

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

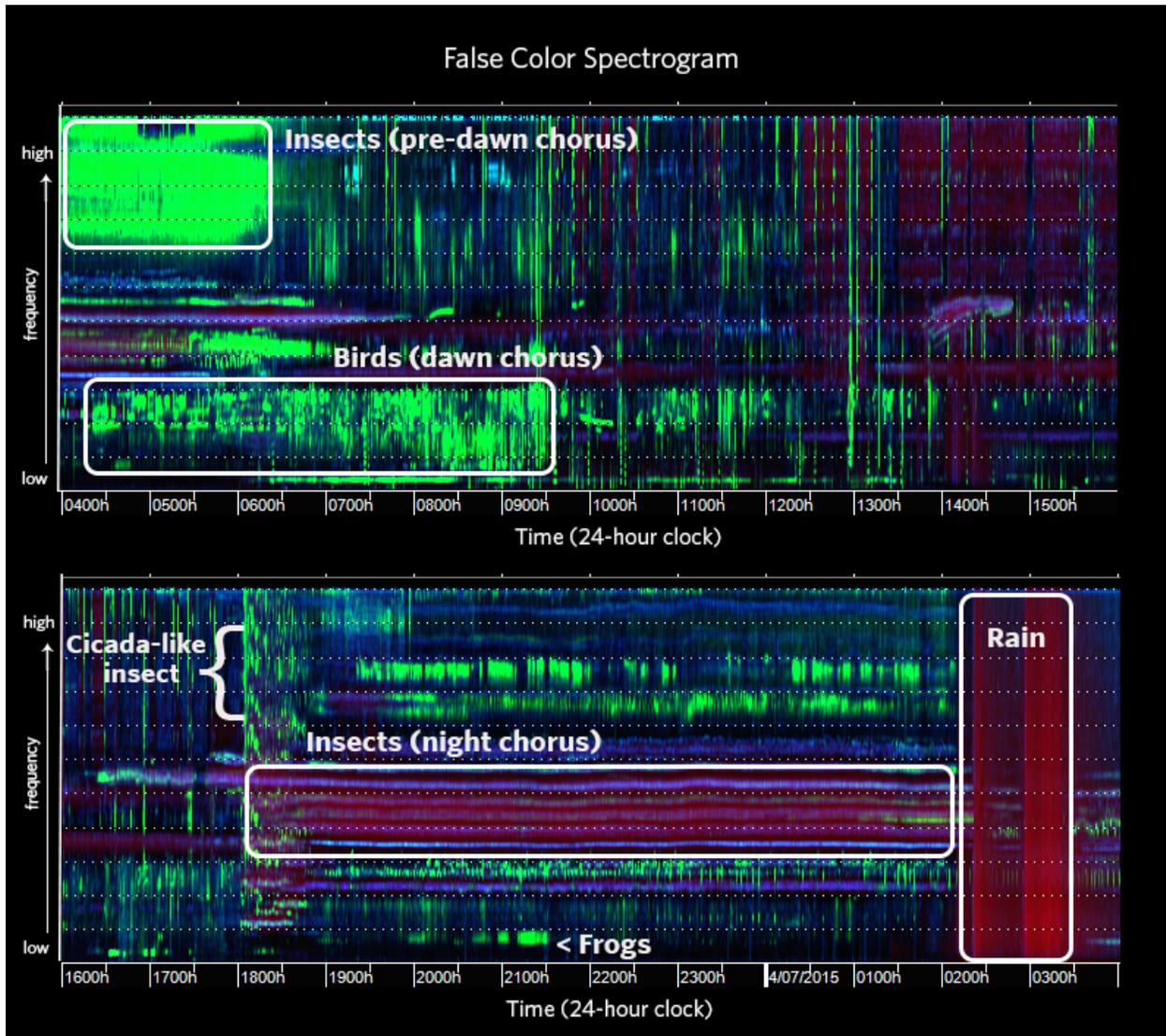
## **Borneo: The Symphony of the Rainforest**

### **Discussion Questions**

1. What is an ecosystem?
2. What is biodiversity and why is it important for an ecosystem?
3. Why are scientists using acoustic surveys to learn about rainforest biodiversity?
4. Why are rainforests in Borneo being cut down?
5. Rainforests are often called the lungs of the planet. How much oxygen do rainforests produce globally?
6. What does audio (or sound) frequency mean?
7. Why do animals communicate at different frequencies?
8. What is a false-color spectrogram?

9. Describe how a healthy forest might sound different than an unhealthy forest.
  
  
  
  
  
  
  
  
  
  
10. How can the acoustic data collected now be useful in the future?
  
  
  
  
  
  
  
  
  
  
11. What percent of their DNA do orangutans share with humans?
  
  
  
  
  
  
  
  
  
  
12. Describe two ways that orangutans help the forest.
  
  
  
  
  
  
  
  
  
  
13. Why is orangutan habitat in Borneo under threat and how can the acoustic survey data support conservation of their habitat?
  
  
  
  
  
  
  
  
  
  
14. Describe at least two things you can do to help protect rainforests and their inhabitants.
  
  
  
  
  
  
  
  
  
  
15. Look at the false color spectrogram provided by your teacher and answer the following questions.  
The time scale is written using 24-hour time instead of 12-hour time (where AM and PM is used).  
This is a more accurate method for scientists since it's harder to confuse the time of day if someone forgets to write AM or PM in their notes. In your answers below, you can write the 24-hour clock time and then convert it to 12-hour time.
  - a. What time of day is the loudest with almost all frequencies (low to high) filled with sound?
  
  
  
  
  
  
  
  
  
  
  - b. What time of day are the birds making the most sound?
  
  
  
  
  
  
  
  
  
  
  - c. When did the rainstorm happen?
  
  
  
  
  
  
  
  
  
  
  - d. What makes the rainstorm sound different from the animal sounds?
  
  
  
  
  
  
  
  
  
  
  - e. Which organisms make sounds for the longest period of time?

- f. What is the quietest time of day?
  
- g. Indicate which animals communicate at the highest and lowest frequencies.
  
- h. The location where this audio recording was taken is near the equator. Because of this, the sun rises and sets close to the same time every day, all year long. On the day this acoustic recording was made, the sun rose around 600h (6:00 AM) and the sun set around 1800h (6:00 PM). Do the increases and decreases in sound correspond with the sunrise and sunset?
  
- i. What factors might contribute to the quiet afternoons on this spectrogram?
  
- j. Name one thing you would like to learn more about with regard to the sounds of the forest or the sound of any landscape?



False-color spectrogram adapted from spectrogram by © Michael Towsey and Anthony Truskinger (Queensland University of Technology) pictured on [The Nature Conservancy's Cool Green Science blog](#).