ERAC-CT-2005-0260025
IWRM-NET
Towards a European-wide exchange Network for integrating research efforts on Integrated Water Resources Management

Thematic priority: Integrated water resource management

DELIVERABLE N°21

National research programmes for Integrated Water Resource Management across Europe.

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PU	Public	√
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services).	
CO	Confidential, only for members of the consortium (including the Commission Services).	

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IWRM ERA-Net

European Research Area (ERA)

The objective of the ERA-NET scheme is to step up the cooperation and coordination of research activities carried out at national or regional level in the Member States and Associated States through:

- the networking of research activities conducted at national or regional level, and
- the mutual opening of national and regional research programmes in specific fields.

The scheme will contribute to making a reality of the European Research Area by improving the coherence and coordination across Europe of such research programmes. The scheme will also enable national systems to take on tasks collectively that they would not have been able to tackle independently. Both networking and mutual opening require a progressive approach. The ERA-NET scheme therefore has a long-term perspective that must also allow for the different way that research is organised in different Member States and Associated States[1]. The ERA-NET scheme is aimed at national and regional programme funders and programme managers and is designed to encourage the creation of close, long-term links between national research programmes with shared goals

IWRM-Net

(Integrated Water Resource Management-Network)

IWRM-NET will tackle, amongst other things, WFD implementation by examining Integrated Water Resources Management issues and identify both short term and long term research needs through a bottom up approach. 17 partners from 14 countries have agreed a shared vision for what IWRM-NET should offer by 2010:

- A privileged source of knowledge for IWRM research in Europe, in particular relation to the WFD.
- A forum for the future development and coordination of research needs, and a communications link between researchers, policy-makers and managers.
- A body that can bring together researchers and funders from different countries so that they can work on joint research activities.
- A place to exchange best practice.
- By improving the knowledge transfer amongst stakeholders in charge of IWRM, our network enables us to work on synergies between research needs and policy, and promotes interdisciplinary activities concerning IWRM across Europe.

In reviewing the current methods for research management across Europe the IWRM network aims to recommend a number of methods and processes that highlight good practice. In order to deliver IWRM one must consider much broader concepts within the spectrum of the knowledge process, including innovation, experimental design and knowledge management. The IWRM network is looking to provide the first level of support to research programme managers in their role within the knowledge process, focussing on knowledge/research management, and will create a common level of understanding of the process of taking blue-sky research and developing the ideas into workable policies or operational guidelines that help achieve IWRM.

[1] http://cordis.europa.eu/coordination/era-net.htm

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The Knowledge process for IWRM

The complexities of research and knowledge management are not covered in detail here but are described in appendix 2? In this section the report introduces the themes for research within IWRM, for example the Global Water Partnership report[2] states that there are various tools and mechanisms available to implement IWRM listed under three headings, these are:

- Enabling environment
- Institutional roles
- Management instruments

The first question a research programme manager must ask is do we have the knowledge base within the region or country to use these tools and implement IRWM. If the answer is no then the design and management of a research programme must deliver the technical knowledge to the right people who will ensure that these tools are used to assist in the achievement of the IWRM goals. This is not a precise science and any number of mechanisms could be suitable for achieving IWRM, which may not be listed here. What is important is that there is continual cross-checking to make sure that a programme continues to consider best practice and developments in thinking but continues to strive for the goals defined by the nations understanding of IWRM.

We have more information now than we can use, and less knowledge and understanding than we need. Indeed, we seem to collect information because we have the ability to do so, but we are so busy collecting the information we haven't devised means of using it. The true measure of any society is not what is knows but what it does with what it knows.

- Warren Bennis.

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[2] Global Water Partnership (2000) *Integrated Water Resource Management*. TAC background Papers No 4.

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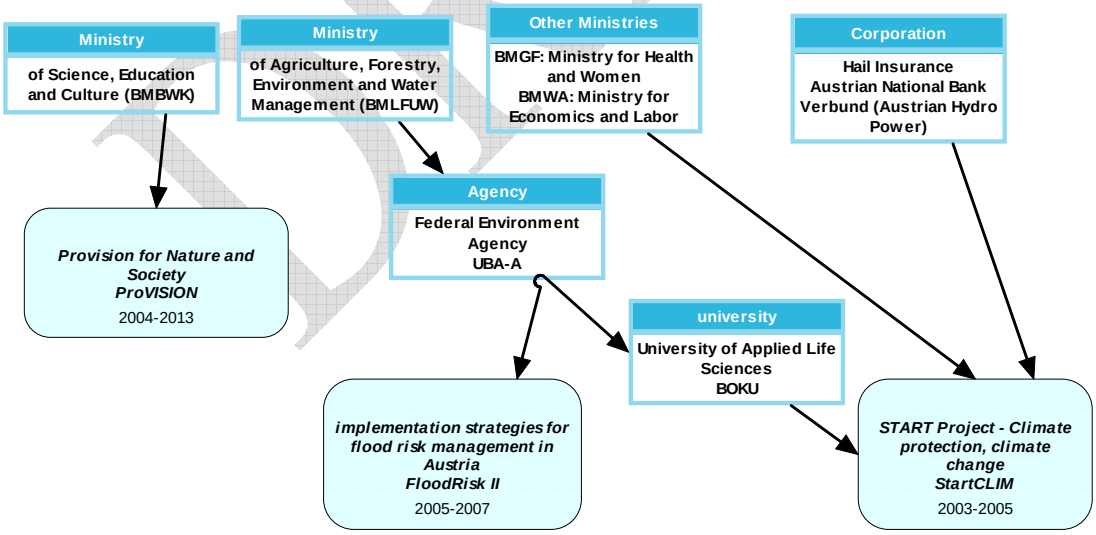
Member states research programmes for IWRM

Austria

IWRM Context

The Austrian federal territory is located in three international river catchment areas. About 96% of the area is located in the catchment area of the Danube and empties into the Black Sea, about 3% empty via the Rhine to the North Sea, approx. 1% empty via the Elbe into the Baltic Sea. Every three years a report on the status of the protection of waters has to be submitted to the National Council. In the “Waters Protection Report” the pressures on water bodies are subdivided according to three aspects: 1) Pollution from point and diffuse sources 2) hydraulic installations liable to cause changes in the structure of water bodies, the connection to groundwater bodies and the interconnection with the surrounding area 3) other sources of pollution. According to the 2002 Waters Protection Report the water quality of Austria’s water bodies is altogether satisfactory. 99 % of the Austrian drinking water originates from groundwater. The obligation to keep domestic waters clean and to protect them is laid down in the Austrian Water Rights Act (Österreichisches Wasserrechtsgesetz). According to this Act the quality of groundwater and spring water must be so high that it can be used as drinking water. This Act falls within the competence of the Federal Ministry of Agriculture, Forestry, Environment and Water Management (Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft) which is also responsible for the application of pesticides and fertilizers. As soon as groundwater is withdrawn for the purpose of drinking water the competence rests with the Federal Ministry of Social Security, Generations and Consumer Protection (Bundesministerium für soziale Sicherheit, Generationen und Konsumentenschutz).

Research Management



The Austrian Ministry of Education, Science and Culture is the government institution responsible for educational issues, for the reform of the Austrian University system, for research policy and scientific research programmes as well as for the larger thematic area of cultural heritage including the reform of Austrian museums. The ministry develops, coordinates and finances major national research programmes such as the Austrian Genome Research-Programme “GEN-AU”, the sustainable development research programme “proVision” and research work in the field of

social sciences. Furthermore, the BMBWK has launched several initiatives to improve chances and opportunities for female researchers, e.g. “fFORTE” which plans to raise the percentage of women scientists in the areas of research and technology.

The Federal Environment Agency Austria is the specialist institution of the Federal Government and provides expertise on the condition of the environment and environmental changes as well as on measures to avoid or reduce environmental pollution. It plays a key role in the implementation of federal environmental laws, EU directives and regulations; it provides expert advice to federal and other institutions; it designs and operates national environmental databases and it cooperate with various national and international institutions. (Web site: http://www.umweltbundesamt.at.)

Key IWRM research programmes

The Federal Environment Agency, Austria is the programme manager of the “Start Project Climate Change (StartClim)” on behalf of the Federal Ministry of Agriculture, Forestry, Environment and Water Management. StartClim is extended on a year-to-year basis, with different scientific foci (2003 extreme weather events and their impacts on Austria, 2004 heat waves and drought, 2005 and 2006 health impacts and impacts on Austria’s most vulnerable economies e.g. tourism)
Further the Federal Environment Agency Austria is managing the programme “FloodRiskII (Implementation strategies for an integrated flood risk management in Austria) on behalf of the Federal Ministry of Agriculture, Forestry, Environment and Water Management. FloodRiskI was based on the 2002 flood event documentation. This analysis marked the next steps in creating basic provisions for strategic decisions of integrated flood management. (subprojects in fields such as meteorology, hydrology, geomorphology, natural disasters, economic aspects, the law, spatial planning and disaster protection). FloodRiskII goes towards the implementation of an integrated flood risk management with model river catchments (e.g. Danube and its alpine tributaries) in Austria
Long-term research
The Austrian Ministry of Education, Science and Culture is the government institution responsible for educational issues, for the reform of the Austrian University system, for research policy and scientific research programmes as well as for the larger thematic area of cultural heritage including the reform of Austrian museums. The ministry develops, coordinates and finances major national research programmes such as the Austrian Genome Research-Programme “GEN-AU” and research work in the field of social sciences. The sustainable development research programme “proVision” is managed by the Agriculture and Environment Ministry.

Project Name	AT - Quality of Life, Landscape and settlements for the future
Acronym	PNR-TP1
Project Name	AT - BIOLOG
Acronym	BIOLOG
Project Name	AT - Integrated Flood Risk Management Implementation
Acronym	Flood Risk 2
Project Description	Flood Risk 1 - was from 2003-2005. Cause and Effect Analysis based on 2002 event data, to develop lessons learnt and implementation strategies. Next stage is flood risk management modelled on basins e.g. Danube.
Start date	01/01/2005
Project funding	
End Date	01/01/2007
Publication	FloodRisk, Federal Environmental Agency (UBA), 2003-2007, Prof. Dr. Helmut Habersack

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Research Management Process	The priorities of research programme obtained through consultation process with stakeholders including synergies and interfaces between fields of interest (e.g. meteorology and hydrology). Proposals evaluated by steering comm.(scientific board & Div heads

Project Name	AT - Provision for Nature and Society
Acronym	ProVISION
Project Description	Operational Goals - enhance international cooperation and integration of Austrian Sust. research, enhance quality and quantity of science practice and research education cooperation, link knowledge and competence of science learning systems and organisats
Start date	01/01/2004
Project funding	
End Date	01/01/2013
Dissemination method	scientific, stakeholders and collaboration
Dissemination details	Joint call with Germany,part of FORNE, (Objective of FORNE-Initiative is the definition and further development of a common set of future goals for Austrian sustainability research and the strategic coordination of the various research programmes.)
Evaluation	Common assessment framework, for monitoring quality within the programme, additionally analyzes whole programme using knowledge management tools. All feed back to FORNE initiative.
Research Management Process	Priorities are defined in the work programme(involving scientific community). The research priorities within a call are defined by the selection of sub-tasks of work programme. Only a few of all the sub-tasks are opened within a call.
Project Name	AT - Start project Climate Protection, Climate Change
Acronym	StartClim
Project Description	Expected results - flood analysis as basis for further developments.
Start date	01/01/2003
Project funding	
Dissemination method	stakeholders, scientific community www.umweltbundesamt.at/startclim/
Dissemination details	www.austroclim.at/startclim
Publication	KROMP-KOLB H. (2003) StartClim2003: First analyses of extreme weather events and their impacts on Austria
Research Management Process	The research priorities for each call are suggested by the Scientific Coordinator. They are discussed and agreed with the committee of funding institutions. Scientific board evaluate proposals, following an eval. Scheme. Ranking is presented in committee

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Belgium

IWRM context

In terms of water resource management policy-making competence has been devolved to the federal states since the 1980. Consequently, any analysis of water issues in Belgium has to consider three regional policies regarding Flanders, Wallonia and the Region of Brussels-Capital. In each region, water management is on the way towards integration. However, the respective policies of water supply and sanitation have been considered rather independently. In Flanders, sanitation activities are embedded in a global water quality policy, while in Wallonia a company supervises the whole water supply and sanitation sector, but operation remains in the hand of distinct operators. In Brussels-Capital, integration is yet to be completed.

First Political level	Federal Ministry	Wallonia (government)	Flanders (government)	Brussels-Capital (government)
Research funding bodies	Belgian Science Policy Office	*TBC*	*TBC*	*TBC*
Environment agencies	Fedral Public Service – Health & Environment,	General Division Natural Resources and Environment (DGRNE)	- Flemish Environment agency (VMM)	Brussels institute for the environment (IBGE)
Institutions at the regional level		Research Centre Nature, Forest and Wood	- VMZ - NV aquafin - Flemish institute of science and technology - VITO	
Provincial level			Coordination center for integrated coastal management	

Key IWRM research programmes

The PPS Science Policy is a federal administration that is responsible for the preparation and implementation of research programmes in several fields (fundamental research, sustainable development, social cohesion, information society, space technology …) with the aim the development of a permanent knowledge resource within scientific and technical spheres at the service of the Federal Authority. The PPS Science Policy manages an annual budget of about 517 million euro. It is also responsible for 10 Research Institutions. The PPS Science Policy coordinates the Belgian participation to the management of European activities (6th Framework programme, COST, EUREKA, GMES, INTAS, …) with the Belgian Communities and Regions. Notwithstanding that water management issue is a main regional competence, the PPS Science Policy is the only government body that has a specific Multi annual research programme on terrestrial ecosystems, including freshwater ecosystems of temperate Regions. This programme is part of the head plan " A science for a sustainable development" aiming at improving scientific understanding as a fundamental basis for sound sustainable decision-making. The programme is developed within the framework of Co-operation agreements with the Belgian Regions and Communities in order to insure the necessary collaboration with the federated entities, in particular for supporting the implementation of the EU Water Framework Directive. More generally, the freshwater programme lies within the scope of the UN Climate Change Convention , the Convention of Biological Diversity, the Ramsar Convention (wetland protection). The programme is implemented by calls for proposals open to universities and public research institutions. Since 2001, teams from European universities or public research institutions are able to join Belgian teams applying for funding and participate as a "minor" partner in the projects. Proposals are funded after a international peer review

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followed by a strategic evaluation by the steering committee of the programme, which is composed of participants from the concerned administrations. The yearly budget of the Multi annual research programme on freshwater ecosystems is approximately 1 Mio EURO. In Wallonia, the Environment Centre of the University of Liege manages the research programme for implementing the Water Framework Directive. The PIRENE programme listed above covers a wide range of issues relating to water resources including socio-economic issues. Integrated is provided through a broad range of stakeholders in the steering group, such as industry, ministries and municipalities.

Regions are supporting specific applied research in support to their competences.

The Belgian Federal Science Policy Office, research programmes Department leads on the implementation of multi-annual research programmes, actions and networks on national or international levels
The programmes are implemented by calls for proposals. Proposals are funded after a peer review followed by a strategic evaluation by the steering committee of the programme, which is composed of participants from the concerned administrations.
The priorities for the next years related to sustainable development are Transport & mobility, Agro-food, Health, Climate - incl. Antarctic research, Biodiversity - Antarctica & North Sea, Atmospheric processes, Terrestrial & marine ecosystems and Clean technologies.

Project Name	Surveillance of marine environment
Acronym	ESCAUT-PR
Project Description	The project is part of the continuous surveillance and evaluation of the quality of the marine environment in the region of the Belgian continental shelf (BCP) and the Western Scheldt estuary in the framework of international programmes (JMAP) and national

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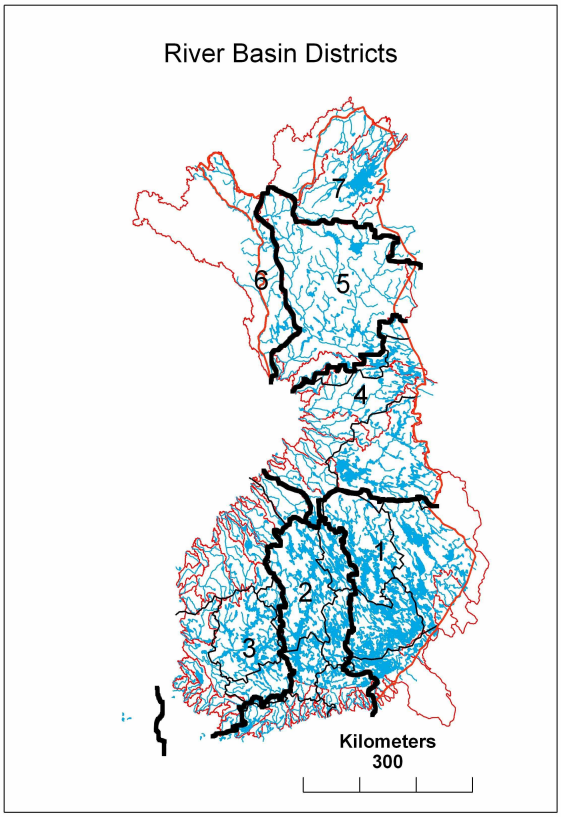
Finland

IWRM context

Finland, a country of thousands of lakes and islands (~ 9% of the surface are covered by inland waters, more than 56,000 lakes are larger than 10,000 m²), is one of the most sparsely populated countries in the world. With more than 338,000 km² and a population of five million people the population density is but 15/km². The Finnish landscape is mostly flat with few hills in the north and is affected by the ice ages.
The greater part of Finland is located at a latitude between 60 and 70 degrees north. Finland is located in a transition zone between a continental and maritime climate and belongs mostly to the boreal zone. The influence of the Baltic Sea and the Gulf Stream makes the climate favourable for the Finnish population. In southern Finland the elevation is typically less than 200 metres and in northern Finland highest elevation is less than 1,400 metres. Land uplifts vary, but with typical annual rates around 0.5—0.8 cm sea level rise is fully offset. There are 74 main water systems with a catchment area larger than 200 km²; the biggest and longest river in Finland is the Kemijoki.



IWRM Research Management

The Ministry of the Environment is in charge of water protection and environment policies including WFD reporting to EU.
The Ministry of Agriculture and Forestry is in charge of management of water resources.
Finland´s 13 regional environment centres are responsible for the planning of river basin management in their respective districts, with one regional environment centre appointed to co-ordinate the management of each of the RBDs, together with a steering group.
Finnish Environment Institute conducts Research and development projects and supports RBD's in implementation of WFD. Within the framework of UNECE working group on IWRM Finland promotes transboundary collaboration in Eastern areas.

- WFD short term priorities
- Support development and implementation of
- Program of Measures
- Ecological classification
- Monitoring programmes
- Risk assessment
- Public participation practises

TEKES is the main public funding organisation for research and development in Finland. TEKES funds mainly industrial projects as well as projects in research organisations, and especially promotes innovative, risk-intensive projects.
The Academy of Finland provides funding for high-quality scientific research, serves as an expert in science and science policy, and strengthens the position of science and research.

Key IWRM research programmes

Project Name	Protection of the Baltic Sea (2002-201x)
Acronym	
Project Description	The Finnish Government made a decision-in-principle on steps to be taken to protect the Baltic, i.e., Finland's programme for the protection of the Baltic Sea. The main aim is to influence the state of the waters and the marine environment in the Gulf of Finland, the Archipelago Sea, the Åland Sea, the north Baltic proper, and the Gulf of Bothnia. The aim is for this influence to come both from Finland and from countries in adjacent regions.
Start date	26.4.2002
Project funding	
Dissemination method	
Dissemination details	http://www.ymparisto.fi/default.asp?contentid=73160&lan=en

Project Name	Environmental Cluster Research Programme
Acronym	
Project Description	*Programme is a collaborative programme* between researchers, the business sector, public authorities and funding organisations. This programme aims at raising the level of environmental know-how, improving the state of the environment, and integrating environmental issues more closely into the Finnish system of innovation.
Start date	(The fourth phase 2006-2009)
Project funding	
Dissemination method	
Dissemination details	http://www.ymparisto.fi/default.asp?contentid=105793&lan=en

Project Name	Joint research programme on water management in agriculture and forestry
Acronym	
Project Description	*Some main objectives are: Development of water management measures for agriculture and forestry; Study of the ecological impacts of water loading from agriculture and forestry.*
Start date	(2006-2009)
Project funding	
Dissemination method	
Dissemination details	http://www.mmm.fi/fi/index/tutkimus/vesienhoidon_tutkimusohjelma.html

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Major international IWRM research projects

SCENES: Water scenarios for Europe and for neighbouring states (2007-2010). The SCENES project will develop and analyse a set of comprehensive scenarios of Europe's freshwater futures up to 2025. The qualitative scenario analysis will also focus on water quality, ecological and hydrological aspects, with special regard to the requirements of the WFD.

WATERSKETCH: The project endeavors to produce a blueprint, which will lead to improved river basin management in the Baltic Sea region (2004-2007). The project partners will take a close look at the spatial planning and implementation of the European Water Framework Directive (WFD) for selected rivers and develop strategies for sustainable use. http://www.watersketch.net/new/

TRABANT: Transnational River Basin Districts on the Eastern Side of the Baltic Sea Network (2005-2007). http://www.ymparisto.fi/default.asp?contentid=206575&lan=EN

REBECCA: Relationships between ecological and chemical status of surface waters (2003-2006). http://www.ymparisto.fi/default.asp?contentid=69677&lan=en

BMW: Benchmark Models for the Water Framework Directive (2002-2004). http://www.environment.fi/default.asp?contentid=116046&lan=EN

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France

IWRM Context

With a territory of about 550,000 km² (675,000 km² including all overseas departments and territories) France has the largest land area of all EU members. It has a population density of about 112 per square kilometre (with 62.9 million inhabitants). With coastal plains in the north and west and mountain ranges in the south-east (the Alps) and the south-west (the Pyrenees) the landscape in the mainland of France shows great diversity. In France, four climate types can be found. A temperate maritime climate will be found in the west, near the coasts; a mountain climate prevails at the several mountainous regions like the Alps. A Mediterranean type of climate is found along the Mediterranean coast in the south, and a mid-latitude continental climate prevails in the interior of the country. The mainland of France consists of 160,000 km of watercourses with four main river systems which are the Loire, the Rhône, the Garonne and the Seine basins. However France is administratively divided into six major watersheds. In each watershed there is a “Watershed Agency” which is responsible for tasks relating to water management. In mountainous regions there is an extensive net of torrents and alpine river systems.

Water resource management in France is integrated, taking into account the ecosystem’s physical, chemical and biological systems: surface and underground water, water quantity and quality and all uses. It uses decentralised management and local decision-making using water agencies, local authorities, industry and farmers. France also has consistent water use and land use policies. The principle of water resources management at the level of river basins has been established by the Water Act of 1964. The Assemblee nationale adopted a Proposal for a Water Act which is to replace the Act of 1964 (and the important amendments made in 1992). In fact, in terms of current practice, the basic structure of water resources management remains unchanged.

There are a large number of organisations involved in managing water and processes that influence water resources. In France , the Ministry (MEDD) thorugh its Water Directorate is responsible for water quality. Resources and flood defence. On a regional basis, at the scale of hydrographic district the water basin agencies implement the public policies; they help the river basin committee, composed of water users and stakeholders in elaborating the Basin action plan and programme of measures, and they are collecting taxes paid by polluters and funding depollution efforts. On a local basis, public water supply and water water treatment are operated by public or private companies as long-term concession.

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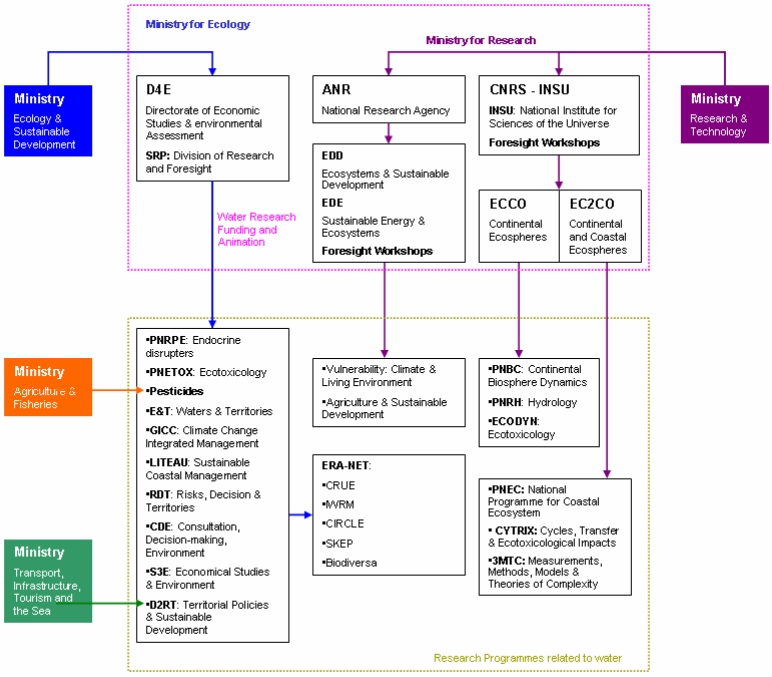

IWRM Research Management:

In terms of research relating to water and WFD, several scientific institutions and financers are involved. National consistency is insured by national priorities set by financiers. The national research agency (ANR) plays a major role by funding thematic research programmes, based on calls for proposals; for the year 2006, ANR had a funding capacity of 800m€. Among the main programmes on water coordinated by ANR ‘vulnerabliltiy: climate and living environment’ and Agriculture and Sustainable development’ are the two related to WFD.

INSU is a funding agency managing some important research programmes related to water, in particular on continental and coastal ecospheres, called ECCO and EC2CO, qwhich are coordinated and funded by several research institutions. The Ministry for ecology and sustainable development (MEDD) is also a research programme funder, providing funding to ensure that specific issues not addressed in other frameworks (institures or ANR) are raised. Of the 20 research programmes financed by MEDD, 5 have direct relevance to the WFD (coastal waters, pesticides, ecotoxicology, waters and territories and endocrine disprupters).

BRGM, Cemagref, CIRAD, CNES, CNRS, IFREMER, INERIS, INRA, IRD and unicverisites are involved as research institutes dedicated to specific areas where water can be improtatnt.

The procedure for research project selection is becoming more and more common to all French research funders. The government defines a national research policy within the framework of national decisions; Ministries which have a trust on scientific institutes will give direction on their priorities. Research programmes are based on calls for proposals, published within themes decided by each funder (ministries, ANR or institutes) and broadly circulated. For each programme funded by MEDD, a steering committee gathers the diversity of stakeholders and decision makers concerned with public water management policies, ensuring that calls for proposals are useful for their implementation of WFD and the programmes specific needs. A scientific committee is also set up for each programme to

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write the calls after the steering committees indications, to evaluate scientific excellence of proposals, and propose a list of best projects to the steering committee, who decides the final allocation of fundings. Once the research projects are achieved, the results are disseminated via seminars, synthesis and teaching documents.

Water Basin Agencies are major stakeholders for WFD related programmes and they are largely involved in the steering committees. Their current concerns for research deal mainly with economic tools for the programme of measures and approaches for establishing public participation.

MEDD also contributes to foresight activities (seminars, scenario exercises, workshops, with experts or with stakeholders) for various environmental policy topics (e.g. agriculture, environment, fisheries, biodiversity). The results of the foresight activities are used to identify long-term strategic research needs and to discuss the relevance of research priorities. The ANR is also starting some foresight activities through collective workshops, as well as INSU. These foresight procedures will be helpful for policymakers to plan tomorrows requirements, today for the research efforts necessary after the first cycle of the of the WFD.

Key research programmes

Project ID	34
Project Name	FR - Assessment and reduction of pesticide related risks
Acronym	Risq_Pest
Project Description	Better knowledge of pesticides dispersion, transformation and concentration ways. Better risk assessment for ecosystems related to pesticide uses Advices and guidelines for a sustainable agriculture.
Research Management Process	All the proposals are evaluated by two members of the scientific committee (SC). The proposals are then discussed with all the members of the SC.
Project ID	13
Project Name	FR - Concertation, decision, environment: experiences in participatory techniques - Particpation, Decision-Making & Environment
Acronym	CDE
Project Description	Encourager, mieux structurer et coordonner des recherches faisant appel à un large éventail de disciplines des sciences sociales
Project ID	23
Project Name	FR - ECCO National Programme for Continental Ecosphere
Acronym	ECCO
Project Description	Ecosphere continental process & modelling
Project ID	77
Project Name	FR - ECOBAG - Environment, Ecology et Economics in Adour-Garonne basin
Project ID	178
Project Name	FR - ECODYN Ecotoxicology and ecodynamics of contaminants
Project ID	32

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Project Name	FR - Impact of agricultural activities on soils and water and pollutants transfer to hydrosystems
Acronym	GESSOL2
Project Description	Impact of agricultural activities on soils and water and pollutants transfer to hydrosystems - Soil quality / Water and dissolved matter transfer / Agricultural practices
Start date	01/01/2004
End Date	01/01/2007

Project ID	33
Project Name	FR : Sustainable management of coastal zone
Acronym	LITEAU
Project Description	Complementary to the PNEC (National program on coastal environment), it aims to improve the knowledge of coastal areas functioning and dysfunctioning, and development of tools for the coastal zone managers

Project ID	68
Project Name	FR - PNBC Functioning and dynamics of continental biosphere

Project ID	59
Project Name	FR - PNEC National Coastal Environment Programme

Project ID	19
Project Name	FR - PNETOX : National Program for Eco Toxicology research
Acronym	PNETOX
Project Description	provide scientific data to public bodies and decision maker in the field of ecotoxicology (development and effects of the pollutants on the environment). Strategic research on effect of pollutants, reliable data for ecotoxicology risk assessment.

Project ID	10
Project Name	FR - PNRH National programme for research in hydrology
Acronym	PNRH

Project ID	20
Project Name	FR - PNRZH National Research Plan on Wetlands
Acronym	PNRZH

Project ID	14
Project Name	FR - RDT Risk Decision and territory - Evaluation and risk analysis (natural and technic)
Acronym	EPR

Project ID	21
Project Name	FR - RIO Flood Risks - Flood Risk Assessment
Acronym	RIO
Project Description	methods and tools for the managers of wetlands.To valorise the results, Creation of a National Observatory for wetlands

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Dissemination method	stakeholders
Dissemination details	stakeholders: in seminars, synthesis, Teaching cards… during the different steps of the projects
Research Management Process	A scientific committee: Analyses the projects and propose a grading of projects A orientation council: Selects financed projects to the partners (Ministries of Ecology and Sustainable development-MEDD, Equipment, Interior…)
Project ID	152
Project Name	FR - RITEAU Research and innovation network for water
Acronym	
Project ID	82
Project Name	FR - S3E - Economical Sciences for environment
Acronym	
Project Name	Pilot study of RBMP on the Seine
Acronym	PIREN Seine
Project Description	The scientific objective of the PIREN-Seine program is to develop in a coordinated and interdisciplinary way overall knowledge of the physical, biological and socio-economic processes necessary for sust'bl management of the hydrological resource of Seine.

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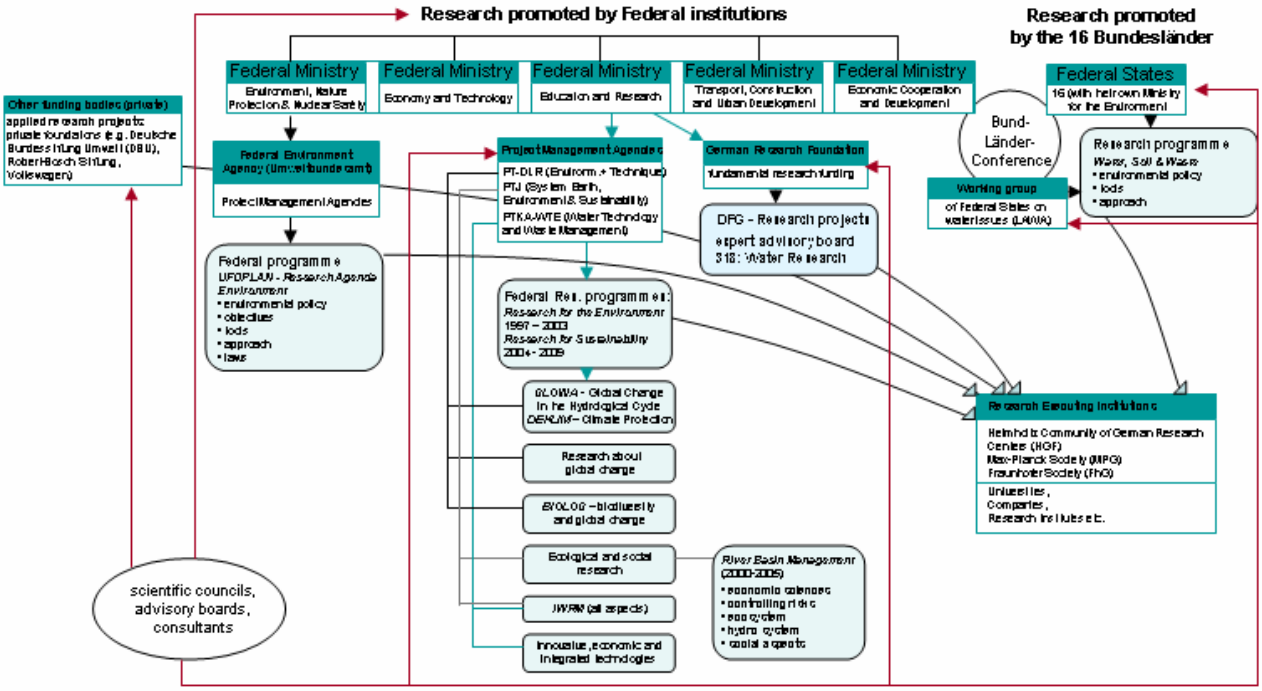
Germany

IWRM Context

Germany has a varied terrain ranging from low coastal flats along the North and Baltic Seas to a central area of rolling hills and river valleys, to forested mountains and the Alps region in the south. Germany has an extensive river network, ranging from small creeks and torrents in the Alps to big rivers and streams in the low-land and deltas. The main river systems in Germany are the Rhine, Danube, Elbe, Meus, Weser, Oder, Ems, Eider, and the Schlei/Trave.



Research Management

The Federal Ministry for Environment, Nature Protection and Nuclear Safety deals with basic questions of water management through the Federal Water Act. Implementation of water management is devolved through the Federal States (Länder). The working group of Federal States then discusses issues and formulates solutions. Research in this field is funded and promoted via the Federal Ministries and their Project Management Agencies listed. Project funding is also provided by private foundations like Deutsche Bundesstiftung Umwelt (DBU = German Federal Foundation for the Environment), Robert-Bosch-Foundation or Volkswagen Foundation.

Priorities:
•Determination of MEP/GEP
•Exemptions
•Cost effectiveness of measures
•In general: Consolidation of the new developed methodologies in biological assessment in particular with respect to adaptations to the ongoing inter-calibration process (long-termed)
•Technical and scientific steering of the inter-calibration process

•Further development of the assessment methodology of natural and artificial lakes with macrophytes and phytobenthos
•Further development of the assessment methodology of phytoplankton in dams and quarry ponds

The Federal Ministry for the environment, nature protection and nuclear safety deals with the basic questions of water resources management as well as with trans-boundary cooperation in the field of water resource management as part of environmental policy. The Ministry is responsible for the federal water act. The implementation of water resources management regulations is exclusively a matter for the Lander and the municipalities.

90% of public expenditure in R&D are spent by the Federal Ministry of Education and Research (of which 66%), Ministry of Economics and Labour and the Ministry of Defence (33% between them). The research management and implementation is delegated to six autonomous organisations which receive funding jointly from Federal State and Landers. There is a clear distinction between research and funding organisations.

Key research programmes

The Federal Ministry for the Environment, Nature Protection and Nuclear Safety promotes research on basic questions of water resources management as well as trans-boundary cooperation in the field of water resource management as part of environmental policy and funds. The implementation of water resources management regulations is exclusively a matter for the Länder. Corresponding research is funded within the programme “Water, Soil & Waste” by the LAWA (working group of Federal States on water issues), with a focus on WFD. 90% of the public expense in R&D, however, is by the Federal Ministries of Education and Research (2/3), Economics and Technology and Environment, Nature Protection & Nuclear Safety. Most research funding is spent through a system of competition via calls for proposals, in which any public or private organisation can take part. **Long-term research** is mostly undertaken by the Deutsche Forschungsgemeinschaft (DFG, fundamental questions) and the Federal Ministry of Education and Research (BMBF, applied research). All public funding bodies are advised and supported by expert boards or scientific councils and evaluate research proposals by external and internal experts or consultants.

Project ID	26
Project Name	Gamma Research Nature & Environment
Acronym	GaMon2
Project Description	Landscape and nature, water, environment, consumption, mobility, problem perception and social causes, social behavioural effects, control in problem situations, sustainable development.
Start date	01/01/2003
Project funding	3,500,000.00
End Date	01/01/2009
Dissemination details	dissemination through papers, conferences, and various publications, dependent on the projects

Project ID	3
Project Name	GE - FlusseinResearch for the Env - River Basin Management
Acronym	FLUSSEIN
Project Description	Expected results: - Tools for integrated water management - Recommendation for authorities

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	- Scientific knowledge	
Start date		01/01/2000
Project funding		13.50
End Date		01/01/2005
Dissemination method	stakeholder and scientific dissemination	
Evaluation	- Meeting of evaluators from science, authorities, associations and Federal States - Evaluation by given criteria; discussion of the proposals and recommendation by the evaluators	
Research Management Process	Before the call of proposals was published the content of the research focal point was discussed and agreed by several stakeholders (Federal States, Water Associations, Federal Agencies, Ministries …)	
Project ID		5
Project Name	GE - GLOWA - Global Change in the Hydrological Cycle	
Acronym	GLOWA	
Project Description	GLOWA aims to create a basis for the development of innovative technologies and cost-effective services for the sustainable, far-sighted management of water resources	
Project ID		89
Project Name	GE - IWRM INTEGRATED WATER RESOURCE MANAGEMENT	
Project ID		144
Project Name	GE - Protection of the biotop and species	
Project ID		87
Project Name	GE - River basin management	

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Greece

IWRM context

Greece consists of a mountainous and craggy mainland jutting out into the sea at the southern end of the Balkans Four-fifths of Greece consist of mountains or hills, making the country one of the most mountainous in Europe. Western Greece contains a number of lakes and wetlands and it is dominated by the Pindus mountain range. The three distinct types are the Mediterranean, the Alpine and the Temperate types. The first one features mild, wet winters and hot, dry summers. Temperatures rarely reach extreme values although snowfalls do occur occasionally even in the Cyclades or the Dodecanese during the winter months[3]. The Alpine type is dominant mainly in the mountainous areas of Northwestern Greece. Finally, the Temperate type affects Central Macedonia and East Macedonia and Thrace; it features cold, damp winters and hot, dry summers. Athens is located in a transitional area featuring both the Mediterranean and the Temperate types. It averages about 16 inches of rain annually.

Research Management

Water management in Greece is in transition currently from the Ministry of development to a special secretariat within the Ministry of Environment, as a central water service. Ministries assign projects (not research) to private companies, universities etc after tenders relating to the management plans for WFD from the Ministry of Development and projects relating to the harmonization of the WFD from the Ministry of Environment.

Research in Greece is funded either from the EU (DG ENv etc) or the General Secretariat for Research and Technology (GSRT). The GSRT is responsible for the planning, development and funding of various research and technology programs. Within the water sector the universities play a very important role, not only in conducting basic and applied research, but also in managing research projects.

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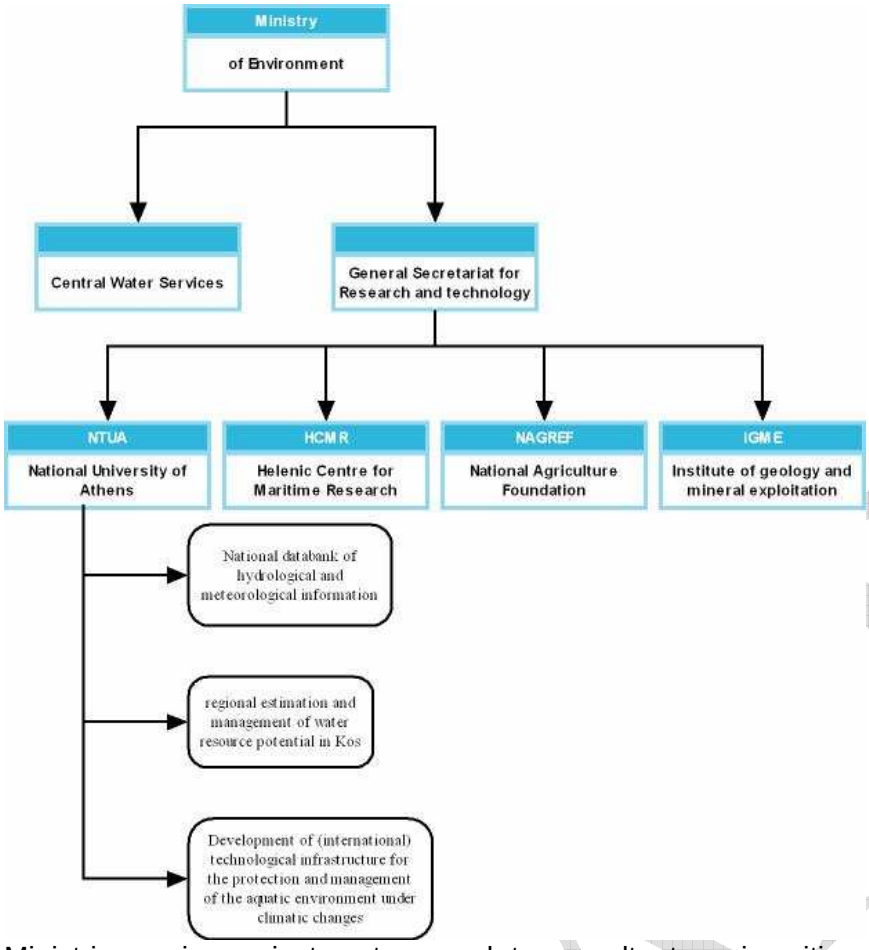
[3] http://en.wikipedia.org/wiki/Greece#Geography



Ministries assign projects not research to consultants, universities etc. The majority of the research in Greece is funded by the EU (DG research, DG Regional Policies) or from the General Secretariat for Research and Technology (GSRT). GSRT is responsible for the planning, development and funding of various research and technology programmes. It supervises 32 of the most important research centres and institutes. There are 3 institutes relating to water. The process is an open call from the GSRT.

Key IWRM research programmes

National Strategy for Water Resources (NSWR) contains a wide series of projects, programmes and actions, according to the requirements of the WFD that will allow meeting set targets at national, EU and international levels, by fully implementing the WFD and law 3199/03.

Priorities…

•networks to monitor quality of marine environment, quality of coastal bathing waters, quality of underground water reserves
•proposed on monitoring sea and groundwater quality 2007-2013.
•Development of water pricing policies that enhance the sustainability of water resources
•Good practice guidance on the adequacy of controls on drinking water quality 2007-2013.
•Monitoring of sea water quality and marine environment.
•A National Programme for the reduction of dangerous substances pollution.
•Setting of new maximum permissible levels of harmful substances concentrations in water resources as the basis of a sound system for liabilities, water protection and promotion of remedial measures, are required. More specifically,
•Development of a new monitoring network for inland surface, transitional, coastal and ground waters, including the development of monitoring programs for biological quality parameters and the assessment of their ecological quality is proposed.

•Monitoring of sea water quality and marine environment , agricultural nitro-pollution 2007-2013.
•Development of Management Plans in Water Districts for each river basin of the country is proposed by the National Strategy for Water Resources (NSWR).
•Public participation on the management plans at a river basin level is high in the priorities for the next Programme Period 2007-201

Project ID	174
Project Name	GR - Development of technological Infrastructure for the protection and management of the Aquatic Environment Under Climatic Changes

Project ID	176
Project Name	GR - Estimation and management of the Water Resource Potential in the Island of Kos

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Hungary

IWRM context

Hungary is around 93,000 km² with a population of population of about 10 million, at a density of 108 inhabitants per square kilometre. The landscape consists mostly of the flat to rolling plains of the Carpathian Basin, with hills and lower mountains to the north along the Slovakian border. Hungary has a moderate climate with strong continental influence (cold, cloudy, humid winters and warm to hot summers). The three major rivers in Hungary are the Danube, Tisza and Dráva. From a hydrology and climate point of view the country can be divided in two different areas: the “Danube” to the west and the “Tisza” catchment to the east. Hungary’s borders are crossed by 24 incoming rivers, which has an enormous effect on water management in the country. Lake Balaton is the biggest lake in Hungary.

The government agency primarily responsible for the policies on protection of freshwater resources is the Ministry for Environment and Water. The basic regulatory framework consists of the Water Act of 1995, and the legal instruments on environmental impact assessments. In addition, there are important general provisions on freshwater resources under the Act on Environmental Protection (1995).
The National Environmental Programme includes substantial provisions and measures for the conservation and management of surface and subsurface water resources. Some of the key targets and approved policy directions are: regulation development to encourage sustainable and economical water use; improvement of water quality for the main watercourses/water bodies (Danube and Tisza Rivers, Lake Balaton); gradual increase (to a level of 65%) of the number of settlements with sewers; at least biological treatment of wastewater from sewers; nitrate and phosphorous load reductions for highly protected and sensitive waters.

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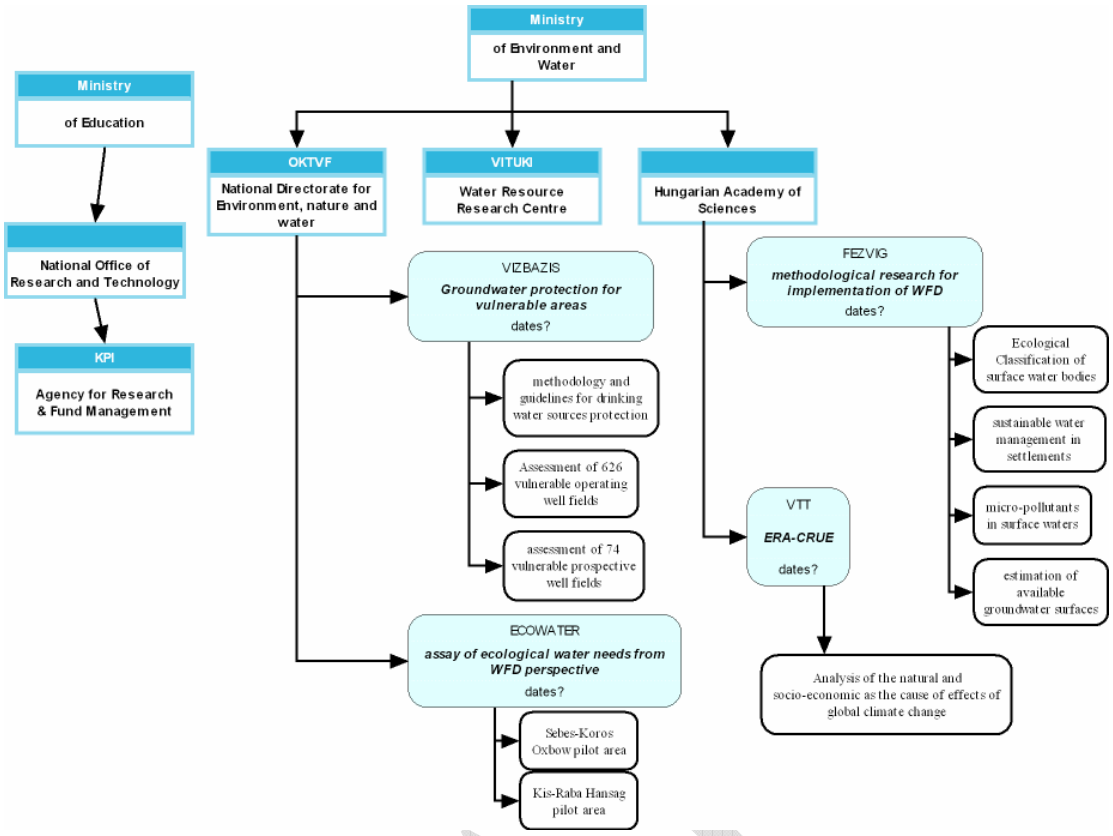

The regional functions of water management are performed by the 12 Directorates for Environment and Water organised by catchments.

Research Management

The Ministry of Education (National Office of Research and Technology - NKTH) is involved in the general management of science, technology and innovation policy. The Ministry of Environment and water coordinates environment, natural protection and water related R&D. The national directorate for Environment, Nature and Water as the body responsible for preparation of river basin management plans manages the investigations of background research for planning programme of measures. The regional directorates also get involved in applied sciences relating to water management problems.

Key IWRM research programmes

The Ministry of Environment and water coordinates environment, natural protection and water related R&D In 2000 it published a call for proposals for R&D actions in five thematic fields. One of the most important scientific priorities of the Programme is “Water Management” and “Quality of Water”. The national directorate for Environment, Nature and Water as the body responsible for preparation of river basin management plans manages the investigations of background research for planning programme of measures. The regional directorates also get involved in applied sciences relating to water management problems. Ministry of Education The National Programme for Environmental Research and Development is formulated jointly by the Ministry for Environment and Water and the NCTD. The programmes place special emphasis on improving the technical and technological conditions for environmental protection. Elements of these programmes include: development of environmentally sound public utilities; technologies for healthy drinking water supply; environmentally-sound technologies integrated into production; material, energy and water saving technologies; and environmental sanitation. A Special Scientific Committee was established to deal with possible consequences of climate change. The Committee is an

important advisory body elaborating long-term strategies and response measures to mitigate the adverse impacts.

Project ID		60
Project Name	HU - Complex Programme for renewing of Tisza river valley VTT	
Project ID		58
Project Name	HU - ECOWATER - Assay of ecological water needs	
Project ID		93
Project Name	HU - FEVIZG - Methodological research for implementation of WFD	
Project ID		17
Project Name	HU - VIZBAZIS - Groundwater protection on vulnerable areas	
Acronym	VIZBASIS	
Project Description	groundwater resources, vulnerabilty, protection zones of groundwater abstraction sites, applied hydrogeology, control of point and diffuse sources of pollution, risk assessment	
Dissemination method	stakeholders & scientific	
Research Management Process	members of scientific working group called by VITUKI. Every vulnerable well fields subject of a single project.consultants for each project found through open tendering procedure.	

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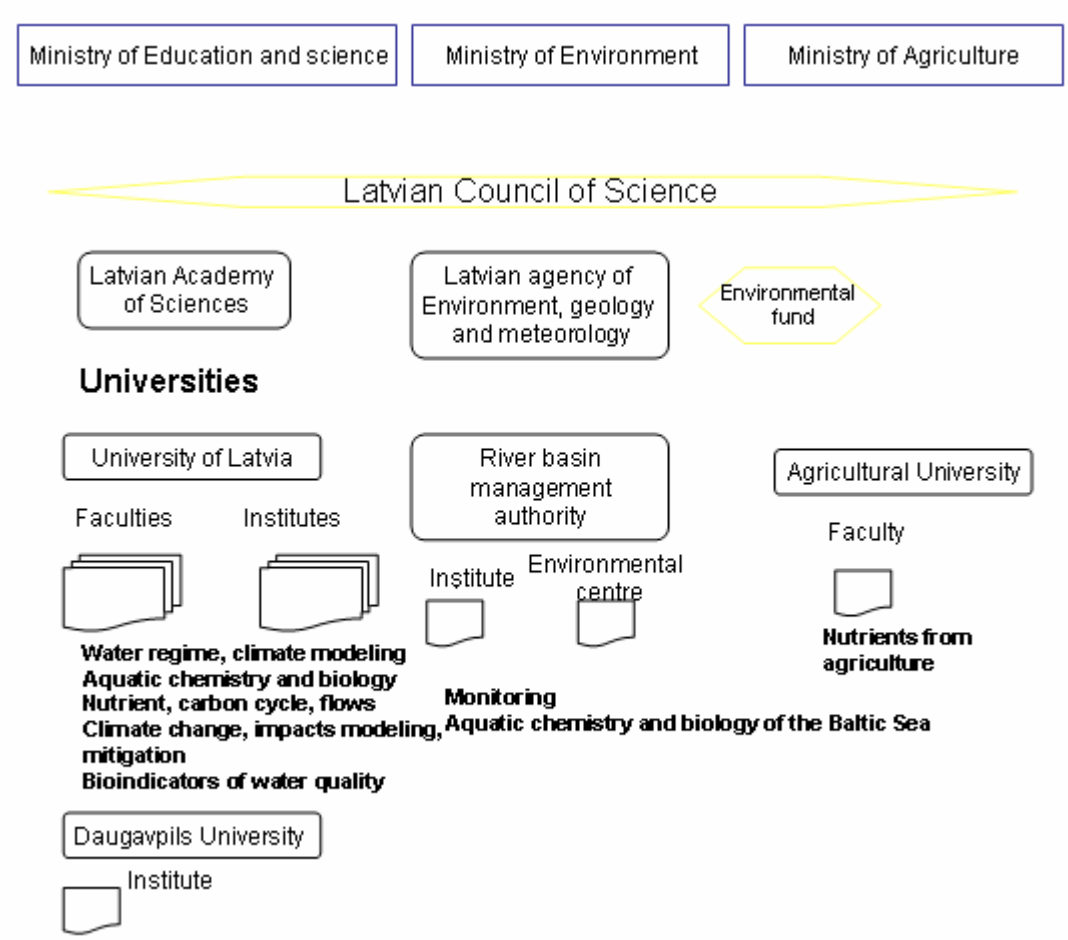
Latvia



Research Management

The Latvian Council of Science is the main public research funding authority in the country and plays an important role as a semi-governmental decision-making body. The Council distributes funding for projects among the branch commissions in the mentioned fields of science. Within the limits of the assigned funding, each branch commission every year distributes the money in the form of project grants on the basis of evaluation of the projects. If the examination is positive, the expert commission suggests the level of funding for the relevant project, the Council makes the final decision.

For 2005 the Council has decided to give grants to 679 of scientific fundamental and applied projects and 25 joint projects according to their scientific level. The total sum of funding amounts to 4.8 milj Ls (6.85 milj. EUR).

Institution type	Number of institutions	
	1996	1999
State research institutes	26	12
Other state research organizations	16	15

Higher Educational Establishment	11	12
University research institutes	7	20
Research units in the business enterprise sector	35	30
TOTAL	**95**	**89**

Currently in Latvia there are 12 state research institutes and 20 university research institutes each with an independent legal status. At present 25 of these are supervised by the Ministry of Education and Science, 5 by the Ministry of Agriculture, one by the Ministry of Economic Affairs and one by the Ministry of Welfare.

There are various other organizations with independent legal status whose primary function is not research. These organizations include the National Botanical Garden, The Latvian Academic Library, breeding and selection stations, engineering centres and others.

In Latvia there are 20 university research institutes with independent legal status, 12 state research institutes and 15 other state research organizations. 25 of research institutes are supervised by the Ministry of Education and Science. The main research potential is concentrated in the following state institutions Technology centres are being developed in order to fill the gap between the system of higher educational scientific institutions and industry. The technology centre was created as a "business incubator" for the support and development of technologically oriented companies. The technology park was created to be a real company with business sectors; education and research structures, and some incubators in different fields for technology based "spin-off" companies.

The Latvian Council of Science is the main public research funding authority in the country and plays an important role as a semi-governmental decision-making body. The Council distributes funding for projects among the branch commissions in the mentioned fields of science. Within the limits of the assigned funding, each branch commission every year distributes the money in the form of project grants on the basis of evaluation of the projects. If the examination is positive, the expert commission suggests the level of funding for the relevant project, the Council makes the final decision. Priority setting has been made accordingly to suggestions of National Council for Strategic Planning and approved by Council of Ministers. Environmental research on water issues is recognized as one of national research priorities

Key IWRM research programmes

Research needed for implementation of WFD and development of IWRM is going on in close cooperation with international research – FP 5, 6 projects (STAR, SWIFT, Eurolimpacs etc), INTERREG and Life projects.
Major activities are coordinated within:

- National research program “Climate change and waters” – funded directly by Ministry of Education and Science and managed by LCS
- Cooperation projects – Long-term ecological observations" and modeling in waterbodies”
    - 22 research projects
    - 8 monitoring projects
- EU twinning and other pilot projects
- Projects funded by agencies

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Project Name	LV - Biodiversity and Development of Ecosystem
Acronym	
Project Description	University of Latvia
Start date	
Project funding	
End Date	01/01/2007

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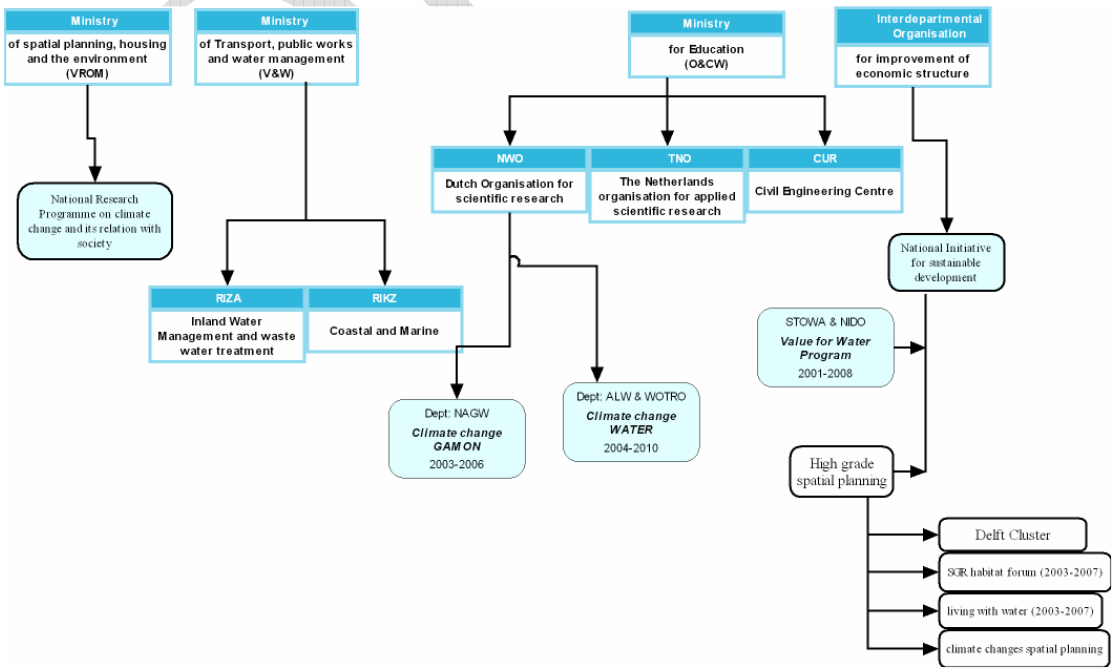
Netherlands

IWRM context

The Netherlands has a territory of about 42,000 km² and more than 16 million inhabitants. It is a very low-lying and flat country (delta country) bordered by the North Sea in the north and north-west. The country has a moderate maritime climate. About half of its surface area is less than 1 metre above sea level, and large parts of it are actually below the level of the sea and of the large rivers that crisscross the Netherlands. An extensive range of dikes and dunes protects these areas from flooding. Numerous massive pumping stations (e.g. windmills) keep the ground water level in check. A substantial part of the Netherlands has been reclaimed from the sea (polders). Four important international river systems are known: Rhine, Waal, Scheldt, and Meuse. The country is hydrologically divided into 53 dike ring systems (which means that a geographical unit is bound by a flood protection system) which are also separate administrative units under the Water Embankment Act. The “IJssel” lake in the north is mainly fed by the river Ijssel. Water management is very decentralised. At the national level environmental management is led by the Ministry of spatial planning, housing and the environment. Water management is undertaken by the Ministry of transport, public works and water management. Within the provinces the responsibility for water management is devolved to the Watershappen and municipalities. In the majority of cases, water supply provision is now delegated to municipally-owned PLCs, which now cover an average of 64 municipalities. The Rijkswaterstaat, is the national government organisation responsible for supervision of the system, and for strategic policy. The provinces are responsible for groundwater management, and also supervise the work and finances of the water boards. Water boards are now responsible for water-related land use planning, nature conservation and environmental protection and related tasks, including wastewater treatment plants (and sewerage networks connecting the treatment plants and the municipally-run sewerage networks) – but not drinking water supply.

IWRM Research Management



The main research organisations are TNO – the Netherlands Organisation for Applied Scientific Research, CUR – Civil Engineering Centre and RIZA – Institute for Inland water management and waste water treatment. RIZA is the research and advisory body for the Directorate General for public works and water management for inland water in the Netherlands and a leading international centre of knowledge for integrated water management.

Project Name	NL - BsIK-KvR ME1-Project - Climate changes spatial planning
Acronym	KvR
Project Description	-availability of a monitoring system for climate change -enforcement of knowledge infrastructure, in particular gamma and beta research aimed at fundamental renewal and application
Start date	01/01/2003
Project funding	100,271.00
End Date	01/01/2010
Dissemination details	internet, conferences, demonstration projects, education.
Project Name	NL - Climate change/Climate changes spatial planning
Acronym	
Project Name	NL - Climate Change/Water - National Study on Climate change - Water
Acronym	CC-Water
Project Description	Key words: Climate change, Water demand, Water avaability, Water quality, Vulnerability, Adaptation mesures, Sustainable water management
Project Name	NL - Delft Cluster / BSiK framework
Acronym	DC
Project Description	sustainable spatial planning and development of densely populated delta areas
Start date	01/01/2003
Project funding	168,600.00
End Date	01/01/2010
Dissemination details	an E-portal is planned to be fully operational in 2007. Furthermore dissemination takes place through reports and conferences. papers / articles, books and publications in journals
Project Name	NL - GaMON - Social Scientific Research into Nature and the Environment
Acronym	GaMON1
Project Name	NL - Habiforum - Dutch expertise network for multiple space use innovation in urban and regional land use & dev't
Acronym	HabiForum

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Project Description	Utilization of knowledge available from the creation of knowledge and from the scientific research, establish lacking knowledge based on demand- driven research, develop methods on contents and process, establishment of capabilities and competences
Start date	01/01/2004
Project funding	72,000.00
End Date	01/01/2007
Dissemination details	workshops, conferences, pilot projects, books and folders.

Project Name	NL - Integrated Water Management
Acronym	Water
Project Description	expected results - Insight into the Abiotic part of water system. Mechanisms of ecosystem dynamics, mobilisation, distribution and use of water across globe.

Project Name	NL - LMW Living with water
Acronym	LMW
Project Description	Communication, valuation, management and institutional arrangements, functioning of water systems, technical, natural and socio-economic sciences
Start date	01/01/2003
Project funding	45,200.00
End Date	01/01/2007

Project Name	NL - NCR research program Netherlands Centre for River Studies Research Prog
Acronym	NCR
Project Description	NCR is an umbrella organisation.
Dissemination details	articles in journals, Phd. theses, conferences, website, meetings

Project Name	NL - Rhine Meuse Delta Studies : Delta evolution program
Acronym	

Project Name	Values of Water
Acronym	WVW
Project Description	Follow-up at other locations and new themes on the research agenda's from other parties, policy recommendations and a vision document.Key Words: Values, sustainability, ecology, economy, urban water management, change processes. Pilot projects regional.
Start date	01/01/2001
End Date	01/01/2008
Dissemination details	articles published and dissemination by the STOWA, that will also evaluate the projects
Evaluation	Evaluation in order to disseminate the result among water managers. NIDO will also evaluate the programme but this has not happened yet.

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Research Management Process	The project is highly aimed at practical application of results and at triggering changes in daily practice

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Portugal

Research Management in Portugal

The Science and Technology Foundation - FCT ("Fundação para a Ciência e a Tecnologia") is the Portuguese governmental agency for non-applied research funding and is integrated in the Ministry of Science and Higher Education. Its mission is mainly to manage, evaluate and fund research in all the fields of Science. The funding of research is done mainly by:

- Funding competitive proposals presented by institutions, research groups and individuals, on the basis of independent evaluations of merit, funding at the moment.
- 1 900 research projects in all fields of science, including biodiversity research.
- Funding research and managing programmes in marine science including marine biodiversity.
- Funding and managing of programmes for research on biodiversity conservation.
- Funding through co-operation agreements and other forms of partnerships with universities and other public and private research institutions in a total of 350 institutions in all scientific fields including several institutions totally or partially dedicated to biodiversity research.
- Funding for research fellowships in all fields of research: more than 4 000 research fellowships for Masters, PhD and Post-doctoral studies.

FCT also provides the institutional framework for the Research Councils that were recently created in Portugal and started recently to discuss priorities for research. The Research Council for Environment and Marine Sciences will be in the future the main responsible for setting up priorities and propose specific research programs in Biodiversity research.
FCT is integrating the Portuguese Platform for Biodiversity that will bring together researcher from all major institutions that deal with biodiversity, NGOs, conservation practitioner and representatives of the Institute of Nature Conservation (Ministry of Environment). It has also offered support for the EPBRS secretariat.
In 2002 FCT had an overall budget of 194.6 million euros

Key IWRM research programmes

Project Name	PT - LINKECOL Linking Community and Ecosystem Ecology
Acronym	

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Romania

IWRM Context

Activity in the field of water management is now based on the new Water Law No. 107/1996. Starting from Constitution provisions and from the provision of the Law for environmental protection (No. 137/1995), this law establishes conservation and protection of water resources by maintaining an ecological balance, the application of key economic factors in water system management and participatory decision-making for all stakeholders.

The Ministry of Agriculture, Forests, Waters and Environment (MAFWE) draws up the national strategy and policies in water resources management and protection. Within MAFWE, the State Water Inspectorate is responsible for the inspection and control of implementation of the legal provisions. The local Environmental Protection Inspectorates are responsible for issuing licences and permits as well as for inspection and control of water quality and emissions into water bodies.The National Administration “Apele Romane” is the authority in charge with the implementation of the 2000/60/UE Water Framework Directive.

During 2001, 11 River Basin Committees were established in Romania, at the level of each river basin, organized on the same river basins as National Administration “Apele Romane” Water Branches. The Committees join the principal actors of the water management and environmental protection, respectively representatives from the Ministry of Waters and Environmental Protection, the Ministry of Health and Family (nowadays there are two ministries: Ministry of Health and Ministry of the Labour, Social Solidarity and Family), County Administration, Municipal and Local Mayors, River Basin Authority and Water Management Systems, Environmental Protection Inspectorate, water users from industry and agriculture, environmental non-governmental organizations or similar associations.

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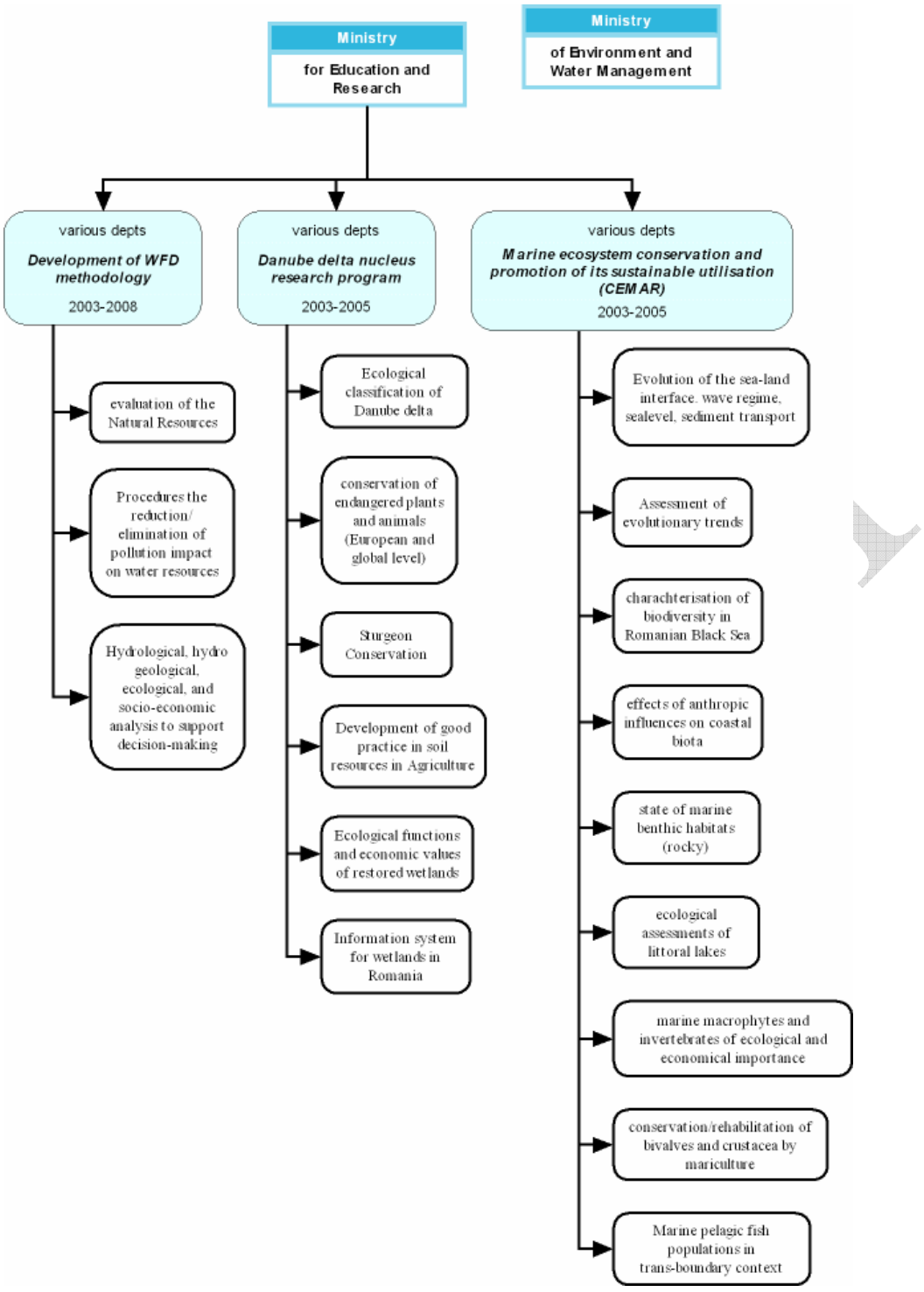
IWRM Research Management



The Ministry of Environment and Water Mangement (MEWM) is the central public authority responsible for environmental protection and water management. The national water authority “Apele Romane” is the agency tasked to manage all waters under the authority of MEWM.

The Ministry for Education and Research has approved and finances 2 nucleus programs for IWRM research – the Danube delta and CEMAR. The Ministry of Environment and Water Management coordinates and finances the research related to WFD through four institutes; national institute for hydrology and water management Bucharest, national research and development institute for environmental Protection - Bucharest, national institute for marine research and development - Constanta and the Danube Delta National Institute for Research and Development - Tulcea.

Key IWRM research programmes

Project Name	RO - DIMINISH
Acronym	
Project Name	RO - Implementation of Water Framework Directive
Acronym	
Project Name	RO - incdd 2003-2005 (Danube delta core research) (danube delta nucleus research programme)
Acronym	
Project Name	RO - incdd 2006-2008 (Danube delta core research)
Acronym	DELTA
Project Description	-Guidelines for good economic practices with low anthropogenic preassures, -Characterisation of biotic and non biotic components of aquatic ecosystems, -Measures to protect species and habitats designated under Directives 92/43/EEC and 79/409/EEC,
Evaluation	Evaluation procedure is set out in government regulations. organised by MER- panel of 3 evaluators,member of speciality commission (environment) is nominated by MER and each project-component of the proposed programme is evaluated
Research Management Process	The research priorities are derived from the objectives of sector strategy of the government for environment. They could be up-dated in order to fulfil international agreements as well.
Project ID	35
Project Name	RO - incdm Constanta - CEMAR 2003-2005 - Ecological Assessment for Littoral Lakes
Acronym	INCDM
Project Description	Ecological state assessment of littoral lakes from the Dobrogea central and southern areas; solutions for natural biological potential rehabilitation. Expected results - databases, environmental impact assessments & scientific support for regional coop.
Research Management Process	Research priorities defined according to Government Programme 2001-2004, National Strategy for Environment Protection 2002-2004 and National Plan for Research, Development and Innovation. Periodic calls for proposals from national authorities.

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Project ID	36
Project Name	RO - incdm Constanta - CEMAR 2006-2008 -Marine Ecosystem conservation & sust. utilisation
Acronym	INCDM2
Project Description	Data bases (erosion, oceanography, eutrophycation, pollution, environment indicators, biodiversity, living resources), environment impact assessments / sheets, scientific substantion of regional / international co-operation.
Project Name	RO - METHODOLOGIES FOR THE IMPLEMENTATION OF WATER FRAMEWORK DIRECTIVE 2000/60/EC IN ROMANIA, CONCERNING GROUNDWATER
Acronym	ICIM1
Project Description	Methodologies and instructions for the implementation of Water Framework Directive for the national water resources, legislation harmonisation, waste-water, nitrates, ecotoxicology, land management, charachterisation, monitoring.
Start date	01/01/2000
End Date	01/01/2009
Research Management Process	TOR are prepared by Ministry of Water and Env. Managemnet. Technical proposals are made by diff. research institutes & author'sd by Ministry. Assessm't of technical proposals made by technical commissns(tech experts from Ministry, academia, res institutes
Project Name	RO - MONDUN
Project Name	RO - ORIZONT 2000
Project Name	RO - Science for Understanding and Sustainability of Socio-ecological complexes
Project Name	RO - Scientific platform for biodiversity study used as health indicator and objective for protection and conservation of marine and coastal ecosystems
Project Name	RO - SEDAN
Project Name	RO - Studies for achievement of Romania's national and international commitments concerning integrated management of marine water and biological resources
Project Name	RO - THE WATER DEVELOPMENT PLANS OF ROMANIAN RIVER BASINS
Project Name	RO - TIGRU Monitoring Extreme flood events
Acronym	TIGRU
Project Description	Monitoring of Extreme Flood Events in Romania and Hungary Using EO Data"
Project Name	RO-INHGA programme water manag2
Project Name	RO-INHGA-8- programme climate change, CC Water
Project Name	RO-INHGA-groundwater,
acronym	IDCAS

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Spain

IWRM Context

With a territory of about 505,000 km² Spain is the largest country on the Iberian Peninsula and includes the Balearic Islands in the Mediterranean Sea, the Canary Islands in the Atlantic Ocean as well as a number of inhabited islands in the Strait of Gibraltar. Spain has a population density of about 87 per square kilometre. To the east it is bordered by the Mediterranean Sea, to its west by the Atlantic Ocean and to the north by the Cantabric sea. The mainland of Spain is characterised by mountain ranges (like the Pyrenees or the Sierra Nevada), high plateaus (e.g. Meseta Central), narrow coastal plains (e.g. the Andalusian Plain), and some lowland river valleys (like the Ebro basin). In Spain, three climatic types are identifiable: a continental, a maritime, and a Mediterranean climate. The continental climate covers the majority of the mainland, influencing especially the Meseta Central. A maritime climate prevails in the northern part of the country, from the Pyrenees to the northwest region. The Mediterranean climatic region extends from the Andalusian Plain along the southern and eastern coasts up to the Pyrenees, where the most flash flood events in Spain are produced (because of locally limited and very high intensity storm rainfall events besides and important watershed). Major river systems in Spain are the Ebro, the Douro, the Tajo, the Guadiana, the Guadalquivir, the Miño, the Segura, the Júcar, and the Turia basins.

The Ministry of Environment and the Territory and Biodiversity Secretariat are in charge of water resources. The National Water Council gives advice for planning projects. The River basin districts elaborate basin plans, manage public water supply and operate public infrastructures. The 1985 Water Law, revised in 2001 is defines the use of water resources in Spain. The State assumes competences regarding legislation, arrangement and concession of resources and hydraulic exploitation when water passes through more than one Autonomous Community (otherwise the AACC have these competences). It also establishes that the AACC assume competences regarding projects and construction of hydraulic exploitations, canals and irrigations when these are of interest for the Autonomous Community.
The National Water Council gives advice for planning projects. The River basin districts elaborate basin plans, manage public water supply and operate public infrastructures. Knowledge requirements are passed on to the Ministry. The Water Framework European Directive establishes a model based on the concept of river basins as basic management unit with their own authority, which existed in Spain many years ago.

Each of the Autonomous Communities has developed a series of regulations concerning management and exploitation of continental water resources, when these resources flow entirely inside the Autonomous Community territory. These regulations concern different phases in the water management, i.e. hydraulic infrastructures, water supply and wastewater disposal. They do though assume State regulation when a legal gap exists.

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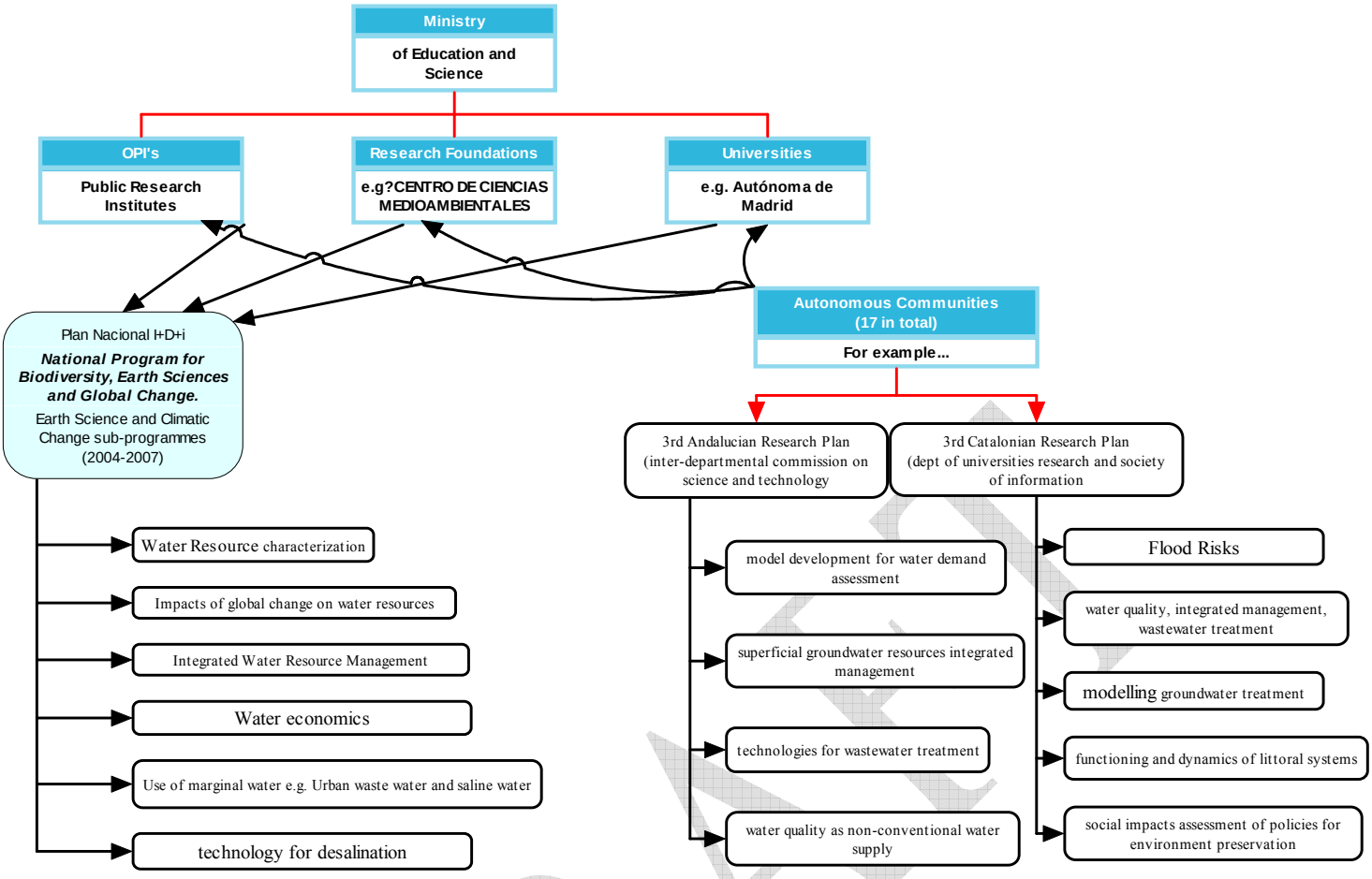
IWRM Research Management



Research is undertaken through the Ministry of Education and Science at the national level and defined in the national plan, which currently runs from 2004-2007. Water research is basically carried out by state-owned research centres through universities & public research institutions

Water Research activities are carried out in Spain basically through University activities, Public Research Institutions (OPIs) the National Plan, and the Autonomous Communities research plans. Funding of research is basically achieved through research plans at national and autonomous level and research and development within the privately-owned companies is limited. Basic and applied research activities at universities are carried out around 25 research groups of the 54 Spanish universities. Also several University institutes on water have been created with or without financial support from other state-owned or private entities, often with important investments on equipment and facilities, but frequently without any specific research programme or with preferential interest in rendering external services. Most of university research groups have focussed their work on groundwater. As regards surface water research and hydrometeorology development has been more limited to university departments. Among the water-related research centres, it is necessary to distinguish between state-owned Centres from private. Among state-owned centres there are universities and university institutes as well as Public Institutions for Research (OPI). Several OPIs are interested in Water Resources. The most relevant are the Consejo Superior de Investigaciones Científicas (CSIC), although its activity is relatively new an limited and mainly focussing in hydrobiology aspects, desertification and basic hydrology. Also the CEDEX and CEH have been very dynamic concerning surface water, water resources studies and projects. The IGME focuses its activity on carrying on outsourcing studies especially related to groundwater resources. In the Public or similar sector, the most outstanding activities in recent years has been the outsourcing of studies by ENRESA, focussing in radioactive wastes. ENRESA, not being an OPI does not carry any work by itself but it manages it's owns budget. The contracts are not allocated under the usual criteria of call for tenders. A

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mixed non-profit association called CENTA was established in 1992 with the objective of contributing to the water sector in Spain. Its main activities are focused on research promotion and promoting the water sector and national technology.

Key IWRM research programmes

Funded water research projects through the National Plan during the last 8 year account for around 240 projects. Information regarding the approved projects is available at Financed research refers to Water quality, water management, ecologic aspects of water, socio economic aspects of water, flood and droughts mitigation among others. Research is undertaken through the Ministry of Education and Science at the national level and defined in the national plan, which currently runs from 2004-2007. This programme is in its final stages and the next programme is currently under development. Hence production of short-term research needs is difficult to produce documentation for and focus is being put into considering the future issues. Water research is basically carried out by state-owned research centres through universities & public research institutions. For the period 2004-2007, research in the field of water is included in the National Programme of Biodiversity, Earth Science and Global Change; which includes the Earth Science sub programme. The priority of research topics include water resources characterization; water quality; global change effect in water resources; water management; water economy and hydrologic risks.

Project Name	SP - Innovamar : National Plan for Scientific Investigation, development and Innovation
Acronym	
Project Name	SP - National Programme on Environmental Sciences and technologies - National Plan on Biodiversity, earth science global
Acronym	Plan Nacional de I D I
Project Description	
Start date	01/01/2004
Project funding	1.50
End Date	01/01/2007
Research Management Process	Research priorities are defined every four years through an ad hoc committee of scientist at National level Call for proposals is once a year for research projects. Proposals finally selected and financed after free competence system - Equal probability

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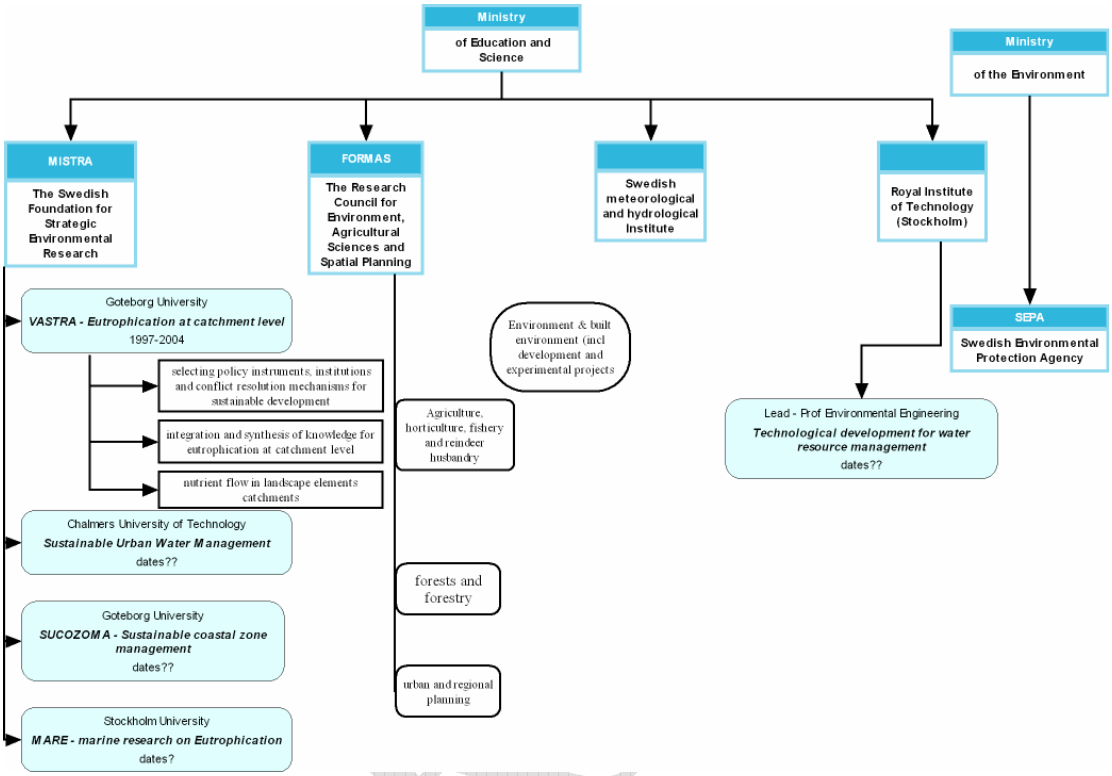
Sweden

IWRM Context

The Ministry of the Environment is responsible for the resource conservation and SEPA is the enforcement agency. The Ministry of Agriculture supervises the quality of drinking water and the Water and Waste Water Association co-ordinates the municipal authorities in the delivery of water services.



Research Management in Sweden

Research policy is co-ordinated by the Ministry of Education and science, but with ¾ of all research in Sweden undertaken by industry this affects only the public funded research. Swedish research councils mainly support basic research, whereas the mission-orientated bodies finance research and development intended to meet the needs for new knowledge in specific sectors of industry and society.

Public funding of R&D takes the form of allocations either directly to universities and colleges through research councils and mission-oriented bodies.

Key IWRM research Programmes

Project Name	SE - MARE - Marine Research on Eutrophication - a Scientific Base for Cost-Effective Measures for the Baltic Sea
Acronym	

Project Name	SE - MiMi - Mitigating the environmental impact of mining waste
Acronym	
Project Name	SE - Plasma-enhanced reaction systems for environment applications
Acronym	
Project Name	SE - RESE - Remote sensing for the environment
Acronym	
Project Name	SE - SUCOZOMA - Sustainable coastal zone management
Acronym	
Project Name	SE - Sustainable Investments
Acronym	
Project Name	SE - Sustainable urban water management
Acronym	
Project Name	SE - Vastra - Swedish Water Management Research Programme
Acronym	VASTRA
Project Description	IWRM, catchment scale, stakeholder participation, conflict resolution, tradable permits, nutrient transport, eutrophication control, integrated tools
Evaluation	first phase (1997-2000) was evaluated both from a scientific and a user perspective in 1999. as result social sciences increased. Prog. For phase2 evaluated by MISTRA board and granted funding in 2001.
Research Management Process	priorities set out in communication with stakeholders (VASTRA Committee)programme is a result of a process that followed a call for tenders by MISTRA in 1995. prog.1 (96) evaluated by scientific board & granted funding
Project Name	SE - Water, Sewage and Waste technology
Acronym	
Project Name	SE - Ways ahead - Paths to sustainable development
Acronym	

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United Kingdom

IWRM Context

Most of England consists of rolling lowland terrain, divided from more mountainous terrain in the north-west, north and south-west. Lower ranges include the limestone hills of the Isle of Purbeck, Cotswolds and Lincolnshire Wolds, and the chalk downs of the Southern England Chalk Formation. The main rivers and estuaries are the Thames, Severn and the Humber Estuary. Scotland's geography is varied, with lowlands in the south and east and highlands in the north and west, including Ben Nevis, the highest mountain in the British Isles at 1,344m (4,406 ft). There are many long and deep-sea arms, firths, and lochs. There are nearly eight hundred islands in Scotland, mainly west and north of the mainland, notably the Hebrides, Orkney Islands and Shetland Islands. In total, it is estimated that the UK includes around one thousand islands. Wales is mostly mountainous, North of the mainland is the island of Anglesey (Ynys Môn). Northern Ireland, making up the north-eastern part of Ireland, is mostly hilly.Lough Neagh, the largest body of water in the British Isles, by surface area (388 km² / 150 mi²), can be found in Northern Ireland. England has a temperate climate, with plentiful rainfall all year round, though the seasons are quite variable in temperature. However, temperatures rarely fall below −4 °C and will only rise above 32 ℃ in the height of the summer. The prevailing wind is from the southwest, bringing mild and wet weather to England regularly, from the Atlantic Ocean. It is driest in the east, warmest in the southwest in winter (closest to Atlantic currents), and warmest in the southeast in summer (closest to the European mainland). Snowfall can occur in winter and early spring, though it is not that common away from high ground. Wales' climate is alike in most regards to that of England, The climate of Scotland is temperate and oceanic, and tends to be very changeable. It is warmed by the Gulf Stream from the Atlantic, and as such is much warmer than areas on similar latitudes, for example Oslo, Norway. However, temperatures are generally lower than in the rest of the UK. The whole of Northern Ireland has a temperate maritime climate, rather wetter in the west than the east, although cloud cover is persistent across the region. The weather is comparatively unpredictable at all times of the year.

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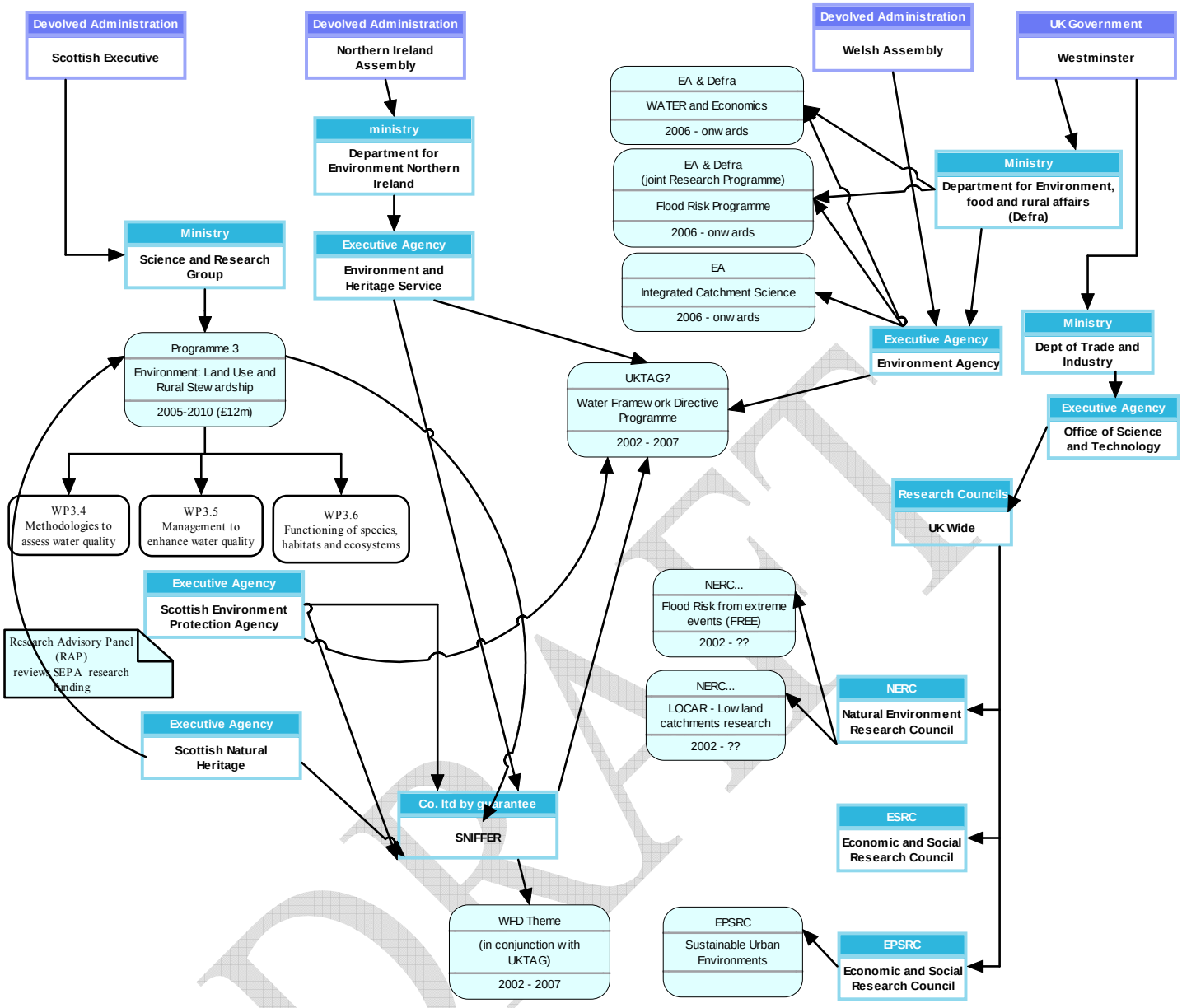
Research Management in the UK



Most government departments and agencies have programmes of research focussed on meeting the evidence and innovation needs of their policy development and implementation. These research programmes are managed in a variety of ways, but many use steering groups or committees to maintain alignment with policy and user needs. NGO's and other more commercial organisations also sponsor relevant programmes of research. The Environmental Research Funders Forum (ERFF) has done some work to assemble a searchable data-base of environmental projects, but there is no overview of all IWRM relevant research in UK.Fundamental research across the whole of the UK is mostly sponsored within universities and specialist units by the UK Research Councils (RC's). The Natural Environment RC (NERC), Economic and Social RC (ESRC) and Biology and Biotechnology RC (BBRC) are most closely related to IWRM. RC's are now being encouraged to align some 'directed' research programmes with users' needs. Moving away from more broad ranging, programmes. More focused policy driven research is often undertaken by devolved administrations and the various departments and agencies within the devolved structure.

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Key IWRM research programmes

In the UK the Technical Advisory Group (UKTAG) works on managing and delivering research relating to the water framework directive. As part of this process it undertakes a process to assess its research needs, through consultation with the technical experts and members of UKTAG. The UKTAG work programme has identified the following research areas as priority for delivery by December 2007.

- Classification tools (to support development and implementation of UK classifications schemes, monitoring programmes and assessment methodologies)
- Measures development
- Further characterisation activities (these may also inform classification and programme of measures)
- WFD communications (not a priority in 2006)

The deliverance of the WFD is defining the short-term research needs, focusing on the first river basin management plan. This is managed by the UKTAG and then implemented within the devolved administrations agencies. Medium term research becomes more divided into the various research programmes which cover sustainable development, or land use and rural stewardship for example. This is usually managed and implemented within devolved administration structures, such as the Scottish Executive, Department for Environment Northern Ireland or the Environment Agency England and Wales.

Project Name	UK - EHS Programme
Acronym	

Project Name	UK - Environment and Rural Affairs Department(ERAD) Sustainable Development
Acronym	

Project Name	UK - Environment and Rural Affairs Department(ERAD) Sustainable Development
Acronym	

Project Name	UK - Fisheries Research Services (FRS) Programme
Acronym	

Project Name	UK - N/S SHARE - future INTERREG programme - EHS
Acronym	

Project Name	Scottish Executive Water Env. Unit research programme
Acronym	WEU-RP
Project Description	Programme history (previous programmes) operational for the last 4 years or so. Initiated with the transposition of WFD into Scottish law, and various consultations with industry, the public and other key bodies on WFD and its implementation.
Start date	01/01/2002
End Date	01/01/2006
Dissemination details	stakeholders, industrial and business groups are included in steering groups and input into the design and provide information from which to develop some of the findings . Project results & consultations are available on the web

Project Name	UK - SEPA
Acronym	

Project Name	UK - UK WFD Programme SNIFFER
Acronym	UKTAG

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Project Description	WFD theme established in 2000. Priorities then (2000-02) were typology and groundwater , current work is related to monitoring classification and economic characterisation and reporting, forthcoming priorities include RBMP and pressures and impacts id.
Start date	01/01/2000
Project funding	5,000,000.00
End Date	01/01/2008
Dissemination method	stakeholders, industry, scientific.
Dissemination details	information is provided directly via presentations, reports or provision of other outputs where identified in results e.g.website. Researchers engaged in process encouraged to give talks and presentations.
Evaluation	The programme is reviewed quarterly meetings of the SNIFFER WFD theme board (made up of member representative and SNIFFER staff). Projects are commonly peer reviewed. It is not evaluated in the sense of EU programme mid term review or final evaluation
Project Name	UK - UKWIR Programme
Acronym	
Project Name	UK? Environment Agency WFD Programme
Acronym	EA-WFD
Project Description	Strategic technical planning, communications, charactersation, monitoring, classification, reporting, EU negotiations (hazardous substances & groundwater) RBMP, programme of measures, ribble pilot study, data and information systems.

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Collaborative Website/database...?
The data that IWRM-net needs to collect is about:

- the research programs information, which is the focus of our project and
- the organisations which are involved
- the projects which are issued from the programs
- The practices used before, during and after the program. They will be analysed afterwards in order to list the best practices.
- The bibliography issued from a project: It may concern reports and other documents issued before the program launch, during its realisation and during, project launching and after the program completion.

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Analysis and comparison of Research Programmes

IWRM-Net has gathered a range of information from its partners and a variety of other sources to validate the research needs it proposes for its pilot joint call. These methodologies will be tested further to validate any research needs that are proposed for any subsequent joint calls.

- Results from IWRM-Net London workshop. (delegates provided their input into the workshop, listing research questions and issues for further deliberation)The London workshop involved over 50 delegates from a wide range of backgrounds and provided us with a long list of research questions of varying degrees. From this simple list SNIFFER amalgamated many of them into basic groups based around the WFD classification system similar to that used by WFD CIS process. The full report is available from the IWRM website. Using this amalgamation of research questions a sorted list was presented as options in draft documents seen by the general assembly. Through discussion with the members of IWRM-Net SNIFFER narrowed the title options down to Integrated Management and pressures and impacts. These titles remain broad enough to cover the wide range of interests noted by the IWRM-Net members.

- Euraqua and WFD CIS - The research need documents can be found on the relevant websites and the summary information is included in the annex of this report. The Common Implementation Strategy has been investigating research needs for the Water Framework Directive for a number of years. The results from this detailed work has been validated by the Water Directors from each member state. Euraqua is a grouping of water research organisations from many of the EU member states. The members are at a senior level and their understanding of water issues is at the forefront of EU work. Any proposals that IWRM-net put forward should be validated against the previous work of both the CIS process and Euraqua.

- SSA questionnaire returns inputted into the KMT - A simple analysis of the programmes has been completed by the International Office of Water. The information has been updated on a continual basis and this has been used for the analysis in tables 1 and 2. This provides a basic highlight for where the main areas of research are currently or in the past 5 years. Due to the lack of detail in the information it does not provide a detailed analysis of knowledge or research. (project information is required for this type of analysis) what it should provide is a suggestion as to the areas where we should be looking to improve current knowledge and areas where we will be more innovative and creating knowledge in a field that it lacking current research.

- Questionnaire returns for WP2 listing research information relating to WFD objectives – these returns were not received from all partners of IWRM-Net and many partners found the completion of this form difficult as it presumed that all states would be able to classify their research into WFD relevant fields, this was not the case. The difficulty in classifying knowledge highlights the need for a rigorous programme of classifying and analysing knowledge from across Europe to allow objective analysis of current knowledge. Even if the process is limited to research projects there still remains difficulties with creating a comprehensive database containing comparable information from all European countries.

- Results from other ERA-Net databases (SKEP, CRUE) & results of research projects listed with the EU. This amalgamation of information is currently in an excel spreadsheet and lists around 300 projects. Most of the information is not detailed and

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is not easily comparable. Again this highlights the need for careful classification and a breakdown of the information available to allow cross-comparison between the current work being done. It is the intention of IWRM-Net to amalgamate all the relevant information into the KMT to undertake further analysis on current research projects and to highlight the gaps in knowledge.

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Results & Conclusions

Table 1: Assessment of IWRM-net research programmes using IWRM classification

Nombre de Program	Country																
Iwrm Theme		AT	CZ	FR	GE	GR	HU	IE	IT	LU	NL	PO	RO	SE	SP	UK	Total
Climate & prospective approach		1			1						2		2				6
Ecosystems		1	1	6	2			3	1	1	1		8	2	3	4	33
Ecotoxicology				5									1	2			8
Hydrology				3			2		1		1		3				10
Quality assessment monitoring				4			1	1	1				2				9
Social economy aspect				2	1						1	1	1	2		1	9
Technology in drinking & waste water														2			2
Water & industry											1			1		2	4
Water & land planning		1		3	1	2	1				4		5	1	2	1	21
Total		3	1	23	5	2	4	4	3	1	10	1	22	10	5	8	102

system.

Table 2: Assessment of IWRM-net research programmes using WFD classification system.

Nombre de Research programs	Country															
WFD objectives	AT	CZ	FR	GE	GR	HU	IE	IT	LU	NL	PO	RO	SE	SP	UK	Total
Economical analysis : cost effectiveness measures analysis (art. 11)												1				1
Economical analysis : others			2	1		1			1	2		2	2			11
Economical analysis : recovery of costs and water-pricing analysis (art. 9)												1				1
Monitoring and good ecological status (art. 4,5 &6)	2		7	4	2	2	4	2	1	5	1	12	3	2	7	54
Others : Climate & hydrology	1		3		1	1				2		6	1	2	1	18
Others: Water & health			1									2	2			5
Others: Water use												1				1
Pressures/impacts and predictive modelling (Ann. II)	1	1	6	2		1				3		4	2			20
Programs of measures (art. 11 & 13)			3	2	1	2	4	1		3		6	4		5	31
Reduction and phasing out of priority substances (art. 16)			3					1				1			1	6
Sociology and public involvement (art. 14)			2	1						4	1	2	4		2	16
Total	4	1	27	10	4	7	8	4	2	19	2	38	18	4	16	164

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Basic questions raised at the London Workshop

WFD CIS classification	Research Questions
Water Resource, demand management, uses and conflicts	Development of methods to facilitate a compromise between stakeholders and researchers?
	Development of decision support tools: integrate different aspects, increase understanding, transfer of knowledge, assessment of alternatives.
	IWRM-Net to improve networking to facilitate harmonisation of monitoring procedures around Europe
	how to integrate ecological and socio-economic objectives at a basin scale.
	if appropriate data and site specific studies can't develop a closer relationship there can't be much of an issue.
	IWRM as comprehensive resources management tool. Not only for water but also energy, ??? Economical aspects also
	integration of hydrology, geomorphology, water, economics, social etc
	inter-disciplinary approaches not only looking at data, providing technical solutions modelling future measures, but combining social, industrial, ecologic & etc…?
	adaptive management and learning
	how should the structures and organisations be organised?
	deliberation support tools for assessing IWRM options against multiple bottom lines
Management of groundwaters	some people looking at crops, others the unsaturated areas, others groundwater.
knowledge of the physical processes	Better understanding of the processes and interactions across the eco-hydrology surface-GW interface to better quantify GES
	Improve our understanding of the processes involved in the transfer/residence times of agro-chemicals in basins. Non-point sources pollution
	Improve our understanding of carbon plus in soils, how to influence it with water effects on extremes on low flows in different landscapes/land-use, climate change on infrastructure, water supply and groundwater
	Improve our understanding of hydrological changes due to climate land-use change – in particular the morphological damage to estuaries and rivers
	Improve our understanding of hydro-morphological requirements of WFD and in particular the potential changes in flood risk management strategies
	What are the ecological aspects of sediment transport changes
	How do we estimate the water volumes for ecologically safe water use for trans-boundary gauging stations on the rivers
	how to have a reliable site specific method for lack of change in flow-due to abstraction to genuine environmental damage
	detailed studies from NO3 leaching ?? Zone movement, groundwater movement. Looking at by-pass flow from peaks for effectiveness of different programmes of measures.
	Create methodologies to identify effects of hydropower and eutrophication on ecological status
	Develop methods to reduce the maximum (peak) concentration of NO3 in groundwater to 50mg/l
	How can we reach an acceptable level of uncertainty in pressure/impact results to invest in action
knowledge of the ecological processes	What are the drivers behind the concept of GES as a process of dynamic interactions
	Is good ecological status a definition of environmental science, social science or political science?
	Better understanding and knowledge of the processes by which we define good ecological status
	what affects achieving good ecological status (obstacles)
	ecological status - limited to info on fish as defined by anglers catches and surveys of invertebrate species - no public measure of worth
	Ecological risk and the human ability to be able to manage risks needs to be studied together

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	Improve our understanding of the relationship between flow and ecology based on appropriate data and site specific studies
	Undertake a baseline survey of what do we know now about GES, including potential?
	Can we have a pragmatic and operational compromise of GES
	Develop methodologies that identify good status that combine methods and understanding from natural, social and political science.
	applied research programme to determine good ecological status
	Research to improve our understanding of how aquatic ecosystem works
	Improve our understanding of hydro-biological interaction
	What do we need to know to better manage and achieve good ecological status
	International river basins - several with economical status??
surveillance	what techniques do we need to monitor & collect data etc. for good ecological status
	Can we quantify good ecological status? - Scientific research – monitoring of state of environment?
	monitoring of data on env. Quality. Is it enough for quantification?
	How do we improve the spatial resolution for monitoring and understanding by water body grouping. Can we get the spatial resolution right to be more effective?
	There should be more proposals for the development of the sciences and research priority areas
	Improve our research and monitoring ability to quantify pollutants and how they are modified during transport through a catchment, e.g. how much NO3 in groundwater is attenuated before entering the river.
	Water body status assessment – improve our monitoring capabilities and methods
	need for taxonomy experts
	data sampling often not followed by immediate data processing – improve monitoring methodologies.
	measurements - effects – assessment (improvement of monitoring methodologies)
	Can we combine the monitoring with development of sets of indicators
	What are the effects of cumulative pressures on ecology
pressures and impacts	Develop our knowledge of how multiple pressures affects the aquatic ecosystem
	improve understanding of the interactions of different pressures on aquatic ecosystems
	develop methodologies to assess and prioritise the efficacy of measures for pressures
	What pressures act in combination? Measuring the interaction between pressures - improve our ability to separate out the effects of individual pressures and then the cumulative effects of pressures
	Do we know the efficiency of the pollution reduction measures, can we measure their efficiency?
	Development of several methods for biological components
	Produce interactive maps of priorities - pressures and impacts and contacts. Create a methodology for…
data management	data - suitable spatial and temporal scales. Correct details for impact assessment
	results from ECOSURV project
	Improving the transformation of data to information?
	integration - how to integrate data from different sources efficiently
	seek out examples to pilot integration of different types of datasets. Try to integrate them.
	how does modelling of integrated datasets at different scales affect decisions as to programmes of measures that should be used towards WFD? Research advanced for FRM but not for integrated data.

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	lack of data for good definition of final objectives? – pressures also
prospective models and scenarios	How will changes in climate affect catchment scale processes?
	Produce scenarios for possible future rivers lakes and estuaries and coasts, accounting for climate & socio-economic & governance …
	Can we produce regional climate change models with better certainty about effects on water management
measures programmes	Develop our understanding of river restoration: how benefits-implementation etc
	How will the H-M regulations of the WFD impact on flood risk management strategies
	Development of environmental objectives for hazardous substances in marine coastal regions in sediments and biota
	Development of common strategy for typology and reference sites
	To develop tools to support the delivery pf WFD programme of measures on the ground (response)
	Develop methodologies on how to set environmental objectives to hydro-morphological pressures in WFD
	how do we intervene? What tools - what impacts?
Economy	How do we evaluate economic flows? Eg env. Services. IWRM actions in basins.
	socio-economics usually means just economics
	How to take into account 'value' in a CBA
	water pricing
	economics modelling - integrated models, simple models as decision-support tools
	how do we value water? - how is the WFD being understood by different stakeholders in different national contexts
social	What are the social, economical, ecological and political drivers of GES
	How do we integrate social, political and economic aspects into characterisation reports
	What is the eligibility of existing networks (which networks?)
	lacking in social capital means you don't have a voice
	balance of measures - regulation, voluntary information, education, economic measures, how affected by social context?
	ecosystem services and other social theories, who will be valued, what values will inform the knowledge production? What makes knowledge pertinent to societal needs and who decides?
	how to apply methods and tools to analyse environment and society. - how do we characterise the environment.
	how is all of this patterned by socio-cultural-historical contexts?
	Disperse settlement patterns and their impacts on water management
incorporation of sectoral and public policies	Develop methodologies and good practice to integrate biodiversity action plan targets & other legal EU environmental duties with water management at a landscape scale
	structure of organisations and institutions
Risk Management	Do we have the confidence + precision of data recommendations (WISE requirements) – for what end?
	risk management for all stakeholders
Water mangement scales	CAMS/UKTAG look up tables - but based on opinions. Not site specific
	To integrate environmental and physical processes in the river basin management.
Participative Management and sharing of knowledge and experiences for better public participation	common vision of the system for participation, negotiation, and consensus building, assessment of risk and uncertainties.
	inter-intra catchment continuity, assessment of scale - reach to catchment interpolation
	specific meetings on common (specific) issues
	Communicate benefits of achieving env. Objectives as part of wider sustainable development agenda to multiple interest groups - engage public interest?
	How can I sell WFD?
	planning cultures, participatory cultures
	how to participate (method) how to value the impact? Evaluation of behaviours

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	what about public participation -
	how best to organise stakeholder dialogue and participation? Expressing, valuing diverse values
	stakeholder validated descriptions of the distributional significance of IWRM options
	how should participation be enabled - who and how?
others	skills to be defined for some catchments - not clear in some SW (Europe?) areas

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Appendix 1: Bibliography

Pichler et al (2007) *A report on the comparison of National Research Programmes on Flood Risk Management across Europe*. CRUE ERA-Net WP2 (UBA-A) 128pp

www.en.wikipedia.org

EurAqua (2007) *EurAqua Position Paper on WFD needs under FP7*. 12pp

Common Implementation Strategy for the WFD (2006) *Improving the comparability and quality of the implementation programme – progress and work programme for 2007-2009*. As agreed by the Water Directors December 2006.

Common Implementation Strategy for the WFD (2005) *Key Issues and Research Needs under the WFD, Final Document.* As agreed by the water directors December 2005. 109pp

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Appendix 2: What is Research?

"research (noun) - *a detailed study of a subject, especially in order to discover (new) information or reach a (new) understanding*"

In the process of undertaking research and the life cycle of a research project or programme there are a number of steps that need to be considered. Best practice will arise from understanding the purpose of each step and the most effective way of achieving that purpose.

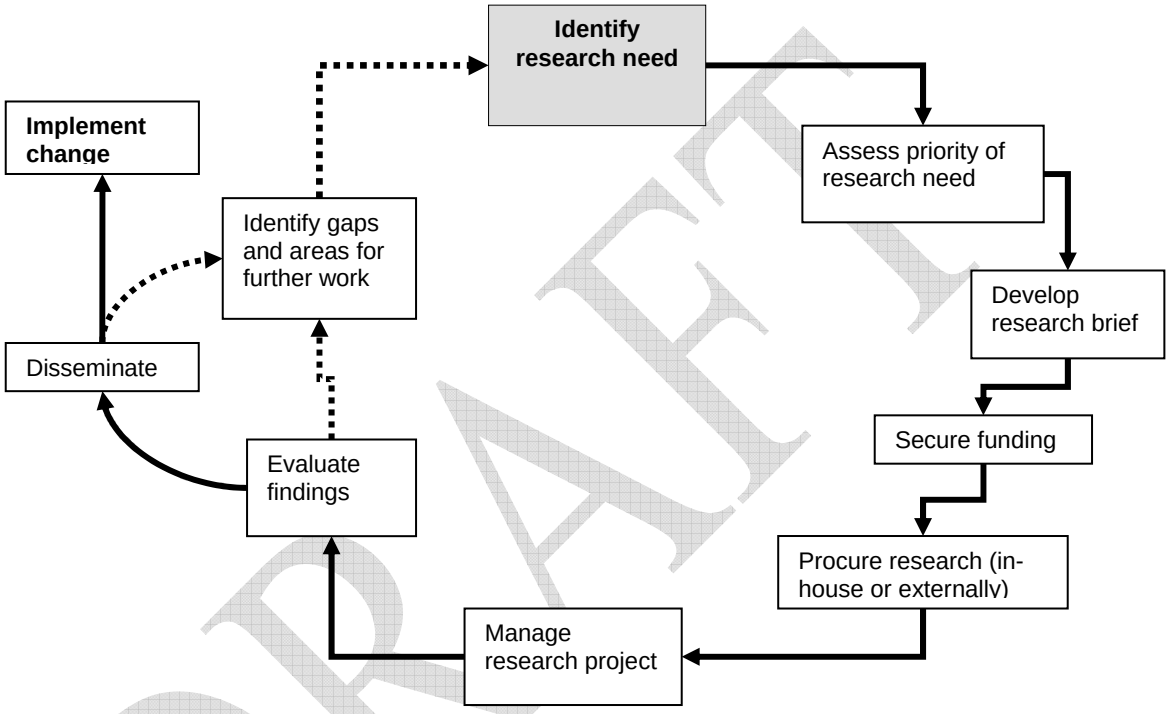

Figure 2 - Research and Development process [from Atkins(2006) – internal report to EHSNI]

What this diagram does not consider is the subtle variations in scale needed to develop research programmes and to change organisational thinking in the form of 'knowledge management'. In 1963 the Organisation of Economic Cooperation and Development (OECD) developed a system for classifying research. The Frascati research classification system divides up research into five categories (*for more information see appendix 1)* which are;

- Pure Basic Research
- Orientated Basic Research
- Strategic Applied Research
- Specific Applied Research
- Experimental Development

These classifications help us to understand the different types of research required to deliver different levels of information and knowledge. When put into a temporal

diagram then we can start to see how the many processes link together, figure 3 shows the process of going from blue sky, innovative thinking to creating research programmes focused on a particular field and then subject to knowledge management to provide those tasked with delivering policy or implementing a 'product' the skills and knowledge to do so. It also suggests a timescale to achieve all these aspects, but this will depend on the complexity of the issue being tackled and the relative time-scales of research projects in that field. Those involved in research programme management must understand and measure the value of these ideas and how they become accepted into normal practice in due time.

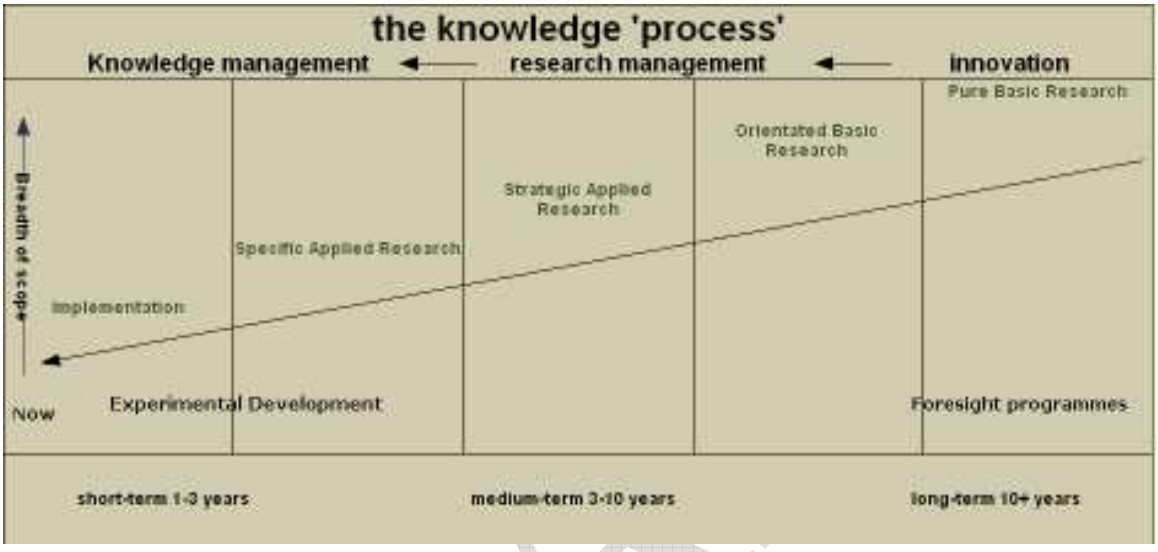

Figure 3 - Knowledge Process

IWRM-Net will consider the whole knowledge management process, i.e. it will look to influence the innovation, research management and knowledge management/dissemination processes as in the above diagram, and ensure that this process is managed to the utmost efficiency for delivering sustainable water resource management.

In order to facilitate this process the IWRM-Net partners have used the criteria for strategic research adopted by the Water Directors involved in the common implementation strategy for the Water Framework Directive. This sets out the parameters by which the members of IWRM-Net can measure their needs against those of other countries and establishes a framework for managing the complex information associated with Integrated water resource management. This framework is important for then analysing individual research programmes and projects and putting them into context with achieving outcomes related to sustainable water use and the application of IWRM.

Managing a Research Programme

There are a number of generic questions that must be answered in setting up a research programme - These include:

- What are the goals of the programme?
- Who will be the end users of the research information generated?

CASE STUDIES:

The **German Federal Ministry of Education and Research** it states aims and tasks as;

"We rely on the best our country can offer in order to create growth and secure it in the long term: That is to say, on the people living, teaching, learning and working in Germany. We want to improve their opportunities for participation and personal development. At the same time, we want to maintain Germany's competitiveness and create new jobs through innovative technologies and services."

At this level research in general has a purpose and the specifics for issues such as water management are not highlighted at this stage of the knowledge process.

Scottish Executive Environment and Rural Affairs Department Research Strategy for 'Environment, Biology and Agriculture' sets out a number of specifically water related themes, yet does not provide clear objectives for water at this level. The first point to note is that it is called a strategy rather than a programme. Is a strategy fundamentally different to a programme and does this alter the way that it is delivered. The targets of the strategy include

- By 2010: the proportion of SEERAD SRG funded research which is classified as policy relevant will increase to at least 75%
- By 2010: basic research will be less than 10% of the total programme.

It is within this strategy that a series of programmes exist, which includes 'Environment-Land use and rural stewardship' which lists the following objectives:

- building more sustainable farming systems
- protecting the nations soils
- enhancing water quality
- functional biodiversity, natural habitats and landscapes.
-

Another example from the UK, this time an Agency of the government, **Environment Agency strategy for 'Integrated Catchment Science**' is split into seven work packages, the first four of which address technical science issues whilst the last three reflect generic work areas, as follows:

1. Understanding aquatic ecosystems;
2. Managing soils and sediments;
3. Identifying and understanding catchment pressures;
4. Restoring habitats/ecosystems and remediating historical pollution;
5. Socio-economic considerations;
6. Knowledge transfer;;
7. Pilots and demonstrations of catchment management.

In answering these questions one can determine the type of programme required and the means of disseminating the information, setting it clearly within the framework of the knowledge process above.

Goals of research?

It is recognised across the board that clearly defined and achievable goals are needed to provide focus and clarity for managing a research programme. But the nature of the goals will depend on the 'level' of the programme. The higher levels of research management often relate to issues relevant to the nation state as a whole, linking with economic growth and development policies, while more applied goals can aim to deliver objectives related to a specific theme.
The emphasis of current WFD and thus IWRM research on ecological aspects is clear and the need to ensure that sustainable development objectives are enshrined

within high level research objectives is clear. In this way the 'research goals can apply to all aspects of research from biomedical technology to wastewater treatment plants and the policy language can remain consistent from national to local level.

Who is the research for?

Research needs to consider the relationship between the many stakeholders within the knowledge management process. A scientist will develop and produce the research in conjunction with stakeholders but once the information is provided many scientists do not undertake the role of ensuring the information is then used and developed into working practise. Ownership and responsibility for knowledge management is a something that is increasingly becoming part of a research manager's job description and will considered within the IWRM programme.

A research programme controlled directly by a ministry or department of government will have clear objectives to achieve the goals set out by the Minister. The timescales will also be dictated by the periods of government, which are often short-term. Within this many nations will recognise the need for longer-term research goals and their needs to be a balance between the needs. British Geological Survey in the UK have a dedicated member of staff to manage the research process ensuring that it encompasses the whole spectrum from Blue Sky to operational/product development.

In order to ensure an effective research programme it is recommended that the timescales and objectives are clearly set out at the beginning or if the programme is considerable, the projects within it are given clear objectives for short or long-term delivery. The UKTAG process for the Water Framework Directive has a short-term focus with an annual

Example of program management issues from CRUE ERA-Net

Within the field of research for flooding the issues that need to be considered within any system of programme management were discussed as:

- Framework Conditions
- Research Needs
- Programme Design and management

Framework Conditions

- Geographical and climatic conditions
- Political targets and strategies
- Driving forces for IWRM research
- Regulations and laws
- Framework programmes or strategies
- Responsibilities

Identification of research needs

- Categories of research
- Approaches to driving forces
    - Problems revealed by actual events
    - Innovation
    - Scientific needs
    - Policy needs
- Methods
    - Inquiries
    - Interviews
    - Multilateral consultation
    - Involvement of stakeholders
    - External studies

Programme Design and Management

- Definition of programme content and scope
- Target groups funding
- Programme duration and financing
- Funding instruments
- Announcement/call/tender
- Programme publication and dissemination of results
- Programme steering group, evaluation and monitoring

process for analysis of priorities and delivery of knowledge is needed for implementation within 1-2 years. This is successful as the WFD has very immediate deadlines and specific goals, yet within the WFD there are aspects of implementation that are not very well known such as the economic valuation of water resources and general knowledge needs to improve significantly. In order to achieve this, more long-term research programmes are required.

Within any research programme there are a number of issues that need to be considered and managed. Many of them relate to figure 1 and the stakeholders either above or below the programme who wish to influence the information and knowledge that emanates from the research.

Some research programmes are developed through the governance process and are designed as a process within evidence based policy making. Examples? Following on from this a government will produce the policy that will need either a strategy or regulations to implement it. Research programmes can be designed to support the decision-makers in the solutions to the problems.

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Appendix 3: CIS and EurAqua research needs

Theme	Sub theme	need/question		programme name		organisation name
Knowledge on ecological processes		Relationship between hydromorphological and biological conditions				Euraqua
		Objectives for hydrology (minimum flow)				Euraqua
						Euraqua
		"Hydrology – ecology and morphology – ecology links. These need to be quantified so that measures to address these pressures, that will result in required degree of improvement in ecological improvements, can be determined."				Euraqua
		"Everything concerning the connection/effect between/on hydrological, hydromorphological, hydro geological factors/processes and the status of the ecosystems"				Euraqua
		Development of common EU-wide biological assessment methods				Euraqua
		Research of the relevance of substances and links between chemicals and status				Euraqua
		"Reinstalling river continuity in order to allow fish to migrate. A lot has been done on ascent constructions, but knowledge on the conditions regarding the downstream migration of fish is currently lacking and not yet covered adequately by research"				Euraqua
Knowledge on ecological processes	4.1	Relationship between hydromorphological and biological conditions		" AQUATERRA, REBECCA, WATERSKETCH "		Water Directors - CIS
	4.3	Environmental standards for annex VIII and X substances				Water Directors - CIS
	4.4	Modelling tools to define reference conditions		" HarmoniCA-WP4, REBECCA EURO-LIMPACS,"		Water Directors - CIS
	4.5	Intercalibration of assessment methods for biological quality elements		" REBECCA, STAR, SWIFT-WFD "		Water Directors - CIS
	4.6	Objectives for hydrology (minimum flow)				Water Directors - CIS
	4.7	" Hydrology – ecology and morphology – ecology links. These need to be quantified so that measures to address these pressures, that will result in required degree of improvement in ecological improvement, can be determined. "		" AQUATERRA, EURO-LIMPACS, REBECCA, WATERSKETCH "		Water Directors - CIS
	4.8	" Everything concerning the connection/effect between/on hydrological, hydromorphological, hydro geological factors/processes and the status of the ecosystems "		" AQUATERRA, EURO-LIMPACS, REBECCA, WATERSKETCH "		Water Directors - CIS
	4.9	Development of common EU-wide biological assessment methods (option 1 of INTERCALIBRATION process guideline)		" REBECCA, STAR "		Water Directors - CIS
	4.10	Elaborations concerning the one out all out principle for chemicals discharged in significant quantities as part of the ecological status/potential. Rephrase: Research of the relevance of substances and links between chemicals and status		" EURO-LIMPACS, MODELKEY "		Water Directors - CIS
	4.11	" Reinstalling river continuity in order to allow fish to migrate. A lot has been done on ascent constructions, but knowledge on the conditions regarding the downstream migration of fish is currently lacking and not yet covered adequately by research. "				Water Directors - CIS

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		"Quantification of the need to internationally reduce the atmospheric deposition of anthropogenic loads of nutrient, heavy metals and POP´s, SO2 (acidification)"				Euraqua
		"Elaboration of models for load of N, P and POP´s on coastal areas and sea"				Euraqua
		Mechanism for transport of N and P in land and water				Euraqua
		POP's in biota				Euraqua
		Further elaboration of the impact of autonomous developments in society on quality elements and parameters representing the status of surface- and groundwater ("baselines in practice").				Euraqua
		Impact of hydropower				Euraqua
		Impact from agricultural activities on water bodies				Euraqua
Measure assessment		Limitation of negative impact of flood defence works				Euraqua
		Assessment of hydromorphological rehabilitation measures for river types				Euraqua
		"General insight in the most effective and cost effective measures (e.g. should we focus on chemical water quality improvement, or focus on improvement of the habitat quality, or which combinations of those?)"				Euraqua
		Decision support systems for the selection of the best alternative in the programme of measures				Euraqua
		Methodologies to deal with social and economic issues to develop future scenarios				Euraqua
		Elaboration of models for prediction				Euraqua
		"Decision support systems taking account the availability of data, the quality of data, the scale to which available data apply, and resulting uncertainties."				Euraqua
		"The decision support systems may focus on various levels of scale (EU, region, country, river basin, smaller area etc)"				Euraqua
		Assessment of the impact of measures on the chemical an biological quality of surface and ground waters using "practical and well considered approaches"				Euraqua
Measure assessment	8.1	Limitation of negative impact of flood defence works				Water Directors - CIS
	8.2	Assessment of hydromorphological rehabilitation measures for river types		WATERSKETCH		Water Directors - CIS
	8.3	" General insight in the most effective and cost effective measures (e.g. should we focus on chemical water quality improvement, or focus on improvement of the habitat quality, or which combinations of those?)"		MODELKEY		Water Directors - CIS
	8.4	Decision support systems for the selection of the best alternative in the programme of measures		MODELKEY		Water Directors - CIS
	8.5	Methodologies to deal with social and economic issues to develop future scenarios		WATERSKETCH		Water Directors - CIS
	8.6	Elaboration of models for prediction		MODELKEY		Water Directors - CIS
	8.7	" Decision support systems taking account the availability of data, the quality of data, the scale to which available data apply, and resulting uncertainties. "		" EUROHARP, HARMONIRIB (!), TRANSCAT"		Water Directors - CIS
	8.8	" The decision support systems may focus on various levels of scale (EU, region, "		" EURO-LIMPACS, HARMONIRIB, TRANSCAT "		Water Directors - CIS

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	8.9	Assessment of the impact of measures on the chemical an biological quality of surface and ground waters using “practical and well considered approaches”				Water Directors - CIS
Economy		Economy - cost/benefits and cost recovery problems				Euraqua
		Scale of the analysis for individual elements (pressures) of the cost-effectiveness analysis				Euraqua
		Dealing with changes to cost recovery mechanisms as potential measures within the first POM				Euraqua
		Developing business as usual models and dealing with less than full application of other water policies in the cost-effectiveness analysis.				Euraqua
		"Incorporating the time related costs of measures in the cost-effectiveness analysis (e.g. related to capacity constraints, industry investment phases etc.)"				Euraqua
		Translating standards for GES/classifications schemes into specifications of environmental benefits from a human (anthropogenic) perspective				Euraqua
		Establish reliable benefits transfer approaches for assessing disproportionate costs.				Euraqua
		Assessing disproportionate costs in protected areas where there is flexibility in meeting WFD related objectives.				Euraqua
		Coordinating cost-effectiveness analysis in transboundary water bodies.				Euraqua
		Dealing with uncertainty about measures given differencing levels of uncertainty across sectors contributing to pressures (e.g. agriculture/water industry) in an even handed manner.				Euraqua
Socio-economy	11.1	Economy - cost/benefits and cost recovery problems		" HarmoniCA-WP3, HARMONIRIB "		Water Directors - CIS
	11.2	Scale of the analysis for individual elements (pressures) of the cost-effectiveness analysis				Water Directors - CIS
	11.3	Dealing with changes to cost recovery mechanisms as potential measures within the first POM				Water Directors - CIS
	11.4	Developing business as usual models and dealing with less than full application of other water policies in the cost-effectiveness analysis.				Water Directors - CIS
	11.5	Prioritising economic appraisal for the first POM given the difficult timings				Water Directors - CIS
	11.6	" Incorporating the time related costs of measures in the cost-effectiveness analysis (e.g. related to capacity constraints, industry investment phases etc.) "		" HarmoniCA-WP3, HARMONIRIB "		Water Directors - CIS
	11.7	Translating standards for GES/classifications schemes into specifications of environmental benefits from a human (anthropogenic) perspective				Water Directors - CIS
	11.8	Establish reliable benefits transfer approaches for assessing disproportionate costs.				Water Directors - CIS
	11.9	Assessing disproportionate costs in protected areas where there is flexibility in meeting WFD related objectives.				Water Directors - CIS
	11.10	Coordinating cost-effectiveness analysis in transboundary water bodies.		" HarmoniCA-WP3, TRANSCAT "		Water Directors - CIS
	11.11	Dealing with uncertainty about measures given differencing levels of uncertainty across sectors contributing to pressures (e.g. agriculture/water industry) in an even handed manner.		" HarmoniCA-WP3, HARMONIRIB "		Water Directors - CIS

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Monitoring		Aspects of different monitoring network's optimisation				Euraqua
		Linking monitoring and modelling				Euraqua
		Relations between the monitoring and the entire assessment of status of WBs.				Euraqua
		Development of techniques for Ecological Monitoring				Euraqua
Monitoring	5.1	Aspects of different monitoring network's optimisation		" CEEAM, HarmoniCA-WP4, STAMPS, SWIFT-WFD "		Water Directors - CIS
	5.2	Linking monitoring and modelling		" HarmoniCA-WP4, HARMONIRIB, HarmonIT "		Water Directors - CIS
	5.3	Relations between the monitoring and the entire assessment of status of WBs.		" HarmoniCA-WP4, SWIFT-WFD "		Water Directors - CIS
	5.4	Development of techniques for Ecological Monitoring		" REBECCA, STAR "		Water Directors - CIS
Data management		"Data aggregation, GIS data management, appropriate database formats for storing water related data"				Euraqua
Data management	7.1	Appropriate database for storing water related data		" EUROHARP, HARMONIQUA, HARMONIRIB"		Water Directors - CIS
	7.2	Data aggregation		" HARMONIQUA, HARMONIRIB, HarmonIT "		Water Directors - CIS
	7.3	GIS data management				Water Directors - CIS
WFD policy questions		Linking ecological and socio-economical models				Euraqua
		Tools for presentation to show the effects of different measures and scenario's				Euraqua
		Community education and involvement in decision making				Euraqua
		Approach to evaluation of artificial irrigation canals (in period of year without water)				Euraqua
WFD policy questions	9.1	Linking ecological and socio-economical models		" HarmoniCA-WP3, HARMONIRIB, HarmonIT "		Water Directors - CIS
	9.2	Tools for presentation to show the effects of different measures and scenario's		" EUROHARP, HARMONIRIB "		Water Directors - CIS
	9.3	Community education and involvement in decision making		" HARMONICOP, NEWATER, WATERSKETCH "		Water Directors - CIS
	9.4	Approach to evaluation of artificial irrigation canals (in period of year without water)				Water Directors - CIS
Policy assessment	10.1	" Assess the effectiveness of the implementation programme. Evaluation of environmental results of implemented programmes of measures (e.g. the effects of completed wastewater programs on the chemical, ecological status of water bodies in selected sub-river basins, urban waste water directive; lessons to be learned) "		" HarmoniCA-WP3, HARMONIRIB, MODELKEY, NEWATER "		Water Directors - CIS
Water resources and demand management		"Water conservation, saving, water saving in irrigation, reuse of treated wastewater, new water sources (e.g. desalinisation), water management in drought prone regions"				Euraqua
Water resources and demand management	1.1	Water saving		HarmoniCA-WP3		Water Directors - CIS
	1.2	Water saving in irrigation				Water Directors - CIS

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	1.3	Water conservation		HarmoniCA-WP3		Water Directors - CIS
	1.4	Water reuse (e.g. treated wastewater)		AQUAREC		Water Directors - CIS
	1.5	New water sources (e.g. desalinisation)		" AQUASOL, EASYMED, "		Water Directors - CIS
				" MEDITATE, RRISEASOIL "		Water Directors - CIS
	1.6	Water management in drought prone regions		" AQUADAPT, ARID, HarmonIT, MEDIS, MEDITATE, OPTIMA, TEMPQSIM, WATERSTRATEGYMAN "		Water Directors - CIS
Groundwater managem ent		"Development of common approach for quantification of diffuse pollution – expressed by nutrients and other parameters (i.e. heavy metals, specific organic pollution)"				Euraqua
		Methodology for monitoring and chemical status evaluation on karstic GW bodies				Euraqua
Groundwater managem ent	2.1	" Development of common approach for quantification of diffuse pollution – expressed by nutrients and other parameters (i.e. heavy metals, specific organic pollution) "		" EUGRIS, HarmoniCA-WP3, LIBERATION, SNOWMAN, TEMPQSIM "		Water Directors - CIS
	2.2	Methodology for monitoring and chemical status evaluation on karstic GW bodies		LIBERATION		Water Directors - CIS
	2.3	Threshold values to prevent deterioration of chemical status of GW bodies		BRIDGE		Water Directors - CIS
Knowledge on physical processes		Interaction groundwater - surface water - sediments				Euraqua
		Trends in coastal erosion				Euraqua
		Saline intrusion; what is meant by 'significant intrusion'. Insight in intrusion mechanisms needed.				Euraqua
Knowledge on physical processes	3.1	Interaction groundwater - surface water - sediments		" AQUATERRA, EUROHARP, HarmoniCA- WP3, HARMONIRIB, HarmonIT, TEMPQSIM "		Water Directors - CIS
	3.2	Trends in coastal erosion				Water Directors - CIS
	3.2	Saline intrusion; what is meant by 'significant intrusion'. Insight in intrusion mechanisms needed.		ALIANCE		Water Directors - CIS
Policy assessme nt		"Assess the effectiveness of the implementation programme. Evaluation of environmental results of implemented programmes of measures (e.g. the effects of completed wastewater programs on the chemical, ecological status of water bodies in selected sub-river basins, urban waste water directive; lessons to be learned)"				Euraqua
Pressure Impact relations	6.1	Mining industry impact mitigation		HarmoniCA-WP3		Water Directors - CIS
	6.2	" Closing down old underground mining areas, which impact the water quality and might have negative effects by causing temporary flooding "		HarmoniCA-WP3		Water Directors - CIS
	6.3	" Quantification of the need to internationally reduce the deposition of anthropogenic loads of nutrient, heavy metals and POP´s, SO2 (acidification) "		" HarmoniCA-WP3, MODELKEY "		Water Directors - CIS
	6.4	" Elaboration of models for load of N, P and POP´s on coastal areas and sea "		" HarmoniCA-WP3, MODELKEY, WATERSKETCH		Water Directors - CIS

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				"		
	6.5	Mechanism for transport of N and P in land and water		" EUROHARP, HarmoniCA-WP3, MODELKEY "		Water Directors - CIS
	6.6	POP's in biota		MODELKEY		Water Directors - CIS
	6.7	Further elaboration of the impact of autonomous developments in society on quality elements and parameters representing the status of surface- and groundwater ("baselines in practice").		EURO-LIMPACS		Water Directors - CIS
	6.8	Impact assessment		MODELKEY		Water Directors - CIS
	6.9	Impact of hydropower		WATERSKETCH		Water Directors - CIS
	6.10	Impact from agricultural activities on water bodies		" EUROHARP, WATERSKETCH"		Water Directors - CIS
Others:	12.1	Climate change		" CLIME, EURO-LIMPACS "		Water Directors - CIS
	12.2	Flooding		" ACTIF, FLOODRELIEF, FLOODSITE EAF Floods "		Water Directors - CIS
	12.3	Industrial Wastewater		WSSTP		Water Directors - CIS
	12.4	Landfill and waste		CEMERA		Water Directors - CIS
	12.5	Urban Wastewater		" AISUWRS, CARE-S, CD4WC, CITYNET, DAYWATER, WSSTP "		Water Directors - CIS

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Appendix 4: Definitions

Frascati Research Classification

- Pure Basic Research (carried out for the advancement of knowledge without working for long-term economic or social benefits and with no positive efforts being made to apply the results to practical problems or to transfer the results to sectors for its application)
- Orientated Basic Research (carried out with the expectation that it will produce a broad base of knowledge likely to form the background to the solution of recognised and expected current or future problems or possibilities)
- Strategic Applied Research (research where the work has practical aims, but no specific uses have been worked out for it yet. Strategic applied research can be initiated by researchers doing basic research where the research will probably have a practical use, but this has not been worked out yet. Alternatively, government departments can initiate strategic applied research by asking for it to be carried out. It can be difficult to distinguish between strategic applied and orientated basic)
- Specific Applied Research (applied research aimed at specific products, processes and systems)
- Experimental Development (using knowledge we already have to develop and test new materials, devices, products, systems, or services. This includes designing, building and using prototypes and pilot plants).

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Appendix 5: Research needs from REBECCA EU project.

Taken from "Relationships between pressures, chemical status, and biological quality elements: Analysis of the current knowledge gaps for the implementation of the Water Framework Directive"
Edited by Anna-Stiina Heiskanen and Angelo G. Solimini

SUMMARY
The general objective of the REBECCA project[4] is to provide relevant scientific support for the implementation of the Water Framework Directive (WFD). The two specific aims of the project are, firstly, to establish links between ecological status of surface waters and physico-chemical quality elements and pressures from different sources, and, secondly, to develop and validate tools that member states can use in the process of classification, in the design of their monitoring programs, and in the design of measures in accordance with the requirements of the WFD.
Historically, there has been great success in maintaining and improving the quality of surface waters by developing an understanding of the links between anthropogenic pressures (e.g. water abstraction, agriculture, and effluent discharges) and the chemical status of waters, although there remain many challenges in reliably designing and implementing the necessary programs of measures. Our present understanding of the link between chemical properties and ecological state, while good in some instances, is generally not adequate to support management intervention against ecological objectives. In this report we review and identify information gaps in our knowledge on relations between pressures, chemical and ecological status for the major pressures types and biological quality elements. We also give an overview of the chemical parameters that are used to determine the ecological status of water body types and of the biological indicators currently applied and/or potentially applicable as classification parameters for inland and coastal waters. This gap-analysis is needed to 1) identify the key areas of further work within the REBECCA project and 2) to identify the areas where further experimental or monitoring work would be needed (beyond the scope of REBECCA), due to lack of data or quantitative understanding of the functional relationships between chemical status and biological quality indicators. This report should help in focusing the on-going WFD intercalibration process in 2005-6. In particular it should provide insights on which biological and pressure parameters should be selected and which data there would be available to illustrate the degradation of the biological quality with respect of pressure gradients. Regarding data availability to Rebecca project, major gaps were identified as follow:

- Data from the Mediterranean and alpine lake types
- Data from large part of the Mediterranean coastal & transitional types (with exception of Italy)
- Data on concentrations of toxic chemical substances in combination with biological quality element indicator data
- Macrophyte and benthic invertebrate data from many lake & coastal types
- Fish data from lakes (and transitional waters – not included in REBECCA)

Apart from these data gaps, there are common "knowledge gaps" in relation to tasks required by the WFD that exist for all surface water categories:

- Development of reference conditions
- Development of type-specific classifications

[4] http://www.environment.fi/syke/rebecca

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- Criteria for setting class boundaries
- Criteria for setting ecological thresholds
- Supporting element classifications related to biological impact
- Relationships between nitrogen conditions and ecological responses
- Estimations of uncertainty in classifications
- Uncertainty in measured data
- Responses to combined pressures

Additionally, a summary of specific knowledge gaps for each combination of pressure and quality element is given in the following pages for inland and marine water ecosystems. Lake ecosystems: summary of major knowledge gaps for pressure and quality elements.

Pressure	**Element**	**Knowledge gap**
Eutrophication	*Phytoplankton*	Threshold concentrations for high/good and good/moderate boundaries Taxonomic indicators for measuring impacts of nutrient pressures Establishment of supporting physico-chemical conditions Reference conditions in different lake types Effect of seasonal variability on classification schemes Ecological impact of nitrogen conditions
	Macrophytes	Relationships that distinguish effects of nutrients from effects of other variables Type-specific reference conditions and classification schemes Assessment of spatial and temporal variability
	Phytobenthos	Absence of classification schemes and quantitative relationships among phytobenthos and nutrients
	Benthic invertebrates	Relationships between level of oxygen depletion and taxonomic composition
	Fish	Standard fish indicators based for different lake types
		Relationships between duration of minimum oxygen-concentrations and different fish indicators
Hydromorphological	*Macrophytes*	Confounding effects of site specific variability, including sediment and water quality

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Lake ecosystems: summary of major knowledge gaps for pressure and quality elements (continue from previous page).

Pressure	**Element**	**Knowledge gap**
Euthrophication-hydromorphological	*Macrophytes*	Phytoplankton-macrophytes competition under fluctuating water level How to account for temporal variability

Euthrophication-acidification	*Macrophytes*	Identification of quantitative indicators and classification schemes
Euthrophication-toxics	*Benthic invertebrates*	Identification of quantitative indicators and classification schemes
Acidification	*Phytoplankton, macrophytes, benthic invertebrates*	Effects of acidification needs to be separated by the effect of other co varying or interacting variables including nutrients and biotic interactions
		Effect of acidification episodes
	Fish	Relationships among water parameters related to acidification and fish based indicators

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