Part 7

MANAGEMENT AND FACILITIES

The management, advisory and operating structure of the Coastal Water Research Project remains essentially unchanged from that described In past annual reports. The organization chart (Appendix A, Figure 1) gives the names and relative positions of those associated with the Project; persons extramurally involved in the work are listed separately.

Our research followed a plan formulated in the late summer of 1975 and then formally reviewed by the Consulting Board. Their broad collective view of marine ecology and their suggestions for priorities have been valuable contributions to our program. The Research Plan underwent numerous small changes throughout the year in which the emphasis on certain research was changed to take advantage of new and better ideas and unexpected findings. Annual report articles summarize our findings; the most important of these will be rewritten as professional papers in learned journals.

Day-to-day decisions relating to the conduct of the investigations are made by the senior staff members, who meet frequently to discuss Project activities. Most of our research projects are the combined efforts of chemists, biologists and engineers, who are in dally contact. The spirit of friendly cooperation among these scientists who are eager to be leaders in environmental studies is one of our strong points.

The Project's Consulting Board, under the chairmanship of Professor John D. Isaacs, meets quarterly with the staff and with representatives of several interested government agencies (Appendix A, Figure 4). Meetings, discussions, and seminars with individual members of the Consulting Board take place several times a quarter. As a means of keeping the local sponsors of this program informed about our research, meetings with a group of their technical representatives (Appendix A, Figure 5) are held on the first Thurs-day of every even-numbered month.

The Project Director meets four times a year with a Commission of distinguished representatives of the public whose president is Mr. Bert Bond to report on such matters as budgets, personnel matters, capital expenditures and insurance. Usually these meetings are followed by scientific briefings that keep the commissioners informed about the Project's work.

Several times a year, members of the general public and representatives of local societies interested in environ-

mental matters are invited to the Project for an evening of discussion. We describe our present research, answer questions, and invite suggestions for future research. The reaction has been quite satisfactory, and there is increasing appreciation that a serious effort is being made to determine precisely what is happening to the environment as a result of human activity, particularly wastewater discharge.

Our official accounting of funds is kept by the County Sanitation Districts of Los Angeles County on a cash basis and audited by the Controller of Los Angeles County. In addition, the Project Administrative Officer keeps data that can be used to determine our financial status on an accrual basis and to control the costs of individual research tasks. This permits financial planning and cost allocation based on our research plan. Our financial statement is shown in Figure 1.

Scientific work such as ours must be supported by laboratories capable of doing experiments and making precise measurements. Five laboratories in our headquarters building have the following equipment and capabilities:

The taxonomy laboratory was established to identify and preserve reference specimens of the marine animals of southern California. We hope that all marine biologists in the area eventually will agree not only on species names and identifying characteristics, but on the best means of recording these and making them available to other scientists. As part of our program, we hold periodic meetings of marine biologists to resolve taxonomic problems and to develop keys for animal identification. In addition to a reference collection of bottled animals, this laboratory has a reference library of taxonomic literature and two microscopes (Leitz compound, 100X to 1,000X, and Aus Jena stereoscope, 4X to 100X) for examining animals.

The toxicity laboratory is a large aquarium room in which ocean water (hauled from Marineland) is used for many kinds of experiments. Four 340-liter (90-gallon) glass tanks and sixteen 150-liter (40-gallon) tanks are kept at 12°C by external cooling baths. Each aquarium has its own individual pump and filter so that natural seawater is recirculated through the filter several times a day. Two flow-through systems of five 20-gallon tanks each are used for testing the toxicity of low levels of metals. In the last year, this capability has been increased by the addition of seventy jars and fourteen 5-gallon tanks for experiments on invertebrates.

The wet chemistry laboratory is used to monitor the chemical climate in each of the tanks in the toxicity laboratory and to determine some of the physical/chemical properties of samples of water, suspended solids, and sediments taken at sea.

The trace metals laboratory uses an atomic absorption spectrophotometer (Varian Techtron AA6) with a carbon rod atomizer. With this device, and very careful preparation techniques, repeatable results are obtained for metals in seawater at the tenths of parts-per-billion level for cadmium, chromium, copper, nickel, manganese, silver, and zinc. Chromium valence levels of three and six are measured independently. In another type of atomic absorption

instrument, mercury and organic mercury are measured independently, also to tenths of parts per billion.

We are fortunate to have an arrangement with Dr. George Alexander of the University of California at Los Angeles in which he uses an arc emission spectrometer to determine levels of 20 trace elements in freeze-dried tissue samples that we prepare. This greatly enhances our ability to obtain statistically significant quantities of data on, for example, uptake of toxicants in various fish organs.

The trace organics laboratory was set up in February 1973 under an Environmental Protection Agency grant to make precise measurements of chlorinated pesticides and polychlorinated biphenyls (to hundredths of parts per trillion in seawater). Concentrations of these compounds have since been measured extensively in the body parts of fish and invertebrates and in bottom sediments, river runoff collected during storms, sewage effluent, aerial fallout, and ocean water.

The principal instrument is a gas chromatograph (Tracor MT 220) containing dual 63^ electron-capture detectors and recording on a strip chart. Other laboratory equipment includes a rotary evaporator, a cell-disrupting homogenizer, an analytical balance, a freeze dryer, and a kiln for cleaning glassware.

The Marine Microbiology Laboratory at California State University, Long Beach, under the direction of Professor J. Kim, has assisted us during the past year by conducting research on microbes and viruses in seawater.

Project personnel spend a great deal of time at sea (283 man days this year) taking samples of water and bottom sediments, trawling and fishing, towing television cameras, and placing current meters and collection devices. Our marine coordinator has been very successful at obtaining the services of various small ships at modest cost. We are especially grateful to the City of Los Angeles for the use of the MARINE SURVEYOR and to the Los Angeles County Sanitation Districts for the use of the SEA-S-DEE. A list of cruises is given in Appendix D.

The project has its own equipment for making measurements at sea, including current meters, drogues and Van Veen grabs. Special instrumentation includes television and photographic cameras with a pan-and tilt unit on a tripod or on a sled, an automatic floatables sampler, a peristaltic pump and tube system for seawater sampling, and several taut-moored buoy systems for suspending mussels to assess uptake of pollutants.

The data processing facilities of the University of California at Los Angeles (IBM 360-91) and at San Diego (CDC 3600 and B 6700) are used to process data on the distribution of fish and benthic invertebrates and to analyze water motions.