Physical and Chemical Evolution of Sediments in Stormwater Detention Basin

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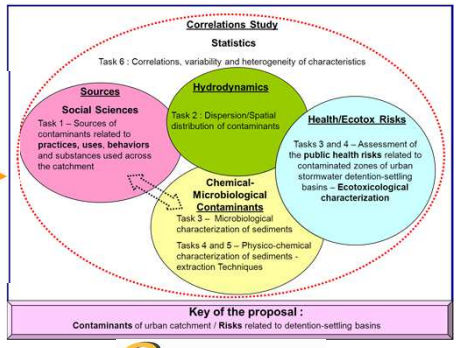
1. Background - Objective

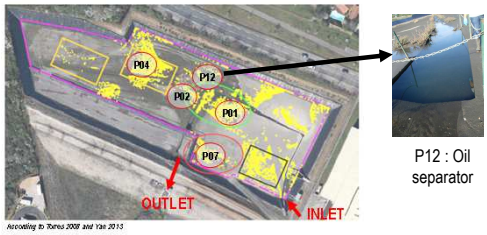


Objective : Compare the characteristics of sediments stored over the time and their spatial distribution

Multidisciplinary CABRRES national project

2. Experimental site

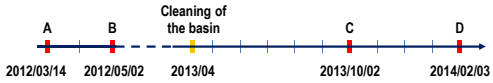
- **Retention/Detention basin at Chassieu, France (69)**
  - At the outlet of a 185 ha industrial catchment drained by a separate stormwater network
  - Surface = 11,000 m²; Storage capacity = 32,000 m³



P12 : Oil separator

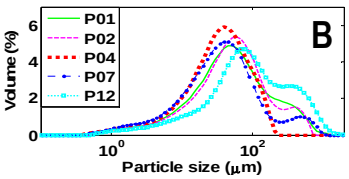
3. Sampling method

- **Grab samples on 5 points**
- **Quartering method**
- **2 physical parameters** (particle size and density), **WFD pollutants** (EC, 2000), **3 metals** (Cr, Cu, Zn)
- **Sampled campaigns**

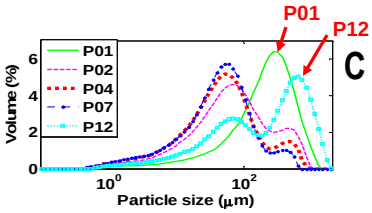


4. Results

- **Particle size**



D50 = [34 – 70 µm]



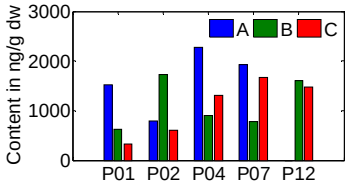
D50 = [48 – 193 µm]

- P02 – P04 – P07 : fine particles for 2 campaigns
- P01 – P12 : coarse particles for campaign C with a heterogeneous spatial distribution

- **Particle density**

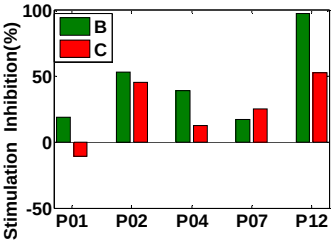
- Homogeneous distribution over time and space [2,200 – 2,500 kg.m^{-3}]

- **Content of Σ 16 PAHs**



- Different over the time
- Heterogeneous spatial distribution

- **Ostracod Test**



- Toxicity of sediments accumulated during 6 years (B) >> 6 months (C)
- Sediments from P12 (oil separator) were more toxic in campaigns B and C.

5. Conclusions and outlook

- **Heterogeneous spatial distribution for PAHs and ecotoxicity**
- **Variability of contamination could be linked to hydrodynamics and to chemical/biological transformations in the basin**
- **In the future : propose some indicators for the practitioners regarding the maintenance planning of these systems**

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