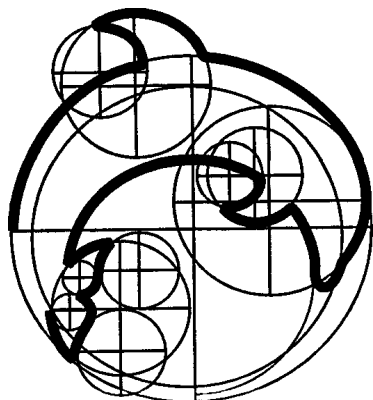


THE CHICAGO ZOOLOGICAL SOCIETY'S SARASOTA DOLPHIN RESEARCH PROGRAM



January 2001

NICKS 'N' NOTCHES

Visit our web site at:

<http://www.mote.org/~rwells/Welcome.phtml>

Celebrating 30 Years of Dolphin Conservation Research and Education

Randy Wells, Program Manager

The world's longest-running dolphin research program has grown dramatically since 1970. What started out as a pair of young guys by the names of Blair Irvine and Randy Wells who were pursuing their interests in wild dolphins during their spare time or time generously provided by Mote Marine Lab's director, Dr. Perry Gilbert*, has now become a full-time, year-round operation. The program involves 5 staff members, 6 or more graduate students, up to 13 volunteer student interns and 5 Earthwatch Institute volunteers on any given day; some projects now involve more than 100 participants, including visiting scientists, animal care professionals, and trained volunteers. Over the last 30 years the program has gained an international reputation for providing high quality information of importance to dolphin conservation.

Our primary purpose is to develop an understanding of the structure and dynamics of populations of small cetaceans, as well as the natural and anthropogenic factors that impact them. We use an interdisciplinary and collaborative approach in conducting studies of bottlenose dolphins within a unique long-term natural laboratory. The five primary goals of this program include (1) collecting biological, behavioral, ecological, and health data of importance to the conservation of small cetaceans, especially bottlenose dolphins, (2) providing requisite information for bottlenose dolphin conservation to wildlife management agencies, (3) disseminating the information generated by our program to scientific and general audiences in order to aid dolphin conservation efforts, (4) using our model program to develop and refine hypotheses regarding bottlenose dolphins in other parts of the species' range as well as other species of small cetaceans, and (5) using the established natural laboratory to develop and test new research tools and methodologies of potential benefit to conservation efforts, and to train cetacean conservation workers from around the world in the use of these techniques.

The work toward achieving these goals is conducted under the umbrella of the "Sarasota Dolphin Research Program" (SDRP). This name links the efforts of several organizations that work together to insure the continuity of the long-term dolphin research in Sarasota. The Conservation Biology Department of the Chicago Zoological Society (CZS) has provided core staff salaries and operational support for the program since 1989. Dolphin Biology Research Institute (DBRI), a Sarasota-based non-profit corporation established in 1982, provides logistical support with its fleet of five small research vessels, computers, cameras, field equipment, etc. Since 1992, Mote Marine Laboratory (MML) has provided a convenient base on City Island in Sarasota Bay, with office, storage and dock space. The SDRP maintains academic connections including graduate student sponsorships primarily through the University of California at Santa Cruz (UCSC), Woods Hole Oceanographic Institution (WHOI), and the University of North Carolina at Wilmington (UNCW).

In the articles that follow, the staff, students, and volunteers of the SDRP provide updates on the many activities of our program during 2000. Once you've had a chance to read the material, we hope that you will agree that the interest and dedication demonstrated by the two young guys in 1970 has continued and developed in important directions that benefit the dolphins of Sarasota Bay and elsewhere.



*Regrettably, Dr. Gilbert and Mote Marine Laboratory benefactor William R. Mote both passed away during 2000, but they left a significant legacy in terms of marine research along Florida's west coast.



Blair Irvine, Randy Wells, and Michael Scott work with “Genie” as a calf in 1976. Genie is now a grandmother.

Sarasota Dolphin Research Program Beginnings

Blair Irvine, President, DBRI

“Where do you think they live?” That was the first question that the late Dr. Jesse White and I discussed as we stood on a beach in Sarasota in 1970 and watched a dolphin swim slowly by. We found it curious that these large and well-known mammals lived nearby, and they were gaining celebrity status at oceanaria and on TV (remember Flipper?). Yet nobody knew much about them. Was the animal we watched going to keep swimming till reaching Key West, or would s/he hang around? And if so where? Was there a “herd,” and if so how big was it, and what was its home range? And how come nobody had tried to find out before this?

Those questions started the SDRP. I was working at Mote Marine Lab, training a dolphin to ward off sharks. So, I contacted Bill Evans, who was tagging dolphins off the Pacific Coast, and he loaned me some tags. Then I contacted Robert Corbin, a local dolphin trainer/collector, and we struck a deal such that I would work as a volunteer on his crew, and I could tag any of the many dolphins he released because they were unsuitable for sale.

A high school kid had been volunteered by his parents to help me with the porpoise-shark project. He turned out to be a bright kid who really liked dolphins, and he was even willing to build boxes, wash buckets and do the dirty work to be able to stay around. His name was Randy Wells, and he wanted to go on the tagging trips too.

So Randy and I went out with Robert every few weeks. Corbin liked us because we were free, and often we doubled the size of his crew. Turns out Randy was even cutting school to go on the trips. Since he was a top student, the big question seemed to be: was I contributing to the delinquency of a minor, or to the future of a budding marine scientist?

We tagged 30 dolphins in 10 months. We found out that they did live there, year round. And Randy was indeed destined for Marine Science.

And that’s the story of how it all started.

Thermal Stress: How Research on Sarasota’s Bottlenose Dolphins can Benefit Spinner and Spotted Dolphins in the Eastern Tropical Pacific Ocean

Michael Scott, Secretary-Treasurer, DBRI

The tuna-dolphin problem has been a contentious one during the last three decades. As the mortality of dolphins associated with the fishery in the eastern tropical Pacific (ETP) has declined from hundreds of thousands per year in the 1960’s to less than 1,500 in 1999, there have been concerns that stress caused by repeated chase and encirclement by the purse seiners might have harmful effects on the dolphin populations that are not apparent to the observers that are placed on all the boats of the international fleet. For example, stress might be affecting the population’s reproduction or survival rates in ways that cannot be measured by the observers. The U.S. Congress has mandated that stress research on dolphins be conducted to answer these questions.

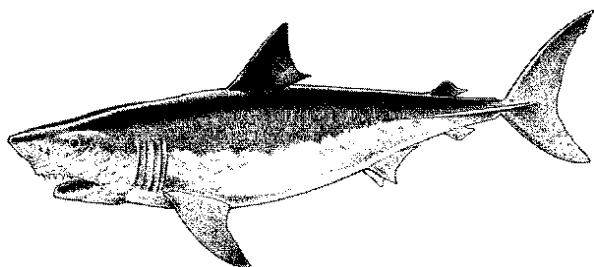
Measuring the effects of stress is extremely difficult however. One difficulty is that most methods for measuring stress exert additional stress on the animal just to collect the data. For example, looking at blood values associated with stress in other mammals requires that a free-ranging dolphin be captured and handled to get a blood sample. We have been using the blood samples of Sarasota dolphins to measure potential stress in a population that has experienced occasional captures that could serve as a baseline that can be compared with spotted and spinner dolphins in the ETP, but we have also been testing new methods that can measure a type of stress without disturbing the dolphin.

Thermal stress can be associated with chase and capture in terrestrial mammals. Increased core body temperatures in terrestrial mammals can cause maladaptive physiological changes and in extreme cases, even death. Hyperthermia may be most severe in pregnant mammals where blood flow to the uterus - required for adequate cooling of the developing fetus - may be compromised. We have been testing in Sarasota the use of a thermographic camera to obtain data on thermal stress without handling the dolphins, in order to understand the relationship between surface body temperature at the dorsal fin and flukes, heat-flux across the fin and flukes, and deep body temperatures. This method would require, however, extensive calibration with internal and external temperatures measured on dolphins held in captivity, wild dolphins held temporarily during captures, and free-ranging dolphins. During the last two years, Ann Pabst, Bill McLellan, Andrew Westgate, and Teri Rowles joined us to undertake a set of experiments aimed at getting thermal data from Sarasota dolphins during and after capture. Immediately upon restraint, dolphin thermal images and deep core temperatures were taken to calibrate the thermographic camera. One goal was to determine the relationship between respiration rate (a behavior that can be easily and non-invasively measured in the field) and heat-flux rate across the dorsal fin. We also deployed six thermal tags – saddles attached with suction cups to the dorsal fin that measure depth, temperature and heat flux.

Preliminary results suggest that that (1) the camera was capable of imaging differential temperature patterns across the dorsal fins of individuals, (2) the camera is capable of producing accurate temperature data, and (3) heat flux across the dorsal fin can be measured on a free-ranging dolphin for up to several hours with the suction-cup tags, and (4) heat flux varies considerably across the surface of the fin. More calibration studies will be conducted on captive animals to understand the relationship between swimming speed and thermal stress. A two-month cruise is planned by the National Marine Fisheries Service for 2001 that will finally allow us to use the techniques developed in Sarasota on spotted and spinner dolphins in the ETP. Support for the Sarasota component of the project was provided by the National Marine Fisheries Service.

Chicago Board of Trade Projects

The Chicago Board of Trade has provided the Sarasota Dolphin Research Program with much-appreciated opportunities over the last few years to conduct pilot studies, to explore potential research directions and develop background information that can aid in seeking extramural support for larger scale projects. During 2000, two CBOT projects were conducted, one on sharks as dolphin predators in Sarasota Bay, and another project exploring manatee and dolphin research opportunities in Belize.



We have long hypothesized that sharks, as potential predators, can have a powerful influence on the distribution, activities, and social patterns of bottlenose dolphins in the Sarasota area. In recent years, we have seen shifts in behavioral patterns, with dolphins exhibiting greater use of the habitats that would be the most reasonable habitats for large sharks as well. To try to move these hypotheses beyond the realm of mere speculation, we attempted to capture and tag large sharks in Sarasota Bay with acoustic transmitters, to allow tracking of their movements. We worked with Mote Marine Laboratory's Pete Hull and his collection crew, along with scientists Colin Simpfendorfer, and Michelle Heupel, to set 74 baited hooks in Sarasota Bay during July, the historic peak of bull shark abundance in the area. Unfortunately for the research team (though perhaps more fortunately for the dolphins), no sharks were caught, suggesting the absence of these predators from Sarasota Bay at the time of our sampling. Consistent with our findings, Dr. Bob Hueter of Mote Marine Lab estimates that populations of large sharks along the west coast of Florida have declined by approximately 80% in recent years. While this may be one possible explanation for the increased use of the Bay by dolphins, additional shark fishing effort in other seasons is

necessary, and alternative and complementary hypotheses regarding increased fish abundance following the net ban, increases in boat traffic in previous shallow water habitat, and improved water quality need to be explored. However, the pilot study helped to develop methodologies and working relationships with Mote Lab personnel that will be very useful for future collaborative studies in Sarasota Bay, as well as Charlotte Harbor.

The CBOT funded an exploratory trip to Belize in August to try to identify new field sites for dolphin behavior and health research in clear water habitats, as well as to help with ongoing manatee conservation research in conjunction with Dr. Buddy Powell. Though no new dolphin sites were found (dolphin densities appear much lower than in Sarasota Bay in the waters off southern Belize), the manatee research site in Southern Lagoon offers tremendous potential for extending the boat disturbance research with manatees that we have conducted over the last several years in Florida waters. The shallow, enclosed lagoon system offers easy access to many manatees for temporary attachment of data collection devices, and the lack of boat activity provides opportunities to better define responses to boat approaches. Based on these findings, we hope to move our Florida State-funded manatee boat disturbance studies to Belize in 2001.

Sarasota Dolphin Research Program 2000

Staff

Randall Wells, Ph.D., Program Manager
Sue Hofmann, B.S., Field Coordinator
Stephanie Nowacek, M.Sc., Lab Manager
Kim Bassos-Hull, M.Sc., Research Associate
Howard Rhinehart, AHT, Veterinary Technician
Todd Speakman, B.S., Research Assistant
Ester Quintana-Rizzo, M.Sc., Research Assistant
Douglas Nowacek, Ph.D., Post-Doctoral Investigator
Kristi Fazioli, M.Sc., Research Assistant
Michael Scott, Ph.D., Secretary-Treasurer, DBRI
Blair Irvine, Ph.D., President, DBRI
Kim Urian, B.S., Data Management Consulting

Graduate Students During 2000

Kara Buckstaff, B.S. (Master's program, UCSC)
Erin Meagher, B.S. (Master's program, UNCW)
Caryn Owen, B.A (Master's program, UCSC)
Edward Owen, B.S. (Doctoral program, UCSC)
Meg (Bolen) Pitchford, B.S. (Master's program, UCSC)
Ester Quintana-Rizzo, M.Sc. (Doctoral program, USF)
Anna Sellas, B.S. (Master's program, UCSC)
Stephanie Watwood, B.S. (Doctoral program, WHOI/MIT)

Interns

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Mayela Alsina-Guerrero	Sunah Kim
Leslie Burdett	James Madden
Jamie Cantu	Katie McHugh
Elizabeth Chandler	Adrienne Romanski
Karisa Conduff	Jennifer Thera
Rebecca Connor	Andrew Wright

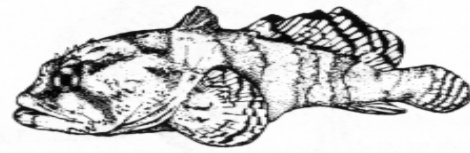
Was that the Dolphin Dinner Bell?

*Doug Nowacek, Post-Doctoral Investigator,
WHOI/National Marine Fisheries Service*

Knowing that bottlenose dolphins have a sophisticated echolocation system, we might assume that they would use it whenever they are searching for or chasing fish. Well, consider the fact that some fish species are able to hear, albeit not very well, some of the frequencies contained in bottlenose dolphin echolocation clicks! If there is the potential that your prey could hear you, you might want to consider a search method that would not announce your presence to your prey. How then would a dolphin find its prey without echolocation since the underwater visibility is poor in most areas they inhabit? We know that dolphins do in fact use echolocation during foraging, but our data suggest that they do not always use this system. If possible, it seems logical that if they had another method for locating prey, they would at least take advantage of that method on an opportunistic basis and possibly use it in a more planned way. Many species of fish make sounds as part of their own territorial or mating displays, and some of these sounds are loud enough in the right frequency range that dolphins could hear them. Dolphins are very capable of precisely localizing the sounds they hear. All of this information begs the question, 'do dolphins locate their fish prey using the sounds produced by the fish themselves?' To test this hypothesis we worked with Duke University PhD candidate Damon Gannon to conduct a set of preliminary experiments in Sarasota Bay during September and October of this year.

To test our hypothesis we laid out the following experiment. Since we wanted to know whether and, if so, how a wild dolphin would respond to the sound made by one of its prey fish, we had to recreate that situation and then closely observe the dolphin's response. To recreate the fish sound we played prerecorded sounds of an oyster toadfish over an underwater speaker to dolphins under our observation. We wanted to be able to record responses from subtle (e.g., head turn) to overt (e.g., approach to the speaker). In order to record baseline data, i.e. before and after playbacks, as well as our test data we used the overhead video system developed in Sarasota for the observation of foraging dolphins. To begin we followed an individual focal dolphin for at least ten minutes recording its behavior with the overhead video camera. Then we positioned a second boat, the playback boat, close to the focal animal. The playback boat, with its engine shut down, played back either our toadfish sound or one of two control sounds. Due to cloudy and windy weather we were able to conduct fewer trials than we had hoped, but we did record some interesting results. At least one focal animal displayed a reaction to the toadfish sound, while a different focal showed no response. We cannot, of course, conclude anything from so few trials, but we are encouraged by the fact that we did observe a response from at least one animal. This dolphin turned towards and briefly approached the playback boat immediately after the playback. We hope to have an opportunity in the near future to conduct more trials of this ecologically fascinating experiment.

Noisy Fish = Dolphin Lunch??



Toadfish

Can Manatees Hear What's Coming?

Doug Nowacek

We are all too familiar with the fact that Florida manatees are often hit and killed by passing boats. Many manatees do survive collisions, as is evident from the numerous scars many animals carry. Why then, if it's been hit before, might a manatee not move out of the path of another oncoming boat? While manatees may not have the acute acoustic sensitivity of its marine mammal cousin, the bottlenose dolphin, we know that manatees are physically able to hear the frequencies produced by the outboard vessels so prevalent in their environment. We believe that, based on their anatomy, manatees are not able to precisely determine the location of a sound source. Despite these disadvantages, manatees should still be able to hear the sounds of an oncoming boat due to the extremely loud sounds produced by the boats. We hypothesized that one factor that could be contributing to a manatee's inability to detect an oncoming boat in enough time to seek refuge is the attenuation of the boat's sound as it travels through the shallow waters manatees inhabit. In particular, a sound made in a relatively deep channel will be significantly reduced in intensity as it travels from the deep water into the extremely shallow areas where manatees spend much of their time.

To test our hypothesis we needed to measure the amount of attenuation or transmission loss of sound energy that occurs between the location of the sound source (e.g., the channel) and the receiver location, the manatee. Researchers at one location in a boat held an underwater speaker at a consistent depth, and another researcher at the receiving location held a hydrophone underwater and recorded the sounds on a DAT recorder.

To test sound transmission we played back a recorded tone of sweeping frequency through the underwater speaker from the source location and recorded the transmitted sound at the receiver, using a variety of source and receiver depths and locations. In addition to measuring the transmission loss strictly based on the distance between source and receiver, we also conducted trials to test the effects on sound transmission of various bottom types. Specifically we were interested in measuring the effects of sea grasses on the sound transmission. Manatees spend a great deal of time in sea grass beds, so we felt that it was important to measure this effect. Analyses of the data generated by this Florida Fish and Wildlife Conservation Commission project are underway.

Assessing the Impacts of Watercraft Noise on the Acoustic Behavior of Bottlenose Dolphins

Kara Buckstaff, Master's Candidate, UCSC

There is much concern that man-made sounds introduced into the marine environment could have especially deleterious effects on acoustically sensitive animals such as cetaceans. Studies have indicated that elevated background noise levels produced by man-made noise may prevent detection of calls from others of their kind and echolocation pulses, thereby, interfering with communication, prey detection, navigation, and detection of predators.

The goal of my Master's thesis research is to determine the impacts of watercraft noise on the acoustic behavior of the resident community of bottlenose dolphins in Sarasota Bay, Florida. Previous studies conducted by Randy Wells and Michael Scott (1997) and Stephanie Nowacek (1999) have shown that bottlenose dolphins are affected by watercraft through collisions and changes in behavior, but it has not been possible to identify direct relationships between watercraft noise and the acoustic sensitivities of these dolphins. For my thesis, I am attempting to determine if Sarasota's dolphins alter their whistles to compensate for watercraft noise interference. Do dolphins alter the frequency range or the amplitude of their whistles in the presence of boats? Are there any differences observed between call rate, call duration, frequency range, or amplitude of whistles between shallow and deeper water habitats when boats are present?

During this past summer, I collected data on opportunistic watercraft activity and dolphin behavior, as well as underwater recordings of both dolphin vocalizations and boat noise during focal follows of individual dolphins. Mothers with newborn calves ($n = 6$) were prioritized because they represent a vulnerable segment of the dolphin population and because this project was a collaborative effort with colleagues at Woods Hole Oceanographic Institution who are conducting a vocal development project. During 58 hours of focal follows, 764 boat approaches were recorded. Underwater recordings were obtained using a rigid, 2-meter, linear array of 15 hydrophones suspended from one side of the observation boat. Data analyses will begin this winter. The second and final field season will be conducted next spring and summer.

This project is being funded by the Disney Wildlife Conservation Fund, Myers Oceanographic Trust Fund, and the American Cetacean Society. The first field season would not have been possible without this support or the help of our interns: Leslie Burdett, Kristine Jankowski, and Katie McHugh.



Manatee Boat Disturbance Project: Year 2

Stephanie Nowacek, Laboratory Manager, SDRP

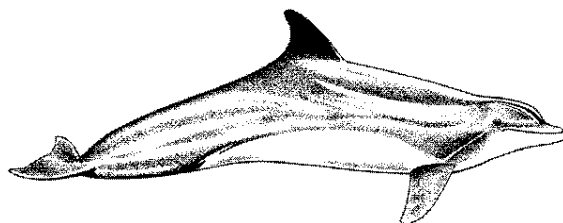
We completed our second year of observations of the endangered Florida Manatee in our continued effort to determine how marine animals respond to boat traffic. Dolphin boat disturbance studies showed increased frequencies of behavioral changes during boat approaches. Would manatees respond in similar ways? Our first year of observations indicated that perhaps response is similar across species lines. However, small sample sizes limited our ability to draw definitive conclusions. This second year increased our sample size allowing us to (i) determine whether boats did in fact influence manatee behavior and (ii) determine under which specific conditions change in behavior was more likely to occur.

Preliminary results indicated that change in behavior did, in fact, occur as a result of vessel approaches. Manatees

were more likely to change behaviors like swimming speed, heading, and inter-manatee distance in response to vessel approaches. Additionally, we saw an increased likelihood of manatees moving from shallow water grass flat areas to channels when boats were approaching. While this seems to be an appropriate response because moving to deep water allows animals to dive beneath approaching vessels; it

appears that manatees may not be able to dive quickly enough upon reaching the channel to get out of the way of the approaching boat. Analyses are continuing that should better describe under what specific conditions manatees are likely to respond to boat approaches. For example, are water depth, boat type or boat speed confounding factors?

While these first two years have provided much insight into the way manatees respond to vessel traffic, many of our questions are still unanswered. Using a non-invasive tag developed by Woods Hole Oceanographic Institution scientists, we hope to look at these responses in a more direct and quantitative way for our third year of research sponsored by the Florida Fish and Wildlife Conservation Commission.



Reproductive and Ecological Functions of the Pair Bond between Adult Male Bottlenose Dolphins

Edward Owen, PhD Candidate, UCSC

In Sarasota, about 3/5 of adult male bottlenose dolphins form strong pair bonds that may last for the duration of the males' adult life (up to 20 years or more). Members of these male pairs are rarely sighted without their male partner. Although the exact function of these pair bonds is unclear, it has been suggested that they may play a significant role in the mating system of bottlenose dolphins, and they may also serve other ecological functions. These paired males provide us with the opportunity to understand further the breeding system and social organization of bottlenose dolphins and to study the rare case of cooperation between mammalian males.

Building upon the methods developed last year, during May-August, 2000, I collected data which will help address why adult males form these pair bonds. Being a member of a male pair may serve to increase mating opportunities and obtain access to females. It has also been proposed that pairing may increase predator detection and protection, enhance foraging ability through cooperative efforts, and provide mutual protection during conflicts with other adult males. However, despite these apparent benefits, about 2/5 of adult males do not form these alliances and remain single throughout their adult lives. Therefore, it is interesting to ask why do some adult males form these pair bonds? What benefits do they receive from such an alliance?

WHOI PhD student Stephanie Watwood and I conducted our collaborative research from the only house boat in the SDRP fleet, "*Hobo*". During May and early June we used the airship and overhead video system to observe sub-surface behaviors of adult males. We then shifted to radiotracking for the following month – during the temporary capture and release program, we were fortunate to handle 8 adult males, 4 of which received VHF transmitters attached to their dorsal fins, "Jack", "Norman", FB28, and FB58. These males include 2 of the oldest males in the community with "Norman" and FB58, and it was exciting to be able to conduct extended observations on these males to determine if adult males of different ages display any differences in their behaviors, particularly with females. These transmitters enabled us to observe the males over consecutive days, including tracking them through the night.



FB28 with Roto-Radiotag 19 June 2000. The white markings are from a longterm skin disease.

Preliminary observations suggest that paired males are able to stay with an adult female over consecutive days, allowing for the possibility of mate guarding. It also seems that the presence or absence of other adult males influences the behavior of adult

males with adult females; that is, if a pair of males is with an adult female, they stay closer to that female if another adult male is present. If another male is not present, then the members of the pair may alternate in maintaining closeness to the receptive female. This fall and winter will be spent conducting analyses of the observations from this past summer, and continuing behavioral observations, weather willing, in order to be able to draw behavioral comparisons between the breeding and non-breeding seasons.

Stephanie's and my research would not have been possible without the help of our dedicated field assistants: Desiree Allcock, Jamie Cantu, Rebecca Connor, Joe Gaspard, Kristine Jankowski, Sunah Kim, James Madden, Adrienne Romanski, Todd Speakman and Jenn Thera. This work was supported primarily by the Disney Wildlife Conservation Fund and Dolphin Quest.

Male Shared Whistles: Catcalls or Coalition Signals?

Stephanie Watwood, PhD Candidate, WHOI/MIT

My thesis project involves examining contextual whistle use by male bottlenose dolphins. Males in tight alliances tend to produce whistles that are more similar to the whistles of their partners than to the whistles of other alliance males in the community. This in effect creates a signal that is unique to each alliance. The question remains, however, as to what purpose these whistles serve. One possibility is that shared whistles play a role in attracting or maintaining access to mates. Males may make similar whistles as a signal to a female, either of their quality as mates or of their ability to guard her and prevent her access to other males. Conversely, the shared whistle could be a signal to other alliances in the area, a vocal threat to keep their distance while guarding a female.

To answer this question, I am recording the whistles that alliance males produce when in particular behavioral contexts. This requires being able to determine where sounds are coming from around the boat and keeping track of the positions of all animals around the boat. In addition to this, I also have to record the behavior of both members of the alliance. To make this possible, I am collaborating with Edward Owen, whose work on the function of the male alliance bond also requires behavioral observations on both animals. Together, we followed six alliances of males during the breeding season, from May-August 2000. A long tube filled with 15 hydrophones was towed alongside our observation vessel, the houseboat "*Hobo*", while we were with animals. The positions of animals and the boat in the water were automatically logged onto a laptop computer that we kept inside the houseboat. In the lab, I am using a beamforming program developed by Patrick Miller at WHOI to determine the locations of sounds and the locations of animals to assign particular vocalizations to specific individuals.

Next summer I hope to continue this project, and also carry out a set of playback experiments. These experiments are useful ways of asking animals how they perceive different sounds. Only through testing can we determine the role that vocal communication plays in the social lives of bottlenose dolphins.

The National Geographic Society Committee for Exploration and Research provided funding for the acoustic portion of the project and I was supported by Woods Hole Oceanographic Institution and NIH.

Mating System of Sarasota Dolphin Researchers

- Kim Bassos-Hull and Peter Hull proud parents of a boy born March 2000
- James and Connie Thorson proud parents of twin girls born August 2000
- Meg (Bolen) and Tom Pitchford proud parents of a girl born September 2000
- Kristi and Marc Fazioli expecting in May 2001

Parental Care as a Function of Experience in Free-Ranging Bottlenose Dolphins

Caryn Owen, Master's Candidate, UCSC

My thesis research involves measuring the difference in parental care between first time bottlenose dolphin mothers and experienced mothers, testing the hypothesis that parenting is a learned skill, which increases each time the mother gives birth. We conducted focal animal observations on 17 mothers with newborn calves during May – August 1999, and May – September 2000.

Preliminary analyses of these data suggest that there is indeed a difference in the parenting styles of older, more experienced mothers, and young mothers who have given birth for the first time (in the first month of the calf's life, which may be a critical period for calf survival). Experienced mothers were found in larger groups, containing other mothers with newborns. These large nursery groups may be a safe environment for calves, providing predation protection and social interaction with other newborns. First time mothers were not frequently found in these nursery groups, but instead were often found alone, or with sub-adult dolphins, therefore not providing their calves with the safety of a larger, more experienced group.

Synchronicity of surfacings between the mother and calf proved to be the most revealing measure of parental care in the first month of the newborn's life. Newborns of first time mothers surfaced alone more than three times more than newborns of the most experienced mothers. If the newborn did not surface synchronously with the mother, the distance between the pair was increased and the calf did not receive the energetic boost from riding in close to its mother, nor can it be protected as effectively from predators or aggressive interactions with other dolphins. It seems that non-synchronous surfacings indicate decreased control by the mother over her calf's environment, thus reflecting a lack of experience of parental care in first time mothers.

This research was conducted through the support of Dolphin Quest and the Chicago Zoological Society, with supplemental support through the WHOI Vocal learning Project. This project could not have been conducted without the help of many research assistants: Stephanie Young, Jocelyn Hittle, Carrie Merola, Kristine Jankowski, Leslie Burdett, and Katie McHugh.

Social Influences on Vocal Development in Wild Bottlenose Dolphins

Ester Quintana-Rizzo, Research Assistant, SDRP

Knowing what sound to make and when to make it is a matter of both knowing how to make the sound and when to use it. Bottlenose dolphins have shown an ability to learn to make new sounds that is unusual among non-human mammals. The Vocal Learning Project, which is directed by Drs. Peter Tyack and Deborah Frupp from Woods Hole Oceanographic Institution (WHOI), examines whether dolphins use this ability in the development of their natural vocalizations. In particular, the project is evaluating the role of experience and the acoustic environment in signature whistle development by bottlenose dolphin calves. Signature whistles are individually distinctive whistles produced by an individual dolphin.

The first part of the project took place this summer. We followed six resident female bottlenose dolphins with newborn calves to record the sounds to which the calves were exposed, for a total of 44 hours. To record sounds, we used an array of 15 hydrophones towed next to the new 22 ft research vessel *R/V Nai'a*. At every surfacing, we recorded the position of all the dolphins in relation to the boat which, in combination, will allow us to determine the identity of the whistlers. Social interactions between dolphins were also recorded using focal animal sampling techniques. This will be used to determine what social factors, if any, play a role in the development of the calf's signature whistle. The project will continue following these six focal females and their calves later this fall and early in the spring. Next summer, the project plans to follow another set of females with newborn calves.

The project is conducted through the support of the National Institutes of Health and WHOI. The project also received assistance from Drs. Patrick Miller and Vincent Janik from WHOI. Kara Buckstaff and Caryn Owen helped with data collection.



Through the sale of several of our older vessels and vehicle, the generous support of Don and Lee Hamilton, Cannons Marina, and Edward McCormick Blair, Jr., and research revenues for equipment use, we were able to obtain a new research vessel and towing vehicle during 2000. The 22 ft Grady White "Nai'a" is equipped with a tower complete with controls, facilitating studies involving focal dolphin behavioral observations. The boat was used for five different projects during 2000.

Earthwatch Dolphin Monitoring Program 1999-2000

Sue Hofmann, SDRP Field Coordinator

Thanks to another year of support from Earthwatch Institute volunteers, we have been able to continue our year-round monthly monitoring of the Sarasota dolphin community. We continue to address increasingly refined questions about the lives of these animals with the benefit of information gained through our intensive year-round studies of the distribution, social, and reproductive patterns of these animals.

Photo-identification surveys were conducted on 95 days from October 1999 through September 2000. Seventy-two Earthwatch volunteers from 18 states and 4 countries aided in our field efforts. We had 678 group sightings that totaled 2,392 dolphins (including resighted animals). Our average number of sightings per day and dolphins per sighting have remained fairly constant throughout the past several years. During this past year, we averaged 7 sightings per day with over 3 dolphins per sighting. We had a high of 16 sightings in one day during a May survey and a high of 62 dolphins in a day during a January survey. Our annual average of the number of dolphins sighted per day was higher, at 25.2, than in the previous four years, reflecting an apparent increase in the number of dolphins using Sarasota Bay in recent years.

We were able to document the presence of nine newborn calves while monitoring the Sarasota dolphin community. Beginning in May and continuing through July, YOYs (young of the year) were born to FB 1, Saida, FB 54, FB 93, FB 99, FB 149, and Pecan Sandie. Of these females, FB 1 was the only first-time mother. Big Shout and Shortcut, females previously identified from surrounding regions, also raised YOYs within the Sarasota study area this summer. Unfortunately, Saida's calf was initially sighted dead. The remaining eight calves all have been sighted and doing well through October. The eleven 1999 calves that survived into 2000 all have been seen doing well through November. All of the 1998 calves are still doing fine. Three of these animals were freeze-branded this past summer. Rose had a son, and FB 15 and RP 27 had daughters. The 1995 calf (daughter) of FB 13 was also freeze-branded, as was the 1996 calf (son) of FB 25. Through our Earthwatch-sponsored surveys, we have accounted for over 95% of the present Sarasota community members.

Once again, we would like to thank all of our Earthwatch volunteers for your interest in and support of the Sarasota Dolphin Research Program. If you are interested in joining one of our Earthwatch teams, please call 1-800-776-0188, and ask about "Wild Dolphin Societies".



Intern Perspective

Kristine Jankowski

After graduating college, I was indecisive as to the exact route to embrace for my career. Fortunately, I was awarded an internship with the Sarasota Dolphin Research Program. SDRP is a unique program in which undergraduate and graduate students can acquire first-hand knowledge of cetacean research through field and laboratory work.

Over 90% of my internship was spent conducting fieldwork in Sarasota Bay and adjacent waters. I assisted in a variety of projects conducted by Dr. Randall Wells' graduate students and visiting scientists. Through Caryn Owen, Edward Owen, and Kara Buckstaff's projects, I received insight on mother-calf relationships, adult male pairs, acoustic behavior, as well as learned to identify many of the dolphins in Sarasota Bay. My field duties included behavioral and survey data collection, setting up acoustic equipment, enhancing boating skills, and monitoring dolphin activity and position during focal follows.

While in the laboratory, I gained valuable skills in the organizing of field information, which included data entry into various software programs. In addition, I learned standardized techniques in photo-identification, labeling and sorting slides, and slide duplication. I also conducted an individual project, as a requirement for the Einar T. Anderson Scholarship I received, which focused on the ten closest associates of the previously released pair Echo and Misha. In my spare time, I volunteered with Mote Marine Laboratory's Dolphin and Whale Hospital by assisting with the attempted rehabilitation of a pygmy sperm whale.

I was extremely fortunate to work with so many intelligent, enthusiastic, and compassionate individuals who served as mentors throughout my internship. Mote Marine and SDRP have provided me with great opportunities to experience numerous aspects of dolphin research while pointing me on the right path towards a career in cetacean research.

Sarasota Dolphin Status in 2000

FEMALES

		<u>EVENT</u>
1	Daughter of FB 43	Had a YOY in 2000
3	Daughter of FB 19	
5	FB 5	
7	Lightning	
9	Pumpkin	
11	Merrily	
13	47LA	
15	Nicklo	
17	FB 17	
25	FB 25	
27	Moonfin Look-alike	
33	Saida Beth	Had a YOY in 2000
35	Squiggy	
43	Cathy	
54	FB 54	Had a YOY in 2000
55	Daughter of FB 5	
59	Genie	
63	Ms. Mayhem	
65	Tramp	
73	Tag 51	
75	Pup	
79	FB 79	
83	Jagged Mama	
84	Mama Mia	
87	Squarenotch	
90	Killer	
93	Daughter of FB 35	Had a YOY in 2000
99	FB 99	Had a YOY in 2000
101	Rose	
105	43LA	
109	Scooter	
111	Clown Look-alike	
113	Lizzie	
115	Mother of FB 166	
117	FB 117	
119	RP 27	
123	Daughter of FB 15	
125	Daughter of RP 27	
127	Daughter of FB 13	
131	Claire	
149	FB 149	Had a YOY in 2000
153	Blacktip Doubledip	
155	Murphy Brown	
157	Pecan Sandie	Had a YOY in 2000
163	LA94	
175	Daughter of FB 75	
183	Tri A	
191	FB 191	
BIST	Big Shout	Had a YOY in 2000
DRSN	Dr. Strangenotch	
FTTP	Fattop	
49LA	49LA	
IKNO	I know	
JOSE	Jose	
SBDO	Scooby Doo	
SHTC	Shortcut	Had a YOY in 2000
ZRBA	Zorba	

UNKNOWN GENDER

POOF	Poof	Changed fin in 2000
CWM3	1991 calf of WTMA	
C354	1992 calf of FB 35	
1535	1995 calf of FB153	Not IDed in 2000
49C4	1995 calf of 49LA	
C871	1996 calf of FB 87	
1311	1996 calf of FB 131	Not IDed in 2000
IKN2	1997 calf of IKNO	
JOSE	1997 calf of JOSE	
SBDC	<1998 calf of SBDO	
C596	1998 calf of FB 59	
C835	1998 calf of FB 83	
1633	1998 calf of FB 163	
1833	1998 calf of FB 183	
C031	1999 calf of FB 3	
C074	1999 calf of FB 7	
C093	1999 calf of FB 9	

MALES

		<u>EVENT</u>
2	Son of FB 59	
6	Son of FB 71	
10	Petey	
14	Jack	
20	Perry	
26	Norman	
28	FB 28	
32	Son of FB 5	
36	B-8	
44	R	
46	FB 46	
48	Jimmy Durante	
58	Ken	
66	Otter	
76	Racing Stripe	
78	Riptorn	
92	Lasagna	
94	Sparks	
96	H	
100	Scythe Fin	
102	Scoopnick	
106	3NIK3	
108	3NIK	
110	FB 110	
114	FB 114	
118	Son of FB 54	
126	FB 126	
128	Son of FB 153	
132	FB 132	Changed fin in 2000
134	Mr. Natural	
136	Sawblade	
138	Son of FB 63	
142	FB 142	
146	Son of FB 11	
148	Son of FB 54	
152	Son of FB 163	Not IDed in 2000
154	RT-3	
158	Grasshopper	
160	FB 160	
162	FB 162	
166	Son of FB 115	
174	TNLV	
176	FB 176	
178	pi; son of FB 9	
180	HSM2	
182	Son of FB 183	
184	Son of FB 149	
186	Famous Amos; son of FB 157	
188	Noah; son of FB 33	
190	Son of Fattop	
192	Blackstripe Leadcrease	
194	Pair 'O Nicks	
196	Bud; son of Rose	
198	Son of FB 25	
C834	Pokey	

UNKNOWN GENDER

C273	1999 calf of FB 27	
C551	1999 calf of FB 55	
C653	1999 calf of FB 65	
C756	1999 calf of FB 75	
C905	1999 calf of FB 90	
1312	1999 calf of FB 131	
1536	1999 calf of FB 153	
CCL6	1999 calf of Clown Look-alike	
ZRBC	1999 calf of ZRBA	
C011	2000 calf of FB 1	
C335	2000 calf of FB 33	Died on 31 May 2000
C545	2000 calf of FB 54	
C932	2000 calf of FB 93	
C992	2000 calf of FB 99	
1493	2000 calf of FB 149	
1573	2000 calf of FB 157	
BISC	2000 calf of BIST	
CSH3	2000 calf of SHTC	

Effects of Environmental Contaminants

Dolphin health continues to be a primary focus of our research program, especially in relation to effects of environmental contaminants. Previous work with the Sarasota dolphins suggests that these animals are exposed to moderate levels of some chemical contaminants (such as DDT metabolites and PCBs), facilitating the investigation of sub-lethal effects of these chemicals on dolphin health and reproduction. Such research requires the examination and collection of samples from individuals of known age, sex, and reproductive history for measurement of contaminant residues, health assessment and reproductive activity. This kind of research has been identified by the International Whaling Commission and the National Marine Fisheries Service as requisite to understanding the effects of contaminants, and identifying biomarkers of the contaminants. To address these issues, we conducted a dolphin capture, sample, and release program in June 2000, in which we worked with 26 residents of the Sarasota dolphin community. Twenty different projects were conducted with each dolphin, and more than 100 scientists, students, and dolphin handlers participated in the work over a two week period.

This summer's sampling and subsequent sample analyses, supported by Dolphin Quest, the National Marine Fisheries Service, and the Center for Conservation Medicine of Chicago, represented the first year of a 3-year international collaborative program coordinated by the IWC, examining contaminants and biomarkers in bottlenose dolphins in the Bahamas, off Spain, and in Sarasota Bay, and harbor porpoises in the Bay of Fundy and Europe. Subsequent years will attempt to increase the sample size of different age and sex classes. Plans for next summer's program were completed in late November at a meeting of the IWC's Pollution 2000+ Program's Steering Group in the Netherlands. Complementing the Pollution 2000+ Program, Dr. Wally Jarman of the University of Utah is completing his analyses of archived blood and milk samples collected during 1990-1999, providing insights into relationships between contaminant loads and age, sex, reproductive condition, and changes in individuals over time. Preliminary findings from this work were presented at the Atlantic Coast Contaminant Workshop in June and the Marine Sentinel Species Workshop in October; a more complete summary will be presented to the International Whaling Commission next July in London.



FB58, "Ken", is among the top sires of Sarasota Bay calves.

Dolphin Paternity Analyses

An understanding of the mating patterns of dolphins is important for conserving wild populations as well as optimizing breeding programs in zoological park settings. The Disney Wildlife Conservation Fund provided much needed support during 1999-2000 for genetic paternity analyses involving the Sarasota Bay dolphins. For the first time, Dr. Debbie Duffield (of Portland State University) was able to screen archived blood samples from 61 calves and their mothers against ALL of the potential resident sires in Sarasota Bay ($n = 46$ males more than 6 years old). Using microsatellite techniques, Dr. Duffield has been able to complete exclusion analyses for a third of the calves. As indicated by earlier analyses, bottlenose dolphins in Sarasota Bay do not appear to be monogamous. Preliminary findings indicate that about 15% of calves are sired by males from outside of Sarasota, providing a healthy degree of genetic exchange with other communities. Locally-resident males identified as probable fathers tend to be members of adult male pairs, and they tend to be among the largest males in the community, regardless of their age. Several calves appear to have been sired by 13-year-old, very large males. Additional analyses are currently underway to resolve paternities for the remainder, where more than one possible sire has been indicated by microsatellites alone. Integrated with the paternity testing results, Edward Owen's and Stephanie Watwood's doctoral dissertations will provide much complementary information on the behavior of the males that are successful breeders.



Taking a blood sample from a dolphin's fluke.

Population Structure of Bottlenose Dolphins in the Gulf of Mexico as Determined from Genetics

Anna Sellas, Master's Candidate, UCSC

Summer 2000 proved to be quite a success for the Gulf Biopsy Project. After forty-two hot and humid days in the field, we obtained 88 dolphin biopsy samples. To date, 35 of these dolphins have been matched to existing animals in our catalogs. As always, the photo-ID continues....

I have recently begun work at a National Ocean Service laboratory in Charleston, South Carolina. Here I am beginning to unravel the genetic relationships the animals in the nearshore Gulf waters hold with each other as well as with the resident dolphins of Sarasota Bay. Under the adept guidance of Dr. Patricia Rosel, I have begun directly sequencing a portion of the control region of the mtDNA molecule from my samples. Concurrently, using primers developed from conserved DNA sequences on the Y chromosome, I have begun to identify the sex of the animals that we sampled. Future genetic analyses also include the use of microsatellites to investigate the relatedness of animals sampled both within and between groups.

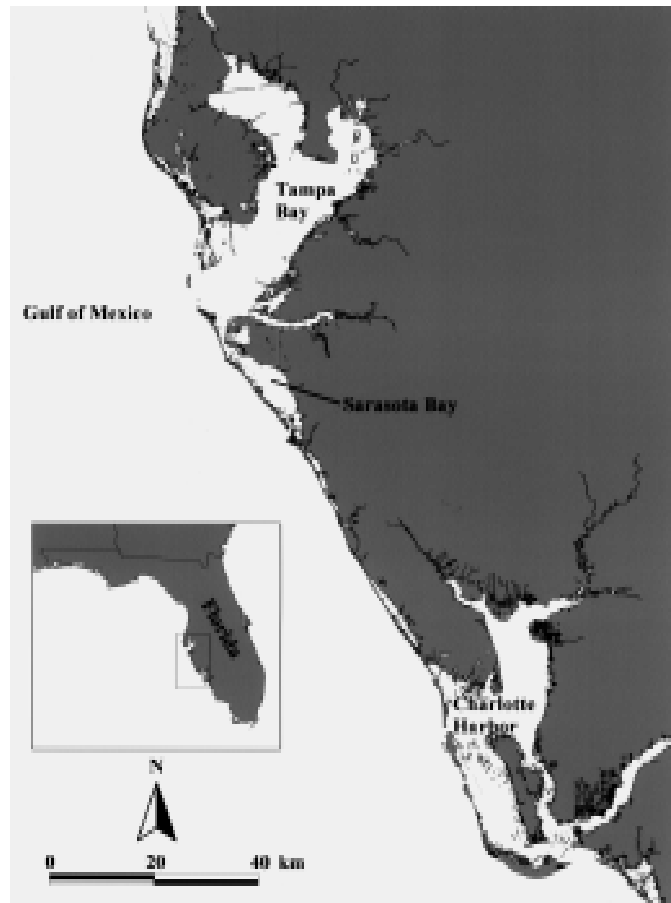
In addition to our genetic studies, both pollutant and red tide toxin studies were conducted using the blubber portion of 20 of our biopsy samples. While no detectable levels of red tide toxin were found, environmental contaminant levels differed significantly between animals; analyses are underway to determine if these differences are gender-related.

Field sampling and laboratory analyses have been supported by the Florida Fish and Wildlife Conservation Commission and the Conservation and Research Committee of the Chicago Zoological Society.

Charlotte Harbor Ecosystem Health Project

Building upon the long-term interests of the late William R. Mote and available expertise and experience, Mote Marine Laboratory has embarked upon a 5-year study of the health of the Charlotte Harbor ecosystem, through the support of the Mote Scientific Foundation, and with the hope of generating significant matching funds. This research will integrate the activities of all of the lab's Research Centers to try to understand the functions and processes in the Harbor, from the water inputs and sediments through the top level predators, in an attempt to develop predictive models regarding natural and human impacts on one of the last remaining nearly-pristine estuaries in the southeastern United States. The Sarasota Dolphin Research Program is participating as a partner in this program, building upon its long-term database from previous surveys and tagging in the area. During 2001, we will work with Mote Lab's research centers to develop an integrated approach to the research program, including initiation of photographic identification surveys and biopsy sampling to try to identify population structure and abundance as a first step toward understanding the role of these top predators in the Charlotte Harbor ecosystem. We will also work with the International Whaling Commission's Pollution

2000+ program to examine blubber samples for environmental contaminant residues and biomarkers of effects of these contaminants, in order to begin to understand dolphin health in the region. We expect fieldwork to take place in September, and plan to involve a "reunion" of those colleagues who have been instrumental in our Program's large-scale photographic survey efforts in the past.



The bays, sounds, estuaries, and Gulf coastal waters along the central west coast of Florida have been the primary focus of SDRP's research activities since 1970.



Dolphin, "Bud", catching a jack.

Professional Activity Summary 2000

One accepted measure of the productivity of a research program is its record of achievement in providing information to the scientific community, wildlife management agencies, and the public. The following list includes our program's products since the publication of our last newsletter. Copies of specific papers can be obtained upon request for the cost of copying and postage.

Manuscripts In Press or In Review

- Duffield, D.A. and R.S. Wells. In press. The molecular profile of a resident community of bottlenose dolphins, *Tursiops truncatus*. In: C.J. Pfeiffer, ed., Molecular and Cell Biology of Marine Mammals. Krieger Publishing Company, Melbourne, FL.
- Wells, R.S. and M.D. Scott. In press. Bottlenose dolphins (*Tursiops truncatus* and *T. aduncus*). In: W.F. Perrin, B. Würsig, and H.G.M. Thewissen, eds., Encyclopedia of Marine Mammals. Academic Press, San Diego, CA.
- Wells, R.S. In press. Identification methods. In: W.F. Perrin, B. Würsig, and H.G.M. Thewissen, eds., Encyclopedia of Marine Mammals. Academic Press, San Diego, CA.
- Nowacek, D.P., Wells, R.S., Tyack, P.L. In press. A platform for continuous behavioral and acoustic observation of free-ranging marine mammals: Overhead video combined with underwater audio. Marine Mammal Science.
- Pabst, D.A., W.A. McLellan, A.J. Read, R.S. Wells, and A.S. Friedlaender. In press. Conservation plan for the Atlantic coastal stock complex of bottlenose dolphins, *Tursiops truncatus*. Draft report to National Marine Fisheries Service.
- Nowacek, S. M., R. S. Wells, and A. Solow. In revision. The effects of boat traffic on bottlenose dolphins, *Tursiops truncatus*, in Sarasota Bay, Florida. Marine Mammal Science.
- Quintana-Rizzo, E. and R. S. Wells. In revision. Resighting and association patterns of resident and non-resident bottlenose dolphins (*Tursiops truncatus*) in the Cedar Keys, Florida: Insights into social organization. Canadian Journal of Zoology.
- Scott, M.D., A.J. Westgate, R.S. Wells, D.A. Pabst, W.A. McLellan, A.J. Read, F.I. Townsend, H.L. Rhinehart, M.B. Hanson, and S.A. Rommel. In revision. Dorsal fin morphology and attachment of radiotags to small cetaceans. Marine Mammal Science.

Peer-reviewed Journal Articles and Book Chapters

- Reynolds, J.E. III, R.S. Wells and S.D. Eide. 2000. Biology and conservation of the bottlenose dolphin. University of Florida Press.
- Flamm, R. O., E.C.G. Owen, C.F. Weiss, R.S. Wells and D.P. Nowacek. 2000. Aerial videogrammetry from a tethered airship to assess manatee life stage structure. Marine Mammal Science 16(3):617-630.
- Reeves, R.R., T.A. Jefferson, T. Kasuya, B.D. Smith, W. Ding, W. Peilie, R.S. Wells, B. Würsig, and Z. Kaiya. 2000. Report of the Workshop to Develop a Conservation Action Plan for the Yangtze River Finless Porpoise, Ocean Park, Hong Kong, 16-18 September 1997. Pp. 67-80 In: R.R. Reeves, B.D. Smith and T. Kasuya, eds., Biology and Conservation of Freshwater Cetaceans in Asia. IUCN, Gland, Switzerland and Cambridge, UK. vii + 152 pp.
- Connor, R.C., R.S. Wells, J. Mann and A.J. Read. 1999. The bottlenose dolphin, *Tursiops* spp: Social relationships in a fission-fusion society. Pp. 91-126 In: P.L. Tyack, R.C. Connor, and J. Mann, eds., Cetacean Societies: Field Studies of Dolphins and Whales. University of Chicago Press. 433 pp.
- Gauthier, J.M., H. Dubeau, E. Rassart, W.M. Jarman and R.S. Wells. 1999. Biomarkers of DNA damage in marine mammals. Mutation Research 444:427-439.
- Crissey, S.D. and R.S. Wells. 1999. Serum alpha and gamma tocopherols, retinol, retinyl palmitate, and carotenoid concentrations in captive and free-ranging bottlenose dolphins (*Tursiops truncatus*). Comparative Biochemistry and Physiology, Part B, 124:391-396.

Popular Articles, Books, Book Reviews, Educational Videos, etc.

- Wells, R.S. 2000. Reproduction and mating. Pp. 98 In: Dolphins. National Geographic Society. Washington, DC.
- McClintock, J. 2000. Baywatch. Discover 21(3):76-83.

Contract and Other Reports

- Waring, G.T., D.L. Palka, P.J. Clapham, S.L. Swartz, M. Rossman, T. Cole, L.J. Hansen, K.D. Bisack, K. Mullin, R.S. Wells, D.K. Odell and N.B. Barros. 1999. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments – 1999. NOAA Tech. Memo. NMFS-NE-153.
- Wells, R.S., S.M. Nowacek and R O. Flamm. 1999. Manatee behavioral responses to vessel approaches. Final Contract report for Contract No. MR-277, Florida Fish and Wildlife Conservation Commission, St. Petersburg, FL. 9 pp.

Presentations at Professional Meetings

- Bassos-Hull, K., R.S. Wells. 2000. Experimental return to the wild of two bottlenose dolphins. Defenders of Wildlife Carnivores 2000 Conference. November 12-15, Denver, CO.
- Bassos-Hull, K., R.S. Wells. 2000. Experimental return to the wild of two bottlenose dolphins. American Cetacean Society Whales 2000 7th International Conference. November 17-19, Monterey, CA.
- Quintana-Rizzo, E., R.S. Wells, and J.F. Eisenberg. 2000. Association patterns of bottlenose dolphins in Cedar Keys, Florida. Animal Behavior Society Conference, August 5-9, Atlanta, GA.
- Wells, R.S., T.K. Rowles, H.L. Rhinehart, J.C. Sweeney, and W.M. Jarman. 2000. Bottlenose dolphins as marine ecosystem sentinels. Wildlife Trusts's Workshop on Marine Vertebrates as Sentinel Species. October 5-8, Tarrytown, NY.
- Wells, R.S. 2000. 30 Years with the bottlenose dolphins of Sarasota Bay. Animal Social Complexity and Intelligence Symposium, Chicago Academy of Sciences, August 23-26, Chicago, IL.
- Wells, R.S., W.M. Jarman, T.K. Rowles, and J. Whaley. 2000. The role of population monitoring in evaluation of the possible effects of organochlorines on bottlenose dolphin health and reproduction. Atlantic Coast Contaminants Workshop, June 23-25, Maine. (presented by Whaley)
- Wells, R.S. 2000. Stock structure of bottlenose dolphins in the eastern Gulf of Mexico. National Marine Fisheries Service Bottlenose Dolphin Stock Structure Workshop, March 14-15, Sarasota, FL.

Invited Public and University Lectures

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|-------------|--|
| 31 Oct 2000 | Bottlenose dolphins of Sarasota Bay. University of St. Andrews, Scotland. |
| 19 Oct 2000 | Conserving wild dolphin societies. Brookfield Zoo Lecture Series, Brookfield, IL. |
| 17 Oct 2000 | Bottlenose dolphin health assessment. Conservation Medicine Center of Chicago, IL. |
| 11 Oct 2000 | Bottlenose dolphin stock structure. Marine Mammal Commission Annual Meeting, St. Petersburg, FL. |
| 11 Oct 2000 | Marine sentinel species. Marine Mammal Commission Annual Meeting, St. Petersburg, FL. |
| 11 Oct 2000 | Docent program for dolphin feeding education. Marine Mammal Commission Annual Meeting, St. Petersburg, FL. |
| 30 Sep 2000 | Marine Mammals Class, U. of Miami, Miami, FL. |
| 7 Sep 2000 | Wild dolphin societies. Bermuda Underwater Exploration Institute, Hamilton, Bermuda. |
| 6 May 2000 | Wild dolphin societies. Science Museum of Minnesota, St. Paul, MN. |
| 5 Feb 2000 | Conservation Matters, Brookfield Zoo, Brookfield, IL. |

Echo and Misha: Ten Years Back in the Wild

Kim Bassos-Hull, Research Associate, SDRP

October 6th 2000 marked a very important day for Mote Marine Laboratory, the Sarasota Dolphin Research Program, and two special dolphins. It was the ten-year anniversary of the return to the wild of Echo and



Misha. Both dolphins were the subjects of a unique two-part scientific experiment. For the first part of the experiment, Echo and Misha were collected from Tampa Bay waters in July of 1988 then transported to and housed at the University of California at Santa Cruz's Long Marine Laboratory where their echolocation processing abilities were studied. Researchers also studied their behavior as Echo and Misha were prepared for part two – return to the wild. The Chicago Zoological Society and Mote Marine Laboratory joined this project in September of 1990 when Echo and Misha were brought back to Florida and placed in a sea-pen by Mote's back dock to re-acclimate to local waters and to demonstrate their ability to capture live fish.

On October 6th 1990 after receiving a clean bill of health, Echo and Misha were transported on Mote's research vessel, the *R/V Mako*, 41 km to the release site in southeastern Tampa Bay (near the location Misha was collected in July 1988) and released. Six days later after waiting out a tropical storm we had our first post-release sighting. Our program intensively monitored them during their first year back in the wild and they displayed typical behavioral, ranging, and social association patterns and excellent body condition. We have been opportunistically monitoring them since October 1991. Misha has been sighted 68 times in the southeastern part of Tampa Bay. Echo was sighted off and on with Misha in Southeastern Tampa Bay



Misha (center-back) on 1 October 2000.

through March 1991 then in Old Tampa Bay through September 1993. More recently, we discovered through collaborative photo-identification efforts comparing dorsal fin catalogs that Echo has been seen in the Boca Ciega Bay area by Eckerd College students since 1997. I

(K. Bassos-Hull) was lucky enough to accompany Eckerd students on 28 August 2000 and observe Echo in the Bunces Pass area of Boca Ciega Bay. Echo now has been seen 51 times since release.

During the first week of October 2000 many old human friends of Echo and Misha went boating in Echo and Misha's range areas in hopes of saying hello. A few of us were lucky enough to find Misha up near Ruskin on October 1st and he made us all smile with several peeks and then a beautiful leap in our stern wake as we headed for home. Many thanks to all of those who have participated, both past and present, in this successful project, and especially to the anonymous Mote Marine Laboratory donor who made our 10th year searches possible!

Echo and Misha "Ten Years Back in the Wild" tee shirts available! Send a check (to address on back cover) for \$15 (shipping incl) made out to "Mote Marine Lab - Echo and Misha Fund". Indicate size (S, M, L, XL) and shipping address.



(From left to right) Kim Johnson, Carol Howard, Howard Rhinehart, Sue Hofmann, Jay Gorzelany, Kim Bassos-Hull, and Bill Scott.



Education

Education is a major component of SDRP activities, directed toward the general public, students, colleagues, and wildlife management agencies. We work to educate the general public regarding bottlenose dolphins and conservation issues through public presentations at Brookfield Zoo and elsewhere, articles and interviews, and through volunteering opportunities through Earthwatch Institute.

The publication during 2000 of *The Bottlenose Dolphin: Biology and Conservation*, a 304 page book authored by John Reynolds, Randall Wells, and Samantha Eide, provides a new tool for education about these animals and their needs. Topics include conservation and management, evolution, behavior, ecology, morphology, reproduction, and genetics, with the Sarasota dolphin community providing much of the book's focus. The book is written for the general public, but includes a comprehensive annotated list of references for those who wish to pursue the topics in greater depth. The hard-cover book is available from the University Press of Florida (Ph. 1-800-226-3822) for \$34.95 plus handling and shipping.

We are currently working with the National Marine Fisheries Service to attempt to curtail illegal feeding and swimming interactions with wild bottlenose dolphins, in Sarasota and elsewhere along the west coast of Florida. This NMFS-contracted program involves a series of open town hall meetings and focused meetings with eco-tour operators, fishers, and boat rental operators. These meetings are combined with meet-and-greet activities on the water to educate boaters attempting to interact with "Beggar" and other dolphins in the Intracoastal Waterway south of Sarasota, expanding the "halo effect" of recently-increased NMFS law enforcement activity.

The 15-minute educational videotape we produced last year through the support of the Florida Fish and Wildlife Conservation Commission, "*Human Interactions With Florida's Marine Mammals*" continues to be in demand by wildlife management agencies, law enforcement agencies, NGOs, eco-tour operators, and marine educators around the world, with more than 120 copies distributed to date. The video describes how human activities can harm dolphins and manatees, and suggests courses of action for improving the lives of these animals. This video is available for the cost of copying and shipping (\$10.00, check made out to "Mote Marine Laboratory" and sent to the Sarasota Dolphin Research Program).

Students at all levels are crucial elements of conservation. Through the encouragement of long-time program supporter and participant Bill Scott, we initiated a program of educating elementary school students in Sarasota about dolphins, their needs, and how to treat them in the wild, through classroom visits by Randy Wells. This program was supported through the Brookfield Zoo's "Adopt a Sarasota Dolphin Program" in which adoptions were purchased specifically for second, fourth, and fifth-grade classes at Southside and Phillippi Shores schools. The response to this program was extremely positive, and we hope to be able to continue and expand the program in 2001. If you wish to provide classroom adoptions, please contact Randy Wells (941-388-4441) for details on how classes are selected, etc.

At the college level, we are fortunate to have access through Mote Marine Laboratory to high quality, dedicated undergraduate student interns who volunteer with our program for at least 3 months at a time (for more information, contact Andrea Davis at 941-388-4441). As described throughout the newsletter, graduate students come to our program through the University of California at Santa

Cruz, Woods Hole Oceanographic Institution, the University of South Florida, and the University of North Carolina, Wilmington to conduct their thesis or dissertation research. We participate in college-level marine mammal courses, and provide supporting materials for these courses. We continue to offer a summer college-level course on the biology and conservation of marine mammals, through Eckerd College and Mote Marine Laboratory. We participated in a marine mammal life history short course, and again hosted the MARVET marine mammal veterinary student course. These courses, and similar course by others, are finding the comprehensive marine mammal textbook to which we contributed last year, *Biology of Marine Mammals* (1999, Smithsonian Institution Press), to be of much value. Both the summer marine mammal course and MARVET program will be offered again in 2001. Please contact Randy Wells (Ph 941-388-4441) for more details about the courses.

Our efforts to provide information to our colleagues and wildlife management agencies continues, through publication of numerous scientific articles, through invited presentations at scientific conferences such as the Animal Social Complexity and Intelligence Symposium held at the Chicago Academy of Sciences in August, the Atlantic Coastal Contaminants Workshop held in Maine in June, the Workshop on Marine Vertebrates as Sentinel Species, held in New York in October, and through participation in national/international panels such as the Atlantic Scientific Review Group, the Florida Manatee Recovery Team, the Florida Manatee Population Status Working Group, and the IUCN Cetacean Specialist Group and Reintroduction Specialist Group.

Adopt a Sarasota Dolphin - For yourself, for a gift, or for a classroom!



Charter adoptions of Pumpkin are available for \$50. Adoptions for student classes can also be arranged. All funds raised through adoptions will support projects of the Sarasota Dolphin Research Program. To

adopt Pumpkin or for more information, please call the Brookfield Zoo Parents Program at (708)-485-0263 ext 341.

Thanks for your support!!

How You Can Make a Difference!

We Need Your Help for 2001 - Charitable Donation Opportunities

The staff and volunteers of the Sarasota Dolphin Research Program would like to be able to maintain our continuing ambitious level of field work, analyses, publishing, and presenting, but we need to expand our base of support in order to make this possible. In particular, we need your assistance in obtaining the following:

- \$22,500 for an 18 ft center console boat and 4-stroke outboard engine to replace our 28-year-old graduate student research vessel *Makila*, which must be retired due to loss of structural integrity.
- \$1,000 for a digital camera
- \$2,000 for two Nikon N80 cameras with 70-300mm zoom lens
- \$20,000 to support one graduate student for a year, including stipend and field research expenses

Dolphin Biology Research Institute (IRS-EI#59:2288387) is a 501(c)(3) not-for-profit corporation; thus donations of funds and/or equipment are tax-deductible.

We would like to take this opportunity to acknowledge the contributions to Dolphin Biology Research Institute and Chicago Zoological Society in support of Sarasota Dolphin Research Program activities from:

Edward McCormick Blair, Jr.

William and Sandra Scott

Conservation Medicine Center of Chicago

Dolphin Quest, Jay Sweeney and Rae Stone

Earthwatch Institute/Center for Field Research

Don and Lee Hamilton

Cannons Marina, David and Lucille Miller

Disney Wildlife Conservation Fund

Indianapolis Zoo

The National Marine Fisheries Service

Ronnie and John Enander

Chicago Board of Trade

The John G. Shedd Aquarium

Take a Cruise and Help Dolphin Research!

Join an adventure cruise on the Amazon River from Peru, through Colombia, to Brazil and back to search for the pink dolphin, and help our dolphin research program in Sarasota Bay!

February 3-11, 2001 9 days, 8 nights

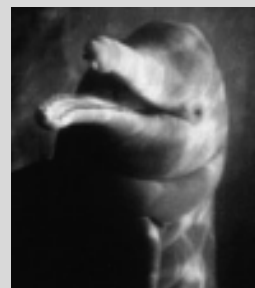
\$2,395 from Miami (includes airfare and almost everything else)

Travel with Dr. Randall Wells to the mightiest river on earth! Here pink dolphins, macaws, monkeys, 3 toed slothes, caiman, anaconda, and many more creatures are likely to be viewed. This is not a luxury cruise, but it is very comfortable for most Americans. It is a fine, small ship. All cabins have private baths and are air-conditioned. This is truly the adventure of a lifetime! Your adventure trip price has a donation included within it to our dolphin research studies (\$140 per person).

The trip will center in the Peruvian Amazon, flying into Iquitos, Peru. The Amazon River is unique on the Planet Earth. It is over 10 times larger in water volume emptied into the oceans than any other river system. During the high water season the river rises 40 feet over 1000 miles upstream from the ocean ...and is best described as an inland sea moving slowly toward the Atlantic Ocean!

The trip price includes:

- * roundtrip airfare from Miami (\$50 r/t shuttle from Sarasota available)
- *air conditioned cabins with private baths
- *all meals but one
- *all side trips, tours, and transfers
- *services of Dr. Wells and local naturalists/guides
- *city tour of Lima



Call Jack Lagoni (Trip Manager) at Siesta Key Travel for more information ...(941) 359-3314 or 1-800-538-4508 or jlagoni@africaconsultants.com

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**The Sarasota Dolphin Research Program
would like to thank you for your interest
in research and conservation!**

**Sarasota Dolphin Research Program
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