

HYDROGEOLOGY OF THE MONT-TERRI ANTICLINE

Context and objectives

The Mont-Terri laboratory is situated near St-Ursanne (Jura) in order to study the characteristics of the Opalinus clay formation. The Opalinus Clay formation is the target formation in Switzerland for the storage of radioactive wastes. Aquifers surround the Opalinus clay formation (aquitard) and it is important to understand the characteristics of the entire systems (aquifers + aquitards) in order to evaluate the hydrogeological regime of the area.

The HS experiment at the Mont-Terri laboratory (HS stands for Hydrogeological Survey) is designed to study this system with the following specific aims: (a) to evaluate the water mass balance across the various formations of the Mont-Terri anticline, (b) to characterize dynamic water flow within carbonate units; (c) to perform a hydro-chemical characterization of the monitored outlet points and (d) to evaluate the role and possible interactions between the aquifer limestone units and Opalinus Clay.

Research approach and methodology

A complete monitoring system is already in place around the Mont-Terri anticline with a number of automatic and manual stations that measure flow rate, conductivity and temperature. Samples are taken systematically in order to measure the hydro-chemical characteristics of the various waters and their evolution with time.

The role of the student will be to integrate the existing information and measurements in order to develop an understanding of the hydrogeological regime of the Mont-Terri anticline. A hydrogeological field survey in order to complement the information already existing will be an essential step to start the project. The student will develop a conceptual model of the hydrogeological system of the Mont-Terri anticline and use the physico-chemical parameters measured to establish the water mass balance across the system. Based on this information a numerical simulation of the system could be envisaged.

Partners and collaboration

The project will be supervised by Prof. B. Valley in close collaboration with Dr. C. Bertrand (Univ. de Franche-Comté); Dr. C. Emblanch (Univ. Avignon) and Dr. D. Jaeggi (Swisstopo). The student will also benefit from the very active and stimulating research community that work at the Mont-Terri laboratory and will participate to the Mont-Terri project meetings.

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