

THE PROGRAM

The solution of these basic marine problems will require investigations on a broad front, at various levels of complexity. These will include laboratory studies of the responses of individual species to controlled variations in their environment, studies of species and populations in their natural habitat, studies of communities of organisms in a restricted habitat or environment and interdisciplinary studies of complex ecosystems. This report emphasizes the more complex problems because the solutions are beyond the resources of a single scientist, or even of existing groups of scientists. Clearly, however, understanding will also require continuing studies of single species, populations, and communities both in the laboratory and in the field. The intent of the proposed program is to offer individual scientists an opportunity to cooperate with others in various ways in order to provide a more comprehensive understanding of the interactions of the multitude of processes which control the productivity of the sea.

Ecosystem Analysis

Nature is too complex for a piecemeal attack, and the time is propitious for an interdisciplinary study of a marine ecosystem so that all parts may be analyzed. The analysis must include evaluation of: (1) The organisms present and their population density, (2) the relation between one species and another, and (3) the effects of currents, seasonal changes, changes in the chemistry of the water, exchanges between the water and the sediments on the bottom, and other variables.

This type of approach is needed because a number of problems confronting biologists deal not with individual organisms or with single species populations but with entire ecological systems. In the marine environment, physical, chemical and geological processes and conditions sometimes affect--and sometimes control--the success of organisms and of populations. A complete study of an ecosystem requires the cooperative effort of many specialists, each contributing his particular insight to the composite description of the system as a whole. The Marine Productivity Subcommittee hopes to bring together interested U. S. scientists and to provide them the opportunity to participate in cooperative and coordinated ecosystem studies.