



## PhD position at the University of Potsdam, Institute of Environmental Science and Geography

PhD Scholarship of up to 3 or 4 years

### Background

In October 2015, the DFG Research Training Group “Natural Hazards and Risks in a Changing World” (<http://natriskchange.de>) was established at the University of Potsdam, in cooperation with the Freie Universität of Berlin, the German Research Centre for Geosciences GFZ, and the Potsdam Institute for Climate Impact Research (PIK). NatRiskChange aims to develop methods that improve hazard and risk analyses and quantifications based on the transient, non-stationary nature of hazards and risks in response to changing natural and anthropogenically altered components of the earth system.

Funded by the **Graduate School Scholarship Programme (GSSP)** of the **German Academic Exchange Service (DAAD)**, the **NatRiskChange Research Training Group** now offers a **full DAAD PhD scholarship** at the Institute of Environmental Sciences and Geography of the University of Potsdam, Germany for a **period of three years (or up to four years for candidates from developing or emerging countries)**. The related PhD project deals with one of the two topics (A, B) proposed below. Further subject-specific information can be obtained from Prof. Dr. Axel Bronstert ([axelbron@uni-potsdam.de](mailto:axelbron@uni-potsdam.de)).

### The scholarship includes

- a monthly scholarship of € 1,200
- travel support and potential support for studies and research
- combined insurance (health, accident, liability)
- a research allowance of currently € 460 per year for scholarship holders from emerging countries, or € 230 per year for scholarship holders from industrialized countries
- under certain circumstances, grant holders may receive the following additional benefits: potential support for rent, family allowance (about € 200 child allowance per child and about € 275 marriage allowance)
- full funding for a German language course in Germany of up to 6 months preceding the scholarship
- a material supervision allowance of currently € 1,000 per year, upon application to the host institution.

The selected candidate will be fully integrated in the activities and the teaching curriculum of the NatRiskChange Research Training Group, and may enjoy the vibrant international research environment at the Institute of Environmental Science and Geography of the University of Potsdam.

**The candidates are required to have the specific qualification indicated for the topics A/B (see below)**

### Formal requirements:

- upon nomination, the last final exam (master degree) must have been obtained no longer than six years ago,
- upon nomination, applicants must not have resided in Germany for more than 15 months.

### Application

Applications should include the following components: a detailed CV, a letter of motivation, a brief research concept for the PhD project (either A\* or B) of not more than 1-2 pages\*, a record of studies, master and bachelor certificates including a transcript of records, an English synopsis of the Master thesis, a list of publications, oral and/or poster presentations at conferences, and two letters of recommendation.

\*for topic A), this should include an own proposition for a suitable study area and its description and potential local partner institutions within one or more west-Balkan countries.

**Applications, either for topic A or for topic B, can only be submitted through <https://www.geo-x.net/daad-gssp/>  
Applications can only be submitted in one single PDF document (< 10 MB).**

**Deadline for applications is 20<sup>th</sup> of Dec. 2021.**

Based on the applications, the University of Potsdam will, in a first stage, nominate two to four candidates. These nominated candidates will be required to submit a full application to the DAAD which will then, in a second stage, be evaluated by DAAD. Candidates will be informed in detail about the second stage in case they are nominated after the first stage. The actual scholarship and the related PhD study are envisaged to start in October 2022. A (funded) German language course between 3 and 6 months duration might precede the actual scientific scholarship.

Handicapped applicants will be given preference in case of equal suitability. The NatRiskChange consortium strives to increase the proportion of women in research and specifically encourages females to apply for these positions.

## **A) Impacts of reservoir networks on rivers in the Balkans**

Reservoirs play a crucial role in the mitigation of multiple (natural) hazards: flood retention, water supply during droughts, hydro-power generation and stabilization of the power network. However, with their construction and operation, several detrimental effects are incurred. This includes an altered hydrological regime, affecting multiple ecological and recreational functions of the river. Moreover, sediment flux experiences severe disruptions, leading to adverse effects like accumulation (reservoir siltation) and sediment deficit (scouring, coastal erosion). The corresponding conflicts are currently of high relevance in the Balkans, where numerous new reservoirs are planned.

Both, the intended benefits and the side effects of reservoir, heavily depend on their interactions within the river/reservoir network of a basin. Consequently, the same benefits may be achieved with reservoir configurations, which differ significantly in their negative effects. From the point of river basin management, finding a multi-objective Pareto-optimum is desirable.

The proposed study aims to analyse reservoirs and their networks with respect to different options of reservoir location and operation. It will employ multiple data sources (e.g. meteorological and hydrological time series, remote sensing, own field work) to collect data to extend, run and validate a hydro-sedimentological model for a selected focus basin in the Balkans. Its modelling results will be evaluated with suitable indices quantifying benefits and negative impacts, allowing the comparison of different reservoir configurations.

The ideal candidate brings the following qualifications and skills:

- very good Master's degree in hydrology, geocology, environmental sciences or closely related fields,
- Experience in hydrological modelling
- Familiarity with a programming or script language
- Advanced skills in GIS
- Fluency in English and Serbo-Croatian or Albanian
- Contacts with a Balkan water-related research institution to co-operate ref. knowledge and data exchange
- Field work experience (optional)

## **B) Hydrological analysis of the August-2021-flood disaster in Western Germany**

The disastrous flood event in July 2021 in Central Europe 2021 was an extremely hazardous event characterized by a combination of severe flash floods and river floods in meso-scale river basins in parts of Belgium, the Netherlands, Austria, Switzerland, and Germany. The event caused over 220 fatalities, in Germany over 180, and material damage of several ten-billion Euros.

The proposed PhD-study aims to analyse, understand and quantify this flood event with a main focus on the governing hydrological and erosion processes. The methods include both retrospective/forensic information analysis and hydrological process-based modelling. Furthermore, the actual and optimum water retention potentials of different landscape compartments and land management practices are to be assessed, compared and evaluated.

The ideal candidate brings the following qualifications and skills:

- very good Master's degree in hydrology, geocology, environmental sciences or closely related fields,
- Strong expertise in hydrological modelling
- Experiences with data analysis / statistics
- Experiences with collection and interpretation of field data as well as remote sensing data
- Familiarity with programming language(s)
- Advanced skills in GIS
- Fluency in English: advanced Knowledge of German is beneficial