

Seasonal dynamics of mercury and methylmercury in plankton of Long Island Sound (USA)

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Seasonal trends in mercury (Hg) and methylmercury (MeHg) in phytoplankton and zooplankton were investigated in Long Island Sound, off the coast of Connecticut (USA). By measuring plankton through the different periods, we examined if there are measurable differences between %MeHg (proportion of Hg as MeHg) in the spring and fall, versus the summer, when productivity, growth rate and bloom sizes of plankton species are remarkably different.

Phytoplankton and zooplankton were collected during each season and sorted into multiple size fractions. Each size was measured for Hg and MeHg, in addition to chlorophyll a, carbon (C), nitrogen (N) and sulfur (S). Stable isotopes for carbon (C^{12} , C^{13}) and nitrogen (N^{14} , N^{15}), were assessed from zooplankton in order to quantify elemental content and trophic position. Water column components (Hg, MeHg, nitrate, DOC) were also measured at each station. Planktons were collected from multiple stations at two locations in order to investigate the impact of additional environmental factors: the Western Sound, which usually experiences anoxic waters during the summer, and the Eastern Sound, which experienced no anoxia during the study. The fall cruise included additional stations along the continental shelf off Long Island to compare coastal to shelf plankton. These measurements help to establish potential seasonal differences in Hg and MeHg at the base of the coastal food chain, and the onset of bioaccumulation.