

The sedimentary connectivity in the valleys of the southern Alps along the post-LGM

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The valleys are the main source of information about the long-term evolution of the geomorphology and stratigraphy of the mountain chains during the Quaternary. The sediments filling the valleys and the unconformity surfaces bounding the phases of deposition and erosion occurred in the past could be mapped, analyzed and dated to reconstruct how and when the dismantling processes affecting the mountain catchments were active and if the evacuation of the material towards the plains was efficient. Considering the southern Alps, the documentation of the periods predating the Last Glacial Maximum (LGM: about 29-19 ka cal. BP) is generally almost lacking, whereas, since the end of the peak of the LGM (23-22 ka cal. BP), the geomorphic and sedimentary record is generally present, even if often not continuous and fragmented.

The project wants to investigate several valleys that can be representative for a large sector of the southern Alps in the last 23 ka to highlight how the sediments have been produced, eventually stored within the catchment, and transported in the basin. The research will be carried out through the elaboration and analyses of DEMs mainly derived from LiDAR data, some specific field survey campaigns, production of subsoil database and application of geochronological methods (radiocarbon and exposure dating). One of the goals is to recognize and characterize the main geomorphological phases occurred in the valleys and to recognize the main forcings for their formation.

Previous studies considered some tracts of major valleys and, in few cases, a whole depositional system, as the one of Piave river. The projects will include these data, but will analyze other important valleys, especially in Trentino Alto Adige (e.g. Val di Non; Adige river valley) and in Friuli Venezia Giulia (e.g. Tagliamento and Fella river valleys), where high-quality LiDAR data are available and on-going mapping projects as the CARG projects recently produced a large quantity of robust new stratigraphic and geomorphologic data. A major target of the research will be the fluvial and glacio-fluvial terraces, because their characterization through integration of DEMs and stratigraphy allow to quantify the volume of sediment stored in the valleys in different phases and to compare the time and modes of their formation with the sedimentary production and connectivity assessed for some of the present Alpine rivers.

Possible collaborations: partnerships with national and international research institutes are planned for learning innovative methods and carrying out specific analyses. In particular, the projects will be carried out together with CNR-IGG (Italian Research Council – Institute of Geosciences and Georesources) and radiocarbon and exposure datings will be produced in collaboration with the Ion Beam Lab of ETH in Zurich.

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