



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



NEPAD
TRANSFORMING AFRICA



Application of GIS to Fast Track Planning and Monitoring of Development Agenda

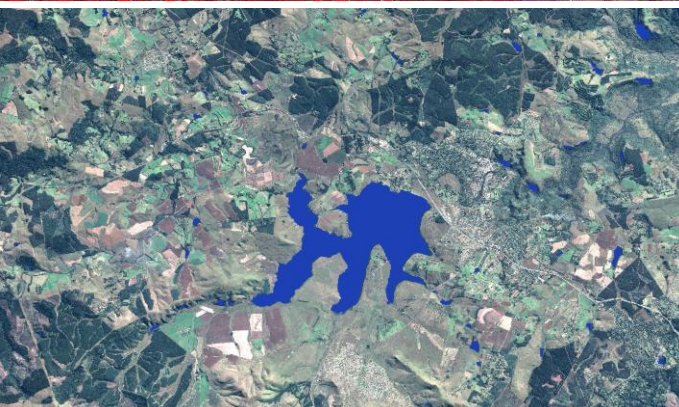
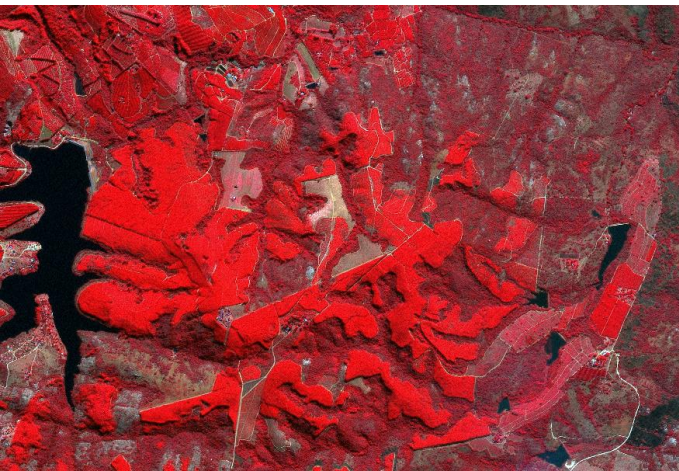
Agriculture Applications

13 – 17 August 2018

2 ZERO
HUNGER



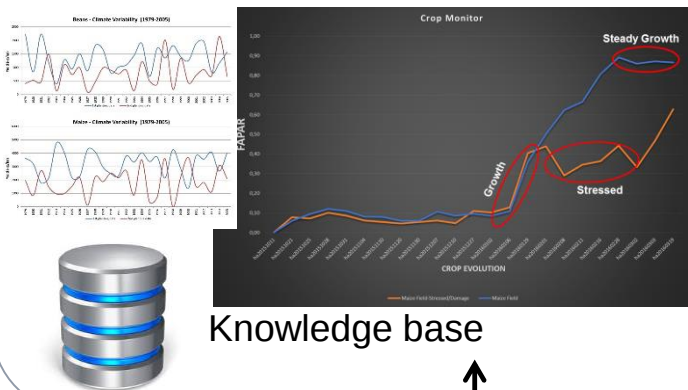
Agricultural Resources Monitoring



- crop type classification
- crop condition assessment
- crop yield estimation
- mapping of soil characteristics
- mapping of soil management practices
- Rangelands Monitoring & Assessment
- compliance monitoring (farming practices).

Concept Framework & ICT Integration

Analysis (domain knowledge)



- Products
- Reports
- Alerts

Dissemination

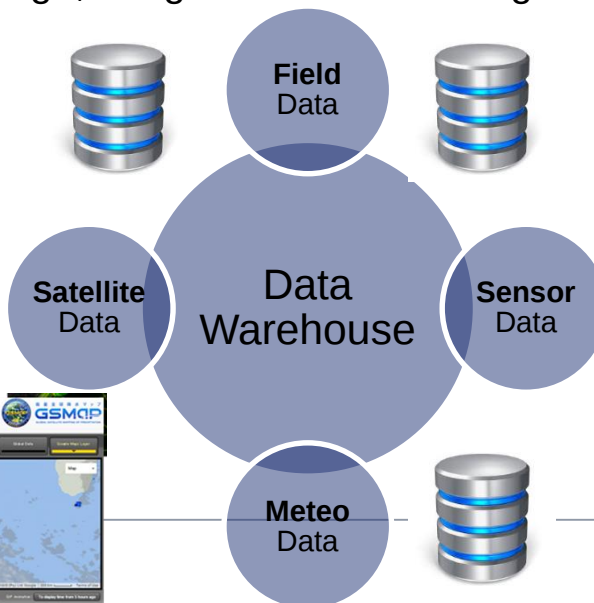


Information sharing

Data sources



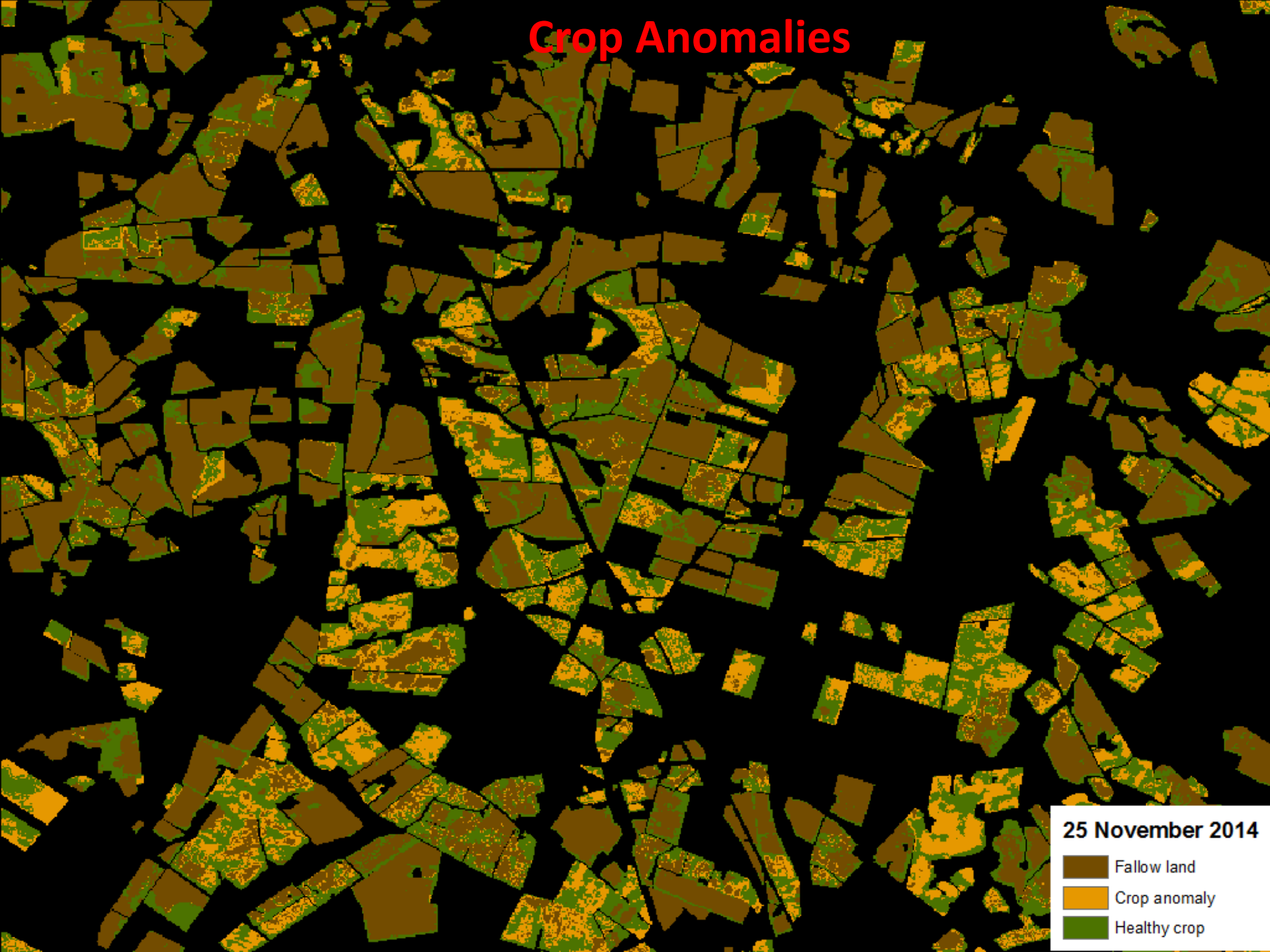
Storage, Integration & Processing



Parallel processing



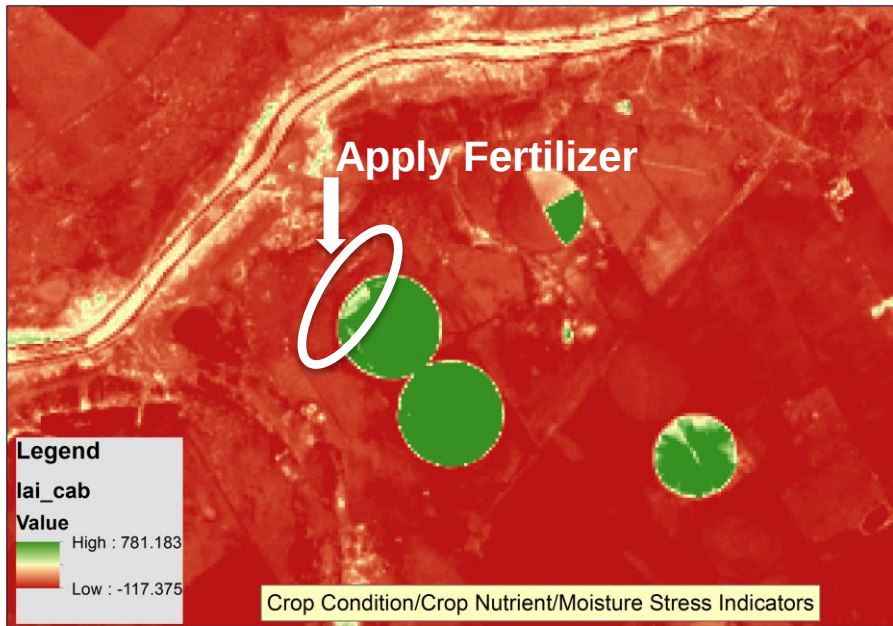
Crop Anomalies



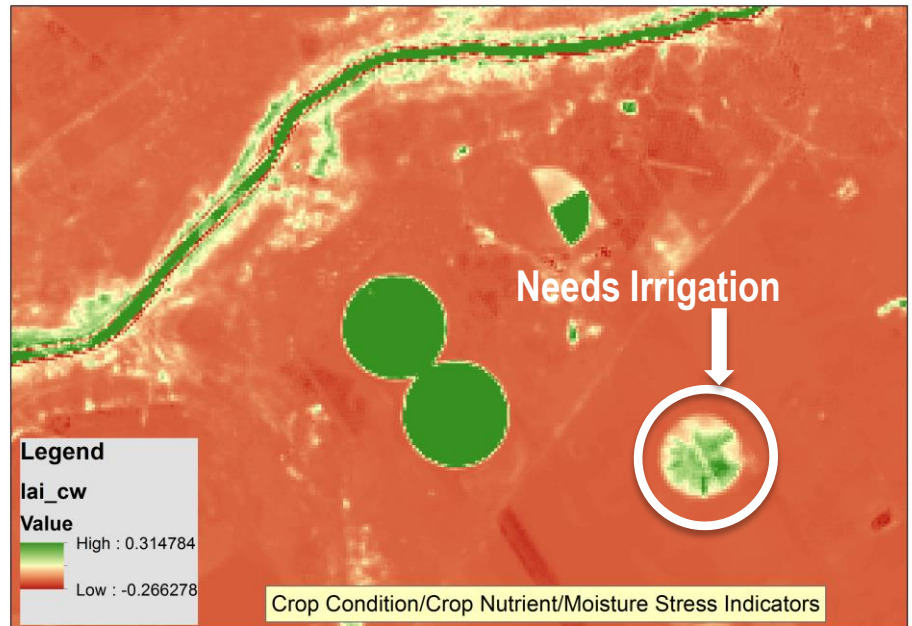
25 November 2014

-  Fallow land
-  Crop anomaly
-  Healthy crop

Relative Canopy Leaf Chlorophyll stress

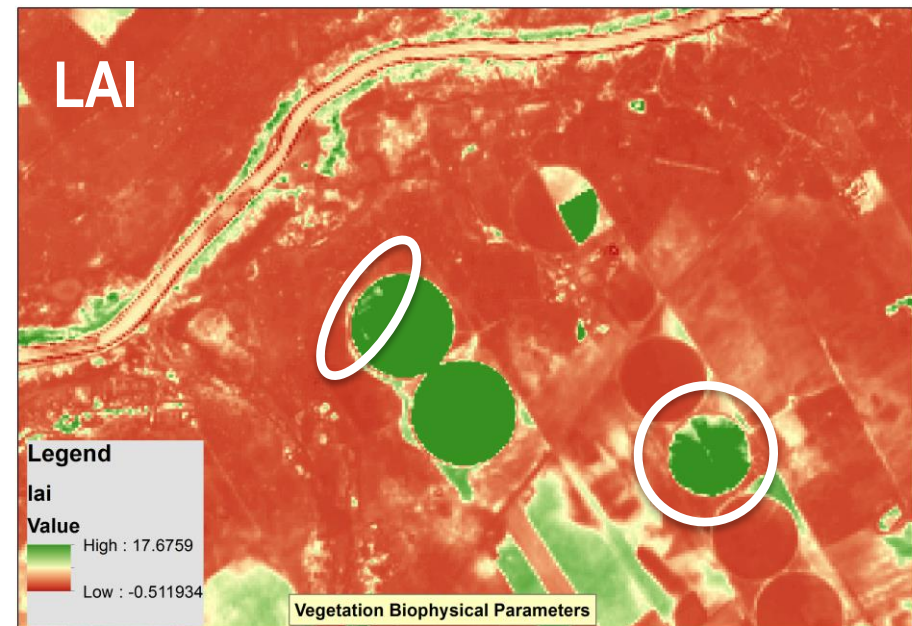


Relative Canopy Leaf Water Stress

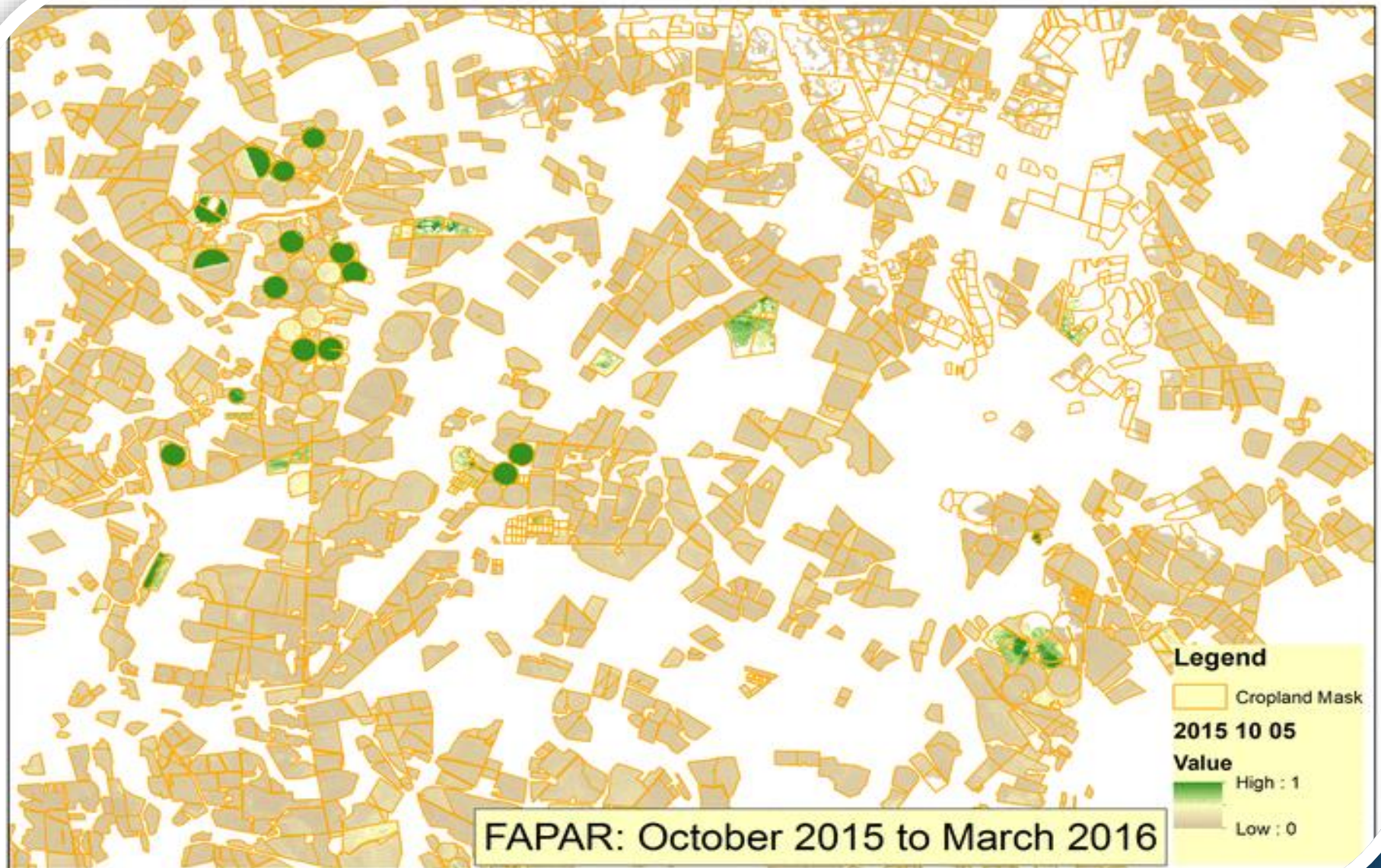


Summary

The two crop fields assessed above displayed symptoms of vegetation stress due to low relative canopy **leaf chlorophyll (CChl)** and relative canopy **leaf water (CW)** values. These two fields were analyzed using retrieved biophysical parameters from sentinel 2 image. The CChl and CW were modelled with the Leaf Area Index (LAI) values to assess whether the low values were, in fact, a cause of stress or a result of a sparse vegetation cover/density.



Field Crops Evolution & Cropped Area Fraction



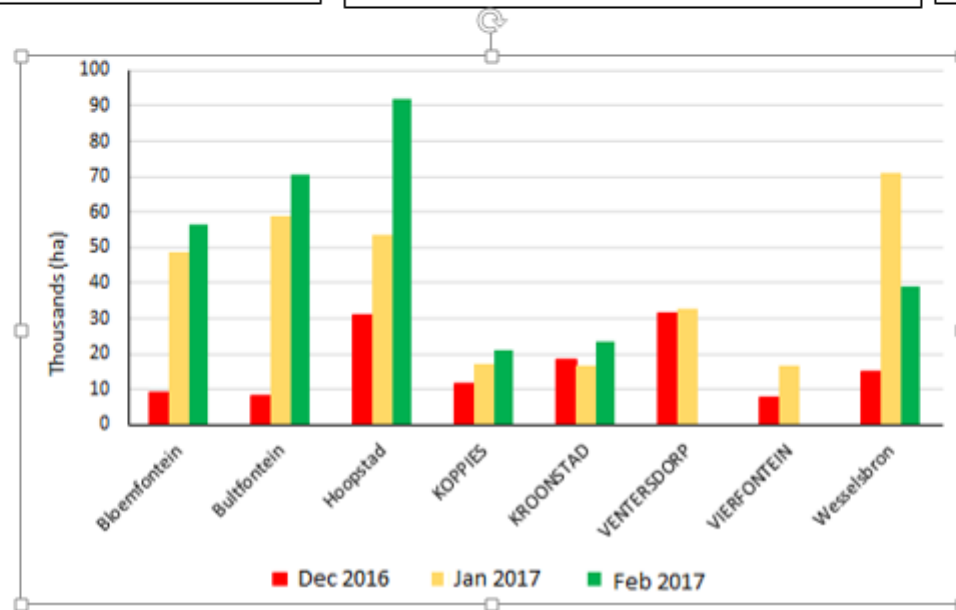
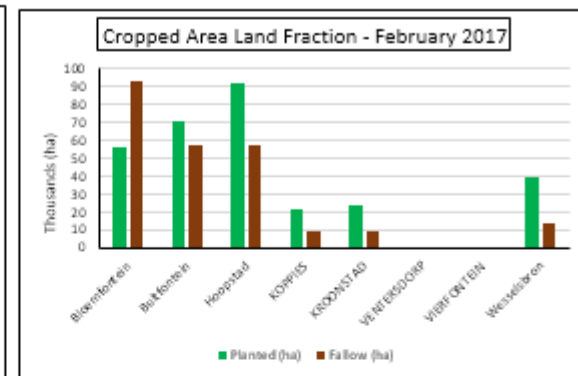
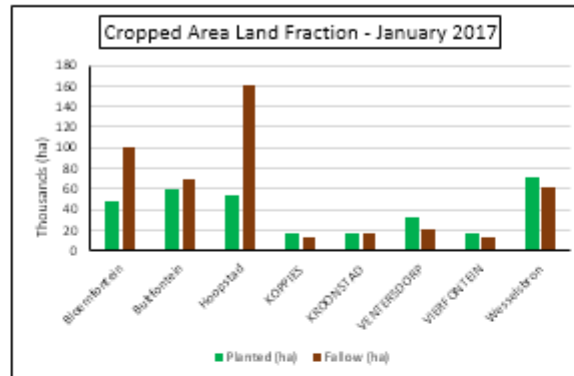
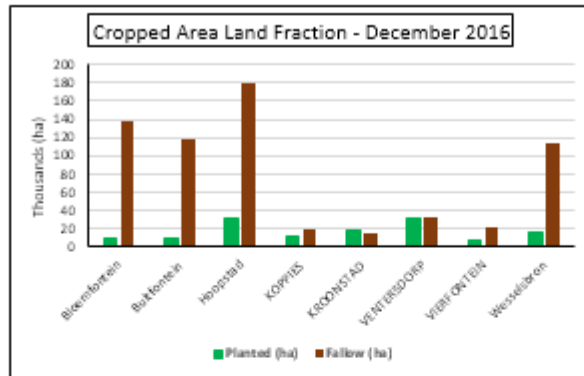
Crop Area Estimates

Service Area	Sum (excluding Pivot Irrigation, Horticulture / Viticulture & Shadenet)	Area: Pivot Irrigation, Horticulture / Viticulture & Shadenet (ha)	Planted (ha)	Fallow (ha)	Sum (excluding Pivot Irrigation, Horticulture / Viticulture & Shadenet) - P.Pastures	P.Patures	% Planted	Image Date
Bloemfontein	146950.69	9854.68	9277.01	137673.68	143113.69	3837.00	6.48	06-12-2016
Bultfontein	125527.90	4622.97	8277.18	117250.72	118827.90	6700.00	6.97	06-12-2016
Hoopstad	211018.85	10954.49	30988.69	180030.16	204621.85	6397.00	15.14	06-12-2016
KOPPIES	30016.07	461.15	11726.49	18289.58	29561.07	455.00	39.67	03-12-2016
KROONSTAD	32311.63	412.99	18598.99	13712.64	32133.63	178.00	57.88	03-12-2016
VENTERSDORP	64289.82	4821.76	31709.65	32580.17	64096.82	193.00	49.47	06-12-2016
VIERFONTEIN	29920.77	916.21	7849.11	22071.66	29859.77	61.00	26.29	06-12-2016
Wesselsbron	128143.98	5543.07	15017.74	113126.24	122169.98	5974.00	12.29	06-12-2016

[illegible]

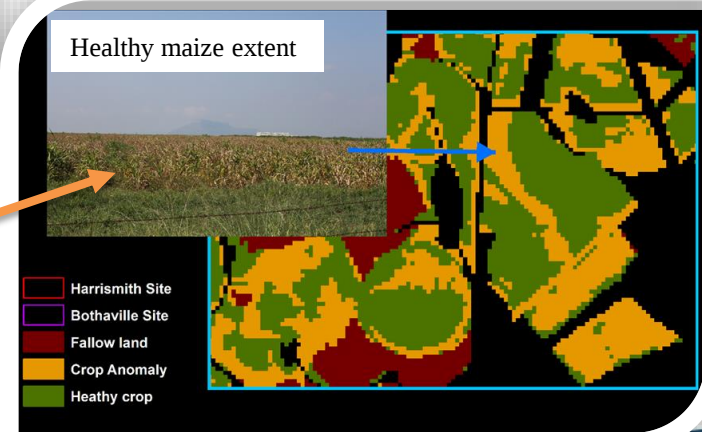
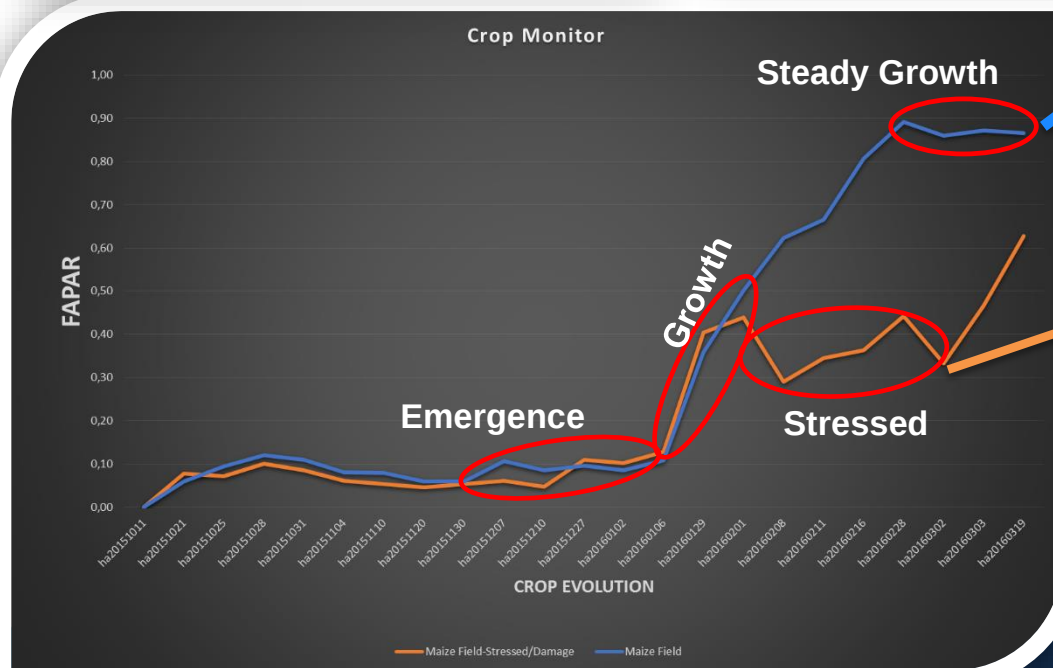
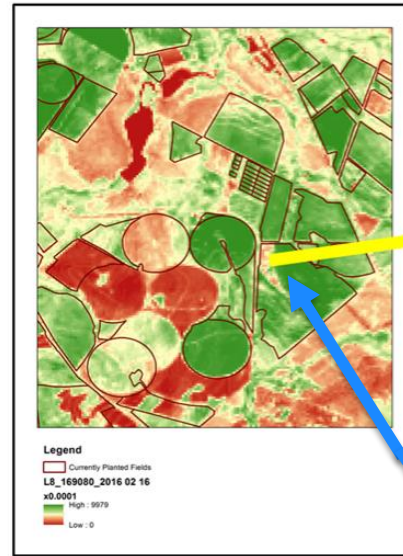
Cropped Area Estimation

Crop Area Statistics 2016/17

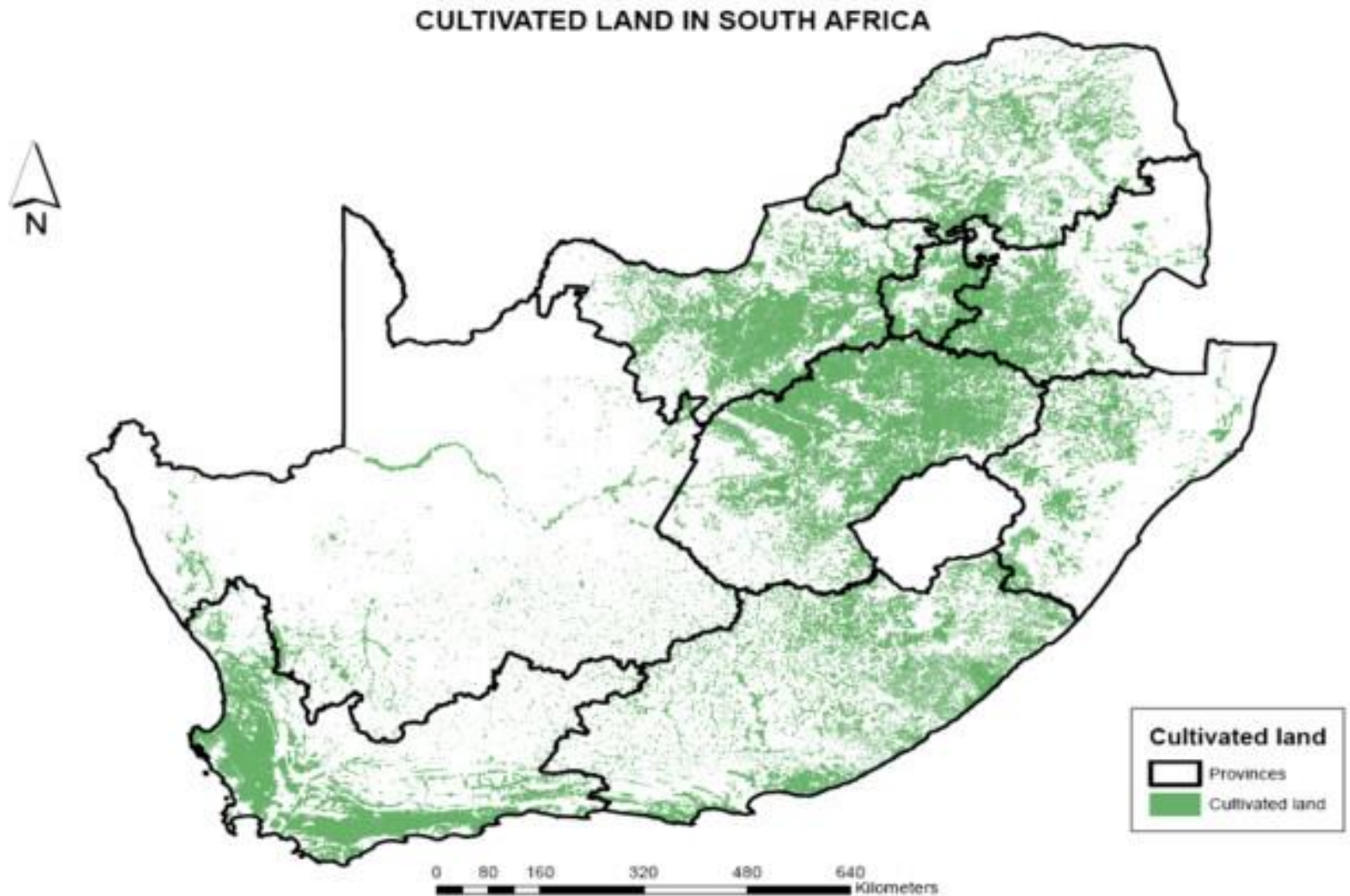


Application examples

Field verification & Validation



Cropland monitoring



Summary of Possible Applications

End-User	Application
Farmers and cooperatives	Farm level information to optimise productivity
National and provincial departments	Information for compliance monitoring to determine problem areas, disaster management and food security imperatives
Crop insurance companies Satellite-based Index based insurance / micro-insurance	Determine appropriate premiums, verify damage and quantify scope, extent, and magnitude of claims
Financial/lending stock exchange/trading institutions	Crop outlook and risk insurance information



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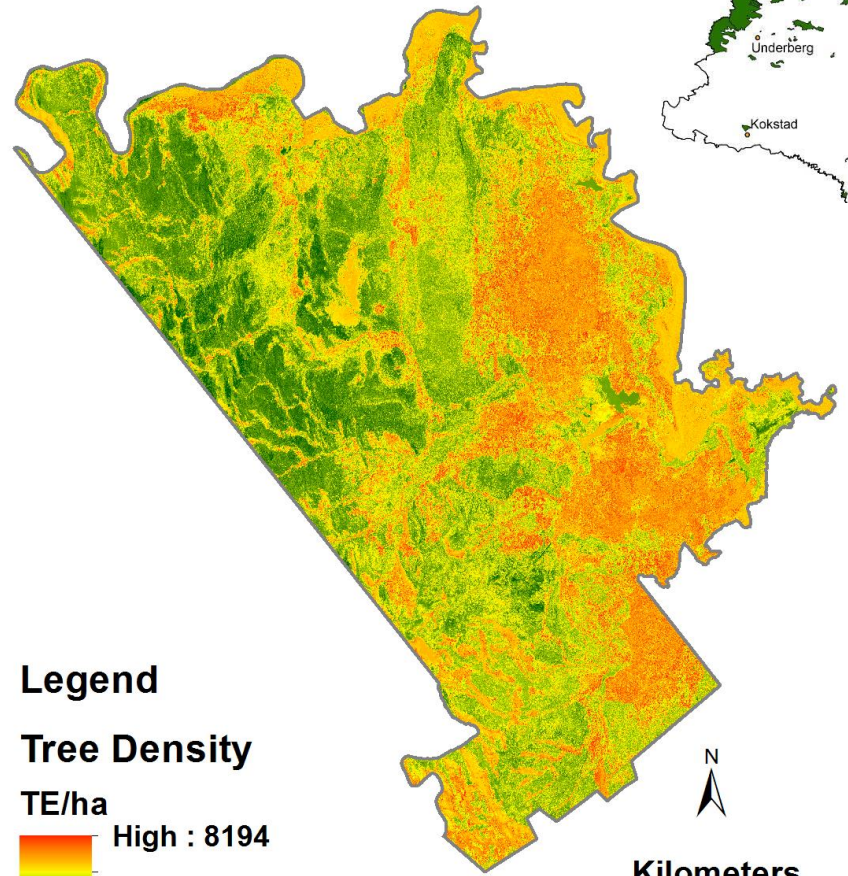
Application of GIS to Fast Track Planning and Monitoring of Development Agenda

Vegetation and Forestry
Applications

13 – 17 August 2018



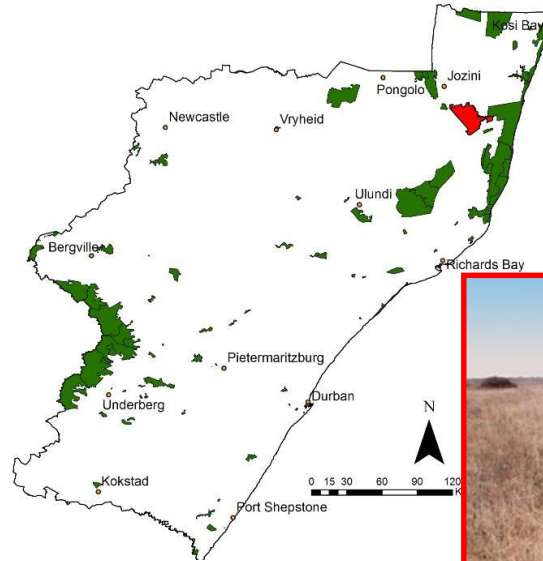
Bush Encroachment



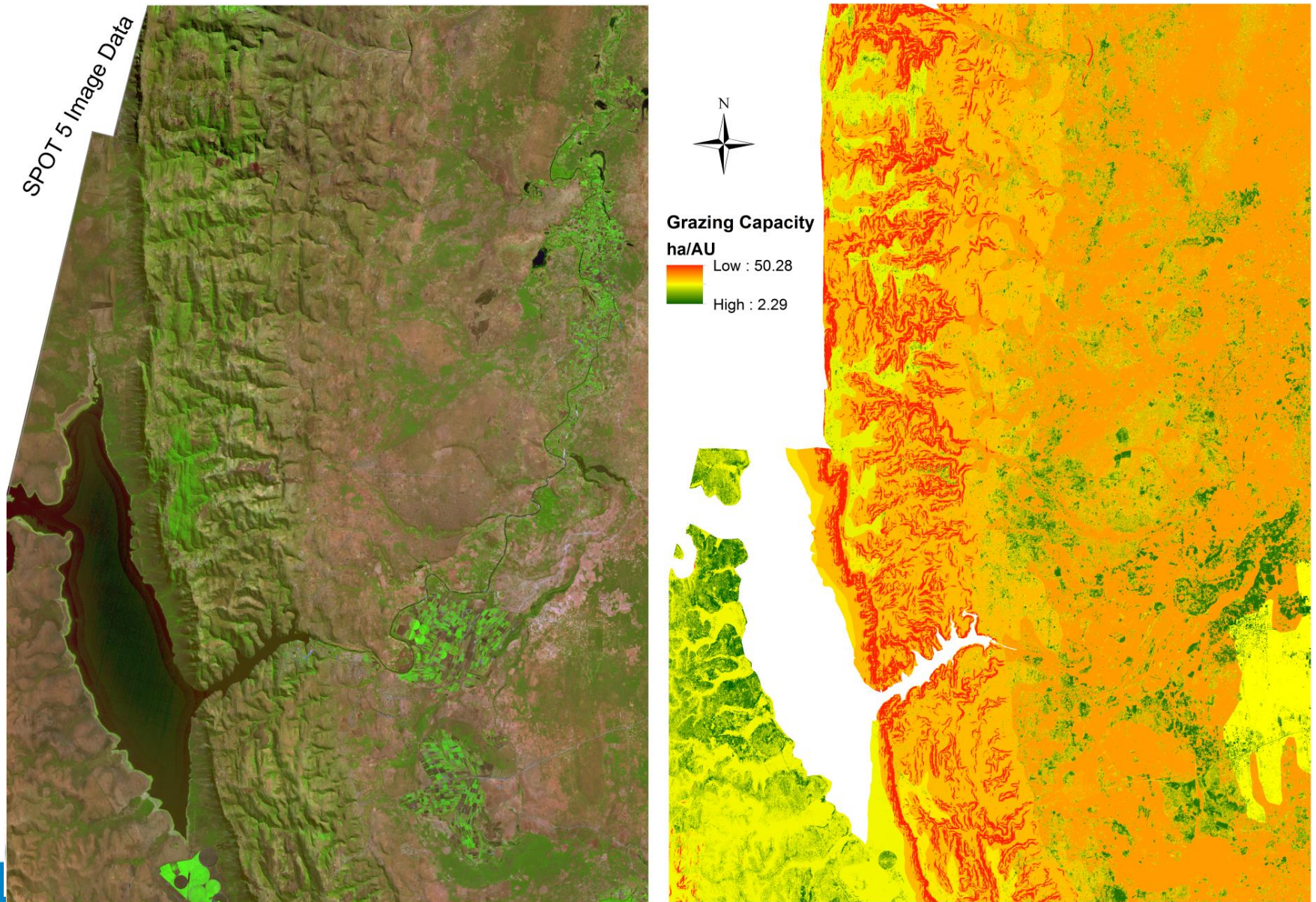
Legend

Tree Density

TE/ha
High : 8194
Low : 632

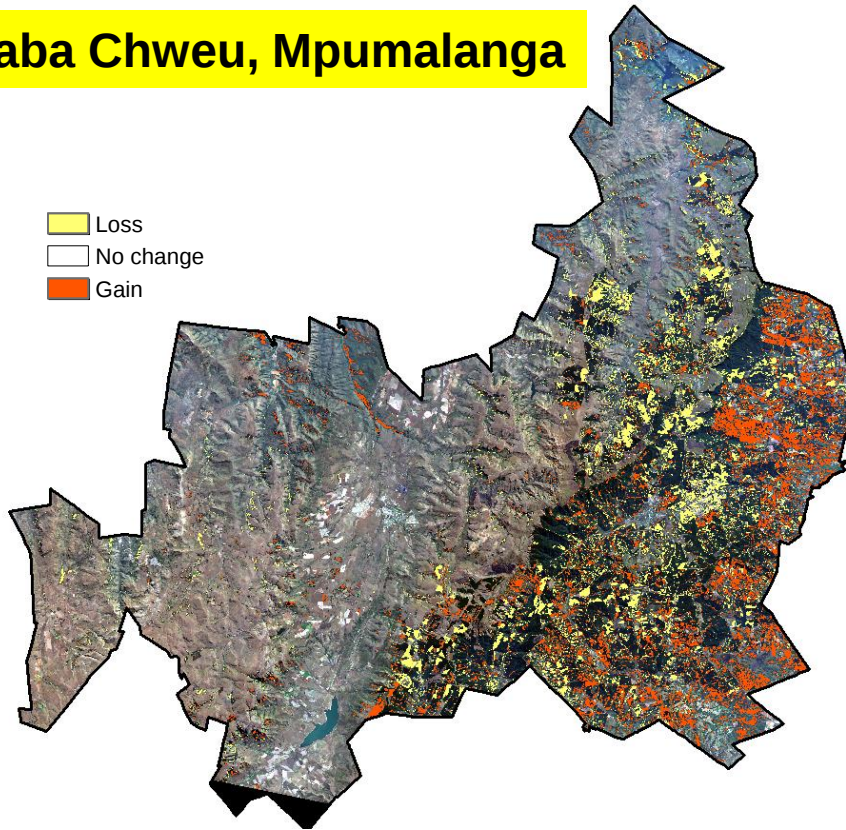


Grazing capacity

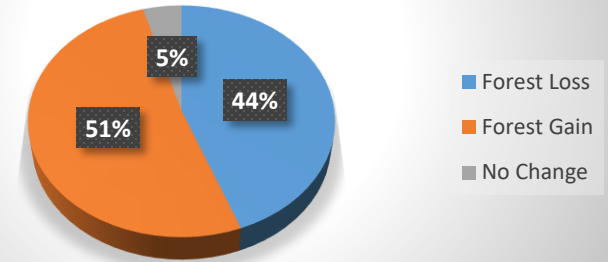


Deforestation, afforestation, reforestation, compliance

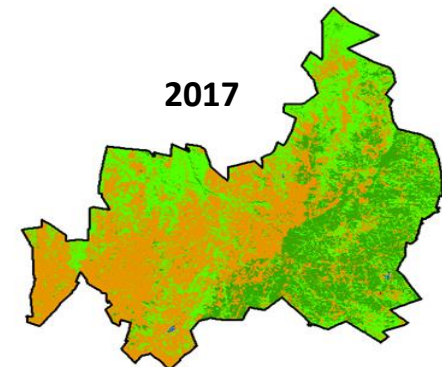
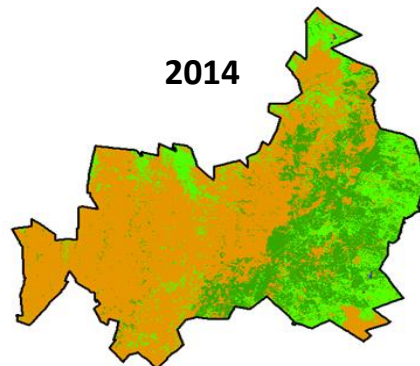
Thaba Chweu, Mpumalanga



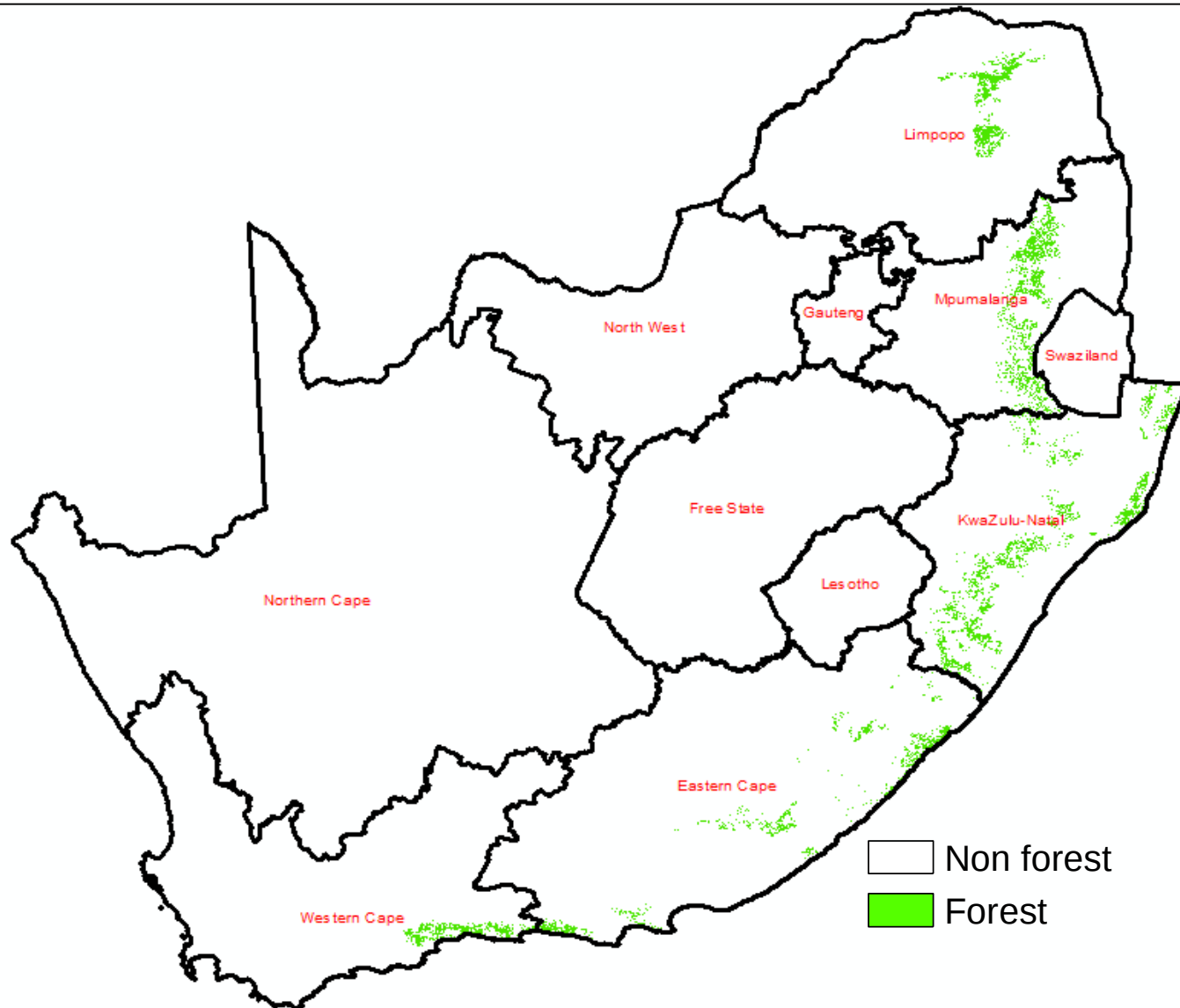
Forest Change in Thaba Chweu (2014 - 2017)



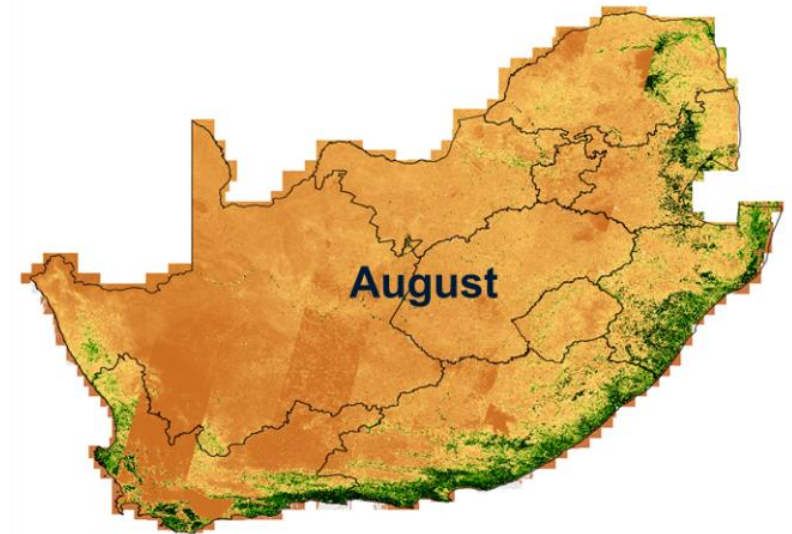
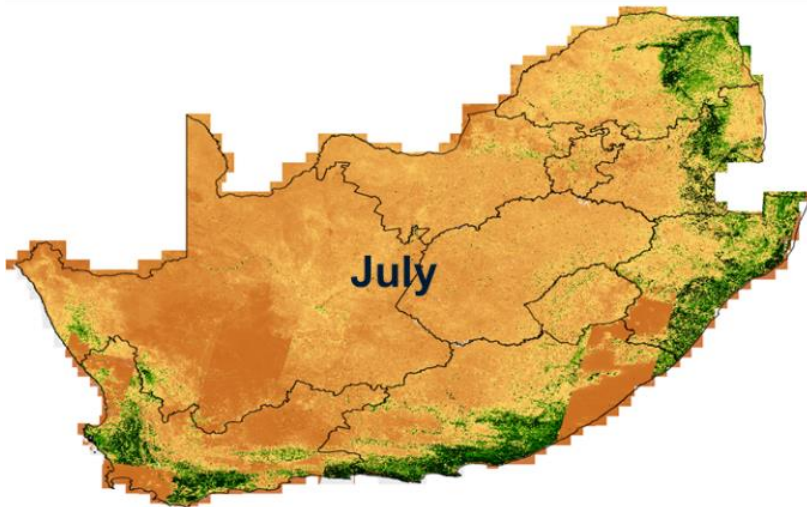
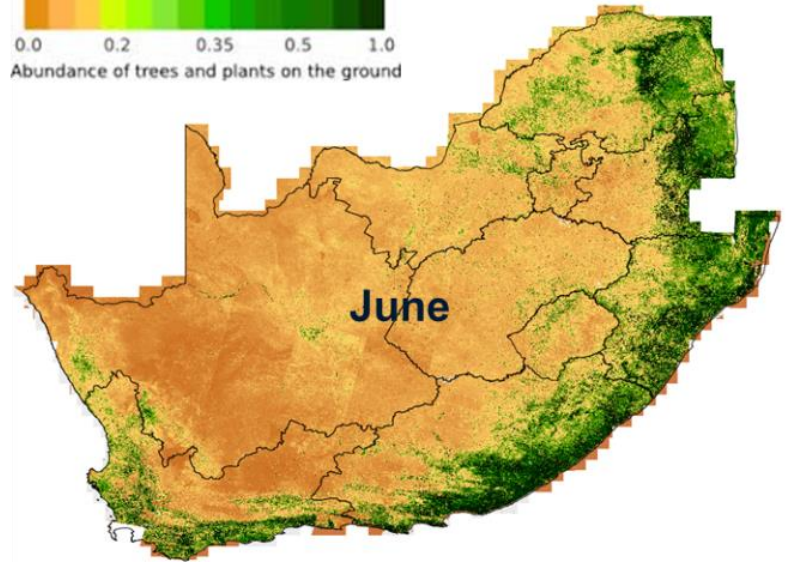
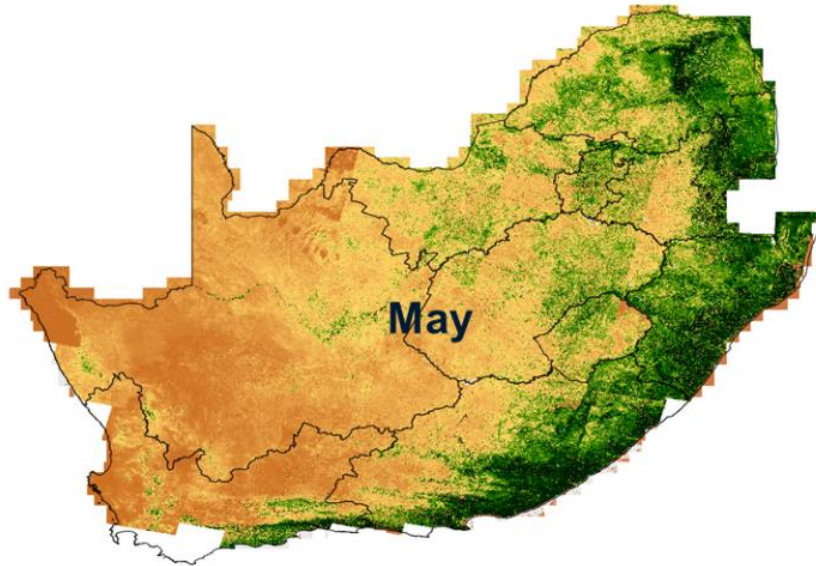
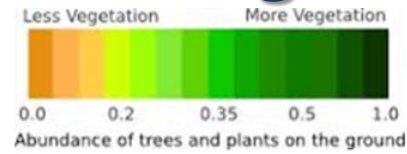
In Support of :



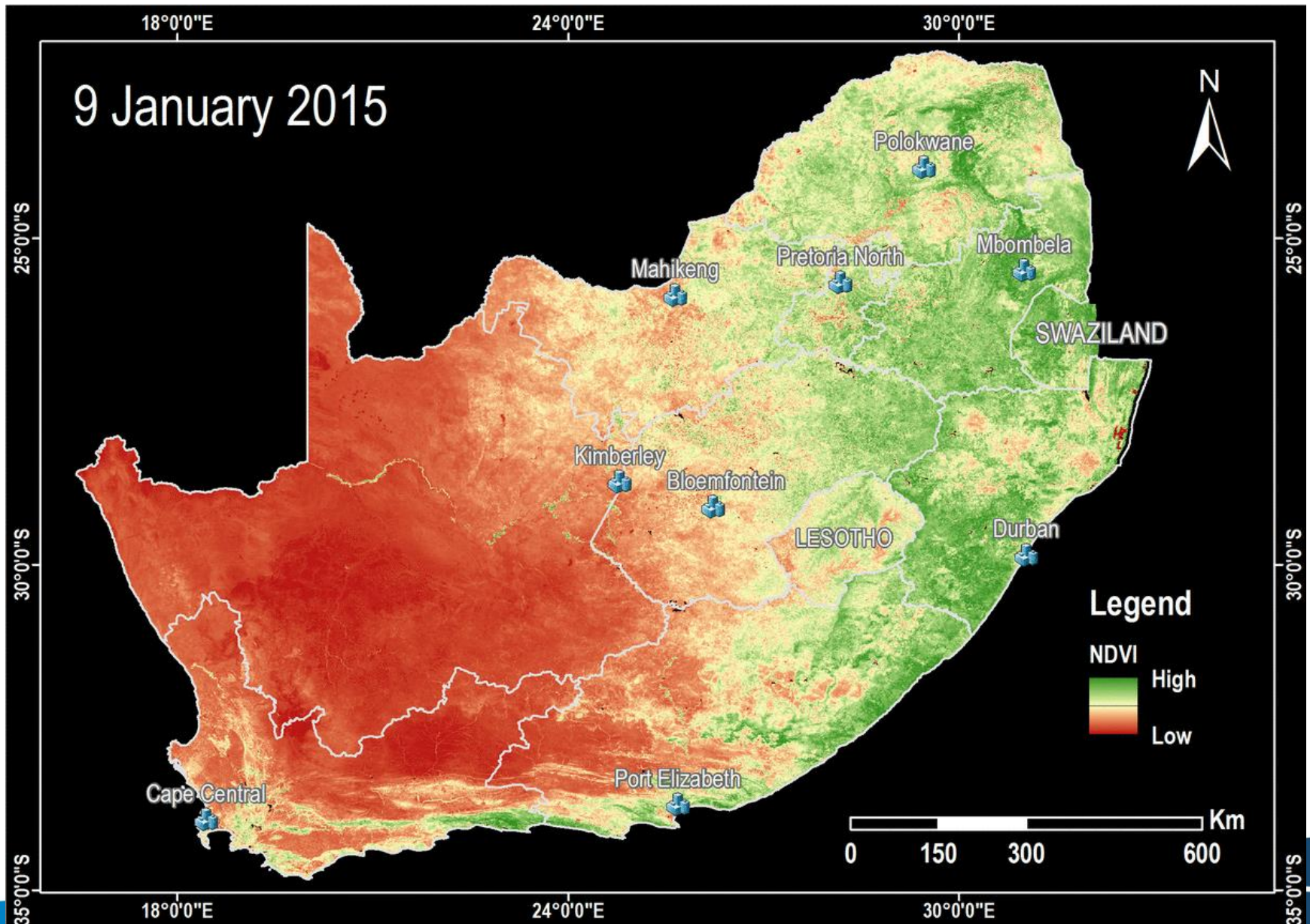
National Forest Layer



Resource monitoring



Drought Monitoring



Transforming Terabytes of EO-Data into Information

