

Calif. waterway cleanups may do more harm than good -- USGS

Debra Kahn, Environment & Energy Publishing , 1-26-11

Cleaning up mercury-laden sediment in California waterways could be more harmful than letting it be, according to a new study from the U.S. Geological Survey.

USGS studied the South Yuba River in the northern Sierra Nevadas at the request of the Bureau of Land Management, which is trying to figure out how to reduce mercury concentrations. The Yuba and other rivers contain mercury from decades of gold and mercury mining, as well as from atmospheric emissions from power plants in-state and overseas.

Researchers found that insects had much higher methylmercury levels just downstream from a historic gold-mining site than in other areas of the river. Methylmercury is an organic, more-toxic form of mercury that affects the central nervous system, including vision, coordination, hearing and speech.

USGS researchers dredged the river in 3-inch sections and found up to 11,000 nanograms per gram of mercury in fine-grained sediment, compared to a peak of 515 ng/g in the largest particles. They wanted to try an 8-inch dredge, but the state Water Resources Control Board said it would discharge too much mercury.

In a closed-tank simulation detailed in a separate study, fine-grained silt remained suspended in the water for up to 40 hours, and the concentration of mercury increased over time as heavier particles settled, in line with mercury's tendency to cling to smaller, more-mobile pieces.

"The primary objective for BLM was to find out whether dredging could be a viable way to clean up mercury at this location," said report co-author Charles Alpers. "Doing nothing might be the best alternative, given the current situation."

Alpers suggested BLM might want to spend its efforts on stabilizing onshore mercury deposits, like a cliff of eroding hydraulic mining debris at the confluence of the South Yuba River and Humbug Creek.

"Eroding cliff tailings off the face of the cliff is a source to the river that's probably more likely to become methylmercury than the river deposits," he said. "The next step might be to try to stabilize that cliff."

Fish absorb mercury from sediment

In two separate studies, University of Michigan researchers found that fish in the San Francisco Bay Delta were absorbing mercury primarily from sediment, rather than the atmosphere.

One Michigan study, published in *Environmental Science and Technology*, measured mercury levels in 4-month-old silverside and topsmelt fish that had not had a chance to travel far from their birthplaces.

The researchers sampled 20 areas of the San Francisco Bay Delta for sediment and 26 sites for fish. They found that the types of mercury in the fish closely mirrored that at the sites where they were found, suggesting they were absorbing the mercury directly from the sediment, rather than the atmosphere or local point sources.

The other Michigan study, published in *Geochimica et Cosmochimica Acta*, examined mercury isotopes in the

San Francisco Bay and found that mercury mines in the Coast Range and gold mines in the Sierra Nevadas and Bay Area were the largest contributors.

Gretchen Gehrke, a co-author of both studies, said the results underscored the significance of mercury sequestered in sediment.

"There's a lot of mercury contamination in the bay, and everyone's pointing fingers at everyone else," Gehrke said. "We're saying there's two dominant sources, one in the north and one in the south, which appear to be from mining contamination. One of the major implications of that is that the mercury has been quote-unquote remediated, and people are saying it has been sequestered and is not a problem anymore, but it obviously still is."