



DOLPHINS IN FACILITIES ARE INSTRUMENTAL IN DEVELOPING FIELD RESEARCH TECHNIQUES

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ABSTRACT

Research with animals requires forethought and mindfulness to develop strong scientific studies and protect the well being of the animals being studied. In marine mammal facilities, dolphins can be willing partners through positive reinforcement training, so we can ask for their participation in refining research techniques. The same isn't true for wild dolphins, with the result that they may be exposed to repeated stressors of trial and error as researchers work out the kinks of data collection.

The dolphins at DRC helped test possible field methodologies for studying wild dolphins using a drone. This included:

- calibrating morphometric software utilizing animals of known dimensions.
- developing techniques for blowhole sample collection and processing.
- refining the logistics of pairing drone photos with photo-ID.

The opportunity to conduct such important preliminary tasks with trained animals leads to stronger data from the field, with no stress on the cooperating resident dolphins and less stress on the wild dolphins.

FURTHER INFORMATION

Please contact research@dolphins.org. Details about DRC's research program can be found at www.dolphins.org.

GOALS AND DESENSITIZATION



DRC's research team on the field boat

- Dolphin Research Center conducts a field study of wild dolphins (NMFS LOC# 22587), dating back to 2013, to determine the distribution, residency, and movement patterns for bottlenose dolphins (*Tursiops truncatus*) in the middle Florida Keys.
- Partnering with MORAES, our additional goals are to:
 - use a DJI Phantom quadcopter to collect morphometric data of wild dolphins to determine body condition, and
 - collect blow samples using the drone to analyze genetic parameters of bottlenose dolphins in our study area.

- To develop the tools and techniques needed to achieve these goals, we partnered with the dolphins that live at DRC.
- The first step in that partnership was to desensitize the DRC dolphins to the drone.



Dummy drone, and speaker playing drone sound

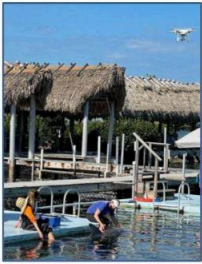


Successive approximations with the dummy drone and speaker

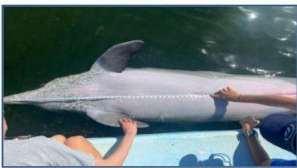


Real drone held by a familiar trainer

MORPHOMETRIC SOFTWARE



DRC dolphins are in comfortable layout positions as the drone flies overhead taking photographs



Known measurements of the DRC dolphins allow for calibrating the software using the drone photos, and establishing body condition scores utilizing known healthy individuals

NOAA LOC # 22587 Photo credit: MORAES

Dolphin ID	Width				Focal Length (mm)	Altitude (m)	Pixel Dimension on wall
	1	2	3	4			
91	2.2	0.1	0.2	0.33	0.27	90	18.2 (0.0039)
92	2.25	0.12	0.24	0.33	0.27		
93	2.26	0.13	0.22	0.33	0.27		

Lengths and half girths for observed bottlenose dolphins in the field analyzed using the calibrated software

BLOWHOLE SAMPLE COLLECTION & PROCESSING



Taking routine chuff samples with a petri dish with DRC dolphins allowed us to refine the processing protocols for genetic sampling



The tray is set up with an array of petri dishes ranging from 35mm to 90mm



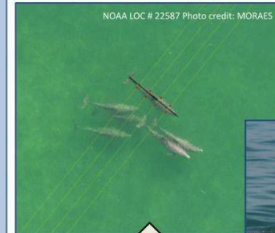
Flying the drone over DRC dolphins comfortable with it and asking them to chuff helped refine the petri dish array and determine optimal height of the drone

Dolphin DNA From Blow Samples

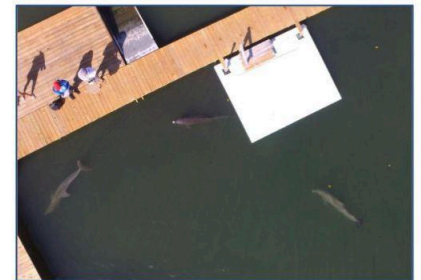
Sample ID	conc. (ng)	260/280	260/230
#1	75	1.85	1.62
#2	78	1.92	2.2
#3	17	1.95	1.1
#4	248	1.95	2.1
#5 (700)	119	1.87	1.36
#6 (560)	146.5	1.84	2

Genetic analysis from hand-collected samples of bottlenose dolphin exhalations

DRONE PHOTOS / PHOTO-ID



How do you match to?



Flying the drone over DRC dolphins comfortable with it, while simultaneously taking photo-ID, allowed us to develop and practice a logistical system to match photos taken by both the drone and the cameras

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