

MOTE MARINE LABORATORY | 2006 ANNUAL REPORT



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## 2006 ANNUAL REPORT

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Traditionally, Mote Marine Laboratory makes its Annual Report in a printed document.

This year, Mote is pleased to provide a new online format that highlights a year's worth of accomplishments, changes and new efforts. This online document also includes a compilation of our research publications.

We invite you to explore other areas of Mote's website ([www.mote.org](http://www.mote.org)) to see all that it has to offer, including information about upcoming events hosted at the Lab and Aquarium, special programs offered by the Education Division and recent news about the organization.

As a marine science organization, we think these changes are important ones — not just to save trees and the cost of printing pages, though that is one reason we've made the switch — but because we know that more and more, people seeking information are turning to the Internet for answers.

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## MILESTONES

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Dear Friends,

Beginning with its founding in 1955, Mote Marine Laboratory has had a long history of remarkable milestones. Mote has demonstrated sharks' ability to learn, analyzed sharks' resistance to cancer, created and overseen what is today the world's longest-running study of wild dolphins, performed comprehensive studies of manatees and sea turtles, worked to understand red tide, its toxins and how they affect marine animals and humans, studied and helped protect coastal watersheds, taken a leading role in marine restocking studies, made enormous breakthroughs in recirculating water systems for aquaculture and begun unlocking the mysteries of coral disease in new ways.

These efforts have had impacts that go beyond our local community. Mote studies have helped protect humans affected by red tide, supported increased protections for endangered marine mammals and sea turtles and led to new breakthroughs for restocking dwindling fish populations and supplying fish for food in ways that do not harm the environment. We have also helped educate thousands of children and adults about our marine ecosystems.

2006 continued to mark many milestones, including the expansion of the Ann & Alfred Goldstein Marine Mammal Research & Rehabilitation Center, a 19-month construction project that provided more room for researchers who study and protect dolphins, manatees and sea turtles in the wild. The expansion included increasing the size of the public viewing area near the dolphins and a conference room that increases Mote's ability to support professional conferences and private functions.

In July, Mote also helped organize and host the first international conference of experts whose work focuses on *Karenia brevis*, the organism that causes

Florida's red tide. The conference marked a new era of interdisciplinary studies that we hope will lead to new efforts to help us better understand and deal with the impacts of Florida red tide.

Other milestones include the creation of a new Marine Policy Institute and a new joint effort with the University of South Florida designed to build a comprehensive real-time monitoring system to understand our coasts and oceans.

Such milestones are even more remarkable in light of a major setback: The July fire at Mote Aquaculture Park that led to the loss of a 25,000-square-foot building containing 16 sturgeon tanks and 54,000 pounds of fish. The fire slowed production efforts and pushed back our goal to use income generated from this project to help support aquaculture research.

We are at a critical period in Mote Marine Laboratory's evolution. State and federal funding of scientific studies is shrinking as operating costs increase. While technology is now allowing us to understand our marine ecosystems in more depth than ever before — and to provide that information to managers whose job it is to protect irreplaceable resources — the development and implementation of these new tools comes at a substantial cost. For instance, maintaining just one red tide detector — called a BreveBuster — on a channel marker or coastal buoy costs an estimated \$1,200 a month. Mote currently has a network of six detectors along the coast from Sarasota south to Naples.

Yet we at Mote feel that to pull back now — as public discussion of global climate change and the threatened loss of numerous animal species planet wide is occurring — would be a disservice to our 51-

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## MILESTONES ( continued )

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year history of scientific pursuit, and to the members, friends and donors who have long-believed in Mote's work.

Bill Mote stood squarely behind our mission because he understood what we would one day become: An integrated organization of people — of biologists and chemists, of educators and animal keepers, of volunteers and board members — working together to ensure that the things we care deeply about will remain in place for generations to come. Bill also knew that keeping the lights on and boats running is every bit as important as supporting individual research programs. To that end, we are working to build a larger endowment that will help support our mission of research and public outreach.

Mote continues to be honored by the strength and support we have received over the last half century from those who have stood with us during some of our most challenging moments. In 2006 alone, we welcomed more guests than ever at Oceanic Evening, our annual black-tie fundraiser. The event raised more than \$150,000. We also received an outpouring of community support for efforts to replace the building and systems lost in the Mote Aquaculture Park fire, and we hope that support will continue.

We were also overwhelmed by the level of expertise among the applicants for a new position created in 2006: Executive Vice President for Research. Dr. Glen Shen, who was chosen to fill the role, is a marine geochemist who brings with him a history of proven successes as a manager, researcher and university professor.

Dr. Shen will support and coordinate Mote's current research missions. He will also help us discover and implement new ways to fund our many efforts and serve as an advocate and liaison to governmental and non-governmental agencies, foundations and organizations.

The task is not his alone, however. Mote is fortunate to be able to draw upon the expertise of its Board of Trustees, Keys Advisory Board, the Advisory Council, 1,400 volunteers and 250 staff members as we move forward. We thank you for your continued support.

With gratitude,

A handwritten signature in black ink, appearing to read "Kumar Mahadevan".

Kumar Mahadevan, Ph.D.  
President

A handwritten signature in black ink, appearing to read "Mike B. McKee".

Mike B. McKee  
Chairman, Board of Trustees

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## EVOLUTION

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Mote's 51st year of research was marked by numerous first-time discoveries and accomplishments. Three new organizational initiatives in 2006 also signal changes in how Mote Marine Laboratory will operate for decades to come.

### **Joint Center of Excellence in Marine Science**

In August, collaborations between Mote researchers and colleagues at the University of South Florida gave birth to a new Mote/USF Joint Center in Coastal Ocean Studies. The initial science phase, named BioSense, is aimed squarely at establishing west Florida as a leader in a nascent, international program called the "Global Ocean Observing System." We need such new ocean sensing systems to help us better understand and protect our oceanic environments and resources as well as our coastlines and those who inhabit them. These systems will prove as critical to us as the existence of the National Weather Service.

The Mote-USF partnership will allow us to bring together technologies that monitor the physical and chemical parameters of the ocean — salinity and water temperature, for example — with those that measure its biological indicators — the production of phytoplankton, the location and sizes of particular fish stocks, the paths and patterns of protected marine mammals. Marrying the oceans' physical characteristics to biological indicators is important because it is largely biology that stimulates private and public groups to take action to protect coastal ecosystems.

New sensors will tell us, for example, whether a red tide bloom has initiated or whether the seasonal run of gamefish has arrived offshore. The information will be available to the public in real-time via the Internet and, perhaps, one day printed in daily newspapers right next to the weather section. Mote has already led the development of a network of BreveBusters along the coast to automatically detect red tide and has created a central clearinghouse for gathering, analyzing and

dispersing this information. The effort will be a model as we move forward with BioSense.

Eventually, this Mote-USF network will feed into technologies adopted by 11 newly established regional associations scattered throughout the continental U.S., Alaska, Hawaii and the Caribbean in what is called the U.S. Integrated Ocean Observing System. U.S.-based observations, data management and modeling will progress from local, such as west Florida, to regional scales, and — once integrated — to a global scale.

As with many modern research "Centers," the infrastructure of the new Mote-USF partnership is a virtual one, and the endowment base — \$10 million in private donations to be raised by Mote and USF and matched by the state of Florida — is mainly a source of seed funds. The real benefit of this Center lies in the spiritual union of researchers from different home bases and different areas of expertise. Such unions feed the creative engine and supply the multi-disciplinary talent needed to do good science, effectively compete for large grants and — of utmost importance — provide science-based information needed for good management of our ecosystems.

Increasingly, this is how marine science will be done in the 21st century. By anticipating this movement in coastal marine science, Mote and USF will be well-positioned to make signature contributions in critical areas of marine research.

### **Marine Policy Institute**

Just after the ceremonial launch of the new Joint Center in Coastal Ocean Studies, Mote announced the creation of a new Marine Policy Institute.

In many ways, the Policy Institute formalizes an ideology that Mote has favored for many years. Mote's expertise in high-profile marine species such as sharks, mammals, turtles, fish and corals, its long-standing

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## EVOLUTION ( continued )

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activity in coastal ecology, pollutant and red tide research and our more recent high-impact efforts in aquaculture, connects the Lab to the things that our society cares most about. Land development, habitat degradation, human health and overfishing are all key concerns for our citizens, our resource managers and, subsequently, our lawmakers. The Marine Policy Institute came about at Mote as part of its strategic plan created by the Lab and its Scientific Advisory Committee.

In addition to maintaining its historical partnerships with stakeholder groups and local, state and federal resource management agencies, Mote is creating a framework that brings social scientists, lawyers and economists into the discussion to help translate marine scientific findings for the public good. The Policy Institute will make issues understandable to the public and policy makers by writing clear articles and convening town-hall style meetings designed to ensure that laws and regulations affecting our marine resources are grounded in the best science possible and that all parties have access to information.

The menu of issues relevant to west Florida is extensive: red tide, beach renourishment, commercial-scale aquaculture, sea level rise and land-based effects on coastal environments are but a few.

Mote is grateful to Professor Frank Alcock of New College of Florida for his leadership in growing this enterprise during its startup phase. Dr. Alcock's analysis of current red tide research and the associated public debate for the Marine Policy Institute will help thrust it into the spotlight in 2007.

### **Executive Vice President for Research**

A third Mote initiative in 2006 was the creation of the office in which I reside. It is a tribute to Mote's efficiency as an independent laboratory that the Lab has managed a \$10 million-plus research portfolio since 2003 with only a skeleton administrative staff. The creation of this office is also yet another sign of changing times.

My chief role as Executive Vice President for Research is to help Mote navigate increasingly turbulent waters in the research funding domain. Sponsorship of marine research at the federal level falls mainly on two agencies: the National Science Foundation (NSF) and the National Oceanic and Atmospheric Administration (NOAA). The combined budgets of these two agencies is less than one-third that of the National Institutes of Health and about one-eighth that of the Defense Research and Development budget.

It is not uncommon for Mote scientists to face average success rates of 15 percent when submitting federal grant proposals to pay the costs of their research, including their own salaries and those of their staff. As a result, Mote has had to rely heavily in recent years on state, local, and foundation grants — many of which are small awards requiring a disproportionately large amount of proposal writing and reporting effort.

Few people realize that research grants do not pay 100 percent of the costs of running a research laboratory. In fact, the more money raised through grants, the more supplemental funds are needed to cover the costs of “overhead” that grants do not pay.

This is why the American research landscape is dominated by academic and government labs — taxpayer, tuition and alumni funds provide those organizations the “hard money” floor on which scientists can depend and also use to cover any overhead deficit.

In Mote's case, rapid growth in research has enabled our expansion into new and exciting avenues, but growth brings new and sometimes difficult choices. Thankfully, the generosity of our many donors, Aquarium members and volunteers has enabled us to keep pace so far.

The road ahead will be rocky despite the potential of modest increases in ocean science funding from governmental sources. The Lab must be strategic in thinking through its science plan for the future, aggressive

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## EVOLUTION ( continued )

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in recruiting new investigators with multi-disciplinary vision and proactive in recognizing opportunities to help promote the globalization of science.

The bedrock, however, must be research excellence. This encompasses everything from the highest-caliber staff to real teamwork, efficiency and shared vision. If these elements are secure, support has a way of finding the most deserving practitioners.

I am very proud and excited to be joining Mote at this pivotal time in the Laboratory's history. As a recognized leader in marine research, Mote and its scientists and remarkable volunteer corps can make a real difference at a time when the challenges facing our oceans are growing. I hope that my experience will strengthen Mote's ability to execute its diverse research and education missions.

A handwritten signature in black ink, appearing to read "Glen T. Shen".

Dr. Glen T. Shen  
Executive Vice President for Research

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## MOTE FIRSTS, 2006

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In 2006, Mote marked many milestones through its seven research centers, Mote Aquarium and through the Education Division. As we move into our next 50 years of research, we are confident that the organization will continue to set and reach new goals that are important to Sarasota, to Florida and to the nation. While we are unable to detail all of Mote's many research accomplishments here, we encourage you to log onto [www.mote.org](http://www.mote.org) to find out more.

### **Risso's Dolphin Rehabilitation, Release and Tracking**

"Clyde," a Risso's dolphin that initially stranded off Marco Island in Collier County in July 2005, was released in February 2006. The release marked the first time Mote had ever treated and released this species of dolphin, a deep-water species rarely seen inshore. Risso's dolphins, *Grampus griseus*, are one of the larger species of dolphin and often compared to pilot whales because of their similar head and body shapes. From tracking via a satellite-linked radio transmitter, Mote scientists documented the deepest dives ever recorded for this species, to depths of 1,300 to 1,600 feet, and provided new information on the habits of Risso's dolphins.

### **Satellite Tracking a Threatened Argentinian Dolphin**

For the first time, scientists with the Sarasota Dolphin Research Program, in collaboration with AquaMarina, Chicago Zoological Society, Wildlife Trust, and Disney, conducted the first tracking of Franciscana dolphins via satellite-linked transmitters. These small dolphins, found only in the coastal waters of Argentina, Uruguay and Brazil, are being decimated by local coastal fisheries, while remaining largely unknown to scientists. Findings from tracking over more than eight months indicated this species remains in very localized areas, an even smaller range than that of the long-term resident Sarasota Bay bottlenose dolphins. The information could help managers create new measures to protect the species. The tagging was done in March and the dolphins were followed through November.

### **Dolphins Know What's in a Name**

Working with the Sarasota Dolphin Research Program, scientists from Scotland's St. Andrews University and the Woods Hole Oceanographic Institution determined for the first time that bottlenose dolphins recognize signature whistles as "names." They are able to recognize themselves and others of their species as individuals with separate identities. The ability to assign abstract labels to individuals, as is done by humans, is rare in the animal kingdom. The study was published in May in the journal *Proceedings of the National Academy of Sciences*.

### **Closing the Snook Lifecycle in Marine Restocking**

Mote reached a milestone in May, that was repeated in June, July and August, by growing and maturing snook in climate controlled facilities and inducing them to spawn. Both female and male snook spawned in tanks inside rooms where temperature and lighting conditions could be changed to mimic natural conditions. The studies suggest that by controlling environmental conditions, Mote will be able to "close the lifecycle" by rearing fish from eggs to release stage — an important development in marine restocking efforts for snook and other species.

### **Great Hammerhead**

Mote scientists performed a necropsy, or animal autopsy, in June on a 14.5-foot great hammerhead that weighed 1,280 pounds and found it to be pregnant with 56 pups. The finding was a first and marked the largest litter of pups ever described for this species of shark. A plaster cast of the shark is now on display in Mote Aquarium. Incidentally, this shark is listed by the International Game Fish Association as an "All-Tackle World Record" for great hammerheads caught on rod-and-reel.



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## MOTE FIRSTS ( continued )

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### Talking Red Tide

In July, red tide experts gathered from across the nation to talk specifically about the organism that causes red tide blooms in the Gulf of Mexico. This first-forum-of-its-kind was designed to bring experts from a variety of scientific disciplines together to discuss red tide and provide a public forum to allow coastal residents from Pinellas County south to Collier to discuss their concerns about red tide.

### 1st Coral Spawning Expedition

Mote organized a coral spawning study in the Florida Keys National Marine Sanctuary. Working in conjunction with the National Oceanic and Atmospheric Administration, Mote and collaborators created a mechanism to capture the sperm and eggs released by the corals. The gametes were then mixed together to fertilize them and brought back to the Lab to grow for future research efforts. Studies on the research cruise include looking at the role bacteria play in the settlement and development of new corals.

### Dolphin Stripped of Speedo — No Kidding

In an odd kind of first, a team of Mote researchers in August freed a male bottlenose dolphin from a man's bikini bathing suit, which had been caught on the animal's torso for several weeks, cutting into its flippers and endangering the animal. The dolphin has been known by the Sarasota Dolphin Research Program since 1998 and is nicknamed "Scrappy." Sarasota Bay is home to approximately 150 resident bottlenose dolphins that have been studied by Mote researchers through five generations for more than 36 years.

### Those Traveling Whale Sharks

Using high-tech instruments that record depth, temperature and position data and report to the Laboratory via satellite, Mote documented the deepest dive ever recorded of a whale shark, the world's largest species of fish. The shark was tagged off the Yucatan peninsula of Mexico

and migrated over the central Gulf of Mexico, where it made daily dives as deep as 1,376 meters — that's more than over 4,500 feet. The shark's deepest dive was recorded in October.

### From Red Tide Reports to Real-Time Knowledge

For the first time, visitors to Sarasota County beaches have access to real-time information about beach conditions. Through the "Beach Conditions Report" online at [www.mote.org/environmentalupdates](http://www.mote.org/environmentalupdates), Mote has partnered with the Florida Department of Health and Sarasota County lifeguards to provide information about current beach conditions — including the presence of red tide, dead fish and respiratory irritation among people already at the beach. The Beach Conditions Report went online for the first time over Labor Day weekend and is expected to be available at beaches in other counties in the future. The report is also available at (941) 388-5223.

### Caviar, Anyone?

October marked a first for Mote Aquaculture Park: The park produced and sold caviar for the first time — becoming the first in the state to do so. Mote Aquaculture Park is a state-of-the-art commercial demonstration project innovating new water recirculation technology and animal husbandry techniques to produce marine and freshwater species, including sturgeon, the fish that caviar comes from. One goal at the park is to determine whether the use of environmentally friendly techniques in aquaculture is economically feasible.

### Just How Old are Those Whales?

A technique originally developed by geologists to age fossils has been modified to determine the age of Arctic bowhead whales using chemical changes in the eye lens. This exciting breakthrough, announced in November, may allow scientists to verify that bowhead whales may live up to 200 years and may also allow scientists to determine age in other species of whales and seabirds, providing critical information about species or habitat management.

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## MOTE FIRSTS ( continued )

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### **A Snook-Eat-Snook World**

For the first time, Mote scientists have documented cannibalism of juvenile snook by adult snook in nursery habitats. The findings shed light on how juvenile snook use habitats and how man-made changes to juvenile habitats may affect the species.

### **Sinking Into Science**

New studies of offshore sinkholes and caverns — which extend hundreds of miles beneath the Gulf of Mexico floor — showed the possibility of freshwater discharge at sea. These newly discovered systems may be among the world's largest, opening new avenues for research in marine biodiversity and archaeology.

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## SCIENCE

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### **Center for Shark Research**

Director: Robert E. Hueter, Ph.D.

Designated by the U.S. Congress as a national center for shark research in 1991.

Mission: Dedicated to the scientific study of sharks, skates and rays; research ranges from studies of sharks' molecular biology in the lab to studies of shark populations in the sea.

#### 2006 Programs and Managers:

Elasmobranch Behavioral Ecology: Michelle Heupel, Ph.D. Examines shark movement patterns and shark habitats in coastal estuaries and rivers. Elasmobranch Fisheries & Conservation Biology: Colin Simpfendorfer, Ph.D. Assesses the population and critical habitat for the endangered smalltooth sawfish and commercial shark species, and assesses ecosystem models for sharks and rays. Elasmobranch Physiology & Environmental Biology: James Gelsleichter, Ph.D. Studies the reproductive physiology of live-bearing sharks and rays. Marine Biomedical Research: Carl Luer, Ph.D. Studies disease resistance, biochemistry and embryonic development of sharks, skates and rays. Marine Immunology: Cathy Walsh, Ph.D. Characterizes cellular immune function in elasmobranchs, identifies immune regulatory factors and characterizes environmental stressors on manatee health. Shark Biology: Robert E. Hueter, Ph.D. Studies shark abundance, nursery grounds, fisheries impacts, shark feeding mechanisms and shark sensory systems.

### **Center for Coastal Ecology**

Director: Ernest D. Estevez, Ph.D.

Mission: Studies the relationships between organisms and their environments in Florida's coastal waters in order to develop scientific methods to restore and protect marine resources.

#### 2006 Programs and Managers:

Benthic Ecology: James Culter. Explores life in the bottom sediments of Florida's rivers, bays and estuaries and conducts nationally significant studies at electric power stations. Chemical Ecology: L. Kellie Dixon, Ph.D. candidate. Monitors coastal water quality in Sarasota County and Charlotte Harbor and is working to advance the study of marine optics. Coastal Resources: Ernest D. Estevez, Ph.D. Develops methods and applications to use mollusks as markers to portray ecological conditions in tidal rivers and coordinates the Charlotte Harbor Research Program. Landscape Ecology: Brad D. Robbins, Ph.D. Works to understand wild celery grass ecology in the Caloosahatchee River and uses Geographic Information Systems for large-scale marine ecological studies.

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## SCIENCE ( continued )

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### **Center for Marine Mammal and Sea Turtle Research**

Director: Randall S. Wells, Ph.D.

Mission: Provides information to enhance the understanding of the biology and habitat requirements for marine mammals and sea turtles to help inform management decisions, and provides professional leadership support for students and programs worldwide.

#### 2006 Programs and Managers:

Dolphin Research: Randall S. Wells, Ph.D. Studies coastal dolphins to understand the population dynamics and structure of small cetaceans and the human factors that affect them. The work is done in collaboration with the Chicago Zoological Society and colleagues worldwide. Offshore dolphin studies seek to understand deepwater dolphin species from a genetic to a population level. Manatee Research: John Reynolds III, Ph.D. Partners with other organizations to answer questions about manatee biology, health and behavior to understand the species and help inform management decisions and educate the public. Sea Turtle Conservation and Research: Tony Tucker, Ph.D. Coordinates turtle monitoring activities in most of Sarasota County to aid in assessment of beach nourishment projects. Satellite tags on nesting females are tracking the migratory paths and inter-nesting habitat use for the largest loggerhead turtle rookery in the Gulf of Mexico. Sensory Biology and Behavior: William Tavolga, Ph.D. Studies the sensory and cognitive processes in a variety of marine mammals. Stranding Investigations: Nélio Barros, Ph.D. Provides 24-hour response to marine mammal and sea turtle strandings in coastal Southwest Florida and offers logistical stranding support to state manatee biologists. Studies seek to understand the natural history of cetaceans and sea turtles and evaluate long-term mortality trends.

### **Center for Ecotoxicology**

Director: Richard H. Pierce, Ph.D.

Mission: Investigates the sources of natural biotoxins and chemical pollutants and how they break down in the marine environment. This center also assesses the risks such toxins pose to public health and natural resources and seeks new techniques to monitor and reduce those effects.

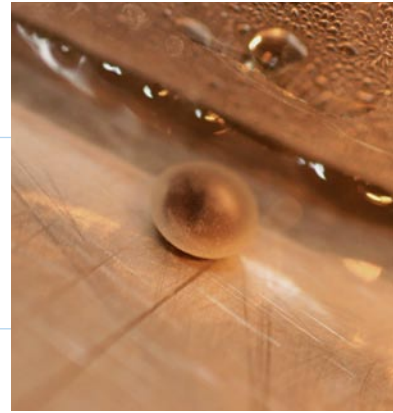
#### 2006 Programs and Managers:

Aquatic Toxicology: Dana Wetzel, Ph.D. Assesses petroleum residues and pesticides in marine mammals eaten by native subsistence hunters and looks for biomarkers that could assess other toxins in other groups of marine mammals. Chemical Fate and Effects: Michael Henry. Studies seek to discover how natural toxins and chemical pollutants are distributed, persist and break down in the marine environment. Environmental Health: Barbara Kirkpatrick, Ed.D. Studies how humans are affected by airborne red tide toxins and how to effectively educate residents and visitors about those findings. Phytoplankton Ecology: Gary Kirkpatrick, Ph.D. Addresses phytoplankton behavior, photophysiology and bloom dynamics, especially red tide. Studies seek to understand how harmful algae function at cellular, community and ecosystem levels.

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## SCIENCE ( continued )

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### **Center for Fisheries Enhancement**

Director: Kenneth M. Leber, Ph.D.

Mission: Strives to substantially increase the knowledge of how to preserve and responsibly enhance coastal fish and invertebrate populations.

2006 Programs and Managers:

Fish Biology: Karen Burns, Ph.D. candidate. Works to understand the life history and migratory patterns of coastal, pelagic and reef fishes as the foundation for stock management. Fisheries Assessment and Ecosystem Management: Carl Walters, Ph.D., William and Lenore Mote Eminent Scholar in Fisheries Ecology. Addresses the need for reliable stock assessment. Fisheries Habitat Ecology: Aaron Adams, Ph.D. Advances knowledge about how to maintain fish habitats and understanding which species most benefit from an increase in habitat. Marine stock enhancement: Kenneth Leber, Ph.D. Focuses on developing marine stock enhancement technology to restore depleted populations, augment fishery yields and advance basic knowledge about wild stocks. Develops effective strategies for using hatcheries to help conserve coral reef communities.

### **Center for Coral Reef Research**

Director: David Vaughan, Ph.D.

Mission: Dedicated to the restoration and preservation of coral reefs in collaboration with other research organizations in Florida Keys.

2006 Programs and Managers:

Coral Reef Science and Monitoring: Erich Bartels. Evaluates the biology and health of coral reef ecosystems. Coral Reef Restoration: David Vaughan, Ph.D. Seeks to develop systems and techniques to grow coral species for replanting in depleted reef systems and for scientific study. Marine Microbiology: Kimberly Ritchie, Ph.D. Seeks to establish health assessments for Florida coral reefs and to create microbial baselines of coral communities.

### **Center for Aquaculture Research and Development**

Director: Kevan L. Main, Ph.D.

Mission: Dedicated to finding innovative and cost-effective systems and husbandry techniques to produce high-value marine and freshwater fish and shellfish.

2006 Programs and Managers:

Marine Aquaculture Research: Kevan L. Main, Ph.D. Develops the technology and husbandry techniques to farm high-value species to advance Florida's food fish aquaculture industry and works on techniques to help restore juvenile snook, coral and other marine fish and invertebrate species. Marine Shrimp Commercial Demonstration: Ryan L. Gandy, Ph.D. Uses commercial-scale raceways and recirculating systems to produce food and bait shrimp in low salinity conditions. Sturgeon Commercial Demonstration: James T. Michaels. Seeks to develop systems and techniques to produce caviar and sturgeon for luxury food markets and promote a new aquaculture industry. In so doing, the program will help relieve pressure on wild sturgeon stocks and fill the current gap of supply vs. demand for food fish.

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## EDUCATION

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In today's world, science learning isn't just about memorizing definitions and following a rigid curriculum. Guidelines created by the National Committee on Science Education Standards and Assessment and the National Research Council focus instead on providing opportunities for investigation, discussion and inquiry.

Mote Marine Laboratory's Education Division has long emphasized these ideas — and added entertainment into the mix — for all of its audiences through three centers: the Center for Distance Learning, The Center for School and Public Programs and the Center for Volunteer and Intern Resources.

Mote education programs seek to teach many different groups about the oceans by engaging them and making learning entertaining whether people are exploring the myths of sea monsters, participating in training classes taught by Mote experts or even spending the night at Mote Aquarium during “Sea Snoozes.”

Interaction and entertainment are critical to engaging people in the learning process. Interactive entertainment that is also educational is the idea behind Mote's Digital Docents program, which was funded in 2005 by the Institute of Museum and Library Services (IMLS) and implemented in 2006. IMLS is an independent, federal grant-making agency dedicated to creating and sustaining a nation of learners by helping libraries and museums serve their communities. Only 49 organizations of the 259 that applied for the competitive National Leadership Grant received funding in 2005.

Digital Docents combines innovative traveling exhibits with special live programming via the Internet based on the methods Mote pioneered through SeaTrek, which is high-energy, multi-media science programming that uses videoconferencing and the Internet to “transport” Mote's science educators to classrooms across the country and world.

In the case of Digital Docents, the exhibits are designed for general audiences of all ages who visit Mote Aquarium and 10 partner museums. “Sea Monsters” was the first of three traveling exhibits to be produced, and it focused on the sea's “monsters”: whale sharks, tasseled wobbegongs, giant squid and other interesting creatures. The first exhibit met with resoundingly positive response when it was unveiled in August at the Cranbrook Institute of Science in Bloomfield Hills, Mich.

So far, the exhibit has traveled to two of its 10 venues. Each includes a minimum of 12 interactive videoconference programs that connect Mote experts to people in locations around the country. The next Digital Docents program will feature corals and the third will focus on wildlife rescue, rehabilitation and release.

### **SeaTrek**

2006 saw a 20 percent increase in demand for SeaTrek programs. New programs were also developed on coral reefs and ocean fisheries.

### **New Programs**

Mote's Education Division brought aboard new staff with new expertise in 2006 to expand its suite of programs for families and for homeschool students. “Mommy and Me at Mote” classes begin in 2007 and are fun, age-appropriate programs designed for children ages 2-5 and their parents or caregivers. The division is also expanding SeaSnoozes, Mote Aquarium sleepovers designed for older children, and offering regular family programs on the second Saturday of each month year-round.

### **Programs for Homeschoolers**

Other audiences Mote's Education Division is reaching out to include homeschool students. The division hosted more than 250 homeschool students through classes, lab programs, videoconferences and

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## EDUCATION ( continued )

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“Homeschool Days,” a day of special offerings in Mote Aquarium geared toward students who don’t attend school in a classroom setting. Mote expanded its homeschool program to reach more students and offer them a variety of fresh learning experiences.

Collectively, volunteers donate more than 200,000 hours of their time each year to help support the staff at Mote Marine Laboratory. After participating in 13 training classes, volunteers take on important and vital jobs helping educate Mote Aquarium visitors, doing special behind-the-scenes tours and even dressing up as Mote mascot Gilly the shark. Volunteers also help with field work in close connection to Mote’s research staff. “In the end,” says Andrea Davis, Director of Volunteer and Intern Resources, “it’s about matching up the right person to the right position. We want our volunteers to get as much enjoyment from being at Mote as we do from having them here.”

*David Niebuhr*

Dr. David Niebuhr  
Vice President, Mote Education Division

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## AQUARIUM

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Mote Aquarium was full of excitement in 2006 with the launch of two new exhibits showcasing Mote science research, numerous successful animal rehabilitation and release efforts and a special promotion to help introduce Florida residents to Sarasota County's cultural institutions. All told, 370,759 visitors came to the Aquarium. The Mote Mobile Exhibit introduced Mote Marine Laboratory to another 250,000 people at 60 events across the state.

### **New Exhibits**

The SharkTracker exhibit uses two computer touch-screens to show how Mote scientists track sharks in the wild using acoustic receivers. The exhibit highlights research on shark movement patterns and habitat use and was designed to teach the public how important coastal bays and waterways are to juvenile sharks and other marine life.

The touch-screens allow visitors to navigate among different topics and see interviews with Dr. Michelle Heupel, the lead researcher. The exhibit also features bonnethead sharks, marking the first time that Mote Aquarium has showcased this species.

SharkTracker was sponsored by lead donor Carol Miller, with grants from the Roberta Leventhal Sudakoff Foundation, The National Science Foundation, the Florida Division of Cultural Affairs, the New Amsterdam Charitable Foundation and Taylor and Sarah Karp.

Mote Aquarium also redesigned and expanded The Mysterious Convict Fish exhibit, which is based on the research of Dr. Eugenie Clark, Mote's founding director. The exhibit features two monitors that show live video from inside the coral tunnels where the fish spend their adult lives. The monitors allow visitors to see the secretive habits of these fish whose behaviors were largely unknown until Dr. Clark began her research on them in Papua New Guinea in 1990. The video is also streamed live into her office at Mote so she can continue watching the fish and learn more about their behavior. The Mysterious Convict

Fish exhibit was sponsored by Windsor P. Booth Jr. and John A. Brady Sr.

### **Rehabilitation Hospitals**

Mote treated 37 sea turtles in 2006, up from 33 in 2005 and 29 in 2004. Fourteen turtles were released (two are still in rehab) after successful treatment, including four that were outfitted with satellite transmitters that allowed Mote's Sea Turtle Research and Conservation Program to track their movements once they returned to the wild. The tags automatically report information to satellites, which relay it to the researchers via computer with the data posted at [www.seaturtle.org](http://www.seaturtle.org). Funding for the satellite transmitters was provided by 1800endoscope.com, WhaleNet, Bruno and Carol Falkenstein and Project Sea Turtle, a children's environmental camp created by Anna Maria Island Turtle Watch.

Mote used a different kind of tag to track an Atlantic bottlenose dolphin that was successfully treated and released in 2006. "Val" was covered with abscesses and was dehydrated and emaciated when she stranded in Oldsmar, Fla. After 102 days of treatment, she was released from the Courtney Campbell Causeway in Safety Harbor, Tampa Bay. Before release, Val was outfitted with a VHF radio transmitter that allowed her movements to be tracked by the Sarasota Dolphin Research Program. Staff recorded her location on six occasions before the transmitter stopped sending signals, indicating the success of the Dolphin and Whale Hospital's treatment.

### **Research with Hugh and Buffett**

Mote's resident manatees, Hugh and Buffett are the only manatees in the world trained to participate in husbandry and research behaviors. The research is designed to help scientists understand how manatees use their senses to perceive their surroundings, and how that knowledge can be used to develop appropriate management strategies to protect endangered manatees in the wild. Studies with Hugh and Buffett have already



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## AQUARIUM ( continued )

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shown that manatees may have relatively poor vision, but they do have an extremely good sense of touch in their vibrissae, or whiskers. In 2006, studies focused on how good manatees are at sound localization, that is, how good they are at figuring out where sounds are coming from. Researchers showed that manatees are very good at this task, which may provide better insight in understanding interactions between boats and manatees in the wild.

### Museum Month

Mote Aquarium helped create “Museum Month” in 2006 to help introduce Florida residents to the cultural offerings that abound in Sarasota County. Mote, Marie Selby Botanical Gardens, John and Mable Ringling Museum of Art, Crowley Museum and Nature Center, Historic Spanish Point and G. WIZ offered special events and discounts to encourage residents to support local attractions. The promotion, supported by the Sarasota Convention & Visitors Bureau, helped boost attendance, resulting in 30 percent more visitors during September 2006 than in September 2005.

A handwritten signature in black ink, reading "Dan Bebak". The signature is written in a cursive style with a long horizontal stroke at the end.

Dan Bebak  
Vice Preident, Mote Aquarium

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## PROTECTING OUR REEFS

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In February, the Protect Our Reefs grants committee awarded 16 grants to support coral reef research, conservation and education efforts. The awards marked the first grants from funds raised through the sale of the Protect Our Reefs specialty license plate. Mote Marine Laboratory directs funds generated by plate sales to Florida organizations that perform coral research, conservation and outreach. The \$295,000 awarded included funding for new reef research and education efforts designed to help understand and protect coral reefs.

Florida's coral generates more than \$1.2 billion annually for the state's economy as a primary attraction for snorkelers, divers, anglers, boaters and other tourists. "The reefs play an extremely vital role in Florida — not just to the economy, but toward protecting our coastlines and keeping healthy marine animal populations," said Bruce Frerer, chairman of the Protect Our Reefs Grants Advisory Committee. "The Florida drivers who have 'stepped up to the plate' by buying this specialty license tag are showing their support to help bring back this valuable resource."

Grants were awarded to nonprofit organizations for efforts on the major reef tract that extends from Miami to the Dry Tortugas. Studies funded in 2006 ranged from reef monitoring programs and studies of reef microbiology to coral and urchin restoration and new outreach efforts.

Log onto to [www.mote.org/4reef](http://www.mote.org/4reef) to find out how to get your reef plate.



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## THANK YOU

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Mote Marine Laboratory is a unique organization. Not many facilities conduct such varied scientific research or boast scientists widely known and respected for their cutting-edge programs. Much of this research occurs right down the hall from a well-established tourist attraction and across the street from education programs that are beamed throughout the world! Mote's support base is similarly diverse. While we receive a portion of our funds from government agencies, our largest source of financial support comes from individuals and private family foundations. Our donors are from all parts of the United States and abroad.

We are very grateful to all of our supporters and want to take this opportunity to publicly thank them for their generosity. This support is critical to Mote's continued success as a marine research facility and Sarasota's No. 1 tourist attraction.

A handwritten signature in black ink that reads "Ronald A. Johnson". The signature is written in a cursive, flowing style with a large, sweeping initial "R" and a long, horizontal tail stroke.

Ron Johnson  
Chair, Development Committee

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# FINANCIAL REPORT

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MOTE MARINE LABORATORY, INC. AND SUBSIDIARIES  
STATEMENTS OF CONSOLIDATED FINANCIAL POSITION  
DECEMBER 31, 2006 AND 2005

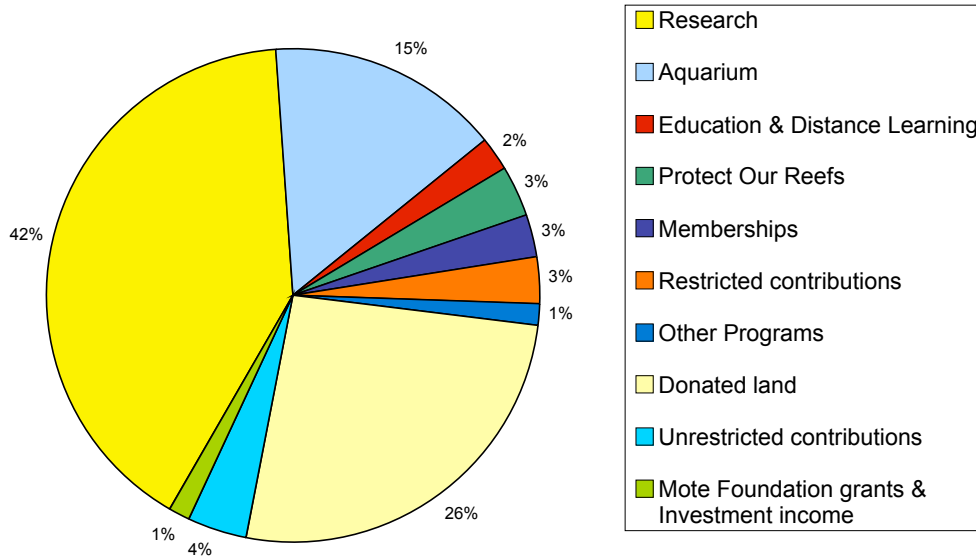
	<u>2006</u>	<u>2005</u>
<u>Assets</u>		
Cash and cash equivalents	\$ 2,239,250	\$ 2,116,045
Accounts receivable	202,495	94,779
Research grants receivable	2,206,379	2,082,803
Bequest receivable	-	452,517
Pledges receivable	271,587	291,500
Inventory	194,352	180,903
Prepaid expenses and other assets	79,021	61,528
Donated assets held for sale	-	20,100
Investments	20,760	5,976
Land	7,498,190	492,240
Construction in progress	371,509	4,965,376
Property and equipment, net	25,012,986	19,426,582
Beneficial interest in the net assets of Mote Marine Foundation, Inc.	<u>12,452,304</u>	<u>11,674,000</u>
Total Assets	<u>\$ 50,548,833</u>	<u>\$ 41,864,349</u>
<u>Liabilities and Net Assets</u>		
Liabilities		
Accounts payable	\$ 655,641	\$ 1,827,836
Accrued payroll	539,133	514,249
Memberships relating to future periods	525,115	597,187
Due to Mote Marine Foundation, Inc.	9,719	7,408
Funds advanced on research programs	2,336,434	1,649,358
Line of credit	7,391,125	2,345,591
Notes payable	<u>2,401,345</u>	<u>2,504,737</u>
Total liabilities	<u>13,858,512</u>	<u>9,446,366</u>
Net Assets		
Unrestricted	23,393,826	19,841,198
Temporarily restricted	4,447,772	3,909,239
Permanently restricted	<u>8,848,723</u>	<u>8,667,546</u>
Total net assets	<u>36,690,321</u>	<u>32,417,983</u>
Total Liabilities and Net Assets	<u>\$ 50,548,833</u>	<u>\$ 41,864,349</u>

**MOTE MARINE LABORATORY, INC. AND SUBSIDIARIES**  
**STATEMENTS OF CONSOLIDATED ACTIVITIES**  
**YEARS ENDED DECEMBER 31, 2006 AND 2005**

	<u>2006</u>	<u>2005</u>
<b>Changes in Unrestricted Net Assets</b>		
Program revenue		
Research grants		
Federal	\$ 5,205,113	\$ 5,401,917
State	3,025,517	3,688,518
Other	3,648,707	5,038,008
Aquarium		
Admission fees	3,368,239	3,342,364
Gift shop	1,135,038	1,191,078
Other	295,147	301,285
Memberships	795,917	752,292
Education	628,571	849,192
Protect Our Reefs-License Plate	853,388	566,042
Other programs	372,222	383,373
Contributions	993,809	1,622,088
Donated assets	7,036,612	185,743
Grants from Mote Marine Foundation, Inc.	392,483	364,820
Investment income	71,779	31,016
Realized loss on investments, net	(767)	(171)
Realized gain (loss) on disposal of assets	(89,119)	14,896
Insurance settlement	-	165,000
Net assets released from restrictions	1,340,288	1,861,994
<b>Total unrestricted revenues and support</b>	<u>26,872,938</u>	<u>23,580,039</u>
<b>Expenses</b>		
Program services		
Research	13,584,906	13,965,707
Education	896,494	887,178
Aquarium	3,824,223	3,335,438
Protect Our Reefs-License Plate	846,289	565,295
Other	685,761	790,614
Supporting services		
Administrative and general	1,658,363	1,359,897
Fund raising	1,044,212	1,044,954
<b>Total expenses</b>	<u>23,540,238</u>	<u>20,859,081</u>
<b>Increase in unrestricted net assets before extraordinary item</b>	<u>4,332,698</u>	<u>3,720,958</u>
Extraordinary item- loss from fire	(780,061)	-
<b>Increase in unrestricted net assets</b>	<u>3,552,637</u>	<u>3,720,958</u>
<b>Changes in Temporarily Restricted Net Assets</b>		
Contributions		
Construction	702,576	866,629
Aquarium	384,206	298,211
Other programs	87,624	119,702
Unrealized loss on investments, net	1,038	-
Investment income	4,028	4,050
Change in net assets of Mote Marine Foundation, Inc.	599,127	1,850,718
Grant from Mote Marine Foundation, Inc.	230	86,265
Net assets released from restrictions	(1,340,288)	(1,861,994)
<b>Increase (decrease) in temporarily restricted net assets</b>	<u>538,533</u>	<u>1,363,573</u>
<b>Changes in Permanently Restricted Net Assets</b>		
Contributions for endowment fund	2,000	9,000
Change in net assets of Mote Marine Foundation, Inc.	179,178	(42,855)
<b>Increase in permanently restricted net assets</b>	<u>181,178</u>	<u>(33,855)</u>
<b>Increase in net assets</b>	<u>4,272,338</u>	<u>4,030,676</u>
Net assets at beginning of year	<u>32,417,983</u>	<u>38,387,307</u>
<b>Net assets at end of year</b>	<u>\$ 36,690,321</u>	<u>\$ 32,417,983</u>

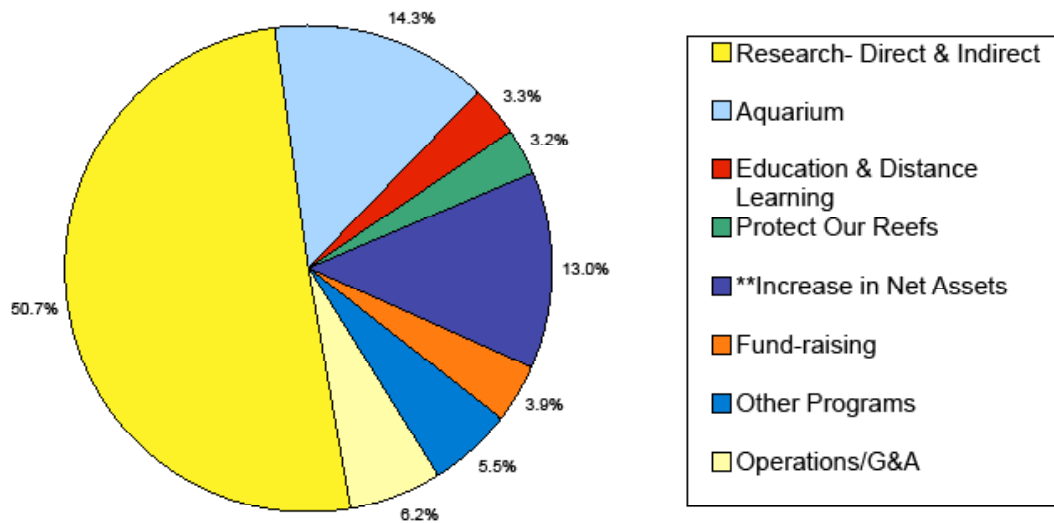
# FINANCIAL REPORT ( continued )

## Mote Marine Laboratory REVENUES 2006 Total \$26,814,332



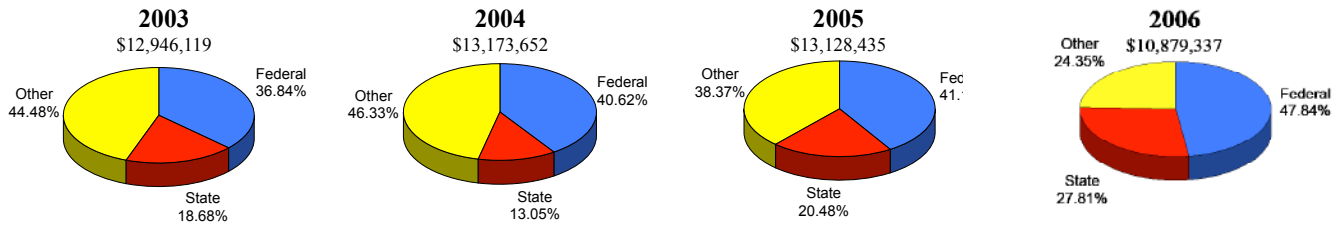
## Mote Marine Laboratory EXPENSES & NET ASSETS 2006 Total \$26,814,332\*

Expenses \$23,320,299 Increase in Net Assets \$3,494,033  
\*Does not include change in Net Assets of Mote Marine Foundation \*\*Includes construction, land, property & equipment

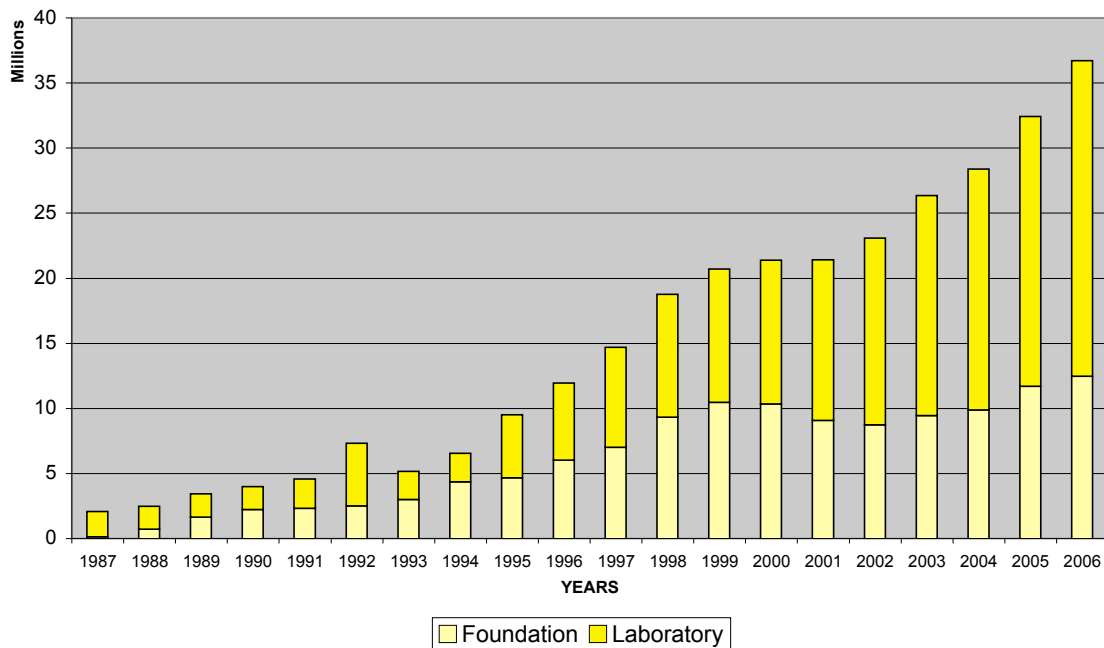


# FINANCIAL REPORT ( continued )

## RESEARCH REVENUES



## TOTAL NET ASSET GROWTH 20 YEARS 1987-2006



The Statement of Financial Position and the Statement of Activities included are excerpts from our complete set of financial statements audited by Kerkering, Berberio & Co., P.A., for the years ended Dec. 31, 2006 and 2005. The complete set of audited financial statements can be obtained from Dena Smith, Chief Financial Officer or downloaded from [www.mote.org/2006audit](http://www.mote.org/2006audit).

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California Institute of Technology (Pasadena, CA)  
California State University-Long Beach (Long Beach, CA)  
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Caribbean Conservation Corporation (Gainesville FL)  
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Coastal Wildlife Club, Inc. (FL)  
Collecte Localisation Satellites (Ramonville, France)  
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Dolphin Quest (San Diego, CA)  
Duke University Marine Lab (Durham, NC)  
Easter Seals/MARC Southwest Florida (Sarasota, FL)  
Eckerd College (St. Petersburg, Florida)  
El Colegio de la Frontera Sur (Chetumal, Mexico)  
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Extreme Edge Fishing (Sanford, FL)  
FLW-Walmart Redfish Tour (Benton, KY)  
Field Museum of Natural History (Chicago, IL)  
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Florida Atlantic University (Boca Raton, FL)  
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Florida Department of Environmental Protection (Tallahassee, FL)  
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Florida Gulf Coast University (Fort Myers, FL)  
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Florida Institute of Technology (Melbourne, FL)  
Florida International University (Miami, FL)  
Florida Keys National Marine Sanctuary (Marathon and Key West, FL)  
Florida Power & Light Corporation (Miami, FL)  
Florida Sea Grant (Gainesville, FL)  
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Oberto National Series Tournaments (Little Rock, AR)  
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Optech International (Vaughan, Ontario, Canada)  
Oregon Graduate Institute of Science and Engineering (Beaverton, OR)  
Panamerican Consultants, Inc. (Memphis, TN)  
Parker Aquarium (Bradenton, FL)  
Pelican Man Bird Sanctuary (Sarasota, FL)  
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Snook Foundation, The (Sarasota, FL)  
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South Carolina Department of Natural Resources (Columbia, SC)  
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University of North Carolina at Wilmington (Wilmington, NC)  
University of Paris (Orsay, France)  
University of Rome "La Sapienza" (Rome, Italy)  
University of South Alabama (Mobile, AL)  
University of South Florida (Biology, Tampa, FL)  
University of South Florida, College of Marine Science, Center for Ocean Technology (St. Petersburg, FL)  
University of South Florida Children's Research Institute (St. Petersburg, FL)  
University of South Florida College of Medicine (Tampa, FL)  
University of Southern Mississippi, Department of Marine Science (Stennis Space Center, MS)  
University of Southern Mississippi's, College of Science & Industry, Gulf Coast Research Lab (Ocean Springs, MS)  
University of Stirling (Stirling, Scotland)  
University of Texas, Marine Science Institute (Port Aransas, TX)  
University of Texas, Department of Chemistry and Biochemistry (Austin, TX)  
University of the West Indies (Barbados)  
University of Toronto (Toronto, Ontario)  
University of Western Illinois (Moline, IL)  
Virginia Institute of Marine Science (Gloucester Point, VA)  
WGCU (Fort Myers, FL)  
Waddell Mariculture Center (Columbia, South Carolina)  
Washington State University (Pullman, WA)  
Webb Research Corporation (Falmouth, MA)  
Weber State University (Ogden, UT)  
Western Connecticut State University, Dept. of Biological and Environmental Sciences (Danbury, CT)  
Whalenet/ Wheelock College (Boston, MA)  
Wildlife Trust (Palisades, NY; Prospect Park, PA; Sarasota, FL)  
Woods Hole Oceanographic Institution (Woods Hole, MA)  
Yale Peabody Museum (New Haven, CT)

### AFFILIATIONS

Mote Marine Laboratory and Aquarium are accredited by:  
The American Association of Museums  
The Association of Zoos and Aquariums

Mote Marine Laboratory is a member of:  
Association of Marine Laboratories of the Caribbean  
Chambers of Commerce of Anna Maria Island,  
Englewood-Cape Haze Area, Longboat Key, Manatee,  
Greater Sarasota and Venice Area  
City Island Leaseholders Association  
Florida Institute of Oceanography  
Florida Ocean Alliance  
Florida Sea Grant  
St. Armands Circle Association  
National Association of Marine Laboratories  
The Ocean Project  
The Oceanography Society  
Science and Environment Council of Sarasota County  
Southern Association of Marine Laboratories

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**FIN**

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Main Campus and Public Aquarium

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Sarasota, FL 34236  
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Fax: 941.388.4312  
Internet: [www.mote.org](http://www.mote.org)  
e-mail: [info@mote.org](mailto:info@mote.org)

Field Stations

**MOTE AQUACULTURE PARK**

12300 Fruitville Road  
Sarasota, FL 34240  
Phone: 941.388.4541  
Fax: 941.377.2905

**CHARLOTTE HARBOR**

P.O. Box 2197  
Pineland, FL 33945  
Phone: 239.283.1622  
Fax: 239.283.2466

**TROPICAL RESEARCH LABORATORY**

24244 Overseas Highway  
Summerland Key, FL 33042  
Phone: 305.745.2729  
Fax: 305.745.2730

Public Outreach Facilities

**MOTE'S LIVING REEF EXHIBIT**

Florida Keys Eco-Discovery Center  
Dr. Nancy Foster Florida Keys Environmental Complex  
33 East Quay Road  
Key West, FL 33040  
Phone: 305.296.3551  
Fax: 305.296.2325