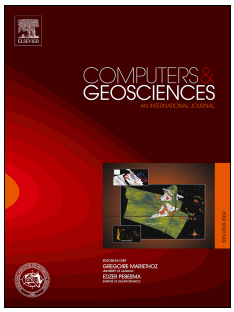
Accepted Manuscript



SedInConnect: A stand-alone, free and open source tool for the assessment of sediment connectivity

Stefano Crema, Marco Cavalli

PII: S0098-3004(16)30827-5

DOI: 10.1016/j.cageo.2017.10.009

Reference: CAGEO 4037

To appear in: *Computers and Geosciences*

Received Date: 16 December 2016

Revised Date: 25 September 2017

Accepted Date: 16 October 2017

Please cite this article as: Crema, S., Cavalli, M., SedInConnect: A stand-alone, free and open source tool for the assessment of sediment connectivity, *Computers and Geosciences* (2017), doi: 10.1016/j.cageo.2017.10.009.

SedInConnect: a stand-alone, free and open source tool for the assessment of sediment connectivity

Stefano Crema[1], Marco Cavalli[1]

[1]*National Research Council (CNR), Research Institute for Geo-Hydrological Protection (IRPI), Corso Stati Uniti, 4, 35127 Padova (PD), Italy tel. 0429 829 58 19*

Corresponding author: Stefano Crema, mailto: stefano.crema@irpi.cnr.it

Abstract

There is a growing call, within the scientific community, for solid theoretic frameworks and usable indices/models to assess sediment connectivity. Connectivity plays a significant role in characterizing structural properties of the landscape and, when considered in combination with forcing processes (e.g., rainfall-runoff modelling), can represent a valuable analysis for an improved landscape management. In this work, the authors present the development and application of SedInConnect: a free, open source and stand-alone application for the computation of the Index of Connectivity (IC), as expressed in Cavalli et al., (2013) with the addition of specific innovative features. The tool is intended to have a wide variety of users, both from the scientific community and from the authorities involved in the environmental planning. Thanks to its open source nature, the tool can be adapted and/or integrated according to the users' requirements. Furthermore, presenting an easy-to-use interface and being a stand-alone application, the tool can help management experts in the quantitative assessment of sediment connectivity in the context of hazard and risk assessment. An application to a sample dataset and an overview on up-to-date applications of the approach and of the tool shows the development potential of such analyses. The modelled connectivity, in fact, appears suitable not only to characterize sediment dynamics at the catchment scale but also to integrate prediction models and as a tool for helping geomorphological interpretation.

Keywords

SedInConnect; sediment connectivity; geomorphometry; open source GIS software, landscape management.