

CSIR Satellite Applications Centre:

Earth Observation Service Centre

Towards a RSO in South Africa

Presented by:

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07/07/2010

For: UN-SPIDER



our future through science

The Satellite Applications Centre Farm (SAC), Hartebeeshoek



OBJECTIVES

- SAC's PLANS FOR EXTENDED PORTFOLIO
 - Need of Base sets and data access
 - An African initiative (ARM)
 - Partnerships and Data democracy
- SAC/SANSA ROLE?
- INTERFACE TO NDMC STRUCTURE
- RSO PLANS OFFER
 - Infrastructure
 - Operational
 - Gearing for UN-SPIDER functions
(Awareness/Outreach/Capacity Building)
- SADC NETWORKING CHALLENGES
- INTERNATIONAL PARTICIPATION (FP7s)
 - Garnet-E / AMESD / GeonetCab
- GEO /GEOSS ALIGNMENT(Standards e.g. AIPs)
- CAPACITY BUILDING AND TRAINING

SAC's PLANS FOR EXTENDED PORTFOLIO

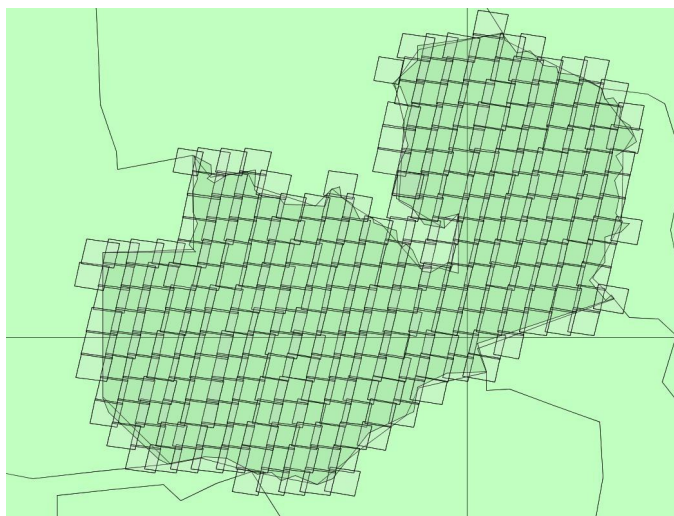
NEEDS

Base sets and data access
African Initiatives (ARM)
Data Democracy and Partnerships

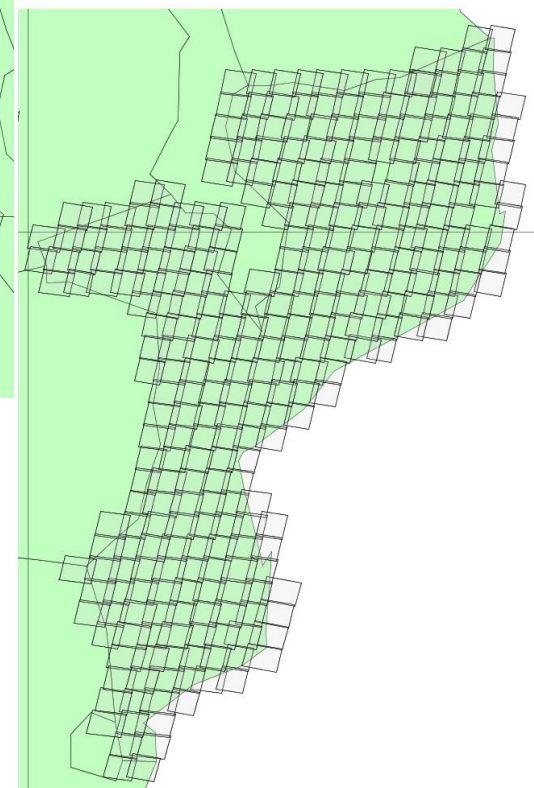
BASE SETS CREATION & RELIANCE ON PROVIDERS

Examples in medium to high resolution like Spot 4/5 offer possibilities of master base sets built on strong provider support

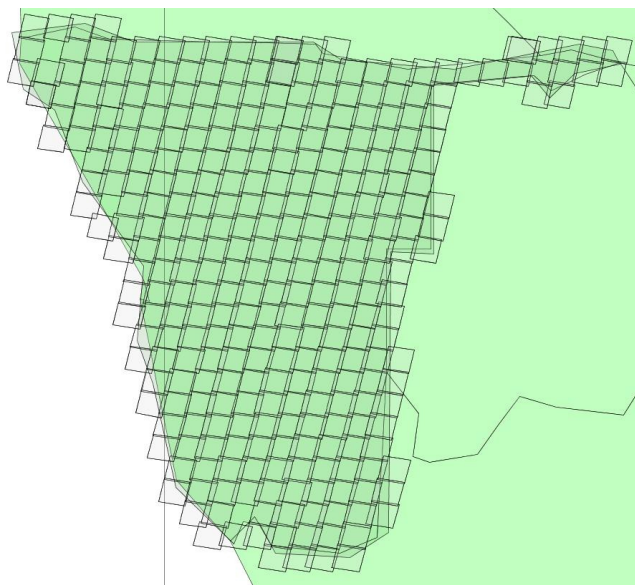
Zambia



Mozambique

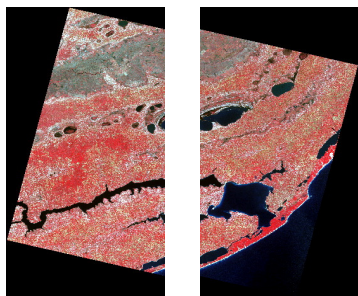


Namibia

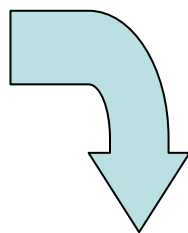


Trade off on spatial vs temporal vs costs etc. will dictate the selection of different sensors or their combinations to achieve similar results

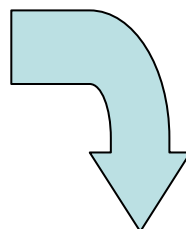
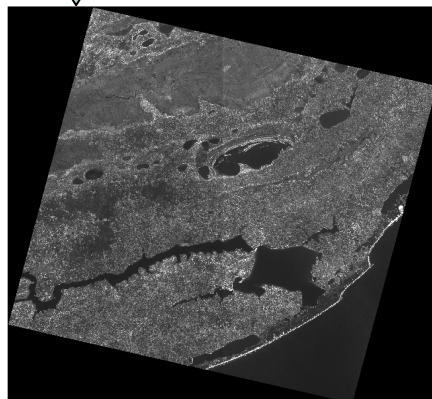
Populating a dynamic master set



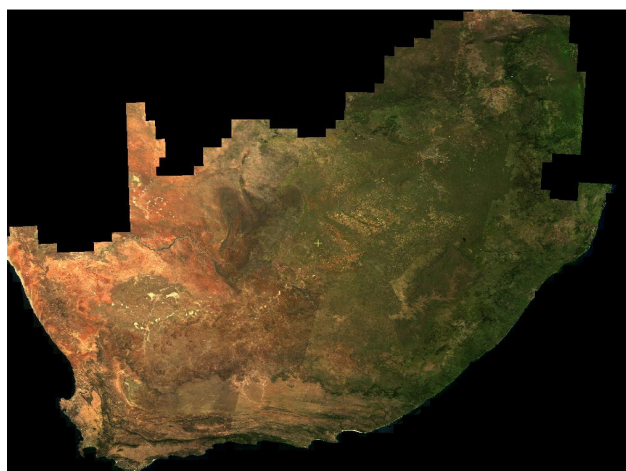
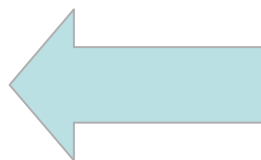
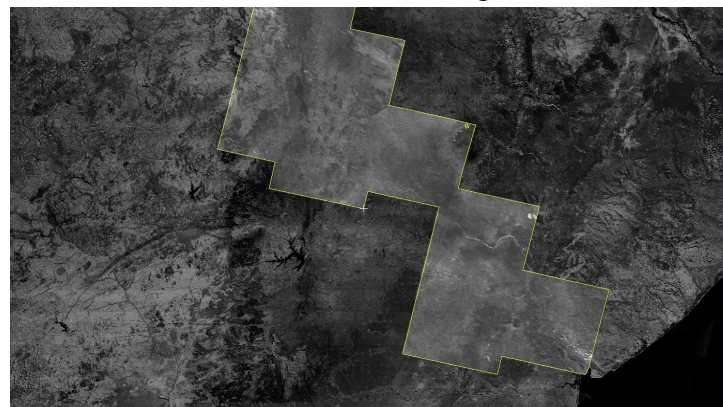
The images which pass the qualification criteria are selected and assembled.



One single layer (Infrared band) is extracted in preparation for integration.

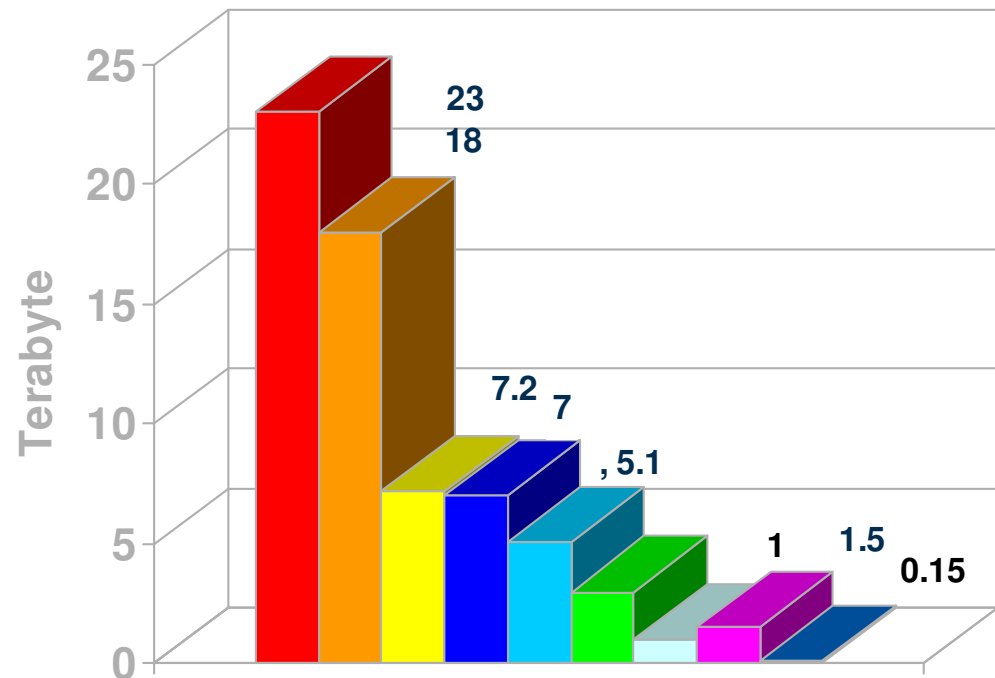


The reference master set is regionally substituted with the more accurate images.



Sensor Portfolio – SAC Archive

- Landsat TM: 1989 to 2008
- Landsat ETM+: 2001 to 2003
- Spot: 1989 to 2008
- EROS: 2001 to 2006
- ERS: 1994 to 2008
- NOAA: 1984 to 2008
- MODIS: 2004 to 2008
- Landsat MSS: 1980 to 1993
- Orbview-2: 1998 to 2008



**NEVER ENOUGH
FOR DISASTER
MANAGEMENT &
MONITORING**



With provisional data of: Ikonos – 2001/QuickBird – 2002 / Radarsat – 2001 / EnvisAT - ASAR, MERIS, ASTER / KompSat-2 / FORMOSAT / CBERS 2b ,SAC-C

NEEDS

- MORE AND THE LATEST
- MORE FREQUENT
- MORE ADEQUATE
- AND “FOR FREE PLEASE”

SAC plans to extend the conventional portfolio with RapidEye / ResourceSAT/ CartoSAT /etc.

AND SUPPORTS FULLY THE AFRICAN INITIATIVES

SumbandilaSat / NigeriaSat /AlgeriaSat / etc.
through constellations like ARM

Where small Satellite Remote Sensing Programs fulfill the need to establish local capacity (technology & Applications) but suffer from critical mass for wide spread use of the satellites and their data management (best practice / quality / access and dissemination)

PARTNESHIPS & DATA DEMOCRACY ???

CBERS2 / SacC /Sumbandilasat / etc..

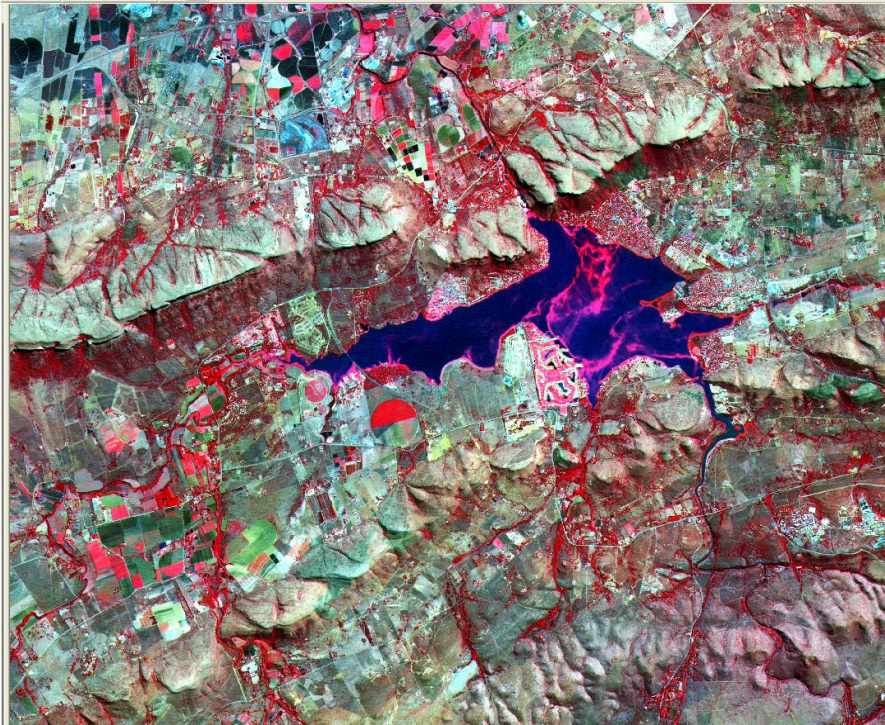
+ Exploring avenues of data exchange (USGS)
Access to archive data for more coverages.

**ALL BECOME MAJOR ASSETS IN
DISASTER MANAGEMENT
AND MONITORING**

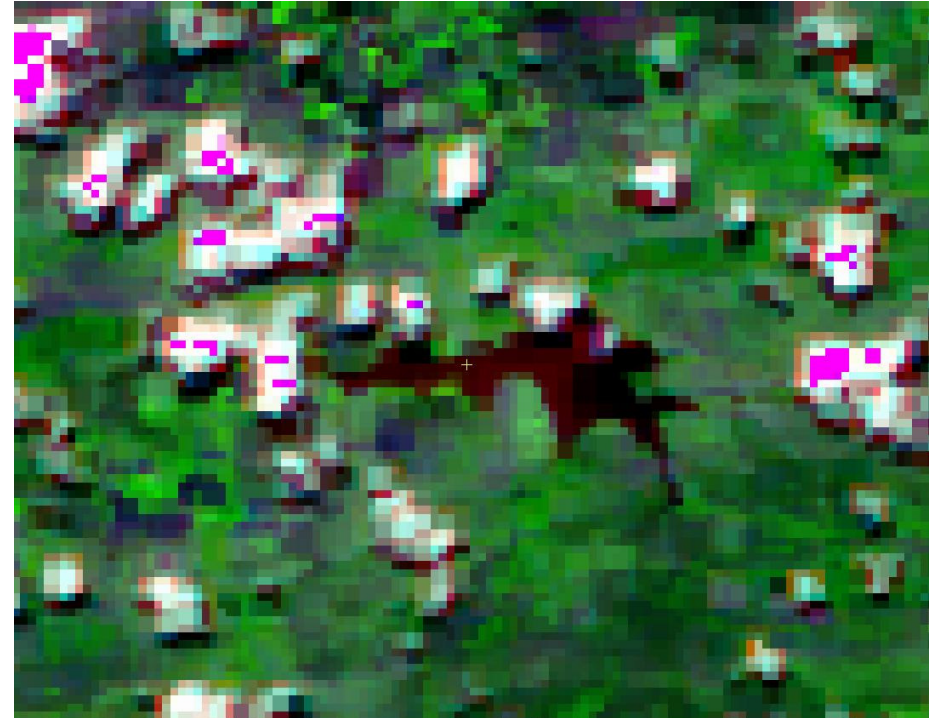
MONITORING CHALLENGES

Resolution vs Frequency vs useful information?

Example of eutrophication at the Hartebeespoort DAM

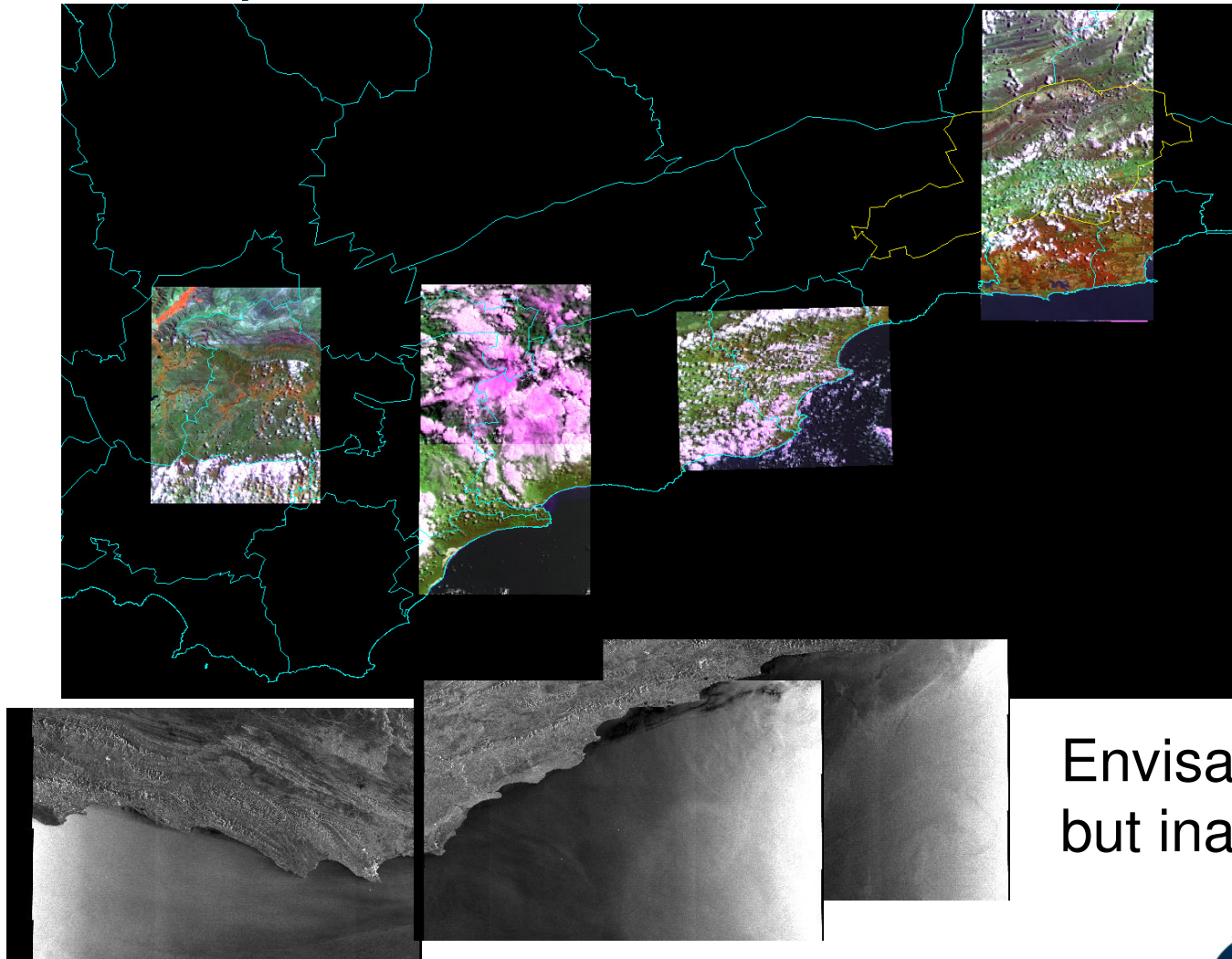


SPOT5 070411



MODIS 070729

Inadequate versus needed data



Spot in
archive
but of little
help for
Timely
assessment

Envisat available
but inaccessible

Sumbandilasat 27 May 2010



Useful data for
Eutrophication
monitoring

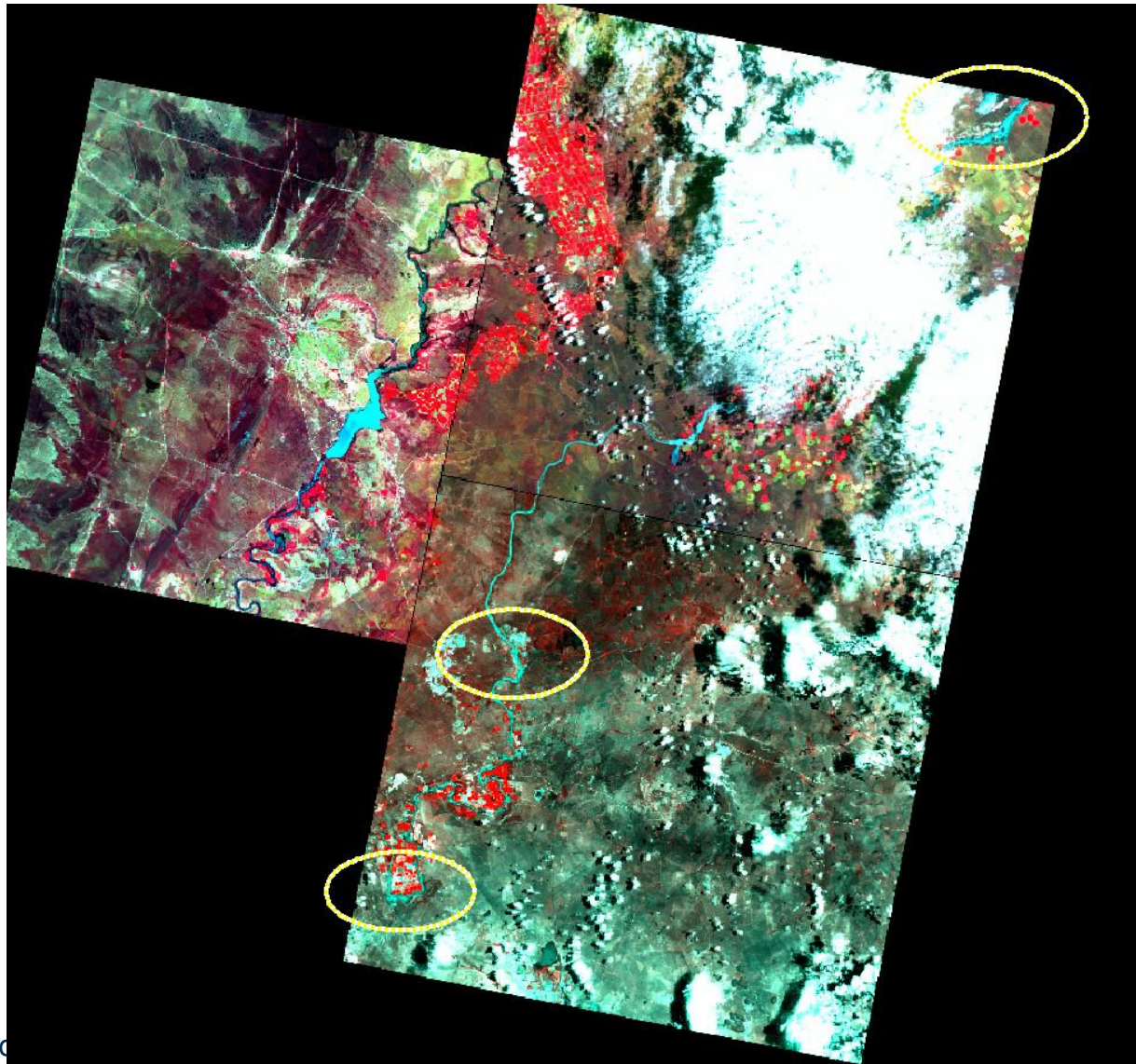


Keeping watch and plenty of luck

Blessed with
excessive
rain + clouds

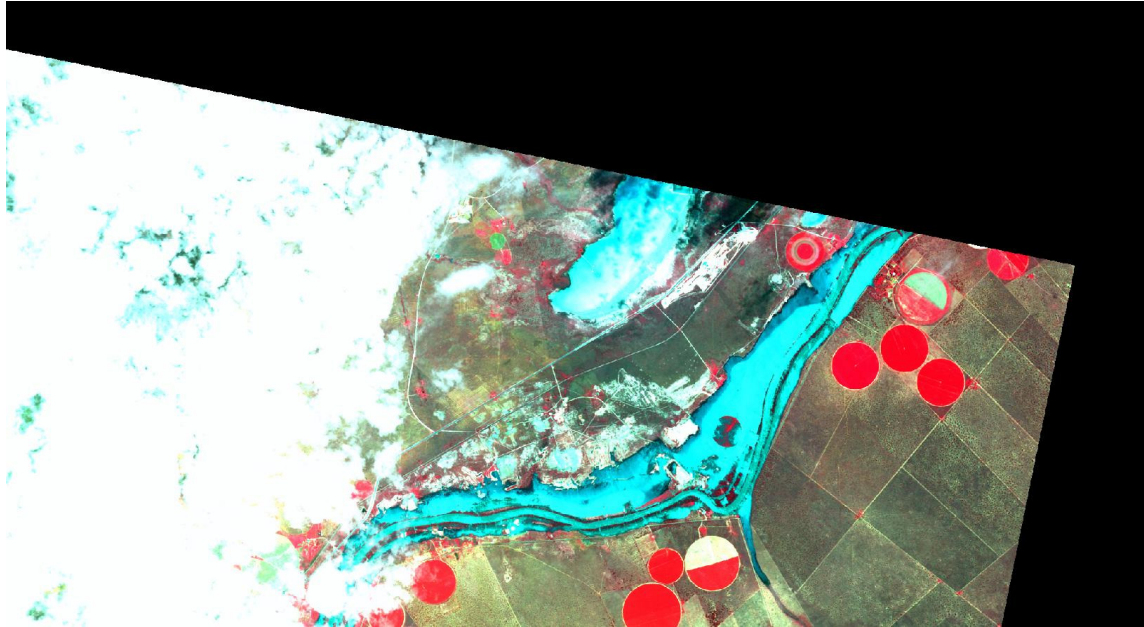
Despite
optical
sensors
limitations

Spot5
acquisitions
on Sunday
31th January
2010



Slide

1) Christiana region after the water gate opening



31/01/2010

Between
clouds

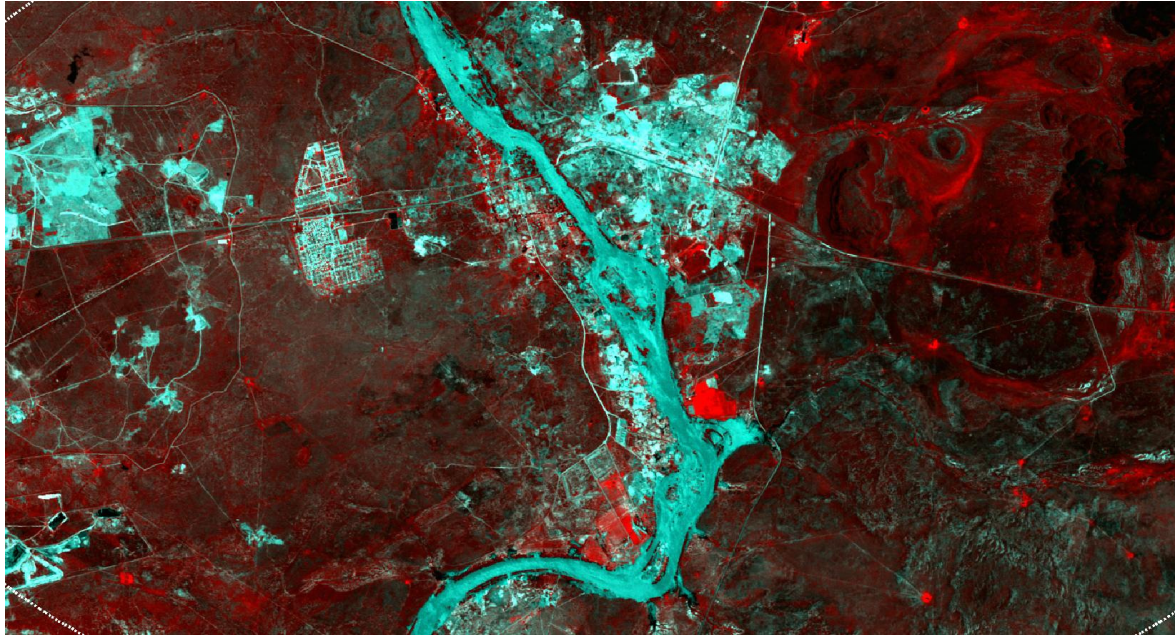
Central pivot
damage



Before image

Spot5 2009
master set

2) Windsorton region after the water gate opening



31/01/2010

Affected
mining
activities



Before image

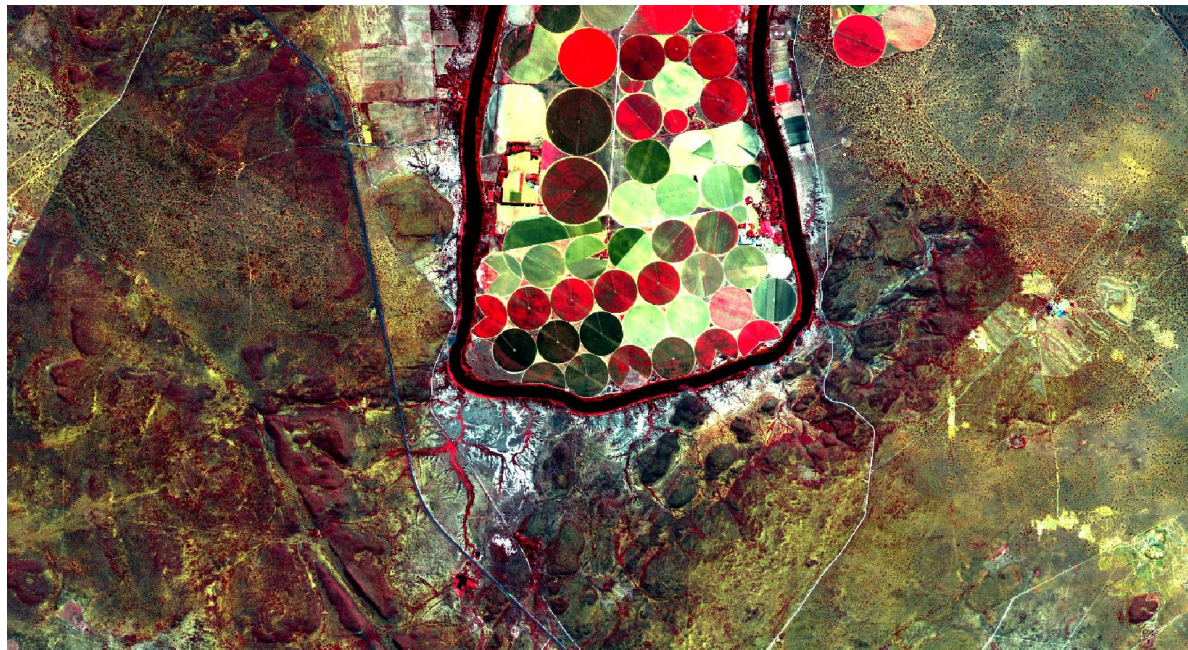
Spot5 2009
master set

3) Affected Region near Barclay West



31/01/2010

Affected
agriculture
activities



Before image

Spot5 2009

master set

SAC /SANSA ROLE

SAC,s role in DISASTER MANAGEMENT

- Quick turnaround time = Stand-by capability 24/7
- Brokering in data access & active in extending sensors portfolio
- Active on planned monitoring capabilities and programmes

+ Some additional roles once migrated to SANSA

- Space Agency seeks answers to needs via future satellites
- Ease of additional data access (Charter adherence, special agreements, International bilaterals, etc.)
- Alignment to world standards but still tailor made for the local requirements e.g. relevance (UN-SPIDER)
- Training and Capacity Building

INTERFACE TO NDMC STRUCTURE

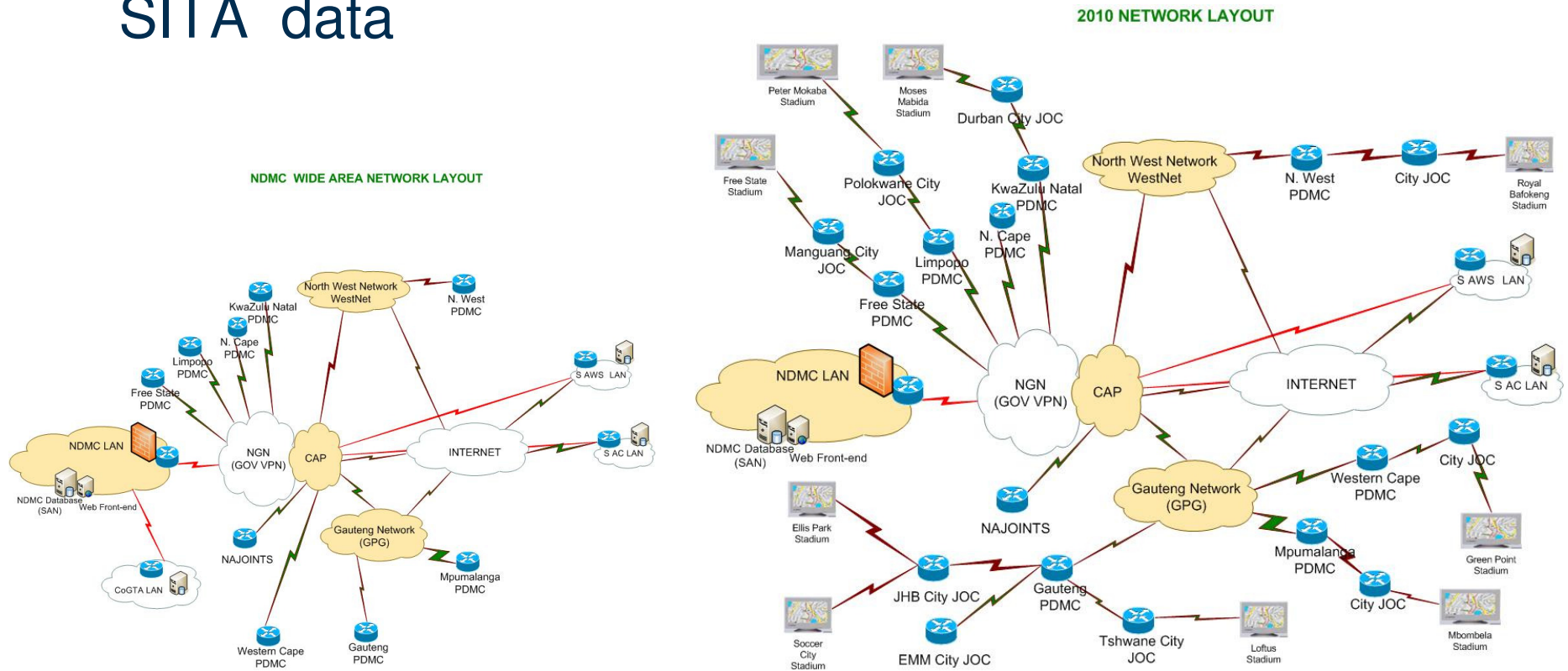
- National Disaster Management Centre (NDMC) is the legal entity and recognised as the national focus point and committed to a UN-SPIDER Regional Support office (RSO)

CHALLENGES

- Infrastructure interconnectivity and access to data
For data dissemination from national to provincial to district
(Connectivity and data hosting)
- Soft capacity (people) a global challenge

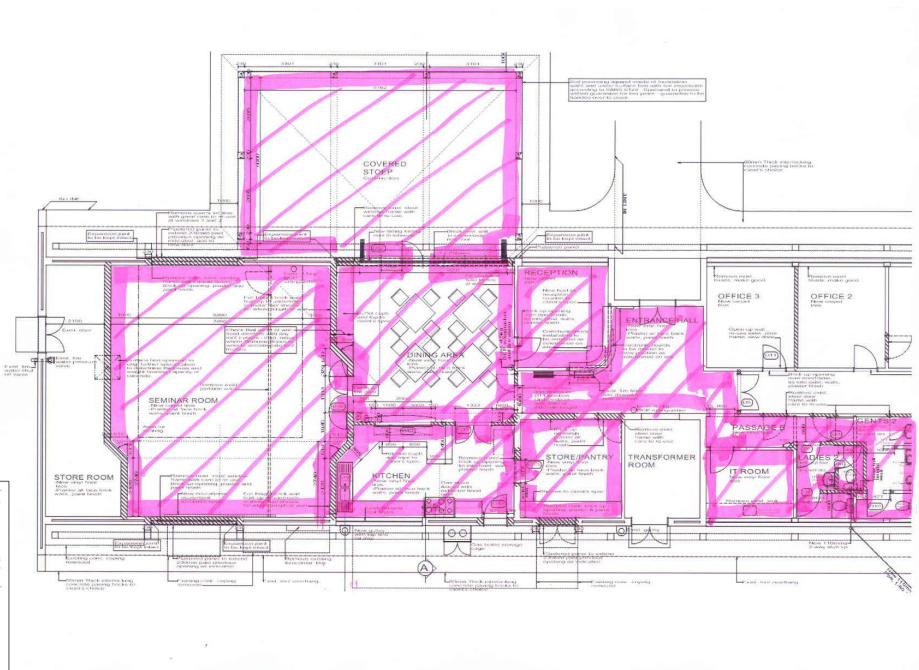
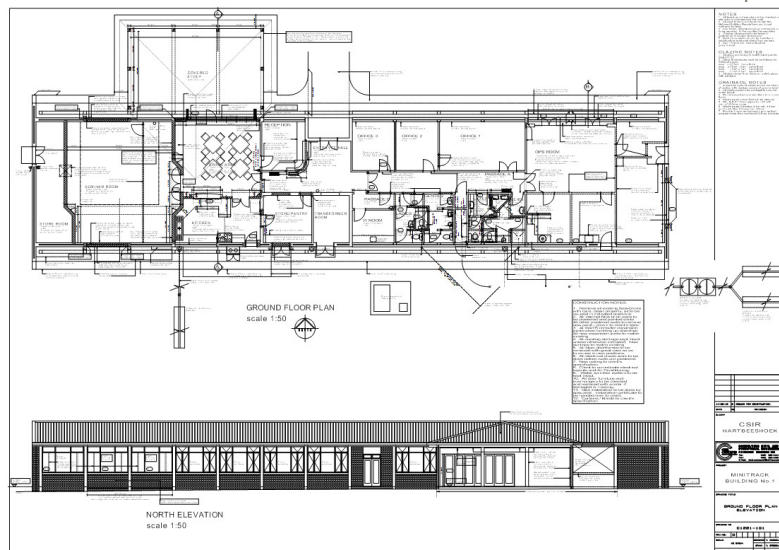
The intent for central data modelling capability and due to lack of local capacity NDMC welcomes products like Vulnerability mapping and risk assessments and monitoring programmes like AFIS

Connectivity Challenges and plans to facilitate access and dissemination of SAC / SAWS and SITA data



RSO PLAN OFFER

Infrastructure:
Seminar Room &
catering facility at
the Minitrack

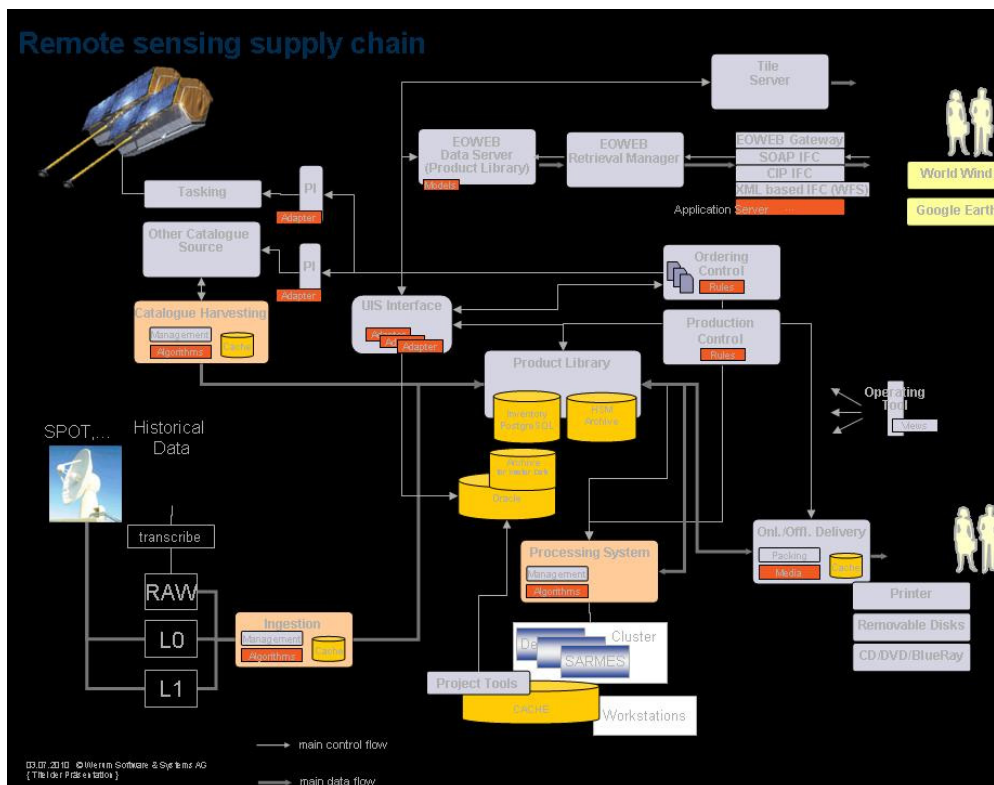
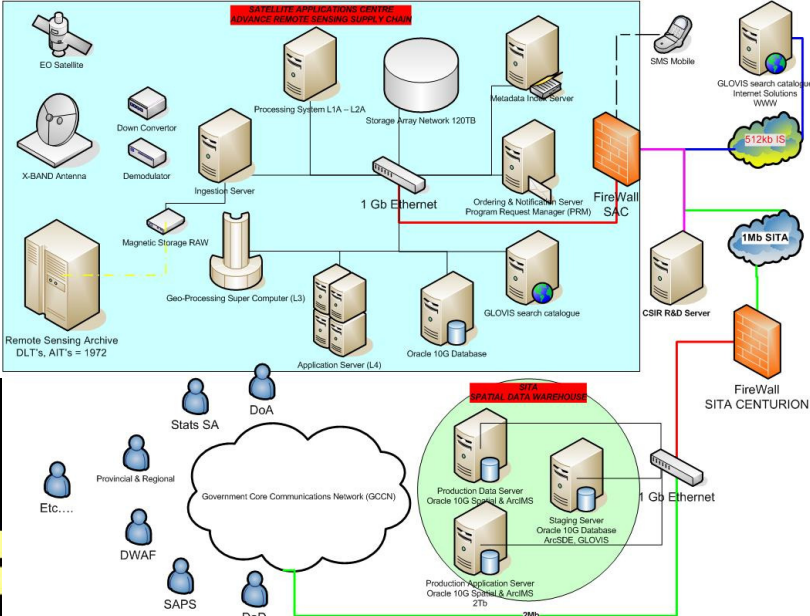


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RSO PLAN OFFER

Organisational: SAEOS
and state of the art
remote sensing supply chain
D.I.M.S system



Plus:

- Access to ESA data via DDS
- Links to major providers for data and services
- International Charter

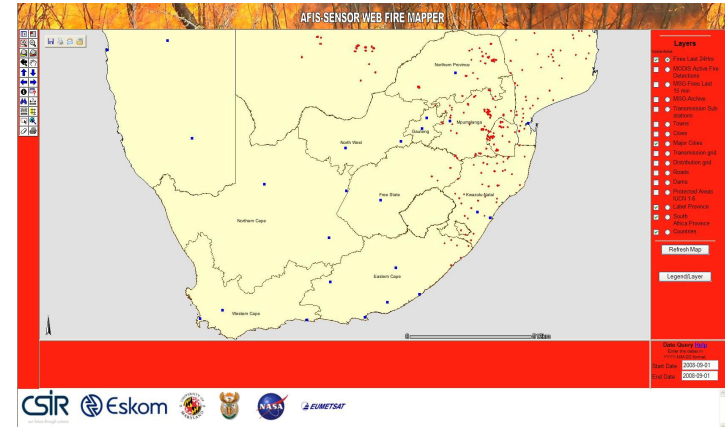
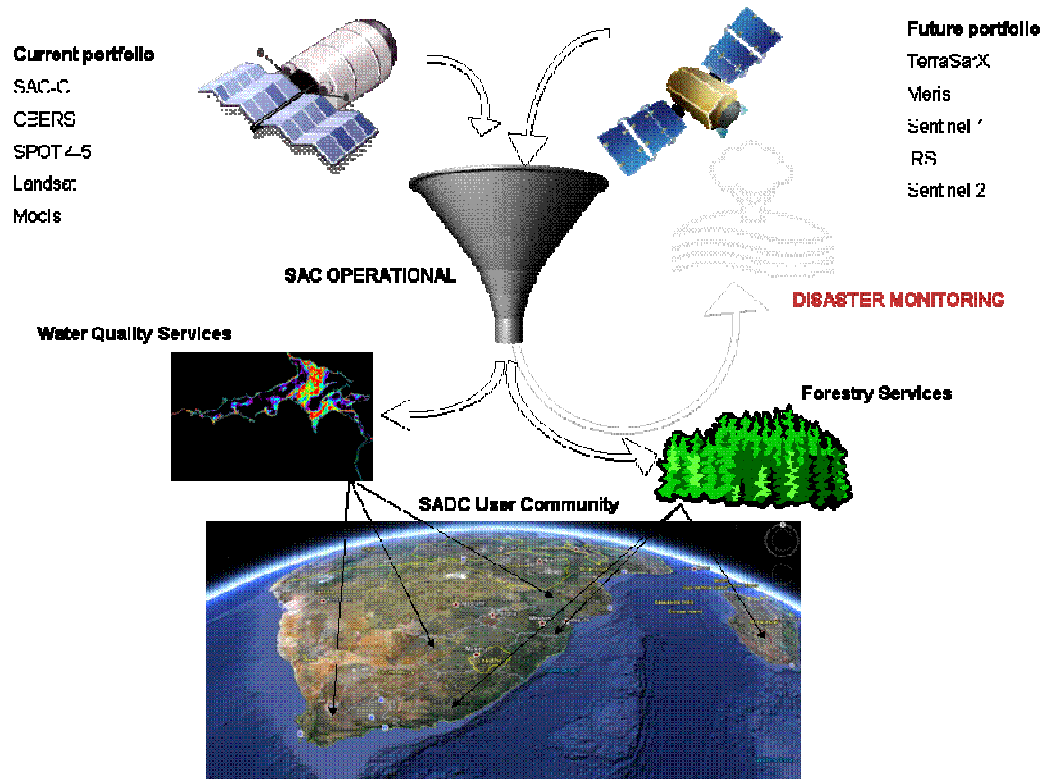
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RSO PLAN OFFER

Gearing for UN-SPIDER functions

Where Disaster Management becomes an additional operational service amongst others like AFIS



Plus:

Cross cutting regional activities currently running whereby avoiding duplication in

- Awareness
- Outreach
- Capacity Building



SADC NETWORKING CHALLENGES

SAC has a role to play on the regional as well as on an international level.

It therefore established an Impact group to explore and address this role not only on a national, regional but at wider scale.

With the help of the Earth Observation community and our stakeholders like DST, DIRCO, DTI, etc.. these first steps must bear fruits soon.

INTERNATIONAL PARTICIPATION



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SPACE TECHNOLOGY



- **CSIR Satellite Applications Centre**
To become
The South African Space Agency (SANSA)
in 2011



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INTERNATIONAL PARTICIPATION

Current participation in SADC Thema of the AMESD Project

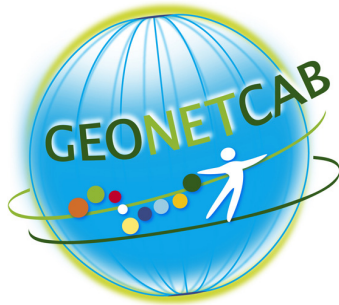


- Data provision to Ministries of Agriculture and Environment & Universities
- CBERS-2B SADC country mosaics
- SAC-C data per SADC country



INTERNATIONAL PARTICIPATION

Current participation in GEONetCab



Total cost: € 1,207,860

EC Contribution: € 999,988

Duration: 36 months -started: 1 Nov 2009

Consortium: 8 partners from 6 Countries

SAC's role in SADC=

- Inventory of current capacity-building activities
- ID bottlenecks
- Connecting & building
- Awareness & dissemination



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INTERNATIONAL PARTICIPATION

Current participation in Garnet-E



Total cost: € 1,190,063

EC Contribution: € 999,470

Duration: 24 months -started: 31 May 2010

Consortium: 17 partners from 15 Countries

1. SAC's role = EO Engagement in South Africa and SADC



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INTERNATIONAL PARTICIPATION

Current participation in TIGER II



Establishment of:

- Data Dissemination System (DDS)
- Regional Tiger Office
- Training facility infrastructure
- Regional Water Information System (RWIS)
- Regional Workshops etc.



AND PERHAPS SOON

Participation in UN-SPIDER



UNITED NATIONS
Office for Outer Space Affairs

United Nations Platform for Space-based
Information for Disaster Management and
Emergency Response (UN-SPIDER)

- Establishment of the UN-SPIDER
Regional Support Office in South Africa for
SADC



- Awareness raising
- Outreach
- Capacity Building
- Community of Practice
- Cooperation
- Etc..



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GEO/GEOSS ALIGNMENT

SAC as SANSA will participate and is expected to contribute at different forums from GMES-Africa to GEO & GEOSS via Geo South Africa

From GEOSS Common Infrastructure to Data Management and Capacity Building the task on user engagement and community of practice should offer the platform for extended networking.

The DI-06-09: Use of satellites for Risk Management Is particularly followed as indicator of best practice.

The GEOSS Architecture Implementation Pilot Phase 3 [GEOSS AIP-3 DM WG] Draft of unified Disaster Management Reference Scenario may come in handy.

CAPACITY BUILDING AND TRAINING

- For the programmes above ,FP7, AMESD and UN-SPIDER in particular SAC hopes to engage our tertiary institution and assure sustainability, not only as institution like SANSA but banks on the new generations to carry EO to the next level.

- **University of Cape Town (UCT)**, Disaster Mitigation for Sustainable Livelihoods Programme (DiMP), South Africa - <http://www.egs.uct.ac.za/dimp/>
- **University of the Free State**, Disaster Risk Management Training and Education Centre for Africa (DiMTEC), Bloemfontein, South Africa - <http://www.uovs.ac.za/>
- **North West University**, African Centre for Disaster Studies (ACDS), Potchesfstroom, South Africa - <http://www.acds.co.za/>
- **University of South Africa (UNISA)**, Centre for Public Administration and Management (CePAM), Florida, South Africa – www.dms-online.co.za
- **Disaster Management Institute of Southern Africa (DMISA)**, Johannesburg, South Africa - <http://disaster.co.za/training.htm>
- **Lowveld Centre for Life Long Learning (C4L)**, White River, South Africa – <http://www.C4L.org>
- **University of Witwatersrand**, Johannesburg, South Africa – <http://www.wits.ac.za/>
- **Southern Business School**, Helderkruijn, South Africa – <http://www.sbsonline.co.za/>
- **SAQA** (South African Qualification Authority) Offers Professional recognition

THANK YOU!!!



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