

Georgia Aquarium Research Center Newsletter

Vol. 1, No. 1

The Bottlenose Dolphin as a Sentinel for Environmental and Human Health

Dr. Gregory Bossart, Georgia Aquarium's Senior Vice President and Chief Veterinary Officer, is principal investigator and permit holder for the Bottlenose Dolphin Health and Risk Assessment (HERA) Project. In collaboration with Harbor Branch Oceanographic Institute at Florida Atlantic University and NOAA's Center for Coastal Environmental Health and Biomolecular Research, the HERA Project was developed to determine dolphin health patterns in nature and their potential impact on humans. The results of this research have sobering implications for public health officials.



Greg Bossart in the field with dolphin (Stephen McCulloch)

During the period from 2003-2007, comprehensive examinations were conducted on 240 bottlenose dolphins (*Tursiops truncatus*) in the Indian River Lagoon (IRL), Florida, and in Charleston (CHS) South Carolina. The results from this investigation have resulted over 40 peer-reviewed publications.

In one study, dolphins from both the IRL and CHS had a high prevalence of disease and less than half were classified as in normal health. Genital tumors on some HERA dolphins were associated with a novel herpesvirus and papillomavirus and were thought to be sexually transmitted. In other dolphins, a yeast-like organism identified as *Lacazia loboi* was causing a high incidence of a skin disease and was associated with immune suppression. (continued page 6)



(Marj Awai)

GAI Provides Help for Amazonian Manatees

Georgia Aquarium is providing a grant and expertise to Brazil to help rescue and rehabilitate Amazonian manatees. In 2007 the Aquatic Mammal research group of the Mamiraua Institute for Sustainable Development (MISD) received a permit to care for a rescued manatee named Piti Aranapu that had been harpooned. Piti was housed in a fiberglass pool on a house boat for six months where he received veterinary care. By 2008 Piti had recuperated and was released in the Amana Reserve. Subsequently, MISD was authorized to operate as a rehabilitation center for manatees. In the first two months of 2010, they received two additional calves, a harpooned female, and an emaciated male manatee placing a severe strain on the MISD facilities. The grant from the Georgia Aquarium will help MISD build additional facilities to better care for these rescued manatees, as well as obtain much needed supplies. In addition, Dr. Greg Bossart will conduct a workshop in Brazil this fall on manatee care and rehabilitation as part of our collaborative conservation program.

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Rescuing sea turtles for rehab at the Georgia Aquarium during the winter freeze of 2010 (Addison Hill)

From the Editors:

Georgia Aquarium is renowned for its amazing exhibits of aquatic animals, but the Aquarium's mission is much broader and includes a commitment to support education, conservation and research. While education programs are a visible part of the daily activities at the Aquarium, the same cannot always be said for conservation and research. Sometimes these programs seem almost invisible and yet a great deal of valuable work is sponsored each year by the Georgia Aquarium to promote a greater understanding of aquatic animals through research, and to protect animals and their habitats through conservation.

The purpose of this e-newsletter is to highlight the conservation and research activities of the Georgia Aquarium through brief reports and photographs.

We expect that each issue will be a collaborative effort with GAI staff and outside biologists contributing information and stories. For this first issue, we are grateful for the volunteer editorial support from John Hitchins and layout and design work from Dina Warnock, as well as article write-ups by Dr. Alistair Dove, George Biedenbach, and Julie Powell.

Please feel free to provide us with feedback on articles you want us to feature and whether you find this newsletter of value and interest.

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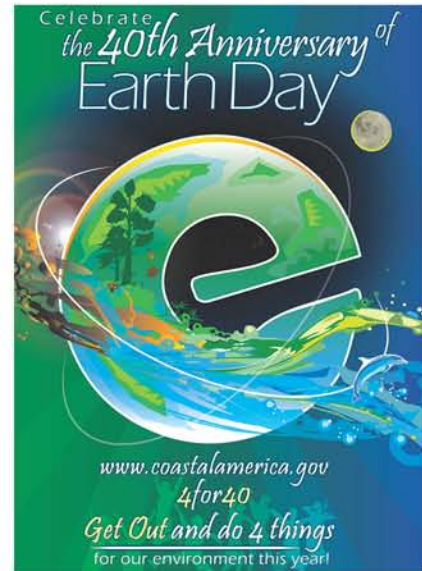
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4 For 40

The Georgia Aquarium and Coastal America have teamed up to celebrate Earth Day. Together we are promoting the Environmental Protection Agency's "4 for 40" campaign. We are pleased to report that this national initiative originated from meetings held at the Georgia Aquarium. In honor of Earth Day's 40th anniversary, everyone is encouraged to commit to 4 new changes in their daily routine that helps protect the environment. There are a number of simple choices that each of us can make. Choose 4 and commit to practicing each for the rest of the year in order to reduce your ecological footprint.

- Take 5 minute showers instead of baths
- Fix leaky faucets and toilets
- Turn off the tap when brushing your teeth
- Buy efficient fixtures that have the WaterSense label
- Use public transportation, walk, carpool or bike to work
- Do a home energy audit
- Install programmable thermostats
- Buy Energy Star products
- Turn off lights when you leave a room
- Change your bulbs to compact fluorescents
- Take reusable bags when shopping
- Reduce, reuse, recycle!

To learn more about GAI's partnership with Coastal America, visit <http://www.coastalamerica.gov/>



Recycling Day

For the second year, Atlanta City Council member Carla Smith organized the City of Atlanta's Electronic Waste Recycling Day, timed to coincide with the 40th anniversary of Earth Day. Georgia Aquarium took advantage of this opportunity to recycle old electronics scattered around various offices, storerooms and the warehouse. Thanks go to Mitch Jones, "Redmoe" Thomas, Dave Rogers, Brad McWhorter, Amit Dongerdive, John Chapman and Keith Hacke for their hard work organizing and moving two truckloads of electronics items to the loading dock and then on to Turner Field. And thanks to everyone else at GAI who dropped in other miscellaneous items for proper recycling.



(Bruce Carlson)

GAI joins WAZA

The Georgia Aquarium is proud to have become a member of the World Association of Zoos and Aquariums. WAZA's mission is to guide, encourage and support the zoos, aquariums, and like-minded organizations of the world in animal care and welfare, environmental education and global conservation. Over 600 million visitors pass through the doors of the 1300 institutions that make up the WAZA network. All members must comply with WAZA's code Ethics and Animal Welfare. To learn more about WAZA's vision visit <http://www.waza.org>

Save Ink. Save Money.
By changing your default font setting to Century Gothic you can use 30% less ink!
To learn more visit <http://www.npr.org/templates/story/story.php?storyId=125639616>
Thanks to Eric Russell, GAI Education Specialist for this Conservation Tip.

News from the Dolphin Conservation Field Station

The Georgia Aquarium, in collaboration with the Dolphin Conservation Center at Marineland, FL - operates a new field station dedicated to research, rescue, rehabilitation and release of dolphins and small whales in northeast Florida. The new Dolphin Conservation Field Station (DCFS) provides accommodations for visiting biologists, administrative office space, and laboratory facilities for understanding the causes of marine mammal stranding. DCFS works in conjunction with the Georgia Aquarium's pathology laboratories in Atlanta to help characterize marine mammal disease that may reflect the health of our oceans and impact public health as well. As a recognized member of the Marine Mammal Stranding Network, the center has several vehicles and boats that provide quick access to reach any stranded marine mammal in their designated region.

Some of the recent activities of the center are highlighted here by George Biedenbach, DCFS's Director of Conservation Programs.



All images obtained as permitted member of National Marine Fisheries Service (NMFS) Marine Mammal Stranding Network (George Biedenbach, DCFS)

Rio's story

Several years ago a bottlenose dolphin named "Rio" was struck by a boat propeller and lost a portion of his dorsal fin. The fin never healed properly and the considerable scar tissue became a magnet for monofilament fishing line and other debris. In January and March of 2010, the DCFS was asked to search for Rio and check on his condition. They were successful in locating Rio and found that he was weak and not surfacing normally. In March, they were asked to intervene and they successfully performed a health assessment on him as well as removing the entangled debris. Before releasing him, a radio transmitter was attached. Since then he has been observed in his home area with no further entanglement issues.

Pygmy sperm whale

The DCFS has been active with strandings and the most notable one recently was a pygmy sperm whale, *Kogia breviceps*, that stranded alive and expired prior to our arrival on scene in Flagler County. It turned out to be an adult female that was in the early to mid stages of pregnancy. Dr. Gregory Bossart will evaluate tissues from this whale in Atlanta. Little is known about this whale species except that it frequently suffers from a unique type of heart disease called cardiomyopathy.



All images obtained as permitted member of National Marine Fisheries Service (NMFS) Marine Mammal Stranding Network (Matthew Denny, DCFS)



(Matthew Denny, DCFS)

Community Outreach

The DCFS recently completed a "pilot" offering to public school grades two and six in Flagler County. Our goal is to present to all 2nd and 6th grades in the county next year which will amount to 3000-4000 students. The Station also took part in a local Earth Day event at nearby State Park. Attendees to the event numbered over 10,000 and on display was the Station's Transport Truck (animal ambulance). George and Matt Denny, the Station's new Field Coordinator, presented an education boat cruise on the Intercoastal Waterway to share our mission as a Field Station for the Georgia Aquarium.

Research Projects for 2010

Whale Sharks in Mexico

Georgia Aquarium has been involved in field research on whale sharks since 2005. The current focus is in Mexico, where whale sharks gather annually in the shallow coastal waters of the Yucatan Peninsula, not too far from Cancun. This year, research focuses on trying to understand an unprecedented gathering that occurred last year, in which hundreds of whale sharks gathered in a tiny patch of water further offshore, to feed on fish eggs. We'll also look at how whale sharks sniff out food like that, in the vast expanses of the ocean. You can join us on a whale shark eco-tour in Mexico this summer. For more information contact Kristie Cobb at kcobb@georgiaaquarium.org.



Right Whales in Georgia

Did you know that the right whale is Georgia's state mammal? These large baleen whales breed every year in the warm waters of the South Atlantic Bight, which includes the Georgia coast. This year the aquarium is partnering with scientists from Woods Hole to monitor right whale populations in our state.



Turtle Nesting in Georgia

Many people are unaware that the endangered loggerhead turtle nests in several wildlife refuges right here on the Georgia Coast. Georgia Aquarium is partnering with the Fish and Wildlife Service and the Caretta Research Project to survey these turtle nesting areas in Georgia so we can better understand the needs of both adults and offspring, and how to protect them.



Spotted Eagle Rays in Florida

With their graceful polka-dotted wings, eagle rays are found in all the tropical oceans of the world, but only recently has it been realized that they reproduce in the coastal waters of Florida. In partnership with the Shark Research group at Mote Marine Laboratory, Georgia Aquarium staff will study the population size, make-up and move-

ments near Sarasota, to build vital knowledge about these poorly understood but beautiful creatures.



Belugas in Alaska

With partners in the National Marine Fisheries Service, Georgia Aquarium helped pioneer health assessments for beluga whales in the Alaska in 2008, using methods developed in the aquarium setting. This year, work will focus on un-



derstanding nutrition of beluga whales in Bristol Bay relative to the population in Cook Inlet, which was recently listed as endangered. In particular, we will work out what belugas eat based on stable isotopes in their blood and biopsies, as well as test for any exposure to pollution.

Photographs: Whale shark in Mexico (Marj Awai); Right whale mother and calf (Marineland Right Whale Project); spotted eagle ray (Bruce Carlson); Loggerhead sea turtle hatchling at Jekyll Island (Terri Frazier); "Beethoven" the Georgia Aquarium's new beluga whale resident (Marj Awai)

Dolphins (continued from page 1)

Of concern is the fact that dolphins and humans are the only species known to be naturally susceptible to infection by *Lacazia loboi*. Thus these dolphins may serve as sentinel species for a public health hazard, especially in the Florida coastal region, which is used extensively for recreational purposes.

The discovery of antibiotic-resistant bacteria in cultures collected from HERA dolphins is also of concern. Of particular interest were cases of methicillin-resistant *Staphylococcus aureus*, known to many in the public health profession simply as "MRSA". These data provide evidence that the emergence of antibiotic resistant bacteria is not confined to humans. Bottlenose dolphins may serve as sentinels for transfer of resistance from humans and domestic animals or indicate that antibiotics are reaching the marine environment and causing resistance to emerge through genetic adaptation.

Another aspect of this research focused on toxins found in HERA dolphin tissues. The alphabet of toxins includes PCB's, DDT's, PFC's and other "legacy" pollutants. Another pollutant, methyl mercury, is of global concern and poses significant health risks to humans and wildlife. Methyl mercury was found in IRL dolphins at levels 4 times higher than the CHS dolphins and well above EPA standards established for fish and human consumption. However, the physiological effects of mercury contamination on cetaceans remain largely unknown.

The IRL HERA study which will continue in June 2010 has documented new and emerging complex diseases that provide important information on aquatic ecosystem health. Dolphin sentinels can provide an early warning system of potential negative environmental trends and may permit better characterization and management of negative impacts on oceans and human health.

Traveling Trevallies Revisit North Florida (excerpt from "The Volunteer Voice")

Although we didn't see as many north Atlantic right whales as we did last year, the Traveling Trevallies' trip to the northeast Florida coast, beautifully organized by Laurie Poppell, was still an unqualified success. Eighteen volunteers spent all or part of the week at the site and 11 of the 18 were newcomers to the Traveling Trevallies. For the second year, we spent a week near Flagler Beach helping the volunteers of the Marine-land Right Whale Project (MRWP) watch for whales. See <http://www.aswh.org/whale/newmain.html> for more information about the project. Frank Gromling, one of the original volunteers with the MRWP, and Becki Smith, our primary MRWP contact, joined us to describe north Atlantic right whales, the problems they face, the MRWP and its goals. For six days, Sunday, Jan. 31 through Friday, Feb. 5, we joined the MRWP each morning for four hours, scanning the ocean for right whales despite cold, wind and rain.



TWO WHALES THURSDAY!!!! Just as our shift was ending, Elizabeth Morgan, on her very first whale watch shift, spotted a whale. Becki confirmed that it was, indeed, a north Atlantic right whale. Our calling system was activated, all of us still in the area were notified of the sighting, and we all arrived in time to see the mother and calf, which we continued to follow several miles south of the original sighting. Dr. Jim Hain, Project Director, Associated Scientists at Woods Hole, Massachusetts, MRWP, was able to get photographs of the whales, which were identified as a first-time mother and her calf, the tenth mother/calf pair seen this season.

Despite the scarcity of whales and the less-than-pleasant weather, most of us already plan to return next year to watch for the seriously endangered north Atlantic right whale and enjoy the winter pleasures of the northeast Florida coast.

Next issue:

african penguin and coral reef conservation as well as research updates