

**Master's thesis**  
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Head: Prof. Dr. Robert Boes  
Supervision: Dr. David Felix, Aquased GmbH  
Dr. Frederic Evers  
Partner: Illwerke vkw AG, Bregenz

# Reduction of sediment inflow into a pre-Alpine hydropower reservoir

Many rivers transport coarse and fine sediment particles, i.e. bedload and suspended load. Such sediment has its ecological value but also poses a challenge for the sustainable operation of hydropower plants (HPP). In particular, HPPs may be affected by reservoir sedimentation and turbine erosion, which require corresponding countermeasures.

In this Master's thesis, options to further reduce the sediment inflow into a pre-Alpine HPP reservoir shall be investigated (Fig. 1). As almost half of the reservoir's inflow is diverted from a neighbouring catchment and the sediment load from the direct catchment area can hardly be reduced, the operation of the water intake at the adduction shall be studied. In the closing and re-opening procedure, the resulting discharge variations in the river reach downstream of the intake need to be considered.

The potential effect of the proposed measures on the reduction of sediment inflow shall be estimated for past and simulated flood events. Moreover, suitable instruments to monitor the suspended sediment concentration of the water in real-time and their potential integration into the existing HPP system shall be studied.



Fig. 1: Reservoir Bolgenach of the storage HPP Langenegg, Austria (Picture: Raumplanung des Landes Vorarlberg, 2012, <https://pid.volare.vorarlberg.at>)

**Contact:**

Dr. David Felix, Aquased GmbH  
[david.felix@aquased.ch](mailto:david.felix@aquased.ch)

**Remarks:**

Interest in suspended sediment and hydraulics;  
Treatment of the project in German is preferred;  
Site visit is planned at the beginning of the project