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OBSERVATIONS ON THE OCCURRENCE AND DISTRIBUTION OF BOTTLENOSE DOLPHINS (*TURSIOPS TRUNCATUS*) IN UPPER GALVESTON BAY

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Preliminary Findings

Background
Galveston Bay (GB) is the largest estuary in Texas, rests adjacent to the nation’s energy capital, and is located in the most populated region of the state. The Houston Ship Channel (HSC) divides GB and is an avenue for heavy maritime traffic ending at the Port of Houston in the northwest. Consequently, GB has suffered degraded water quality due to anthropogenic influences. Current concerns include heavy metals, chlorinated organic compounds, and pathogenic bacteria, making GB a high priority for biological monitoring. Historically, common bottlenose dolphins (*Tursiops truncatus*) have been documented in lower GB, the Galveston Ship Channel and Bolivar Roads. Surveys conducted in the 1990’s suggested limited dolphin activity in upper GB. Until recently, no other surveys have been conducted in this region. Based on these previous studies and current observations, dolphins likely forage frequently in the HSC, the region most concentrated by toxic pollutants. Determining dolphins’ behavioral patterns will contribute to basic life history knowledge of the GB population and identify key foraging habitats. My proposed research will contribute to future management plans by providing insight to prey selection and documenting bioaccumulated contaminants for ecosystem modeling.

Objectives

- Estimate dolphin distribution, relative abundance, site fidelity, and human interactions in upper GB
- Establish a long-term monitoring plan for the region

Methods

- Boat-based photo identification (photo-id) surveys followed meandering routes conducted in upper GB & HSC (Fig. 1) using standardized protocols
- Photos analyzed following standardized methods & archived in FinBase
- Two seasons defined based on environmental conditions:
  - Summer-Fall (SF): June-October
  - Winter-Spring (WS): November-May
- Relative abundance= # of dolphins sighted (d) per kilometer (km) surveyed

Preliminary Results

- 13 surveys conducted from Mar. 2013 – Dec. 2014 covering 577 km, resulting in 54 group sightings containing 361 dolphins (Table 1)
- Identified 160 distinct individuals some with 2 or more sightings (n = 51)
- Dolphins sighted year round, however concentrations of dolphins sighted were higher in SF (p=0.021, Mann-Whitney U=31, one-tailed)
- Group size ranged from 1-31, with larger groups sighted during SF
- No significant difference in group size between season (p=0.055, Mann-Whitney U=376, one-tailed)
- 30% of groups sighted were patrolling around shrimp boats, 24% were bow-riding on a vessel (Fig. 2)

Discussion

- Preliminary data suggests that dolphins regularly utilize the upper GB with a seasonal variation in abundance of dolphins in upper GB peaking in SF
- Dolphins often associate with vessels in upper GB & the HSC

Future Research

Expected Results

- Dolphins with † δ¹³C likely foraging in upper GB or Trinity Bay
- Dolphins with † δ¹⁵N likely foraging in lower GB, or East/West Bay
- δ¹⁵N will vary depending on trophic levels consumed & location
- Transients will have depleted δ¹³C & enriched δ¹⁵N

Discussion

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 and identify key foraging habitats. My data will also be useful for future management plans by providing insight to prey selection and documenting bioaccumulated contaminants for ecosystem modeling.

Part of the Texas Bottlenose Dolphin Research Collaborative

A cooperative network of scientists & institutions facilitating the creation of a long-term monitoring program with goals to provide population distribution & abundance estimates, identify natural & human-generated risks and establish baseline health parameters for Texas bay, sound, estuary & near-coastal bottlenose dolphins.