

**Marie-Curie Post Doc position in Mathematical Modelling in Hydrology
at Helmholtz Center Munich, Institute of Groundwater Ecology**

Title: Development of integrated tracer and mathematical modelling techniques to quantify water fluxes and transport parameters in a heterogeneous porous aquifer.

Work package number: 11

Objectives

- Development and application of mathematical models to characterize aquifer transport parameters and aquifer heterogeneity, taking into account the existence of stagnant water and the diffusive exchange between mobile and immobile water phases, and quantifying the system parameters;
- Modelling of reactive pollutants transport incorporating sorption and biodegradation reaction kinetics, as well as CSIA of reactive contaminants.

Summary

The main task of the research will be a development of new methods to understand and quantify the heterogeneity of a water system. Further, the influence of such heterogeneities will be investigated on quantifying of organic pollutant degradation using compound-specific isotope ratios of the contaminants (CSIA). In the first stage the tracer technique will be applied and mathematical models will be developed to quantify: (i) different forms of water transport (preferential or channel and matrix flow); (ii) the existence of stagnant water, and (iii) the diffusive exchange between mobile and immobile water phases. In the second stage mathematical models describing pollutant migration, which take into account the kinetic reaction (kinetic sorption and desorption on the porous matrix and in the zones with stagnant water), biodegradation processes and the transport of degradation products should be adopted and further develop. The outcome should be compared with estimates of pollutant degradation derived alternatively from changes in contaminant-specific stable isotope ratios. Modeling results shall form the basis to predict the dynamics of contaminated sites and to develop strategies to stimulate and support remediation processes.

Entry requirements

The applicant should hold a PhD in hydrology/hydrogeology, eco-hydrology, and environmental science or in civil engineering with experience in (i) using artificial tracers in laboratory or field studies and in (ii) application and developing mathematical models to describe water and pollutant transport.

The researcher may be a national of a Member State of the Community, of an Associated Country or of any other third country. **To be eligible he/she must not have resided or carried out your main activity in the host country for more than 12 month in the past 3 years and have more than 5 years work experience.**

The network aims at a participation of at least 40% women in the vacant positions.

Application

The initial closing date for formal applications is the 20st December 2009.

We expect successful candidates to join the network in April 2010.

Formal applications should be **exclusively send electronically** and should include:

- Full CV
- A statement of motivation (not more than one page)
- Copies of relevant exams, grades, master thesis, dissertation, work or publications
- Contact information to two reference persons

Please send your application electronically to

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