Common Framework for Addressing Climate Change in Post-Closure Radiological Assessment of Solid Waste Disposal

Working Group 6 Progress
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A landscape is an area of interest for environmental impact evaluation with natural geographical boundaries governing mass transport over the assessment period.

From Climate to Landscape to "biospheres"

1. Define the large-scale landscape context
2. Define one or more climate scenarios
3. Define other large-scale drivers of landscape change (e.g. tectonics, permafrost, ice-sheets, denudation, crustal deformation)
4. Apply drivers in a structured representation of large-scale landscape change and the processes operating
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6. Identify elements of the landscape relevant to transport modelling (Receptors/Biosphere Objects)
7. Perform a structured analysis of landscape elements of interest
8. Application of Interaction Matrices
9. Iterative mathematical modelling of mass fluxes
10. Application of Interaction Matrices

- Depends on facility type
- Typically at drainage basin scale
- Source term definition
- Regulatory requirements
Potential Climate Variables to be Stored

- Time series of monthly air temperature and precipitation

- Time series of soil temperature at different depths, showing diurnal and seasonal cycles and inter-annual variability

- Time series of monthly short-wave and long-wave radiation at ground level, and measures of cloud cover

- Time series of monthly snowfall and snowpack depth (possibly also snowpack albedo if an aging snowpack is represented)

- Time series of monthly sea-ice extent and indices of wind-field characteristics

- Time series of monthly potential evapotranspiration, actual evapotranspiration, and precipitation – actual evapotranspiration

- Time series of monthly vegetation cover characteristic of the climate domain
Structure of the report and status

1. Background, Objectives and Scope  **OK**
2. Approach to the Project and Outline of the Report  **OK**
3. Methodological Approach and Application to Different Facility Types  **OK**
4. Controls on Long-term Climate Change  **OK**
5. Modelling of Global Climate  **OK**
6. Downscaling Requirements and Approaches  **OK**
7. Use of a Climate Emulator in providing Long-term Climate Projections  **May**
8. Influences of Downscaled Climate at the Regional or Site Level  **May**
9. The Development of Climate- and Landscape-change Narratives for Specific Sites or Regions  **May**
10. Implications for Radiological Assessment Modelling  **May**
11. Conclusions and Recommendations  **Nov**

Annexes
Next meeting in May-June CIEMAT, Madrid
WG 6 Suggestions for Modaria II

• Review and enhancement of IAEA Biomass-6 methodology for "reference biospheres" for solid radioactive waste disposal

  Why?
  Need to take account of new practical experience
  Scientific development
  Updated regulations

• Conservative versus realistic assumptions in assessments

• Explore and then exploit opportunities for model validation