

# Managing reporting, assessment and dissemination of status and pressures on Europe's waters – the WISE context

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## ABSTRACT

*Monitoring of status and pressures on Europe's waters forms a backbone for informing policy makers, stakeholders in water management and the public, in general. Reporting via priority data flows from countries to European institutions takes place in the context of the Water Information System for Europe (WISE)<sup>1</sup> to be seen as implementation of the Shared Environmental Information System (SEIS)<sup>2</sup> based on cooperation in the so-called Group of Four (Go4) institutions: DG ENV, EEA, Eurostat and Joint Research Centre (JRC).*

*The reporting to EU water directives as well as to EEA Eionet priority data flows takes place by electronic reporting via Reportnet<sup>3</sup> including automated as well as manual QA process leading to generation of indicators and other publicly available products, such as interactive maps and downloadable datasets<sup>4</sup>.*

*Some data flows via EU directives, Eionet framework, Eurostat water statistics have partial overlaps, which is recognized and intended to streamline. Challenges in terms of aggregation levels, comparability of basic parameters and reporting obligations and practices will be addressed.*

*Identification and filling of data gaps is only possible when reporting takes place as a disaggregated level and the possibility of conducting QA is strongly enhanced when numerical values (flows, concentrations, loads) are provided at the monitoring station / facility level.*

## From data to information

An overview of the chain from data reported by countries and their use at the national and European level, respectively is illustrated in Figure 1. The data reported to EEA include State-of-the - Environment (SoE) reporting via the European Environment Information and Observation Network (Eionet) and EU Directive reporting via the appointed national reporters (per directive). Reporting takes place in electronic form via Reportnet<sup>5</sup> including automated as well as manual QA process conducted by EEA and it's European Topic Centre for Inland, Coastal and Marine Waters.

The products, which are freely available for viewing or downloads include the European datasets, graphs and maps (static and interactive) as well as indicators. These services can be accessed via the Water Data Centre, managed by the EEA. Recent examples of published thematic reports are on water resources<sup>6, 7</sup> and freshwater quality<sup>8</sup>.

<sup>1</sup> <http://water.europa.eu>

<sup>2</sup> <http://ec.europa.eu/environment/seis>

<sup>3</sup> <http://www.eionet.europa.eu/reportnet>

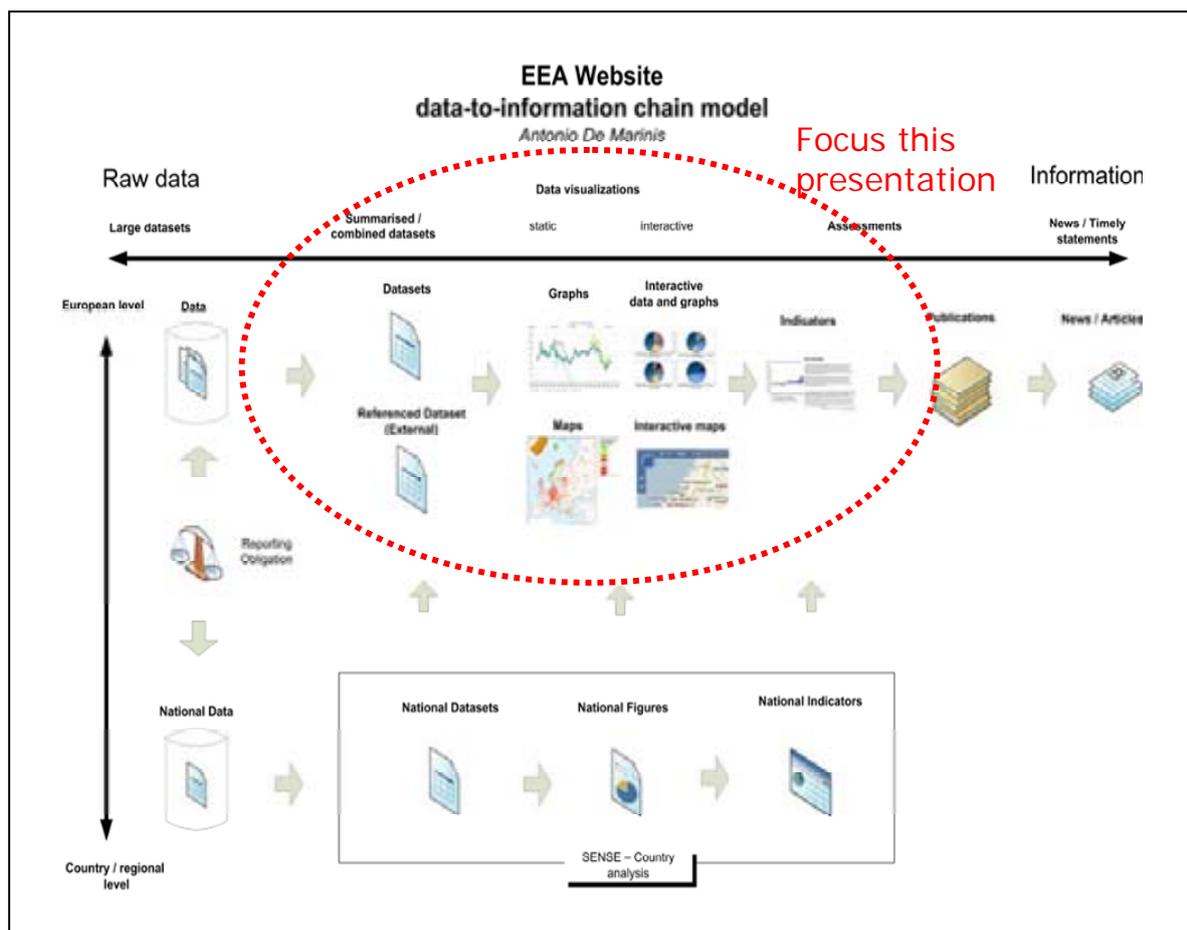
<sup>4</sup> <http://www.eea.europa.eu/themes/water/dc>

<sup>5</sup> <http://www.eionet.europa.eu/reportnet>

<sup>6</sup> <http://www.eea.europa.eu/publications/water-resources-across-europe>

<sup>7</sup> <http://www.eea.europa.eu/soer/europe/water-resources-quantity-and-flows>

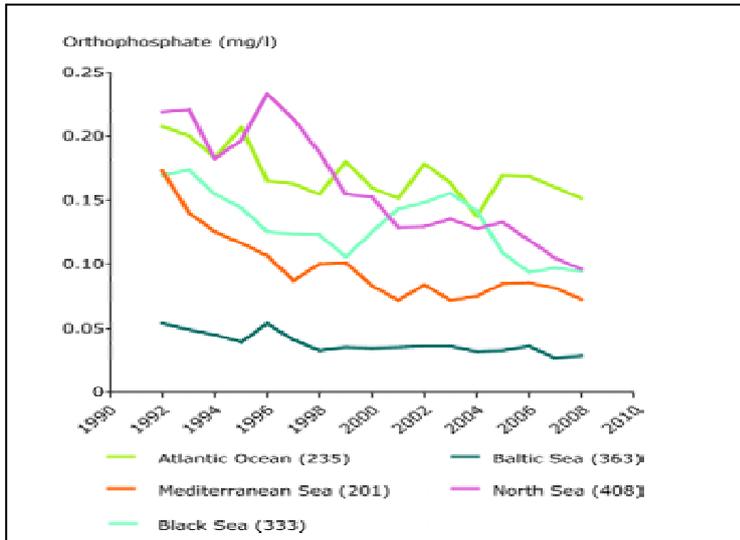
<sup>8</sup> <http://www.eea.europa.eu/soer/europe/freshwater-quality>



**Figure 1 . Overview diagram – from data to information**

The majority of data are reported on a quite disaggregated level, e.g. per monitoring station or per facility/plant, which enables QA procedures to check for outliers and potential errors. A set of criteria has been defined both for accepted ranges of the numerical values in question as well as ranges for relations to other parameters. Based on this, a feed-back to the reporter takes place for eventual data correction and, in any case, the data records in the published European datasets are flagged for filtering away before the preparation of maps and indicators.

An example of an indicator for freshwater quality is shown in Figure 2. The monitoring stations included is a subset of all monitoring stations using only those with long time series and with filling of minor data gaps by inter/extrapolation. The data processing of the monitoring data into such indicators provide answers to policy relevant questions, in this case the key policy question is: *Are concentrations of nutrients in our freshwaters decreasing?*



(number of monitoring stations included in analysis)

Figure 2. Trends in annually averaged river orthophosphate concentrations (mg/l) aggregated to the sea region to which each river drains. Source: EEA - ETC/ICM (CSI 020)

Data streamlining

Reporting of data to water statistics to Eurostat using the OECD/Eurostat Joint Questionnaire for Inland waters (JQ-IW) has been well-established before reporting to EU water directives and Eionet. Seen within the context of WISE, some parallel reporting takes place as illustrated in Figure 3. This issue is recognized by EEA and Eurostat and a co-operative effort – called data streamlining - is ongoing through the ETC/ICM.

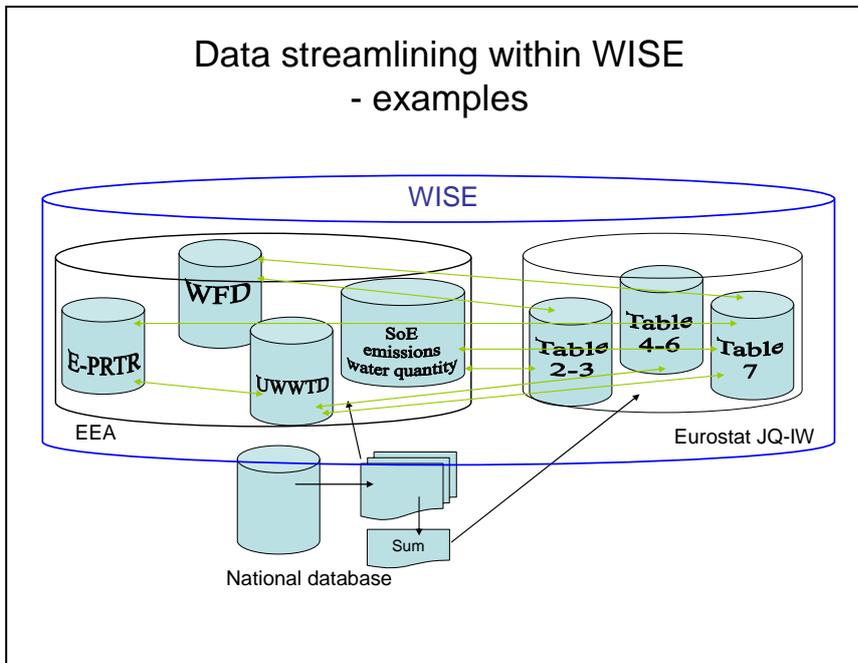


Figure 3. Indications of some data streamlining potentials between SoE and EU directive reportings to EEA versus water statistics reporting to Eurostat.

Some difficulties are due to underlying differences in the basic parameters used for normalization. As an example, the Urban Waste Water Treatment Directive (UWWTD)<sup>9</sup> is based on population equivalents (p.e.), whereas the JQ-IW is based on population (inhabitants). In consequence, data streamlining is only possible if cross-linkages are established, e.g. by extending the reporting to UWWTD with data on population, which currently is provided by some countries as additional parameter.

As indicated on the figure, the reporting to JQ-IW takes place on a more aggregated level (national or per river basin district), which means that some prefilling of JQ-IW is possible from European datasets managed by the EEA – but not the other way.

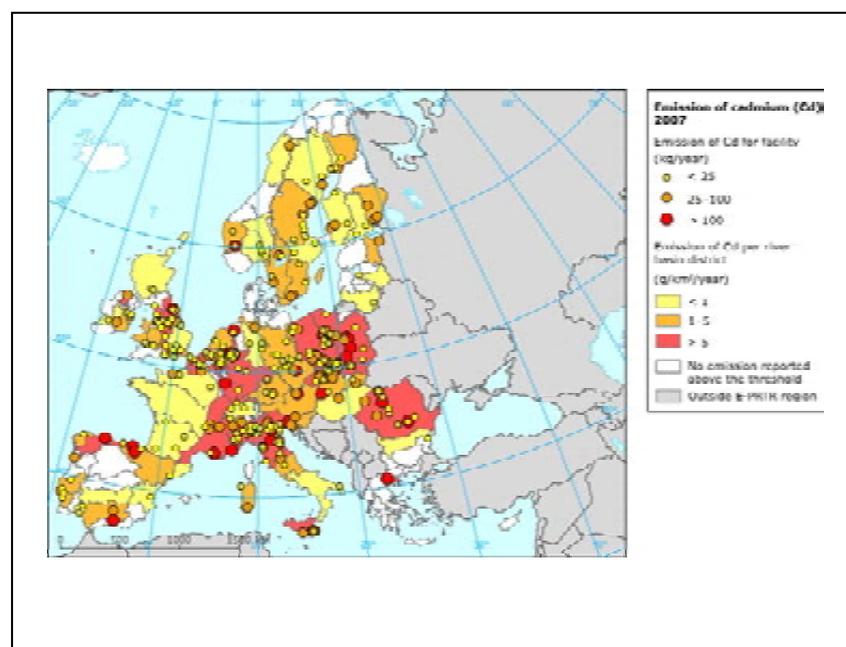
### Addressing data gaps in emission inventories

The higher the level of data aggregation in the reporting, the more difficult it is to identify and fill data gaps. Whereas limitations in capacity for

Comparative analyses have been conducted between reporting to the European Pollutant Release and Transfer Register (E-PRTR)<sup>10</sup> and the UWWTD resulting in the identification of several data gaps for facilities, which should appear in both datasets but only being in one or the other. As these data flows have different origins and organizational set-up in some countries, this has highlighted the need for data streamlining within the countries.

As an initial step at the European level, the reporting to UWWTD has been extended with E-PRTR ID-code for the corresponding treatment plant enabling a 1:1 link of the reported data.

In Figure 4 is shown data reported for releases of cadmium per facility as well as normalized per km<sup>2</sup> aggregated at river basin district level. It is evident that in cases of data gaps – being facilities not reported or parameters not reported for given facilities – the aggregations will be systematically underestimating the total emissions, which should have been reported. Only with the disaggregated reporting per facility, it is possible to identify such data gaps – and potentially to fill data gaps by default assumptions (correlation to other basic parameters), where this is possible.



**Figure 4. Emissions of cadmium to water based on E-PRTR reporting of 2007 data<sup>11</sup>**

Note: Reported emissions (releases) are from the following E-PRTR sectors; energy; production and processing of metals; mineral industry; chemical industry; waste and water management; paper and wood production and processing; animal and vegetable products from the food and beverage sector, other activities

<sup>9</sup> [http://ec.europa.eu/environment/water/water-urbanwaste/legislation/directive\\_en.htm](http://ec.europa.eu/environment/water/water-urbanwaste/legislation/directive_en.htm)

<sup>10</sup> <http://prtr.ec.europa.eu/>

<sup>11</sup> <http://www.eea.europa.eu/data-and-maps/figures/emissions-of-cadmium-to-water> (v. 13.12.2010)

### **Way forward**

Some of the current reporting systems related to water were designed decades ago. Advances in data handling capacities by improved and affordable information technology (IT) enables more disaggregated reporting than before.

Reporting at highly aggregated levels depends on complete data coverage and standardized methodologies for full comparability of the data.

A combination of automated quality assurance (QA) and manual quality checks (QC) of reported data already takes place for identifying data gaps, outliers and potential errors. The corresponding data management – dialogue for data corrections or exclusions of data for web-service products generated from the European datasets.- needs to be transparent and effective in order to build and maintain confidence to the indicators used for addressing key policy questions.

New data policies and management strategies should address automated filling of data gaps on the basis of default values generated from inter- and extrapolation methods or from regression relationships with other reported basic parameters. This will improve the comparisons and reliability of data used for analyzing developments of status and pressure for Europe's waters.