310

IN SITU GEOPHYSICAL EXPLORATION OF SUBGLACIAL LAKE ELLSWORTH, WEST ANTARCTICA

Andres Rivera[1], Rodrigo Zamora[1], Jens Wendt[1], Guillermo Neira[1], Anja Wendt[1], Luis Araya[1], Claudio Bunster[1], Martin Siegert[2], Gino Casassa[1]

[1]Centro de Estudios Cientificos, Valdivia, Chile, [2]University of Bristol, Bristol, United Kingdom

In January 2006 a new Chilean scientific terrestrial expedition took place in Western Antarctica, which was organized by Centro de Estudios Científicos, Valdivia, Chile (CECS) and the private company Antarctic and Logistic Expeditions (ALE), with the financial support of the Chilean Minister of Defence and the collaboration of the Chilean Army, the Chilean Air Force, the University of Kansas, the University of Bristol and the National Institute for Polar Research of Japan. The main aim of the campaign was to study Institute Ice Stream and the surroundings of subglacial Lake Ellsworth (90.6ºW 78.9ºS). This operation began at Punta Arenas, Southern Chile, where an Ilyushin airplane of ALE take off with instruments, cargo and personnel to Patriot Hills (80ºS), where landed with wheels on the local blue ice area. At Patriot Hills, ALE provided a new Camoplast tractor able to tract sledges carrying fuel, cargo and three modules especially designed for Trans Antarctic campaigns. These modules include a bathroom, a scientific room and an office/kitchen/resting room for scientists. The planned track followed approximately 450 km along one tributary of Institute Ice Stream. This track was carefully analyzed using ASTER and RADARSAT satellite images, following similar procedures used by USA expeditions. Prior departure from Patriot Hills, an airborne survey was conducted by ALE Twin Otter airplanes allowing a more closely analysis of possible crevasse fields. Several instruments were mounted onboard the convoy, including a radar for measuring ice thickness and the internal structure of the ice (Model CARDS 150 MHz). Geodetic quality GPS receivers (Javad model Lexon GD) were also used during the traverse allowing a high accuracy mapping of the surface topography. Stakes were planted each 20 km allowing ice velocities measurements. In the surroundings of Lake Ellsworth, several radar and GPS profiles were surveyed, allowing a better delineation of the subglacial lake. Preliminary results show a deep fjord type subglacial morphology where a 15 km long and 2 to 5 km width subglacial lake was detected at ice thicknesses between 3000 and 3200 m.