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# The TIGER Newsletter

## Content

TIGER endorsed by AMCOW	1
TIGER in the 4 <sup>th</sup> World Water Forum, Mexico	2
UNESCO Training Course	3
TIGER Canada project update	4
Short News	6

Edited by:



With the contribution of



## TIGER endorsed by AMCOW



The last 15 and 16 February, the meeting of the Technical Advisory Committee (TAC) of the African Ministerial Conference On Water (AMCOW) took place in Entebbe, Uganda, chaired by Dr. Henry Ntale. This was followed by the meeting of the AMCOW Executive Committee the 17 February, chaired by the Minister of Water Resources of Uganda, Honourable Maria Mutaganba.

The meeting counted with the participation of several African ministers of water, directors of water resources and other representatives from African organisations, United Nations and International institutions.

At the meeting, the TIGER initiative was presented to the AMCOW-TAC representatives, which appreciated the efforts carried out so far by all the TIGER partners and encouraged the initiative to continue the work in line with AMCOW objectives.

In this context, the technical Advisory Committee recommended the initiative to be endorsed by AMCOW. This recommendation was taken the 17 February by the Executive Committee, which endorsed officially the initiative.

Now, TIGER is an AMCOW endorsed initiative, which represents a step forward to reinforce the African ownership of the initiative. TIGER will continue its work under the political support of the African Ministers of Water in line with their targets and objectives.

Following the meeting results, TIGER will prepare an annual report to be presented to AMCOW at the next meeting in 2007.

LOOKING AFTER WATER IN AFRICA

The TIGER Newsletter



## TIGER in the 4th World Water Forum, Mexico City

The Fourth World Water Forum (WWF4) was held in Mexico City from 16 to 22 March 2006. The World Water Forum is the world's premier global freshwater event, organized every three years by the World Water Council and the host Government, together with numerous partners. The overarching theme of WWF4 was 'Local Actions for a Global Challenge', focusing on the means for implementing water-related Millennium Development Goals. The TIGER initiative enjoyed good visibility throughout the Forum, which was attended by over 14,000 registered participants. The Forum aimed to raise awareness on water issues worldwide and enable multi-stakeholder participation and dialogue to influence water policy-making at a global level. Of the partners in the TIGER initiative, United Nations Educational, Scientific and Cultural Organization (UNESCO) played the lead role in the launch of the second edition of the World Water Development Report, the main output of the coalition of the 24 UN agencies that constitute the World Water Assessment Programme, and in the launch of the UN-Water celebrations of the 2006 World Water Day on 22 March, whose theme this year was 'Water and Culture'.



*TIGER Section at the African Pavilion*

TIGER was showcased to the global water community on different occasions during WWF4. A poster on TIGER activities of the Canadian Space Agency was displayed at the well-placed UNESCO booth. The European Space Agency's materials on TIGER were displayed and distributed in the Africa region's booth. As a panellist, the TIGER coordinator, Diego Fernandez, gave a well-received presentation of the TIGER experience during the side event devoted to the Group on Earth Observations (GEO), entitled 'Earth Observation with Wet Feet'.

The session 'Space-Based Water Observations Alliances for providing information essential for managing the World's water resources' was organized by the International Association of Hydrological Sciences (IAHS), Integrated Global Water Cycle Observations (IGWCO) and UNESCO, with the support of European Space Agency (ESA), World Climate Research Programme and the GEO. The aim of the session was to demonstrate to the broader water community, through examples, that the use of satellite data and emerging Earth Observation

analysis tools in conjunction with river basin and aquifer simulation models holds much promise in overcoming deficiencies in water management that result from a lack of relevant data. Furthermore, the session allowed a discussion of the opportunity provided by the development of the Global Earth Observing System of Systems (GEOSS) to accelerate the development and operational implementation of Earth Observation based tools, and to start a debate on building an alliance for data provision on a global basis.

The session was opened by Mr Walter Erdelen, Assistant Director-General for Natural Sciences of UNESCO, who emphasized the key role of education and training to expand the application of Earth Observation data and services. Mr Rachid Taibi, the director of the National Agency of Water Resources of Algeria, presented results from the TIGER Demonstrator Project AQUIFER, which supports the management of the transboundary North-West Sahara Aquifer System, shared by Algeria and Tunisia. First results from the land-cover mapping, digital terrain model development and groundwater abstraction estimates were presented, highlighting the importance of ground truth for better calibration and assessment. Among the local actions that were presented, there were examples of the use of satellite observations for flood forecasting in the Mekong Basin, hydrological forecasting for farmers and assessing the water clarity of Wisconsin Lakes. Mr Diego Fernández presented ESA's experience with space agency partnerships and supporting research, drawing on the TIGER initiative. An expert panel, moderated by Rick Lawford, enriched the thematic discussion with additional examples.

In conclusion, it was recognized that there are currently many on-going initiatives that can contribute to GEOSS. In particular, the participants of the session agreed to recommend the following:

1. Governments are urged to support the development of partnerships, research programs, integrated data systems and demonstration projects to advance capabilities for using Earth Observation, and to support the training and infrastructure sharing needed to make these technologies widely available.
2. As Earth Observation systems lend themselves to delivering information on ungauged or poorly gauged areas, especially those with difficult access and/or that cross administrative boundaries, this information should be used to facilitate the transboundary, basin-scale and regional management of water resources.
3. GEO and other international partnerships should be used to promote the development and application of Earth Observations from satellites and in-situ measurement networks to water management at all levels. Specific areas that require attention are capacity building and enhancing user-provider dialogues, possibly through a water cycle community of practice.
4. A set of goals and action plans on information availability for efficient water development should be established such as to double the number of data collection, handling and application activities in the least developed countries by 2015.

5. Collaboration in Space to Earth programmes among engineers, scientists, environmentalists and users must be promoted to deliver the best available technology in information acquisition, analysis and application to wherever needed for improved water management.
6. Plans are needed for broad 'North-South' and 'South-South' partnerships that will involve developing expertise, infrastructure and indigenous sustainable capacities supported by industrialized

countries to reduce disparities in science and technology.

7. A review of the factors that limit data user access to high resolution data should be undertaken with a view to making these data much more widely available.

Source: UNESCO & ESA  
Contact: tiger@esa.int



## UNESCO Training Course

**A**pplication of space technology was identified at the Johannesburg Earth Summit (Article 27) as an approach to help reach the MGDs. Its importance was again stressed in Kyoto, Japan where it was given a special focus on Africa. The Tiger Project workshop in Morocco was held to convert this objective into action. A follow-up workshop was held in Pretoria, South Africa 18-20 February 2004. This training course was another building block for capacitating the sub region in a field that lies within the future of IWRM.



*Hon Min. M.T.A. Mtezo, Minister of Water Affairs, Zimbabwe during the opening*

A short training course on the 'Application of Remote Sensing for Integrated Management of Water Resources and Ecosystems' was organized at the University of the Western Cape (UWC), Bellville, South Africa. Prof Yongxin Xu, UNESCO Chair in Hydrogeology, based at the Earth Sciences Department of UWC initiated the idea of organizing such a training course as part of TIGER's capacity development of remote sensing applications in SADC region and the UNESCO Office based at Windhoek, Namibia came forward with willingness to sponsor this training workshop. UNESCO Harare Office upon receiving information about the training session decided to co-sponsor it and to upgrade the extent of the initiative from a 5 country wide sub regional workshop to a SADC Regional activity.

The overall purpose of the workshop was to contribute towards capacity building on the application of remote

sensing for integrated management of water resources in Southern Africa

The objective of the workshop was to train scientists and / or governmental officials whose line of work is related to remote sensing, IWRM and ecosystems in order to respond to the requirement of their profession and keep up with the use of new techniques developed.

The workshop was a basic course aimed to provide fundamental knowledge of remote sensing, digital image processing, and application of remote sensing for water resource management and ecosystem management with case studies from SADC or South Africa. Water resource management using remote sensing technology was the main thrust area for this course.

This workshop was held in the UWC campus at Bellville (near Cape Town, South Africa) for five days from 24 – 28 October 2005 at the premises of Department of Earth Sciences, Department of Biodiversity & Conservation Biology (BCB) and the Institute for Historical Research. Under the direction of Prof Yongxin Xu, Prof Abraham Thomas from the Earth Sciences Department coordinated the entire course organization. With great help and cooperation from Prof Yongxin's team (Ms Caroline Barnard, Mr Jaco Nel, Mr Anthony Duah and Mr Segun Adelana) this course was organized very successfully at UWC.

The main focuses of the training course were:

1. Remote sensing fundamentals (including aerial photography and photogrammetry, optical, thermal/infrared and microwave remote sensing techniques);
2. Basics of digital image processing
3. Remote sensing applications or case studies on surface water body mapping, groundwater investigation/exploration, soil moisture determination, assessment of evapotranspiration, watershed characterization, flood inundation mapping, mapping of water logging, soil salinity, fluvial geomorphology, geological structures/faults/lineaments etc.
4. Time series analysis of remotely sensed data and
5. Vegetation mapping was also covered.

There were presentations/lectures on Remote Sensing Information and Data Availability for SADC (existing sources of information on remote sensing and infra structural facilities available in SADC or South Africa).

Sixteen experts spanning from universities, research institutes and industry were invited to give lectures in above cited topics/fields.

The course had practical sessions on aerial photography, hard copy visual interpretation, digital image processing (visualization, image enhancement, georeferencing, image interpretation and feature extraction and finally image classification using supervised, unsupervised, principal component analysis and tasseled cap methods). The academic version of ILWIS software (one month evaluation version) was used for the hands on practical sessions. Dr Piotr Wolski, hydrologist and remote sensing specialist from Harry Oppenheimer Okavango Research Centre, University of Botswana, was the main course presenter for the digital image processing sessions.

Prof Stanley Ridge, Vice Rector (Academic) opened the workshop giving a warm welcome to the participants from SADC. Dr. Alexandros Makarigakis gave a short speech with the message from UNESCO. Hon Min. M.T.A. Mtezo, Minister of Water Affairs, Zimbabwe, gave a message on behalf of the SADC region. Prof Yongxin Xu gave an introductory speech. Prof Abraham Thomas facilitated the whole workshop.

There were 25 trainees for this training course who were mainly officials from institutes dealing with water resources, hydrological investigations, flood studies, and land use mapping from SADC region. Fifteen trainees were from 10 SADC countries (who were nominated and sponsored by the UNESCO offices at Windhoek and Harare) and ten from South Africa. The initiative was the first training initiative under UNESCO's SIMDAS Flagship Programme and a follow up to the TIGER workshop that was held in Pretoria (18 – 20 February 2004).

On the last day of the training a feedback from the trainees was collected through an evaluation form. The overall feedback from 19 evaluation forms received reveals that this training was very fruitful and informative asking for more practical sessions.

A round table discussion was arranged towards the end of the workshop (way forward session chaired by Dr Alexandros Makarigakis and assisted by Mr Boniface

O.Y. Aleobua from DWAF). The feelings and the remarks from the course participants and the organizers responses were noted. . A CD containing all the presentations and the data for the practical exercises and course attendance certificates were distributed to each course participant before the closing ceremony.

Resulting from the discussions on the way forward it became clear that the workshop was a successful one that everyone enjoyed. A number of suggestions / observations were made, which once they were cluster are resulting in the following:

1. There is a demand for more practical sessions within the training course
2. The needs of each country, may differ (i.e Lesotho has hardware and software but no trained personnel, whereas Namibia needs more hardware and software).
3. Capacity in all aspects (training of personnel, hardware and software) is needed throughout SADC
4. Inability to receive images and data especially on time
5. Training of trainers
6. Database of experts and projects in each country
7. Communication between people on the field (public, academic and private sectors)
8. Recommend to SADC to establish Centers for Remote Sensing Data and exchange
9. There are International data from the SADC Region that SADC does not have

Dr Emmanuel Naah, Regional Hydrologist from UNESCO Nairobi Office, aided in the conceptualization of the workshop and represented UNESCO during the training course, closing it officially on its last day.

Based on the success of the workshop and on the needs that the Region has in training in the field of remote sensing, UNESCO is planning to repeat the course late in 2006 at the same venue.

Source: UNESCO  
Contact: tiger@esa.int



## TIGER Canada project update

In support to the Integrated Water Resource Management in Africa and to contribute to the ESA TIGER objective, the Canadian Space Agency committed more than 3.4 millions (Cdn dollars) for the practical utilization of space technology in Africa's water sector. After an evaluation process held in 2005, seven projects were selected and are currently underway in various parts of Africa involving Canadian industry and their partners in various African institutions. In the following an update on each project is described.

**Golder Associates:** *Satellite Hydrogeology for Water Resource Management – Northern Ghana*

The overall project is well underway. RADARSAT Standard Beam data has been tasked to address the first

phase of regional structure interpretations of the project region. In support of the RADARSAT imagery a large number of supporting baseline datasets (both raster and vector) have been assembled for the project. Members of the project team from both Golder Associates Ltd. and World Vision Canada recently completed a site visit to Ghana to review available hydrogeological datasets for the project area as well meetings with End Users. A number of meetings where also held in the countries capital (Accra) with Government Agencies which included a session with the Canadian team members of the CIDA sponsored Hydrological Assessment program for Northern Ghana (HAP) towards further collaboration.

**Hatfield Consultants Ltd.:** *Nile River Awareness Kit*

The 'Nile River Awareness Kit' (Nile RAK) is an interactive CD-ROM training tool designed to promote sustainable

LOOKING AFTER WATER IN AFRICA

**The TIGER Newsletter**

management of water resources within the Nile basin. Initiated in March 2005, the main deliverable for the project, the Nile RAK CD, will be launched at the Nile Council of Ministers Meeting (Nile-COM) in Bujumbura, Burundi on April 26th, 2006. This will be followed by a regional launch in Cairo, Egypt on May 2nd. National training sessions in Ethiopia, Kenya, Uganda, and Sudan will be held in May 2006. The Nile RAK project is a collaborative partnership between the Nile Transboundary Environmental Action Project (NTEAP) of the Nile Basin Initiative (NBI) and a project team led by Hatfield Consultants Ltd. (Hatfield; West Vancouver, BC). Other team members include Strata360 (Strata; Montreal, QC), and the Food and Agricultural Organization of the United Nations (FAO; Rome).

**Info-Electronics Systems Inc. (IES):** *Development of an Integrate Decision Aid System for water resource management based on satellites data for the Sous-Massa basin in Morocco.*

The project started six months ago. During this period, the official kick-off meeting was held on Oct 12, 2005 with all the partners representative followed by two field missions with the end user in Morocco; first one from November 13 to 18 by the CRTS team and the second from December 12 to 16 by IES, UQAM and CRTS. At this stage, the project team achieved the review of the needs, the census, the existing data gathering and completed the exchange on the conceptual model of the database with the end user. The data acquisition plan was finalized and approved, the order and the programming were engaged for the optical images and are in preparation for SAR. The evaluation of GIS and Radar tools are at its final phase.

**IUCN Canada:** *Remote Sensing and GIS Application in Integrated River Basin Management Vulnerability Assessment and Formulation of Adaptation Strategies in the Zambezi Delta and Medium Limpopo Basin*

*The World Conservation Union – IUCN, through its offices in Canada and Mozambique and in partnership with Gartner Lee Ltd and CENACARTA in Maputo will be signing soon a contract with the Canadian Space Agency aiming at the implementation of an integrated water resources management project in the Zambezi Delta, using remote sensing. A team of 3 Canadian experts in earth observation and resource management will be visiting the project site early May 2006 in view of determining the operational references and activities. This visit would also serve as a reconnaissance mission that would help in the task distribution according to priorities and field observations.*

**Noetix Research Inc.:** *Development and Demonstration of EO Technology for Identifying Natural Mosquito Habitats and Predicting Malaria Risk in Africa*

The project was initiated in July 2005 to demonstrate the use of SAR and optical earth observation (EO) data in identifying mosquito larval habitat areas in coastal Kenya. The EO data will be integrated with DEM derived data and other ancillary data (climate, soils, etc.) to generate a seasonally dynamic product. This information will be useful in identifying areas at risk. The first of a series of ground confirmation surveys identifying and characterizing mosquito larval habitats was successfully completed in March 2006 with follow on surveys planned during the wet season and subsequent dry down period. The habitat and environmental data will become part of a

larger information system that includes detailed demographic data for the Kilifi district. This data will be instrumental in any malaria mitigation efforts.

**Vexcel Canada:** *Aquifer and River basin resource evaluation (ARBRE)*

The ARBRE project, started in August 2005, was prepared in response to the need for sustainable water development in Africa, and the integration of earth observation based tools and knowledge to support improved natural resources management in Burkina Faso. The first visit to Burkina Faso by the project team was in October 2005, in order to complete the needs analysis. The results of the needs analysis has been used to refine the products which will be delivered to the partners in Burkina Faso, which are led by the Programme Nationale de la Gestion du Terroir 2 (PNGT2). During this first trip, the Burkina partners provided the Canadian team with geographic base layers that will be used to support the development of information products. This database includes base layers such as hydrology, road network, administrative boundaries, the "Base de Donnée de l'Occupation des Terres (BDOT)" for 1992 and 2002, as well as field pictures and corresponding GPS data recently captured in the field. The Canadian project team will be in Burkina Faso once again in May 2006 to carry out field work activities in the 4 areas which are part of the ARBRE project inside Burkina Faso. The second part of the mission will be in June 2006, and will be focused on capacity building, with the intent to provide the necessary knowledge to the Burkina partners so that they can eventually create information layers for operational management using earth observation tools and techniques

**Viasat Geo-Technologies:** *An operational solution using satellite stereoscopy to provide assistance for sustainable water management in the Volta River Basin*

Since the beginning of the project in March 2005, VIASAT in liaison with its partner in Burkina Faso and the representatives of PAGEV project reached several stages aiming at providing a technical support in Earth Observation to water management personnel responsible of the Volta River Basin between Burkina Faso and Ghana borders. In addition to the project meetings, which took place in Canada and in West Africa, the project team carried out several field campaigns (April and November 2005 and April 2006) in order to coordinate with the local resources, establish the calendar of the activities and the methods of participation, collect ground data for positioning and observations necessary to initiate the satellite image processing. Training workshops and courses on VIASAT StéréoSat technology also took place on multiple occasions to reinforce the technical capabilities of the local personnel implied in the PAGEV project. More than 20 images of Radarsat-1, Landsat, Ikonos and other sensors were acquired to carry out cartographic products meeting the expressed needs. Three topographic and planimetric maps showing the Bagré dam area in 1989, 1999 and 2004 were produced. They are also the thematic maps showing the landuse for the same period. These documents are under evaluation by the PAGEV personnel in order to identify the needs for the next stages of the project.

Source: CSA  
Contact: [Steve.iris@space.gc.ca](mailto:Steve.iris@space.gc.ca)

### UNESCO premises in Nairobi selected to host the TIGER Executive Bureau

After the selection process, the TIGER Steering Committee has selected the UN premises in Nairobi offered by UNESCO-IHP to host the TIGER Executive Bureau. The selection was carried out among five different candidates (African and international institutions located in Africa), which offered office space to host the Bureau.

The Bureau will be responsible for implementing the initiative from Africa, hence reinforcing the African ownership of TIGER.

Now ESA will fund the operations and staffing of the Bureau with 300,000 Euros for the next 3 years. To this end, ESA will start an open tender competition following ESA rules.

An announcement of Tender will be published soon on the TIGER web site as well as via the ESA Mail Invitation to Tender System (EMITS).

Source: ESA

For more information: [tiger@esa.int](mailto:tiger@esa.int)

### CSA TIGER Initiative Knowledge Network

In order to further the collaboration and increase the exchange of information between the Canadian TIGER project teams, the Canadian Space Agency initiate the development of a knowledge network. Contract was given to Hatfield Consultants for developing a web application for knowledge sharing based on the web tool created for their Nile-RAK project. When running, the application will allow users to view and contribute to the TIGER Canada Knowledge Network by using useful functionalities such as: events calendar, image/document database with search tool and a message board for online discussion. Initially, access to the network will be limited to the Canadian partners but could be extend to a larger audience in the future. The application is actually under evaluation and testing at CSA and will be operational in the next coming months.

Source: CSA

For more information: [Steve.iris@space.gc.ca](mailto:Steve.iris@space.gc.ca)

### JRC digital archive of soil maps

A digital archive of soil maps of Africa can be found on the European Soil Portal of the Joint Research Centre of the European Commission Institute for Environment

Source: EIS-Africa Newsletter

For more information:

[http://eussoils.jrc.it/esdb\\_archive/EuDASM/Africa/index.htm](http://eussoils.jrc.it/esdb_archive/EuDASM/Africa/index.htm)

### 2d edition of UN World Water Development Report

The document is the main outcome of Phase 2 of the World Water Assessment Programme (WWAP), founded

in 2000 as a collective response of the UN system to assist countries in reaching their commitments in key water-related challenge areas.

For more information:

<http://unesdoc.unesco.org/images/0014/001444/144409E.pdf>

### Upcoming events in Africa

1st International Conference on ICT for Development, Education and Training, 24—26 May 2006, UNCC, Addis Ababa, Ethiopia. For more information, see:

<http://www.elearning-africa.com/>

Biodiversity in inhabited areas of Eastern Africa, Makerere University, Uganda, 19—21 July 2006. For more information: [nbdb@muenr.mak.ac.ug](mailto:nbdb@muenr.mak.ac.ug)

6th African Association of Remote Sensing of the Environment (AARSE) Conference. Cairo, Egypt, 30 October to 2 November 2006. For more information, see <http://www.narss.sci.eg/aarse2006>

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