Working Group 8
"Environmental Sensitivity"
Progress Report

2nd EMRAS II Technical Meeting
Opening Plenary
25 January 2010

Presented by:

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Health Canada

Participating countries

- **Austria**
- **Belgium**
- **Brazil**
- **Canada**
- **Finland**
- **France**
- **Germany**
- **Italy**
- **Norway**
- **Sweden**

Environmental sensitivity WG

Objective:

Explore the concept of environmental sensitivity in rural and semi-natural environments in the framework of assessments after an emergency situation

Main tasks:

- Clarify the concept of environmental sensitivity
- Compile a list of sensitivity factors
- Design scenarios
- Carry out modelling exercises

Task	**Deadline**
Review of the concept of environmental sensitivity	
Literature review	June 2009
Draft concept document	November 2009
List of environmental sensitivity factors	
Initial list	January 2010
Final list	2011
Scenario Development	
Design	January 2010
Modelling exercises	
Model results completion	End 2010
Analysis of model results	June 2011
Final report	
Preparation of final report	End 2011

What is meant by environmental (or radioecological) sensitivity?

"The relation between the response of a particular environmental component to a given stress, and the severity of that stress." [Buckley 1982]

$$ES = \frac{\text{Measure of an environmental effect}}{\text{Measure of an external stimulus}}$$

Factors that can affect or alter sensitivity

- **Environmental pathways**
- **Variation in environmental characteristics**
- **Habits (dietary etc.)**
- **Ecosystem response *or* community countermeasures**

Benefits of environmental sensitivity modelling

- **Risk management & decision-making**
  - Emergency planning and preparedness for existing installations
    - Identification of areas that may be particularly sensitive
    - Development of standard response scenarios
    - Land-use planning
  - Emergency response
    - Strategic overview of potentially affected territory
    - Priority setting for resource allocation in the management of contaminated territories
  - Decision aid for the location of new installations

Model uncertainty and sensitivity analysis

- **Uncertainty analysis:**
  - where the greatest uncertainty lies in the model and which parameter estimates need to be improved in order to achieve better predictions

- **Sensitivity analysis:**
  - which environmental parameters are most "responsible" for ecosystem sensitivity and can thus lead to higher doses

Focus is on non-urban environments

- **Agricultural**
- **Temperate forest**
- **Alpine**
- **Arctic**
- **Tropical (?)**

Source term

- **Start with the same radionuclide deposition per unit area in different environments**
- **Use a suite of radionuclides to determine which ones are most important in the different environments**
- **Field measurements of deposition following the Chernobyl accident could be one starting point.**

Time frame of deposition

- **The deposition event must be short-term, since we are modelling accident scenarios**
- **We may want to look at the same deposition during different seasons of the year**
- **We need to look at the long term effects (weeks, months, years, decades?) after the deposition event**

Environmental compartments

- **Abiotic**
  - **Water bodies**
  - **Soil**
  - **Sediments**
  - **Air (re-suspension)?**
- **Biotic**
  - **Plants**
  - **Animals**
  - **Humans**

Endpoints

- **Radionuclide concentrations in selected abiotic and biotic compartments**
- **Doses to non-human biota**
- **Doses to humans**

Tentative agenda for WG 8

Monday 25 January

09:30 – 13:00	**Opening Plenary**
14:00 – 17:30	**Presentation of models and concepts**

Tuesday 26 January

09:30 – 17:00	**Presentation of models and concepts (cont)**

Wednesday 27 January

09:00 – 12:00	**Plenary**
13:00 – 17:00	**Discussion and design of scenarios**

Thursday 28 January

09:30 – 17:00	**Design of scenarios (continued)**

Friday 29 January

09:00 – 13:00	**Closing Plenary**