

## **Definition of a mobilizing volume of sediment in a valley interested by volcanic eruption: Rio Blanco valley (Chile)**

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Volcanic explosive activity can strongly affect the riverine environments. Deposition of tephra, pyroclastic and hyperconcentrated flows along both the valley bottom and hillslopes can radically change the environmental morphology. Accumulation and transport of pyroclastic material can increase hazards and risks for anthropic activities. The aims of this research are to evaluate and quantify the amount of erodible sediment that can be transported along a gravel bed river affected by a volcanic eruption. The Rio Blanco valley (Chile) was upset by the plinian-type eruption of Chaiten volcano in 2008. The great amount of tephra released in the initial phase and the subsequent pyroclastic flows, accumulated up to 8 m of sediment over a great portion of the Rio Blanco valley. Using aerial photographs was possible to define the extension of vegetated zones affected by the eruption. The area was interested by a high mortality of vegetation, as confirmed by field surveys. Dendrometric measurements permitted to quantify the volume of wood and observe that renewal and herbal layer are almost absent, determining low soil cohesion and easier erosion by superficial and river erosion processes. Analysis of sediment accumulation allowed quantifying the volume of sediment that can be transported downstream. The analyses were carried out considering 7 km-long a reach, from the river mouth to the confluence between Caldera creek and Rio Blanco. After the eruption, was possible to define as a total area of about 2.19 km<sup>2</sup> was affected by tephra deposition, the 40% (0,87 km<sup>2</sup>) was eroded by flows, while 60% (1,32 km<sup>2</sup>) is still present and composed by tephra, buried large wood (LW) and dead standing trees. Considering an average high of 5 m, the potential erodible sediment is around 6,5 x 10<sup>6</sup> m<sup>3</sup>, moreover there is a potential amount of about 7,3 x 10<sup>4</sup> m<sup>3</sup> of LW that can be transported towards mouth. These analyses can be useful to better define the management plan for the river delta. In fact, in this area there is the Chaiten port, a fundamental structure for the human activities. These results can permit to better define the dragging activities and sediment abstraction. This research is funded within the Department of TESAF, University of Padua (Italy), and Chilean research Project FONDECYT 1141064 “Effects of vegetation on channel morphodynamics: a multiscale investigation in Chilean gravel-bed rivers”.