



SINAC – Simulator Software for Interactive Modelling of Environmental Consequences of Nuclear Accidents (Second Generation)



P. Szántó, S. Deme, E. Láng, I. Németh, T. Pázmándi

Hungarian Academy of Sciences Centre for Energy Research, Budapest, tamas.pazmandi@energia.mta.hu

Introduction

The SINAC programme system was developed to follow the consequences of radioactive releases of a (hypothetical) nuclear accident. Atmospheric dispersion, plume depletion by dry-out and wash-out, cloudshine and groundshine doses, dose consequences of inhalation and ingestion, early and late health effects are computed in the software. Effects of the introduction of countermeasures are also taken into account.

The SINAC system – developed in our Institute in the 1990's – has gone through a lot of development in the last few years according to users' needs and to the Hungarian and the international regulations and protocols of radiation protection. Continuous development ensured that the SINAC environmental simulator was used as an interactive expert system in the Hungarian Atomic Energy Authority Centre for Emergency Response, Training and Analysis in the last decade.

Description

The common goal, as a result of several years of development, was to obtain an easily usable, flexibly developable software that gives results comparable to those of other software products being developed in international collaboration. As a first step we defined the potential directions of development and made a suggestion to carry out the tasks.

The second generation of the SINAC system has basically three functions:

- Handles the input data of calculations,
- Executes the calculations,
- Visualizes and saves the results.

Besides of handling the input data and the results in a user interface for data input and visualization, storage and loading of input and output data structures were resolved as well.

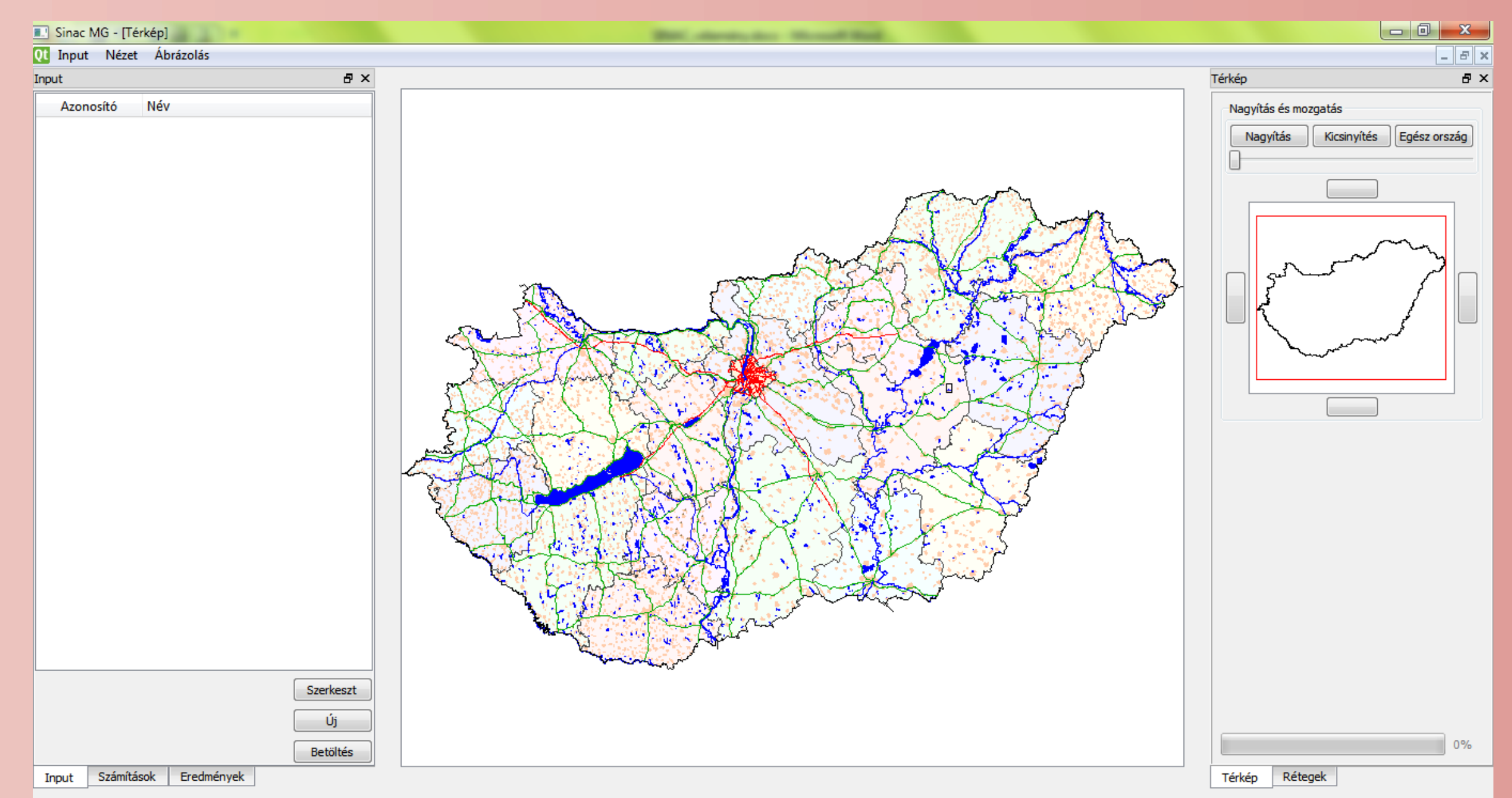


Fig. 1: Starting screen of the programme

Structure

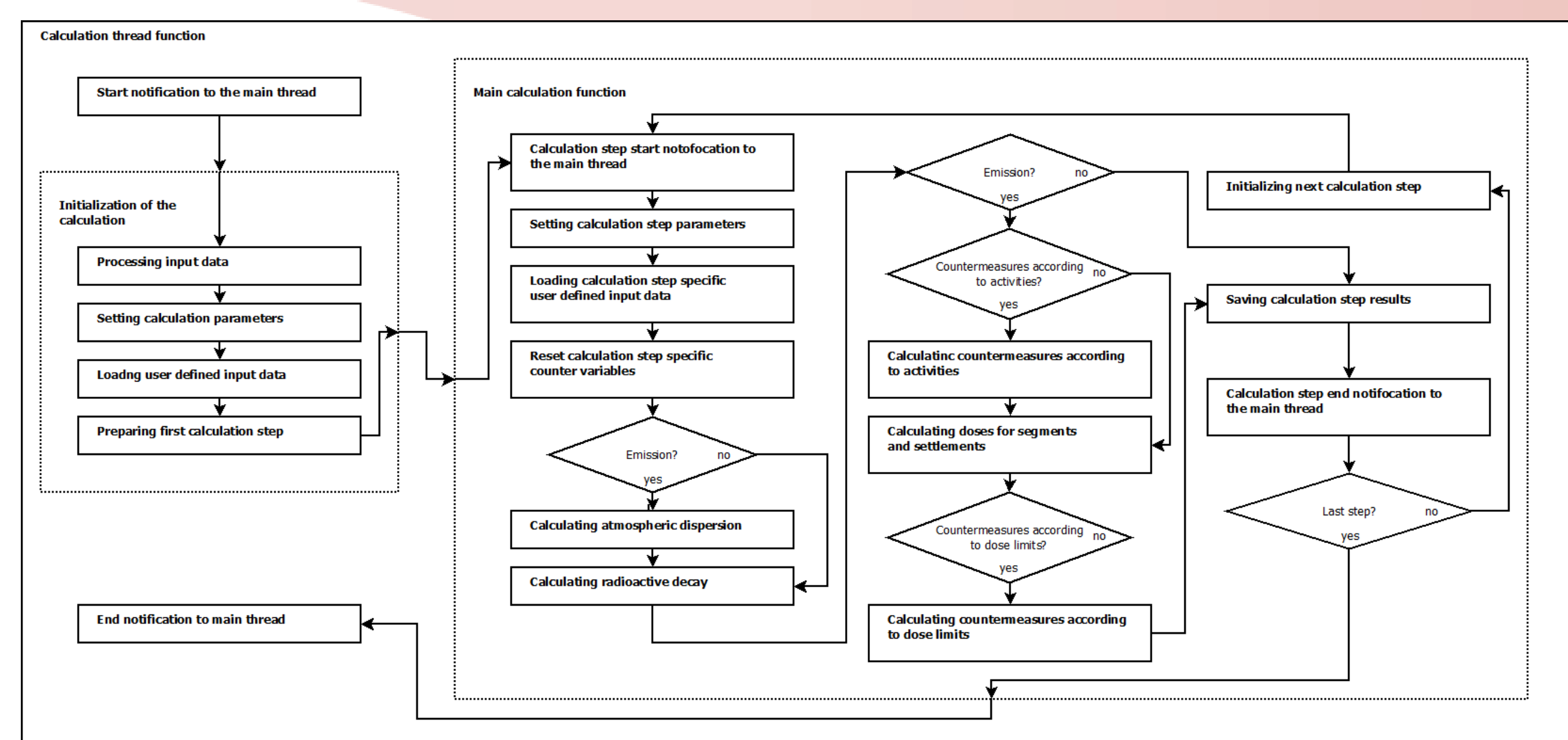


Fig. 2: Calculation diagram of the programme

The three functions are separated in the structure of the programme. The user has a comfortable and transparent interface to set the parameters of calculations. The parameters are stored and reloadable, since they might be needed at analyzing the results or at performing new calculations using them. Since the input of the calculations might contain earlier results, they are also loadable as an input structure of the calculation.

The module responsible for executing the calculations performs these tasks according to the input data and forwards the output data to the visualization module.

The visualization module does not only display the calculation results but some of the input data as well. The results can be saved in different formats: binary (raw data), text (tables) and images (maps, charts).

User Interface

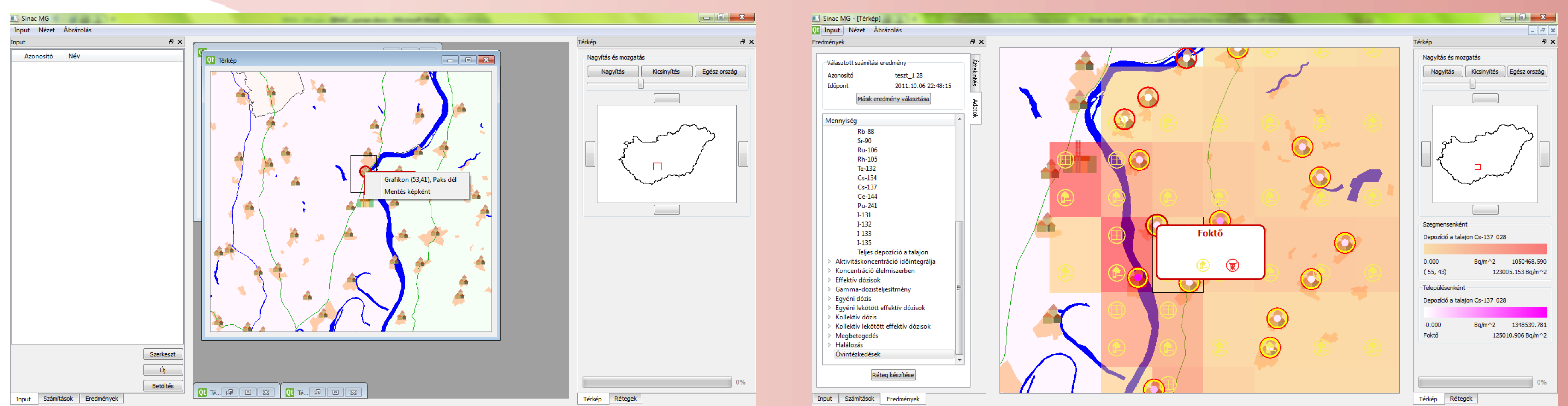


Fig. 3: Screenshots