COMBINING CLOSE AND DISTANT READING: A MULTISCALAR ANALYSIS OF THE ENGLISH LAKE DISTRICT'S HISTORICAL SOUNDSCAPE

Joanna E. Taylor, Ian N. Gregory, Christopher Donaldson (Lancaster University)

Scholarship in the digital humanities is of limited relevance to scholarship in the humanities more broadly when it fails to account for the fitness of its methods to its object of study. Equally, though, scholars in the humanities limit themselves when they ignore how digital humanities scholarship can challenge, or even change, the way their object of study is perceived and understood. These observations are particularly relevant to the debate over close and distant reading. This binary (close reading/distant reading) continues to constitute a vexed bifurcation in disciplines where textual sources are a privileged object for research. It is a concern for historians, of course, as well as for linguistics specialists. But its homeland – its place of origin – is in literary studies, and it is chiefly by scholars of literature that the debate over close and distant reading has been conducted. Following Franco Moretti's influential advocacy of 'distant reading', scholars such as Michael Tavel Clark and David Wittenberg have argued that scholars should move away from close reading in favour of macroanalytic techniques, which they see as being more suitable for literary study in a digital age.[1] More frequently, though, digital humanists have begun to recognise that, in Adam Hammond, Julian Brooke and Graeme Hirst's words, 'computational analysis can only thrive in an ecosystem of close reading'.[2] We join these calls for literary scholarship to move beyond the limitations of binary oppositions between 'close' and 'distant' reading and towards the development of approaches that exploit the macroanalytic

[1] F. Moretti, *Distant Reading* (Verso, 2013). M. Tavel Clark and D. Wittenberg, eds., *Scale in Literature and Culture* (Palgrave Macmillan, 2017).

[2] A. Hammond, A. J. Brooke and G. Hirst, 'Modeling Modernist Dialogism: Close Reading with Big Data', in S. Ross and J. O'Sullivan, eds., *Reading Modernism With Machines: Digital Humanities and Modernist Literature* (Palgrave Macmillan, 2016), pp. 49–78. See also S. Ramsay, *Reading Machines: Towards an Algorithmic Criticism* (University of Illinois Press, 2011) and T. Clement, 'Text Analysis, Data Mining, and Visualizations in Literary Scholarship', in K. M. Price and R. Siemens, eds., *Literary Studies in the Digital Age: An Evolving Anthology* (MLA Commons, 2013) <http://perma.cc/2CED-BNEK> [accessed 9 September 2017].

potential of digital methods while maintaining a respect for the unique integrity and importance of the objects – the literary works – upon which such research is based.

The present article takes a significant step in this direction. In what follows, we demonstrate how the reciprocal application of both conventional and computationally driven modes of textual analysis can mutually benefit digital humanities research and literary-historical scholarship. Drawing on a customised corpus of writing about the English Lake District, we model the application of a multiscalar approach known as geographical text analysis (GTA), which combines aspects of close reading and distant reading, and, in doing so, introduces a new method for literary research. In implementing GTA in this manner our aim is to examine an oft-noted but significantly understudied dimension of this world-famous region: namely, its historical 'soundscape'.[3] As we explain below, accounts of the Lake District from the eighteenth and nineteenth centuries attest to an abiding interest in how the region's topography can facilitate – even heighten – specific kinds of acoustic experiences. This interest in the Lake District's soundscape is something that a multiscalar method such as GTA is particularly well suited to identify and to explore.

The Corpus of Lake District Writing and Geographical Text Analysis

The English Lake District is one of the most culturally canonised regions in the United Kingdom. It has been home to several of Britain's most influential writers, including William Wordsworth (1770–1850), John Ruskin (1819–1900) and Beatrix Potter (1866–1943). It has also been integral to the development of important trends in landscape aesthetics and environmental

[3] On the concept of 'soundscape', see R.M. Schafer, *The Soundscape: Our Sonic Environment and the Tuning of the World* (Destiny Books, 1993).

thought.[4] In this paper, we focus on the representative sample of historical accounts of the Lake District included in the Corpus of Lake District Writing (CLDW). This corpus comprises eighty texts, which contain accounts or descriptions of the Lake District from the beginning of the seventeenth century through to the beginning of the twentieth century (Appendix A). The earliest items included in the corpus are extracts from the second instalment of Michael Drayton's poem *Poly-Olbion* (1622). The most recent item included is the twenty-second edition of the popular Victorian guidebook *Black's Shilling Guide to the English Lakes* (1900). The other texts in the corpus include works by famous writers, such as the so-called 'Lake' poets: Wordsworth, Samuel Taylor Coleridge (1772–1834) and Robert Southey (1774–1843). Crucially, though, the corpus also contains the writings of lesser-known authors, such as Edwin Waugh (1817–1890) and Harriet Martineau (1802–1876).[5] These texts were manually digitised and marked up with XML to encode both formatting and other key typographical and thematic features.[6]

[4] See M. Andrews, *The Search for the Picturesque: Landscape Aesthetics and Tourism in Britain, 1760–1800* (Stanford University Press, 1989); H. Ritvo, *The Dawn of Green: Manchester, Thirlmere, and Modern Environmentalism* (Chicago University Press, 2009); and J.K. Walton and J. Wood, *The Making of a Cultural Landscape: The English Lake District as Tourist Destination, 1750–2010* (Ashgate, 2013).

[5] See: 'Corpus of Lake District Writing, 1622-1900', *Spatial Humanities: Texts, Places, GIS*, Lancaster University <http://www.lancaster.ac.uk/fass/projects/spatialhum.wordpress/?page_id=64> [accessed 23 May 2017]. For more information about the development of the corpus, see C.E. Donaldson, I.N. Gregory and J.E. Taylor, 'Locating the beautiful, picturesque, sublime and majestic: spatially analysing the application of aesthetic terminology in descriptions of the English Lake District', *Journal of Historical Geography*, 56 (2017), pp. 43–60.

[6] XML (eXtensible Markup Language) enables additional information to be encoded within a document; see A. Hardie, 'Modest XML for Corpora: Not a Standard, but a Suggestion', *ICAME Journal* 38,1 (2014), pp. 73–103.

Once digitised, the texts in our corpus were geoparsed.[7] Geoparsing is an automated process that identifies the place-names in text data and assigns coordinate information to those place names using designated XML tagsets. Geoparsing our Lake District corpus proved a difficult task. This was partly because of the number of place-names it contains (nearly 40,000 in total) and because of the variety of those place-names. It was also partly because many of the texts in the corpus included variant spellings and historical name forms that modern gazetteers either fail to recognise or struggle to disambiguate.[8] Accordingly, a significant amount of manual checking and updating was required to bring the quality of the geoparsing to an acceptable standard. Having completed this process, we then used the information in the designated XML tags to convert the texts in our corpus into a tabular form suitable for reading into a GIS application. Effectively, this step involved dividing each of the nearly 40,000 place-names in our corpus into separate rows in an attribute table. Each of these rows was then linked with columns containing additional information, such as coordinates and co-text (the text found to the left and right of the place-name in the work in which it appears). Once this table was read into a GIS application, it could be converted into an XY feature and submitted to spatial analysis.

Geoparsing provides a platform for geographical text analysis (GTA), which is a semi-automated technique that combines methods from spatial analysis and corpus linguistics.[9] The

---

[7] C. Grover, R. Tobin, K. Byrne, M. Woollard, J. Reid, S. Dunn and J. Ball, 'Use of the Edinburgh geoparser for georeferencing digitized historical collections', *Philosophical Transactions of the Royal Society A,* 368 (2010) pp. 3875-3889; I.N. Gregory, C.E. Donaldson, P. Murrieta-Flores and P. Rayson, 'Geoparsing, GIS and textual analysis: Current developments in Spatial Humanities research', *International Journal of Humanities and Arts Computing*, 9 (2015) pp. 1-14.

[8] For more on how we have approached some of these onomastic issues, see: J.O Butler, C.E. Donaldson., J.E. Taylor. and I.N. Gregory, 'Alts, Abbreviations, and AKAs: Historical onomastic variation and automated named entity recognition', *Journal of Maps and Geography Libraries*, 13 (2017), pp. 58–81.

[9] I.N. Gregory and C.E. Donaldson, 'Geographical Text Analysis: Digital cartographies of Lake District literature', in D. Cooper, C.E. Donaldson and P. Murrieta-Flores, eds., *Literary Mapping in the Digital Age* (Routledge, 2016) pp. 67-87; C. Porter, P. Atkinson and I.N. Gregory 'Geographical Text Analysis: A new key to nineteenth-century mortality', *Health and Place*, 36 (2015), pp. 25-34.

initial GTA process is essentially twofold. In the first place, it integrates textual analysis approaches from corpus linguistics that enable one to determine the different terms and concepts with which the named places in a corpus are associated.[10] In the second place, it implements GIS technology to facilitate the spatial analysis of the way those terms and concepts are mobilised geographically in the corpus.[11] Both of these automated steps serve as important precursors to a close reading that focuses attention on specific texts and locations which forms the basis of subsequent critical interrogation.

The concept of a place-name co-occurrence (PNC) is particularly important in this context. PNC is a label designating a place-name that occurs in close proximity to a search term of interest within the text or corpus being evaluated. This proximity is normally determined by a specific boundary, whether lexical (a set number of words) or grammatical (a sentence or phrasal unit). When a place-name occurs in close proximity to a search term, we assume a relationship between the two, and this assists us in mapping and spatially analysing the geography underlying the use of the search term in the corpus. Ordinarily (although, as will become clear, not always) we use a bandwidth of ten word tokens to indicate a relationship between the search term and any PNCs.[12]

The PNCs identified through this process are then examined individually by a human reader in order to evaluate the validity and nature of the perceived association between the place-name and the search term. This process of examination, consequently, returns us to the specific works in which the PNCs occur, and it is these works that then form the basis of further inquiry

[10] For an introduction to corpus linguistics, see S. Adolphs, *Introducing Electronic Text Analysis* (Routledge, 2006) and A.M. McEnery and A. Hardie, *Corpus Linguistics: Method, Theory and Practice* (Cambridge, 2012).

[11] For introductions to spatial analysis see T.C. Bailey and A.C. Gatrell, *Interactive Spatial Data Analysis* (Longman, 1995) and A.S. Fotheringham, C. Brunsdon and M. Charlton, *Quantitative Geography: Perspectives on Spatial Data Analysis* (Sage, 2000).

[12] For more information about the reasons for selecting a bandwidth of ten word tokens, see Donaldson et al., 'Locating the beautiful'.

and investigation into issues of more specific literary concern, such as lexical, formal, and thematic structures. It returns us, in other words, to a close reading of the text. The process of GTA is not, however, merely unidirectional, with the use of computational analysis situating the interpretation of individual literary works. Crucially, the process of interpretation generates findings that return us to the results of the computational component of GTA with a clearer sense of their relevance (or irrelevance) to the particular lexical, formal, and thematic concerns of the works they supposedly represent.

In bridging the macro-analytical and micro-analytical in this way, our approach to GTA complements the work of scholars, like Matthew Jockers, who have indicated the benefit of developing new methodologies by combining elements of close reading and distant reading. 'The[se] two scales of analysis', as Jockers affirms, 'should and need to coexist.'[13] Our previous research has corroborated the validity of this assertion by applying GTA to explore a range of different phenomena, including both the use of aesthetic terminology in historical travel writing (such as the words beautiful, picturesque and sublime) and the documentation of particular diseases in government reports.[14] In this article, our intention is to use GTA to identify and investigate those locations in the Lake District that are strongly associated with specific types of acoustic experiences. In doing so, we aim to extend previous applications of GTA by demonstrating how, in combining both conventional and computational modes of textual analysis, it can move literary scholarship beyond the close reading/distant reading binary and towards more flexible, multiscalar interpretative approaches.

[13] M.L. Jockers, *Macroanalysis: Digital methods and literary history* (University of Illinois Press, 2013), p. 9.

[14] C.E. Donaldson et al., 'Locating the beautiful'; P. Murrieta-Flores, A. Baron, I.N. Gregory, A. Hardie and P. Rayson, 'Automatically analysing large texts in a GIS environment: The Registrar General's reports and cholera in the nineteenth century', *Transactions in GIS*, 19 (2015), pp. 296-320; Porter et al. 'Geographical Text Analysis'.

Keynotes and soundmarks

Sound studies offers an apt platform on which to test out the approach to GTA we are proposing. Like digital humanities, sound studies are a rapidly emerging field; in humanities scholarship, sound has become second only to sight as the most significant sense.[15] More than that, sound studies scholarship experiments with the kind of multi-scalar reading we are interested in here. Mark Smith's observation that '[h]istorians are listening to the past with an intensity, frequency, keenness, and acuity unprecedented in scope and magnitude' indicates that the 'intensity' of a sound should be understood as part of wider trends.[16] R. Murray Schafer's definition of the term 'soundscape' in the late 1960s and early 1970s anticipated this way of understanding the critical study of sound. Schafer identified three main components to the soundscape: the keynote, which are sounds 'created by [a place's] geography and climate'; signals, or the 'foreground sounds' that we listen to consciously, including alarms or sirens; and soundmarks, or sounds that are specific to a community.[17] To use Schafer's approach, then, reading a soundscape comprehensively relies on recognising and analysing interplays between large-scale (keynote) and small-scale (soundmark) sounds.

The more recent turn towards a 'soundscape ecology' highlights the importance of interconnections between these elements. For Pijanowski et al., a 'soundscape ecology' emphasises 'the ecological characteristics of sounds and their spatial-temporal patterns as they

[15] See, for example: S. Halliday, *Sonic Modernity: Representing Sound in Literature, Culture and the Arts* (Edinburgh University Press, 2013); C. Colligan and M. Linley (eds), *Media, technology, and literature in the nineteenth century: image, sound, touch* (Routledge, 2016).

[16] M.M. Smith, 'Introduction: Onward to Audible Parts', in M.M. Smith (ed.) *Hearing History: A Reader* (University of Georgia Press, 2004), p. ix.

[17] R.M. Schafer, *The Soundscape*, pp. 9-10.

emerge from landscapes'.[18] A soundscape ecology considers the interactions between the biophony (sounds created by organisms), the geophony (sounds from nonbiological natural elements, such as wind or rain) and the anthrophony (sounds caused by humans), and asks how these elements of the soundscape mutually affect each other.[19] To these categories, we would add the topophony, or the ways that sound interacts with the physical environment.[20] According to Bruce Smith, a location's environmental features 'affect the propagation of sound and help give a community its acoustic identity'.[21] We are primarily interested here in precisely such topophonic sound effects, which, we suggest, GTA is uniquely able to represent.

The ephemerality of sound means that written sources are the most reliable way of accessing a historical soundscape; written texts preserve, however imperfectly, sounds which risk being forgotten – even lost – as social, cultural and technological contexts change.[22] Travel writing is particularly helpful for recording lost soundscapes, since travellers tend to pay attention to a soundscape's keynotes.[23] However, travellers could also be censured for insensitive responses to the details of a local soundscape. Travellers can be said to have engaged, at different times, with a close evaluation of the soundscape's details and with a distant appreciation of its overall effect. What we want to argue, then, is that by applying GTA we can begin to understand

---

[18] B.C. Pijanowski, L.J. Villanueva-Rivera, S.L. Dumyahn, A. Farina, B.L. Krause, B.M. Napoletano, S.H. Gage, and N. Pieretti, 'Soundscape Ecology: The Science of Sound in the Landscape', *BioScience*, 61.3 (2011), pp. 203-16; p. 203.

[19] B.L. Krause, 'Bioacoustics: habitat ambience in ecological balance', *Whole Earth Review*, 57 (1987), pp. 14-18; Pijanowski et. al., 'Soundscape Ecology', p. 204.

[20] See C. Fox, *Topophony* (2014-15 – orchestral piece). Ulrich Schönherr also engages with the term in his article 'Topophony of Facism: On Marcel Beyer's *The Karnau Tapes*', *The Germanic Review: Literature, Culture, Theory*, 73.4 (1998), pp. 328-48.

[21] B. Smith, *The Acoustic World of Early Modern England: Attending to the O-Factor* (Chicago and London: University of Chicago Press, 1999), p. 47.

[22] S.J. Smith, 'Soundscape', *Area*, 26.3 (1994), pp. 232-40; p. 233.

[23] Vanessa Agnew makes a similar point; see 'Hearing Things: Music and Sounds the Traveller Heard and Didn't Hear on the Grand Tour', *Cultural Studies Review*, 18.3 (2012), pp. 67-84.

the role played by geography in the formation of a specific historical soundscape.

A GTA of 'sound' and 'noise'

To the seventeenth-, eighteenth- or nineteenth-century ear, quietness ruled the countryside. That is not to say that the countryside was silent; indeed, the sounds of church bells, agricultural labour, hunting horns – not to mention multitudinous animal and bird noises – were a constant refrain. Yet, without the consistent thrum of electricity or the ever-present roar of the internal combustion engine, subtle sounds were able to be heard much more distinctly.[24] They were, however, often taken for granted. Quietness seemed to indicate a wilderness or, at least, what John Fisher calls 'untrammeled nature'.[25] It was widely perceived to be one of the Lake District's defining qualities. In fact, though, once travellers began to attend closely to the soundscape of the region they discovered that this apparent silence actually comprised a complex array of subtle sounds. Henri Lefebvre identifies two main rhythmic categories that sit alongside silence: noise, which is 'chaotic', and sound, wherein harmonies can be discerned.[26] Although these terms result in variant understandings of place-based acoustics – and the phenomenological responses they inspire – for the purposes of this paper we will treat them as synonyms for a general topophonic experience.

[Figure 1: Key locations and features]

The writers in our corpus employed certain terms that emphasised distance to enhance

[24] See A. Corbin, *Village Bells: Sound and Meaning in the Nineteenth-Century French Countryside* (1998) (Macmillan, 1999).
[25] J.A. Fisher, 'The Value of Natural Sounds', *The Journal of Aesthetic Education*, 33.3 (1999), pp. 26-42; p. 27.
[26] H. Lefebvre, *Rhythmanalysis: Space, Time and Everyday Life* (1992), trans. by Stuart Elden and Gerald Moore (Bloomsbury, 2004; repr. 2014), p. 37.

their understandings of the local soundscape. 'Sound', 'noise' and their lexemes ('noisy' or 'sounding', for example) occur 528 times throughout the corpus. Certain places emerge as being particularly significant for acoustic experiences. There are 87 PNCs for these terms (Figure 2); that is, 87 place-names occur within ten tokens of either 'sound', 'noise' or their lexemes.[27] But, while the points in Figure 2 indicate that mentions of 'sound' or 'noise' occurred throughout the Lake District, they do not tell us how intensely each location was associated with writing about the soundscape. When we density smooth (a GIS-based operation that measures the number of points near to each location) this data, however, distinct patterns emerge. Three locations appear to be especially related to either sound or noise: in the north-west a cluster is located at Crummock Water, Buttermere and the waterfall of Scale Force; east of this, a second cluster is formed around Derwentwater and Lodore Falls; and further south a third is centred on Silver How and Loughrigg.

[Figure 2: Map of sound and noise]

It may be that these are the places most associated with records of the soundscape in the corpus, but this representation does not take into account the fact that certain locations in the texts were more established parts of the average tourist itinerary, and so are more frequently discussed. Another form of spatial analysis can be used to identify significant locations (or hot spots) that occur more frequently against the variable background geography of the corpus (in this case, all of the place-names in the corpus). In other words, it can reveal whether the patterning displayed in the density-smoothed map is a result of the corpus's bias towards certain locations, or if it is statistically significant. Applying Kulldorff's Spatial Scan statistic reveals that

[27] In corpus linguistics, items of punctuation and other symbols – as well as words – are included in the count of tokens.

the cluster around Silver How and Loughrigg is the only statistically significant hot spot.[28] Conversely, sound or noise are not discussed around Buttermere and Derwentwater any more than would be statistically expected. To establish why these mountains were so particularly important to the Lake District's soundscape in the period covered by our corpus, we have to combine this kind of distant reading with close readings of texts from the corpus as well as other relevant contemporary accounts.

'Images of voice': echoes and reading the historic soundscape

Silver How and Loughrigg co-occur so frequently with either sound or noise thanks to a phenomenon that emerged in the late eighteenth century, and which remained a popular pastime for travellers in the first half of the nineteenth century: the deliberate creation of echoes. Silver How and Loughrigg are two of the mountains that enclose the valley and village of Grasmere. They are particularly associated with the term 'noise' due to the frequent quotation of William Wordsworth's poem on the naming of places, 'To Joanna', in the corpus. In this poem, Wordsworth records an instance when his sister-in-law, Joanna Hutchinson, unwittingly created a series of echoes that transformed the quiet vale into a noisy amphitheatre:

> When I had gazed perhaps two minutes' space,
> Joanna, looking in my eyes, beheld
> That ravishment of mine, and laughed aloud.
> The rock, like something starting from a sleep,
> Took up the Lady's voice, and laughed again:
> That ancient Woman seated on Helm-crag
> Was ready with her cavern; Hammar-scar,

[28] M. Kulldorff, 'A spatial scan statistic', *Communications in statistics – theory and methods*, 26 (1997), pp. 1481-1496. For a description of how this is used in GTA see: I.N. Gregory and C.E. Donaldson 'Geographical Text Analysis' pp. 80-83. The test was implemented using SatScan v. 9.4 <http://www.satscan.org> [accessed 26 April 2017].

> And the tall Steep of Silver-How, sent forth
> A noise of laughter; southern Loughrigg heard,
> And Fairfield answered with a mountain tone:
> Helvellyn far into the clear blue sky
> Carried the Lady's voice, – old Skiddaw blew
> His speaking-trumpet; – back out of the clouds
> Of Glaramara southward came the voice;
> And Kirkstone tossed it from his misty head.[29]

Joanna's laugh mocks the speaker for his self-conscious poetic absorption in the landscape, and the mountains – Helm Crag, Hammer Scar, Silver How, Loughrigg, Fairfield, Helvellyn, Glaramara and Kirkstone – seem to laugh back as they echo the noise she makes. The travel writer Charles Mackay commented in 1846 that this was a 'portentous laugh for a lady, but nevertheless very beautiful to read of', and the sound certainly appears to have carried a long way.[30] According to Wordsworth, Joanna's laugh seemed to reverberate throughout the Lake District.

Echoes like these initiated a new way of reading the landscape. The echo is a record of sound's interactions with the environment. Echoes seemed to travellers to reveal aspects of the landscape that remained hidden to the eye, and this form of second sight was facilitated by the acoustic capacities of the Lake District's topography. The result was an uncanny experience of space; for the guide-book writer Charles Cooke, it seemed as though he was 'surrounded by the unseen spirits of the mountains, reproving his intrusion into their sacred recesses'.[31] Elsewhere, Wordsworth ascribes a more benign intent to the mountains' echoes. In 'On the Power of Sound', he attributes the Lake District's distinctive soundscape to its terrain, and he suggests that

---

[29] W. Wordsworth, To Joanna', ll. 51-65, in S. Gill (ed.), *The Major Works* (Oxford University Press, 1984; 2011), p. 202.

[30] C. Mackay, *The Scenery and Poetry of the English Lakes. A Summer Ramble* (Longman and Co., 1846), p. 27.

[31] C. Cooke, *The Tourist's and Traveller's Companion to the Lakes of Cumberland, Westmoreland, and Lancashire: Including a description of the surrounding scenery* (London: Sherwood, Jones and Co., 1827), p. 45.

the resultant topophonies can have profound implications for personal responses to the landscape:

> Ye Voices, and ye Shadows,
> And Images of voice – to hound and horn
> From rocky steep and rock-bestudded meadows
> Flung back, and, in the sky's blue caves, reborn,
> On with your pastime![32]

The echoes that Wordsworth describes here have the potential to alter radically perceptions of both sound and place. He envisages echoes as reified sound, or forms of what Martin Kaltenecker has much more recently termed the 'materialisation of the listening discourse'.[33] The echoes become 'Images' that make the sounds of 'hound and horn' tangible. More than that, though, they allow the listener to imagine vividly the mountains and meadows that lie out of their line of sight. In other words, sound opens out the landscape so that listeners can vicariously 'see' areas that are physically hidden to them. Even the 'sky's blue caves' are brought into the listener's comprehension thanks to the sounds that echo from them. Echoes, then, offered listeners a means by which to perform a kind of 'distant reading' of – or reading of distance in – the Lakeland landscape.

Similarly, by scanning the textual data for references to echoes we can begin to understand the impact sound had on historical understandings of place, and vice-versa. The Lakeland rocks, and the mountains they form, reflect soundwaves in such a way that a loud noise could result in particularly impressive echoes that were not possible elsewhere. We can see from Figure 3, which displays the PNCs for 'echo' or its lexemes, that the pattern is less distinct than we saw in relation to sound and noise (Figure 2); in this case, because the echo was frequently described in terms of long lists of place names – in effect, spatial networks united under the

---

[32] W.Wordsworth, 'On the Power of Sound', ll. 33-37, in S. Gill, *The Major Works*, p. 359.

[33] M. Kaltenecker, 'The Discourse of Sound', *Tempo*, 70 (2016), pp. 5-15; p. 9.

same soundmark – PNCs here are defined as place-names occurring in the same sentence as the search term. The largest clusters for echo are around Derwentwater and Ullswater, and these are both statistically significant hot spots. This time, the Loughrigg cluster is pronounced but is not statistically significant. Interestingly, unlike almost every other major lake, and in marked contrast to noise and sound, there are no instances of 'echo' associated with the Buttermere and Crummock Water area.

[Figure 3: Echo]

The reasons behind these differences become clearer when we analyse the terrain and the texts more closely. Figure 2 suggested that sound and noise are particularly associated with low-lying places in valleys. This relationship was confirmed by using a GIS overlay operation between the PNCs and a digital terrain model (DTM) that provided the heights of each location. This overlay revealed that 67.6% of 'noise' and 'sound' PNCs are found below 300m. The results are almost identical for an overlay between the 'echo' PNCs and the same DTM, suggesting that echoes were a particularly pertinent type of acoustic experience in this region throughout the period covered by our corpus.

One of the Lake District's stranger tourist attractions emerged thanks to this interest in echoes: namely, the deliberate creation of very loud noises. A variety of sound sources were used to generate echoes. Charles Cooke advocated the use of a clarinet and a few French horns to create an orchestral echo that would offer 'a continuation of musical echoes, which reverberating round the lake, are exquisitely melodious in their several gradations, and form a thousand symphonies, playing together from every part'.[34] Others were happy to use their own voices. The Romantic poet Samuel Taylor Coleridge particularly enjoyed the sensation that the mountains

[34] C. Cooke p. 96.

were calling back to him.[35] Some found that voices were not an effective instrument. Edward Baines thought that women's voices were neither deep nor loud enough to generate satisfactory echoes (although, as we have seen, Wordsworth suggests otherwise).[36] Regardless, there was one object that emerged as being the clear favourite for creating impressive echoes: the cannon.

Cannon-fire was one of the loudest known sounds until the late nineteenth-century; according to commentators on historical soundscapes, sounds like it induced a '*sort of vertigo*' in listeners, and could drive minds to distraction.[37] Alain Corbin claims that before the 'continuous noise of the internal combustion engine, electric motor, or amplifier', many people enjoyed the sensation of 'being sporadically deafened' by noises such as cannon fire.[38] The firing of cannon in the Lake District's valleys was undertaken in order to draw attention to the complicated forms of quietness that followed a loud, and out of place, noise. The experience of hearing a loud noise that obliterated all other sounds, followed by a series of echoes that enhanced the quality of the quietness between them, revealed details about the soundscape that otherwise appeared insignificant.

'Reading' the landscape through cannon-fire

According to John Fisher, the problem with natural sounds is that they are 'not like music, not intentionally produced to be appreciated as expressive or aesthetic objects'. He continues: 'They surround us, occurring at many levels and distances from us, with no beginning or end'.[39] This means that listeners might fail to appreciate the acoustic experience they are perceiving: because

---

[35] S. T. Coleridge, Letter to Sara Hutchinson: 6 August 1802, in E.L. Griggs (ed.), *Letters of Samuel Taylor Coleridge: Volume II* (Clarendon Press, 1956), p. 844.

[36] E. Baines, *A Companion to the Lakes of Cumberland, Westmoreland, and Lancashire: In a descriptive account of a family tour and excursions on horseback and on foot* (Simpkin and Marshall, 1829), p. 134.

[37] L. Schmidt, quoted in A. Corbin, p. 5 (original emphasis).

[38] A. Corbin, *Village Bells*, p. 97.

[39] J.A. Fisher, 'The Value of Natural Sounds', *The Journal of Aesthetic Education*, 33.3 (1999), pp. 26-42; p. 28.

these natural sounds appear to be endless, they can be taken for granted as part of a rural landscape. For Fisher, it seems that listeners are naturally inclined to distant read soundscapes with the effect of flattening out, or missing entirely, the details that form them. Elsewhere, Fisher summarises this issue as 'a serious framing problem'. He asks:

> which sounds do I pay attention to and for how long? We have extensive and complicated conventions for appreciating music, anchored by a conception of music as produced in integrated whole units by the intentional activities of musicians and composers. We have clear boundaries around the musical units excluding ambient and environmental sounds. Such boundaries exclude what is "noise" relative to music. Do we also have boundaries conventionally regimenting the "noise" into certain sound event packages? It sounds fantastic to claim that we do[.][40]

This 'fantastic' claim is precisely what cannon-fire offered historical travellers to the Lake District: the loud noise that issued from the cannon drew listeners' focus to their ears, and encouraged them to concentrate on the soundscape in ways that they ordinarily did not. In other words, it provided a sonic frame for the natural soundscape that encouraged listeners to pay closer attention to quieter sounds. Cannon-fire and, more importantly, the echoes it created, both extended the traveller's knowledge of and feeling of connection with the Lakeland landscape beyond what they could see, and encouraged them to attend more carefully to the complexity of the silence that followed the cannon's boom.

[Figure 4 – Cannon]

Cannon were found at various points around the Lake District, although, as Figure 4 shows, the corpus suggests that interest in them was heavily concentrated on Derwentwater and Ullswater.

[40] J.A. Fisher, 'What the Hills Are Alive with: In Defense of the Sounds of Nature', *The Journal of Aesthetics and Art Criticism*, 56.2 (1998), pp. 167-79; p. 172.

Windermere also appears as a more minor cluster. Again, we have used the place names that co-occur in the same sentence as 'cannon', since – like 'echo' – cannon tended to be associated with several places at once thanks to the expansive echoes they produced.

Cannon appear to have been an early development in the Lake District's tourist trade; as early as 1786, William Gilpin recorded that 'the most celebrated ecchoes [*sic*] are said to be found on Ulleswater [*sic*]'.[41] This is the earliest mention of cannon in the corpus, but it is clear that the practice was already well-established. The echo at Ullswater seems to have been particularly impressive; Gilpin observed that in some places on that lake, 'the sound of a cannon is distinctly reverberated six, or seven times'. It was the mobility of the sound that offered such an unusual perspective on the landscape:

> It first rolls over the head in one vast peal. Then subsiding a few seconds, it rises again in a grand, interrupted burst, perhaps on the right. Another solemn pause ensues. Then the sound arises again on the left. Thus thrown from rock to rock, in a sort of aerial perspective, it is caught again perhaps by some nearer promontory; and returning full on the ear, surprizes you, after you thought all had been over, with as great a peal as at first.[42]

Gilpin's sentences here seem to mimic the effect of the echo; they roll over multiple commas as the echo builds, and then become staccato as he records the 'solemn pauses' between those disorientating sounds. Gilpin was, of course, renowned for promoting the highly influential aesthetic concept of the picturesque, and here he considers the echo's role in creating a frame through which to view or hear the scenery. This sonic experience appears to raise the listener above the earth to offer them an 'aerial perspective' that enables them to perform a kind of 'reading' of the landscape; the echoes seem to reveal prospects that are further away as well as on those 'nearer promontor[ies]'. The instant of quiet after an excessively loud sound draws the

[41] W. Gilpin, *Observations, Relative Chiefly to Picturesque Beauty, Made in the Year 1772, on several parts of England; Particularly the Mountains, and Lakes of Cumberland, and Westmoreland* (R. Blamire, 1786), p. 60.

[42] Ibid.

listener's attention to the minutiae of the soundscape. To put it simply, the pauses after the cannon fire and between the echoes frame the listener's close reading of hitherto concealed details.

Conclusion

In this article we have demonstrated how GTA can enhance our understanding of the ways historical travellers and tourists perceived and appreciated the soundscape of the Lake District. This approach has helped us not only to uncover sound as an important theme in a representative sample of writing about the Lake District, but also to establish the significance of the region's topography to its historical soundscape. By moving from the macro-analytical study of the use of the terms 'sound' or 'noise' to more focussed interrogations of specific accounts of these acoustic experiences, we have demonstrated that historical writers thought carefully about the Lake District's soundscape. In this way, our methodology bears a resemblance to that applied by the writers we have discussed. Just as they used one form of technology (the cannon) to enhance their appreciation of the Lake District, we use a combination of computational approaches to develop more nuanced, spatially-orientated analyses of the accounts of the Lake District found in our corpus. Just as these authors discovered that the soundscape close to hand could be adequately comprehended only when understood as part of the region's wider acoustics, so have we demonstrated that distant and close reading can be productively combined.

Acknowledgements:

Research for this article was carried out as part of the project *Geospatial Innovations in the Digital Humanities: A Deep Map of the English Lake District*, funded by the Leverhulme Trust (RPG-2015-230). The authors would like to thank audiences at the British Association for Romantic Studies PG and ECR Conference (University of Oxford, 2016) and the Spatial Humanities conference

(Lancaster University, 2016) for their helpful comments and insights into earlier versions of this article.

Bibliography

Adolphs, S., *Introducing Electronic Text Analysis* (Routledge, 2006).

Agnew, V., 'Hearing Things: Music and Sounds the Traveller Heard and Didn't Hear on the Grand Tour', *Cultural Studies Review*, 18.3 (2012), pp. 67-84.

Andrews, M., *The Search for the Picturesque: Landscape Aesthetics and Tourism in Britain, 1760–1800* (Stanford University Press, 1989).

Bailey, T.C. and A.C. Gatrell, *Interactive Spatial Data Analysis* (Longman, 1995).

Baines, E., *A Companion to the Lakes of Cumberland, Westmoreland, and Lancashire: In a descriptive account of a family tour and excursions on horseback and on foot* (Simpkin and Marshall, 1829).

Butler, J.O., C.E. Donaldson., J.E. Taylor. and I.N. Gregory, 'Alts, Abbreviations, and AKAs: Historical onomastic variation and automated named entity recognition', *Journal of Maps and Geography Libraries*, 13 (2017), pp. 58–81.

Colligan, C. and M. Linley (eds), *Media, technology, and literature in the nineteenth century: image, sound, touch* (Routledge, 2016).

Cooke, C., *The Tourist's and Traveller's Companion to the Lakes of Cumberland, Westmoreland, and Lancashire: Including a description of the surrounding scenery* (London: Sherwood, Jones and Co., 1827).

Corbin, A., *Village Bells: Sound and Meaning in the Nineteenth-Century French Countryside* (1998) (Macmillan, 1999).

Donaldson, C.E., I.N. Gregory and J.E. Taylor, 'Locating the beautiful, picturesque, sublime and majestic: spatially analysing the application of aesthetic terminology in descriptions of the English Lake District', *Journal of Historical Geography*, 56 (2017), pp. 43–60.

Fisher, J.A., 'What the Hills Are Alive with: In Defense of the Sounds of Nature', *The Journal of Aesthetics and Art Criticism*, 56.2 (1998), pp. 167-79.

---------- 'The Value of Natural Sounds', *The Journal of Aesthetic Education*, 33.3 (1999), pp. 26-42.

Fotheringham, A.S., C. Brunsdon and M. Charlton, *Quantitative Geography: Perspectives on Spatial Data Analysis* (Sage, 2000).

Fox, C *Topophony* (2014-15 – orchestral piece).

Gill, S., (ed.), *The Major Works* (Oxford University Press, 1984; 2011).

Gilpin, W., *Observations, Relative Chiefly to Picturesque Beauty, Made in the Year 1772, on several parts of England; Particularly the Mountains, and Lakes of Cumberland, and Westmoreland* (R. Blamire, 1786).

Gregory, I.N., C.E. Donaldson, P. Murrieta-Flores and P. Rayson, 'Geoparsing, GIS and textual analysis: Current developments in Spatial Humanities research', *International Journal of Humanities and Arts Computing*, 9 (2015) pp. 1-14.

Gregory, I.N. and C.E. Donaldson, 'Geographical Text Analysis: Digital cartographies of Lake District literature', in D. Cooper, C.E. Donaldson and P. Murrieta-Flores, eds., *Literary Mapping in the Digital Age* (Routledge, 2016) pp. 67-87.

Griggs, E.L. (ed.), *Letters of Samuel Taylor Coleridge: Volume II* (Clarendon Press, 1956).

Grover, C., R. Tobin, K. Byrne, M. Woollard, J. Reid, S. Dunn and J. Ball, 'Use of the Edinburgh geoparser for georeferencing digitized historical collections', *Philosophical Transactions of the Royal Society A,* 368 (2010) pp. 3875-3889.

Halliday, S. *Sonic Modernity: Representing Sound in Literature, Culture and the Arts* (Edinburgh University Press, 2013)

Hardie, A., 'Modest XML for Corpora: Not a Standard, but a Suggestion', *ICAME Journal* 38,1 (2014), pp. 73–103.

Jockers, M.L., *Macroanalysis: Digital methods and literary history* (University of Illinois Press, 2013).

Kaltenecker, M., 'The Discourse of Sound', *Tempo*, 70 (2016), pp. 5-15.

Krause, B.L., 'Bioacoustics: habitat ambience in ecological balance', *Whole Earth Review*, 57 (1987), pp. 14-18.

Kulldorff, M., 'A spatial scan statistic', *Communications in statistics – theory and methods*, 26 (1997), pp. 1481-1496.

Lancaster University, 'Corpus of Lake District Writing, 1622-1900', *Spatial Humanities: Texts, Places, GIS*, <http://www.lancaster.ac.uk/fass/projects/spatialhum.wordpress/?page_id=64> [accessed 23 May 2017].

Lefebvre, H., *Rhythmanalysis: Space, Time and Everyday Life* (1992), trans. by Stuart Elden and Gerald Moore (Bloomsbury, 2004; repr. 2014).

Mackay, C., *The Scenery and Poetry of the English Lakes. A Summer Ramble* (Longman and Co., 1846).

McEnery, A.M. and A. Hardie, *Corpus Linguistics: Method, Theory and Practice* (Cambridge, 2012).

Murrieta-Flores, P., A. Baron, I.N. Gregory, A. Hardie and P. Rayson, 'Automatically analysing large texts in a GIS environment: The Registrar General's reports and cholera in the nineteenth century', *Transactions in GIS*, 19 (2015), pp. 296-320.

Porter, C., P. Atkinson and I.N. Gregory 'Geographical Text Analysis: A new key to nineteenth-century mortality', *Health and Place*, 36 (2015), pp. 25-34.

Pijanowski, B.C., L.J. Villanueva-Rivera, S.L. Dumyahn, A. Farina, B.L. Krause, B.M. Napoletano, S.H. Gage, and N. Pieretti, 'Soundscape Ecology: The Science of Sound in the Landscape', *BioScience*, 61.3 (2011), pp. 203-16

Ritvo, H., *The Dawn of Green: Manchester, Thirlmere, and Modern Environmentalism* (Chicago University Press, 2009).

Schafer, R.M., *The Soundscape: Our Sonic Environment and the Tuning of the World* (Destiny Books, 1993).

Schönherr, U., 'Topophony of Facism: On Marcel Beyer's *The Karnau Tapes*', *The Germanic Review: Literature, Culture, Theory*, 73.4 (1998), pp. 328-48.

Smith, B., *The Acoustic World of Early Modern England: Attending to the O-Factor* (Chicago and London: University of Chicago Press, 1999).

Smith, M.M., 'Introduction: Onward to Audible Parts', in M.M. Smith (ed.) *Hearing History: A Reader* (University of Georgia Press, 2004).

Smith, S.J., 'Soundscape', *Area*, 26.3 (1994), pp. 232-40; p. 233.

Walton, J.K. and J. Wood, *The Making of a Cultural Landscape: The English Lake District as Tourist Destination, 1750–2010* (Ashgate, 2013).

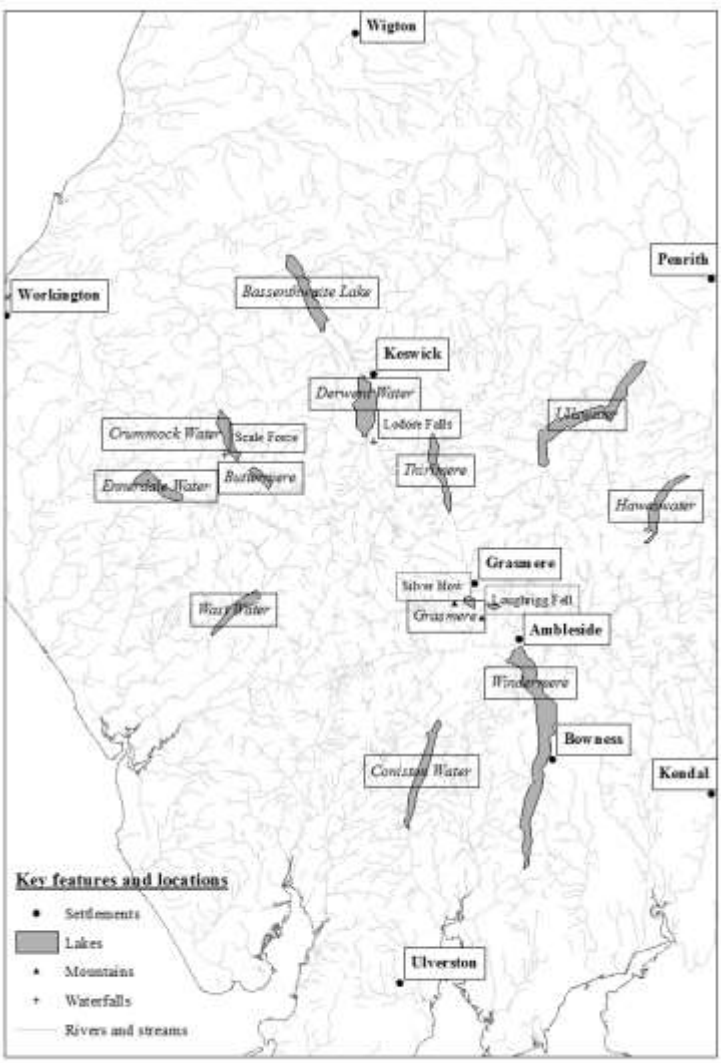

Figure 1: Key features and locations in the Lake District. This includes all of the locations discussed in this paper.

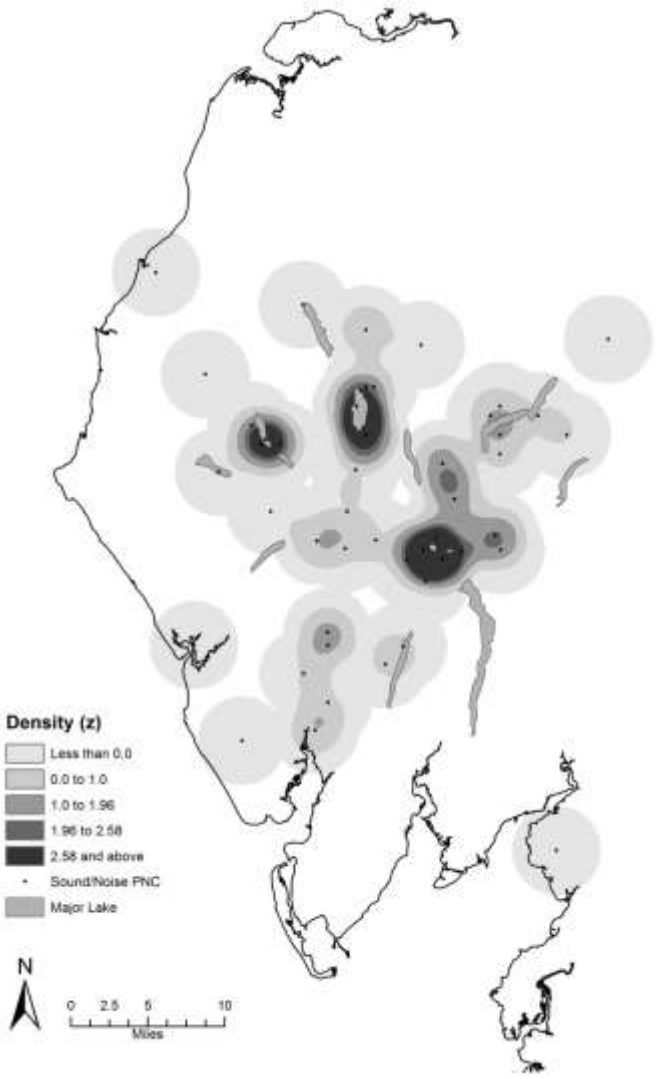

Figure 2: Place-name co-occurrences (PNCs) of 'noise', 'sound' and their lexemes. In this case PNCs are defined as co-occurring within 10 words.

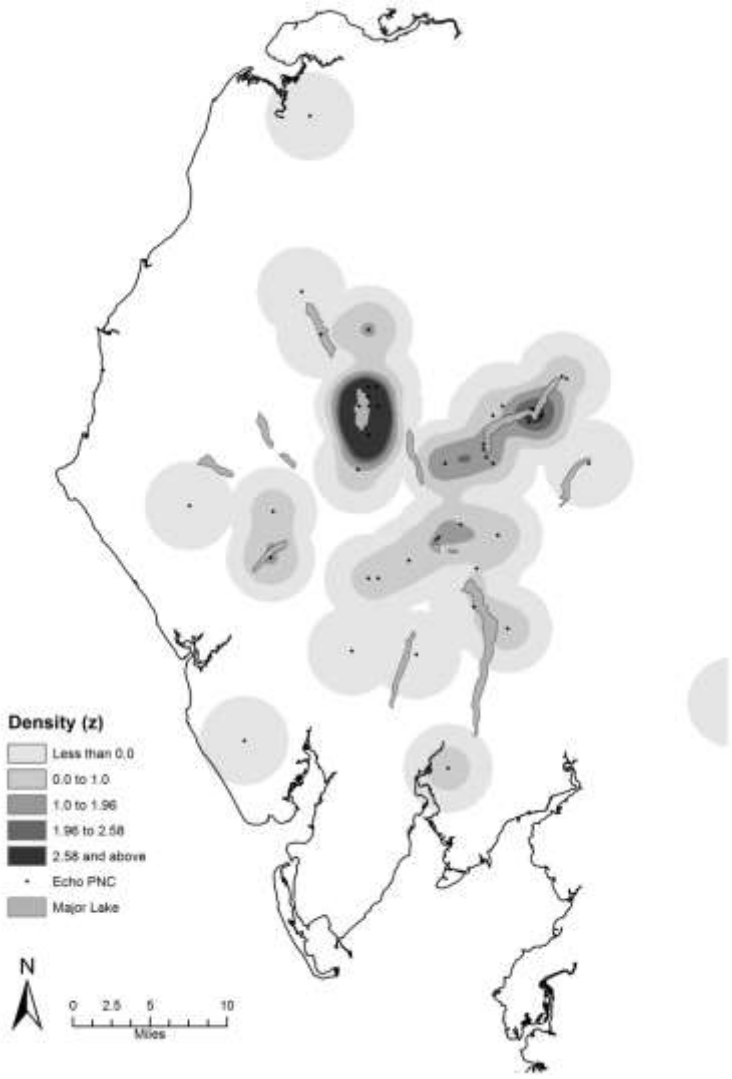

Figure 3: Place-name co-occurrences (PNCs) of 'echo' and its lexemes. In this case PNCs are defined as co-occurring within the same sentence.

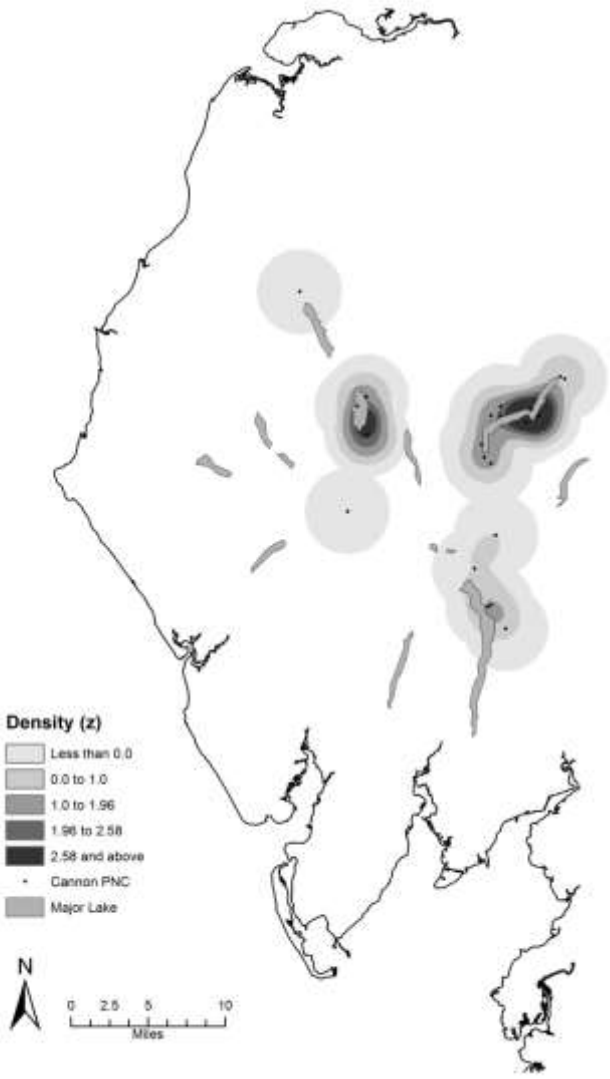

Figure 4: Place-name co-occurrences (PNCs) of 'cannon' and its lexemes. In this case PNCs are defined as co-occurring within the same sentence.

Appendix A

Corpus of Lake District Writing

Author	Title	Date
Michael Drayton	*Poly-Olbion*	1622
[Lt. Hammond]	*A Relation of a Short Survey of 26 Counties*	1634
Celia Fiennes	*Through England on a Side-Saddle*	1698
Daniel Defoe	*A Tour thro' the Whole Island of Great Britain*	1727
George Smith	'Survey of the Northwest Coast of England'	1746
George Smith	'A Journey up to Cross-Fell Mountain'	1747
George Smith	'A Journey to Caudbec Fells'	1747
John Brown	*Description of the Lake and Vale at Keswick*	1751
John Dalton	*A Descriptive Poem, Addressed to Two Ladies*	1755
John Wesley	*An Extract of the Rev. Mr. John Wesley's Journal*	1759
Thomas Gray	*Journal of A Visit to the Lake District in 1769*	1769
Thomas Pennant	*A Tour in Scotland. MDCCLXIX*	1769
Arthur Young	*Six Months' Tour Through the North of England*	1770
William Gilpin	*Observations, Relative Chiefly to Picturesque Beauty*	1772
Thomas Pennant	*A Tour in Scotland, and Voyage to the Hebrides*	1772
William Hutchinson	*An Excursion to the Lakes*	1776
R. Cumberland	*Odes*	1776
Thomas West	*A Guide to the Lakes*	1778
W. Wilberforce	*Journey to the Lake District from Cambridge*	1779
William Cockin	*Ode to the Genius of the Lakes. A Poem*	1780
R. J. Sullivan	*Observations Made During a Tour*	1780
Thomas Newte	*A Tour in England and Scotland, in 1785*	1785
James Clarke	*A Survey of the Lakes*	1787
Stebbing Shaw	*A Tour in 1787*	1787
Henry Skrine	*Three Successive Tours in the North of England*	1795
Richard Colt Hoare	*The Journeys of Sir Richard Colt Hoare*	1800
Adam Walker	*Remarks Made in A Tour from London to the Lakes*	1792
Joseph Budworth	*A Fortnight's Ramble to the Lakes*	1792
Ann Radcliffe	*A Journey Made in the Summer of 1794*	1794
J. H. Manners	*Journal of a Tour*	1796
William Gell	*A Tour in the Lakes, 1797*	1797
John Housman	*A Topographical Description*	1797–98
James Plumptre	*The Lakers: A Comic Opera in Three Acts*	1798
Richard Colt Hoare	*The Journeys of Sir Richard Colt Hoare*	1800
S. T. Coleridge	Letters and Notebooks	1802
[Anonymous]	*Observations, Chiefly Lithological,*	1804
James Denholm	*A tour to the principal Scotch and English Lakes*	1804
Thomas Thornton	*A Sporting Tour*	1804
Priscilla Wakefield	*A Family Tour through the British Empire*	1804
[Anonymous]	*Gleanings of a Wanderer*	1805
Joseph Mawman	*An Excursion*	1805
Robert Southey	*Letters from England*	1807

William Combe	*The tour of Doctor Syntax*	1812
John Keats	Letters	1818
John Robinson	*A Guide to the Lakes*	1819
Catherine Hutton	*Oakwood Hall: A Novel*	1819
S. H. Spiker	*Travels through England, Wales & Scotland*	1820
W. Wordsworth	*The River Duddon: A Series of Sonnets*	1820
W. Wordsworth	*A Description of the Scenery of the Lakes*	1822
Jonathan Otley	*A Concise Description of the English Lakes*	1823
Thomas Wilkinson	*Tours to the British Mountains*	1824
Charles Cooke	*The Tourist's and Traveller's Companion*	1827
Nathaniel H. Carter	*Letters from Europe*	1827
Edward Baines	*A Companion to the Lakes*	1829
Samuel Leigh	*Leigh's Guide to the Lakes and Mountains*	1830
John Ruskin	*Iteriad; or, Three Weeks Among the Lakes*	1830–1832
John Bree	*Saint Herbert's Isle: A Legendary Poem*	1832
John Robinson	*Views of the Lakes in the North of England*	1833
W. Wordsworth	*Guide through the District of the Lakes*	1835
James Thorne	*Rambles by Rivers*	1844
Charles Mackay	*The Scenery and Poetry of the English Lakes*	1846
A. C. Gibson	*The Old Man*	1849
[Anonymous]	*Keswick and its Neighbourhood: A Hand-book*	1852
James F. Clarke	*Eleven Weeks in Europe*	1852
[Anonymous]	*Black's Shilling Guide to the English Lakes*	1853
N. Hawthorne	*English Notebooks*	1855
Harriet Martineau	*A Complete Guide to the English Lakes*	1855
[Anonymous]	*The English Lakes*	1859
Edwin Waugh	*Over Sands to the Lakes*	1860
Harriet Martineau	'The Lights of the English Lakes'	1861
Edwin Waugh	*Rambles in the Lake Country and its Borders*	1861
William Dickinson	*Cumbriana: or Fragments of Cumbrian Life*	1875
Ellis Yarnall	'Walks and Visits in Wordsworth's Country'	1876
Henry Frith	'Wanderings in Wordsworthshire'	1881
John Burroughs	'In Wordsworth's Country'	1884
C. N. Williamson	'The Climbs of the English Lake District'	1884
W. G. Collingwood	*Coniston Tales*	1889
F. A. Malleson	*Holiday Studies of Wordsworth*	1890
Samuel Barber	*Beneath Helvellyn's Shade: Notes and Sketches*	1892
Herbert Rix	'Down the Duddon with Wordsworth'	1893
M. J. B. Baddeley	*Black's Shilling Guide to the English Lakes*	1900