

TECTONIC MORPHOLOGY OF OSORNO VOLCANO (SOUTHERN ANDES): REGIONAL STRESS AND LOADING STRESS EFFECTS.

LARA, L.1; MORENO, H.1 (1) Servicio Nacional de Geología y Minería (SERNAGEOMIN). Santiago, Chile.

Osorno volcano ($41.1^{\circ}\text{S}/72.5^{\circ}\text{W}$) is a high-Al basaltic pleistocene-holocene stratocone of 2652 m.a.s.l. and covers a semi-elliptic area of ca. 210 km². It records flood lava and pyroclastic flows in its postglacial (i.e., ca. 14.000 y.B.P. in Southern Andes) history. Osorno volcano is located in a NE-SW transversal chain that contains monogenitic cones and eroded stratovolcanoes. NE-SW chains are regional in scale and also describe the systematic en echelon location of adventitious cones in stratovolcanoes. Pre-andean structures and the N-S Liquiñe-Ofqui Fault also show a spatial association with volcanic foci. Current models suppose dextral transpression in the volcanic arc but the instantaneous deformation picture is not well constrained. At Osorno volcano, some postglacial (e.g., 160 y.B.P.) flank cones are radially distributed displaying an isotropic stress signature. Nevertheless, cones and sigmoidal fissures of the 1835 eruption are NE-SW orientated and all located in the SW quadrant. We propose that, while regional patterns are recorded in volcano structures, the regional stress field is variable. In addition, local effects are also recognized in the asymmetric morphology of the stratocone whose central summit crater does not overlie its centre of mass. This behaviour is possibly related to a local distribution of forces where loading stress becomes a key factor. Collapse episodes are not recorded at Osorno volcano but the potential collapse area could be defined in the light of a local stress balance due to its asymmetric growth. In addition, this tectonic framework is a critical consideration in risk and land management evaluation studies. Current investigations are focused on the instantaneous deformation pattern and volcano-tectonic morphology at regional and local scales. This project was supported by Fondecyt grant No. 1960885. Corresponding author: e-mail: lelara@sernageomin.cl