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A History of Florida's Fish and Wildlife Research Institute

GIL McRAE

When I consider the breadth and complexity of the issues we deal with, I often forget that the organization that ultimately became the Florida Fish and Wildlife Conservation Commission's (FWC) Fish and Wildlife Research Institute (FWRI) was founded because of a single issue—Florida red tide. We have come a long way in 55 yr, and in many ways, the evolution of our Florida red tide research parallels progress made in other scientific disciplines. The institute has experienced many changes, including modifications of the agency's composition, focus, and name. A few of the name changes include the following:

- 1955—Marine Laboratory, Florida State Board of Conservation
- 1969—Marine Research Laboratory, Florida Department of Natural Resources
- 1988—Florida Marine Research Institute, Florida Department of Natural Resources
- 1993—Florida Marine Research Institute, Florida Department of Environmental Protection
- 1999—Florida Marine Research Institute, Florida Fish and Wildlife Conservation Commission
- 2004—Fish and Wildlife Research Institute, Florida Fish and Wildlife Conservation Commission

In explaining how the institute came to be what it is today, I need to recount how the red tide program in Florida began. The Florida red tide of 1946–1947 was a large and destructive one, but it had at least one positive outcome: the culprit was finally identified. Scientists with the University of Miami determined the agent to be an organism called *Gymnodinium breve* (now known as *Karenia brevis*; Fig. 1). After submitting a report on Florida red tide in 1954 to the Florida State Board of Conservation, the University of Florida established a small research outpost in early 1955 at the former U.S. Maritime Service Training Station at Bayboro Harbor in St. Petersburg. Later that year, the board assumed operation of the laboratory with its two staff members, one small rent-free building, and about \$15,000 to study Florida red tide.

In 1957, Robert M. Ingle, the first marine biologist hired by the state of Florida, was named

director of research of the laboratory, leading a staff of 10 in two buildings (Fig. 2). Under Ingle's direction, recalls invertebrate biologist William G. Lyons, the lab was “a place of excitement, of adventure, a place where people were thrilled to have opportunities to explore, to learn, and to contribute.” During the early days, money for much of the research came from dredged-oyster-shell royalties and funds for studying Florida red tide. Although Florida red tide was its primary focus, the lab's research programs diversified to include ecological studies of the effects of dredging and filling Florida estuaries and research on important commercial fisheries. Scientists also investigated shrimp, oysters, fish, clams, marine plants, and parasites and diseases of marine animals.

In the 1960s, research expanded to include reproductive physiology of fishes and aquaculture. In 1965, scientists began studying the Florida spiny lobster from a new field station in the Florida Keys. By 1966, there were 40 scientists, 16 support staff, a few small boats, several field labs, and a donated 72-foot wooden-hulled shrimp trawler, the R/V *Hernan Cortez* (Fig. 3). The trawler allowed the Marine Laboratory to expand its research to the west Florida shelf with the Hourglass Cruises from 1965 to 1967, which comprised the first systematic spatial and temporal investigation of resources in the eastern Gulf of Mexico.

The laboratory nearly closed in 1971–1972 when funding from oyster-shell royalties was lost; this loss made it difficult to match federal dollars, an increasingly important funding source. Three field laboratories were closed, and five biologists were laid off. Fortunately, local and legislative efforts raised \$77,000 to keep the doors open.

In addition to funding challenges of the early 1970s, the laboratory also experienced changes in leadership when Ingle retired and was replaced by Edwin A. Joyce, Jr., in 1972. When Joyce became the division director in 1975, Dale S. Beaumariage filled the lead role at the laboratory. By 1978, the Marine Research Laboratory occupied two buildings in St. Petersburg and had field laboratories in Key West, West Palm Beach, and Jensen Beach. The 1970s were an era of great expansion for the lab. A budget of

Fig. 1. Electron micrograph of *Karenia brevis*.

approximately \$1.25 million supported about 75 staff, whose research focused on Florida red tide, fisheries biology, aquaculture, fish disease, power-plant thermal studies, and descriptive biology. In 1974, staff responded to angler concerns about the decline of the snook population along Florida's southwestern coast by beginning life-history studies and monitoring the population. Species-composition surveys of corals in the Florida Keys began in the early 1970s and led to a status-and-trends monitoring program that continues today. Our sea turtle program also began in the mid-1970s with a head start project for green turtles.

In 1980, Dr. Karen A. Steidinger became responsible for the Marine Research Laboratory, the Department of Natural Resources' statewide shellfish program, and the field laboratories around the state (Fig. 4). A new laboratory and office building was completed on Bayboro Harbor in 1982, enhancing the space available for the growing research projects. It was the first facility built by the state for marine research and was named after Ingle as a tribute to his contributions to marine research. The laboratory's research capabilities and the significance of its research results in supporting management efforts continued to grow in the 1980s. An example of the value of Florida's marine research was evident during this time, when the lab served as staff to the Saltwater Fisheries Study and Advisory Council. This council recommended the creation of the state Marine Fisheries Commission, which was established in 1983.

From 1983 to 1988, new marine research projects continued to be added, including

Fig. 2. Robert Ingle and Karen Steidinger.

species-targeted programs for blue crabs, spotted seatrout, queen conch, hard clams, baitfish, and mullet, as well as programs for red drum stock enhancement, juvenile fish monitoring, fish health, and species identification using biochemical information. In 1988, the budget of the renamed Florida Marine Research Institute, funded by state and federal dollars, was \$8 million supporting about 165 staff. The main facility, in St. Petersburg, operated field labs in Fort Myers, Marathon, Tequesta, Stuart, and Port Manatee.

Some of the most significant research developments in the 1980s were the establishment of the fisheries-independent and fisheries-dependent monitoring programs and the creation of a geographic information systems (GIS) and remote-sensing section. These initiatives were made possible, in large part, by the establishment of fishing license fees for recreational anglers in 1989 and saltwater products harvest licenses for commercial fishermen. These programs continue to produce vital products for today's resource managers.

The institute's marine fisheries research projects now provide nearly all of the biological information and analyses used by the FWC and other fisheries managers in regulating Florida's marine fisheries resources, which translates to over \$10 billion in economic benefits to Florida (Fig. 5). For example, the institute's research and monitoring data are important to the management of genetically different stocks of common snook on the east and west coasts of the state and of large pelagic fishes such as billfish. In the late 1980s, a widespread die-off of seagrass in Florida Bay prompted a new multidisciplinary scientific focus on this unique ecosystem. The devastating damage from the grounding of the M/V *Mavro Vetranic* in 1989 on a Dry Tortugas reef led to the formation of a multiagency

Fig. 3. Biologists aboard the R/V *Herman Cortez* retrieve a box dredge, used to sample bottom-dwelling animals, in Tampa Bay in 1966.

Fig. 4. Karen Steidinger observes phytoplankton in Sept. 1970.

program to respond to ship groundings, to assess their damage to the environment, and to restore damaged areas. In 1989, the legislature directed the state agencies to computerize data about sensitive habitats in Florida.

After a 13-yr tenure overseeing all marine research, Dr. Steidinger stepped down in 1993 but remained with the institute to direct its Florida red tide research. Ken Haddad was appointed to lead the institute that summer. That same summer three vessels collided at the entrance to Tampa Bay, releasing more than 300,000 gallons of heavy oil and 33,000 gallons of jet fuel into the water. Institute staff and their GIS data on sensitive habitats were instrumental in the emergency-response effort. Refined coastal-resource mapping continues today to support governmental emergency-response efforts and scientific investigations and analyses.

Fig. 5. FWRI fisheries biologists pull in a seine net to examine the fish species present along this portion of the coastline.

During the 1990s, the scope of research and the institute's presence around the state expanded. As the institute reached its 40th anniversary, it employed approximately 350 staff conducting research activities from as many as 11 laboratories located statewide. Florida's manatee research and conservation program began at this time and continues today, using dedicated revenues from the Save the Manatee license plate that was enacted by the Florida Legislature in 1990.

At the institute's headquarters in St. Petersburg, a new joint-use marine research facility was dedicated in 1994 (Fig. 6). This facility was the culmination of discussions that began in the mid-

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Fig. 7. FWRI scientists aboard the R/V *Pelican* study Florida red tide by deploying a conductivity-temperature-depth and rosette sampler. The instruments will profile temperature and salinity through the water while taking water samples for analysis onboard the ship.

Fig. 6. The Fish and Wildlife Research Institute in the early 1970s (top) and today (bottom).

1980s between Dr. Steidinger and Dr. Peter R. Betzer, dean of the University of South Florida's College of Marine Science, which is also located on Bayboro Harbor. Support from the university, the local community, and the Florida Legislature were instrumental in helping the facility become a reality. The joint-use facility continues to provide a high-quality laboratory setting to study the marine and coastal environments and learn how to best protect and preserve its resources.

Throughout its history, the institute has positioned itself at the forefront of Florida red tide research and has received significant state general revenue and federal grant funding to examine this issue (Fig. 7). It continues to provide statewide testing for biotoxins in shellfish following Florida red tides and other harmful algal blooms and is the only U.S. Food and Drug Administration–certified laboratory in

Florida for this analysis. In 2000, after determining that Florida's red tide organism was misclassified, an international group of scientists changed the scientific name to *Karenia brevis* in honor of Dr. Steidinger's contribution to red tide research. She continues to pursue her investigation of this complex organism in association with the institute.

In 2004, an agency-wide reorganization integrated research on freshwater and terrestrial organisms and habitats with the institute's existing marine research to form the Fish and Wildlife Research Institute (FWRI). The broadening of the institute's responsibilities to encompass the entirety of Florida's fish and wildlife issues has been the biggest change in its history. As Florida's human population and environmental stresses have increased, the "need to know" has become urgent. FWRI strives to fill that need

by being the leader in providing the scientific foundation for wise management of Florida's fish and wildlife resources. The FWRI mission statement, "Through effective research and technical knowledge, we provide timely information and guidance to protect, conserve, and manage Florida's fish and wildlife resources," guides the staff in their everyday work.

In the reorganization, the FWRI became the research arm of the FWC, providing timely and relevant information to resource managers for informed decision making.

Florida statute charges FWRI with the following responsibilities:

- Monitoring marine and freshwater fish and wildlife and their habitats
- Developing and implementing techniques for restoring plant and animal species and their habitats
- Providing technical support when oil spills and human-related or natural disasters occur
- Monitoring red tides and providing technical support for state and local governments handling public health concerns
- Providing technical results of fish and wildlife research to state and local governments

The institute continues to be involved in local, state, national, and international marine research. The institute's staff, their science, and their informational products are internationally recognized. In the past decade, the institute has sponsored several major meetings and conferences, including those of the 2001 Estuarine Research Federation, the Tenth International Conference on Harmful Algae (2002), the 2002 U.S. Commission on Ocean Policy, the 2004 National Marine Educators Association, and the 2004 Gulf and Caribbean Fisheries Institute. The institute also anchors one of the world's largest communities of organizations dedicated to marine science, which includes the National Marine Fisheries Service Southeast Regional Office, U.S. Geological Survey—Florida Integrated Science Center, Florida Institute of Oceanography, University of South Florida College of Marine Science, and most recently SRI International's Marine Technology office.

The diverse programs being conducted at the institute today are planned to provide the vital scientific information necessary to manage and protect Florida's living resources and their habitats. The institute collaborates with numerous governmental, academic, private, and non-profit organizations to further research in the conservation of Florida's natural resources. The institute has about 200 current grant awards totaling about \$41 million, a long way from the

\$15,000 provided by the state to study Florida red tide in 1955.

In its 56th year of existence, FWRI now employs about 600 people. Its headquarters in St. Petersburg occupy three multistory buildings, and more than 20 field laboratories and offices are situated at key inland and coastal locations statewide. FWRI's annual operating budget of approximately \$50 million in state and grant funding supports research projects that are organized within five broad, interrelated science sections: marine fisheries research, freshwater fisheries research, ecosystem assessment and restoration, wildlife research, and information science and management. The principal liaison between the institute and the public is our Outreach Coordination Office.

Much of the institute's data and information are available over the Internet to resource managers and the public as reports, maps, atlases, GIS layers, and peer-reviewed papers. More than 1,500 published works document the findings of institute staff. Additionally, the institute publishes three serial journals, of which the FWRI Technical Report series is most active.

Since 1995, the institute has hosted Marine-Quest, our open house held each spring that showcases the value and variety of our marine research and that attracts about 4,000 visitors and 2,000 school children. Our Outreach Coordination Office assists scientific staff in the development of a wide variety of nontechnical informational products such as posters and brochures, boating and angling guides, magazine articles, press releases, and articles for our web site (<http://www.MyFWC.com/Research>), as well as the agency's social media sites.

When I came to work at what was known as the Florida Marine Research Institute within the Florida Department of Environmental Protection in 1995, I was an associate research scientist in the aquatic health group. Over the next several years, I served as a research scientist doing fisheries stock assessments and as a research administrator before becoming the institute's director in 2002 when Haddad, my predecessor, was appointed the executive director of FWC.

The institute has been in constant change over its history, even in my relatively short tenure at the lab. The changes have provided the challenges and opportunities for the institute to expand its research scope and investigate the complexities of Florida's natural resources. I'm extremely proud of the institute's past and look forward to the opportunities ahead. FWRI continues to be a place of excitement, of adventure, and of opportunity to explore, learn, and contribute. Florida must make forward-looking, informed manage-

ment decisions to protect critical resources and to balance competing demands for limited resources. These management decisions must be driven by timely, science-based information—the reason for the establishment of the Marine Laboratory in 1955, the focus of the Fish and Wildlife Research Institute today, and our guiding principle for the future.

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FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION, FISH AND WILDLIFE RESEARCH INSTITUTE.