

**Groundwater/surface water interactions as a management issue for groundwater extraction: a detailed hydrogeological model approach, Hyvinkäänkylä, Finland.**

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The municipality of Hyvinkää, southern Finland supplies water to ~46,000 people from groundwater directly pumped from aquifers or surface waters artificially recharged through them. The aquifers are a part of a complex glacial system of eskers, moraines and glacial-lacustrine sediments, which cover a large part of the study site and through which groundwater is channelled towards the extraction wells. In order to optimise the management and protection of these waters and to determine which groundwater routes are affecting the supply most of all, a detailed geological model was built using various indirect and direct methods. Then, along with measured hydraulic conductivities, groundwater elevations, stream flow measurements and simulated recharge values a flow model was adapted from the geological model and calibrated using MODFLOW. The water budget could determine which of three likely scenarios is true. Either the flow paths dominate from the north or south through the esker system or along the river valley itself through buried highly conductive sediments. The study also incorporated an infra-red imaging field technique to identify areas of groundwater/surface water interaction i.e. areas along the river where groundwaters discharges.