

GEOCHEMICAL STUDY OF WATER

In the field WP6, we proceed to the characterization of surface and groundwater water bodies by chemical analysis of major anions and cations, trace metals and isotopes δD and δO_{18} , in addition to the hydrogeological model. The geochemical data allowed to identify the areas affected by interactions between surface water and groundwater, and to verify the possible contributions of fossil waters during the minimum recharge. The hydrogeological investigation defines a conceptual model of recharge and to trace the paths of water in karst environment in support to the conceptual hydrogeological model on which the study of processes of pollution spreading is based. The typical geochemical markers of the water bodies are linked to the water-rock interactions and they can be considered as «natural tracers» for the characterization of the karst and alluvial water bodies vulnerability. These tracers resolve the problem of the environmental impact that the artificial tracers have on drinking water. The cations (Ca, Mg, Na, K) and trace elements (Al, Fe, B, Li, Cr, Ni, Sr, Ba, Mn, As, Pb, Ga, Cu, Sn, Sb, Se, U, Tl) are detected by ICP-MS instrument (*Inductively Coupled Plasma Mass Spectrometry*) (Fig.1), meanwhile the anions (HCO_3 , NO_3 , Cl^- , SO_4) are detected by Ion-chromatography.



Fig.1 ICP-MS Instrument at Physic and Earth Sciences Department Laboratory (UNIFE), Ferrara

Progetto GEP finanziato nell'ambito del Programma per la Cooperazione Transfrontaliera Italia-Slovenia 2007-2013, dal Fondo europeo di sviluppo regionale e dai fondi nazionali.

Projekt GEP Sofinanciran v okviru Programa čezmejnega sodelovanja Slovenija-Italija 2007-2013 iz sredstev Evropskega sklada za regionalni razvoj in nacionalnih sredstev



Ministero dell'Economia e delle Finanze



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA GOSPODARSKI RAZVOJ IN TEHNOLOGIJO

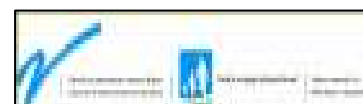
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2007-2013
cooperazione territoriale europea
programma per la cooperazione
transfrontaliera
Italia-Slovenia
evropsko teritorialno sodelovanje
program čezmejnega sodelovanja
Slovenija-Italija



The measures of the **Radon gas** are useful tracers for establish the provenance of different water bodies, because the carbonate and terrigenous rocks have significant variations in the radon emission depending on chemistry, formation environment and petrophysical characters (porosity, permeability, degree of cementing, etc...)



Fig.2 Gas Radon Instrument at Physic and Earth Sciences Department Laboratory (UNIFE), Ferrara