UNESCO INITIATIVES IN THE FIELDS OF APPLICATIONS OF REMOTE SENSING FOR SUSTAINABLE DEVELOPMENT IN AFRICA
TIGER WORKSHOP
21 NOVEMBER 2006
UWC, CAPE TOWN – SOUTH AFRICA
The International Hydrological Programme (IHP)

Intergovernmental scientific programme on Water Resources of the UN system

Countries established National Committees that present their priorities for consideration by the IHP (jointly formulate strategies)

Water and associated ecosystems are recognized as UNESCO priority action

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21 November 2006
Water Interactions: Systems at Risk and Social Challenges

Phase VI (2002-2007)
International Hydrological Programme of UNESCO

Themes
1 Global changes and water resources
2 Integrated Watershed and Aquifer Dynamics
3 Land Habitat Hydrology
4 Water and Society
5 Water Education and Training

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21 November 2006
UNESCO-Water: Network, channel to exchange with the water community

- UNESCO-IHP
- UNESCO-IHE Institute for Water Education, Delft
- Secretariat of the World Water Assessment Programme
- Regional institutes/centres
- UNESCO Chairs in Water
- IHP National Committees

In TIGER, IHP of UNESCO is facilitating the dialogue between the remote sensing and water communities.

IHP contributes with projects, publications, training activities, support to workshops.

UNESCO-IHE and UNESCO Chair in Sudan implement TIGER projects.

UNESCO Chair in Western

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UNESCO Environmental Programme: Cooperation with UNESCO's environmental programmes allows for broad cross-sectoral implementation of IHP's specific environmentally focused goals.

- Intergovernmental Oceanographic Commission (IOC)
- International Geoscience Programme (IGCP)
- Man and the Biosphere Programme (MAB)
- Management of Social Transformations Programme (MOST)
UNESCO CROSSCUTTING PROJECT ON THE APPLICATIONS OF THE REMOTE SENSING FOR INTEGRATED MANAGEMENT OF ECOSYSTEMS AND WATER RESOURCES IN AFRICA
APPLICATIONS OF THE REMOTE SENSING FOR INTEGRATED MANAGEMENT OF ECOSYSTEMS AND WATER RESOURCES IN AFRICA

Developing Learning and Users Networks

National Network in DRC: Decision 52/32C5

Partnership between the DRC National Network and «Campus Numérique»
1-Results Achieved

EDUCATION, TRAINING & SCIENTIFIC RESEARCH

♥ UNIVERSITY CURRICULA With MASTER/PostMSC/Ph.D Degrees CREATED in participating countries: Benin, Cote d’Ivoire, Niger, Guinea Conakry, Equatorial Guinea, Senegal, Botswana, South Africa, Mozambique, Zimbabwe, …

♥ Students completed Ph.D Thesis

♥ Fellowship provided for scientific mobility: Exchange of staff and students Inside Africa, from Africa to Europe and to Americas

♥ Publication of Scientific Papers in National and International Journals

♥ Support to Pan-African Associations on Remote Sensing of the Environment including AARSE
Apport de la Télédétection dans la gestion des Aires protégées

Kinshasa, RD Congo, 04/12 - La télédétection peut se révéler d’un apport important dans la gestion des aires protégées car on peut, à partir d’elle, produire des cartes géographiques actualisées capables de fournir des renseignements ou des informations nécessaires dans le traçage des pistes pour guider les visiteurs, a estimé l’océanographe Justin Ahanhanzo de l’UNESCO/Paris.

Dans un entretien accordé jeudi à la PANA au cours d’une visite guidée que des participants à un atelier national sur la télédétection ont effectué jeudi au Jardin botanique de Kisantu, dans la province du Bas-Congo, à environ 70 Km à l’Ouest de Kinshasa, M. Ahanhanzo a défini cette discipline comme étant une technique qui permet de recueillir des informations à partir des images prises par satellite dans le cadre de l’eau, des forêts, des écosystèmes marins, côtiers et des mangroves.

Ces informations recueillies sont comparées, enregistrées sur des longues séries et périodes pour observer leur évolution, a-t-il noté.

Cet expert de l’UNESCO a fait ce rapprochement entre la télédétection et la gestion des Aires protégées.

Dans ce site touristique, ces derniers ont pu contempler le musée, la paléontologie, l’herbarium, la bibliothèque du Jardin avant de silloner l’échantillon de la forêt tropicale humide et le mangoustanier où ils ont pu découvrir plusieurs espèces d’essences d’arbres notamment l’Arbre qui marche, l’Arbre du bonheur, etc., que renferment les lieux.

Selon Mme Francesca Lanata, assistante technique au Projet de réhabilitation de Jardin Botanique de Kisantu, l’Union européenne a accordé 400.000 euros pour la réhabilitation de ce site et pour la formation de ses agents en gestion du Jardin botanique pour une durée de deux ans et demi.
GOOS-AFICA The original ROOFS-AFRICA project was formally endorsed by the Heads of States Partnership Conference of the African Process during the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa 30 August 2002. That document has now been revised in line with the NEPAD Development Goals and WSSD Implementation Plan. The project is a major component of the NEPAD Environmental Action Plan for immediate implementation.

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21 November 2006
1- GOOS-AFRICA: WHAT IS IT? WHY IS IT NEEDED?

2- GOOS-AFRICA: BUILDING POSITIVE SYNERGY- CONTRIBUTING TO THE CCLME TDA/SAP PROCESS

2.1. Observations and Forecasting underpin Ecosystem-based Management towards a sound CCLME Protection and Sustain Development

2-1.1. Coastal Ocean In situ Observations & Measurements
2-1.2. Coastal Ocean Satellite Remote Sensing
2-1.3. Coastal Ocean Modelling
2-1.4. Coastal Ocean Hindcasts/Forecasts and Data Assimilation

3- Partnership and Positive Synergy with partners

4- FUTURE PERSPECTIVES: specific ACTIONS
Groundwater Map of the World

Hydrogeological Regions / Political Boundaries

Groundwater Resources of the World - Africa

Surface Water
- polar ice
- large freshwater lake

Other Geographic and Climate Features
- political boundary

DRAFT
ISARM project Internationally Shared (Transboundary) Aquifer Resources Management: Multidisciplinary aspects

- **Legal**
  - eg Treaties, interstate agreements

- **Scientific**
  - Hydrology, hydrogeology, conceptual modelling

- **Socio-economic**
  - Water security, accessibility, efficiency, poverty reduction

- **Institutional Capacity Building**
  - Awareness raising, counterpart agencies

- **Environmental**
  - Sustainability, biodiversity, risks, vulnerability
In common with many parts of the World, Africa too is endowed with transboundary aquifers that have not as yet been completely investigated.
Some GEF funded projects where UNESCO-IHP is involved

- Formulation, Scientific supervision of the implementation of the GEF/UNEP-MSP Managing Hydrogeological Risk in the Shared Iullemeden Aquifer system (Mali, Niger, Nigeria).
- Execution of Gulf of Guinea - West African transboundary Coastal Aquifers GEF-UNEP MSP (Benin, Ghana, Ivory Coast, Nigeria)
- Participation/ scientific supervision of the proposed GEF-UNDP /IAEA Nubian Sandstone project
UNESCO volume on Groundwater and Remote Sensing; applications and methods

- an expert group working on the manuscript, coordinated by prof. A. Meijerink/ITC
- manual to give practical examples and cases, discuss spatial aspects of groundwater studies

Among the contents:

- Demonstrate the various aspects of RS contributions for modeling and information systems
- Image processing and hydrogeologic interpretation
- Groundwater management, environmental aspects
- Global databases of interest

The manual is expected to be published in 2007
The CEOS strategy for Earth observation education and training is the creation of an effective coordination and partnership mechanism among CEOS agencies and institutions offering education and training. The CEOS WGEdu was established by the 13th CEOS Plenary in November 1999. Tasked to develop a plan for future CEOS activities in education and training particularly in developing countries, a coordination and partnership mechanism between CEOS agencies was established. The goal of the WGEdu is to facilitate activities that enhance international education and training in Earth observation techniques, data analysis interpretation, and applications.

UNESCO co-chairs with UN-OOSA the CEOS Working Group on Education, Training and Capacity Building, which has developed a portal on Earth Observation educational materials. The website is: http://wgedu.ceos.org.

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Networking

- FETWATER (Phase II: 2006 – 2010)
- SADC wide training (RP)
Earth Observation & GIS for IWRM

Some Fields of Application

- Water Availability:
  - Backup and extrapolation tool for hydro(geo)logical studies, precipitation, evapotranspiration, surface and groundwater flow, flooding, drought

- Environmental Protection:
  - Broad range assessment tool for natural and man-made processes such as erosion, sedimentation, deforestation, land-use changes, contamination, environmental flow requirements, etc.

- Demography & Water Demand:
  - Analysis of population concentrations, consumption patterns, water allocation, transport & distribution, dams & reservoirs, irrigation & drainage, waste water, navigation, tourism, etc.

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21 November 2006
Earth Observation & GIS for IWRM - 2

- Some Levels of Application
  - Resource Assessment
  - Database and visualisation tool for WS&S
  - Modeling Tool for Quantity and Quality Flows
  - Real-Time Decision-Support System for Management
Earth Observation & GIS for IWRM - 3

- **Required Competency Levels**
  - **Basic User Level:** Data Entry, Database Use, Basic Mapping, Basic Analysis, DSS, Managers
    - Training Needs: Short Courses, Occasional Updates
  - **Advanced User Level:** Sector Specialists & Sector Researchers
    - Training Needs: Several Short Courses, but preferably University level educational modules, integrated with disciplinary subjects.
  - **Expert User Level:** Database Administrators, GIS & ICT Support Staff, EO & GIS Researchers
    - Training Needs: Specialised polytechnic and/or university education.
Centres providing RS application training in Africa

UNESCO Chair scheme, e.g. University of Western Cape (UWC) in South Africa

Short Training Course on the Application of Remote Sensing for Integrated Management of Water Resources and Ecosystems
24 – 28 October 2005
Organised by the Earth Sciences Department at the UWC

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SIMDAS, UNESCO’s regional flagship programme intends to address the most urgent and pressing needs for regional multisectoral cooperation between Southern African countries (14 SADC countries) among themselves and with their multiple external partners:

- Climate and global climatic changes and sustainable development
- Remote sensing and integrated study of arid and semi-arid regions of Southern Africa
- Soil and land degradation
- Water resources and sustainable development
- Ecology, ecosystems and their protection and preservation
- Energy and sustainable development
- Environmental systems and integrated management.
Precipitation

Modeling Short Course Materials

The 1st G-WADI workshop was held in Roorkee, India where world leaders in arid zone hydrology and modelling came to provide advice and training on hydrological modeling methods and software, focused on the special needs and problems of arid and semi-arid areas. Participants came from Australia, Africa (North and South), South America, the Middle East, USA, UK, India, Pakistan, China and the Central Asian region. The aim is to produce web-based information and access to software tools. Course materials will be available on the G-WADI web site.

Remote Sensing Data

G-WADI has teamed up with the University of California-Irvine and SAHRA to make remotely sensed data on key hydrologic parameters available over the Internet. The Hydrologic Data and Information System (HyDIS) provides precipitation, and other data sets at user-selected spatial and temporal resolutions through a user-friendly interface.
The FRIEND Project is an international collaborative project of contribution to the IHP. The primary objective is to improve understanding of hydrological variability and similarity across time and space in order to develop hydrological science and practical design methods.

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Hydrology for the Environment, Life and Policy

http://www.unesco.org/water/ihp/help

To deliver social, economic and environmental benefit to stakeholders through sustainable and appropriate use of water by directing hydrological science towards improved integrated catchment management basins

Real people
Real catchments
Real answers
What is HELP?

- IHP Global network of basins
- Interdisciplinary Research
- Links hydrology and society by taking a “bottom-up approach”
- Working together on human-environment relations
- Sharing experiences and results
- Local water related issues
- IWRM on the ground
IN FOCUS

6th United Nations Conference on Desertification and Drought

The 6th session of the Conference of the Parties (COP6) of the UN Convention to Combat Desertification (UNCCD), is being held in Havana, Cuba, from 25 August to 5 September 2003. Some 170 countries are participating in the event, which comes at a time when deforestation and changes in land use and climate are having severe environmental and human effects. At the opening session, Ricardo Alarcon, president of the National Assembly of People's Power, linked desertification to poverty and malnutrition. While 24,000 tons of land disappears every year through desertification, salinization affects around 80 million hectares of irrigated land worldwide, and deforestation accounts for the...
Water
a shared responsibility

The United Nations
World Water Development
Report 2

"...shows the
United Nations
at work, helping the
world to confront
current and impending
water cases.
I recommend this
publication to the
widest possible
audience."
Kofi Annan

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Water Interactions: Systems under stress and societal responses

Phase VII (2008-2013)

International Hydrological Programme of UNESCO

Themes

Theme 1: ADAPTING TO THE IMPACTS OF GLOBAL CHANGES ON RIVER BASINS AND AQUIFER SYSTEMS
Theme 2: STRENGTHENING WATER GOVERNANCE FOR SUSTAINABILITY
Theme 3: ECOHYDROLOGY FOR SUSTAINABILITY
Theme 4: WATER AND LIFE SUPPORT SYSTEMS
Theme 5: WATER EDUCATION FOR SUSTAINABLE DEVELOPMENT

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THANK U 4 UR @ENTION