ESTUARY

YOUR BAY-DELTA NEWS CLEARINGHOUSE

STILL KICKING!

Happy Birthday to us! With this issue, ESTUARY is one year old, growing fast and going strong.

STILL WITH US?

As we dive into a new year, we'd like to thank all of you who've gone to the mat for us — who've sent in your $20 to secure your place as a subscriber. Many of you cared enough to renew early, before we sent you renewal notices. Thank you!

Thank you also to those who've provided us with additional support: the U.S. Environmental Protection Agency, the S.F. Estuary Project, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the S.F. Regional Water Quality Control Board, the S.F. Bay Conservation and Development Commission and Friends of the San Francisco Estuary.

STILL DITHERING?

We need all the individual subscriptions we can get to keep ESTUARY on the press and in your mailbox, and that means you, yes you — the one still reading us cover to cover for free. This is your last chance to sign up at our introductory rate of $20 (through December 31), so we hope you decide to subscribe today (see form inside).

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HAPPY HOLIDAYS!

Bay Seals on the Ebb

The number of seals inhabiting coastal waters grew steadily in the 1980s and in areas like Point Reyes, it more than doubled. But the seal population that has long lived, fished and tended its pups in San Francisco Bay didn't grow at all — puzzling Dianne Kopec and Jim Harvey of Moss Landing Marine Laboratories.

The sustained low — 425 seals Baywide in 1989 — inspired Kopec and Harvey to begin the first comprehensive research study on these marine mammals conducted in the Bay in over 15 years. Their study, funded in part by the S.F. Estuary Project, is also the first to explore the top of the estuarine food chain for impacts from human activities.

The study began with the capture of 70 seals at haul-out spots in the North, Central and South bays. Researchers approached in a fast boat and ringed offshore waters with a large seine net. "The seals' natural defense is to go into the water but not swim away," says Kopec. "That gave us time to encircle them with the net."

After hauling the net full of seals ashore, they weighed, measured and tagged the marine mammals, attached radios equipped to track the creatures from air and land and took blood samples and fecal swabs. Most seals found themselves back in the Bay within 15 minutes.

Laboratories checking for PCBs, DDT and other pollutants in the seals' blood discovered especially high levels of PCBs — 51.8 parts per billion total wet weight. Levels one fourth as high caused serious reproductive problems in a study of captive seals in Europe's North Sea. Mercury and selenium also turned up at elevated levels (O.9 ppm selenium), and Kopec thinks the latter may have something to do with the scarlet hue of many seal coats. Up to 40 percent of the Bay's seals have "red coat" — compared to only 5 percent in the overall population of the Northern Hemisphere.

The seals could be encountering these pollutants in their food. Scat analysis revealed that they mostly eat yellowfin gobi, staghorn sculpin, plainfin midshipmen and white croaker. There's little data on local contaminant levels in these fish because none are commercially important, according to Harvey. But a Los Angeles white croaker study revealed high DDT concentrations. And studies on contaminants in fish caught by Bay Area subsistence fishers — who favor croaker — are planned for this year. Since the seals spend virtually all their time in the Bay, Harvey says they're more likely to be exposed to pollutants from urban sources. Radio tracking showed 87 percent never ventured out of the Golden Gate.

During the 1991 breeding season, Kopec and Harvey documented an alarming dive in the South Bay seal population. The number of seals hauling out at Mowry and Newark Sloughs dropped by over 50 percent, from a maximum of 340 to a minimum of 150. "[The drop] was not compensated for by increases in other areas," says Kopec. Low seal counts have continued through 1993.

For their final report, due out this January, Kopec and Harvey are now busy analyzing their results and considering possible reasons for the seals' demise. Clearly, the PCBs and other pollutants in their blood could be a major factor. And Kopec thinks declines in Bay fish stocks after the long years of drought might be another.

"The fact that trace elements have accumulated to toxic levels, levels we know are harmful to harbor seals and mammals in general, is cause for grave concern," she says.
Contact: Dianne Kopec

NEWS ROUND-UP

FEDS DISH UP SUPPLY PIE

Club Fed — alias EPA, U.S. Fish & Wildlife, BurRec and the National Marine Fisheries Service — announced November 1 that it thinks it will take 540,000-740,000 acre-feet per year of additional freshwater flows to protect the Bay-Delta ecosystem. Filling in this water supply pie paves the way for joint Club Fed proposals and water quality standards — to be announced December 15 — addressing the state's failure to meet Clean Water Act and Endangered Species Act requirements. State water officials took a bleaker view, responding with their own estimates of up to 3.1 million acre-feet per year. Though the feds plan to leave decisions on how to slice up the water supply pie to California, they know the state remains wary of any pie dished up by Washington. A November letter of comment from the State Water Board says EPA's draft standards "substantially exceed the level of protection required by the Clean Water Act." Contact: Virginia Donohue, EPA (415)744-1585 *AR*

BAY FILL FOR CYPRESS

Caltrans, the Bay Commission and environmentalists may soon butt heads over a pending permit application for the West Grand/Cypress Structure freeway replacement along I-880. The proposed project would require new Bay fill, both for demolition of the existing West Grand structure and for construction of a new HOV lane. It would also impact public access and views along the shoreline. These were two factors BCDC considered in its recent denial of an earlier Caltrans permit for an elevated carpool lane along I-80 north of the Bay Bridge (an appeal may still be forthcoming). But the agency's action will not impact the Cypress segment of the I-880 project, according to Caltrans' Frank Niess. The Cypress application may go before the full commission at a public hearing on December 16. Contact: Nick Salcedo (415)557-3686 *KA*

COMMUNITY CREEK MANAGEMENT

Marin's Corte Madera Creek sustains steelhead, salt marsh harvest mice and clapper rails despite the homes, businesses and roads lining its banks. But urbanization and water quality problems threaten this fragile habitat, according to a report from the S.F. Regional Board. For solutions, the agency will ask local residents, businesses and officials for their ideas on a watershed management plan at a series of public meetings. "Instead of imposing regulations from the top down, we're asking the people who live and work in the watershed to help come up with an effective way to manage it," says the Board's Dale Hopkins. Contact: Dale Hopkins (510)286-4398 *KA*

DISPOSAL TO A TEE

The Oakland City Council has approved its port's plan to place one million cubic yards of contaminated dredging sediments on the Galbraith golf course. The 170-acre site is owned by the Port of Oakland but leased by the city for use as a golf course. The council voted to suspend the lease for a 5-7 year period. During that time, the Port will cover the site with a layer of harbor-bottom sediment up to ten feet thick. After the sludge dries, it will be landscaped into a newly designed "championship" golf course and returned to the city. If the port can get the necessary environmental approval, it plans to begin using the site in May 1994. Contact: Jim McGrath (510)272-1100 *O'B*

CLUB MUST GET THE LEAD OUT

Members of the Richmond Rod and Gun Club have been shooting skeet over the mudflats of San Pablo Bay for more than 30 years — adding an estimated 300 tons of lead shot to the mud. Members didn't believe they were doing any harm until BayKeeper filed a lawsuit last year. As a result, the State Board ordered the club to stop using lead shot, so it switched to steel. If tests now underway show that lead is polluting the water, the club could be held liable for cleaning up the 16-acre mudflat. Cleanup costs, however, could easily run into the millions of dollars, a financial burden that the 800-member organization may not be able to handle. Contact: Gun Club (510)620-9519 *O'B*

SPOTTED OWL IN SNAKESKIN?

Federal authorities recently granted the giant garter snake, a denizen of muddy-bottomed streams and sloughs in the San Joaquin and Sacramento Valleys, protection as a threatened species. The reptile ranges from 18 inches to more than four feet long and sports a brown skin with black spots. One of its habitats lies in the Natomas Basin outside of Sacramento where thousands of new homes are planned, leading a worried developer to call the garter "the spotted owl of the Central Valley." But Cal Fish & Game says it will work with developers and government officials to develop a "multi-species" approach protecting both the snake and local interest in development. Contact: John Brode (916)355-7112 *O'B*

ACTION POINT

GOVERNOR GIVES CCMP GO-AHEAD

Governor Pete Wilson conditionally concurred on the San Francisco Estuary Project's *Comprehensive Conservation and Management Plan* in a ten-page letter issued November 17. Although Wilson indicated general support for the CCMP's goals and actions, he also made it clear that the state still has reservations. In particular, Wilson cautioned against interpreting his concurrence as a commitment to a specific state funding level and asked the Executive Council, which has primary responsibility for CCMP implementation, to "determine a priority sequencing among CCMP actions based upon cost-effectiveness and available funding from the state, federal and private sectors." Wilson also stated that his concurrence is specific to the Executive Council composition laid out in the CCMP (two federal and two state representatives, plus one local elected official). The governor detailed concerns about the plan's aquatic resources and wetlands sections, saying they should be made consistent with his own policies and programs. EPA Administrator Carol Browner is expected to approve the CCMP soon. Contact: Marcia Brockbank (510)286-0780 *KA*

INSIDE THE AGENCIES

HONING IN ON HOT SPOTS

Environmentalists coined the term *toxic hot spot* in the 1980s, but the spots had no hard and fast definition until this fall, when California's Bay Protection and Toxic Cleanup Program generated the first draft list of toxic hot spots statewide.

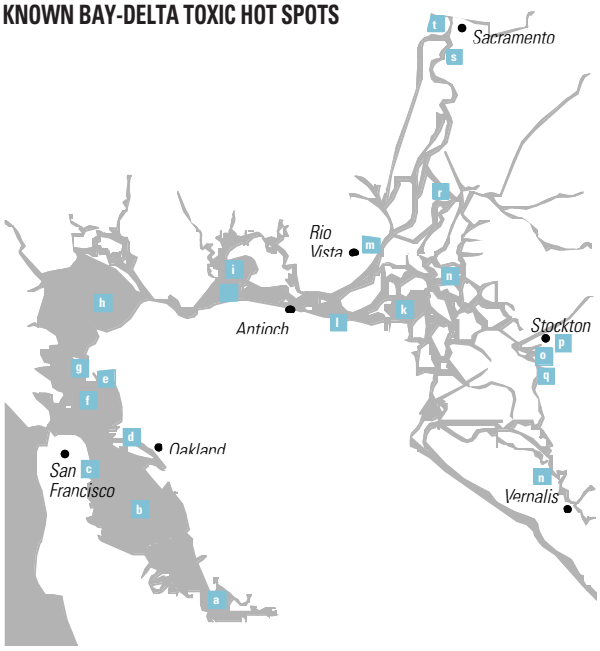
To come up with the list, which includes 26 known and 60 potential hot spots in the Bay-Delta region (see map), the state laid out a precise new working definition. Under this definition, a known toxic hot spot must meet any one or more of several conditions, including: exceedance of water or sediment quality objectives for toxic pollutants in state water quality control plans; demonstration of toxicity based on Bay Protection Program testing protocols; exceedance of human health protection standards for fish consumption; impairment of growth or reproduction of aquatic organisms in tests; or significant drops in aquatic species populations associated with toxic pollution.

Making a sound assessment of sediment quality presents the stickiest side of the new criteria for listing right now, as state officials struggle to establish clean reference sites for natural background levels of contaminants. Reference sites offer essential points of local comparison in evaluating a spot's toxicity. But recent studies of long-thought pristine sites in Bolinas Lagoon and Tomales Bay resulted in 50-100 percent mortality of test organisms. The S.F. Regional Board's Karen Taberski suspects the culprit may either be testing methods or natural interferences. To iron out these problems, an extensive Bay Area reference sites study is now underway.

Upstream in the Central Valley, sediment quality has played a lesser role in the hot spots listing process. "In our area, we're talking about whole moving rivers, not stationary spots," says the Central Valley Regional Board's Jerry Bruns. Freshwater sediment testing protocols and criteria aren't as developed, as "off the shelf," as those for salt water, says Bruns. Because of this, his list is largely based on water column criteria or health warnings on fish.

Under the state's Bay Protection Program, these and other regional boards are now refining testing protocols, confirming the status of known and potential toxic hot spots and developing plans for clean up. Contact: Karen Taberski (510)286-1346 or Jerry Bruns (916)255-3093 *AR*

KNOWN BAY-DELTA TOXIC HOT SPOTS



a South of Dumbarton Bridge
b Between Dumbarton & Bay Bridges
c Hunter's Point
d Oakland Inner Harbor
e Richmond Harbor
f San Francisco Bay & Delta*
g Castro Cove
h Between Richmond & Carquinez Bridges
i Suisun Bay
Between Carquinez Bridge & Chipps Island
k Bethel Island
l SJ River at Antioch
m Oxbow & Rio Vista Marinas
n San Joaquin River (Vernalis – Old River)
o SJ River Turning Basin
p Stockton Waterfront Yacht Club Village West Marina Paradise Point
q French Camp Slough
r Walnut Grove
s Beach Lake
t I Street

*All Bay and Delta waterways are classified as water quality impaired based on mercury levels in fish.

COMMISSION GOES FOR GOLD

The financially strapped S.F. Bay Commission sent a strategy for an ambitious increase in its coastal management activities to the feds December 1 with an equally ambitious $600,000 price tag. The multi-task strategy addresses eight priority areas laid out in 1990 amendments to the Coastal Zone Management Act. At a Commission meeting on November 18, members decided to place highest priority on the task of planning for reuse of bayfront military bases slated for closure. If awarded, over half the federal funds would go to a second task — forging a partnership with local governments to develop a *Special Area Plan* for the protection, restoration, use and development of the North Bay's diked baylands and open space. "The rubber meets the road at the local level," says the Commission's Will Travis. "Local governments are receptive to gaining predictability through a plan." Other tasks include updating wetland policies in the Commission's 1968 *San Francisco Bay Plan*, working with the S.F. Regional Board on assuming responsibility for Army Corps wetland permitting in the Bay Area and expanding the Commission's authority to address shoreline hazards. Contact: Will Travis (415)557-3686 *AR*

BURNING ISSUE

STATE PROCESS QUESTIONED

A judge's ruling in October smacked the state's hand for not following its own rules and shook the foundations of its water quality planning process. In the lawsuit, five dischargers (San Jose, Sunnyvale, Sacramento, Stockton and Simpson Paper) challenged procedures used by California's Water Resources Control Board in adopting statewide standards for toxics. The standards guide two overarching state plans for inland surface waters and enclosed bays and estuaries. In a tentative decision, the judge ruled that the State Board's planning procedures had sidestepped environmental and economic checks and balances, primarily by failing to write the equivalent of an environmental impact report required under CEQA and by inadequately considering economics and the characteristics of individual water bodies as called for in the California Water Code. If the decision is finalized this January, statewide toxic standards will no longer be in effect. The state can then either go back to square one and redo all its plans — a prospect neither the state nor the dischargers relishes. Or it can wait for EPA to promulgate the standards, as it has in other states. Contact: Gary Grimm (510)286-0889 *AR*

HARD SCIENCE

PLUGGING THE GAPS

A gap in the science is an invitation to question any management decision proposed to enhance the health of the Bay-Delta ecosystem, and three years ago the S.F. Estuary Project decided to close some of the most critical gaps by funding six studies costing a total of $242,000. The studies include the first look at how pollution affects the Bay's marine mammals (see cover). Here is a brief overview of the five others (see *Now in Print*).

CORD GRASSES COMPARED

This study compared the wetland functions of a smooth cord grass introduced to the Bay Area from the Atlantic coast in the 1970s (*Spartina alterniflora*) with those of a Pacific coast native of the same species class (*Spartina foliosa*). Both grow in the same intertidal range, and field work focused on two locations — one a sandy spot off Alameda and the second mudflats near San Francisco airport. Wetland functions examined included sedimentation rates, shoreline erosion control, abundance of bottom-dwelling organisms, plant debris and use by shorebirds.

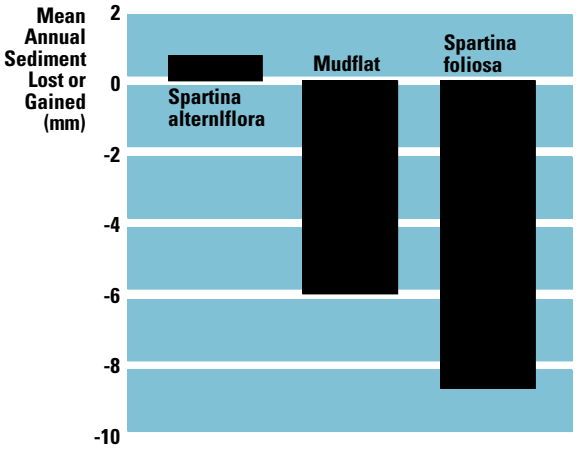
Researchers found that the Atlantic species spread 2-3 times faster, grew more densely and colonized barren mud zones at lower tidal elevations more successfully than its native counterpart. The greater stem density of the introduced species enabled it to trap more sediment, prevent more erosion and thus more effectively control the loss of high marsh to wave action (see chart). Biological differences were less pronounced. No strong trends emerged to suggest that one species had greater or more diverse populations of bottom-dwelling organisms or visiting shorebirds than the other. Grown side by side, the Atlantic species spread into and eventually replaced the Pacific species, suggesting that continuing South Bay invasion by the Atlantic interloper could physically modify the intertidal environment, colonize now barren mudflats and thus reduce foraging area for shorebirds.

ASIAN CLAM FILTRATION RATES

This research delved into the dietary habits of the introduced Asian clam *Potamorcorbula amurensis*, whose appearance coincides with a dramatic reduction in phytoplankton abundance. The study, still in draft form, measured the clam's filtration rate (bivalves filter water for phytoplankton and other food) under a variety of cross-flow velocities in a laboratory flume. Preliminary results showed that a maximum filtration rate of 3-4 liters per clam per day occurred at cross-flow velocities of 6 and 24 centimeters per second. Rates at mid-flow velocities diminished by 50 percent.

Researchers found the clam capable of filtering the water column once a day (assuming a well-mixed water column, conservative clam densities and percent of animals feeding, and a low individual filtration rate). Once a day far exceeds estimated phytoplankton doubling time of 2.9 - 27 days. Thus, report authors believe *Potamorcorbula* is capable of limiting the biomass accumulation of phytoplankton in Suisun Bay.

EROSION AND ACCRETION RATES IN THREE HABITAT TYPES



BIOMARKERS OF CONTAMINATION

Researchers wanted to find out whether the response of certain *biomarkers* — markers of sublethal physical, biochemical or genetic change in an organism — could be clearly linked to contaminant exposure. So they exposed sanddabs (a bottom-dwelling fish) in the laboratory to contaminated sediments from San Francisco Bay's Castro Cove — site of an old oil refinery outfall — and two reference sites. By comparing responses of the fish to

TECHNO-FIXES

POLYMER PANACEA?

Irrigation water flowing off a farmfield into a canal or river can be pretty murky stuff. But researchers in Stanislaus County are testing a substance that could mean less erosion and a corresponding drop in sediments clouding the Delta. The substance, polyacrylamide (PAM), is a synthetic polymer used in sewage treatment plants.

Researcher Phil Osterli of UC Cooperative Extension says PAM is injected into irrigation water at the head of the furrows. It bonds with soil particles in the water and causes them to settle out and remain behind in the field. Test results so far indicate the process reduces the amount of sediment leaving the furrow by more than 90 percent. "The water was clearer running down the furrow than it was at the source," says Osterli. The polymer also helps water penetrate the soil more thoroughly, which could allow farmers to cut back on irrigation water use by 10 percent. Pesticide residues may also stay behind in the furrows and out of runoff as chemicals often bind to soil particles.

Researchers used applications of 2.5 parts per million (ppm), although concentrations as low as 1 ppm give "pretty good results," says Osterli. He estimates the price of treating an acre foot of water to be about $10, although the cost could come down if the polymer gains wide acceptance among farmers. He's found no adverse environmental effects from using PAM so far. Contact: Phil Osterli (209)525-6654 *O'B*

amphipod bioassays (lab tests on small crustaceans) using the same sediment, this study also sought to determine if amphipods were responding to pollutants or other sediment characteristics, such as grain size.

Researchers chose four biomarkers. The first was P450 proteins produced by the fish to metabolize contaminants. The three other biomarkers tracked abnormalities in kidney, liver and gill tissues; the production of certain stress proteins (which help repair damaged cells); and increases in abnormalities in the nuclei of red blood cells associated with genetic damage.

Though the latter two biomarkers didn't yield clear results, the sanddabs exposed to contaminants showed significant increases of P450 proteins in their gills, livers and kidneys relative to the controls after 60 days. More importantly, researchers discovered clear correlations between this higher protein production and tissue abnormalities, confirming the usefulness of the P450 biomarker in contaminant studies. The elevated P450 production also correlated highly with amphipod mortality in the companion tests. Because scientists know P450 production is not influenced by sediment grain size, this result supports the use of amphipod sediment bioassays as indicators of pollutant effects.

SEDIMENT DYNAMICS

This report marks the first in a series on the nature of suspended sediment variability in the San Francisco Estuary. It reviews the broad geologic history of the Bay (including the advance and retreat of shorelines), examines how sediments released by hydraulic gold mining in the 1800s overwhelmed the effects of sea level rise, touches on the role of agriculture in annual sediment concentrations and explores how dams built in the middle of this century became new sinks for sediments, reducing riverine emissions into the Bay. It also presents more recent sediment suspension data for 1979 (low riverine emissions) and 1980 (high riverine emissions). The brief history and data sets will provide an information basis for sediment dynamics analysis in the rest of the reports in the series.

SPECIES SPOT

SMELT UPS AND DOWNS

It should have been a good year for both Delta and longfin smelt, what with increased freshwater inflows, an ideal entrapment zone location in Suisun Bay, careful water project management for salmon and smelt protection, and the state's short-lived but fish-friendly 1630 water rights decision. "You'd expect, if you were a Delta smelt, that this is the best you're going to get," says Dale Sweetnam of Cal Fish & Game.

But Sweetnam didn't see the kind of numbers he expected in the summer townet index. It wasn't until the fall midwater trawls that he stopped worrying. September produced an index of 374.6 and October, 470 — a sizable jump up from the 71.5 and 3.5 observed in the same months last year. The longfin, on the other hand, improved over 1991-1992 indexes but "fell far short of what was predicted for 1993," according to Fish & Game's Randy Baxter.

Historically, the relationship between flows and abundance has been different for each species. The Delta smelt seem to do better with medium, rather than high and low flows. The longfin, according to an analysis of 1967-1992 data by Baxter, seem to increase with flows in a more linear fashion. "The argument for longfin has always been add a little water and the longfin will bounce right back," says Baxter. "But this year, they didn't bounce as high as we expected. Perhaps there weren't enough spawners to take advantage of the flows."

Meanwhile, EPA's Bruce Herbold recently added a little salt to the flows/abun-dance equation by looking back over the past 25 years for correlations between the location of the 2 ppt isohaline (parts per thousand salt in the water) in the Estuary and Delta smelt abundance. Herbold wanted to see if the criteria his agency is proposing for a new Delta salinity standard protected the smelt. They did. Over the past quarter century, the more days the 2 ppt isohaline occurred in Suisun Bay, the more smelt. Herbold also discovered that the peak of the

PARTICULATE ORGANIC MATTER

This study explores the abundance, origin, composition and nutritional quality of particulate organic matter (POM) in the Bay and Delta. Sampling took place throughout the Estuary — from the Sacramento River to the South Bay — and dates were chosen to represent a range of hydrologic and hydrographic conditions, including periods of low river flow, winter and spring floods, phytoplankton blooms and enhanced resuspension.

Researchers looked at biochemical indicators (such as carbon and nitrogen isotopes and lipids) in both suspended particulate matter and in the tissues of the clam *Potamorcorbula amurensis* so that both the nature of the matter and its incorporation into the food web (via the clam) could be assessed. They discovered that while phytoplankton sources of POM are important throughout San Francisco Bay, the North Bay receives additional inputs from bacterial and terrestrial sources. Clam tissues indicated that phytoplankton supply a large fraction of the consumable carbon in S.F. Bay clams, and that freshwater algae (probably from Delta rivers) may be more important in the North Bay. The study suggests that consumer organisms with widespread distribution, like the Asian clam, might be exploited as biological indicators of fluctuations in metabolizable POM within ecosystems receiving multiple inputs.

Contact: Cord Grass, Michael Josselyn (415)454-8868; Biomarkers, Bob Spies (510)373-7142; Clams, Janet Thompson (415)354-3219; Organic Matter, Liz Canuel (415)354-3354; Sediments, David Peterson (415)354-3366 *AR*

BUSINESS WISE

APARTMENTS WIN RUNOFF REBATE

Getting landlords and tenants of large apartment complexes to stop their storm drain pollution can be difficult, so the city of Richmond is trying a new approach — a rebate on stormwater utility fees. In July, Richmond began charging landlords $32 a unit in fees but owners can get up to $20 a unit back if they comply with regulations for reducing runoff. The better the job they do, the larger the rebate. "It's a creative way to encourage people to deal with the problem on site," says Henry Tingle of the city's public works department.

The 194-unit Creekside apartment complex was the first to submit a plan under the new city program. Creekside began by educating tenants, through meetings and newsletters, about pollution problems. "People don't realize the impact of what they're doing when they use Ajax to whiten their whitewall tires," says Tingle. Creekside banned car washing, required tenants to fix oil leaks and clean up out-door fluid spills, sent crews out to clean parking areas and inspect storm drains, enclosed dumpsters and told gardeners not to store pesticides or fertilizers on site. Their crews now sweep, rather than wash, sidewalks.

After the first heavy rains, the city will test runoff from the complex for petroleum products, hydrocarbons and metals contamination. If the water is clean, then Creekside will get its rebate. City inspector Mary Phelps is optimistic. "The turnaround they did was basically miraculous," she says.

Contact: Henry Tingle (510)620-6538 *O'B*

WATER BANK GETS ONCEOVER

When Governor Pete Wilson launched a water bank in 1991, many feared it would split farming communities, steal from local economies and tax rolls, and put land, field workers and suppliers out of work. But a 1993 Rand report commissioned by the state Department of Water Resources says new money going into the pockets of sellers pretty much offset any negative impacts of the bank.

The bank gave farmers, landlords and water agencies a chance to sell their water to cities and other thirsty folk via the Department of Water Resources. Sellers freed up the water either by not irrigating certain crops or by exchanging surface water for groundwater of sometimes lesser quality. Through the 1991 bank, the state bought an estimated 821,000 acre-feet of water for around $100 million.

The report finds that the bank reduced operating costs and crop sales substantially, which adversely affected farm suppliers. But the losses weren't large (2-3 percent) compared to the overall economy of the selling region and historic variations in the agricultural sector. Though crop revenue decreased, the ready cash enabled farmers to spend more on improvements and infrastructure. In general, sellers benefitted from the bank (see chart).

The report also details lessons learned for future water marketing ventures. Rand will examine the other side of the coin — impacts on buying communities — in a report slated for release this January. Contact: Lloyd Dixon (310)393-0411 *AR*

NET BENEFITS OF THE WATER BANK TO FARMERS, LANDLORDS & WATER AGENCIES

	No-Irrigation Contracts		Groundwater Exchange Contracts	
	Total ($mil)	Per AF Sold ($/AF)	Total ($mil)	Per AF Sold ($/AF)
Water Bank payments	56.6	125	25.9	125
Savings on inputs	17.1	38	0.6	3
Increased pumping cost	0	0	-3.9	-19
Change in crop revenues	-58.0	-28	-19.1	-92
Net contract revenue	**15.7**	**35**	**3.5**	**17**
Payment to landlord	3.4	8	8.8	42
Payment to water agency	0.6	1	4.4	21
Net benefit to farmer	**$ 11.7**	**$ 26**	**- $ 9.7**	**- $ 46**

NATURAL VENTURES

WETLANDS RETAKE BASES

The environment may emerge as a surprise victor as conversion plans currently on the table for three different military sites call for wetlands. At San Francisco's Presidio, the National Park Service proposes to restore 20-80 acres of tidal wetlands along Crissy Field. The restoration means there's a chance to develop a "real estuarine system," says the Sierra Club's Michael Alexander. The Park Service would revegetate the edges of the restored wetlands with native plants; liberate the natural drainage of El Polin Spring and Tennessee Hollow from current artificial drainage culverts; and add freshwater flows and riparian habitat to the area. The Park Service is soliciting public comment on the plan through December 21. Meanwhile, reuse plans for Sacramento's Mather Air Force Base envision an artificial lake and wetlands, which would create wildlife habitat and an alternative treatment system for contaminated groundwater. And at Hamilton Air Force Base in Novato, the Army Corps will restore 12 acres of wetlands as mitigation for four acres destroyed to cap a leaking landfill. Contacts: Kate Nichol, Presidio (415)556-3111, Rob Leonard, Mather (916)440-7991 *KA*

SELENIUM SETTLEMENT

Three oil companies didn't meet the deadline for cutting their selenium discharges to the Bay by 50 percent but state regulators, in a recent tentative out-of-court lawsuit settlement, agreed to give them more time at a price. The settlement would give Exxon, Shell and Unocal until 1998 to get the selenium levels in their wastewater down to 50 parts per billion. Three other companies (Chevron, Pacific Refining and Tosco) are already in compliance. Because the first three didn't meet the 1993 deadline, they'll pay a collective penalty of $2 million. But the Bay Institute's Gary Bobker says, "Penalties for non-com-

PLACES TO GO & THINGS TO DO

WORKSHOPS & SEMINARS

Delta Wildlife Workshop

WED • 1/19 • All day
Topic: Habitat restoration for farmers and landowners.
Sponsors: Ducks Unlimited, U.S. EPA & Yolo County RCD
M & T Staton Ranch, Walnut Grove
(916)363-8257

Putting Our Communities Back on Their Feet — Land Use Planning for More Livable Communities

THUR-FRI • 2/3-4 • All day
Topics: Ideas for planning and developing compact, walkable communities, including mixed-use developments; transit-based housing; safer, more walkable neighborhoods; community-participation strategies and innovative land-use guidelines.
Sponsors: Local Government Commission & over 70 public agencies, businesses & organizations
Sheraton Palace Hotel, San Francisco
(916)448-1198

Teacher Training Workshops — Save Our Seas Curriculum

Ongoing from Dec-Feb
Topic: How to implement the "Save Our Seas Curriculum" in the classroom (part of the Coastal Clean Up/Adopt-a-Beach Program).
Sponsor: California Coastal Commission
(415)904-5216

MEETINGS & HEARINGS

S.F. Regional Board

WED • 12/15 • 9:30 AM
Topic: Public hearing on selenium settlement (see p. 6) and other topics.
800 Madison Street, Oakland
(510)286-1255

U.S. Fish & Wildlife Service Open House

WED • 12/15 • 5:30 PM
Topic: Public comment on additions to San Pablo Bay National Wildlife Refuge.
Sonoma Valley Library, Sonoma
(800)662-8933

Bay Commission

THUR • 12/16 • 1 PM
Topic: Public hearing on Caltrans' West Grand/Cypress Structure freeway replacement.
Room 455—State Building, San Francisco
(415)557-3686

U.S. Fish & Wildlife Service Open House

THUR • 12/16 • 6:30 - 10 PM
Topic: Public comment on additions to San Pablo Bay National Wildlife Refuge.
John F. Kennedy Library, Vallejo
(800)662-8933

SFEP Watershed Demonstration Projects Quarterly Meeting

MON • 1/11 • 9:30 AM
Conference Room 4A—S.F. Regional Board, Oakland (415)744-1990

Save San Pablo Baylands

SAT • 1/15
Harbormaster's Building, Richmond Marina, Richmond
(707)557-9816

The Impact of Depositing Dredged Spoils Inland

THUR • 1/20 • 7:30 PM
Topic: Panelists will discuss various dredging issues, including the Galbraith Golf Course and the 9th St. Terminal.
Sponsor: Sierra Club, N. Alameda Chapter
Laney College, Oakland (510)568-5333

State Water Resources Control Board

THUR • 1/20
Hearing Room—901 "P" Street, Sacramento
(916)657-0990

NOW IN PRINT

Benthic Filtration Rates Measured in a Recirculating Laboratory Flume
Thompson & Cole; U.S. Geological Survey
Copies from (415)354-3219

California's 1991 Drought Water Bank: Economic Impacts in the Selling Regions
Dixon, Moore & Schechter; Rand Corp. for California DWR; Copies from (310)451-7002

California's Rivers: A Public Trust Report
California State Lands Commission
Copies from (916)322-6877

Conceptual Level Design Report: Cargill and Leonard Ranch Sites
Gahagan & Bryant for S.F. Bay Commission
Copies from Steve Goldbeck (415)557-3686

Corte Madera Watershed Resource Evaluation and Information Report
Marshall, Denisoff & Hopkins, S.F. Regional Board
Copies from (510)286-4398

An Ecological Comparison of an Introduced Marsh Plant,* Spartina Alterniflora*, With Its Native Congener,* Spartina Foliosa*, in San Francisco Bay
Josselyn, Larsson & Fiorillo; Romberg Tiburon Centers
Copies from (415)435-1717

Ecological Restoration in the San Francisco Bay Area
Restoring the Earth; Copies from (510)286-0734

Friends of the San Francisco Estuary Annual Report
Friends of the San Francisco Estuary
Copies from (510)286-0734

Guide to East Bay Creeks
Richard; Oakland Museum
Copies from (510)834-2129

Guide to Federal Water Quality Programs and Information, EPA; Doc #EPA-230-B-93-001
Copies from Public Information Center, U.S. EPA, 401 M St., SW, Washington, DC 20460

Induction of Biochemical, Genetic and Morphological Markers of Contamination in Speckled Sanddabs Experimentally Exposed to Sediments from San Francisco Bay
Spies, Gunther, Stegeman, Woodin, Smolowitz, Saunders & Hain; Copies from (510)373-7142

'93 Survey of Water Recycling Potential in California
WateReuse Association of California; Copies from (213)237-0887

Particulate Organic Matter in the San Francisco Bay Estuary, California: Chemical Indicators of its Origin and Assimilation into the Benthic Food Web
Cloern, Canuel & Wienke, U.S. Geological Survey — Open File Report 93-146; Copies from U.S.G.S., Books & Open File Reports, Federal Center, Box 25425, Federal Center, Denver, CO 80225

State and Local Funding of Nonpoint Source Control Programs, EPA; Doc #EPA-841-R-92-003
Copies from NPS Control Branch (WH-553), U.S. EPA, 401 M St., SW, Washington, DC 20460

Suspended Sediments in San Francisco Bay Estuary, California — Recent History and Available Data Sets
Peterson, Noble & Smith; U.S. Geological Survey
Copies from U.S.G.S., Books & Open File Reports, Federal Center, Box 25425, Federal Center, Denver, CO 80225

DREDGE SCOOP

COSTING OUT REHANDLING

Using sediments scooped off the Bay bottom to cover landfills, build roads or grade golf courses is more than a matter of dredge, haul and dump. In dredge-speak, the sediments need to be "rehandled" before reuse, and rehandling typically means dewatering. Why bother going through the expensive process of handling material twice? Because Bay Area dredgers, planners and regulators — plagued by a lack of environmentally sound disposal sites — like the reuse idea.

"It reduces the amount that we have to dispose of on a permanent basis," says the Army Corps' Karen Mason. "It also makes more material available for wetland enhancement."

Development of rehandling facilities that can process large volumes of various materials is a priority for those agencies, ports and other interests cooperating to develop a long-term management strategy for dredged material disposal regionwide (LTMS). Past Bay Area rehandling endeavors have been limited to small volumes generated by and slated for specific projects. But a report due out this December and prepared by Gahagan and Bryant Associates for LTMS promises bigger and better rehandling options.

The report focuses on two sites. It says the Leonard Ranch in Sonoma County could process up to 783,000 cubic yards of material per rehandling episode (12-18 months) and would cost $2,007,000 to construct. The second site, the Cargill crystallizer ponds in Napa County, could process almost twice as much and would cost a few thousand dollars less. The report (see *Now in Print*) also proposes conceptual designs for the two facilities, assesses necessary permitting, evaluates potential mitigation options and costs (as well as operating costs) and concludes that from an engineering standpoint, establishing rehandling facilities at the two sites is both feasible and practical. Contact: Steve Goldbeck (415)557-3686 *AR*

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