



Cold-maritime processes in the Fuegian Mountains (Tierra del Fuego, Argentina)

A. Pérez-Alberti (1), M. Valcarcel-Diaz (1), F. Castillo-Rodriguez (1), S. Naya-Fernandez (2), P. Carrera-Gomez (1), J. Lopez-Bedoya (1), R. Blanco-Chao (1), and F. Macias-Vazquez (3)

(1) Departamento de Geografía. USC. Facultad de Geografía e Historia. Plaza de la Universidad 1. 15782. Santiago de Compostela. Spain.(augusto.perez@usc.es), (2) Departamento de Matemáticas. Escuela Politécnica Superior. UDC. Campus de Esteiro. Rua Mendizábal s/n. 15403. Ferrol. Spain. (salva@udc.es), (3) Departamento de Edafología y Química Agrícola. USC. Facultad de Biología. Universidad de Santiago. Campus Universitario Sur. 15782. Santiago de Compostela. Spain. (felipe.macias.vazquez@usc.es)

Studies carried out since 2004 in the “Andes Fueguinos” (Tierra del Fuego, Argentina) demonstrate the great importance that cryogenic processes have at the present time.

The current investigations are based on two directions of research: (1) the mapping of the existing cryonival forms, and (2) the measurement of their activity. First, the existing geomorphic forms have been identified and their positions located on a map by means of GPS; second, a number of ground control stations were established to provide environmental information for a variety of locations with differing conditions. In addition, grain size analysis of stones in different areas was undertaken to characterize the varying sediment characteristics.

The first results demonstrate:

1. - The existence of numerous cryogenic geomorphic forms: sorted polygons and sorted stripes, rock glaciers, stratified slope deposits, solifluction lobes, and cryonival steps and debris flows.
2. - The importance of structural and lithological control on landforms and sediments.
3. - The presence of noticeable differences in the genesis and current dynamics of geomorphic forms due to topographic variables: orientation, slope and elevation.
4. - The importance of the role of the wind in the distribution of the snow and, consequently, in the degree of activity of the landforms.
5. - The role of the snow, as a factor of protection of the ground as well as a driving agent for the geomorphic processes.
6. - Differences in development between the presently active forms and those that have been produced in the recent past (which are now being colonized by vegetation).

The installation of control stations to monitoring the temperature and moisture of ground and air has allowed us to know:

1. - The large variability in air temperatures (mean annual of - 3° C).
2. - The existence of marked differences in temperatures between the spring and the autumn with respect to the winter and the summer.
3. - The important role of frost heave.
4. - The significant difference between the surface and subsurface ground temperatures.
5. - The progressive cooling of the ground with depth.
6. - The data collected between January of 2006 and January of the 2008 have demonstrated the presence of permafrost at a depth of 130 cm.

Aknowledgements: This work was supported by the research projects POL2006-09071 and GL2004-3380/BOS (Ministerio de Educacion y Ciencia).