Soils Science Cluster

Nancy 17 November 1998

Minutes of the meeting

1. Agenda

9.00-9.30 Informal gathering and welcoming

9.30-10.30 Discussion of the objectives of the cluster

10.30-12.30 Rapid presentation of involved projects

12.30-14.30 Lunch

14.30-14.50 Discussion of the structure of the cluster

14.50-15.10 Discussion on the links with other networks

15.10-16.00 Discussion on research proposals

16.00-16.15 Action plan

16.15-17.00 Visit of the CPB research centre

2. The Soils Science Cluster : An acronym and three topics.

The participants agreed on an new acronym for this cluster : **SCORE**.

This acronym stands for **Soils Contamination Research.**

In addition, the three main topics identified for structuring exchange activities have been discussed, They are defined on the basis of a fundamental research area of soils science and a present field of application within on-going research projects :

- the soils - plants interactions :
- presently applied to the phytoremediation of contaminated land.
- the transfer and transformation of pollutants in soils :
- presently applied to the natural attenuation of soil contamination and in situ remediation of contaminated soil and sub-soil systems.
- the ecotoxicological effects of soil contamination :
- presently applied to the hazard assessment of contaminated soils and the risk assessment of contaminated sites.

1. Links with European networks

The participants agreed to give information on the general activities of the cluster to three selected network of the EU « Environment and Climate » programme :

NICOLE : the Network for Industrially Contaminated Land in Europe.

A first information paragraph has been sent for publication in the next Newsletter of this network.

CLARINET : Contaminated Land Rehabilitation Network for Environmental Technologies.

ETCA : the Environmental Technologies Concerted Action.

2. List of identified projects

1. Brown Fields and Gardens of the City of Tomorrow :

- Site Specific Ecological Risk Assessment (SPERA) for the Redevelopment of Brown Fields in the City of Tomorrow.
- Ecotoxicological Strategies as a Sustainable Tool in the City of Tomorrow.
- Application of Biomarkers Studies to Risk Assessment of Urban Vegetable Gardens.
- Assessment of Human Exposure to Substances in Contaminated Soil used for Kitchen Gardens (the City of Tomorrow was built on Contaminated Soils).
- Soil Contamination in Urban Gardens.
- Multipollutants in Soils of Urban Areas : Identification of Key Mechanisms for Protection of Vulnerable Transport Routes and Accumulating Bodies (MURMEP).

Interested organisations : VKI, IFA, CPB, ROTH, ENSAIA, EPFL, RUB, RWTH, IRH, ...

1. Ecotoxicological approach and Bioassays for a Sustainable Land Use

- Guidelines to apply Ecotoxicological Bioassays.
- Determination of Matrix Effects in Soil for the Standardisation of Bioassays.
- Testing Existing Ecotoxicity Tests into Tools for Ecotoxicological Assessment of Contaminated Samples : (i) solving the problem of reference soils, (ii) solving the problem of environmentally realistic aqueous extracts.
- Soil Interface in the Management of Land for a Sustainable Use.
- Use of a set of Biomarkers for all Important Organic Pollutants for Risk Assessment : Mammalian Cytochromes P450 of the Families 1, 2 and 3.
- When is a Soil considered as Polluted, as Hazardous, as Risky ? Which Value for Which Decision ?
- Field Study of Ecotoxicological Effects related to the Potential Use of Bioassays on Soils.

Interested organisations : VKI, IFA, CPB, INETI, RUB, RWTH, IRH, DMT...

1. ***Phytoremediation technologies***

- Phytoextraction : basic mechanisms of metal tolerance, uptake and transport.
- Phytostabilization : basic mechanisms of immobilisation and durability under field conditions.
- Ecotoxicology : evaluation of phytoremediated soils using chemical and biological methods.
- Development of Screening Methods for Choosing Plants for Phytoremediation.
- Phytoremediation of Sites using Trees : Field Scale Application.
- Phytoremediation of Mixed Metal-Organic Contaminated Soils.
- Fundamental Study of Soils and Plant Factors Affecting Metal Uptake By Vegetables.

Interested organisations : ULB, INRA, LECES, ENSAIA, VKI, EPFL, B.STEEL, ROTH, CPB...

1. ***Natural Attenuation, Bioavailability, ...***

- Natural Attenuation of PAH-Metal Contamination on Ancient Coke Oven Sites.
- Fate of Mixed Pollutants (Heavy metals, PAH) during Bioremediation.
- Fate of Mixed Pollutants (Heavy Metals, PAH) in the Rhizosphere.
- Effect of Combined Pollution (Multiple : HM and Organics) on Plants and on their « Phytoremediation Efficiency ».
- Influence of Microbial and Rhizosphere Activity on the Bioavailability of Contaminants.
- Development of Rapid Tests Systems for the Determination of the Bioavailability of Organic Pollutants in Soil.
- Mechanisms Related to and Processes to Enhance and/or Decrease Bioavailability of Pollutants.

Interested organisations : IRH, ENSAIA, VKI, EPFL, IFA, GSD, DMT, CPB...

1. ***Biosensors,....***

- Analysis of Biomarker Profiles by Biosensors through Surface Plasmon Resonance.
- Biosensor Technology for Monitoring Soil Contaminants and Soil Treatment Processes.

Interested organisations : RUB, VKI, IRH...

1. ***Subsoil and Groundwater systems, ...***

- DNAPL, Distribution in Heterogeneous Soils and Groundwater Aquifers : Processes and Modelling.
- Groundwater Contamination of Former Coke Oven Sites : Importance of Natural Attenuation and Possibility of Stimulation of Microbial Processes.

Interested organisations : GSD, EPFL, RWTH, IRH, DMT...

1. ***Reactive Walls Technologies, ...***

- Remediation of Contaminated Sites with a Combination of Reductive Passive Wall

Techniques (Fe°) and Oxidative Microbial Technologies.

- Processes to be Applied in Reactive Walls.

Interested organisations : VKI, IRH, RWTH...

1. ***Long term effect of Soil Additives, ...***

- Long term Effect of Additives of Immobilisation and Mobilisation in Soils.

Interested organisations : ULB, ...

1. ***Natural Attenuation, Bioavailability, ...***

- Contaminated Sites from Military Production Plants : Mixed Contamination with Nitroaromatics and Heavy Metals, Risk Assessment (i) during removal of munitions and (ii) during remediation.

Interested organisations : RWTH, ...

1. ***Metal Contamination, ...***

- Prediction of Metal Availability on a Site Specific Basis.
- Improved Risk Assessment of Metal Contaminated Sites via Routine Application of Metal Phase Characterisation, Biosensors, ...
- **Interested organisations : INTERLAB, INRA, B.STEEL, ...**

1. ***Network of Experimental Sites, ...***

- Network of Experimental Sites in Europe for Contaminated Land Issues.
- **Interested organisations : IRH, CPB, ENSAIA, ...**

1. Next meeting

The next meeting of the SCORE Cluster will be organised during the Environmental Technologies’99 meeting in Dresden in June this year.