



# Earth Observation for water

Bruno Meyer

GEOSS Joint Asia Africa Water Cycle Symposium 25-27 November 2013

---

## OVERVIEW

SANSA ? (South African National Space Agency)

PLANS ? (Eosat 1)

WATER ? (MoU with DWA)

What do we do?

(HCD)  
(TIGER&TIGER-NET)



# SANSA South African National Space Agency

SANSA proposes to create 5 Value propositions

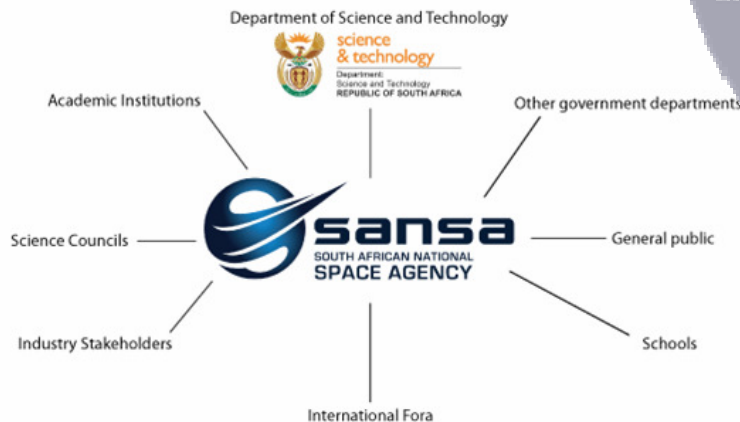
*“In Service of humanity”*  
<http://www.sansa.org.za>

SANSA is mandated by the SANSA Act, 36 of 2008, to:

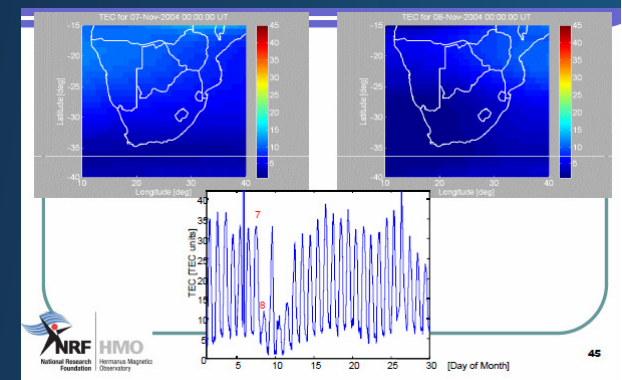
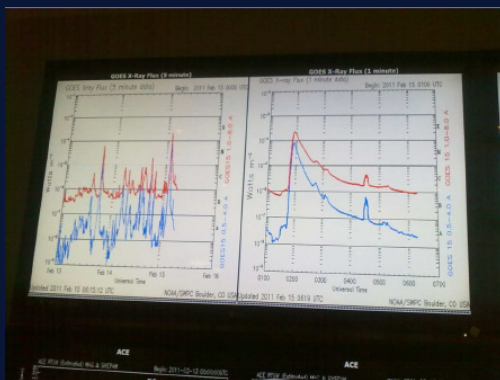
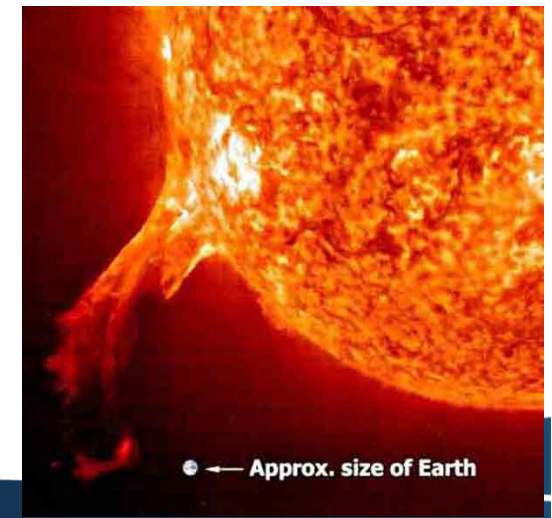
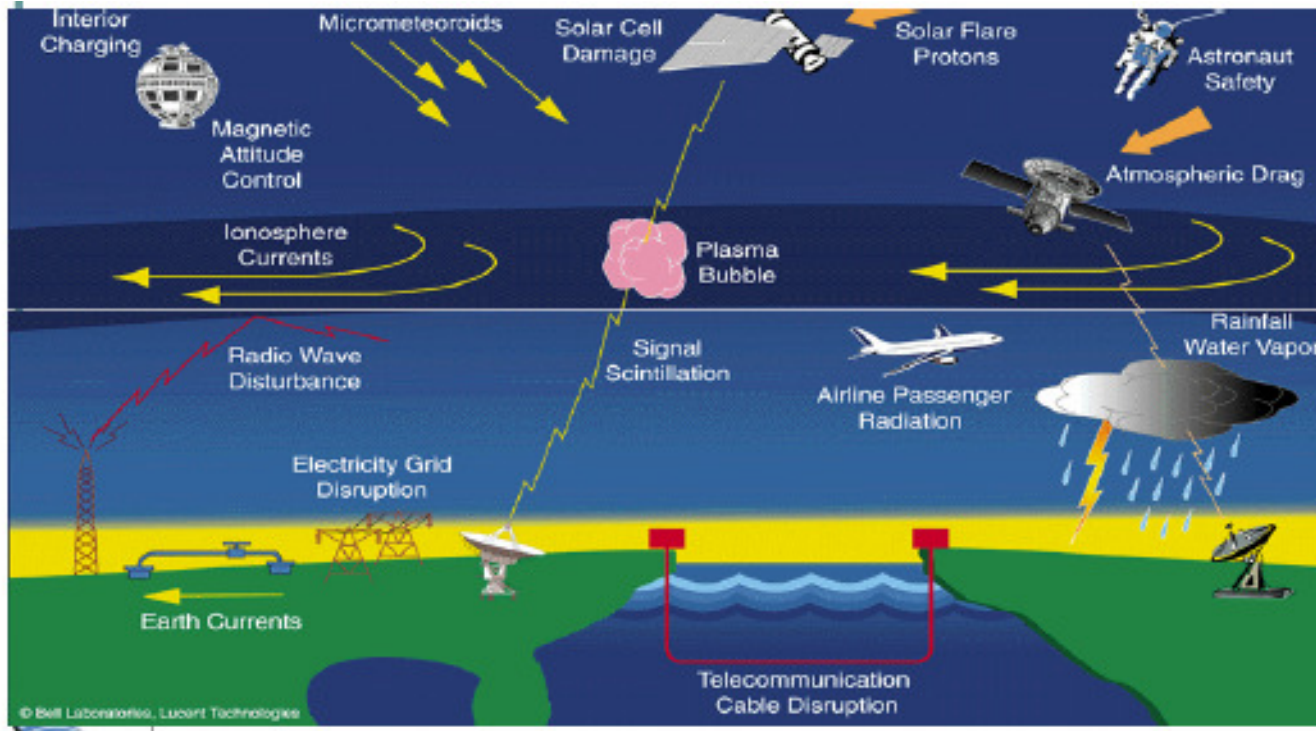
- Promote the peaceful use of space;
- Support the creation of an environment conducive to industrial development in space technology;
- Foster research in space science, communications, navigation and space physics;
- Advance scientific, engineering and technological competencies and capabilities through human capital development (HCD), outreach programmes and infrastructure development; and
- Forster international cooperation in space related activities.



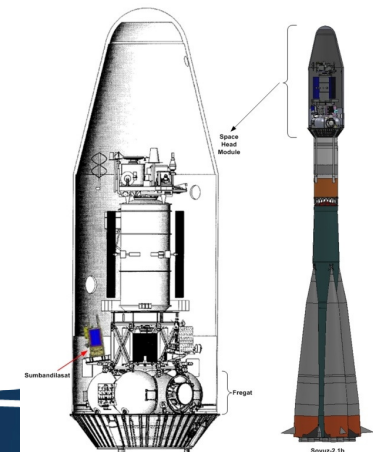
## SA Space domain role players



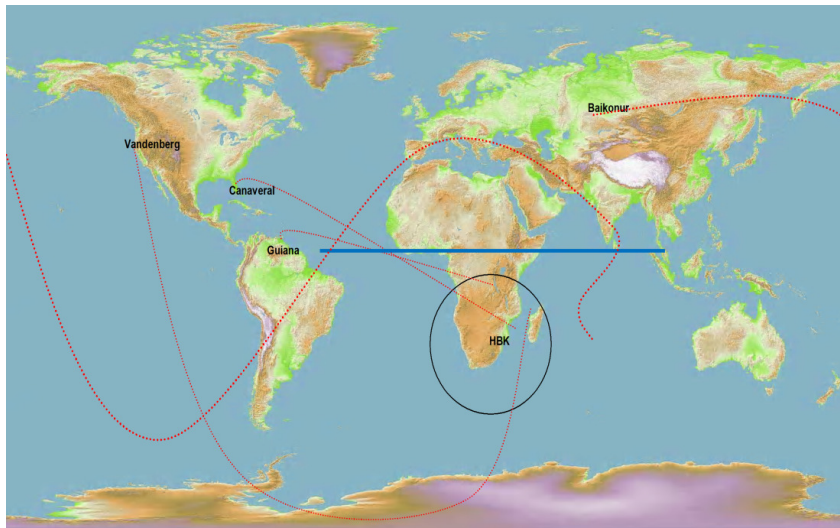
# Space Science Directorate (Hermanus)



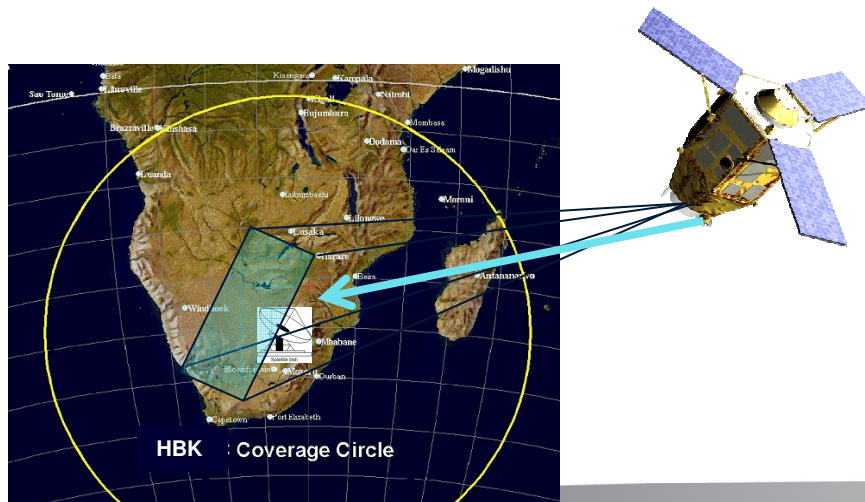
# Space Engineering Directorate (DENEL Dynamics on behalf on SANSA) (Grabouw)



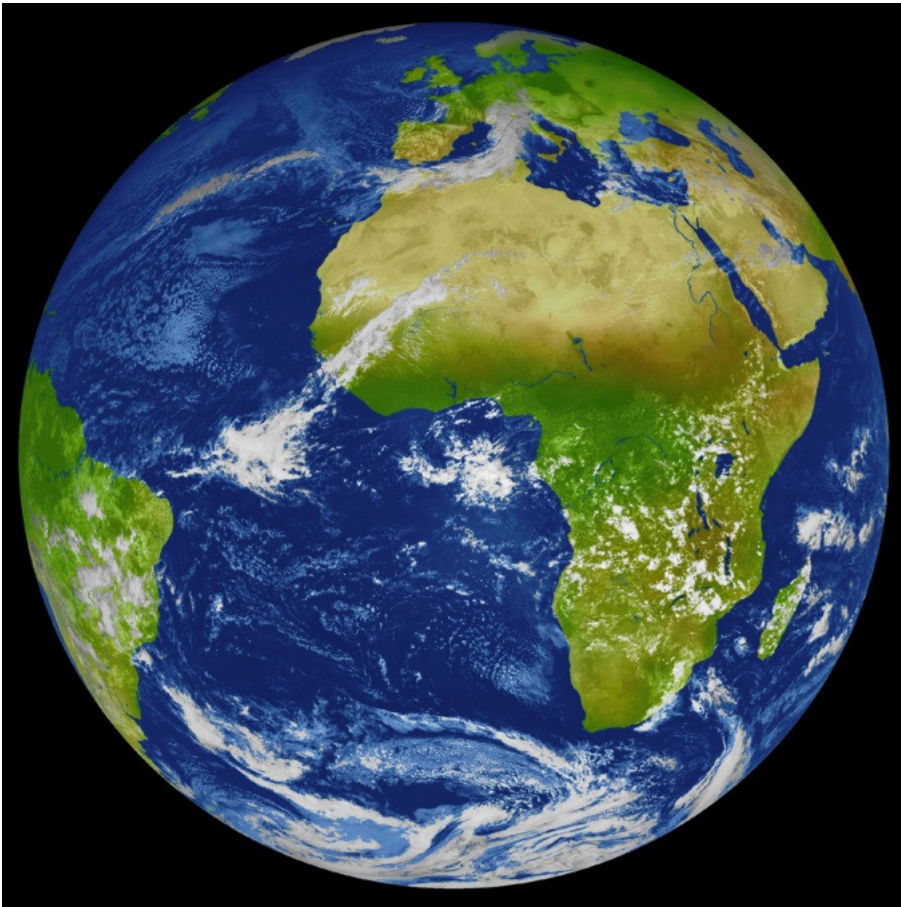
# SANSA Space Operations Directorate (Hartebeeshoek)



- Launch support
- Transfer orbit support
- In Orbit Testing
- Lifecycle support
- Emergency support
- Carrier monitoring
- Remote Sensing TM reception
- Hosted Infrastructure
- Mission control

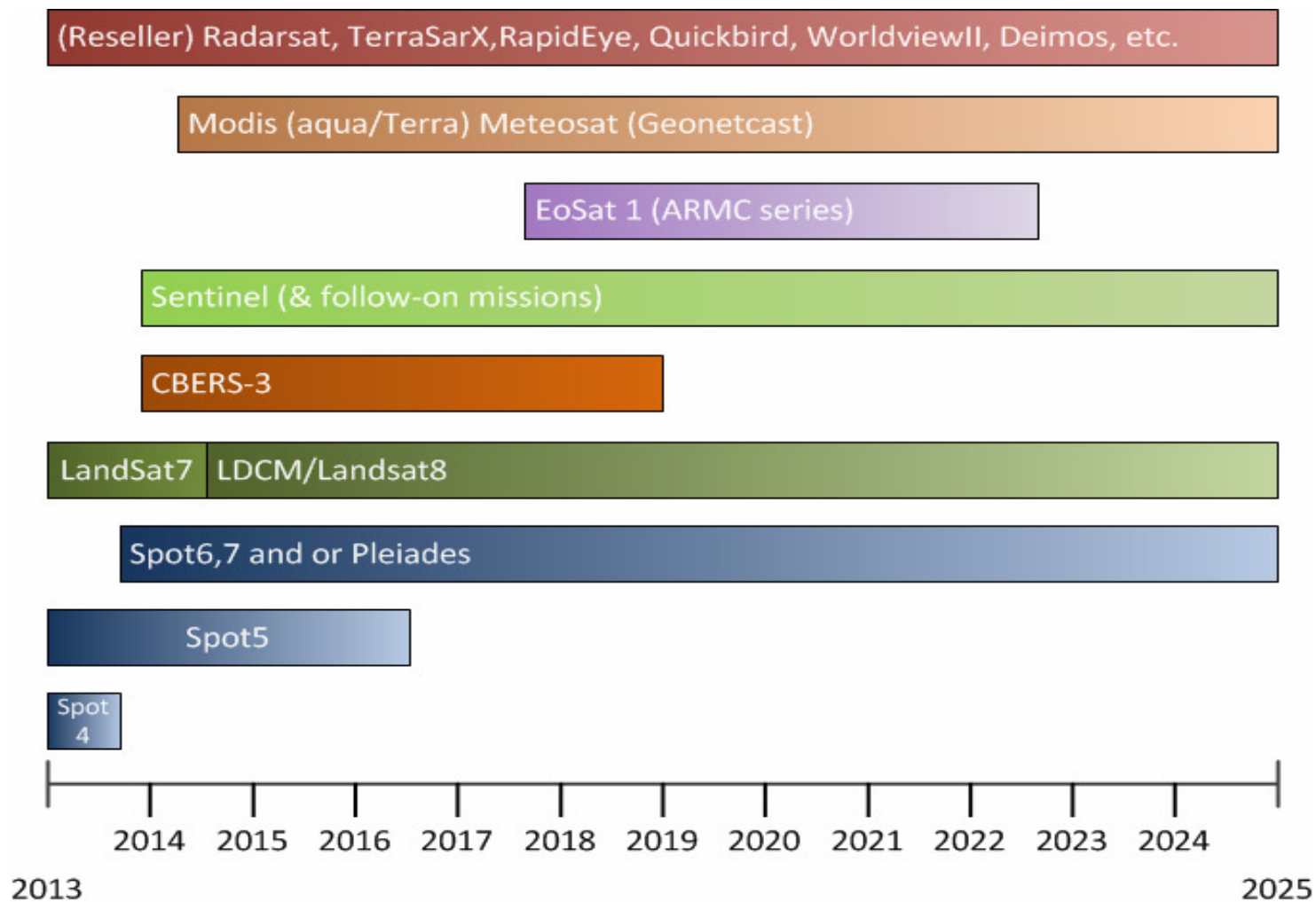


# SANSA Earth Observation Directorate (Pretoria)



- Data acquisition for South African & global Earth Observation satellites
- Long term archiving of EO data
- Processing and production of VA & satellite images products and services
- Easy access and dissemination of data
- Development of EO applications per stakeholder needs
- Maintain & develop International partnerships
- Develop HCD and advance science amongst youth & public

# SANSA SENSOR PORTFOLIO 2013



WHO ?



http://catalogue.sansa.org.za


**sansa**  
SOUTH AFRICAN NATIONAL  
SPACE AGENCY


**SANSA Earth Observation  
Online Catalogue**


Catalogue Funded by the Department of Science & Technology

Home Login Register Reset Password About Contact


## Welcome to the SANSA Earth Observation Online Catalogue


 **Search**


 **Visualise**


 **Order**


**Earth  
Observation  
Data**


 **Welcome:** This site provides the SANSA (South African National Space Agency) Earth Observation data catalogue for South Africa and the SADC Region.

 **Legacy Catalogue:** Still [online here](#).

 **QGis download:** Free and Open Source SANSA branded special edition of Quantum GIS to view imagery. Click [here](#) to download.

 **Browser compatibility:** This web site works with Mozilla Firefox 3 or better, recent versions of Google Chrome, Opera, Safari and Internet Explorer 8.

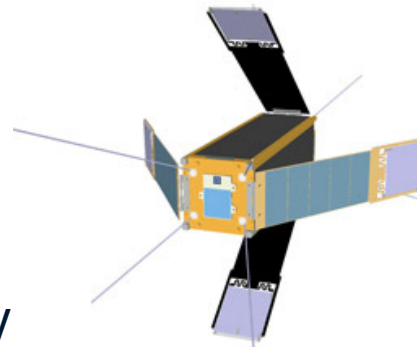
 **Getting Started:** Watch our [short video](#) which provides a quick-start guide to using the catalogue.

 This catalogue was

Website © 2010 SANSA, Earth

# CURRENT and FUTURE ACTIVITIES & TRENDS

- Microsatellites to cut costs
- Cubesats
- (launched last week)
- Unmanned Aerial Vehicules (UAV,
  - (Sentinel 3 CAL/VAL team)
  - Involvement in FP7 / Horizon .
  - International projects (AMESD / Tiger-Net/ etc.
  - International Charter Activations
  - EUMETSAT links to SAWS & WMO
  - SASSCAL research projects
  - Etc.



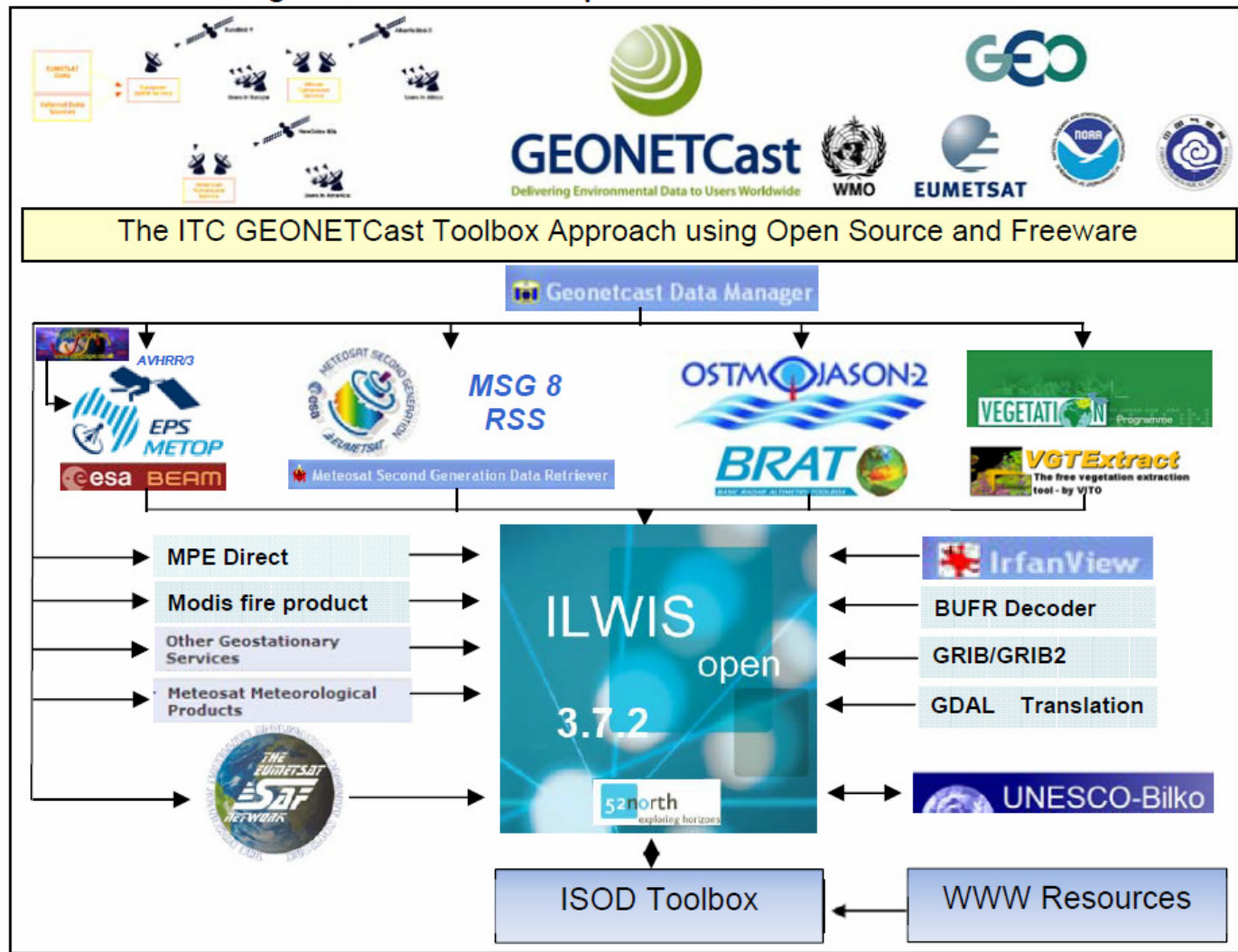
# EO-SAT1

- 1<sup>st</sup> year in 5Year project
- User consultation & Feed-back
- Technical specifications
- Key words like:

ARMC, EO-SAT 1, spectral resolution, spatial resolution, swath width, temporal resolution, signal to noise ratio, radiometric resolution, food security, land use and land cover, disaster management, trade-offs

# ALTERNATIVE DISSEMINATION ROUTES

Figure 3.1: Overall concept of the GEONETCast-Toolbox



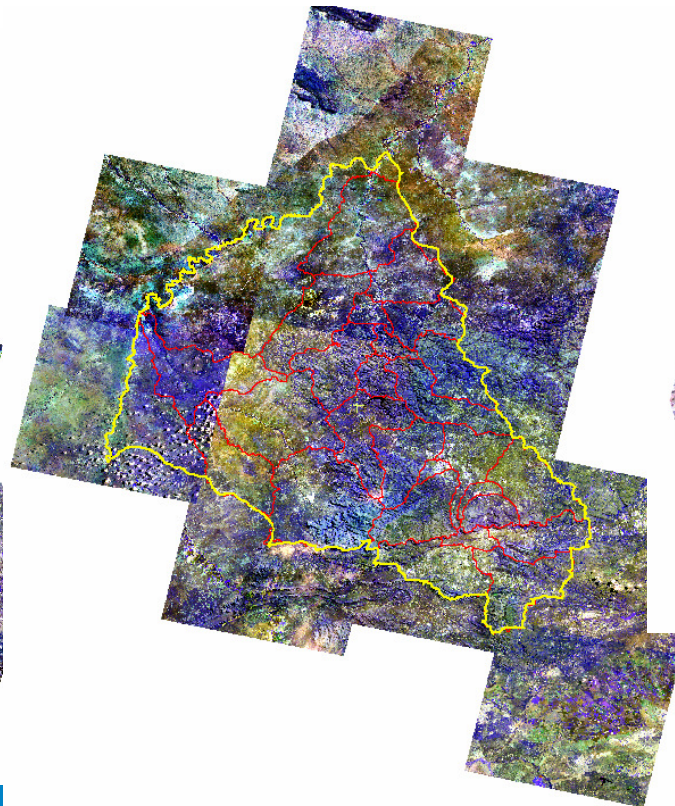
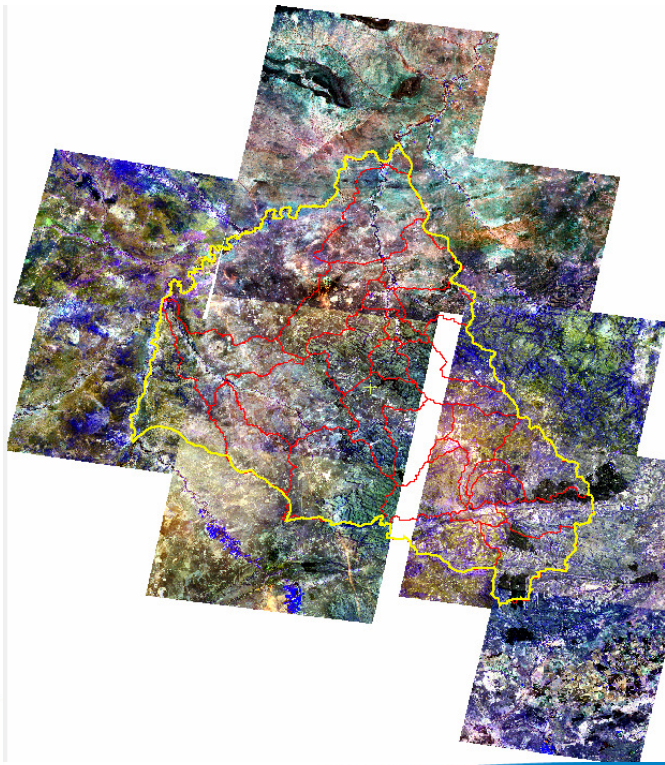
# PRACTICAL CONTRIBUTIONS

## AOI MOKOLO catchment

SPOT4 coverage

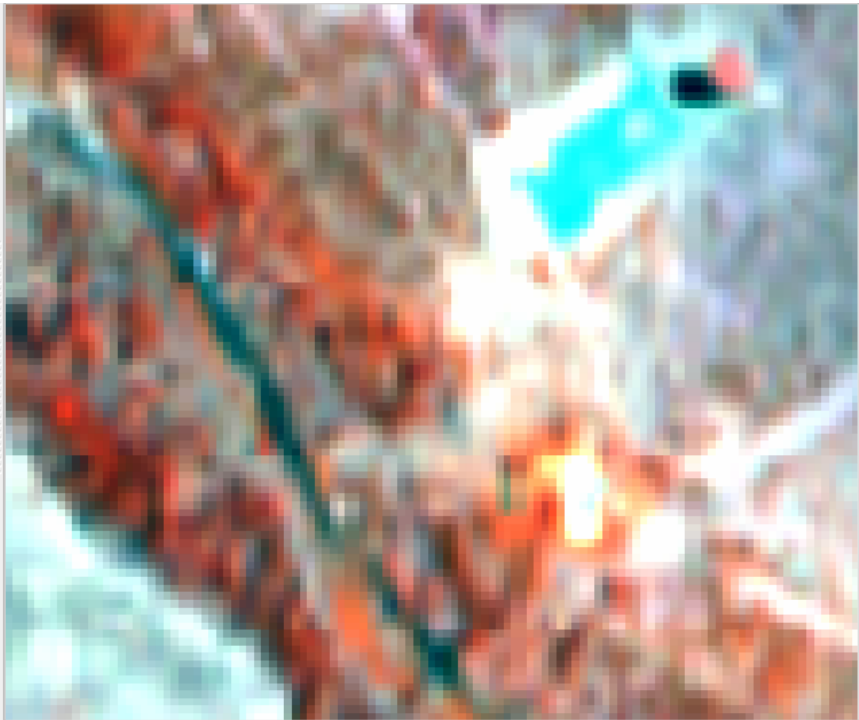
SPOT5 coverage

SPOT6 coverage

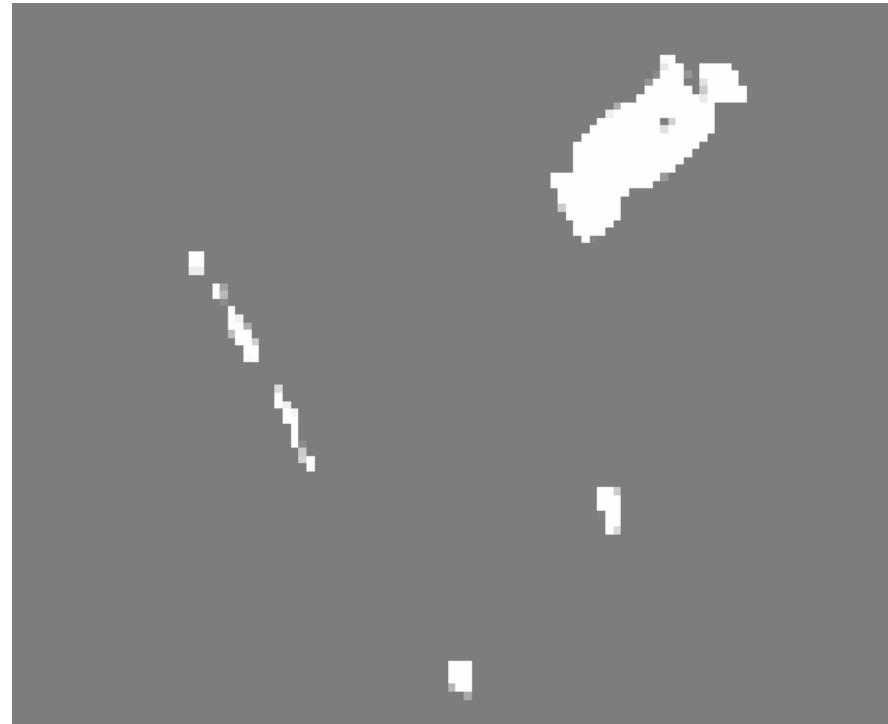


## RESOLUTION EXAMPLE ON SPOT6

2427AB SPOT6

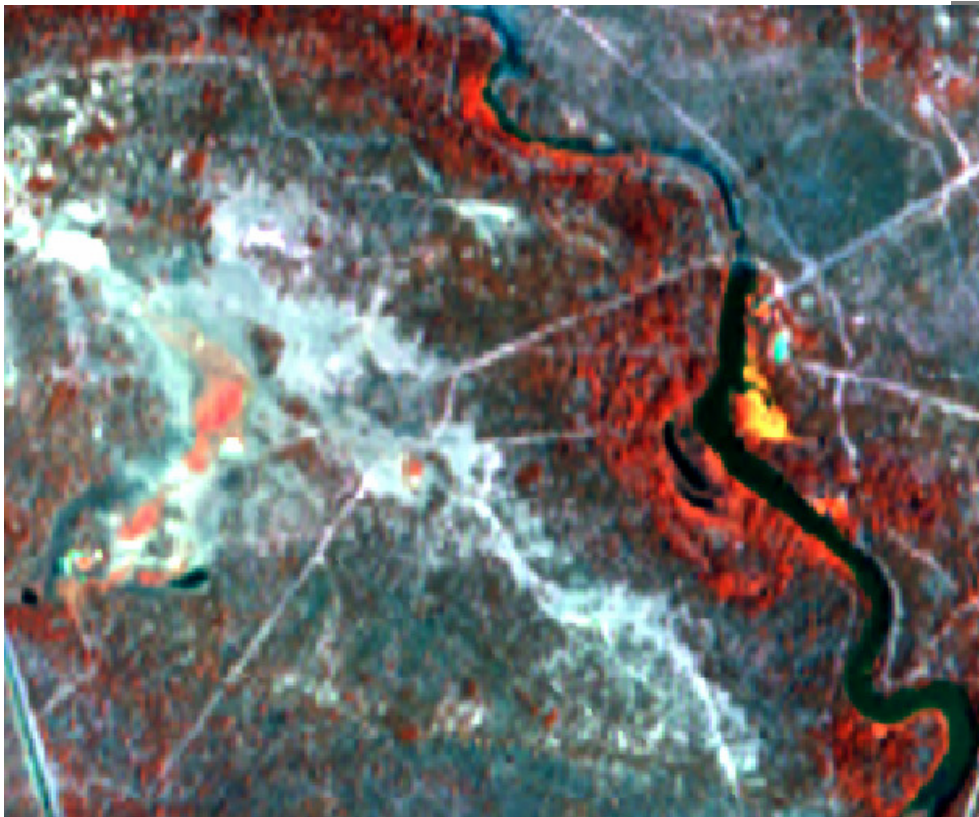


2427AB SPOT6

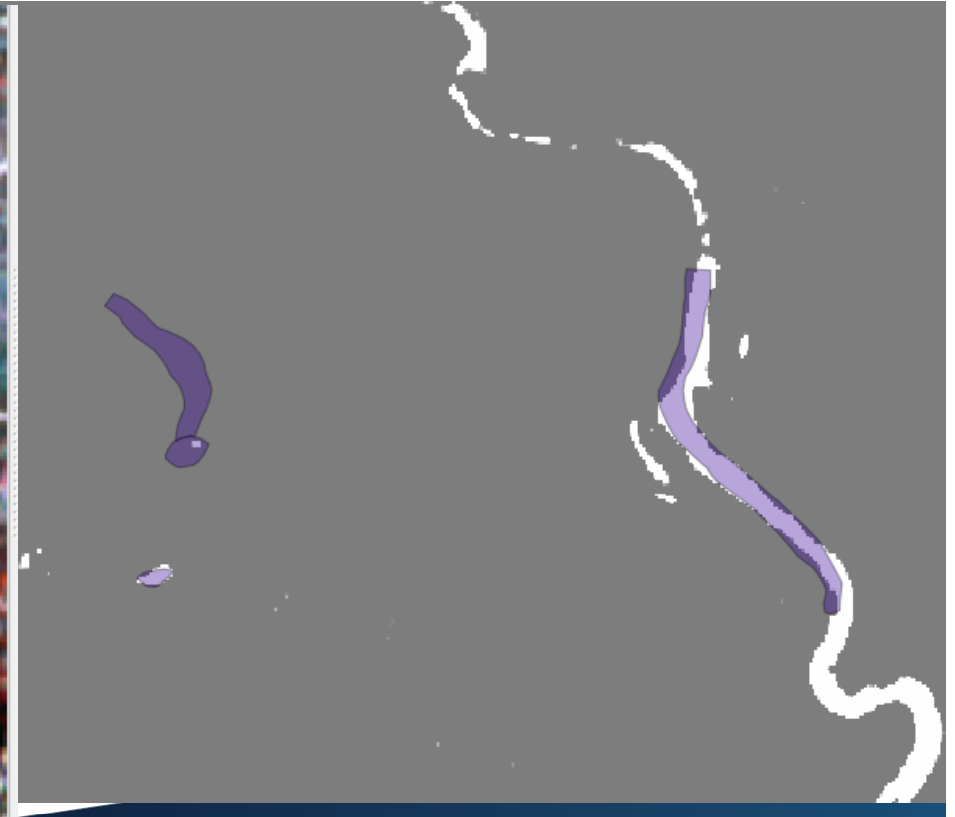


# MEASUREMENT AGAINST BASE SET (dams\_50) ?

2427AB SPOT6

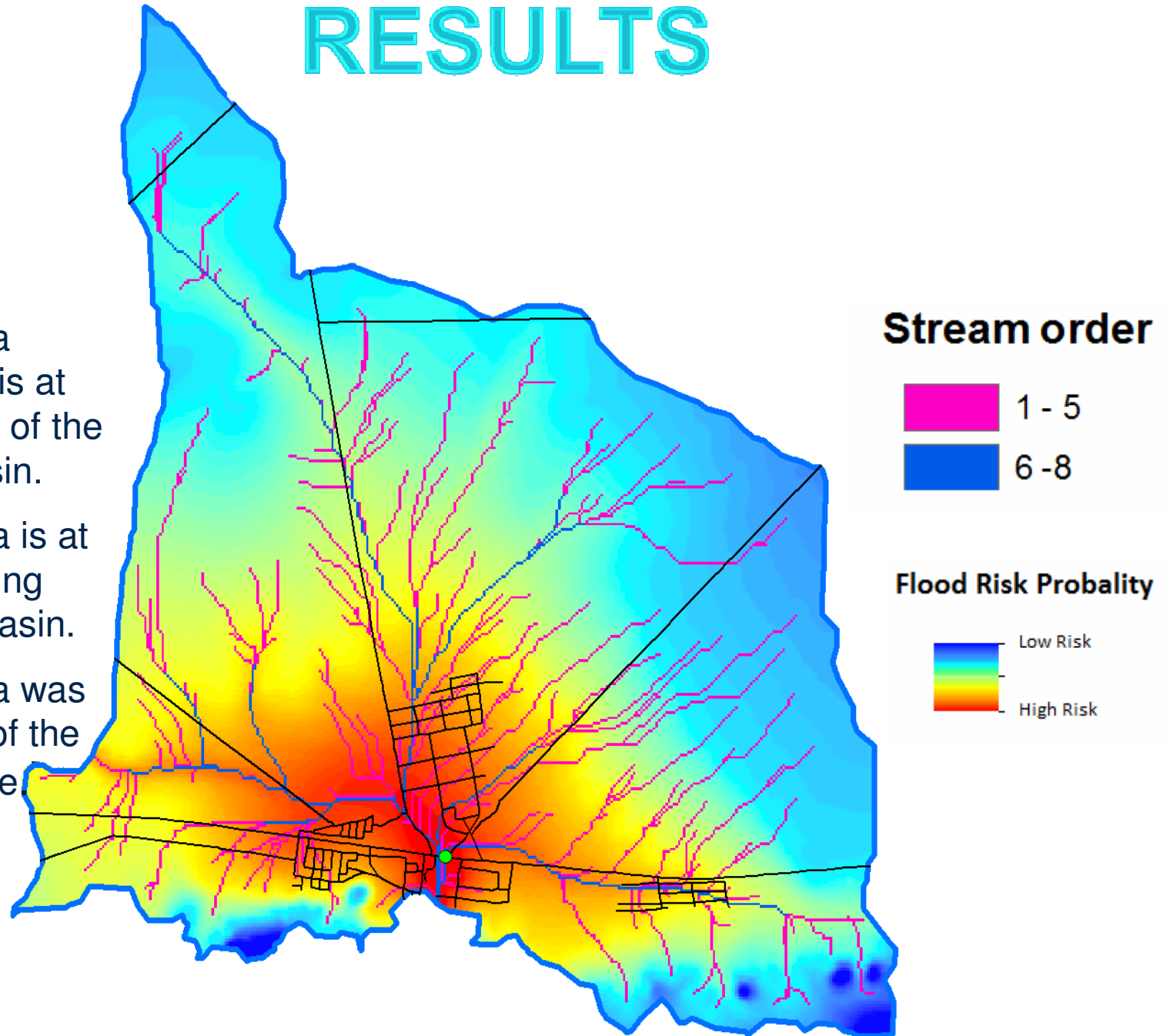


2427AB SPOT6



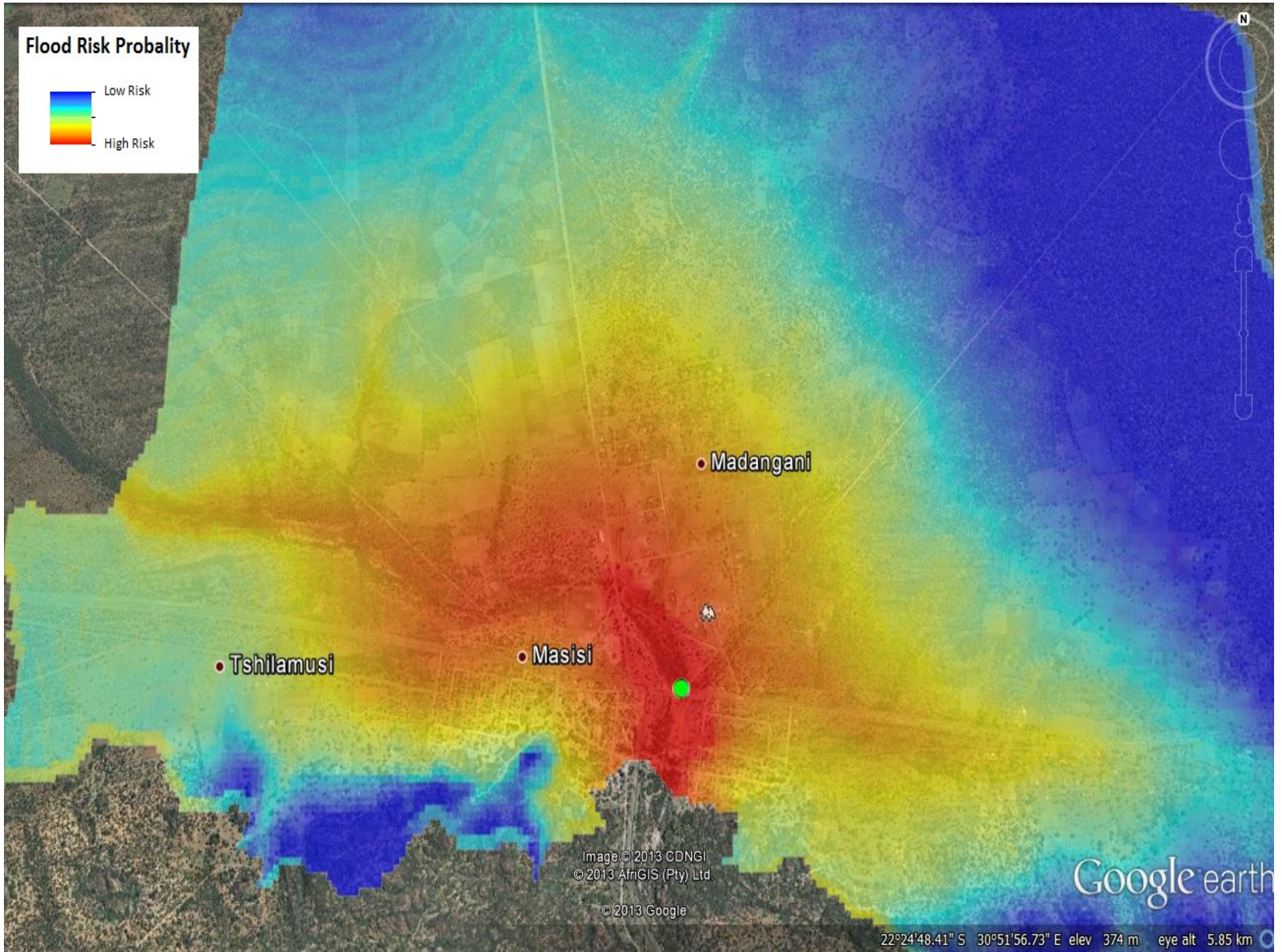
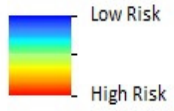
# RESULTS

- Affected area (R525 road) is at the exit point of the drainage basin.
- Affected area is at the lowest lying area of the basin.
- Affected area was at the heart of the high risk zone.



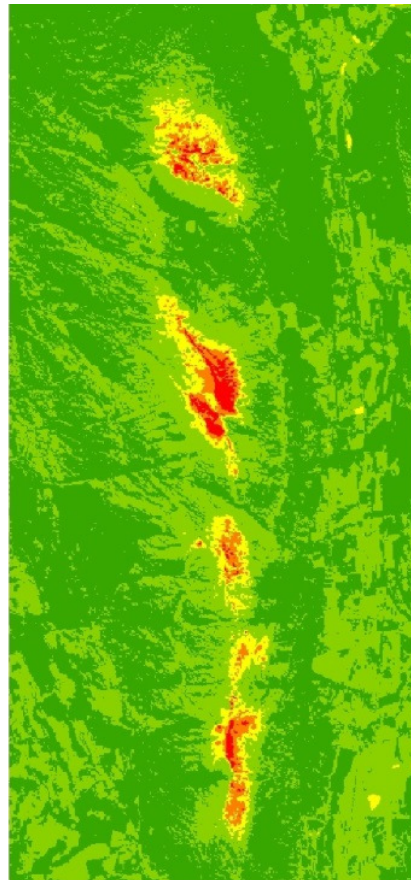
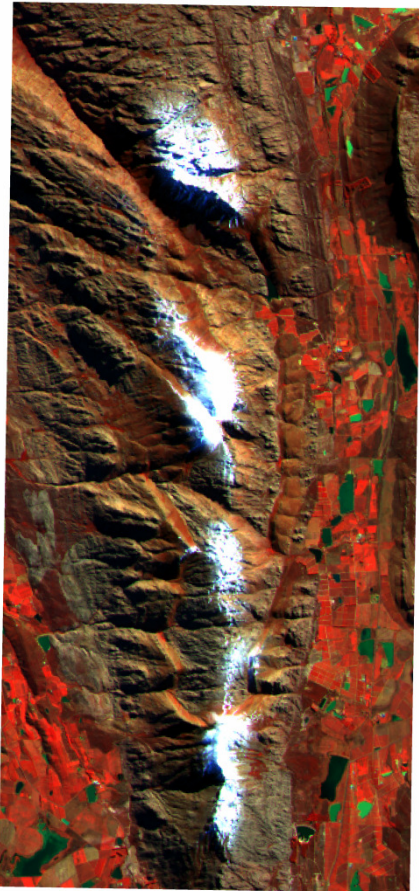


### Flood Risk Probality



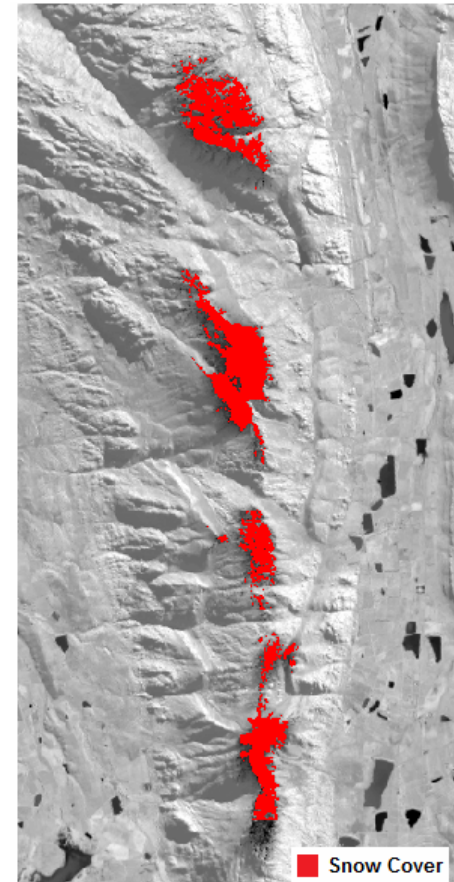
# CURRENT EXAMPLES OF CONTRIBUTIONS

This winter's snow Cover in the Koue Bokkeveld mountains (WC)



## Legend

- No snow
- Melting snow/water
- Thin snow
- Think snow



WHEN ?

# HCD CONTRIBUTIONS

## Training capabilities

SANSA identified Human Capital Development (HCD) as a KPI and promotes training offering the use of its infrastructure and expertise matching and in collaboration with similar programs supporting :

- Outreach and Capacity Building**
- Horizontal Cooperation**
- Technical Advisory Support**

example: TIGER, DIMTEC, UNU-EHS, etc.



-Academic support from local and International experts

-Student bursaries & Internships

-Summer schools & Tailor made courses

HOW ?

# FUNDISA

# STUDENT PORTAL



HOME RESOURCES EXPLORER COMMUNITY CONTACT US

Cape Town - SPOT 5 true colour



**Using the SANSAT Earth Observation Catalogue**  
Updated 9/1/2013

The SANSAT Earth Observation catalogue contains a very large selection of satellite imagery dating back as early as 1972. Archived satellite images that are found here can be viewed via the catalogue. Taking requests for imagery is done through SANSAT Earth Observation customer services. Data on our archives is funded to students from South Africa.

To learn how to order data on our catalogue, please click read more.

**About Resources**

On this page you will find a variety of links with descriptions to earth observation resources, ranging from user guides, commercial catalogues, to free data sources, other portals and software. Should you know of any other interesting links, please send them to us and we will add them to the resources webpage.

**Optical Satellite Imagery**

- SANSAT Earth Observation Catalogue
- SANSAT Funded Satellite Imagery
- SPOT Missions - Astrium
- Landsat Program-USGS
- VVV & GeoEye - Digital Globe
- Global Landcover Data
- MODIS - NASA

**Radar Imagery**

- Terra SAR-X
- ERS 1 & 2

**Open Source GIS & RS Software**

- Quantum GIS (QGIS)
- QGIS SANSAT Edition
- EBA Software
- ILWIS Open
- Grass GIS

**Download Vectors**

**Funded Satellite Imagery on the SANSAT Earth Observation Catalogue**  
Updated 9/1/2013

Satellite imagery is collected from satellites which are either orbiting the earth or geo-stationary. There are many uses today for satellite imagery. Satellite imagery has applications in agriculture, biodiversity conservation, education, forestry, geology, intelligence, land cover, meteorology, and regional planning to name a few.

For useful links and information regarding satellite imagery on the SANSAT Earth Observation archive, please click read more.

**SPOT 5 Products**  
Updated 9/1/2013

SANSAT Space Operations first began tracking SPOT satellites in the late 80's. To date SANSAT has tracked and archived thousands of SPOT satellite images. In 2006, SANSAT Space operations began tracking and archiving SPOT 5 imagery. In 2006, the earth observation team began creating the SPOT 5 national mosaic. This article discusses the different SPOT 5 processing levels offered by SANSAT Earth Observation as well as the specifications of the satellite. Click read more for the full article.

## Community

Join the community forum and ask our team of earth observation experts for support on Fundisa data, remote sensing, GIS and more...

**Spot 5 Coverage for RSA (2006 - 2011)**  
Preview and query SPOT-5 coverage over RSA for 2006-2011.

**SPOT-5 Coverage RSA**

**SumbandilaSat Level 3**  
Preview and download SumbandilaSat imagery over RSA.

**Watch this space for new content**  
**CBERS-2B**  
Preview and query CBERS-2B coverage over RSA.

**Watch this space for new content**  
**SAC-C coverage RSA**  
Preview and query SAC-C coverage over RSA.

**LANDSAT SERIES : Explore Changes through time.**  
**Landsat Series**  
Compare 1990 Landsat views with recent true-color imagery (ESRI Story Maps).

**Feeding the World**  
Can global crop production meet future demands? (ESRI Story Maps).

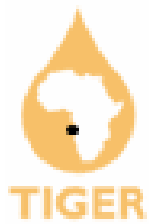
**IUCN - Red List**  
**IUCN Amazing Species**  
A story map co-produced by Esri and IUCN featuring a selection of threatened species from the Red List.

**Global Footprint**  
**Global Footprint**  
An app that explores our global footprint (ESRI Story Maps).

**Human Population Reaches a Milestone**  
**7 Billion Humans**  
An app that explores a new milestone in human population (ESRI Story Maps).

# TIGER RoT & ToT

## Multi-institutional participation



**water affairs**  
Department:  
Water Affairs  
REPUBLIC OF SOUTH AFRICA



- Tunisia
- Mozambique
- Kenya
- Cameroon
- Benin
- Malawi
- Zambia
- South Africa





Thank you

[bmeyer@sansa.org.za](mailto:bmeyer@sansa.org.za)