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Design and implementation of a risk assessment module in a spatial decision support system

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The spatial decision support system named 'Changes SDSS' is currently under development. The goal of this system is to analyze changing hydro-meteorological hazards and the effect of risk reduction alternatives to support decision makers in choosing the best alternatives. The risk assessment module within the system is to assess the current risk, analyze the risk after implementations of risk reduction alternatives, and analyze the risk in different future years when considering scenarios such as climate change, land use change and population growth.
The objective of this work is to present the detailed design and implementation plan of the risk assessment module. The main challenges faced consist of how to shift the risk assessment from traditional desktop software to an open source web-based platform, the availability of input data and the inclusion of uncertainties in the risk analysis. The risk assessment module is developed using Ext JS library for the implementation of user interface on the client side, using Python for scripting, as well as PostGIS spatial functions for complex computations on the server side. The comprehensive consideration of the underlying uncertainties in input data can lead to a better quantification of risk assessment and a more reliable Changes SDSS, since the outputs of risk assessment module are the basis for decision making module within the system. The implementation of this module will contribute to the development of open source web-based modules for multi-hazard risk assessment in the future.
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