You may use the information and images contained in this document for non-commercial, personal, or educational purposes only, provided that you (1) do not modify such information and (2) include proper citation. If material is used for other purposes, you must obtain written permission from the author(s) to use the copyrighted material prior to its use.

FORAGING ECOLOGY OF COMMON BOTTLENOSE DOLPHINS (*TURSIOPS TRUNCATUS*) IN GALVESTON BAY

Sherah Loe[1], Kristi Fazioli[2], George Guillen[2]

[1]University of Houston-Clear Lake, School of Science and Computer Engineering
[2]University of Houston-Clear Lake, Environmental Institute of Houston
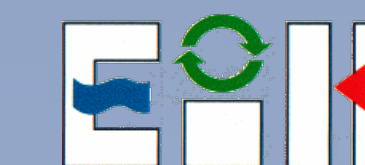
Introduction

Recent surveys suggest year round residence of common bottlenose dolphins (*Tursiops truncatus*) in upper Galveston Bay (UGB), an area where dolphins were not previously observed. One of the most important factors affecting bottlenose dolphin movement patterns & habitat preferences is the spatial & temporal distribution of prey resources. Determining their foraging ecology is crucial to understanding their life history. Atlantic croaker, spot, & sand seatrout have been reported as important prey items for bottlenose dolphins.

Objectives

- Estimate habitats used for foraging in the GB ecosystem
- Estimate proportions of different prey consumed by dolphins
- Delineate year-round residents & seasonal transients

Methods

- Conduct standardized photo-identification surveys
- Collect 60 remotely based biopsy samples (10x25mm) from free ranging dolphins
- Foraging behavior- following shrimp boats, fluke out diving, swirling, fish in mouth, fish chasing, fish tossing, quick & variable directional movements
- Collect target fish to run stable isotope analysis (SIA)
- Compare $\delta^{13}C$ & $\delta^{15}N$ values of dolphins to different sub-bays in GB using SIA
- Use previously published data on prey items & Bayesian mixing models ($\delta^{13}C$, $\delta^{15}N$) to estimate proportions of prey consumed
- Pair photo-id survey data & SIA results to estimate foraging areas & seasonal occurrences of individuals
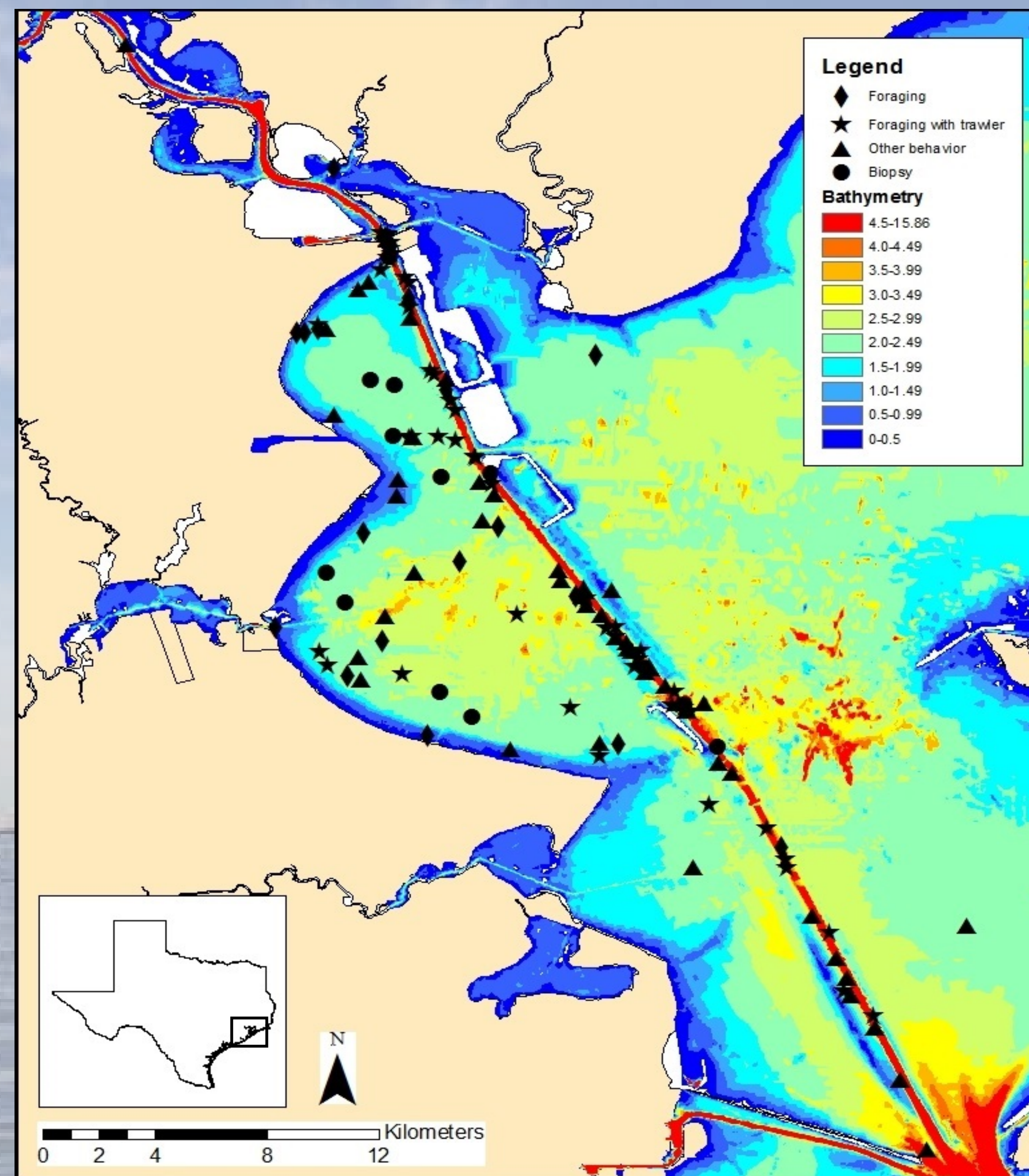
Part of the Texas Bottlenose Dolphin Research Collaborative

Figure 1: Occurrence of all sightings & foraging observations at different depths in GB.
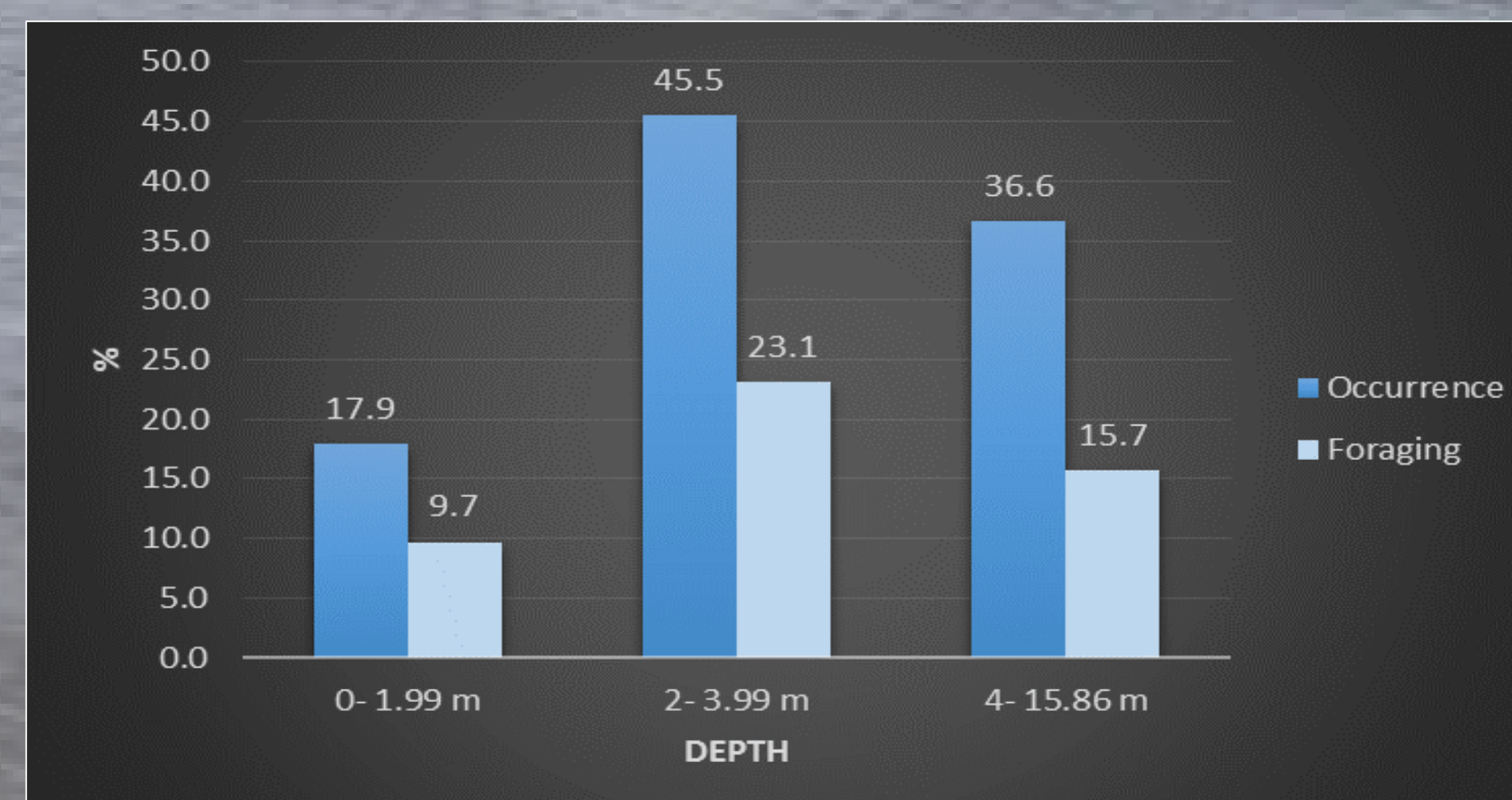
Figure 2: Occurrence of all sightings & foraging observations at different depths in GB.

Preliminary Results

- 30 photo-ID surveys completed Aug. 2013-Dec. 2015
- 124 sightings
- 13 samples collected (Aug.-Oct. 2015)
- Dolphins observed foraging in 54% of all sightings
- Dolphins observed patrolling shrimp trawlers in 41% of the sightings
- 76% of foraging dolphins were with a shrimp trawler

Expected Results

- Dolphins with ↓ $\delta^{13}C$ likely foraging in UGB or Trinity Bay
- Dolphins with ↑ $\delta^{13}C$ likely foraging in lower GB, East or West Bay
- $\delta^{15}N$ will vary depending on trophic levels consumed & location
- Transients will have depleted $\delta^{13}C$ & enriched $\delta^{15}N$
- Estimate proportions of prey consumed using Bayesian models
- Photo-id survey data & SIA will reveal evidence of site fidelity

Future Work & Discussion

We will continue biopsy surveys & conducting photo-ID surveys. As apex predators, bottlenose dolphins act as sentinels for the overall health of the GB ecosystem. My proposed research will contribute to basic life history knowledge of the GB population & identify key foraging habitats. My data will also be useful for future management plans by providing insight to prey selection & documenting bioaccumulated contaminants for ecosystem modeling.

Acknowledgments