

## **Vacancy 72194**

The Faculty of Geosciences offers a wide spectrum of education and research concerning the geosphere, biosphere, atmosphere and antroposphere. The faculty enjoys international acclaim, both proven by our many graduates who have achieved important positions at leading foreign universities and the large number of visiting scientists. In the Netherlands, the faculty is the largest institute in the field of Geosciences. We teach approximately 2000 students in five Bachelor and 19 Master programmes.

The research conducted by the **Hydrology Group of the Department of Physical Geography** focuses on Large-scale hydrology, ecohydrology and the development of geocomputational methods, including monitoring. Together with the research institute **TNO Built Environment and Geosciences** the Hydrology Group develops methods for monitoring soil and groundwater.

Within that theme we seek a

### **PhD researcher Monitoring strategy for Hydrogeological Parameters (1,0 fte)**

#### **Job description**

The main goal of the proposed research is to explore the possibility of using information obtained from calibrating groundwater models to improve estimates of hydrogeological parameters. In particular the following two research questions are addressed:

1. How can we improve the hydro-geological model REGIS (the national hydrogeological model of TNO used in many regional groundwater models) with information gained by the calibration of groundwater models, in particular by focusing on the dynamic response?
2. How can we devise optimal strategies for monitoring groundwater in space that will, together with groundwater flow modeling and calibration, provide the maximum improvement of the static parameters in the hydrogeological model REGIS?

Groundwater models are important tools for regional water management. Mostly these groundwater models are spatially distributed, discretized numerical models, with a large number of grid blocks or elements. In recent years for large parts of the Netherlands and elsewhere several regional groundwater models have been built. The initial values of the Hydrogeological parameters in the grid blocks are obtained from (hydro)geological survey. REGIS (Regional Groundwater Information System) contains this information for the Netherlands. In most groundwater models the initial values of hydrogeological parameters are further adjusted to obtain a better fit of the model output to the observations, usually observations of groundwater head. Until now, no systematic procedure is available to feed back calibration results of a groundwater flow model to a static hydro-geological model such as REGIS. To devise such a method and to devise a related monitoring strategy is the subject of this PhD research. The research will be conducted in close cooperation with TNO (REGIS) and the research institute Deltares (groundwater modeling). The candidate will be work both at the department of Physical Geography as well as at TNO in Utrecht.

It will be your task to conduct research resulting in a PhD thesis including peer reviewed publications. Development of a method to use calibration results of groundwater flow models to improve estimates of hydrogeological parameters and to develop monitoring strategies to optimise the improvement. You are required to assist in MSc Hydrology courses and to advise MSc students.

#### **Job requirements**

A recent MSc diploma in Hydro(geo)logy, Geophysics, Civil Engineering, Applied mathematics, or related disciplines. A sound knowledge of numerical modelling is required; willingness to travel abroad; have good oral and writing skills; knowledge of programming languages (e.g. FORTRAN, C++) is highly desirable.

**Terms of employment**

The successful candidate will be offered a full-time PhD position, initially for one year. Contingent on a satisfactory performance this may be extended to a total period of four years, with the specific intent that it results in a doctorate within this period.

Employment conditions are based on the Collective Labour Agreement of the Dutch Universities.

The gross monthly salary starts at € 2,042.- in the first year and increases to € 2,612.- in the fourth year and is supplemented by a holiday allowance of 8% per year and an end-of-year bonus of 8.3%.

**Contact person**

Interested? For further information about this position, please contact Prof. dr. F.C. van Geer (+31 30 2564757/2564750, [frans.vangeer@tno.nl](mailto:frans.vangeer@tno.nl)) or Prof. dr. M.F.P. Bierkens (+31 30 2532777/2564769; e-mail: [m.bierkens@geo.uu.nl](mailto:m.bierkens@geo.uu.nl) )

**Application**

Applications, including an application letter, a curriculum vitae and the names and addresses of 2 references, must be sent to the Personnel Department, Department of Physical Geography, Utrecht University, P.O.Box 80115, 3508 TC Utrecht, Netherlands, or submitted by e-mail to [PenO@geo.uu.nl](mailto:PenO@geo.uu.nl).

Please mention where you originally saw our advertisement and quote **vacancy number 72194** in all communications.

**Deadline for application is March 1 2011.**