



## GMPE-1: Paleoclima y reconstrucciones paleoambientales

### Late Quaternary glacier advancements in the Andes of Santiago, central Chile, and paleoclimatic implications

**Mariajosé Herrera<sup>1</sup>**, Gabriel Vargas<sup>1</sup>, José Luis Antinao<sup>2</sup>, Steven Forman<sup>3</sup>.

(1) Geología, Ciencias Físicas y Matemáticas, Universidad de Chile

(2) Geology, Indiana Geological Survey, Indiana, Estados Unidos

(3) Geology, Department of Geosciences, Baylor University, Texas, Estados Unidos

Andean mountain glaciers in central Chile are located in a transitional zone between the seasonal influence of the mid latitude westerlies and subtropical semiarid conditions to the north, in spite of their relevancy, long term glacial dynamics related to paleoclimate conditions during the Late Quaternary is poorly known. Here, from geomorphological and geochronological analyzes we reconstruct the timing and position of Late Quaternary glaciers in the Andes of Santiago (33°50'S), and we discuss paleoclimatic implications of our findings. Based on the recognition of outwash plains, moraines and glaciolacustrine deposits dated by Optically Stimulated Luminescence (OSL), <sup>36</sup>Cl cosmogenic radionuclide and <sup>14</sup>C geochronological methods, we defined two glacial geomorphological systems in El Volcán river-mountain hydrologic catchment named San Gabriel and La Engorda drifts. Our observations evidence an Early Local Last Glacial Maximum (ELGM) at San Gabriel drift (1300 m a.s.l.), dated as 45-36 ka BP. Glacial stages concomitant with the global Last Glacial Maximum (LGM) and the Younger Dryas (YD) were identified and dated at La Engorda drift (2450-2570 m a.s.l.), as 24-17 ka BP and 10 ka BP, respectively. We propose that San Gabriel drift represents a prolonged glacial advancement associated with regional wet conditions as reported by previous paleoclimate records in central Chile. While a glacial advancement during the LGM at La Engorda was most probably driven by global cold and relatively humid regional conditions, a glacial stage at the time of the YD recorded in the same drift was associated with regional arid conditions, drawing the sensitivity of these subtropical mountain glacier systems to climate changes. We estimate a maximum variation of 1200 m in the position of the Late Pleistocene Equilibrium Line Altitude (ELA), inferred at 3400 and 3600 m a.s.l. at the time of San Gabriel and La Engorda drifts, respectively, with respect to its modern location at 4600 m a.s.l.