

# WISE: Water Information System for Europe, issues and challenges for Member States

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# Water Information System for Europe (WISE)

A GIS based system for visualisation of water information from the entire Europe.

Provides background information on:

- EU legislation, and on
- Thematic knowledge on the European waters, on Water Pollution, and on the Status and Monitoring of the Water Resources
- Provides European covering maps and data access for diverse aspects of water
- Provides access to Data centre services, Reports and Indicators.



# The Commission requires water related information to be reported for the following reasons:

- To check compliance with the requirements of specific articles of the WFD
- To carry out preliminary assessment of the situation in the Member States
- To carry out further detailed analysis (where additional data may be required)
- To compile statistics for its own needs and to inform the European Parliament and,  
to create a European-wide picture to inform the public.



# Water Frame Directive - key elements / requirements

- Protection of all waters and achieving “good status” for all waters by 2015
- Covering all impacts on waters (e.g. human activities)
- Development of Registers (e.g. protected areas, significant pressures, ...)
- Water quality defined in terms of biology, chemistry and morphology - Monitoring of data and Data management
- Co-ordination in International River Basins
- Active Public Participation (Public information and consultation)
- River Basin Management Plans
- Economical Aspects
- **Reporting Obligations**



# Reporting Obligations

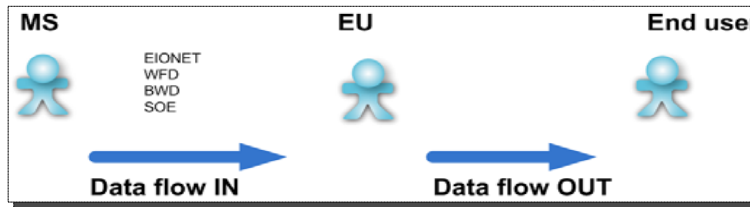
National Reports are

- The fulfilment of obligations of the EC water policy Directives
- Showing the success of taken measures
- The basis for the Compliance Check for the European Commission
- The basis for Synthesis reports of the European Commission
- The basis for the evaluation of policy effectiveness of directives
- The basis for the State of Environment analysis
- The basis for the starting point of infringement procedures



**Reporting is the most important tool of the implementation of EC Directives!**

# WISE community network



## Information providers

EU – wide

International

National / federal

Regional:  
provinces, landers, etc.



## Information users:

*decision-makers; influencing public; researchers, and EU citizens in general*

EU institutions: EP, EC, Commission: ENV, JRC, ESTAT; EEA

IRB Commissions: ICPR, Rhine, Elbe, etc,  
IM Conventions: OSPAR, HELCOM, etc

National / federal water management administrative units

*Regional / local water management administrative units,*

*NGOs,*

*Research community*

# WISE and Consultancies

- The overall objective is to assist the ongoing development of strategies for the reporting on the European water related directives with concrete tools and services.
- This encompasses the provision of services and development of tools in implementing the water information system for Europe (WISE) (2007-2010) for reporting and data management on both existing and new or upcoming directives.



# WISE and Consultancies

SADL/Geosolutions is such a consultancy that provides a number of services under the WISE framework, mainly on diagnostic analysis of submitted data, development of QA/QC tools, implementation plan for a WISE distributed system and so on.





# TASKS in WISE

**Task-SG-1b-01**  
Diagnostic  
Analysis of data  
reported under  
WFD Art 5

**Task-SG-1f**  
Consultancy on  
distributed  
systems and  
distributed  
architecture  
design

**Task-SG-1d-01**  
Reporting under  
WFD Art 5:  
Procedure  
development for  
QA/QC

**Task-SG-1h-1**  
Link UWWTD -  
JQ IW

**Task-SG-1i**  
Metadata system

**Task-SG-1h-2**  
Link to  
EUROSTAT  
Water Statistics

**Task-SG-2A-01**  
Reference  
dataset: RDB &  
subunits

**Task-SG-1d-02**  
Reporting under  
WFD Art.5:  
Automated QA/  
QC tool

Missions (CPHx2,  
DUB, MAD, CPH,  
LUX)

**Task-SG-4a-1**  
Contract  
management and  
participation in  
WISE meetings  
(BXL)

**Task-SG-4b**  
End-user  
Workshops

**Task-SG-2a**  
Tools and services for  
existing water  
directives : reference  
datasets

**Task-SG-2b, 2c, 2d, 2e**  
Tools and services for  
existing water  
directives :  
development of tools  
and services for  
UWWTD, BWD, DWD,  
NiD

**Task-SG-3a, 3b**  
Tools and services for  
future directives  
(analysis +  
development/  
concept): for MSD,  
FRMD

**Task-SG-1e-01**  
Procedures for  
compliance  
checking of  
datasets delivered  
under art 5 & art  
8 of the WFD

**Task-SG-1e-02**  
Development of  
compliance tools  
for datasets  
reported under  
article 5 & 8 of the  
WFD

**Task-SG-1a**  
Development of  
multilingual list  
of terms and  
codes

**Task-SG-1g**  
Support on  
technical  
matters of the  
WISE GIS  
guidance  
document

**Task-SG-1b-02**  
Analysis of  
reporting  
obligations

**Task-SG-1c**  
Translation of  
docs

TOGETHER  
SADL/GEO  
GEOSOLUTIONS

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# Diagnostic Analysis

- SADL/Geosolutions performed a diagnostic analysis on the reported data, under the reporting obligations of Article 5 of the WFD, of each Member State on both geographic and alphanumeric inputs of the characteristics of their River Basin Districts (RBD).
- This diagnostic analysis focused on the way the data were reported and the compliance of the reported data with Art.5 requirements.



# Diagnostic Analysis

As result per each MS a detailed report was provided containing:

- Missing Data;
- Obvious errors;
- Problems in data report that hinder further analysis;
- General remarks and Recommendations towards a harmonised data submission at EU level.



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## Handling of reported datased

- Since the MS report their files independently a number of differences were identified among the reported schemes of each MS
- Additionally a number of errors and inconsistencies were identified in each MS reported data



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Some examples are displayed below

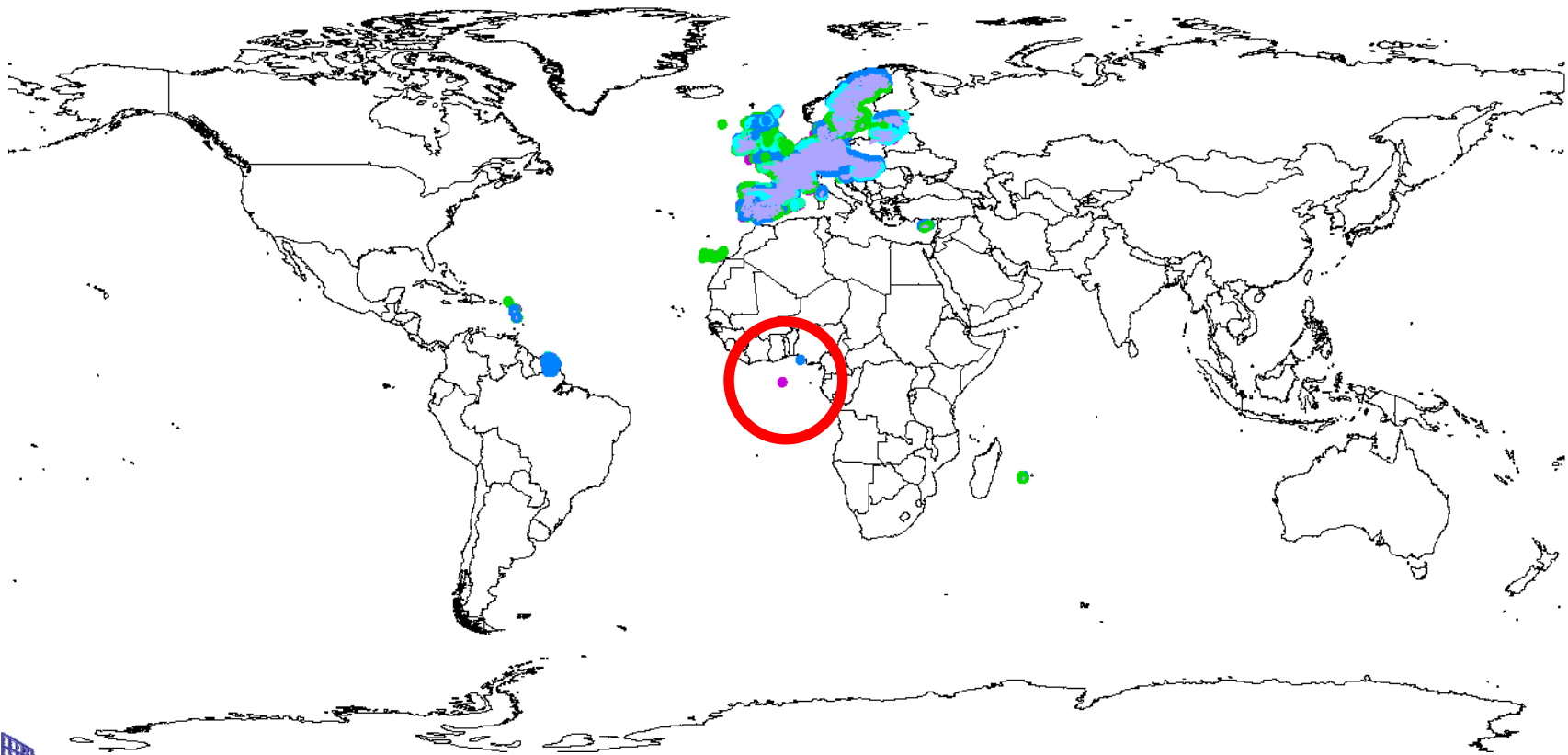
# ***Obvious Errors / Inconsistencies in database***

*Obvious wrong location from shapefiles*

e.g.:

- 1 point for a country located near Nigerian coast (problem: LAT decimal should shift one number)





Obvious wrong location

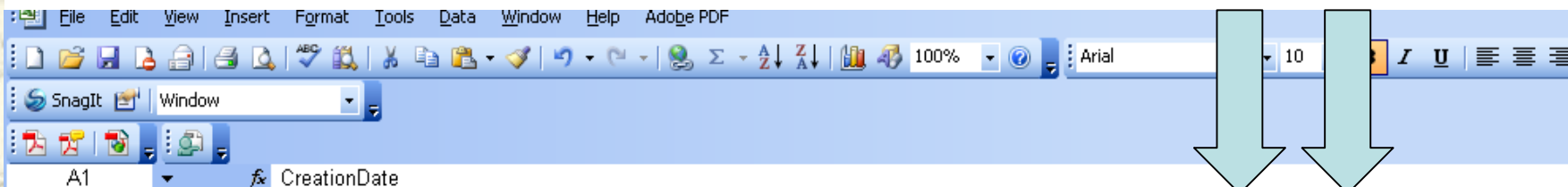


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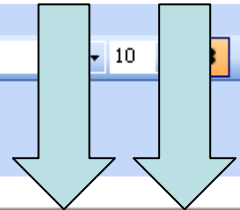
# Examples of Obvious Errors / Inconsistencies

- Reverse input for Latitude and Longitude





	I	J	K	L	M	N
1	ns1:URL	ns1:EU_CD	ns1:MS_CD	ns1:LAT	ns1:LON	ns1:CATEGORY
2	<a href="http://www.wasserblick.net/servlet/is/34785/">http://www.wasserblick.net/servlet/is/34785/</a>	DE_LS_2414149102	2414149102	11.48776	50.3395	LW
3	<a href="http://www.wasserblick.net/servlet/is/34785/">http://www.wasserblick.net/servlet/is/34785/</a>	DE_LS_2421261001	2421261001	10.87653	49.13384	LW
4	<a href="http://www.wasserblick.net/servlet/is/34785/">http://www.wasserblick.net/servlet/is/34785/</a>	DE_LS_2421263001	2421263001	10.9284	49.13051	LW
5	<a href="http://www.wasserblick.net/servlet/is/34785/">http://www.wasserblick.net/servlet/is/34785/</a>	DE_LS_2421264001	2421264001	10.89562	49.14867	LW
6	<a href="http://www.wasserblick.net/servlet/is/34785/">http://www.wasserblick.net/servlet/is/34785/</a>	DE_LS_2421469001	2421469001	11.18711	49.22402	LW
7	<a href="http://www.wasserblick.net/servlet/is/34785/">http://www.wasserblick.net/servlet/is/34785/</a>	DE_LW_237349	237349	8.30829	49.06306	LW
8	<a href="http://www.wasserblick.net/servlet/is/34785/">http://www.wasserblick.net/servlet/is/34785/</a>	DE_LW_237732	237732	8.97883	49.24905	LW



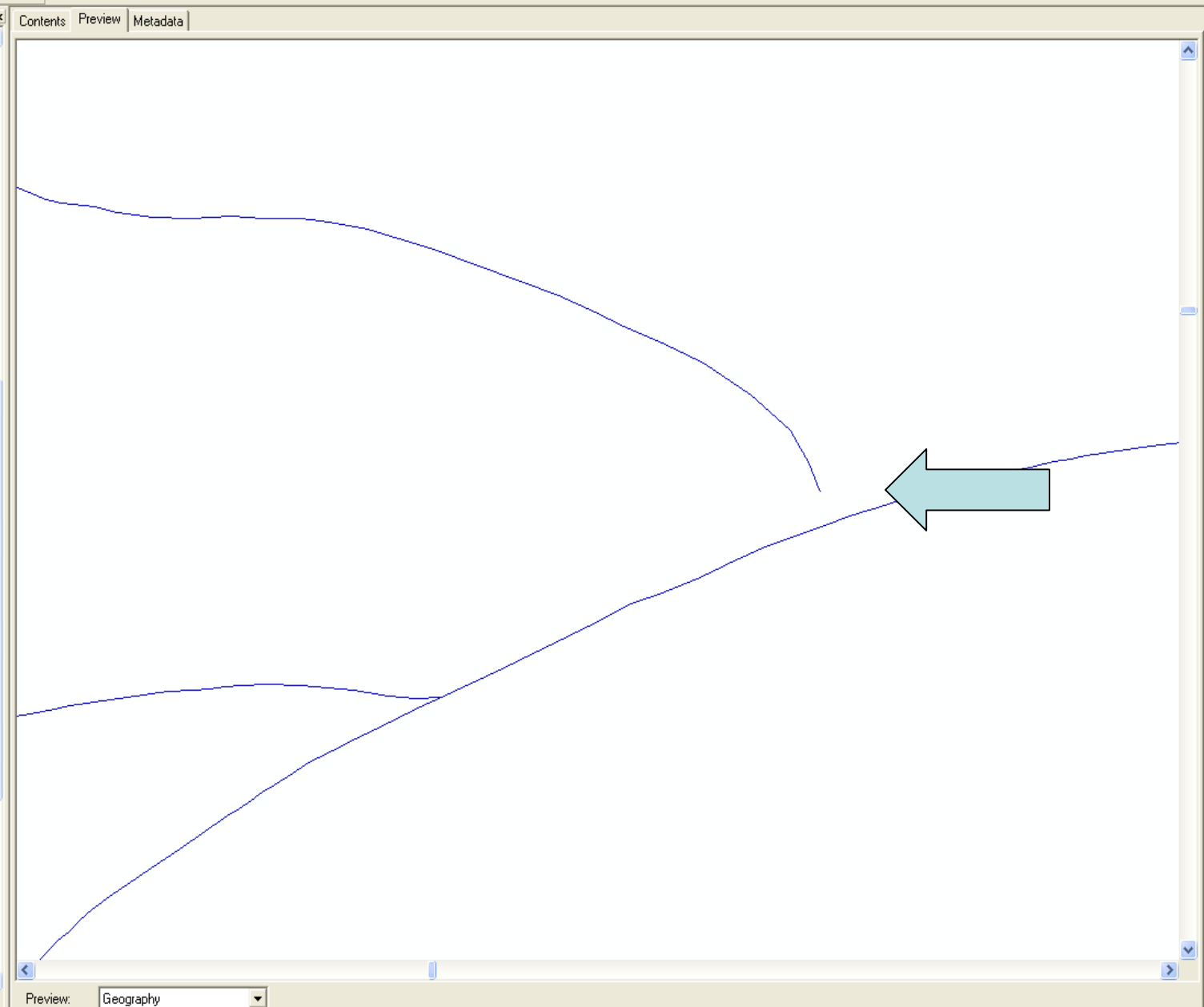


# Examples of Obvious Errors / Inconsistencies

- Topological errors such as non connectivity among the river networks are common to all MS



- AT\_5000\_LWBver1
- AT\_5000\_PRA\_POLYver1
- AT\_5000\_RWBver1
  - AT\_5000\_RWB.shp
- AT\_5000\_TWBver1
  - AT\_GWB\_5000ver1.xml
  - AT\_ProtArea\_5000ver1.xml
  - AT\_RBD\_5000ver1.xml
  - AT\_SWB\_5000ver1.xml
- BE\_wfd\_art5
  - BE
    - BE\_Escaut\_BR
    - BE\_Escaut\_RW
    - BE\_Meuse\_RW
      - BE\_CWBmeusever1
      - BE\_GWBMEUSEver1
      - BE\_LWBmeusever1
      - BE\_RPA\_LINEmeusever1
      - BE\_RPA\_POLYmeusever2
      - BE\_rwbmeusever1
        - rwmeuse.shp
      - BE\_TWBescoutver1
      - BE\_TWBmeusever2
      - BE\_GWB\_BE\_Meuse\_RWver1.:
      - BE\_GWB\_BE\_Meuse\_RWver2.:
      - BE\_ProtArea\_BE\_Meuse\_RWver1.:
      - BE\_RBD\_BE\_Meuse\_RWver1.x
      - BE\_SWB\_BE\_Meuse\_RWver1.:
    - BE\_Rhin\_RW
    - BE\_Seine\_RW
    - BEMaas\_VL
    - BESchelde\_VL
    - SADL\_BR
  - CY\_wfd\_art5
  - CZ\_wfd\_art5
  - DE\_wfd\_art5
  - DK\_wfd\_art5
  - EE\_wfd\_art5
  - ES\_wfd\_art5
  - FR\_wfd\_art5
  - HU\_wfd\_art5
  - IE\_wfd\_art5
  - IT\_wfd\_art5
  - LT\_wfd\_art5
  - LU\_wfd\_art5
  - LV\_wfd\_art5
  - NL\_wfd\_art5
  - PL\_wfd\_art5
  - PT\_wfd\_art5
  - SE\_wfd\_art5
  - SI\_wfd\_art5



# Art.5 – procedure development for QA/QC

- Current status of reported databases makes automated diagnostic analysis very cumbersome if not impossible
- **THEREFORE**



# Art.5 – procedure development for QA/QC

- SADL/GEOSOLUTIONS proposes several recommendations towards a unified method of data submission



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# Recommendations

## File organisation

- Versioning of files should be avoided. Different versions should be incremental improvements that take into account all corrections made in previous files.
- Cascading directories are to be avoided. This makes the structure of deliverables per MS more transparent.
- Standardized Metadata are needed that describe inter alia the origin and corrections made.
- File naming should be consistent so that automatic uploads are facilitated.



# Recommendations

## Geometry files (shape file format)

- Referential integrity  
Codes should match among different files as well as field names.
- Projection system  
The projection system should be defined.
- Accuracy (scale)  
The recommendations in the GIS guidance are 125 meters with a minimum of 1000 meters.
- Topology  
Overlaps, overshoots, undershoots, slivers to be avoided. Connectivity of river network is desirable, certainly within the country.



# Recommendations

## Data files (xml)

- Referential integrity  
Codes should match among the different files and should be according to the GIS guidelines.
- Accuracy of reporting  
All field names in the predefined schemas should be present and used correctly.  
The records should be filled, including the Member State coding.



# Art.5 – procedure development for QA/QC

- SADL/GEOSOLUTIONS identified the bottlenecks in the reported data and proposes a QA/QC tool that would allow MS submissions to be checked on different levels that are dealing with data assessment and control.





# Art.5 – procedure development for QA/QC

- At the data input stage, QA/QC tools comprise a set of validation rules that enable a first assessment in terms of integrity and completeness of the data.
- At the data control stage, QC tools will automate a procedure or set of procedures intended to ensure that the information delivered adheres to a defined set of accuracy and comparability criteria.
- The procedure development of the QA/QC is in accordance with EEA, the GIS guidance and reporting obligations of the Member States.
- QA/QC tools should check and conclude on harmonization of the different types of reported data.



# QA/QC on Harmonization of reported datasets

- File harmonization
- Data harmonization
- File harmonization considers the naming of the submitting files/data/schemas
- Data harmonization deals with the harmonization of the content (attributes, metadata) and harmonization of geometry



# QA/QC on Harmonization of reported datasets

- Data harmonization
  - Check Element Naming;
  - Check Mandatory fields;
  - Value domain restrictions. According to a list of acceptable values for each element a QA/QC tool should be present to ensure that only valid values are passed;
  - The File name and identification should be checked per schema and water body;
  - The amount of documents for each of the XML schemas should be checked;
  - Regarding RBD, QA/QC tools should check that at least one ground water body is defined for each river basin district;
  - Regarding referential integrity among the level codes for the different water bodies, QA/QC tools should check the existence and the validity of all codes (e.g EU\_CD, DIST\_CD, etc).



# QA/QC on Harmonization of reported datasets

- Geometry harmonization
  - The coordinate system for all Member States;
  - The X,Y coordinates of each centroid and points/line/polygons of each water body to ensure that they belong to the Member State that they refer to;
  - Connectivity and gaps among the main river network and river stretches;
  - Existing polygons (polygons closed/not closed);
  - If all surface water bodies and protected areas shapes connect and edge-match the country borders and the coastline;
  - That adjacent river water body line shapes connect and edge-match within a Member State and across Member State border;
  - If river water body line shapes stop/start at the edge of lake water body shapes or if they are continuous;
  - For overlaps, slivers, dangles, undershoots, overshoots in and between each water body and protected area.



# QA/QC on Harmonization of reported datasets

- As a result of the QA/QC tools performed on the reported databases a **summary** of the main uncertainties and data gaps together with **actions** identified to address these issues should be indicated and reported over web services back to the responsible Member State.



# Conclusions

- During the submission of data to WISE a number of practical obstacles were encountered such as incomplete or not submitted data, variable format of the provided datasets and often the data did not comply with the GIS guidance.
- The quality of the information submitted by Member States is very diverse and often difficult to read, validate and process.
- This might be due to the fact that there are often differences between Member States in the interpretation of the GIS guidance as well as the resources they provide for the assimilation of this information.



# WISE: Water Information System for Europe, issues and challenges for Member States

Thank you for your attention



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