Implications of the EU Water Framework Directive for Ports and Harbours

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A quick scan of the functions, roles, business actions and legal issues for Ports arising from the Water Framework Directive (2000/60/EC)

Dr Tim Stojanovic
Dr Chris Wooldridge
CARDIFF UNIVERSITY/ECOPORTS

Contractors:

<table>
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<tr>
<th>Port or Company</th>
<th>Country</th>
<th>Project Full Title</th>
<th>Contract No.</th>
<th>Project Start Date</th>
<th>Project Duration</th>
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<tr>
<td>Port of Antwerp</td>
<td>BE</td>
<td>Information exchange and impact assessment for enhanced environmental conscious operations in European ports and terminals</td>
<td>GRD2-2000-30195</td>
<td>1 June 2002</td>
<td>36 months</td>
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<tr>
<td>Port of Barcelona</td>
<td>ES</td>
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<td>British Ports Association</td>
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<td>Port of Genoa</td>
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<td>Port of Hamburg</td>
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<td>Associated British Ports</td>
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Assistant contractors: Cardiff University of Wales, University of Amsterdam, Universitat Politecnica de Catalunya, Technical University of Gdansk, World Maritime University, ANPA, Sogesca, Cisco Systems, Lloyd’s Register, IPEC, Europhar, Artemis, IBM

Preface

This report has been prepared by the ECOPORTS partner team from the Marine and Coastal Environment Research Group at Cardiff University. The writers wish to acknowledge the assistance provided partners of the ECOPORTS project and the work done as part of the PIANC Seminar series on “Navigating the EU Water Framework Directive” in contributing to the present assessment.

Cardiff University, October 2004.
Executive summary

The ECOPORTS project: sharing know-how towards self-regulation
The ECOPORTS project, sponsored by EU DG TREN, is a consortium of port, university and consultancy partners working toward the development of a harmonised approach to Environmental Management in European ports. The project has identified a number of environmental issues for European-wide collaboration across the port sector. The Water Framework Directive is a significant piece of European environmental legislation that is expected to affect the operation and development of seaports and harbours. The objective of this report is to collate information, identify key challenges for ports, and analyse the procedural and legal measures that are likely to arise concerning the Water Framework Directive.

1. All environmental aspects of port activities will come under increased security, particularly discharges, effluents and abstraction.
2. A range of technical solutions which reduce environmental impacts are presently being developed and catalogued through European port collaboration.
3. These solutions will be more effectively applied where ports are taking a sustainable development approach and actively internalising environmental management into the working practices of the port.
4. A number of innovative approaches to port development and mitigation measures have been considered in the implementation of the Habitats Directive.
5. The impact of dredging on the morphological flow of Estuaries and Coastal areas is a key area of scientific debate requiring further assessment. Ports should continue to explore and define how this will be interpreted in the directive.
6. A number of derogations to the WFD are allowed for Flood Protection and Navigation purposes, however their application remains uncertain and untested.
7. Criteria for the legitimate pursuit of economic activity remain strict, including; over-riding public interest, mitigation of adverse impacts, justification of the proposal against other alternatives, integration with the goals of the River Basin Management Plan.
8. Some port areas will be defined as Artificial or Heavily Modified Water bodies, and in such areas water quality objectives may allow for human uses.
9. Port and Harbour authorities should actively seek to engage in the river basin management planning process and also the scientific and technical assessments which form the basis for the WFD.

Many of the practical implications of the directive for ports and harbours remain unknown, since the directive is only in the second year of a 12 year planning cycle (first phase ends 2015). However, experience of implementing the Habitats Directive, and growth in the environmental awareness and practices of the seaports and harbours, demonstrates that proactive approach will prove the most beneficial way to deal with the uncertainties and complexities raised by this new environmental legislation.
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1 The Water Framework Directive

The Water Framework Directive (2000/60/EC), has been described as the most extensive piece of environmental legislation emanating from the EU. This chapter provides a basic introduction to the scope, goals and operations of the directive, to provide the context for chapter 2 which considers the specific implications of this legislation for seaports and harbours.

1.1 Scope

The Directive applies to all surface freshwater bodies, groundwaters, estuaries and coastal waters out to one mile from low-water. Preamble 17 particularly mentions coastal waters, Article 2 (7) defines “Coastal waters” as:

“surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.”

The directive makes a number of classifications that seek to allow for the sustainable use of non-natural water bodies:

Article (8) “Artificial water body” means a body of surface water created by human activity.

Article 2 (9) “Heavily modified water body” means a body of surface water which as a result of physical alterations by human activity is substantially changed in character, as designated by the Member State in accordance with the provisions of Annex II.

These classifications might be applied to port areas which have been created by extensive physical modifications. Such areas will still have to meet environmental standards, but there will be allowance for specific human activities, and different objectives will be set for these areas.

The directive also makes a number of classifications of waterbodies for the purposes of management:

Article 2 (15) “River basin district” means the area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters, which is identified under Article 3(1) as the main unit for management of river basins.

Article 3(1) Coastal waters shall be identified and assigned to the nearest or most appropriate river basin district or districts.

Therefore, each water body within a port will be part of a designated geographical area based on the natural boundaries of River Basins. Efforts at management will be co-ordinated around this unit rather than administrative areas (see Appendix 1 of this report).
1.2 Goals

The basic goal of the directive is to make sure that water throughout Europe remains unpolluted and that polluted waters are made clean. The directive seeks to achieve this through the approach of Integrated River Basin Management. Implicit in this approach is a series of stages, including: monitoring; setting of chemical and ecological parameters; setting of objectives; and implementation of planning and management to achieve these objectives.

The directive will seek to control a range of interrelated functions, including flooding and droughts, health of aquatic ecosystems, discharges, pollution, and water consumption. These functions have previously been controlled by various different pieces of legislation (see Table 1), but the WFD will act to rationalise this.

The central aim will be the achievement and maintenance of “good water status” in all water bodies of member states. In addition for groundwater, any significant and sustained upward trend in the concentration of any pollutant should be identified and reversed.

<table>
<thead>
<tr>
<th>Table 1. Legislation Replaced by the Water Framework Directive</th>
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<tbody>
<tr>
<td>Surface Water Abstraction Directive – 75/440/EEC</td>
</tr>
<tr>
<td>Exchange of Information on Surface Water Decision – 77/795/EEC</td>
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</tbody>
</table>

By the end of 2013 the Directive will also replace:

- Freshwater Fish Directive – 78/659/EEC
- Shellfish Waters Directive – 79/923/EEC

1 In practice these issues are closely interrelated- for example levels of extraction (Water Consumption) affect concentration and impact of contaminants (Pollution).
1.3 Operation

The directive envisages the development of operational programmes according to a timetable. In each country of the EU, a government organisation (commonly environmental or water ministries/agencies) will have co-ordinating responsibility for the directive, and be known as the Water Directors or Competent Authorities. (see Appendix 2 of this report)

Whilst ports have no formal, legally prescribed role, they will be involved as interested parties. (They may be designated as statutory consultees within the national transposing legislation). The following outline presents the key stages of the WFD that are of interest to ports:

Table 2 Timeline of Implementation for the Water Framework Directive

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>Transposition of directive into national laws (e.g. 2 January 2004, UK)</td>
</tr>
<tr>
<td>2004</td>
<td>Characterisation and Risk Assessment Economic analysis of water use Register of protected areas</td>
</tr>
<tr>
<td>2007</td>
<td>Interim overview of the significant water management issues</td>
</tr>
<tr>
<td>2008</td>
<td>Publish draft River Basin Management Plans for consultation</td>
</tr>
<tr>
<td>2009</td>
<td>Finalise and publish first River Basin Management Plans</td>
</tr>
<tr>
<td>2012</td>
<td>Measures fully operational Work programme for second River Basin Management Plans</td>
</tr>
<tr>
<td>2013</td>
<td>Review Characterisation and risk assessment Review of Economic Analysis of water use Interim overview of the significant water management issues</td>
</tr>
<tr>
<td>2014</td>
<td>Publish second draft River Basin Management Plans for consultation</td>
</tr>
<tr>
<td>2015</td>
<td>Achieve environmental objectives in first Basin Plans Finalise and publish second River Basin Management Plans</td>
</tr>
<tr>
<td>2021</td>
<td>First Management Cycle Ends</td>
</tr>
<tr>
<td>2027</td>
<td>Second management cycle ends, final deadline for meeting objectives</td>
</tr>
</tbody>
</table>

1.3.1 Characterisation (article 5)

The first task of the competent authority is to classify and characterise rivers, lakes, transitional waters and coastal waters (out to 1 nm) into a series of ‘River Basins’. The competent authority will also classifying some areas such as ports within ‘Artificial/ or Heavily Modified Waterbodies’ (see Appendix of this report). Concurrent with the classification stage, competent authorities will also register protected areas, run a risk assessment of the human pressures that are affecting water quality in each waterbody, and make an economic analysis of the use of water. The economic analysis will enable rational discussion on the cost-effectiveness of the various possible measures that are presented later in the programme. The characterisation phase should be completed by the ambitious deadline of 2005 and assessments will be based on currently available data.

Figure 1 Example Classification for Risk Assessment

The characterisation is ultimately of concern to ports and harbours, since it will define the reference conditions which are stipulated in the following programme of operational measures:

- Ports will have concerns where existing data for assessment may be inadequate (This could give to high or too low baseline assessment which will subsequently affect targets. The identification of pressures could provide an inaccurate assessment of some port related pressures: for example the general assessment of diffuse pollution or morphological alterations arising from dredging).

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1 The classification will be based on a number of key factors (identified in Annex II of the WFD) including physical and chemical characteristics, so that each waterbody is set reference conditions that are specific to its type. Therefore, although standards are inter-calibrated across Europe, each river basin will have standards to suit its natural variability.

2 Many of the risks and impacts of anthropogenic activities have been investigated as part of the Habitats Directive implementation through “appropriate assessments”.
• Ports may wish to contribute some of their environmental (hydrographic and oceanographic) data holdings to the assessment.
• Ports will be concerned to comment on the results of the risk assessment of human activities\(^1\) and characterisation- to audit the decision-process and check that the science is valid- as these will determine targets that must be met later in the programme.

It should be noted that the Classification and Risk Assessment do not necessitate input from ports, since they will be based on scientific and technological assessments commissioned by government agencies. Nevertheless, ports may wish to ensure that they are aware of any working groups convened to make assessments for the WFD.

1.3.2 River Basin Management Plans

Many of the activities resulting from the WFD will be related to the river basin management process. Plans will be produced that will guide the activities and projects that must be undertaken for all River Basins to achieve ‘good quality’ status by 2015.

Essentially, decisions will be made at basin level about what measures need to be used to tackle pollution, proportionate to the problem. Consultation in 2007 will lead to plans at basin (and possibly sub-basin levels) in 2008. The planning process will compare the river basin’s characteristics, and the impact of human activity on the status of waters in the basin. If a gap remains between existing legislation and meeting these objectives, a set of measures will be designed to fill the gap (Olsen, 2003). The provisions of the WFD in Article 14, call for full and active involvement in discussing the Programme of Measures (PoM), and in the preparation of the river basin management plan as a whole. However, the details of public participation are not outlined within the directive (except for instructions concerning access to work programmes and background documents and information). This puts an onus on port and harbour authorities to make sure that there is provision for active involvement and consultation by interested parties.

It is difficult to assess the likely practical costs of implementation for ports, although some evidence could be provided from pilot river basin planning being conducted between 2003 and 2007. (The pilot river basins: are Scheldt, Moselle-Sarre, Marne, Shannon, Odense Fjord, Ouloujoki, Guadiana, Jucar, Pinios, Somes, Neisse, Tevere, Cecina, Suldalsvassdraget and Ribble). Potential types of measures are listed in Annex 6 Part B, and cover a wide range of approaches from legislative to economic, technical, educational or practical solutions. Likely examples of measures related to the dredging function in ports, might include dredging according to best practice guidelines, or dredging at appropriate times and seasons.

• Ports will want to be closely involved in any programmes of consultation for the river basin planning process, and as part of this work, there may be additional requirements for environmental training of port employees involved in the drafting and consultation process.

\(^1\) The risk assessment will include some implicit assumptions about the need for human development and its economic value, and this may prove disadvantageous to smaller ports and harbours who are less clearly able to justify their social and sustainability contribution (Murray et al., 2004)
• Ports will be interested in preparing and proposing cost-effective and technically feasible solutions, where they are likely to contribute measures to the River Basin Management Plans.

1.3.3 Programme of Measures and Dealing with Non-Compliance

The approach of the WFD is to manage a river basin district: analysing the present state, human and natural needs and impacts; doing monitoring; and planning and proposing measures.

Part of the programme of measures will be a number of economic or regulatory instruments. These are provided for in the transposition of laws into national legislation (see Appendix 4 of this report). Preamble 38 and Article 8 stipulate that member states may create “economic instruments to recover the costs of water services, including environmental or resource costs associated with damage or negative impact”. One of the accepted approaches is the imposition of penalties (as suggested in Article 23) which incur the costs of clean up activities. The Water Framework Directive also makes provisions for a series of negotiated, fiscal or legislative controls (Article 11) including, amongst others; abstraction and injection controls, direct and diffuse pollution controls, emission controls and limits, binding rules and regulations covering pollutants, prior authorisations concerning activities that might affect the hydromorphological conditions of waterbodies; and pollution warning systems.

Accompanying the measures will be a substantial monitoring programme, which forms a major technical challenge (Edwards and Jowett, 2004). Annex 5 suggests that monitoring should be divided into 3 constituent elements:

**Surveillance Monitoring** (to provide a general assessment of the state of the environment) will occur once per year between 2006-9. This will provide long term data on natural/anthropogenic change with reference to the quality indicators identified within the directive. It will also validate the risk assessment undertaken as part of the characterisation in 2004.

**Operational Monitoring** (focusing on the most sensitive environments). This is likely to be implemented in key waterbodies which have been identified at risk, and measure parameters such as priority hazardous substances.

**Investigatory Monitoring** (which will explore why waterbodies have failed to achieve objectives). This will investigate the causes of exceedance, and the contributors to, and impacts of, pollution events.

The key requirement of the WFD centres on the concept of *Good Surface Water Status*.1 This is an Environmental Objective, with both physio-chemical (e.g. temperature, oxygen balance, pH and salinity inside normal range for a particular water type) and ecological (e.g. good concentration and abundance of phytoplankton for a particular water type) elements, and which must be met and maintained by 2015 in all European waters.

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1 Article 2 (18) and also good Groundwater Status.
• Ports will want to ensure that they clearly demonstrate compliance with the directive. The success of this task will be dependent on the right water quality assessment being made in the first place.

1.4 Principles

The Water Framework Directive can be interpreted within the context and ethos of existing European environmental legislation (http://europa.eu.int/comm/environment/water/water-framework/overview.html). The legislation reflects number of principles that increasingly characterise European environmental law.

Greater integration. The WFD is a streamlining legislation that intends to make a phased replacement a number of European directives. This approach benefits ports by simplifying the legislative regime. Furthermore, by considering together the ecology, chemistry and human use of both surface and groundwaters, the directive encourages a more strategic assessment of environmental problems based on likely outcomes in contrast to previous legislation which has set unresponsive standards and encouraged more “end of pipe” solutions.1

Citizen involvement. The provisions of the River basin management plans seek to involve local communities more closely in the setting of measures. The requirements of the directive move beyond reporting by government agencies, to encouraging active involvement in decision-making.2 This will place an onus on ports to make sure participants are well informed about the port environmental issues related to the directive.

Participatory approach to target setting. The WFD recognises need for greater participation right from the initial phase of target setting. For example, whilst measurements such as pollutant levels can be directly recorded by environmental sensors, targets such as ‘good ecological status’ represent human classifications that can be agreed by a transparent and informed network of participants (European Commission, 2003). Ports may choose to champion this interactive style of decision-making, and mobilise any scientific and analytical capabilities they have, in order to contribute to the assessments required by the directive.

Innovative approaches. The directive encourages the use of cost-effective and locally specific solutions3 to protect water and promote sustainable use. The port sector can provide a number of examples of environmental innovation that might be used to minimise environmental impacts, ranging from codes of good practice to reuse of dredged spoil and recycling of ship’s packaging materials.

Long term perspective. The WFD envisages the achievement of targets through a phased approach. The key deadlines are 2015 and 2027. This comparatively long term approach allows time for the measures created by the directive to have effect,

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1 ‘End of Pipe’ solutions refer to technical interventions which focus on reducing pollution inputs such as sewage treatment, rather than preventing pollution in the first place.

2 Preamble 14, Article 14 (1)

3 Preamble 13, Annex 6, part B.
whilst also maintaining the ambitious goals of eventual elimination of priority Hazardous Substances in the environment, and no deterioration in the status of water quality.

**Polluter Pays Principle.** Much recent European legislation has sought to implement the polluter pays principle. The aim is to transfer the burden of costs for environmental externalities\(^1\) from society at large to businesses and individual users. While the ethics of this approach are accepted, difficulties arise for Ports and other business due to the many uncertainties and complexities involved in equitable pricing and costing for the use of the environment.

**Precautionary Principle.** This principle is enshrined in preamble 11 of the directive, despite being much contested in its meaning. The precautionary principle states that ‘where lack of data, analytical difficulties or the scale of environmental issues prevents conclusions within the boundaries of scientific certainty, lack of evidence should not preclude precaution- otherwise management might fail to prevent irreversible and costly damages\(^2\). Different interpretations of the principle have led to varying bases for scientific criteria in assessing port projects.\(^3\)

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1 Environmental Externalities refer to the benefits that can be accrued free of charge from the air, landscapes, rivers and oceans, since they are not owned by anyone but free to use. However, free use of, for example, Air by a company to pump out exhaust gases creates external costs in the form of cleanup costs for government, health costs for individuals and deterioration of ecosystems, which are not paid for by the company. Most forms of pollution are therefore externalities (Blair and Hichcock, 2001)

2 Defined at the Bergen Ministerial Declaration (1990)

3 For example, one port development might be required to commission extensive scientific research on the legacy of historical contaminants in sediments, whilst another port could experience a more ‘lenient’ or ‘pragmatic’ interpretation of the precautionary principle. The problem is therefore inconsistency of interpretation.
2 The Water Framework Directive and Ports

This chapter considers the implications of the Water Framework Directive legislation for seaports and harbours, as major stakeholders in the coastal zone.

Seaports as Stakeholders in the Coastal Zone

Seaports may be considered unique businesses located in the coastal zone with specific environmental issues arising from their activities. Ports represent a concentration of human activity, as nodes in the logistic chain, and points of transfer within transport networks. Port responsibilities and liabilities may range from dredging to issues related to the safety of navigation and, under some types of ownership, responsibilities for environmental protection (Wooldridge and Stojanovic, 2004).

Ports are able to support environmentally favourable forms of transport. For example, because of reduced fossil fuel consumption, ships make lower inputs to the environment than alternative modes of transport, thereby lowering emissions and reducing the contribution to global warming. However, a range of activities occur within ports with environmental aspects related to the media of water, including; anti-fouling paints, bunkering, cargo handling (including dust), dredging, dredgings disposal, industrial emissions and effluent, ship discharges (ballast), vehicle traffic and waste disposal.

The Water Framework Directive has the potential to effect ports in a number of ways. Firstly, ports will face increased scrutiny on all environmental impacts that impinge on water quality, both in terms of assessment of risks and monitoring of general environmental quality objectives. Also, in common with all other industries which are consumers of water and disposers of waste water, it will impinge on the water resource consumption of port authorities and activities. Secondly, insofar as the legislation applies to physical modifications and uses of the environment, it will impact the development of port infrastructure and terminals. Finally, in a more general sense, the directive presents new opportunities and challenges for the port sector in developing port environmental management, and engaging with regulators, competitors and environmental pressure groups. Environmentally friendly Ports will seek to maintain a balance between natural and built environments, whilst attending to the considerations of functioning as a ‘green’ port facility and engaging constructively with other stakeholders in the coastal zone.

2.1 Operational Management

The day to day operations of ports entail skilled work, procedures, activities, and technologies and all of which have health, safety and environmental implications. The primary operations related to water quality within ports concern consents to discharge water, trade effluent licences or abstraction licences. Frequently within port areas, the drainage systems of different installations are connected, which encourages port authorities to have a good overview of the network within the port complex. A highly effective approach to ensuring compliance can be an internal environmental audit by a port environmental manager.
Table 3 shows other aspects of port activities also have the potential to impact the biological, hydromorphological and physio-chemical indicators listed within the WFD (including Priority Substances in Annex 10).

Table 3 Potential impacts arising from Port Activities

<table>
<thead>
<tr>
<th>Port Activity</th>
<th>Environmental Aspect Related to WFD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Modifications</td>
<td>Impact on hydrological regime, sediment transport and therefore (benthic) ecology.</td>
</tr>
<tr>
<td>Disposal of Dredge Spoil</td>
<td>Disturbance/smothering of ecology and habitats.</td>
</tr>
<tr>
<td>Pollution Incidents</td>
<td>Release of hazardous and toxic materials.</td>
</tr>
<tr>
<td>Maintenance Dredging</td>
<td>Disturbance of pollutants suspended within sediments.</td>
</tr>
<tr>
<td>Ballast Water Discharge</td>
<td>Discharge of foreign aquatic organisms or pathogens.</td>
</tr>
<tr>
<td>Traffic Emissions</td>
<td>Release of NOx SOx and other vented gases into aquatic environment.</td>
</tr>
<tr>
<td>Cargo Handling</td>
<td>Spillage of oil and liquid chemicals into run off and coastal waters. Accidental release of other contaminants.</td>
</tr>
<tr>
<td>Bunkering</td>
<td>Spillage of oil into coastal waters.</td>
</tr>
<tr>
<td>Anti-fouling paints</td>
<td>Release of toxins into water.</td>
</tr>
</tbody>
</table>

It is not always a simple matter to understand the cause and effect relationships involved in port environmental impacts. Neither is it a simple matter to isolate the effects of port related pollution from other local urban and industrial sources or natural trends and background levels. However, a number of technical solutions have been developed by ports and for ports, to ameliorate the impacts of individual activities. These solutions may bring internal costs savings or improvements in efficiency, or conversely, may entail costs and changes in business processes. The WFD applies the concept of ‘disproportionate costs\(^1\)' in making an assessment of which measures should be required. This is not an altogether clear basis for assessment, but expenses are likely to be set against the costs of lack of action (See Appendix 4 of this report). The WFD also allows for the ‘phased implementation of measures according to costs.’

Choosing the most appropriate solutions to apply will be most effective where ports have ‘set their own house in order’ and take a systematic approach to environmental management. Port businesses that take a Risk Management approach are likely to consider the Environment as key a factor within their strategic business planning. Municipally and Trust owned ports are likely to have environmental issues high on their agenda due to the definition of responsibilities within their business model. The appointment of an environmental manager and implementation of an environmental management system are often seen as the ultimate commitment to achieving sustainable development within ports. Self regulation, with ports generating knowledge and applying solutions, is the policy espoused by the European Sea Ports Organisation as the best way to support and implement EU environmental legislation (ESPO, 2003).

\(^1\) Article 4 (3)
Increasingly, the port sector in Europe is collaborating in identifying useful environmental solutions and good practice. The ECOPORTS project Solutions Database (www.ecoports.com) provides examples of many technical, legal, procedural and managerial solutions piloted by ports. Some, such as water treatment processes, monitoring programmes and containment and drainage technologies, are particularly relevant to the WFD.

Operations Summary

All environmental aspects of port activities will come under increased security, particularly discharges, effluents and abstraction.

A range of technical solutions which reduce environmental impacts are presently being developed and catalogued through European port collaboration.

These solutions will be more effectively applied where ports are taking a sustainable development approach and actively internalising environmental management into the working practices of the port.

2.2 Development and construction

The port sector is experiencing a period of expansion in line with the growth of global trade. The recent ESPO 2003 Environmental Survey identified proposals for development in 65% of European ports (Stojanovic and Wooldridge, 2003). These developments are likely to form a major consideration for the WFD due to the potential of shoreline modification and land reclamation to cause morphological alterations to the waterbodies, thereby affecting their ecological quality status. The emphasis on biological aspects is a new consideration for water quality legislation provided in the WFD. Ports will want to understand the science of whether dredging related to navigation will affect the morphological flow changes in Estuaries and Coastal areas.

Through the experience of implementing the Habitats Directive and Environmental Impact Assessments, ports have developed innovative approaches in the construction process to reduce conflict (such as seasonal activities that allow for wildlife) and to maximise benefits (such as providing opportunities for conservation objectives within developments). However, some ports have less experience in environmental innovation than others, since the Habitats Directive has had less comprehensive coverage across European coasts than the Water Framework Directive.

The directive does allow for the legitimate pursuit of economic activity. The possibility of using derogations under Article 4 (7) gives space for further sustainable human development. However there are strict criteria for using derogations, which will have to prove “over-riding public interest.” Furthermore, new developments will need to provide compensatory measures to “mitigate adverse impacts,” justify the proposal against other alternatives, and be commensurate with the goals of the River Basin Management Plan. So for example, new (capital) dredging activities would have to mitigate all impacts and be fully justified in the river basin management plan (i.e. carried out due to reasons of over-riding public interest or benefit to
environment/society). In all scenarios for development, ports will need to make a clear case for their economic contribution to national, regional and local communities; a task which may be easier for large and important commercial ports than smaller recreational based harbours.

A large proportion of ports may have their waters designated as Artificial or Heavily Modified Water Bodies (HMWB) (see Appendix 4 of this report). The scenario of making physical modifications to HMWB could have different levels of stringency, however the differences in criteria are not made clear in the directive (Murray et al., 2004). Specific derogations are mentioned in the WFD for Flood Protection and Navigation, but how and where derogations might apply also remains uncertain and untested aspect of the new legislation.

**Development Summary**

A number of innovative approaches to port development and mitigation measures have been considered in the implementation of the Habitats Directive.

The impact of dredging on the morphological flow of Estuaries and Coastal areas is a key area of scientific debate requiring further assessment. Ports should continue to explore and define how this will be interpreted in the directive.

A number of derogations to the WFD are allowed for Flood Protection and Navigation purposes, however their application remains uncertain and untested.

Criteria for the legitimate pursuit of economic activity remain strict, including; over-riding public interest, mitigation of adverse impacts, justification of the proposal against other alternatives, integration with the goals of the River Basin Management Plan.

Some port areas will be defined as Artificial or Heavily Modified Water bodies, and in such areas water quality objectives may allow for human uses.

### 2.3 Engagement

It is clear that seaports and harbours will have a number of roles in implementing the WFD ranging from checking drafts of River Basin Management Plans to involvement in the science and assessment of the impacts of port development. A successful approach will entail active participation, not just merely consultation. The extent to which port and harbour authorities will enter into full partnership with Non Governmental Organisations and regulators will depend on their philosophy of engagement with environmental issues. One measure of the priority of the environment to commercial European ports, is the integration environmental issues into their business plans as a core risk.

With reference to the timetable of implementation (Table 1), there are a number of important stages at which ports could seek to make inputs:
Classification of areas.
The first opportunity for port involvement is an evaluation of the scientific assessment associated with the Characterisation stage (2004-5). This includes the definition of some port areas as Artificial or Heavily Modified Waterbodies (see Appendix 4 of this report) and the assessment of present water quality status. These assessments will be crucial in determining the requirements for ports at later stages of implementation. European ports have varying capabilities for environmental science and monitoring, nevertheless, they will be less able to enter into the management debate unless they have also understood the physical symptoms under assessment in the natural environment.

Characterisation: risk assessment
Many of the parameters within the WFD can be directly measured by environmental sensors. However, some values rely more on human classifications such as “poor status.” It is important that coastal stakeholders such as ports enter into dialogue with regulators and environmentalists to define these classifications, and consider providing data from their own environmental monitoring. Ports can make an important contribution in validating the full range of human activities taken into account in the assessment of risks. The appointment of port and shipping representation within bodies established for technical and scientific assessment is an important, related consideration.

Draft River Basin Management Plans
Every River Basin Management Plan must undergo a process of public consultation, for which a port may register themselves as an interested party. The directive calls for close co-operation at the local level with users (preamble, para 11) but the exact working arrangements and groups for port input will be decided at national and local levels. There is therefore an opportunity for ports to opt for a high level of engagement, and take an active role in the planning process. Ports may wish to consider and audit the implications of any proposed measures for the port sector, the public understanding or port environmental issues, and the compatibility of River Basin measures with other plans and regional development goals.

At minimum, ports or port associations in each country should consider involvement in government stakeholder groups which can explain the implications of the legislation, and debate the technical and scientific aspects of implementation in a transparent manner.

Such involvement brings into question the issue of how the environmental issues are managed within port organisations and associations themselves. The WFD provides an opportunity for collaborative rather than adversarial approach amongst all partners by recognising human activity and sustainable water use as integral component in environment management. A collaborative approach includes better understanding by the port sector of regulatory requirements, and better understanding by regulators and environmentalists of the functions and business practices of ports, including full integration of global and local environmental benefits and disbenefits into assessments. Table 4 provides an outline of key considerations to be integrated into working relationships.

Ultimately this high level of engagement may bring a number of strategic advantages to ports:
Avoid costly penalties by having good awareness of regulatory requirements.
Discover existing non-compliance and rectify before litigation.
Gain information about innovative technologies and approaches which can produce cost savings.
Create positive public relations through genuine partnerships with respected environmentalists and contribute to local sustainability and conservation agendas.
Gain a competitive advantage with those customers which have a market reliance on environmentally sustainable products and logistics chains.

Table 4 Developing Relationships with Environmental Regulators: Water Framework Directive.

<table>
<thead>
<tr>
<th>Relationships: Require Port Input to work of Regulators</th>
<th>Relationship: Provide Input from Port's Work to Regulators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outline role for port and navigation authorities</td>
<td>Clearly demonstrate compliance</td>
</tr>
<tr>
<td>Define environmental realities</td>
<td>Present costs and benefits of alternative measures</td>
</tr>
<tr>
<td>Negotiate standards</td>
<td>Make the case for sustainable transport solutions.</td>
</tr>
<tr>
<td>Create formal working groups.</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS

The Water Framework Directive (2000/60/EC) establishes a requirement for competent authorities to manage the water quality of river basins and coastal waters throughout Europe, so that they achieve good status by 2015 (with no deterioration).

A number of unclear issues remain with respect to the application of the WFD, ranging from the science of defining good status with physio-chemical, ecological and hydrological components for each individual river basin, to the exact measures which will be instigated to improve water quality in each basin.

Ports are likely to experience a number significant affects, including costs imposed to make their operations more environmentally friendly, and delays to developments in order to prove that they are of over-riding public interest or do not impact water quality. The port sector can draw on the experience in implementing the Habitats Directive for proposing mitigation measures.

In response to the demands of the legislation, ports will want to clearly demonstrate compliance with the environmental quality objectives defined in the WFD, and compliance with any emission or discharge standards or procedures established to meet these objectives. Where ports are called upon to implement measures as a contribution to the river basin management plan, they will want to ensure that these measures are practical and cost-effective, and they that complement their strategic plan for environmental management.

Ports should continue to develop a clear understanding of the issues in the later stages of the first planning cycle (2004-2015) and some implications will become apparent in testing the application of the WFD conditions to ports. Whilst the WFD may be regarded as a potential threat to the port sector, due to the constraints posed on development, this rationalised, participatory and systems-oriented legislation provides an opportunity improve dialogue and establish more effective engagement between the key partners in the environmental management of the coast.
Appendix 1 European River Basins for the Water Framework Directive
[Provisional Map: Source Nilsson et al. (2004)]

European Water Management Online
Official Publication of the European Water Association (EWA)
© EWA 2004

Figure 1. Prospective RBDs in Europe.
### Appendix 2 The Water Directors
(of EU Countries where Directive has been fully Transposed into National Laws as of 1 January 2004)

<table>
<thead>
<tr>
<th>Country</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>Flemish Co-ordination committee for the Integration of Water (CIW), (comprised of Environment Ministry and Transport Department)</td>
</tr>
<tr>
<td>Denmark</td>
<td>Danish Environmental Protection Agency, Danish Counties as River Basin Authorities.</td>
</tr>
<tr>
<td>England and Wales</td>
<td>Environment Agency (Department of Environment, Food and Rural Affairs)</td>
</tr>
<tr>
<td>France</td>
<td>Ministry of Ecology and Sustainable Development</td>
</tr>
<tr>
<td>Germany</td>
<td>LAWA Länderarbeitsgemeinschaft Wasser (Working Group of the Federal States on Water Problems)</td>
</tr>
<tr>
<td>Greece</td>
<td>Ministry for the Environment, Physical Planning and Public Works</td>
</tr>
<tr>
<td>Ireland</td>
<td>Department of the Environment, Heritage and Local Government</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>Environment and Heritage Service (Department of the Environment in Northern Ireland )</td>
</tr>
<tr>
<td>Scotland</td>
<td>Scottish Environment Protection Agency (Scottish Executive)</td>
</tr>
<tr>
<td>Spain</td>
<td>Spanish Ministry of the Environment</td>
</tr>
<tr>
<td>Sweden</td>
<td>River Basin District Authorities</td>
</tr>
</tbody>
</table>
Appendix 3 Economic and Regulatory Instruments (Draft Table of EU Directives Application to Port Sector)

<table>
<thead>
<tr>
<th>Directive</th>
<th>Financial Penalties</th>
<th>Legal Requirements</th>
<th>Regulatory Charges</th>
<th>Clean up costs/ criminal charges</th>
<th>Other Penalties and prosecutions</th>
<th>Management and mitigation Measures</th>
<th>Monitoring costs (Cost-Benefit Analysis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFD</td>
<td>Pollution Penalties</td>
<td>Yes Reduce Pollution, Phase out Hazardous Substances.</td>
<td>Costs for Abstraction Costs for waste treatment</td>
<td>Damages of aquatic environment</td>
<td>No</td>
<td>Management Measures</td>
<td>Environmental Quality Objectives</td>
</tr>
<tr>
<td>Habitats Directive</td>
<td>No</td>
<td>Protection of Species</td>
<td>No</td>
<td>Protection of Species</td>
<td>Destruction of breeding sites or resting places.</td>
<td>Conservation Measures</td>
<td>Appropriate Assessments. Conservation Status</td>
</tr>
<tr>
<td>EIA</td>
<td>No</td>
<td>Environmental Assessment Risk Assessment.</td>
<td>Development Consent</td>
<td>No</td>
<td>No</td>
<td>Mitigation Measures</td>
<td>Data on Environmental Effects</td>
</tr>
<tr>
<td>Env Liability</td>
<td>Damages</td>
<td>Restoration Measures</td>
<td>Cost Recovery by Regulators</td>
<td>Financial liability for environmental damage</td>
<td>No</td>
<td>Preventative and Remedial Measures</td>
<td>General Data Collection and Monitoring</td>
</tr>
</tbody>
</table>
Appendix 4 Legal Definitions and Implementation

Definition of Artificial and Heavily Modified Surface Water Bodies

Article 2 describes the definition of Artificial water bodies as ‘those created by human activity’, which would include canals, or docks or impoundments where no waterbody existed before. Heavily Modified Water Bodies (HMWB) are those which are ‘substantially changed in character as a result of physical alterations by human activity’. The HMWB status is more complex. It recognises that many waterbodies have been altered to allow for human use, but designation of HMWB is not simply a matter of identifying those waterbodies that are not totally natural. There are other elements to the classification test:

Table 4 Defining Heavily Modified Waterbodies (Art 4(3))

<table>
<thead>
<tr>
<th>Element of Assessment</th>
<th>Port Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characterisation</td>
<td>Not a pristine environment, and there are already specified human uses, which provide valuable social and economic benefits: e.g. navigation and port activities. The waterbody would therefore be unable to achieve Good Ecological Status due to existing hydrological and morphological alterations.</td>
</tr>
<tr>
<td>Substantially Changed</td>
<td>The natural coastline and environment has experienced extensive physical modifications in the creation of a port.</td>
</tr>
<tr>
<td>Significant Adverse Effects</td>
<td>AND Achieving Good Ecological Status (e.g. through restoration measures) would have significant adverse affects on navigation or port facilities.</td>
</tr>
<tr>
<td>Alternative Means</td>
<td>AND All environmentally beneficial and technically feasible alternatives for providing use-related benefits are disproportionately costly</td>
</tr>
</tbody>
</table>

Article 4 (3) specifically relates the HMWB classification to ports, with a condition for classification that ‘changes to the hydromorphological characteristics necessary for achieving good ecological status would have a significant effect on navigation, including port facilities or recreation’.

This classification in itself is not a derogation (these are covered in Article 4 (7) and Article 11). A range of environmental conditions will still need to be monitored for these water types, and quality status will need to evolve toward a less stringent standard of ‘good ecological potential.’ The HMWB status therefore provides water quality targets that account for human uses rather than simply natural environmental states.

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1 This pretext is key: if the water body could achieve Good Ecological Status then it need not be designated HMWB.
Interpretation of Terminology

The WFD contains a number of concepts that are crucial in determining decisions. Unfortunately what constitutes these situations in practice is a matter of uncertainty and debate. Four key terms are relevant to the assessment of port developments:

- Viable Alternatives (especially in the case of smaller ports and harbours, where proportional expenditure for improvements, and intangible benefits to local communities, may not be well taken into account) (Brooke, 2003)
- Over-riding public interest
- Alternative Solutions
- Disproportionate Costs

The rulings of the European Court of Justice may provide some guidance for terms such as ‘over-riding public interest,’ which have been disputed in the implementation of the Habitats Directive.

Another level of interpretation includes a number of loose definitions with respect to environmental quality objectives. Whilst the science itself in determining water quality status is not straightforward, the requirements of the directive are precise (Edwards and Jowett, 2004). Nevertheless the criteria for detailed classification are more subjective (e.g. Normative definitions in Annex 5). The following list provides a few examples of loose definition:

- No or very minor alterations
- Low levels of distortion
- Deviate moderately from…undisturbed conditions
- Corresponds totally or nearly totally to undisturbed conditions
- Slight changes in composition and abundance

These definitions will introduce a further level of uncertainty into the interpretation of the directive, and have the potential to create anomalies in standards, placing different environmental requirements across European ports.

Policy Integration

Preamble 16 refers to other EU policies and in particular the integration of the directive with Transport and Energy Policies. However, no provisions are made within the legislation itself or for achieving this integration. For example, amongst the present environmentally related Transport Policies is the Expansion of Short Sea Shipping (PIANC et al., 2003) which is likely to require the development of port facilities on a local scale, whilst reducing environmental impact on a global scale. At present no mechanisms exist within the WFD to make an assessment of this trade-off.

The integration of European policies and consideration of broader functioning of environmental systems is crucial in selecting the most cost-effective, sustainable solutions, and allowing ports to maximise the additional benefits of the measures taken in the WFD.
Appendix 5 Further Information about the WFD Process.

Key Research Gaps:

More detailed assessment of who the key players are for each EU country and at the EU commission level

Explanation of more complex elements of the science and technology: the Common Implementation Strategy

Case Study: Experience of 1 Port in Pilot River Basin Management Plans:

Explore Monitoring and networks designed to monitor parameters appropriate to ports requirements
Bibliography


