



## B.Sc. / M.Sc. Topic

### Exploring the linkages between microbial biomass, microbial products and sediment stability

#### Background

Understanding how biofilms influence sediment stability and erodibility is critical for effective sediment management in rivers and reservoirs. Effective sediment management is relevant to many concerns, including sediment-associated pollutant dispersal, geochemical fluxes, changes in community structures and functions, as well as successful river restoration and reservoir maintenance. Numerous studies have previously shown the stabilization effects of biofilms (“biostabilization”) in freshwater and coastal ecosystems. Biostabilization has been found to be correlated with a range of bio-sediment parameters, including biomass, microbially secreted products (i.e. extracellular polymeric matrix) and water content. Yet, the linkages between bio-sediment parameters and erosion thresholds are not well understood. Establishing relations that integrate biological impacts is of importance for further development of sediment transport models.

We provide a Master’s thesis opportunity for systematic review and meta-analysis of biostabilization. Specifically, the applicant is expected i) to address the question of whether erosion thresholds and sediment transport rates in rivers can be inferred from easily-measurable proxy measurements and ii) to explore whether the results from laboratory experiments can be extrapolated to the field studies.

#### Objectives

- Systematic review of the literature on biostabilization, and development of a work-plan.
- Synthesis of laboratory and field data (e.g. biomass, erosion thresholds, etc.) from various resources.
- Digitization, extraction, and pooling of the data using the existing codes.
- Performance of meta-analysis, exploring interrelations among different bio-sediment parameters for predicting sediment stability.
- Analysis, interpretation, and discussion of the results within the framework of the research objectives.

#### Your profile

- Experience in R or MATLAB
- Basic knowledge of statistical concepts and basic skills in multivariate data analysis



### Apply now!

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Please send your CV and explain in a few lines why you are interested in this thesis project.

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