



## **Characterization of landslide dams in the San Juan province (Argentina)**

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River blockages caused by landslide deposition are common phenomena in active mountain chains, influencing erosion-sedimentation patterns and acting as primary and secondary hazards. Regional scale analyses regarding their spatial distribution and morphometry allow establishing boundary conditions for their occurrence and stability, and determine differences among regions with different landscape and climatic conditions. Owing to the combination of endogenous and exogenous factors, landslide dams are frequent phenomena in the Andes. In the Argentinean NW and the Patagonian Andes, previous studies showed that stability of landslide dams determined by morphometric parameters generally matched satisfactorily with dam behavior, with some exceptions in which climatic component played an important role in dam longevity. Aiming to expand the knowledge of landslide dams in the Argentinean Andes, in this work we analyzed the stability of rock avalanche dams in the Pampean flat slab subduction zone. In the study area, mountain dynamics creates suitable conditions for the occurrence of 34 rock avalanches with volumes up to 0.3 km<sup>3</sup>. They developed in deeply carved valleys (Cordillera) and Inter-thrust valleys (Precordillera). 22 impoundments of rivers resulted from channelized rock avalanches with long runouts (4-10 km) that blocked tributaries rivers, but most of them by rock avalanches that filled the valley bottom, with run up in the opposite slope and limited movement parallel to the valley axis. Most of the dams breached in unknown times, except for the last event that occurred on November 12th 2005. The quantification of morphometric parameters and contributing areas indicates the existence of dams with dimensionless blockage index above 2.75 (stable domain) and below 3.08 (instable domain). The Los Erizos dam in our study area and the Barrancas dam in the Patagonian Andes show that besides morphometric parameters, climatic conditions are decisive. Stable landslide dams lasting for millennia can collapse suddenly due to anomalous weather conditions, and unstable dams can have a higher longevity depending on the season controlling the inflow into the lake.