



Stream power of selected recent flash floods in Europe

Lorenzo Marchi (1), Marco Borga (2), Marco Cavalli (1), and Eric Gaume (3)

(1) CNR - IRPI, Padova, Italy (lorenzo.marchi@irpi.cnr.it, +39 049 8295827), (2) Dipartimento Territorio e Sistemi Agroforestali, Università di Padova, Legnaro, Italy, (3) Laboratoire Central des Ponts et Chaussées, Bouguenais, France

Stream power is a key variable for the analysis of landforms associated to the fluvial systems. Several studies on stream power related to bankfull or near-bankfull discharges, which are regarded as morphologically significant. The analysis of stream power for bankfull discharges makes it possible homogeneous comparisons of stream power between different parts of a channel network. However, it does not permit depicting patterns of stream power resulting from larger floods that hit various parts of a basin with different intensity. The studies on stream power for large floods have provided important insights on river energy expenditure for floods responsible for major, abrupt morphological changes in channels and on floodplains and deserve to be extended by collecting more experimental data. Post-flood assessment of peak discharge after major floods makes it possible to analyse stream power in fluvial systems stressed by high-intensity floods. The reconstruction of peak discharge from flood marks at different cross sections along the main stream and on tributaries enables a distributed, basin-wide analysis of stream power. This study analyses the stream power of some extreme (return period > 100 years) flash floods in mountainous basins of Europe in the last decade. The spatial variability of stream power is examined with regard to differences in the flood response across the basin and to the observed geomorphic effects.