



# Exploitation of Earth Observation for water management in the Mediterranean



## -Workshop and training course-

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November / December, Frascati (Italy)

*Workshop factsheet - Version dated 2012-07-13*

### Preamble

In September 2010, the Euro-Mediterranean Information System on know-how in the Water Sector – EMWIS- and the European Space Agency –ESA- jointly organized a workshop to explore the potential offered by Earth Observation for water management in the Mediterranean, bringing together representatives from water authorities and remote sensing institutes from 4 Southern Mediterranean countries (Morocco, Egypt, Jordan and Lebanon). This 2 days technical workshop (27-28 September 2010; Frascati/Italy<sup>1</sup>) resulted in a concept note<sup>2</sup> highlighting priority domains for Earth Observation applications in the Mediterranean and defining a strong capacity building program aiming at improving water management by the means of earth observation. This proposal has been welcomed by the EMWIS Steering Committee (Water Directors from 13 Mediterranean countries). However, up to now, the proposal could not be implemented due the lack of suitable source of funding.

ESA and EMWIS want to move a step forward by providing a technical introductory training course focusing on some priorities identified at the end of 2010 and reviewing potential joint activities taking into account recent developments in the region, in particular:

- The Regional project on “Strengthening National Water Information Systems and Harmonization of Data Collection towards a Shared Water Information System” (Med-WIS) prepared by EMWIS, the Arab League and Lebanon together with some pilot countries (Tentative list: Bosnia Herzegovina, Morocco, Tunisia, Jordan, Lebanon and Palestine). This project will be submitted to the secretariat of the Union for the Mediterranean for labellisation by the end of the year.
- The EU initiatives on:

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<sup>1</sup> [http://www.emwis.net/documents/meetings/fo1791509/ESA-EMWIS\\_ROMA2010](http://www.emwis.net/documents/meetings/fo1791509/ESA-EMWIS_ROMA2010)

<sup>2</sup> [http://www.emwis.net/documents/meetings/fo1791509/ESA-EMWIS\\_ROMA2010/conceptnote\\_eo4medwatermgt.doc/download/1/ConceptNote\\_EO4MedWaterMgt.pdf](http://www.emwis.net/documents/meetings/fo1791509/ESA-EMWIS_ROMA2010/conceptnote_eo4medwatermgt.doc/download/1/ConceptNote_EO4MedWaterMgt.pdf)

- The extension Shared Environment Information System –SEIS- to the Mediterranean Countries conducted by European Environment Agency. The above mentioned project, Med-WIS is developed as SEIS component;
- The development [the European Catchment and Rivers Network System \(ECRINS\)](#) and its application for processing physical water accounts at elementary catchment level to support drought and water scarcity management planning;
- Research and Technological developments related to the use of Earth Observation for the environment in particular with contribution to GEOS (e.g. priority “ENV.2013.6.3-3 Contribution to the assessment of global water resources through the use of new Earth Observation datasets and techniques”) and open data framework
- The World Bank Regional Coordination project on improved water Resources Management, carried out in Cooperation with NASA<sup>3</sup>.

## Objectives

Exponentially increasing amount of Earth Observation (EO) data and derived products are made readily available for users in many forms from uncountable sources, increasing the opportunity for informed decisions. Furthermore, there is an increasing demand in the water sector for using more data for better decisions. Unfortunately, these two ends (information supply and demand) frequently do not meet, especially when the stakeholders are spread over large regions, including several countries and several sectors.

The proposed short course aims at making these ends meet by providing up-to-date information about the results of Earth Observation developments applicable for water management, exchanging information on the best practices and available tools for applications of EO for water resources management in the Mediterranean region, consolidating regional and national requirements upon the existing infrastructure and improving regional capacity building for applications of EO for water resources management in the Mediterranean.

The idea is to advance the knowledge on water cycle at different scales in space and time; to accelerate the development of robust regional geo-information data products to characterise and model the water cycle from regional to national (basin) scales; and to show existing models and data assimilation systems to support global water cycle predictions, climate change impacts and development of mitigation strategies in water resources management.

Hence, the course will be an opportunity to give an introduction of the Earth Observation technology and its products available for the water sector in the Mediterranean region.

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<sup>3</sup> <http://www.worldbank.org/projects/P117170/5m--regional-coordination-improved-water-resources-management-capacity-building-cooperation-nasa?lang=en>

## Targeted participants

Information and water management professionals (eg: policy makers, Earth observation providers, resource managers and top remote sensing institutions members) from non EU Mediterranean countries:

- Up to 10 participants (with travel and accommodation costs covered by ESA): 2 representatives from targeted pilot countries (Morocco, Jordan, Lebanon, Egypt and potentially Tunisia), one from the water sector and one from key technical agencies with expertise in remote sensing.
- Other participants from countries or international organisations (maximum 10) are also welcome to share their experiences (on their own budget):
  - National experts in charge of water information systems or directors of water sector planning
  - National providers of space services (e.g. remote sensing institutes)
  - ESA-ESRIN team
  - EMWIS Technical Unit team

## Duration and location

- ✚ Tentative dates: Early December 2012 (tbc)
- ✚ Duration: 2.5 days
- ✚ Working language: English
- ✚ Location: ESA-ESRIN offices, Frascati (Rome), Italy

## Expected results

By completing the training course, participants will:

- understand how EO works,
- be able to find EO data relevant for water management on the Internet,
- know which most important water management related variables can be defined/measured from EO data,
- understand which water management fields can use EO data and how,
- appreciate the limitations of the EO technology,
- Be able to combine between remote sensing and the conventional in-situ data. For instance, in the case of drought monitoring in-situ measurements on terrain variables should complement remote sensing data. Not only the data but also the water related issues in some aspects need to be solved by taking an integral approach.
- Know about the directions of EO technology developments.

The workshop will result in:

- Further details on activities related to EO integrated to the UfM project proposal on harmonizing national water information systems in Mediterranean countries
- Definition of potential synergy with the World Bank/NASA Regional Coordination project on improved water Resources Management
- a revised concept note for potential joint project proposal

## Proposed content

ID	Topic	Presentation type	Contents/comments
<b>TRAINING</b>			
Day1/1	Introduction & EO for Water Management	Presentation by Eric MINO (EMWIS) by Benjamin Koetz (ESA)	- Objectives of training and workshop - How EO works, what we can see and what not, how information can be used / overview
Day1/2	ESA missions, EO data access	Presentation and demo (+ film) - TCBF	Data sources, products, applications
Day1/3	Data and data types	Demo and exercise TCBF	Raw data and products, archive and real-time data accessibility, processing software accessibility/Participants search selected data from the internet about their regions of interest.
Day1/4	Land cover, crop mapping	Presentation and exercise TCBF	How LC maps are made. Land cover products, change monitoring and reporting. Time series for monitoring/Participants (download and) display/analyse (basic statistics) LC data.
Day2/1	Water body, flood identification/mapping	Presentation - TCBF	Optical and microwave methods/Overview.
Day2/2	Evapotranspiration, water budget, irrigation	Presentation - TCBF	How it works (models used: surface energy balance 'SEBAL', S-SEBI, TSEB, etc), time series, limitations, products.
Day2/3	Ground water (storage change, recharge/extraction)	Presentation and demo - TCBF	Physical background, accuracies and limitations, products.
Day2/4	Change detection	Practical - TCBF	Participants can chose one from some topics (e.g. LC, ET and create a change map or a time series).
<b>WORKSHOP</b>			
Day3/1	EO for water management in the Mediterranean	Discussion & presentation – EMWIS & ESA	- reminding on capacity building proposal (2010) - revising EMWIS-ESA concept note - overview of possibilities for collaborations – e.g. TIGER, UfM, Worldbank/NASA
Day3/2	- Ongoing NASA – World Bank project: Regional Coordination on Improved Water Resources Management and Capacity Building	Presentation Talal Darwish & Belal El-Leithy	Dr. Talal Darwish (CNRS/Lebanon) and Dr. Belal EL-leithy (NARSS/Egypt) will present the project and its on-going activities in Lebanon and Egypt (NASA Water Information System Platform -WISP installed in Lebanon, etc)
Day3/3	- UfM project proposal on water information systems - EU research activities related to earth observation for	Presentation Eric MINO & Jauad El Kharraz (EMWIS)	EMWIS TU representatives will present also the UfM project proposal on water information systems. Finally, they will present the potential EU research activities suitable to support planned activities

	environment - Discussion on the way forward	Discussion	The participants will discuss the way forward and the next steps
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The proposed course is mostly based on material developed in the framework of the TIGER Capacity Building Facility (TCBF), which, among others, provided short courses for African water and EO professionals. Examples can be found on: [http://www.itc.nl/tiger/phase2/training\\_sessions.asp](http://www.itc.nl/tiger/phase2/training_sessions.asp)<sup>4</sup>

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<sup>4</sup> Dr. Zoltán Vekerdy; Faculty of Geo-Information Science and Earth Observation (ITC), University of Twente