



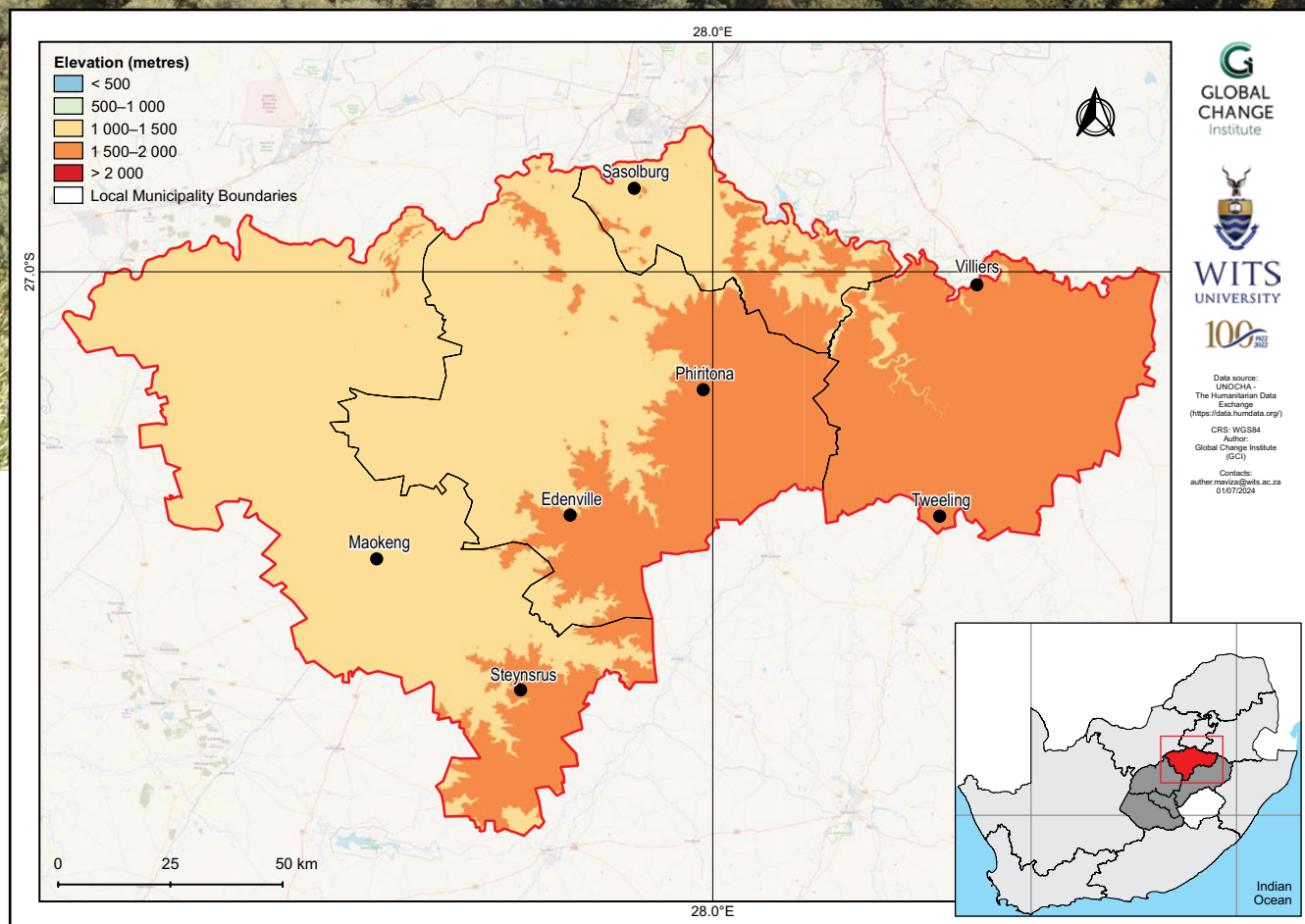
Fezile Dabi District Municipality climate change fact sheet

Free State, South Africa

MUNICIPAL

Introduction

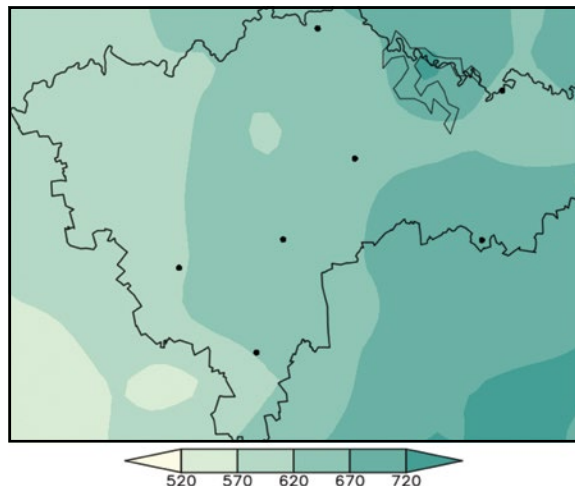
- This fact sheet is part of a series of district municipality fact sheets developed by the Wits GCI and SANBI. The fact sheets present a summary of observed and projected changes in climate over district municipalities in South Africa. They should be used together with the guidelines presented in the cover page.
- Fezile Dabi District Municipality covers an area of approximately 21 301 km², with elevation ranging from 1 200 m above sea level in the western interior to 1 600 m above sea level in the eastern higher plateau regions.
- The district experiences a subtropical continental climate, influenced largely by its location on the Highveld plateau. Rainfall is seasonal, occurring mostly in warm summers, while winters are cool and drier.



Observed climate: rainfall (1981–2000)

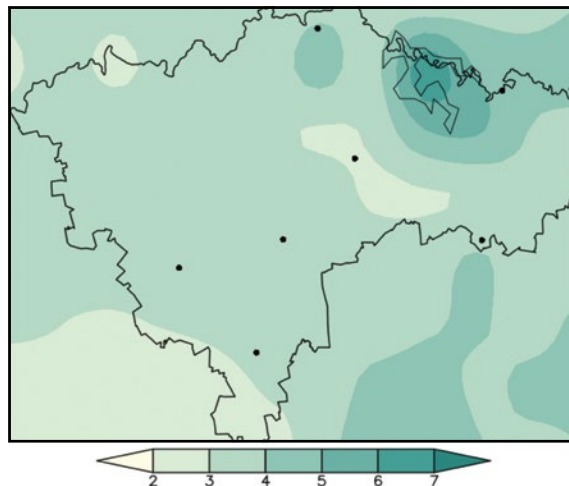
Mean annual rainfall

Mean annual rainfall ranges from 600 mm in the western region to over 700 mm over the eastern Highveld region.



Extreme rainfall days

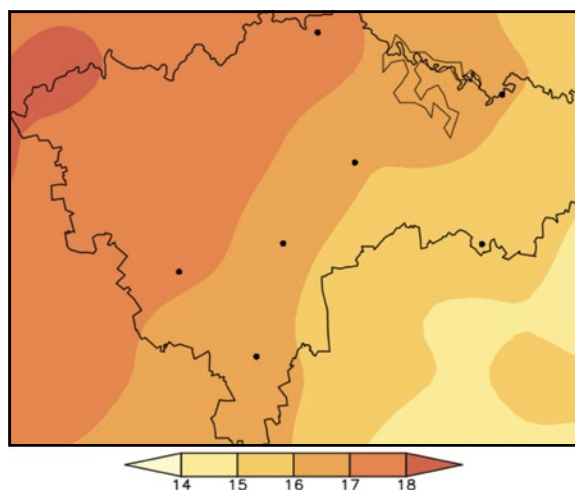
Mean annual number of extreme rainfall days range from 2 days over the southern tip to 5 days over the northeastern parts, near the Vaal Dam.



Observed climate: temperature (1981–2000)

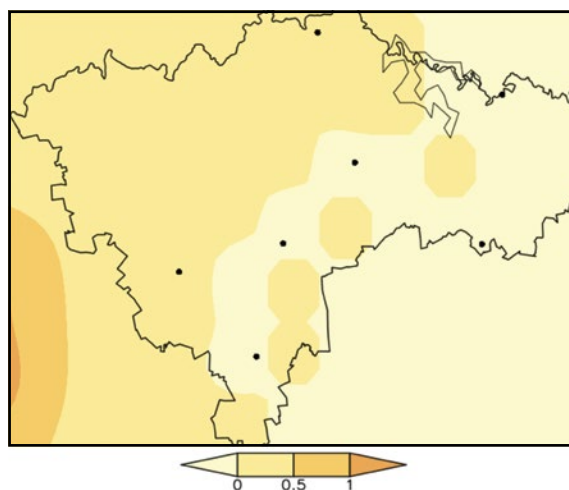
Mean annual temperature

Mean annual temperature ranges from 15 °C in the east increasing to 18 °C in the northwesternmost part.



Very hot days

Mean annual number of very hot days are less than 1 day over the entire district, with 0 days per year occurring over the eastern region.

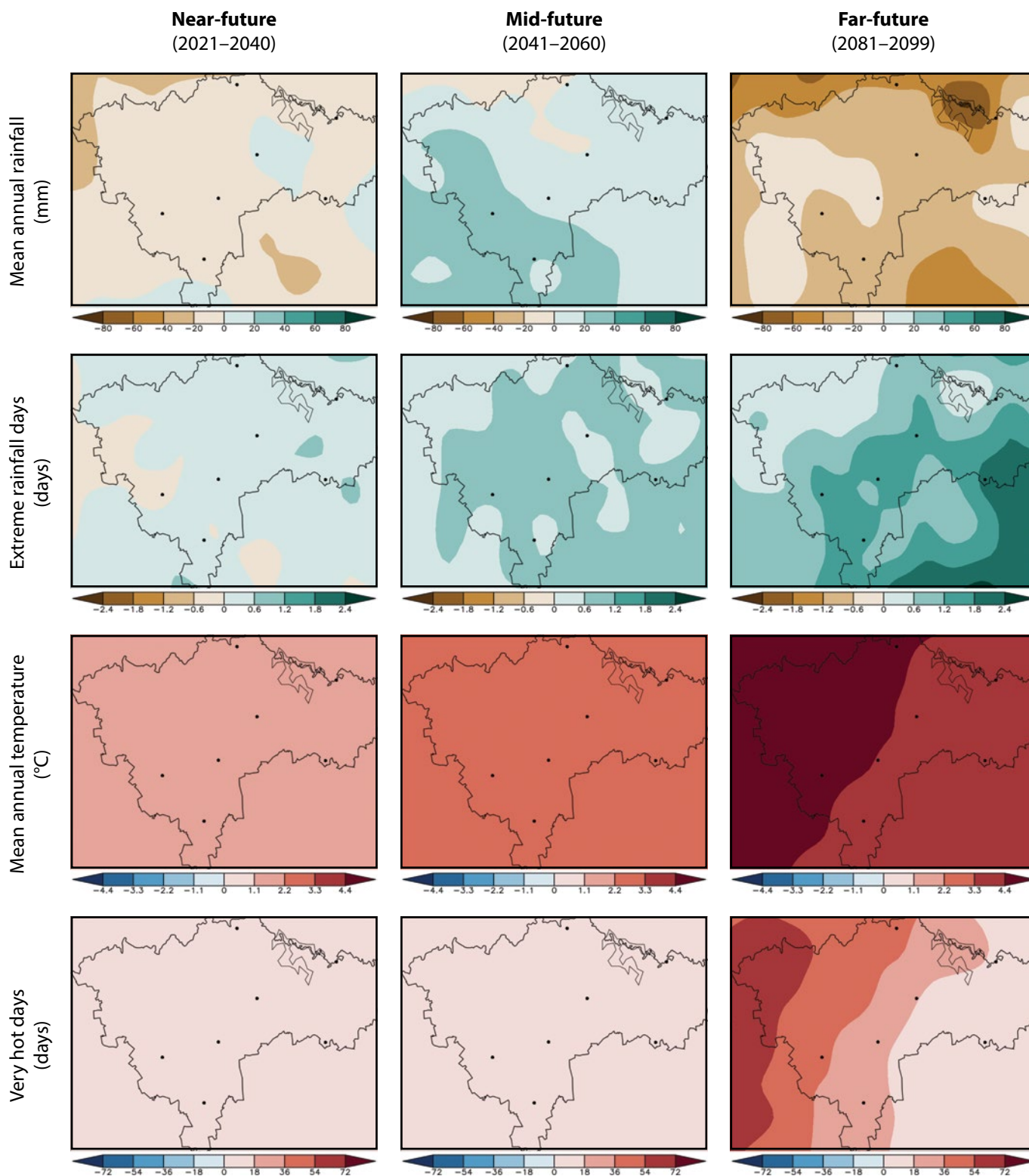


Observed climate trends (overview)

- Observed decrease in mean annual rainfall (*low confidence*).
- Observed increase in the frequency of extreme rainfall events (*medium confidence*).
- Observed increase in mean annual temperature and warm extremes (*virtually certain*); decrease in cold extremes (*high confidence*).
- Observed increases in meteorological and agricultural drought (*low confidence*).

Projected future climate change (overview)

- Projected changes in mean annual rainfall are *uncertain* in the near- and mid-future, but with projected decreases in the far-future (*high confidence*).
- Projected increase in the frequency of extreme rainfall events (*high confidence*).
- Projected increase in mean annual temperature and warm extremes (*virtually certain*); decrease in cold extremes (*high confidence*).
- Projected increase in agricultural and meteorological drought in the far-future (*high confidence*).



Projected future climate change (*detailed*)

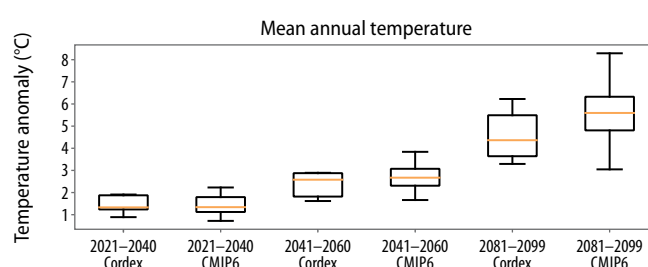
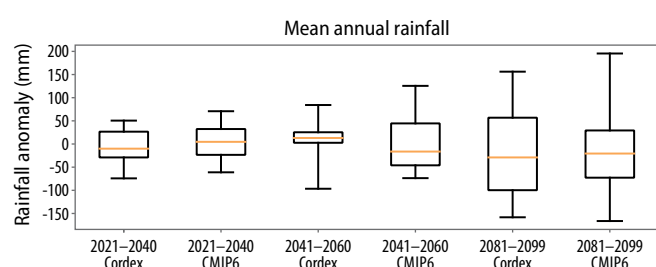
Near- and mid-future

- Projected changes in mean annual rainfall in the near- and mid-future are *uncertain*.
- Projected increase in extreme rainfall events (*likely*).
- Projected increase in temperature and warm extremes (*virtually certain*); decrease in cold extremes (*likely*).
- Projected increase in agricultural and meteorological drought (*more likely than not*).

Far-future

- Projected decrease in rainfall (*likely*) and associated increase in agricultural and meteorological drought (*very likely*).
- Projected increase in extreme rainfall events (*likely*).
- Projected increase in temperature and warm extremes (*virtually certain*), with drastic increases over the western parts.
- Projected decrease in cold extremes (*likely*).

Climate model projections: model agreement and uncertainties



Mean annual rainfall

- Averaged across the district, projected rainfall changes for the near- and mid-future are *uncertain*.
- Rainfall decreases are projected in the district in the far-future under low mitigation scenarios (*likely*).
- Partially in response to *virtually certain* temperature increases, agricultural drought is to occur more frequently in the near- to mid-future (*low confidence*) and far-future (*very likely*).

Mean annual temperature

- Temperature increases averaged across the district are *virtually certain* in the near-future and may be as high as 2.0 °C.
- Under low mitigation, further temperature increases are *virtually certain* and may approach 3.0 °C in the mid-future and 6.0 °C in the far-future.
- Increases in average temperature will be accompanied by increases in warm temperature extremes such as heatwaves and high fire-danger days (*likely*).

Citation:

Engelbrecht, F.A., Maviza, A., Steinkopf, J., Vogel, C., Von Maltitz, G., Yose, P. & Barnett, M. 2025. *Sub-national climate change fact sheets for South Africa*. © South African National Biodiversity Institute (SANBI) and University of the Witwatersrand – Global Change Institute (WITS-GCI). DOI: <https://doi.org/10.5281/zenodo.16962181>.

This work is licensed under CC BY-NC-ND 4.0 (Attribution-NonCommercial-NoDerivatives 4.0 International).

<https://creativecommons.org/licenses/by-nc-nd/4.0/deed.en>.

Contact

- Global Change Institute (GCI), University of the Witwatersrand, Johannesburg, South Africa. Website: www.wits.ac.za/gci
- South African National Biodiversity Institute (SANBI). Website: www.sanbi.org