Heavy metals in ice cores from mexican mountains

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The first interest on drilling and analysis ice cores for general chemistry and isotopes was in Antarctica, Greenland and the Alps. Then the interest moved to other major mountain ranges. Since the 1990's several kilometres of ice cores have been drilled in the Himalayas, Alaska, Andes, and even Kilimanjaro [1, 2]. However, no attention had been focused on the Mexican Glaciers. Ground Penetration Radar data indicates more than 30 m of ice in the thickest section of the glaciers. Geographically these glaciers are important because they are the only glaciers between Ecuador and norther USA in North America, and some of the very few at 19-20° north latitude in the world. Low latitud glaciers are unique in various ways since they have archives of past climate and environmental changes on millenial to decadal times escales [1]. We present here preliminary data on heavy metals in the ice from three shallow ice cores (1.6 meters depth) in Iztaccihuatl (5,280 meters above sea level –masl- total altitude; one core at 5,130 masl) and Pico de Orizaba (5, 714 masl total altitude; two cores, one at 5,100 masl and other at 5,200 masl). The data indicates that some concentrations of Cl, NO_3, SO_4, Fe, Ni Cu, Zn, Pb and As very likely are from aerosols and atmospheric dust. However, there are some anomalies in Zn, Co, Cu and Ni that need other sources to explain their concentrations. We also present some correlations between some heavy metals in the Iztaccihualt ice (located relatively close to Mexico City atmospheric influence) and Pico de Orizaba ice (relatively far from any big city). No age dates have been obtained for these glaceirs, but Vazquez-Selem & Heine [3] suggest that the current glaciers in Mexico are the remains of bigger glaciers during the Little Ice Age, so the dephest ice should be, at least a couple of hundred years old. This current investigatios aims to get ice cores from all the depth.

[1] Cecil *et al.* eds (2004) Kluwer Academia Publishers, 3-15.
[2] Ferrari *et al.* (2001) *Atmos. Enviro.* **35,** 5809–5815.
[3] Ehlers & Gibbard (2004) Elsevier, 233-242.

Degradation and transformation of organic nitrogen compounds in two Swiss lakes—linking biogeochemistry and microbiology

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In order to study the fate of lacustrine organic nitrogen compounds in two Swiss lakes dissolved organic matter (DOM) and particulate organic matter (POM) were sampled. The study sites distinguish themselves in trophic level and redox conditions. Lake Brienz was chosen as an oligotrophic and fully oxic peri-alpine lake. By contrast Lake Zug is eutrophic and under a certain water depth anoxic. Ten different water depths throughout the entire water column were sampled and additionally a core from the underlying sediment was taken. The concentrations of single amino acids and amino sugars which mainly contribute to the DOM and POM in lakes were measured in all samples. To characterize the degradation status of the organic material the pigment based Chlorin Index and amino sugar ratios were applied. Additionally, variations in amino acids patterns related to degradation processes were investigated. One focus of this study is set on biomarkers as the amino sugar muramic acid and D-amino acids which can be synthesized only by bacteria.

In a further step the obtained results will be linked to microbiological data characterizing the microbial communities in the two lakes. Changes in the microbial communities as well as their abundances will be related to organic matter changes. Here we present first results from both lake systems.