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Friday, 8 December 2023

## Widespread heavy rain this weekend and early next week (10 to 12 December)

Following close on the heels of yet another heatwave over southern Africa, a welcome spell of rain is predicted to occur over the eastern half of the country in the days ahead. Whilst this is good news for farmers and those involved with the agricultural industry, there is also a significant risk of flooding, or river flooding, in association with persistent heavy rain, which could cause significant disruption over some provinces.

The cause of the widespread rainy weather will be the combination of three distinct circulation features in the atmosphere over southern Africa. Firstly, a cut-off low is expected to develop, in the upper air of the atmosphere, over the central interior during the latter half of the weekend. Secondly, a surface trough is expected to begin intensifying, in sympathy with the deepening upper-air cut-off low. The combination of these two features is well-known to have the potential to drive episodes of widespread, often heavy, rain over southern Africa. Importantly, in this particular case, there is a third significant factor which is expected to elevate the risk of heavy rainfall from this system. This factor is the expected introduction of a stream of tropically sourced moisture, drawn southwards over the central and eastern interior of South Africa, under the influence of the circulation associated with the surface trough and upper-air system respectively. Tropically sourced air is well known to be associated with rainfall of a potentially heavy, widespread nature.

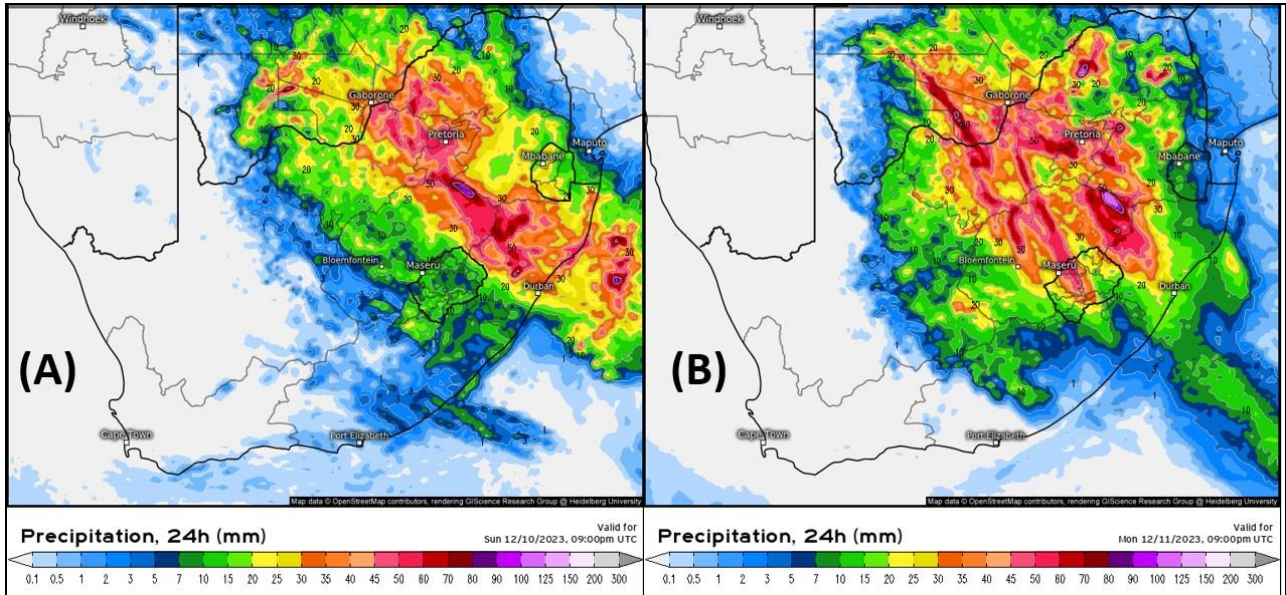
Initially the weather this weekend will be relatively settled, with just a small chance of thunder storms over some of the eastern provinces on Friday, 8 December and Saturday, 9 December. Incidentally, neither the Western Cape nor the Eastern Cape will be directly affected by this weather system. On Sunday, 10 December, weather conditions will begin to deteriorate significantly, as the cut-off low manifests itself over the northern parts of the Northern Cape, introducing marked instability into the atmosphere, to drive widespread showers and thundershowers. As tropical air begins to stream southward over Botswana and South Africa, conditions will become progressively cloudy to overcast. During the course of the day, rain will set in over numerous provinces, including North West, the Free State, Gauteng, Mpumalanga, Limpopo and to a lesser extent, KwaZulu-Natal (KZN). Heavy rainfall is likely to occur in many parts of the above-mentioned provinces, elevating the risk of flooding as well as river flooding. The public are urged to

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monitor, and to take heed of, regular weather updates and warnings issued by the South African Weather Service.



**Figure 1:** Numerical weather prediction data, based on the ECMWF model, indicating 24-hour accumulated rainfall for (A) Sunday, 10 December 2023 and (B) Monday, 11 December 2023. Red areas indicate rainfall amounts of 50 mm per 24 hours, while mauve areas indicate 90 mm per 24 hours. Source: ECMWF model hosted by Meteologix.com

Moreover, as the rain produced by this system is expected to continue unabated into Monday, 11 December, the ground is likely to become saturated, leading to widespread overland runoff into streams and rivers. Whilst this phenomenon will ultimately lead to increased dam levels, the risk of river flooding (and associated road closures and general traffic disruption) will remain particularly high. Disaster Management practitioners are also advised to maintain a high level of vigilance during this period, should river flooding continue to pose a safety and health risk to the public at large. Motorists and pedestrians are urged not to try to cross rivers or streams which are already flooded, under any circumstances. Currently, numeric weather prediction models suggest that the rainfall in association with this system will start clearing from the west, during the course of Tuesday, 12 December, although areas of heavier rainfall may still linger over KZN, eSwatini and the lowveld regions of Mpumalanga and Limpopo. A surface high pressure system is likely to sustain light rainfall over aforementioned provinces on Wednesday, 13 December, as cooler, moist maritime air is introduced to the eastern coastal regions. However, the upper air cut-off low will have moved off the country completely by this time.

The South African Weather Service will continue to monitor this weather system and issue subsequent updates and impact-based warnings over the next few days. It is strongly advised that the public regularly follow weather forecasts on television and radio, as well as all social media platforms. Updated information in this regard will regularly be available at [www.weathersa.co.za](http://www.weathersa.co.za) as well as on X at @SAWeatherServic and Facebook @SouthAfricanWeatherservic.

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