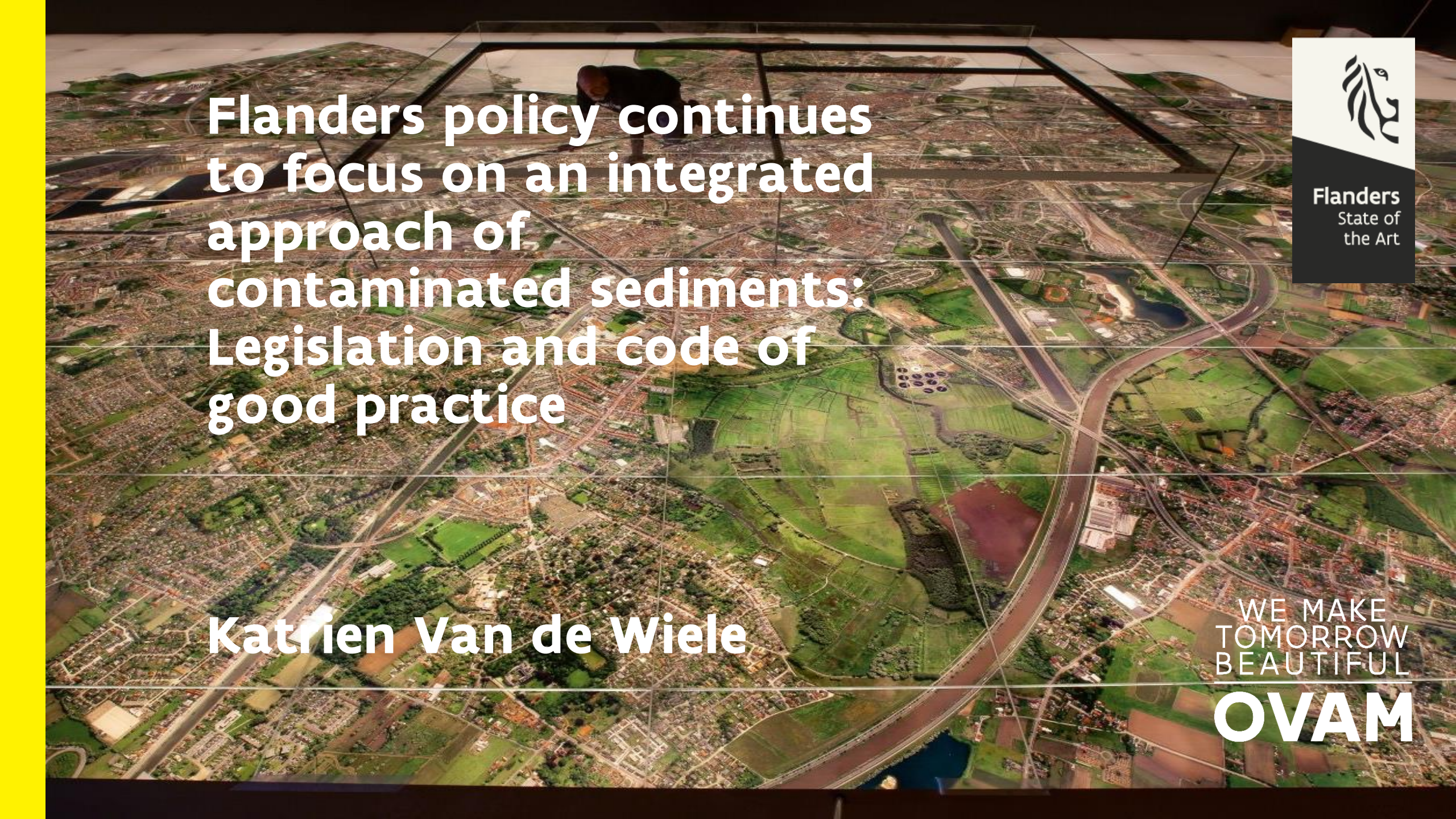

Flanders policy continues to focus on an integrated approach of contaminated sediments: Legislation and code of good practice

Katrien Van de Wiele

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WE MAKE TOMORROW BEAUTIFUL

OVAM

Flanders policy continues to focus on an integrated approach of contaminated sediments

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- Legislation and code of good practice

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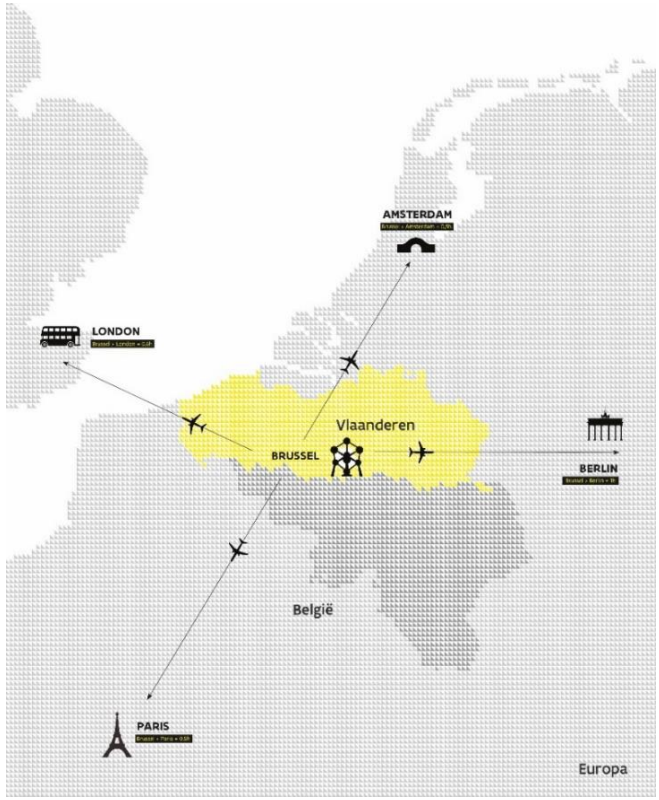
OVAM – Public Waste Agency of Flanders

- **Contact point in Flanders for:**
  - → Waste issues
  - → Environment-oriented use and production of materials
  - → Soil remediation
- **The Soil Decree: Chapter on assessment and remediation of contaminated sediments**



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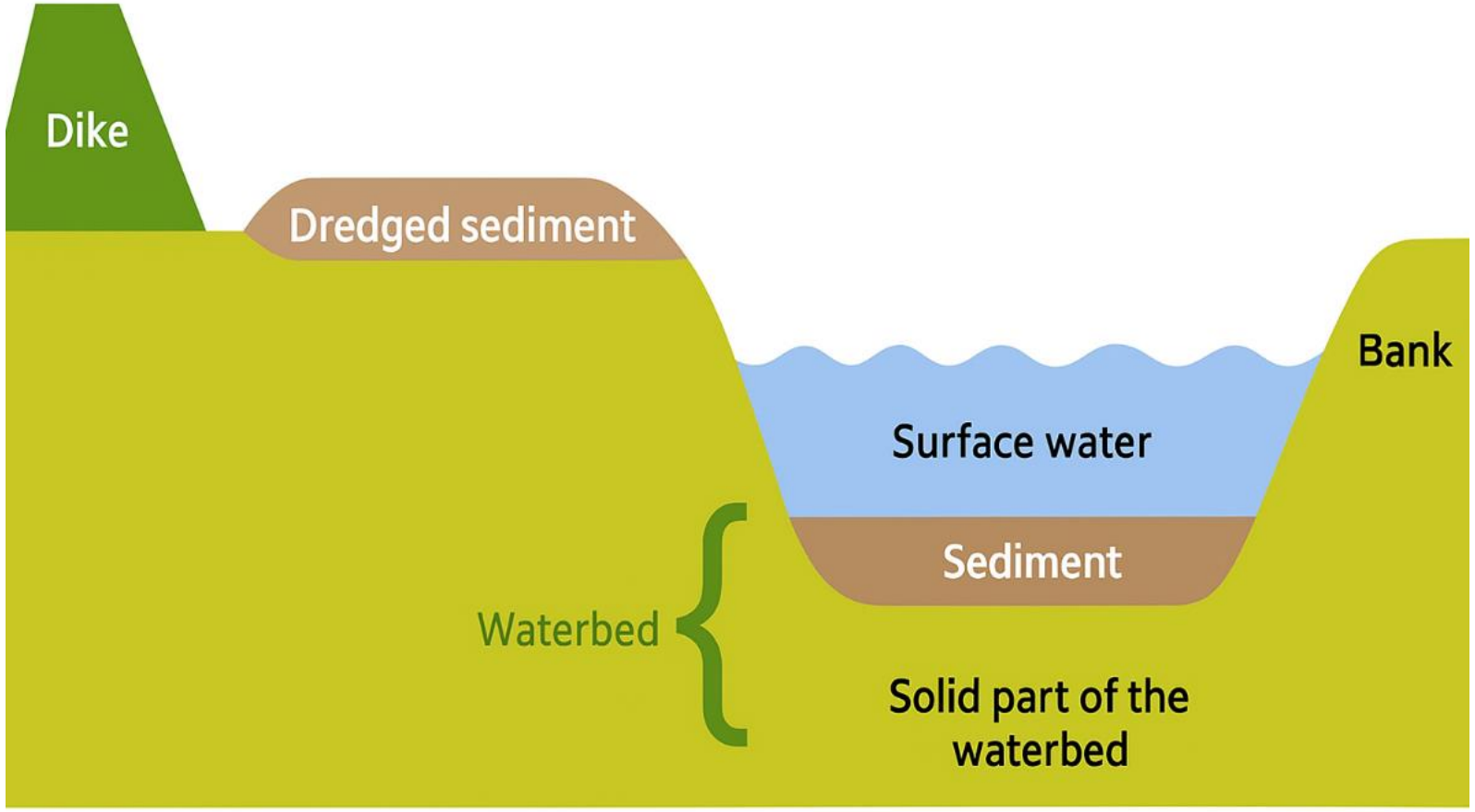
Contaminated sediments and river banks: a complex problem



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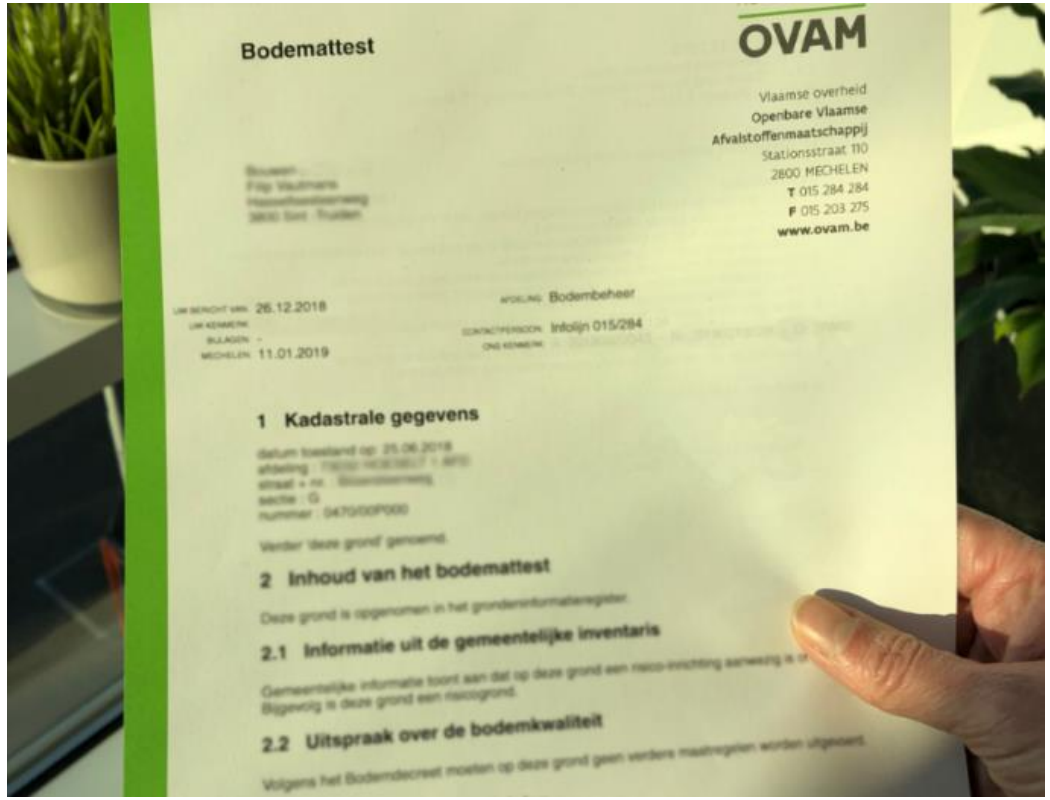
The Flemish Soil Decree

- Preliminary Soil Investigation (PSI)
- Descriptive Soil Investigation (DSI)
- Sediment Assessment: Specific regulations for the investigation of contaminated sediments in the Flemish Soil Decree (chapter XII of the Soil Decree – since 2016)

- when the PSI shows that further measures are required, transfer of the land is not possible

The Flemish Soil Decree



General procedure for soil investigation and remediation, including sediment

- → when further investigation needed after PSI: determine the party responsible for remediation: cascade operator, user, owner
- → Land transfer is not possible* (exception - see next slide)
- → DSI => Soil Remediation Project => Soil Remediaton by party responsible for remediation
- → Land transfer is possible provided certificate of conformity for the Soil Remediation Project, commitment to remediation and financial guarantee

Chapter XII of the Flemish Soil Decree:

- → After imposed by the Flemish Government or voluntarily
- → Watercourse manager is responsible for sediment assessment
- → Watercourse manager and polluter are responsible for sediment remediation

The Flemish Soil Decree - february 2024

- When PSI shows that further measures are required **only for sediment* contamination, transfer of the land is possible

⇒ February 2026 : Investigation of sediment at discharge points and other potential sources of pollution for sediment in the PSI

- Guidelines in standard procedures and code of good practice.

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When to investigate sediment

- In a PSI:
  - → Investigation of sediment at discharge points and other potential sources of pollution for sediment => sampling strategy for sediment in standard procedure
  - → Detailed guidelines in code of good practice
- Descriptive Soil Investigation (DSI): when PSI shows sediment pollution
  - → Guidelines in code of good practice
- Sediment Assessment:
  - → Conducted by watercourse management imposed by the Flemish Government
  - → Guidelines in code of good practice

Sediment in a preliminary soil investigation (PSI)

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Sediment in PSI – investigation strategy

- **determining the necessity for sampling of the sediment, depends on**
  - → (former) presence of risk activity with increased risk of sediment contamination
  - → Located along a watercourse and other indications for sediment contamination
- **administrative and historical research**

23.6 BIJLAGE 6: LIJST VAN RISICOACTIVITEITEN MET VERHOOGDE KANS OP HET VEROORZAKEN VAN WATERBODEMVERONTREINIGING

Volgens de methodiek toegelicht in de studie 'Identificeren van hotspots met waterbodemverontreiniging gelinkt aan risico-activiteiten' werd een lijst opgesteld met risico-activiteiten die een verhoogde kans hebben om waterbodemverontreiniging te veroorzaken. Hierbij werd gekeken naar activiteiten uit 14 industriële sectoren:

- Carbochemie, inclusief cokesfabrieken
- Petrochemie
- Chemische industrie
- Primaire metaalindustrie
- Afvalverwerkingsbedrijven
- Cleaning en vatenreconditioneringsbedrijven
- Elektriciteitscentrales
- Papierfabrieken
- Scheepswerven
- Houtconservering
- Leerlooierijen
- Textielververijen
- Asbestcementfabrieken
- Asbestpapierfabrieken

Deze sectoren werden vertaald in een lijst van 208 risico-activiteiten, die opgesomd worden in de onderstaande tabel.

Naam hoofdrubriek	Naam rubriek	Rubriek (V) = Vlarem
Aardolie of aardolieproducten	Raffinage, voor de distillatie, het kraken, het vergassen of enige andere wijze van verwerking van aardolie of aardolieproducten	1.1.
Aardolie of aardolieproducten	Commerciële winning van aardolie	1.3.
Aardolie of aardolieproducten	Inrichtingen voor de opslag van aardolie, petrochemische of chemische producten	1.4.
Aardolie of aardolieproducten	Winning van andere dan in 1.3 genoemde vloeibare koolwaterstoffen	1.5.
Afvalstoffen	Opslag en nuttige toepassing van afvalstoffen	2.2.1.c)2°
Afvalstoffen	Opslag en nuttige toepassing van afvalstoffen	2.2.1.d)2°
Afvalstoffen	Opslag en nuttige toepassing van afvalstoffen	2.2.2.a)2°
Afvalstoffen	Opslag en nuttige toepassing van afvalstoffen	2.2.2.b)2°

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Sediment in PSI – investigation strategy

- **Sediment sampling and analysis:**
  - → At least 1 sediment sample downstream each discharge point and
  - → 1 sediment sample downstream on the most relevant/suspicious location (accumulation of sediment)
  - → Analyses on SAP and 'suspicious substances' related to the investigated exploitation site, whereby SAP contains:
    - X Heavy metals (As, Cd, Cr, Cu, Hg, Pb, Ni en Zn)
    - X Mineral oil (C10-C40)
    - X PCB
    - X PAH
    - X Pesticides (OCB)
- **Interpretation and evaluation**
- **Methodology – Clear indication of severe sediment contamination**

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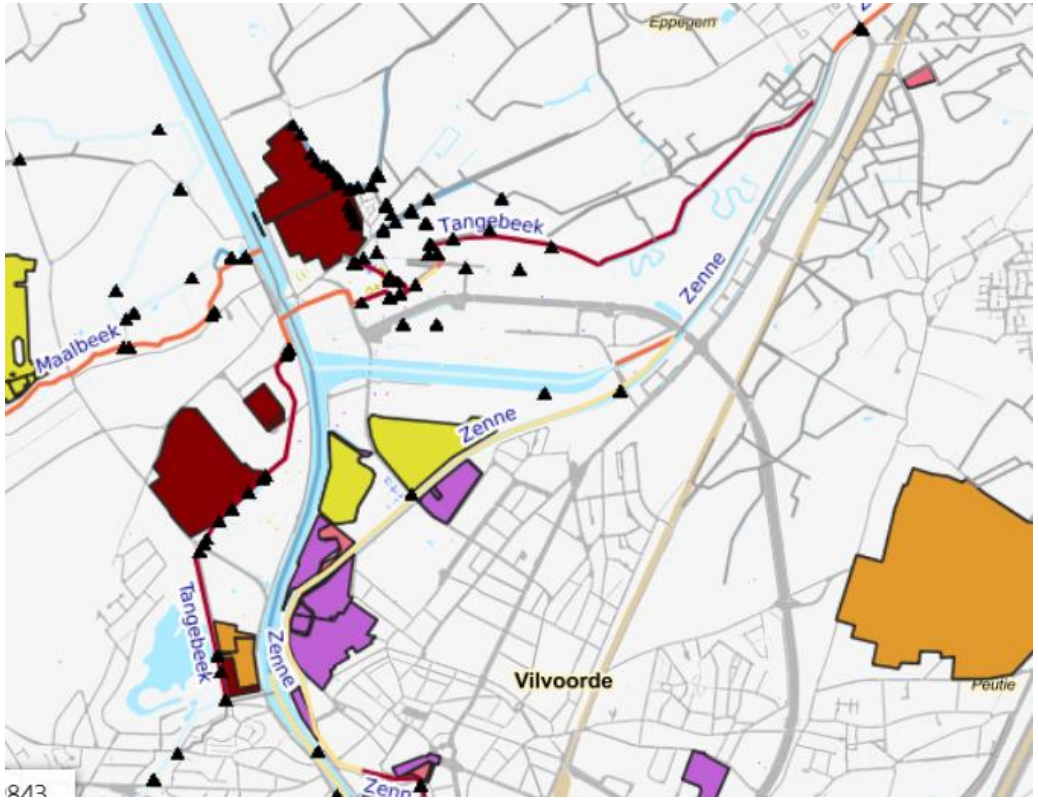
Digital explorer for contaminated sediments – an important source of information

The digital explorer for contaminated sediments is part of the Database Underground Flanders data platform Waterbodemverkenner

- → Measurement data on sediment quality: physicochemical and triade
- → Potential hotspots
- → Data on dredging of the watercourse
- → Discharge points (work in progress)
- → Floodplains
- → Administrative data on water segments
- → …



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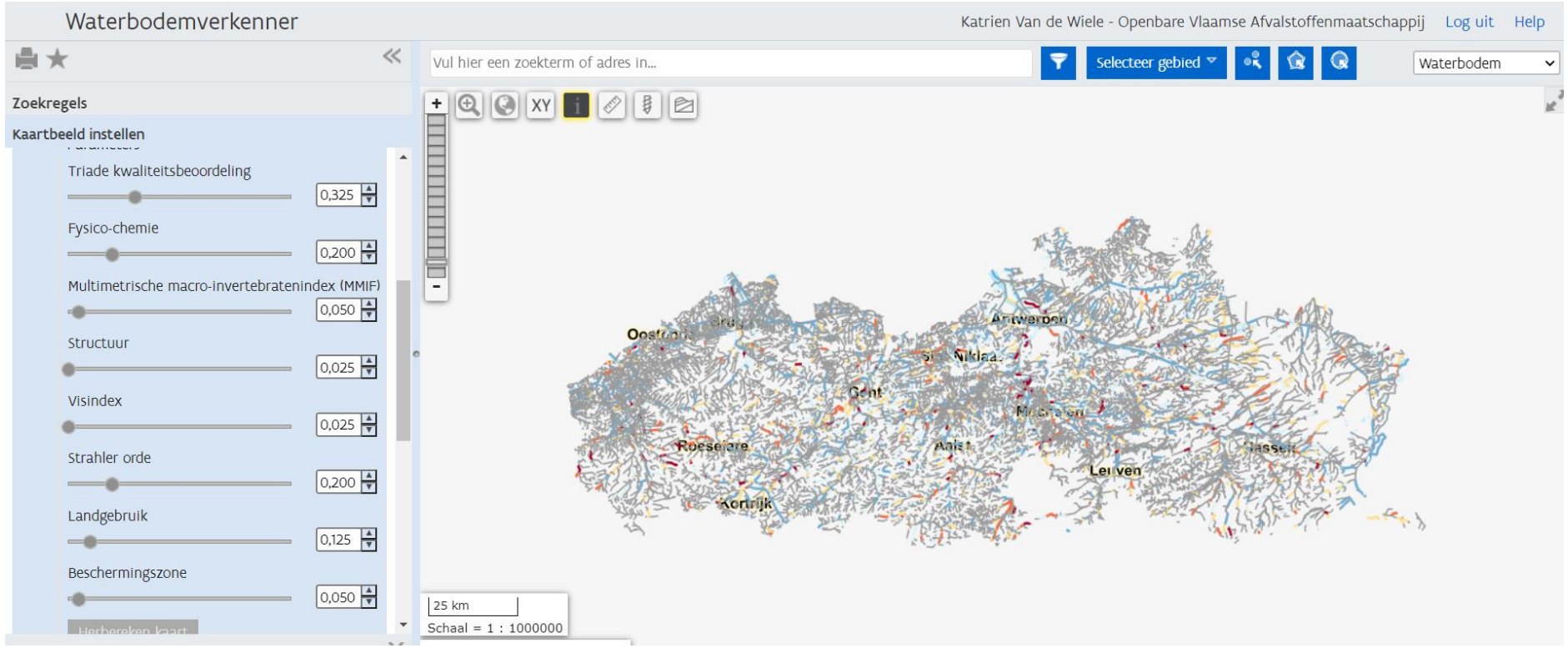
Digital explorer for contaminated sediments



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Sediment in PSI – investigation strategy – trigger values

- In 2018, Antwerp University developed trigger values, i.e. the concentrations below which no significant effects on the biota are expected.
- Trigger values were developed for various substances, e.g. metals, PAH, PCB, BRF, TBT, pesticides, cyanides. Trigger values for PFAS and ftalates are being developed at the moment.
- When trigger values are exceeded: Methodology – Clear indication of severe sediment contamination (Dutch: DAEW)

Methodology – Clear indication of severe sediment contamination

- Concentration > trigger value
- Criteria:
  - → Contamination: amount of substances exceeding the trigger value and exceeding factor
  - → Land use: e.g. risk of human contact, land use, protection zone for drinking water, …
  - → Risk of spreading of the contamination: flood area, riverbank deposits
  - → Other: e.g. surface water contamination, spreading to groundwater

=> Score > 250 => further investigation

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Sediment in a descriptive soil investigation (DSI)

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Sediment in DSI – investigation strategy

- **DAEW-score in PSI > 250: further measures needed for sediment contamination**
- **Goal: mapping the contamination and evaluating the need for soil/sediment remediation**
- **Principles:**
  - → supplementary administrative and historical research
  - → Sampling strategy suitable for mapping the sediment contamination and contamination on riverbanks and floodplaines
  - → Risk assessment:
    - × Human
    - × Spreading
    - × Ecotoxicological
- **Remediation and/or recommendations for land use**

Sediment assessment (Chapter XII of the Soil Decree)

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Sediment assessment

- After imposed by the Flemish Government or voluntarily
- Guidelines in code of good practice
- 2 phases:
  - → exploratory phase:
    - × extensive historical research
    - × investigation of sediment and riverbanks
    - × DAEW
  - → descriptive phase:
    - × complete mapping of contamination, also in floodplaines
    - × risk assessment

Determining the area of the sediment assessment

- Investigation of the area designated by the Flemish Government
- Subdivision into sub-areas (depending on the length and characteristics of the watercourse)
- Further subdivision into sections
- Riverbanks and floodplains: sampling transects perpendicularly to the watercourse

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Section
(deeltraject)

Transect
(river banks, flood plains

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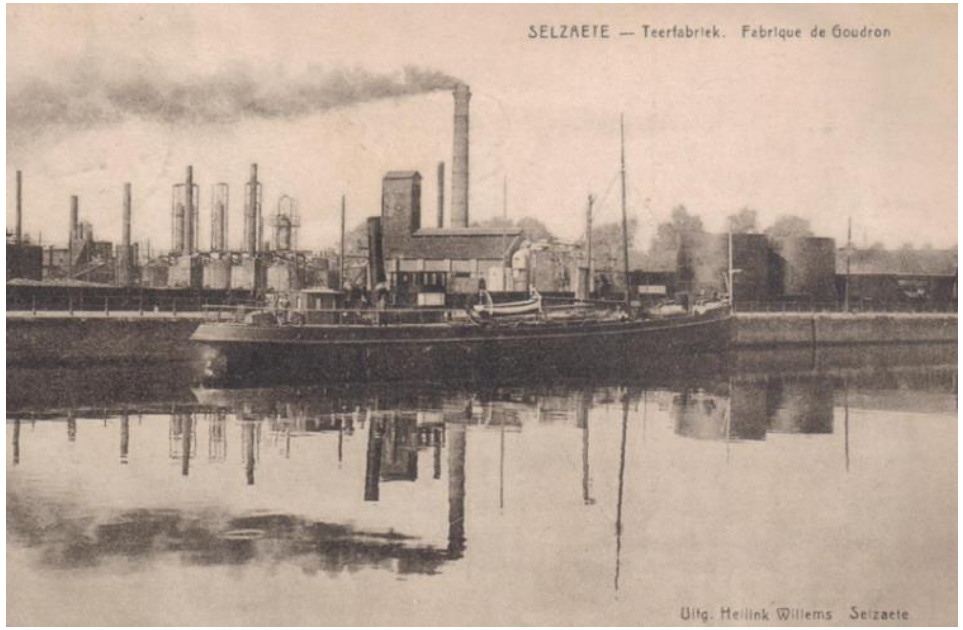
Extensive historical research

- **Mapping all former and current potential sources for contamination:**
  - → discharge points
  - → loading docks
  - → spills,
  - → diffuse sources
  - → …
- **Mapping activities that can affect the quality of the sediment**
- **Data on dredging**
- **Research results from previous studies**
- **Characteristics of the watercourse**
- **….**

=> Consulting the digital explorer for contaminated sediments



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Sampling and analysis

- Sampling and analyses according to the compendium for sampling and analysis (CMA): Compendium voor monsterneming en analyses van afvalstoffen en bodem (CMA) | EMIS.
- Sampling of the most relevant/suspicious locations in and along the watercourse
- Linear area: zigzag pattern
- Non linear watercourse: raster pattern
- Sampling of other water bodies in contact with the watercourse (e.g. side streams, ponds, canals)
- Analyses on SAP and 'suspicious substances' for all former and current potential sources for contamination along the watercourse

Exploratory phase: Interpretation and conclusion

When trigger values are exceeded for sediment: Clear indication of severe **sediment** contamination **(DAEW)**

When 80% of the soil remediation standard is exceeded for riverbank floodplain (related to spreading of contamination via the watercourse): Clear indication of severe **soil** contamination **(DAEB)**

When **DAEW score > 250: descriptive phase**

When **DAEB score > 150: descriptive phase**

When scores DAEW < 250 and DAEB < 150: no further measures needed

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Descriptive phase

- complete mapping of contamination: sediment/waterbed, riverbanks and dykes, floodplains and waterbodies in contact with the watercourse (e.g. side streams, ponds, canals)
- alternative research techniques:
  - → X-ray Fluorescence Spectrometry (XRF) for metals
  - → radiological measurements when associated with radioactivity
  - → Medusa
  - → I-Flux
- additional measurements in the context of risk assessment, e.g. SEM-AVS, biotests, …
- additional measurements in the context of fingerprinting

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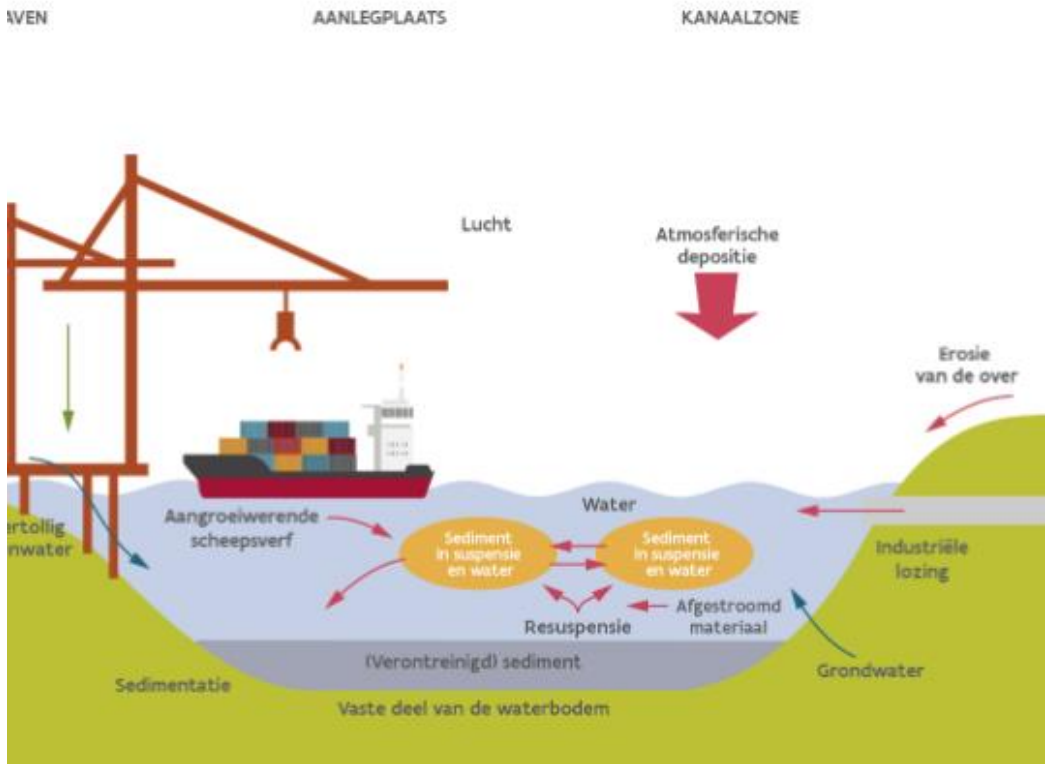
Risk assessment



- **Actual and potential risks**
- **Tiered approach:**
  - → Modelling
  - → additional measurements in the context of risk assessment and bioavailability, e.g. SEM-AVS, biotests, surface water analysis, crop analysis, …
- **Humane, spreading and ecotoxicological**
- **Attention to specific routes of exposure, e.g. water recreation and routes of spreading e.g. erosion, flooding**
- **Guidelines in studies conducted by VITO and experts on risk assessment: Voor professionals**

=> Soil and sediment remediation?

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https://ovam.vlaanderen.be/waterbodem

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