

Making and Learning with Environmental Sound: Maker Culture, Ecomusicology, and the Digital Humanities in Music History Pedagogy

KATE GALLOWAY, WESLEYAN UNIVERSITY

How can we use digital media in music history research and our teaching to tell stories, create visual art, perform stage works, and compose music about ecologies of climate change, and other pressing global environmental issues in the twenty-first century in a way that reaches everyone? The adoption of digital humanities methods, tools, and values by ecomusicology is one potential answer to this question. As Yi-Fu Tuan suggests, when humans give meaning to spaces, places come into being.¹ Tuan recognized that there is “an important distinction between the passive and active modes of experience: the sensations of the passive mode are locked inside individuals and have no public existence.”² We come to understand places through their spatiality and the relationships we forge with their human and nonhuman sensorial (including musical) content. We come to understand environments—their soundscapes and the environmental issues that shape them, as well as the music used to represent those environments—through acts of collective listening and making sound using recording technologies.

To facilitate project-based learning, the classroom becomes a community maker space, one in which connections are made among people, ideas, and made things, and one that is informed by collective critical thinking about these connections.³ Makerspaces are “informal sites for creative production in art, science, and engineering where people of all ages blend digital and physical

1. Yi-Fu Tuan, *Space and Place: The Perspective of Experience* (Minneapolis: University of Minnesota Press, 1977).

2. Yi-Fu Tuan, “Place: An Experiential Perspective,” *Geographical Review* 65, no. 2 (1975): 152.

3. Dale Dougherty, “The Maker Movement,” *Innovations* 7, no. 3 (2012): 11–14; and Jentery Sayers, “Tinker-centric Pedagogy in Literature and Language Classrooms,” in *Collaborative Approaches to the Digital in English Studies*, ed. Laura McGrath (Logan, UT: Computers and Composition Digital Press, 2011), 279–300.

technologies to explore ideas, learn technical skills, and create new products.”⁴ Maker culture promotes open innovation, sharing, exchange, versioning, and critical creativity in a learning environment where members participate in both digital making and traditional analog crafts and do-it-yourself resources.⁵ This process of creating knowledge and understanding through hands-on creation adopts principles of design thinking in higher education. Design methodology involves a scaffolded and repeated sequence of identifying a problem, drafting ideas and approaches, creating a product, experimenting with and reflecting on the product to determine whether it provides an answer to the research question, and revising where necessary.⁶ The application of maker culture to the teaching of music history is another way of fostering experiential object-based learning, where students understand the materiality and processes of music through creation and direct interaction with objects, technologies, and sounds.

The concept of the digital humanities has been in circulation through North American academic institutions for more than a decade now. Digital humanities is an area of scholarly activity at the intersection of digital technologies and the disciplines of the humanities. It can be defined as a new way of doing scholarship using digital formats and methods that involve collaborative, transdisciplinary, and computationally engaged research; teaching; and publishing. Its impact on disciplines such as literary studies has been profound, and scholars in other humanities fields (such as history, anthropology, gender studies, indigenous studies, theater, ethnomusicology and musicology) are beginning to explore what the digital humanities can offer.⁷ And yet sound studies, musicology, and ethnomusicology have not had a pronounced impact

4. Kimberly Sheridan, Erica Rosenfeld Halverson, Breanne Litts, Lisa Brahms, Lynette Jacobs-Priebe, and Trevor Owens, “Learning in the Making: A Comparative Case Study of Three Makerspaces,” *Harvard Educational Review* 84, no. 4 (2014): 505.

5. See Alex Christie, Jana Miller Usiskin, Jentery Sayers, and Kathryn Tanigawa, “Introduction: Digital Humanities, Public Humanities,” *NANO: New American Notes Online* 4 (2014), accessed September 15, 2017, <https://nanocrit.com/issues/issue5/introduction-digital-humanities-public-humanities>; Sheridan et al., “Learning in the Making,” 505–531; and Dale Dougherty, “The Maker Movement,” *Innovations* 7, no. 3 (2012): 11–14.

6. Nigel Cross, *Design Thinking: Understanding How Designers Think and Work* (Oxford: Berg Publishers, 2011).

7. The Digital Humanities Summer Institute (DHSI) at the University of Victoria has recently included new curriculum opportunities in their catalogue of intensive summer week-long courses, including Feminist Digital Humanities: Theoretical, Social, and Material Engagements; Digital Storytelling; Digital Indigeneity; Palpability and Wearable Computing; and Sounds and Digital Humanities. For further information on DHSI training and course offerings, see <http://www.dhsi.org>. Other partnering DHSI institutes and conference workshops affiliated with DHSI include DH@Guelph, DH@Leipzig, DH@Oxford, and the conference workshops DHSI@Congress and DHSI@MLA, among others. DH@Oxford is the only institute that offers a course geared specifically to musicologists and ethnomusicologists, Digital Musicology, first offered in summer 2015.

on the digital humanities. In those fields, the digital humanities continues to be astonishingly silent. Soundwork, however, is gradually being incorporated into digital humanities training and scholarship. By soundwork, I refer not only to academic writings concerned with sound, but also to the practice of using and analyzing sound in varying ways to make digital objects that readers can interact with—even hear—rather than simply reading music scholarship on the pages of an academic journal. Above all, the digital humanities promote open-access scholarship, ensuring that research findings are accessible across varied social, economic, geographic, and education demographics. Often this soundwork involves both the creation of born-digital research materials, such as making an MP3 field recording of a mockingbird’s call, or the digitization of analog materials.

As evidenced by the numerous job calls for applicants with digital humanities training and collaborative funding opportunities that intersect with digital humanities, the opening of digital humanities centers, and the creation of maker spaces on campuses that bridge the university and the community, the field of digital humanities is increasingly important in academia. Many scholars, moreover, are also overwhelmed by the breadth of the field when trying to decipher what form a digital humanities-informed approach to music history should take. What can the digital humanities offer music history and, specifically, ecomusicology research and pedagogy?

The digital humanities can vary academic modes of communication. In ecomusicology, we can use the tools, methods, and values of the digital humanities to vary how we communicate music history to our students, our colleagues, and the public.⁸ Most importantly, digital humanities methods and modes of presentation expand our audience to include not only academics, but also those who are dealing first-hand with climate change, poor ecosystem health, and environmental degradation.

Digital humanities tools and methods can also assist those working in ecomusicology, as well as scholars interested in the geospatial analysis of music—the study of soundscapes and artistic renderings of environmental conditions and events. The archive is a central concept to the digital humanities and sound studies. We can archive and tell the stories of places and music inspired by those environments through forms of digital storytelling, using a combination of sound, digital editing and recording methods, and the multisensory experiences of ethnographic fieldwork to evocatively narrate music history.⁹ Digital

8. My approach to music history pedagogy is one in which the fields of historical musicology and ethnomusicology and the techniques of historical and ethnographic methodologies are folded together.

9. See also Veit Erlmann, “But What of the Ethnographic Ear? Anthropology, Sound, and the Senses,” in *Hearing Cultures: Essays on Sound, Listening and Modernity*, ed. Veit Erlmann (Oxford: Berg Publishers, 2004), 1-20.

storytelling can take a variety of forms, including audio recorded soundwalks, multi-modal sound maps, and digital radio and audio documentary, providing “new opportunities for humanities scholarship and teaching, especially with regard to critical thinking, communication, digital literacy, and civic engagement.”¹⁰ For music historians, music, its material culture, and other forms of aural culture such as oral histories are already regarded as valuable materials to archive. However, the less-valued, ubiquitous, and ephemeral sounds of the everyday are less frequently recorded and granted archival space.

This essay sketches out some of the ways scholars of music history, specifically those interested in issues of place, environmental politics, and the geospatial analysis of music, can have a sustained engagement with the digital humanities. This essay is informed by my experiences designing and implementing assignments where students directly make and work with the sounds connected to place. It also draws from developing digital objects for my research addressing how sound technology is used by artists of experimental music and popular music to remix, reuse, and remediate climate change information, soundscape field recordings, and environmentalism discourse. Drawing on evidence from project-based learning incorporated into my seminar *Music, Sound, and the Environment in the Anthropocene*, I illustrate that by treating assignments and seminar meetings as research-creation components of a digital media workshop, students put into practice the ideas and concepts from readings by making with sound and come to an understanding of how the sonic environment operates in their everyday experience.¹¹ Students become what Tara McPherson calls “hybrid practitioners,” taking on roles in different forms, including “artist-theorists, programming humanist, activist scholars, critical race coders,” entangling traditional, public, and digital humanities work.¹² By working with environmental sound and music directly and creatively, students learn how technologies and participatory approaches can be used to convey narratives and social activism, illustrating the importance of embodied knowledge to musicological scholarship.

By incorporating tools, methods, and perspectives from the digital humanities, music history pedagogy can foster experiential, process-based learning

10. John F. Barber, “Digital Storytelling: New Opportunities for Humanities Scholarship and Pedagogy,” *Cogent Arts & Humanities* 3, no. 1 (2016): 2.

11. This seminar was first offered at Wesleyan University during the Spring 2017 semester and cross-listed between the Department of Music and the College of the Environment. Enrollment was capped at eighteen students with junior or senior standing, while students with alternate standing were admitted by permission of the instructor. The course incorporated pedagogical materials and ideas that I first developed during the 2015 Digital Humanities Summer Institute (DHSI) held annually at the University of Victoria (see Appendix A).

12. Tara McPherson, “Why Are the Digital Humanities So White? or Thinking the Histories of Race and Computation,” in *Debates in the Digital Humanities*, ed. Matthew K. Gold (Minneapolis: University of Minnesota Press, 2012), 154.

through making and experimenting with sound. I explore two approaches to geospatial musical analysis that use digital media to illustrate how methods, tools, and values developed in the digital humanities inform a multisensory understanding of music history topics, particularly in ecomusicology. I will also detail some of the possible applications of digital humanities practice and theory in music history pedagogy, such as addressing the intersections of music, sound, culture, and the environment. I use an ethnographer's perspective in this article by presenting a selection of the digital methods and tools that I have brought to my own work at the intersections of music, site-specific performance, and the geospatial analysis of music, specifically my research concerning R. Murray Schafer's *Patria* cycle and the St. John's Sound Symposium's *Harbour Symphony* series.

The applications of the digital humanities that I reference in this article can extend beyond ecomusicology to music history pedagogy. As an advocate for digital scholarship I argue that the digital platforms, tools, and spaces developed by digital humanists afford scholars alternative communication formats and research environments. For musicologists and ethnomusicologists, this means an unprecedented array of methods and tools to analyze, remediate, and exhibit the diverse sonic environments and sounds of research materials previously qualified as ephemeral sonic artifacts.¹³

Although I have applied these digital methodologies to pedagogy and research in ecomusicology, they have broad applications across all areas of musicology, ethnomusicology, and sound studies. Digital literacy is more than just learning how to code, build a website, or use Twitter. In music history pedagogy, we must integrate digital literacy and digital humanities methods and values through the use of research-creation projects as we explore what digital humanities has to offer music history.

Sound studies and music history benefit from multimodal formats of presentation. By augmenting our text-based works (e.g., articles, books, dissertations, and the like) with multimodal digital objects, our readers more fully experience the sensory worlds of the communities and practices portrayed. Music history and sound studies critically engage with the production, performance, circulation, and reception of diverse sound cultures and practices. Yet scholars are not acquiring digital humanities training on a regular basis. One

13. In my courses, I have used the following large-scale digital humanities projects of note that address the curation and historiography of sound, music, and performance cultures: Emily Thompson's *The Roaring Twenties*, <http://vectorsdev.usc.edu/NYCsound/777b.html>; Louis Epstein's *Mapping the Sounds of 1920s Paris*, <https://pages.stolaf.edu/musicalgeography/>; Duke University's *NC Jukebox*, <http://dukewired.net/ncjukebox/exhibits/show/ncjukebox/fcb-overview>; *Provoke! Digital Sound Studies*, <http://soundboxproject.com/index.html>; and Ryan Bañagale, Idris Goodwin, and Steve Hayward's *Critical Karaoke* at Colorado College, <http://www.criticalkaraoke.com/>, among others.

way to rectify this shortage of digital humanities soundwork is through the use of open-access sound maps to audiovisually model our scholarship for our readers' ears.¹⁴ Sound maps, soundwalk recordings, sound collages, and other digital objects are potent pedagogical tools. Used in this manner, the production of these objects can stimulate practice-based learning focused on the development of digital literacy, critical media studies, and deep engagement with the material and aural practices of working with and making sound. In my own research and teaching in ecomusicology, I see the creation of digital objects as an opportunity for community outreach and research engagement outside the academy. Indeed, through sustained digital humanities training, such community outreach has become an essential part of my scholarship. Creating and presenting in alternative formats allows me to reach a wide audience outside of the academy.

When I first began to incorporate the digital humanities into my research and teaching, I realized that environmental soundwork has an important place in digital pedagogy. Digitization has enabled the environmental humanities to communicate information concerning the relationships among society, the human and nonhuman environment, and culture in alternative, often multimodal formats. Indeed, the newly digitized environmental humanities may provide solutions for some of our most pressing problems. For instance, environmental and energy issues have received sustained attention in varied forms of cultural expression, which could include music compositions that incorporate sounds from the environment or projects that map perceivable changes in the composition of regional soundscapes.

The scarcity of sustained digital humanities soundwork could be attributed to the tendency for scholars who do not specialize in music and sound studies to perceive themselves as "deficient in" the necessary technical vocabulary and scholarly tools to critically engage with aestheticized sound. In their introduction to *Sound Clash: Listening to American Studies*, Kara Keeling and Josh Kun point out that the "increase in scholarly attention to sonic phenomena is [...] perhaps attributable to more recent, turn of the twenty-first century innovations

14. A sound map is a digital geographic map that places emphasis on the sonic representation of a location. It associates the individual features of a location (e.g., schools, stores, pathways, lakes, botanical garden, transportation systems) with their representative sounds and the overall soundscape of the place. Sound mapping involves the association of landmarks and soundscapes. Sound maps can also, for example, model geographic data applying to a composer's biography, music genres, the performance and reception history of a composition, and networks of musicians and composers in a city. Louis Epstein's *The Musical Geography of 1920s* (<http://pages.stolaf.edu/musicalgeography>) is an excellent example of the latter form of a sound map and was awarded the 2016 American Musicological Society (AMS) Teaching Award honoring an exceptional pedagogical resource for musicology.

in audio technology and new media practices.”¹⁵ A number of humanist scholars participating in the 2015 class of “*Sound of/in Digital Humanities*” at DHSI, who also work outside the fields of music history and sound studies, disclosed that they are more comfortable discussing “everyday sound” rather than “music.”¹⁶

I have adopted design thinking and maker culture into my music history pedagogy to transform seminars into learning spaces that promote critical thinking, versioning, discovery, and making connections to everyday life. These instances of maker culture digital storytelling addressing relationships among music, sound, culture, and the environment can be adapted to other subject matter in music history pedagogy as well. Jentery Sayers observes that collaboration, digital media, and making and tinkering are not ubiquitous in English studies (aside from those with digital humanities initiatives), therefore “embracing tinkering’s inexpert, tactical, and situational experimentation lends itself well to introducing students of literature and language to otherwise unfamiliar modes of learning.”¹⁷ I argue that Sayers’ argument applies across the humanities and the visual and performing arts. As digital media becomes more common in today’s reading, writing, performance, outreach, and researching practices, acts of making, tinkering, and explorative play with analog and digital technology, especially sound technologies, are a valuable inclusion to the graduate and undergraduate music history classroom. Students learn that media and technologies are not neutral apolitical tools.

The Making and Sharing of Sonic Research

Maker culture is a form of public humanities work. Through acts of bringing people together to create, experiment with, and reconsider environmental sound and music, collective making in the music history classroom encourages students to think through the social, cultural, geospatial, and historical significance of music and everyday sound. This process also can involve working directly with the technologies, texts, and artifacts related to music making and listening cultures. “Even when texts are treated more like physical objects for hands-on engagement (e.g., during archival research or in textual studies),” Jentery Sayers explains, “that engagement must be incredibly careful and methodical, especially if rare books, incunabula, or other such artifacts are

15. Kara Keeling and Josh Kun, “Introduction,” in *Soundclash: Listening to American Studies*, ed. Kara Keeling and Josh Kun (Baltimore: John Hopkins University Press, 2012), 3.

16. Group Workshop Discussion on sounds and the digital humanities at the University of Victoria Digital Humanities Summer Institute (DHSI), June 10, 2017.

17. Sayers, “Tinker-centric Pedagogy in Literature and Language Classrooms,” 279.

involved.”¹⁸ In ecomusicology, studying and making music, everyday sound, and soundscapes through new media helps us understand through embodied experience the mechanics, politics, and cultural significance of the relationships among sound, music, nature, and culture.

The making of digital objects that circulate in an open-access format and often contain research materials contributed by a research collective rather than an individual researcher is a form of social knowledge creation. Digital humanities knowledge creation takes on a variety of forms, including archival representation and textual editing, interpretive theory and criticism, and protocols of knowledge construction and communication—all using computational and digital tools and techniques.¹⁹ As a field based in both theory and practice, the digital humanities continues to develop tools, methods, and theories to address issues concerning the remediation of humanistic research materials, the analysis originating in those materials, and the communication of the results of research-creation.

As twenty-first century scholars question how they can make their research more readily accessible, the digital humanities is developing multimodal and collaborative methods to communicate open-access research. This groundbreaking work is taking place in two emergent areas of the digital humanities: Critical Making and Social Knowledge Creation (SKC). These subfields promote experimental forms of knowledge creation and circulation that promote interdisciplinary exchange, collaboration, and research-creation. Scholars in these subfields are also performing critical interventions with traditional formats of scholarly knowledge transfer.²⁰ Critical making, in particular, uses design thinking and hands-on projects to connect digital technologies with society to answer humanist research questions through processes of experimentation

18. Jentery Sayers, “Tinker-centric Pedagogy in Literature and Language Classrooms,” 279.

19. For an exhaustive online registry of digital research tools for scholarly use (both open-access and with paid subscription) see *Digital Research Tools (DIRT)*, <http://dirtdirectory.org>.

20. See for further information Alyssa Arbuckle et al., “Social Knowledge Creation: Three Annotated Bibliographies,” *Scholarly and Research Communication* 5, no. 2 (2014), available at: <http://src-online.ca/index.php/src/article/view/150/299>, accessed 1 August 2016; Alyssa Arbuckle, Alex Christie, ETCL Research Group, INKE Research Group, and MVP Research Group, “Intersections Between Social Knowledge Creation and Critical Making,” *Scholarly and Research Communication* 6, no. 3 (2015): 1-13; William R. Bowen, Matthew Hiebert, and Constance Crompton, “Iter Community: Prototyping an Environment for Social Knowledge Creation and Communication,” *Scholarly and Research Communication* 5, no. 4 (2014); Matthew Hiebert, William R. Bowen, and Raymond Siemens, “Implementing a Social Knowledge Creation Environment,” *Scholarly and Research Communication* 6, no. 3 (2015): 1-9; and Ray Siemens and Jentery Sayers, “Toward Problem-based Modelling in the Digital Humanities,” in *Humanities and the Digital*, ed. Patrik Svensson and David Theo Goldberg (Cambridge, MA: MIT Press, 2015), 145-63.

and the creation of material digital objects. It is a research-creation approach that incorporates physical and conceptual exploration. These two experiential forms of knowledge creation could, for example, take the form of peer-reviewed open-access publication platforms that support multimedia scholarship as an alternative to print-only and paywall-controlled journals; a DIY hand-crafted zine that critically reflects on the interconnections among technology, society, and the environment; or building small sound producing electronics using contact microphones and sensors that produce sound in respond to small movements of the body.

By bringing ecomusicology into the broader fields of the environmental humanities and digital humanities, scholars can use multisensory modes of communication to tell stories in order to converse with the public about aural culture, environments, and environmental issues. Digital storytelling methods that use sound and music can be used to craft narratives about sonic environments, performance spaces, and how audiences and composers listen to and understand music inspired by place and environmental issues. In many cases, digital storytelling projects are collaboratively produced, generating knowledge that is socially created and intended to extend scholarly outreach to those directly dealing with the consequences of environmental change.

Taking as our starting point Karin Bijsterveld's observation in the introduction to *Soundscapes of the Urban Past* that any study of urban sounds before 1900 must engage with the question of how sounds are staged, sound studies is not so much the study of sound as the study of a "*mediated* cultural heritage of sound."²¹ The same can be said for curated and exhibited digital humanities soundwork, as sonic content moves from one environment to another, and is remediated (or staged, to use Bijsterveld's term) in a digital environment. Even born-digital sound takes on new form and meaning when recontextualized alongside other media in multimodal digital humanities projects. The sound, for example a recording of a lake, in conjunction with the image forms an associative relationship, sound = image, through knowledge and memory. When the sound is in opposition to the image, the sound of a lake in a war movie, sound \neq image, it forms a dissociative relationship and gives new meaning to the sound. Bijsterveld's approach can be adopted in digital ecomusicology projects. When environmental sound is remediated and curated in a digital environment, decontextualized from the non-aural connective tissues of place, these digital media texts and spaces become valuable sites for what Bijsterveld refers to as the "dramatization of sound."²² The sounds of our digital ecomusicology projects are mediated, and recording and listening technology connect

21. Karin Bijsterveld, "Introduction," in *Soundscapes of the Urban Past: Staged Sound as Mediated Cultural Heritage*, ed. Karin Bijsterveld (Bielefeld: transcript Verlag, 2014), 14.

22. Karin Bijsterveld, "Introduction," 14.

the actual sounds of the environment and a composer's mimetic musical representation of nature and the nonhuman to listeners' ears.

Soundwalking and Field Recording in Digital Ecomusicology Pedagogy

In my digital musicology practice I advocate for an exploratory and collaborative approach to sound through the "making" of digital ecomusicology objects. Although it is not conventionally defined as such, soundwalking is a form of social knowledge formation in which listeners individually and collectively make meaning about a place and its defining aural features. The research-creation practice of soundwalking does not mandate digital recording and mediation; however, by recording soundwalks, we can re-listen to place in detail and to the sounds we might have initially missed, examining how the microphone registers place differently than the human ear. According to Jonathan Sterne, the central challenge of sound studies is the need "to think across sounds, to consider sonic phenomena in relation to one another," crossing disciplinary boundary lines to engage with "alternative epistemologies, methods [and] approaches," and ultimately to "move beyond the academy to try and effect change in the world."²³ Soundwalking is situated uniquely as a method of teaching, research-creation, and community outreach grounded in sound studies and ecomusicology. Digital soundwalking can interrogate our technologized interactions with sound and place when recorded soundscapes are analyzed and then communicated through research or community soundwalk activities.

Audio projects informed by critical making, such as the creation and curation of field recordings, sound collages of remixed found sounds, and recorded soundwalks, embed humanities values and methodologies into technologies and position "research production within an ongoing and interactive process and public engagement."²⁴ The making of digital objects is intentionally iterative and values process, versioning, and revision as researchers understand the intricacies of their research objects. Through versioning, experimentation, and productive failure, researchers learn from what did not work as well as what immediately did work, rather than solely privileging the final product. By taking such an approach, scholars experiment with and work through different versions of their research to produce meaning and understanding.

Hildegard Westerkamp, a founding member of the World Soundscape Project and an early proponent of soundwalking and soundscape composition,

23. Jonathan Sterne, "Sonic Imaginations," in *The Sound Studies Reader*, ed. Jonathan Sterne (New York: Routledge, 2012), 3-4.

24. Arbuckle, Alyssa, Alex Christie, ETCL Research Group, INKE Research Group, and MVP Research Group, "Intersections Between Social Knowledge Creation and Critical Making," *Scholarly and Research Communication* 6, no. 3 (2015): 5.

inclusively positions a soundwalk as “any excursion whose main purpose is listening to the environment. It is exposing our ears to every sound around us no matter where we are.”²⁵ Westerkamp frequently uses her soundwalk field recordings in her soundscape compositions, as heard in *Kits Beach Soundwalk* (1989). Andra McCartney further situates soundwalking as a “creative and research practice that involves listening and sometimes recording while moving through a place at a walking pace. Soundwalking, whether conducted solo or in a group, is concerned with the relationship between soundwalkers and their surrounding sonic environment.”²⁶ McCartney prefers to record her soundwalks and the community discussions she hosts following her group soundwalks using binaural stereo microphones affixed to her head adjacent to her ears.

I argue that soundwalking is a maker practice. It is a method of integrating the study of sound and music into the digital humanities and incorporating digital humanities into the narratives of the history of electroacoustic music composition taught in the music history classroom. She contributes sound to the acoustic environment as her body occupies space and listens to its surroundings, and she creates audio archival documents that record these aural and physical encounters.

In my teaching I experiment with multimodal assignments where students work directly with live and recorded sound to augment print-based forms of scholarship. I have designed digital soundwork assignments for two courses: *Music, Sound, and the Environment in the Anthropocene* and *Music, Technology, and Critical Geography* (see Appendix A for two sample digital audio assignments that combine digital technology, environmental sound, and ecomusicology). As Joanna Demers explains, “audio footage ties a soundscape composition to the ecological, social, historical, or cultural dynamics of a specific location, which both personalizes and politicizes the act of listening.”²⁷ In these seminars, students use digital humanities training to develop communication strategies to convey sound studies and music history research to a broader audience by using different media, and they additionally consider the political stakes in producing research intended for public use.²⁸

25. Hildegard Westerkamp, “Soundwalking,” in *Autumn Leaves, Sound and the Environment in Artistic Practice*, ed. Agnus Carlyle (Paris: Double Entendre: 2007), 49.

26. Andra McCartney, “Soundwalking: Creating Moving Environmental Sound Narratives,” in *The Oxford Handbook to Mobile Media Studies*, vol. 2, ed. Sumanth Gopinath and Jason Stanyek (Oxford: Oxford University Press: 2014), 212.

27. Joanna Demers, *Listening through the Noise: The Aesthetics of Experimental Electronic Music* (Oxford: Oxford University Press, 2010), 120.

28. Throughout the semester, students contribute to an open-access course webpage that archives and makes publically accessible all soundwork and digital scholarship created in the course.

The digital research-creation assignment guides students through the critical design, practice, and analysis of the intersectional relationships among movement, place, community, and everyday sound. Through the use of ubiquitous technology (e.g., iPhones) and immersive listening (e.g., earphones), the students and the public who later listen to the course's soundwork are encouraged to focus on sounds they might typically ignore. This digital audio soundwalk exercise and the accompanying pedagogical document inform the public (including the students) in embodied explorations of places and their soundscapes.

In these digital audio assignments, students are directed to use a digital audio recorder (or a similar device such as an iPhone outfitted with a good quality external microphone) to record and curate three soundwalks or sound collages (at least one of each). Each sound document must be approximately fifteen minutes in duration. Using Audacity, a free open-access audio recording and editing program suitable for beginners, students edit their field recordings. In the editing process, students add metadata describing the audiovisual details of the field recordings, route, and other supplementary commentary detailing the sounds and sensory information encountered on the soundwalk that may or may not be audible in the digital recording. They also provide a physical map of their route and recording locations. Students then upload their audio files to the course audio playlist platform account page (in this case I used SoundCloud in a high quality .WAV format and permitted public download of these files). Metadata entry fields in Audacity and other sound recording and editing programs are designed for the input of archival cataloguing information for popular music, and therefore include fields for artist, producer, song title, album title, and instrumentation, as well as an "other" field for uncategorized information. Much of the sound information that students include in their metadata will fall outside the purview of popular music cataloguing. This unconventional metadata includes ethnographic thick description, time code markers to identify notable sounds, sound sources, route, time of day, and physical and weather conditions. This information is entered into the "other" input field, and remains searchable by users.

By exhibiting soundwalks, sound collages, and digital radio soundwork on digital audio platforms like SoundCloud and by allowing public download, a broad audience of listeners has access to our sonic experiences of place. They can listen on location if they have access to the site where the sound recording was initially made, or they can listen to the recording off-site, imagining place through the author's aural prompts and the sounds highlighted through the approach to recording the soundscape. Open-access soundwalking documentation and compositions operate as a form of public humanities whereby the general public can listen to and interact with sound recordings that explore a

variety of natural and urban spaces from different physical, social, economic, aesthetic, and political perspectives.

One of the challenges that I encountered while workshopping these exercises at DHSI occurred when listeners who had not participated in the soundwalk listened to the resulting recordings. The soundscape is heard without visual reference, and the sounds are displaced from the things that produce them. For this reason, I revised the exercise, requesting recordists to visually document their recording locations using different focal lengths and photographic framing methods, photographing the sound sources that caught the attention of their ears during their soundwalk.

Future iterations of this digital audio assignment will incorporate personalized approaches to experiencing space through movement. Many of the available GPS mapping applications used can track human activity, but like many of the popular cardio fitness and driving apps, stop short and do not map all forms of human movement. GPS mobile media mapping applications are restrictive and can't track human movement in architectural structures. For example, the applications are not designed to track a soundwalker's path through the various floors and corridors of a mall or museum. They are not able to record a walk from the city street to the inside of buildings, through the many possible unofficial paths across a neighbor's lawn, or through a city park or conservation area. To map a walk that moves from a landscaped courtyard, through the hallways of a university building, into the student cafeteria, and back outside into a sports field, the field recordists must manipulate the map and its data to reflect their path through a combination of exterior and interior structures. I often turn to a combination of digital and hand drawn maps to present my geographic data in order to augment the experience of listening to soundwalks in my own research, until such time I can develop a custom designed soundwalk GPS mapping mobile media application.

In an age of ubiquitous digital online listening formats and platforms where active and close listening can suffer, how can we as digital pedagogues develop the listening skills of both our students and the general public? Publically available open-access audio documentaries, whether in the format of a digital radio program, podcast, recorded soundwalk, or sound art, encourage listeners and the students who create these digital objects to think about how audiences, publics, and listening are conceptualized and realized in relation to environments, as well as how society inscribes evident, often degradative, change upon these environments. The increase in listening to digital audio and listening in virtual spaces has led many skeptics to comment on the decline of the active listener through the rise of digital broadcasting. Challenging the skeptics of new media practices, David Kusek and Gerd Leonhard write that digital music invigorates and empowers listeners through its immediacy, proximity, accessibility, and

convenience.²⁹ Kusek and Leonhard suggest that “the digital distribution of music will gradually minimize the pay-for-product mentality that has dominated the music business for over a century, and technology may finally create some deeper empowerment for more of the involved parties.”³⁰ New media extends the reach and attends to the multisensory character of music history scholarship, and in particular to the ecomusicological subject matter, in the areas of analysis, synthesis, communication, and formal dissemination.³¹

Sound Maps and the Spatiality of Environmental Information

A clear intervention by the digital humanities into music history is in the geospatial analysis of music whereby humanities data and information addressing music, place, and geography is organized and remediated in sound maps. Environmental sound and music can be archived in a variety of forms, ranging from websites with publically accessible sound files and detailed databases to rich sound maps featuring geo-located sounds contributed by a community of listeners. Geospatial formats that organize sound data, model the spatial features of a performance event, and map performance venue and community locations and their site-specific information are all forms of research-creation that can be adapted by scholars interested in digital methods in ecomusicology. Geographic information refers in some way to a location on the earth’s surface and has both a spatial (where) and a thematic (what) component that communicate how things occur differently at different locations on the earth’s surface. It is necessary to explore the available open-source mapping software to see which mapping methods best suit a project’s data and research questions. Each program has strengths and limitations depending on the kind of humanities data available for analysis.

Digital mapping reveals a variety of ways that the spatial documentation of field recordings and performance events can be used to establish a sense of place for a digital audience. Soundwalks and field recordings made within the local community, as I discussed earlier in this essay, are just a few examples of

29. For further information see David Kusek, Gerd Leonhard, and Susan Gedutis Lindsay, *The Future of Music: Manifesto for the Digital Music Revolution* (Berkeley, CA: Berklee Press, 2005). This controversy about the liberation or dehumanizing effects of technology is an ongoing debate in the digital humanities circles and extends back to Walter Benjamin’s *The Work of Art in the Age of Mechanical Reproduction* (1935).

30. David Kusek, Gerd Leonhard, and Susan Gedutis Lindsay, *The Future of Music: Manifesto for the Digital Music Revolution* (Berkeley, CA: Berklee Press, 2005), 12.

31. See Ray Siemens, Meagan Timney, Cara Leitch, Corina Koolen, Alex Garnett, with the ETCL, INKE, and PKP Research Groups, “Toward Modeling the Social Edition: An Approach to Understanding the Electronic Scholarly Edition in the Context of New and Emerging Social Media,” *Literary and Linguistic Computing* 27, no. 4 (2012): 452.

how ecomusicology can be informed by geospatial analysis and sound mapping. An ideal community-based model is the launch of an open-access sound map featuring preliminary contributions from the members of a research team or students in a course, but after a period of development the map would be turned over to the community. At that point the community can not only listen to the sound map, but also contribute field recordings of their own. By opening sound maps up to public contributors, the sound map archives varied points of audition, recording locations and sounds collected using different qualities of recording equipment. By listening to and mapping place from multiple perspectives, sound maps archive how places and performances are heard and remembered. Static maps, however, even if accurate, serve only as historical snapshots and do not depict the dynamic reshaping of place that occurs over time and is documented in the aural histories of a region's community members. Dynamic, multimodal maps express the experiential and vagarious sensory information that defines a place. These maps might outline the shifts in the sonic profile of a region over time, show the social flows and networks of musicians engaged in eco-activist activity, or document the source location of field recordings used in a composer's soundscape composition.

Digital mapping provides many ways to document, analyze, and experience field recordings that communicate an understanding of place and soundscape. GIS, for example, facilitates the mapping of recording locations on a topographic map that includes vital information to the visualization and analysis of a landscape. This geographic information could include the gradation of the landscape or the historic urban planning of a city, which shape and are shaped by the soundscape of a certain time and place. However, these approaches to mapping aural culture do not provide users with a three-dimensional perspective of a listening position or the audio recording described in the text of an article, because sound files cannot be easily embedded into many GIS map platforms. The limitations of existing and accessible GIS software for sound mapping have led some projects to develop their own project platforms or to extend the reach of Google Maps.³²

In my research and pedagogy, I advocate for a move towards increased multimodal forms of presentation (for example, sound maps) as a potential solution to the current characteristic silence of the digital humanities that I referenced at the start of this essay. Much of my research involves the geospatial analysis of contemporary music, particularly experimental and popular music that addresses environmental and energy issues, remediates live and field recorded environmental sound, or is performed in an outdoor context (e.g., on a lake or in a forest). For many of these works, spatiality is important. My work

32. See for example the British Library's *UK Sound Map*, <http://sounds.bl.uk/sound-maps/uk-soundmap>, and *Cities and Memory*, <http://citiesandmemory.com/>.

in the digital humanities asks three principle questions: How can we document the spatiality of site-specific field recording and performance events through digital mapping practices? Will I be able to generate accurate representations of a particular performance space? How can digital mapping augment the geospatial analysis of my research and its public presentation?

Spatiality refers to the shaping characteristics of space and place, including, for example, topography, vegetation, weather conditions, and community populations. I examine how those spatial factors figure into the practice and theory of contemporary music and sound art. The central issue that digital humanists encounter in map creation is that much of the available mapping software is not designed for the types of data humanists use to model the complex relationships among space, place, and society. I have encountered these issues in my own research and teaching on the music dramas of R. Murray Schafer's *Patria* cycle (1966-), particularly *The Princess of the Stars* (1981/1986), which is staged on and around a wilderness lake.³³ I am exploring different sound mapping strategies for site-specific performance in order to analyze the relationships among site, environment, community, and performance in a single production; namely, the performances from the late summer/early autumn 2007 production on Bone Lake in the Haliburton Forest and Wildlife Reserve (Haliburton, Ontario, Canada). Conventional mapping software is unable to model the site-specific spatial and sonic characteristics of these ephemeral performance events and their environment.

In the geospatial analysis and presentation of music, digital tools proved useful for analyzing and understanding the spatiality of performance sites, the field recording practices of composers, networks of circulation, and compositional representations of environmental sound. Map creation augments ethnographic thick description and analytic text-based modes of communication, and can enhance discussions of music and place. My application of digital humanities mapping tools to my research and teaching in ecomusicology is an iterative process in a constant state of exploration and adaptation. I am currently using Google Maps and Google Earth in conjunction with Excel to organize my data sets of geolocated performance sites and recording location coordinates in CSV (comma-separated values) format.³⁴ In the future, I will also use the same data

33. See also Kate Galloway, "Roughing It in the Woods: Community and Emplaced Experience in the Cultural Practice of *Patria*," *MUSICultures* 39, no. 2 (2012): 30-60; and "Pathways and Pilgrimages: The In-Between Spaces in the *Patria* Cycle," *Intersections: Canadian Journal of Music/Intersections: Revue canadienne de musique* 28, no. 1 (2007): 139-50.

34. A CSV (comma-separated values) file format is a simple file format used to store tabular data, such as a spreadsheet or database. Files in the CSV format can be imported to and exported from programs that store data in tables, such as Microsoft Excel or OpenOffice Calc.

sets in ArcGIS.³⁵ The main disadvantages of ArcGIS are that it is not freeware, is costly, has a steep learning curve, and is only available for use on PCs. There is a web-based platform that serves as a useful alternative; however, the analytic toolkit of the web-based platform is not as extensive as the ArcGIS PC program. That is why I use the open-access GIS software package Quantum GIS (QGIS), which is available for both PC and Mac operating systems. GIS programs are used to create and use maps, analyze mapped information, compile and manage geographic data, share maps and geographic information, and use maps and geographic information in a range of spatial analysis applications.

I continue to explore other open-source mapping software that may better accommodate performance data and can be applied to small-scale localized maps (e.g., one lake vs. one country). I anticipate encountering a variety of challenges when I begin to visualize the geographic data I collected during my fieldwork on site-specific performance events and field recording. While mapping the 2007 production of *The Princess of the Stars* performed on and around Bone Lake in the Haliburton Forest and Wildlife Reserve, for example, I discovered that some performance location information is idiosyncratic, derived from personal field notes and interviews rather than conventional cartographic records or geographical information systems. These names and labels, which include the positions of each performer around Bone Lake, location of crew camping and production tents, and the regions of a city with colloquial names used by local residents, do not appear in conventional maps (e.g., Google Earth), and I must approximate the longitudinal and latitudinal coordinates from memory or by using a GPS tool to recreate specific performance positions that were not recorded at the time by the creative team.

I have also adopted digital humanities mapping methods as an analytic and presentation tool in my research on the St. John's Sound Symposium's *Harbour Symphony*.³⁶ I use sound maps to synthesize and organize my fieldwork conducted in 2012, 2014, and 2016 during the biannual event, which is held for one week in early July. The *Harbour Symphony* is a collection of site-specific works composed for the docked ships and performed in collaboration with the soundscape and landscape of the St. John's harbor. The *Harbour Symphony* was inaugurated in 1983 at the first Sound Symposium, an experimental music festival held throughout the provincial capital of St. John's, Newfoundland. Since its inception, numerous composers have created works that interpret the soundscape and landscape of St. John's harbour, particularly the distinct

35. ArcGIS is a geographic information system (GIS) PC program and web-based platform for working with maps and geographic information.

36. For further information on the *Harbour Symphony*, see Kate Galloway, "Materiality and Aural Memory in the *Harbour Symphony* (St. John's, Newfoundland)," *Sound Studies* 1, no. 1 (2015): 118-143.

soundmarks of the tugboats, trawlers, and ocean freighters. In my work on the *Harbour Symphony*, I use Google Maps to show my own physical (and auditory) position as a field recordist, listener, and performer. These sound map prototypes will serve as a research-creation model for future crowdsourced research (Figure 1).³⁷ Future versions of the *Harbour Symphony* sound map will feature an interface with one color-coded layer per composition, as multiple student and community member field recordists contribute recordings to the map, solicited using crowdsourcing methods.³⁸ Through the process of working on this project, students have learned strategies for recording and listening to environmental sound, and have gained insight into the ways that different geospatial conditions impact how we listen to and record performances. They have learned how to participate in an ethics of field recording by recording sensitively in public spaces, in order to avoid recording without consent the private conversations and activities of the public in the everyday spaces of performance.³⁹ Crowdsourcing field recordings and geographic data in future iterations of the *Harbour Symphony* map will lead to a more nuanced understanding of the geospatial relationships among the event, its performance space, and the community of listeners. We may, for instance, use different layers for each day or for each composition, although this is complicated by deviations in the performance schedule in which two compositions are performed in one day (at the discretion of the performance director Delf Hohmann and with the cooperation of the Port Authority). Research assistants will solicit crowdsourced recordings, and composers and performers participating in the Sound Symposium will be granted editorial control to map their personal listening practices and compositional intentions.

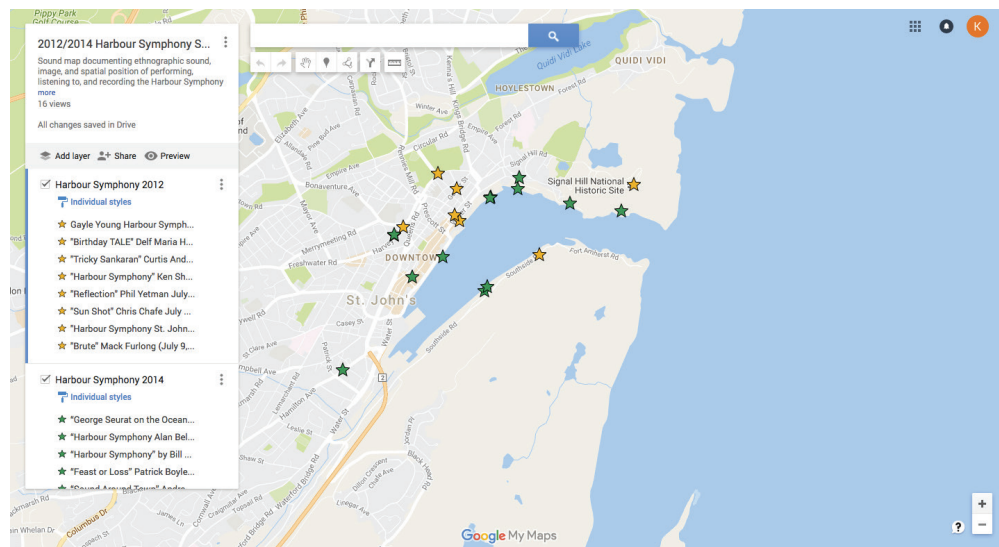
37. See https://www.google.com/maps/d/edit?mid=1UA5bgOhjfAXgmdcx1_uIC_gBudY for phase one of the iterative project “Sound Maps and the St. John’s *Harbour Symphony*,” which uses digital humanities methodologies and tools.

38. Crowdsourcing is a method of gathering and obtaining information and data by enlisting the services of a number of people, often the general public. Their contributions are either paid or unpaid, and typically solicited via the Internet, particularly social media. Crowdsourcing continues to be an asset to activist digital humanities projects and Science and Technology Studies (STS) citizen science initiatives as a research tool that directly interfaces with the general public on topics that impact their way of life, values and includes their voices in research findings, and gets everyday individuals involved in the collection and analysis of research data.

39. Before my class begins any field recording assignment, I assign articles by Andra McCartney in which she self-reflexively writes about her soundwalking and field recording practices in public spaces. See Andra McCartney, “Soundwalking: Creating Moving Environmental Sound Narratives,” in *The Oxford Handbook to Mobile Media Studies*, vol. 2, ed. Sumanth Gopinath and Jason Stanyek (Oxford: Oxford University Press: 2014), 212-237; and “Performing soundwalks for *Journées Sonores, canal de Lachine*,” in *Performing Nature: Explorations in Ecology and the Arts*, ed. Gabriella Giannachi and Nigel Stewart (Bern, Switzerland: Peter Lang, 2005), 217-234.

Sound maps are examples of how music history and sound studies can adopt multimodal methods from the digital humanities to express the aurality of music history to the academic community and the public. The text of an article can only express the spatial experience to a limited extent, even with detailed thick ethnographic description. A sound map, however, compiles and formats into a virtual image the listening practices of the public during the sound event; accompanying images provide a sense of topography and the local character of each site of audition. Sound mapping shapes how sound is encountered in the digital humanities, and by using digital sound mapping as an ethnographic method, an analytic research tool, and a teaching resource, music history can participate in the advancement of and future developments in the digital humanities.

Figure 1: 2012/2014 Harbour Symphony Sound Map (Image by Author)



Making and Telling Stories of an Environment

Ecomusicology and the digital humanities are interdisciplinary fields in constant dialogue with contemporary social issues. It might seem incongruous to use digital technology to tell stories about the environment and environmental change; however, digital media enriches how we present and disseminate our work. There is an ironic dissonance between the subject (an environmental message) and its technological mode of presentation that could potentially be exploitative. Many examples of composers addressing environmental and energy issues in their music use technology, for example, digital field recorders, SuperCollider, or Max/MSP, to collect and compose with human and nonhuman sounds. Those working in the environmental humanities need to move past a reductive approach to electronic technology as a cause of environmental harm, and instead realize that technology can be used in creative and affective

ways to communicate environmental issues and experiences. Digital resources can help us democratize our scholarship and make tremendous resources available at the touch of a button, obviating the need for extensive travel and thereby reducing the carbon footprint of our scholarship. By exploring forms of digital storytelling tools and methods both in the classroom and in recorded soundwalks, sound collages, and sound maps, new insight into narratives of environmental change can be presented to listeners directly impacted by contemporary environmental challenges.

One of the pioneering sound archive projects that influenced the proliferation of archival, creative, and scholarly sound research and soundwork in the digital humanities is the World Soundscape Project. Founded by R. Murray Schafer in the late 1960s at Simon Fraser University, the World Soundscape Project sought to record, analyze, and compile a comparative archive of field recordings of the soundscapes of Canada and Western Europe.⁴⁰ Since its inception, the interdisciplinary collective has faced the challenges associated with different recording formats and their material degradation. The sound collection has been transferred from magnetic reel-to-reel tape to Digital Audio Tape (DAT), and most recently from DAT to online digital audio MP3 files as the DAT recordings deteriorated.⁴¹ Sound scholars are seeking new ways to present the World Soundscape Project archive and make it publically accessible and relevant for public use. The researchers at the Simon Fraser University Sonic Research Studio, for example, continue to develop projects that archive the Vancouver Soundscape and document incremental changes in the sonic environment. They are applying visualization techniques, such as sound maps of the World Soundscape Project archive, to analyze and organize its content.⁴² Over the years this repository of sound files and field recording metadata has been used by soundscape composers like Hildegard Westerkamp, researchers from fields across the humanities and social sciences, and educators teaching modules on sonic citizenship, noise pollution, and the sonic environment.

Critical making with new media extends the reach of humanities scholarship, particularly “in areas of analysis, synthesis, communication, and formal

40. R. Murray Schafer, *The Tuning of the World* (Toronto: McClelland & Stewart, 1977).

41. See the website for the Sonic Arts Studio and World Soundscape Project archive at Simon Fraser University, <http://www.sfu.ca/sonic-studio/>.

42. See “mapping Audiovisual Vancouver,” a digital cartography project led by Randolph Jordan during his postdoctoral research at Simon Fraser University. Phase one of this project sought to plot the recording locations of the World Soundscape Project archive into Google Maps and interlink the relevant pages in the World Soundscape Project database (see <http://www.randolphjordan.com/schizophone/vancouver-soundscape-chronicles-mapping-the-wsp-archive/> and https://www.google.com/maps/d/viewer?ll=49.307441%2C-123.051682&spn=0.268168%2C0.517387&msa=0&iwloc=0004e22f3529ca2d57084&mid=1jldsIo6UwID-dnk_0Y8W973deqI)

dissemination.”⁴³ Critical making is a model of knowledge creation that integrates research, creation, dissemination through practices of doing and making things that are connected to, supplement, or *constitute* our scholarship. By approaching music history pedagogy and research from a digital humanities perspective, these methods can “facilitate a model of textual interaction and intervention that encourage us to see the scholarly text as a process rather than a product, and the initial, primary editor as a facilitator, rather than progenitor.”⁴⁴ As Arbuckle et al. propose, critical making “offers an opportunity to transform and recirculate research materials that figure into such [scholarly] publications, particularly in online environments.”⁴⁵ Critical making in ecomusicology takes the form of digital objects that communicate and are created from environmental information, field recordings, musical interpretations of an environment or environmental phenomena, or political messages.

The purpose of these objects, ultimately, is to tell stories. Digital storytelling is a key example of how the digital humanities can inform research and teaching in ecomusicology. Sound and radio artist John Barber defines digital storytelling as “combining storytelling, digital tools, and humanities scholarship.”⁴⁶ Ecomusicology could be enhanced by the variety of expressive possibilities afforded by digital storytelling for the transmission of research and creative soundwork across environmental humanities disciplines in the academy and the general public. Digital storytelling practices are central to digital humanities narrative strategies in the presentation of research to the public, and sound plays an important narrative role in the telling of those stories (especially those conveying environmental messages). In ecomusicology, digital storytelling uses music and found everyday sound to translate non-humanist data and information (e.g., climate change data) into graspable narratives for the public, students, and academic colleagues. Digital storytelling provides musicologists and their students with the creative and scholarly tools to depict the ways knowledge concerning the relationships among society, music, sound, and the environment are constructed and conveyed to listeners.

43. Ray Siemens, Meagan Timney, Cara Leitch, Corina Koolen, and Alex Garnett, “Toward Modeling the Social Edition: An Approach to Understanding the Electronic Scholarly Edition in the Context of New and Emerging Social Media,” *Literary and Linguistic Computing* 27, no. 4 (2012): 452. See also Lisa Gitelman, *Always Already New: Media, History, and the Data of Culture* (Cambridge: MIT Press, 2006).

44. Ray Siemens et al., “Toward Modeling the Social Edition,” 453.

45. Arbuckle et al., “Intersections Between Social Knowledge Creation and Critical Making,” 5.

46. John F. Barber, “Digital Storytelling: New Opportunities for Humanities Scholarship and Pedagogy,” *Cogent Arts & Humanities* 3, no. 1 (2016): 2.

Digital ecomusicology communicates the complicated relationships among music, nature, environment, society, and technology. In this article, I outlined a selection of the practical and political implications of combining ecomusicology, pedagogy, and research with the digital humanities, particularly in the areas of critical making and social knowledge creation. Digital humanities is a huge field with varied approaches, and this essay is intentionally a starting point in the ongoing conversation identifying emerging opportunities for music history to adopt digital humanities methods and values. Both ecomusicology and the digital humanities strive towards activism within and beyond the academy, working towards the creation and dissemination of information and developing tools that keep communities informed on important issues and experiential environments.

Digital ecomusicology projects that bring communities facing environmental change into the conversation are important resources that connect academic and non-academic audiences committed to environmental issues and socially-engaged listening. Digital storytelling, moreover, is an incredibly productive way for ecomusicology scholars to further their own research, enabling them to think about how listeners and environments are conceptualized in relation to each other and about how all might contribute to social change and democratic ways of being and listening together.⁴⁷ I will conclude with words from the research team at the Electronic Textual Cultures Lab (ETCL) based at the University of Victoria led by Ray Siemens: “Through privileging social knowledge creation/production/access/dissemination as necessary activities in higher education,” they write, “we can engage individuals from many communities and contribute, together and purposefully, to the human record at the heart of the humanities.”⁴⁸ The digital remediation and sound-based methods and projects surveyed in this essay present some of the ways that sharing research about music, sound, and the environment challenge how listeners hear the eco-conscious music and sound art in music history.

47. See for further information Kate Lacey, *Listening Publics: The Politics and Experience of Listening in the Media Age* (Cambridge: Polity Press, 2013).

48. Arbuckle et al., “Intersections Between Social Knowledge Creation and Critical Making,” 9.

Appendix A: Two Sample Creative Digital Humanities Audio Ecomusicology Assignments

Digital Humanities Activity #1: Digital Storytelling through Soundwalks and Sound Collages

The objective of this assignment is to work collaboratively in the design, development, reflection on, and theorization of a soundwalk of an everyday environment. I have appended to this assignment three soundwalk examples: 1) a through-composed soundwalk, 2) an unconventional “walk” (e.g., involving types of non-walking movement), and 3) a soundwalk sound collage

What is a Soundwalk?

Hildegard Westerkamp, a founding member of the World Soundscape Project and an early proponent of soundwalking and soundscape composition, inclusively positions a soundwalk as “any excursion whose main purpose is listening to the environment. It is exposing our ears to every sound around us no matter where we are” (2007: 49). Andra McCartney further defines soundwalking as a “creative and research practice that involves listening and sometimes recording while moving through a place at a walking pace. It is concerned with the relationship between soundwalkers and their surrounding sonic environment” (2014: 212). As Joanna Demers explains, “audio footage ties a soundscape composition to the ecological, social, historical, or cultural dynamics of a specific location, which both personalizes and politicizes the act of listening” (2010: 120).

Assignment Objective

The objective of this assignment is to learn how to listen to, reflect on, and critically articulate your experience of the sonic world.

Soundwalk Design, Methodology, and Documentation

1. Select a route: You may select a route and location that is familiar to you or one that you have little familiarity with. It is a good idea to have a general idea of the route you choose, but be prepared to adapt to new listening conditions. It is also a good idea to first walk the route, just listening with the naked ear and taking into account particular sounds and sound relationships you encounter. Follow-up that walk with your formal recorded soundwalk so that you can return to those sounds that first sparked your interest to hear if they are still present while exploring the sounds that you did not notice initially.

2. Record: Using your digital recorder, make a recording of your soundwalk. Each person's recording will differ because his/her point of audition will be different and will move and position the microphone in different ways according to movement in space and individual physiology (e.g., height).

3. Actively Listen: Listen closely and carefully both during your soundwalk and when you listen back to your soundwalk for the ways in which specific sounds shape, inform, condition, and communicate place. What function do these sounds play in the soundscape? What would be lost in the soundscape if these sounds were no longer present? As a group, reflect on how your individual listening experiences differed or were similar. How was each walk personalized?

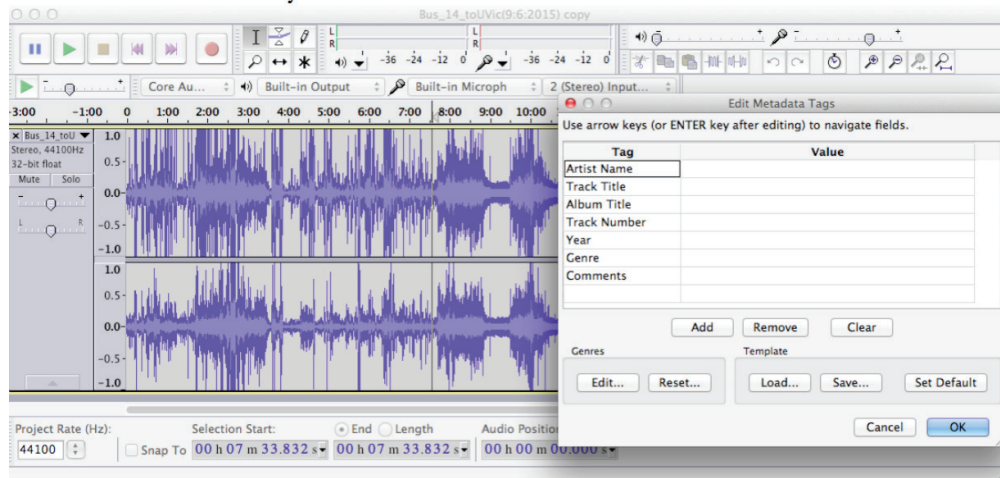
4. Create Soundwalk Images: During your soundwalk, stop to take close and distant images of the physical source of the sounds you are recording at a minimum of five moments of sonic interest during the walk. These will help map the audio of the walk when you listen back through your recording and spatially orient what you are hearing and remembering. For each interest point, take one distant and one detailed photograph.

5. Critically Reflect: Write approximately 500 words describing your experience of the soundwalk. Following this writing activity, discuss how your listening experiences differed from other members of your group and how your approach to listening might have shifted and changed since the start of this activity. It is helpful to create a listening log where you document your process of designing, composing, and listening to your soundwalk. The log should include the following:

- The location of your route. Use a Google Map or another GPS map to track your route, but take into account that it may not track you into built structures (e.g., coffee shop)
- Information about location particulars (street address/intersection, neighborhood, city, and country)
- Your reaction to the sounds, as well as the reactions of those around you (e.g., members of your group, those who pass by)
- Other comments about what you learned about listening and place.

6. Archive Metadata in Audacity:

Figure 2: Screenshot of a sample Audacity file



7. Create: Using a copy of your original soundwalk file, use segments of your favorite sounds from this file to compose a sound collage that you feel best evokes your subject/place. This sound collage should be no more than four minutes in duration. Try to compose your sound collage in such a way that the arrangement of the recordings and segments provide the listener with a sense of movement across contrasting spaces and points of audition and through your selected region of the city.

8. Upload: Upload your soundwalk and sound collage files to SoundCloud in high quality .WAV format and permit public download. Include a brief description for your potential audience.

Digital Humanities Activity #2: Digital Storytelling with Digital Radio

Assignment Objectives

The objective of this assignment is to engage in a close reading of sound composed for an online and campus/community radio broadcast to a local community of listeners. In groups of three, you will compose a radio program that is a close reading of a sound or of a location that is defined by a specific type of sound. In the sound design of your radio program, consider the following questions: What is “radio” in the age of new digital media and listening practices? How has the format of radio changed? How have our expectations of radio changed? How has digital sound recording equipment and production software

impacted how we engage and create with everyday environmental sound? How does encountering unconventional sound materials (e.g., the sounds of water or traffic) on the radio alter the listening experience?

Design, Methodology, and Documentation:

1. Select a sound: Select a sound (e.g., water feature or fountain) or a location that features a specific type of sound (e.g., a café with espresso machines)

2. Record: Using your digital recorder, make a recording of your sound from a variety of physical (close recording, distance recording), spatial (different angles), and temporal (different times of day) perspectives. Each recording will differ because the point of audition will be different and the microphone will be moved and positioned in different ways according to personal movement in space and individual physiology (e.g., your height).

3. Actively Listen: Before you start editing and compiling your recordings into an audio collage, carefully listen back through your recordings, planning which sounds might sound better when juxtaposed against other recordings and where silence could be carefully positioned to aid the close listening process. How will your audience listen to these sounds? How can you attract and maintain listeners for your broadcast soundwork?

4. Sound Editing: Using Audacity or another sound editing program with which you are comfortable and familiar, compose a sound compilation of your specific sound source using a variety of different sound perspectives (or recordings) from your field recording.

5. Critically Reflect: Write approximately 500 words describing your experience of recording your sound from multiple perspectives and closely listening to these recordings. Following this writing activity, discuss how your listening experiences differed from other members of the class and how your approach to listening might have shifted and changed since the outset of this activity. It is helpful to create a listening log where you document your process of designing, composing, and listening to your sound and the radio soundwork you composed from your field recordings. This reflection should include:

- The location and the social and sonic context of your sound.
- The location particulars (street address/intersection, neighborhood, city, etc.)
- Your reaction to the sounds as well as the reactions of those around you during field recording
- Comments about what you learned through close listening and multi-perspective field recording

As you critically analyze how you composed and listened to your soundwork, compile a visualization of the most frequently used words used to describe the sound(s) you selected for your close listening study.

6. Upload: Upload your soundwalk and sound collage files to SoundCloud in high quality .WAV format and permit public download. Include a brief description for your potential audience. We will also distribute these .WAV files to the local campus radio station, where each of you will introduce your soundwork over the airwaves from the radio studio with assistance from the station studio manager of our partnered program.