

Simulated Veld Production at the end of July 2009

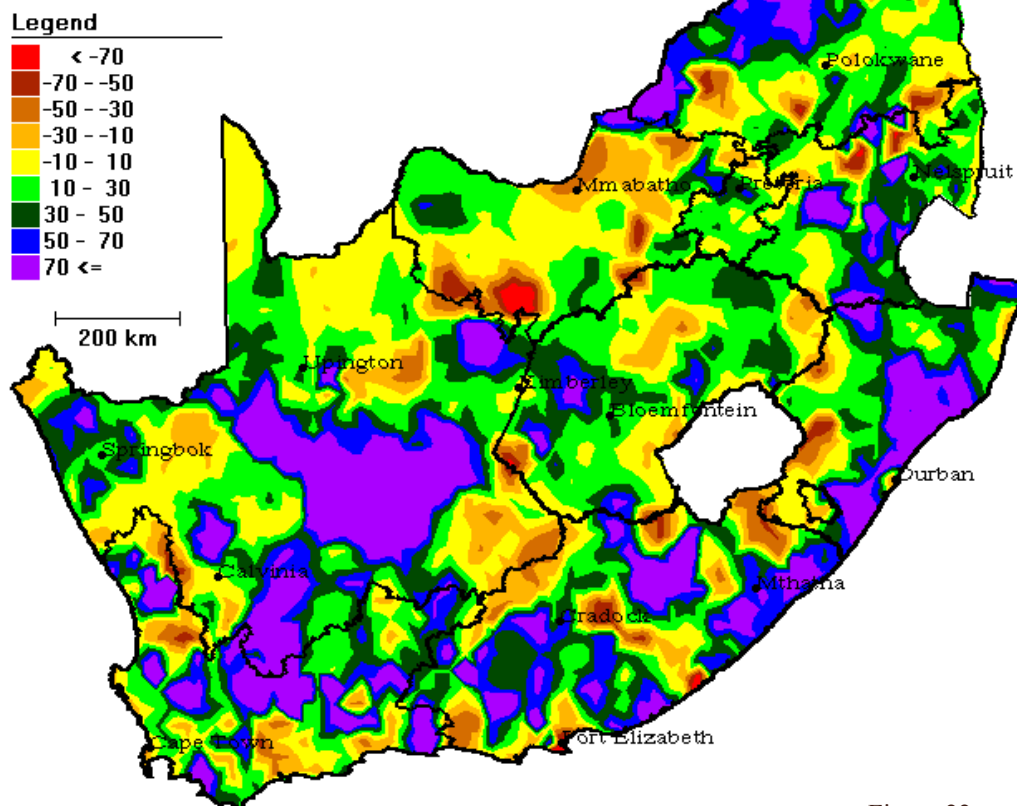


Figure 22

Figure 22

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

Grazing production conditions for the country as a whole are favourable. It must be kept in mind that the fodder on the veld must last till the first effective growth of the season (December 2009).

Figures 23-30

What is the extent of the drought in the different provinces?

The veld production levels were calculated monthly and are expressed as the percentage deviation from the average production for the month concerned. The following graphs present the percentage calculated for each of the various production levels of the area of the province. The more red or warmer colours in the graph, the bigger the part of the province affected and the more intense the drought conditions.

Key:

- Purple = >70% above normal
- Blue = 50 to 70% above normal
- Dark green = 30 to 50% above normal
- Light green = 10 to 30% above normal
- Yellow = 10% above normal to 10% below normal
- Yellowbrown = 10 to 30% below normal
- Redbrown = 30 to 50% below normal
- Brown = 50 to 70% below normal
- Red = >70% below normal

Drought extent - Limpopo Veld production levels as % of expected

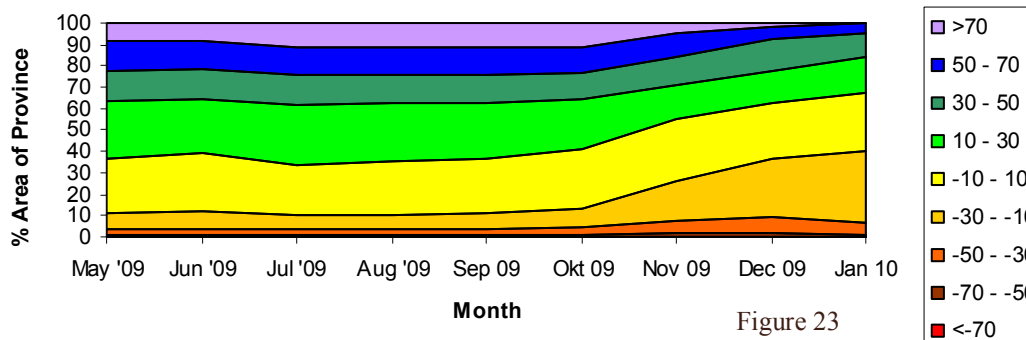


Figure 23

Drought extent - Gauteng Province Veld production levels as % of expected

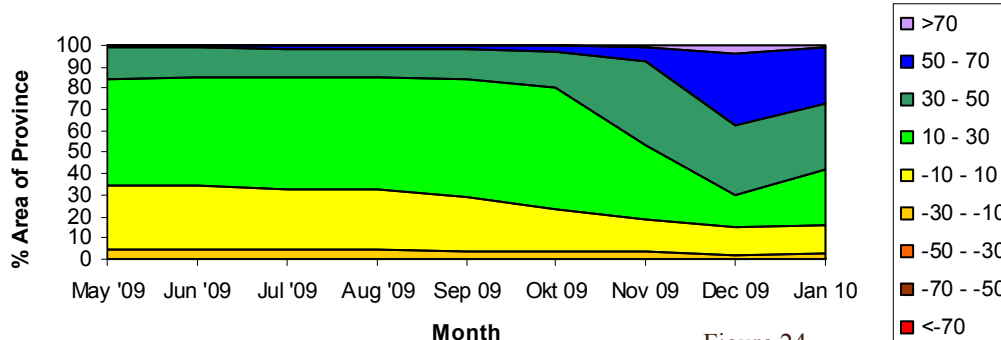


Figure 24

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Drought extent - Mpumalanga Veld production levels as % of expected

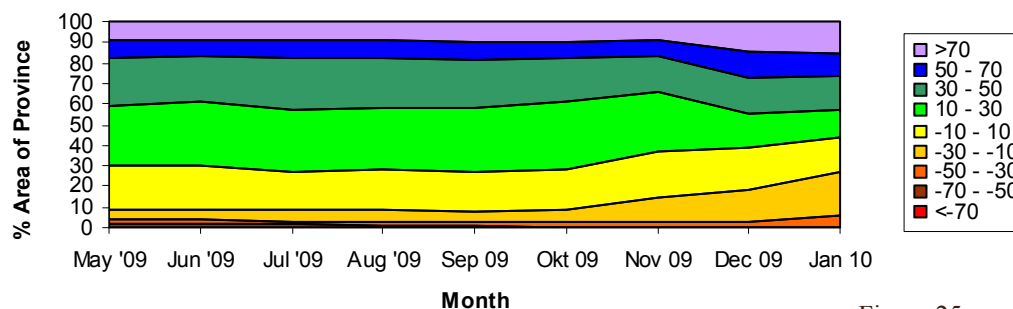


Figure 25

Drought extent - Western Cape Veld production levels as % of expected

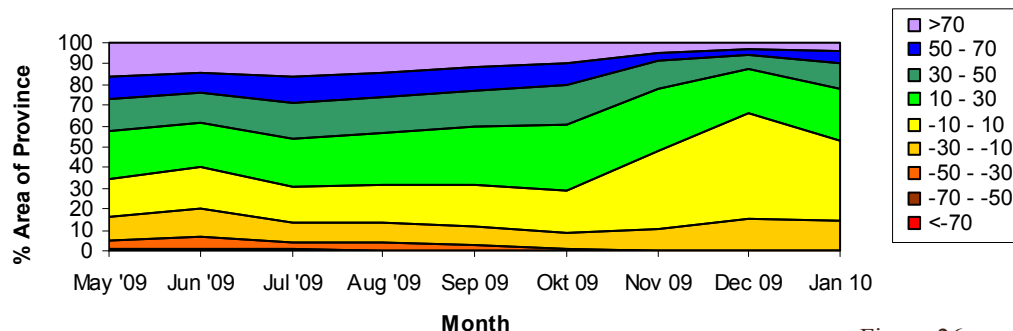


Figure 26

Drought extent - Eastern Cape Veld production levels as % of expected

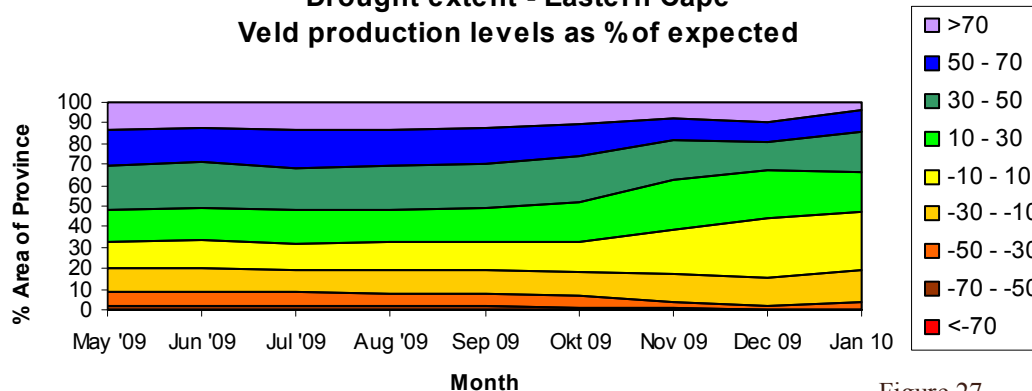


Figure 27

Drought extent - North West Veld production levels as % of expected

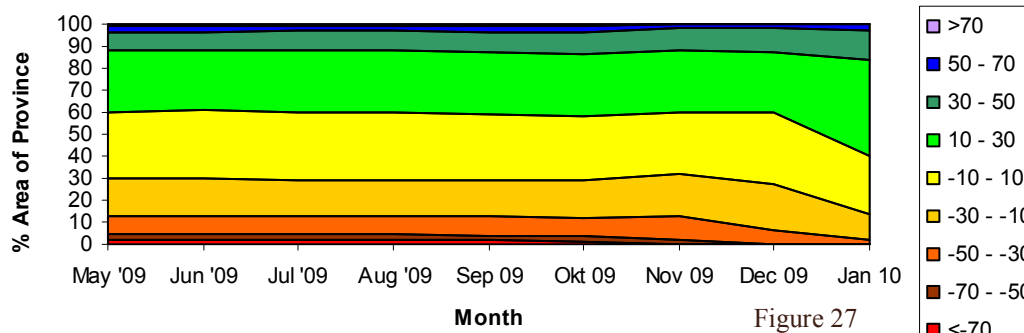


Figure 27

Key:

- Purple = >70% above normal
- Blue = 50 to 70% above normal
- Dark green = 30 to 50% above normal
- Light green = 10 to 30% above normal
- Yellow = 10% above normal to 10% below normal
- Yellowbrown = 10 to 30% below normal
- Redbrown = 30 to 50% below normal
- Brown = 50 to 70% below normal
- Red = >70% below normal

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Drought extent - Free State Veld production levels as % of expected

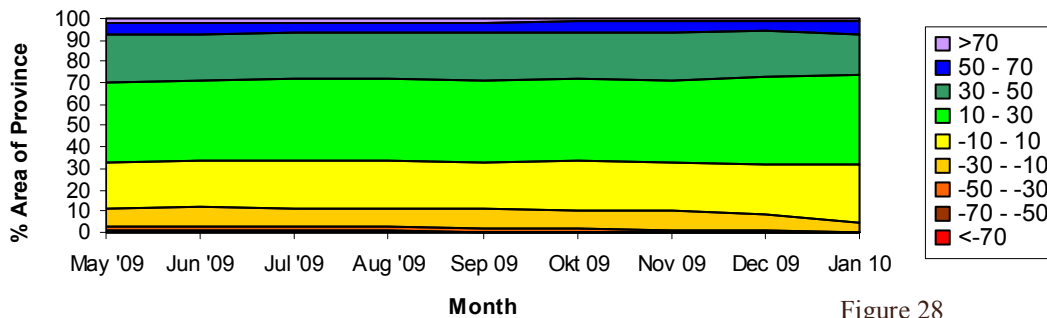


Figure 28

Drought extent - Kwazulu Natal Veld production levels as % of expected

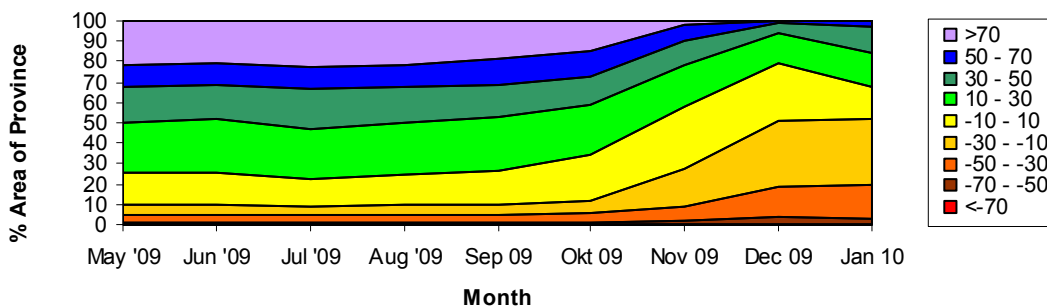


Figure 29

Drought extent - Northern Cape Veld production levels as % of expected

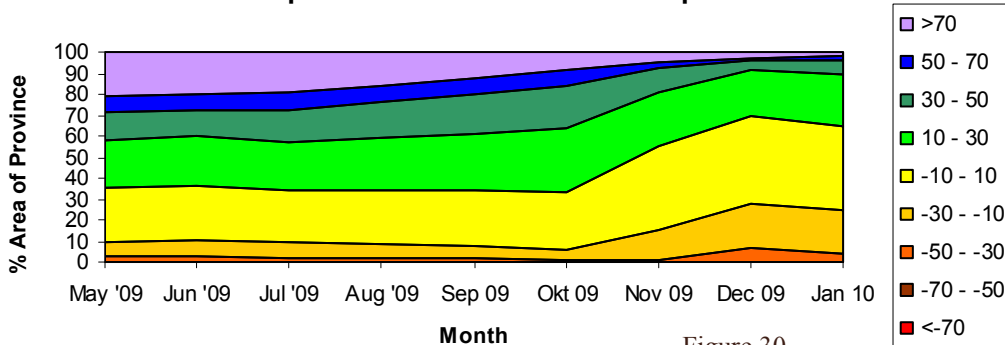


Figure 30

Key:

Purple = >70% above normal
Blue = 50 to 70% above normal
Dark green = 30 to 50% above normal
Light green = 10 to 30% above normal
Yellow = 10% above normal to 10% below normal
Yellowbrown = 10 to 30% below normal
Redbrown = 30 to 50% below normal
Brown = 50 to 70% below normal
Red = >70% below normal

Questions/Comments:

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Figure 31
The expected conditions for August 2009.

Simulated Veld Production for August 2009

Legend

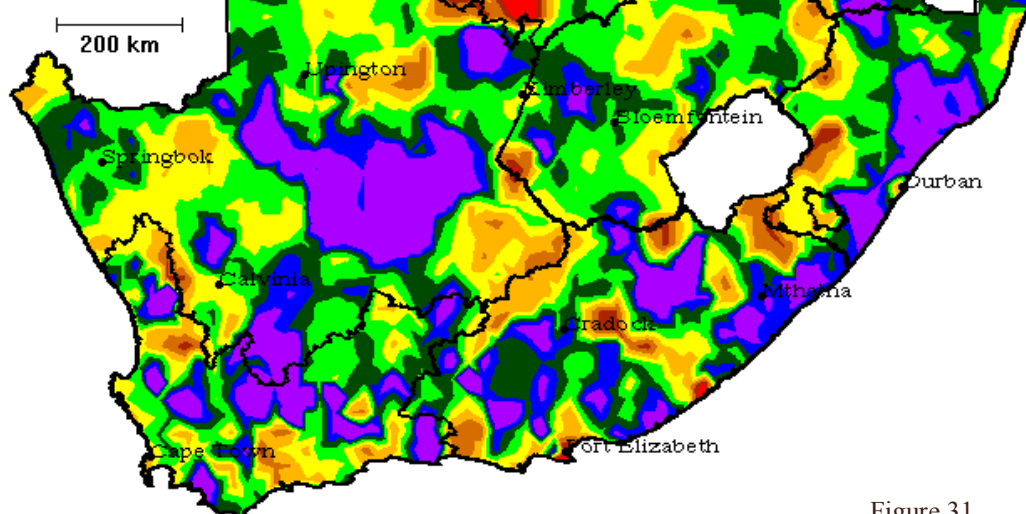
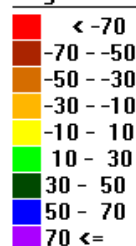


Figure 31

Figure 32
The expected conditions for September 2009.

Simulated Veld Production for September 2009

Legend

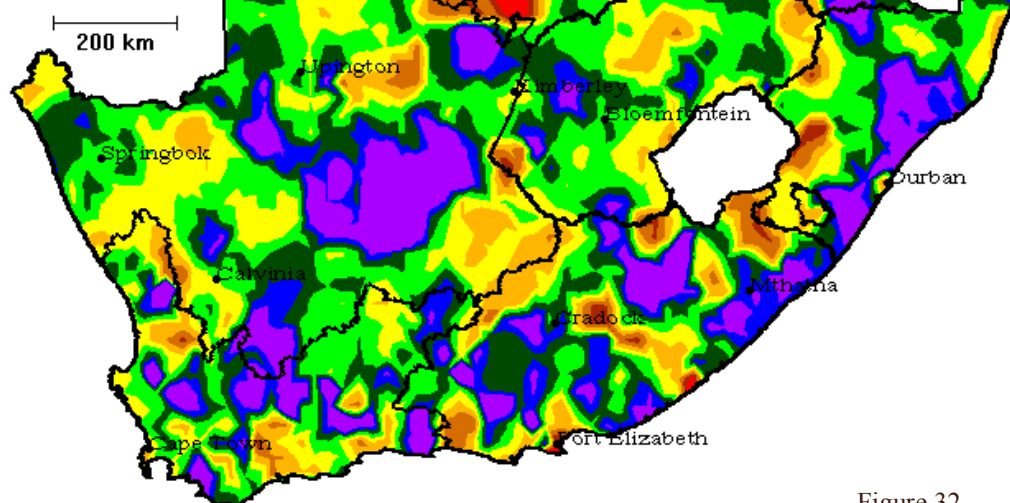
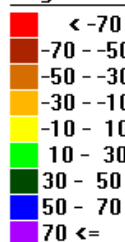


Figure 32

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Simulated Veld Production for October 2009

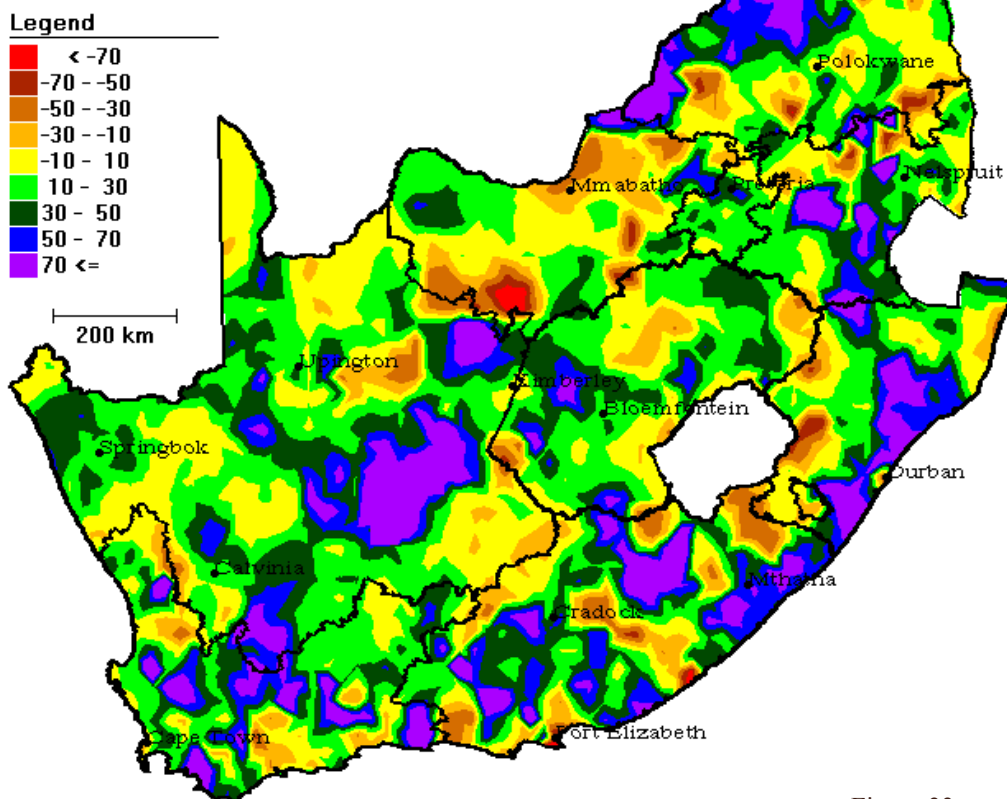


Figure 33

Figure 33

The expected conditions for October 2009.

Simulated Veld Production for December 2009

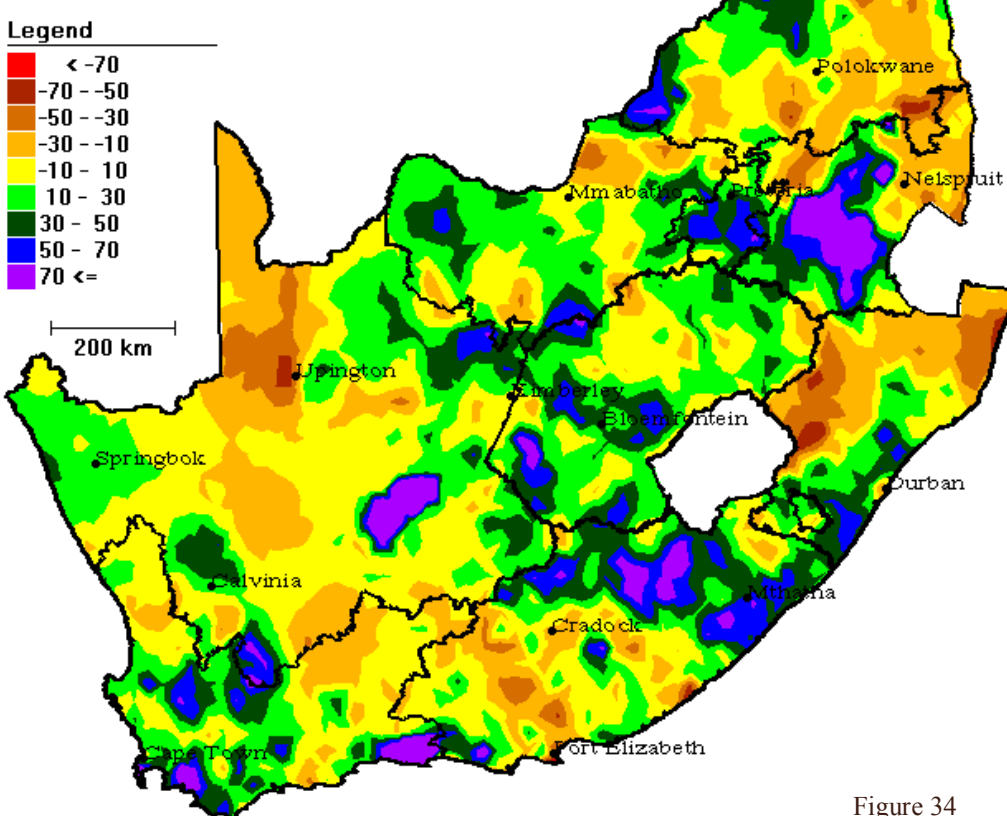


Figure 34

Figure 34

The expected conditions for December 2009.

There is a tendency that it might become dryer. There are a warning out that due to the development of El Nino one can expect below normal rainfall so conditions could deteriorate towards mid summer. It is important to do timely adjustments in stocking rates according to the available fodder.

PLEASE NOTE: The above information must be considered carefully as it is only valid for a specific rainfall point. The situation of every farmer differs regarding rainfall, management, veld condition, soil, etc.

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5. Fire Watch

PAGE 16

Active Fires

Forest and vegetation fires have temperatures in the range of 500 K (Kelvin) to 1000 K. According to Wien's Displacement Law, the peak emission of radiance for blackbody surfaces of such temperatures is at around 4 μm . For an ambient temperature of 290 K, the peak of radiance emission is located at approximately 11 μm . Active fire detection algorithms from remote sensing use this behaviour to detect "hot spot" fires.

Figure 35

The graph shows the total number of active fires detected between 1-20 August 2009 per province. Limpopo and KwaZulu-Natal show a slight increase in fire activity compared to the average for the same period for the last 10 years.

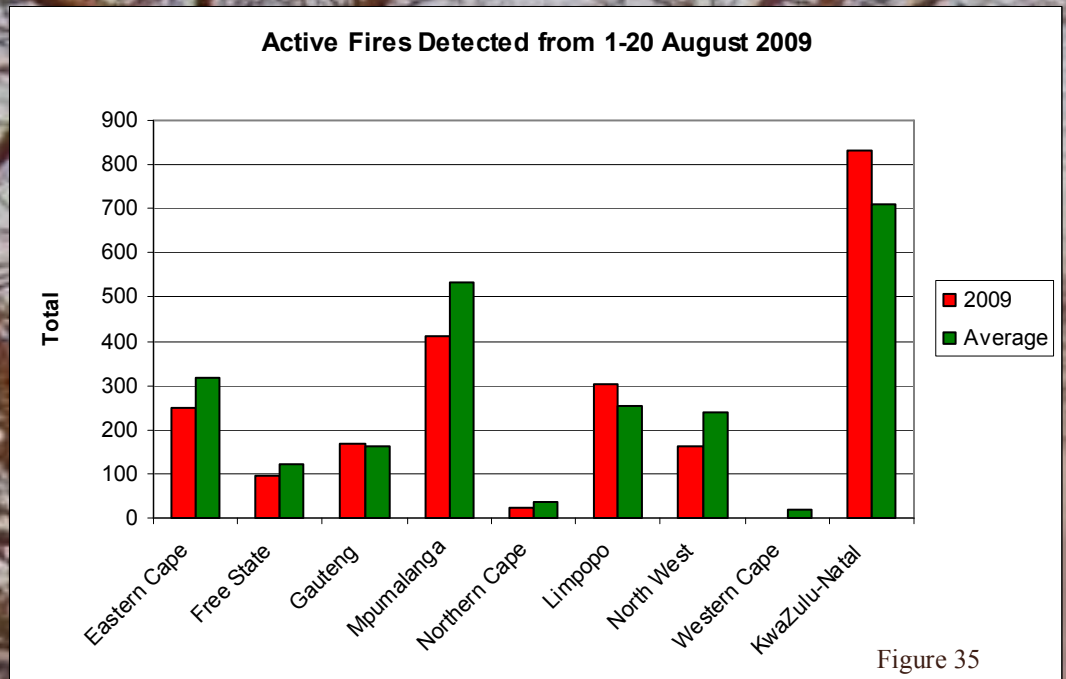


Figure 35

Important News

The Terra Spacecraft experienced an anomaly with the Science Formatter Equipment causing a loss of data. Due to this problem, fire watch may be missing or terminated in the next issue of Umlindi. A technical team from NASA is working on the problem.

Figure 36

The map shows active fires detected between 1-20 August 2009.

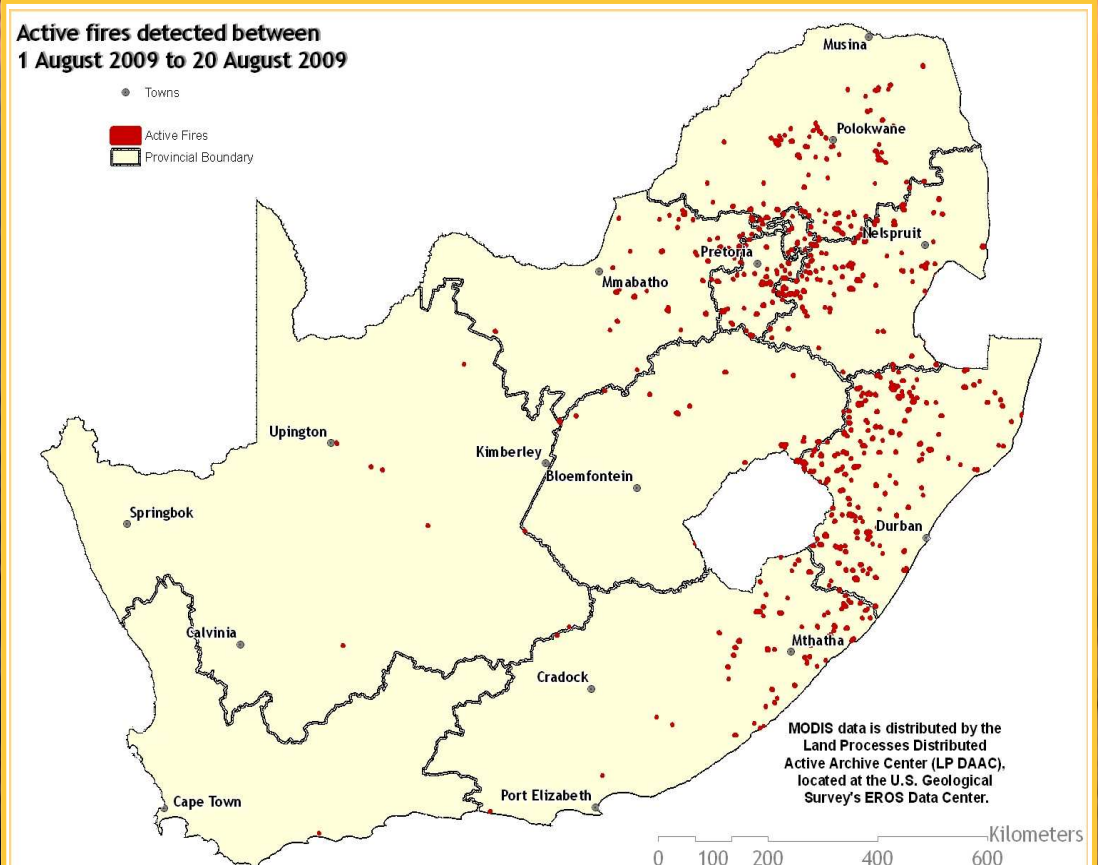


Figure 36

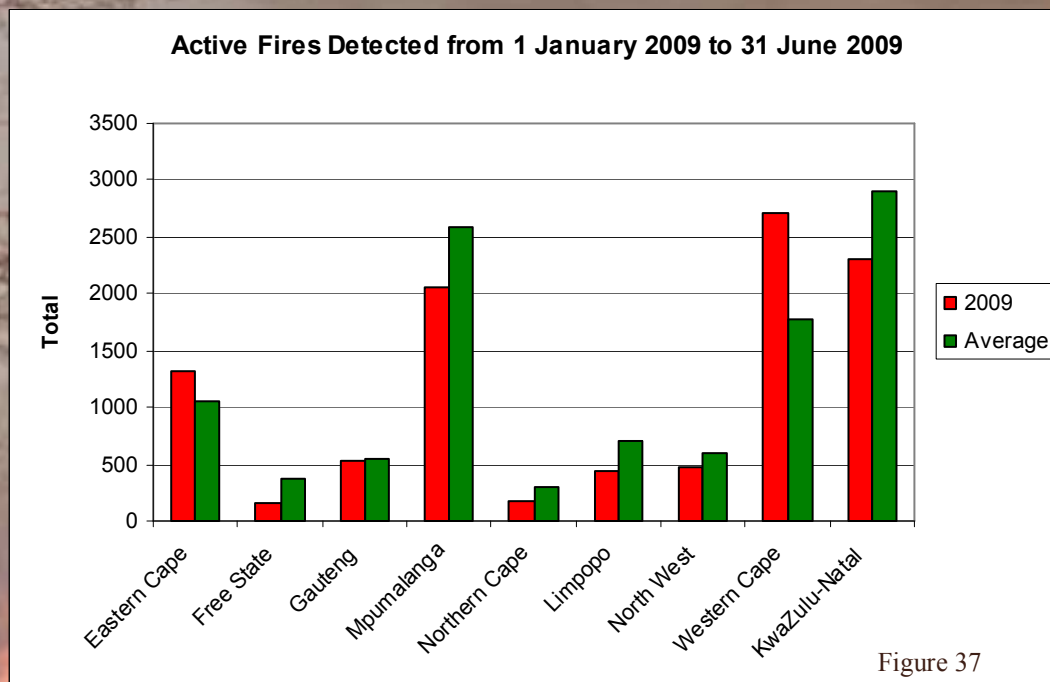


Figure 37

The fire activity was higher in the Western and Eastern Cape provinces this year compared to the average for the same period for the last 10 years.

**Active fires detected between
1 January 2009 to 31 July 2009**

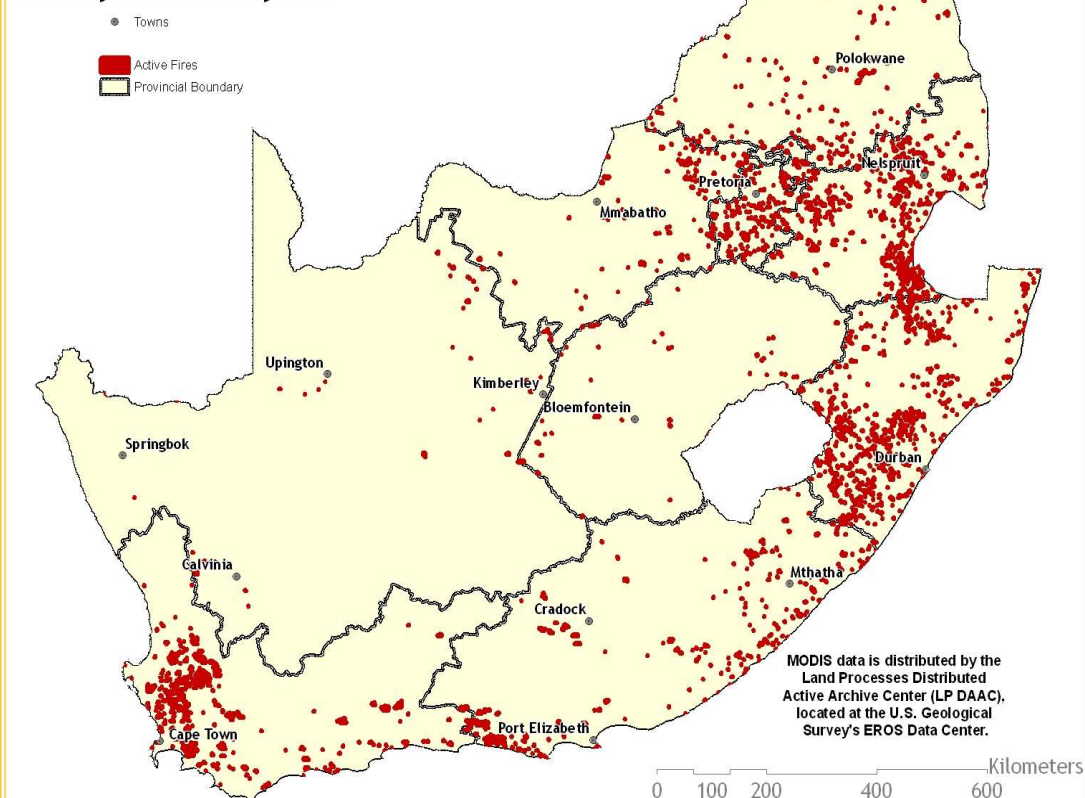


Figure 38

The map shows the location of active fires detected from 1 January 2009 to 31 August 2009.

Figure 39

The area affected by fires is larger in the Eastern Cape, Mpumalanga, Limpopo, North West and Western Cape provinces compared to the average for the same period for the last 10 years.

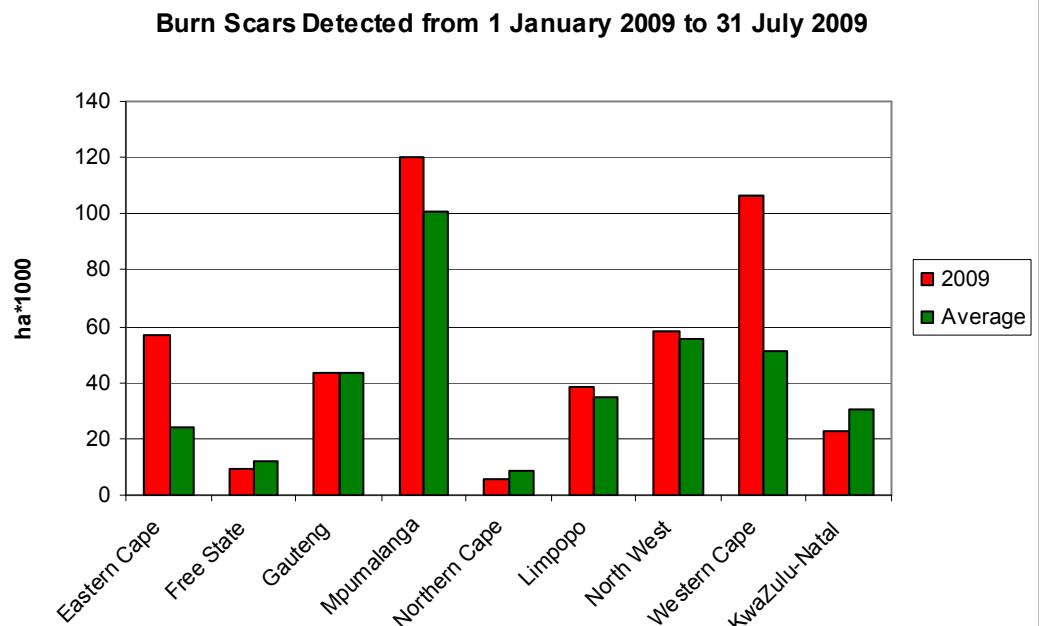


Figure 39

Burn Scars

Burnt areas are characterized by deposits of charcoal and ash, removal of vegetation, and alteration of the vegetation structure. The MODIS algorithm to map burned areas takes advantage of these spectral, temporal, and structural changes. The algorithm detects the approximate date of burning at 500 m by locating the occurrence of rapid changes in daily surface reflectance time series data.

Source: MODIS Burned Area Users Guide

Figure 40

The map shows burnt areas detected from 1 January 2009 to 31 August 2009.

Questions/Comments:
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**Burn Scars detected between
1 January 2009 and 31 July 2009**

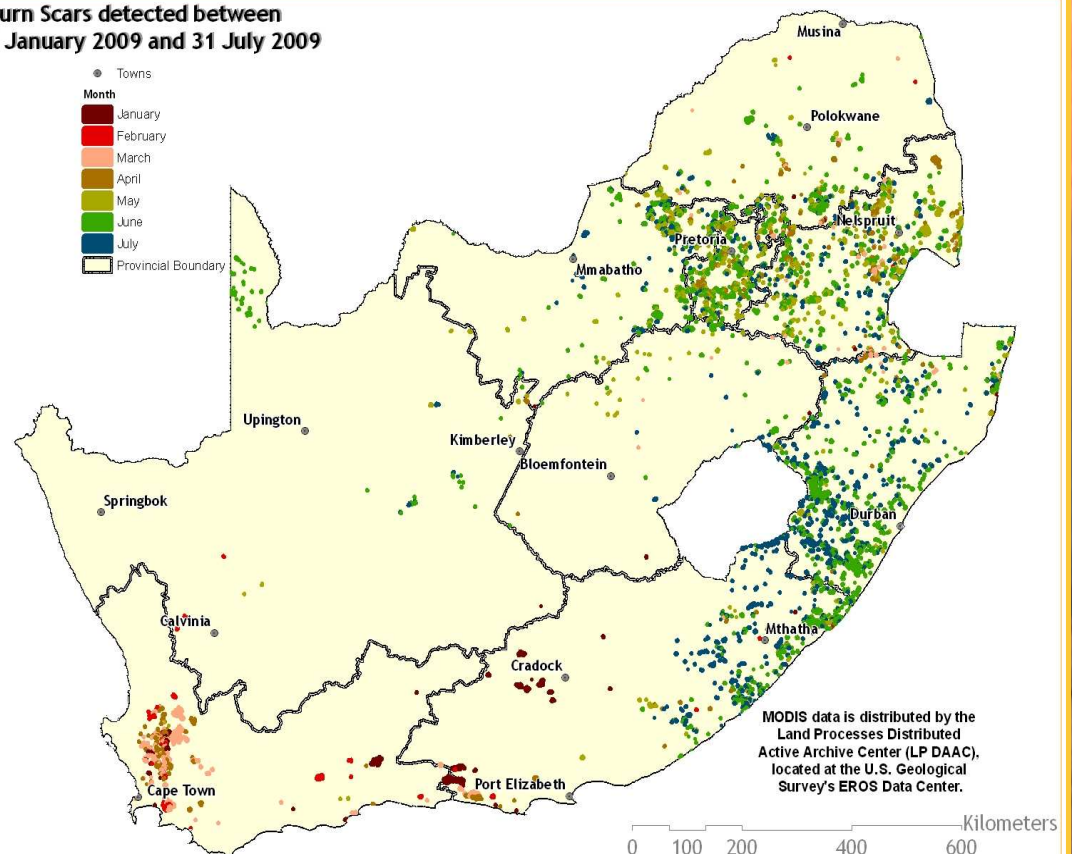


Figure 40

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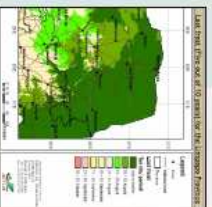


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Agrometeorology

The Agromet Division of ARC-ISCW conducts and implements research in the field of Agrometeorology and Climatology to promote sustainable utilization of the region's climate, soil and water resources.

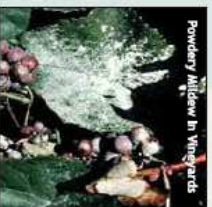
Since 1940, ARC-ISCW Agromet has installed a countrywide network of weather stations aimed at satisfying the climatological requirements of Agriculture in particular. This network has grown to the stage where there are now 110 mechanical weather stations and 455 automatic weather stations.



Since 1940, ARC-ISCW Agromet has collected all the available climate information from its own climate monitoring network as well as from other organizations such as the South African Weather Service. This collection has now grown to $\pm 10\,000$ data points in the climate databank.

ARC-ISCW Agromet is involved in the following activities:

- **Climate Monitoring (Weather Station Network), Data Management and Dissemination**
 - Sending out reports, including Disease Warnings, Indices and Daily Data Reports
 - Disease warnings include: Powdery Mildew and Downy Mildew warnings
 - Indices calculated are: Evapotranspiration, Chill Units, Heat Units and other Temperature Thresholds
 - Elements include: Rainfall, Air Temperature, Sunshine Duration, Solar Radiation, Relative Humidity, Evaporation, Wind Speed and Wind Direction
- **Climate Analysis for Agricultural Purposes**
- **Crop Micro- and Meso-Climate Monitoring**
- **Crop-Climate Matching**
 - Crop Suitability Surfaces
- **Crop Growth Modeling**
- **Developing new Climatic Related Early Warning Systems**
- **Spatial Interpolation of Climate Elements**
 - Long-term Climate Surfaces
 - Climate Monitoring
- **Climate Classification according to the Köppen Climate Zones**



Powdery Mildew in Vineyards



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Earth Observation / Remote Sensing APPLICATIONS IN SOCIETAL BENEFIT AREAS

Disasters

- Drought
- Fire
- Locust Early Warning

Health

- Disease Vectors
- Illicit Drug Cultivation ID

Energy

- Tree Cover
- Biofuel Crop Estimation

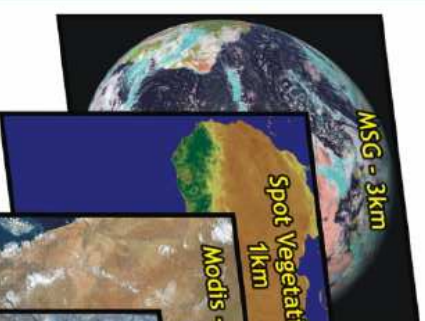
Climate

- Temperature Surfaces
- Soil Moisture Estimation
- Rainfall

Water

- Hydrology/Integrated Catchment Studies

arCsat



Spot Vegetation
1km

Modis - South Africa
500m

Landsat - Gauteng
30m

Aster - Johannesburg
15m

Spot - Pretoria
2.5m

Quickbird
Pretoria - 60cm

ARGeagle
Soutpansberg
28cm

Weather

- Cloud Boundaries
- Properties and Altitude

Ecosystems

- LandCover/Change
- Degradation
- Erosion
- Bush Thickness
- Deforestation

Agriculture

- Precision Agriculture
- Crop Estimation
- Forestry Inventories
- Rangeland Monitoring

Biodiversity

- Invader Vegetation Monitoring
- Landscape Diversity

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The Coarse Resolution Imagery Database (CRID)

NOAA AVHRR

The ARC-ISCW has an archive of daily NOAA AVHRR data dating from 1985 to 2004. This database includes all 5 bands as well as the Normalised Difference Vegetation Index (NDVI), Active Fire and Land Surface Temperature (LST) images. The NOAA data are used, for example, for crop production and grazing capacity estimation.

MODIS

MODIS data is distributed by the Land Processes Distributed Active Archive Center (LP DAAC), located at the U.S. Geological Survey's EROS Data Center. The MODIS sensor is more advanced than NOAA with regard to its high spatial (250 m² to 1 km²) and spectral resolution. The ARC-ISCW has an archive of MODIS (version 4 and 5) data.

- MODIS V4 from 2000 to 2006
- MODIS V5 from 2000 to present

Datasets include:

- MOD09 (Surface Reflectance)
- MOD11 (Land Surface Temperature)
- MOD13 (Vegetation Products)
- MOD14 (Active Fire)
- MOD15 (Leaf Area Index & Fraction of Photosynthetically Active Radiation)
- MOD17 (Gross Primary Productivity)
- MCD43 (Albedo & Nadir Reflectance)
- MCD45 (Burn Scar)

Coverage for version 5 includes South Africa, Namibia, Botswana, Zimbabwe and Mozambique.

More information:

<http://modis.gsfc.nasa.gov>

VG4AFRICA and GEOSUCCESS

SPOT NDVI data is provided courtesy of the VEGETATION Programme and the VGT4AFRICA project. The European Commission jointly developed the VEGETATION Programme. The VGT4AFRICA project disseminates VEGETATION

products in Africa through GEONET-Cast. ARC-ISCW has an archive of VEGETATION data dating from 1998 to the present. Other products distributed through VGT4AFRICA and GEOSUCCESS include Net Primary Productivity, Normalised Difference Wetness Index and Dry Matter Productivity data.

Meteosat Second Generation (MSG)

The ARC-ISCW has an operational MSG receiving station. Data from April 2005 to the present have been archived. MSG produces data with a 15-minute temporal resolution for the entire African continent. Over South Africa the spatial resolution of the data is in the order of 3 km. The ARC-ISCW investigated the potential for the development of products for application in agriculture. NDVI, LST and cloud cover products were some of the initial products derived from the MSG SEVIRI data. Other products derived from MSG used weather station data, including air temperature, humidity and solar radiation.



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The operational Coarse Resolution Imagery Database (CRID) project of ARC-ISCW is funded by the National Department of Agriculture, Forestry and Fisheries. Development of the monitoring system was made possible through LEAD funding from the Department of Science and Technology.

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To subscribe to the newsletter, please submit
a request to:

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What does Umlindi mean?

UMLINDI is the Zulu word for “the watchman”.

<http://www.agis.agric.za>

Disclaimer:

The ARC-ISCW and its collaborators have obtained data from sources believed to be reliable and have made every reasonable effort to ensure accuracy of the data. The ARC-ISCW and its collaborators cannot assume responsibility for errors and omissions in the data nor in the documentation accompanying them. The ARC-ISCW and its collaborators will not be held responsible for any consequence from the use or misuse of the data by any organisation or individual.