

**FESEABILITY STUDY ON
THE DEVELOPMENT OF
A REGIONAL WATER
OBSERVATION SYSTEM
IN THE
MEDITERRANEAN
REGION**

SPAIN

Final report

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MEDA Water



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Executive Summary

Objective:

The aim of this study is to identify the potential functionalities, needs and expectations of Spanish stakeholders for a Mediterranean Water Observation Mechanism. To that end we have compiled the opinion of water management institutions with competence in information systems, prepared a complete diagnosis of the situation in Spain and updated the UN Country Profile.

Methodology

To obtain the information presented in this study we have searched in the internet to find the information that is directly available to the public, we have interviewed water management experts and have collected information through surveys analysis.

Conclusions

The complexity of the hydrological conditions in the Mediterranean countries makes it necessary to have information systems to carry out efficient and effective water management.

An Observation Mechanism for the Mediterranean could be of great help in order to organise and systematise the increasing amount of information now available. Added to this, the Observation Mechanism could be a very useful tool to help those countries, which are behind in the field of water information systems, to improve them.

Focusing now on the Spanish situation, we have identified the main weaknesses and strengths of water information systems. Summarising, we could say that there is a lot of information available and a great effort has been done to introduce new monitoring networks used to report to EU institutions for the WFD and the forthcoming WISE (Water Information System for Europe).



1 FOREWORD

At their conference held in Rome, 24-25 November 2005, the Euro-Mediterranean Water Directors proposed that EMWIS “Studies, with interested countries, the objectives and the feasibility of building up within EMWIS a regional water observation mechanism to monitor the indicators towards the achievements of the Millennium Development Goals related to water and sanitation in the Mediterranean, as well as the implementation of the water related section of the Mediterranean Strategy of Sustainable Development, based on the information provided by the National Water Information Systems, whenever they exist.”

The first phase of this feasibility study aims at preparing the vision of the main orientations of the water observation mechanism, on the basis of diagnostic studies on needs, expectations and analysis of existing systems for data collections and information production at regional and national levels. Four pilot countries have been selected for this phase: France, Jordan, Spain and Tunisia.

This report is related to the Spanish study that has been carried out by Infraeco between September and November 2006 on the basis of 2 survey questionnaires provided by EMWIS, one related to the existing processes for data collection, reporting and monitoring and the second one to the needs and expectations for such a regional mechanism.

This report includes:

- an overview of water management in Spain
- an update of the Spanish country profile prepared for Johannesburg summit in 2002 in order to have a summary assessment of the organisations managing water data at the national level
- an analysis of Spanish water sector stakeholders related to the regional water observation mechanism
- an analysis of existing processes for data collection, reporting and dissemination processes
- a presentation of the Spanish water information system: Hispagua
- the study conclusions

The first results of the feasibility study have been welcome by the Euromed water directors at their meeting in Athens, 6-7 November 2006. They decided:

- To call this mechanism: Mediterranean Water Information Partnership



- To carry-out the 2nd phase of the study in 2007, including the first practical tests with voluntary countries and international organisations concerned.

2 INTRODUCTION

Following the principle of “decentralised management”, included in the Water Framework Directive, the three levels of the Spanish Public Administrations have authority over water issues.

The State, through the Spanish Ministry for the Environment, is responsible for passing General Legislation on water management (Law of Inland Waters or the Hydrological National Plan) and the management of those river basins included in more than one Autonomous Region (inter-community basins). The Hydrographical Confederations, dependants on the Ministry, carry out this duty.

The Autonomous Regions can develop the State’s legislation and increase the protection of water resources. They are also responsible for the management of those basins that are on the whole included in their territory (intra-community basins).

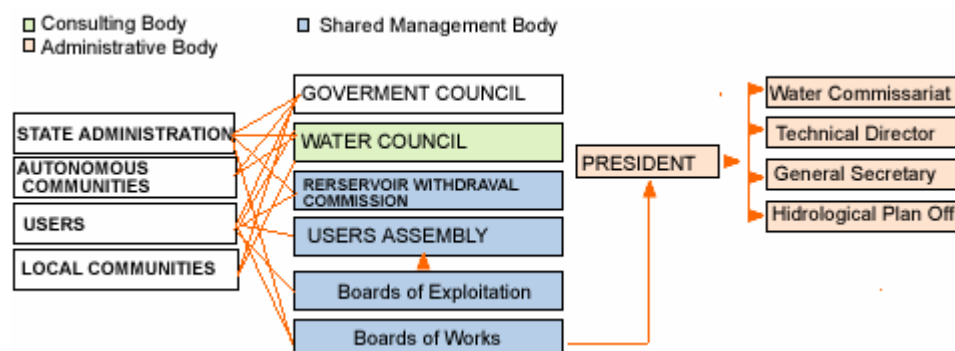
Local authorities are responsible for water supply and sewage management, but they have no legislative authority.

A Hydrographical Basin is a territory which water drains through an affluent network, to a main river which, at its turn, flows to the sea. That means it is a territorial and natural entity not coincident with administrative borders.

The Hydrographical Confederations (Confederaciones Hidrográficas) are Public Law entities with their own legal personality, different from the State, and attached to the Ministry of Environment for administrative purposes, but having full autonomy of action, according to Law of Inland Waters. Public administration on water issues is exerted by Basin Councils in inter-community basins, and by the Hydraulic Authorities of Autonomous Communities in intra-community basins.



Scheme of a Basin Council:



According to article 21 of Law of Inland Waters, the duties of the Basin Councils are:

To prepare the Basin's Hydrological Plan, to survey and review it.

To administrate and control the Hydraulic Public Property.

To Administrate and control uses of general interest or those belonging to more than one Autonomous Region.

To plan and exploit the work done with their own funding, and those ordered by the State.

Those originated from agreements with Autonomous Regions, City Councils and other public or private bodies, or those agreed with private organisations.

In any case, water management in Spain is based on the General Principles of Public Administration on water issues, which are:

- The Hydraulic Public Property belongs to the State
- Respect for the unity of the Hydrographical Basin, hydraulic systems and hydrological cycle
- Integral approach, water economy, principle decentralisation, co-ordination, efficiency and users participation
- Compatibility of public water policies with regional planning, preservation, protection and restoration of environment
- Indivisibility of Hydrographical Basins for management purposes

With regard to information management, under article 6.2 of the Law 38/1995, on Access to Environmental Information, Public Authorities have to publish Environmental and Statistical information, periodically and sorted by thematic areas. Most institutions, within their area of

responsibility, provide technical information on the state of water, flora and fauna, natural parks and air pollution among others. Information on legislation, responsibilities, aids and grants and links to other national and international sources of information are also available through their web pages.

Current computing tools allow an extensive use of the Internet for the implementation of information and reporting policies. This is advantage as it multiplies the diffusion capacity in a wide national and international range and makes it easier to modify and update contents. For that reason, the Ministry of Environment, from its web page (www.mma.es) gives information related to the WFD implementation in the different River Basin Districts.

3 2002 COUNTRY PROFILE UPDATE

Update of the relevant chapters of the Spanish country profile prepared for World Summit of Sustainable Development in 2002 at Johannesburg in order to provide an over view of water data management in Spain.

3.1 Chapter 2: International cooperation to boost sustainable development in developing countries and connected domestic policies

Information and data about bilateral, sub regional, regional or multilateral and international cooperation, at a national level, can be obtained through AECI'S (Spanish International Cooperation Agency) web page (www.aeci.es). AECI is an autonomous body belonging to the Spanish Ministry of Foreign Affairs and Cooperation through the State Secretariat for International Cooperation. This Agency is responsible for the design, implementation and management of the cooperation and development programmes and projects, whether it is with their own financial resources or in collaboration with other national and international organisations and Non-Governmental Organisations. At the level of Autonomous Regions and Municipalities, you can find information at their respective web pages.

The General Secretariat of Foreign Trade, belonging to the State Secretariat of Tourism and Foreign Trade of the Spanish Ministry of Industry, Tourism and Trade (www.mityc.es), provides information through its web page (www.comercio.es). It includes: economic publications, data, statistics, indicators of the Spanish Foreign Sector, of foreign investment in Spain, of Spanish foreign investment and investment flows.



3.2 Chapter 17: Protection of Oceans and seas

The Directorate General for Coasts has information available for those who ask for it, but it is not available through the Internet. Spain has developed information indicators on the quality of: air, water, soil, energy, fishing, transport, urban areas, natural and technological disasters, biodiversity, waste management, agriculture, industry, tourism and households. Indicators on the seaside and sea environment are currently being prepared. With regard to integrated planning and development of seaside environment, a GIS/SGPM database has been created to provide the needed information. With regard to sustainable use and preservation of sea living resources a Geographical Information System has been developed to improve fishing management. Information on all these issues can be found at the web pages of the Ministry for the Environment (www.mma.es), Ministry for Agriculture, Fishing and Food (www.mapya.es) and the Oceanographic Spanish Institute, more precisely at the Oceanographic Information Centre (www.ieo.es).

3.3 Chapter 18: Quality and water supply: implementation of integrated criteria in order to improve the use and planning of water resources

The Spanish Water Information System (<http://hispagua.cedex.es>) is an initiative from the Ministry for the Environment, together with CEDEX (Public Works Studies and Experimentation Centre) and with the support of the Scientific Information and Documentation Centre (CINDOC), belonging to the Higher Council for Scientific Investigation (CSIC). Spain has 1200 sampling stations, of which, a thousand take samples periodically and 200 do it occasionally. This network makes it possible to monitor quantitative and qualitative characteristics of water, in the nine Spanish River Basins managed by the Ministry of Environment. This is done through automated and manual sampling procedures, followed by laboratory analysis and finishing with the use of other existing networks, such as the fishery, quality of water supply, COAS.... Water quality surveillance is carried out through 115 Automated Alert Stations (EAA), which continuously measure certain water quality parameters and other elements that might cause an alarming situation. This system is rounded out with 9 peripheral control centres, one for each River Basin and a central unit, located at the Ministry of Public Works. The link between them is established throughout the HISPASAT system.

Information on the planning and development of water resources is regularly collected by the following authorities:



- In the agricultural sector, Autonomous Regions and the Spanish Ministry for the Environment,
- In the household sector, the Ministry of Health, the Ministry of Environment and Municipalities;
- In the industrial sector, the Ministry of Industry and Ministry of Environment.

In all cases, information is spread through the electronic means of the Ministry's of Environment, such as DBASE, ARC/INFO and the Internet (www.mma.es).

3.4 Chapter 40: Information for the decision making process

The Spanish Ministry of Environment has created a "Common Core of Environment Indicators", with the participation of the users of the Spanish EIONET Network, National Reference Centres and Autonomous Focal Points. The selection of new indicators is done following this procedure:

The proposal of a new indicator must include a filling card with the main characteristics of the indicator and Meta-data needed to interpret it. Every new indicator is circulated within the Network with the aim to collect the opinion and consensus on its content, of the Public Environmental Indicators Databank (BPIA). In this way, the social nature of the project is kept.

The next phase includes the calculation of the indicators and the preparation of the first report based on them. The 2004 Spanish Environment Profile is the first report, on a national level, with essential information on the main environment fields, natural resources and productive sector in our economy, as well as the interrelationship between them.

It aims at showing a general view of the environment in Spain, which serves as a diagnosis of its situation, and helps to mobilise as many resources as possible for its protection and sustainability. To that end, 73 indicators, included in 13 areas and prefaced with a brief introduction and reference to the sources of information used, have been studied. The work is illustrated with 140 graphs and content tables, and 25 maps. Whenever possible, the information has been provided separately for each Autonomous Region and reference has been made to the situation of the environment in the European Union. Copies of this report can be bought through the Publications Service of the Ministry of Environment.



In 2005, a second report, on a national level and based on the use of environment indicators, was done. It kept the main structure and conceptual framework of the one edited in 2004. Its objective is to provide useful information about the situation and evolution of the environment in Spain, using environmental indicators. In each case, it includes the trends and changes that have occurred by comparison with the information provided in the first edition of this report.

The method used to evaluate the situation of the environment and to assess the actions taken by the Civil Authorities in the field of environment integration, is based on the system: persuasion-state-response, assumed by all member countries of the Organisation for Economic Co-operation and Development (OECD). Information can be found at the web pages of the National Meteorological Institute (www.inm.es), Hispagua (www.hispagua.cedex.es) and the Ministry of Environment (www.mma.es).

4 STAKEHOLDERS EXPECTATIONS ON THE WATER OBSERVATION MECHANISM

The questionnaire prepared by SEMIDE/EMWIS has been sent to the most important institutions with competence in water management and information systems in Spain. Unfortunately we have not received as many answers as we expected.

Only six institutions have replied to the survey in time (Spanish Ministry for the Environment, Catalanian Water Agency, University of Castilla La Mancha, Ecology and Development Foundation and Centre for New Water Technologies). This situation makes it difficult to draw out conclusions that represent the opinion of water managers. Anyway, we are going to analyse the information received and show the results.

- Who will benefit from the Observation Mechanism?

According to the answers received, all categories of targeted public mentioned in the survey will find it useful to have an Observation Mechanism working in the Mediterranean region. Nevertheless, two people consider that it will be of no use for International Organisations and one person has no opinion in this particular point.

- Which topics should the Observation Mechanism deal with?



It is important to highlight that all topics are considered of some importance. Droughts has received the maximum score, which makes sense if we consider that Spain is currently under one of the most severe droughts it has ever suffered. On the contrary, meteorological information has received the lowest score of all. Probably this is due to the fact that we already have an Institute devoted to the collection of this kind of information, so it is not considered a gap in our information systems.

Some people added new areas of interest such as desertification. The South of Spain and many other areas in the Mediterranean region are in great danger of desertification, so this could be considered as a topic to be included in the Mechanism.

Most people interviewed consider that it would be necessary to focus on a number of topics and avoid trying to cope with too many issues.

- What is the use of the Observation Mechanism?

This question is especially difficult to analyse because one person only gave a mark to the big headings and four people didn't give a mark to that one and just focused on the sub-headings. This makes it difficult to give a concluding result. In general terms, it could be said that most people agree that the Observation Mechanism should:

- Give assistance with the definition and production of indicators for the follow up and results of the Integrated Water Resources Management (IWRM) policies.
- Increase the exchanges of experience between countries on data administration and enhancement.
- Provide indicators for following up the implementation of IWRM policies.
- Provide information useful for Environmental Economy; Water accounts/environment accounts
- Support the definition of common reference frames between International Organisations and countries allowing the strengthening of data comparability at regional level.
- Give support to points of access to the produced information (reporting) within international partnerships.
- Follow up of the measures taken by governments.

It would be important not to duplicate efforts, so it is very important to have a clear idea of the tools already available in order to get the most out of them.



- Which geographical area should be covered by the Mechanism?

Out of the six answers received, three people consider that it should cover all Euromediterranean Countries; two think that it should focus on countries in the Mediterranean Basin and one thinks that it would be useful to cover the whole area. We would need more surveys to draw a conclusion on this particular issue.

Most people agree that only the main water resources management units in contact with the Mediterranean Basin should be included in the Mechanism.

No other relevant comments or information has been provided. Some new answers are expected from Hydrographical Confederations and CEDEX. As soon as we get an answer from their side we will include the results in the study.

5 SYSTEMS FOR THE COLLECTION AND PRODUCTION OF INFORMATION REPORTING AND DISSEMINATION PROCESSES

5.1 *Spanish Ministry for the Environment*

The Spanish Ministry of Environment is responsible for the proposal and execution of the Government's environment policy together with the Autonomous Regions. That includes, among others, to legislate on inland, sea and seashore water, environment and forestry, to manage the Hydraulic Public Domain, the Seashore Public Domain and the Meteorological National Service and to represent Spain in front of International Institutions in those areas under its responsibility.

Being Water and the Hydraulic and Seashore Public Domain under its field of activity and following the Aarhus Convention¹, one of its duties is to collect and distribute environmental information through its Library and Publications Service. Gain access through the Ministry's web page (<http://www.mma.es>).

¹ Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, adopted on the 25th of June 1998 in the Danish city of Aarhus at the Fourth Ministerial Conference in the 'Environment for Europe'. It is also a Convention about government accountability, transparency and responsiveness as it grants the public rights and imposes on Parties and public authorities' obligations regarding access to information and public participation and access to justice.



The Publications Centre publishes numerous studies, reports and leaflets with general and specialized information. Every month it publishes the review “*Ambienta*”, available on paper, and on the internet, and three reports: *Hydrological Information* (weekly on the internet), “*Meteorological Information*” (daily on paper), and every three months “*Bibliographical Information*” (on paper and on the internet).

It also has various free databases on the internet: BIBLIOMA (books, reports and newspaper articles); LEMA (Legislation); REMA (Magazine titles); EMA (Grey literature) and BIREMA (Bibliographical reference) and an annual CD (subject to payment) called: “Environmental Documentation”.

On the internet you can find information on the following issues:

- Environmental legislation and jurisprudence
- Information including: actions taken by public authorities, situation reports, EIONET² network.
- Water policy Planning
- Updated documents
- Technical thematic areas

Added to this, the Spanish Ministry for the environment has a Sub Directorate General for Public Information and Technological Services, which develops the following tasks:

Provide information to citizens and the rest of Public Authorities

Coordinate administrative and environmental information activities

Promote and develop the e-administration

5.1.a General Directorate for Water

In the water sector, the General Directorate for Water, belonging to the Ministry of Environment, provides information about European Union Directives, analytic data on inland water quality, water quality control networks, water quality indicators, composition of industrial discharges, authorisations, sanctions applied, National Census of discharges,

² EIONET is a network of European organisations, belonging to the European Environment Agency, which provides information to Member States and European Commission, in order to help them in the task of protecting the environment.



dams, hydrological reports and information about the performance in relation to the National Hydrologic Plan and the Water Framework Directive.

The Directorate General for Water has various databanks of which, SAICA (Information System on Water Quality) is the most important one. It includes information about discharges, sanctions and authorisation proceedings, National Discharges Census, Aquifers, Depth Official Control Network, Irrigation Communities and record of public water and hydroelectric power uses.

Periodically, this General Directorate publishes Environmental Reports. It also has a system of environment indicators with information on:

- Population without access to water treatment facilities
- Aquifers polluted with Nitrates
- Pollution caused by dangerous substances
- Saline coastal aquifers due to sea water intrusion
- Eutrophic reservoirs
- Rivers with good water quality according to biotic indicators
- Organic pollution

All this information is available through the Ministry's web page.

5.1.b General Directorate of the National Meteorology Institute

The NMI has various databases with meteorological information:

ADABAS: Daily information on climate variables

SIAM: real time and historical files on meteorological variables

Analysis, forecasts, satellite images.

All this information is available through its web page (<http://www.inm.es>) and through periodical publications such as the Daily Meteorological report and the meteorological calendar, both subject to payment, and the Observer, free of charge.

5.1.c General Directorate for Coasts

On the internet, this General Directorate provides information about water quality of Spanish beaches according to the European Union standards (blue flags) and general information



about the maritime environment. Other information can be requested through the internet, but it is not directly available.

5.1.d Droughts National Observation Mechanism

The Droughts National Observation Mechanism (DNOM) is an initiative of the Spanish Ministry of Environment and the Ministry for Agriculture, Fishing and Food meant to coordinate all the authorities responsible for water management in Spain, in order to build a centre of knowledge, prevention, mitigation and monitoring of the effects of droughts.

The following authorities can take part in this Observation Mechanism:

- The eight State's Hydrographical Confederations
- Autonomous Basin Authorities (Galicia Coast, Basque Country, Catalanian's Interior Basins, Mediterranean Basins in Andalusia, Balearic Islands, Canary Islands).
- Autonomous cities of Ceuta and Melilla
- Autonomous Regions
- Municipalities

Each of these authorities has to provide information to assure an adequate management of droughts and help prevent and mitigate its environmental, economic and social effects. This initiative intends to improve the quality, transparency and participation in the information process. The Ministry has offered its web page to host the DNOM, including the following issues:

- Hydrological information: rainfall, inland water, river flow, water quality, non conventional resources, reservoirs in the form of snow and wetlands.
- Reports on the monitoring of droughts carried out by the Ministry
- Management and legislative actions implemented by Autonomous and local Authorities.
- Information about environment training to citizens
- Actions to minimise the effect of droughts on agriculture



5.1.e Water State-owned Companies

The Water State-owned Companies were created in 1997, as a new instrument of the hydraulic policy to boost and implement users' participation in the development and exploitation of infrastructures, obtain private financing and implement European Union funds.

At the moment, there are 10 companies functioning: Aguas del Duero, ACESA, Hidroguadiana, Aguas del Júcar, ACSegura, Acusur, Acunor, Baix Llobregat, Aquavir and Acuamed.

5.2 Hydrographical Confederations

Water management and planning in Spain is organised on the basis of river basins and through Hydrographical Confederations (HC). HC's are Autonomous Organisms attached to the Ministry for the Environment. There are eight HCs, one for each of the inter community.

Hydrographical Confederations are responsible, among others, for the hydrological planning, the hydraulic infrastructure plans, the implementation of water international agreements, and authorisations and concessions in the Hydraulic Public Domain in intercommunity basins.

Hydrological Planning requires a lot of information, especially in a country like Spain that has very important hydrological problems. Rainfall irregularity in time and space is a Mediterranean climate characteristic, which causes contradictory situations: terrible droughts in some areas and catastrophic floods in others.

In order to mitigate these effects, in the last years, hydrological information systems and networks have been installed in every HC in order to have real time information on the hydrological situation of each river basin.

The SAIH (Hydrological Information Automated System) network was initially conceived as a tool to help with making decisions that would mitigate the effect of droughts and floods. Nevertheless, it was soon made clear that this system was an essential working tool to improve everyday water management.

Currently, seven out of the eight HC have the SAIH system. Its objectives are:



- Foreseeing and monitoring floods
- Optimise water resources management, in quality and quantity
- Improve dam's security
- Improve hydro meteorological and hydrological data bases

The SAIH System consists of three hierarchical levels:

- Remote Station or Control point (R.S)
- Concentration Point (C.P)
- Basin's Processing Centre (B.P.C)

The first level (R.S) collects raw data. Information is stored, processed and transferred to the following hierarchical level (C.P), when asked for it.

Concentration Points (C.P) process and store the information and transfer it to the Basin's Processing Centre, when the latter asks for it.

The Basin's Processing Centre receives the information from all the points, processes it and stores it.

Summing up the SAIH works as follows:

- Raw data is collected by sensors in the remote station
- Data is sent to the Concentration Points through radio links
- Data is sent to the Basin's Processing Centre
- Computer processing of data received from C.P and BPC

The system works in a different way depending on whether we are under normal or crisis conditions:

Normal: Every 15 minutes the corresponding PC makes a request for information to the stations. Stations answer with the average of the data stored during that period or with the changes experienced during that time.

Crisis: Information is requested every five minutes to those stations located in the affected area, and every 20-30 minutes to the rest of stations.



SAIH information system provides information on:

Rainfall

Rivers flow

Reservoir's standing level

Sluice gates position

Quality information: pH, conductivity, dissolved oxygen, temperature, ammonia, hydrocarbons, total organic carbon, heavy metals.

In **Annex 1** there is a description of the information provided by each Hydrographical Confederation through their web pages.

5.3 Spanish Ministry for Agriculture, Fishing and Food

The Ministry of Agriculture, Fisheries and Food deals with the proposal and execution of the Government's general guidelines on agrarian, fisheries and food policy.

Its web page (www.mapa.es) offers information on its organisation, the formalities involved in the recruitment processes for jobs related to the Ministry, on the approved lists of services conceived as an instrument so that citizens can know in advance what class of services to expect and request, as well as on service quality commitments.

It also provides information about facts and figures on Agriculture, including Exterior Commerce. It provides an access to the Library's Computerised Catalogue of Modern Monographs (CERES), with 24,000 copies, and to the Ministry's publications.

Finally, the weekly bulletins and annexes of the Weekly Agro-alimentary and Fishing International Information Bulletin constitute a very valuable documentary collection.

Through Ministry's web page you can check documents, data and actions taken in Spain with regard to irrigation systems. Under the issue "rural development" you can find information on irrigation and water resources management such as: saving water in the Spanish irrigation systems, environmental improvement in irrigated areas, productivity and social improvement, coordination between different management authorities, legislation and action plans.



5.3.a National Centre for Irrigation Technology (CENTER)

Other webs dependants on this Ministry are the Spanish Irrigation Observation Mechanism, National Centre for Irrigation Technology and the National Irrigation Plan, all at public disposal. The Irrigation Observation Mechanism is meant to provide society with information, through the internet, on how irrigation is managed in Spain.

This Centre was created in 1985 to study, develop and implement the irrigation technology and then transfer it to the agriculture sector both at National and International level. Its main objectives are to study, develop and apply the irrigation technology for Agriculture.

Another entity responsible for Irrigation management is the Federation of Spanish Irrigators Communities (FENACORE), founded in 1955. It is a National Association that represents entities devoted to irrigation management. Their objective is to solve common problems of the Spanish irrigation systems. To that end, this Federation has put together their objectives, legal basis and managing operation. It is a millennial corporation, currently of Public Law, in which farmers gather together to conduct the self-management irrigation water in order to allocate water in more efficient, methodical and equitable way. Due both to the millennial character of the Irrigators Communities and to their proved efficiency, as well as to being unique in the World, it is important to know them in order to be able to export this type of Farmer's Associations to other countries, so that the limited water resources might be distributed with the maximum strictness and equity.

Through its web page www.fenecore.org, you can gain access to the information project called CORENET. It provides information to all Irrigation Communities associated under FENACORE to help them improve their efficiency and competitiveness. It covers the following topics:

- Management modernisation
- Efficient use of water and energy in irrigation
- Training

CORENET includes irrigation communities, institutions and companies involved in the irrigation and hydraulic works sectors.



5.4 Autonomous Regions

Spain is divided into 17 Autonomous Regions each with a different degree of responsibility in water management, and thus in water information systems.

They all have a Regional Environmental Ministry and through their web page, they provide general information on the water cycle, environmental legislation, their competency and infrastructure. Anyway, some of them manage intra-community basins and thus, have developed a wider information system. Such is the case of Andalusia, Catalonia, Basque Country and Galicia, which are going to be analysed in further detail.

5.4.a Andalusia

The Autonomous Region of Andalusia is the biggest one in Spain. It has two intra-community river basins: Atlantic Andalusian Basins and Mediterranean Andalusian Basins. Through the main web page: www.juntadeandalucia.es you can gain access to the Regional Environmental Ministry. There you can find information about: water, air pollution, biodiversity, seashore water, protected areas, fishing and hunting, environmental training, soils...

Under the heading “Water”, there are five links available:

- Water resources
- Seashore water quality
- Seashore water: monitoring and surveillance
- Drought information (Infosequía)
- Andalusian Water Agency (“Agencia Andaluza del Agua”)





The first four links on the list provide information on: polluting sources and competency of this Autonomous Region (discharges authorisation and use of the Public Domain). With regard to seashore water issues, information is provided on seashore water quality. Quality reports are published every month. The last one dates back to August 2006 and can be checked through this link:

http://www.juntadeandalucia.es/medioambiente/aguas_litorales/informes_mensuales/meses06/IMH0608.pdf

The link “Infosequía” provides information about water management, droughts and water resources in Andalusia: situation and actions taken, water infrastructures, impact indicators, news and other related links.

Andalusian Water Agency

The Andalusian Water Agency is an Autonomous Organism, attached to the Regional Environmental Ministry, responsible for the coordination of all water competency of the Autonomous Region. It was created in 2005, which coincides with the implementation of the Water Framework Directive 2000/60/CE. It aims at designing a new water policy that assures participatory processes, environmental protection and responsible resources management.



Through its web page: <http://www.agenciaandaluzadelagua.com> you can find information on the two Intra - Community basins that completely fall in the territory of Andalusia:

Mediterranean Andalusian Basin

Atlantic Andalusian Basin

For both of them information is provided on the following issues:

Rivers: current water level

Reservoirs: water level and situation map

Rainfall

Aquifers: water level

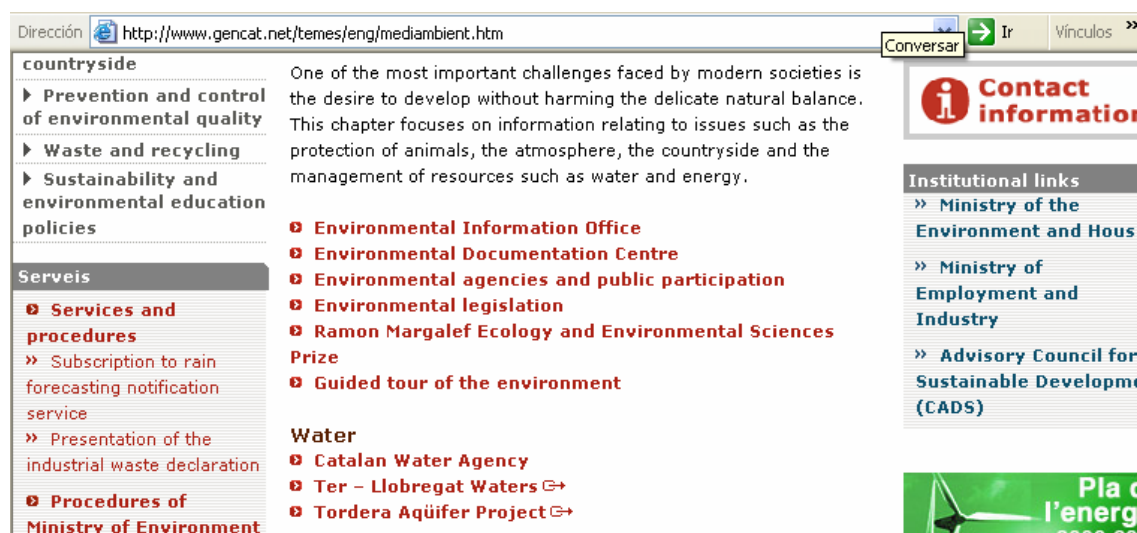
Authorisations

Information about Irrigation Communities

The screenshot shows the website interface for the Andalusian Atlantic Basin. At the top left is the logo of the Junta de Andalucía, featuring a stylized green arch and triangle. To its right, the text reads "Agencia Andaluza del Agua" and "CONSEJERÍA DE MEDIO AMBIENTE". Further right, the title "Cuenca Atlántica Andaluza" is displayed. Below the logo is a small image of a water droplet. A navigation menu on the left lists: "Presentación", "Descripción", "Datos", "Enlaces de interés", and "Gabinete de comunicación", each with a small red square icon. Below the menu is the text "administración electrónica". On the right, a map of Spain is shown with the Andalusian Atlantic Basin highlighted in blue. The word "España" is written on the map, and "Cuenca Atlántica Andaluza" is written in red below the highlighted area. The word "Inicio" is written in red above the map.

5.4.b Catalanian Autonomous Region

Through its web page <http://www.gencat.net/> you can find information on all the issues for which the Autonomous Region is responsible for. One of them is “environment”. You gain access to this topic through the following link: <http://www.gencat.net/temes/cas/mediambient.htm>.



There are various links of interest:

Environmental Information Office

It provides information on: the situation of surface and ground water resources, reservoir's standing level, situation of hydraulic infrastructures, and sewage treatment stations.

FEASIBILITY STUDY ON THE DEVELOPMENT OF A REGIONAL WATER OBSERVATION SYSTEM IN THE MEDITERRANEAN REGION

The screenshot shows the Gencat website's 'Environmental Information Office' page. The browser address bar displays 'http://mediambient.gencat.net/eng//ciutadans/informacio_ambiental/inici.jsp'. The page header includes the Gencat logo, the text 'Web del Departament de Medi Ambient i Habitatge', and navigation links for 'català | castellano', 'contact | site map | accessibility', and a search bar. A main navigation menu highlights 'The Environment'. The page content is organized into several sections: a introductory paragraph, a grid of menu items including 'What is the Environmental Information Office?', 'Activity Programme', 'Environmental Documentation Centre', 'Training Resources', 'Sistema d'Atenció al Ciutadà', 'Actions and Services (files)', 'Aid and Grants', 'State of the Environment', and 'Links'; a 'New' section with a news item about extended public attention hours; a 'Highlights' section with a demand form and e-newsletters; and a 'Related links' section with information and participation, newspaper library, press room, and organization chart.

Environmental Documentation Centre

It provides environmental information and links to other related organisms. A digital library is now under construction but electronic publications of various environmental magazines are already available.

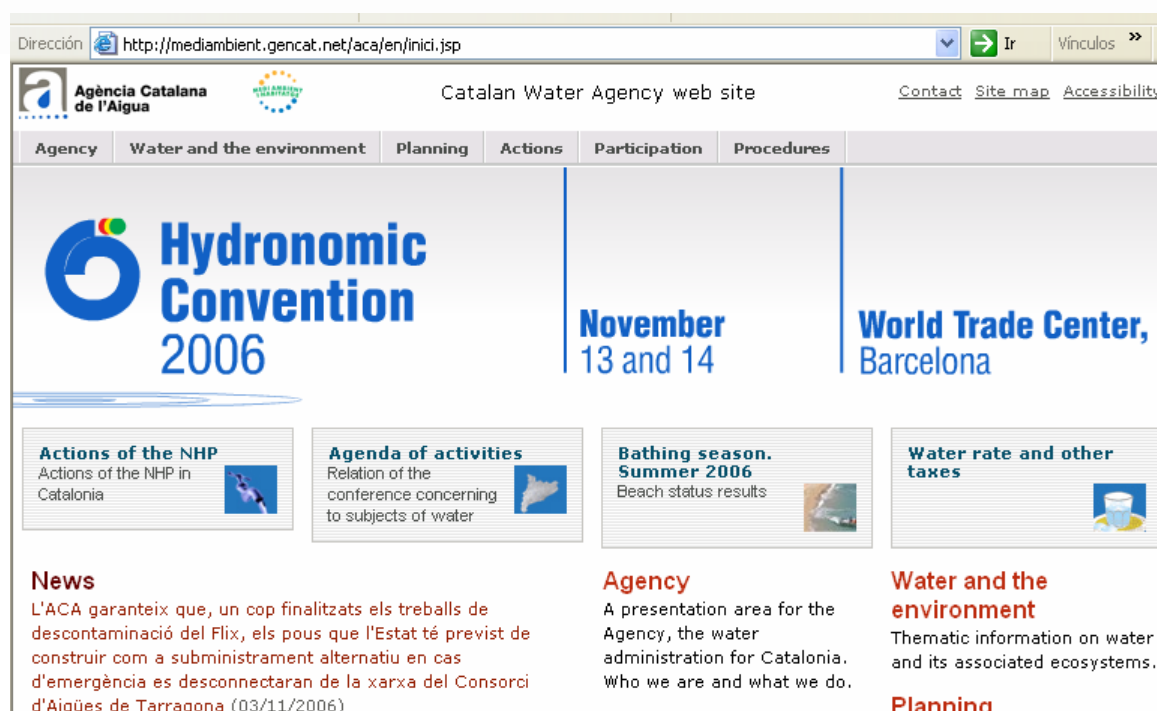
This is an identical screenshot of the Gencat website's 'Environmental Information Office' page as shown above, providing a second view of the page's layout and content.

Agencies and public participation

Citizens can participate and express their opinion through this section. They can also take part in surveys and forums that take place between specific dates. There are none open at the moment.

The screenshot shows a web browser window with the URL http://mediambient.gencat.net/eng//ciudadans/participacio_publica/inici.jsp. The page header includes the Gencat logo, the text 'Web del Departament de Medi Ambient i Habitatge', and navigation links for 'català | castellano', 'contact | site map | accessibility', and a search bar. A main navigation menu highlights 'Citizens'. The main content area is titled 'Public Participation' and contains the text: 'Citizens can participate and express their opinion through this section. They can also take part in surveys and forums that take place between specific dates. There are none open at present.' Below this text are three buttons: 'Query and Suggestion Box (CAT)', 'E-newsletters', and 'Fòrum del Medi Natural'. A 'New' section on the right lists 'Public information of the project of the Line 9 of underground of Barcel'. At the bottom, there is a footer with 'legal advice | about the web | contact' and '© 2005 Departament de Medi Ambient i Habitatge'.

FEASIBILITY STUDY ON THE DEVELOPMENT OF A REGIONAL WATER OBSERVATION SYSTEM IN THE MEDITERRANEAN REGION



The screenshot shows the Catalan Water Agency website. At the top, there is a navigation bar with the agency's name in Catalan and English, and links for Contact, Site map, and Accessibility. Below this is a main menu with categories: Agency, Water and the environment, Planning, Actions, Participation, and Procedures. The central banner features the 'Hydronomic Convention 2006' logo, with the dates 'November 13 and 14' and the location 'World Trade Center, Barcelona'. Below the banner are four boxes: 'Actions of the NHP' (Actions of the NHP in Catalonia), 'Agenda of activities' (Relation of the conference concerning to subjects of water), 'Bathing season. Summer 2006' (Beach status results), and 'Water rate and other taxes'. At the bottom, there are three columns: 'News' (L'ACA garanteix que, un cop finalitzats els treballs de descontaminació del Flix, els pous que l'Estat té previst de construir com a subministrament alternatiu en cas d'emergència es desconnectaran de la xarxa del Consorci d'Aigües de Tarraçona (03/11/2006)), 'Agency' (A presentation area for the Agency, the water administration for Catalonia. Who we are and what we do.), and 'Water and the environment' (Thematic information on water and its associated ecosystems. Planning).

This agency provides information about the quality and quantity of inland and coastal waters. The information is provided through a query sheet in which you choose the basin, the river, the date and the parameters you want to check. The information is then sent to you via e-mail. The parameters provided are: pH, salinity, temperature, turbidity, alkalinity, suspended matter, saturated and dissolved oxygen and conductivity.

There are also other quality networks, for example:

Reservoir network: Consists of a series of reservoir checkpoints. These are sampled twice per year. Basic indicator parameters of eutrophication are controlled.

Wetlands network: These are a series of wetland areas, ponds and similar. Specially those included in the PEIN (Plan for Areas of Natural Interest). Testing takes place twice per year and indicative parameters of eutrophication and in some cases metals, industrial solvents, volatile organohalogens and pesticides are set.

Ground water quality networks: It measures the quality of ground waters. Monitoring is carried out considering the most restrictive use, that is, human consumption, as established in the Technical-Sanitary Regulation which will have to be adapted to Community Directive 98/83/CE on water for human consumption.

The study of ground waters is made by hydro-geological units and the results obtained are established in ground water quality networks.

These networks consist of a series of wells, which supply the whole territory and are monitored with a pre-established periodicity and with the same diagnostic objective.

Basic network: It monitors the physical-chemical compositions of water that results from water-environment interaction and from diffuse pollution phenomena (not attributable to specific sources). Pollution from nitrates, salinity and pesticides are clear examples of diffuse pollution.

In all **sub-networks of the basic network** the general parameters are analyzed: conductivity, pH, hardness, TOC, majority of anions and cations (Ca, Mg, Na, K, HCO₃, SO₄, Cl), nitrogenous compounds (NO₃, NH₄ and NO₂) and the metals iron and Manganese. Moreover, volatile organ chlorates, industrial solvents, dioxins and other metals are analyzed if deemed necessary.

- **Salinity network** It monitors the penetration of seawater in Catalan coastal aquifers. It is divided into different salinity sub-networks defined by the hydro geological units that have a part on the coast.
- **Network of nitrate-vulnerable areas** Established by Royal Decree 261/1996, which transposes Directive 91/676/CEE for the protection of waters against pollution caused by agricultural nitrates.

Decree 283/1996 of 21 October designates those areas vulnerable to this pollution in the Catalan territory. In accordance with this regulation, **six vulnerable zones** have been identified and make up this network. The parameters controlled are: majority of anions and cations, nitrogenous compounds (NO₃, NO₂, and NH₄) and metals formulated in food for animal consumption (Fe, Mn, Co, Zn, Se and Cu).

- **Pesticide network:** This specific network was created to underscore the incidence of pesticides in areas with significant agricultural activity.

Levels are controlled for 25 organochlorate compounds and 19 organophosphorates in the insecticide group and 7 triazines in the herbicide group. Every year two controls are organized in **pesticides sub-networks**, the first in the months of April, May, June and July and the second in September and October.

With regard to ground water, information is provided through a query sheet in which you choose the Hydrological unit and the year you want to check. The information is sent to your e-mail address.



5.4.c Basque Country

Through the link "http://www.ingurumena.ejgv.euskadi.net/r49579/es/el " you gain access to the Regional Environmental Ministry and to all the information they provide on water issues.



Under the link "Aguas y litoral" you can find information on:

- **Legislation:** Full-text of the Autonomous Region's General legislation is available through the internet.
- **Water Framework Directive (WFD).** Full text of the WFD is provided, as well as the document on the Common Implementation Strategy and a report on the implementation of articles 5 and 6 of the before mentioned Directive.
- **Water quality:** 2005 and 2004 reports based on the information provided by the River Ecological State Monitoring Network, 2004 and 2005 reports based on the information provided by the Surveillance Network of the River Pollution State caused by Priority Substances, 2004 and 2005 reports based on the information provided by the Surveillance Network of costal and transitional water quality and 2002 and 2003 reports based on the Surface Water Quality Surveillance Network.
- **Wetlands:** Basque Country Report based on the information provided by the Basque Country Wetlands Monitoring Network.
- **Underground water:** 2005 and 2004 reports on the results provided by the gauging stations, standing level and chemical monitoring stations.

- **Publications:** Description of surface in land waters in the Basque Country; 1:150.000 Hydrological Maps including the drainage network and river basins; 1:100000 digital mapping of river courses and environmental training material.

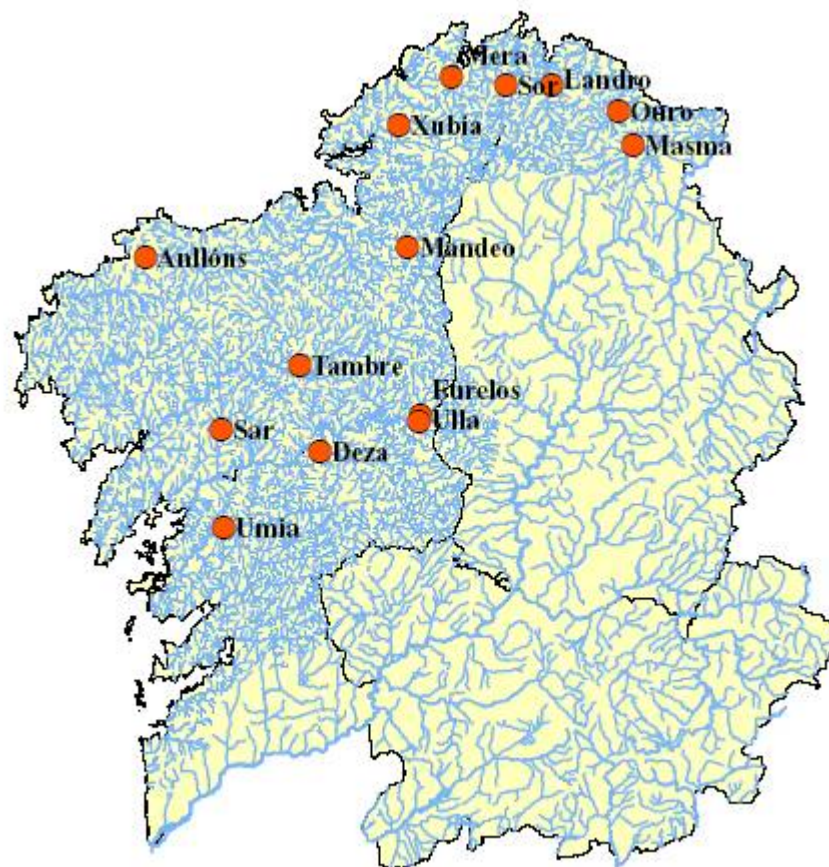


5.4.d Galicia

Through the web page <http://medioambiente.xunta.es> you can gain access to “Waters of Galicia” <http://augasdegalicia.xunta.es/>. “Waters of Galicia” is an Autonomous Organism attached to the Regional Environmental Ministry responsible to carry out the competency in water issues of the regional government.

It provides information on:

- **Discharges authorisations**
- **Standing level Networks**, consisting of 14 stations all being equipped with data-logger. This reduces data loss and cheapens exploitation costs. Those that have data-logger available, take measures every 10 minutes. The information is digitalised and hydrographs are prepared. You can gain access to each station directly through the internet clicking directly on the map.



- **Quality Monitoring Network**

Galicia's quality network consists of 34 stations. A series of physic-chemical and microbiological parameters are analysed in order to establish the quality of the water being studied.

5.5 Other

5.5.a CEDEX

The Centre for Centro de “Estudios Hidrográficos” (Hydrographic Studies) is, within CEDEX, the organization specialized in hydraulic planning, hydrology, continental waters engineering and all those other aspects related with the quality of the resource.

The “Centro de Estudios y Experimentación de Obras Públicas” (Centre for Public Work's Studies and Experimentation) was founded in 1957 as an autonomous organisation. It is, currently, organically attached to the Ministry of Public Works and functionally to the Ministries of Public Works and Environment of Spain, in the sphere of their respective

competences. It is an institution that provides multidisciplinary support for the civil engineering and associated environment technologies.

Its wide range of activities includes:

- Acquisition, analysis, use and application of basic data.
- Physical scale models and numerical simulation.
- Studies and research in its own installations and with prototypes.
- Quality control in public works.
- Support to the planning and implementation of the Department own basic standardisation.
- Environmental studies.
- Sonic testing of works, elements and systems.
- Scientific and technological information and documentation.
- Organisation of postgraduate courses, seminars and other educational activities.

5.5.b National Statistics Institute INE

The National Statistics Institute (www.ine.es) is an autonomous organism with an administrative nature, with legal personality and capital gains, attached to the Ministry of Economy and Tax via the State Secretariat for Economy. In performing its competences and functions, the National Statistics Institute is governed by Law 12/1989, of 9 May, on the Public Statistical Services (LFEP) which regulates statistical activity for state purposes which is under the exclusive jurisdiction of the State.

The functions of the National Statistics Institute include the general coordination of the statistical services of the State General Administration, the monitoring, control and surveillance of the technical competences of the state's statistical services, and other tasks envisaged in the LFEP (compilation of demographic and economic censuses, national accounts, demographic and social statistics, economic and social indicators, coordination and maintenance of company directories, creation of the Electoral Census,...).

INEbase is the system the INE uses to store statistical information on the Internet (www.ine.es/inebase/index.html). It contains all the information the INE produces in electronic formats; that is, nearly 100% of our current production.



The information available at INEbase is always updated. All available information can be viewed on INEbase the moment the statistical data are supplied to the media: press release, table summaries and detailed results.

Environment statistics of water

For the **sustainable development strategy**, approved by the European Council, one of the priority areas is highlighted as the sustainable use of natural resources. Community authorities will monitor and study water as a natural and essential resource for human activity.

As a result, the availability of statistical data on water, in all its quantitative and qualitative, physical and economic forms and in terms of flows or availability, is essential for the monitoring of public actions in terms of hydrological planning.

The Environmental Statistic on water is part of the National Statistics Plan (2005-2008). Currently, this statistical operation is developed using other environmental surveys: those that collect information on the use of water industrial and services by the industrial and services sectors, and two specific surveys (the Use of Water in Agriculture Survey and the Survey on Water Supply and Treatment). The application of the Water Framework Directive and the need to implement various policies in this field, demand the gradual development of new studies and greater details on those that already exist. The Spanish statistical system must tackle this task throughout the coming years, just as other Member States must do.

Eurostat's website is the information source for European data where further information can be found through the theme Environment and energy, for example:

- Supply and treatment of water survey: to quantify productive activity in non-monetary terms, physical units, of the urban supply of water and of the treatment of residual water in urban sewage networks.
- Survey on water use in the agrarian sector: to quantify the water volume used for agrarian sector irrigation. It involves describing the productive activity expressed in monetary terms and in physical units (cubic metres) of the units that provide services related to the distribution of water for agrarian exploitations.



- Industrial sector water use survey: to establish a method that facilitates the integration of economic and environmental aspects of water.

Water indicators

One of the ways to analyse the information supplied by the statistics and environmental accounts is to present a battery of indicators that synthetically express the Environment situation. The indicators supply information and/or trends on the environmental conditions and phenomena. The importance of having indicators available is based on the need to supply political officials with information that is presented in a concise and representative way, which can easily be understood and used.

The indicators presented there, describe the most relevant aspects of the Sixth Community Action Program on the Environment and refer to greenhouse effect gases, **to water as a renewable natural resource** and the management of waste. It has to be noted that the construction of a system of sustainable development indicators that facilitates jointly integrating the economic, social and environmental aspects is being started.

The indicators on water for INEBase are:

- Provision and treatment of water by volume of available and supplied water:
 - Volume of available water
 - Coming from own collection
 - Surface waters
 - Subterranean waters
 - Other water resources
 - Coming from other resources
 - Water volume supplied
 - To households
 - Other use
 - Water volume losses un the distribution network
 - Percentage of water volume losses in the distribution network
- Provision and treatment of water by type of indicator:
 - Volume of treated residual water
 - Volume of dumping water
 - Volume of reusable water



- Demand
 - Oxygen
 - Chemistry
-
- Provision and treatment of water by economic indicators, Autonomous Region and year:
 - Average price of cubic meter
 - Supply of water
 - Public sewage

5.5.c IGME

The “Instituto Geológico y Minero de España” (www.igme.es) is an Autonomous Public Investigation Organism, attached to the Ministry for Science and Education.

It is responsible for:

- The study, investigation, analysis and recognitions in the field of Sciences and Earth Technologies.
- Formation of knowledge infrastructure.
- The information, scientific technical assistance and advising to the public Administrations, economic agents and to the society in general, in geology, hydrogeology, environmental geology sciences, geologic and mineral resources.
- The relations with other areas of knowledge
- The elaboration and execution of the budgets of I+D and development of knowledge infrastructure in national and international programs.

The information available on its Web page allows queries and gaining access to digital information in the data bases of the IGME, such as:

- Geographic Information System -GIS: Management an integration of geo-referenced information. Digitalisation and edition of cartography. Display, discharge and query of digital cartography.
- Documental Information System - DIS: Access to studies and technical projects done by IGME and bibliographical information on Earth Sciences.



- Geophysics Information System - GEOPIS: Query and display of geophysical data of the whole National Territory
- Underground Water Information System - UWIS: Integrates and puts at public disposal the Official Hydro geological Databases.
- Data Base Systems: Geological, hydrological and mineral resources documental and factual data bases.
- Publications – Scientific library: Information and sale of publications, reports, books, maps, atlas, etc.
- Library: Catalogue of the books, magazines and map collections available. Access to library services, electronic magazines, digital library.
- Thesaurus: Access to the multilingual thesaurus on Earth Sciences.



6 THE SPANISH WATER INFORMATION SYSTEM: HISPAGUA

The Spanish Water Information System, **Hispagua**, is an initiative of the General Directorate of Water, attached to the Secretaría de Estado de Aguas y Costas of the Ministry of Environment, in collaboration with the CETA (Centro de Estudios de Técnicas Aplicadas within CEDEX (Centro de Estudios y Experimentación de Obras Públicas), with the technological support of the Consejo Superior de Investigaciones Científicas (CSIC).

The screenshot shows the Hispagua website interface. At the top, there is a navigation menu with categories: Portada, Instituciones, Documentación, Formación, Investigación, and Datos sobre el agua. The main content area is divided into several sections:

- 14/11/2006**: A search bar and a list of links including Noticias, Boletín, Documentos, Legislación, El agua en internet, Quién es quién, Cultura del agua, Bases de datos, and Foro.
- Novedades**: A section for news updates, including:
 - Boletín de noticias de octubre
 - Monográfico sobre Huella Hídrica
 - 11 de octubre Día Internacional para la reducción de los desastres
 - Monográfico sobre los vertidos contaminantes en España
 - SIAS España: Sistema de Información del Agua Subterránea
 - Suplemento electrónico de fuentes sobre "Desertificación"
- La falta de agua se cobra más vidas que las guerras**: A featured article discussing water scarcity and its impact on children. It mentions that two million children die each year due to lack of clean water and inadequate sanitation. The article is attributed to Weblogs Madi+d El Agua.
- Noticias**: A section for news items, including:
 - 14-11-2006: Los embalses de la cabecera del Tajo bajan 5 hectómetros y quedan al 10,34%. (EFE)
 - 14-11-2006: Un experto afirma que el trasvase del Ebro era una "solución" para el "estrés hídrico" de los ecosistemas mediterráneos (Europa Press)
- Agenda**: A section for upcoming events, including:
 - 14-11-2006: Seminario sobre recursos hídricos en Irlanda y cambio climático
 - 15-11-2006: Conferencia ICASALS 2006 "El agua en tierras áridas y semiáridas: enfoques innovadores e información para la toma de decisiones"

Being the **Spanish Focal Point** in charge of structuring the information in matter of continental waters in this country, **Hispagua** is part of the Euro Mediterranean Water Information System, EMWIS, whose financing and functioning are backed by the European Union and the three countries that conform the Technical Unit (Spain, Italy and France).

Hispagua gives you the possibility to gain access to the information available on continental waters in Spain, which is disseminated through the different websites of those institutions with responsibility in water management. Most of the information is accessible through the database.

Its objectives are:

- To become a centre of reference for information on continental waters in this country.
- To offer the users an interactive way of communication on this subject to exchange ideas, collaboration in projects, requests of information, suggestions, on-line publications by the authors, etc.

Through **Hispagua** you can gain access to the existing information on water matters in the following fields:

- Institutions
- Documentation
- Research
- Training
- Data on Water
- The new culture of water in Spain



7 CONCLUSIONS

Information systems are essential to carry out efficient and effective water management. This is especially important for Mediterranean Countries, which share a common concern for uneven rainfall distribution, both in time and space. Under these conditions, efficient water management is a key element to ensure water supply and sanitation services, which is essential for the socio economic development of the region. All economic activities (agriculture, industry and services) depend, somehow or the other, on water of adequate quality and enough quantity.

Water Information Systems are the basis for coherent water management, hydrological planning and sustainable water policies deployment. In that sense, an Observation Mechanism for the Mediterranean could be of great help in order to organise and systematise the increasing amount of information now available. To that end it would be necessary to:

- Define a number of topics of common interest to all the Mediterranean Countries
- Define the frequency with which information should be provided and updated
- Design common formats and same measuring units that make it possible to compare data.
- Provide an appropriate environment in which, countries could exchange experiences and know-how in the field of water information systems.

Added to this, the Observation Mechanism could be a very useful tool to help those countries, which are behind in the field of water information systems, to develop them, and for the others to improve their own.

Focusing now on the Spanish situation, and after having gone through the wide variety of institutions that collect and use water information, some conclusions have been drawn, which should help in designing an Observation Mechanism that lives up to the expectations and needs of Mediterranean Countries. These conclusions are now going to be briefly explained.

In Spain there is a wide variety of institutions with areas of competence in water management. Ranging from the Estate's level, to private companies and going through user's communities and organisations. All of them collect and process information on the



topics under their responsibility. In most cases this information is available directly through the internet or, at least, you can request it via e-mail. In some cases you need to pay a small amount of money for it.

Due to the complex distribution of water competencies in different hierarchical levels throughout the Spanish Public Administrations, you need thorough knowledge on how it is organised and who is competent for what, to identify where to look for the information. Added to this, there usually are a lot of issues related to water, so you need to have a very clear idea of what you are looking for in order to be able to find it. Added to this, most institutions provide information using their own formats, neither the standard EU nor even a country design. In fact, in some cases, one same institution uses different formats for similar kind of information.

Clear examples of this situation are Hydrographical Confederations. They carry out the same duties, have the same competencies, similar management tools and they are all dependant on the Spanish Ministry for the Environment. Nevertheless, each of them provides different kind of information, in different level of detail and using its own formats. In general terms, those that have the biggest problems of water scarcity tend to reduce the amount of information directly available through the internet.

In the last years, the introduction of new information systems, such as the SAIH and SAICA, have boosted the production of information and facilitated its availability. In general terms, one could say that there is a lot of information and data available, the problem comes when analysing how that information is put forward. Hispagua is an attempt to solve this situation. It is meant to centralise all, or most, of what is published, but in many cases what you get is the link to other institution's web page and not the information straight away.

According to the surveys received so far, most of the people interviewed consider that an Observation Mechanism for the Mediterranean is very important and could help Spain, and the rest of the Mediterranean countries, to organise and homogenise their information systems. It also provides an umbrella for a wider perspective of inland water issues and a forum where stakeholders could participate and share their particular views.

To systematise the information collected through the study, we have done a SWOT Analysis of the Information Systems in Spain, the following results have been obtained:



	STRENGTHS				WEAKNESSES				
	Much information available	Information updated in most cases	Automated Monitoring Networks	Experience in info management	Incomplete information	Historic data missing	Lack of organisation	Too many organisations competent in water	
THREATS									
OPPORTUNITIES									
Incoherent water policies	-	-	=	=	+	=	+	+	+
Insufficient preventive measures	-	-	=	-	+	+	+	+	+
Difficult IWRM and planning	-	-	=	-	+	+	+	+	+
Water conflicts	-	-	=	=	+	=	=	+	=
Prevention of extreme events	+	+	+	+	-	-	-	-	=
Agreements among countries	=	=	=	=	=	=	-	-	-
Effective and efficient planning	+	+	+	+	-	-	-	-	=
Development of new technologies	+	+	+	+	-	=	-	=	+

The right hand column provides the global result of the analysis. We need to focus on the minus signs that appear there, analyse the weaknesses that cause this situation and search for support in our strengths.

According to this methodology, our biggest problem is the big number of organisations and institutions with competence over water management and thus, in its information systems. This situation causes organisation problems and makes it difficult to know who should provide which information and how it should be displayed. Added to this, each institution chooses the topics of its interest, but there is no consensus on which are the most important.

List of Acronyms

- AECI Agencia Española de Cooperación Internacional (Spanish International Cooperation Agency)
- BPIA Public Environmental Indicators Databank
- CEDEX Centro de Estudios y Experimentación de Infraestructuras (Centre for Studies on Public Works and Experimentation)
- CENTER National Centre for Irrigation Technology
- CINDOC Scientific Information and Documentation Centre
- CSIC Centro Superior de Investigaciones Científicas (Higher Council for Scientific Investigation)
- DNOM Droughts National Observation Mechanism
- EAA Estaciones Automáticas de Alerta (Alert Automated Stations)
- EIONET European Environment Information and Observation Network
- EMWIS/SEMIDE Euromediterranean Water Information System
- FENACORE Federación Nacional de Comunidades de Regantes (Federation of Spanish Irrigators Communities)
- GIS Geographical Information System
- HC Hydrographical Confederation
- IGME Instituto Geológico y Minero de España (Spanish Geological and Mining Institute)
- INE Instituto Nacional de Estadística (Statistics National Institute)
- IWRM Integrated Water Resources Management
- LFEP Public Statistical Services
- OECD Organisation for Economic Co-operation and Development
- SAICA Sistema Automático de Información sobre Calidad del Agua (Water Quality Automated Information System)
- SAIH Sistema Automático de Información Hidrológica (Hydrological Automated Information System)
- SWOT Strengths, Weaknesses, Opportunities and Threats Analysis
- UN United Nations
- WFD Water Framework Directive

