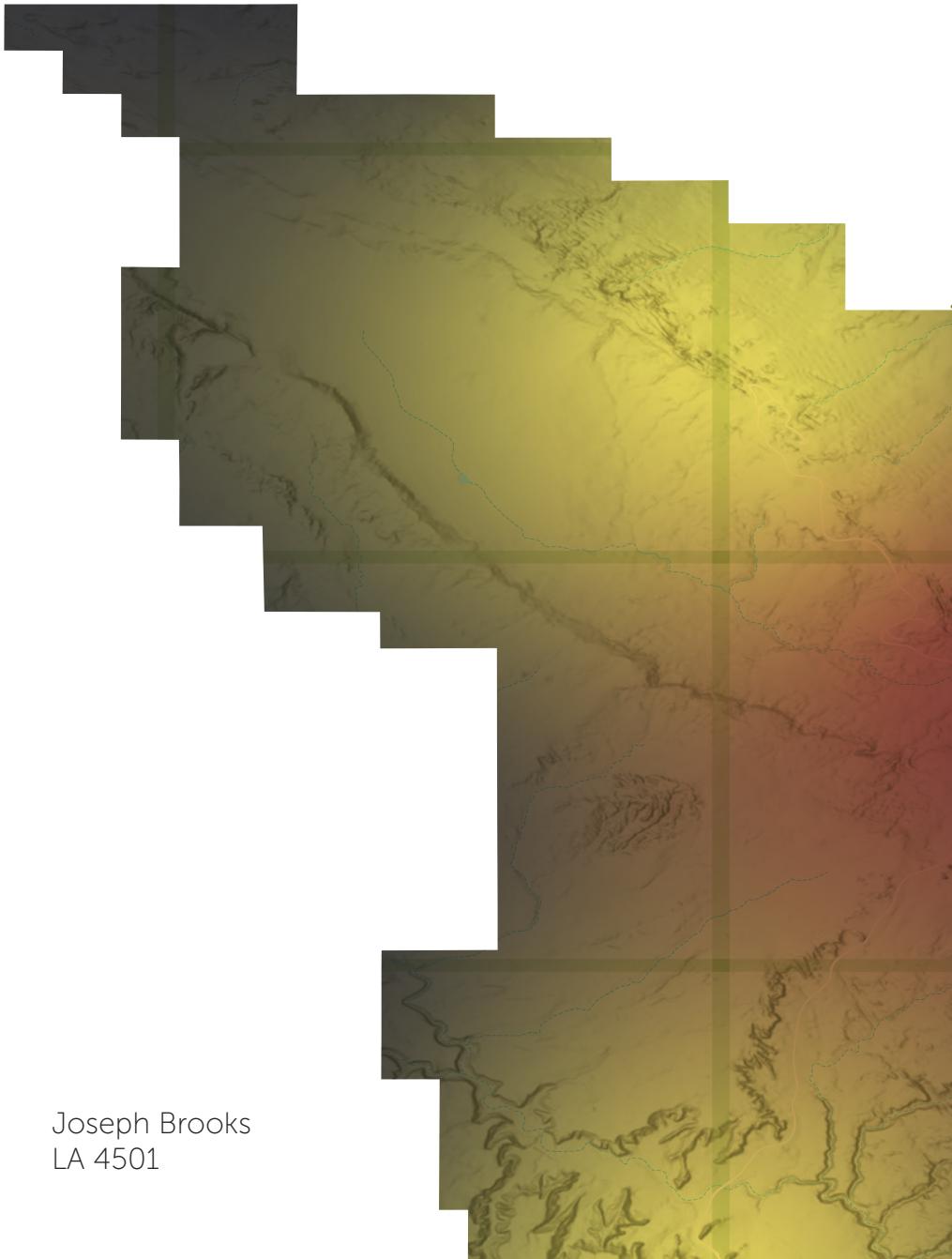


# Program in Utah's National Parks

## A Sonic Analysis



Joseph Brooks  
LA 4501



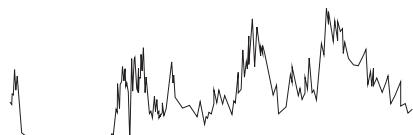
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# Background

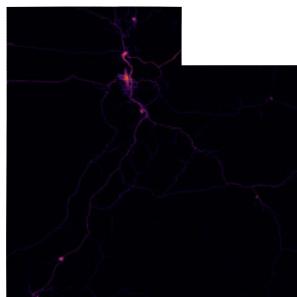
In the spring of 2024, I went to Utah's national parks with faculty and fellow students from the Robert Reich school of Landscape Architecture at Louisiana State University. This trip was organized to expose students studying Louisiana's relatively flat, deltaic geography to an environment that was its polar opposite. As an out-of-state student hailing from the comparatively mountainous state of New York, I was interested to observe and document how my fellow classmates would react to such stark topography. I was also interested in how I would engage with such terrain.

At the same time, I was excited to experience the soundscape of Utah. As an ex-music student and sonic enthusiast, I looked forward to a change from the constant din emitted by LSU's campus. Such a loud but static soundscape made for boring, sometimes ear-splitting listening. By contrast, I imagined that the Utah soundscape would be dynamic, evolving, and rich with the sounds of natural ecosystems that I had never experienced before. These were the thoughts drifting through my head as I flew from New Orleans to Salt Lake City.

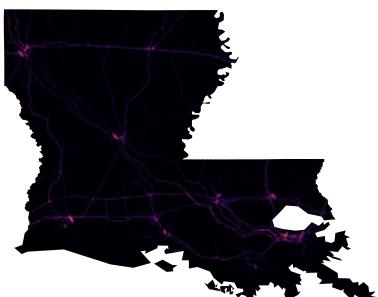


Selected elevation profile, Utah

Selected elevation profile, Louisiana



Transportation noise, Utah



Transportation noise, Louisiana

It didn't take long for me to realize that the soundscapes of Utah's national parks were very different from the soundscapes I had envisioned. First and foremost, I had failed to consider that I would be traveling with a relatively large group, meaning that the endemic soundscape would be mostly drowned out by human interference. Nature is also relatively quiet, even in an unaltered state. Even with the high-sensitivity field recorder I brought with me, it would be difficult to capture the fleeting motions of fauna who have evolved over millennia to move in silence.

Feeling humbled, I reassessed my soundscape documentation mission. I eventually concluded that there was still a dynamic soundscape I could document. The only difference was that it was generated by different animals -- humans. By recording my group, as well as other national park visitors, in conjunction with the landscape around us, I could track how humans were engaging with their surroundings. This would give me enough information to develop a graphical analysis of Utah's hybrid soundscape, allowing me to further investigate the connection between the natural landscape and the program that its inhabitants develop and execute.



2024 RRSLA Utah trip

## Methods

My methodology was split between two phases: recording and processing. In the recording phase, which I conducted in Utah, I focused on collecting as much data as possible. To do this, I made audio recordings using a Tascam DR-07X field recorder. This allowed me to record a wide variety of sounds and (to an extent) the location relative to the recorder at which they originated. I also associated each recording with a geotag and image, which I could later reference to re-immerse myself in the landscape I captured.

As for my recording subjects, I deliberately cast a wide net so that I had a surplus of data that I could cull later. I recorded moments, sounds, and views of interest -- things that I could listen for in the later processing stage. One of the most interesting soundscapes, both natural and anthropogenic, was when it snowed in Bryce Canyon. I was able to capture lots of mud squelches and concerned conversation.



### Portion of recording map

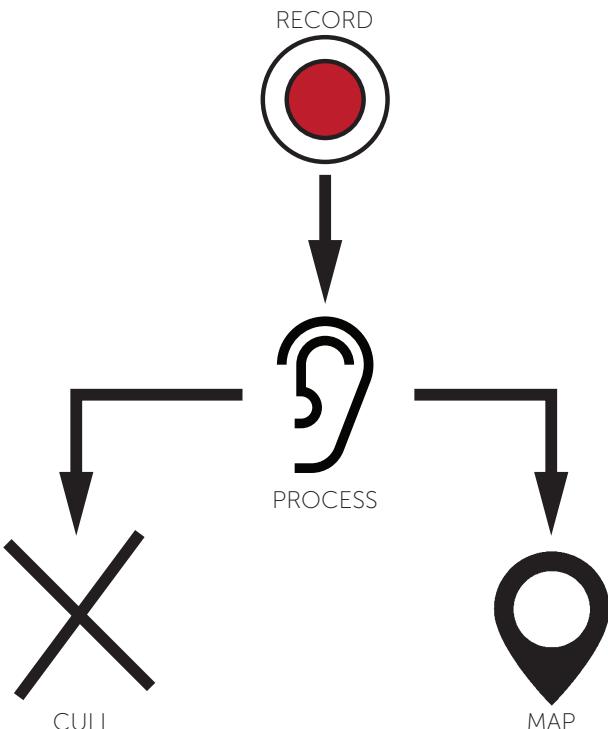


## Typical geotag



## Snow in Bryce Canyon

My processing methodology was heavily focused on distilling information about how Utah's natural landscape was being used by humans in the recordings I captured. This was primarily because I wanted to investigate how recreational activity varied between each of the parks we visited on the trip. Once I listened to every recording, I categorized them based on whatever program was being executed and developed a modular iconography to graphically describe each recording. This iconography, which consists of a symbol for the sound generator, the program occurring, and the environment in which it occurs, allowed me to more succinctly denote each recording once I began to map them.



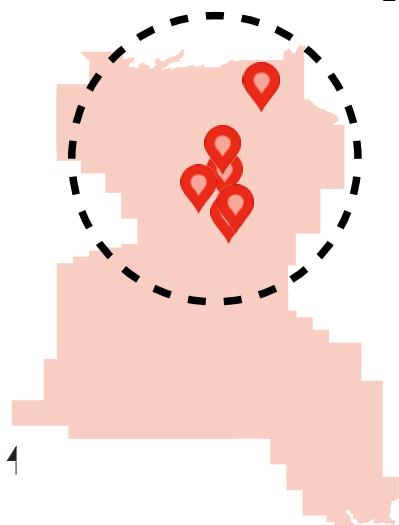
# Products



Recording site map

Although it wasn't on my original list of deliverables, I found it crucial to map our journey as an initial step in my analysis. The map pictured above shows each national park we visited numbered in chronological order. This allowed me to evaluate the spatial and topographic qualities of each park. I was also able to track macroscopic changes in terrain across our journey. I found that Bryce Canyon and Zion national park had much more jagged terrain than Canyonlands and Arches. This led me to hypothesize that Bryce and Zion might host a greater amount of recreational program, as their terrain makes for more interesting hiking.

This map also allowed me to evaluate spatial relationships between my soundscape recordings. I began to realize that although we covered a lot of ground on the trip, my recordings covered a very limited geographic area. I was also able to evaluate density of recordings. I realized that I had much more sonic data on the latter two parks we visited. I attributed this disparity to the amount of time spent at each park, as well as a shift in my recording methodology once I decided to cast a wider net.



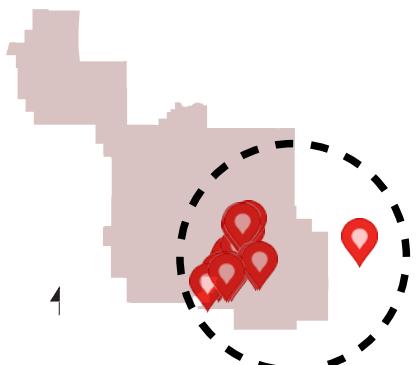
Canyonlands recording locations



Arches recording locations

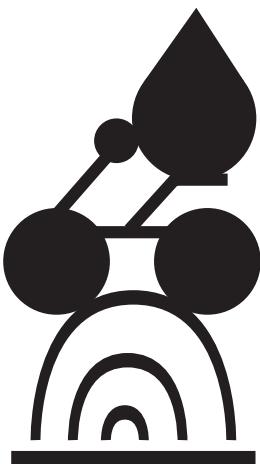


Bryce Canyon  
recording locations

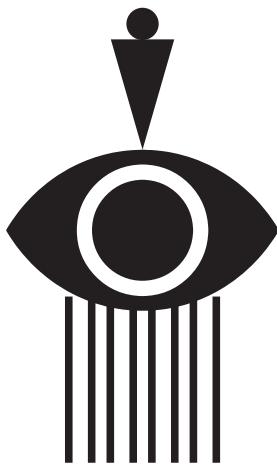


Zion recording locations

## Assembled Icon Samples



Recreational activity  
causing the rustling of  
leaves in an open area.



Humans observing and  
discussing snowfall.

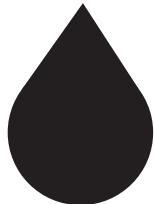


Park visitors clapping in  
a reverberant rock  
formation to test its  
sonic properties.

Icon assembly can be done in a variety of ways. Each compound field recording icon is comprised of the icon modules pictured right. The assembly of the icons, however, is ultimately up to the user. I assembled my compound icons from top to bottom based on which element was most present in each recording. This approach allows the icons to also communicate a hierarchy of presence, denoting how much each factor contributed to a recording.

# Icon Modules

## Generator



Process or entity  
of natural origin



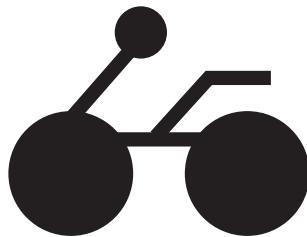
Process or  
entity of human  
origin



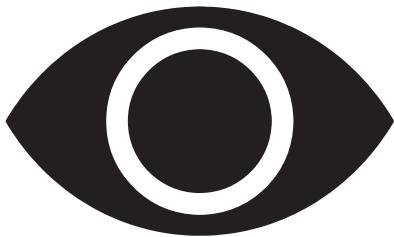
Landscape  
formations or  
processes

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## Program



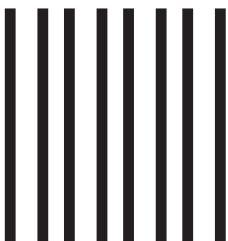
Recreational activity or  
infrastructure



Activity or verbal expression relating  
to landscape observation

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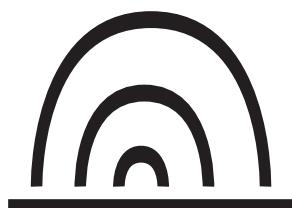
## Environment



Disrupted  
(Windy/Rainy/Snowy)

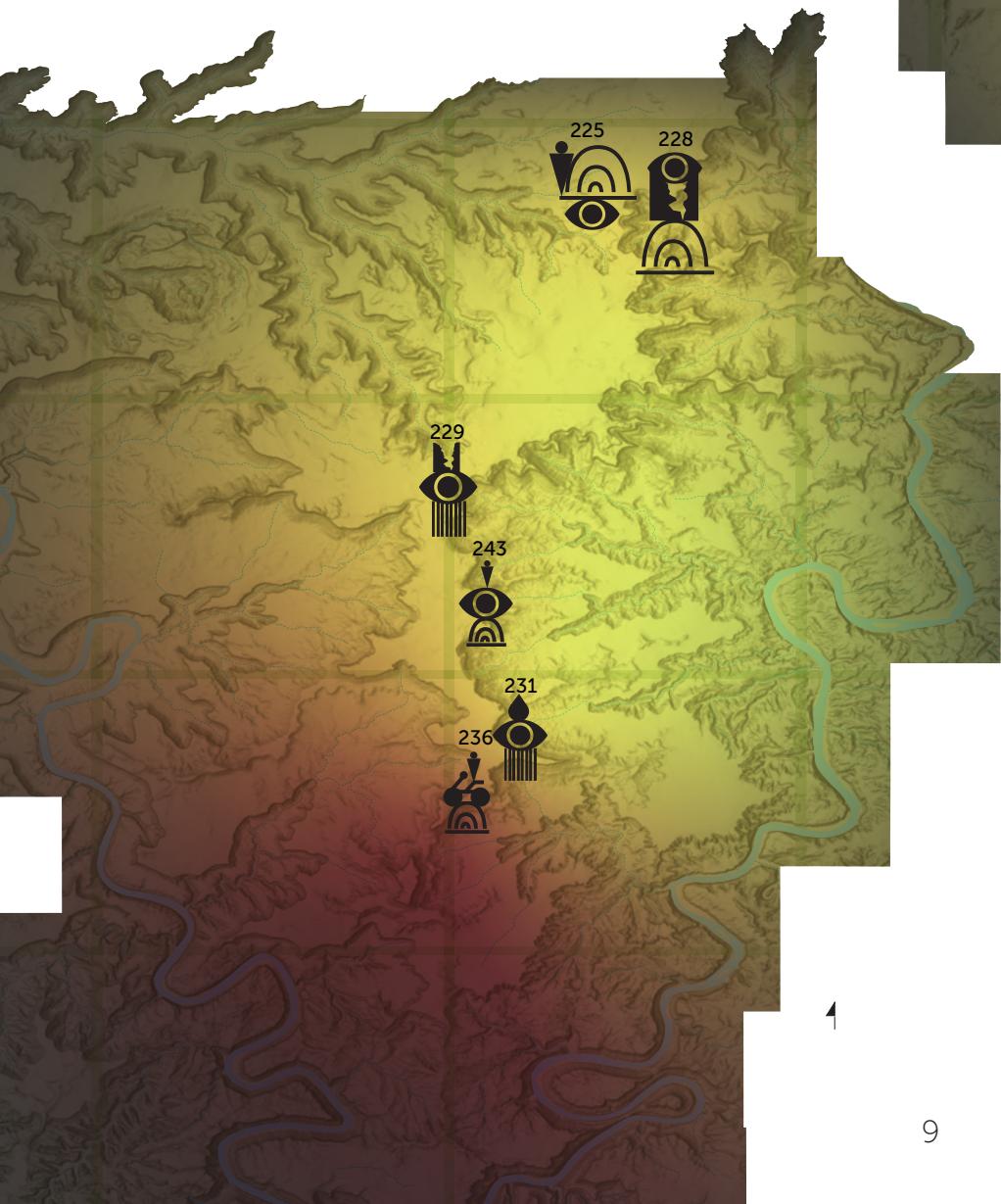
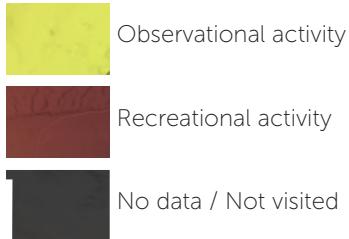


Enclosed

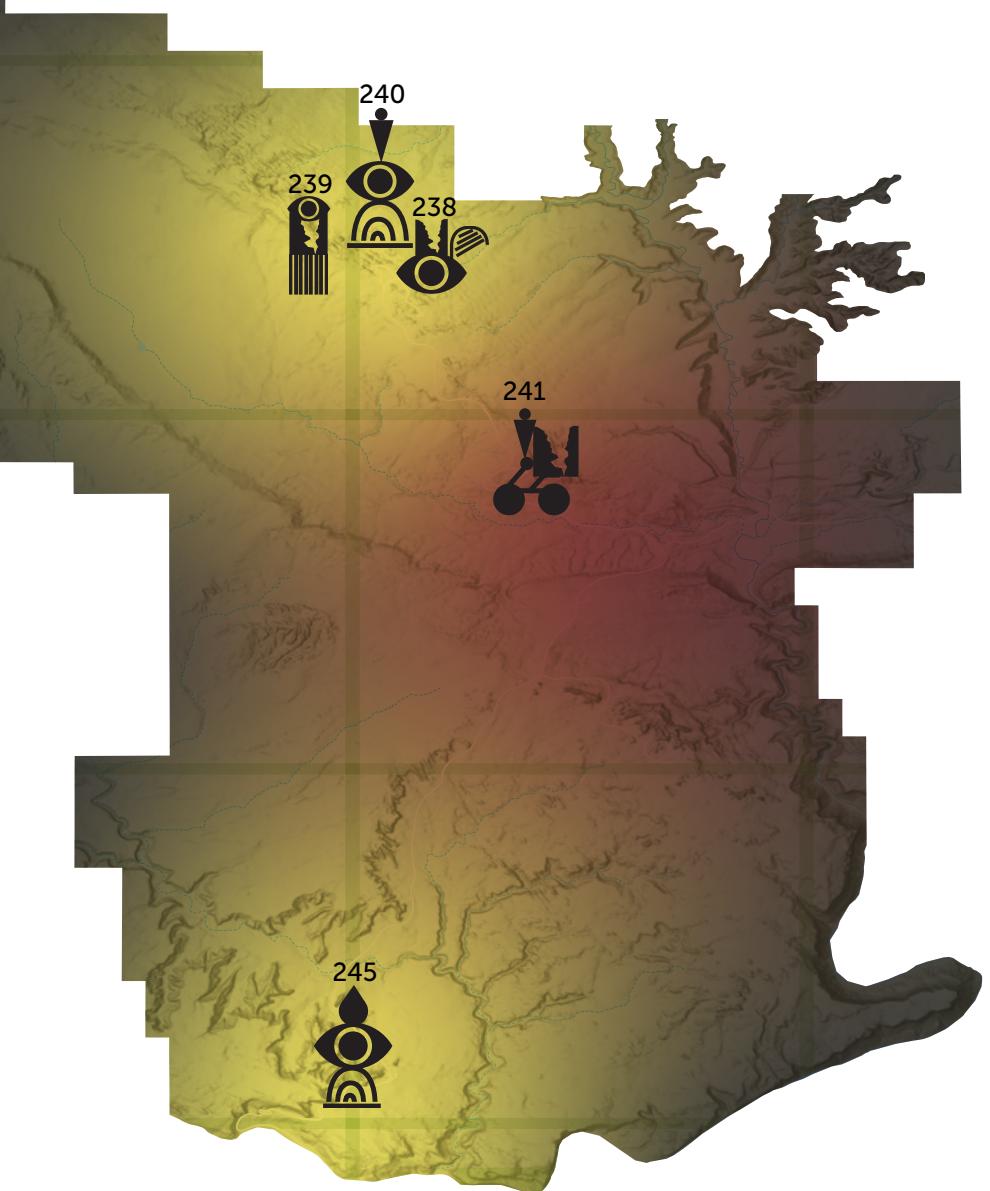


Open

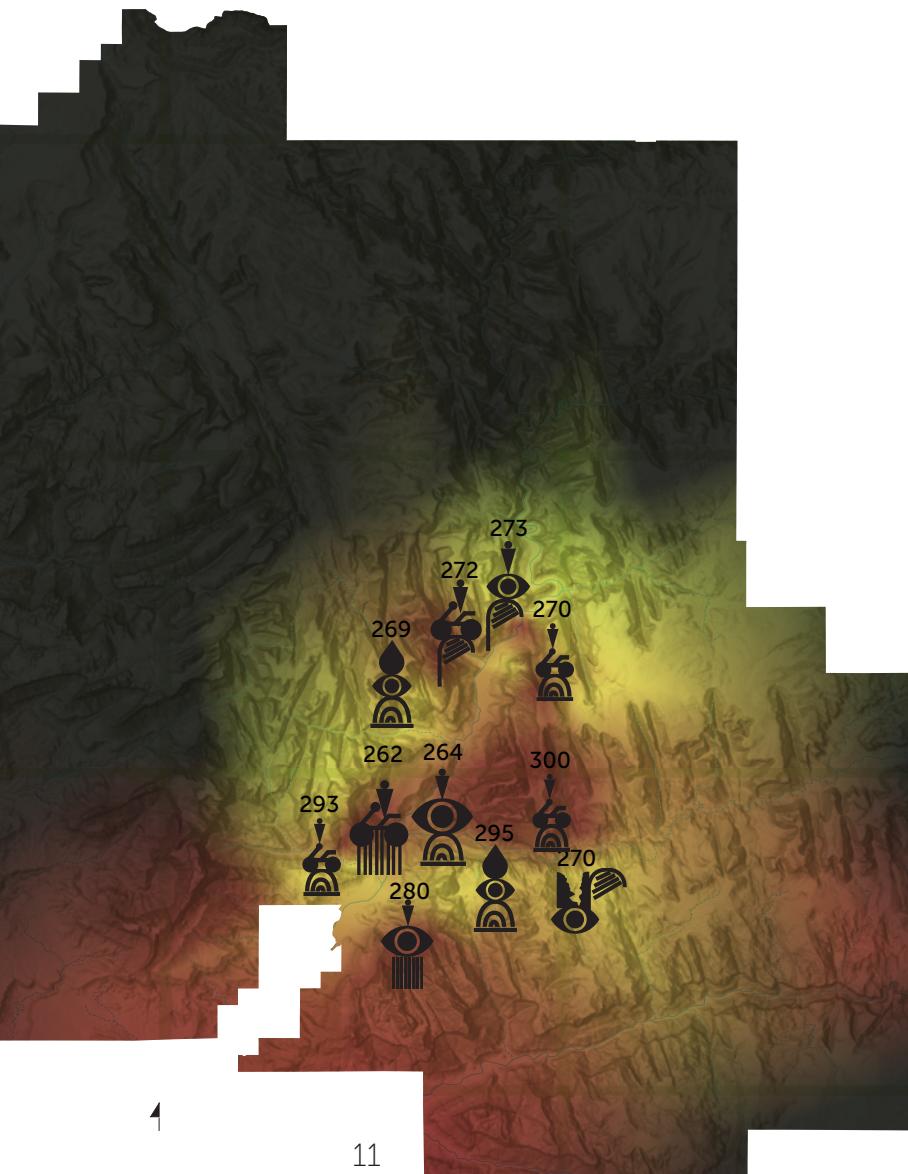
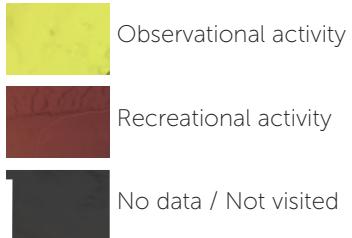
# Canyonlands Sonic Program Map



# Arches Sonic Program Map



# Zion Sonic Program Map



# Bryce Canyon Program Map



## Closing Reflection

This project was an incredible opportunity to tell the story of the Spring 2024 RRSLA Utah trip in a unique way. By evaluating the program occurring in each national park through sound, I was able to make connections that I otherwise wouldn't have made. There is a definite difference in the program occurring in each park we visited, although the general trend is that Zion and Bryce Canyon had a lot more audible recreation going on. This could be due to changes in topography, climate, or more robust infrastructure. Whatever the case, the data collection, processing, and analysis I conducted was exciting and allowed me to further immerse myself in the landscapes we visited.

There were a few things I wish I had done better. For starters, I should've more clearly defined my recording methodology. This could include length limitations, more rigid criteria regarding my recording subjects, or more robust geospatial data collection to supplement my recordings. I also wasn't appropriately equipped to record in such a windy environment. As such, my recordings contain a lot of interference, even rendering a few of them unusable. This could've been avoided if I had brought the appropriate microphone filter along with me.

My final shortcoming was with my iconography itself. I intended for it to be very general so that it was easy to comprehend. In doing so, however, I failed to capture certain programmatic intricacies. In fact, my two categories of program, "recreational" and "observational", often occur simultaneously and in similar locations. An audio recording typically only captures one or the other, but my analysis could be much more detailed if I included other data, especially regarding park facilities and landmarks.

Overall, I am proud of the work I did on this project and look forward to doing more soundscape analysis in the future. Learning to listen to the landscape is changing the way I interact with the world around me, and I appreciate the opportunity to keep exploring my research interest.

# References

GIS Data:

USA Transportation Noise - Road, Rail and Aviation 2020  
USDOT November 2022

NPS\_Boundary  
ESRI

State Boundaries  
ESRI

World Topographic Map  
ESRI

Terrain DEM  
ESRI

## Repositories

All files referenced in this booklet are available at <https://github.com/BrooksStuff/LA2401FinalProject>. Raw recordings, numbered as seen on pages 11 - 14, are available in the "Field Recordings" folder. The last three digits of each file name correspond with its icon number. A KMZ file with recording locations and reference photos is available in the "GIS" folder. Finally, an SVG file with all of my icons can be found in the "Icons" folder. All materials are licensed under the GNU General Public License v3.