

Multi-Isotope (Hg, C & N) approach to assess mercury origin along the French coast

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Mercury (Hg) is a natural element toxic to all living organisms. Human activities contribute to disrupt significantly its biogeochemical cycle. Because Hg is bioaccumulated and bioamplified by marine organisms throughout their food webs, a better understanding of biogeochemical processes leading to Hg concentrations found in coastal species is necessary. The aim of the project was to map for the first time and on a national scale the temporal and spatial isotopic variations of Hg, and C and N. This work also attempts to better discriminate the sources and trace the origin of Hg in bivalves (e.g., Hg from the global ocean, fluvial OM, or atmospheric local deposition...). The project is based on the ROCCH (a French Mussel Watch-like program), which tracks since the 1970's contaminants on the French coastline using of bivalves as quantitative indicators of coastal chemical contamination. Preliminary Hg isotopes results show specific spatial signatures (Atlantic Ocean/Mediterranean Sea). They may come from different trophic regimes as shown by N and C stable isotopes. Furthermore, at all estuarine sites, we observe $\delta^{202}\text{Hg}$ variations and for some, a constant increase of $\delta^{202}\text{Hg}$ since 1990 (-0.5 to 0.25‰), potentially indicating a temporal change in Hg sources fluxing into the ocean. Along with a companion paper dealing with Hg speciation, we will present mercury isotopic composition data for the entire French coastline.

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