



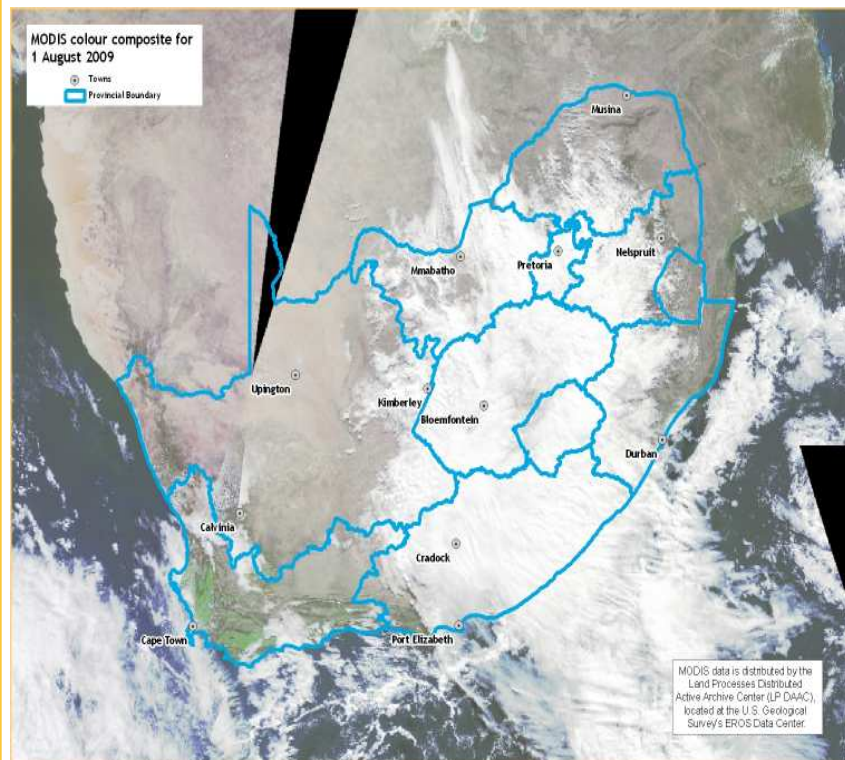
INSTITUTE FOR SOIL, CLIMATE AND WATER

- Latest vegetation conditions as deduced from SPOT VEGETATION
- Rainfall for August 2009

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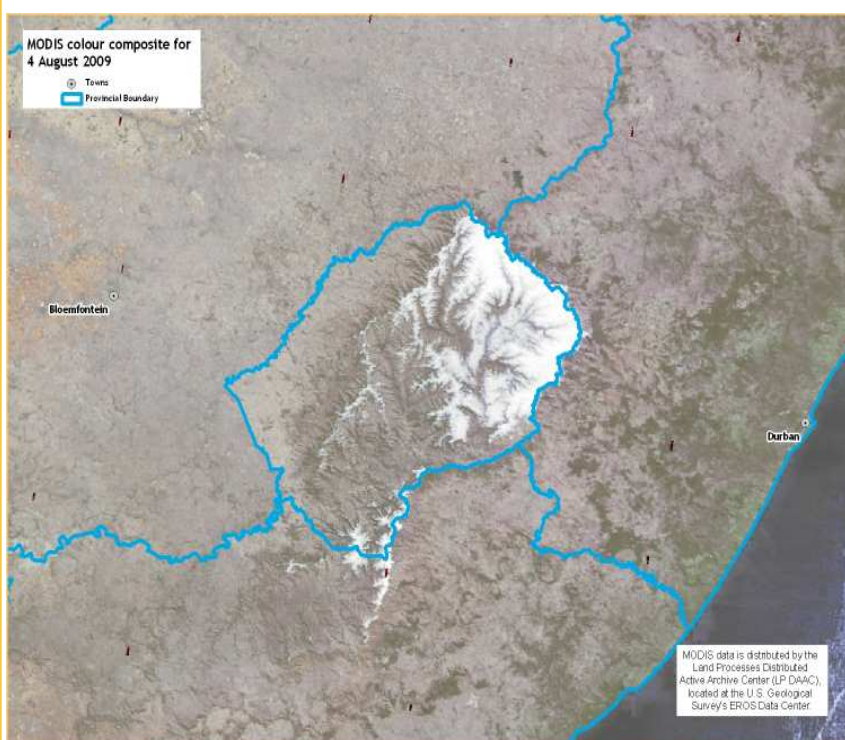
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Images of the Month



An upper air cut-off low-pressure system was responsible for wide-spread rain over the central and eastern interior. This system was largely responsible for above normal rainfall over the eastern interior. Temperatures were low and small hail occurred over many areas. Snow was reported from the Drakensberg over KwaZulu Natal, Lesotho and the Eastern Cape.

Another feature visible on this image is the two green areas over the southwestern parts of the Western Cape Province. They represent the growing wheat and other vegetation over the Swartland (in the west) and Ruens (in the south).



The snow cover over the mountains of Lesotho is clearly distinguishable a few days after the cut-off low-pressure. By the 11th, most of this snow cover had disappeared except over the highest areas along the border with KwaZulu-Natal.

1. Vegetation Conditions

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Vegetation Mapping

The Normalised Difference Vegetation Index (NDVI) is computed from the equation:

$$NDVI = (IR - R) / (IR + R)$$

where:

IR = Infrared reflectance &
R = Red band

NDVI images describe the vegetation activity. A decadal NDVI image shows the highest possible "greenness" values that have been measured during a 10-day period.

Vegetated areas will generally yield high values because of their relatively high near infrared reflectance and low visible reflectance. For better interpretation and understanding of the NDVI images, a temporal image difference approach for change detection is used.

NDVI difference map for August 2009 compared to the long-term (12-years) mean

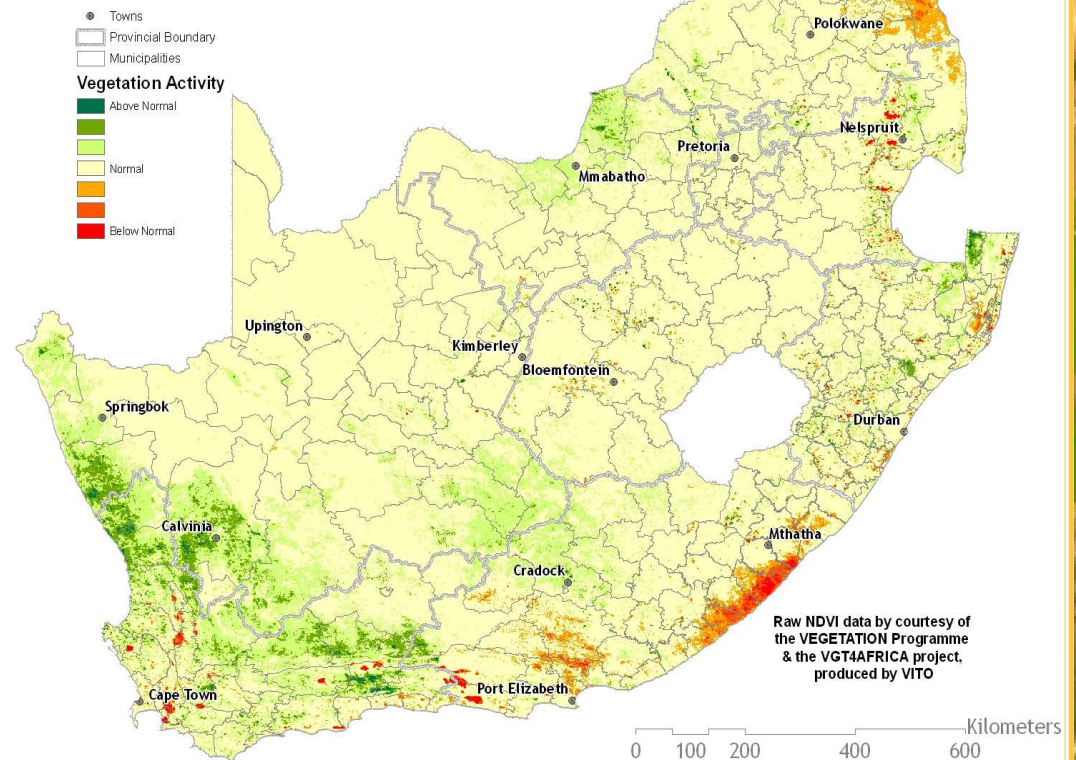


Figure 1

Figure 1:

Vegetation conditions for August 2009 were normal throughout most of the country. However, lower vegetation activity can be seen in the Eastern Cape and eastern Limpopo (see also Figures 7 & 14-18). Higher vegetation activity can be seen in the Western Cape and along the west coast.

Figure 2:

Vegetation activity along the east coast and in the central region of the country (Kimberley) shows much lower vegetation activity in 2009 compared to 2008.

NDVI difference map for August 2009 compared to August 2008

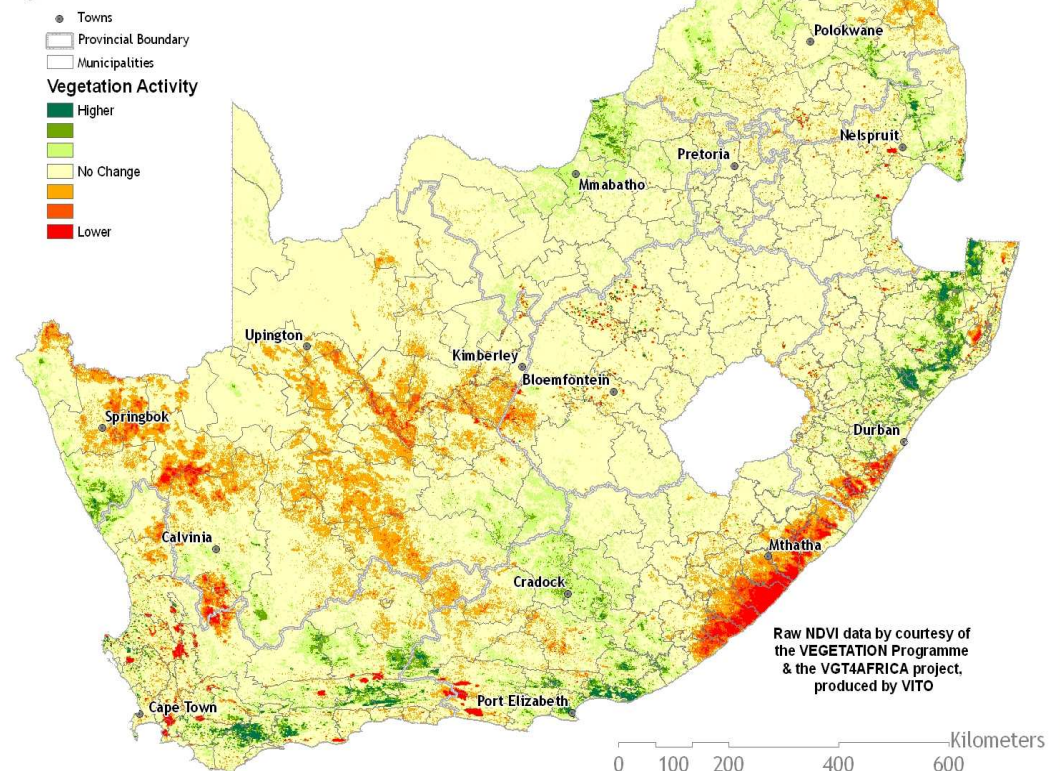


Figure 2

Percentage of Average Seasonal Greenness (PASG) for 1 June 2009 - 31 August 2009 (Compared to 10 years)

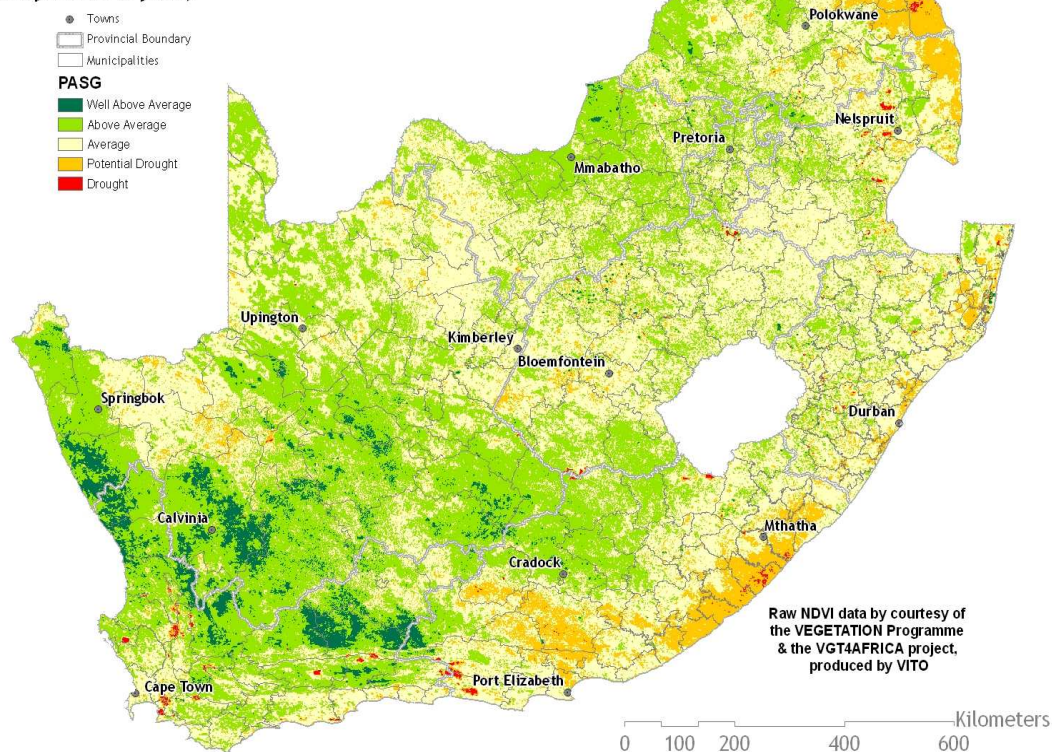


Figure 3

Percentage of Average Seasonal Greenness (PASG) for 1 January 2009 - 31 August 2009 (Compared to 10 years)

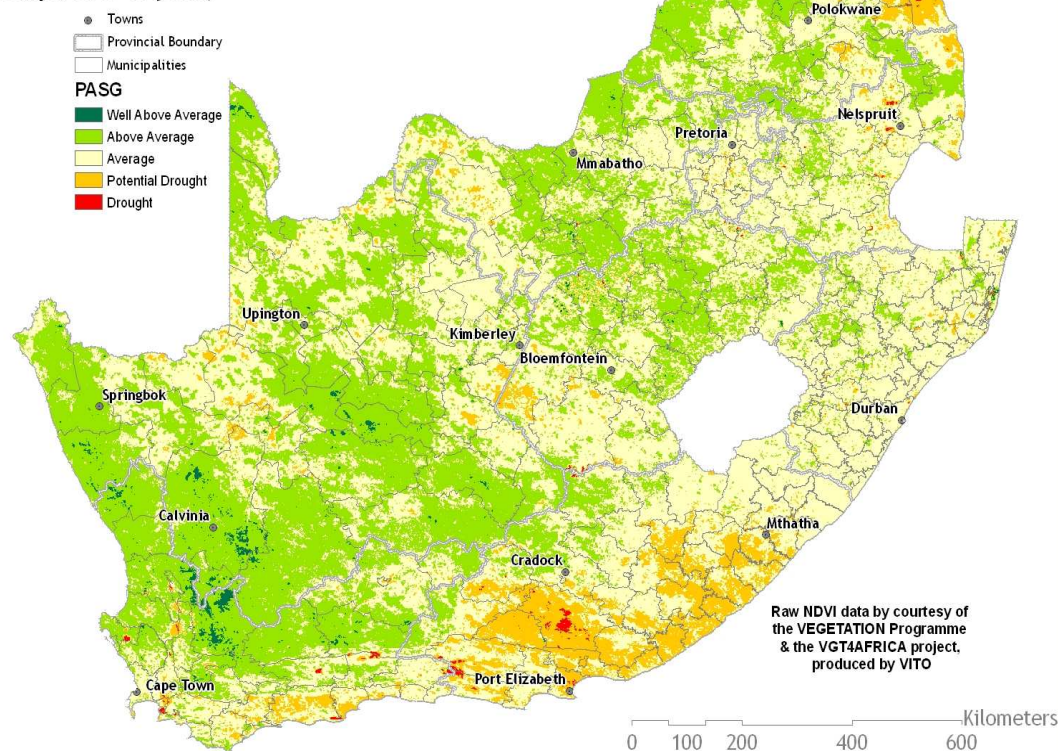


Figure 4

Vegetation Mapping cont.... (from p. 2)

Interpretation of map legend

NDVI values range between 0 and 1. These values are incorporated in the legend of the difference maps, ranging from -1 (lower vegetation activity) to 1 (higher vegetation activity) with 0 indicating normal/the same vegetation activity or no significant difference between the images.

Cumulative NDVI maps:

Two cumulative NDVI datasets have been created for drought monitoring purposes:

Winter - January to December

Summer - July to June

Figure 3:

The PASG map for June to August 2009 shows normal to higher vegetation conditions over the western half of South Africa (see also Figures 10-12). Areas of concern, with lower vegetation conditions, include large parts of eastern Limpopo (Figure 7 & 17), and the Eastern Cape (Figures 7, 14-16 & 18).

Figure 4:

The PASG map for the 2009 season shows normal to above-normal vegetation conditions throughout South Africa. The eastern half of the country had a much drier year with lower vegetation activity dominating the Eastern Cape as well as the eastern region of Limpopo.

Questions/Comments:
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2. Rainfall

PAGE 4

Overview:

While the winter rainfall area received near-normal rainfall during August, after above-normal rainfall during May to July, the eastern parts of the summer rainfall area received above normal rain. Taking June into account also, the summer rainfall region received above-normal rain during two winter months this year. During the beginning of the month, a cut-off low pressure system caused widespread showers and thundershowers over the eastern parts of the country. Most of the precipitation over these areas occurred during this period. Small hail occurred over some parts while snow was reported from the mountainous areas over the southeastern and eastern parts of the country.

Cold fronts caused rain over the winter rainfall area around the 6th, 12th and 18th. With the system moving through around the 18th, widespread showers also occurred over the southeastern parts of the country. The system was also responsible for very low minimum temperatures over the interior with widespread frost. Between the 26th and 27th, another upper air trough moved over the country, causing showers and thundershowers over the southern and eastern areas, as far north as the southern parts of the Limpopo Province.

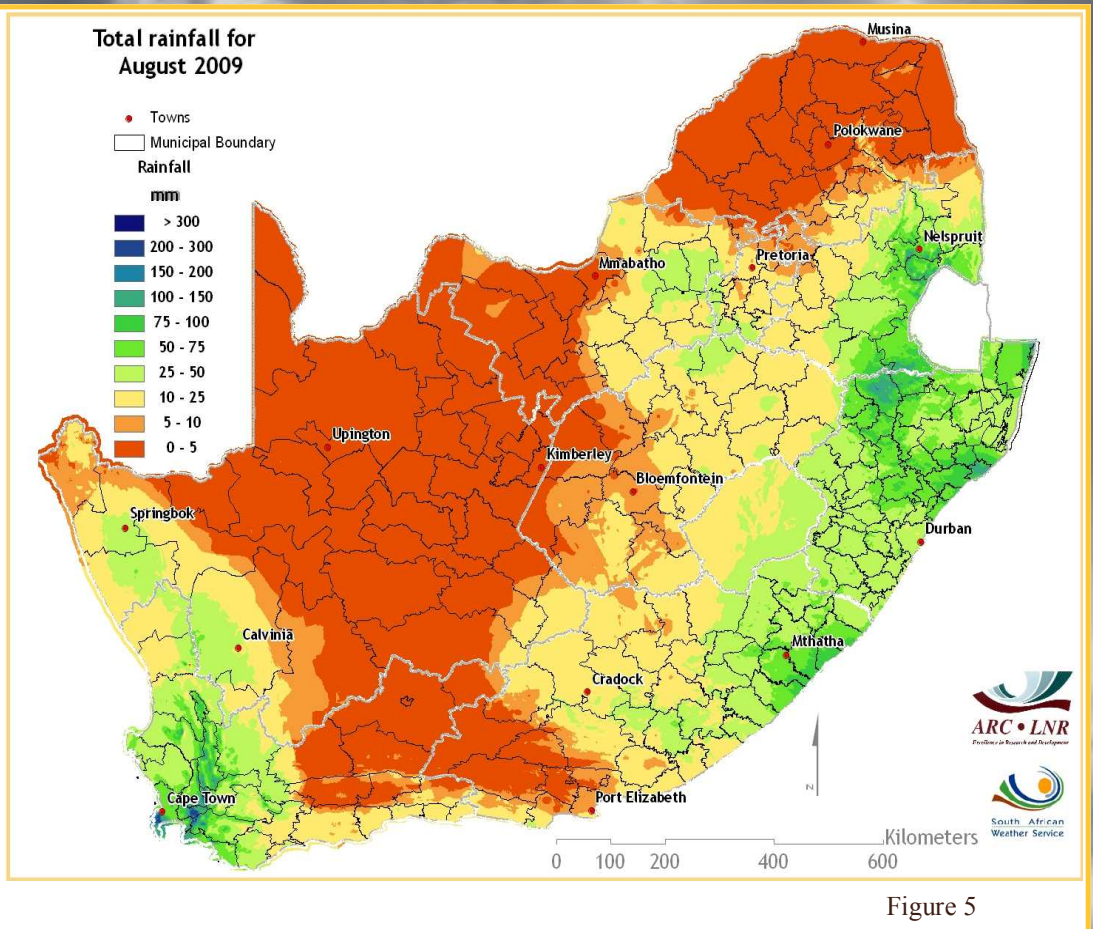


Figure 5

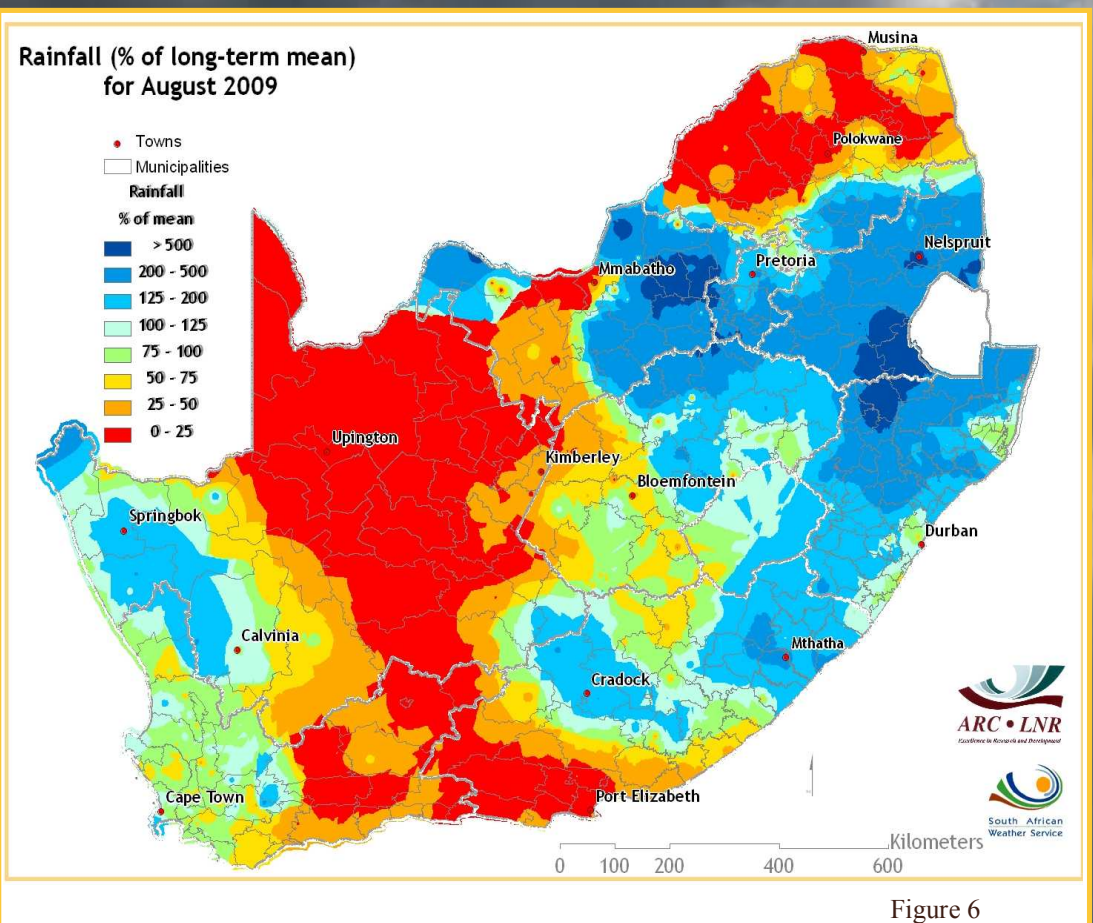


Figure 6

**Total rainfall
(% of long-term mean)
for 1 April to 31 August 2009**

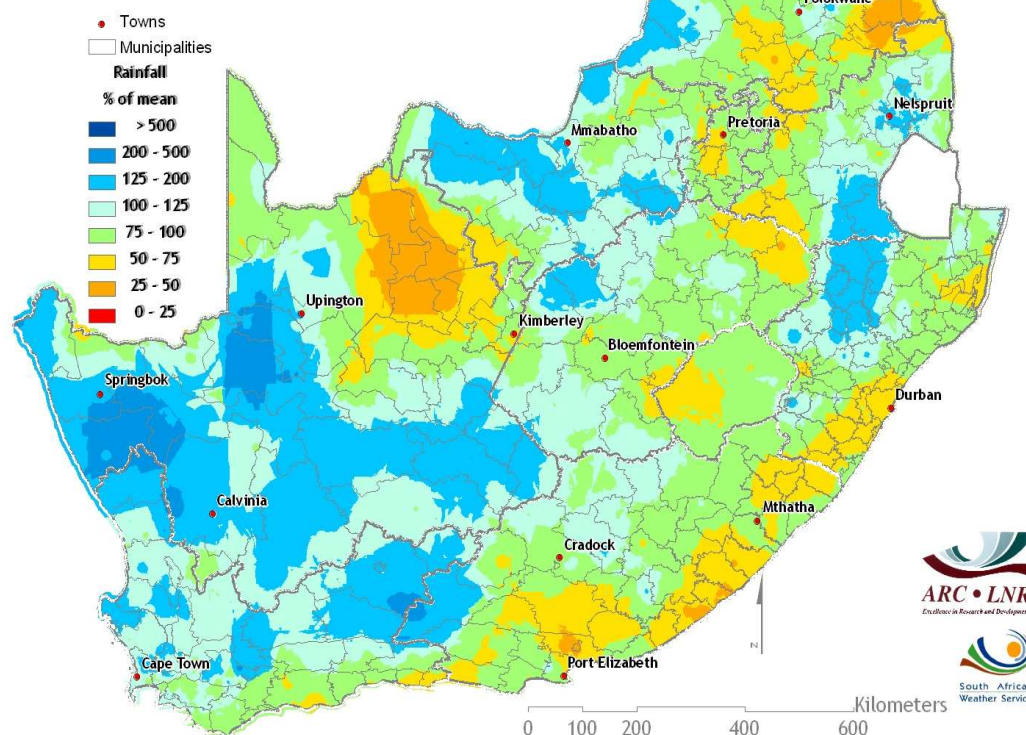


Figure 7

**Total rainfall difference
for 1 June to 31 August
(2009 minus 2008)**

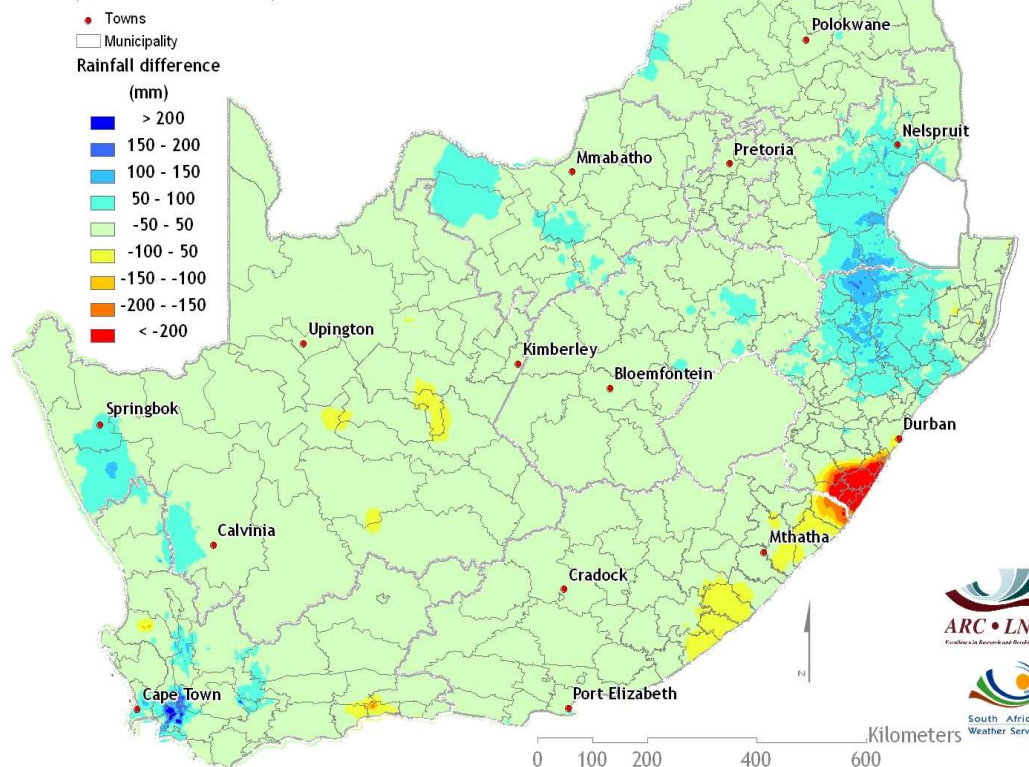


Figure 8

Figures 5 & 6:

Large parts of the winter rainfall area and the eastern parts of the country received more than 25 mm of rain during August. Falls in excess of 100 mm occurred over the southwestern mountainous areas of the Western Cape and the eastern escarpment in the region of northern KwaZulu-Natal and Mpumalanga as well as parts of the KwaZulu-Natal coastal area. Large parts of the Northern Cape interior and the northern half of the Limpopo Province didn't receive rain during August. It is only over these areas, together with the eastern parts of the Western Cape and the western parts of the Eastern Cape provinces where rainfall was far below normal. Over the remainder of the country, rainfall was generally normal to above normal.

Figure 7:

During the period April to August 2009, the western and northern parts of the winter rainfall area received above normal rain while the southern and eastern parts of the winter rainfall area received normal to below normal rainfall. Considering the important wheat producing areas of the Western Cape, the Swartland received above normal rainfall while the Ruens received normal to below normal rainfall during this period.

Figure 8:

Large parts of the winter rainfall area as well as the northeastern parts of the country received more rain during the June – August period this year than last year while the central and southeastern parts received generally less rain this year.

Questions/Comments:
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3. Vegetation Conditions & Rainfall

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NDVI and Rainfall Graphs

Figure 9:
Orientation map showing the areas of interest for August 2009. The district colour matches the border of the corresponding graph.

Questions/Comments:
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District Municipalities

- Provincial Boundary
- Municipalities
- Towns
- Amatole
- Boland
- Cacadu
- Capricorn
- Chris Hani
- Mopani
- Namakwa
- Nelson Mandela Metro
- West Coast
- Zululand

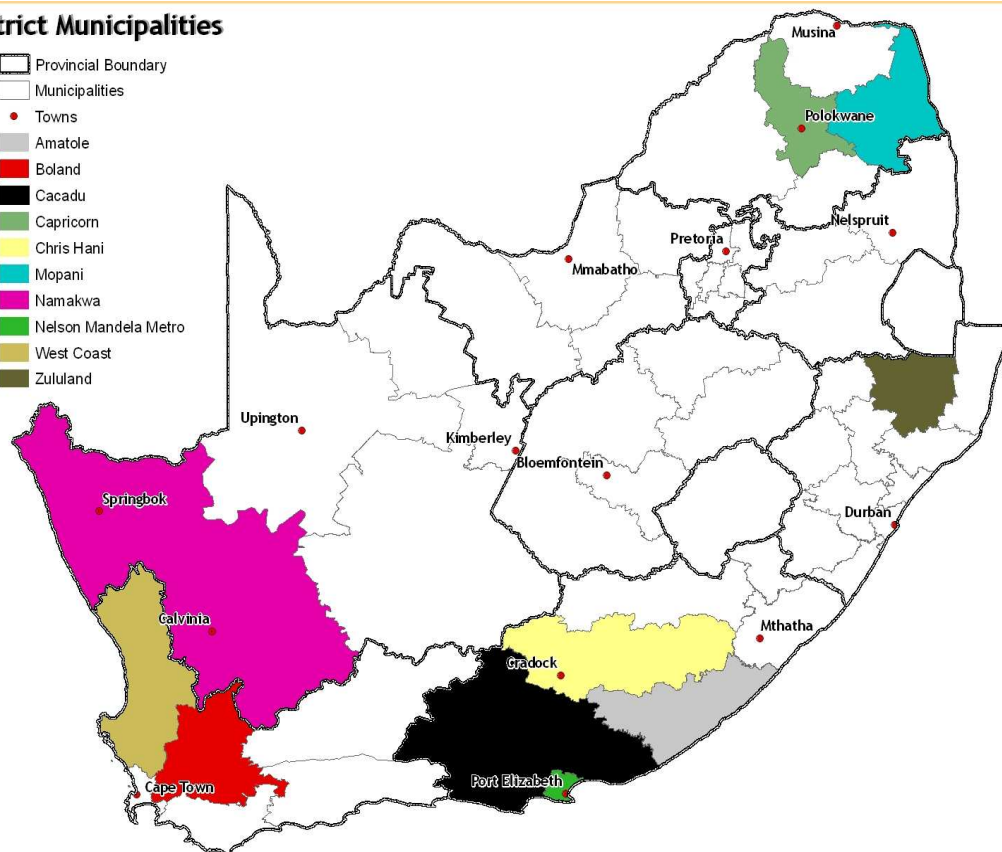


Figure 9

Figures 10-13:
Indicate areas with higher cumulative vegetation activity for the last year.

Figures 14-19:
Indicate areas with lower cumulative vegetation activity for the last year.

West Coast - Rainfall & NDVI

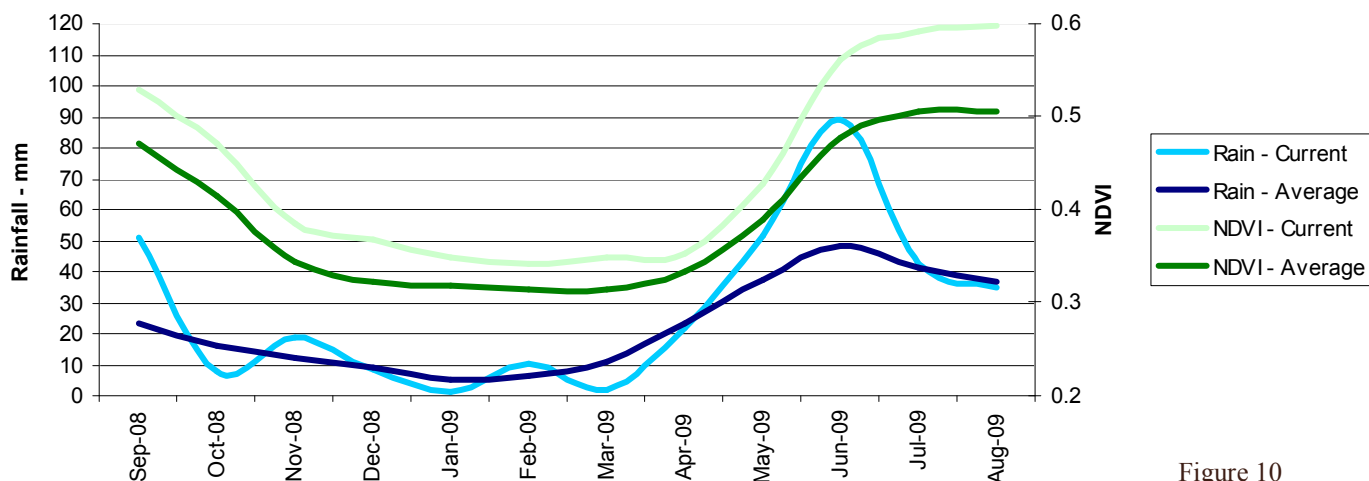
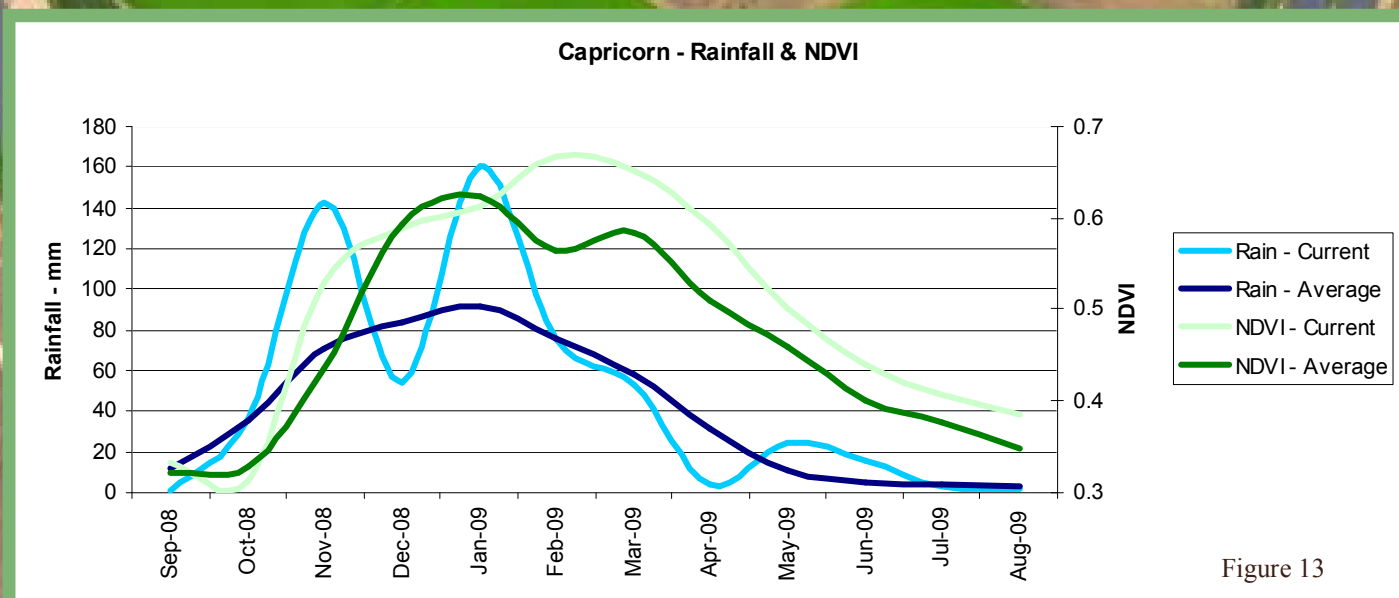
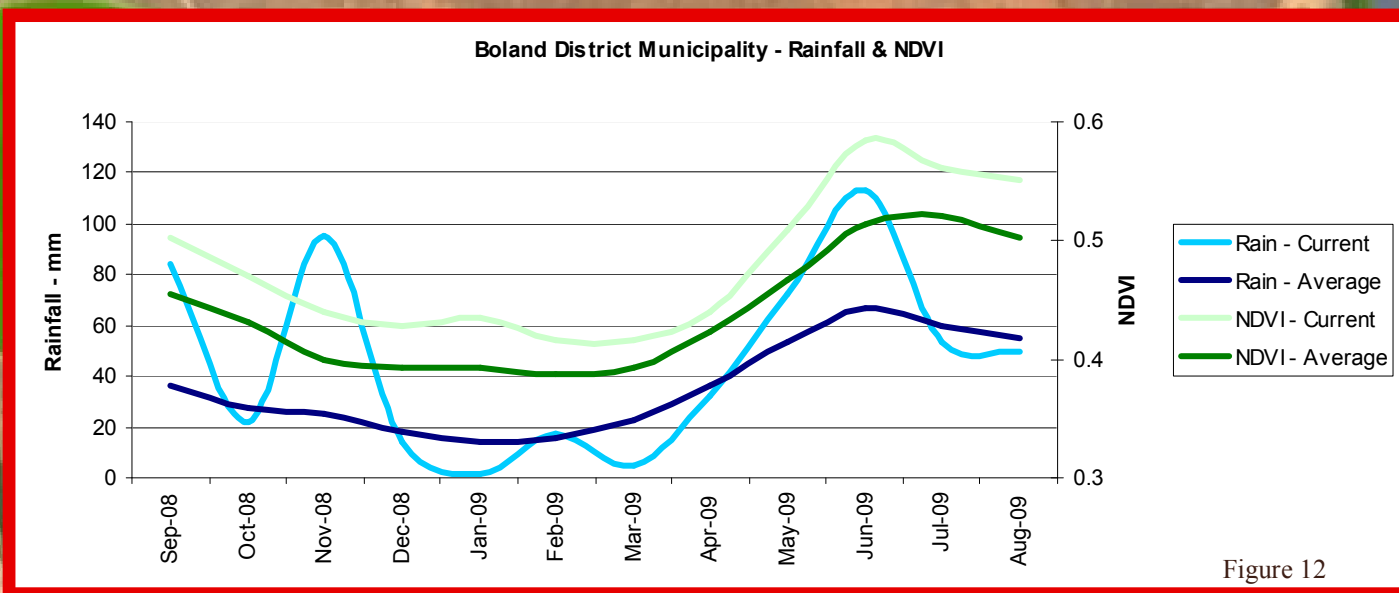
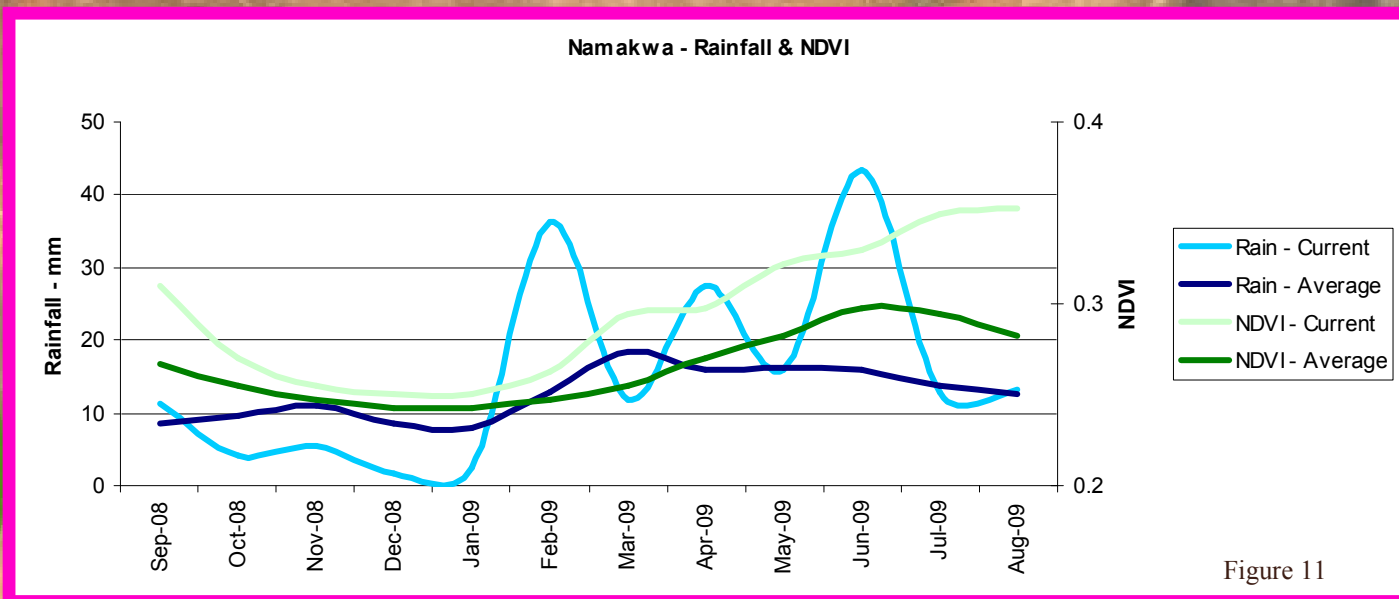
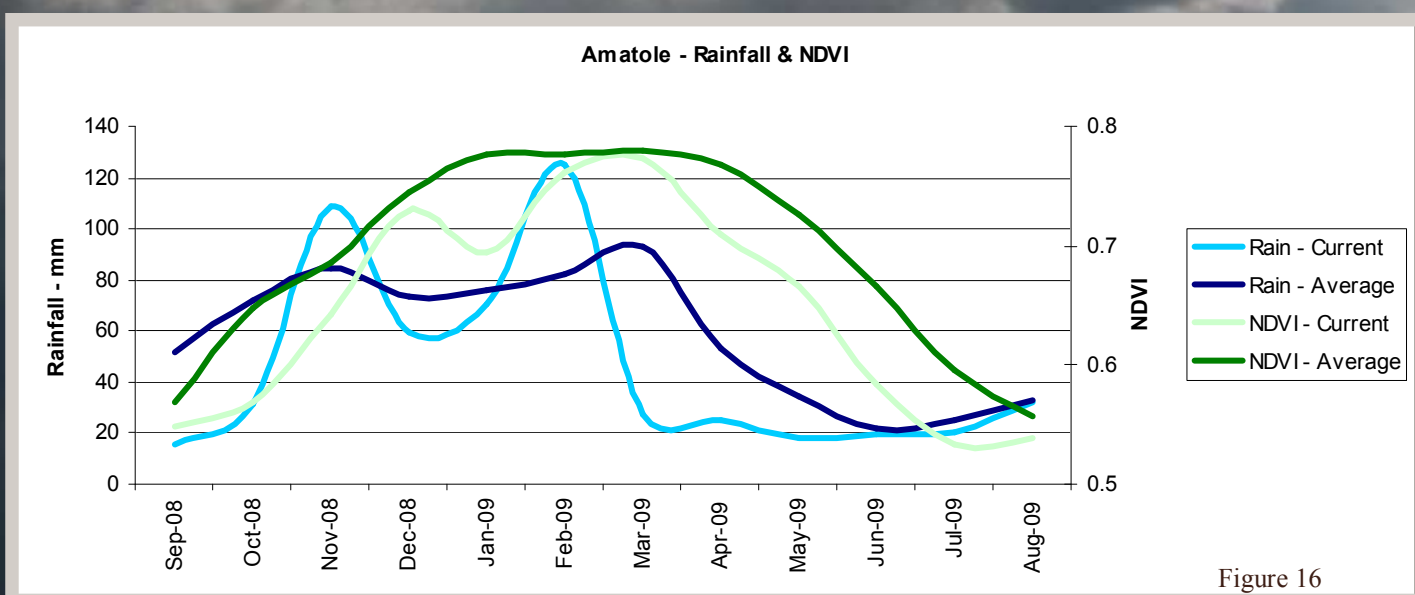
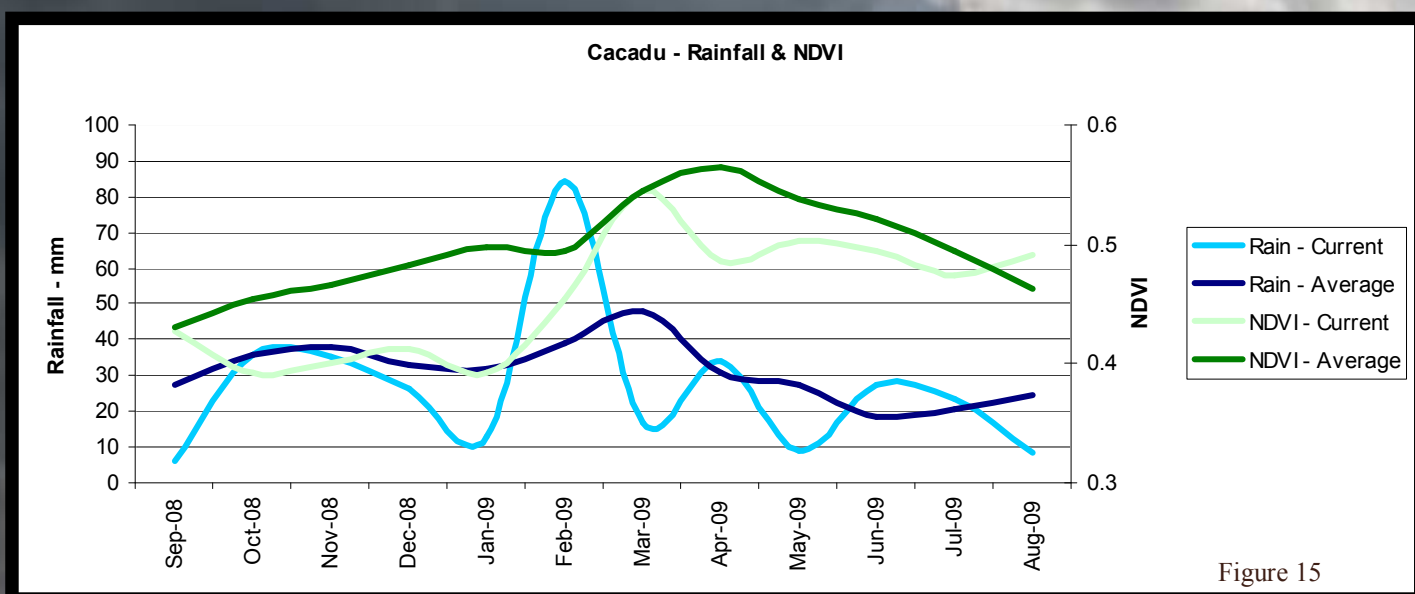
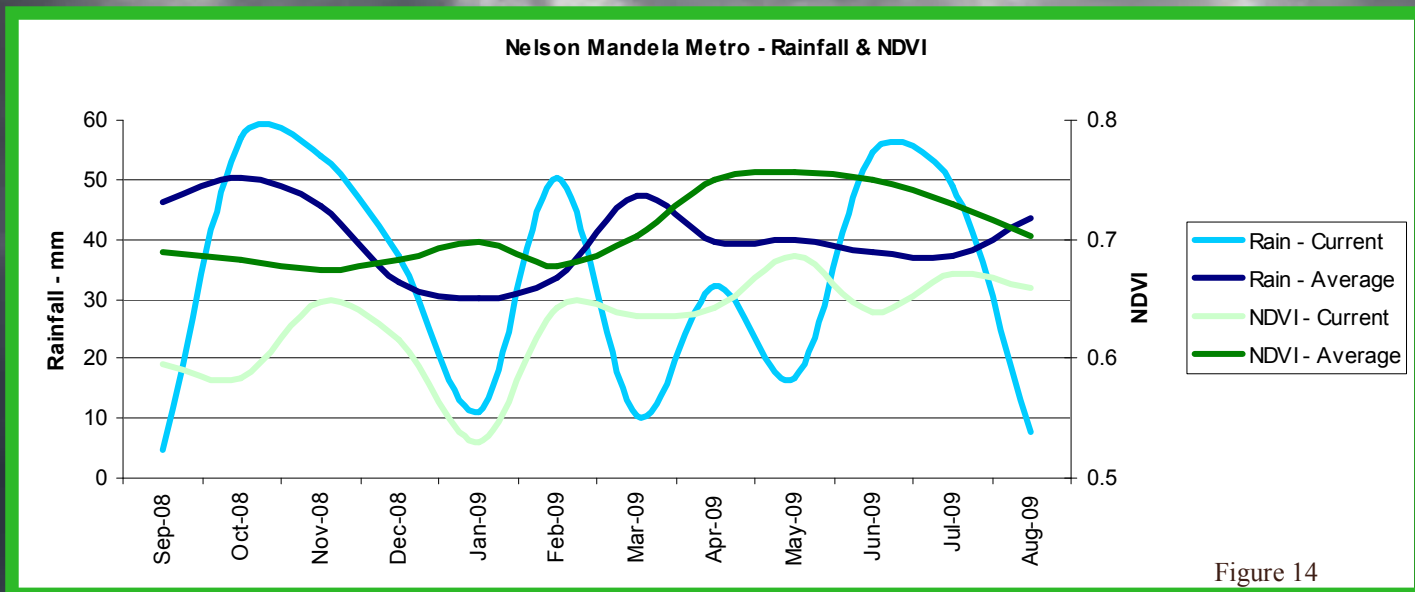


Figure 10





Mopani - Rainfall & NDVI

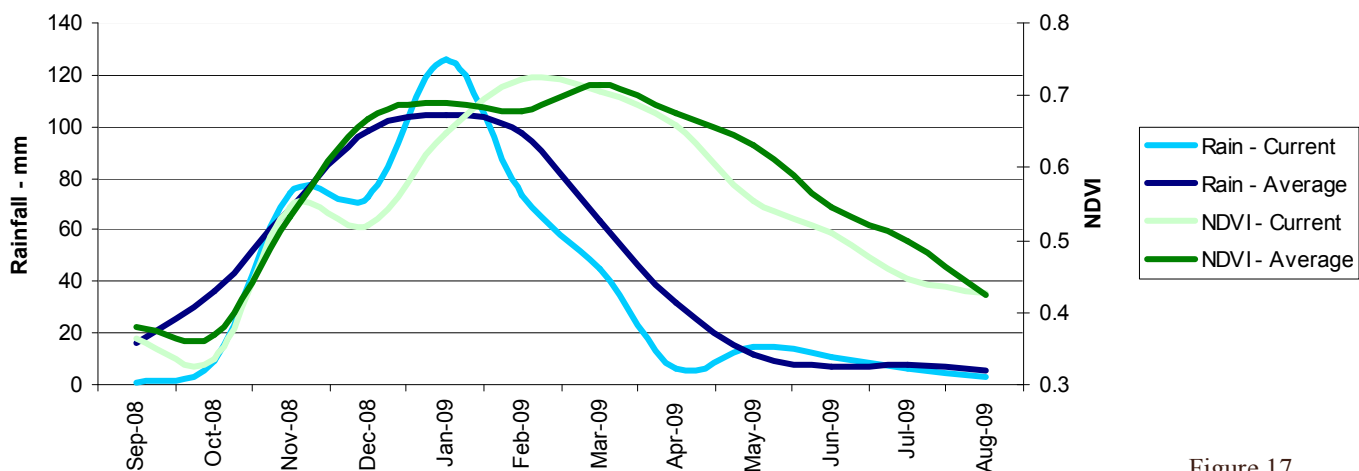


Figure 17

Chris Hani - Rainfall & NDVI

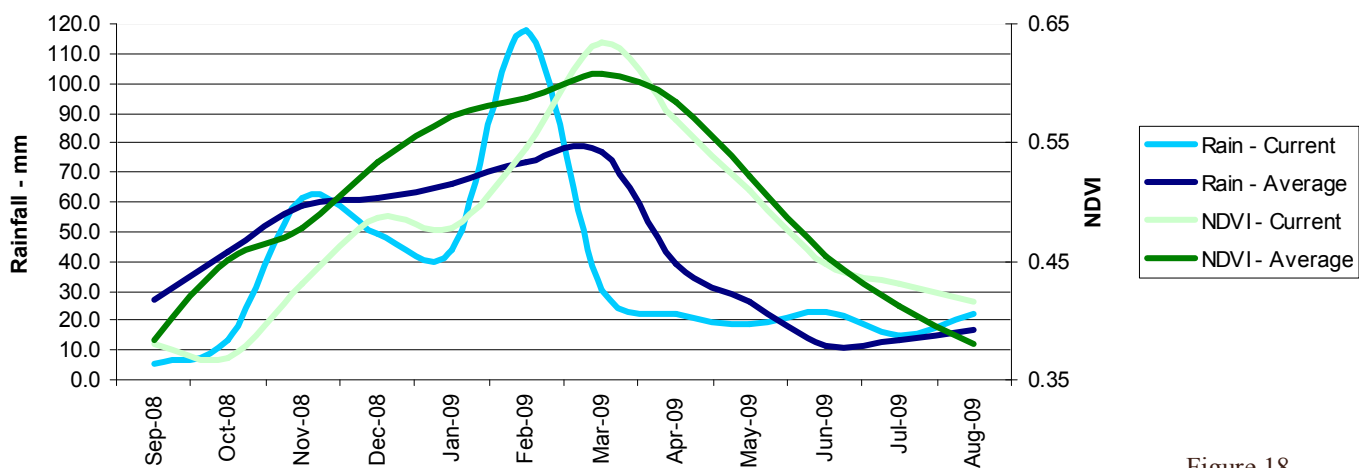


Figure 18

Zululand - Rainfall & NDVI

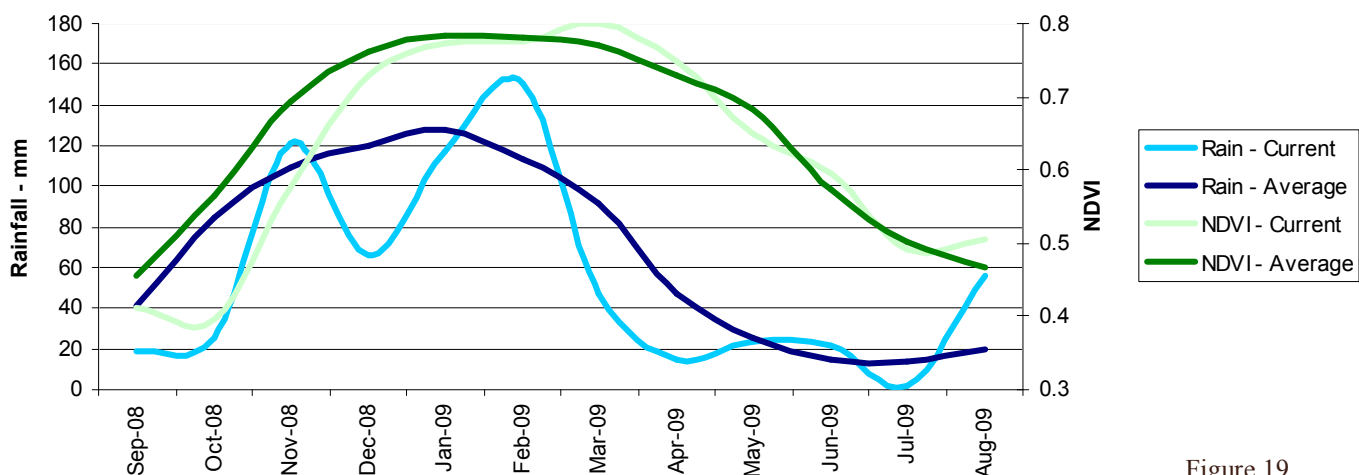


Figure 19

4. Veld Info

PAGE 10

The seasonal variation in the production potential or grazing capacity of veld is primarily driven by climate. The variability and unpredictability of climate complicates the situation. However, the use of simulation models makes it possible to calculate these complex relationships. The PUTU 11 model is a daily time step model which uses weather and soil data to simulate the growth of veld. The climate data required by the model includes daily rainfall, temperature, evaporation and sunshine hours. The soil data, which includes clay content and soil depth, is used to calculate the soil water holding capacity. With these inputs the PUTU 11 model then calculates the daily increase in dry matter production. From this information it is possible to:

- Simulate the growth of veld
- Compare the simulated monthly production with the long-term production of that specific month and calculate deviations
- Produce production forecasts with the use of medium and long-term climate forecasts

Current conditions are calculated and expressed as a percentage deviation from the long-term situation.

The following figures give an indication of current production potential relative to the long-term average condition at the end of that month.

Figure 20

Simulated veld production at the end of May 2009 as a percentage deviation from

Figure 21

Simulated veld production at the end of June 2009 as a percentage deviation from the long-term average.

Compiled and released by the Animal Production Institute of the ARC in co-operation with Santam Agriculture

Simulated Veld Production at the end of May 2009

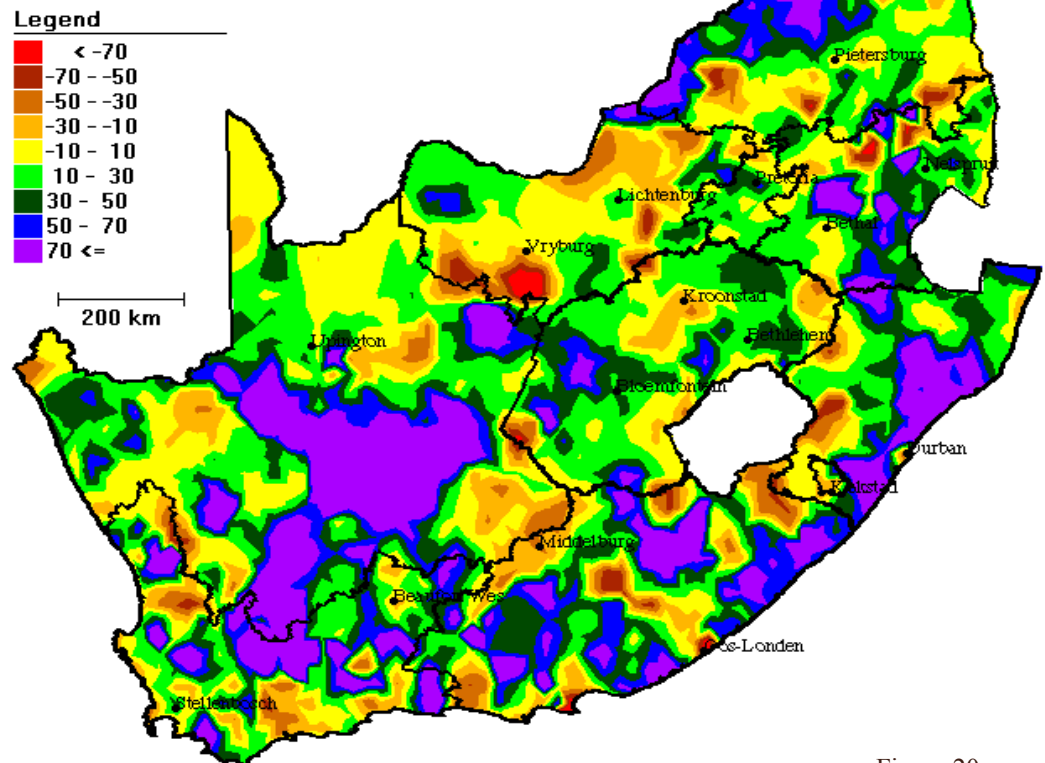


Figure 20

Simulated Veld Production at the end of June 2009

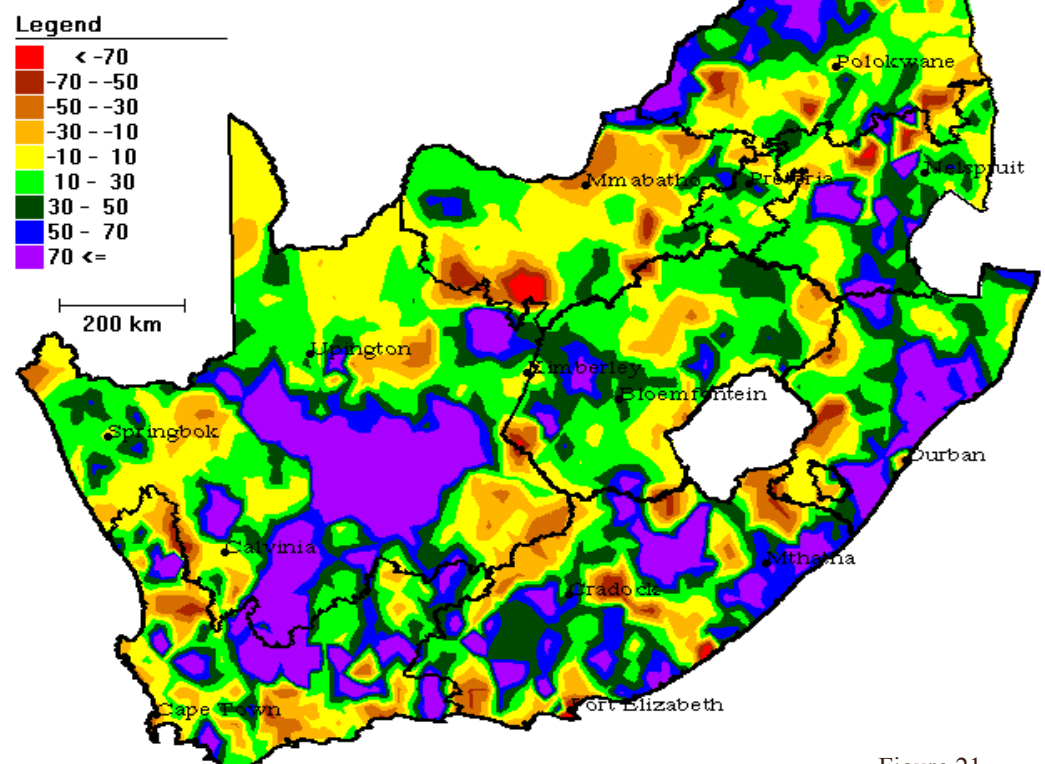


Figure 21