



Glacier elevation and mass change over the upper Maipo Basin, Central Andes, Chile.

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The upper Maipo basin (33° S, 70° W, ~ 5400 km²) is located ~ 15 km from the eastern outskirts of the megacity of Santiago. The basin is characterized by Mediterranean climate with marked winter and summer seasons and occasionally disturbed by large annual and multi-annual variations in temperature and precipitation (ENSO). The upper Maipo basin is the main glacierized region of Chile, where the last Chilean glacier inventory revealed a glacier extent of about 397.6 km² distributed over 1009 glaciers larger than 0.01 km². The glaciers located in this basin represent 2% of the total glacierized area in Chile. The 1009 glaciers in this area, compose of 708 rock glaciers (159.91 km²), 126 glaciarets (5.85 km²) and 175 valley and mountain glaciers (231.84 km²). Our focus in this study is to evaluate the suitability of TanDEM-X to derive geodetic glacier mass balance on small mountain glaciers. Our database comprises different digital elevation models (DEM) from historical cartography based on aerial photographs (1955), SRTM (2000), Lidar data and TanDEM-X (2015). The historical cartography was scanned and georeferenced with the aid of several GCPs derived from the Lidar dataset. The TanDEM-X data was processed using differential interferometry using SRTM C-band DEM as reference. Differences resulting from X- and C-band penetration are considered comparing X- and C-band SRTM data. All DEMs were horizontal and vertically co-registered to each other. Error assessment was done over stable ground (off-glacier). On our poster we present preliminary results about detailed quantification of glacier elevation and mass change in this area.