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The impacts of vegetation on degradation and soil removal in ephemeral channels of Mediterranean-type areas

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Much of the removal of soil and transfer of off-site effects in catchments takes place via the stream channels. In channels in the drier parts of the Mediterranean-type region, where water only flows occasionally, vegetation growth within the channel can be quite abundant. Field measurements and theoretical analyses have been applied to assess the effects of different types of vegetation on erosion and deposition processes within channels. Quadrats have been monitored over a period of years to measure the interaction of flow processes and vegetation. Reaches have been mapped and cross-sections measured in detail to detect effects of flow events. Lengths of channel with contrasts in vegetation characteristics have been examined in relation to processes and connectivity of sediment transfer down systems. At the quadrat scale the results indicate how the type, size, state, spacing and position of plants can influence processes. At the cross-section and reach scale the zones and amounts of erosion and sedimentation are analysed in relation to the vegetation characteristics. Within the channel system vegetated reaches are shown to encourage sedimentation and reduce sediment transfer downstream. The effects of different types of vegetation on roughness are assessed. Thresholds for removal of different types of plants are calculated from measured impacts of flood events. The increased knowledge of process –vegetation interactions is used to make recommendations on channel management.