



SOURCES AND VARIATIONS OF MERCURY IN TUNA

A. M. L. Kraepiel (1), **K. Keller** (2), H. B. Chin (3), E. G. Malcolm (4), and F. M. M. Morel (4)

(1) Ecole et Observatoire des Sciences de la Terre, Strasbourg (2) Department of Geosciences, Pennsylvania State University (kkeller@geosc.psu.edu, fax: (814) 863-7823), (3) National Food Processors Association, Dublin (4) Department of Geosciences, Princeton University

While the bulk of human exposure to mercury is through the consumption of marine fish, most of what we know about mercury methylation and bioaccumulation is from studies of freshwaters. We know little of where and how mercury is methylated in the open oceans and there is currently a debate whether or not methylmercury concentrations in marine fish have increased along with global anthropogenic mercury emissions. Measurements of mercury concentrations in Yellowfin tuna caught off Hawaii in 1998 show no increase compared to measurements of the same species caught in the same area in 1971. On the basis of the known increase in the global emissions of mercury over the past century and of a simple model of mercury biogeochemistry in the Equatorial and subtropical Pacific ocean, we predict that the methylmercury concentration in these surface waters should have increased between 10 and 25 % over this 27 years span if methylation occurred in the mixed layer or in the thermocline. Such an increase is statistically inconsistent with the constant mercury concentrations measured in tuna. We conclude tentatively that mercury methylation in the oceans may occur in deep waters or in sediments where the impact of anthropogenic mercury inputs is negligible.