

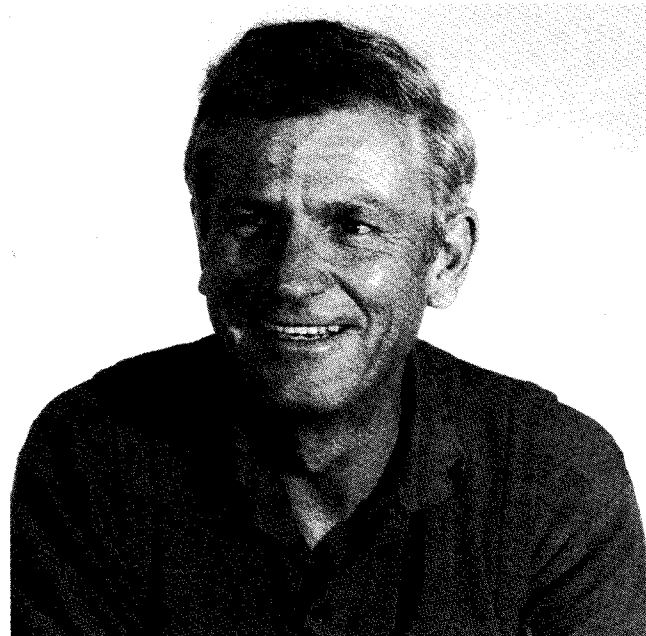
GARTH I. MURPHY
1923–2001

The founding CalCOFI coordinator, Professor Garth I. Murphy, died on 5 May 2001 in Woodland, California, at the age of 78. Before becoming coordinator in 1959, Garth was the director of the Pacific Oceanic Fisheries Investigations in Hawaii. After serving as coordinator until 1965, Garth was appointed professor of oceanography at the University of Hawaii. His principal contribution to CalCOFI and population dynamics was the thorough documentation of the fisheries on the sardine *Sardinops sagax* and interpretations of the causes for its decline along the west coast of North America. Two principal works followed this: a population projection of the recovery of the sardine, and the description of the function of multiple year-classes in the evolution of this and similar populations.

Murphy became interested in sardine at a three-day crisis meeting of 36 physical and biological oceanographers: the Rancho Santa Fe Symposium in June of 1958. In a question-and-answer session regarding how El Niño warming of the Pacific affected the sardine, Garth Murphy asked John Radovich, "What is the typical number of year-classes in a spawning [sardine] population?" Radovich said, "Predominantly three." Three decades before, the answer would have been "ten." This question marked the end of Murphy's 15-year career as biological technician and government administrator, and began his professional career as a graduate student in oceanography at Scripps Institution of Oceanography.

During his term as coordinator and as editor of *CalCOFI Reports* he transformed the publication from a gray literature of agency reports into an edited journal of original scientific contributions. Over the next five years he studied the Pacific sardine population and fishery with the help of mentors E. W. Fager, D. G. Chapman, M. Lloyd, and M. B. Schaefer.

During his tenure at the University of Hawaii, Murphy captured the practical significance of the longevity of sardine and founded a field of theoretical population biology concerned with the evolution of life history in variable environments. Theoretical ecologist Lamont Cole had found that a single reproductive period was essentially as useful to population maintenance as multiple reproductive periods. Murphy questioned Cole's view by using the history of the sardine population. He reasoned that sardines evolved repetitive reproduction and extended lifetimes after first maturity in response to



environmental variations. He believed that the joint influence of the fishery and the environment had affected the sardine by decreasing the number of reproducing year-classes from ten to three, thus making the sardine population sensitive to interannual, environmentally caused reproductive failure.

His rationale that preserving iteroparity, or multiple spawning, in a population protected it from collapse during short environmental events like El Niño aroused the wrath of the Peruvian government (which declared him *persona non grata*) when he blamed the collapse of the Peruvian anchoveta on overfishing by demographic truncation. He expressed these views during a United Nations Food and Agriculture mission study, to counter the accepted view that placed sole blame for the collapse of the anchoveta, the world's largest fishery, on the 1972 El Niño.

Garth Murphy's achievements in population biology have contributed to the CalCOFI time history; to the Pacific sardine, which recovered in the manner he predicted; to the practice of generalized population management under combined environmental and fishing pressure; and to theoretical population ecology.

Biological and fisheries oceanography has lost one of its earliest practitioners.

Paul E. Smith