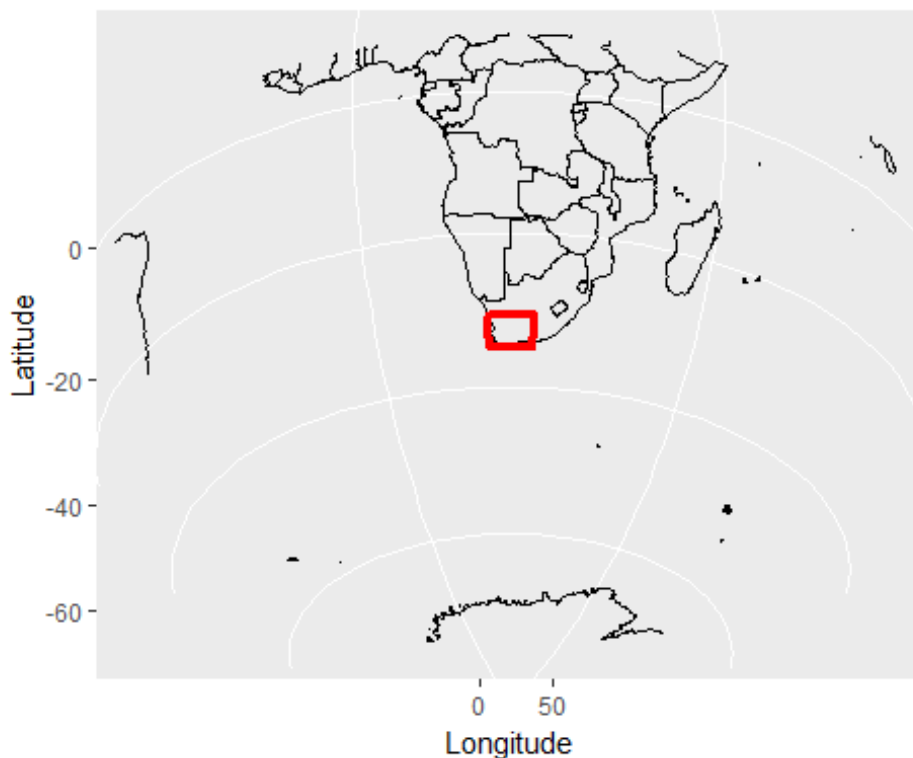


Analytical Report

Drought in South Africa – June 2017

JRC Drought Team and ERCC Analytical Team – 06/07/2017



Executive summary

- The Western Cape province is going through a severe drought, affecting in particular the highly populated urban area of Cape Town and its water provisioning.
- The drought is mainly the effect of a sustained below-average monthly rainfall series since August/October 2016, only broken by June 2017 precipitations.
- July will be critical, as significant yearly precipitations occur during that month, but may not be enough to recharge storage, for which abundant precipitations may be needed until September.

Geographical context

The South African province of Western Cape is located at the southernmost part of the continent, over an area of more than a million sq.km. The region has a set of mountain ranges running parallel to the coastline, which give rise to its varied climatic gradients and vegetation patterns. In general, climate is a mild Mediterranean type on the coasts (wet winter and dry summer), shifting to semi-arid and continental towards the interior and past the mountains. Vegetation is mostly made of scrubland, here called fynbos, a very typical and fire prone vegetation type. Agriculture is a growing sector in the region and hosts renowned vineyards. Western Cape includes one of the Country capitals, Cape Town, which is also one of the main urban areas.

Analytical Report

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Western Cape, South Africa	
Total area [km ²]	1.219.912
Population	55.011.977
G.D.P.*	5.718
Poverty [%]**	9%

*in US dollars. ** Percent population with less than 1.25 US \$ per day

Likelihood of drought impact (LDI)

The LDI shows the likelihood of having impacts from a drought, by taking into account the exposure and socio-economic vulnerability of the area (Figure 1).

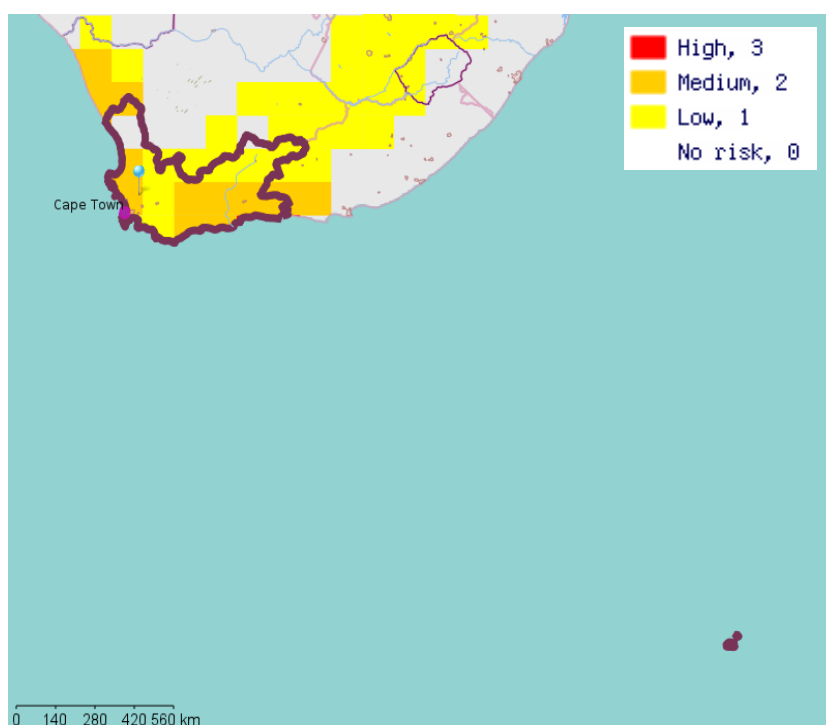


Figure 1 - Likelihood of drought impact (LDI), Western Cape (South Africa)

Share of population by LDI class (10 to 18/06/2017)

Class	Fraction	Total
3	1.05 %	60842
2	48.43 %	2808960
1	40.85 %	2369141

Analytical Report

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0	9.67 %	506606
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Precipitations

Precipitations include total cumulative monthly measurements of both rainfall and snow (Figure 2).

In Western Cape precipitations have been systematically poor since August 2016, albeit mostly within the usual monthly variability. As a good part of yearly precipitations occur during June and July, this period is critical. June 2017 has been about average, breaking the consecutive lack of rainfall. However, normal precipitations likely will not be enough to compensate for the deficit accumulated over the last several months.

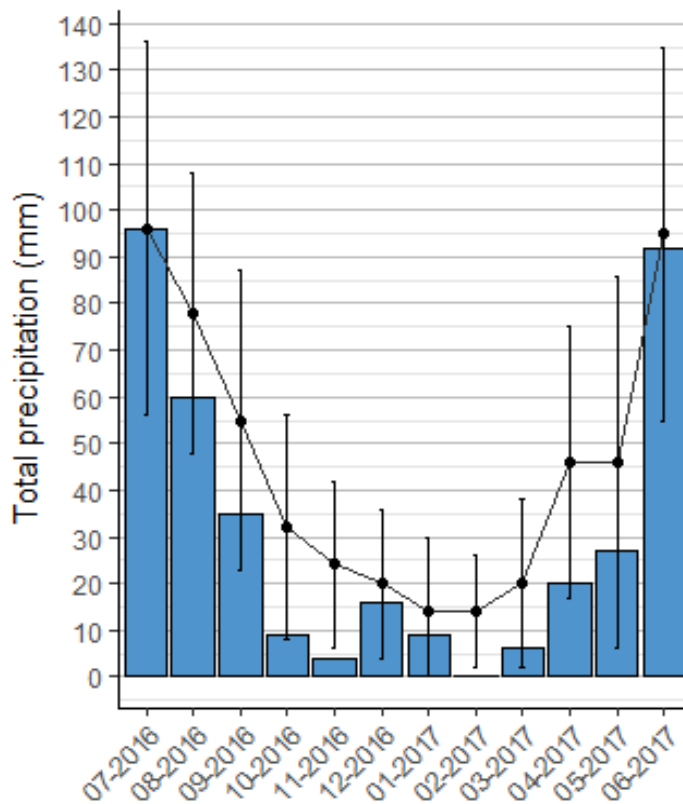


Figure 2 - Monthly total precipitation (blue bars) near Malmesbury (Western Cape, South Africa, E18.9 N-33.4). The dots represent the long-term monthly average (1981-2010) with standard deviation, the line shows the historical precipitation pattern.

Standardized Precipitation Index (SPI)

The SPI is a meteorological index used to monitor the occurrence of drought. The lower the SPI, the more intense is the drought. Note which accumulation period is shown (3, 6, 9, 12 or 24 months) (Figure 3). Due to the sequential monthly rainfall lows in Western Cape, SPI shows a worsening pattern towards severely dry conditions of meteorological drought. June provided a relief, but over the 9-months balance SPI is still very low. A full recovery may require several months of in-average precipitations, especially during wetter months (July to September).

Analytical Report

Drought in South Africa – June 2017

JRC Drought Team and ERCC Analytical Team – 06/07/2017

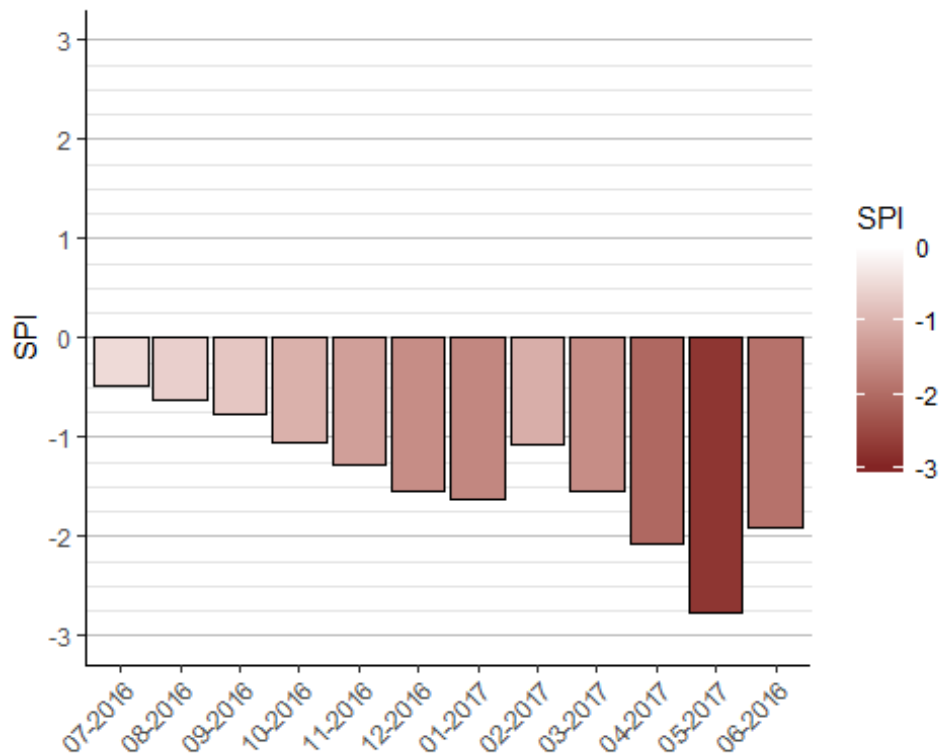


Figure 3 - SPI for a cumulative period of 9 months near Malmesbury (Western Cape, South Africa, 18.9E;-33.4N).

fAPAR anomaly

The fraction of Absorbed Photosynthetically Active Radiation (fAPAR) represents the fraction of the solar energy absorbed by leaves. fAPAR anomalies, which deviate from the long term mean over the same period, are a good indicator to detect and assess drought impacts on vegetation. fAPAR anomaly went progressively down in most of the Western Cape province over the last three months (Figure 4), reflecting the progressively decreasing SPI.

Analytical Report

Drought in South Africa – June 2017

JRC Drought Team and ERCC Analytical Team – 06/07/2017



Figure 4 - fAPAR anomaly in Western Cape (South Africa). From top to bottom, the situation in mid-April, mid-May and mid June 2017.

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Drought in South Africa – June 2017

JRC Drought Team and ERCC Analytical Team – 06/07/2017

From the media

[South Africa's Western Cape declares drought disaster](#)

[Storms in South Africa's Cape fail to stem water shortages](#)

Information Sources:

Joint Research Centre (European Commission): Global Drought Observatory (GDO) - <http://edo.jrc.ec.europa.eu/gdo/>

Global Precipitation Climatology Centre (GPCC) - <http://gpcc.dwd.de/pub/data/gpcc/>

Distribution: For ERCC and related partners use Request: Analysis of the drought situation in South Africa

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