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Sediment deposits and large wood –related hazards in the Blanco River, Southern Chile, affected by a volcanic eruption

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The Chaitén eruption (Southern Chile) generated deposition of pyroclastic sediments along the Blanco River valley which damaged riparian vegetation and increased large wood (LW) abundance. During flood events the non-cohesive material and LW can be mobilized representing a hazard for the nearby Chaitén village and infrastructure. The study quantified the volume of in-channel LW and estimated the potential amount of erodible sediments and dead standing LW that can be mobilized and transported downstream. The volume and mobilization of LW was analyzed measuring and positioning all wood pieces (diameter ? 0.10 m and length ? 1 m) within three 80 m-long reaches with additional field surveys following low and high floods. Potential volumes of sediments and standing wood were estimated in a 7 km-long reach identifying, on aerial photographs, the extension of affected areas and considering an average deposition thickness of 5 m. Four sample areas were used to collect dendrometric measurements of standing wood. Results showed how in-channel LW is easily mobilized also during ordinary floods with a minimum exported volume of about 52 m3?ha-1, whereas increasing floods are able to export up to 81 m3?ha-1 and cause great riverbank erosions (~5200 m2). In addition, after 8 years since the eruption, an area of 1.32 km2 is still affected by pyroclastic material, accounting for a potential erodible volume of ~ 6.6?106 m3 and ~ 4.4?104 m3 of sediments and LW, respectively. These results can support proposals for management plans for the lower course of the river, with the design of trapping systems (check-dams, rope net barriers, cable-filter dams) as possible strategies to reduce the amount of material passing through the Chaitén village. This research was supported by the Project FONDECYT 1141064 and by the University of Padova Research Project CPDA149091.