

HARBOR BRANCH

FLORIDA ATLANTIC UNIVERSITY

Ocean Science for a Better World™

Bulletin

JUNE 2009

DR. AMY WRIGHT NAMED FAU RESEARCHER OF THE YEAR

Florida Atlantic University's Division of Research announced the 2009 "Researchers and Creative Scholars of the Year" at the recent Honors Convocation. Each year, FAU's University Research Committee (URC) selects faculty to be recognized by the University for outstanding research, scholarly and creative contributions. Awards are presented at the academic ranks of professor, associate professor and assistant professor in two categories: sponsored and project-oriented research; and creative and scholarly activities research. This year, the URC selected six nominees to receive these awards, and we are proud to announce that Harbor Branch's **Dr. Amy Wright** was selected for her breakthrough work in the category of **Professor, Sponsored/ Project-Oriented work**.

Dr. Wright's research focuses on the discovery of novel marine natural products that have utility in the treatment of human diseases or as tools for better understanding the disease process. **Over the course of Dr. Wright's career, her research group has identified over 100 different marine natural products with biological activity.**



Dr. Amy Wright and Kathleen Janda catalogue the collected samples that will be used for drug discovery research.

One compound she identified early in her career has been approved in Europe for the treatment of soft tissue sarcoma. Another compound from the laboratory was evaluated in human clinical trials for utility against a range of solid tumors.

An additional compound recently discovered in her laboratory has been shown to block adenosine triphosphate (ATP) production in cancer cells and is currently the subject of a significant research effort at a pharmaceutical company. Dr. Wright's research has been primarily funded through research grants awarded from state and national agencies. She has served as either a principal investigator or co-principal investigator on **12 projects in the past five years with total grants exceeding \$8.5 million since 2004.** Dr. Wright has worked with students at all levels and is active at the state and national levels in organizing meetings, workshops, and serving on review panels as an expert in the field of marine natural products research. She has been selected as the **Vice Chair for the 2010 and Chair of the 2012 Gordon Research Conference on Marine Natural Products.**



FAU Researcher of the Year -- Professor, Sponsored/Project-Oriented Category – Dr. Amy Wright, Research Professor and Director, Center for Marine Biomedical and Biotechnology Research, Harbor Branch Oceanographic Institute at FAU

MARINE MAMMAL RESEARCH & CONSERVATION PHOTO ID PROGRAM



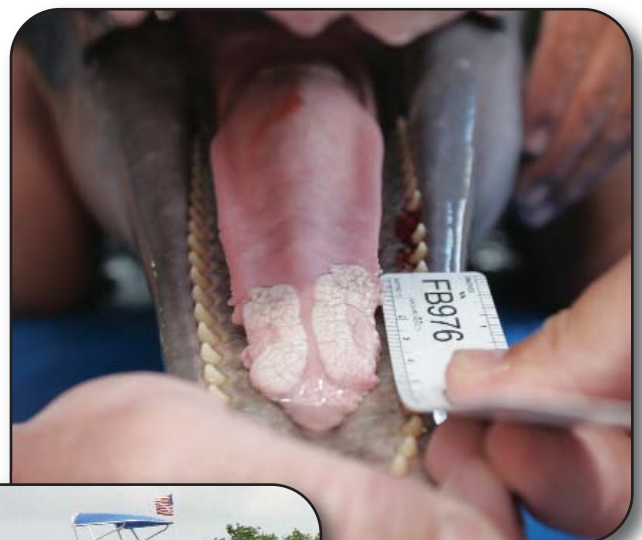
Another day at the office for Marilyn Mazzoil and the photo-identification team.

Steadying herself in the rocking boat, **Marilyn Mazzoil** takes the Canon 1DS and pushes the button. An explosion of clicks later, a young male wild dolphin is identified as Number Twenty-three. He's three years old and ducks under the water just as she's trying to get a photo—a juvenile's game of hide-and-peek.

While the information gained by **Marilyn and the Marine Mammal Research and Conservation team for the photo-identification program at Harbor Branch Oceanographic Institute at FAU** is used for resource management and evaluation of the wild dolphin populations, the process is an intimate one. Each number on the chart is like an extended family member to the team and each one has a story. Number Sixty-five had a calf last year and it's her third. Number Seventy-three and number Twenty-four form a male bond coalition, hunting together and corralling females. Sixteen was rescued after being bitten by bull sharks and was released after six months of rehabilitation. Number Fourteen is very protective of her calf, touching him with her fluke each time she dives. Seventy-two is a bully. Forty-four was hit by a boat and left behind an orphan that died shortly afterwards. The stories go on and on. Ten years of history of the wild dolphin populations that stretch from New Smyrna to Jupiter in the Indian River Lagoon (IRL) and the Atlantic Ocean yields a lot of data. Ten years of births and deaths and stories of a sentinel species—the canary in the coalmine—begin to focus the picture for the health of the lagoon and coastal waters off of the East Coast of Florida.

Each dorsal fin is distinctive. A scar, a lean to the right or left, a different coloration, an old freeze brand **all serve to identify individual wild dolphins.** The dorsal fin is photographed, GPS coordinates, environmental conditions and dolphin behavior are captured and put into a database. Why? Because once you can recognize an individual dolphin you can find a wealth of population data, including residency, home range, social structure, organization and life history information.

In 1994, the Marine Mammal Protection Act amendments required NOAA to establish a stock for all whales and dolphins occurring in U.S. waters. A stock is simply a group of the same species interbreeding and sharing the same space. There are currently seven management units defined from New Jersey to Florida along the Atlantic seaboard, but these do not include dolphins found in bays and estuaries. By establishing a stock, the National Oceanic and Atmospheric Administration (NOAA) can manage and protect these wild dolphins where they live. Key to this is defining the Potential Biological Removal rate. Simply put, this is the sustainable number of annual human-caused dolphin mortalities. **In the Indian River Lagoon mortality rates are attributed to the blue crab industry, recreational gear—such as monofilament line entanglement—or indirect impacts such as pollution and toxic spills.**



Increasing disease frequency, such as these tongue lesions, is one of several troubling signs of the possible effects of environmental stress.



It takes a small fleet of boats to cover the 156-mile stretch that is the Indian River Lagoon, home of the dolphins studied by Harbor Branch.

Knowing the individual dolphins helps the Harbor Branch researchers put the mortality rates into context. When looking at 30 years of data collected on dead animals, the first 20 years show an average mortality rate of 25 dolphins per year. In 1996 the rate doubled and it has remained high ever since. **In 2008, 65 dolphins died, the highest-ever recorded mortality rate.** While troubling, these numbers cannot be looked at in isolation. To get a better sense of the implications of these numbers, questions need to be asked and answered. *How many dolphins are in the population? Are we having an increase in mortality due to an increase in the population? Do we have seasonal residents coming down that are spiking these mortality rates or is it simply a single population that is declining and is this mortality really impacting survival?*

As background, the Indian River Lagoon **has been declared an Estuary of National Significance and is one of 28 estuaries in the country with that designation.** A comprehensive management plan was established but more information about the dolphin populations was needed and **that's where the Marine Mammal Research and Conservation program at Harbor Branch stepped in to help.**

The data are also important for the Comprehensive Everglades Restoration Program (CERP)—the world's largest ecosystem restoration plan—a \$12 billion program aimed to restore the historic flow from Lake Okeechobee through the Everglades. Currently, the flows from Lake Okeechobee are diverted out to the Gulf of Mexico and directly into the Indian River Lagoon. **These discharges are linked to algal blooms, fish kills, and toxin accumulations in the IRL. Dolphins are long-lived and feed at the top of the food web, giving them ample time and opportunity to ingest and store representative samples of the toxins and contaminants present in the IRL.**

In 2002, Harbor Branch partnered with NOAA's National Ocean Service (NOS) under Dr. Greg Bossart to do a five-year, annual collection and release of dolphins to get a suite of biological samples. Under Marilyn's direction, photo identification is used to provide the identity of dolphins. Certain dolphins are targeted for annual recapture and sampling so that their previously collected biological history can be built on further. Knowing the home ranges of these dolphins anchors the data collected from the health assessment. It

home ranges of these dolphins anchors the data collected from the health assessment. Knowing home ranges enables the researchers to be able **to pinpoint environmental exposure and link it to health risks.**

So what has been learned? **Over 800 dolphins have been identified in the IRL.** Only about 50% of the population have marked dorsal fins and about 20% of dolphins with indistinct fins are calves. Half of the distinct population has been sexed since the photo-ID program started, some through collection efforts. They've also learned there is a long term residency in the lagoon from re-sighting dolphins originally freeze-branded by SeaWorld during the early 1980's.

It's also been discovered that there are three communities of dolphins that occur in the IRL. The Mosquito Lagoon population resides primarily in the Mosquito Lagoon. There is a population in the St. Lucie Estuary, from the St. Lucie Estuary to Ft. Pierce. Finally, the Banana River populations stay there and are rarely, if ever, seen in the Mosquito Lagoon or down in the St. Lucie Estuary.

When surveying dolphins in the **Atlantic Ocean** Harbor Branch researchers **Steve McCulloch** and **Malcolm de Sieyes** were surprised to find **250 more distinct dolphins and no Indian River**



Marilyn Mazzoil in the field



Three out of four. This picture captures the dorsal fins of three of four dolphins swimming together. Individuals are identified by the distinctive marks of their dorsal fins.

dolphins. Covering four inlets from Sebastian down to Jupiter Inlet, Marilyn and her photo-ID team never saw a mixing of the populations. These social animals have surprisingly distinct ranges.

Dolphins in the IRL have a very fluid social structure. Groups are composed of mom/calf pairs, male coalitions whose male bonds form at a young age and last a lifetime. Male coalitions enhance breeding success. Rounding out this structure are dispersed juveniles. These are dolphins that have been weaned but are not old enough to breed so they form mixed sexed groups and then reproductive groups, where mothers share in calf rearing while allowing the youngsters to play together.

Thirty-one year old photo-ID research biologist Elisabeth Howells is a “grandmother” so to speak. She has just documented a third generation of calves in the lagoon. Knowledge of individual reproductive success is one way to gauge potential growth and overall health of the population. Along the way, she published a unique account of a female adopting an orphaned calf when its biological mother died from ingesting a fish hook and monofilament line.

Photo-ID research biologist Sarah Bechdel is using genetics to get a clear idea of the community structure within

the lagoon, another valuable tool in getting a better idea of the IRL and ocean dolphins. Dr. Greg O’Corry-Crowe assists that effort at Harbor Branch and has recently established a dedicated ancient DNA laboratory.

Dark storm clouds come up suddenly and with them the threat of lightning, the team must call it a day. Hopefully tomorrow they’ll find Number Thirty-five, a mother with **lobomycosis, a disease thought to come from polluted water.** This highlights the sad reality of environmental and population stressors on the shallow IRL and the dolphin populations within it. Photo-ID research biologist **Elizabeth Murdoch** is closely monitoring Number Thirty-five’s calf closely, to see if she acquires the disease as well. **She has documented over 50 cases so far.**

The good news and bad news is that **as a result of the data collection efforts by Harbor Branch, NOAA, in 2009, drafted a stock assessment report. The first report ever for the estuary,** the data collected by Marilyn’s team were included to designate the IRL dolphins as a stock. Sadly they were also designated as “strategic” which means that the human caused mortality for these dolphins exceeds the potential biological removal rate to maintain an optimally sustainable population—a serious situation for the future of the IRL dolphins and a reason why the work of the Harbor Branch Marine Mammal Research and Conservation program remains so critical.

Photos taken under NMFS Permit no. 998-1678-03, issued under the authority of the Marine Mammal Protection Act.



Research biologist Elizabeth Murdoch entering photos and related data from recent photo ID efforts into the Harbor Branch database.

IT'S ALL ABOUT THE DOLPHINS

Family Festival - Saturday, June 13 - 10am to 3pm
Harbor Branch Ocean Discovery Center
5600 US 1 North, Fort Pierce



Photo By Stephen McCulloch

Bring your family and friends to ***Celebrate the Dolphin*** — the state saltwater mammal of Florida. Join us at Harbor Branch for a day of fins, food, films and fun. Harbor Branch-FAU researchers will share their latest findings about dolphins and the environment we share with them. We'll also have hands-on educational activities and crafts for kids, photos with "Flipper," and much more. **Admission is FREE.**

Also enjoy an Eco Boat Tour of the Indian River Lagoon with Sunshine Wildlife Tours. Get up-close views of bottlenose dolphins, manatees, birds and more. Only \$10 per person. Boats depart hourly starting at 10:30am. First come, first served the day of the event.

This event is sponsored by Harbor Branch's ***Protect Wild Dolphins*** license plate, helping support dolphin rescue and rehabilitation, education, and research throughout Florida since 1999. This environmental specialty plate is available at your tax collector's office or online at www.ProtectWildDolphins.org.

For more information, please call 772.465.2400 ext. 293.



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HARBOR BRANCH CAMPUS CHANGES

by Peter Thomson,
Associate Director of Facilities Planning

Our beautiful campus on the Indian River Lagoon will see some dramatic changes thanks to the hard work of **many members of the new FAU-HBOI team**. A Master Plan is being developed, a new building will be built, existing buildings will be renovated and the campus as a whole will be enhanced. **It's all being designed and built by the state funding received in 2007 when Harbor Branch became a part of FAU.**

Campus Master Plan

"What is the vision for the Harbor Branch campus in 2018?" It is not finalized, but it is coming together. Master Plan consultants, Schenkel-Shultz Architects, have been meeting with a core working group since last October to address key Master Plan elements. The Harbor Branch community has been presented with the initial findings and invited to work with other stakeholders and users to develop goals, objectives and policies for each element. This process **will establish guiding concepts and design directions for the Master Plan. That process is expected to be completed by December 2009.**

New Building: Research Laboratory

This state-of-the-art building will enable Harbor Branch to consolidate 16 separate labs and their supporting elements in one facility. **The new structure, to be located on the channel, will be built to meet the LEED (Leadership in Energy and Environmental Design) Silver standard of the U.S. Green Building Council (www.usgbc.org).** The standards go from silver to gold to platinum, with levels based on amassing energy-saving and carbon footprint-saving points from a menu of approved items. **The design phase has begun and construction is scheduled to begin at the end of November, 2009.**

Renovation: Link Building

The Link Building at the front entrance to the Harbor Branch campus sorely needs some attention, and help is on the way. **The second floor labs will be gutted and the space will be rebuilt to accommodate a library, office space and dry laboratory space. The first floor spaces will be refurbished, including the existing office spaces, the lobby and the cafeteria.** Upgrades to the building systems and exterior will be included. The finished project will comply with applicable current codes and LEED silver certificate energy requirements. Design has started with construction scheduled to start at the end of November 2009.



The Johnson Residence is being refurbished and adapted to become the new marine mammal stranding center.



**DRAFT
MASTER PLAN**



The Johnson residence pool will once again be used to rehabilitate, strengthen and prepare wild dolphins for release back into their natural habitat.

Renovation of Johnson House for Marine Mammal Stranding Center

The Johnson House, the building with the dome at the NE end of the main channel, will soon begin a new life as our **Marine Mammal Stranding Center**. Construction on the renovation of the existing house started in January and the site has been abuzz with activity since. **The refurbished house will provide office space for the center, the pool is being resurfaced, the dome has received new screening and a life support system is being manufactured to ensure that the water quality in the pool will be suitable for caring for at-risk animals.** The project will provide a self-contained facility using state-of-the-art equipment to **rehabilitate the marine mammals that are rescued by our Marine Mammal Rescue and Conservation team.** Occupancy is scheduled for the early part of June.

Revitalizing On-site Housing for Students and Post-docs

A freshening of the duplex and apartments located between U.S. 1 and Old Dixie Highway is complete. **The work on the complex was completed in time to welcome the FAU Semester by the Sea students earlier this year.**

Upgrading of the Johnson Education Center

Since it was built in 1990, the Johnson Education Center has served Harbor Branch well. It has experienced 19 years of wear and weathered several hurricanes. It is one of the key buildings on our campus and it's going to be upgraded to better withstand future hurricanes. **The revitalizing and hardening of the building exterior will be followed by interior improvements to provide energy efficient building systems, code upgrades and enhanced finishes.** The design of the exterior package is well underway with construction planned for this summer.

Campus-wide Cleanup: Debris and Derelict Structures

A campus-wide spring cleaning got rid of lots of debris, and structures that needed to be removed. Most of the materials were recycled, some for future use on campus.

Infrastructure

As part of the Master Plan process we are taking a close look at the capacity and condition of existing utilities in relation to current needs and for future development. **The process includes identifying immediate capacity requirements as well as long term solutions** to replace or enhance our aging utility infrastructure. This is important for **our plans to grow Harbor Branch and make our beloved research institution an integral part of the FAU family.**



photo courtesy Leslie Sturmer

Clam farmer Johnny Sheridan with sunray clam seed in bags.

Sunray Venus Clam: Sustainable & Delicious!

The chef intently drops a handful of sunray venus clams in a citrus beurre blanc watching carefully as they turn a rose pink. He deftly scoops them up and places them in a serving dish. The tasting begins and the verdict for the sunray venus clam is in – delicious. Is it the new cultured clam species for Florida?

Over the past two decades, Florida has seen a dramatic increase in **aquacultured shellfish production, brought about in part by Harbor Branch Oceanographic Institute** training programs and research. The Florida cultured hard clam (quahog) industry grew from \$0.4 million in farmgate sales in 1987 to \$19 million in 2007. However, the industry is built upon a single hard clam species, *Mercenaria mercenaria*, which leaves the industry prone to economic uncertainty for price and potential catastrophic diseases.

Dr. John Scarpa, associate research professor in the **Harbor Branch Oceanographic Institute at FAU Center for Aquaculture and Stock Enhancement**, has been examining sunray venus clam culture for the past three years. He and his University of Florida (UF) collaborators are examining all aspects of sunray venus clam culture, including consumer acceptance and economics, with support from Florida Sea Grant through the end of this year.

The sunray venus clam, *Macrocallista nimbosa*, is a large attractive clam distributed from South Carolina to Florida and the Gulf states. From 1967 to 1972, two million pounds of these clams were harvested in the panhandle region of Florida. However, insufficient natural stocks of sunray venus clams, as well as the small size of fishing grounds, limited the development of the natural fishery. This **prior fishery, market and potential growth rate, along with being a native species, makes the sunray venus clam a logical choice as a new candidate species to expand the modern Florida cultured hard clam industry.**



Sunrays on ice.
Courtesy of Leslie Sturmer

Original broodstock were collected by UF personnel from the wild in the Florida panhandle, shipped to Harbor Branch by overnight courier and conditioned for spawning in temperature-controlled tanks. **Three months later the first ever successful induced spawning of both sexes was accomplished, resulting in over 30,000 sunray clam seed. A second successful spawning produced over 500,000 sunray clam seed.** From spawning to seed size, which is about a ½ inch long, took six to eight months.

Ms. Leslie Sturmer, UF statewide shellfish extension agent, is conducting the experimental grow-out portion of the study, as well as supervising volunteer clam farmers on the project. **As Dr. Scarpa explains, "This is a critical part in the study. By having clam farmers participate we are assured of multiple real-world conditions and methods to compare".**

Determining culture methods is important, but acceptance by consumers and positive economics will determine true success. **Dr. Charles Adams**, professor and marine economics specialist in the Department of Food and Resource Economics at UF, will assess these aspects through placement of the clams at specific restaurants and surveys of diners. One of the first experimental groups of sunray venus clams was sampled in a non-formal tasting at a recent industry event called "Romancing the Clam" held in Savannah, Georgia (www.ecsga.org). **One word said it all – delicious. Dr. Scarpa remarked "We're excited about the potential for the sunray venus clam to expand the cultured shellfish industry in Florida, but we still have research to do.** It's our hope that with further research we can produce culture protocols for Florida clam farmers and give consumers a delicious alternative clam to eat and enjoy."



Sunray Venus Clam seed.
Courtesy of Leslie Sturmer

Semester by the Sea



Students on the second leg of the cruise, decked out and ready to go work on the stern.



Students emptying the cod-end from the neuston net.



Students sorting through Capetown dredge sample.



Students on the first leg of the cruise, standing on the bow of the Weatherbird II shortly before departure.

Fourteen students in **Oceanographic Experience for Undergraduates**, a new course in the “Semester by the Sea” program at Harbor Branch Oceanographic Institute at Florida Atlantic University, recently wet their feet on a research cruise on the **RV Weatherbird II**.

Drs. Tammy Frank and Ned Smith, who designed and taught the course, obtained funding for the Weatherbird through the **Florida Institute of Oceanography**. Development of the course was supported by a generous donation from **Lon and Audrey Kight**.

Due to howling winds and high seas, the ship could not go to the outer edge of the shelf as planned, so the students conducted their research on two overnight expeditions at two nearshore sites—one 11 miles offshore and another in the Fort Pierce Inlet.

The students collected a variety of meteorological, physical, chemical, and biological data at their study sites, which they then quantified and presented during a poster session at HBOI. In spite of some queasy stomachs, the students thoroughly enjoyed their first oceanographic research cruise!

MARGO LAUNCHES 1,000 MILE JOURNEY FROM HARBOR BRANCH



Back Row: Eric Reese, Jill Roberts, Andy Brady, Tangie Jennings, Jennifer Choate, Brian Lapointe, Greg Morgan, Kim Cochran, Chip Baumberger Jan Petri. Front Row: Mr. Pellegrino, Kevin Murray, Hilaire Wangun, Lynn Robertson, Dennis Hanisak, Margo Pellegrino, Carol Harwood, Priscilla Winder, Elisabeth Howells

Message in a Bottle

One person can make a difference. **Margo Pellegrino** is not a professional athlete, but an ordinary mother of two from New Jersey who has paddled more than 2,500 miles of America's coast to inspire her children and others to take an active role in the stewardship of our oceans.



On Wednesday April 15th, Margo launched her Healthy Ocean's Campaign from Harbor Branch!

At the end of her journey Margo will have paddled more than 1,000 miles from Florida's Atlantic coast to New Orleans, collecting S.O.S. messages from residents who want to urge their representatives to protect, preserve and restore our oceans for future generations.

You can learn about Margo's trip at www.nrdc.org/healthyoceansnow.

Get involved!

Harbor Branch at FAU receives private support from individuals, corporations and foundations. Contributions are administered through the FAU Foundation, Inc. Harbor Branch is also a recipient of funding from federal, state and local entities for grants, programs and special events.

Gifts may be given in the form of cash, securities, real estate, tangible personal property/gifts-in-kind and planned giving such as bequests, annuities, trusts and life insurance. To give by check, please make it payable to HBOI-FAUF.

For more information regarding the many options available, contact:

JACK AYLOR, Director of Development
HARBOR BRANCH OCEANOGRAPHIC INSTITUTE
5600 US 1 North • Ft. Pierce, FL 34946
jaylor@fau.edu 772-466-9876

To give on-line go to: **www.hboi.fau.edu**

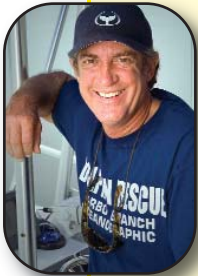


Ocean Science Lecture Series

at the Johnson Education Center at Harbor Branch. 5600 US 1 North, Ft. Pierce, FL. **Free Admission**

• **June 10, 7 pm STEVE McCULLOCH - A Decade of Protecting Wild Dolphins and Florida Whales**

Steve McCulloch has more than 30 years specialized experience working within the marine mammal industry and research community. In 1997, Steve joined Harbor Branch and established the Marine Mammal Research and Conservation program. As a scientific investigator, Steve helped create and continues to conduct ongoing photo-ID field research surveys that cover 40% of Florida's east coast. Steve also developed a stranding response and rehabilitation capability to care for sick and injured marine mammals, and since 1999 has responded to more than 200 stranding events. Each year since 2003, Steve has logistically planned and executed Harbor Branch's annual live dolphin health and risk assessment studies conducted in the Indian River Lagoon, and has also participated in similar projects throughout Florida, the Gulf of Mexico, and South Carolina.



Harbor Branch Associates Membership Program Events

unless otherwise designated, open to the public

Upcoming Events:

- **June 13th** from 10-3pm Family Festival "It's All About the Dolphins"
- **June 16th** at 4 & 7pm – Film Series – "Kilimanjaro" Members & their guests only
- **June 25th** Green Tour Series – "Barrier Island Sanctuary Center"
- **June 30th** at 9:30am - VIP Tour – Members & their guests only
- **July 1st** - Annual Turtle Walk – Special (no charge) Turtle Walk for Associates & Guests at FPL Energy Encounter on South Hutchinson Island. Free to HBOI associates, volunteers, and employees. Limited space, so reservations are needed by calling 772/465-2400 ext. 559.
- **July 14th** at 4 & 7pm – "March of the Penguins" Film and Ice Cream Social Members & their guests only
- **July 21st** at 9:30am – VIP Tour – Members & their guests only
- **July 23rd** – Tour McLarty Museum & The Sebastian Fishing Museum
- **July 25th** – Lagoon Cleanup - Sponsored by Treasure Coast Marine Industry Association. Call 772-465-2400 ext. 559 for more information.
- **August 11th** at 4 & 7pm – Film Series – "Extreme Alaska" Members & their guests only
- **August 18th** at 9:30am – VIP Tour – Members & their guests only

Join the Associates Program, Support Harbor Branch and take full advantage of all upcoming events!
For membership information call (772) 465-2400 ext. 559

www.hboi.fau.edu

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Visit the
OCEAN DISCOVERY CENTER at HARBOR BRANCH

Celebrate the Dolphin Family Festival on Saturday June 13 from 10am to 3pm

10 am - 5 pm Monday through Friday; 10 am - 2 pm on Saturday
FREE ADMISSION • 5600 US 1 North, Ft. Pierce • 772-465-2400 ext. 293

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