Lake water that was pushed up along the inner crater walls drains back down and into the conduit. The downflow of lake water and upflow of water from the Indus is due to the changing of hydrostatic pressures within the system. As the lake water drains down, magma rises through the crater walls. The water level begins to drop once the crater walls begins to drain back down and into the conduit. The downward movement of the lake water and upward movement of the magma is subject to the influence of hydrostatic pressures. The sequence of events becomes more complex when the walls deform, magma rises through the crater and a thermal source is used to pressurize the conduit prior to eruption. All results will be presented in a series of parametric animations.

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Interest of 238U-234U-226Ra Disequilibrium for Tracing Groundwater Inputs Into Surface Waters: A Case Study

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Characterization of deep water inputs into surface water requires geochemical tracers that develop different signatures in surface and ground waters. It has been suggested that U activity ratios could play such a role (e.g. Riette and Chabaux 1999). Here we propose to test this hypothesis in the case of the Lauter stream (East France-West Germany), a stream that drains sandstone of the Bundsandstein sequence, in which several superimposed and more or less independent aquifers are developed. Major elements, trace elements, Sr isotope ratio and 238U-234U-226Ra disequilibrium have been analysed in the dissolved load of water samples collected in the Lauter stream and in the different groundwater of the sandstone formations. The data certainly give the first convincing demonstration of the usefulness of U activity ratios in surface waters to quantify the influence of deep water inputs. The data point out that, in the specific case of the Lauter stream, more than 50% of the total activity carried by the stream is supplied by deep waters. This contribution significantly modifies the 238U/234U activity ratio, which in turn suggests that 238U-226Ra disequilibrium could also be helpful for the global chemical fluxes carried by rivers, those representative of surface weathering processes. Overall these results highlight (1) the need to focus on the surface water fluxes from deeper ones in order to establish realistic weathering budgets and (2) the importance of deep groundwater fluxes from chemical analysis of river waters and (2) the potential of 238U-234U-226Ra disequilibrium to perform such distinction. Riette et Chabaux (1999) Geochim. Cosmochim. Acta 63 1263-1275.

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238U-234U disequilibrium in surface waters: A new tool to discriminate weathering processes

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The rivers draining the Himalaya are recognized as major contributors to the dissolved riverine flux to the oceans, with roughly 660 km3 of water leaving the Himalayan region annually. As such, the study of dissolved fluxes from river waters is of great importance in environmental science. However, due to the complexity of these systems, there are many questions that remain unanswered. One of the most important questions is whether or not there is sufficient variability in the dissolved fluxes to provide a means of distinguishing between different sources of water. The Himalayan rivers are a complex system of interacting processes, and there may be several sources contributing to the dissolved fluxes. By analyzing the 238U/234U activity ratio in river waters, it is possible to discriminate between different sources of water. The 238U/234U activity ratio is a sensitive tracer of weathering processes, and it has been used to distinguish between different sources of water. The study of the 238U/234U activity ratio in river waters is a new tool to discriminate weathering processes, and it has the potential to provide valuable insights into the sources of water.
U-series data in combination with XRD and isotopic ICP-MS spectra were collected using a CW lamp at room temperature. Luminescence spectroscopic analysis of the organic-rich calcite demonstrates that uranium is present in the organic matter. Uranium is a weathering tracer for the a-recoil flux, yield weathering rates of approximate 1 Ma ago. For a 65 cm long stalagmite, concordant uranyl Incorporation in Soil Organic-Bearing Soil Calcite E Troy Rasbury, Julie Pett-Ridge, Louis A. Derry 1 1Department of Geosciences, SUNY Stony Brook, Stony Brook, NY 11794-2100, United States

U-series data in combination with XRD and isotopic ICP-MS analyses provide information on the role of Fe-oxide and organic matter sorption on the behavior of uranium in the soil. Temporal sampling of streamwaters through varying discharge allows us to connect specific isotopic signatures to flow-paths through different layers of the weathering profile. A detailed account of the weathering mass balances in the watershed is available to evidence the transformation of the U.

The project investigates the potential of U-series data to date weathering columns. We aim to test the applicability of this technique in surface waters, and calculate weathering mass balances.

Uranyle Incorporation in Organic-Bearing Soil Calcite E Troy Rasbury (631 362 1488; troy.rasbury@sunysb.edu)
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Phosphate in streamwater reveal a close correlation between uranium and organic-rich calcite that lines roots in an ancient caliche soil. Concomitant U-oxide precipitation and uraninite mobilization as the soil calcite formed 298 ± 12 Ma ago. Luminous images of the soil calcite demonstrate that uranium is present in the oxidized, phosphate-bearing, layers of the soil. The data suggest that uranium is bound to organic matter. The results of the study are enhanced at high liquid nitrogen temperatures over room temperature and thus the similarity may suggest that the U is bound to organic matter. U-oxide precipitation, therefore, indicates that uranium is acquired under similar conditions and consistent with that reported previously for humate matrices. Since these spectra are dominated by the carbon backbone structure, it is not possible to determine the uranium structure. The uranium signature is not consistent, but persists of the ligating functional groups cannot be proven directly. We suggest that this sample contains a mixture of uranium complexation with organic acids in natural systems. In our model organic acid functional groups that complex uranyl are sorbed onto the calcite surface and the incorporated into mineral complexes. Further, the uranyl complexation is dependent on changes in conditions and temperatures to the conditions associated with 2700 meters burial depths. These results demonstrate a significance limitation. U-oxide precipitation exists that prevents quantification of uraninite in the soil environment, but also inhibits the breakdown of the humic soil. Further spectroscopic and mineralogical data suggests that the uraninite may be isolated as uraninite and precipitated as calcite. The kinetics of the dissolution of uraninite and the organic matter is noted, but persistence of the ligating functional groups is essential. These spectra are dominated by the carbon backbone structure, but are slightly different from those reported previously for humate substances. Since these peaks are essentially identical to that of sodium humate, it is possible that uraninite is incorporated into mineral complexes. The results of the study show that the uraninite is bound to organic matter. UV-excitation Raman spectroscopy of the calcite samples reveals a vibrational signature that is, in addition to the calcite structure, essentially identical to that of sodium humate. This study has profound implications for understanding the potential of U-series data to date weathering columns. We aim to test the applicability of this technique in surface waters, and calculate weathering mass balances.

follows some fundamental assumptions. Uranium and some thorium measurements were obtained using a Micromass Sarius TIMS equipped with a WARP quadrupole. Most of the thorium measurements were obtained with a TV Precious Metal concentrator and a Micromass Sarius TIMS instrument. Uranium concentrations in quartz, opal and calcite separates were obtained from 0.001 to 2.27 ppm, and Th from 0.001 to 3.278 ppm. Ages were obtained from isochron plots of calcite-opal/ quartz pairs, or from a given group of samples assumed to share the same initial or detrital 230Th/238U and 234U/238U ratios. Th/U values of 2.2-4.4 were observed at: Group 1: 5 ka; Group 2: 4 ka and 5 ka; Group 3: 97 ka; Group 5: 4.7 ka, 0.4 ka, 0.7 ka, 0.5 ka, and 5 ka for most samples from Groups 1, 2, and 5 are consistent with expectations based on the presence of active fumaroles and the timing of Group 3 travertine deposit is also consistent with expectations, as cold seeps and the absence of significant fumaroles that indicate a current heat source, as well as geologic observations for recent faulting that has provided conduits for fluid flow. The older age of 97 ka from group 3 travertine deposit is also consistent with expectations, as cold seeps and the absence of significant fumaroles that indicate a current heat source, as well as geologic observations for recent faulting that has provided conduits for fluid flow. The older age of 97 ka from group 3 travertine deposit is also consistent with expectations, as cold seeps and the absence of significant fumaroles that indicate a current heat source, as well as geologic observations for recent faulting that has provided conduits for fluid flow.