



## **SYMPHONY OF THE RAINFOREST**

### **Part 3: Community Soundscapes**

**Time:** Multiple class periods based on study design and procedure.

#### **Objectives:**

The student will...

- Design and conduct an investigation of a local “habitat” using an acoustic survey.
- Generate spectrograms in Audacity or other software for analysis.
- Compare and contrast soundscapes.
- Communicate and share data and study results visually using a story map, Google map, or other means.

#### **Materials:**

- Materials may vary based on the project that students choose
- Recording devices or cell phones
- Computers, internet, headphones
- Audacity (free audio software)
- VLC Player or other file conversion software (free)
- Google My Maps Account or Esri Free Education ArcGIS accounts

#### **Suggested Flow:**

1. Students can conduct their own local version of an acoustic survey to map out sounds across the urban areas they inhabit. Possible uses of this information:
  - a. Record sounds of the school environment.
  - b. Compare urban sound spectrograms to tropical rainforest spectrograms.
  - c. Create and view spectrograms of the sounds and try to pinpoint areas of highest “acoustic biodiversity”, or times of day with the richest urban soundscapes, or urban areas that have the most anthrophony, etc.
  - d. Record and map urban sounds and create a catalog of the community.
2. How to do it:

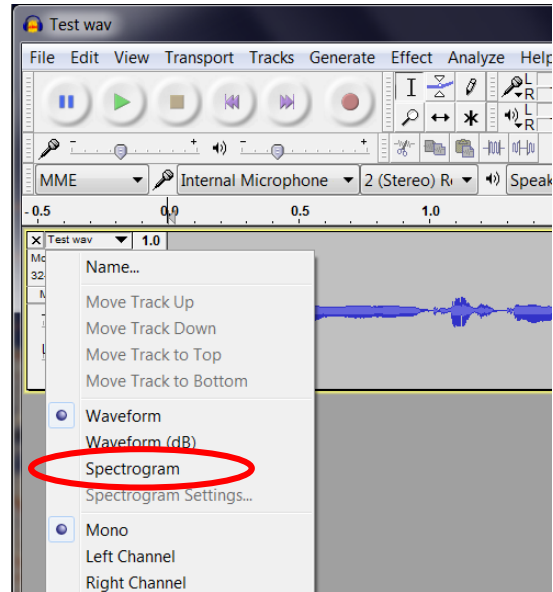
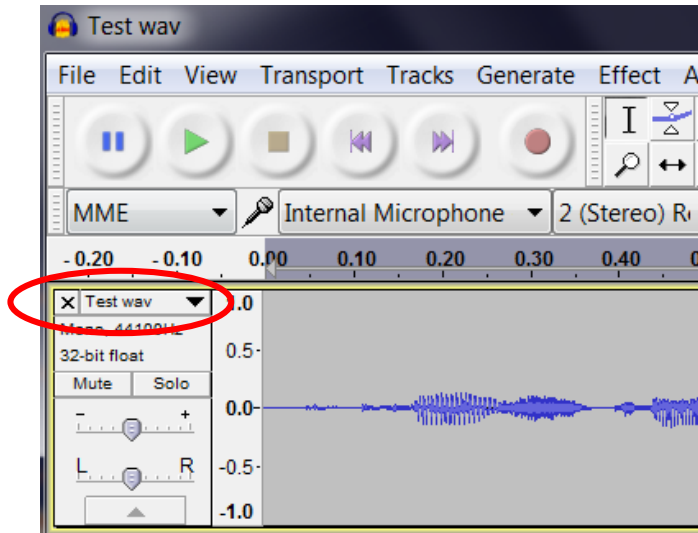
##### To record sounds:

Use a cell phone or other recording device. If using the native voice recording apps on iPhone or Android, students will need to convert the sounds into MP3 or WAV format. This can be done using the free VLC player or other software. A VLC player can be downloaded here: <http://www.videolan.org/vlc/index.html>. Alternatively, there are many free apps that can be downloaded to phones that will record sound and let you specify the file format. For the next step, the audio files will need to be in WAV or MP3 format. Once the sounds are recorded, students can email them to themselves, save in a folder, and open in Audacity.

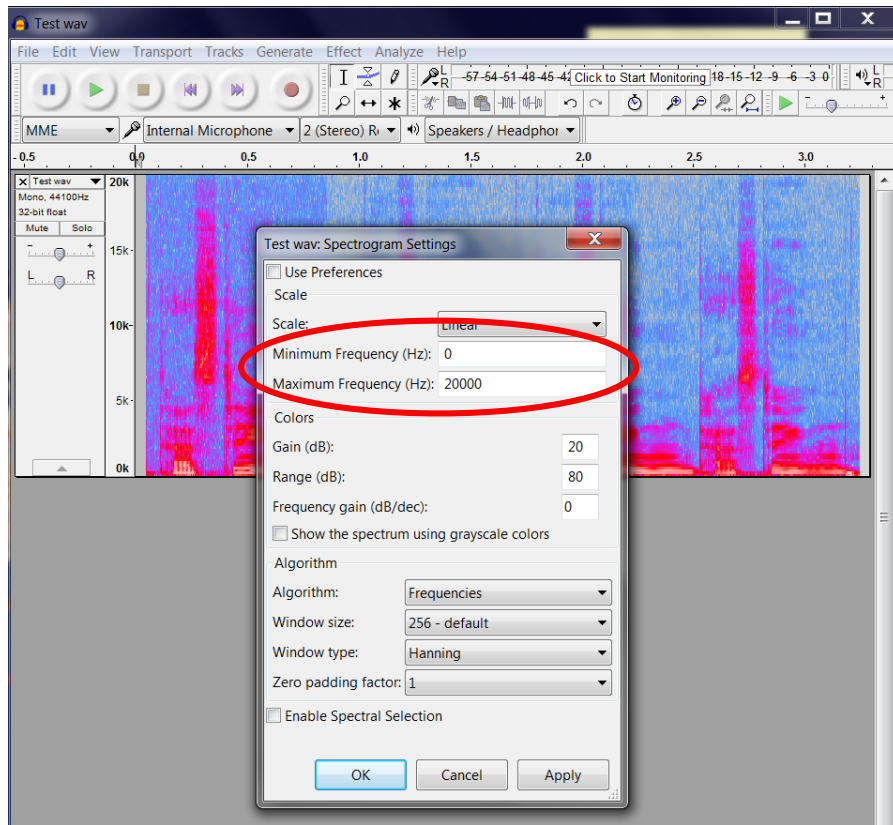
To use Audacity to view spectrograms:

Download Audacity <http://www.audacityteam.org/> (free) if you don't already have it. Go to file>open and choose the appropriate file.

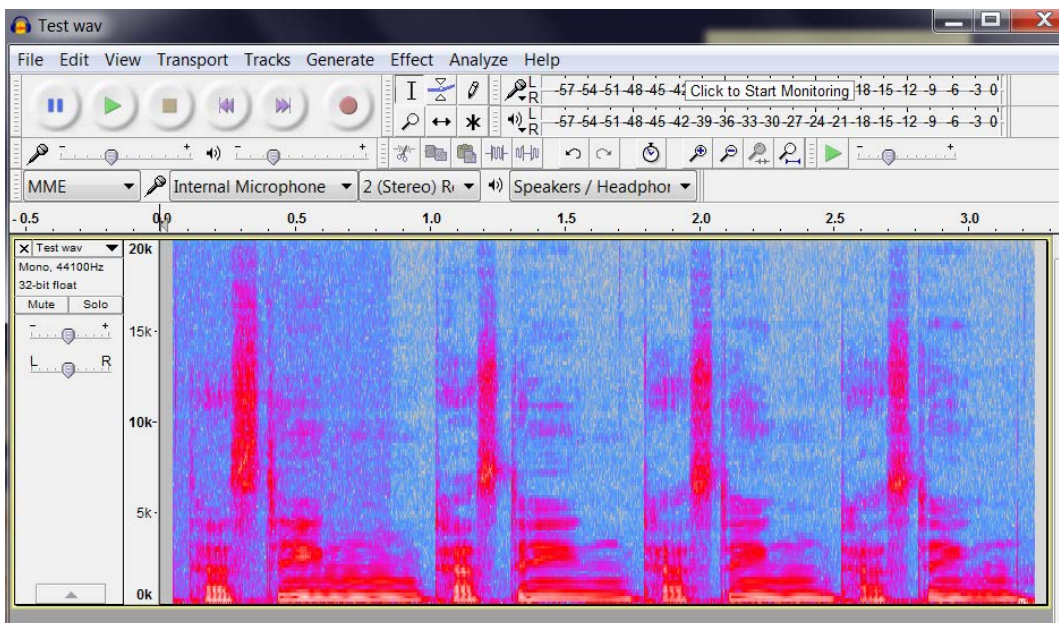
Then click on the dropdown menu for your sound file. In the example below, the sound file is called "Test wav". Then select "Spectrogram".



Once in spectrogram view, you can go back to this same menu and change the frequency range viewable. Since the limit of human hearing is 20,000 Hertz, you may want to adjust the upper limit to 20,000 Hz. You can also adjust the color range or show in grayscale.



The final spectrogram for the “Test wav” can be seen below. Students can take a screenshot (printscreen) of their image, open MS Paint, Photoshop or any other photo editing software and save as a JPEG for later use.



### 3. Considerations:

- Students should record at the same time of day depending on the goal. You may wish have them record at dawn or dusk.
- Consider having students take a photo of the area where they record to document the landscape.
- Students could be assigned to record sounds in various parts of an urban area. Be sure to be specific on what time and where they should record. You could turn this into a GPS activity by having them record their GPS coordinates.

4. There are a variety of ways your students can tell the story of their sounds and display and share their sounds, spectrograms, and photos. If students are going to map and share their sound information publicly on the internet, you should avoid having them map and label their personal residences due to issues of privacy and safety of minors. A few examples of ways to share sounds are included below.

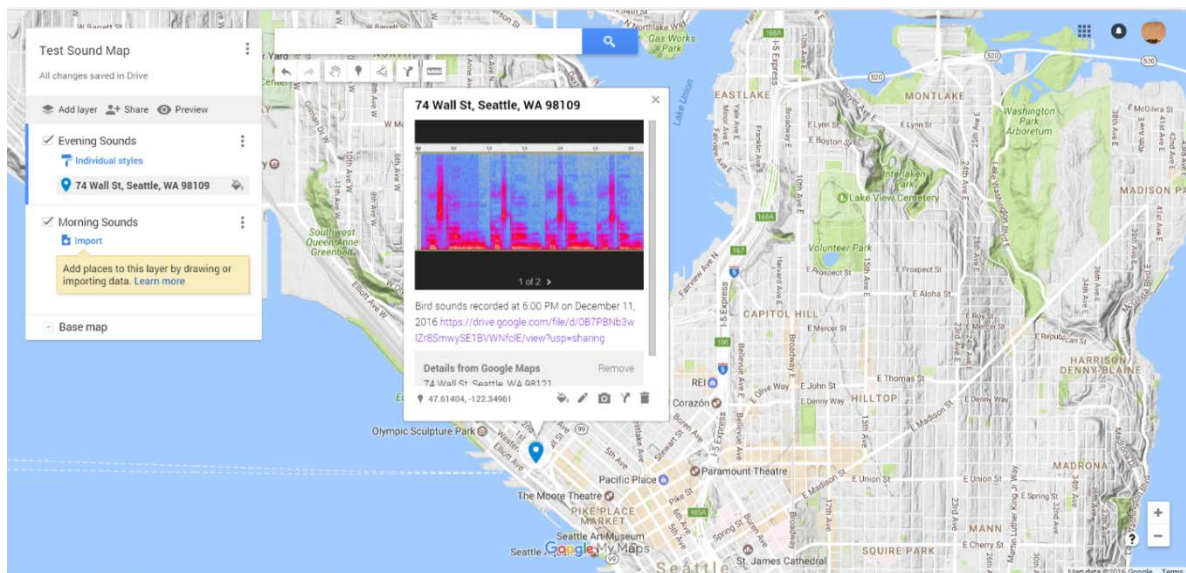
#### Podcasting

Students could create a sound story about their community and turn it into a podcast. For more information on podcasting in the classroom, check out the blogs below:

- Podcasting – Using Podcasts in the Classroom, by EdTechTeacher  
<http://edtechteacher.org/tools/multimedia/podcasting/>
- Podcasts: The Nuts and Bolts of Creating Podcasts, on ReadWriteThink by NCTE  
<http://www.readwritethink.org/classroom-resources/printouts/podcasts-nuts-bolts-creating-30311.html>

#### Google My Maps (<https://www.google.com/maps/about/mymaps/>)

- a. You can create a Google My Map with multiple layers for time of day or type of sound (anthrophony, geophony, biophony).
- b. If you make the map link available (and editable) by your students, they can upload their information on their own.
- c. They can find their location by entering the street address or by locating it on the map. When there, they can drop a pin, give it a title, description, and upload photos. They can upload their sounds to a sound hosting site like SoundCloud and then include the URL. Alternatively, it's easy to upload MP3 files to a Google Drive. You could have a class folder where students drop their sounds and then paste the share link in the description (it will appear as a hyperlink). An example of what this might look like is below.





Esri Story Maps – Crowdsource or Other (<https://storymaps.arcgis.com/en/>)

- a. Esri offers free educator accounts – you can find out more by visiting this site: <http://www.esri.com/industries/education/schools>
- b. There are many forms of Story Maps available, but the Crowdsource Story Map (<https://storymaps.arcgis.com/en/app-list/crowdsource/>) might prove to be a useful template for hosting this type of information.
- c. In the Crowdsource Story Map, you can quickly build the platform that students can go to using a link and click a button to upload information. Once on the Crowdsource Story Map, they find their location and share their spectrogram, photo, description of location to the map. Similar to above, they can host their recorded sounds in Google Drive or a site like SoundCloud. They can past the URL for the sound in to the description text in the Story Map. An example Crowdsource Story Map is below.

