

Summary of workshop W3: eEcoRA - Information Technologies in Ecological Risk Assessment

In general terms the risk assessment is based on comparing a likelihood of exposure with sensitivity distributions (Callow, 1997). Traditional methods of ecotoxicological risk assessment, mainly based on laboratory testing, need to be extended to more site-specific and ecologically-oriented approaches. Assessment methods are changed from medium-oriented (air, water, soil) to ecosystem or landscape targets. Challenge for scientific community is to increase ecological complexity in ecotoxicology, but doing it with relatively simple and pragmatically applicable tools (Vighi et al., 2006). Hierarchical levels of spatial dimension, temporal aspect of exposition and biological response (cell-individual-population-community) allow linkage to general ecological concepts. Development of new methods and tools related to implementation of EU directives intensified bridging between theoretical and applied disciplines in relation to environmental enforcement directives. The workshop contributed to following topics:

- general applicability of EcoRA methodology
- role of ICT
- natural resources information exchange
- multidisciplinary research
- development of information systems

1. General applicability of EcoRA methodology

Risk assessment and ecological risk assessment methodology become standard for analyzing potential influence of human activities and environmental processes on the environment and human society.

2. Role of ICT

There is clear direction towards application of ICT in the all stages of the EcoRA process from the data acquisition and storage through modeling and data analysis to results deployment, communication and decision support.

3. Natural resources information exchange

The other important trend is the wide usage of on-line services and internet for the communication, EcoRA analysis and results deployment in the real time.

4. Multidisciplinary research

Expert knowledge from various areas of the biology, ecology, chemistry and other research disciplines is necessary for the correct application of EcoRA methodology. This knowledge has to be parameterized and incorporated into ICT systems to reach consistent results of the risk analysis; ontology development can be the one possible choice. Hierarchical approach to risk assessment is supported by ecological concepts (Species Sensitivity Distribution - van Straalen & Denneman, 1989; Trait-Based Ecological Risk Assessment – Baird et al., 2008), ecological subdisciplines (Stress Ecology - van Straalen, 2003) and spatio-temporal aspects of ecosystems (Brabec et al., 2009).

5. Development of information systems

Development of the complex environmental information systems aggregating various data sources, providing analysis of the data and combine its results with the expert knowledge to gain precise environmental and human risk predictions is one of the hot topics of the current development in this field of the environmental science. Decision support systems (DSS) based on legislative framework, scale of analysis, functionalities, methodological and structural elements, technical and web-based features and flexibility can be developed for freshwater and terrestrial ecosystems (Gottardo et al., 2009).

The conclusions of the workshop can be applied to following directives:

- Water Framework Directive
- Soil Framework Directive (under development)
- Flood Risk Directive
- Major hazard directive
- Impact assessment directive (EIA)

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