COMMON IMPLEMENTATION STRATEGY FOR THE WATER FRAMEWORK DIRECTIVE (2000/60/EC)



WORKSHOP REPORT OF

SURFACE WATERS MONITORING NETWORKS AND CLASSIFICATION SYSTEMS

Output of the Workshop held in Brussels on 27-28 April 2006

Produced by S C Nixon, WRc plc

DISCLAIMER: This report has been prepared by a consultant under the framework of a support contract with DG Environment. It does not necessarily reflect the opinion of DG Environment or other European Commission services.

Table of Contents

Summary 1

1. Introduction 3
2. Key issue 1: Design of networks/general principles 4
3. Key issue 2: Costs of monitoring 6
4. Key issue 3: Purposes of operational monitoring and when it should start 7
5. Key issue 4: Status of water bodies included in surveillance monitoring 8
6. Key issue 5: Grouping of water bodies 9
7. Key issue 6: Numbers of monitoring stations/water bodies included in surveillance and operational monitoring 10
8. Key issue 7: Numbers of monitoring stations in water bodies 12
9. Key issue 8: Quality elements monitored 13
10. Key issue 9: Frequency of monitoring 14
11. Key issue 10: Confidence and precision of monitoring results, assessments and classification 15
12. Key issue 11: Identification of water bodies, and the monitoring and classification of very large (coastal) water bodies 16

Annexes:

Annex A Summary of planned monitoring compiled from Member States presentations and responses given at workshop

Annex B Figures summarising preliminary monitoring networks for rivers and lakes

SUMMARY

A Workshop on Water Framework Directive surface water monitoring networks and classification systems was organised in Brussels by European Commission DG Environment on 27-28 April 2006. 80 representatives from 26 countries attended. The following points summarise some of the key issues discussed.

1. The costs of monitoring appear to be one of the prime factors determining the design of monitoring networks for the WFD. In one case this appears to be leading to a reduction in existing monitoring networks so that resources can be redirected to other quality elements and water categories not currently routinely monitored.

2. There is also evidence that the requirements of the WFD and the CIS guidance are being interpreted differently by Member States in terms of, for example, quality elements and the status of water bodies to be included in surveillance monitoring, when operational monitoring should start, the inclusion of different ecological statuses in one water body, and the aggregation of water bodies.

3. At least some Member States have considered the confidence and precision of monitoring results, assessments and classification. For example, some have recognised that the minimum monitoring frequencies given in the WFD may not be adequate to have sufficient confidence and precision in the assessment of the status of water bodies.

4. Member States appear to have very different levels of ambition and effort in terms of the numbers of stations required to monitor their water bodies. Currently there is no available information, and it is too early, to state whether these differences will lead to different levels of compliance with the WFD, and to differences in the confidence and precision in Members States' assessments of the status of their water bodies, and the subsequent establishment of Programmes of Measures.

5. The monitoring and classification of very large water bodies (particularly in coastal waters) is an important issue. Water bodies should enable status to be accurately described and compared to environmental objectives. There needs to be a common understanding between Member States on how a balance is obtained between:

   - the numbers of monitoring stations required to assess the impact of the often many different pressures on the water body,
   - the resulting classification of the water body based on the monitoring results from potentially many stations, and
   - the need of subdividing very large water bodies into smaller water bodies so that status can be accurately described.

   If not the objectives of the Directive may not be properly implemented, and some countries may spend money on measures and others not.

6. There were mixed views on the usefulness of the CIS guidance on monitoring in the design of national networks. Some Member States thought they were useful and had used them as a basis of their national guidance. Others thought they had been inadequate in at least some aspects.

7. Member States suggested that further discussion and maybe guidance was required on some other aspects: grouping water bodies across catchments; common criteria for the numbers of monitoring stations required in a water body; monitoring frequencies to detect long term trends; and, operational definition of allowable zones of effect. It was also suggested that there should be a Member State workshop on investigative monitoring in a years or so time.

1. Introduction

The Commission made a few introductory comments at the start of the workshop. Monitoring is the basis for classification and assessment and so it is vital that we get it right. Annex 5 of the WFD is not perfect especially in terms of frequency so we might have to do more than it says in order to achieve the objectives and make environmental improvements. Monitoring is cheaper than programmes of measures.

The Commission made the following observations about information and reports they have received from Member States (MS) to date:

- Minimum monitoring frequencies appear to be very low, particularly for Risk Assessments;
- All MS's Article 5 reports are incomplete because many water bodies have not been classified. Because of this a lot of monitoring must be going on.
- MS appear not to be using the guidance documents; why is this and how useful were they?
- Monitoring frequency does not seem sufficient, but the risk assessments are not very certain so MS will probably have to do more monitoring to classify all water bodies.

The presentations made at the workshop can be found on CIRCA:
http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/framework_directive/thematic_documents/12_-_monitoring/monitoring_networks

The following sections summarise the main points and issues arising from the presentations and subsequent discussions. It is recognised that the workshop just represented a "snap-shot" in time and the design of MS networks may have changed considerably over period between the workshop and the production of this report.

2. Key issue 1: Design of networks/general principles

The starting point for many countries appears to be their current monitoring networks (used for other existing needs and policies) that will be modified/adapted to make them suitable for the WFD.

- For example, in the UK most of the surveillance network will be derived from existing networks. In Scotland it is anticipated that 240 surveillance monitoring stations will remain out of existing 2000 river stations, and 35 out of 300 lakes stations. In England and Wales, 450 surveillance stations will remain out of 5870, and 45 out of 430 lake station.

- A guiding philosophy in Denmark is "no monitoring without objective, no objective without monitoring". The WFD programme will provide a national overview with a few intensive sites, and many extensive sites (monitored every 6 years with representative monitoring for selected parameters), and must enable statistical trends and analysis to be undertaken (NOVANO programme). In addition Denmark has designed a separate, one-off, programme (DEVANO) to establish the status of water bodies in 1 year. The DEVANO sites are not in NOVANA, and there will be a reduced set of parameters, with lower monitoring frequencies. DEVANO will include WBs obviously meeting objectives, at no risk, maybe at risk, probably at risk, and at risk.

- In Austria the number of river monitoring sites in the national network (285) will be reduced for the WFD. Three types of surveillance monitoring stations have been defined: one type on the larger and transboundary rivers; a second type selected to reflect dominant pressures, and based on sites with long time series in rivers over 1000 km^2; and, the third type is reference sites (5) monitored once every 6 years. The operational monitoring of rivers will take place between 2007 and 2008 on rivers >100km^2, following the risk assessment and in particular for water bodies 'at risk' and 'possibly at risk' (total of 198 water bodies) from chemical point and diffuse pollution.

- In Finland operational monitoring will be based on existing obligatory monitoring at 5000 water quality sampling sites: 100 to 300 of these sites will be chosen to contribute to WFD operational based on the risk assessments.

- The ICPDR has considered how to make its existing Trans-National Monitoring Network (TNMN) WFD compliant. Surveillance monitoring is considered to be equivalent to the current TNMN with information on trends and loads. The assessment of long term changes/natural conditions will be through monitoring of reference sites. Operational monitoring will not be considered to be part of the TNMN. This is national monitoring, and the only information reported to ICPDR will be the aggregated information on compliance etc.

Countries are also designing the monitoring networks to give a (more) representative view. The Netherlands is including smaller and larger water bodies. Finland had already revised its programmes to include smaller water bodies to improve representativity, and added new substances. For surveillance monitoring between

2006-2008 there will be new sites in or near reference conditions, and in types that were previously under-represented e.g. humic lakes

In some countries, such as Finland, investigative monitoring has not yet been discussed. The Netherlands proposed that a workshop on investigative monitoring would be useful in about 2 years time.

3. Key issue 2: Costs of monitoring

One of the main "design" criteria for WFD monitoring networks is cost. Examples of comments include:

- Countries (e.g. Poland) cannot afford to monitor every water body as there are too many.
- The reduction in the number of current monitoring sites in the UK is to accommodate the increased number of Quality Elements (QE) and water categories required. The cost of monitoring at the existing 7000 river sites used for general quality assessment with added QEs would be prohibitive.
- There was a "no increased costs criterion" from the Finnish government in the design of their WFD networks.
- In Finland macrophytes will not be routinely monitored in lakes because of cost: phytoplankton is considered to be more cost-effective.
- Hydrological data are required for the assessment of some hydromorphological quality elements. However, there may be a limit to their use and availability because data holders in some countries (e.g. France) may charge for their provision.
- In Austria, there are provisionally 300 sampling sites for the 700 water bodies (WB) at risk from hydromorphological pressures, but in reality there will be a decrease in number of sites because of costs.

Spain gave an estimate of costs for the adaptation of its monitoring networks to WFD: €11.8 million in 2005, €33.9 million in 2006, €32.4 million in 2007 and €25.5 million in 2008. However, it was not clear from the presentation if this is just for the monitoring of ecological status of rivers and lakes or whether it includes other water categories and chemical status.

4. Key issue 3: Purposes of operational monitoring and when it should start

This issue is when operational monitoring should commence in relation to its purpose as specified in the WFD.

Annex V.1.3.2. Operational monitoring shall be undertaken in order to establish the status of those bodies identified as being at risk of failing to meet their environmental objectives, and to assess any changes in the status of such bodies resulting from the programmes of measures.

Operational monitoring is, therefore, required for the classification of the status of water bodies (*identified as being at risk)* and to see the effect of Programmes of Measures (PoMs).

Denmark intends to start operational monitoring only after 2009 in a limited number of water bodies and when the programme of measures is in place and effects (improvements) expected. Their view is that there is only a need to monitor and assess those water bodies of unknown status, not the others. Having identified that a water body is at risk, there is no point in continuing to prove it (by monitoring) until the programme of measures has been put in place. The Danish once-only DEVANO programme would be used for classification of WBs before the production of the first River Basin Management Plan (RBMP).

Another participant (Netherlands) indicated that operational monitoring is also for the classification of those water bodies at risk, so must be done before the programme of measures are established. When developing the RBMP the results of the operational monitoring will be used to define the programme of measures. The emphasis of operational monitoring will also shift with time (from classification to effects of measures purposes) as the Article 5 risk assessments improve.

France also recognised that there is general issue in terms of the relationship between monitoring, RBMPs and PoMs. Can countries wait for the effects of measures to start before starting operational monitoring? One view is no because water bodies have to be classified before identifying where PoMs are needed.

5. Key issue 4: Status of water bodies included in surveillance monitoring

Annex V of the WFD states that*: "Surveillance monitoring shall be carried out of sufficient surface water bodies to provide an assessment of the overall surface water status within each catchment or subcatchments within the river basin district".*

One aspect here is whether water bodies covering the full range of statuses (from bad to high) present in the subcatchments and catchments need to be included to provide an assessment of the overall water status, or whether countries are able to just include water bodies at high and good status.

Many countries have indicated in other fora (e.g. the drafting group on State of the Environment under Working Group D on Reporting) that they will include water bodies over the complete range of statuses present.

For example, in the UK, 60% of surveillance stations in rivers will be in water bodies at risk, and 40 % in water bodies not at risk. Generally the distribution of stations will be in proportion to types and numbers within types, and will cover the range of all statuses.

However, in contrast in Finland surveillance monitoring will only include high and good status water bodies.

6. Key issue 5: Grouping of water bodies

The CIS guidance on the identification of water bodies states that:
"Surface water bodies or bodies of groundwater may each be grouped for the purposes of assessing the risk of failing to achieve the objectives set for them under Article 4 (pressures and impacts). They may also be grouped for monitoring, reporting and management purposes where monitoring sufficient indicative or representative water bodies in the sub-groups of surface water or groundwater bodies provides for an acceptable level of confidence and precision in the results of monitoring, and in particular the classification of water body status".

In addition it indicates that: *"Where contiguous elements of surface water within a type are of the same status, their combination in a single water body will provide for an accurate description of surface water status".*

The Netherlands are clustering (grouping) water bodies in terms of the same type and status based on the biological and hydromorphological elements.

The UK reported that the grouping of coastal water bodies is very difficult because of the variability of pressures and types. They are still developing tools that need to be put into place, such as the consideration of length of time series of monitoring data is necessary for classification. Grouping of WBs will be undertaken for operational monitoring impacted by the same pressures. For example, 900 WBs will be at risk from nutrients, but not all will be monitored. The working assumption is to sample around 20% of water bodies in a group.

The UK will be grouping water bodies across catchments and asked other participants their opinions on this. In response Ireland said it would not be taking this approach.

Poland has identified 5571 surface WBs. One of two approaches being considered for surveillance monitoring is the aggregation of water bodies (1105 in the country) on the basis of the most important characteristics/features of the area such as typology, land management and population. Adjacent/contiguous water bodies seem to have been aggregated together but it is not clear whether the aggregated water bodies are of the same type and status. If they are then the water body guidance has been followed. The fact that 5571 surface water bodies and 47 different types had previously been identified suggests perhaps they may not have followed the guidance. Alternatively their original typology may have been too discriminatory and a coarser version has now been applied.

In Austria water bodies have only been grouped for diffuse pollution and in only successive water bodies.

7. Key issue 6: Numbers of monitoring stations/water bodies included in surveillance and operational monitoring

Workshop participants were asked to provide details of the their planned surveillance and operational monitoring in terms of the numbers of monitoring stations/locations included and the numbers of WBs they have identified. This was done at the meeting or in correspondence with the Commission after the meeting. A table summarising the information is given in Annex 1 of this report.

Figures 1 to 8 summarise the information presented in Annex 1. The Figures should be interpreted jointly with the tabulated information as there are many qualifying statements and comments made by the countries submitting information to the Table. The Figures and the interpretation given here should, therefore, be considered as draft and preliminary[1]. The information on transitional and coastal waters has not been presented as figures because of the relative sparseness of information on these water categories.

In Spain the operational monitoring for ecological status will be undertaken on the 454 WBs that have been identified as being risk and also for those WBs with a low confidence in the risk assessment.

Depending on which of the two approaches being considered is adopted, Poland may undertake surveillance monitoring on either 250 WBs or in each of the 1105 aggregated water bodies. Operational monitoring sampling points would be located either in 1000 WBs or at each of the 2437 river WBs at risk or potentially at risk.

In Germany the surveillance monitoring sites will be focused on transboundary and large rivers but will also include reference sites. Operational monitoring will be limited to WBs which (probably) fail the good status target or other targets (e.g. in protected areas). Smaller water bodies (~100 km^2) have also been included in operational monitoring.

In the Netherlands surveillance monitoring starts with locations in major rivers (transboundary) and also on regional subcatchments. Measuring locations are on rivers, including tributaries, of sufficient size. Polders on the Rhine are included only where there is flow from the polder into a lake. In the Scheldt there will be no monitoring where there is no outflow from small bodies and brooks, only big water bodies are monitored.

Figures 1 and 2 show the numbers of river and lake monitoring stations, respectively, currently proposed for surveillance and operational monitoring. Generally there are more stations proposed for operational than surveillance monitoring. France and Poland have proposed the most river surveillance monitoring stations, and Germany, UK and Sweden the most river operational monitoring stations. In terms of lakes, Sweden and Denmark have proposed the most surveillance and operational monitoring stations.

[1] For example, it has been assumed at this stage that one monitoring station equates to one water body. In practice one monitoring station may represent a group of water bodies, and some water bodies will contain more than one monitoring station. Some surveillance monitoring stations may also be operational monitoring stations. The representation in the figures should, therefore, be considered to be indicative rather than definitive.

Figures 3 and 4 attempt to normalise the number of proposed river and lake surveillance monitoring stations, respectively, in terms of the percentage of water bodies monitored. This information is not available for some countries as the numbers of water bodies was not reported at the workshop. Lithuania has indicated that it intends to include over 60 % of its river water bodies in surveillance monitoring. In contrast, 6 of the 16 countries who provided information propose to monitor less than 10 % of their river water bodies, and 10 less than 20 %. For lakes, Belgium may include all its lakes in surveillance monitoring. Six of the 13 countries providing information propose to monitor less than 20 % of their lake water bodies, and one (Finland[2]) about 5 %.

Figures 5 and 6 examines another way of normalising the information and attempts to give an indication of the relative effort or ambition countries are taking in their monitoring networks. The Figures show the numbers of river and lake surveillance monitoring stations in relation to the countries surface area. In general terms it might be expected that bigger countries would have more monitoring stations if an overview of surface water status is to be achieved. However, this 'normalisation' does not take into account the different hydrological densities in countries (very significant for lakes), the differences and variability in water body types and the pressures upon them, and differences in how water bodies have been identified in Member States. In general terms, Denmark and Lithuania are proposing relatively dense river surveillance networks, and Finland and Latvia relatively low density (Figure 5). For lakes, Denmark and Sweden are proposing the densest lake surveillance networks and Austria and Germany the least (Figure 6).

It is more difficult to 'normalise' the information with regards to operational monitoring as only water bodies at risk need to be included, and this is likely to vary significantly from country to country. Grouping of water bodies for monitoring purposes is also allowed. Nevertheless Figure 7 indicates that Hungary proposes to include 80 % of its river water bodies in operational monitoring, and Sweden[3] 110 % of its lake water bodies (Figure 8).

[2] Finland has many thousands of lakes
[3] Implies that there may be more than one monitoring station in some lakes

8. Key issue 7: Numbers of monitoring stations in water bodies

Member States will need to determine the numbers of monitoring stations that will be required to classify the status of a water body(ies) with adequate confidence and precision. More than one station may be required in a water body for a particular quality element, and different monitoring stations may be required for the different quality elements that may be measured in the water body. The number of stations required may also be dependent on the size of the water body, with more perhaps being needed in very large water bodies (with many different habitats and pressures) compared to small ones.

Denmark thought that discussion and definition of common criteria were needed on what is the optimum density of the monitoring sites within a water body (and presumably in catchments etc.). The Netherlands also thought that the difference/relationship between a monitoring location and monitoring site/station should be discussed.

For operational monitoring in the UK there will be generally one site per WB, with the QE most sensitive to priority pressure monitored (not everything will be monitored at this stage). In Finland there will generally be one site per lake though sometimes may be more than one site. In rivers there will be at least one site per WB.

9. Key issue 8: Quality elements monitored

According to WFD Annex V surveillance monitoring is required for parameters indicative of all biological, hydromorphological and general physico-chemical quality elements, Priority List substances if discharged in the River Basin and other pollutants if discharged in significant quantities. Operational monitoring is required for parameters indicative of those biological and hydromorphological quality elements most sensitive to the pressures to which the body(ies) are subject, and only those priority substances discharged, and other significant pollutants (including nutrients) e.g. that might cause failure of environmental objectives.

The WFD requirements for surveillance monitoring are not fully met in Finland as all biological elements are not monitored at every site though the elements included will be gradually increased after the first monitoring period (2006-2008). Phytoplankton will be sampled once in the monitoring period (August) in all lakes, and annually 6 times (May to September) at 10 % of sites. Profundal benthic fauna will be monitored once in 50 % of the lake sites. Macrophytes are only sampled in some lakes because of the cost. In rivers benthic fauna, fish and phytobenthos will be measured at reference lake sites only (40% of all sites). In terms of the surveillance monitoring of hazardous substances background status will be monitored at a few sites <10 rivers and <10 lakes.

In Germany other significant pollutants are defined when the substance concentration is >0.5 times the EQS value. National EQSs have been derived using Annex V methodologies for other pollutants, and the proposed EU EQSs are used for the Priority Substances.

It is proposed that in France the monitoring of Priority Substances in transitional and coastal water WBs will be in sediments and biota instead of in water except for a few hydrophilic substances. Nutrient concentrations are extremely variable and difficult to assess in coastal waters and there was a question about its usefulness in surveillance programmes.

The International Meteorological Organisation raised the use of hydrological monitoring networks for WFD monitoring and assessment. Water level and river discharge are the basic variables of hydrological surface water monitoring programmes and probably are also the most relevant and usable for the WFD monitoring. In particular the question raised was whether the WFD QE ”quantity and dynamics of water flow” and the hydrological term ”river discharge” were equivalent. In response, in terms of the WFD it is not just river discharge, it is the temporal and spatial variability of water velocity and depth as well. Some hydrologists are not sure of the differences and what the terms mean.

The inclusion of hydromorphological QEs into ICPRD’s TNMN is being considered. Austria is using fish as the indicative QE for most hydromorphological pressures and intends to monitor two times in two consecutive years.

10.Key issue 9: Frequency of monitoring

The WFD Annex V gives minimum monitoring frequencies for all quality elements. It is recognised in the CIS Monitoring guidance that more frequent (than the minimum) monitoring may be necessary (e.g. to detect long term changes and/or initially before the first RBMP). Less frequent monitoring may be acceptable if technically justifiable, and monitoring may also be seasonally targeted. However, according to WFD Annex V "*frequencies of monitoring shall be chosen so as to achieve an acceptable level of confidence and precision*" in assessing status of water bodies.

Denmark raised the question as to what frequencies were required for detecting long term changes.

In Finland, phytoplankton will be sampled once (August) in the monitoring period (2006-2008) in all the lakes included in surveillance monitoring, and annually 6 times (May to September) at 10 % of the sites. Benthic fauna will be monitored once in 50 % of the lake sites. There will also be rotational sampling of phytoplankton in lakes: 2006 humic lakes; 2007 northern lakes; 2008 large lakes; and, between 2006-2008, annually 6 times a year in lakes with intensive biological monitoring. The intensive biological monitoring in lakes programme is a subset of surveillance monitoring.

In ICPRD's TNMN, 52 determinands are measured at 78 stations with a minimum sampling 12 times a year for physicochemical QEs, and twice per year for biology.

Spain intends to use a higher monitoring frequency than the WFD minima for the 1st RBMPs and will undertake surveillance monitoring every year. They have also defined optimal sampling periods for each QE.

Surveillance monitoring for the physicochemical quality elements and phytoplankton in rivers will be undertaken every year in Germany. Operational monitoring will be undertaken every, or every second, year for the physicochemical QEs; for the Priority Substances and other pollutants it will be every 3rd year. In Baden Württemberg, invertebrates will be sampled at more stations than other biological QEs. Surveillance monitoring frequencies are greater than required by the WFD (13 times a year for physicochemical parameters compared to 4 per annum in the WFD). This will continues every year for trend detection.

In the Slovak Republic biological quality elements will be monitored once per year, physicochemical QE's, 6 times per year, Priority Substances once to 6 times per year and others pollutants once to three times per year..

11. Key issue 10: Confidence and precision of monitoring results, assessments and classification

Risk, confidence and also precision are words used in Annex V (design of monitoring programmes). Their interpretation will affect the scale and extent of the monitoring required to assess status at any particular time and changes in status with time. What are considered to be "acceptable", "adequate" and "sufficient" levels of precision and confidence, and a "significant" risk, will determine aspects such as the:

- number of water bodies included in the various types of monitoring;
- number of stations that will be required to assess the status of each water body; and
- frequency at which parameters indicative of surface water quality elements will have to be monitored.

The level of acceptable risk will affect the amount of monitoring required to estimate a water body's status. In general terms, the lower the desired risk of misclassification, the more monitoring required to assess the status of a water body. Misclassification implies that measures to improve status could be inefficiently and inappropriately targeted.

Romania stated that a minimum frequency of 12 samples a year for 3 years gives sufficient precision and confidence in classification. The desired confidence and precision, is also likely to be different for different determinands (Poland). Finland used the guidance but found it difficult. Denmark also agreed that this was difficult to do. In the UK monitoring frequency is being derived from a classification tool. This will say 'x' times per 'z' years to give an 'acceptable' level of precision. In reality this usually means taking a large number of samples. The recommendation for coastal WBs is monthly sampling for 5 years to get acceptable levels of precision. However, it is hard to have absolute rules for everything.

Spain has its own guidance document on the selection of WBs and frequency to achieve adequate confidence and precisions based on statistical assessments of datasets from existing monitoring networks.

Poland is evaluating what monitoring approach should be taken. The network derived from the first approach network is probably too sparse and may not meet acceptable level of precision and confidence. The second approach considered the monitoring of aggregated water bodies as it cannot afford to monitor every water body.

In terms of the CIS guidance document, the UK has used it in association with its own guidance. Poland thought the guidance was poor. Sweden found it very useful to structure discussions leading to some level of common understanding. Ireland used both the Directive and guidance. The Netherlands suggested that there was a need for some guidance on how to report on confidence and precision.

12. Key issue 11: Identification of water bodies, and the monitoring and classification of very large (coastal) water bodies

The CIS guidance on the identification of water bodies states that:
"The main purpose of identifying "water bodies" is to enable the status to be accurately described and compared to environmental objectives".
"If water bodies are identified that do not permit an accurate description of the status of aquatic ecosystems, Member States will be unable to apply the Directive's objectives correctly".
"A discrete element of surface water should not contain significant elements of different status. A "water body" must be capable of being assigned to a single ecological status class with sufficient confidence and precision through the Directive's monitoring programmes".
"It will be necessary to balance the requirement to adequately describe water status with the need to avoid the fragmentation of surface waters into unmanageable numbers of water bodies".

Austria has found that ecological resolution is finer than that provided by the method used for the identification of WBs. Because it was not possible to have an unlimited division of WBs in Austria, there are now different ecological statuses within one WB. This is contrary to the CIS guidance. Austria asked how other MSs were dealing with this problem. Norway said it was having similar problems and would like other countries to put their national guidelines on a common Internet page. Austria offered to put their guidance on CIRCA.

The Spanish identification criteria for river water bodies included average flow >100 l/s, catchment area >10 km^2, >75 % of months with flow >0.

There are large water bodies in transitional and coastal waters and so spatial scale is important. In principle, very large waters will have more sites. "Allowable zones of effect" (AZEs) will be defined in areas of impact around, for example, point source discharges. These will often be incorporated into larger water bodies to prevent the creation of too many separate water bodies. It would be expected that good status would be achieved outside the AZE. Because of the size of the water body, pressures could be acting in combination, a threshold above which good status could not be achieved. It must be ensured that impacts from all industrial sectors are assessed at the same scale. The issue is how to classify on the basis of number of sites in very large water bodies: does the "one out all out" principle apply, or should an average of the classifications of the sites in the water body be taken. This is important because different methods lead to different classification results between countries, and results in some countries spending money on measures and others not. The answer probably is that the larger water body needs splitting into smaller ones because the data is telling you that the pressures are acting differently within the large water body (UK).

In the opinion of the Netherlands the one out all out principle should be applicable at the site level, or a separate water body should be made around the site. This is in the spirit of the Directive. If not, any signs of deterioration may not be detected whilst the WB as a whole is classified as good. The Netherlands also proposes to aggregate all samples from sites and hence there will be an average for a site.

Different pressures may cause different responses in the various quality elements and the classification may not be the same for all quality elements if more than one type of pressure is present (DK). In this case the one-out all-out principle applies.

It was suggested that there was a need for an operational definition of “allowable zones of effect” (NL): the Commission thought that this should be addressed at the MS level.

ANNEX A SUMMARY OF PLANNED MONITORING COMPILED FROM MEMBER STATES PRESENTATIONS AND RESPONSES GIVEN AT WORKSHOP

Country	Number of Water Bodies	Number of surveillance monitoring stations/ locations	Number of operational monitoring stations/ locations	Priority Substances (number of WB where priority substances are monitored)
Rivers				
Austria	~3000	31 Type 1 39 Type 2 5 type 3	2007-2009 WB > 100 km²: 101 in 2007/08 ~300 for hydro-morphology 2010-2012 WB > 10-100 km²:??	2007-2009 WB>100km²: appr. 90 2010-2012 WB>10-100km²: ??
Belgium	~520	~90	~370	?
Czech Rep.[4]	1070	96	Not fixed yet	
Cyprus	216	Not fixed yet[5]	Not fixed yet[5]	
Denmark[6]		500	500	5[7]
Estonia	728			
Finland	647[8]	147	not fixed yet	<10[9]
France	3500 (>100 km²)	1500	Not fixed yet[10]	≤41
Germany		300	6000	
Hungary	~1000	80 to 100	800 theoretically, but depends on budget	?
Ireland	4467	188	1177	Not yet fixed[11]
Latvia	262	33	189	
Lithuania	877	592	524	72
Netherlands	~300			
Poland	4510	1105 rivers (lakes, transitional and coastal waters not decided yet)	2437 In each water body at risk or potentially at risk	

[4] in the case of the Czech Republic reference sites are not included in surveillance monitoring, there is another programme for the monitoring of reference conditions where there are another ~300 sites from old system PERLA (1996 –2001) and we will add about 130 more sites (these are all reference sites or best available sites).

[5] To be decided through the on-going project "Development of Integrated Water Monitoring Programmes and Tools for cost – effective monitoring and assessment to support sustainability of water resources and the implementation of Water Framework Directive 2000/60/EC in Cyprus" which is funded through the 2004 E.U. Transition Facility

[6] 50 intensively monitored sites every year for all parameters; 800 (670 representative, 130 reference) sites extensively monitored every 3 or 6 years (biology, physical and chemical conditions); 200 sites monitored every 5 years for chemical conditions and nutrient transport.

[7] Heavy metals an hazardous substances

[8] Number or rivers – not reported water bodies in Article 5 report. The number of water bodies will be decided later.

[9] Priority substances in surveillance monitoring. The priority substances in operational monitoring will be decided later.

[10] In 2008-2009, the first management plan will assign environmental objectives to each water body. Operational monitoring will apply only to water bodies for which extensions of deadlines (good status or good potential in 2021 or 2027) or less stringent environmental objectives will be fixed. Consequently, the network of operational monitoring sites can only be completed in 2008-2009.

[11] We are not yet in a position to give data for PS and await outcome of screening studies

Country	Number of Water Bodies	Number of surveillance monitoring stations/ locations	Number of operational monitoring stations/ locations	Priority Substances (number of WB where priority substances are monitored)
Romania	3795[12]	991[13] 461	403[14]	[15]
Slovak Rep.	403	214	101	
Slovenia	136	19 plus 2 reference stations[16]	Under discussion	All
Spain	Nearly 4000	~500[17]	454 WBs are going to be controlled by operational monitoring. 2567 WBs are in study to evaluate their risk	
Sweden[18]	~7700[19]	National, between150 and 350 Regional ~500	~3500	~140
UK[20]	8250	822	4740	Work underway
Lakes				
Austria	64	~13	1	
Belgium	29	±29	17	0
Czech Rep.	71	~25	Not fixed yet	
Cyprus	18	Not fixed yet [5]	Not fixed yet [5]	
Denmark	1100[21]	370	730	23[22]
Estonia	72			
Finland	4600[23]	245	not fixed yet	<10[9]
France	500	250	Not fixed yet[10]	≤41
Germany		25	500	
Hungary	200	20 to 30	100 theoretically	
Ireland	745	73	214	Not yet fixed[11]
Latvia	207	30	177	
Lithuania	289	198	125	

[12] Includes lakes and temporary (non permanent) river WBs; a new reassessment and final characterisation of WBs will be done in 2006-2008;

[13] Total number of river monitoring stations, includes: surveillance, operational, reference sites and other sites for different programmes (surface water abstraction, vulnerable zones, fish life, habitat and species, international conventions)

[14] Some of these stations are also surveillance stations (will remain permanent after complying with the environmental objectives)

[15] For reporting to different directives Romania will need to monitor (firstly a screening) about 200 substances. Maybe some of them are and will be not detected. From these 200 substances only 60 to 70 can be analysed (because of lack of equipment and methods).

[16] For chemical elements, for biological elements still under discussion

[17] Provisional data

[18] Not fixed yet

[19] Those 7700 are 7700 clustered WBs in the Article 5 report, in Sweden we have at least 560 000 km of rivers

[20] For all water categories UK monitoring locations/numbers not yet agreed and subject to change.

[21] 23 lakes >5 ha intensively monitored for all parameters every year; 204 lakes >5 ha extensively monitored every 3 years, 870 lakes between 0.1 and 5 ha extensively monitored every 6 years

[22] Lakes >5ha every year for heavy metals and hazardous substances

[23] Numbers of lakes > 0.5 km^2 - not reported water bodies in Article 5 report. The number of water bodies will be decided later

Country	Number of Water Bodies	Number of surveillance monitoring stations/ locations	Number of operational monitoring stations/ locations	Priority Substances (number of WB where priority substances are monitored)
Netherlands	~500			
Poland	1041	>250	Not fixed yet	
Slovak Rep.	111[24]			
Slovenia	12	Under discussion	Under discussion	
Spain	>200	Not fixed yet	Not fixed yet	
Sweden[18]	~3900[25]	National, between 600 and 2000, Regional ~600	~4300	~200
UK	465	79	190	Work underway
Transitional waters				
Belgium	11	6	11	3
Finland	?	?	?	
France	92	39	Not fixed yet[10]	39
Germany		5	5	
Ireland	196	25	57	Not yet fixed[11]
Latvia	1	9	1	
Lithuania	3		20	9
Netherlands	~10			
Poland	9	Not fixed yet		
Spain	>100	Under study	Under study	
Sweden[18]	19	Not fixed yet	~20	~7
UK	191	34	43	
Coastal waters				
Belgium	1 (2)	?	?	?
Cyprus	25	Not fixed yet [5]	Not fixed yet [5]	
Denmark	34[26]			
Estonia	15			
Finland	?	154	Not fixed yet	?
France	121	65	Not fixed yet[10]	65
Germany		30	50	
Ireland	113	12	23	Not yet fixed[11]
Latvia	6	12	4	
Lithuania	2		15	4
Netherlands	~10			
Poland	11	Not fixed yet	Not fixed yet	
Slovenia	6	1	Under discussion	
Spain	>200	Under study	Under study	
Sweden[18]	~570	~200	~700	~100
UK	576	62	131	?
Totals				
Netherlands	~800	100	500	

[24] All lakes <0.5 km^2

[25] Those 3000 are 3000 clustered WBs in the Article 5 report: in Sweden there are >10000 lakes bigger than 1 ha

[26] Monitored intensively (all parameters every year); 30 of these include hazardous substances. 845 soft bottom fauna sites

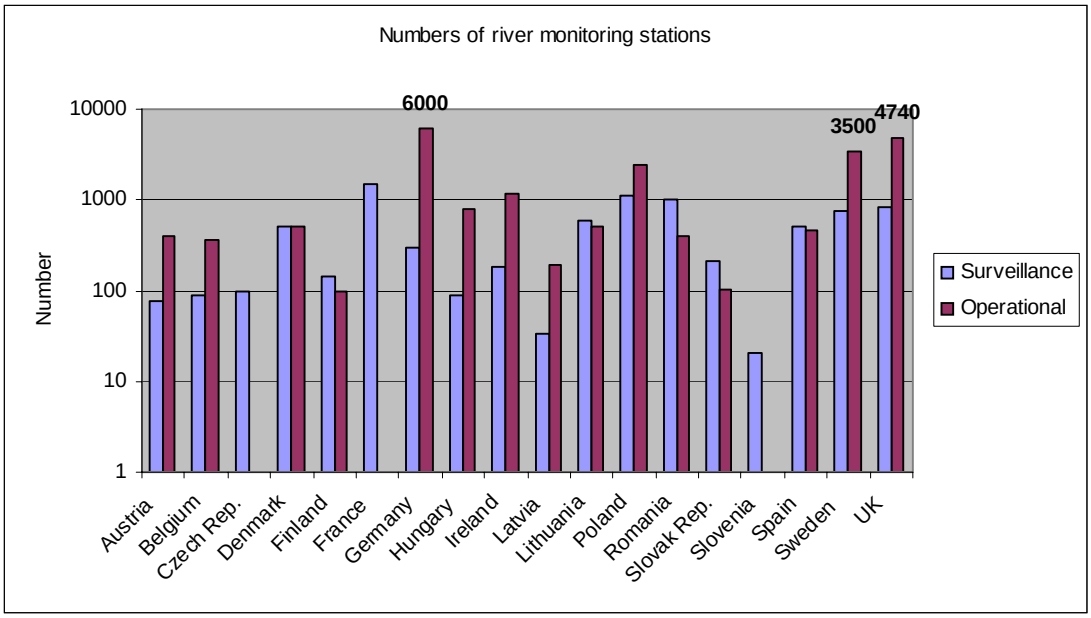
Country	Number of Water Bodies	Number of surveillance monitoring stations/ locations	Number of operational monitoring stations/ locations	Priority Substances (number of WB where priority substances are monitored)
Romania[27]	3756[28]			

[27] Final characterisation of WBs will be made by 2006-2008

[28] Surface waters (rivers, lakes, transitional and coastal waters and non-permanent WBs). About 200 reference sites (rivers and lakes (30))

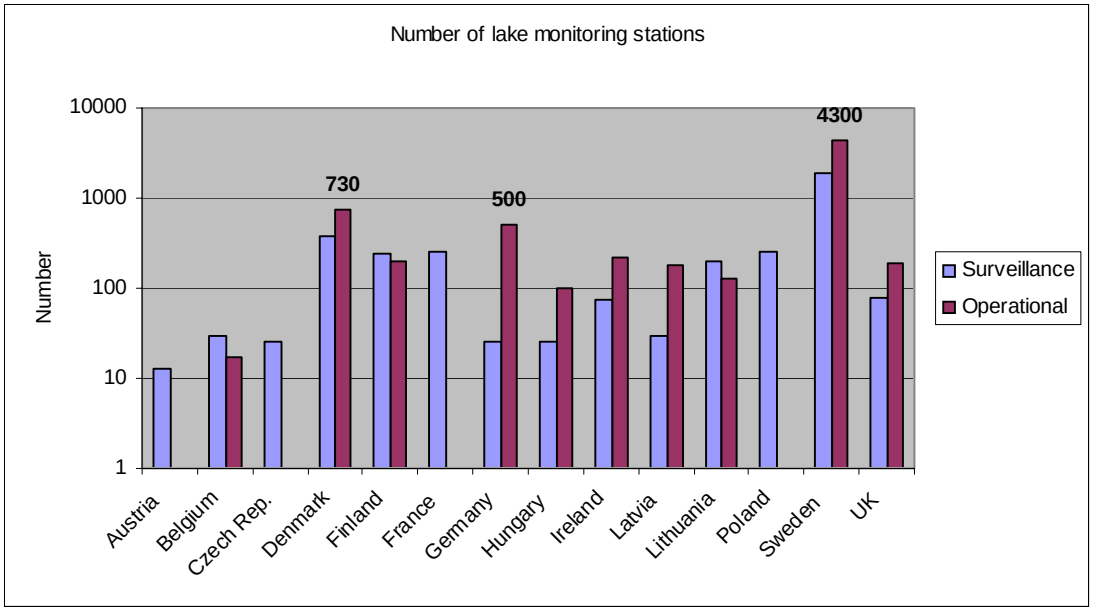
ANNEX B FIGURES SUMMARISING PRELIMINARY MONITORING NETWORKS FOR RIVERS AND LAKES

Figure 1



Note: Logarithmic scale on 'y'-axis

Figure 2



Note: Logarithmic scale on 'y'-axis

Figure 3

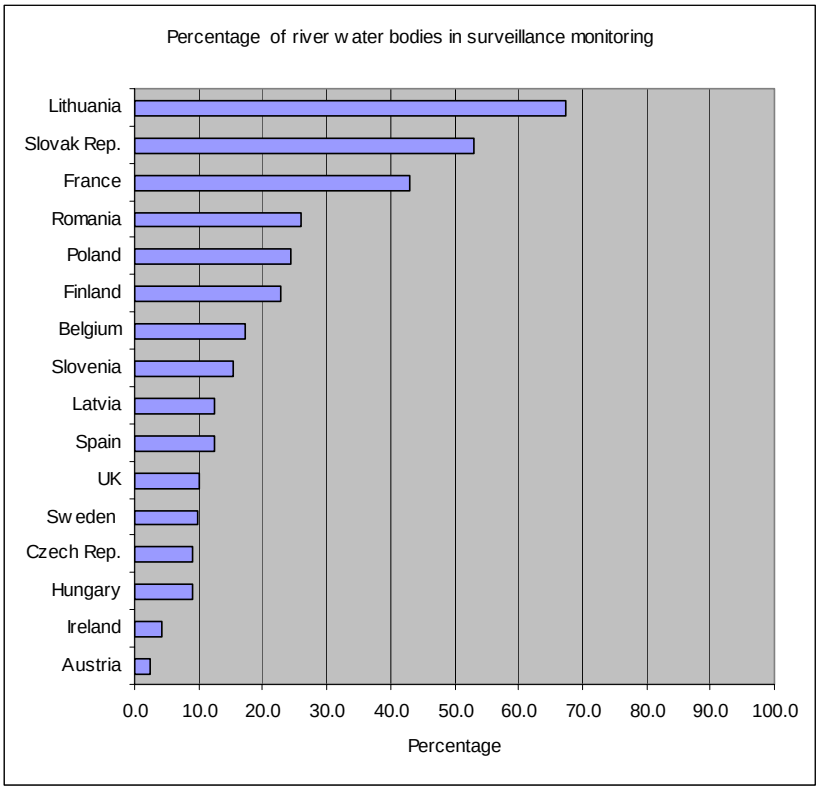
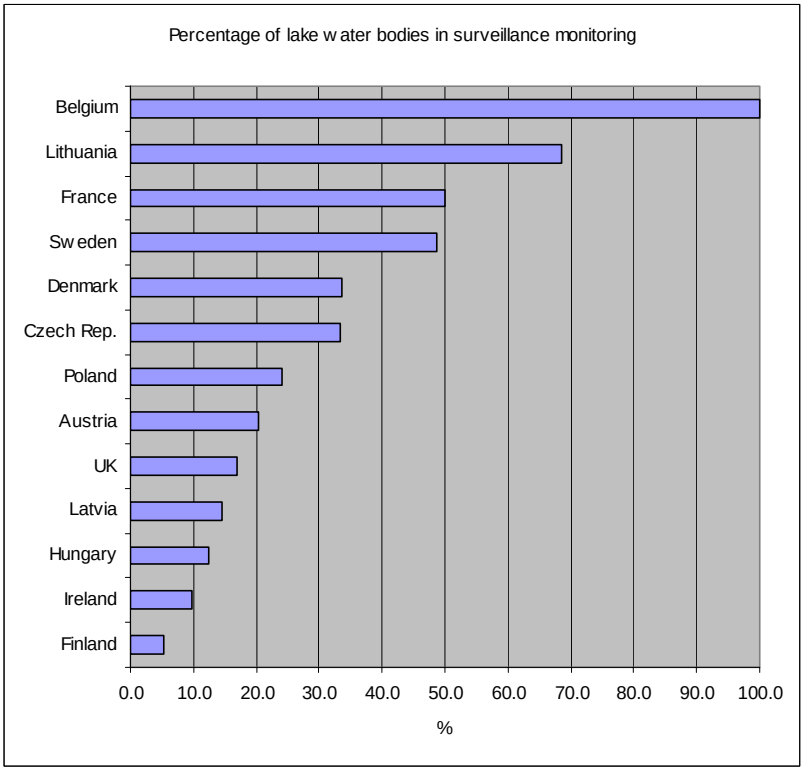


Figure 4



Note: It is assumed in Figures 3 and 4 that there is one monitoring station per water body. This may not be the case in some countries.

Figure 5

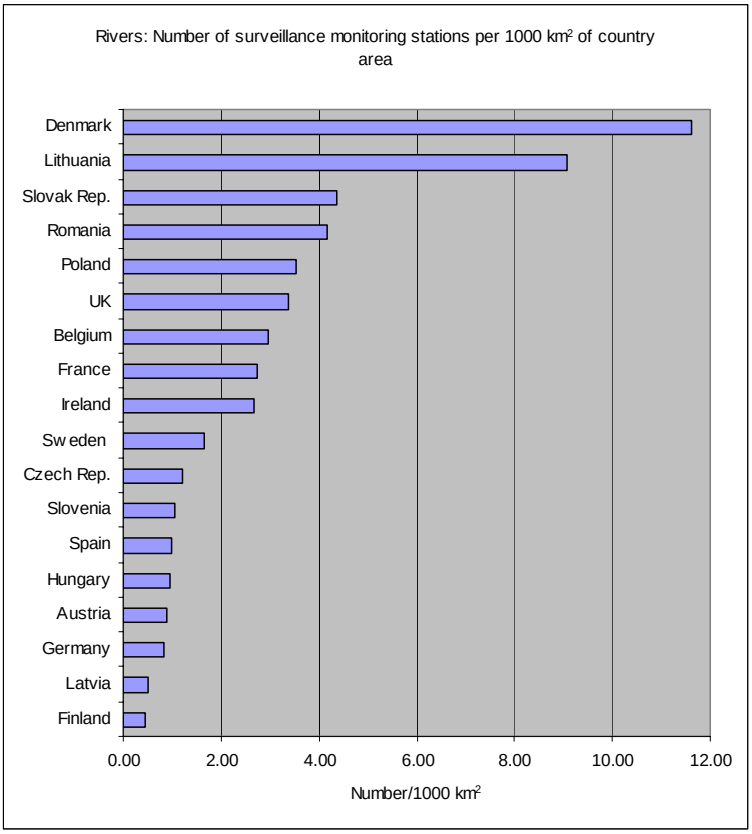


Figure 6

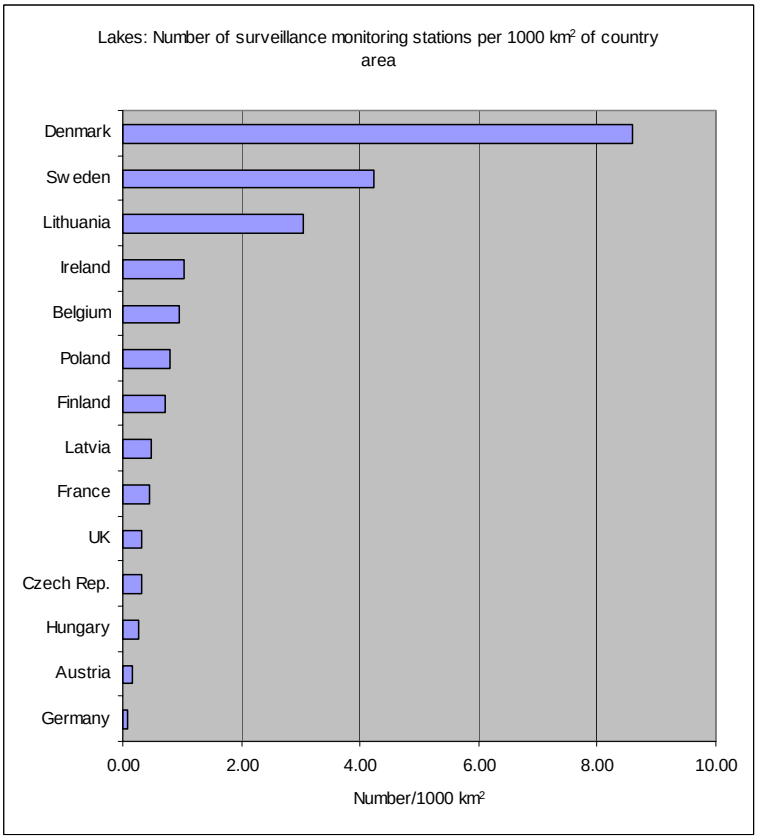


Figure 7

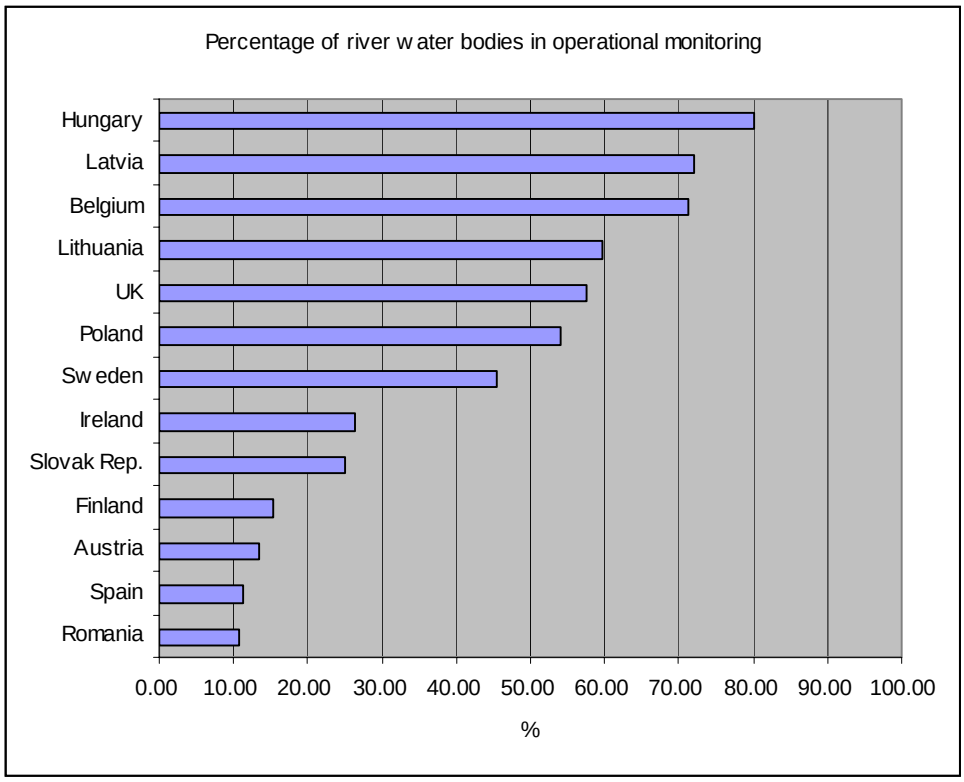
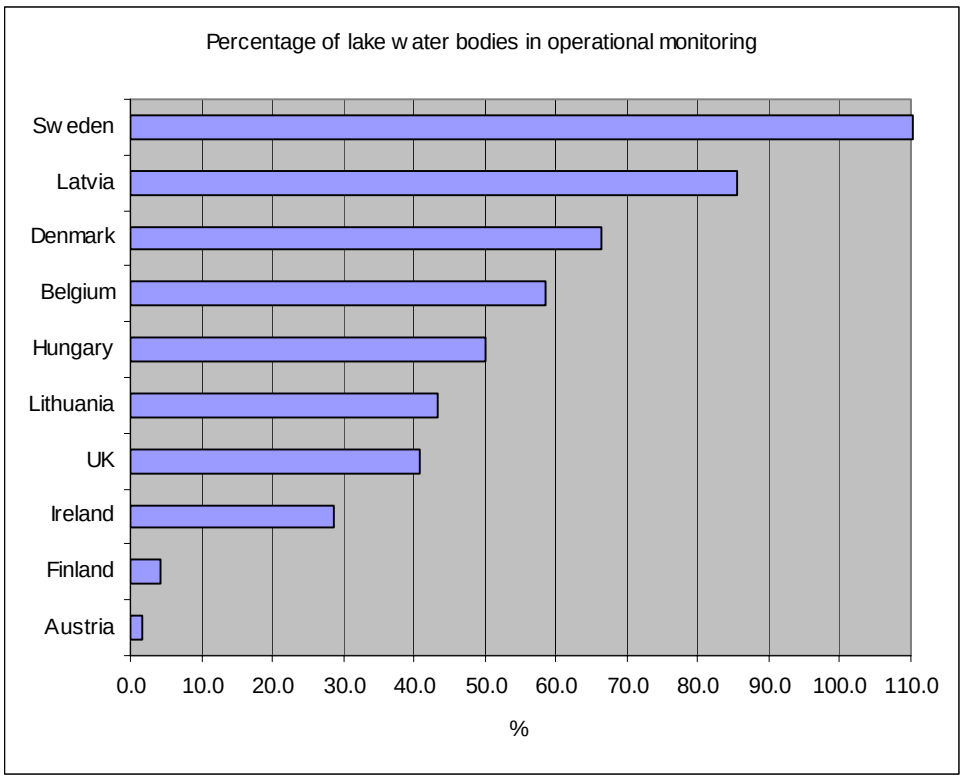


Figure 8



Note: It is assumed in Figures 7 and 8 that there is one monitoring station per water body. This may not be the case in some countries, as is demonstrated by Sweden where there are more stations than lake water bodies.