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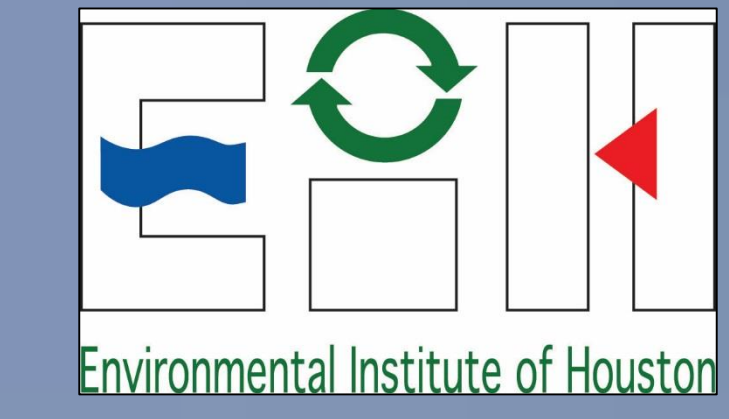
FORAGING ECOLOGY OF COMMON BOTTLENOSE DOLPHINS (*TURSIOPS TRUNCATUS*) IN GALVESTON BAY



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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 Galveston Bay (GB) ecosystem
- Estimate proportions of different prey consumed by dolphins

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
- Collect target fish to run stable isotope analysis (SIA)
- Compare $\delta^{13}\text{C}$ & $\delta^{15}\text{N}$ values of dolphins to different sub-bays in GB using SIA
- Use previously published data on prey items & Bayesian mixing models ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$) to estimate proportions of prey consumed
- Pair photo-id survey data & SIA results to estimate foraging areas & seasonal occurrences of individuals

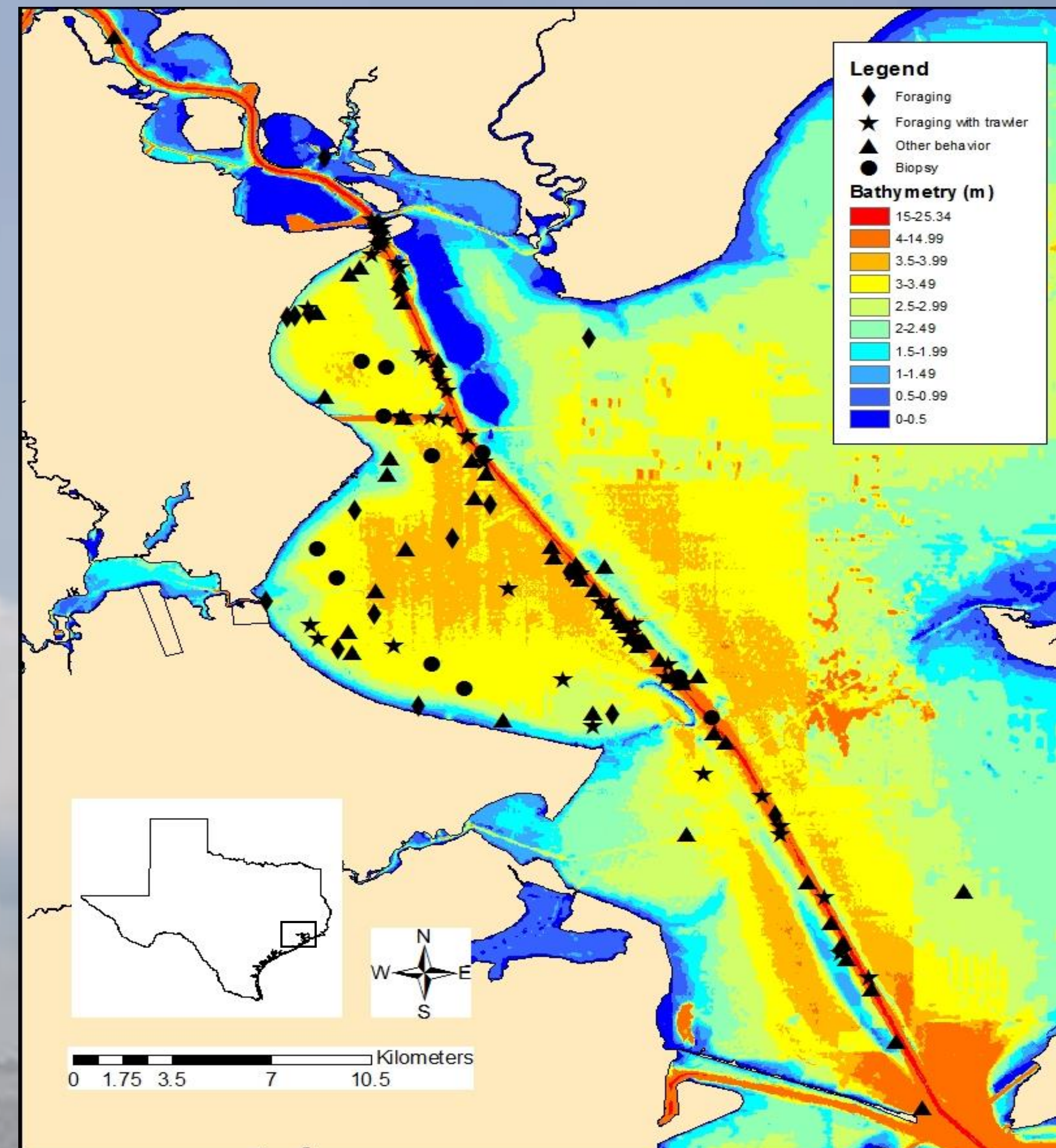


Figure 1: Occurrence of all sightings & foraging observations at different depths (m) in GB from August 2013- December 2015.

Preliminary Results

- 30 photo-ID surveys completed Aug. 2013-Dec. 2015
- 122 sightings in GB
- 13 samples collected (Aug.-Oct. 2015)
- Dolphins observed foraging in 55% of all sightings
- Dolphins observed patrolling shrimp trawlers in 40% of the sightings
- 73% of foraging dolphins were with a shrimp trawler

Expected Results

- Based on historical studies in the GB ecosystem¹:
 - Dolphins with $\downarrow \delta^{13}\text{C}$ likely foraging in UGB or Trinity Bay
 - Dolphins with $\uparrow \delta^{13}\text{C}$ likely foraging in lower GB, East or West Bay
 - $\delta^{15}\text{N}$ will be \uparrow in UGB & Trinity Bay due to anthropogenic nitrogen loading
- Estimate proportions of prey consumed using Bayesian models
- Photo-id survey data & SIA will reveal evidence of site fidelity

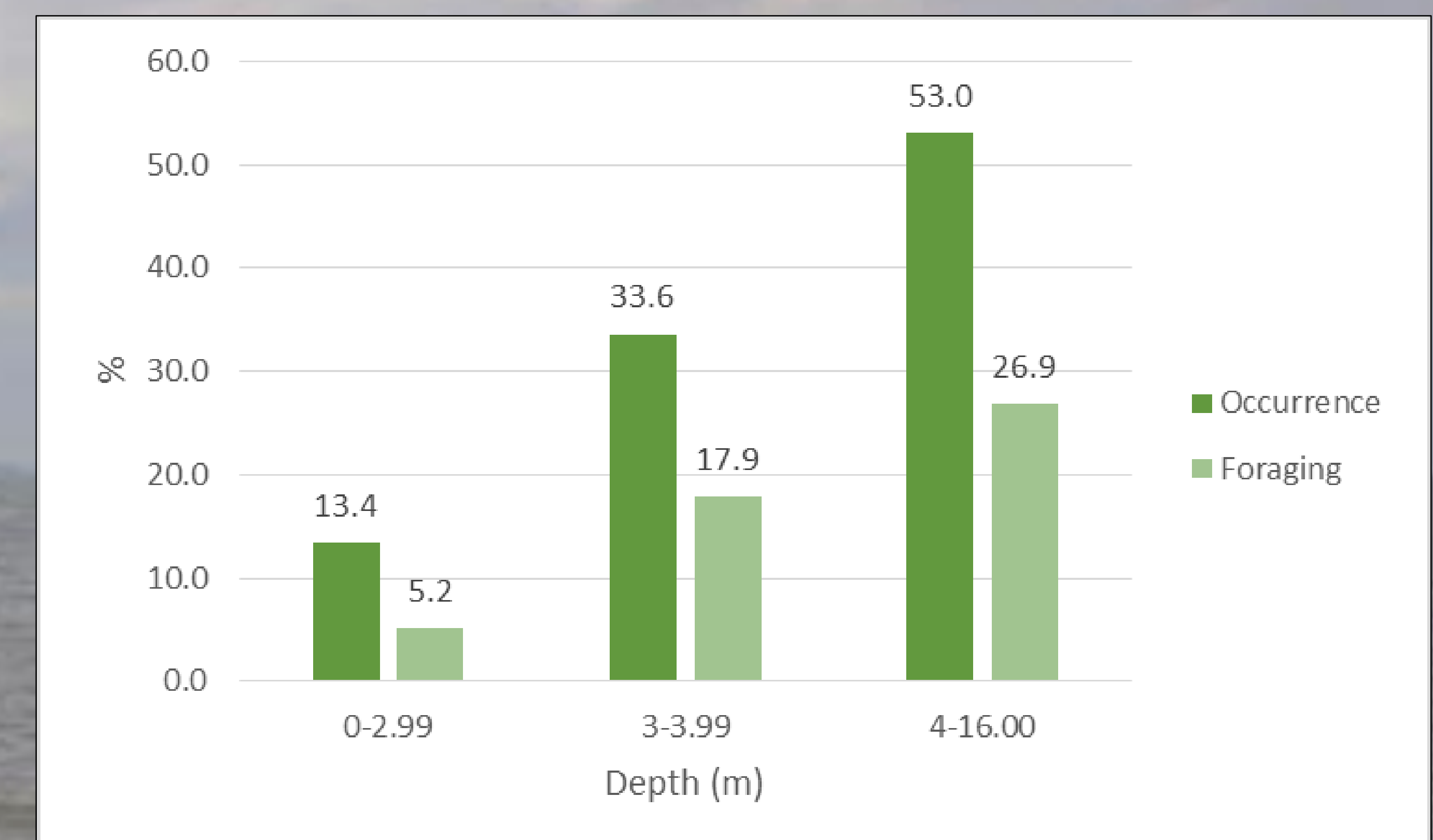


Figure 2: Occurrence of all sightings & foraging observations at different depths in GB from August 2013- December 2015. One sighting was reported without any behaviors (n=121).

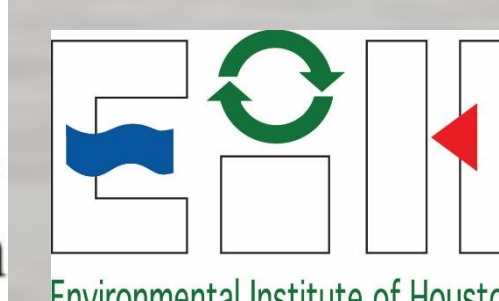


Literature Cited

¹Barcenas, Danielle L. (2013). Use of stable isotope analyses to describe trophic dynamics of aquatic ecosystems in Galveston Bay, Texas. University of Houston-Clear Lake.

Part of the Texas Bottlenose Dolphin Research

Collaborative



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. This proposed research will contribute to basic life history knowledge of the GB population & identify key foraging habitats. The data will also be useful for future management plans by providing insight to prey selection & documenting bioaccumulated contaminants for ecosystem modeling.