

The contribution of european projects in the cross-border management of drinking water: between hydrodynamics and vulnerability

Chiara Calligaris (1), Franco Cucchi (1), Philippe Turpaud (1), Nataša Ravbar (2), Metka Petrič (2), Janko Urbanc (3), and Luca Zini (1)

(1) Dipartimento di Matematica e Geoscienze, Università degli Studi di Trieste, Italy (calligar@units.it), (2) Karst Research Institute, ZRC SAZU – Postojna, Slovenia (metka.petric@zrc-sazu.si), (3) Geological Survey of Slovenija (GeoZS), Ljubjana, Slovenia (janko.urbanc@geo-zs.si)

The Classical Karst Region represents an evolved binary karst hydrostructure located across NE Italy and SW Slovenia. Its deeply karstified limestones and dolomitic limestones swallow rainfall in a network of caves and fractures through the epikarst and vadose zones. In the phreatic zone, horizontal or sub-horizontal conduits quickly convey water to the springs. The aquifer is also recharged by the input of three rivers. Along its SE edge in Slovenia, the Reka River sinks entirely into the Škocjan caves. Along its NW edge, the Isonzo/Soča and Vipacco/Vipava rivers recharge the aquifer in a more diffuse manner as the input is supplied by porous aquifers alimented by riverbed leakages. The hydrostructure is drained by numerous springs situated NW of the plateau along its SE facing edge, between Monfalcone and Duino. The common average discharge of the Timavo spring is about 35.5 m³/s.

The Reka-Timavo aquifer has attracted the attention of researchers for the last 200 years due to the increasing need for good quality drinking water. Water withdrawn in this area is guaranteed drinking water for the inhabitants of the Classical Karst. This water is supplied by AcegasApsAmga and Kraški Vodovod delivering to more than 250.000 inhabitants.

Since World War II, the Classical Karst Region has been politically divided. Consequently this area has been studied and managed separately for almost 70 years. Only recently has a collaboration between researchers of both countries begun. Within this framework is the 3-year Hydrokarst Project funded by the European Union which focussed on the joint protection and management of the cross border aquifer through the analysis of groundwater dynamics. The structuring and implementation of a shared geodatabase has allowed for the hydrochemical, hydrogeological and hydrodynamic characterisation of the aquifer. A second step consisted of the elaboration of a joint hydrogeological map. Thirdly, vulnerability mapping has allowed for the identification of areas which require the highest level of protection in order to guarantee good quality freshwater. Effective cooperation between the authorities of both countries is the only way to overcome the difficulties in protecting such a large cross border aquifer.