

Climate Profiles of Countries in Southern Africa: South Africa

Dr Meghan Bailey, Senior Technical Advisor, Red Cross Red Crescent Climate Centre
Dorothy Heinrich, Technical Advisor, Red Cross Red Crescent Climate Centre
Andrew Kruczkiewicz, Technical Advisor, Red Cross Red Crescent Climate Centre

The following climate factsheet⁸ provides an overview of the climate of South Africa, one of ten countries of interest for the Finnish Red Cross Food Security Study, 'Interventions to improve food security in a changing climate in Southern Africa'. Each of the factsheets were written as a compilation of information from peer-reviewed academic papers, government publications, and INGO documentation, and are also available in one compiled document.

1. What is the general climate of South Africa, and what are its climate zones?

South Africa experiences a generally subtropical and temperate climate ([Republic of South Africa 2018](#)). In the southwest, the climate is Mediterranean while the central and north west experience desert conditions (warm and dry); at higher elevation in the eastern Drakensberg region, the climate is relatively cool and wet while in the north-east temperatures are warmer and the climate is classified as subtropical ([Republic of South Africa 2018](#)). The presence of the ocean on three sides of the country also has an effect of moderating temperatures. Indeed, the eastern coast of the country is relatively warmer, due to the presence of the Agulhas Current, while the western coast is generally cooler, driven by the cold Benguela Current ([South African Government n.d](#)).

Temperatures are relatively moderate, compared to many places at the same latitude, a characteristic notably driven by the country's high altitude. In the summer months (from December to March) daily temperatures are highest, with averages ranging between 15°C and 36°C. Temperatures dip to their lowest in the winter (from June to September) and average between -2°C to 26°C (GCIS 2015, [Republic of South Africa 2018](#)).

The country is also relatively dry, with average annual precipitation about 646 mm; the Western Cape is generally the wettest region. Most of the rain in the Western Cape falls in the country's winter months while the rest of the country receives most of its precipitation in the summer, from December to February ([Republic of South Africa 2018](#)).

⁸ Suggested citation: RCRC (Red Cross Climate Centre) (2021) Climate Profiles of Countries in Southern Africa: South Africa. The Hague: RCRC.

2. What types of extreme weather and climate does South African experience?

South Africa experiences a range of extreme weather and climate, including drought, floods, storms, and fires ([IFRC 2020](#)). For example, in 2019, severe floods due to heavy rain displaced at least 1889 people ([IFRC 2019](#)) and in March of 2014, floods in Mpumalanga province are calculated to have cost at least R 61 million (approximately USD 4 million) in infrastructure damage (COGTA 2015 - as reported in [Republic of South Africa 2018](#)). The country also experiences chronic water scarcity and drought. Severe drought conditions in 2014 and 2015 notably were felt throughout the country and in particular in KwaZulu-Natal Province, where 80% of community boreholes were measured to have completely dried up ([BBC News 2015](#), [Republic of South Africa 2018](#)). In 2018, Cape Town experienced its worst drought in a hundred years, creating fears of a "Day Zero", where the city's water supply would have to be turned off; although this was avoided, the region's water resources remain stressed at high levels ([CapeTownDrought](#), [Mahlaele et al. 2020](#)). ENSO also has an effect on South Africa's climate, with El Nino years being drier and more drought prone ([Baudoin et al. 2020](#)).

3. What are certain current and projected impacts of climate change in South Africa?

As reported in South Africa's Third Communication to the UNFCCC, annual maximum and minimum temperatures have been significantly warming since 1931 and throughout the country apart from the central interior ([Republic of South Africa 2018](#)). This has been particularly noteworthy in the western and eastern regions of the country, where 2°C of warming per century has been recorded. Extreme maximum temperatures are increasing and cold night frequency decreasing throughout most of the country. The trends are somewhat less clear for precipitation due to high inter- and intra-annual variability. While annual trends are difficult to highlight, there has been a decrease in the number of annual rainy days and an increase in the frequency of extreme daily rainfall events in the southern interior of the country (between 1921 and 2015). The intensity of precipitation events has also increased, as has the duration of dry spells ([Republic of South Africa 2018](#)).

Under different climate change scenarios, temperatures are expected to continue to increase significantly. For instance, in high emission scenarios, temperatures are to have increased by over 4°C by 2090 throughout most of the country, with certain regions recording increases of more than 6°C. Projections of precipitation are less clear but, generally, increases in rainfall are projected over certain regions, notably the central and southern interior; strong rainfall events would also increase under high emission scenarios but drier overall conditions would be expected. With lower emission scenarios, these trends are weaker, with overall drier conditions but less strikingly so and even significantly wetter conditions in the central and eastern regions ([Republic of South Africa 2018](#)). Please note that the use of these projections would require far more research than is within the scope of this overview.

References

Baudoin, M. A., Vogel, C., Nortje, K., & Naik, M. (2017). Living with drought in South Africa: lessons learnt from the recent El Niño drought period. *International Journal of Disaster Risk Reduction*, 23, 128-137.

BBC News. (2015). South Africa grapples with worst drought in 30 years. <https://www.bbc.com/news/world-africa-34884135>

Capetown Drought (n.d.). Cape Town's Water Crisis - Monitoring, information, and data about South Africa's worst drought in history. <http://www.capetowndrought.com/>

IFRC. (2020). All South Africa Emergencies. *Go*. <https://go.ifrc.org/emergencies/all?country=158>

Mahlalela, P. T., Blamey, R. C., Hart, N. C. G., & Reason, C. J. C. (2020). Drought in the Eastern Cape region of South Africa and trends in rainfall characteristics. *Climate Dynamics*, 55(9), 2743-2759.

Republic of South Africa. (2018). South Africa's Third National Communication under the United Nations Framework Convention on Climate Change. https://unfccc.int/sites/default/files/resource/South%20African%20TNC%20Report%20%20to%20the%20UNFCCC_31%20Aug.pdf

South African Government. (n.d.). Geography and Climate. <https://www.gov.za/about-sa/geography-and-climate>