

JOINT EVENT

5th World Conference on **Climate Change**

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16th Annual Meeting onOctober 04-06, 2018
London, UK**Environmental Toxicology and Biological Systems****Potential glacial lake outburst flood (GLOF) in Santa Lucia village, Lake Region, Chile**Francisco Ferrando A and Pablo Sarricolea
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The Santa Lucía village (Lat.: 43°24'50"S – Long.: 72°21'59"W; 236 m.a.s.l.) is located near to the Frio River, Lake Region. This village has risks considering the natural system dynamics of the place where it is located; a wide and deep glacial valley surrounded by mountain chains with summits 1700–1800 m.a.s.l., where there are several glaciers. The analysis of the geographic surrounding of the Santa Lucía village reveals that there exist potential hazards in the nearest associated with the geomorphology and the glacial context of the upper Frio River valley. These threats are related to four glaciers that have proglacial lagoons and to the effect of the warming tendencies, with the consequent ice structural stability loss, meaning potential scenery of GLOF's occurrence, and a possibility of a disaster for the village. The climate of the zone is characterized by considerable temperature variations, with more than 20°C in summer, and <0°C in winter, and by 3000 mm of precipitation. In summer 2017, a debris flow was triggered by a 122 mm/24 hours precipitation; intensity that is the double of the 60 mm/24 hours established by Hauser (1985) for the occurrence of mass movements in central Chile. This rain, that unchained a slope-slide and then a debris flow, happened over 1400 m.a.s.l., indicating where the high of the 0°C isotherm was during the event. Because no temperature information, the MODIS thermal sensor data gives the possibility to approximate the altitude and the tendency of the 0°C isotherm, process directly ligated to the occurrence of GLOF's. According to the results of the thermal sensor data for the 2001–2017 period, the height of the 0°C isotherm was increased in ±400 m. This result, not sufficient accuracy ($R^2=0.3342$), can be associated with an increase of the potential hazard of GLOF's, and constitute information for the determination of a new location for the Santa Lucia village.



Figure 1: Frio River & Santa Lucia Village. (Afr: No risk área)

Recent Publications

1. Vergara Dal Pont I, Santibañez F, Araneo D, Ferrando F and Moreiras S (2018) Determination of probabilities for the generation of high-discharge flows in the middle basin of Elqui River, Chile. *Rev. Natural Hazards* 16.
2. Janke J, Bellisario A and Ferrando F (2015) Classification of debris-covered glaciers and rock glaciers in the Andes of Central Chile. *Geomorphology* 241(2015):98–121.
3. Bellisario A, Ferrando F and Janke J (2013) Water resources in Chile: The critical relation between glaciers and mining for sustainable water management. *Revista Investigaciones Geográficas* 46(2013):3–24.

Biography

Francisco Ferrando A Geographer and Doctor in geography and territorial ordering, has his expertise in hydrology, glacial geomorphology, rock glaciers and Andean permafrost, and in the effect of global warming on their mass balance. Also, participate in governance actions about mining activities impact on the cryosphere and water quality and security. How titular professor of the department of geography of the University of Chile, brings the courses of Hydrology, Natural Hazards & Risks, and Introduction to Glaciology. At the magister, is responsible for the seminar about Climate change & Rock glaciers.

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