COMMON IMPLEMENTATION STRATEGY FOR THE WATER FRAMEWORK DIRECTIVE

KEY ISSUES AND RESEARCH NEEDS UNDER THE WATER FRAMEWORK DIRECTIVE

FINAL DOCUMENT, COMPRISING PHASE 1 AND PHASE 2

Note: The Phase 1 document was discussed and the policy summary endorsed at the Water Directors' meeting on 20 June 2005 in Mondorf-les-Bains (Luxembourg). The Phase 2 document was endorsed at the Water Directors' meeting on 28 November 2005 in London. The document should be regarded as presenting an informal consensus agreed by all partners. However, the document does not necessarily represent the official, formal position of any of the partners.

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1. INTRODUCTION

The year 2005 is an important milestone in the implementation of the Water Framework Directive. In March of this year, the so-called 'article 5 reports' should be submitted, that consist of a profound analysis of the condition of the European water systems and the pressures threatening them. In 2004, during the preparation of the new working programme of the Common Implementation Strategy (CIS) under the European Water Directors (WD), it was obvious that the knowledge on key issues that deserved further action acquired in the preparation of the article 5 reports should be part of the considerations regarding the future activities in the CIS process. At the same time, it was clear that waiting for the official article 5 reports and then carrying out an analysis would take too long, and would face practical obstacles such as the different EU languages and incomparability of report formats. Therefore, the Water Directors decided to get this information in a light process.

Phase 1

The 'activity on key issues and research needs' obtained the key issues via a questionnaire to the European countries. The main aim of the first phase of the activity was to identify those issues that would merit action at EU level by the CIS process. The background document "Information exchange on WFD key issues and research needs" elaborates in more detail the methods and results of the activity.

The questionnaire had a high return of all 25 EU member states, together with Norway and Iceland. It turned out that most of the issues mentioned in the return of the European countries, were already covered by the different activities under the CIS process. This leads to the conclusion that the mechanism of prioritising in the CIS structure provided a sound overview of the WFD topics deserving a co-ordination at EU level. The activity on key issues only adds some details to this process.

The activity focussed on issues that deserve extra attention at EU level, since it was input for the working programme of the CIS process. One should bear in mind that issues not included in the list, could be of severe concern in individual member states.

The questionnaire gives insight in the presence of a topic (is it a widely spread concern, or only in a few countries?) and in the severity (is it high or low on the priority list?). The issues were differentiated in 'driving forces and pressures' and 'other obstacles' (how easily could the article 5 report be produced?).

Phase 2

In the second phase of the activity, the role of research in the WFD implementation has been investigated in more detail. Ideally, the second phase would lead to a list of specific topics as input for the research community. During the discussions it turned out that neither the demand side, nor the result side could provide lists that were specified enough to match them easily. Therefore, the original mandate has been taken in a broader manner. The background document describes the findings and conclusions from the discussions, with some broader recommendations.

2. DRIVING FORCES AND PRESSURES

- The European countries broadly judged 'agriculture' and 'morphological pressures' as issues of the highest concern. Almost all countries mentioned these topics, and also put them high on the priority list. Both issues already are subject of activities under the CIS process. The Strategic Steering Group on WFD and Agriculture is dedicated to the impacts of agriculture on the water system, and the effect of the WFD on agriculture. The topic 'morphological pressures' has been explored by the EC via a letter to all WD, in order to start a new activity on the subject.
- Municipal wastewater was another issue broadly reported by the European countries, although it didn't get high marks on severity. The Urban Wastewater Treatment Directive largely covers the issue (UWWTD, 91/271/EC). Nevertheless, it might be worthwhile to investigate whether additional measures are needed in order to comply with the objectives of the WFD, especially with respect to municipal wastewater from smaller agglomerations and to substances that are not sufficiently retained in treatment facilities.
- The issue 'industry' shows a diverse picture. The input from the questionnaire leads to the conclusion that industry is not broadly regarded as an issue of concern. At the same time, specific industries pose great difficulties to specific countries. Generally speaking, the "IPPC BREF-process" covers the industrial sectors mentioned. Nevertheless, given the diverse picture, it might be worthwhile to consider the installation of a system of information exchange between individual countries. The issues of "mining" and "landfill and waste" might need extra attention.
- Regarding other issues of pollution, 'long range transport of air pollution' seems to be the main issue that is not covered under the CIS process.
- Several of the issues might be very difficult to tackle with WFD instruments only. Integration with other policy areas is considered to be worthwhile.

3. OTHER OBSTACLES

- Many countries faced difficulties related to data availability, data formats and the level of aggregation of data. Actions at the level of member states and international river basin districts are needed to overcome the difficulties with data availability. Some are tackled by the activities of Working Group D on reporting and the Working Group A with regard to the topic of intercalibration.
- Specific interest was given on 'how to present the outcomes of the article 5 reports in the WFD context' (key elements: 'pre-selection of problems for follow up steps', 'communication with stakeholders, actors and the public at large', 'rules of the game'). This is not only a concern of member states, but also for the European Commission when the results of the Article 5 analysis are synthesised and communicated, e.g. clarification of the role of socio-economics in the implementation of the Directive. This issue is partially covered by the group on Environmental Objectives.
- At an international level, similar difficulties were encountered as at national level regarding disunity in methods and data formats. This issue seems more profound in cases where non-EU countries are part of the international river basin district. An additional point in international river basins is the 'upstream-downstream' relation. In a number of cases, adequate measures can only be formulated at EU level (e.g. marketing and use, pesticide directive, etcetera). These issues deserve further investigation in the CIS process.

4. RESEARCH NEEDS

- Countries had to face different knowledge gaps. Generally speaking, the issue categories "Water resources and demand management", "Groundwater management", "Knowledge on physical processes" en "Policy assessment" are relatively well covered by research. The issue categories "Knowledge on ecological processes", "Impact assessment", "Measures assessment" and "Economics" are relatively poorly covered. The categories "Monitoring", "Data management" and "WFD policy questions" fall in between.
- It turned out during the activity that there are some fundamental gaps in our understanding of ecological processes and particularly of the impact of human activities on those processes. Whilst there is ongoing research, it won't deliver all of the answers and there are still going to be gaps in our understanding when we come to doing river basin planning.
- The relationship between research and policy is not always an easy one, but can be improved by intensifying the face-to-face communication between the respective groups. It would be worthwhile to organise a closer cooperation between CIS working groups and relevant research projects. On the one hand, WG leaders can invite research groups regularly to the meetings of working groups and discuss the demands and possible solutions offered (starting on a broad level, and narrowing down to a very specified level). On the other hand, WG leaders can join meetings and workshops of research projects of interest.

5. CONCLUSIONS

"We, the Water Directors of the European Union[1], the Accession Countries[2] and the EFTA Countries[3], welcome this policy document on Key Issues under the Water Framework Directive. It is a timely and valuable contribution to the prioritisation of activities under the Common Implementation Strategy.

The Water Directors agree to publish the policy summary and the background document on WFD key issues and research needs, and to disseminate them widely. The Water Directors ask the Strategic Co-ordination Group to prepare proposals for integration of outstanding issues in the CIS process. Furthermore, the Water Directors encourage the continuation of the process of positive collaboration between the CIS and research communities, by involving representatives of research projects in the CIS Working Groups and deliver the outputs of the work on research needs as an active input for WISE-RTD. "

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1 Austria, Belgium, Czech Republic, Cyprus, Denmark, Estonia, France, Finland, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom, the European Commission and the European Environment Agency

2 Bulgaria, Romania

3 Iceland, Norway, Switzerland and Liechtenstein

BACKGROUND DOCUMENT

WFD KEY ISSUES AND RESEARCH NEEDS

1. INTRODUCTION TO THE ACTIVITY

1.1. Objectives and main activities

This report is a product of the project 'Activity on Information Exchange and Research Needs', which is an activity under Working Group B (Integrated River Basin Management) of the Common Implementation Strategy (CIS). This CIS serves, among other things, to support the implementation of the Water Framework Directive (WFD) in the EU. See for the exact work programme: "Moving to the next stage in Common Implementation Strategy for the Water Framework Directive –Progress and work programme for 2005 and 2006 – ", which was agreed to by the Water Directors during their meeting in Amsterdam (December 2004)[4].

The objective of the 'Activity on Information Exchange and Research Needs' is to identify and prioritise issues arising from the WFD Article 5 activity, which in turn require an EU-wide approach, and to identify blank spots in research.
In order to achieve the objective, the following activities were carried out:

- The first activity was to prepare a first draft list of issues and gaps identified during the WFD Article 5 activity in a 'light process', prior to the finalisation of the actual Article 5 reports. The results of this first step are presented in the annexes.
- Secondly, this first draft list was checked for EU level relevance and prioritised, once the Article 5 reports were published (resulting in a final draft list of problems issues). This step was taken during the Ghent meeting on April 4 and 5. Following on from this "check", the research needs arising from the problem issues were made more explicit (taking into account input from the research society, and resulting in a draft list of research topics). The discussion with the research society started during the HarmoniCA Forum and Conference, also in Ghent on April 5-7.
- Finally, the objective is to have both lists endorsed by the WD via the SCG.

In practice, this means that during the process three lists will be provided:
An initial list detailing all issues raised by the Member States, secondly an advanced list containing issues relevant at EU level, and thirdly a list identifying the research needs emerging from the EU relevant issues. See also Figure 1 below.

[4] http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive/implementation_documents&vm=detailed&sb=Title

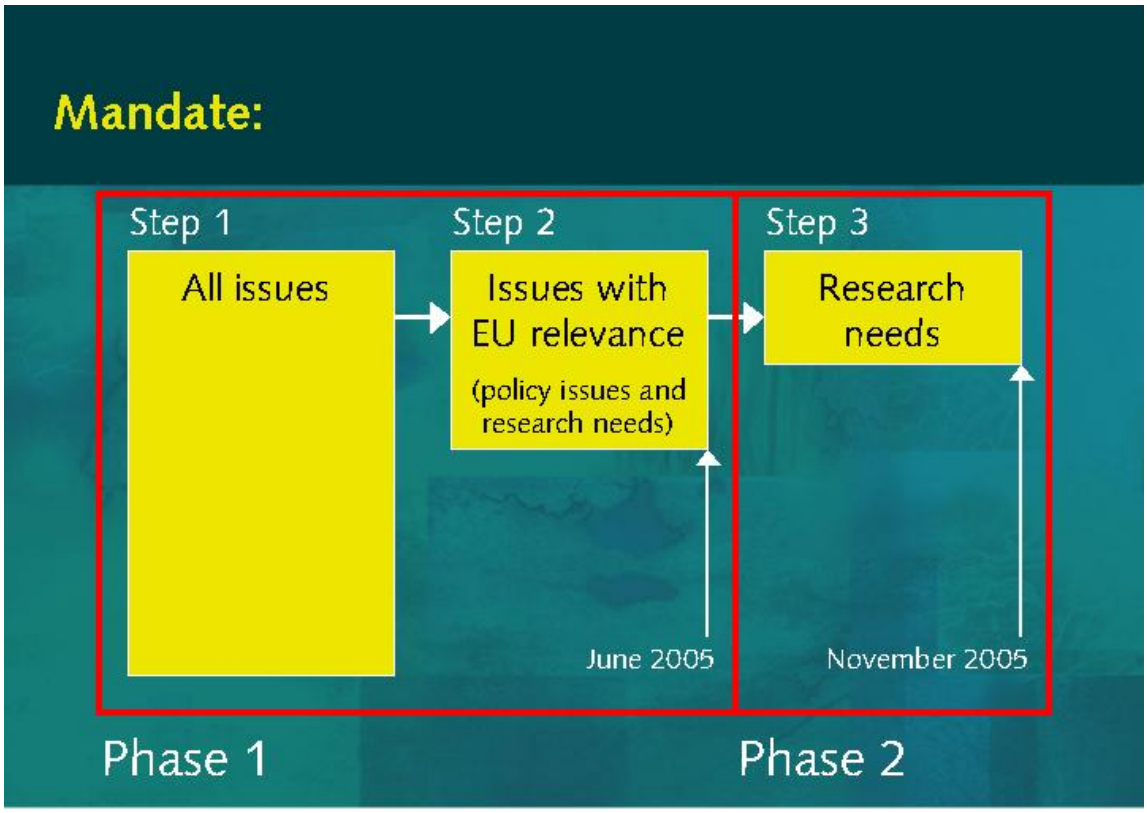


Figure 1: Overview of the activity

1.2. Method

The two key points of the activity are 'quick' and 'transparent', since it aims at future steps to take in the CIS process. Hence the key issues were obtained from the EU Member States, Accession Countries and EFTA Countries with the help of a questionnaire in the first months of 2005. The questionnaire was drafted on the basis of the IMPRESS guidance document, and commented on by the Sounding Board[5] and the WGB members before sending it out to the Water Directors and SCG delegates.
During the Ghent meeting, the draft report that followed the questionnaire was presented by the project team (Spain and The Netherlands). All countries were asked to check the analysis presented, and to give feedback on whether or not the issues were presented correctly. In the first half of the meeting, a higher degree of consolidation was obtained. During the latter half of the meeting, key issues were checked on EU-relevance and were prioritised. The analysis, enriched by the outcomes of the workshop, will be placed on the agenda of the Water Directors seminar in Luxembourg.
The concluding session was at the same time the opening session of the 2nd HarmoniCA Forum and Conference, in which European researchers discussed their contribution to the WFD process. During this event, the first steps were taken to identify the list of research requirements, which was to be developed further in the second phase of the activity, during the second half of 2005.
Ideally, the second phase would lead to a list of specific topics as input for the research community. This specified list would neatly fit into the process of the coming about of the next EU research programme, FP 7. Nevertheless, such a list requires a very specified 'wish list' ('what do we exactly want to know?') and a thorough insight in the

[5] Members of the Sounding Board and the participants to the Ghent meeting are listed in Annex I.

results of already performed research. During the discussions it turned out that neither the demand side, nor the result side could provide lists this specified that matching could be easily done. Therefore, the original mandate has been taken in a broader manner

The way of working aimed at guaranteeing that no issues would be overlooked, and that the input from the different countries would be correctly represented. Among the discussions arising at the Ghent and WGB meetings, the issue of long-range air pollution seemed to be underestimated in the analysis (based on the questionnaire). Another topic under discussion was whether or not the persons completing the questionnaires had a sound overview of the issues in their respective country. However, no country has since made any amendments to their original input.

2. RESULTS

The questionnaire had a remarkably high return of all the EU member states, together with Iceland and Norway. The following two exceptions were noted from the submissions:

- In the case of Belgium, a region completed the form instead of the state.
- France completed the questionnaire in such a way that only qualitative data could be derived from it.

The questionnaire was aimed at finding answers to the following questions:

1. What are the most important driving forces and pressures that prevent a good status?
2. Which obstacles did countries face in the process of producing an article 5 report, and which obstacles do they expect to face in the future?
3. Which issues (both driving forces, pressures and other obstacles) would merit an international approach?
4. Which issues would need extra research?

The results of the questionnaire will be reported following these questions.

2.1. Important driving forces and pressures

The list of possible driving forces and pressures was based upon the guidance document on pressures and impacts (IMPRESS). Driving forces and pressures were divided into general categories (the lines in grey) and had a possibility to specify (the lines in white).

POLLUTION	
Households	
	Households - municipal waste water
	Households - storm water overflows
	Households - domestic waste water (not connected to a sewer system)
Industry	
	Oil and gas (including refineries and petrochemical industries)
	Chemicals (organic and inorganic)
	Pulp, paper & boards
	Textile industry (including wool)
	Tanning of hides and leather manufacture
	Iron and steel
	Non-ferrous metals
	Power generation (not hydropower)
	Shipyards
	Other manufacturing processes, namely: …
Agriculture	
	Arable land, grassland, mixed farming
	Crops with intensive nutrient or pesticide usage or long bare soil periods (e.g. corn, potato, sugar beet, grapevine, hop, fruit, vegetable)
	Over grazing and cropping practice – resulting in erosion
	Horticulture, including greenhouses
Other sources of pollution	
	Aquaculture / fish farming
	Forestry
	Impervious areas
	Mining (including quarries)
	Landfill and waste sites
	Transport
ABSTRACTION	
Reduction in flow	
	Abstractions for agriculture
	Abstractions for drinking water supply
	Abstractions for industrial purposes
	Abstractions for fish farming
	Abstractions for mining
	Abstractions for navigation (e.g. canals)

ARTIFICIAL RECHARGE	
	Groundwater recharge
MORPHOLOGY	
Flow management	
	Hydropower works (including dams)
	Reservoirs
	Flood defence works
	Water transfer (including pumping stations)
	Weirs, dams, locks, and sluices for navigational purposes
River management	
	Physical alteration of channel (including banks and dikes)
	Shipping
	Modification for agricultural purposes
	Modification for fishery purposes
	Land transport infrastructure (road/bridge construction)
	Dredging
Transitional and coastal management	
	Estuarine/coastal dredging
	Maritime engineering works (shipyards, harbours)
	Land reclamation and polders
	Coastal sand supply (safety)
OTHER ANTHROPOGENIC PRESSURES AND IMPACTS	
	Recreation
	Fishing/angling
	Introduced / alien species
	Climate change
	Others, namely …

The questionnaire required an indication as to whether the issues were of concern to the country, and if so, to add an indication of the weighting of an item. This was done by a figure between 1-5:

- 1 highlighting the issue as a problem, or potential problem, but with little impact and not a high priority at this moment.
- 5 indicating that the issue is the main reason for not achieving the objectives, and is the top-priority.

In addition, the water category had to be noted (rivers, lakes, coastal and transitional waters, or groundwater). Annex III presents the return of the questionnaire in the form of a table. Forty issues were ranked at least once at the level 4 or 5 (5 indicating that "the issue is our top priority").

In order to bring the important issues in perspective, the percentage of countries reporting an issue was calculated, as well as the average weighting when an issue was reported. The percentage gives an idea whether an issue is broadly regarded as a problem, while the weighting marks the severity of a problem.

The table in Annex III highlights issues with a frequency of 70% or higher in orange. Weightings of 3.0 and higher are marked green. The issues ranked 4 or 5 are marked in yellow, giving an overview of the issues regarded as important by individual countries.

Pollution from agriculture

Many countries reported agriculture as being an issue of concern. Agriculture in general was reported for rivers (77% of the countries) and groundwater (73%). The average weighting of agriculture was high, from 3.7 in groundwater to 3.4 in rivers. These results signify agriculture is a severe problem for a large majority of the countries. This is confirmed by the question on the programme of measures (PoM), where 24 of the 26[6] countries reported agriculture to be a topic in their PoM.

Morphology

Another area of broad concern relates to morphology. The general categories, 'flow management' and 'river management', include issues like 'hydropower works', 'flood defence works', and 'physical alteration of the channel'. The two general terms 'flow management' and 'river management' were reported in 65% and 62% of the cases as being a problem. This figure was higher in the specified issues, up to 88% for 'physical alteration of the channel'. The weighting of the issues was also high, with several issues scoring a 3.0 and 3.2. The high score on morphology is endorsed by the question on PoM, where 21 countries noted measures to mitigate hydromorphological impacts caused by bank alterations, navigation, hydropower and the presence of dikes.

Pollution from municipal wastewater

An extensively reported issue category is pollution from municipal wastewater. The general category was acknowledged in 77% of the cases for rivers. The more specified terms where reported even more often, with the highest percentage for 'municipal wastewater' in the category rivers: 92% (the most frequently reported issue in the questionnaire!). However, in the overall scenario of weighting issues, pollution from households is of less concern; none of the issues exceeds a weighting of 2.9. The topic also often was mentioned for the PoM by 22 countries (out of 26).

The difficulties faced with wastewater emissions from households depend on: the percentage connected to a sewer system (e.g. due to scattered dwellings);

[6] France did not complete this section

agglomerations under 2000 inhabitants; and storm water overflow in the case of combined sewers (sewage and rainwater). Other difficulties mentioned are the discharge of wastewater treatment systems on small water bodies and the presence of substances in the sewage that pass through the treatment facilities (e.g. metals, health products and endocrine disruptors). Finally, various countries made reference to the financial burdens that accompany sewage collection and treatment (e.g. maintenance costs).

Pollution from industry

None of the issues under the heading 'industry' exceeds the 70% in frequency. The three industrial sectors with the highest frequency are 'chemicals (organic and inorganic)' (58%), 'pulp, paper & boards' (58%), textile industry (54%), and 'non-ferrous metals' (54%), all with respect to rivers. The weighting of the issues stays under 2.9, except for the issue 'food processing industry', that was added by 5 countries and reached 3.0 for groundwater. Nevertheless, the frequency of this specific item was only 8%.
Although industry doesn't seem to be a major issue in general, individual countries did report high weightings for industry (4 and 5). This is confirmed by the question on PoM. 17 countries reported measures to be taken for industries, without prevalence for specific sectors though.
At the Ghent meeting, some countries expressed their concerns about industries, though the topic clearly was of less concern to others. When checking the list of BAT reference documents (BREF's, see also Annex V), all industrial sectors mentioned have been covered.

Other sources of pollution

Remarkable in this category is the issues 'landfill and waste', being reported by 77% of the countries. Yet, the average weightings in the category 'other sources of pollution' are relatively low, though in individual cases countries do weigh issues high (e.g. the issue 'mining').
In the PoM, additional issues arise, e.g. pollution from old contaminated sites and contaminated sediments due to historic pollution, recreation and salt intrusion. Transport causes difficulties because of new transport infrastructure as well as diffuse pollution contributions, mainly in urban areas.
A topic mentioned only a few times, but with potentially consequences for the international level, is pollution caused by atmospheric deposition, e.g. Iceland reports "long range chemical transport from other countries to Iceland (POP's and heavy metals)" as high priority.

Reduction in flow

This category has a picture comparable to 'other sources of pollution'; 'abstractions for drinking water supply' is broadly reported (77%), but lowly weighted. The issue got a higher priority is countries where abstraction regulatory regimes were not in place or where major resource shortage occurs.

Distribution over the EU

Although one might assume specific issues to be occurring in specific regions in Europe more than others, this hardly seems the case. Of course, for broadly reported issues any preference for a region will be difficult to identify by definition, since almost every country mentions the issue (e.g. households and agriculture). But also issues like 'landfill and waste', 'mining', and 'old contaminated sites' seem to occur across the board.

The only issue that reflected region-dependency was 'reduction in flow', which is geographical and climate-related. It is a problem in the Mediterranean region, because of the abstraction of river water for agricultural purposes (Italy, Greece and Spain reporting high weighting figures). However, the issue also concerns northern countries, but merely as a problem in the groundwater flow due to abstractions for drinking water and mining.

2.2. Obstacles now and in the future

Countries were asked to list the obstacles they faced within the production of the article 5 reports. The reactions fall into 5 groups: data (19 countries), knowledge gaps (14), resources (10), international co-ordination (8), and the WFD process (7).

Data

Firstly, countries had a lack of data, especially in the fields of hydromorphology, biology and economics. Apparently, up to now there was no need to gather those data. A country stated that they suffered from a "limited availability of data, particularly with regard to pressures not currently subject to regulation".
Secondly, there is the problem of data formats; different formats from different agencies, and a disunity of input data (with input from official statistics, data bases of water users and data bases of authorities), e.g.: "Information is available, but is collected on an inappropriate scale and thus is not suitable for the intended use."
Finally, the level of aggregation of available data was very diverse, both at national and international level. "This was most striking for issues related to the economic analysis."

Although the topic data is recorded as a future concern by fourteen, this is not necessarily a common view: "Data availability at river basin scale is of course one of the issues but does not seem to be a problem as new databases have been established especially, for the needs of river basin management." Stated elsewhere: "A general problem is that we all had to work with available data, although more information should be used in order to estimate whether the objectives of the WFD could be met in a more precise way. This underpins the importance of the future monitoring activities in affirming the choices made in the art 5 report, which in turn can be sanctioned (or deselected) if specific and targeted information becomes available."

Knowledge gaps

The different knowledge gaps fall into 5 groups:
Insights and tools to estimate the current status of the water system are lacking, e.g. in some cases the detection limits of substances are higher than the standards set for those substances in the environment.
In diverse wordings, countries indicate that the interactions between different water systems are poorly documented (relations surface water – groundwater – sediment, or coastal zone – open sea, and others).
Countries have difficulties with impact assessment and lack the models to calculate the effects of several pressures, e.g. morphology, significance of pressures, historic pollution of sediments, diffuse pollution, and the mixed effects of different pressures.
Insight is also lacking in how reference conditions and good status actually appear, and thus what the objectives are.
Finally, and hardly surprising after this list, countries find it difficult to perform a sound measures assessment.

The issues on data and knowledge gaps were resumed by one country, stating that "to find an expert with the solid opinion seems to be rather difficult, since there are other experts who have different opinions".

Countries reported similar knowledge gaps when asked to list future problems.

Resources
Countries are hindered in their attempts to source adequate financial and human means for the WFD implementation. A justification here fore is that the information exchange internally has been poor, and all the relevant institutions have not been notified timely or they did not comprehend the volume of work involved. Another, more external reason given, is the very high workload due to international co-ordination.

The number of countries expecting the resources to be a problem in the future is remarkably higher (16) than the countries that actually had problems with it in the production of the article 5 report (10).

International co-ordination
The challenges in international river basin districts are twofold.
On the one hand, approaches, evaluation methods and data formats differ from country to country (on top of differences within countries, refer to 'data' above) and need harmonisation or co-ordination. In some parts of the EU, this process is even more difficult because countries must co-ordinate with non-EU countries (eastern border of the EU).
On the other hand, there is the upstream – downstream relation that complicates the situation. "Pollution from upstream countries" is the most obvious hampering factor in this relation, but of course, downstream countries blocking migration routes for biota also may become a topic.
Countries expect the same issues to occur in the future.

A third aspect of international co-ordination concerns the need for measures taken at EU level. "Many substances (priority, priority hazardous and "substances discharged in significant amounts" are related to EU legislation based on prevention of distortion of competition. For many substances it will be vital that generic measures are formulated at EU level."

WFD process
Some issues are related to the WFD process itself, the new ways of water management introduced by it, and the adaptation time needed by the authorities in the EU countries.
The 'general mindset' of the WFD seems to leave little room for all kind of atypical water systems. This goes for the many smaller lakes and rivers in the Nordic countries, as well as the heavily modified water systems in the deltas of big European rivers.
In some cases, countries experience the lack of standardisation methods for defining typologies; clear criteria for the definition of reference conditions; and assessment criteria for the risk analysis.
The type of planning introduced with the WFD brings with it its own challenges. As stated by a country: "The time frame of the WFD covers a period of 15 years or even more in the case of exemptions. Widespread discussions took place at technical and political level in order to become familiar with the stepwise approach of the WFD, the

role of the article 5 analysis, of the monitoring programme and the programmes of measures to be included in the River Basin Management Plan. Specifically, the fact that the article 5 report was a kind of pre-selection of potential problem area's (preventing the achievement of WFD objectives) and that only in a later stage the set of possible measures were to be decided, was very difficult to communicate."
Finally, during the implementation of the WFD, the theoretically formulated objectives took on a more operational role and it turned out that many more efforts seem to be necessary in order to meet the objectives. "This fact was and still is a subject of a national political debate," or, as stated by another country: "Political approval is necessary for many issues that are included in the report."

These issues are not reported in the same wordings as future obstacles, but notes like "integration of sectoral policies and stakeholders expectations", "social costs; increase of water prises", "acceptance of measures", and "the difficulty to explain the WFD method for assessing water quality (one out all out, with substances as quality elements)" indicate that it won't be just a matter of time to have the WFD rational accepted, and some action might be needed.
With respect to the future obstacles, the "lack of harmonisation of WFD with CAP" is mentioned as an obstacle, as well as "the fragmentation of the water legislation and powers" and "limited economic strength of major polluting sectors". This encourages a closer co-ordination of the WFD with other policy areas.

2.3. Issues meriting an international approach

The countries were asked to indicate what issues would merit an international approach, and to make a distinction between actions at EU level, at international river basin district level (IRBD), or at both levels.

Analysis of the answers showed that they can be divided into three categories, namely:
Common understanding of main principles, objectives and methods, e.g. do we assess the quality of water systems in such a way that we understand the same by a certain outcome? This can be a matter approached at EU or IRBD level.
Implementation of the WFD in an effective and efficient manner, e.g. in a co-ordinated way at the most effective level. This also can be a matter at EU, IRBD or at an even lower level.
Development of new knowledge and new methods. Partially, this will be a matter of new research, but information exchange could be adequate too in some areas. Most countries address direct these demands at EU level.

Common understanding of main principles, objectives and methods
The EU countries reported several issues regarding 'assessment of the quality of water systems', 'economic topics', and 'environmental objectives'.

The assessment of water quality systems covers:
Intercalibration of assessment methods for biological quality elements (IRBD and EU),
Relations between the monitoring and the entire assessment of the status of water bodies (EU),
International agreement on biological assessment methods (IRBD and EU), and
The relationship between hydromorphological and biological conditions (IRBD and EU).

The economic topics are related to:
Cost-benefits and cost recovery topics (EU), and
Common understandings concerning what are "economic instruments" and what are "economic measures" (EU).

The environmental objectives relate to:
Environmental standards for annex VIII and X substances (EU),
Agreement on operational variables as a result of common or co-ordinated objectives (IRBD),
Establishing threshold values (EU),
Collection and evaluation of toxicity test data (EU).

Implementation of the WFD in an effective and efficient manner
This title covers several topics regarding the handling of data, measures assessment and the programme of measures, and the relations of the WFD with other policy areas.

Data management issues cover the collection of data, data storage and data management. It would be worthwhile to strive after a data management system allowing simple interactions among all systems in Europe. Some countries who mentioned this issue requested some form of action at EU level, others had a preference for it to be tackled at IRBD level.

Several countries refer to measures assessment and the programme of measures (PoM) as issues that need co-ordination. In most instances, countries refer to the actual assessment and actual measures for specified activities. The level of involvement (EU or IRBD) is well related to the scale of the problem, e.g. the issue of abstraction and co-ordination of measures to save water in irrigation should be dealt with at IRBD level, while climate change is an issue for EU level. At the same time, issues occur at river basin level, but are so widely spread through Europe that an EU level approach would be preferable. This is the case for diffuse sources, eutrophication, alien species management, and morphology issues.

In several answers, there is the wish for harmonisation of WFD objectives with other policy areas. The issue mentioned most frequently in this respect is agriculture. Nevertheless, since legislation at the EU level might be the most effective and appropriate tool for adequate and generic emission control measures in some areas, other policy areas might also be at stake (e.g. transport).

Development of new knowledge and methods
In this part, several issues are mentioned. In some cases, new research or development activities seem appropriate, but in other cases, information exchange between different countries could be adequate too. The demand for new knowledge turns up with the topics 'assessment of quality', 'impact assessment', 'interactions between different water systems', 'programme of measures', 'water resources management', and 'unknown substances'. Most countries ask for action at EU level. Countries demand for simple model approaches related to e.g. calculation of diffuse inputs, ecological effects due to various pressures, prediction models, etc. Also is insight demanded in relations between groundwater – surface water – sediments, and in relations in various quantitative surface- and groundwater issues, such as water saving, water conservation, water management during drought periods, etc. See also section 3, on issues demanding research.

3. ISSUES DEMANDING RESEARCH

Phase I of the activity produced a list of issues that would need extra research. The table below links those topics (first four columns) to the CIS working groups[7] concerned and to research projects that are currently being executed (see Annex 6 for information about the research projects).

No		No	Sub-issue	CIS group	Research project
1	**Water resources and demand management**	1.1	Water saving	WGB	HarmoniCA-WP3
		1.2	Water saving in irrigation		
		1.3	Water conservation		HarmoniCA-WP3
		1.4	Water reuse (e.g. treated wastewater)		AQUAREC
		1.5	New water sources (e.g. desalinisation)		AQUASOL, EASYMED, MEDITATE, RRISEASOIL
		1.6	Water management in drought prone regions		AQUADAPT, ARID, HarmonIT, MEDIS, MEDITATE, OPTIMA, TEMPQSIM, WATERSTRATEGYMAN
2	**Groundwater management**	2.1	Development of common approach for quantification of diffuse pollution – expressed by nutrients and other parameters (i.e. heavy metals, specific organic pollution)	WGC	EUGRIS, HarmoniCA-WP3, LIBERATION, SNOWMAN, TEMPQSIM
		2.2	Methodology for monitoring and chemical status evaluation on karstic GW bodies		LIBERATION
		2.3	Threshold values to prevent deterioration of chemical status of GW bodies		BRIDGE
3	**Knowledge on physical processes**	3.1	Interaction groundwater - surface water - sediments	WGA, WGB, WGC, WGE	AQUATERRA, EUROHARP, HarmoniCA-WP3, HARMONIRIB, HarmonIT, TEMPQSIM
		3.2	Trends in coastal erosion		
		3.2	Saline intrusion; what is meant by ‘significant intrusion’. Insight in intrusion mechanisms needed.	WGC	ALIANCE
4	**Knowledge on ecological processes**	4.1	Relationship between hydromorphological and biological conditions	WGA	AQUATERRA, REBECCA, WATERSKETCH
		4.3	Environmental standards for annex VIII and X substances	WGE	
		4.4	Modelling tools to define reference conditions	WGA	EURO-LIMPACS, HarmoniCA-WP4, REBECCA
		4.5	Intercalibration of assessment methods for biological quality elements	WGA	REBECCA, STAR, SWIFT-WFD
		4.6	Objectives for hydrology (minimum flow)	WGA	

[7] Common Implementation Strategy. See for details the link under footnote 4 above.

No		No	Sub-issue	CIS group	Research project
		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.	WGA	AQUATERRA, EURO-LIMPACS, REBECCA, WATERSKETCH
		4.8	Everything concerning the connection/effect between/on hydrological, hydromorphological, hydro geological factors/processes and the status of the ecosystems	WGA	AQUATERRA, EURO-LIMPACS, REBECCA, WATERSKETCH
		4.9	Development of common EU-wide biological assessment methods (option 1 of INTERCALIBRATION process guideline)	WGA	REBECCA, STAR
		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	WGA, WGC, WGE	EURO-LIMPACS, MODELKEY
		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.	WGA	
5	**Monitoring**	5.1	Aspects of different monitoring network's optimisation	WGC, WGE	CEEAM, HarmoniCA-WP4, STAMPS, SWIFT-WFD
		5.2	Linking monitoring and modelling		HarmoniCA-WP4, HARMONIRIB, HarmonIT
		5.3	Relations between the monitoring and the entire assessment of status of WBs.		HarmoniCA-WP4, SWIFT-WFD
		5.4	Development of techniques for Ecological Monitoring	WGA	REBECCA, STAR
6	**Pressure Impact relations**	6.1	Mining industry impact mitigation		HarmoniCA-WP3
		6.2	Closing down old underground mining areas, which impact the water quality and might have negative effects by causing temporary flooding		HarmoniCA-WP3
		6.3	Quantification of the need to internationally reduce the deposition of anthropogenic loads of nutrient, heavy metals and POP´s, SO_2 (acidification)		HarmoniCA-WP3, MODELKEY
		6.4	Elaboration of models for load of N, P and POP´s on coastal areas and sea	WGA	HarmoniCA-WP3, MODELKEY, WATERSKETCH
		6.5	Mechanism for transport of N and P in land and water	WGA	EUROHARP, HarmoniCA-WP3, MODELKEY
		6.6	POP's in biota	WGE	MODELKEY

No		No	Sub-issue	CIS group	Research project
		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").	WGB	EURO-LIMPACS
		6.8	Impact assessment	WGA, WGB, WGC, WGE	MODELKEY
		6.9	Impact of hydropower	WGA, WGB	WATERSKETCH
		6.10	Impact from agricultural activities on water bodies	WGA, WGB	EUROHARP, WATERSKETCH
7	**Data management**	7.1	Appropriate database for storing water related data	WGD	EUROHARP, HARMONIQUA, HARMONIRIB
		7.2	Data aggregation	WGD	HARMONIQUA, HARMONIRIB, HarmonIT
		7.3	GIS data management	WGD	
8	**Measure assessment**	8.1	Limitation of negative impact of flood defence works		
		8.2	Assessment of hydromorphological rehabilitation measures for river types	WGA	WATERSKETCH
		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?)	WGB	MODELKEY
		8.4	Decision support systems for the selection of the best alternative in the programme of measures	WGB	MODELKEY
		8.5	Methodologies to deal with social and economic issues to develop future scenarios	WGB	WATERSKETCH
		8.6	Elaboration of models for prediction	WGB	MODELKEY
		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.	WGB	EUROHARP, HARMONIRIB (!), TRANSCAT
		8.8	The decision support systems may focus on various levels of scale (EU, region, country, river basin, smaller area etc)	WGB	EURO-LIMPACS, HARMONIRIB, TRANSCAT
		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"	WGB	
9	**WFD policy questions**	9.1	Linking ecological and socio-economical models	WGA, WGB	HarmoniCA-WP3, HARMONIRIB, HarmonIT
		9.2	Tools for presentation to show the effects of different measures and scenario's	WGB	EUROHARP, HARMONIRIB

No		No	Sub-issue	CIS group	Research project
		9.3	Community education and involvement in decision making	WGB	HARMONICOP, NEWATER, WATERSKETCH
		9.4	Approach to evaluation of artificial irrigation canals (in period of year without water)		
10	**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
11	**Socio-economy**	11.1	Economy - cost/benefits and cost recovery problems	WGB	HarmoniCA-WP3, HARMONIRIB
		11.2	Scale of the analysis for individual elements (pressures) of the cost-effectiveness analysis		
		11.3	Dealing with changes to cost recovery mechanisms as potential measures within the first POM		
		11.4	Developing business as usual models and dealing with less than full application of other water policies in the cost-effectiveness analysis.		
		11.5	Prioritising economic appraisal for the first POM given the difficult timings		
		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
		11.7	Translating standards for GES/classifications schemes into specifications of environmental benefits from a human (anthropogenic) perspective		
		11.8	Establish reliable benefits transfer approaches for assessing disproportionate costs.		
		11.9	Assessing disproportionate costs in protected areas where there is flexibility in meeting WFD related objectives.		
		11.10	Coordinating cost-effectiveness analysis in transboundary water bodies.		HarmoniCA-WP3, TRANSCAT
		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
12	**Others:**	12.1	Climate change		CLIME, EURO-LIMPACS

No		No	Sub-issue	CIS group	Research project
		12.2	Flooding	EAF Floods	ACTIF, FLOODRELIEF, FLOODSITE
		12.3	Industrial Wastewater		WSSTP
		12.4	Landfill and waste		CEMERA
		12.5	Urban Wastewater		AISUWRS, CARE-S, CD4WC, CITYNET, DAYWATER, WSSTP

Generally speaking, most issues are covered by one or more research projects. This conclusion can be specified into two opposite directions:

1. The only research projects taken into consideration are EU financed projects that are currently being executed. Undoubtedly, even more issues would have matched with research when also already finalised projects would have been considered (the reason for this choice is explained later). This would lead to the conclusion that research covers even a higher degree of issues.
2. On the contrary, the issues for research as identified by Phase I, are not described in a very specific manner. The description leaves room for interpretation, which makes is relatively easy to find research projects that seem to fit the question completely or at least partially. This would lead to the conclusion that the degree of coverage is significantly lower.

Another way of examining the subject is to simply take the number of research projects dedicated to a certain issue, e.g. in order to be able to prioritise new research to be started. This leads to a division into three groups (see table below[8]).

High coverage (2-4 research projects per issue)	**Medium coverage** (1-2 research projects per issue)	**Low coverage** (Less than 1 research project per issue)
- Water resources and demand management - Groundwater management - Knowledge on physical processes - Policy assessment	- Monitoring - Data management - WFD policy questions	- Knowledge on ecological processes - Impact assessment - Measures assessment - Economics

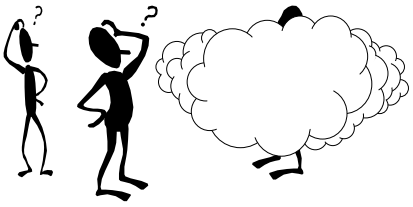
Still, it is very difficult to draw conclusions on whether research projects match with demands from the WFD implementation side without specification of both project results and questions. During Phase 2 it has been proved to be very difficult to provide such specifications in a generic way. At the same time, it is obvious that only research that is well tuned into the needs at policy level will be used effectively. It doesn't make much sense to – for example – develop 'decision support systems' if those are not wanted by the ones intended to make use of them. This brings us to the relation between research and policy.

[8] The category "Others" is left out of the table. This category gathers issues and research projects that were not identified in Phase I, but are still relevant for the CIS process.

Research and policy – improving the relationship

The relationship between researchers and policy-makers is an uneasy one. Researchers often consider that there is no audience for their work; despite the important products they develop. By contrast, policy-makers often consider that what researchers contribute is not relevant, too theoretical and not applicable in practice.

Caricaturing – slightly provoking – the following respective viewpoints about each other can be drafted:

Policy	**Research**
- Researchers do not understand how policy processes work, and therefore develop tools that we do not need or cannot apply. - I never get a clear answer from researchers on my clear question. - Research produces information that is unintelligible, irrelevant and inassimilable. - The reality we have to work with is too complex to be understood. - Researchers need too much – and too expensive – data. - If we don't have scientifically sound tools at our disposal, we just develop them ourselves.	- Policy-makers do not know how much research is already available, just waiting for them to be used. - Policy-makers even seem to ignore the existence of research, and rather develop simplified knowledge themselves. - Policy-makers think ahead only one day, so we don't get time to answer their questions. - Policy-makers take decisions that do not have rational foundations. - New scientific insights should lead to changes in policy as soon as possible. - Policy-makers want sound research without having to pay for it.
	

A lot has been written and said about this relation, and when it comes to recommendations for improvement, the solution is frequently sought in improving the communications between the two worlds, e.g. by exchange programmes. Initiatives to improve the relationship between research and WFD implementation also do exist. Two examples are mentioned here; the "Scientific support to policy" instrument under FP6, and the Harmoni-CA initiative.

The EU Sixth Framework Programme (FP6) provides funds for research projects, with "research for policy support" being one of the fields of interest. The activities under this heading underpin the formulation and implementation of Community policies; amongst

others the implementation of the WFD. REBECCA, SWIFT-WFD and BRIDGE[9] are such projects with relevance for the WFD, and other projects are under negotiation.
An important learning point from the cooperation between Working Group A on Ecological Status and the research project REBECCA is that improving the communication is an important matter that pays. The cooperation between the two groups did not arise by itself. People have to bring about the cooperation together, which means that they have to meet and communicate frequently. For example, REBECCA produced a 'gap report', reviewing and identifying information gaps in knowledge on relations between pressures, chemical and ecological status for the major pressure types and biological quality elements. This document aimed at serving as working document in the Working Group A. In this way, not only the gaps in knowledge were identified, but also the gap between policy-makers and researchers was bridged.

This relation between research and policy was *the* item during the last two Harmoni-CA conferences (Feb. 2004 and April 2005) and since April 2004 first steps have been set to bridge the gap between both groups. An important activity of Harmoni-CA is the setting up of a web portal 'WISE-RTD' that enables policy-makers to find information about research results and experiences (both national and international) on key-issues related to the implementation of the WFD.
A second activity is connecting researchers to project leaders of the Pilot River Basins. For this a cross-table has been prepared to link the key-activities from the PRBs with products delivered by the CatchMod projects.
A third activity is the preparation of guidance documents for tools in the field of uncertainty analysis, quality assurance, etc.
Finally, Harmoni-CA prepares synthesis reports on different issues like data bases, IWRM overview, N&P tools, data availability & accessibility problems, tools for monitoring network design, etc. This activity is being carried out in close cooperation with the FP6 project Newater.
All these information with be accessible by the web portal WISE-RTD. Since April 2004 Harmoni-CA participates in Working Group B and the PRB meetings and Working Group B participates in the CatchMod meetings.

Taking the experiences with REBECCA and Harmoni-CA into consideration, it seems worthwhile to involve representatives of research projects in several parts of the Common Implementation Strategy. Or, to be more precise, to involve representatives of projects that are currently under execution. Running projects have the possibility to anticipate and to adapt the output, e.g. "The model needs 4 parameters while only 3 are available, can we work around it?" In direct communication the merits of the project can be judged, for which problems it produces solutions, and where other solutions are needed. This does not only concerns the field of expertise, but also the applicability at a given scale (water body level ⇔ EU level), level of abstraction (conceptual, serving as input for a guidance document ⇔ concrete, serving as input for e.g. a PRB), the data and data formats needed and available, geographical circumstances, and finally the administrative culture in which the solution fits best.
Of course, the emphasis on running projects does not mean that finalised projects are of no interest. At the same time, one may assume that researchers of running projects do

[9] Annex 2 provides more information about the individual projects.

have knowledge about the findings of previous projects. The website of the finalised project MULINO for example, announces that the results will be further developed in the projects NEWATER and TRANSCAT.

Conclusions

- It turned out to be impossible to generate a list of specific topics as input for the research community with the generic information available.
- Generally speaking, the issue categories “Water resources and demand management”, “Groundwater management”, “Knowledge on physical processes” en “Policy assessment” are relatively well covered by research, with 2-4 projects per issue. The issue categories “Knowledge on ecological processes”, “Impact assessment”, “Measures assessment” and “Economics” are relatively poorly covered, with less than 1 project per issue. The categories “Monitoring”, “Data management” and “WFD policy questions” fall in between, with 1-2 projects per issue.
- It turned out during the activity that there are some fundamental gaps in our understanding of ecological processes and particularly of the impact of human activities on those processes. Whilst there is ongoing research, it won't deliver all of the answers and there are still going to be gaps in our understanding when we come to doing river basin planning.

4. ASSESSMENT IN COMPARISON WITH PRB REPORT AND CIS WORK PROGRAMME

This section assesses the outcomes of the questionnaire in comparison with the outcomes of the PRB exercise and the CIS work programme for 2005 and 2006.

PRB reports

In 2004, two PRB reports were produced; the first one on PRB phase 1A testing, that covered the CIS guidance documents regarding the article 5 report, the second one on PRB phase 1B testing, that covered the rest of the guidance documents.

In general terms, the PRB reports underline the outcomes of the questionnaire:

- The implementation of the WFD will have effects on water management structures throughout Europe. The structure of many administrations with tasks in water management does not fit the WFD requirements. This could often raise problems during the implementation of the directive (PRB 1B pg. 8 and conclusions).
- The PRBs reported data gaps and difficulties in comparing data from different sources, especially in the first phase of the PRB exercise (PRB 1B pg.12 and section 3.3).
- Difficulties with knowledge of pressure – impact relations, threshold values for pressures, and the conditions of good status following from reference conditions (PRB 1A pg. 12). Though the PRB experienced these difficulties, they also conclude that on the level of detail: "The focus of the guidance documents has shifted during their development from recipe books for the operational level to sketches of outlines for the national scale, but the current level of detail suits well. Less detail would give too little direction, while more detail would mean that not all situations would fit. Of course, this approach implies that specific elements do need development at a national scale." Instead, one also could read "at river basin district scale".
- PRBs reported specific challenges in international river basin district, e.g. regarding upstream-downstream relationships (PRB 1B pg. 15).
- Although in the questionnaire countries ask for harmonisation of data collection, storage and management, the PRBs could not reach an agreement on how to perform this (PRB 1B pg.16).
- The PRB report specifically discussed the issue of public participation. In the questionnaire, this issue hardly was mentioned as being of concern (PRB 1A and 1B).
- The PRB report discusses several bottlenecks in the WFD planning process, summarised into a few basic issues within the Directive: unclear objectives and data that become available only long after they are needed in the process (PRB 1A pg. 20 and on).
- The article 5 analyses and objectives should be revised and improved after 2005, as an iterative process, to optimise the design of both the monitoring programmes and the programme of measures (PRB 1A conclusion).

CIS work programme

The CIS work programme presents a list of priority activities (refer to Annex IV). All these activities merit equal considerations. However, a few important aspects are highlighted below. The following description is copied from the final draft work programme.

The **intercalibration** is a core task provided by the Water Framework Directive which

is essential for ensuring a comparable level of protection in consistency with the Directive. A number of additional activities, including the preparation of the eutrophication guidance, are all intended to support the intercalibration exercise and improve the quality of the results.

The **pilot river basin exercise** will continue to be an important exercise and "symbol" of the Common Implementation Strategy. The integration of pilot basins in all working groups and all activities under the CIS will create a closer link to the practical implementation work.

Integrated river basin management covers a wide range of issues and aspects. It is therefore important to identify priority issues, which need to be addressed on EU level. The activity on **screening the Article 5 analysis reports and linking it to research priorities** is designed to this end. In addition, the **assessment of cost-effectiveness** is in the centre of attention in the beginning. Moreover, the initiated activity on **water scarcity** should be incorporated into this framework. This activity is carried out in co-operation with the EU Water Initiative and participation from countries outside the EU should be encouraged. At a later stage in the work programme, issues related to improve **international river basin management** should be addressed.

On **groundwater** and **priority substances**, the CIS process should provide an information exchange platform to address issues of practical relevance and importance as long as the negotiations on the proposals is ongoing. In particular, the aspects of **chemical monitoring** should be addressed to develop guidance on some key issues. As regards priority substances, the information exchange may also address all those aspects referred to in Article 16 (such as the identification of new priority substances, the setting of environmental quality standards, the source screening and the reflection on emission control measures).

On **reporting**, the preparation of the guidance part on **reporting of monitoring** results should be addressed in 2005 and the part on **reporting the river basin management plan** should be started as soon as possible afterwards. Furthermore, the harmonisation and information exchange on **geographical information systems (GIS)** should be another priority in order to improve the tools necessary to exchange spatial data in the context of reporting into the "Water Information System for Europe" (WISE).

The link of **agriculture** and WFD has been identified as one of the highest priority in this work programme. It will be important to discuss on how the Common Agricultural Policy can contribute to the achievements of the WFD objectives and provide guidance on how the authorities working on the WFD and the CAP can co-operate more closely. In addition, recommendations should be made on how work with the farming community can achieve these results in a co-operative manner.

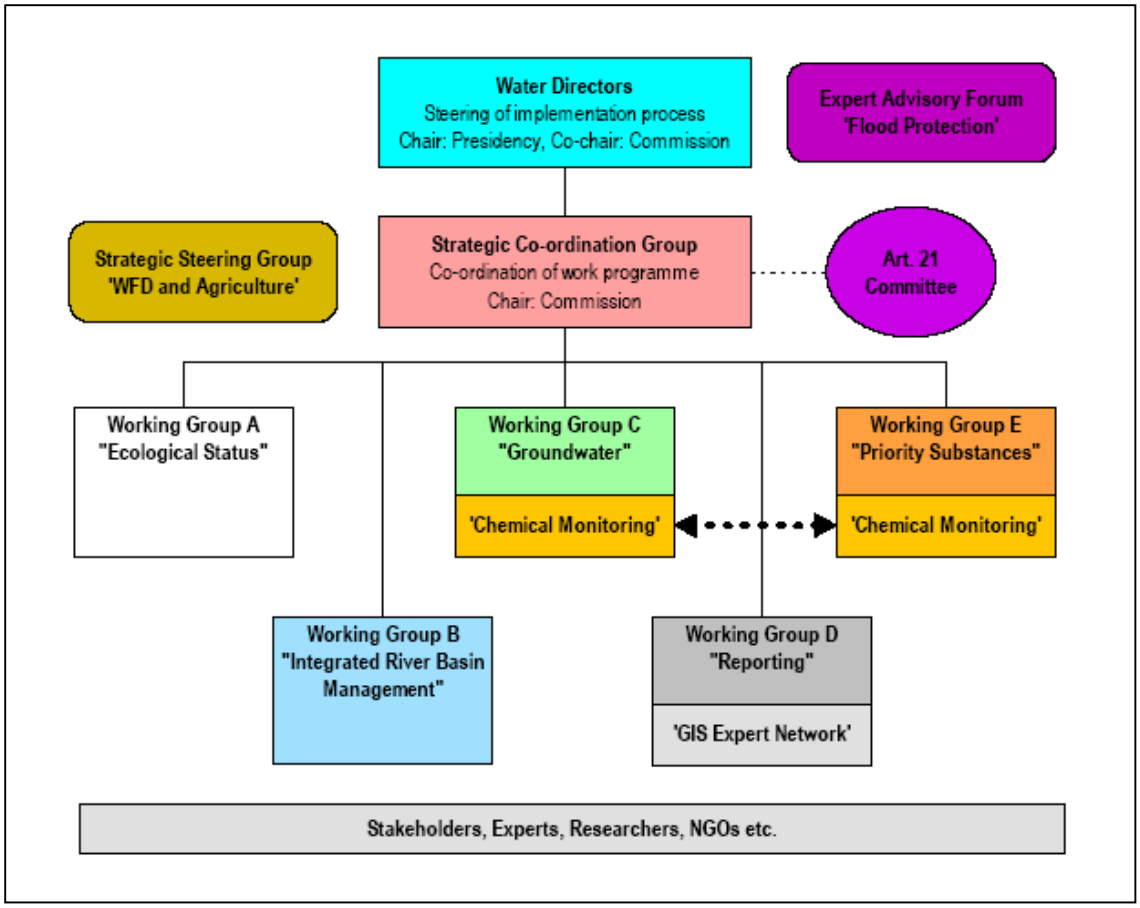
A new policy on **flood protection** is developing at the moment following the Commission Communication11 of July 2004 and the recent Council conclusion on this document. In order to prepare the necessary follow-up, the work on flood risk management should be brought under the umbrella of the CIS process.

Moreover, the work on **environmental objectives** will become increasingly important. Currently, a discussion document is under preparation. On the basis of this document, the

Water Directors will identify the subsequent activities, which will be engaged in the CIS work programme 2005/2006. The work on environmental objectives will be carried out by a step-by-step approach in which the mandate is formulated iteratively by addressing some of the key aspects in more detail such as, e.g. discussions on derogations.

Finally, there are also other priorities, which have emerged already, such as the **integration** of the WFD aspects into other Community policy, in particular the **Cohesion Policy, Transport Policy (navigation)** and the **Renewable Energies Policy (hydropower)**. Detailed initiatives should be developed during 2005 for each of those. On Cohesion Policy, there is already a drafting group established under another forum, the Expert Group on environmental aspects in Structural and Cohesion Policy. The WFD is investigated as a case study on how Cohesion Policy can contribute better to the achievements of EU environmental policies. For the other two aspects, a workshop dealing with hydromorphological pressures and the designation of HMWB during 2005 may be a starting point to prepare a new, targeted activity on transport and navigation under the CIS 2005/2006.

Below an overview of the organisational structure is presented.



Conclusions

As already written above, the PRB reports underline the outcomes of the questionnaire in general terms. Most of the issues identified by the European countries are part of the CIS work programme, or can easily be fitted in.

At this moment, no group is addressing the hydromorphology issue explicitly, but the first steps are made in such a direction. The structure presented above does also not directly cover the difficulties felt with pollution from households and industries. It might be worthwhile to investigate whether other policy areas sufficiently tackle these topics or new initiatives could be useful (Annex V provides a short overview of the BAT reference documents from the IPPC Directive). The conclusion that co-ordination with other policy areas might be needed, is stressed by the outcomes under 'WFD process' (2.2), noting that there is a "fragmentation of the water legislation and powers".

Several returns mention the need for tools, methods and insight in processes in the water systems, and so underline the importance the strengthening of the relations with the research community.

5. SUMMARY

Below, the results are summarised of the questionnaire to the most important issues in the WFD implementation, as identified by the European countries. Firstly, the summary focuses on the key issues with EU relevance, divided in 'driving forces and pressures' (4.1) and 'other obstacles' (4.2). Secondly, the issues are assessed in comparison with the CIS working programme 2005-2006 (4.3). As foreseen in the activities' mandate, the key issues and identified knowledge gaps will be further linked with existing research projects during the course of 2005.

5.1. Driving forces and pressures with EU relevance

- Impact of **agriculture** is considered as the "crucial issue" for almost every water category regarding pollution and has the highest priority. In a great majority of the countries, agriculture is the cause of severe problems. In some parts of Europe agriculture has an impact on the reduction of flows of rivers and groundwater.
- A second priority is **morphology**. This issue is mainly affected by works related to hydropower, flood defence, building of reservoirs and agriculture in rivers. In some parts of Europe navigation is considered to be a principal issue. The issue is considered especially relevant for rivers. In certain regions, marine engineering works are of specific concern. Aquifer modifications are only mentioned when linked to the presence of reservoirs. Alleviation of hydromorphological impacts - caused by bank alterations, navigation, hydropower and the presence of dykes - are also emphasised.
- Pollution from "households" (**municipal wastewater**) is a problem in a large majority of the countries in rivers. This applies all sub-categories mentioned in the questionnaire (municipal waste water, storm water overflows, and domestic waste water not connected to a sewer system). Three major reasons for problems with this issue have been identified: firstly, in several countries the sewer and treatment facilities are not sufficiently developed. Secondly, in some countries the discharge of treated wastewater into small streams leads to problems. Finally, the presence of substances in the sewage that are hardly retained in the treatment facilities causes difficulties (e.g. heavy metals). During the discussions, it was stressed that pollution from point sources (i.e. municipal and industrial wastewater) must be tackled in order to reach the objective of good status.
- Pollution from "**industry**" does not seem to be an important issue at EU level. Nevertheless, the fact cannot be ignored that individual countries face severe problems with the consequences of existing industries.
- Under the topic "**other sources of pollution**", the issues "diffuse sources", "transport", "long range transport of air pollution", "new priority substances", and "historic pollution" are issues of concern.
- Reduction in flow linked to groundwater is mainly identified with abstractions for drinking water supply and agriculture.
- Other anthropogenic pressures are not considered very relevant at EU level. In general, lakes, and coastal and transitional waters are considered more susceptible to these types of pressures. Climate change is considered a pertinent issue, though the effects on the water system, and thus the WFD implementation, are not well understood. The issue of Climate Change could have impacts on reference conditions.

5.2. Other obstacles

- Problems were encountered related to **data** availability, data formats and the level of aggregation of data. Although not commonly supported, the general feeling was that further implementation of the WFD will lead to a solution for the problems.
- Similar difficulties were encountered at international level regarding disunity in methods and data formats. This issue seems more profound in cases where non-EU countries are part of the international river basin district. An additional point in international river basins is the '**upstream-downstream**' relation.
  In a number of cases, adequate measures can only be formulated at EU level (e.g. marketing and use, pesticide directive, etcetera).
- Countries had to face different **knowledge gaps**, such as the absence of possibilities to estimate the current status of the water system, gaps in knowledge on the interactions between different water systems (e.g. the interactions between surface water, groundwater and sediments), lack of models to predict the effects and the combined effects of pressures, lack of insight in reference conditions and the good status, and, finally, a deficiency in instruments to assess the effect of proposed measures.
- Several countries reported difficulties in securing appropriate **resources** for the WFD implementation. Many countries expect this resource problem to increase in the future.
- Specific attention was paid to the method of '**how to present** the outcomes of the Article 5 reports in the WFD context' (key elements: 'pre-selection of problems for follow up steps', 'communication with stakeholders, actors and the public at large', 'rules of the game'). This is not only a concern for Member States, but also for the European Commission when the results of the Article 5 analyses are synthesised and communicated, e.g. clarification of the role of socio-economics in the implementation of the Directive.

5.3. Research needs

- It turned out to be impossible to generate a list of specific topics as input for the research community with the generic information available.
- Generally speaking, the issue categories "Water resources and demand management", "Groundwater management", "Knowledge on physical processes" en "Policy assessment" are relatively well covered by research, with 2-4 projects per issue. The issue categories "Knowledge on ecological processes", "Impact assessment", "Measures assessment" and "Economics" are relatively poorly covered, with less than 1 project per issue. The categories "Monitoring", "Data management" and "WFD policy questions" fall in between, with 1-2 projects per issue.
- It turned out during the activity that there are some fundamental gaps in our understanding of ecological processes and particularly of the impact of human activities on those processes. Whilst there is ongoing research, it won't deliver all of the answers and there are still going to be gaps in our understanding when we come to doing river basin planning.

5.4. Assessment in comparison with the CIS working programme 2005-2006 and other existing initiatives

Most of the key issues are already covered by activities under the current CIS working programme:

Driving forces and pressures

The issue of agriculture is already recognised by the WD given the start of the new Strategic Steering Group "WFD and Agriculture". Since the activities of this group cover the issue, no additional activities are needed until further notice.

Following the discussions during the WD meeting in Amsterdam, the EC requested an input on views from the WD concerning hydropower and navigation, as a first step to establish a new activity with respect to hydromorphology. This action seems to cover the issue of hydromorphology to a large extent, though further development might be worthwhile. At the planned September workshop, the issue of the HMWB designation process and Good Ecological Potential should be explored.

The issue of municipal wastewater is covered by the implementation of the urban wastewater treatment directive (UWWTD, 91/271/EC) when it comes to insufficient wastewater treatment facilities. It might be worthwhile to investigate whether additional measures are needed in order to comply with the objectives of the WFD, especially with regards to municipal wastewater from smaller agglomerations and to substances that are not sufficiently retained in treatment facilities.

Generally speaking, the "IPPC BREF-process" covers the industrial sectors previously mentioned. Nevertheless, it might be worthwhile to set up a system of information exchange between individual countries, and the issue of "mining" and "landfill and waste" might need extra attention.

In a number of a cases, with respect to the "other sources of pollution", adequate measures can only be formulated at EU level in a number of cases. This issue deserves further investigation at EU level.

The issue "reduction in flow" is covered by the activity on water scarcity (under WGB).

The issue "climate change" has been studied already by the JRC, and deserves further attention at EU level, since the impacts are largely unknown but may possibly have substantial effects on the European water systems.

Several of the above-mentioned issues, might be very difficult to tackle with WFD instruments only. Integration with other policy areas is therefore an option to be considered.

Other obstacles

Actions at the level of Member States and International River Basin Districts are necessary in order to overcome the difficulties with data availability. Some of them are tackled by the activities of the Working Group D on Reporting and the Working Group A with regard to the topic of intercalibration.

It is worthwhile to further investigate the various issues covered by the title "international co-ordination" at EU level.

The same applies to "knowledge gaps". In the second phase of this activity, steps will be taken to improve the link between CIS and the research community.

The issue of "resources" should be solved by MS individually.

Finally, it could be advantageous to further formulate the issue of "communication of WFD implementation results" at EU level.

Research needs

The relationship between research and policy is not always an easy one, but can be improved by intensifying the face-to-face communication between the respective groups. It would be worthwhile to organise a closer cooperation between CIS working groups and relevant research projects. On the one hand, WG leaders can invite research groups

regularly to the meetings of working groups and discuss the demands and possible solutions offered (starting on a broad level, and narrowing down to a very specified level). On the other hand, WG leaders can join meetings and workshops of research projects of interest.

Annex 1: Project team, Sounding Board, and Participants Ghent meeting

Project team

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Gerard	Broseliske	RIZA	The Netherlands	g.h.Broseliske@riza.rws.minvenw.nl
Sandra	Mol	RIZA	The Netherlands	s.mol@riza.rws.minvenw.nl

Sounding Board

Giovanni	Bidoglio	JRC	Italy
Stéphanie	Croguennec	Ministry of Environment	France
Thierry	Davy	French Water Agencies	France
Joachim	d'Eugenio	DG Environment	European Commission
Jean	Erbacher	SNIFFER	United Kingdom
Anne	Gendebien	WRC	United Kingdom
Robert	Hitchen	DEFRA	United Kingdom
Marta	Moren	Ministry of Environment	Spain
Philippe	Quevauviller	DG Environment	European Commission
Seppo	Rekolainen	Finnish Environment Institute - SYKE	Finland
Sabine	Rosenbaum	Länder	Germany
Francesca	Somma	JRC	Italy
Thomas	Stratenwerth	Federal Environmental Ministry	Germany

Participants to the Ghent meeting

Anna	Åhr Evertson	Swedish EPA	Sweden
Geo	Arnold	RIZA	The Netherlands
Eleonora	Bartkova	Ministry of Environment	Slovakia
Gerard	Broseliske	RIZA	The Netherlands
Stéphanie	Croguennec	Ministry of Environment	France
Bob	Dekker	Ministry of Public Works and Water Management	The Netherlands
Marc	De Rooy	RIZA	The Netherlands
Ilke	Dieltjens	Vlaamse Milieu Maatschappij	Belgium
Anne	Gendebien	WRC	United Kingdom
Eszter	Havasné Szilágyi	Ministry of Environment and Water	Hungary
Mariina	Hiiob	Ministry of Environment	Estonia
Robert	Hitchen	DEFRA	United Kingdom
Edith	Hödl	DG Environment	EC
Kirsty	Irving	SNIFFER	United Kingdom
Manuel	Menendez	Cedex	Spain
Sandra	Mol	RIZA	The Netherlands
Roger	Moore	Centre for Ecology and Hydrology	United Kingdom
Marta	Moren	Ministry of Environment	Spain
Tony	Niilonen	Danish EPA	Denmark
Giorgio	Pineschi	Ministry of Environment	Italy
Philippe	Quevauviller	DG Environment	EC
Seppo	Rekolainen	Finnish Environment Institute - SYKE	Finland
Jean-Marie	Ries	Ministry of Interior	Luxembourg
John	Sadlier	Department of Environment	Ireland
Francesca	Somma	JRC	Italy
Anne	Thoren	Swedish EPA	Sweden
Natasa	Vodopivec	Ministry of Environment and Spatial Planning	Slovenia

Questionnaire
On WFD key issues

Purpose of the questionnaire

In the 2005-2006 mandate for WGB (on Integrated River Basin Management), an activity is foreseen on the exchange of information deriving from the article 5 activities, and the need for research resulting from that exchange. That mandate has been endorsed by the Water Directors during their meeting in Amsterdam, last December.

The objective of the activity is to identify and prioritise issues and research needs deriving from the WFD Article 5 activity, that need a EU-wide approach. In order to reach that objective, the following steps will be executed:

- The first step consists in preparing a first draft list of issues and gaps identified during the WFD Article 5 activity in a 'light process', before the actual Article 5 reports are finalised.
- In a second step, this first draft list is checked for EU level relevance and prioritised, once the Article 5 reports have been published (during a workshop in the beginning of April). Right after this check, the research needs deriving from the problems issues are made more explicit (taking into account input from the research society, and resulting in a draft list of research topics).
- Finally, the objective is to have both lists endorsed by the WD via the SCG.

This questionnaire must provide us with the information for the first draft list of issues and gaps, and forms thus the basis of the activity.

Introduction to the questionnaire

The questionnaire aims at collecting answers at national level, with a national perspective. We ask you to complete one questionnaire per country, so not for every river basin district. The questionnaire consists of seven boxes to complete, starting with the coordinates of the official completing the form and then continuing with six questions divided into three sections.

Section A asks for information on driving forces and pressures that prevent the achievement of good status. It addresses the alterations of the physical or hydromorphological, quantitative, chemical and biological conditions of the water system.
Section B asks for information on other conditions that hamper or even prevent the achievement of good status, in particular at the level of the actual implementation of the WFD, and your views on any future issues.
Section C finally, asks for your opinion on those issues that should be further developed at EU level.

If you have any questions when completing the questionnaire, please contact Marc de Rooy (+31 6 2000 4508), Gerard Broseliske (+31 320 298447) or Manuel Menéndez Prieto (+34 91 335 7939)

Completed by:

Country:			
Name:			
Organisation:			
Address:			
E-mail:			
Mobile phone:		Telephone:	
Fax:			

SECTION A;
Driving forces and pressures that prevent the achievement of good status

This first section asks for information on driving forces and pressures that altered the *physical, quantitative, chemical and biological conditions* of the water system in a way that prevents the achievement of good status.
In discussions, often general issues such as 'agriculture' or 'hydromorphological changes' are stated to be the cause for not achieving good status. Our intention is to generate more in depth answers. We therefore added specifications to the different issues, and we ask which issues generate concern for which categories of water bodies (i.e. rivers, lakes, coastal or transitional water, and groundwater).
The list in this section is based upon the IMPRESS guidance document.

Please use the following guidance (see also example below):

- Please complete the grey lines and specify your answer in the white lines underneath. The yellow lines are meant as headers only.
- If an issue is of concern to you, please indicate the weighting of the item using a scale of 1- 5; 1 indicates 'it is a problem, or might become a problem, but with little impact and not of high priority at this moment', while 5 indicates that 'the issue is the main reason for not achieving the objectives, and is our top-priority'. You can also put a question mark (?), meaning that the issue might possibly be a big pressure, but the actual impacts on the ecological quality are poorly known or you you're lacking data or you're insure about the quality of the data.
- Please indicate the category of water body that is affected by the pressure.
- Boxes left open tell us that the issue is of no concern, or is not relevant for that category of water body.

Example:

For a country, to the extent possible, households in cities are connected to outdated sewer systems, the capacity of which needs upgrading. The sewer systems are connected to sewage treatment plants with appropriate phosphate and nitrogen removal.
Households scattered in rural areas are not connected, and discharge into groundwater after individual treatment, that often needs improving.
There are no lakes and the rivers flow into sea directly. The majority of the population lives in the cities
The table could be completed as follows:

This is an example	A1: Driving forces and pressures	Water Body Category			
		Rivers	Lakes	Coastal / Transitional	Groundwater
	POLLUTION				
	Households	**3**		**2**	**3**
	Households - municipal waste water	1		1	2
	Households - storm water overflows	5		3	
	Households - domestic waste water (not connected to a sewer system)				4

A1: Driving forces and pressures - **Complete both grey and white lines** - **Scale 1-5** - **Also indicate the category of water body** - **Left blank? ⇒ not of concern or not relevant in your case**	**Water Body Category**			
	Rivers	**Lakes**	**Coastal / Transitional**	**Groundwater**
POLLUTION				
Households				
Households - municipal waste water				
Households - storm water overflows				
Households - domestic waste water (not connected to a sewer system)				
Industry				
Oil and gas (including refineries and petrochemical industries)				
Chemicals (organic and inorganic)				
Pulp, paper & boards				
Textile industry (including wool)				
Tanning of hides and leather manufacture				
Iron and steel				
Non-ferrous metals				
Power generation (**not** hydropower)				
Shipyards				
Other manufacturing processes (namely: .....)				
Agriculture				
Arable land, grassland, mixed farming				
Crops with intensive nutrient or pesticide usage or long bare soil periods (e.g. corn, potato, sugar beet, grapevine, hop, fruit, vegetable)				
Over grazing and cropping practice – resulting in erosion				
Horticulture, including greenhouses				
Other sources of pollution				
Aquaculture / fish farming				
Forestry				
Impervious areas				
Mining (including quarries)				
Landfill and waste sites				
Transport				
ABSTRACTION				
Reduction in flow				
Abstractions for agriculture				
Abstractions for drinking water supply				
Abstractions for industrial purposes				
Abstractions for fish farming				
Abstractions for mining				
Abstractions for navigation (e.g. canals)				
ARTIFICIAL RECHARGE				
Groundwater recharge				
MORPHOLOGY				
Flow management				
Hydropower works (including dams)				
Reservoirs				

CONTINUES ON THE NEXT PAGE

A1: Driving forces and pressures - Complete both grey and white lines - Scale 1-5 - Also indicate the category of water body - Left blank? ⇒ not of concern or not relevant in your case		Water Body Category			
		Rivers	Lakes	Coastal / Transitional	Groundwater
	Flood defence works				
	Water transfer (including pumping stations)				
	Weirs, dams, locks, and sluices for navigational purposes				
River management					
	Physical alteration of channel (including banks and dikes)				
	Shipping				
	Modification for agricultural purposes				
	Modification for fishery purposes				
	Land transport infrastructure (road/bridge construction)				
	Dredging				
Transitional and coastal management					
	Estuarine/coastal dredging				
	Maritime engineering works (shipyards, harbours)				
	Land reclamation and polders				
	Coastal sand supply (safety)				
OTHER ANTHROPOGENIC PRESSURES AND IMPACTS					
	Recreation				
	Fishing/angling				
	Introduced / alien species				
	Climate change				
	Others, namely ……				

A2: Programme of Measures

Which 10 of these issues are the most significant and will most probably be included in the Programme of Measures?

	Issue	Priority (high-medium-low)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

SECTION B;
Other conditions that hamper the achievement of good status

Not only chemical, physical, quantitative and biological conditions hamper the achievement of the objectives. Also other issues could be at stake, such as the availability of data, non-harmonised data formats and methods of data aggregation, human resources, and international co-operation in a river basin that may also complicate achieving those objectives.

B.1: What other obstacles did you face when producing the Article 5 report?

B.2: What issues do you expect to be an obstacle in the future (2-10 years)?

SECTION C;
- Issues that deserve further development at EU level
- The need for research

Some of the issues that you listed above will gain from a transnational approach, while for others this is less favourable. One would expect that issues with major transnational characteristics will benefit from an EU-wide approach, but also issues that occur at local level in the majority of EU member states could merit from a transnational approach.

C.1 When looking at potential measures for the issues listed in sections A and B, which of them would merit from an international approach? Indicate EU-level or International River Basin District-level.

	Issue	EU	IRBD	both
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

C.2 For which of the issues listed under C.1 do you identify gaps of knowledge or a lack of methodologies that could be input for research projects?

	Issue
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Thank you for your assistance!

Please return the questionnaire to Marc de Rooy by e-mail (m.drooy@riza.rws.minvenw.nl).

Section A1		Number of respondents	Times mentioned				Added scores				Times mentioned (%) (broad issue?)				Average ranking (important if mentioned?)				Aus	
			Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes
POLLUTION																				
Households		**26**	**20**	**12**	**16**	**16**	**58**	**27**	**41**	**32**	**77**	**46**	**62**	**62**	**2,9**	**2,3**	**2,6**	**2,0**		
	Households - municipal waste water	26	24	14	17	16	70	32	44	29	**92**	**54**	**65**	**62**	**2,9**	**2,3**	**2,6**	**1,8**	3	
	Households - storm water overflows	26	21	11	12	8	56	24	23	9	**81**	**42**	**46**	**31**	**2,7**	**2,2**	**1,9**	**1,1**	1	
	Households - domestic waste water (not connected to a sewer system)	26	22	11	10	19	58	29	23	47	**85**	**42**	**38**	**73**	**2,6**	**2,6**	**2,3**	**2,5**	1	
Industry		**26**	**17**	**11**	**14**	**17**	**41**	**18**	**29**	**40**	**65**	**42**	**54**	**65**	**2,4**	**1,6**	**2,1**	**2,4**		
	Oil and gas (including refineries and petrochemical industries)	26	10	4	14	10	21	5	27	23	**38**	**15**	**54**	**38**	**2,1**	**1,3**	**1,9**	**2,3**	2	
	Chemicals (organic and inorganic)	26	15	7	11	12	44	14	26	33	**58**	**27**	**42**	**46**	**2,9**	**2,0**	**2,4**	**2,8**	2	
	Pulp, paper & boards	26	15	6	7	7	32	10	13	18	**58**	**23**	**27**	**27**	**2,1**	**1,7**	**1,9**	**2,6**	2	
	Textile industry (including wool)	26	14	6	4	5	28	10	4	12	**54**	**23**	**15**	**19**	**2,0**	**1,7**	**1,0**	**2,4**	2	
	Tanning of hides and leather manufacture	26	10	4	4	8	21	5	5	16	**38**	**15**	**15**	**31**	**2,1**	**1,3**	**1,3**	**2,0**	2	
	Iron and steel	26	12	7	10	10	32	11	15	24	**46**	**27**	**38**	**38**	**2,7**	**1,6**	**1,5**	**2,4**	2	
	Non-ferrous metals	26	14	7	10	10	32	12	20	24	**54**	**27**	**38**	**38**	**2,3**	**1,7**	**2,0**	**2,4**	2	
	Power generation (**not** hydropower)	26	13	8	9	8	28	12	12	20	**50**	**31**	**35**	**31**	**2,2**	**1,5**	**1,3**	**2,5**	1	
	Shipyards	26	6	6	13	3	9	10	25	3	**23**	**23**	**50**	**12**	**1,5**	**1,7**	**1,9**	**1,0**		
	Other manufacturing processes (namely: ……)																			
	BE, CZ, LV, NL, HU, HE, SI: food processing industry	26	7	2	2	2	20	4	5	6	**27**	**8**	**8**	**8**	**2,9**	**2,0**	**2,5**	**3,0**		
	MT: mechanical servicing	26	0	0	0	1	0	0	0	1	**0**	**0**	**0**	**4**	**-**	**-**	**-**	**1,0**		
Agriculture		**26**	**20**	**14**	**18**	**19**	**67**	**45**	**53**	**71**	**77**	**54**	**69**	**73**	**3,4**	**3,2**	**2,9**	**3,7**		
	Arable land, grassland, mixed farming	26	20	14	14	20	61	41	36	64	**77**	**54**	**54**	**77**	**3,1**	**2,9**	**2,6**	**3,2**	1	
	Crops with intensive nutrient or pesticide usage or long bare soil periods (e.g. corn, potato, sugar beet, grapevine, hop, fruit, vegetable)	26	22	15	13	20	72	48	41	73	**85**	**58**	**50**	**77**	**3,3**	**3,2**	**3,2**	**3,7**	2	
	Over grazing and cropping practice – resulting in erosion	26	14	8	9	9	38	21	20	19	**54**	**31**	**35**	**35**	**2,7**	**2,6**	**2,2**	**2,1**	1	
	Horticulture, including greenhouses	26	15	10	8	14	35	22	19	38	**58**	**38**	**31**	**54**	**2,3**	**2,2**	**2,4**	**2,7**	2	
	NL: intensive stock farming (part of agricultural policy)	26	1	1	0	1	4	4	0	4	**4**	**4**	**0**	**4**	**4,0**	**4,0**	**-**	**4,0**		
Other sources of pollution		**26**	**13**	**8**	**12**	**13**	**29**	**18**	**22**	**31**	**50**	**31**	**46**	**50**	**2,2**	**2,3**	**1,8**	**2,4**		
	Aquaculture / fish farming	26	14	8	15	7	30	15	29	8	**54**	**31**	**58**	**27**	**2,1**	**1,9**	**1,9**	**1,1**		
	Forestry	26	12	10	7	8	25	19	10	10	**46**	**38**	**27**	**31**	**2,1**	**1,9**	**1,4**	**1,3**		
	Impervious areas	26	9	5	5	3	18	6	9	3	**35**	**19**	**19**	**12**	**2,0**	**1,2**	**1,8**	**1,0**	1	
	Mining (including quarries)	26	16	10	7	15	41	19	8	39	**62**	**38**	**27**	**58**	**2,6**	**1,9**	**1,1**	**2,6**	1	
	Landfill and waste sites	26	18	8	7	20	44	18	15	52	**69**	**31**	**27**	**77**	**2,4**	**2,3**	**2,1**	**2,6**	1	
	Transport	26	18	9	11	12	35	20	23	20	**69**	**35**	**42**	**46**	**1,9**	**2,2**	**2,1**	**1,7**	1	
ABSTRACTION																				
Reduction in flow		**26**	**16**	**10**	**5**	**17**	**34**	**18**	**6**	**45**	**62**	**38**	**19**	**65**	**2,1**	**1,8**	**1,2**	**2,6**		
	Abstractions for agriculture	26	18	12	3	18	40	20	3	37	**69**	**46**	**12**	**69**	**2,2**	**1,7**	**1,0**	**2,1**	2	
	Abstractions for drinking water supply	26	16	11	2	20	32	18	2	51	**62**	**42**	**8**	**77**	**2,0**	**1,6**	**1,0**	**2,6**		
	Abstractions for industrial purposes	26	16	10	2	16	31	16	2	31	**62**	**38**	**8**	**62**	**1,9**	**1,6**	**1,0**	**1,9**		
	Abstractions for fish farming	26	10	6	2	6	17	8	2	7	**38**	**23**	**8**	**23**	**1,7**	**1,3**	**1,0**	**1,2**		
	Abstractions for mining	26	6	3	1	10	10	3	1	24	**23**	**12**	**4**	**38**	**1,7**	**1,0**	**1,0**	**2,4**		
	Abstractions for navigation (e.g. canals)	26	5	2	2	1	6	2	3	1	**19**	**8**	**8**	**4**	**1,2**	**1,0**	**1,5**	**1,0**		
	AU: Abstraction for hydropower generation	26	2	1	1	0	7	2	2	0	**8**	**4**	**4**	**0**	**3,5**	**2,0**	**2,0**	**-**	5	
ARTIFICIAL RECHARGE																				
	Groundwater recharge	26	1	0	0	11	1	0	0	17	**4**	**0**	**0**	**42**	**1,0**	**-**	**-**	**1,5**		
MORPHOLOGY																				
Flow management		**26**	**17**	**9**	**6**	**5**	**52**	**21**	**12**	**9**	**65**	**35**	**23**	**19**	**3,1**	**2,3**	**2,0**	**1,8**		
	Hydropower works (including dams)	26	20	9	1	2	63	21	1	4	**77**	**35**	**4**	**8**	**3,2**	**2,3**	**1,0**	**2,0**	5	2
	Reservoirs	26	20	10	2	5	57	20	2	9	**77**	**38**	**8**	**19**	**2,9**	**2,0**	**1,0**	**1,8**	3	3
	Flood defence works	26	19	10	7	1	49	20	17	2	**73**	**38**	**27**	**4**	**2,6**	**2,0**	**2,4**	**2,0**	4	1
	Water transfer (including pumping stations)	26	12	5	2	2	28	9	3	5	**46**	**19**	**8**	**8**	**2,3**	**1,8**	**1,5**	**2,5**	2	
	Weirs, dams, locks, and sluices for navigational purposes	26	15	4	3	0	42	6	8	0	**58**	**15**	**12**	**0**	**2,8**	**1,5**	**2,7**	**-**		
River management		**26**	**16**	**5**	**4**	**3**	**45**	**12**	**10**	**6**	**62**	**19**	**15**	**12**	**2,8**	**2,4**	**2,5**	**2,0**		
	Physical alteration of channel (including banks and dikes)	26	23	8	4	3	68	15	11	6	**88**	**31**	**15**	**12**	**3,0**	**1,9**	**2,8**	**2,0**	4	1
	Shipping	26	14	5	4	0	30	9	9	0	**54**	**19**	**15**	**0**	**2,1**	**1,8**	**2,3**	**-**	1	
	Modification for agricultural purposes	26	21	8	3	3	58	21	4	9	**81**	**31**	**12**	**12**	**2,8**	**2,6**	**1,3**	**3,0**	3	
	Modification for fishery purposes	26	12	4	3	0	21	4	4	0	**46**	**15**	**12**	**0**	**1,8**	**1,0**	**1,3**	**-**		
	Land transport infrastructure (road/bridge construction)	26	15	6	5	1	33	15	10	1	**58**	**23**	**19**	**4**	**2,2**	**2,5**	**2,0**	**1,0**	2	
	Dredging	26	17	7	7	1	39	12	17	2	**65**	**27**	**27**	**4**	**2,3**	**1,7**	**2,4**	**2,0**	1	
Transitional and coastal management		**26**	**3**	**1**	**12**	**0**	**5**	**3**	**31**	**0**	**12**	**4**	**46**	**0**	**1,7**	**3,0**	**2,6**	**-**		
	Estuarine/coastal dredging	26	4	1	13	0	9	3	37	0	**15**	**4**	**50**	**0**	**2,3**	**3,0**	**2,8**	**-**		
	Maritime engineering works (shipyards, harbours)	26	3	1	15	0	8	3	41	0	**12**	**4**	**58**	**0**	**2,7**	**3,0**	**2,7**	**-**		
	Land reclamation and polders	26	1	0	8	0	1	0	20	0	**4**	**0**	**31**	**0**	**1,0**	**-**	**2,5**	**-**		
	Coastal sand supply (safety)	26	2	1	10	0	3	2	21	0	**8**	**4**	**38**	**0**	**1,5**	**2,0**	**2,1**	**-**		
OTHER ANTHROPOGENIC PRESSURES AND IMPACTS																				
	Recreation	26	11	10	8	2	19	21	19	4	**42**	**38**	**31**	**8**	**1,7**	**2,1**	**2,4**	**2,0**		
	Fishing/angling	26	8	8	8	1	15	16	18	2	**31**	**31**	**31**	**4**	**1,9**	**2,0**	**2,3**	**2,0**	1	
	Introduced / alien species	26	14	10	11	0	31	29	24	0	**54**	**38**	**42**	**0**	**2,2**	**2,9**	**2,2**	**-**	1	
	Climate change	26	10	7	8	2	21	19	18	7	**38**	**27**	**31**	**8**	**2,1**	**2,7**	**2,3**	**3,5**		
	Others, namely:	26	0	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**	**-**	**-**	**-**	**-**		
	Austria: transboundary impacts	26	1	0	0	0	1	0	0	0	**4**	**0**	**0**	**0**	**1,0**	**-**	**-**	**-**	**1**	
	Belgium (Flanders): storage cold / warm	26	0	0	0	1	0	0	0	1	**0**	**0**	**0**	**4**	**-**	**-**	**-**	**1,0**		
	CZ: old contaminated sites	26	0	0	0	1	0	0	0	4	**0**	**0**	**0**	**4**	**-**	**-**	**-**	**4,0**		
	DE: lifestock farming	26	1	0	0	0	4	0	0	0	**4**	**0**	**0**	**0**	**4,0**	**-**	**-**	**-**		
	DE: enhancement of river depth/width relation	26	1	0	0	0	5	0	0	0	**4**	**0**	**0**	**0**	**5,0**	**-**	**-**	**-**		
	DE: acidification	26	1	1	0	1	1	1	0	3	**4**	**4**	**0**	**4**	**1,0**	**1,0**	**-**	**3,0**		
	HU: military sites, wastewater irrigation, wastewater sludge disposal, abandoned wells	26	0	0	0	1	0	0	0	3	**0**	**0**	**0**	**4**	**-**	**-**	**-**	**3,0**		
	IT: urbanisation	26	1	0	0	0	2	0	0	0	**4**	**0**	**0**	**0**	**2,0**	**-**	**-**	**-**		
	MT: Saline intrusion in response to abstraction	26	0	0	0	1	0	0	0	5	**0**	**0**	**0**	**4**	**-**	**-**	**-**	**5,0**		
	LV:transboundary pollution	26	1	1	0	0	5	3	0	0	**4**	**4**	**0**	**0**	**5,0**	**3,0**	**-**	**-**		

stria		Belgium (Flanders)				Cyprus				Czech republic				Denmark				Estonia				Finland				Germany				Greece				Hungary				Icel	
Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes
		3		**3**	**1**	**1**		**1**	**2**	**3**			**2**	**2**	**1**			**4**	**3**	**1**	**1**	**1**				**3**		**3**		**3**	**3**	**3**	**3**	**3**	**1**		**2**				
	1	2		2		1		1	2	3				1	1	2		4	3	1	1	1				3			2	3	3	3	3	4	1		3		1	
		3		3		1		1	1	1						1		4	2	2	1					4				2	3	1		3	2		1			
		4		4	4	1		1	2	3			2	2	2			4	2	1	1	1				1			2	3	2	2	3	1	1		5	1		
		2		**2**	**2**			**1**	**1**	**3**			**2**					**3**	**2**	**1**	**5**	**1**	**1**	**1**	**1**	**2**			**1**	**2**	**1**	**2**	**3**	**3**	**1**		**3**			
				2	1					3			2			1								1							2	2	2	1		4				
		3		3	1					4			2			1						1	1	2	1	3							4	3	1		5			
		1			1					3			2									1	1	1		2				1			4	3	1					
		1			1					3			2													2					3		3	2	1			1		
		1			1				1	2			2													2						2	3	3	1		1			
		2		2	2					3						1										2						3	3	3	1		2			
		2		2	3					3						1								1		2						4	3	1	1		1			
		1						1		3			2					3	2	1	5			1		2					2		3	2	1		2			
																1												2			1		2	4					
		1								3																				4			3	3	1		3			
		1								3																							3	3	1		3			
		4		**4**	**4**	**1**		**1**	**3**	**3**			**3**	**1**	**5**	**5**	**5**	**4**	**3**	**1**	**4**	**1**	**1**	**1**		**4**	**2**	**4**	**4**	**4**	**4**	**3**	**3**	**3**	**2**		**3**			
	1	4		4	4			1	3	3			3	1	5	5	5	4	3	1	4	2	2	1		4	2		4			2	2	2	2		2	1	1	
	3	4		4	4	1			3	4			4	1	5	5	5	1	1	1	3	1	1			5			5	4	4	3	3	3	3		4			
		3		3						3					1	1										1			2	3	3	2	3	2	2		2			
	2	3		3	3				1																	1			2			3	3	2	2		5			
		1		**1**	**1**	**1**		**2**	**2**	**2**			**2**					**5**	**2**	**1**	**5**	**1**	**1**	**1**	**1**							**2**		**3**	**2**		**2**			
								2		3				2	1	2								1		1			1			2		1	2		2	1	1	
										2			2	1	1	2	1	4	2			1							1				2	2	2					
																										2								4	1					
					1	1			1				4					5	1	1	5	1							4				3	4	1		2			
		2			1	1			3	2			2									1			1			1			1	4	4	3		4	1		
		2		2		1			2	2			2			2							1	1		1			2			1	2	2	3		1			
		2		**2**	**3**	**1**		**1**	**4**	**2**			**2**					**1**	**1**	**1**	**4**								**4**	**3**		**3**	**3**	**2**		**3**			
	2	1			2	1	1		4	2			1					1	1	1	1							2	4	3		3	4	2		2			
	1	2			4				1	2			3	3	1		3	1	2	1	4							2				3	1	1		4			
		1			3					2			1	1				2	1	1	4							2				2	3	2		3			
										2				2				1	1													1	2	2		1			
										1			2								5							4					4							
		2		2						1																														
	1				1				1				1																		4				1			
		2		**2**		**2**			**3**	**4**											**1**				**5**		**2**		**4**	**1**		**3**	**2**	**1**					
										4				1	1						2				5							3	2				1	1	
						2			3	5											1				3	1						3	2	2		1			
		2		3						3				1							1				1		3			1		2	3						
		2		2						2																							3	2						
		3		3						4				2	1											5								2						
		3		**3**						**3**								**4**				**1**				**5**				**3**				**2**	**2**					
		4		4						4				4	1							1				5				1	4			3	2				1	1
		3		3						3				1												4									1					
		1								2				4	2							1				4								3	2					
										3								4																	2				1	
										2																				1				1				1	
		2		2						2																3				1									
				3				**1**																**1**						**1**		**1**							
				4																				1				3		1									
				3				1																				2				2								
				2																												1								
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and		Ireland				Italy				Latvia				Lithuania				Luxembourg				Malta				Netherlands				Norway				Poland				Port	
Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes
		4	2	1	2	3		3	2	4	3	4	1											4	3	3	3	3		4	3	3	1	3	2	2	2	3	
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		4	2	1	1	1				3				4				3			1			4		3	3	2		4	3	3		3	1	1	1		
	1	3	2	1	3	1				3	3		1	5			3	2			1				2					4	4	2	1	4	4	2	3		
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		2	1	3	3					1		1	1			3								1	1	1		1				2		3	1	2	2		
		3	3	2	3								3	4				1								3		3	1			2	2	3	2	3	3		
		2	2	1	3																					1						3		3	1	1	3		
1		3	2	1	3					1				2												2				1	2			4	1	1	3		
1		4	2	1	3																					1				1	1			3	1	1	3		
		3	2	1	3						1							2								2		2	1			2	2	3	1	1	3		
		3	2	1	2													3								2		2	1			5	2	3	1	1	3		
		2	1	1	2									2	2									2		2	2	1						3	1	1	3		
1		1	1	3						1		1												3		2	1	2	1			3		2	1	2	1		
										5	3	3														2													
																									1														
		5	4	4	4	3		4	5	4	1	3	1											3	5	4	5	4	4	3	3	2		4	3	2	4	3	
	1	5	5	4	5					4	1			4			4	4			3			3	4	4	5	4	5	2	2	2		3	3	2	3		
		5	5	4	4					4	1	3	1				3	3			3	3	3	3	5	5	5	4	5	3	3	2		3	2	2	3		
		4	4	2	1									3				3						3						3	3	2		3	2	2	3		
		4	3	3	4					1								1			1	1	1	1	4	4	3	4	3	1	1			3	1	1	2		
																										4	4		4										
		3	2	1	3	1		1	1	3	2	1	4											3		2	1	1	2	3	3	4							
1		2	2	3	1					3		1	1	3										4								1		2	1	1	1	1	
		3	4	1	1					3	1	1	1																	1	1			2	1	1	1		
		3	2	1	1					1	1	1						2						4										2	1	1	1		
		4	3	1	4					1	1		1					2											2	3	3			5	2	1	3	2	
	1	4	2	1	3								4	3			4	2			1			2		2			2	2	3	4	2	4	3	2	4		
		3	2	1	1	1			1					2				2			2			3		2	4	4		1	1			3	2	1	3		
		2	2	1	2	3			3	1	1		1												5	1	1	1	1	1	1			2	1		2	2	
		2	2	1	1	5			1	1	1		1					1			1				5	1	1		1	2	2			2	1	1	2		
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		2	2	1	2	1			3	1	1		1					2			1					1	1		1	1	1			3	1		1		
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		2	1	1	3					1	1		1																					3	1				
		1	1	1	1																													1	1				
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	1				1								3																										
		3	2	1		2				4	2		1													4	4	4		4	4			2	1	1		2	
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		3	2	1		2				2	2			2				1								5	5	5		2	2			3	1	1			
		2	1	1		1																				4	4							2					
		2	1	1		1				3								3								4	2	4						2					
		2	1	1		2				3																4	4	4	3	2				2	1				
		3	2	1		2				3				4				1				3				4	4	4		1				2	1				
		1	1	1						1								2								4	4	4						2	1				
		1	1	1		3				3				4				2				5	5	1		4	4		5	2				2	1				
		1	1	1						2																				2				1	1				
		2	1	1		2				1								2				5	5	2										3	1				
		3	2	1						3				1								4	2	4		4	2	4						3	1				
				4								3												3				3				2		1		2			
1				5								3		4										3				4						1		2			
1				5								3		4										4				4				2		1		2			
				3								3												2				2						1		2			
				3								3												2				2						1		2			
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		1	1	3						1	1	1												5			2	3											
		3	3	2		1				1		1						1				5	5	5		3	1	3		2	2	2							
																		1						3		3	3	3											
					2																																		
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ugal		Slovakia				Slovenia				Spain				Sweden				UK			
Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater	Rivers	Lakes	Coastal / Transitional	Groundwater
3		**4**			**4**					**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**2**
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		3				2	2			3	2			2	2	1	1	2	2	3	2
		5			5	4	4	5					3	3	3	2	2	2	2	3	3
4	**3**	**3**			**3**					**3**	**2**	**3**	**3**	**2**	**2**	**2**		**2**	**1**	**3**	**3**
		3			4					1	2	3	3			2		3		3	
		5			4	4	3	3		4	3	4	4	1	1	1				2	
		3			2	3				3	3	3	3	2	2	2		2		2	
						2												2	1	1	
		2			2	2															
		5			4	3	3			2	1	1	1	2	2	1					3
		3			3	3	3			3	3	2	3	1	1	1		1	1		3
		2			2	3				2	1	2	1							2	
										1	1	2	1		2	2				2	
						2		2													
2	**4**	**3**			**4**					**4**	**3**	**2**	**4**	**4**	**4**	**4**	**3**	**5**	**5**	**4**	**4**
		3			3					3	3	1	3	3	3	3	2	4	4	3	3
		4			5	3	3			4	4	2	4	5	5	5	3	4	3	3	3
		3			1					3	3	2	3				1	3	3	3	3
					1	3	3			5	4	2	5	2	2			2	2	2	2
		2			**3**												**2**	**2**	**5**	**4**	**3**
1						4		3		3	2	2	1	1	1	1	1	3	5	4	
										1	1	1		2	2	1	1	3	4	3	
		1															1	2	1	2	
1		2			2	3	2			2	2	1	3	2	2	1	1	3	2	2	3
	3	4			5	4	2			2	2	2	3	2	2		1	3	1	3	3
		1			1	3				1	1	1	1	3	3	3	2	4	3	4	
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		3			3	2	1			2	2		3				1	4	4		3
		2			2	3	1			2	2		2				1	4	4		2
		1			1	3											1	2	2		2
		1			1												1	2			2
																		1			
						1											1				2
		3			**1**					**4**	**2**						**1**	**4**	**4**	**2**	
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		2				4	1	1		4	2							4	3	3	
		3			2	3	1			3	1							2	2		
		3				3								3				2	2		
		2			**1**					**3**	**2**	**2**						**4**	**4**		
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		3						1						2	2			2	1		
		2				4		2		4	4			2	2			3	2		
		1				1		1		1	1	2						2	1		
		2				2		3		3	3	2		2	2	2		3	3		
		1			2	3		2		2	2	3		1	1	1		3	2		
										3	**3**	**3**								**5**	
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								2		3	3	3				2				5	
								2												4	
										2	2	2				1				3	
		2				2	3	2		1	3	2						2	2	3	3
						2	2	2		2	2					1		3	2		2
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					3	1	1	2		4	4	4	4	2	2	2		1		2	

A2: Programme of Measures (26 countries; excl. FR)

	Issue	Priority (high3-medium2-low1)	key word
BE	Decrease cattle breeding (agriculture)	3	agriculture
BE	Minimise erosion (agriculture)	3	agriculture
CY	Abstractions for agriculture	3	agriculture
CY	Pollution from agriculture	3	agriculture
DE	Agriculture (general)	3	agriculture
DK	Inputs of nutrients from agricultural activity	3	agriculture
EE	Measures for reduction of diffuse pollution from agricultural sources	3	agriculture
EL	Agriculture: Crops with intensive nutrient or pesticide usage or long bare soil periods	3	agriculture
EL	Abstractions for agriculture	3	agriculture
EL	Agriculture: Over grazing and cropping practice – resulting in erosion	3	agriculture
HU	Good agricultural practice (Nitrate Action Program)	3	agriculture
IE	Agriculture (including farmyard runoff)	3	agriculture
IT	8. Limitation of soil input from chemical and organic fertilisers pertaining to animal breeding effluents, according to good agricultural practices standards;	3	agriculture
IT	9. Assessment of load reduction relating to animal breeding effluents, with respect to updating of vulnerable zones for nitrates, by making reference to limits indicated by D.C.R. 570/97;	3	agriculture
LT	Agriculture	3	agriculture
MT	Intensive nutrient and pesticide use in agriculture	3	agriculture
MT	Horticulture (including greenhouses)	3	agriculture
NL	Agriculture	3	agriculture
NO	Cropping practice	3	agriculture
PO	Diffuse pollution from agriculture and mining	3	agriculture
SE	Agricultural sector	3	agriculture
SK	Diffuse pollution from agriculture	3	agriculture
UK	Arable land, grassland, mixed farming	3	agriculture
UK	Over grazing and cropping practice – resulting in erosion	3	agriculture
UK	Agriculture – arable land, grassland mixed farming etc.Over-grazing and cropping practice – resulting in erosion.	3	agriculture
UK	Agriculture - nutrient management issues	3	agriculture
AU	River Management - Modification for agricultural purposes	2	agriculture
BE	Minimise the use of pesticides (agriculture)	2	agriculture
CY	Pollution from animal husbandry	2	agriculture
CY	Pollution from aquaculture	2	agriculture

CZ	Agriculture	2	agriculture
DK	Inputs of pesticides from agriculture and aquaculture	2	agriculture
DK	Inputs of nutrients and pesticides from forestry	2	agriculture
FI	Point source pollution from agriculture/regionally, locally	2	agriculture
IE	Forestry	2	agriculture
LV	Diffuse pollution caused by intensive nutrient or pesticide usage	2	agriculture
LV	Diffuse pollution caused by mixed farming	2	agriculture
PL	Agriculture impact mitigation	2	agriculture
SK	Agriculture - insufficient treatment of waste waters and waste control	2	agriculture
UK	Aquaculture / fish farming	2	agriculture
IS	Aquaculture	1	agriculture
IS	Agriculture	1	agriculture
LU	Arable land, grassland, mixed farming		agriculture
LU	Crops with intensive nutrient or pesticide usage or long bare soil periods (e.g. corn,)		agriculture
MT	Control of alien species	3	alien species
IE	Introduced species	2	alien species
IS	Long range chemical transport from other countries to Iceland (POP´s and Heavy metals)	3	atmospheric deposition
SE	Heavy metals and POP´s	3	atmospheric deposition
NL	Atmospheric deposition	2	atmospheric deposition
ES	Best practices to reduce diffuse pollution	3	diffuse sources
MT	Run off management	3	diffuse sources
ES	Reduction of erosion in river basins	3	erosion
UK	Aquaculture/fish farming (Scot only)	3	fishery
DK	Abstractions for fish farming	2	fishery
EL	Fishing/angling	2	fishery
CZ	Intesive fishery	1	fishery
FI	Fish farming	1	fishery
LV	Pollution caused by fish farming	1	fishery
AU	Flow Management – Flood defence works (migration barriers)	3	flood defence
ES	Implementation of flood mitigation measures	3	flood defence
AU	Flow Management – Flood defence works	2	flood defence
CZ	Flood protection	2	flood defence
PL	Limitation of negative impact of flood defense works	1	flood defence
BE	Purification of historical soil and groundwater pollution (other source of pollution)	3	historic pollution
HU	Remediation of polluted sites	3	historic pollution
CZ	Old contaminated sites	2	historic pollution
DE	Historical contaminated sites	2	historic pollution
BE	Optimise existing wastewater treatment plants (households)	3	households
BE	Minimise storm water overflows (households)	3	households

CY	Pollution from Households municipal waste water	3	households
CZ	Waste water – households	3	households
EE	Municipal wastewater treatment, wastewater collection	3	households
ES	Improvement of waste water treatment (specially in small towns)	3	households
HU	Urban wastewater program	3	households
IE	Municipal wastewater discharges (substances unknown) & Storm water overflows	3	households
IT	3. Conveyance to treatment plants with secondary treatment for all conglomerations with more than 2,000 I.E.;	3	households
IT	4. Adoption of appropriate treatments (equivalent to a secondary treatment) for conglomerations from 200 to 2,000 I.E.;	3	households
IT	5. Thorough removal of nutrients in treatment plants with capacity exceeding 10,000 I.E. for phosphorous, 100,000 I.E. also for nitrogen. This latter treatment is extended to the timetable of 2016, also to plants > 20,000 I.E. (10,000 I.E. when they significantly affect water bodies with abstractions for drinking water);	3	households
IT	6. Performing summer purification for treatment facilities exceeding 20,000 I.E. in the 10-km stretch from the coast line;	3	households
IT	7. Setting-up of earlier rainfall-holding tanks, or other useful devises for the reduction of pollutant loads discharged in water bodies during rainfall. Through proposed actions, it would be possible to convey to the existing treatment system 25% of discharged loads, in the expected conditions, for built-up areas with more than 20,000 inhabitants, to be brought up to 50% for 2016, and to 25% for areas ranging between 10,000 and 20,000 inhabitants; for coastal centres in the 10-km stretch, in order to improve conditions at sea, previous figures have been raised by 20%;	3	households
LT	Households	3	households
LV	Pollution caused by municipal waste water	3	households
LV	Households not connected to a sewer system	3	households
NO	Domestic waste water (scattered dwellings)	3	households
PL	Municipal sewage systems	3	households
PL	Individual sewege systems	3	households
PO	Municipal and industrial wastewaters – collection and treatment	3	households
SK	Insufficient collection and treatment of urban waste water treatments: construction and reconstruction of sewer system, construction and reconstruction of WWTPs, mitigation of storm water overflows impacts on surface waters, reduction of leakage from the sewers (to harmonise with requirements of 91/271/EEC Directive),	3	households
UK	Households - municipal waste water	3	households
UK	Households - storm water overflows	3	households
BE	Extension wastewater treatment plants (households)	2	households
CY	Pollution from Households - domestic waste water	2	households

DK	Inputs from scattered residential houses not connected to sewers	2	households
EL	Households: municipal and domestic waste water	2	households
IE	Unconnected households	2	households
IS	Municipal waste water (incl. Fish- and Agricultural industry waste water)	2	households
MT	Domestic waste-water	2	households
NL	Households	2	households
NO	Municipal waste water	2	households
NO	Storm water	2	households
SE	Municipal stormwater	2	households
UK	Households - domestic waste water (not connected to a sewer system)	2	households
UK	Urban diffuse pollution (including transport) (NI, Eng)	2	households
UK	Household – waste municipal wastewater, stormwater overflows (higher priority) (except for single dwelling septic tanks)	2	households
CY	Pollution from Households - storm water overflows	1	households
LU	Households - municipal waste water		households
LU	Households - storm water overflows		households
AU	Flow Management - Hydropower works (migration barriers)	3	hydropower
AU	Reduction in flow - Abstraction for hydropower generation	3	hydropower
LV	Flow management by hydropower works	3	hydropower
NO	Hydropower works	3	hydropower
NO	Reservoirs	3	hydropower
UK	Hydropower works (including dams)	3	hydropower
FI	Hydropower/ regionally, locally	2	hydropower
SE	Hydropower sector	2	hydropower
UK	Hydropower (Scot only)	2	hydropower
AU	Water transfer-for energy production	1	hydropower
AU	Reservoirs	1	hydropower
IS	Hydropower (+ geothermal)	1	hydropower
BE	Environmental permit policy (Industry)	3	industry
CZ	Waste water – industry	3	industry
HU	IPPC measures	3	industry
IE	Industrial discharges (substances unknown)	3	industry
IT	11. Feasible drops in pollutant input, with relation to the use of best available techniques, for industrial companies covered by the framework of application of IPPC regulation;	3	industry
LT	Industry	3	industry
LV	Pollution caused by industries	3	industry
NO	Metal industry	3	industry
PO	Control of point source pollution	3	industry
SE	Some industries	3	industry
DK	Inputs of hazardous substances from industry	2	industry

EE	Measures for reduction of abstraction of surface water for cooling water in energy production	2	industry
EL	Industry: Textile industry (including wool), olive oil press, pulp, paper & boards, chemicals, etc.	2	industry
FI	Pulp and paper industries/regionally, locally	2	industry
FI	Chemicals	2	industry
NL	Industry	2	industry
NO	Chemical industry	2	industry
SK	Industry – insufficient treatment of waste waters and waste control	2	industry
FI	Iron and steel/ regionally, locally	1	industry
FI	Non-ferrous metals/ regionally, locally	1	industry
FI	Power generation (not hydropower)/ regionally, locally	1	industry
IS	Tannery	1	industry
CY	Pollution from landfill and waste sites	3	landfill and waste
HU	Waste management programs with special regard to landfills	3	landfill and waste
NO	Landfill/waste sites	3	landfill and waste
PL	Landfill and waste sites	3	landfill and waste
SK	Landfills and waste sites	2	landfill and waste
UK	Landfill and waste management (NI only)	2	landfill and waste
IS	Landfill and waste sites	1	landfill and waste
PL	Minning industry impact mitigation	3	mining
PO	Diffuse pollution from agriculture and mining	3	mining
DE	Mining	2	mining
EE	Measures for reduction of water losses in mining activities	2	mining
HU	Recultivation of abandoned mines	2	mining
UK	Mining (including quarries)	2	mining
UK	Mining (including quarries) (Eng, Wales, Scot)	2	mining
NO	Mining	1	mining
SL	Physical alteration of channel	4	other morpholigical
BE	Restore infrastructure of banks (morphology)	3	other morpholigical
CY	Flow management from reservoirs	3	other morpholigical
CZ	Cross barriers	3	other morpholigical
EL	Physical alteration of channel (including banks and dikes) and modification for agricultural purposes	3	other morpholigical
EL	Flow management	3	other morpholigical
ES	Reduction of hydro-morphological impacts in rivers	3	other morpholigical
NL	Flow management	3	other morpholigical
NL	River management	3	other morpholigical
NL	Transitional and coastal waters management (recovery of brackish water zones)	3	other morpholigical
PO	Ecosystems conservation and biological integrity – hydromorphological aspects	3	other morpholigical

SL	Improvement of river continuities	3	other morpholigical
UK	Hydromphology – Physical alteration of channel, drainage management	3	other morpholigical
AU	River Management – Physical alteration of channel	2	other morpholigical
CZ	Physical alteration	2	other morpholigical
LT	Flow management	2	other morpholigical
LT	River management	2	other morpholigical
LV	Maritime engineering works	2	other morpholigical
SE	Physical alterations	2	other morpholigical
SK	Flow management – disruption of longitudinal river continuity, migration bariers	2	other morpholigical
UK	Physical alteration of channel (including banks and dikes)	2	other morpholigical
UK	Morphology /flow management	2	other morpholigical
FI	Physical alteration of channel (including banks and dikes)/ regionally, locally	1	other morpholigical
LV	Physical alteration of a river channel	1	other morpholigical
LU	Physical alteration of water courses		other morpholigical
PL	Recreational waters protection with land use planning	2	recreation
IS	Recreation	1	recreation
ES	Reduction of sea intrusion in coastal aquifers	3	salt intrusion
MT	Limiting saline intrusion	3	salt intrusion
IE	Dredging activities (freshwater & marine)	3	shipping
MT	Physical alterations including dredging and channelling	3	shipping
SE	Shipping, international agreements needed	3	shipping
FI	Transport of oil on sea areas (also during ice covered periods)	2	shipping
MT	Control of pollution by hydrocarbons in coastal waters	2	shipping
CY	Morphology- Maritime engineering works (shipyards, harbours	1	shipping
IS	Harbours – Shipyards	1	shipping
LU	Weirs, dams, locks, and sluices for navigational purposes		shipping
LV	Transboundary pollution	3	transboundary pollution
SE	Transport	3	transport / infrastructure
SE	Infrastructure questions	2	transport / infrastructure
IS	Infrastructure (roads / bridges / infrastructure)	1	transport / infrastructure
BE	Decrease abstracted volumes	3	water supply
BE	Sustainable water supply: diminish use of high quality groundwater	3	water supply
EE	Providing safe and good quality drinking water	3	water supply
EL	Groundwater recharge	3	water supply
ES	Reduction of impacts produced by water abstractions for irrigation	3	water supply
ES	Search of additional sources of water in arid and semi arid areas: Desalinisation and water re-use	3	water supply
ES	Elaboration of emergency plans for drought situations	3	water supply
HU	Drinking water source protection program (Safeguarding of public water supply)	3	water supply
IT	1. With respect to minimum vital runoff (DMV);	3	water supply

IT	2. Water resource saving and streamlining actions, in domestic, farming and industrial sectors;	3	water supply
IT	10. Progressive reuse of waste waters for irrigation, specifically for identified priority treatment plants;	3	water supply
MT	Groundwater abstractions (including municipal and agricultural abstractions)	3	water supply
MT	Surface water abstractions	3	water supply
PO	Abstractions for drinking water supply – delimitation of protection zones and regulation	3	water supply
PO	Minimization of drought effects	3	water supply
PO	Water supply - construction and rehabilitation of infrastructures	3	water supply
PO	Promote efficient water use	3	water supply
UK	Abstractions for drinking water supply	3	water supply
CZ	Abstractions	2	water supply
DK	Abstractions for drinking water supply	2	water supply
IE	Abstraction (regulation issues)	2	water supply
UK	Abstractions for drinking water (Scot, Eng, Wales)	2	water supply
DE	Reduction in groundwater flow	1	water supply
EL	Climate change	?	
ES	Protection of sensible areas	3	
HU	Mitigation of emission of hazardous substances (surface and groundwater)	3	
IT	12. Return to natural conditions of some river stretches, as defined by competent Basin Authorities.	3	
PO	Prevention of flood events	3	
PO	Integration of land use planning and water protection	3	
IE	Point discharges to groundwaters (coalfields, mines, landfills etc)	2	
IE	Land use change	2	
PL	Improvement of river training using biological systems	2	
SE	Rural areas	2	
SL	Improvement of physical planniing	2	
LT	Transitional and coastal management	1	
SL	Reduction of pollution(agriculture, households, other sources, ind.)	1	

B.1: What other obstacles did you face when producing the Article 5 report? (27 countries)

	Issue	**Key word**
UK	Issues but not expecting actions under CIS Work programmes:o Agreement on definitions, political and legal context o New areas of expertise requiredo Data storage issues o Resources to investigate all that was required.	
AU	Availability of data e.g. local data	data
BE	Datamanagement	data
BE	Lack of structured data Hydromorphological pressures	data
BE	Lack of structured data about waterabstraction and flow regulation	data

BE	Lack of information about costs (eg environmental, ressource costs, financial costs)	data
BE	Lack of information about some wateruses.	data
CY	Availability of data in usable format	data
CY	Lack of an appropriate national monitoring and database system	data
CZ	Disunity of input data (Official statistics, databases of water users, databases of authorities)	data
CZ	Input data availability (no access due to the business property legislation)	data
CZ	Missing data (biological parameters, economical data)	data
DE	Availability of data and date formats	data
DE	Missing chemical data for small water bodies	data
EE	2. Availability of existing data – although the necessary data exist it takes too much time to coordinate internally between different institutions the need of the data. Data availability in river basin scale is of course one of the issues but seems to be not a problem as new databases are established specially for the needs of the river basin management.	data
EL	Lack of data in certain fields (e.g. economic, biological data)	data
EL	Need for harmonisation of most of the available data according to the WFD and the L.3199/2003 (transposition of the WFD into national legislation) requirements	data
ES	Insufficiency of biological data	data
ES	Lack of appropriate data about cost recovery. Unavailability due to harmonisation issues, scale, etc	data
FI	Availability of data varies considering different water categories and water types	data
FR	Economic data: evaluation of water-related equipment, costs linked to uses, environmental costs, economic weighting of uses at local level	data
HU	Lack of data on transboundary groundwater bodies	data
HU	Lack of ecological data	data
HU	Not adequately harmonised water quantity and quality monitoring	data
IE	Lack of detailed pressure information (farmyard facility status, regulation of abstractions, petroleum storage facilities)	data
IE	Lack of dangerous substances monitoring or licensing information	data
IE	Inadequate resolution of data eg reporting units for census information	data
IE	Lack of up to date data in some assessments (eg Forestry information)	data
IE	Lack of comprehensive impact data	data
IE	Lack of databases for previously unrecorded pressures (eg alien species)	data
IS	Lack of basic background data and information.	data
LT	There is a limited availability of emission data on dangerous substances. The problem is that until recently authorities and enterprises were not fully aware of the kinds of substances that are released as a consequence of production processes.	data
LT	The information systems on water pressures, status and other related data are not designed to the level which would allow proper collection of necessary data.	data

LT	Limited knowledge of pressures agricultural activities induce on water bodies. There is a lack of precise input data (application of fertilizers, population, number of livestock, area of different crops) to be used in the models to assess agricultural loads of pollutants. The data possessed is collected on the basis of administrative boundaries, not river basin district ones.	data
LT	Lake monitoring data is very limited and does not allow to reliably assess the current status of majority of Lithuanian lakes and the impacts various pressures have on them.	data
LT	The socio-economic data necessary for the economic analysis is collected either nationwide or on a basis of existing administrative units (depending on data type).	data
LV	Information is available, but is collected on inappropriate scale and thus is not suitable for the intended use, as the national environmental monitoring programme is not designated for gathering of information on the level of water bodies so far.	data
LV	Necessary information is not separated during aggregation of the State statistics.	data
LV	Information is not collected at all/ there a no data of environmental monitoring.	data
LV	Currently available data are not sufficient to develop proposals, to analyse all pressures and impacts and to make precise risk assessment.	data
MT	- Collection and collation of data from different Authorities and Government Departments and subsequent amalgamation.	data
MT	- Insufficient data available	data
MT	- Funding for the collection of necessary data	data
NL	In some cases the level of aggregation of available data was very diverse, both at national and at international level. This “scale problem” was most striking for issues related to the economic analysis.	data
NL	A general problem is that we all had to work with available data, although more information should be used in order to estimate whether the objectives of the WFD could be met in a more precise way. This underpins the importance of the future monitoring activities in order to make sure that the choices made in the art 5 report can be confirmed (or deselected) if specific and targeted information gets available.	data
NO	Availability of data (harmonised formats)	data
PL	Limited biological data	data
PL	Data formats	data
PL	Industry data not fully available	data
PL	Limited number of monitoring points	data
PL	System of data exchange not sufficient	data
PO	Lack of data on pollutants use patterns	data
PO	Lack of data on biological, hydromorphological and economic issues	data
PO	Lack of data on pollutants discharges	data
PO	Lack of data on water uses	data
PO	Lack of sampling protocols at national level	data
PO	Integration of existing data due to different scales and collection practices	data

SK	Lack of biological and priority pollutants data for surface waters	data
SK	Lack of hydromorphological data for small water bodies	data
SK	Groundwater: Databases on point sources pollution - only basic parameters of water quality were available, incomplete coordinates for sources of pollution	data
SK	Lack of data about urban waste waters collection and treatment of smaller municipalities (smaller than 2000 PE)	data
SK	Lack of data on waste water dealing in settlements without public sewerage system	data
SK	Groundwater: Database on water abstraction – only mean monthly data available	data
SK	Groundwater: Data related to diffuse pollution from agriculture – different scale (per administration division and not river basin division) and not in GIS	data
SL	Missing data about impacts on ecosystem for many driving forces and pressures	data
SL	Missing data about atmospheric deposition	data
SL	Missing data about soil erosion (conection to determine phosphorus loss from soil)	data
SL	Not enough data to develop complex abiotic typology	data
SL	Lack of sediment transport data	data
SL	Missing data on hydromorphological pressure (characteristics of fish farms, small irrigation systems, pumping for different use	data
UK	Limited availability of data, particularly with regard to pressures not currently subject to regulation in Scotland, ie, abstraction, flow regulation and morphological change	data
UK	Lack of coverage of information for Scotland	data
UK	Data storage issues	data
UK	Limited availability of data/coverage of information, particularly with:	data
UK	Lack of data o regard to pressures not currently subject to regulation (Scotland: abstraction, flow regulation and morphological change, NI: Abstraction)	data
UK	Lack of data o elements not covered in existing monitoring systems and ecological data being aligned with terms and expressions in WFD	data
UK	o lack of groundwater data	data
UK	o lack of baseline data in some areas e.g. economic analysis	data
UK	o Variable availability of datasets across IRBDs	data
UK	Need for work (now underway) to harmonise data management across IRBD boundaries (NI):	data
EE	3. Expert opinions – to find an expert with the solid opinion seems to be rather difficult, since there are other experts who have different opinions.	expert judgement
BE	Different approaches of neighbour countries in addressing issues of transboundary W.B. evaluation	international co-ordination
CZ	Different approaches of neighbour countries in addressing issues of transboundary W.B. evaluation	international co-ordination

EE	1. Cooperation in international river basin districts (with Latvia and Russia), mainly due to different work programs and difficulties in information exchange.	international co-ordination
HU	Pollution from upstream countries	international co-ordination
LU	No harmonised evaluation methods in international river basin district	international co-ordination
LV	Neighbour countries, which are not the EU Member States (Russia and Byelorussia), are not keen on the cooperation within international river basin districts.	international co-ordination
NL	The Netherlands are located at the down stream end of 4 international rivers, The Rhine, Meuse, Scheldt and the Ems. As a consequence all national river basin districts are part of larger international districts. The international co-ordination of the implementation of the WFD is also applied to the preparation of the WFD art 5 report, resulting in 4 so-called “international roof reports”	international co-ordination
NL	International co-ordination is a time consuming and complex process, in spite of many years of common experience in the frame of existing international river basin treaties.	international co-ordination
NL	At national level many efforts were needed to harmonise the information available at local level to get a harmonised set of information at national level. In addition to that a lot of discussion took place (and will continue) in order to try to harmonise/to co-ordinate the national (harmonised) data with the national data of our neighbouring countries with whom we share the international river basins of the 4 earlier mentioned rivers.	international co-ordination
NL	In the context of international river basin districts differences in interpretation of the WFD and resulting different “approaches” made comparison of results a time consuming activity.	international co-ordination
PO	Coordination in international river basin districts due to different work programmes	international co-ordination
PO	Integration of data in international river basin districts due to different approaches and methodologies applied	international co-ordination
SL	Missing data about transboundary pollution (sea)	international co-ordination
BE	Risk analyses in relation to the effect of existing measures on the status of (transboundary) waters	knowledge gap
BE	Knowledge gaps : good status (good potential), reference conditions	knowledge gap
BE	Interaction of different pressures on watersystem	knowledge gap
BE	Impact assessment (for ex. historical pollution of sediments)	knowledge gap
DE	Unsure objective definition due to missing WFD-appropriate assessment methods	knowledge gap
DE	Several unknown pressure-impact relationships for morphology	knowledge gap
DK	Lack of tools to estimate the ecological status of the water bodies and for lakes and coastal areas lack of consistent data on the biological quality elements.	knowledge gap
ES	Difficulty in evaluating the degree of significance of the impacts	knowledge gap
FR	Geographical frames of reference need to be improved	knowledge gap
FR	Knowledge of pressures: notably diffuse pollution, hydromorphology	knowledge gap
FR	Knowledge of the quality of aquatic environments	knowledge gap

IE	Unknown impacts due to morphological and hydrological factors	knowledge gap
IE	Inadequate knowledge of pollutant runoff behaviour	knowledge gap
IE	Poorly understood relationships between some pressure, state and impact indicators	knowledge gap
IE	Lack of certainty of relationship between existing impact data and future status definition	knowledge gap
IE	Uncertainty in link between pressures and their source economic sectors and subsectors	knowledge gap
IS	Lack of methods to quantify pressure force to weight if issue is of concern.	knowledge gap
LT	There is no sufficient data and knowledge on interrelationships between physico-chemical factors and biology to determine meaningful types in Lithuania.	knowledge gap
LT	Limited knowledge of the impacts different pressures have on water body ecosystems (specifically to biology). A number of decisions for the designation of risk water bodies were based on expert judgments, assumptions, which are not still validated with clear evidences. Moreover, forecasts of water status as a result of various water management scenarios and measures are also aggravated because of limited knowledge of those interrelationships.	knowledge gap
LT	There is the lack of knowledge on the economic importance of the candidate water bodies for the designation as heavily modified.	knowledge gap
LT	There is incomplete knowledge on the level of cost recovery for different users (households, industry and agriculture)	knowledge gap
LU	Needs of research for evaluation methods p.ex. Biological and hydromorphological evaluation methods	knowledge gap
LV	Currently recovery of costs can be assessed for water supply and wastewater collection services only, because information about the environmental impacts and costs associated with other water services is insufficient.	knowledge gap
LV	Existing knowledge and information are insufficient to evaluate possible effects and costs of proposed measures.	knowledge gap
NO	Good and simple methods /models for predicting ecological effects from quantified pressures, often a mix of different pressures	knowledge gap
NO	Difficulties in finding operational pressure criteria for risk assessment	knowledge gap
PO	Lack of tools to relate hydromorphological pressures and ecological impact	knowledge gap
PO	Identification of linkages between surface water, groundwater and terrestrial ecosystem	knowledge gap
SE	Development of models for better calculations	knowledge gap
SE	Better background documents for judging good status	knowledge gap
SE	Tools for assessing water exchange between adjacent coastal regions as well as between	knowledge gap
SK	Preliminary objectives for some of chemical parameters higher than limit of quantification of the analyses, missing objectives for some of the parameters	knowledge gap
SK	Lack of tools for facilitation of analyses	knowledge gap
SK	Lack of information about state of art in implementation of measures	knowledge gap

SL	Missing environmental quality standards – especially for concentrations of pollutants in sediment and biota	knowledge gap
SL	Evaluation/ prediction of impact on ecosystem for combining effect of different pollutants	knowledge gap
UK	Lack of ecological tools for assessing impacts, particularly with regard to morphology and diffuse pollution	knowledge gap
UK	New areas of expertise required	knowledge gap
UK	Lack of ecological tools for assessing impacts, particularly with regard to morphology and diffuse pollution	knowledge gap
EL	Political approval for many issues that will be included in the report	national priorities in policies
ES	Administrative complexity of Spanish distribution of competences between central and regional governments	national priorities in policies
LV	Start-up and completion time of sewerage infrastructure projects is just preliminary, therefore it is complicated to make forecasts about the effects of improved wastewater treatment on water quality in lakes, rivers etc.	national priorities in policies
NL	In NL the political agenda was dominated by safety against flooding. When the WFD came into force a change in mindset and organization was necessary in order to combine, and, where necessary, to co-ordinate and to prioritize the 2 political obligations.	national priorities in policies
AU	Limited resources (human and financial)	resources
CY	Human resources	resources
DE	Human resources	resources
EE	4. Capacity problems – the availability of human resources is lacking behind, probably due to the fact that the information exchange internally has been poor and all the relevant intuitions have not been notified timely or have not understood the real amount of work that had to be done.	resources
EL	Technical problems related to the delay on providing technical assistance for producing the Article 5 report	resources
IS	Lack of human resources	resources
LU	Human resources	resources
LU	Very high load of work due to international coordination	resources
MT	- Human resources (lack of)	resources
MT	- Deficiency in expertise in particular areas	resources
SE	Lack of time and in some cases difficulties to get data	resources
UK	o Limitation of resources especially to address technical cross - IRBD Issues such as typology	resources
EL	Administrative arrangements for the implementation of the Article 5	WFD process
ES	Lack of standardisation of methods for defining typologies	WFD process
ES	Lack of clear criteria for the definition of reference conditions	WFD process
IE	Uncertainty in quantifying driving force trends (eg CAP changes)	WFD process

LT	There is the lack of reference unimpacted sites in bigger rivers as well as in the transitional and coastal waters to estimate the values of reference conditions for certain types.	WFD process
LT	The knowledge of pollution from agglomerations below 2000 person equivalents is limited since a part of them do not posses centralized sewer system and therefore are not obliged to get a permit. According to national legislation a permit is required when discharge from a point source is >5 m3 a day. This amount is rarely reached without centralized sewerage connection system. As the result, there is no requirement to monitor their discharges and report data to relevant authorities.	WFD process
LT	There is a big uncertainty with respect to how melioration ditches, small canalized rivers and artificial interbasin water transfer channels should be treated. In the meantime there is not enough data to conclude if melioration ditches and small canalized rivers will naturally recover, which of them are planned to be continually maintained and which of them are or will be abandoned in this respect. Furthermore, there are significant spatial data gaps which form obstacles to locate and analyze the system of ditches. Consequently, the ditches were neither assigned to heavily modified or artificial water bodies nor to water bodies at risk. Similar situation is with dug out channels, which were not designated as artificial for now since some of them resemble natural streams. More observation to decide on their status is needed.	WFD process
LV	Development of various plans that influence water status is not harmonised and consistent in time.	WFD process
NL	The time frame of the WFD covers a period of 15 years or even more in case of exemptions. A lot of discussion took place at technical and political level in order to get used to the stepwise approach of the WFD, the role of the art 5 analysis, of the monitoring programme and the programmes of measures to be included in the River basin management plan. Specifically the fact that the art. 5 report was a kind of pre-selection of potential problem area's (standing in the way to meet the WFD objectives) and that in a later stage the set of possible measures were to be decided taking on board the political acceptance and viability of a set of measures was very difficult to communicate.	WFD process
NL	The WFD objectives are formulated in a theoretical way. In the process of making them operational it turned out that many more efforts seem to be necessary in order to meet the objectives. This fact was and still is a subject of a national political debate.	WFD process
NL	The geographical position of NL is such that a major part of the water bodies are either artificial of candidate heavily modified. It was felt that the general mindset of the WFD was more focusing on natural and pristine water bodies. Time was (and still) is needed to explain the factual situation in the NL ("…..you have the burden of proof position……"	WFD process

NL	Missing of the (new) Groundwater Directive and the Daughter Directive on priority substances (WFD art. 16 (7) and (8).	WFD process
SE	The competent authorities are new and need time for consolidation	WFD process
SE	Very many lakes and rivers	WFD process
SE	Assessment criteria for the risk analysis are preliminary and under development, boundaries for good status is not set	WFD process
SK	Identification of preliminary objectives for hydromorphology	WFD process
UK	Agreement on definitions, political and legal context	WFD process
SL	Deposit sites from industrial and agriculture activities	

B.2:What issues do you expect to be an obstacle in the future? (27 countries)

	Issue	Key word
MT	- Attainment of quality standards in groundwater since the groundwater quality (particularly that of 'deep' groundwater) does not respond immediately to measures taken in the surface catchment area.	
MT	- High population density and high population per linear km of coastline	
MT	- Island status	
MT	- Small nation size	
MT	- Dependence of GDP on coastal tourism	
SE	Recovery time very long specially concerning eutrophication	
uk	Issues around cost effectiveness of POMs and disproportionate costs	
LU	The agriculture policies	agriculture
SE	The agricultural sector	agriculture
SE	Airborne impact	atmospheric deposition
AU	Availability of data	data
BE	datamanagement	data
BE	Lack of information about costs (eg environmental, ressource costs, financial costs)	data
BE	Lack of information about some wateruses.	data
CY	Availability of data in usable format	data
EL	Non-harmonised data formats	data
EL	Availability of data (mainly biological quality data for inland surface waters)	data
ES	Cost of the adaptation of the water data monitoring networks	data
HU	Not enough data to establish threshold values	data
IE	Availability of appropriate economic data	data
IE	Obtaining data for further characterisation assessments	data
IS	Lack of basic background data and information.	data
LT	The knowledge of pollution from agglomerations below 2000 person equivalents is limited since a part of them do not posses centralized sewer system .	data
LV	The level at which the State statistics are aggregated, as aggregation is traditionally made at the level of administrative units.	data

LV	Insufficient data for those proposals, risk assessments etc., where long time series of data are necessary to ground the decision.	data
NO	Availability of data (harmonised formats)	data
PO	Lack of data on economic and hydromorphological issues	data
PO	Updating of databases	data
SL	Lack of sediment transport data	data
UK	Large quantities of additional data are required. Much of this is new data to be acquired and other data is disparate and needs to be collated.	data
uk	Large quantities of additional data are required.	data
uk	o Much of this is new data to be acquired and other data is disparate and needs to be collated:	data
uk	o Currently undefined but largely demand for monitoring and data for further characterisation	data
PO	Definition of environmental objectives	environmental objectives
PO	Establishment of environmental quality standards for pollutants discharged in river basin districts	environmental standards
CZ	Flood protection measures as a part of WFD 2000/60/EC (Article 4 ??)	flood defence
LU	Flood protection	flood defence
CZ	Common approach in evaluation of transboundary W.B. (data spectrum and methodology)	international co-ordination
EE	1. Cooperation with non member states (Russia)	international co-ordination
LV	Cooperation with the neighbour countries, which are not the EU Member States.	international co-ordination
NL	Many substances (priority, priority hazardous and “substances discharged in significant amounts” are related to EU legislation based on prevention of distortion of competition (“marketing and use directive”, pesticide directive etc.). For many substances it will be vital that generic measures are formulated at EU level.	international co-ordination
NL	In case the Daughter directive on priority/priority hazardous substances lacks measures at EU level, very laborious notification procedures are foreseen with in fact unpredictable outcomes. For this reason the Netherlands always took the stand that measures should be formulated at the most appropriate level using the most appropriate (legal) instruments (in this case at EU level).	international co-ordination
NL	Complex discussions are expected concerning the adverse effects resulting from upstream downstream relations (shift of responsibility from upstream to downstream and vise versa).	international co-ordination
PO	Coordination of environmental quality standards setting for pollutants discharged in international river basin districts	international co-ordination
PO	Coordination in international river basin districts	international co-ordination
SE	Load from other countries affecting the Swedish coastal waters	international co-ordination
SL	Achieve high level of certainty about transboundary pollution (sea)	international co-ordination
BE	Knowledge gaps on diffuse pollution	knowledge gap
BE	Relation pressure -impact	knowledge gap

BE	Qualitative and quantitative relationship surface water- groundwater – sediments for all relevant substances	knowledge gap
BE	Relationship groundwater & ecosystem	knowledge gap
BE	Measure-effectiveness (all pressures work together, so need for integrated solution)	knowledge gap
DK	Level of costs incurred from measures aimed at achieving the goals of WFD	knowledge gap
ES	New scenarios for water demand (not considered or wrongly evaluated in the elaboration of the Article 5 reports)	knowledge gap
FR	Evaluation of measures' impact	knowledge gap
FR	Absence of accurate definition of the good status	knowledge gap
IE	Establishment of consistent methodologies for cost-effectiveness, cost-benefit and cost incidence analysis	knowledge gap
IE	Quantification of economic value of ecological/environmental resource	knowledge gap
IE	Quantifying pollutant losses	knowledge gap
IE	Establishing EQS for relevant pollutants	knowledge gap
IS	Lack of methods to quantify pressure force.	knowledge gap
LT	Limited knowledge of the impacts different pressures have on water body ecosystems (specifically to biology), forecasts of water status as a result of various water management scenarios and measures are also aggravated because of limited knowledge of those interrelationships.	knowledge gap
LT	Limited knowledge of pressures agricultural activities induce on water bodies. There is a lack of precise input data (application of fertilizers, population, number of livestock, area of different crops) to be used in the models to assess agricultural loads of pollutants.	knowledge gap
LV	Forecasts of the effects of the proposed investment projects in the wastewater treatment sector.	knowledge gap
NL	Availability of practical instruments to assess the expected impact of measures. One may think of simple models/approaches which take account of the (limited) availability of data ("no sophisticated models for which the necessary data is not or cannot be made available")	knowledge gap
NL	Time and debate is needed to eliminate knowledge gaps and to gain the necessary experiences (knowledge concerning substances; what are the exact steering variables for a good ecologic status/potential etc).	knowledge gap
NO	Good and simple methods /models for predicting ecological effects from quantified pressures, often a mix of different pressures	knowledge gap
NO	Difficulties in finding operational pressure criteria for risk assessment	knowledge gap
NO	Common, accepted and simple methods/models for calculating inputs (esp. diffuse inputs)	knowledge gap
NO	Common, accepted and simple methods/models for analysis of cost/efficient measures	knowledge gap

NO	Common, accepted and simple methods/models for calculating benefits / disproportionate costs	knowledge gap
PL	Economical issues respecting full recovery costs including specially resources costs	knowledge gap
PO	Lack of knowledge about the response of aquatic system to pressures	knowledge gap
SE	Elaboration of models	knowledge gap
SE	Leakage coefficients	knowledge gap
SE	Questions concerning water exchange between adjacent coastal regions and between coastal zone and open see	knowledge gap
SK	Incomplete information of diffuse pollution from agriculture	knowledge gap
SL	Achieve high level of certainty about impacts on ecosystem for some of driving forces and pressures – especially new hazardous substances and alien species	knowledge gap
SL	Setting of missing environmental quality standards – especially for concentrations of pollutants in sediment and biota	knowledge gap
SL	Achieve high level of certainty about atmospheric deposition	knowledge gap
SL	Determine phosphorus loss from soil	knowledge gap
SL	Relationship between hydromorphological and biological conditions	knowledge gap
SL	Impact of alloctonous fish species on other biological elements	knowledge gap
SL	Assessment of biological rehabilitation measures for river types	knowledge gap
SL	Lack of common European hydromorphological assessment method	knowledge gap
UK	Availability of monitoring/assessment tools	knowledge gap
uk	Availability of monitoring/assessment tools	knowledge gap
uk	o many classification tools not fully validated for another 2-3+ years	knowledge gap
uk	Lack of recognition of need to prioritise work and be pragmatic in approaches – some knowledge gaps will take a very long time to fill.	knowledge gap
LU	Monitoring of the priority substances	monitoring
PO	Monitoring – technical and financial aspects	monitoring
IT	Interregional co-operation in the Po river basin	national co-ordination
BE	Hydrological regime – good status achievement (needs and threats of water are priority functions above environmental objectives)	national priorities in policies
CY	Social costs (increase in water prices)	national priorities in policies
CY	Mentality of certain water users	national priorities in policies
CZ	Economy analysis (recovery of the costs of all water services (not only drinking water & sewage)	national priorities in policies
DE	Acceptance of measures by the people concerned (e.g. landowners)	national priorities in policies
DE	Area-wide morphological alterations due to important uses will prevent from achieving good status in a significant number of water bodies (esp. rivers)	national priorities in policies
DE	Enforcement of measures in agriculture	national priorities in policies
IE	Creating legislation to implement POM	national priorities in policies
IE	Establishing water charging principals	national priorities in policies
MT	- Enforcement	national priorities in policies

NL	Looking at the priorities, a complex assessment is needed in order to combine in an equitable way all the functions a water system may have.	national priorities in policies
NL	A transparent process will be needed to strike the right balance among all the functions of a water system when preparing the programme and measures	national priorities in policies
NL	How to explain to politicians/decision makers and the public that although the ecological functioning of a water body is OK, that the classification leads to moderate because some chemicals (discharged in significant quantities) do not meet the water quality standard	national priorities in policies
NL	Major polluting sectors have a limited economic strength which will make the discussion regarding their contribution to the set of programme of measures difficult	national priorities in policies
NL	NL is a densely populated country. Availability of space for various (WFD required) measures cannot easily be made available (Land clauses act procedures)	national priorities in policies
UK	Pressure from stakeholders,	national priorities in policies
EL	Organisation of an efficient public participation and consultation process	public participation
uk	Effective stakeholder involvement:	public participation
uk	o Pressure from stakeholders	public participation
uk	o Conflict between stockholders at IRBD level e.g. on expectations with respect to good ecological quality and potential cost of achieving this	public participation
AU	Financial resources as well as for data collection and measures	resources
AU	Human resources	resources
CY	Relevant human resources	resources
CY	Implementation costs	resources
CZ	Range of monitoring and its costs	resources
CZ	Financing of Programme of measures	resources
DE	Financial means	resources
DE	Human resources	resources
FI	Resources to river basin analysis, monitoring, water status assessment and river basin management planning. Biological monitoring should especially be developed and augmented, as well as the monitoring of the littoral zone.	resources
HU	Bottlenecks in institutional capacities	resources
IS	Lack of human resources	resources
IT	Fund raising	resources
IT	Human resources	resources
LT	Shortage of resources for measures required under WFD as now all funds are divided to fulfil other directive requirements.	resources
LU	Lack of human resources	resources
LV	Slow growth of capacity necessary to evaluate possible effects and costs of the proposed	resources
MT	- Implementation of measures; that is transforming issues into actions through possibly the enactment of subsidiary legislation.	resources
MT	- Keeping up with monitoring obligations particularly due to envisaged lack of human resources and high costs involved.	resources

PL	Financial resources to fully implement requirements	resources
SE	Enough personal and financial resources	resources
SL	Lack of human resources	resources
SL	Lack of financial resources	resources
UK	Resources for monitoring impact	resources
UK	The need to keep costs within budget	resources
uk	Limited budget & resources for:	resources
uk	o monitoring impact of WFD	resources
uk	o costs of groundwater data	resources
CZ	New water resources (possible climate change >>> reservoirs, BAT in households & industry)	water supply
CY	The fragmentation of the water legislation and powers	WFD process
CY	Tight Deadlines	WFD process
DE	Lack of harmonisation of CAP/WFD	WFD process
ES	Uncertainty in the definition of environmental objectives until 2009	WFD process
HU	Not clear criteria for assessment of good status	WFD process
IE	Establishment of GES, MEP & GEP	WFD process
IE	Prioritisation of POM	WFD process
IE	Gaining stakeholder buy-in	WFD process
LV	Harmonisation of development plans and programmes elaborated by different sectors, as most of them have their own time plans, which do not correspond to the WFD implementation.	WFD process
MT	- Integration of all issues in the RBD and ensuring the coordination between all entities concerned	WFD process
NL	Different target groups and varying public interests are involved such as e.g. navigation, production of hydropower, safety (protection against flooding) and nature conservation.	WFD process
NL	If (many) new priority and priority hazardous substances are placed on annex X of the WFD a complicated process may start. The existing 33 Annex X substances play, amongst other substances and quality elements, an important role in the recently finalized art. 5 risk analysis. A monitoring programme will be developed and programme of measures will be based taking account of these 33 substances. In case the list in annex X will be expanded this may have an impact on both the monitoring programme and also on the programme of measures. The next set of Annex X substances may lead to other programme of measures than based on the first set of 33 annex X substances (risk of disinvestments in measures). Give water managers a good chance to start building the necessary measures.	WFD process
PO	Operationalization of criteria applied to the heavily modified water bodies designation	WFD process
PO	Programme of measures – priority setting and financing	WFD process
SL	Measures: How to reach consensus between the sectors	WFD process

uk	Effective interaction and prioritisation between policy underlying different directives (CAP-WFD, NOD-WFD, etc)	WFD process
PO	Integration of sectoral policies and stakeholders expectations	
PO	Administrative aspects	

C.1 When looking at potential measures for the issues listed in sections A and B, which of them would merit an international approach? Indicate EU-level or International River Basin District-level. (27 countries)

	Issue	EU	IRBD	both	key word
LT	Research projects			x	
LT	New methodologies	x			
LT	Support for non-member states			x	
NO	All (esp. those under B)	x	x	x	
PL	Improvement of river training using biological systems			1	
BE	Intercalibration of assessment methods for biological quality elements			X	assessment of quality
CZ	Relations between the monitoring and the entire assessment of status of WBs.	X			assessment of quality
CZ	Transboundary aspects of the assessment of status of WBs.		X		assessment of quality
DE	International agreement on biological assessment methods			X	assessment of quality
HU	To develop assessment methods	x			assessment of quality
MT	Control of alien species	x			assessment of quality
PO	Harmonization of the criteria applied to the heavily modified water bodies designation		x		assessment of quality
PO	Ecological status classification system			x	assessment of quality
SK	Objectives for hydrology (minimum flow)			x	assessment of quality
SK	Approach to evaluation of artificial irrigation canals (in period of year without water)			x	assessment of quality
SK	Relationship among hydromorhological and biological condition			x	assessment of quality
SL	Relationship between hydromorphological and biological conditions				assessment of quality
EE	Management of coastal waters, measures and coordination of measures for coastal waters			x	coastal water management
MT	More in-depth analysis of the problems specific to coastal areas with particular reference to saline intrusion	x			coastal water management
MT	Small island and island state issues in relation to water and coastal management	x			coastal water management
BE	Datamanagement			x	data management
CY	Appropriate database for storing water related data	X			data management
CY	Lack of biological and general water quality data	X			data management
ES	Harmonisation of data collection			X	data management
MT	Funding for the collection of necessary data	x			data management
MT	Collation of monitoring data	x			data management
NL	Data management in such a way that a simple interaction among all systems in Europe is possible		1e priot	*	data management

PO	Harmonization of data collection and management		x		data management
PO	Harmonization of monitoring programmes		x		data management
PO	Harmonization of monitoring technical specifications	x			data management
BE	Environmental, ressource, financial costs and effects of measures			X	economy
CZ	Economy - cost/benefits and cost recovery problems.	X			economy
IE	Establishment of consistent methodologies for cost-effectiveness, cost-benefit and cost incidence analysis			Y	economy
IE	Quantification of economic value of ecological/environmental resource			Y	economy
LV	Assessment of environmental impacts and costs associated with all water services and evaluation of the possible effects and costs of the proposed measures.	+			economy
NL	Common analyses at (international) river basin scale concerning the development of cost effective programme of measures		*		economy
NL	A common understanding concerning “what are economic instruments” and what are “economic measures”	x			economy
CY	Community education and involvement in decision making	X			education
CZ	Harmonisation of environmental objectives.			X	environmental objectives
IE	Establishment of GES, MEP & GEP			Y	environmental objectives
NL	Agreement on operational variables as a result of (international) common or co-ordinated objectives		*		environmental objectives
PO	Definition of environmental objectives		x		environmental objectives
AU	Collection and evaluation of toxicity test data	X			environmental standards
BE	Environmental standards for annex VIII and X substances	X			environmental standards
HU	Establishing threshold values	x			environmental standards
IE	Establishing EQS for relevant pollutants			Y	environmental standards
PO	Environmental quality standards setting for pollutants discharged in international river basin districts		x		environmental standards
SE	Elaboration of EQS for POP´s in biota	X			environmental standards
SL	Setting of missing environmental quality standards – especially for concentrations of pollutants in sediment and biota				environmental standards
ES	Flood control measures		X		flood defence
PO	Prevention of flood events			x	flood defence
DE	Enforcement of measures in agriculture	X			harmonising WFD with other policies
FI	Impacts of common policies on water quality (particularly CAP)				harmonising WFD with other policies
HU	Harmonising the WFD and the Nitrate Directive	x			harmonising WFD with other policies
HU	Harmonisation of the WFD and the CAP	x			harmonising WFD with other policies
LT	Coordination of activities in pollution reduction		x		harmonising WFD with other policies
LV	Control of pollution caused by agricultural activities: coordination of the proposed pollution reduction measures and common agricultural policy	+			harmonising WFD with other policies
MT	Development of effective measures to limit pollution from agricultural sources possibly through amalgamating the EU Water Policy with the CAP	x			harmonising WFD with other policies

NL	Setting of adequate and generic emission control measures at EU level for those substances where quality objectives at EU level exist and EU legislation is the most effective and appropriate tool.	*			harmonising WFD with other policies
ES	Municipal sewage systems (small towns)			X	households
AU	Identification of new relevant substances	X			impact assessment
BE	Impact assessment			x	impact assessment
CZ	Long term changes of driving forces and the environmental objectives	X			impact assessment
DE	Area-wide morphological alterations due to important uses			X	impact assessment
FR	Evaluation of actual agricultural pressures				impact assessment
FR	Links between pressures and impacts (ecological charecteristics)				impact assessment
IE	Inadequate knowledge of pollutant runoff behaviour			Y	impact assessment
IE	Unknown relationships between pressure state and impact			Y	impact assessment
LV	Estimation of the impacts and measures to control pollution caused by forestry.			+	impact assessment
MT	Desalination - impacts and implications	x			impact assessment
MT	Effects of Climate Change	x			impact assessment
MT	Assessment of erosion phenomena	x			impact assessment
SE	Quantification of the need to internationally reduce the deposition of antrophogenic loads of nutrient, heavy metals and POP´s	X			impact assessment
SE	Mechanism for transport of N and P in land and water	X			impact assessment
SE	Elaboration of models for load of N, P and POP´s on coastal areas and see	X			impact assessment
SE	Elaboration of models for prediction	X			impact assessment
SK	Development of common approach for quantification of diffuse pollution – expressed by nutrients and other parameters (i.e. heavy metals, specific organic pollution)			x	impact assessment
SL	Achieve high level of certainty about impacts on ecosystem for some of driving forces and pressures – especially new hazardous substances and alien species				impact assessment
SL	Assessment of transboundary pollution (sea)				impact assessment
SL	Comprehensive assessmentchieve of atmospheric deposition				impact assessment
SL	Determine phosphorus loss from soil				impact assessment
SL	Impact of alloctonous fish species on other biological elements				impact assessment
SL	Common European hydromorphological assessment method			+	impact assessment
UK	Impacts of reduced flows due to abstraction (research?)	X			impact assessment
UK	Waste management /landfill issues		X		impact assessment
UK	Agricultural nutrient management issues		X		impact assessment
LV	Control of transboundary pollution		+		international co-ordination
CZ	Transboundary aspects of R.B.M.Plans public consultations.		X		international public consultation
AU	Assessment of hydromorphological rehabilitation measures for river types			X	measures assessment
ES	Best practices to reduce diffuse pollution			X	measures assessment
IE	Developing measures for agriculture losses (including farmyard runoff)	Y			measures assessment
IE	Developing measures for dredging activities (freshwater & marine)	Y			measures assessment
IE	Developing measures for introduced species	Y			measures assessment

LU	POLLUTION (households, industry and agriculture)			Yes	measures assessment
LU	ABSTRACTION		YES		measures assessment
LU	MORPHOLOGY		YES		measures assessment
LU	OTHER ANTHROPOGENIC PRESSURES AND IMPACTS (Climate change)	YES			measures assessment
LV	Control of pollution caused by other sources: landfills and transport	+		+	measures assessment
LV	Measures to minimise adverse effects of maritime engineering works	+		+	measures assessment
NL	Assessment of the impact of measures on the chemical an biological quality of surface and ground waters using “practical and well considered approaches”		1e priot	*	measures assessment
PL	Municipal sewage systems		1		measures assessment
PL	Individual sewege systems		1		measures assessment
PL	Landfill and waste sites				measures assessment
PL	Minning industry impact mitigation			1	measures assessment
PL	Agriculture impact mitigation			1	measures assessment
PL	Recreational waters protection with land use planning			1	measures assessment
PL	Limitation of negative impact of flood defense works			1	measures assessment
SE	Elaboration of tools for presentation to show the effects of different measures and scenarios	X			measures assessment
SL	Assessment of biological rehabilitation measures for river types				measures assessment
UK	Diffuse pollution (Mainly agricultural, but also road run-off)	X			measures assessment
UK	Morphology pressures	X			measures assessment
UK	Alien species management		X		measures assessment
UK	Flow management /navigation issues		X		measures assessment
BE	Interaction groundwater – surfacewater - sediments		x		physical interactions
BE	Interaction flood protection – ecological restoration			X	physical interactions
BE	Interaction water balance – water quality objectives			X	physical interactions
FR	Links between groundwater and surface water (reciprocal influences)				physical interactions
SK	Development of criteria for identification of change in surface water category			x	physical interactions
SK	Development of criteria for identification of change in groundwater water category			x	physical interactions
EE	Coordination of programme of measures in international river basin districts			x	PoM
EL	Agricultural practises including abstractions for irrigation			✓	PoM
EL	Pollution from households	✓			PoM
EL	Flow management including physical alterations of channels and modifications for agricultural purposes	✓	✓		PoM
EL	Pollution from industry	✓	✓		PoM
EL	Other water abstractions (for drinking water supply, industrial purposes, etc.)	✓	✓		PoM
EL	Groundwater recharge	✓		✓	PoM
EL	Fishing/angling			✓	PoM
EL	Landfill and waste sites	✓			PoM
EL	Climate change			✓	PoM
LV	Control of pollution caused by various branches of industry: a common approach would be valuable.	+			PoM

LV	Control of pollution caused by agricultural activities: a common approach would be valuable.		+		PoM
NL	A common understanding of the societal impact of environmental objectives and the role of political decision making e.g. as regards the programme of measures			*	PoM
PO	Programme of measures			X	PoM
UK	Morphology pressures (best practice exchange/definition – no guidance)	X			PoM
UK	Diffuse pollution (Mainly agricultural, but also road run-off): EU: Not formal guidance but management and information exchange	X			PoM
FR	Addressing concrete cases at sub basin scale				water management at sub basin scale
CY	Water resource management in drought prone regions	X			water resources management
CY	Artificial recharge of treated wastewater				water resources management
EE	Management of groundwater, availability and resource management in international districts			x	water resources management
ES	Coordination of measures to save water in irrigation		X		water resources management
ES	Emergency plans for drought situations		X		water resources management
IT	Water saving	X			water resources management
IT	Water conservation	X			water resources management
IT	Water demand management	X			water resources management
IT	Water reuse	X			water resources management
PO	Promote efficient water use		x		water resources management
PO	Minimization of drought effects		x		water resources management
UK	Impacts of reduced flows due to abstraction	X			water resources management

C.2 For which of the issues listed under C.1 do you identify gaps of knowledge or a lack of methodologies that could be input for research projects? (27 cntrs)

FR	All issues	?
NO	Esp. those under B	?
CZ	Relations between the monitoring and the entire assessment of status of WBs.	assessment of quality
DE	Development of common EU-wide biological assessment methods (option 1 of INTERCALIBRATION process guideline)	assessment of quality
FI	Linking monitoring and modelling	assessment of quality
HU	Everything concerning the connection/effect between/on hydrological, hydromorpholgical, hydrogeological factors/processes and the status of the ecosystems	assessment of quality
HU	Aspects of different monitoring network's optimalisation	assessment of quality
LU	Assessment methods	assessment of quality
MT	Development of techniques for Ecological Monitoring	assessment of quality
NL	Elaborations concerning the one out all out principle for chemicals discharged in significant quantities as part of the ecological status/potential.	assessment of quality
PO	Ecological status classification system – indicative parameters and integration approaches	assessment of quality

PO	Ecological potential classification system - indicative parameters and integration approaches	assessment of quality
SK	Objectives for hydrology (minimum flow)	assessment of quality
SK	Approach to evaluation of artificial irrigation canals (in period of year without water)	assessment of quality
SL	Relationship between hydromorphological and biological conditions	assessment of quality
SL	Methodology for monitoring and chemical status evaluation on karstic GW bodies	assessment of quality
SL	Treshhold values to prevent deterioration of chemical status of GW bodies	assessment of quality
UK	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.	assessment of quality
UK	Groundwater – surface water: Ecological interactions	assessment of quality
BE	Datamanagement	data management
CY	Appropriate database for storing water related data	data management
LU	Data aggregation	data management
LU	GIS data management	data management
NL	Decision support systems taking account the availability of data, the quality of data, the scale to which available data apply, and resulting uncertainties.	data management
NL	The decision support systems may focus on various levels of scale (EU, region, country, river basin, smaller area etc)	data management
PO	Technologies for real time data collection and management	data management
CZ	Economy - cost/benefits and cost recovery problems.	economy
IE	Establishment of consistent methodologies for cost-effectiveness, cost-benefit and cost incidence analysis	economy
IE	Quantification of economic value of ecological/environmental resource	economy
LV	Assessment of environmental impacts and costs associated with all water services and evaluation of the possible effects and costs of the proposed measures: methodology adapted to our conditions and best practices	economy
PO	Methodologies to estimate environmental and resource costs	economy
CY	Community education and involvement in decision making	education
BE	Intercalibration of assessment methods for biological quality elements (	environmental objectives
ES	Modelling tools to define reference conditions	environmental objectives
IE	Establishment of GES, MEP & GEP	environmental objectives
BE	Environmental standards for annex VIII and X substances	environmental standards
IE	Establishing EQS for relevant pollutants	environmental standards
PO	Environmental quality standards	environmental standards
SE	Elaboration of EQS for POP´s in biota	environmental standards
SL	Setting of missing environmental quality standards – especially for concentrations of pollutants in sediment and biota	environmental standards
BE	Impact assessment	impact assessment
CZ	Long term changes of driving forces and the environmental objectives	impact assessment

IE	Inadequate knowledge of pollutant runoff behaviour	impact assessment
IE	Unknown relationships between pressure state and impact	impact assessment
LT	Limited knowledge of the impacts different pressures on water body ecosystems (specifically to biology)	impact assessment
LT	Limited knowledge of impact from agricultural activities on water bodies	impact assessment
LT	Limited knowledge on interaction between biological and chemical parameters	impact assessment
LT	Limited knowledge on impact of hydropowers to ecosystem	impact assessment
LU	Diffuse assessment	impact assessment
LV	Estimation of the impacts and measures to control pollution caused by forestry: methodology	impact assessment
LV	How to calculate precisely pollution loads that affect a single water body and their cumulative effects?	impact assessment
MT	Trends in Coastal Erosion	impact assessment
NL	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")	impact assessment
PO	Linkages between individual and multiple pressures and ecological status	impact assessment
SE	Mechanism for transport of N and P in land and water	impact assessment
SE	Elaboration of models for load of N, P and POP´s on coastal areas and see	impact assessment
SE	Quantification of the need to internationally reduce the deposition of antrophogenic loads of nutrient, heavy metals and POP´s	impact assessment
SE	Elaboration of models for prediction	impact assessment
SK	Groundwater: Development of common approach for quantification of diffuse pollution – expressed by nutrients and other parameters (i.e. heavy metals, specific organic pollution)	impact assessment
SL	Achieve high level of certainty about impacts on ecosystem for some of driving forces and pressures – especially new hazardous substances and alien species	impact assessment
SL	Assessment of transboundary pollution (sea)	impact assessment
SL	Comprehensive assessment of atmospheric deposition	impact assessment
SL	Determine phosphorus loss from soil	impact assessment
SL	Impact of alloctonous fish species on other biological elements	impact assessment
LV	Best practices in the control of transboundary pollution	international co-ordination
AU	Assessment of hydromorphological rehabilitation measures for river types	measures assessment
BE	Costs and effects of measures	measures assessment
EE	Closing down old underground mining areas, which impact the water quality and might have negative effects by causing temporary floodings	measures assessment
ES	Methodologies to deal with social and economic issues to develop future scenarios	measures assessment
ES	Decision support systems for the selection of the best alternative in the programme of measures	measures assessment

HU	Evaluation of environmental results of implemented program of measures. (e.g: Effects of completed wastewater programs on the chemical, ecological status of waterbodies in selected sub-river basins – lessons to be learned)	measures assessment
LV	Control of pollution caused by landfills and transport: methodology, practical experience	measures assessment
LV	Measures to minimise adverse effects of maritime engineering works: best practices	measures assessment
MT	Development of synergies between the CAP and agricultural pollution	measures assessment
MT	Action plans for the control and eradication of alien invasive species	measures assessment
NL	General insight is needed to find out what the most effective and cost effective measures are. (focus on chemical water quality improvement, focus on improvement of the habitat quality or focus on combinations of chemical and habitat oriented measures)	measures assessment
PL	Limitation of negative impact of flood defense works	measures assessment
SE	Elaboration of tools for presentation to show the effects of different measures and scenarios	measures assessment
SL	Assessment of biological rehabilitation measures for river types	measures assessment
UK	Groundwater – surface water: Pressures management	measures assessment
BE	Interaction groundwater – surfacewater - sediments	physical interactions
MT	Saline Intrusion - firstly a clear definition is needed in the Directive of what is meant by 'significant intrusion'. This is achievable only through further Community-wide research in 'intrusion mechanisms'.	physical interactions
PO	Linkages between groundwater, surface waters and terrestrial ecosystem	physical interactions
SK	Development of criteria for identification of change in surface water category	physical interactions
SK	Relationship among hydromorhological and biological condition	physical interactions
EL	Agricultural practises including abstractions for irrigation	PoM
EL	Flow management including physical alterations of channels and modifications for agricultural purposes	PoM
EL	Groundwater recharge	PoM
EL	Climate change	PoM
EL	Landfill and waste sites	PoM
FI	Linking ecological and socio-economical models	PoM
PL	Minning industry impact mitigation	PoM
CY	Water resource management in drought prone regions	water resources management
CY	Artificial recharge of treated wastewater	water resources management
EE	Groundwater management	water resources management
ES	New technologies to save water in irrigation	water resources management
ES	New technologies for non conventional water sources(desalinisation and reuse)	water resources management
IT	Water saving	water resources management
IT	Water conservation	water resources management
IT	Water reuse	water resources management

PO	Technologies and methodologies to support an efficient water use	water resources management
PO	Integration of climate change in water resources management	water resources management
MT	The impact of implementing the WFD on small islands; where the implementation of obligations result in specific complications not encountered in larger MS	WFD process

Annex IV: Priorities under CIS 2005-2006

Table 3 from the CIS work programme 2005/2006:
Priority activities under the Common Implementation Strategy 2005/2006 including attribution to the Working Groups and tentative timeframe for start and completion of work (WG: working group; EAF: expert advisory forum; IRBM: integrated river basin management; GW: groundwater).

No	Key activities	Responsible Group	Tentative timeframe
A1	Intercalibration exercise	WG A – Ecological Status (led by JRc)	Results reported to Committee in July 2006
A2	Eutrophication guidance	WG A – Ecological Status (led by DG ENV)	Guidance by end 2005
B1	Integration of pilot river basins into all CIS activities	WG B – IRBM	Outcome report in Dec 2006
B2	Information sheets on cost-effectiveness	WG B – IRBM (led by FR)	Information sheets by [check]
B3	Link to research and Article 5 evaluation	WG B – IRBM (led by SP/NL)	Various products, finalised in late 2005
B4	Water scarcity	WG B – IRBM (led by FR) (also linked to EU Water Initiative)	Guidance end 2005
C1	Preparatory work on groundwater	WG C – Groundwater	Ongoing
E1	Preparatory work on priority substances	WG E – Priority Substances	Ongoing
F1	Preparatory work on flooding	EAF Flooding	Ongoing
C2	Monitoring	DG Monitoring linked to WG C and E	Guidance documents for GW and PS end 2006
D1	Reporting and GIS – development of WISE and reporting guidance 2007 and 2010	WG D – Reporting	Reporting guidance on monitoring end 2005 and on RBMP mid 2007
S1	Link of Agriculture / WFD	Strategic Steering Group (led by UK and DG ENV)	Summary report with key results end 2006
S2	Improving integration of WFD in other policy areas – regional policy, transport/navigation, energy/hydropower (agriculture and research see separate point)	Strategic Co-ordination Group	Ongoing

No	Key activities	Responsible Group	Tentative timeframe
S3	Environmental objectives	Strategic Co-ordination Group	Stepwise work programme according to discussion paper
S4	Improvement of transboundary co-operation	Strategic Co-ordination Group	Mandate to be defined later

Annex V: Information on BREFs, from: http://eippcb.jrc.es/pages/BActivities.cfm

Activities of the EIPPCB. Here you will find details of the industrial sectors being addressed, the people involved in that work, the background information being used in the work, records of early technical working group meetings and draft reference documents as they become available.

It is the intention to develop a series of reference documents so as to cover, as far as practicable, the activities listed in Annex 1 to the Directive. The work program consists of a number of work sectors each year as determined by the Information Exchange Forum (IEF). The IEF consists of representatives from Member States, industry and environmental non-governmental organisations. Each sector of work is addressed by a specific Technical Working Group (TWG) established for the duration of the work. The documents drafted by the EIPPCB will be circulated around the TWGs for comments before being submitted to the Environment Directorate-General of the Commission and being further considered by the IEF.

The reference documents are produced following a set BREF outline and guide as agreed with DG Environment and the IEF which gives important foundations for the understanding of best available techniques reference documents (BREFs).

For advice on downloading Documents click here. BREFs and DRAFTs are large documents and in order to avoid problems they should be downloaded rather than opened straight from the Web page. When you click on one of these links you are given the option to select the site where you prefer to download the document from. This does not apply to MRs, which are smaller documents, and can be downloaded directly from this page.

The (8) adopted BREFs in English language together with translations of parts of them into all Member State languages have been published on a CD by the Office for Official Publications of the European Communities. The CD is titled "Reference Documents on Best Available Techniques (Council Directive 96/61/EC) : First edition (multilingual)" ISBN 92-894-3678-6 (http://europa.eu.int/comm/environment/pubs/industry.htm).

= BREF formally adopted; = BREF finalised; = Final Draft BREF; = Working Draft BREF; = work started.

TWG & Members list (click on TWG name to see the list of members)	Documents available (see key below table)	Background material	Additional Information
Pulp and Paper manufacture	BREF (12.01)	List	Yes
Iron and Steel production	BREF (12.01)	List	Yes
Cement and Lime production	BREF (12.01)	List	Yes
Cooling Systems	BREF (12.01)	List	Yes
Chlor-Alkali manufacture	BREF (12.01)	List	Yes

Ferrous Metal processing	BREF (12.01)	List	Yes
Non-Ferrous Metal processes	BREF (12.01)	List	Yes
Glass manufacture	BREF (12.01)	List	Yes
Tanning of hides and skins	BREF (02.03)	List	Yes
Textile processing	BREF (07.03)	List	Yes
Monitoring systems	BREF (07.03)	List	Yes
Refineries	BREF (02.03)	List	Yes
Large Volume Organic Chemicals	BREF (02.03)	List	Yes
Smitheries and Foundries	MR BREF (07.04)	List	
Intensive Livestock Farming	BREF (07.03)	List	Yes
Emissions from storage of bulk or dangerous materials	MR BREF (01.05)	List	
Common waste water and waste gas treatment and management systems in the chemical sector	BREF (02.03)	List	Yes
Economic and cross media issues under IPPC	MR FD (11.04)	List	
Large Combustion Plant	MR FD (11.04)	List	
Large Volume Inorganic Chemicals - Ammonia, Acids & Fertilisers	MR D2 (03.04)	List	
Large Volume Inorganic Chemicals - Solid & Others	MR D1 (08.04)	List	
Slaughterhouses and Animal By-products	MR BREF (11.03)	List	
Food, Drink and Milk processes	MR D2 (05.03)	List	

Ceramics	MR D1 (10.04)	List	
Management of Tailings and Waste-Rock in Mining Activities	MR BREF (07.04)	List	
Surface treatment of metals	MR D2 (04.04)	List	
Surface treatments using solvents	MR D1 (05.04)	List	Yes
Waste Incineration	MR D2 (03.04)	List	
Waste Treatments [Previously Waste Recovery/Disposal activities]	MR D2 (01.04)	List	
Speciality inorganic chemicals	MR D1 (09.04)	List	
Organic fine chemicals	MR D2 (12.04)	List	
Polymers	MR D1 (09.04)	List	
Energy Efficiency	2003	List	

Key to "Documents available":

BREF (mm.yy)	indicates that a document has been formally adopted by the Commission and can be downloaded by following the link which leads to the list of mirrors available and selecting the site nearer to you.
BREF (mm.yy)	indicates that a document has been finalised after submission to DG Environment and the final version dated as shown can be downloaded by following the link which leads to the list of mirrors available and selecting the site nearer to you.
FD (mm.yy)	indicates that a **Final Draft** document dated as shown has been put up for discussion with DG Environment and the Information Exchange Forum and the draft can be downloaded by following the link.
D1/2/3 (mm.yy)	indicates that a 1st / 2nd / 3rd working **Draft** reference document dated as shown has been put to consultation in the TWG and the draft can be downloaded by following the link.
MR (mm.yy)	indicates work has started, theTWG has met for the first time on date shown and a **Meeting Report** of that first meeting can be downloaded by following the link where shown.
yyyy	indicates work is planned to commence in the year shown and has not yet started.

Annex 6; Overview of relevant currently running research projects

Introduction

This Annex gives an overview of the currently executed research projects with relevance for the WFD implementation. Of course, more relevant research projects and initiatives exist than the ones mentioned below. Nevertheless, in order to keep a list that is easily accessible, the projects are limited to the currently running projects and to the FP projects. Another reason for sticking to the currently executed projects is that in those projects, people still can be contacted to discuss with and to adapt the product if necessary (as stated in the main body of the document).

FP projects can often be considered as a core in a network of researchers around a certain topic, and FP projects are frequently followed by LIFE or INTERREG projects. Generally speaking, the people within a certain FP project know what relevant LIFE, INTERREG or COST initiatives exist.

More information about LIFE, INTERREG or COST projects is available at the respective websites:

LIFE database: http://europa.eu.int/comm/environment/life/project/Projects/index.cfm

LIFE, the Financial Instrument for the Environment, introduced in 1992, is one of the spearheads of the European Union's environmental policy. LIFE-Environment aims to implement Community policy and legislation on the environment in the European Union and candidate countries. This approach enables demonstration and development of new methods for the protection and the enhancement of the environment.

INTERREG: http://europa.eu.int/comm/regional_policy/interreg3/abc/abc_en.htm

General principles:

Economic and social cohesion
Balanced and sustainable development of the European territory
Territorial integration with candidate and other neighbouring countries

An example of a LIFE project with relevance for the WFD implementation is presented below, nr. 42 Watersketch.

COST site: http://www.cost.esf.org/index.php

Founded in 1971, COST is an intergovernmental framework for European Co-operation in the field of Scientific and Technical Research, allowing the co-ordination of nationally funded research on a European level. COST Actions cover basic and pre-competitive research as well as activities of public utility. The goal of COST is to ensure that Europe holds a strong position in the field of scientific and technical research for peaceful purposes, by increasing European co-operation and interaction in this field.

Finally, the **Water supply and sanitation technology platform** (WSSTP) must be mentioned. The Water Supply and Sanitation Technology Platform (WSSTP) is one of the technology platforms that are set up within the European Environmental Technology Action Plan (ETAP) that was adopted by the European Commission in 2004. It is a European initiative, open to all stakeholders involved in European water supply and sanitation and major end-user groups. The participants in the platform will together produce a common vision document for the whole European water industry together with a strategic research agenda and an implementation plan for the short (2010), medium (2020) and long term (2030). The WSSTP will contribute to:

- The competitiveness of the European water industry (Lisbon Strategy);
- Solving the European water problems
- Reaching the Millennium Development Goals (Johannesburg).

By this, the scope of WSSTP goes beyond the WFD. Member States are involved via the Member State Mirror Group.
WSSTP site: http://www.wsstp.org/default.aspx

Projects:

1. Achieving technological innovation in flood forecasting (ACTIF – FP5)

General Project Information

Objectives: ACTIF will actively consolidate and disseminate Fifth Framework research advances in Flood Forecasting through three scientific meetings and preparation of best European practice guidance. The ACTIF partners will compile best practice guides on three topics where significant research advances have been made in recent years and also on cataloguing specific data sets of long-term value to the research community. Thus ACTIF will facilitate the uptake by end-users of European research advances in flood forecasting, warning and dissemination.

Project Reference: ***EVK1-CT-2002-80014***	Contract Type: Preparatory, accompanying and support measures
Start Date: 2003-02-01	End Date: 2006-01-31
Duration: 36 months	Project Status: Execution
Project Acronym: ACTIF	Update Date: 2005-06-07

http://www.actif-ec.net/

Coordinator

Organisation Type: Other

Organisation: H R Wallingford Group Ltd
Howberry Park
OX10 8BA Wallingford
UNITED KINGDOM

Contact Person:
Name: POWELL, Keith (Dr.)

2. Assessing and improving sustainablilty of urban water resources and systems (AISUWRS – FP5)

General Project Information

Objectives: The overall scope is to assess and improve the sustainability of urban water resources and systems with the help of computer tools. The project will analyse a range of existing urban water supply and disposal scenarios by demonstrating how each scenario differs in its handling of contaminants. The sources of contaminants, their flow paths and the sinks will be identified for different urban areas and a quantification of the contaminant loads undertaken. The impact of these contaminant loads on their capability to contaminate groundwater will be estimated. For the verification and validation of the model, detailed field studies will be carried out in 4 case study cities. In addition AISUWRS aims to develop a management and DS system that will make use of innovative pipeline and urban water system assessment procedures to deliver detailed guidelines and recommendations for the safeguarding and protection of urban water resources.

Project Reference: ***EVK1-CT-2002-00110***	Contract Type: Cost-sharing contracts
Start Date: 2002-11-01	End Date: 2005-10-31
Duration: 36 months	Project Status: Execution
Project Acronym: AISUWRS	Update Date: 2005-06-07

URL: http://www.urbanwater.de/

Coordinator

Organisation Type: Education

Department: DEPARTMENT OF APPLIED GEOLOGY

Organisation: UNIVERSITAET KARLSRUHE (TECHNISCHE HOCHSCHULE)
12 Kaiserstrasse 12
PF 6980
76128 KARLSRUHE
GERMANY

Contact Person:
Name: SCHMIRANDER, Andrea (MRS)

3. Advance logging investigations of aquifers in coastal environments (ALIANCE – FP5)

General Project Information

Objectives: The goal of ALIANCE is to improve the investigation, characterisation and monitoring of coastal aquifers for vulnerability assessment. For this, ALIANCE proposes to develop a set of geophysical approaches for the quantitative evaluation of brine intrusion. This includes state-of-the-art geological, geochemical, petrophysical, logging and hydrological methods, and the design of 5 new geophysical and hydrodynamical logging/testing sensors yielding new data for model validation. Two end-member sites in terms of hydrogeological behaviour will be set up for long-term experimentation, the testing of the new tools, and the validation of site-specific experimental and modelling protocols from µm- to 100 m-scale. Active in-site testing from short and longer-term injections with variable salinity fluids will simulate over drafting or saline water intrusion. The electro-hydraulic coupling principle will be used to characterise and monitor water/brine hydrodynamics in coastal environments.

Project Reference: ***EVK1-CT-2001-00091***

Contract Type: Cost-sharing contracts

Start Date: 2002-01-01

End Date: 2005-07-31

Duration: 43 months

Project Status: Execution

Project Acronym: ALIANCE

Update Date: 2005-06-07

URL: http://www.isteem.univ-montp2.fr/LGHF/water/ALIANCE/

Coordinator

Organisation Type: Research

Department: INSTITUT DES SCIENCES DE LA TERRE, DE L'EAU DE MONTPELLIER

Organisation: CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
Place Eugene Bataillon
34095 MONTPELLIER
FRANCE

Contact Person:
Name: RETOURNA, Michel (Mr)

4. Strategic tools to support adaptive, integrated water resource management under changing utilisation conditions at catchment scale : a co-evolutionary approach. (AQUADAPT – FP5)

General Project Information

Objectives: The AQUADAPT project will generate knowledge and tools to support strategic water resource planning in semi-arid contexts with an emphasis on the co-ordination of planning with other aspects of environmental, land use, and socio-economic development. The project is characterised by a co evolutionary perspective, the application of a cross-disciplinary enquiry framework, and emphasis on practical outputs, informed by end-users. Research will characterise co evolutionary trajectories and identify robust configurations of technologies, policies and distribution arrangements. Actions focus on an analysis of the spatial and temporal relationships between climate change, land use, governance arrangements, human behaviour, water quality/quantity, and environmental integrity. Output supports decision-making and stakeholder participation in water resource planning and management. The consortium combines contributions from theoretical and empirical research, industry and potential end-users.

Project Reference: ***EVK1-CT-2001-00104***

Contract Type: Cost-sharing contracts

Start Date: 2002-02-01

End Date: 2005-07-31

Duration: 42 months

Project Status: Execution

Project Acronym: AQUADAPT

Update Date: 2005-06-07

URL: http://www.aquadapt.net/

Coordinator

Organisation Type: Education

Department: DEPARTAMIENTO DE ECOLOGIA - FACULTAD DE CIENCIAS

Organisation: UNIVERSITY OF ALICANTE
Carretera de Alicante a San Vicente s/n
P.O. Box 99
03080 ALICANTE
SPAIN

Contact Person:
Name: RUIZ, Juan (Prof)

5. Integrated concepts for reuse of upgrated wastewater (AQUAREC – FP5)

General Project Information

Objectives: The project intends to develop integrated strategies for the reuse of upgraded ef-fluent from wastewater treatment plants (WWTP) as a fresh water substitute for non-potable use. It will provide standards, recommendations and data for policy makers (strategy level), methodologies, practices and guidelines for preparing and operating reuse systems (management level) and design standards and cost data for proven reuse process chains (technology level). Case and feasibility studies serve to substantiate and validate the results. The consortium consists of 23 partners from 12 countries and integrates fields as diverse as economics, environmental science, medicine, hygiene, geology, chemical, systems and civil engineering. Innovation is expected mainly from novel targets (inclusion of pre-accession states, focus on multi-purpose industrial reuse), application of best available tools from many disciplines, user oriented approach and introduction of hybrid processes.

Project Reference: ***EVK1-CT-2002-00130***

Contract Type: Cost-sharing contracts

Start Date: 2003-03-01

End Date: 2006-02-28

Duration: 36 months | Project Status: Execution

Project Acronym: AQUAREC | Update Date: 2005-06-07

http://www.ivt.rwth-aachen.de/Eng/Forschung/aquarec.html

Coordinator

Organisation Type: Education

Department: INSTITUT FUER VERFAHRENSTECHNIK

Organisation: AACHEN UNIVERSITY OF TECHNOLOGY
Turmstrasse 46
52064 AACHEN
GERMANY

Contact Person:
Name: RAUHUT, Burkhart (Prof. Dr.)

6. Enhanced zero discharge seawater desalination using hybrid solar technology (AQUASOL – FP5)

General Project Information

Objectives: Proposal addressed to perform an innovative development of environmentally friendly seawarer desalination with zero discharge brine. Scientific and technological developments will be focused in the increasing of current Performance Ratio of conventional MED desalination systems by the inclusion of a double heat pump to energy recovering from brine, the use of brine to the commercial production of salt, avoiding any discharge, and coupling a hybrid solar/gas-fired cost-efficient thermal energy system. Final developed system is expected to have remarkable environmental features, with relevant aspects in energy efficiency and water production cost, when compared with conventional MED systems.

Project Reference: ***EVK1-CT-2001-00102*** | Contract Type: Cost-sharing contracts

Start Date: 2002-03-01 | End Date: 2006-02-28

Duration: 48 months | Project Status: Execution

Project Acronym: AQUASOL | Update Date: 2005-06-07

URL: http://www.psa.es/webeng/aquasol/index.html

Coordinator

Organisation Type: Research

Department: PLATAFORMA SOLAR DE ALMERIA

Organisation: CENTRO DE INVESTIGACIONES ENERGETICAS, MEDIAMBIENTALES Y TECNOLOGICAS
S/N Carretera Senes S/N
PO Box 22
04200 TABERNAS
SPAIN

7. Mitigation of Water Stress through new Approaches to Integrating Management, Technical, Economic and Institutional Instruments (AQUASTRESS – FP6)

Aqua**S**tress is an Integrated Project (IP) funded by the European Commission in the frame of the 6th R&D Framework Programme (www.cordis.lu). Water stress is a global problem with far-reaching **economic** and social implications. The mitigation of water stress at regional scale depends not just on technological innovations, but also on the development of new integrated water management tools and decision-making practices. The **A**qua**S**tress IP delivers enhanced interdisciplinary methodologies enabling actors at different levels of involvement and at different stages of the planning process to mitigate water stress problems. This IP draws on both academic and practitioner skills to generate knowledge in technological, operational management, policy, socio-economic, and environmental domains. Contributions come from 35 renowned organizations, including SMEs, from 17 Countries. **A**qua**S**tress will generate scientific innovations to improve the understanding of water stress from an integrated multisectoral perspective to support:

- diagnosis and characterisation of sources and causes of water stress;
- assessment of the effectiveness of water stress management measures and development of new tailored options;
- development of supporting methods and tools to evaluate different mitigation options and their potential interactions;
- development and dissemination of guidelines, protocols, and policies;
- development of a participatory process to implement solutions tailored to environmental, cultural, economic and institutional settings;
- identification of barriers to policy mechanism implementation;
- continuous involvement of citizens and institutions within a social learning process that promotes new forms of water culture and nurtures long-term change and social adaptivity.

The IP adopts a Case Study stakeholder driven approach and is organised in three phases; (i) characterisation of selected reference sites and relative water stress problems, (ii) collaborative identification of preferred solution options, (iii) testing of solutions according to stakeholder interests and expectations (Figure 1-1). It will make a major contribution to the objectives of the Global Change and Ecosystems Sub-Priority 1.1.6.3, addressing Topic II.3.3.b of the 6th Framework Programme of the European Commission www.cordis.lu and it supports the Community Directive 2000/60/EC and the EU Water Initiative.

http://www.aquastress.net

aquastress@aquastress.net

8. Understanding river-sediment-soil-groundwater interactions for support of management of waterbodies (river basin & catchment areas) (AQUATERRA – FP6)

Action Line: River-soil-groundwater system functioning

Changes in climatic conditions, land use practices and soil and sediment pollution have large-scale adverse impacts on water quantity and quality. The current knowledge base in river basin management is not adequate to deal with these impacts. Austere is both integrating and developing knowledge to resolve this and disseminating it to stakeholders. In the water cycle, soil is a key element affecting groundwater recharge and the chemical composition of both subsurface and surface waters (the latter is additionally affected by sediments). The proper functioning of the river-sediment-soil-groundwater system is linked to key biogeochemical processes determining the filter, buffer and transformation capacity of soils and sediments. Austere aims at a better understanding of the system as a whole by identifying relevant processes, quantifying the associated parameters and developing numerical models of the groundwater-soil-sediment-river system to identify adverse trends in soil functioning, water quantity and quality. The modelling addresses all relevant scales starting from

micro-scale water/solid interactions, the transport of dissolved species, pollutants as well as suspended matter in soil and groundwater systems at the catchments scale, and finally the regional scale, with case studies located in major river basins in Europe. With this integrated modelling system, Austere provides the basis for improved river basin management, enhanced soil and groundwater monitoring programs and the early identification and forecasting of impacts on water quantity and quality during this century. Austere is committed to the dissemination and exploitation of project results through structured workshops, dedicated short courses, and the active participation of consortium partners in national and international conferences. A peer review panel supervises the quality and direction of the project.

Coordinator	
Contact Person: Name: FRANK, Elisabeth Email: efrank©attempto-service.de http://www.attempto-projects.de/aquaterra/	**Organisation:** Attempto Service GmbH ATTEMPTO - EU-Management Albrechtstr. 9 72072 Tübingen GERMANY
Project details	
Project Reference: 505428	**Contract Type:** Integrated Project
Start Date: 2004-06-01	**End Date:** 2009-06-01
Duration: 60 months	**Project Status:** Execution
Project Cost: 20.22 million euro	**Project Funding:** 13.00 million euro

9. Arid cluster: strengthening complementarity and exploitation of results of related rtd projects dealing with water resources use and management in arid and semi-arid regions (ARID – FP5)

General Project Information

Objectives: The ARID Cluster will review and consolidate the work of three currently funded EU projects with a view at ensuring that through collaboration, information sharing and dissemination a consistent set of recommendations and user friendly tools and methodologies for water management in arid and semi arid areas are developed. The three projects have concentrated their research efforts on integrated water resource management based on GIS databases. They all draw on hydrological, socio-economic and institutional data but each one of them places emphasis on different determinants of water supply and demand conditions: e.g. co-evolutionary dynamics, participation of end-users and socio-economics. The proposal will serve to bring together each projects existing and acquired expertise to improve knowledge on water resources use and management in areas prone of water shortages and drought.

Project Reference: ***EVK1-CT-2002-80018***	Contract Type: Preparatory, accompanying and support measures
Start Date: 2003-02-01	End Date: 2006-01-31
Duration: 36 months	Project Status: Execution
Project Acronym: ARID	Update Date: 2005-06-07
URL: http://arid.chemeng.ntua.gr/	

Coordinator

Organisation Type: Other

Department: DEPARTMENT OF ECONOMICS

Organisation: UNIVERSITY COLLEGE LONDON
Gower Street
WC1E 6BT LONDON
UNITED KINGDOM

Contact Person:
Name: VICKERS, Ilse (Dr)

10. Background cRiteria for the IDentification of Groundwater thresholds (BRIDGE – FP6)

Action Line: Sustainable management of Europe's natural resources - Environmental assessment

The Commission proposal of Groundwater Directive COM(2003)550 developed under Article 17 of the Water Framework Directive (2000/60/EC) sets out criteria for the assessment of the chemical status of groundwater, which is based on existing Community quality standards (nitrates, pesticides and biocides) and on the requirement for Member States to identify pollutants and threshold values that are representative of groundwater bodies found as being at risk, in accordance with the analysis of pressures and impacts carried out under the WFD. In the light of the above, the objectives of BRIDGE are:
i) to study and gather scientific outputs which could be used to set out criteria for the assessment of the chemical status of groundwater,
ii) to derive a plausible general approach, how to structure relevant criteria appropriately with the aim to set representative groundwater threshold values scientifically sound and defined at national river basin district or groundwater body level,
iii) to check the applicability and validity by means of case studies at European scale,
iv) to undertake additional research studies to complete the available data,
v) and to carry out an environmental impact assessment taking into account the economic and social impacts.

The project shall be carried out at European level, involving a range of stakeholders and efficiently linking the scientific and policy-making communities. Considering the requirement of the diary of the Groundwater Daughter Directive proposal, which implies that groundwater pollutants and related threshold values should be identified before December 2005 and listed by June 2006, the duration of the project should be 24 months. In that way the proposed research will contribute to provide research elements that will be indispensable for preparing discussions on further steps of the future Groundwater Directive.

Coordinator	
Contact Person: Name: FOUILLAC, Anne Marie Email: contact-this-project-via@cec.eu.int	**Organisation:** BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES Service Analyse et caracterisation minerale 39-43 quai André Citroen - Tour Mirabeau 75739 PARIS FRANCE
Project details	
Project Reference: 6538	**Contract Type:** Specific Targeted Research Project
Start Date: 2004-12-23	**End Date:** 2006-01-01
Duration: 12 months	**Project Status:** Execution
Project Cost: 2.96 million euro	**Project Funding:** 1.88 million euro

10. Computer aided rehabilitation of sewer networks (CARE-S – FP5)

General Project Information

Objectives: This project deals with public sewer and storm water networks and their problems caused by ageing such as structural failures, insufficient capacity causing floods, local pollution, and increasing maintenance costs. The ultimate goal is to develop a suite of tools, which provide the most cost-efficient system of maintenance, repair and rehabilitation of sewer networks, with the aim to guarantee a security of sanitary sewage collection and storm water drainage that meets social, health, economic and environmental requirements as well as the re-use of water for consumption.

Project Reference: ***EVK1-CT-2002-00106***

Contract Type: Cost-sharing contracts

Start Date: 2002-10-01

End Date: 2005-09-30

Duration: 36 months

Project Status: Execution

Project Acronym: CARE-S

Update Date: 2005-06-07

URL: http://care-s.unife.it/

Coordinator

Organisation Type: Research

Organisation: FOUNDATION FOR TECHNICAL AND INDUSTRIAL RESEARCH AT THE NORWEGIAN INSTITUTE OF TECHNOLOGY
1 D Strindveien 4
7465 TRONDHEIM
NORWAY

Contact Person:
Name: ARNTZEN, Roar (Doctor)

12. Cost-effective development of urban wastewater systems for water framework directive compliance (CD4WC – FP5)

General Project Information

Objectives: The project CD4WC will deal with optimising the efficiency of the urban wastewater system with regard to impacts in natural water bodies and with regard to investment and operation costs. The European Water Framework Directive sets "good water quality" as the ultimate goal for water management, from which the necessary performance of the wastewater system must be derived. With this water-quality based approach, the design of the systems is not predetermined and the options to meet the goals become much more widespread as compared to the common approach where the design of the wastewater system is prescribed. Further, interactions between the subsystems sewer system, wastewater treatment plant (WWTP) and receiving water may result in synergy effects. This synergy potential will be systematically evaluated and the cost benefits will be quantified, in order to give guidance to wastewater managers for efficient development of their systems.

Project Reference: ***EVK1-CT-2002-00118***

Contract Type: Cost-sharing contracts

Start Date: 2003-02-01

End Date: 2006-07-31

Duration: 42 months

Project Status: Execution

Project Acronym: CD4WC

Update Date: 2005-06-07

http://www.tu-dresden.de/CD4WC/src/index.php?id=1&session_id=none

Coordinator

Organisation Type: Education

Department: INSTITUTE FOR URBAN WATER MANAGEMENT

Organisation: DRESDEN UNIVERSITY OF TECHNOLOGY
Mommsenstrasse 13
01062 DRESDEN
GERMANY

Contact Person:
Name: POST, Alfred (Mr)

13. Centre of excellence in environmental analysis and monitoring (CEEAM – FP5)

General Project Information

Objectives: The CEEAM will be a leading centre in Central and Eastern Europe focusing on development of new analytical and monitoring tools in the field of water pollution and air-to-water/water-to-air transfer of pollutants. It will be principally dedicated to proper procedures of collection of environmental samples (passive dosemeters and. other cheap methods), their pre-treatment, storage and preparation for analyses (preconcentration, isolation, etc.) by analytical techniques such as: GC, HPLC (both coupled with MS), and ECZ. The key is sue is an observable trend in environmental analysis towards more and more complicated matrices (living organisms, tissues, etc.), requiring strengthening of the aforementioned stages of the analytical process. The Centre intends to act as a contact point between the ERA and PL and other NAB. It will also concentrate on increasing networking both to boost the research and implement the results.

Project Reference: ***EVK1-CT-2002-80010***	Contract Type: Preparatory, accompanying and support measures
Start Date: 2003-01-01	End Date: 2005-12-31
Duration: 36 months	Project Status: Execution
Project Acronym: CEEAM	Update Date: 2005-06-07

URL: http://www.pg.gda.pl/chem/CEEAM/

Coordinator

Organisation Type: Other

Department: FACULTY OF CHEMISTRY
DEPARTMENT OF ANALYTICAL CHEMISTRY

Organisation: TECHNICAL UNIVERSITY OF GDANSK
G.Narutowicza Street 11-12
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80 952 GDANSK
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Contact Person:
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Tel: +48-58-3471474
Fax: +48-58-3415821
Email: proren@pg.gda.pl

14. Centre of complex environmental monitoring and environmental risk assessment (CEMERA – FP5)

General Project Information

Objectives: The objective of the proposal is to create CEMERA, a leader in Central Europe in the area of complex environmental protection and closely tied to the quality of life of the individual. The activity of the Centre will be based on interdisciplinary research groups composed of scientists from both EU and NAS countries. The activity of the Centre will be closely linked with ERA through networking, scientific exchange, and twinning. Reaching the goals of Cemera will allow in the future: improved preparation of new landfills and better management of existing ones; creation a basis for the rational taking of decisions that, will be compatible with social expectations regarding protection of the environment as a result of the educational and information drives; increased social acceptation for the use of recycled materials, horticulture and forestry; increased social trust. In scientific authorities in the fields of environmental protection.

Project Reference: ***EVK1-CT-2002-80008***

Contract Type: Preparatory, accompanying and support measures

Start Date: 2002-12-01

End Date: 2005-11-30

Duration: 36 months

Project Status: Execution

Project Acronym: CEMERA

Update Date: 2005-06-07

http://www.cemera.pl/

Coordinator

Organisation Type: Other

Department: FACULTY OF BIOLOGY

Organisation: WARSAW UNIVERSITY
Miecznikowa 1
02 096 WARSZAWA
POLAND

Contact Person:
Name: MACIEJEWSKI, Wojciech (Prof.)
Email: maciejewski@mercury.ci.uw.edu.pl

15. Citynet - the network of european research projects on integrated urban water management (CITYNET – FP5)

General Project Information

Objectives: The CityNet project cluster consists of six individual 5 FWP projects and deals with the integrated aspects of water management in urban areas (water supply, sewerage, drainage) including their urban/rural interfaces (raw water sources, receiving waters, groundwater). The CityNet cluster consists of 47 research partners and 59 end-users I thus comprising a significant part of the European R&D capacity and implementation potential in urban water systems.
This proposal for Accompanying Measures (AM) aims to widen and deepen the joint activities of the cluster partners with respect to three aspects of integration, i.e.
(1) the urban water system and its water resources
(2) the necessary infrastructure for water supply, urban drainage and wastewater management, and
(3) the socio-economic aspects of urban water management.

Project Reference: ***EVK1-CT-2002-80013***

Contract Type: Preparatory, accompanying and support measures

Start Date: 2003-02-01

End Date: 2006-01-31

Duration: 36 months

Project Status: Execution

Project Acronym: CITYNET

Update Date: 2005-06-07

URL: http://citynet.unife.it/

Coordinator

Organisation Type: Other

Organisation: FOUNDATION FOR TECHNICAL AND INDUSTRIAL RESEARCH AT THE NORWEGIAN INSTITUTE OF TECHNOLOGY
1 D Strindveien 4
7465 TRONDHEIM
NORWAY

Contact Person:
Name: LOKTU, Morten (Dr.)

16. Climate and lake impacts in Europe (CLIME – FP5)

General Project Information

Objectives: We have brought together a consortium of scientists and end-users from 10 countries to assess the direct and indirect effects of changes in the weather on the dynamics of lakes in northern, western and central Europe. Particular attention will be paid to water quality variables used as diagnostic elements in the water Framework Directive. The primary objective is to develop a suite of well as past changes in the weather. The models will be validated by historical data and perturbed by simulations of future variations in the weather. These simulations will be based on the output from an ensemble of Regional Climate Models and will be linked to socio-economic analyses of their costs and benefits of the predicted changes. One of the main outputs will be a Decision Support System that can be used to optimise the management of lakes in a warmer world.

Project Reference: ***EVK1-CT-2002-00121***

Contract Type: Cost-sharing contracts

Start Date: 2003-01-01

End Date: 2005-12-31

Duration: 36 months

Project Status: Execution

Project Acronym: CLIME

Update Date: 2005-06-07

URL: http://clime.tkk.fi/

Coordinator

Organisation Type: Research

Department: CENTRE FOR ECOLOGY AND HYDROLOGY

Organisation: NATURAL ENVIRONMENT RESEARCH COUNCIL
Hill of Brathens
AB31 4BW BANCHORY(KINCARDINSHIRE)
UNITED KINGDOM

Contact Person:
Name: BUTLER, Brian (Mr)

17. Adaptive decision support system for stormwater pollution control (DAYWATER – FP5)

General Project Information

Objectives: The project aims at developing an adaptive decision support system (ADSS) for use by stakeholders involved in urban storm water management where decisions are made on many scales reflecting the spatial topology of urban catchments and the dynamic nature of urban development. The ADSS is a combination of simulation models, assessment tools, databases, guidance documents, road maps etc. Part of the research focuses on the functional behaviour of structural and non-structural best management practices (BMPs). Models will be developed for simulating pollution fluxes and assessing their possible source-elimination and fate in structural BMPs, and procedures for environmental risk assessment related to discharge of storm water priority pollutants to surface waters as well as urban soils and ground waters will be developed. The project is carried out by a multi-disciplinary research team and includes end-users and case studies in four European cities.

Project Reference: ***EVK1-CT-2002-00111***

Contract Type: Cost-sharing contracts

Start Date: 2002-12-01

End Date: 2005-11-30

Duration: 36 months

Project Status: Execution

Project Acronym: DAYWATER

Update Date: 2005-06-07

URL: http://www.daywater.org/

Coordinator

Organisation Type: Education

Department: CENTRE D'ENSEIGNEMENT ET DE RECHERCHE SUR L'EAU, LA VILLE ET L'ENVIRONNEMENT (CEREVE)

Organisation: ECOLE NATIONALE DES PONTS ET CHAUSSEES
Avenue Blaise Pascal, 6 et 8,
77455 MARNE LA VALLEE
FRANCE

Contact Person:
Name: VELTZ, Pierre (Dr.)

18. Development of an innovative plate multi-effect evaporator for seawater desalination (EASYMED – FP5)

General Project Information

Objectives: Water scarcity is a global major concern. The use of alternative water sources, such as desalination, is a high potential solution in sustainable development perspective. A qualified workforce has been implemented to promote research and development of an innovative desalination process, based on plate Multi-Effect Distillation, which focuses on four attractive points: low investment and running costs, construction-friendly, high modularity, low-level energy requirements. Economic, political, end-user issues and environmental considerations influence the challenging water desalination market. Water management and desalination policies have to be considered at a regional, social and economic scale. A user-oriented market analysis will enhance the pertinence of the dissemination phase up to industrialisation.

Project Reference: ***EVK1-CT-2001-00095***

Contract Type: Cost-sharing contracts

Start Date: 2002-01-01

End Date: 2005-06-30

Duration: 42 months

Project Status: Execution

Project Acronym: EASYMED Update Date: 2005-06-07

URL: http://www.easymed-eu.com

Coordinator

Organisation Type: Other

Organisation: NAN C.I.E. - CENTRE INTERNATIONAL DE L 'EAU
Rue Gabriel Péri 149
BP 290
54515 VANDOEUVRE-LES-NANCY
FRANCE

Contact Person:
Name: BEGORRE, Henri (Mr)

19. European groundwater and contaminated land remediation information system (EUGRIS – FP5)

General Project Information

Objectives: This proposal outlines an Accompanying Measure to develop an European web based information management system(EUGRIS)on groundwater and contaminated land remediation. The management of this issues requires complex interdisciplinary expertise as well as a considerable amount of supporting technical information and knowledge. EUGRIS will be generally available and applicable providing a comprehensive and overarching information and innovation resource. The gateway will provide a "one stop shop" for information provided by research projects, legislation, standards, best practice and other technical guidance and policy/regulatory publications from the EC, participating Member and Accession States and from various international networks dealing with groundwater and contaminated land issues.

Project Reference: ***EVK1-CT-2002-80021*** Contract Type: Preparatory, accompanying and support measures

Start Date: 2003-03-01 End Date: 2005-08-31

Duration: 30 months Project Status: Execution

Project Acronym: EUGRIS Update Date: 2005-05-03

http://www.eugris.info/

Coordinator

Organisation Type: Other

Organisation: FEDERAL ENVIRONMENT AGENCY
1 Bismarckplatz 1
PF 33 00 22
14191 BERLIN
GERMANY

Contact Person:
Name: LANGER, Hans (Mr.)

20. Towards harmonised procedures for quantification of catchment scale nutrient losses from european catchments (EUROHARP – FP5)

General Project Information

Objectives: Implementation of the Water Framework Directive calls, i.a., for harmonised methodologies (hereafter referred to as 'tools') to quantify nutrient losses from diffuse sources. Experiences gained from reporting on quantitative nutrient data at European level, and the development of the HARP Guidelines, have revealed the need for reliable and comparable quantification tools.
EUROHARP will compare the performance of 10 tools by applying them on a large number of European-wide catchments, starting with the 5 catchments with the most comprehensive N and P related data available, located on a north.south/east- west gradient, before a final full scale application in a network of 17 catchments throughout Europe. EUROHARP will deliver an electronic decision support system ('toolbox') to assist end-users in selecting the most practicable and cost-effective tools for quantifying N and P losses from diffuse sources under different environmental conditions in Europe for their implementation of, i.a., the Water Framework Directive. Furthermore, social and economic consequences of improved quantification of diffuse losses of nutrients will be investigated.

Project Reference: ***EVK1-CT-2001-00096***

Contract Type: Cost-sharing contracts

Start Date: 2002-01-01

End Date: 2005-12-31

Duration: 48 months

Project Status: Execution

Project Acronym: EUROHARP

Update Date: 2005-06-07

URL: http://www.euroharp.org/

Coordinator

Organisation Type: Research

Organisation: NORWEGIAN INSTITUTE FOR WATER RESEARCH
19 Brekkeveien 19
P.O. Box 173
0411 OSLO
NORWAY

Contact Person:
Name: JOHANNESSEN ULSTEIN, Merete (Research Director)

21. Integrated Project to Evaluate the Impacts of Global Change on European Freshwater Ecosystems (EURO-LIMPACS – FP6)

Action Line: "Assessment of ecological impacts of global change on freshwater bodies, development of ecological indicators of ecosystem ""health"" and related remediation strategies"

Freshwater ecosystems, under stress from land-use change and pollution, face additional pressures from climate change, directly and through interaction with other drivers of change. Euro-lampas is concerned with the science required to understand and manage the ecological consequences of these interactions. It is relevant to the Water Framework Directive and other international directives and protocols and supports the Ems Charter on Sustainable Development. The Project comprises a consortium of leading scientists to integrate river, lake and wetland ecosystem science at the catchments scale. It focuses on the key drivers of aquatic ecosystem change (land-use, nutrients, acid deposition and toxic substances) and examines their interactions with global, especially climate, change using time-series analysis, space-for-time substitution, palaeolimnology, experiments and process modelling. It considers these interactions at 3 critical time-scales:
(i) hours/days, concerned with changes in the magnitude and frequency of extreme events;
(ii) seasons, concerned with changes in ecosystem function and life-cycle strategies of freshwater

biota;
(iii) years/decades, concerned with ecological response to environmental pressure, including stress reduction and ecosystem recovery. An innovative toolkit for integrated catchments analysis and modelling will be developed to simulate hydrological, hydro chemical and ecological processes at the catchments scale for use in assessing the potential impact of global change under different climate and socio-economic scenarios. A unified system of ecological indicators for monitoring freshwater ecosystem health, and new methods for defining reference conditions and restoration strategies will be developed. These will take into account the probable impacts of future climate change and the need for a holistic approach to restoration based on habitat connectivity.

Coordinator	
Contact Person: Name: PATRICK, Simon Email: contact-this-project-via@cec.eu.int http://www.eurolimpacs.ucl.ac.uk/index.php	**Organisation:** UNIVERSITY COLLEGE LONDON Environmental Change Research, Centre, Department of Geography Gower Street WC1E 6BT LONDON UNITED KINGDOM
Project details	
Project Reference: 505540	**Contract Type:** Integrated Project
Start Date: 2004-02-01	**End Date:** 2009-02-01
Duration: 60 months	**Project Status:** Execution
Project Cost: 19.15 million euro	**Project Funding:** 12.65 million euro

22. Real-time flood decision support system integrating hydrological, meteorological and radar technologies (FLOODRELIEF – FP5)

General Project Information

Objectives: The FLOODRELIEF project aims
I) to develop and demonstrate a new generation of flood forecasting methodologies which will advance present capabilities and accuracies and
2) to make the results more readily accessible both to flood managers and those threatened by floods. This will be achieved by exploiting and integrating different sources of forecast information, including improved hydrological and meteorological model systems and databases, radar, advanced data assimilation procedures and uncertainty estimation, into a real-time flood management decision support tool designed to meet the needs of regional flood forecasting authorities. The benefits expected from this project are increased accuracy of both quantitative precipitation forecasts and hydrological forecasts cost-effective implementations of numerical weather modelling for precipitation forecasts in a highly accessible internet-based forecast information system.

Project Reference: ***EVK1-CT-2002-00117***

Contract Type: Cost-sharing contracts

Start Date: 2002-11-01

End Date: 2006-04-30

Duration: 42 months

Project Status: Execution

Project Acronym: FLOODRELIEF

Update Date: 2005-06-07

http://projects.dhi.dk/floodrelief/index2.asp?goto=http%3A//projects.dhi.dk/floodrelief/overview.htm

Coordinator

Organisation Type: Other

Department: WATER RESOURCES DIVISION

Organisation: DHI - INSTITUTE OF WATER & ENVIRONMENT
Agern Allee 11
2970 HOERSHOLM
DENMARK

Contact Person:
Name: HAVNOE, Karsten (Mr)

23. Integrated flood risk analysis and management methodologies (FLOODSITE – FP6)

Action Line: Integrated flood risk management methodologies

The management of flood risk is a critical component of public safety and quality of life. The FLOODsiteIntegrated Project will produce improved understanding of specific flood processes and mechanisms and methodologies for flood risk analysis and management ranging from the high level management of risk at arider-basin, estuary and coastal process cell scale down to the detailed assessment in specific areas. It includes specific actions on the hazard of coastal extremes, coastal morph dynamics and flash flood forecasting, as wells understanding of social vulnerability and flood impacts, which are critical to improving the mitigation of flood risk from all causes. The project seeks to identify technologies and strategies for sustainable flood mitigation and defence, recognising the complex interaction between natural biophysical systems and socio-economic systems, to support spatial and policy planning in the context of global change and societal advance. Several pilot studies are included in FLOOD site. These will identify lessons from recent floods (e.g. Elbe, 2002), and test the proposed operational use of methods on integrated risk management and sustainable flood defence (the Thames and Schultz Estuaries and the Ebor coastal delta) or new technology for flash flood forecasting (in France and Italy). FLOOD site will also develop common language, guidance and tools for dissemination of the project results and professional training packages. FLOOD site will build upon the previous and current European and national research and practice in river and coastal flood processes and flood risk mitigation methods to promote consistency of approach. Several of the FLOOD site project partners are identified as contributors to proposals for the virtual centre on floods and droughts identified in Para 1.1.6.3.II of the work programme; this virtual centre will complement the activities of the FLOOD site project.

Coordinator	
Contact Person: Name: SAMUELS, Paul E-mail: floodsite@hrwallingford.co.uk http://www.floodsite.net/	**Organisation:** HR WALLINGFORD LTD Water Management Group / Coastal Group Howbery Park OX10 8BA WALLINGFORD UNITED KINGDOM
Project details	
Project Reference: 505420	**Contract Type:** Integrated Project
Start Date: 2004-03-01	**End Date:** 2009-03-01
Duration: 60 months	**Project Status:** Execution
Project Cost: 13.99 million euro	**Project Funding:** 9.68 million euro

24. Harmonised modelling tools for integrated basin management (HARMONICA – FP5)

General Project Information

Objectives: The Water Framework Directive provides a European policy basis for water management and the elaboration in river basins. It prescribes the development of river basin management plans. The development of these plans increasingly needs high quality computer based tools (ICT tools), including tools for socio-economic analysis and stakeholder participation. Though many tools have been developed, there is no clear and complete overview on what is available and which tools to use in which situations. HarmoniCA will establish a forum for unambiguous communication and discussion concerning the use and development of all tools relevant to the implementation at the WFD. In six work packages key aspects of integrated modelling will be considered in close collaboration with the modelling community, the policy makers and the users.

Project Reference: ***EVK1-CT-2002-20003***

Contract Type: Coordination of research actions

Start Date: 2002-10-01

End Date: 2007-09-30

Duration: 60 months

Project Status: Execution

Project Acronym: HARMONICA

Update Date: 2005-06-07

URL: http://www.harmoni-ca.info

Coordinator

Organisation Type: Other

Department: HOOFDADELING WATERSYSTEMEN
AFDELING LANDELIJKE ZAKEN

Organisation: INSTITUTE FOR INLAND WATER MANAGEMENT AND WASTE WATER TREATMENT
Zuiderwagenplein 2
8224 AA LELYSTAD
NETHERLANDS

Contact Person:
Name: VAN BENNEKOM, André (ir.)

25. Harmonising collaborative planning (HARMONICOP – FP5)

General Project Information

Objectives: The main objective of the HarmoniCOP project is to increase our understanding of participatory river basin management in Europe and support the implementation of the Water Framework Directive on this point.
The research will focus on three aspects that are both essential for river basin management and scientifically challenging:
- scale issues (at which level and in which phase to organise which kind of PP)
- the role of information and information tools
- the influence of the cultural-/ political-/ geographical context. Nine countries will be studied and in-depth case studies will be conducted. The research will result in a Handbook on public participation methodologies to be used in implementing the Water Framework Directive. Throughout the project, end-users will be involved through workshops, the case studies, the Internet, etc.

Project Reference: ***EVK1-CT-2002-00120***

Contract Type: Cost-sharing contracts

Start Date: 2002-11-01

End Date: 2005-10-31

Duration: 36 months

Project Status: Execution

Project Acronym: HARMONICOP

Update Date: 2005-06-07

URL: http://www.harmonicop.de

Coordinator

Organisation Type: Education

Department: INSTITUTE OF ENVIRONMENTAL SYSTEMS RESEARCH
CHAIR FOR RESOURCE FLOW MANAGEMENT

Organisation: UNIVERSITAET OSNABRUECK
Albrechtstrasse 28
49069 OSNABRUECK
GERMANY

Contact Person:
Name: Prof. Dr. Claudia Pahl-Wostl
E-mail: pahl@usf.uni-osnabrueck.de

26. Harmonising quality assurance in model based catchment and river basin management (HarmoniQUA – FP5)

General Project Information

Objectives: The WFD challenges water managers to cope with a complex of problems. Increased problem scale and an integrated approach force organisations to co-operate. This raises the need to couple models and to incorporate socio-economic aspects. Sound coupling of models requires a widely accepted, transparent methodology. The project will develop a European methodology for modelling and simulation in water management, covering both generic and domain specific modelling activities. The methodology and derived guidelines are accessible by software tools, also allowing monitoring of the process and facilitating quality assurance. The methodology and tools are extensively tested in both multidomain and integrated case studies; covering geographical conditions and modelling cultures, involving various stakeholders and end users. An exploitation infrastructure guarantees long term support and future use by the entire community of water managers.

Project Reference: ***EVK1-CT-2001-00097***

Contract Type: Cost-sharing contracts

Start Date: 2002-01-01

End Date: 2005-12-31

Duration: 48 months

Project Status: Execution

Project Acronym: HARMONIQUA

Update Date: 2005-06-07

URL: http://harmoniqua.wau.nl/

Coordinator

Organisation Type: Education

Organisation: WAGENINGEN UNIVERSITY
Costerweg 50
P.B. 9101
6701 HB WAGENINGEN
NETHERLANDS

Contact Person:
Name: DE VISSER, Piet (mr)

27. Harmonised techniques and representative river basin data for assessment and use of uncertainty information in integrated water management (HarmoniRIB – FP5)

General Project Information

Objectives: The preparation of integrated water management plans for the WFD will require making a large number of decisions by operational agencies in Europe. A decision maker has to make decisions based on the available information. In most cases this information is deficient, incomplete and uncertain. How should this affect the decision-making? The methodology to quantify uncertainty and to assess the propagation of uncertainty from the raw data to concise management information and decision-making is the main subject in this project. HarmoniRiB will develop an uncertainty analysis toolkit comprising methodologies and tools for identifying, assessing and quantifying uncertainty and risk in decision making - Furthermore, a network of representative river basins with datasets comprising information on uncertainty will be developed and made publicly available. The suitability of the methodologies, the tools and the datasets will be demonstrated through a number of integrated case studies.

Project Reference: ***EVK1-CT-2002-00109***

Contract Type: Cost-sharing contracts

Start Date: 2002-10-01

End Date: 2006-03-31

Duration: 42 months

Project Status: Execution

Project Acronym: HARMONIRIB

Update Date: 2005-06-07

URL: http://www.harmonirib.dk/

Coordinator

Organisation Type: Research

Organisation: GEOLOGICAL SURVEY OF DENMARK AND GREENLAND
8 Oester Voldgade 10
1350 KOEBENHAVN K/COPENHAEGEN
DENMARK

Contact Person:
Name: SONNENBORG, Alex (Mr)

28. IT frameworks (HarmonIT – FP5)

General Project Information

Objectives: The aim of integrated water management is to develop sustainable policies that reconcile competing demands within catchments. Interactions between processes make this a difficult task. Consequently, managers use models to help foresee the likely outcomes of different options. Models tend to address single issues and to see the wider implications, several models must be linked. Few current models are designed for linking and no generic plug and play mechanism exists that allows models of large multi-national catchments or complex processes spanning many disciplines to be built up. The HarmonIT project is one of a cluster concerned with developing the methodologies and tools required to implement integrated water management as envisaged by the Water Framework Directive. Its objective is to identify the user requirement for model linking and deliver solutions at two levels: file transfer (XML) and an Object Oriented approach.

Project Reference: ***EVK1-CT-2001-00090***

Contract Type: Cost-sharing contracts

Start Date: 2002-01-01

End Date: 2005-12-31

Duration: 48 months

Project Status: Execution

Project Acronym: HARMONIT

Update Date: 2005-06-07

URL: http://www.harmonit.org/

Coordinator

Organisation Type: Research

Department: CENTRE FOR ECOLOGY AND HYDROLOGY

Organisation: NATURAL ENVIRONMENT RESEARCH COUNCIL
Maclean Building, Crowmarsh Gifford
OX10 8BB WALLINGFORD
UNITED KINGDOM

Contact Person:
Name: RODGERS, Keith (Mr)

29. Development of a decision support system for sustainable management of contaminated land by linking bioavailability, ecological risk and ground water pollution of organic pollutants (LIBERATION – FP5)

General Project Information

Objectives: The primary objective is to improve ground water: protection and ecological risk assessment by developing and validating a decision support system (DSS) for sustainable management of contaminated land and connective freshwater and groundwater systems. Current risk assessment practise is based on determining total concentrations in soils, which overestimate risks by not considering bioavailability. Bioavailability provides a measure of exposure to organisms within in the soil and influence dispersion of pollutants to ground water. The results from this project will help in reducing remediation costs and at the same time ensure sustainable land management, as it links bio availability measures to ecological effects and ground water pollution. The DSS will help site redevelopers to manage risk by providing rapid, cheap and reliable chemical and biological tools for assessing bioavailability and leaching.

Project Reference: ***EVK1-CT-2001-00105***

Contract Type: Cost-sharing contracts

Start Date: 2002-01-01

End Date: 2005-06-30

Duration: 42 months

Project Status: Execution

Project Acronym: LIBERATION

Update Date: 2005-06-07

URL: http://www.liberation.dk/

Coordinator

Organisation Type: Research

Department: DEPARTMENT OF TERRESTRIAL ECOLOGY

Organisation: NATIONAL ENVIRONMENTAL RESEARCH INSTITUTE - MINISTRY OF ENVIRONMENT AND ENERGY
25 Vejlsoevej 25
P.O. Box 358
8600 SILKEBORG
DENMARK

Contact Person:
Name: LOEKKE, Hans (Dr.)

30. Towards sustainable water use on mediterranean islands: addressing conflicting demands and varying hydrological, social and economic conditions (MEDIS – FP5)

General Project Information

Objectives: MEDIS will advance a rational sustainable and equitable use of water on islands in the Mediterranean and will thereby contribute to the implementation of the Water Framework Directive. The study will be carried out on Corsica, Crete, Cyprus, Mallorca and Sicily. Based on data on hydrology, geophysics and climate improved methodologies for the characterisation of aquifers and the monitoring of water consumption; recharge and safe field will be developed. Improved agricultural practices aimed to conserve water will be specified. A stakeholder analysis and the collection and analysis of information on water demand by various consumers will lead to mutually agreeable water distribution schemes in a participatory process. This will form the basis for recommendations on equitable and sustainable water management regimes as derived through Multi-Criteria-Malysis under current and future precipitation rates.

Project Reference: ***EVK1-CT-2001-00092***

Contract Type: Cost-sharing contracts

Start Date: 2002-02-01

End Date: 2006-01-31

Duration: 48 months

Project Status: Execution

Project Acronym: MEDIS

Update Date: 2005-06-07

URL: http://www.uni-muenster.de/Umweltforschung/medis

Coordinator

Organisation Type: Education

Department: CENTRE FOR ENVIRONMENTAL RESEARCH

Organisation: WESTFAELISCHE WILHELMS - UNIVERSITAET MUENSTER
Mendelstrasse 11
48149 MUENSTER
GERMANY

Contact Person:
Name: STEGTMEYER, Christoph (Dr)

31. MEditeranean Development of Innovative Technologies for intergAted waTer managEment (MEDITATE – FP6)

Action Line: Comprehensive policy for integrated water planning

MEDITATE aims at the development of a water management support system at the Mediterranean catchments level, integrating the use of alternative water resources such as karts submarine springs, seawater or brackish water desalination and water reuse, for water scarcity management. Innovative technologies for submarine springs, from survey using an autonomous underwater vehicle, monitoring at the spring level till capture prototype, will be developed mainly in this project. Economical and environmental study of submarine springs will be conducted and taken into consideration. Submarine springs study will also be used to determine the real water resource potential at the coastal karts aquifers in three Mediterranean catchments. The submarine springs could represent important alternative water resource as it has been reported during the last 30 years, but without serious scientific arguments. New technology for characterising the submarine springs will help to infirm or confirm this hypothesis. Low cost and low energy desalination plants for temporary use and salinity variability of submarine springs water will not be developed within MEDITATE, but designed based unfeasibility analysis. A general analysis of desalination cost for various conditions will be taken into account in the socio-economic analysis for the management system. In the same manner, a review of water reuse will be carried out, taking into consideration environmental and health problems, technical

and cost problems in order to have serious data to be considered in water management scenarios. The water management support system will bring stakeholders in a decision-making process considering water visions for 2025. The WMSS will provide set of scenarios, giving safe water yield, based on the characterisation and hydrological modelling of four catchments. This WMSS will allow integrating different types of knowledge inclusive all social actors, in a decision-making process.

Coordinator	
Contact Person: Name: DORFLIGER, Nathalie Email: contact-this-project-via@cec.eu.int http://www.brgm.fr/Fichiers/europe/MEDITATE.pdf	**Organisation:** BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES Water Department, Ressource Assessment Discontinuous Aquifers Unit 39-43, quai André Citroën - Tour Mirabeau 75739 PARIS FRANCE
Project details	
Project Reference: 509112	**Contract Type:** Specific Targeted Research Project
Start Date: 2004-05-01	**End Date:** 2007-05-01
Duration: 36 months	**Project Status:** Execution
Project Cost: 2.51 million euro	**Project Funding:** 1.65 million euro

32. Models for Assessing and Forecasting the Impact of Environmental Key Pollutants on Marine and Freshwater Ecosystems and Biodiversity (MODELKEY – FP6)

Action Line: Develop model(s) for assessing and forecasting the impact of environmental pollution on fresh water and marine ecosystems and their biological diversity

MODELKEY comprises a multidisciplinary approach aiming at developing interlinked and verified predictive modelling toolsas well as state-of-the-art effect-assessment and analytical methods generally applicable to European freshwater and marine ecosystems:
1)to assess, forecast, and mitigate the risks of traditional and recently evolving pollutants on fresh water and marine ecosystems and their biodiversity at a river basin and adjacent marine environment scale,
2)to provide early warning strategies on the basis of sub-lethal effects in vitro and in vivo,
3)to provide a better understanding of cause-effect-relationships between changes in biodiversity and the ecological status, as addressed by the Water Framework Directive, and the impact of environmental pollution as causative factor,
4)to provide methods for state-of-the-art risk assessment and decision support systems for the selection of the most efficient management options to prevent effects on biodiversity and to priorities contamination sources and contaminated sites,
5)to strengthen the scientific knowledge on an European level in the field of impact assessment of environmental pollution on aquatic eco-systems and their biodiversity by extensive training activities and knowledge dissemination to stakeholders and the scientific community. This goal shall be achieved by combining innovative predictive tools for modelling exposure on a river basin scale including the estuary and the coastal zone, for modelling effects on higher levels of biological organization with powerful assessment tools for the identification of key modes of action, key toxicants and key parameters determining exposure. The developed tools will be verified in case studies representing European key areas including Mediterranean, Western and Central European river basins. An end-user-directed decision support system will be provided for cost-effective tool selection and appropriate risk and site prioritization.

Coordinator	
Contact Person: Name: BRACK, Werner e-mail: werner.brack@ufz.de http://www.modelkey.ufz.de/	**Organisation:** UFZ - Umweltforschungszentrum Leipzig - Halle GmbH Department of Chemical Ecotoxicology Permoserstrasse 15 Postfach 2 4318 Leipzig GERMANY

Project details	
Project Reference: 511237	**Contract Type:** Integrated Project
Start Date: 2005-02-01	**End Date:** 2010-02-01
Duration: 60 months	**Project Status:** Execution
Project Cost: 12.43 million euro	**Project Funding:** 8.40 million euro

33. New Approaches to Adaptive Water Management under Uncertainty (NEWATER – FP6)

Action Line: Methodologies of integrated water resource management and transboundary issues

The central tenet of the NeWater project is a transition from currently prevailing regimes of river basinwater management into more adaptive regimes in the future. This transition calls for a highly integratedwater resources management concept. NeWater identifies key typical elements of the current watermanagement system and focuses its research on processes of transition of these elements to adaptiveIWRM. Each key element is studied by novel approaches. Key IWRM areas where NeWater isexpected to deliver breakthrough results include:
1. governance in water management (methods to arrive at polycentric, horizontal broad stakeholderparticipation in IWRM)
2. sectoral integration (integration of IWRM and spatial planning; integration with climate changeadaptation strategies, cross-sectoral optimization and cost-benefit analysis)
3. scales of analysis in IWRM (methods to resolve resource use conflicts; transboundary issues)
4. information management (multi stakeholder dialogue, multi-agent systems modelling; role ofgames in decision making; novel monitoring systems for decision systems in water management)
5. infrastructure (innovative methods for river basin buffering capacity; role of storage in adaptation toclimate variability and climate extremes)
6. finances and risk mitigation strategies in water management (new instruments, role of public-private arrangements in risk-sharing)
7. stakeholder participation; promoting new ways of bridging between science, policy andimplementationThe development of concepts and tools that guide an integrated analysis and support a stepwiseprocess of change in water management is the corner-stone of research activities in the NeWaterproject. To achieve its objectives the project is structured into six work blocks, and it adopts amanagement structure that allows effective exchange between innovative and cutting edge researchon integrative water management concepts.

Coordinator	
Contact Person: Name: PAHL-WOSTL, Claudia E-mail: moeltgen@usf.uni-osnabrueck.de http://www.newater.info/index.html	**Organisation:** University of Osnabrueck Institute of Environmental Systems Research (USF) Neuer Graben / Schloss 49076 Osnabrueck GERMANY

Project details	
Project Reference: 511179	**Contract Type:** Integrated Project
Start Date: 2005-01-01	**End Date:** 2009-01-01
Duration: 48 months	**Project Status:** Execution
Project Cost: 15.91 million euro	**Project Funding:** 12.00 million euro

34. Optimisation for Sustainable Water Management (OPTIMA – FP6)

Action Line: Comprehensive policy for integrated water planning

Water is a key resource in the Mediterranean region, and efficient use and allocation are paramount to sustainable development, in particular in the coastal zone of the South and East, undergoing fast economic development, land use and demographic change. The overall aim of OPTIMA is to develop, implement, test, critically evaluate, and exploit an innovative, scientifically rigorous yet practical approach to water resources management intended to increase efficiencies and to reconcile conflicting demands. Based on the European Water Framework Directive (2000/60/EC) the approach equally considers economic efficiency, environmental compatibility, and social equity as the pillars of sustainable development. The proposed methodology will extend classical optimisation and mathematical programming methodology, in several respects, by: Using a full-featured dynamic and distributed simulation model and genetic programming as the core to generate feasible and non-dominated alternatives. Water technology alternatives including their cost structure, and up-to-date remote-sensing derived land use information are primary inputs; Extending the set of objectives, criteria and constraints through expert systems technology to include difficult to quantify environmental and social dimensions; Putting specific emphasis on local acceptance and implementation through the inclusion of stake-holders in an interactive, participatory decision making process carefully embedded in institutional structures, using a discretemulti-criteria reference point methodology; Comparative evaluation and benchmarking across the set of local and regional case studies in 12 countries, namely Italy, Greece, Cyprus, Malta, Turkey, Syria, Lebanon, Jordan, Palestine, Tunisia and Morocco around the Southern and Eastern Mediterranean. The project also aims at building a wide dissemination network of expertise and knowledge exchange sharing its findings and generic data.

Coordinator	
Contact Person: Name: PINELLI, Dino E-mail: kurt@ess.co.at http://www.ess.co.at/OPTIMA/	**Organisation:** FONDAZIONE ENI ENRICO MATTEI Fondazione Eni Enrico Mattei Corso Magenta 63 N/A 20123 MILANO ITALY
Project details	
Project Reference: 509091	**Contract Type:** Specific Targeted Research Project
Start Date: 2004-07-01	**End Date:** 2007-07-01
Duration: 36 months	**Project Status:** Execution
Project Cost: 1.98 million euro	**Project Funding:** 1.50 million euro

35. Relationships between ecological and chemical status of surface waters (REBECCA – FP6)

Action Line: Sustainable management of Europe's natural resources - Environmental assessment

The strategic objective of the REBECCA proposal 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 physic-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. These objectives will be achieved by collating existing knowledge and analysing knowledge gaps, and using this information as a basis for analysing the dose-response relationships between pressures and chemical/biological quality elements based on existing data. Furthermore, REBECCA will explore, develop and improve models and statistical tools, which can be used in assessing the links between the ecological and chemical quality elements; or to assess critical/target loads and other objectives for pressures. These tools will be validated in selected test sites. The results of the project will be disseminated throughout the project lifetime to stakeholders at EU and national levels, particularly to the Working Groups of the Common Implementation Strategy (CIS) for the WFD, and used to develop a Toolbox containing detailed information of the methods, tools and models.

Coordinator	
Contact Person: Name: REKOLAINEN, Seppo E-mail: seppo.rekolainen@ymparisto.fi http://www.environment.fi/default.asp?node=11778&lan=en	**Organisation:** SUOMEN YMPARISTOKESKUS Mechelininkatu 34a PO Box 140 251 HELSINKI FINLAND
Project details	
Project Reference: 502158	**Contract Type:** Specific Targeted Research Project
Start Date: 2003-12-01	**End Date:** 2006-12-01
Duration: 36 months	**Project Status:** Execution
Project Cost: 7.45 million euro	**Project Funding:** 4.00 million euro

36. A cheap easy-to-handle desalination approach for crop irrigation under Mediterranean conditions (RRISEASOIL – FP6)

Action Line: Advanced water treatment, re-use and energy implications

Considering that
(i) one of the most serious problems facing the Mediterranean Region is related with water due to the limited amount of natural water resources and the fact that neither the increase in population of this region nor the foreseen climatic changes are going to contribute favourably to improve the regional situation as far as water is concerned and
(ii) improving the water consumption by users and uses and plant breeding for efficient water and nutrient use is one of the areas addressed in the Call (INCO-2002-B. 1.2)together with water treatment (INCO-2002-B. 1.3)
The objectives of this Proposal are:
(i) The development of selective polymeric materials (cheap to produce) for desalination of seawater, post-irrigation water and soil with the aim of developing a most effective technological approach than

the existing ones.
(ii) The use of biotechnological modes and means for promoting efficient and nutrient use of watery plants, improving their immunity and resistance towards diseases and droughts.
To achieve these objectives the following steps are to be undertaken.
Step 1. Selection of main strategic cultures of three Mediterranean Countries as Pilot sources for vegetation experiments based on socio-economic importance, crops quality and structure, agronomical, agrochemical and climatic conditions of their cultivation.
Step 2. Synthesis, characterisation of calixchitin polymers for desalination of seawater, post-irrigation water and soil, followed by their application at Laboratory and Pilot Plant scale.
Step 3. Qualitative and quantitative assessment of the industrial potential de-sorption solutions resulting from sea, post-irrigation waters and soil.
Step 4. Design of material phenylpropanoid polymeric derivatives with the capability to function as a plant growth regulatory, fertilizers, quality enhancers for the protection of crop quality and productivity under drought conditions.
Step 5. Combination

Coordinator	
Contact Person: Name: DANIL DE NAMOR, Angela Email: contact-this-project-via@cec.eu.int	**Organisation:** THE UNIVERSITY OF SURREY SCHOOL OF BIOMEDICAL AND LIFE SCIENCES, THERMOCHEMISTRY LABORATORY UNIVERSITY OF SURREY GU2 7XH GUILDFORD UNITED KINGDOM
Project details	
Project Reference: 509153	**Contract Type:** Specific Targeted Research Project
Start Date: 2004-04-01	**End Date:** 2007-04-01
Duration: 36 months	**Project Status:** Execution
Project Cost: 1.56 million euro	**Project Funding:** 1.25 million euro

37. Sustainable management of soil and groundwater under the pressure of soil pollution and soil contamination (SNOWMAN – FP6)

Action Line: Coordination of national activities - Networking of national or regional programmes or parts of programmes actors: public authorities, research agencies, open call for proposals (ERA-NETs)

Aiming at solution and prevention of actual and future environmental problems, EU policy resulted in many Directives concerning water and soil. Moreover, the Commission of the European Communities composed a paper "Toward a Thematic Strategy for Soil Protection" and set up a tight time schedule. Despite of above mentioned legislative efforts an effective EU-wide approach to the problem of site remediation and groundwater contamination is hindered by a number of problems described by the CLARINET Working Group on Co-ordination of RTD on an European level:
-There is little synergy at EU level between national and EU RTD programmes, leading to a serious overlap of research projects and parallel expenditures and less efficient use of limited resources.
-The broad dissemination of project results through national RTD programmes at an European level is very modest and fragmented.
%These are the starting points of SNOWMAN-Era-Net:
What do we HAVE? The consortium will produce a sound overview on programmes and their contents and management in the field specified. A database containing all relevant information will be produced and analysed. What do we WANT? A Vision Paper will define the goal of European research activities in this specific field of environmental research. How can we GET co-operation NOW? ? Specification

of next steps, short- and medium-term, preparing ground in order to reach the overall goal of ERANET, i.e. to implement and conduct a research programme on bi-/multilateral level throughout Europe. Suitable tools (like uniform evaluation criteria etc.) will be developed in Working group meetings and collected within a summary report. Knowledge dissemination will be supported by a close linkage with the EUGRIS project. On this portal, all findings produced within SNOWMAN will be published and made available to a wider community. On interpersonal level, networking with the European Soil Policy Working Group or Cost activities will be maintained.

Coordinator	
Contact Person: Name: VETTER, Stefan W J Email: contact-this-project-via@cec.eu.int	**Organisation:** BUNDESMINISTERIUM FUR LAND UND FORSTWIRTSCHAFT, UMWELT UND WASSERWIRTSCHAFT Unit II/1 Stubenring 1 1010 Wien AUSTRIA
Project details	
Project Reference: 3219	**Contract Type:** Coordination action
Start Date: 2004-01-01	**End Date:** 2007-01-01
Duration: 36 months	**Project Status:** Execution
Project Cost: 1.05 million euro	**Project Funding:** 1.05 million euro

38. Standardized aquatic monitoring of priority pollutants using passive sampling (STAMPS – FP5)

General Project Information

Objectives: STAMPS is a 10 partner consortium of scientists from universities, commercial and governmental organisations, and a Normation Organisation to achieve normation of passive sampling methods for monitoring priority pollutants in freshwater. Calibrated devices and sampling procedures will be developed and their performance validated along side spot sampling for pollutants in freshwater across Europe. A commercial design will be manufactured in large numbers for field evaluation alongside spot sampling. Throughout, the data and methodology will inform normation. Results will be disseminated across the EU to end-users. The potential of this approach in environmental management and water quality legislation will be demonstrated, and the technical standardisation of passive sampling will be integrated fully with formal standardisation at European level.

Project Reference: ***EVK1-CT-2002-00119***

Contract Type: Cost-sharing contracts

Start Date: 2003-01-01

End Date: 2006-03-31

Duration: 39 months

Project Status: Execution

Project Acronym: STAMPS

Update Date: 2005-06-07

http://www.port.ac.uk/research/stamps/

Coordinator

Organisation Type: Education

Department: SCHOOL OF BIOLOGICAL SCIENCES

Organisation: UNIVERSITY OF PORTSMOUTH

King Henry I Street
PO1 2DY PORTSMOUTH
UNITED KINGDOM

Contact Person:
Name: ACE, Malcolm (Mr)

39. Standardisation of river classifications: framework method for calibrating different biological survey results against ecological quality classifications to be developed for the water framework directive (STAR – FP5)

General Project Information

Objectives: The Water Framework Directive defines a framework for monitoring the Ecological Status of surface and ground waters. The Ecological Status of rivers will be determined from a range of taxonomic groups and a variety of methods. Most Member States will have their own assessment procedures but a common European Standard is required.
Through field sampling and desk studies we aim to:
1) cross-calibrate and integrate assessments using different methods and taxonomic groups
2)recommend which procedures to use in which situations
3) define the precision and reliability of each method and
4) assist the EU in defining the boundaries of classes of Ecological Status. A decision support system will be developed for applying the project findings. The research will used to help establish a European standard for assigning the Ecological Status of rivers from multiple sources of ecological data.

Project Reference: ***EVK1-CT-2001-00089***

Contract Type: Cost-sharing contracts

Start Date: 2002-01-01

End Date: 2005-06-30

Duration: 42 months

Project Status: Execution

Project Acronym: STAR

Update Date: 2005-06-07

URL: http://www.eu-star.at/

Coordinator

Organisation Type: Research

Department: CENTRE FOR ECOLOGY AND HYDROLOGY DORSET

Organisation: NATURAL ENVIRONMENT RESEARCH COUNCIL
Winfrith Technology Centre, Winfrith Newburgh
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UNITED KINGDOM

Contact Person:
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40. Screening method for Water data Information in support of the implementation of the Water Framework Directive (SWIFT-WFD – FP6)

Action Line: Sustainable management of Europe's natural resources - Environmental assessment

The monitoring requirements for successfully implementing the WFD will directly depend upon available measurement techniques of demonstrated quality, which will be able to deliver reliable data at unaffordable cost. Besides the necessary "classical" laboratory analyses, screening methodologies

will play a key role in the WFD implementation, in particular for the detection of accidental pollution or the control of water bodies at risk. The WFD will represent a powerful management tool only if monitoring data are of reliable and comparable quality.
The costs of wrong decisions based on erroneous data could be tremendous, which justifies that Community efforts are made to ensure that data are produced according to a proper quality assurance regime. In the light of the above, the objectives of SWIFT-WFD should focus on the production of quality control tools for validation purposes of screening methods, an inventory of existing screening test (chemical and biological) methods through laboratory-based (tank experiments) and/or field interlaboratory studies based on a selection of reference aquatic ecosystems at European scale, and with classical laboratory-based analyses to validate their results and demonstrate their equivalence for parameters regulated both WFD. In parallel, the project should consider the development of new "low-cost", innovative, screening techniques (both for chemical and biological parameters) and their validation using the same approach (interlaboratory testing and comparison with laboratory-based methods). In addition, exchange of knowledge, transfer of technologies and training related to water monitoring will represent a key issue for ensuring the comparability of data produced by screening methods

Coordinator	
Contact Person: Name: GONZALEZ, Catherine E-mail: catherine.gonzalez@ema.fr http://www.swift-wfd.com/	**Organisation:** ASSOCIATION POUR LA RECHERCHE ET LE DEVELOPPEMENT DES METHODES ET PROCESSUS INDUSTRIELS Ecole Nationale Supérieure des Mines d'Alès - Centre LGEI' Boulevard Saint-Michel 60 75272 PARIS FRANCE
Project details	
Project Reference: 502492	**Contract Type:** Specific Targeted Research Project
Start Date: 2004-01-01	**End Date:** 2007-01-01
Duration: 36 months	**Project Status:** Execution
Project Cost: 6.74 million euro	**Project Funding:** 4.03 million euro

41. Evaluation and improvement of water quality models for application to temporary waters in southern european catchments (TEMPQSIM – FP5)

General Project Information

Objectives: The aim of the project is to provide advanced tools to significantly improve the efficiency of integrated water management in the Mediterranean and semiarid river catchments. There are major problems in the application of existing water quality models during periods without runoff and the extreme first flush effects at the beginning of the rain period. The dynamic processes in sediments during the period of no Surface runoff and the interaction of resuspended matter and water quality is often not considered. It is proposed that selected models will be improved by development of new hydrological and sediment modules. They will be tested in a rigorous experimental catchments framework, at various Mediterranean case study sites at the sub-basin scale. Experience of data needs and model application, through close interaction to a range of end-users, will be used to prepare guidelines for the operational use of models and adapted management strategies.

Project Reference: ***EVK1-CT-2002-00112***
Contract Type: Cost-sharing contracts

Start Date: 2002-11-01
End Date: 2005-10-31

Duration: 36 months

Project Status: Execution

Project Acronym: TEMPQSIM

Update Date: 2005-06-07

URL: http://www.tempqsim.net/

Coordinator

Organisation Type: Education

Department: FACHGEBIET GEWAESSERGUETEMODELLIERUNG

Organisation: UNIVERSITAET HANNOVER
Am kleinen Felde 1
30167 HANNOVER
GERMANY

Contact Person:
Name: HOWIND, Henning (Regierungsoberamtsts)

42. Integrated water management of transboundary catchments (TRANSCAT – FP5)

General Project Information

Objectives: Transboundary catchments are usually differently managed in each country, not respecting the interests of its neighbour. These different approaches to utilization of the catchments may have catastrophic effects. The main goal of the project will be to create a Decision Support System (DSS) that will allow an integrated water management system within the scope of the transboundary catchments. It will be able to cope with the complexity of the water resources systems and the uncertainty of decision-making. The DSS will be built around modules that allow simulation of the range of different climatic, topographic, environmental and socio-economic conditions. Five pilot sites with different natural, social, political, and economical conditions were selected so that collection and evaluation of the data would be as broad and as general as possible.

Project Reference: ***EVK1-CT-2002-00124***

Contract Type: Cost-sharing contracts

Start Date: 2003-02-01

End Date: 2006-01-31

Duration: 36 months

Project Status: Execution

Project Acronym: TRANSCAT

Update Date: 2005-06-07

http://www.transcat-project.net/index.php

Coordinator

Organisation Type: Industry

Department: RESEARCH & DEVELOPMENT DIVISION

Organisation: INSTITUTO DE SOLDADURA E QUALIDADE
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2780920 OEIRAS
PORTUGAL

Contact Person:
Name: DIAS LOPES, Eduardo (Mr.)

43. Principles, tools and systems to extend spatial planning on water courses (WATERSKETCH – Interreg IIIB)

River basin planning in the BSR has always been a complex, yet important topic. It has gained a new momentum with the implementation of EU Water Framework Directive (WFD). Also principles of Integrated Coastal Zone Management (ICZM) are to be applied and national expansions of Natura2000 networks are in progress. All these actions support sustainable use of waters, but they also restrain and steer economical activities of society. Even different EU directives have opposing goals. All these practices and contrasting goals need to be taken into account in river basin planning. In BSR especially the needs of increasing tourism for natural and recreational areas together with well-developed areas have to be foreseen in land and river basin planning. Often these contrary actions are too demanding for spatial planners, and therefore multiple criteria decision support systems addressing as well the ecological as the socio-economic dimensions are urgently needed. Legally binding workload will be demanding especially in sparsely populated areas, where resources and funds are highly limited. Moreover, some such regions have numerous water bodies, which further impedes the planning processes. New member states will aggravate the situation in European scale, since with different societal backgrounds and environmental problems they are required to begin their river basin planning activities according to EU legislation
and directives.

The main aims of the project are to prepare a strategy via which challenges seen in river basin planning in the Baltic Sea region may be addressed by

1) Analysing and synthesising the different directives and conventions focused on use of watercourses.
2) Evaluating, how the goals of the regulations are expressed at the regional scale land use planning (especially related to WFD)
3) Demonstrating different situations of river basin planning with a wide set of case studies ranging from southern tip of BSR (Poland) to northern parts of it (Northern Finland)
4) Providing a Water Planning Decision Support System for spatial planners, which takes into account all main components needed for economically, socially and ecologically sustainable use of watercourses
5) Raising capacity to promote the sustainable development in river basins by means of an information exchange platform, training workshops and the dissemination of the information needed for sustainable use of river basins by a handbook.

<table>
<tr><td rowspan="2">Lead Partner:
Finnish Environment Institute
P.O.Box 413
FIN-90014 Oulun yliopisto
FINLAND</td><td>Duration: 01.07.2004 - 30.06.2007, 36 months</td></tr>
<tr><td>Approximate total project budget:
1,552,000.00€</td></tr>
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<tr><td colspan="2">http://www.watersketch.net/en/index.php?page=main</td></tr>
</table>

44. Developing strategies for regulating and managing water resources and demand in water deficient regions (WATERSTRATEGYMAN – FP5)

General Project Information

Objectives: Objective of the project is to develop and evaluate alternative strategies for regulating and managing water resources development of the Southern European water deficient regions. Methodology, tools, guidelines and protocols of implementation will be developed that enable decision makers to delineate and assess a wider range of integrated water management strategies. Expected results include the evaluation of existing water management situation in Southern Europe through a systematic typology of water management problematique, the development of a methodology for evaluating water management scenarios, the development of water resources allocation scenarios and water cost recovery strategies, the formulation of guidelines and protocols for integrated water management and training decision makers on implementing multi-objective water management.

Project Reference: ***EVK1-CT-2001-00098***

Contract Type: Cost-sharing contracts

Start Date: 2002-01-01

End Date: 2005-06-30

Duration: 42 months

Project Status: Execution

Project Acronym: WATERSTRATEGYMAN

Update Date: 2005-06-07

URL: http://environ.chemeng.ntua.gr/wsm/

Coordinator

Organisation Type: Education

Department: DEPARTMENT OF CHEMICAL ENGINEERING

Organisation: NATIONAL TECHNICAL UNIVERSITY OF ATHENS
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