

# Prevention against Alpine Natural Hazards: Sustainable chalet management

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The key aim of the project „Prevention against Alpine Natural Hazards“ was to combine the interdisciplinary topics of geodesy, geoinformatics and land management. Developing efficient data models to store relevant information of buildings can be a very useful and sustainable method to analyze and assess existing and planned objects. On basis of a data model combining geometries and formal attributes an assessment of the management of two chalets was carried out in September 2013. The alpine region Hornbergle was thereby in the focus.

In the field geoinformatics the data from the survey were integrated in the existing CityGML data model utilizing ETL (Extract, Transform, Load) software. The data model was enhanced by adding Application Domain Extensions (ADE) to represent the survey data that was not supported by the standard CityGML schema. All chalet located in the survey area were shown through simple geometries based on digital terrain models and measurement data of electronic total stations. The following solar radiation analysis showed results for the direct irradiation from about 1.300 to 1.500 kWh/m<sup>2</sup>.

In the field land management the topics of electricity, heat, waste and water management were analyzed and recommendations verbalized. At 'Singer Hütte' a PV-System with grid connection is recommended. Solar heat and wood pellets should provide additional and ecological heat supply. For waste and wastewater is, apart from avoiding, no improvement potential possible. At the 'Schneetalalm' we recommend a fuel exchange from diesel to plant oil for the generator. Additionally the existing photovoltaic electricity should heat in a cartridge heater the combined-storage-tanks. Waste should be avoided where possible. The rainwater use for cleaning purpose and toilet flush would relieve the spring discharge and should be considered.