DISTRIBUTION OF ORGANIC CONTAMINANTS ACROSS EUROPE

RIVER BASIN MANAGEMENT ISSUE

Water Quality						Water Quantity		Alterations		Others
1	2	3	4	5	6	7	8	9	10	
(C, M, T)		(C, M, T)	C, M, T		(C, M, T)					

(1) Diffuse pollution by agriculture
(2) Salinisation
(3) Contaminated sediment and floodplain soils
(4) Large scale pollution due to past mining / industries activities
(5) Pollution by organic matter
(6) Emerging compounds
(7) Water scarcity
(8) Floods and low flow
(9) Hydromorphological alterations
(10) Soil erosion

C = System Characterisation
M = System Monitoring
T = System Trend
R = System Remediation, Mitigation

RIVER BASIN

Danube	Ebro	Meuse	Elbe	Brévilles	Others
✓	✓		✓	✓	

Spec. : Results specific to selected River Basin

KEY FINDING TYPE

Understanding Processes (lab-scale)	Characterisation (field scale)	Modelling
	✓	

BENEFITS TO END-USERS

Technical		Management	Policy	
WFD Implementation	Research	River Basin	Compliance	Policy making
✓	✓	✓		✓

INTRODUCTION

BGC2 deals with the sorption of organic contaminants. BGC2 aims to understand what part of the organic matter controls the sorption process and especially studied the contribution from black particles on the sorption process. The novelty of BGC2 is to follow a **mechanistic approach for the determination of Kd**. BGC2 also studies the relationship between atmospheric pollution and sediment pollution by quantifying the distribution of organic contaminants in soil samples.

KEY ISSUES

BGC2 studied the distribution of PAHs, pesticides and PCBs in soil samples coming from the five AT catchment. However, the main results obtained from the research deal with PAHs. Therefore the main river basin management issue addressed by the distribution of organic contaminants to date is the "*Large scale pollution due to industrial activities and non-point sources (e.g. traffic)*".

Large scale pollution due to industrial activities

BGC2 results on the distribution of the organic contaminants enable to characterise diffuse pollution due to atmospheric deposition of organic compounds in soil. Therefore, it developed knowledge in system characterisation, monitoring and change of the system associated with land-use change.

- ***System characterisation:***

  - 60 samples collected in the context of AT (in the 5 selected river basins) and 100 samples from other project were analysed for PAHs. The results of these sampling campaigns and existing historical data showed that all the soil samples contained PAHs. It also showed that concentration of PAHs increased over time.
  - Comparison of soil concentration and air concentration showed that concentrations in soils are higher than concentration in air: This confirmed that PAHs do not degrade easily and are accumulated in the soils. Moreover, comparison of PAHs level in soil and the total historical atmospheric deposition since time of industrialisation showed that PAH levels were above what could have been deposited through the past. This demonstrated that atmospheric deposition from industrial activities contributes partially to PAHs level measured in the soils and that there is another source of PAHs (natural source, forest fire).
  - Some of the PAHs values in soils were above the precautionary value of 10mg/kg.
  - Measurement of mass flux between air, soil and water showed that 90% of PAHs coming from atmospheric deposition was trapped in the soils.
- ***Monitoring:*** PAHs could be used as a tracer / an indicator of diffuse pollution of hydrophobic organic contaminants.
- ***System Trend:*** *Distribution of PAHs in soils showed that some of the PAHs have an anthropogenic origin and therefore that change in land-use has a direct effect on PAHs level in soils. As for any diffuse source issue, it is necessary to have the adequate regulations in order to control the pollution at the source.*

RECOMMENDATIONS

The research carried out distribution of contamination across Europe enabled to draw the following recommendations:

- As for any diffuse source issue, it is necessary to have the adequate regulations in order to control the pollution at the source.

These recommendations can be useful for the following **end-users:**

- **Policy makers**