

WARM STORMS ASSOCIATED WITH AVALANCHES HAZARD AND FLOODS IN THE ANDES MOUNTAINS

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ABSTRACT: Rain-on-snow events produce avalanches of different magnitude depending on the snowpack properties, air temperatures and rain intensities. Winter storms in this mountain range typically have rain/snow levels between 1000 and 2200 m above sea level, but warm storms with a higher rain/snow level up to 3000 m above sea level occur in extreme winters and have the potential to generate rain on snow floods and wet-snow avalanche. For example, the flood of June 29 of 2000 occurred after one of the wettest Junes of the last 40 years where snowfall was 991 cm in the Aconcagua Valley. Rare storm activity generated a huge snowfall and rainfall over the Andes mountains on June of 2000 (1525 mm in El Maule Valley) and the end of the unusual period, the flood was triggered by rising temperatures on the mountains and heavy rainfall (199 mm in 24 hours) on the fresh snow. On the morning of June 29, a flood wave developed and moved down along the entire river located on the Central part of Chile. The flood's peak was 2970 m³/s in the El Maule basin on the morning of June 29. This paper studies the characteristics of warm storms that had the potential to generate wet-snow avalanches and floods.

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