



6th YOUNG GEOMORPHOLOGISTS' DAY

Geomorphology for Society
from risk knowledge to landscape heritage

Cagliari, 28-30 September 2015

MULTITEMPORAL AERIAL IMAGE ANALYSIS OF A CALANCHI BADLAND IN CENTRAL ITALY (UPPER ORCIA VALLEY, TUSCANY). A QUANTITATIVE ASSESSMENT OF EROSION RATES AND DYNAMICS

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Soil erosion is a hazard in many parts of the world and particularly in the Mediterranean environment, where rainfall occurs seasonally and is concentrated in autumn and winter. Badlands develop frequently in central and southern Italy and mainly consist of two types: calanchi (sharp-edged) and biancane (rounded-edged).

This study focuses on the morphological development of a badland area within the Upper Orcia River Valley in Central Italy (Tuscany). In Southern Tuscany, specific geological and climatic settings and anthropogenic land use have led to accelerated erosion and to the evolution of large badlands.

The aim of this work is to analyze slope and catchment erosion dynamics (mainly denudation and gravitational processes), its distribution and to quantify erosion rates on selected sites, as well as to evaluate the spatial-temporal development of the whole catchment over the last 30 years.

Therefore, digital photogrammetric analysis have been performed at the catchment scale on aerial images (1976 & 1997), GoogleEarth images (2001 & 2013) and UAV images (2014 & 2015) in order to map different process- and landforms, as well as land use changes in the direct surroundings of the badland. TLS is used to take direct measurements on selected test plots in regular intervals (April/September/October) throughout the years 2014 and 2015.

