



ANNUAL REPORT

2022





“FOR GENERATIONS, WE HAVE BEEN TAKING FROM THE SEA.

NOW, IT’S TIME TO START GIVING BACK.”

— WILLIAM R. MOTE, MOTE BENEFACTOR AND NAMESAKE

Mote’s 2022 Annual Report presents accomplishments and finances
for the 2022 fiscal year, Oct. 1, 2021 – Sept. 30, 2022.

To read the expanded version of this report,
scan this QR code or visit mote.org/2022AR



FROM THE CHAIRMAN



It was an absolute pleasure this year to celebrate our Founding Director, Dr. Eugenie “Genie” Clark, on what would have been her 100th birthday. Not only was she honored with a new Forever Stamp by the United States Postal Service, but the organization she founded nearly 70 years ago has grown to become the third-largest independent marine science laboratory in the country in terms of research and development revenue.

Genie started Mote with just one local fisherman assistant. Since then, we’ve grown to over 270 staff including more than 40 Ph.D.-level scientists.

In our last five years of astonishing growth, we have doubled our research budget, expanded our range of studies and increased our scientific output.

In fiscal year 2022 alone, Mote scientists contributed to approximately 70 peer-reviewed publications and continued presenting their research around the world.

Mote spearheaded scientific progress as a leader in several large, multi-partner, private-public initiatives critical to Florida’s economy and our quality of life. As the leader of the Florida Keys Coral Disease Response & Restoration Initiative, Mote is laser-focused on the science of restoring genetically diverse, resilient coral reefs. As of this year, Mote hosts 6,455 coral genotypes across our campuses, including our International Coral Gene Bank. Through our leadership of the Florida Red Tide Mitigation & Technology Development Initiative, more than 200 red tide mitigation compounds and

processes have been tested to identify the most promising candidates for controlled, permitted field testing.

In Education, Mote was the first non-academic institution granted the National Science Foundation’s Louis Stokes Alliance for Minority Participation award, which continued supporting our Marine Science Laboratory Alliance Center of Excellence (MarSci-LACE) in its successful efforts to recruit and support underrepresented minority participation in marine science.

Mote Education staff now lead more than 50 educational programs and enlist roughly 200 college interns per year. Mote Aquarium provided informal marine science education for a record-breaking 378,000 guests this year, while our *Oceans for All* campaign to build the state-of-the-art Mote Science Education Aquarium reached key milestones this year—allowing us to launch vertical construction.

All of this is possible because we have remained true to our mission of groundbreaking science—the legacy of Dr. Eugenie Clark. On behalf of our dedicated Board of Trustees, I warmly invite you to join us in that mission.

Maurice Cunniffe
Chairman, Mote Marine Laboratory
Board of Trustees

FROM THE PRESIDENT & CEO



A great dreamer and man of science once said, “Imagination is everything. It is the preview of life’s coming attractions.” As we implement Mote’s vision for a future of “Oceans for All,” it is worth taking a moment to remember where we began. Mote Marine Laboratory was founded nearly 68 years ago in Placida, Florida, where we established our foundational pillars of passion, partnership and philanthropy—reflecting the values of our southwest Florida communities. After the recent destruction in Placida, Fort Myers and surrounding communities brought on by Hurricane Ian, we’re reminded of these community values that are helping to lift so many who need their neighbors’ support now more than ever. Our community is indeed a special place where we strongly support each other, our culture, our environment, and the goal of enhancing our quality of life now and for future generations.

Over the decades, Mote has grown and evolved into a global powerhouse of innovative research, science education and public outreach without forgetting where we came from and the intimate connections we have with local communities and the oceans.

Mote is now in our 30th year of operations in the Florida Keys. In 1993, Monroe County entered into a 30-year lease with the Pigeon Key Foundation for the use of public lands and facilities located on Pigeon Key. The Foundation’s proposal to Monroe

County included a plan for Mote to develop a research station, on-site, that would include a focus on coral reef ecology.

This past year, we officially opened our second satellite, land-based coral nursery in Monroe County. We now proudly maintain a physical presence for coral reef research and restoration throughout the entire Florida Keys—from Key Largo to Key West. This new location, at the Reefhouse Resort & Marina in Key Largo, joins our other satellite coral nursery in Islamorada and our flagship Keys facility—Mote’s Elizabeth Moore International Center for Coral Reef Research & Restoration on Summerland Key. This is the ongoing realization of a long-standing and evolving vision: A future where Mote leads efforts to restore Florida’s Coral Reef is now the present.

Nearly 45 years ago in southwest Florida, Mote moved its primary research campus from Siesta Key to our current home on City Island in Sarasota. Among many other positive developments, this move paved the way for Mote to open our Marine Science Center in 1980. The facility, which would later become known as Mote Aquarium, was our first major informal, open-to-the-public, marine science education outreach center.

This past year, we formally entered into a partnership with the City of Anna Maria and Manatee County to open our third satellite education

outreach center on the historic Anna Maria City Pier. Upon completion, this new center will be open to visitors and residents completely free of charge, will host field trips from local schools and will join our two other satellite public outreach centers in Key West and Islamorada. This is the ongoing realization of our vision where Mote is a leader in translating and transferring marine science and technology development as a public service to increase ocean literacy.

Today, we continue to define the future as it should be and are deeply thankful for the commitment to, and support of, our grandest vision to-date. We envision a future in which tens of millions of visitors will experience the transformative power of discovery, learning and changes in the way they think about our oceans, conservation and sustainable use. We envision a future where students have access to state-of-the-art STEM teaching labs that provide unparalleled hands-on research and

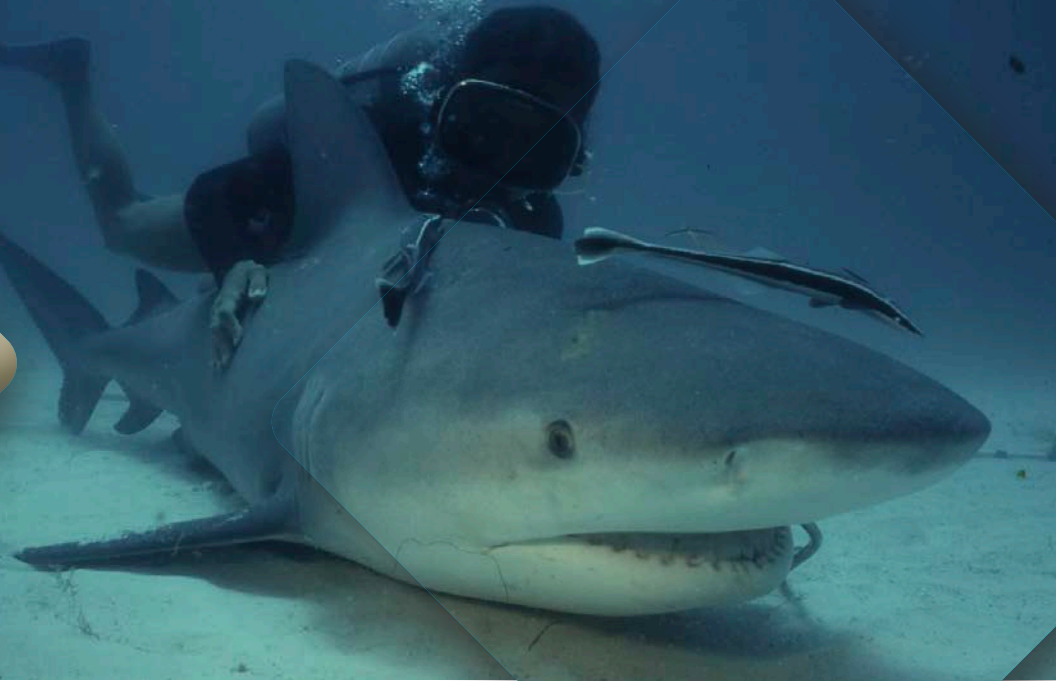
technology experience. That future is defined by a once-in-a-generation opportunity to ensure so many positive impacts for generations to come—the rebirth of Mote Aquarium as the new Mote Science Education Aquarium (Mote SEA) at Nathan Benderson Park.

This is a pivotal time for Mote, for our community, for Southwest Florida and for our oceans around the world. I ask that all of you continue to support Mote’s vision for a future where our legacy is defined not by what we’ve built, but by what we’ve achieved for future generations—ensuring “Oceans for All.”



Dr. Michael P. Crosby,
President & CEO

IN THE SPOTLIGHT: OUR “SHARK LADY”



100 YEARS, ONE INCREDIBLE LIFE

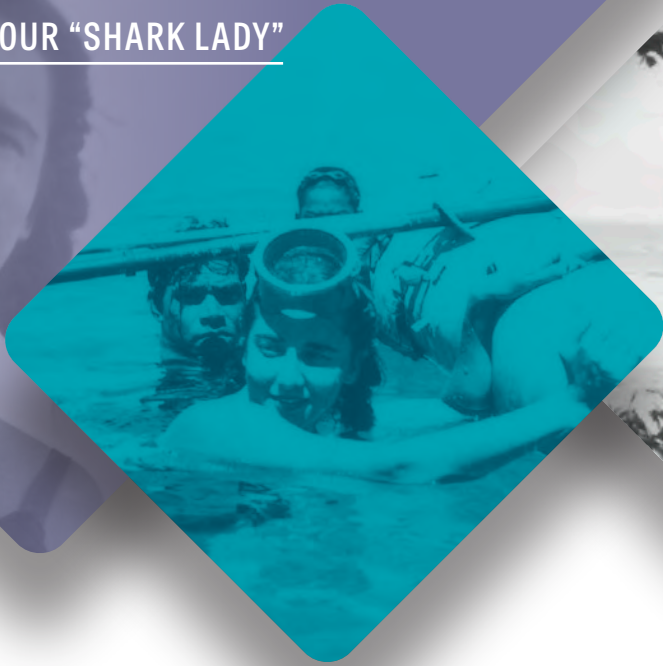
On May 4, 2022, Mote Marine Laboratory & Aquarium’s courtyard was flooded with friends, family and fans of the “Shark Lady” who left an indelible stamp on marine science: Dr. Eugenie Clark.

Clark, who founded Mote in 1955, would have turned 100 that day. In her honor, the U.S. Postal Service (USPS) unveiled a commemorative Forever® Stamp at Mote.

Clark passed away in 2015 after a lifetime of studying sharks and other fishes. She was a scientist ahead of her time—by the 1950s, she’d already recognized that sharks are fascinating rather than frightening, and that women belong in marine science fields once dominated by men.

THE TIMELINE ON THE FOLLOWING PAGES PROVIDES A GLIMPSE INTO CLARK’S INCREDIBLE LIFE AND LEGACY, WHICH EMPOWERS MOTE’S MISSION TODAY AND OUR PROGRESS TOWARD AN EVEN BRIGHTER TOMORROW.

IN THE SPOTLIGHT: OUR “SHARK LADY”



1922

EUGENIE (“GENIE”) CLARK IS BORN

Born in New York to Yumico (née Mitomi) & Charles Clark.

Early 1930s

FIRST AQUARIUM VISIT

Young Genie falls in love with fish at New York Aquarium at Battery Park.

1940–50

FROM “BUG CAMP” TO A DOCTORATE IN ZOOLOGY

As Genie progresses through her education and begins her career, she travels a truly uncommon path—as a Japanese-American woman excelling in male-dominated fields of science after World War II.

1940–41: She attends “Bug Camp” fieldwork courses, University of Michigan Biological Station.

1942: Attains Bachelor of Arts in Zoology, Hunter College.

1946: Master of Arts in Zoology from New York University.

1950: Doctorate in Zoology from New York University.

1946–47

FIRST DIVE, EARLY RESEARCH

Genie makes her first dive using a dive helmet as a research assistant to Dr. Carl Hubbs, Scripps Institution of Oceanography. In the 1940s, diving was much more perilous than it is today. Through her bravery and love of underwater research, Genie eventually becomes renowned for studying fishes in their ocean environments. Her early research includes roles with: Celanese Corporation, New York Zoological Society, U.S. Fish and Wildlife Service and Cornell University Medical School.

1949–1951

FISH STUDIES IN MICRONESIA & EGYPT

Genie studies poisonous fishes in Micronesia for Pacific Science Board of National Research Council • Red Sea plectognath fishes via Fulbright Scholarship • Poeciliid fishes for American Museum of Natural History.

1955

FOUNDING MOTE MARINE LABORATORY

Genie & her fisherman assistant launch Cape Haze Marine Laboratory in Placida, Florida, supported by philanthropists Anne & William H. Vanderbilt. In 1960 the Lab moves to Siesta Key and in 1967 is renamed Mote Marine Laboratory to honor new benefactors William R. Mote and his sister, Elizabeth Mote Rose.

1958–59

INNOVATIVE STUDY ON SHARK LEARNING

Genie & colleagues demonstrate for the first time that sharks can learn through training, publishing results in *Science*. Groundbreaking efforts like these become the foundation of Mote’s 67-year legacy of world-class research on sharks and an ever-growing array of marine life.

1965

A TRAINED SHARK FOR A PRINCE

Genie brings Japan’s Crown Prince Akihito a nurse shark (*Ginglymostoma cirratum*) trained to press a target for food. The two share a fascination with fishes.

Late 1960s

A TALENTED TEACHER

Genie accepts a faculty position at City University of New York and then a professorship at University of Maryland (UMD), College Park, where she inspires the next generation of scientists. She retires from UMD in 1992.

1970s

FINDING A NATURAL SHARK REPELLENT

She finds that a Red Sea fish, the Moses sole (*Pardachirus marmoratus*), produces natural shark repellent—informing the scientific community seeking to reduce shark-human interactions.





1974

“SLEEPING” SHARKS
Genie and colleagues investigate why some sharks lay on the bottom in caves of Mexico’s Yucatan Peninsula, allowing divers to come close and even touch them. Fresh water from the cave bottoms might be loosening parasites on the sharks.



1978–80

MOTE’S NEW HOME, NEW AQUARIUM
Mote moves to City Island, Sarasota. Mote Aquarium opens to share Mote research with the public.

1980

WILD WHALE SHARK ENCOUNTER
Genie dives with more than 50 whale sharks (Earth’s largest fish) over the years. In 1980, National Geographic photographers capture her swimming near one of these plankton-eating giants.

1980s–90s

EXPLORING THE DEPTHS
Genie’s first submersible dive is in 1986 off Bermuda. In 1988, she undertakes a 12,000-foot submersible dive to the bottom of Monterey Canyon. Her deepest scuba dive is 267 feet at age 73 (1995), accompanying diver John Pohle to view a tilefish nest off Papua New Guinea. Genie completes more than 70 submersible dives in her lifetime.

2000 & onward

HER ADVENTURES CONTINUE AT MOTE
Returning to Mote, Genie continues her research. Over the 2000s, she is especially known for studying the mysterious convict fish (*Pholidichthys*) and the poisonous catfish (*Plotosus*).



2008

EXPLORERS CLUB MEDAL
One of many awards Genie receives for her work. The Explorers Club is an international society advancing scientific exploration and resource conservation.

2014

LAST DIVES
In May 2014, Genie celebrates her 92nd birthday in Israel & Jordan, diving with Mote President & CEO Dr. Michael P. Crosby & other friends & colleagues in the Gulf of Aqaba. On her last dive (June 2014) Genie and her volunteers study deepwater triggerfish in the Solomon Islands.

2015

HER LIFE ENDS; HER LEGACY LIVES ON
Dr. Eugenie Clark passes away at age 92. People around the world share their fond memories of her incredible life and career. Her legacy continues through the research she published and the many people she inspired.

2022

HER STAMP ON SCIENCE
United States Postal Service issues a special Forever® Stamp on Genie’s 100th birthday, honoring her incredible impact on marine science and conservation.





Above: Dr. Erinn Muller works in Mote's International Coral Gene Bank. Far Right: Mote's President & CEO, Dr. Michael P. Crosby (in hat) celebrates the opening of Mote's Key Largo Coral Nursery with elected officials, community leaders and Mote staff.

A CORAL GROWTH SPURT

Global climate change and other stressors continue to ravage coral reefs—the rainforests of the sea that support fisheries, wildlife, economies and coastal resilience to storms worldwide. Florida's Coral Reef remains a hotspot in this crisis. There, corals cover less than 5% of their historical range, and coral disease, climate change, coastal development, pollution and more have brought some coral populations to the brink of functional extinction. That's why Mote Marine Laboratory scientists are swiftly expanding their unparalleled efforts to save the reef.

This fiscal year, Mote scientists restored 38,260 corals to Florida's Coral Reef, bringing our total to more than 170,000 since 2008, and Mote scientists expanded the horizons of coral science and restoration with critical new infrastructure and successful efforts to breed, raise, study and restore naturally resilient and genetically diverse corals, monitor restored reefs and adapt restoration strategies to maximize success.

BRANCHING OUT

This year, Mote opened the first and only land-based coral nursery in Key Largo, Florida, which extends Mote's coral restoration footprint from Key Largo to Key West. Based at Reefhouse Resort & Marina, the Key Largo nursery will produce 6,000–10,000 fragments for restoration per year.

The Key Largo Coral Nursery, developed with support from the National Marine Sanctuary Foundation, joins Mote's other satellite nursery in Islamorada, Mote's Elizabeth Moore International Center for Coral Reef Research & Restoration on Summerland Key, and Mote's underwater nurseries near Key West, Looe Key, Islamorada and Key Largo. Northward along Florida's Gulf Coast, Sarasota County is home to Mote's primary research campus and Mote Aquaculture Research Park, which features Mote's International Coral Gene Bank.

GAME OF GENES

Mote's International Coral Gene Bank is a “Noah's Ark” protecting coral genetic diversity from around the world to empower restoration and research. By the end of this fiscal year, the Gene Bank had amassed 2,111 coral colonies or fragments representing 21 species—461 more corals and seven more species than this time last year.

In a landmark moment this year, two symmetrical brain corals (*Pseudodiploria strigosa*) and one mountainous star coral (*Orbicella faveolata*) spawned—began sexually reproducing—inside the Gene Bank's state-of-the-art spawning system, producing 200 new coral babies with fresh genetics for Mote's restoration pipeline.

Across all Mote campuses, Mote scientists are caring for 6,455 coral genotypes (genetic varieties). Managing them all requires many decisions: Which genotypes should be kept in which nurseries? Which should be planted on a given reef? Which are compatible as parents? Which are too closely related to be bred or restored close together?

Those questions—the chess moves of science-based coral restoration—are the focus of something truly cutting-edge: Mote's new Coral Genetic Management Plan.

“To our knowledge, we are the only group that has developed an organization-level genetic management plan related to restoring Florida's Coral Reef,” said Mote Associate Vice President for Research and Senior Scientist Dr. Erinn Muller. “It describes the decision trees associated with new corals that come in, and it helps guide where they are retained, where they go among our campuses and how we plan to outplant them.”

FIGHTING ALGAE AND DISEASE

As a core partner in *Mission: Iconic Reefs (M:IR)*—the NOAA-led collaboration restoring seven Iconic Reef sites in Florida—Mote began recruiting new helpers to the cause this year: Caribbean king crabs (*Maguimithrax spinosissimus*). These crabs help keep reefs healthy by

grazing on algae (seaweeds) that are expected to overtake more coral reefs with continued climate change.

Since January 2022, Mote scientists have hatched 67 clutches of crab larvae, with funding in-part from the National Marine Sanctuary Foundation, and established their research and production pipeline for the species to prepare for introducing crabs to M:IR sites.

These crabs seem tough enough for their future on restored reefs, suggested a new study by Mote scientists and partners in *Marine Biology* titled, “Caribbean king crab larvae and juveniles show tolerance to ocean acidification and ocean warming.”

“We looked at these crabs under climate change conditions they may experience on reefs in the future and found that they don't mind low pH and high temperatures much, and they're likely to be winners,” said Mote Postdoctoral Scientist Dr. Jason Spadaro.

Another Mote-led research paper, “A highly effective therapeutic ointment for treating corals with black band disease,” accepted this year by *PLOS ONE* and published subsequently, shared a simple treatment that eliminated the appearance of the lethal black band disease in 100% of the corals tested.

“This treatment can be used to preserve iconic corals, prevent the loss of corals within highly valued reef sites, and mitigate disease outbreaks within restoration sites,” Muller said.

This was the first-ever study to show that a treatment for a worldwide coral disease has potential to be 100% effective.



PHOTO BY: MARY D. GRIFFIN

INNOVATIVE RESEARCH

MOTE IS... REVOLUTIONIZING RED TIDE MITIGATION

+200 RED TIDE MITIGATION COMPOUNDS tested as of 2022, revealing at least a dozen promising candidates for fighting red tide impacts, through the Florida Red Tide Mitigation & Technology Development Initiative led by Mote in partnership with FWC.*

EXAMPLES: NATURAL COMPOUNDS FROM SEAWEEDS, ULTRAVIOLET (UV-C) LIGHT, QUATERNARY AMMONIUM COMPOUNDS (QUATS), OZONATION & MORE.
*FLORIDA FISH & WILDLIFE CONSERVATION COMMISSION

54 BILLION CELLS OF RED TIDE ALGAE (*Karenia brevis*) produced this year in Mote's culture lab, which is unique in producing high volumes of *K. brevis* for research designed to help fight red tide impacts.



+96% REMOVAL OF RED TIDE CELLS & 75% REMOVAL OF TOXINS achieved by some red tide mitigation compounds tested by Mote & partners this year.



99% MAX DECREASE IN BREATHABLE RED TIDE TOXINS documented by Mote scientists after adding colored organic material to red tide cultures in the lab. This ongoing, preliminary study focuses on reducing red tide respiratory irritation in people.

SAFE SHELLFISH SOONER is the goal of a new, Mote-designed "wet-storage" system that eliminated red tide toxins stored in shellfish tested this year. Mote scientists aim to help Gulf of Mexico shellfish producers overcome the economic impacts of red tides that suspend shellfish harvesting.

MOTE IS... AN OBJECTIVE LENS ON CHANGING ENVIRONMENTS

+6,000 CARBONATE CHEMISTRY SAMPLES ANALYZED by Mote scientists this year, including **+5,000 FOR STUDIES OF CORAL RESILIENCE** to ocean acidification/warming/disease and **+1,000 FOR UNDERSTANDING CARBONATE CHEMISTRY CHANGES** with the presence & absence of red tide.



783 FISH OF 19 SPECIES tagged & released in Manatee County's Robinson Preserve Restoration Area by Mote **TO DETECT MIGRATION & HABITAT-USE PATTERNS OF SPORTFISH THE RESTORATION IS MEANT TO BENEFIT**. 73% of the fish have been detected since release by Mote's solar-powered monitoring systems.

56 BEACHES IN 3 STATES MONITORED by Mote's Beach Conditions Reporting System (BCRS, visitbeaches.org) as of year's end, providing the public vital condition updates including red tide impacts. **13 NEW SITES WERE ADDED THIS YEAR**, & the BCRS now reaches Florida, Alabama & South Carolina (new).

2 NEW PARTNERSHIPS allowing Mote's Beach Conditions Reporting System to **REPORT MORE ENVIRONMENTAL CONDITIONS** with help from, & for the benefit of, the public.

1: PARTNERSHIP WITH CITY OF SARASOTA FOR MORE DATA ON WATER QUALITY & SEA LEVEL RISE. 2: PARTNERSHIP WITH FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION'S CITIZEN SCIENCE PROGRAM.

94 DAYS OF ROBOTIC GLIDER SURVEYS led by Mote to monitor ocean conditions relevant to red tide research, including comparing conditions before & after Hurricane Ian.

6-YEAR RED TIDE STUDY addressing bloom termination, forecasting & more wrapped up year 3 with great success: a 10-day intensive research cruise, monthly water sampling at 28 stations, timely new insights on how Tampa Bay's 2021 Piney Point wastewater spill affected red tide & **EMERGING RESEARCH ON HOW CLIMATE DYNAMICS (EL NINO) & FLORIDA'S VARIABLE RAINY SEASON RELATE TO RED TIDE**.

6,577 WATER SAMPLES ANALYZED FOR RED TIDE, nutrients & carbonate chemistry by the Mote-FWC Cooperative Red Tide Research Program. Nutrients support algal growth, & carbonate chemistry helps reveal the relationship between red tide & acidification due to local conditions or climate change.

17 SCIENTIFIC TEAMS from around the world did research in **MOTE'S CLIMATE AND ACIDIFICATION OCEAN SIMULATOR (CAOS) SYSTEM** this year, highlighting the value of Mote's state-of-the-art facility for studying coral reef species' response to climate change.

MOTE IS... A PEERLESS LEADER

100% GROUNDBREAKING

Mote led the first-ever peer-reviewed study showing that a treatment for a worldwide coral disease has potential to be 100% effective.

TREATMENT DEVELOPED BY OCEAN ALCHEMISTS ELIMINATED SIGNS OF LETHAL BLACK BAND DISEASE IN ALL BRAIN CORALS MOTE TESTED.



FIRST-OF-ITS-KIND STUDY

Launched this year by Mote to look for groundwater seeps between Florida's aquifer & the Gulf of Mexico—potentially undocumented sources of nutrients for red tide.



~400-FOOT DIVE conducted by Mote-led team this year to complete a groundbreaking research effort on the dynamics of **"BLUE HOLE" OCEAN HABITATS** never before examined scientifically in the Gulf of Mexico.

3 NOVEL SEAFOOD SOURCES

being investigated by Mote scientists who are studying how to cultivate cells from **PACIFIC WHITE SHRIMP, RED DRUM & ALMAGO JACK**—raw material for the emerging, sustainable cell-cultured seafood industry.



FIRST WOMEN OF THE WATER

CONFERENCE held by Florida Department of Agriculture & Consumer Services in partnership with Mote. **75 ATTENDEES FROM 5 STATES** toured Mote Aquaculture Research Park & discussed aquaculture science & women's leadership in the field.

MOTE IS... A BIG FISH IN OUR FIELD

+100,000 SNOOK RELEASED MILESTONE reached by Mote scientists who have partnered with FWC* since 1997 to develop fisheries enhancement strategies that will benefit Florida's ecosystems & economy.
*FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

109 COMMERCIAL FISHING TRIPS DOCUMENTED THIS YEAR BY MOTE-LED ELECTRONIC MONITORING (EM) efforts to improve data for Gulf of Mexico fisheries management. Since 2016 Mote-led EM has documented **451 TRIPS WITH 157,000 CATCH EVENTS**.

NEW MEDICINES FROM STINGRAY VENOM, such as blood pressure regulators, anticoagulants & pain inhibitors, are the end goals of **NOVEL RESEARCH BY MOTE & PARTNERS**. As of this year, the team has investigated how Atlantic stingray venom-gland compounds affect cells that contribute to skin connective tissue. Next year's research will include nervous-system cells.



3 NOVEL ANTIBODIES

PUT TO WORK THIS YEAR: Mote scientists & partners are using 3 unique antibodies they generated **TO HELP IDENTIFY AND PURIFY CANCER-FIGHTING COMPOUNDS** derived from shark immune cells & unlock their potential to improve human cancer therapies.

2 NEW TOOLS FOR FISHERIES MONITORING



deployed on commercial bottom longline reef fish vessels by Mote scientists & partners who are pioneering electronic monitoring (EM) to improve data for Gulf of Mexico fisheries management.

1: THE FIRST "DISCARD CHUTE" USED IN GULF EM TO IMPROVE VIDEO OBSERVATIONS & LENGTH MEASUREMENTS OF NON-TARGET (BYCATCH) FISH THROWN BACK TO SEA. 2: THE FIRST UNDERWATER CAMERA FOR GULF EM, COLLECTING VIDEO OF BYCATCH SHARKS RELEASED UNDERWATER.

MOTE IS... ON A MISSION TO HELP FEED THE WORLD

8,216 SQUARE-FOOT AQUAPONICS CENTER completed in fall 2022. Mote's new Ron & Marla Wolf Aquaponics Center initially aims to produce **10,000 POUNDS OF REDFISH COUPLED WITH EDIBLE PLANTS** for local markets/restaurants to help this sustainable food technology take off.

SUPPORTED BY THE BERNARD & NORTON WOLF FAMILY FOUNDATION.



5 AQUATIC PLANTS & 4 MARINE FISHES

were the focus of Mote's aquaculture research for conservation & cultivation this year, with an emphasis on providing sustainable food sources for Earth's growing population of 8 billion people.

25,000 ANNOTATED FISH SOUND FILES in the massive database established by Mote & state & federal partners to train machine learning models that can help us extract valuable biological information from audio recordings to inform fisheries management.

SPECIAL ISSUE OF A PEER-REVIEWED JOURNAL CO-EDITED

by Mote scientists to share new fisheries research with the world: *Bulletin of Marine Science* featured the 10th FSU*-Mote International Symposium on Fisheries Ecology & 6th International Symposium on Stock Enhancement & Sea Ranching. *FLORIDA STATE UNIVERSITY

467 BIOLOGICAL SAMPLES from 16 data-deficient fish species collected & shared with fisheries managers & research partners this year by Mote scientists & commercial fishermen—an added-value service from Mote-led fisheries electronic monitoring work.



Left & Above: Mote's Sea Turtle Rehabilitation Hospital team prepares to release turtles that have recovered in Mote's care. **Left:** Weston Spoon and Mote interns. **Above:** Weston Spoon and Lynne Byrd **Far Right:** A sea turtle hatchling emerges from a nesting beach.

NEST & RECOVERY: SEA TURTLE RESEARCH & REHABILITATION

Just after the fiscal year ended, sea turtle nesting season officially wrapped up on Florida's Southwest coast, and Mote Marine Laboratory & Aquarium staff reported outstanding nest numbers.

Mote staff and volunteers finished documenting sea turtle nesting activity on Oct. 31, after monitoring 35 miles of beaches from Venice to Longboat Key since mid-April.

Throughout the season, Mote recorded a total of 4,483 nests across all sea turtle species—4,318 loggerhead sea turtle nests, 163 green sea turtle nests, one Kemp's ridley nest, and one leatherback nest.

These numbers made 2022 the fourth-highest nesting season documented in Mote's four-decade monitoring history. Since 1982 Mote scientists have documented more

than 133,000 marine turtle crawls and they estimate that more than three million hatchlings have emerged from local beaches and entered the Gulf of Mexico.

In addition to recording nesting numbers, Mote scientists have been busy tagging nesting sea turtles at night. Expanding upon their tagging efforts on Casey Key, Mote staff have begun tagging nesting sea turtles at two other beaches in Sarasota County: Siesta Key and Venice. This year, Mote's tagging team encountered 501 individual turtles, their highest number ever.

This year, Mote scientists deployed satellite tags on nine turtles to track their location. These tags help to determine important nesting parameters including how many nests turtles lay, how often they lay and where they go when they are not nesting.

This year's satellite-tagged turtles included:

- Loggerhead turtle LEO, the first rehabilitated adult male tracked from the Florida Panhandle (an endangered loggerhead subpopulation).
- Adult male loggerheads JT and Bobby. Both turtles were already being tracked by Mote tags, and were spending time off Longboat Key and Anna Maria Island, before they stranded on Oct. 25 and 26, respectively. Both turtles were successfully rehabilitated at Mote's Sea Turtle Rehabilitation Hospital, and when released, one retained its original tag while the other received a new tag.
- Loggerhead turtle Sheldon, the third adult male tracked after release from The Turtle Hospital in the Florida Keys.
- Green sea turtles Sweet Pea and Amelia, who were previously tracked by Mote in 2007 and 2019, respectively.

Mote's satellite-tagging data are helping the federal government better understand which habitats are essential to green sea turtles, a threatened species, with the goal to formally designate more geographic areas as Critical Habitat. Critical Habitat helps increase the protection and conservation focus on these essential areas during activities conducted, funded or permitted by the federal government. Mote's work is also helping to reveal which geographic areas are important to adult male loggerhead turtles, including little-understood turtles like LEO.

Most exciting this year, 29 patients in Mote's Sea Turtle Rehabilitation Hospital made it back home to the Gulf of Mexico, including a green sea turtle nicknamed Waves who ingested a hook and suffered a fishing line entanglement and fibropapilloma tumors. The turtle made a strong recovery by August 2022 and was released from Lido Beach.

Former patient Pierre was also released from Anna Maria Island in July 2022. The juvenile green sea turtle was admitted to Mote's hospital on Jan. 31, 2022. The turtle was found floating at the surface near Anna Maria Island City Pier with watercraft injuries and moderate fibropapilloma tumors.

Mote's rarest patient of the year was found under the Sunshine Skyway Bridge in late February. Hawkeye, a hawksbill sea turtle, was entangled in line tightly wrapped around its neck and flipper. A fisherman found the juvenile turtle and notified Mote's team.

The turtle was transported to Mote, where the remaining line was removed. Hawkeye made a full recovery and was released from Anna Maria Island. Mote's Sea Turtle Rehabilitation Hospital has rescued only four hawksbill sea turtles since 2001. Hawksbills are an endangered species, and each one treated and released has a new chance to live, reproduce and help sustain the population.



SCIENCE
TO POWER

CONSERVATION &

SUSTAINABLE USE

MOTE IS...

SHOWING THE WAY TO HELP SHARKS & RAYS

70% OF SHARK SPECIES FOUND IN THE GLOBAL SHARK FIN TRADE ARE AT RISK OF EXTINCTION, reported new peer-reviewed research co-authored by Mote scientists. Mote scientists are sharing this knowledge to inform increased global protection measures that aim to balance the needs of sharks & people.

FIRST GREENLAND SHARK DOCUMENTED IN THE WESTERN CARIBBEAN by scientists & fishers in a Mote-led project. This species, known from the Arctic, was observed by an FIU* student mentored by a Mote scientist near Belize, where Mote science has supported increased protection for sharks. *FLORIDA INTERNATIONAL UNIVERSITY



FIRST AGE AND GROWTH ESTIMATES for wild & aquarium-housed whitespotted eagle rays co-authored by Mote scientists to inform conservation & management for this IUCN* Endangered species.

*INTERNATIONAL UNION FOR CONSERVATION OF NATURE STUDY'S FIRST AUTHOR IS FROM AIX-MARSEILLE UNI IN FRANCE.

77 MARINE ANIMAL DETECTORS called "acoustic receivers" installed in Florida's Sarasota-Manatee region by Mote & partners in the Sarasota Coast Acoustic Network (SCAN) as of 2022. Receivers detect animals tagged with acoustic "pingers," including 80 sharks, 95 rays, 52 snook & 6 whelk tagged through SCAN.

MOTE IS...

SHEDDING NEW LIGHT ON ICONIC ANIMALS

+650 DISTINCTIVE MANATEES

PHOTO-DOCUMENTED BY MOTE IN waters from South Carolina to the Florida Keys this year. Some have been documented for up to 43 years. 80 were identified in the Manatee Individual Photo Identification System maintained by federal, state & Mote partners.

220 MANATEES, A SARASOTA COUNTY RECORD, counted by Mote observers on May 31, 2022. Mote's monitoring efforts provide valuable data for manatee population management & conservation.

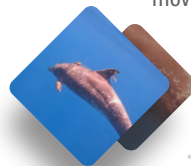
+60 MANATEE BLOOD SAMPLES

assayed by Mote scientists in a multi-year effort to **UNDERSTAND HOW RED TIDE EXPOSURE AFFECTS MANATEE HEALTH & SUPPORT BETTER TREATMENTS FOR RESCUED MANATEES**. Results are being analyzed.

FIRST BABIES AT THE BANK

The first coral sexual reproduction event at Mote's International Coral Gene Bank produced **200 BABY SYMMETRICAL BRAIN CORALS & MOUNTAINOUS STAR CORALS**, which are being raised to integrate into Mote's coral restoration pipeline.

6,455 CORAL GENOTYPES (GENETIC VARIETIES) MAINTAINED BY MOTE SCIENTISTS for restoration & research emphasizing healthy, genetically diverse coral populations. That includes **+3,000 GENOTYPES OF 20 CORAL SPECIES AT MOTE'S INTERNATIONAL CORAL GENE BANK**.



SOUND OF MANATEE MOTHERHOOD?

Manatees make five types of vocalizations, & in a new peer-reviewed study, **MOTE SCIENTISTS DOCUMENTED MORE "HIGH SQUEAKS" WHEN CALVES (BABIES) WERE PRESENT**. High squeaks may be useful for detecting calf-mom interactions.

FIRST HEALTH ASSESSMENT & TAGGING OF DOLPHINS OVER THE WEST FLORIDA SHELF by Sarasota Dolphin Research Program (SDRP)* providing **FIRST-OF-ITS-KIND INFORMATION** about movement, dive patterns & health of 2 Atlantic spotted, 2 bottlenose & 1 rough-toothed dolphin in the eastern Gulf of Mexico. **A TAGGED ATLANTIC SPOTTED DOLPHIN (LEFT) WAS NAMED "EUGENIE CLARK" TO HONOR MOTE'S FOUNDING DIRECTOR**.

*SDRP IS A CHICAGO ZOOLOGICAL SOCIETY PROGRAM IN PARTNERSHIP WITH MOTE MARINE LABORATORY.

DOLPHIN PHOTO BY: SDRP, TAKEN UNDER NMFS PERMIT NO. 20485.



4,483 SEA TURTLE NESTS*

DOCUMENTED BY MOTE on Longboat Key through Venice, Florida—the 4th highest total in Mote's 41 years of turtle conservation & research. Mote scientists estimate **3.5 MILLION HATCHLINGS** have emerged from these beaches to date. *CALENDAR YEAR STAT

9 TURTLES SATELLITE TAGGED

this year to track their location, including the first loggerhead turtle tracked from Florida's Panhandle region & green sea turtles at the center of a national discussion: **MOTE'S DATA WILL AID A FEDERAL GOVERNMENT EFFORT TO DESIGNATE MORE CRITICAL HABITAT FOR GREEN TURTLES**.

2,751 SEA TURTLE HATCHLINGS

admitted to Mote's Hatchling Hospital this year.

5 WILDLIFE FORENSICS CASES

AIDED this year by Mote's independent scientists who worked with crime-scene technicians at the Florida Fish and Wildlife Conservation Commission & Sarasota County Sheriff's Office. Mote's team evaluated stranded dolphins using two alternate light source forensic kits.



+38,260 CORALS PLANTED

by Mote scientists to restore Florida's Coral Reef this year. Of those, 2,670 staghorn corals were produced through assisted sexual reproduction, allowing Mote to add **1,424 NEW STAGHORN GENETIC VARIETIES** across 15 Lower Florida Keys reef sites that need more genetic diversity of this threatened species. **SINCE 2008, MOTE HAS PLANTED MORE THAN 170,000 CORALS TOTAL**.



FIRST CORAL GENETIC MANAGEMENT PLAN for any institution restoring Florida's Coral Reef developed by Mote this year. The plan addresses key questions for growing & restoring genetically diverse, resilient corals.

2,500 1-YEAR-OLD CORALS

PRODUCED THROUGH MOTE'S CORAL SEXUAL REPRODUCTION EFFORTS WITH 5 THREATENED STONY CORAL SPECIES THIS YEAR. These corals will add fresh genetics to Mote's restoration gene pools & contribute to future research.

+6,550 CORALS SHARED BY MOTE WITH RESTORATION PARTNERS & SCIENTIFIC PEERS across many institutions.

MOTE IS...

TRACKING TURTLE TRENDS ACROSS TIME

501 INDIVIDUAL SEA TURTLES

ENCOUNTERED (A RECORD) during Mote's nighttime tagging patrol. **371 TURTLES TAGGED** for identification. **324 NEW TURTLES OBSERVED**, indicating a good year for the population.

59-YEAR-OLD SEA TURTLE

DOCUMENTED BY MOTE SCIENTISTS on a Casey Key nesting beach this year. This turtle has been documented 19 times since Mote's team originally tagged her for identification in 1988.

124 SEA TURTLES

RESCUED, RECOVERED &/OR REHABILITATED BY MOTE this fiscal year and **36 MARINE MAMMAL RESCUES OR RECOVERIES** conducted or assisted by Mote this year: 14 bottlenose dolphins & 22 Florida manatees.



MOTE IS...

AN ALLY TO WILDLIFE IN DISTRESS

656 CALLS TO MOTE'S 24-HOUR HOTLINE FOR STRANDED MARINE ANIMAL RESPONSE (888-345-2335) this year.

67 CLUTCHES OF CRAB LARVAE

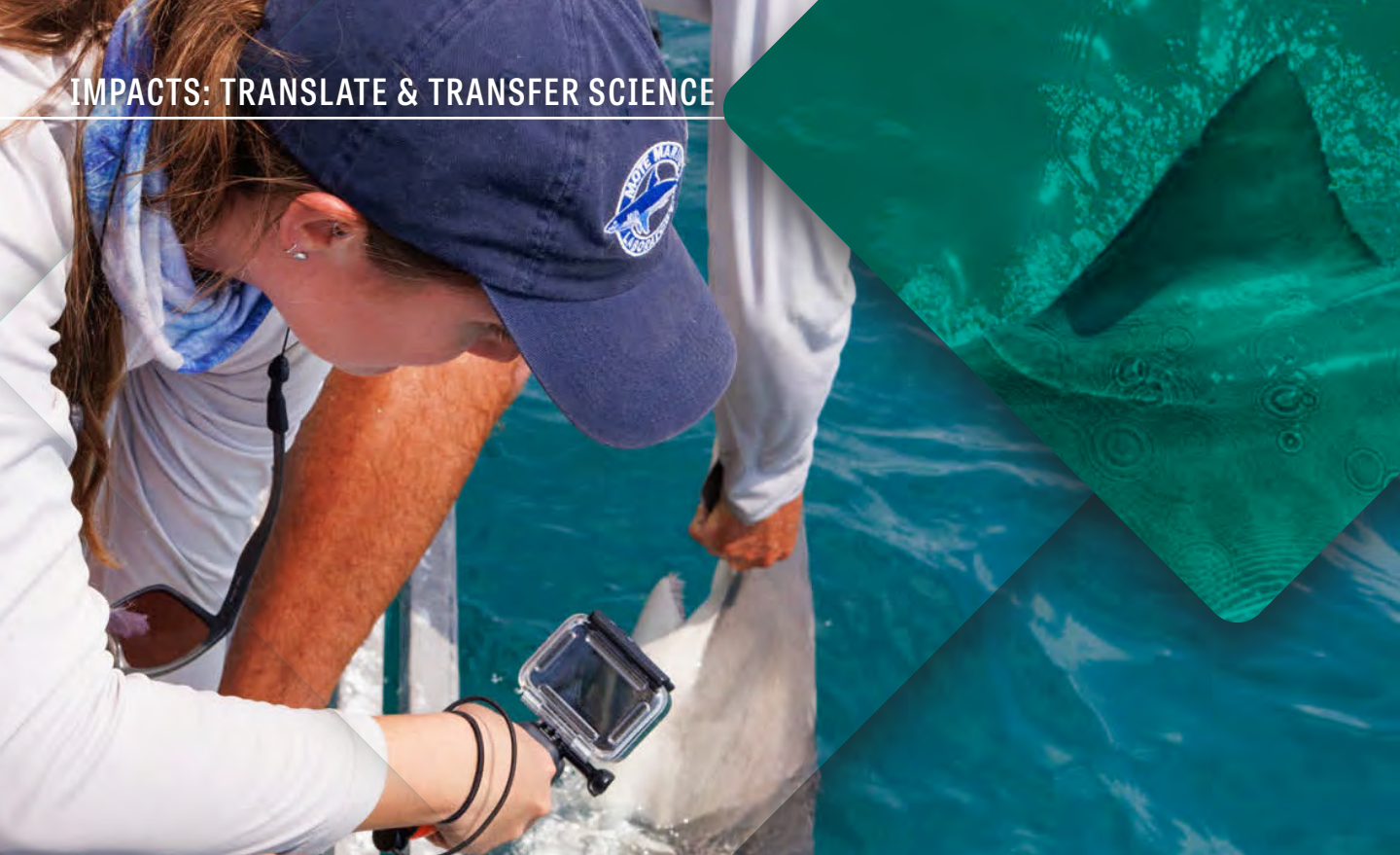
hatched since January 2022 by Mote scientists who are raising Caribbean king crabs to help keep restored reefs healthy. The crabs graze on algae (seaweeds) that are expected to overtake more coral reefs with continued climate change.



850% MORE CORAL

AFTER 3 YEARS: estimated average staghorn coral growth (compared with original amounts planted) at Mote restoration sites that hit their 3-year mark this year.





Left: Mote Staff Biologist Valerie Hagan participates in a shark-tagging expedition.

Far Right: Mote intern Hordrice Graham works in the lab.



CATALYZING CHANGE

SCIENCE CAN CHANGE THE WORLD—WHEN IT IS SHARED WITH THE WORLD. HERE ARE TWO EXCITING WAYS MOTE SCIENTISTS, EDUCATORS AND INTERNS TRANSLATED AND TRANSFERRED OUR DISCOVERIES TO SERVE OUR OCEANS AND COMMUNITIES IN 2022.

SHARK STUDY HAS RIPPLE EFFECTS

Shark research has been central to Mote’s mission since our founding in 1955. Today, by translating that research for societal decision makers, Mote is sparking change and hope for imperiled shark species worldwide.

In summer 2022, Mote and partners published staggering findings in the peer-reviewed journal *Conservation Letters*: 70% of shark species found in the global shark fin trade are at risk of extinction. For nearly a decade, project partners sampled DNA from processed shark fins at international markets in Hong Kong and South China to identify which species ended up in the trade, and how frequently. They found 86 species, 61 of which are considered at risk.

As noted by Dr. Demian Chapman, Director of Mote’s Sharks & Rays Conservation Research Program and an author on the new study: “Quite a few of the coastal sharks we found in the trade are listed as Endangered or Critically Endangered and yet there are no regulations protecting them anywhere in their range. Unless the relevant governments respond with management soon, we are likely to experience a wave of extinctions among coastal sharks and rays.”

Mote scientists are translating these discoveries for global decision makers and calling for a new wave of support for imperiled sharks and rays. In November 2022, just after this fiscal year concluded, Mote scientists traveled to Panama for the 19th meeting of the Conference of Parties to the Convention on International Trade in Endangered

Species of Wild Fauna and Flora (CITES) to present these findings and advocate for one of the largest additions of a group of species to CITES.

In a major win for sharks worldwide, two key proposals achieved the votes to pass. They include protections for the Carcharhinidae and Sphyrnidae families of sharks on CITES Appendix II—a sharp increase in the number of shark species regulated. CITES Appendix II requires that participating countries provide extensive documentation that any trade in products from listed animals is traceable and sustainable.

CHANGE BEGINS AT HOME

Mote Marine Laboratory researchers know that translating and transferring our science involves more than sharing information. It involves exchanging knowledge with people of all backgrounds and building a welcoming atmosphere for diverse perspectives—including those historically underrepresented in marine science careers.

This year, 82% of students in Mote’s Research Experiences for Undergraduates (REU) program identified as underrepresented minorities—up from 37% in 2019. That success was driven in great part by the Mote-led LSAMP MarSci-LACE (Louis Stokes Alliance for Minority Participation Marine Science Laboratory Alliance Center of Excellence), which was founded in 2019 to increase the number and preparedness of underrepresented minority people earning undergraduate degrees in marine sciences and related natural resources fields.

These results align with the findings of Mote’s 2022 peer-reviewed research paper “BIPOC voices in ocean sciences: A qualitative exploration of factors impacting career retention,” published in the *Journal of Geoscience Education*. Jasmin Graham, Project Coordinator for MarSci-LACE and first author on the paper, analyzed the exclusion of Black, Indigenous or People of Color (BIPOC) in STEM (science, technology, engineering and math). As a result, Graham and her co-authors from Mote identified that research mentoring experiences must be developed intentionally to recruit and retain BIPOC students in marine science.

The publication calls attention to the future of marine STEM, and the research behind how discrimination can disrupt the relationship between a mentor and a colleague. To help mentors and students overcome such barriers, the MarSci-LACE team at Mote creates and hosts mentor development workshops for participating mentors.

As a result of these workshops and other MarSciLACE efforts, 100% of post-REU survey respondents from summer 2020 through summer 2022 reported feeling supported by their mentor, and in general, during their research experience. These feelings of mentor support are linked to a significant increase in a sense of “belonging in science” also reported by participants.

The program’s early findings will likely contribute to a better understanding of how participation in intentionally designed, mentored undergraduate research experiences increases underrepresented minority participation in marine STEM.



TRANSLATE & TRANSFER SCIENCE FOR PUBLIC SERVICE

MOTE IS... THRIVING THANKS TO OUR VITAL VOLUNTEERS



40 & 35 YEARS OF VOLUNTEER SERVICE

MILESTONES REACHED BY TWO VOLUNTEERS THIS YEAR. Mote's 2022 Volunteer Awards Ceremony honored 554 volunteers reaching milestones for years to decades of service.

1,495 VOLUNTEERS

GAVE 153,631 HOURS of their time to Mote's mission & our oceans this fiscal year.



47,623 PEOPLE OF ALL AGES

learned about the oceans and Mote research this year thanks to **MOTE'S SCIENCE EDUCATION PROGRAMS.**

40 STATES, 25 COUNTRIES

Locations of participants in **MOTE'S ONSITE & VIRTUAL EDUCATION PROGRAMS & EVENTS.**

Through our education programs, we continue to expand Mote's reach to curious learners across the globe.



MOTE IS... ENSURING OCEANS FOR ALL THROUGH EDUCATION

20-YEAR MILESTONE



CELEBRATED FOR MOTE'S NATIONAL SCIENCE FOUNDATION-FUNDED RESEARCH EXPERIENCES FOR UNDERGRADUATES INTERNSHIP PROGRAM (NSF-REU) in 2022. This program comprises the most prestigious & competitive subset of REU internships that Mote offers to train the next generation of scientists.

216 UNDERGRADUATE INTERNS

CONTRIBUTED 91,326 HOURS TO MOTE'S MISSION this year, while developing valuable skills in marine science, education & more.

82%—PERCENTAGE OF MOTE'S RESEARCH EXPERIENCES FOR UNDERGRADUATES INTERNSHIPS*

FILLED BY UNDERREPRESENTED MINORITY STUDENTS THIS YEAR, up from 37% in 2019, supported by recruitment efforts of the Mote-led Marine Science Laboratory Alliance Center of Excellence (MarSci-LACE)**.

*FUNDED PRIMARILY BY MOTE DONATIONS

**FUNDED BY NATIONAL SCIENCE FOUNDATION AWARD NUMBER 1922351.



MarSci-LACE



VERTICAL CONSTRUCTION

LAUNCHED FOR MOTE SCIENCE EDUCATION AQUARIUM (MOTE SEA), starting with 46 auger, cast-in-place pilings 80 feet deep in the ground. This tremendous effort required a towering crane, 145 tons of steel rebar & 312 truckloads of concrete.

+\$100 MILLION

COMMITTED FOR MOTE SEA as of October 2022, a big step toward the \$130-million goal of our campaign to create this exciting new facility and realize its educational, economic and cultural benefits for southwest Florida.

2,340 FISH TRANSPORTED FOR THEIR PROTECTION BY MOTE SCIENTISTS

at the future home of Mote SEA, where construction required draining a pond temporarily. Mote scientists transported 1,366 bluegill, 439 redear sunfish, 19 black crappie, 101 yellow bullhead, 20 white catfish, 4 Florida gar, 1 longnose gar & 390 largemouth bass to nearby habitats.



NEW FLORIDA WATERSHED EXHIBIT

at Mote Aquarium transformed & expanded our existing crocodilian exhibit. Featured watershed animals now include an American alligator, two roseate spoonbills & a gopher tortoise.

7,100 MENTIONS OF MOTE IN NEWS MEDIA STORIES

allowed us to share our science, education, our outreach through Mote Aquarium, and other highlights from our mission this year.



+28 BRIEFINGS

FOR LOCAL TO NATIONAL GOVERNMENT LEADERS were provided this year by Mote President & CEO Dr. Michael P. Crosby and fellow Mote scientists, a key way that we translate and transfer our knowledge to inform societal decisions vital to the ocean's future.

MOTE IS... MOVING ONWARD & UPWARD TOWARD OUR NEW AQUARIUM

378,000 VISITORS

(A RECORD NUMBER) came to Mote Aquarium this year to learn about the oceans & Mote's groundbreaking marine science & to see our **LIMITED-TIME, VISITING EXHIBIT SHARKS: ON ASSIGNMENT WITH BRIAN SKERRY.**

EXHIBIT SPONSORED LOCALLY IN PART BY SARASOTA COUNTY TOURIST DEVELOPMENT TAX REVENUES



+300 MOTE MEMBERS

ATTENDED THE EXCLUSIVE PREVIEW OF THE SHARKS EXHIBIT AT MOTE AQUARIUM & enjoyed special giveaways & a first peek at the amazing, massive photographic works of National Geographic photographer Brian Skerry.



50 MAJOR EMPLOYERS

REACHED BY INTERNATIONAL COMMUNICATIONS ABOUT MOTE SEA thanks to Mote's participation in Global Impact's Annual Fundraising Program.

424 MARINE SPECIES

LIVED IN MOTE AQUARIUM AS OF THIS YEAR from sharks, otters, manatees, turtles & reef fishes to corals rescued from reef areas vulnerable to a major disease outbreak through the Florida Reef Tract Rescue Project.



MOTE IS... A TRUSTED SOURCE FOR SCIENCE

13 MILLION IMPRESSIONS

(number of times Mote content was seen) this year on Mote's Facebook page, which had an estimated reach of 8.3 million users who engaged with Mote posts +200,000 times. Mote's Instagram profile had a total reach was 2.8 million users, 4.4 million impressions and 186,974 total engagement. On TikTok, Mote ended the year with +54,000 followers and one breakout star—resident manatee Buffett, who earned 13.5 million views, 2.4 million likes and 57,800 shares from one viral video.

SUPPORTING OUR BEST AND BRIGHTEST

Mote is dedicated to nurturing the best and the brightest minds in marine science and technology fields—a key priority in our *Beyond 2020 Vision & Strategic Plan*. Mote offers the following awards and fellowships—made possible by philanthropic support—to deserving members of its research staff. Below each award is a list of this year’s recipients.

MOTE POSTDOCTORAL RESEARCH FELLOWSHIPS ▼

These three-year fellowships provide 100% salary support, research start-up, supplies, equipment and mentorship to postdoctoral scientists conducting outstanding work early in their careers.

NEW IN 2022:



DR. JENNIFER TOYODA joined Mote’s Ecotoxicology Program in 2022 with the goal to understand and mitigate the health impacts of harmful environmental chemicals on important marine species and public health. Dr. Toyoda earned her doctorate in Pharmacology & Toxicology at the University of Louisville. Using the One Environmental Health approach, which holistically addresses risks of environmental toxicants to human health, wildlife health, and ecosystem health, she employed field work and molecular assays to investigate genotoxicity in cells from humans, whales and alligators. Her experience allows our Ecotoxicology Program to dive deeper into the intracellular effects of environmental contaminants such as Florida red tide toxins, pesticides, and other compounds that threaten wildlife and cause human diseases.

FELLOWSHIP RECIPIENTS WHO CONTINUED IN 2022:



DR. BETH BRADY
Manatee Research Program



DR. HANNA KOCH
Coral Reef Restoration Program



DR. JAKE LASALA
Sea Turtle Conservation & Research Program

MOTE EMINENT SCHOLAR AWARDS ►

These three-year awards provide 50% salary coverage to Mote senior scientists with great potential to significantly advance or develop a research initiative consistent with Mote’s *Beyond 2020 Vision*, and which will help ensure the long-term prosperity of Mote’s research enterprise.

MOTE SCHOLARLY & SERVICE AWARDS ▼

These two-year awards provide 25% salary support for scholarly and service activities that further Mote’s mission, consistent with Mote’s *Beyond 2020 Vision*.

SCHOLARLY AND SERVICE AWARDEES CONTINUING IN 2022:



DR. NATE BRENNAN Staff Scientist in the Fisheries Ecology & Enhancement Program



DR. EMILY HALL Manager of the Ocean Acidification Research Program and the Chemical & Physical Ecology Program



DR. JIM LOCASCIO Manager of the Fisheries Habitat Ecology & Acoustics Program



DR. VINCE LOVKO Manager of the Phytoplankton Ecology Program



DR. KEVAN MAIN Manager of the Marine & Freshwater Aquaculture Research Program and Associate Vice President for Research in the Directorate of Fisheries & Aquaculture



DR. NICOLE RHODY Staff Scientist in the Marine & Freshwater Aquaculture Research Program



DR. TRACY SHERWOOD Staff Scientist in the Environmental Laboratory for Forensics



DR. CATHY WALSH Manager of the the Marine Immunology Program & Manatee Research Program



DR. DANA WETZEL Manager of the Environmental Laboratory for Forensics



DR. ERINN MULLER, Manager of the Coral Health & Disease Research Program and Coral Reef Restoration Program, and Associate Vice President for Research in the Directorate of Marine Biology & Conservation



DR. CYNTHIA HEIL, Director of the Red Tide Institute at Mote and Manager of the HAB Mitigation & Ecology Program

EMINENT SCHOLAR AWARDEES CONTINUING IN 2022:



LOOKING AHEAD

A BRIGHT FUTURE

Photo: Mote Staff Chemist Jess Frankle holds a beaker containing cucumin, one candidate compound for red tide mitigation.

AT MOTE MARINE LABORATORY & AQUARIUM, WE ARE VISIONARIES—SCIENTISTS WHO ENVISION A BETTER QUALITY OF LIFE FOR COASTAL COMMUNITIES AFFECTED BY HARMFUL ALGAE NATIONWIDE, EDUCATORS AND BIOLOGISTS WHO ENVISION A POPULAR PUBLIC PIER BECOMING A HUB OF OCEAN EDUCATION, AND THE ENTIRE MOTE FAMILY WHOSE VISION OF THE NEW MOTE SCIENCE EDUCATION AQUARIUM IS NOW ANCHORED IN CONCRETE AND READY TO RISE.

TACKLING HARMFUL ALGAE FROM SEA TO SHINING SEA

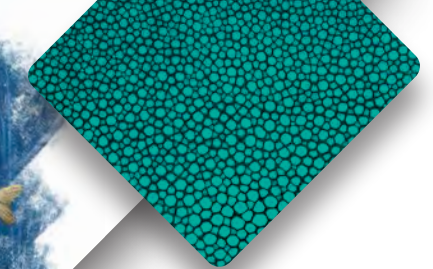
Just after fiscal year 2022 wrapped up, a significant expansion of Mote’s Florida Red Tide Mitigation & Technology Development Initiative came to fruition. Mote Marine Laboratory partnered with the University of Maryland Center for Environmental Science (UMCES) Institute of Marine and Environmental Technology (IMET) and the National Oceanic and Atmospheric Administration (NOAA) to launch an innovative U.S. Harmful Algal Bloom Control Technologies Incubator (US HAB-CTI).

The US HAB-CTI, supported by a new \$7.5 million NOAA grant, is designed to fund extramural proof-of-concept research on innovative harmful algal bloom (HAB) control tools and technology projects to assess their real-world feasibility.

HABs are a ubiquitous problem in coastal and Great Lakes waters around the U.S. Science has significantly advanced our understanding of the dynamics that lead to HAB formation and spread; however, effective means to control and mitigate HABs at multiple geographic scales remain elusive.



On this page: Renderings of Mote’s planned educational outreach center on the Anna Maria City Pier.



Right: Construction teams use a large crane with a drill to create pilings for Mote Science Education Aquarium—an early step in vertical construction.



“We know firsthand how devastating HABs can be,” said Dr. Michael P. Crosby, Mote President & CEO and a Principal Investigator on the project. “NOAA recognized the important role that our innovative Mote-UMCES collaboration will have in effectively and efficiently bringing together many diverse partners from industry, academia and non-profit organizations with a laser focus on utilizing past research and existing knowledge to develop new technologies and approaches for mitigating the impacts of HABs to the environment, economy and quality of life in communities across the U.S.”

The US HAB-CTI not only supports feasibility testing for HAB control and mitigation methods—it also provides guidance to end users and stakeholders on navigating the relevant state and federal licensing and permitting processes (e.g., state requirements, National Environmental Protection Act, and Federal Insecticide, Fungicide, and Rodenticide Act requirements). The US HAB-CTI goal is the development and implementation of scalable, environmentally acceptable, cost-effective HAB control strategies. Additionally, US HAB-CTI is archiving

tool and technology project data for sharing with the broader HAB and resource management community.

PIER-ING INTO ANNA MARIA WATERS

In spring 2023, Mote will open its third marine science education and public outreach center on the historic Anna Maria City Pier, which will inspire visitors and residents alike to connect with the vital marine ecosystem that makes Anna Maria Island one of Florida’s top destinations.

Throughout 2022, Mote worked closely with the City of Anna Maria on architectural plans and exhibit design concepts that will highlight local wildlife and Mote’s scientific mission while providing a new venue for Mote’s award-winning, informal marine science education programming. The 1,800-square-foot center will feature four aquatic exhibits, including a hands-on invertebrate touch pool, multiple interactive experiences, including a digital drawing experience where guests can see their colored illustrations come to life, and a number of educational signs, graphics and videos.

Mote’s new center will be open to the public free of charge. Mote’s Education Department will coordinate with local schools to host field trips that will help local students better understand, appreciate, protect and conserve the area’s native marine flora and fauna.

The Anna Maria City Pier location will extend Mote’s longstanding commitment to translating and transferring marine science and technology development as a public service to increase ocean literacy. The new center builds upon the mission of Mote Marine Laboratory & Aquarium in Sarasota, Florida, and Mote’s existing science education and outreach centers at the Florida Keys History and Discovery Center and the Florida Keys National Marine Sanctuary’s Eco-Discovery Center.

Construction of the new Anna Maria center is funded primarily by the Manatee County Tourist Development Tax, through a partnership between the City of Anna Maria and Manatee County, with ongoing operational costs provided by Mote.

ANCHORING OUR NEW AQUARIUM 80 FEET DEEP

Even more exciting progress is on the horizon for 2023: a significant leap forward in the construction of the new Mote Science Education Aquarium (Mote SEA) at Nathan Benderson Park.

In July 2022, the Board of Sarasota County Commissioners unanimously approved the transfer of

land for Mote SEA from the County to Mote—a key step to prepare for vertical construction. Before that, Mote and its construction partners had already completed the first two phases of construction, including finishing the parking lot area in the spring.

Once ownership was transferred, Mote was able to formally submit for construction permits, which were approved by the County in August. Vertical construction began in September, when site workers began placing 346 auger, cast-in-place pilings 80 feet deep into the ground. This tremendous effort required a towering crane, 145 tons of steel rebar and 312 truckloads of concrete.

What’s next? Unlike most buildings, Mote SEA will be built from the inside-out to accommodate the unique homes we’re building for our animals. The acrylic (clear, strong aquarium window material) needed to house the multiple, multi-story aquatic habitats must be constructed before the building shell is complete.

By the end of Mote’s 2022 fiscal year, over \$100 million in generous and visionary philanthropic, public and private support had been committed to the construction of Mote SEA. Upon completion, slated for winter 2024, Mote SEA will welcome nearly 700,000 guests to experience 110,000 square feet of informal marine science education, with three stories of science-focused aquatic exhibits, amazing new resident animals, hands-on teaching labs with no-cost opportunities for local students, and much more.



A TASTE OF WHAT'S TO COME

On April 12, the University Town Center (UTC) community came together to celebrate their incoming neighbor— Mote Science Education Aquarium (Mote SEA)—during a special SEASONAL Tasting. About 130 people joined Mote staff at the Finish Tower in Nathan Benderson Park to savor 12 food stations provided by participating restaurants and enter raffles for prizes donated by 11 area organizations. Guests visited the Finish Tower's fifth floor for a bird's-eye view of the construction site where our vision for Mote SEA is rapidly becoming a reality.

Left page: A sample of the delicious offerings enjoyed by guests at Mote's first SEASONAL Tasting event.

Right page (from top left to bottom right): Guests on the dance floor at Oceanic Evening; Mote Trustee Lt. Col. Frances Rice and her husband, Peter; Mote's Board Vice Chairman, Sandi Stuart; Mote President & CEO Dr. Michael P. Crosby; Mote Board Chairman Emeritus, Trustee and Event Chair Judy Graham.

A SEA-SATIONAL OCEANIC EVENING

We were thrilled to “Seas the Moment” at Mote’s annual Oceanic Evening event, where Mote leaders and scientists joined 520 guests in black-tie attire to celebrate the golden opportunity that our new Mote Science Education Aquarium (Mote SEA) represents.

Mote SEA, the rebirth of Mote Aquarium, is now undergoing vertical construction at Nathan Benderson Park and is expected to double the number of visitors Mote can educate each year, offer no-cost opportunities for local students in three innovative teaching laboratories, and clear the way for expanded, transformative marine science and technology at Mote Marine Laboratory’s home on City Island, Sarasota.

Oceanic Evening guests gathered in the gorgeous Grand Ballroom of The Ritz-Carlton Sarasota for welcome remarks from Mote Board Chairman Emeritus, Trustee, and Oceanic Evening Chair Judy Graham, Mote Board Vice Chairman Sandi Stuart, and Mote Board Chairman Maurice Cunniffe. Guests enjoyed delicious food courtesy of The Ritz-Carlton Sarasota and were inspired as Mote President & CEO Dr. Michael P. Crosby shared his vision for the future of Mote’s world-class marine research, conservation, science education, and bringing to fruition our Mote SEA goal of *Oceans for All*.

OCEANIC EVENING PHOTOS BY: CLIFF ROLES



WE ARE MOTE

TO DOWNLOAD MOTE'S FULL STRATEGIC PLAN, SCAN THIS QR CODE OR GO ONLINE TO: [MOTE.ORG/BEYOND2020](https://mote.org/beyond2020)



280 MOTE STAFF **42 DOCTORAL-LEVEL STAFF** **59 AQUARIUM STAFF**
 INCLUDING: **123 RESEARCH STAFF** **25 EDUCATION STAFF**
+\$18,961,623 DONATED TO MOTE **8,970 MEMBERS**
 VIA **5,393 DONATIONS** FROM **3,777 GENEROUS DONORS** **222 CORPORATE DONORS**

27 RESEARCH PROGRAMS LEADING MARINE SCIENCE AROUND THE WORLD

- Benthic Ecology
- Chemical & Physical Ecology
- Coral Health & Disease Research
- Coral Reef Monitoring & Assessment
- Coral Reef Restoration
- Ecotoxicology
- Environmental Health / Beach Conditions Reporting System
- Environmental Laboratory for Forensics
- Fisheries Ecology & Enhancement
- Fisheries Habitat Ecology & Acoustics
- Florida Red Tide Mitigation & Technology Development Initiative
- Harmful Algal Bloom Mitigation & Ecology
- Informal Science Education
- International Coral Gene Bank
- Manatee Research
- Marine & Freshwater Aquaculture Research
- Marine Biomedical Research
- Marine Immunology
- Ocean Acidification Research
- Ocean Technology
- Phytoplankton Ecology
- Sarasota Dolphin Research
- Sea Turtle Conservation & Research
- Sea Turtle Rehabilitation Hospital
- Sharks & Rays Conservation Research
- Stranding Investigations
- U.S. Harmful Algal Bloom Control Technologies Incubator (US HAB-CTI)

63 SCIENCE EDUCATION PROGRAMS (42 IN PERSON & 21 VIRTUAL), INCLUDING:

Behind-the-scenes Aquarium experiences • Camp programs • College internships • Community outreach and engagement programs • Endless Oceans adult learning program • Family programs & events • Florida Keys programs • Florida Master Naturalist Program • High school internships • Homeschool programs • Junior Educators in Training • Kayaking programs • Literacy programs with libraries • Professional development programs • Project Nature Bridge • Research Experiences for Undergraduates • School programs: field trips, outreach, classroom kits, partnerships and more • Scout programs • SEA Trek and other virtual learning programs • Special needs programs • Volunteer opportunities • Youth Ocean Conservation Summit

6 CENTERS OF EXCELLENCE

Alfred Goldstein Institute for Climate Change Studies • Center for Fisheries Electronic Monitoring at Mote • Center for Shark Research • Louis Stokes Alliance for Minority Participation: Marine Science Laboratory Alliance Center of Excellence • Marine Policy Institute • Red Tide Institute

6 ANNUAL GOALS MET OR SURPASSED BEYOND 2020 VISION & STRATEGIC PLAN

Mote's *Beyond 2020 Vision & Strategic Plan*, endorsed by our Board of Trustees, charts a course for the success of Mote's mission. Below are the annual strategic goals met or exceeded by our hardworking Mote family this year.

INCREASE THE LEVEL OF FUNDING FROM ALL SOURCES FOR ANNUAL RESEARCH OPERATIONS TO APPROXIMATELY \$27 MILLION IN 2030.



EXPAND THE TOTAL NUMBER OF MOTE PH.D.-LEVEL RESEARCHERS TO 45 IN 2030.



RECRUIT AT LEAST TWO NEW FULL TIME, SENIOR LEVEL RESEARCH STAFF BY 2030.



INCREASE THE ANNUAL TOTAL OF MOTE-ORGANIZED PUBLIC FORUMS TO 20 BY 2030.



RECRUIT AND ANNUALLY MAINTAIN FOUR CONTINUOUSLY ROTATING THREE-YEAR POSTDOCTORAL RESEARCH FELLOWSHIP POSITIONS WITH FULL SALARY/FRINGE/START-UP COSTS BY 2025.



INCREASE THE NUMBER OF PARTICIPANTS SERVED BY MOTE'S STRUCTURED EDUCATION PROGRAMS (I.E., DIGITAL LEARNING, FIELD TRIPS, CAMPUS PROGRAMS) TO APPROXIMATELY 60,000 IN 2030.

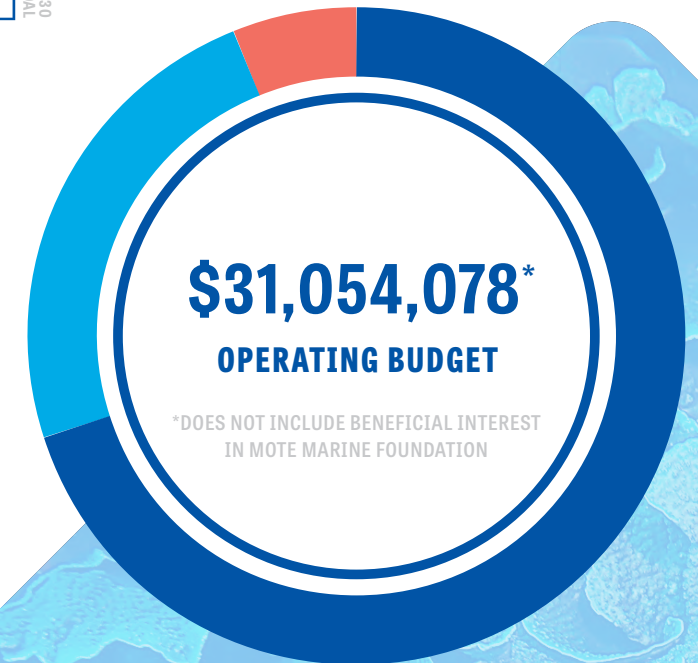


70 PEER-REVIEWED PUBLICATIONS, BOOKS & CHAPTERS

17 PATENTS HELD BY MOTE AS OF YEAR END, with two new patent applications filed this year.

RESEARCH \$21,766,426 **70%**
EDUCATION & AQUARIUM \$7,285,098 **24%**
FACILITIES & ADMINISTRATION \$2,002,554 **6%**

346,182 SQUARE FEET TOTAL BUILDINGS AND STRUCTURES





MAKING GENIE PROUD

Mote Marine Laboratory’s founding “Shark Lady,” Dr. Eugenie (“Genie”) Clark, was known for sharing her knowledge freely. Her door was always open and she enriched each conversation with fascinating science and stories.

Her generous spirit lives on through Mote supporters who shared their time, knowledge and resources to support our science, conservation and education mission this year: 29 trustees, 1,495 volunteers, 3,777 donors, 8,970 members, and countless other friends and advisors.

Many of these supporters gathered in Mote’s courtyard on May 4, proudly wearing buttons featuring Genie, to remember the Shark Lady on her 100th birthday. They also celebrated milestones of their own—some completing their 25th, 30th, 35th and even 40th year of volunteer service.

Mote’s donors went above and beyond this year to help us reach a critical point: \$100 million pledged for Mote Science Education Aquarium (Mote SEA), the rebirth of Mote Aquarium that will help us share science with visitors from far and wide, including local students who will benefit from no-cost opportunities in Mote SEA’s interactive STEM teaching labs.

Overall, Mote’s donors pledged \$18,961,623 this year for science, conservation and education—but it’s not just about one good year. Mote supporters are in it for the long haul; many have discovered our new, monthly giving program and our longstanding Legacy Society for those who include Mote in their wills or estate plans.

Mote volunteers raised both funds and fun this year, forming teams to add \$9,300 to Mote’s total raised in the Giving Challenge presented by the Community Foundation of Sarasota County, playing critical roles in Mote’s Run for the Turtles, which raised more than \$50,000 for sea turtles this year, and offering SEASON’s greetings during a thrilling holiday parade at University Town Center.

Mote members, who provide vital support to Mote’s mission and enjoy year-round Aquarium admission, brought smiles to our faces all year—especially when 300 of them turned up for a sneak peek of our limited-time exhibit “SHARKS: On Assignment with Brian Skerry.”

All of these generous supporters achieved more than enough this year to make our Shark Lady proud.

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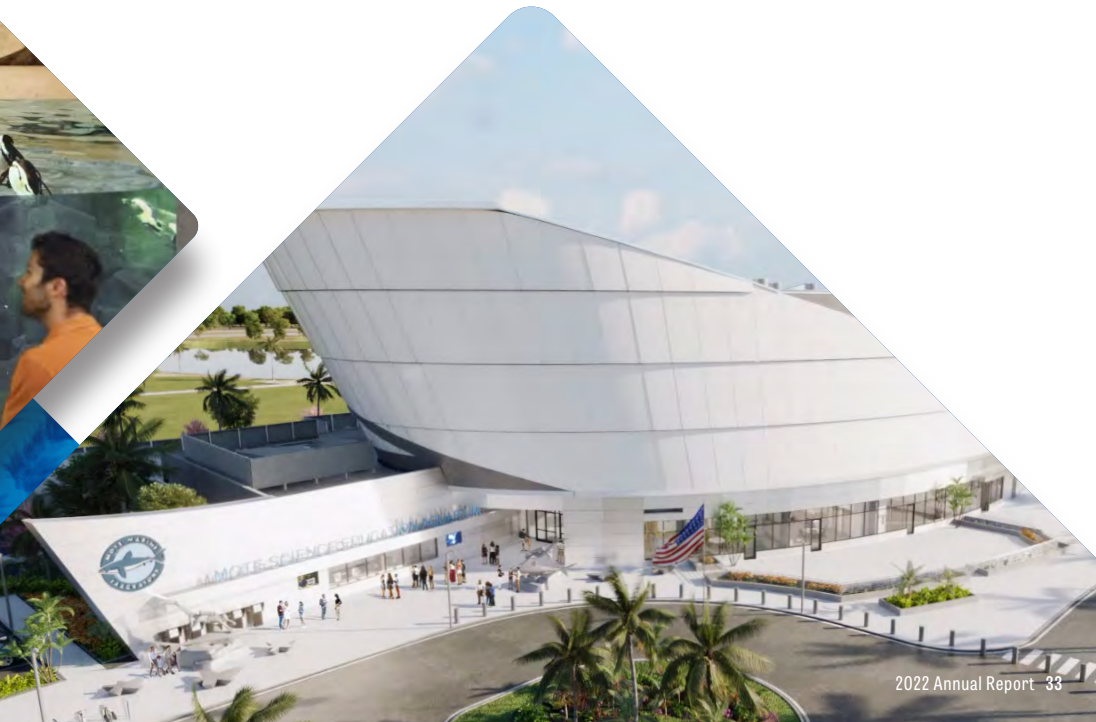
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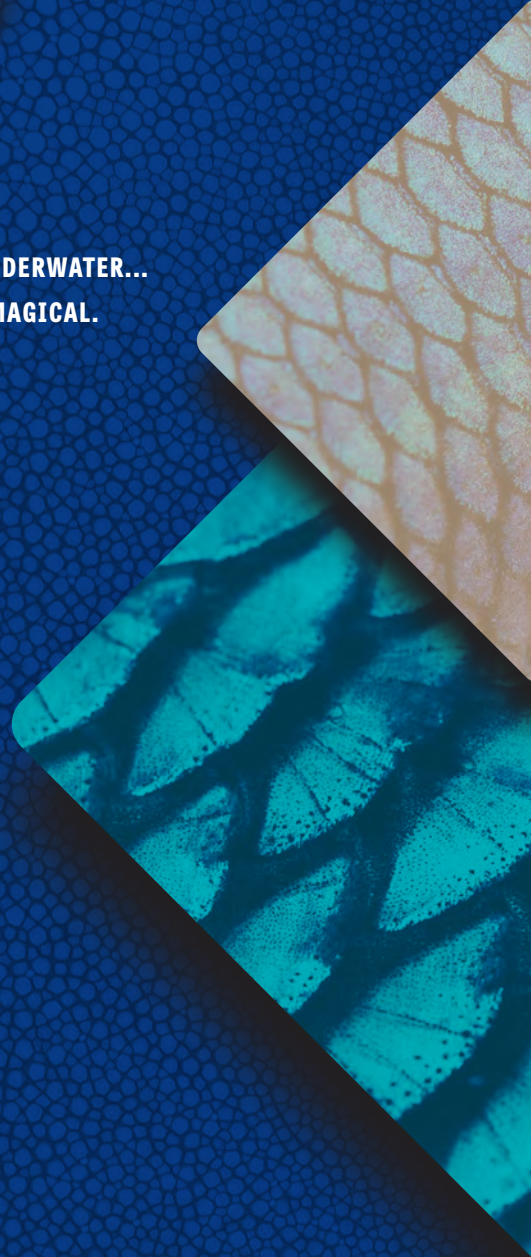
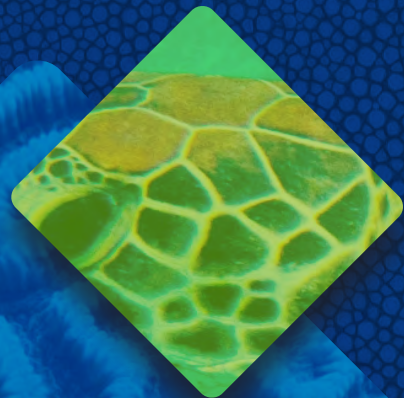
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