Marine Environmental Conditions off the Coasts of the United States, January 1977-March 1978

Foreword

"Scientific studies of the fisheries are scarcely 100 years old, although fishing itself is an ancient occupation. The birth of fishery science can be attributed in large degree to the great fluctuations in abundance that characterize almost all fishery resources. The causes of these fluctuations are still imperfectly known, but it is important to understand the separate effects of man and nature and the interactions between them in determining abundance of living resources, so that one will not be confused with the other. The wrong remedial measures might not only fail to have the desired effect, but also place unnecessary restrictions on the fisheries at a time of economic hardship. Much of the effort of fishery scientists has been devoted to understanding the effects of these two major sources of variation." (McHugh, J. L. 1976. Effects of climatic change on fisheries. *In* Hearings before the Subcommittee on the Environment and Atmosphere of the Committee on Science and Technology in regard to the National Climate Program Act, U.S. House of Representatives, 94th Congress, 2nd Session, 18-27 May 1976, p. 544-562.)

"After many decades of intensive research in various parts of the world, it is now accepted that natural fluctuations in the size of fish stocks are of common occurrence and also that individual year classes of important food-fishes may vary widely in their numerical strength. The explanation of these fluctuations is one of the most important problems confronting fishery science, for it provides the key to intelligent prediction of the future supply of fish and can, in certain cases, be useful in schemes to control or modify survival. Yet it is noteworthy that, particularly in marine investigations, understanding of the casual factors in population fluctuations has been slow in developing.

"A number of serious difficulties confront investigations of this kind. Wholly satisfactory means may not be available to obtain an accurate quantitative expression of the changes in strengths of year classes. The main obstacle, however, seems to lie in the difficulty of obtaining an accurate description of the environmental events which transpire during that period in the life history when the strength of a year class is determined. Even if it is possible to relate these events to the changes in survival, there remains the task of establishing with reasonable certainty that the observed relationships are direct and not merely associated with some still unidentified factor or factors. Thus, it is not surprising, in view of the complexity of the marine environment and the various impediments to precise analysis, that ventures into this field generally have not been successful." (Ketchen, K. S. 1956. Factors influencing the survival of lemon sole (*Parophrys vetulus*) in Hecate Strait, British Columbia. J. Fish. Res. Board Can. 13:647-694.)