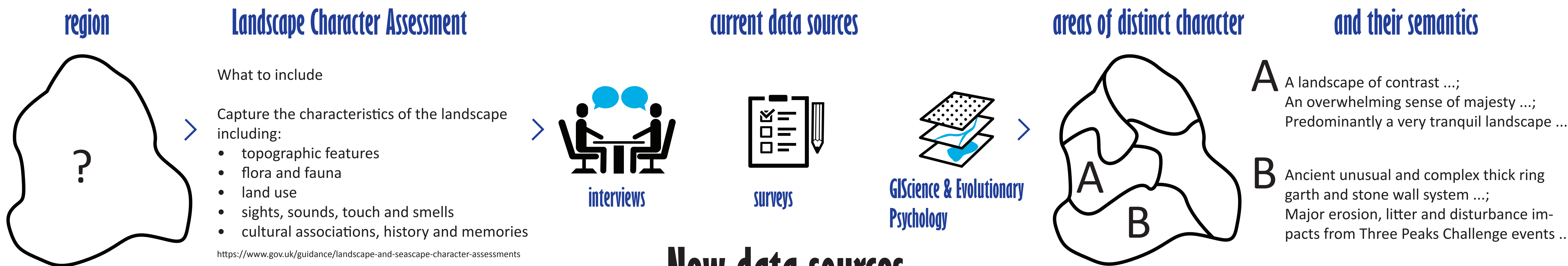# Extracting landscape properties from text

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Requirements

region

?

Landscape Character Assessment

What to include

Capture the characteristics of the landscape including:
• topographic features
• flora and fauna
• land use
• sights, sounds, touch and smells
• cultural associations, history and memories

https://www.gov.uk/guidance/landscape-and-seascape-character-assessments

current data sources

interviews

surveys

GIScience & Evolutionary Psychology

areas of distinct character

A
B

and their semantics

A A landscape of contrast ...;
An overwhelming sense of majesty ...;
Predominantly a very tranquil landscape ...

B Ancient unusual and complex thick ring garth and stone wall system ...;
Major erosion, litter and disturbance impacts from Three Peaks Challenge events ...

New data sources

advantages

• in situ observations
• large territories are covered
• possibility to "travel back in time"
• possibility to compare different seasons

• availability of perceived information as opposed to absolute measures
• availability of information about different concepts related to landscapes (e.g. wilderness, tranquillity)

After the Storm I passed on & came to a great Peat Road, that wound down a hill, called Maddock How, & now came out upon the first cultivated Land which begins with a Bridge that goes over a Stream, a Waterfall of considerable height & beautifully wooded above you, & a great water-slope under you/ the Gill down which it falls, is called Scale Gill -& the Fall Scale Gill Force.

Samuel Coleridge, 1802

The road up to Coignafearn Lodge, closed to motorists, provides a wonderful easy walk in the wildest scenery.

Oliver Dixon, 2010

Whelter Bottom is a wide corrie which drains into Haweswater. Today it was occupied by many deer and the sound of the stags' roaring could be heard from up here. Across the lake/reservoir are the rounded summits of Branstree (right) and Selside Pike.

Karl and Ali, 2012

historical letters, guidebooks and travel diaries

crowdsourcing, gamification

I reached the wide valley that holds Bleaberry Tarn, and behind which rises the line of peaks including Red Pike, High Stile and High Crag. Looking to my east and north, all I could see were white mountains...
From a black rock wall spilled a waterfall which was only part frozen: a hard portcullis of ice, beautifully mottled by dark figures of thaw, and water falling from it...
The shoreline forest, as I came back through it, was busy with birdsong.

Robert Macfarlane, 2007

The next morning we woke early and climbed up a wooded hill called Castlehead to a great view point which afforded absolutely stunning views over Derwent Water... As we drifted back towards Keswick we were distracted by signs for a stone circle. I know what you are thinking 'could it really beat stone henge'? Well, actually it kind of could!! And unlike stone henge it felt like you were in the middle of nowhere and had more of a mystical feel to it, especially at sunset.

"KristiMartin", 2009

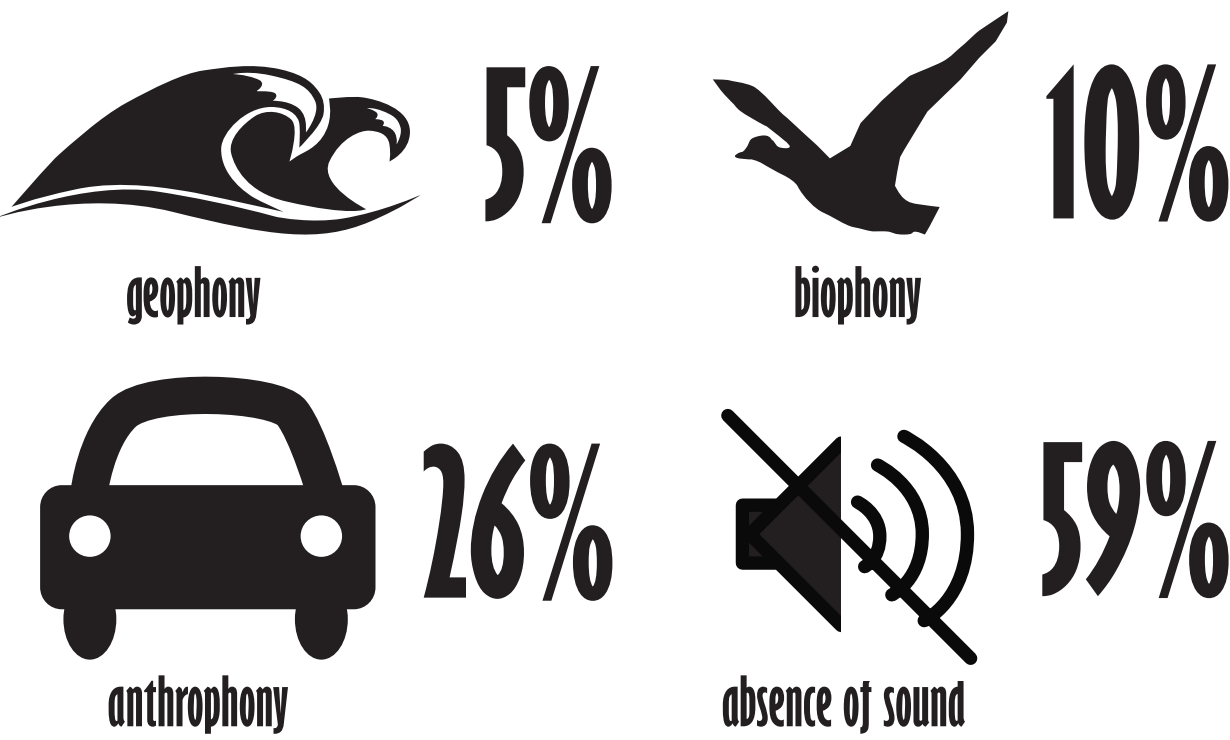**contemporary nature writing**

travel blogs

ca. 9000 descriptions related to sound perception are available in the corpus of the crowdsourced descriptions of photographs (0.25% of the corpus in total)

Chesnokova and Purves 2018

• Natural Language Processing (tokenisation, lemmatisation, part of speech tagging, word sense disambiguation)
• Machine Learning
• Sentiment Analysis

we see that what is meant by quietness in landscape descriptions has undergone a significant shift between 19th and 21st centuries where the number of descriptions of disturbing anthropogenic noises has increased
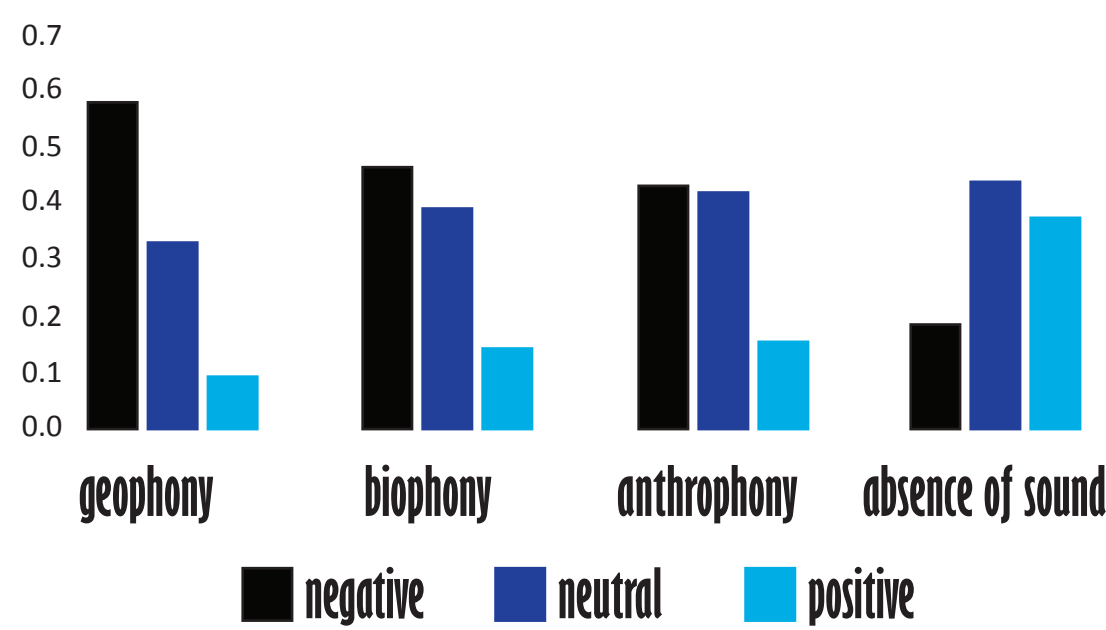
Types of sound emitters extracted from descriptions

geophony 5%
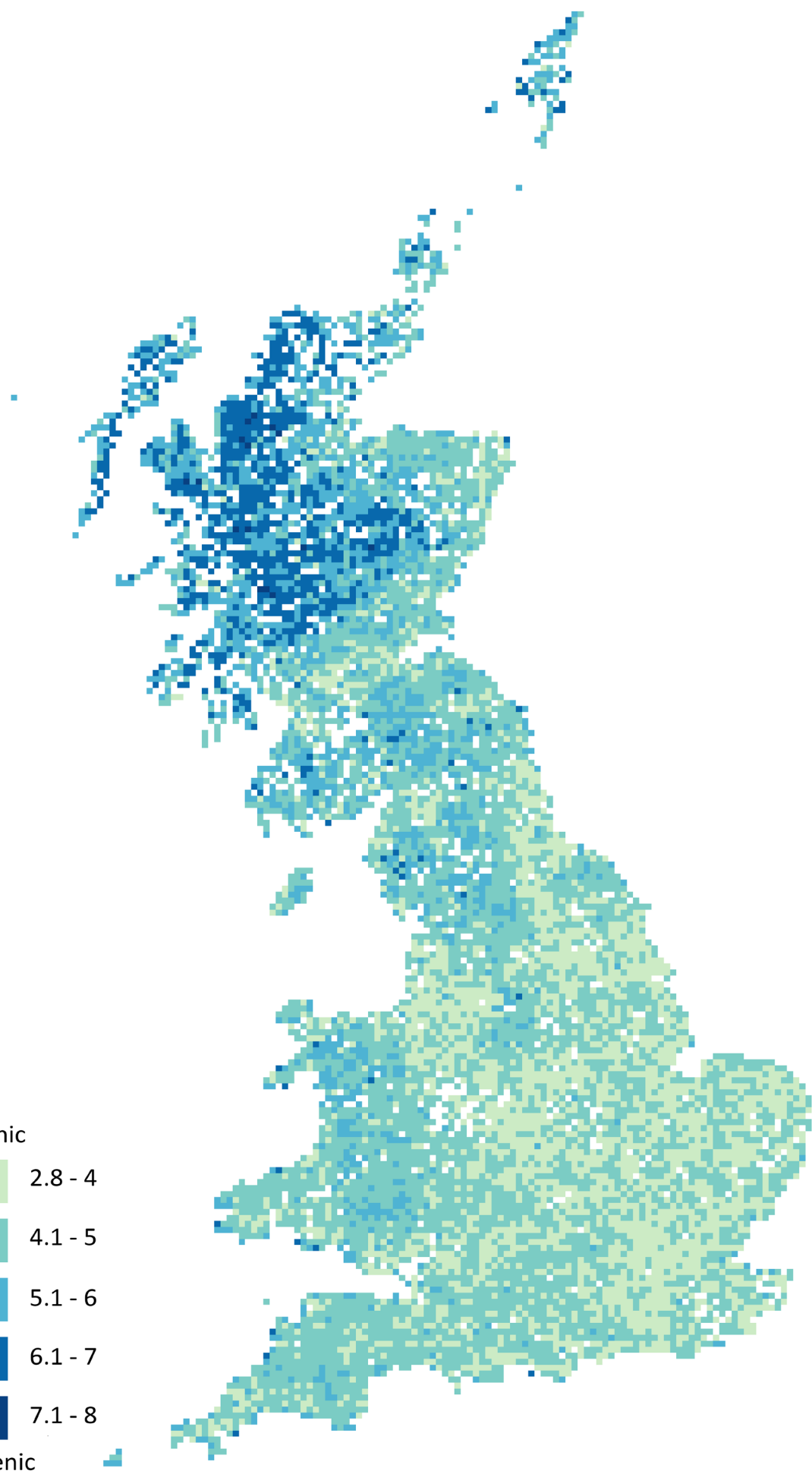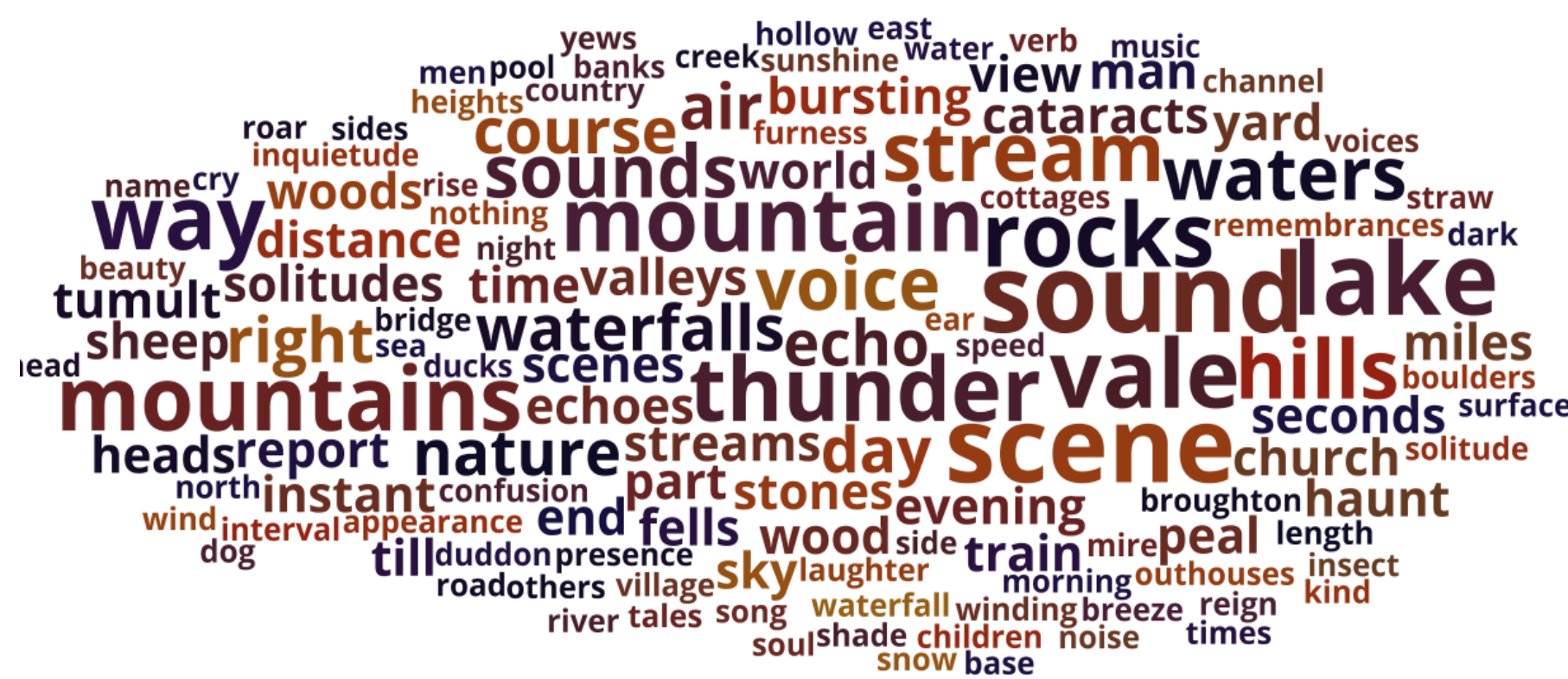biophony 10%
anthrophony 26%
absence of sound 59%

52% of variance in visual landscape preference can be explained by a language-based model

Chesnokova et al. 2017

150 most frequent nouns contrasted with silence

historical corpus

modern corpus

Example

• Geophony
• Biophony
• Anthrophony
• Absence of sound

Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Proportion of descriptions according to sentiment values

geophony   biophony   anthrophony   absence of sound

■ negative   ■ neutral   ■ positive

not scenic
2.8 - 4
4.1 - 5
5.1 - 6
6.1 - 7
7.1 - 8
very scenic

References and sources

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Chesnokova, O. and Purves, R.S., 2018. From image descriptions to perceived sounds and sources in landscape: Analyzing aural experience through text. Applied Geography, 93, 103–111.
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