

LESSONS FROM 3D HYDROGEOLOGICAL CONCEPTUAL MODEL BUILDING IN DENMARK

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INTRODUCTION

The Danish government adopted a new Water Supply Act in 1998, according to which about 40% of the country was designated as particularly valuable for groundwater withdrawal. The Act, in many ways reminiscent of the Californian SGMA, mandated comprehensive hydrogeological mapping of those areas. The aim of the Act was to establish site-specific groundwater protection zones and associated regulation of land use. This effort was completed in an exemplary public-private partnership in 2015, with a total estimated cost about €250 million (Refsgaard, 2009).

Geophysics and 3D modelling for decision making

Geophysical methods were used extensively in the mapping campaign, including improved airborne geophysical methods, for the groundwater target. The amounts and types of data, posed a new set of problems. The size and scope of the mapping project, with many public and private stakeholders and actors, working over a very wide time period, created a need for new, integrated data management and optimized software tools to effectively process, manage, visualize and model the data to generate 3D conceptual models, targeting the groundwater resource mapping. Through a series of concrete examples, we present lessons learned and future developments underway, on workflows and methods for the 3D hydrogeological conceptual model building, together with some of the challenges encountered and the solutions implemented while working with the Danish version of SGMA, and in other countries as well.

A series of 3D modelling scenarios will be presented, including workflow, obstacles and solutions developed