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News and Commentary:

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Linking Marine Science to Industry: One Building Block

by Kathleen Ellis

Editor's note: All involved in the work to develop Maine's marine industry seemingly are united in one sentiment: that partnerships are paramount in maximizing the potential of this resource for the benefit of the state's economy in a global marketplace. One entity with experience in the arena of working in collaboration with the private and public sectors is the University of Maine, which now is attempting to develop its role within the state's marine industry further by becoming the home of a new School of Marine Sciences. The following commentary, written by Kathleen Ellis, Sea Grant communications coordinator on the Orono campus, offers some historical perspective of the university's place in the state's marine science equation, some of its public-private partnership success stories, and its aspirations for the future. The Review is committed to exploring a variety of marine industry perspectives in future issues.

When Governor Angus King revealed his "vision" in the last State of the State address to make Maine home of the world's premier cold-water marine research facilities, Bruce Sidell, director of the new School of Marine Sciences at the University of Maine (UM), couldn't have asked for more. Sidell has been pursuing cold-water research in Antarctica since the early 1960s when he was a graduate student at Stanford. Now, the UM School of Marine Sciences is poised to become a national leader in cold-water fisheries.

Sidell spoke at an Action Committee of 50 forum last March at Husson College in Bangor, where he entreated the state's business leaders and industry sector to "take ownership of your state university and ask what we can do for you."

As a Land Grant University and Sea Grant College Program, the University of Maine has a responsibility and a mandate to serve the needs of Maine in the areas of marine education, research, technology, industry, policy, and environmental quality. UM officials hope the new school serves as a catalyst in developing marine sciences programs that will create a synergy that, in turn, will benefit students, the university, the state, and the nation.

According to Sidell, one emphasis of the new school centers on the Gulf of Maine as a unique ecological and economic resource, but an understanding of the linkages to the global ocean, climate, and biosphere also is critical. Sidell said the university's efforts in marine sciences must attract undergraduate and graduate students of high academic potential, deliver quality marine science degree programs, and graduate capable marine scientists. The school's activities will contribute to the improved use and management of the gulf's resources through collaboration with local, state, and federal governments, as well as the private sector. To accomplish these objectives, Sidell said the School of Marine Sciences needs an increased operating budget to construct a building to centralize marine faculty and to conduct basic research that is important

for the state's marine industry. Since the early 1970s, much of this research has been supported by the university's Sea Grant College Program through federal funding from the National Oceanographic and Atmospheric Administration (NOAA).

For example, representative Sea Grant-funded projects in the 1970s and 1980s concerned the development of a sustainable blue mussel industry and the effects of digging on mud flats and soft-shell clam populations. During the 1970s and 1980s, the Sea Grant status also played an important role in developing key sections of the Maine State Aquaculture Plan and organizing the annual Maine Fishermen's Forum. Initiated 22 years ago by UM marine economist James Wilson, now associate director of the School of Marine Resources, and then-Sea Grant Marine Advisory Program agent Robin Alden, now commissioner of the Maine Department of Marine Resources, along with a handful of commercial fishermen, the Maine Fishermen's Forum is considered the largest and most successful of its kind in the country.

Today, federal investments in the UM Sea Grant College Program continue to make a difference in Maine's marine-related industries, as well as benefit the state's economy from the direct infusion of other federal and private contract monies. This benefit is comparable to the economic effect that occurs whenever a Maine business obtains a contract for the production of goods and services. At the university, the annual value of these contracts, including Sea Grant, varies between \$5-\$7 million and averages \$5.9 million, excluding contacts from state appropriations.

Last January, Wilson undertook a survey of scientists at the new school to ascertain the estimated economic value of recent marine research at the university. The results reveal a high return to the state, on the order of \$42 of direct economic activity for every \$1 of state expenditure.

Wilson concluded there are two reasons for this ratio: 1) State expenditures provide a powerful lever for obtaining federal and private research dollars; and 2) Some research projects have very high payoffs for Maine's marine industry.

Some examples of the economic value of marine research projects at the University of Maine in the recent past include:

- In 1986, the Portland Fish Exchange and Pier opened. This development was the direct out-growth of two Sea Grant-funded projects in the mid- and late 1970s. These projects involved an analysis of Maine's and New England's ground-fish markets and concluded with a recommendation for a display auction site in Portland. As a result, the state passed a \$6 million bond issue for the project; the city of Portland contributed another \$5 million; and the U.S. Economic Development Administration put in \$5 million. Processing of Maine-landed product within the state increased from about 10 percent to more than 40 percent, leading to another \$4.5 million added to the Maine economy each year. Since the exchange began operating, Portland has moved from the fourth to the top-ranked ground fish port on the Atlantic coast.

Project amount:	\$23,000
Annual payoff:	\$27,500,000
Source:	Sea Grant

- Working with fish veterinarians in Down East Maine, a UM Sea Grant finfish aquaculture specialist and a colleague from the UM Cooperative Extension helped control the infestation of sea lice in the Cobscook/ Passamaquoddy Bay area. In 1995, sea lice emerged as the most significant disease problem for salmon farming in Maine, and caused losses of \$25 million to the Canadian salmon industry in 1994 and 1995. Cypermethrin, an antiparasitic drug, was approved for experimental use in Maine by the Federal Drug Administration. This drug has been extremely effective in preventing significant losses to Maine salmon farms. Studies are ongoing to confirm the safety of the drug for use in the marine environment. The Maine Aquaculture Innovation Center (MAIC) estimates the value to the Maine salmon industry to be of the order of 15 to 20 percent annually.

Project amount: \$10,000
Annual payoff: \$10,000,000
Source: MAIC, Salmonid Health consortium

- Ongoing research on the impacts of disease on shellfish aquaculture in Maine has led to strategies for minimizing losses. For example, in 1996 at least one oyster grower followed the researchers' recommended protocol and significantly reduced his oyster mortality rate. This will result in a much greater harvest in two years.

Project amount: \$214,000
Annual payoff: \$300,000
Source: Sea Grant, NOAA/NMFS, NRAC, MAIC, MAFES

- Research by a UM lobster scientist and his graduate students has resulted in the adoption of the concept of feeding medicated lobster feed to lobsters in cars and pounds. This is the first FDA-approved drug for lobsters. This medicated feed has led to the development of two small businesses, Lobster Products, Inc. in Hancock, and Maine Lobster Technology, Inc., a competing company.

Project amount: \$40,000
Annual payoff: \$5,000,000
Source: Sea Grant, Lobster Institute, state's lobster industry

These examples demonstrate the wide array of marine research activities ongoing at the University of Maine. However, to achieve Governor King's goals of maintaining the current level of employment in traditional fisheries, doubling to 1,000 the number of jobs in aquaculture, and using research to help increase employment in fields like marine biotechnology, the links among Maine's marine science, government, and business communities must grow even stronger.

Kathleen Ellis is Sea Grant communications coordinator at the University of Maine.

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