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## Regional scale analysis of the altimetric stream network evolution

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**Abstract.** Floods result from the limited carrying capacity of stream channels when compared to the discharge peak value. The transit of flood waves - with the associated erosion and sedimentation processes - often modifies local stream geometry. In some cases this results in a reduction of the stream carrying capacity, and consequently in an enhancement of the flooding risk.

A mathematical model for the prediction of potential altimetric stream network evolution due to erosion and sedimentation processes is here formalized. It works at the regional scale, identifying the tendency of river segments to sedimentation, stability, or erosion. The model builds on geomorphologic concepts, and derives its parameters from extensive surveys. As a case study, tendencies of rivers pertaining to the Valle d'Aosta region are analyzed. Some validation is provided both at regional and local scales of analysis. Local validation is performed both through a mathematical model able to simulate the temporal evolution of the stream profile, and through comparison of the prediction with ante and post-event river surveys, where available. Overall results are strongly encouraging. Possible use of the information derived from the model in the context of flood and landslide hazard mitigation is briefly discussed.

Full Article in PDF (PDF, 376 KB)

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