



Introduction

The primary objectives of the Southern California Coastal Water Research Project (SCCWRP) are to understand the sources, fates, and effects of contaminants entering the marine coastal environment. In order to emphasize each of these aspects, our report for this year is organized under four primary headings: Sources, Fates, Effects, and Communications.

As usual, the first article updates the contribution of contaminants to coastal waters by municipal wastewaters. A major event in late 1987 was the termination of the 7-mile sludge outfall in Santa Monica Bay, resulting in a 50% reduction of mass emissions during 1988. The

inputs of contaminants from storm water in Los Angeles and Ventura Counties is described and compared with wastewater inputs. Aerial transport, storm water runoff, discharges of dredged material, industrial outfalls, and municipal wastewater effluents all represent significant sources of pollution. There is a tremendous amount of information on the mass emissions from municipal outfalls, but contributions from storm water, dredged material, or aerial sources are not understood well at this time. By sampling the sea-surface microlayer, SCCWRP investigators are finding the net result of contributions from aerial and floatable contaminants. Efforts to quantitate

inputs from storm water will continue but will be restricted to the Los Angeles River, which contributes about 30% of the total volume to the Southern California Bight. Increased attention is required regarding the mass inputs and potential effects of aerial pollutants and contaminated dredged material.

Both oceanographic and geochemical studies will be covered under the heading of Fates, as physical and chemical factors control the distribution of contaminants in the coastal environment. The fate of discharged materials is obviously very important, but extremely difficult to assess. Environmental variability requires the

collection of massive amounts of data to determine meaningful trends in the direction and magnitude of currents or the degree of sediment resuspension. Several reports were completed in the last year regarding actual and predicted distribution of discharged wastes. To aid in processing the numerous samples collected by SCCWRP scientists, the capabilities of the trace organics laboratory have been significantly expanded in the past year. The cornerstone of the laboratory is a Kratos Model MS25RFA gas chromatograph/mass spectrometer, which is capable of measuring picogram (10^{-12} gram) quantities of contaminants in samples. This piece of equipment was partially funded by a grant from the Los Angeles County Department of Harbors and Beaches.

Studies in the Effects section encompass a variety of projects including fish, invertebrates, and their larvae. Parameters measured include growth, reproduction, and survival. Research concerning the effects of contaminants on fish has been extended to different species in different locations. Results have confirmed SCCWRP's previous findings that increased contamination yields an increased frequency of micronuclei in the cells of affected fish. This past year SCCWRP scientists demonstrated that white croaker from contaminated areas of southern California exhibit impaired reproduction. We are taking advantage of a unique opportu-

nity by measuring the rates of change in biota and chemistry around the terminated 7-mile sludge outfall. Also included in this section are studies about the effects of contaminated sediment on benthic species, an area that has been quite productive. These approaches will help us to understand the potential impacts of contaminated particles emanating from a range of coastal sources. The urchins and amphipods used in these studies are from southern California and they are appropriate for use in both acute and chronic effect studies. Better methods of measuring the toxicity of sediments and wastewater are being developed which will aid in interpreting and predicting impacts in the marine environment.

The communications we are attempting are of necessity quite diverse, ranging from presentations to interested groups to peer-reviewed publication in the scientific literature. Authors may need to view and prepare their data in three or more ways, but we feel this extra effort is required because dissemination of the knowledge obtained from the various projects to the public is an important function at SCCWRP. We plan to pursue all possible means of marine environmental education. SCCWRP has been involved with compiling information on regional monitoring for a case study on the Southern California Bight by the National Research Council (NRC). Recommendations from

the NRC study suggest the design and implementation of a regional monitoring program. Quality assurance and comparability among laboratories in southern California has been handled in an excellent manner by two organizations called SCAMIT and SCECS, which you will learn more about in this report. We have also added some new and important projects during the last year that directly relate to our goals and will provide valuable information to the public of southern California and the scientific community.