

## Many Perspectives, Many Questions on Non-Native Oysters

Scientists, policy makers, industry representatives and watermen from Virginia, Maryland, New Jersey, Delaware and North Carolina gathered in Williamsburg recently to share information and views on the potential use of the non-native oyster *Crassostrea ariakensis* for aquaculture.

In 1996, VIMS was directed by the Virginia General Assembly to investigate the potential for using a foreign oyster both in aquaculture and for the possible introduction of a self-sustaining fishery. Initial work was conducted on *Crassostrea gigas*, an oyster that is used extensively in aquaculture in other parts of the world. However, it did not perform well in Chesapeake Bay. Subsequent work has shown that *C. ariakensis* appears to thrive in the Bay environment. Both species are found throughout Asia.

For the past two years, the Virginia Marine Resources Commission has allowed industry trials of sterile *C. ariakensis* to be conducted in controlled aquaculture projects. VIMS Aquaculture Breeding and Technology Center, directed by Dr. Stan Allen, developed a technique for producing

oysters with three sets of chromosomes, making them effectively unable to reproduce. These oysters, called triploids, were provided to industry to test their performance in aquaculture in Chesapeake Bay. This species was chosen because early field tests had shown that they adapt well to the Bay environment and are resistant to the diseases that have ravaged native populations. In the field, the oysters exhibited rapid growth, reaching market size of 3" in one year to eighteen months. Additional research at VIMS has focused on developing techniques to mass-produce triploid (sterile) oysters that could be safely grown in the wild without threatening restoration efforts of the native *C. virginica* that are underway. "The goal of our research has not been just academic," says Allen, "we have been working to find ways to develop and sustain an oyster aquaculture industry in Virginia."

At the symposium, industry and watermen from both Virginia and Maryland felt that dwindling harvests should be a major consideration in future plans for the use of a nonnative

species. Other attendees expressed opinions that having more filter feeders in the bay could only be good for improving water quality and other environmental conditions. Most scientists agreed that additional information on the biology of the oyster is needed, but especially before considering diploid introductions. Questions were raised about the potential for introducing unknown diseases. By using hatchery-reared oysters, scientists can eliminate the threat of parasites and bacteria, but because of a lack of bivalve mollusk cell lines, viruses are difficult to detect. Over time, a small percentage of the triploid oysters begin to revert to their natural diploid (two sets of chromosomes) state. In time some individuals may become capable of reproducing although, in laboratory tests, this has not been observed. Even in a controlled aquaculture situation, some animals could be scattered during storm events raising the likelihood that in time they

could revert to diploids and begin reproducing. There was general agreement that any introduction – even triploid — carried the potential that a self-sustaining population in the Bay could occur at some time in the future. "A lot of the research questions we need to address now relate to diploids, says VIMS Director of Research, Dr. Eugene M. Burreson. "I think the research focus is going to shift."

"The range of options available is still all over the board, from abandoning the research on a promising new species to its full fledged introduction to the Bay. Triploid aquaculture still represents a moderate practical course," says Allen.



One year old *C. ariakensis* grown in VIMS hatchery.

## An Evening For Honors

Approximately 125 guests attended the Annual Maury Dinner on June 8, 2001. Highlights of the evening included acknowledging recent student and faculty awards.

Dr. Jack Musick was named Outstanding Professor of the Year by the State Council of Higher Education and also received an American Fisheries Society Award for his lifetime contributions to fisheries management.

Dr. Linda Schaffner received the Thomas Jefferson Teaching Award from the College of William and Mary and Dr. Elizabeth Canuel received the Alumni Society Outstanding Faculty Award for 2000. During the evening, Capt. Maury Werth presented the Mathew Fontaine Maury Award to Krissa Murray, a Ph.D. student in the Department of Physical Sciences for her outstanding interdisciplinary work.



Guests at the annual Maury Dinner.

## VIMS Environmental Scientists Author New Risk Assessment Book *Coastal and Estuarine Risk Assessment*

Risk assessment is the cornerstone of contemporary environmental protection. Despite recent progress, implementation of the ecological risk assessment paradigm to coastal and estuarine ecosystems still lags behind that for freshwater and terrestrial systems. VIMS faculty have now developed a book to address this imbalance. Written by Dr. Morris Roberts, Chair, Department of Environmental Sciences, Dr. Michael Newman, Dean of Graduate Studies, and Associate Professor Robert Hale, the book discusses the development of fundamental concepts related to chemical risks from the molecular to the landscape level. It also covers early recognition and evaluation of exposure to new-use chemicals before they reach critical levels. "Understanding

and assessing these risks is essential to sound environmental policy and management," says Newman who has authored other books on risk assessment. The team drew examples from their varied career experiences as well as from diverse North American and European ecosystems. This is the first book to apply the NRC risk assessment paradigm to coastal marine environments.

Newman is also the author of the well known and widely acclaimed "Fundamentals of Ecotoxicology," which is considered to be the most comprehensive textbook or working reference in the new science of toxicants in the environment.

Both books are available through Lewis Publishers.