

LOUD AND BRIGHT PROJECT INSTRUCTIONS

Sound Measurement for **Android Phones/Devices**

Thank you for your participation in the Loud and Bright Project, a citizen science project of the University of California, Los Angeles (UCLA) and the Cornell Lab of Ornithology. This document provides information about the study and the instructions needed to collect data. Please read over the entire document and the attached handout before performing any of the tasks.

Introduction

Your participation in this study will provide the Cornell Lab of Ornithology with a better understanding of the level of sound at times and locations with bird activity. Researchers can use this information to determine how these noise levels affect bird distribution, communication, and reproduction.

Scientific Background

What is Anthropogenic Sound?

Anthropogenic sound is undesirable sound that is created by human activity, including roadways, airplanes, loud music, *etc.* It is extra sound generated in addition to natural sounds.

What is natural sound?

Natural sound is created from nature such as rustling of leaves, crashing of ocean waves, birds chirping, *etc.*

Why is this Important?

Researchers have shown that excess sound can disrupt many of the sounds and songs birds use to communicate. If these social triggers are unheard, it can change the way some types of birds detect predators, select mates and reproduce, and choose territories. Humans have played a large role in raising sound levels, especially in urban areas. The heightened level of sound is an area of interest to scientists.

What can we do?

Your participation in this citizen science project can help raise awareness of our impact on sound levels. You can help scientists determine how sound can influence bird ecology by measuring sound levels.

Materials

You will need the following materials:

1. Android Device (OS 2.1 and up)
 - Your device should have about 4 MB of space available to download the necessary apps and store data.
2. Device Apps (Download instructions given below)
 - Noise Exposure app (Free): to measure noise in decibels (dB)
 - Compass app (Free): to find your longitude and latitude
3. Internet Access
 - To download the necessary apps
 - Optionally: To submit data online on your device or computer
4. Sound Measurement Data Sheet (attached at the end of protocol)

Preparing the Study Area and Materials

Downloading the apps

Step 1: Locate and select the Google Play app (Figure 1). You will be brought to the Google Play home screen, where you can search/download apps.

Step 2: Locate the magnifying glass in the upper right corner of the home screen (Figure 2). This is the search function. Tap it and search the app name (i.e. Noise Exposure or Compass).



Figure 1.Google Play icon

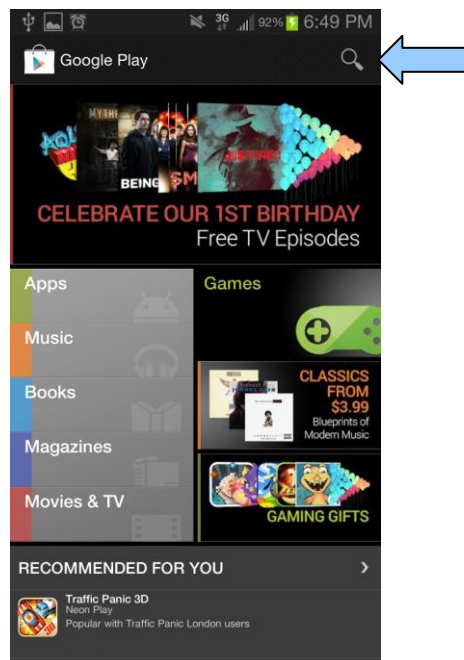


Figure 2. Google Play home screen

Step 3: You will be brought to a search results page (Figure 3). Tap the app you are looking for.

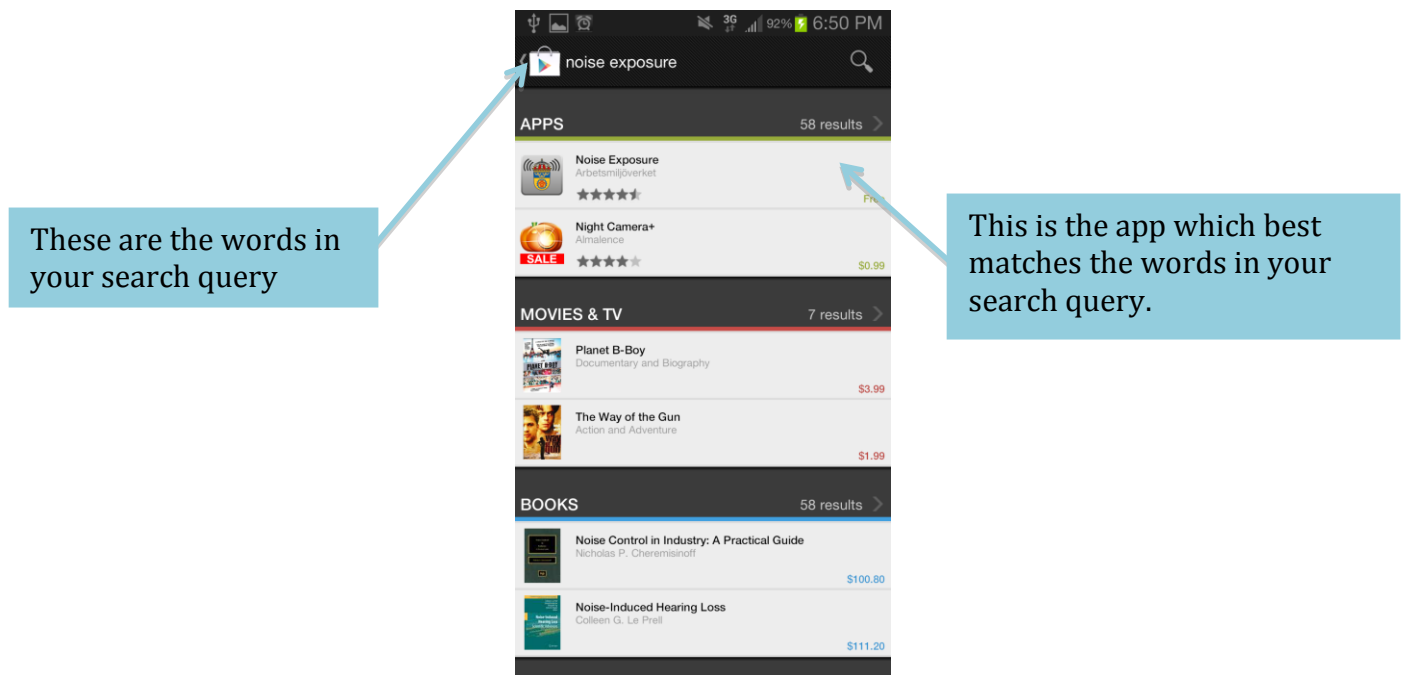


Figure 3.Google Play search results page

Step 4: After selecting your app, you will be brought the app's details page (Figure 4). Here you can read about the app and also download/install the app to your device. Tap the blue "Install" button on the upper right corner to do so.

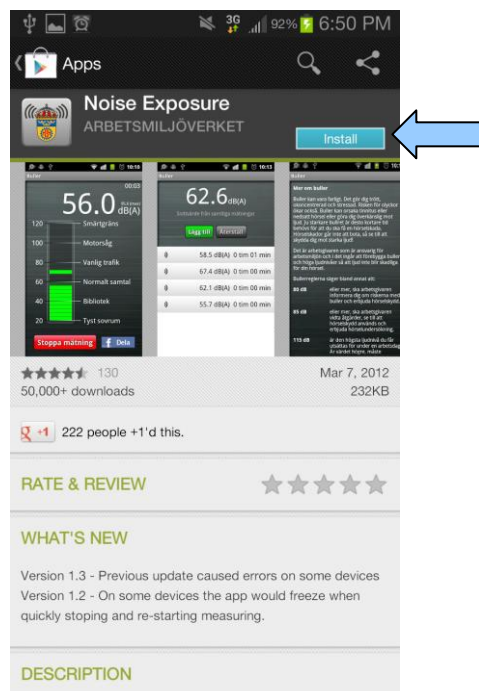


Figure 4. Noise Exposure app page

Step 5: Finally, you will be brought to the app's download page, where you can see the list of permissions the app is allowed access to. Tap the blue "Accept & download" button to continue the app download. After the download is complete, you're done!

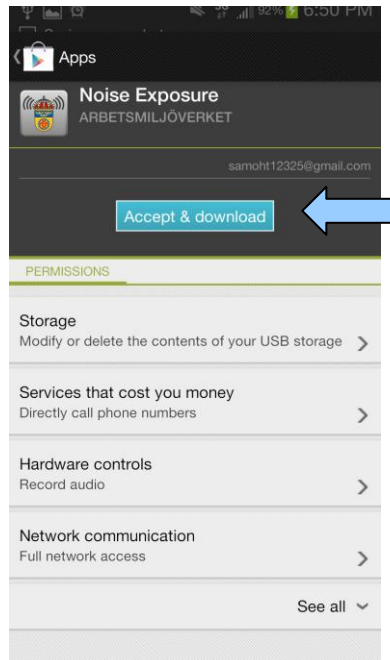


Figure 5.Noise Exposure download page

Preparing to take measurements

Timing: Sound measurements should be taken on a *weekday* at three time windows:

- Within 30 minutes before or after dawn
- Between 10am and 12pm
- Within 30 minutes before or after dusk

Measurements for different time windows can be taken on different weekdays *within the same week*. However, it is recommended that you take all sound measurements on the same weekday.

Frequency: You will take three *consecutive* measurements in each time window for a total of 9 measurements.

Location: You should take measurements at the center of activity with which the noise measurement will be associated. E.g., near the feeder for Project FeederWatch, in the center of your backyard for Backyard Bird Count, at the nest for NestWatch, etc.

Weather: Measurements should NOT be conducted when there is precipitation or excessive wind because it will pick up natural sounds that we do not want to measure.

What is considered excessive wind?

If your surroundings have tree branches that are swaying intensely for periods longer than 1 minute, then there is too much wind.

In-the-Field Instructions

Task 1: Recording

You should record data with a pencil or pen directly on the attached handout, which will later be transferred to the “Loud and Bright” website. The handout is divided into three sections: Dawn Measurements, Daytime Measurements (between 10am and 12pm), and Dusk Measurements.



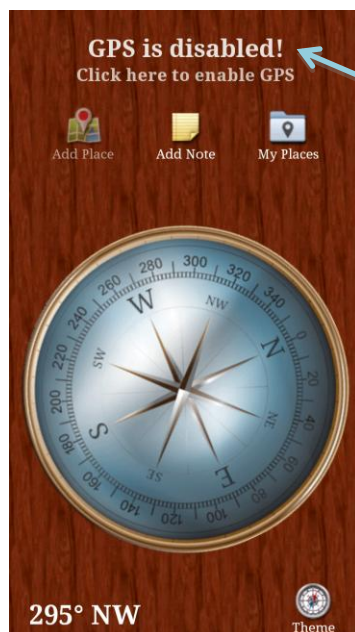
Compass

Figure 6. Compass app icon

Task 2: Specify Location and Surroundings

Locate your Compass app (Figure 6). Open your Compass app and determine your longitude and latitude (located at top of screen). If the app specifies your GPS is off, be sure to turn it on (Figure 7). Record the coordinates with as many decimal places shown by the device on the handout. Also provide a brief description of your surroundings in the section, “Briefly describe your surroundings.” You should specify:

- Whether you are in an urban, rural, or suburban setting
- Type of location (i.e., residential yard, woodland, etc.)
- Vegetation, buildings, or other obstructions
- General surroundings (i.e., near a busy roadway)



If your GPS is **off**, you will not be able to view co-ordinates. If your GPS is **on**, your latitude and longitude co-ordinates will be displayed here.

Figure 7. Compass app home screen

Task 3: Measure Sound

Locate your Noise Exposure app (Figure 8). Be sure you are standing at the center of activity of the area you are measuring. Position your device as follows:

- At breast height
- With the microphone pointing straight up (microphone is usually located at the bottom of the device)
- You must stand STILL in one location
- Do not talk during the measurement



Figure 8.Noise app icon

Note: The following instructions must be followed for every noise measurement.

Step 1: Tap the green “Measure” button when you are ready to begin measuring (Figure 9).

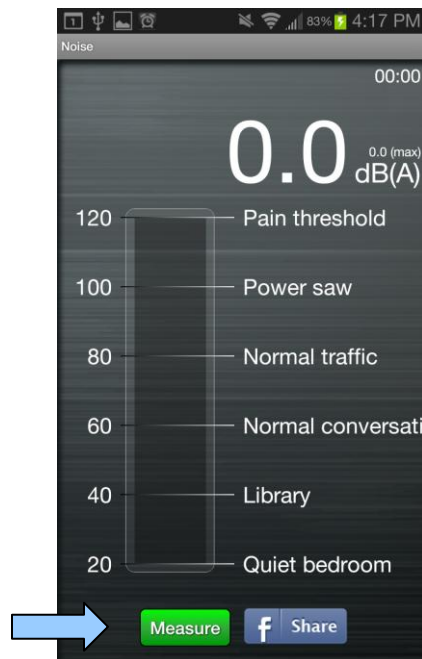


Figure 9.Noise Exposure app home screen

Step 2:Collect measurement for 30 seconds. The duration of your measurements can be seen in the upper right corner of the main screen (Figure 10).

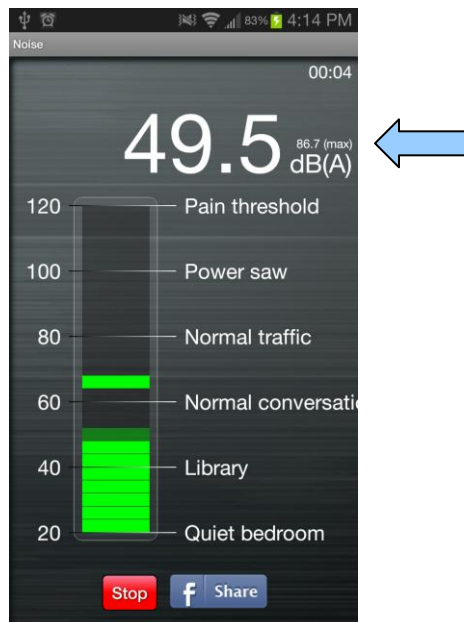


Figure 10.During measurement

Step 3:Tap "Stop" when 30 seconds have elapsed, and record the sound level measurement max and average (Figure 11). This measurement is the automatic calculated average of the sound data collected over the 30 seconds. Record the time as well.

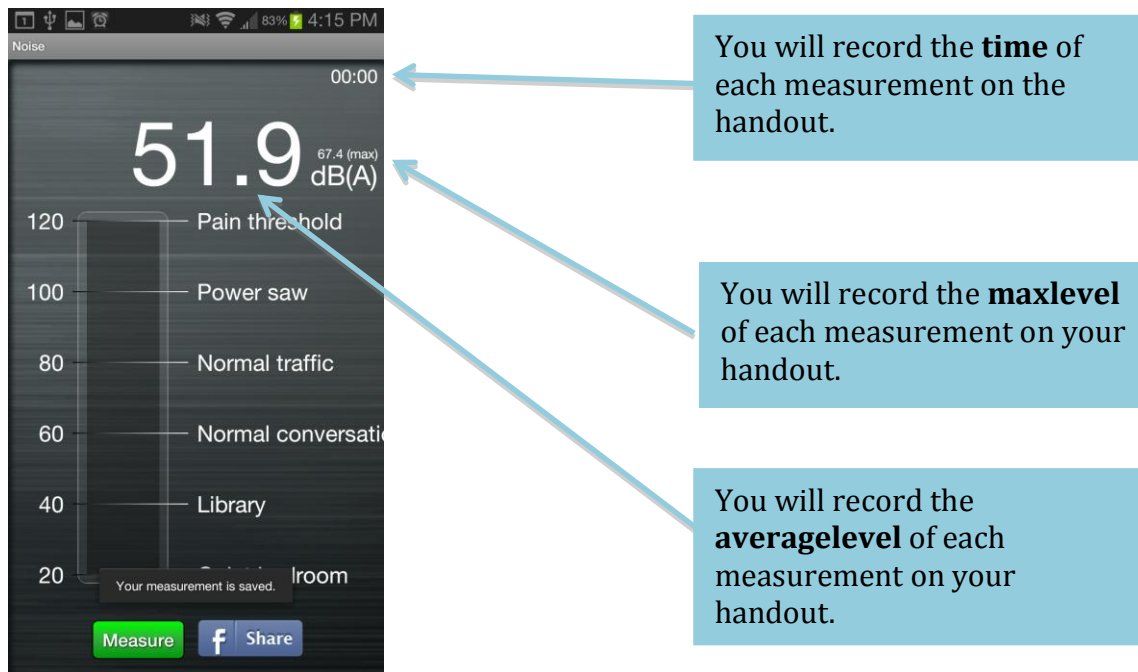


Figure 11.Saved measurement

Task 4: Keep Track of Sound Sources

While you are measuring, you should be aware of intermittent sound (e.g., airplanes, sirens, gusts of wind, etc.), as well as the dominant sound source. Record these observations on the handout in the section, “What is the dominant sound source and what intermittent sounds do you hear?”

Task 5: Repeat

Repeat the above tasks two more times in the same location. You should conduct three *consecutive* measurements at a single time around dawn (30 minutes before or after sunrise), three *consecutive* measurements between 10am and 12pm, and three *consecutive* measurements around dusk (30 minutes before or after sunset).

Task 6: Submit data**Option 1: Loud and Bright Project Website**

- Go to www.LoudandBright.wix.com/LABP
- Click “Submit Data” located at the top right of the screen
- Click “Sound”
- Fill out the form, using your data sheet as reference
- Click “Submit”

Option 2: Send Data Sheet by Mail

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