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3 October 2022

Confirmation of Swellendam landspout – 26 September 2022

On the afternoon of 26 September 2022, thunderstorms developed over the Overberg region of the Western Cape. These thunderstorms developed as a result the interaction between the upper air cut-off low pressure system and a surface high pressure ridging over the Overberg, from south of the country. Figure 1 shows the satellite image valid for the afternoon of the 26th, where thunderstorms can be identified over the Overberg region. Associated with the thunderstorms, a wind vortex was observed on the farm, Springerskuil, which is situated between Swellendam and Malgas (Western Cape).

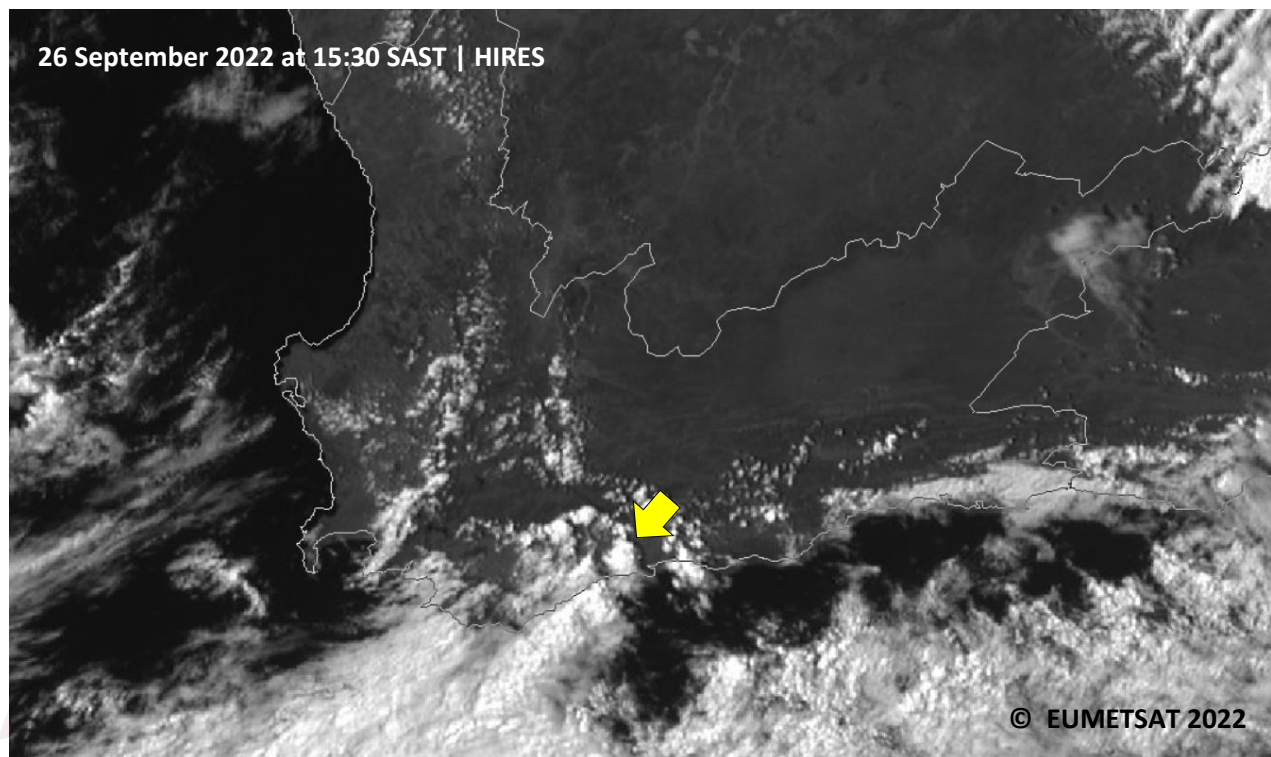


Figure 1: HIRES satellite image for 26 September 2022 at 15:30 SAST showing the thunderstorm situated near the Swellendam area (source: EUMETSAT).

On 29 September 2022, forecasters from the Cape Town Weather Office went to the affected area to conduct a damage assessment. The purpose of this assessment was to determine whether the wind

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vortex was a tornado, landspout or merely a dust devil. The strength, duration, and length of the path it took was also considered in the classification. The definitions of each are described below:

Tornado: *“A rotating column of air, extending from the base of a cumuliform cloud, and often visible as a condensation funnel in contact with the ground, and/or attendant circulating dust or debris cloud at the ground” as defined by World Meteorological Organization (WMO, 2017).*

Landspout: *The Bureau of Meteorology gives a description of a landspout: “The mechanism which forms a landspout is similar to the waterspout: relatively cool air passing over hot ground produces updraughts and cumulus clouds. Random swirls can be caught up in an updraught and so tighten up into a funnel which is made visible by raised dust, rather than by condensation of moisture” (Bureau of Meteorology, 2022).*

Dust devil: *“A well-developed dust whirl; a small but vigorous whirlwind, usually of short duration, rendered visible by dust, sand, and debris picked up from the ground. Dust devils are not considered tornadoes since they are not associated with cumuliform clouds” defined in the American Meteorological Society (AMS, 2016).*

The assessment team was granted access to the farm, Springerskuil that made it possible to complete the assessment. Through reports and video evidence it was determined that the wind vortex started from the surface, picking up dust and later extended upwards joining the storm cloud (Figure 2). Resultantly, this can be classified as a landspout. Further assessment on the farm was conducted to determine the full length and possible width of the landspout as accurately as possible. The track of the landspout from start to end can be seen in Figure 3. It was calculated that the length was roughly 1800 m as calculated from Google Earth and the width was estimated to be around 280 m. From reports it was concluded that the landspout formed around 15h30 and lasted for approximately 15 minutes.

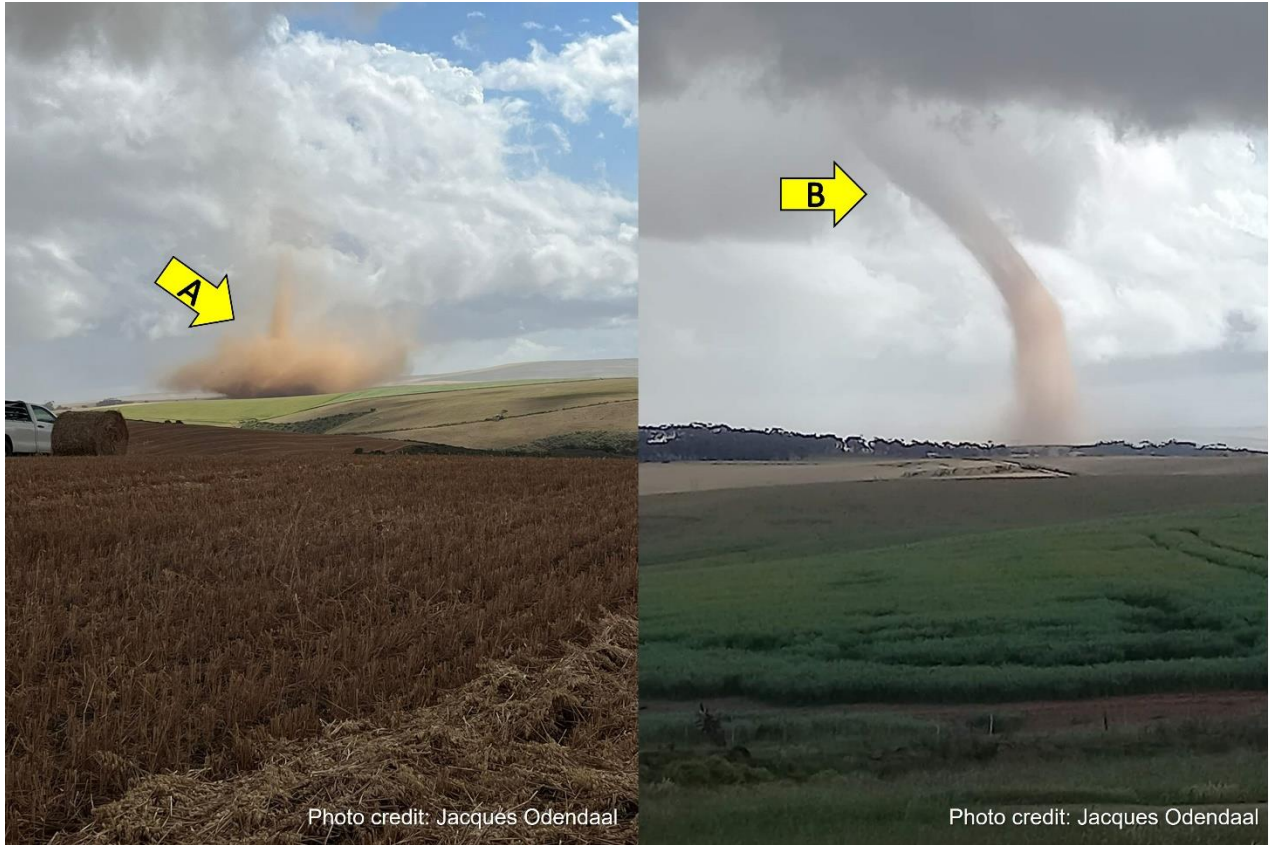


Figure 2: The start of the landspout (A) and its mature stage (B).



Figure 3: The track of the landspout from start to finish with the estimated swath path. An insert image of the location of the landspout in relation to Cape Town is shown in the bottom left (source: Google Maps).

Fortunately, the farmer confirmed the start point of the landspout, while the end point was captured on video and could also be seen on the ground. The start of the damage that the landspout caused as it rotated clockwise and moved from south to north can be seen in Figure 4 where it damaged and transported hay bales and uprooted a taabos tree and pushed it against a fence.



Figure 4: Hay bales that were damaged (left) and transported by the landspout (center) and a taabos tree that was uprooted and pushed against a fence.

More evidence of the type of damage that this landspout caused can be seen in Figures 5 to 7 which assisted in determining the Enhanced-Fujita (EF) rating (strength) of the landspout. An irrigation pivot point and some of the farmer's crops were damaged and pressed down (as seen in Figure 5), which was near the middle of its path.



Figure 5: An irrigation pivot point that was damaged (left) and an illustration of how the landspout pressed the crops down (right).

Figure 6 and 7 show the damage of well-established trees down at the river where it dissipated shortly afterwards. There was also evidence of broken branches and uprooted trees. The rotation of the landspout could also be recognised by referring to the direction in which the grass and bushes were pressed into.



Figure 6: Trees that were twisted and uprooted near the river.



Figure 7: Trees that were twisted and uprooted near the river.

The South African Weather Service can confirm that an EF1 landspout did indeed occur over the farm, Springerskuil, on the afternoon of 26 September 2022. Any additional photos or videos of this event or of reports of hail, heavy downpours and/or strong gusty winds on this day, from members of the public, will be helpful and vital for future research. This information can be shared with the Cape Town Weather Office via email (factfc@weathersa.co.za) or via WhatsApp (084 279 1166).

The Cape Town Weather Office would also like to express their gratitude to the SSK, Jacques Odendaal, Hennie Eksteen and Reinhard Geldenhuys who assisted with photos and videos; gave thorough explanations of the experience and agreed for this assessment to be conducted.

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