

Soundscape

VOLUME 16 | 2017

SOUNDS EMERGENT: DIVERSE ECOLOGIES PART II



The Journal of Acoustic Ecology

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Soundscape: The Journal of Acoustic Ecology is an English language publication of the World Forum for Acoustic Ecology (WFAE). The publication is conceived as a forum for communication and discussion about interdisciplinary research and practice in the field of Acoustic Ecology, focusing on the interrelationships between sound, nature, and society. *Soundscape* seeks to balance its content among scholarly writings, research, and an active engagement in current soundscape issues, both in and beyond academia while serving as a voice for the WFAE's diverse and global community.

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Submissions. Texts can be submitted for the following sections in the journal: *Feature Articles*; *Current Research*: a section devoted to a summary of current research within the field; *Dialogue*: an opportunity for editorial comment from readers; *Perspectives*: reports of events, conferences, installations etc.; *Sound Journals*: personal reflections on listening in the soundscape; *Soundwalks* from around the world; *Reviews*: of books, CDs, videos, websites, and other media; *Students' and/or Children's Writings*; *Quotes*: sound and listening-related quotations from literature, articles, correspondence, etc.: **Please send correspondence and submissions to: *Soundscape – The Journal of Acoustic Ecology*, (c/o Leah Barclay, Editor-in-Chief). Email contact: soundscape-editor@wfae.net**

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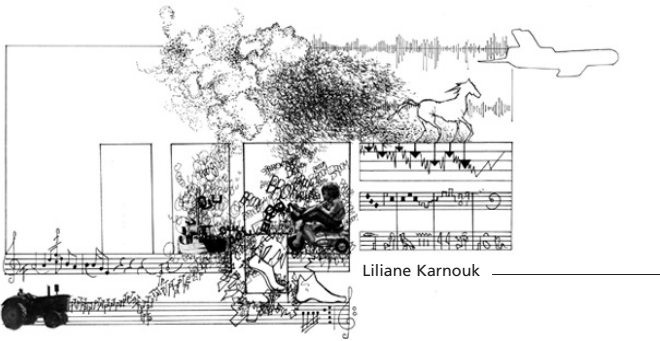
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Introduction

LISTENING AND HEARING PAULINE OLIVEROS: *Remembering Her Gift of 'Sonic Awareness'*
Symposium – Sounds Emergent: Diverse Ecologies, Part II

W elcome to part two of the symposium “Sounds Emergent: Diverse Ecologies.” As we conclude this series, the World Forum of Acoustic Ecology’s Editorial Board is saddened by the passing of legendary composer Pauline Oliveros on November 24, 2016. The reverberations of her life are felt through the words of those selected for this special issue, similar to the various signals that rebound within our very beings. We tune to round two of “Sounds Emergent” being once again curated by guest editor Jay Needham, who connects the musical notes in this issue, not to create acoustic borders, but in the hope that paths will open up new ways of hearing, deeply across the aural plains of which only a handful have led, one being Distinguished Research Music Professor Pauline Oliveros. She has been a mentor to many, some of whom recall her impact on their lives and careers in this issue. We are reminded that not sound, nor life, should be confined by tradition or artificial boundaries. Every day we all compose our own life songs, ones

that draw deeply from inside our respective frames of reference, as we make sense and music from the range of frequencies that surround us. Even better yet is when we choose to harmonize with the sonic texture in which we are immersed. In this issue, Jay Needham invites us to eavesdrop into such sonic conversations as the sound community pays tribute to one of its own.

PHYLIS JOHNSON, PH.D.
Editor-in-Chief, *Soundscape: The Journal of Acoustic Ecology*

PHYLIS JOHNSON is Director and Professor of Journalism and Mass Communications at San Jose State University, San Jose, California. She is author/co-author of four books, machinima reviews editor for *The Journal of Gaming and Virtual Worlds*, and has extensively presented and published internationally. She is the immediate former editor of the *Journal of Radio and Audio Media*, and Editor-in-Chief of *Soundscape*. She writes on sound, new media, and virtual reality as culture and practice.

Cover Art by Todd Birdsong

My images for this edition of *Soundscape* (also see pages 5 and 7) are inspired by the works of Pauline Oliveros and the essay by Edward Shanken and Yolande Harris. More specifically, they attempt to visually capture a practice that compelled listening not just to the conventional details of a given traditional audio experience—melody, harmony, rhythm—but also to the sounds of space and noise.

TODD BIRDSONG received his MFA from Southern Illinois University in Carbondale in Mass Communication and Media Arts. He is an interdisciplinary artist who works with both analog and digital processes within photography, sound and transmission art, time-based media and instrument making using found objects and electronics. Execution of his work takes the form of conceptual installations and performances. Concepts of indeterminacy and randomness are used to examine the ideas of mindfulness and being present in the moment of witnessing, understanding and decoding our daily lives.

Report from the WFAE President

If you are new to the WFAE and this journal, I would like to say hello and introduce ourselves. The WFAE began in 1993 to serve as a world-wide collaborative network of Affiliated Organizations who produce and promote research, education, events, conferences and publications revolving around the interdisciplinary field of Acoustic Ecology. This is our basic mission. Publishing this annual journal is one way we realize this mission. Our affiliated organizations represent the individuals who do the production and promotion, while a small number volunteer to run the WFAE.

Most of the affiliates have chosen to be defined by their geographic borders and national identities. This is not required for starting a WFAE Affiliate Organization. Other identities and cultural affinities can form an active community and use names that reflect this.

Many individuals are contacting me about starting new WFAE affiliates. They represent local communities from around the world, including Malaysia, India, and Taiwan. Others are interested in reactivating affiliate groups that have been dormant. Of those, I am pleased to report that Luz Maria Sanchez has convened a meeting at Fonoteca Nacional in Mexico City to discuss formation of either a new transnational Latin American affiliate, or a more national affiliate of Mexico.

I was fortunate to be able to participate in the WFAE endorsed Invisible Places 2017 (<http://invisibleplaces.org>). Held in Ponta Delgado, São Miguel Island, Portugal in early April, the beautiful landscape was a perfect backdrop for presentations, touring, and installations. Meeting with my cohort from Portugal afforded us a change to revisit the possibilities of forming a Portuguese WFAE Affiliate Organization.

I was unable to attend the WFAE endorsed Sound of Memory Symposium (https://www.kent.ac.uk/smfa/events/soundofmemory_symposium.html) in late April, in the United Kingdom. However, I did go to the Sound + Environment 2017 conference in June/July at University of Hull. This provided a chance for WFAE Vice President, Leah Barclay and I to meet and discuss the WFAE with its participants. We were especially gratified by the large number of people who expressed interest in reactivating the UK/Ireland Soundscape Collective (UKISC). Efforts are now underway by Rob Mackay and Marcus Leadley to organize an active leadership team.

Leah Barclay organized the fourth WFAE endorsed conference of this year, the 2017 Biosphere Soundscapes International Workshop and Symposium “Perspectives on Listening” (<http://www.acousticecology.com.au/blog/perspectives-on-listening-international-symposium-showcasing-interdisciplinary-research-in-acoustic-ecology>). Taking place in Brisbane, Australia in early December, it featured keynotes from Steven Feld and Monica Gagliano, “... in addition to panels, performances, immersive installations and field trips across the rainforests of the Sunshine Coast and aquatic ecosystems of the Noosa Biosphere Reserve in Queensland, Australia.”

In addition to directing Biosphere Soundscapes, Leah serves as President of the Australian Forum for Acoustic Ecology (AFAE), celebrating its 20th anniversary in 2018. The AFAE and WFAE have endorsed the Symposium and International Ecoacoustics Congress 2018, organised by the International Society of Ecoacoustics (ISE) in partnership with QUT and Griffith University. The call for proposals goes out in January.

Most likely you are reading this journal on a digital device display rather than paper. As mentioned previously, in my report for Volume 15, the move to a digital journal became necessary as a cost-saving

measure. Printing and mailing physical paper copies to our members and library subscribers exceeded what the WFAE received from its affiliated organizations, who constitute the major part of our membership, in addition to support from our library subscribers. It is important to emphasize that our stepped transition into an engaging and accessible format is underway. Two important ingredients for this are the support of dues-paying members of our Affiliate Organizations and library subscribers. If you are interested in becoming a WFAE member but have no local or regional Affiliate Organization to join, please consider an individual membership. Information on how to become a member are provided in the back pages of this journal.

Another important ingredient for our journal's success is the people who comprise our Editorial Committee and our Editor-in-Chief Phylis Johnson and Guest Editor Jay Needham, American Society for Acoustic Ecology members.

Following five years of dedicated service as *Soundscape's* Editor-in-Chief, Phylis Johnson is transitioning her role over to Leah Barclay, who is working on the next volume of the journal, due in June 2018 celebrating AFAE's 20th anniversary and the Symposium and International Ecoacoustics Congress 2018. On behalf of the WFAE, I want to express our great appreciation and thanks to Phylis for picking up the reigns from Hildegard Westerkamp in 2012, working with the guest editors of the next five, high-quality volumes of *Soundscape*.

In August, Christopher DeLaurenti decided to step down as WFAE Secretary. I am deeply grateful for the three years of dedicated service he gave the WFAE, especially in the daunting project of migrating the WFAE website following Gary Ferrington's transition. Chris earned my deep respect as an exceptional artist and composer with a wealth of skills. Chris helped us find a successor, providing highly practical advice in distribution of tasks and a smooth transition for Tyler Kinnear, who I am relieved and gratified to report has stepped up to succeed Chris as our new WFAE Secretary. Tyler has been serving on the WFAE Board as the Rep for the Canadian Association for Sound Ecology (CASE) and comes highly recommended from CASE leaders. Tyler is resuming the WFAE website rebuild with assistance from Chris and Leah. Rebuilding the WFAE website includes adding the online library; a free and accessible archive of the WFAE's online Newsletter, all the past volumes of *Soundscape*, supplementary articles, and other historical resources. The fully implemented website is intended to receive input from the WFAE's network of Affiliated Organizations, raising the profile of their diverse activities and content more frequently, enriching the global discourse in Acoustic Ecology.

ERIC LEONARDSON, a Chicago-based audio artist, serves as the Executive Director of the World Listening Project, founder and co-chair of the Midwest Society for Acoustic Ecology, and President of the World Forum for Acoustic Ecology. He is Adjunct Associate Professor in the Department of Sound at The School of the Art Institute of Chicago (SAIC). As a performer, composer, and sound designer, Leonardson created sound with the Chicago based physical theater company Plasticene (1995–2012). Leonardson performs internationally with the Springboard, a self-built instrument made in 1994 and often presents on acoustic ecology to new audiences. As an artist and educator Leonardson's practice inhabits the elusive lines that separate art media and disciplines; the promise of technology to enable new possibilities in art, discovering connections between physical action, sound, images, and ideas through artistic collaborations and research.

Guest Editorial, *Sounds Emergent Part II*

by Jay Needham

To resound on the insightful and varied career of 20th century composer and improviser Pauline Oliveros, is to think ecologically. Understanding the breadth of her musical, spiritual and communicative legacies requires us to extend our figurative margins and dream in volumes of thought and volumes of sound. This good work is ongoing and while some of Deep Listening's life lessons and profound ideas are traced within this continuation of the *Sounds Emergent* thematic, it is designed as an overture to help chronicle aspects of her influence and to make evident an often unexplored but wonderfully nuanced kinship to Acoustic Ecology. It is my hope that the collective works in this edition serve to inspire and that those who might not be familiar with her work, now have several new reference points that are rich in detail and insight. Our authors have added to an already resonant ecology of words surrounding the important work of Pauline Oliveros and we are proud to present them here.

For this edition of *Soundscape*, Edward Shanken and Yolande Harris have co-authored an important new work, *A Sounding Happens: Pauline Oliveros, Expanded Consciousness, and Healing*. Their fascinating approach to collaboration has rendered a hybrid form of arts scholarship that is poetic, historical, compositional and inspiring. In the work, Harris' sonic sensitivity is coupled with Shanken's acumen for history and the result is profoundly personal. One might say that their approach is *eco-editorial* as they co-compose and dream art historical modalities between the lines.

Seth Cluett and Tomie Hahn playfully reflect on Pauline's heartfelt influence in their *Haiku for Pauline, as Pauline*. Their contribution is an artful meditation on the infinite possibilities of listening, as love, as practice and as a fond remembrance of a teacher, collaborator and friend. Their words provide clues to accessing a partial list of listening essentials, a minimal catalog of soundings made all the more relevant to us because both Cluett and Hahn have each played a vital role in preserving Pauline's archives.

Three Recent Moments with Pauline Oliveros, is artist Stephan Moore's detailed contemplation on how his former teacher's ideas still reward and inform. For Moore, Pauline's voice gently guides his conception of a generative sound work in Melbourne just as it mentors him as he works through a temporary bout of tinnitus. His duality of scale, that of the global din of traffic and to the reception of his own interiority helps to frame the scope and import of Oliveros' teachings. Ultimately, Moore would like the tenets of Ecology to blend and balance with those of Deep Listening and his proactive bearing on scholarship and practice is an inclusive call to action.

Amid our layered electronic landscapes, media artists have sought to engage the specificity of site through sound in a number of compelling ways, often-times aggregating the roles of archivist, ecologist, artist and historian. Leah Barclay's *Augmenting Urban Space with Environmental Soundscapes and Mobile Technologies* is a satisfying history of her many collaborations with the late

Nora Farell. This recent history of hertzian dreaming charts works such as *Sonic Babylon* through all their important progressions and paths of influence.

Ione, Pauline's partner and collaborator shares with us her poem *This Day/That Day*. The piece is a fitting coda for this colloquium as it celebrates not only their shared memories but it also reminds readers that politically empowering moments occur while actively listening. The poem also affirms that these days of ours are wound together, listening collectively, dreaming and composing ideas of peace.

Acknowledgements

IT HAS BEEN MY GREAT PLEASURE to work with Dr. Phylis Johnson, a gifted thinker and scholar who has helped the journal in many insightful ways as Editor-in-Chief. She is an excellent collaborator, listener and I look forward to opportunities where we can continue to foster an atmosphere of shared knowledge and practice. I would also like to thank the WFAE and our journal editorial Board for the opportunity to guest edit two editions of *Soundscape*—the experience has been very rewarding. My thanks go to all of our contributing authors; your work awakens me. Additional thanks to our cover artist Todd Birdsong. I could not work in the field or in the studio were it not for the good patience, humor and love of my wife Jennifer and daughter Miranda.

– Jay Needham, Carbondale Illinois, October, 2017

JAY NEEDHAM, MFA is an artist, Professor, scholar at Southern Illinois University Carbondale. He utilizes multiple creative platforms and his works often have a focus on recorded sound, archives and the interpretation of artifacts. His sound art, works for radio and visual art have appeared at museums, festivals and on the airwaves worldwide. Through applied aspects of his research, Needham strives to affect positive change and bridge the gap between the arts and the sciences. His most recent sound installation is on permanent display in the BioMuseo, designed by Frank Gehry in Panama. His research is published in the journals, *Exposure*, *Soundscape: The Journal of Acoustic Ecology*, *Leonardo Music Journal*, and in the book *Hearing Places: Sound, Place, Time, Culture*. He has been invited to speak and present his work at many notable programs including the Amsterdam School for Cultural Analysis, the Department of Techno-Cultural Studies, University of California, Davis, California Institute of the Arts and the School of the Art Institute, Chicago. Needham is a member of the boards of the World Forum of Acoustic Ecology, the Institute for Neotropical Conservation and is President of the Board at Carbondale Community Arts. He received his MFA from The School of Art at California Institute of the Arts.

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“A Sounding Happens: Pauline Oliveros, Expanded Consciousness, and Healing”

by Edward Shanken and Yolande Harris

Santa Cruz, July 2017

A sounding happens. The sound continues or is followed or joined by another sound. The trajectory of sounding gradually constitutes a long line of soundings that is perceived as a shape or form that is music. Within that trajectory are myriad decisions that are intuited and join to refer back to the initial sounding and forward to the ending sound. – *Pauline Oliveros*¹

Our essay is written with the deepest (pun intended) respect for the life and work of Pauline Oliveros. We draw on her performances, recordings and writings, those of her numerous collaborators and others who write so well about her, and on our own experiences. By writing together, by generating a dialogue, or, perhaps better, by performing an improvisation around Pauline’s influence “a sounding happens.” Our metalogue of multiple voices, fragments of situations, and historical resonances parallels and reveals the subjective, experiential and embodied modes of knowing and healing that Oliveros’ work ultimately achieves and teaches. As in publications by Oliveros and her collaborator Ione, we blend methods of analysis and intuition through different modes of writing.² This format is designed to encourage the reader to allow connections and continuities to emerge.³ Mirroring the participatory role of the audience in many of Oliveros’ compositions, your performance as a reader plays an integral role in producing meaning out of our words. Please listen and sound with us!

Listening to this space I sound the space. Listening to the energy of all who are present I sound this energy. Listening to my listening and your listening I make music here and now with the assistance of all that there is. I dedicate this music to a world where peace is more exciting than war.
–*Pauline Oliveros*⁴

Our process led us repeatedly to Oliveros’ goal of expanding consciousness. Our meditations converged on exploring what that actually means and where it may take us in the future. It is no small feat to bridge such apparently contradictory worlds as technology and intuition, what we call “techno-intuition”. Allowing rational and supra-rational forms of knowledge to occupy the same space is by its very nature open to criticism from one side or the other. Yet, as a musician, Oliveros grounds these ideas and apparent contradictions in practical work, the practice of making music in the moment and the importance of the body in this process. She writes:

I consider my task to be to increase my conscious awareness as much as possible each day of my life and respect what the body signals to me through sensations and feelings just as much as what my verbal mind tells me through thoughts and intuitions. Synthesis and integration of all of these modes of perception and knowing empowers my musical being in the world. –*Pauline Oliveros*⁵

Following her lead, we embrace her synthetic and integrated model of creating knowledge. Doing so provoked us to seriously investigate the following topics: altered states of consciousness, telepathy and telematics, the artist as shaman, healing, and deep listening for environmental transformation.

The proper relationship of attention and awareness can be symbolized by a circle with a dot in the center. –*Pauline Oliveros*⁶

It is 1997, I am 21 years old and I am walking alone for four days and nights along the Devon coast and Dartmoor, leaving sound sculptures for an ‘absent public’ with found materials along the way. As a music student, I am absorbing the American experimental composers and trying to figure out how my music and art making relates to the environment. It is the first day of my journey. Crossing a field with my dog Mungo, we are chased and encircled by a herd of aggressive young female cows. This occurs at the height of the BSE ‘Mad Cow Disease’ epidemic and millions of cattle are being slaughtered. I know that people have recently been trampled to death by herds like this. They come in close and push us with their heads, rolling their eyes, stamping their feet, pushing Mungo over, cow saliva covering us. My dog is crouching on the ground shaking but I hold him on the leash so that he doesn’t run and get trampled when he gets caught at the edge of the field. I am shouting and lunging at the cows, throwing my arms at them, stamping my feet, swaying around in circles to ward off the cows coming at my back, trying not to be knocked over with the big pack on my back. We are encircled and there is no one around to help. I see a gate at the edge of the field, but we are in the middle. I steadily work my way towards it, somehow keeping my feet, dragging Mungo along with me. Nearly there, I see a very large bull appear behind me. We make it to the gate, I throw myself over it, Mungo squeezes underneath, we are both lying in a shaking heap, lost but safe from death by trampling.

“Listen to everything, all the time and remind yourself when you are not listening.” –*Pauline Oliveros*⁷

This oft-quoted imperative statement by Oliveros is actually two statements in one. The first part, “Listen to everything, all the time,” instructs us to be constantly attentive to sound, the sounds inside us and those outside, the interactions among those sounds, how they affect us and the environment in infinite feedback loops. Although the two parts are joined by the conjunction “and” suggesting “a + b,” the second part, “remind yourself when you are not listening,” is more than additive; it is also contingent. The second part functions like a conditional construct in a computer program, e.g., “if not x, then y.” Here the conditional construct takes the logical form, “if not a, then a” or in narrative form, “if you are not listening to everything, all the time, then remind yourself to listen to everything, all the time.” In other words, it is a recursive loop with a redundant safeguard designed to lock the practitioner into the desired behavior. The first part is itself a mantra: a self-programmed guiding principle that reminds us to refocus on what is important. The second part is

subterranean constellation

Photo by Todd Birdsong.

Sounds attack, decay and fold –
their latency enveloping and
possessing you like a spirit.



a meta-mantra; as a reminder to perform the first mantra, it loops us back to it if we should happen to stray. In cybernetic terms, the second part functions as negative feedback that helps us maintain our mantric self-programming, to regain our own inner balance and preserve homeostasis. The meta-mantra implicitly acknowledges that the task is highly challenging and perhaps impossible to achieve in the ultimate sense, short of becoming divine.

I am listening again to Oliveros' most well-known recording, *Deep Listening* (1989), performed with Stuart Dempster and Panaiotis in a two million gallon underground cistern, precipitating the birth of Deep Listening as a practice. Listening to the recording takes me into this place deep underground and immerses me in a liquidity of sounds let loose by the musicians in collaboration with the cavernous space. The long forty-five second reverberation makes these sounds hang in the space, filling it as if with water, like adding a drop of pigment into a bowl of water. Anthropologist Michael Taussig illustrates how color is not simply a quantitative characteristic added to an existing object, but rather a "polymorphous magical substance" that has the ability to transform states of consciousness.⁸ This sense of color resonates with the sonic palette of *Deep Listening*: trombone, accordion, didgeridoo, voice, all sounds of the breath and air. The musicians are pushing the air around them, mixing and stirring these polymorphic magical substances. I imagine inhabiting a three-dimensional liquid space, being free from gravity, in outer-space or underwater, and at the same time deeply grounded. As this sound-cauldron bubbles underground, the concentration is evident as the musicians are absorbed into their environment. As a listener I am pulled into the moment of each sonic happening, each sounding. These are ecstatic mental spaces, sonic spaces laid out for us to explore in multiple dimensions, conjured by musicians with supreme command of their improvisational abilities. In their own way and with their own music, they are tapping into the age-old understanding of how music gives access to fields of expanded consciousness, to trance states, those that are broader than the everyday awareness of our conscious mind.

I use the term "sonic consciousness" to access such states of being.⁹ By this I mean a heightened awareness of sounds around us and of the materiality of sound. Learning to listen more acutely to the sonic environments we live in day-to-day is literally ear-opening to my students. They inhabit an oculocentric world, in which their sonic environment has been usurped by recorded music incessantly played through headphones. Listening to other beings, other phenomena, other machines, strengthens relationships between us and our environment. It demands our attentiveness to other beings, and calls into question distinctions between human and nonhuman, sentient and insentient. Sound is often referred to as immaterial because it cannot be seen—a visual bias. Yes, it is non-visual, or perhaps invisible, but its material nature allows it to be created, sculpted, and manipulated. Sound asks for and requires us to pay attention. It requests a relationship with us. And it is active in these demands, which happen in the moment and can be fulfilled at that moment. Sonic attention is acute and diffuse at the same time. It has the effect of situating us within a field of relationships, a field of different qualities. Oliveros' challenge to listen to everything all the time has the effect of shifting our state of awareness from one consumed with *doing*, to one attuned to *being*.

Oliveros admitted that listening to everything, all the time is a "seemingly impossible task." In this sense it is both a mantra and a koan, an enigmatic riddle that serves an aspirational function. As intimated in Jack Kerouac's beat manifesto, *On the Road* (1951), the journey is at least as important as the destination. We may never fully realize Oliveros' command but the active pursuit of it reveals, onion-like, ever-richer layers of "sonic consciousness," a term that suggests how listening deeply can generate a heightened awareness

of self, environment, and the relationship between them. To listen to everything all the time must incorporate both "focal attention" and "global attention" to use her terms and, ideally, one simultaneously tunes-in to both. The performer must listen in a global mode in order to respond meaningfully but must shift to focal mode in order to "verify that the response was correct." The performer must remove intentionality from the equation, for if she is focused on her own intentions she will be distracted from listening to everything all the time. "The best state is for the player to have nothing in mind," Oliveros instructs. In improvised music performance, only by listening to everything all of the time—other performers, the audience, the environment, oneself, and the interactions between them as a temporal-spatial phenomenon—can one participate in the sort of musically meaningful exchange to which Oliveros aspired. To this end, she thought that her role as a composer was to create an "attentional strategy" that structured how performers play and develop a piece as it unfolds through collective improvisation.

Oliveros' mantra/koan "Listen to everything..." applied not only to her composition and performance practice but to her life and to life in general. As vital as it was to music, she believed that this method was equally vital to human interactions and to interactions between humans and non-humans on global and cosmic scales. Artist Cory Arcangel, a former Oliveros student at Oberlin College, recounted that,

The thing I took away from your class was about living more, about how to conduct yourself on a daily basis. It sounds crazy, but I just remember thinking about creativity as something bigger than "composition" or "counterpoint" or "performance." It was a way of being that involved listening to others and the world . . . and responding.¹⁰

Oliveros believed that if everyone (or even many people) followed this path, the resulting global expansion of consciousness would have healing effects on individuals, human civilization, and the Earth. As she noted, the *Sonic Mediations* can catalyze healing under several conditions, including when "individuals feel the common bond with others through a shared experience" and "when one is aware of and in tune with one's surroundings." In this sense, listening to everything all the time is itself an attentional strategy, a noble way of co-existing, and a survival technique.

The proper relationship of attention and awareness can be symbolized by a circle with a dot in the center. The dot represents attention, and the circle, awareness. In these respective positions, each is centered in relation to the other. Awareness can expand, without losing center or its balanced relationship with attention, and simultaneously become more inclusive. Attention can be focused as fine as possible in any direction, and can probe all aspects of awareness without losing its balanced relationship to awareness. —Pauline Oliveros¹¹

It is 1998, I am 22 years old, sailing across the Sargasso Sea. I'm trying to complete my graduating project, this time by making a journey at sea to assess an "absent public" in the Bermuda Triangle, legendary for disappearing ships. The sky is full of fast-growing thunderclouds that pile up in high columns. We nervously watch them growing around us. We have never sailed in this part of the world before. There is almost no wind, so we motor for hours day and night avoiding clumps of floating Sargassum seaweed. It is hot and the sun is powerful. We make the mistake of not rigging up shade for fear it will impede our speed. Three or four days have gone by and the heat overtakes me. Accompanied by the fatigue of menstruation my body gives in to exposure and heat-stroke, vomiting, shaking and hallucinating. Look! I can see the tall masts of old

sailing ships over the edge of the horizon! All this time the inboard diesel engine is throbbing, producing a drone that resonates the boat. Half delirious, I pass the time singing with the vibrating overtones and difference tones. It never changes but I am always content to sing to myself. I realize that days and nights have gone by and despite seeing the water and weed pass by the hull of the boat and the small trail of disturbed water behind us, it appears as if we have moved nowhere. I can trace our position on the chart but I can see no visible change in my surroundings. We are floating in the center of a disk, never moving closer to the circle of the horizon that surrounds us.

Psychedelics were probably the single most significant experience in my life. Otherwise I think I would be going along believing that this visible reality here is all that there is.... [T]here are levels of organizations of consciousness that are way beyond what people are fooling with in day to day reality. —Jerry Garcia¹²

Oliveros, like the beats and the generation that came of age in the 1960s in the US, was seeking alternatives to the restrictive, parochial culture of post-war US: McCarthyism and the House Un-American Activities Committee, the fear of the bomb, homophobia and other sexual hang-ups, patriarchy and the subjugation of women, the military-industrial complex and the Viet Nam War, sprawling and monotonous housing developments like Levittown, and the cookie-cutter lifestyle these elements conspired to sustain. Economic prosperity and a large, post-war generation fueled a powerful youth culture that opposed the “Leave It to Beaver” world of their parents. It witnessed, participated in, and benefitted from a concomitance of factors, including the Civil Rights movement, the attitudinal shift that beat poets and writers offered, the Women’s Liberation movement, the sexual revolution, the proliferation of rock and roll, the availability of marijuana and psychedelics, and widespread protests against the war in Viet Nam. They were emboldened to question authority and to reshape the world in a new way.

The Summer of Love, the Grateful Dead, the Haight-Ashbury hippies and drug culture were thus all part of a larger shift in consciousness, sometimes referred to as the “new sensibility,” a term popularized by Susan Sontag and Tom Wolfe. One aspect of this shift was explicitly involved with trying to expand consciousness through music and psychedelic drug experiences, often in combination. The Grateful Dead (or the Dead, as they are known for short), performed at some of the mid-sixties “Acid Test” parties hosted by Ken Kesey and the Merry Pranksters, in which people “turned-on” to LSD, which was legal at the time.

Both Oliveros and the Dead were committed to improvised music, which was essential to their common passion to always be creating something new. The Dead experimented with LSD and other psychedelics both onstage and off, and their music, particularly with respect to improvisation, evolved in relationship with these experiences. The Dead’s extended improvisations—they are the original “jam band”—are a distinctive feature of their live performances. Like Oliveros’ improvised music and attentional strategies, in the Dead’s jams and their even more abstract “Space” group improvisations, the band members closely listen to each other, intuitively anticipate and respond to each other’s sounds, and channel musical ideas from the audience and from other sources.

Oliveros and the Dead both performed as part of the legendary Trips Festival, a three-day acid test in San Francisco in 1966, with “Side Trips” at other venues. The event was co-produced by Kesey and the Pranksters, Stewart Brand (who published the *Whole Earth Catalog* in 1968), and Ramon Sender, who co-founded the San Francisco Tape Music Center (SFTMC) with Oliveros and Morton Subotnick in 1962. The Trips Festival thus brought together

a remarkable convergence of psychedelics, hippy culture, rock and roll, electronic music, and experimental dance and theater, “a meeting of the San Francisco avant-garde arts scene and the counterculture.”¹³ From Brand’s perspective, “The Grateful Dead and the Merry Pranksters pretty much stole the show.” The audience “sort of applauded politely” for the avant-garde performances, but “they wanted to dance.”¹⁴ Ken Babbs, a Merry Prankster who helped organize the Trips Festival, credits the Dead with playing a central role in the Acid Tests: they were “the power that propelled the rocket ship everyone rode to the stars and beyond the whole night the acid test took place.”¹⁵

It is unlikely that Oliveros rode the Dead’s rocket ship to the stars and beyond in 1966. Indeed, she and Subotnick were alarmed by Sender’s involvement with Richard Alpert and the psychedelic movement in 1965.¹⁶ They politely declined invitations to partake with Sender, despite his efforts to convince them of “the beauty of an LSD trip and how it could inform our humanity and creative work.”¹⁷ According to the Trips program, Oliveros performed with Elizabeth Harris and the 12-foot light sitar as part of the Sunday 10pm Acid Test, with a long list of participants including the Grateful Dead. At a “Side Trip” at the Encore Theater on Sunday at 3pm, Oliveros performed *A Theater Piece*: an hour-long, collaborative, multimedia event. Sound sources, including Oliveros’ compositions *Mnemonics III* and *Rock Symphony* both recorded at SFTMC in 1965, were processed by tape delay.¹⁸

Like many artists of her generation, Oliveros was on her own path to expanded consciousness that had a kinship with psychedelic culture but without all the accouterments or popular acclaim. Through her initial study of Karate and subsequent exploration of other non-western disciplines and systems of knowledge, her practice and process became increasingly meditative. By 1970, she had begun writing the *Sonic Meditations*, a landmark in contemporary music composition that continues to inspire composers and performers nearly half a century later. As William Osborne observes,

“Oliveros’ phenomenological analysis of listening led her to a special interest in the involuntary changes that occurred while the Ensemble sustained tones.... [S]he began to lead improvisations that encouraged spontaneous, subconscious transformation.” In this respect, her “involvement with meditation synthesized academic research with the revolutionary, consciousness-expanding characteristics of the new sensibility.”¹⁹

Although she shunned drugs, Oliveros recognized parallels between the elevated states of consciousness induced by psychedelics and those stimulated by her own methods. To wit, regarding the Deep Listening class that she taught at Rensselaer Polytechnic Institute in the 2000s, she explained,

I teach experiencing a heightened awareness of sound and sounding and silence, without drugs.... What happens is that your own serotonin—dopamine—is released when you experience the pleasure of listening and you don’t necessarily need anything to amplify that, although some people need drugs to break through to the point where they can have that experience. It’s why there’s so much drugging going on in the student population. Deep Listening is an inexpensive, healthful, and accessible alternative to drugs. Drugs take over the body whereas the effects of Deep Listening come from one’s own abilities.²⁰

Oliveros shared a passion for the nexus of music improvisation and expanded consciousness with the Grateful Dead and psychedelic culture. She tuned-in to and followed her own idiosyncratic path with the rigor that her vision for the future demanded. In common

with the utopian dreams that characterize the new sensibility, she unflinchingly pursued a new musical language that pushed the limits of the western concert tradition and entered into the domain of healing. Ultimately, this pursuit strived to bring “music to a world where peace is more exciting than war.”²¹

It is 2009, I am 34 and in Amsterdam, telling my Dutch therapist how disturbed I am that the EMDR treatment he has been giving me has changed an old repetitive nightmare. While listening to clicks once per second alternating between my ears, I have been recounting the moment of explosion of my Satellite Sounder lithium ion batteries in a hotel and the subsequent fire. I remember exhibiting my GPS instruments at the Schirn Kunsthalle Frankfurt and it is going well. I put the batteries to charge at night to be ready for the next day's events. A sudden flash and what seems to be an electric shock jolts me awake. I smell foul smoke and open my eyes to see a fire just an arm's length from my head! Remembering hotel fire codes I do my best to smother the fire with a pillow, open windows, and try to find the emergency number through a swimming sea of numbers on the hotel telephone. It rings, “I have a report of a fire in your room” ... (I later discover that John Cage was in a fire in Frankfurt too, somehow that intrigues me, what kind of initiation rite is this anyway?!) But that was not the nightmare that has changed. Now, instead of the cows chasing me and waking in a panic, the cows are walking the other way! How, please tell me how this is happening?! He answers that he wishes he was a psychotherapist and able to interpret dreams but this is not his expertise and he really doesn't understand how EMDR could achieve such results. He becomes so concerned that he immediately stops the therapy. I realize I need a dream helper to heal myself!

Healing is central to Oliveros' work and her approaches share affinities with recent therapeutic methods. The last decades have seen a dramatic increase in the clinical use of mindfulness practices such as MBSR (Mindfulness Based Stress Reduction) to treat multiple forms of stress and psychological illness.²² Mindfulness and meditation practices (purposely detached from any religious or spiritual tradition) have entered the mainstream, from large corporations to the military, as ways of increasing success in stressful environments. There has also been a cultural absorption and often, appropriation, of meditation and body practices that come from various spiritual traditions, notably Buddhism and Hinduism. While acknowledging her specific influences and interests in spirituality, Oliveros does not espouse any particular way but encourages a complete openness. As a participant in a Deep Listening session, or as a listener to her concerts, or as a reader of her many writings, one is never required to adopt a specific spiritual path. Rather, while drawing on an eclectic mix of influences her work embraces and celebrates the individual's choice.²³

Through her intensive studies of Zen Buddhist, Tibetan Buddhist and yoga meditation and the body practices of T'ai Chi, Qigong and Karate, Oliveros developed a discipline and language of mind-body energetic flow and control. Like the techniques upon which she drew, her practice and pedagogy are designed to rebalance the body's complex systems and thus promote health. It is inspiring to observe the flowing forms of a group doing Qigong. However, it is transformative to experience in one's own body how each form activates particular energetic fields and flows. In other words, these practices must be directly experienced in order to gain an embodied understanding of their physical and mental effects. Similarly, one cannot fully understand or be transformed by Oliveros' work without experiencing it directly. Her *Sonic Meditations* and Deep Listening workshops were designed in order to enable non-musicians to participate. In addition to musicians like myself, The Deep Listening Retreat that I attended also included a number of professional

healers. The processes and techniques in which we were immersed had notable healing effects, both in the short and long term. Healing takes place through the use of sound itself, the use of voice, specific vibrational frequencies as they affect the body, the support of one's breath, the support of the group, and the focus of listening. As Stuart Dempster, trombonist in the Deep Listening Band, writes, “The therapeutic component is so strong in this practice that one can make a case for it being the primary purpose of the work. There are audio, dreaming and movement exercises throughout containing either a direct or indirect healing message or result.”²⁴

In the Deep Listening Retreats, Oliveros' own techniques are amplified by those of her collaborators, Heloise Gold (dancer/choreographer and T'ai Chi/Qi Gong instructor) and Ione, (playwright/director and “Dream Keeper”). This combination of approaches places the composer's work in a context of therapeutic healing rather than academic scholarship and electronic music. The early *Sonic Meditations* were initially developed as a way of bringing presence and voice, and the healing that they bring, to women who were under-represented in musical life in her community at UC San Diego.²⁵ In the Deep Listening Retreats, Gold, Ione, and Oliveros combined practical techniques of sound improvisation, dream work, and movement to help participants recalibrate, transform, and heal. By providing a model of compassion and generosity throughout, trust is built up through the collective relationships formed by the participants. The Deep Listening community that develops around these retreats and continues afterwards demonstrates the need for methods that enable people who feel marginalized to claim their voices and strengthen their positions.

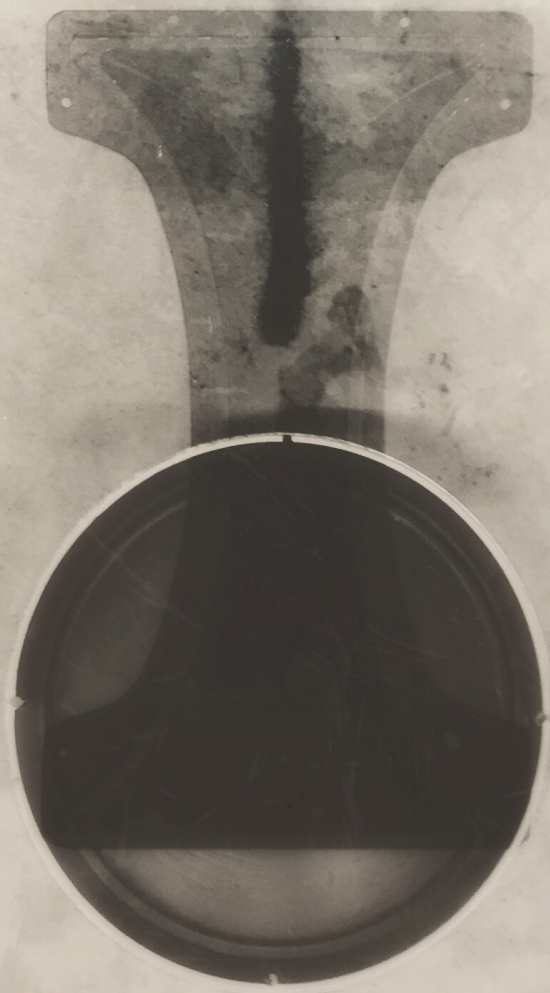
It is the summer of 2010, I am 35, and immersed in a week-long Deep Listening Retreat with Pauline Oliveros, Ione, and Heloise Gold, at a small art center in rural Catalonia. I am staying in a very primitive stable and I wake very early, walk across the field high with wild flowers at dawn, meet others under the small pine trees; silence, no talking, walking meditation up through the woods, stopping and lifting the arms in a great arc breathing in and pulling the energy into the lower body, to a large golden field; T'ai Chi and Qi Gong, group movement improvisations, facing the six directions; the slow walk back to the small house and rough land around it for breakfast under the trees; all very open, warm summer weather, calmness throughout and an expansion of listening, an expansion of general awareness, a sense of being part of the place and not a separate visitor on it.

We are eating breakfast in silence—aware of the awkwardness of being with others and not using words to navigate—how to thank without using words, how to ask for something? Yet this attunes me to other's needs, closer to the subtler exchanges of the group and individuals. Food of course tastes better, eating is more conscious, being with people without using words I feel more present and engaged. My sensory awareness of the early morning environment is magnified.

After practicing sonic meditations with Pauline (the Tuning Meditation is particularly powerful for the group) Ione the Dream Keeper leads us into the week's work we will be doing on dreams. This is partly so that we can learn to listen all the hours of day and night while awake and while asleep. Ione asks us to always recount our dreams in the first person present tense, which helps to bring them into present consciousness. She also lets us know that there is no one proper interpretation of a dream, and that a dream fragment contains a kind of holographic image of the whole dream. We form dream-pods, mine is a group of three women, and we work on our dreams everyday together. I start to notice that I dream almost every night of explosions and fires, usually in cities. By bringing the dreams into my conscious mind and intervening

sounding; resounding
Photo by Todd Birdsong

There is a binary relationship
with sound; the internal
and external that can be
expressed like morse code
moving between us and our
environments.



with them through lucid dreaming I begin the long but real process of healing.

It is about two months after the retreat and I wake with an unusual dream that I intuit concerns the dream-pod, so I share it with them. We are now in Amsterdam, Catalonia, and Colombia and have not communicated since the retreat. This is the unedited email correspondence between the three of us about this dream:

Yolande's dream, 5 September: I am crossing a big bridge over a canal and walking through fields to get to the river banks over there to swim, it is hot so i take off my shirt, there are people around, it is quite busy out here, hot day. two young women are coming out of the water with all their clothes on, wet. going on through a path with bare feet and tall tall grasses, i come to a young woman with long hair, she stands up and announces in a strong voice "i have been dreaming! it was here, these fields, full of white ostriches!" i ask if she's seen ostriches before? "yes, but this field is full of them, hundreds." I think of white feathers.

Olga's response, 10 September: Our project is called PARINAMA (impermanence in Sanskrit language) ... the couple of the centre call us the "eco-misticas"!

Three days ago we went to a fabulous place in the middle of the jungle, with a water fall and a natural piscine in between trees and many plants... we feel so peaceful there that we start to imagine and reproduce a part of our performance.

We decided to start our performance with us both coming from under the water and going outside with our clothes on... wet...

Also we are planning to do a curtain of feathers... to put in the middle of the jungle... to transmit the message of in between two realities...

Ximena's response, 11 September: One week ago when I read your dream Yolande, I smile and smile, because the weekend before in Colombia for the first time in my life I see...Ostriches! We went to a farm where they have a tour and explain the life of Ostriches, and then we can play with them, and feed them. The guide was telling us how it is lucky to collect feathers, and he gave me a bunch of these to take home. We were on horses, and from my pocket the feathers were trying to fly. Beautiful feathers, incredibly soft and with a special oil that's used to heal scars, amongst others. Ostriches are very incredible animals strong and fragile, strong and fragile. The eggs are strong like rocks, but fragile as porcelain.

On some level, music, sound, consciousness and religion are all one, and she [Pauline Oliveros] would seem to be very close to that level. –John Rockwell²⁶

Oliveros' praxis bears striking affinities with shamanic rituals. A shaman is a special individual, one who is partly self-selected and partly anointed by other shamans to play a unique role in a community. The shaman is at once revered and feared because of their powers, which can both cure and harm. Often a shaman proves their shamanic potential through a self-healing process. The shaman is both of this world and of the world beyond. The shaman communicates with spirits and ancestors in the beyond, learns from them, and brings that knowledge or wisdom back to this world in order to cure ill members of their community and to protect or heal the community as a whole. In "The Artist as Shaman" Jack Burnham states that, "it is precisely those artists involved in the most naked projections of their personalities who will contribute the most to society's comprehension of its self." For Burnham, society's pathologies could be overcome only through revealing its "mythic structures" and unfolding its "metaprograms." He saw art as a vehicle for such revela-

tions and certain individual artists as the shamans whose neurotic incantations could liberate us from those metaprograms, for the shaman "magnifies every human gesture until it assumes archetypal or collective importance."²⁷

The work of Roy Ascott, like that of Oliveros, emphasizes consciousness and joins art, science, and technology with various spiritual traditions.²⁸ In late 1990s, Ascott's conception of art was dramatically impacted by his participation in shamanic rituals with Kuikuru pagés in the Amazon and through his indoctrination into the Santo Daime community in Brazil. Ascott (who has organized the annual "Consciousness Reframed" international conferences since 1997, when he also first encountered the pagés) writes that, "The shaman is the one who 'cares' for consciousness, for whom the navigation of consciousness for purposes of spiritual and physical wholeness is the subject and object of living." In states of consciousness expanded through highly developed ayahuasca rituals, the shaman can "pass through many layers of reality, through different realities" and engage with "disembodied entities, avatars, and the phenomena of other worlds. He sees the world through different eyes, navigates the world with different bodies."²⁹ The shaman can embody the consciousness of other beings, including other animals, and in so doing gains insight into how, for example, humans can prey on much more powerful animals like leopards and alligators that might otherwise prey on far smaller, weaker, and slower animals like us. The shaman can exorcise evil spirits that have overtaken someone. By absorbing that spirit and then purging himself of it, the shaman can restore the victim to health. This procedure can be extremely dangerous, so the shaman must be very strong of spirit, capable of healing himself, and very knowledgeable in his craft.³⁰ Oliveros performed some of the shamanic roles described by Burnham and Ascott. The "navigation of consciousness for purposes of spiritual and physical wholeness" was "the subject and object" of her personal and professional life. Her compositions develop attentional strategies that enable performers and the audience member to "pass through many layers of reality, through different realities." Finally, as many personal testimonials demonstrate, the healing aspect of Oliveros' work is profound.

More closely connected to Pauline Oliveros' circle, American Experimental composer Sam Ashley, son of composer Robert Ashley, self-identifies as a shaman.³¹ In response to eulogies shared on the occasion of his father's death, Sam Ashley wrote:

I have been a mystic for more than 45 years. An actual "shaman." That's not a word I toss around because it's cool. I'm sure I've spent at least one third of my actual lifetime in trance. Being a mystic for real just means one thing ultimately: trance, lots of trance ("meditation", whatever). Like hours/day every day. Everything that could be considered real "shamanism" flows from that.

Oliveros strove to listen to everything all of the time. Meditation and other mind-body practices were integral to her work. Like Sam Ashley, she must have spent a large proportion of her lifetime in a trance. She pursued this path not because it was cool but because she was compelled to do so. It was, to paraphrase Burnham, a naked projection of her personality. Her very being questioned and resisted the status quo of classical music and western culture in general. She contributed to healing them by revealing, as Burnham proposed, their mythic structures and metaprograms, by exorcising toxic spirits that unwittingly inhabit us and our cultural forms. From *Bye Bye Butterfly* (1965) to *Sonic Mediations* (1974) to *Deep Listening* (1989-ongoing), Oliveros reprogrammed us to "listen to everything all the time," helping us to heal ourselves and to mend our relationship with others. Over decades of self-induced trances Oliveros expanded her consciousness, tuned into the consciousness of others, and helped

others do the same. As a result, her work plays an important role in stimulating new ways of thinking that are the prerequisite to healing society's pathologies and to recreating the world in a more sensitive, inclusive, and caring way.

This altered state of consciousness in performance is exhilarating and inspiring. The music comes through as if I have nothing to do with it but allow it to emerge through my instrument and voice. –Pauline Oliveros³²

It is 2011, I am 36 years old, and I am transitioning to the second stage of labor with my first child. I am experiencing an altered state of consciousness. We are at home as is the Dutch custom, in an Amsterdam apartment four floors up. I have been meditating on my breathing through the contractions for 18 hours without making a sound and the endorphins, the body's pain relief, have swamped me and presumably my baby too. I need to communicate something to Eddie who's been with me all along, but the hormones flooding my system make me able to speak only one or two words. The midwife comes close, holds my hands, looks in my eyes and tells me I must listen very carefully to her, which I hear and try to register. But my body is beginning to explode and a deep loud long roar rushes through me from the depth of my belly. I experience it as a massive force taking over my whole body released through my mouth where my vocal chords are just part of the huge vibration rushing through me. I have never heard or felt anything like this. I lose my voice. I lose my voice.

Relying on the body to play the music, listening not in musical styles that come through the intellectual mind but listening to what comes through and to the musical body, creates a different kind of flow, a different choice of musical material, and an openness to change in the moment that is external to stylistic musical sense but has bodily musical integrity. An embodied knowledge is built up through experience and deep listening to all sounds all the time, integrating global attention with focal attention. Such music is not reactive but super sensitive and alert. The sound is channeled through the body of the receptive musician. Sometimes it's as if someone else is playing through you, that the music comes from another place that is not your conscious mind.

Humanity has been forced to a new frontier by the accelerating rate of change instigated by technology. This frontier is the exploration of consciousness: all forms of consciousness and especially human consciousness. –Pauline Oliveros, "Software for People," 1980.

The joining of western science and technology with non-western systems of knowledge demarcates a domain of inquiry that Oliveros shares with a number of composers and artists of her generation, though with only a handful of women, notably Éliane Radigue and Annea Lockwood. Oliveros and Lockwood, the pioneering electronic music composer who also had been studying meditation, had a lively correspondence. A note from Oliveros to Lockwood in November 1970 ends with the warning, "Watch out for telepathic pitches. I send them out once in a while."³³ In May 1971, prior to their publication, Oliveros shared several early *Sonic Mediations* with Lockwood, including "Teach Yourself to Fly" and "Telepathic Improvisation."

Teach Yourself To Fly: "Any number of persons sit in a circle facing the center. Illuminate the space with a dim blue light. Begin by simply observing your own breathing. Always be an observer. Gradually allow your breathing to become audible. Then gradually introduce your voice. Allow your vocal cords to vibrate in any mode which

occurs naturally. Allow the intensity of the vibrations to increase very slowly. Continue as long as possible, naturally, and until all others are quiet, always observing your own breath cycle."

As arranged through their correspondence, both artists performed the *Sonic Mediations* over the same weekend, May 21-22, with their own groups in remote locations (Oliveros in Joshua Tree, California and Lockwood in Epping Forest, England)³⁴. Lockwood recently noted that they were "interested in a telepathic exchange between our two groups, in seeing if it was possible. I think I recall some intriguing convergences but could not swear to it after all this time."³⁵

When we tread, do we tread feeling through our sensitive feet, part of the place we are in, or do we tread heavily on top of it as a visitor or a clumsy one who stumbles in unaware? Can we feel the roots grow down through each step, the vibration of the ground for other creatures, as our weight lands? Do we feel the lift up, the flight into the air around as the birds lift off? Can we inhabit this exchange of weight and lift, ground and flight? Flying? Lightening the energy through the body and upwards, moving it with the breath through to the voice and with other voices for lift-off.

It is 2014, I am 39 years old and giving a performance / lecture on my recent work at Design Media Arts UCLA. Ed calls this my "coming-out". I'm trying to explain how I experienced flying with bald eagles over the Puget Sound. I am very nervous about this in an academic setting in case its dismissed as an irrational anecdote, which would be reasonable after all, but it is so central to my work that I can't adequately describe what I'm exploring without at least attempting to talk about it. Pauline Oliveros' example gives me confidence. I read aloud:

"I am a hermit. I inhabit an eyrie. I look down on the resting eagles. I fly with them. There is no sense of time in this journey. Just the gliding of wings through air and the motion of water. Can you look through my layered lenses, open your ears and hear the air moving? Can you listen to the distance with me?"³⁶

Telepresence and telepathy were recurring themes in Oliveros' work. Perhaps her first explicit reference to telepathy appears in her theater piece, *Aeolian Partitions* (1969), which calls on both players and audience members to influence the sounds performed. The third sonic mediation, which consists of "Pacific Tell" and "Telepathic Improvisation" is amplified by the fourth (untitled) which instructs groups of participants to perform either part of the third mediation while "attempting inter-group or interstellar telepathic transmission." Telepathy also is manifest in the dreamwork element of the *Deep Listening Retreats*, as described above.

Also joining telepresence and telepathy, in the early 1970s, visual artist Nina Sobell began developing her brain-wave drawings. Whereas Alvin Lucier's *Music for Solo Performer* (1965) utilized biofeedback to allow a single artist to trigger sound, Sobell's *Brain Wave Drawing LA* (1974) deployed biofeedback and closed-circuit video to visualize nonverbal communication between two people as represented by the interplay of their alpha waves. Two subjects were connected to EEGs, with output sent to an oscilloscope, which displayed the combined brain wave emission of both subjects. "I arranged for them to sit very closely together, watching their faces on a monitor in front of them, and their Brain Wave drawing was superimposed on their faces," Sobell explained.³⁷ One person's brain waves were represented on the x-axis and the other's on the y-axis, forming a lissajous pattern (an irregular circle). If both participants simultaneously emit brain waves of similar amplitude and frequency, the circle becomes regular; if they are not on the same wavelength, so to speak, the circle will distort. Paralleling Oliveros' research on networked improvisation, in 2007, Sobell and her collaborators

made a brain wave drawing over the Internet between Poland and Los Angeles. As she recounted, “we could see each other’s physical image, color-keyed brainwave output, and text message, all in web-time. My idea is creating a non-verbal intimacy in cyberspace, one world one time.”³⁸

As mentioned above, Ascott’s work, like that of Oliveros, emphasizes expanded forms of consciousness. His praxis draws parallels between cybernetics and psi phenomena, telematics and telepathy, and virtual reality and expanded states of shamanic consciousness. At the same moment that Oliveros was writing the *Sonic Meditations*, Ascott’s 1970 essay, “The Psibernetic Arch,” drew parallels between “two apparently opposed spheres: cybernetics and parapsychology. The west and east sides of the mind, so to speak; technology and telepathy; provision and prevision; cyb and psi.” He further proposed that, “art will become, and is perhaps already beginning to be the expression of a psibernetic culture in the fullest and most hopeful sense: the art of visual and structural alternatives.”³⁹

The work of Oliveros and Ascott joins technology and intuition.⁴⁰ Oliveros’ artistic aims for expanding consciousness and transforming culture share affinities with Ascott’s aspirations for joining “cyb and psi” and for instant, global artistic exchanges. Recalling his first experience with computer networking, Ascott wrote, “In Mill Valley, California in the spring of 1978, I got high on networking. I had anticipated the condition ... years earlier, formulating a prospectus for creative work that could, as I saw it, raise consciousness to a higher level.”⁴¹ Joining east and west, ancient Taoist oracle and silicon techno-futurism, Ascott’s *Ten Wings* (1982) connected artists in sixteen cities on three continents via computer networking to facilitate the first planetary throwing of the *I Ching*. In a tellingly-titled essay, “Art and Telematics: Toward a Network Consciousness,” the artist explained the result: “We got close to eighth hexagram, pi (holding together/union), but the bottom line of the lower trigram was unbroken, which transformed the reading into the third hexagram, chun (difficulty at the beginning), which was undoubtedly true.”⁴²

Ascott’s praxis, especially his theorization of telematic art, offers profound insights that could inform research on networked music performance. Participants in Ascott’s telematic art projects experienced an emergent, global field of consciousness, which the artist framed in terms of Teilhard’s concept of the noosphere, Gregory Bateson’s notion of “mind at large,” and Peter Russell’s model of the global brain. In words that might as easily have come from Oliveros, Ascott proclaimed that telematics “constitutes a paradigm change in our culture and ... what may amount to a quantum leap in human consciousness.”⁴³ Throughout their careers, both artists have pushed the limits of their art and consciousness. Oliveros’ musings on quantum listening and quantum improvisation from the late 1990s to the mid-2000s parallel Ascott’s musings on technoetics and photonics from the same period, both offering artistic visions for the future.

Oliveros embraces emerging technology and is especially interested in applying it in ways that are intuitive or not purely functional. In “Quantum Improvisation” (1999) she lists the ideal attributes for a future artificial intelligence “chip” with which she could make music. They include the imaginable technical ability to calculate at speed and complexity beyond the human brain, as well as more abstract psychic abilities, including:

the ability to understand the relational wisdom that comprehends the nature of musical energy; the ability to perceive and comprehend the spiritual connection and interdependence of all beings and all creation as the basis and privilege of music making; the ability to create

community and healing through music making; the ability to sound and perceive the far reaches of the universe much as whales sound and perceive the vastness of the oceans. This could set the stage for interdimensional galactic improvisations with yet unknown beings.⁴⁴

Even as Oliveros consistently frames her work within the inexorable march of technology and scientific research, at the same time she insistently grounds her practice in embodied experience, an element that Ascott de-emphasizes. In this respect it must be noted that since the 1960s, women artists have been the primary force in making the body central to art discourses.⁴⁵ Oliveros was a key champion of this aesthetic shift. Throughout her career, she has combined technology and intuition in body-centered practices that rely on affective experience and subjective reflection.

I trust the accuracy of my body in this enterprise. I am bypassing “thinking” my way in the improvisation. I am counting on and trusting my body to manifest the music purely and freely I have progressed through many changes in music technology from the end of the 1950s to the present. Along the way I developed a bodily relation to machines for making music. It has always been necessary for me to have a bodily performing relationship with sound. I now understand this to be so because of the essential knowledge of the body that is preconscious and nonverbal.⁴⁶

Oliveros is techno-intuitive. Her methods for extending embodied knowledge and expanding consciousness, together with her visionary proposals for the musical application of future technologies in ways that “create community and healing,” lay a foundation for transforming our relationship with the Earth. Sound is relationship. Listening deeply brings us into a relationship with the environment; we merge with it. Oliveros’ emphasis on our embodied relationship to sound leads to the recognition of our inherently embodied relationship with the environment. Which leads to the many threads that link Oliveros to areas outside her domain of music, sound and healing, in particular to current ecological thinking and art making. In *Becoming Animal*, eco-philosopher David Abram explores the sensual relationship between human and the “more-than-human” world. He warns of “machinic modes of activity that stifle the eros between our body and the leafing forest” and claims that “it is time to listen ... [to] the animal stirrings that move within our limbs” and to “the tensions expressed by the sounds or movements of another creature ... [that] sometimes trigger a resonance in my own flesh.”⁴⁷ Embodied sentient knowledge is central to our understanding of other life on our planet.

Deep Listening is web-like in its implications: “Listening involves a reciprocity of energy flow, and exchange of energy, sympathetic vibration: tuning into the web of mutually supportive interconnected thoughts, feelings, dreams, and vital forces comprising our lives—empathy, the basis for compassion and love.”⁴⁸ In 2009, artists Beth Stevens and Annie Sprinkle (who once worked with Oliveros) married the Earth, launching the “EcoSexual” movement, which celebrates the human relationship with the Earth as a lover, promoting caring, responsibility and activism. The EcoSexual Manifesto calls “We invite and encourage ecosexuals to come out. We are everywhere. We are polymorphous and pollen-amorous.”⁴⁹ Donna Haraway describes their work as having a “polymorphic sensuality that is for and of the earth”⁵⁰, which recalls Taussig’s “polymorphic magical substance” of color and Oliveros’ first Deep Listening recording in the cistern. Like Oliveros, the ecosexuals present a positive, highly charged, celebration of life, aligned with Haraway’s

mantra “Staying with the Trouble”, a call to keep focused and to not allow end-of-the-world nihilism to deflect our energies away from healing our troubled-planet.⁵¹ In her *Camille Stories*, which follow five generations of a symbiotic human-butterfly child, Haraway revives the importance of story telling, or “speculative fabulation”, proposing the method of creatively imagining possible futures across multiple generations. It reminds me of Oliveros’ incantations on future listening, for example “how will we meet the genius of more rapidly evolving interactive culture—a genius of culture that could give us freedom of perception beyond present, physical, and mental limitations? Will we stop the evolution with destruction and annihilation, or embrace it courageously to go forward into the new world we are creating with all of its edges?”⁵²

Visionary imaginings of future ecological states of being are invoked through Deep Listening. Oliveros’ proposed ways of listening, rather than being confined to the audible (as is Acoustic Ecology), opens up richer possibilities of interaction with multiple sensual modes of perception and being. Deep listening expands the possibilities of relationships beyond any kind of sensory hierarchy—listening deeply teaches us how to relate to webs of interrelated phenomena on varying scales. It is this potential of sound to reach beyond sound, that helps me think of artists who are engaging in practical solutions to current and future ecological problems. Artists Helen Mayer Harrison and Newton Harrison, who were colleagues of Oliveros at University of California, San Diego, have designed large-scale interventions on the scale of watersheds and continents, transcending geopolitical boundaries and the aesthetic confines of art institutions. Their visionary scale of reimagining the world and the practical solutions they have developed emerge from an ongoing forty-five year dialogue between the artists and the life-web. “We always have to listen to what the life-web wants,” they explain.⁵³ Echoing the land ethics of indigenous people and the tenets of biodynamic farming practices, early in their career the Harrisons made a promise that their art would never take more from the life-web than it gave back.⁵⁴ This commitment of being an agent within a web, rather than an external force controlling it, is again a teaching of the practice of Deep Listening. Composer David Dunn, also friend and colleague of Oliveros, has honed his ability to listen to sounds and understand their potential role in maintaining or tipping ecological balance. His research has led to the implementation of a patented method of sonic intervention to combat bark beetle infestation in forests across western North America.⁵⁵ As Annea Lockwood observed, “[Oliveros] has left us an extensive teaching and much writing to guide us and as she anticipated, it will continue to expand and bloom because it is essential—to deeply listen to one another, to fully hear other phenomena on the planet; from that comes respect and caring. This is healing, and fundamental. Her work and that of her spouse, Ione, is profoundly generous, deeply informed, and continues.”⁵⁶

It is 2017, I am 41 and playing Balinese Gamelan again, now in Santa Cruz. I learn the parts by listening, watching, copying and repeating over and over again. Gradually my body becomes so confident in the part that my conscious memory plays little if any role, my bodily and musical memory takes over. If I try to learn the part by reading the notation I am preoccupied with remembering a string of numbers rather than remembering the sequence of sounds and hand movements. The conscious translation required to turn visual notation into bodily musical sound creates too much delay to the extent that it disrupts my ability to play in the moment and hear all the other interlocking parts of the musical algorithms. The trance like mental states that this music induces in me are disrupted by consciously foregrounding notation, or remembering a series of numbers, but are induced by playing from an embodied musical memory. This way of passing down music through

people’s musical memories rather than through memories’ surrogate, notation, creates a sensation that the music is alive. It is as if the music has a life of its own, that it is continuous, and that musicians tap into it to bring it into our present hearing. This aliveness and continuity of music, requires the necessary channeling by the musicians to bring it alive in our sensual world.

I come to these realizations while driving through the desert expanses of Joshua Tree, California. Finally Jasmin is asleep in the back seat, and I say to Eddie, “that’s it! Its as if the music is always there, every music possible is always there, and we as musicians tap into it, channel it through us, bring it into our waking consciousness—that’s what I mean by sonic consciousness!” The desert and the ocean tend to induce such realizations in me. The desert speaks to me, clarifies my thoughts, I see things clearly and held in a crystal air full of bright light dark shadows dust and distance. It may be called a hallucination, yes certainly music is always everywhere all the time all around me and all around everyone else far away from here. Its clearest here right now a water fall of falling sounds music that I catch dreaming some things sounded some things not yet sounded some never sounded the ecomisticas the ecomusicas. Yes even a waterfall can appear in the desert. I can fly.

Endnotes

- 1 Pauline Oliveros, “Improvising Composition: How to Listen in the Time Between,” in Gillian Siddall and Ellen Waterman, eds. *Negotiated Moments: Improvisation, Sound, and Subjectivity*. (Duke University Press, 2016): 89.
- 2 Harris’ personal reflections interspersed in our essay emulate Oliveros’ *Deep Listening: A Composer’s Sound Practice*, iUniverse, 2005 and Ione’s *Listening in Dreams*, iUniverse, 2005, which both include extensive personal commentaries written by participants who worked with them.
- 3 For another example of joint writing inspired by Oliveros, see Ximena Alarcon and Ron Herrema “Pauline Oliveros: A Shared Resonance” in *Organised Sound 22–1* (Cambridge University Press, 2017). Ximena contributes in the section on telepathy and dreams later in this essay.
- 4 Pauline Oliveros “Pauline’s Solo” in *Sounding the Margins Collected Writings 1992–2009* (Deep Listening Publications, 2010): 266
- 5 Pauline Oliveros, “Improvising Composition: How to Listen in the Time Between,” in Gillian Siddall and Ellen Waterman, eds. *Negotiated Moments: Improvisation, Sound, and Subjectivity*. (Duke University Press, 2016): 89.
- 6 Pauline Oliveros, “On Sonic Meditation” in *Software for People*. Smith Publications, 1984.
- 7 Pauline Oliveros, “Quantum Listening: From Practice to Theory (to Practise Practice) *Music Works* (Spring 2000): 38.
- 8 Michael Taussig. *What color is the sacred?* University of Chicago Press, 2010.
- 9 Yolande Harris, “Scorescapes: On Sound Environment and Sonic Consciousness” Doctoral Dissertation, Leiden University, 2011.
- 10 Cory Arcangel, “Pauline Oliveros by Cory Arcangel” Interview. BOMB 107 (Spring 2009).
- 11 Pauline Oliveros, “On Sonic Meditation” in *Software for People*. Smith Publications, 1984.
- 12 David Jay Brown and Rebecca McClen Novick, “Tales of the Living Dead with Jerry Garcia,” *Voices from the Edge*. Freedom: Crossing Press, 1995. Online at <http://www.mavericksofthemind.com/gar-int.htm> Cited July 20, 2017.
- 13 David W. Bernstein, “Interview with Stewart Brand” in David W. Bernstein, ed., *The San Francisco Tape Music Center: 1960s Counterculture and the Avant-garde*, 2008, p 243.

- 14 Ibid, 244, 243.
- 15 Andrew Olson, interview with Ken Babbs, The Fountainheads website, <https://sites.google.com/view/andrew-olson/ken-babbs> Cited December 7, 2017.
- 16 Alpert was a colleague of Timothy Leary at Harvard and he co-authored with Leary with Ralph Metzner, *The Psychedelic Experience: A Manual Based on The Tibetan Book of the Dead* (1964).
- 17 Pauline Oliveros, "Memoir of a Community Enterprise," in Bernstein, op cit, p 90.
- 18 Ibid. It was directed and staged by dancer-choreographer Elizabeth Harris and Ronald Chase, with slides by Tony Martin and light instruments by Bill Maginnis, both SFTMC collaborators, and a cameo performance by San Francisco Mime Troupe founder and director Ronnie Davis, playing violin in the nude. The music was performed live by Oliveros and others. See Bernstein, op cit, p 90 and Rob Chapman, *Psychedelia and Other Colours*, Faber and Faber, 2016, ebook, np.
- 19 William Osborne, "Sounding the Abyss of Otherness" (2000)
- 20 Cory Arcangel, "Pauline Oliveros by Cory Arcangel" Interview. BOMB 107 (Spring 2009). <https://bombmagazine.org/articles/pauline-oliveros> Cited July 12, 2017.
- 21 p 266 Sounding the Margins "Pauline's Solo" 1998-2003
- 22 Jon Kabat-Zinn (Thich Nhat Hanh, preface). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. Delta, 2009.
- 23 Douglas Kahn states "She comes from a spiritual and occult tradition among American modernist composers that was influenced by Theosophy ... Theosophy invoked contemporary physics, alongside a panoply of Western esotericism, Hinduism, and occult practices, in proposing a vibratory cosmos" *Earth Sound Earth Signal: Energies and Earth Magnitude in the Arts* (Berkeley: University of California Press, 2013): 176.
- 24 Stuart Dempster, "Forward," *Deep Listening A Composers Sound Practice*, xii
- 25 This coincides with other movements in this direction, which responded to a gross need to explore women's psyches through the art of storytelling, dreams, and Jungian archetypes. See, for example, Clarissa Pinkola Estes, *Women who run with the wolves: Myths and stories of the wild woman archetype*. New York: Ballantine Books, 1992.
- 26 John Rockwell, "New Music: Pauline Oliveros," New York Times, Sept 23, 1977.
- 27 Jack Burnham, "The Artist as Shaman", in *Great Western Salt Works: Essays on the Meaning of Post-Formalist Art* (New York, 1974): 141.
- 28 Edward A. Shanken, "Technology and Intuition: a Love Story? Roy Ascott's Telematic Embrace." (abstract) Leonardo 30.1 (1997): 66. Full text online <https://www.leonardo.info/isast/articles/shanken.html>. Cited Oct 4, 2017.
- 29 Roy Ascott, "Weaving the Shamantic Web: Art and Technoetics in the Bio-Telematic Domain" (1998) in *Telematic Embrace: Visionary Theories of Art, Technology, and Consciousness*. Ed., Edward A. Shanken. (Berkeley: University of California Press, 2004): 356-62.
- 30 Marilyns Downey, Skype interview with Edward Shanken, May 5, 2017.
- 31 Robert Ashley's seven episode opera for television, *Music with Roots in the Aether*, 1975, includes "Landscape with Pauline Oliveros," consisting of an interview with Oliveros and several multimedia and music performances by her and collaborators.
- 32 Pauline Oliveros "Introduction," *Deep Listening: a Composers Sound Practice*. iUniverse 2005, p xix.
- 33 Martha Mockus, *Sounding Out: Pauline Oliveros and Lesbian Musicality*, (London: Routledge, 2008): 58.
- 34 Ibid. p 59.
- 35 Annea Lockwood, Email correspondence with Yolande Harris, July 19, 2017.
- 36 Yolande Harris *Listening to the Distance: Eagle* (2015)
- 37 Nina Sobell, artist's website: http://colophon.com/ninasobell/parkbench_docs/portfolio/3/frame.html Cited July 21, 2017.
- 38 Evelyn Stermitz, "Interview with Nina Sobell" (Aug 2007) <http://rhizome.org/community/9286/> Cited July 21, 2017.
- 39 Roy Ascott, "The Psibernetic Arch" (1970). Reprinted in *Telematic Embrace*: 162.
- 40 See Edward A. Shanken, "Technology and Intuition: A Love Story? Roy Ascott's Telematic Embrace" (1997). <https://www.leonardo.info/isast/articles/shanken.html> Cited October 27, 2017.
- 41 Roy Ascott, "Art and Telematics: Towards a Network Consciousness" (1984). Reprinted in *Telematic Embrace*: 186-200. In Indeed, In 1966-67, Ascott anticipated artistic and interdisciplinary exchanges between participants in remote locations, interacting via electronic networks: "Instant person-to-person contact would support specialised creative work... An artist could be brought right into the working studio of other artists ... however far apart in the world... they may separately be located. By means of holography or a visual telex, instant transmission of facsimiles of their artwork could be effected... [D]istinguished minds in all fields of art and science could be contacted and linked." Roy Ascott, "Behaviorist Art and the Cybernetic Vision" (1966-67) in *Telematic Embrace*...
- 42 Ibid: 186.
- 43 Ibid: 189-90.
- 44 Pauline Oliveros, "Quantum Improvisation: The Cybernetic Presence," in *Sounding the Margins* :53
- 45 See, for example, Amelia Jones, *Body Art/Performing the Subject*. University of Minnesota Press, 1998.
- 46 Pauline Oliveros, "Improvising Composition: How to Listen in the Time Between," c. 2012, in Gillian Siddall and Ellen Waterman, eds. *Negotiated Moments: Improvisation, Sound, and Subjectivity*. (Duke University Press, 2016): 83.
- 47 David Abram *Becoming Animal: An Earthly Cosmology* (Vintage Books, New York 2010) p.80 and p.192
- 48 Pauline Oliveros, "Quantum Listening", in *Music Works*, Spring 2000: 45
- 49 Beth Stephens and Annie Sprinkle 'Eco Sex Manifesto' <https://thecosexuals.ucsc.edu/ecosexualmanifesto>
- 50 Beth Stephens and Annie Sprinkle film 'Water Makes us Wet' (2017), premier Documenta XII, Kassel, 2017.
- 51 Donna Harraway *Staying with the Trouble: Making Kin in the Chthulucene* (Duke University Press, 2016)
- 52 Pauline Oliveros, "Quantum Listening", *iMusic Works*, Spring 2000: 45
- 53 Conversation with the authors 2017.
- 54 Helen Mayer Harrison and Newton Harrison *The Time of the Force Majeure: After 45 Years Counterforce is on the Horizon*. Prestel, 2016
- 55 David Dunn <https://vimeo.com/206778388>
- 56 Email correspondence with author Yolande Harris, July 19, 2017.

Haiku for Pauline, as Pauline

Words from Seth Cluett and Tomie Hahn

Both of our work with Pauline has cut across many elements of her life and practice. We performed with her, managed projects, organized events, engaged in Deep Listening, studied with her, and have been deeply involved in the stewardship of her archival materials. Most importantly she was our friend and mentor as a colleague in her role as a Professor of Practice at Rensselaer Polytechnic Institute.

We wrote the haiku below together as a series of games. The fifteen letters of her name, multiplied by the three lines of the fifteen haiku equals 85 lines, which would be her birthday number this year. Fortuitously, the resulting 255 syllables equals the maximum value representable by an 8-bit byte and is both a sphenic number and a Mersenne Prime. Since Pauline was a supreme punster, it seems only appropriate to note it here. We can almost hear her giggling.

Pauline, our soundscape
Moving, resounding, expands
Beyond bounds for you

Aquiet stream sounds
While a torrent fills the mind,
Find peace in between

Utopia, a
Dream-reality, listen
All ears opening

Listen to it all
A dump truck, a lawn sprinkler
Some birds, and yourself

Improvising land
A Sonic Meditation
Conch sounding sea, see?

No words can describe
The infinite sound... aza
Wubahhh moooooo luuuuuuuu zah

Energy flowing
Singing cicada... zehzeh!
Chanting in treetops

On open reel tape
The world is frozen in time
And crafted anew

Laugh a belly laugh
Smile broadly as a secret
Mischief makes great sounds

In the pinna, an
Inner landscape unfolding
Mountains and valleys

Very far away
A sound reflects off the moon
She, a pinball champ

Ears alert, fingers
Reaching out to a soundscape
Giggling cochlea

Really? So many
Cables abound under foot
Ah, telepresence

Oh such memories
Soundscapes are never silent
Deeply listening

Spiraling above
An accordion dreaming
Listens to your heart

Three Recent Moments With Pauline Oliveros

by Stephan Moore

I. JUST PAST MID-AFTERNOON we edge into rush hour, and traffic on the motorway slows down. From behind a 4-meter noise barrier, I track the sounds of passing cars and trucks. As the road becomes more congested, their deceleration shifts the soundscape's dominant sounds from the high-frequency whiz of speeding tires to a lower drone of purring motors.

It is late February 2017, and for a fourth day I am sitting under a tent by a motorway in the Cremorne neighborhood of Melbourne, Australia, surrounded by speakers and, more distantly, microphones. I am here at the invitation of RMIT post-doctoral fellow Jordan Lacey, the principal investigator on a research project studying experimental methods of mitigating the noise of motorways passing through residential areas. My task is to create generative compositions that assimilate and dynamically accompany the traffic noise, transforming its role in the soundscape from an annoyance to an organic, unfolding musical experience. The sounds of the traffic flow through the microphones, through my code, and then, quietly, back out into this pocket park.

Throughout this process, I am listening to the voice of my teacher, Pauline Oliveros. It comes to me in the way that I often hear a mentor's internalized voice, where I am not sure whether I am recalling something once heard, or if I am simply talking to myself via my memory of Pauline's voice and personality. As I sit here, listening to the traffic and preparing to work, I hear Pauline encouraging me to direct my attention inwards. She advises me to become aware of the mechanics of my own listening process, and to catalog its characteristics under these unique circumstances, in order to better understand what I have been and will be doing. Pauline liked these kinds of lists. I take her suggestion.

- **Acclimation:** when I initiate a new transformation program, at first it seems quite soft and indistinct, but its perceptual volume increases rapidly over the first minute of listening.
- **Habit:** after listening to a transformation for a few minutes, I will continue to hear it after I shut it off, as though my ears have a "blind spot" that my mind fills in.
- **Ambiguation:** if a transformation is working, I will eventually start to lose track of what sounds are actually traffic and what sounds are being produced by my program.
- **Familiarity:** as I listen to the variety of sounds that sum to create the traffic noise, their familial membership, frequency (population density), range of variation, and consequential relationships become known, allowing outliers to be easily detected.
- **Horizon of now:** when two related sounds occur within approximately eight seconds of each other, I naturally correlate and connect the events that produced them. Beyond that threshold, the gestalt has moved on, and my mind no longer urgently seeks to draw a correlation.
- **Role reversal:** the sounds of the transformation program flowing around the traffic, which are simply filtered and delayed versions of the traffic sounds, begin to sound like the main sounds, while the sounds of traffic begin to feel ornamental.
- **Transference of perspective:** few things have the power to alter my listening experience more than the known presence of other listeners. When another researcher comes to sit beside me, my listening process begins again, and unfolds differently, taking my sense of their awareness into account.

- **Vacuum:** the sudden cessation of a transformation program is jarring out of proportion to the amount of change in the soundscape it produces. There is an entrainment, an interlocking of perception and expectation, that I participate in without will or consent. Its disruption feels violent.

As I compile this catalog, I realize the important role that duration plays in this project, and that the artistic medium I am engaging with is the domain of aural attention, with all of its shifting qualities: sensitivity, stimulation, discernment, blending, fatigue. Listening is revealed in this context as a narrative process, and its story is the multivalent play of sounds across my ever-changing awareness. In attending to this awareness, I practice what Pauline called Deep Listening, trying to expand my perceptive abilities in their scope and sensitivity to nuance. It also occurs to me that my code will succeed in its aims only to the extent to which it embodies and emulates Pauline's model of everyday awareness and attention.

Leading up to this project, Jordan and I first connected over our shared practice of Acoustic Ecology – field recording, soundscape composition, and actively exploring the interface between humanity and the natural soundscape. So now I note that in approaching this project, which is fundamentally rooted in Acoustic Ecology, I draw my primary tools from a practice of Deep Listening. This work sits comfortably in the curved spot where these two disciplinary branches of musical awareness converge, or diverge, depending on what direction one travels.

II. IT'S EARLY MARCH, back in Chicago, and I've had a squealing in my right ear for nearly a week. I caught a cold just before my flight home from Australia, and my congested skull has been uncomfortably pressurized ever since I landed in LA on the way home. The hop from LA to Chicago only made matters worse. I had been mildly panicking, but earlier today a doctor reassured me that this is not an ear infection, and that issues like this resolve themselves within two weeks, usually. My ear is emitting a high pitched tone that is loud enough to mask the consonants in other people's speech.

After cursing my situation, cursing my ear, and roundly shaking my fist at all of the shortcomings of the human body for good measure, I remain in the same situation, sitting alone with this sound. Once again, Pauline comes to mind, and her voice offers counsel. Now I am listening into my ear, finally overcoming my discomfort and knee-jerk rejection and getting inside this insistent sound. It exists neither in the outside world nor in my imagination— it is an artifact of the physical apparatus of hearing, a consequence of having ears. A malfunction, but only if I choose to think of it as one. For a moment, at Pauline's suggestion, I allow myself to choose differently, to hear this sound as just another part of my reality, no more or less worthy of my attention than any other sound.

Once I separate it from its inconvenience, I find that it's a complex, alien sound of considerable beauty. When my attention wanders away from it, it is high-pitched enough to sound like a single, crystalline sine tone, but under scrutiny it unwinds into a multi-threaded silver rope. I begin to notice how one part of the sound is fluctuating slightly with my pulse, and another with my breathing. Individual threads oscillate independently in pitch and/or intensity, and are masked or foregrounded as they interact with other threads. Even as I study it, I observe how easily my attention slides away from its rippling surface. After having formed a habit of ignoring it, paying close attention to it is hard work.

What does Acoustic Ecology tell me about this sound? Is it merely obstructive noise? Or is it possibly a legitimate and interesting sound but beside the point of a study of environmental sound? Questions of provenance muddy the waters. I check the Handbook for Acoustic Ecology online, and find an entry for “Tinnitus”, which leads to the terse definition of “Acoasma” (also spelled acousma, acoasm, or acosm): “A nonverbal auditory hallucination, such as a ringing, buzzing or hissing.” From there, I can only proceed to a definition of “Hearing Loss” in all of its causes, occupational or not (“sociocusis”). It seems that my experience with this sound is understood, then, the context of a loss of ability to perceive the environment, which is absolutely true, and which would be disheartening if it were not temporary.

And then, what does Deep Listening tell me about this sound? Pauline emphasized listening to all sounds, real, imaginary, and in-between. Her aim was not necessarily to draw inspiration from these sounds (though she certainly often did), or to evaluate them or choose among them — the point was to hear them, as many of them as possible, and then to act, or not, from this position of expanded awareness. What if this sound in my ear were permanent, as it, or something like it, someday might be?

Where Acoustic Ecology talks about the limitations of my internal listening environment, Deep Listening moves the horizon of that environment. Still, on the whole, I find it unfair to compare these perspectives beyond noting that, in this situation, one perspective seems closed-ended while the other seems so open. The goals of each discipline are different, and it is impossible to choose between them, not that anyone is asking me to. Each is a tool, to be used together or independently, as the situation demands. The problem, then, lies not in the difference between these approaches, but in the dogmatic application of either.

I begin thinking about what it would take to produce this sound with technology, to synthesize it and then manipulate it, to get deeper inside it, to try to imitate its shimmers and fluctuations. This is an unrecordable sound, so far as I understand the limits of recording technology, and it also cannot be shut off, but I am finding a way into it, to become friends with it and to coexist with it. The sound becomes my sound, it belongs to me. Since I carry it around with me, I find moments to study it in different contexts. Between classes at my university, I stand at the shore of Lake Michigan and listen to how my sound interacts with the waves crashing on the rocks. Four days later, when I wake up to find it greatly diminished, I actually almost miss it.

III. IN EARLY APRIL, I travel to San Miguel Island in the Azores to attend the Invisible Places conference, where Jordan Lacey and I are scheduled to speak about our work with motorway noise transformation. We hope to connect with the community of artists and ecologists in attendance, share our process and hear outside perspectives on what we have done. Our paper is among the first to be given. In the discussion that follows, the central question raised is whether the implementation of soundscape transformation systems would dissuade communities from taking other steps to address noise pollution more directly. It is as though our work, by promising to lessen the impact of traffic noise, has somehow positioned us as apologists for the purveyors and perpetrators of urban noise production.

Obviously, from our perspective, this is a mischaracterization. At first I am frustrated at what feels like a dismissal of the potential for our work to have a positive impact — considering the cultural trajectory of noise, ever since internal combustion engines began to drastically alter our urban soundscapes well over a century ago, it seems like a misplaced idealism to think that only absolute measures have merit. It feels like a continuation of the tale of the war between evil modern noise and good old-fashioned quietude. Perhaps this group is simply not willing to consider the potential value of the project. As these thoughts escalate in my mind, Pauline’s wise voice visits me again,

encouraging me to open my mind, release my agenda, and hear the anxieties expressed in this pushback as valid and instructive. After all, it’s not as though I do not share their concerns about the damage caused by the deafness of industrial development and transportation culture. Indeed, my interest in the project stems from these very concerns. So why the disconnect?

Heeding Pauline’s counsel, I listen more openly to the conference as it progresses. What I hear, far more than fear and pessimism about the state of the soundscape, is the excitement of people energized by their own projects for raising auditory awareness and enriching their communities with sonic experiences. I realize that I have been drawn to both Deep listening and Acoustic Ecology, in part, by the aspirational aspects of each discipline. Each harbors an admirable idealism about the relationship of sound to the human condition. In Acoustic Ecology, that idealism is focused outward, on the relationship of individuals and societies to the environment, while Deep Listening’s focuses inward, on honing human perception, and fostering an understanding of its implications. These differing paths often lead to similar destinations, which is why we found the response to our paper surprising. But, that encounter aside, to the extent that there is a disconnect between the practices, one has to listen hard to hear it at this conference.

Then, in the conference’s final keynote, on the occasion of her birthday, Hildegard Westerkamp chooses to speak very personally about her family’s connection to the Azores. During the Q&A, she is asked to tell the story of how she became involved in the Vancouver Soundscape project, and how that led to the World Forum for Acoustic Ecology. One detail in her recounting of this story is new to me — when citing the work of R. Murray Schaffer as influential and compelling, she mentions the influence of Pauline Oliveros’ Sonic Meditations in the same breath. This is the thing I have been trying to reconcile — that there are some of us who draw upon AE and DL as two legs of our practice, and see past their possible incompatibilities to a kind of synthesized practice. It never occurred to me that Hildegard might share this integrated practice. Afterwards, I find a moment to approach her and thank her for the talk and ask about this connection. She says, as though I had just pointed out something very obvious, “Oh yes, well, Pauline and Murray were like the mother and the father.”

Now that Pauline has left us in the physical plane, and Murray has stopped making public appearances, those of us influenced by their work have an opportunity to think broadly about the project of pulling both of these powerful and important legacies forward, and perhaps joining them, hybridizing them, and exploring how they can usefully be incorporated into each other. At the very least, we can begin talking about how useful they can be when applied in tandem. In my own practice, I find myself balanced between Acoustic Ecology’s specificity of time and place and Deep Listening’s orientation towards the here and now. Another fulcrum can be identified balancing between Deep Listening’s radical receptivity and Acoustic Ecology’s emphasis on advocacy and civic engagement. Where Acoustic Ecology’s approach tilts towards the empirical, Deep Listening moves towards the phenomenological. Yet, both approaches seek to identify and strengthen a nexus between art and science, seeking ways to infuse one with the other. Both disciplines bring their practitioners more fully into an engagement with the world. Already, as I conduct myself day to day, I endeavor to do so as a child of “the mother and the father.” Perhaps, through listening, engagement, and discussion, this will be a moment for that hybrid community to grow.

STEPHAN MOORE is sound artist, designer and composer based in Chicago. He is a past president of the American Society for Acoustic Ecology and was a student and then collaborator of Pauline Oliveros. He is now a lecturer in the Sound Arts and Industries program in the Department of Radio, Television and Film at Northwestern University.

THIS DAY/THAT DAY

December 1, 2016

Pauline:

This day
A double rainbow over our city of Kingston
Reveals
This is really happening
All is real as any rainbow
A display
Being and Non-Being create each other
Or so they say.
I shall return to check that this is really happening
You shall return to check that this is really happening

Pauline:

Uranus cycles through your stars
Returning in your eighty-fourth year.
Crow eyes me through the kitchen window
Our skylight opens to the myriad lights and
The 10,000 Interviewers want to know
your process
more than ever before.
Speaking with the BBC you say:
“Yes—some do place a feminist interpretation on it,
but I was not thinking of that when I created
Bye Bye Butterfly.
I was in the studio and I knew I wanted to use
a record.
So, I just reached for one on the shelf,
without knowing what it was.
It turned out to be *Madama Butterfly*.”

Pauline:

You are here!
You are not here!
I don't understand what day it is.
Days have fallen in between spaces.
Remember to remember
We will survive this.

Pauline:

One day,
We are tossing exotic crumbs,
strolling by the Rondout Creek,
Your words float in the wind:
“I chose
Rosa Parks Day
December 1, 1955
because ...”

Pauline:

You chose that day
Because
You are drawn
to truth
and the extreme essence
of listening
in deep time.
Listening
to the heart
of the world.
That day
Rosa Parks did not give up
her seat.
There was a power within her.
“I wanted to be free ...
so other people would be also free.”

Pauline:

You are free and
traveling through
Sounds of Great Liberation.
No matter the venue,
the composition
is the listening,
Sounding,
Dreaming.
Being
and
Non-Being.
Choosing
in each
moment
until the listening of all
is heard,
and everything you do
is in all ways
New

—lone

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Resonance of Resistance

By Honna Veerkamp

It is just after 9:00 am, January 21st, 2017. In St. Louis, MO, as in hundreds of cities in the U.S. and around the world, the streets are filled with demonstrators, rallying for social justice and women's rights. Like many others, my friends and I have come out to protest a dangerous and authoritarian shift of power. As we approach the crowd from a few blocks away, swells of chants rise and fall as a helicopter circles overhead.

I hear the *br-br-br-br-br-br-br*-constant thrum of the propeller as its aural path traces from my left ear to my right and back around again. Being here feels to me like a small resistance against a giant, out-of-control machine; the least I can do to resist a regime built on hatred and divisiveness. Walking up, it seems, in turns, futile and critical to join with others and, at least, not be silent. The sound of the helicopter circling above echoes my rage and frustration. Although it's likely just a news vehicle, I imagine it as a siege.

Market Street is packed for blocks (reports will estimate about 10,000 in the streets here today). From a slight distance, the crowds' chants are indistinct, but eruptions of cheers and whoops rise in pitch and volume every few moments, punctuating the generic crowd sounds.

As we join the march, the composition of this din comes into focus as an amalgamation of conversations, laughter, wind hitting protest signs, and feet slapping pavement. Near by, a young girl stomp-slides her gold sneakers as she marches, marveling at the fine squealing rhythm they make on the street. Periodic calls and responses ring out, but they tend to fizzle rather quickly. In large part, this crowd seems to prefer to let its signs do the talking. A silent chorus of slogans rings out from countless posters:

Don't be Complicit
Protect VAWA
I Support Planned Parenthood
Resist
Black Lives Matter
Why March? Equality!
Love Trumps Hate
Words Matter
Democracy, Tolerance, Justice, Equality
Love, Rise, Resist

Hell Hath No Fury
Grab Back
Find and Destroy
Volde-Trump's Horcruxes
This Body is not a Political Battleground
Time to Impeach
Not a Racist, Not a Criminal,
Proud to be a Mexican
Not my Role Model
Truth Matters
Silence is not an Option
Health Care is a Human Right
Women's Rights are Human Rights
Love Hugely
Nasty Woman
Keep Abortion Legal
Make America Think Again
Girls Just Wanna Have Fundamental Rights
I'm so Mad
Where do we go from Here?

Rainbow flags and pink pussycat hats are everywhere, communicating in the registers of symbols and memes. Despite the festivity of these accessories, the mood is staid. Suddenly, a line of drummers breaks the relative quiet, as it makes its way down the line at a faster clip. The crowd's energy starts to rise as the drummers, who are called Justice Beats, draw closer. They circle and dance, rallying the crowd as they move. Cheers mix with drumbeats. *Bam-ba-bam-bam, bam-ba-bam-bam, bam-ba-bam-bam, ba-ba-ba-ba-bam-bam*. Music is what has been missing from this march.

Unapologetic and backed with percussion, the drummers' chants are fierce. "No Trump, no KKK, no fascist U.S.A.! No Trump, no KKK, no fascist U.S.A.!" The crowd joins in with the drummers, but I notice a collective discomfort among some of the marchers that seems to expose the tenuousness of our solidarity. Are the words too direct? Do we think we need permission to scream?

This eruption of music and the infectious rhythm of the snaking line of drummers, now moving further ahead, has disrupted not only the soundscape of this sector of

the protest, but also its racial and cultural makeup. To characterize the protest as mostly white would dismiss the presence of many people of color, but it should be acknowledged that the majority-white, mostly-middle-class crowd is just about the inverse of St. Louis City's population. The drummers, all people of color, and their raucous chanting, challenge white and otherwise privileged protesters not be complicit as they call out:

Our Lives are under attack. What do we do?
Stand up, fight back!
Black Lives are under attack. What do we do?
Stand up, fight back!
Immigrant Lives are under attack. What do we do?
Stand up, fight back!
Trans Lives are under attack. What do we do?
Stand up, fight back!
Gay Lives are under attack. What do we do?
Stand up, fight back!
Women's Lives are under attack. What do we do?
Stand up, fight back!
Stand up, fight back!

As the crowd closes back in on itself, filling the space left by the drummers, construction on Market Street causes a bottle neck in the march. My friends and I step into the nearby City Garden sculpture park to take a little break, while the demonstration inches by. Our favorite sculpture is a musical piece called *Dance Chimes*, by Alfons Van Leggelo, which consists of a grid of nine foot-long brass squares tuned to a pentatonic scale that you "play" by walking or jumping on them. Playing the instrument looks kind of like a combination of hopscotch and tap-dance and can be done solo or in tandem with someone else. The sounds are like bells, and there is no discordance. Whatever squares you happen to step on, they all sound great. The helicopter, still flying above, now sounds like a drum to me, beating out a complimentary rhythm. A crowd of kids gathers

Commentary (continued)

around as my friends jump out their ditties, and then the kids take turns, cautiously at first. They run up, and bounce, *one-two-three*, and then retreat, the littlest one of them surprised by the effort it takes to get out a clear sound. An older man with a cane waits and then does an elegant turn on the dance floor, telling us that this is his favorite sculpture in the park too. This playful improvisation with strangers contrasts the social rhythms of the protest and reminds me that moments of wonder and solidarity are often found in unexpected places.

We rejoin the march as it nears its destination, the grounds of the Gateway Arch, which is symbolic not only of St. Louis, but also of expansion. This is a nice sentiment if you think about it in terms of belief systems

rather than conquest. Speakers have begun to address the marchers from in front of the arch, but the grounds are crowded, and we are feeling ready to head home soon. Even with amplification, the speakers' voices sound muffled from where we are, and the crowd noises once again become indistinct.

We watch for a while from the steps of the Old Courthouse across the street, where Dred and Harriet Scott once tasted freedom before their suit was overturned in Missouri—a verdict that would go on to be upheld as one of the most deplorable cases in U.S. Supreme Court history. Around us, a jumble of conversations, with rising and falling pitches and cadences, mixes with the sounds of traffic and the dull thrum of the helicopter still circling above. Framing

a crowd of thousands who have come here today to stand up to injustice and rally for human rights, the arch makes a great picture, even though I know it stands for Manifest Destiny. What better symbol to punctuate our resistance?

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Justice Beats. Photo by Sarah Foster.

Augmenting Urban Space with Environmental Soundscapes and Mobile Technologies

Dr. Leah Barclay, Griffith University, Australia

Abstract

As locative media and augmented reality swell into mainstream culture, this article traces my creative explorations with locative sound, stretching across a decade of practice. The featured projects are all embedded into larger research initiatives, which are designed to explore the value of acoustic ecology as a socially engaged, accessible and interdisciplinary field that can inspire communities across the world to listen to their environment. These interconnected projects draw on sound walking, mobile technologies and locative media to investigate the role of sound in achieving presence and connection to place. The creative works are accompanied by the introduction of new projects that are informed by this research, and reflections on the future possibilities of locative media in exploring layers of our social, cultural and ecological environments through sound.

Introduction

Sound has a profound ability to make us feel present and connected to our surrounding environment. In recent years, there has been a proliferation of site-specific audio works exploring the possibilities of mobile technologies and locative media in place. This means at any given moment in an urban environment, we could be moving through a sound field of voices, music, memories and sonic art, dispersed invisibly throughout the places we inhabit. While this material is available only to those with mobile devices and knowledge of the locative experiences, the advancement of new technologies and the accessibility of mobile devices means new opportunities for exploring our social, cultural and ecological environments through sound. In the 2007 CreateWorld keynote presentation in Australia, pioneering media artist Nora Farrell, remarked that the future of computing is in the mobile phone. She proposed it to be the most valuable platform for creative artists to focus our energies, and predicted an incredible future for interactive spatial audio on mobile platforms. The body of work that has evolved internationally over the last decade suggests Farrell's premonition was certainly correct and she has been an endless source of inspiration for my ongoing research.

New technologies are providing a rapid increase in accessibility and engagement, however these practices stem from a significant body of creative work dating back to the 1960s. Transient experiences in which the core focus is sound and listening, are well established in practices such as Soundwalking, which has been active since the 1970s when it was pioneered by practitioners

including Westerkamp (1974), McCartney (2014) and Corringham (2016). Locative sound art practices have been active for almost four decades, with artists including Max Neuhaus in the 1960s, Janet Cardiff and George Bures Miller's audio walks in the 1990s and a wide diversity of artists over the last two decades. Significant works include Graeme Miller's *'Linked'* (2003), a piece that broadcast voices and memories along the M11 Link Road in London after 400 houses were demolished, and Christina Kubisch's *'Electric Walks'* which launched in Cologne in 2004 and involved listeners wearing sensitive wireless headphones that amplify inaudible electromagnetic fields in one's surrounding environment (Kubisch, 2016).

Many of the works in the field have an underpinning ecological focus. In *'Listen Toward the Ground'* by Jeremiah Moore (exhibited at ISEA2012 in New Mexico), the soundscape of downtown Albuquerque was superimposed with oilfield infrastructure to highlight the realities of energy extraction. ISEA2012 also featured the work of Teri Rueb, who is widely considered a leader in the field particularly through her work *'Core Sample'* (2007) which uses GPS across Spectacle Island in Boston Harbor to evoke sound material and cultural histories of the landscape. At ISEA2012, Rueb collaborated with Larry Phan on the work *'No Places With Names'*, which explored the concept of wilderness and its shifting meanings across cultural contexts through geolocated sounds surrounding the Institute for American Indian Art in Santa Fe. The sounds and personal stories emerged from the landscape and facilitated a profound connection to the immediate environment that would have

been impossible to achieve inside a gallery.

Listening and walking are both temporal activities that have the capacity to connect us to the physical landscape (Behrendt, 2013). Despite the emerging body of work, it has been widely considered that mobile technologies disconnect us from the environment. During a session at the 2013 IUCN World Parks Congress in Sydney, there were numerous presentations that suggested spending time in the wilderness free from mobile devices. These were the most effective means to inspire ecological engagement and climate action amongst younger generations. However, having witnessed young people engage with ecological locative media experiences, I hold the position that a headphone-based sonic experience can motivate communities to connect to their environment through sound. Thus my presentations during the congress revolved around thinking of mobile technologies as tools for reconnection as opposed to disconnection, which was met by a mixture of curiosity and disagreement.

This notion has been championed by others including Behrendt (2013) who suggests that locative media experiences such as Rueb's *'Core Sample'* (2007) have the potential to reconnect people with natural ecosystems rather than alienate them. Speed (2010) believes locative media has the capacity to construct a sense of place through its potential to bind geographical, social and cultural dimensions. Droumeva (2016) examines the multimodal possibilities of the smartphone and highlights how it is increasingly integrated into the fabric of everyday life particularly through sensorial encounters with physical spaces. In

the context of oral history, Bradley (2012) suggests locative audio experiences can have important implications in the ways oral history can be presented and connected to places, and moreover, play a vital role on how it is collected, achieved and curated. As locative media and augmented reality shifts into mainstream culture, this article traces my creative explorations with locative sound stretching across a decade of practice. While the highlighted projects differ in terms of content, they all share the same intention in experimenting with the possibilities of mobile technologies as tools for ecological connection and exploring the value of acoustic ecology as a socially engaged, accessible and interdisciplinary field that can inspire communities across the world to listen to the environment.

Creative Explorations in Locative Audio and Site-Specific Sound Art

My initial encounters with sound in locative media experiences happened in Europe and Australia, through museum tours and audio walks that had a tourism or historical focus. While I was intrigued by the possibilities, it was not until a performance in 2007 that I became engaged in exploring locative media experiences in my own creative practice. *'iOrpheus'*, otherwise known as the *'iPod Opera'*, was a large-scale transient performance which used sound to activate the South Bank Parklands in Brisbane, Australia, on August 31, 2007. *'iOrpheus'* was conceived and created by American composer William Duckworth and media artist Nora Farrell, who are widely regarded as internet pioneers through their creation of virtual music and interactive web based experiences (Duckworth, 2005). The project was produced by the Queensland Conservatorium Research Centre with the support of a Fulbright Senior Specialist Grant.

The performance interpreted the story of the mythical musician Orpheus in five acts stretching the entire length of South Bank parklands with live music, immersive sound installations, dance and dynamic fire displays. *'iOrpheus'* was a ground breaking work that pioneered the possibilities of iPods in live performance. Multiple devices were dispersed throughout the event streaming ribbons of sound that moved throughout the parklands sonically connecting each node of the performance. The sounds were streamed via podcasts, with Farrell and Duckworth truly exploring the creative potential of

emerging technologies. This was the first largescale performance to use podcasting in such an innovative way and exposed the audience to the future possibilities of mobile technologies in music composition. I was deeply inspired by the entire experience—from the transient nature of the performance to the incredible way mobile technologies were seamlessly used to heighten our connection to place and sense of sonic immersion.

I was privileged to meet and work with Nora Farrell and William Duckworth during their time in Australia and my pathway into locative media was solidified in 2008 when they invited me to collaborate on *'Sonic Babylon'*, an interactive sound garden riding local Wi-Fi networks. The *'Sonic Babylon'* sound gardens were designed to grow with music, sounds, and stories, accessible on mobile devices in selected spaces within a community. As visitors move through the garden, the *'Sonic Babylon'* application tracks their position in the space and the 3D audio engine generates a real-time sound mix relative to the location of the planted sounds. The Sound Garden toolkit and *'Sonic Babylon'* application, developed by Nora Farrell, was modified from Tactical Sound Garden [TSG], an open source software platform for cultivating public sound gardens developed by artist and architect Mark Shepard. The Tactical Sound Garden tool kit draws on the culture of urban community gardening to posit a participatory environment for new spatial practices and social interactions (Shepard, 2005).

The positional audio environment of *'Sonic Babylon'* and TSG allows users to not only listen to the soundscapes but also participate by planting and pruning sounds. Mark Shepard describes the TSG Toolkit as a parasitic technology, as it feeds on the propagation of WiFi access points in dense urban environments (Shepard, 2005). In locations where there are minimal WiFi access points, the gardens may consist of a single street, but when there is a density of nodes the gardens have the capacity to grow across the entire city and beyond (Farrell, 2009). While both *'Sonic Babylon'* and the Tactical Sound Garden toolkit had a clear intention for densely populated urban spaces, I was interested in exploring the potential in regional areas during the first phase of Sound Gardens in Australia. In addition to *'Sonic Babylon'* installations at the National Film and Sound Archive in Canberra and the Queensland Conservatorium Research

Centre in Brisbane, I worked with Duckworth and Farrell to install sound gardens in regional communities on the Sunshine Coast, which required the installation of WiFi nodes specifically for this experience.

The first *'Sonic Babylon'* installation on the Sunshine Coast launched at the Noosa Regional Gallery on September 12, 2009. The sound garden grew with historic recordings, local stories, indigenous voices and excerpts from my sound installation *'Eco Sonus'*, commissioned for Floating Land 2009. *'Eco Sonus'* was a multi-platform project designed to connect communities to the environment through sound and acoustic ecology. The collaboration with *'Sonic Babylon'* was a perfect extension to *'Eco Sonus'* in allowing communities to experience the acoustic ecology of Floating Land, augmented through the art gallery and along the Noosa River. The *'Sonic Babylon'* sound gardens have a diversity of positive outcomes for a community, including the ability to repurpose existing digital content (such as oral history) and also the ability to observe a system, a virtual ecology, and hear what kind of voices and themes may arise. I was fascinated by the versatility of the project and its ability to grow within a community over time. I was also in awe of the creative process of both Duckworth and Farrell and inspired to delve deeper into the potential of mobile technologies and locative media in my own creative practice. The *'Sonic Babylon'* mobile application and overarching creative project was clearly ahead of its time, highlighting the incredible creative and technical genius of Nora Farrell. The mobile app had the capacity to host dynamic and interactive spatial audio experiences, it provided incredible agency to the community in sculpting personal sonic experiences. As some of the world's leading artists, Nora Farrell and William Duckworth were incredibly generous collaborators and designed the experience to meet the needs of the community. It was evident their work was truly about the value of deep listening and sound as a tool for connecting, inspiring and revealing possibilities for the future.

'Sonic Babylon' became an integral element of various acoustic ecology projects I produced across regional Queensland from 2010–2015. The project was a core layer for *'Cypress Trilogy'*, a work commissioned for the Sunshine Coast Council TreeLine initiative—one of Australia's most ambitious green art projects in 2010. *'Cypress Trilogy'* combined immersive environmental soundscapes, live performers, interactive

Research (continued)

lighting and live projection art and was my first major commission inspired by the Noosa Biosphere Reserve. The piece opened with a collaboration between Indigenous artist Lyndon Davis and the Gubbi Gubbi Dance troupe on the banks of the Noosa River and was followed by 'Dusk, Darkness and Dawn', three contrasting movements that formed the body of this multi-sensory performance. The work provided a rich tapestry of local history abstracted through the soundscape and featured pioneering Korean taegum artist Hyelim Kim, virtuoso guitarist Anthony Garcia, video artist James Muller and dancers Jeremy Neideck and

agency. By the community adding their own sonic responses and becoming part of the project, the sound garden was dynamic, alive and constantly evolving, resulting in a sustained process of community engagement beyond the performance, and encouraging engagement with place in new ways.

Amongst the first layers of sound planted in 'Sonic Babylon', were conversations with Lyndon Davis, who spoke about the Indigenous history of the Noosa Biosphere Reserve and introduced Gubbi Gubbi words (the Indigenous language of the region). As this cultural knowledge is not easily accessible for the local community, it was rewarding to

layers of local history though sound. 'Cypress Trilogy' also used twitter to host a conversation with the community about the project and explore new ideas for the future. The idea of mobile technologies reconnecting communities to the environment was seen as a contradiction by some, but the local community was clearly engaged and actively listening to environments that were not traditionally audible.

While 'Sonic Babylon' was undeniably a ground breaking milestone for locative sound art and ahead of its time in terms of concept, technology and innovation—maintaining the engagement of the community was always a challenge. The project came at a time when smart phones were not in everyone's pocket, and the notion of using a mobile phone to plant and prune locative soundscapes was beyond comprehension for some members of the community. This inspired the development of community workshops and initiatives such as 'NeoSonic' (2010), which provided accessible pathways for regional communities to explore and experiment with the creative potential of mobile technologies in public space. 'NeoSonic' was developed and funded under the banner of NeoGeoGraphy, a creative place-making program initiated by Queensland local government to assist communities in navigating new technology. In addition to 'Sonic Babylon' installations at the Cooroy Library and Mill Place Precinct, I launched a suite of other projects through 'NeoSonic' including a virtual orchestra (using mobile devices), networked performances with children, sound walks and extensive interactive workshops which were supported by funding from Arts Queensland and Sunshine Coast Regional Council.

At the NeoGeoGraphy showcase in November 2010, we created a multi-sensory performance mixing community interviews and environmental recordings with live

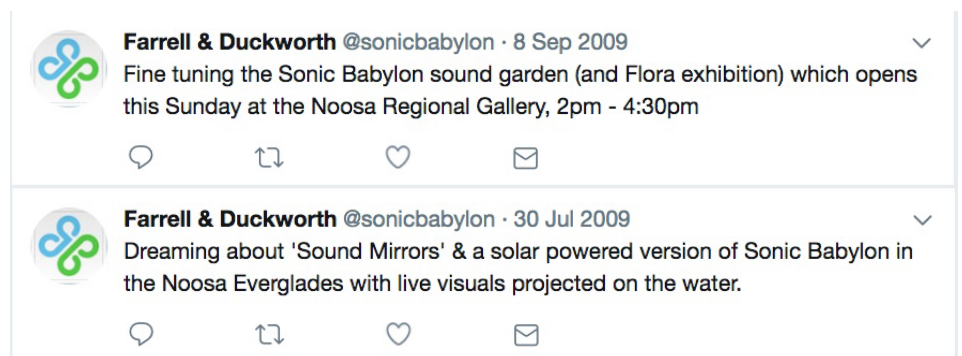


Cypress Trilogy

Mary Eggleston.

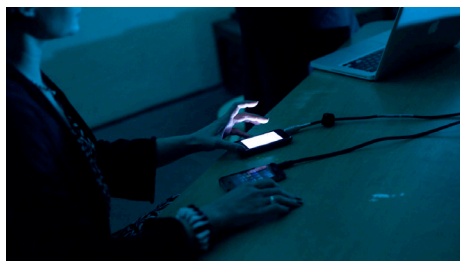
'Cypress Trilogy' concluded by returning outdoors to the same location as the prelude, with the soundscapes blending into the 'Sonic Babylon' sound garden, together with interactive lighting set among the trees along the Noosa River. While the performance had been a passive experience, this final experience was deliberately designed to directly engage the community in the interactivity of the work. The 'Sonic Babylon' sound garden enabled interaction, engagement and immersion with the environmental soundscapes. The idea was to empower the community to become collaborators in the work and also to emphasise the importance of acoustic ecology and participatory engagement in the overall project. I was inspired to integrate 'Sonic Babylon' to offer the community

observe this project facilitating knowledge sharing through new technologies. Young children were learning the Gubbi Gubbi words for their surrounding environment as they walked throughout the gallery—their parents were equally curious in discovering



Tweets from 'Sonic Babylon' in 2009

digital drawings, projection art, live musicians and Gubbi Gubbi Dancers. I improvised with soundscapes streaming on two iPads, while Nora Farrell composed a live mix from *'Sonic Babylon'* with iPhones in each hand. As we were using the first iPads distributed in Australia—we believe this was the first-time iPads and iPhones were combined for an immersive performance that integrated live streaming audio and spatial diffusion. The concert was a prelude to ongoing community engagement with *'Sonic Babylon'*, where local audiences recorded and composed their own soundscapes. Despite these periods of intensive community engagement, it was a continual challenge encouraging the local community to engage with these locative media experiences independently. This was largely due to the accessibility of mobile devices and the technical aptitude of the communities engaged in these projects in regional areas.



Nora Farrell and Leah Barclay performing at the NeoSonic showcase in 2010

Throughout 2010–2013, I created various stand-alone sound walk experiences which simply used fixed media compositions streamed on mobile phones, and physical sound maps including walking directions. These had varied successes in terms of engagement but lacked the sophisticated complexity and interactive possibilities of *'Sonic Babylon'*. I began to explore the multi-platform potential of locative media in extending the experience of live performances. The first public outcome of this research was during the 2013 season of *'Zameen'* at Sydney's Riverside Theatre for Paramasala Festival.

'Zameen' is the first major performance from *'The DAM(N) Project'*, a large-scale interdisciplinary art venture that connects Australian and Indian communities around the common concern of global water security. It presents the lives of remote communities in the Narmada Valley of North India, displaced by large-scale dam development which is securing hydropower for Indian cities. *'Zameen'* is a Hindi word meaning 'land.'

It is a word that has become synonymous with the Narmada movement and with the submergence of the valley. As a performance piece *'Zameen'* is a holistic project. It integrates innovative technology, diverse community perspectives and true stories of resilience, to create an immersive performance through projections, choreography and multi-channel soundscapes. Described as mysterious, beautiful and utterly captivating (Paramasala, 2013) *'Zameen'* pulls audiences into the heart of a remote Indian community fighting for their way of life. Within this world, two dancers perform an intense, controlled and intricate dance score inspired by the stories and movement of the community. An immersive audiovisual environment, composed entirely out of recordings from the Namada Valley, positions the audience in the midst of their song and struggle to secure land in the face of large scale dam development.

'Zameen' was developed collaboratively with Sydney-based producer Jehan Kanga and S. Shakthidharan, the director of CuriousWorks, who created triptych visuals for the show in response to my immersive soundscapes. My material for this project was sourced during a journey we made into India's Narmada Valley in 2011. We lived and worked alongside families whose lands and livelihoods are slowly being submerged due to large scale dam development in the area. The movement to halt the submergence and question India's development processes—called the Narmada Bachao Andola or "NBA"—has become one of the most successful activist movements in contemporary social history.

The season of *'Zameen'* at Parramasala Festival 2013, was designed as a multi-platform experience. Our documentary screened on a loop prior to the show and the foyer featured a photography installation that visually explored the communities we encountered during our creative development in North India. The festival also invited us to create a locative sound installation to accompany the show. Unlike the participatory *'Sonic Babylon'*, this was to be a singular experience with a specific thematic focus. The source sound material is predominately from the regional area of Jobat, where we collected stories and solidarity songs from over 20 displaced groups who had gathered at a satyagraha (non-violent protest). Each soundscape draws from our experiences in situ, ranging from abstract explorations of hydrophone recordings in the Narmada River, to songs of hope from the children.

Ultimately, the soundscapes of *'Zameen'* were designed to connect global communities around the common concern of global water security and to reveal the ramifications of damming rivers that hold cultural and spiritual significance for indigenous communities world-wide. The locative media experience needed to be culturally sensitive to these voices as well as adapt to how audiences shifted through the work. My response was to compose a series of three minute experiences that worked together as a multi-layered composition and were designed to draw the audience outside towards the Parramatta River.

I explored the possibilities available—developing a custom mobile application or various existing platforms that would be appropriate. We settled on using an application called *Sonic Maps*, a locative audio application that will be discussed in detail in the next section of this article. I was attracted to *Sonic Maps* as it allowed me to use GPS to position the soundscapes, thus allowing the audience to journey through a non-linear exploration of the soundscapes throughout the Riverside foyer and along the Parramatta River. However, I encountered some immediate technical problems as the theatre and its surrounding area was in a GPS blackspot, which meant the app was unable to recognise the locations and the audio playback did not function correctly. Due to time and budget constraints we were unable to develop a customised app, so we resorted to recreating the sonic environment as a series of fixed media experiences streaming from our website (www.thedamnproject.com). Audiences could use their own smartphone or the players and headphones provided at the box office, to immerse themselves in the soundscapes before or after the show. Despite the technical issues, this provided a rich layer to the work and gave audiences the opportunity to engage with the soundscapes in a more embodied way, particularly as they walked along the river bank. The juxtaposition of listening to the heart-breaking stories of the Narmada River while walking along an altogether different and healthy river system, opened up possibilities to deeply reflect on the water thematic that rippled throughout this project.

The audio tours model was also explored during the launch of the Biosphere Soundscapes project in 2012 (www.biospheresoundscapes.org), with binaural recordings and electroacoustic compositions designed for augmented reality sound walks

through particular locations in the Noosa Biosphere Reserve. These were not location triggers, but simply just visual sound maps and streaming audio files. This process highlighted for me, the limitations and simplistic nature of these experiences. While they are very effective in some instances, they were too restrictive for the style of experiences I envisaged that were truly responsive to place and only activated with location and movement. I was much more interested in the idea of the sounds only triggering once a listener was present in the specific locations, which is the feature of the WiFi technology pioneered through 'Sonic Babylon' and TSG, as well as the plethora of GPS triggered locative media tools becoming readily available. As McCartney (2014) outlines there are many limitations of audio tours, particularly in relations to pacing, rhythm and timing, but she also emphasises that "decisions about the location, style, content, and montage of sound in a soundwalk have political, social and ecological consequences" McCartney (2014).

At this point in time when locative media applications were gradually proliferating public spaces, I was intrigued by platforms that presented opportunities for collaboration, where community voices, memories and local history were intertwined with locative artworks and soundscapes. This was the underpinning of the creative projects that will now be discussed. They explore the idea of adapting and appropriating existing tools that work towards the development of a custom application for acoustic ecology and augmented reality audio. Prior to introducing these projects, I will briefly reflect on the available tools to contextualise my decisions with using specific platforms.

Augmented Reality Sound and GPS Audio Tools

The following section does not seek to review all existing augmented reality or locative media applications for audio, but rather chronicle the applications that have influenced this research and highlight the platforms that are collaborative in nature and focus on specific tools relevant to the creative projects I was engaged with throughout these projects. It should be noted, that while aspects of these mobile applications influence and inform how audiences interact in public space, the focus of this research remains on deep listening, engaging with our soundscape, and exploring the possibilities of mobile technologies

in interrogating and understanding our relationship with place.

NoTours NoTours.org, is a locative media project by the collective Escoitar.org, designed by Horacio Gonzalez and Enrique Tomas. This application encourages community participation and allows users to attach sounds to a location using GPS. While this app has many positive features, it runs on android only, so was not suitable to meet the accessibility guidelines of this research. The *NoTours* application has inspired a wide spectrum of similar projects and has been particularly influential at the NOVARS Research Centre, currently directed by Professor Ricardo Climent at the University of Manchester. The NOVARS Research Centre has developed a large portfolio of augmented reality projects and its alumni include some of the current leaders in the field, including Dr Ignacio Pecino, who developed *Sonic Maps* when he was a PhD student at NOVARS. In addition to providing a sophisticated GPS audio platform, *Sonic Maps* includes a 3D audio engine option using Unity3D for immersive soundscapes and rendering sounds in realtime. It also allows flexibility when experiencing sounds in situ and includes tools such as panning through device rotation and responsive sound levels based on your location in relation to the sound file. *Sonic Maps* is also available for iOS and Android and builds on the original tools developed by *NoTours*. *Sonic Maps* was the platform used for the initial sound experiences for 'Zameen' and it allowed us to explore the challenges and opportunities when using GPS to trigger audio experiences in urban and regional locations.

Josh Kopeck, a London based entrepreneur and artist working with sound and geolocation, was also a PhD student at NOVARS where he was inspired by *Sonic Maps* after experiencing one of the sound walks produced using the app. This resulted in the creation of *Echoes* (Echoes.xyz), an augmented reality application that uses GPS to determine the users' location and orientation, in order to trigger content while moving through an environment. *Echoes* was developed in collaboration with Mathias Rossignol and has produced a wide spectrum of dynamic experiences in addition to supporting an expanding database of user generated content. While *Echoes* was not used in the initial creative projects outlined in this article, the potential of this platform sparked a range of new

projects and influenced the development of my latest body of work that will be discussed at the end of this paper.

There are a wide spectrum of other applications that facilitate the creation of GPS audio tours such as *Shoudio* (www.shoudio.com) and *U-GRUVE* (www.u-gruve.com), an application that has commissioned composers to create music in response to place and use GPS to trigger the compositions for listeners. *U-GRUVE* was designed and created by Richard Rodkin, a New York-based composer and creative coder who launched the app for Creative Tech Week 2016 in New York City. The accessibility of location-based technology and the popularity of podcasts means GPS audio experiences are gradually becoming part of consumer media, particularly with ventures such as *DeTour* (www.detour.com) producing GPS audio walks that take you beneath the surface of the city "infused with cinematic scoring and storytelling by some of the best writers and sound designers in the world" (www.detour.com).

Amongst these applications, I discovered *Recho* (www.recho.org), an app that was attempting to establish a social network for sound and had perfected an interface for GPS audio. The platform hosts an incredible diversity of content across the world ranging from geo-located sonic art and museum tours, to community stories and challenging treasure hunts. *Recho* also allows users to record directly into the app, responding in realtime to their experience and allowing the soundscapes to grow in a similar way to 'Sonic Babylon'. The platform was created by Copenhagen based designer Åsmund Sollihøgda and transmedia-producer Mads Damsbo, who were inspired to create *Recho* by their love for podcasts. The pair were interested in the idea of users leaving digital sounds in physical places and the notion that stories and interactions inherently belong to place. The user experience of *Recho* is also designed to explore the possibilities of audio in location-based social media, with the ability to connect, share and collaborate, or even leave sounds at a specific location for a single user. My initial attraction to the app was the accessible sonic experience and the interface. While many GPS audio apps are reliant on map based visual interfaces, *Recho* transforms the users' device into a dynamic sonic compass with sound appearing in colour coded shapes and sizes in relation to the featured content. The interface for interact-

ing with the soundscapes was intuitive and accessible and allowed users to experience the soundscapes in a non-linear way.

Åsmund Sollihøgda and the *Recho* team were enthusiastic about the possibilities for their tools being used in the context of acoustic ecology, environmental engagement and awareness. While not the initial intention of the platform, they were highly supportive in exploring a range of ideas related to sound, place and locative media. In December 2014, we formed a partnership to explore the creative potential of *Recho* through a series of sound installations augmenting public spaces with environmental soundscapes. The following creative projects outline the results from our partnership from 2014–2016.

Wira River Listening

WIRA means moving water in Gubbi Gubbi language, the first nation people of the Noosa Biosphere Reserve in Queensland, Australia. In late 2004, I composed my first piece inspired by the Noosa River. This was the beginning of a decade of creative work that explores the value of sound, digital technology and community engagement in environmental awareness. *'WIRA River Listening'* is an interactive sound installation that reimagined the world beneath the surface of the Noosa River for Floating Land 2015 at the Noosa Regional Gallery in Queensland, Australia. Floating Land began as a biennial outdoor sculpture event in 2001 and has since grown to become one of the most significant contemporary 'green art' events in Australia. The theme of Floating Land 2015 was Reflect & Re-imagine which provided an opportunity to pause and reconnect with the grassroots beginnings of this event, exploring the connection between art, the environment and the local community.

'WIRA' explores rivers as the lifeblood of communities and reimagines the Noosa River in sound by layering the environmental sounds of the river system with sonic art, stories and soundscapes from Floating Land that I have recorded and composed over the last decade. The installation is underpinned by hydrophone (underwater) recordings layered with a diversity of cultural and biological soundscapes. Many of these soundscapes include the voice of Gubbi Gubbi artist Lyndon Davis speaking in Gubbi Gubbi language and introducing the Indigenous history of the Noosa River. When experiencing *'WIRA'* on location, these geo-located soundscapes are layered with binaural and hydrophone recordings and live

streams of the Noosa River. These recordings and hydrophone streams evolve and adapt based on the conditions of the Noosa River, meaning every walk is a unique experience. The installation was designed inside the application *Recho* and was the first public outcome from our partnership. *'WIRA'* was also the first major creative outcome from *'River Listening'*, an interdisciplinary project exploring the creative possibilities of aquatic bioacoustics in global river systems. *'River Listening'* launched in 2014 through my Synapse Residency supported by the Australian Network for Art and Technology and Australia Council for the Arts and was developed in collaboration with the Australian Rivers Institute.

'WIRA River Listening' opened on August 27, 2015, and has remained a permanent installation for the community. The entire installation takes roughly one hour to experience, but the compositions were created in a non-linear layout meaning listeners could experience the installation in sections or return to different locations over the duration of the exhibition. The distance of each sound varied, with some placed very close together and others further apart, to encourage reflections and active listening to the natural sounds of the Noosa River and surrounding environment. In these instances, the listener was encouraged to walk for up to five minutes before they reached the next soundscape. It was essential *'WIRA'* was accessible for the local community, so those without access to a smart phone could also listen inside Noosa Regional Gallery at the *'WIRA'* listening station. I also created an accessible version online (www.leahbarclay.com/wira) with selected compositions, to allow community members who were unable to walk the distance the opportunity to listen from any location. The gallery provided headphones and listening devices during open hours, although the installation remained live consistently, thus listeners could come at dawn or dusk to experience the installation and many opted for listening at times when the gallery was closed and the surrounding environment was much quieter.

The soundscapes of *'WIRA'* explore the value of sound and technology in contributing towards environmental awareness and engagement. Each sound was located in direct relation to a relevant part of the river bank. Snapping shrimp became louder as you walked towards the jetty, community voices arose at landmarks, and the sounds of deep hydrophones drew listeners closer

to the water. While much of my previous research had suggested that a multi-channel immersive acousmatic concert with high-quality speakers is the most effective method to inspire environmental engagement through electroacoustic music, *'WIRA'* suggested otherwise. Community members who would never attend an electroacoustic concert were enthralled by the experience and children stayed engaged and listening for a remarkable amount of time. Naturally some compromises had to be made in order to stream via the mobile application. Initially I had composed the soundscapes as approximately three minutes each and had attempted to maintain the quality by using limited compression on the resulting sound files. This was not realistic as the sound files were taking up to 30 seconds to load. The second iteration during my creative development involved two-minute sound files with minimal compression. This reduced the load time to 10–15 seconds, however my preliminary tests with community members recommended that the sounds needed to load in 3 seconds, or ideally play instantly. This resulted in a compromise in the sound quality which was ultimately worth it as listeners tended to stay engaged for longer periods of time.

'WIRA' was accompanied by performances, community workshops and regular group sound walks which all contributed towards the accessibility and engagement of this installation. Comments including *"I have never thought about rivers making sound, or how sound affects the environment"*, *"Listening to the soundscapes and voices as I walk along the river made me lose all sense of time and notice things I didn't even know were there"* and *"WIRA opened up a different way of listening and a new way of understanding sound in the environment"*, were amongst the positive responses to the installation. Some members of the community struggled with the technology on their phone, but fortunately the gallery listening station and the other listening methods meant there were multiple ways to access the sounds.

As *'WIRA'* stretches towards the river mouth, looking out towards the ocean, the voices from Indigenous communities in Vanuatu could be heard across the surface of the water. These included the rich soundscapes from the Leweton Cultural Group and Vanuatu Women's Water Music who were visiting artists at Floating Land 2015 and who are exploring new ways to

Research (continued)

preserve their cultural knowledge as their islands continue to experience the true ramifications of climate change.

Sandy Sur, the leader of the Leweton Cultural Group, visited Noosa and listened to the sounds of his communities for the first time along Noosa River before the installation formally opened at Floating Land. Although he had granted permission to use the sounds, it was important to me that he experienced the work and found value in the project before we proceeded. He stood in silence at the river mouth and looked out towards Vanuatu listening intently. He thought this technology could be powerful in sharing his culture and bringing awareness to rising sea levels in the Pacific Islands. These Island communities are at risk of not just losing their homes, but their cultural knowledge systems which are deeply connected to the environment. While this was the first time Sandy had experienced a locative media installation, he could immediately understand that this technology had the potential to contribute to his mission in bringing wider awareness to the state of the Pacific Islands and the knowledge and culture that will be lost if we do not take action.

At a time when communities urgently require new ways to connect with the

environment, locative sonic art offers the possibilities to reconnect listeners through the social, cultural and ecological dimensions of place, memory and sound. Members of the local community also experienced the preview of 'WIRA' with Sandy and made comments such as; *"This is how sound should be kept and preserved, outdoors in the environment, not on a hard drive in the library"* and *"It is like discovering another world floating in the air, that we can all access"*.

Through ongoing conversations with Sandy Sur and my long-term collaborations with local Gubbi Gubbi artists and Indigenous communities in India, Brazil and across Australia, I was privileged to learn about traditional knowledge systems and how cultural soundscapes are intrinsically connected to place. Through this initial collaboration with Sandy for the 'WIRA' installation, it became apparent that soundscapes located in environments using GPS, resonated strongly with Indigenous perspectives on place and sound. Sandy believed it made perfect sense for a sound to be attached to an environment with GPS and he felt it to be much more natural than the way we currently consume music and podcasts through mobile devices.

Sandy Sur's personal research aims to

develop a deeper understanding of the role sound plays in ecology and how the music of Vanuatu is deeply inspired by place. The Vanuatu *Water Music* is now evolving in response to rapidly changing climates and Sur advocates for this tradition as a call to action. He describes the *Water Music* as a message passing through space that connects with every aspect of the surrounding environment; the sound travels and transforms, remaining part of an interconnected mesh that allows people to understand land, water, nature and culture. This resonates strongly with what Timothy Morton (Morton, 2007) describes as the vast intertangling 'mesh' flowing through all dimensions of life, as well as Steven Feld's concept of acoustemology, which explores sound as a distinctive medium for knowing the world (Feld, 1996).

Sandy Sur and his community perceive sound and water in similar ways—a substance that is essential for survival with cultural and spiritual significance. It holds knowledge and is deeply connected to place. Sandy recognised the possibilities of locative sonic art as a dynamic and accessible call to action that mirrored his cultural perspectives and offered an intimate window for communities to connect to place through traditional knowledge, memories and soundscapes. We spoke for many hours



River Listening Image from Brisbane River, Queensland, Australia

about the synchronicity between Sandy's perspectives on listening, the Australian Indigenous tradition of Dadirri (deep listening to the land) and Pauline Oliveros' incredible deep listening practice which has been profoundly influential on my personal artistic practice. Oliveros' perspectives on sound, embodiment, listening and tuning to our environment continue to inspire and influence how I think about sonic relationships and connections in these installations. Her work provided a wonderful connection point for us to share ideas for the preliminary work with 'WIRA' and ongoing collaboration between Australia and Vanuatu.

The 'WIRA' collaboration with Sandy Sur also sparked a wide spectrum of other new ideas such as coastal sound walks that live streamed the sounds of humpback whales songs and stories of Island communities in the distance, composed into a rich and immersive sonic experience. Accessible mobile technologies could become valuable tools in not just reconnecting us to the environment, but also in helping us to explore the acoustic ecologies of changing environments across the globe. While many continue to consider mobile technologies as key factors in our disconnection to the environment, particularly amongst the younger generations, 'WIRA' explored ways for repurposing these technologies as accessible creative technology that can reconnect us to the environment and facilitate collaborations that reveal ecological systems. It opened up the potential synchronicities between location based augmented reality and Indigenous knowledge systems. 'WIRA' allowed communities of listeners to hear sounds beneath the surface of a river they would not usually think about, and to explore the importance of sound in our surrounding environment, particularly at a time when it is increasingly important to listen to the rapid ecological changes taking place across the world.

Rainforest Listening: Climate Week New York City 2015

'Rainforest Listening' is an augmented reality project that layers a canopy of rainforest soundscapes in urban environments to inspire ecological engagement. Listeners access the sounds via mobile devices and sculpt their own experience by triggering geolocated soundscapes as they walk through iconic locations across the world. The soundscapes are all drawn from a

database of my field recordings from tropical rainforests in South America and the Asia Pacific region gathered across a decade. I had created numerous installations and performances drawing on these recordings that were designed to educate audiences in the complexity of rainforest soundscapes, but now I was interested in designing experiences to translate this awareness into action. 'Rainforest Listening' was created specifically as an engagement tool for Rainforest Partnership (www.rainforestpartnership.org), an international NGO founded with a mission to protect tropical rainforests by partnering with people at global and local levels to create lasting solutions to deforestation. By connecting this installation to a conservation organisation, the audience has a direct pathway to take action, either by educating themselves further about rainforest conservation or donating directly to Amazon communities during the experience.

There are numerous conservation organisations who would have been appropriate for this collaboration. I was attracted to Rainforest Partnership as they work directly with rainforest communities to find opportunities and collaborations for ecological and economic sustainability. This involves developing projects that protect the forest by solidifying its local value through eco-tourism, research, traditional knowledge, medicine and arts and cultural ventures. While local communities see inherent value to the forest, the economic benefit of logging, mining and agriculture often influences their decisions, especially when they may have limited opportunities and their livelihoods are under threat. Rainforest Partnership employs a collaborative, results-driven model and works in collaboration with local governments, conservation organisations and established contacts that have already gained community trust. Most importantly, the communities play an active leadership role in the design and implementation of projects and the income generated goes directly to the communities.

Rainforest Partnership have had an incredible impact in a short period of time in supporting 14,744 people, preserving 31,249,556 trees, storing 741,683 tons of CO₂ and protecting 197,782 acres (Spelman, 2016). Nonetheless, like many conservation organisations they struggle to engage the general public in their cause and are constantly seeking new tools that allow people to experience the Amazon Rainforest.

The Amazon Rainforest is widely considered as the lungs of our planet, the Amazon Basin alone stores 400 million metric tons of CO₂ per year—about 25% of all carbon stored on land, and it produces 20% of the world's oxygen. Nearly 4,500 acres of rainforests are lost every hour from illegal logging, mining, agriculture, forest fires, and oil drilling (Spelman, 2016). There is a global imperative to protect tropical rainforests and an urgent need for new tools for engagement and awareness.

I worked collaboratively with Rainforest Partnership in developing a series of creative projects that could bring attention and awareness to their work. Our specific interest was finding ways that people could experience the Amazon Rainforest during international events, and we decided on the idea of connecting people to the rainforest during international climate conferences (hosted in urban environments) through experiencing the soundscapes of the Amazon. In many instances, the decision makers at these significant events have never had the opportunity to experience the Amazon, yet they are making critical decisions about the future of this ecosystem. Niyanta Spelman, Executive Director of Rainforest Partnership, often spoke about the value of film and story telling in connecting policy makers to the rainforest. Having experienced the rich and dynamic soundscapes of the Amazon she was immediately enthusiastic about the potential of sound to connect people with the rainforest.

'Rainforest Listening' launched in September, 2015, in the centre of Times Square with an augmented reality sound walk programmed as part of Climate Week NYC. The sounds of the rainforest grew across New York City where hundreds of people engaged with this experience in iconic locations such as Central Park and Dag Hammarskjöld Plaza, the gateway to the United Nations. During the major events and our scheduled sound walks, listeners downloaded the app *Recho* and were encouraged to sculpt their own experience by triggering geolocated soundscapes as they walked throughout New York City. The experience was composed as twenty minute non-linear soundscapes pivoting on the major venues for Climate Week NYC. Each twenty-minute experience included a collection of two-minute excerpts that tracked various ecosystems throughout a twenty-four-hour period in the centre of the Amazon Rainforest. The featured ecosystems

were lowland tropical rainforest with abundant wildlife. Listeners could hear the rich biodiversity of insects and birdlife and those who ventured deeper into the sound map discovered the endangered Amazon River dolphins or elusive howler monkeys hidden throughout Manhattan.

The placement of each sound was planned meticulously to encourage listeners into spaces where the urban soundscapes were less intrusive and provided room for reflection and immersion in the soundscapes. The sounds expanded and evolved each day, particularly for specific events throughout Climate Week NYC. This included the Social Good Summit on September 27–28 at the 92Y building in Manhattan, where I added voices of activists and communities speaking about the ramifications of climate change and the importance of conservation. Additional recordings were also incorporated over the duration of the installation including Jay Needham's Panama recordings that were created in partnership with the Asociación Panamericana para la Conservación and the Institute for Neotropical Conservation.

The key activities for *'Rainforest Listening'* in New York City were also supported by organisations such as Ear to the Earth and the Streaming Museum and this project extended our partnership with *Recho*, who assisted in adapting aspects of their audio tools to deliver this installation. The support and partnerships enabled a streamlined process for user generated content throughout Climate Week NYC and encouraged people to respond to the installation. We provided headphones and listening devices at major events and also fixed streaming options via rainforestlistening.com for those unable to run the app on their smart phone. The daily engagement was positive and far exceeded previous installations, with an average of 80–100 streams per day across the various listening options. 70% of users listened to between five and ten minutes of audio, with 15% listening to more than twenty minutes. This retention rate exceeded my previous installations of a similar nature, which was possibly due to the subject matter and many of the listeners already having a personal affinity with rainforest conservation.

I had some initial concerns about launching the project in Times Square, while it is undeniably an iconic location, the sensory overload of sound, screens and the constant flow of people does not make it an ideal listening environment. However, this

juxtaposition proved valuable in observing how the rainforest soundscapes affected the participants in the installation. Many people arrived in Times Square flustered and in a rush to experience *'Rainforest Listening'* between sessions or other Climate Week commitments and it was fascinating to observe this initial tension dissolve as listeners put on the headphones and started to walk through Times Square exploring the rainforest. They were visibly moving slower and immediately engaging with the environment in a much calmer state, which was in direct contrast to the large crowds flowing through Times Square around them. This observation was made by the Rainforest Partnership team, but also by a series of university students who could identify who was participating in the installation and who was just wearing headphones based on how they were acting. This sparked some further explorations with a team of neurologists at New York University in exploring the neurological value of listening to the Amazon Rainforest in urban environments.

The overall feedback was extremely positive and while we had accurate data for engagement, it was complicated to measure impact. How could this experience influence listeners to make conscious decisions and take action to support the Amazon Rainforest? It was possible to gauge the initial layer of impact based on how people engaged with Rainforest Partnership, particularly via social media platforms, online content and making donations to rainforest communities. However, measuring the long-term impact required further research.

While there were still many questions in terms of impact and the requirement of further technical development, the installation during Climate Week NYC solidified the future potential of this project and quickly resulted in numerous invitations to other international events. It was clear that listening to the rainforest connected people in an immediate and embodied way that is not possible with any other sensory experience. *'Rainforest Listening'* is not just an artwork, but a long-term research project that will see recording devices and live streaming networks installed in rainforest communities over the next decade. This project is equally grounded in the scientific possibilities of listening to the environment, drawing on bioacoustics, ecoacoustics and emerging fields of biology concerned with the study of environment pattern and changes through sound. In the

coming years, we hope you will be able to walk through international landmarks, from London Bridge to the Sydney Opera House, and listen to the changing soundscapes of the Amazon Rainforest.

Two Rivers, One World, Austin, Texas

Following Climate Week 2015 in New York City, the *'Rainforest Listening'* installation toured to SXSW Eco 2015, a global environmental conference in Austin, Texas. During the three-day event we hosted sound walks and activities based at the Social Good Hub, a venue produced by the United Nations Foundation. As part of the official SXSW program we also produced an event called *'Rainforest Recharge'* for attendants of the conference to listen to a live performance of immersive rainforest soundscapes that I created in collaboration with Garth Paine. An unexpected outcome of *'Rainforest Listening'* in Austin was SXSW Eco delegates using the installation to navigate between different venues. The geotagged sounds connected the venues for the purposes of our scheduled sound walks, but delegates using the app for navigation outside of these scheduled times, sparked a series of creative ideas for hosting conservation events where the audience would have to discover the venue by following the soundscapes. *'Rainforest Listening'* also featured at Austin City Limits music festival, October 2–11, 2015 as part of ACL Cares with Rainforest Partnership. While this generated a lot of curiosity amongst attendees, it also highlighted the difficulties of hosting the project during a music festival where network coverage was unpredictable and attendees were conscious of preserving their phone battery to last the duration of the festival.

Inspired by *'WIRA River Listening'* and my ongoing work with global river systems, we conceived a new project in Austin titled *'Two Rivers, One World'*. This project was designed to connect the sounds of the Amazon River with the Colorado River that flows through Austin. The project was produced in collaboration with Rainforest Partnership as a public event for the City of Austin. The creative process initially involved hydrophone recordings in the Colorado River and creating a sound walk that mapped the sounds beneath the surface of the Colorado River with a series of my existing recordings and compositions from the Amazon River in central Brazil. The audience could navigate



Austin Mayor Steve Adler and Rainforest Partnership Executive Director Niyanta Spellman

their way along the river bank, weaving between the soundscapes of the two distinctive river systems in addition to listening to live hydrophones during the scheduled sound walks.

The evocative idea of Amazon River dolphins intertwining with the sounds of the waterways of Austin ignited the curiosity of a diversity of demographics, particularly those engaged with water management. The Austin City Council were highly supportive of this endeavour and hosted a proclamation and official opening in the Austin City Hall Plaza where Steve Adler, the Mayor of the City of Austin declared October 8, 2015 as *Two Rivers, One World Day*. This was certainly an unexpected level of support and engagement, and revealed another positive layer to these installations in connecting like-minded organisations and facilitating ongoing partnerships. As a result of this installation, Rainforest Partnership established a stronger relationship with Austin City Council and positioned themselves as innovators in the conservation space. This installation also opened up the possibilities for new ways of connecting and comparing the soundscapes of river systems, both through live streams and merging fixed media.

COP21, Paris, 2015

At the 2015 United Nations Conference on Climate Change (COP21), we brought the rainforests and rivers of the world to Paris and encouraged global leaders to listen to nature and take climate action. It was a venture that further extended my collaborations with Rainforest Partnership and Recho. Together we connected the banks of the Seine

River with river systems across the world and transformed iconic locations throughout Paris into the Amazon Rainforest. The Eiffel Tower and surrounding parklands were reimagined as immersive sonic experience layering rainforest soundscapes over the city. Each observatory platform of the Eiffel Tower was interpreted as the four distinct layers of tropical rainforest vegetation through immersive soundscapes and original sonic art I composed exclusively for COP21. Over 200 rainforest sounds were planted across Paris during COP21 at major side events including Petit Palais for Earth To Paris—Le Hub, The Global Landscapes Forum, The Hub Culture Paris Pavilion and throughout Le Bourget, the main location of COP21.

Conscious of previous issues with large-scale events (including ACL in Austin), I created other ways for listeners to access the sounds which included streaming from social media platforms and presenting experiences in Podwalk, a new app developed by the Recho team specifically for site-specific podcasts. Our Podwalk experiencers followed a similar path to the Recho sound maps but allowed listeners to trigger continuous audio files (using GPS) as opposed to navigating through shorter sound files. Podwalks were created as twenty minute compositions, providing a more immersive and narrative driven experience in situ. The benefit of the Podwalk app was that listeners could download the entire audio file (while on WiFi) then experience the installation on location just by triggering GPS without using cellular data. I produced six compositions for Podwalk, three revolving around rivers and three focused on tropical

rainforests. While we viewed Podwalk as an additional layer to the Recho experience for those without local data, the Podwalk proved more popular in some locations where listeners opted for extended listening experiences as they moved between venues.

Our augmented reality sound walks were a featured part of ArtCOP21, a cultural program designed to position art as playing an integral role in ecological transition and sustainable development. This resulted in significant engagement around the installation, particularly during key activism events in Paris. We encouraged listeners to add their voices by recording directly into the app. This additional layer of the experience proved highly valuable as we were able to weave the voices of policy makers alongside Indigenous elders speaking about the true ramifications of climate change. I was joined in Paris by Dr Toby Gifford, another collaborator from Australia who assisted in adapting the installations onsite. During the UN meetings and side events we interviewed delegates and activists to incorporate their voices into the installation each day. The layers of voices also stretched across the globe to those that were unable to attend COP21 but had messages they wanted to share with delegates. While the focus of this installation remained on connecting listeners to the rainforests and rivers of the world, the layers of voices offering hope, inspiration and calls to action, became central to the success of this project. With permission from Sandy Sur and his family in Vanuatu, we included the Leweton voices and songs alongside political leaders speaking about the unfathomably future for Pacific Island communities.

The augmented reality sound walks showcased at COP21 demonstrated that locative sound can offer a profound and embodied way for communities to engage with complex information about climate change and ecological crisis. While the ephemeral nature of this installation meant it was not accessible to all, those who experienced the work commented on the value of listening and the importance for moments of reflection in the context of largescale conferences. While there was certainly a wide spectrum of ways we could improve the technology and dissemination, it was clear these experiences provide ongoing value in the context of climate change events.

Yarra River Listening

'Yarra River Listening' was commissioned for Pause Fest 2016, in Melbourne, Australia. It was designed as an augmented reality

installation to explore the soundscapes of the Yarra River which flows through the city of Melbourne. This experience extended on previous 'River Listening' installations by stretching throughout Melbourne's iconic Federation Square with a sound map connecting to river systems across the world. Listeners could hear snapping shrimp in the centre of Federation Square, Amazon river dolphins as they walk down the steps, and pilgrims chanting on the banks of India's Pamba River as they look towards the sky. These sonic discoveries were composed to connect listeners to the soundscapes of global river systems and explore the value of sound in contributing towards environmental awareness and engagement. The soundscapes were all based on my field recordings from rivers across the world that I have collected over the last decade. The piece was composed in the form of an extended electroacoustic piece, yet the non-linear layout of the sound map (literally reflecting a scaled down map of the world) meant listeners could mix the layers of sound in real-time and explore constantly changing soundscapes.

As listeners walked closer to the Yarra River, local sounds become more prevalent until the installation is filled primarily with hydrophone recordings and responses to the Yarra River. In this particular instance, I experimented with the notion of mobile devices connecting listeners to the sound of their surrounding environment. As the listener walked along the river bank, the installation sounds gradually reduced in volume until the final two sounds were mostly silence with very sparse sounds almost inaudible. While some listeners tended to disperse when they reached the subtle material, many stayed till the end, walking slower and in some case standing still and continuing to listen to their surrounding environment. During interviews with listeners after the experience, they reflected on simple observations such as "I really never noticed how loud the trams are" or "It's very relaxing to just stand and listen" to more profound observations such as "Towards the end, I thought I was still listening to the app but then I realised I was actually hearing the sounds that were all around me, I was listening to a boat drifting below the bridge as if it was music and I realised that everything around me sounded louder and more interesting". This comment and others similar, suggested that this experience certainly has the capacity to encourage people to actively listen to their surrounding environment and engage with place through sound.

In 'Yarra River Listening', through the app Recho, users had the option to record a response to the installation that was geo-located and included in the work in real-time. While I monitor this very closely, allowing and encouraging user generated content in these installations is both an asset and a risk if listeners choose to record inappropriate content. Community engagement remains to be an integral part of my art practice and the majority of my projects are multi-platform and participatory, always encouraging communities to be an active part of the process and welcoming them to collaborate and contribute. This interactivity allows listeners to have agency in the experience, which has been particularly powerful when working with indigenous communities as evident in previous installations. In 'Yarra River Listening', as with all the projects highlighted in this paper, sounds are placed meticulously in locations, responding to the sonic environments of each place and constructed in ways that they flow together with the pacing, timing and structure of my immersive compositions, regardless of the directions listeners navigate through the space. I am naturally open to the community adapting these experiences, but 'Yarra River Listening' was the first installation where I questioned the ongoing inclusion of these tools after the need to censor multiple recordings added by users. One example was a user who planted recordings behind multiple trees along the river bank whispering "I'm behind the tree, watching you".

While some listeners found these creative interventions highly amusing others were offended by this material which created an unsettling layer that was certainly not relevant to the content of the project. In these instances, I remove the user generated content as soon as possible, but as these installations continued to expand at various locations across the world (and in multiple time zones) it became imperative to explore other avenues for managing user generated content. The reality was that increased engagement, nationally and internationally, was resulting in an increase of inappropriate content. When sensitive cultural material, partner organisations and funding bodies are involved, the risk was too high to continue with the open format in Recho.

The partnership with Recho and the resulting creative projects presented an incredible platform to explore and experiment with the possibilities of augmenting urban environments with mobile technologies. Recho launched with a mission to become a global

interconnected social network for sound. While the platform has been successful in global engagement, the developers shift in focus to the Podwalk platform means Recho development has halted for the time being. In addition to the complexities with user generated content, I also reached a limit with Recho in terms of adapting existing tools as we placed more focus on live streaming audio, 3D soundscapes, head tracking, interactivity, and triggering with other data. The preliminary research suggested that developing these installations through one central mobile application would be most effective to maximise accessibility and engagement.

'Sonic Babylon' undeniably paved the way for location audio and interactivity and remains to be one of the most effective platforms for user generated content and engagement. While both 'Sonic Babylon' and Recho offered a diversity of opportunities for location audio, it was clear the curated experiences I was composing required different options for presenting complex soundscapes and sensitive material involving Indigenous voices. Despite this, I am excited and inspired about the future possibilities of blurring the lines between artists and audiences, particularly in the context of connecting these projects across multiple continents in real-time.

CANOPY (Rainforest Listening)

In early 2016, we began development on CANOPY, a custom application for 'Rainforest Listening' augmented reality audio experiences. The CANOPY application placed more focus on immersive sound environments and shifting through vertical and horizontal ecosystems. The CANOPY pilot was responsive to the conditions of the surrounding environment and triggered soundscapes based on weather patterns and time of day. It was designed so these features would allow listeners to explore soundscapes that will change and adapt in real-time. The application features tools that will allow listeners to connect and donate to rainforest conservation in a much more accessible way and provides more scientific context for the soundscapes. The final feature that will be added in the future is live streams from the central Amazon Rainforest that can be accessed through the application. In collaboration with Dr Toby Gifford, we are also adapting a head tracking interface he has designed to allow listeners to shift through 3D sound fields in urban environments. The CANOPY app is still in development phase and will be released publicly in 2018.

South Bank Augmented Reality Sound Walks—World Science Festival 2017

In March 2017, the Queensland Conservatorium Research Centre launched '100 Ways to Listen'—a new project exploring the art and science of sound and documenting a decade of innovative music-making in Queensland. '100 Ways to Listen' launched at the 2017 World Science Festival Brisbane, with performances, interactive installations and immersive sonic environments presented by over 150 staff and students at the Queensland Conservatorium. '100 Ways to Listen' was conceived as a reflection on the innovation and impact of iOrpheus, the project mentioned at the beginning of this article that was presented across South Bank Parklands.

I planned to develop a series of new augmented reality sound walks, inspired by the innovation of iOrpheus and 'Sonic Babylon' and connecting the outcomes of the recent projects I had the privilege of presenting across the USA and Europe. After much research, I decided to return to my collaboration with Josh Kopecek at Echoes.xyz to develop a new portfolio of accessible experiences. We established a partnership and began working on a new customised platform for acoustic ecology and augmented reality.

On July 22, World Water Day 2017, I launched the South Bank Augmented Reality Sound Walks as part of the '100 Ways to Listen' program at World Science Festival Brisbane. The sound walks all revolved around aquatic recordings and compositions, highlighting marine and freshwater environments across the world. The sound walks were created within the Echoes.xyz platform and used GPS points along the Brisbane River to trigger audio based on location and movement. These experiences explored the artistic and scientific possibilities of listening to the environment and the potential for new approaches in the conservation of global waterways.

The project featured three augmented reality sound walks responding to bodies of water. The first, *Hydrology*, explored the diverse sonic properties of aquatic ecosystems that cover over 70% of the Earth's surface. The sounds were recorded using hydrophones in freshwater and marine ecosystems across the planet. The featured soundscapes included snapping shrimp on coastal reefs in the Sian Ka'an Biosphere Reserve of Mexico, melting ice in Norway's Kvina River and

Humpback Whales along the Queensland coastline. The second experience was an adapted *River Listening* sound walk that reimagined the world beneath the surface of the Brisbane River. The sounds of the river system were layered with creative responses that connected to river systems across the world. This sound walk contributed to our ongoing 'River Listening' interdisciplinary project exploring the art and science of listening to rivers and the creative possibilities of aquatic ecoacoustics. This sound walk also showcased the ongoing interdisciplinary collaborations at Griffith University between the Australian Rivers Institute and the Queensland Conservatorium Research Centre. The final featured sound walk, *Sonic Reef*, was a call to action to protect the Great Barrier Reef, one of the greatest natural wonders of the world. This installation draws on scientific recordings from the reef that showcase the value of sound in understanding ecosystem health. *Sonic Reef* was a pilot project developed in collaboration with the Queensland Conservatorium Research Centre, the Australian Marine Conservation Society, JASCO Applied Sciences and a team of passionate artists, scientists and conservationists.

World Science Festival Brisbane provided the perfect platform to launch these new augmented reality sound walks. Based on my previous experiences, we provided a variety of ways to make sure the listening experiences were accessible including pop up listening stations with student guides, headphones, additional devices and online streaming for listeners without smart phones. Audiences downloaded the free app Echoes.xyz (for iOS and Android) and selected a personalised sound walk to explore over 100 aquatic soundscapes throughout South Bank. Their phone acted as a sonic compass as the soundscapes triggered automatically as listeners walked into active locations.

It was exciting to witness the general public engaging with the changing soundscapes of the Great Barrier Reef and I was impressed by the level of engagement with the experiences throughout the festival. One of the most exciting elements of these mobile experiences is the ability to take them directly to places of congregation and locations with politicians and decision makers. During the launch of the World Science Festival on World Water Day, we hosted a listening station and were able to demonstrate the sound walks to media, politicians and even the Queensland Science

Minister, who was shocked to learn that fish make sounds that can be used for assessing freshwater biodiversity.

It is unlikely I would have been able to convince the Queensland Science Minister to attend an immersive electroacoustic concert, yet the accessibility of mobile technologies means I could literally put this installation in the hands of decision makers at a major event. The sound walks received multiple invitations following the World Science Festival Brisbane, including the Smithsonian Earth Optimism Summit in Washington, DC, where the soundscapes of waterways across the world were installed throughout the Smithsonian in April 2017. The future possibilities were evident and I continued working with Nora Farrell and Josh Kopecek on our new customised platform for acoustic ecology and augmented reality audio.

Aurality

On July 18, World Listening Day 2017, we launched *Aurality*—a new mobile application for acoustic ecology and augmented reality audio powered by Echoes.xyz and developed in collaboration with Josh Kopecek. The long-term ideas for *Aurality* were developed in collaboration with Nora Farrell and inspired by her pioneering work in locative audio from 2005. *Aurality* was presented as a major work at the 2017 Queensland Music Festival by Brisbane City Council, The Queensland Conservatorium Research Centre, Noosa Alive and Noosa Regional Gallery.

Aurality launched as a site-specific augmented reality audio project exploring and connecting Queensland's rainforests, rivers and reefs through music, sound and acoustic ecology. The app used GPS points along the entire coastline of Queensland to trigger audio based on location and movement. The experience was activated in eight communities and designed as a tool to connect listeners to conservation efforts around protecting the Queensland's rivers, reefs and rainforests. The soundscapes also stretched to Pacific Island communities based on my long-term collaborations with Sandy Sur in Vanuatu. I developed and composed the initial layer of sonic material, based on my database of Queensland field recordings stretching across a decade. We plan to facilitate community collaborations and curated user generated content in the future iterations across Queensland. The project has extensions planned throughout Australia and the Asia-Pacific region.



Aurality: South Bank, Queensland, Australia

The next phase of *Aurality* is currently in development and in 2018 the platform will open up as a community acoustic ecology platform, focused around augmented reality and location-aware audio experiences for conservation and climate action. *Aurality* combines acoustic ecology, environmental field recordings and sonic art with live streaming audio. We are developing a network of permanent open microphones and hydrophones in collaboration with a network of international sound art organisations that will facilitate real-time listening within the app, building on the initial success of live hydrophones in the WIRA River Listening installation.

Conclusions

The installations outlined in this paper are not stand alone experiences, but all connected to larger research initiatives exploring the value of acoustic ecology as a socially engaged, accessible, interdisciplinary field that can inspire communities across the world to listen to the environment. The notion of augmenting urban spaces with environmental soundscapes is something that has been explored through many of my projects over the last decade. These ideas continue to play a vital role in my research into the role of mobile technologies

and locative media in inspiring ecological awareness and engagement.

These sonic experiences provide opportunities for the general public to explore sound worlds they would not necessarily have access to, ranging from the centre of the Amazon Rainforest to remote river systems throughout South India. While the installations traditionally involve headphones, they encourage deep listening and are created in response to the acoustic ecologies of each place. By positioning sounds in very specific locations, these experiences are designed to use mobile technologies to connect to our surroundings and draw listeners into their sonic environment. This research acknowledges the inherent contradictions in suggesting locative media and mobile technologies can be tools for responding to climate change. As Behrendt (2013) and others have highlighted, mobile technologies are fossil-fuelled and carry a heavy carbon footprint through their production and the satellite networks and infrastructures that support them. However, emerging mobile technologies are increasingly accessible and offer possibilities that deserve further exploration particularly as more people relocate to cities and do not have access to wilderness areas. As the field of acoustic ecology continues to expand

and become more interdisciplinary, these technologies allow us to explore other layers of our social, cultural and ecological environments through sound.

Considering the rapid developments in this field in recent years, it is almost impossible to predict what the future holds, but it is likely we will see a shift away from screen based augmented reality with more focus on wearable technology and sound. We have already seen a rapid increase of reimagined headphone experiences that support personal auditory profiles, ambisonic decoding and interactive head tracking (Ossic, Nura and Audeara to name a few). This shift will naturally allow for more opportunities in sound for locative media and will hopefully facilitate a balance between visual and auditory engagement. While the technology is an integral layer to this research, the core focus remains on sound and its ability to influence our perception and awareness of the environment around us. Recent research (Boulton, 2016) suggests that engagement with our ecological crisis and ultimately behavioural change towards our environment, needs to happen at a deeply philosophical and sensory level. These projects investigate the role of sound in facilitating connection to place and the value of mobile technologies in exploring

and exposing changing acoustic ecologies across the globe.

THIS ARTICLE IS DEDICATED TO NORA FARRELL (1966–2017) who opened my mind to the possibilities of mobile technologies in understanding and interrogating our relationship with places and communities through sound. While this edition of *Soundscape* reflects on the life and work of Pauline Oliveros, who has also been a profound influence on my work, it seemed appropriate to reflect on the impact and influence of Nora Farrell, a friend and collaborator of Pauline who I found equally innovative and inspiring in her perspectives on sound. While Nora remained out of the limelight for much of her career, her technical genius and pioneering ideas will undoubtedly continue to influence and inspire for generations to come.

About the Author

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Musique et écologies du son Propositions théoriques pour une écoute du monde / Music and ecologies of sound Theoretical Projects for a Listening of the World

Reviewed by Maile Colbert

Edited by Makis Solomos, Roberto Barbanti, Guillaume Loizillon, Kostas Paparrigopoulos, Carmen Pardo

L'Harmattan, 2016, Paris; book of partial proceedings of the international symposium by the same title from the 27–30 of May 2012

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The international symposium *Musique et écologies du son: Projets théoriques et pratiques pour une écoute du monde / Music and ecologies of sound: Theoretical and practical projects for a listening of the world*, was held at Université Paris 8, May 27–30 of 2013. I was fortunate to attend and present a paper myself, and having experienced first hand the value of the work presented and discussed there, I was looking forward to reading this fourth publication of the proceedings from that very exceptional event.

I approach this review with enthusiasm, and feel also impelled towards transparency. My perspective is within a frame I will describe, my background is not in a specific tradition or education of music or musicology, I came to working with and thinking about sound through cinematic sound design and sound art, which led me through a wonderful winding path to soundscape ecology. My native tongue is English, and my French is limited, though I am better at comprehending text than spoken word. I say this because within this frame and possible obstacles to some of the text—many of the essays are written in French without translation, as are the English texts vice versa—I found this book in its entirety and diversity compelling and expanding, and very contributive towards multiple fields in the study of sound and music, weaving and interconnecting threads of thought and rippling waves of question though the borders of both emerging areas in sound-music studies, and those considered established.

Interconnectivity and an urge against dualism is a continual theme throughout the text. From thought on nature and culture, to urban and rural, to music and noise; what is desirable and undesirable in and from sound, what is individual and what is social in our relationship to sound, conservation and preservation, phonography and phenomenology, landscape and soundscape and the human within them, and the non-human within them? The tension between these and related categories, and what can be found and discussed between them, or what can be found and discussed if we do away with them, or what can be found and discussed if we interconnect them, forge towards theories and methodologies on sound-music ecologies and ecosophy¹. As Ljubica Ilic writes in her essay, “Between Retreat and Return: Rethinking the Sonic Pastoral”: “We are, globally, faced with the fact that the environment is one whole ... The symbolic mesh that we live in, intertwined in all possible manners, requires more subtle choices, even when sound is in question.” (256)

The environment when considered as a whole is a complicated and interconnected rhizome. A drop of water falls into a puddle and creates a wave. A wave is a disturbance that travels through time and space, affecting everything it touches, creating other waves. It continues colliding and transferring energy to molecules that do the same in turn to other molecules. It can be water, it can be light, it can be sound. It can be many things that collide into our molecules, and our system translates. The water is cold, the light is bright, the sound is loud. This is passive information. But when we actively feel and consider how cooling the water is on a very hot day, when we actively feel and consider how strong that sun is, and when we actively enjoy how the sound of the crash of an ocean wave makes our heart race, our world becomes richer, and there is information in that experience. “Every sound is evidence of a particular, earthly vitality, and

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L'Harmattan

MUSIQUE \ PHILOSOPHIE

the provenance and impact of these vitalities is of course the business of sound ecology,” reads one of my favourite statements, from the text “But Does the World Listen? Some Thoughts on Rhythmic Bonding Between Humans and the Sounding World”, from author Peter Nelson. The essays in this book consider in various ways, from various angles, the embodied information gained from the sound of place connecting the listener to their surroundings, such as the text from Makis Solomos and Frédéric Duhautpas, considering sound and music’s ability to allow us the experience of place, and this ability allowing the “capacity to create links, connections, and bonds,” taking as example works and writing from Hildegard Westerkamp. (75)

Increasingly more known and recognized (and certainly to readers here) the study of the soundscape—soundscape ecology—

focuses on the relationship between living beings and their environment through sound. This relationship is then of course inclusive to music and sonic designs, and interconnected with really any sonic studies one might consider. An author, Frans Mossberg, points out in the section “Fragmentation of the Field” in his wonderfully comprehensive, *Soundscape, Noise, and Music in Interdisciplinary Research and Design*: “The complexity of exposure to sound in today’s life and urban environment calls for interdisciplinary approaches that encompass technical, medical, psychological, and cultural disciplines to get an understanding of the effects of sound on the multitude of levels involved.” (184) Ecology is by definition a large register of inters... interconnected, interactive, interdisciplinary. The inter attempts to sense a whole in seeing part of the whole and its connection to other parts of the whole. These connections can help us begin to create definitions. As the authors describe in their introduction:

In recent music as well as in sound art, sound has emerged as a cross-road of theoretical and practical questions. Many of these questions concern the permanent interaction of sound with what surrounds it: physical space, the environment, the audience... This interaction

leads to the idea of an ecology of sound in the broad sense of the term “ecology” as a relationship between music or sound and oikos, the common home, the world. Félix Guattari designates three ecologies: environmental, social and mental. What then are the links between music or sound and the environment (or nature), society and subjectivity? More generally, what are the links between music-sound and the world? Studying these links will help us define the boundaries of a flourishing artistic field. (5)

Sections within the book, following the introduction co-written by the editors: Makis Solomos, Roberto Barbanti, Guillaume Loizillon, Kostas Paparrigopoulos, and Carmen Pardo, include *Lécoutte, le son, l’écologie du son et la musique* /Listening, Sound, Ecology of Sound and Music, with texts by; Pascale Criton, Agostino Di Scipio, Kostas Paparrigopoulos, François Bonnet—Gérard Pelé, Philippe Michel, Frédéric Duhautpas—Makis Solomos, *Musique et nature*/Music and Nature, with texts by; Rosalía Martínez, Jean Paul Olive, Georges Bériachvili, Ljubica Ilic, *Field recording, phonographies*/Field Recording, Phonography, with texts by; Guillaume Loizillon, Marie-Hélène Bernard, *Paysages*

et environnement sonores, son et architecture/Soundscape, Sound Environment, Sound and Architecture, with texts by; Jordan Lacey, Mylène Pardoen, Aimilia Karapostoli –Nikolaos Tsinikas, Frans Mossberg, Silvia Zambrini, and *Vers une approche écosophique*/Towards an Ecosophical Approach, with texts by; Carmen Pardo Salgado, Peter Nelson, Mihai Iliescu, and Roberto Barbanti.

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Endnote

1 Guattari, F. 1989. *Trois ecologies*. Paris: Editions Galilée.

Todd Birdsong, Artist Statement

When asked to contribute images for this edition of *Soundscape*, I was reminded of the Walt Whitman poem *I Sing The Body Electric*:

The full-spread pride of man is calming and excellent to the soul,
Knowledge becomes him, he likes it always,
he brings every thing to the test of himself,
Whatever the survey, whatever the sea
and the sail he strikes soundings at last only here,
(Where else does he strike soundings except here?)”

Whitman’s talk of the importance of the body and the soul and their inter-connectedness celebrates the significance in constructing connections between people. For me, the *Deep Listening* recording (along with other works by Pauline Oliveros) strengthens the “sacred” linkage of our physical and spiritual selves. Our generated experiences building a conduit to our metaphysical existence.

The Tone of Our Times: Sound, Sense, Economy, and Ecology by Frances Dyson

Reviewed by Heather Contant, University of New South Wales

Cambridge, MA: MIT Press, 2014), 232 pages

In 2001, when Australian improviser and experimental bassist Clayton Thomas was trying to create the logo for a new sound art festival in his hometown of Sydney, Australia, he wanted to underscore the variations in the creative atmosphere that the event sought to highlight. He looked down at his Olivetti 1968 typewriter and noticed the shift key. Channelling his inner poet, he pressed it down and wrote: “the NOW.” As the hammers struck, the palpable *shifts* in the experimental music scene were imprinted onto the page.

Amanda Stewart, a Sydney poet that works with sound, described these shifts in *The Tone of Our Times: Sound, Sense, Economy, and Ecology*, a recent, and proving to be timely and significant, book by Frances Dyson published by MIT Press: “Without wishing to generalize, she notes a tendency in the ‘90s and early 2000s for performers to focus on ‘the idea of extended tone.’”¹ Dyson’s book explores the theoretical and ultimately political implications of this practice along with many others, like liturgical chant, sonification, robotic voices, and the people’s mic, in order to bring sound studies outside of its newly established niche in the academy. It explores the various concepts of “tone” throughout history—from the mathematically produced “pure” tone to the tone of one’s voice—and examines the potential of these sounds to confront the dual “eco-” crises of economics and ecology in the present.

The book was launched on Saturday, January 17, day 4 of that year’s NOW festival in Sydney. Then in its 14th year, the event continues to bring together local and global performers to showcase “exploratory, experimental, improvised, noise, sound-art, outsider, free, unpopular and generally ‘othered’ musics.”² In its 2015 iteration, the echo typographically implied by the festival’s logo all those years ago could still be heard during the five-day affair, which included over 80 performers and still operates through volunteer efforts on a shoestring budget.

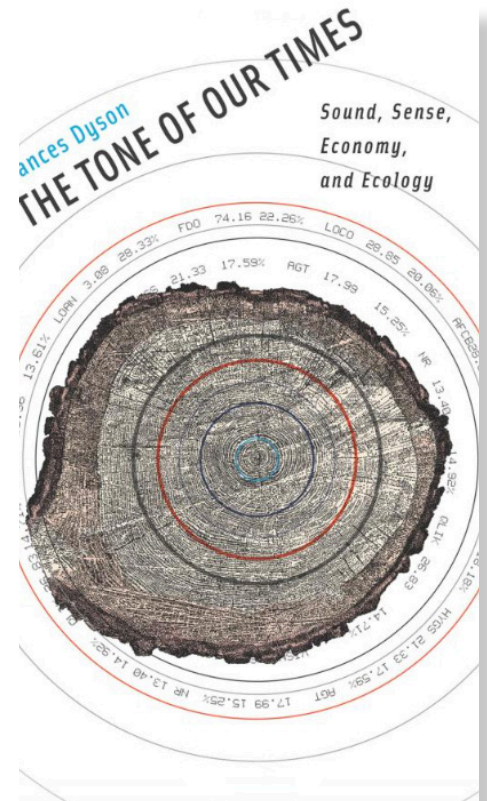
I was particularly struck by the way that this book launch informed my experience of the rest of the day’s programming, especially

during the performance by Thomas and cellist Anthea Caddy, who played a single resonant tone for about twenty minutes. These two events brought the theories and practices at the root of the sound art community together and formed a constellation that illuminated the spirit of this scene, which is nestled in the long shadow of the world’s most iconic Opera House.

The book launch took place in the early afternoon at the Sydney Non Objective (SNO) Galleries in the city’s inner-west. Local saxophonist Jim Denley teamed up with Amanda Stewart, whose work received long overdue attention by Dyson, to present the publication in a non-traditional, thought provoking, and uplifting performance. The two, who have worked together since 1987, took turns reading selected passages, while the other punctuated words with the appropriate sonic improvised accompaniment.

You know a book is good when its theories become immediately applicable to the present situation. This was the case for *The Tone of Our Times*. While packed into the crowded sweltering room during the high Australian Summer, I found myself observing in real-time, the perfect self-reflexive caption for the panoramic scene created by the festival. As Jim Denley read about Amanda Stewart, who has haunted listeners with her live vocal practice that mimics the noises and non-sensical overflow of information in the digital media landscape, she quietly, almost imperceptibly offered a demonstration. Later on, she admitted that it was, in fact, “very bizarre, when Jim mentioned me in the third person,” but this bizarre self-awareness only reinforced the words being read.

The corporeal self-consciousness and sonic self-annihilation with respect to Stewart’s “voice-that-is-not-a-voice” are also characteristics shared by the audience, as they quiet their bodies as much as possible within the highly reverberative spaces where many of the performances are held. If someone tips over a glass, its sound is absorbed as an impromptu or



improvisational element, yet it is also accounted for, and made parenthetical to the performance.³ (and here Denley deftly kicks over a beer bottle to accentuate this point)

As the audience was called out, a feeling of exposure washed over us. A feeling that would not have been possible, by the way, if the same passage had been silently read. As we saw our present situation reflected by the words and performance, it was as if we had caught a glimpse of ourselves in the mirror for the first time. Captivated by our own image, the underlying hidden attributes of our collective potential could be revealed. The duo switched roles, Denley played his saxophone, interrupted its tone with various homemade apparatuses, and Stewart began to read,

Sound ... offers a way to negotiate the “unthought” and the unspoken, to develop other vocabularies and

other forms of political, economic, and social organization. Sound's ephemeral and atmospheric nature is, like the environment, something that circulates outside of exchange, and refocuses attention on the space and environment of the subject rather than the subject per se. The aural opens avenues towards an understanding that is arational, that evokes a grain (or rather tone) of thought and an aesthetics of listening that, I would argue offers some entry into the dilemma of how to hear the world and in hearing, also to be able to act, with the aim and existential condition of the "in-common."⁴

Norman Abjorensen, a writer and scholar of Australian public policy, explained that this unprecedented approach to the book launch was "refreshingly different from the usual stumbling, self-conscious speeches. But, more importantly, it engaged in a most direct way with the core of the book, inviting all of us gathered in that intimate space to focus on the sounds being improvised and what they meant."⁵ For me, the intellectual force released during the launch continued to propel my experience of the festival later in night, as I relocated a few blocks up to an old converted warehouse venue called the Red Rattler. Once again...

...in basements, sometimes called "galleries" in lounge rooms or empty warehouses, people of all ages sit on old sofas or cushions on the ground just to listen to sound, or music, that is without analogy or reason, that seems at times to be brilliant and then again dreadful, in a way that is concentrated and focused...⁶

It was, in particular the performance by Anthea Caddy and Clayton Thomas that took these ideas to their outer limits. Caddy, a cellist, and Thomas, a bassist, both played one single note—a tone—on their respective instruments by bowing the strings. The duo had worked with sound engineer Jon Watts earlier in the day to find a resonant frequency that reverberated with their instruments, the acoustics of the large space, and the house sound system. They began to play this note again later in the evening, very quietly at

first, to the room full of receptive bodies that all fell silent.

Caddy, who wanted to try this experiment at the NOW festival, insisted that the bar stop serving patrons, so that people could devote full attention to the performance.⁷ However, this does not adequately explain the degree of silence produced by the audience in that room. Over the course of 20 minutes, as the tone slowly crescendoed, as Watts brought up the volume on the sound system, pushing it right up "just on the edge" of feedback,⁸ listeners quietly and attentively zeroed in on the sounds they heard. As the instruments started to purr like two tigers resting in the shade, a number of unintended collaborators contributed to the composition. Caddy explained that the focus of the composition "wasn't actually on us per se, it's more of what's going on in the whole environment:"⁹ a low-flying aircraft from Sydney International Airport, whose flight path we sat underneath; the inhaling and exhaling of the red mylar draped on the walls and blowing in the fan; my own breathing and subtle movements, which seemed especially loud at that time.

Amid this atmosphere, the ideas planted earlier in the day by Dyson's book blossomed. I perceived the effect that listening had on a crowd of individuals, the power of sound to become political by inducing a change in people's action. I observed how this simple tone caused the audience to, once again, become acutely aware of its bodily presence and how it became a foundation for sensing our relationships to the exterior world. Later, when I read Dyson's book in its entirety, the profundity of the performance grew in degrees of magnitude. The playing of a single imperfect note inspired "a listening practice that is unique in its ability to 'hear' noise, within its environment and as an aesthetic experience that is shared and inclusive of all sound."¹⁰ By accomplishing this, the performance also demonstrated "the transformation of noise into an expression that registers consensus, a shared understanding, sympathy, empathy, one could say resonance, and the short-circuiting of language and discourse to produce direct action."¹¹

The experiences of this day and their subsequent clarification in the text of Dyson's book created what I can only describe as a refining action. Theory and practice bounced back and forth and collide, allowing the elements to quicken in my mind.

It is important to note that this refining action does not have an ultimate end product, for even if it were to ever produce "pure gold," that shine of this precious metal would soon be tarnished with exposure to the environment. This is why the continued existence of events like the now festival and the communities they support is so important. These gatherings offer a space, a caldron perhaps, for these refining actions to flourish. By exposing us to new sounds and ideas, they acclimate us to the noise of our chaotic world, and continue to shift our already shifting artistic communities¹² so that we can better deal with increasingly dynamic changes of economic and ecological spheres.

About the Author

HEATHER CONTANT researches communities that have come together throughout history to explore the possibilities of the radio band of the electromagnetic spectrum in an artistic context. She lectures in media art and audio production at the University of New South Wales | Art & Design in Sydney, Australia, where she is a member of the *Sound, Energies & Environments* research group. Her writings have appeared in *Leonardo Music Journal* and elsewhere. She is currently completing a PhD thesis about Walter Benjamin and collectivist tendencies in radio throughout history.

Endnotes

- 1 Dyson, Frances, *The Tone of Our Times: Sound, Sense, Economy, and Ecology*, Cambridge, Mass, MIT Press: 2015. p 102.
- 2 thenow.net
- 3 Dyson, 141.
- 4 Dyson, 149.
- 5 Abjorensen, Norman, email.
- 6 Dyson, 154.
- 7 *ibid.*
- 8 Watts, Jon, interview.
- 9 Caddy, Anthea and Clayton Thomas, interview.
- 10 Dyson, 141.
- 11 Dyson, 97.
- 12 Dyson, interview, explained that the NOW now festival community is "shifting and still shifting."

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