

ARTICLE

The soundscape of Anthropocene: Exploring the instrumentality of collaboration and agency in environmental field recordings

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Recently, much attention has been paid to the many different forms of collaborative or participatory practice both within, and out with the academy; from practice-based research to theoretical contributions and artistic experimentations. In terms of *acoustemology* as described by Steven Feld, the creative processes of collaborative soundscaping practices, developed as *dialogic editing*, produce theories of sound as knowledge production. Within this trend of doing anthropology in sound, sound art works aim to reconnect communities to the environment and indicate the emergence and presence of an ecological and aesthetic co-evolution. Such projects, in fostering interdisciplinary approaches, allow the development of hybrid types of knowledge through dialogic exchanges, and engage multiple agents by developing audile techniques. They also raise interesting questions within collaborative and interdisciplinary creative practice, in relation to the critical examination of the instrumentality of collaboration. By focusing on field recordings and soundscape compositions this paper discusses ecological sound art works that use collaborative creativity, new technologies, and phenomenological listening, to produce dialogic and collaborative forms of epistemic and material equity. These sound art works are the result of complex expressions of creative processes that involve multiple agents, while successfully voice their authorial presence. The interdisciplinary, collaborative and open-ended nature of these projects brings forward the social and political dimension of sound and listening, which could figure in more collaborative forms of knowledge production and inspire climate action.

Keywords: acoustemology, soundscape, acoustic ecology, dialogic editing, ecocritical listening

Introduction

When it comes to Ecology and talking about the human environment, most people's thinking focuses on environmental issues and our relationship with the environment, and nature. In the book, *Steps to an Ecology of the Mind*, Gregory Bateson (1972) sees the world as a homeostatic system containing individuals, societies and ecosystems. Felix Guattari's essay *The Three Ecologies* (2005) has radically expanded our understanding of what ecology, environmental awareness and action is. It looks at the role of humans and of social ecology in the world and identifies three distinct areas in which ecological thinking is applied: the environment, social relationships, and human subjectivity; three interrelated spectra of the human experience. In taking this thinking further, this paper aims to turn our ears to the sounds of nature, as well as the sounds of our society, and discuss sound art works that investigate whether there is another environment of our own thinking, which could figure in more collaborative forms of knowledge production and inspire climate action.

Music is associated with each of these fields to varying degrees. Throughout the history of (western art) music, in times of intense renewal, theorists and composers turn their ears and listen to the sounds of nature and use field

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recordings as compositional and music-making primary material. This dialogue between artists and nature to generate new ideas, new methods, and finally new sounds, has been at the centre of aesthetics and approaches of music ecologies.

Sound as a natural phenomenon and an object itself denotes a return to natural materiality for 20th century western art music revealing a different ontological conception according to Cox (2011). Sound as matter has created new musical 'theories' and a new subtype of episteme which sound artists are utilizing to interrogate the physical dimension of music, of sound, but also beyond that. They are exploring the meaning of words such as (musical) sound, noise, acoustic experience, and perception. This is what Robin James has called the *sonic episteme*, and criticizes for its neoliberal tendency towards probabilistic statistics, in order to build these sonic new theories. She argues that specific fields or practices of the sonic episteme are "misrepresent[ing] sociohistorically specific concepts of sound and vision", declaring the existence of a universal and "natural" character of sound (James 2019, 3). On the other hand, among auditory culture theorists and sonic philosophers, there is a tendency to evade the tradition of speculative realism around sound; moving away from the view of sound as an object in itself they propose a move towards aural specificity arguing for an analytical agency on sound that enables them to engage with issues of locality and specificity (Lima 2018).

Within this trend, the notion of the soundscape and the field of acoustic ecology follow suit with research in the environmental humanities. A soundscape is the human perception of the acoustic environment within it. The term became widely known by Canadian composer R. Murray Schafer (1977). Recent cultural-historic scholarship has viewed the soundscape as the sonic characteristic of an era, society or culture; and for the past fifteen years, sound studies scholars are investigating the part that sound plays in the construction of the reality of the world. Here, soundscape offers the interpretation of a world of things rendered in acoustic forms, by drawing attention to the sensory register. The soundscape, according to Schafer, is a conceptual apparatus which designates an acoustic environment that listeners experience as surrounding them in space: it refers to environmental sound as found in given places and at given times. The term was established in parallel with the development of the World Soundscape Project (WSP) in the early 1970s aiming to raise peoples' consciousness about the effects of sound on the human condition. Researchers and artists at the Simon Fraser University collated and analysed environmental sound through recordings, information databases, community surveys, workshops, artistic and musical works, and research projects. Schafer's definition of the soundscape, although general, has been the most popular since it allows sound studies scholars and sound artists a greater degree of freedom in interpreting the term soundscape in their creative practices.

Studying the soundscape is the subject of acoustic ecology. Acoustic Ecology is the science that helps us understand the mediating sounds between any living organism and environment around it. The concept of the soundscape refers to both the natural acoustic environment, which consists of natural sounds, including the phonetic expression of animals, the expression of collective habitat, the sounds produced by weather and other natural elements, the environmental sounds created by human beings such as music composition, sound design and language, work and sounds of mechanical origin resulting from the use of industrial technology. Importantly, the term soundscape also encompasses the listener's perception of sounds heard as an environment: how that environment is understood by those living within it and thus mediates these relationships. Pauline Oliveros defined the term soundscape as "[a]ll waveforms transmitted faithfully to our brain's auditory cortex and its mechanisms" (2005, 18).

The term soundscape also refers to the sound recordings or rendering of sounds that create the feeling of experiencing a particular acoustic environment, or to the compositions created using the 'original' sounds of an acoustic environment either solely or in combination with musical performances. Acoustic Ecology elevated sound to the foreground of musical praxis, thus expanding its potential for aesthetic value as material for music-making.

At the same time, it registered sound in the realm of the perception of the hearing subject. The result has been a cultivation of a sonic sociology, where music, ecology, and society are merged as a hybrid between research and musical practice. In administering a social, musical, and ontological register for sound art, acoustic ecology increased its capacity for an auditory understanding of subjectivity (LaBelle 2006). Thus, by developing such explicit awareness about the power of sound, it added to experimental music and the emerging field of sound art, the possibility of working directly with the soundscape (LaBelle 2006).

In a time when environmental concern is escalating, ethnomusicology, zoomusicology, ecomusicology, and bioacoustics are contributing to the ongoing conversations around the “web of interactions between biodiversity, climate and human wellbeing” (Watts 2019). Within this trend, there is a particular type of sound art works at the intersections among music, sound, culture, and the environment, that form the genre of ecological sound art (Gilmurray 2018). These works are “listening” to climate change and environmental action and develop audile techniques (Sterne 2003) that reconnect communities to the environment, and indicate the emergence and presence of an ecological and aesthetic co-evolution. Indeed, a variety of music and sound art works have already provided insights into the cultural dimensions of ecological crises across a wide range of settings affirming sound studies’ critical engagement with environmental science, environmental humanities, sound studies and ecomusicology (Allen and Dawe 2016).

Interdisciplinary considerations for music ecologies

How can climate researchers, composers, and sound artists convey the urgency and importance of their message? Some of them have turned to music and sound, ranging from projects in weather and climate data sonification that artistically interpret climate research data, to spectral music compositions that analyse complex sounds as standard materials and procedures for music creation, to the “borrowing” of sound patterns from the animals, to experimental jazz and rock compositions from environmental and ethnographic field recordings.

The relatively recent discipline of zoomusicology, enquires how natural sounds or animal sounds can be artistically interesting; it is the study of animal music, or rather the musical aspects of audio and audio communication produced and taken up by animals. Zoomusicology as a field was inaugurated in the book by French composer François-Bernard Mâche, *Music, Myth and Nature or Arion's Dolphins* (1992). A student of Olivier Messiaen, Mâche ‘borrows’ sound patterns from the natural world (speech, insect sounds, natural phenomena, etc.) that he transforms in musical forms. Mâche suggested that the resemblance between animal signals and human music is more than superficial. Understanding music as a widespread phenomenon in several living species outside of the human, Mâche calls into question the definition of music, and more broadly of culture, as well as the idea that we have of the animal itself (F. B. Mâche 1997). There is of course the question whether sonic utterances are really “music”, in the sense of entertainment, play, aesthetical pleasure, or some kind of “communication” code, posited by evolutionary biologists (Titon 2019). Titon notices how Amerindian and indigenous peoples’ ecological knowledges have entirely different ways in which they approach animals and animal sound communication. Ochoa Gautier also notices how the history of western music is traversed by a zoo-politics of the acoustic that is obsessed with separating the human from the nonhuman (2016, 131). From an ethnomusicological perspective this is not the right question, as it is hard to make “clear-cut distinctions between “music” and “communication” or “language,” even among human cultures. In other words, it is not a question of either/or” (Keller 2012).

One of the first ecological campaigns to become known to many people was Greenpeace's *Save the Whales* (1975-) (Greenpeace 2015). As part of this campaign, many artists were asked to create works that would help raise public awareness around its goals. These included John Cage, Toru Takemitsu, et al. The so-called ‘whale song’ became

especially popular with bio-audiologist Roger Payne's highly acclaimed album, *Songs of the Humpback Whale* in 1970, and has since been one of the most distinctive cultural emblems of environmental awareness (Dell 2010). The sounds themselves are placed in an environment that exemplifies their form and articulates them in successions and sequences that make sense to the human-listener's mind. One of the best-known composers in the field of ecology, Pulitzer Prize-winning author John Luther Adams has been active in the environmental movement and environmental activism since 1975. Central to his work is the natural world and the influence of place that inspired him to develop the concept of audio geography (Adams n.d.). The sound of the Arctic and semi-arctic regions that have been the focus of Adams' creative practice are used to explore the territory of audio geography and the sense of the Arctic as a place and culture. Inspired by the rich urban soundscape of today's western urban life, Irish composer Jennifer Walshe with her two collections of Folksongs travels listeners in an imaginative and humorous way in an ecology we rarely think of as such, the ecology of the urban soundscape (Milker Corporation n.d.).

Various composers and sound artists have turned their attention to interdisciplinary collaborations with scientists to engage with artistic interpretations of climate research data in their works. Turning 130 years of climate data into a cello piece; creating string quartets where the instruments interpret temperature data from the Northern hemisphere; turning 36 years of measurements on Arctic Sea Ice levels into a piano piece; incorporating historic data and models of potential future scenarios to create musical works (Amsen 2019). There is a nuanced distinction between sound art, music, and sonification when turning climate data into sound: Researchers at the Center for Computer Research in Music and Acoustics at Stanford converted temperature and CO₂ data into sound. The process of sonification, the conversion of data to sound, can help environmental researchers identify certain small changes or disruptions in weather or temperature patterns in a way that makes it more obvious than with visual representations. Whether sonifications are employed as data analysis method or as an opportunity for education, listening to climate change data as (musical) sound can convey a sense of dissonance and urgency according to the author of the Forbes article *What Does Climate Change Sound Like As Music?* (Amsen 2019).

What role does *listening* play in conveying this message of urgency, developing environmental understanding, empathy, communication, action and justice? Australian sound artist, composer and researcher, Leah Barclay, who works at the intersection of art, science and technology, explores the creative possibilities afforded by combining acoustic ecology, bioacoustics, and electroacoustic music to research environmental patterns and changes through sound. Biosphere Soundscapes is a project at the forefront of explorations in sound with an ecological focus, a portal and a virtual (mobile, online) platform "built with three fundamental systems in mind: supporting artistic residency programs, scientific labs and international masterclasses" (Barclay 2015). This initiative is aimed at enabling "biosphere-networked performance, live streaming tools, the ability to mix soundscapes in real time, and the ability to compare climates and environmental changes" (Barclay 2015). It features a map of extremely technical, high-quality recordings of natural habitats, including much of Australia's wildlife, an Amazon Rainforest and habitats from Northern indigenous communities in British Columbia, Canada, while promising that the next stage of the initiative will invite members of the public to upload natural sounds. More than anything, initiatives such as this point to a burgeoning soundscape culture evolving around the world in line with technological advancement; focusing both on urban and natural settings.

According to Barclay (2015), environmental field recordings are a "powerful means to stimulate this shift in consciousness" and facilitate a development of environmental understanding, empathy, communication, and action. The Biosphere Soundscapes projects thus depends on interdisciplinary collaborations among sound artists, composers, field recordists, scientists, community leaders and stakeholders to generate content, educational resources, and opportunities for community engagement. By involving sound labs, artist residencies and extensive

community engagement the different projects under the Biosphere Soundscapes umbrella can generate a shared sensory experience of the soundscapes under investigation. Inviting us to listen in with focused attention on what is being heard, it is possible to open up listeners' ears to the state of our environment and its state of impeding global ecological crisis.

The need for interdisciplinary research on soundscapes is simultaneously bringing together artistic, social, and rapidly evolving fields of biology and environmental humanities approaches. The content that is generated by the three key systems - the BioScapes Residencies, the BioScapes Lab, and the BioScapes Community – is embedded in a virtual network of global Biosphere Reserves via google earth technology and shared through the BioScapes community sound map on the projects' website. The process and creative outcomes are delivered by a core team of artists and advisors from all over the world, including Locus Sonus (Aix-Marseille), Cyberforest (Tokyo), Jasper Ridge Biological Preserve (Stanford, CA), Sound + Environment (University of Hull) and Soundcamp (London). Working together with their colleagues at Biosphere Soundscapes (Brisbane), they bring interdisciplinary creative and collaborative work that creates an aural portrait of our planet, acting as “catalysts for a global participatory environmental project accessible to anyone with an internet connection” (Barclay 2015).

The LP “Voices of the Rainforest” (1991) is the product of Steven Feld’s extensive ethnographic fieldwork in Papua New Guinea’s Bosavi rainforest region (Feld n.d.). According to Feld, it is a documentary sound art composition made from field recordings in the rainforest as a way of being present. It features one hour “day-in-the-life” of the rainforest and Bosavi people in sound. Feld walked to record the body’s tracing of space and then he played back his recordings to the Bosavi. This served as the methodological tool for getting feedback and conducting more recordings. For Feld, field recordings are a critical mode of field method and representation. Dialogic editing aims not only to gather data, but also to initiate a conversation about what is going on in the world: relational negotiations are taking place during dialogic editing. What is listened to, how the Bosavi know and question the world by listening to it, how they edit and arrange its meanings as a composition. Through this method, people were engaged in the process; and over a 25-year period, Steven Feld has recorded 1000 different Bosavi songs that function as maps of the rainforest. The LP *Voices of the Rainforest* was the connection between the dialogic field methodology of recording and the playing back of recordings. This experimental practice provided a way of merging methods of dialogic editing with theories of sound as knowledge production.

Feld reworked on the original analogue tape recordings of the Voices of the Rainforest from 1991, for its 25th anniversary in 2016; he digitized them, and recomposed a “60 minute piece in 7.1 cinema surround sound, in collaboration with Skywalker Sound editor Dennis Leonard, [w]ith the support of producer Mickey Hart and the School for Advanced Research” (Feld n.d.). The film was built around the soundtrack, drawing both from Feld’s 1976-1999 photographs, and a return to Bosavi with filmmaker Jeremiah Ra Richards. According to Feld, the editing and approach is cinematic, very much like making a soundtrack to a film, with no images, using music and music history, questioning where the boundaries lie between the musical and the documentary. The result is an experiential, immersive “eco-rockumentary” about “the ecological and aesthetic coevolution of Papua New Guinea’s Bosavi rainforest region and its inhabitants”, a cinematic concert for ears. The project benefits the Bosavi Peoples Fund, advocating for environmental and cultural survival in the most remote part of Papua New Guinea (Feld n.d.).

The development of field recordings and field recording technology has created a musical form that invites a reflective response to place through listening. Place and site have, through modern technology, developed from being a container of music to something that might be articulated through sound. Works of ecological sound art combine a focus on sound with an interest in the environment and the relation between the two, as well as with the individual in the social context. This movement toward soundwalks and soundmaps (also known as field

recording or field phonography; subsequently mixing and broadcasting these sound walks and soundmaps) seems opposed to the original aims of Schafer's acoustic ecology. This practice, employed extensively by Westerkamp and many others, seems to contradict Schafer's emphasis on the soundscape's inextricable connection to place (Westerkamp 2002). Westerkamp argues that listening to a soundscape composition does not disorient the listener, but rather "creates a clearer sense of place and belonging for both composer and listener" (Westerkamp 2002, 52) through the artistic transmission of meanings about place.

Field recording has had a great impact on sound art and plays an important role in engaging with spaces, places, and environments. An increasing number of ecological sound art works are bringing field recordings into public spaces, both urban and rural. Soundwalks and soundmaps employ field recordings and soundscapes as a way of understanding and connecting with a place. A narrative composed by field recordings draws from documentary and ethnographic processes and involves the ways places are inhabited by human and non-human subjects alike; it is a collaborative and interactive method of understanding life. Experimenting with field recordings as representational media, helps one to become aware of environmental sounds and of the listening process. This potential for contributing audio content is a key feature in ecological sound art that involves participants using various platforms available to contribute their sounds. These sounds act as a symbol of presence, of the soundscape, but also of people's connection to the sounds of the particular place.

The collective soundscape

Recently, much attention has been paid to the many different forms of collaborative or participatory practice both within, and out with the academy; from practice-based research to theoretical contributions and artistic experimentations. In terms of acoustemology as described by Steven Feld (2015), the creative processes of collaborative soundscaping practices, developed as *dialogic editing*, produce theories of sound as knowledge production, constructing what is known as anthropology of sound.

The act of field recording is a fundamental process for many composers working in electroacoustic music, but the use and treatment of those recordings can vary to great extents. Sound artists explore the creative use of environmental field recordings to consider the ethical considerations and responsibilities of the composer working with environmental sound material. Field recordings that deal with ecological issues remind us that we must have a relationship with our environment as we are in an inter-actuality with it. Sound, in that sense, is approached and understood as a unifying term. At the same time, field recordings can exist outside of their context and function as texts, but also go beyond that. This produces a sonic methodology of generating knowledge and methods that are disseminating knowledge. Feld's works are embracing phenomenological and ontological relations and go beyond paradigms of musical anthropology. They are making ethnographic field recordings that carry important sonic knowledge accessible. Sound and image come together as interacting epistemologies, ways of knowing with and through the materiality of the senses.

Another important consideration relates to the positionality of the artist/researcher working with sound. By employing the technique of dialogic editing, Feld worked collaboratively with his informants; the question they were asking was how much can you know (us) by listening? Acoustic dimensions of place were brought into memory by engaging in a performative listening; one that combined aesthetics and politics. This kind of collaborative soundscaping practices, developed as a *dialogic editing* of the sonic material (Lane and Carlyle 2013). While participation and interaction prevail as key strategies within non-Western musical practices, for LaBelle (2012) the sound arts fundamentally presuppose such strategies. In other words, participation and interaction are already engraved within the sound arts (LaBelle 2012), supporting associations and relational exchanges between body and

object, self and other, here and there. The experience of sound art requires a type of a de-idealized listening that presupposes the invention of sound; we are invited to listen in, rather than listen to the sounds (Voegelin 2010, xiv).

For the past two decades, collaboration has emerged as a keyword and an important methodological and ethical concern in various scientific disciplines. Collaboration was the theme of The Biennial Meeting of the Society for Cultural Anthropology 2016 conference (Miyazaki, 2016): “From scientific laboratory research collaboration to collaboration among social movements and the sharing (or collaborative) economy, collaboration is a widely observed old and new phenomenon in the world, and recently, much ethnographic attention has been paid to many different forms of collaborative practice” raising interesting questions in relation to the critical examination of the instrumentality of collaboration. Anthropological research has always been collaborative in the sense that anthropologists have never worked alone. However, critiques of ethnographic fieldwork and representational practices have led to the further fundamental reframing of the relationship between researchers and research subjects as a commitment to co-producing anthropological knowledge and theory with research subjects. The reframing has resulted in various experimental engagements with para-ethnography or in ethnographic replications of expert knowledge forms.

By focusing on sound recording technologies and techniques sound artists use collaborative creativity, audio technologies, and phenomenological listening, to produce dialogic and collaborative forms of epistemic and material equity (Feld and Panopoulos 2015). There are various degrees of sonic situatedness that sound artists and theorists encounter in relation to an acute awareness of their role and position, when writing about/composing with sounds with others. Whether these are interdisciplinary collaborations with scientists and/or practitioners from other epistemic fields, or audiences and participants invited to collaborate or participate in the production of the artwork, this calls for a development of experimental sound methodologies.

During the course of my PhD research, I have participated in and organised a variety of collaborative and creative research activities, so as to explore issues of collaboration and co-creation and the emergence of acoustic micro-communities within the transnational and transcultural context of an Institution such as the Edinburgh College of Art (ECA). By inviting people to experience, document, and share their soundscapes within everyday listening practices, I attempted to reveal the manner in which we relate to places through sound and movement, and consequently gain insights to how environmental sound art can make meaningful contributions to the environmental challenges we face, through ethnographically-informed experimental research. Here, key junctures of this journey have marked by been my collaborations with the Akoo-o group and our concurrence in various sound walking/mapping projects¹. Their work is based on research that includes the process of collaboration in their artistic practice. I have been following Akoo-o since 2014, shadowing them in various ventures they took part in, either as commissioned artists, or as a group working with participants in different settings. Another major point in this journey has been my collaboration with master’s students from the Design and Digital Media and Sound Design programmes. I worked together with students in order to co-produce sound art works that deployed digital media technologies.

In terms of methodology, I drew from para-ethnographic experimentation and the concept of the “para-site” or “third space” as has been suggested by George Marcus (2012). In organising these activities, I set out to explore and critically examine the further potential, as well as the limits, of collaboration; mainly, how can we bring the idea of collaboration into a “third space”. What are the stages of collaboration, how is interdisciplinary collaboration

¹ Akoo-o are a group of artists and researchers, based in Athens, that use sound and mobility as vehicles of expression and social inquiry. Departing from different fields, such as visual arts, cultural studies, musicology, and anthropology, they are sharing a common understanding of sound as a cultural material that transgresses the limits of their disciplines.

achieved, and what is the relationship between knowledge generated through collaboration and collective intelligence, experience and creativity? In order to examine mobile sound practices that investigate relationships between people, sounds, and places, my intention has been to explore how locative media and field recordings can be used to reveal the manner in which people relate to places through sound and movement by deploying a methodological triangulation of participant observation, interviews and experimental phenomenology.

The Impossible Inaudible Soundwalk workshop that I organized together with artist group Akoo-o invited participants to question the conceptions of silence and noise, and to discuss the idea of urban voids and emptiness, through collaboration, application of innovative methodologies and the use of locative media. Participants were introduced to field recording techniques, during a field-based expedition of walking and listening and recording, in the form of a listening walk. The stages of the workshop included processing of sonic data in the lab; soundscape composition and sound design; as well as reproduction and sound composition upon the map of the city, to create a geo-located collaborative composition for a specific area. The outcome was a sound walk/map around George Square at the University of Edinburgh, which augmented the sensorial dimensions of the sonic experience of the area for participants and listeners.

The student group project, entitled Data Flâneurs resulted to the audio work *SoundTag*, as part of the Digital Media Studio Project course (DMSP). My role has been to supervise students in their experimentations with computational and multimodal approaches to fieldwork and ethnographic representation (Talianni 2016). As their final project, the group developed *SoundTag*, a prototype web and mobile phone application that simulated the experience of a soundwalk for users. The mobile application, accompanied by two site-specific sound walks, aimed to shift the focus from the visual to the aural, by inviting users to rethink their experience of place through social and playful sonic interactions. This listening experience was two-fold, since users were encouraged to experience the available soundwalks both indoors (i.e. the simulation on the computer/phone screen with the use of the application) and also soundwalk outdoors, in the 'real' space, with their mobile devices. The two sound designers of the group chose two short routes to augment sonically, while the web developers and designers of the group focused on the development of the web and mobile prototype application. Research and decisions were collaborative; based on the knowledge, time and resource restrictions of an educational student project.

Invisible Cities: Mapping the Invisible was another a student group formed by masters' students aiming to understand the relationship between the city as it is usually shown and the invisible elements that fulfil the individual experience. My role has been to supervise students in their explorations of the constantly transforming notion of public space, through immersion in a hybrid environment between material and potential reality. As their final project, the group developed the audiovisual art installation *Exposing the Invisible City: a brain-driven audiovisual walk*. The installation was an attempt to detect the hidden aspects of urban life and to reveal something invisible, in this case, emotions, during a walk, in order to create an artistic representation of the interaction between the body and the urban environment. To explore the relationship between emotions and the city, the group used an EEG - the abbreviation of Electroencephalography - headset to collect affective data from experiment subjects. Students measured the affective response of different experiment subjects while walking in a predefined route in the city centre of Edinburgh. The data was merged and analysed for the visualization and sonification of the walk, resulting in an audiovisual piece that links images and shapes to emotions and that translates the inaudible into the audible, in order to reinterpret the route.

The experimental practices I have discussed above draw on George Marcus' concept of para-ethnography (Holmes and Marcus 2008; Marcus 2010; 2012; 2013) which was developed to capture the reflexive and intellectual practices in contemporary fieldwork contexts. Marcus argues about "the appeal of alternative forms of articulating thinking, ideas, and concepts inside or alongside the challenge of situating and managing the fieldwork process— in "third

spaces,” archives, studios, labs, “para-sites” and the like” (Marcus 2012, 430). These third spaces are hybrids between the research report and the ethnographic research itself, an overlapping academic fieldwork space outside conventional notions of the field and fieldwork in contemporary ethnographic projects.

My collaborators, through creativity and collaboration were transformed into an artistic acoustic (micro)-community. Guided by insights from multi-sited, global and online ethnographic approaches, my fieldwork programme included both on- and offline interviews with members of the acoustic micro-communities under examination, as well as participant observation with all communities, extensive discussions that had the form of semi-structured interviews, (both walking and sedentary), and listening and walking sessions, accompanied by field recordings. My enquiry into the emergence and shaping of acoustic communities through collaborative and creative practices was ethnographic and as such it was “one mode of representation” among many (Bruner 1986 cited in Travlou 2014, 247). It has been an on-going process, since I was a part of these communities, and should be seen as such.

Using participant observation and interviews, I investigated the experiences of members of these acoustic communities and how they reflected on their experiences of place. This method took me into “unexpected trajectories in tracing a cultural formation across and within multiple sites of activity” (Marcus 1995, 96). The actual interviews, discussions, practice-based research and collaboration with my informants, sometimes led to somewhat different paths than were initially foreseen, but such unexpected ideas, feelings, and opinions expressed, all contributed substantially more to my research questions than I had initially expected. In the case of this research project, my ‘third space fieldwork’ have been the workshops I organized with students, either individually or as part of a course that I was tutoring, and my collaboration with Akoo-o. This methodological convergence found a fertile ground in the third space collaborations, focusing around public engagement and participatory research. Approaching the fieldwork as an artistic practice and as an effective method forgetting to know a region and its local people way of life, I set out to investigate the possibilities of sound art in public spaces. The anticipated outcome was to construct a creative research process where soundwalks and soundmaps are used to create collaborative sonic improvisations, in relation to a broader discourse on art, society, and the environment.

Participatory, shared, reflexive, collaborative and experimental practices, such as the paradigms discussed above, developed through techniques of dialogic editing in text, sound, and image and through interdisciplinary collaborations. Such projects, in fostering interdisciplinary approaches, allow the development of hybrid types of knowledge through dialogic exchanges, and engage multiple agents (Latour 2005)². Hence, Informed by actor-network theory and the theme of agential multiplicity devised by Bruno Latour, the interdisciplinary nature of those projects affords a cognition that is distributed, social, and “out there” in the environment (Coyne 2010, 130). They also raise interesting questions within collaborative and interdisciplinary creative practice, in relation to the critical examination of the instrumentality of collaboration. These sound art works are the result of complex expressions of creative processes that involve multiple agents, while bringing empirical knowledge and reconstructive social criticism about the relationships between nature and culture and music in ways that respond to contemporary ecological crises. The interdisciplinary, collaborative and open-ended nature of these projects brings forward the social and political dimension of sound and listening that could figure in more collaborative forms of knowledge production and inspire climate action.

Interdisciplinary collaborations can play a critical role in climate change mitigation and adaptation, while participatory acoustic ecology projects that value artistic, aesthetic and scientific perspectives are facilitating

² Actor-Network Theory (ANT) assumes that “life is shared with others--in--relation, with numerous sources of action” (Feld 2015, 15), or “actants” according to Bruno Latour’s terminology (2005). According to this theoretical model, “actors plus relationships shape networks both within and across species or materialities” (Feld 2015, 13).

connections between art, science and technology to mobilise local and global communities to listen, connect and collaborate. Participatory interdisciplinary projects working directly with local communities can inspire communities across the world to listen to the environment. That stretches outside the ecological listening, it's about be listening to you, and we both, us together, make sounds in the invisible space between us. This also extends to inanimate objects and our relationship with them and the space between them, the in-betweenness. Ecological sound art can play a pivotal role in this process, bringing to the fore the possibilities that frame it as a socially engaged, inclusive, accessible, interdisciplinary field that can contribute towards shifting the climate narrative to one of hope, engagement and ultimately action.

Ecocritical listening: Listening to the soundscape of Anthropocene

According to Westerkamp, the essence of soundscape composition's long history not only as a compositional genre but also as an educational tool, "is the artistic, sonic transmission of meanings about place, time, environment and listening perception" (Westerkamp 2002, 52). For Westerkamp, the immersive nature of a soundscape composition enhances a listener's understanding of place (Polli 2012): "On a more activist/ political level one could perhaps say that soundscape composition can and should create a strong oppositional place of *conscious* listening [...] Rather than lulling us into false comfort, it can make use of the schizophonic medium to awaken our curiosity and to create a desire for deeper knowledge and information about our own as well as other places and cultures. It is a forum for us as composers to 'speak back' to problematic 'voices' in the soundscape, to deepen our relationship to positive forces in our surroundings or to comment on many other aspects of a society" (Westerkamp 2002, 52).

Ecological sound art and soundscape compositions have added a layer of openness to the ways we perceive our environment and our expanded role as listeners and creative collaborators to encountered meaning. As Westerkamp puts it: "How can the soundscape composer raise listening awareness in an already overloaded sound world with yet another sound piece?" (2002, 52). Based on the works discussed previously in this paper we can identify different approaches that composers and sound artists take, when it comes to raise environmental awareness to their listeners or participants. Some are developing compositions or data sonifications to create an emotional connection to the data and emphasize its role and aid in the understanding of that information. Others invite audiences to interact with the sound material, either by facilitating collaborative field recording, sound exploration and soundscape creation or by inviting participants to engage in all stages of the creative process. In this manner, listeners are engaging with their aural environments, they explore, discover and share the sounds they find, and uncover their own creativity along with the music of their environment. Listeners become increasingly aware of the sounds in their natural environment and perceive their surroundings anew, moving away from a top-down conception of transmission of meanings from composer to listener. Instead they discover, create and sometimes share their own meanings as they explore a physical environment or its sonic representation; also, the potential of soundscape composition to reveal the inner sonic life of a particular place and frame of time.

Feld argues that art-making with field recordings should take a more central role to anthropological thinking. For him, field recordings act as acoustic mirrors; they make audible, make public, circulate and amplify some aspects of what it means to listen in on social and sonic relations. For Born (2013), Feld's work is seminal for the development of a sonic-social phenomenology, in that it addresses music, sound, and their interrelations. In this broader framework of enquiry, that utilizes collaboration in all the layers of production, he combines social phenomenology and hermeneutics of senses of place. From content to collaboration, these artworks are presenting the environment as a site for theorizing the emergence of auditory consciousness (Lane and Carlyle 2013). The interdisciplinary, collaborative and open-ended nature of these projects might do as a project of transformative criticism and action: they bring forward the social and political dimension of sound and listening; they intensify the

relationship between the acoustic environment and the perception of musical and non-musical sound, and they exist in the *socialscape*. Merging together the natural soundscape and the cultural soundscape (human-made sounds), they inform the socio-ecological transition to more environmentally-conscious forms of living.

Kelman argues that Schafer's definition of the soundscape carries ideological and ecological messages about the meaning of sounds, as it is suffused with instructions about how people ought to listen. For him, the problem is that today the term has become ubiquitous: "[it] has come to refer to almost any experience of sound in almost any context" (Kelman 2010, 214). Schafer, Helmreich argues, "articulated the soundscape as a sonic version of landscape, an object of contemplation" (2010). In this sense, soundscapes are also things in the world. However, the question of representation, that is who speaks on behalf of whom, is clearly related to social, political, and ethical concerns, as the soundscape both affects and is an effect of social practices, power relations and ideologies. According to Schafer, the soundscape is a reciprocal relationship of sorts, where people in some way echo their soundscape in language and music. Steven Feld used this idea to produce an ethnography of sound, or study of sound as a cultural system, in order to relate the importance of acoustic ecology and connect the environment with musicality and poetics (2012), particularly amongst the Kaluli people in the Bosavi rainforest in Papua New Guinea. Feld describes the development of *acoustemology* as a practice of knowing-through and knowing-with sound; it prioritises "relational practices of listening and sounding" (Feld 2017, 87) in order to study the dynamic interactions across species and materialities.

Feld's theory of *acoustemology* (2015) brings acoustics and epistemology together and theorizes ecosophical thinking about sound further; the term emerged from his fieldwork inquiring into the local conditions of acoustic sensation, knowledge and imagination, embodied in the culturally particular sense of place resounding in the Bosavi forest and Kaluli people (Feld 1996). He places *acoustemology* in opposition to the metaphysical or transcendental assumptions suggested by "epistemology with a capital 'E'" (2015, 12), proposing an alternative to soundscape and sound studies as a regime. Drawing on contemporary theorists such as Donna Haraway (1988) Feld argues that being does not pre-exist relating. Therefore, he asks how does (it) become relational; and he goes on to argue that things become in sound, advancing a theorization of sound and listening that deals with "relational practices of listening and sounding and their reflexive productions of feedback" (2015, 15). Feld (2015) foregrounds relational epistemology in his theoretical model, to link *acoustemology* to indigenous research methodologies, in which questions of representation, signification and subjective experience are recognized as paradigmatic and culturally specific and challenge philosophical assumptions around reality, knowledge, and the world. *Acoustemology* also resonates within ethical debates, particularly in accounting for ethnomusicology's colonial past, and refers to relationality as "a cornerstone of decolonized indigenous methodologies" (Chilasa 2012 in Feld 2015, 14), key to understanding accountability in human and nonhuman relations.

The listening strategy that employs all channels of communication and affective registers at its disposal in order to make people feel—as well as understand— sound art for its inherent ecological characteristics is an ecocritical listening strategy. According to Born, listening is intentional and concentrated, entailing understanding and "co-creation", while hearing is a passive and inadvertent, disengaged and unconcentrated activity. Our experience of sound, our disposition toward the act of listening, and our semantic and affective engagement with sound, are mediated by social and cultural location and identities, as well as audio and recording technologies (Born 2010b, 85). Listening challenges colonial histories by amplifying the voices of the people.

Audio is a powerful tool when it comes to communicating the climate crisis and when we engage critically with the soundscape of the Anthropocene. Understood as "a time interval marked by rapid but profound and far-reaching change to the Earth's geology, currently driven by various forms of human impact", the Anthropocene is marked by human society acting as a geological force (Zalasiewicz et al. 2017, 56). The kind of listening we need in the time

of the Anthropocene, when “human beings have become the primary emergent geological force affecting the future of the Earth system” (Angus 2016, 9), calls for an ecocriticism whose goal is to make the urgency of our ecological moment audible in a new way. Ecocritical listening thus explores the possibilities of an ecological ear, developing modes of a polyphonic and empirical listening to sounds made by contemporary sound artists and field recordists that make possible connections between sound ecology and cosmology (Smith 2019). This polyphonic listening will act as a model for environmental awareness.

As Gilmurray points out, “[a]n ecocritical understanding of arts and culture has thus become essential to the development of a properly holistic critical understanding of how contemporary audiences may engage with and interpret works of any kind” (2018, 190). In the present time, when the ecological crisis becomes more and more urgent, acoustemology can equip us with the tools and techniques for listening to the world empirically, polyphonically, and imaginatively; also inspire us to “approach all aspects of life, including arts and culture, with an ecologically-attuned mindset” (Gilmurray 2018, 190). Gilmurray goes on to identify that ecocritical listening is “an exercise which can ultimately be applied to any work, regardless of artist intention” (2018, 190), as long as it enables us to observe and analyse, as well as empathize with and respond to contemporary ecological issues. Acoustemology can be the recompositional tool or strategy that connects humans, spaces, technologies, and the natural world; that makes relational ontologies audible; that amplifies (indigenous) aural knowledge without appropriating it or making it a commercial product. Acoustemology is the way of knowing through and knowing with the body; of moving beyond seeing sound as object.

What does acoustemology reveal about ecological sound art? For sonic ecologists aesthetization can augment emotion. Bringing forward aural contributions to constructions of culture they use recorded sound as an essential component in the making of an argument they turn the environment into sound art. Feld’s forthcoming work, an audiovisual installation which will be exhibited at Stegi-Onassis Foundation in Athens is a sound artwork of ecocriticism that addresses sound’s critical and creative agency. Its theme is heat, sound, and bodies and the heartbeat of the city. Feld has talked about the field recording he and his collaborators – Panos Panopoulos and George Samantas - conducted for this, in his lecture *Hearing Heat*. There, he characterized the cicadas, whose sound is featured prominently in the composition, as the thermometers of the Anthropocene.

In his essay on “The Anthropocene and Music Studies” Sykes wonders how would it sound like if Feld had written *Sound and Sentiment* from the birds’ point of view (Sykes 2020). Following this trend of decentring the human as the listening subject, sound studies scholars are increasingly arguing for an ethico-affective approach that runs contrary to the sonic anthropocentrism of subject-oriented definition and the phenomenological accounts of sound (Thompson 2017). In decentring the listening subject, sound art’s aim is to draw together sound’s social, informational and artistic manifestations that together enable the emergence of a collaborative creativity. Concurrently, researchers in the field of ethnomusicology are taking a multispecies approach, in line with Ochoa Gautier’s writing (2016), which enables the development of connections between sound’s audible manifestations and its imperceptible manifestations, which affect human, non-human and more-than-human relations. Sound artists and ethnomusicologists are interrogating further these relationships with the natural environment, expressing them through sound and music. At the same time musical practices are echoing the natural environment (and vice versa), renegotiating the dominant dualisms of traditional nature-culture and subject-object relations. By drawing connections between sound, culture and the world’s ecosystems sound artists working with environmental field recordings aim to make a meaningful contribution to the environmental challenges we face.

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