
Flanders
State of
the Art
Integrated approach of contaminated sediments in Flanders
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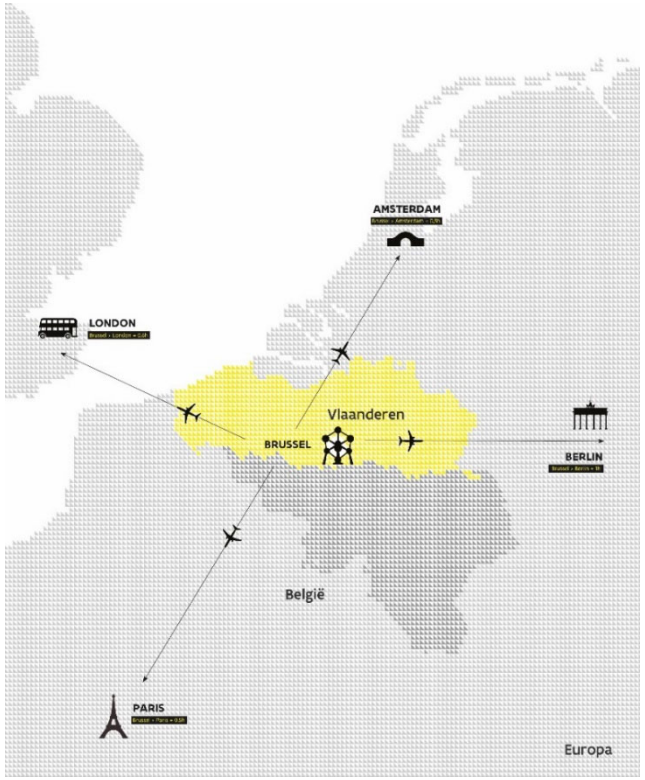
4/03/2019

OVAM - Public Waste Agency of Flanders

- Contact point in Flanders for:
  - → waste issues
  - → environment-oriented use and production of materials
  - → soil remediation
- In the Soil Decree:
  - → Chapter on assessment and remediation of contaminated sediments
- Circular economy:
  - → reuse of sediment



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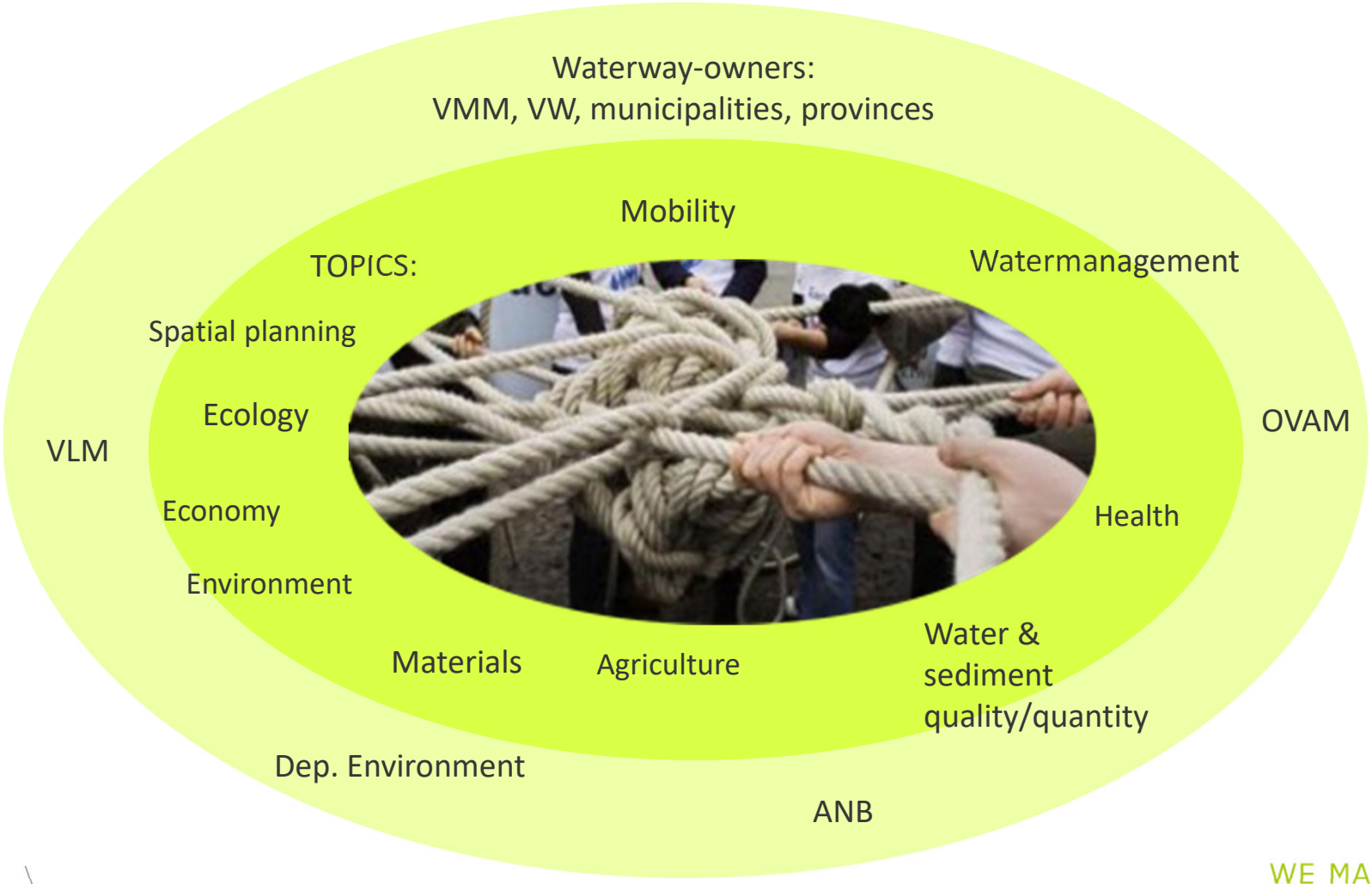
Contaminated sediments + river banks = a complex problem

Integrated approach and collaboration



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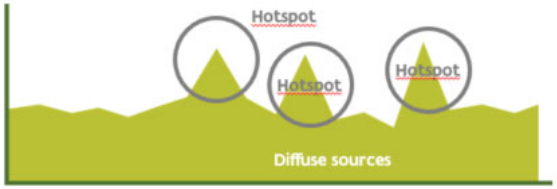
Benefits for society

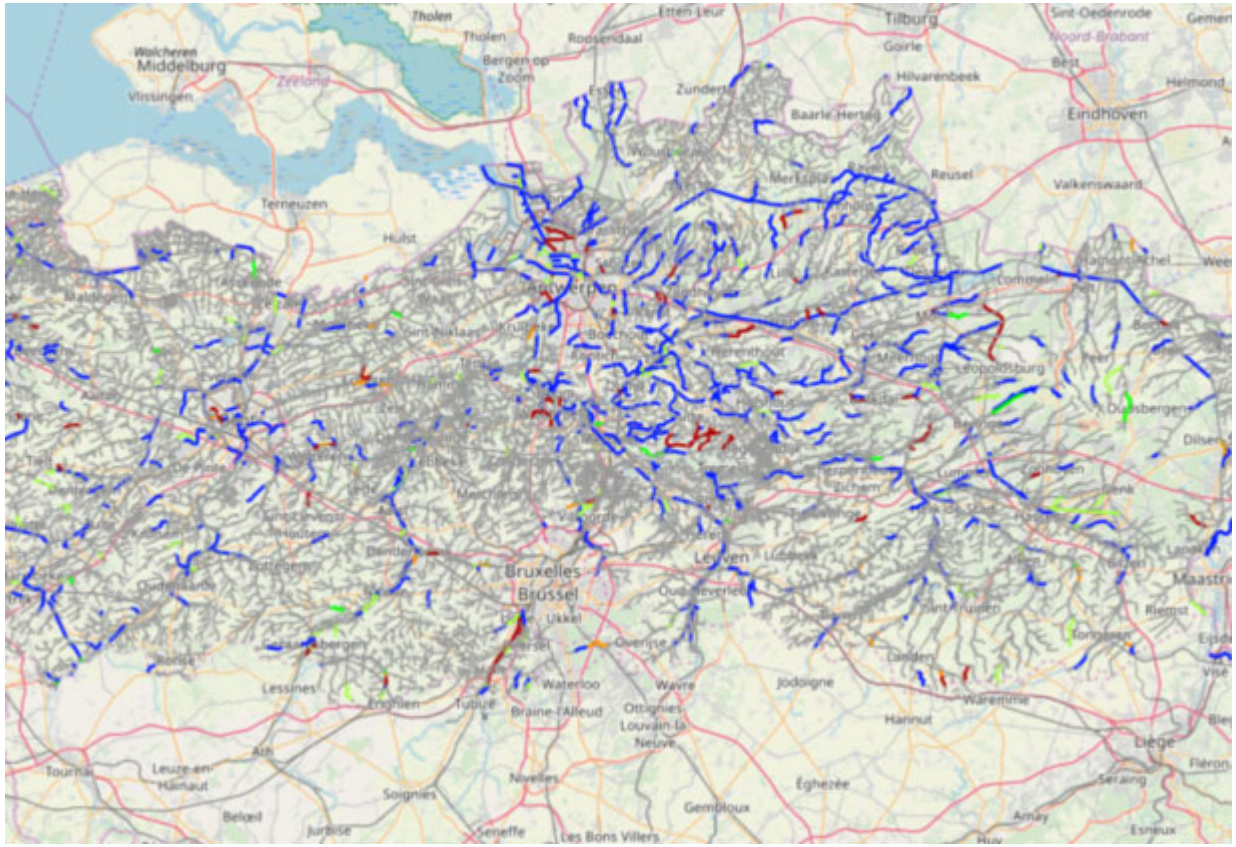
- Environment: to reach goals of the Waterframework Directive (EU), biodiversity, Conservation objectives Nature, …
- Agriculture: bank contamination caused by sludge disposal in the past or by floods
- Health: drinking water, gardens contaminated by disposal of contaminated sediments or floods
- Spatial planning: green – blue networks are a boundary condition for spatial densification, biodiversity in towns
- Economy: tackling the hotspots avoids further spreading of the contamination and higher costs for dredging, value increase 'living near the water', recreation tourism

Integration of data – prioritization- validation

Integration of data + Prioritization	Digital explorer for contaminated sediments in waterways
Validation	**Intensive historical review and sampling campaigns to validate potential hotspots of sediment pollution linked to (former) risk activities**



Digital explorer for contaminated sediments in waterways



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Digital explorer for contaminated sediments in waterways

- Application

  → = making measurement data available for different measurement points

  → = mapping the research priority of different water segments
  - × Calculation of different scenarios (based on weighting factors)

  → =making synergies visible and the potential for value creation (flooded areas / redevelopment projects, …)

Measures of sediment contamination

INDICATORS	SHORT DESCRIPTION
Triad quality assessment	Ecological assessment of the quality based on physico-chemical, biological and eco-toxicological measurements (calculated by VMM)
Physico-chemistry	Physico-chemical signal value 'Trigger value' (research UA) based on 'worst case' of different (measured) parameter values

Quality of aquatic ecosystem and chance of environmentally sustainable recovery

INDICATORS	SHORT DESCRIPTION
MMIF	Multimetric macro-invertebrate index: assessment of the water quality based on macro-invertebrates
Structure	Measurement for the morphological variation and thus also for the self-cleaning ability of the watercourse
Fish index	Integrated score of the ecological quality of the fish stock (INBO)

Characteristics of the watercourse

INDICATORS	SHORT DESCRIPTION
Strahler order	Map layer Schneiders, Wils et al. (1995) - applied to new VHA segments

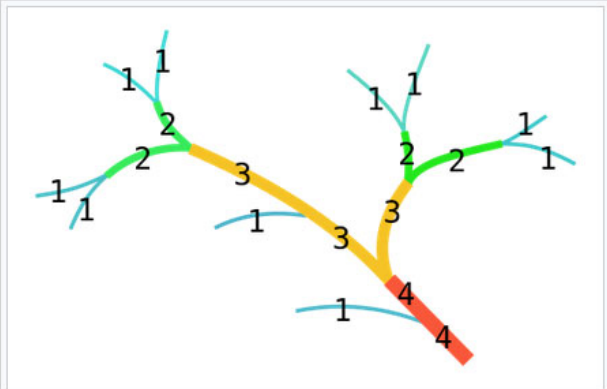


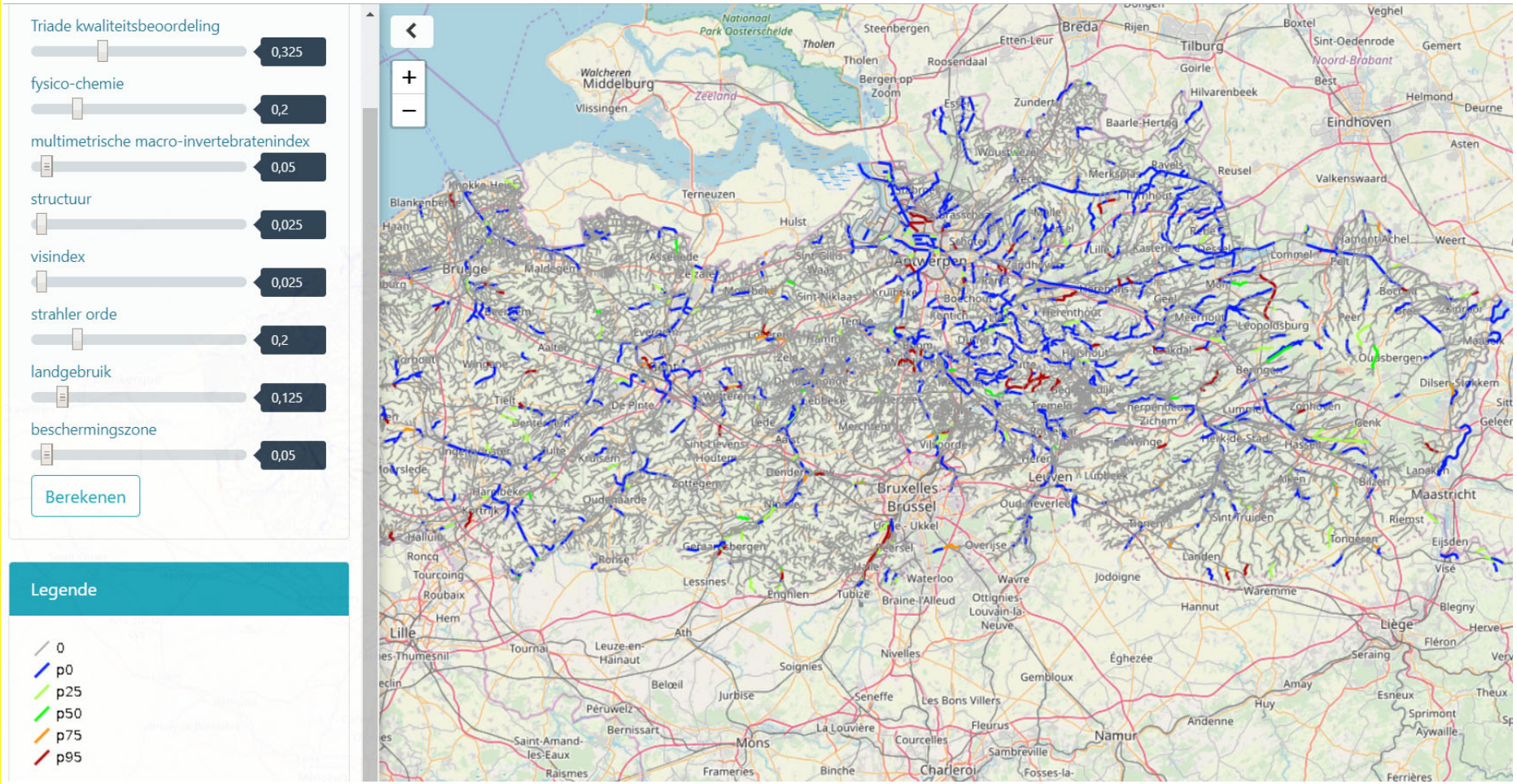
Diagram showing the Strahler stream order

Location / Land Use

INDICATORS	SHORT DESCRIPTION
Land Use	Score asv most dominant use of space (VITO) and flood risk along the banks
Protection Zone	Score for location segment in drinking water or groundwater extraction area and its protection zones

Research priority

- Weighted average of the indicator scores
  - → No total score if the indicator values for TKB and physico-chemistry are missing
  - → Weights Research priority = default weights



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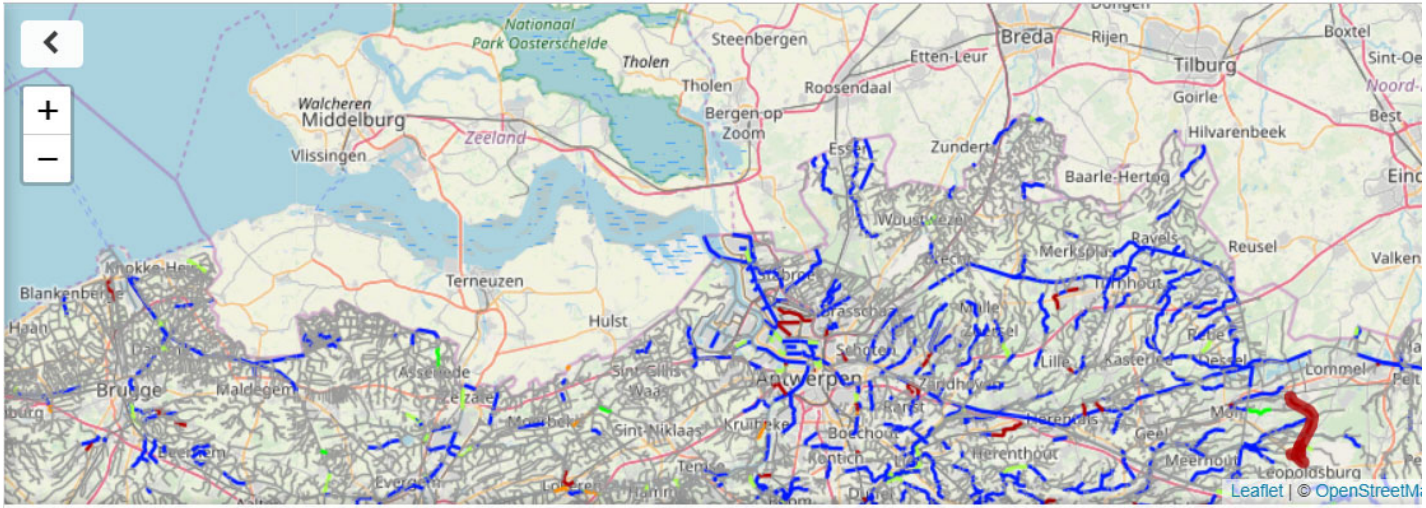

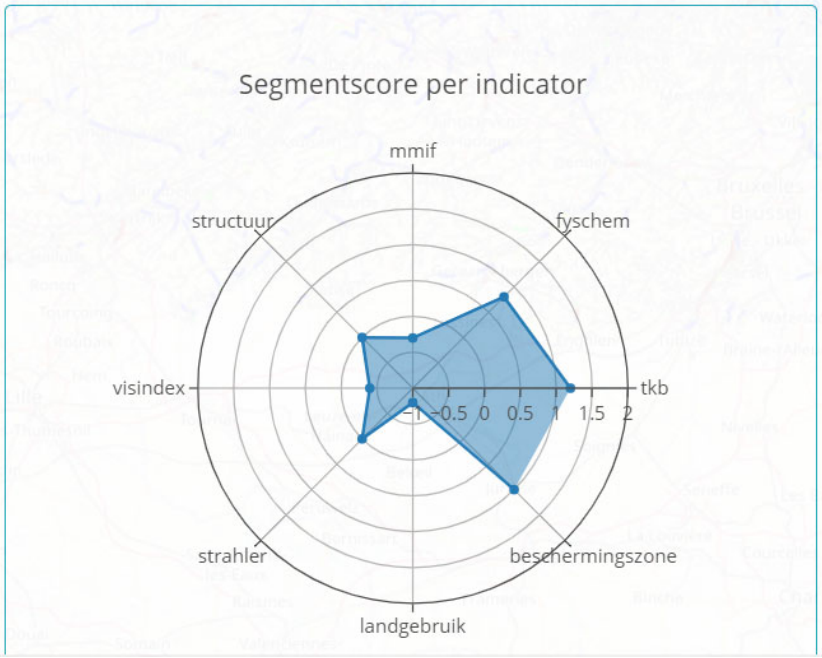

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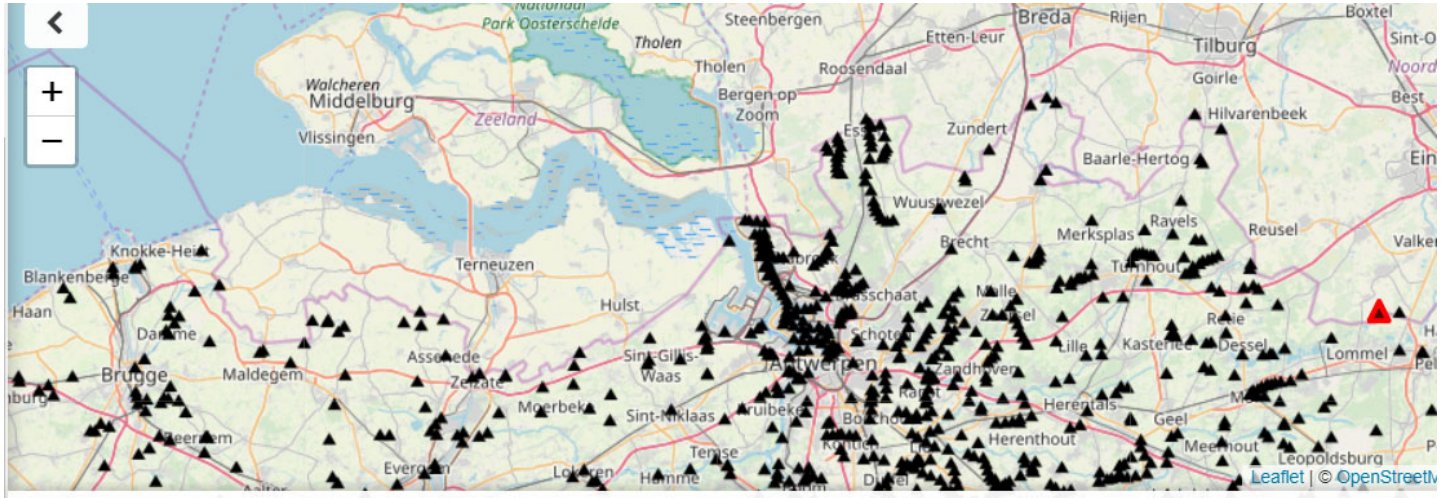

Bron: VMM, Locatie 89200: De Hutten, thv grenspaal 1843, opw oostzijde weg

Stof	29-11-00	05-05-04	13-05-08	04-06-13
B(b)Flu	0.0057 mg/kg ds	0.003 mg/kg ds	0.004 mg/kg ds	< 0.11 mg/kg ds
BI	9 -	10 -	10 -	10 -
B(a)P	0.0015 mg/kg ds	0.001 mg/kg ds	< 0.0037 mg/kg ds	< 0.09 mg/kg ds
PAK 6	0.0263 mg/kg ds	0.012 mg/kg ds	0.012 mg/kg ds	< 0.16 mg/kg ds
PCB t	< 0.05 µg/kg ds	< 0.05 µg/kg ds	< 0.1 µg/kg ds	2.05 µg/kg ds
Hyal	* 74 %	* 6 %	* 7 %	* 4 %
Cr t	8.1 mg/kg ds	2.7 mg/kg ds	4.1 mg/kg ds	6.6 mg/kg ds
Cu t	4.5 mg/kg ds	3.6 mg/kg ds	5.6 mg/kg ds	10.6 mg/kg ds

Future for the prototype of the digital explorer for contaminated sediments

- Added value for multiple parties! – data collection
- Instrument which gives insight into data
- Insight in the location of hotspots and research priority
- Possibility to define priorities + recommendations for reuse

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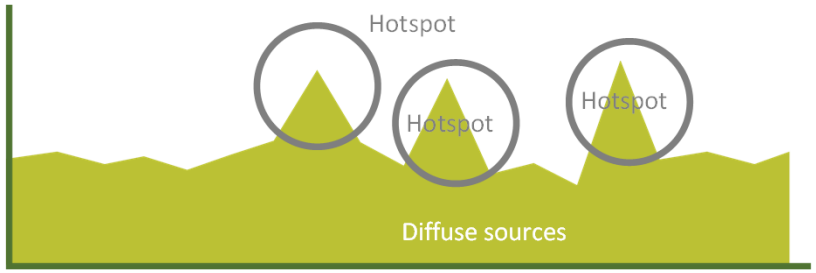
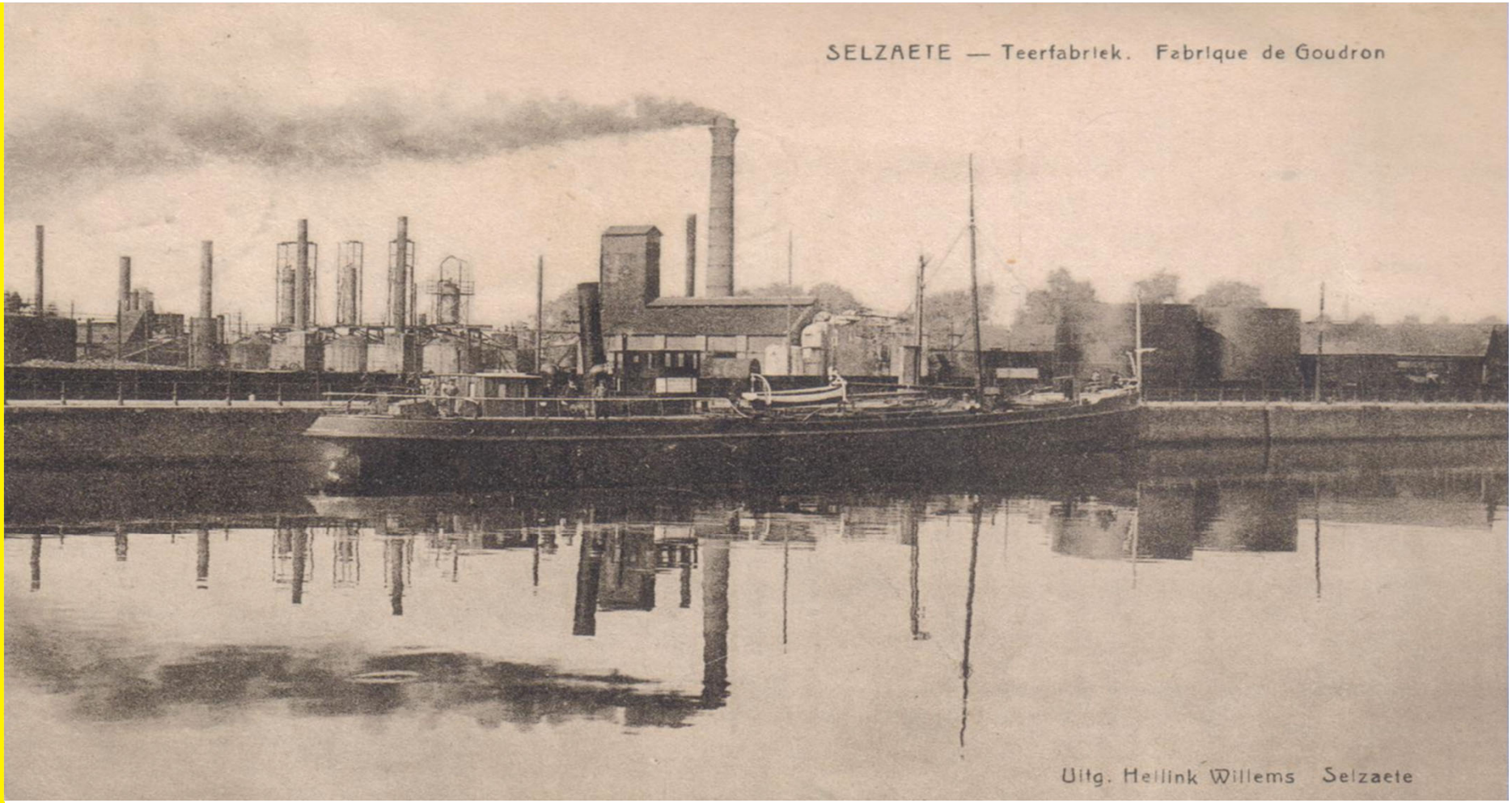
Study validation of potential hotspots

- The investigation and remediation of contaminated sediments is expensive!
- Clean-up goal: elimination of the risks according to the BATNEEC-principle
- ‘Remediation of everything’ does not make sense, because recontamination of diffuse sources is possible
- Focus on historical activities

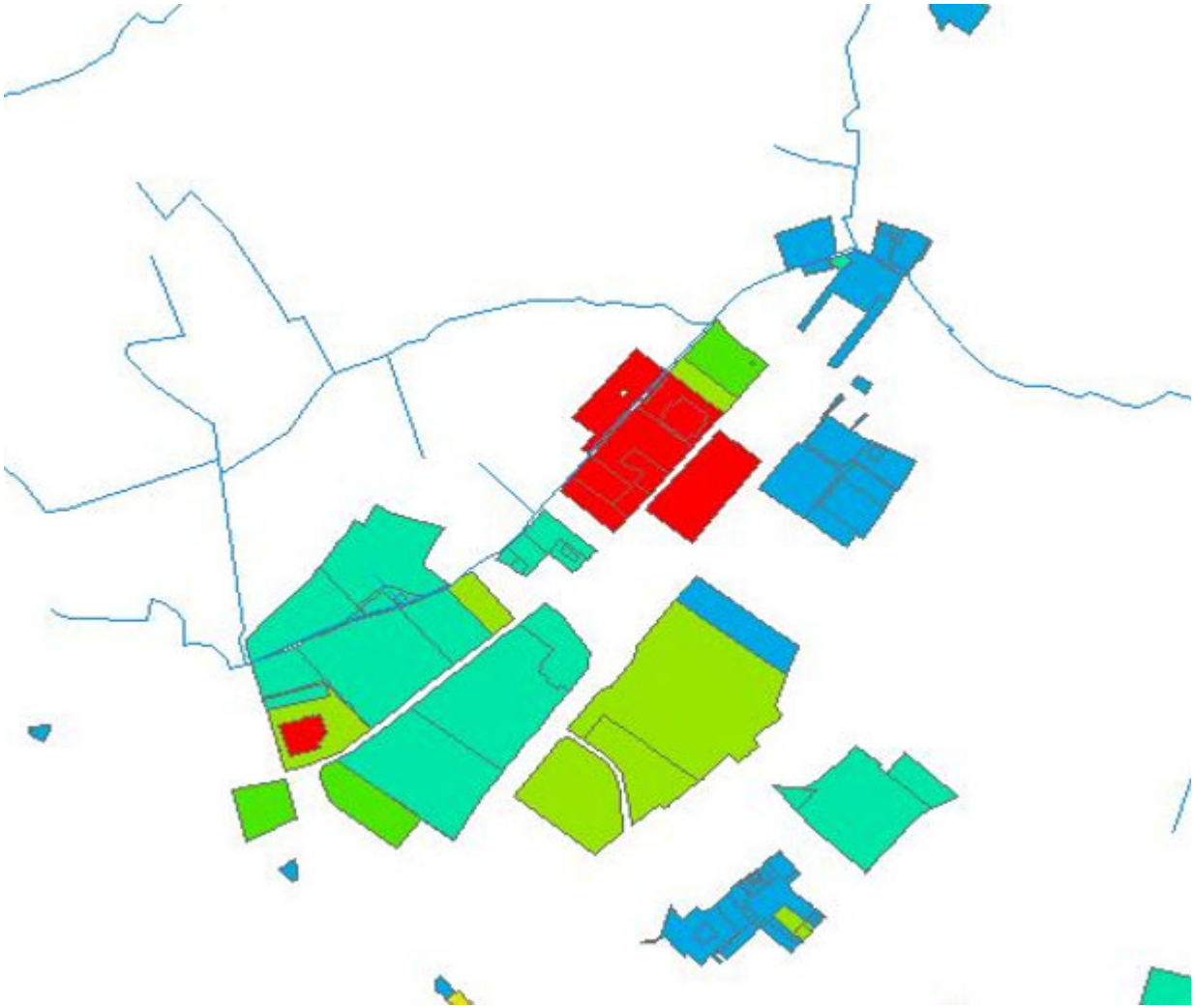




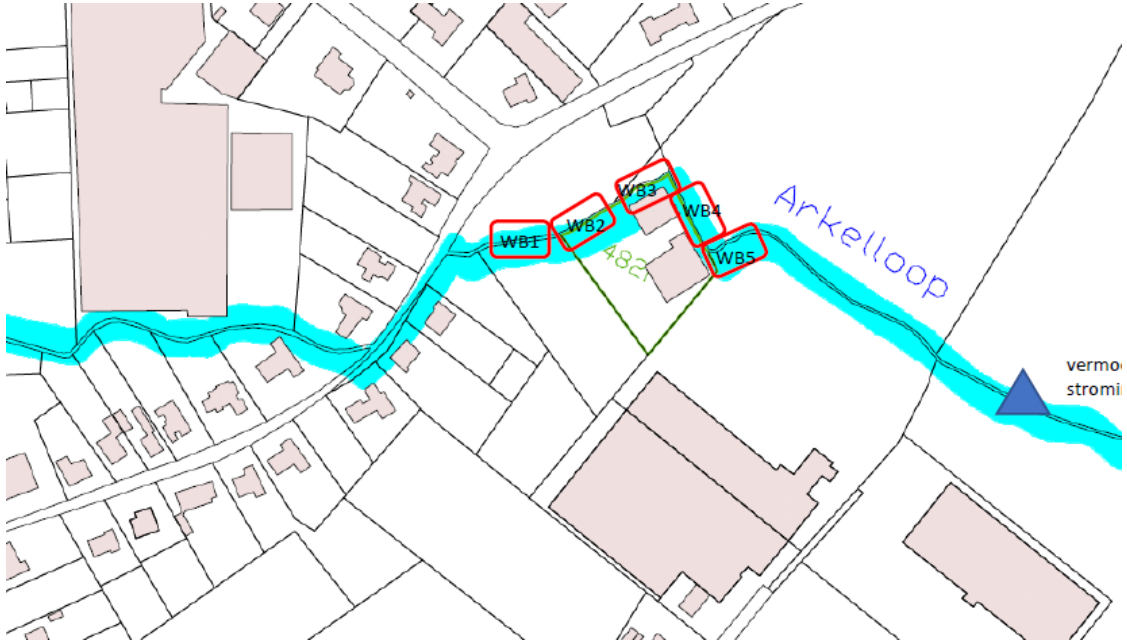
Desk study resulted in the identification of a list of (former) risk activities with a high potential of sediment contamination

Tiered selection approach to select locations for the validation

- 4 key factors:
  - → Cadastral plots: identify and locate the hotspots
  - → Risk activities - activities with a relatively higher risk for sediment contamination: identifying (former) industrial sectors: gas plants, tanneries, paper mills, wood preservation, etc
  - → The start date of the environmental permits: insight into historical development
  - → The number of risk activities and 'environmental permits' - related to a cadastral plot



Validation study



Conclusions

- Prioritization is needed
  - → Financial resources are limited
  - → Choices have to be made
  - → Vizualisation of the biggest problems / opportunities

- Share experiences – information :

waterbodem@ovam.be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