Biomarker flux in surface sediments corrected from ^{230}Th flux in the middle latitude of North Pacific

M. AMO[1], M. MINAGAWA[1] , M. YAMADA[2]

[1]Graduate School of Environmental Earth Science, Hokkaido University, Sapporo, Japan (amou@ees.hokudai.ac.jp)

[2]National Institute of Radiological Sciences, Hitachinaka, Japan

Analyses of ^{230}Th and biomarkers were done using seven multiple cores collected from the middle latitude of North Pacific to evaluate whether biomarkers fluxes are valuable proxies reconstructing marine productivity and terrestrial input. We estimate lateral transport of sediment using ^{230}Th and use it for correcting biomarker fluxes.

The flux to sediment of ^{230}Th is widely assumed to be related only to water depth, and to act as a constant-flux indicator for marine sediments. An evaluation of lateral transport can be conducted by a comparison of measured ^{230}Th accumulation rates at a specific site with accumulation rates expected from the production of ^{230}Th in the water column above that site. The measured ^{230}Th fluxes of cores were smaller than the predicted ^{230}Th fluxes estimated from the production rates of ^{230}Th in the water column. These suggested that reduced ^{230}Th fluxes were caused by the lateral transport of sediment and/or the low particle flux particularly in gyre regions.

Assuming the former case, we corrected TOC and biomarkers fluxes. The corrected TOC and alkenone fluxes were higher at 40°N compared to those at 20°N, reflecting differences in the productivities of phytoplankton and haptophyte algae, respectively. The corrected *n*-alkane fluxes decreased gradually from west to east, and were higher at 40°N compared to those at 20°N. These fluxes were consistent with the distribution of mineral dust fluxes. Such the corrected TOC and biomarkers fluxes in sediments reflected overlying water. These suggested TOC and biomarker fluxes could be beneficial proxies to reconstruct paleoproductivity and terrestrial input.

Evasion of gasous metal and metalloid species (Se, Sn, Hg, I) to the atmosphere from European estuaries.

D. AMOUROUX, E. TESSIER AND O.F.X. DONARD

Laboratoire de Chimie Analytique Bioinorganique et Environnement CNRS UMR 5034, Université de Pau et des Pays de l'Adour, 64000 Pau (France)

Estuaries are well known sources for major inputs of trace and major elements to the oceans. Fluxes of trace elements inter the continental as either dissolved or particulate phases. Estuaries and more specifically macrotidal estuaries in European temperate climate display important seasonal biochemical turn over. These processes are most often responsible for particulate to dissolved phase transfer of metals species and also changes in the metal speciation. These areas have also been thoroughly investigated for green house gas emission to the atmosphere such as CO2,....

If metal are fully uptaken in the biochemical process, it is very likely that some of them will undergoes methylation reactions and that if this reaction is carried out to completion, the fully methylated species may then display Henry Constant properties that could allow their diffusion to the atmosphere. To test this hypothesis, we have worked within the European program BIOGEST (Biogas in Estuaries) together with research groups evaluating the fluxes of major green house gases, on the possibilities of occurrence of volatile metal fluxes concomitant to that of the major greenhouse gases.

Samples of water were collected together with other research groups over a large array of seasonal conditions and estuaries (Rhin, Schedlte and Gironde). Water samples were degassed and the gaseous analytes were condensed on cryotubes. Analysis by flash desorption and GC-ICP/MS clearly showed that a number of elements (Hg, Se, Sn and I) presented several volatile species for all sampling campaigns and presented significant seasonal variability. The fluxes calculated clearly demonstrated that these diffused but continuous emissions can represent global significative fluxes that need to be taken into account when making global geochemical budgets. We will present and discuss the main results from the BIOGEST program with regard to the metal and metalloid fluxes from the water to the atmosphere and position there biogeochemical significance.