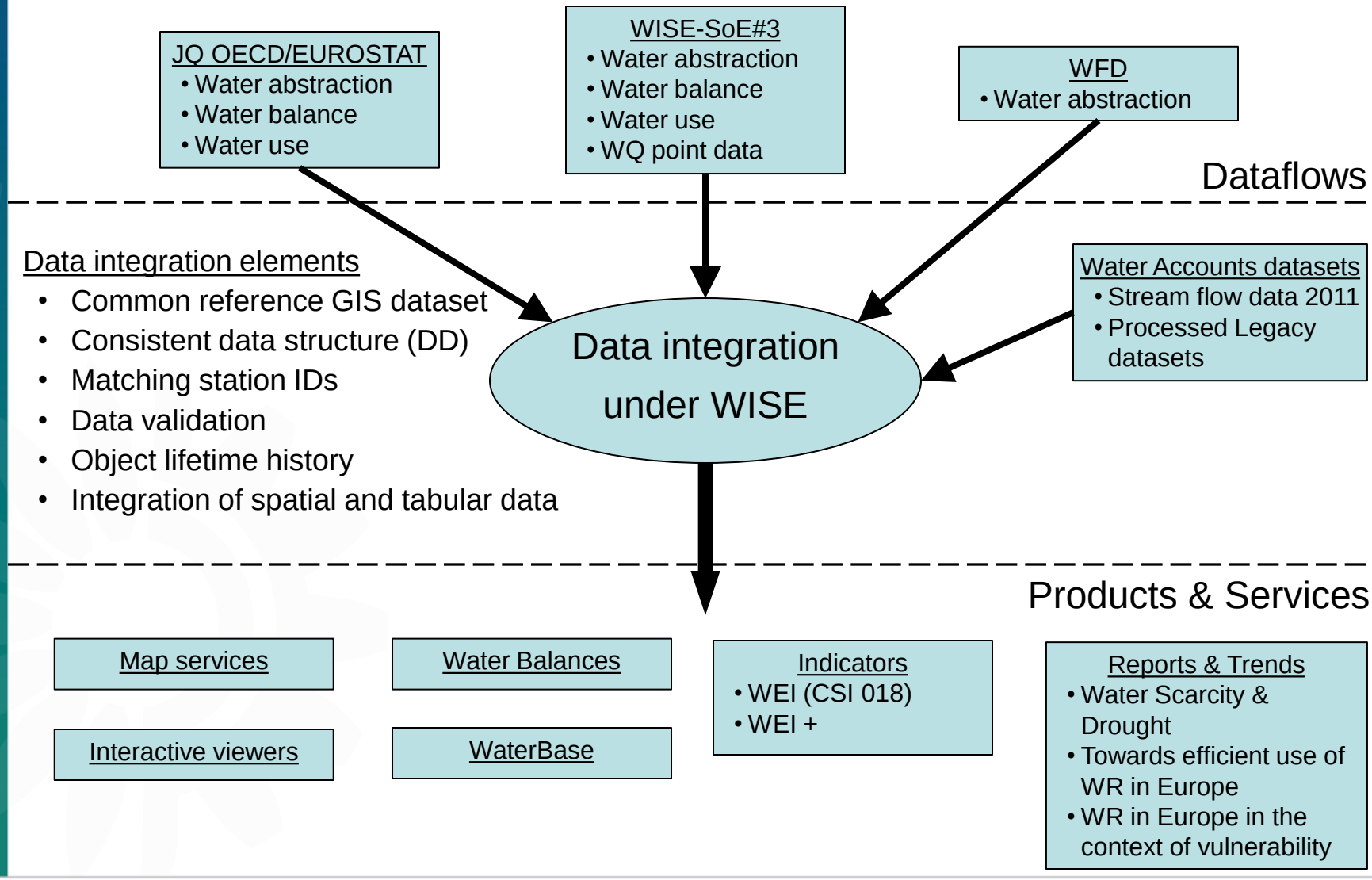
Water quantity data reporting and streamlining with Eurostat, indicators and water accounts

2013 Freshwater Eionet Workshop
19/20 September 2013, Copenhagen

George Karavokiros, ETC/ICM, NTUA

Streamlining Water Quantity dataflows



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Established water quantity dataflows

	OECD/EUROSTAT	WISE-SoE	WFD
Data categories	water abstraction, water balance, water use	water abstraction, water balance, water use	water abstraction
Spatial scale	Country (JQ), RBD, Sub-Unit, NUTS (REQ)	Country, RBD, Sub-Unit, NUTS	RBD, Sub-Unit
Reference to geographical entity	Region	Region and Point (Station)	Region
Time scale	Annual	Annual, Seasonal, Monthly, Daily	Annual, Seasonal
Data collection period	Biennially	Annually	~6 yrs (i.e. following WFD implementation schedule)
Number of quantifiable param.	131 (JQ)	186	SW: 11 GW: 8
Character	Supported by national stat. offices and EUROSTAT (specific grants also applicable)	Voluntary, using national resources, supported by EEA – ETC/ICM	Mandatory, EU-Directive
Responses 2012	35	29	27
Reporting format	MS-Excel file	XML (produced by Reporting tool)	XML (produced from MS-Access)

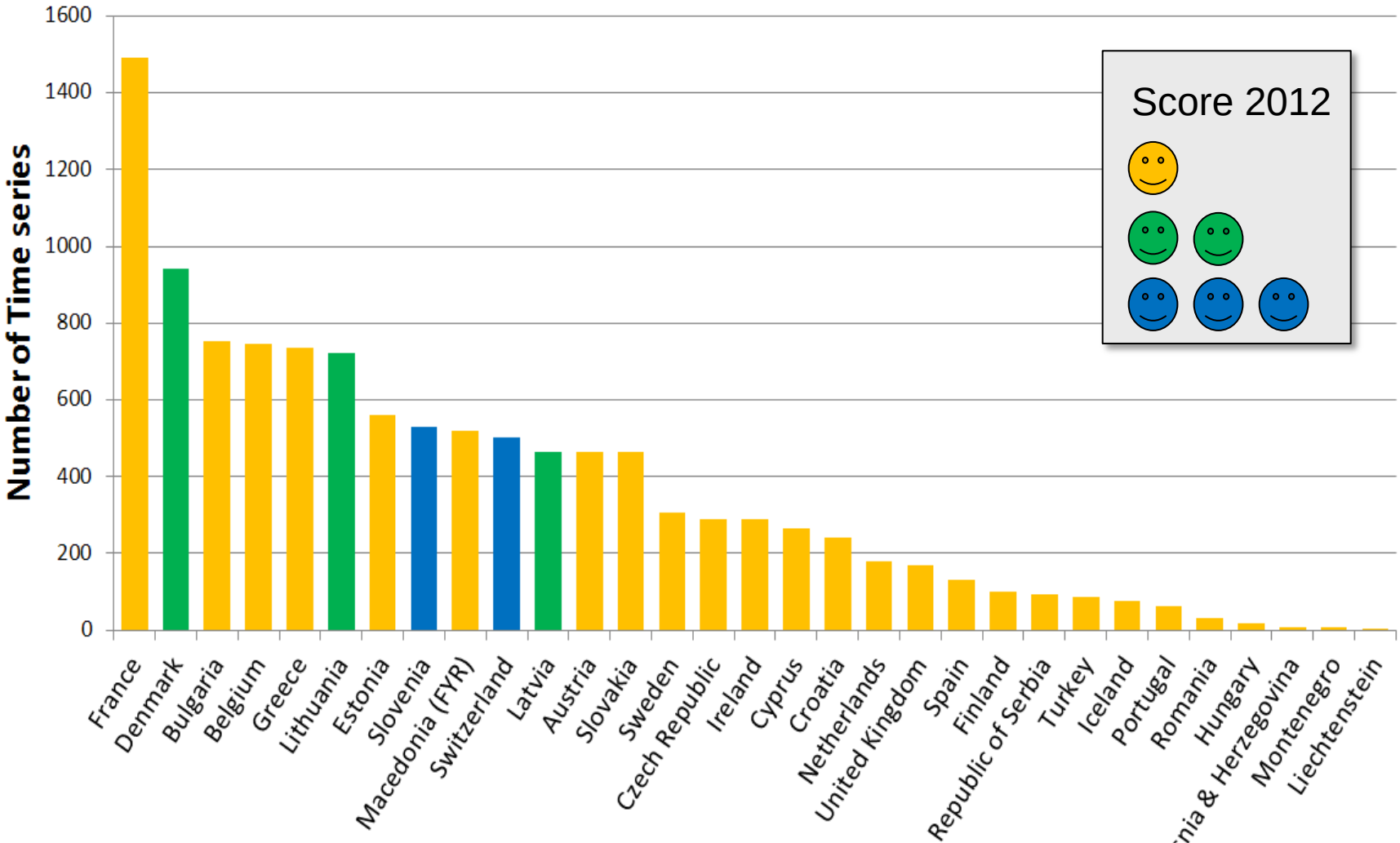
WISE-SoE dataflow

Reporting year	2009	2010	2011	2012
Geographical point entities (stations)	3 687	4 380	5 246	8 625
Total time series	3 680	5 190	8 066	11 257
Time series on geographical points	1 343	2 347	3 770	6 027
Time series on geographical areas	2 337	2 843	4 296	5 230
Total number of time series records	147 438	290 634	1 027 551	1 862 476
Total number of participating countries	17	22	26	31

Reporting issues

- Some countries focus only on specific parameters
- Data delivered not always in the specified XML format
- Poor response to the validation questions

Number of reported time series per country under WISE-SoE



Total number of all reported time series: 11257

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Complementing and enhancing the water quantity data flow to support Water Assets Accounts

- A one-off data request to support the production of **Water Balances**
- Data collection period: June-November 2011
- Various sources (excel file, text file, official websites)
- **Main goal**: Create a layer of gauging stations and their respective long time series
  - Daily stream flow data complementing and enhancing the hydrographic reference system (ECRINS)
  - Preferable reference period: the past 15 years
- **Other goals**
  - Clarify the country policy as regards to the provision of disaggregated data
  - Provide a formal agreement on using the data for enhancing the water quantity data flow
  - Declare interest and specify expectations regarding the return of experience

Stream flow stations (Water Accounts + WISE SoE)

Countries: **28**

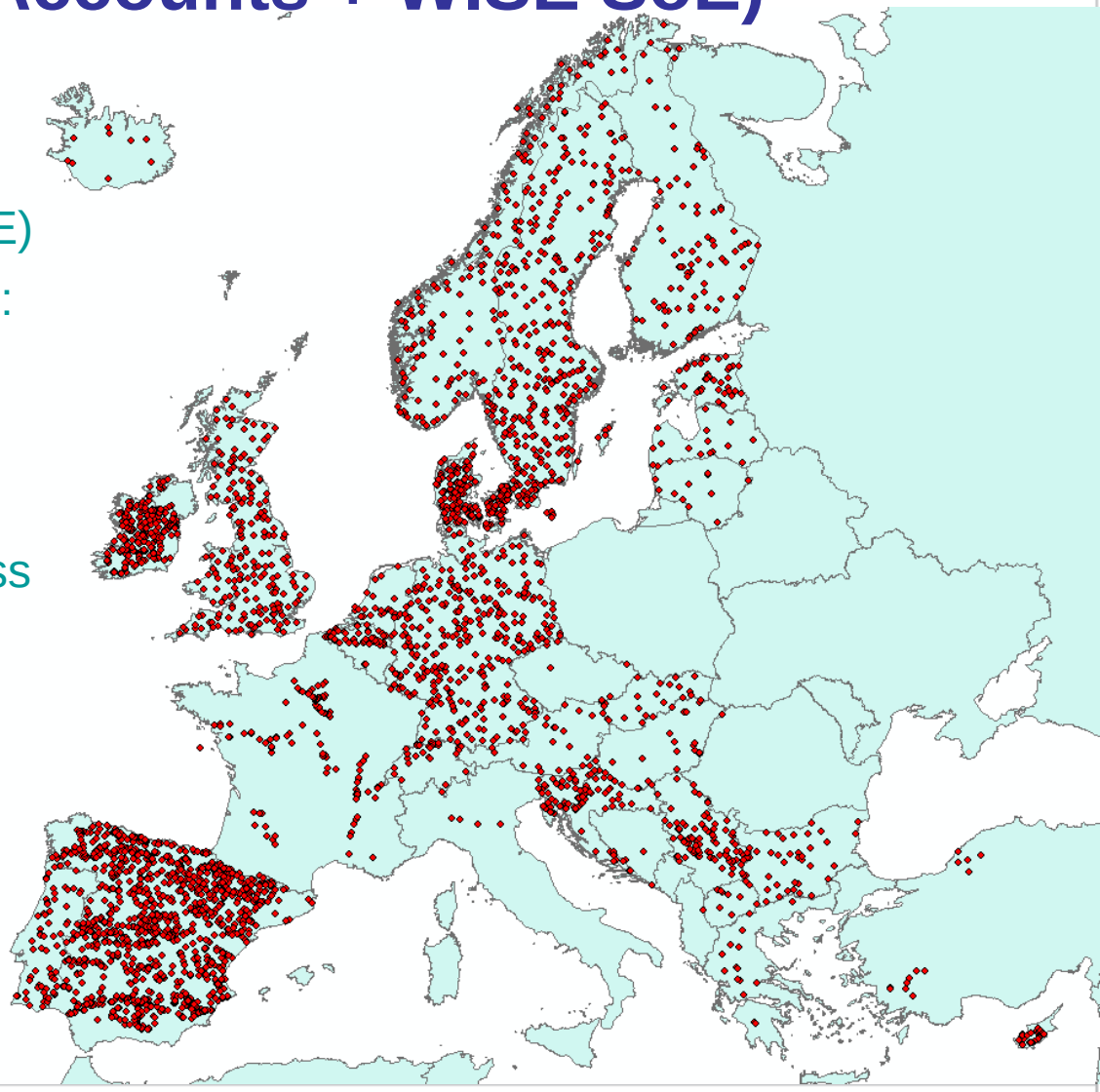
Number of stations:
3505 (2981 WA + 1013 SoE)

Number of daily time series:
2734

Number of Records:
37 507 096

Very diverse situation across Europe

- Extent and density of the measuring stations network
- Management and administration (e.g. level of centralization)
- Policy regarding publication/licensing
- Data dissemination approach
- IT infrastructure/ architecture



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Data validation under WISE-SoE Water Quantity

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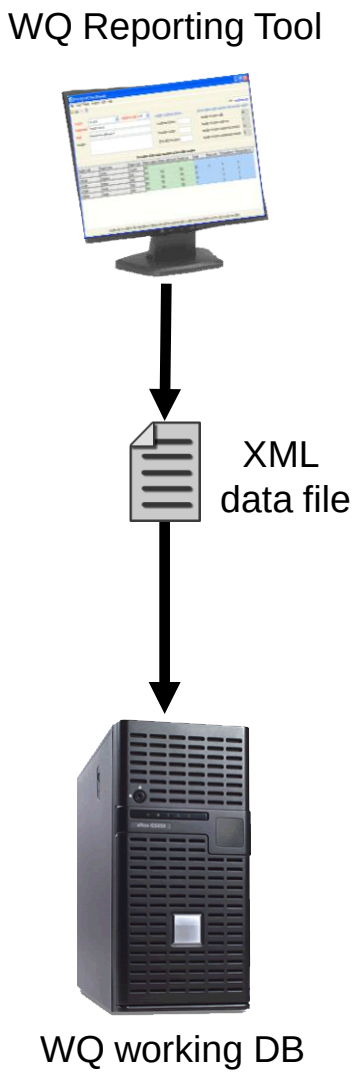
Phase 1: Early stage error detection

Potential errors instantly detected when using the WQ Reporting Tool:

- Duplicate stations or invalid codes
- Invalid data types
- Missing mandatory parameters
- Violation of logical rules
- Detection of extreme values

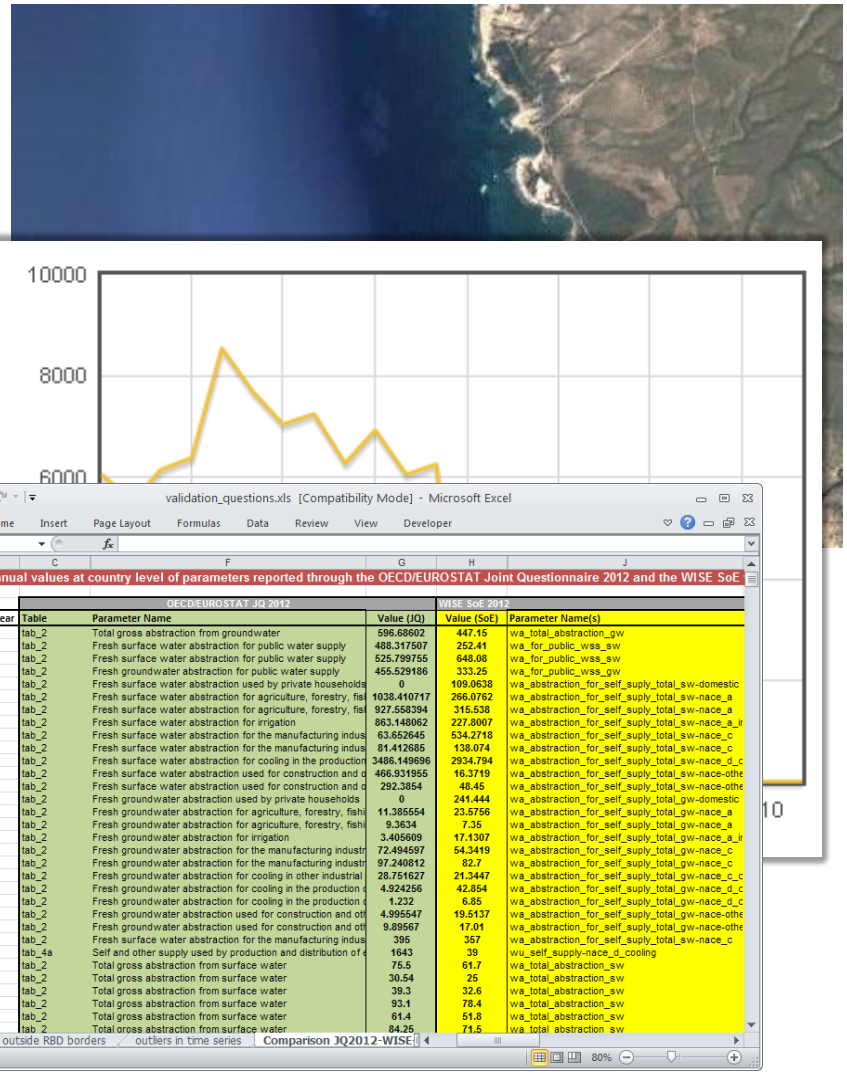


Phase 2: Database constraints

- Referential integrity (foreign key)
- Identification of entities through primary keys
- Correct data types
- Existence of mandatory data
- Uniqueness of data (e.g. IDs and codes)

Phase 3: QA procedures performed on the whole dataset

- Logical rule violations
- Displaced stations (outside the reported country's or RBD's borders)
- Outliers in time series
  - Range checks
  - Temporal consistency
- Inconsistencies between OECD/EUROSTAT Joint Questionnaire 2012 and the WISE SoE water quantity dataflow



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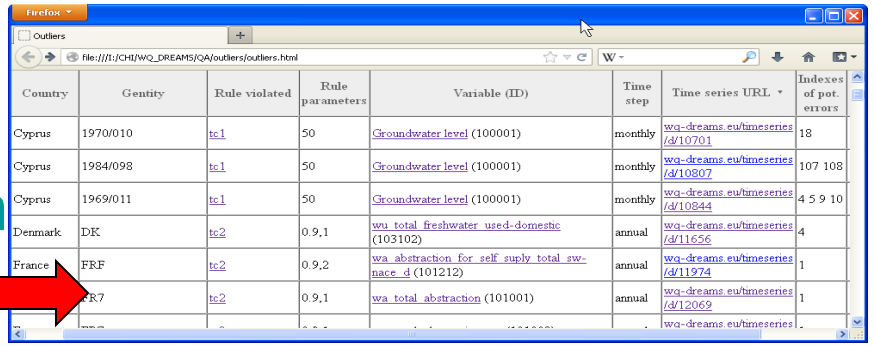
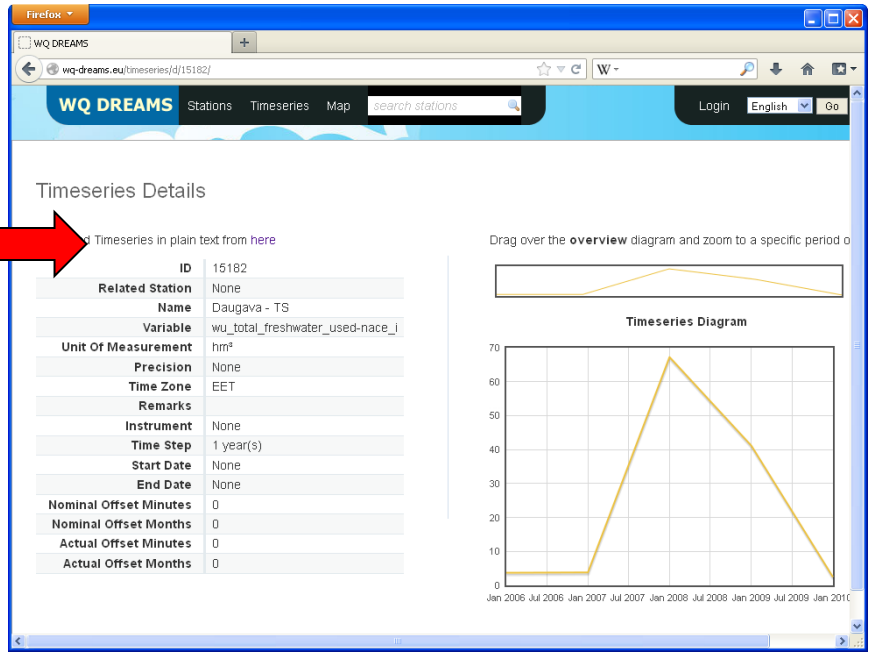
Actions in case of suspicious or erroneous data

- Contact data providers
- Exclude obvious errors from the official publication
- Flag out records with suspicious data
- Links to URLs showing suspicious time series (wq-dreams.eu)
- Formulate validation questions to the MS pointing out suspicious and erroneous time series





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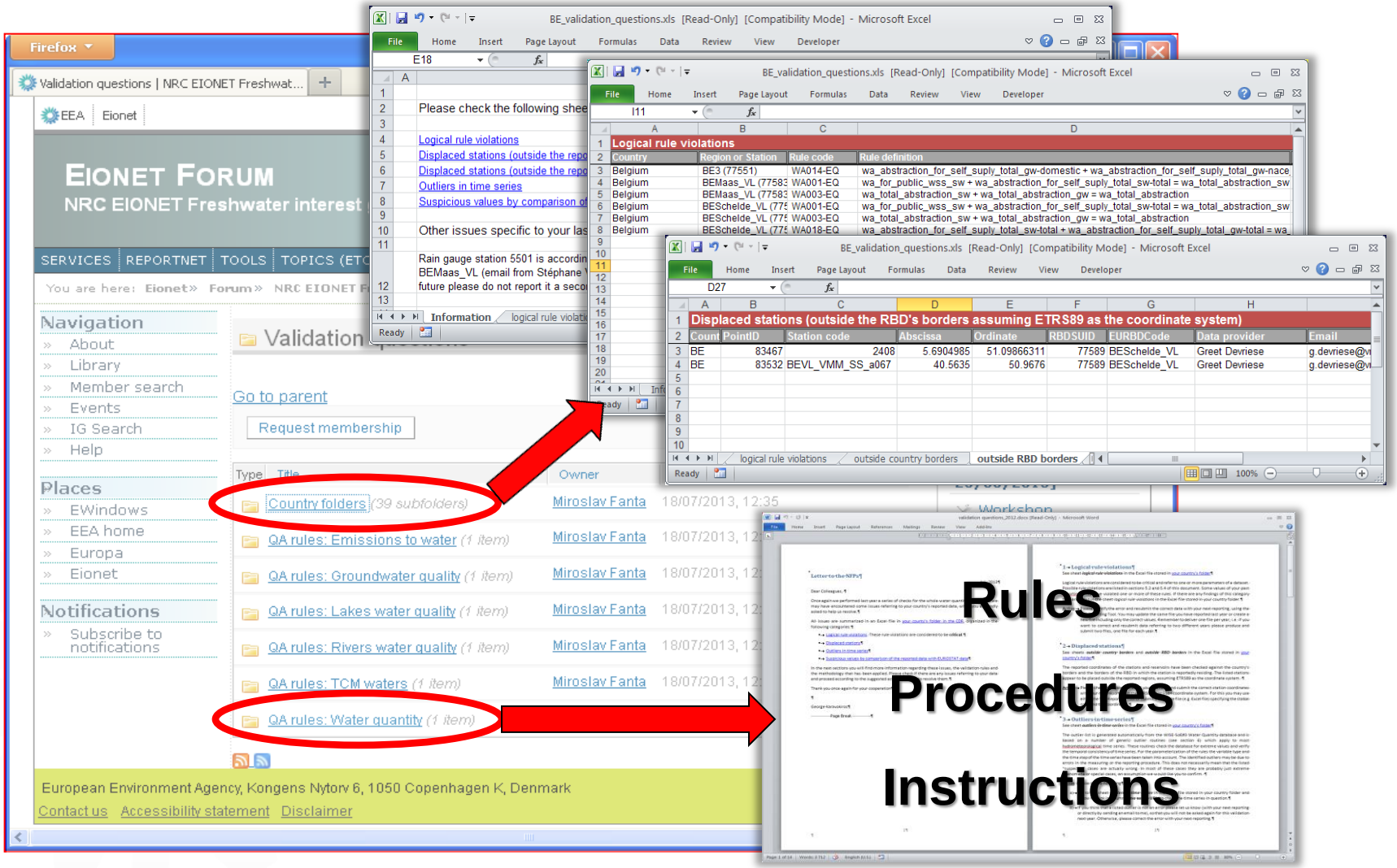
Validation questions (2/2)



http://forum.eionet.europa.eu/nrc-eionet-freshwater/library/wise-soe-reporting-2013/validation-questions/

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Pre-filling OECD/Eurostat Joint Questionnaire 2012 with WISE-SoE Water Quantity data

Milestones

- March 2011: Initial consultations between EEA-EUROSTAT
- September 2012: Delivery of WISE-SoE data (incl. 2011 data request)
- October 2012: Pre-filling the JQ2012 and the REQ2012 with WISE-SoE data
- End 2012: MS response to JQ2012 and REQ2012
- June 2013: Compilation/Validation of JQ2012 data
- July 2013: Formulation of validation questions to MS

Problems during pre-filling

- **Identification of identical parameters** in both datasets
  - 106 parameters in both datasets are identical (1:1) or identical to a combination of parameters (1:n)
  - Some parameters have similar but not identical definitions
- **Aggregation** of WISE-SoE parameter values in all available years:
  - **Spatial aggregation** from Sub-Unit to RBD (for REQ) and from RBD to Country (for JQ)
  - **Temporal aggregation** from monthly or seasonal to annual
  - **Combination** of WISE-SoE parameters to one JQ/REQ parameter
- Finally, 5242 WISE-SoE data records in total from 21 countries have been provided to EUROSTAT:
  - 1487 records at country level
  - 3755 records at RBD level

Example of Table 1 of the JQ 2012 pre-filled

INLAND WATERS

TABLE 1: Renewable freshwater resources (a)

Territory CH Switzerland Contact:

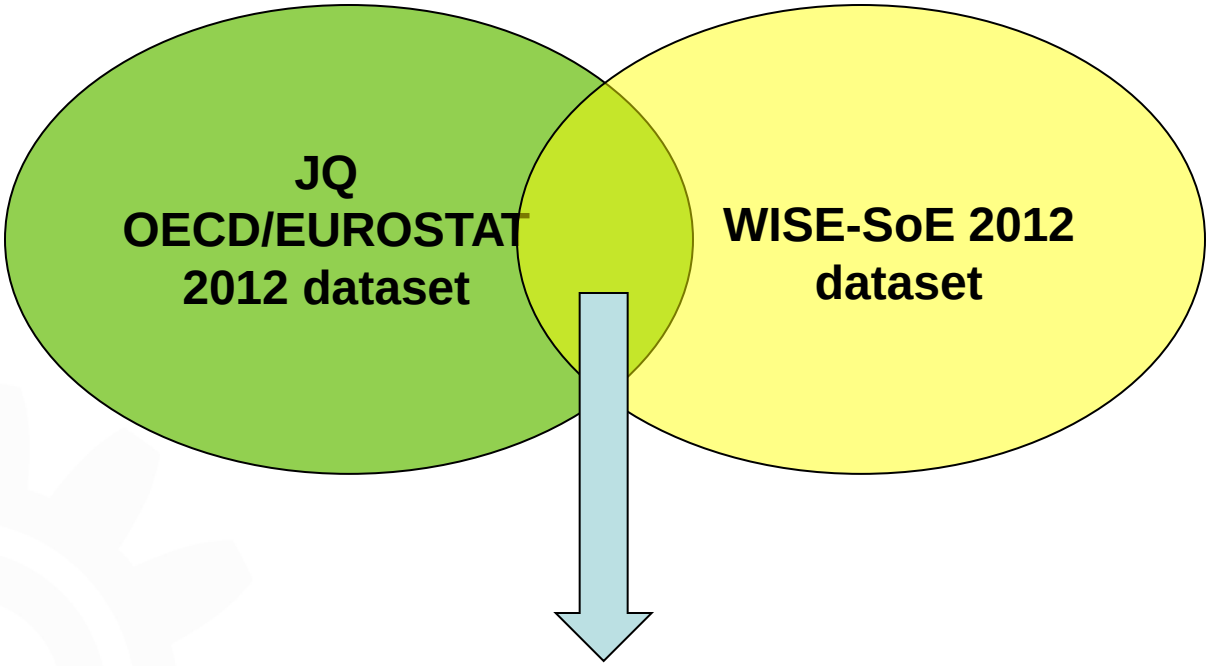
unit = (10^6 m^3)		LTAA	2011	2010	2009	2008	2007	2006
Precipitation (1)	P	61 207.00	49 767.00	59 183.00 c)	55 425.00	58 563.00 c)	63 723.00	56 696.00
Actual evapotranspiration (b) (2)	E	21 382.00	18 709.00	21 690.00 c)	17 734.00	18 729.00	24 524.00	22 325.00
Internal Flow (3)	(IF=P-E)	39 826.00	31 058.00	37 492.00 c)	37 691.00	39 834.00 c)	39 200.00	34 372.00
Actual external inflow (c) (4)	EI	12 560.00	8 823.00	10 344.00 c)	9 807.00	11 089.00	12 158.00	12 403.00
Total actual outflow (c) (5)	O	53 140.00	41 409.00	48 637.00 c)	48 926.00	51 818.00 c)	51 869.00	47 903.00
of which : - into the sea (6)	Os	0.00	0.00	0.00 c)	0.00 c)	0.00	0.00	0.00
- into neighbouring territories (7)	Ot	53 140.00	41 409.00	48 637.00 c)	48 926.00	51 818.00 c)	51 869.00	47 903.00
TOTAL RENEWABLE FRESHWATER RESOURCE	(IF+EI)	52 386.00	39 881.00	58 733.00 c)	47 498.00	50 923.00	51 358.00	46 775.00
Recharge into the Aquifer (9)		18 184.00						
Groundwater available for annual abstraction (10)		17 752.00		36 000.00 c)				
Freshwater resources 95 % of years, LTAA (11)		53 140.00						

YOUR FOOTNOTES

a) All data was reassessed and partly corrected in 2012 (see green/bold script)

c) Data reported to the EEA via the EIONET (Environment Ministries) as well as under the UWWTD.

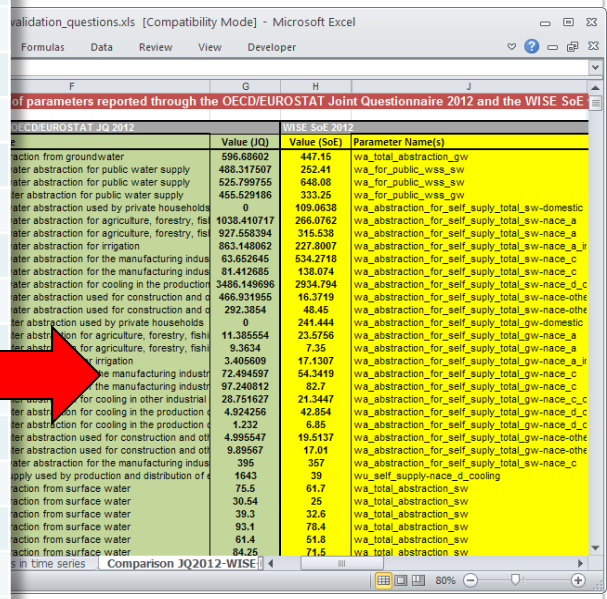
Cross-checking WISE-SoE and OECD/Eurostat dataflows



1445 records of annual water quantity parameters at country level with identical definitions in both dataflows

Difference of parameter values between the datasets SoE 2012 and JQ 2012

	identical	<1%	1%-10%	10%-50%	>50%
AT	15	2			
BA	1		1		
BG	1	4	7	9	23
CH	130	1	4	1	1
CY	89	65	38	17	7
CZ	8	7	2	6	12
DK	123	17	8	3	3
EE	16	1	1	3	11
FI	23				
FR	4	6	4		
HU	2				8
LT	98	24	20	28	77
LV	129	10	10	2	12
MK	3				4
NL	41	35	24	33	18
PT	4				1
RO	12	1	2	6	2
RS				2	1
SI	58	20	17	14	11
SK	15	7	4	6	10
Sum	772	200	142	130	201
%	**53.4**	**13.8**	**9.8**	**9.0**	**13.9**



22,9%

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Possible reasons for inconsistencies

- Same meaning of parameter definitions in both streamflows but differences in the wording may lead to confusion
- Different national agencies report the same parameters, possibly using different methodologies, measurements etc.
- Parameter definition not understood
  (e.g. systematic confusion between ETa and PET, inclusion/exclusion of cooling water and hydropower)
- Confusion in unit selection

Defining the needs of a regular dataflow for the production on Water Balances at the EU level

Policy need: Water Balances at the adequate spatiotemporal scale

Preconditions:

(a)
A dataflow that can secure the data needs at the relevant resolution

(b)
Representative Indicators capturing key messages
(i.e. on water exploitation, unmet demand, water use efficiency, etc.)

Work in progress:

- Assessment of the complementarities of the existing dataflows, identification of the data gaps which need to be bridged
- Suggestion of a targeted dataflow supporting the production of water balances (e.g. based on a simplification of the SoE#3)
- Adding/complementing with indicators to support the assessment and visualisation

Issues and questions to NRCs

Issues to be discussed

- *Review of the data validation procedure and the role of ETC/ICM and MS*
- *Reasons for inconsistencies in datasets and how to increase data quality*

Questions to NRCs

- *Why are there differences between the SoE and JQ water quantity data?*