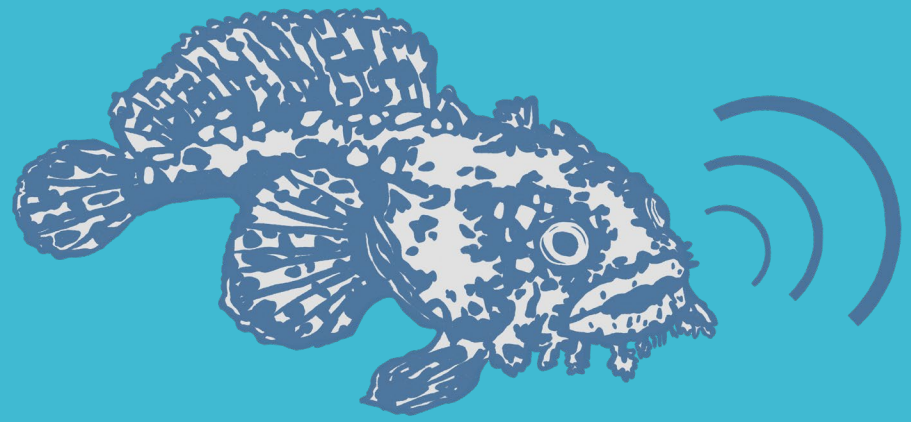


FishSounds Fisheries

Open Knowledge in Support of Industry

Presented by

Sarah Vela

FishSounds

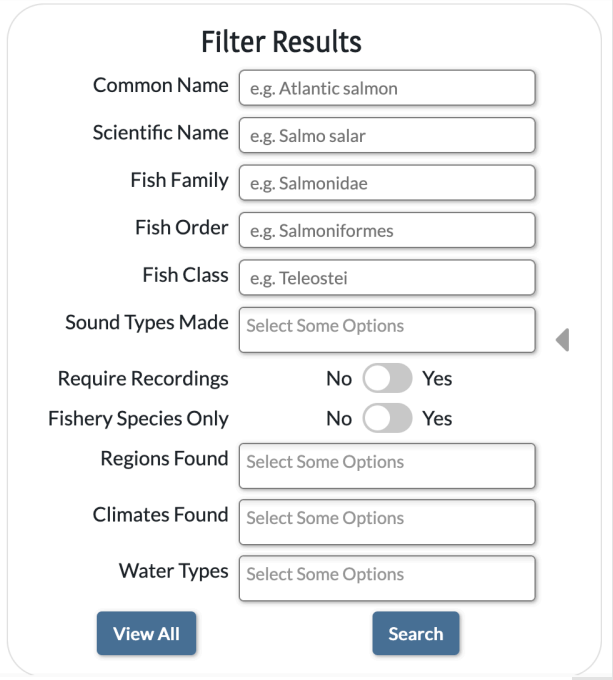
Co-founder,
Senior Data Manager
and Web Developer

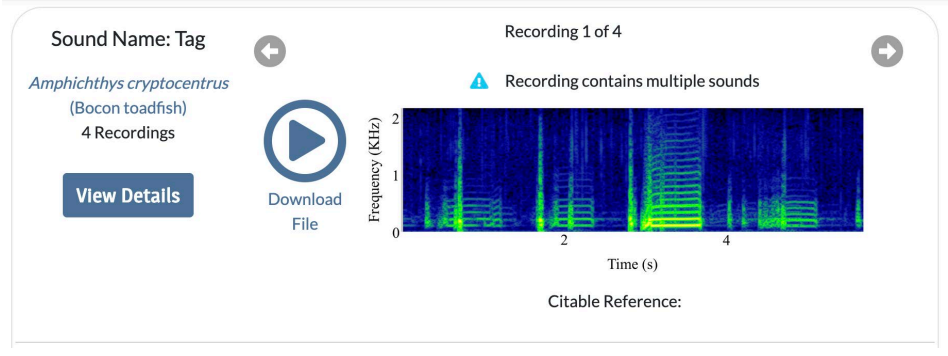
What is FishSounds?

- Bioacoustics is the study of sounds produced by animals
  - Well-established for terrestrial species (birds, insects)
  - Moderately established for underwater mammals (whales, dolphins)
  - Less organized for other underwater species (fish, invertebrates)
- In 2019 Dr. Audrey Looby performed a systematized review of research on fish sound production
  - What species were studied
  - What methods were used
  - What kinds of sound were detected
- Resulting findings summarized in collection of CSVs

What is FishSounds?

- Collaborated with MERIDIAN research group to produce searchable online tool for data at https://fishsounds.net
- Version 1 launched in October 2021
- Search and view data centered on:
  - Fish species
  - Research publications
  - Sound recordings
- Initially designed for academic audience





What is FishSounds?

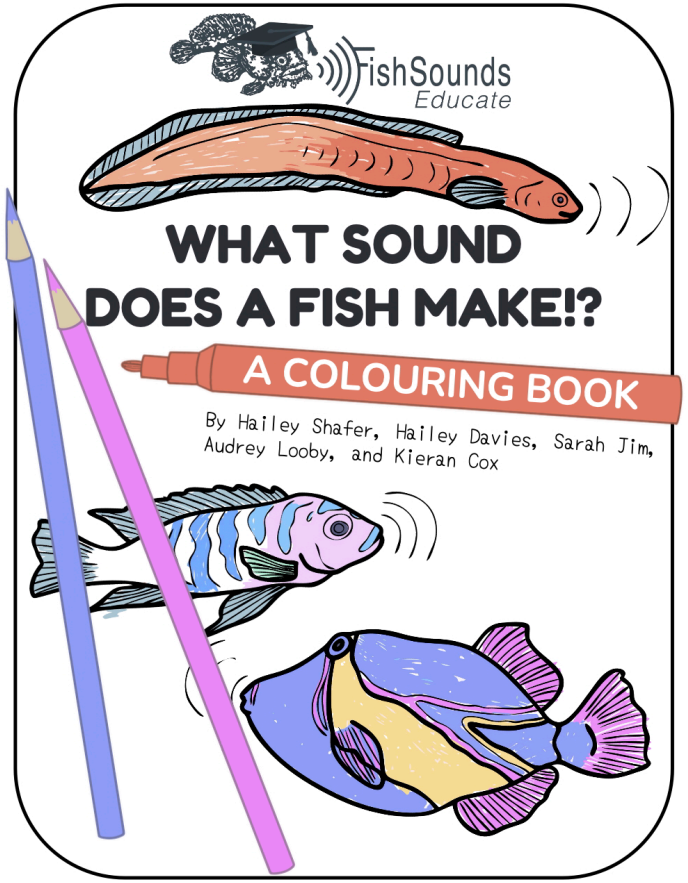
- Positive response from different parties spurned further expansion
  - Academic
    - Global Library of Underwater Biological Sounds (GLUBS)
  - Media and General Public
  - Educators
  - Artists
- Versions 2 & 3
  - Expanded dataset (new publications, donated recordings)
  - Links to other repositories (Macaulay collection)
  - Data visualizations
  - Improvements to data model
- Growing number of projects and collaborations

FishSounds Educate

- Funded by Fisheries and Oceans Canada
- Brought the science of underwater sounds into classrooms of all sorts
  - K-12 workshops
  - University lectures
  - Aquariums
  - Nature clubs
  - Online lessons
- 67 events held for 2790 total participants across Canada and USA

FishSounds Educate

- Lesson materials now available for download in English and French
  - Presentation and worksheet
  - "Fish or Fart" minigame
- Colouring book
- Forthcoming collaborations with educational organizations



Searchable Online Catalogues of Knowledge (SOCKs)

- Original FishSounds problem is common in academia:
  - Meta-analysis or data collection effort produces dataset
  - Desire to share data (commonly required by funding)
  - Research data repositories offer limited functionality for key activities
    - Filtering to subset of data
    - Connecting datasets together
- Code used to produce FishSounds designed to be reusable for similar websites
  - Define data models and search function based on common structures
  - Design search result cards and individual record page
  - Select search options from library of form inputs

Searchable Online Catalogues of Knowledge (SOCKs)

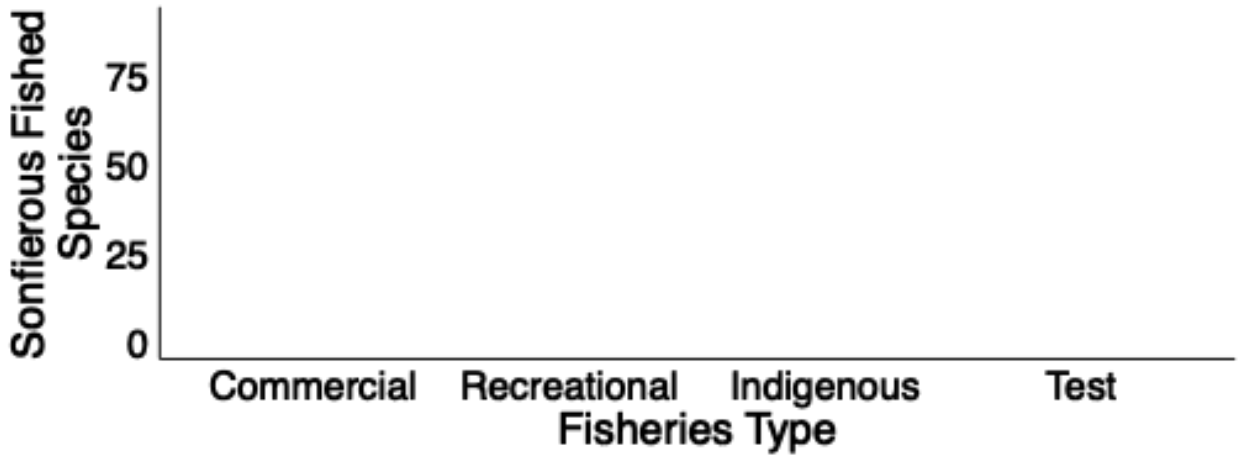
- Intention to create graphical interface to assist with construction
  - WordPress-like experience (and required skill level)
  - Produce search and result pages as on FishSounds
- Project progress limited by available funding and expertise
  - Currently testing data administration code
  - Seeking partners with suitable datasets

FishSounds Fisheries

- Funded by Fisheries and Oceans Canada
- Compile additional information from academic and government publications relating to species present in fisheries
- Determine whether, when, and how passive acoustic monitoring (PAM) could be used to inform fisheries management
- Make the information available in useful ways

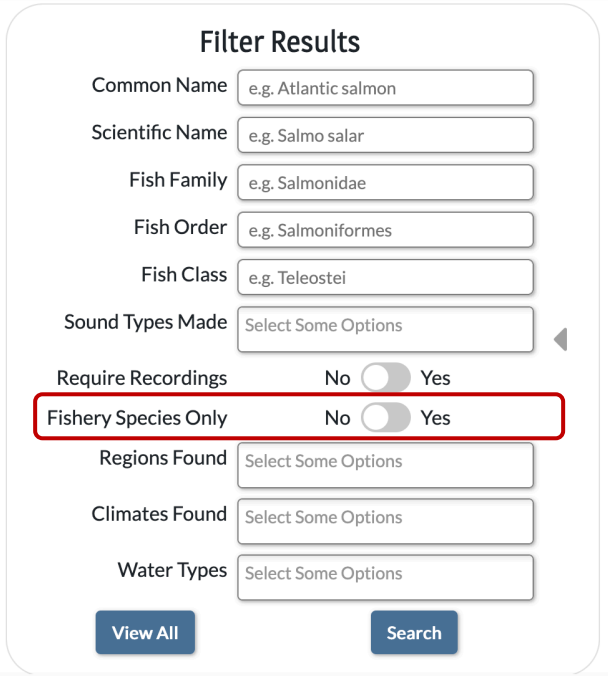
Current State

- Identified species that are fished in Canada and produce "active" sounds
- Compiled information on sound production characteristics
  - Acoustic features (e.g. sound frequency)
  - Behavioural context (e.g. mating)
- Determined uses of PAM supported by literature
  - Geographical distribution and abundance of species
  - Tracking reproductive activities
  - Species demographics (sex, developmental stage)
  - Presence of predators?



Current State

- Preliminary data available as CSV download
- Search for fishery species
- Fishery types incorporated into fish species information



Climates: Boreal
Subtropical
Temperate
Tropical

Waters: Brackish water
Freshwater
Marine

Known Canadian Fisheries: Commercial
Indigenous

(Possible) Next Steps

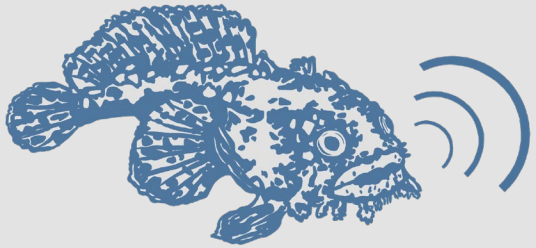
- Meet with fishery managers and other stakeholders
  - Identify needed data and data presentations
  - Educate on uses of PAM in their work
  - Dependent on available staff (on both sides)
- Expand data collection to other locales and species
  - Alabama project upcoming
  - Dependent on funding (especially for monitoring deployments)
- Develop standards for assessing/describing fishery applications
  - Collaborate with researchers and experts (e.g. GLUBS)
  - Slow process of reaching consensus
  - Academic, government and industry perceptions often conflict
    - Research often isn't clearcut or efficient

(Possible) Next Steps

- Summary table of fishery species and PAM applications
  - Convenient view for comparing species
  - Difficult to convey that negative data is not definitive
    - Only 4% of fish species have been assessed
    - Studies can conflict

- Visual representation of PAM usefulness for a species
  - Requires quantifying or ranking likelihood of PAM being useful
  - Complicated by lack of standards for research

Questions?



Visit us at
https://FishSounds.net

Support our work: