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Introduction

- Bottlenose dolphins (Tursiops truncatus) are an ecologically important, long-lived apex predator that act as a sentinel of Galveston Bay (GB).
- Due to crucial data gaps, the National Marine Fisheries Service considers GB a high priority area for dolphin research.
- One of the most important factors affecting bottlenose dolphin movement patterns is the spatial & temporal distribution of prey resources.
- Stable isotope analysis (SIA) & Bayesian mixing models have become useful tools to estimate proportions of prey consumption by predators.

Objectives

- Estimate important habitats in the GB system used for foraging, with photo-identification (photo-ID) & behavioral data.
- Estimate likely proportions of different prey items consumed by dolphins using stable isotope mixing models.

Methods

- Boat-based photo-ID surveys were conducted between 2015-2017.
- Remote biopsy tissue sampling using a crossbow & modified dart from free ranging dolphins from 2015-2017 to run SIA ($^{13}$C, $^{15}$N) (Fig. 1).
- Probable feeding/feeding: patrolling shrimp boats, fluke out diving, swirling, fish in mouth, fish chasing, fish towing, quick & variable directional movements.
- Habitats characterized by nearshore, open bay, & channel (Fig. 2).
- Used previously published data of $^{13}$C & $^{15}$N on potential prey items & fish collected from 2015-2016 (otter trawling to model proportions of prey consumed using the package MixSIAR (v 3.1.10) in R (v 3.6.1).
- Used discrimination factors of 1.01‰ for $^{13}$C & 1.57‰ for $^{15}$N in the model.

Results

- 75 photo-ID surveys, 303 group sightings.
- Of 303 sightings, 191 were observed probable feeding or feeding; 100 of the 191 sightings were observed in the channel habitat.
- 37 biopsy surveys, 36 tissue samples.
- Of the 7 species evaluated in this model:
  - Striped Mullet was estimated to make up 30.3% of the total diet, as the primary prey source, for the overall sampling period (Fig. 4).
  - In 2015 & 2017 Striped Mullet composed an estimated 33.5% & 36.5% of the total diet, respectively.
  - In 2016 Striped Mullet dropped to 14.3% while Spotted Seatrout increased to 42.8% of the estimated diet.

Discussion

- Yearly prey abundance may be a crucial factor contributing to disparities in the estimated contributions of prey in GB dolphin diets.
- Although Striped Mullet & Spotted Seatrout were the highest proportions in the overall diet, different fishes not used in this study with similar $^{13}$C & $^{15}$N values may fulfill a substantial part of dolphin total estimated diet.

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Literature Cited