In 2007, the Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP) began a pilot study in collaboration with the San Francisco Bay Association to examine biocaccumulation of perfluorinated compounds in harbor seals. The study focused on evaluating the effect of contaminant levels and infectious diseases in live seals (trapped and released). This poster presents preliminary results of analyses that were conducted in the first year.

Introduction

Due to their stability and their hydrophobic and hydrophilic properties, perfluorinated compounds have been widely used for the last 50 years. As shown in Table 1, perfluorooctanesulfonate (PFOS) and perfluorooctanoate (PFOA) are dominant compounds by an order of magnitude (Houde et al. 2007). As shown, the perfluorinated compounds observed in seals worldwide. The possible causes for this static population are unclear and could include loss of habitat, decline in prey, and contaminants. In 2007, the Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP) began a pilot study in collaboration with the Marine Mammal Center to examine biocaccumulation in contaminants in harbor seals in the San Francisco Bay. Environ. Sci. Technol. 39, 7416-7422.

Conclusions

Results

Perfluorinated Compounds in San Francisco Bay Harbor Seals

As shown in Figure 3, due to the small sample size, there was no statistically significant age or sex differences although average concentrations of San Francisco Bay adult males were lower than San Francisco adult females (e.g., PFOS concentrations in females was 174 ng/mL vs 470 ng/mL, in males). Review of the literature does not show a correlation with contaminant levels and infectious diseases in live seals (trapped and released). This poster presents preliminary results of analyses that were conducted in the first year.

Materials and Methods

Fourteen seals were captured using seveners and tangle nets in the full of 2006 and spring of 2007 from an urbanized area of the San Francisco Bay (Castro Rocks) north of the Richmond Bridge. This is the largest of three haul-out sites in San Francisco Bay. Another seven seals were collected from the reference site, Tomales Bay, adjacent to the Point Reyes National Seashore (Figure 1). The animals were weighed, length measured, sex determined, and a tracking device (heat resistant) attached. Animals were classified into age categories: newborn (less than one month), yearling (approximately one year old), subadult (older than yearling but not an adult), adult, and young (less than one year old). Blood, bladder, and hair samples were collected for contaminant analysis and basic health and identification (e.g., blood cell count, exposure to infectious diseases, presence of pathogenic bacteria, etc.). Serum was sent to ATY’s Analytical (Sidney, BC Canada) for analysis of perfluorinated compounds using SPE cartridges for extraction and high performance liquid chromatography – mass spectrometry (HPLC-MS/MS). Aurox was analyzed for the following 12 perfluorinated compounds: perfluorooctane sulfonate (PFOS); perfluorooctanesulfonate (PFHxS); perfluorooctanoate (PFOA); perfluorooctanoate (PFHxS); perfluorobutanesulfonate (PFBS); perfluorobutane sulfonate (PFBS); perfluorocarbonatesulfonate (PFICA); perfluorocarboxylate (PFIA) and perfluorocarboxylate (PFIA).

Results

Perfluorinated compounds detected by site and gender (95% confidence intervals shown on average concentration)

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