



**INCO-CT-2004-509158**

**NOSTRUM-DSS**

**NETWORK ON GOVERNANCE, SCIENCE AND TECHNOLOGY**

**FOR SUSTAINABLE WATER RESOURCE MANAGEMENT IN THE MEDITERRANEAN.**

**THE ROLE OF DSS TOOLS**

**INSTRUMENT: Co-ordination Action**

**THEMATIC PRIORITY: INCO-MPC, Specific measures in support of international  
co-operation - Mediterranean Partner Countries (MPC)**

## **Deliverable D4-2**

# **Survey of relevant information centers and sources for geographical data**

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<b>ORGANISATION NAME OF LEAD CONTRACTOR FOR THIS DELIVERABLE: National Center for Remote Sensing (NCRS - Lebanon)</b>	
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<b>PROJECT CO-FUNDED BY THE EUROPEAN COMMISSION WITHIN THE SIXTH FRAMEWORK PROGRAMME (2002-2006)</b>	

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## **I- WP04 objectives and tasks**

### **1.1- Team in Lebanon**

In order to complete the work required in WP4 a team is organized to complete each task and their related subtasks. This team consisted of different personnel with different skills. The majority of the team is related to information technology, their work ranges between collecting information ( national reports and World Wide Web WWW, and surveillance) and building Database Management system for metadata repository and search. The following are the Team members:

- Mohamad Khawlie, professor of environment geology, he is the manager of this project in Lebanon and the planning of WP4 different phases.
- Mohamad Awad GIS and RS expert his main work is on the collection of Geo metadata in the Mediterranean basin and organizing these data and the dissemination of the data by using up-to-date information technology.
- Tarek Khaled is computer scientist whose main job is to help in the creation of the tools.
- Theodora Haddad – environment and urban planner with socio economic analysis.
- Roula Giya-executive secretary helping in administrative aspects
- Three assistants for field and office logistics.

In general, all team members have experience in different fields of information technology,

## 1.2 Project meetings

There have been many administrative meetings during a period of two years; however, two workshops took place in the last six months. They cover three different topics. The first technical workshop took place in Tunisia, Feb. 2006, where two topics covered concern the WP2 on Sectoral issues for DSS use in water resource management, and WP3 on Methodological issues for DSS use in water resource management. However, at the end of the workshop there were discussion about WP04-06 and we presented an assessment of data availability with reference to the National report and our overview of an acceptable DSS system. Another presentation was about data limitations, accuracy and uncertainty within WP04.

The second workshop took place in Aswan, April 2006. The main topic of this workshop is decision makers need and their expectations. In the workshop CEDARE discussed the Decision support system EIADSS and the impact components of socio-economic, political, economic, biological resources, and natural resources, then there were a brief introduction by Medias to the climate data sources, and a presentation made by our team covered the sources of the geographic data and the obstacles and problems faced in the collection process.

## 1.3 Work Package 4 objectives (D4-2 GIS/RS Centers)

The WP4 is divided into four main tasks:

- *Task a) Statistical data issues:* to investigate the needed data for meaningful research and informed policy making, as well as existing database and efforts in the socio-economic sector;
- *Task b) Territorial analysis & implementation of GIS systems:* to set up a knowledge base about the availability of geographical data (remote sensed information, geophysical databases, monitoring networks, etc.);
- *Task c) Water and climate change in the Mediterranean:* inventory of data and studies on climate change, and climate change modelling and scenario building, in the Mediterranean area;
- *Task d) Data needs assessment* for supporting DSSs use for IWRM.

Figure 1 depicts the position of WP4 in comparison to other WPs in the project. Tasks b and d are the responsibility of NCRS.

In WP4 the work concentrates on Identification of data availability and constraints in relation to water management. NCRS will carry out a desk survey of relevant information centers and sources in the Mediterranean basin. The survey should include all information pertinent to availability of geographical data (remote sensed information, geophysical databases, monitoring networks, etc.). Data needs assessment for supporting DSS use for IWRM. The final aim is to compile an interactive meta-data analysis based on the data surveys performed on tasks a, b, and c.

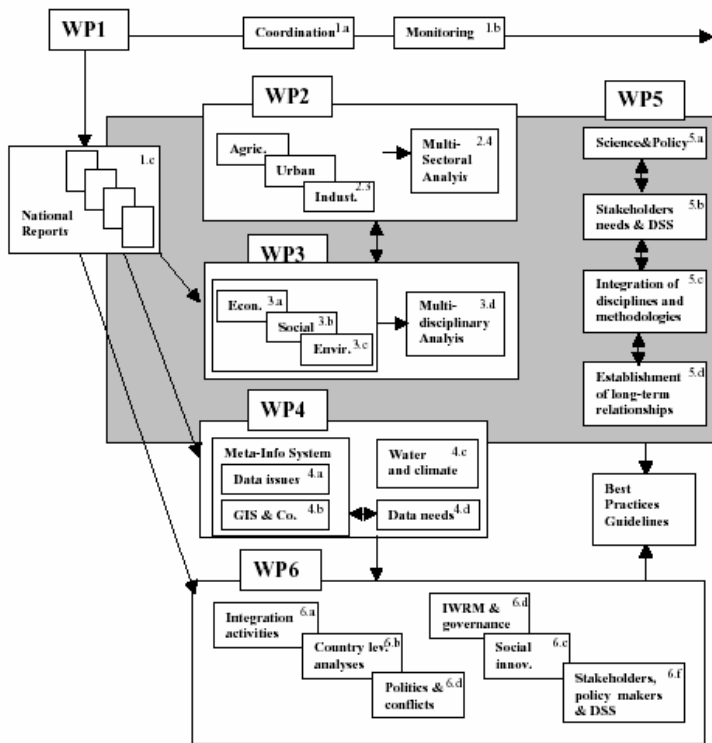


Figure 1. WP4 position with respect to the remaining WPs of the project

## 2-Progress achievement

### 2.1 Screening the national reports

In phase I Nostrum partners have prepared and made available two reports about each country's multi-purpose development information status in the Mediterranean basin. A thorough screening of these reports is done in order to find out the available metadata about GIS and remote sensing sources in relation to water and DSS. Each country report is investigated. Some of the countries have indicated the sources of the GIS and remotely sensed data, others did not indicate that, and some were of different sources. There are major problems which range from undefined source, different sources of information (the same country) which have different geographical characteristics, no indication of type of the project which created these data, and if indicated, no complete details such as organizations, time started, time completed, who is in charge ...etc. There are no complete data set details such as processing history, accuracy and type of classification system. In the national report we found the following themes that must be considered for Meta-data description of geographic data as they are important for water and DSS in a geospatial context:

Administrative boundaries and physical characteristics	Map of Population density
Elevation and Slope	Potential erosion - CORINE methodology
Elevation and surface of the main river basins and country	Water quality map - biological conditions
Temperature	Different data
Geological map	Biodiversity map and protecting areas
Karst coverage of the main river basins and country	River basin and river basin management authority
Precipitation	Soil type map
Main river basins	Land cover map
Main groundwater systems	Agriculture map
Rivers and water bodies	Location of the main industrial districts of the country

The following tables and charts show main examples of the characteristics of GIS and remote sensing data according to some countries whose sources of information are complete in the national report.

#### Egypt geographic data availability and sources

Date	Source
ADMINISTRATIVE BOUNDARIES	FAO
SLOPE	FAO
TEMPERATURE	FAO
PRECIPITATION	FAO
MAP OF POPULATION DENSITY	FAO
NATURAL HAZARD MAP	INTERNATIONAL STRATEGY FOR DISASTER REDUCTION (ISDR)

LOCATIONS OF POTENTIAL INDUSTRIAL EFFLUENTS DISCHARGES TO THE NILE	EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY
SOIL PROBLEM MAP	FAO
PROTECTED AREAS	EGYPTIAN ENVIRONMENTAL AFFAIRS AGENCY
WETLANDS	Geo Data Portal
BASIN AND RIVER BASIN MANAGEMENT AUTHORITY	WORLD RESOURCES INSTITUTE
SOIL TYPE MAP	FAO
LAND COVER MAP	FAO
AGRICULTURE MAP – FARMING SYSTEMS	FAO
LOCATION OF THE MAIN INDUSTRIAL DISTRICTS OF THE COUNTRY	EGYPT STATE INFORMATION SERVICE

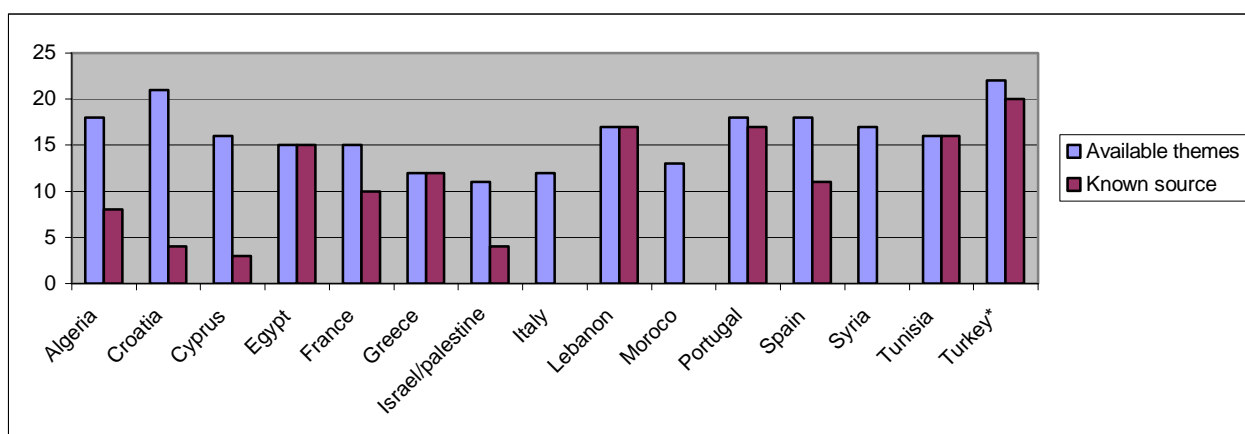
Greece geographic data availability and source

ADMINISTRATIVE BOUNDARIES	FAO
GEOMORPHOLOGICAL MAP	Ministry of Development, Directorate of Water and Natural Resources
ELEVATION AND SLOPE	WSM
PRECIPITATION	FAO
TEMPERATURE MAP	Ministry of Development, Directorate of Water and Natural Resources
POTENTIAL EVAPORATION RATE	WSM
MAIN SURFACE AND GROUND WATER SYSTEMS; HYDROLOGICAL BASINS	WSM
MAP OF POPULATION DENSITY	Ministry of Development, Directorate of Water and Natural Resources
SEISMIC HAZARD MAP	U.S. GEOLOGICAL SURVEY EARTHQUAKE HAZARDS PROGRAM
SOIL PROBLEM MAP	GREEK NATIONAL COMMITTEE FOR COMBATING DESERTIFICATION,
PROTECTED AREAS	Ministry of Environment
RAMSAR AREAS	HELLENIC ORNITHOLOGICAL SOCIETY
AGRICULTURE MAP	Ministry of Development, Directorate of Water and Natural Resources
ADMINISTRATIVE BOUNDARIES	FAO
GEOMORPHOLOGICAL MAP	Ministry of Development, Directorate of Water and Natural Resources

### Tunisia geographic data availability and source

ELEVATION AND SLOPE	Fao-Cropwat
TEMPERATURE	Zouari and Gaaloul
PRECIPITATION	Zouari and Gaaloul
POTENTIAL EVAPORATION RATE	Henia
MAIN SURFACE AND GROUND WATER SYSTEMS; HYDROLOGICAL BASINS	Zouari and Gaaloul
MAP OF POPULATION DENSITY	FAO
HAZARD MAP	FAO
SOIL PROBLEM MAP	ANPE
PROTECTED AREAS: IUCN CATEGORIES I-VI	ANPE
WETLANDS	Map of hydrographic network of Tunisia (1/500000)
RIVER BASIN AND RIVER BASIN MANAGEMENT AUTHORITY	Map of hydrographic network of Tunisia (1/500000)
SOIL TYPE MAP	Zouari and Gaaloul
LAND COVER MAP	FAO
AGRICULTURE MAP	Zouari and Gaaloul
LOCATION OF MAIN INDUSTRIAL DISTRICTS (UNIDO CLASSIFICATION)	Zouari and Gaaloul

In general, the status of GIS data sources is depicted in the following chart:



## **2.2 GIS and RS in the National Reports**

From the above screening of the national reports we found that many information are missing, however, we were able to collect information available from some countries about GIS and RS sources. They were found in the Annexes of every report. These collected information were saved in DBMS of metadata information. This information includes the name of the organization which provides GIS and RS data, their role if it is a part of bigger organization, point of contact, web address...etc. Most of these GIS and RS information are extracted from international databases such as NASA<sup>i</sup> (USA space research agency), The WebGIS<sup>ii</sup> of AdbPo's (Authority of Po river Basin in Italy), one of the AdbPo's main requirements is to communicate its activities in the Po basin. A specific goal is to provide a continuous view of the territory, based on unitary concept of the hydrographical basin and on the analysis of the connection between the diverse natural and anthropic events; an additional objective is to encourage cooperation and document exchange between public and private agencies operating within AdbPo's jurisdiction. MapServer GIS search engine\_MapServer is an Open Source development environment for building spatially-enabled internet applications. MapServer is not a full-featured GIS system, nor does it aspire to be. Instead, MapServer excels at rendering spatial data (maps, images, and vector data) for the web. Beyond browsing GIS data, MapServer allows you create "geographic image maps", that is, maps that can direct users to content. For example, the Minnesota DNR Recreation Compass provides users with more than 10,000 web pages, reports and maps via a single application. The same application serves as a "map engine" for other portions of the site, providing spatial context where needed. Another free source of GIS data is ESRI<sup>iii</sup> world map 1:1000000. The World Basemap Data includes Country Boundaries, Coastlines, Administrative Boundaries, Water Bodies, Perennial Rivers, Intermittent Rivers, Populated Places, Major Roads, Major Trails, Capital Cities, Major Cities, Cities, and Airports.

## **2.3 GIS and Remote Sensing information available from other resources**

GlobeXplorer<sup>iv</sup> is another Satellite images portal, it is a commercial satellite images provider and it is free to browse and to search and examine all kind of satellite images around the world. The search technique is easy, just enter the name of the city/village and the country name and you get a snap view of the place with different available satellite images. Alexandria Digital Library (ADL)<sup>v</sup> is part of University of California Santa Barbara Libraries, this portal provides search engine to find any type of aerial or satellite images around the world by specifying the geographic extent and the date of the image, these images are free to download. Another free source of an up-to-date satellite images with high resolution is Google Earth<sup>vi</sup>, this portal provides an easy method to surf the world and search for any feature (roads, hydro-network, boundaries, etc...). However, these resources are only downloadable if used for commercial reasons in this case can be used for analysis. RS and GIS resources are not all captured or produced in the same date and the resolution depends on the area and the countries (in other words not all countries have updated information except USA).

## 2.4 Guideline and questionnaire

To speed up the process of RS and GIS meta data collection, another approach was followed which works by filling a questionnaire concerning the availability of RS and GIS data in GIS and RS Centers in the Mediterranean basin. The questionnaire concentrate on the type of available data and projects concerning WRM, the following is part of the questionnaire supplied by e-mail to many institutions (It is in English and Arabic – in case computer gives unreadable text)

### Available digital maps

تاريخ انتاج الخريطة Date of production	الجهة القائمة بالتحويل الرقمي Who produced it	الشكل الرقمي Formats (E00/DXF/shp/...)	التغطية الجغرافية (محافظة / مدينة / قرية / حي) Geographic extent (Province, City, Village )	نوع الإسقاط Projection	مقياس Scale	نوع الخريطة ... (طبوغرافية/جيولوجية/ ( Type of Map

ملاحظات Remark	التغطية الجغرافية Geographic Extent	التاريخ Date	عدد الصور Number of photos	النوع Type (Spot/LANDSAT/...)

■ مشاريع أخرى تعتمد الاستشعار عن بعد و نظم المعلومات الجغرافية

**information on other projects using RS & GIS**

(اسم المشروع، المنطقة الجغرافية، الفترة الزمنية)

(title of the project, Geographic area, Time interval)

..... .1  
..... .2  
..... .3  
..... .4  
.....

**2.5 Main references**

- i <http://www.nasa.gov>
- ii <http://www.webgis.com/index.html>
- iii <http://www.esri.com/data/download/basemap>
- iv <http://imageatlas.globexplorer.com/ImageAtlas/view.do?group=ImageAtlas>
- v <http://webclient.alexandria.ucsb.edu/mw/index.jsp>
- vi <http://earth.google.com>