

PhD researcher groundwater hydrology (1.0 fte)

Job description

Project description

The Sand Engine pilot is a concentrated 21 Mm³ shore nourishment (i.e. sand deposition) at the Delfland coast (NL). This unprecedented experiment aims to protect the hinterland from flooding by letting natural processes distribute sand over the shoreface, beach and dunes, thus constituting a climate-robust and environmentally friendly way of coastal protection. The NatureCoast project was funded by STW with the objective to raise our understanding and predictive capability regarding the various aspects of this type of shore nourishments, up to a level enabling to assess their effectiveness and to export the underlying technology worldwide. The proposed interdisciplinary research involves six research projects covering the disciplines morphology, ecology, hydrology, geochemistry and governance. This PhD is part of the research project titled "Hydrology and Geochemistry" that focuses on understanding of the hydrological and geochemical processes associated with mega-nourishments such as the Sand Engine.

In the proposed research, that is performed in close co-operation with the research Institute Deltares, you will develop the tools to understand and predict the effects of the Sand Engine and similar mega-nourishments on fresh water availability in the dune-beach system. To understand the complex hydrological development of the sand-engine, you will model the interaction between hydrology, atmosphere, sea-water variation at both longer and shorter time scales and large and smaller spatial scales.

You will focus on research questions such as: What is the development of the fresh-salt water interface and 3D salinity distribution in the sand-engine itself and the neighboring beach system during the different stages of morphological development? How will this be affected by varying sea water levels due to tides and surges? What are the possibilities to increase coastal fresh groundwater reserves in other areas of the world via mega-nourishments? To answer these research questions you will develop a 3D density-dependent groundwater flow model of the sand engine and the bordering beach and dune area to predict current and future salt-freshwater distributions within the sand engine and its surrounding during the various stages of its development. The model will be supported with field data that you collect on site.

The PhD project is performed in close co-operation with another PhD candidate investigating the soil and groundwater geochemistry of the sand engine. Also, the candidate will spend considerable time with the fresh-saline groundwater group of Deltares during the model building phases of the project.

Qualifications

We seek a highly motivated candidate with:

- MSc degree in Hydrology, Hydrogeology, Physical Geography, Civil Engineering, or a closely related discipline;
- Strong motivation for research;
- Keen interest in translating scientific findings to practical applications;
- Good knowledge of groundwater hydrology or hydrogeology;
- Experience in field-data collection, numerical modeling and handling large data sets.

You should be proficient in English, have excellent scientific writing and planning skills, and be an

enthusiastic team player. An open and communicative attitude and a cooperative spirit are requirements for success in this multidisciplinary and applied project. The ability to communicate the main research results to non-specialized end users is an essential aspect of these skills.

Offer

You are offered an 18-month fulltime position with - at good performance - the prospect of a phased extension with a maximum of 30 months (in total 4 years fulltime). The salary starts with € 2,042.- gross per month in the first year and increases to € 2,612.- gross per month in the fourth year of employment at fulltime appointment. The extent of these position officially is 38 hours per week (1.0 fte). The salary is supplemented with a holiday bonus of 8% and an end-of-year bonus of 8.3% per year. In addition we offer a pension scheme, a collective health insurance and flexible employment conditions. Conditions are based on the Collective Labour Agreement of the Dutch Universities.

More information: [terms of employment](#).

About the organisation

Utrecht University's Faculty of Geosciences offers education and research concerning the geosphere, biosphere, atmosphere and anthroposphere. With a population of 2200 students (BSc and MSc) and 500 staff, the faculty is a strong and challenging organisation. The faculty is organised in four departments: Earth Sciences, Physical Geography, Innovation & Environmental Sciences, and Human Geography & Urban & Regional Planning.

Further information concerning the faculty is available at the website www.uu.nl/geo. General information about Utrecht University can be found at www.uu.nl. Information concerning our hydrology group research activities can be found at www.earthsurfacehydrology.nl and about the [fresh-saline groundwater group](#) of Deltares at the Deltares website.

Additional information

Additional information can be obtained from Prof. dr. M.F.P. Bierkens (m.f.p.bierkens@uu.nl) or Dr. G. Oude Essink (qualbert.oudeessink@deltares.nl).

Apply

Applications, including a motivated cover letter, a curriculum vitae, a list of publications, and contact information of three referees, should be submitted via the application button below.

Apply until

15/02/2013

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