

COASTAL WATER QUALITY

Run-off entering the Monterey Bay National Marine Sanctuary from urban and agricultural sources is consistently monitored for pollutants by a variety of agencies and institutions. The Central Coast Long-term Environmental Assessment Network (CCLEAN) is one group with a long-term monitoring program that seeks to determine the sources, amounts, and effects of contaminants that enter our nearshore waters. CCLEAN collects effluent samples in municipal discharges, monitors the nearshore waters off central California, and uses satellite imagery to evaluate phytoplankton blooms associated with periods of high nutrient discharges. Findings from long-term CCLEAN monitoring of central California rivers include:

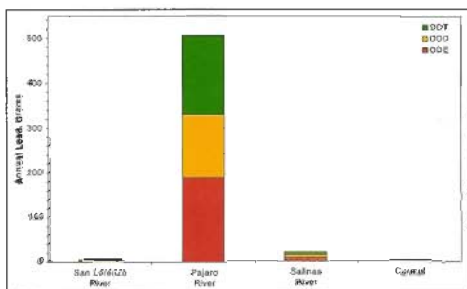


Figure 9. Annual levels of DDT, DDD, and DDE in the San Lorenzo, Pajaro, Salinas, and Carmel rivers. Note the high levels of all three chemicals in the Pajaro River. Figure taken from the CCLEAN 2002-2003 Annual Report.

- The Salinas and Pajaro Rivers typically have the highest concentrations of nutrients.
- The Pajaro River typically has the highest concentrations of DDT (Figure 9).
- The San Lorenzo River usually has the highest annual load of E. coli and enterococcus bacteria.

FOCUS ON TECHNOLOGY

The SIMoN web site has an interactive mapping feature specifically tailored to water quality issues. This tool allows you to build custom maps showing monitoring stations, watershed boundaries, outfalls, and view related information from various water monitoring groups. Go to www.mbnms-simon.org and click on the Interactive Maps button.

CCLEAN shares these and other findings with local and state governments to better inform management decisions on water quality issues such as beach closures on the central California coast.

HARMFUL ALGAL BLOOMS

Single-celled toxic algae are found in Sanctuary waters and periodically undergo a period of rapid growth, creating what is called a harmful algal bloom (HAB). One particular type of toxic algae, *Pseudo-nitzschia australis*, has been found to produce domoic acid, a neurotoxin that damages the brains of marine mammals and seabirds. In the Monterey Bay, levels of



Dr. Mary Silver collecting a surface water sample during a CIMT survey.

Pseudo-nitzschia are monitored by Dr. Mary Silver of the Center for Integrated Marine Technologies (CIMT) program. Findings from monthly CIMT surveys in the Monterey Bay include:

- There is no clear pattern of geographic distribution of HABs in Monterey Bay.
- There are multiple toxic species of algae present in Monterey Bay.

Not all algal blooms are toxic and species that are able to produce toxins do not always do so, which makes the timing and location of HABs variable.

MOSS LANDING POWER PLANT THERMAL DISCHARGE

In 2002, SIMoN initiated a study to monitor the ecological effects of thermal discharge into Monterey Bay from the Moss Landing power plant. During the energy production process, seawater is used for cooling turbine engines; that water is pumped back out through a discharge pipe offshore of Salinas River State Beach. The impacts of this discharge on the nearshore

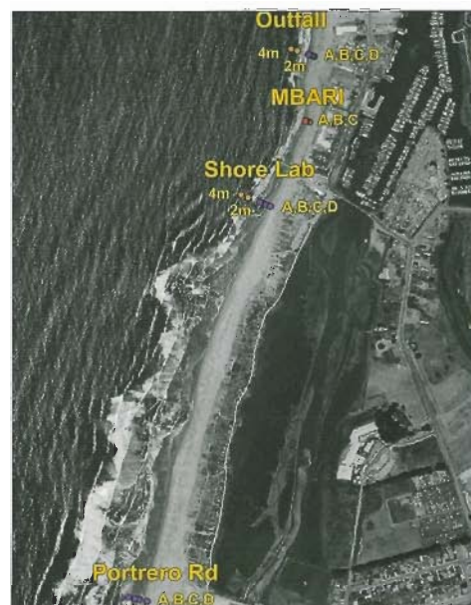


Figure 10. Locations of intertidal and subtidal sampling stations at Moss Landing.

ecosystem are the focus of an on-going study by researchers at Moss Landing Marine Laboratories. Preliminary findings include

- Sea surface temperature at the outfall site is higher than areas 500 meters away from the outfall.
- Bacteria measurements at the outfall site are higher than those measured 500 meters away.

Other components to this project include the monitoring of benthic invertebrate populations, planktonic communities, and birds to assess impacts to the nearshore ecosystem. Future findings will be made available on the SIMoN web site (www.mbnms-simon.org).

WHAT YOU CAN DO

- Do not dump waste into storm drains. Storm drains flow into creeks, rivers, and ultimately, the ocean.
- Monitor water quality in your area by joining the Citizen Watershed Monitoring Network. Call (831) 883-9303 for more details.
- Visit the Water Quality section of the SIMoN web site for more information on water monitoring activities (www.mbnms-simon.org).