



## **Modeling soil erosion for a Swiss Alpine Valley**

**D. Bänninger**, N. Konz, K. Meusburger and C. Alewell

Institute of Environmental Geosciences, University of Basel, Bernoullistrasse 30, CH - 4056  
Basel (dominik.baenninger@unibas.ch)

Soil erosion research has a long history in developing soil erosion models to predict and quantify soil erosion from particular areas. Classical erosion research focused on the description of soil erosion on agricultural land. Few studies were done with respect to describe soil erosion for mountainous areas. Mountains all over the world are unique in their economy, culture and ecology. The extreme topography, climate and remoteness of the areas are the origin of the beauty whilst simultaneously causing high instability, fragility and sensitivity of ecosystems in general and soils in particular. Recent mountain systems are threatened by changes in land use management and climate. The aim of our study was to assess these influences, by applying models which predict soil erosion under given management and environmental conditions.

Our study sites are situated within the catchment area of the Furkareuss valley (80 square km, 1400 - 2500 m asl), located in the Central Swiss Alps. For the test sites we measured various environmental parameters (soil texture, soil moisture, precipitation, vegetation composition, organic matter, vegetation cover) as well as cumulative overland flow and sediment discharge from plot areas. Typical features of our test site are steep hill slopes, permanent covered soil by grass dominated vegetation, intensive pasturing, a high drainage potential of the soil, and thick humus layers causing hydrophobic conditions after some days of drought.

We discuss two established models (the PESERA as a more conceptual model and the WEPP as a pure physical based model) whether they are suitable to describe the erosion processes at our mountainous test sites. The discussion follows two directions: On the one hand we discuss the uncertainty of the input measures required for these models. On the other hand the sensitivity of the two models with respect to selected

parameters is analyzed. The model output is compared with the measurements.