

A matter of degrees - Prediction, monitoring, and evaluation of subsurface temperatures for the sustainable use of shallow geothermal energy

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The thermal use of the shallow subsurface for heat generation, cooling, and thermal energy storage is increasingly gaining importance for the future low emission energy supply. The exploitation of shallow geothermal energy is often promoted as being of little costs during operation, while simultaneously being environmentally friendly. However, the thermal use of the shallow subsurface directly impacts soil and ground water temperatures. Resulting conflicts of an intensive use may arise between individual users or between different subsurface utilizations, e.g. energy and ground water provision. Therefore, an understanding of the subsurface temperature regime and induced changes is in the interest of all involved actors to facilitate a sustainable ecological and economic intensive thermal use of the shallow subsurface. Although computer-based simulations strongly support impact assessment, the overall problem is that processes in the subsurface are in many cases only accessible by drillings and sensor-based monitoring. This in turn is generally associated with large efforts and costs. To reveal potential conflicts in interest as well as resulting ecological and economic trade-offs, this presentation will give an insight in subsurface temperature monitoring and its relevance from the different perspectives of regulators, planners, and end-users.