

Part I

REPORTS, REVIEW, AND PUBLICATIONS

REPORT OF THE CALCOFI COMMITTEE

The CalCOFI Committee is pleased to report that the research, monitoring, and advisory roles of the CalCOFI program continued into 1992. The California Department of Fish and Game at Long Beach, and the Southwest Fisheries Science Center, NOAA, and the Scripps Institution of Oceanography, UCSD, both located in La Jolla, continue to cooperate in evaluating the status of stocks and the condition of the California Current ecosystem. We have begun new research initiatives, forming new alliances and making new management arrangements.

The California sardine population slowly continues to recover. The third annual workshop involving state, federal, and industry biologists was convened by the California Department of Fish and Game (CDFG) to examine sardine assessment procedures and management options. Participants used CalCOFI collections of sardine eggs and larvae, aerial survey data from fish spotters, and fishery landing data to estimate the spawning biomass of sardines. The consensus estimate was 385,000 short tons. As a result, CDFG set the 1992 directed fishery quota at 20,500 tons, nearly double the quota for last year, and the largest harvest allowed since the recovery began. The 1992 fishery has been slow, however, partly because of financial problems in the industry.

The symposium of the 1991 CalCOFI Conference focused on the recovery of the sardine. The proceedings of that symposium appear in this volume, and offer new insights into the mechanisms governing the variability of sardine populations, historic and prehistoric population sizes, and current assessment and management tools.

The reduction fishery for northern anchovy has stopped. Although U.S. fish meal production averages about 250,000 MT annually, anchovy prices and biomass since 1982 have not generated enough earnings to cover the cost to California fishermen.

In late 1991 signs of an incipient El Niño Norte became apparent. By the end of March 1992 it was clear that a large perturbation was in progress. The January 1992 sea height at Scripps Pier in La Jolla was the second highest in the 68-year record; the February, March, and April sea heights set new

monthly mean records. In addition, the Scripps Pier monthly mean sea-surface temperature for April set a new 76-year high of 19.00°C (3.46°C above the mean). SIO and NOAA vessels working north of Point Arenas in March reported a strong northward-flowing countercurrent and little or no active coastal upwelling. They also observed low chlorophyll concentrations and low zooplankton abundances, implying a possible diminution of the biomass at the lower end of the pelagic food chain. During the April CalCOFI cruise scientists aboard R/V *David Starr Jordan* measured the temperature and salinity field across the California Current at various latitudes. The data show a positive temperature anomaly in the first 100 km offshore to a depth greater than 300 m. The positive anomaly continued in the upper 100 m as far as 650 km offshore, a significant redistribution of heat. At this writing, it is still too early to catalogue the biological response to this event, or even to evaluate its magnitude. Anecdotal and observational information will be collected throughout this year and reported at the November CalCOFI Conference and in next year's *CalCOFI Reports*.

El Niño events affect our understanding of changes related to possible global warming. A hypothetical effect of global change is increased ultraviolet radiation (UVB). A new NOAA project called BURNM studies the survival of anchovy larvae under various intensities of irradiation, using biochemically based estimates of UVB damage to the DNA of larval anchovy.

NMFS and CDFG embarked on several cooperative efforts this year. Cruises aboard the R/V *Mako* and NOAA ship *David Starr Jordan* were designed to evaluate the performance and effectiveness of a rope trawl for capturing adult sardines and mackerel. Scientists from NMFS-Pacific Fisheries Environmental Group, Moss Landing Marine Laboratories, and the CDFG made several cruises to assess halibut stocks in the southern California region, using an "area-swept" technique.

The working relationship between NMFS and SIO, long a strong feature of the CalCOFI pro-

gram, was further strengthened by the development of a Joint Institute for Marine Observation. John Knauss, Under Secretary for Oceans and Atmosphere, and Edward Frieman, Director of SIO, signed the memorandum of understanding establishing the institute in November 1991. The institute will serve as a research center for collaboration between NOAA and Scripps scientists.

Another cooperative venture was the two-ship operation involving UCSD's R/V *New Horizon* and NOAA's ship *David Starr Jordan* in a project called FORAGE (Fishery Oceanography Research and Groundfish Ecology). The object of this effort is to determine the relationship between the successful return and settlement of juvenile groundfishes on the continental shelf and the dynamics of mesoscale features such as eddies and jets.

A team of federal and state biologists, economists, and statisticians is developing a federal fishery management plan for coastal pelagic species (sardine, Pacific mackerel, jack mackerel, and northern anchovy). The plan is necessitated by the recent increase in the sardine population, and because factory trawlers from the Pacific Northwest are considering fishing for coastal pelagic species in federal waters, where no management plan is in place. Implementation of the plan, scheduled for 1993, will shift responsibility for sardine, Pacific mackerel, and jack mackerel from state to federal agencies.

The Committee will miss Rick Klingbeil, a member for the last five years and an alternate long before. Patricia Wolf has been appointed as the new CDFG representative, after having served an excellent two-year stint as CalCOFI coordinator.

The Committee also acknowledges the retirement of two senior CalCOFI investigators: Joseph L. Reid and Edward Brinton. Joe's research on the physical oceanography of the North Pacific Ocean has significantly enhanced our understanding of the coupling between the California Current system and other

currents and water masses. Joe was director of the Marine Life Research Group (the SIO component of CalCOFI) from 1974 to 1987, and a member of the Committee for the same period. His quiet tenacity arguably kept Scripps in CalCOFI. Ed's encyclopedic knowledge of the taxonomy, ontogeny, and zoogeography of euphausiids helped him understand such phenomena as changes in boundaries associated with El Niño events, and semi-isolated populations within the Southern California Bight region. Both Ed and Joe continue their research, on California Current euphausiids and on the deep circulation of the world's ocean, respectively.

We wish to thank the officers and crews of the CDFG's R/V *Mako* and of the F/V *Good News*, the University of California's R/V *New Horizon*, and the NOAA ship *David Starr Jordan* for their continued excellent support of the CalCOFI mission. These research platforms are essential to the continuity of CalCOFI time-series studies as well as to experimental work arising from the long-term observations.

We also wish to thank *CalCOFI Reports* editor Julie Olfe and Spanish language editor Jesús Pineda for another excellent volume of *CalCOFI Reports*. Our deep appreciation goes to our colleagues who served as reviewers and editorial consultants for this volume: Angeles Alvarino, Pablo Arenas, Louis Botsford, Edward Brinton, Daniel Cayan, Thomas Crowley, Rick Deriso, John Govoni, George Hemingway, Anne Babcock Hollowed, Larry Jacobson, Dan Kimura, Alec MacCall, Gordon McFarlane, Geoffrey Moser, Ashley Mullen, Michael Mullin, Richard Parrish, Immants Priede, Kurt Schaefer, Paul Smith, Gary Stauffer, and Elizabeth Venrick.

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