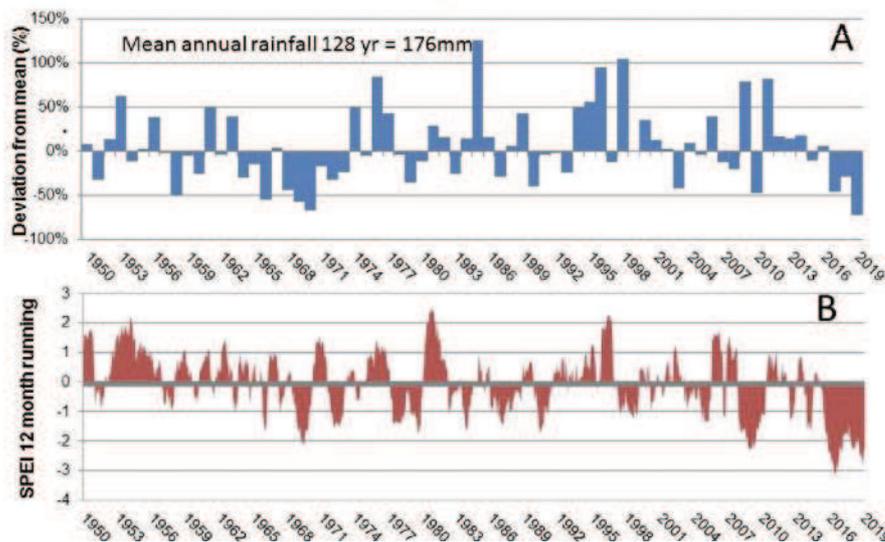


Drought Effects on Veld in the Prince Albert Area

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Tierberg Long-Term Ecological Research (LTER) site in the Prince Albert Succulent Karoo has been the focus of research on vegetation change in natural veld since 1987. Ownership of this 100 hectare livestock enclosure was transferred to the National Research Foundation (NRF) in 2014, and since then the property has been managed by the South African Environmental Observation Network (SAEON) Arid Lands Node.

For most of the years since 1987, rainfall in the Prince Albert area was above the long-term average of 176 mm. When Arid Lands Node research manager Joh Henschel visited Tierberg on 8 January 2014, his vehicle was trapped for some hours by a flood, following a 25mm cloudburst. Despite the flash flood, the 2014 rainfall was average. Thereafter, hot and dry conditions prevailed until drought-breaking rains in October 2021. This widespread drought, exacerbated by abnormally high winter and summer temperatures, little cloud cover and high evapotranspiration rates, was to bring about major changes in vegetation, economics and land ownership in the Karoo.



Graph. Annual rainfall represented as the deviation from the mean and the Standardised Precipitation Evapotranspiration Index (SPEI) for Prince Albert from 1950 until 2020.



Bietou and doring vygie flowering one month after drought-breaking rains at Tierberg may be benefitting from reduced competition caused by die-back of the once-dominant Scholtzbos (right).

During the drought years, SAEON Arid Lands Node staff and interns monitored the vegetation cover, composition and health on the Tierberg LTER site and adjacent game farm (Sandrivier, Argentina), as well as at Wolwekraal Nature Reserve and an adjacent sheep farm. Their major findings, recently published in *African Journal of Range and Forage Science* were:

- Drought mortality differed among plant species but affected both succulents and bushes;
- Rangelands where past grazing had led to dominance by a few species of unpalatable shrubs, such as Scholtzbos, and to losses of palatable plants, suffered a greater decrease grazing capacity during drought than rangelands in better condition;
- Dieback was greater on deep, well-drained soils and on slopes than on rocky ground or drainage features;
- Fast-growing, short-lived succulent and non-succulent shrubs had greater dieback (>60%); than slow-growing, long-lived shrubs;
- Post drought canopy health was lowest (9%) in Scholtzbos (*Pteronia pallens*), a toxic species that dominates over-grazed veld, but over 50% for the more palatable plants such as doring vygie (*Ruschia spinosa*), Karoo bietou (*Osteospermum sinuatum*), sjambokbos (*Kleinia longiflora*) and blomkool ganna (*Salsola turberculata*).

Our conclusions are that although the drought led to considerable dieback and loss of grazing capacity throughout the southern Karoo region, the reduction in *Scholtzbos* cover relative to that of more palatable species (see photo) could, given good livestock and game management, lead to improved rangeland conditions in the years ahead. On the other hand, rapid restocking of recovering veld, particularly with ostriches that uproot seedlings of succulent plants, will result in further decline in veld condition. Continued monitoring of long-term research sites in the arid zone will enable future generations of SAEON researchers to test this hypothesis. ●

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