

GEOSS African Water Cycle Symposium

Tunis, Tunisia, 6-9 January 2009

Co-hosting Organizations

National Engineering School of Tunis *ENIT*
University of Tokyo *UT*
Ecopark Borj Cedria
National Institute of Meteorology of Tunisia *INM*
Water Researches and Technologies Center, *CERTE*
National Institute of Agriculture Tunis *INAT*
Group on Earth Observations *GEO*
Japan Aerospace Exploration Agency *JAXA*
The European Space Agency *ESA*
United Nation University *UNU*
UNESCO Water division for UNESCO *IHP- UNESCO*
The African Development Bank *ADB*
The United Nations Economic Commission for Africa *UNECA*
The International Water Management Institute *IWMI, Ghana*

Sponsoring Body

Ministry of Higher Education, Scientific Research and Technology of Tunisia, *MESRST*
Ministry of Education, Culture, Sport, Science and Technology of Japan, *MEXT*
Japan Society for Promotion of Science, *JSPS*
Agence Universitaire de la Francophonie, *AUF*
El Manar University
National Engineering School of Tunis, *ENIT*
Research Laboratory on Hydraulic and Environment Modeling, *LMHE*
EcoPark Borj Cedria
Water Researches and Technologies Center, *CERTE*
European Space Agency, *ESA*
Japanese Space Agency, *JAXA*
Group on Earth Observation, *GEO*

I- Water-related issues in Africa

There is a rapidly growing concern about the water resources and the water cycle in Africa.

The current water situation in Africa raises the following issues and challenges:

Floods and droughts

Large fluctuations in the African climate systems result in floods and droughts. In turn, these water-related disasters engender large human and socio-economic losses throughout the continent.

Environmental degradation

The variability of the African Water Cycle, and the cycle of floods and droughts, are

resulting in pollution, and desertification and are thus increasing the vulnerability of the eco-systems, especially in the fragile and vulnerable desert and tropical zones.

Water scarcity & Food security

Africa is one of the most densely populated regions and has one of the largest population increments in the World. Desertification and environmental degradation result into increasingly serious challenges of water scarcity, including potable water, and food security.

Global climate change

Many countries are worried about the possibly considerable impact of the global Climate Change on the water-related situation in Africa, which is already vulnerable and critical.

II- Forecasting the African Water Cycle

Understanding and predicting variability

There is an urgent need for both the African and international stakeholders to better understand and better predict through modeling the variability of the African Water Cycle. Such better understanding and prediction issues are a prerequisite for the *NEPAD* priority of sustainable development. It is also necessary for achieving progress towards the Millennium Development Goals, the MDG, as underlined at the African-Union Summit of June 2008.

Information access, interpretation and modeling

Modeling, prediction and forecasting of the African Water Cycle can be facilitated by the enhancement of country's capacity of interpretation of the available and relevant information relatively to the various water environments in the different regions. Hence the importance of capacity building in observation, geo-information systems and in modeling is outlined. Fostering exchange, cooperation and networking of scientists and patricians is also primary in order to help water related decision making.

III- African Water Cycle stakeholders and initiatives

In Africa, many national, international, independent programs, initiatives and associations are sharing the same goal and have a stake in the African Water Cycle. In particular:

AMMA: African Monsoon Multidisciplinary Analysis is now being cooperatively implemented by:

- WCRP : World Climate Research Program
- GEWEX : Global Energy and Water Cycle Experiment
- CLIVAR : Climate variability and Predictability

TIGER : Technology Informatics Guiding Education Reform is an European initiative was launched by the European Space Agency (ESA) in 2002. It aims at “assisting African countries to overcome problems faced in the collection, analysis and dissemination of water-related geo-information by exploiting the advantages of Earth-Observation Technology”.

GWSP : Global Water Science Project is one of the projects of the international Council for Science (ICSU) and the Earth System Science Partnership (ESSP). It has researched components in Africa.

TICAD : Tokyo International Conference on African Development is a Japanese initiative, The 4th edition of the TICAD summit met in Yokohama, in May 2008. It acknowledged the importance of water as an indispensable resource for addressing development needs such as health, agriculture/food production, disaster risk reduction, and peace and security.

IV- Place and contribution of the GEOSS

Under the inter-governmental cooperative framework, a 10-year implementation plan (2003- 2013) for a Global Earth Observation System of Systems was agreed in Washington Earth Summit (July 2003) . Also at the third Earth observation Summit held

in Brussels, in February 2005, a Group on Earth Observation, GEO, was formally established. The GEOSS mission is to realize a future decision-making environment wherein decisions and actions for the benefit of human kind are informed by and made in the light of coordinated, comprehensive and sustained Earth observation and information. To accomplish its mission, The GEOSS seeks to “integrate heterogeneous information systems across technical, semantic, institutional and political boundaries to enable continuous monitoring of the Earth and access by a wide variety of researchers to a vast shared set of information resources” .

Societal benefit areas

Through better understanding of the water cycle, GEOSS is expected to help improve societal benefit areas such as disasters, health, energy, climate, water, ecosystem, weather, agriculture and biodiversity. In particular, the GEOSS is expected to contribute to the improvement of basis for decision making in water resource management.

Contribution to the demand for Earth observation

At the Hokkaido Toyako Summit in July 2008, the 48 Leaders called for the acceleration of efforts within the GEOSS. They underlined that GEOSS builds on the work of UN specialized agencies and programs, in priority areas, climate-change and water resources management. GEOSS accomplishes this contribution by strengthening geo-observation, prediction, data sharing and capacity building for developing countries in Earth observation, to fulfill the growing demand for Earth observation.

V- The Asian Water Cycle Initiative

Under the framework of the GEOSS, a fruitful experience with similar objectives has been implemented in the Asia-Pacific Region with Japanese leadership. The initiative consisted in the launching of the Asian Water Cycle Initiative (ASWCI) . This successful experience can be easily transferred to the African.

VI-The African Water Cycle Symposium

Concept

Thus in conjunction with MDG, NEPAD, TICAD IV main objectives, the Hokkaido Toyako G8 Summit of May 2008, and the African Union June 2008 Summit recommendations and under the GEOSS and GEO framework, we propose to organize an African Water Cycle Symposium, AWCS.

Specifically AWCS will aim at the:

- Introduction of the scientific and research themes related to the water cycle in Africa and their operational applications.
- Introduction of planned and on going operational or preoperational projects and systems related to AWC.
- Introduction of on-going AMMA, GWSP and TIGER initiatives demonstration projects.
- Demonstration of the value of the global integrated data sets to decision makers through the actual use of data by the on going GEOSS, TIGER initiative demonstration projects.
- Discussion of the systems interoperability and observation convergence in Africa.
- Identification of ways in which these activities can contribute to benefit the target societal areas of the water cycle of the GEO.

AWCS outputs

The African water cycle symposium is expected to have the following outputs:

- Recognition of the on going- water cycle variations and identifications of the climate change risk, and
- Adoption of a regional and international cooperative approach for solving problems and adapting to variations.

- Establishment of a cooperative framework in cooperation with national governments, African and international institutes/institutions and research communities in order to exchange scientific knowledge and information on the water cycle in Africa.

Venue, Date and Organization

- The symposium will be held in Tunis, Tunisia from January 6th -9th, 2009.
- About 100 participants, including researchers, policy makers, and operators from Africa, Asia, Europe, Japan and Tunisia will address issues related to the Water Cycle in Africa.

Language & Website

- Both English and French can be used for papers, speeches presentations, talks, debates, questions and answers, with simultaneous translations from one language to the other.
- A bilingual website in English for AWCS is in progress. The address is (<http://www.geoss-awcs.com>).

Sponsors

The sponsors of the AWCS include the Ministry of Higher Education, Scientific Research and Technology of Tunisia, the Japan Society of the Promotion of Science, the University of Tokyo, the El Manar University, National School of Engineers of Tunis (ENIT) and its research Laboratory on hydraulic and environment modeling (LMHE), the Borj Cedria Science and Technology Ecopark, and its Water Research and Technology Center (CERTÉ). The European Space Agency (ESA), the Japanese Space Agency (JAXA), the Group on Earth Observation (GEO) are also sponsors of the AWCS.

Scientific Committee

Chair: Prof. Salah HANNACHI (*EcoPark* Borj Cedria)

Prof. Toshio KOIKE (University of Tokyo, *UT*)

Prof. Zoubeida BARGAOUI (National Engineering School of Tunis, *ENIT*)

Prof. Khelifa MAALEL (National Engineering School of Tunis, *ENIT*)

Prof. Mourad BEDIR (*Ecopark* Borj Cedria, *CERTÉ*)

Prof Fethi LEBDI (National Institute of Agriculture Tunis, *INAT / GEO* Tunisia principal)

Ing. Moncef RAJHI (National Institute of Meteorology of Tunisia, *INM*)
Prof. Srikantha HERATH (United Nation University, *UNU*)
Dr. Douglas CRIPE (Group on Earth Observations, *GEO*)
Dr. Chu ISHIDA (Japan Aerospace Exploration Agency, *JAXA*)
Dr. Einar-Arne HERLAND (European Space Agency, *ESA*)
Dr. RAKOTOBÉ (African Development Bank, *ADB*)
Mrs Karima BOUNEMERA (*UNECA Maghreb*)
Dr. Abou AMANI (*PHI-UNESCO, Ghana*)
Dr Akissa BAHRI (International Water Management Institute, *IWMI*)

Local Organizing Committee

Chair: Prof Zoubeida BARGAOUI (*ENIT*)

National Engineering School of Tunis, ENIT

Prof. Khelifa MAALEL

Prof. Rachida BOUHLILA

Prof. Mahmoud MOUSSA

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Ing. Moncef RAJHI (*Head National Meteorological Institute*)

Dr. Abdelwahab NMIRI

General Division of Water Resources, DGRE

Ing. Abdelmajid GHORBEL (*IHP-UNESCO, Tunisia*)

Ing. Salaheddine BOUZAIANE

University of Tokyo

Dr. Souhail BOUSSETTA

Meeting Web Site [http:// www.geoss-awcs.com](http://www.geoss-awcs.com); **Contacts :** secretary@geoss-awcs.com

Schedule

6 January

AM: Registration and Opening ceremony: 8h30-10h

Scientific session 1: 10 h-11h30

Key Note Lectures

Climate change impacts: Prof. Masahide Kimoto, UT, Japan

Data system and interoperability: Prof. Ryosuke Shibasaki, UT, Japan

Remote sensing: Prof. Toshio Koike, UT, Japan

Country report session 1: 11h30-13h

Two country representatives from almost 10 countries are expected to attend the conference one from the operational sector and one from the academic field. Country representatives are requested to present water related issues and existing data systems and data exchange Case studies of global water cycle observation and evaluation will be highlighted. Existing meteorological and hydrological networks will be presented and Needs for solution, on-going and/or planning approaches will be addressed. Expectation to earth observations, predictions, data integration and modeling will be discussed.

PM:

Country reports session 2: 14h30-16h

Scientific session 2: 16h30-17h30

Poster Presentations

Poster session aims at presenting and exchanging ideas and experiences of the African water cycle investigations at different time and space scales in different African regions. It will help network building between African representatives and meeting participants. Poster presentations will deal with Data systems and decision support tools related to the African water cycle observation, analysis, and prediction as well as forecasting. Issues will be related to :

- Precipitation variability
- Water balance, hydrodynamics and hydrological processes, scales
- Evapotranspiration and soil moisture modeling, including using remote sensing
- Regionalization approaches
- Network optimization
- Hydrological forecasting in data sparse conditions
- Flood and drought risk management
- Global Water Systems

7 January

AM: Scientific session 3: 8h30-9h30

Key Note Lecture

Surface water: Prof. Zoubeida Bargaoui, ENIT, Tunisia

Groundwater: Prof. Claudio Paniconi, Univ. Quebec Canada

Country reports session 3: 10h-12h

PM: *Field trip 13h-18h*

Oudhna archeological site, Khelidia artificial recharge site and visit of an irrigated area.

8 January

AM: *Country report session 3: 9h-10h30*

International activity session 1 11h00-13h00

Introductory presentations on GEOSS and water-related international projects in Africa are scheduled.

PM: *International activity session 2: 14h30-16h30*

Summary session: 17h-18h30

Summarizing the water-related science update, the country reports and the international activities introduced in the previous sessions, discussion on directions for cooperation and coordination toward solutions for water related common issues in Africa is scheduled.

9 January

Workshops (AM and PM)

W1: Groundwater/surface water interactions and data assimilation (C. Paniconi, Univ. Quebec)

W2: Sampling techniques (T. Ouarda, Univ. Quebec)

W3: Remote sensing for water resources assessment (T. Koike, Univ. Tokyo)

Conference program

	6 January 2009	7 January 2009	8 January 2009	9 January 2009
Registration and Opening ceremony	<i>8h30-10h</i>			
Scientific session 1	<i>10h00-11h30</i>			
<i>Country reports S1</i>	<i>11h30-13h</i>			
<i>Country reports S 2</i>	<i>14h30-16h</i>			
<i>Scientific session 2 Poster Presentations</i>	<i>16h30-17h30</i>			
<i>Scientific session 3</i>		<i>8h30-9h30</i>		
<i>Country reports S3</i>		<i>10h-12h</i>		
<i>Field trip</i>		<i>13h-18h</i>		
<i>Country report S3</i>			<i>8h30-10h</i>	
<i>International activity S1</i>			<i>10h30-13h</i>	
<i>International activity S2</i>			<i>14h30-16h30</i>	
<i>Summary session</i>			<i>17h-18h30</i>	
<i>Workshops</i> W1, W3 W1, W3 W1, W2 W1, W2				<i>9h-10h30 11h-12h30 14h30-16h 16h30-18h</i>