

## → THE TIGER INITIATIVE

### Looking After Water in Africa

TIGER was launched in 2002 by the European Space Agency (ESA) within the framework of the Committee of Earth Observation Satellites (CEOS), to respond to the urgent need for **action in Africa for sustainable water resource management** stressed by the Johannesburg World Summit on Sustainable Development. **TIGER is an international partnership** involving the African Ministerial Council On Water (AMCOW), the African Water Facility, UNESCO, UN-ECA, the World Bank, UNDP CapNet and stakeholders from more than 40 African countries.

*The TIGER initiative 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 (EO) technology.*

For more information about TIGER, please visit: [www.tiger.esa.int](http://www.tiger.esa.int)

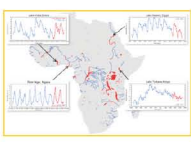
### The Water Observation and Information System (WOIS)

Building on the ten years R&D experience within TIGER, a free, open source Water Observation and Information System (WOIS) has been developed following the specifications of several African water authorities. Such system, fully based on **open-source software, contains modules allowing to manage and process Earth Observation data for IWRM**. It also features dedicated tools to integrate the derived information in the daily practices for which the Authorities have an institutional mandate.

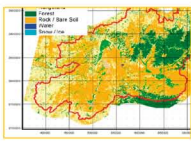
**TIGER also supports capacity building and training** of African water authorities and technical centers to fully exploit the increasing observation capacity for monitoring and management of water resources offered by current and upcoming generations of satellites, including the Sentinel missions.

#### EO WATER PRODUCTS

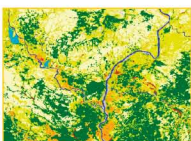
- Large lakes water quality and levels monitoring
- Soil moisture
- Evapotranspiration (optional)
- Precipitation (optional)



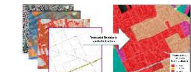
- Base mapping
- Medium resolution land degradation index
- Medium resolution full basin characterization



- High resolution full basin characterization
- Small water bodies mapping
- Flood mapping system
- Hydrological characterization



- Water supply and sanitation planning support



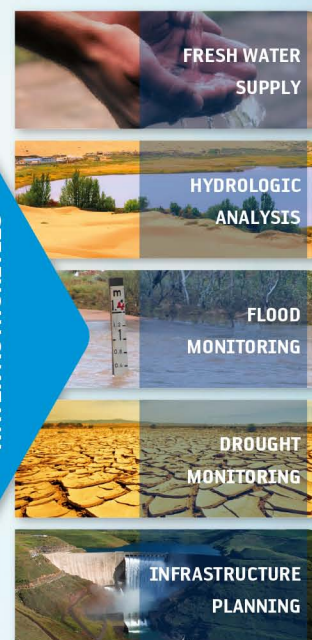
#### PROCESSING CAPACITY

##### Water Observation & Information System

- DATABASE MODULE**
  - Storage • Import/export • ftp
- EO PROCESSING MODULE**
  - Pre-processing • Image classification
  - Change detection • Accuracy assessment
- GEOGRAPHIC INFORMATION SYSTEM MODULE**
  - Visualization • Digitizing • Multi-criteria decision analysis • Presentation (Maps, Charts, Plots, Tables)
- HYDROLOGICAL MODELLING MODULE**
  - Data preparation • Hydrological response units based on terrain slope, land cover and soil type
  - Simulation of crop growth, soil moisture, groundwater storage and river discharge
  - Post-processing of time-series and map output from the simulation • Validation from in-situ data, radar altimetry and soil moisture products
- DECISION SUPPORT TOOLS**
  - Support for scenario development (e.g. land-use change, irrigation development)

Overview of WOIS, including its functionality, EO information and relevant applications.

APPLICATIONS FOR AFRICAN WATER AUTHORITIES



The WOIS is currently being demonstrated and refined in **collaboration with the following African water authorities:**

- Nile Basin Initiative
- Department of Water Affairs, Namibia
- Lake Chad Basin Commission
- Department of Water Affairs, South Africa
- Volta Basin Authority
- Department of Water Affairs, Zambia
- Agence Nationale de Météorologie et de Télédétection par Satellite, D.R. of Congo
- Zambezi Watercourse Commission

### WOIS Showcases

The WOIS offers to all users a set of pre-defined and customisable routines: the showcases illustrated in the following pages provide examples of use of the tool by the various stakeholders.

For more information about the WOIS, please visit: [www.tiger-net.org](http://www.tiger-net.org)

## → THE SENTINELS

ESA is developing a new family of missions called **Sentinels specifically for operational needs**. Each Sentinel mission is based on a constellation of satellites to fulfil revisit and coverage requirements, **providing operational datasets for the next 20 years, available under a free and open data policy**. These missions carry a range of technologies, such as radar and multi-spectral imaging instruments for land, ocean and atmospheric monitoring.



**sentinel-1** is an all-weather, day-and-night radar imaging mission for land and ocean services: the first satellite was launched on the 3rd of April 2014.

**sentinel-2** is a multispectral high-resolution imaging mission for land monitoring (including coastal areas): the first satellite is foreseen for launch in 2015.

**sentinel-3** is a multi-instrument mission for ocean forecasting systems, as well as environmental and climate monitoring: the first satellite is foreseen for launch in 2015.