



Fan morphodynamics and slope instability in the Mucone River basin (Sila Massif, southern Italy): significance of weathering and role of land use changes

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In the present paper, the preliminary results of a study concerning the fan dynamics in the valley of the Mucone River (Sila Massif, southern Italy) are presented. In the study area highly weathered Palaeozoic crystalline rocks crop out, ranging from residual soils to moderately weathered rocks. Because of the rugged topography and the abundance of weathered deposits, mass movements affect the great majority of the catchments. The most common instability phenomena are represented by rotational and translational slides, with subordinate rockfalls on steep to near vertical slopes. Debris-flow and debris avalanche scars occur at the upper-middle reaches of many catchments. They are caused by mobilization of colluvial and weathered materials during large storms and are usually channelized in the main canyon of the basin. At the catchment mouth, deposition of debris-flow material occurs, contributing to the building up of fans. In order to assess the fan morphodynamics and the slope evolution in the temporal range 1955-1996, multiyear air-photo interpretation and field surveys concerning morphodynamic processes and vegetation cover features were carried out. Field observations allowed discriminating the type of fan deposits (debris-flows or water-flows dominated, mixed deposits) and the successional stages of vegetation. Results showed that fans were concerned by different activity and dissection modality, in addition to diverse evolution patterns in vegetation communities, according to the fan aspect. At the basin scale, from 1955 to 1996 changes in land use and in the disturbance regime involved a considerable expansion of natural vegetation cover at

the expense of cultivated lands. Such occurrences very likely played a major role in determining a progressive stabilization trend of fans and a remarkable attenuation in slope instability.