John White - Press Questions RE: rad contamination in river sediment

From: "Timothy Rice" <tbrice@gw.dec.state.ny.us>
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Date: 02/02/2007 12:58 PM
Subject: Press Questions RE: rad contamination in river sediment

Hello John,
We are being asked to respond to a Press inquiry from the Schenectady Daily Gazette re: contamination of river sediments in the Mohawk and Hudson rivers, particularly re: Pu. Below is the abstract that is apparently being used as the basis for the story. As you will see they talk about comparison of contaminants in sediment from above and below IP as well as from "global fallout" and the KAPL site in Niskayuna. Do you have (or know of anyone who may have) any knowledge of any Pu in sediment data for the Hudson relative to IP? I realize you won't be able to get back to us in time for responding to this inquiry, but it would be helpful to have access to any available data for the future.
Thanks,
Tim

Abstract: ----------

Determining Sources and Transport of Nuclear Contamination in Hudson River Sediments with Plutonium, Neptunium, and Cesium isotope ratios
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Different sources of radioactive contamination contain characteristic and identifiable isotopic signatures, which can be used to study sediment transport. We focus on Pu-239, Pu-240, Np-237 and Cs-137, which are strongly bound to fine grained sediments. The Hudson River drainage basin has received contamination from at least three separate sources: 1) global fallout from atmospheric testing of nuclear weapons, which contributed Pu, Np and Cs; 2) contamination resulting from reactor releases at the Indian Point Nuclear Power Plant (IPNPP) located on the Hudson River Estuary $\sim$70km north of New York Harbor, where records document releases of Cs-137; 3) contamination resulting from activities at the Knolls Atomic Power Laboratory (KAPL) located on the Mohawk River, where incomplete records document releases of Cs-137 but no mention is made of Pu or Np. Here we report measurements of Pu isotopes, Np-237 and Cs-137 for a series of sediment cores collected from various locations within the drainage basin: 1) Mohawk River downstream of KAPL, 2) Hudson River upstream of its confluence with the Mohawk River, and 3) lower Hudson River at a location in close proximity to IPNPP. In addition, we present data from selected samples from two other lower Hudson River locations: One site located $\sim$30km downstream of IPNPP and another $\sim$30km upstream of IPNPP. By comparing the isotopic ratios Pu-240/Pu-239, Np-237/Pu-239, and Cs-137/Pu-239, measured in fluvial sediments to mean global fallout values, it is possible

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to identify and resolve different sources of non-fallout contamination. To date, isotopic data for sediments indicate non-fallout sources of Pu-239, Pu-240, and Cs-137; Np-237, however, appears to originate from global fallout only. Mohawk River sediments downstream of KAPL exhibit enrichments in Pu-239, Pu-240, and Cs-137 that are 7 to 20 times higher than levels expected from global fallout as indicated from Np-237. The elevated levels, non-fallout isotopic signatures, and core location are all consistent with KAPL being a source of Pu and Cs isotopes. Sediments from upper Hudson River and a section of the lower Hudson Estuary both contain Cs-137 levels that are more than twice that expected from global fallout. While elevated Cs-137 in selected lower Hudson samples is consistent with reported reactor releases from IPNPP, there is no known source of non-fallout Cs in the upper Hudson. We have been able to estimate end-member isotopic compositions of radionuclides originating from KAPL as well as detect its presence and estimate its contribution to contaminant inventories far downstream in tidal Hudson sediments. By comparing KAPL-derived Pu-239 inventories measured in the Mohawk and Lower Hudson Rivers, we estimate a dilution factor of $\sim$140. While there is isotopic evidence of KAPL derived radionuclides in all the lower Hudson sediments that we have analyzed, elevated levels of Cs-137 (not attributable to KAPL)were only observed in sediments collected in the vicinity of IPNPP and those collected 30km downstream of the plantÕs location. We attribute the elevated Cs-137 levels in these Lower Hudson sediments to contamination originating from IPNPP. The lack of elevated levels of Cs-137 in sediments collected 30km upstream of the plantÕs location plus a dilution factor for Upper Hudson sediments that is larger than that estimated for Mohawk River sediments alone, allows us to conclude that Cs-137 enrichment observed in the Upper Hudson is not likely to be a significant source of Cs-137 contamination to lower Hudson River sediments.