

# RMP

## Regional Monitoring News

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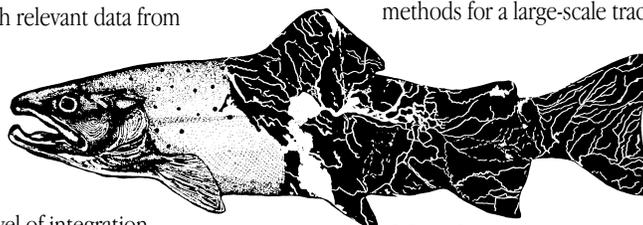
Summer 1995

### Highlights from the 1994 Findings of the Regional Monitoring Program for Trace Substances

by Rainer Hoenicke, Ph.D.

The 1994 Draft Annual Report will shortly be sent to the printer, and subsequently distributed to participating agencies and interested parties. In this second Annual Report for the RMP, SFEI staff placed greater emphasis on interpreting the findings, rather than just presenting descriptions of contaminant concentrations. Although still far from an exhaustive analysis, this year's Annual Report attempts to place findings in some perspective with relevant data from other studies and explain some of the spatial and temporal patterns that were observed. We would appreciate receiving your comments, be they scientific in nature or related to the level of integration of information.

Unlike the preceding year, 1994 was dry and produced only about half of the 1993 peak flows into the Estuary. This may have significantly influenced contaminant levels and distributions. The original 16 sampling stations were augmented by eight. Two of these stations were added on a trial basis upon request by the Regional Board in the vicinity of the wastewater outfalls of the Cities of San Jose and Sunnyvale. However, not all parameters were measured at all stations at all times in all three media (water, sediment, or bivalve tissue).



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### Regional Monitoring Program Update

by Margaret Johnston, Executive Director

The Regional Monitoring Program (RMP) is now in its third year of implementation. The program began out of the Regional Board's frustration that it could not answer simple questions such as, "How clean (or how polluted) is the San Francisco Estuary?" and "Is it getting better or getting worse?" Funding from the Bay Protection and Toxic Cleanup Program provided the opportunity for the San Francisco Bay Regional Water Quality Control Board (Region 2) to initiate pilot monitoring studies that would test the design and methods for a large-scale trace substances monitoring program.

Once the Regional Board staff were convinced of the feasibility of the program, the Board itself enacted Resolution 92-043 endorsing the Regional Monitoring Program, authorizing the Executive Officer to select major dischargers to participate, requiring annual reports on the program, and stating the intention to include requirements for RMP participation in NPDES permits.

The current shape of the RMP began to take place when representatives of 48 publicly owned treatment works (POTWs), industries, local stormwater management agencies, the U.S. Army Corps of Engineers, and Pacific Gas and Electric met with Steve Ritchie, the Executive Officer at the Regional Board, at the offices of

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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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Highlight findings from the second year of monitoring are :

As in 1993, concentrations of PCBs in water were well above guideline levels established by the U.S. Environmental Protection Agency and the Regional Water Quality Control Board at all of the stations sampled. Polychlorinated biphenyl (PCB) levels in water were higher in 1994, particularly in the South Bay, than the previous year. Concentrations of total copper, mercury and nickel were often above U.S. EPA criteria, but unlike 1993 measurements, concentrations of lead and chromium were below water quality criteria. Copper, in particular, had wide-spread elevations. Seven individual polycyclic aromatic hydrocarbons (PAH) compounds and p,p'-DDE (a breakdown product of DDT) were above water quality criteria. The insecticide diazinon was above the National Academy of Science guideline of 9,000 parts per quadrillion at three freshwater stations in February.

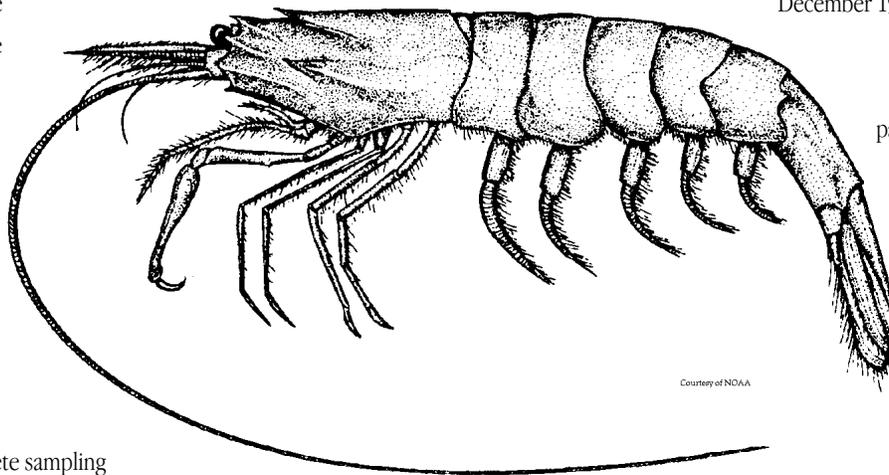
Bioassays conducted with water collected on two discrete sampling dates during both wet and dry seasons at Red Rock, just south of the San Rafael Bridge near Richmond, and at the Napa River, revealed toxic effects on selected organisms in February. This was in contrast to 1993 results, where no toxic effects were observed.

Sediment bioassays showed that nine of the 12 RMP stations tested indicated toxicity during one or the other of the two sampling periods in 1994. Comparisons of the general patterns in sediment contamination with the sediment bioassay results show that both elevated trace contaminant concentrations and significant toxicity were observed in the South Bay and northern Estuary. Conversely, sediment contamination was generally low in the Central Bay, and there was no sediment toxicity. Because the sediments measured contain mixtures of numerous potential agents, it is not possible using

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SFEI (then called the Aquatic Habitat Institute). The group collectively agreed to carry out the program in a collaborative fashion by asking SFEI to act as a program coordinator and fiscal agent.

A Memorandum of Understanding between the Regional Board and SFEI assigns roles and responsibilities for the program. Between July and December of 1992, program participants agreed upon a cost allocation and funded the program, and SFEI, working with the Regional Board and technical staff of program participants, designed the program, selected a prime contractor, and let a contract for water, sediment and bivalve sampling. Monitoring began in 1993; SFEI issued the program's first annual report in draft in June of 1994 and in final form at the Program's Annual Meeting in December 1994.



In 1994, several new participants joined the program, bringing the total to 63. Some of those 63 participants are counted more than once; for example, the City and County of San Francisco participates as a POTW and also as a stormwater

management agency.

A management structure has been developed for the program that includes both a steering committee and a technical review committee. Both meet quarterly. The Steering Committee advises the Regional Board on matters of policy, including the allocation of costs among program participants. The Technical Review Committee works with SFEI staff to help determine issues of program design and sampling and analysis methods. Membership in each committee includes representatives of each participant category—POTWs, Stormwater, Industry, Cooling Water, Dredgers—in addition to staff from SFEI and the Regional Board. A list of Committee representatives is included on page 6. All RMP meetings are open, and observers are welcome.

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the RMP data alone to determine which contaminants may have been responsible for the observed toxicity effects.

Most metals and all organic contaminants were available for bioaccumulation by transplanted mussels, oysters and clams. Lead showed consistently elevated concentrations in bivalve tissue throughout the Estuary, and so did all of the organic contaminants that occurred at levels above the detection limit. PCB concentrations showed the same spatial patterns in bivalve tissue as in water, with the highest levels found in the South Bay.

The Sacramento and San Joaquin Rivers were major contributors of pesticides to the Estuary, as evidenced by very noticeable concentration gradients in water. Bivalves showed pesticide concentration gradients in tissue as well, but it is possible that species differences in bioaccumulation may have influenced the gradient.

Seasonal differences in trace contaminant concentrations may suggest different sources. For example, dissolved zinc and total selenium were higher in February and April than during the dry-season sampling in August, pointing toward runoff as likely source of these metals. Conversely, elements that are elevated during the dry season, when little surface runoff enters the Estuary, suggest continuous sources, such as waste water outfalls, atmospheric deposition, or mobilization from sediments. The mixture of PAH compounds, PCB congeners, and pesticide degradation product ratios can reveal information about the source or age of a contaminant group. The PAH "fingerprint" in sediment, for example, pointed toward automobile exhaust as the most likely source. Further examination of contaminant profiles for information on sources will be presented in the 1995 Annual Report.

As envisioned in the Regional Monitoring Strategy for the San Francisco Estuary, we are eventually hoping to produce an *Estuary Contamination Index*. This Contamination Index could be used, together with a *Biological Resource Index*, a *Habitat Index*, and other suitable indicators of "Estuary Health," in developing an overall picture of how the ecosystem is responding to all kinds of environmental protection measures. Development of the *Estuary Contamination Index* will be investigated more thoroughly in the next year. ■■■■

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The Steering Committee met most recently on July 17. Much of the discussion at that meeting centered around the question of how best to address the need for more information on polychlorinated biphenyls (PCBs) in the Estuary. In 1993, the Regional Board conducted a Fish Contamination Study which resulted in health warnings about eating seafood from the Estuary; one of the chemical groups contributing to these health warnings was PCBs. The 1993 and 1994 RMP data also indicate that PCB contamination is widespread in the Bay.

Other issues the Steering committee is grappling with include how much "interpretation" to include in RMP Annual Reports, how best to disseminate information derived from the program, how much of the program's resources should be used for studies involving pollutant sources and effects, and how to integrate information related to contaminants with other estuary health questions. The next scheduled meeting of the Steering Committee is planned for October 16. You are encouraged to attend that meeting and participate in these discussions.

For 1996, the total program costs will be \$2,290,000. Costs are allocated among dischargers according to the following formula:

35 POTWs	44%	or	\$1,007,600
11 Industries	11%	or	\$251,900
9 Stormwater agencies	23.5%	or	\$538,150
1 Cooling Water dischargers	4%	or	\$91,600
7 Dredgers	17.5%	or	\$400,750

Various formulas are used to relate the fees for individual dischargers to the load of trace substances discharged. Fees range from a low of \$3,571 for a small POTW to \$249,000 for the Army Corps of Engineers and \$303,946 for the East Bay Municipal Utility District. In a few cases in which a NPDES permit holder had no discharge for the previous year (such as a port that did no dredging) the fee can be \$0.

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