



# Water quality, nutrient budgets

UNSD Environment Statistics Toolbox; Freshwater quality (Topic 1.3.2)

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# Basic set of environment statistics

[hyperlink to manual](#)

## Topic 1.3.2 Freshwater quality

### Tier 1 Concentration of:

a.1	Nutrients	Nitrogen
a.2	Nutrients	Phosphorous
b.1	Organic matter	Biochemical oxygen demand (BOD)
c.1	Pathogens	Faecal coliforms

Tier 2 11 statistics

Tier 3 1 statistic

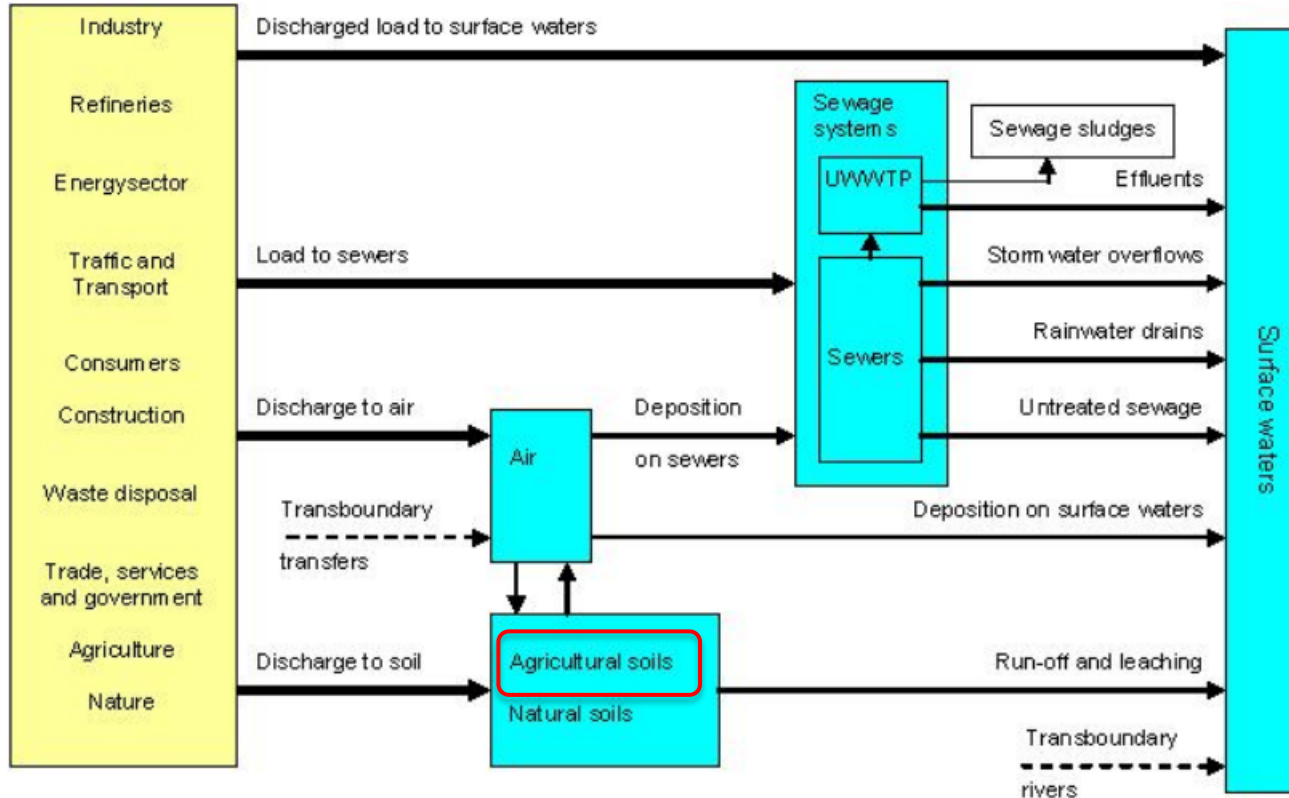
Linked to: soils (1.1.4), crops (2.5.3), livestock (2.5.4) -> **nutrient budgets**  
air quality (1.3.1), marine water quality (1.3.3), water resources (2.6)  
generation and management of wastewater (3.2)



# Diagram for discharges to water

Sources

Concentrations

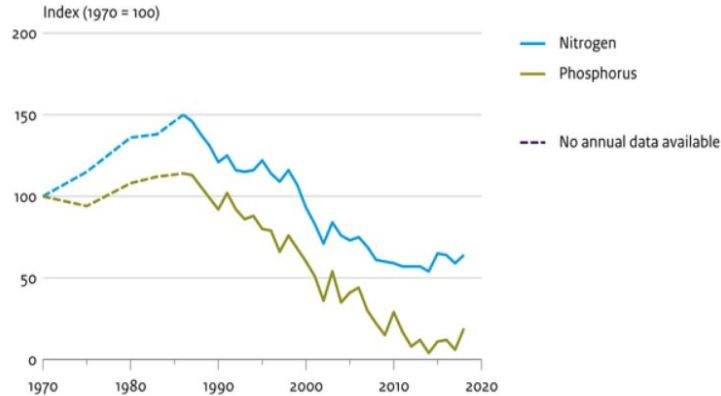


[Hyperlink to explanation of this scheme \(in English\)](#)



# Statistics; nutrient budgets

## Nutrient surpluses in agriculture

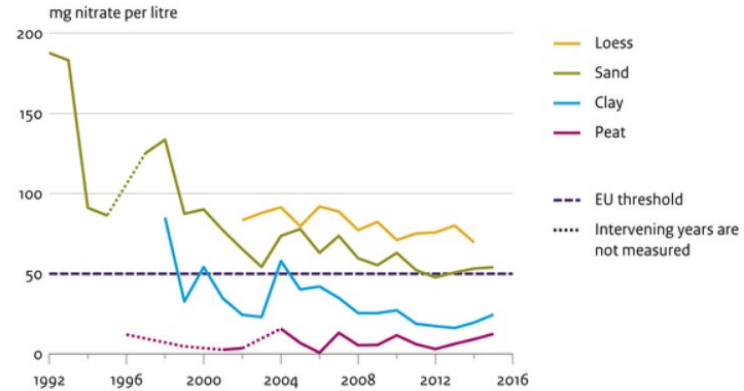


Source: CBS

CBS/febzo  
www.clo.nl/en009619

# Measured concentrations

## Nitrates in upper groundwater under agricultural land



Source: RIVM-LMM

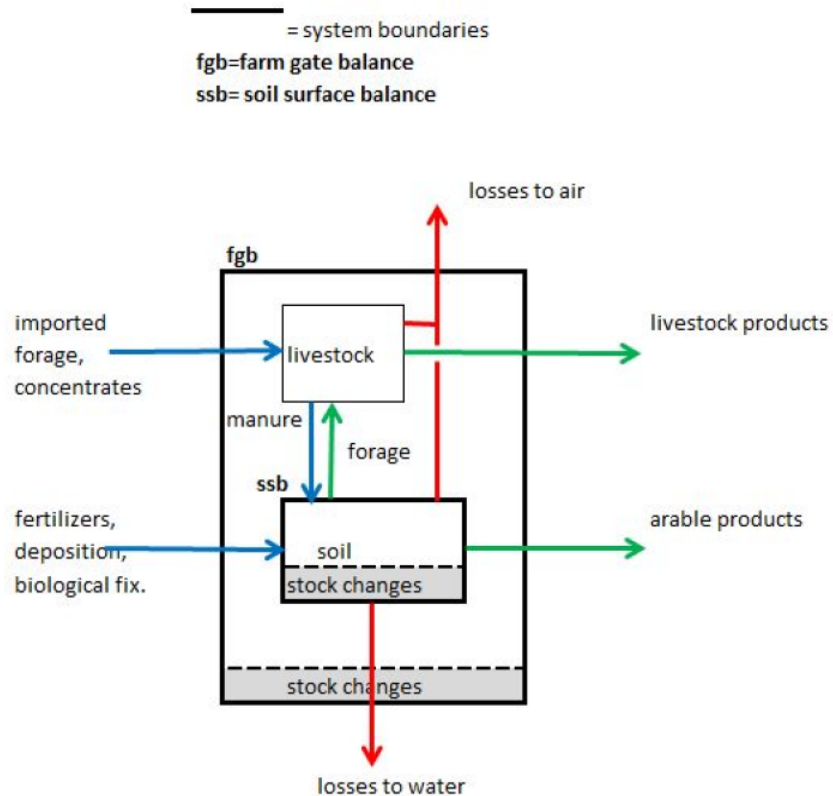
PBL/aug16  
www.clo.nl/en027110

[Hyperlink \(in English\)](#)

[Hyperlink \(in English\)](#)  
[More recent data \(in Dutch\)](#)



# Nutrient budgets (N and P); Agriculture



Outcomes may vary due to:

- 1) different system boundaries
- 2) inclusion or exclusion of specific input and output terms
- 3) adopting different numerical values (coefficients) for these terms

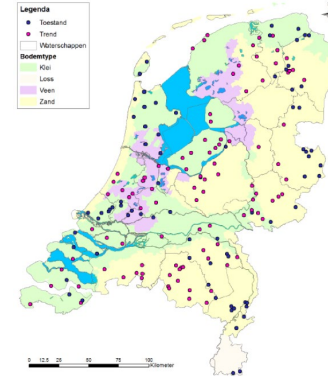
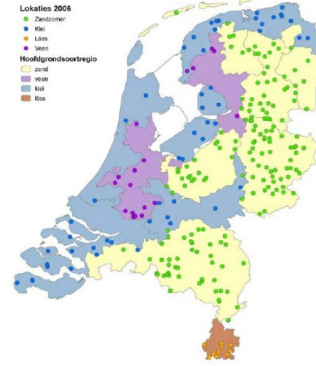
Harmonisation is needed. It is strongly advised to set up a national expert panel.

[Hyperlink: EU grant report on NL expert panel](#)

It is not easy to calculate the losses to groundwater and surface water from the nutrient surpluses (= inputs minus outputs; soil surface balance).



# Measurement systems; Freshwater quality



## Measurement locations

Upper left: surface water,  
linked to Farm Accountancy  
Data Network (FADN)

Upper right: surface water,  
only source is agriculture

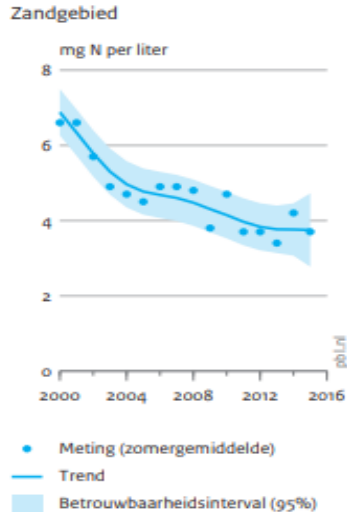
Lower left: groundwater



# Same measurement data -> different conclusions?

## Downward trend

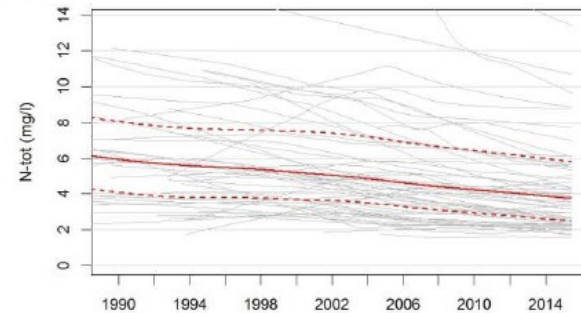
### Stabilisation



Bron: Deltares; bewerking PBL

### No stabilisation

#### N-totaal zand



### Four differences:

- Used trend method
- Average <-> Median
- Accuracy margin
- Aggregation local data

### Also:

Presentation of the results is completely different!



# Concluding remarks

Freshwater quality (Topic 1.3.2) involves both statistics (like nutrient budgets) and concentration measurements. Statistics are needed to connect (economic) activities to what is measured.

It is essential to use the expertise from the different stakeholders. Expert panels are needed to set up/improve the statistics in a harmonised way.

Concentration measurements are done at several research institutes or water quality monitoring stations, and normally not at statistical offices. However, expertise of statistical offices may be needed, in entire data flow, in order to present the measurement data in a statistically sound way.

