A Topography of Climate Change Research

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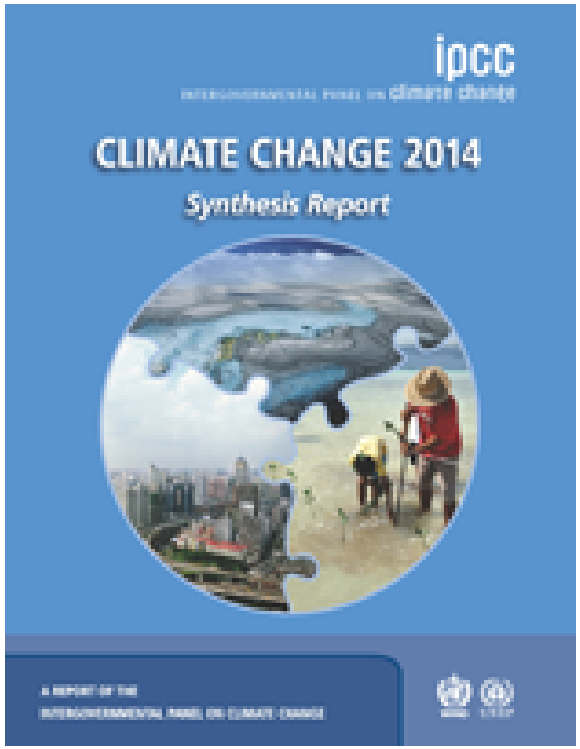
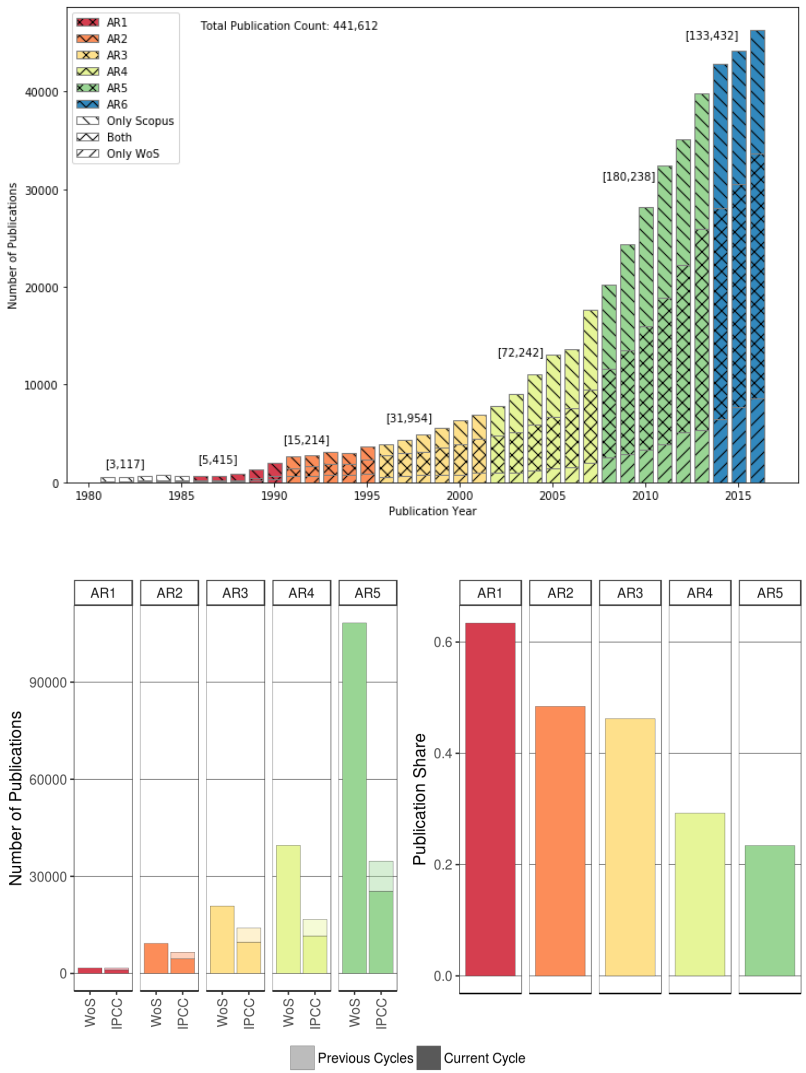
Context



- Climate Change is complicated
- The IPCC *assess* the science on climate change
- These assessments should be comprehensive, credible and relevant

Motivation

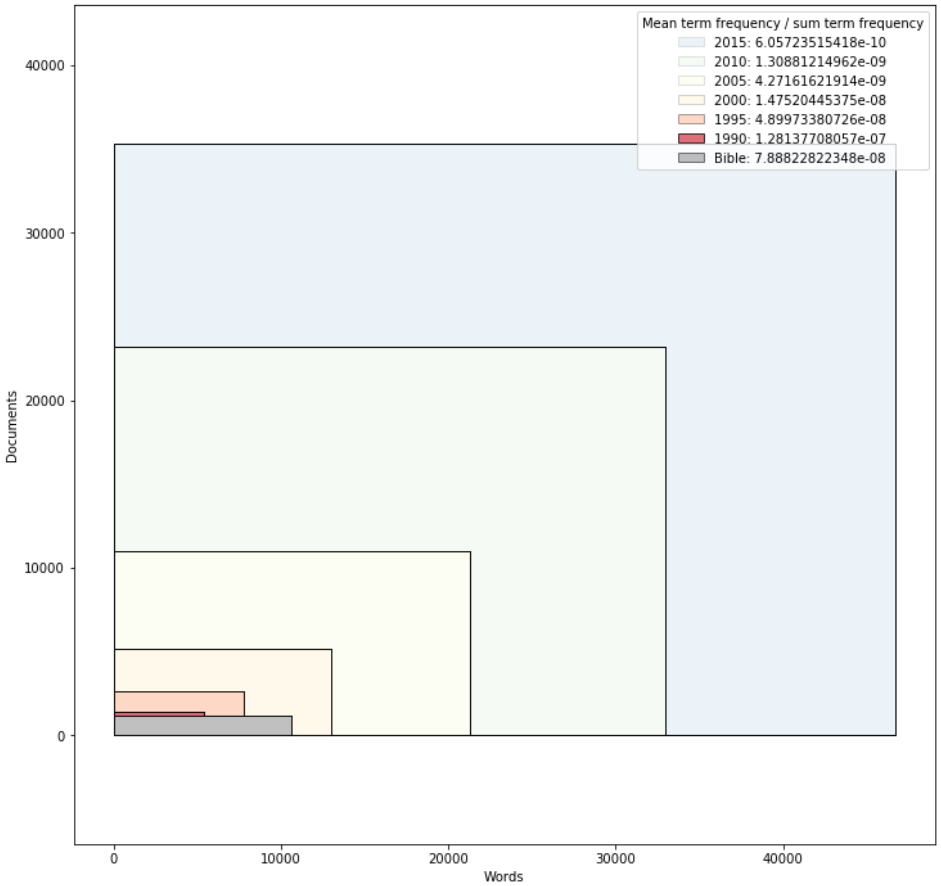


- Comprehensive, credible and relevant assessments become more challenging as the literature grows

To understand, and to aid, scientific assessments of climate change, we need to machine read the literature

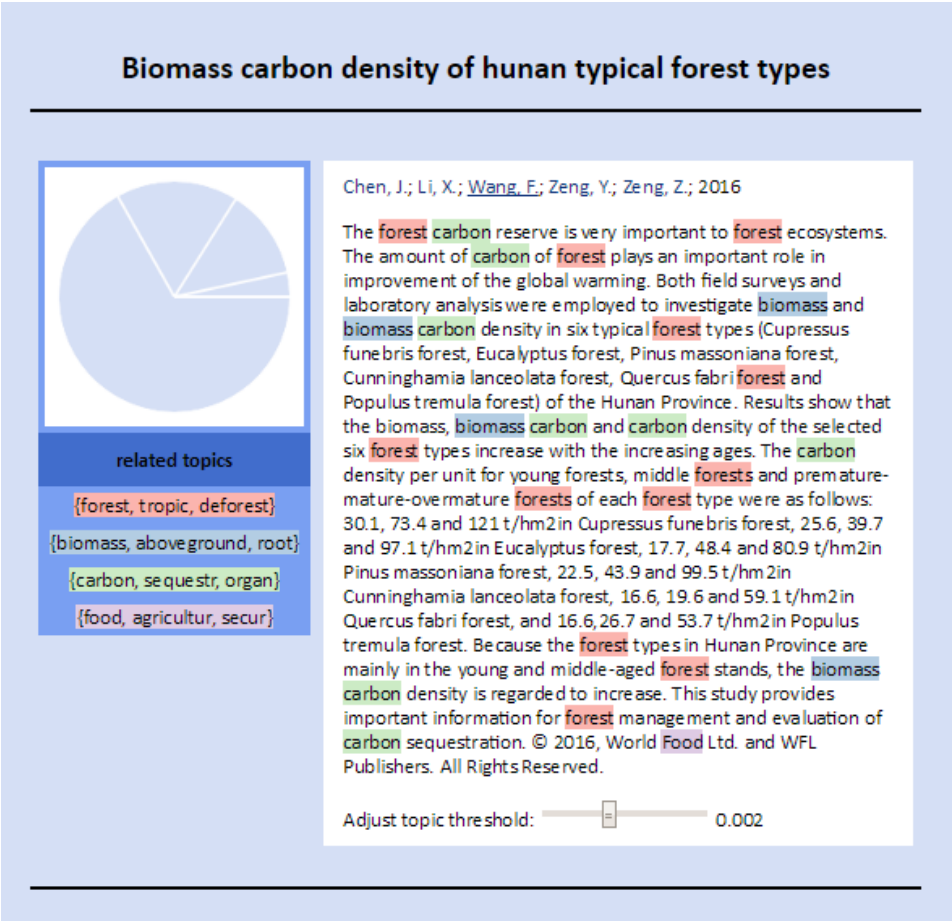
Figure: Source: Minx et al. (2017)

Approach - Words, words, words



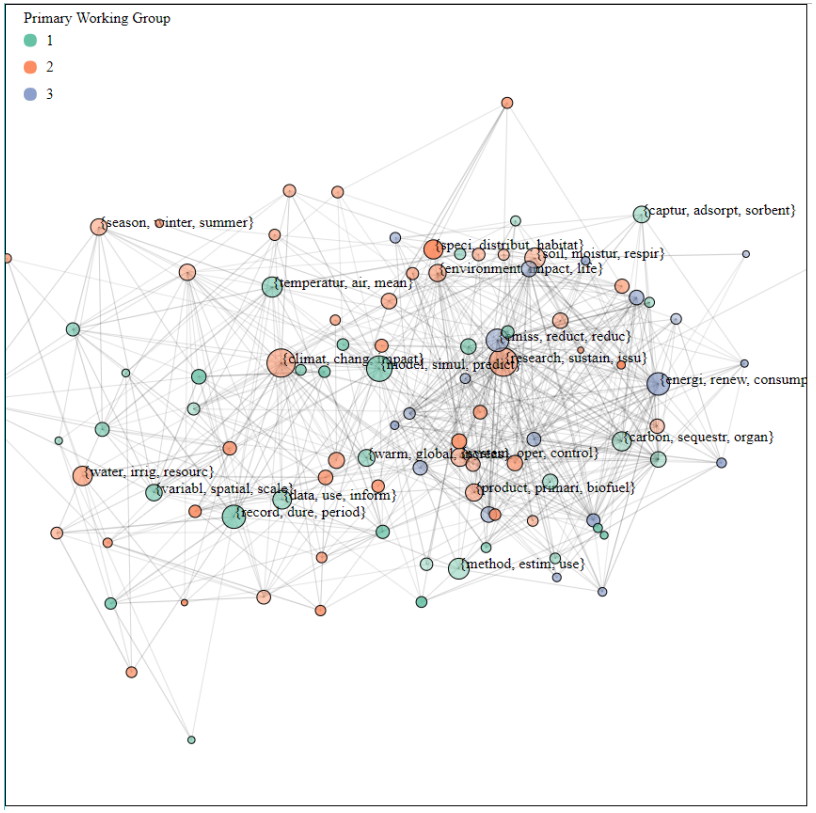
- Topic modelling is a way of reducing the dimensionality of a corpus of documents
- A large matrix of documents x words is factorised by a matrix of topics x words and a matrix of topics x documents (Lee and Seung, 1999)
- Topics describe the latent structure of the document corpus

Preliminary results - explanation



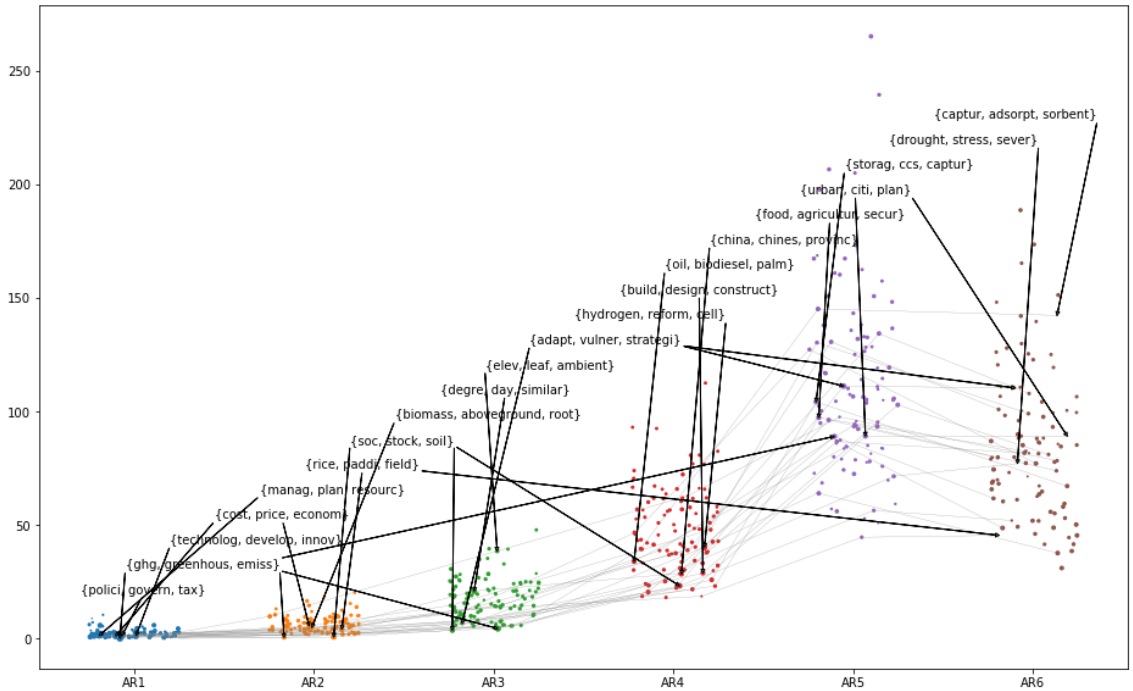
- Documents are mixtures of topics, based on the words which occur in them

Preliminary results - structure



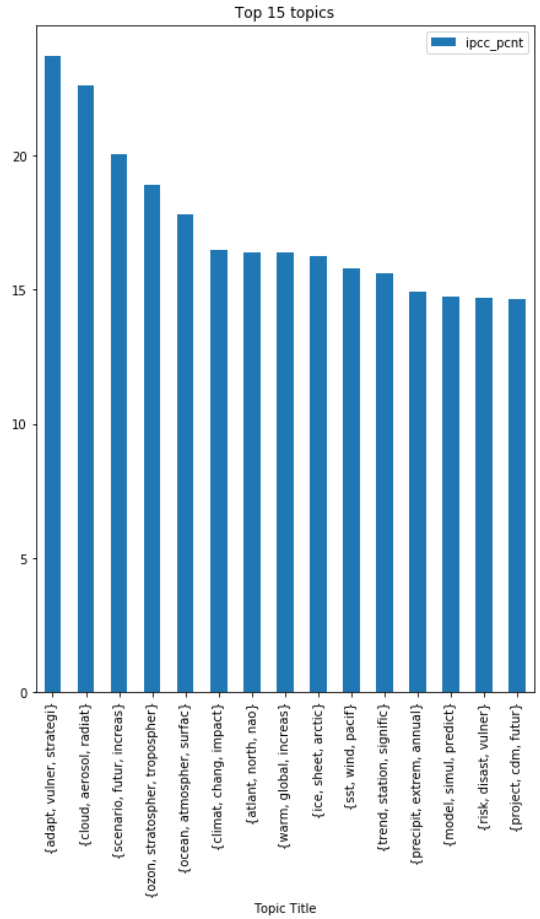
- A network of comprehensible topics is generated with 100 topics
- Topics can be matched to the IPCC working group from which the majority of the topic documents are referenced in
- Topics from the same working group are **significantly** more likely to be correlated with each other than those which are not

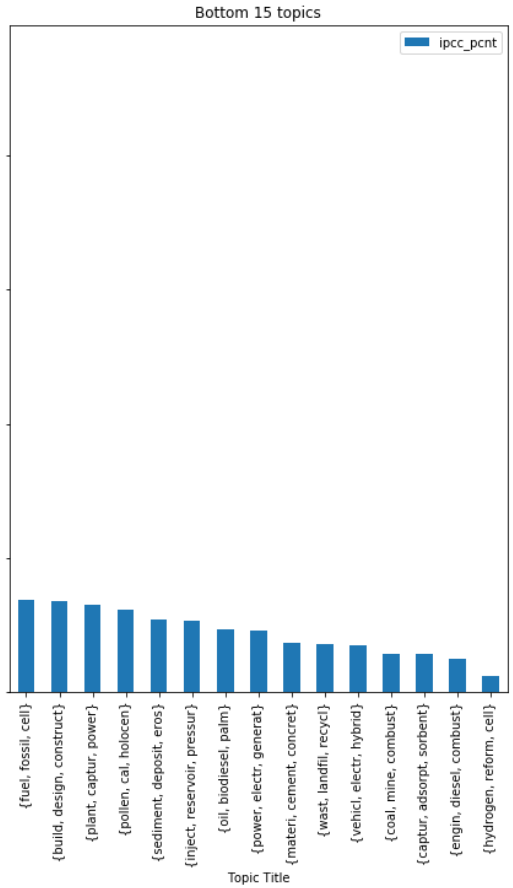
Preliminary results - growth



- Negative emissions related topics have shown strong growth in recent years
- As have topics on food security and cities

Preliminary results - gaps in coverage



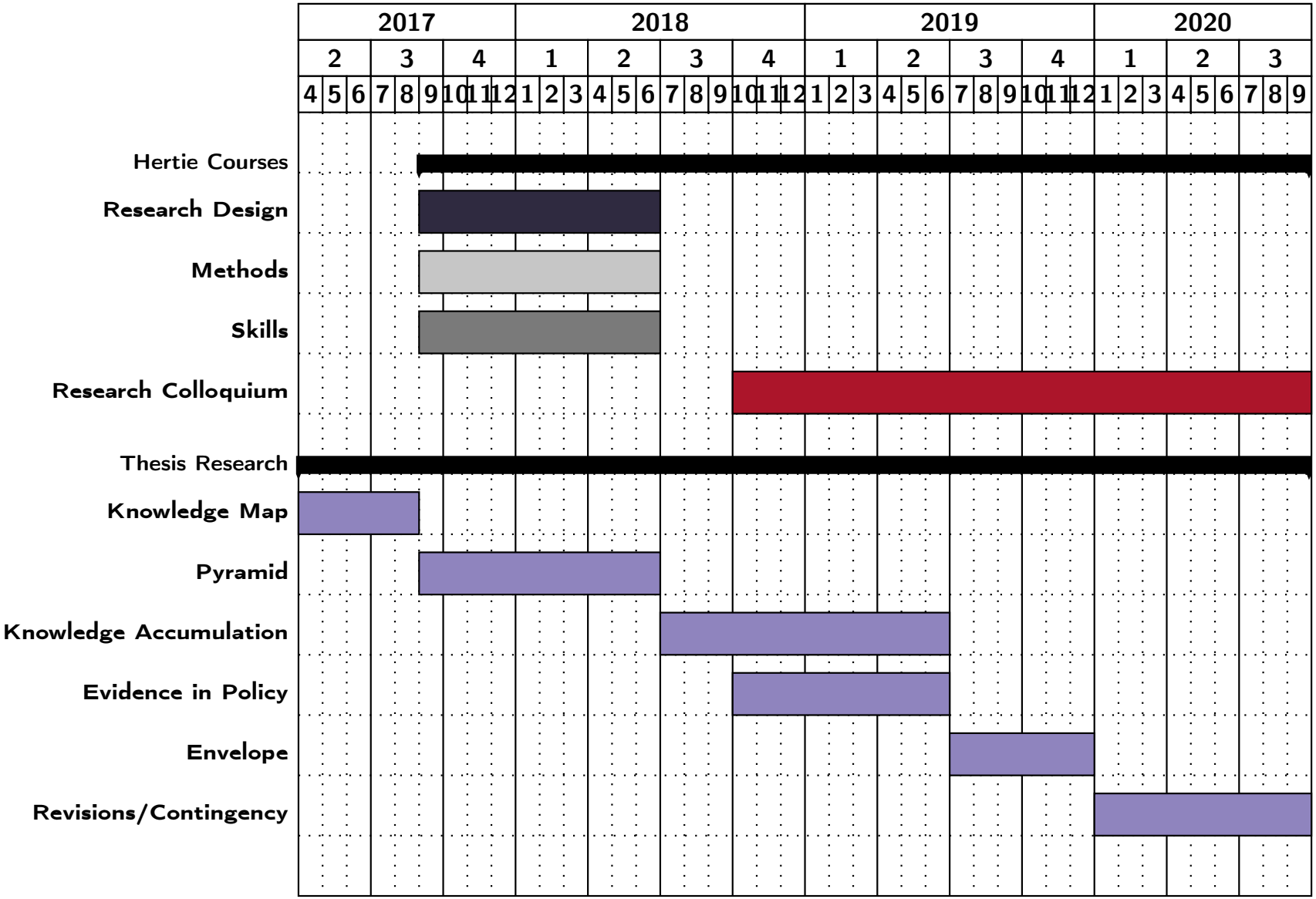


- The physical science aspects of climate change, as well topics on impacts, adaptation and scenarios are well covered by the IPCC
- "Niche" topics on specific technological solutions, are less well covered

Next steps

- Can I get a clearer research question, and make the analysis less descriptive?

Outlook


2017
2018
2019
2020
Hertie Courses
Research Design
Methods
Skills
Research Colloquium
Thesis Research
Knowledge Map
Pyramid
Knowledge Accumulation
Evidence in Policy
Envelope
Revisions/Contingency

Frame Title

Lee, D. D. and Seung, H. S. (1999). Learning the parts of objects by non-negative matrix factorization. *Nature*, 401(6755):788–91.

Minx, J. C., Callaghan, M. W., Creutzig, F., Hilaire, J., and Lamb, W. F. (2017). The dynamic landscape of sustainability science. *Nature Sustainability*.