

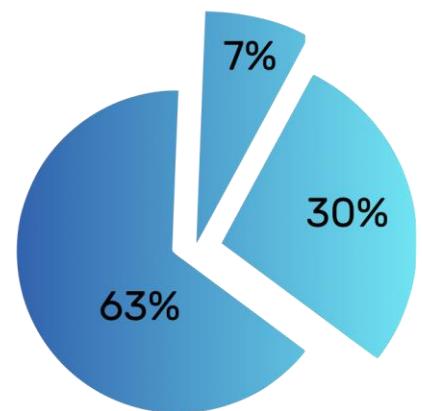
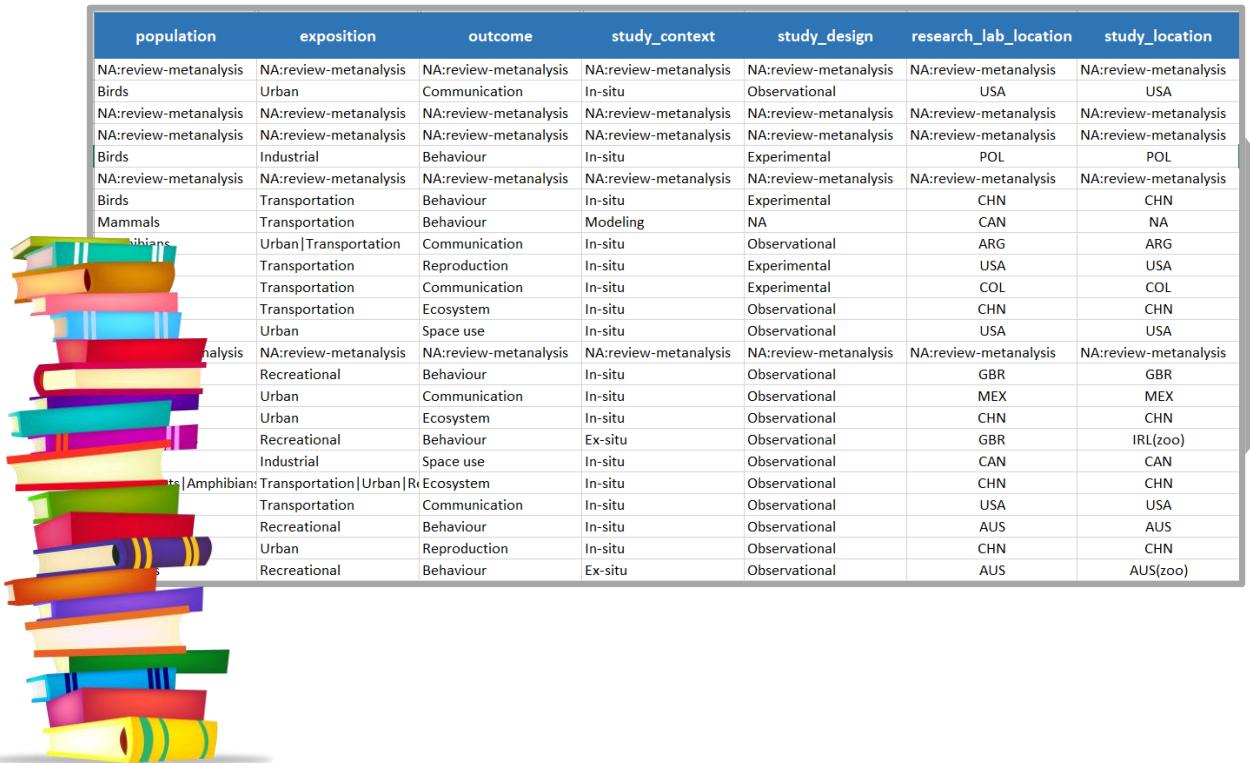
# Biodiversity knowledge synthesis: an introduction to meta-analyses and systematic reviews

## Metadata visualisation



Léa Terray & Romain Sordello  
Cellule Cartes et Revues systématiques, PatriNat

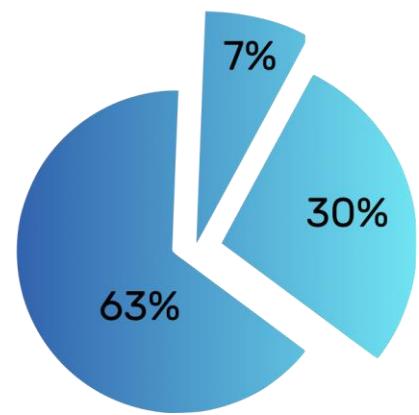
# Objective



# Objective



population	exposition	outcome	study_context	study_design	research_lab_location	study_location
NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis
Birds	Urban	Communication	In-situ	Observational	USA	USA
NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis
NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis
Birds	Industrial	Behaviour	In-situ	Experimental	POL	POL
NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis
Birds	Transportation	Behaviour	In-situ	Experimental	CHN	CHN
Mammals	Transportation	Behaviour	Modeling	NA	CAN	NA
NA:review-metanalysis	Urban   Transportation	Communication	In-situ	Observational	ARG	ARG
NA:review-metanalysis	Transportation	Reproduction	In-situ	Experimental	USA	USA
NA:review-metanalysis	Transportation	Communication	In-situ	Experimental	COL	COL
NA:review-metanalysis	Transportation	Ecosystem	In-situ	Observational	CHN	CHN
NA:review-metanalysis	Urban	Space use	In-situ	Observational	USA	USA
NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis	NA:review-metanalysis
Recreational	Behaviour	In-situ	Observational	GBR	GBR	
Recreational	Urban	Communication	In-situ	Observational	MEX	MEX
Recreational	Urban	Ecosystem	In-situ	Observational	CHN	CHN
Recreational	Behaviour	Ex-situ	Observational	GBR	IRL(zoo)	
Industrial	Space use	In-situ	Observational	CAN	CAN	
NA:review-metanalysis	Amphibian   Transportation   Urban   Recreational	Ecosystem	In-situ	Observational	CHN	CHN
NA:review-metanalysis	Transportation	Communication	In-situ	Observational	USA	USA
NA:review-metanalysis	Recreational	Behaviour	In-situ	Observational	AUS	AUS
NA:review-metanalysis	Urban	Reproduction	In-situ	Observational	CHN	CHN
NA:review-metanalysis	Recreational	Behaviour	Ex-situ	Observational	AUS	AUS(zoo)



All the features mentioned in the systematic overview protocol must be represented

# EEJ guidelines

## Mapping the quantity of studies relevant to the question

Present here a figure or a database, showing **how the relevant literature is organized** (categories, coding...) according to transparent, replicable criteria.



## Mapping the quality of studies relevant to the question

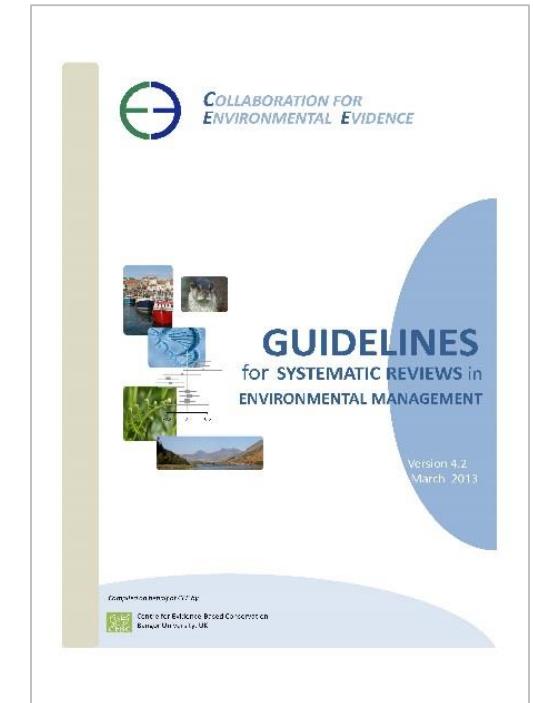
The map should provide some preliminary **estimate of the quality of the available evidence**. This may involve providing a **description of the design of each study**.

The visualizations presented should make it easier to navigate through the collected literature and **identify avenues for future systematic reviews**.

Must be identified and described:

**Knowledge gaps**, unrepresented or underrepresented subtopics that warrant further primary research.

**Knowledge clusters**, well-represented subtopics that are amenable to full synthesis via systematic review.



# Which data should be represented?

## Key data

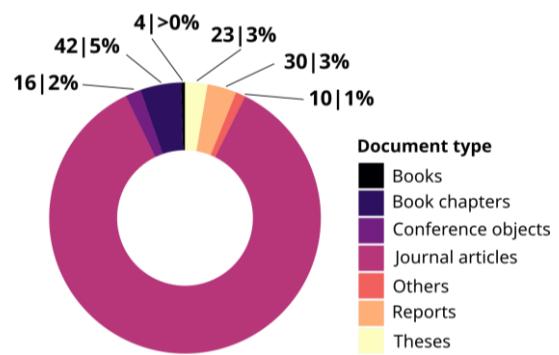
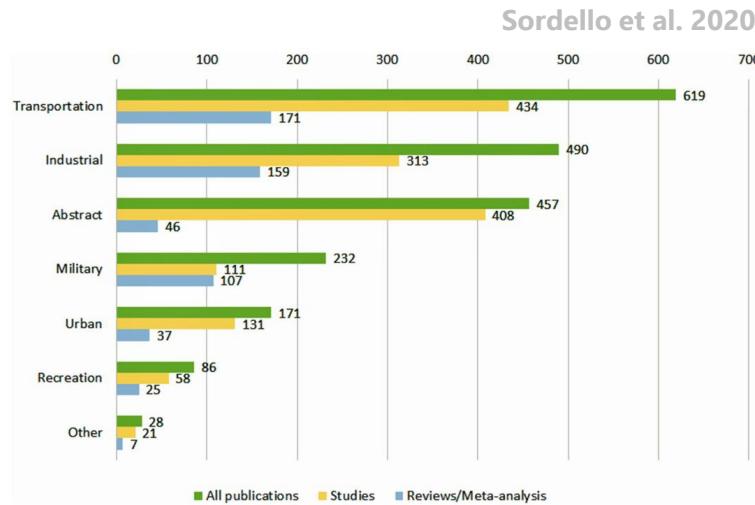
- Bibliometric data: chronological distribution of publications, locality of studies, documents types, documents contents
- Population
- Exposition
- Outcomes

## Data related to study design

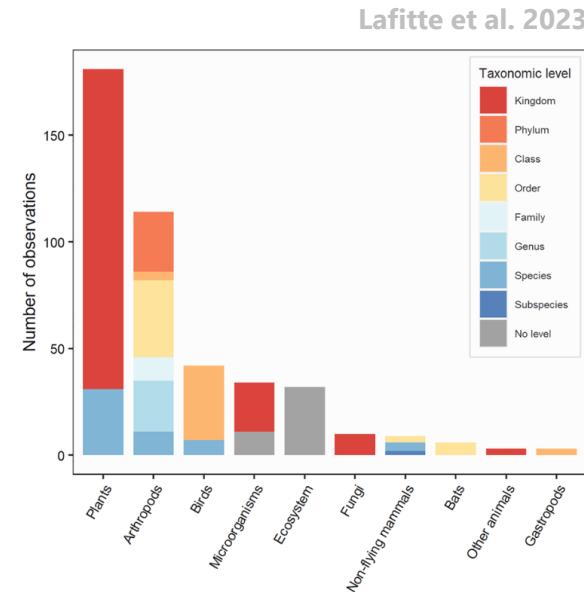
- observational/experimental
  - types of experimental protocols
  - *in situ/ex situ*
- etc

Key data highlighting strong results

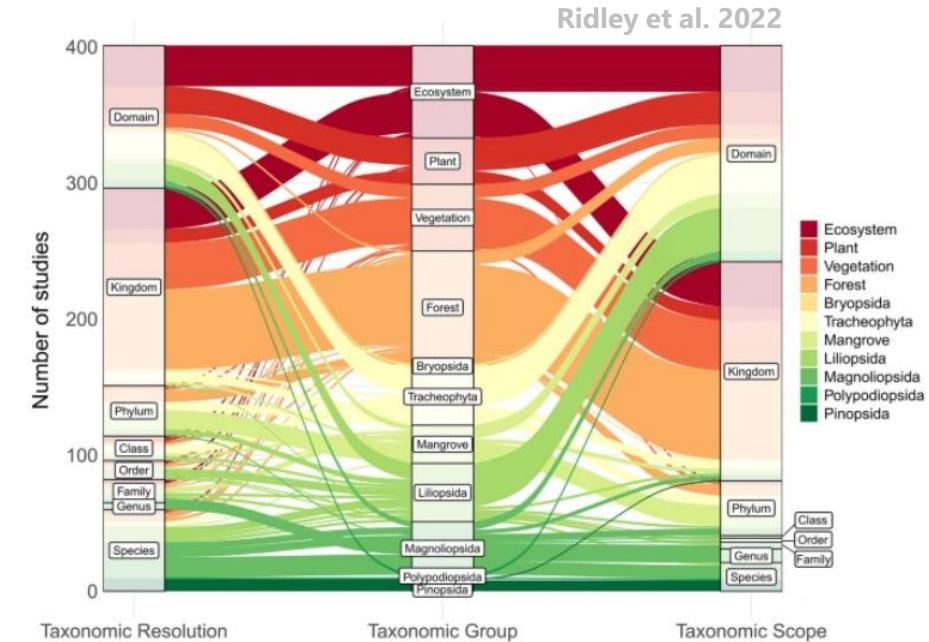
# Endless possibilities



Terray et al. in prep



	Abstract	Industrial	Transportation	Military	Urban	Recreation	Other
<b>Mammals</b>	181	145	145	73	12	27	11
<b>Fishes</b>	86	104	97	14	2	11	5
<b>Birds</b>	74	60	142	25	109	20	3
<b>Amphibians</b>	23	4	31	0	5	2	0
<b>Insects</b>	19	2	10	0	2	2	1
<b>Crustaceans</b>	9	18	8	1	0	0	2
<b>Mollusks</b>	9	9	6	1	0	0	0
<b>Other invertebrates</b>	2	3	5	0	0	0	0
<b>Reptiles</b>	1	7	7	3	0	1	0
<b>Other vertebrates</b>	1	1	2	0	0	2	0
<b>Arachnids</b>	1	1	1	0	1	0	0



Sordello et al. 2020

# Endless possibilities

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To sort out the possibilities, you need to :

## **Choose the right data to represent**

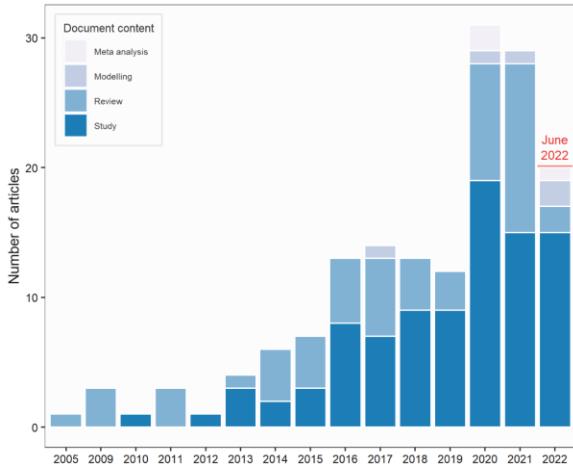
The data chosen must be the most relevant, and present both an overview of the corpus and the data that responds specifically to the question(s) on the map.

## **Choose the right visualisations**

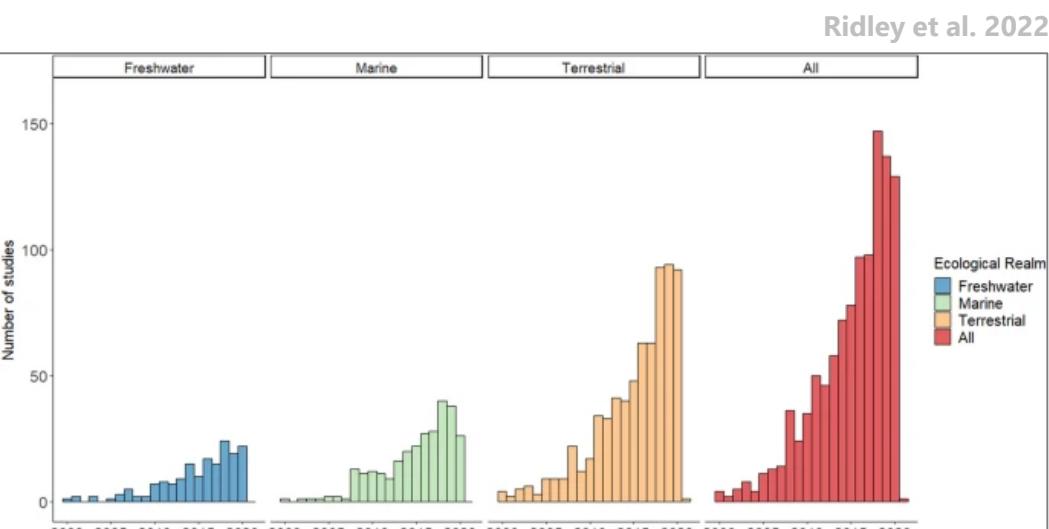
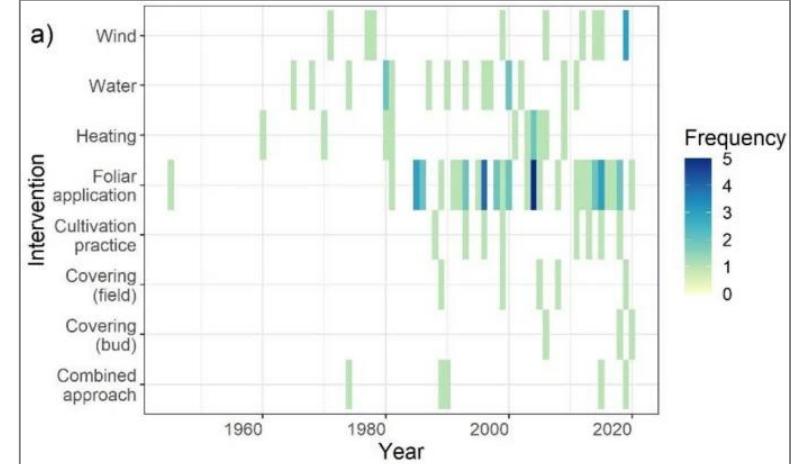
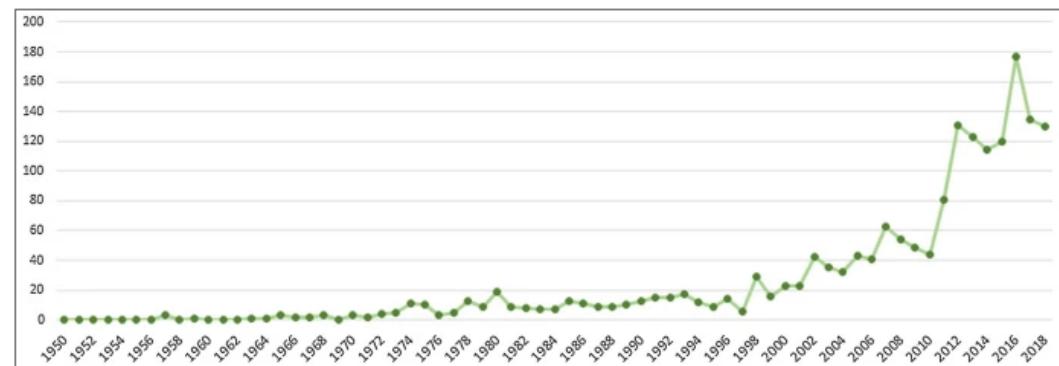
The visualisations chosen must be the most appropriate for representing the data selected

# Bibliometric data

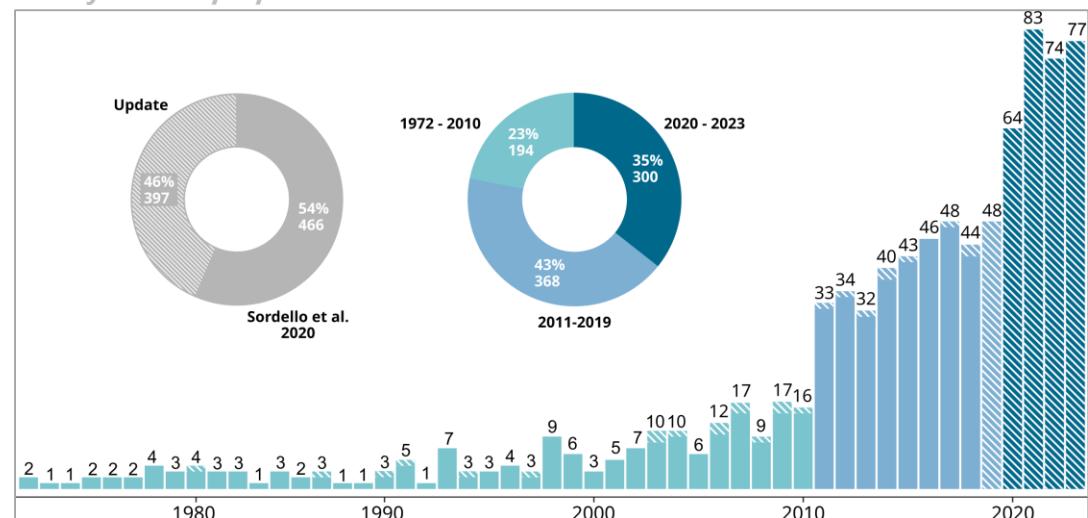
## Chronological distribution of studies



Sordello et al. 2020

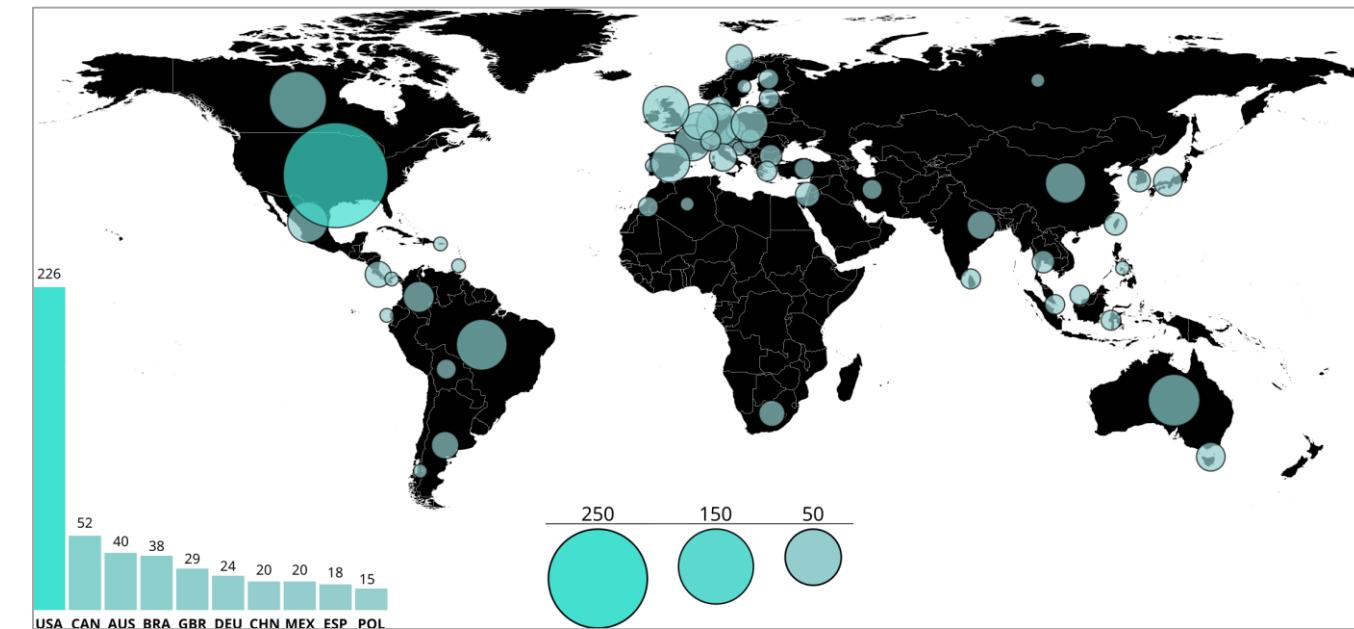


Terray et al. *in prep*



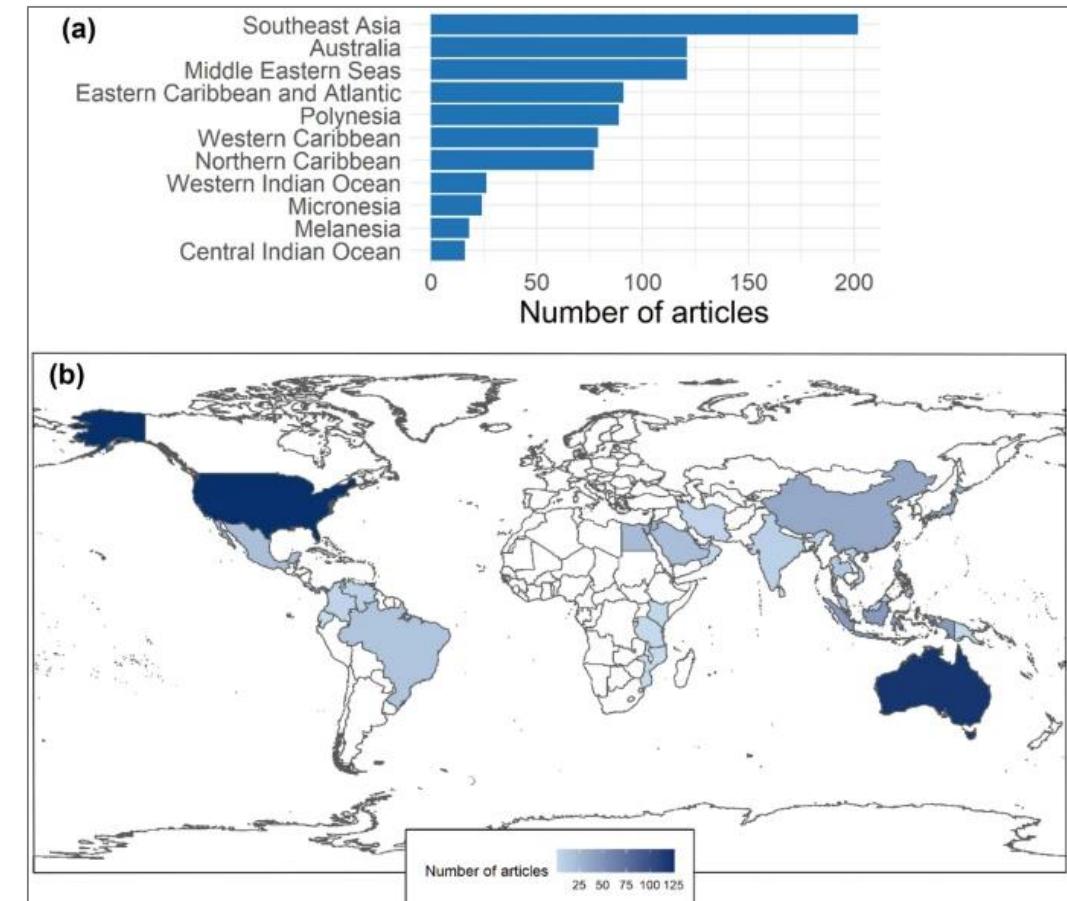
# Bibliometric data

## Spatial distribution of studies



Terray et al. *in prep*

9

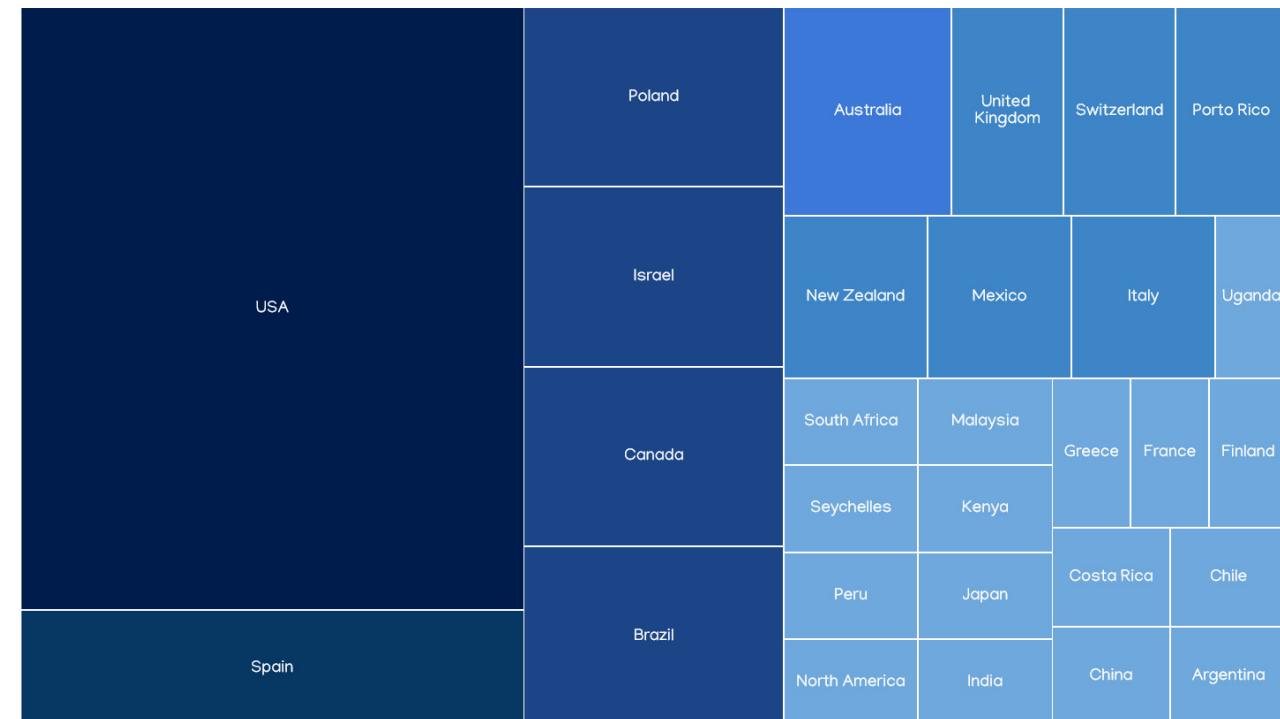


Ouédraogo et al. 2021

# Bibliometric data

## Spatial distribution of studies

TreeMap, online tool: <https://online.visual-paradigm.com/>



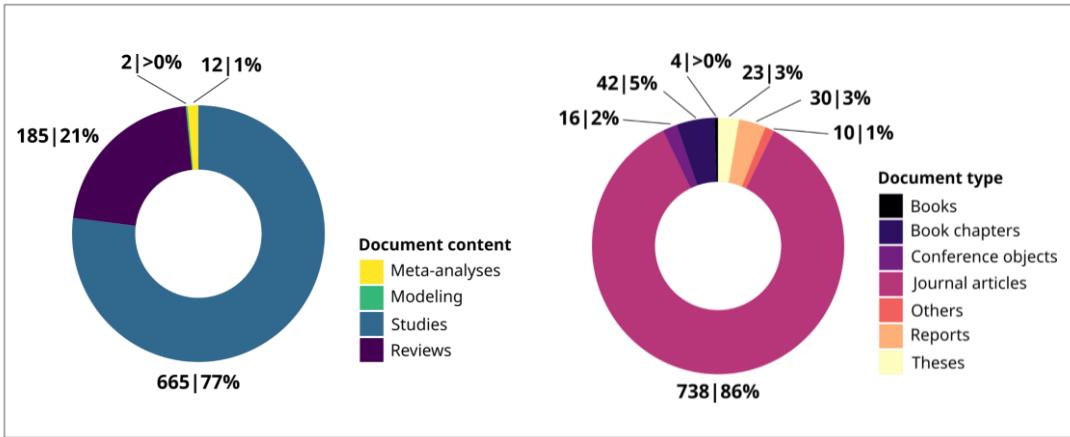
Sordello et al. 2023



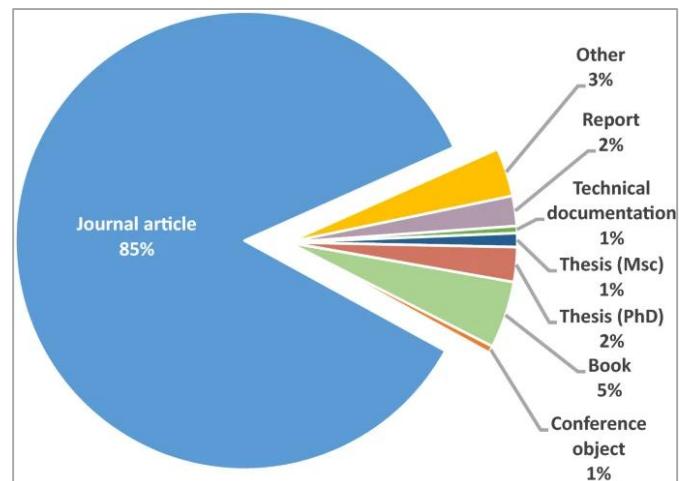
Sordello et al. 2020

# Bibliometric data

## Documents types and contents

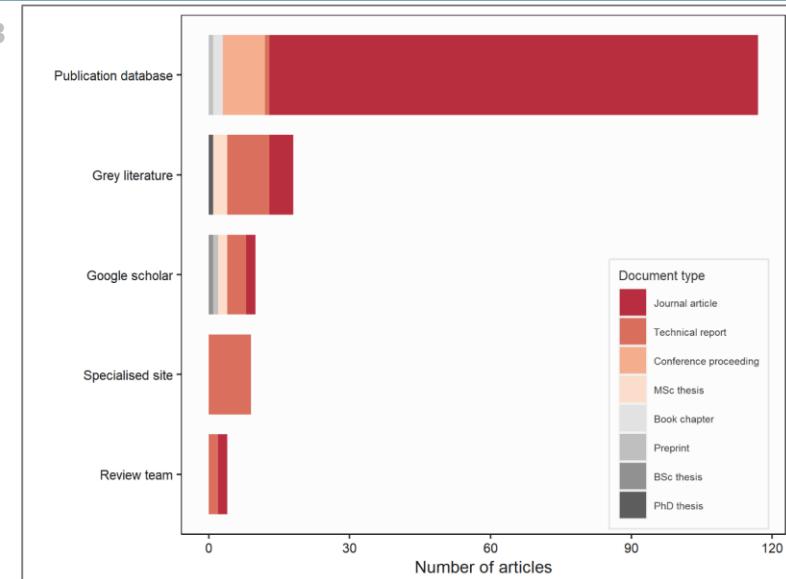


Terray et al. *in prep*



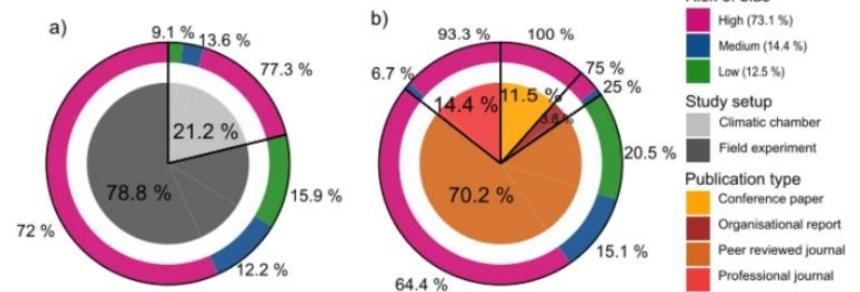
Langridge et al. 2021

Lafitte et al. 2023



Drepper et al. 2022

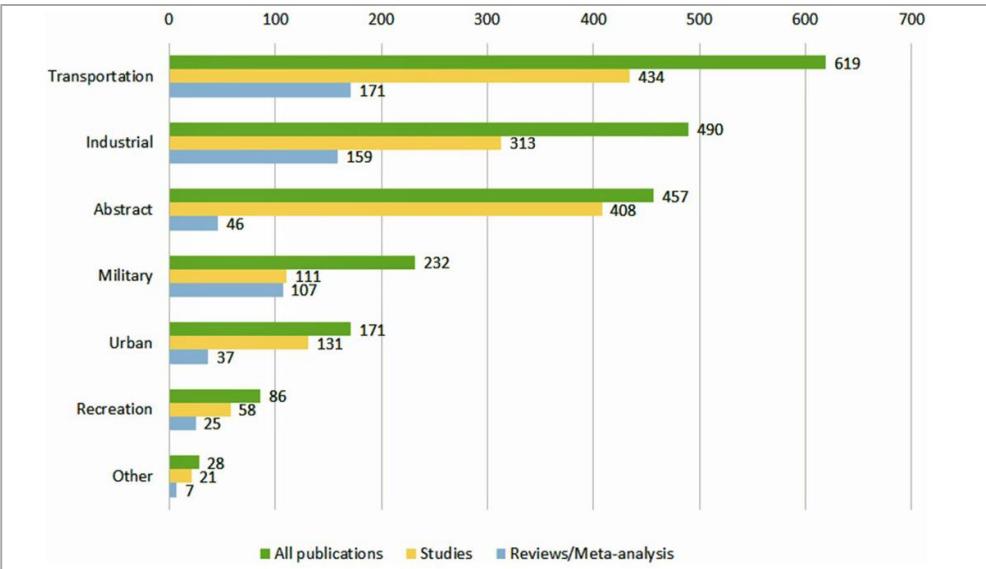
Fig. 8



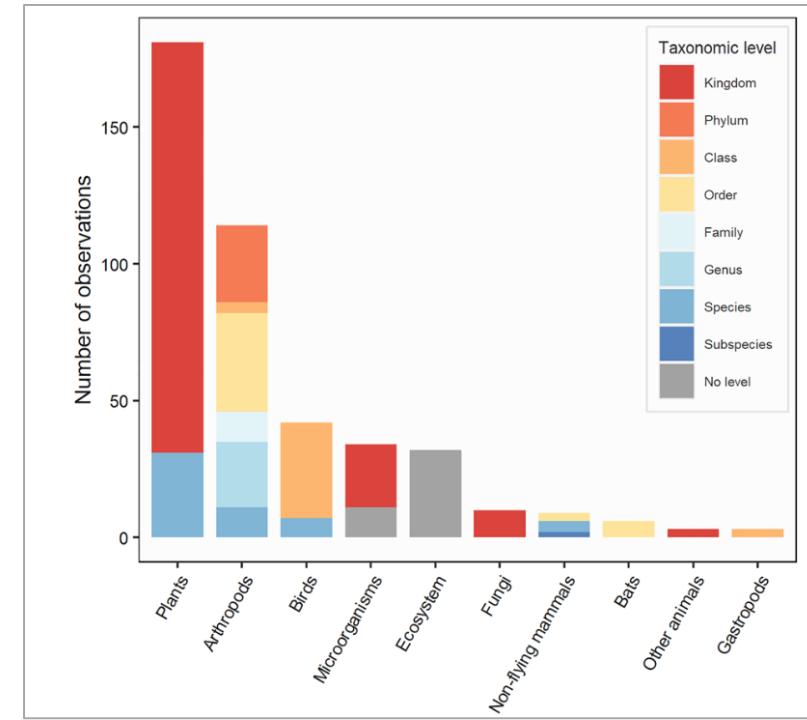
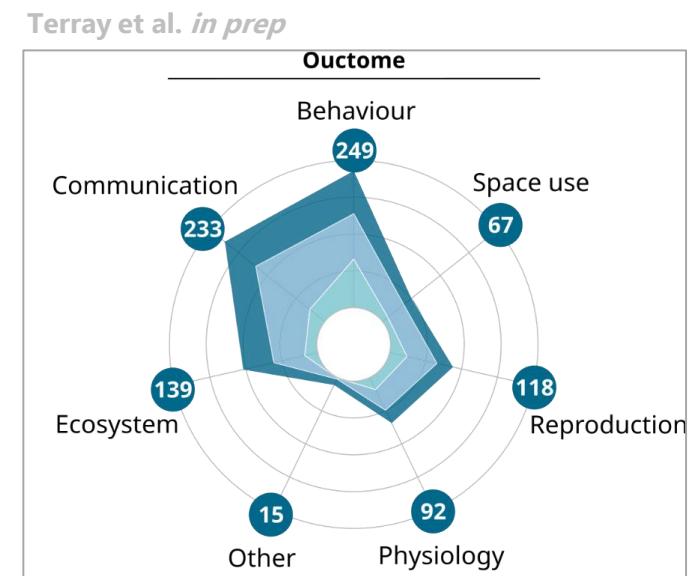
Share of articles judged as having a low, medium or high risk of bias by (a) type of study (controlled or field environments) and (b) type of publication

# PEO elements

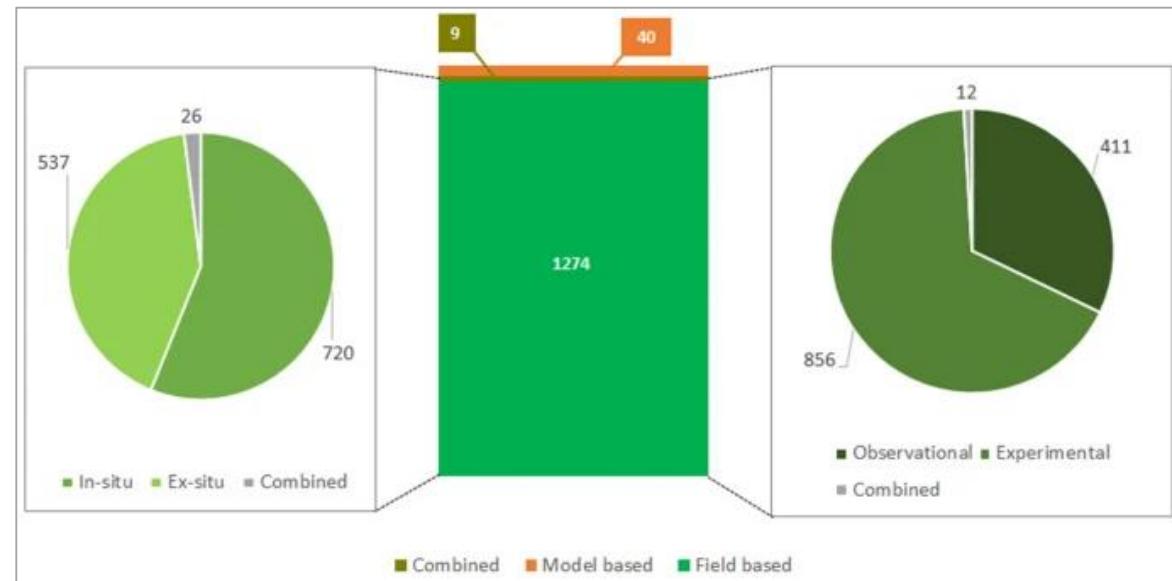
## Population, exposition, outcomes



Sordello et al. 2020

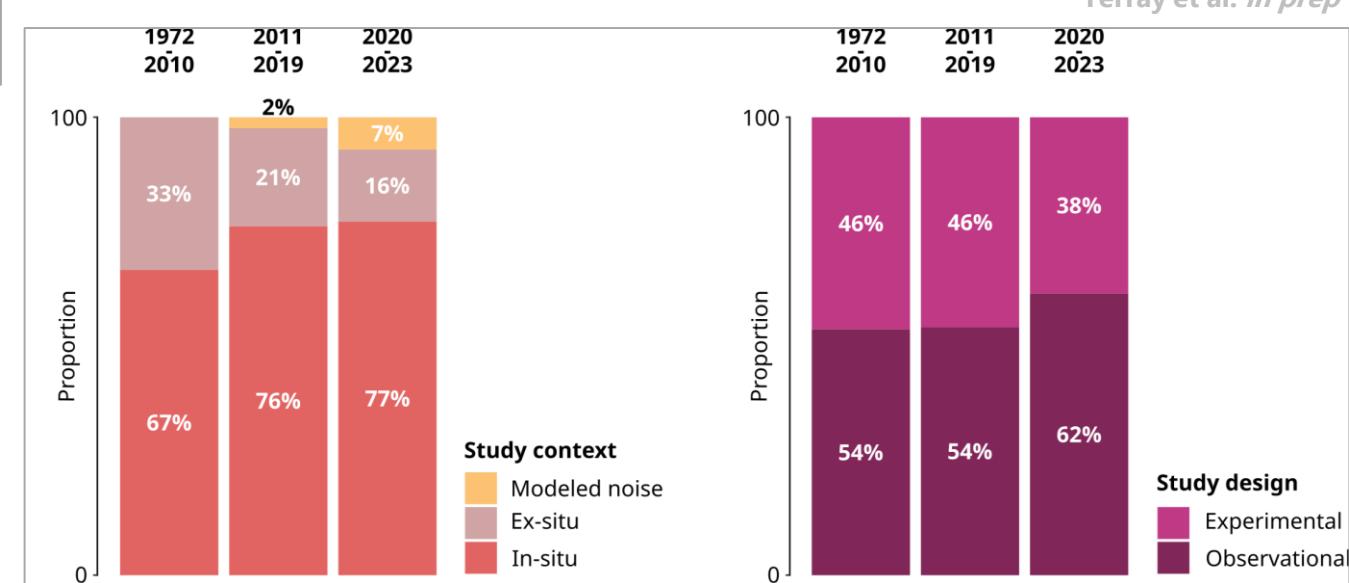


# Context and methodology



Sordello et al. 2020

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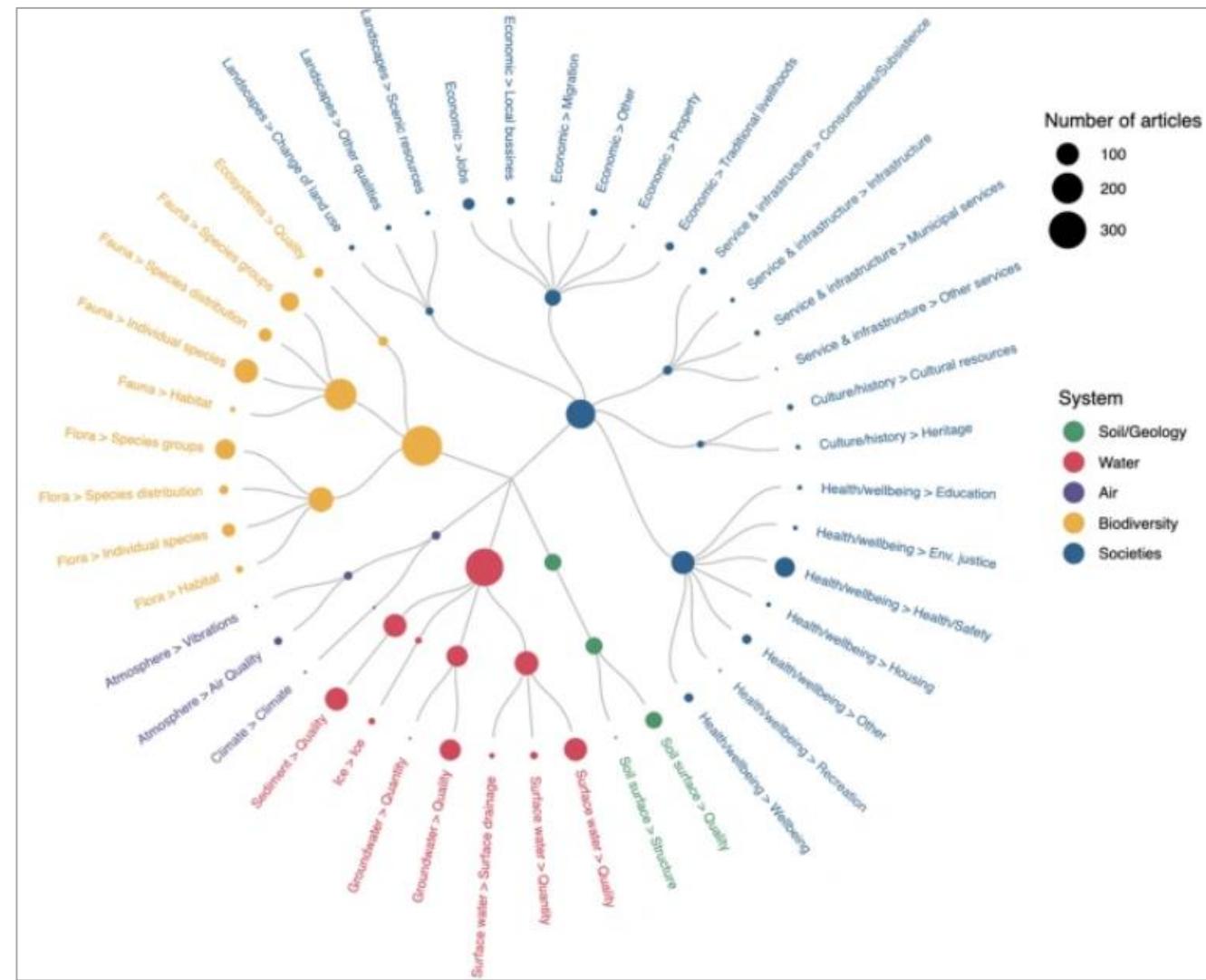
# Context and methodology

From: [Evidence on the impacts of chemicals arising from human activity on tropical reef-building corals; a systematic map](#)

Taxa	Total		Experimental		Observational	
<i>Pocillopora damicornis</i>	719	(9.1%)	546	(14.2%)	173	(4.2%)
<i>Stylophora pistillata</i>	603	(7.6%)	537	(14%)	66	(1.6%)
Coral	555	(7%)	33	(0.9%)	522	(12.8%)
<i>Porites</i>	255	(3.2%)	18	(0.5%)	237	(5.8%)
Scleractinia	218	(2.7%)	20	(0.5%)	198	(4.8%)
<i>Acropora tenuis</i>	207	(2.6%)	148	(3.8%)	59	(1.4%)
<i>Acropora muricata</i>	199	(2.5%)	154	(4%)	45	(1.1%)
<i>Porites astreoides</i>	197	(2.5%)	109	(2.8%)	88	(2.2%)
<i>Porites lutea</i>	190	(2.4%)	32	(0.8%)	158	(3.9%)
<i>Acropora</i>	184	(2.3%)	58	(1.5%)	126	(3.1%)
<i>Orbicella annularis</i>	169	(2.1%)	101	(2.6%)	68	(1.7%)
<i>Acropora cervicornis</i>	152	(1.9%)	146	(3.8%)	6	(0.1%)
<i>Acropora millepora</i>	149	(1.9%)	140	(3.6%)	9	(0.2%)
<i>Siderastrea siderea</i>	125	(1.6%)	64	(1.7%)	61	(1.5%)
<i>Pocillopora verrucosa</i>	122	(1.5%)	59	(1.5%)	63	(1.5%)
<i>Porites porites</i>	110	(1.4%)	89	(2.3%)	21	(0.5%)
<i>Porites lobata</i>	105	(1.3%)	34	(0.9%)	71	(1.7%)
<i>Turbinaria reniformis</i>	101	(1.3%)	100	(2.6%)	1	(0%)
<i>Acropora valida</i>	100	(1.3%)	34	(0.9%)	66	(1.6%)
<i>Orbicella faveolata</i>	99	(1.2%)	49	(1.3%)	50	(1.2%)

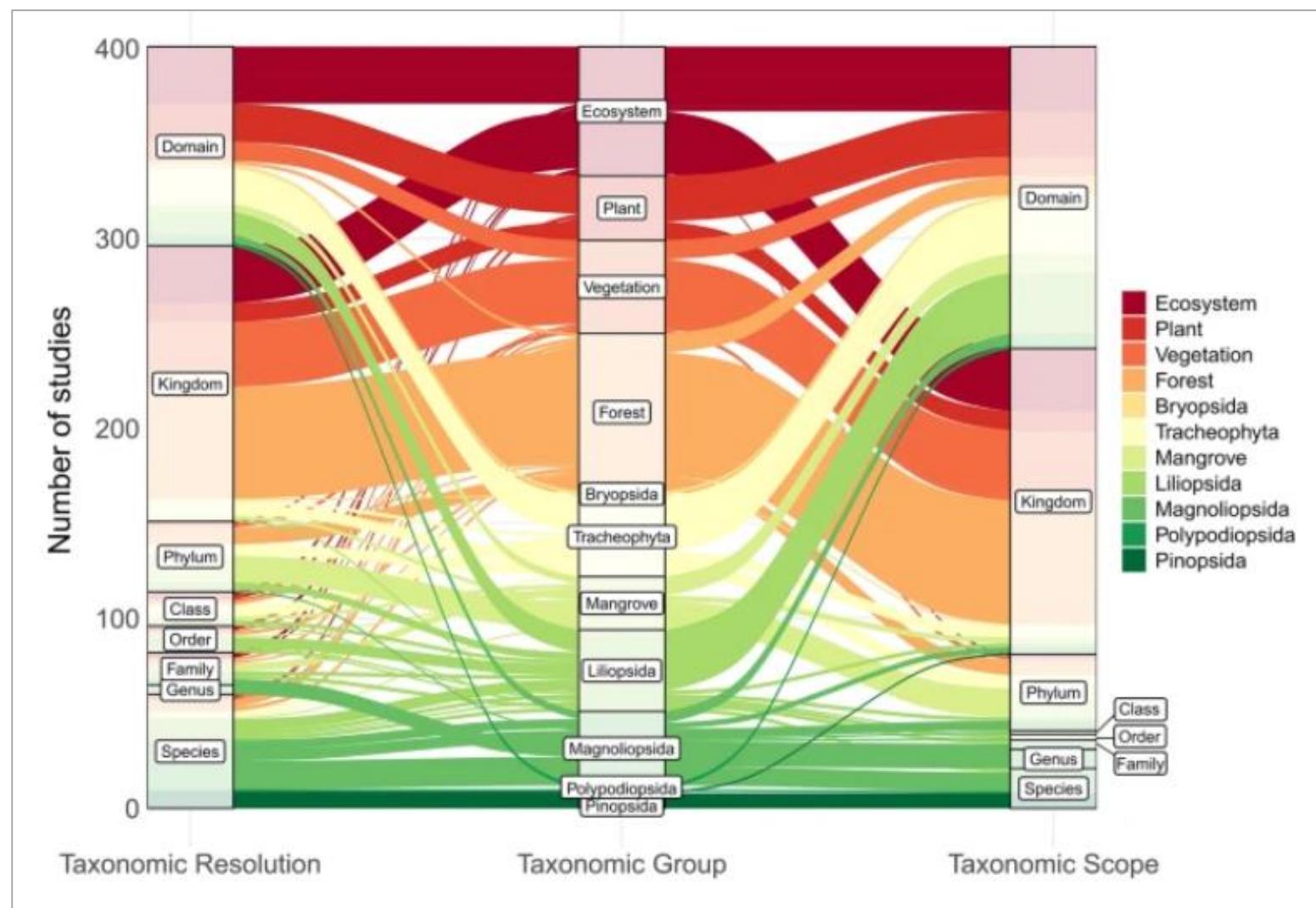
# Complex representations

# Dendrogram



# Complex representations

## Taxonomic tree



# Knowledge gaps and clusters

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The purpose of the map is to identify :

- **Knowledge gaps** to prioritise future primary studies (calls for projects, for example)
- **Knowledge clusters** for future systematic reviews

# Knowledge gaps and clusters

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- Different methods exist:
  - Based on the volumes of the P, E, O elements
  - Based on functional grouping (design types, etc.)
  - ...
- **Heatmap** are particularly relevant
- The process can - and should - extend to identifying clear issues that can be addressed in reviews

# Knowledge gaps and clusters

## Crossing of PEO elements

Taxonomic kingdom X Programme motivation	Intervention type						Total
	Intro+suppl	Introduction	Reintro+suppl	Reintroduction	Supplementation	Unknown	
<b>Animalia</b>	6	6	176	158	158	182	686
Conservation (improving status of focal species)	6	4	158	123	110	88	489
Experimental or trial translocations		1	4	12	13	16	46
Human-wildlife conflict				5	11	17	33
Rewilding (restoring natural functions)			3	3		2	8
Unknown		1	9	11	9	33	63
Wildlife rescue operation			2	4	15	26	47
<b>Fungi</b>				4	3		7
Wildlife rescue operation				4	3		7
<b>Plantae</b>		4	10	11	41	82	148
Conservation (improving status of focal species)		3	10	9	39	72	133
Experimental or trial translocations		1		2	2		5
Unknown						1	1
Wildlife rescue operation						4	4
Total	6	10	186	173	202	264	841

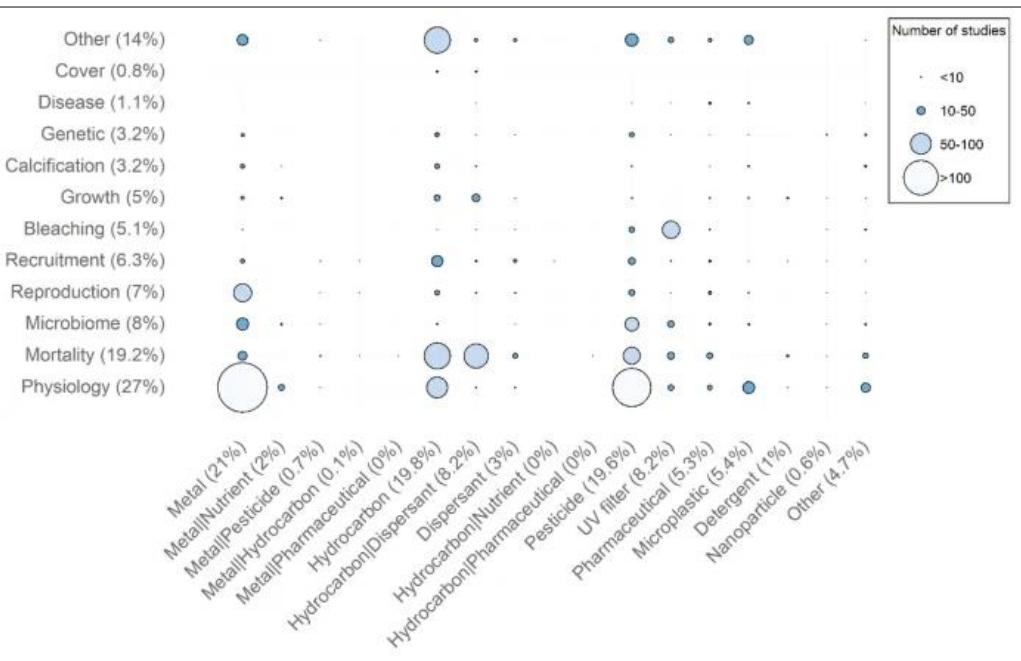
Langridge et al. 2021

Lafitte et al. 2023



# Knowledge gaps and clusters

## Crossing of PEO elements



Sordello et al. 2020

From: [Evidence of the impact of noise pollution on biodiversity: a systematic map](#)

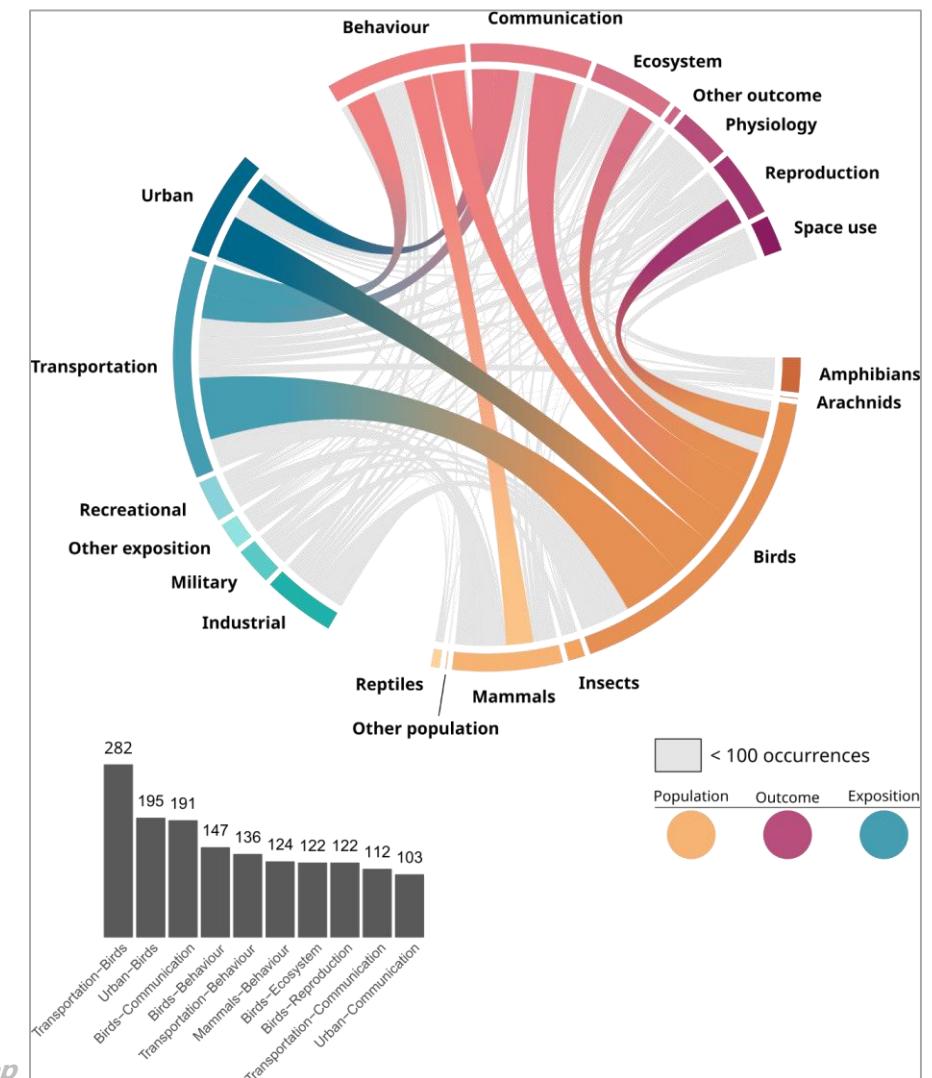
Cluster	Number of studies	Combinations		
		P	E	O
Behavioural impacts of noise on mammals	355	x		x
Impacts of transportation noise on behaviour	216		x	x
Impacts of abstract noises on biophysiology	208		x	x
Impacts of abstract noise on behaviour	202		x	x
Impacts of industrial noises on behaviour	187		x	x
Impacts of abstract noise on mammals	181	x	x	
Biophysiological impacts of noise on mammals	181	x		x
Behavioural impacts of noise on fishes	159	x		x
Biophysiological impacts of noise on fishes	149	x		x
Impacts of industrial noise on mammals	145	x	x	
Impacts of transportation noise on mammals	145	x	x	
Impacts of transportation noise on birds	142	x	x	

Ouédraogo et al. 2021

# Knowledge gaps and clusters

## Crossing of PEO elements

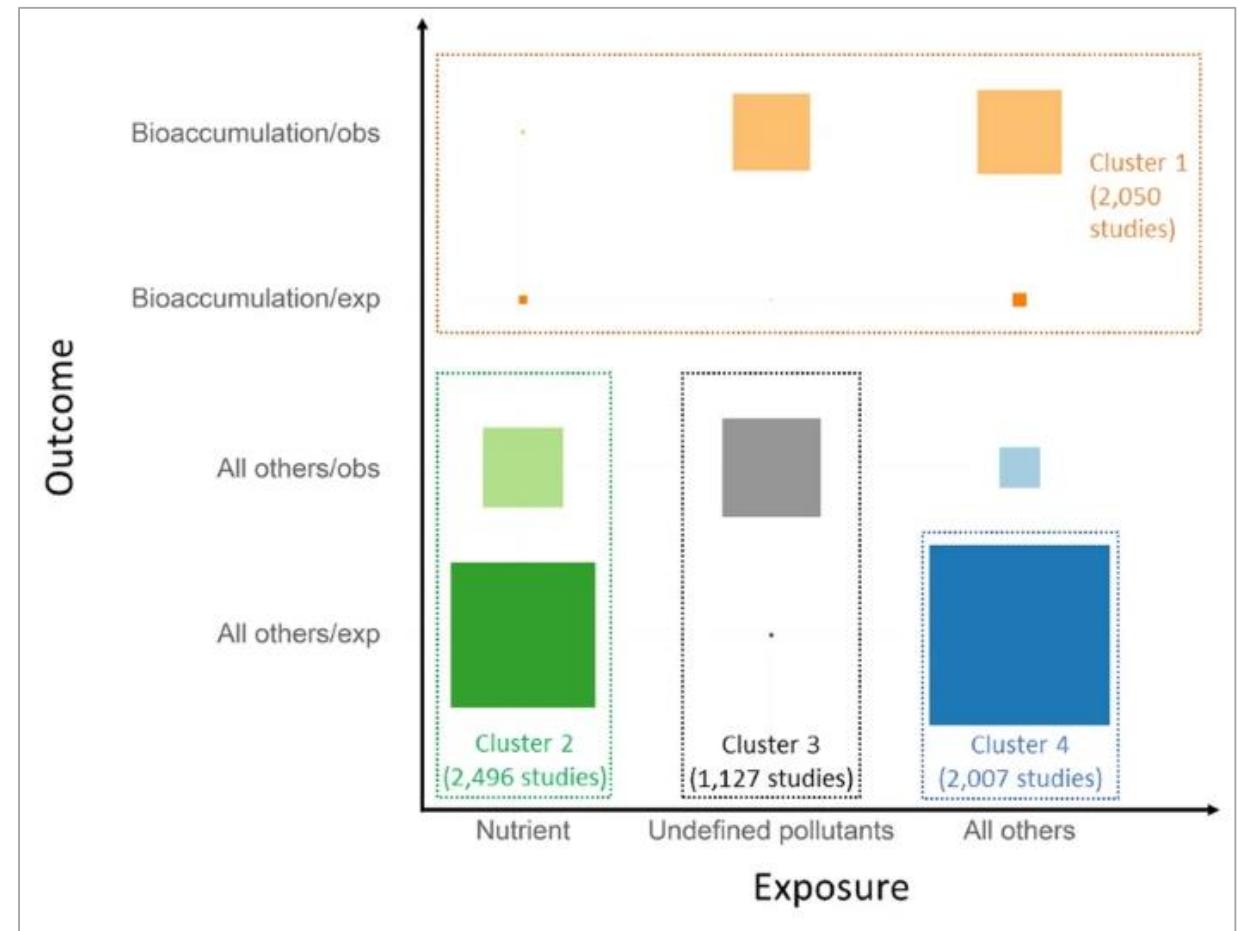
→ The 3 elements presented on a single figure



# Knowledge gaps and clusters

## Clusters on more than 2 criteria

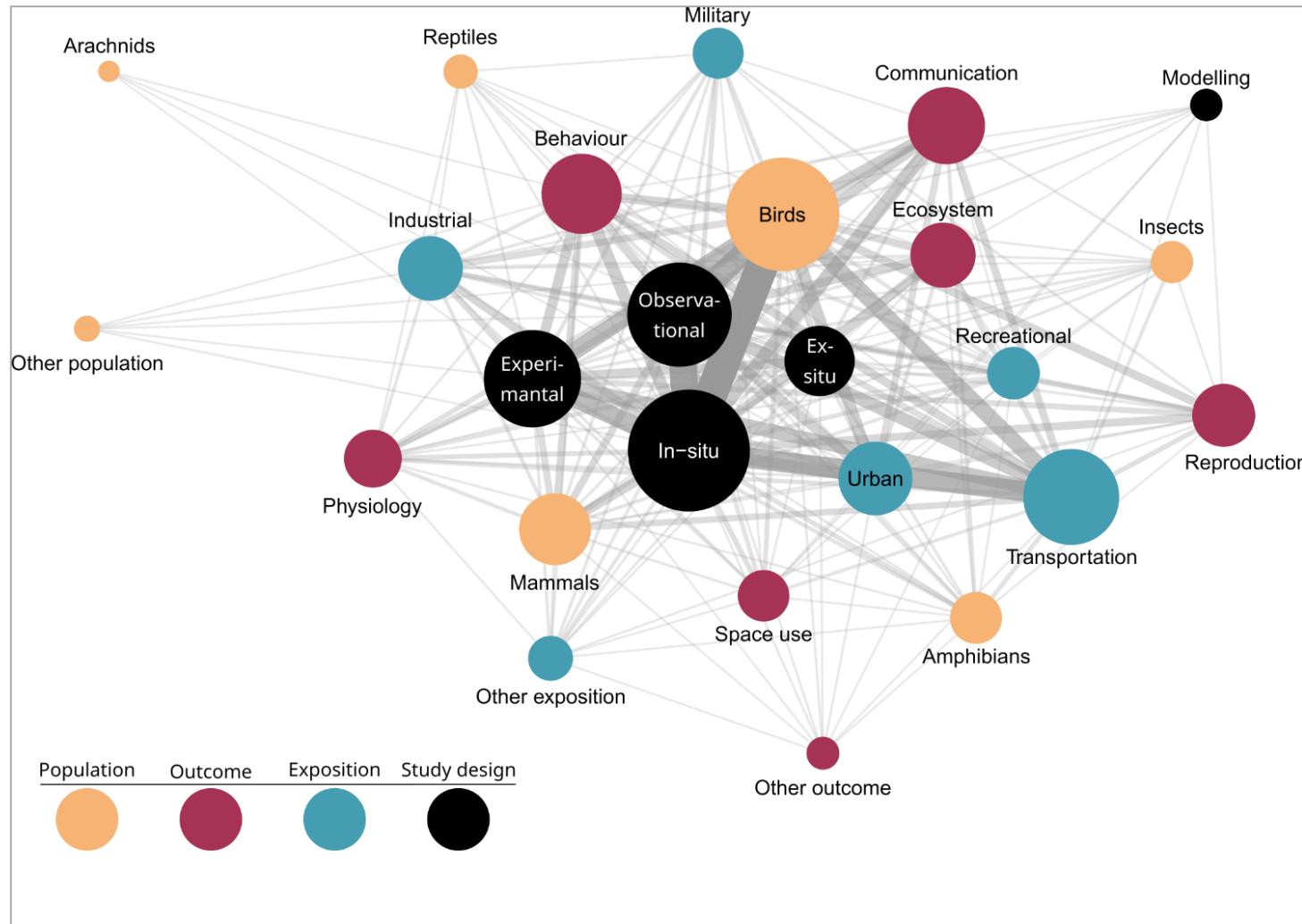
- Outcome
- Exposure
- Study design



# Knowledge gaps and clusters

## Clusters on more than 2 criteria

- Outcome
- Exposure
- Population
- Study design
- Study context



# Representing existing syntheses

## Compare existing syntheses to our map

From: [Existing evidence on the outcomes of wildlife translocations in protected areas: a systematic map](#)

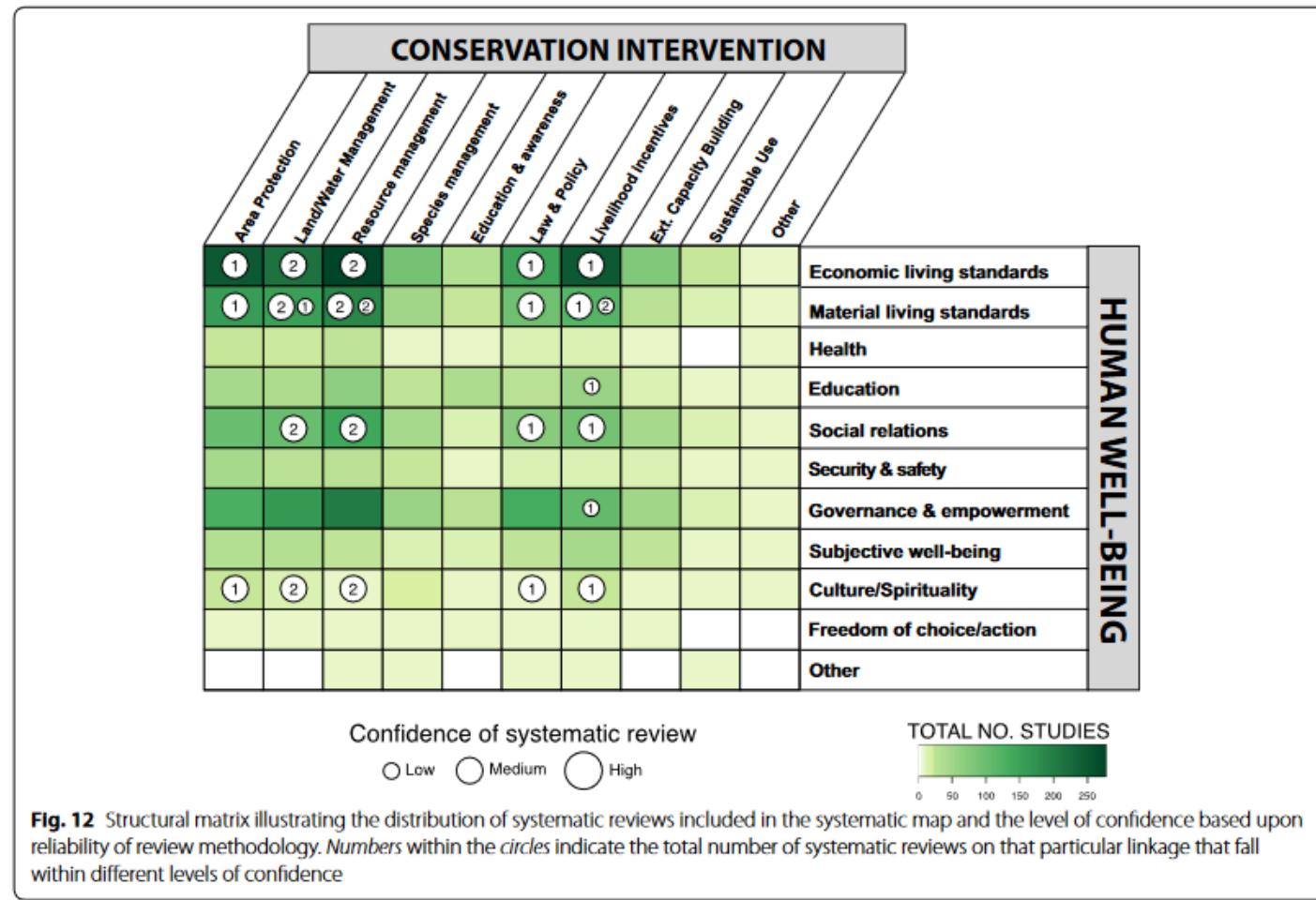
Citation	Scope of review	Nature of synthesis	Search databases	No. of other literature sources	Publication data range of included articles	No. of included publications
<i>Our map (translocation synthesis)</i>	P: all biodiversity worldwide I: reintroductions, introductions, Supplementation C: protected areas	Systematic map	2 databases: WOS, SCOPUS	12 (+2 grey literature calls)	1969 to 2020	498
Fischer J, Lindenmayer DB. An assessment of the published results of animal relocations. <i>Biological Conservation</i> . 2000; 96: 1–11	P: animals worldwide I: reintroductions, suplementations, introductions	Map-like	0 databases	A search for articles across 12 major journals only	1979 to 1998	124
Hale SL, Koprowski JL. Ecosystem-level effects of keystone species reintroduction: a literature review. <i>Restoration Ecology</i> . 2018; 26: 439–45	P: key-stone species I: reintroductions only	Map-like	1 database: WOS	0	1995 to 2016	69
Tetzlaff SJ, Sperry JH, DeGregorio BA. Effects of antipredator training, environmental enrichment, and soft release on wildlife translocations: a review and meta-analysis. <i>Biol Cons.</i> 2019; 236: 324–31	P: all biodiversity <sup>a</sup> I: translocations <sup>a</sup> C: antipredator training, soft release, or environmental Enrichment	Meta-analysis	0 databases (Search in google scholar only)	0	1981 to 2018	41
Resende, P., Viana-Junior, A., Young, R., Azevedo, C., 2020. A global review of animal translocation programs. <i>Anim. Biodivers. Conserv.</i> 221–232. <a href="https://doi.org/10.32800/abc.2020.43.0221">https://doi.org/10.32800/abc.2020.43.0221</a>	P: animals I: introduction, reintroduction, translocations <sup>a</sup>	Map-like	2 databases: WOS, SCOPUS	1	1986 to 2017	145

P population, I interventions, C context

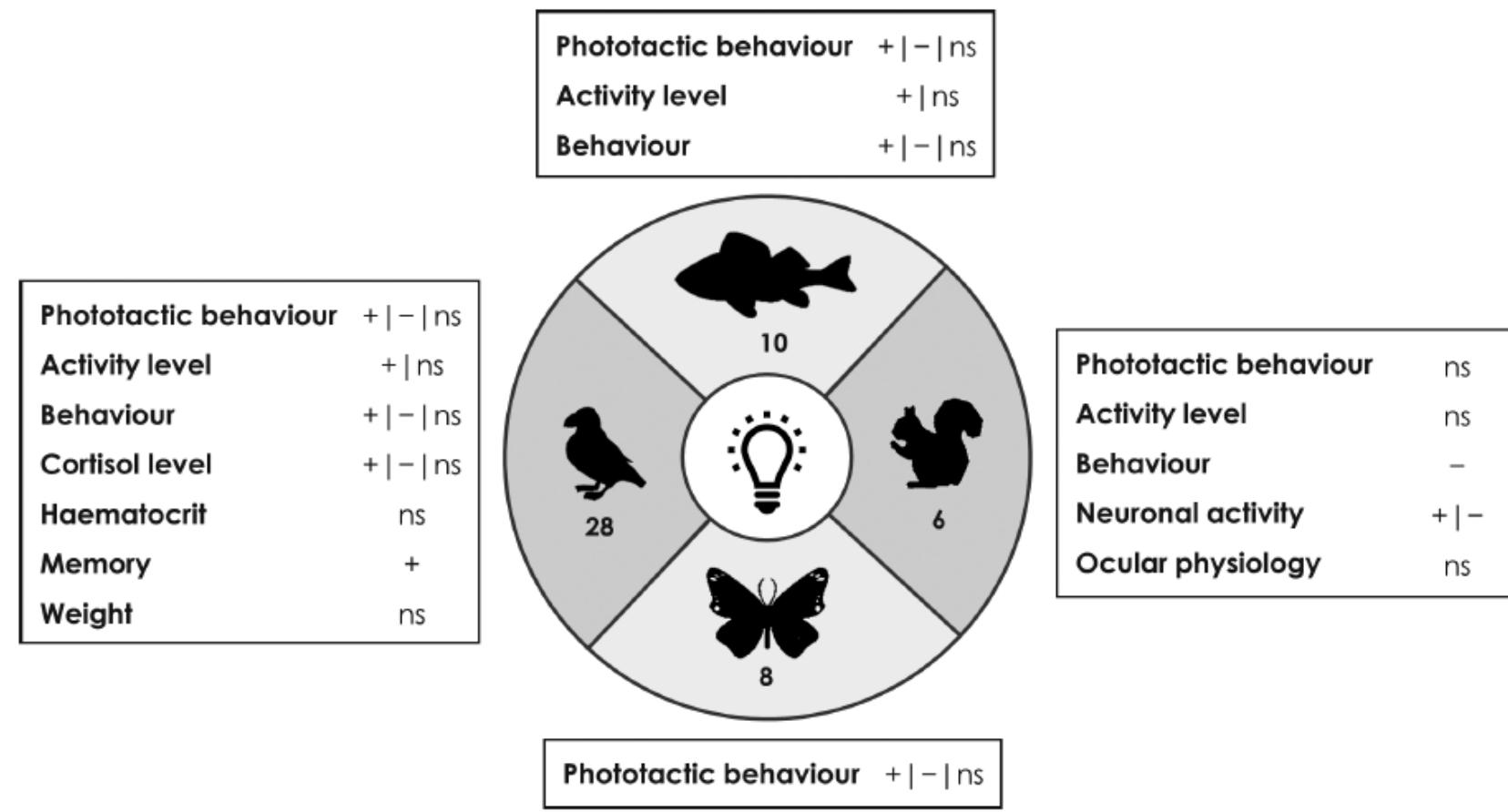
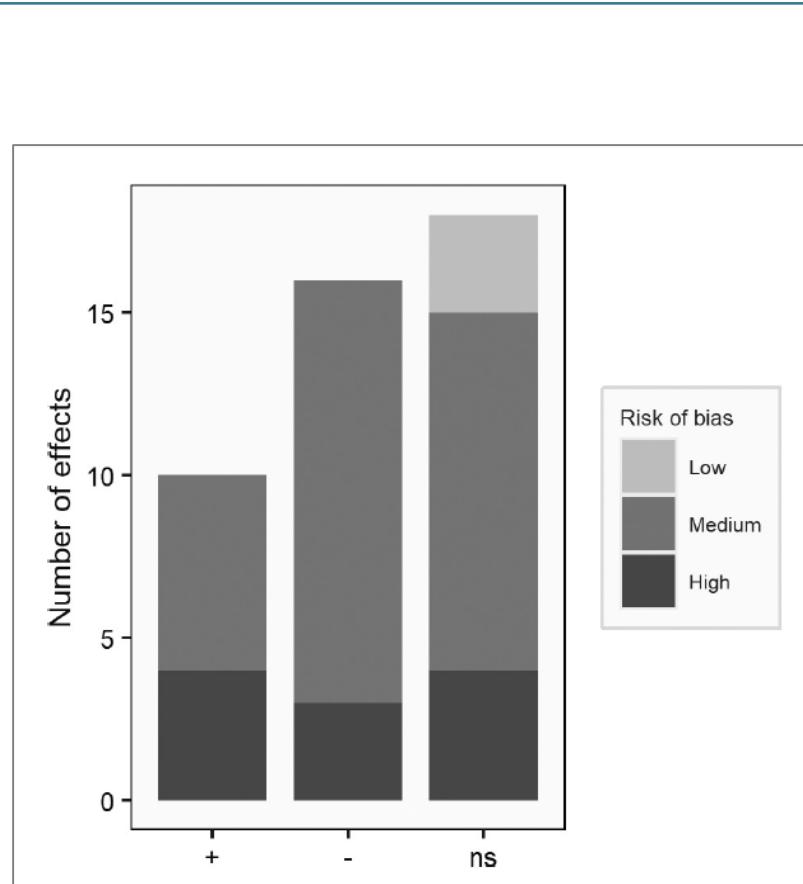
<sup>a</sup>Methods unclear and exclusion criteria difficult to ascertain. The first line in italics corresponds to this map

# Representing existing syntheses

## Add those syntheses to our visualisations



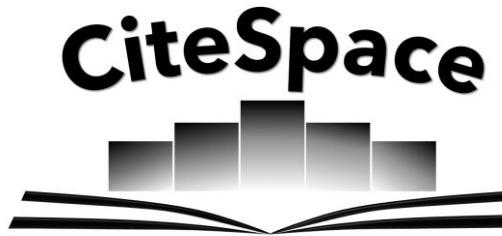
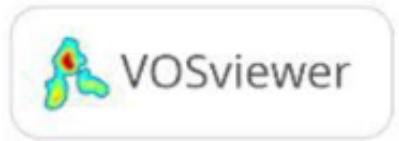
# Narrative synthesis



**Figure 7.** Summary of results for the four main studied taxonomic classes. '+' flashing light increases the outcome compared to continuous light, '-' flashing light decreases the outcome compared to continuous light, 'ns' no significant effect. For clarity, the two observations on plankton phototactic behaviour are not shown but were both found to be non-significant.

# Tools

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# Tools



## Excel: TreeMaps



## Excel: Tableau croisés dynamiques

**FICHIER ACCUEIL INSERTION MISE EN PAGE FORMULES DONNÉES RÉVISION AFFICHAGE**

**Tableau croisé dynamique Tableaux croisés Tableau dynamique Tableaux**

**Tableau croisé dynamique**

Simplifier l'organisation et la synthèse des données complexes dans un tableau croisé dynamique.

Vous pouvez double-cliquer sur une valeur pour afficher les valeurs détaillées incluses dans le total résumé.

**En savoir plus**

		D	E	F
ent_id	biblio_authors	biblio_content	biblio_title	
1098-2361(1)	Carlestaed, K., Fraser, J., Bennett, C., al	ZOO BIOLOGY	Black rhinoceros (Dic	
83	Friedlaender, AS., Hazen, EL., Goldbog	ECOLOGICAL AP	Prey-mediated behav	
189	Cubero-Pardo, P., Herron, P., and Gon	AQUATIC CONS	Shark reactions to sc	
190	Jung, CA., and Sweare, SE.	AQUATIC CONS	Reactions of tempera	
355	La Manna, G., Manghi, M., Pavani, G.,	AQUATIC CONS	Behavioural strategy	
668	Osterrieder, SK., Kent, CS., and Robin	AQUATIC CONS	Responses of Austral	
7	43	10.1002/aqc.2693	Jain-Schlaepfer, SMR., Blouin-Demier	AQUATIC CONS Do boating and bask
8	47	10.1002/aqc.2915	Maxwell, RJ., Zoldredo, AJ., de Brue	AQUATIC CONS Does motor noise fro
9	50	10.1002/aqc.941	Graham, AL., and Cooke, SJ	AQUATIC CONS The effects of noise o
10	74	10.1002/eap.1437	Kleist, NJ., Guralnick, RP., Cruz, A., an	ECOLOGICAL Sound settlement: no
11	79	10.1002/eece3.2357	Domonino, DM., Griff, S., Nemeth, E.,	ECOLOGY AND Airport noise predicts
12	80	10.1002/eece3.2608	Long, AM., Colon, MR., Bosman, JL.	ECOLOGY AND A before-after contro
13	82	10.1002/eece3.2622	Nelson, DV., Klinck, H., Carbaugh-Rut	ECOLOGY AND Calling at the highwa
14	83	10.1002/eece3.2698	Bunkley, JP., McClure, CJW., Kawahara	ECOLOGY AND Anthropogenic noise
15	87	10.1002/eece3.3037	Derryberry, EP., Gentry, K., Derryberry,	ECOLOGY AND White-crowned sparr
16	89	10.1002/eece3.4002	Mensinger, AF., Putland, RL., and Rad	ECOLOGY AND The effect of motorbo
17	91	10.1002/eece3.1793	Kleist, NJ., Guralnick, RP., Cruz, A., an	ECOSPHERE Anthropogenic noise
18	92	10.1002/eece3.1793	Graham, IM., Pirotta, E., Merchant, NJ.	ECOSPHERE Responses to
19	95	10.1002/eece3.1916	Gentry, KE., Derryberry, EP., Danner, R.	ECOSPHERE Immediate s
20	96	10.1002/eece3.2044	Isojumppa, S., Sadykova, D., DeRuiter,	ECOSPHERE Individual e
21	97	10.1002/eece3.2127	Rosa, P., and Koper, N	ECOSPHERE Integrating multiple e
22	98	10.1002/eece3.2440	Phillips, JN., Gentry, KE., Luther, DA.,	ECOSPHERE Surviving in the city: h
23	99	10.1002/ecy.1770/suppl1	McMahon, TA., Rohr, JR., and Bernat,	ECOLOGY Light and noise pollu
24	121	10.1002/jec.1965	Potvin, DA., and Macdougall-Shackle	JOURNAL OF EX Traffic noise Affects t
25	138	10.1002/jwmg.467	Bennett, VJ., and Zurich, AA	JOURNAL OF W When corridors collid
26	139	10.1002/jwmg.925	Hillman, MD., Karpany, SM., Fraser, JL.	JOURNAL OF W Effects of Aircraft an
27	174	10.1002/wmon.3	Delaney, DK., Pater, LL., Carlile, LD., S	WILDLIFE M On Response of Red-Coi
28	179	10.1002/wsb.6	Lackey, MA., Morrison, ML., Loman, ZS	WILDLIFE SOC Effects of Road Const
29	180	10.1002/wsb.777	Long, AM., Colon, MR., Bosman, JL.	WILDLIFE SOC Effects of Road Const
30	183	10.1002/zoo.10124	Owen, MA., Swaisgood, RR., Czekala,	ZOO BIOLOGY Monitoring stress in
31	184	10.1002/zoo.20098	Powell, DM., Carlstead, K., Tarou, Z.	ZOO BIOLOGY Effects of constructio
32	186	10.1002/zoo.20412	Gorecki, MT., Juszkiewicz, A., Gracki,	ZOO BIOLOGY Exposure to Humans
33	188	10.1002/zoo.21355	Serres, A., and Delfour, F	ZOO BIOLOGY Environmental chang
34	189	10.1002/zoo.21357	Woolway, EE., and Goodenough, AE.	ZOO BIOLOGY Effects of visitor num
35	194	10.1006/anbe.1998.0879	Langemann, U., Gauger, B., and Klum	ANIMAL BEHAV Auditory sensitivity in
36	201	10.1006/anbe.2001.1968	Brumm, H., and Todt, D	ANIMAL BEHAV noise-dependent son
37	202	10.1006/anbe.2003.2093	Lohr, B., Wright, TF., and Dooling, RJ.	ANIMAL BEHAV Detection and discrimin
38	226	10.1006/jmsc.2000.1025	Ross, BP., Lien, J., and Furness, RW.	ICES JOURNAL Use of underwater pl
39	228	10.1006/jmsc.2001.1136	Morton, AB., and Symonds, HS	ICES JOURNAL Displacement of Orc
40	232	10.1006/jsvi.2001.3899	Niu, X., and Canlion, B	JOURNAL OF SG Protecting against no
41	246	10.1007/978-1-4419-7311-1	Slabbekoor, H.	Advances in ex The Complexity of no
42	251	10.1007/978-1-4419-7311-1	Hanna, BW., Cott, PA., Joyst, AA., and	Advances in ex Managing Anthropon
43	253	10.1007/978-1-4419-7311-1	Erbe, C.	Advances in ex Effects of Underwater
44	256	10.1007/978-1-4419-7311-1	Kerten, D.R.	Advances in ex Marine Mammal Aud
45	258	10.1007/978-1-4419-7311-1	Spiga, I., Fox, J., and Benson, R	EFFECTS OF NO Effects of Short-and L
46	259	10.1007/978-1-4419-7311-1	Spiga, I., Fox, J., and Benson, R	EFFECTS OF NO Potential Effects of L
47	260	10.1007/978-1-4419-7311-1	Parks, SE., Johnson, MP., nowacek, DW	Advances in ex Changes in Vocal Bel
48	261	10.1007/978-1-4419-7311-1	De Robertis, A., Wilson, CD., and Wil	Advances in ex Do Silent Ships See N

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**FICHIER ACCUEIL INSERTION MISE EN PAGE FORMULES DONNÉES RÉVISION AFFICHAGE OUTILS DE TABLEAU**

**Tableau croisé dynamique1 Champ actif : biblio\_year**

**Paramètres de champs**

**Options du tableau croisé dynamique**

**Champs de tableau croisé dy... Choisissez les champs à inclure dans le rapport :**

- biblio\_permanent\_id
- biblio\_authors
- biblio\_container
- biblio\_title
- biblio\_abstract
- biblio\_year
- biblio\_language
- biblio\_doiotype
- biblio\_content
- population\_prokaryotes
- annotation\_inventarisation

**Faites glisser les champs dans les zones voulues ci-dessous:**

**FILTRES**

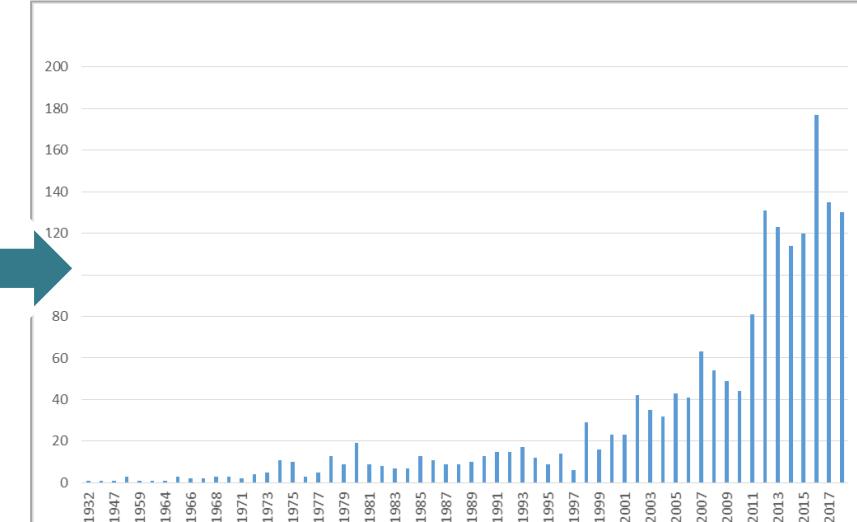
**COLONNES**

**LIGNES** biblio\_year

**VALEURS** Nombre de map\_id

Différer la mise à jour de la disposit... METTRE À JOUR

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## Excel: Heatmaps

Screenshot of Microsoft Excel showing a heatmap of study counts across taxonomic groups and noise sources.

**Table Data:**

	Abstract	Industrial	Transportation	Military	Urban	Recreation
Mammals	178	143	142	72	12	27
Fishes	85	101	96	13	2	11
Birds	74	59	136	22	109	19
Amphibians	23	4	31	0	5	2
Insects	18	2	10	0	2	2
Crustaceans	9	18	8	1	0	0
Shellfishes	9	9	6	1	0	0
Other invertebrates	2	3	5	0	0	0
Reptiles	1	7	7	3	0	1
Other vertebrates	1	1	2	0	0	2
Arachnids	1	1	1	0	1	0

**Conditional Formatting Contextual Menu:**

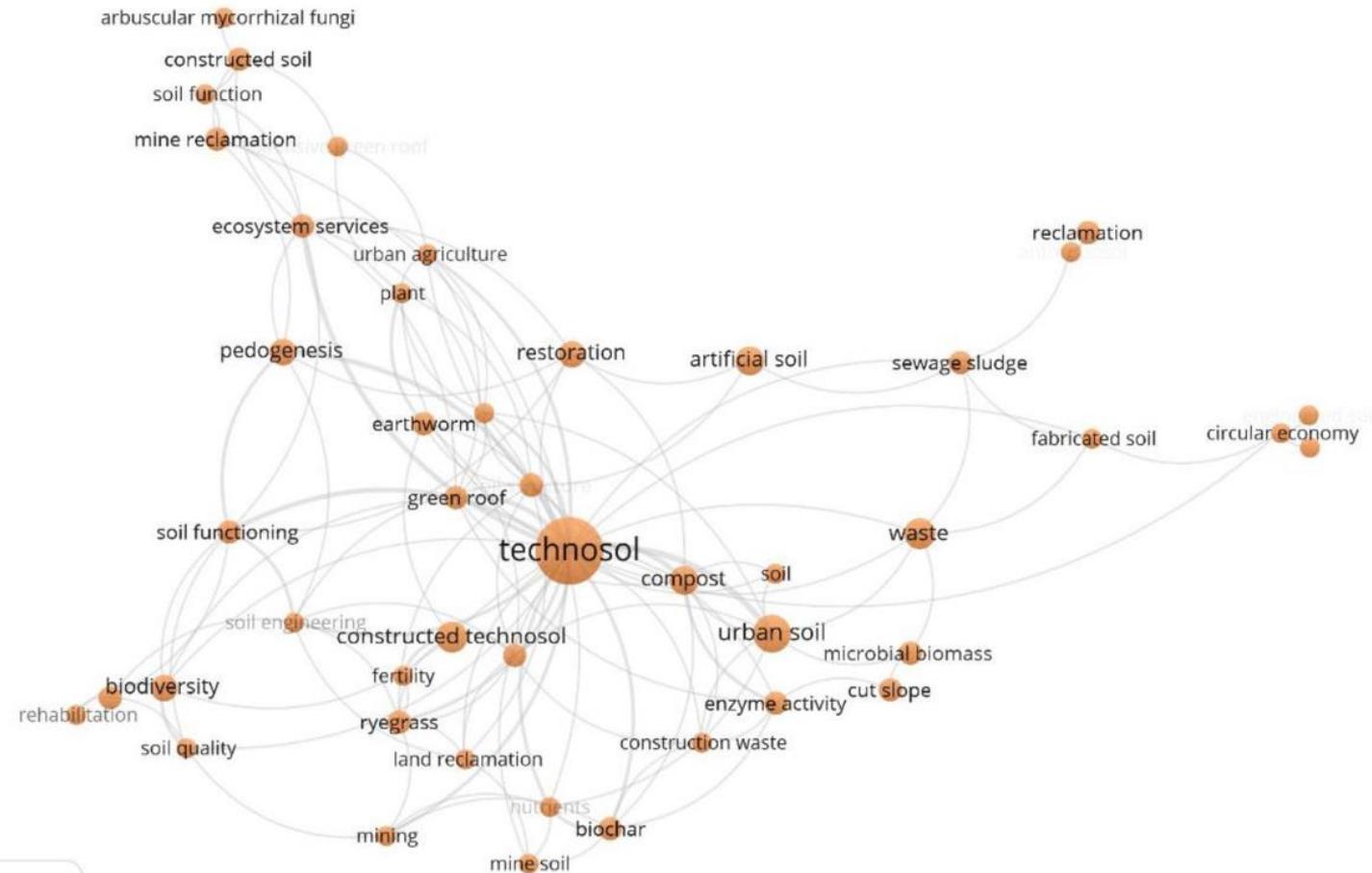
- Mise en forme conditionnelle
- Règles de mise en surbrillance des cellules
- Règles des valeurs plus/moins élevées
- Barres de données
- Nuances de couleurs
- Jeux d'icônes
- Nouvelle règle...
- Effacer les règles
- Gérer les règles...

**Color Scale Description:**

Échelle de couleur Vert - Jaune - Rouge  
Afficher un dégradé de couleur dans une plage de cellules. La couleur indique l'emplacement de chaque valeur de cellule dans cette plage.

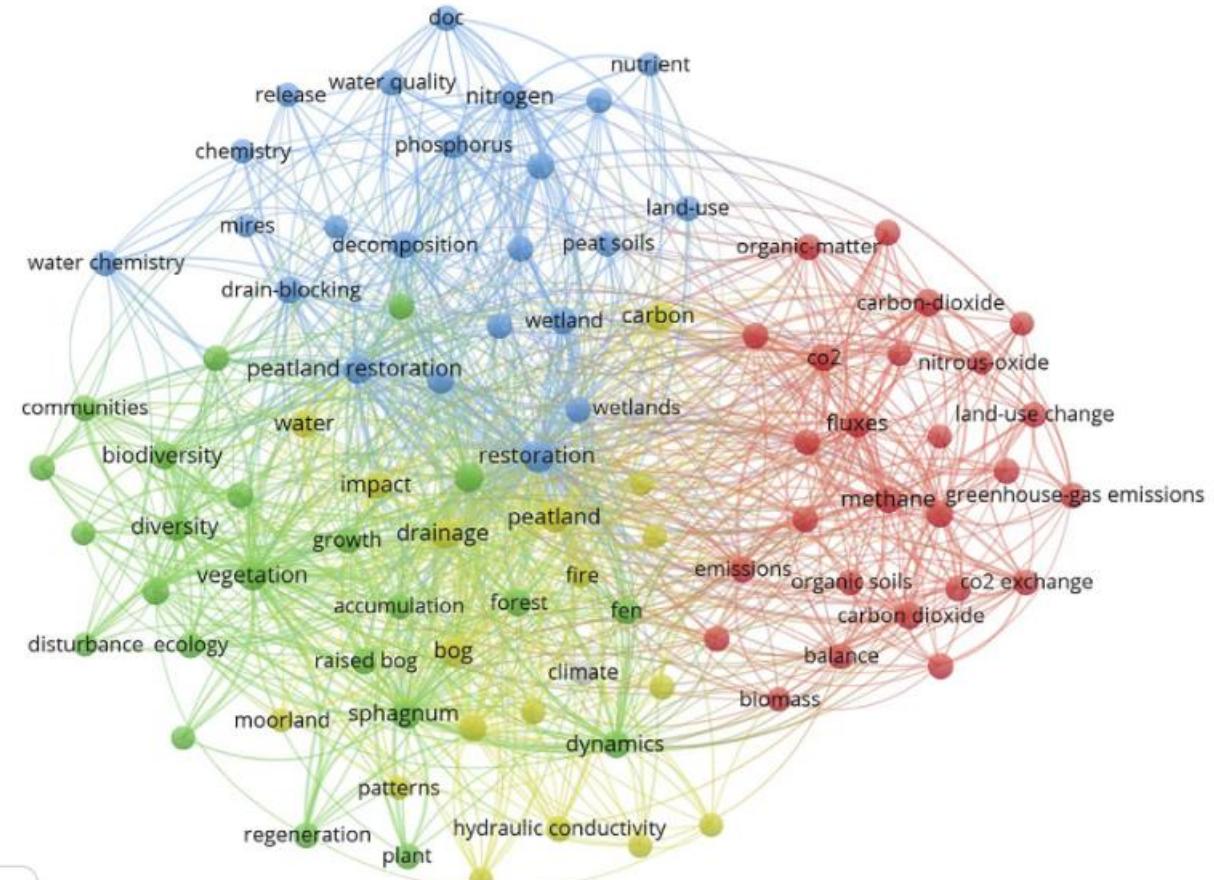
## VOSviewer

## Network of keywords



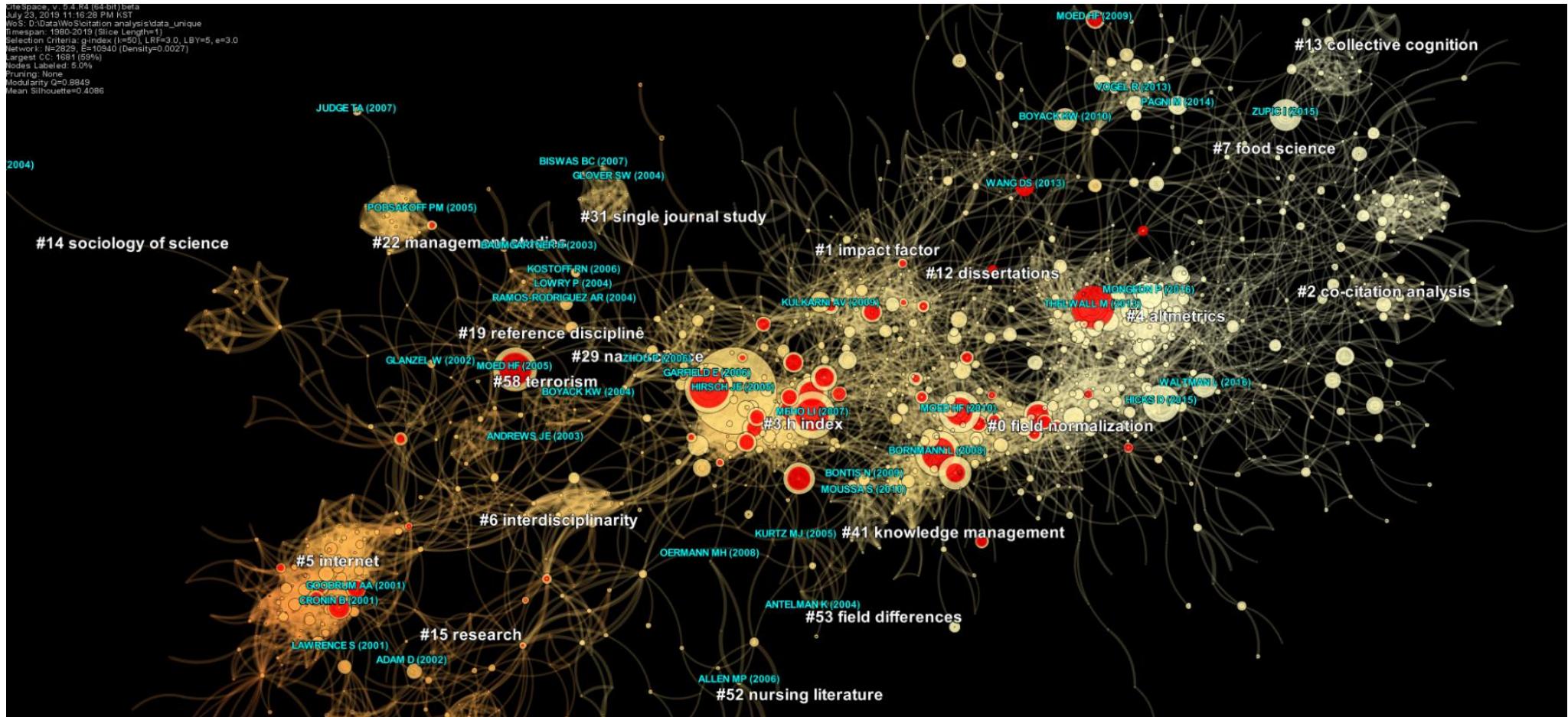
## VOSviewer

### Network of keywords



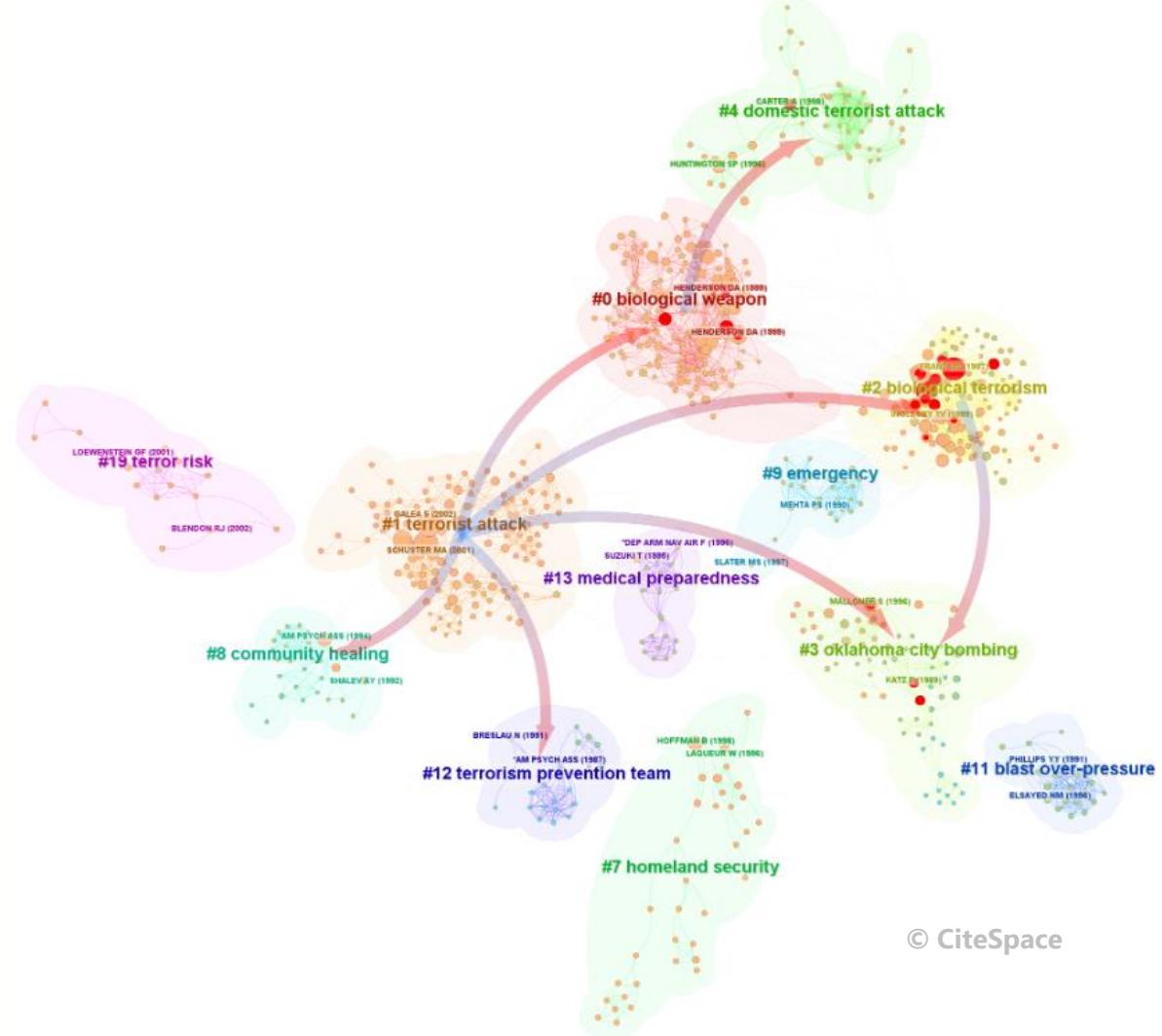
## CiteSpace

### Network of keywords



## CiteSpace

### Network of keywords



# Tools



## EviAtlas

Eichier Édition Affichage Historique Marque-pages Outils Aide

Zimbra: Reception (11689) DeepL Traduction – DeepL Trans Evidence for the impacts of agr Google Agenda - Semaine du 1 EviAtlas (5) (PDF) EviAtlas: A tool for visu GitHub - ESHackathon/eviatlas: +

https://estech.shinyapps.io/eviatlas/ Autres marque-pages

EviAtlas

About EviAtlas Evidence Atlas Map Database Descriptive Plots Heatmap Resources View Code

About EviAtlas About Systematic Maps How to Use EviAtlas How to Cite EviAtlas

**About EviAtlas**

EviAtlas is an Open Source tool for creating and hosting visualisations from databases of studies created within systematic maps and systematic reviews. The tool was created as part of the ongoing Evidence Synthesis Hackathon series of events ([www.evidencesynthesishackathon.com](http://www.evidencesynthesishackathon.com)) aimed at producing free-to-use tools to support systematic reviews and maps across disciplines.

EviAtlas allows users to create a suite of visualisations from a database of studies, including Evidence Atlases (interactive geographical maps showing studies and their details over space), Heat Maps (cross tabulations of categorical variables that highlight clusters and gaps in the evidence), descriptive plots that help to visualise the evidence base (e.g. the number of publications per year), and human-readable databases that are easily filterable.

EviAtlas is built on coding written in R (<https://www.r-project.org>) and uses a Shiny App to provide a web-based user interface. As we develop the app further, we will provide source code to allow R users to further refine their visualisations.

EviAtlas is currently in a testing phase but is fully functional. We intend to add further options and functionality in the near future. If you have any feedback, please contact Neal Haddaway (Research Fellow at the Stockholm Environment Institute): [neal.haddaway@sei.org](mailto:neal.haddaway@sei.org).

Data Attributes Upload a dataset using the panel to the right -->

Upload Data Which Data to Use?

Sample Data  Upload from .csv format (spreadsheet)  Upload from .shp format (shapefile)

Choose CSV File Browse... Systematic Map Data (100 MB Limit)

CSV Properties  Header row?

Select File Encoding Default

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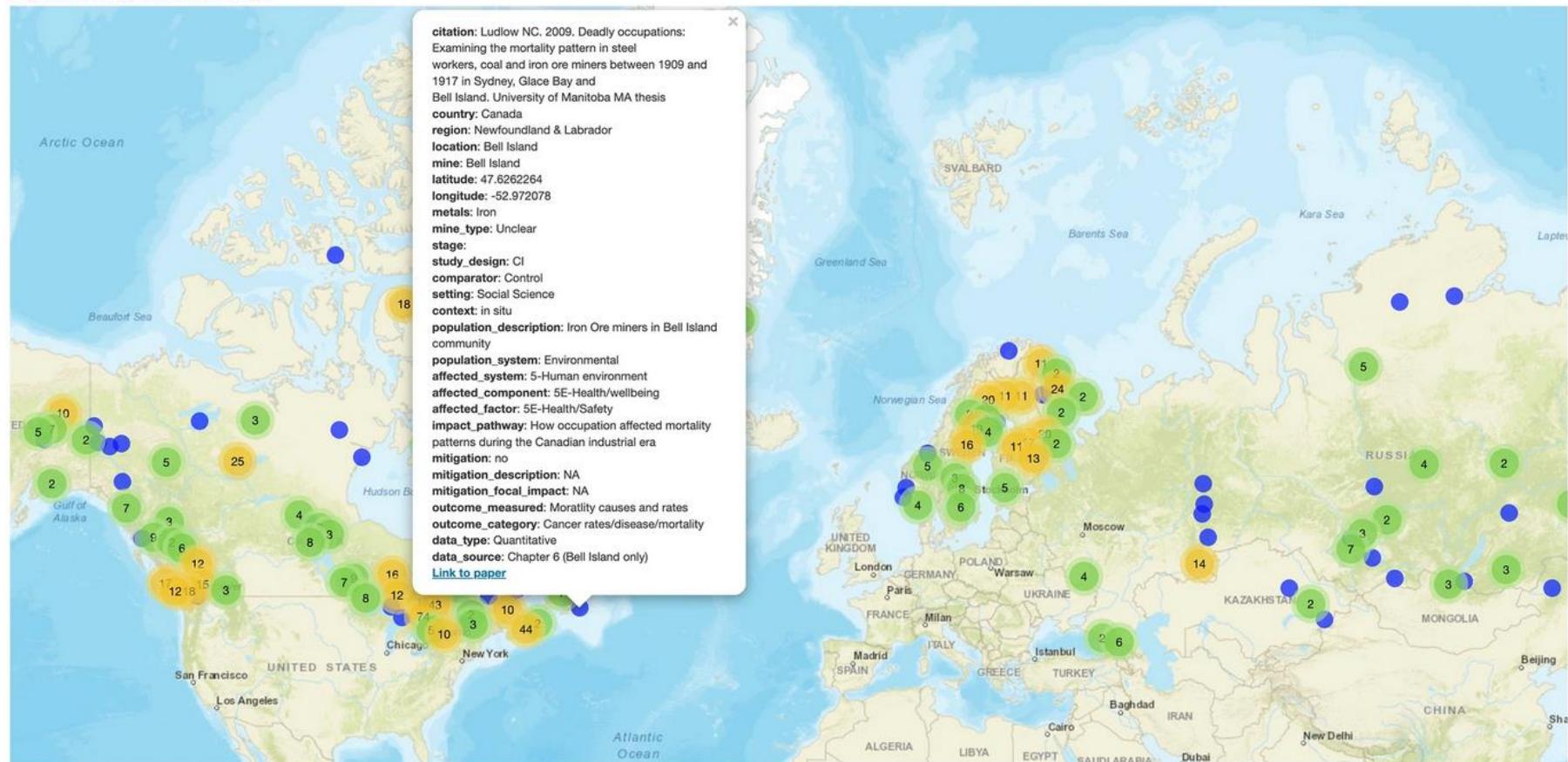
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## EviAtlas

EviAtlas														
<a href="#">?</a> About EviAtlas <a href="#">☰</a>														
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map_id	biblio_internal_id	biblio_permanent_id	biblio_authors	biblio_container	biblio_title	biblio_abstract	biblio_year	biblio_language	biblio_doctype	biblio_content	population_prokaryotes	population_inverte		
1	1	6 10.1002/(SICI)1098-2361(1999)1...	Carlstead, K., Fraser, J., Ben...	ZOO BIOLOGY	Black rhinoceros ( <i>Diceros bico...</i> )	The captive population of black...	1999	en	journal article	study	no	no		
2	2	9 10.1002/15-0783	Friedlaender, AS., Hazen, EL,...	ECOLOGICAL APPLICATIONS	Prey-mediated behavioral response...	Behavioral response studies prior to...	2016	en	journal article	study	no	no		
3	3	34 10.1002/aqc.1189	Cubero-Pardo, P., Herron, P., ...	AQUATIC CONSERVATION-MARINE AN...	Shark reactions to scuba divers	1. Worldwide, there are concerns about...	2011	en	journal article	study	no	no		
4	4	35 10.1002/aqc.1190	Jung, CA., and Swearer, SE.	AQUATIC CONSERVATION-MARINE AN...	Reactions of temperate reef fishes to...	1. Anthropogenic sound as a stressor	2011	en	journal article	study	no	no		
5	5	37 10.1002/aqc.2355	La Manna, G., Manghi, M., Pava...	AQUATIC CONSERVATION-MARINE AN...	Behavioural strategy of common sharks	Owing to the increase of boat traffic	2013	en	journal article	study	no	no		
6	6	42 10.1002/aqc.2668	Osterrieder, SK., Kent, CS., and Robinson, RW	AQUATIC CONSERVATION-MARINE AN...	Responses of Australian sea lions to...	1. Tourist-based activities,...	2017	en	journal article	study	no	no		
7	7	43 10.1002/aqc.2693	Jain-Schlaepfer, SMR., Blouin-...	AQUATIC CONSERVATION-MARINE AN...	Do boating and basking mix? Theory...	1. Basking is the primary mechanism for...	2017	en	journal article	study	no	no		
8	8	47 10.1002/aqc.2915	Maxwell, R.J., Zolderdo, AJ., d...	AQUATIC CONSERVATION-MARINE AN...	Does motor noise from recreationa...	1. Recreational boating activities	2018	en	journal article	study	no	no		
9	9	50 10.1002/aqc.941	Graham, AL., and Cooke, SJ	AQUATIC CONSERVATION-MARINE AN...	The effects of noise disturbance on...	1. Recreational boating continues to...	2008	en	journal article	study	no	no		
10	10	74 10.1002/eap.1437	Kleist, NJ., Guralnick, RB., C...	ECOLOGICAL APPLICATIONS	Sound settlement	Birds breeding in heterogeneous...	2017	en	journal article	study	no	no		

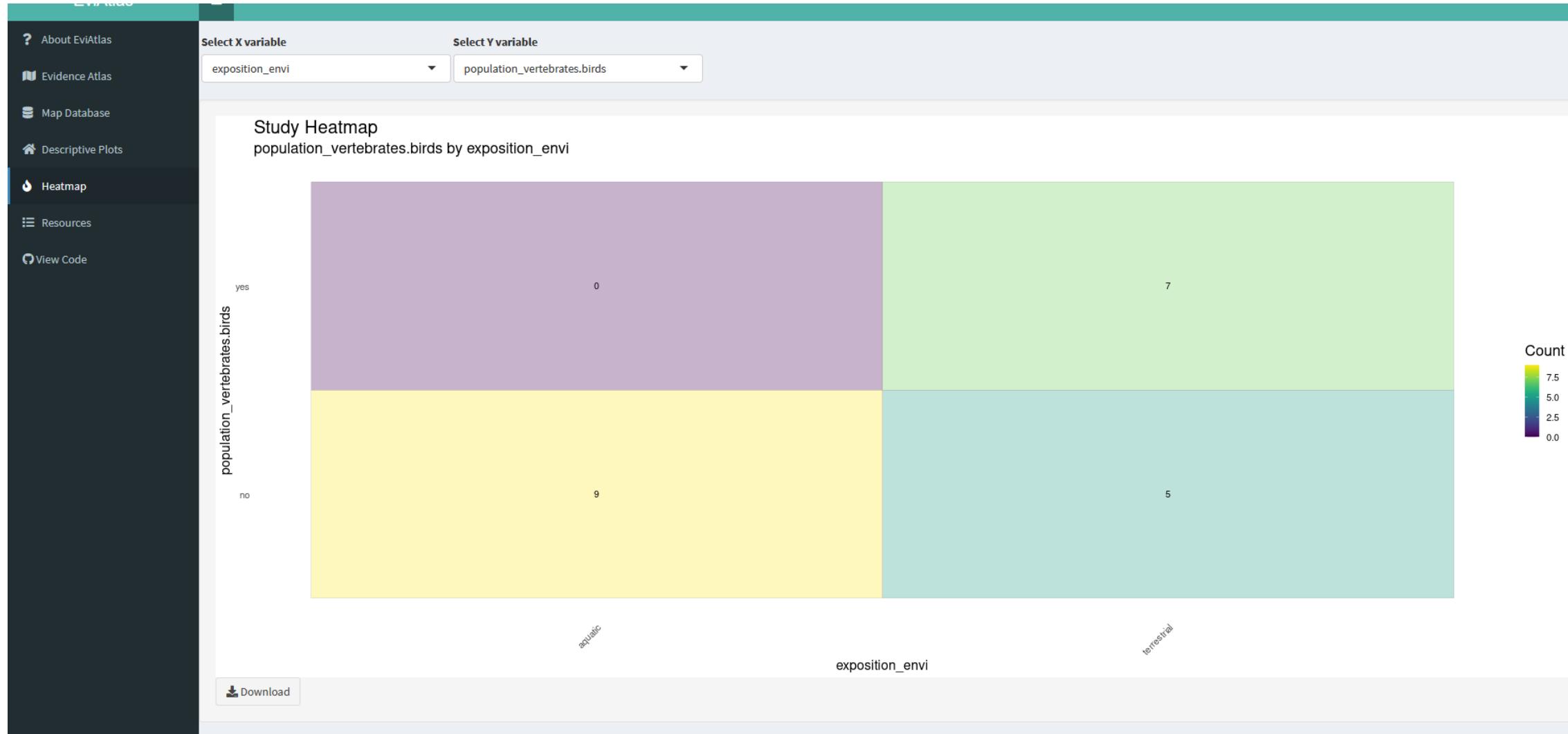
## EviAtlas

From: [Evidence of the impacts of metal mining and the effectiveness of mining mitigation measures on social–ecological systems in Arctic and boreal regions: a systematic map](#)



Screenshot of the interactive evidence atlas showing the location of all study systems in the 585 included studies across 902 total outcome measures. The popup contains descriptive meta-data and a link to the paper on Google Scholar. The interactive evidence atlas is available here: <https://3mkproject.github.io/research.html>

## EviAtlas



# Now it's up to you!

