# DIRECTOR'S STATEMENT

In this report the scientists of the Coastal Water Research Project describe their experiments, analyses, and findings for the fiscal year ending 30 June 1976. Over the last few years, we believe we have made significant advances in the understanding of the ecology of the coastal waters of southern California, especially with regard to changes caused by man, including the effects of the emission of large quantities of municipal wastewater.

Advances in natural sciences often come from improvements in the capability to make measurements. Thus our scientists are constantly trying to measure additional parameters, or to measure familiar ones more precisely, to make measurements in more difficult environments, and to quantify certain environmental situations for the first time. In the last year, we have begun probing the complex chemistry of benzenes, measured viruses in the sea, used television to count under-sea animals, and conducted metal toxicity tests at levels close to those found in nature. In the future we hope to be able to measure and experiment at even lower levels.

One measure of a laboratory is the difficulty of the problems it sets itself to solve. We are constantly striving to understand more details of the complicated chemical/bio-logical processes of sea animals exposed to toxicants, and we are continually improving the instruments and techniques that are used to quantify the ocean's chemicals and animals.

The Project has an increasing number of contacts with other scientists at leading university and government lab-oratories both in the U.S. and abroad and through them we are able to keep informed about progress by other scientific ecology groups. Early in this year the National Commission on Water Quality invited us to prepare a definitive report entitled "Environmental Effects of the Disposal of Municipal Wastewaters in open Coastal Waters." The resulting document was selected for printing as an official government publication and has received very kind reviews in international journals.

A reasonable definition of pollution is that it is a "damaging excess." Our view is that man must not pollute the ocean by adding damaging excesses of various materials and chemicals. However, opinions about what constitutes a pollutant and what is damaging are steadily changing, and we have suggested that different priorities be considered. For example, a few years ago, we took the somewhat unpopular position that the restrictions on biological oxygen demand, ammonia, and nutrients in California ocean discharges were unnecessarily stringent. This has now been generally accepted, and concern is shifting to other constituents. We have pointed out that secondary treatment of wastewaters causes many of the metals to become more biologically avail-able and thus more likely to cause problems. Although this does seem to be happening, we also have noted that the amounts-of heavy metals actually available to sea animals around most outfalls already much lower than the level that produces undesirable effects.

We hope that effluent standards will be adjusted to fit recent scientific findings about the toxicity of various trace elements and chlorinated hydrocarbons. We also wish to call attention to the need for additional studies of other trace elements that may affect marine animals, and for a more rigorous investigation of certain exotic organic compounds, including the synthetic benzenes. Soon we will be working with the State of California and the EPA, making open sea measurements to confirm theoretical initial dilution ratios of wastes discharged from deep diffuser outfalls.

In such ways we are attempting to study immediate, important problems and apply our findings to the practical needs of the communities we serve. We feel a responsibility to

provide decision makers and the public with scientifically documented data and information on the effects of ocean discharges.

All interested persons are welcome to visit our lab-oratories and question our scientists. A few hours spent in considering the facts may prevent serious misunderstanding of the environmental situation and incidentally save large amounts of public funds.

WILLARD BASCOM
Project Director