displacement of affected communities, sinkholes, mudslides, rock falls and poor driving conditions expected over the south-eastern interior of KwaZulu-Natal.

C. **Orange level 6 warning** for disruptive rain leading to flooding is expected in places over Port St Johns LM, Ingquza Hill LM and Mbizana LM in the Eastern Cape.



**Figure 2:** Accumulated rainfall (mm) for the period 8 to 11 April 2022 (including the first 8 hours of 12 April). Of particular interest and relevance are the values indicated in light pink, indicating 200-400 mm. Source SAWS.

**Could this rain system be attributed to global warming and climate change?** No, as weather scientists we cannot attribute individual weather events occurring on short timescales to longer-term events, occurring over years or decades. However, notwithstanding the above, we can state with confidence that globally (as a direct result of global warming and associated climate change) *all forms of severe and extreme weather (such as heatwaves, heavy rain, and coastal storm surge events) are becoming more frequent and more extreme than in the recent past.* In other words, heavy rain events such as the current incident can rightfully be expected to recur in the future and with increasing frequency.

<b>Likelihood</b>	High		2	6	10
	Medium		1	5	9
	Low			4	8
	Very Low			3	7
		Minimal	Minor	Significant	Severe
<b>Impact</b>					

**Figure 3:** Matrix for Impact-based warnings. Each number represents different levels of impacts as well as their likelihood.

The good news is that, by tomorrow the current rainfall system will have weakened considerably, heralding a spell of a few days of settled dry weather. However, the public should take note that rain is expected to return to many of our provinces, ahead of and during the coming easter weekend, when many people will be traveling to other parts of the country. The public are therefore urged to continue to monitor forecasts and warnings issued by SAWS. **A dedicated media release, covering the weather forecast for the Easter weekend, will be issued by SAWS soon.**

The South African Weather Service will continue to monitor any further developments relating to this weather system and will issue subsequent updates as required. Furthermore, the public are urged and encouraged to regularly follow weather forecasts on television and radio. Updated information in this regard will regularly be available at [www.weathersa.co.za](http://www.weathersa.co.za) as well as via the SA Weather Service Twitter account @SAWeatherServic

Compiled by Kevin Rae  
 Edited by Ezekiel Sebego

**For technical and weather enquiries:**

National Forecasting Centre: Tel: 012 367 6041

**Media enquiries:** Ms Hannelee Doubell: Acting Senior Manager, Communications; Tel: (012) 367 6104; Cell: 072 222 6305; E-mail: [hannelee.doubell@weathersa.co.za](mailto:hannelee.doubell@weathersa.co.za)

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