



Timescales of sediment dynamics, climate and topographic change in mountain landscapes (SedyMONT) - Erdalen and Bodalen site project

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The focus of this Norwegian Individual Project (2008-2012) within the European Science Foundation (ESF) EUROCORES TOPO-EUROPE programme is on the Erdalen and Bodalen catchments (glacier-fed tributary streams) in Nordfjord, western Norway. The innovative approach of this new project is the integrated quantitative study of longer-term (Holocene), sub-recent and contemporary sedimentary fluxes, budgets and process rates using a novel combination of advanced methods and techniques.

With respect to the main aims and objectives of ESF SedyMONT, the following key aims of the Erdalen and Bodalen site project can be stressed: (1) Analyse how the inheritance of the landscape due to the influence of the Last Glacial Maximum (LGM) has affected process rates over time (paraglacial system), (2) Document changes in process rates over different timescales by combining existing quantitative knowledge on Holocene process rates with newly generated data on sub-recent and contemporary process rates.

Monitoring programmes in Erdalen and Bodalen, in combination with repeated analyses of surface water chemistry, atmospheric solute inputs and granulometric analyses of suspended sediments provide high-resolution data to analyse and quantify present-day sedimentary and solute fluxes as well as sediment sources, denudation rates, and meteorological and topographic / landscape morphometric controls of denudative processes. In addition to standard methods for monitoring bedload transport, innovative techniques like shock sensor tracers and biofilm analyses are applied to analyse channel stability / mobility and bedload transport rates in both valleys. The volume and composition of lake sediments are investigated using echo-sounder, georadar and coring. Studies on volumes and architecture of storage elements (valley infills, talus cones) using different geophysical methods like georadar and seismic refraction surveys are carried out to further improve the quantitative knowledge on Holocene process rates. Detailed mapping is performed and interpreted in combination with digital elevation models and data.