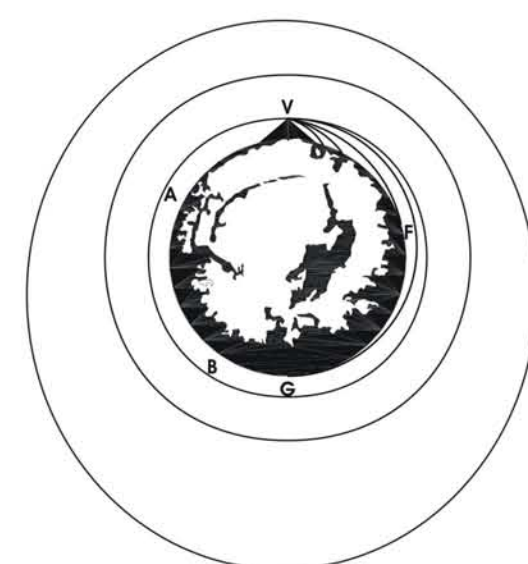
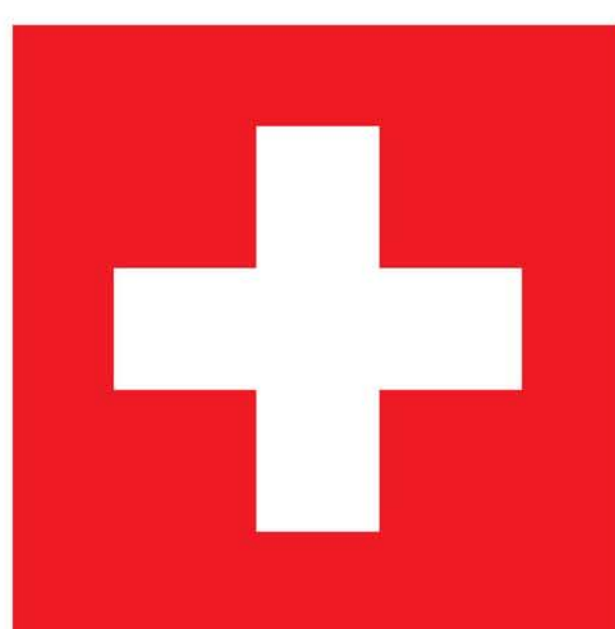


# ICE AND CLIMATE RESEARCH COLLABORATION SWITZERLAND-CHILE



CECS

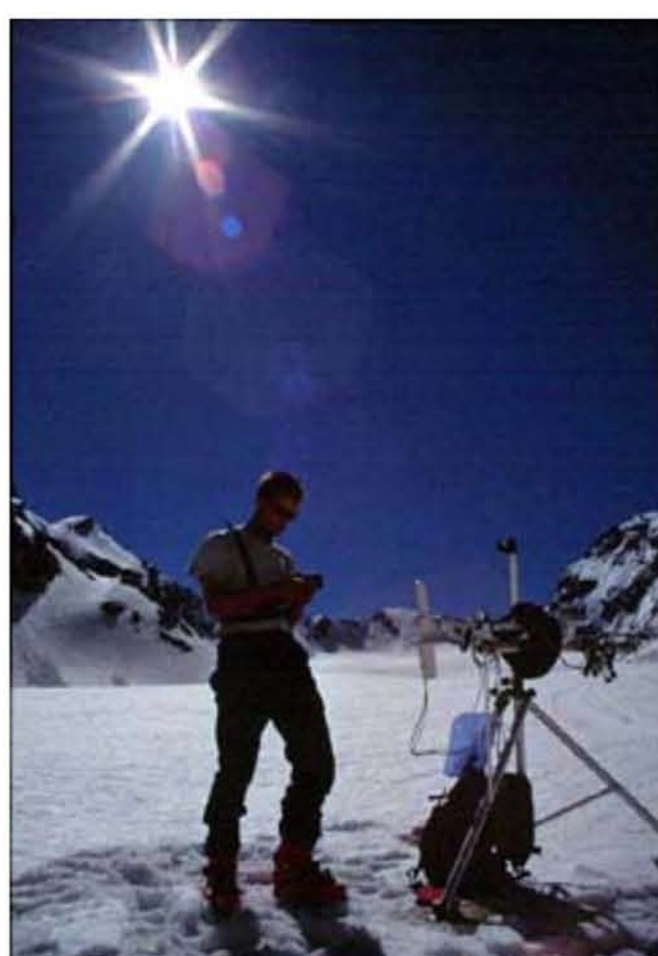


## CERRO TAPADO



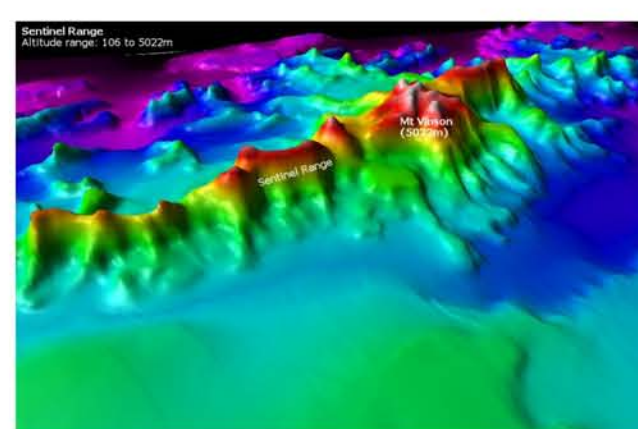
A 36 m long ice core down to bedrock from the Cerro Tapado glacier (5536 m a.s.l., 30° 08' S, 69° 55' W) drilled in 1999 was analyzed to reconstruct past climatic conditions for Northern Chile. Because of the marked seasonality in the precipitation (short wet winter and extended dry summer periods) in this region, major snow ablation and related post-depositional processes occur on the glacier surface during summer periods. They include predominantly sublimation and dry deposition. Under certain assumptions the chemical record along the ice core may be applied to reconstruct the history of such secondary processes. For the time period 1962/1999, a mean annual net accumulation of 316 mm water equivalent (weq) and 327 mm weq loss by sublimation was deduced by this method. This corresponds to an initial total annual accumulation of 539 mm weq. The annual variability of the accumulation and sublimation may exhibit a correlation with the Southern Oscillation Index (SOI). The deepest part of the ice record shows a time discontinuity; its age is unknown.

## ACONCAGUA RIVER BASIN

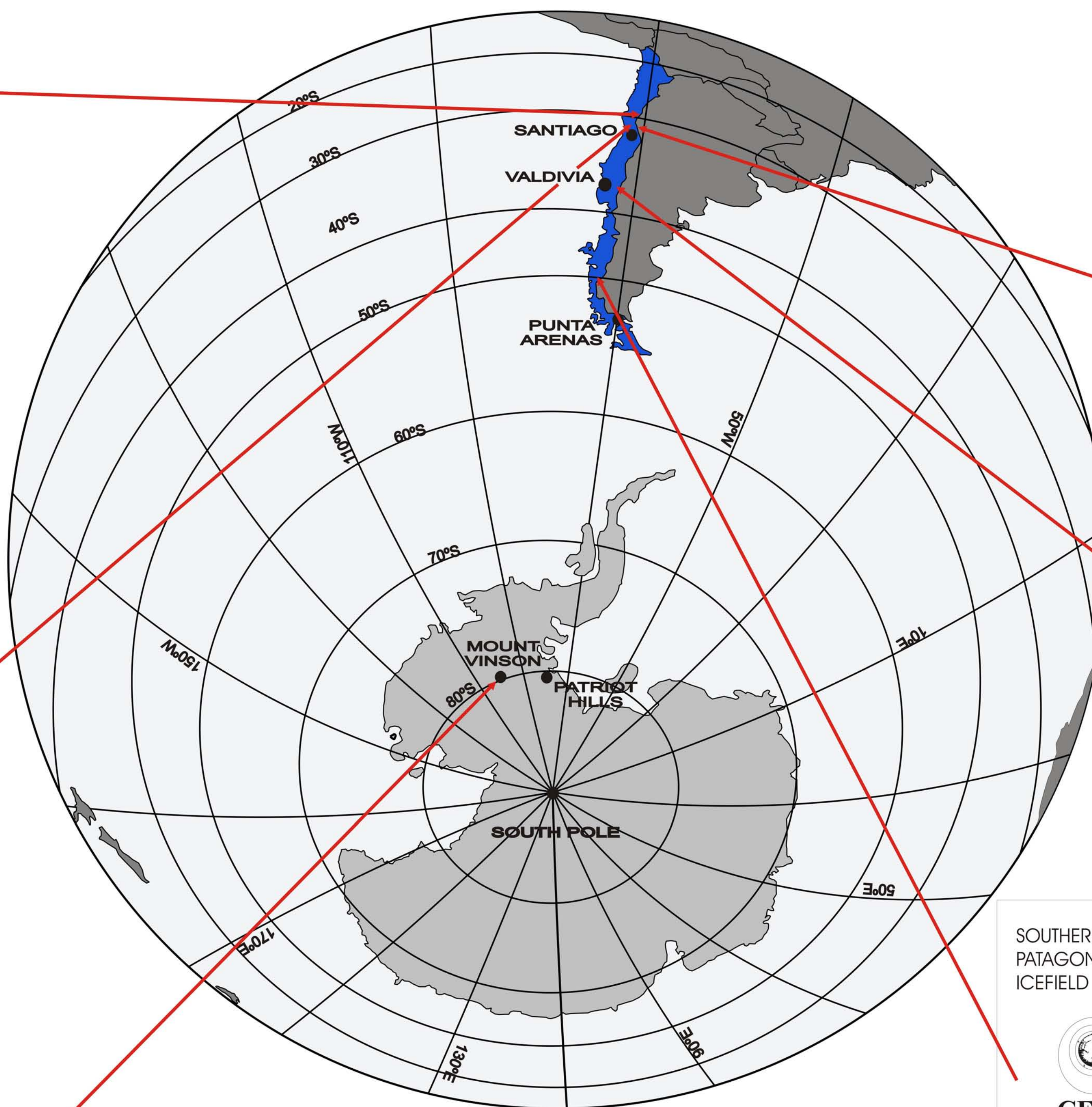


Glacio-hydrological study of the upper Aconcagua river basin. Field work will be performed between November 2005 and February 2006. Topics include meteorology, glaciology, snow depth and density and river runoff. The effects of climate change will be assessed, and the characteristics of the southern Andes will be compared with the Alps.

## MOUNT VINSON



First Expedition to Mount Vinson by Human & Nature's Power. The plan is to climb the highest point in Antarctica in harmony with nature. Travel will be performed with the sailboat Pachamama to the Antarctic coast. This boat is a reference for what can be done with renewable technologies. From the coast there will be about 600 km of skiing combined with the use of kites to reach the base of the mountain. From there it will be high altitude climbing up to the top (5140 m). Along the way samples and data will be collected in collaboration with the climate change program of CECS.



## CERRO MERCEDARIO and CERRO EL PLOMO



In January 2003, shallow firn cores were recovered from Glaciar Esmeralda on Cerro del Plomo (33°14'S, 70°13'W, 5300 m a.s.l.), Central Chile and from Glaciar La Ollada on Cerro Mercedario (31°58'S, 70°07'W, 6070 m a.s.l.), Argentina in order to find a suitable archive for paleo climate reconstruction in a region strongly influenced by the El Niño/Southern Oscillation. In the area between 28°S and 35°S, the amount of winter precipitation is significantly correlated to the Southern Oscillation Index with higher values during El Niño years. Glaciochemical analysis indicates that the paleo record at Glaciar La Ollada on Cerro Mercedario is well preserved whereas at the Glaciar Esmeralda the record is strongly influenced by melt water formation and percolation. A preliminary dating of the Mercedario core by annual layer counting results in a time span of 17 years (1986 - 2002), yielding an average annual net accumulation of 0.45 m water equivalent. In February 2005 a 104 m-deep ice core was retrieved from Cerro Mercedario (see figure). Core analyses are under way to assess the paleoenvironmental conditions in the region.

## VOLCAN MOCHO and VOLCAN OSORNO



Firn core studies are being undertaken in Volcán Mocho and Volcán Osorno, Chilean Lake District as part of climate change research. The glaciers are temperate but some chemical and biological species might be preserved, possibly yielding valuable paleoclimatological information for the area. The volcanoes are ice capped and the glaciers show a rapid retreat in recent decades in response to regional warming and precipitation decrease. In November 2005 10 m firn core records were drilled on both volcanoes. Biological and chemical analyses will be performed. In addition to the scientific objectives, Top to Top performed a crevasse rescue seminar on Volcán Mocho in April of 2005.

## SOUTHERN PATAGONIA ICEFIELD



Firn/ice drilling in Patagonia is essential for retrieving a paleoenvironmental record of mid-latitudes, filling a gap between the tropics and Antarctica. A 4-m and a 3-m core were retrieved on 25 and 27 September 2001 from Paso Marconi (49°11'2.1" S, 73°08'40.3" W, 1543 m asl), Gorra Blanca Sur (49°09'22.6" S, 73°06'51.9" W, 1836 m asl), and on 28 September 2001 a 5-m core was collected from the Plateau of Gorra Blanca Norte (49°07'52" S, 73°03'11" W, 2300 m asl, which was reached by helicopter. The Paso Marconi and Gorra Blanca Sur cores show strong water percolation and obliteration of the chemical signals. The Gorra Blanca Norte core shows preservation of chemical species and a valuable paleoenvironmental record. A deep ice core is planned to be drilled in 2006 at the plateau of Cordón Mariano Moreno, Southern Patagonia Icefield, co-sponsored by NATIONAL GEOGRAPHIC Committee for Research and Exploration.

## PROJECT LEADERS

Dario Schwoerer, TOP to TOP



Margit Schwikowski, PSI



Francesca Pellicciotti, ETH



Andrés Rivera, CECS



Gino Casassa, CECS



## JOINT SCIENTIFIC PUBLICATIONS

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## PARTNERS and SPONSORS to TOP to TOP



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