

Development of the radioecological expert & information system *ECORAD*

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From 1989 the radioecological expert & information system **ECORAD** was developed in the Radioecology Laboratory of Soil Science Faculty of Lomonosov Moscow State University [1,2].

ECORAD was primarily developed for use in the educational process, running under Windows. Since the last report about this system, essential changes have been introduced. The most prominent modifications apply to the set of mathematical models used:

- The system is supplemented by a model of long-term dynamics of ^{90}Sr in pine forests of different age. This model was developed on the basis of the improved version of the algorithm used in the model for ^{137}Cs [3] and was modified with regard to particular properties of the behaviour of ^{90}Sr in vegetation and soil of the forest ecosystems. It includes three sub-models. Long-term dynamics of organic substance carbon, calcium and ^{90}Sr are calculated. Data from the Ural accident of 1957 (Kyshtym) and from field experiments were used for the definition of the parameters and validation of the model.
- Based on the model for simulation of seasonal dynamics of organic substance carbon in oak forest ecosystem with a one hour step [4] the new model of ^{137}Cs behaviour in deciduous forest ecosystems was developed. Here, both long-term and seasonal dynamics of ^{137}Cs in components of a vegetative cover can be reproduced with a one day step. This model includes seven sub-models. Hourly dynamics of soil moisture and temperature, meteorological parameters, plant moisturing, dynamics of organic substance carbon, potassium and ^{137}Cs dynamics are calculated.

Simulation models were developed as modules, which can be executed autonomously. It allows to use any module separately or in combination with other algorithms. Modifications can easily be introduced.

With these new models, additional information about the behaviour of ^{90}Sr and ^{137}Cs in forest ecosystems was achieved. For example, the quantitative data for the transposition of radionuclides in a soil-plant system were obtained.

References:

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