

**Behavior & Communication among Atlantic Spotted and Bottlenose Dolphins around
Bimini, Bahamas
Summary Report – 1 January – 30 September 2009**

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1) LIVING/WORKING ON BIMINI

Arrival on **1 January 2009**. Departure on **7 October 2009**.

While on Bimini, we continued our collaboration with Bimini Undersea (BU) and Sea Crest Hotel & Marina. We accompanied staff on a total of 63 of dolphin swim excursions.

The duration of our field season this year included:

| <i>Month</i> | March | April | May | June | July | August | September |
|-----------------------|-------|-------|-----|------|------|--------|-----------|
| <i>No. Boat trips</i> | 1 | 10 | 6 | 12 | 16 | 16 | 1 |

See Table 1 below.

We gathered data on dolphin movement patterns, sighting location, species, and group size whenever dolphins were encountered at sea. When underwater observations were possible, we collected video using the MVA camera system and photographs using digital still cameras. Surface photographs were collected when bottlenose dolphins (*Tursiops truncatus*) were in view. We confirmed individual dolphin identifications from video data when sea conditions pre-empted boat trips and when scheduling allowed.

We met with *Bimini Undersea* and *Sea Crest* passengers more formally once a week in addition to on-board conversations about the dolphins, our research, and their interests and concerns. We look forward to spending time and speaking with the eco-tour groups again next summer. We have offered our services, at no charge, as guest speakers to each of the local schools and camp programs. We hope that our visits to local classrooms will continue.

We confirmed the identification of 35 individual Atlantic spotted dolphins from the 12 videotapes that were recorded (Table 2). The remaining still photographs of both species will be processed during fall (2009) and winter (2010) months. All video data and still photographs will be analyzed for individual associations, behavioral interactions, and for data related to ongoing research studies by DCP. Dolphin ID numbers with respective age categories and sex determination(s) are from the DCP database (Table 2).

2) PURPOSE OF 2009 DATA COLLECTION:

Each season represents a continuation of DCP's research on communication among Atlantic spotted and bottlenose dolphins around Bimini, The Bahamas. Dolphins are long-lived social mammals: to best understand their social structure, the affect of kinship on interactions, and use of signals to communicate requires long-term studies. The data gathered this summer add to the information already possessed by DCP. Additionally, data collected from 2003 through 2007 was used by Melillo for the completion of requirements for her Master's course of study as a graduate student at Alaska Pacific University. This work was

recently published in the peer reviewed journal *Aquatic Mammals*, and is included with our application for your records (Melillo et al. 2009). Data were also used in support of a second DCP student's Master's work (Beard 2008), which has recently been submitted for publication. Upon acceptance, this publication will also be provided to the permit office.

This season marked the 9th year of the Bimini Dolphin Project for DCP: continued data collection was conducted using the Mobile Video/Acoustic (MVA) System. Data were gathered to continue our longitudinal study of photo-identification, as well as signal exchange and communication among dolphins. We focus on individual identification and behaviors exchanged in general, as well as examine how signals are related to individuals. We have many records of pectoral fin rubs and touches, which will expand our dataset with respect to how dolphins use their pectoral fins to exchange information. We also have records of interactions between the Atlantic spotted and bottlenose dolphins, which was the focus of our 2009 *Aquatic Mammals* publication, and will continue to be a research project of interest in the future for DCP. Our photo-identification efforts have been expanded to more formally include individual bottlenose dolphins. This will allow us to better assess population numbers, site fidelity, etc. of this lesser-understood species.

3) PRELIMINARY RESULTS

Data were collected on videotape while swimming among dolphins following a non-invasive protocol (Table 1). Where and when each group was sighted and recorded was documented for each video sequence. Preliminary details of the data gathered this summer are presented (Table 1 and Table 2). At least 35 individual Atlantic spotted dolphins were identified this summer from the videotapes, including 4 animals added to the photo-identification catalog this year (Table 2). We observed several new calves this season in addition to several 1-2 year old calves with no reliable markings for recognition. Thus, these young animals were not included in the DCP ID catalog for 2009.

Table 1. Summary of research effort, January – September 2009, studying dolphin behavior and communication at Bimini, The Bahamas.

| | |
|----------------------|-----------------------------------------------|
| # Boat trips: | 63 trips total (from 31 March – 17 September) |
| # minutes on effort: | 253 hours, 24 minutes* |
| # sightings: | 118* |
| # water entries: | 67* |

*Note: These values do not include effort, sightings and water entries for trips 62 and 63. These data have not yet been processed.

Table 2. Identification (ID) numbers of the Atlantic spotted dolphins observed repeatedly around Bimini. IDs confirmed from DCP videotapes. M = male. F = female. UID = unidentified sex.

| Calf M | Calf F | Juvenile M | Juvenile F | Juvenile UID | Sub-adult M | Sub-adult F | Adult M | Adult F | Adult UID |
|--------|--------|------------|------------|--------------|-------------|-------------|---------|---------|-----------|
| N/A | 91* | 64 | 14 | 89 | 04 | 09 | 11 | 29 | 07 |
| | 92* | 69 | 76 | | 22 | 10 | 17 | 48 | 40 |
| | 93* | 78 | 80 | | 24 | 12 | 75 | 56 | 43 |
| | | 79 | 84 | | | 25 | | 57 | |
| | | 88 | 87 | | | 35 | | 82 | |
| | | | 94* | | | 36 | | | |
| | | | | | | 41 | | | |

*Individuals added to DCP's photo-ID catalog in 2009

4) FUTURE UPDATES

Please let us know if you have any concerns or questions about the information in this report. Our mailing address is above. Thank you.

Future academic and peer reviewed publications will be provided to the Marine Resources Office when available.

5) 2010 FIELD SEASON

Assuming it is acceptable to The Bahamas Government, Bimini Undersea and Sea Crest Hotel & Marina, DCP will return to Bimini as time and funding allow throughout 2010. This flexibility will allow DCP the opportunity to opportunistically join excursions with Bimini Undersea and Sea Crest. Our goal is to increase the library of data during all seasons to allow for a better understanding of these dolphin populations across seasons. We will continue DCP's studies of association and site fidelity, communication, patterns of echolocation use, and changes in these and other behaviors with development in dolphins. We will continue to develop education workshops for students on the island and for eco-tour passengers.

6) ACKNOWLEDGMENTS

We gratefully thank the following individuals for their support of DCP's research program as well as more immediate and direct support to Melillo during her field season:

Bimini Undersea and Sea Crest Hotel & Marina for the generous use of their boats and facilities for data collection and processing.

The residents of Bimini for their generosity and kindness during our stay on Bimini.

Passengers from Bimini Undersea and Sea Crest for their interest and enthusiasm with our studies of dolphin behavior and communication.

The Dolphin Communication Project thanks the individual supporters of DCP for their financial support of our 2009 field season research.

Our research was sanctioned by a scientific permit from The Bahamian Ministry of Agriculture, Department of Fisheries for the year 2009 to the Dolphin Communication Project to observe and record dolphin behavior and sounds from around Bimini Islands, The Bahamas.