

# The Dolphin Gazette



MYSTIC AQUARIUM  
INSTITUTE  
FOR EXPLORATION



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Newsletter  
of the  
Dolphin Communication Project

**Dolphin Communication Project at Mystic Aquarium & Institute for Exploration**  
55 Coogan Blvd., Mystic, CT 06355

*In this issue you will find:*

- \* An update on our pectoral fin contact study
- \* An update on our Bimini research interns projects
- \* An update on the analyses of our data collected at RIMS
- \* An update on Robin Paulos' master's degree research on dolphin behavioral ontogeny



## ***Pectoral Fin Contact among Dolphins:***

### ***Just a "handshake" or something more?***

Dolphins are tactile mammals. They are often observed traveling either in physical contact or close enough to each other to "simulate" physical contact by water and current movement. We are specifically focusing on how dolphins might exchange touch with their flippers (i.e., pectoral fins): type, location and duration of touch by a dolphin's pectoral fin can convey different meanings. Since 1992 we have been recording the behavior and sounds of Atlantic spotted dolphins in the Bahamas. Since 1997, we have been recording the behavior and sounds of the Indo-Pacific bottlenose dolphins around Mikura Island, Japan. From this collection of data (~100 hrs of video), we recently began analyzing how, when and with whom dolphins exchange pectoral fin contact. We also have been documenting who initiates the touch, if it was a touch or rub and who leaves the interaction first. Our protocol for analysis is an *event sampling* of pectoral fin touches and rubs. The video sequences have all been sampled and we are currently conducting the statistical examination of these data. But, let

me give you a preview of what we expect to find. First, I think it best to tell you that only one other study of the possible function of touch by the flipper between dolphins has been conducted. Mai Sakai, of the Tokyo Institute of Technology, completed her Master's Degree (in 2003) studying flipper rubbing behavior among the bottlenose dolphins around Mikura Island. She found that dolphins use pectoral fin contact for both hygienic and social reasons which varied by who initiated the contact and where the touch (on the dolphin's body) occurred. We are doing similar analyses, but with a few distinctions.

We are studying two species of free-ranging dolphins for comparison to see if species and habitat differences might also affect the use of this behavior. Also, we are looking at both static contact (i.e., touch) and rubbing (i.e., active movement between the flipper and body of two dolphins). In addition later this year, we will add a third group of dolphins to this study - the bottlenose dolphins in human care at the Roatan Institute for Marine Sciences. But, I digress. So, back to the topic at hand.

story continued on page 4 (*see pec fin use*)

[www.mysticaquarium.org](http://www.mysticaquarium.org)

[www.dolphincommunicationproject.org](http://www.dolphincommunicationproject.org)

## Research Projects for Bimini Project Interns

Kelly Melillo, Research Intern, Connecticut College, Connecticut

At Connecticut College, Kelly has been completing an independent study based on some of the observations from this season around Bimini, The Bahamas. Her query focuses on the interactions, including mating, between the two species of dolphins found in the waters of Bimini, the bottlenose and Atlantic spotted dolphins. This paper begins as a review of known cases of interspecific interactions, mating and hybridization among cetaceans, both in the wild and in captivity. It continues with an attempt to apply existing theories to the witnessed mating between bottlenose (*Tursiops truncatus*) and Atlantic spotted (*Stenella frontalis*) dolphins.

When looking at interspecific mating, it is helpful to break "mating" down into four categories: 1) mating attempts with no copulation, 2) copulation with no fertilization, 3) copulation with fertilization, but no viable offspring, and 4) copulation, fertilization and viable offspring. There is an obvious time frame challenge, however, as these levels of mating cannot be determined for quite some time, if ever.

When mating or sexual play does occur between different species, why does it happen? This paper looks at four different, non-exclusive theories: confusion, aggression, population decline or as an outlet for weaker individuals. Each provides a different motivation for why individuals are driven to mate outside their species. Using these ideas as tools, Kelly analyzed 2 captive cases (rough-tooth dolphin/bottlenose dolphin and bottlenose dolphin/false killer whale) and 2 wild cases (blue whale/fin whale and Dall's porpoise/harbor porpoise) in order to gain a basis of comparison before looking at the dolphins of Bimini. This past season in Bimini, in each interspecific sexual situation, the bottlenose dolphins always initiated sexual contact with the spotted, but it is unclear at this time why this is occurring. It is unlikely that it has to do with population decline or confusion, but it may be a result of interspecific aggression and/or serve as an outlet for weaker bottlenose dolphins. Kelly is looking forward to gathering more data for this study during the 2004 field season.



Katherine DeStefano, Research Intern, Northeastern University, Massachusetts  
Survey and Analysis of Play Behaviors Exhibited by Wild Atlantic Spotted Dolphins (*Stenella frontalis*) near Bimini, Bahamas

Controversies have surrounded the scientific study of animal play behavior for years. One of the problems with play existing as its own behavior category is that the behaviors contained within it do not share any common characteristics that define the category, as foraging or sexual behaviors do. Play behaviors can involve manipulating a food object without ingesting it, and can also be locomotion in a way that is seemingly pointless. In addition to having an ambiguous definition, the functional value of play is also still up for debate. Unlike other behaviors such as foraging, the adaptive significance of play behaviors is not immediately obvious (Fagen, 1981). Play does not appear to be directly crucial to the animal's survival, nor does it lend itself to reproductive goals. In addition, it seems that the costs of play far outweigh the benefits (Smith, 1982).

Theories providing reasons for mammal play range from biological predisposition to resources available during ontogeny. This paper focused on applying the theory proposed by Spinka, et al. to play in Atlantic spotted dolphins. This theory states that play behaviors function as training regimens for future unexpected situations (2001) by physically, mentally and emotionally preparing animals for any future situation that may challenge survival: fleeing predators, fighting with conspecifics, hunting prey, and coping with stressful situations. Seven of the 24 predictions were considered. First, dolphins will play in groups of three or more because more conspecifics add to the unpredictability of a situation. Second, bouts will be initiated by the younger, smaller, or more disadvantaged animal because that individual requires more practice in unexpected situations. Third, locomotor play will peak at a younger age because the unpredictability of social stimuli will persist longer than environmental. Fourth, play will occur more often after an environmental change but (5) will only occur in safe situations. Sixth, locomotor play will dominate due to the varying nature of the ocean environment. And finally, preferred play partners will be unmatched yet familiar (challenging but safe).

*DeStefano continued on page 4*

## *Volunteer Thanks*

Several individuals have volunteered their time to assist DCP with data analyses, content design & development for displays of DCP research and methods, and with the organization of our reference library at the DCP office at MAIFE. Your time and effort are greatly appreciated. Thanks to Binti, Marc, April, Aggie, Becky, Pete and John. DCP also has three interns during this spring semester: Darcie from URI, Kathy from Northeastern, and Kelly from Conn College. Your dedication and participation are awesome!

## *Volunteer Opportunities*

Opportunities are available to volunteer with DCP researchers primarily in the office working on data processing and analyses. For more details, please see the Education page of the DCP web site. All DCP volunteers coordinate their time through Mystic Aquarium & Institute for Exploration (MAIFE) and Kathleen Dudzinski. MAIFE also offers volunteer opportunities on site at the aquarium facility. The Volunteer Manager is Tim Robbins. Tim can be reached by calling 1-860-572-5955 x209, or by email at trobbins@mysticaquarium.org to inquire about volunteer opportunities at MAIFE.



## *Internships*

We offer internships to students for personal development & for college credit. Credit is arranged by each intern with respect to their school guidelines. DCP has merged the application process for internship requests with that of MAIFE. Internships are offered on a semester basis & typically run for 10-12 weeks. Please visit the Education page of DCP's web site, which is linked directly to the college internships section of the MAIFE web site, for details on applications & internships. Feel free to email Kathleen with specific questions related to internships. DCP is offering limited field internships beginning Summer 2004.

## *Spring Semester 2004 - Research Intern Project & RIMS Data Progress*

*Darcie Blanding, Research Intern, University of Rhode Island, Rhode Island*

Patterns in whistling behavior as related to diurnal activity, gender and age in captive bottlenose dolphins (*Tursiops truncatus*) in Roatan, Honduras.

I will be working on the RIMS data gathered in September and October 2003 by Kathleen and Robin at the Roatan Institute for Marine Sciences (RIMS), Roatan, Honduras. The primary goal of my project is to determine what factors might influence whistling behaviors in dolphins including diurnal periodicity as well as age and sex. A difference between age classes in whistling behavior might suggest that dolphins must learn when and how to use whistles. As a personal goal, I want to improve my research and scientific writing capabilities as well as begin a project that could effectively be continued as I enter graduate school. My hypotheses follow:

### **Hypotheses:**

1. There is significant difference in whistling behavior between time periods (am & pm).
2. There is significant difference in whistling behavior between male and female dolphins.
3. There is significant difference in whistling behavior between each dolphin age class: calf, juvenile, sub-adult, adult.

*We are continuing to process all the data from RIMS, Japan & Bimini that were gathered this past year. Results updates will be posted quarterly in the Dolphin Gazette as well as to our web site. Thank you for your continued interest and support.*

### *pec fin use ... continued from page 1*

We have found subtle differences between how the spotted and bottlenose dolphins use pectoral fin contact to exchange information. That is, where and how they rub or touch, as well as who initiates the contact, seem to have slightly different functions for each species. Older bottlenose dolphins (adults and sub-adults) touch more with their flippers than younger individuals. The reverse is true for the spotted dolphins.

As we study how dolphins use their pectoral fins to signal to each other it can get a bit cumbersome to talk about “the dolphin who touches another with its pectoral fin.” Or, “the dolphin whose body comes into contact with another’s flipper.” So, to make life easier, we use defined terms. The *rubber* is the dolphin whose flipper touches another’s body. The *rubbee* is the individual whose body touches another dolphin’s pectoral fin.

Either the rubber or rubbee can initiate contact. And, we have seen both do just that ... but differently for each study species. Bottlenose dolphin rubbees at Mikura Island seem to initiate more rubbing contact. They seem to solicit rubs on what would seem to be more sensitive body parts (the face) or on body parts they cannot easily reach (their back and side). Spotted dolphins seem to use pectoral fin contact more socially while the dolphins around Mikura Island may need flipper contact more for hygienic reasons.

In the summer issue of *The Dolphin Gazette*, we will present more results and information about this topic. The statistical analyses of our data set looking at both dolphin groups are currently ongoing. Also, we are now examining the data gathered on the dolphins at RIMS with an eye to how these bottlenose dolphins exchange flipper contacts. We’ll share results in the *Gazette* and on our web site. Stay Tuned!

### *DeStefano update continued from page 2*

Results from this study showed that dolphins spent 10.9% (87 minutes of a total observed 795) of their time engaged in playful behaviors. They did indeed seem to prefer groups of three or more, but play groups did not exceed five individuals. There were a few occurrences where there were multiple groups play at the same time and within view of each other but there was no interaction between groups. Initiation of play bouts was found to be equally split between juveniles and calves. Juveniles only initiated with older animals when engaged in object play 30% of all calf initiations. Other initiations were one instance of social locomotor play involving a group of calves and one subadult, and solitary locomotor play in the vicinity of older, larger animals but not directly interacting with them. Locomotor play was indeed more dominant than any other form of play in younger animals but it peaked in juveniles, as did social play. There was only one direct observation of environmental change while on survey which involved proximity to the Gulf Stream and the introduction of a strong current. Play did increase in this situation but this one instance is not enough evidence to support the prediction. Most other play bouts occurred in relatively safe conditions (Beaufort 2-3). Locomotor play did dominate over social and object play through all age groups with the exception of the juveniles who engaged in locomotor and contact play equally as much. Preferred play partners are still being investigated at the time of this report.

If you would like a copy of Katherine’s paper in its entirety, please email her at [kadestef@yahoo.com](mailto:kadestef@yahoo.com).

### 2004 Ecotour Updates

DCP has arranged our schedule for the 2004 season to continue our research on the dolphins at RIMS, Anthony’s Key Resort in Honduras.

One-week trips are available: **11-18 September & 25 September - 2 October.**

Darlene Allen & Bill Sperling are handling details.

You can reach Darlene at MAIFE’s reservations office: 860-572-5955 x215.

You can reach Bill at [bsperling@idyllwild.com](mailto:bsperling@idyllwild.com) or at P.O. Box 2400, Idyllwild, CA 92549.

[www.dolphincommunicationproject.org/ecotours](http://www.dolphincommunicationproject.org/ecotours)

# **Non-vocal communication in the Atlantic spotted dolphin (*Stenella frontalis*) and the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*)**

**Robin Paulos,  
Master's Degree Candidate,  
Psychology, University of S. Mississippi**

Hello everyone! My name is Robin Paulos and I am a graduate student at the University of Southern Mississippi. If you have been following Kathleen and her adventures under the sea by reading the newsletters or field reports online, you might recognize my name. However, I am not here to tell you about the wonderful time I had on Mikura in 2002. I am also not here to tell you about the fantastic experience I had working with Kathleen at RIMS in Honduras in 2003. I am here to tell you about something very near and dear to my heart - my Master's thesis.

The topic of my thesis is non-vocal communication in dolphins. More specifically, how two of the species of dolphin that Kathleen studies (the Indo-Pacific bottlenose dolphin in Japan and the Atlantic spotted dolphin in the Bahamas) use non-vocal means of communication. Kathleen was gracious enough to let me use data that she collected in Japan and the Bahamas for my analysis.

My project was based on the fact that as social animals, dolphins communicate with each other. They live in a group and so communication about such things as predators, prey, or behavioral state (being aggressive or friendly) is crucial in keeping the group together. Whistles and other sounds the dolphins make could be used in communication, but I was interested in how they might use non-vocal types of behavior to communicate with each other. I thought that perhaps they might even have sequences of behavior that may "mean" something to another dolphin.

To examine this, I viewed video clips taken with Kathleen's MVA over several years. As I watched, I noted the behavior of the dolphins in view. I then looked at specific behaviors that I called "culmination events" that would serve as the endpoint of a behavior

sequence. From these culmination events, I examined the probabilities of behaviors occurring one, two, or three behaviors prior. With this statistical information I could identify sequences of behavior that occurred.

After all the statistical analyses were complete, they showed that no sequences of behaviors were occurring. What does this mean? That I have spent two years on this for nothing? Not at all! Science is not always predictable. The results indicated that no sequences of events occurred. This could mean that they do not use sequences of behaviors to communicate-a valuable finding. Perhaps only a single behavioral event is enough to communicate the necessary information from one animal to another.

While in the process of scoring the video for behaviors, I did come across something else that was interesting. In both species, I noticed a particular swim behavior that occurred on a pretty regular basis. I called it the "oscillating swim". It is different from a normal dolphin swim. In the oscillating swim the dolphin uses its whole body in a kind of "figure-8" pattern, leading with the head while projecting forward. In the bottlenose dolphins (Japan) 52% of the females and 51% of the identified animals used in this project were seen to exhibit the oscillating swim. In the spotted dolphins, it was seen in 34% of the females and 14% of the males. I thought this was very interesting, especially since I have not seen this behavior described before. It is certainly worth further investigation! I'll keep you posted on my findings!

***Robin finishes her MS degree this  
spring. A summary of her thesis will be  
posted to DCP's web site. Congrats to  
Robin for all her hard work!***



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### Welcome Packet

1 packet of 5 bookmarks, welcome letter, DCP flyer, one-year subscription to the *Dolphin Gazette* (DCP's newsletter), and a 10% discount on DCP-related merchandise.



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## ***Adopt-A-Dolphin***

DCP offers Bimini Atlantic spotted dolphin Adopt-A-Dolphin and Name-A-Dolphin Programs. These programs help fund our Bimini dolphin research and education programs. Each one-year adoption costs \$30. A dolphin name purchased is entered into DCP's permanent database and costs \$200.00. Packets include a certificate, a photo of your dolphin, a spotted dolphin fact sheet, biographies of our named dolphins, a DCP flyer, & a copy of our most recent issue of the *Dolphin Gazette*.

**Become a spotted dolphin parent today & support valuable scientific research!**

***For more information about adopting a spotted dolphin, look to the back page of this issue of the Gazette OR contact DCP at [www.dolphincommunicationproject.org](http://www.dolphincommunicationproject.org)***

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