

**Development of Technically Valid, Cost-Effective
Hg Control for
Sacramento River Delta & Upper San Francisco Bay**

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Problem: Excessive Bioaccumulation of Hg in Fish Tissue
High Hg Input during High Winter/Spring Flow of Cache Creek

Hg Source: Former Hg Mining in Cache Creek Watershed

Issue: How to Use Financial and Other Resources Available to Control the
Cache Creek Hg Input to Cost-Effectively Reduce Excessive Hg in Fish in
Delta and Northern San Francisco Bay

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**National Forum on
Mercury in Fish**

Proceedings

The Problem

**Fish in Lower Sacramento River and Upper San Francisco Bay Contain Sufficient
Hg to Be a Health Threat to Those Who Eat the Fish**

Need Current Data on Hg Content of Delta Fish

RMP

Regional Monitoring News

Mercury In the Estuary

by Rainer Hoenicke, Jay Davis, and Adrienne Yang

Mercury (or quicksilver) is a naturally occurring metal which has several forms. It is also one of the most toxic substances, especially when combined with other elements to produce organic mercury compounds like methylmercury. Mercury has been found throughout the San Francisco Estuary at elevated concentrations in water, sediment, and organisms. It is of particular concern as a human health issue, as it accumulates in tissues and its levels increase up the food web. For example, fish bioaccumulate mercury of the most toxic form—monomethylmercury—and fish at the top of the food web can harbor mercury concentrations over one million times the mercury concentration in the water in which they swim.

As a result of the tremendous increase in mercury production and use in this century, as well as the ease with which many forms of mercury dissolve in water, contamination of this metal is virtually world-wide. It travels easily through different environmental media including the atmosphere, in a variety of chemical forms, and is toxic to humans and other organisms in very low concentrations. California is unique in mercury contamination because in addition to the general, industrially related global increases, it also contains specific contamination sites. The California Coast Range contains one of the world's great geologic deposits of mercury. This mercury was mined intensively during the late 1800s and early 1900s primarily in support of gold mining in the Sierra Nevada where the mercury was used in the gold extraction process. A legacy of leaking Coast Range mercury mines and lost Sierra Nevada quicksilver is providing a significant, ongoing burden of mercury to the Estuary from both sides of the State (see also *Estuary* Vol. 5, No. 5, October 1996, available from the San Francisco Estuary Project (510) 286-4392).

Toxicity and Health Concerns

As mercury cycles through various forms and media, its bioavailability (ability to contaminate organisms) and toxicity change. Toxicity heavily depends upon the form the mercury is in. Since only 2%

In Brief: 1995 RMP Results

by Adrienne Yang

The 1995 RMP Annual Report has been completed. That report includes monitoring results from the Base Program, Pilot and Special Studies, and summary and perspective articles contributed by RMP investigators and other scientists. Below are a few highlights from the RMP Base Program. For the Executive Summary and the full report please contact SFEI at (510) 231-9539 or visit our world wide web site at <http://www.sfei.org>.

Water

Dissolved trace element (i.e., metals) concentrations were generally elevated at the Southern Slough and South Bay monitoring stations. Relative to other Estuary reaches, most dissolved trace organics were elevated in the South Bay with concentrations progressively decreasing from Coyote Creek to the Golden Gate station. This pattern was repeated with dissolved organics data adjusted for total suspended sediment, which indicated the presence of trace organic sources in the South Bay and DDT compounds at the Rivers station.

Clear seasonal variations were observed for arsenic, cadmium, dissolved silver, and some trace organics. Arsenic, cadmium, and dissolved PAH concentrations were high throughout the Estuary in August, silver concentrations were especially elevated in the South Bay in August, and the pesticide diazinon was highest at nearly all stations in February.

In 1995, the overall pattern of water quality exceedances was very similar to that of 1994; concentrations of many contaminants were above applicable water quality objectives or criteria. Of the trace elements, copper, chromium, lead, mercury, and nickel had concentrations higher than water quality guidelines on one or more occasions with copper, mercury, and nickel being most frequently above guidelines in the Southern Sloughs, South Bay, and Northern Estuary. Of the trace organics, contaminants total PCBs, total PAHs, and several individual PAHs and

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Regional Monitoring Program for Trace Substances
A Cooperative Program Managed and Administered by the San Francisco Estuary Institute

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