Introduction

One Ecology and Many Ecologies: The Problem and Opportunity of Ecology for Music and Sound Studies

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The "problem of ecology" for music and sound studies, as I see it, is the invocation of ecology to mean something other than what ecological scientists mean by it. At the same time, however, this "problem" is an opportunity because, since its 19th-century development as a biological science, ecology has informed other realms of inquiry that resonate with music and sound studies. With this special issue of *MUSICultures*, we aim to address that problem and take advantage of the opportunity. In particular, we aim to help in understanding ecological science and to begin distinguishing the richness of the many ecologies that make useful contributions to music and sound studies. Given the diversity of definitions and uses of ecology already displayed in scholarship writ large (including those presented and not presented in this special issue), disagreements will surely persist, and individuals (myself included) will continue to use ecology in denotative and connotative ways that are understood harmoniously and discordantly in various scholarly communities. The upshots will be consternation and confusion but also creativity and even collaboration — that is, definitions will both hurt and help, and invoking the term ecology without clarification can be both detrimental and useful. My hope is that music and sound scholars will be aware of the distinctions and thus be able to choose wisely the appropriate definition, to studiously avoid such definitions, or at the least, to be cognizant of the implications of both approaches and be aware that not everyone understands equally the various uses of ecology. Such a diversity of possibilities would not solve the problem, and that diversity is simultaneously the source of the opportunity.

The 3rd edition of *Ecology* by Robert E. Ricklefs (1990) begins Chapter 1 with the following paragraph:

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> The English word 'ecology' is taken from the Greek *oikos*, meaning house, the immediate human environment. In 1870 [1866], the German zoologist Ernst Haeckel first gave the word its broader meaning, the study of the natural environment and of the relations of organisms to each other and to their surroundings. General use of the word came only in the late 1800s, when European and American scientists began to call themselves ecologists. The first societies and journals explicitly devoted to ecology appeared in the early decades of this [the 20th] century. Since that time, ecology has undergone immense growth and diversification, so much so that persons devoting their professional lives to ecology now number in the tens of thousands. With the dual crises of rapid growth of human population and accelerating deterioration of the earth's environment, ecology has taken on the utmost importance to everyone. Management of biotic resources in a way that sustains a reasonable quality of human life depends upon wise ecological principles, not merely to solve or prevent environmental problems but to inform our economic, political, and social thought and practice.

Ricklefs gives appropriate emphasis to one of the founders of ecological science, Ernst Haeckel (1834-1919), and paraphrases his 1866 definition of "oecologie." Haeckel is a controversial figure (see Egerton 2013), and he was but one of many individuals who formulated the modern science of ecology, the ideas for which Egerton (2012) has traced to antiquity. Nevertheless, Haeckel's first definition of ecology has had considerable influence, so it is worth considering his original formulation as presented in the chapter "Oecologie und Chorologie" in Volume 2 of *Generelle Morphologie der Organismen* (1866):

> By ecology, we mean the whole science of the relations of the organism to the environment including, in the broad sense, all the "conditions of existence." These are partly organic, partly inorganic. ... Among the inorganic conditions of existence to which every organism must adapt itself belong, first of all, the physical and chemical properties of its habitat, the climate (light, warmth, atmospheric conditions of humidity and electricity), the inorganic nutrients, nature of the water and of the soil, etc.
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> As organic conditions of existence we consider the entire relations of the organism to all other organisms with which it comes

> into contact, and of which most contribute either to its advantage or its harm. Each organism has among the other organisms its friends and its enemies, those which favor its existence and those which harm it. The organisms which serve as organic foodstuff for others or which live upon them as parasites also belong in this category of organic conditions of existence. ... The extraordinary significance of these relations does not correspond in the least to their scientific treatment, however. (qtd. in Egerton 2013: 226)

Among many possible connections to make between this definition and this special issue of *MUSICultures*, three stand out. First, the term ecology originates in the biological sciences. Haeckel coined the term "oecologie," which was translated into English as "ecology." Since the 19th century, ecology has spread into a great variety of scholarly and popular pursuits; it has taken on new meanings in those realms, a situation furthered by its morphing through translations. But Haeckel's original definition has been particularly influential, as were a number of his other important scientific neologisms, such as *ontogeny*, *phylum*, and *phylogeny* (Egerton 2013). Second, context is an important part of Haeckel's definition: the context for an organism involves organic and inorganic relationships that range from light, chemistry, and temperature to food, friends, and predators. Although apparently simple, it is worth emphasizing that the idea of context involves a complex multiplicity of variables and factors rather than a simplistic relationship between part and whole, which was characteristic of the science of physiology that Haeckel was critiquing. Such contexts were both biotic (Haeckel's "organic") and abiotic ("inorganic") — i.e., they concerned both the organism and other living organisms as well as the non-living features of the environment surrounding those organisms. (In chemistry the categories of organic and inorganic, with carbon atoms and without respectively, are fundamental, but they do not necessarily translate to Haeckel's distinctions.) That leads to the third important point: environment and ecology are not synonyms (see Titon's Afterword). The study of ecology considers organism(s), organic and inorganic environments (i.e., contexts), and their many relationships. Thus, Haeckel uses "environment" as a part of ecology, not an equivalent.

Haeckel's definition is over 150 years old, but it is still useful, as indicated by its regular citation (in the many dates of Haeckel's publications with continually refined definitions). A fourth edition of Ricklefs' book, from 2000, is available. One could also consult the 8th edition of his other ecology textbook, *Ecology: The Economy of Nature* (2018), or of course one could consult any of the other myriad textbooks on the subject. The discipline of ecology has changed

in the past 30 years, yet Ricklefs' nearly three-decades old statement is still valid as I write in 2018. Why cite it rather than a newer one? My goal in part is to show the enduring power of the meaning of ecology. But more particularly, I cite the 3rd edition of the Ricklefs because it is the ecology textbook I studied as an undergraduate at Tulane University, and it has informed my understanding of ecology. I took other ecological classes (restoration ecology, ecological anthropology, etc.), but the ecology class I took in the fall of 1997 with Thomas Sherry ingrained in me a conception of ecology that is fundamentally rooted in the Haeckel definition. Haeckel may have had his own contextual influences that prompted him to define ecology in the 1860s, just as the Ricklefs approach to ecological science came about in the period when humanity has taken heed (or has been forced to take heed — or is still in the process of taking heed) of the increasingly problematic pressures we place on our home planet: pressures that impact human societies, other life forms, and the systems that provide for us all. Therefore, ecology, for me, is "the study of the natural environment and of the relations of organisms to each other and to their surroundings" (Ricklefs 1990: 3) done "in a period of environmental crisis" (Titon 2013: 8).

Jeff Titon has also influenced my thinking with regard to ecology, not only because he is my co-editor for this special issue and because we have collaborated previously (Allen, Titon, and Von Glahn 2014; Allen et al. 2015; and Allen and Dawe 2016), but also because his writing was an early source for me regarding the cultural approach to sustainability and music (Titon 2009a, 2009b, 2009c; see also Titon's Afterword). Titon and Ricklefs, among others, have informed my ideas about ecomusicology. Sustainability relates fundamentally to environmental crises and ecological principles, in addition to social justice and appropriate economics, a point I elaborate elsewhere with a particular emphasis on the inclusion of aesthetics (Allen 2019), and that many others have made as well (Orr 2010; Brundtland et al. 1987; Titon 2009c, 2015). Titon has extensive experience with the science of ecology, which comes across in his long career: from his studies in college and lifetime as an organic gardener to a course he co-taught at Tufts called "History and Ecology in America;" and from his *Powerhouse for God* (1988) chapter on "Land and Life" (discussing culture, agriculture, and ecology in the northern Blue Ridge Mountains) to his recent essays in the second decade of the 21st century. In a handful of Titon's most-cited approaches (1984: 9, 2009a, 2009b, 2009c) he drew from ecological thinking to formulate powerful ideas for music study and cultural policy. To state that differently: rather than dealing with ecological science and environmental issues directly, he found useful and insightful frameworks to apply to the sustainability (or preservation) of music and music cultures (something he continues in his Afterword to this special issue). Beginning particularly with his appeal for a

sound commons for all living creatures (Titon 2012), his subsequent writings on music and sustainability began incorporating considerably more ecology and environmental issues (in addition to his Afterword, see Titon 2013, Titon 2015, and Allen 2019).

Others in music and sound studies have proceded as in that handful of Titon's work which used ecology as inspiration for approaches to music sustainability. For example, Schippers and Grant (2016) drew on the cultural sustainability discourse and invoked the ecological idea of networked systems (see also Titon's Afterword). But Schippers and Grant did so without engaging the relationships to environmental crises and the non-human and abiotic contexts that are fundamental to ecological science (see my critique in Allen 2017, which is contextualized further in Allen 2019). This approach (what I am calling the "problem of ecology" for music and sound studies) has precedent in ethnomusicology: Archer (1964) sought to draw out the ecological metaphor by arguing for the study of the social contexts for music. Surely Archer's goal was an improvement over studying music as if it were a thing unto itself divorced even from human context (and I particularly appreciate Archer's idea to take into account raw materials for musical instruments, as have others including Allen 2012, Trump 2013, Dawe 2016, and Smith 2016). Of course, very few scholars were approaching music as ecology in the 1960s. At the time, musicology and ethnomusicology were predicated on considering music in context: with musicologists emphasizing biographical, historical, stylistic, and textual (editorial) contexts and with ethnomusicologists emphasizing social and cultural contexts (and those two broadly delineated disciplines were not necessarily mutually exclusive). Archer's contribution was to think about such contexts also as ecological (see also Titon's Afterword), yet we seem not to have been able to fully expand on the implications of his call: we may study music and sound in human context, but, notable exceptions notwithstanding, we still have not expanded well enough to the planetary, non-human, and abiotic contexts that make that human context possible. (To make a parallel to Haeckel's organic and inorganic: we are still working on considering the organism in its organic context but have not managed to fully integrate our study into inorganic contexts and into the linkages between organic and inorganic contexts in relation to the organism.) The 2010 conference of the Society for Ethnomusicology was entitled "Sound Ecologies," during which many participants used "ecology" to mean "connection"; rather than "ecology," the term "network" (or even "social networks" or "cybernetics") would have been more accurate, because the abiotic/non-human/environmental/natural contexts were largely absent in the abstracts and papers in Los Angeles that year (despite a few notable exceptions, such as Katharine Payne's presentation

on whale song, "Why Listen to the Other Animals?"). While I recognize Keogh and Collinson's (2016) concern about the "abuses" of ecology in music and sound studies, I find their reading of ecomusicology to be incomplete and their own conceptions of ecology problematically lacking the pluralistic, dynamic, and diversified approaches that characterize broader engagements with the concept.

In general, then, this is what I see as the "problem of ecology" for music and sound studies: the invocation of ecology to mean something other than what Haeckel and Ricklefs — or any of those "tens of thousands" of professional ecologists (Ricklefs 1990: 3) — would understand as ecological. This "problem" relates fundamentally to the three points I made above about Haeckel's "oecologie" definition. First, despite (or perhaps because of) the 19th-century coining and definition of ecology that remains current today, the term has evolved into much more, particularly in the humanities and in the disciplines of philosophy and literature. Second, when incorporated into music and sound studies, the term ecology has often lost touch with the complex contexts (i.e. those both organic and inorganic) and is instead re-simplified to focus only on the human organism. And third, it is necessary to disambiguate ecology and environment in order to more accurately and carefully study, understand, advocate, and promote preservation and change with regard to human (musical) cultures, non-human and human soundscapes, and the interactions between them and other biotic and abiotic contexts (see also Titon's Afterword). Thus, the "problem of ecology" is essentially about how we use the term — about how the term has been defined, co-opted, used, misused, and reused in various contexts with and without explanation.

This "problem" as I have outlined it, however, is not insurmountable and indeed may be an opportunity. For example, there are numerous ecologically inspired fields in the humanities and social sciences; these fields have developed disciplinary communities who understand the term ecology in particular ways distinct from, and also related to, Haeckel and Ricklefs. Ecomusicology is one such field (although it also represents a panoply of other fields and disciplinary influences, and one may also find in ecomusicological work uses of ecology that Haeckel and Ricklefs would recognize). The authors of *Current Directions in Ecomusicology* dealt with about a dozen other ecological fields that are defined concisely in that book's "Glossary of Keywords" (Allen and Dawe 2016: 288-292). The CFP for this special issue of *MUSICultures* invoked those and other ecologies: conservation ecology, soundscape ecology, cultural ecology, ecological/environmental psychology, human ecology, political ecology, acoustic ecology, deep ecology, ecocriticism, ecomusicology, ecophilosophy, environmental humanities, sacred ecology, etc. The resulting contributors in this special issue

address many of these. Having one person define and attempt to disambiguate them would be a cumbersome (and boring) venture, subject to failing before even beginning. The point nevertheless remains: many fields of inquiry and practice have taken on the mantle of ecology, and while their diversity and distinctions can be confounding, many are useful and productive partners for music and sound studies.

But the "problem of ecology" is only part of the motivation for this special issue. To be sure, this "problem" is grounds for defensive reaction, critical engagement, and attempts at clarification. Nevertheless, there are also reasons to promote what we might call "the opportunity of ecology" for music and sound studies, particularly with regard to ecomusicology. I defined ecomusicology (after a lengthy community vetting process) as "the study of music, culture, and nature in all the complexities of those terms. Ecomusicology considers musical and sonic issues, both textual and performative, related to ecology and the natural environment" (Allen 2014). Ecomusicology could be seen as part of the "problem" and as a path of "opportunity": it references ecology, and some ecomusicological literature engages the science, yet much in the literature does not directly relate with the science of ecology and instead deals more with vague concepts of nature or general environmental issues. The prefix "eco-" in the portmanteau ecomusicology can certainly be understood as "ecological," and there is increasing evidence that such a use is the case as in, for example, the first "direction" of *Current Directions in Ecomusicology* (Allen and Dawe 2016). (The other three directions are fieldwork, critical, and textual.) In fact, as Dawe and I described the field of ecomusicology, it is "the coming together of music/sound studies with environmental/ecological studies and sciences" (Allen and Dawe 2016: 2). But it is important to call out the eliding that happens in that sentence because there are at least four distinct (inter) disciplines/fields at play in the latter half of that definition (to say nothing of the diversity of the first part regarding music and sound studies): environmental studies, environmental sciences, ecological studies, and the science of ecology. The "problem of ecology" in ecomusicology comes from the historical influence of literary studies on musicology in general and from the particular influence on ecomusicology from the literary field known as ecocriticism (see Allen 2014 and Allen et al. 2011). Hence ecomusicology as "ecocritical musicology" ("ecological critical musicology") is at least one step removed from the science of ecology (similar concerns could be brought to bear on the relationships of literary studies, ecology, and ecocriticism, but this is not the place for such an excursus). That removal seems to have resulted in the loss of some of the original, scientific aspects of ecology, but for ecomusicology what remained is decidedly environmental (see Titon 2013 and the introduction to Allen and

Dawe 2016). Therefore, for ecomusicology at least, it is important to distinguish the key environmental (and/or nature) themes into those that are oriented to the specific scientific discipline of ecology and those that are oriented to the interdiscipline (or transdiscipline) of the more general environmental studies. We would benefit from a more careful use of language that clarifies our use of ecology (the science) from any of a variety of other ecologies, including those that mean environmental more generally and those that offer little apparent connection with the non-human or abiotic elements of human contexts. Titon furthers this distinction in his Afterword, and we hope this special issue is a solid step toward greater clarity (or at least to recognizing the problem).

Titon and I sought out articles for this special issue that illustrated the plurality of ecologies but that simultaneously engaged more with ecology than the more general ideas of environment or nature. Of course, a special issue of a journal cannot be comprehensive, and there should be no expectation that what we provide here would be a comprehensive approach to the variety of ecologies. What we propose with this special issue is to further develop this idea of the plural ecologies as they are related to music and sound studies. Rather than addressing directly the "problem of ecology" for music and sound studies, we appreciate instead that the authors have decided on a more straight-forward approach to the opportunities that ecologies offer for music and sound studies. These are not limited to the scientific, and they are not unique to music and sound studies. The science of ecology has been influential in many fields of study in the social sciences and humanities, and we see much of that influence in this special issue. A brief overview of the contributions shows some of that diversity and influence.

Julianne Graper's background in biology informs her multi-species ethnomusicological research for "Bat City: Becoming with Bats in the Austin Music Scene," in which she draws on the ecological science of conservation biology as well as science and technology studies to "argue for a new understanding of ecology as a process that does not seek to separate the human from the non-human, but rather evaluates and values interspecies interactions of all types, searching for ways that humans and non-humans can (and already do) productively coexist in a rapidly shrinking world." Historian of science Alexandra Hui focuses on another flying non-human species in "Imagining Ecologies through Sound: An Historic-ecological Approach to the Soundscape of the Mississippi Flyway." Hui considers the changing sonic environment for ducks, or more properly duck calls and duck callers (including but not limited to hunters), draws on the history of ecological science and ecosystem thinking, and argues for the idea she calls "imagined ecologies," which involves "an individual's or community's understanding of themselves as part of an ecological system."

Ecologist John E. Quinn and his colleagues Anna J. Markey, Dakota Howard, Sam Crummett, and Alexander R. Schindler present the results of their research on noise in pine forests and at a zoo in "Intersections of Soundscapes and Conservation: Ecologies of Sound in Naturecultures." This article may be quite different from the usual format and style of articles familiar to readers of *MUSICultures*; it is a scientific article, reviewed by ecological scientists and written primarily for other scientists but with an overture to the necessary interdisciplinarity that characterizes soundscape ecology. Ethnomusicologist Jennifer C. Post and soundscape ecologist Bryan C. Pijanowski address directly the necessity of that interdisciplinary approach in their essay "Coupling Scientific and Humanistic Approaches to Address Wicked Environmental Problems of the Twenty-first Century: Collaborating in an Acoustic Community Nexus." Post and Pijanowski argue for close collaboration between scientists (as represented by an ecologist) and humanists (as represented by an ethnomusicologist) to address biodiversity and other environmental challenges as related to sound in human and non-human communities. Post and Pinjanowski have, both separately and together as part of a larger team, done research in Mongolia, where another of our contributors has also done research. In her essay "What's in the Song? *Urtyn duu* as Sonic 'Ritual' Among Mongolian Herder-singers," ethnomusicologist Sunmin Yoon considers a ritual approach to representing ecocentric worldviews. Ecocentrism — as promoted by philosopher Arne Naess in his ecosophy of deep ecology, which is opposed to the human-centeredness of anthropocentrism — is a worldview that does not privilege one component of a system but rather finds balance among the components of a system. Yoon argues that the act of singing is a way to transcend the separateness of humans, non-human animals, and their environmental context of earth and sky.

In "Haiti, Singing for the Land, Sea, and Sky: Cultivating Ecological Metaphysics and Environmental Awareness through Music," ethnomusicologist Rebecca Dirksen reflects on the traditional ecological knowledge in the spiritual ecology of Vodou. As a country particularly vulnerable to the impacts of climate change, Haiti has much to lose but also much to offer. Dirksen considers a selection of songs that illustrate "the deleterious effects of imbalance between the visible (human) and invisible (spiritual) worlds, and that play with tensions between precarity and resiliency" and reflects on the ways Haitians are navigating their environmental crises musically. On another island on the other side of the world, ethnomusicologist James Edwards chronicles how a different culture is confronting environmental problems in "A Field Report from Okinawa, Japan: Applied Ecomusicology and the 100-Year Kuruchi Forest Project." Edwards has written a "state-of-the-field" report not for a discipline or academic field but rather for his on-going fieldwork,

which puts theory and practice in ecomusicology into dialogue with regard to an effort to increase the population of an ebony tree (kuruchi or Ryūkyūan ebony, *Diospyros ferrea* or *Ryūkyū kokutan*) that is the preferred material for the necks of the sanshin (a three-stringed lute). Edwards offers a potential political ecology approach to understanding what is essentially a restoration ecology project.

Musician and scholar Laura Chambers considers the idea of restoring Western Art Music through the lens of Jeff Titon's theories of sustainability, which draw on concepts from the science of ecology. In her "Feed the Soil, Not the Plant: Case Studies in the Sustainability of Ontario's Regional Orchestras," Chambers considers how arts administrators and musicians managed two at-risk ensembles to keep them afloat. In another, quite different approach to Western Art Music, musicologist Juha Torvinen considers a song cycle based on poems in the Northern Sámi language by a Finnish composer. In "Resounding: Feeling, Mytho-ecological Framing, and the Sámi Conception of Nature in Outi Tarkiainen's *The Earth, Spring's Daughter*," he argues that Tarkiainen uses "mytho-ecological framing" — adaptations of Sámi mythology, cyclical conceptions of time, and motifs related to nature — in order to reflect changes in Sámi culture and concerns about contemporary environmental issues. With a different approach to environmental imagination, Joshua Ottum, a professor of commercial music, considers how two composers of New Age music (Will Ackerman and Steven Halpern) imagine the natural world in the context of environmental crisis, particularly regarding the sublime, wilderness, and climate change. In "Between Two Worlds: American New Age Music and Environmental Imaginaries," Ottum provides contrasting views of how New Age contexts understand nature, the environment, and ecology.

Music theorist and organist Randall Harlow's article "Ecologies of Practice in Musical Performance" offers a model for understanding performance based on ecological psychology and actor-network theory. Harlow draws on the literature around the work of James Gibson and Bruno Latour to consider the ecological relationship of embodied gesture that governs musicians and their instruments (particularly organists). In offering an "ecology of practice" for musicking, Harlow draws attention to an abstract understanding of ecology. Composer and musicologist Daryl Jamieson also relies on Gibsonian ecological psychology in his article, "Uncanny Movement through Virtual Spaces: Michael Pisaro's *fields have ears*." Jamieson argues for understanding Pisaro's series of ten compositions as taking an ecological approach to composition because of the way the location of sound producer and listener is more important than the timing of the performer. Both Jamieson and Harlow take us far afield in our exploration of ecologies for music and sound studies.

If there is a takeaway message from this diverse collection of essays, I would suggest that it is an encouragement to take a "both/and" rather than an "either/or" approach to the problem and opportunity of ecology for music and sound studies: there are both established views of ecology and a variety of other interpretations of it, all of which are valid. Such a pluralistic approach could cause confusion if not done well, but it would also contribute to the diversification and development of teaching and research approaches for music and sound studies in general and for ecomusicology in particular. This pluralistic approach resonates with what Dawe and I called "ecomusicologies" (Allen and Dawe 2016) and would serve to connect the related but often disparate areas of soundscape ecology and acoustic ecology, biomusicology and zoomusicology, environmental studies and environmental humanities, and others. Another potential upshot from this pluralistic approach could further Mark Pedelty's move "Toward an Applied Ecomusicology" (2016: 255). Such a result would build on the longstanding efforts in applied ethnomusicology (for which Jeff Titon has been such a seminal figure), connect them with the burgeoning field of ecomusicology, and create a stronger engagement with the problem and opportunity of ecology.

Ecologies matter for music and sound studies. Given the challenges that humans and the entire planet face, it is imperative that we give more fundamental importance to ecology as we seek to preserve, engage with, disseminate, and participate in our sounding world. As the scientist John Kricher pointed out, "Ecology is no longer the arcane study of natural history. Ecology, in the twenty-first century, may be the key to human destiny in the twenty-second century and beyond" (2009: x). Music and sound studies scholars and practitioners would do well to take heed of such advice, and we look forward to reading, hearing, seeing, and talking about how these diverse conversations continue.

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