



An attempt for the calculation of soil-temperatures using publicly available data. A case study from the Interreg project GRETA in the region Leogang – Saalbach-Hinterglemm in Salzburg, Austria

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The EU-funded project GRETA (Near-surface Geothermal Resources in the Territory of the Alpine space) performs potential assessments for the use of near-surface geothermal energy in six focus regions across the Alpine space. In Austria the two communities Leogang and Saalbach-Hinterglemm represent the focus region. The demand for heating and domestic hot water in this region of about 6.000 inhabitants rises significantly in the winter months due to skiing tourism. Settlements are located in altitudes of about 800 – 1.000 m with a large number of remote houses, where near-surface geothermal energy can be a useful solution for a self-sufficient energy supply.

An important parameter for the modelling of near-surface geothermal energy systems are ground temperatures. The objective within the project is to which extent various parameters like the elevation, the gradient and the orientation of the hillside and underground properties like the soil composition influence the ground-temperature and therefore the geothermal usability of the shallow underground. To predict temperatures in depths of up to 100 m it is necessary to attain precise ground-temperatures that reflect the upper model boundary. As there are no ground-temperature data available within the region, the GBA has installed four monitoring stations. Two of these stations are located in the valley, at altitudes of about 800 m, and two in higher altitudes of about 1.200 m, one on a south- and one on a north slope. Results are used for the validation of the software SoilTempSim developed by the University of Soil Sciences in Vienna. The ground temperature calculation is based on numerous climatic data, like daily maximum and minimum air temperatures, the daily global radiation sum and the snow coverage, and considers the soil composition. Climatic data in Austria are easily available from the Austrian national weather service ZAMG. Parameters for soil composition or the lithological content can be obtained by information included in soil maps and geological maps. A successful use of this easy available or public data could help to create large-scale ground-temperatures maps and as a calculation base for geothermal energy systems.