Bioavailability of Persistent Organic Pollutants (POPs) in the Western Scheldt Estuary, The Netherlands

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Food chain studies

- Exposure assessment throughout food chain
  - Non polar compounds $\rightarrow$ sediment

- Focus on brominated flame retardants (BFRs) as suspected endocrine disrupters
Brominated flame retardants (BFRs)

Polybrominated diphenyl ethers (PBDEs)

- BDE-47
- BDE-99
- BDE-209

Hexabromocyclododecane (HBCD)

- “Alpha”
- “Beta”
- “Gamma”
Risk area identification for estuarine food chain

- Current production area
  - Output limitation standards
  - No or little deposition

- Food chain Common tern
  - From suspended matter to Tern eggs
Sample collection
Western Scheldt
PBDEs and PCBs in tern food chain

- Sum 15 PCBs
- Sum 15 PBDEs

Concentration (ng/g lw or TOC)

SPM | Invertebrates | Fish | Tern egg

PCB

PBDE
PBDEs, PCB and HBCD in tern food chain

- Concentration (ng/g lw or TOC)
- SPM, Invertebrates, Fish, Tern egg
HBCD Composition in Food Chain

Technical mixture

Sediment SPM

Flounder

Tern egg

Seal
Tern eggs Terneuzen vs. Saeftinge

Concentration (ng/g lipid weight)

- HBCD
  - Terneuzen
  - Saeftinge
- PBDEs
  - Terneuzen
  - Saeftinge
Total HBCD in Sediment from the Western Scheldt
Sediment budget Western Scheldt 1955 – 2004

Source: Actualisatie van de zandbalans van de Westerschelde
Haecon September 2006

‘Terneuzen’: erosion

‘Saeftinghe’: deposition
Conclusions

Food chain studies show high accumulative potential of POP.

However, slow uptake of pollutants and preferential degradation may occur.

Risk assessment throughout food chain required.

Risk areas not always at source of pollution, erosion and sedimentation influence ecotoxicological risk of non-polar pollutants.