

Call and Response: SEM President's Roundtable 2018, "Humanities' Responses to the Anthropocene" – From Anthropocentrism to Ecocentrism

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Abstract:

Paul Crutzen (2002) proposed calling our current geological epoch the Anthropocene. He shared the 1995 Nobel Prize for work understanding the chemistry of the ozone hole, and he was well aware of the science on the state of our planet. Crutzen worked with ecologist Eugene Stoermer, who previously advanced the idea of the Anthropocene. They cited precedents in Vladimir Verdnasky, who in the early twentieth century popularized the idea that life was a geological force. They also recognized Antonio Stoppani, who in the late nineteenth century proposed the "anthropozoic" era. But it was Crutzen's 2002 paper in *Nature* that popularized the Anthropocene. As one critique noted, "The concept has enjoyed a truly meteoric career" (Malm and Hornborg 2014:62). Although not officially the name of a geological epoch, Anthropocene is used regularly to reference the increasing impacts humans have on the planet, such as climate catastrophe, nuclear threats, plastic pollution, and the sixth mass extinction.

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Call and Response: SEM President's Roundtable 2018, "Humanities' Responses to the Anthropocene"

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The following essays are revised versions of statements presented at the President's Roundtable, organized by Timothy Cooley and hosted by Gregory Barz, at the 63rd Annual Meeting of the Society for Ethnomusicology in Albuquerque, New Mexico, November 15–18, 2018.

Call: Retooling Music Studies for a Sustainable Future

Timothy J. Cooley / University of California, Santa Barbara

What skill sets do musicians, music scholars, and ethnographers have that might be used to ameliorate humans' destructive impact on our planet's ecosystems? With our methods for interpreting human cultural practices within deep context, might ethnomusicologists in particular be well equipped to study and interpret ecosystems? How might we retune our abilities to better enable humans to hear, feel, see, smell, and sense empathetically not just other humans but also other biological beings so that we might live together sustainably? Will we adapt our research, teaching (Hellier below), and musicking (Pedelty below and 2016) to advocate for a sustainable future? Can we position ethnomusicology and musicology at the forefront of the battles for ecojustice?

The climate crisis is a call for human social action. I propose that many ethnomusicologists, musicologists, and others engaged in music studies are among the small percentage of humans with particular responsibility to hear this call. While there are significant and meaningful exceptions, the vast majority of the members of the Society for Ethnomusicology (SEM) live and work in

industrialized societies that consume the vast majority of planet Earth's resources and generate most of the greenhouse gases that are responsible for the growing climate crisis. On the other hand, many members of SEM engage significantly with individuals and communities that produce insignificant amounts of greenhouse gases, yet those communities are among the first to have their homelands and lifeways destroyed in climate emergencies. Striking examples are Mongolian Kazakh pastoralists with whom Jennifer Post has collaborated in her research. For centuries they used traditional ecological knowledge to sustain their ecosystem (Guyette and Post 2016:47–48), but in recent years both human-caused climate and social changes have forced some pastoralists to leave the land for urban areas, since their traditional lifeways are no longer sustainable (Post 2019a). The Anthropocene is witness to the extinction of not only unprecedented numbers of biological organisms but also human traditions of ecological knowledge that are needed now more than ever.

Two words in the previous sentence implicate me personally as an ethnomusicologist and musicologist, the first newly coined and the second as old as time: “Anthropocene” and “tradition.” Anthropocene, that big, controversial, and inescapable word pointing right at us in so many ways with a prefix that identifies and names humans. While we who sometimes reluctantly affiliate with the humanities may not be tasked with determining whether or not the term itself is appropriate (let's leave that to our colleagues in the earth sciences [see Zalasiewicz et al. 2008]), few among us can claim that we are not contributing to a global environmental crisis. Humans are negatively impacting the global environment; therefore, it must be humans who change, and this will be a human-cultural change. Who better to advocate for human-cultural change than those of us in the humanities, including music scholars? What can we contribute to this urgent call for change and action?

Tradition, that thing invented, that word that fascinates and vexes our fields and disciplines. Though the specter of tradition no longer defines ethnomusicology (if it ever did), ethnomusicologists are revisiting the notion of tradition as we come to terms with the implications of the material forms of its tacit antonym, the modern world as imagined by the Global North. But do we risk mining traditional ecological knowledge from our interlocutors from the Global South, the Orient, the Other, only to replicate our discipline's colonial legacy for our own enrichment (or survival) while our interlocutors become the first casualties of the climate crisis and its social and economic fallout? Musicology has a different but still salient relationship to the concept of tradition focused on, with occasional exceptions, the study of a tradition of musical practice we might call Western art music. Does this focus lend itself to efforts that sustain resource-consumptive cultural practices for an elite few (Drummond 2016; Hurley-Glowa 2019:108–9)? Does tradition trap us in human behaviors that are

detrimental to ecosystems, or might tradition remind us of our connections to other biological beings? Is it a question of good traditions versus bad?

We humans, the creators of the Anthropocene, face the challenge and the opportunity to invent new cultural practices and traditions that go beyond human exceptionalism. This is a call to consider what we individually and collectively can do to encourage positive changes—private and public. This requires deliberate thought about humans’ engagement with each other and all other beings. It also requires profound listening; something at which ethnomusicologists, musicologists, and ethnographers are highly skilled (see below Von Glahn on how composer Charles Ives heard his subjects through sound and Post for ecologists’ use of sound analysis to measure ecosystem dynamics). How might we in the humanities turn our particular skill sets toward enabling humans to hear, feel, see, and smell the ecosystem around us and, by listening to other biological beings, curb our deleterious impact on the global ecosystem that we all share?

This call is not new. The emergent field of ecomusicology has made strides toward bringing together the studies of musics, ecologies, and environments (e.g., Titon 2009a; Allen et al. 2011; Allen and Dawe 2016; Post and Pijanowski 2018). Even before the term “ecomusicology” tripped off tongues with all the ease (ahem) of “ethnomusicology,” some touted the links between human cultures, ecologies, and the environment with musicking (e.g., Feld 1982; Schafer [1977] 1994). This was preceded by early musical ethnographies that contain a wealth of information about people’s engagement with their natural environments. See, for example, Frances Densmore’s *Mandan and Hidatsa Music*, which contains descriptions of specific Native American practices for preserving and distributing seeds for varieties of corn and other crops (1923:36–38). Indeed, one can read this document, ostensibly about songs, as a catalog of traditional ecological practices undergoing changes brought by, as Densmore put it in the language of the time, “the white man’s ways” (2). In the century since Densmore researched her book, other music studies have added to our historical knowledge about changes to ecological practices brought on by expanding human consumption fueled by colonialism and capitalist systems of economy. A classic example in ethnomusicological literature is Anthony Seeger’s *Why Suyá Sing*, “a study of society from the perspective of musical performance” (1987:xiii). While readers of that book learn much about the musicking of the Suyá Indians in Mato Grosso, Brazil, they also learn about economic and ecological conditions for Suyá that were changed by the creation of the Xingu National Park, the commercial quest for rubber, and the threat of Indigenous communities losing rights to land if they are declared to be “non-Indians” (134, 136). Western musicological thinking about the environment is often traced back to the concept of the Harmony of the Spheres, attributed to Pythagoras. These ideas share core similarities with

much earlier Chinese musical thought (see Titon 2018:258). Still today much thinking about musicking and the Anthropocene is encumbered by the lingering resonances of Enlightenment ideas about human relationships to—and distinguished from—problematic notions of both culture and nature. Musicologists who reinterpret and problematize the impact of Western art music on natural resources include Aaron Allen and Denise Von Glahn below (see also Allen et al. 2011).

While this call is not new, the advent of the Anthropocene demands that we now listen and respond in new ways. I encourage all readers to consider the responses that follow and then to think about how you individually and collectively will respond, and how you would like our academic disciplines and fields to positively reflect and put in practice these responses.

From Anthropocentrism to Ecocentrism

Aaron S. Allen / UNC Greensboro

Paul Crutzen (2002) proposed calling our current geological epoch the Anthropocene. He shared the 1995 Nobel Prize for work understanding the chemistry of the ozone hole, and he was well aware of the science on the state of our planet. Crutzen worked with ecologist Eugene Stoermer, who previously advanced the idea of the Anthropocene. They cited precedents in Vladimir Verdnasky, who in the early twentieth century popularized the idea that life was a geological force. They also recognized Antonio Stoppani, who in the late nineteenth century proposed the “anthropozoic” era. But it was Crutzen’s 2002 paper in *Nature* that popularized the Anthropocene. As one critique noted, “The concept has enjoyed a truly meteoric career” (Malm and Hornborg 2014:62). Although not officially the name of a geological epoch, Anthropocene is used regularly to reference the increasing impacts humans have on the planet, such as climate catastrophe, nuclear threats, plastic pollution, and the sixth mass extinction.

Humans cause these problems, but we must recognize that not all humans do the causing (Klein 2014; Malm and Hornborg 2014). In our global neoliberal system, fossil-fuel producers and users are most culpable. Andreas Malm and Alf Hornborg emphasize the historical roots of this unequal system: it was “a clique of white British men . . . an infinitesimal fraction of the population of *Homo sapiens* in the early 19th century . . . [who] invested in steam, laying the foundation stone for the fossil economy” (2014:64). They observe that “in the early 21st century, the poorest 45% of the human population accounted for 7% of emissions, while the richest 7% produced 50%” and that since 1850 the global North has been responsible for 72.7 percent of the carbon emitted yet in 2008 only comprised 18.8 percent of the world’s population (64). So some humans

are more to blame than others—and as Cooley notes in his call, that “some” includes nearly all of us card-carrying musicologists and ethnomusicologists.

But we study sound and people making music, so surely we are not in the same category as those “extractivists” (Klein 2014:161ff.) who plunder the planet for short-term profits. Or are we? I suggest that we are no different, because we share with them an anthropocentrism that undergirds the neoliberalism that is causing the climate crisis. I agree with Malm and Hornborg that the Anthropocene is “the product of the dominance of natural science” and an “analytically defective” concept that is “inimical to action” (2014:67); moreover, the humanities have had a “late awakening” to the crises enmeshed in the Anthropocene idea (66). But what’s a humanist to do? Some have suggested alternative terminology, such as the Capitalocene to explain more accurately our current planetary crisis or the Ecocene to open up a more dynamic transition to a sustainable future (Boehnert 2019). I suggest that we eschew the Anthropocene and advocate for the Ecocene, which is, however lofty a goal, something our scholarly disciplines can pursue by decreasing our anthropocentrism and increasing our ecocentrism (Allen, forthcoming).

The term “anthropocentric” means “centered on the human,” but environmental philosophers define “anthropocentrism” as valuing nonhuman nature only for its instrumental contributions to humans. As Ben Minteer puts it, this perspective is the “root cause of environmental problems such as species extinction, the loss of natural areas and wilderness, and the general decline of environmental quality” (2009:58). This is a human centeredness akin to sexism, racism, ageism, or any other prejudicial power imbalance. The philosopher Arne Næss contrasted anthropocentrism with its opposite: the “biospherical egalitarianism” of someone who does fieldwork and develops respect for other ways and forms of life. To such a person, “*the equal right to live and blossom*” is intuitive and obvious (Næss 1973:96, emphasis original). If we instead restrict that right to humans, as is done in anthropocentrism, we end up with an anthropocentrism paradoxically detrimental to humans.

I am opposed to such a detrimental anthropocentrism, and, similarly to Næss, I believe humans must become more ecocentric and less anthropocentric. Ecocentrism is a “perspective that privileges the integrity, health, or functioning of ecological systems” (Jenkins and Bauman 2010:119). Humans are merely a part of ecological systems, not the determinants of all systems. The academic movement known as the environmental humanities aims to move us from anthropocentrism and toward ecocentrism. The environmental humanities include history, art, literary studies, and even sociology and anthropology.

However, sound and music studies have not been a part of the environmental humanities (Allen, forthcoming). Perhaps we are too focused on studying people making music (to paraphrase Jeff Titon). We emphasize the people, the

making, and the music, and in so doing, we are anthropocentric. If we want to go about “sustaining people making music” (Titon 2009a:6), we must include nonhuman life and the abiotic foundations for life that allow for human culture and musicking. We need to recognize the biased assumptions of being human-focused that are made so prominent in the idea of the Anthropocene. A better way of thinking might be to move toward what Joanna Boehnert (2019) has called the Ecocene.

One of Tim Cooley’s questions in the call of this “Call and Response” speaks directly to the point I am making here: Might ethnomusicologists in particular be well equipped to study and interpret ecosystems? My response is a resounding no: ethnomusicology has little to offer the environmental humanities until we can move away from the anthropocentric study of *people making music* to the more ecocentric *environments enabling people to make music* or the equally awkward *ecologies of nature and people making music*. Ethnomusicologists will be ill-equipped until we can take as axiomatic and make explicit the radical notion that to go about “sustaining people making music” we must have healthy and diverse environments. Ethnomusicologists need a more holistic approach that studies humans making music while situating both them and it in our biophysical, planetary contexts. We must not ignore how cultural actions impact the environment nor how environmental conditions impact human culture. More than just affirming place and connectedness, ethnomusicologists must call out environmental exploitation and identify strategies for confronting neoliberalism and other destructive forms of domination. At the same time, we must provide useful models to rally the troops, mourn the losses of life, and celebrate victories over neoliberalism and other ecologically destructive power imbalances.

Moreover, we need to stop “sounding sustainable.” We should instead use rigorous sustainability frameworks with foundations in environmental issues and ecological systems, as well as social equity and economic justice (Allen 2019). This is not a critique limited to ethnomusicology; historical musicology has even further to go and yet, similarly, also has a basis on which to build (Allen 2017a). Ecomusicology is pushing in some particularly useful directions, such as the ecological and critical (Allen and Dawe 2016), but more could certainly be done to build on ecological work (cf. Allen and Titon 2018) and to articulate the direct environmental implications of musical culture (Devine 2015 and 2019). Ethnomusicological, musicological, and ecomusicological work is relevant to the environmental liberal arts and environmental humanities movements and therefore also to a transition to the Ecocene (Allen, forthcoming). One particular place where this transition could be effected is in ethnomusicology graduate education, in which students would need to take fewer classes in anthropology and sociology and more classes in ecology and environmental studies.

For now, I remain an optimistic pessimist: although I do not find that we scholars of music and sound contribute to the study of ecosystems in relation to the great environmental crises of our time, I do believe that we can, if we become less anthropocentric and more ecocentric—if we can help get beyond the Anthropocene and aim for the Ecocene.

Echo-muse-ecology: On Collaborative Teaching and Learning with Undergraduates in Departments of Music

Ruth Hellier / University of California, Santa Barbara

For many years the political-poetical idea of echo-muse-ecology has had a deep impact on me. Steven Feld generated this provocative, multipart word in response to and to interact with ethnomusicology. For Feld, “echo’ is about presence, about reverberant pasts in the present,” and muse-ecology encompasses “the constant interplay of inspiration, imitation, and incorporation” (1994:9). Through his creative-scholarly intervention, Feld opened up diverse inquiries about sound, music, ecologies, and environments, offering possibilities for a multiplicity of actions and processes. In a similar vein, Ana María Ochoa Gautier has recently proposed a focus on questions around sound, music, ecologies, and environmentalism, specifically in response to ecomusicology, through her article on acoustic multinaturalism. She seems to echo Feld’s interaction and transformation through her rigorous and provocative discussion, observing that “one of the fundamental political needs posed by the existential implications of climate change—the end of humans as a species and of the world as we know it—is to take the time needed to think. The way we engage with the politics of the knowledge economy . . . is a central aspect of what is questioned by the political urgency of climate change” (Ochoa Gautier 2016:140). In her final paragraph she identifies a need for “a deep critical engagement with pioneering areas within musico-anthropological studies that have questioned our very concepts of sound/music,” calling for a deep engagement with transdisciplinary discussions (141). Drawing on Feld and Ochoa Gautier, for my contribution to ongoing dialogues concerning a humanities’ responses to the Anthropocene, particularly within the context of the Society for Ethnomusicology, I repeat Feld’s idea of echo-muse-ecology and echo Ochoa Gautier’s call for taking the time to think by questioning concepts of sound/music and engaging with transdisciplinary discussions. My specific proposal is that we put these processes into action by generating courses and classes for and with our undergraduate students within the departments and schools of music where many of us work and study. All of us who are teachers and students of ethnomusicology and music (faculty and graduate students alike) are in a position to generate opportunities and to make

changes within the curriculum, changes that specifically open up questions of the more-than-human and of ecologies, environments, sound, and music. As ecology concerns relations of organisms to one another and to their physical surroundings—connecting with *oecology*, from the Greek *oikos*, meaning “house” (plus -ology)—for many SEM members, our university or college department is our quotidian ecological environment and professional home. Our local habitat is the rarefied (and usually politically problematic) context of a department/school of music (or conservatory) in an institute of higher education in the United States or other global location. This is where we can make changes and take action.

When designing a new undergraduate course focused on ecological questions, I advocate that we use forms of engaged pedagogy and radical inclusiveness by taking the lead from the very people whom we are employed to teach: the undergraduate students. These are the people who are participating in so many visible activities relating to environmental matters, from the local to the global. They are already teaching us because they are concerned for their futures. So by coplanning and collaborating with our undergraduate students within the ecosystems of a department/school of music, we can generate “a radical transformation of the conditions for posing questions” (Ochoa Gautier 2016:108).

In creating a new undergraduate course within a department of music, I am not suggesting a new discipline, disciplinary subdivision, or field. There are so many terms, ideas, practices, and literatures to draw on and work through with our undergraduate students: acoustemology, acoustic ecology, acoustic multinaturalism, biomusic, ecocritical musicology, ecocritical studies of music, ecomusicology, soundscape studies, and zoomusicology, to name a few. Indeed, as Ochoa Gautier observes, “neither Feld . . . nor [Anthony] Seeger . . . saw themselves as developing *new* fields; . . . they sought only to signal that they were reconsidering how to configure questions regarding sound” (2016:134, emphasis in original). By creating new undergraduate opportunities for engaged praxis, we can therefore provide spaces for configuring questions and for exploring values by providing “entry points” into disciplinary fields and frameworks (109).

This proposition does not erase histories of naming and ontological questions but would instead embed them into the very material of the course, enabling the interrogation of the constitution of ontological categories. Indeed, the fact that the very word “Anthropocene” is (relatively) new and is specifically a technical term of geological stratigraphy is, I suggest, a crucial element in these classes, conversations, and interventions within a department/school of music. That this word was created after years of intense debates by a transdisciplinary working group of researchers led by geologists, that these processes necessarily involved the International Commission on Nomenclature dealing with the language of geology, and that the start of the geological epoch labeled the Anthropocene has

been identified as the mid-twentieth century (Davison 2019) are all weighty and significant elements. As faculty and graduate students, we are all implicated.

Over the last few years the idea of “Anthropocene” has become a vehicle for practitioners beyond geology to generate practices and discussion about human impacts on the planet not only in other branches of the earth sciences but also in social sciences, environmental humanities, and creative arts, including (as this roundtable title suggests) music studies. Again, drawing on Ochoa Gautier (2016:140), now is the time for drastic rethinking, and now is the time for all music scholars and students to be concerned with the environment. By designing undergraduate courses in departments/schools of music that engage the Anthropocene, we can critique anthropocentrism, decenter the human, pose questions, and generate interventions to enable change as we teach and learn with our undergraduate students. For my own response, as a transdisciplinary teacher, creative artist, and scholar who engages with contexts, methods, and approaches of music studies and ethnomusicology, I have started my processes by introducing one short course in preparation for coplanning a full-credit class.

In closing this brief personal position concerning humanities’ responses to the Anthropocene, I turn to a recent film project titled *ANTHROPOCENE: The Human Epoch* (2018). This collaborative endeavor uses striking photographic images to generate explorations of problems around human impacts on planet Earth. Characterizing his role in this project, photographer Edward Burtynsky describes himself as an artist who is “bearing witness to these places” by generating contexts for sharing. He explains, “I don’t see myself as an environmentalist per se. . . . I’d rather see the images that I make as points of departure for a more complex conversation about ‘so now that we’re here, what do we do?’” (quoted in Sharp and Foster 2019). Burtynsky seems to offer an example for our own possible responses as teachers and students. We do not need to see ourselves as environmentalists per se, but we can all seek to open up spaces to bear witness and to enable collaborative and complex exchanges and actions with our undergraduate students around matters of sounds, musics, ecologies, and environments.

Moving Forward with Ecomusicology

Mark Pedelty / University of Minnesota

What can music scholars do in an age of environmental exigency? Answering that question, Alexander Rehding (2002) suggested that we adopt the term “eco-musicology.” At that time, few US music scholars were studying issues of environmental justice, biodiversity, climate change, and other pressing environmental questions. Of course, there were long-standing traditions of considering

musical environment(s), especially when considering “environment” in the more proximate sense. Studies of connections between animal sounds, organology, and composition predate the development of musicology itself. However, until the early 2000s, few scholars had considered music in relation to broader ecological contexts, meanings, and crises (although musicians had been doing so for quite some time). Ecomusicology provided a forum for ecocritical exchange.

As a result, many ethnomusicologists welcomed and have been taking active roles in the ecomusicological conversation. But not all. Ana María Ochoa Gautier views “the emergence of this discipline” as “a new encompassing musical field fueled by recourse to the notion of nature.” She thus argues against “the value in the emergence of ecomusicology as a discipline” (2016:109). I agree. There is no value in creating a new “discipline.” In fact, in 2013 I wrote that scholars involved in the discussion had been “working to build an interdisciplinary conversation rather than a separate subdiscipline” (44). To my knowledge, no one has called for such a discipline. Ecomusicology is best described as a transdisciplinary “field” (Allen 2012:193). One of the main strengths of ecomusicology is the diversity of disciplines that are contributing to the field. The use of the term “ecomusicology” spread because it is a fairly obvious appellation for environmentally focused musical research.

Ethnomusicologists have contributed a great deal to the field of ecomusicology, and in turn, the ecomusicological discussion and special interest group have played meaningful roles in the discipline of ethnomusicology. One of the most important figures in the collective effort to bring these questions to the fore has been ethnomusicologist Jeff Todd Titon, whose attention to ecological matters predates ecomusicology. Yet ecomusicological references in Titon’s *Sustainable Music* blog (2008–) demonstrate how the field of ecomusicology has also contributed to the discipline of ethnomusicology. It is not a question of either/or but rather both/and.

The other knock on ecomusicology is that it is unnecessary or, even worse, invalid. Why do we need ecomusicology if ethnomusicologists like Steven Feld (1982) had been doing related work well before Rehding uttered the word “ecomusicology”? One of my ethnomusicological heroes, Anthony Seeger, expressed that sentiment well. As we sat and enjoyed listening to the Wesleyan gamelan ensemble, Seeger leaned over and wryly whispered: “I’m glad that you have given a name to something we have been doing for decades.” I laughed, knowing that his point was mostly tongue-in-cheek. Yet two responses are in order. First, I did not give ecomusicology its name. I merely suggested it to my editor as a book title. As a result, *Ecomusicology: Rock, Folk, and the Environment* (2012) might have been the first book to adopt the term as title. Yet my idiosyncratic work on rock and folk is in no way representative of the field as a whole. More

importantly, I was definitely not the first to use ecomusicology as a descriptor for their research, and certainly not the most influential. For example, Nancy Guy (2009) used the term in the title of her seminal work on the Tamsui River in Taiwan. Nor was Guy the first, although hers was certainly one of the finest applications. Years later, after a critical mass of work developed, Aaron Allen and Kevin Dawe found ecomusicology to be a fitting term for their compendium, *Current Directions in Ecomusicology* (2016). My point is that people circle back to the word “ecomusicology” time and again, for lack of a better term. “Ecomusicology” is specific enough to indicate environmental relevance while sufficiently polysemic to bring together a very broad range of research. Therefore, it is little wonder that “ecomusicology” became the most common moniker for environmentally relevant research in musicology and ethnomusicology. For the same reason, it is unfortunate that an influential ethnomusicologist would call for its erasure.

Given the diversity of perspectives presented in ecomusicology, it is inaccurate to impute a singular and simplistic “notion of nature” (Ochoa Gautier 2016:109) to the field. Ecological perspectives foster relational understandings and eschew totalizing constructs. Instead, a transdisciplinary recognition of complexity, connectivity, and polysemy has been at the heart of the ecomusiological conversation. Granted, strategic essentialism is sometimes employed by those who choose to have meaningful engagements with audiences outside the academy. I made that point in discussing “the nature debate” in 2012 (76–82), although I’ll admit that I have likewise tended to avoid the term.

Seeger’s joke captures the gist of another criticism levied at ecomusicology: that it is redundant. Ochoa Gautier puts forth the extreme version. “In proposing a new discipline,” she argues, “ecomusicology ultimately appropriates the sense of urgency that the topic of sound/music and nature has acquired today” (2016:113). I disagree with her historiography. Before ecomusicology, the music studies disciplines were not heavily invested in research dealing with environmental justice, biodiversity, and ecological crises like climate change, pollution, overconsumption, and overdevelopment. In the early 2000s I came to the AMS, SEM, and IASPM looking for colleagues doing such work. I found those kindred spirits, innovative researchers like Aaron Allen, Denise Von Glahn, Jennifer Post, and Jeff Todd Titon, to name just a few. (I will artificially limit the list there, to fellow roundtable panelists, so as not to offend anyone on the very long list of scholars involved.) These were among the people who created ecomusicology, not usurpers of some robust ongoing discussion. In the 2000s those of us doing this work had to constantly argue for the relevance of environmentally relevant musical research in the first place. Therefore, to read many years later that we all somehow “appropriated” a firmly established movement attending

to critical ecological questions does not jibe with my experience or reading of the literature. Granted, all things have antecedents, including ethnomusicology (comparative musicology and anthropology), but when the ecomusicological conversation began, precious few music scholars were doing work on the sorts of questions Timothy Cooley has asked us to address with this panel. Yes, the discussion has now taken off with a sense of “urgency,” but that is at least in part thanks to ecomusicology. The term “ecomusicology” spurred a new wave of scholarship, and common use of the term at recent conferences indicates that it is still serving a productive purpose. A critical mass of publications has developed over the past two decades, as have lively exchanges of ideas at conferences, in the *Ecomusicology Review (ER)*, and through a very active listserv community.

The “critical issue that ecomusicology will have to wrestle with,” Rehding noted in 2011, “is how to implement this sense of crisis” (410). That strikes me as a better question than whether or not ecomusicology, sound studies, sound ecology, bioacoustics, ethnomusicology, anthropology, or (name your least favorite discipline or field) should be wiped from the face of the earth. Unfortunately, if we do not respond to extinction-level arguments, the space for critical work will be reduced and momentum lost. Limited good thinking is the last thing we need in an era of multiplying environmental crises.

Personally, I don’t care what we call musical research that deals with environmental exigencies in a relational (i.e., ecological), critical, and pluralistic way as long as it is done. Ecomusicology serves as useful shorthand. But some might argue that R. Murray Schafer’s ([1977] 1994) brainchild, acoustic ecology, obviates the need for ecomusicology. I would agree, if acoustic ecology had not become a relatively specific field. Acoustic ecology’s admirable focus on soundscape is one of that field’s greatest strengths. Its practitioners’ deep aural exploration of soundscape(s) distinguishes the field from any single discipline, as well as from ecomusicology. However, there is complementarity and overlap rather than an either/or competition between these fields. Opening the ears to proximate ecologies (e.g., soundscapes) *and* to wider ecologies, crises, ecopolitics, and musical experiences is an equally valid and highly complementary approach (Guyette and Post 2016).

As an anthropologist, I am particularly drawn toward ethnomusicology’s emphasis on fieldwork and bimusicality, so much so that I probably fall on the ethnomusicological side of Michelle Bigenho’s (2008) comparative definition of the disciplines. Therefore, I was delighted to witness several sessions at the 2018 SEM annual meeting that included ecomusicological work. Space limitations compel me to single out just one such example: Chiao-Wen Chiang’s “Tao Singing and the 2017 Anti-nuclear Waste Concert, Lanyu, Taiwan.” Her

paper represented the affordances of ethnomusicology (e.g., place-based field-work) and ecomusicology (e.g., critical and ecologically imbricated research and theorization of musical responses to environmental injustice). Chiang's work, as well as the other papers on that panel and work presented in other sessions, instantiated anthropologist Eduardo Viveiros de Castro's (2005) concept of "multinaturalism." Ochoa Gautier contrasts that term with ecomusicology in binary fashion, but I would again suggest complementarity, the "both/and" approach Allen has repeatedly suggested for the field. Multinaturalism is not advanced through straw-person polemics. An ecocritical field should be more concerned about inequitable ecologies than internecine quarrels over polysemic metaphors. I wonder, for example, what sort of sounds and musics are made by the one hundred corporations responsible for 70 percent of greenhouse gas emissions since 1988 (Griffin 2017)? There is so much important work to be done.

Of course, ecomusicology needs to decolonize, as do the music studies disciplines and the US academy as a whole. As Ruth Hellier noted in her presentation, that requires us to go beyond "rethinking" our wordplay. As long as methods are predicated on metropolitan elites flying thousands of miles to study the musical labor of disenfranchised others (and collect academic capital), the promise of critical ecomusicology remains unmet (see <https://academic-flyingblog.wordpress.com/>). However, ecomusicological scholars have offered alternative visions and practices. Koji Matsunobu's (2018) work on community music in Japan and Olusegun Stephen Titus and Rachel Obonose Titus's (2017) research on climate change, flooding, and oil extraction in their home country of Nigeria are among exciting glocal approaches developing around the world. Work by place-based scholars can help us to more meaningfully match method to theory.

A bit of "studying up"—turning the ethnographic gaze on power—would also help (Nader 1969). Several young(er than me) colleagues reminded us of that point at the SEM panel's Q&A. They argued that we need to take our research beyond text and talk. I think ecomusicology provides some promising examples. Ecomusicologists' affinity for political ecology (see Post's entry to this discussion), environmental activism (Kinnear 2014), environmentally relevant performance, and critical interdisciplinary appreciation for the environmental sciences, arts, and humanities has led to several promising new praxes, an opening rather than the narrowing sometimes attributed to the field. Therefore, I hope that ecomusicology survives the slings, arrows, and broad brushes wielded by a few critics. However, it is not my business to tell ethnomusicologists what they should or should not allow into their canons and conference halls. I hope that the innovative spirit that first gave birth to ethnomusicology not so terribly long

ago might help the discipline to creatively face the Anthropocene, Capitalocene, or whatever one wants to call this current era. Ecomusicology has been central to the conversation so far, and I hope it remains so.

Ives, Michael, Machines, and River Gods

Denise Von Glahn / Florida State University

One hundred and nine years ago, a half century before Rachel Carson published *Silent Spring*, Charles Ives wrote a song he called “The New River.” His pencil sketch for the piece included a brief note identifying a date (June 9, 1911), a place (the Housatonic River), and a precise location along its 139-mile stretch (Zoar Bridge). Beside these cryptic field notes Ives added a single comment: “Gas Machine kills Housatonic!” His eight-line song text explained his thinking:

Down the river comes a noise!
It is not the voice of rolling waters;
It's only the sounds of man:
Phonographs and gasoline,
Dancing halls and tambourine,
Human beings gone machine.
Killed is the blare of the hunting horn;
The River Gods are gone.

Like fully half of Ives's 129 songs, “The New River” focused on sounds. Ives heard his subjects; he understood them through sound, much like Carson would do when she imagined the implications of a spring devoid of bird song. “The New River” was unique among Ives's songs, however, for its full-bore criticism of environmental degradation. Wiley Hitchcock heard the song as Ives “snarl[ing] angrily at noise pollution” (2004:lvi). When Ives arranged the song in 1913 for a chamber orchestra set, he renamed it “The Ruined River.” Given ubiquitous news coverage of the diversion of the Tuolumne River and the flooding of the Hetch Hetchy Valley in Yosemite National Park that same year, the name change seems significant (see Von Glahn 2019:114–16). Beyond providing a general statement on violated waterways, Ives's song connected the human-degraded state of the natural world and the increased mechanization of daily life to his beloved local river, the Housatonic. This was a place he had memorialized just a few years earlier in another song, one that he had created after a honeymoon walk with his bride, Harmony Twichell. Then Ives used Robert Underwood Johnson's words and described it as “contented.”

Now, with a four-word indictment—“Human beings gone machine”—Ives fired an early musical warning shot about the consequences of a technology-driven

world. And, referencing sound, he exhorted us to do something. Beyond hearing that which could not be ignored, the ubiquitous loud sounds, Ives also registered what was “gone”: he heard the silence and challenged us to do the same.

October 10, 2018, Tallahassee, Florida: Hurricane Michael provided an analogous situation for me to listen to noises and “rolling waters” of a different kind. I share Ives’s auditory orientation and his way of knowing the world largely through sound. So when Michael pummeled the gulf-hugging panhandle of the Sunshine State, its sounds reminded me of a question I’d kicked around with some folks on this panel a number of years ago. I’d asked: “What does climate change sound like?” And now what stays with me after experiencing this category 5 storm is not what you might think, it’s not what I expected. It’s not the roaring winds or pounding rain. It’s not the sounds of trees creaking or groaning, or limbs snapping, or trunks breaking, or sixty-foot giants losing their grip and simply falling over and thudding on the ground, although there were hundreds of longleaf pines and live oaks doing just that in my neighborhood. And it’s not the sound of debris swirling like dervishes and slapping against the windows. These are all, no doubt, part of the soundtrack of climate change.

What resonated most profoundly and has stayed with me since the fall of 2018 was the sound of quiet when we lost power—when the ubiquitous, seemingly inaudible electric thrumming of my high-tech household ceased: when it was gone. No refrigerator motor, no HVAC, no “silent” overhead Casablanca ceiling fans, no security system beeping when a door opened, no electric current at the ready when I flipped on a switch, and no traffic noises: downed trees had blocked our roads. Although traffic sounds are not an issue in my neighborhood, their complete absence was noticeable. For four days there was a rare kind of stillness in my house. It wasn’t the river gods that had disappeared, it was the sounds I’d learned to ignore: the quotidian sounds of electrical current invisibly vibrating the airwaves and constantly buzzing around and through me, the muffled sounds of cars occasionally driving by. And because my home was still standing, and no one I knew had lost their life or suffered irreparable damage to their property, and I was confident that power would return, I welcomed the silence. It was even comforting. In the most unexpected of ways, the category 5 maelstrom provided what Mark Pedelty wished for in his film *Loud*: “a quiet place,” and “a quiet time,” and “a little bit of peace” (2019). It was in this stillness that I could locate my place within the sounds that regularly fill my world.

I'm left with a complex, occasionally contradictory, and convoluted sense of what climate change sounds like. There's the frighteningly loud and incessant wind and rain and the disassembling thudding and shaking of the ground, different from the feel of earthquakes I've experienced, if similarly disquieting. But these dramatic sound events were what I had expected. I assumed climate change would be loud, appropriately wrathful, apocalyptic. We would all be chastised by a fist-pounding all-knowing force shaking us from the heavens. I wasn't prepared for silence, for stillness. The sound and feel of what was not there. The sound and feel of what was gone (my equivalent of Ives's river gods). While I sank into and even welcomed the calm respite, I also considered the idea of a completely quiet world and the reasons it would be so, and I recognized that silence may be the final, ultimate sound of climate change. A state that Rachel Carson had predicted would result from a different kind of disregard: the indiscriminate use of synthetic pesticides.

Soon after Hurricane Michael moved on but before my electric power returned, the quiet was broken. Numbingly loud gas-powered generators, buzzing chain saws, and whining wood chippers filled the air with their relentless noise and inescapable, choking, fossil-fueled fumes. Life had returned to "normal": "Human Beings Gone Machine." And the moment to think about what all the sound and silence portended was gone. I am no closer to knowing with certainty what climate change sounds like, but I believe that one answer to my original question lies in the *seeming* silences that we don't pay attention to and the sounds that are not especially loud, or dramatic, or insistent but that accompany us every day. Those that shape what Jeff Todd Titon (2012) has called our "sound commons." These everyday sounds are filled with lessons and warnings, ones that as musicians and music scholars we are well trained to discern and to teach.

It may be argued that "art" songs with environmental messages or scholarship about the same reach too few people to matter, that they do little to impact the thinking or change the habits of a critical mass. But you are reading this essay, and before that, a couple hundred people heard it presented as part of a conference panel titled "Humanities' Responses to the Anthropocene." Not everyone can reach millions or directly inform government policies the way Rachel Carson did with her 1962 best seller, but a small, committed minority can heighten our collective awareness regarding the wisdom contained in sound. Even the humblest effort can have an impact, and 25 percent of a population can reshape society (Noonan 2018). The sensory overload of our lives may have inured us to the messages contained in the airwaves or to hearing them at all, but that only means we've got to listen more carefully and encourage others to do the same and to heed their warnings, lest the sounds cease to exist, and all of us with them.

Music's Contribution to Global Warming

Jeff Todd Titon / Brown University

How much does music contribute to global heating? If ethnomusicologists are to contribute our understandings of people making music to discussions surrounding carbon emissions, greenhouse gases, and the climate emergency, it would be useful to know at the outset how much all the activities surrounding music production, delivery, and consumption contribute to the overall emission of greenhouse gases (GHGs) that have been heating the planet.

In the preindustrial era, of course, musical activities did almost nothing to raise global temperatures. Musical activities made a larger contribution to GHG output and climate change during the industrial, mass consumption era. Musical instrument and sheet music distribution, radio, recordings, and television utilized energy resources on a larger scale, as did the shift to electronically amplified instruments. Ironically, in our postindustrial era, the delivery and consumption of music via the internet require more energy than the manufacture, distribution, and consumption of music on vinyl records, cassettes, and CDs did during their years of peak use (Brennan and Devine 2019).

Music GHG statistics are few and far between, and much more research needs doing, yet we do have reliable GHG estimates for all musical activities in the UK in 2009. We also have them for recorded music in the US from 1977 to 2016. With US figures adjusted upward to include live performances, in 2009 the musical activities in the UK and US accounted for about three million of the then-total forty-eight billion tonnes of GHG emissions, or .00625 percent, a minuscule amount.¹ Extrapolating from the UK and US to the rest of the world, the contribution of the music industry overall in 2009 is unlikely to have exceeded .02 percent, or two hundredths of 1 percent—still seemingly insignificant. When only ninety corporations, the vast majority being fossil fuel producers such as Exxon and state entities such as GAZPROM (Russian Federation) and Aramco (Saudi Arabia), contribute more than 70 percent of GHGs annually (Heede 2014), one wonders whether ethnomusicologists' time wouldn't be better spent in convincing our institutions to divest from fossil fuels than in encouraging the music industry to reduce GHGs.

Here's a more optimistic way to think about it: the US music industry contributes almost as much to the United States' annual gross domestic product (GDP) as the automobile industry.² Everyone knows that the auto industry is moving, however slowly, toward more efficient gasoline engines and hybrid and electric vehicles. Few doubt that an all-electric vehicle future would significantly reduce GHGs, so long as most of the electricity comes from renewable energy sources. The same could be said if the music industry moved to a carbon-neutral future.

Let's look at GHGs more closely (see fig. 1). Those emitted by human activities consist of carbon dioxide (CO₂) from burning fossil fuels (76 percent); methane from agricultural activities, waste management, energy use, and biomass (16 percent); nitrogen oxides from fertilizer use and other agricultural activities (6 percent); and fluorinated gases from industrial processes, refrigeration, and so on (2 percent). Considered in terms of energy source (see fig. 2), global GHGs come from electricity and heat production (25 percent); industries that burn fossil fuels on site for energy (21 percent); agriculture, forestry, and other land

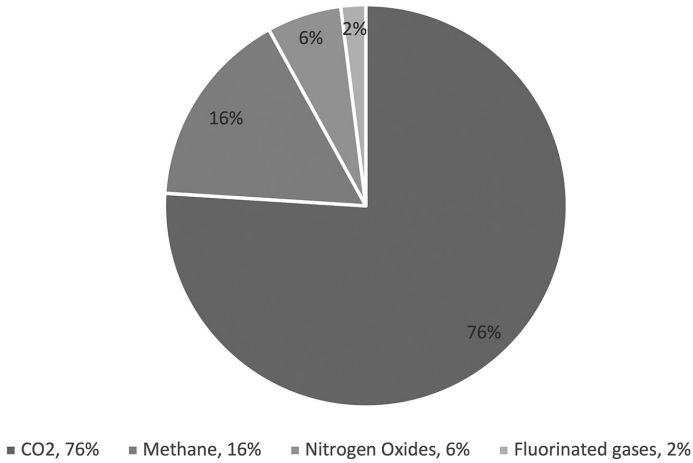


Figure 1. Sources of Greenhouse gases

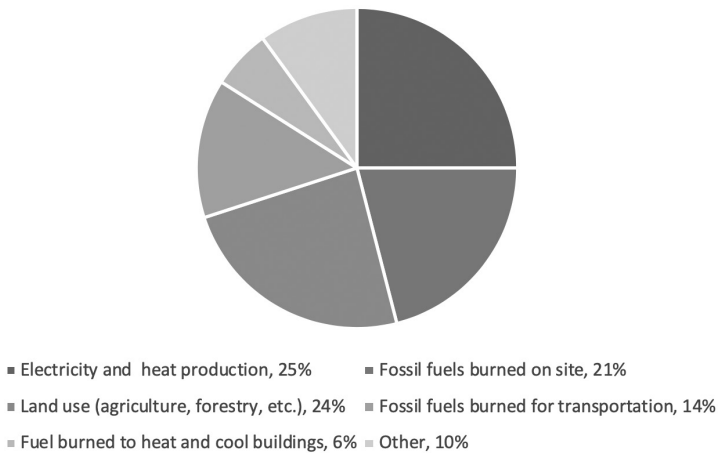


Figure 2. Anthropogenic contributions to GHGs

use (24 percent); fossil fuels burned for transportation (14 percent); fuel burned to heat and cool buildings (6 percent); and other (10 percent) (United States Environmental Protection Agency n.d.).

From 1970 to 2011 global CO₂ emissions increased by nearly 100 percent, with three-quarters of the increase coming from industrial processes and fossil fuel burning. In 2012 the total amount of GHGs emitted as a result of human activities had risen to fifty-three billion tonnes from forty-eight billion in 2009 (World Bank n.d.). Despite international efforts to reduce GHG emissions, for 2018 the total had increased to 55.3 billion tonnes, a rise at an average rate of 1.5 percent every year in the past decade (United Nations Environment Programme 2019:xiv).

Three studies of the UK and US music industries help in understanding music's contribution to global warming. First, the Environmental Change Institute at Oxford University conducted a study for the environmental organization Julie's Bicycle on the sources and amount of GHGs generated in 2007 by the UK music market (Bottrill et al. 2007; Bottrill, Lye, and Boykoff 2010). The report calculated an annual total of 540 million kilograms (540,000 tonnes) of GHGs coming from the following sources: manufacture and distribution of musical instruments, books and sheet music, and recorded music, 138 million kilograms; live performances (including audience travel, which generated 231 million kilograms), 402 million kilograms. This figure of 540,000 tonnes applied only to the UK. Although it included GHGs generated by music's share of distribution over the internet, in 2007 internet downloads and streaming were fewer than today, while correspondingly more music was delivered via CD.

A second useful study compared the amounts of GHGs required to manufacture and deliver music on plastic (vinyl, cassette, and CD) versus the internet. The study took into consideration that some albums delivered digitally over the internet were subsequently burned to CD-R discs for CD use and kept in plastic jewel cases. The authors concluded that "despite the increased energy and emissions associated with Internet data flows, purchasing music digitally reduces the energy and CO₂ emissions associated with delivering music to customers by between 40 and 80% from the best-case physical CD delivery, depending on whether a customer then burns the files to CD or not" (Weber, Koomey, and Matthews 2009). Ten years later, consumers are burning many fewer CDs; indeed, most computers today no longer contain optical drives for disc burning.

This second study predicted that a shift to internet music delivery would significantly reduce GHGs. However, as its authors acknowledge, it was conducted for two IT corporations (Microsoft and Intel) that had an interest in seeing that kind of result. What is the situation today, when most recorded music is delivered to customers via internet streaming on Spotify, Apple Music, YouTube, Pandora, and so on? The results are not quite so sanguine. In a third environmental cost

study, Matt Brennan and Kyle Devine chose to sample GHG outputs in certain key years from 1907 to 2016. Devine terms this shift from plastic to internet delivery the “dematerialization” of music. They reported total GHG outputs for the United States only, from vinyl, cassettes, and CDs, versus GHG outputs from internet delivery via mp3 and streaming. They consider only the years 1977, 1988, 2000, and 2013–16 (Brennan and Devine 2019; Devine 2019).

Figure 3 shows that in 1977, US CO₂ emissions from the manufacture and sale of music (chiefly on vinyl records, then at their peak) were 140 million kilograms. The first CDs appeared in 1982. In 1988, when vinyl records made up roughly 19 percent of sales revenues, CDs 20 percent, and cassettes and 8-tracks 60 percent, the total CO₂ figure for the United States was slightly lower, 136 million kilograms. In 2000, when CDs were at their peak revenue (and not many vinyl records and cassettes were sold), that number had increased to 157 million kilograms, almost all from CDs. Yet by 2016, when the revenue from CDs was one-eighth of what it had been in 2000, and when most music recordings were sold via mp3 downloads or by subscription streaming on the internet, the US energy costs of music delivery had increased to as much as 350 million kilograms of GHGs, or 350,000 tonnes (Brennan and Devine 2019; RIAA U.S. Sales Database n.d.).

How could this be? It seems counterintuitive that the environmental costs of making plastic CDs and jewel cases could be about half as much as internet music delivery with little or no plastic product (and waste), now that music appears to have exited the Plasticine. It seems inconceivable that a shift from a manufacturing economy to a service economy for recorded music could result in double the CO₂ emissions. Yet what drove up the cost of internet delivery

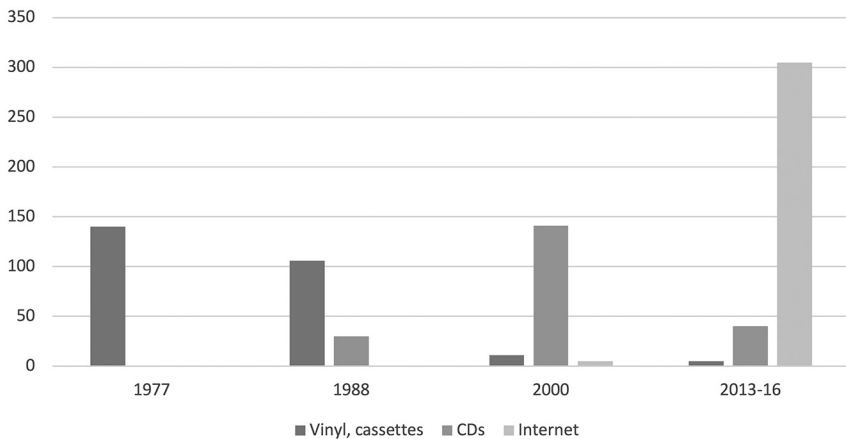


Figure 3. GHG outputs from Recordings by Source US only 1977–2016

was “the energy used to power online music listening. Storing and processing music in the cloud depends on vast data centres that use a tremendous amount of resources and energy” (Brennan and Devine 2019:3).³

To be sure, Brennan and Devine did not calculate the environmental cost of distributing LPs, cassettes, and CDs to consumers in record stores. Nor did they calculate the environmental costs of making the record, CD, and DVD players. Doing so would have increased the GHG figures for 1977, 1988, and 2000. But they also did not calculate the costs of making the smartphones, mp3 players, and computers that consumers rely on today to download and stream their music. Moreover, as the US population grew from 203 million in 1970 to 307 million in 2010, it’s likely that there were proportionately half again as many music consumers in the latter year than the former, consuming 50 percent more energy. And of course, unlike the Oxford University study of UK music’s carbon footprint, Brennan and Devine’s study did not attempt to calculate the environmental costs of live music, which, extrapolating from the UK study (Bottrill et al. 2007), would have been for the US about three times more than for recorded music, or approximately 1.05 million tonnes of GHGs. Add that to the carbon footprint of recorded music, and in 2016 the US likely generated around 1.4 million tonnes. If the UK’s footprint was 540,000 tonnes in 2009, extrapolating to 2016 from that and then adding the US figures would result in a UK plus US annual total somewhere between 2.5 and 3 million tonnes (6.6 billion US pounds) of GHGs for 2016.

Efforts to reduce the music industry’s contribution to global warming have been under way for more than a decade. The 2007 Oxford study sponsored by Julie’s Bicycle resulted in a variety of actions to lower music’s carbon footprint, such as the change from plastic CD packaging to cardboard digipacks. In 2013 REVERB was created and dedicated to reducing touring bands’ carbon footprints as much as possible. On their tours, the Dave Matthews Band, Phish, Dead and Company, Drake, Walk the Moon, and others reduce carbon use by employing solar energy, distributing reusable water bottles, providing solar charging stations at concerts, and handing out information about environmental issues, green products and tech, and so on. REVERB sponsors a Farm-to-Stage program that works with local farmers to provide artists and their crews with locally sourced food (REVERB n.d.). By 2018 Spotify had closed almost all of its data centers and reduced its carbon footprint by 1,500 tons of CO₂ while switching to Google cloud services, which, like competitor Apple, have “gone green.” By converting to solar power and purchasing renewable energy certificates, which work like carbon offsets, Spotify can claim that its data centers are carbon neutral. In July 2019 a group of music industry professionals formed an organization called Music Declares Emergency, calling for “the music industry to acknowledge how its practices impact the environment and to commit to taking urgent action” and to

“work toward making our businesses ecologically sustainable and regenerative.” Some of the suggestions include reducing the energy used on tours, greening merchandise, using sustainable materials, and purchasing carbon offsets. Many musicians have signed on as supporters (MUSIC DECLARES EMERGENCY n.d.). And because music has the power to raise environmental consciousness and incite environmental activism, its impact goes well beyond the boundaries of the music industry to galvanize the environmental movement more broadly, whether targeting fossil fuel corporations, agrochemical producers, or threats to species extinction.⁴

Notes

1. Calculated by combining and extrapolating from Bottrill, Lye, and Boykoff (2010) and Brennan and Devine (2019). A metric tonne is 1,000 kilograms, or 2,200 pounds, which is 1.1 times the US ton of 2,000 pounds.

2. Siwek and Friedlander (2018) calculated that in 2015 the music industry contributed \$143 billion to the US economy, four-fifths of the auto industry’s contribution.

3. Their study, “The Cost of Music,” was widely reported in the press in April 2019. Devine’s book on the subject, *Decomposed* (2019), offers more detail. Some of these data centers now are powered partly if not fully by solar energy, however.

4. Ecosong, a collaboration among musicians, media makers, scientists, and community organizations, is one of many such efforts (ECOSONG n.d.).

Problem Solving Ecomusicology

Jennifer C. Post / University of Arizona

Timothy Cooley asked us to respond to questions addressing sustainability issues and especially to comment on roles that we, as ethnomusicologists, might play to make a lasting difference in our rapidly changing environments. Does our training prepare us to work to help reduce humanity’s destructive impact on our planet’s ecosystems? Can ethnomusicologists and musicologists take leading roles in battles for environmental justice? I consider these questions as an ethnomusicologist actively engaged in fieldwork with people living in areas where residents struggle with both environmental degradation and social justice issues. Recent research in the expanding field of ecomusicology indicates that scholars have found direct relationships between music/sound and ecological systems (Ryan 2016; Simonett 2016), and references to knowledge that indicate biocultural systems linking local communities to conservation measures have been in place for generations (Ingram 2017; Impey 2018). Other studies demonstrate that ecosystem changes and opportunities for addressing them in local settings are entangled with political power (Mendivil 2016; Silvers 2018) and/or linked to spirituality (Dirksen 2018). Engaging with the climate crisis

and other environmental problems, our understanding of issues is expanding, but pathways to making local/global differences still need to be cut. We will not accomplish meaningful change until we are involved in problem-solving and networking across the disciplines, actions that, when implemented, will truly integrate information on environmental issues. Developing new links will reveal new knowledge critical to human and ecological health and well-being.

Ecomusicologists need to have broader knowledge of the ecological systems that are being threatened in areas where they work. Discussions about ecosystems, the biotic communities made up of animals and plants interacting with other organisms in their physical (abiotic) environments (such as soils, nutrients, and water), have been contentious in some academic circles. The word “ecosystem” (and other sustainability-related vocabulary) is used too often in ecomusicology to support arguments with indirect relationships to actual ecosystems. We have muddied our understanding of the concept—as we did with sustainability and ecology—by establishing ecosystem analogies, such as referring to “musical ecosystems” built around place and cultural activities that help to define and characterize a location (Schippers and Grant 2016). Huib Schippers alters the meaning with references to musical ecosystems as tools for sustainability of cultural systems, such as in India, where biodiversity protections are almost nonexistent. India ranked 177 out of 180 countries in the 2018 Environmental Performance Index, and its ecosystem vitality, including its biodiversity and habitat index, sits in the bottom quartile (Environmental Performance Index 2018). Ignoring actual ecosystem issues may cause scholars to overlook some of the important links between environmental changes and cultural practices (see Allen 2017b). Focus on musical ecosystems signals support for cultural preservation, not for actions to address environmental conservation—of critical importance to the future of the earth. In the sciences and social sciences, ecosystem services include the products of human involvement (roadways, water storage systems) and services related to cultural production and maintaining traditional knowledge (Fernández-Giménez et al. 2017), opening space for collaboration among scientists and social scientists using mixed method approaches (Liu et al. 2007; Fernández-Giménez et al. 2015). When studies that focus on music/sound and ecology establish such integrated methods they will create new pathways to directly benefit ecosystems and biodiversity (Post and Pijanowski 2018).

In my current research in rural Mongolia, pastoralists who have benefited from collaborative, community-based lifeways today struggle with the climate crisis and resource degradation with unpredictable outcomes. Mongolia’s grassland system, one of the largest in the world, covers 80 percent of the country and encompasses three primary ecological zones. These systems support plant diversity and water resources and provide habitats for various species (Convention on Biological Diversity 2015). The land also supports over sixty-six million head

of livestock, as well as several hundred thousand mobile pastoralists who have been stewards of the land for centuries. Healthy grasslands and adequate clean water for pastoralists are essential for their economic and ecological survival. Livestock and wildlife behavior and meteorological events often act as biocultural indicators for pastoralists; sonic practices offer acoustic pathways to knowledge, such as sounds signaling weather changes or health risks (Post 2019b). Water sources and the characteristics of grasslands and landforms figure prominently in songs that highlight their environment and reinforce the ecological, social, and spiritual value of the local resources. Support for resources is strengthened in social settings where songs are shared; songs contribute to informing and mobilizing local residents with common environmental concerns. Today in Mongolia the land and ways of life are threatened by drought, declining species diversity, and unpredictable weather patterns. New industries, most significantly mining, exploit water supplies, among other resources, and new economic systems encourage some pastoralists to swell their herds and others to abandon grasslands to move from rural to urban sites (Priess et al. 2011; Khishigbayar et al. 2018). Dispirited pastoralists now manage radically changing lifeways that impact what some herders hear, what they value, and what they know through sound and sonic practices.

How might ecomusicology contribute to problem solving and participatory action in the Mongolian grasslands? A key challenge for scientists concerned with loss of grasslands, reliable water sources, and social systems that support them is to understand the full dynamics of ecosystems and the anthropogenic roles in both degradation and stewardship. Rangeland science research during the last twenty years indicates significant changes in species composition and diversity linked to the growing climate crisis, but in-depth studies in Mongolia do not indicate that most rangelands have reached a tipping point (Khishigbayar et al. 2015). At the same time, though, declining herder populations do reveal an approaching cultural tipping point (Fernández-Giménez et al. 2017). Since soundscapes tie human and nonhuman data and experience together, sound is a means to evaluate and address ecosystem challenges. In fact, landscape ecologists now map feedbacks between land-use systems and ecosystem dynamics using sound (Pijanowski 2011), and ecomusicological research, as noted above, indicates that engagement with the environment through sound and music is a powerful cultural and ecological practice. Just as soundscape study in ecology is limited by its methods, which rely heavily on quantitative data and focus on nonhuman species richness, music study on sound production in environmental contexts conducted in ethnomusicology draws on qualitative research methods that engage in community partnerships to highlight human—and sometimes nonhuman—cultural production.

Despite epistemological differences, cultivating broader relationships among concerned actors offers opportunities for new sources of knowledge to apply to sound and listening practices in acoustic communities in order to address environmental challenges (Post and Pijanowski 2018). In educational settings, ethnomusicologists need to grow programs to encourage students and scholars to step out of the academy and into forests, waterways, and grasslands to engage in teamwork with representatives from different disciplines, fields, and walks of life. Some of these relationships can be related in what Andrew Mathews (2009) refers to as “unlikely alliances,” offering greater opportunity for locally impacted people to mobilize and contribute their own beliefs to effect policy. The concept might also be applied to relationships ecomusicologists build with ecologists and ecological knowledge. Networks that are established can offer integrated methods to measure and map the effects of climate events and industrial growth and to gauge loss of ecosystem productivity. Establishing mixed methods to link sonic practices, scientific research, and local knowledge systems will contribute to broader environmental discourse. While applied ethnomusicology programs have established means for effective, collaborative, and creative work in communities, such engagement with problem-solving across these disciplines to address the climate crisis and other land degradation issues has yet to be fully established.

Ecomusicologists conducting research on biodiversity loss and music/sound practices are frequently confronted with environmental injustice, which occurs when there is an unequal distribution of environmental risk and an imbalance between policy-makers, national goals, social hierarchy, and local communities struggling both economically and ecologically (Schlosberg 2007; Mohai, Pellow, and Roberts 2009). Such risks are disproportionately experienced by Indigenous peoples, ethnic minorities, people of color, and the economically disadvantaged. In Mongolia, the government’s industrial development plans and nationalist efforts have deeply impacted pastoralists, with arguably the most profound effect on minority ethnic groups—the Kazakhs, Tuvans, and others. As development plans for the nation expand, local soundscapes change and then disappear due to land degradation and resource loss. In fact, loss of sonic practices is a widespread issue. In other fieldwork, I have experienced the impact of the destruction of the Aral Sea and its natural ecosystems for economic gain on the health and well-being of Karakalpak artists in Uzbekistan, causing the loss of materials for musical instruments and loss of artists to disease brought on by environmental abuse. I also witnessed over time the expanding population and changing lifeways that have affected the Uyghur, Kazakh, Kyrgyz, and Tuvan peoples living in drylands and deserts in Xinjiang Uyghur Autonomous Region in China, drastically changing their soundscapes and musical opportunities.

Engaging with environmental injustice as an ecomusicologist requires the same knowledge shared in interdisciplinary and transdisciplinary teams addressing ecosystems and biodiversity. And while ecomusicologists may be good scholars, most are not yet good collaborators for the cause. Viewed as a social movement, ecomusicology is not fully formed and struggles still to clearly define its issues, methods, and trajectories, reflecting other emergent climate justice movements that Andrew Jamison (2010) identifies. Until ecomusicologists work with ecologists who have documented critical biological changes and those directly impacted by climate events and environmental injustice who carry other ecological knowledge, the field will remain a site for scholarly discourse rather than an interactive problem-solving network that reflects key ethnomusicological values identified with applied work: to be “inclusive, plural, and interdisciplinary” (Tan 2015:127).

We could continue to develop ecomusicology as a distinct field with its own vocabulary, using ecology as a metaphor and ecosystem as a model for music, but we would all benefit if we learned more about ecosystems and biodiversity loss and their relationships to sonic practices, as well as about human *and* ecological well-being. When we all listen to each other and harness our collaborative tendencies as ethnomusicologists, we expand exponentially our spheres of knowledge. The development of new networks will allow us to contribute more effectively to efforts to reduce ecosystem destruction and address environmental injustice, actions that will likely play critical roles in environmental repair during the next generation.

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