The influence of soil properties and local characteristics on the distribution, migration and potential bioavailability of Radio-Cesium in Bavarian forest ecosystems more than 20 years after the Chernobyl accident

J. Winkelbauer (1), J. Voelkel (1), M. Leopold (1), K. Huerkamp (1) and R.W. Dehos (2)

(1) Department of Geomorphology and Soil Science, Technical University Munich, Freising, Germany, (2) Bavarian State Ministry of the Environment, Public Health and Consumer Protection, Munich, Germany (geo@wzw.tum.de)

Soil properties and local characteristics of landscapes and ecosystems influence the behaviour of Radio-Cesium. Humic horizons are a main factor in understanding the migration and potential bioavailability of radio-nuclides in soils. Until 1962 and in the year 1986, nuclear arms tests in the Pacific and the Chernobyl reactor accident emitted persistent radionuclides in the atmosphere that are stored in several European ecosystems. Short-term high as well as long-term low immissions lead to enrichments and increasing contamination of the environment up to superposition effects in certain ecosystems. South German forest ecosystems like the Bavarian Forest or the Northern pre-Alps are subareas of the caesium fallout affected sites after the Chernobyl accident. Cesium-137 is constantly contained in the vegetation and food chain in spite of decreasing local doses. Investigations have shown that the enrichment of caesium is mainly restricted to the organic top layers of the forest soils. Examples of several Bavarian forest ecosystems are given. Horizontal and vertical forest soil distributions of the cesium contamination and its bioavailability were determined to provide a default-document how to act in case of a repetition of a nuclear accident. Such a guideline has been created by order of the Bavarian State Government and its scope is

presented here.