

## 4.5.75

### REE patterns in small streams from a mixed basaltic-granitic catchment area (Massif Central, France)

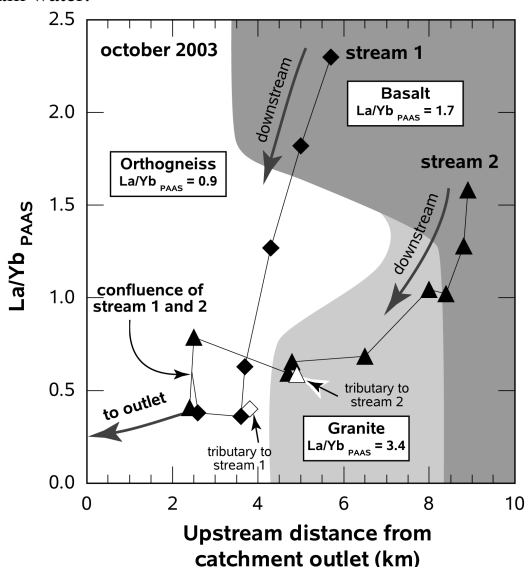
M. STEINMANN<sup>1</sup> AND P. STILLE<sup>2</sup>

<sup>1</sup>Département de Géosciences, Université de Franche-Comté, 25030 Besançon cedex, France (marc.steinmann@univ-fcomte.fr)

<sup>2</sup>Centre de Géochimie de la Surface, ULP-EOST-CNRS, 67084 Strasbourg Cedex, France (pstille@illite.u-strasbg.fr)

We present dissolved load rare earth element (REE) patterns of small streams from a catchment area in the French Massif Central that is underlain by Quaternary basalts in its upper part, and by Hercynian granites and orthogneisses in its lower part. These lithologies are characterized by clearly different REE distributions, and distinct Sr and Nd isotopic compositions.

Our preliminary data show downstream decreasing La/Yb ratios for the dissolved load without a direct link with source rock composition. At present we consider preferential alteration of REE carrier phases in the source rock and/or the physico-chemical composition of stream water as potential mechanisms that control REE fractionation in stream water. We are actually completing our data set with Nd and Sr isotopic compositions of stream water, and altered and unaltered basement rocks in order to get additional information on the processes that control REE distribution in stream water.



Downstream evolution of dissolved load PAAS normalized La/Yb ratios of stream 1 and 2, overlain on the basement rock lithologies of the sampling points.

## 4.5.76

### River water in NE Iceland: S isotopes, Fe and Mn concentrations

P. TORSSANDER<sup>1</sup>, S.R. GISLASON<sup>2</sup>, E.S. EIRIKSDÓTTIR<sup>2</sup>, S.Ó. ELEFSEN<sup>3</sup>, CM. MÖRTH<sup>1</sup> AND A. SNORRASON<sup>3</sup>

<sup>1</sup>Dept of Geology and Geochemistry, Stockholm University, SE-106 91 Stockholm, Sweden (peter.torssander@geo.su.se)

<sup>2</sup>Science Institute, University of Iceland, Dunhaga 3, IS-108 Reykjavík, Iceland

<sup>3</sup>National Energy Authority, Grensásvegi 9, IS-108 Reykjavík, Iceland

Three glacial rivers and some of their tributaries in NE Iceland have been collected and analysed for chemistry and their sulfur isotope composition to determine the origin of sulfur in river water. Eight to ten samples were collected each year for the last 5 years. Here we present results from the first 3-4 years.

The  $\delta^{34}\text{S}$  values show an overall variation in all samples from 0 to 15‰. Difference between some rivers and tributaries were rather large. The maximum variation at each site was never more than 7‰. This variation is distributed as an enhanced  $\delta^{34}\text{S}$  value occurring short time every spring in the beginning of the high discharge period, simultaneously as the major elements (e.g. sulfate, chloride) was decreasing in concentration. In spite of the continuing high discharge the  $\delta^{34}\text{S}$  values were in most cases declining back to background values of a few‰. We attribute this difference to be due to mixing with bedrock S ( $\delta^{34}\text{S}$  close to 0‰) with marine sea spray S ( $\delta^{34}\text{S}$  up to 21‰), whose proportion will be much larger during initial snow melt.

Concurrent to the S isotope peaks Fe, Mn and DOC have short enhanced concentrations (peaks) occurring in early spring when the discharge was increasing. Fe and Mn is mobile at their relatively reduced states, indicating the source of these elements were wetlands and peat areas, concurred by the DOC peaks. Addition of water from those areas also explains the highest  $\delta^{34}\text{S}$  values and particularly higher background values of around 7‰ at some tributaries due to bacterial sulphate reduction.