

Listening to Abu Dhabi

Capstone Project in Music

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Introduction

Listening to Abu Dhabi is a joint capstone project in Music practice and Music studies. It is a creative sound art project drawing on data-driven and theory-driven research to explore how Abu Dhabi (AD) residents' relationship to the city will change as sea levels and temperatures rise as a result of anthropogenic climate change. It is a technologically mediated soundwalk along the AD Corniche, using the global positioning system (GPS) app Echoes (Kopeček and Fuache) to walk listeners through soundscape compositions that imagine past, present, and future environments. It utilises and explores embodied listening in space as a tool for deepening relationship to place. In doing so it aims to facilitate and foster a personal relationship to the data it presents.

Anthropogenic climate change will most likely bring increasingly intense heat, receding coastlines and extreme weather events to the Arabian Gulf region (Emirates Wildlife Society – World Wildlife Fund (EWS-WWF)) Abu Dhabi

urban planners and architects will doubtless adapt to these changes (Abu Dhabi Urban Planning Council 34; Abu Dhabi Systems and Information Committee (ADSIC)), and residents' lifestyles will shift in response to the new environments. Activists often struggle to get people to recognise that climate change is relevant and urgent to their own lives. In *Listening to Abu Dhabi* I sonify environmental changes through imagined soundscapes, creating an aural-temporal layering of experience in place. Asking participants to walk through space while listening to environmental changes layered on their immediate experience creates that personal connection and sense of urgency. The project asks participants to question how we relate to and understand ourselves in relation to the changing climate of Abu Dhabi.

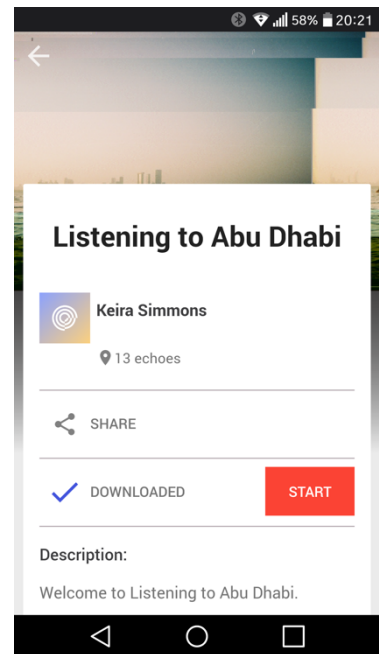


Figure 1. Cover page of the soundwalk.

About the Piece

Listening to Abu Dhabi is 13 sound pieces mapped to specific locations along the Corniche,

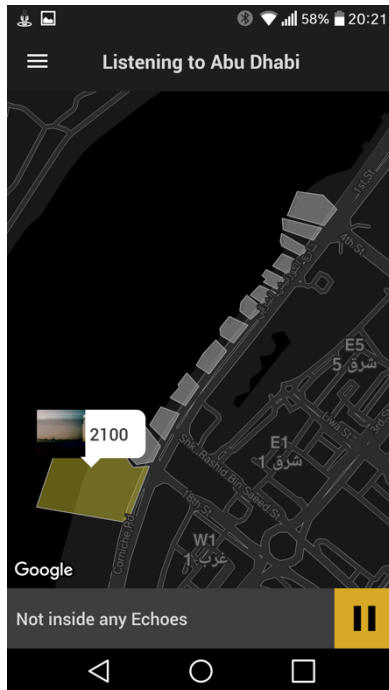


Figure 2. Map view of the walk on Echoes.

hosted on the Echoes smartphone app. The app allows artists to create their own soundwalks, drawing shapes on the map to specify areas in which sound files will play. As participants enter the area delineated by the creator (using GPS to track their position on the map), the sound file assigned to that location will be triggered to play. For this project I created a walk that leads participants along the Corniche walking/cycling path from the intersection with Sultan Bin Zayed the First Street to Rashid Bin Saeed Street. Each piece is a soundscape composition that imagines a specific moment in history, from the Stone Age, to the 20th Century, to the Present Day, and up until the end of the 21st Century. They progress chronologically along the walking path. The pieces

were composed using my own field recordings in the United Arab Emirates (UAE) in combination with sounds from other sound libraries and my own vocal narration.

Experiencing the Walk

Because it exists on the app, which is free to download and use, the walk can be accessed at any time, and it is possible to listen to the sound pieces by selecting the assigned area on the map and manually playing the file. These are not my ideal conditions for experiencing the piece, however. Participants should walk along the path *in situ*, and (provided their smartphone GPS is functioning correctly) walk or otherwise move slowly forward, allowing the sounds



Figure 3. Walking in situ. Photo courtesy of Neyva Hernandez.

to trigger as they enter each mapped area, without needing to open or look at their phone. The piece should be experienced through headphones or earphones, to fully experience the immersive stereo soundscapes and feel that they are fully listening into another environment. I intentionally do not specify that they should be isolating or noise cancelling headphones, because although full isolation allows for hearing compositional details, hearing the ambient outside world filter in and acknowledging its presence also gives a valuable experience.

I recommend beginning the walk around 25 minutes before the sunset Maghrib call to prayer for optimal environmental conditions. I chose this time of day because it creates a



Figure 4. Ideal ending at the beach at sunset.

beautiful temporal interplay between time passing and the sun setting, and the call to prayer sounding towards the end of the walk calls attention to the sounds and embodied experience of the present day. Throughout the walk I repeatedly ask participants to listen and imagine, reminding them

that if there are silences between each new soundscape, they should take that moment to ground themselves in the world around them and remember the present day.

Areas of Inquiry

To structure the relevant academic framework for my project I identify four areas of inquiry: the role of the body and (aural) senses in emplacement, the significance of listening in transformation of the body and relationship between self and place, how enclosure (architectural, spatial and technological) mediates experience of place, and the relationship between environmental soundscapes and emplacement within them.

Embodied Senses of Place

My capstone project is grounded in a phenomenological understanding of the world as being constituted through the senses, a position which comes from anthropology of the senses (Classen; Feld *Senses of Place*; McLuhan). In his introduction to *Empire of the Senses*, David Howes introduces the concept of intersensoriality, the “multi-directional interaction of the senses,” arguing that the senses comprise a cohesive medium through which we engage with and understand the world (Howes 9). My project facilitates an intersensory experience of place by enabling participants to interact with a familiar environment while providing composed auditory input, creating a sensory tension between the world they presently, physically inhabit, and the worlds I ask them to imagine through listening. This sensory tension heightens the phenomenological tension between the past, present and future I evoke through layering recorded and speculative soundscapes from different time periods. Although in many cultures there is a hierarchy of the senses, and in the West the visual sense tends to dominate our media culture, “we relate to and create environments through all of our senses” (Howes 7-8; see also Feld *Senses of Place*). Emplacement is thus an intersensorial process of embodying and making meaning of spaces.

Writing from the perspectives of the anthropology of space and place and theories of embodiment, Setha Low draws together Gibson’s theoretical insights of perception as psychosomatic (Low 104), theories of habitus (repeated bodily movements and social influences as creating the bodily apparatus) (Bourdieu) and Munn’s argument about place (Low 102) in order to develop a notion of ‘embodied space’ (see also: Mauss; Eisenberg “Space”; Kapchan “Body”). Low’s keyword in her writing is ‘space,’ but her discussion of embodiment informs my notion of place; I understand space as primary and place as the meanings we ascribe to space, and therefore understand ‘embodied space’ to be part of emplacement. My project explores how embodied space shapes emplacement in Abu Dhabi by enabling Participants to experience histories and futures of other bodies moving through the space to spark a new awareness of place as existing across time.

The practice of Soundwalking is central to my exploration of emplacement through embodied listening experiences. Hildegard Westerkamp developed the practice in response to R. Murray Schafer's idea of the soundscape (see Schafer) as a method for experientially understanding the soundscape of one's lived environment, and deepening one's aesthetic engagement with place. The idea is to focus on the "varying subjective experiences of places," (Westerkamp "Ecological Practice") and position the self as sound maker in the soundscape as agent. The ideas behind Soundwalking come from a Schaferian approach to Acoustic Ecology, or the relationship between human beings and their environment as mediated through sound (see Schafer; Truax). I am similarly interested in positioning the individual listener as agent in their sound world, drawing attention to personal emplacement within spaces, and individual impact on the earth on an environmental level through imagining future spaces in which they will be a part.

Westerkamp's Soundwalking practice is particularly focused on a mindful awareness of noticing and "[letting] the world in," (Westerkamp "Ecological Practice"), fostering a connection between walker and environment that should not involve the technological mediation of microphones and recording equipment. I use soundwalking as a method for deepening experience of environment and relationship to place. But rather than opening a passive reception of existing soundscapes, I am specifically interested in mediating listening through technology in order to facilitate a multi-layered experience of place. David Abram and Jane Bennett argue that it is through sensuous perception of one's surroundings, and "attunement or synchronisation" between oneself and the world, that we come to understand our bodies as being intersensorially connected, and part of a larger whole (qtd. in Gilmurray 37; see also Bennett). It is through sensory attentiveness to other living beings around us that we breed intersensory understanding of the world as being impacted by our actions and ourselves as being enmeshed within a web of existence.

Transformative Listening

As a piece communicating primarily through sound and with the aim of inspiring emotional or intellectual reflection in participants, *Listening to Abu Dhabi* is grounded in ideas of listening as an active, transformative process. Pauline Oliveros developed Deep Listening as a compositional practice intended to “expand the perception of sounds to include the whole space/time continuum of sound,” (Oliveros xxiii), a practice for knowing and understanding the world through expanded awareness. I utilise her intention to “heighten and expand consciousness of sound” (xxiii) by facilitating an encounter between people and place, using the Deep Listening practice to expand awareness of past, present and future experiences of place. Like Westerkamp, Oliveros sees expanded sensory engagement as deepening connections to “the whole of the environment and beyond,” (xxiii) widening focus from “what seems of value and concern to the listener” to the whole space/time continuum (xxv). I use this intention of Deep Listening to expand Participants’ awareness of place from the tangible present to imagined histories and futures.

My piece is grounded in the idea that listening not only expands a person’s awareness of their environment, but changes their perceptive apparatus on the vibrational level. Deborah Kapchan introduces the idea that deep listening is a form of slow activism, an encounter between bodies that, according to Ranciere, through vibrating together changes their perception of the world, “enveloping the listening subject” in new forms of affective imagination (Kapchan “Listening Acts” 280; see also: Ranciere; Bourdieu; Kapchan “Body”). My hope is not to radically change listeners’ ways of perceiving the world but to ask them to linger in the uncomfortable space of imagining, and therefore witnessing, our global climate crisis, and in doing so subtly shift their relationship to the world around them. Furthermore, Kapchan discusses the “basic paradox of sound - the ability to inhabit space without owning it - to effect transformation,” (“Listening Acts” 285), a paradox that my project and the Echoes app explicitly utilise. By mapping sound pieces onto a smartphone app using GPS coordinates, rather than placing a speaker in the same public area, I digitally

inhabit space without owning it and effect transformation through this ephemeral technology.

The Corniche is a public, urban, city environment, alive with the social pathways and interactions of Abu Dhabi's residents and visitors. In *Acoustic Territories* Brandon Labelle discusses various urban spheres from the perspective of sound culture, exploring how sound functions in the metropolis, in the everyday lives of people who live in it, and thereby how it acts as a "medium for personal and social transformation" (Labelle xx-xxi). His approach to sound as creating a weave between the self and their surroundings, transforming identity formation, informs my understanding of emplacement through listening. He understands sound as "creating connective moments and deepening the sense for both the present and the distant, the real and the mediated," (*Acoustic Territories* xxv) speaking to both Kapchan's notion of listening as bodily encounter and my synthesis of Oliveros' and Westerkamp's ideas of listening as widening phenomenological and affective experiences of place.

Mediated Experiences of Place

Broadly, Labelle argues that our experience of different locations and parts of the urban landscape is mediated by our aural experience of them. Through mapping space with aural soundtracks, I shape and compose participants' aural experience of the Corniche. In his chapter on "The Street", Labelle discusses how people use music, through iPod or car stereo systems (see also Bull), as a way to "manage everyday life through sonic experience[, giving] individual body temporal and material support, figuring as auditory scaffolding that grants structure to location, mood or desire" (Labelle *Acoustic Territories* 131). My project is grounded in this concept of auditory scaffolding as a structural model for mapping sounds to space, manipulating the sensorium by composing a soundtrack on the present to map alternate emplacements on the present and future experiences of people in place. I choose to conceptualise the piece through the term 'auditory scaffolding' because it speaks to placing a temporary structure (the sound piece, imaginations of the past and future) on top

of something more concrete (the bodily experience of the present day), which points to development and change of the same kind in the future.

Sounding Places

This project is geographically and phenomenologically based in Abu Dhabi, and the soundscape of this city thus impacts the sonic emplacements of its residents in the places I am exploring. My focus on emplacement through sound is grounded in an understanding of Steven Feld's concept of acoustemology, of knowing the world through sound, of emplacing oneself through the aural experience of the surrounding environment (Feld "Acoustemology"; see Feld and Brenneis; Feld "Waterfalls of Song"; Eisenberg "Space"). In this project I explore existing acoustemologies and experiences of emplacement in the city through facilitating that process, and adding another layer to them. Thus I create imaginations of how we emplace and do acoustemology in a historical trajectory wherein the soundscape has increasingly changed through mediation and enclosure.

Intentions for the Piece

My project synthesises these scholars and concepts by recontextualising their research and theory in the context of Abu Dhabi, distilling and embodying their work into an experiential art piece that facilitates exploration of their ideas through sound and walking. The purpose of the piece is not to remain entrenched in research and scholarship, however, but to focus on the experience of the participants and their future experiences of these places as a result of their participation. Each of the writers discussed so far is interested in sound, place and knowledge as experienced by people, and through this project I re-embody these academic ideas in the bodies of participants.

In *Listening to Abu Dhabi* I invite participants to listen with an open mind to the soundscapes I give them, and allow the sounds and captions on the pieces to prompt emotions and thoughts as they may. After showing a prototype to attendees of the NYUAD



Figure 5. Presenting prototype at NYUAD Research Conference.

Research Conference, I received consistent feedback that the pieces became increasingly difficult to listen to as the years progressed and the listener's imagination took over. I aim not to blindside participants with pessimistic data that will lead to their disconnecting from the experience, but to instead facilitate this gradual realisation of a probable reality, slowly bringing them to a space of discomfort in which they begin to anticipate the incoming soundscapes.

In doing so I ask and encourage them to linger in the uncomfortable knowledge that although the soundscapes may be speculative, the data I present is not fiction. The future is scary, but it must be acknowledged.

A major challenge that climate activists face is getting members of the public to recognise that climate change will directly affect their own lives, and as a result acknowledge the urgency of the situation. Sound as medium is visceral, embodied, and provides a sensuous experience of the world that affects transformation through directly accessing the emotions and imaginations of listeners. By utilising sound as embodied material and communicating speculative soundscapes *Listening to Abu Dhabi* places participants in the literal, physical, embodied position of a person experiencing the effects of climate change first-hand. Sound art not only enables listeners to become attuned to ecological connectedness through intersensory embodiment, it also enables listeners to become immersed in sonic possible worlds, a term I borrow from Salomé Voegelin (Voegelin qtd. in Gilmurray). To experience a sound work is to imagine what the world could be like, and upon stepping back into the 'real world', be infected with the possibilities that you experienced and embodied through listening (Voegelin 31 qtd. in Gilmurray 39).

I aim to foster an understanding in participants that the spaces they inhabit and experience in their everyday do not merely exist in the moment, but are part of a much bigger historical trajectory. Listening to changing sound while moving in space brings this abstract concept into the body, bridging the gap between abstraction and experience. It emphasises that this place was something different in the past and will inevitably become something different again in the future, a future they have an impact on and responsibility for. In facilitating this understanding of time in space I ask them not only to reshape their relationships to these physical spaces, but their relationships to the future and climate crisis itself. It is easy to feel removed from something we perceive as being far in the future, vague and out of our direct experience. By acknowledging these years as being imminent, urgent, and bringing the sonic experience of shifting environments into the bodies of the participants, I ask participants to reframe their own part and agency within the future.

It is not comfortable or even necessarily productive to think in this lofty reflective mode in our everyday lives. I am not directly asking participants to change their habits or mode of existing in the world on a permanent scale. I am asking them to broaden the scope of their awareness of space and time for the duration of the piece, inviting them to entertain intimidating thoughts about the impact climate change will have on their own lives, for a short period of time. The auditory scaffolding I create for the Corniche will be a further invitation to remember my piece when they return to that space, layering and inflecting their personal future experiences of place with a broader, reflective awareness of one's impact and experience of time/space.

[Related Artworks](#)

My goals and intentions for the piece are not uncommon in acoustic ecology and sound art in general, and by nature of the influences and techniques that inspired its development, *Listening to Abu Dhabi* exists in conversation with existing works that inform the various

elements that comprise it. Artists such as Leah Barclay¹, David Monacchi², David Dunn³, and Steven Feld⁴ utilise field recording and soundscape composition to bring awareness and consciousness to ecological issues, particularly to draw attention to changes in animal habitat and behaviour as a result of human impacts. These kinds of acoustic ecology-based sound art pieces provide the broad foundation of my artistic practice. I have drawn on the work of artists such as Hildegard Westerkamp⁵, Annea Lockwood⁶, Carlos Guedes⁷ and the teams behind the Cities and Memory Project⁸ and the Locus Sonus Soundmap⁹ to formulate my conceptualisation of sound as mapped and conceived of in space.

There are several examples of pieces and artists concerned with concepts that more tightly overlap with my capstone work. Andrea Polli's "Heat and Heartbeat of the City" sonifies climate projection data to track the rising heat NYC's summers in Central Park in an online map interface¹⁰. Polli's interest in placing listeners in an uncomfortable space (Bianchi and Manzo xiii, 5) to feel the increasing heat waves through sound broadly matches parts of my project, but where she is interested in direct data sonification, I use more subjective modes of soundscape composition and physical mapping to create a more personal and emotional embodiment of that same discomfort. In her virtual sonic environment "Sounding Underground"¹¹, Ximena Alarcón explores bodies in space and memory, transposing Oliveros' Deep Listening techniques into the technological realm. She and I ask similar questions about listening as embodied experience in place, but where she explores personal and shared memory in space I explore speculative futures in space. Other soundwalks on

¹ Barclay's immersive sound installation piece "Migration Patterns: From Freshwater to Saltwater" sparked the genesis of my capstone idea.

² See Monnachi's "Fragments of Extinction" project.

³ See Dunn's "The Sound of Light in Trees".

⁴ See Feld's "Rainforest Soundwalks".

⁵ See Westerkamp's "Kits Beach Soundwalk".

⁶ See Lockwood's "A sound map of the Hudson River".

⁷ See Guede's "Sounds of Sir Bani Yas" online sound map project.

⁸ See The Cities and Memory Project's online sound map projects, particularly "Sounding Nature".

⁹ See Locus Sonus' LocusStream open microphones sound map.

¹⁰ See Polli's interactive website.

¹¹ See Alarcón's "Sounding Underground" interactive audiovisual piece at her website.

the Echoes app are similarly engaged with memory in space, tending towards preservation and dissemination of ecological sound recordings or of oral histories and personal memories¹². Rimini Protokoll's Remote X Project (Kaegi), particularly their Remote Abu Dhabi (Remote AD) iteration, explores a science-fiction-style future through the mode of a narrative instructional audio walk, leading participants through urban spaces to explore future technologies and the imminent reality of artificial intelligence in cities. Being a participant in this piece in AD in 2015 deeply influenced my capstone development. Initially I conceived of my piece as being quite similar to Remote AD, but later chose to utilise soundscape composition rather than narration to create an immersive audio experience.

The Corniche

I designed the piece with the Corniche location in mind to enhance and support the immersive listening experience. As a popular family and recreational space it maintains a balance between being quiet, calm, and bustling with movement and activity depending

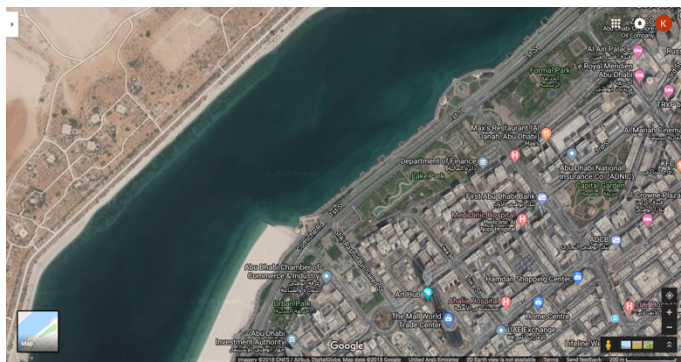


Figure 6. Google Maps location for the Corniche soundwalk.

on time of day and position on the path.

The sonic and sensory contrast between the open water on the right and traffic on the left provides an easy reference point for situating soundscapes in that particular environment through stereo panning.

The Corniche location also gives participants some distance from the downtown city centre, allowing them to reflect on it but also be close enough to listen to it, or imagine being inside it. The Corniche is also a popular space for outdoor activities like running, cycling, and fishing, all of which I argue will be impossible, or at least very uncomfortable, in the future. Seeing people doing these

¹² See other Echoes soundwalks on app, for example “[e]ternal koloma”, “Shoreham Film Heritage Trail”, “Urban Emptiness”, “A Short Tour of Chichester.”

things, enjoying pleasant weather, and generally existing outside while hearing their absence adds to the dramatic effect of listening into the future.

I chose the specific path between Sultan Bin Zayed and Rashid Bin Saeed for a number of reasons. It begins and ends at recognisable landmarks, which make it easy for residents to find and navigate through. Similarly, if driving to the location you must park on the other side of the street and walk through a pedestrian underpass at each end; moving through this physically liminal space marks the beginning and end of the listening experience. Along this area of the Corniche, the GPS areas I marked for

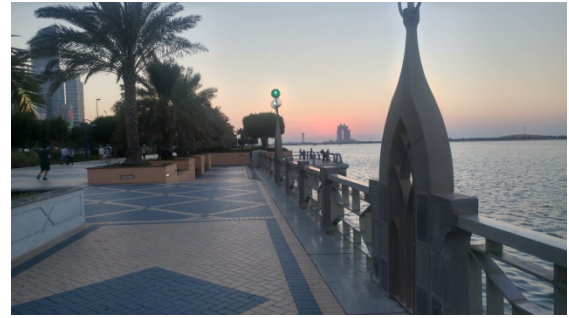


Figure 8. Soundwalk path.

the piece encompass two options for travel, on a straight, raised path, or twisting and turning around corners closer to the water. I prefer to walk on the right, turning corners and changing the direction I face as new the soundscapes change, but if participants prefer to move slowly in one direction the piece will still work. As they reach 2080 the participants



Figure 7. Finishing the soundwalk at water level.

arrive at a semi-enclosed lookout area, which enhances the dramatic effect of hearing an indoor city. The path ends at the beach (with a choice to move onto the sand or stay on the lower level footpath), which is essential to the piece as it brings the participants down onto the water level as it rises around them.

Creating the Piece

The process of developing this capstone project after the initial concept stage comprised



Figure 9. Emplacement in the city.

several phases: emplacement in the city, field recording, factual research, fictional narrative development, and finally sound piece composition. During the summer of 2017, I lived and worked in Abu Dhabi, commuting daily between Al Danah and Saadiyat Island. This period, during which I

experienced the weather gradually changing and the city's subsequent response to the intense heat, was important for my own emplacement in the city, building my personal relationship with spaces and experiences in the city I had not previously fully encountered. Following this I began field recording, first as an explorative exercise to find sonically and spatially interesting locations, and later as a targeted exercise in which I went searching for specific sounds and soundscapes I knew I would need. During this time I was also developing the project through data-driven research.

Field Recording

For my early, more explorative field recording sessions, I used my Zoom H5 recorder with the standard XY attachment, to record a sense of space while keeping the presence of my equipment subtle, so I could become accustomed to the activity of recording in public spaces in AD without feeling too self-conscious. For my more targeted field recording I used a more complex rig depending on what I was looking for and where I was going. To achieve a rich sense of space I used the Soundfield ST450 ambisonic microphone, recorded through the Soundfield pre-amp to a Sound Devices 788T



Figure 10. Zoom H5 with Rhode NTG2.

recorder. Most of the compositions have as their sonic foundation an ambisonic recording from the Corniche, to provide a baseline spatiality between pieces. When looking to record



Figure 11. Recording in the mangroves with the Soundfield.

directional sounds, for example recording a boat offshore, I used a Rhode NTG2 shotgun microphone and my Zoom H5 recorder. On one occasion, when I needed to record ambience of people talking in public, I used the Soundman Binaural microphone in-ear pair, to achieve a strong sense of movement and not disturb the

people around me. For underwater recordings, of the shrimp, fish, and boats passing, I used two Aquarian H2A XLR hydrophones sent to the Zoom H5. I compiled field recordings on a hard drive, organised by location and date of recording. For a project any larger than this one, that method would not have been complex enough, but it worked adequately in the end, as I was able to mentally recall recorded sounds knowing where and on which day I had taken them.

Research Process

To write a narrative of Abu Dhabi's future I first began by researching its past, learning how it was founded and grew into the city we know today. While reading I focused on understanding how city spaces changed and developed over time, how the landscape changed as the city grew, and how natural resources were utilised over time. I imagined the dynamic soundscapes of the city and how I might evoke and embody the experience of being in these spaces. This gave me perspective on how the city developed in response to a changing environment and enabled me to construct a timeline that I would use for my speculations of the future. In this timeline I included significant historical events in the city's development, as well as future dates to which certain numerical data had been mapped in climate change projection, creating 'by-this-year' markers to organise my work.

As I researched climate change in the context of the Gulf I quickly realised and acknowledged the scale of indeterminacy in the numbers I was finding. Due to the nebulous and therefore often contradictory nature of climate predictions, I focused on choosing a few key sources that are accessible by the public. I chose sources that gave me data specific to the UAE/Gulf region, and were simple enough to understand, explain and synthesise into soundscapes. Most of these sources used the Intergovernmental Panel on Climate Change 5th Assessment Report (Pachauri and Myer) as a reference but gave data in the context of the UAE's conditions and actions (see EWS-WWF; Carrington and Shaheen, Luomi, Lokier et al.). It would have been possible for me to delve infinitely deeper into the complexities of climate predictions but the purpose of this research was to use climate data as a factual foundation for imaginative writing. For generating these speculative future snapshots I worked under a business-as-usual RCP 8.5 scenario (Nielson-Gammon) (assuming that globally and locally no significant measures would be taken to mitigate the effects of climate change) and explored the various ways AD would adapt to the changing environmental conditions. While this choice heightens the drama of the soundscape compositions, creating a more emotionally and phenomenologically jarring experience for the participants, I made this choice primarily because that is our current trajectory.

Compositional Process

After developing the timeline of events, I chose significant years on which to focus, and within those periods brainstormed technologies, spaces, and urban environments that I speculated would be employed to mitigate the effects of climate change. From those narratives I designed environmental components for each soundscape, then brainstormed keynotes, soundmarks and signals (Schafer 9-10) for each piece. This led to compiling palettes of field recordings and translating each temporal environment into a short sonic piece, considering each as existing not only in their own time period, but as layered on the

present day soundscape and physical environment of the Corniche. To compose and edit these pieces I used Logic Pro X, because I am most comfortable in that software environment. Although there are other digital audio workstations that are arguably better suited to this kind of audio editing, such as ProTools, I chose to prioritise efficiency and creative fluency over pristine sound quality for the sake of the process. My compositional process was to follow organic emotional and



Figure 12. Composing using Logic Pro X.

narrative arcs, treating my field recording palettes as fabric which I shape, cut, sew, and blend together to create what feels like a singular, cohesive soundscape recording. I wrestled with the question of whether to give important contextual information about the soundscapes in caption form (meaning the soundscapes would not be uninterrupted by my voice) or in narration (thereby allowing participants to walk without reading, keeping all content in the auditory domain), but chose the latter. I kept the text untechnical, so it would be most relatable to an everyday participant, while keeping the style very matter of fact, to the point, and undramatic, to enhance the sense of inevitability.

Working with the App

After editing the pieces I worked with the Echoes app, using their online creator platform.

I began by drawing mostly equidistant polygonal shapes onto the map, beginning closer together near Sultan Bin Zayed and becoming increasingly further apart as the walk progresses to account for longer pieces and progressively faster travel (as participants become more comfortable in the experience). I then

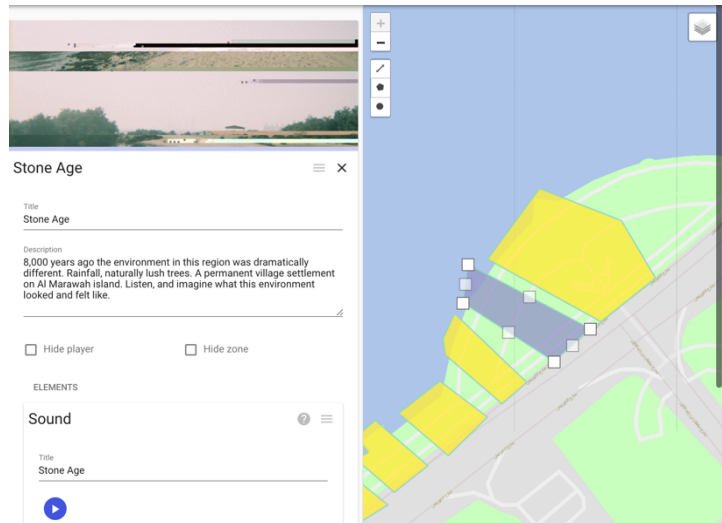


Figure 14. Echoes' online creator platform, drawing polygons.

added sound files, captions (which share the text of the narration) and photos. The images were prints from my and Kuvonn Richardson's (see kuvonn.myportfolio.com) personal photography in the UAE, which I then glitched using Hex Editor. I chose to glitch the photos to speak to the varying degrees of technological intervention I implemented on each present day field recording while composing soundscapes, as well as the technological mediation of the soundwalk existing



Figure 13. Film photo glitched using Hex Editor (photo courtesy of Kuvonn Richardson).

on top of the participants' present day experience of the world. With the app functionally ready to go, I tested the walk alone to clarify and edit any timing issues, then repeating the process with friends to work through any technological glitches in using different phones. Through the capstone showings I encountered various different

smartphone issues in the app, from Bluetooth headphones not working, to GPS failure, to download issues. Over time I developed strategies for mitigating them; meeting

participants early to check app functionality, tethering my data so they could stream the app while walking, and triggering the sound pieces manually for participants whose phones did not do so automatically.

Contribution

The project is a product of imagination and speculation, which utilises research and climate projection data to inform both idea development and narrative content. Drawing on theories from literatures in the areas of sound studies, anthropology of the senses, acoustic ecology, and studies of urban space, I synthesise the project's format through ideas of sound in emplacement, and conceptualise the piece as an audio walk in which participants experience a layering of sensory and narrative content. My science-fiction-esque speculations of the future draw on research into urban design history in AD and climate change projections for the region. Through presenting scientific data in an artistic, experiential mode I aim to use imagination to inspire personal connection to the climate data. The data itself hits home through embodied listening, making future soundscapes feel tangible and real to the participants.

As much as it is in the lineage of these existing pieces, *Listening to Abu Dhabi* sits at a unique intersection of research, speculation, and composition, responding to a history of sound art and acoustic ecology works and adding to a new artistic field. My work is invested in many of the same ideas that Jono Gilmurray articulated as common themes in ecological sound art in his recent paper establishing the field: facilitating personal connection with environmental issues, exploring potential for the harmonious connection between humans, technology and the natural world, making normally inaccessible sounds hearable, and facilitating community engagement with environmental issues (Gilmurray). Although artists have dealt with these themes for decades, his synthesising them into a cohesive, labelled field provides a fertile ground for future projects and ways of conceiving of art and research.

Future Directions

Listening to Abu Dhabi's contribution lies in its synthesis of sound scholarship into an experiential, activist artwork. The piece not only draws on ideas of the body in emplacement, listening as transformative, mediated emplacements, and the relationship between soundscapes and emplacement, but brings these scholarly explorations back into embodied experience through facilitating a mediated encounter between bodies and space. In presenting speculative soundscapes of our changing climate, I use imagination to foster thoughtful interaction with climate data. This speculative aspect makes the piece unusual, perhaps unique, in ecological sound art and activist sound art in general, and provides an exciting framework and direction for future pieces. I plan to reproduce the piece in other coastal cities, especially at home in Australia. I have plans to produce a new piece of activist ecological sound art using the Echoes app: a soundwalk through the national park near my house (which is routinely threatened by bushfires), mapping sounds of fire and interviews with local fire safety officers, to motivate local residents to create a bushfire action plan that could save their houses and lives. Looking further into more complex technologies, *Listening to Abu Dhabi* can be extended to incorporate augmented reality; participants could hear the present day soundscape around them filtered, warped, and layered with other sounds to more fully integrate the past, present and future. The headphone audio walk concept provides an exciting model for future artworks that deal with embodied listening in space, because it allows pieces to inhabit public space with only a participant's own equipment, needing no extra funding or logistical support. This kind of guerrilla platform lends itself well to climate activism and other social movements, as it allows anyone to share their work and experience others'. *Listening to Abu Dhabi* utilises this new medium to explore and push the boundaries of the ecological sound art zeitgeist, asking listeners to not only listen passively but actively engage with the piece in imagining the future and their responsibility towards it.

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Appendix

To hear the full work, either access the soundwalk on the free Echoes app, or listen to the 13 pieces in in playlist form on SoundCloud.

(<https://soundcloud.com/keirasimmons/sets/listening-to-abu-dhabi>).

Text for Narration and Captions

Text in italics denotes instructions, panned to the left. Normal formatting denotes descriptive narration panned to the right.

Introduction

You are about to start an audio walk along the Abu Dhabi Corniche. Sounds will play as you move forward along the path. Please begin at the north eastern end and move with the water on your right, traffic on your left. You will be sonically transported through different time periods and different spaces. There may be silent moments in between each soundscape. Take these as opportunities to re-ground yourself in the world around you. Listen, and imagine.

Stone Age

Please begin moving forward down the Corniche towards Marina Mall, at a comfortable, slow pace. 8,000 years ago the environment in this region was dramatically different. Rainfall, naturally lush trees. A permanent village settlement on Al Marawah island. Listen, and imagine what this environment looked and felt like.

Fast-forward

Let's speed time up a bit, shall we? We have many years to listen through. The rainfall gradually stops. The climate has changed a lot in the last 8,000 years. A soft wind. Sand moves and settles. You feel the dry heat set in. This is the desert you know. And there's the ocean, lapping the shore.

1800's

In turn of the 19th century, the city of Abu Dhabi is founded, a result of the Bedouin community facing environmental hardship and following gazelles to find water.

1939

Let's move out onto the open ocean. Up until the mid 1900's, pearl diving has been the major source of economic prosperity for Abu Dhabians. In 1939, offshore oil drilling begins.

1971

In the 1970's, Sheikh Zayed allows for large scale development, the city rapidly builds upwards and outwards. He sets clear instructions for a green city lined with trees, and public spaces like the Corniche are established.

1990's

In the 1990's the city begins to sound more like the present day, traffic hums and industrial expansion continues. Hear the massive volcano fountain on your left, a sonic and social landmark of the city from this period.

Present Day

When it's safe to do so, please stop and watch the water. We're in the present day. This soundscape is probably very familiar to you. You've heard the environment around you change drastically, from the Stone Age, to early modern settlements, to massive growth in the last half century. But what will the future sound like?

The world is getting warmer. Globally, seas are rising. Anthropogenic climate change is already underway and further change is now inevitable.

The summer heat is intensifying. The worst heat you've felt here will soon be normal life. Humidity will also increase, making heat waves more frequent and more fatal. Seas are rising. Over 85% of the UAE's population lives in areas that will flood. Shortly we will experience severe water stress, and increased aridity and desertification will mean more food scarcity. More imports of more things. More pollution from transport of goods. More emissions. The cycle repeats.

Air pollution from construction and traffic is increasing. Intensifying heat will lead to more air conditioner use, which in turn increases greenhouse gas emissions. At this moment, if every human in the world led the lifestyle of the average UAE resident, we would need 5-7 Earths worth of resources to sustain humanity. How many Earths do we have?

Enduring and flourishing in a tough climate is not new for the UAE. But continuing business as usual, we may not be able to endure what the future brings. Listen, and hear what we're in for. *Please continue moving along the path.*

2025

In the year 2025, urban planners begin to construct elevated buildings, in anticipation of rising water. Air is heavy. Traffic is thick. Fountains on the Corniche are made larger to cool the air and provide sonic relief from the city.

2040

2040. Drinking water is running low. Very low. The fountains have been turned off to conserve resources. The air is heavily polluted, and those who walk outside often wear masks to filter it. Flash storms lead to flash floods in summer.

2060

In 2060 the Corniche is covered by a temporary structure, which filters air and provides some air conditioning in the intensifying heat. There are hardly any people outside. Construction has dramatically increased all over the city in preparation.

2080

In 2080 the Corniche is all but silent. It's far, far too hot to be outside, so let's move across the street, and enter the city. Abu Dhabi is totally indoors, one massive closed city. We're shielded from the outside world, so it's easy to forget it exists. But let's go back out.

2100

We're about to arrive at the beach. If you feel comfortable, please continue onto the sand. If not, stay on the far righthand side of the path. Please stop here and look towards the waves. We moved indoors to protect ourselves from an inescapable truth. But that doesn't stop the sea from rising. It permeates everything, engulfs us. That crackling sound is the snapping shrimp, and the grunting is fish. They have always been here, but now the Corniche is their space, no longer ours. Humans aren't gone. But we have moved, inland and up into the sky, higher and higher, away from the rising tides. Listen. This is our future.