

# Role of EO technology on climate change

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South African National Space Agency

United Nations Symposium  
13 September 2023



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# SANSA Earth Observation

## Data and Infrastructure

- Collection, storage, archiving, processing and dissemination of satellite imagery
  - Sensor portfolio
  - HPC
  - Large data storage
  - Data cubes

## Research & Development

- Mission Planning
- New methodologies
- New algorithms
- Production of fundamental dataset
- HCD

## Coordination, development of products & services

- Collating user requirements.
- Collaborative mechanisms for developing Geospatial products and services.
- Industry Development
- Science Engagement



# SANSA STAKEHOLDERS



# Climate change & Earth observation technology



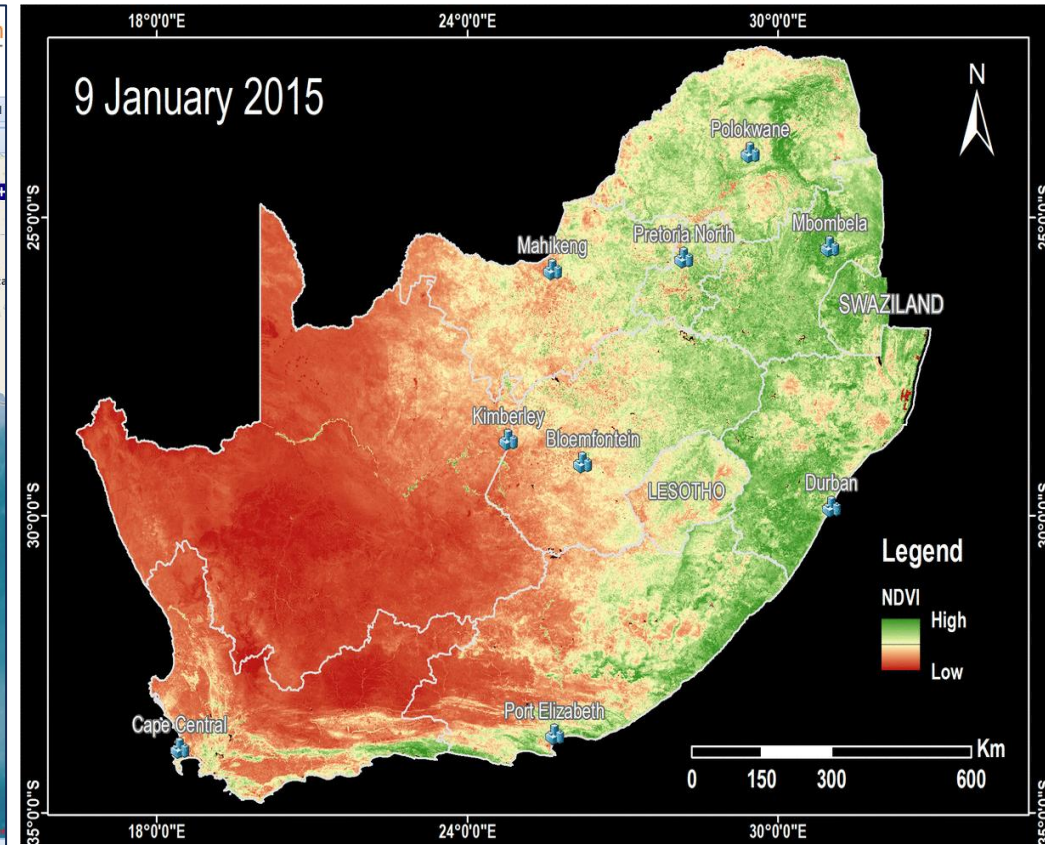
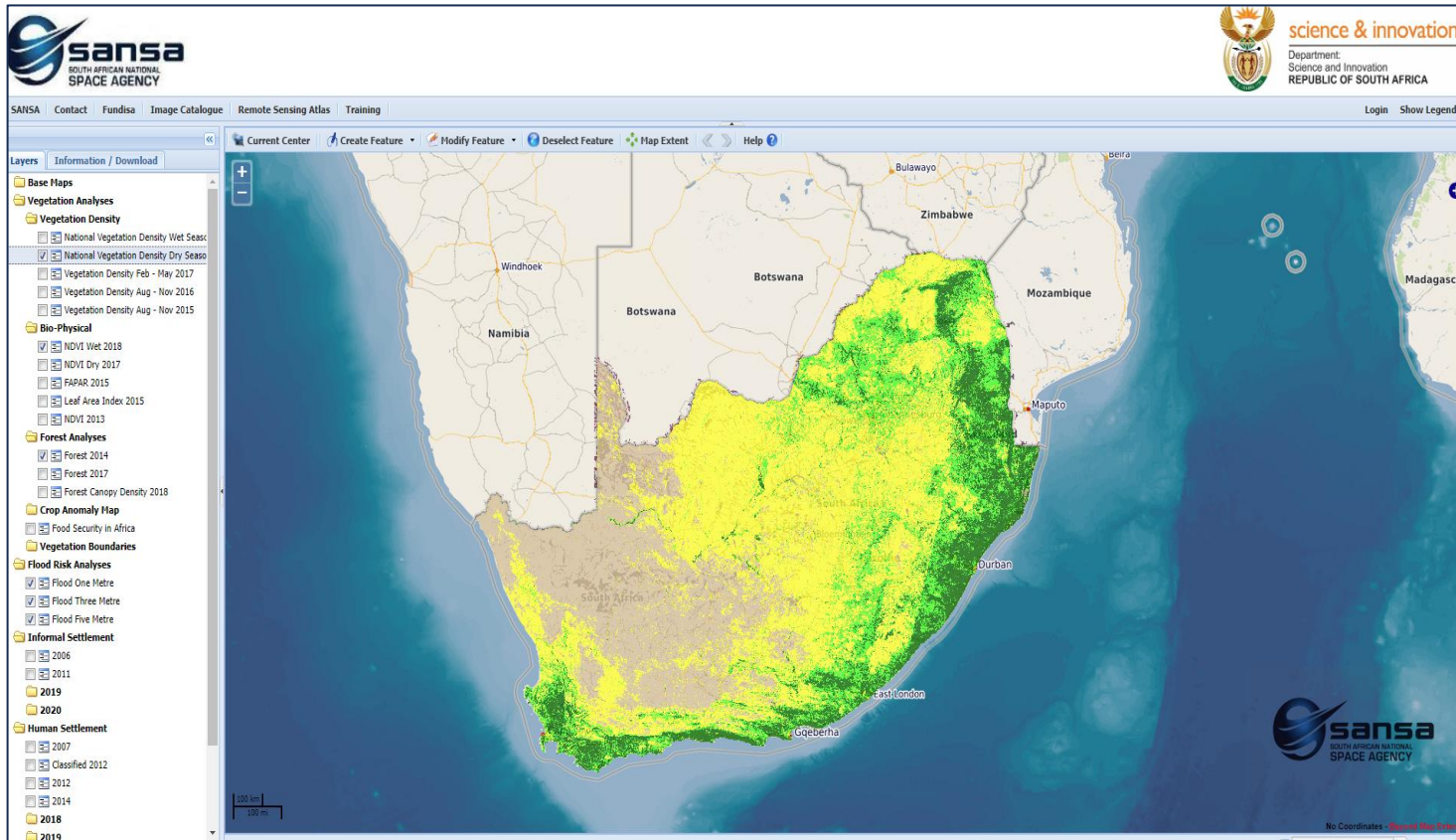
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# Vegetation condition monitoring



Vegetation condition changes due to drought

Layers (ZA only) can be accessed at :

<http://products.sansa.org.za/mapApp/index.html>



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# Drought monitoring tool : National Integrated Water Information System



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## NATIONAL INTEGRATED WATER INFORMATION SYSTEM

[Drought Status Overview](#)
[Vegetation Condition Status](#)
[Rainfall Status Overview](#)
[Runoff Status Overview](#)
[Dam Status Overview](#)
[Groundwater Status Overview](#)
[Drought Affected Settlements](#)

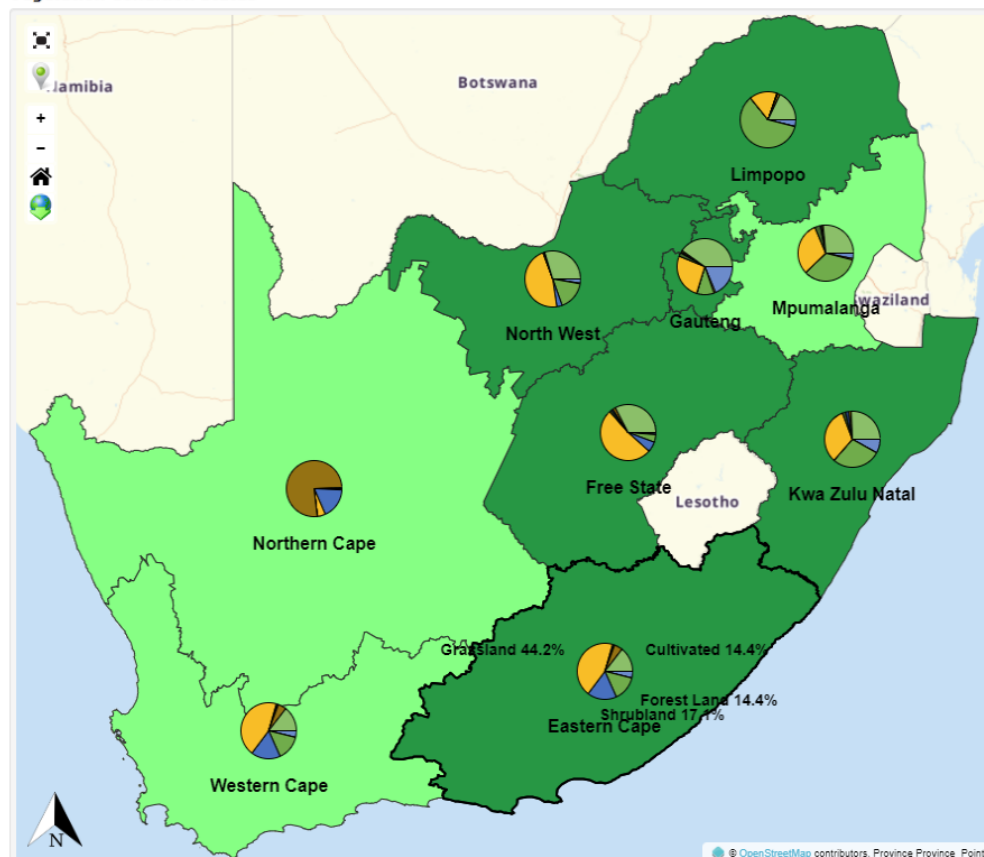
Disaster Management

Vegetation Condition Status

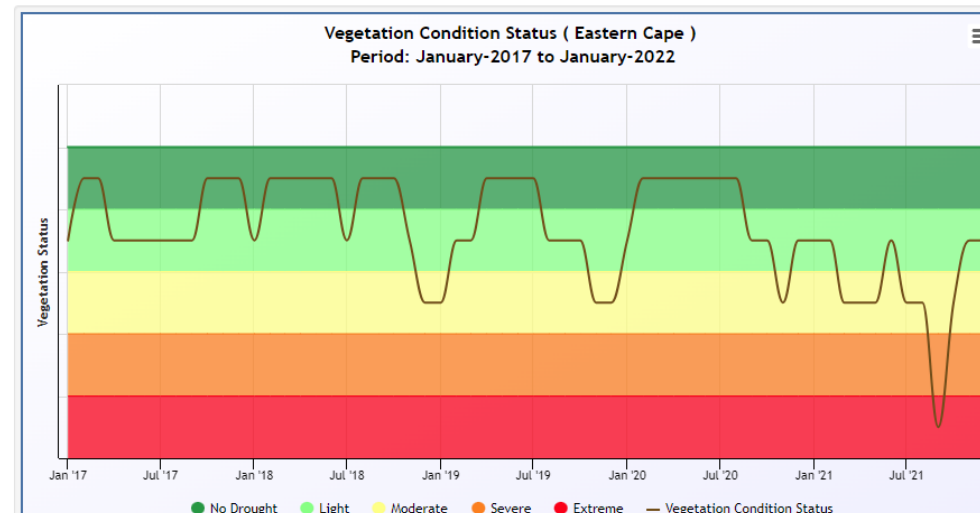


From: January-2017  
To: January-2022

Latest Data Available  
January-2022



Province	Drought Status Overview	Vegetation Condition	Rainfall Status Overview	Runoff Status Overview	Dams Status Overview	Groundwater Status Overview	Drought Status Outlook
Eastern Cape	No Drought	No Drought	Moderately High	Moderately Low	Moderately Low	Moderately Low	Stable
Free State	Very Wet	No Drought	High	Moderately High	High	Normal	Improving
Gauteng	Wet	No Drought	High	Normal	High	Normal	Improving
Kwa Zulu Natal	Wet	No Drought	Moderately High	Low	Moderately High	Normal	Stable
Limpopo	Wet	No Drought	High	Moderately Low	High	Normal	Improving
Mpumalanga	Wet	Light	High	Low	Moderately High	Normal	Stable
North West	Wet	No Drought	High	Normal	Moderately High	Normal	Improving
Northern Cape	Wet	Light	High	Moderately Low	High	Normal	Improving
Western Cape	Wet	Light	Moderately High	Low	High	Normal	Stable



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EO derived Vegetation Condition Index used as one of the drought indicators in the NIWI system owned by Department of Water and Sanitation



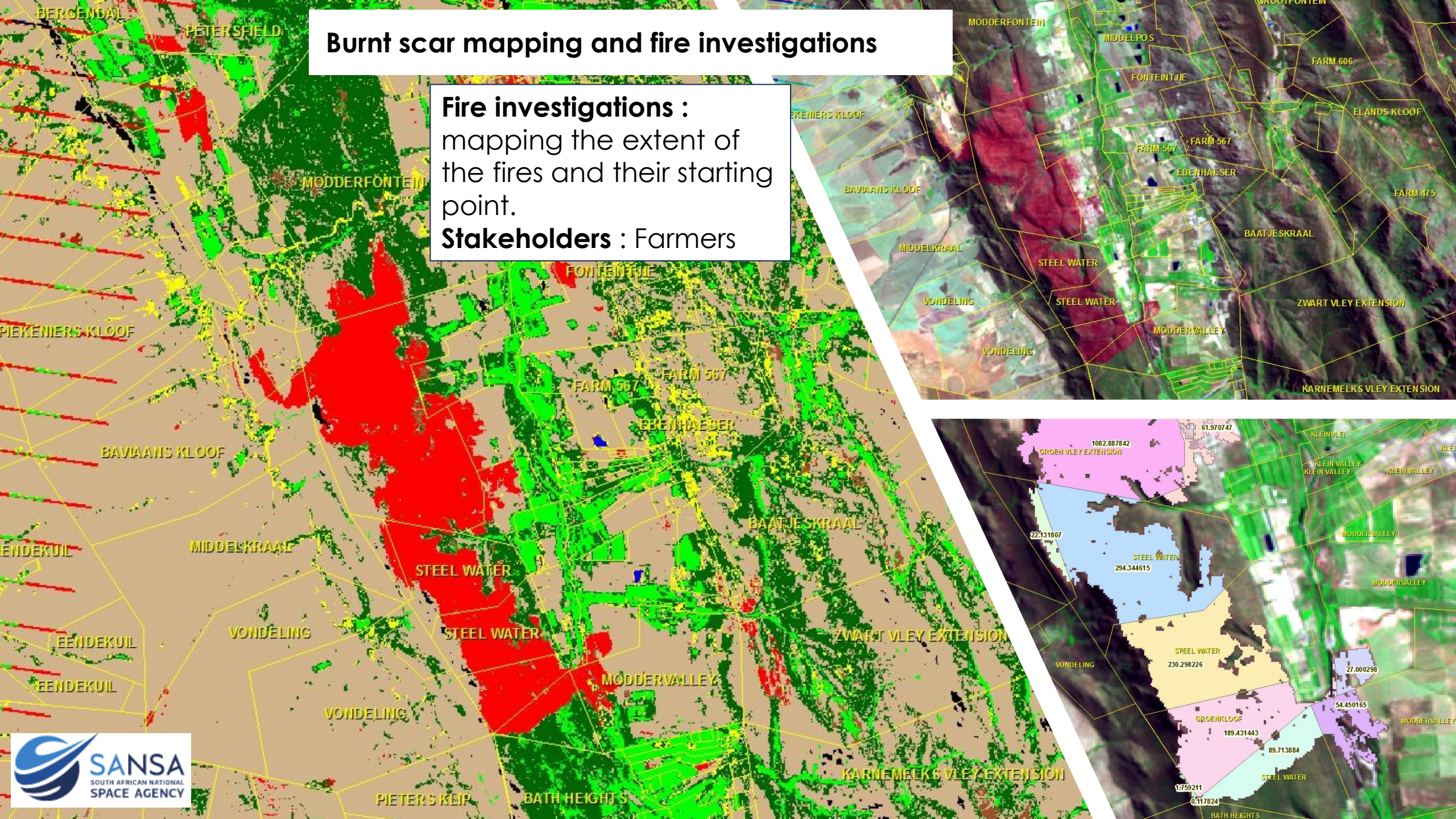
<https://www.dws.gov.za/niwis2/DroughtStatusManagement>



## Burnt scar mapping and fire investigations

**Fire investigations :**  
mapping the extent of  
the fires and their starting  
point.

**Stakeholders :** Farmers



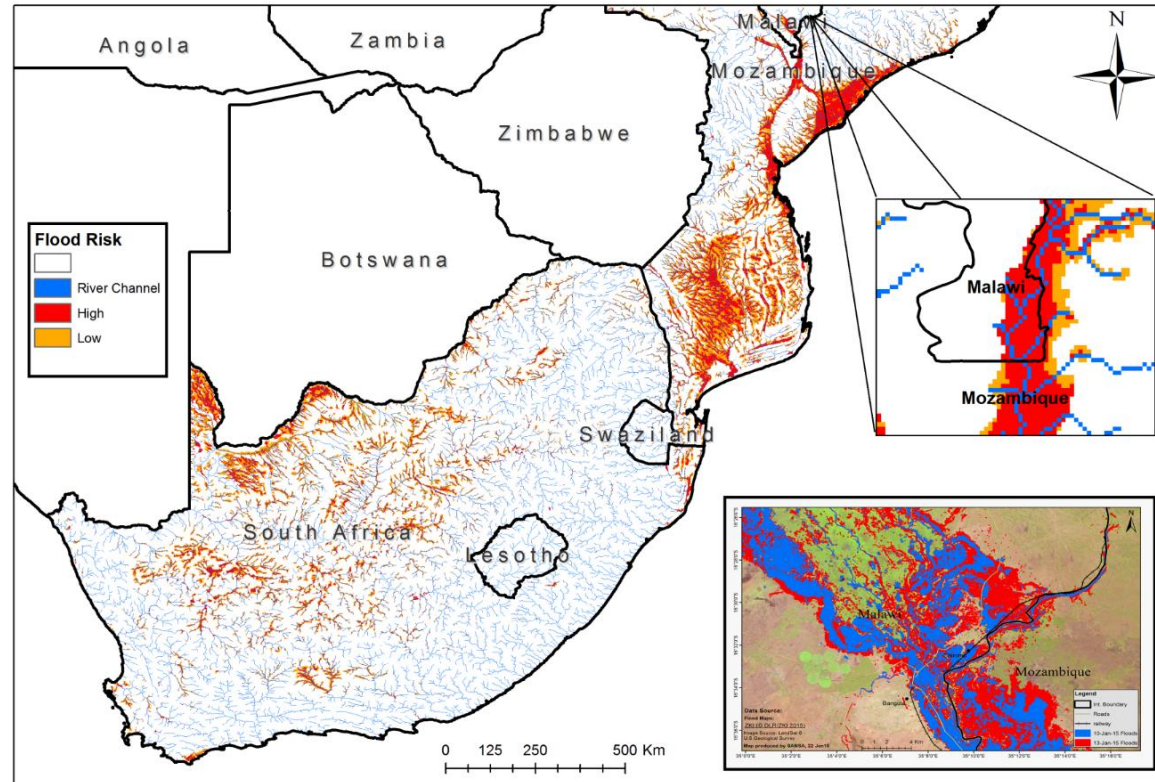


# Wild Fire Mapping : Advanced Fire Information system





# Flood Risk Map



Layer can be accessed at :  
<http://products.sansa.org.za/mapApp/index.html>

Flood inundation layers show areas that are likely to be flooded at 1 meter, 3 meter, and 5 meter rise in water levels.



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# Flood risk map example : Lydenburg Area



Flood inundation layer at 3m. Flood risk areas highlighted in blue



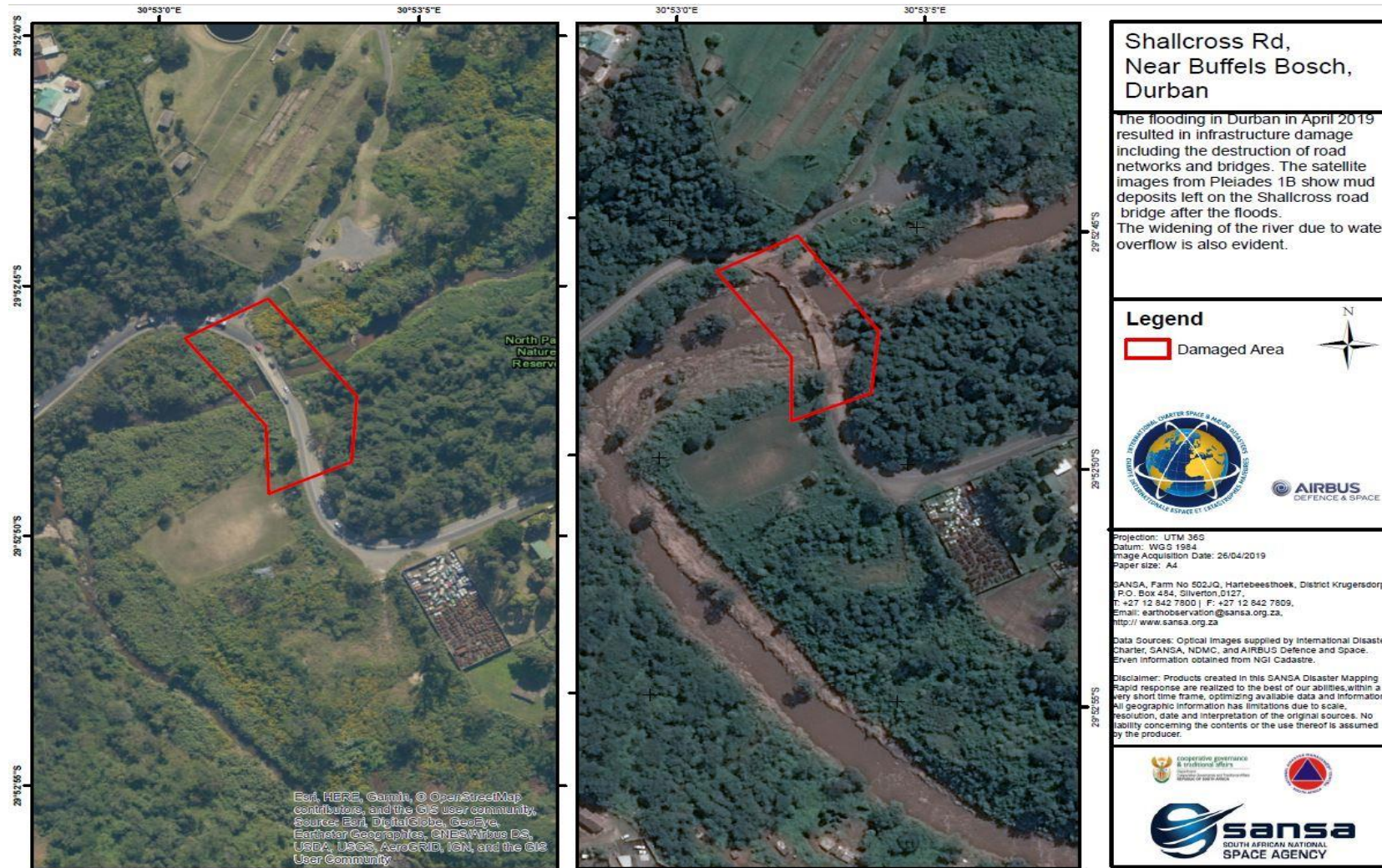
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# Post flooding damage assessment



The flooding in Durban in April 2019 resulted in infrastructure damage including the destruction of road networks and bridges, e.g. the Shallcross road bridge highlighted in red.



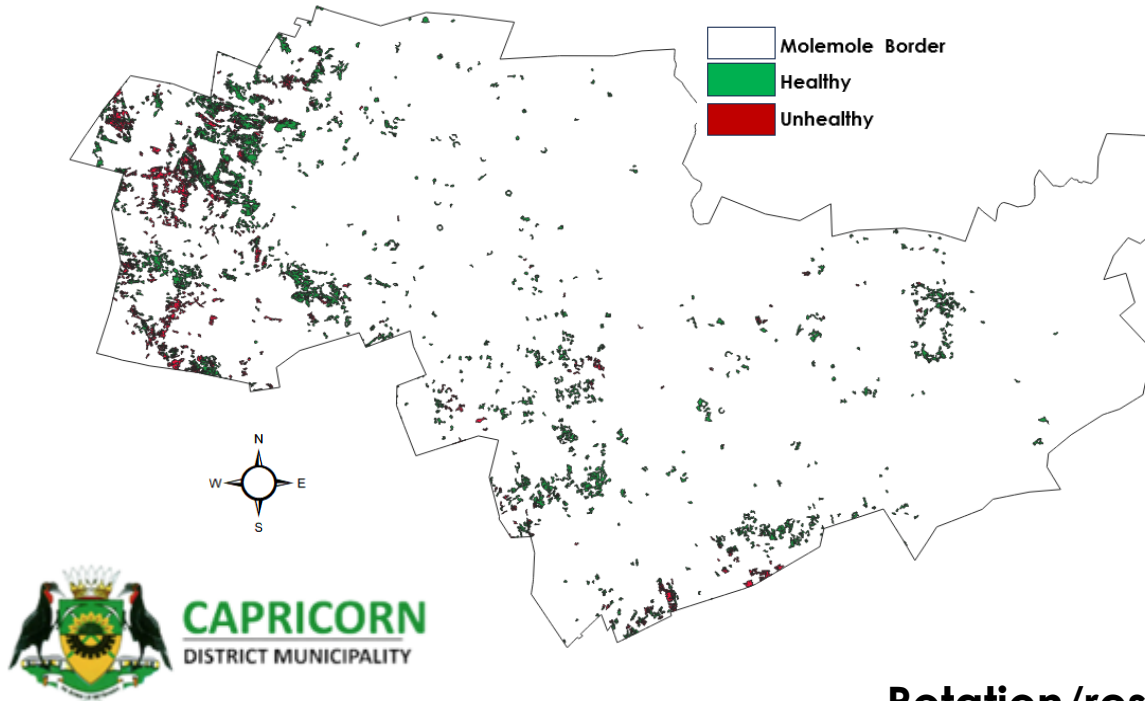
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# Rangelands health monitoring



- Assist livestock farmers with development of risk management and coping strategies.
- Support implementation, improvement and update of policies and assessing their effectiveness.

*Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)*

"the grazing/browsing capacity of veld and the maximum number and the kind of animals which may be kept on veld."

## Rotation/rest grazing system

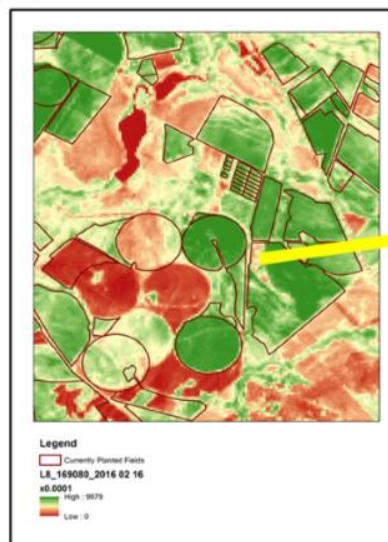
	Dec/Jan/Feb	Mar/Apr/May	June/July/Aug	Sept/Oct/Nov	Rest
Year 1	Camp A	Camp B	Camp C	Camp A	Camp D
Year 2	Camp B	Camp C	Camp D	Camp B	Camp A
Year 3	Camp C	Camp D	Camp A	Camp C	Camp B
Year 4	Camp D	Camp A	Camp B	Camp D	Camp C



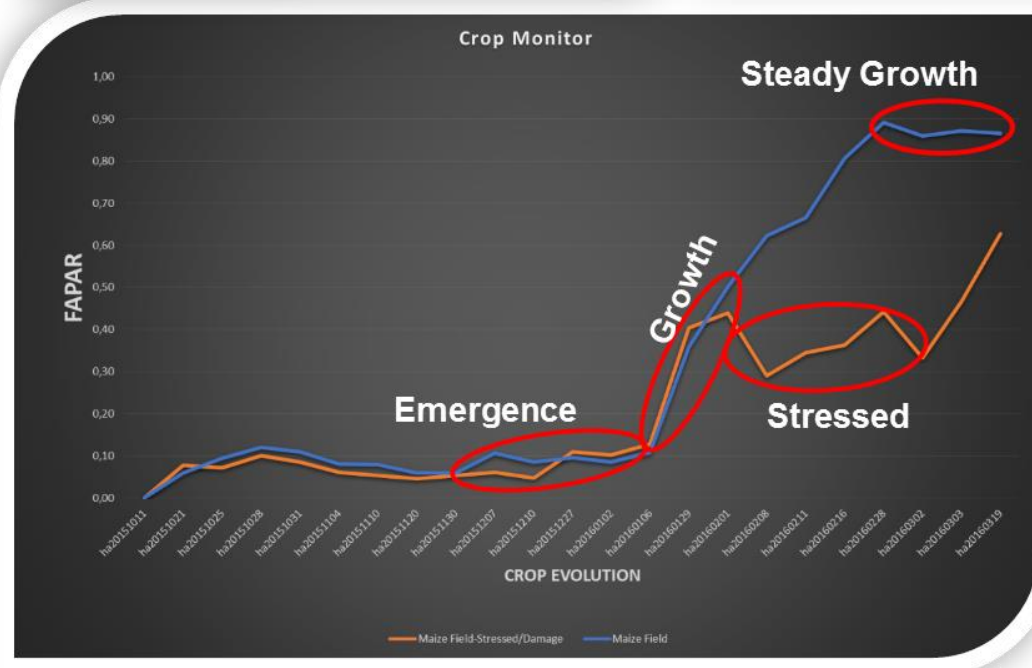
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## Crop Condition Monitoring



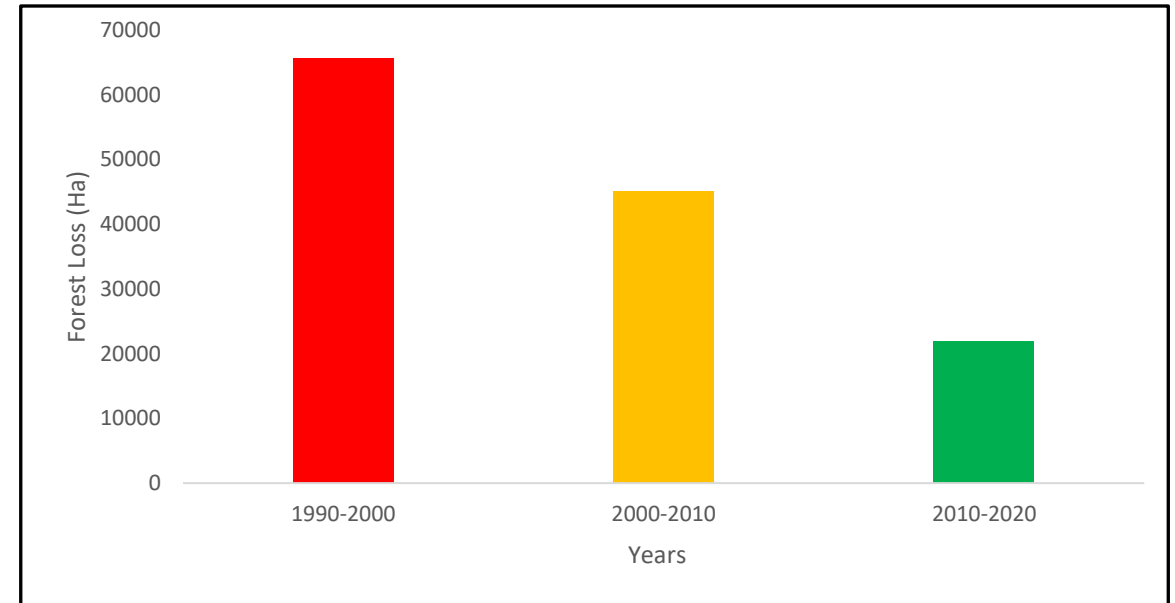
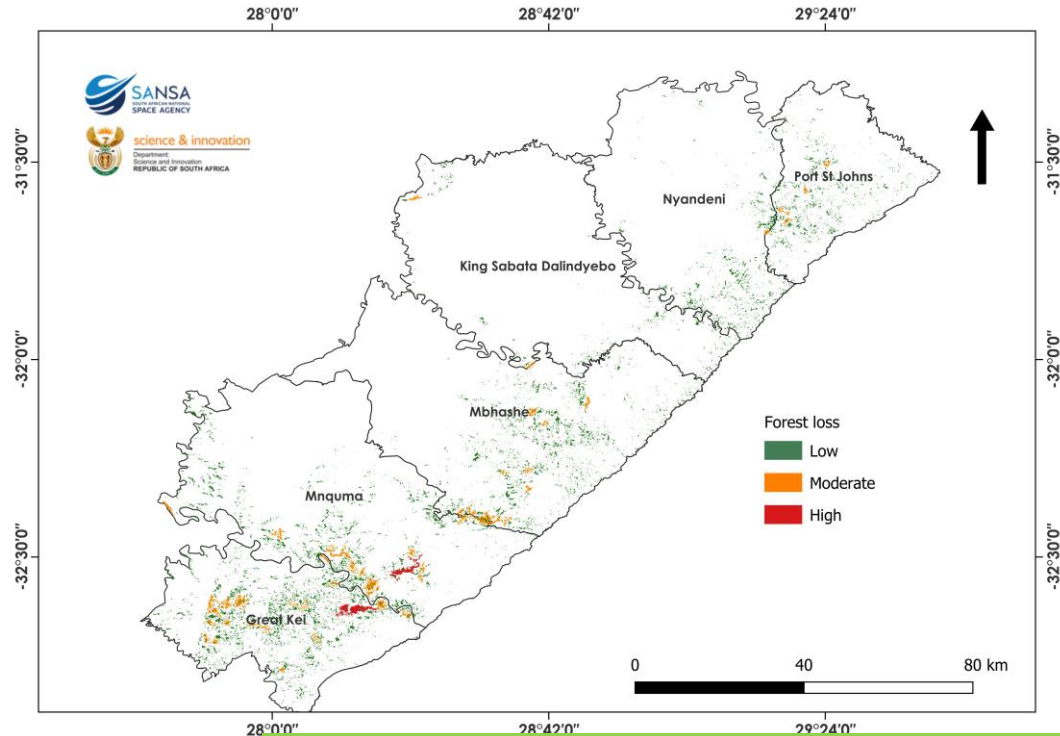
**CROP STRESS DUE TO :**  
**HAIL, PESTS,**  
**DISEASES, WATER & NUTRIENT DEFICIENCY, ETC**







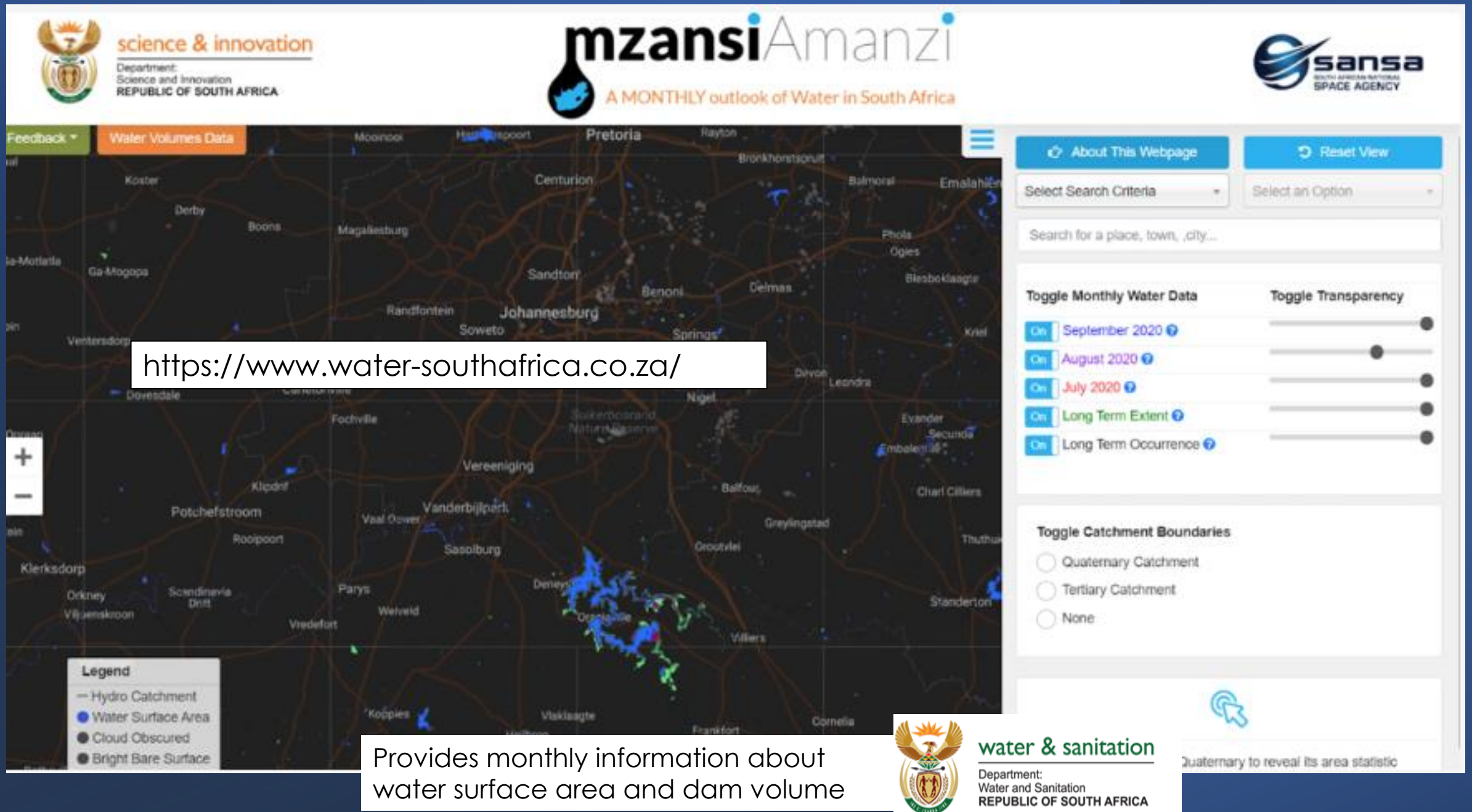
# Deforestation Mapping



- Deforestation in the Eastern Cape coastal indigenous forests between 1990 and 2020.
- About 132 448 Ha of forests lost in this period.
- Deforestation drivers include land use activities such as agriculture, human settlements, etc.



# Water resource management



<https://www.water-southafrica.co.za/>

Provides monthly information about water surface area and dam volume



# Training and outreach



- Training of government officials including teachers.
- Awareness campaigns in collaboration with govt departments and other entities



Remote Sensing for Municipalities Training Programme		
TIME	AGENDA ITEM	RESPONSIBLE PERSON
DAY 1		
08:30-09:00	1. Registration and tea	
09:00-09:05	2. Welcoming remarks & opening prayer	CDM
09:05-09:15	3. Acknowledgement of guests & introduction	CDM
09:15-09:30	4. Purpose of the learning exchange and agenda	CDM AND SANSa
09:30-11:00	5. Introduction to remote sensing and earth observation technology	SANSa
11:00-12:30	6. Remote sensing for Agriculture:	SANSa

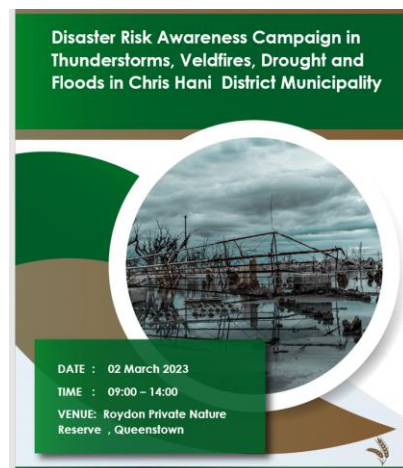
## Upcoming training :

“The use of Earth observation and geospatial technology to support decision making in local municipalities “

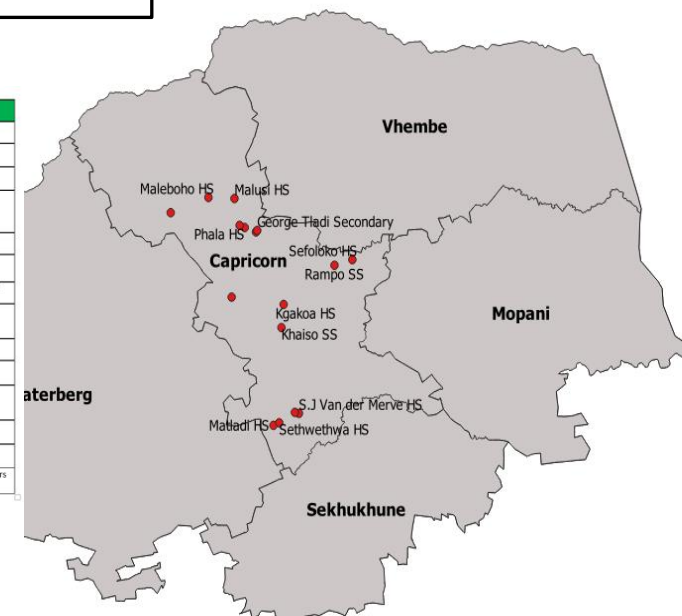
Date : 27 September 2023

Registration link :

<https://www.unoosa.org/oosa/en/ourwork/psa/schedule/2023/sansa-training.html> .



Time	Item	Speaker/Action By
08:00-08:50	Arrival and Registration	All
09:00-09:10	Opening prayer and remarks	Programme Director
09:10-09:20	Welcoming of Guests	Mr Majavu
09:20-09:40	Purpose of the day	Mr Karabo Raykhache
	DALRRD Presentation	Dr Shirene Shwababa
10:00-10:30	Tea Break	Tea Break
10:30-10:50	Role of PDMC during Veldfires, Floods, Thunderstorms and Droughts	Mr Phisoa Mabandla Mr Vusumuzi Mgebezi
10:50-11:10	Working on Fire	Mr Zola Hana/ Mr Teko Mooki
11:10-11:30	Role of Department of Environment, Forestry and Fisheries for Fire Protection Associations	Mr Sonwabo Namba
11:30-11:50	Role of EC Umbrella Fire Protection Association	Mr
11:50-12:10	SAWS Weather SMART Pies	Mr Ezekiel Selego
12:10-12:30	Role of South African National Space Agency (SANSa)	Ms Nontso Maseko
12:30-13:20	Questions & Answers	Programme Director
13:20-13:30	Vote of Thanks	Ms Jaji
13:40-14:40	LUNCH	DALRRD, SAWS & Exhibitors



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# Thank you!

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