Honored Life Member Roger L. Mann

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Roger Mann continues to enjoy a dynamic career in marine ecology based on research, education, and advisory service. The breadth and depth of his research interests are remarkable. His contributions to shellfish biology and malacology range from biochemistry to ecosystem analysis. His work, which spans more than three decades, includes contributions on molluscan growth, mortality, physiology, gametogenesis, contaminants, biomechanics, larval ecology, and introduced species as well as public health and ecosystem restoration. He is a recognized leader in the field who applies sound scientific reasoning to management, conservation, and restoration of estuarine, coastal, and oceanic marine resources.

Roger received his Bachelor of Science degree from the University of East Anglia in 1972. His graduate work was done under the direction of Dr. Peter Walne at the Fisheries Experiment Station at Conwy and the Marine Science Laboratories, Menai Bridge, University College of North Wales (now University of Wales) with his Ph.D. awarded in 1976. His research with Walne on flat oysters, *Ostrea edulis* and Pacific oysters, *Crassostrea gigas* set high standards for the quantitative examination of oyster physiological ecology in field and laboratory settings, particularly with regard to aquaculture.

He left Wales in 1975 to accept a Jessie Smith Noyes Post-doctoral Fellowship in Marine Science at the Woods Hole Oceanographic Institute to study with Dr. John Ryther. His early work at WHOI examined the culture of bivalve molluscs and the uptake and release of contaminants in organisms grown in a waste recycling aquaculture system. This research examined the physiological ecology of specific bivalves (e.g. *Mytilus edulis*, *Tapes japonica*, *Tapes philippinanum*, *Argopecten irradians*) and algal species as well as the development of culture techniques and related instrumentation. During this period he began work with Scott Gallager to examine the use of lipid-specific dyes to evaluate condition and nutrition in cultured bivalve larvae, particularly oysters. This application combined his skills in physiology and instrumentation to address applied questions for aquaculture development.

From 1977 to 1984, he worked as an Assistant, then as an Associate Scientist on projects examining estuarine, coastal, and offshore molluscan communities in the mid-Atlantic Bight. While his research describing the physiological ecology of cultured bivalves and public health issues related to aquaculture in a waste recycling aquaculture system continued, he expanded his program to include research on ocean quahogs, *Arctica islandica*, and invasive species.

His research on ocean quahogs began with field collections to describe the gonad development cycle in the context of population dynamics for northern mid-Atlantic Bight populations. His fieldwork was complemented by focused examination of the biology and growth of cultured larval and juvenile *Arctica* under controlled laboratory conditions. The creation of a temperature- and pressure-controlled experimental chambers enabled him to work with students to describe the swimming behavior of larval *Arctica*, as well as other bivalve larvae, and then apply the laboratory data to oceanographic data sets to explore recruitment and population processes for offshore, coastal, and estuarine molluscan species in the mid-Atlantic Bight. Examination of the zooplankton community on the southern New England shelf for *Arctica* larvae led to general descriptions of bivalve larval composition, behavior, seasonal dynamics, recruitment to the benthos and appropriate sampling strategies.

In 1978, he hosted an international workshop on the introduction of exotic species for mariculture, which resulted in an edited volume by the same name. In the early 1980s, he worked with Dr. Jim Carlton to develop a sampling protocol for the presence and abundance of invasive species, notably planktonic marine invertebrate larvae, in the ballast tanks of ships. These sampling challenges were a natural companion to the offshore and coastal research on bivalve larvae that he had in progress at the same time.

While at Woods Hole, he met Prof. Ruth Turner at the Harvard Museum of Zoology and his interest in shipworm biology and physiological ecology began. He examined the nutritional physiology, growth, morphology, and energetics of several shipworm species (*Teredo*, *Bankia*, and *Nototeredo*) using a combination of culture, field, and laboratory methods.

In 1985, he was appointed an Associate Professor in the Department of Fisheries Science at the Virginia Institute of Marine Science/College of William and Mary and inherited the VIMS oyster program dating from the 1930s. He was promoted to Professor in 1987. He served as Chair of the VIMS Department of Fisheries Science from 1993-97. Since 2003, he has served as the VIMS Director of Research and Advisory Service.

During his early years at VIMS, he focused on recruitment and population biology of the native eastern oyster *Crassostrea virginica* in relation to habitat and environmental factors. By the late 1980s, he and his students were examining the physiology, nutrition, and behavior of oyster larvae using a combination of field, laboratory, and culture approaches. Intense seasonal field collections of oysters provided population parameters (demographics, sex ratios, condition index) while simultaneously examining fecundity, egg condition, and egg viability. Student projects on oyster predators (crabs, cownose rays) and the development of local fouling communities complemented the ongoing oyster stock descriptions made possible by the standardization of survey methods begun in the mid-1980s and advanced by the development of an annual fishery independent patent tong survey in collaboration with the Virginia Marine Resources Commission begun in 1993 and continuing through the present.

With the decline of native Chesapeake oyster populations in the 1980s, regional oyster biologists began investigating strategies to restore and reinvigorate oyster populations and the industries that they support. Roger has been actively involved at local, regional, national and international levels in oyster stock assessment and monitoring, development and evaluation of restoration strategies, development and impacts of aquaculture techniques, as well as consideration of non-native species in support of fishery enhancement (*Crassostrea gigas* in the late 1980s and *C. ariakensis* more recently). Since 1998, he and VIMS colleague, Dr. Juliana Harding, have examined the potential effects of the veined rapa whelk *Rapana venosa*, an introduced shellfish predator, on Chesapeake shellfish stocks in collaboration with more than 200 commercial watermen. He continues to work with Prof. Eric Powell at Rutgers University and the fishing industry examining offshore clam (*Arctica* and *Spisula*) population dynamics, demographics and recruitment in the context of regional climate and environmental changes.

In recent years, Roger has drawn on his experiences based in aquaculture, invasive species, and marine bivalve physiological ecology to become an active participant in regional and national discussions of climate change and its effects on coastal and offshore shellfish resources and concurrent changes in ecosystem dynamics and function. He served on the 2008 Virginia Governors Commission on Climate Change. These areas of interest complement his ongoing collaborations with government, industry, and academic partners as a fisheries ecologist and as the VIMS Director of Research and Advisory Services. His scientific expertise provides a basis for sound policy and management advice with an eye to both the present and the future.

Roger's service to the National Shellfisheries Association covers more than two decades including terms as Vice President (1986–87), President (1988–89), annual meeting organizer (1989–90), and Editor of the *Journal of Shellfish Research* (1982–1986). His tenure as Editor provided the transition for the *Journal of Shellfish Research* from the *Proceedings of the National Shellfisheries Association*, and began its transition into an internationally recognized journal.

Roger is aware of his responsibility to communicate and provide technical advisory service at all levels. He has authored or co-authored 115 peer-reviewed publications. He has testified before Congress three times as an expert on ballast water and invasive species regulations and continues to work with the International Council for Exploration of the Seas Working Groups on Ballast Water and Introduced Species.

As a faculty member in the School of Marine Science/VIMS, he has mentored 18 Masters and 5 Ph.D. students, many of whom are now science professionals mentoring the next generation(s) of shellfish biologists. He has served on more than 40 student advisory committees within the School of Marine Science, including physical and biological oceanography as well as fisheries science topics. He regularly teaches graduate level courses in Larval Ecology and Malacology and was the recipient of the SMS/VIMS Outstanding Teacher award in 2001. His research guides his teaching and his skills as a communicator combine with his enthusiasm for the material to create memorable educational experiences.

Roger Mann has already distinguished himself as a guiding force in marine science and shellfish biology and shows no signs of slowing down—the field can look forward to many more years of his enthusiastic discussions, thoughtful contributions and significant insight.

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