ACOUSTIC MAPPING: NOTES FROM THE INTERFACE

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> *There is something about mapping that seems almost antithetical to sound. The idea of mapping stems from our desire to know where we are going. In order to orient ourselves, we need to create grids and boundaries. But boundaries don't apply to sound. Unlike maps, sound does not rely on surfaces or depths; rather, it penetrates them.*
> Steph Ceraso[1]

The interactive sound map is a relatively recent invention, having emerged at the intersection of soundscape studies, acoustic ecology, and sound art practices in the late 1990s. New mapping technologies like Google Maps and social media websites such as Facebook, Twitter, and AudioBoo have significantly impacted how sound maps are developed and understood; so have licensing agreements including Creative Commons "ShareAlike," which permits people to freely share media including audio recordings, with the right to copy, distribute, transmit and adapt the recordings for non-commercial purposes if they are credited to the author and attributed in the manner the author or licensor specifies.[2] Such innovations helped facilitate projects such as the British Library's UK Soundmap (2010–2011), to which over 350 people submitted approximately 2,000 recordings over the period of one year, tagging field recordings onto a Google Map of the UK, and sharing uploads and commentary through their social media accounts.[3] The same technologies and licensing agreements underpin numerous other online and interactive sound mapping projects, many of which share the aim of popularizing the concept of soundscape.[4] What is more contested is the effectiveness of sound maps in transmitting information about the acoustic environment in meaningful ways, and indeed the very notion of the sound map itself. Some, like cultural theorist Steph Ceraso, regard sound maps as oxymoronic, bringing an ephemeral, three-dimensional, dynamic, and "boundless" medium (sound) into dialogue with a tool (maps/mapping) that has historically evolved in two-dimensional and static terms, and that generally aims to establish boundaries that are understood as being fixed. Others see sound maps as a means to "control" sound. One blogger writes, "reducing sound to a visual field is a bit awkward—do we really hear better while looking at a two-dimensional picture on a screen than we would if we were actually in the space being represented? Maybe not, but the general desire to control sound is very strong, and what better way to control something than to pinpoint it?"[5] In what ways do sound maps succeed, and in what ways do they fail? How do they change the ways in which people

1 A tagged electrical box on Annandale Embankment in Belfast as part of the project X Marks the Spot (2012–ongoing) by Matilde Meireles. The poster indicates the frequencies of the different tones that are being emitted by the box (48 Hz, 191 Hz, etc.). The relative lightness or darkness of the numbers corresponds to their relative amplitudes, with darker numbers corresponding to louder tones. In this case, the most prominent tone is 239 Hz. Below the list of frequencies is a QR-Code or Quick Response Code that, when read by a smartphone, will load the project's Web site, xmsbelfast.com.
Photo by Matilde Meireles

engage with the sonic environment, and in particular the urban soundscape? Are sound and mapping indeed antithetical, or can they come into dialogue in ways that critically alter our understanding of soundscape and its representation?

In *Favourite Sounds*, a project started in London by artist and musician Peter Cusack in 1998, which currently covers over a dozen cities, contributors are invited to respond to the question "What is your favourite [Name of City] sound and why?"[6] Cusack started the project in order to initiate conversations about urban sounds, "to try to get people talking about the way they hear everyday sounds and how they react to them, or what they think they feel about them, and how important (or not important) they are."[7] Initiating dialogue about soundscapes and bringing new voices into this dialogue are at the heart of many sound mapping projects. Max Stein and Julian Stein, the creators of the Google Maps-powered Montréal Sound Map, claim that their project:

> *offers an interface for users to explore and listen to the city with a purposeful and special attention that is rarely given to the sounds of the environment. We aim for people to continue this attentive listening and experience the complexity and lure of the soundscape first-hand. This promotes a more optimistic approach to acoustic ecology, encouraging listeners to lend a musical ear to the soundscape.*[8]

Developing a positive approach towards acoustic ecology is an important idea, which diverges from many historical soundscape projects that document noise pollution and other undesirable aspects of the acoustic environment—exemplified by the early work of R. Murray Schafer and the World Soundscape Project.[9] The idea of "lending a musical ear to the soundscape" is also compelling, as it invites contributors and users of the sound map alike to experience the urban soundscape in aesthetic terms. On the website, uploaded field recordings can be played back in a random order, forming a kind of indeterminate soundscape composition that listeners can stream at any time. On occasion, the "musicalization" of the sound map is literalized. For the event *ABC:MTL* (2013), at the Canadian Centre for Architecture in Montréal, two local sound artists—Lisa Gamble (aka Gambletron) and Jen Reimer—streamed recordings from the Montréal Sound Map as part of their project *Silent Montréal*.[10] The map was projected onto a wall, and listeners were given cordless headsets; they could choose which part of the map they wanted to hear, and the associated field recording was played along with recordings of music curated by Gamble and Reimer. According to Max Stein, on this occasion the musical qualities of the soundscape recordings were brought to the foreground in much the same way as they are on the Stockholm Soundmap, where field recordings tagged to a Google Map of Stockholm are played together with music by a collective of local composers.[11] In curating music for *ABC:MTL*, Reimer says that she and Gamble:

> *wanted to find music that was sensitive and could combine aesthetically with the field recordings. Most of the music chosen had an ambient atmospheric quality and rhythms were sparse in order to not interfere with the field recordings. Sometimes the music would be so subtle in combination with the field recordings that it was difficult to know which was which.*[12]

Reimer's statement shows both the influence that soundscape composition has exerted on musical practices (especially in music that is typically described as "minimalist" or "ambient"), as well as the changing perspective of listeners, who might hear soundscapes as music more readily today than they did in the early- to mid-twentieth century, when composers working in experimental music traditions first put pressure on blurring the boundaries between "musical" and "real-world" sounds.[13]

In addition to promoting new dialogues and creative listening experiences of soundscapes, another way in which sound maps most obviously succeed is in facilitating collective ideas about soundscapes. Many sound mapping projects are collectively created, facilitated by network technologies and share-alike licensing agreements, or by inviting public participation and contribution in other ways. For the celebrated sound recordist Chris Watson's installation *Inside the Circle of Fire: A Sheffield Sound Map* (2013), the Millennium Gallery in Sheffield invited Watson to create a sound map of Sheffield, his hometown. Over a period of eighteen months, Watson collected sounds of the city, "charting its boundaries on the edge of the Peak [River] and travelling its waterways to the bustling heart of the city:"[14]

> *Sheffield is a city built on rivers … water is the reason the city's there. It's driven the industry and it's nourished the population, both culturally and in terms of the water supply. So I chose waterways as a way to navigate my way through the city, and then stop off in various places that I thought had particular and signature soundmark—both the built environment and the natural geography of the place.*[15]

Thus, *Inside the Circle of Fire* illustrated a specific geographical and cultural history of the city through its particular sonic mappings, and, through its multichannel installation in the Millennium Gallery made this history both sensorial and immersive.[16] In developing the project, Watson invited the public to contribute recordings of Sheffield. He incorporated all public submissions into the gallery installation, and undertook soundwalks with interested participants, during which time he also made recordings:

> *the whole aim … was to make a piece which makes people think about the sounds of their city.… Listening to something is quite a creative act. It's not passive. And actively listening, you can decide what you like, and what you don't like, and then you're in a position to start thinking about how you might change the sounds or acoustics of what you don't like.*[17]

Thus, Watson not only sought to create an installation that immerses listeners in a sound map of their city, but also to empower people to engage with their acoustic environments in a critical way. Such projects diverge in important ways from historical forms of soundscape composition, which typically put forth a single artist or composer's view of a soundscape, and are often experienced or consumed in a passive way (similar to a concert), without necessarily bringing audiences/participants into a critical dialogue or active engagement with their sonic environments.[18] It is notable that, in the first month of its opening, the installation had over 23,000 visitors, many of whom have reported emotive and powerful listening experiences.[19] The Belfast-based sound artist Matilde Meireles's *X Marks The Spot* (2012–ongoing) is another recent sound mapping artwork that evolves through listener participation (figure 1). For this project, Meireles tagged street-level telecommunication boxes throughout the city of Belfast with posters that showed the frequencies and relative amplitudes of electrical hums that the boxes were emitting. The posters contained QR codes (Quick Response codes) that, when unscrambled by a smartphone, launch the project's Web site.[20] There, visitors can suggest further electrical boxes for tagging, listen to compositions created from recordings of tagged boxes, and find maps of tagged boxes that they can search for while undertaking a "sound hunt":

> *The tagging process aims to engage people with the space around them. To understand how sound shapes our experience of the city. For obvious reasons I started mapping places closer to me. Places I pass by daily and therefore have a closer relationship with or remember vividly. By inviting other people to participate in the process, this activity is designed to spread throughout Belfast, creating a stronger connection with the city.*[21]

Again, the participative, collaborative and open-ended nature of the project distinguishes it from historical forms of fixed, single-authored soundscape composition (as exemplified by electro-acoustic soundscape compositions heard in concert settings). The social dimension of sound mapping—whether through online interactions, or through in-person interactions with artists, designers, or other contributors in the context of listening walks, collective recording sessions, participative artworks, and so on—provides a basis for integrating sound mapping into various kinds of shared experiences of city life.

Another area in which sound maps succeed is in developing rich and easily accessible archives of sound environments. Between 2010 and 2013, the sound historian Emily Thompson, working in collaboration with designer Scott Mahoy, developed *The Roaring 'Twenties,* a media-rich rendering of New York City's soundscape in the late 1920s and early 1930s that focuses on the city's then emerging problem of noise pollution.[22] Published as an interactive website by the multimedia journal *Vectors, The Roaring 'Twenties* collects approximately 1,000 documents related to noise: 600 unique noise complaints culled from the Municipal Archives of the City of New York; 50 clippings of news reels loaned by the Fox Movietone News Collection; and 350 newspaper and magazine clippings. These documents—each meticulously captioned, catalogued, and organized—can be navigated temporally, via a timeline interface that organizes documents by year and month, and spatially, via a high-resolution, digitized map of New York City from 1933, which appears over a contemporary, zoomable Google Map of the city. Thompson introduces the project by writing, "The aim here is not just to present sonic content, but to evoke the original contexts of those sounds, to help us better understand that context as well as the sounds themselves."[23] Among other things, the project enables audiences to discover how concerns about urban noise have changed over time, what kinds of noises were historically considered undesirable (and why), and what the urban soundscape actually sounded like nearly a century ago. Assembled as they are on the web site, the documents further reveal how dialogues about sound and noise have been critical to negotiations of private and public space in the city, and the extent to which these dialogues inform and imbue individual and collective experiences of city life. In the case of *The Roaring 'Twenties,* network technologies facilitate the storage and distribution of a vast quantity of information and media relating to an historical soundscape. Notably, Thompson does not provide any interpretation to the documents she collects in the project. Rather, she acts strictly as archivist, collector, and cataloguer, presenting data that only becomes meaningful through the visitor's engagement with it.[24]

Contemporary sound maps can also function effectively as archives. The creators of the Montréal Sound Map, for example, write that their project "allows users to upload field recordings to a Google Map of Montréal. The soundscape is constantly changing, and this project acts as a sonic time capsule with the goal of preserving sounds before they disappear."[25] Visitors to the Montréal Sound Map can click on individual audio icons to listen to sound files; or, they can choose "Autoplay" or "Shuffle" functions which, respectively, play back all the sound files in alphabetical order (by name of location), or at random. Individual sound files can also be downloaded. A "Sound Browser" allows visitors to search or sort sounds by location (boroughs, neighbourhoods, municipalities, suburbs); date (year, time of day, month, seasons, day of the week); tags (human, mechanical, natural, societal, music, noise); or by the name of the contributor. When selected, an audio file is accompanied by notes on the equipment used in making the recording (e.g., "Olympus LS-10 & OKM Binaurals"), as well as a description of the sounds (e.g., "Standing underneath the Charlevoix Bridge, there is an interesting mixture of traffic above, passing bikes/inline skates/runners, and birds").[26] Contributors also have the option of uploading a photo of the location where the recording was made. These features have become standard elements of online, interactive sound maps, and can be found on the Belfast Sound Map, the Inukjuak Sound Map, the Toronto Sound Map, among others. Most recently, the software programmer Julian Vogels has been developing an iPhone app for the Montréal Sound Map that will allow contributors to make recordings on their iPhones and automatically tag them to the web

site. These new technologies will extend the sound map's reach into everyday spaces, and make the sound map increasingly accessible and ubiquitous, as part of everyday experiences of the city. This will potentially alter not only the demographics of the sound map's users/contributors but also the map's content, as mundane and "personal" activities may become increasingly highlighted through frequent and ubiquitous use.

Some sound mapping projects, like Ian Rawes's *London Sound Survey*, archive historical as well as contemporary sound environments, and offer new ways of representing soundscapes. Rawes describes the project, which he started in 2008, as "a collection of Creative Commons-licensed sound recordings of places, events and wildlife [in London]. Historical references are also gathered to find out how London's sounds have changed.'[27] Rawes acts as sound recordist, archivist, mapper, and designer for the project. He records London soundscapes (several hundred of his recordings can be heard on the website), collects soundscape recordings by others that are licensed under the Creative Commons agreement, gathers documents relating to historical sounds of London, and invents ways of visualizing and organizing this data. Historical features range from a database of radio location recordings from the mid-twentieth century, to written descriptions of sounds of London that date as far back as the tenth century. Rawes has also created sound maps of London for the website: a Day Sound Map and Night Sound Map, a Waterways Map, and an Estuary Map—all of which collect soundscape recordings tagged onto historical and contemporary maps of London—and a Grid Map that depicts these soundscapes using only graphical icons.[28] As a visual map of sounds, the Grid Map is particularly effective in transmitting a large amount of sonic information in a way that can be quickly digested. It is immediately apparent, for example, that there is a predominance of sounds of road traffic, aircraft, fixed machinery, and tools and plants across the city, while the sounds of people and birdsong are relatively less prominent, and are generally clustered in specific regions. About 5 per cent of the map is marked "inaccessible," forming a kind of sonic no-man's land on the outermost edges of East London. A blog post by Rawes discusses the legal limits that field recordists might encounter, shedding light on these inaccessible zones:

> *Those of us recording the sounds of urban environments in particular might run into problems similar to those besetting photographers, with overzealous officials and others claiming that recording in such-and-such place is illegal, that it infringes someone's human rights, and so on.*
>
> *There's also the growing habit of bringing words like "terrorism" and "security" into play as an attempt at shut-up-and-do-as-you're-told, but as we'll see there are few situations in which such claims have any legal, let alone rational, substance.*[29]

We learn that there are few places in the UK where making an audio recording is specifically prohibited: courts, prisons, nuclear power plants, military bases, and electronics communications providers. It is also, unsurprisingly, illegal to use audio recordings for the purpose of espionage, and against the objections of private property owners.[30] What is more problematic is the blurring of private and public space. According to Rawes, "More and more of what appear to be public spaces are, in fact, privately owned. Shopping centres, many newly-built squares and plazas, and that slender corridor of possession between the side of a building and the row of brass studs set into the pavement are all private property."[31] There are also laws that apply to making recordings of copyrighted material and private conversations. Rawes indicates that he never focuses on private conversations and ensures that specific people cannot be identified in his recordings. These issues shed light on some of the particular challenges sonic cartographers face in documenting the sonic environment, as well as the content of urban sound maps, which typically focus on outdoor locations and spaces that are understood to be public spaces, and which rarely focus on social interactions like conversations or private social occasions.

Although sound maps can serve multiple functions and can do so effectively, they have been criticized for failing to put forth cohesive ideas of soundscape, and for not providing enough context to enable meaningful interpretation. Barry Truax, an influential soundscape composer and researcher, and a founding member of the World Soundscape Project, has said that he finds the sound map "useful to orient people who are unfamiliar with the soundscape concept to the idea that soundscape recordings are markers of place. However, lacking any coherent temporal perspective, and usually lacking any interpretative analysis, the listener is left trying to imagine what has been recorded and what significance it has."[32] Truax's criticism can be especially applied to sound maps whose temporal or geographical reach is so broad or disconnected that any meaningful engagement beyond "listening to field recordings tagged on a map" is effectively extinguished for some audiences. The soundscape composer and theorist Jacqueline Waldock has also questioned whether sound maps are able to effectively realize their aims, and reminds us of the hierarchies, fractures, and divisions that can arise even when projects are well intentioned. For Waldock, some projects have unrealistic goals. She describes the aims of Sound Seeker, an online sound map of New York City that claims to "[reach] across geographical, economical, educational, cultural and racial divides," for example, as "extravagant."[33] Waldock also points out issues of unequal access, asking, "will [sound] maps exclude the sounding worlds of those who cannot afford smart phones? And: have the makers taken into account the recording culture and norms that are produced and reiterated by these maps?"[34] In terms of the latter question, Waldock is especially concerned that sound maps reproduce dominant divisions of "gender, domestic and public, private and collective, poor and well-resourced."[35] On a more basic level, the merging of sound with mapping has also been problematized. Ceraso describes the ephemerality of sound as a feature that puts it into contradiction with conventional ideas of mapping, and argues that the dynamism of the sonic environment is not effectively translated via static recordings of place.[36] For listeners like Ceraso, sound maps fail to capture the "em-

bodied experience of encountering sound in its original environment."[37] Such criticisms will be important for sonic cartographers to consider as the genre matures. At the same time, it should be acknowledged that urban sound maps can and already do reflect a variety of interests and concerns, from archival, historical, and cultural studies of cities to socially-oriented and networked mapping projects, to creative works that bring sound mapping into dialogue with artistic traditions. They also have realizable aims like inspiring attentive listening in others and generating critical dialogues about soundscapes. While still an emerging genre, sound maps have already offered new ways of conceptualizing and representing the urban soundscape—especially in the context of collectively created, interactive, and participatory works. These features position sound maps to be deployed in domains like urban design, city planning, and architecture in new ways that might positively impact urban communities. Udo Noll, the founder of radio aporee, one of the most extensive online sound mapping projects, has written that:

> *the whole aporee soundmap thing began as a reaction to the lack and loss of sense of place, the personal experience of decreasing sensitivity for things "in between," the absence of resonance in my relationship to the surrounding world.… i understand that some feel uncomfortable with the amount of contributions, in all their different qualities, the flattening perspective of the map maybe, and insist on distinction, for whatever reason. zoom in, go to the details, listen to the individual sounds, that may change your perspective.*[38]

By inviting people to experience, document, and share ideas about soundscapes in ways that were previously unimagined, sound maps have fundamentally altered perspectives on sound as it evolves in relation to space and place, our connection to sound in its environmental and spatial forms, and the many "resonances"—social, cultural, historical, and aesthetic—of these relationships.

Endnotes

1 Steph Ceraso, "The Site of Sound: Mapping Audio," Blog post at Humanities, Arts, Science and Technology Alliance and Collaboratory (HASTAC), 5 October 2010. http://www.hastac.org/blogs/stephceraso/sight-sound-mapping-audio (accessed 25 December 2013).

2 See Creative Commons "Attribution-NonCommercial-ShareAlike 3.0 Unported," http://creativecommons.org/licenses/by-nc-sa/3.0/ (accessed 7 January 2014).

3 See UK Soundmap, http://sounds.bl.uk/Sound-Maps/UK-Soundmap (accessed 28 November 2013).

4 Not all sound map designers are keen to build their projects using "brand name" technologies with corporate interests in their users—like Facebook, Twitter, or Google Maps—but do so out of necessity. Udo Noll, the founder of the global sound mapping project radio aporee, writes, "i don't like [Google Maps] but there's no alternative so far on that scale and detail." See Udo Noll, "sound, place and global reach," Blog post on radio aporee, 2 December 2012. http://radio-aporee.blogspot.co.uk/2012/12/sound-place-and-global-reach.html (accessed 8 January 2012).

5 Anonymous, "Atlas Sound: A Typology of Sound Maps," Blog post on Weird Vibrations, 10 January 2012. http://www.weirdvibrations.com/2010/01/10/atlas-sound-a-typology-of-sound-maps/ (accessed 8 January 2014).

6 See Peter Cusack, Favourite Sounds, http://favouritesounds.org/ (accessed 25 December 2013).

7 Zuzana Friday Prikrylova, "'You learn a lot about the city by asking about its sound': Peter Cusack Interview, Sounds," *Create Digital Music*, 21 May 2013. http://createdigitalmusic.com/2013/05/you-learn-a-lot-about-the-city-by-asking-about-its-sound-peter-cusack-interview/ (accessed 28 November 2013).

8 See Max Stein and Julian Stein, Montréal Sound Map, http://www.montrealsoundmap.com/. Last accessed 25 December 2013.

9 The World Soundscape Project itself emerged out of Schafer's course on noise pollution at Simon Fraser University in the late 1960s and early 1970s, "as well as from [Schafer's] personal distaste for the more raucous aspects of Vancouver's rapidly changing soundscape." See Barry Truax, "The World Soundscape Project," http://www.sfu.ca/~truax/wsp.html. (accessed 7 January 2013).

10 "2013 Nuit blanche à Montréal at the CCA." Announcement on Canadian Centre for Architecture (CCA) Web site, 2 March 2013. http://www.cca.qc.ca/en/education-events/1952-2013-nuit-blanche-a-montreal-at-the-cca. The description of Silent Montréal reads: "The silent disco in the Rotunda melds the sounds of the city with electronic music. Cordless headsets will be distributed to participants."

11 Gascia Ouzounian, Unpublished email correspondence with Max Stein, 18 November 2013. The Stockholm Soundmap—Soundtrack is online at http://oljudsthlm.se/soundmap/soundtrack.php. (accessed 28 November 2013).

12 Gascia Ouzounian, Unpublished email correspondence with Jen Reimer, 8 January 2014.

13 For a discussion of twentieth-century experimental music traditions that draw upon "real-world" sounds, see Michael Nyman, *Experimental Music: Cage and Beyond* (Cambridge: Cambridge University Press, 1999 [1974]). Nyman's discussion touches on influences as varied as the burgeoning industrial soundscape in the case of the Futurist composers' use of *intonarumori*, noise-making instruments; the French composer Erik Satie's idea of *musique d'ameublement*, an early precedent for "ambient" music as popularized by Brian Eno; the early American experimentalist Charles Ives' Postface to *112 Songs*, which describes "someone sitting on a porch … looking out over the landscape, sitting there doing nothing and 'hearing his own symphony'" (Nyman, *Experimental Music* p. 41); the work of musique concrète pioneers Pierre Schaeffer and Pierre Henry; and, crucially, John Cage's invitation for listeners to hear any and all incidental sounds as music, widely considered the premise of his "silent" composition *4'33"* (1952).

14 Gascia Ouzounian, unpublished interview with Chris Watson, Belfast, 25 October 2013.

15 Ibid.

16 Most of the recordings in *Inside the Circle of Fire* were made by Watson using a SoundField microphone, which records sound in three dimensions. Inside the gallery, the sounds were projected over a system of twenty loudspeakers: "twelve loudspeakers in the horizontal, four beneath the floor level, and four in the ceiling. The idea is that you create a sphere, effectively, and the listener is towards the centre of the sphere" (Ibid.). Watson tells me that the SoundField ambisonic recording system is especially well suited to sound mapping, it allows people to "hear the space" (Ibid.).

17 Ibid.

18 This discussion does not intend to diminish the value of single-authored, fixed soundscape compositions (or works intended for concert listening), but rather seeks to highlight the participative and collaborative basis of many sound mapping projects, including those that evolve as artworks. In terms of historical precedents, the "soundwalk"—exemplified by the early listening walks of American sound artist Max Neuhaus in his project *LISTEN* (late 1960s) and the soundwalks of the World Soundscape Project (WSP)—is perhaps equally important to sound mapping as soundscape composition. Hildegard Westerkamp, a central figure in the WSP, has written that, "[soundwalking] can be done alone or with a friend.… It can also be done in small groups, in which case it is always interesting to explore the interplay between group listening and individual listening." See Hildegard Westerkamp, "Soundwalking," 1974 (revised 2001) http://www.sfu.ca/~westerka/writings%20page/articles%20pages/soundwalking.html. See also Max Neuhaus, *LISTEN*, 2004. http://www.max-neuhaus.info/soundworks/vectors/walks/LISTEN/LISTEN.pdf. Last accessed 8 January 2014. A more contemporary project that illuminates the social aspects of soundwalking is Andra McCartney's Soundwalking Interactions, http://soundwalkinginteractions.wordpress.com/. (accessed 8 January 2014).

19 Gascia Ouzounian, Unpublished interview with Chris Watson, 2013.

20 See Matilde Meireles, *X Marks the Spot*, 2013. http://matildemeireles.com/portfolio/x-marks-the-spot. (accessed 7 January 2014).

21 Ibid.

22 Emily Thompson and Scott Mahoy, "The Roaring' Twenties: An Interactive Exploration of the Historical Soundscape of New York City," in *Vectors* 4/1 (Fall 2013). Online at http://vectorsdev.usc.edu/NYCsound/777b.html. Last accessed 28 November 2013.

23 Emily Thompson, "Author's Statement on *The Roaring 'Twenties*," in *Vectors* 4/1 (Fall 2013). Online at http://vectors.usc.edu/projects/index.php?project=98&thread=AuthorsStatement. (accessed 28 November 2013).

24 Some sound map designers let the audio data they collect "speak for itself," while others, including those for UK Soundmap, Favourite Sounds, Montréal Sound Map, and Belfast Sound Map, include scope for commentary and descriptions. The Belfast Sound Map (www.belfastsoundmap.org) further permits contributors to submit texts that describe "a sound experience"—i.e., verbal commentary without audio files. At times, commentary on sound maps has a personal or critical scope, touching on personal experiences, local politics, ecology, and other issues that are highlighted through "listening to place"; in other cases, commentary consists of matter-of-fact descriptions of what has been heard or experienced. For the project Sounds Around You (http://www.soundaroundyou.com/), contributors are asked to rate the quality of soundscape recordings they upload (on a scale "bad–good", as well as other features of their uploads ("unpleasant–pleasant," "uneventful-eventful," "chaotic-tranquil"); they are also asked to describe "positive" and "negative" sounds that feature in their recordings. Such features enhance the subjective and personal aspects of sound maps, and provide arguably important context for sounds that might otherwise hold little meaning for listeners; at the same time, listeners might want to hear a recording that is "unadulterated" by commentary, in order to experience it on their own terms, without reference to the recordist's intentions or reflections.

25 See Max Stein and Julian Stein, Montréal Sound Map, http://www.montrealsoundmap.com/. (accessed 25 December 2013).

26 A 7:09 recording contributed by Max Stein, "Charlevoix Bridge (under)," posted May 04 2009 on Montréal Sound Map.

27 See Ian Rawes, London Sound Survey, http://www.soundsurvey.org.uk/. (accessed 28 November 2013).

28 Ian Rawes, "Grid Map," London Sound Survey, http://www.soundsurvey.org.uk/index.php/survey/grid/. Last accessed 25 December 2013.

29 Ian Rawes, "Sound and the Law: What are the limits on recording?" Blog post on London Sound Survey, 13 October 2013. http://www.soundsurvey.org.uk/index.php/survey/post/sound_and_the_law/. (accessed 25 December 2013).

30 As Rawes describes in "Sound and the Law," these laws include: Section 1 of the Official Secrets Act of 1911, which prohibits the use of audio recordings for the purpose of espionage; Section 34C of the Prison Act of 1952, which prohibits audio recordings and transmissions from inside prisons; Section 9 of the Contempt of Court Act 1981, which makes it illegal to record audio in court without permission; the Official Secrets (Prohibited Places) Order of 1994, which prohibits audio recordings from a number of nuclear installations and military bases; and Schedule 17 of the Communications Act 2003, which adds electronic communications stations and offices to the list of prohibited places. Article 8 of the Human Rights Act (1998) protects the privacy of individual homes and personal correspondences, and the CCTV Code of Conduct (revised 2008, by the Information Commissioner's Office) declares that "CCTV must not be used to record conversations between members of the public" (Ibid.).

31 Ibid.

32 Barry Truax, "Sound, Listening and Place: The Aesthetic Dilemma," *Organised Sound* 17/3 (2012): 1–9. Accessible online at http://www.sfu.ca/~truax/OS8.html. (accessed 28 November 2013).

33 Jacqueline Waldock, "Soundmapping: Critiques and Reflections on this New Publicly Engaging Medium," *Journal of Sonic Studies* 1/1 (October 2011). Online at http://journal.sonicstudies.org/vol01/nr01/a08. (accessed 28 November 2013). See also Soundseeker, http://www.soundseeker.org/. (accessed 7 January 2013).

34 See Waldock, "Soundmapping."

35 Ibid.

36 See Ceraso, "The Site of Sound."

37 Ibid.

38 Udo Noll, "sound, place, and global reach."