<u>Sonic Methods</u>, Jonathan Prior

Introduction

Research into sound – including both musical and non-musical sound – amounts to a varied body of work that straddles numerous disciplines, including history, philosophy, anthropology, sociology, musicology, and ecology. Scholarship focused on sound has also led to the formation of discrete sub-disciplines, most notably sound studies, bioacoustics, and acoustic ecology. Much of this wealth of material considers the spatial properties of sounds and their reception (both by humans and non-humans), yet geographers have been relatively slow to consider sound in a systematic manner, and explicitly geographical studies of sound remain few and far between, even if this has picked up since the 2000s, especially by cultural geographers (See the separate *Oxford Bibliographies* in Geography article *Geographies of Music, Sound, and Auditory Culture[obo-9780199874002-0130]*.). Much of the geographical scholarship on sound and music, which, broadly constituted, has been referred to as audio geography or sonic geography, has tended to rely upon already existing methods of data collection, analysis, and (re)presentation, including interviews, close textual readings, and written forms of dissemination. Of course, such methods remain invaluable, and have their own particular sonorities, yet they also raise important questions that sound researchers are only just starting to grapple with. Principally, it has been questioned whether existing research methods need to be extended, complemented, or new ones initiated, so as to account for the diverse ways in which sounds produce spaces, and how spaces affect sounds and their reception at different scales, as well as helping to generate entirely new forms of data. This has been met by a range of responses that generally do not reject existing ways of undertaking research, but instead seek to complement them.

General Overviews

While there is currently no single text that provides a comprehensive overview of sonic methods pertinent to geographical research, much can be gleaned from across a number of texts. Given its role in developing an array of methodological approaches and coining a considerable amount of relevant terminology, Schafer 1994 is a foundational text within sound studies that has a lot to offer sonic geographical enquiry. Gallagher and Prior 2014 provide an introduction to some of the most prominent sonic methods and outline how these could be expanded, while Wood et al 2007 discuss how researchers could better account for in-the-moment musical performances. Bull and Back 2016 is an edited collection that brings to life a variety of sonic methods through worked examples, and Makagon and Neumann 2009 is essential methods reading for ethnographers (and others) that want to delve into the world of audio documentaries.

Bull, M., and L. Back, eds. *The Auditory Culture Reader, 2nd edition*. London: Bloomsbury, 2016.

An edited volume of short chapters that cover a wide range of topics, from urban regeneration to music sub-cultures, predominantly from a sociological perspective. Many of the chapters explicitly focus on research methods, including ruminations on tape recorders, soundwalks, and ways to approach listening to historical materials.

Gallagher, M., and J. Prior. "Sonic Geographies: Exploring Phonographic Methods." *Progress in Human Geography* 38.2 (2014): 267–284.
Provides an overview of existing methods relevant to sonic geographical research and makes a case for their further development, before moving to consider a range of epistemological and ethical questions that such methods raise.

Makagon, D., and M. Neumann. *Recording Culture: Audio Documentary and the Ethnographic Experience*. London: SAGE, 2009.
A short but very informative text on the production of audio documentaries as a tool for ethnographic research, and how these may allow ethnographers to move beyond written text and potentially find new audiences outside of the academy. Provides a useful historical overview of ethnographic audio recording, as well as different approaches to the composition of audio documentaries and practical tips for getting started.

Schafer, R.M. *Our Sonic Environment and the Soundscape: The Tuning of the World*. Rochester, VA: Destiny Books, 1994.
Originally published in the late 1970s, this text remains as one of the most important texts on sonic research across a variety disciplines, and is still widely cited. Amongst other contributions, it provides a variety of different approaches to the spatial study of sound, from sound and listening walks, to methods of classification, notation, and sound mapping.

Wood N., M. Duffy, and S.J. Smith. "The Art of Doing (Geographies of) Music." *Environment and Planning D: Society and Space* 25 (2007): 867-889.
Considers the challenges of researching music making and musical experience through existing social research methodologies, before discussing ways to expand these, with an emphasis on non-representational and performance-based research practices.

Sound and Listening
Listening as a method is a fundamental component of a variety of approaches to the study of sound, including sonic geography. There is general consensus that 'listening' is a consciously active form of attention to sound, whereas 'hearing' is a passive form of sonic reception. As a consequence, listening is posited as a skill that can be developed and refined through a variety of listening activities, such as the series of 'ear cleaning' exercises developed by Schafer 1969, or listening walks – a method of listening while walking – that attempt to sensitise people to in-the-moment sonic experiences, as described by Gallagher and Prior 2017. Relatedly, Adams 2009, Iscen 2014, and Southworth 1969, use methods of listening while walking to access peoples' perceptions of urban soundscapes. We can also distinguish between different types of listening, and Chion 1994 provides a useful structure to do so, while the edited text by Carlyle and Lane 2013 offers a range of approaches to listening as a method of analysis, and Lorimer and Wylie 2010 demonstrate a way of narrating listening experiences.

Adams, M. "Hearing the City: Reflections on Soundwalking." *Qualitative Researcher* 10 (2009): 6-9.

Provides a very useful account of soundwalking as a research method for investigating people's perceptions and values of urban soundscapes. The paper offers procedural details of the method, as well as the types of uses that resulting data can be put towards.

Carlyle, A., and C. Lane, eds. *On Listening*. Axminster: Uniformbooks, 2013.
A collection of essays edited by two prominent sound theorists based at the University of the Arts, London. The book covers a very diverse set of approaches to listening by sound artists, composers, and academics, with much to offer those seeking an understanding of listening as a method in a variety of cultural, political, and environmental contexts.

Chion, M. "The Three Listening Modes." In *Audio-Vision: Sound on Screen*, 25-34. New York: Columbia University Press, 1994.
A short book chapter that explores three types or 'modes' of listening. The three modes specified by Chion are perhaps only a starting point for a thorough engagement with different types of listening, but the chapter nonetheless provides a valuable framework for the conceptualisation and analysis of what constitutes human listening.

Gallagher, M., and J. Prior. "Listening Walks: A Method of Multiplicity." In *Walking Through Social Research*. Edited by C. Bates, and A. Rhys-Taylor, 162-177. London: Routledge, 2017.
Provides an introduction to listening walks, which is a mode of walking that focuses on listening to the acoustic environment. An example of a group listening walk in Edinburgh is narrated as a means to demonstrate the wide applicability of listening walks as a method, and a procedure for conducting a listening walk is outlined.

Iscen, O.E. "In-Between Soundscapes of Vancouver: The Newcomer's Acoustic Experience of a City with a Sensory Repertoire of another Place." *Organised Sound* 19.2 (2014): 125-135.
Offers reflections on the use of different methods to help access and represent the sonic experience of being a newcomer to a city (in this case, Vancouver, Canada), including participant-led listening walks and follow-up discussion sessions. The results reported demonstrates the power of in situ listening methods for ethnographic research.

Lorimer, H., and J. Wylie. "LOOP (A Geography)." *Performance Research* 15.4 (2010): 6-13.
Narrates the two authors' experiences of undertaking a walk to an academic conference in Aberystwyth, Wales, who converse with each via SMS text messaging as they mostly walk separate from each other. The narration recounts moments of both walks, predominantly the sonic qualities of the landscapes traversed. What is important from a methods perspective is the way in which sonic encounters are vividly transcribed through the narration.

Schafer, R.M. *Ear Cleaning: Notes For an Experimental Music Course*. Toronto: Clark & Cruickshank, 1969.
A short publication comprised of different listening exercises that explore a range of sonic qualities. While written with music students in mind, the exercises are widely applicable as useful pedagogic tools for listening.

Southworth, M. "The Sonic Environment of Cities." *Environment and Behavior* 1.1 (1969): 49-70.
Reports data from a project that seeks to influence the perceived quality of city soundscapes through urban design. The project uses different listening experiments, including participants being blindfolded

and led through central Boston, Massachusetts. Results of the listening experiments are well presented through a series of photographs, text, diagrams, and a sound map.

Historical Sonic Methods

Analyses of various kinds of historical materials, including texts and images, have been undertaken from a sonic perspective, often with the aim of trying to gain an understanding of how historical environments may have sounded, and the likely resulting social effects. Smith 2004 undertakes this task in respect to the soundscapes of early modern England through examining visual evidence, while Mills 2014 turns to the land itself to discover likely prehistoric and historic sounds in different regions of the world. Matless 2005 examines a range of written documents from the nineteenth and twentieth centuries that point to a lively politics of sound linked to the construction of a regional identity in east England. Meanwhile, O'Connor 2011 contemplates ways in which acoustic values could be included within heritage assessment procedures in Australia. Other researchers have turned to archived audio recordings for the basis of their analyses; Hill 2015 considers the affective capacity of audio recordings and their relation to the contemporary landscape, while Mills 2017 carefully listens to recordings of interviews with school children in the 1960s to explore the sonic qualities of voices.

Hill, L.J. "More-Than-Representational Geographies of the Past and the Affectivity of Sound: Revisiting the Lynmouth Flood Event of 1952." *Social & Cultural Geography* 16.7 (2015): 821-843.
A reflection on a flood event that occurred in Lynmouth, England, in the 1950s, through a listening to (and reading of) archival documents, including audio recordings of interviews with flood survivors held by local government, and the contemporary watery landscape of the coastal village.

Matless, D. "Sonic Geography in a Nature Region." *Social & Cultural Geography* 6.5 (2005): 745-766.
Through a close reading of a range of archival materials, including private journals, press reports, and government documents, the article considers the judgements about, and management practices within, the soundscape of a wetlands region in east England since the late nineteenth century. Particular focus is given to efforts to promote quietude across the region.

Mills, S. *Auditory Archaeology: Understanding Sound and Hearing in the Past*. Walnut Creek, CA: Left Coast Press, Inc., 2014.
A very detailed examination of auditory archaeology, which attempts to understand how prehistoric and historic landscapes, including built human features, may have sounded, and how these would have been experienced and interpreted sonically by people in the past, using a range of case examples from around the world. Across the book the author outlines a methodology, and specific methods, to recreate, characterise, and analyse these sound worlds.

Mills, S. "Voice: Sonic Geographies of Childhood." *Children's Geographies* (2017)
http://dx.doi.org/10.1080/14733285.2017.1287879
Using archival audio recordings of interviews with children undertaken across a number of London schools in the 1960s, this paper explores the sonic qualities of the voices of the interviewed children, as well as the spaces in which the interviews take place. Useful methodological considerations of sonic archival research are provided, including ethical issues concerning access and representation.

O'Connor, P. "Turning a Deaf Ear: Acoustic Value in the Assessment of Heritage Landscapes." *Landscape Research* 36.3 (2011): 269-290.
This paper considers the potential role of acoustic values in making assessments about the cultural heritage of landscapes in Australia. After critically assessing the prevailing focus of heritage work on

visual qualities, the author proposes a workable method for assessing acoustic values within current assessment procedures, using two case examples to do so.

Smith, B.R. "Listening to the Wild Blue Yonder: The Challenges of Acoustic Ecology." In *Hearing Cultures: Essays on Sound, Listening and Modernity*. Edited by V. Erlmann, 21-41. Oxford, UK: Berg, 2004.
A fascinating summary of different approaches that can enable researchers to recompose historical sounds (and their reception), with a particular focus on early modern English plays, fiction, and ballads. These approaches include how to listen to visual evidence such as woodcuts, and how to reconstruct the sounds of early seventeenth century estates.

Audio and Field Recording Methods
Critical reflections on the ability of written texts to adequately capture, represent, or perform the complexity of sound worlds, have dovetailed with the proliferation of affordable and mobile audio recording technologies. This has led to the emergence of a variety of uses of audio recording that attempt to enlarge and enliven what constitutes data within research practices. The potential for audio recordings to complement more 'traditional' forms of data collection, has been taken up by Baker 2003 to investigate musical practices of young girls, Kanngieser 2012 to investigate the political qualities of human voices, Duffy and Waitt 2013 in their study of the contribution of sound to the construction of a sense of 'home', and by Battesti and Puig 2016, Porteous and Mastin 1985, and Benfield et al 2010 to understand and analyse peoples' perceptions of urban and environmental sounds, while Morton 2005 uses audio recordings in conjunction with other methods to gain insights about musical performance. When audio recording is undertaken outside of the controlled environment of a recording studio, it is often referred to as 'field' recording. Gallagher 2015 provides a schema of field recording and its relation to the production of space, while Lane and Carlyle 2016 interview a range of field recordists to gain a better sense of their practice. This proliferation of audio recording methods has led to epistemological and practical challenges regarding how to handle audio material within traditional formats of academic publishing; Cobussen 2012 demonstrates a way to integrate audio with text and images in such a way that avoids audio playing an ancillary role within academic research.

Baker, S. "Auto-Audio Ethnography; Or, Pre-Teen Girls' Capturing Their Popular Musical Practices on Tape." *Context: Journal of Music Research* 26 (2003): 57-65.
Outlines a method of auto-ethnography that combines photography with tape recorders. A group of pre-teenage girls were provided with small, inexpensive, and portable tape recorders to record anything they wanted. Subsequently, the musical practices captured (including recordings of their favourite songs, discussions of music, and themselves singing) were analysed to understand the ways in which each girl attempted to represent their identity. Along the way, the paper carefully considers issues around access, power, agency, and representation.

Battesti, V. and N. Puig. ""The Sound of Society": A Method for Investigating Sound Perception in Cairo." *The Senses and Society* 11.3 (2016): 298-319.
The paper elaborates upon a sonic method akin to photo-elicitation that the authors term 'Mics in the Ears'. As a means to understand Cairo residents' sonic experiences and perceptions of the city, the researchers provided participants with in-ear microphones to record a routine route through their neighbourhood. The resulting recordings were subsequently narrated and discussed by the participants during playback sessions.

Benfield, J. A., P. A. Bell, L.J. Troup, and N.C. Soderstrom. "Aesthetic and Affective Effects of Vocal and Traffic Noise on Natural Landscape Assessment." *Journal of Environmental Psychology* 30.1 (2010): 103-111.
Reports on an environmental preference experiment to ascertain people's sonic aesthetic and affective valuations of national park landscapes, in part using audio recordings. Participants rated static scenes of US national parks while listening to a range of natural and mechanical soundtracks, including bird and air traffic sounds. The article is part of a burgeoning literature on sonic environmental preferences undertaken from a landscape management perspective.

Cobussen, M. "*Editorial: Encounters with Southeast Asia through Sound[http://sonicstudies.org/jss12]*." *Journal of Sonic Studies* 12 (2012)
A collection of online essays with an introductory editorial that demonstrates how the *Journal of Sonic Studies* manages to seamlessly integrate audio recordings, photographs and video clips with written text; a feat that 'traditional' academic publishers often struggle with. The essays collected here are wide ranging, exploring the sounds of religious festivals, the development of sound technology in Indian cinema, the use of sound and listening to examine the political-economy of places, and much else besides.

Duffy, M., and G. Waitt. "Home Sounds: Experiential Practices and Performativities of Hearing and Listening." *Social & Cultural Geography* 14.4 (2013): 466-481.
This paper exemplifies and expands upon a method that has been developed by the authors that they term 'sound diaries'. This method involves getting research participants to record everyday sounds, which are then discussed with the researchers during a follow-up session. The paper uses this method as a means to explore the connections between people and place – particularly the construction of a sense of 'home' – in Bermagui, New South Wales, Australia, as constituted through sound.

Gallagher, M. "Field Recording and The Sounding of Spaces." *Environment and Planning D: Society and Space* 33.3 (2015): 560-576.
Outlines the potential contribution of field recordings to academic geography practices. The paper begins by providing a brief history of field recording and a typology of different styles, before moving to explore a range of its functions – affective, performative, representational, and spatial – with particular emphasis on how field recordings represent, produce, and reassemble space. Audio recordings amplify moments of the argument.

Kanngieser, A. "A Sonic Geography of Voice: Towards an Affective Politics." *Progress in Human Geography* 36.3 (2012): 336-353.
Explores the politics of voices, both from the perspective of speaking and listening, as well as the ways in which voices make, and are remade by, space. The paper calls attention to the affective capacity of voice, moving an analysis of speech acts and their reception beyond their linguistic content to also include accents, dialects, amplitudes, and other vocal qualities. Links to audio recordings complement the written analysis.

Lane, C., and A. Carlyle. *In the Field: The Art of Field Recording*. Uniformbooks, 2016.
A series of interviews with artists, academics, and those somewhere in-between, who use field recording within their work. Through these interviews we gain a sense of how each practitioner approaches field recording, including what tools and techniques they use, what motivates and inspires them, what they use their recordings for, and what methods they use to distribute them.

Morton, F. "Performing Ethnography: Irish Traditional Music Sessions and New Methodological Spaces." *Social & Cultural Geography* 6.5 (2005): 661-676.
Through a sustained engagement with non-representational theory, the article examines the spaces that are made through musical performance – in this case Irish traditional music. The paper outlines a 'performance ethnography' methodology, which includes audio recordings of both performances of music sessions and the experiences of the performers themselves, as well as photography, video recording, and interviews. It is argued that this suite of methods allows for a sustained analysis of the liveliness, bodily affects, and other intricacies of one-off musical sessions.

Porteous, J.D., and J.F. Mastin. "Soundscape." *Journal of Architectural and Planning Research* 2.3 (1985): 169-186.
Develops a method for empirical soundscape research, utilising audio recording alongside a qualitative questionnaire and sound pressure level monitoring (a method of quantifying sound levels). The article goes on to demonstrate how qualitative and quantitative data can be analysed in tandem.

Recorded Audio Walks and Tours
A particular form of audio recording practice that has received notable attention within the geographical and aligned spatial science literature is variously described as an audio walk, audio tour, or a recorded soundwalk. Regardless of the nomenclature used, this method involves the use of audio technologies to record and edit audio recordings – field recordings, narration or interview clips, and sometimes music – to compose an audio piece that relates to a specific place. More often than not, the composed audio piece is to be listened to on headphones via mobile listening devices (mobile telephones, portable CD players), while walking through the location of its production along a pre-determined route. Researchers have used these audio walks as a method of disseminating research findings, oral histories, and other spatial excursions, often with a non-academic listening audience in mind. Butler 2007 gives a useful overview of the production of audio walks, particularly by artists, before describing the production of two oral history audio walks he himself created, while Butler 2006 argues in favour of audio walks as a means of presenting cultural geography to a variety of non-academic publics in an accessible manner. By contrast, Saunders and Moles 2013 caution against assuming public engagement practices as mediated through audio walks are necessarily an uncomplicated undertaking, while Saunders and Moles 2016 reflect upon the production of a community-based audio tour that challenges tourist-friendly audio tours that make places easily consumable and knowable. In a similar vein, Gallagher 2015 reflects upon his experimental audio walk that is at times provocatively disorientating. Geographers have also reflected upon the pedagogic role of audio tours. Wissmann 2013 examines the potential for audio tours to act as teaching tools in the context of undergraduate field trips, while Rich 2016 critically analyses the production of a museum-based audio tour in the 1960s that was intended to educate the visiting public.

Butler, T. "A Walk of Art: The Potential of the Sound Walk as Practice in Cultural Geography." *Social & Cultural Geography* 7 (2006): 889–908.
The paper examines different audio walk production strategies from a sound arts perspective. Covering a range of artistic audio walks, the paper considers the ways in which they bring listeners in to contact with different people, places, and stories, and how the conceptual flexibility of such audio walks allows for social and cultural geographers to produce their own in a manner that would have appeal beyond academia.

Butler, T. "Memoryscape: How Audio Walks can deepen our Sense of Place by Integrating Art, Oral History and Cultural Geography." *Geography Compass* (2007) 1: 360-372.

Provides a concise historical overview of the use and development of audio walks, particularly in artistic contexts, and makes a compelling argument in favour of the use of audio walks as a method of narrating oral histories in situ. Butler also outlines some of the process behind his making of two oral history audio walks located along the River Thames in London.

Gallagher, M. "Sounding Ruins: Reflections on the Production of an 'Audio Drift'." Cultural Geographies 22.3 (2015): 467-485.
Provides a methodological overview of the production of an experimental audio walk (here styled as an audio 'drift') titled *Kilmahew Audio Drift No.1*, which is located within the landscape of the ruins of St Peter's Seminary, near Cardross, Scotland. Along the way, the article reflects upon the tour's rejection of a pre-determined pathway through this landscape, the uncanniness of presenting sound out of sequence and in (potentially) disorientating juxtaposition, and the ethics and epistemological questions that arise from such re-workings of landscape.

Rich, J. "Sound, Mobility and Landscapes of Exhibition: Radio-Guided Tours at the Science Museum, London, 1960-1964." *Journal of Historical Geography* 52 (2016): 61-73.
Explores the makings of a radio-guided audio tour of four galleries within the London Science Museum in the early 1960s. The article analyses the ways in which the audio tour contributed to the production of new forms of museum display and education in response to rapidly growing museum attendance numbers, as well as the role of sound as a mediator between mobile listeners and the museum landscape.

Saunders, A., and K. Moles. "The Spatial Practice of Public Engagement: 'Doing' Geography in the South Wales Valleys." *Social & Cultural Geography* 14.1 (2013) 23-40.
Through the production of a series of audio walks in the town of Ebbw Vale in the South Wales valleys, this paper critically reflects upon the process of initiating and progressing with a public engagement project. The audio walks, which tell three different stories about the town, are revealed to be in part an act of clarifying and simplifying complex histories and interweavings of people and place.

Saunders, A., and K. Moles. "Following or Forging a Way through the World: Audio Walks and the Making of Place." *Emotion, Space and Society* 20 (2016): 68-74.
A reflective account of the production of a community-based audio tour project within Cardiff, Wales. The authors make an argument against audio tours that provide an uncomplicated, smooth, and linear narration through places, which dominates touristic audio tours.

Wissmann, T. "Tuning the Field Trip: Audio-Guided Tours as a Replacement For 1-day Excursions in Human Geography." *Journal of Geography in Higher Education* 37.4 (2013): 595-610.
Wissmann makes a convincing case for the use of audio tours as a teaching tool, using three examples of audio tours produced for an undergraduate field trip to the Rhine-Main region of Germany. Careful consideration is given to the practical and pedagogic value of audio tours, and the use of audio in teaching settings in relation to other types of media, including written notes and visual maps.

Sound Mapping
Given sonic geography's focus on the spatial properties of sound, it is perhaps not surprising that geographers have turned to various cartographic methods to investigate and represent sound environments at different spatial scales, which have come to be collectively known as sound mapping. Oftentimes, these methods involve the visualisation of sonic data. In their ethnographic research, Duffy et al 2016 visually map out an individual's visceral responses to sound, while O'Keeffe 2015 uses visually

annotated sound maps as part of a collective research endeavour. At a larger spatial scale, Papadimitriou et al 2009 develop a mixed-methods approach to visualise the sonic qualities of a rural landscape. With the advent of new digital cartographic tools, there has been a concurrent move to create interactive sound maps, often hosted online, in which audio recordings are embedded. Lawrence et al 2009 provide an account of an interactive map that includes both haptic and auditory information for blind or visually impaired users, while Ouzounian 2014 offers some thoughts on participatory ways of working within the context of online interactive sound maps. The majority of interactive sound maps hosted online have been produced from outside the academy. Both Thulin 2016 and Anderson 2015 explore some of the most popular non-academic sound mapping platforms, and are critical of the ways in which they index recordings to specific locations in a seemingly uncomplicated manner, before outlining some alternative methods that are more experimental with regard to the relationship between sound, geo-located space, and vision.

Anderson, I. "*Soundmapping Beyond The Grid: Alternative Cartographies of Sound[https://www.researchcatalogue.net/view/234645/234646]*." *Journal of Sonic Studies* 11 (2015)
Makes an argument for creative sound mapping techniques that move the method beyond affixing locational recordings to two-dimensional gridded maps. The essay provides examples of creative mapping techniques that provide greater context for mapped sounds, and sound maps that eliminate the need for visual representations of sonic space. Audio excerpts from the sound maps discussed are integrated within the essay.

Duffy, M., G. Waitt, and T. Harada. "Making Sense of Sound: Visceral Sonic Mapping as a Research Tool." *Emotion, Space and Society* 20 (2016): 49-57.
Makes a case for the cartographic representation of visceral responses to sound, using an example of an ethnographic study of car driving. Data collection methods included semi-structured interviews and audio recordings produced by a research participant, and subsequent methods of data analysis and representation involved a visual mapping of these sounds and texts.

Lawrence, M.M., N. Martinelli, and R. Nehmer. "A Haptic Soundscape Map of the University of Oregon." *Journal of Maps* 5.1 (2009): 19-29.
Details a collaborative student project to produce a map of the University of Oregon campus from a multi-sensory perspective. The map, described as a 'haptic soundscape map', incorporates both haptic and auditory information to enable a blind or visually impaired user to navigate it.

O'Keeffe, L. "Thinking Through New Methodologies. Sounding Out the City With Teenagers." *Qualitative Sociology Review* 4.1 (2015): 6-32
The paper outlines a range of methods used to explore teenagers' experiences of urban soundscapes in Dublin, Ireland. These methods included soundwalking and focus groups but also sound mapping. Visual annotated sound maps were used as a means for the teenagers to spatially locate different sonic qualities of the city and the spatiality of different meanings of sounds.

Ouzounian, G. "Acoustic Mapping: Notes from the Interface." In *The Acoustic City*. Edited by M. Gandy, and B.J. Nilsen, 164–173. Berlin: JOVIS Verlag, 2014.
Provides a useful, concise introduction to some of the ways in which online sound maps have come into being, and some of the issues that such sound maps bring about. Of particular interest from a methods perspective are the reflections on participatory and collaborative approaches to sound mapping.

Papadimitriou, K.D., A. D. Mazaris, A. S. Kallimanis, and J. D. Pantis. "Cartographic Representation of the Sonic Environment." *The Cartographic Journal* 46.2 (2009): 126-135.
Outlines a methodology for the mapping of both quantitative and qualitative sonic data through focusing on various data visualisations of sonic attributes of a rural landscape in Corfu, Greece. The paper describes the mapping methodology in detail, and reflects upon the application of the resulting maps and some limitations to the approach taken.

Thulin, S. "Sound Maps Matter: Expanding Cartophony." *Social & Cultural Geography* (2016)
http://dx.doi.org/10.1080/14649365.2016.1266028
Examines the recent trend of online sound maps, predominantly through a close analysis of three popular sound mapping platforms. While the article is critical of sound mapping methods that aim for high-fidelity recordings that are straightforwardly indexed to a specific location, it points to productive ways in which sound mapping methods are being extended beyond such forms.

Sound and the Arts

In line with the relatively recent re-emergence of geographical interest in a variety of humanities disciplines in general (which has led to the development of GeoHumanities scholarship), and the arts in particular, there has been a modest focus on artistic forms of sonic knowledge production and dissemination by social and cultural geographers. Concurrently, sound artists often produce and contextualise their work through a spatial lens. Carlyle 2007 is a useful resource that provides a range of creative methods for sonic representations of spaces, while Sinclair 2012 introduces an edited collection of papers that interrogate artistic approaches to making environmental data audible. Jones and Fairclough 2016 identify artistic field recording methods as a means of probing landscape identity, while the geographical qualities of particular sound art works are explored by DeSilvey 2010 and Pinder 2001, who both offer stimulating thoughts on memory, identity, and place. Attoh 2011 and Prior and Walton 2017 present creative audio work, in the form of a song and an ecopoetic sound piece respectively.

Attoh, K. "The Bus Hub." *ACME: An International E-Journal for Critical Geographies* 10.2 (2011): 280-285.
A written poem about public transit in Syracuse, USA, is performed as a song; both are presented in the paper, with the former as text and the latter as a downloadable audio piece. The editor's preface to the paper reflects on questions that are raised when such work is submitted to an academic journal.

Carlyle, A, ed. *Autumn Leaves: Sound and the Environment in Artistic Practice*. Paris: Double Entendre, 2007.
A compendium of short essays and interviews with a range of scholars and practicing sound artists, with a specific focus on how to innovatively represent sound in space through photography, text, maps, and audio recordings.

DeSilvey, C. "Memory in Motion: Soundings from Milltown, Montana." *Social & Cultural Geography* 11.5 (2010): 491-510.
Analyses a sound art installation produced in response to the environmental restoration of an industrialised river system in Western Montana. It is demonstrated how the creation of the installation acts not only as a method of cultural remembrance, but also one that helps to recirculate the discordant politics of deindustrialisation and restoration.

Jones, O., and L. Fairclough. "Sounding Grief: The Severn Estuary as an Emotional Soundscape." *Emotion, Space and Society* 20 (2016): 98-110.

Considers the work of artist Louisa Fairclough and her various field recording and film projects that draw upon the Severn Estuary in South West England. The paper provides a thoughtful account of how creative approaches to field recording can be used as a method for exploring emotional responses to landscapes.

Pinder, D. "Ghostly Footsteps: Voices, Memories and Walks in the City." *Cultural Geographies* 8.1 (2001): 1-19.
The paper examines artists and writers who use walking as a way of exploring city spaces, both real and imagined, with a particular focus on an audio art work produced by the Canadian artist Janet Cardiff. From a methods perspective, the paper is useful to think through the role of sound in forming narratives, identities, and atmospheres at the juncture between self and space.

Sinclair, P. ed. "Sonification: What Where How Why Artistic Practice Relating Sonification to Environments." *AI & Society* 27.2 (2012).
A collection of papers and an editorial (pp. 173-175) that considers different methods of sonification, which, in essence, is the process of making data audible, within artistic practice. The papers consider a range of artistic sonification practices based on different data sources, including tidal flows, sensor data from high-speed trains, and meteorological data.

Prior, J., and S. Walton. "The Bristol and Bath Railway Path: An Ecopoetic Sound Collaboration." *GeoHumanities* (2017) http://dx.doi.org/10.1080/2373566X.2016.1273076
A sound piece produced in response to the Bristol and Bath railway path in England, a walking and cycling route built on the remnants of a former coal and commuter railway line. The piece combines a spoken ecopoem that reflects upon the site's contentious cultural and natural history with audio recordings from across the route.