



Content related SoE review

Background document for 2014 Freshwater Eionet Workshop,

- Developing an efficient and sustainable way forward on
the Eionet water data flows: Review of water data flows
and data handling processes -**

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Prepared by / compiled by:

Sandra Richter (UFZ), Peter Kristensen (EEA), Beate Werner (EEA), Anita Künitzer
(UFZ), Kari Austnes + Anne Lyche Solheim (NIVA)

Hana Prchalova (CENIA), Bo Jacobsen (EEA) (Annex 1)

Evangelos Baltas, George Karavokiros, Dimitrios Panagos, Alexandros Psomas,
Bariamis George, Maria Mimikou (NTUA), Nihat Zal (EEA) (Annex 2).

EEA project manager: Wouter Vanneuville

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1 Introduction

A review of the WISE SoE databases will be performed from second half of 2014 onwards. The activity will focus on the established data flows to ensure both State of Environment (SoE) priority data flows and established data flows of the WFD and other Water Directives to be updated in a more converged way in the mid and long term.

Aims of this content related review of SoE data flows are to:

- Ensure EEA assessments to be carried out during 2016 – 2018.
- Ensure a stable and well defined reporting of “high priority” parameters for EEA uses (European, pan-European and regional integrated environmental data and indicator sets, assessments and thematic analyses);
- Improve integrated assessments with Water Framework Directive and other Water Directives;
- Reduce reporting burdens for Member States.

2 EEA water assessments

The European Environment Agency (EEA) has the mandate to produce objective, reliable and comparable information to allow the Commission, member countries and the general public to judge the effectiveness of policy and the needs for policy development. This comprises straight forward State of Environment assessments using indicators such like the EEA Core Set Indicators (CSI) and other more specific indicators to assess the state of, and trends in, the water environment.

At the core of any water related State of Environment (SoE) assessment is to quantify and identify the current state of, and impacts on, water environment - how these are changing in time and whether the measures taken at different levels are effective.

Such an assessment should:

- a. provide the basis for identification and assessment of environmental problems and the dominant threats at regional and European levels;
- b. provide information necessary to enable actions/policies to be taken to improve the environmental state of the water bodies and to ensure sustainable development.
- c. be based at the most relevant time and space scales to meet the two objectives stated above

At European, regional, national and on river basins level the following generic questions could be asked:

State of waters	How is it? (Nutrients, pesticides, heavy metals, ecological quality.....) How much is there? (Runoff, availability, water stress.....)
Time trends	Getting better or worse? Within or outside agreed limits? Responding to measures or to other factors?
Pressures on the environment - what is causing the problem?	Water abstraction and use Water pollution Threats by sectors (Human – domestic; Industrial; Agricultural) Climate change and natural factors
State of action on policies	Which measures are taken on national/regional level? Are they working towards targets?

A comprehensive picture addressing these questions on European, national or regional level, RBD or sub-basin level, needs a considerable amount of information to be aggregated to the right level for the purpose. Monitoring and assessment of the environmental state of European waters are performed by numerous regional and national authorities. The results from the national monitoring programmes and the monitoring at RBD level to be performed in relation to the WFD is the most important source of information to get an overview of the status of Europe’s water and pressures affecting the water bodies.

2.1 EEA assessments of state of Europe’s waters during 2016-2018

The next “big” EEA assessments of state of Europe’s water will be prepared in the period from the reporting in 2016 until its publication in 2018 and should cover a comprehensive range of water related aspects, such as:

- Overall freshwater quality (overall status, ecological status, conservation status of freshwater habitats and species);
- Water pollution and quality (e.g. nutrients in groundwater, rivers and lakes and transitional water bodies; chemical status, pollution sources and emissions);
- Water and health (Bathing water quality, drinking water quality, hazardous substances related to health);
- Water resources focus on water scarcity and drought (Water Exploitation Index, water abstraction by sectors, water accounts, water efficiency)
- Floods and water related disasters
- Climate change impacts on water and water adaptation measures
- Hydromorphological /structural activities (e.g. hydropower, navigation, number of barriers in rivers, straightened rivers).

Other activities, closely related with the implementation of the WFD and the reporting requirements from Article 18, are

- Assessments of progress from 1st to 2nd RBMP
 - improvement in status;
 - reduction in pressures;
 - effect of measures
- provide a clear and focused report on WFD implementation in 2018
- update and improvement of status and pressure information
- better integration of WISE-WFD; other Directives and WISE-SoE information

To ensure that these various assessments and analyzes can be carried out, it is necessary to make the best possible use of the big amount of data and information from the different European reporting flows on water.

2.2 EEA water assessments based on data and information from national activities

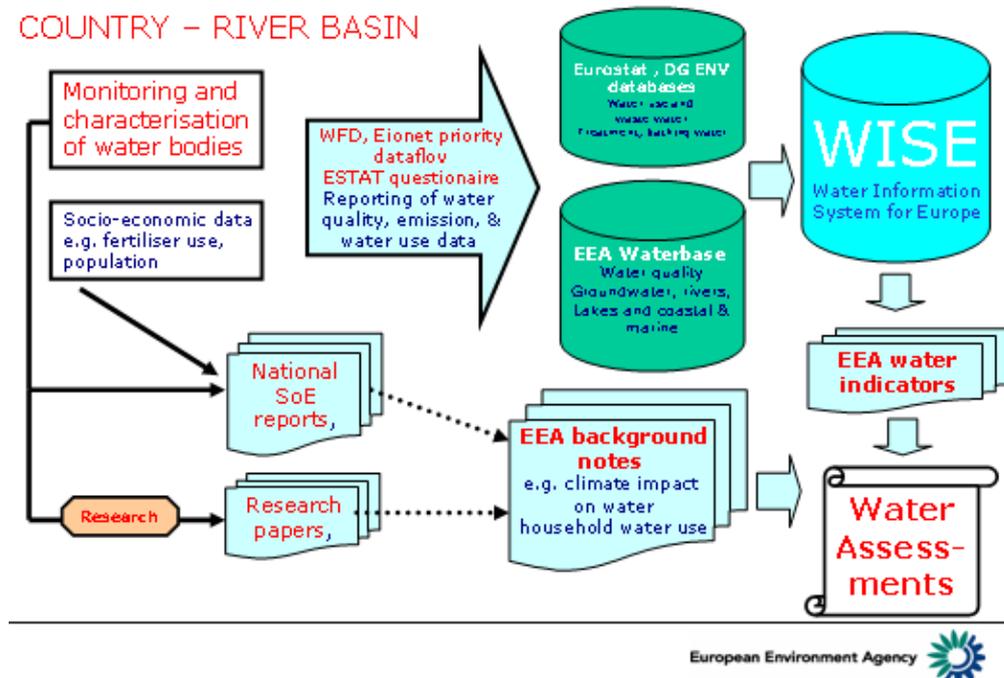
The data and information EEA needs for its State of Environment (SOE) assessments of Europe's waters are generated via national monitoring networks set up for national or EU level purposes, such as the monitoring activities established in relation to the WFD (Article 8). Up to now countries have been reporting data via different channels such as

- EEA priority data flows,
- Obligatory reporting in relation to EU Directives including WFD; and
- via the OECD/Eurostat Joint Questionnaire on the State of the Environment.

These data are stored in databases and communicated via WISE. The quality of the EEA's assessments relies on the quality of the Member States' reports and data delivery.

Error! Reference source not found. provides a conceptual overview of the current information flow for EEA assessments. Data and information are generated at local, river basin and country level and aggregated to EEA overviews of the state of Europe's water. In many cases, EEA uses information and assessments from national state of the environment reports and research projects as important input to complete and validate European assessments.

Figure 1: Conceptual overview of the current information flow for EEA water assessments.



2.3 Eionet priority data flows

The EEA Eionet priority data flows identifies a set of agreed, stable, well-defined objectives to provide a focus for countries when they are putting procedures in place for regular reporting.

The European Environment Agency (EEA) holds inland data sets reported voluntarily by EEA member countries (water quality in groundwater, rivers, lakes; biology in rivers and lakes; emissions of pollutants and water quantity).

2.3.1 Water (rivers, lakes, and groundwater) quality data

EEA holds water quality data, reported voluntarily by EEA member countries each year. These data reflect a sub-set of national sampling. Data are transferred regularly on an annual basis from the countries to the EEA using electronic reporting and quality assurance tools, and are stored in the Agency's 'Waterbase'¹.

The current Waterbase contains a vast amount of water quality information covering more than 10000 river stations in 37 countries, 3500 lake stations in 35 countries, 5000 coastal stations in 28 countries, and around 1500 groundwater bodies. For rivers EEA has around 1000-1500 time series (dependent on the pollutant) covering the last 20 years 1992 to 2012 (and some longer time series and many shorter).

¹ Waterbase is the generic name given to the EEA's databases on the status and quality of Europe's rivers, lakes, groundwater bodies and transitional, coastal and marine waters, and on the emissions to and on quantity of Europe's water resources.

On water quality EEA in general collects aggregated annual statistics (number of samples, mean, median, etc.) from countries; however, on hazardous substances and groundwater, data on sampling dates and different depth of groundwater is also reported.

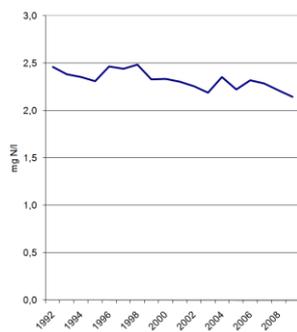
All the databases (e.g. rivers, lakes, and groundwater) are available for download here. http://www.eea.europa.eu/data-and-maps/data#c11=water&c17=&c5=all&c0=5&b_start=0.

2.3.2 EEAs use of water quality data

The data in Waterbases are the basis for EEAs water quality indicators and the WISE interactive maps to provide European overviews. The specific data used in the indicators are also available for viewing and download separately.

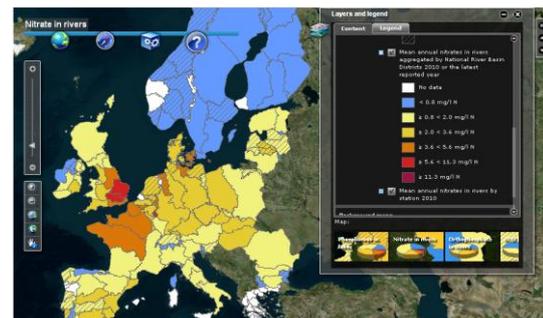
The graph below illustrates the overall trend in nitrate in European rivers (based on 1200 consistent time series). The interactive map presents on European scale aggregated statistics (e.g. average concentration per river basin district – but by zooming, information from single stations can viewed – see maps below; interactive biology maps, e.g. macroinvertebrates in rivers. These maps are displaying both single stations and columns showing the distribution of status classes in each country. (<http://www.eea.europa.eu/themes/water/interactive/biological-water-quality-in-rivers>).

Nitrate trend in European rivers

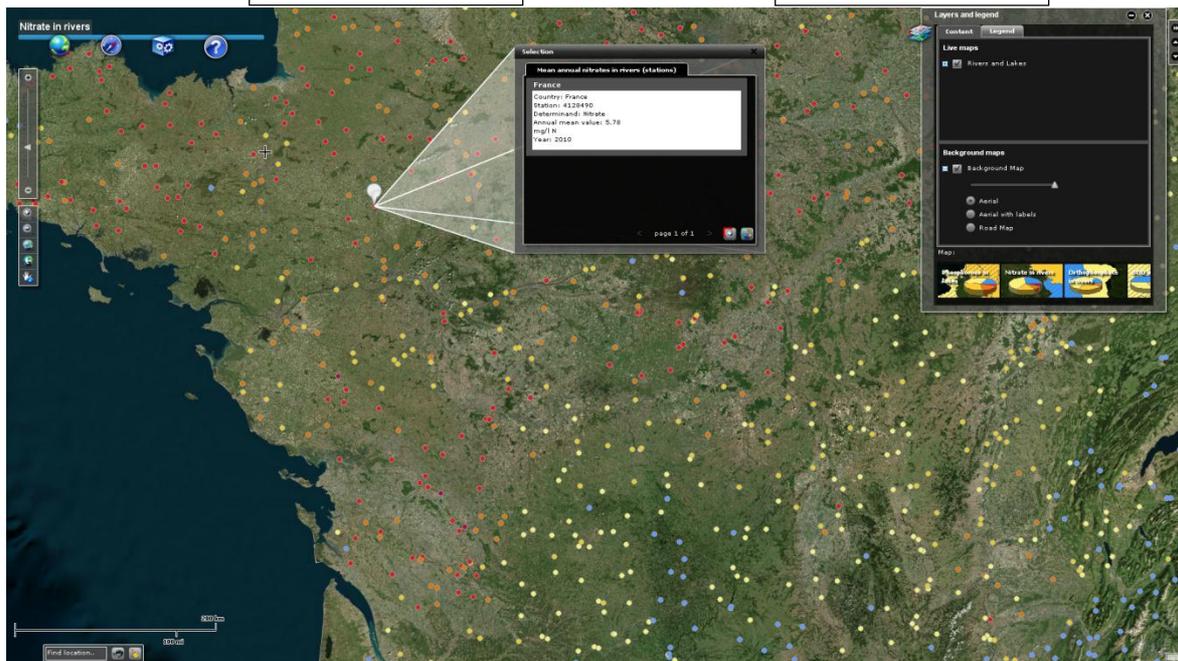


Based on 1200 river time series

Nitrate in River Basin Districts



Based on 10 000 river stations



2.3.3 Water quantity and emissions to water

Eionet Water also includes data on emissions and loads to all water categories (Waterbase – Emissions to water), and a methodology for producing comparable information on Europe's water resources (Waterbase - Water Quantity).

Data on emissions are collected annually through the WISE-SoE Reporting process. Following the test data request in 2008, data on emissions to water are requested as regular data flow from 2009 onwards. The information reported will be used in the assessments of pressures from diffuse and point sources on Europe's waters.

Data on freshwater resources availability, abstraction and use at regional spatial scale are collected annually through the WISE-SoE annual data flow. These data are primarily used to formulate indicators (associated with the EEA's Core Set Indicators) and assess the state and trends of the water resources and associated pressures, and monitor the progress with European policy objectives.

The databases on emissions and water quantity are available for download here: http://www.eea.europa.eu/data-and-maps/data#c11=water&c17=&c5=all&c0=5&b_start=0.

3 Streamlining of WISE SoE and Water Directive data requests

3.1 WISE Water data centre

The European Environment Agency (EEA) holds inland data sets reported either voluntarily by EEA member countries (water quality in groundwater, rivers, lakes; emissions of pollutants and water quantity); and data reported via EU water directives: Water Framework Directive; Bathing Water Directives; Urban Waste Water Treatment Directive, Nitrate Directive and Drinking water Directive (NiD and DWD data not yet available at EEA water data centre home page).

The first reporting of the River Basin Management Plans (RBMPs) under the Water Framework Directive (WFD) was due at the end of 2009. In addition to the RBMPs, Member States have reported a comprehensive set of data related to the results of the RBMPs (such as ecological status for each individual water body or significant pressures affecting a water body) to the Water Information System for Europe (WISE). The EEA has a central role in the management of WISE due to the Agency's role as the EU data centre for water.

3.2 Streamlining SoE with WFD reporting

The first reporting of the RBMPs under the WFD was due at the end of 2009. Member States reported their RBMPs and delivered an enormous amount of data on status, pressures and measures to the Water Information System for Europe (WISE) WFD database. The EEA 2012 water assessments were based on an assessment by the EEA of the RBMPs and data reported by Member States. The information in the RBMPs, together with other related sources of information, has been analysed to establish an assessment of the status of and pressures affecting Europe's waters. This work by the EEA reflects the cooperation with the Commission on the assessment of implementation of the WFD as laid out in Article 18 of the WFD according to which:

'The EU Commission shall publish a report on the implementation of this Directive at the latest 12 years after the date of entry into force of this Directive (two years after the Member States have delivered the RBMPs). The report shall among others include the following:

- *a review of progress in the implementation of the Directive;*
- *a review of the status of surface water and groundwater in the Community undertaken in coordination with the European Environment Agency.'*

In the EEA's opinion, the results in the EEA 2012 water reports present good and robust European overviews of the data reported by the first RBMPs and the ecological status and pressures affecting Europe's waters. Caution is advised for country and RBD comparisons, as the results may be affected by the methodology approach used by the individual Member State.

In 2018 the next report on the implementation of the WFD has to be provided. To improve the possibility of supporting WFD assessments with SoE data, EEA starts together with ETC a new attempt now to align WFD and SoE reporting.

The aim behind the better integration of SoE and WFD data therefore is to

- **Reduce the reporting efforts for Member States and to**
- **Improve the means for integrated assessments to be carried out in 2018.**

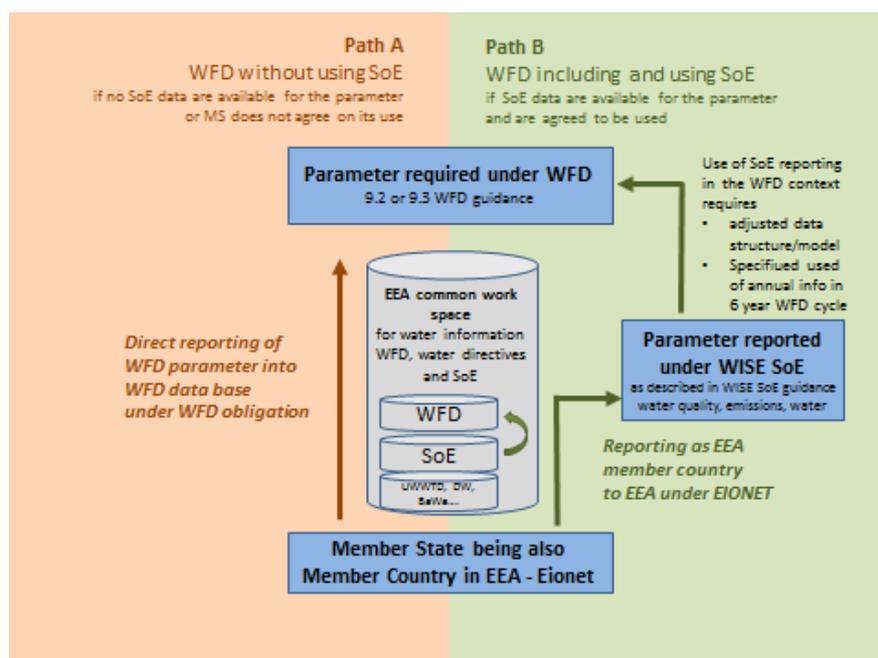
3.2.1 Reduce the reporting efforts for EU Member States: SoE Emissions and Water Quantity

The first WFD reporting guidance prepared for the River Basin Management Plans 2009/2010 included already some references to the EEA data flows. In 2007/2008 the SoE reporting guidance were developed together with NRCs to align the information more with the WFD reporting and to enable common assessments. A common coding was at that time in the centre of interest. The new WFD reporting guidance for the 2nd reporting now includes significantly more references to SoE reporting in different chapters.

Next to further references in the area of monitoring stations as described in section 3.2.2 the information on emissions to water and water quantity can provide most synergies between the two reporting streams in the way that SoE reported information could be used to fulfill requirements, which have now been set up as WFD requirements.

This is the information required in the WFD guidance chapters 9.2 “Inputs of pollutants to surface waters (and groundwaters), including inventories of emissions, discharges and losses of EQSD Annex I substances” and 9.3 “Water abstractions and exploitation of water resources”. Those WFD requirements could be provided by reporting of SoE Emissions and SoE Water Quantity. The practical process for this is described in Figure 2. Therefore adjustments to SoE Emissions and Water Quantity reporting are necessary to facilitate this synergy (overview of proposed changes in reporting for these reporting flows see Annex 1 and 2).

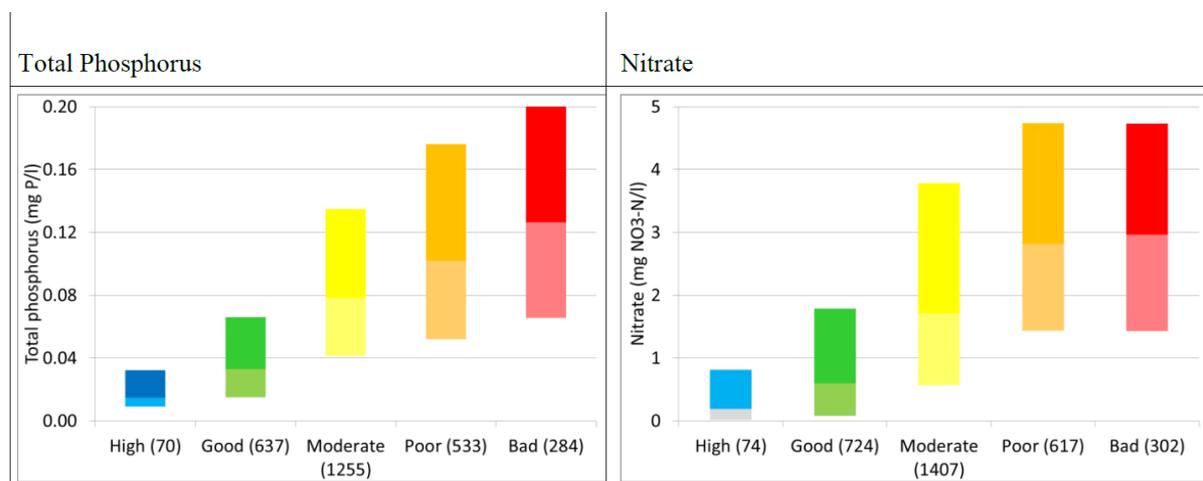
Figure 2: Practical process of using already reported SoE Emissions and Water Quantity information in the context of the WFD



3.2.2 Improve the means for integrated assessments to be carried out in 2018.

Other important linkages between WFD and SoE reporting are given in chapter 4 of the reporting guidance on monitoring. The information reported by EEA Countries can only be interpreted reasonably when streamlined with the WFD reporting. Combining water quality results with information on ecological status and potential (example see Figure 3), as foreseen in the WFD reporting guidance, are only possible if the WFD water body is linked with SoE stations which provide long time series on relevant determinants.

Figure 3: Rivers: Concentration range (1st quartile, median and 3rd quartile) of annual average nutrient concentrations in river water bodies in different classes of ecological status or potential (high to bad)

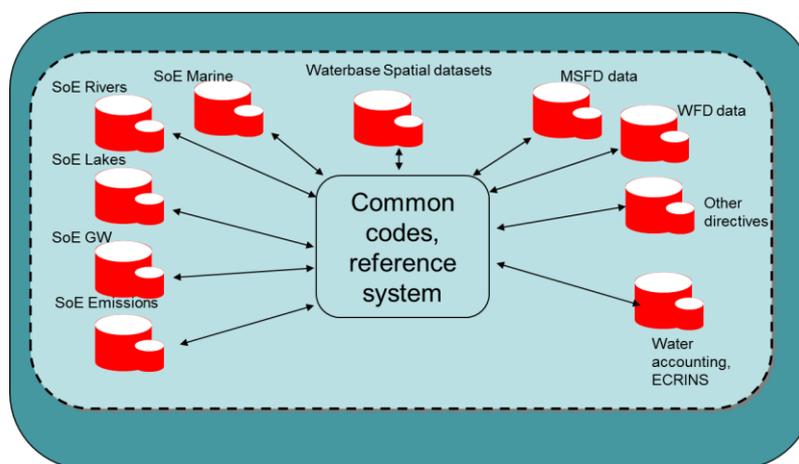


Most Member States already report water quality monitoring results from most of their surface water and groundwater surveillance monitoring stations via EEA’s EIONET priority data flows (WISE-SoE) to EEAs Waterbases. The result from Eionet water monitoring stations can be a common basis for the assessment of status of and pressures affecting the surface water and groundwater in Europe. For this purpose reporting from more WFD monitoring stations, e.g. from operational stations, to EEAs Waterbases would be very valuable.

The information already reported by EEA member countries including EU Member States can only be interpreted reasonably when streamlined with the WFD reporting, i.e. when clearly related to the WFD water body they are placed in or the water bodies they would represent.

During this year a list of common monitoring stations between WFD and WISE SoE reporting flows shall be prepared. In addition, a reference list of all WFD Water body codes will be established helping in insuring consistency between the different water related directives (WFD, NiD, UWWT, Bathing Water) and WISE SoE (see Figure 4).

Figure 4: Reference system for water related directives and all WISE SoE reporting streams



The information provided by the Member States will be used by the Commission, among others, to *assess* the implementation of the requirements of the WFD in the different Member States and to *assess* the improvements in the state of the water environment that have been achieved also as a means of policy effectiveness on EU level. The WFD reporting guidance contains different subchapters “Products from Reporting”. Among others, products from WFD reporting will be:

- Overview on the significant pressures and impacts on surface water bodies and groundwater bodies;
- Assessments of
 - ecological and chemical status of surface water bodies
 - quantitative and chemical status of groundwater bodies;
- Trends of relevant determinants supporting ecological status assessments (such as nitrate);
- Significant inputs of pollutants from diffuse and point sources and trends in total inputs;
- Water exploitation index (WEI+), water scarcity;
- Percentage of water bodies failing objectives due to different pressures.

It is very important to point out here, that compliance checking is only one part of this assessment and to follow the letter of the directive needs only a certain amount and type of information. A large part of the information in particular at the interface of pressures and impacts gives information about the policy effectiveness and uptake of measures (also at European level) outside the environmental acquis e.g. in agriculture, energy, transport, and thus on policy effectiveness in a wider perspective.

The annual reporting from the different SoE reporting streams can significantly contribute to these assessments (examples see Table 1). The possible support is depending on a number of factors, such as the level (scale) of reporting (water body level, sub-unit level, RBD level); availability of relevant determinants; and possibility to link SoE station information with WFD water bodies.

Table 1: Examples for WFD assessments and data flows from WFD and SoE reporting

Assessment	from WFD reporting	from SoE reporting
Ecological status of surface water bodies	Ecological status classes per water body (overall status, as well as BQE specific status)	Annual values (concentrations) per station; Time series since 1992; EQR values per station
Trends of relevant determinants supporting ecological status assessments (such as total ammonium, phosphorus, nitrate)		Annual values (concentrations) per station; Time series since 1992; EQR values per station for selected BQEs (macroinvertebrates, phytobenthos, phytoplankton, macrophytes) and specific impacts (e.g. eutrophication, hydromorphology, acidification)
		Trends assessments are possible with SoE data.
		<u>Support assessments with SoE data:</u>
		- Interpret current ecological status and pressure reporting (WFD) with respect to

		<p>previous pollution history (SoE), e.g.</p> <ul style="list-style-type: none"> - <i>Water quality time series (SoE) have flattened out – additional improvements of ecological status (WFD) requires new measures</i> - <i>Poor BQE status (WFD), but acceptable water quality (SoE) can indicate delay in biological recovery or HyMo pressures affecting the BQEs (WFD and SoE)</i> - <i>Reported pressure reduction from the 1st to the 2nd reporting cycle (WFD) should be visible in the SoE time series</i> - <i>Coupling BQE status (WFD) with SoE Biology EQRs specific for the same BQEs: Has there been improvement of EQRs within the status classes?</i> <p><i>Coupling of QE status with SoE water quality – which determinants are the best indicators for status of different QEs?</i></p> <ul style="list-style-type: none"> - <i>SoE can be used for QA – are the status and pressures results reported in the WFD reasonable given the past and present water quality?</i> - <i>SoE time series fill the gaps between WFD reportings</i> <p><i>(SoE Rivers and lakes: Nutrients, organic matter and other physico-chemical elements; Biology)</i></p>
Chemical status of surface water bodies	Chemical status classes per water body; Priority substances causing failure	<p>Annual values (if reported from MS) for priority substances and supportive determinants per station</p> <p><u>Supporting assessments with SoE data</u> Additional assessments may include analyses of certain pollutants/ of trends for certain pollutants.</p> <p><i>(SoE Rivers and lakes: Hazardous substances)</i></p>
Significant inputs of pollutants from diffuse and point sources and trends in total inputs at sub-unit or RBD level	<p>Significant inputs of pollutants from diffuse and point sources; trend assessment</p> <p>(Information can be provided under SoE reporting in the future)</p>	<p><u>Supporting assessments with SoE data</u> More detailed source apportionment (not only from point and diffuse sources); Partly better trend information available (annual values are aimed for in SoE reporting)</p> <p><i>(SoE Emissions)</i></p>

Water scarcity and pressures	For those RBDs where water abstraction is considered a significant pressure: WEI+, consumptive water use, support parameters	More detailed information on water abstraction and water use in temporal and spatial scale, as well as streamflow data allowing the identification of trends (e.g. overexploitation) in between the WFD reporting periods. (SoE Water Quantity)
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3.2.3 Streamlining SoE and other Water Directive dataflows

There are numerous sources for information on water: The WISE SoE priority dataflows; Data/information from WFD and other Water Directives; Data/information from modelling or other.

One example for different sources of information is the different reporting flows related to nitrate in groundwater (see Table 2). Information is available from WFD reporting, from WISE SoE Groundwater as well as from the Nitrate Directive. All reporting flows include information on nitrate in groundwater, but on different levels, with different policy relevance, temporal and spatial coverage etc. So for example the Nitrate Directive data flow is in 3 years period, WFD reporting in 6 years period, whereas SoE data flow is annually and therefore enables best preparing of time series. WFD reporting may have the best spatial coverage because all groundwater bodies in the EU Member States plus Norway are covered while SoE reporting is voluntary and the Nitrate Directive covers 33500 stations in the EU Member States.

Table 2: Reporting flows related to nitrate in groundwater

Reporting flow	Policy relevance	Temporal coverage	Trend assessments	Spatial coverage	Spatial assessments	Country comparison	Linked to pressure	Linked to measures
WISE-WFD RBMPs	Objective of having all groundwater bodies in good chemical status	Every six year 1 st and 2 nd RBMPs	*	EU MS +Norway All groundwater bodies	***	**	**	**
WISE-SOE Groundwater	Assessment of state of groundwater	Annually, time series 1992-2012	***	EEA member countries 24 200 stations	**	**	*	*
Nitrate Directive	Aims to reduce water pollution caused by nitrates from agricultural sources	Three years periods e.g. 2008-2011	*	EU Member States 33 500 stations	**	**	**	**

The aim is to get the greatest benefit of the different reporting flows including available supporting information, e.g. on measures to reduce diffuse pollution, and to ensure that they contribute to the 2016/18 assessments.

3.3 *Review of WISE SoE reporting*

During the process of review of WISE SoE data bases the following issues have to be clarified:

- How it is ensured that all SoE reporting flows on water can contribute to 2016/18 assessments?
- Are the different data requests fit for purpose and what has to be coordinated between them?
- Do we need further adjustments to the WISE-SOE dataflow (see below)?
- And what does that mean for the update of reporting sheets and data dictionary?
- What is missing in the data bases, what can be removed?

Proposed adjustments in SoE reporting:

- Adjustments in the WISE-SoE dataflow are necessary especially in reporting streams on Emissions and Water Quantity to streamline these reporting streams with WFD reporting (see Annexes).
- Other proposed changes in SoE reporting:
 - In general: better linkage of SoE monitoring stations and water bodies with other reporting streams;
 - SoE Reporting Guidance: Revision of the guidance document in order to simplify and shorten; Details of data request will be provided in the data dictionary, whereas the reporting guidance should provide background information. Better linkage of the reporting sheets with the data dictionaries should be provided;
 - Reporting sheet on biology in rivers, lakes: Add national (or normalised) EQR for fish in rivers – commonly monitored, good indicator of hydromorphology (e.g. migration barriers), national methods are successfully intercalibrated and thus comparable in most countries;
 - Reporting sheet on nutrients, organic matter and physico-chemical elements in rivers, lakes: no major changes
 - Reporting sheet on hazardous substances in rivers, lakes, groundwater: Reporting of a common set of SoE preferred and “WFD pollutants” under SoE advise;
 - Reporting sheet on groundwater quality: Only disaggregated reporting of nutrients in groundwater (reporting per station, not only per waterbody)

4 **Country fact sheets on SoE reporting**

In the context of the review of SoE data, country fact sheets on QA of SoE data will be prepared for all EEA countries.

The aim of the country fiches is both to clean-up and correcting errors in the data member countries now have reported for 15-20 years; as well as in the data handling. Some errors have been introduced by the EEA and its Topic Centres handling of the reported data; others are due to errors introduced in member countries reporting. Another aspect is to improve the spatial and temporal coverage and to ensure that the relevant determinants are reported.

- In some cases member countries will be asked for more stations to increase the spatial coverage or density of stations; or clarifications on why data have not been reported from some of the RBDs.

- EEA water quality indicators are used for trend assessments based on consistent time series with some gap filling. For a single country consistent time series are established for the defined period (e.g. 1992-2012; or 2000-2012) with some gap filling (e.g. up to 3 years) and only stations with values for all years in the defined period are used. This ensures that any trend is because of change in the observations and not in the stations included.
- In the current data set the reporting of some high priority determinants has stopped or there has been changed in the determinants in the database e.g. cadmium changed to dissolved cadmium. EEA wants to clarify if these changes are real changes or it has been errors/misinterpretations introduced in compiling the databases. In addition, the aim is to ensure that the high priority determinants (e.g. nitrate or orthophosphate) have as complete coverage as possible.

The last part is on ensuring linkage between the different Waterbases by having a common coding system (Water Body ID) and linked to different reference layers such as the RBDcodes.

The country fact sheets are prepared as simple queries per country on all WISE SoE databases. In the queries mainly the reporting of preferred SoE determinants (used for indicators, assessments etc.) are considered. Issues such as representativeness of stations, covering of whole countries, continuous reporting of relevant determinants, breaks in time series etc. are addressed. The queries result in a document that provides an overview of what has been reported by the country. In preparation for the Eionet workshop in June 2014, the following countries have been selected as examples based on good data coverage and geographical representation: Cyprus, Denmark, Germany, Portugal, Sweden and Spain. Besides this, to have a good mix of northern, eastern, southern, western European countries as well as smaller and larger ones, federal and non-federal ones, but also where specific climatologic or water management issues can be expected, was the aim.

The current idea is to prepare two different versions of country fiches:

- The first version to give an overview on problems and gaps in reporting as basis to contact EEA countries/NRCs and ask for improvements, redeliveries of data etc. This version should be prepared for all countries until end of 2014. The results of the country fiches should be used to improve the data base (“cleaning” of SoE database);
- A future version of country fiches could be prepared as an easily viewed display of results for countries to illustrate what has been reported. This version could be carried out as webpage and, besides the overview, could contain data products (see e.g. Bathing Water directive reporting <http://www.eea.europa.eu/themes/water/status-and-monitoring/state-of-bathing-water/bathing-water-data-viewer>).

Annex 1: Overview of proposed changes in SoE Emissions reporting (Reporting Sheet SoE 4)

Introduction

The most important issue for proposed changes in SoE Emissions reporting is the Water Framework Directive (WFD) new Reporting guidance for 2nd RBMP reporting. The major reasons for changes are:

- To facilitate Member States use of SoE reported data for River Basin Management Plans under Water Framework Directive by improving comparability with EQS inventory guidance and WFD pressure list
- To support reporting products required by DG Environment providing source apportionment and data from more years
- To provide necessary information for environmental assessments by the European Environmental Agency

The present version of WFD Reporting guidance (https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp?FormPrincipal: idcl=FormPrincipal: id3&FormPrincipal_SUBMIT=1&id=dd515282-8fbe-4c2a-91b5-0d4bfe637122&javax.faces.ViewState=r00ABXVyABNbTGphdmEubGFuZy5PYmplY3Q7kM5YnxBzKWwCAAB4cAAAAAN0AAE4cHQAKy9qc3AvZXh0ZW5zaW9uL3dhaS9uYXZpZ2F0aW9uL2NvbnRhaW5lci5qc3A=) includes chapter 9.2 “Inputs of pollutants to surface waters (and groundwaters), including inventories of emissions, discharges and losses of EQSD Annex I substances”.

WFD Reporting guidance requirements

Emissions data are required on RBD or sub-unit level for all priority and hazardous substances, but with different level of detail. Substances should be identified as relevant in line with the following criteria (at least one of them has to be met):

- The substance causes a failure of good chemical status in at least one water body;
- The level of concentration for a substance is above half of the EQS in more than one water Body;
- Monitoring results show an increasing trend of concentration which may cause problems within the next RBMP cycles;
- PRTR data show releases which might lead to concentrations matching the criteria above;
- Known sources and activities causing inputs in the RBD exist which might lead to concentrations matching the criteria above.

Source: CIS Guidance No 28: Technical Guidance on the Preparation of an Inventory of Emissions, Discharges and Losses of Priority and Priority Hazardous Substances (<https://circabc.europa.eu/sd/a/6a3fb5a0-4dec-4fde-a69d-5ac93dfbbadd/Guidance%20document%20n28.pdf>).

For relevant substances quantification of total point and total diffuse source inputs (or total point and diffuse sources together) is required as a minimum. For not relevant substances riverine load should be provided.

More detailed reporting of information on source or pathway apportionment (categorisation) for all substances is also optional. MS may select the system they have used to categorise inputs (or pathways – Guidance No 28 enumeration , or source categories: WFD pressures or SoE Emissions.

Emission data from 2008, 2009 or 2010 as reference year or a period of up to six years within the relevant RBMP period are required.

Comparison of source categories between WFD pressures and SoE Emissions

The following table correlates the WFD pressures list and SoE source categories:

WFD list of pressures		size class	SoE Emissions			DO	Riverine input to coastal water
Source coding and category			Source coding and category	sub-type	size class		
1,1	Point – Urban waste water		U	Urban wastewater discharges total	U1-untreated	U11 U12 U13 U14	Direct discharges to coastal and transitional, total
1,2	Point - Storm Overflows				U2-treated	U21 U22 U23 U24	
	(Industrial discharges total (1.3 + 1.4))	1,3 1,4	I	Industrial wastewater discharges	I4-untreated I3 - treated		
1,5	Point - Contaminated Sites / Abandoned industrial sites		O	Other waste water discharges total			
1,6	Point - Waste disposal sites						
1,7	Point - Mine waters						
1,8	Point - Aquaculture						
1,9	Point – Other						
(Total point sources) - sum of above			(total point sources) - PT + DO				
2,1	Diffuse - Urban run off		NP5	Storm overflow emissions			Riverine input to coastal water
2,2	Diffuse – Agricultural		NP1	Agricultural emissions			
2,6	Diffuse - Discharges not connected to sewerage network		NP3	Un-connected dwellings emissions			
2,7	Diffuse - Atmospheric deposition		NP2	Atmospheric deposition			
2,3	Diffuse – Forestry						
2,4	Diffuse – Transport						
2,5	Diffuse – Contaminated sites/Abandoned industrial sites		NP7	Other diffuse emissions			
2,8	Diffuse – Mining						
2,9	Diffuse – Aquaculture						
2,1	Diffuse – Other						
(Total diffuse sources) - sum of above			NP Total diffuse emissions to inland waters				
(Total - point and diffuse sources)			(Total - point and diffuse sources)				
		1.3 in E-PRTR 1.4 Not in E-PRTR	U11 < 2.000 p.e. U12 - 2.000 - 10.000 p.e. U13 - 10.000 - 100.000 p.e. U14 - > 100.000 p.e.				

Use of SoE data for WFD reporting (2016)

Data reported under SoE Emissions could be re-used for WFD reporting.

MSs could provide values from SoE data (total point, total diffuse or specific sources) – provide values or specify that a particular year of data be taken into account.

Proposed changes in SoE Emissions reporting

The proposal of changes is focused on better (but not full) harmonisation between WFD reporting guidance and SoE Emissions reporting with the possibility to provide the necessary information for assessments by the European Environmental Agency.

Terminology: WFD use emission input² and riverine load, SoE Emission load in the same meaning as input.

Spatial units: RBD or sub-unit level (no change)

Pollutants: SoE list of “preferred” substances (not only EQS substances) will be updated according new EQS directive and frequently monitored chemical substances

Emission categories: The source oriented approach should be kept but parameters and their aggregation better aligned with the WFD pressure list. Also, there should be the possibility to report riverine load for inland monitoring stations (either as new parameter in SoE emissions or as currently enabled in SoE river water quality reporting). The list of categories will be updated - especially D0 - Direct discharges to coastal and transitional should be disaggregated to the individual source categories and “other” wastewater discharges and diffuse emissions should be better aligned with the WFD pressure list. However, some detailed categories from SoE Emission should be kept unchanged (e.g. treated and untreated urban wastewater discharges according to the size) and on the contrary some detailed categories from WFD pressures (e.g. Waste disposal sites 1.6 and Contaminated Sites 1.5) could be merged for SoE emissions. But a clear link between WFD pressures and SoE categories is important.

² Input = movement of a substance into the aquatic environment, i.e. sum of emissions, discharges and losses (inputs) to surface and groundwater, from land and sea-based sources and from point and diffuse sources, including atmospheric deposition.

Annex 2: Overview of proposed changes in SoE Water Quantity reporting (Reporting Sheet SoE water quantity)

The WISE SoE water quantity dataflow has been established in 2009 collecting water quantity data, i.e. data related to water availability, water abstraction, water accounts and water use. During the last five years new developments have taken place at European level requiring to better streamline WISE SoE water quantity reporting with other dataflows. At the same time, new data products related to water quantity have been identified as being important for the estimation of the State of Environment in Europe.

As a result of the above developments and considering the reporting experience of the past years, changes to the current dataset are proposed having the following goals:

- To better align WISE SoE water quantity data with established and new data products such as the Water Accounts and WEI+
- To take into account new issues emerging from the discussion of the new reporting cycle of the Water Framework Directive
- To streamline water quantity terms with those used in other established dataflows (e.g. OECD/EUROSTAT JQ)
- At the same time to reduce reporting burden for the MS, in order to facilitate MS participation, by establishing a more attractive dataflow thus taking also into account their overall reporting behavior so far.

In line with the above policy related developments in water quantity, EEA and ETC is currently analyzing the structure of the WISE SoE water quantity dataflow with a view of further simplifying the reported parameters and reducing the reporting burden of Member Countries by alignment of different reported streams. The following paragraphs provide information on preliminary results of exploratory analysis carried out by ETC on how to further simplification can be made without harming necessary parameters to be reported for Water Accounts.

1. Further alignment of WISE SoE water quantity with the Water Accounts and WEI+

Water accounts provides information on water availability and water use at different spatial and temporal scales which is essential for the decision makers to be informed for further policy alignments and developments in sustainable water management. The **Water Exploitation Index plus (WEI+)** is a Water Scarcity and Drought index. It is important especially in countries with water scarcity and depicts the extent of water abstraction pressure to the environment. The ideal temporal scale of reported data for this index is monthly or seasonal. The annual WEI+ may be sufficient in cases where the absence of water scarcity problems is evident.

In general WEI+ is calculated by the general expression:

$$\text{WEI+} = (\text{Abstractions} - \text{Returns}) / \text{Renewable Water Resources} \quad (1)$$

$$(\text{Abstractions} - \text{Returns}) = \text{Consumptions} \quad (2)$$

Renewable Water Resources (RWR) can be calculated either by the equation:

$$\text{RWR} = \text{ExIn} + \text{P} - \text{ETa} - \Delta \text{Snat} \quad (3)$$

or:

$$\text{RWR} = \text{Outflow} + (\text{Abstraction} - \text{Return}) - \Delta \text{Sart} \quad (4)$$

where ExIn is actual external Inflow, P is precipitation, ETa is actual evapotranspiration, ΔS_{nat} are changes in the volume of water from natural processes and ΔS_{art} from artificial processes (regulated lakes or artificial reservoirs).

1.a Renewable Water Resources

Given the WISE SoE water quantity dataset, renewable water resources can be calculated from the consisting parameters, i.e. Areal precipitation (wb_areal_precipitation), Actual evapotranspiration (wb_act_evapotranspiration), Total actual external inflow (wb_total_act_ext_inflow) and the Changes in reservoir storage (wb_changes_in_reservoir_storage). It is therefore recommended that MS will continue reporting those important parameters at monthly and RBD/SU scale.

1.b Water Abstractions and Returns

Water Abstractions are defined as water removed from any source, either permanently or temporarily. Return flow is the water abstracted from any fresh water source and discharged into fresh waters before or after use. Discharges to the sea are excluded and reflect the losses from the system.

Water abstractions and returns are important in any water balance calculation. They are a significant part of almost all data products (e.g. Water Accounts, WEI+). As a consequence, the requested water abstraction and returns should be further analysed into sources and sectors according to the WFD classification and should be aligned to the SEEAW asset classification, based on which the Water Accounts are produced. Preserving the above principals, the number of currently requested parameters can be reduced or two or more parameters can be merged into one.

1.c Water Use

In the current SoE dataset the “water use” group of parameters is divided in three main subgroups: “Total freshwater”, “Public Supply” and “Self supply”. The first subgroup is the sum of the other two:

$$\text{“Total freshwater”} = \text{“Public Supply”} + \text{“Self supply”}$$

For these subgroups, water uses by NACE sectors are currently requested under the WISE SoE to be utilized in the Water Accounts. A significant number of the parameters related to freshwater used from self-supply and from public water supply systems are also requested every second year at annual scale under the OECD/EUROSTAT dataflow. It is therefore proposed to obtain the values from this dataflow, rather than requesting them every year in the WISE-SoE dataflow, reducing this way the reporting burden for the MS.

Another group of parameters that were poorly reported in the past, play a minor role in the Water Accounts. It is therefore proposed that they could be merged due to this reason. An example for this is the volume of *reused water for domestic use*. Such domestic installations are rare (till now) across Europe and very difficult to be reported since they refer to specific households (which usually are not keeping volume measurements). Moreover their contribution in the Water Accounts can only be estimated by statistical data (e.g. by the sales of relative construction or distribution companies of such installations).

1.d New parameters

In the last years WEI+ has been established as the main indicator for water scarcity and drought. WEI+ estimates the water consumption in relation to renewable water resources and takes into account the temporal and spatial variability of water exploitation. Thus, it is more flexible and accurate than its predecessor (WEI). According to the guidance document for the next WFD reporting cycle WEI+ will be requested for those RBDs where water abstraction is a significant pressure. Especially for those sensitive regions it is important that WEI+ is reported annually as part of the WISE-SoE dataflow in order to keep track of possible trends in between the WFD 6 year reporting periods.

Ecological flows describe the quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems. There are at European level (e.g. in WG Eflows) ongoing discussions about the importance of man-made water scarcity and the need to maintain the ecosystems in these sensitive areas. The parameter Ecological stream flow intends to address these concerns and give an overview of the pressures and water needs in sensitive regions by providing a qualitative view of the ecological status of an RBD. If every perennial stream in the district area of an RBD maintains the specifically determined minimum ecological flow on a seasonal basis, then the value of this parameter for the certain RBD is “YES”, otherwise the value is “NO”. Through the introduction of this parameter and the consequent reporting, a pressure is expected to MS, to establish observatories of Ecological Flows, identify RBDs most prone to failure of compliance, and gradually take the necessary actions in following RBMPs to address this important issue.

Another two groups of parameters which it is proposed to be introduced to the WISE-SoE water quantity dataflow are *consumptive uses* and *return flows*. Consumptive use is requested to be reported for validation purposes or in case that abstractions or returns are not reported. These two categories are needed for understanding the reason for possible overexploitation in certain areas, and also are (by definition) needed for the derivation of the indicator WEI+.

1.e Spatial and temporal scale

The dataset will continue providing the flexibility to MS to report in same temporal and spatial scales as in the past, i.e. Sub-Unit, River Basin District, country and monthly, seasonal, annual scales (also daily only for stream flow data). However, it is highly recommended that MS report in the smallest available spatial and temporal scale. For example if WEI+ is reported in an annual temporal scale then potential problems of overexploitation during the summer period will not be identified, so the real problem will be “hidden” under the average annual value. Moreover if WEI+ is reported in national scale, a particular RBD that faces overexploitation issues will not be identified if the national scale average values don’t exhibit similar issues. The possibility to report in more coarse temporal and spatial scales is given especially for those cases for which data are not available at more detailed scales.

2. Use of SoE Reporting Data in WFD Context

Although the WFD is primarily focused on water quality, the management of water quantity plays a very important role through the objective of good quantitative status for groundwater and the hydro-morphological component of good ecological status. Ultimately, it is only possible to achieve the WFD objectives of good status if sufficient quantity of water is available. In the new reporting cycle (2016) additional information is requested for those RBDs for which the MS consider that water abstraction is a significant pressure. In alignment with the guidance document for the RBMP reporting, WEI+ is introduced as a new indicator in this dataflow (see section “New parameters”).

Data reported under SoE water quantity such as WEI+ and water consumption per source and sector or support parameters requested under the WFD dataflow could be re-used for WFD reporting, as long as MS indicate the reference month/year/period. In those cases where parameters are reported under SoE in smaller temporal or spatial scales (e.g. monthly and RBD) than needed under WFD (e.g. annual and country), the values can be aggregated by ETC/ICM before re-using them for WFD reporting.

3. Conceptual alignment with OECD/EUROSTAT

In order to better align the common understanding from the terminology and related content used for data handling between EEA and OECD/EUROSTAT, the following changes would be proposals for the definition of some parameters:

- (Total) *water abstraction* now excludes water for hydropower. These volumes of water are returned to the environment, typically very close to the place of abstraction, with unchanged water quality and normally without any significant losses, but in countries with hydropower use, they may dominate the balance. Water abstraction used for hydropower is requested as a separate parameter.
- *Cooling water* is now requested separately for the same reason as above and is not included in the definition of *wastewater discharge*. This change is obvious especially from the point of view of the environment: cooling water typically does not have wastewater characteristics (no pollution, just slightly warmer) but has very large volumes which dominate the total and hence 'mask' the volumes of 'real' wastewater.
- *Leakage losses* include now not only losses between point of use and re-use but also all losses occurring before use, during the transport. This is proposed because losses between points of use and re-use make up only for a small part of all losses: firstly, because only a small fraction of all used water gets actually re-used, and secondly, because there is a high likelihood of losses also in the distribution system between abstraction and use.

In return, once a common approach would be developed among EEA and OECD/EUROSTAT, it will have some implications over approximately 28 parameters in total are to be changed and modified.

4. Summary results of exploratory analysis

According to the considerations mentioned previously, a number of changes in the WISE-SoE water quantity dataset are proposed. Some proposals result in new parameters to be explored for better alignment with current policy developments such as Water Accounts, WFD Reporting Guidance and further pre-filling OECD/EUROSTAT JQ/REQ. At the same time, a number of parameters no longer will be requested reducing significantly the number of overall reporting burden. The first analysis reveals that there is a possibility of removing from the dataset 97 of the currently 185 water quantity parameters. On the other hand, 15 new parameters will be introduced, adding to a total number of 103 requested parameters.