

WORKING GROUPS 2 & 4

Training School on  
Water and Sediment Connectivity in Mountain Environments  
July 25<sup>th</sup>-29<sup>th</sup>, 2016

Lasa, Val Venosta, Italy

### Organising Committee

Francesco Brardinoni, Bologna  
Marco Cavalli, Padova  
Tobias Heckmann, Eichstaett  
Ronald Poepl, Vienna  
Damià Vericat, Lleida

## REPORT

Water and sediment connectivity are of paramount importance in mountain environments. For example, they are closely linked with sediment delivery, catchment sensitivity and landscape evolution, natural hazards, economic resources, and ecological functions of mountain rivers. Within the framework of the COST action CONNECTEUR, we conducted a training school targeted mainly at young researchers in different stages of their PhD. The main aims were (i) to introduce and discuss conceptual frameworks of water and sediment connectivity and their relevance for mountain hydrological and geomorphic systems, and (ii) to acquaint the participants with state-of-the-art methods to analyse connectivity using field mapping and digital data.

The Training school consisted of four interrelated building blocks:

- Keynote lectures on different aspects of connectivity in mountain environments:
  - Geological and Quaternary history of Vinschgau (Volkmar Mair, Geological Survey of Bolzano)
  - The Vinschgau cluster of paraglacial fans: Quaternary-inherited connectivity (Vincenzo Picotti, ETH Zurich)
  - Landslides, landslide dams, and connectivity (Ivanna Penna, NGU Trondheim)
  - Debris flows/floods, structural countermeasures, and sediment connectivity (Johannes Hübl, BOKU Vienna)
  - Tracing hydrologic connectivity in snowmelt and glacier-fed streams (Daniele Penna, University of Firenze)

- Tracing sediment and wood connectivity in forested streams (Francesco Comiti, University of Bolzano)
- Provenance analysis: tracing minerals in river sands (Giovanni Vezzoli, University of Milano-Bicocca)
- The 17 participants, who came from 8 different countries, presented their own research projects and discussed what role connectivity plays (or could play) therein. The range of research projects was very wide, reaching from glacial geomorphology to the historical development of river systems.
- Hands-on workshops in which the participants worked in small teams on example data from different study areas. Each team presented their particular study to the plenary, and we discussed results and implications. The workshops included:
  - Geomorphological mapping in mountain environments, specifically in relation to sediment sources and colluvial source-to-sink pathways
  - Computation and interpretation of a connectivity index based on digital elevation models (DEM); evaluation of the index in relation to the mapping results
  - Computation, error assessment, and interpretation of DEMs of difference (topographic change detection) in terms of sediment connectivity
- Visits to selected field sites (Gadria debris flow retention structures, Tre Fontane debris cone, Ponte Stelvio gauge, Strimm basin) to appraise “connectivity in the field” and its relevance for sediment and natural hazards management, and to validate the orthophoto- and DEM-based maps and indices.

In a final discussion round, we summarised the main points that were addressed during the training school, with respect to (i) the concepts and techniques taught and (ii) their applicability to the participants’ own projects. The overall feedback (both from the participants and the organizing committee) was overwhelmingly positive, closing a successful training school. We’re looking forward to reading connectivity-related papers written by the participants !

On behalf of the organizing committee

Tobias Heckmann, Eichstätt & Francesco Brardinoni, University of Bologna, Chairs of WG4

## SOME IMPRESSIONS...: (Photos: Ronny Pöppl, Damià Vericat)







