Acoustically Fascinating and Often Free: The World of Acoustic Ecology, Field Recording, Soundscape, & Soundwalking

The Basics, Logistics, and an Invitation to Explore via Online Resources

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Introduction

Because of the essential communicative, ecological and aesthetic functions in sound and listening, one may be surprised at first—hopefully in a positive way—by the complex ways in which they work in our lives, and connect us to the natural world. If you feel a bit unsure about how to lead rich, sound-based experiences, we invite you to explore the resources offered below. They are organized under 10 categories. Under each heading, we recommend a particular resource for novices with a capitalized and bold-faced **RN,** and at least one or more for deeper exploration with **ADV**. As you add to your knowledge, consider building skills in these areas. Look for a color coded circle to indicate, for example:

- Gaining skills for leading an experience for others (Red) 🔴
- Become knowledgeable about studies on sound and soundscape (Green) 🟢
- Know something about field recording (Blue) 🔵
- Become proficient in presenting data (Gold) 🟡

Because the new and rapidly expanding field of acoustic ecology includes the contributions of artists, historians, philosophers, architects, psychologists, physicists, sociologists, and biologists, the resources listed here are not all-inclusive. New approaches and controversies are developing and resolving. Like the acoustic environment itself, it is always in change and immersive.

We begin with the primary texts under **Acoustic Ecology and Acoustic Communication**, those being *The Tuning of the World,* published in 1977, in which R. Murray Schafer introduces the first non-technical lexicon for describing the acoustic environment as a meaningful part of our experiences, beginning with the

term “soundscape.” Following the concepts introduced by Schafer, Barry Truax, Hildegard Westerkamp, and Dr. Bernie Krause, readers and interested folks can quickly grasp how listening and sound making are immediately and simply engaging. To keep up with new innovations and approaches, see the other nine categories listed.

This resource is not intended to be all-inclusive. The fields of sound and ecology are rapidly expanding, with an abundance of contributions from artists, architects, philosophers, engineers, data scientists and biologists, among others. By reading one article or exploring one site, following links and/or subscribing to email lists of the affiliates and associates of the World Forum for Acoustic Ecology (WFAE), readers and interested folks can connect with an activity community, seek out a mentor, and keep up with new innovations and approaches.

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Acoustic Ecology, Soundscape Studies and Acoustic Communication

ADV, ***Acoustic Communication*** (1984 edition, PDF); *Acoustic Communication* at SFU by Barry Truax. 🟢

Acoustic Ecology Institute mostly archival, concerning news, issues, research, and activism dating from 2004-2009, the ***AEI news*** ended in 2019. 🟢

RN, **An Introduction To Acoustic Ecology** by Kendall Wrightson.

Arcana Editions R. Murray Schafer's imprint for mail order music, books, recordings, including *The Tuning of the World* (orig. publ. 1977) the primary text in which Schafer introduces soundscape as a new field of study, later retitled in 1994 as ***The Soundscape: Our Sonic Environment and the Tuning of the World***, its clear and attractive prose makes it accessible for students, their teachers, and general readers "as the grammar for acoustic ecology." 🔴🟢

Biosphere Soundscapes led by Leah Barclay. 🔴🟢🔵🟡

The Disruptive Nature of Listening 2015 article by Hildegard Westerkamp. 🔴🟢🔵

Handbook for Acoustic Ecology *Originally published by the World Soundscape Project, Simon Fraser University, and ARC Publications, 1978. Edited by Barry Truax, Professor in the Schools of Communication and Contemporary Arts at Simon Fraser University, is a 160 page reference work, originally published in 1978, which compiles all major terminology from the fields of acoustics, psychoacoustics, environmental acoustics and noise measurement, electroacoustics, music, linguistics, and soundscape studies, with extensive cross-references and straightforward explanations.* Truax has completed a 19 module online Tutorial for the Handbook For Acoustic Ecology with HTML5 audio examples and quizzes, available in the **World Soundscape Project Database,** noted below. 🔴🟢🔵🟡

How opening our ears can open our minds: Hildegard Westerkamp, CBC radio February 2, 2017. 🔴🟢

How soundscapes can reflect healthy ecosystems, by Kent Miller, *Land Lines* 2019.

Midwest Society for Acoustic Ecology Non-profit organization based in Chicago promoting acoustic ecology practice in the United States since 2009. 🔴🟢🔵

Soundscape Explorations is a searchable directory of Internet videos related to the field of acoustic ecology. The subjects are varied and range in length from a few minutes to an hour or more. 🔴🟢🔵🟡

Sound, Media, Ecology Edited by Milena Droumeva and Randolph Jordan, Palgrave 2019. 🟢

Sound and Noise: A Listener's Guide to Everyday Life, by Marcia Jenneth Epstein, Foreword by Arline Bronzaft, McGill-Queen's University Press, 2020. 🟢

Soundscape Studies and Methods (2002) Ed. by Helmi Järviluoma, Greg Wagstaff, The Finnish Society for Ethnomusicology is a small book loaded with excellent examples of applied research. 🟢

World Forum for Acoustic Ecology, founded in 1993, is an international association of affiliated organizations and individuals who share a common concern for the state of the world's soundscapes. Our members represent a multi-disciplinary spectrum of individuals engaged in the study of the social, cultural, and ecological aspects of the sonic environment across the world. The WFAE publishes ***Soundscape: The Journal of Acoustic Ecology*** (est. 2000 and available free as a digital download). The WFAE supports conferences, provides a growing online resource library, and news about opportunities and resources. 🔴🟢🔵🟡

World Listening Project - Non-profit artist-run organization founded in 2008, devoted to diverse listening practices through field recording, mainly through promotion of the annual **World Listening Day** every July 18th, to inclusively and publicly engage all stakeholders in their soundscapes globally and locally. 🟢🔵

World Soundscape Project Database of the **World Soundscape Project,** where foundational soundscape research began in the early-1970s, by a team including Barry Truax and Hildegard Westerkamp, and others, led by R. Murray Schafer at the **School of Communications**, Simon Fraser University, BC. The database continues to grow and is open. This includes the online version of the Handbook for Acoustic Ecology with sound examples and the new online Tutorial mentioned above. For access, email Barry Truax truax@sfu.ca to request **guest login**. 🔴🟢🔵🟡

Auditory Spatial Awareness & Aural Architecture

All sounds inhabit time and space and reflect the features of the space and the place in which sounds are produced. How they propagate in spaces and our association with them are, beyond measurable room acoustics, a key component of our sonic experience.

RN, **Barry Blesser**, author with Linda-Ruth Salter, of *Spaces Speak, Are You Listening? Experiencing Aural Architecture* - We experience spaces not only by seeing but also by listening. We can navigate a room in the dark, and "hear" the emptiness of a house without furniture. Our experience of music in a concert hall depends on whether we sit in the front row or under the balcony. Social relationships are strongly influenced by the way that space changes sound. In *Spaces Speak, Are You Listening? Experiencing Aural Architecture*, Barry Blesser and Linda-Ruth Salter examine auditory spatial awareness: experiencing space by attentive listening. Every environment has an aural architecture. Auditory spatial awareness is a prism that reveals a culture's attitudes toward hearing and space. Even without training in architecture or acoustics, we can all hear, be influenced by, and discuss spatial geometry. 🟢

Bioacoustics, Ecoacoustics

Biologists study the sounds of animals as an indicator of ecosystem health. Generally, bioacoustics is the study of the sounds of individual species. More recently, scientists have become interested in the totality of sounds across species living in a particular habitat and call this approach "soundscape ecology," and more recently, "ecoacoustics." Remote environmental (audio) sensors and software data analysis is a non-invasive and less harmful way to collect information about the creatures and habitats studied en vivo. These ecosystems include undersea environments where, in the absence of light, deep sea creatures depend more on sound for their survival.

Avisoft Bioacoustics hardware and (Windows) software for sound analysis, editing, classification and synthesis. 🟡🟢

Tutorials and resources on the **Discovery of Sounds in the Sea** also are potentially useful for teachers and their students. 🔴🟢🟡

Michael Stocker's book ***Hear Where We Are: Sound, Ecology, and Place*** is a wonderful introduction to sound, ecology and sense of place that updates the orthodoxies of bioacoustics regarding both human and non-human communication. 🟢

In addition to Michael Stocker's book mentioned above, the author is director of **Ocean Conservation Research**, a non-profit organization offering many learning resources, including a sound library. The OCR blog provides regularly posted news on the policies and bioacoustic research into the impacts of human-generated sounds upon marine life. 🔴🟢🔵🟡

REAL: Remote Environmental Assessment Laboratory at Michigan State University. 🟢🟡

Sound of Light in Trees: The Acoustic Ecology of Pinyon Pines by David Dunn and this report, **Composer Records Beetles to Mark Climate Change : NPR** concerns Dunn's creative and scientific discoveries. 🟢🔵

RN, online introductions: **Dr. Bernie Krause's 2013 TEDTalk, "The voice of the natural world,"** this episode of NPR's ***TED Radio Hour***, **How Does Listening To Nature Teach Us About Changing Habitats?** 🟢🔵🟡

ADV, Bernie Krause introduces soundscape ecology. He has been recording wild soundscapes for 45 years. **Soundscape Ecology: The Science of Sound in the Landscape** is a 2011 article published in *BioScience,* co-authored by Bernie Krause, founder of **Wild Sanctuary**, with Almo Farina, founder of **Journal of Ecoacoustics** and author of ***Ecoacoustics: The Ecological Roles of Sounds*** (book), and Bryan Pijanowski, founder of the **Center for Global Soundscapes.** 🟢

Citizen Science Projects for Data Analysis and Presentation

Acoustic Commons is a UK-based, artist-run collective self-described as “a sticky concept for thinking together about sounds, ecologies, atmospheres and collective actions in (un)common time(s).” Their activities include public engagement with affordable technologies for live streaming in remote locations. 🔴🟢🔵

Calling Frog Survey a Chicago-area citizen science initiative. 🔴🟢

ADV, Geographic Citizen Science Design open access e-book published in 2021. 🔴🟢🔵🟡

Hush City App for crowd-sourced analysis and mapping of quiet places in cities. 🟢🔵🟡

NoiseTube, an app for measuring and analysing noise levels. 🟢🔵🟡

RN, Singing Insects Monitoring Program (SIMP) Citizen science initiative in the U.S. Midwest region. 🔴🟢🟡

Kathleen Soler’s presentation on SIMP for iSwoopparks. 🔴🟢🟡

NPS Natural Sounds Outreach and Education 🔴🟢🔵🟡

Deep Listening

Pioneering American composer Pauline Oliveros (1934-2016) coined the term "Deep Listening" for the title of a 1989 improvised music recording made with musicians Stuart Dempster and Panoiotis, in a gigantic underground cistern, in Port Washington. This space, with its incredibly long reverberation time, made itself a fourth player, leading the three musicians to include its response as an instrument in itself. The incredible effects sounds and their successful improvisation inspired Oliveros to create a special practice of Deep Listening devoted to the creative, therapeutic, and restorative power of listening to one's environment. Deep Listening is accessible and inclusive for everyone to explore any and all sounds whether natural or technological, intended or unintended, real, remembered or imaginary.

Deep Listening links to lectures and reflections on her life and work, archives, books, and resources. 🔴

RN, The Center for Deep Listening - Deep Listening is a practice that includes bodywork, sonic meditations, and interactive performance, as well as listening to the sounds of daily life, nature, one’s own thoughts, imagination, and dreams. It cultivates a heightened awareness of the sonic environment, both external and internal, and promotes experimentation, improvisation, collaboration, playfulness, and other creative skills vital to personal and community growth. Deep Listening as a practice consists of listening and sounding exercises and pieces Oliveros and others have composed since 1970. The results are processed by group discussions in workshops and retreats. Deep Listening is for musicians as well as participants from other disciplines and

interests. Previous musical training is not required. The exercises are very helpful and open to everyone. Note that training for Deep Listening certification does require a fee. 🔴

Field Recording and Phonography

The practice of field recording has a long history, now growing in popular interest as the technologies of sound recording and storage become ever more affordable. So surprising is the effect of their initial recording experiences, that many musicians have stopped playing instruments, and now compose their work based almost solely on listening and recording of real world sounds outside the recording studio. Some, like Bernie Krause and Leah Barclay, have merged their music with biological research and art-science collaborations.

Field recording, sometimes referred to as phonography, also possesses a history in ethnography and biological sciences. This section 1 begins with a list of online beginners' guides and articles. This is followed by *section 2,* a sampling of field recordists and their works, and then 3, a short list of specifically nature sound recording associations and publications.

1. Beginners' Guides and Getting Started

A Beginner's Guide To... Field Recording by Lawrence English. 🔵

Ten top simple field recording tips | Cities and Memory. 🔵

fieldrecordingsaic - Course blog by students in Eric Leonardson's *Field Recording & Phonography* course. 🔵

Getting started with tech tips for the **radio aporee** sound map. 🔵🟡

Ten top simple field recording tips 🔵

phonography.org 🔵

Wild Soundscapes: Discovering the Voice of the Natural World, Revised Ed., with sound examples online, by Bernie Krause, Yale University Press, 2016. 🔴🟢🔵🟡

2. Selected creative field recordists and their work

Cheryl E. Leonard- *Antarctica*

Chris Watson - *Weather Report*

Christopher DeLaurenti | Phonography

David Monacchi- *Fragments of Extinction*

Jez riley French - Jez is widely regarded as having played a pivotal role expanding the use of contact microphones, hydrophones, electromagnetic coils, ultrasonic detectors, geophones and vlf receivers in the sound arts, sound design (for screen, theatre and radio) and music in a wide range of contexts. In 2017, as part of Hull's City of Culture year, he was commissioned by Opera North & Hull CoC to be involved in the 'Height of the Reeds' project, turning the Humber Bridge into a sonic experience that was experienced by over 10,000 people. A reworked version of the piece was later released on cd & in February 2019 Jez was nominated for a Norwegian Grammy for his work on the album.

Shadow Walks by Viv Corringham

3. Nature Sound Recording Associations, Record labels & Journals

Are You Listening? Hear What Uninterrupted Silence Sounds Like: NPR

Nature Sounds Society

Wildlife Sound Recording Society (WSRS) founded in 1968

EarthEar record label

Sounds From Dangerous Places: Sonic Journalism 2014 post about Peter Cusack

FieldRecording.de *- Das Field Recording Onlinemagazin*

Gruenrekorder record label and a free bi-lingual magazine edited and published by Daniel Knef and Lasse-Marc Riek. The magazine is concerned with the phenomenon of sound from the most varied perspectives: artists, musicians, journalists and scientists add to Field Notes with their essays, interviews, travelogues, anecdotes, notes and picture series. The magazine took a pause, but Field Notes is back with … free audio releases and articles from Eli Neuman-Hammond (exploring the microphone-recorder as a creative tool and its role as a descriptive apparatus), and Ludwig Berger (on a long-form field recording that he captured in an abandoned structure in Zurich and the unequal perceptions one place can elicit in different people).

Sound Maps and Archives

Most of what we experience through sound is perceived unconsciously. Beyond the coded meanings of music and speech, the acoustic information our mind and body uses are embedded in the soundscape: an acoustic communication system that is largely subliminal and subtle. The ear and brain sense temporal and spatial cues perceived with a deep level of physical immediacy that directly connects the auditory to the autonomic nervous system and memory.

Bringing the soundscape—the sum of individual perceived and socially defined sound—to conscious awareness reveals and mobilizes a new range of sensory aesthetic experiences and knowledge with the potential for cross over into musical and visual arts practices, and social science research, in the form sound maps, spectral visualization, archiving, etc.

Annea Lockwood, widely published composer of *A Sound Map of the Hudson River*, and many other breakthrough accomplishments in music. 🟢🔵🟡

British Library Sound Maps. 🟡

COVID-19 Sound Map by Pete Stollery. 🟡

Creative Research into Sound Arts Practice (CRiSAP) London College of Communication. 🔴🟢🔵🟡

Favourite Sounds by UK sound artist, Peter Cusack. 🟡

ADV, Locustream Soundmap | Live Worldwide Open Microphones an open community project, an initiative of Locus Sonus (ESA-Aix). 🔵🟡

RN, radio aporee ::: maps - sounds of the world an open global soundmap platform established by Udo Noll. 🔵🟡

U.S. Geological Survey Science Explorer publications on Ecoacoustics. 🟢🔵🟡

Health, Hearing & Psychoacoustics

Hearing is necessary to experience acoustic information in the environment. The study of auditory processing, the individual's ability to perceive and make sense of what is heard involves a complex set of neurological and cognitive events. Psychoacoustics, audiology and cognitive psychology are among the sciences involved in understanding the physical, emotional, and perceptual interrelationships. It's a fascinating area of research with findings that are critically important for childhood learning, public and individual health, and aging. In 2018 the WHO estimates widespread and preventable noise-induced hearing impairment and loss is a global problem affecting 466 million persons or 6.1% of the world's population.

Brainvolts - Auditory Neuroscience Laboratory

Can Hearing Loss Damage the Brain?

ADV, Diana Deutsch preeminent scholar of the psychology of music at University of California at San Diego. 🟡

MANCAD Season 1 – Episode 02 – Jenna Littlejohn: Hearing loss, loneliness and mental health during social distancing, June 12, 2020.

Noise-Induced Hearing Loss, National Institutes of Health (NIH)

RN, **Why You Hear What You Hear** web resources for the book by Eric J Heller. 🟡

Physics of Sound: Acoustics and Vibration

Demonstrations in Acoustics video series by Richard E. Berg, University of Maryland

RN, Listening to Waves, is a set of online tools and tutorials so users can explore and experiment with a signal generator, oscilloscope, and spectrograms. A recording of Victor Minces workshop introducing the tools is available on iswoopparks.com/about/resources

NEXT.cc learning module on sound

Soundwalking: Theory and Practice of

Soundwalking was developed by the socially-engaged artistic researchers of the World Soundscape Project, namely R. Murray Schafer and Hildegard Westerkamp. The practice has gained widespread interest and acceptance as a non-technological and creative method to understand sound-making and listening outside the lab, in situ. It is highly suitable for public engagement, a general topic mentioned further on in this guide. In her article, "**Soundwalking**," Westerkamp says it can be a form of research or a meditation, an entertainment or all of these. She describes it as an ecological practice. Listening demands that we slow down. This can be a welcome break or a ***disruption***. Sometimes a listening walk can be effective. Either way, they are a practice to be learned and conducted in many different and creative ways.

Acouscenic Listening Intensive by art-science duo Softday. 🔴🟢🔵🟡

Atlantic Center for the Arts provides soundwalks and iSwoop's **Young Sound Seekers** program. 🔴🟢🔵🟡

Beyond the Noise: Open Source Soundscapes by Antonella Radicchi. 🔴🟢🔵🟡

Soundwalking Interactions by Andra McCartney (1955-2019) 🔴🟢🔵🟡

The Practice of Listening in Unsettled Times (video) by Hildegard Westerkamp 🔴🟢

The Sonic Ecology of the Tourist City by **Brandon LaBelle** 🔴

Electrical Walks by Christina Kubisch 🔴🟡

Ecology of Sound: Hildegard Westerkamp (CBC radio) 🔴

Elizabeth Burke-Dain, Listening to Two Neighborhoods 🔴

Junior Ranger Sounds Explorer, an online guidebook for youth from the National Park Service. 🔴

Good Vibrations - Megapolis Audio Festival by Johann Diedrick and Christie Leece 🔴🔵🟡

Katrin Emler, Path of Awareness

ADV, "How do Soundwalks Engage Urban Communities in Soundscape Awareness?" by Amanda Gutierrez, Eric Leonardson, and Norman W. Long - Proceedings of Invisible Places 2017 🔴

"How to conduct your own soundwalk**"** by Sophia Yang, *Land Lines* 2016 🔴

"How to soundwalk" Part 1 **and** Part 2 by Eric Leonardson, *Land Lines* 2015 🔴

"Our Sonic Playground: A Model For Public Engagement In Urban Soundscape Awareness," by Eric Leonardson, *The Journal of Urban Cultural Studies* 🔴🟢

"Silent Soundwalking: an urban pedestrian soundscape methodology," by John Drever

"Soundwalking as a methodology for understanding soundscapes," Adams, MD, Bruce, NS, Davies, WJ , Cain, R, Jennings, P, Carlyle, A, Cusack, P, Hume, K and Plack, C 🔴

"Soundwalking as Ecological Practice" by Hildegard Westerkamp 🔴🟢🟡

"Soundwalking" by Hildegard Westerkamp 🔴🟢🟡

Participatory (DIY Soundwalk) by Stephanie Loveless

"Tactical Soundwalking in the City: A Feminist Turn from Eye to Ear" by Stephanie Loveless, *Leonardo Music Journal 30.* 🟢

"World Listening Day - Soundwalks- Reflections" by Norman W. Long.

"World Listening Day 2020 - The Collective Field, Reflections & Recordings by Norman W. Long"

A Sound Education 100 Exercises in Listening and Soundmaking, "Ear Cleaning" exercises - R. Murray Schafer, Canadian composer, educator, author and founder of acoustic ecology. 🔴

RN, What is a soundwalk? on Vimeo by Amanda Gutierrez. 🔴

Author

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Acknowledgments

Interpreters and Scientists Working On Our Parks (iSWOOP) was funded by the National Science Foundation as a model program to build visitors' understanding of science at National Parks. This project advances STEM (science, technology, engineering, and math) learning among national park visitors. iSWOOP brings together educators, scientists, and National Park Service (NPS) interpreters to incorporate site-based science into programs for the public.
This project is made possible with support from the National Science Foundation DRL-1514667 and DRL-1514776. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.