Geophysical Research Abstracts
Vol. 14, EGU2012-3563, 2012
EGU General Assembly 2012

A discussion of issues related to hydrogeology of deep geologic systems

CF Tsang (1,2) and A Niemi (1)

(1) University of Uppsala, Earth Sciences, Uppsala, Sweden (auli.niemi@geo.uu.se, +46-701 679 233), (2) Lawrence Berkeley National Laboratory, Berkeley, CA (CFTsang@lbl.gov)

The state of the deep hydrogeological system, including its hydraulic structures and flow patterns, distribution of permeability and porosity, and distribution of hydraulic head values, is very much an open research field. Much work needs to be done to obtain such data and to understand the current conditions at depth. Deep drilling projects worldwide have often been dominated by studies concerning the geological and geophysical processes, as well as the geochemical composition of the deep underground. Hydrogeological processes, on the other hand, have received relatively less attention. Yet many of the important chemical, thermal and mechanical processes of the deep underground are closely linked and cannot be properly addressed without an adequate understanding of fluid flow and solute migration. Hydrologic condition and its evolution may also play a significant role in long term geologic processes, such as orogenesis. Presently, intended to be part of the International Continental Drilling Program (ICDP), a deep drilling project is under preparation on the Swedish Caledonides (www.sddp.se/cosc), with the objective to address, among other things, issues related to fluid flow and solute migration. Partly prompted by this project, and partly by the desire to compile the existing knowledge, a workshop was convened in September 2011 in Uppsala, Sweden, to review the state-of-the-art of hydrogeological studies of deep systems, both from the point of view of available observations and data, and from the point of view of modeling and generic conceptual considerations. The discussions and presentations were structured around the following topics: (1) Spatial Extent and Dynamics of the Fluid Flow in the Deep Subsurface; (2) Fluid Flow in Coupled Thermo-Hydro-Mechanical-Chemical Processes occurring at depth; and (3) Monitoring and Modeling Methods. The present talk will aim to present the main outcomes and recommendations from this workshop.