



# Analysis of increasing soil erosion in the high montane and the subalpine altitudinal zone of Western Austria

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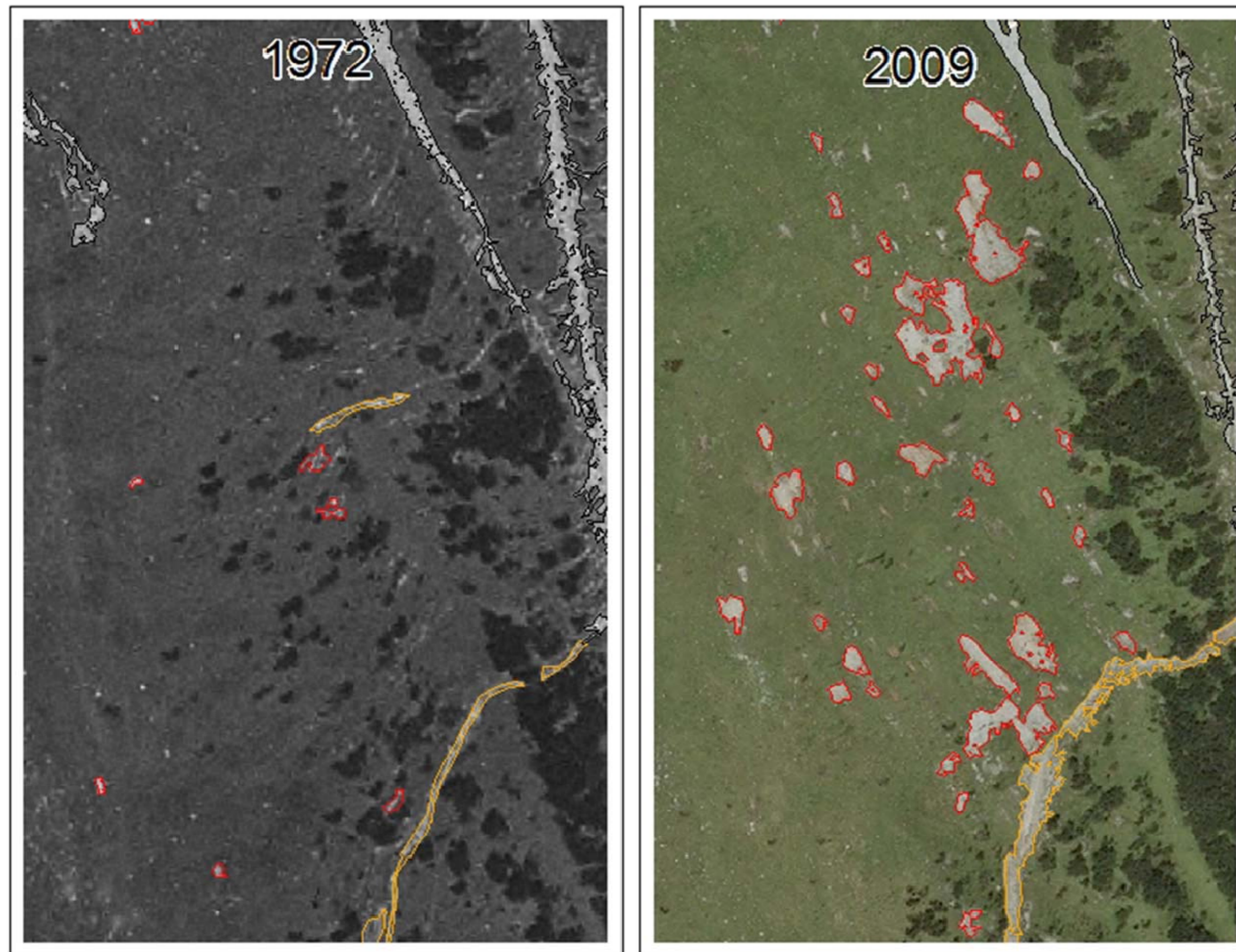
## [1] Introduction

There are significant hints for an increase of soil erosion in treeless areas in the high montane and the subalpine altitudinal zone of the Alps. Reasons for this recent augmentation of eroded areas in the 2nd half of the 20th century are not clear and subject of a currently started interdisciplinary research project - EROSTAB. The spatial variability of the geology determines significantly the temporal-spatial variability of the hydro-geomorphological processes and process-cascades. Based on this background, it is important to analyse the relation between these aspects by case studies in catchments, which are characterized by different natural conditions. Soil erosion, land use and vegetation cover influence erosional scar processes and will be defined according to their different spatial extensions and temporal developments.

## [2] Indicative processes

The spatial and temporal occurrence of erosion is determined and triggered by manifold types of processes affecting each other:

- i) Indicators of local areas show that a decline of pasturing leads to a higher potential of shallow landslides,
- ii) on the contrary intensive mechanical impacts of livestock cause a loss of soil cover.
- iii) Investigations in the Allgäu region (Bavaria) indicate a connection between release of wet ground avalanches and soil erosion.
- iv) Snow gliding on wood-less plots in the montane zone might be an additional impact factor of erosive processes.



## [3] Approach

The basic concept of the investigations planned in the frame of the project EROSTAB – funded by the Austrian Ministry of Agriculture and Forestry, Environment and Water Management (BMLFUW, Forestry Section) focuses on:

- i) The investigation of the interaction of factors causing soil erosion in high altitude
- ii) Determining the impact of recent soil erosion on bed load retrieval in torrent catchment areas. Under which conditions can an increasing bed load supply be expected?
- iii) Quantification of relevant factors and their interaction for diagnosing and prognosticate soil erosion processes in a spatial and temporal context.

## [4] Objectives

Investigation of the combination of factors causing the increase of soil erosion on wood-less sites in alpine catchments from the high montane to the alpine zone in western Austria.

To improve the process-understanding and assessment of future soil-erosion-scenarios under the aspect of changing climate conditions.

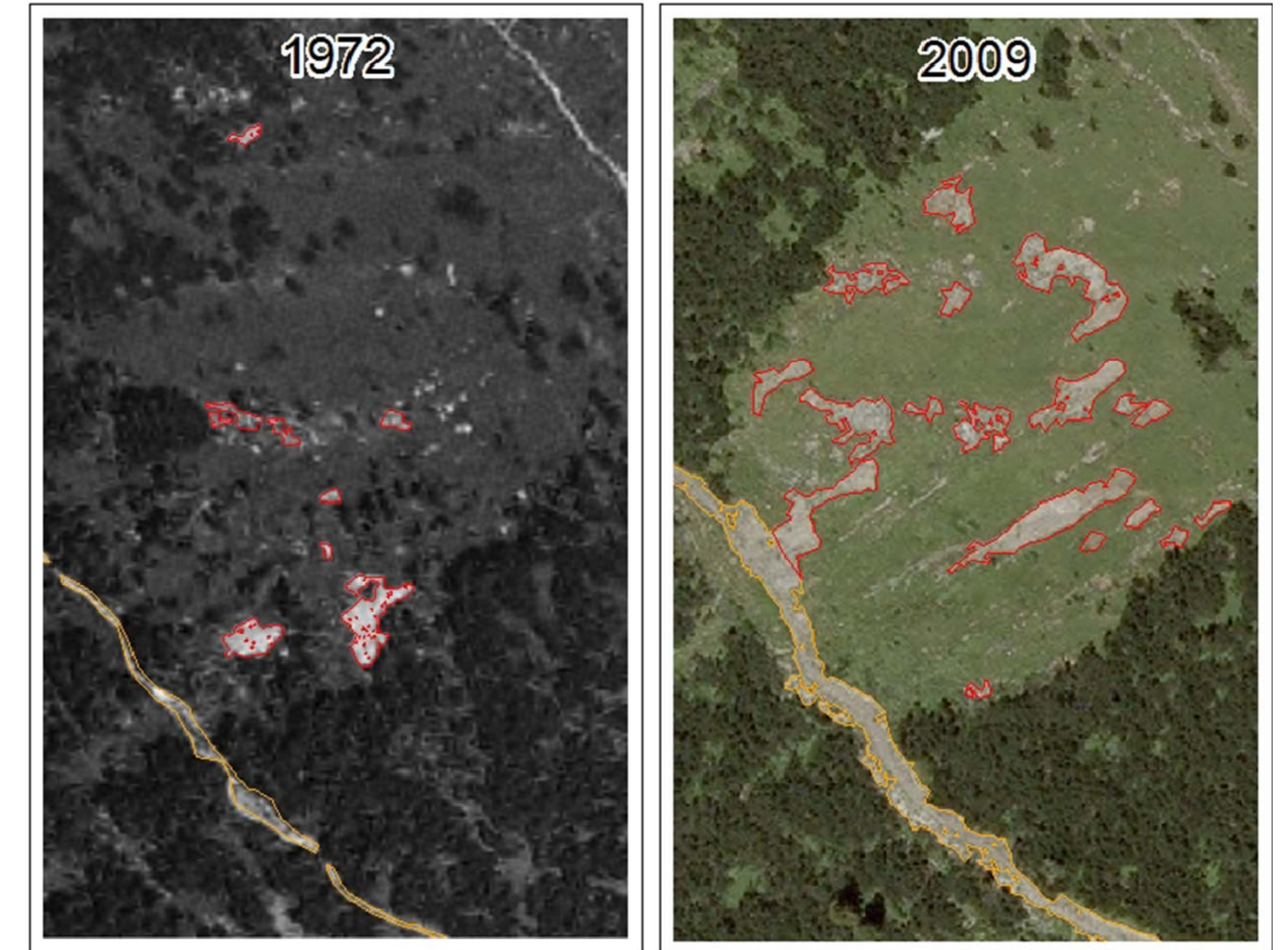
To use plant parameters for the early detection on instable hillsides

To develop approaches for diagnosis and prognosis of soil erosion

To develop a basis for derivation / adaptation of simple, economic and durable stabilization methods for practitioners (WLV, civil and bio engineers).

## [5] Methodology

- i) Preselecting suitable catchment areas with occurring of relevant soil erosion processes and existing data sets.
- ii) Preselecting suitable catchment areas with occurring of relevant soil erosion processes and existing data sets.
- iii) Analysis of aerial images in a temporal context (time series starting from 1953 until 2009).
- iv) Analysis of airborne laser scan data sets.
- v) Field survey of relevant erosion parameters affecting soil, vegetational and geomorphological conditions.
- vi) Geo-statistical analysis of the field data sets
- vii) Modeling of erosion scenarios



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