# Postdoc announcement: OSR4 / CEREGE UMR 7330, Aix - en - Provence, France

## Title:

Inherited versus present-day controls on bed slope and gain size distributions and characterization of transport capacities, the Rhone River, France

### Key words:

sediment transport, river morphodynamics, quantitative geomorphology, hydraulic modeling, geomorphology of large rivers, long profile analysis

## Context and research objectives:

The Rhone Sediments Observatory (OSR4) invites applications for a postdoctoral researcher to work on reconstructing the geomorphic evolution of the Rhone and analyzing present-day bed slopes and grain size distributions along the 512 km length from Lake Geneva to the Mediterranean Sea. Over the past century and a half the Rhône River has been heavily altered by human infrastructures. The first wave of modifications (1860 - 1930) consisted of dikes and groynes designed to narrow the channel and promote incision in order to facilitate navigation. A second period (1948 – 1986), involved the construction of a series of canals and dams for hydroelectricity production. These works bypass multiple reaches of the original channel and drastically reduce the discharge and sediment load reaching them. The modern day operation is superimposed on a river bed with a complex legacy of tectonic and glacial influences. Our aims are to identify inherited versus present-day controls on bed slope and gain size distributions and characterize present-day transport capacities in order to inform future management schemes that include sediment augmentation and reactivation of channel margins. The research will be based on a comprehensive and unique data set for a large river compiled during the past OSR programs (2010-2014). The data set includes long profiles and transects from historical maps and bathymetric surveys conducted by the Compagnie National du Rhone (CNR) since the start of dam operation (1950 – 2010) and grain size distributions of bed samples collected approximately every 5 km for the entire Rhone. The post-doc is expected to couple this data with a 1D hydraulic model of the Rhone.

The Rhone Sediment Observatory (OSR) is an inter-disciplinary platform established in 2009 in response to management questions that emerged as part of the "Plan Rhone" framework. The mission of the observatory is to carry out collaborative research between scientific researchers and managers in order to compile and manage data on sediment dynamics and associated contaminants within the Rhone. These data are intended to aid river managers and stakeholders in their decisions.

#### **Qualifications:**

Applicants should have a PhD degree in Earth Sciences, Engineering, Geography, or closely related fields by the start of the contract. Preference will be given to candidates with demonstrated research experience in sediment transport, river morphodynamics, hydraulic modeling, and geomorphic analysis of large rivers. Candidates need not be fluent in French, although a basic level in oral communication would be nice.

#### **Start date and duration of contract:**

The contract will begin on October 1, 2016 for a fixed duration of 1 yr. The postdoc will be highly encouraged and assisted in applying for funding in order to obtain a contract for a second year.

## Conditions de stage / Details about the position:

The postdoc will be based at the CEREGE laboratory (UMR 7330) and will be directly by Michal Tal, assistant professor at Aix-Marseille University whose research program is based at CEREGE. The postdoc will also collaborate closely with Benoit Camanen, researcher at IRSTEA- Lyon, and Hervé Piegay, CNRS research director at the ENS - Lyon, UMR 5600. Monthly meetings are expected to be coordinated by the candidate in to discuss the project with all the PI's. These meetings can alternate between being held in Lyon (round-trip by train easily feasible in a day), at CEREGE, and via video-conference. Spending stretches of several days working in Lyon throughout the year may be required to work on the modeling (the model that will be used was developed by IRSTEA). The gross monthly salary is approximately 2250 Euros (may vary slightly depending on no. of years of prior work experience). CEREGE is located in the commune of Aix-en-Provence and approximately 30 minutes away from Marseille. It is possible to live in either city and commute by car or bus to the lab. It is also possible to live in one of the many small villages in the area.

## **Application procedure :**

Interested candidates should send a cover letter, CV, PDFs of up to 3 publications, and contact information for 2 persons that can provide references by July 5. Interviews for short-listed candidates will be scheduled during the last 2 weeks of july.

# **Contact for applications and inquiries :**

Michal Tal: <u>tal@cerege.fr</u> Hervé Piegay: herve.piegay@ens-lyon.fr Benoit Camanen: benoit.camenen@irstea.fr