



## **Pathway of radioisotopes from land surface to sewage sludge**

Helmut W. Fischer (1) and Yoshiyuki Yokoo (2)

(1) Environmental Physics, University of Bremen, Bremen, Germany (hfischer@physik.uni-bremen.de), (2) Symbiotic Systems Science, Fukushima University, Fukushima, Japan (yokoo@sss.fukushima-u.ac.jp)

Radioactive surface contaminations will only partially remain at the original location - a fraction of the inventory will take part in (mainly terrestrial and aquatic) environmental transport processes. The probably best known and most important process comprises the food chain. Besides, the translocation of dissolved and particle-bound radioisotopes with surface waters plays an important role. These processes can have the effect of displacing large radioisotope amounts over considerable distances and of creating new sinks and hot spots, as it is already known for sewage sludge.

We are reporting on a combined modeling and experimental project concerning the transport of I-131 and Cs-134/Cs-137 FDNPP 2011 depositions in the Fukushima Prefecture. Well-documented experimental data sets are available for surface deposition and sewage sludge concentrations. The goal is to model the pathway in between, involving surface runoff, transport in the sewer system and processes in the sewage treatment plant. Watershed runoff and sewer transport will be treated with models developed recently by us in other projects. For sewage treatment processes a new model is currently being constructed. For comparison and further validation, historical data from Chernobyl depositions and tracer data from natural and artificial, e.g. medical, isotopes will be used. First results for 2011 data from Fukushima Prefecture will be presented.

The benefits of the study are expected to be two-fold: on one hand, the abundant recent and historical data will help to develop and improve environmental transport models; on the other hand, both data and models will help in identifying the most critical points in the envisaged transport pathways in terms of radiation protection and waste management.