Title: **SimSurvey - an R-based E-learning tool for geo-statistical analyses**

Authors:
Mario Gellrich[1], Rudolf Gubler[1], Andreas Papritz[1], Andreas Schönborn[1], Rainer Schulin[1]

Affiliations:
Swiss Federal Institute of Technology (ETH), Institute of Terrestrial Ecology (ITE), Universitätsstrasse 16, CH-8092, Zürich

Assessment of land pollution and soil degradation is a task that environmental scientists and engineers may face in their daily work. Geo-statistical methods are often used for such purposes. Geo-statistics lessons are part of the academic education of many environmental scientists, but as experiences show, the complexity of statistical methods is often difficult for students. We are developing an E-learning tool to complement the theoretical lessons for students. The aim of our project, 'SimSurvey', is to make the learning of geo-statistical methods easier. By creating a virtual environment (similar to the situation in a professional consulting company), students will face 'real life' problems such as the collection of soil samples, geo-statistical analyses of the collected data and the handling of financial recourses. SimSurvey consists of a 'project environment' and a statistics module. The project environment facilitates students to navigate through virtual maps, manage recourses and handle data. The statistics module consists of a graphical user interface (GUI) and a classical programming environment, which makes it a very flexible tool for the analysis of spatially explicit data. SimSurvey runs on a Linux-Server and requires Apache, Flash-Player, MySQL, PHP and R. As Flash uses XML-files to create the R-GUI, the statistics module can be easily extended and adapted without extensive programming knowledge. Single R processes run via socket connections, i.e. there is a permanent connection between the server and each R-process. This makes statistical computing faster than in 'batch mode', which is used in most existing web-based R-projects. SimSurvey is still under development. To date, the GUI allows students to explore spatial datasets graphically and by means of statistical models. Linear regression and geo-statistics functions (variograms, kriging) are implemented for multivariate data analyses and predictions.