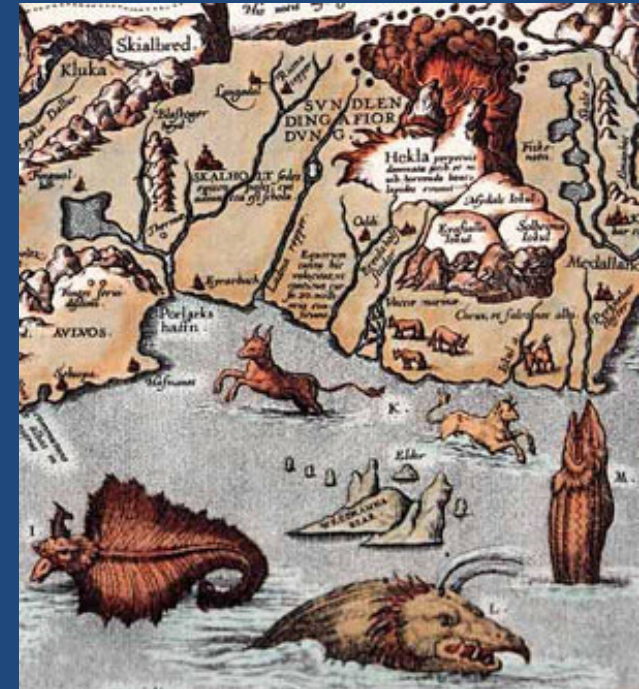# Advanced workshop on Systematic Quantitative Literature Reviews

1. Quick recap of method
2. Challenges in being systematic
3. Bibliometric analysis to start with
4. Coding challenges
5. Analysis of data
   A. Basic
   B. Moderate
   C. Advanced
6. Questions raised by reviewers and possible responses

Prof Catherine Pickering,
School of Environment and Science, Griffith University
(c.pickering@griffith.edu.au)

1. Quick recap

Systematic quantitative literature review = Mapping the discipline...

1. **Systematic** = methods to survey literature and select papers to include are explicit and reproducible

2. **Quantitative** = measure of the amount (number of papers) of research within different sections of topic

3. **Comprehensive** = assesses different combinations of locations, subjects, variables and responses

4. **Structured** = working out what is important about the literature (categories/subcategories) - collecting, analysing literature, and writing follows clear steps
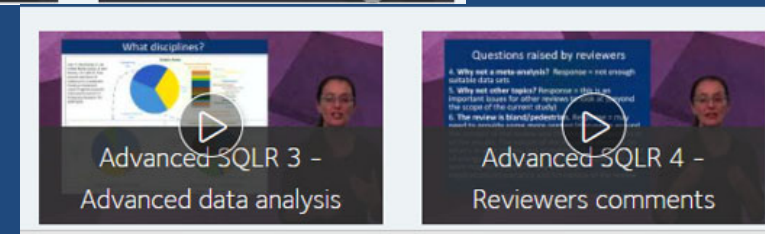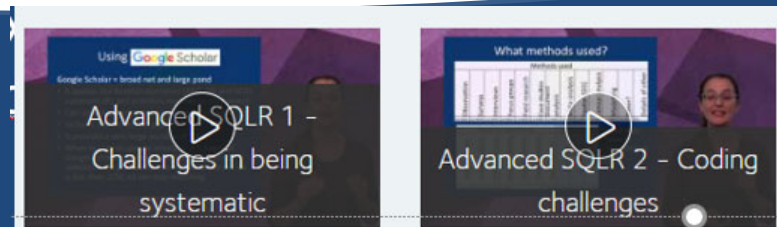
So how do you do it…

https://www2.griffith.edu.au/griffith-sciences/school-environment-science/research/systematic-quantitative-literature-review
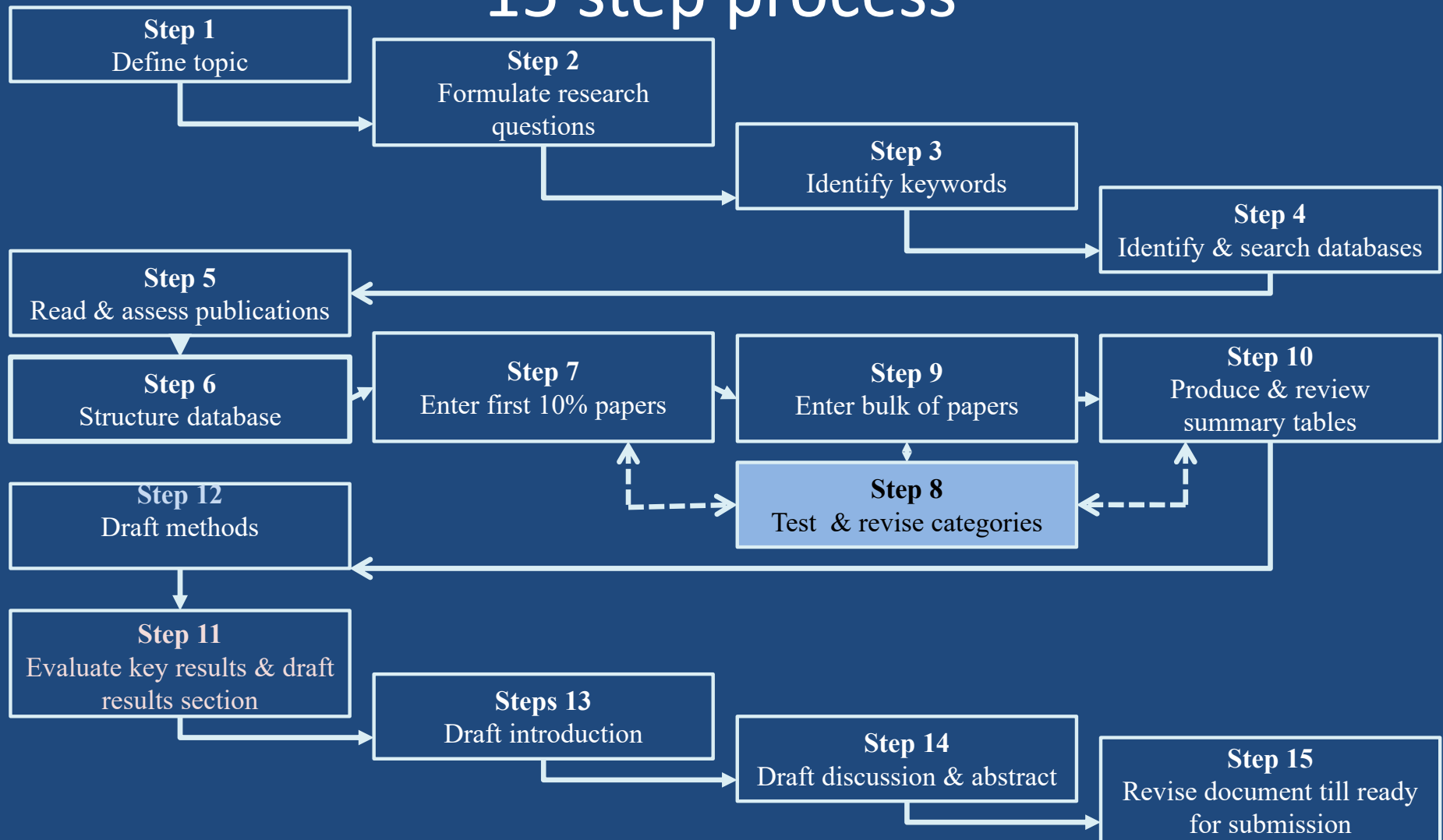

Includes –
1. Youtube videos on each stage
2. Papers outlining the approach
3. Papers published using the method,
4. Youtube videos of students talking about the method
5. Example Excel databases
6. Youtube video on why publish during your PhD

Also article in The Conversation

15 step process

Step 1
Define topic

Step 2
Formulate research questions

Step 3
Identify keywords

Step 4
Identify & search databases

Step 5
Read & assess publications

Step 6
Structure database

Step 7
Enter first 10% papers

Step 9
Enter bulk of papers

Step 10
Produce & review summary tables

Step 8
Test & revise categories

Step 12
Draft methods

Step 11
Evaluate key results & draft results section

Steps 13
Draft introduction

Step 14
Draft discussion & abstract

Step 15
Revise document till ready for submission

Please cite our paper if you use the method -

Pickering, C.M. and Byrne, J. (2014). The benefits of publishing systematic quantitative literature reviews for PhD candidates and other early career researchers. *Higher Education Research and Development*. 33: 534-548. http://dx.doi.org/10.1080/07294360.2013.841651.

e.g. it's a buzz for us to read….

"We conducted a systematic literature review following the approach outlined in Pickering and Byrne (2014)."

The benefits of publishing systematic quantitative literature reviews for PhD candidates and other early-career researchers

Catherine Pickering* and Jason Byrne

Environmental Futures Research Centre, Griffith University, Queensland, Australia

Universities increasingly expect students to publish during a PhD candidature because it benefits the candidate, supervisor, institution, and wider community. Here, we describe a method successfully used by early-career researchers including PhD candidates to undertake and publish literature reviews – a challenge for researchers new to a field. Our method allows researchers new to a field to systematically analyse existing academic literature to produce a structured quantitative summary of the field. This method is a more straightforward and systematic approach than the traditional 'narrative method' common to many student theses. When published, this type of review can also complement existing narrative reviews produced by experts in a field by quantitatively assessing the literature, including identifying research gaps. The method can also be used as the initial step for further analysis, including identifying suitable datasets for meta-analysis. Students report that the method is enabling and rewarding.

Keywords: doctoral education; PhD students; publication output; research student; thesis

How is it going for SQLR's?
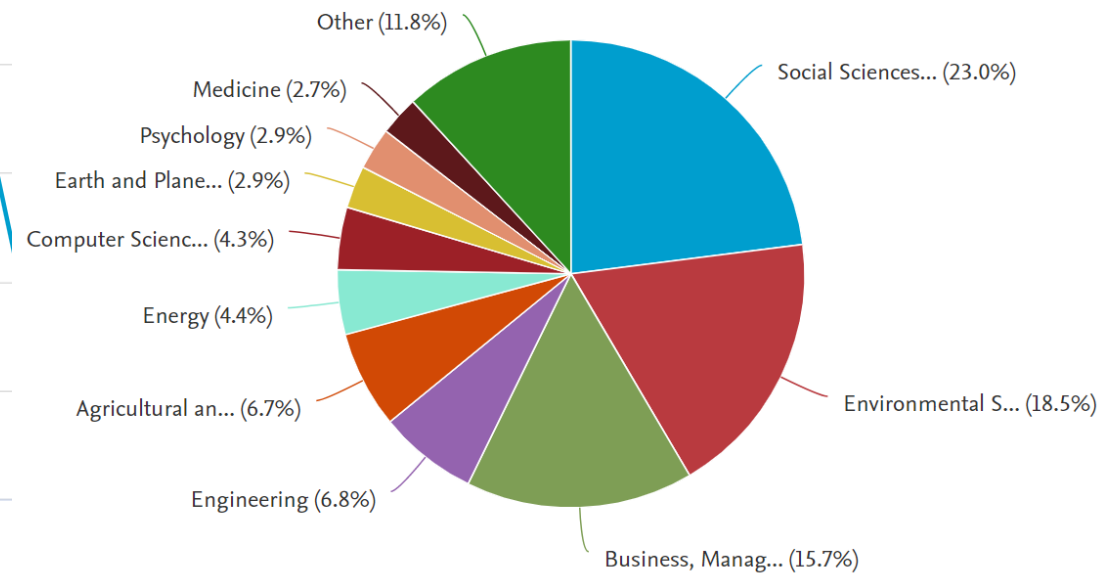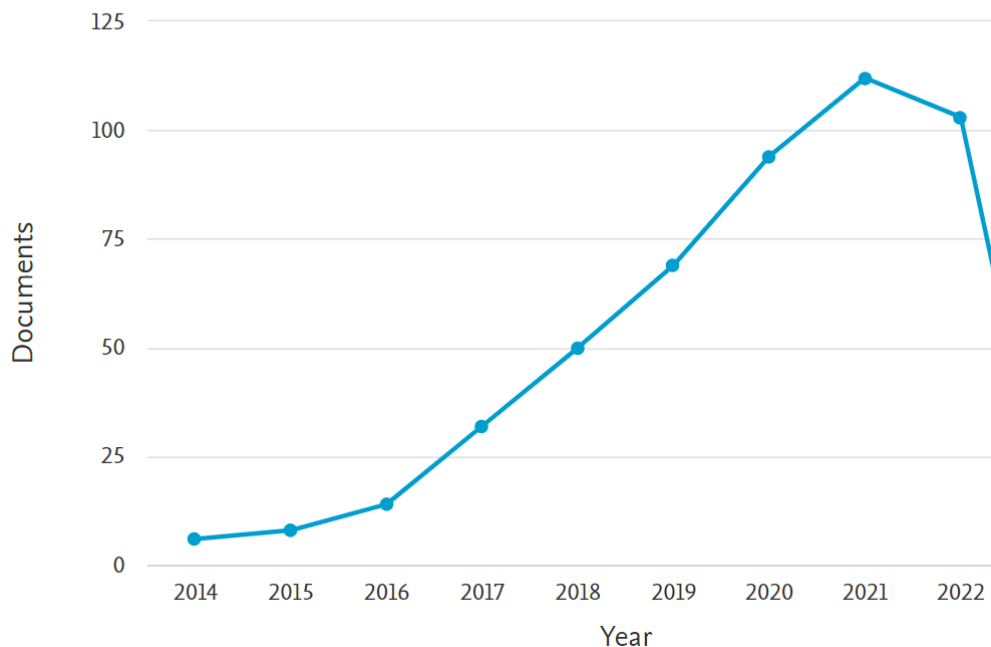## >850 papers (Google Scholar),
>175 just from Griffith on Scopus

Documents by country or territory

Compare the document counts for up to 15 countries/territories.
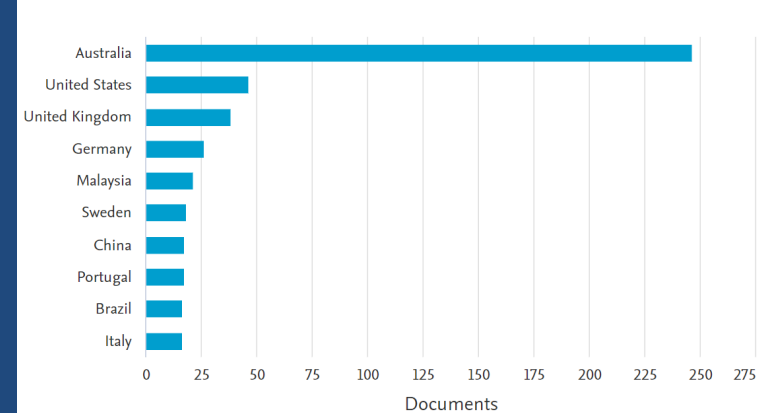
Documents by year

Documents by subject area

Systematic quantitative literature views works for students

Average 7.5 times as many citations as none review papers
Often cited in first paragraph of other papers

Contents lists available at ScienceDirect

Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman

Review

A review of the impacts of nature

Rochelle Steven, Catherine Pickering*, J. Guy

School of Environment, Griffith University, Gold Coast, Queensland, 4222 Au

Contents lists available at SciVerse ScienceDirect

Urban Forestry & Urban Greening

journal homepage: www.elsevier.de/ufug

Review

A systematic quantitative revie
methods across cities in differe

Sudipto Roy[a], Jason Byrne[b,*], Catherine

[a] Urban Research Program, Nathan Campus, Griffith School of Enviro
[b] Environmental Futures Research Centre, Griffith School of Environ

Contents lists available at SciVerse ScienceDirect

Urban Forestry & Urban Greening
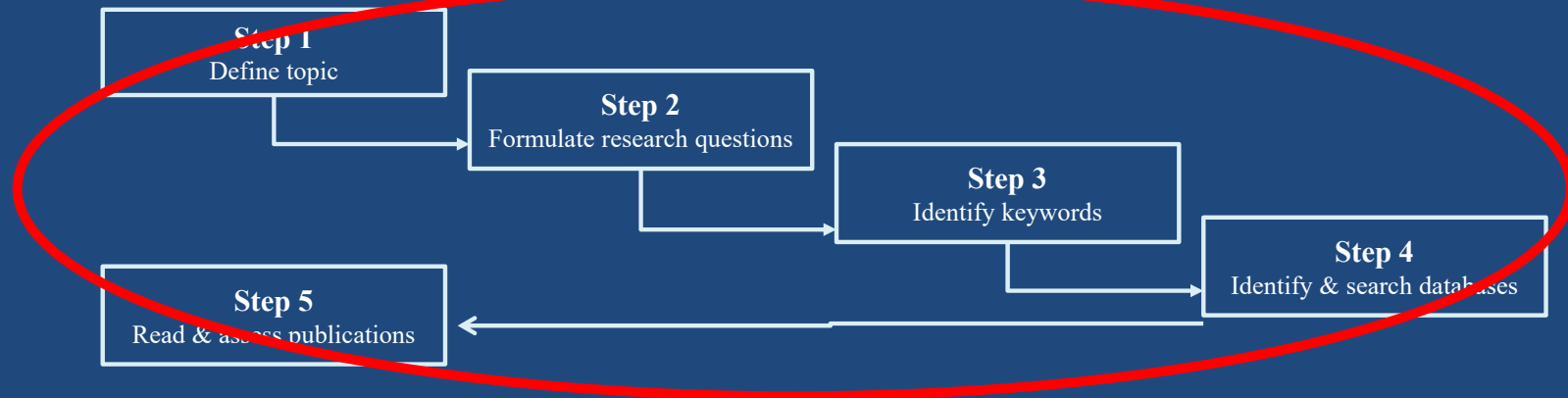
journal homepage: www.elsevier.de/ufug

Review

Past results and future directions in urban community gardens research

Daniela Guitart[1], Catherine Pickering*, Jason Byrne[2]

Environmental Futures Centre, School of Environment, Griffith University, Gold Coast Campus, Queensland 4222, Australia

Lots of them to use as examples

2. Challenges in being systematic

Step 1
Define topic

Step 2
Formulate research questions

Step 3
Identify keywords

Step 4
Identify & search databases

Step 5
Read & assess publications

Reminder - being systematic when fishing

Aim: need to catch all the specified fish, but not spend forever, and minimise bycatch.

Questions

Why fish? Aims and research questions

What fish? Papers vs books, thesis, reports, other grey literature, other languages etc

What nets to use? Are there keywords that work? Title+Keywords+Abstract vs whole paper?

Where to fish? Which Databases and how do they differ?

How long to fish? When have you found all the specified fish?

NB: check out this webpage to find out who is your expert librarian
https://www.griffith.edu.au/library/research-publishing

Methods: Words, graphics and tables

Emondi, N.V., Okereke, C. Abam, F.I., Diemuodeke, O.E, Owebor, , and Nnamani, U.A. (2022). Transport sector decarbonisation in the Global South: A systematic review. Energy Strategy Reviews, 43: 100925.
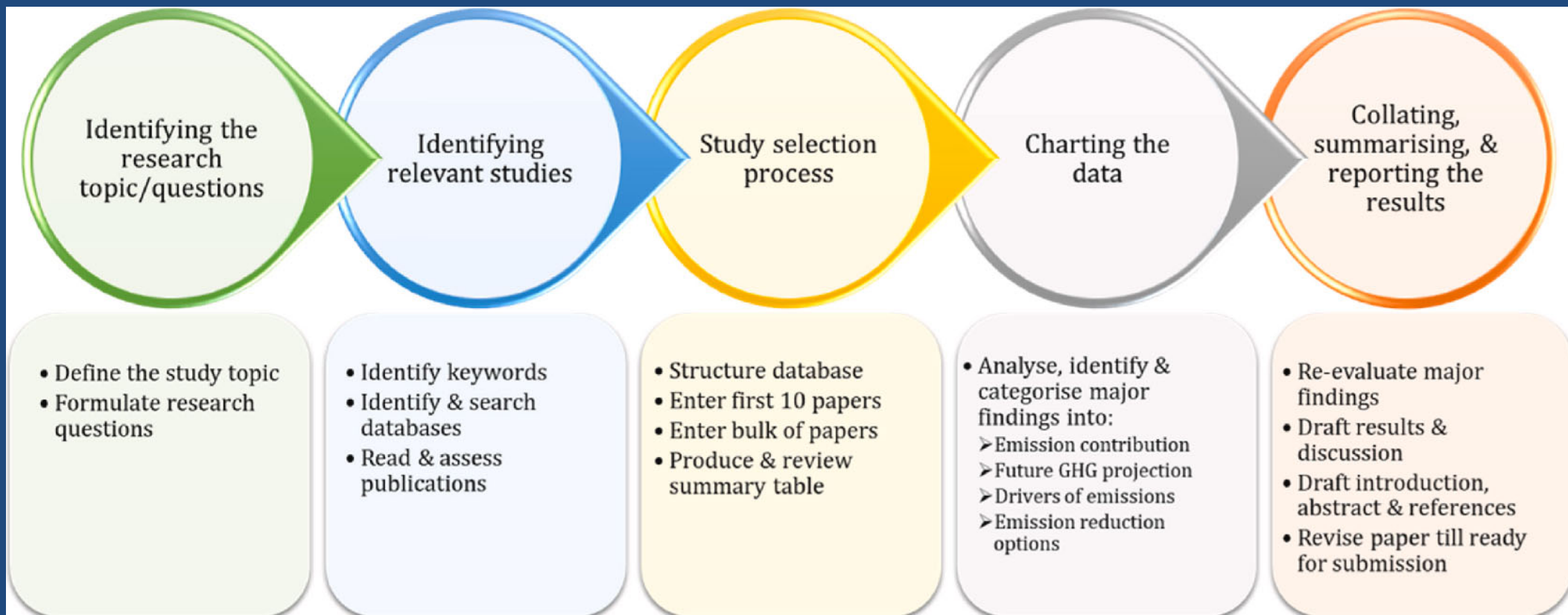
Common protocol is PRISMA

http://www.prisma-statement.org/

PRISMA
TRANSPARENT REPORTING of SYSTEMATIC REVIEWS and META-ANALYSES

HOME | PRISMA STATEMENT | EXTENSIONS | TRANSLATIONS | PRO

Welcome to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) website!

PRISMA is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses. PRISMA primarily focuses on the reporting of reviews evaluating the effects of interventions, but can also be used as a basis for reporting systematic reviews with objectives other than evaluating interventions (e.g. evaluating aetiology, prevalence, diagnosis or prognosis).

Who should use PRISMA?

- Authors: PRISMA aims to help authors improve the reporting of systematic reviews and meta-analyses.
- Journal Peer reviewers and editors: PRISMA may also be useful for critical appraisal of published systematic reviews, although it is not a quality assessment instrument to gauge the quality of a systematic review.

News Feed

PRISMA Website re-design

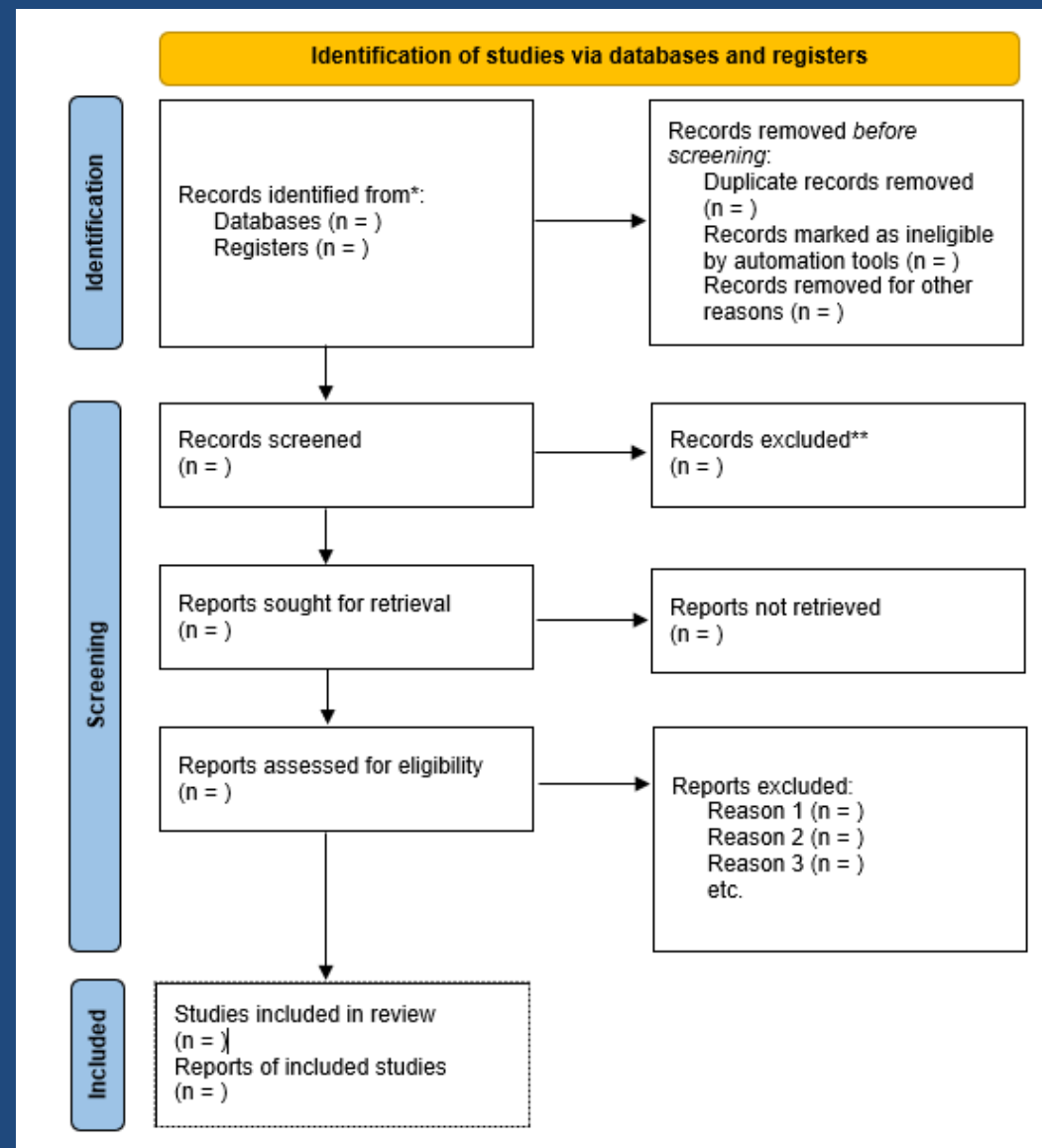The PRISMA website underwent a much-needed update in October 2015 to update the content of the website. We have updated the look of the site and added the PRISMA extensions, translations, and information about review protocols.

Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

Use around 3 databases – but which are relevant in your area?

Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. (2020). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

Dekkers, R., Carey, L. and Langhorne, P. (2022). Making Literature Reviews Work: A Multidisciplinary Guide to Systematic Approaches. Springer, London.

Identification of studies via databases and registers

Identification

Records identified from*:
Databases (n =)
Registers (n =)

Records removed *before screening*:
Duplicate records removed (n =)
Records marked as ineligible by automation tools (n =)
Records removed for other reasons (n =)

Screening

Records screened (n =)

Records excluded** (n =)

Reports sought for retrieval (n =)

Reports not retrieved (n =)

Reports assessed for eligibility (n =)

Reports excluded:
Reason 1 (n =)
Reason 2 (n =)
Reason 3 (n =)
etc.

Included

Studies included in review (n =)
Reports of included studies (n =)

PRISMA 2020 Checklist

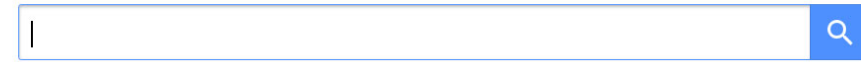| Section and Topic	Item #	Checklist item
TITLE		
Title	1	Identify the report as a systematic review.
ABSTRACT		
Abstract	2	See the PRISMA 2020 for Abstracts checklist.
INTRODUCTION		
Rationale	3	Describe the rationale for the review in the context of existing knowledge.
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.
METHODS		
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.

27-item checklist

Section and Topic	Item #	Checklist item
RESULTS		
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.
Study characteristics	17	Cite each included study and present its characteristics.
Risk of bias in studies	18	Present assessments of risk of bias for each included study.
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.
	20c	Present results of all investigations of possible causes of heterogeneity among study results.
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.
DISCUSSION		
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.
	23b	Discuss any limitations of the evidence included in the review.
	23c	Discuss any limitations of the review processes used.
	23d	Discuss implications of the results for practice, policy, and future research.
OTHER INFORMATION		
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.
	24c	Describe and explain any amendments to information provided at registration or in the protocol.
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.
Competing interests	26	Declare any competing interests of review authors.
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.

27-item checklist

Using Google Scholar

Google Scholar

[search box]

○ Articles   ○ Case law

Google scholar = broad net and large pond

It applies the Boolean operators (AND, OR and NOT) automatically and priorities matches to your search
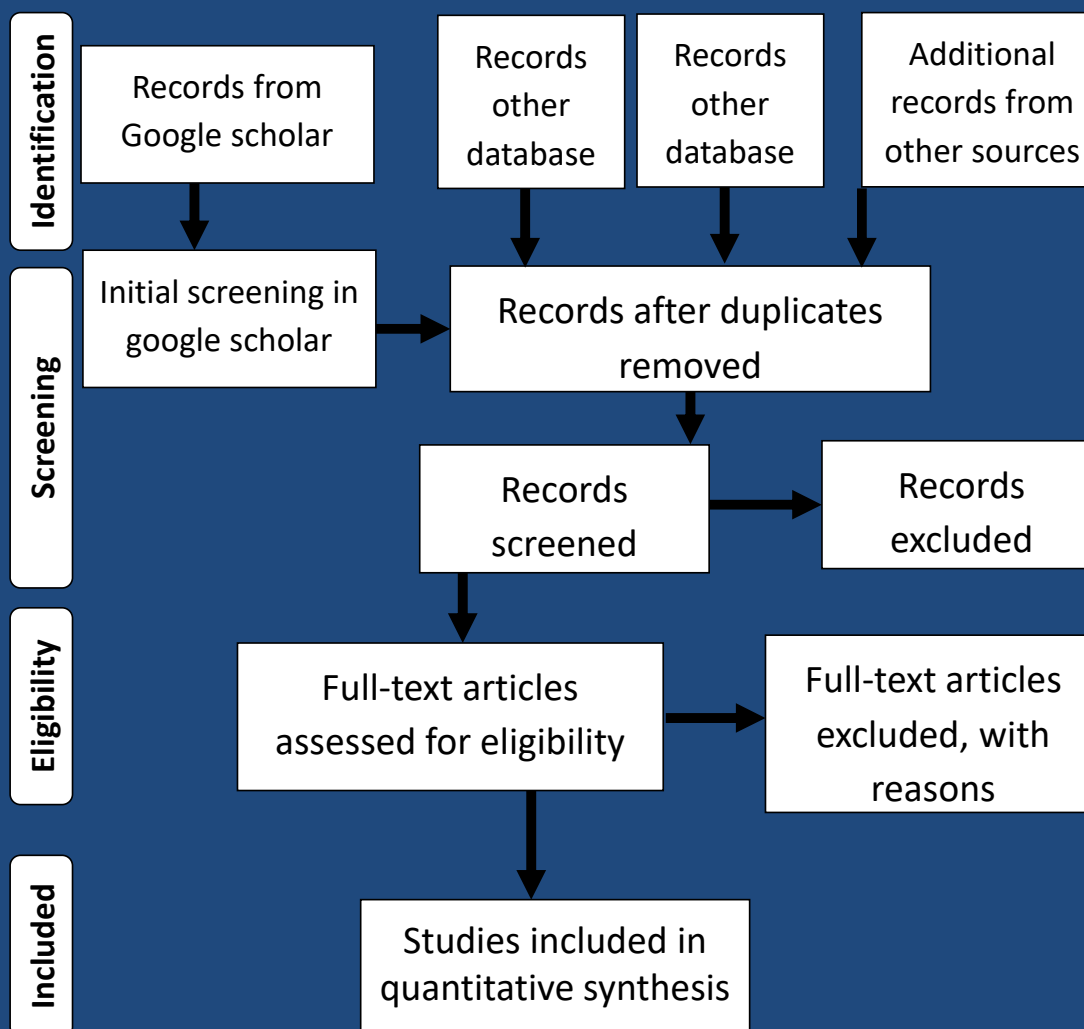
Includes more than just papers

It provides a very large number of 'hits'

When to stop on google scholar = If 5 pages of google scholar search results are not relevant… the probability the next example will be is less than 1/50, so can stop searching.
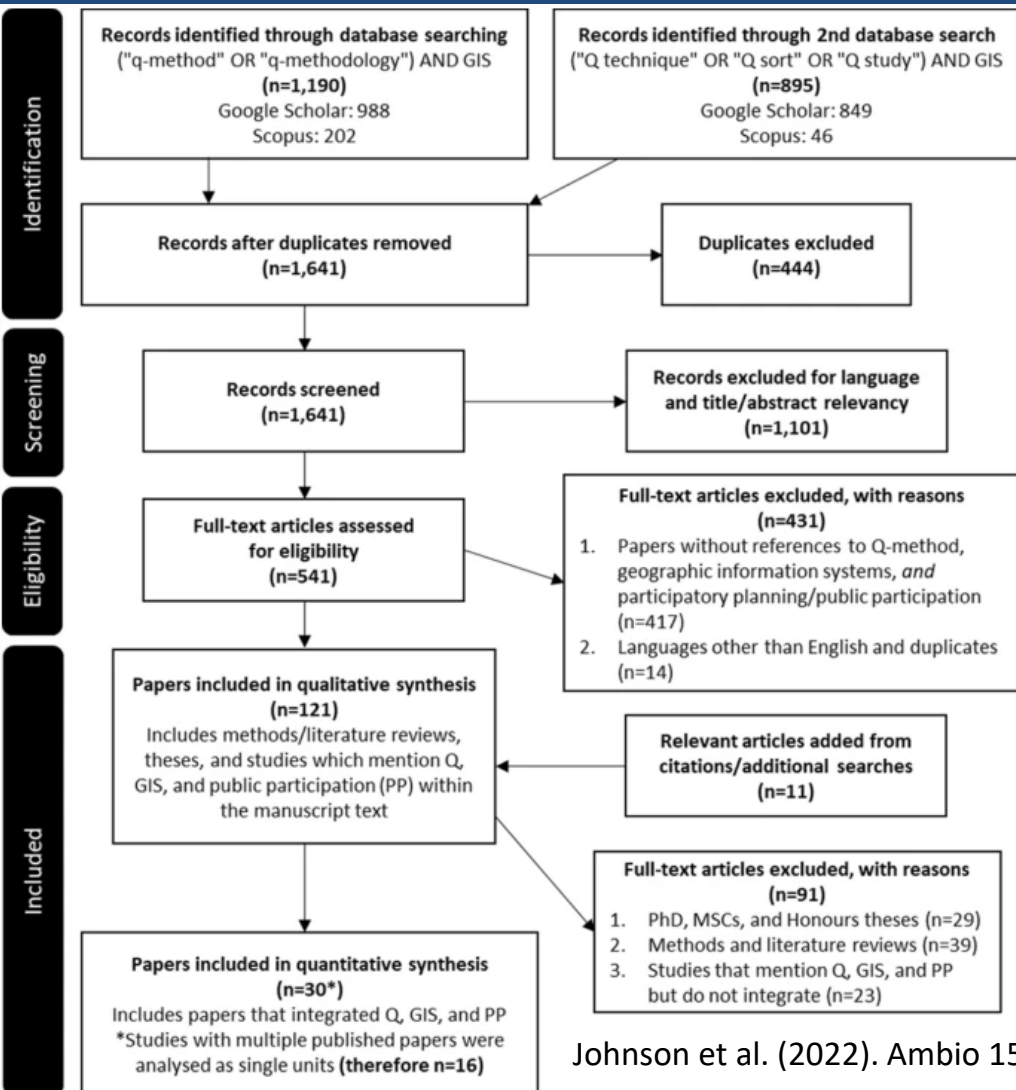
See How can I use Google Scholar to enhance my systematic-style review? – at https://staffhelp.secure.griffith.edu.au/app/answers/detail/a_id/4415
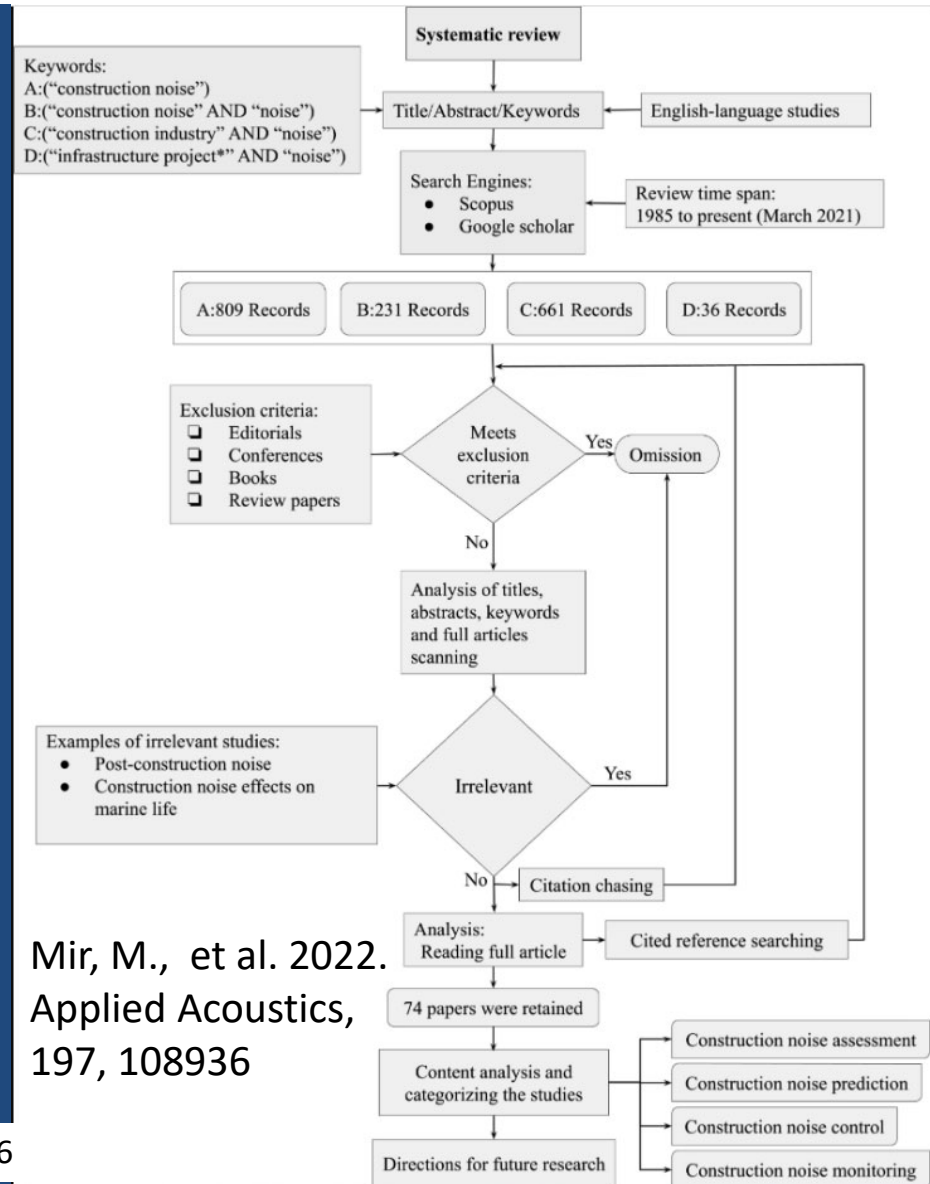
Modified PRISMA if using google scholar

Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-

Analyses: The PRISMA

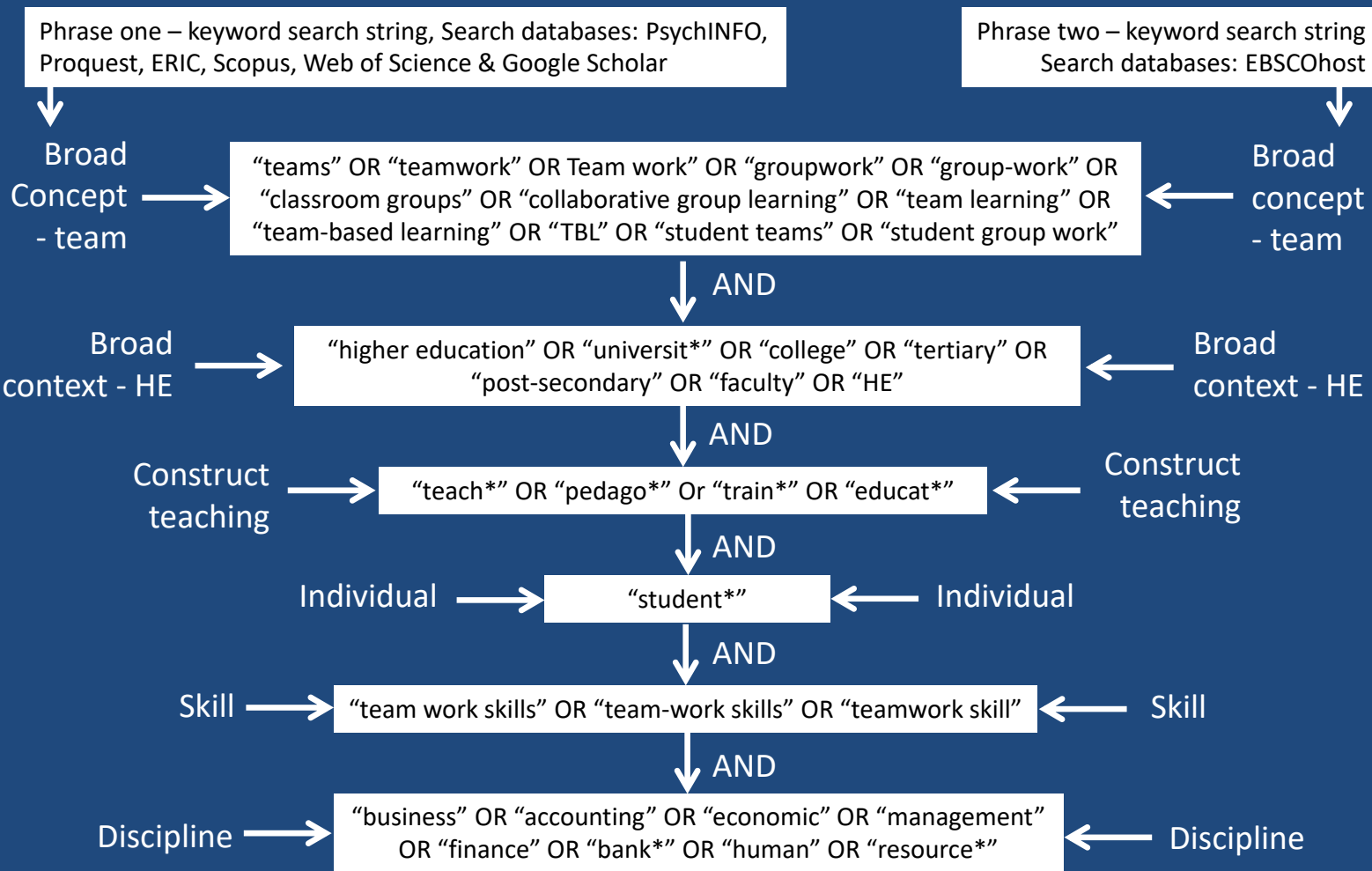Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

Identification

Records from Google scholar

Records other database

Records other database

Additional records from other sources

Screening

Initial screening in google scholar → Records after duplicates removed

Records screened → Records excluded

Eligibility

Full-text articles assessed for eligibility → Full-text articles excluded, with reasons

Included

Studies included in quantitative synthesis

Other details in PRISMA?

Identification

Records identified through database searching
("q-method" OR "q-methodology") AND GIS
(n=1,190)
Google Scholar: 988
Scopus: 202

Records identified through 2nd database search
("Q technique" OR "Q sort" OR "Q study") AND GIS
(n=895)
Google Scholar: 849
Scopus: 46

Records after duplicates removed
(n=1,641)

Duplicates excluded
(n=444)

Screening

Records screened
(n=1,641)

Records excluded for language and title/abstract relevancy
(n=1,101)

Eligibility

Full-text articles assessed for eligibility
(n=541)

Full-text articles excluded, with reasons
(n=431)
1. Papers without references to Q-method, geographic information systems, *and* participatory planning/public participation (n=417)
2. Languages other than English and duplicates (n=14)

Included

Papers included in qualitative synthesis
(n=121)
Includes methods/literature reviews, theses, and studies which mention Q, GIS, and public participation (PP) within the manuscript text

Relevant articles added from citations/additional searches
(n=11)

Full-text articles excluded, with reasons
(n=91)
1. PhD, MSCs, and Honours theses (n=29)
2. Methods and literature reviews (n=39)
3. Studies that mention Q, GIS, and PP but do not integrate (n=23)

Papers included in quantitative synthesis
(n=30*)
Includes papers that integrated Q, GIS, and PP
*Studies with multiple published papers were analysed as single units **(therefore n=16)**

Johnson et al. (2022). Ambio 15: 1819-1836

Mir, M., et al. 2022. Applied Acoustics, 197, 108936

Broad
Concept
- team

"teams" OR "teamwork" OR Team work" OR "groupwork" OR "group-work" OR "classroom groups" OR "collaborative group learning" OR "team learning" OR "team-based learning" OR "TBL" OR "student teams" OR "student group work"

Broad
concept
- team

AND

Broad
context - HE

"higher education" OR "universit*" OR "college" OR "tertiary" OR "post-secondary" OR "faculty" OR "HE"

Broad
context - HE

AND

Construct
teaching

"teach*" OR "pedago*" Or "train*" OR "educat*"

Construct
teaching

AND

Individual

"student*"

Individual

AND

Skill

"team work skills" OR "team-work skills" OR "teamwork skill"

Skill

AND

Discipline

"business" OR "accounting" OR "economic" OR "management" OR "finance" OR "bank*" OR "human" OR "resource*"

Discipline

Some times working out keywords & search terms is complex

Riebe, L., Girardi, A. and Whitsed, C. (2016). A systematic literature review of teamwork pedagogy in higher education. Small Group Research 47: 619-664

Step	Research question/Methods
Review question	What FCA methods have been developed to date?
Inclusion criteria	**Population**: Studies representing the FCA concept **Intervention:** No intervention in the research question **Comparison:** No comparison in the research question **Outcome:** Studies that represent, constitute or strengthen any FCA method
Exclusion criteria	Presentations, book reviews, comments and all studies reported in non-English language
Searching the literature	**Methods:** database searching, grey literature searching, reference list checking, citation searching and consultation with an expert **Databases searched:** Google Scholar, ScienceDirect, Emerald Insight, Wiley Online, Web of Science **Keywords for database searching:** 'full cost accounting', 'total cost accounting', 'full environmental cost accounting', 'total cost assessment' and a combination of the following terms: 'accounting', 'valuing', 'externalities', 'external cost', 'social accounts' and 'environmental accounts'
Quality assessment	**Methods:** hierarchy of study design (experimental, observational, expert opinion) and quality checklist (lists of questions appropriate to the research question)
Data extraction	**Data extraction form with developed categories from relevant studies:** title, authors, year of publication, place of study, type of industry, type of focus (industry, organisation, project, product or process), and brief methodology description **Software used for extracting data:** Microsoft Access
Data synthesis	**Methods:** narrative synthesis, developed categories from a detailed examination of all FCA studies **Presentation methods:** tables, matrices and qualitative thematic analysis

Jasinski, D., Meredith, J., and Kirwan, K. (2015). Journal of Cleaner Production. 108: 1123–1139

An example of reasons for exclusion/inclusions for less clear-cut topics

Excluded:

1. Search engine reason : paper only has title, abstract and key words in English, but not full text

2. Not–related:

   a. not an academic article – e.g. editorial materials, conferences reviews, contents, forwards, book, grey literature

   b. the definition of the topic used in paper does not match that used in the review.

3. Loosely-related: the paper doesn't focus directly on the topic of the review

   a. the topic is only used as an example

   b. the topic is only included in the discussion under the need for future research perspectives etc.

   c. the topic is only used as a cited expression

   d. the topic is only used in keywords and/or references

Included:

1. Partly related

   a. paper focused on general issues with out mentioning specific topic

   b. topic is only used to support the description of some challenges, issues or trends

   c. topic is only one of serval to be reviewed, surveyed or discussed

2. Closely related: the research efforts of the paper are exclusively and specifically dedicated to the topic.

Liao, Y., Deschamps, F., de Freitas Rocha Loures, E. and Ramos, L.F.P. (2017). Past, present and future of Industry 4.0- a systematic literature review and research agenda proposal. International Journal of Production Research. 55: 3609-3629.

✎ May want to try Machine Learning approaches...

Khol, C. McIntosh, E.J., Uger, S. Haddaway, N.R. Kecke, S., Schiemann, J. and Wilhelm, R. (2018). Online toots supporting the conduct and reporting of systematic reviews and systematic maps. Environmental Evidence 7, 8. …. Lots of them including…..

CADIMA, Colandr, Covidence, DistillerSR, Early review organizing software (EROS), EPPI-Reviewer 4, Health Assessment Workspace Collaborative (HAWC), METAGEAR package for R , PARSIFAL, Rayyan, REviewER, RevMan Web, SESRA (supporting systematic literature reviews in software engineering), SLR-tool , SLuRp (systematic literature unified Review program), SRDB.PRO—systematic review intelligence Platform, SRDR (systematic review data repository), StArt (state of the art through systematic review), SUMARI (system for the unified management, assessment and review of information), SWIFT-review (Sciome workbench for interactive computer-facilitated text-mining, SyRF (systematic review and meta-analysis facility)

3. Bibliometric Analysis to start with?

- Search online database for publications

- Download meta-data about papers as csv files (Authors, Title, Year, Source title, Volume, Issue, Art. No., Page start, Page end, Page count, Cited by, DOI, Link, Abstract, Index Keywords, Document Type, Access Type, Source)

- Import into Excel to calculate simple numbers (number pubs and citations per year, major journals, discipline areas or use online database options for this)

☑ Lecture Notes In Computer Scie...	26
☑ Lecture Notes In Geoinformatio...	6
☑ ACM International Conference ...	5
☑ Computers Environment And Ur...	5
☑ ACM Transactions On Intelligen...	4
☐ Applied Geography	4
☐ Ceur Workshop Proceedings	4
☐ International Conference On Inf...	4
☐ Multimedia Tools And Applications	4
☐ ACM Transactions On Multimed...	3

Pie chart:
- Computer Scienc... (71.0%)
- Social Sciences... (20.7%)
- Engineering (15.3%)
- Mathematics (12.7%)
- Business, Manag... (10.3%)
- Decision Scienc... (6.3%)
- Environmental S... (6.3%)
- Earth and Plane... (5.7%)
- Agricultural an... (4.3%)
- Arts and Humani... (2.0%)
- Other (7.0%)

Then …

- Import files into VOSviewer or similar programs to generate maps of key words, key papers, co-citations etc

- Lots examples on VOSviewer website.
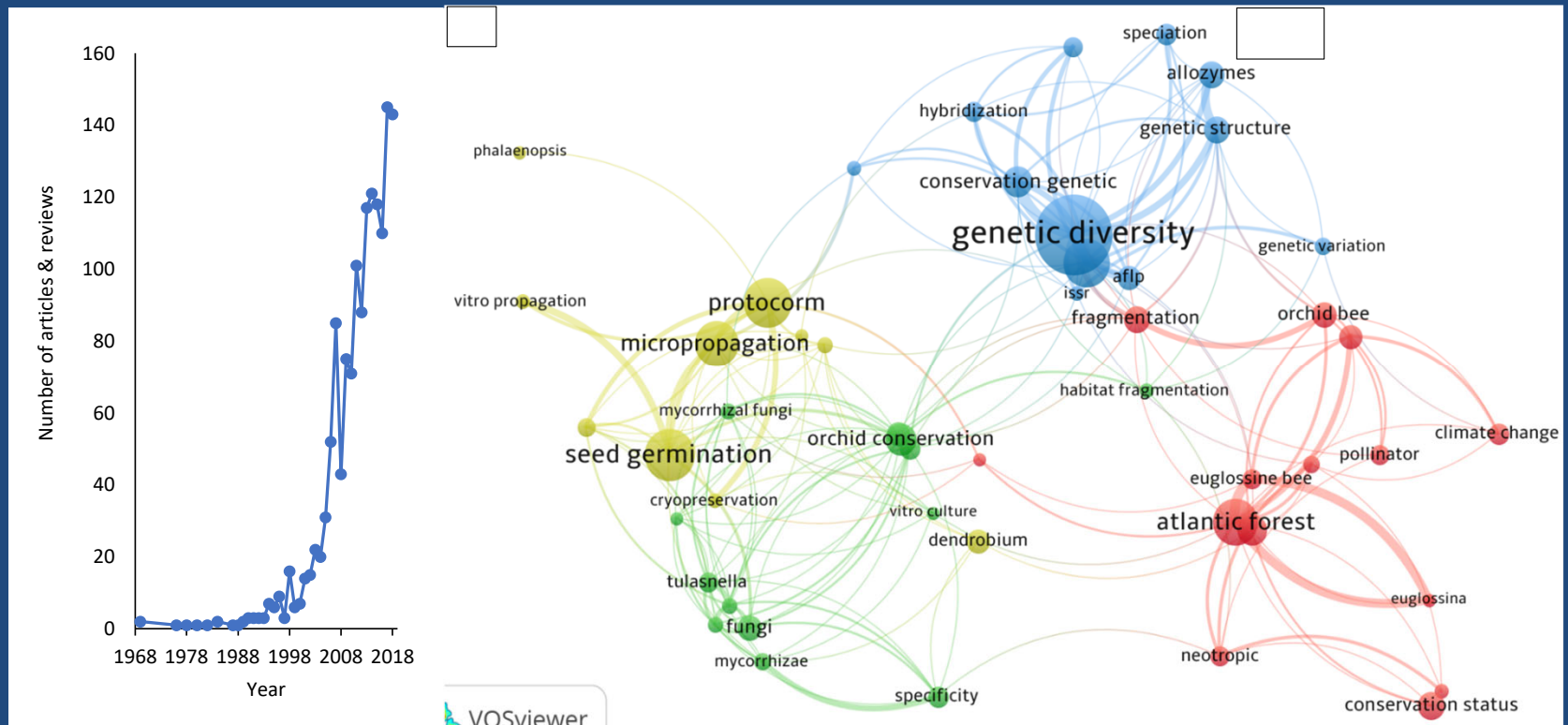
Good way to understand the literature including at the start of a PhD

- Example using Scopus database
- Specific search terms

TITLE-ABS-KEY (("Climat* change" OR "Climat* Warming" OR "Global Warming" OR greenhous*) AND "Alpine" AND ("Plant*" OR "Vegetat*" OR "Flora")) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "re") OR LIMIT-TO (DOCTYPE , "cp") OR LIMIT-TO (DOCTYPE , "ch") OR LIMIT-TO (DOCTYPE , "bk"))

- Useful to review literature and identify key papers, research directions, authors and affiliations
- Identify cohesiveness and gaps
- Comparative and cluster analysis (VOSViewer)

Verrall, B. and Pickering, C.M. (2020). Alpine vegetation in the context of climate change: A global review of past research and future directions. *Science of the Total Environment.* 748: 141344.

	Period	1961 – 1999	2000 – 2009	2010 – 2019
	Documents	**136**	**506**	**1861**
Type of Publication	Article	133 (98%)	447 (88%)	1719 (92%)
	Review	1 (<1%)	29 (6%)	58 (3%)
	Conference Paper	2 (1%)	23 (5%)	37 (2%)
	Book Chapter	-	7 (1%)	41 (2%)
	Books	-	-	6 (<1%)
Subject Areas	Agricultural and Biological Sciences	64 (47%)	311 (61%)	1206 (65%)
	Environmental Sciences	61 (45%)	263 (52%)	1028 (55%)
	Earth and Planetary Sciences	49 (36%)	161 (32%)	453 (24%)
Country	China	3 (2.2%)	70 (13.8%)	730 (39.7%)
	United States	33 (24.3%)	104 (20.6%)	409 (22.3%)
	Switzerland	20 (14.7%)	66 (13.0%)	230 (12.4%)
Affiliations	Chinese Academy of Sciences	4 (2.9%)	107 (21.2%)	1112 (59.8%)
	Eidgenössische Forschungsanstalt fur Wald	4 (2.9%)	14 (2.8%)	76 (4.1%)
	ETH Zürich	4 (2.9%)	9 (1.8%)	59 (3.2%)
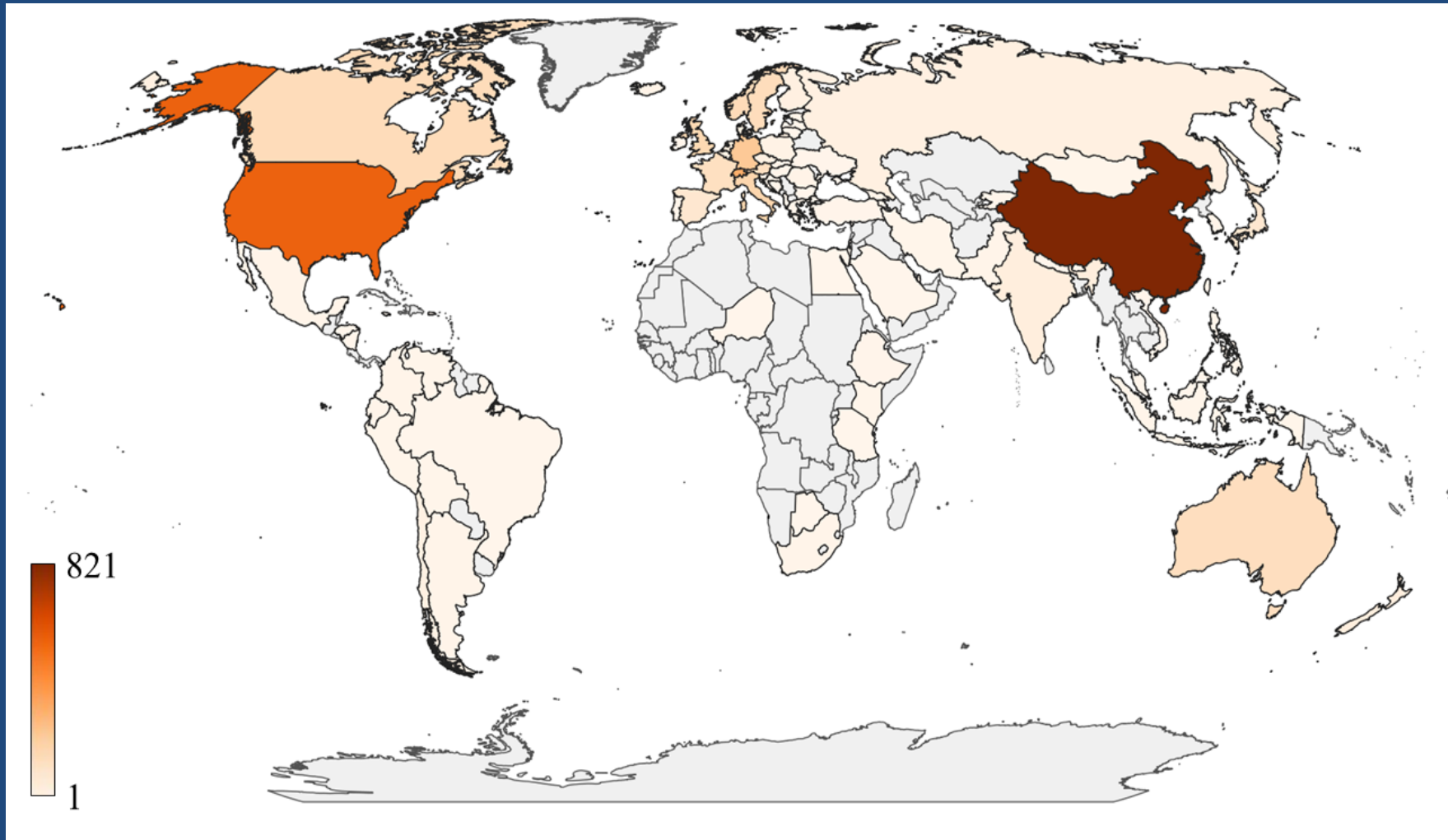
Global distribution of authors publishing on climate change and alpine vegetation bases on their affiliations for 2,530 publications obtained from focused search of Scopus.

Major themes in the focused literature on climate change and alpine vegetation based on the most common 50 keywords used by authors from a focused search of Scopus, with the data displayed as distance maps, using VOSViewer

Figure 2. The methodological framework of the bibliometric analysis.

Also checkout other example such as Elomari, et al. (2022). Sustainability, 14: 9249.
https://doi.org/10.3390/su14159249
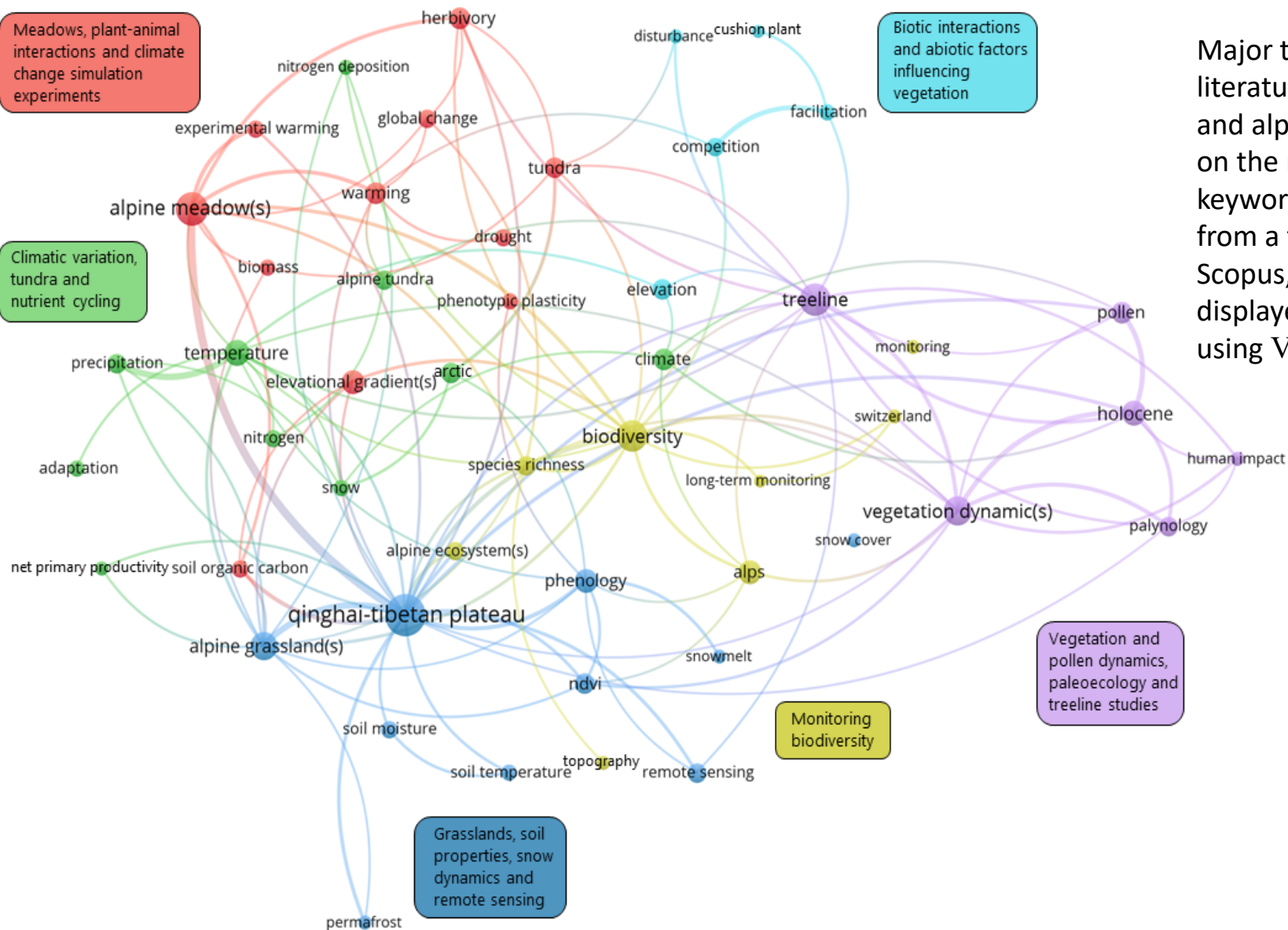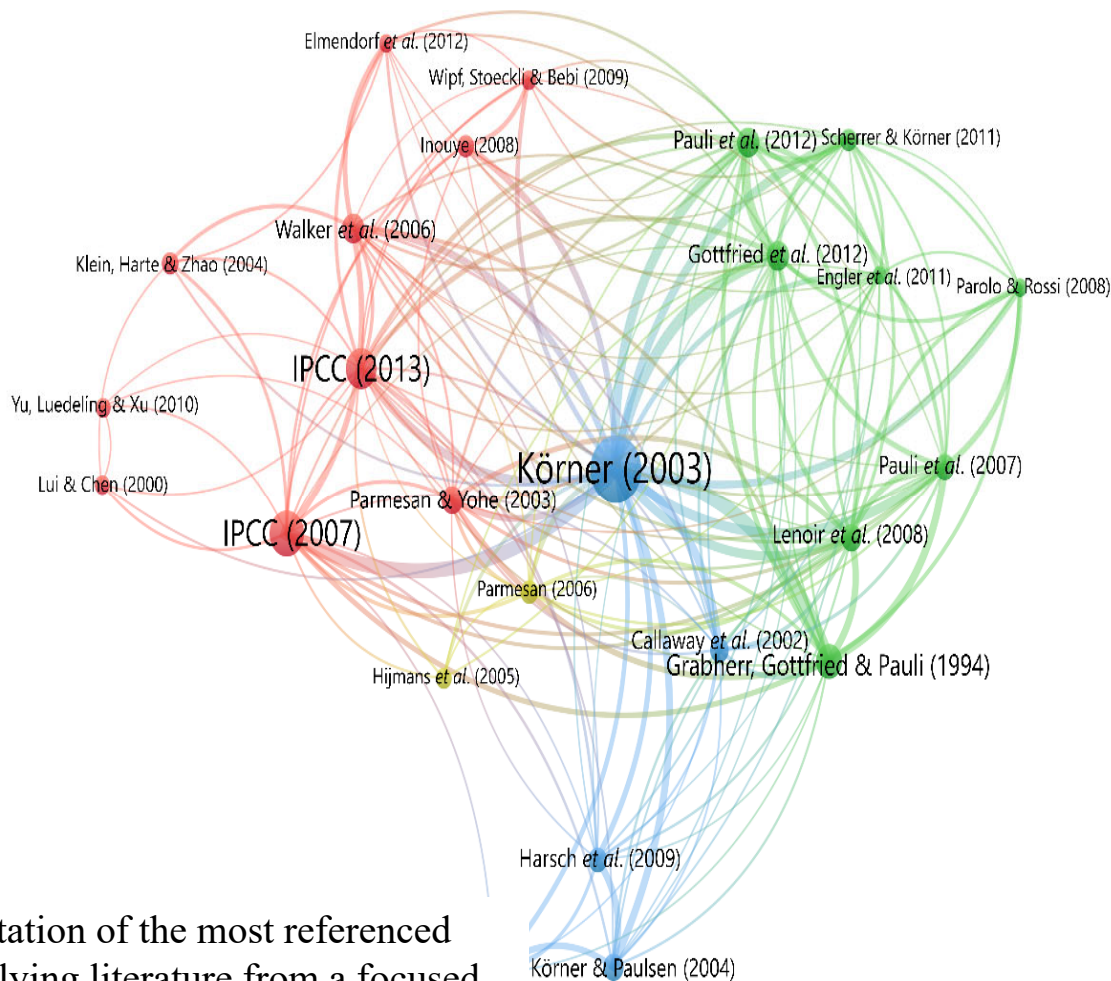
Co-citation of the most referenced underlying literature from a focused search of climate change and alpine vegetation in Scopus, with the data displayed as distance maps, using VOSViewer software

4. Coding challenges

Remember coding issues highlighted previously

1. Spend time working out the categories and subcategories and test them
2. Use lots of categories/subcategories
3. For each paper its often better to just use '1' or blank if paper does this (will be easy then to calculate results)
4. Be clear about rules for categories/subcategories (Falkland/Malvinas Islands example)
5. Often good to check coding by different people gives the same results for a subsample of papers (increased consistence)
6. Record details in a second page of the Excel sheet about what you did with hard to code examples
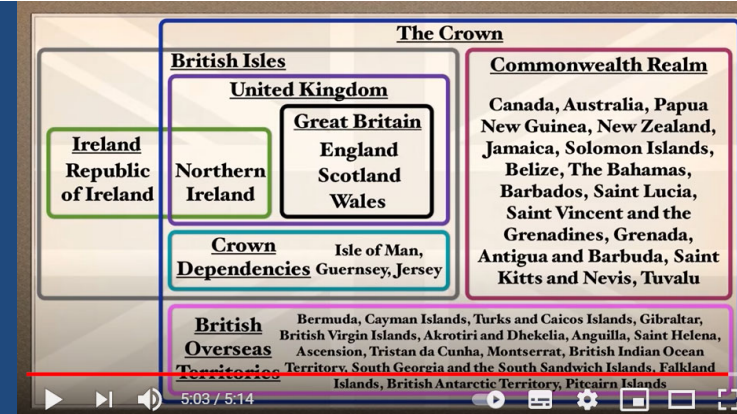
Coding different types of documents using content analysis

Category	No.	Dates	Sources						Document Types							
			Provided by ExxonMobil			ICN	NYT	Other	Academic journal	Conference/ workshop proceeding	Gov. report	Book	Industry white paper	Internal doc.	Ad	Misc. opinion
			'Peer-reviewed'	'Additional'	'Supporting materials'											
Internal Documents	32	1977–1995	0	0	22	28	0	1	0	0	0	0	0	32	0	0
Peer-Reviewed	72	1982–2014	50	19	0	0	0	3	53	2	13	4	0	0	0	0
Non-Peer-Reviewed	47	1980–2014	3	29	0	3	0	12	0	24	5	2	2	0	0	13
Advertorials	36	1989–2004	0	0	0	0	36	0	0	0	0	0	0	0	36	0

"Each document's manifest content is then further characterized in four ways: type, topic, position with respect to AGW, and position with respect to risks of stranded assets…"

"One of the authors coded all of the documents, and ambiguities were resolved through discussion between authors. To verify intercoder reliability and intercoder agreement, both authors independently coded a random subset of 36 documents (approximately 19% of the total number of documents in each category). Intracoder reliability was also calculated."

Table 2. Definitions of the Endorsement, Impact, and Solvable Points used to code levels of acknowledgment of AGW as real and human-caused, serious, and solvable, respectively. See section S1, supplementary information, for details on the content analysis and coding scheme.

AGW as Real and Human-Caused

Endorsement points (EPs)		Description
'Acknowledge'	(EP1) Explicit endorsement with quantification	Explicitly supports position that humans are the primary cause of global warming (with quantification)
	(EP2) Explicit endorsement without quantification	Explicitly supports position that humans are the primary cause of global warming (without quantification) or refers to anthropogenic global warming as a known fact
	(EP3a) Implicit endorsement	Implicitly supports position that humans are the primary cause of global warming. e.g. research assumes greenhouse gas emissions cause warming without explicitly stating humans are the cause
	(EP3b) Implicit endorsement of consensus	Implicitly supports position that humans are the primary cause of global warming by referring to a consensus of the scientific community
'No position'	(EP4a) No position	Does not address the cause of global warming
'Doubt'	(EP4b- 1) Uncertain of reality of AGW	Expresses position that the *reality* of recent global warming is uncertain/undefined, namely 'it's not happening'
	2) Uncertain of human contribution to AGW	Expresses position that the *human contribution* to recent global warming is uncertain/undefined, namely 'it's not us'

5a. Basic analysis: Tables of totals & percentages

Kim, E. and Cuskelly, G. (2017). A systematic quantitative review of volunteer management in events. Event Management. 21: 83-100

Turner, J.A., Babcock, R.C., Hovey, R., and Kendrick, G.A. (2017).Deep thinking: a systematic review of mesophotic coral ecosystems. ICES Journal of Marine Science. https://doi.org/10.1093/icesjms/fsx085

Table 1

Distribution of Peer-Reviewed Research Articles Examining Volunteer Management in Events by Study Location and Country of Author (Based on Author Affiliation)

Country	Study Locations [Frequency (%)][a]	Authors [Frequency (%)][a]
United States	13 (17.8)	31 (19.7)
Canada	11 (15.1)	25 (15.9)
Australia	11 (15.1)	23 (14.6)
United Kingdom	9 (12.3)	27 (17.1)
Norway	7 (9.6)	12 (7.6)
Greece	4 (5.5)	8 (5.1)
Korea	4 (5.5)	6 (3.8)
China	4 (5.5)	3 (1.9)
Switzerland	2 (2.7)	6 (3.8)
New Zealand	2 (2.7)	5 (3.2)
Iran	1 (1.4)	3 (1.9)
Germany	1 (1.4)	2 (1.3)
Egypt	1 (1.4)	2 (1.3)
South Africa	1 (1.4)	1 (0.6)
Kuwait	–	1 (0.6)
Malaysia	–	1 (0.6)
Taiwan	–	1 (0.6)
Not specified	2 (2.7)	–
Total	73[b]	157

[a]Does not add to 100% due to rounding.
[b]Total > 71. One article by Dickson, Benson, and Terwiel
(2014) and one article by Kemp (2002) examined volunteers

Research focus	Number of studies	
Descriptive	137	39.3%
Molecular Ecology	38	10.9%
Taxonomy	33	9.5%
Structuring Variables	30	8.6%
Review	23	6.6%
Ecosystem Function	20	5.7%
Geomorphology	18	5.2%
Life History	18	5.2%
Methods	11	3.2%
Natural Impacts	10	2.9%
Anthropogenic Impact	7	2.0%
Management	4	1.1%

Basic analysis: Similar data but in graphs

Emondi, N.V., Okereke, C. Abam, F.I., Diemuodeke, O.E, Owebor, , and Nnamani, U.A. (2022). Transport sector decarbonisation in the Global South: A systematic review. Energy Strategy Reviews, 43: 100925.

Number publications + key events

Affiliations vs where study
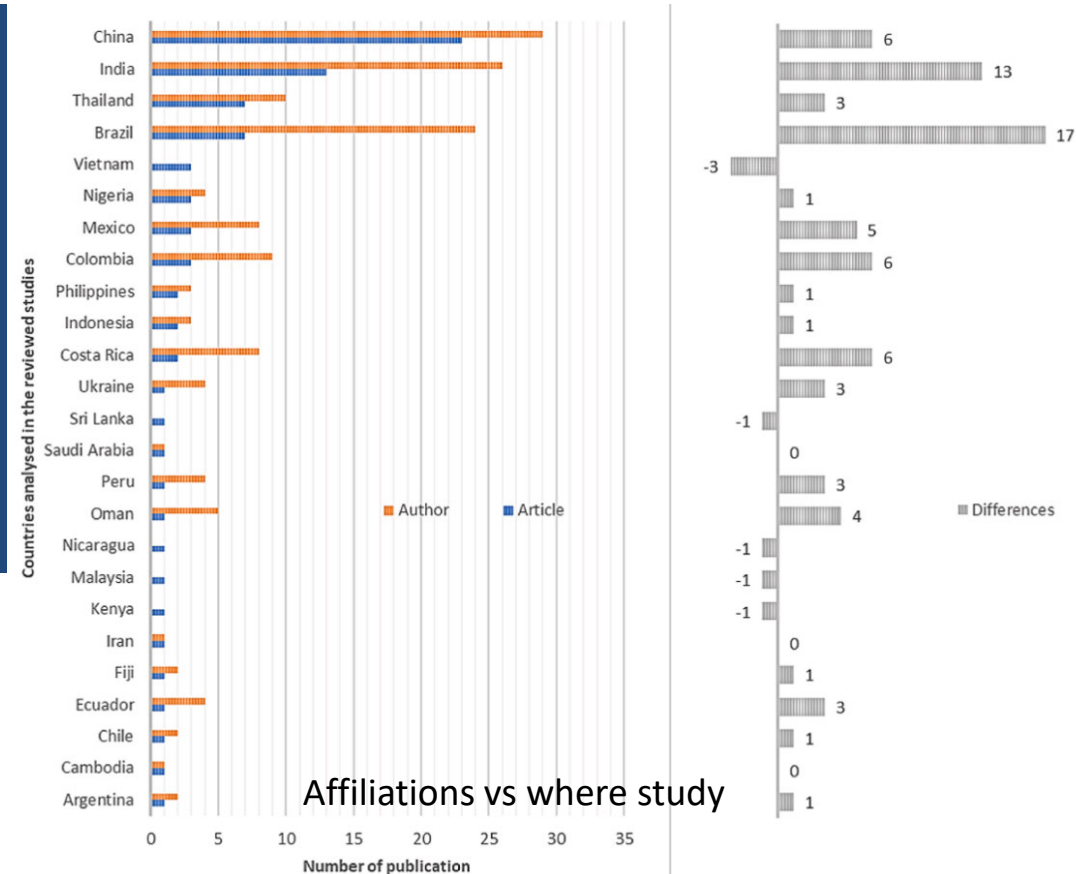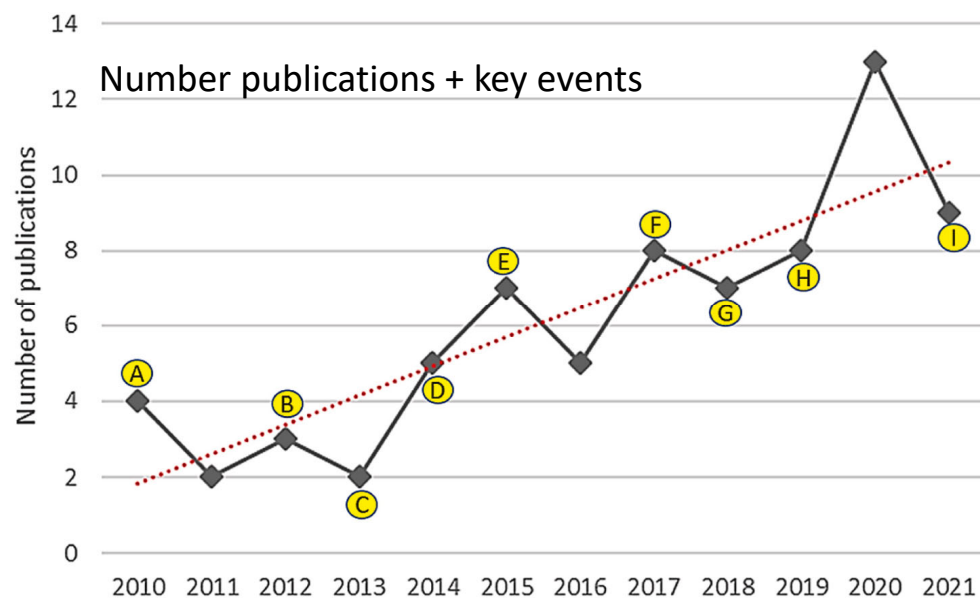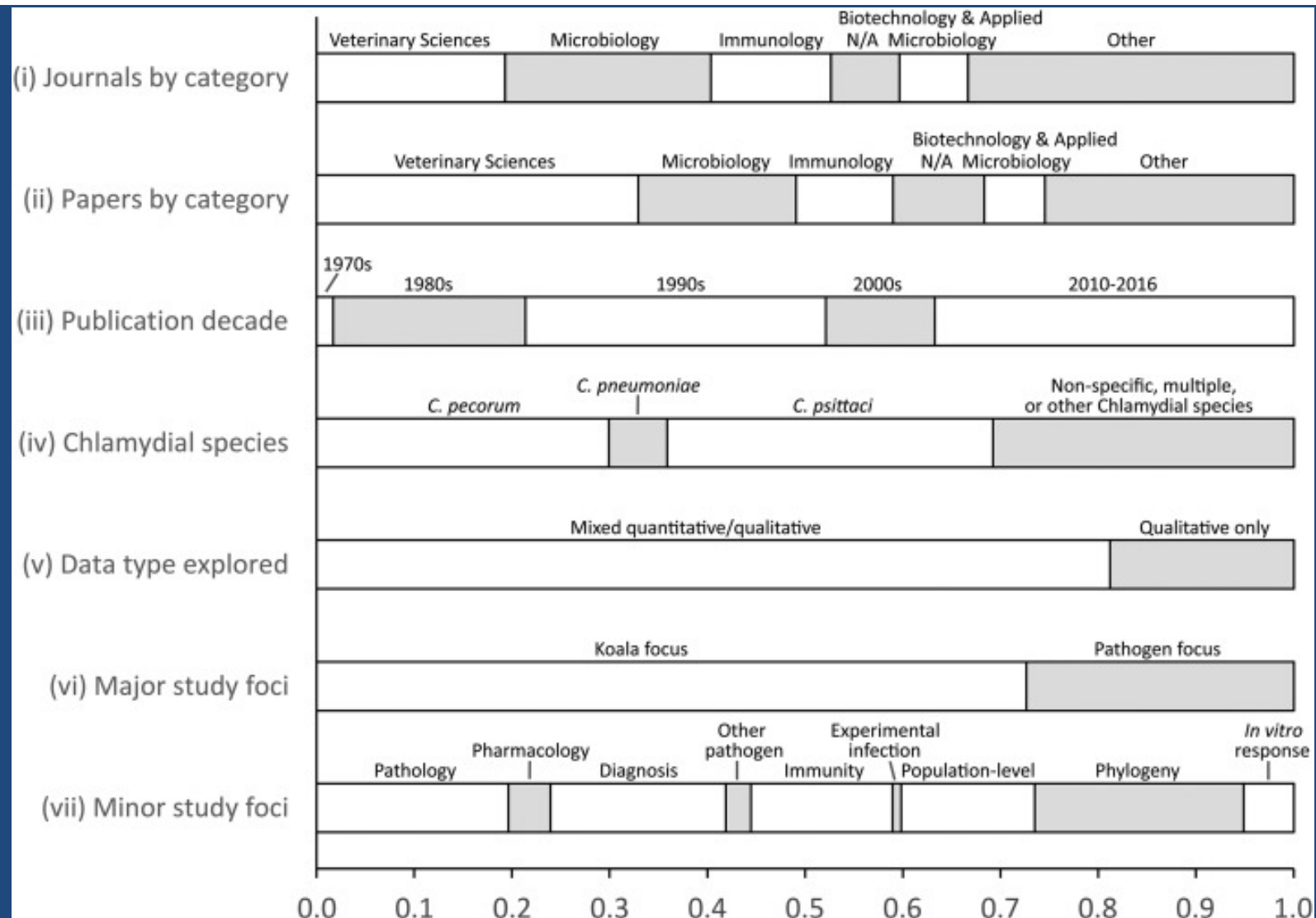
Grogan et al. 2017. Current trends and future directions in koala chlamydial disease research Biological Conservation 215: 179-188

Coding of journals by disciplines

Official list of categories journals
Check with librarians for the latest ways to do this…..

ext_list_June_2017.xlsx

	A	B	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO
1	Sourcerecord id	Source Title (Medline-sourced journals are indicated in Green) Titles indicated in bold red do not meet the Scopus quality criteria anymore and therefore Scopus discontinued the forward capturing	Top level: Life Sciences	Top level: Social Sciences	Top level: Physical Sciences	Top level: Health Sciences	1000 General	1100 Agricultural and Biological Sciences	1200 Arts and Humanities	1300 Biochemistry, Genetics and Molecular	1400 Business, Management and Accounting	1500 Chemical Engineering	1600 Chemistry
19643	12810	Journal of Information Ethics		Social Sciences					Arts and Humanities				
19644	21100223313	Journal of Information Hiding and Multimedia Signal Processing			Physical Sciences								
19645	21100329302	Journal of Information Literacy		Social Sciences									
19646	32853	Journal of Information Processing			Physical Sciences								
19647	21100203301	Journal of Information Processing Systems			Physical Sciences								
19648	58702	Journal of Information Recording		Social Sciences					Arts and Humanities				
19649	12813	Journal of Information Science		Social Scien(	Physical Sciences								
19650	12492	Journal of Information Science and Engineering		Social Scien(	Physical Sciences								
19651	21100332403	Journal of Information Security and Applications			Physical Sciences								
19652	73889	Journal of Information Storage and Processing Systems			Physical Sciences								
19653	15688	Journal of Information Systems		Social Scien(	Physical Sciences						Business, Management and Accounting		
19654	21100211745	Journal of Information Systems Education		Social Scien(	Physical Sciences								
19655	66016	Journal of Information Systems Management		Social Scien(	Physical Sciences								
19656	12815	Journal of Information Technology		Social Scien(	Physical Sciences						Business, Management and Accounting		
19657	19700170417	Journal of Information Technology and Politics		Social Scien(	Physical Sciences								
19658	21100775395	Journal of Information Technology Education: Discussion Cases		Social Scien(	Physical Sciences								
19659	21100448516	Journal of Information Technology Education: Innovations in Practice		Social Scien(	Physical Sciences								
19660	21100199856	Journal of Information Technology Education:Research		Social Scien(	Physical Sciences								
19661	19700201308	Journal of Information Technology Research			Physical Sciences								
19662	21100448566	Journal of Information Technology Teaching Cases		Social Sciences									
19663	21100242617	Journal of Information, Communication and Ethics in Society		Social Scien(	Physical Sciences				Arts and Humanities				
19664	5100155103	Journal of Informetrics		Social Scien(	Physical Sciences								
19665	18500162200	Journal of Infrared, Millimeter, and Terahertz Waves			Physical Sciences								
19666	16297	Journal of Infrastructure Systems			Physical Sciences								
19667	28211	Journal of Infusion Nursing				Health Sciences							
19668	15106	Journal of Inherited Metabolic Disease	Life Sciences			Health Sciences				Biochemistry, Genetics and Molecular Biology			
19669	13667	Journal of Injection Molding Technology			Physical Sciences							Chemical Engineering	
19670	19900192606	Journal of Injury and Violence Research				Health Sciences							

Coding of journals by disciplines

Liao, Y., Deschamps, F., de Freitas Rocha Loures, E. and Ramos, L.F.P. (2017). Past, present and future of Industry 4.0- a systematic literature review and research agenda proposal. International Journal of Production Research. 55: 3609-3629.

Subject Areas

- Engineering 28%
- Computer Science 41%
- Others, 31%

Business, Management and Accounting
- Business
- Social Sciences
- Chemistry
- Mathematics
- Decision Sciences
- Management and Accounting
- Health Professions
- Physics and Astronomy
- Materials Science
- Energy
- Medicine
- Biochemistry, Genetics and Molecular Biology

Subject Categories - Engineering

- Engineering (miscellaneous) 9%
- Industrial and Manufacturing Engineering 24%
- Electrical and Electronic Engineering 29%
- Control and Systems Engineering 14%
- Mechanical Engineering 19%
- Aerospace Engineering 5%

Subject Categories - Computer Science

- Computer Vision and Pattern Recognition 2%
- Hardware and Architecture 12%
- Computer Networks and Communications 17%
- Information Systems 10%
- Computer Science Applications 15%
- Computational Theory and Mathematics 2%
- Artificial Intelligence 7%
- Computer Science (miscellaneous) 5%
- Software 27%
- Computer Graphics and Computer-Aided Design 3%

(b) Journal Categorizations (SCImago) based on Each Different Journal with an IF

Basic analysis: Maps

Botzat, A., Fischer, L.K, and Kowarik, I. (2016).. Global Environmental Change. 39: 220-233.

Johnson et al. (2022). Ambio 15: 1819-

Fig. 3

Location of Q+PPGIS studies and their primary focal area
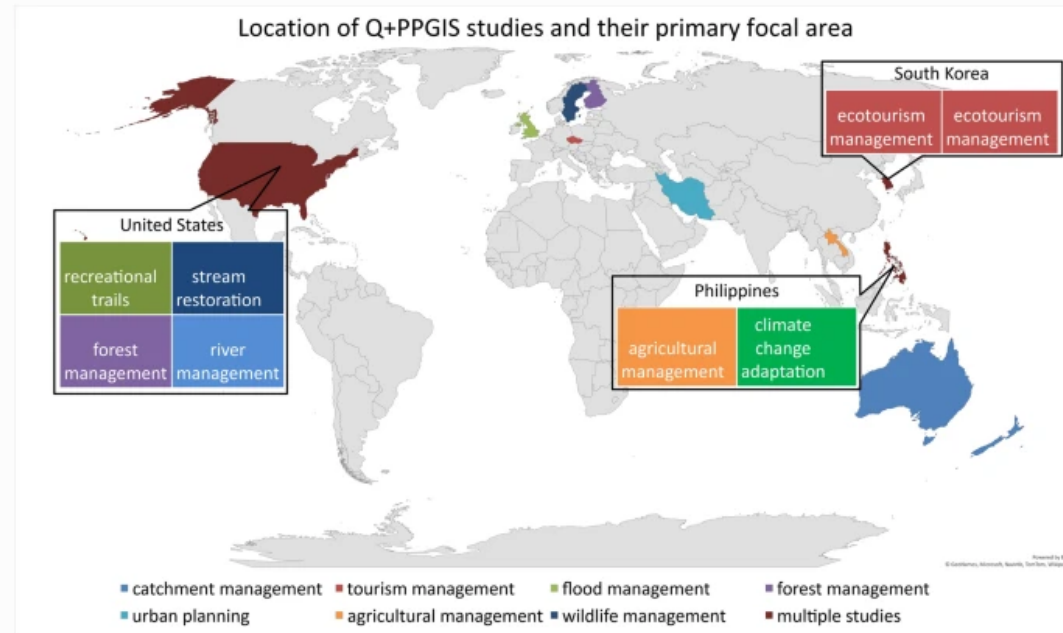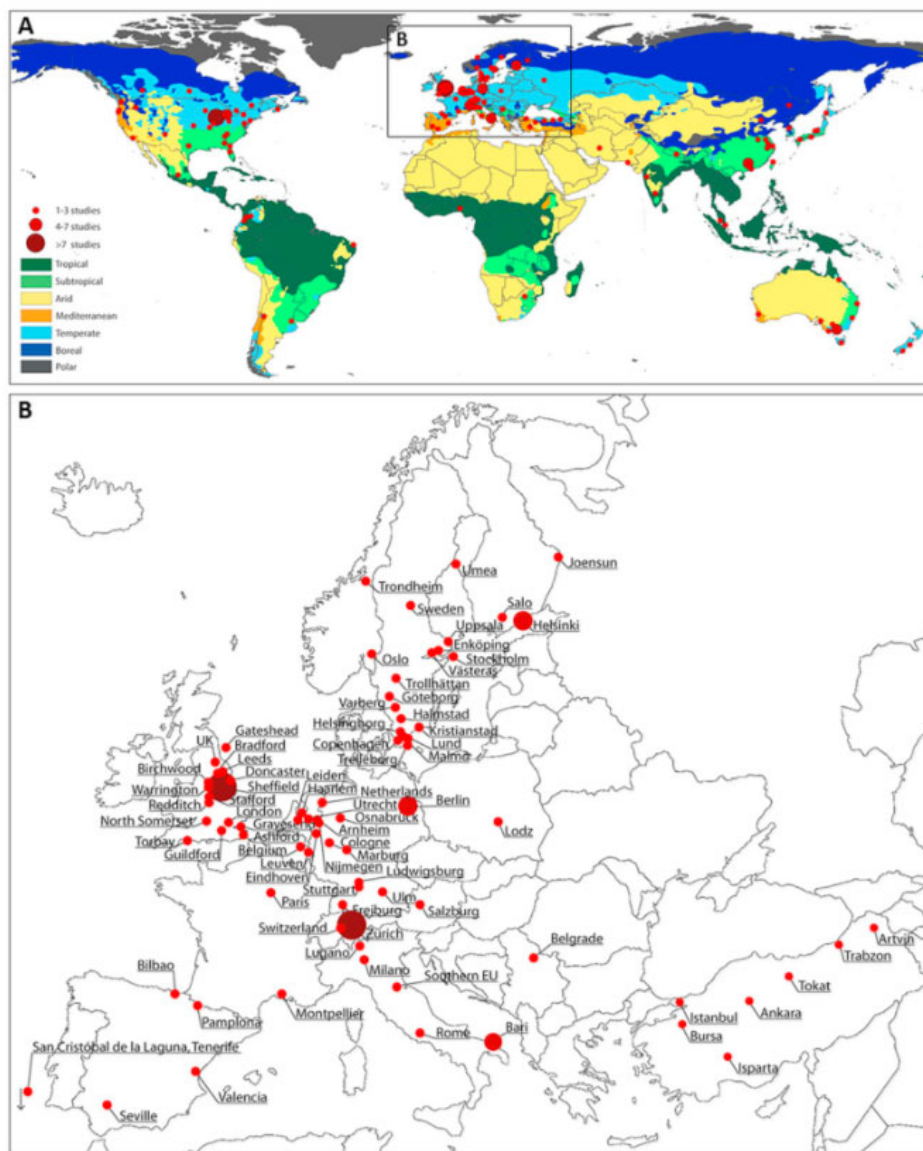
Location and primary focus of studies (n = 16)

5.b Moderate analysis:
One variable against another (% studies) in tables

Table 3. Benefits attained by transformative travelers		All (%)	All (n)	Health & wellness (%)	Physical activity (%)	Spiritual (%)	Cultural (%)	Volunteering (%)
Benefit classification	Individual benefits	n	126	28	27	18	18	35
Health, well-being	Psychological well-being	72	90	79	89	89	40	60
Health, well-being	Emotional well-being	64	80	58	85	83	40	54
Personal competence	Independence	57	72	38	63	33	65	77
Environmental	Appreciation	55	70	49	74	61	45	49
Personal competence	Self-enrichment	55	69	62	56	56	55	49
Health, well-being	Physical health	50	63	72	78	72	25	11
Sociocultural relationships	Social	44	55	38	67	50	25	37
Additional benefits	Sense of achievement	43	54	40	63	50	5	46
Sociocultural relationships	Cultural	38	48	19	37	11	60	57
Environmental	Awareness, sensitivity	37	47	40	63	50	10	23
Additional benefits	Repeated participation	36	46	40	59	39	20	23

Wolf, I.B., Ainsworth, G.B., and Crowley, J. (2017). Transformative travel as a sustainable market niche for protected areas: a new development, marketing and conservation model. Journal of Sustainable Tourism. http://dx.doi.org/10.1080/09669582.2017.1302454

Moderate analysis:
One variable against another in tables (add statistics = chi-square)

	# abstracts*	2002	2004	2006	2008	2010	2012	2014	χ^2
Social	644	61	48	106	84	104	138	103	0.959
Topics									
Perceptions	207 (32%)	9	15	32	24	44	40	43	0.017
Attitudes	128 (19%)	3	6	13	17	31	27	31	<0.001
Profile	155 (24%)	26	18	28	23	22	24	15	0.022
Behaviour	100 (16%)	10	5	7	14	9	30	25	0.002
Motivations	93 (14%)	4	7	9	16	12	22	23	0.031
Experiences	64 (10%)		1	6	5	20	22	10	
Satisfaction	50 (8%)	4		6	9	3	13	15	
Willingness to pay	78 (12%)	8	4	13	16	12	14	11	0.685
Social values	42 (7%)	2	4	6	6	7	12	5	0.741
Economic benefits of tourism	23 (4%)		1	5	6	7	3	1	
Social carrying capacity	16 (2%)		2	7	2	1	3	1	
Expectations	14 (2%)	2	1	3	1	5	2		

Pickering, C.M., Rossi, S.D., Hernando, A, and Barros, A. (in review) Current knowledge and future research directions for the Monitoring and Management of Visitors in Recreational and Protected Areas *Journal of Outdoor Recreation and Tourism*
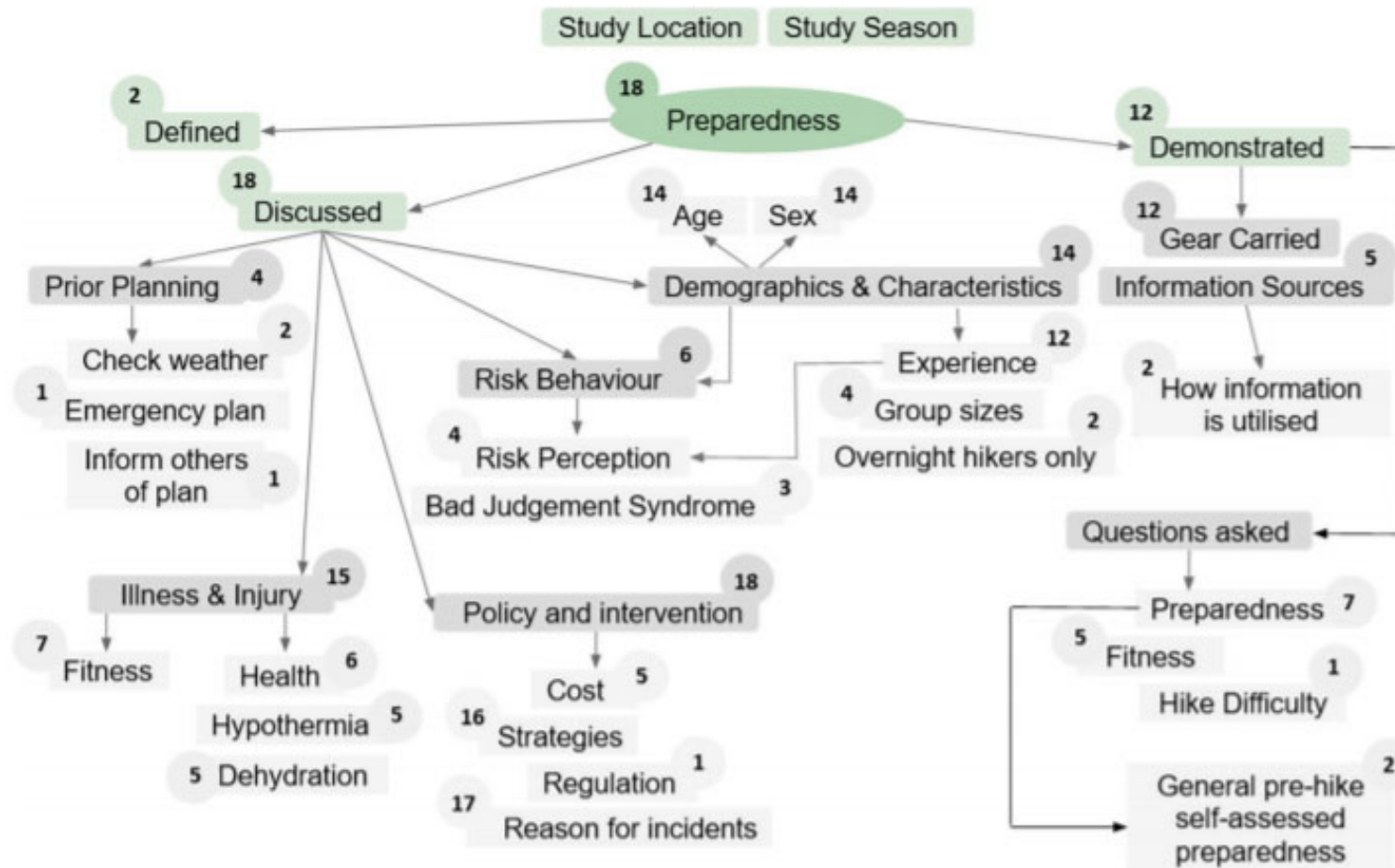
Fig. 4. Results summary - number of papers focusing on preparedness aspects.
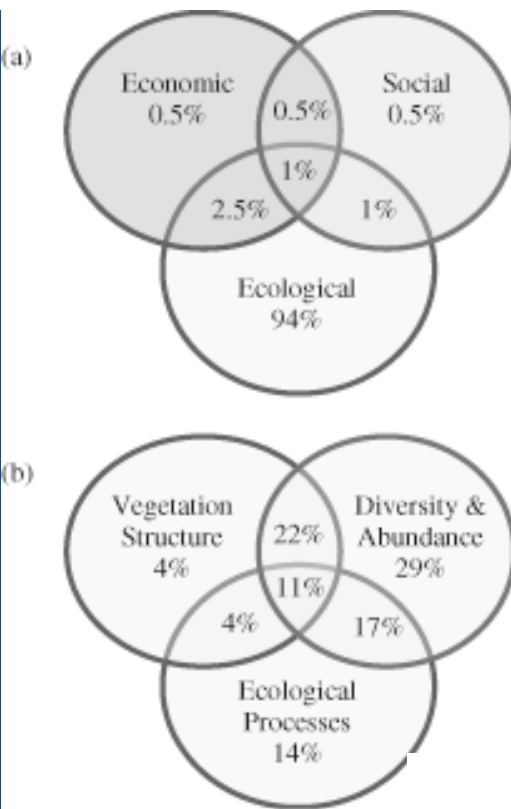
Venn Diagrams showing number of papers by related concepts

(a) the percentage of papers that addressed ecological, economic, or social attributes individually and in combination; (b) of the papers that included ecological attributes, the percentage that addressed vegetation structure, diversity and abundance, and ecological processes. Wortley, L. Hero, J., Howes, M. (2013). Evaluating ecological restoration success: A review of the literature. Restoration Ecology, 21: 537-543

Herington, M.J., van de Fliertb, E., Smarta, S., Greiga, C. and Lanta P.A. (2017). Rural energy planning remains out-of-step with contemporary paradigms of energy access and development. Renewable and Sustainable Energy Reviews 67: 1412–1419.

Spider diagrams showing % papers by disciplines/paradigms
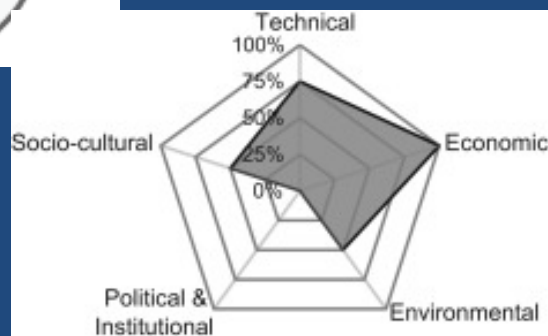
A) Donor-gift paradigm, 1970 to 1989
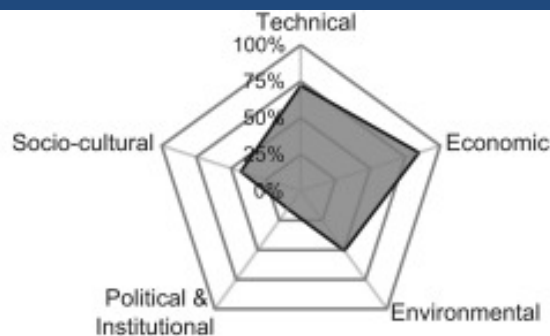
B) Market creation paradigm, 1990 to 2009
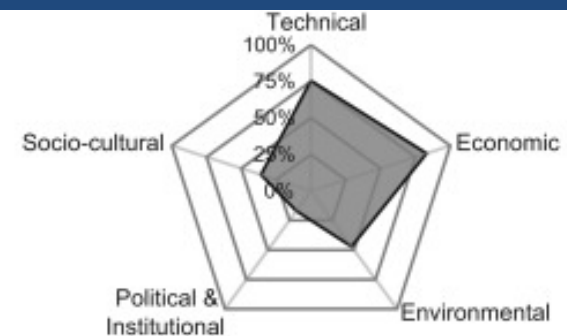
C) Sustainable development paradigm 2010- Present

Moderate analysis :
One variable against another graphs
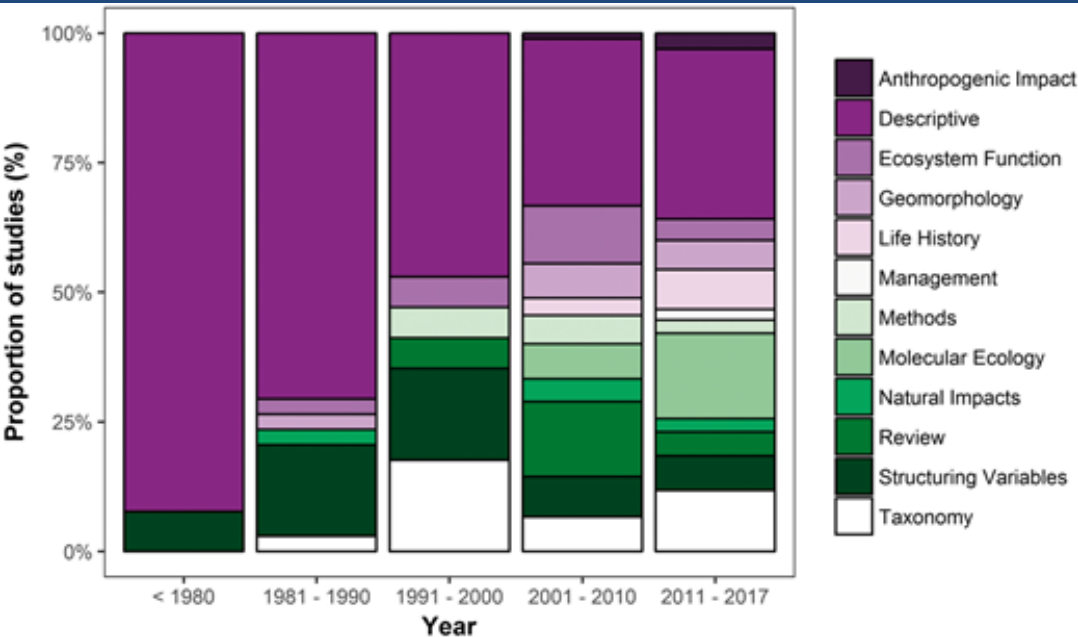
Turner, J.A., Babcock, R.C., Hovey, R., and Kendrick, G.A. (2017).Deep thinking: a systematic review of mesophotic coral ecosystems. ICES Journal of Marine Science. 74, 2309-2320. https://doi.org/10.1093/icesjms/fsx085
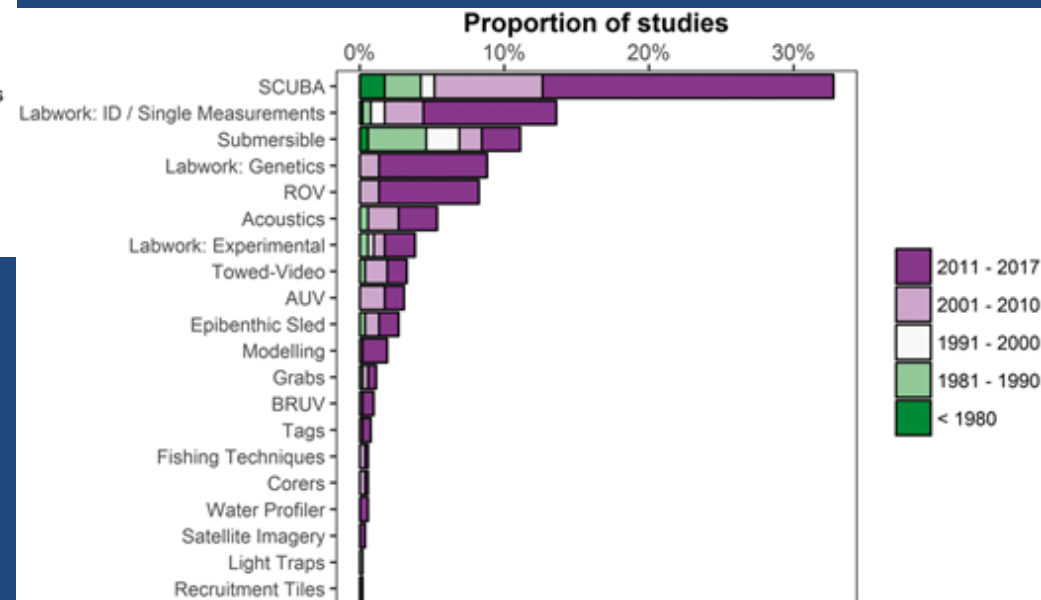
Figure 1. Timeline of the overall positions of all 187 documents on AGW as (a) real and human-caused and (b) serious. Each line represents an individual document. Documents are sorted by category and publication date.
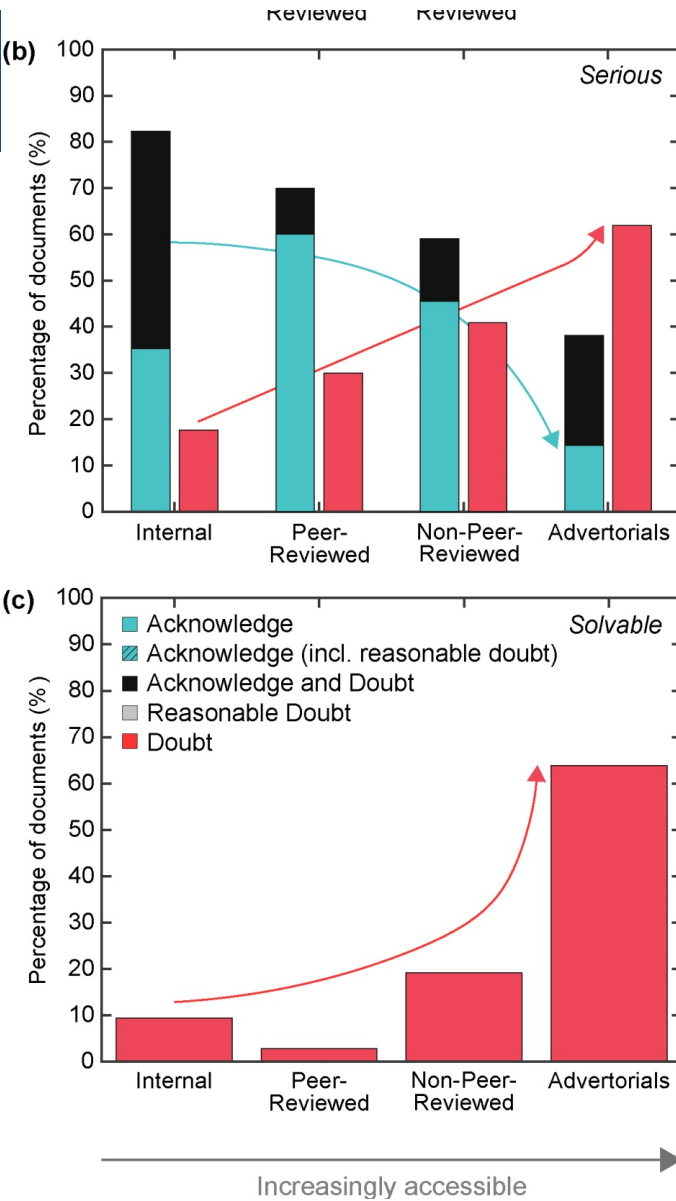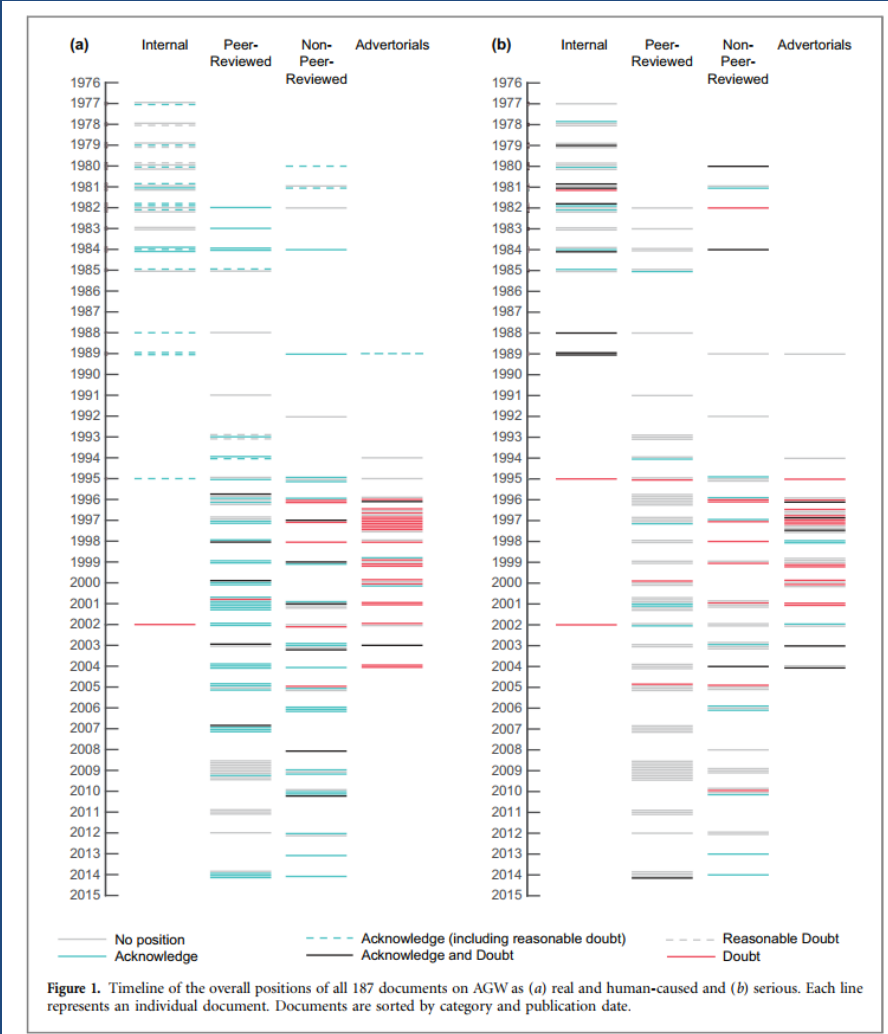
5.c Advanced analysis:
Multidimensional analysis

Results of a Multivariate Categorical Principal Components Analysis of 644 social science abstracts from the first seven Managing and Monitoring Visitors in Recreational and Protected Areas conferences.

Vector lines indicate the strength and direction of the variable in explaining variation among the abstracts, with lines close together indicating a cluster of abstracts assessing similar combinations of the variables.

Pickering, C.M., Rossi, S.D., Hernando, A. and Barros, A. (2018). Current knowledge and future research directions for monitoring and management of visitors in recreational and protected areas. *Journal of Outdoor Recreation and Tourism*. 21: 10-18
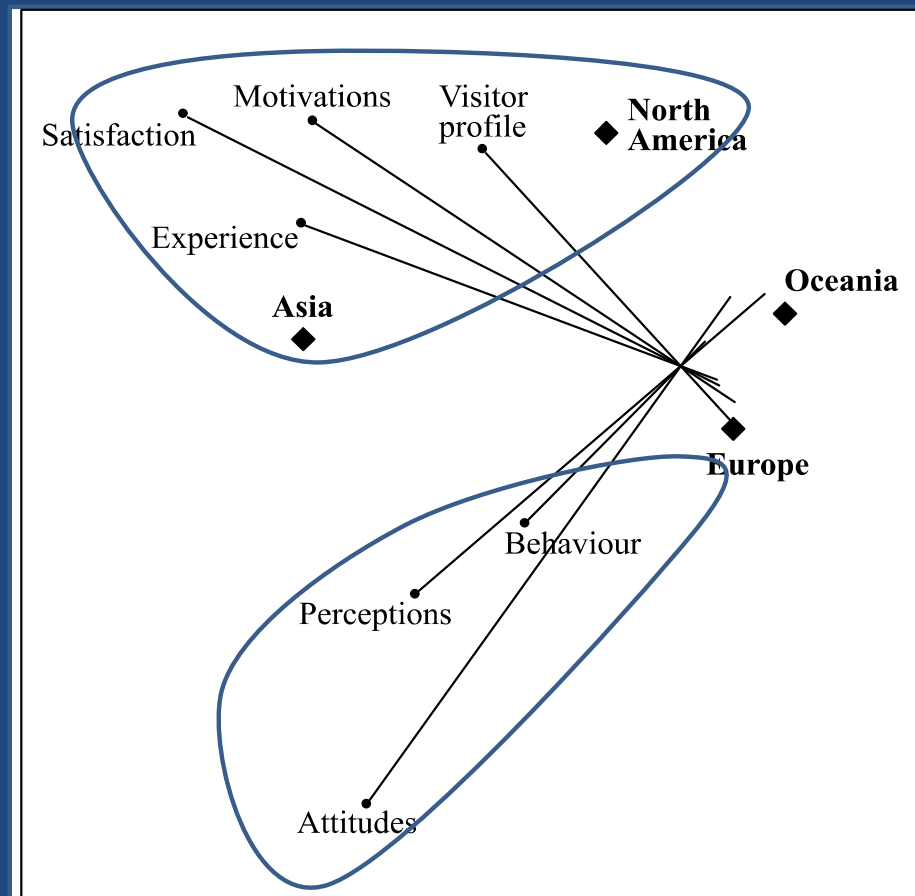
Cluster analysis of related theory/theorist for Schmitt

Robb, L., Lawson, C., **Pickering, C**. and Bikundo, E. (2021). Schmitt's Life Within the Academy Since 2001. In Tranter, K. and Bikundo, E. (eds). Carl Schmitt and The Buribunks: Technology, Law, Literature. London: Routledge.

Group average

Resemblance: S17 Bray Curtis similarity
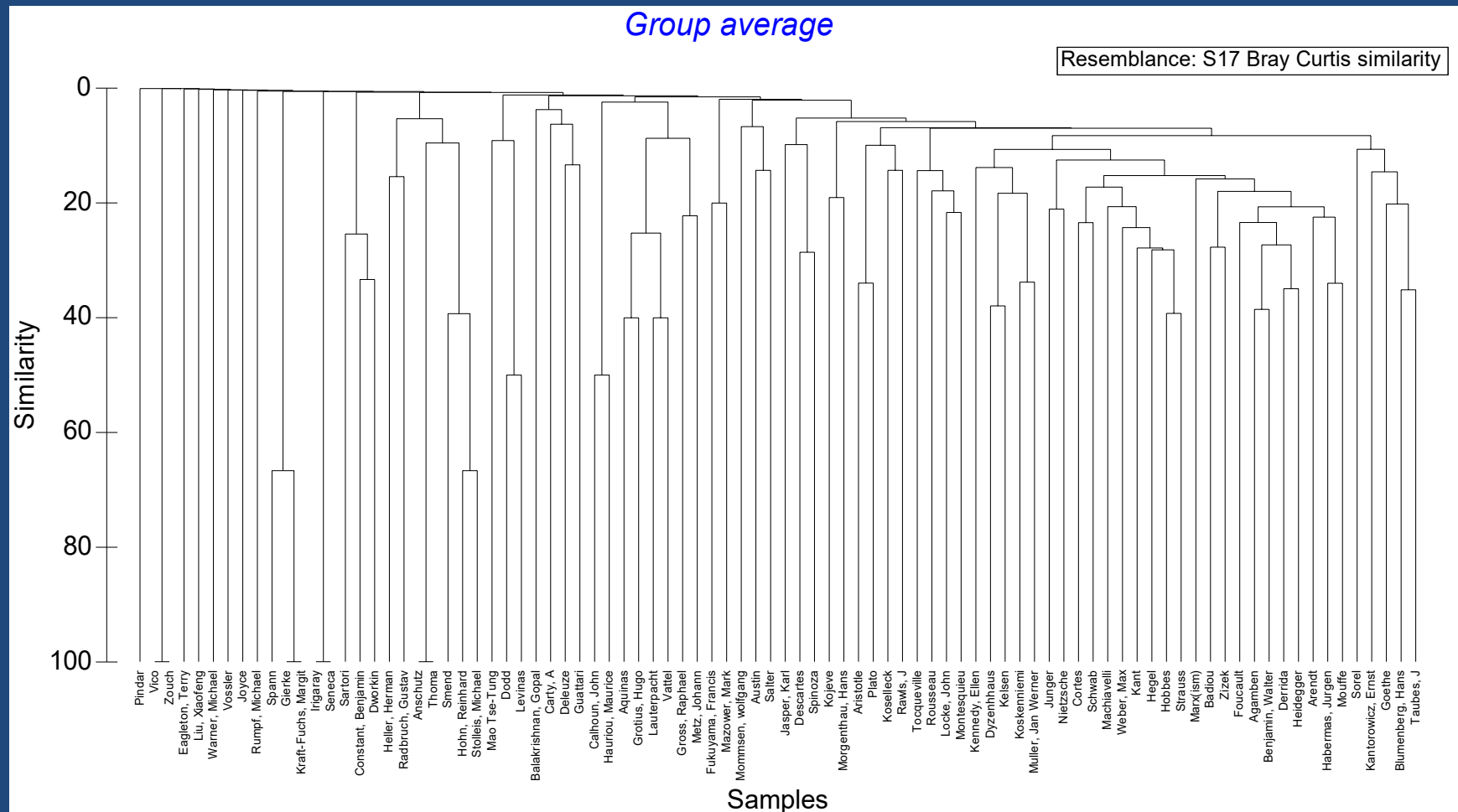
Milcu, A.I., Hanspach, J. Abson, d. and Fischer, J. (2013). Cultural ecosystem services: a literature review and prospects for future research . Ecology and Society 18(3):44. http://dx.doi.org/10.5751/ ES-05790-180344

Agglomerative hierarchical cluster analysis using Euclidian distances of publications based on attributes of the study – minimizes within-group variance and maximises between group variance.

Fig. 6. Dendrogram showing the five groups of publications identified by the cluster analysis.
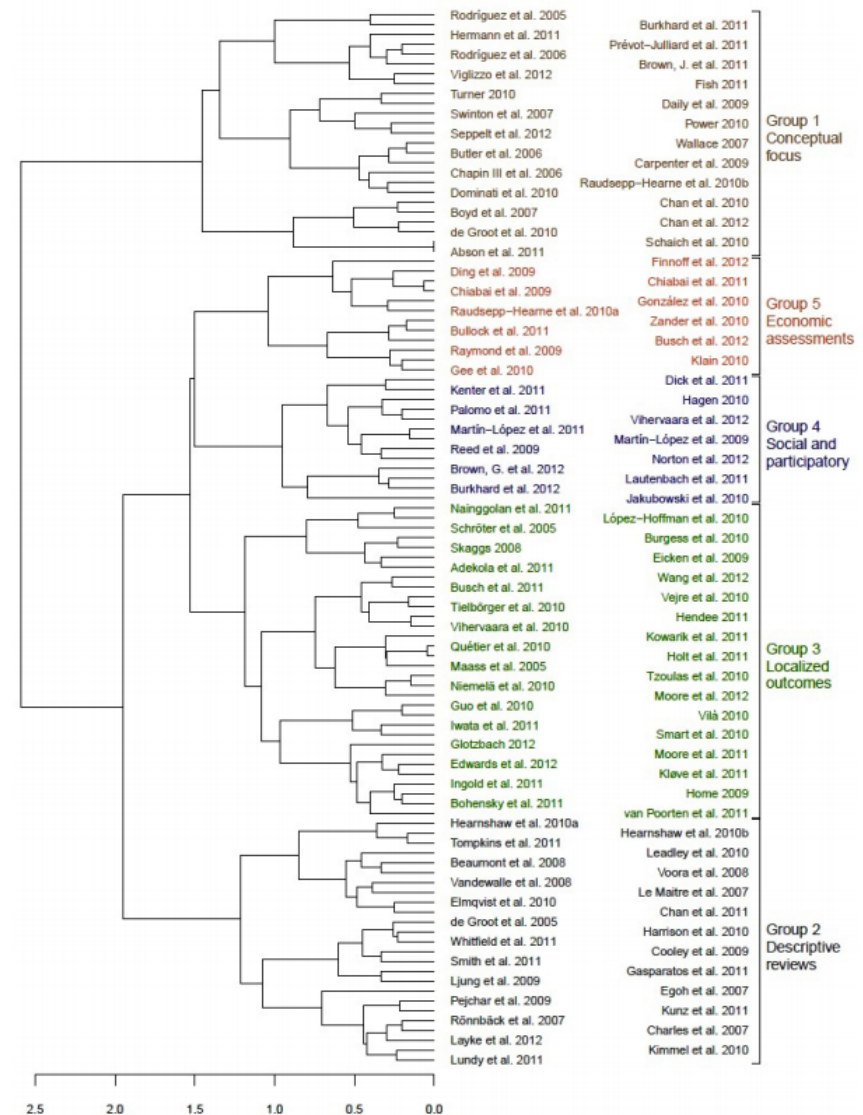
Leximancer analysis of themes

Thomas, S. (2014). Blue carbon: Knowledge gaps, critical issues and novel approaches. Ecological Economics, 107: 22-38

Map concepts by extracting and ranking a list of key words and phrases from source texts. Then uses intelligent algorithm to iteratively build a thesaurus of concepts from more than one or two keywords. Concepts are indexed and weighted.

Identify related concepts, but also topics missing
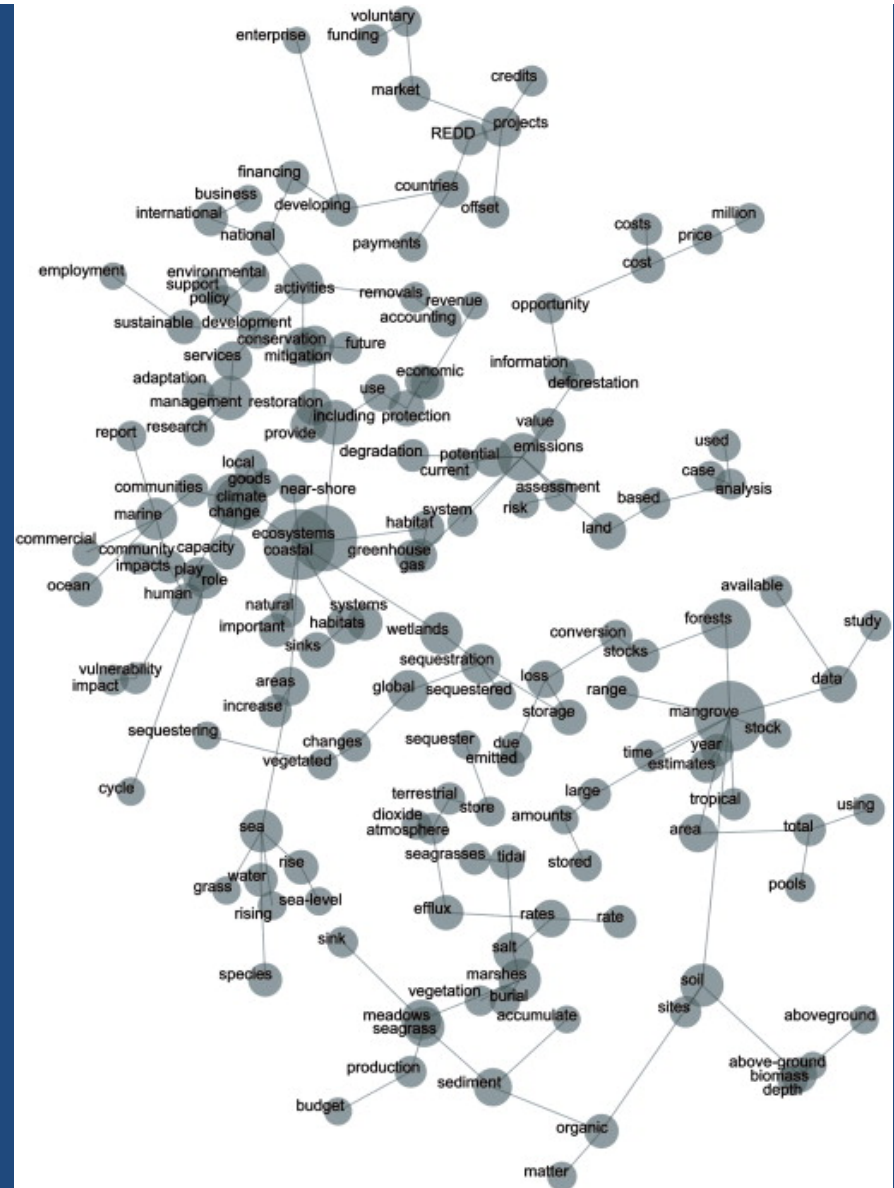
6. Questions raised by reviewers and possible responses

1. **Why only English language?** Response = most research is in English

2. **Why only journal articles?** (e.g. why not grey literature etc) Response = not same standard of work - details methods results etc, have not been peer reviewed, and are not as consistently available as in papers via online search engines

3. **Why was a specific paper not included?** Response = need to provide greater clarification around the criteria used for inclusion/ exclusion for the systematic component of the methods

Questions raised by reviewers

4. **Why not a meta-analysis?** Response = not enough suitable data sets

5. **Why not other topics?** Response = this is an important issues for other reviews to look at (beyond the scope of the current study)

6. **The review is bland/pedestrian.** Response = may need to provide some more context/discussion around the context of the review and the meaning/importance of the results. The nature of the response depends on what's in your review, but sometimes its easy to run out of energy by the discussion, and this is where a bit more work may be needed to fully examine implications/importance and limitations of the review

Examples of responses in papers

"Only peer-reviewed journals were included because they reflect the interests and values of mainstream research communities and have a degree of control and credibility through peer review processes (Fox and Diezmann, 2007 ; Lubienski and Bowen, 2000)…..We note that the identified publications are unlikely to reflect the full scope of work in the field. For example, we were only able to access papers written in English. We are cognizant that relevant publications could well appear in a number of different journals indexed in different databases. Nevertheless, our selection of databases was informed by advice from university librarians, preliminary searches and careful review of individual titles. While peer-reviewed journals are the most common, reliable and current dissemination methods, research on embedding of sustainability into initial teacher education may also be published in other formats."

from Evans, N, Stevenson, R.B., Lasen, M., Ferreira, J. and Davis, J. (2017). Approaches to embedding sustainability in teaching education: A synthesis of the literature. Teaching and Teacher Education, 63: 405-417

Examples of responses in papers

By focusing on peer reviewed academic journals we were able to use a consistent sampling method to identify a literature that has contains similar levels of detail about the study and standards of research. It follows on from the approach used in other systematic quantitative literature reviews (Guitart et al., 2012;Pickering et al., 2014) including in recreation ecology (e.g. Steven et al., 2011; Ansong and Pickering, 2013). We do this while recognizing that original research on trail impacts occurs in other sources including peer reviewed academic journals published in languages other than English and in a range of 'grey' literature such as protected area management plans and reports. Reviewing non-English language peer reviewed journals, however, was beyond the expertise of the authors. As more than 90% of sciences papers are in English (Hamel, 2007) including papers in other languages may not dramatically alter the general patterns found in the current review apart from than those relating to the geographical spread of studies (see below).

We did not include grey literature such as protected area management plans and reports as much of this literature tends to be very specific to certain regions or problems and is often not publically available and hence included in online searchable databases. Also there can be less consistency in the details provided within grey literature about how research was conducted and data analysed and the work often have not been subject to peer review. Future reviews encompass such 'grey' literature are likely to provide important insights particularly for certain regions, although consistent access to grey literature globally remains a challenge.

Ballantyne, M. and Pickering C.M. (2015). The impacts of trail infrastructure on vegetation and soils: current literature and future directions. Journal of Environmental Management. 164: 53-64. 10.1016/j.jenvman.2015.08.032

Importance of demand and supply of research
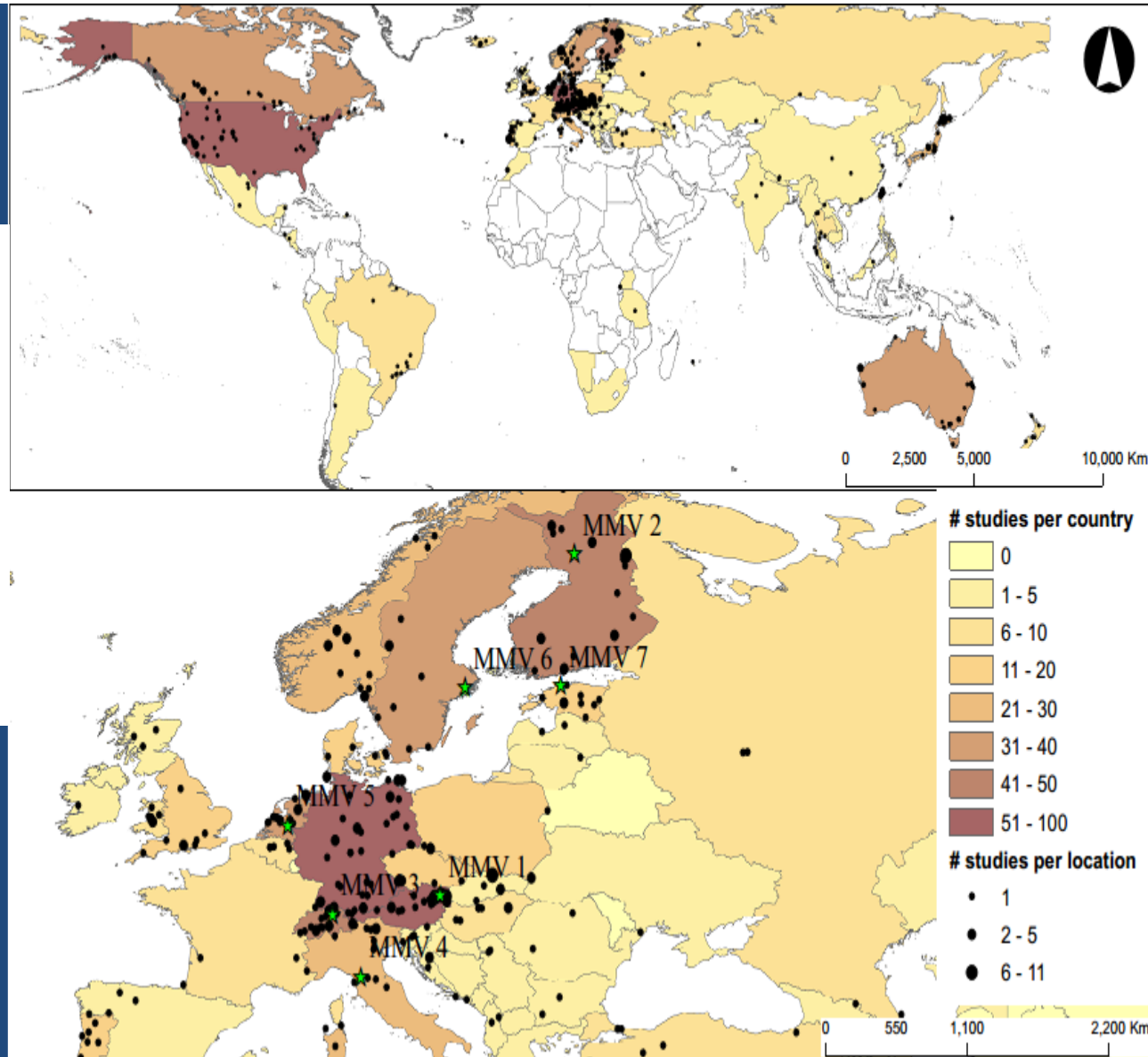
Examples of responses in papers

In terms of the DEMAND factors, there are ways of documenting the NEED for research. This includes quantifying the number of papers vs need using appropriate measures. Here we have done it for research monitoring and managing nature-based tourism.

	Location of research	Total (km²) of terrestrial PA	% terrestrial PA globally	Abstract per 1000 km² PA
Total	758	~20,600,000		0.0368
Europe	551 (72%)	2,915,790	14.15	0.00019
Countries with large PA systems				
Brazil	10 (1.3%)	2,468,479	11.98	0.0041
China	4 (0.5%)	1,598,471	7.76	0.0025
Russian Federation	7* (0.9%)	1,640,125	7.96	0.0043
Australia	38 (5%)	1,311,945	6.37	0.0290
USA	76 (10%)	1,247,228	6.05	0.0609
Canada	34 (4.5%)	926,034	4.50	0.0367

Pickering, C.M., Rossi, S.D., Hernando, A, and Barros, A. (2018). Current knowledge and future research directions for the Monitoring and Management of Visitors in Recreational and Protected Areas *Journal of Outdoor Recreation and Tourism*. 21: 10-18.

Examples of responses in papers

In terms of the SUPPLY factors, explanations for the geographical biases in research include:

(1) more researchers and research funding in the USA and wealthy parts of Europe (Pasgaard and Strange, 2013),

(2) the dominance of the English language in academic publishing (Hamel, 2007; Muresan and Pérez-Llantada, 2014),

(3) often higher rates of citation/impact for American journals (Anderson-Levitt, 2014), but also

(4) social biases affecting perceptions regarding the importance of research from different regions/languages (Anderson-Levitt, 2014; Liddicoat, 2016; Muresan and Pérez-Llantada, 2014; Pérez-Llantada et al., 2011).

All four of these factors are important and their impacts on academia in general are increasingly recognized.

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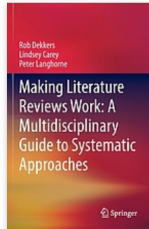- It may to get your review cited faster and more frequently

General resources

- Boote, and Beile (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. Educational Researcher. 34: 3-15.

- Petticrew, M. and Roberts, H. (2006). Systematic Reviews in the Social Sciences: A Practical Guide. Blackwell Publishing, Oxford, England.

- Dekkers, R., Carey, L. and Langhorne, P. (2022). Making Literature Reviews Work: A Multidisciplinary Guide to Systematic Approaches. Springer, London.

Library has resources – check out:

- Systematic style reviews: https://www.griffith.edu.au/library/research-publishing/working-with-literature/systematic-reviews#review-type

- Systematic style literature reviews for education and social sciences https://libraryguides.griffith.edu.au/c.php?g=451351&p=3333115

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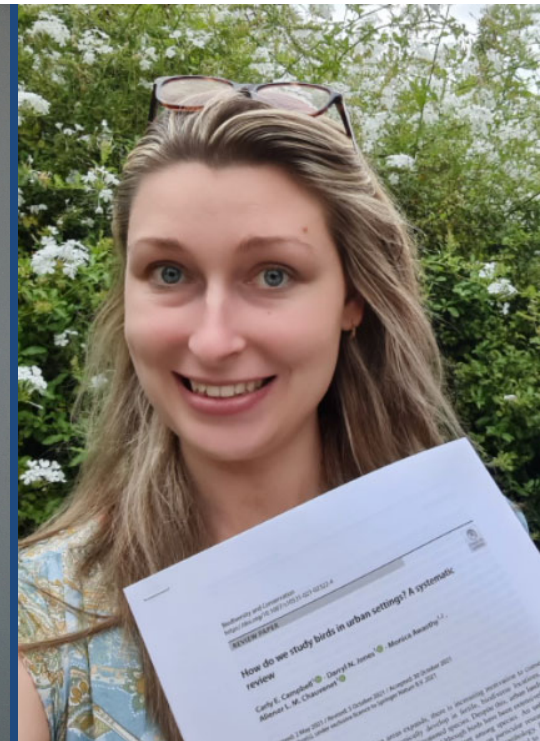
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Our publications and resources

- **Pickering, C.M.** and Byrne, J. (2014). The benefits of publishing systematic quantitative literature reviews for PhD candidates and other early career researchers. *Higher Education Research and Development*. 33: 534-548.
- **Pickering, C.**, Grignon, J., Steven, R., Guitart, D. and Byrne. J. (2015). Publishing not perishing: How research students transition from novice to knowledgeable using systematic quantitative literature reviews. *Studies in Higher Education.* 40:10, 1756-1769
- **Pickering, C.** and Morrison, C. (2022). Systematic quantitative literature reviews. In Dekker, R., Carey, L. and Langhorne, P., (eds). Making Literature Reviews Work: A Multidisciplinary Guide to Systematic Approaches. Springer, London. pp 336-344.
- **Pickering, C.**, Johnson, M. and Byrne, J. (2021). Using systematic quantitative literature reviews for urban analysis. In: Baum S. (ed) Methods in Urban Analysis. Cities Research Series, Springer, Singapore. pp. 29-49. https://doi.org/10.1007/978-981-16-1677-8_3

Lots resources on our method at - http://www.griffith.edu.au/environment-planning-architecture/griffith-school-environment/research/systematic-quantitative-literature-review

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