Collection locations, dates, and weight and length measurements of individuals of three fish species from the Matagorda Bay region of Texas in the northwestern Gulf of Mexico from 2021 to 2023

Website: https://www.bco-dmo.org/dataset/916418
Data Type: Other Field Results
Version: 1
Version Date: 2023-12-07

Project
» Collaborative Research: Shifting the Hypoxia Paradigm – New Directions to Explore the Spread and Impacts of Ocean/Great Lakes Deoxygenation (HypoxiDigm)

Contributors	Affiliation	Role
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Abstract
This dataset describes the collection locations of individuals of three fish species (Red Drum Sciaenops ocellatus, Southern Flounder Paralichthys lethostigma, and Atlantic Croaker Micropogonias undulatus) in the Matagorda Bay region of Texas in the northwestern Gulf of Mexico. Fish carcasses were obtained from anglers at boat docks, fish cleaning stations, or other locations in the region. Fish were also obtained from bait shops where the proprietors verified the fish were sourced from the Matagorda Bay study region. These fish will be dissected to subsample muscle tissue, eye lenses, and otoliths for chemical analysis to reconstruct environmental histories (trace element proxies for hypoxia, salinity, and other parameters), mercury concentrations, and stable isotopes to reconstruct food web interactions.

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Coverage

Spatial Extent: **N**:28.7012066 **E**:-96.2284072 **S**:27.6796764 **W**:-97.3201482
Temporal Extent: 2021-07-16 - 2023-07-01

Methods & Sampling

Fish were collected from anglers or bait shops who had sourced their specimens from the study region in the Matagorda Bay complex in the northwestern Gulf of Mexico. Specimens were either obtained whole, or after the primary portion of the filets had been removed for angler consumption and the remainder of the carcass was provided to us. Because of this, in some cases, whole carcass wet weight could not be obtained for all samples. Collection locations are either where the specimens were obtained from anglers and bait shops themselves, or the locations where the anglers told us they had collected the fish themselves (if such location was known and provided). Three species were targeted for collection: Red Drum *Sciaenops ocellatus*, Southern

Flounder *Paralichthys lethostigma*, and Atlantic Croaker *Micropogonias undulatus*. Specimens were weighed (if the whole carcass was present) with an Ohaus Scout balance, measured for fish total length using a fish measuring board, and then dissected to remove muscle tissue, eye lenses, and otoliths for subsequent chemical analyses.

BCO-DMO Processing Description

- Imported the second sheet ("Fish Masterlist") of the original file "Oster MetaData NSF Upload.xlsx" into the BCO-DMO system.
- Marked "NA" as a missing data value (missing data are blank/empty in the final CSV file).
- Renamed fields to comply with BCO-DMO naming conventions.
- Converted the Date_Collected field to YYYY-MM-DD format.
- Generated a unique list of species names and checked them in the World Register of Marine Species (WoRMS). All are valid, accepted taxonomic names.
- Saved the final data file as "916418_v1_fish_collection_locations.csv".

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Data Files

File
916418_v1_fish_collection_locations.csv (Comma Separated Values (.csv), 22.27 KB) MD5:6a8c642041bf07e76971daba9cb1114f
Primary data file for dataset ID 916418, version 1

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Parameters

Parameter	Description	Units
FishID	Unique identifier number for each individual fish included in the project. IDs include a prefix of "MB" (Matagorda Bay) or "PB" (Project Breathless) followed by a unique sequence of digits.	unitless
Station_Name	Name of location where fish were collected from anglers or bait shops. In some cases, anglers provided us with a location where the fish were retrieved from the water and this location was used when available.	unitless
Station_Latitude	Collection location latitude in decimal degrees; positive values = North	decimal degrees
Station_Longitude	Collection location longitude in decimal degrees; negative values = West	decimal degrees
Date_Collected	Date of fish collection	unitless
Species	Latin binomial (Genus species) of each individual collected	unitless
Weight_g	Wet weight of undissected specimen in grams (where available)	grams (g)
Length_mm	Total length in millimeters of each specimen	millimeters (mm)

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Instruments

Dataset-specific Instrument Name	Ohaus Scout balance
Generic Instrument Name	scale
Dataset-specific Description	An Ohaus Scout balance was used to weigh the fish.
Generic Instrument Description	An instrument used to measure weight or mass.

Project Information

Collaborative Research: Shifting the Hypoxia Paradigm – New Directions to Explore the Spread and Impacts of Ocean/Great Lakes Deoxygenation (HypoxiDigm)

Coverage: Central Baltic Sea; Lake Erie; and Lavaca Bay, Texas

NSF Award Abstract:
Ocean oxygen loss (deoxygenation) is increasing due to climate warming. This warming, together with nutrient loading, is causing many marine and freshwater systems to experience increasing episodes of hypoxia (low oxygen) of greater duration and intensity. Impacts on fish and fisheries have been difficult to quantify; direct observation has been challenged by a lack of long-term exposure indicators. This team has successfully refined the use of fish chemical biomarkers in fish otoliths (earstones) to directly assess lifetime hypoxia exposure in fishes. This project will those findings to look for additional biomarkers and models, to expand our understanding of how hypoxia affects fish and their food webs, contaminant transfers, and ecosystem services including economic impacts. The project includes a unique way of training students in science communication, posing the question: What forms of media and "messaging strategies" about deoxygenation are most effective at raising public awareness and understanding? Students are developing entries for PlanetForward's Storyfest, which is a contest to tell compelling stories to foster environmental understanding and solutions. Students from historically underrepresented, economically disadvantaged backgrounds are particularly sought out to participate. The investigators will engage with regional, national, and international management agencies and other relevant stakeholder groups to share information.

This project encompasses a novel, linked set of interdisciplinary studies of food webs, and ecosystem services assessment. The thematic questions explored in this project are: 1. How does hypoxia alter habitat use for fishes? 2. How does hypoxia-altered habitat use and habitat productivity change food webs? 3. How does hypoxia affect/enhance trophic transfer of methylmercury? 4. How do hypoxia-induced changes in food webs affect aquatic ecosystem services? The set of linked studies will employ chemical analyses of otoliths and eye lenses, combined with chemical analyses of muscle tissues (Questions 1 and 3), physiologically-structured food web modeling informed by monitoring time-series (Questions 2 and 4), and a scoping workshop to address ecosystem services (Question 4). The investigators are using a "trans-basin" comparative approach to system-specific responses, studying fishes in Lake Erie, the Baltic Sea, and a Gulf of Mexico estuary. They study three species from each system that represent different degrees of benthic reliance, to discern differential responses to the increasingly hypoxic environment. This research provides novel insight about variable biotic responses to oxygen loss and the impacts on ecosystem functioning.

Funding

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