1. Introduction

* Looking into effects eclipse has on wildlife activity
* Search for interesting patterns in audio activity
* Unique opportunity to work with data from SLU and little research on this topic

1. Audio recorder placement

* 20 audio recorders
* Positioned to discourage Anthropogenic sound
* ArcGIS was used to find forested wetland so both avian and amphibian appear
* Paper used as a reference

1. Data Collection

* Recording between March 30th and April 16th
* Sampled 4 segments of a day (Dawn, Eclipse, Sunset, Night)
* 55 on and 5 off, this was the default programming, produced MANY clips

1. Audio Indices

* Needed to quantify these sounds
* Using SoundEcology package, we had access to 5 common audiological indices
* Explain 2 because we will see visuals with these soon:
  + Bioacoustic: Assess diversity of sound in relation to the lowest sound in file
  + Biophony: Total biological sound within the clip
  + Both high: lots of species making lots of noise
  + High BI and low bio: one loud species, high BI low bio: high quiet diversity

1. Visualize and Youtube

* Clip corresponds to just one portion of dawn
* Graph from April 9th, example of a full day of one index

1. Using R and HPC

* Create function to turn files to clean data frame
* A couple rows from table shows not only indices but date, time, and folder info
* Terabyte of data wouldn’t be possible to process on a desktop
* Used HPC to store and run files incrementally

1. Generalized Additive Modeling

* Chose GAMs due to the curvature and non-linearity.
* Decided on final equation with 3 main parts
  + Hour spline, by day. One line per day across hours
  + Folder spline. Account for variation but don’t estimate directly
  + Linear Day. Baseline adjustment between the days

1. Bioacoustics Model Viz

* **Subset of 5 days** due to weather and migration (not too far away in time)
* **Explain more about the visual**
* Eclipse 2:11 – 4:35; Totality 3:23 – 3:27
* We can see pattern on April 8th around totality time, direct maximum
* Peak begins and ends quickly, around totality

1. Biophony Model Viz

* Example of an index without interesting patterns
* April 8th looks like the rest and no interesting patterns during time of eclipse

1. Findings

* Found 2 other indices had potential patterns: Bioacoustic, Acoustic Evenness, and Acoustic Diversity (YET NEED MORE EXPLORATION TO BE SURE)
* By interesting, we mean increases or decreases during time of eclipse
* Specifically, totality
* Suggests change in light is affecting wildlife, or some other eclipse-driven change

1. Future projects

* Temporal Autocorrelation: incorporate time series approaches
* Account for variation between time segments in model
* Species recognition: what animals are being affected?
* Identify species in the clips
* Due to amount of clips, possible use machine learning methods to classify