

Young-of-the-year Baltic flounder otolith chemistry collection information from 2014 to 2017 at Baltic Sea sites in Sweden and Latvia.

Website: <https://www.bco-dmo.org/dataset/775412>

Data Type: Other Field Results

Version: 1

Version Date: 2019-08-15

Project

» [Collaborative Research: Consequences of sub-lethal hypoxia exposure for teleosts tracked with biogeochemical markers: a trans-basin comparison](#) (OtolithHypoxia)

Contributors	Affiliation	Role
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Abstract

Young-of-the-year (YOY) flounder were collected by beach seines at Baltic Sea sites in Sweden and Latvia. Fish were stored frozen until they were processed. This dataset is comprised of collection data information, which associates each individual fish with a particular collection date and location, provides fish length, etc. The corresponding chemistry data is found in the YOY chem dataset (<https://www.bco-dmo.org/dataset/775428>)

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Coverage

Temporal Extent: 2014-07-07 - 2017-06-02

Dataset Description

Young-of-the-year (YOY) flounder were collected by beach seines at Baltic Sea sites in Sweden and Latvia. Fish were stored frozen until they were processed. This dataset is comprised of collection data information, which associates each individual fish with a particular collection date and location, provides fish length, etc. The corresponding chemistry data is found in the YOY chem dataset (<https://www.bco-dmo.org/dataset/775428>)

Methods & Sampling

Young-of-the-year (YOY) flounder were collected by beach seines at Baltic Sea sites in Sweden and Latvia. Fish were stored frozen until they were processed. Processing consisted of measuring total lengths and extracting their sagittal otoliths. The otoliths were cleaned, dried, mounted on glass slides, and then polished to expose the core. Chemical analyses were conducted by laser ablation-inductively coupled plasma mass spectrometry (LA-ICPMS) at the SUNY College of Environmental Science and Forestry. A USGS carbonate standard (MACS-3) was used to calibrate and correct for instrument drift. Spot size was 35 microns, and transects were run from core to outer edge at 5 microns/second.

Data Processing Description

BCO-DMO Processing Notes:

- reformatted dates into yyyy-mm-dd format
- removed empty rows
- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions

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Parameters

Parameter	Description	Units
survey_site	Site at which specimen was collected: Rinkaby (Hano Bay; Sweden); Vastra Torso (Hano Bay; Sweden); Hide (Gotland; Sweden); Bunge (Gotland; Sweden); Pape (Kurzeme/Courland; Latvia); Pavilosta (Kurzeme/Courland; Latvia) and Kolka (Kurzeme/Courland; Latvia)	unitless
fish_id	The ID for a fish given during extraction of otoliths	unitless
ices_sd	International Council for the Exploration of the Seas Sub-Division: fishing areas.	unitless
date_of_capture	Calendar Date of Capture of the fish specimen; formatted as YYYY-MM-DD	unitless
period_of_capture	Period of the Year of Capture of the fish specimen; Early = 4-19 July 2014; Mid = 31 July - 7 August 2014; Late = 28 August - 2 September 2014	unitless
total_L_mm	Total length of the fish	millimeters (mm)
weight_g	Weight of the fish	grams (g)
otolith_id	The ID for an otolith given during preparation for microchemistry analysis and used during microchemistry analysis	unitless
date_analyzed	Date of chemical analysis; formatted as YYYY-MM-DD	unitless
remarks	additional comments	unitless

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Project Information

Collaborative Research: Consequences of sub-lethal hypoxia exposure for teleosts tracked with

biogeochemical markers: a trans-basin comparison (OtolithHypoxia)

Coverage: Northern Gulf of Mexico, Baltic Sea, and Lake Erie

Description from NSF award abstract:

Hypoxia occurs when dissolved oxygen concentrations in aquatic habitats drop below levels required by living organisms. The increased frequency, duration and intensity of hypoxia events worldwide have led to impaired health and functioning of marine and freshwater ecosystems. Although the potential impacts of hypoxic exposure are severe, there is little known about the consequences of systemic, sub-lethal exposure to hypoxic events for populations and communities of fishes. The objective of this project is to determine whether sub-lethal exposure to hypoxia during early life stages leads to poor growth and hence increased mortality. This project will use "environmental fingerprint" methods in fish ear stones (otoliths) retrospectively to identify periods of hypoxia exposure. The project will compare consequences of hypoxia exposure in different fish species from the Gulf of Mexico, the Baltic Sea, and Lake Erie, thus examining the largest anthropogenic hypoxic regions in the world spanning freshwater, estuarine, and marine ecosystems.

This project will employ long-term, permanent markers incorporated into fish otoliths to identify life-long patterns of sub-lethal hypoxia exposure far beyond time spans currently achievable using molecular markers. This work will capitalize on patterns of geochemical proxies such as Mn/Ca and I/Ca incorporated into otoliths and analyzed using laser ablation inductively coupled plasma mass spectrometry to identify patterns of sub-lethal hypoxia exposure. The investigators will then determine whether exposure results in differential growth and survival patterns compared to non-exposed fish by tracking cohorts over time and identifying characteristics of survivors. Because this work involves multiple species in multiple hypoxic regions, it will allow cross-system comparisons among unique ecosystems. The results from this project will thus provide unprecedented insight into effects of hypoxia exposure in three major basins using novel biogeochemical proxies, thereby paving the way for a fuller understanding of the impacts of "dead zones" on coastal resources.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1433759

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