Al-organic complexes can be formed. The relative abundances of the soil components depend on the composition of the parent rock, weathering stage, and hydrological conditions.

Sampling and Analysis: We collected 48 water samples, and they were analyzed by inductively coupled plasma atomic emission spectrometry (ICP-AES) for Ca, Mg, K, Na, Si, Fe, and Al, by ion chromatography for Cl, SO₄, and NO₃, and by titration for alkalinity. Overall quality was checked by the charge balance (<10% off). In some samples SiD and AlD were analyzed by mass spectrometry.

Results and Discussion: Waters with the lowest conductivities occur in the central highlands. The relative contribution of marine aerosols to the water compositions decreased from lower to higher altitudes, whereas the relative as well as the absolute contributions by water-rock interactions increased. Despite efforts to avoid inclusion of waters affected by agriculture, quite a few samples had NO₃ concentrations above background values. The Al and Fe concentrations were practically all below the detection limits, indicating their immobility in the weathering processes and in accordance with the described soil mineralogy. The SiD and AlD values decreased significantly with increasing altitude (lower T's). The pCO₂ values, calculated on the basis of alkalinity, field-pH, and in situ T, were above the atmospheric value. Corrections for the marine contributions on the basis of the Cl concentrations showed that there were only minor excesses in SO₄ concentrations.

Using a clustering program, introduced by [1], on the elemental composition, 10 subgroups of water samples were identified. They are primarily defined by differences in their alkalinites, but are also expressed in differences of molar ratios of the various components. The marked differences between ratios of HCO₃ / H₂SO₄ / H₂SiO₄ are indicative of the degree of weathering of the parent rocks. Differences in Ca/Mg are partly due to compositional variations in plagoclases. Rather high Mg concentrations and small variations in Ca/Mg indicate that these waters are not in equilibrium with smectite, one of the incipient products of weathering of olivine and plagioclase.

Conclusion: Apart from the marine contributions, the water chemistries are mainly the result of weathering of olivine, pyroxene, and Ca-rich plagioclase and formation of soil components representative of severe weathering as described above.


HIGH-RESOLUTION LEAD AND NEODIUMYUM RECORDS OF NORTHEAST INDIAN OCEAN SEDIMENTS OVER THE PAST 150 ka: FLUCTUATIONS IN THE MONSOON AND HIMALAYAN WEATHERING ASSOCIATED WITH NORTHERN HEMISPHERE GLACIATION. D. Vance1 and K. W. Murton1. Department of Earth Sciences, The Open University, Walton Hall, Milton Keynes, MK7 6AA, UK (d.vance@open.ac.uk) and Département des Sciences de la Terre, UMR 6524 Centre National de la Recherche Scientifique, Université Blaise Pascal, 5 Rue Kessler, 63036 Clermont-Ferrand, France.

Introduction: The radiogenic isotopes of Sr, Nd, and Pb have long been used to investigate the provenance of marine sedimentary products. More recently, it has been realized that the record of short residence-time elements such as Nd and Pb in ferromanganese crusts, preserve information on the long-term variability of continental weathering and oceanic circulation. Furthermore, we have recently shown that the high-resolution record of Nd available from foraminifera records the short-term response of continental weathering rates [1] and hydrographic regime [2] to recent climate fluctuations associated with glaciation. For example, foraminifera from the past 150 ka from ODP site 758A in the northeast Indian Ocean record changes in the Nd-isotopic composition of surface water on the order of 2 ‰.

These fluctuations are in phase with the global G-isotopic record, with more radiogenic Nd obtained during interglacials and radiogenic values characterizing glacial. These variations have been attributed to changes in the rate of runoff from the Himalaya in response to fluctuations in the strength of the southwest monsoon. Here we present Nd and high-resolution Pb-isotopic data for the latter obtained by multiple collector inductively coupled plasma mass spectrometry (MC-ICP-MS) [3], on the carbonate-rich bulk sediments from...