

Sounding Extremes: Ecological Sound Art in the Anthropocene

Les sons des extrêmes : l'art sonore écologique dans l'Anthropocène

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Volume 32, Number 2, 2022

Composer dans l'Anthropocène

URI: <https://id.erudit.org/iderudit/1091901ar>

DOI: <https://doi.org/10.7202/1091901ar>

[See table of contents](#)

Publisher(s)

Circuit, musiques contemporaines

ISSN

1183-1693 (print)

1488-9692 (digital)

[Explore this journal](#)

Cite this article

Barclay, L. (2022). Sounding Extremes: Ecological Sound Art in the Anthropocene. *Circuit*, 32(2), 37–44. <https://doi.org/10.7202/1091901ar>

Article abstract

The catastrophic impacts of climate change, vanishing biodiversity, and the rapid deterioration of our global ecosystems require urgent attention and aggressive political action. This article explores a body of interdisciplinary research through a series of ecological sound projects designed to draw attention and awareness to changing ecosystems. These projects are framed as participatory acoustic ecology and position the discipline as a socially engaged, inclusive, accessible, interdisciplinary field that inspires communities to listen and act during times of crisis.

Sounding Extremes: Ecological Sound Art in the Anthropocene

Leah Barclay

It is clear that our planetary boundaries are reaching irreversible tipping points. The catastrophic impacts of climate change, vanishing biodiversity, and the rapid deterioration of our global ecosystems require urgent attention and aggressive political action. Scientists have been sounding the alarm for decades—yet lack of public engagement remains one of the greatest challenges in mitigating this disaster.

As a composer and sound artist, I have grappled with the most effective ways my research and creative practice can be part of the solution. The ruptures occurring in social, cultural, and political spheres triggered by the COVID-19 pandemic reveal shocking inequalities and injustices that accentuate the fact that climate change will have dire consequences for the planet's most vulnerable communities. While the scale of the challenge is almost impossible to comprehend, it is clear that climate change mitigation and adaptation requires interdisciplinary approaches, urgent collective action, and new methods for mobilizing community engagement.

It is evident that we need more effective ways to communicate about climate change and motivate communities to act. I have been inspired by artists who have approached this challenge and by the underpinning research that suggests the arts have a role to play. Elizabeth Boulton published an article in 2016 that suggests that the current scientific framing of climate change has not accounted for the importance of cultural, ontological, and psychological dimensions. In her research she combines cognitive science, evolutionary psychology, and philosophy to argue that climate change exceeds our current cognitive and sensory abilities. She calls on artists to respond to climate

change through sensory experiences that inspire communities to engage and take action.¹

1. Boulton, 2016.

Sound and the act of listening provide embodied and immersive experiences that can transport audiences to different places and times. Listening to performances and installations that draw on field recordings from the planet's ecosystems can stimulate a sense of environmental empathy that may trigger climate action in the listener.² A wide spectrum of composers and sound artists across the world have turned their attention to the environment, resulting in increased engagement in fields such as acoustic ecology, ecomusicology, and ecological sound art. Ros Bandt and Vanessa Tomlinson have inspired new ways of engaging with place through site-specific performances in Australia; Matthew Burtner and Daniel Blinkhorn have composed works that immerse listeners in the soundscapes of the Arctic; and Chris Watson and Jana Winderen take listeners to the depths of the ocean, revealing often invisible ecosystems. The rapid rise in engagement has seen practitioners working in an increasingly interdisciplinary context across arts, science, activism, education, and community engagement. Scholars such as Salomé Voegelin³ and Johnathan Gilmurray⁴ have advocated for the role of composers and sound artists in calling attention to climate change, immersing listeners in virtual ecosystems and providing an embodied temporal medium for comprehending and processing what Voegelin describes as "sonic possible worlds."

2. Monacchi, 2013; Burtner, 2011; Barclay, 2017.

3. Voegelin, 2014.

4. Gilmurray, 2017.

Parallel to these creative expansions, scientific opportunities and implications for sound as a tool for understanding environmental health have increased through the field of ecoacoustics. Advances in digital technology have made audio recorders more affordable and accessible, and the resulting acoustic data is a viable and effective tool for monitoring biodiversity and environmental changes.⁵ Artistic and scientific approaches to recording the changing soundscapes of ecosystems raises various epistemological tensions, particularly around the role of aesthetics and human perception. Field recording for the purpose of artistic practice usually opts for quality over quantity, with high sampling rates and multi-channel recording techniques, while recordings for scientific purposes are often mono, using low sampling rates to allow the collection of hours, weeks, or months of acoustic data. I have argued previously that this difference reveals different positions toward the role of human perception,⁶ where scientific approaches often seek to remove subjectivity from the process, while artistic practice values the knowledge that can be acquired by the person listening in the field. Much of my research revolves around advocating for practices of listening from both scientific and artistic

5. Towsey *et al.*, 2014; Sueur and Farina, 2015.

6. Barclay and Gifford, 2017.

perspectives. Through my recent research projects *Biosphere Soundscapes* (mapping the changing soundscapes of UNESCO Biosphere Reserves) and *River Listening* (exploring the cultural and biological diversity of global river systems) I have argued that these approaches do not need to be mutually exclusive; the greatest value emerges from interdisciplinary collaboration.

Over the last fifteen years, my creative work has taken a strong interdisciplinary trajectory: I engage with field recording in the context of both artistic practice and scientific research and lead a range of research projects designed to inspire communities to listen to ecosystems. These projects explore tropical rainforests, isolated deserts, wetlands, reefs, rivers, and oceans. I have created immersive installations, live performances, and interdisciplinary community projects that inspire communities to listen and engage with natural environments in new ways. My personal artistic practice evolved from composing music inspired by the environment to developing participatory projects. My research, as well, began as an exploration of the value of sound in drawing attention to climate change and has evolved into a body of interconnected projects.

The resulting performances and installations are designed to encourage listeners to engage with ecosystems and facilitate embodied connection with different environments and species through sound. I believe that ecological sound art can inspire a sense of temporal environmental empathy in a way that is difficult to achieve through other creative mediums—this is the kind of empathy that evolutionary ecologist Monica Gagliano says is the missing link in the response to climate action.⁷ I work with sound materials intuitively and draw on climate research and diverse bodies of knowledge to construct sonic narratives that highlight biodiversity and our rapidly changing ecosystems.

7. Gagliano, 2018.

Perhaps the most important aspect of my practice is collaboration. My work is inherently collaborative through partnerships with scientists, activists and educators, and my research is framed around working directly with local communities. This approach has evolved over the last decade and was particularly influenced by my doctoral research, where I explored the value of creative practice in climate action and suggested that composers and sound artists have a significant role to play.⁸ My research findings indicated that sound is a powerful medium and artists can have an impact if their creative projects are socially embedded, multi-platform, interdisciplinary, and designed with clear long-term community engagement strategies. This research was also transformational for me in learning the critical importance of engaging with Indigenous knowledge systems, the importance of asking for permission, and the ethics of field recording and intercultural collaborations.

8. Barclay, 2013; Barclay, 2017.

Throughout my research I have been privileged to work with and learn from Indigenous leaders, passionate scientists, and local communities and knowledge holders. The projects I have developed are respectful of diverse knowledge systems and move beyond the problematic tones of exoticism, imperialism and exploitation that are sometimes associated with field recording. These projects are framed as participatory acoustic ecology and position the discipline as a socially engaged, inclusive, accessible, interdisciplinary field that inspire communities to listen. Ultimately my key learnings highlight the value of listening: listening to collaborating communities, listening to Indigenous knowledge, listening to scientists, listening to the perspectives of project partners and collaborators, and above all listening to the ecosystems.

9. See <http://www.biospheresoundscapes.org> (accessed July 4, 2022).

As an example, *Biosphere Soundscapes*⁹ is a large-scale international research project that works directly with the communities of UNESCO biosphere reserves to facilitate local acoustic ecology research projects. Biosphere reserves are sites recognised by UNESCO as learning laboratories for sustainable development. They are sites for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including the management of cultural and biological diversity. *Biosphere Soundscapes* builds relationships with local communities through listening—these experiences provide a starting point for exploring the notion of knowing a place through sound and the importance of acoustic ecology for social, cultural, and ecological health. The project is a catalyst for bringing diverse voices together and highlighting the critical importance of Indigenous approaches in environmental management. *Biosphere Soundscapes* brings together interdisciplinary knowledge, emerging science, new technology and responsive community engagement. The project has worked across the planet with a focus on biosphere reserves through Australia, Mexico, Brazil, Peru and the Asia-Pacific region. The *Biosphere Soundscapes* team has delivered workshops, education programs, acoustic monitoring and large-scale research projects in over twenty biosphere reserves and offer the communities they reside in various pathways and tools for engaging with acoustic ecology and practices of listening.

Biosphere Soundscapes is fundamentally focused on promoting the value of listening to the environment from artistic and scientific perspectives and encouraging pathways for interdisciplinary engagement. While I lead the research collaborations, and function in multiple roles from facilitator and producer to educator and field recordist, the creative outcomes remain a critical focus throughout the project. As an example, my work in the Central Amazon Biosphere Reserve in Brazil resulted in the *Rainforest Listening*

project, an immersive augmented reality installation that launched in Times Square in New York in September 2015.¹⁰ This work layers rainforest soundscapes in iconic locations to inspire ecological engagement and allow listeners to access spatial geolocated soundscapes via their mobile devices as they walk through urban environments.

At COP21, the world's most significant climate change conference, hosted in Paris in 2014, the *Rainforest Listening* project was expanded as a vertical sonic environment using the Eiffel Tower and surrounding parklands, transforming them into an immersive sound installation, layering rainforest soundscapes over Paris. This augmented reality installation allowed the audience to listen to the acoustic ecology of the Amazon rainforest through raw field recordings and binaural soundscape compositions. The installation featured pristine sounds recorded in a diversity of ecosystems including lowland tropical rainforests with abundant wildlife and the depths of the Amazon River recorded with hydrophones. Listeners could hear the rich biodiversity of insects and birdlife, and those who ventured deeper into the sound maps could discover the Amazon River dolphins and elusive howler monkeys. The project attracted thousands of listeners and was designed to inspire empathy and engagement with one of the most critical ecosystems on the planet, the Amazon rainforest. As with most of my research projects, this installation provided direct pathways for listeners to take actions and connect with conservation organisations. In this instance I collaborated with the NGO Rainforest Partnership, who work directly with Indigenous communities throughout the Amazon rainforest.

The most recent creative outcome from *Biosphere Soundscapes* is an immersive installation called *Holocene*, which draws from over a decade of recordings and livestreams. *Holocene* is a twelve-hour immersive soundscape presented in full surround sound within a custom designed geodesic sound dome. The installation mixes composed soundscapes with live audio streams from different ecosystems within biosphere reserves, including the Brazilian Amazon, Mexico, Columbia, India, Cambodia, and Australia. The work uses an original spatial design to provide a deeply immersive experience in diverse ecosystems that are usually inaccessible, such as the rainforest canopy and ocean floor. As a creative work, *Holocene* has advanced both scientific and artistic knowledge in ecoacoustics, demonstrating the value of high-quality immersive audio in facilitating deep listening and engagement with ecological complexity. The installation title references the current period of geologic time and corresponds with the global changes caused by human activity and technological revolutions. It explores the tensions present in UNESCO

10. See <http://www.rainforestlistening.com> (accessed July 4, 2022).

biosphere reserves, the impact of the COVID-19 pandemic, and the challenges and contradictions of sustainable development.

Biosphere Soundscapes has inspired various other research projects that focus on acoustic ecology and ecoacoustics research in specific ecosystems. One example is *Sonic Reef*, a project I launched in 2017 with the intention of using sound as a call to action to protect and conserve the Great Barrier Reef. The project was developed in collaboration with Griffith University, the Australian Marine Conservation Society, JASCO Applied Sciences, and a team of passionate artists, scientists and conservationists. It draws on over a decade of hydrophone recordings from the Great Barrier Reef.

While the project has a scientific and activist focus, its core outcomes have been creative works that facilitate public engagement and conversations around the urgent need to protect the reef. The first series of sound installations were launched at World Science Festival 2017 in Queensland, Australia as augmented reality 3D audio sound walks accessible via mobile phone in a custom-designed application. The hydrophone recordings from the reef were woven with community voices and creative responses. The installation was subsequently presented at the 2017 Smithsonian Earth Optimism Summit in Washington, DC where the sounds of the Great Barrier Reef were located virtually throughout the Smithsonian, engaging with thousands of listeners who may never have considered the reef as an acoustic environment or experienced immersive underwater soundscapes.

Another resulting creative work, *Requiem for the Reef* (2018), is an immersive surround sound performance that explores the past, present, and possible futures of the Great Barrier Reef. It offers a visceral and embodied connection to field recordings and confronts the reality of the reef's future. The field recordings are processed, filtered and textured into a rich and immersive soundscape that provides listeners with an experience of exploring the acoustic ecology of the Great Barrier Reef. The work draws on scientific hydrophone recordings to reflect on acidification, extinction, and the urgent need for interdisciplinary action. It was first presented in Cairns on the coastline of the Great Barrier Reef at the Australian Anthropological Society (AAS) Conference, before touring Europe. The performance has served as a valuable tool for generating conversation and education around the rapid degradation that is taking place in this incredible ecosystem.

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The projects in this article offer a brief insight into a large body of creative work that is embedded in participatory acoustic ecology projects that value artistic, aesthetic, and scientific perspectives. My work seeks to highlight the value of listening to ecosystems and the interdisciplinary possibilities of ecological sound art. I believe that participatory interdisciplinary acoustic ecology projects that work directly with local communities can have significant impact, and after more than a decade of embedding these projects within communities it is rewarding and inspiring to witness shifts and changes. These examples seek to show the trajectory of my creative practice, composing and creating in the Anthropocene and seeking the most effective methods for respond to our crisis. I hope these research projects will continue to expand, and I welcome further collaborations between artists, scientists, and communities to listen, document and respond to the changing soundscapes of our planet's ecosystems.

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