



Two funded PhD projects in the framework of the French- German collaboration project WEARING_DOWN

PhD#1- Using luminescence signals and paired in situ cosmogenic isotopes to quantify landscape erosion in New Zealand and Chile

PhD#2- Using luminescence signals and paired in situ cosmogenic isotopes to quantify fluvial transport and storage in New Zealand and Chile

WEARING_DOWN is a French-German collaborative research project funded by ANR and DFG which involves researchers from Universities in France (Toulouse, Rennes) and Germany (Cologne, Potsdam). The main objective of the project is to develop new tools for quantifying sediment production and transfer at the Earth's surface, from weathering and erosion on hillslopes to transport in fluvial systems. For this purpose, new tracing tools of Earth's surface processes will be developed based on natural luminescence of sediments, combined with state-of-the-art quantification of rates of surface processes by *in-situ* Terrestrial Cosmogenic Nuclides (TCN). This will include the use of *in situ* cosmogenic ^{14}C , the recent developments of which allows investigation of surface processes at a shorter time-scale than other TCN-based methods. The project requires extensive data acquisition in selected catchments and rivers of New Zealand and Chile chosen to represent a wide range of geomorphological, tectonic and climatic contexts, complemented by numerical modelling (codes CIDRE and EROS).

We are recruiting two PhD candidates (3 years, starting 1 September 2022) who will work in close collaboration (joint field work in New Zealand and Chile, joint lab training sessions, etc):

- **PhD#1, based at the University of Cologne** will work under supervision of Prof. T. Reimann (U. Cologne), Dr S. Binnie and Prof. T. Dunai (U. Cologne), and Pr. S. Bonnet (Univ. Toulouse) with input of the Wearing_down project members. He/she will develop luminescence-based surface process tracing to link catchment-wide erosion rates determined by pairing *in situ* ^{14}C and ^{10}Be measured in fluvial deposits to surface processes on hillslopes (soil formation and erosion, landsliding).
- **PhD#2, based at the University of Toulouse** will work under supervision of Pr. S. Bonnet (Univ. Toulouse), Prof. T. Reimann (U. Cologne) and Dr S. Binnie and Prof. T. Dunai (U. Cologne) with input of the Wearing_down project members. He/she develop the use of luminescence-based surface process tracing and in situ TCN for investigating the fate of sediment particles during their source-to-sink transfer in rivers. He/she will provide new quantitative estimates of fluvial transport parameters and

temporal storage of particles in floodplains for different river patterns *and* sediment supply from catchments' erosion.

Qualifications for the positions include:

- MSc in Geosciences (preferably associated with Geomorphology and/or Geochronology)
- Affinity with field work in remote areas and with experimental laboratory work
- Affinity with statistical and/or numerical methods
- Curiosity driven and dedicated researcher
- Good oral and written communication skills in English
- Good interpersonal skills, and comfortable working in a team.

Applications:

Applicants should send their application materials (CV, names of two referees, letter of motivation) with proof of the sought qualifications (record of academic degrees including a transcript of records) by May 22, 2022 at the latest:

- for PhD#1 by email (in one pdf-file) to t.reimann@uni-koeln.de
- for PhD#2 by email (in one pdf-file) to stephane.bonnet@get.omp.eu

If you have questions regarding the position(s) do not hesitate to contact Stéphane Bonnet (stephane.bonnet@get.omp.eu) and/or Tony Reimann (t.reimann@uni-koeln.de).