



UN/Austria/ESA WSSD Symposium

13-16 Sep 2004, Graz, Austria

Water for the World: Space Solutions for Water Management

- TIGER -

ESA Initiative: Africa

Jim Williams (J Aschbacher)

TIGER Coordinator

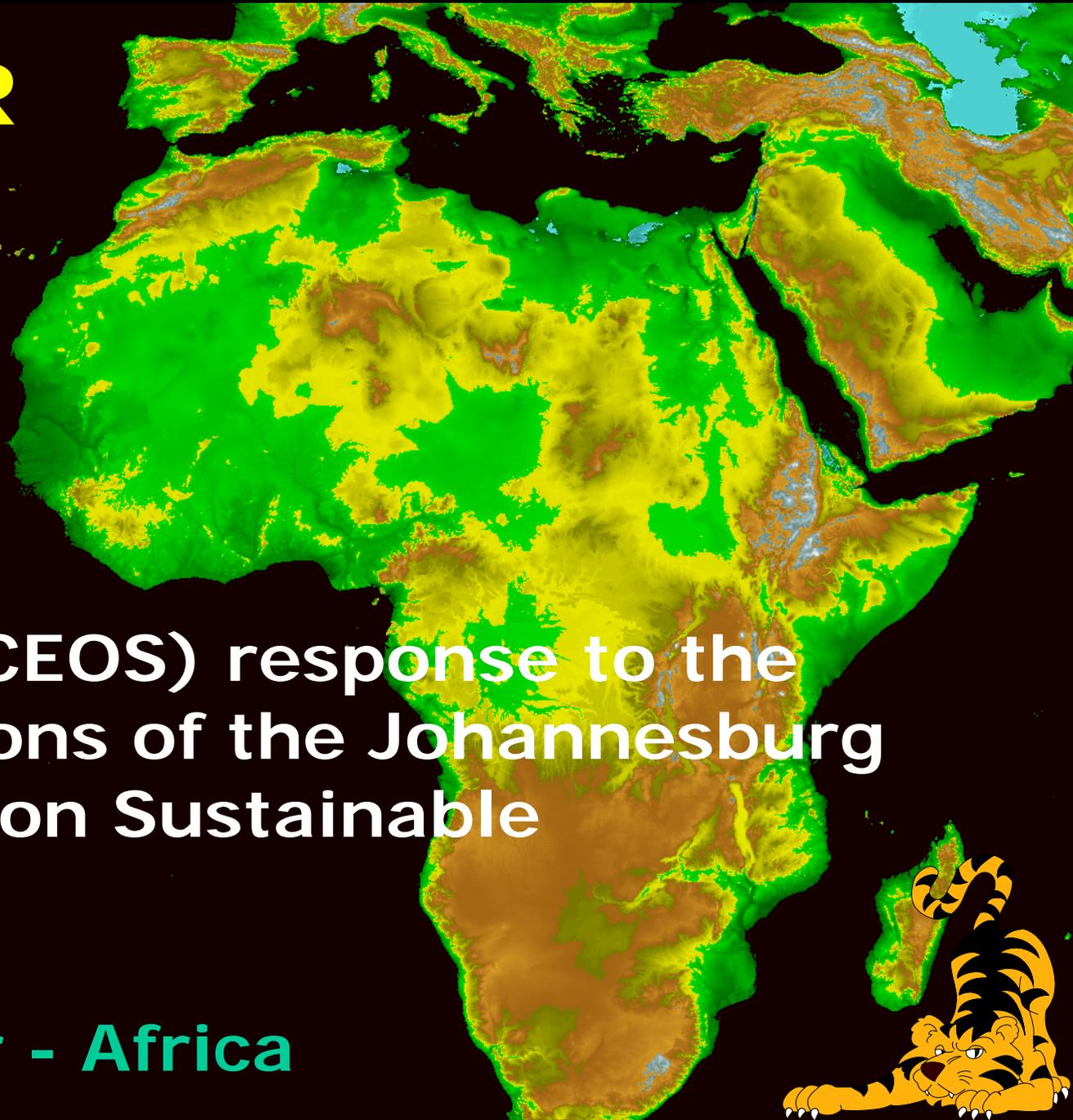
ESA's TIGER Initiative



TIGER

is a practical (CEOS) response to the recommendations of the Johannesburg World Summit on Sustainable Development.

Its focus is on
Space – Water - Africa





TIGER's Dual Objectives

"Develop sustainable Water Services for Africa"

Objective 1

Demonstrator Projects

Objective 2

Political Process

- AQUIFER (ESA)
- GLOBWETLAND (ESA)
- GMFS (ESA)
- WRM (UNESCO)
- WAMIS (CSIR/SAC)
- Nakambé (UN/ESA)
- TIGER AO
- OTHERS

- AMCOW
- NEPAD
- SADC, UMA, ECOWAS,
- IGAD, CEMAC (TBC)
- WB
- AFDB
- EC
- OTHERS



2003

2006+



3 Types of TIGER Projects

1 - ESA projects

- GLOBWETLAND, GMFS, EPIDEMIO, AQUIFER
- Investment 4+ M € (ESA only) in 2003/2004

2 - Response to ESA TIGER AO

- Free ERS/ENVISAT data; Call closes 30 Sep 2004
- Partners interested in joining TIGER network

3 – Projects of TIGER Partners

- Substantial Activities by partners
- To date: Canada Radarsat Call (Y. Crevier), UNESCO actions (A Lipponen), NOAA (training), UNOOSA (Graz WS), etc.



TIGER Network

Projects in **TIGER Network** will benefit from:

- Privileged access to EO data - ERS and ENVISAT data free of charge
- Support with data transfer infrastructure if needed
- Support with awareness raising, training, capacity building activities
- Shared experiences with similar activities across Africa
- Support with approaches to donor organisations to raise funding for operational activities

**Call for proposals issued on 1 Jul 2004,
closes 30 Sep 2004**



TIGER Network Projects

Deadline 30 Sep 2004

12 proposals received so far

- Botswana, Madagascar, Mali, Niger Basin, RSA, Sudan, West Africa, Zambia, Canada, Netherlands, India, Switzerland

Expressions of Interest

- Egypt, Ghana, Morocco, Namibia, SA regional, SA region, RSA, Senegal, Togo, Tunisia, SADC, RCMRD and Agrhymet, etc.

Expected but not confirmed

- Cameroun, Congo, Ethiopia, Libya, Nigeria, Zimbabwe, etc.

→ See TIGER web-site <http://earth.esa.int/tiger> CE 



TIGER – Topics & Partners

Thematic Priorities to date

- Wetland monitoring
- Food security
- Epidemiology
- Groundwater resources management

3 types of stakeholders

- Users – water authorities (in Africa)
- Providers – data and information providers
- Sustainers – funding and development agencies



GlobWetland – Sites in Africa

- **User Group:**

- ✓ *10 countries:
Algeria, Egypt,
Senegal, South
Africa, Kenya and
the Lake Chad
Commission
Members.*

- **Wetlands:**

- ✓ *15 wetlands sites;*



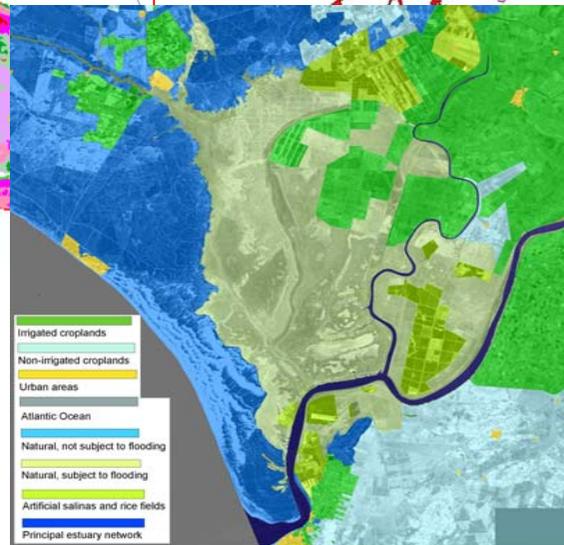
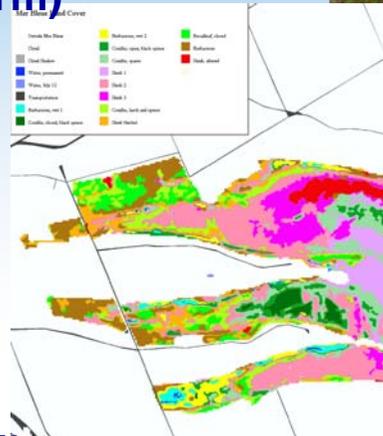


GlobWetland



GlobWetland products

- Base maps for inventorying
- Water cycle monitoring (seasonal and long-term)
 - *Water table*
 - *Inundated vegetation*
- Land cover/use and change
 - At wetland site scale
 - At basin scale
- Topography Dynamics
- Wetlands identification, delimitation and attributes
- DEMS
- Mapping and location of peat fires
- Water quality & Biophysical parameters



Target Users

- *National Focal Points of the Ramsar Convention*
- *Local authorities (wetland managers)*



AQUIFER - Products & sites

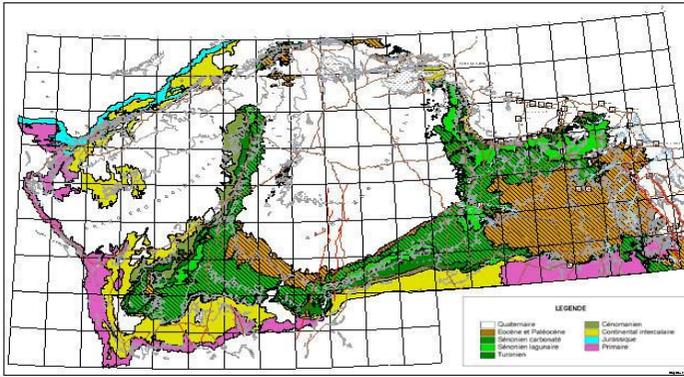
- DTMs
- land-use & land-use change
- water extension & dynamics
- soil moisture
- subsidence monitoring
- water abstraction

1:500,000 maps covering
 entire aquifers

1:50,000-100,000 maps
 covering 200,000 km²

Science products covering
 25,000 km²

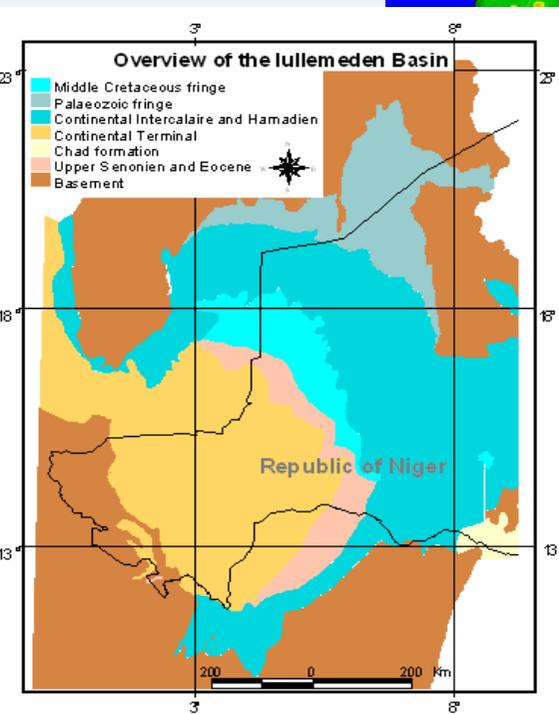
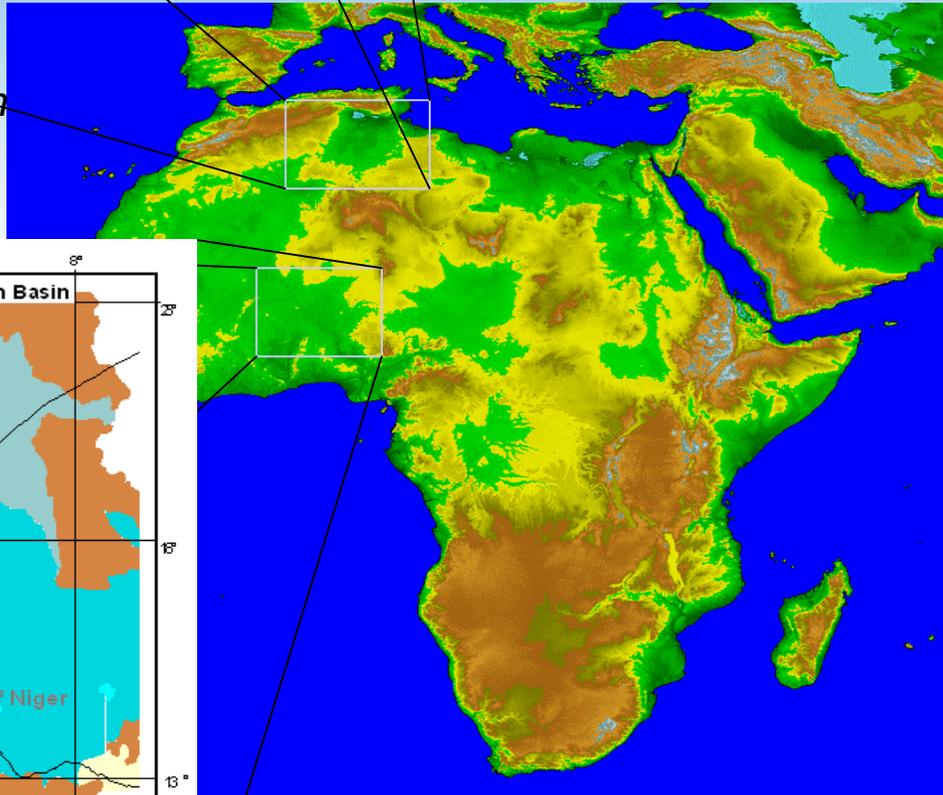
**Users: Ministries in Algeria, Libya, Mali, Niger,
 Nigeria, Tunisia (+4 African service providers)**



SASS

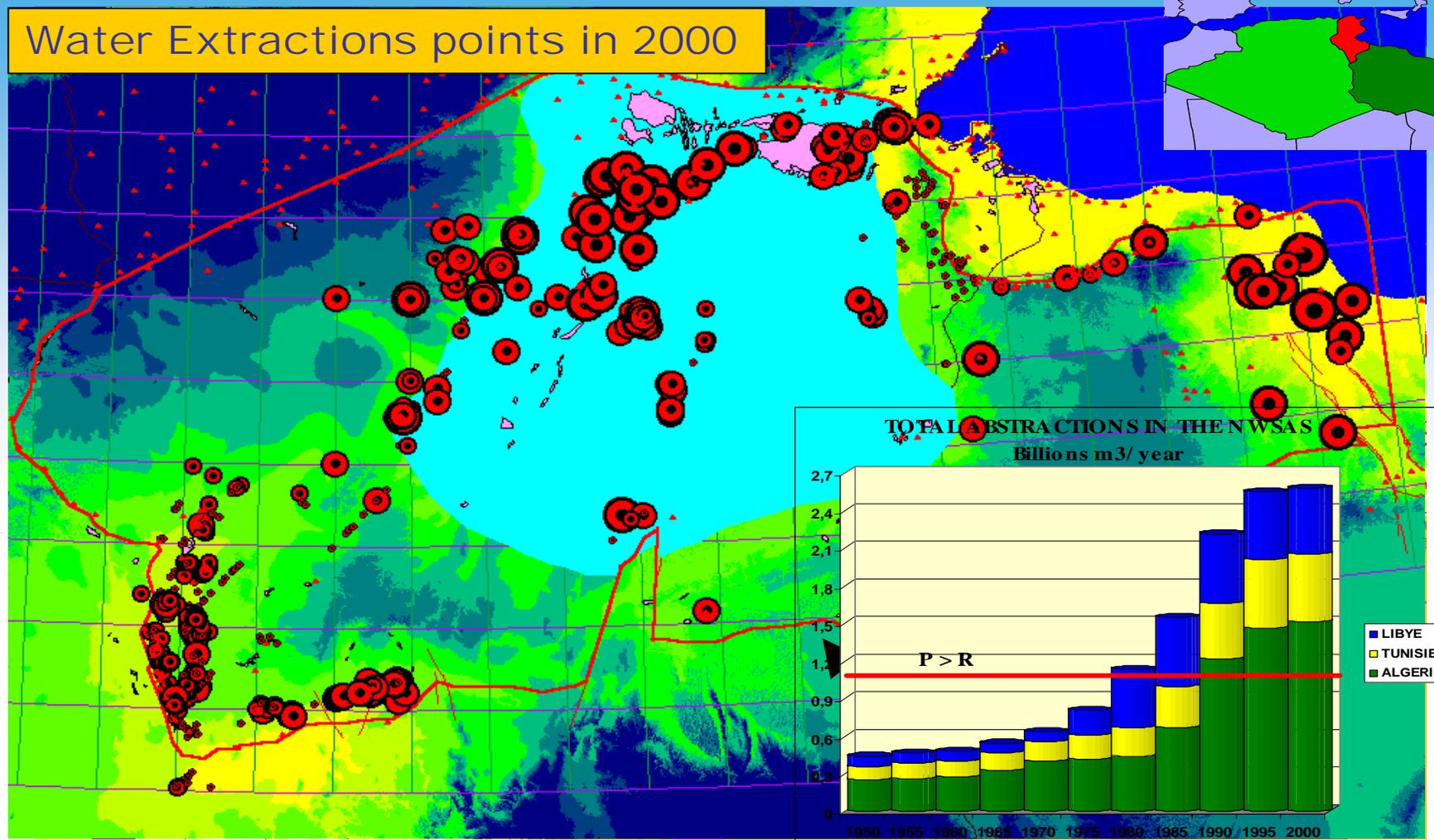
1 Mkm² each

Iullemeden





Water Extractions points in 2000



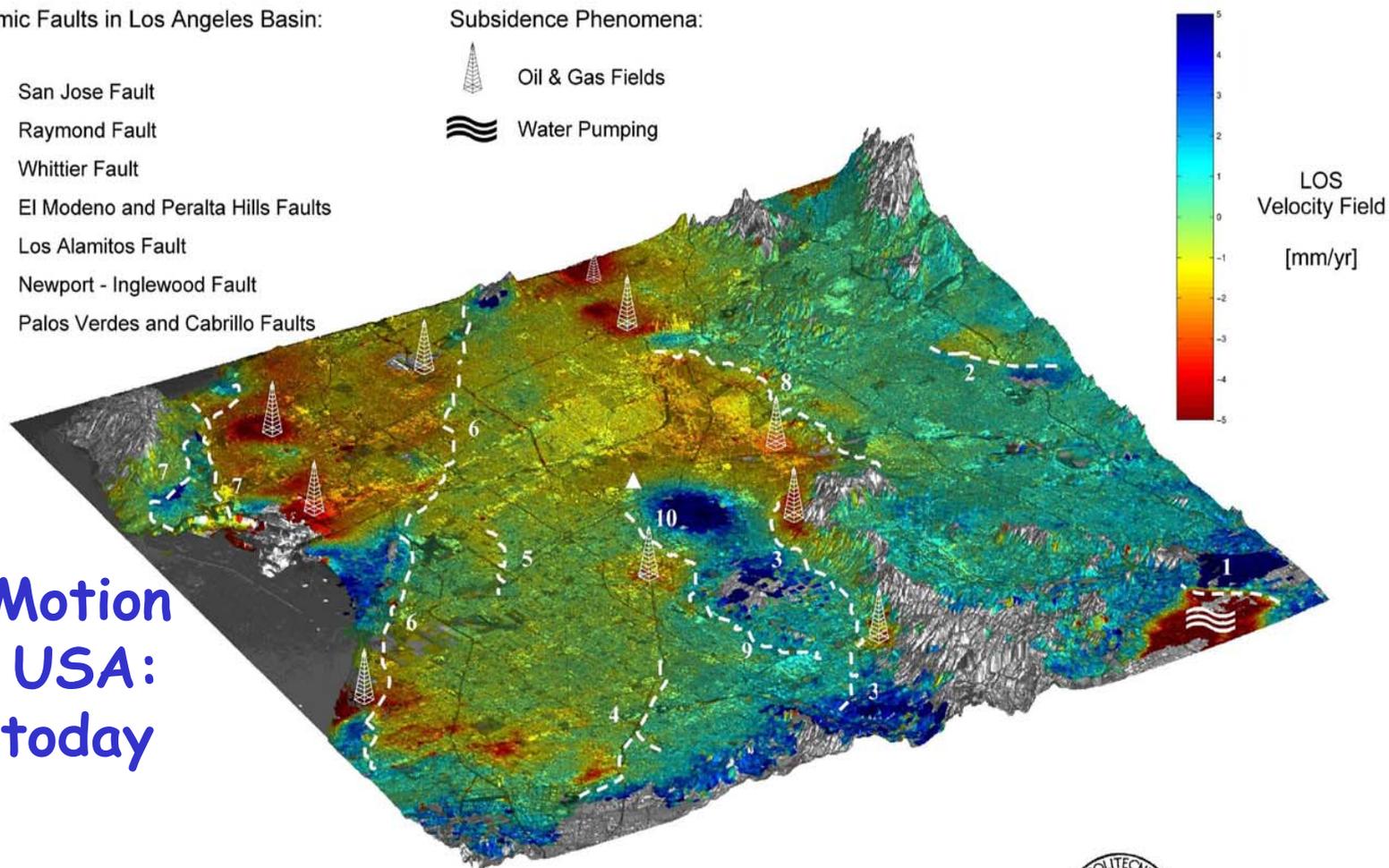


Seismic Faults in Los Angeles Basin:

1. San Jose Fault
2. Raymond Fault
3. Whittier Fault
4. El Modeno and Peralta Hills Faults
5. Los Alamitos Fault
6. Newport - Inglewood Fault
7. Palos Verdes and Cabrillo Faults

Subsidence Phenomena:

- Oil & Gas Fields
- Water Pumping



Terrain Motion in L.A., USA: 1992 - today

8. Elysian Park Blind Thrust (?)
 9. Coyote Hills Blind Thrust (?)
 10. Santa Fe Spring Blind Thrust (?)
- } Puente Hills Blind Thrust (?)

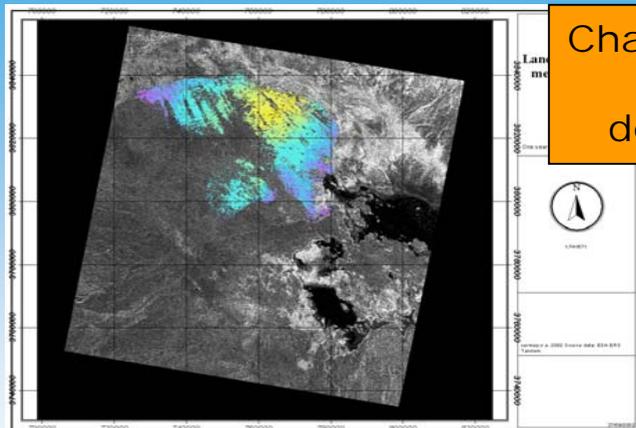


T.R.E.

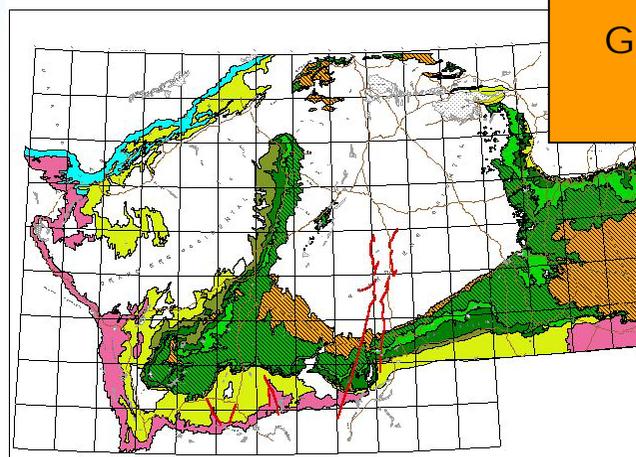




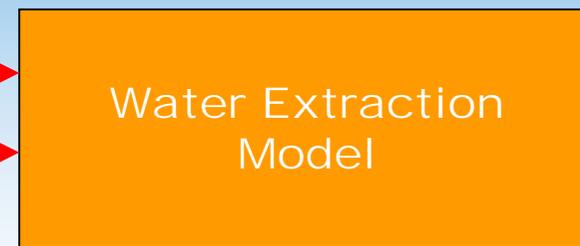
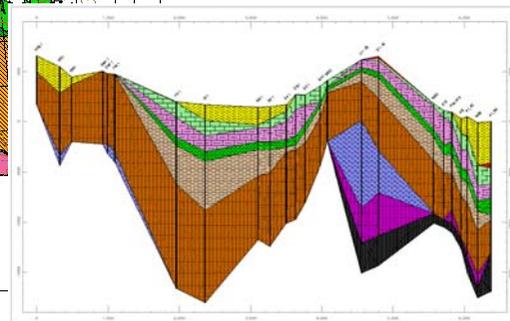
- Water extraction model



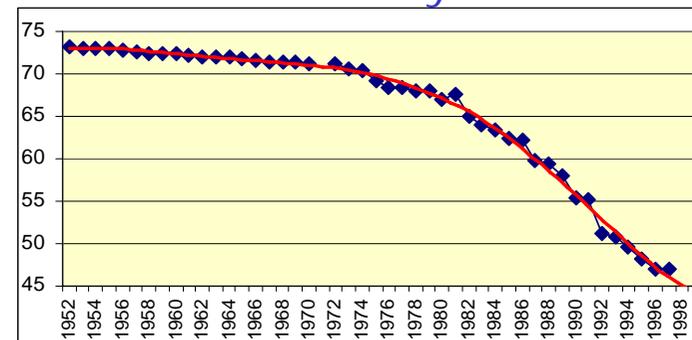
Changes in volume due to subsidence derived from ERS data



Geological information Provided by OSS



Water availability

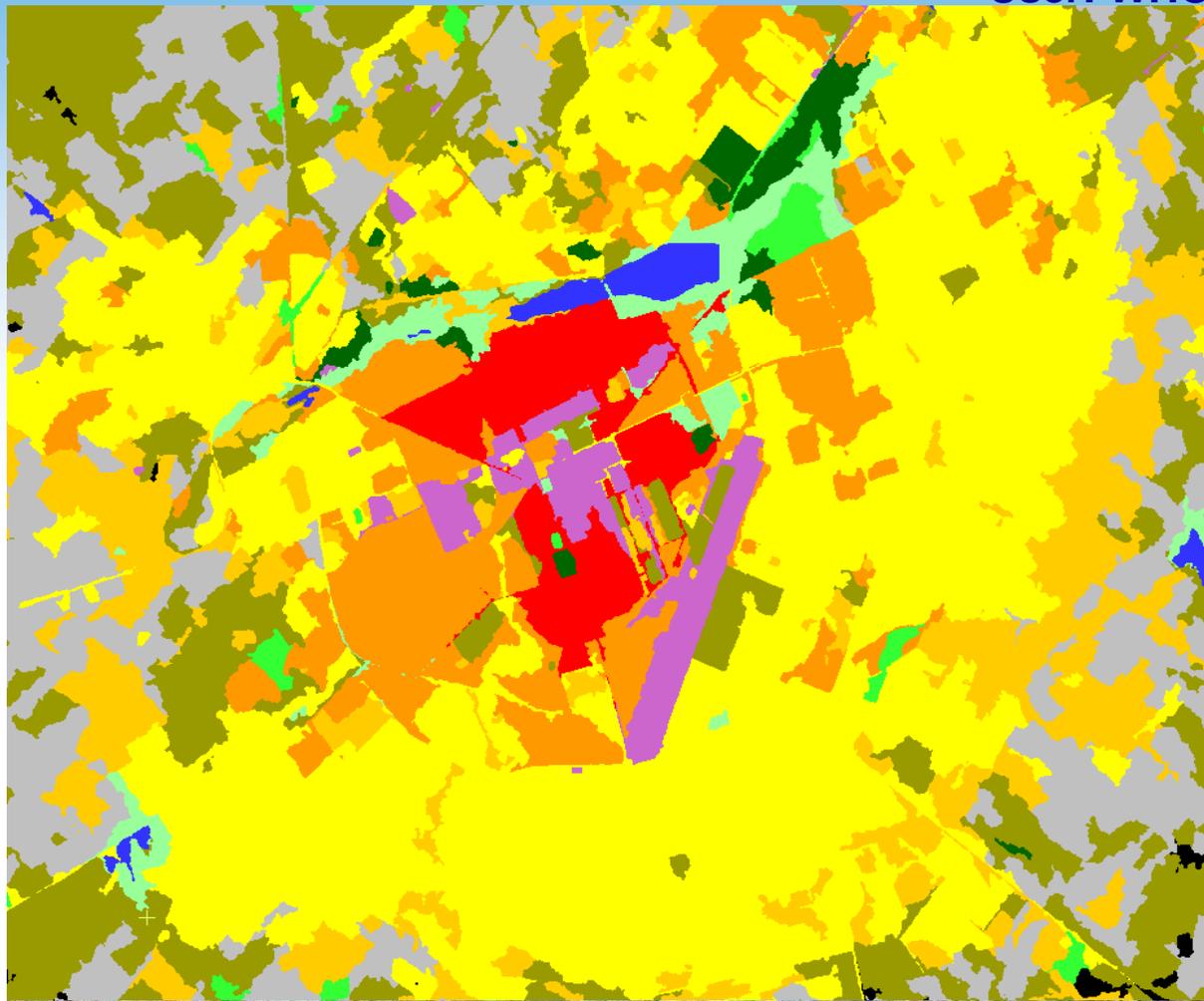




EPIDEMIO

Prototype Urban Map for Ouagadougou, Burkina Faso

User: WHO Healthmap Group



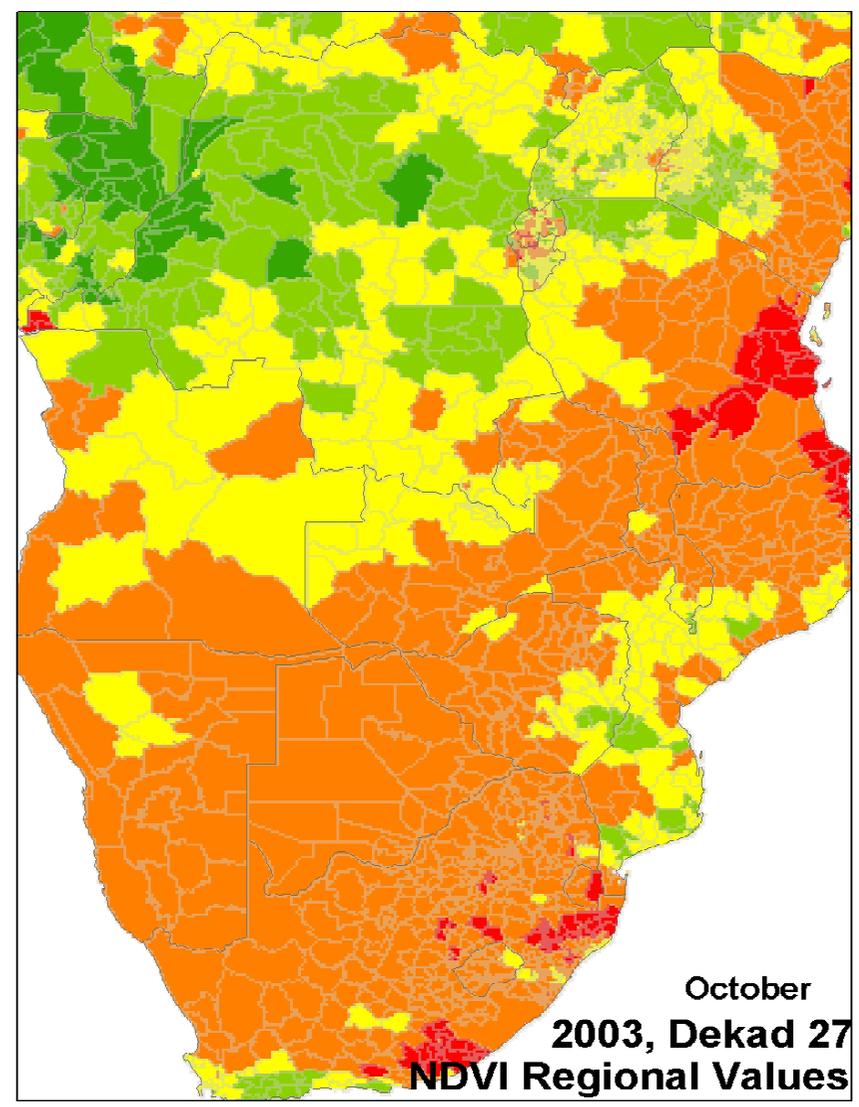
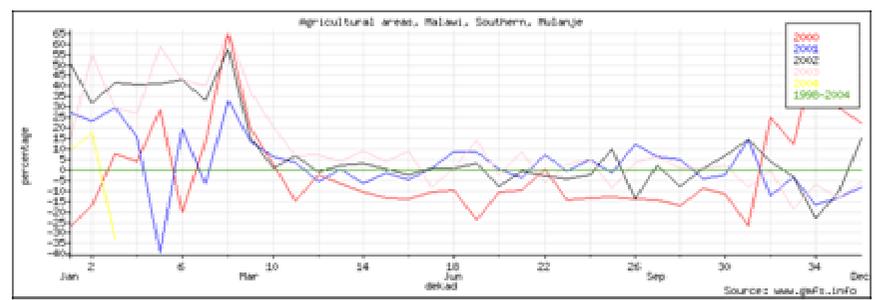
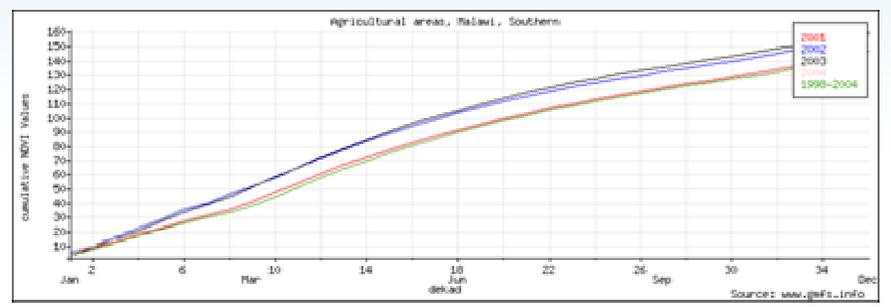
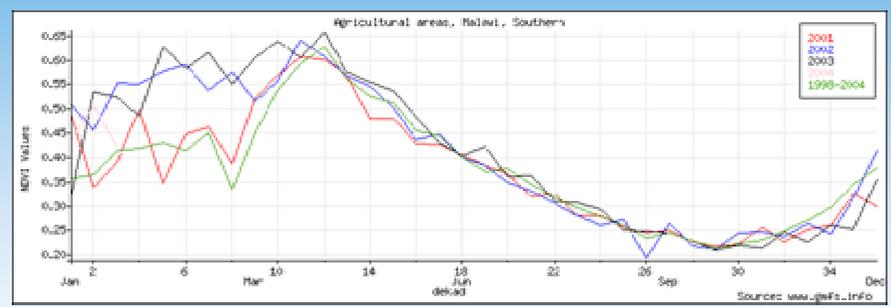
Prototype classification
of SPOT-5 image
(early results)

- Water
- Potential Wetlands
- Open Spaces/Vegetated
- Open Spaces/Bare Soil
- Wooded Areas
- Non-Wooded Areas
- Urban Dense
- Urban Medium Dense
- Urban Diffuse
- Commercial and Industrial Zones
- Villages
- Unidentified

GMFS

Global Monitoring for Food Security

Continental Scale Monitoring, Southern Africa (Users: SADC-REWU, EC/JRC)





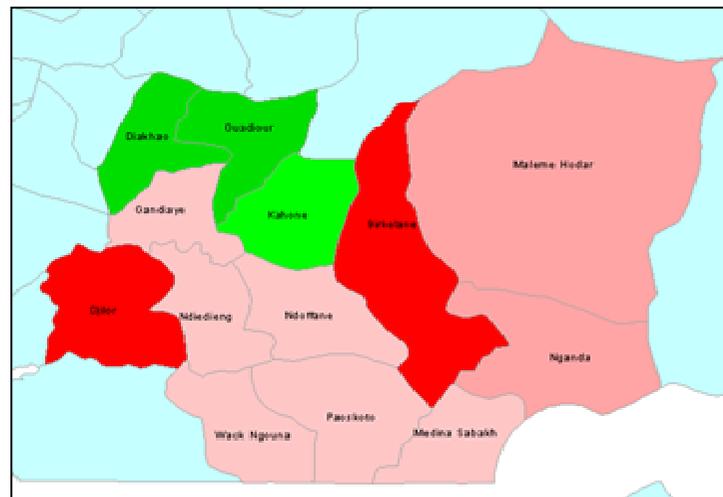
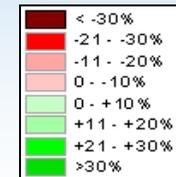
Sub-national production forecast, Senegal, 2003

User: Ministry Agriculture, Senegal



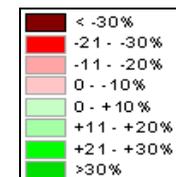
Millet yield forecasts 2003
relative to 10-year average

Average = + 5%



Peanut yield forecasts 2003
relative to 10-year average

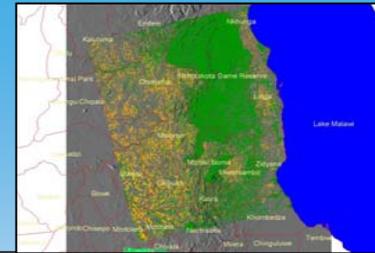
Average = - 6%



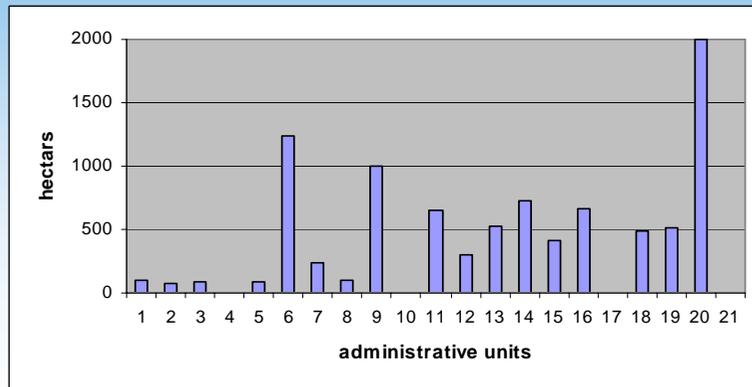


High Resolution Crop Area - Time Series, Nchisi, Malawi

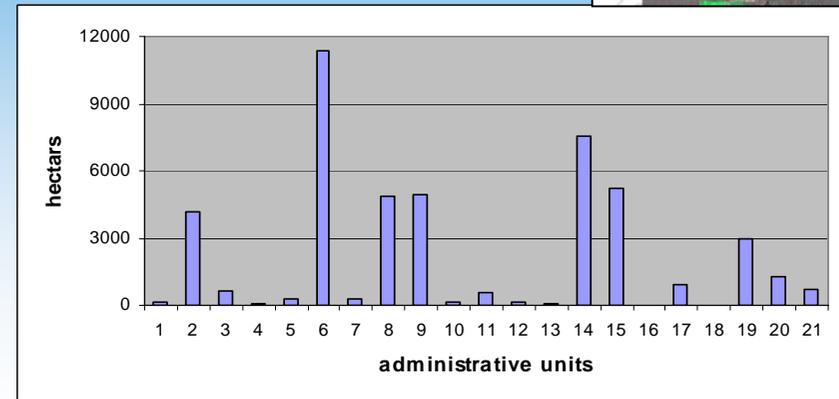
User: Min Agriculture, Malawi



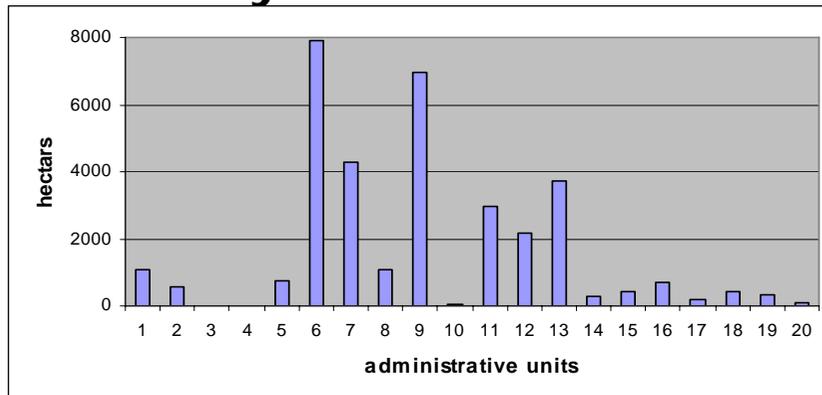
7 December 2003



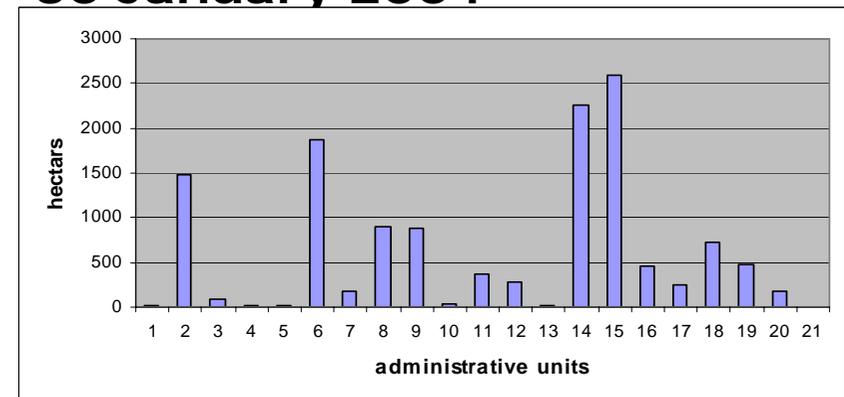
26 December 2003



11 January 2004



30 January 2004





TIGER Management

TIGER support established in 2004

- **TIGER Steering Committee** → First meeting in Pretoria (Nov)
- **TIGER Secretariat** → First meeting in Salzburg (Sept)
- **TIGER Coordinator** hired May 2004



TIGER Consultation Phase

- How do our African partners want TIGER to work In practice?
- How do our CEOS/UN/European partners want TIGER to work ?
- Where and What can we learn from earlier experiences?



TIGER Consultation Phase

- In Africa, how many Departments of Water use EO* routinely today?
- Do we concentrate TIGER resources on the most advanced users? Or the least?
- Can we find an attractive uptake pathway to help engage current non-users?
- Are decision makers ready for better information?

What can we learn from earlier experience?



TIGER Consultation Phase

- Data
- Information
- Knowledge
- Wisdom

What role for TIGER?

What can we learn from earlier experience?



TIGER Consultation Phase

- Research
- Demonstration of practicality ...
- Operational Uptake
- Sustainable services

What can we learn from earlier experience?



TIGER Consultation Phase

Context & Issues

- Increasing demand for water
- Declining reserves/sustainable supplies
- Water policies : too valuable for agriculture?
- Real time decisions as flood warning
- Coping with Climate Variability
- Coping with Climate Change

What can we learn from earlier experience?



TIGER Consultation Phase

Water and sustainable development is primarily

- A technical problem?
- A financial problem Lack of Staff, Training Equipment?
- An institutional problem?
- A political, social, legal problem?
- A local, national, international scale problem?
- **What can we learn from earlier experience?**



TIGER Consultation Phase

Who then are the principal stakeholders?

Many local, national and regional bodies

- Government, civil society, private sector
- Very important role for the universities ... training the trainers towards institutional sustainability
- How to bring in social and economic interests
- A large number of external stakeholders (UNOOSA, UNESCO, FAO, WMO, UNEP)
- **What can we learn from earlier experience?**



TIGER Consultation Phase

Is TIGER more than just another attempt at top down 'technology push'?

- ENVISAT, ERS, MSG Exceptional sources of data Provide information that is very difficult to obtain any other way....
- Environmental change ... faster than development in Africa ... Need to be informed
- Trans-boundary watersheds Exceptionally difficult problems Make best use of the comparative advantages of satellite data.
- **What can we learn from earlier experience?**



TIGER Consultation Phase

What's new?

- WSSD → new resolve NEPAD
- Partnership approach ... several CEOs and UN partners working together
- Some extremely capable satellites
- Free access to data, products and techniques
- The Millennium Development Goals and special donor concentration on Africa
- The success with using EO in India
community level work, M&E, up-scaling

What can we learn from earlier experience?





TIGER Consultation Phase

Final Pointers

1. No finance for projects → sharing and collaboration ... initiative rather than a programme.
2. How to bring India fully on board?
3. Water level recording with satellite radar altimeters..... major potential ... for engagement of the weaker services

What can we learn from earlier experience?





TIGER Schedule - Summary

Sep 2002	WSSD in Johannesburg
Nov 2002	WSSD Follow-up Programme initiated at CEOS Plenary
2003/04	4 ESA Projects initiated, Paris-Rabat WSs
Feb 2004	Regional TIGER Workshops (S-Africa)
Apr 2004	TIGER Coordinator takes up duty
Jul-Sep 2004	TIGER AO open (free ERS, ENVISAT data)
mid 2004	Setup of TIGER Secretariat, Steering Committee
(Sep	Canada Call for Proposals - free RS data, etc)
Mid 2004	SHIP agreement with UNESCO
Sep 2004	ENVISAT Symposium, UNOOSA WS
Nov 2004	TIGER-2 South Africa (Pretoria)
Mid/end 2005	"Donors" Conference / "Space for Water"
End 2005	End of Phase 1, decision on Phase 2



TIGER Challenges Ahead

- 1 – Succeed with TIGER AO: technical building blocks**
- 2 – Develop a network of committed partners in Africa**
- 3 – Broaden the range of Development Partners (top down meets bottom up)**
- 4 – Sustainability: Operationalisation and Africanisation**
- 5 – IMPACT through better informed decisions**



TIGER Information

1 TIGER Website

<http://earth.esa.int/tiger>

2. TIGER Contact

Tiger@esa.int