Setting up a project - example publications, best practices, and helpful hints
- [Ecological Inferences about marine mammals from passive acoustic data](#)

Recorders/hardware
1. Ocean Sonic's [icListen](#)
2. Ocean Instrument's [SoundTrap](#)
3. Desert Star's [SonarPoint](#)
4. Open Acoustic Device's [Hydromoth](#)
5. Loggerhead Instruments ([Loggerhead Instruments](#))
6. [Multi-electronique Aural](#)
7. RTsys [RESEA](#)
8. [JASCO Applied Sciences](#)

Data Archiving Standards and Best Practices:
- [IOOS Metadata Convention for Passive Acoustic Recordings](#)
- [Tethys](#)
- [Passive Acoustic Data | National Centers for Environmental Information (NCEI)](#)
  - [PassivePacker](#) - NCEI's data packaging and metadata gathering software tool

Useful Software and Analytical Tools
- Adobe Audition
- Audacity
- Raven
- [Comprehensive list of software](#) by Tessa Rhinehart
- [ACCURATE](#) project or marine mammal density estimation from passive acoustics
- SanctSound [software](#)
- PAM Guide (sound levels only)
- PAM Guard (https://www.pamguard.org/)
- Manta (https://bitbucket.org/CLO-BRP/manta-wiki/wiki/Home)
- Arbimon (https://arbimon.org/)
- Pypam

Detection and Classification Software
- PerchPicker (https://github.com/drbohnen/PerchPicker) - American silver perch (Bairdiella chrysoura)
- ToadFishFinder (https://github.com/drbohnen/ToadFishFinder) - oyster toadfish (Opsanus tau)

Programming Languages for Acoustic Analysis
- Python: scikit-maad, OpenSoundscape, librosa
- MATLAB (requires license)
- R (slower than Python): seewave, tuneR, warbleR, monitoR

Underwater Sound Libraries and Archives

- Pending Launch: [Global Library of Underwater Biological Sounds (GLUBS)](#)
- Pending Launch: [World Ocean's Passive Acoustic Monitoring Day](#)
- [NOAA NCEI Passive Acoustic Data Archive](#)
- [Fish Sounds: global inventory of fish sound production research](#)
- SanctSound [data portal](#) of PAM in US national marine sanctuaries
- Dosits (https://dosits.org/)
- Estuarine Soundscape Observatory Network in the Southeast (https://sound.secoora.org/)
- [IWC blue and fin whale acoustic trends annotated library](#)
- [Terrestrial & aquatic repository list](#)
- [Fonozoo](#): 11,656 sound samples of 1,620 species, including invertebrates, marine mammals, amphibians and fishes
- [Voices of the sea: UCSD](#)
- [British Library Sound Archive](#): 240,000 sound samples of 10,000 bird, mammal, amphibian, reptile, fish, and invertebrate species from around the world
- [Sonothèque](#) (Muséum National d'Histoire Naturelle): 19,589 sound samples of wildlife species, including marine mammals and fishes, predominantly collected by Bernie Krause with
- additional contributors
- [Watkins Marine Mammal Sound Database](#) (Woods Hole Oceanographic Institution): About 15,000 sound samples of 55 marine mammal species, as well as about 1,600 full soundscape recordings, mainly collected during the career of William Watkins
- [Ocean Networks Canada (Sound Cloud)](#): 60 sound samples of marine mammal and fish species from Canada
- [Marine Mammals of Australia and Antarctica (Curtin University)](#): Sound samples of 43 mammal species from Australasia
- [Macaulay Library](#)
- [iNaturalist](#)
- Data for: ToadFishFinder classifier model v4: A catalog of oyster toadfish (Opsanus tau) calls for machine learning. - waveforms for 10,000 labeled call examples https://datadryad.org/stash/dataset/doi:10.5061/dryad.gtht76hr9
- Data for: PerchPicker classifier model v7: A catalog of American silver perch (Bairdiella chrysoura) calls for machine learning - waveforms for 6,000 labeled call examples https://datadryad.org/stash/dataset/doi:10.5061/dryad.4qrfj6qf0

Title (host)	Weblink (citation)	Details
Audio Gallery (Discovery of Sound in the Sea)	https://dosits.org/galleries/audio-gallery/ (Vigness-Raposa et al., 2012)	Sound samples of 44 marine mammal, 29 fish and 4 invertebrate species from around the world
Fish Sounds (University of Rhode Island)	http://www.gso.uri.edu/fishsounds/ (Fish and Mowbray, 1970)	155 sound samples of 153 fish species from the Western North Atlantic (Fish and Mowbray, 1970)
The SOUND Table (FishBase)	https://www.fishbase.de/topic/List.php?group=sounds (Kaschner, 2012)	121 sound samples of 90 fish species, mostly from the Western North Atlantic (Fish and Mowbray, 1970)
Macaulay Library (Cornell University)	https://www.macaulaylibrary.org/ (Macaulay Library, 2021)	1,189,562 sound samples of 10,056 bird species and 2,674 non-bird species
Marine Mammals of Australia and Antarctica (Curtin University)	http://cmst.curtin.edu.au/research/marine-mammal-bioacoustics/ (Erbe et al., 2017)	Sound samples of 43 marine mammal species from Australasia
Ocean Networks Canada (Sound Cloud)	https://soundcloud.com/oceannetworkscanada/albums (Ocean Networks Canada, 2021)	60 sound samples of marine mammal and fish species from Canada
Watkins Marine Mammal Sound Database (Woods Hole Oceanographic Institution)	https://cis.whoi.edu/science/B/whalesounds/index.cfm (Sayigh et al., 2016; Watkins Marine Mammal Sound Database, 2021)	About 15,000 sound samples of 55 marine mammal species, as well as about 1,600 full soundscape recordings, mainly collected during the career of William Watkins
Sonothèque (Muséum National d'Histoire Naturelle)	https://sonotheque.mnhn.fr/ (Sonothèque, 2018)	19,589 sound samples of wildlife species, including marine mammals and fishes, predominantly collected by Bernie Krause with additional contributors
British Library Sound Archive (The British Library)	https://sounds.bl.uk/Environment (The British Library, 2021)	240,000 sound samples of 10,000 bird, mammal, amphibian, reptile, fish, and invertebrate species from around the world
Voices in the Sea (University of California San Diego)	http://voicesinthesea.ucsd.edu/ (Voices in the Sea, 2018)	Sound samples of 33 Cetacean and 10 Pinniped species
FishSounds (MERIDIAN)	https://www.fishsounds.net (Looby et al., 2021)	240 sound samples of 130 fish species
MobySound	mobysound.org (Heimlich et al., 2021)	Sound samples of 25 Cetacean and 2 Pinniped species
Animal Sound Archive (Museum für Naturkunde in Berlin)	https://www.tierstimmenarchiv.de/ (Tierstimmenarchiv, 2021)	120,000 sound samples of any wildlife, including invertebrates, marine mammals, and fishes
FonoZoo (Museo Nacional de Ciencias Naturales Madrid)	http://www.fonozoo.com/ (FonoZoo, 2021)	11,656 sound samples of 1,620 species, including invertebrates, marine mammals, amphibians and fishes

Other Useful Resources:

- [Ocean Science Analytics Recommendations](#)
- [SanctSound](#)