



Sustainable agriculture for the future

March | Maart 2026

No 155

Youth in Agriculture

Innovation and Opportunities

Training for Tomorrow

Innovation in Action

Start small – grow persistently

Irrigation training at schools

Underutilized indigenous crops
Boosting Dry Anaerobic Digestion
Making Craft-Style Tomato Chutney

Weather Risk App

The Trusted Home of Agriculture
Die Betroubare Tuiste van Landbou



Weather Risk App:

A new online tool to help South African farmers manage weather risks

Dr Sarah Roffe

Agrometeorology Division, ARC – Natural Resources and Engineering

South Africa experiences highly variable weather, with periods of extreme heat, heavy rainfall, prolonged dry conditions, and occasional extreme cold affecting agricultural production and water availability across many regions. Consequently, farmers and others involved in weather-sensitive activities, such as agriculture, require reliable and accessible information to support planning and day-to-day decision-making. However, weather and water-related information is not always easy to access in a form that is practical and relevant, especially at more local scales, such as the farm level. To help address this need, the Agricultural Research Council (ARC) has developed the Weather Risk app (www.weatherrisk.arc.agric.za). It is a freely available web-based tool that provides national coverage and brings together key weather and water

availability indicators across South Africa in a single interactive interface (Figure 1).

Introducing the Weather Risk app

The Weather Risk app has been developed by the ARC, with researchers from the

Agrometeorology Division leading the scientific development in collaboration with systems developers and researchers from the Water Science Division. The app is freely available online and can currently be accessed via a desktop computer. As shown in Figure 1, the app provides national coverage across South Africa, while users can explore



conditions in greater detail at local scales within the interface. Observed weather and water-related data are combined with short-term forecast information, bringing multiple

weather and water availability indicators together in a single interactive interface that enables users to assess current conditions and potential upcoming risks. The app has been designed to support practical decision-making and is intended for farmers, extension officers, agricultural advisors, researchers, and others working in weather-sensitive sectors who require accessible and reliable information for planning and risk management. Although the app has been designed to be relatively simple, guidance on using the Weather Risk app is available through an online user guide (https://github.com/climindex/hydroclimsa/blob/main/App_user_guide/Weather_Risk_app_user_guide.md#weather-risk-app-user-guide).

Turning weather and water information into useful insights

The Weather Risk app presents weather and water availability information in the form of indices, which are designed to make complex data easier to interpret. An index, with the plural form indices, summarises weather or water conditions over a defined period (e.g., over several days to seasonal timescales) into a single, meaningful measure. For example, temperature values can be summarised into the number of heat stress days over a recent period, such as the number of days when maximum temperatures exceeded 30 °C

over the past month. Similarly, rainfall data can be summarised into accumulated rainfall totals over a range of periods, while minimum temperature data can be used to indicate the occurrence of frost days.

Numerous indices are available on the Weather Risk app using both observed (weather and water-related) data and short-term forecasts. Rather than only presenting raw daily values, the indices in the app provide simplified indicators that help users quickly identify conditions such as unusually hot spells, cold or frost-prone periods, recent rainfall accumulations, periods with high evapotranspiration levels, and developing dry or wet spells that may influence farming activities and water management. Figure 2 shows examples of two indices currently available on the Weather Risk app. These examples show heat stress days and accumulated rainfall, shown spatially as is available on the app, and to illustrate how such conditions can vary across South Africa.

From information to action: a practical example

Weather and water availability information is most useful when it can support practical decisions on the ground. Observed indices on the Weather Risk app help users understand



Figure 1: Homepage of the Weather Risk app showing the national coverage and the interactive web-based interface.

recent conditions, such as accumulated rainfall, recent heat stress, or frost occurrence, allowing farmers and advisors to assess current impacts and adjust management where necessary. Forecast-based information then provides an opportunity to anticipate conditions in the days ahead and plan proactively. Several forecast indices are available on the app and, when considered together, these can provide a more complete picture of developing conditions and potential risks. Focusing on the value of the forecast information available in the app, Figure 3

shows the seven-day average maximum temperature forecast that was issued for 11 to 17 February 2026, indicating widespread hot conditions across several parts of South Africa, with temperatures in some areas expected to exceed 35 °C. Information like this could support short-term planning and risk reduction. Livestock farmers, for example, could use such forecasts to ensure adequate shade and water availability, adjust grazing or handling times, and reduce heat exposure during peak temperature periods, while crop producers could use the same information

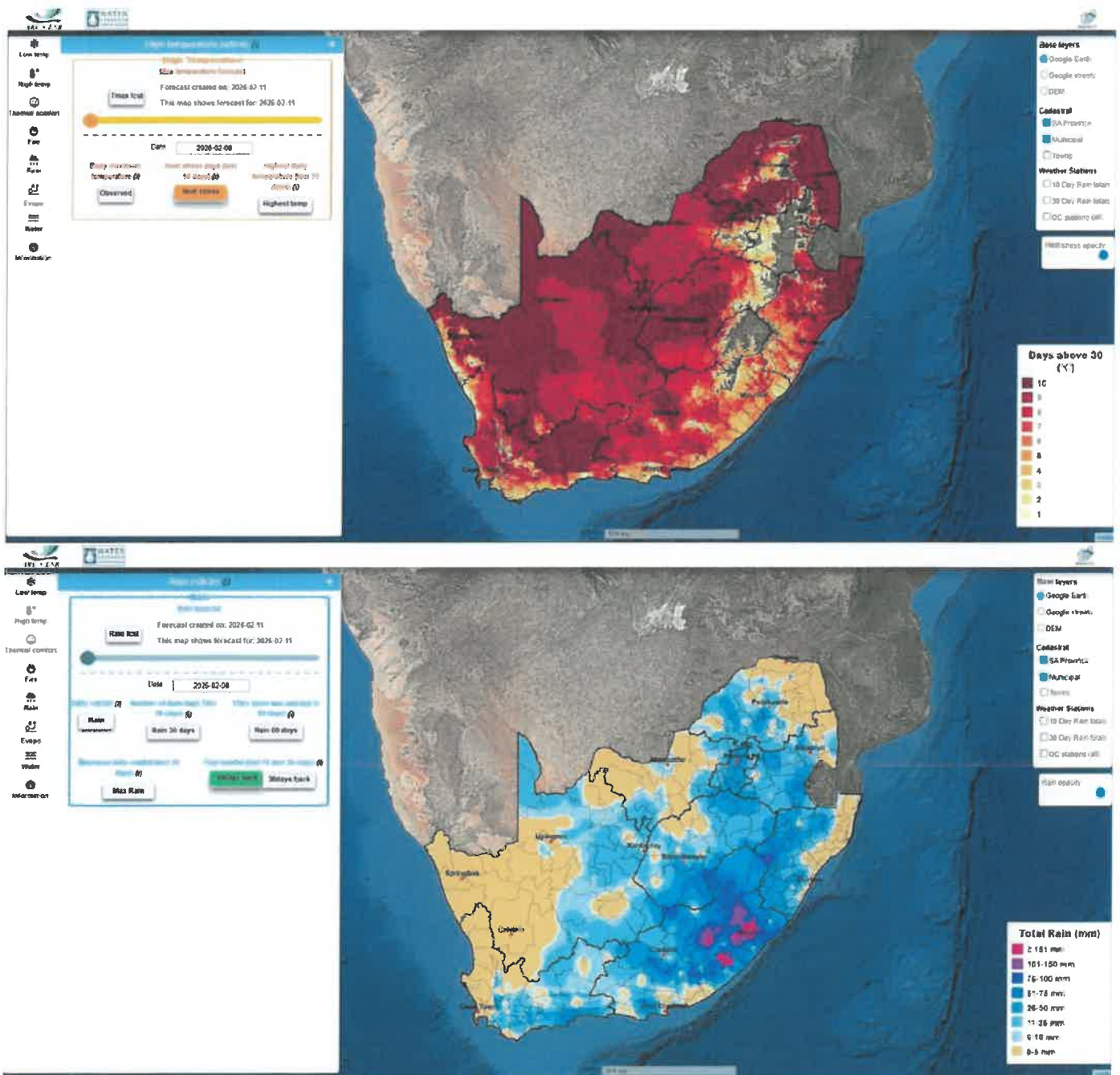


Figure 2: Examples of weather risk indices available on the Weather Risk app: (a) heat stress conditions, and (b) recent rainfall conditions, both for the last 10 days as of 8 February 2026.

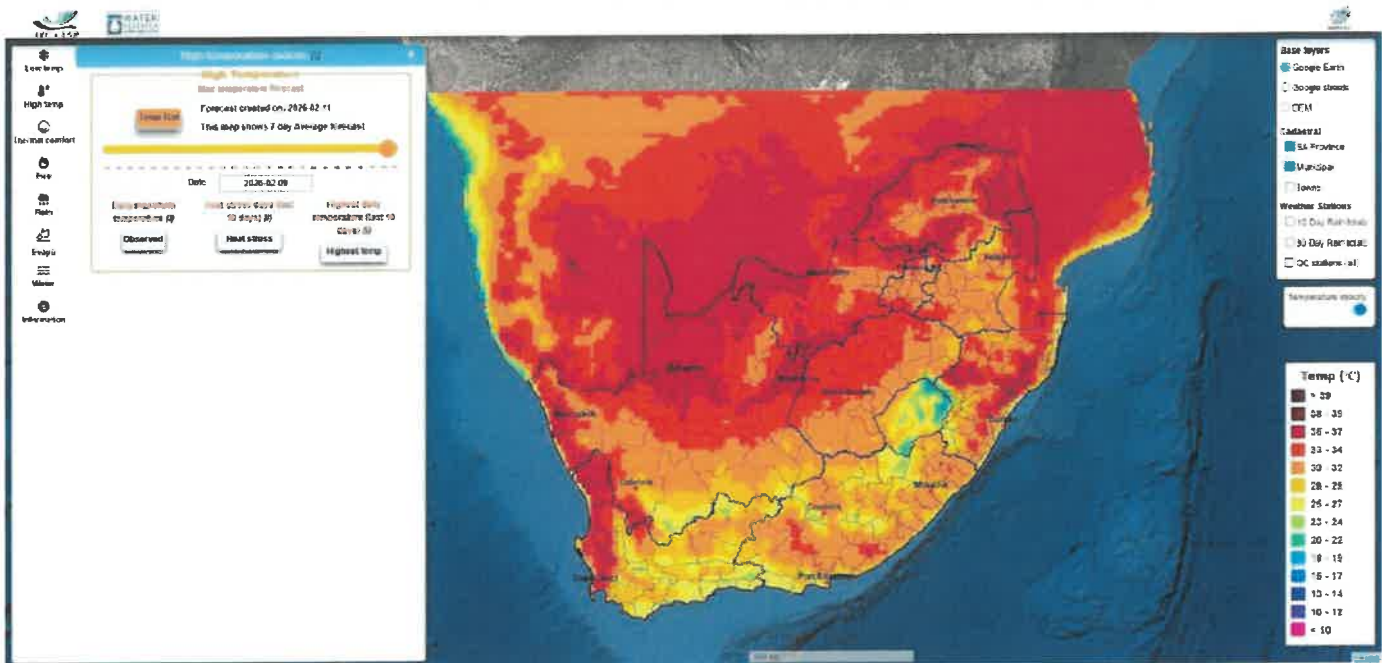


Figure 3: Seven-day average daily maximum temperature forecast for 11 to 17 February 2026.

to guide irrigation scheduling, protect sensitive crops where possible, and prepare for increased water demand. By presenting both observed and forecast information in a clear and accessible format, the Weather Risk app supports more proactive and informed decision-making across weather-sensitive agricultural activities.

Built with users, and still growing

The Weather Risk app has been developed with input from a range of stakeholders across the agricultural sector, including farmers, extension officers, and other users of weather and water information. Feedback received during development has shaped the app's design and functionality, ensuring it remains practical and relevant for real-world decision-making. Ongoing feedback is welcome, and the app will continue to evolve as additional user input is received. Planned enhancements include the introduction of user login and customisation features, the development of alert functions, the addition of further indices, and the continued refinement of existing tools. As the app grows, opportunities for longer-term sustainability and potential commercialisation are also being explored to support ongoing development and expansion of its services.

Readers are encouraged to explore the Weather Risk app and consider how it may support planning and risk management within their own activities. Feedback from users remains an important part of the app's ongoing development and can be provided directly via the online feedback questionnaire available on the site (<https://forms.gle/z2aSdZhHvhPqwRHh7>). By making accessible weather and water availability information more widely available, the Weather Risk app aims to support more informed and proactive decision-making across South Africa's weather-sensitive agricultural sector.

Acknowledgments

The Weather Risk app was developed by the Agricultural Research Council (ARC) with financial support from the Water Research Commission (WRC) under the project *Development of a climate and water availability indices app to support decision-making across South African water management areas* (Project number C2023/2024-01182). The views expressed in this article are those of the author and do not necessarily reflect those of the ARC or the WRC.

Inquiries: RoffeS@arc.agric.za