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Eawag Seminar Invitation

The Karst Aquifers: A Strategic Resource in Arid Countries And a Mitigation Alternative of Climate Change

Speaker **Dr. Pierre-Yves Jeannin,**
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When **October 13, 11.00 – 12.00 a.m.**
Where **Forum Chriesbach, room C20, Eawag Dübendorf**

Abstract The talk will deal with three aspects:
1) Karst encloses a large amount of water, even in arid countries. Due to the extreme heterogeneity of karst aquifers dedicated investigation and management methods are being developed. Combining geological and hydrological data in 3D models makes possible to predict the position and characteristics of the main groundwater flowpaths in karst. This enhances the rate of success in tapping groundwater. Water quality is another issue in karst, for which collaboration between karst hydrogeologists and water engineers will give access to new resources.
2) The condensation of air humidity flowing through the unsaturated zone of karst aquifers seems to contribute to groundwater recharge (Dublyansky 1998). It could explain very slow recessions ok karst springs in dry and hot regions. The talk will show how air circulations can recharge karst aquifers, as well as some ongoing research on this topic, including issues for the protection of Paleolithic cave paintings, or heat pumps in karst regions.
3) The dissolution of carbonate rocks acts as a carbon sink with respect to the atmosphere. A key-question is how long carbonates remain dissolved, because the process is reversed when limestone is precipitated again (e.g. in travertine). Climate warming enhances carbonate dissolution, i.e. increases the associated carbon sink (Jeannin et al 2015). The conditions and rate of carbonate dissolution and precipitation are not well known, leading to a large uncertainty about this effect. At global scale the carbon sink was indirectly assessed to 0.1 to 0.4 GtC/year (Zaihua et al 1998, Gombert 2002). Very little field data were used for this estimate. New data and measurement methods are now available and would make possible to be more precise. Could this process be artificially enhanced in order to contribute more to reduce atmospheric CO2?