



Chemical weathering based on surface water solutes, case studies in Central Italian badlands

Samanta Pelacani and Fiorenzo C Ugolini

Department of Plant, Soil and Environmental Science, University of Florence, Florence, Italy (samanta.pelacani@unifi.it; fiorenzo.ugolini@unifi.it)

Evaluation of erosion, generally, has been made by models tied to physical processes with the tendency to neglect the chemical contribution. In a case study located in the Northern Apennines, Italy, suspended sediments and dissolved loads were measured. The results show that the stream impacted by highway construction was, respectively, 8 times and twice higher than non impacted one. Presently, similar information are gathered for the badland areas. In Italy badlands occur in several different geomorphological and lithological situations. They are locally known as calanchi and biancane. Badlands generally occur on fine textured lithologies, but whereas calanchi can be found over different lithological units e.g. marls, shales and weakly cemented pyroclastic deposits, biancane occur only on Pliocene marine clays. The occurrence of badlands is probably controlled by a number of factors. Their distribution is associated with different morphostructural features and also strictly controlled by agricultural management. A chemical fluxes methods were used to calculate the solute discharge The solute fluxes were calculated for the major cations (Ca, Mg, Na, K) and the contribution of the precipitation was subtracted from the mean concentration of the cations.

The purpose of this paper is: (i) to examine solute fluxes of major cations from badland areas in order to quantify the hydrochemical composition and solute provenance, and (ii) to assess the rate of chemical denudation.