The Use of the Macaulay Library of Natural Sounds to Supplement Labs and Field Studies

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Abstract

Our students have been playing recordings from the Macaulay Library of Cornell University of natural sounds and videos (macaulaylibrary.org) while simultaneously recording with the sound recording program Audacity. In this way they can analyze number of vocalizations per a certain time period, the range of frequency of the sounds, as well as other parameters. This data has been used for compare/contrast scenarios in their own live recordings of vocalizations of sea lions from zoos and aquaria. The students have been able to hear recordings of animals (including sea lions) from places such as New Zealand and the Galapagos that are currently inaccessible to them in person.

Introduction

The Macaulay Sound Library, initiated by the Cornell University Lab of Ornithology in 1957 (originally called the Library of Natural Sound or LNS) is a treasure-trove of both audio and video recordings from birds, mammals, amphibians, reptiles, invertebrates, and fish. Students can simultaneously record for analysis sounds from this library using the free downloadable software Audacity or Raven Lite or b. add their own recordings to the website. These programs allow you to calculate maximum and minimum frequencies of vocalizations on a spectrogram as well as number and duration of each sound during a defined time period. Patterns emerge that can be recorded and analyzed.

Several biology majors have been recording sea lion vocalizations using the free downloadable program Audacity in an attempt to discern interesting patterns. This interest was initiated by Dr. Biolsi through a travel course that she taught in which she introduced the students to pinnipeds and explained that mothers and pups can recognize each other through vocalizations. In the meantime, we discovered the Macaulay Library of Sounds (ML) organized and sponsored by Cornell University. The ML has, in addition, added a Bioacoustics resource that records large mammals such as elephants and whales, and has creative visuals for the public to view these sounds. We will continue to take students on field trips to various zoos and aquaria in the New York City area and record sea lion vocalizations (sample data given here), as well as add information from these web sites to the curriculum. For example, we plan on using the websites to aid in common bird call recognition.

Order Genus Family Scientific name Order Genus Family Scientific name
Cetacea Whales, dolphins, porpoises 2159 312
Sirenians Manatees, dugongs, sea cows 12 ‐‐‐‐‐ Carnivora
Otariidae Sea lions, fur seals 83 294
Phocidae seals 1586 172
Pinnipedia Sea lions, fur seals 89 294
Sirenia Manatees, dugongs, sea cows 32 ‐‐‐‐‐
Cetacea Whales, dolphins, porpoises 2159 312

Future ideas

With sea lions, are their substantial differences based on species, sex, age, seasonal, or whether or not the animals are captive or free? Can the vocalizations be typed to individuals and/or type of behavior? Do the animals vocalize differently based on whether people, such as trainers or children are present or not? How do vocalizations figure into their interactions with each other? Can we apply the same techniques to birds or other animals?

What other differences, especially in marine mammals, do we note as we search the library? Can we contribute our own sounds to the library? Would we be able to establish a service learning internship using the library with children? With blind people?