STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME
MARINE RESEARCH COMMITTEE

CALIFORNIA
COOPERATIVE
OCEANIC
FISHERIES
INVESTIGATIONS

Reports
VOLUME XIX

1 July 1975 to 30 June 1976

Cooperating Agencies:

CALIFORNIA ACADEMY OF SCIENCES

CALIFORNIA DEPARTMENT OF FISH AND GAME

UNIVERSITY OF CALIFORNIA, SCRIPPS INSTITUTION OF OCEANOGRAPHY

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL MARINE

FISHERIES SERVICE

October 1977

DEPARTMENT OF FISH AND GAME MARINE RESEARCH COMMITTEE



1 October 1977

The Honorable Edmund G. Brown Jr.

Governor of the State of California

Sacramento, California

Dear Governor Brown:

We have the honor to submit the nineteenth report of the California Cooperative Oceanic Fisheries Investigations.

The report consists of three sections. The first contains a review of the administrative and research activities during the period 1 July 1975 to 30 June 1976, a description of the fisheries, and a list of publications arising from the programs.

The second section consists of papers presented at a Symposium, "The Anchovy Management Challenge," held December 9, 1975. Participants in the Symposium included knowledgeable scientists and resource managers from various parts of the world interested in the management of pelagic fish resources. In particular, Daniel Lluch of the Instituto Nacional de Pesca of Mexico and Robert Kaneen of the California Department of Fish and Game discussed, respectively, the exploitation and conservation of the Northern anchovy as seen from Baja California and California.

The third section consists of scientific contributions that represent research directly pertinent to the living marine resources of California. Some of these were original papers given at the Symposium on Fishery Biology, held in Ensenada, Baja California, Mexico, February 1975.

Respectfully submitted,

MARINE RESEARCH COMMITTEE Charles R. Carry, Chairman

CONTENTS

I.	Review of Activities of 1 July 1975 to 30 June 1976	
	Report of the CalCOFI Committee	5
	Agency Reports	6
	Review of the Pelagic Wet-Fisheries for 1975	19
	Publications	21
II.	Symposium of the CalCOFI Conference	
	THE ANCHOVY MANAGEMENT CHALLENGE	
	La Jolla, California, December 9, 1975	
	California's View of Anchovy Management. Robert G. Kaneen	25
	The Mexican View of the Basic Research Needs for the Management of the	
	Anchovy Fishery. Daniel Lluch B	28
	Research and Management in Southeast Atlantic Pelagic Fisheries. David	
III.	L. Cram	33
	The Lessons of the Peruvian Anchoveta Fishery. William G. Clark	57
	Scientific Contributions	
	Dwarf Hake Off the Coast of Baja California, Mexico. Andrew M. Vrooman	67
	and Pedro A. Paloma	07
	Recurrent Group Analysis of Hyperiid Amphipods from the North Pacific Central Gyre. <i>Eric Shulenberger</i>	7 3
	Hidrologia Comparativa de las Bocas de Dos Antiestuarios de Baja	
	California. Saul Alvarez Borrego, Manuel de Jesus Acosta Ruiz, and Jose	
	Ruben Lara Lara	78
	Parametros Relacionados con la Productividad Organica Primaria en dos	
	Antiestuarios de Baja California. Saul Alvarez Borrego, Jose Ruben Lara	
	Lara, and Manuel de Jesus Acosta Ruiz	84
	Corrientes Geostroficas en el Golfo de California en la Superficie y a 200	
	Metros, Durante Las Estaciones de Invierno y Verano. Armando Rosas	
	Cota	89
	Climatology of Upwelling Related Processes off Baja California. Andrew	
	Bakun and Craig S. Nelson	107
	Estimation of the Effects of Environmental Variations on the Eggs and	
	Larvae of the Northern Anchovy. Reuben Lasker and Paul E. Smith	128
	Behavior and Survival of Northern Anchovy Engraulis mordax larvae. John	
	R. Hunter	138
	The Fishery for Northern Anchovy, Engraulis mordax, off California and	
	Baja California in 1975. Humberto Chavez, Silvia Silva, and John S.	
	Sunada	14'