

**Behavior & Communication among Atlantic Spotted and Bottlenose Dolphins around
Bimini, Bahamas
Summary Report – 1 January – 14 October 2010**

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1) LIVING/WORKING ON BIMINI

Arrival on **1 January 2010**. Departure on **14 October 2010**.

While on Bimini, we continued our collaboration with Bill & Nowdla Keefe's Bimini Undersea and Sea Crest Hotel & Marina. We accompanied staff on a total of 86 dolphin swim excursions.

The duration of our field season this year included:

<i>Month</i>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
<i>No. Boat trips</i>	1	1	0	2	17	18	19	15	11	2

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 Mobile Video/Acoustic Array (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 continue to offer our services, at no charge, as guest speakers to each of the local schools and camp programs. We hope our visits to local classrooms continue.

We confirmed the identification of 29 individual Atlantic spotted dolphins (Table 2) from the seven videotapes that have been reviewed. Fourteen videotapes were recorded and the remaining tapes will be reviewed this fall/winter. Additionally, still photographs of both species will continue to be processed during the coming 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 2010 DATA COLLECTION:

Each research 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 over the last year add to the information already possessed by DCP. Additionally, data collected from 2004 through 2009 was used by a DCP undergraduate intern for the completion of requirements for her honors program at Connecticut College. This work on object play in dolphins is currently being prepared for publication. A second publication by DCP researchers (including Dudzinski and Melillo) focusing on dolphin contact behavior is being prepared for the *International Journal of Comparative Psychology*. A third manuscript, in the form of a short research note, has been prepared with co-authors from The Bahamas Department of Marine Resources and the US Geological Survey and US Fish and Wildlife. This note outlines the observations and management of a wayward manatee in Bimini during late 2008/early 2009 and stresses the successful cooperation between local residents and businesses and international agencies. Once accepted and formatted for publication, all publications will be provided to the permit office.

This season marked the 10th year of the Bimini Dolphin Project for DCP: continued data collection was conducted using the 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 recent *Aquatic Mammals* publication (Melillo et al., 2009), 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 (Tables 1 and 2). At least 29 individual Atlantic spotted dolphins were identified this summer from the videotapes (Table 2). This number will likely increase, and previously un-identified individuals will be added to DCP's photo-identification catalog, as the remaining video and photographic data are processed. 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 2010.

Table 1. Summary of research effort, January – October 2010, studying dolphin behavior and communication at Bimini, The Bahamas.

# Boat trips:	86 trips total (from 20 January – 9 October)
# minutes on effort:	347 hours, 1 minute
# sightings:	162
# water entries:	97*

*Note: This corresponds to water entries greater than or equal to 3 minutes. This value may be adjusted after all video data are 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. No male calves or juveniles of unidentified sex with ID numbers were observed.

Calf F	Juvenile M	Juvenile F	Sub-adult M	Sub-adult F	Adult M	Adult F	Adult UID
91	64	76	04	09	17	15	43
92	69	80	22	10	75	29	
93	78	84	24	35		56	
	79	87		36		57	
		94		38		70	
						82	

4) EDUCATIONAL PROGRAMMING

DCP met our 2010 educational goals utilizing our research presence in Bimini. Two education programs were completed in 2010 with students visiting Bimini and assisting DCP in our data collection. Also, the DCP Internship program was offered during July.

A) Fifteen students from the University of New Brunswick, Canada accompanied their professor to Bimini for a six day dolphin research course, held at Sea Crest Hotel & Marina.

B) Two university-level interns (unpaid) assisted Melillo for four weeks, gaining experience in fieldwork. These two students were from Redlands College, CA and Connecticut College, CT.

C) Thirteen junior high school students joined the DCP team for six days on Bimini as part of our Dolphin Research Trainee (DRT) program. All students participated in a semester-long after-school program in Connecticut and this field trip marked the culmination of that program. In addition to experiencing Bimini's wild dolphins, the students visited the South Bimini Biological Field Station, the South Bimini Nature Trail, were given tours of North Bimini and its mangroves, visited the Bimini Museum and completed a beach clean-up. The trip DVD is included with this summary report.

5) 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.

6) 2011 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 2011. 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.

7) 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:

Bill & Nowdla Keefe's 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 2010 field season research.

Our research was sanctioned by a scientific permit from The Bahamian Ministry of
Agriculture, Department of Fisheries for the year 2010 to the Dolphin Communication
Project to observe and record dolphin behavior and sounds from around Bimini Islands, The
Bahamas.