Methodology sheet on Freshwater Quality Statistics

UNSD Environment Statistics Toolbox; Freshwater quality (Topic 1.3.2)

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Basic set of environment statistics

Methodology sheet: Topic 1.3.2 Freshwater quality

Statistics and Related Information (Bold Text - Core Set/Tier 1; Regular Text - Tier 2; Italicized Text - Tier 3)		**Category of Measurement**
a.	Nutrients and chlorophyll	
	1. **Concentration level of nitrogen**	Concentration
	2. **Concentration level of phosphorous**	Concentration
	3. Concentration level of chlorophyll A	Concentration
b.	Organic matter	
	1. **Biochemical oxygen demand (BOD)**	Concentration
	2. Chemical oxygen demand (COD)	Concentration
c.	Pathogens	
	1. **Concentration levels of faecal coliforms**	Concentration
d.	Metals (e.g., mercury, lead, nickel, arsenic, cadmium)	
	1. Concentration levels in sediment and freshwater	Concentration
	2. Concentration levels in freshwater organisms	Concentration
e.	Organic contaminants (e.g., PCBs, DDT, pesticides, furans, dioxins, phenols, radioactive waste)	
	1. Concentration levels in sediment and freshwater	Concentration
	2. Concentration levels in freshwater organisms	Concentration
f.	Physical and chemical characteristics	
	1. pH/Acidity/Alkalinity	Level
	2. Temperature	Degrees
	3. *Total suspended solids (TSS)*	Concentration
	4. Salinity	Concentration
	5. Dissolved oxygen (DO)	Concentration
g.	Plastic waste and other freshwater debris	
	1. Amount of plastic waste and other debris	Area, Mass

Other methodology sheets:
Marine water quality statistics (1.3.3),
Water resources (2.6) and Wastewater (3.2).

Diagram for discharges to water

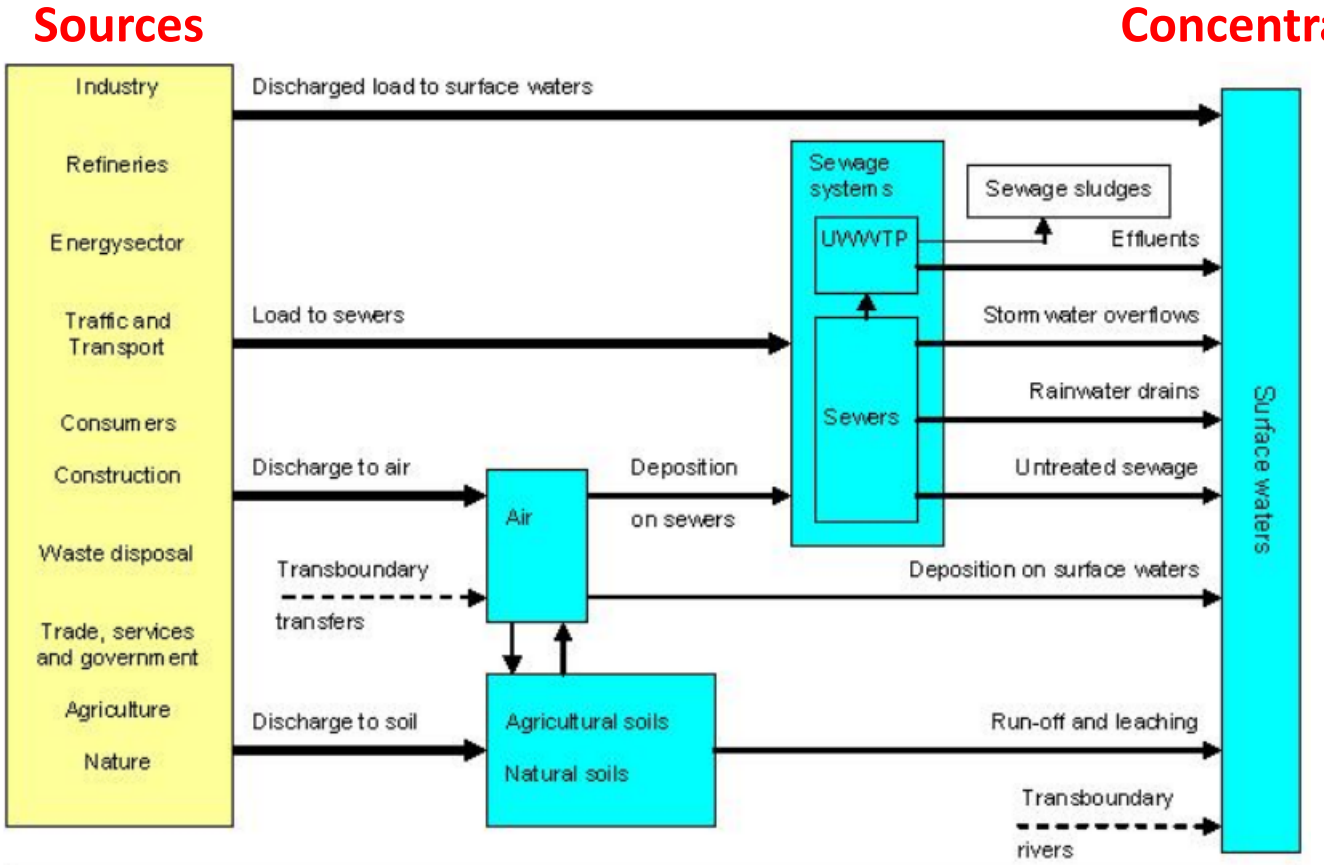
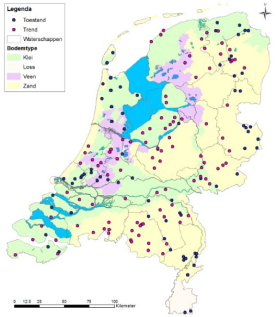


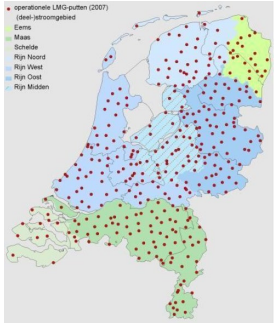
Diagram adapted from Statistics Netherlands.

Other (country) examples?

Monitoring systems



Essential elements	Statistical aspects
Data management	Metadata
Training	Trend estimations
Technology	Data validation
Network design	No random sample
Quality Management	Harmonized standards

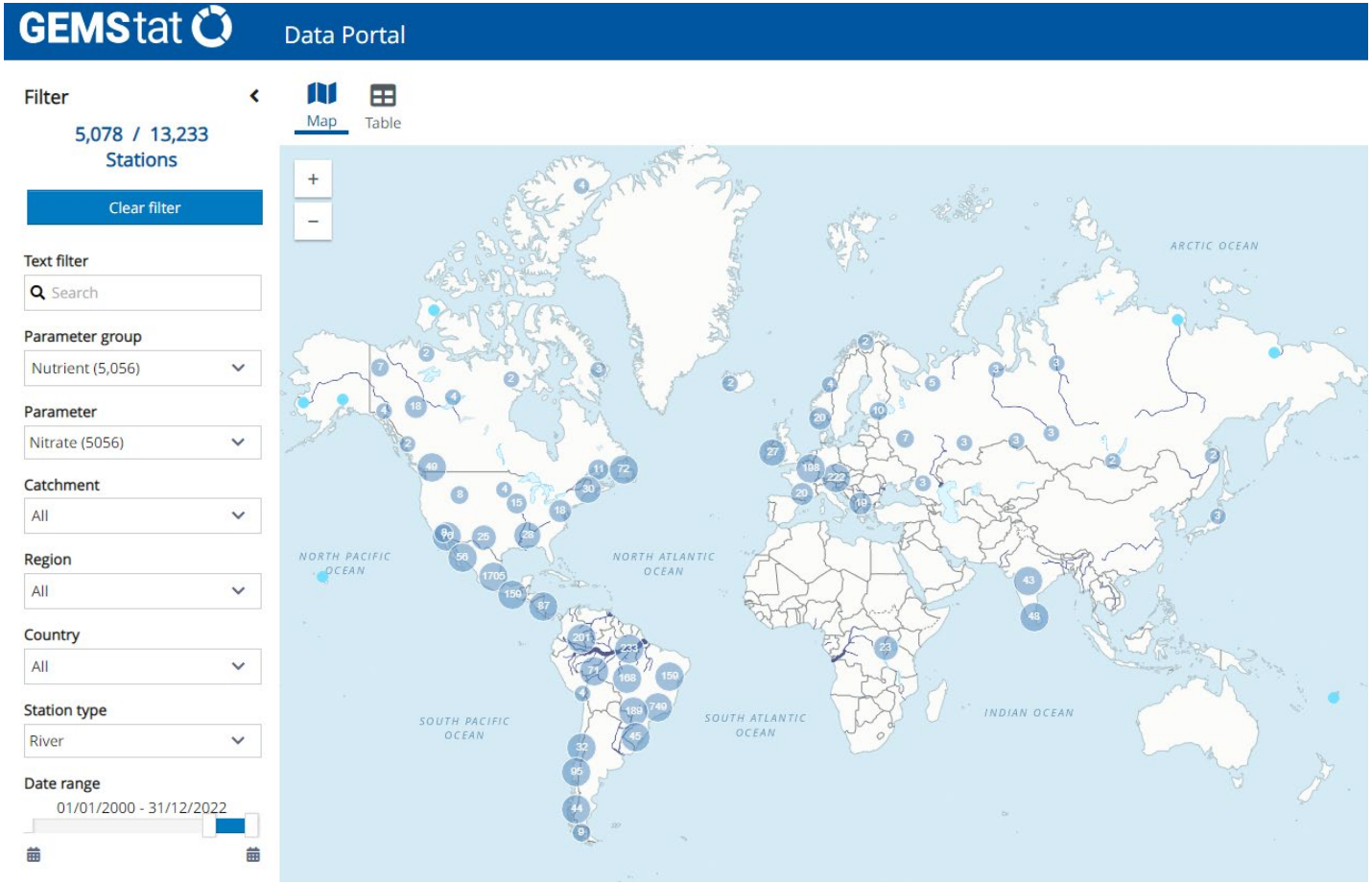


Aggregation is not trivial: Location of stations is risk-driven (dirty spots) and linked to different soil types (sand, clay, peat, …)

Sequence of data processing steps: aggregation of local data -> estimation of national trend
local trend estimations -> aggregation of trends

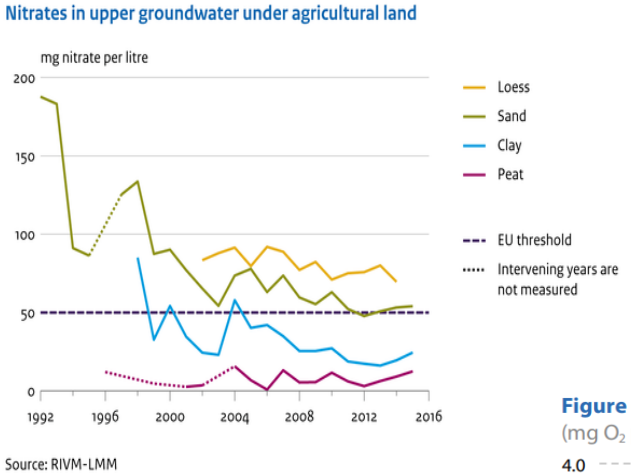
Other: Seasonal effects -> winter and summer averages, what correction method?
Different time series lengths -> all versus ‘beauties’ (at least 80% of full period)
Which trend estimation method? What output (median or average)?

UNEP: GEMStat data portal



What other data portals do exist?

Dissemination: Line charts (Nitrates in NL and BOD in EU)



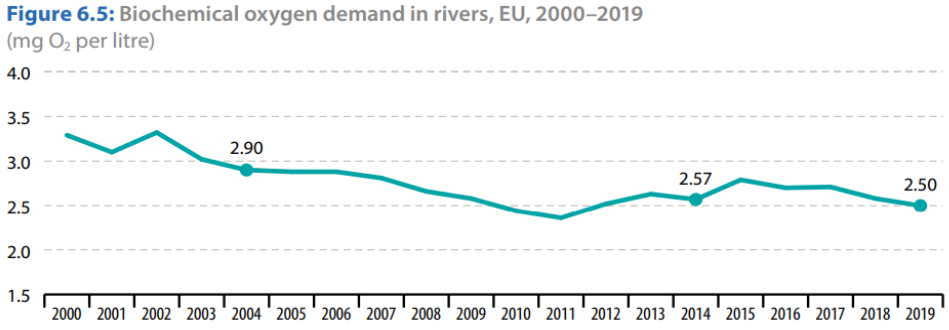
Source: RIVM-LMM

Line charts tell half of the story.

Do you dare to swim in it,
to use it or to drink it?

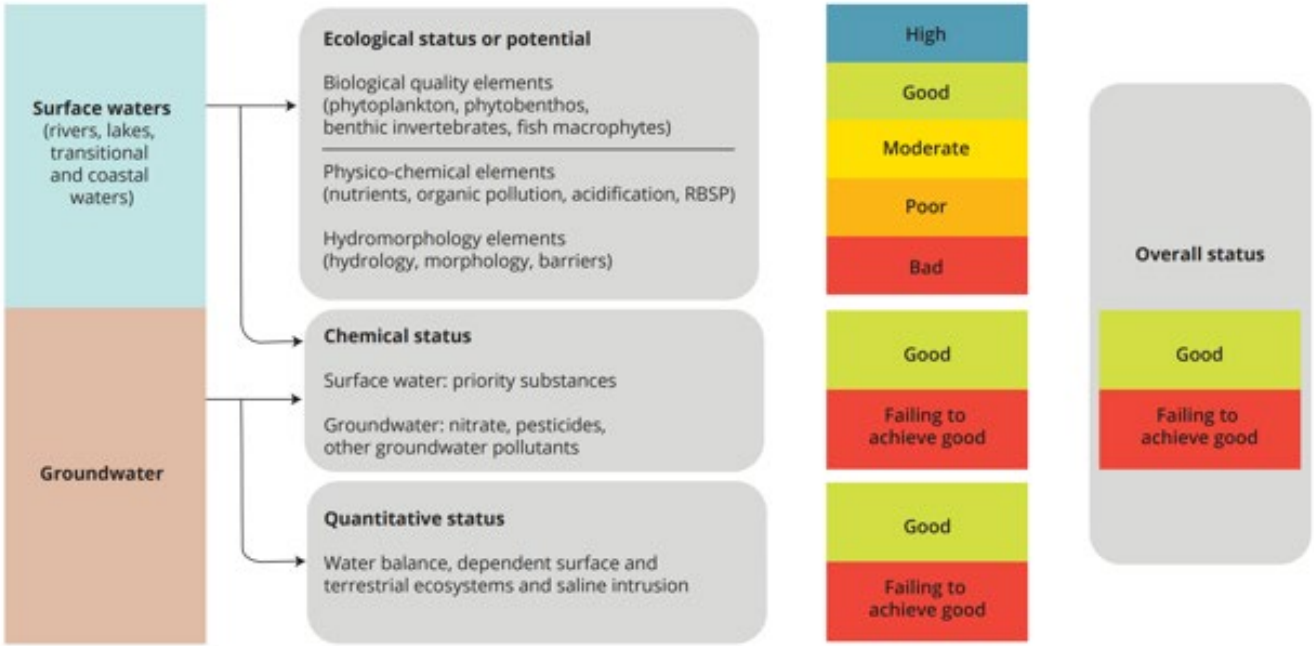
Is the water quality
GOOD or **NOT GOOD**?

Other (country) examples?



Note: 'EU' refers to an aggregate based on 18 Member States.
Compound annual growth rate (CAGR): – 1.0 % per year in the period 2004–2019; – 0.6 % per year in the period 2014–2019.
Source: EEA (Eurostat online data code: sdg_06_30)

Quality assessment; EU Water Framework Directive



Institutional setting: what mandate and which organizations, at national and international level?

Do other (country) experiences exist?

Also relevant: SDG indicator 6.3.2 Proportion of bodies of water with good ambient water quality

‘One out All out’ rule

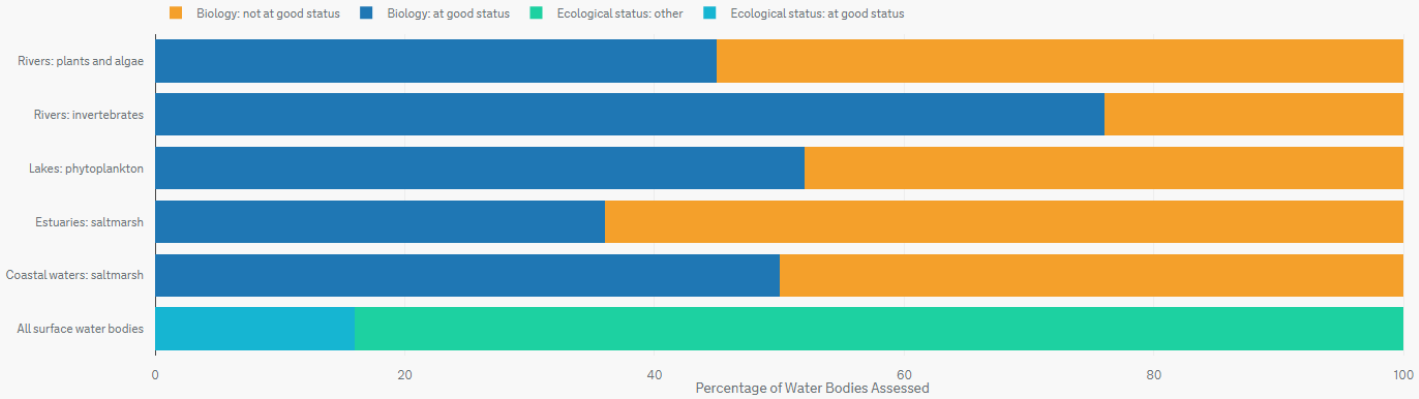
Failure of any one individual test -> whole water body fails to achieve good status

Dissemination: Bar chart (ecological quality; England)

Status of surface waters in England, 2019

This indicator takes an overview of the condition of surface water bodies in England in 2019; it relates to rivers, lakes, estuaries and coastal waters. For rivers, invertebrates and the combined test for macrophytes and phytobenthos (plants and algae) are reported to indicate biological quality, where 76% and 45% of tests carried out passed for the water bodies assessed respectively. For lakes, the representative biological element shown is phytoplankton with 52% of water bodies assessed passing. Saltmarsh is shown for estuaries and coasts and reflects the extent of habitat and show 36% and 50% of water bodies monitored, pass the test respectively.

Other country examples?

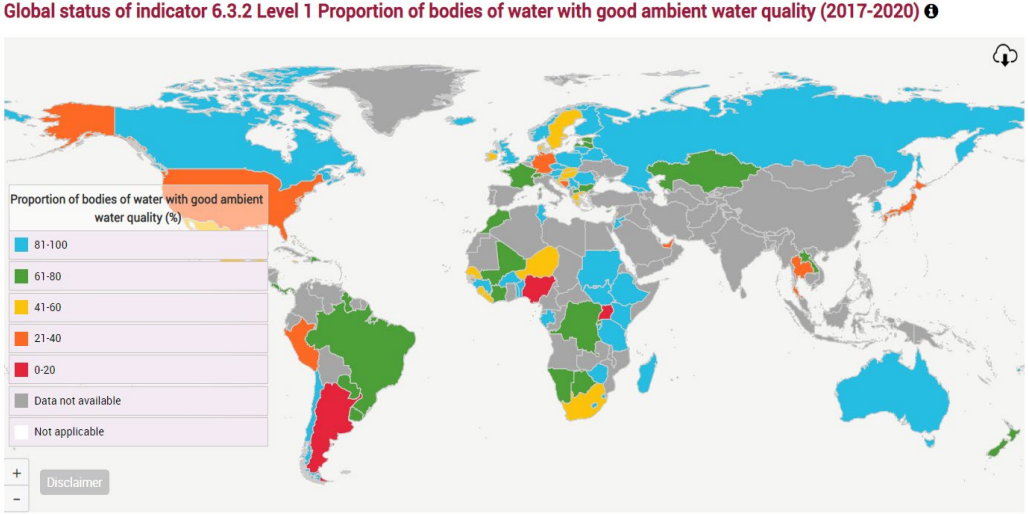


Source: Department for Environment, Food & Rural Affairs

. Results are based on the numbers of water bodies assessed and represent the achievement of good or better status. Ecological status is assigned using various water, habitat and biological quality tests. Failure of any one individual test means that the whole water body fails to achieve good or better ecological status (the “one out all out” rule).

Dissemination: color-coded maps (ecological and SDG 6.3.2)

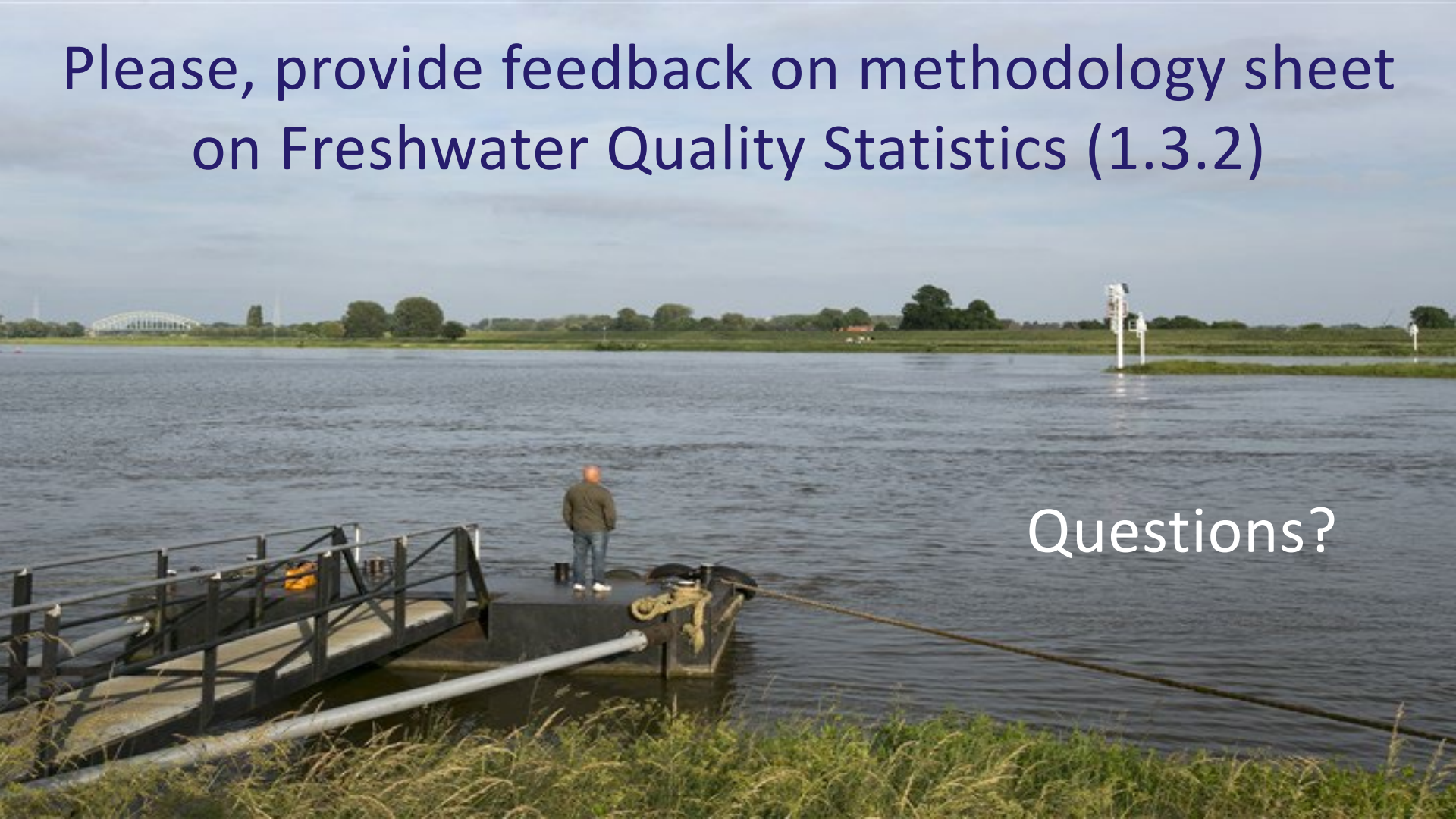
‘One out All out’ rule:
No **GOOD** in NL.



Other examples?

Is data consistent: at local, national, regional and global level?

Please, provide feedback on methodology sheet on Freshwater Quality Statistics (1.3.2)



Questions?