CSIR Meraka Institute
Earth Observation Science & IT

Fire monitoring in southern Africa

Riaan van den Dool

CSIR

our future through science

Overview

Fires in Africa:

- 🌍 **Cultural perspective**
- 🌍 **Fire management**
- 🌍 **Detecting fires from space**
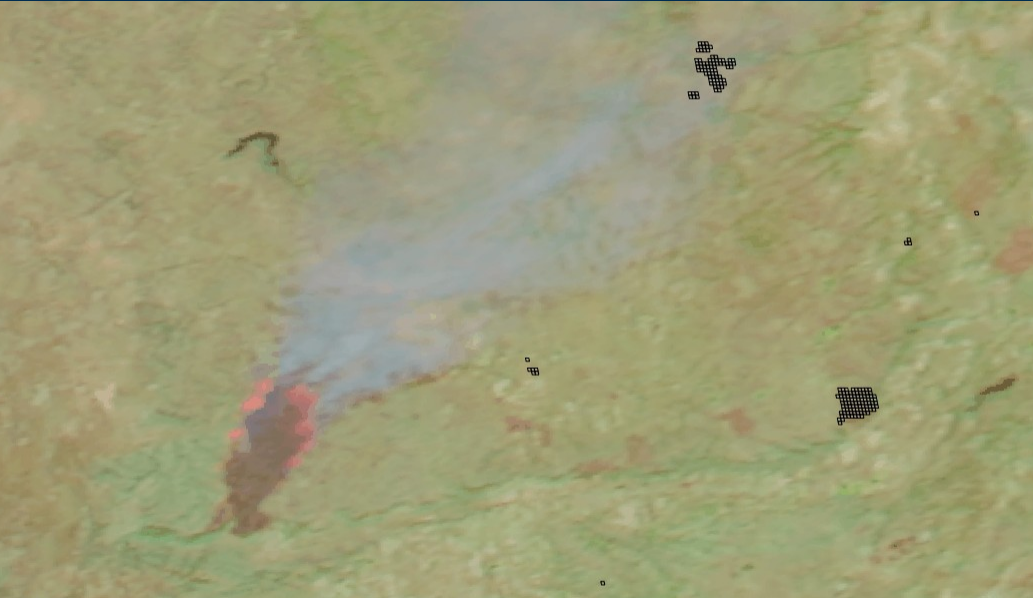- 🌍 **Technology**
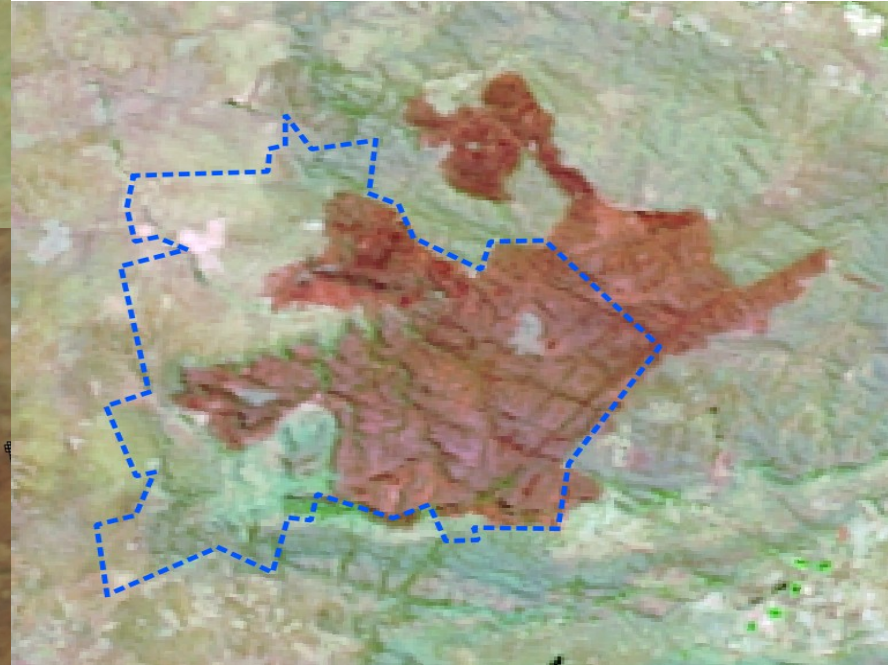- 🌍 **Community**

Cultural perspective

Conflict between authorities and communities during colonial times and up to today.

William C.P. (2010) "Ecology, conservation and climate fire challenges on Uluguru mountain biodiversity hotspot, Tanzania"
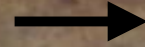
Fire management

Marakele National Park, South Africa
23 September 2012

Fire management

- Good fires vs bad fires
  - Fire management makes the difference
  - Early vs late dry season burns
  - Education and implementation

- Information needed
 - Before,
  - During and
  - After fires

date	FWI	LFDI	rain_mm	rh_pct	temp_c	uwind_ms	vwind_ms	ws_kmh
2012-08-27	63	65	0.00	29.71	26.69	-4.24	-3.35	19.46
2012-08-28	54	61	0.00	33.40	26.10	-3.61	-3.22	17.41
2012-08-29	51	64	0.00	17.60	28.08	-1.87	-2.28	10.63
2012-08-30	52	66	0.00	17.15	29.69	-2.49	-1.28	10.00
2012-08-31	43	61	0.00	15.19	29.27	-0.03	-0.75	
2012-09-01	76	76	0.00	12.07	32.57	4.59	1.72	
2012-09-02	55	58	0.00	37.11	23.97	-3.80	-3.72	

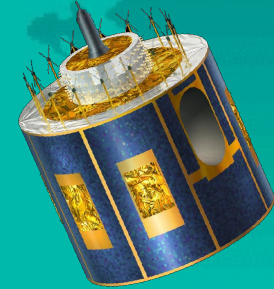Sondela Game Reserve (13 Aug - 11 Sept 2012)

FDI=76
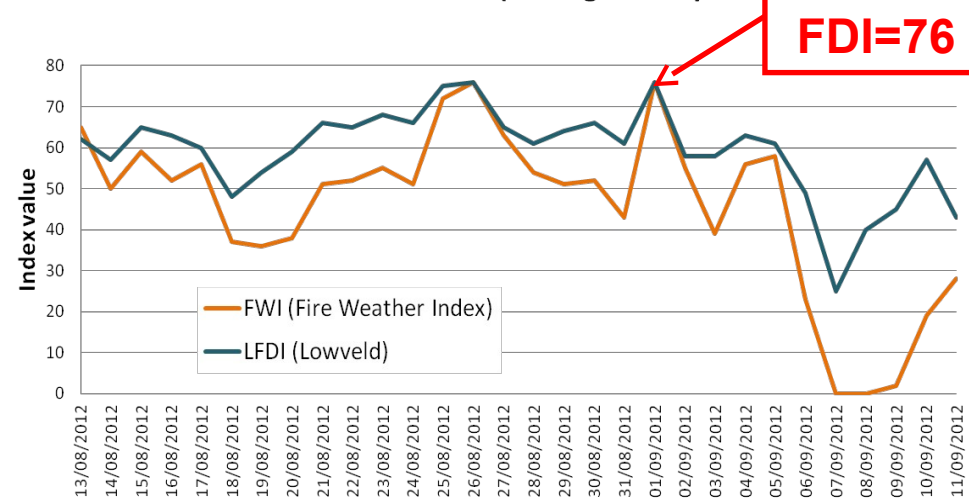
Fire danger describe conditions that are conducive to the ignition, rate of spread and impact of fires.

Fire Danger Indices (FDIs) predict fire danger based on meteorological data

Detecting fires from space

Geostationary Orbit

LEO (Polar)

AQUA (~14H00)

NPP

TERRA (~10H00)

MSG/GOES – every 15 minutes

EUMETSAT

NASA

CSIR
our future through science

sansa
SOUTH AFRICAN NATIONAL
SPACE AGENCY
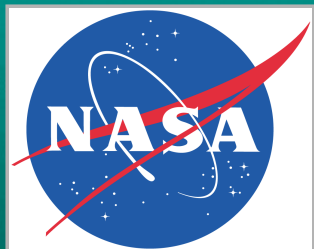
Detecting fires from space

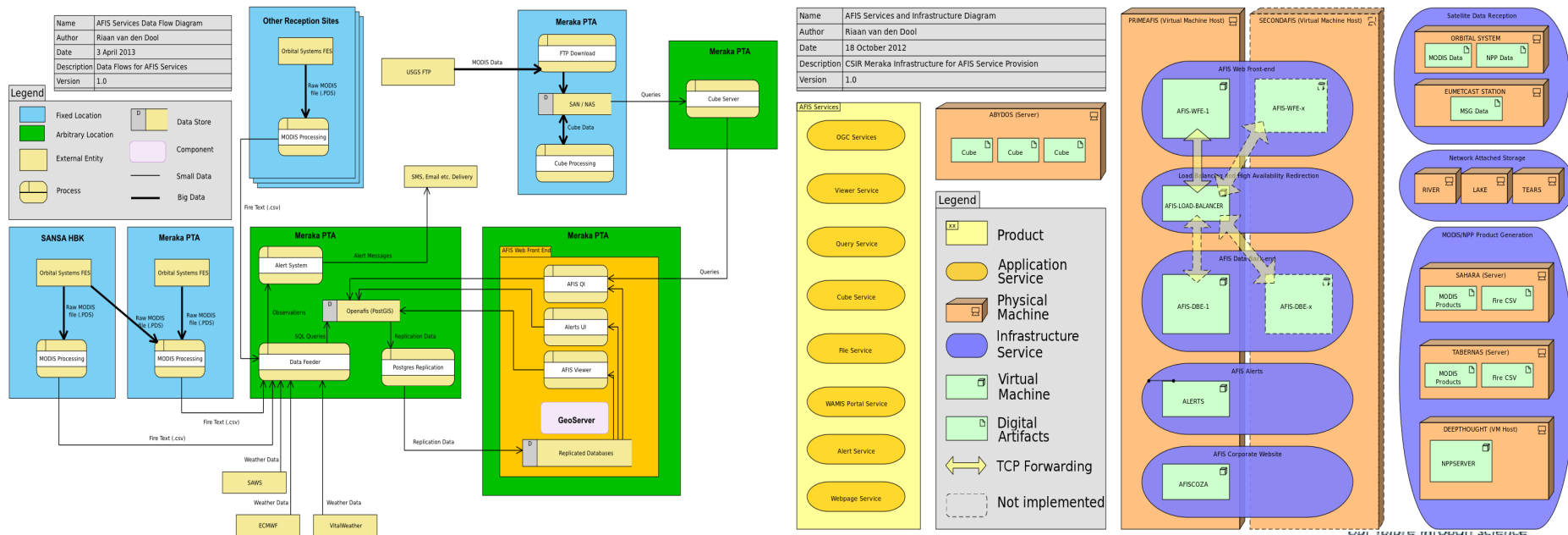EDF: AMESD and

MESA projects

our future through science
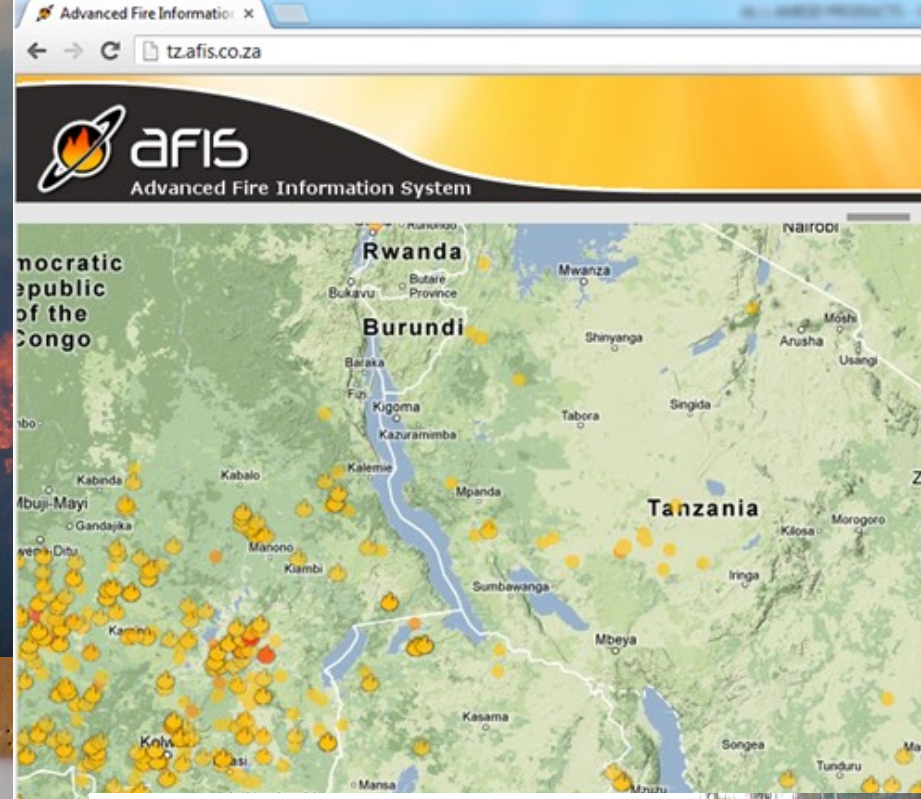
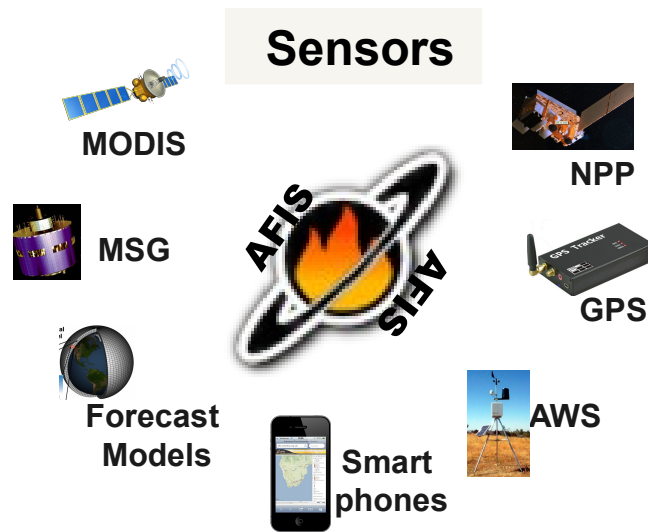Credit:
Kekilia Kabalimu

AFIS Technology

A system to process incoming data streams such as satellite images and weather station readings, interpret the results spatially and alert utilities of actual or potential fire events near transmission lines using email and SMS alerts.
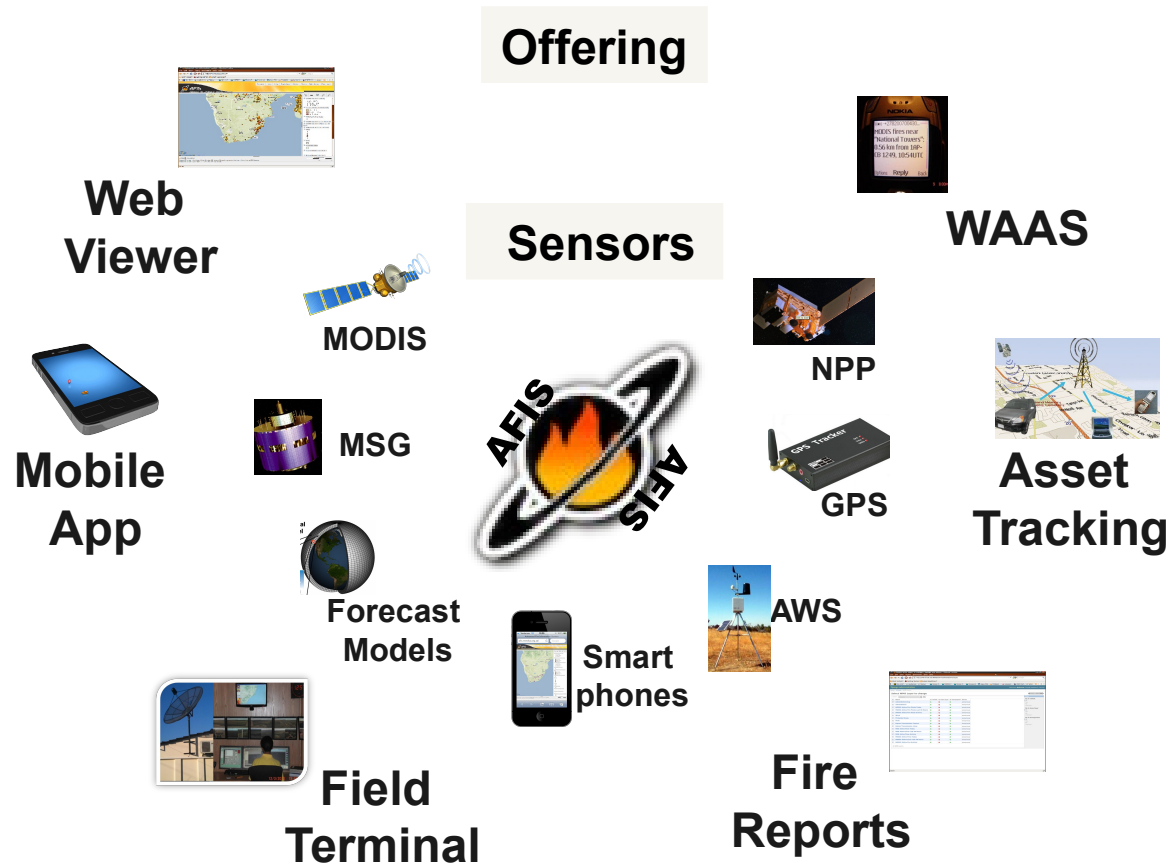
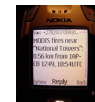# The AFIS Portfolio

The AFIS Portfolio

Sensors

MODIS

MSG

Forecast Models

Smart phones

AFIS

NPP

GPS

AWS

The AFIS Portfolio

Offering

Sensors

Web Viewer

WAAS

MODIS

NPP

MSG

Mobile App

GPS

Asset Tracking

AFIS AFIS

Forecast Models

AWS

Smart phones

Field Terminal

Fire Reports

The AFIS Portfolio

Community

- Community participation
  - Fire management training
  - Fire-fighting teams
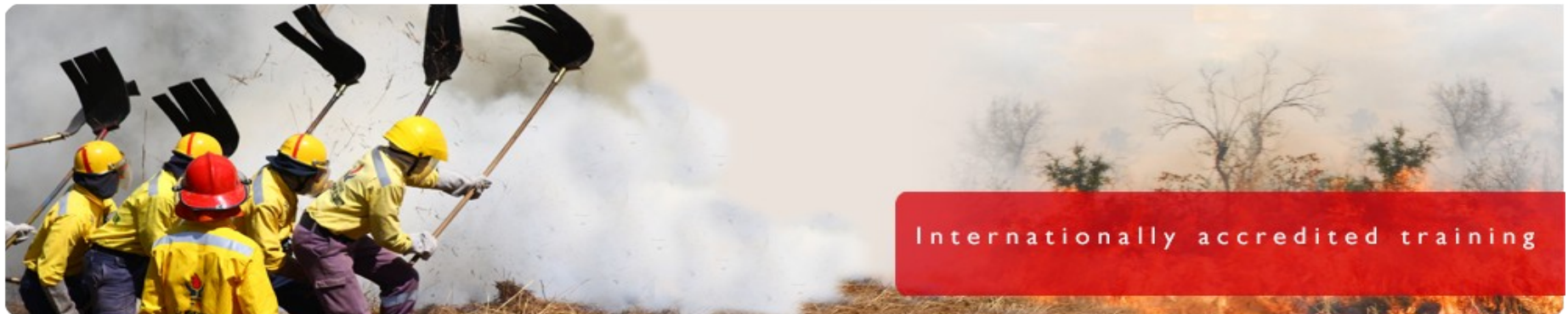 - Record keeping

Community

- Social programmes
  - Job creation
  - Training and education

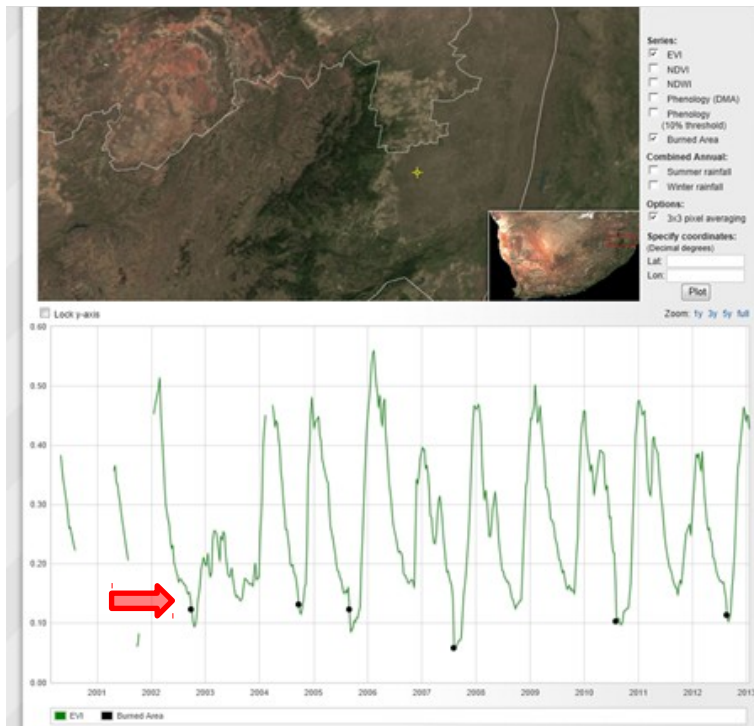Implementing the EPWP Working on Fire Programme
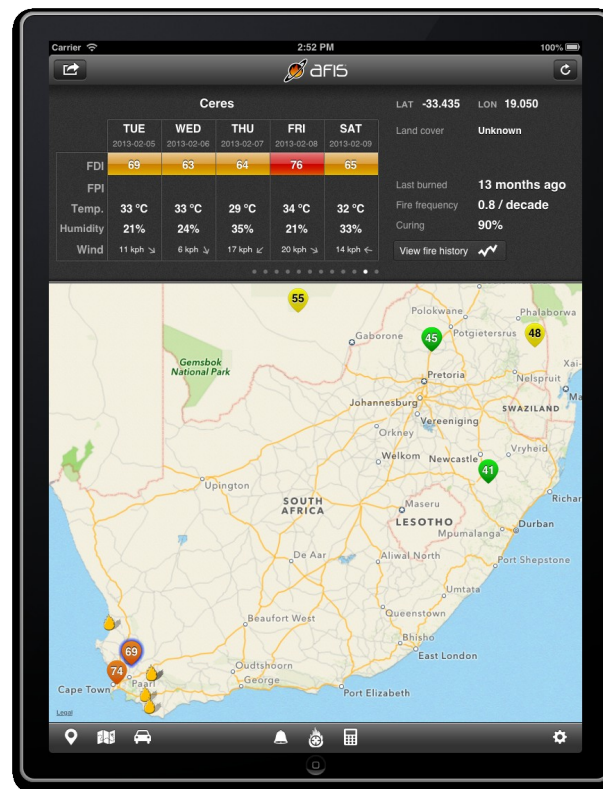

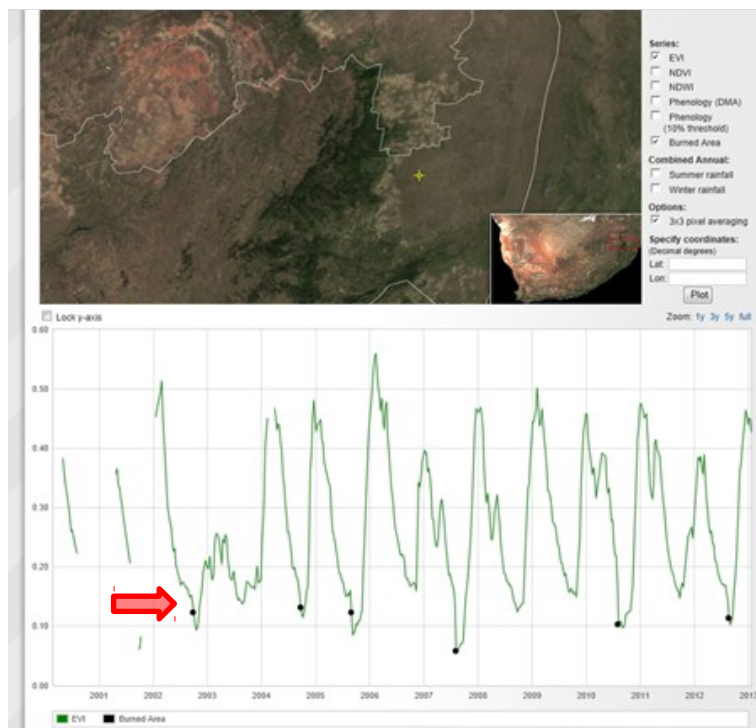Internationally accredited training

AFIS Developments

- Burnt Area: Derived Products
    - Combined BA: Roy and Giglio
    - Burn sum layer
- MODIS time series from data cubes
- AFIS Mobile App (iOS and Android)
- Local FDI indicators
- Publishing of fire info / alerts (social media etc.)
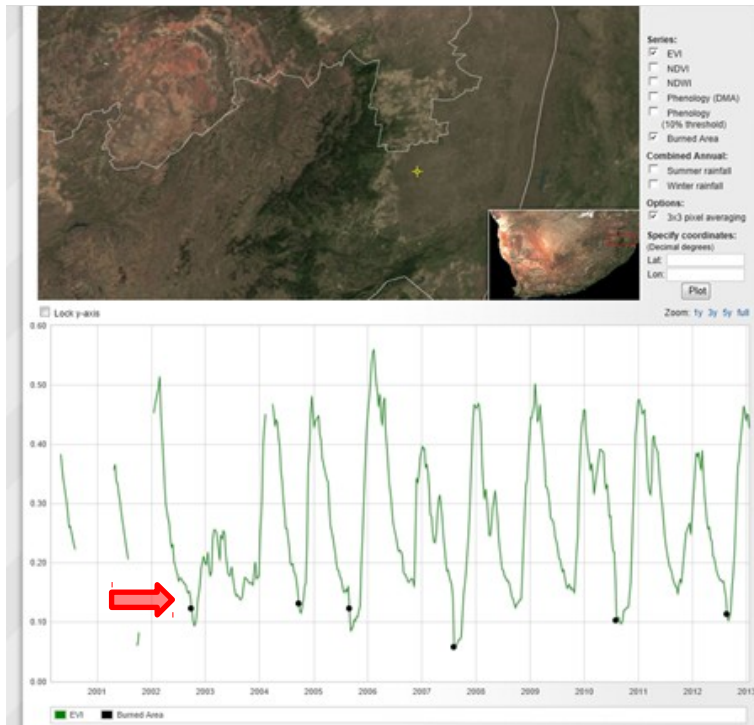- GeoPhoto upload: crowd sourcing / user participation

CSIR

our future through science

AFIS Developments

our future through science

AFIS Developments
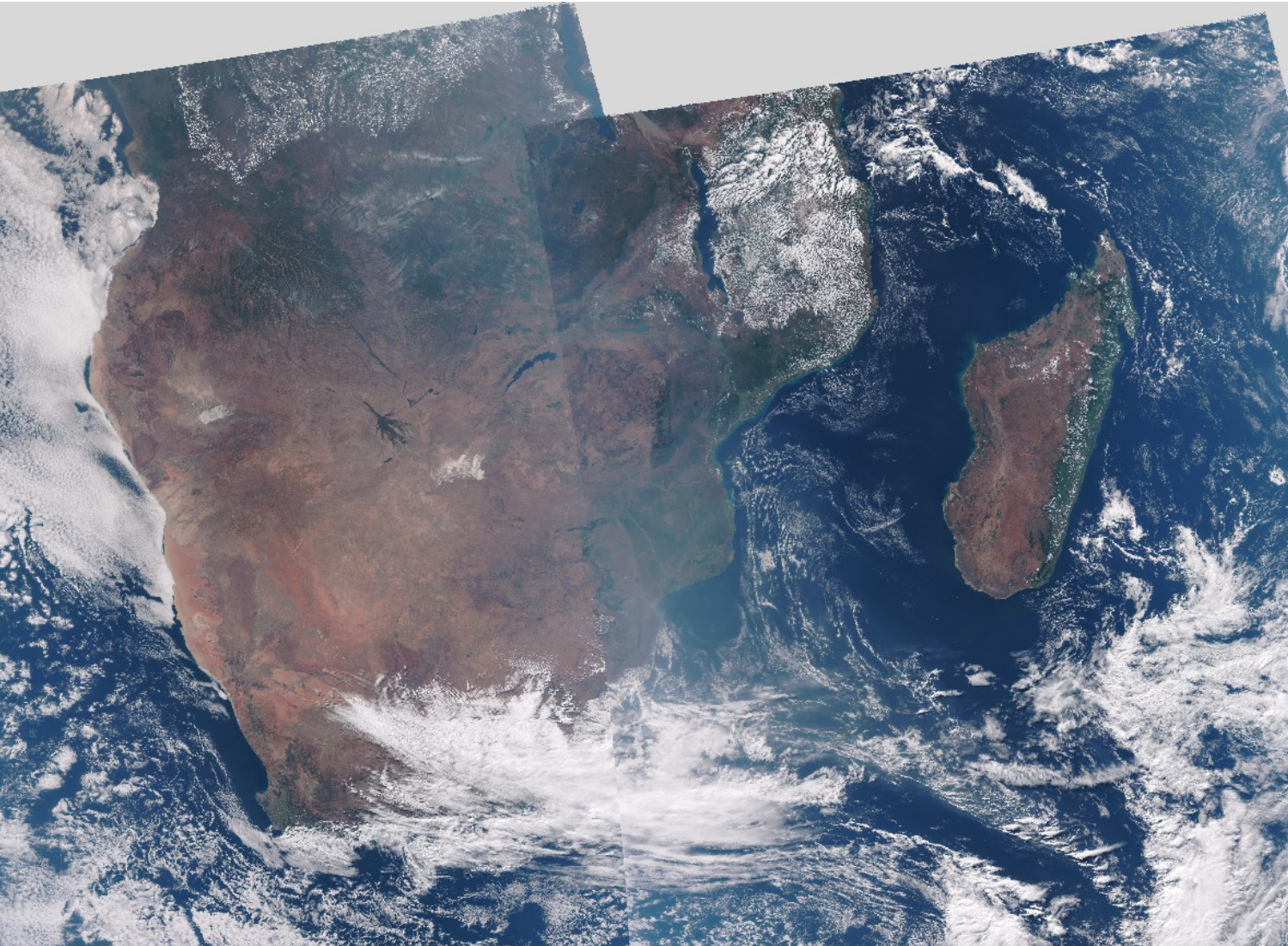
CSIR
our future through science

AFIS Developments

AFIS Developments

NPP: VIIRS Active Fires used operationally in AFIS

AFIS Developments

MODIS Burn sum product

CSIR

our future through science
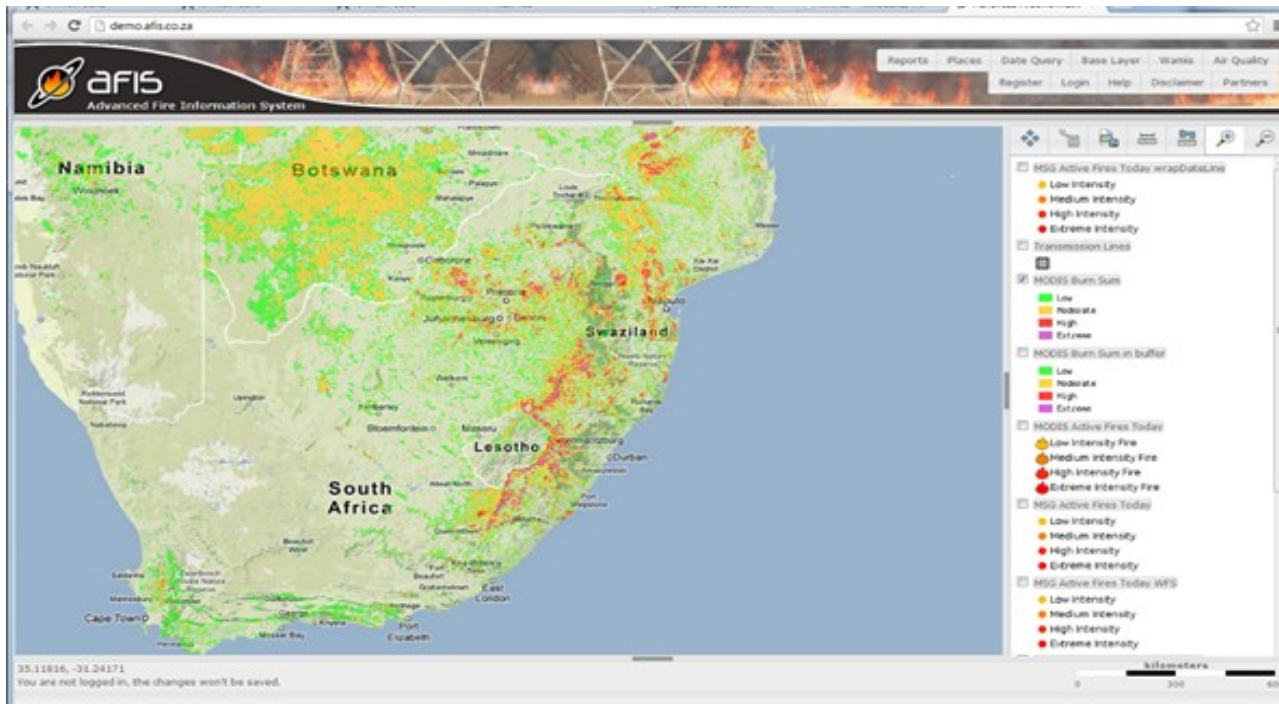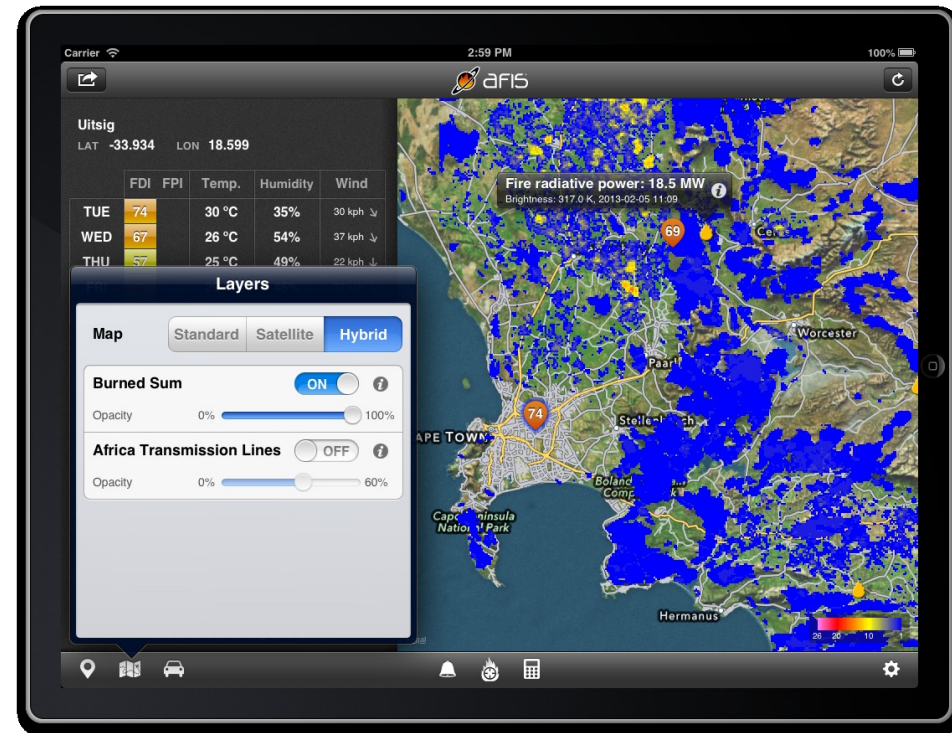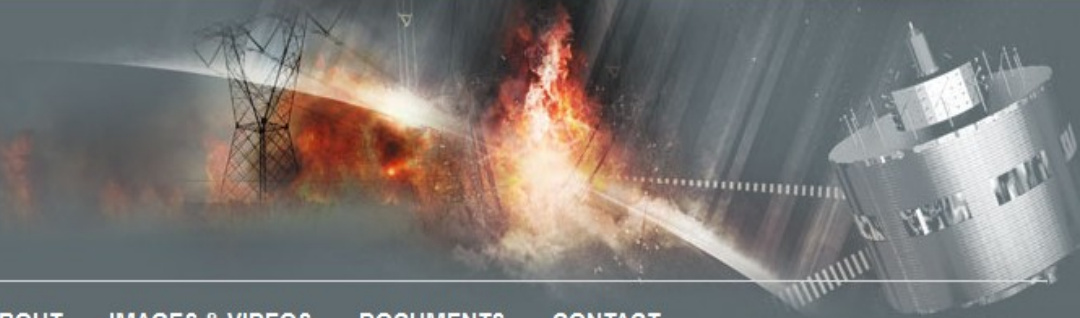
AFIS Developments

- DAFF – National Veld and Forest Fire Act.
- DAFF requested report from Meraka on research findings
- CSIR asked to provide government with AFIS alert and reporting services – including mobile app

AFIS Website

http://www.afis.co.za

www.csir.co.za

In Conclusion

Fire monitoring in Southern Africa

✔ *Not all fires are bad*

✔ *Satellite based monitoring solutions help to manage wildfires and minimize destruction caused by fire*

? *Role of satellite based monitoring in carbon offset projects*

Relax, the only thing on fire here is this meat I burned!

CSIR
our future through science

Acknowledgements

The continued success of the

Advanced Fire Information System

is possible because of

strong partnerships

Queries:
rvddool@csir.co.za