

THE
HIKE
THROUGH
THE TERMS
SURROUNDING
REFORESTATION

D E N -
S I T Y
G N +



POLITECNICO
MILANO 1863

SCHOOL OF DESIGN

FINAL SYNTHESIS DESIGN STUDIO
LM in Communication Design
Sez. C3 — 2022/2023

GROUP 03

Lost in the woods: a hike through the terms surrounding reforestation

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INTRO

With the threat of climate change growing day by day, our responsibility to care for our planet is more important than ever. This is where reforestation comes into play. The topic is connected to a range of practices adapted to solving environmental problems, from restoring habitats to replanting acres of damaged woodland. However, due to these varying methods, a branching canopy of terms emerges.

The aim of this investigation is to determine how these practices are connected, their growth overtime, and which factors affect our associations to them. To conduct this analysis, three platforms were mainly used, Wikipedia, Google Trends and Google Images, to collect data and build findings.

The following research expands on reforestation terms to find related topics using Wikipedia, allowing for the creation of network graphs which highlight connections and clusters between the data gathered. Google Trends was used to reveal the search trends of terms over time. Their popularity and how it fluctuates is shown, along with events and patterns that cause these changes. By analysing Google Image results, the way terms are visually portrayed is investigated. This reveals usage of common tropes they share, or imagery unique to them.

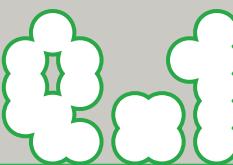
INDEX

pag.01

TERMS

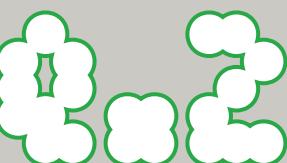
pag.06

Which are the Wikipedia pages related to the concept of reforestation?



pag.21

How have the terms associated to reforestation evolved overtime according to Google Trends?



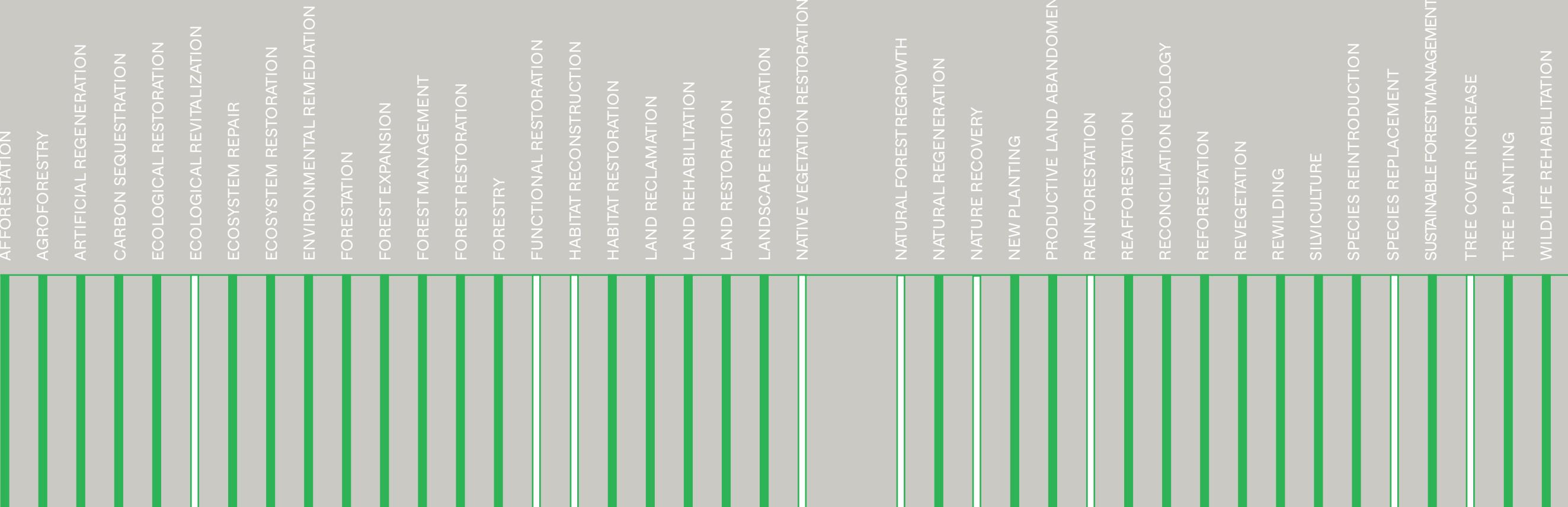
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How are the terms associated to reforestation represented on Google Images?

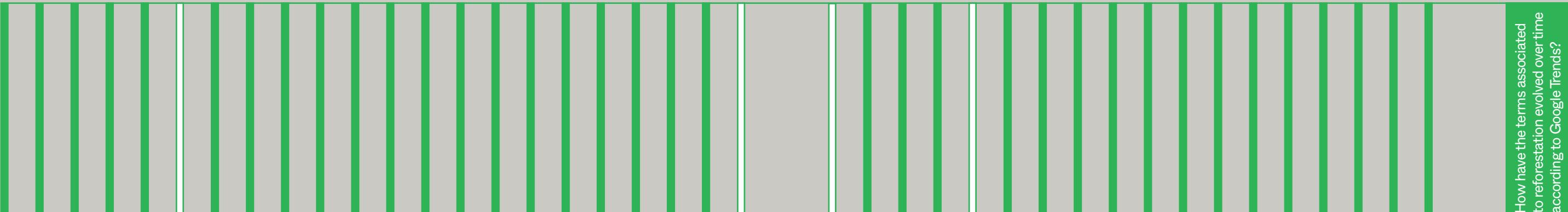


TERMS

THE TERMS OF REFORESTATION

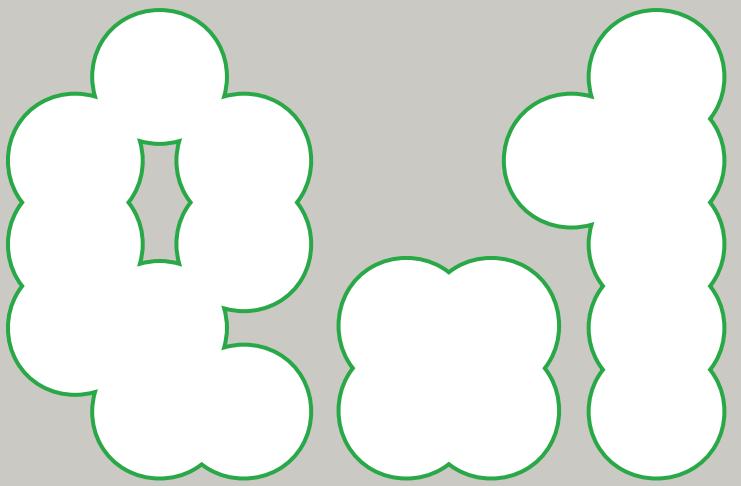


Which are the Wikipedia pages related to the concept of reforestation?



How are the terms associated to reforestation represented on Google Images?

focus: TERMINOLOGY

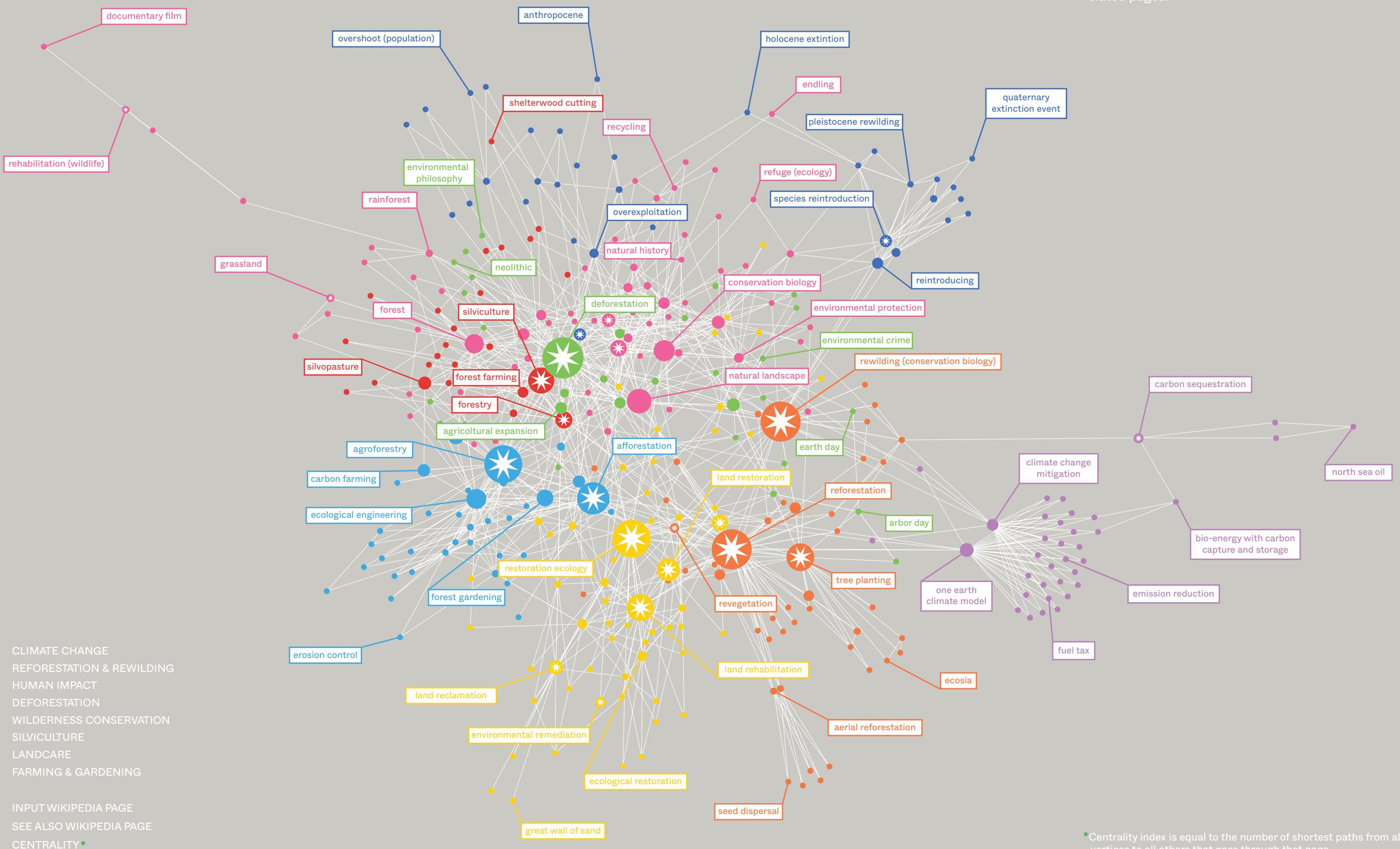


WHICH ARE THE WIKIPEDIA PAGES RELATED TO THE CONCEPT OF REFORESTATION?

We began our research by investigating the broader web of topics surrounding reforestation. We used Seealsoology to find pages that are off-shoots and logical links between our terms on Wikipedia. This allowed for the creation of a network of interconnected concepts, which is explored through this first research question.

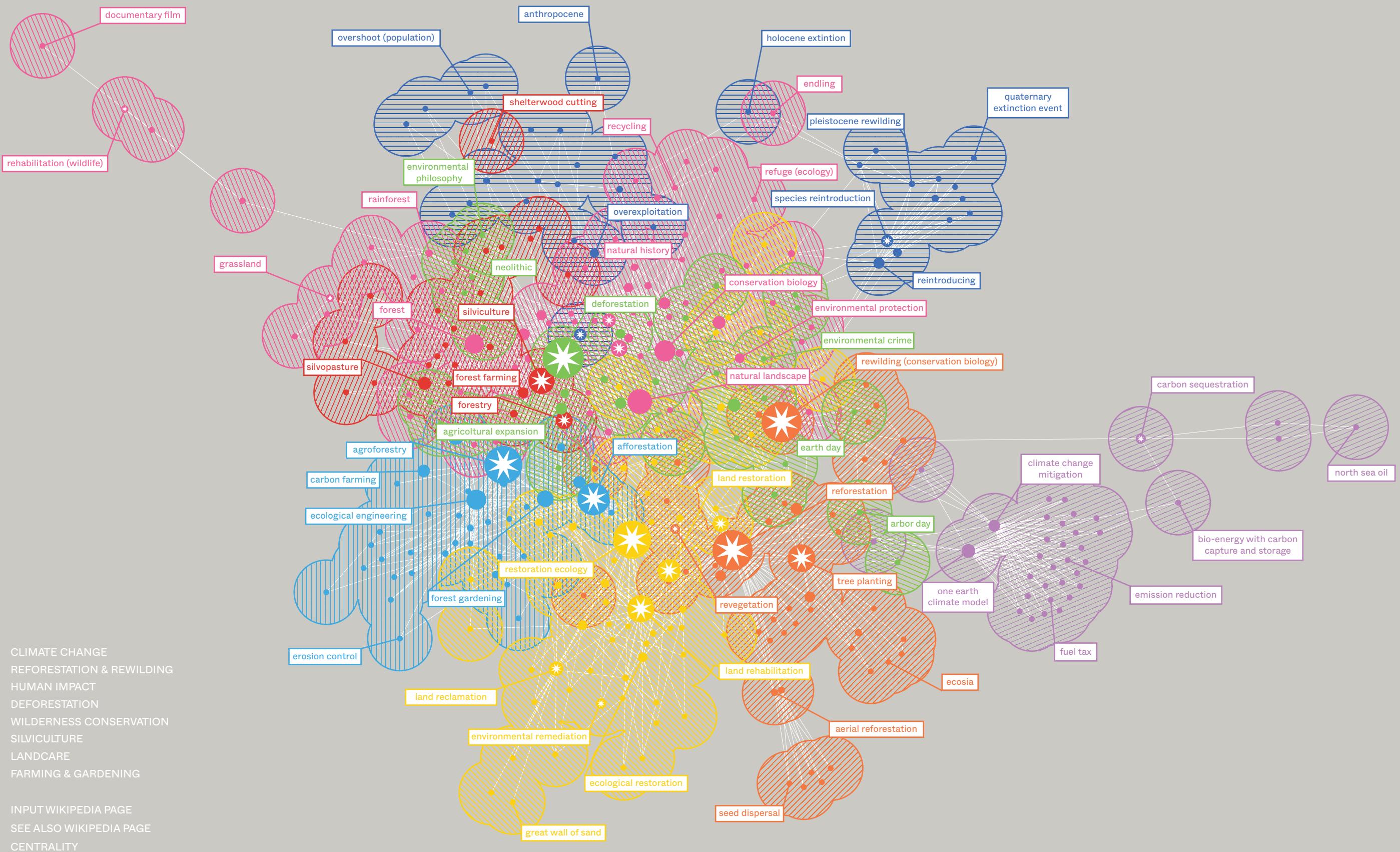
RELATED PAGES NETWORK

This network map shows the input terms on Seealosology and their *See also* connected pages on Wikipedia and a further layer of *See also*. Gephi's community detection algorithm was used to organise the pages, which allowed us to name clusters based on the topics of closely related pages.



CLUSTERS & GEOGRAPHY

There are 346 pages related to reforestation that we divided into 8 interconnected clusters. The climate change cluster is further from the core and only connected by two pages, the cluster regarding negative human impact is isolated, and pages associated with documentaries and animal shelters stretch out to the top left.

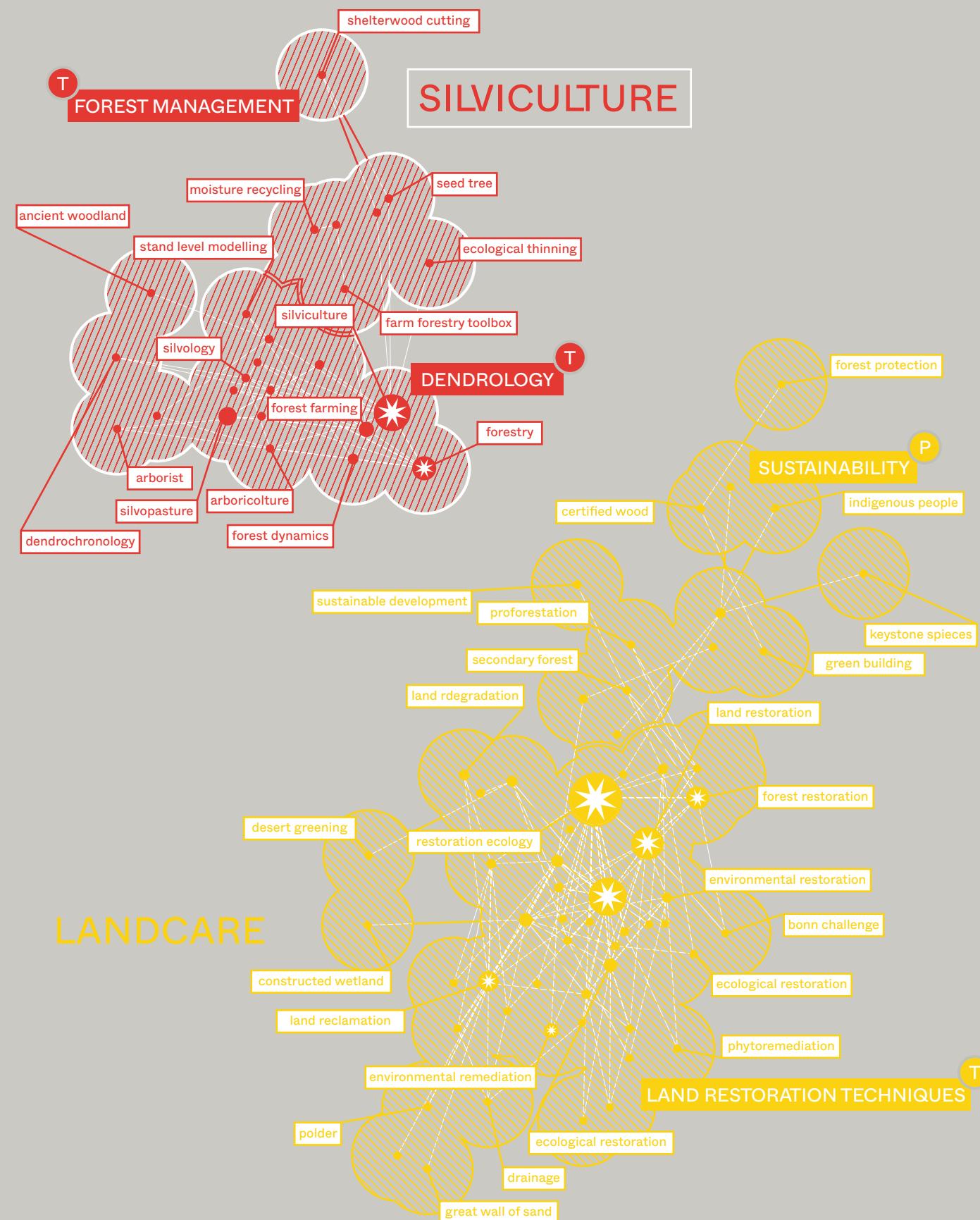
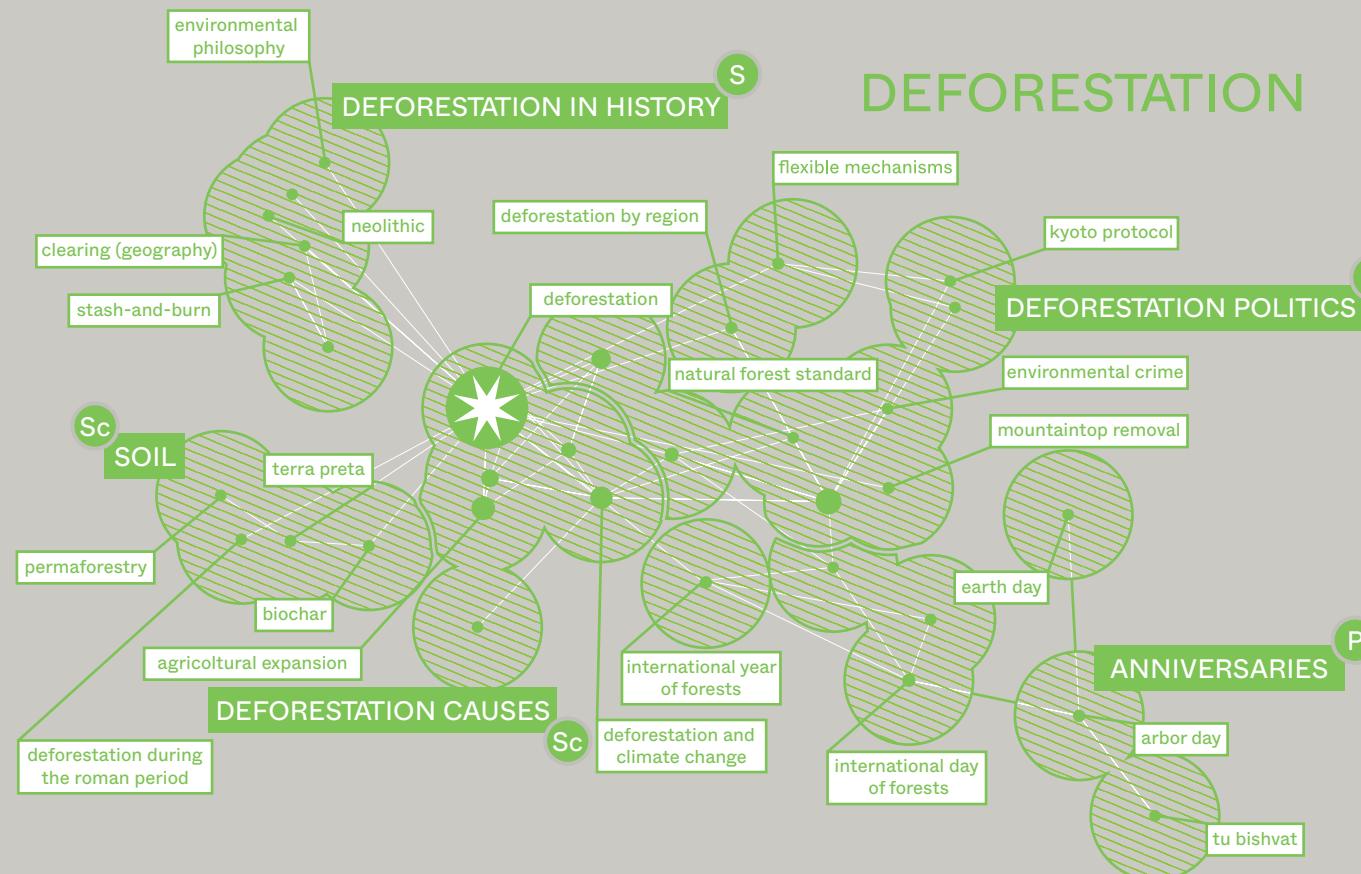


CLUSTERS' TOPICS

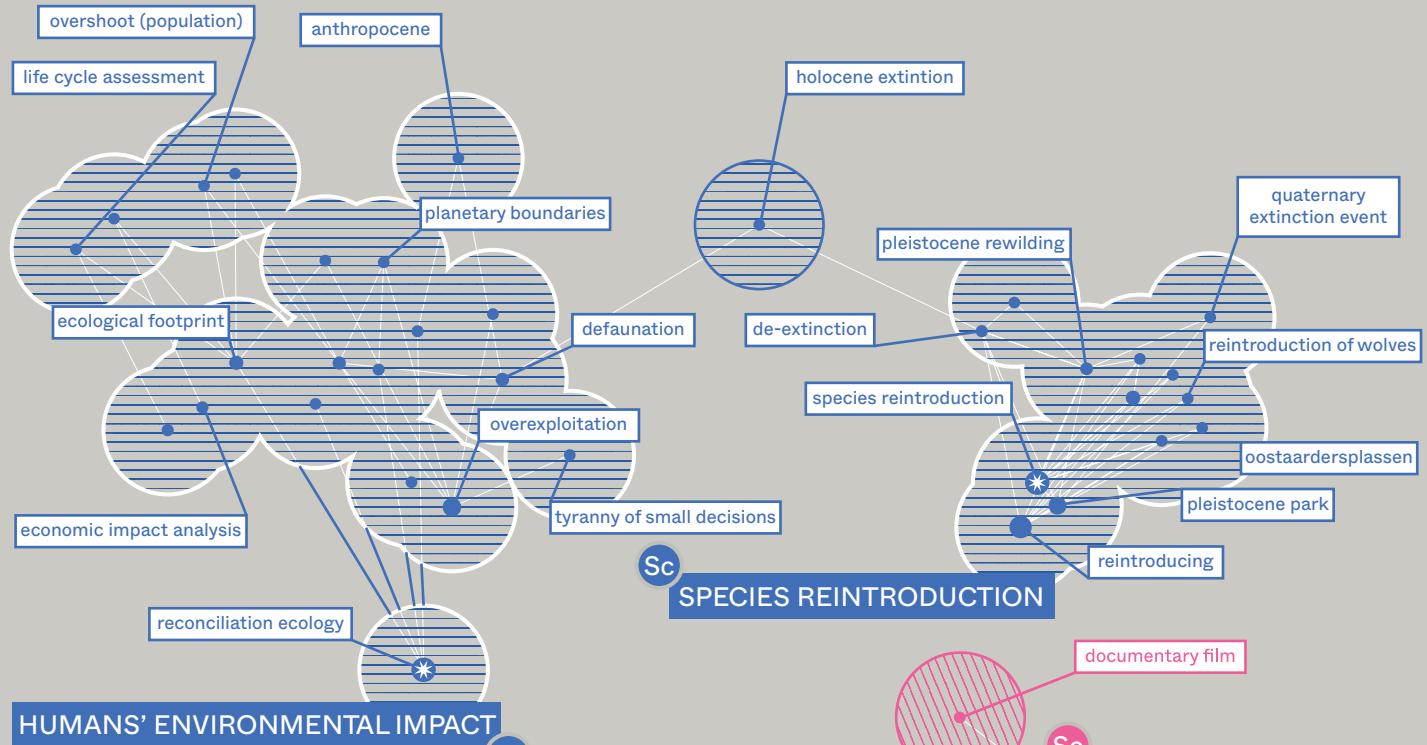
RECURGENCY

Analysis of the pages show they refer to four general categories: politics, science, technology, and social issues. These categories can be used to subcluster the main clusters. "Silviculture" and "Farming & Gardening" clusters only contain technology related pages.

- S SOCIAL ISSUES
- T TECHNOLOGIES
- Sc SCIENCE
- P POLITICS

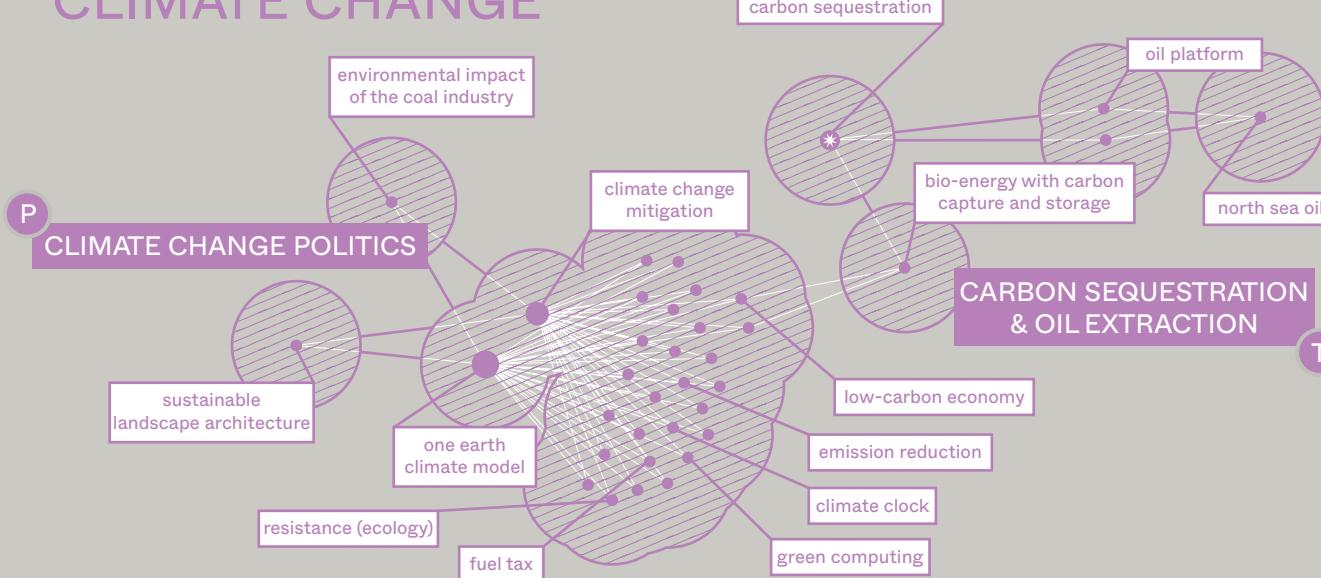


CLUSTERS' TOPICS UNIQUENESS



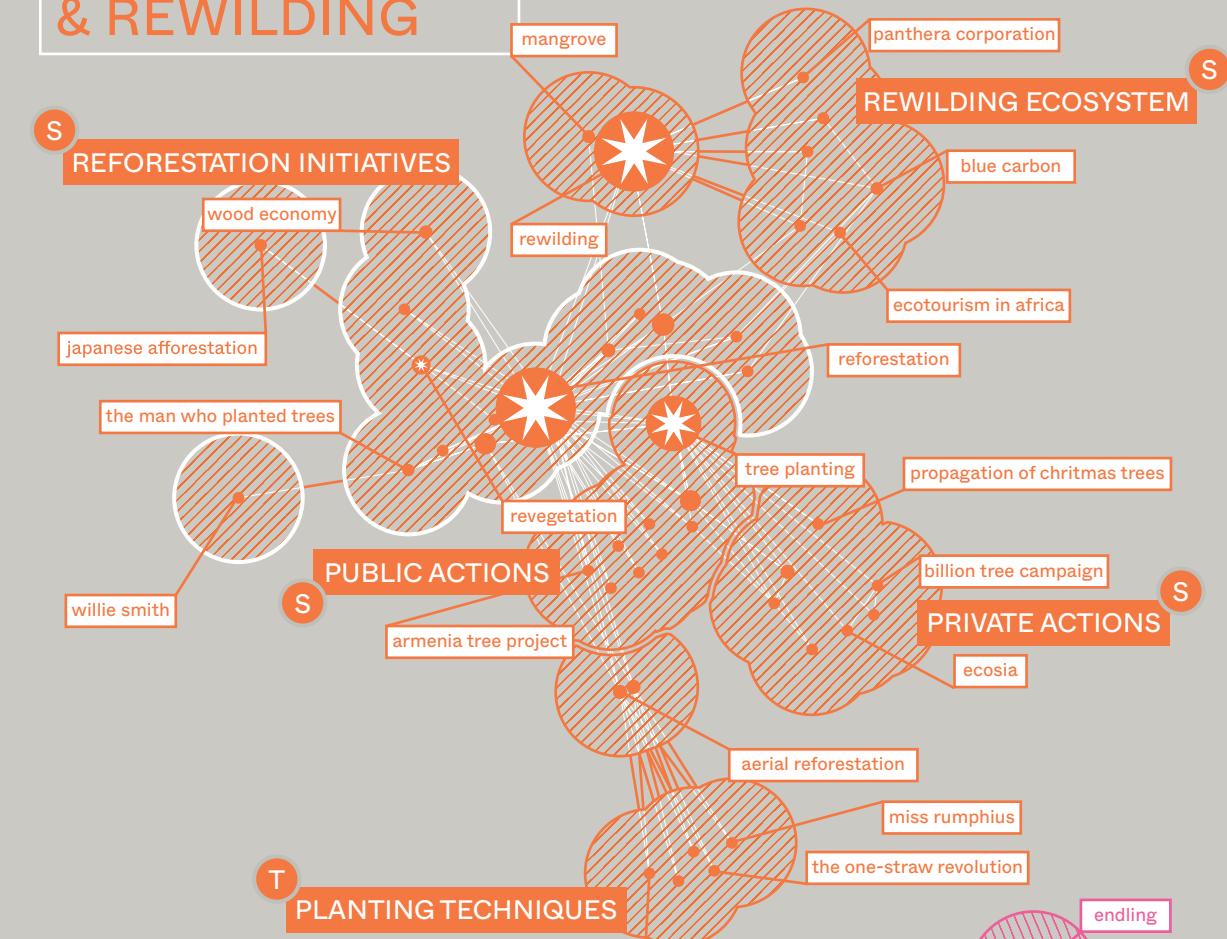
HUMAN IMPACT

CLIMATE CHANGE

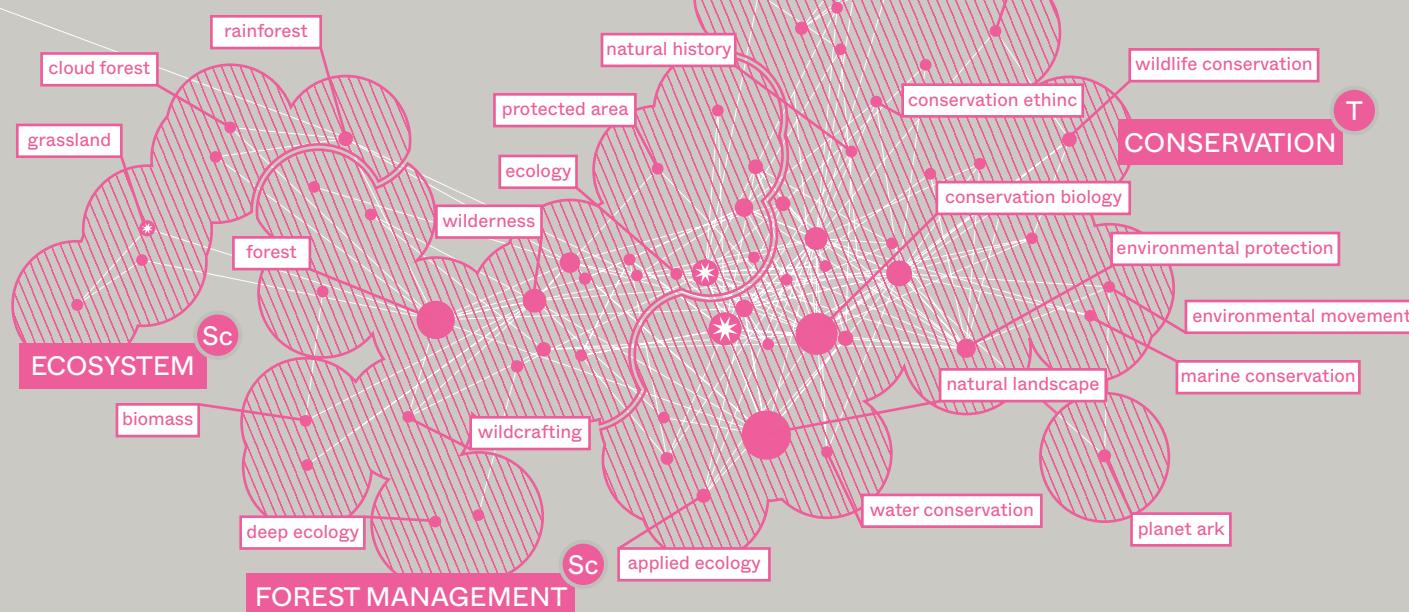


The "Human Impact" cluster is divided into two subclusters, one for positive impacts and the other for negative. Reforestation and rewilding is the only cluster containing famous figures, projects and books related to the field.

REFORESTATION & REWILDING

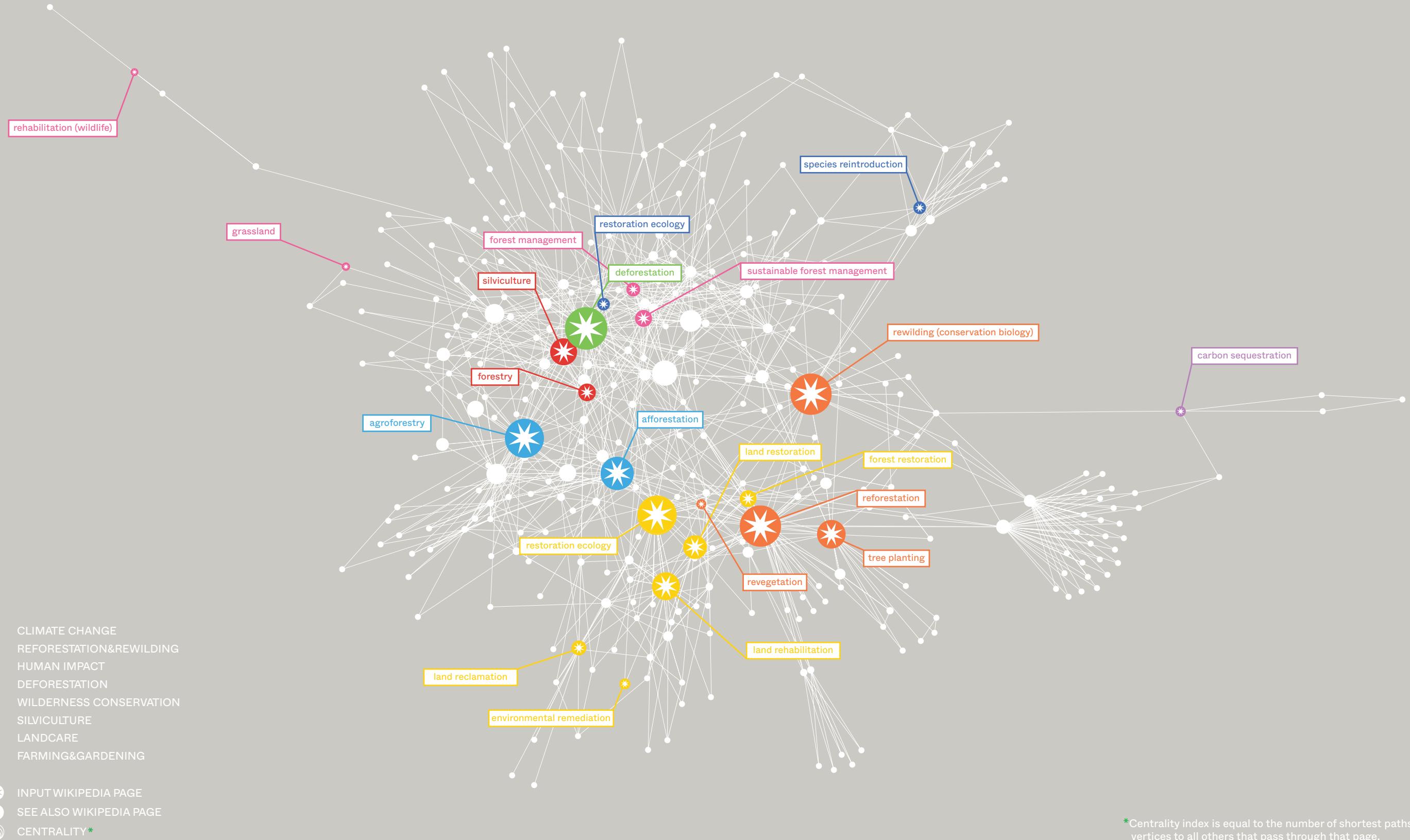


WILDERNESS CONSERVATION

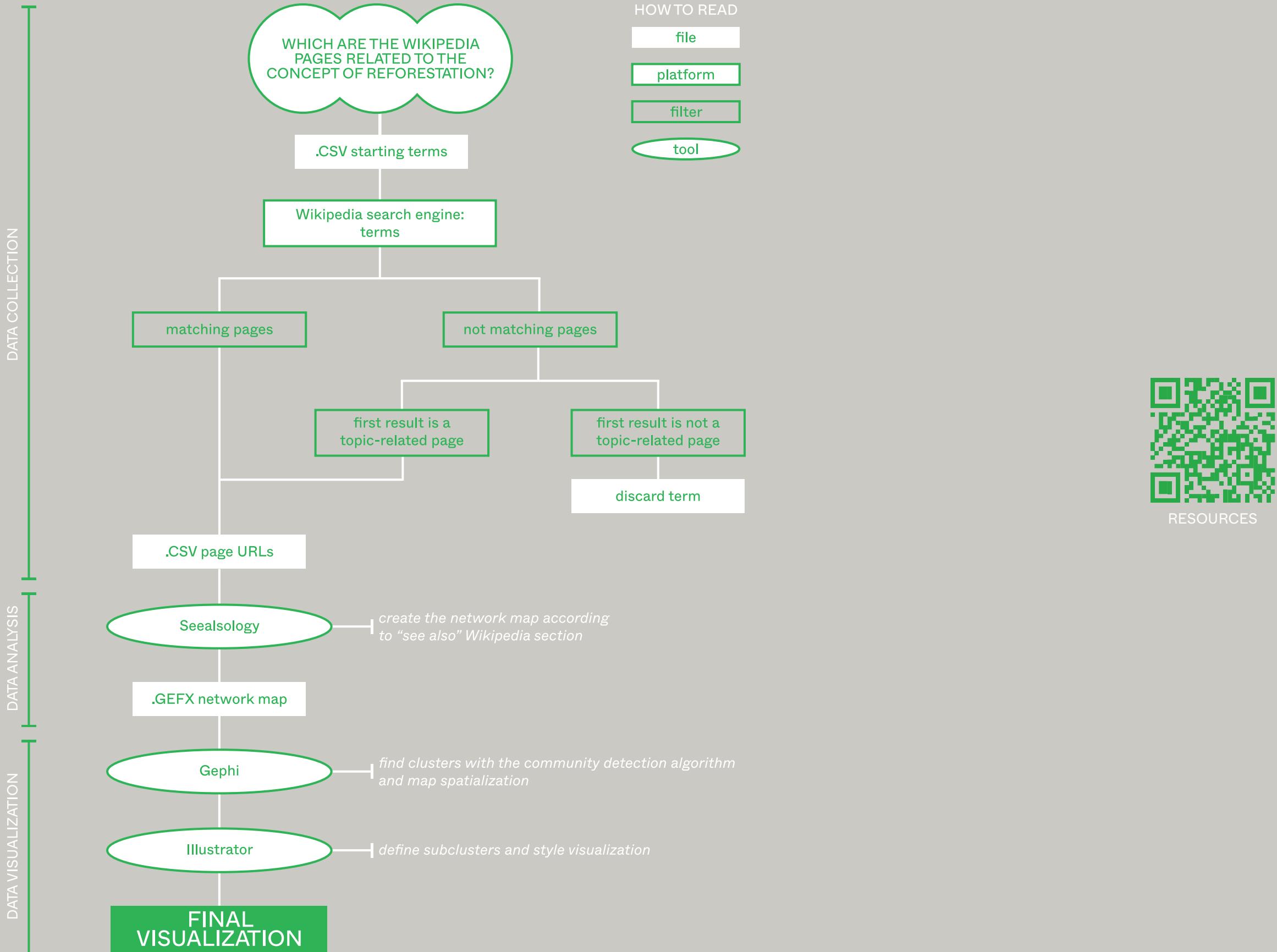


INPUT PAGES CENTRALITY

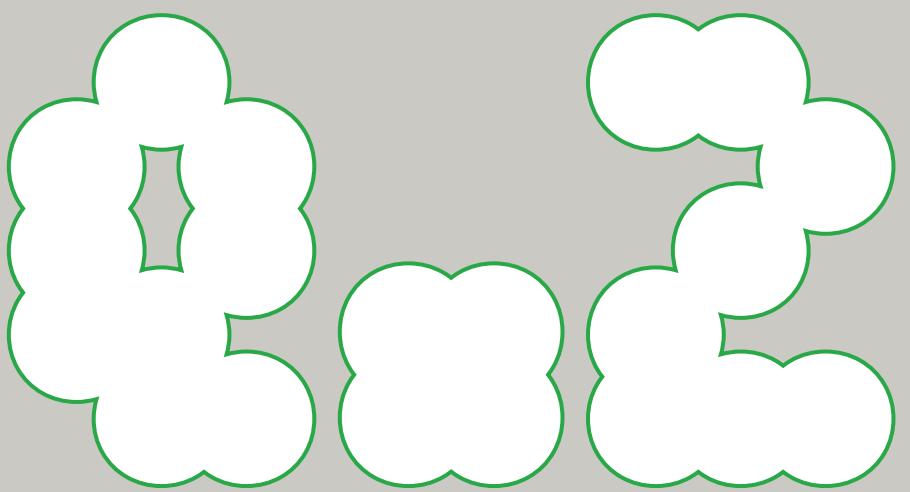
Here we see the centrality between pages, which is an indicator of their position in the network. The pages with higher centrality, and therefore closer to the network core, are mainly our input terms. However, there are input pages further from the core which may indicate they are more niche, due to them having less links to central pages whose topics seem to be more mainstream.



RESEARCH PROTOCOL



focus: TIME



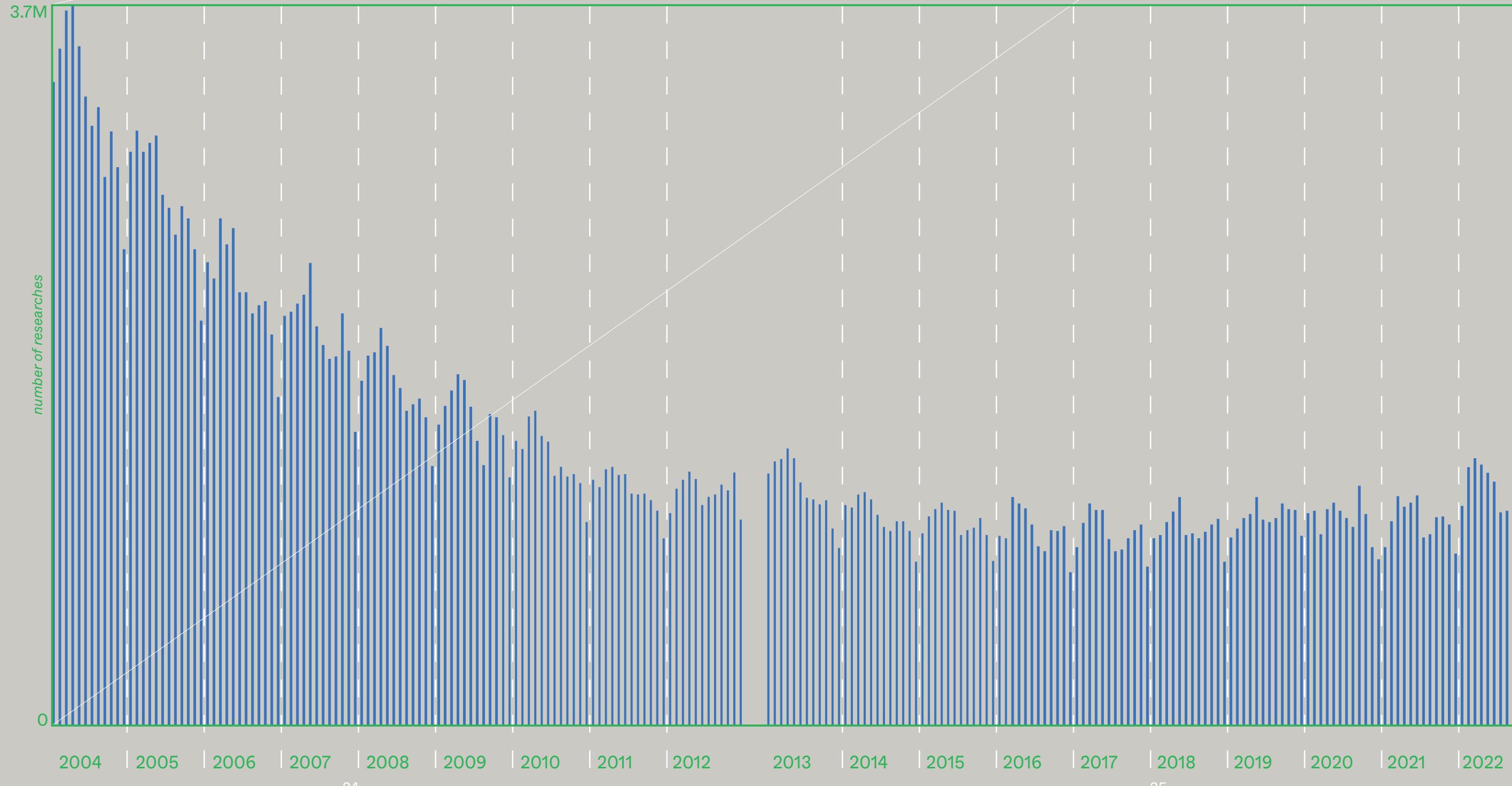
HOW HAVE
THE TERMS
ASSOCIATED TO
REFORESTATION
EVOLVED OVER
TIME ACCORDING
TO GOOGLE
TRENDS?

Question two uses Google Trends data to analyze search volumes for the chosen terms, and show how interest in them changes over time. By doing this we were able to visualize how the trends have evolved from 2004 to 2022 and see whether there are changes in interest between the different reforestation terms.

SEARCH VOLUME TREND

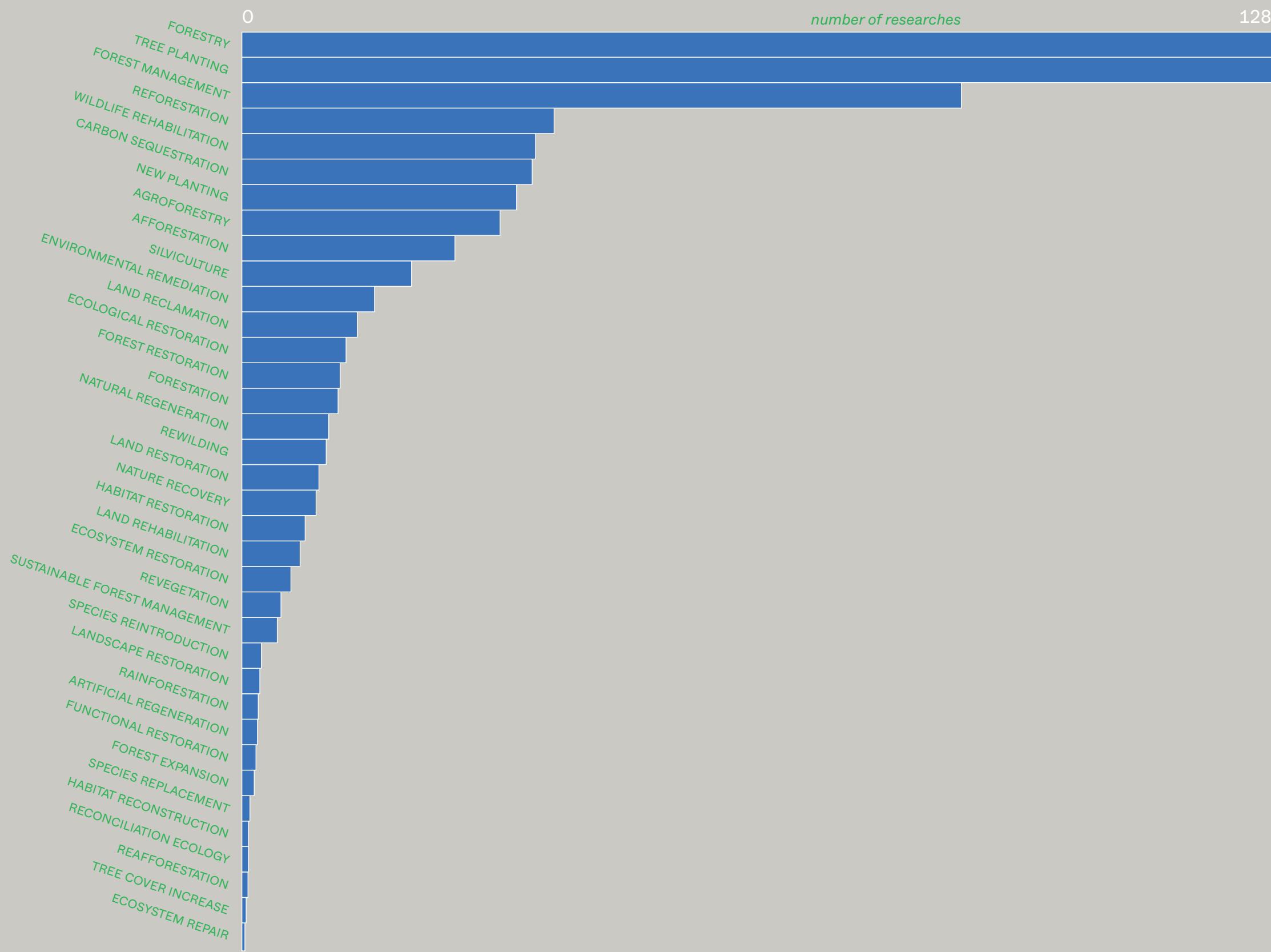
This visualization represents the overall search volumes for the combined terms. Data was collected from Google Trends on the search volume of each term for every month in the time frame 2004-2022. These volumes are summed up to show how interest in the general topic changes over time.

The month with the highest search volume is April 2004 with 3.7 million searches.



AVERAGE SEARCH VOLUME RANKING

The analysis of the average search volumes for terms for the entire time frame 2004-2022 highlights how the searches for “Forestry” greatly exceed the searches for the other terms combined. Indeed, on average there are a total of 1.5 million searches per month, while it lowers to 599k excluding “Forestry”.





200k

300k

400k

500k



600k

700k

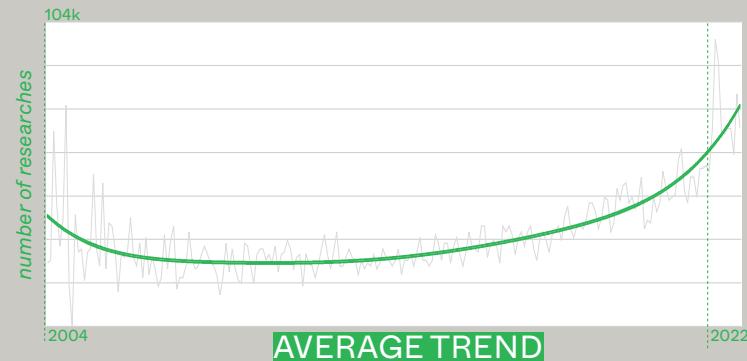
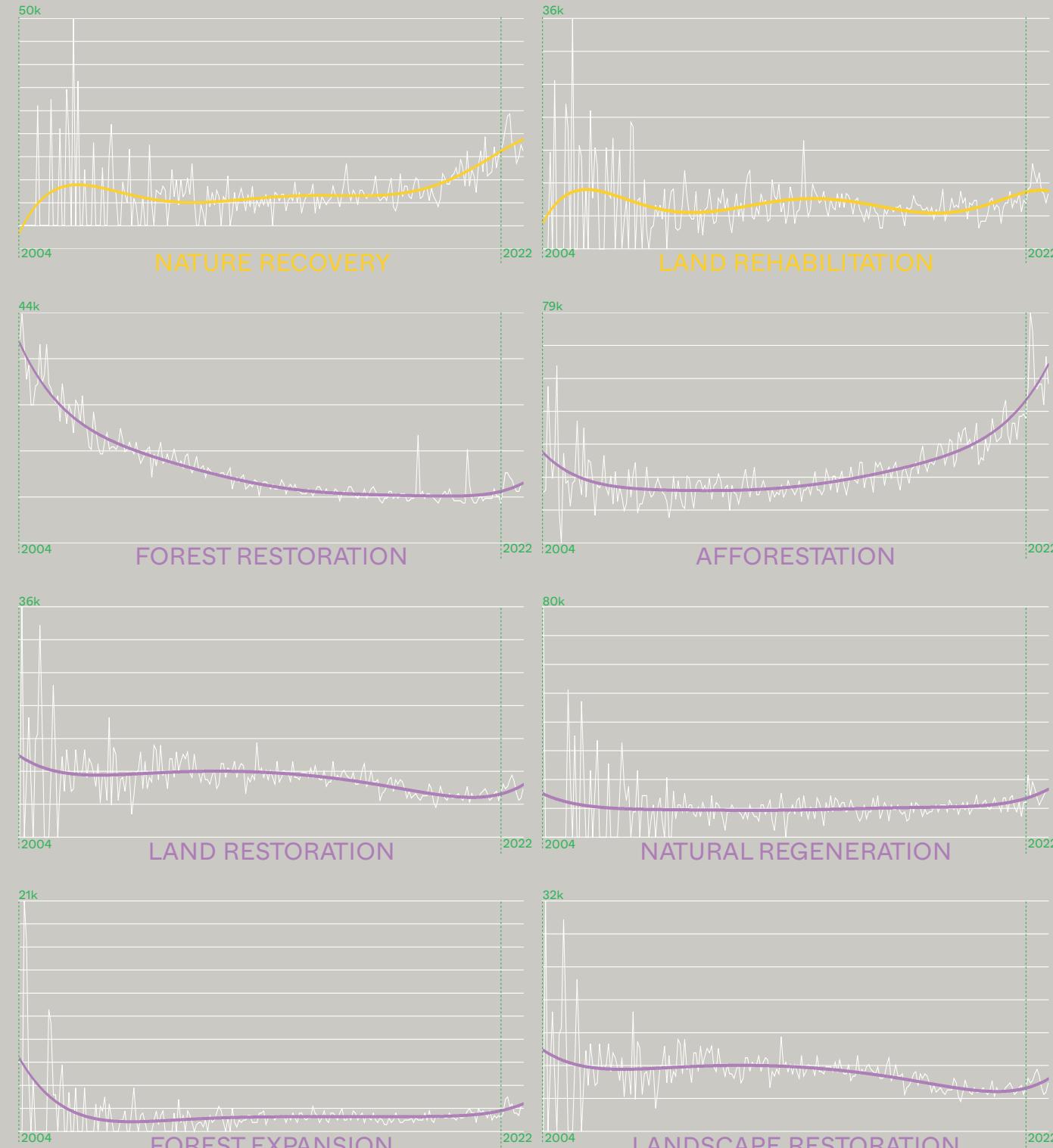
800k

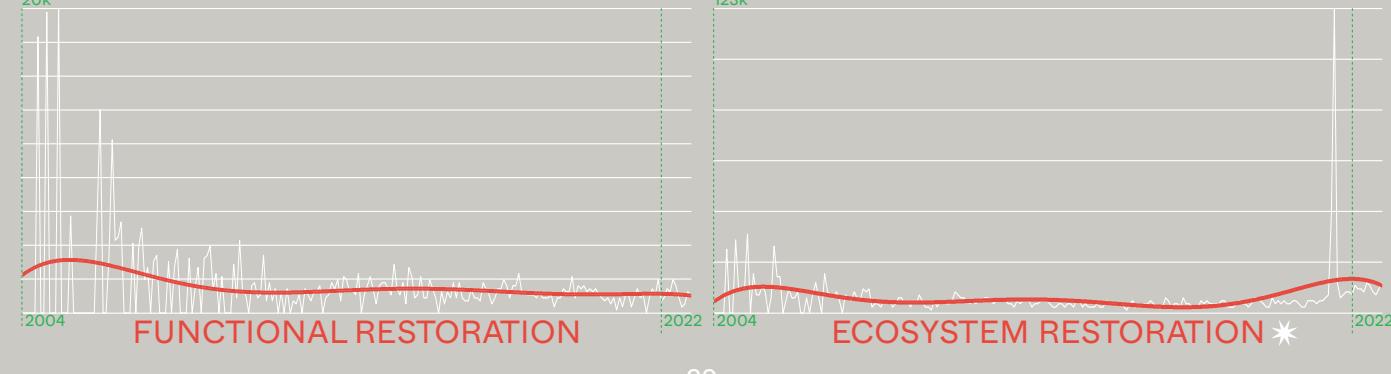
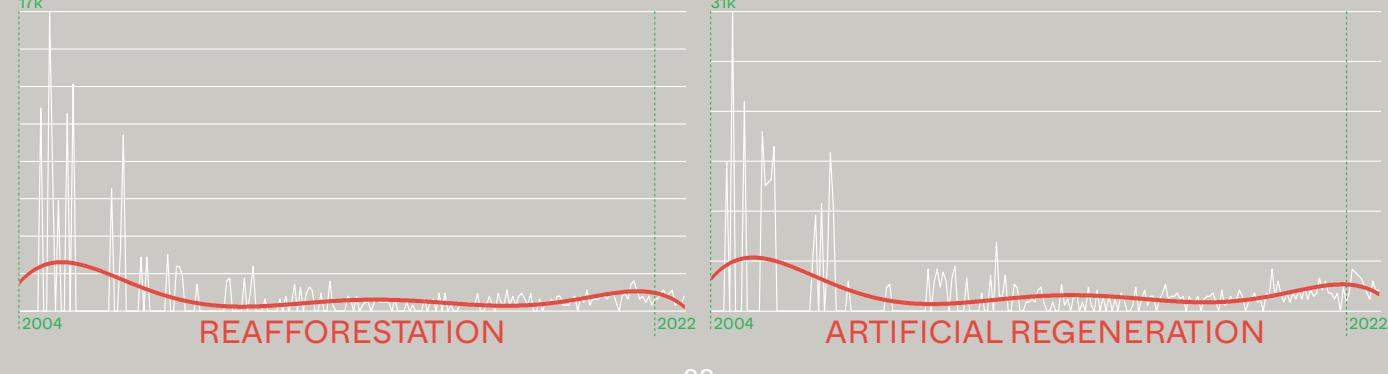
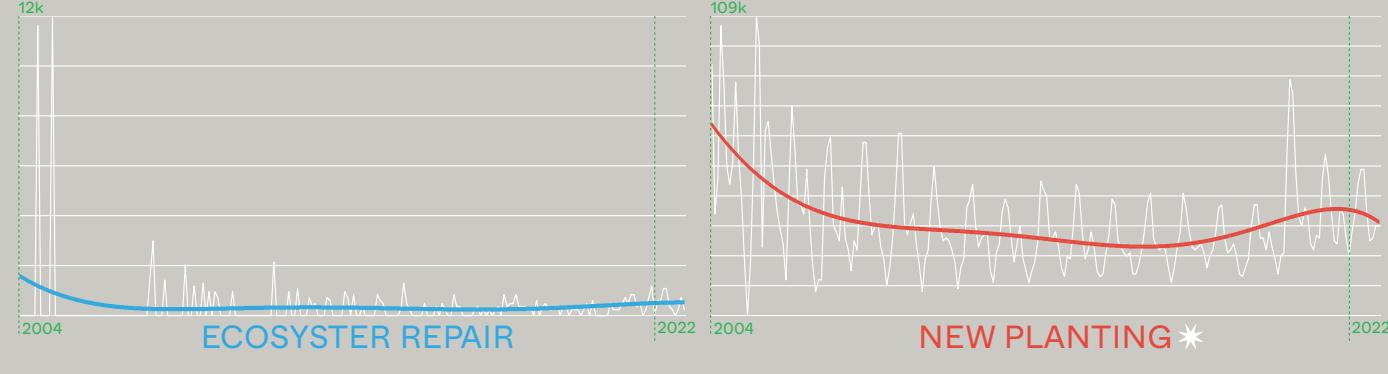
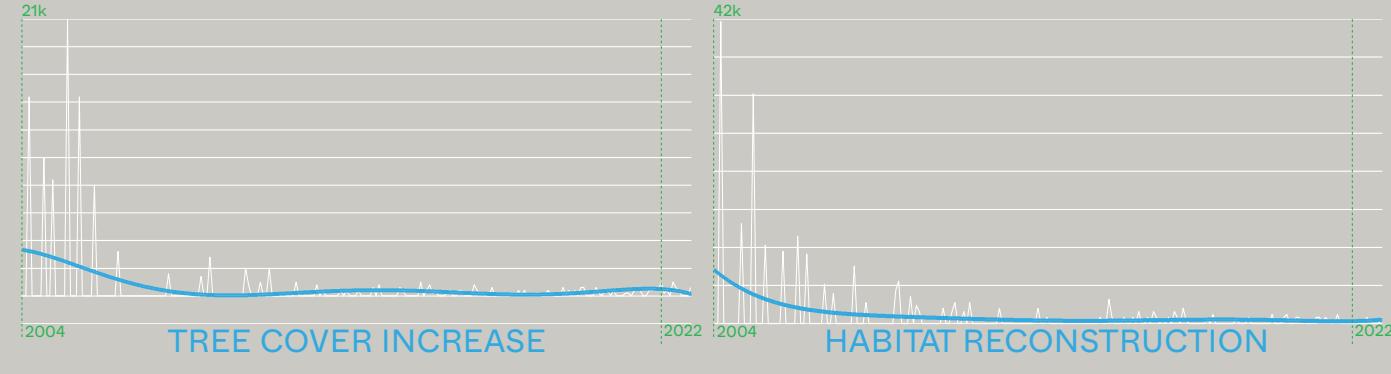
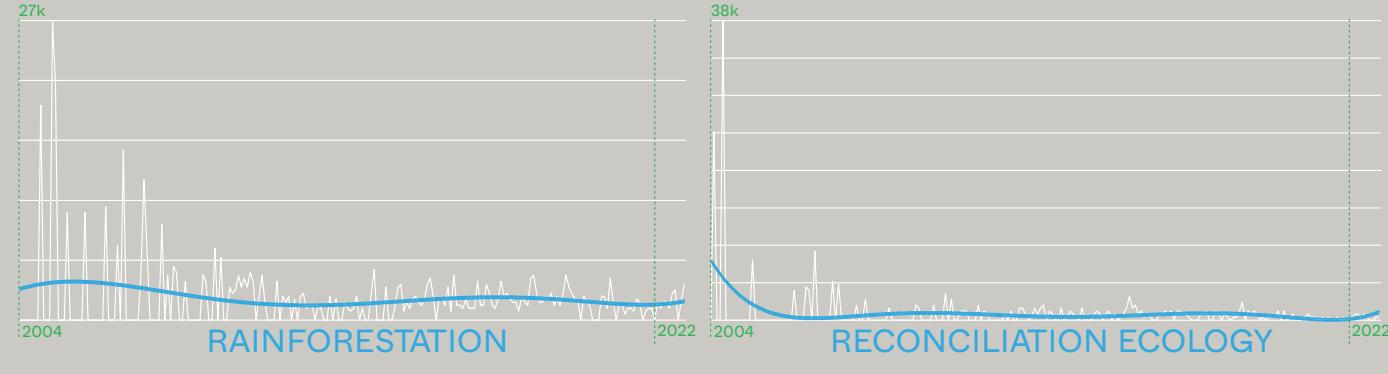
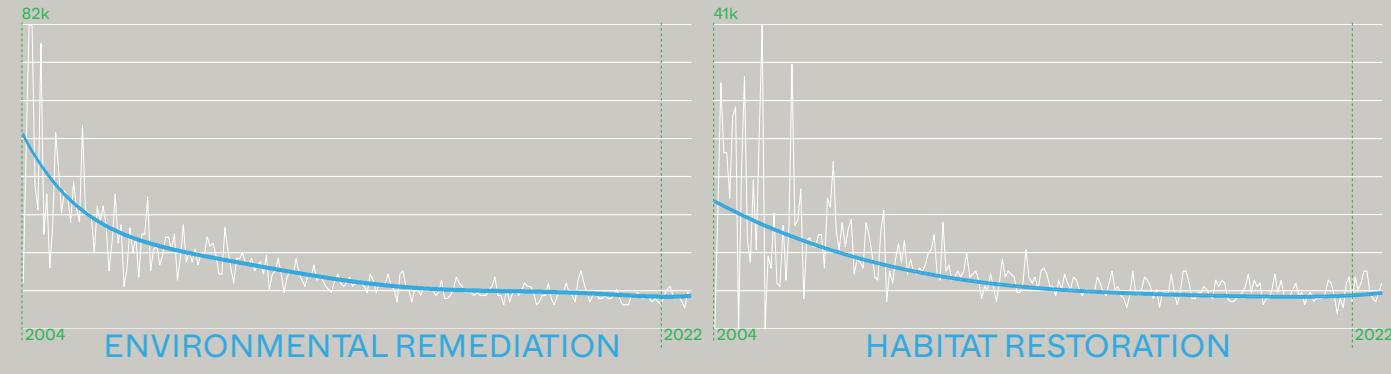
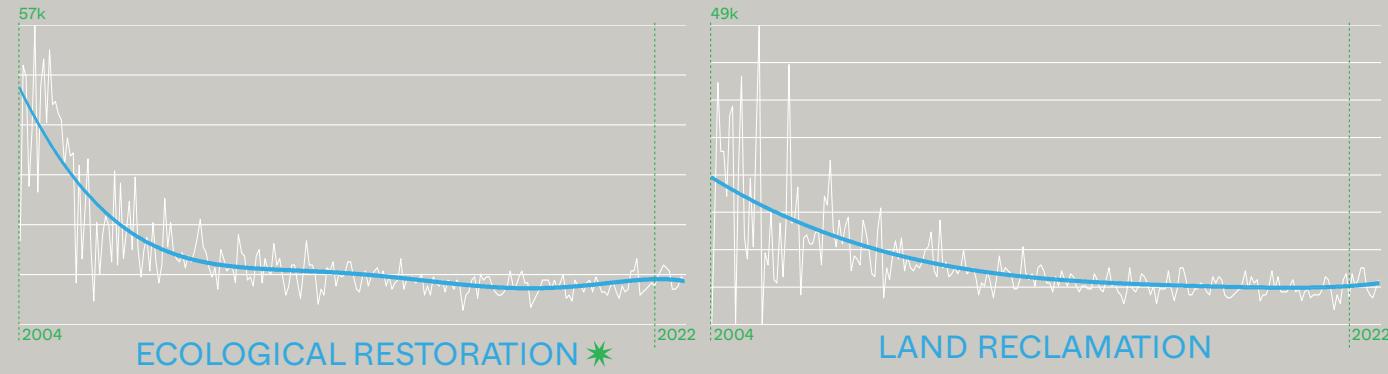
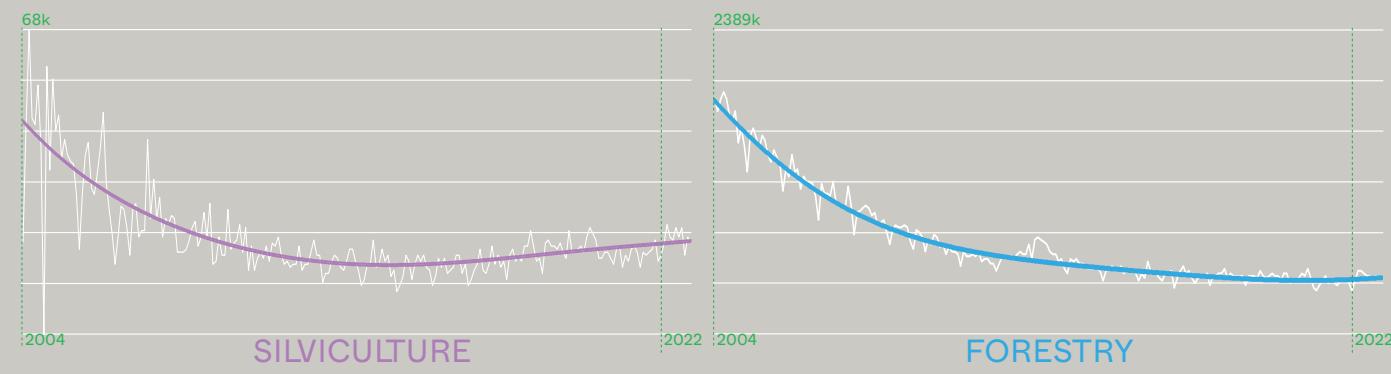
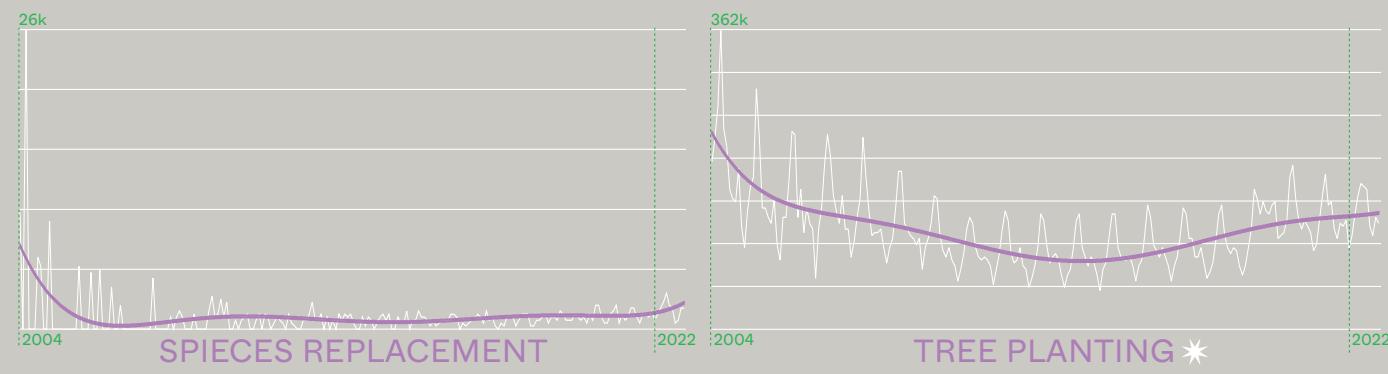
913k

SEARCH TREND AVERAGES

In this visualization terms are categorized into four groups based on similarities in their trend lines. The comparison shows that the interest was higher before the late 2000s but there are no common spikes between them. The average trendline (top right) presents a dip midway that then rises.

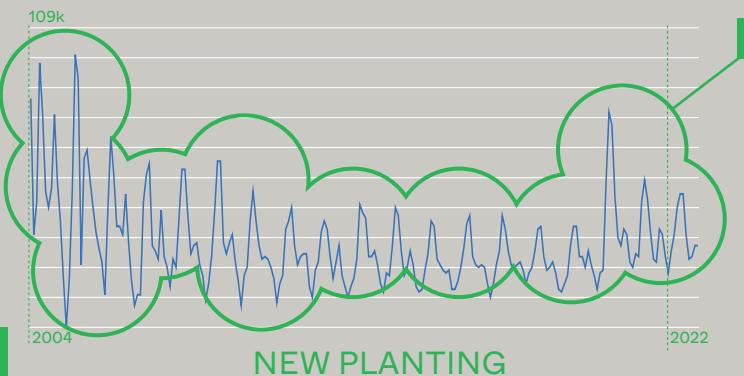
- $\uparrow \downarrow \uparrow$
- $\downarrow \rightarrow \uparrow$
- $\downarrow \rightarrow \rightarrow$
- $\downarrow \rightarrow \downarrow$
- * RECURRING PATTERNS
- * UNUSUAL SPIKES



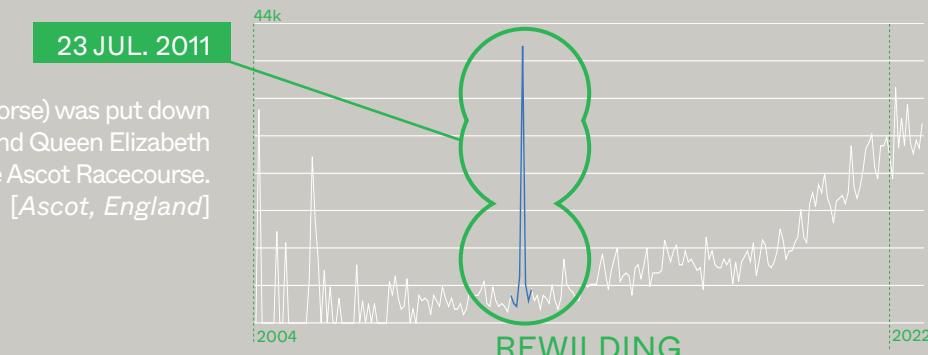
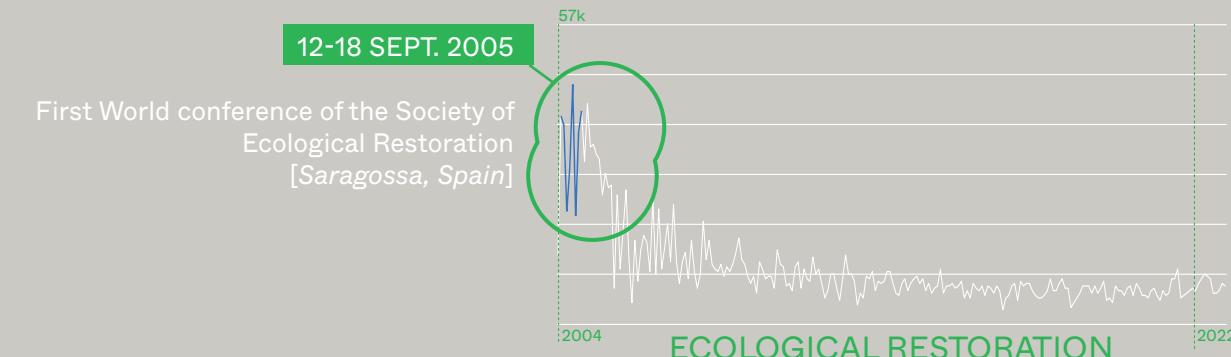


★ RECURRING PATTERNS

The observation of spikes in trend timelines unveiled that several terms have patterns of regular spikes that appear at yearly intervals.

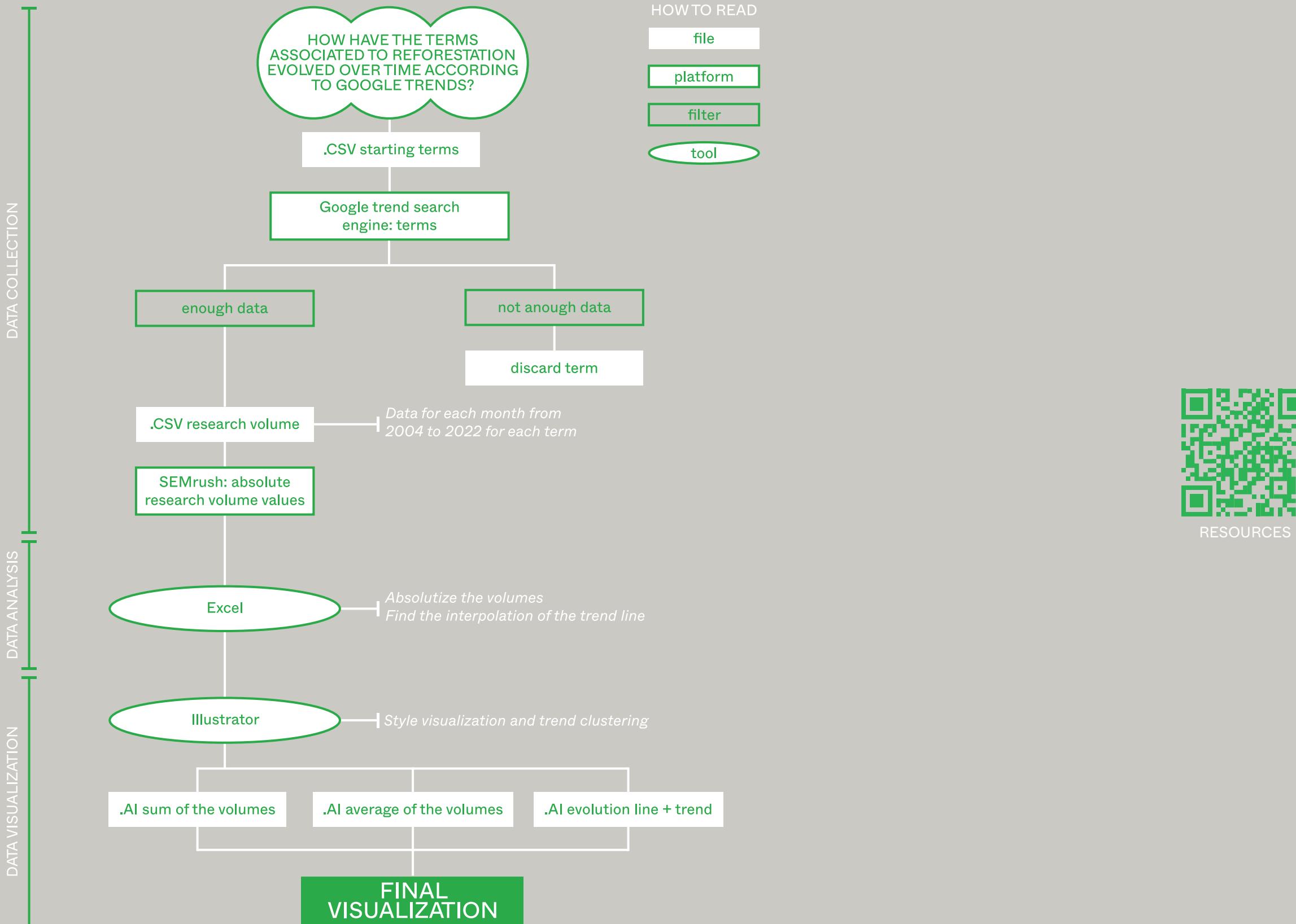


In contrast, there are terms that show sharp, irregular spikes due to a surge in news coverage or term popularity.

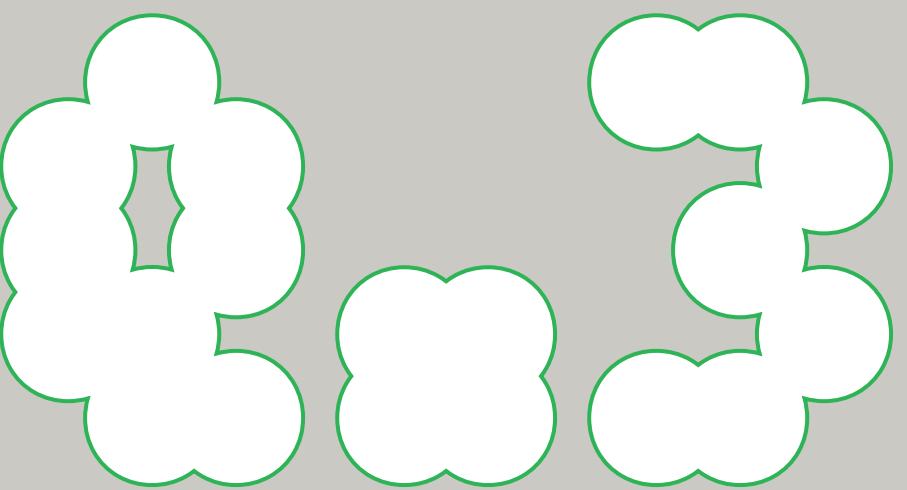


UNUSUAL ★ SPIKES

RESEARCH PROTOCOL



focus: IMAGES

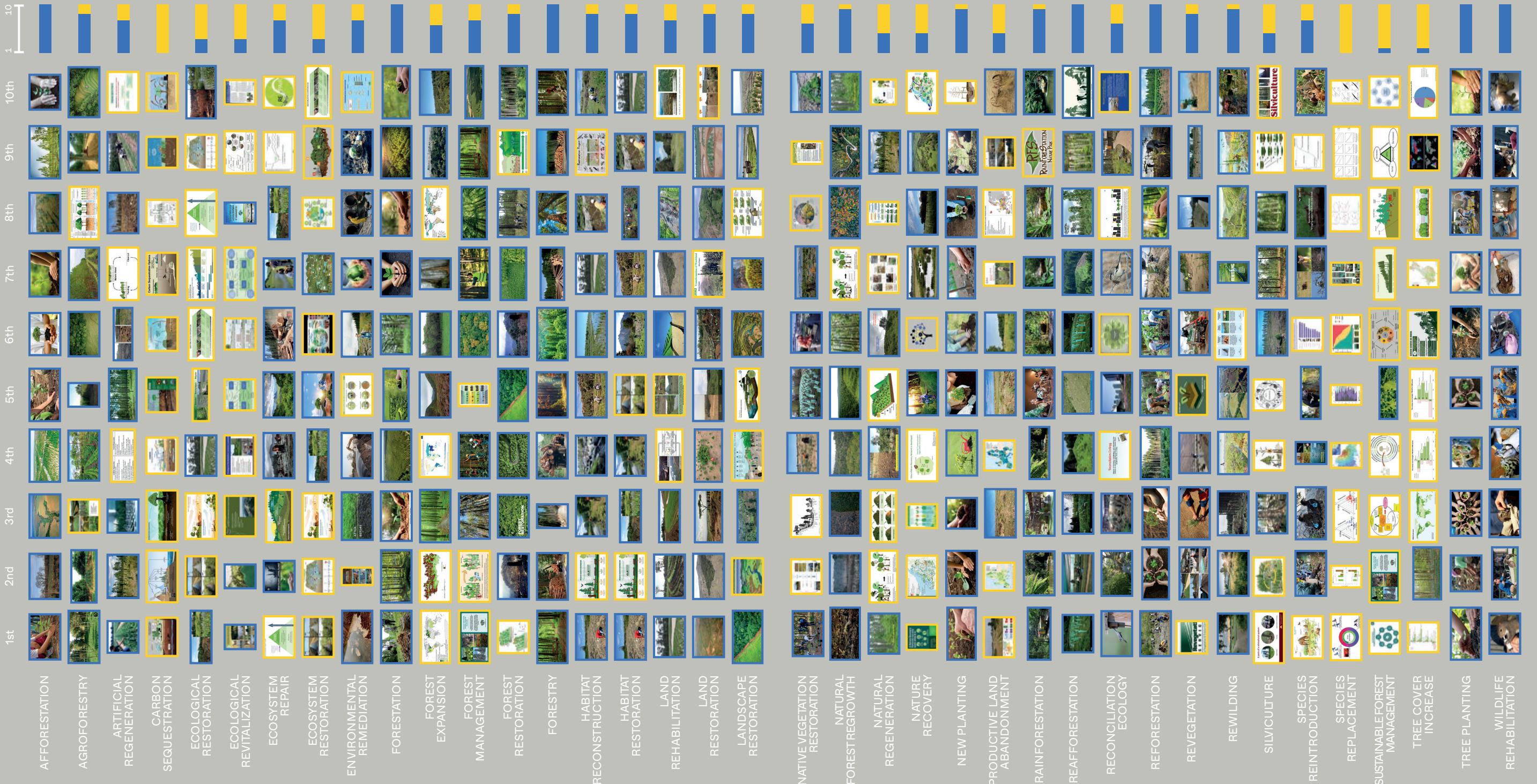


HOW ARE THE TERMS ASSOCIATED TO REPRESENTATION REPRESENTED ON GOOGLE IMAGES?

The final question focuses on how the chosen terms are represented visually. For each term we downloaded the first ten results of Google Images and displayed them as they were ranked by the platform. The process allowed to make comparisons regarding different media involved, recurring tropes in the content, and image sources.

DIAGRAMMATIC VS FIGURATIVE

IMAGE CATEGORIZATION

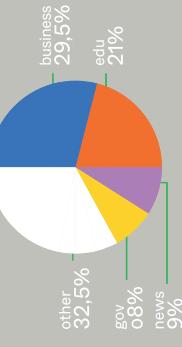
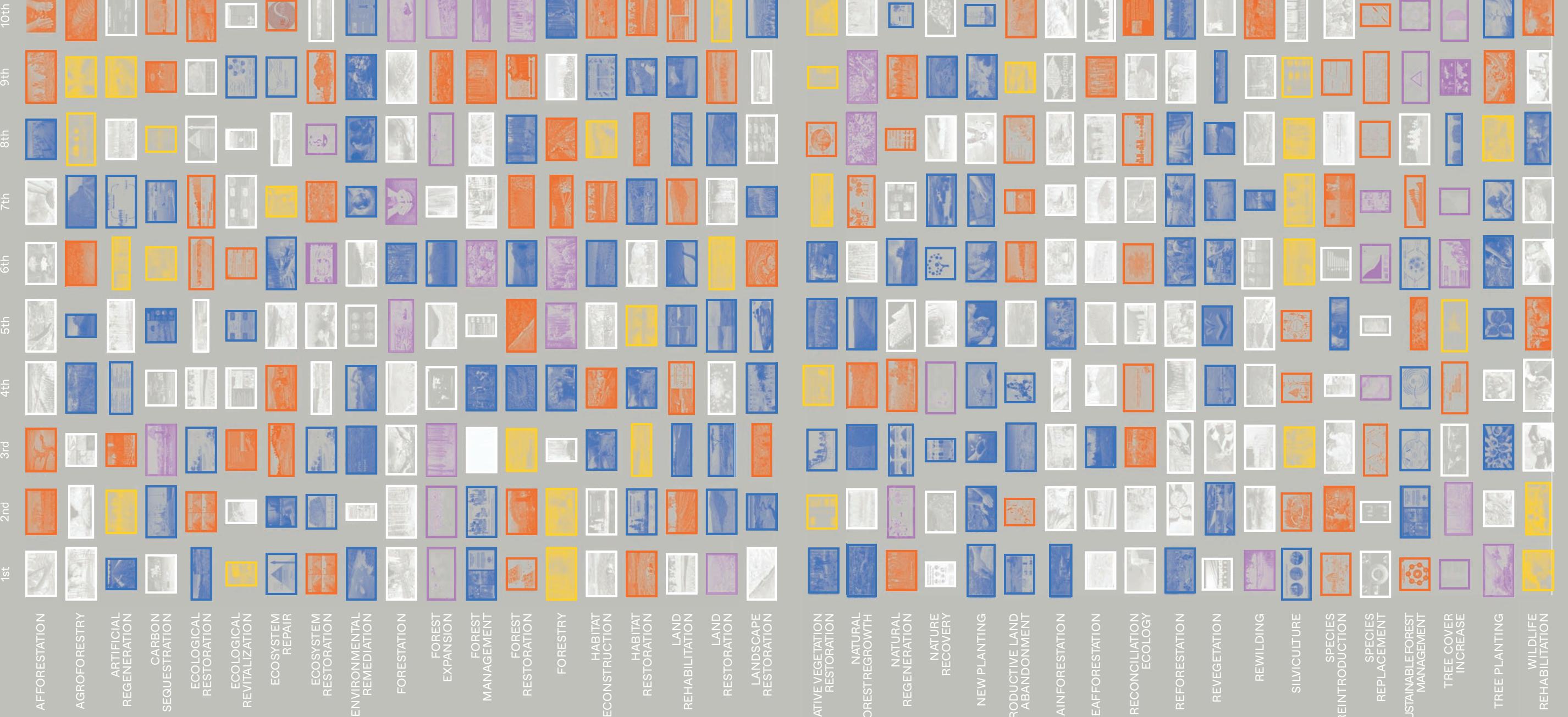


■ DIAGRAMMATIC
■ FIGURATIVE

Images that represent reforestation can be divided into two groups, diagrammatic and figurative. The first includes both textual-only and highly-illustrated diagrams that, like the second group, mainly depicts greenery.

ANALYSIS OF THE SOURCES

URL CATEGORIZATION



HANDS PLANTING/ HOLDING SPROUTS

RECURRING TROPS



The most recurring trope is imagery of hands planting or holding seeds, usually staged in appearance. These images are generally associated with terms that refer to action, where the trope occurs multiple times in different versions, while in other terms it is completely missing.



Stack of all the images depicting the trope of hand holding or planting sprouts.

8,7% OF TOTAL IMAGES
THE TROPE OCCURS
IN 47% OF IMAGES
REFERRING TO TERMS
IN WHICH IT APPEARS

BEFORE AND AFTER

RECURRING TROPS

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
AFFORESTATION										
AGROFORESTRY										
ARTIFICIAL REGENERATION										
CARBON SEQUESTRATION										
ECOLOGICAL RESTORATION										
ECOLOGICAL REVITALIZATION										
ECOSYSTEM REPAIR										
ECOSYSTEM RESTORATION										
ENVIRONMENTAL REMEDIATION										
FORESTATION										
FOREST MANAGEMENT										
FOREST RESTORATION										
FORESTRY										
HABITAT RECONSTRUCTION										
HABITAT RESTORATION										
LAND REHABILITATION										
LAND RESTORATION										
LANDSCAPE RESTORATION										
NATIVE VEGETATION RESTORATION										
NATURAL FORESTREGROWTH										
NATURAL REGENERATION										
NATURE RECOVERY										
NEW PLANTING										
PRODUCTIVE LAND ABANDONMENT										
RAINFORESTATION										
REAFFORESTATION										
RECONCILIATION ECOLOGY										
REFORESTATION										
REVEGETATION										
REWILDING										
SILVICULTURE										
SPECIES REINTRODUCTION										
SPECIES REPLACEMENT										
SUSTAINABLE FOREST MANAGEMENT										
TREE COVER INCREASE										
TREE PLANTING										
WILDLIFE REHABILITATION										

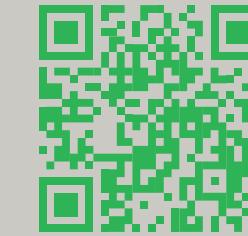
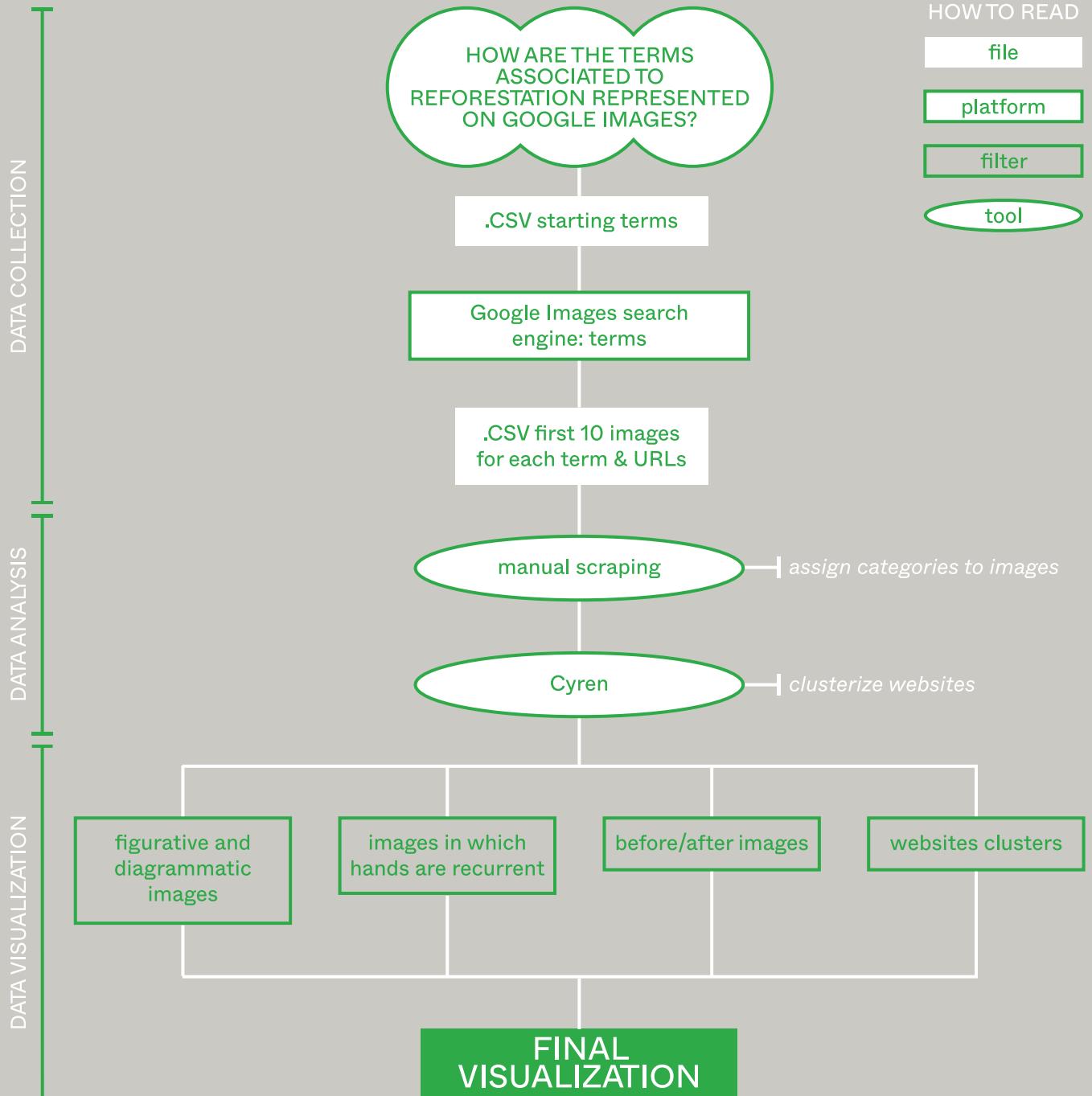
PROGRAM RESULTS
HOW TO" TIMELINE

Images representing reforestation often show a comparison of before and after. This trope is used for two purposes. The first, to represent the results of reforestation programs, the second, mainly composed of diagrams, represent timelines on how to fully recover a deforested area.



Images of program results arranged to highlight their chromatic differences.

RESEARCH PROTOCOL



RESOURCES



