



VLAAMSE MILIEUMAATSCHAPPIJ

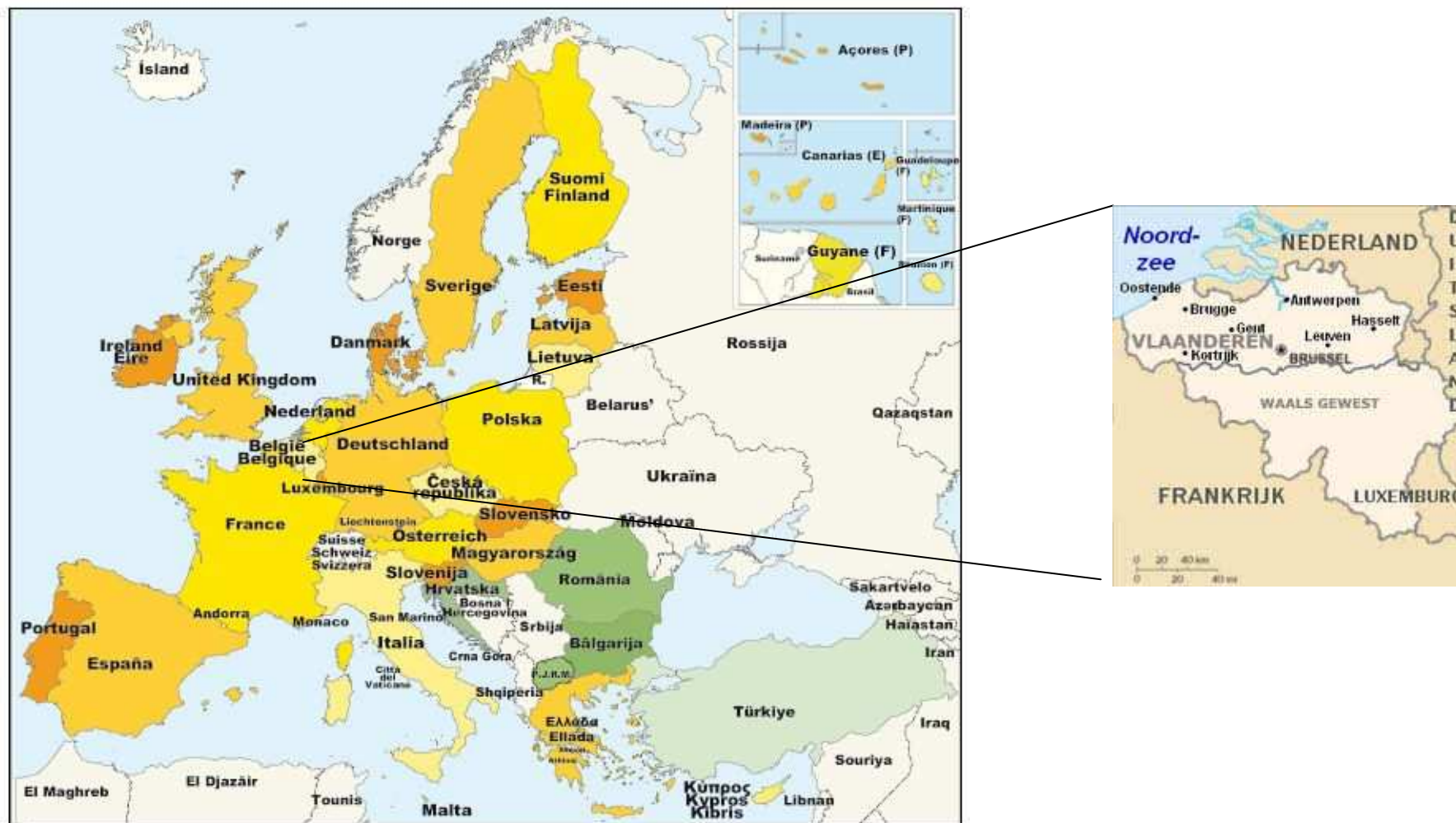
Sediment characterisation in Flanders (Belgium) using the Triad approach

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- Definitions, research & milestones
- Monitoring Quality Network: why – how
- Triad-approach
- D-base – Geoview – mapping
- SQC

Belgium and Flanders in Europe

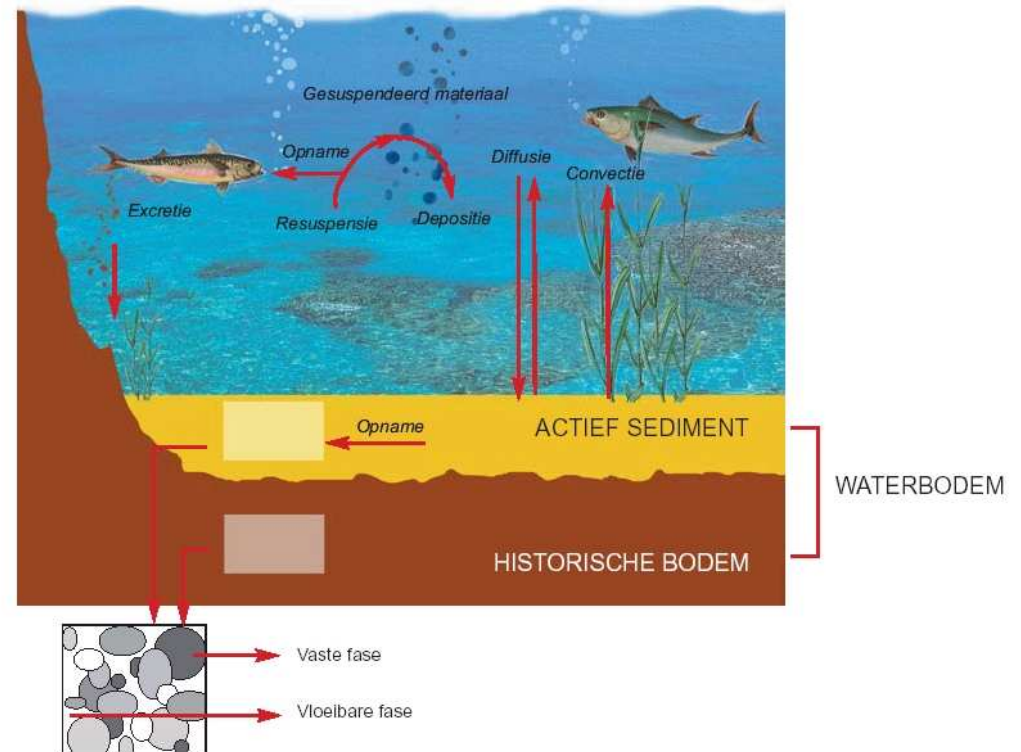


Organisation chart

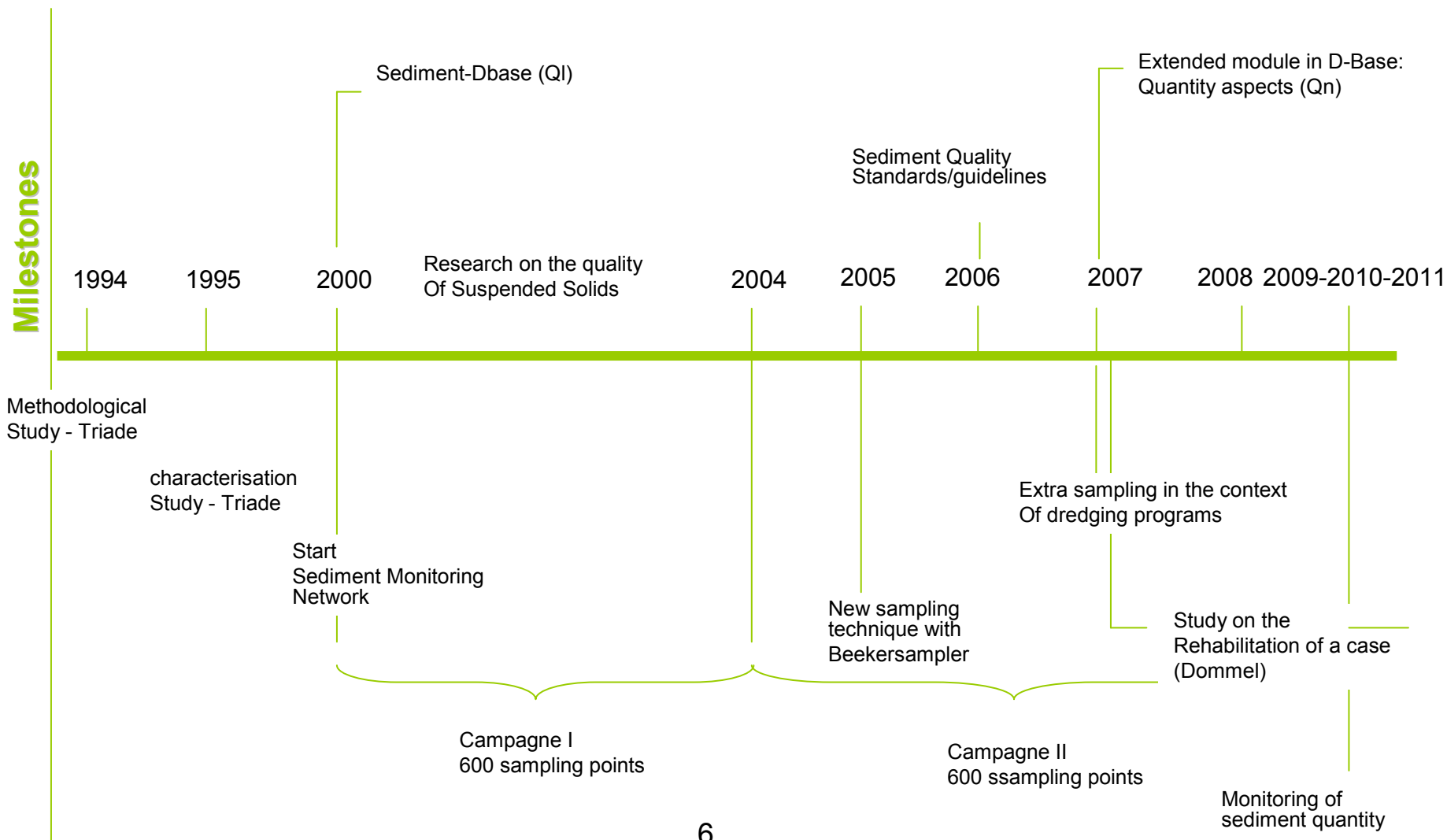


Definitions sediment

- **Natural sediment:**
 - part of aquatic ecosystem underneath sedimentlayer, or the ecological soil of the region (sand, clay, loam)
- **Sediment (active layer):**
 - disposed suspended sediments (sedimentlayer).



Milestones of the last 17 years



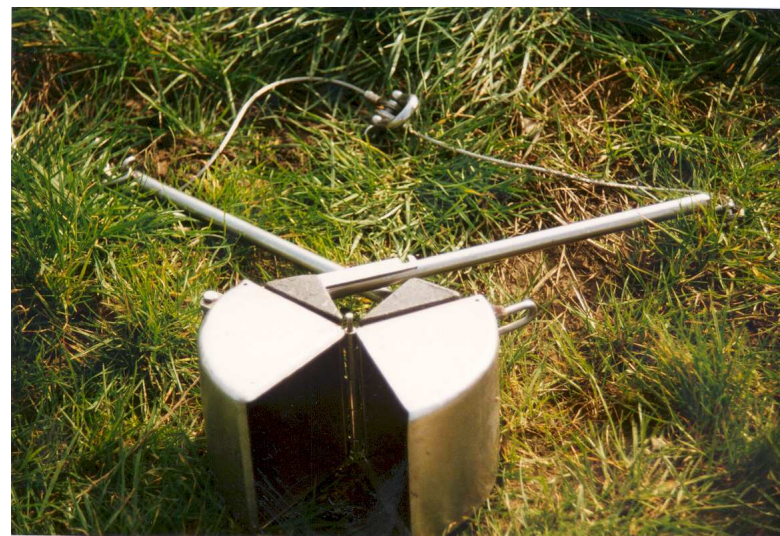
Why monitoring??

- Collecting abiotic and biotic information of the aquatic ecosystem
- Sediment quality/quantity inventory with respect to
 - integrated water management
 - sediment policy
 - international reporting of sediment quality
- Reporting sediment quality/Quantity (on maps)
- Assessment changes before and after dredging programs
- Evaluation environmental policy

Sediment quality/quantity inventory Sampling



- **Van Veen grab sampler (2 liter/6 liter)**
- **Zig zag sampling in 50 meter zones or stratified ad random sampling**
- **20-70 subsamples**
- **Mixed sample : ~40 à 50 liter**







TRIAD approach

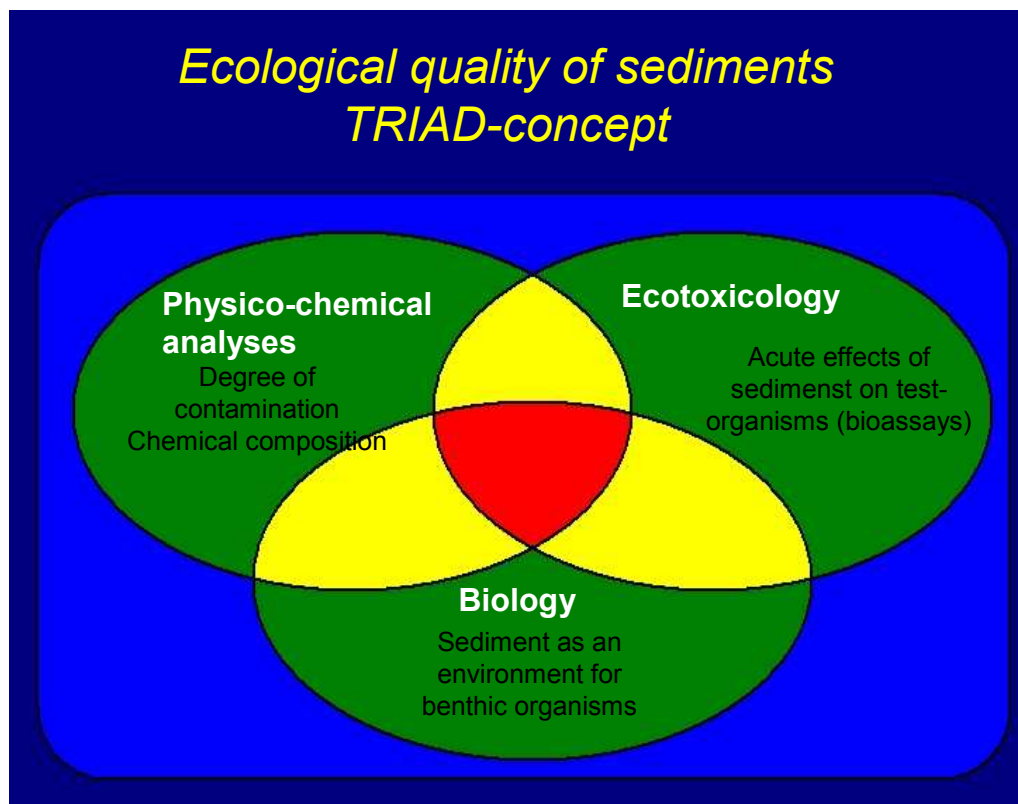
- Fysico-chemical analyses
 - chemical content
 - but: bioavailability or effects
- Ecotoxicological analyses:
 - effects
 - but: extrapolation to field conditions
- Biological analyses:
 - effects on in situ benthic community
 - but: effects of other ecological factors

TRIAD-approach

Physico-chemical parameters:

Fractions,
Organic matter,
Mineral oil,
Heavy metals,
OCP's,
PAH's,
PCB's.

Ecological quality of sediments TRIAD-concept



Ecotoxicological parameters:

Solid-phase test:

- *Hyalella azteca*



Liquid-phase test:

- *Raphidocelis subcapitata*



Liquid-phase test:

- *Thamnocephalus platyurus*



Biological parameter:

Benthic macro-invertebrates



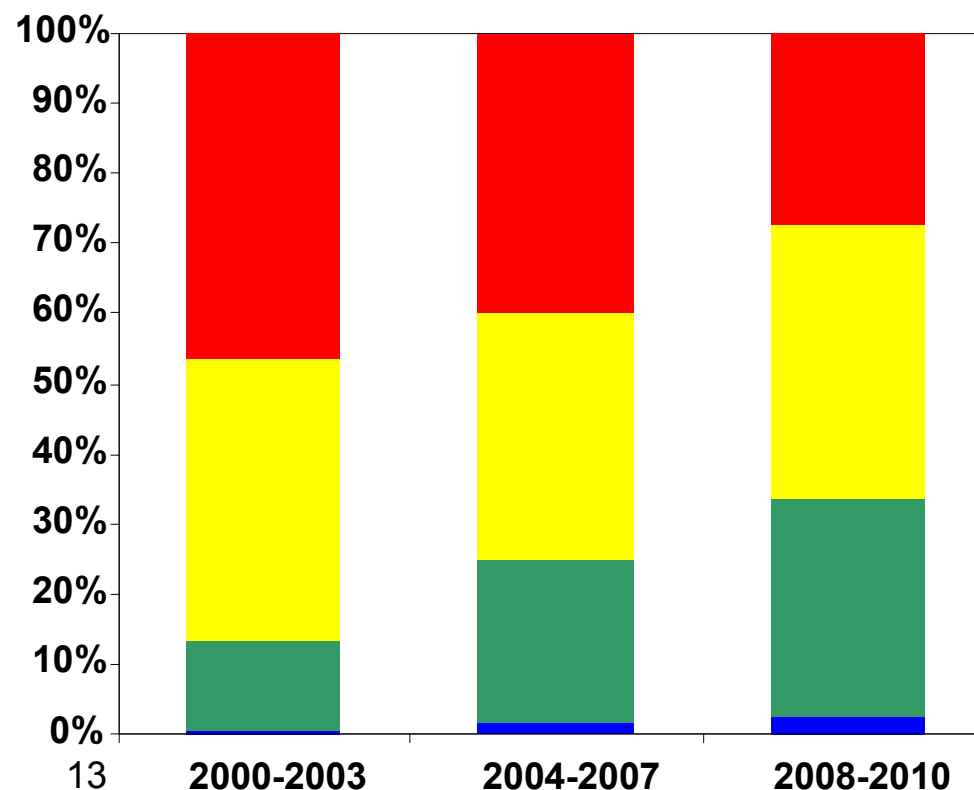
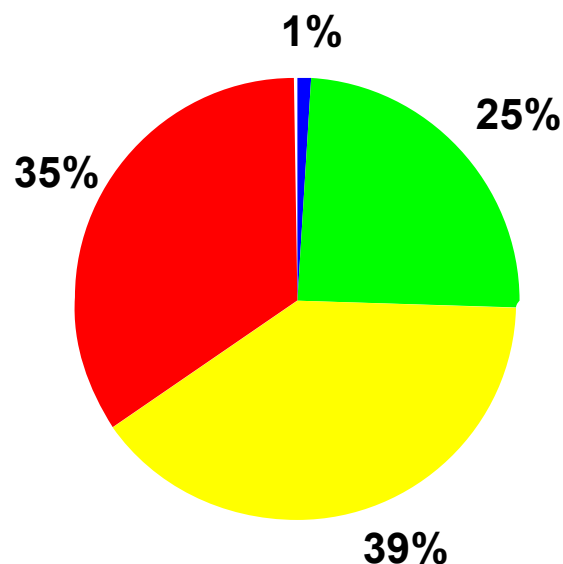
Biotic Sediment index (BSI): presence of indicator organisms and taxonomic diversity



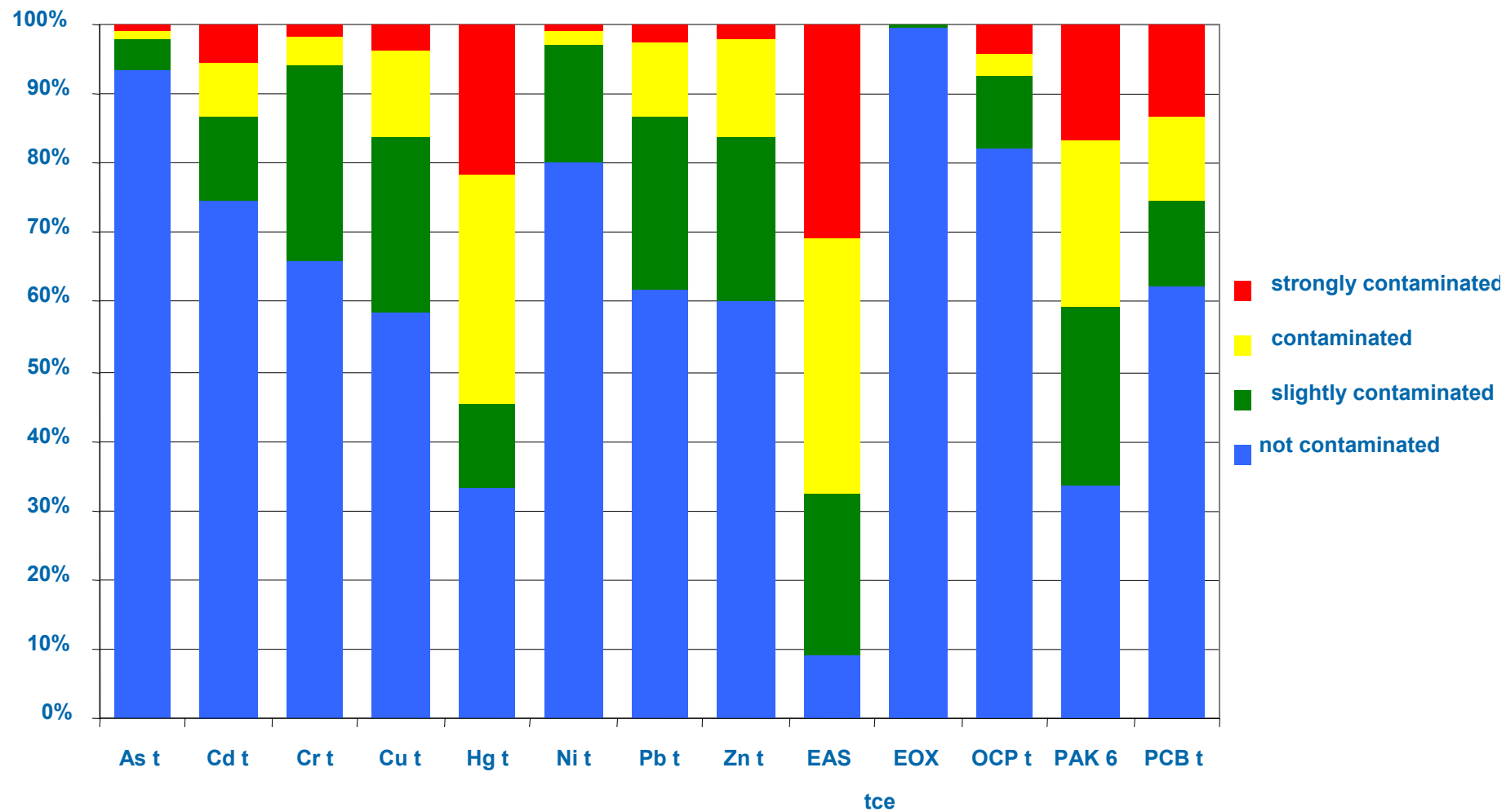
Ecological characterisation of sediments in Flanders

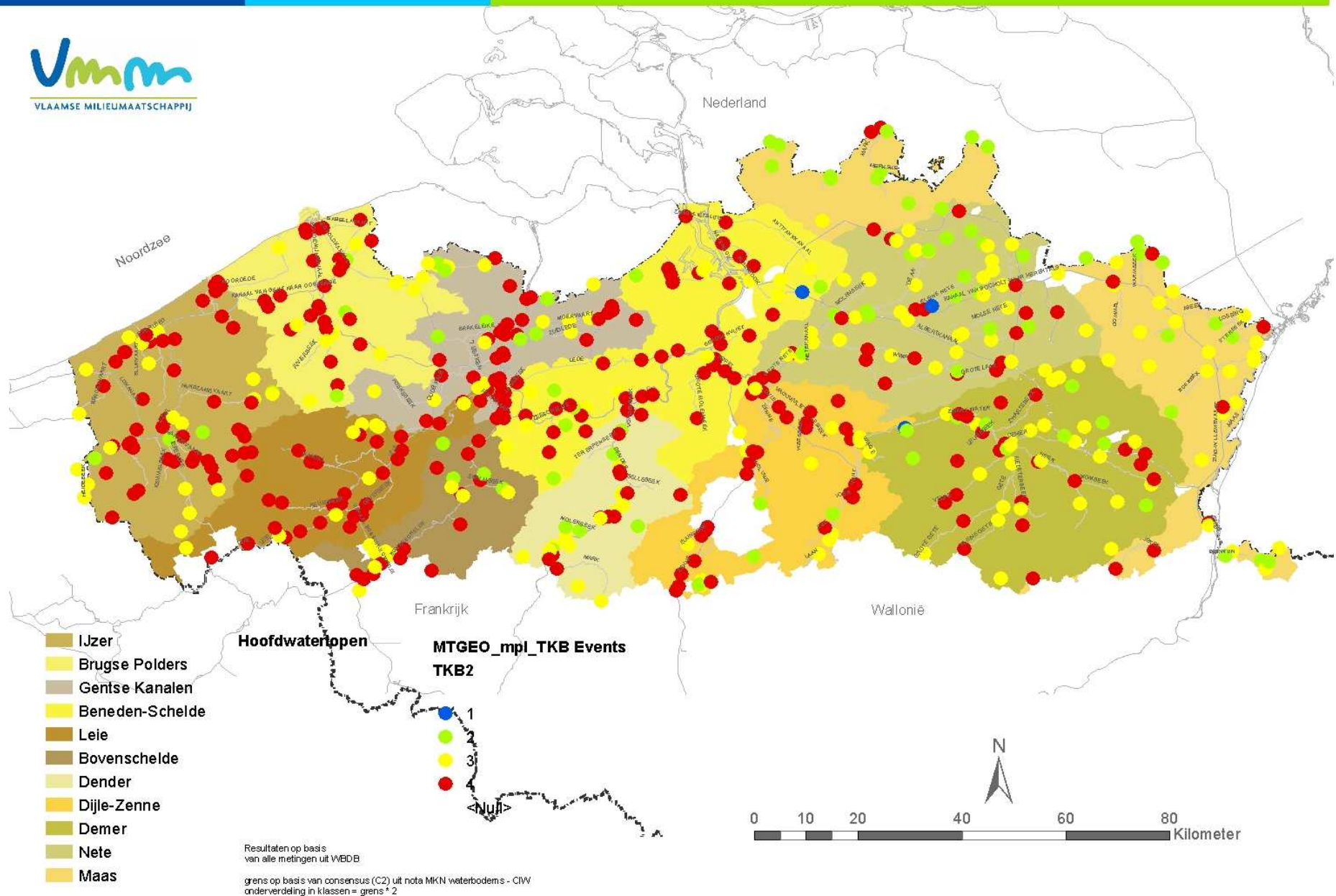
Integrated results

**Triad Assessment of 600 points
(2006-2010)**

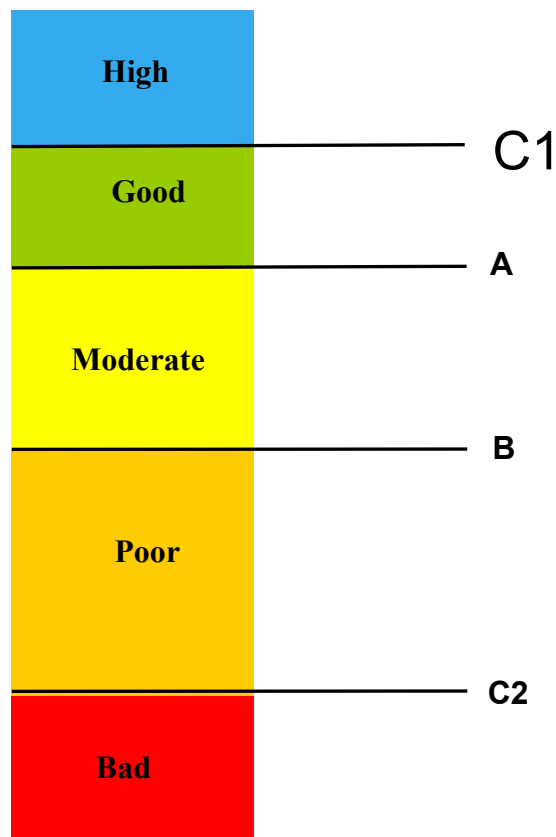


Fysico-chemical assessment





Sediment Quality Criteria



Consensus between:

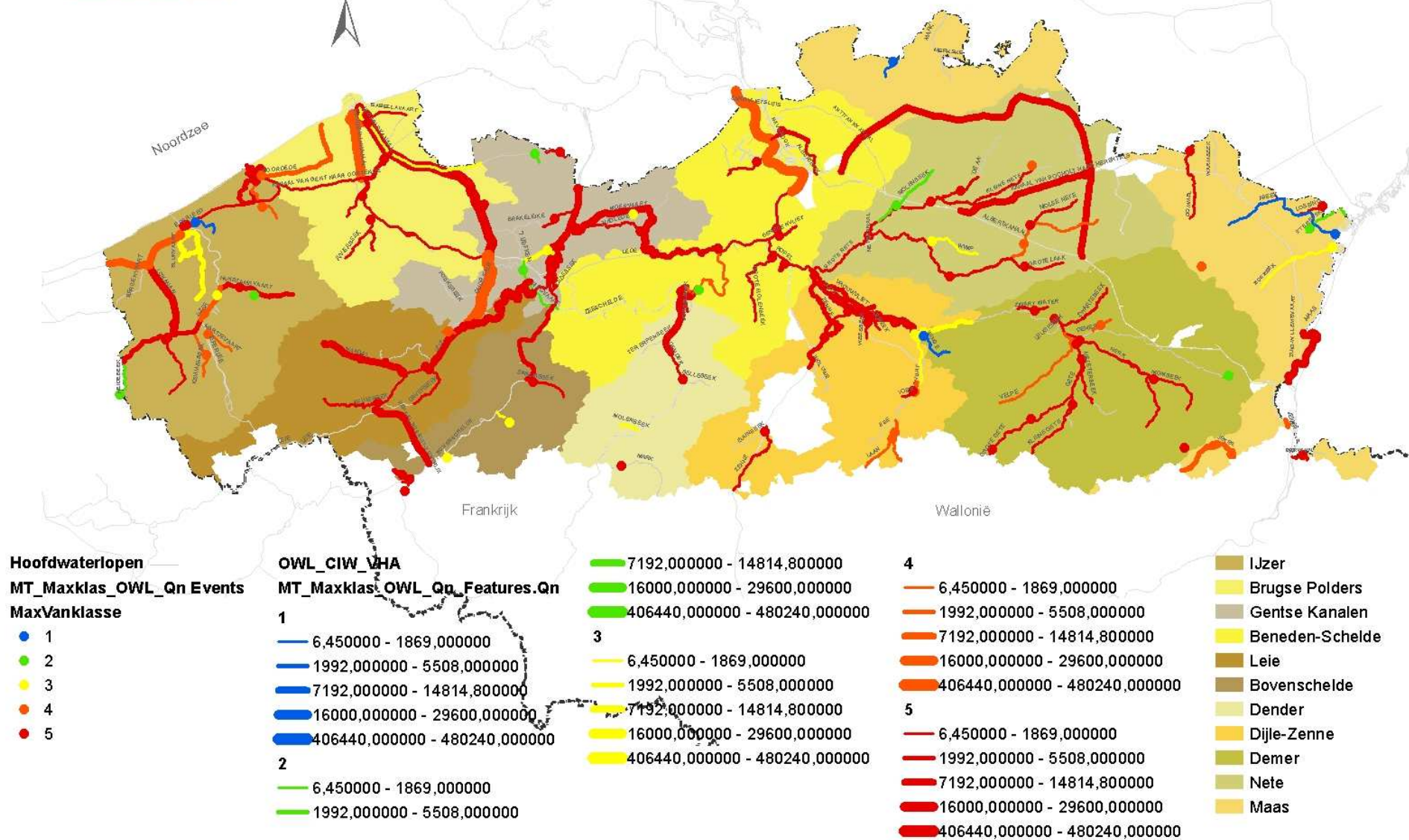
biological abundances
(LEL and SEL)

ecotoxicological thresholds
(TEL and PEL)



Nederland

0 10 20 40 60 80 Kilometer



Questions?

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