First exposure ages from Mt Chimborazo, Ecuador

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Moraine sequences present around Mt Chimborazo, Ecuador suggest wider glacier extents at time of colder and possibly wetter conditions but the timing of these glacial stages is poorly known. We have sampled boulders for surface exposure dating with cosmogenic nuclides from moraines belonging to the late glacial group and the full glacial group. Here we report ^{36}Cl exposure ages on boulder samples prepared at the NERC-CIAF, UK and measured by AMS at the SUERC, UK. We used the program CHLOE3 [1] and production rates estimated by Phillips *et al.* [2] scaled for latitude and altitude to calculate the exposure ages. No corrections for ash cover or erosion have been applied. The uncertainties correspond to the analytical uncertainties and do not include the uncertainties associated with the estimated production rates used to calculate the exposure ages. Three boulders from the late glacial moraine have exposure ages ranging from 8.5 ± 0.5 ^{36}Cl kyr to 9.9 ± 0.5 ^{36}Cl kyr. Two boulders from the full glacial stage moraine have similar exposure ages as boulders from the late glacial moraine. Additional analyses on samples from the late glacial moraine will be carried out.

[1] Phillips F. M. & Plummer M. A. (1996) *Radiocarbon* **38**, 98-99. [2] Philips *et al.* (2001) *Chem. Geol.* **175**, 689-701.

Origin of riverine dissolved inorganic carbon: Comparison between West Indies, Reunion and Iceland

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Volcanic rocks are responsible of about 30% of the global consumption rates of CO_2 by chemical weathering of silicate rocks (Dessert et al. 2003). The origin of CO_2 implied in the weathering reactions is however still poorly known, particularly in volcanic areas. We propose here a study of three volcanic areas: West Indies, Reunion and Iceland. The studied areas have high weathering rates, but differ in the geodynamic context (subduction, hot spot, and ridge), climate (tropical versus subpolar climate) and vegetative cover. To estimate chemical weathering, we used dissolved inorganic carbon (DIC) and its δ^{13}C, and major ions in the rivers, soil solutions and hydrothermal springs.

Our data show two main origins for the DIC: biogenic for 58-72% and magmatic for 42-28%. In West Indies (n=110), the proportion of magmatic CO_2 is lower than in Reunion (n=39) and in Iceland (n=40). The contribution of each reservoir varies in the rivers according to the geodynamic context, the ongoing or recent volcanic activity, the proximity from the volcanic edifices and the vegetative cover. These observations illustrate that a significant amount of magmatic CO_2 is exported to the ocean via rivers, which could lead to reconsider the balance of magmatic CO_2 emissions by the volcanoes at global scale, and its role in weathering reactions.

[1] Dessert *et al.* (2003) *Chemical Geology* **202**, 3-4, 257-273.