

TIGER – An Initiative to Use  
Space Technology for  
Water Resources Management

***CEOP/IGOS-P/IGWCO Meeting***

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# The TIGER Initiative



## TIGER

is a concrete action to implement the recommendations of the Johannesburg World Summit on Sustainable Development, focusing on  
**Space – Water - Africa**





# TIGER's Dual Objectives

"Develop sustainable WRM Services for Africa"

Objective 1

Demonstrator Projects

Objective 2

Political Process

ESA Projects  
 UNESCO Projects  
 CSA Projects  
 CEOS WSSD / NASA / NOAA  
 Tiger AO→95 Proposals  
 UNOOSA Training WSs

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



2003 OTHERS

2006+

## ***3 Types of TIGER Projects***

### **1 - ESA projects (first actions, initiated 2003)**

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

### **2 – Projects of TIGER Partners**

- Substantial activities by partners
- To date: Canada Radarsat Call (Y. Crevier), UNESCO actions (A. Lipponen), UNOOSA (S. Camacho), NOAA (R. Lawford), NASA (Bruce Davis)

### **3 - Response to ESA TIGER AO**

- Free ERS/ENVISAT data
- Partners interested to obtain TIGER « label »



Projects with **TIGER label** will benefit from:

- Privileged access to EO data – ERS, ENVISAT free of charge, others TBD
- Support to data transfer infrastructure if needed
- Support to education, training, capacity building activities
- Coordination of similar activities across Africa
- Support to approach donor organisations and to raise funding for routine operations

Call for proposals issued on 1 Jul 2004,  
closed 30 Sep 2004

- 95 responses received
- 66 projects rated 1 or 2 (excellent/good, but may need further re-grouping/discussion) → invited to Pretoria
- 21 projects rated 3 (interesting, but too early for first batch)
- 8 projects rated 4 (out of scope)

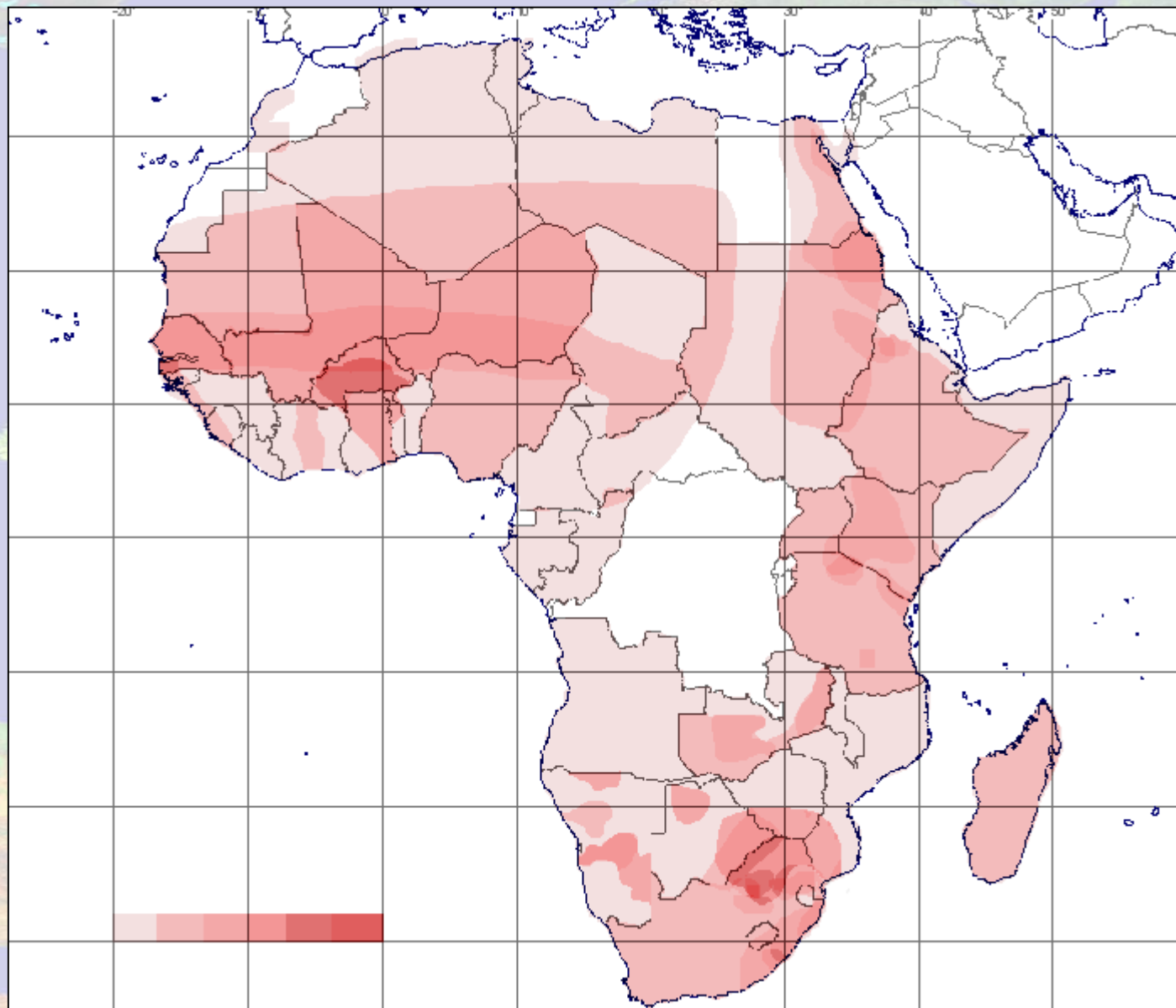
Grouped into 4 topics:

- Aquifer
- Watershed Management
- Wetlands, Lakes, Coastal Zones
- Hydrology, Soil Moisture, Floods, Health

Organising these projects is non-trivial task and needs your support



# Geographic coverage of the 95 responses



# AQUIFER - Products & sites

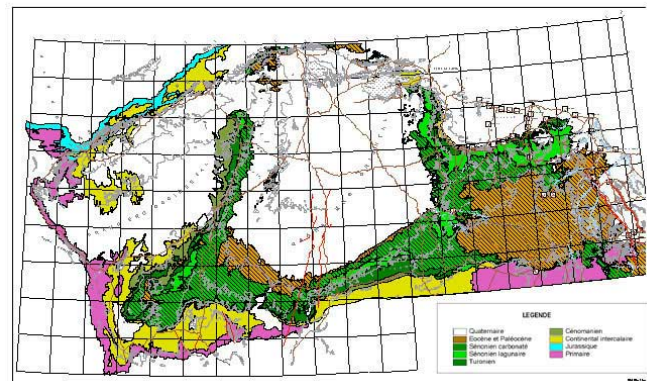
- DTMs
- land-use & land-use change
- water extension & dynamics
- soil moisture
- subsidence monitoring
- water abstraction

1:500,000 maps covering entire aquifers

1:50,000-100,000 maps covering 200,000 km<sup>2</sup>

Science products covering 25,000 km<sup>2</sup>

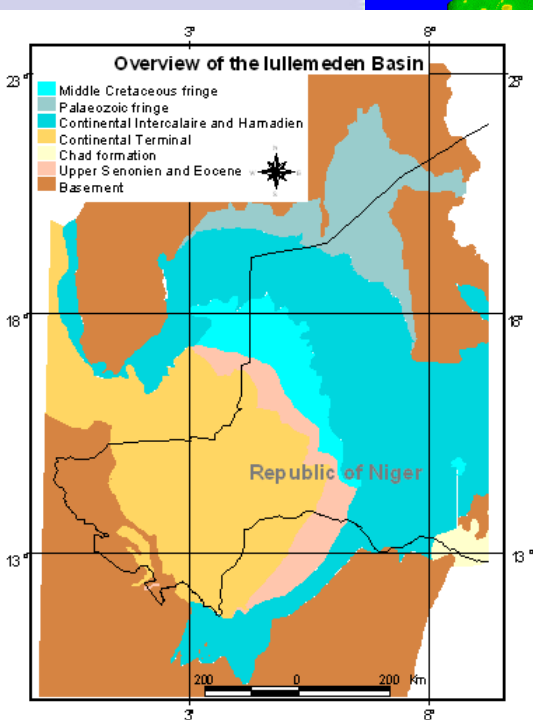
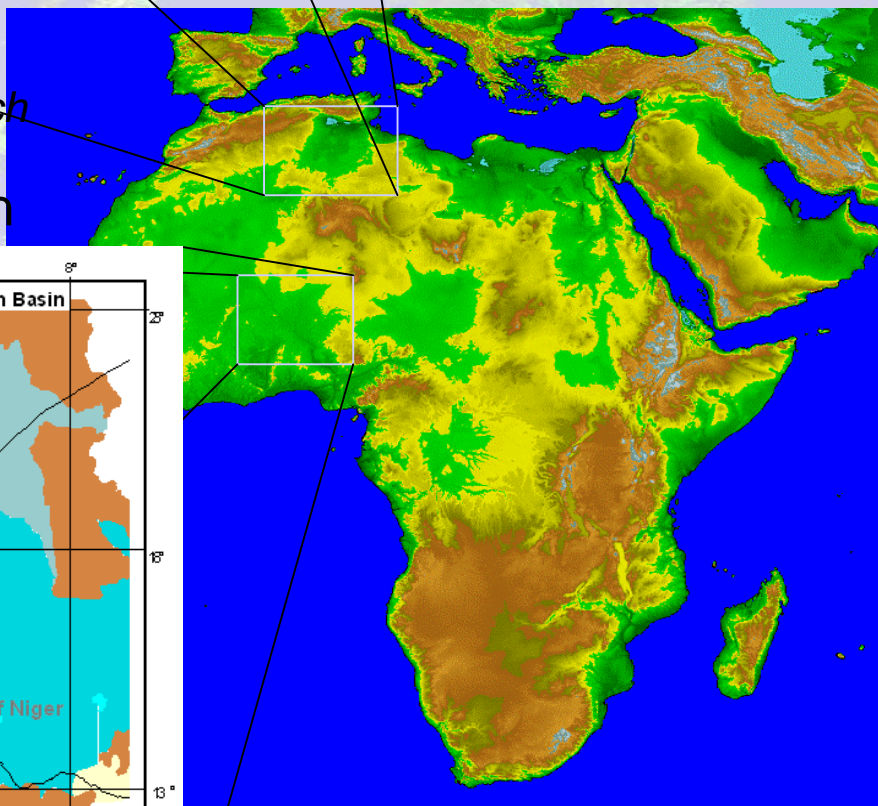
**Users: Ministries in Algeria, Libya, Mali, Niger, Nigeria, Tunisia (+4 African service providers)**



SASS

1 Mkm<sup>2</sup> each

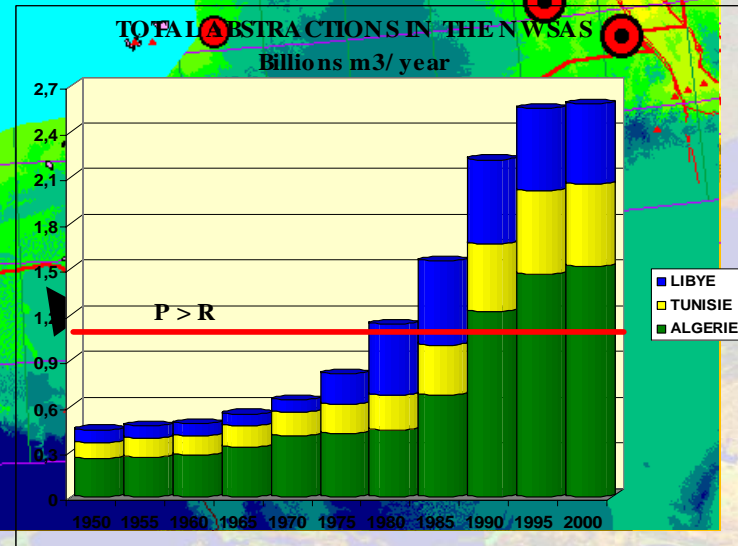
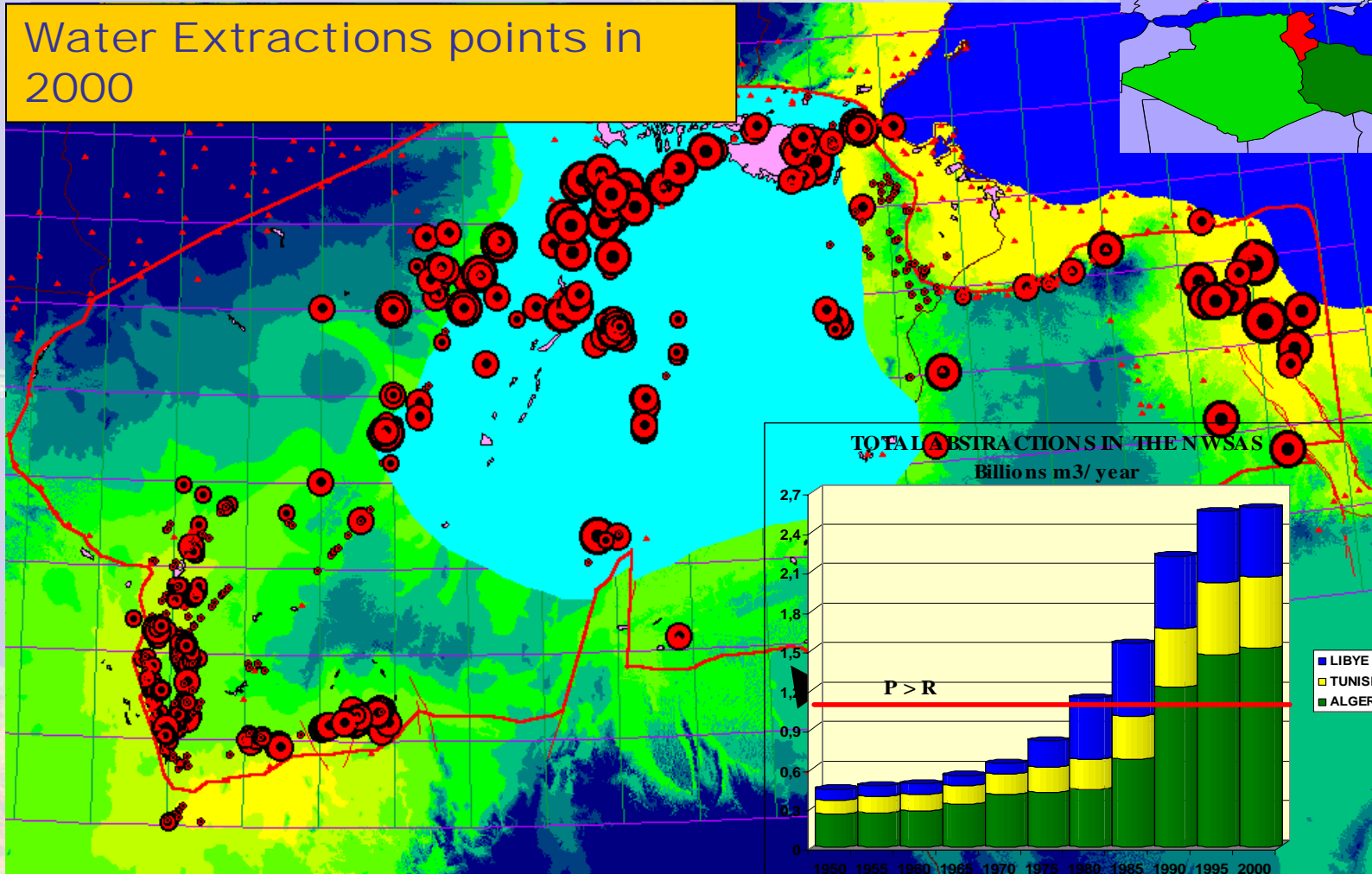
Iullemeden





# Water extraction

Water Extractions points in 2000



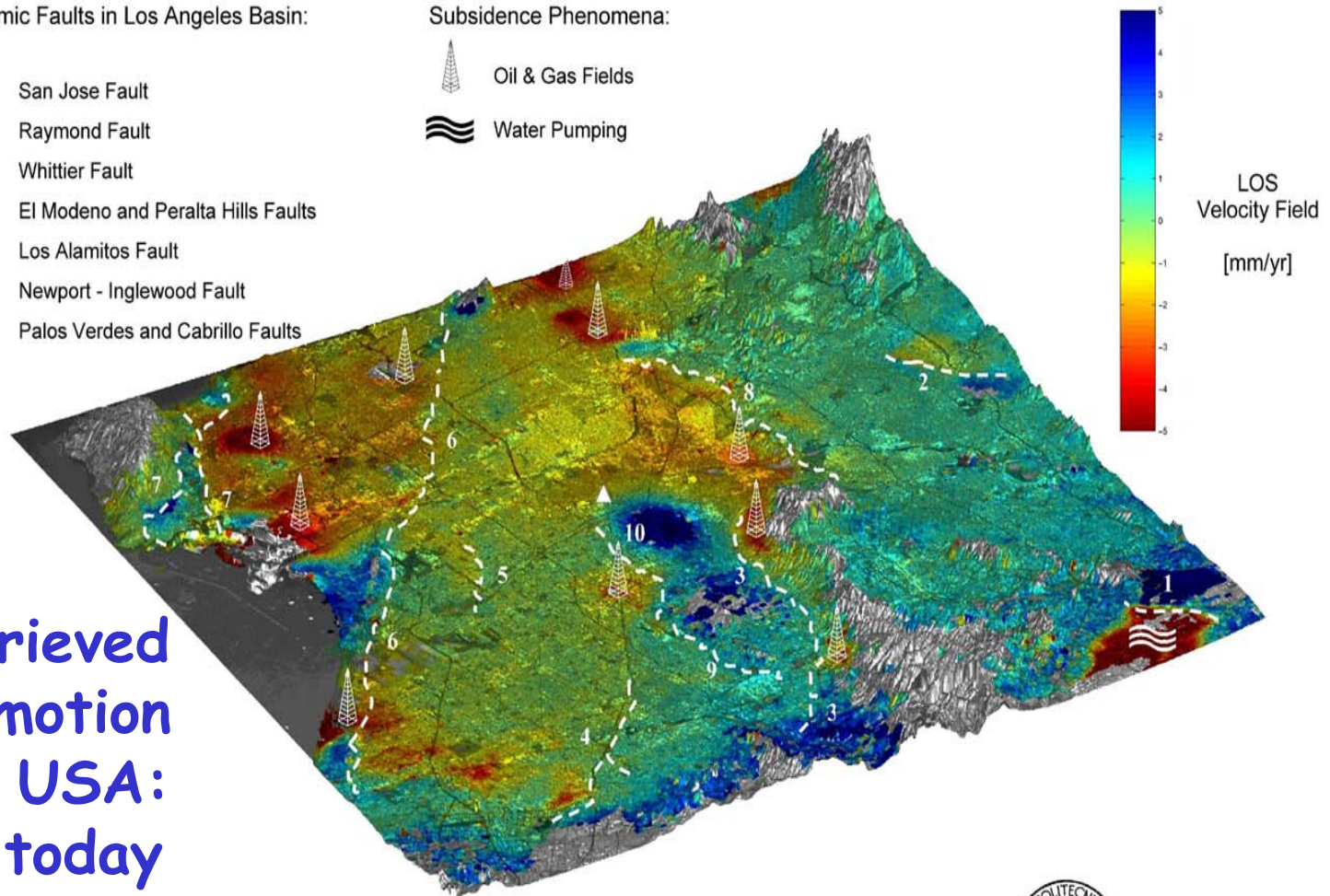
# Terrain motion

## 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



ERS retrieved terrain motion in L.A., USA: 1992 - today

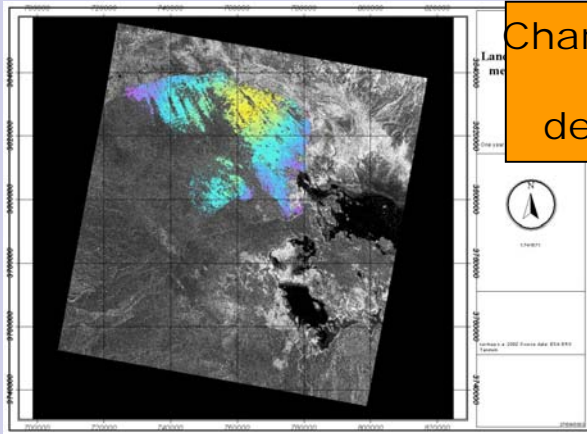
8. Elysian Park Blind Thrust (?)
  9. Coyote Hills Blind Thrust (?)
  10. Santa Fe Spring Blind Thrust (?)
- } Puente Hills Blind Thrust (?)



T.R.E.

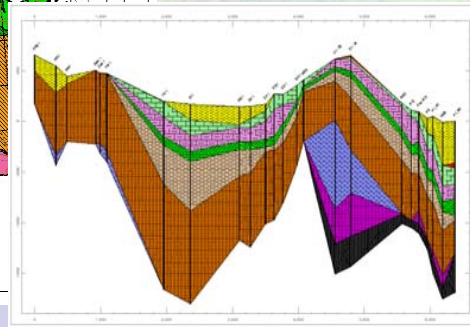
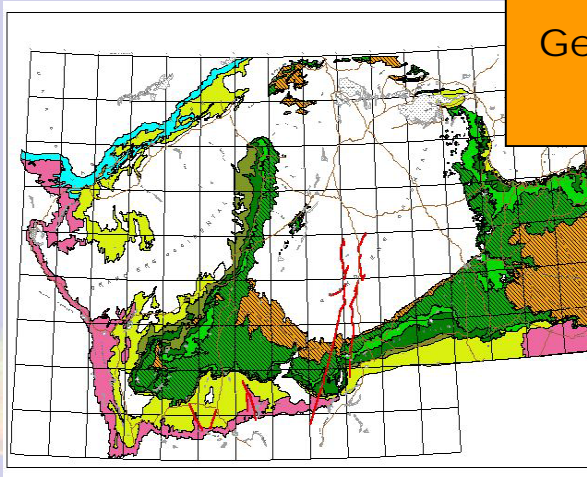


• Water extraction model



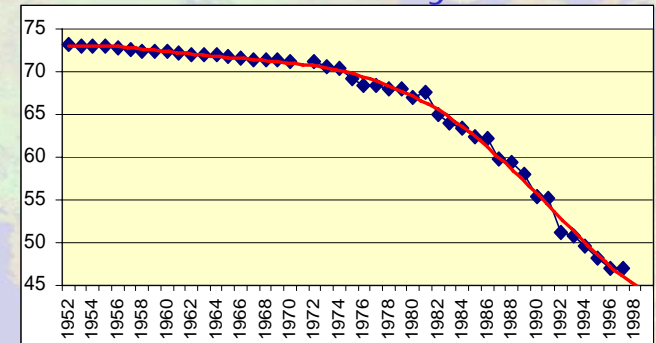
Changes in volume due to subsidence derived from ERS data

Geological information Provided by OSS



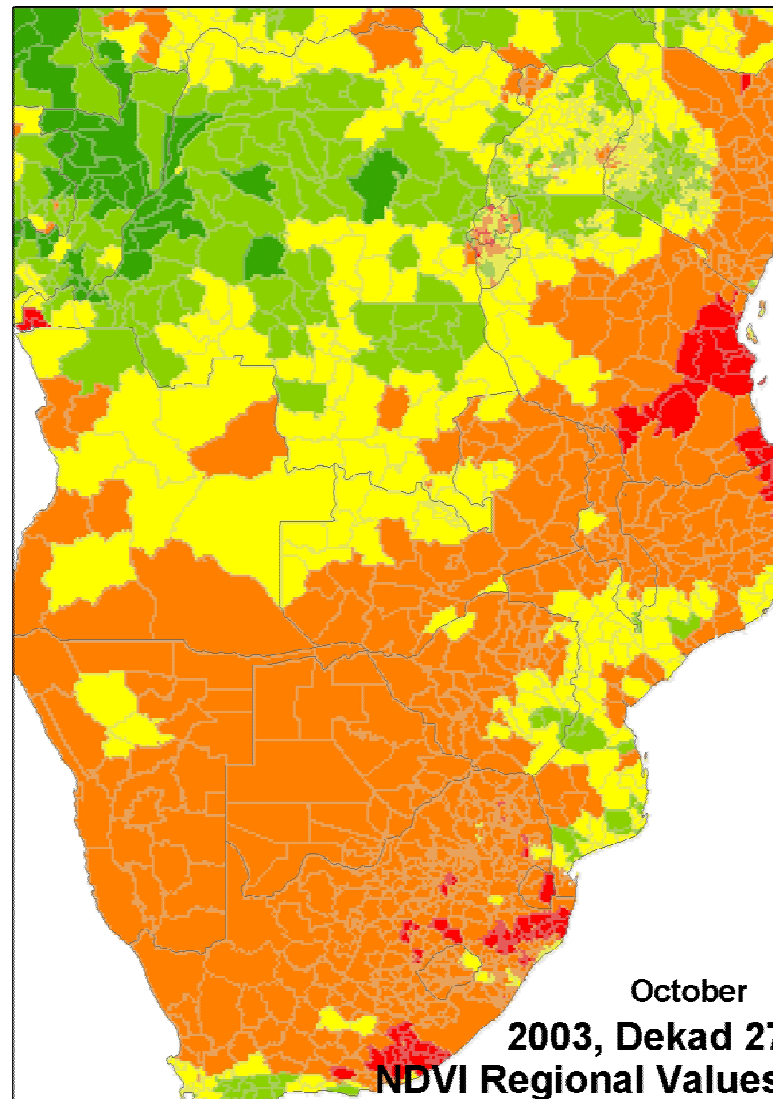
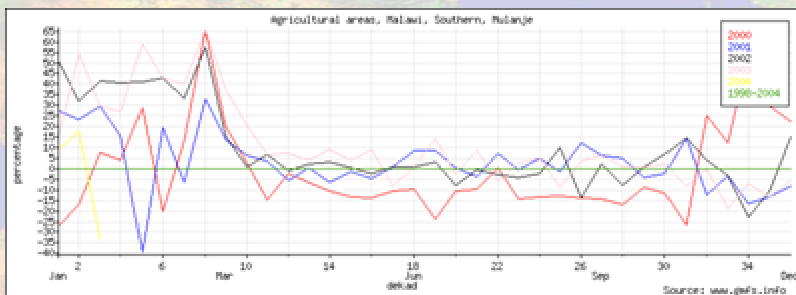
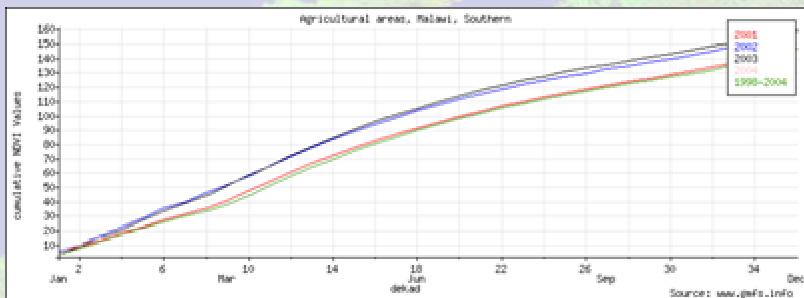
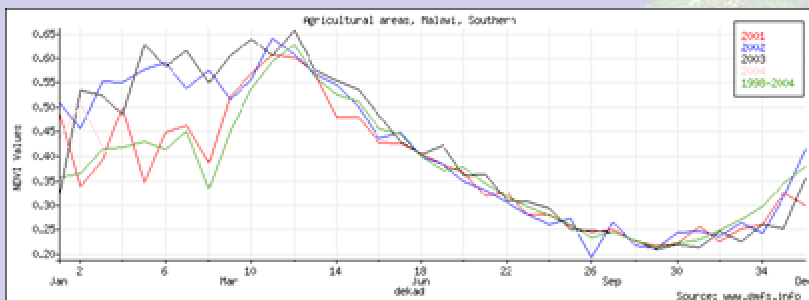
Water Extraction Model

Water availability





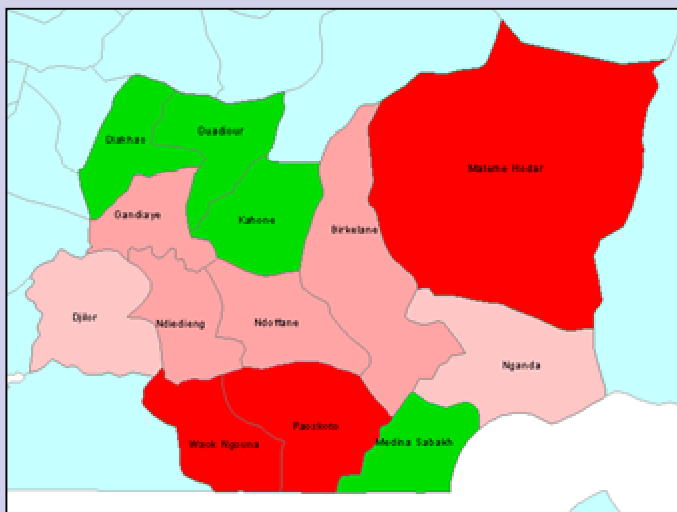
**GMFS**  
Global Monitoring for Food Security





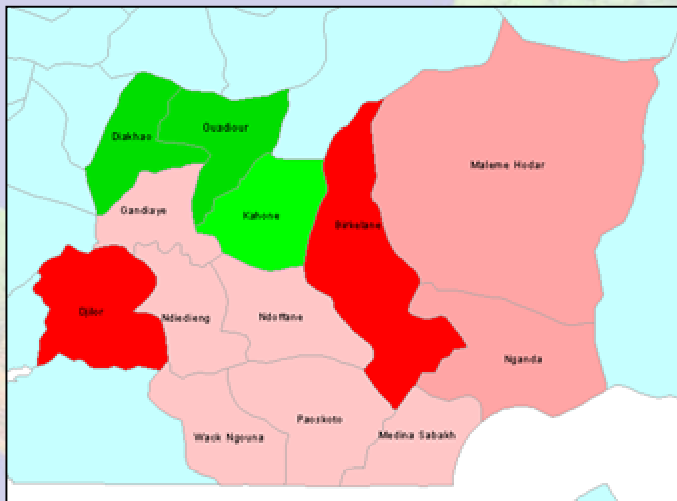
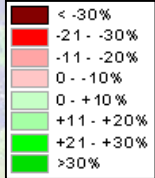
# Sub-national production forecast, Senegal, 2003

## User: Ministry Agriculture, Senegal



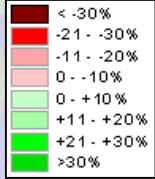
Millet yield forecasts 2003 relative to 10-year average

Average = + 5%



Peanut yield forecasts 2003 relative to 10-year average

Average = - 6%



## TIGER support established in 2004

- TIGER **Coordinator** hired in May 2004 – Jim Williams
- TIGER **Secretariat** → First meeting in Salzburg in Sep '04
- TIGER **Steering Committee** → First meeting in Pretoria in Nov '04



# ***TIGER Schedule - Summary***

Sep 2002	WSSD in Johannesburg
Nov 2002	WSSD Follow-up Programme initiated by CEOS
2003	TIGER Paris, 4 ESA Projects initiated
Oct 2003	TIGER Rabat
Feb 2004	Regional TIGER Workshop - Southern Africa
Jul-Sep 2004	TIGER AO (free ERS, ENVISAT data)
Sep	Canada Call for Proposals - free RS data, etc
Nov 2004	TIGER Pretoria
2005	"Donors" Conference / "Space for Water"
End 2005	End of Phase 1, decision on Phase 2

- Hosted by DWAF and CSIR, opened by H.E. B.P. Sonjica, Minister of WAF and Dr. Bob Adam, GEO-Co-Chair
- 135 participants from Africa (90), Europe (30), US/Canada (15)
- 10 Year Strategic Plan 2005-2015 proposed by participants, based on "Africa Water Vision for 2025"
- Demonstrated strong, joint effort of CEOS



Several CEOS M+A already significantly contribute or plan to do so

- EUM – link with PUMA/AMESD, discussions end 2004/2005
- CSA – Radarsat-1 data, support of 4-7 projects
- NASA – support to 2-4 projects (Univ. Mississippi, South Carolina) / Mod. 3
- NOAA – capacity building / Mod. 1
- JAXA – JERS-1, TRMM data
- UNESCO – joint implementation with ESA
- (+ ESA actions – ERS/ENVISAT data, capacity building, funded projects, 95 AO proposals, TIGER consultant)

**TIGER has become a CEOS wide action and is a very concrete response by CEOS to Johannesburg recommendations**

## ***Reflection on TIGER after 2 years***

- **What has TIGER achieved so far ?**
- **What are the main challenges still ahead to succeed ?**



## **1 – TIGER has mobilized the African community**

- User community is really engaged in the process
- Provider community teams up with user community (thanks to UNESCO)
- Awareness for 'space and water' significantly raised

## **2 – Start of concrete actions**

- ESA, CSA – projects; NOAA, NASA, JAXA support
- Provide free data from ERS, ENVISAT, RADARSAT, JERS-1, TRMM, others
- Capacity building actions - CEOS, UNOOSA, UNESCO

### **3 – Significant pre-investment by space agencies**

- Through CEOS - remarkable engagement today

### **4 – Partnership with UNESCO**

- Partnership is starting to become effective
- UNESCO provides access to hydrology networks (IHP, WWAP, etc.)



## Short term

### **1 – Develop portfolio of demonstrated services**

- TIGER AO: how to reduce 95/66 proposals to manageable number of projects (thematic, regional?) ?

→ These projects need to lay ground work for future WRM services; success is key to credibility and next steps

### **2 – Enlarge TIGER to other partners**

- How to structure user base ? How to consolidate space agencies ?
- Roles of private sector, NGOs ?

## **3 – Capacity building**

- Linked to projects, also generic actions ?
- Need for capacity building plan → CEOS WSSD Module 1 responsibility ?

## **4 – Sustainability is key**

- Get political, policy framework right → roles of NEPAD, AMCOW, AMSEN, regional groupings ?
- Develop credible funding scheme for long-term operation of TIGER ?
- How to achieve ACTIVE involvement of development and donor agencies ?



## **Africa has seen a number of development projects**

- TIGER should learn from these
- TIGER should build upon past activities and enrich them with new data, knowledge and technology

## **Africa has a chance to catch up quickly through a technology leap**

- Information from space is transparent and 'fair'
- This is an opportunity for the young generation