Lab vs field granite weathering rates: A 12-year experiment

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Introduction

Controls on natural rates of silicate weathering can be classified as intrinsic to the reacting phase and extrinsic to weathering environment. The duration of reaction, which may influence both of these characteristics is the one parameter that can not be directly reproduced under laboratory conditions [1]. This study approaches this issue based on results of the longest-term experimental weathering study yet conducted.

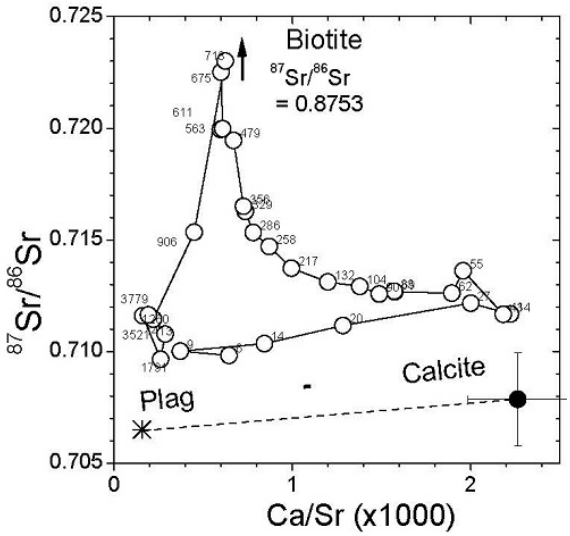

Figure 1: Impact of changes in mineral reactivity on effucient Ca/Sr and 87Sr/86Sr ratios over time (data in days).

Results

Solute fluxes for 4 pairs of fresh and naturally weathered granites exhibited progressive changes, which to a first order, were dependent on long-term changes in specific mineral reactivities as indicate for Ca and Sr data plotted in Fig. 1. Solute fluxes decreased exponentially over 12 years, gradually converged to comparable values between paired samples, but never achieved steady-state conditions commonly assumed in much shorter-term experimental studies

[1] White & Brantley (2003) *Chem. Geology* **202**, 479-506.

Coupling stable isotopes, nucleic acid detection and whole cell physiology to resolve microbial functions *in situ*

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Nucleic acid based technologies have revolutionised the field of microbial ecology, from discovering hitherto unknown microbial species, the enormity of gene richness within the natural environment and the functions carries out by our natural biota. This latter category has developed substantially over the last decade, principally by linking the use of stable isotope based physiological tracers with nucleic acid detection. In this presentation I will outline some of the key technologies being developed in microbial ecology which allow researchers to link community processes with the organisms responsible, at scales from the total population down to the individual cells themselves.