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# La synthèse des connaissances sur la biodiversité : introduction aux méta-analyses et revues systématiques – 2024

Recherche de littérature : Bases de données & Equation de recherche

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CNRS • SORBONNE UNIVERSITÉ  
Station Biologique  
de Roscoff



**Bienvenue**



*This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 899546.*



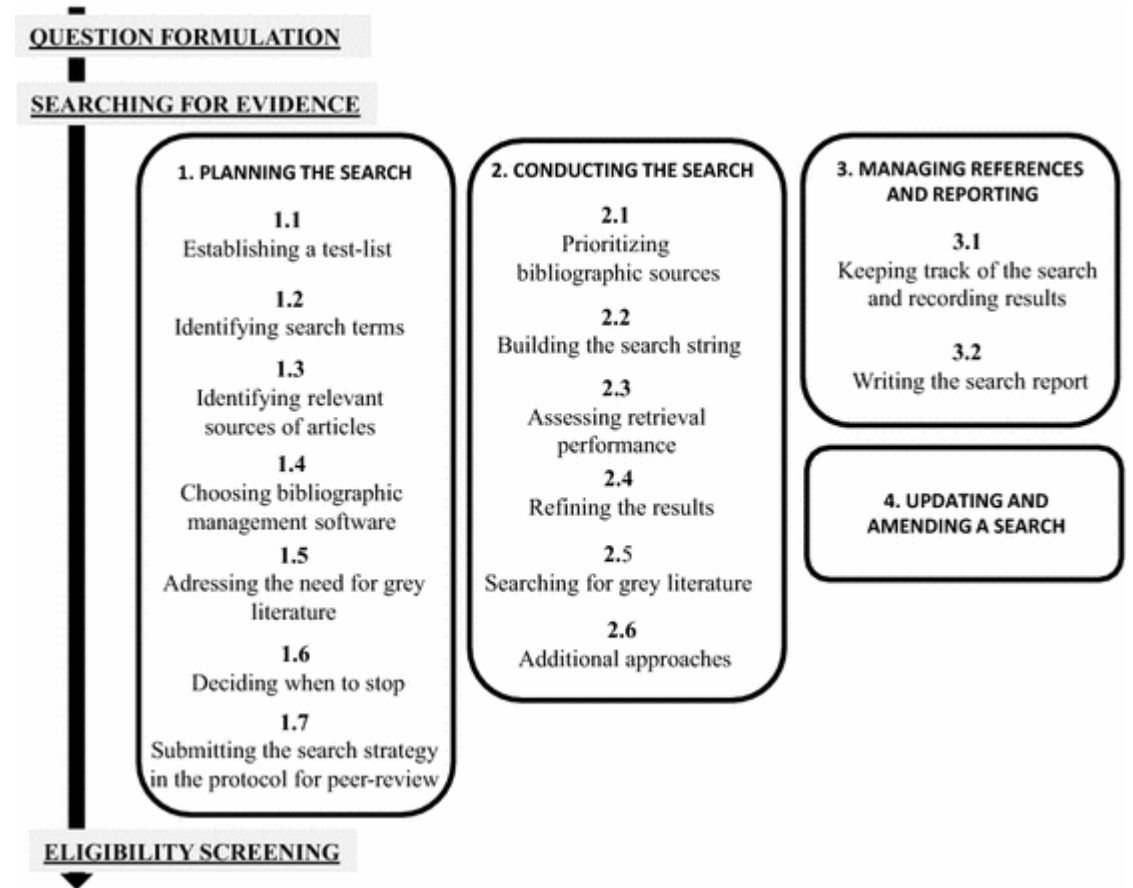
# The search strategy

## The goal:

Find the relevant bibliographic references !

The search strategy :

1. The search string
2. The bibliographic sources
3. The test-list

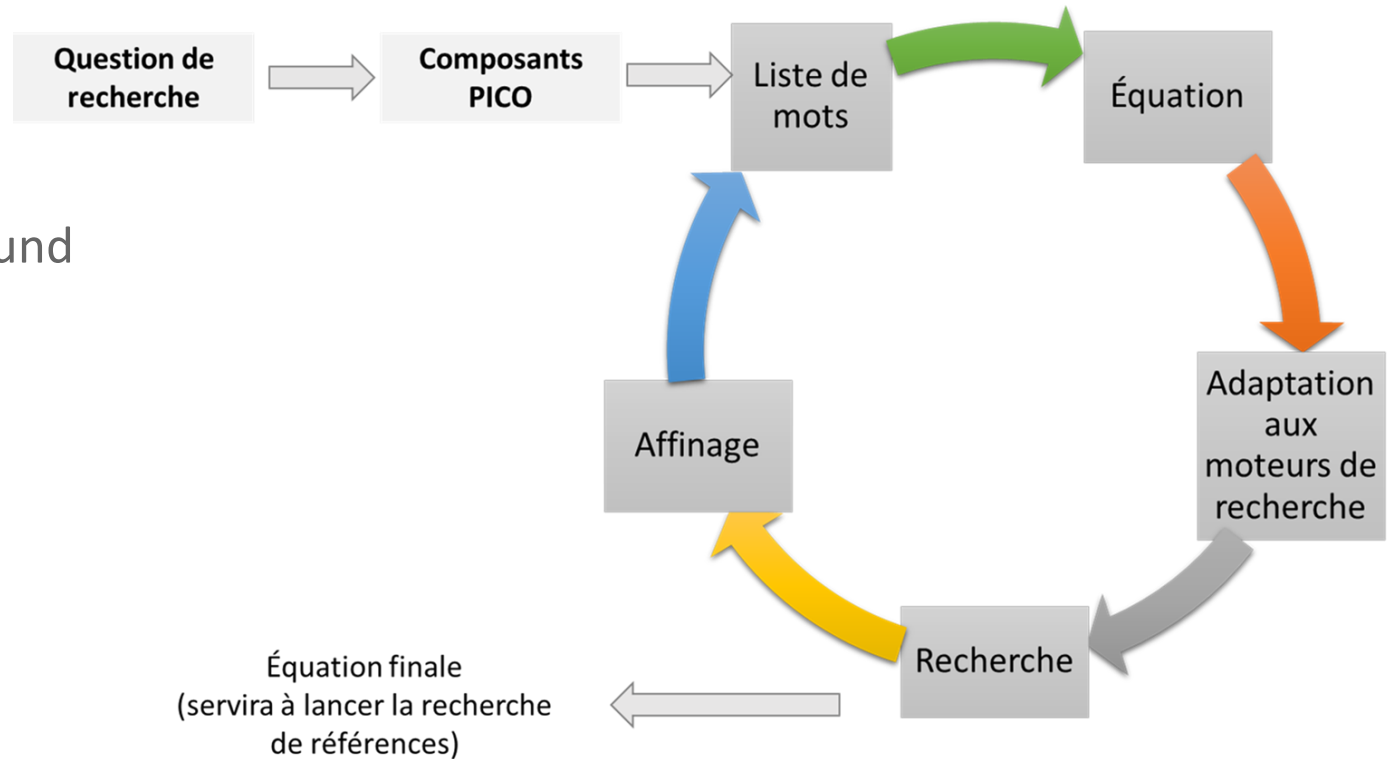


# The search strategy

## Starting with the research questions Define the search string

**search terms** encompasses individual or compound words used in a search to find relevant articles

**search string** is a combination of search terms combined using Boolean operators



# The search string

## PICO/PECO elements (Richardson et al. 1995)

**Population** : *effect on what?*

**Intervention / Exposure** : *effect of what ?*

**Comparator** : *compared to what? to what reference?*

**Outcome** : *effect measured by what?*

( **Context** : *what type of study?* )

| Question element         | Definition  |
|--------------------------|---|
| Population (of subjects) | Unit of study (e.g. ecosystem, species) that should be defined in terms of the statistical populations of subject(s) to which the intervention will be applied. |
| Intervention/exposure    | Proposed management regime, policy, action or the environmental variable to which the subject populations are exposed.  |
| Comparator               | Either a control with no intervention/exposure or an alternative intervention or a counterfactual scenario.   |
| Outcome                  | All relevant outcomes from the proposed intervention or environmental exposure that can be reliably measured  |

# The search string

1

Define the PICO based on the research question

**PICO/PECO elements** (Richardson et al. 1995)

**My PICO**

**Population** : *effect on what?*

**Intervention / Exposure** : *effect of what ?*

**Comparator** : *compared to what? to what reference?*

**Outcome** : *effect measured by what?*

( **Context** : *what type of study?* )



Example with the Agri-TE project:

What is the effect of agricultural practices on biodiversity at the global level?

# The search string

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Define the PICO based on the research question

## PICO/PECO elements (Richardson et al. 1995)

**Population** : *effect on what?*

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**Outcome** : *effect measured by what?*

( **Context** : *what type of study?* )



## My PICO

Any unplanned/uncultivated taxon

Any agricultural practice

Agricultural witness or natural environment of ref.

Effect-size representing a biodiv metric.

Meta-analyses only

**Example with the Agri-TE project:**  
What is the effect of agricultural practices on biodiversity at the global level?

# The search string

## 2 Establish the list of words that will be used to construct the search equation

### My search terms

biodiversity, soil fauna, birds, butterflies

tillage, fertilization, pesticides

croplands, forest

species richness, biomass, Shannon's entertainment

meta-analyses



### My PICO

Any unplanned/uncultivated taxon

Any agricultural practice

Agricultural witness or natural environment of ref.

Effect-size representing a biodiv metric.

Meta-analyses only

**Example with the Agri-TE project:  
What is the effect of agricultural practices on biodiversity at the global level?**

## 3

### Building the search string by adapting to search engines (eg: WoS)

#### My search terms

biodiversity, soil fauna, birds, butterflies

tillage, fertilization, pesticides

croplands, forest

species richness, biomass, Shannon's diversity

meta-analyses



#### My search string

**TS=** ((biodiversity OR soil fauna OR birds OR butterflies)

AND (tillage OR fertilizers **OR** pesticides )

AND (croplands OR forest)

**AND** (species richness OR biomass OR Shannon's diversity)

AND (meta-analyses))

Example with the Agri-TE project:

What is the effect of agricultural practices on biodiversity at the global level?



# The search string

## My search string

**TS=** ((biodiversity OR soil fauna OR birds OR butterflies)

AND (tillage OR fertilizers **OR** pesticides )

AND (croplands OR forest)

**AND** (species richness OR biomass OR Shannon's diversity)

AND (meta-analyses))

Topic (title, abstract,  
keywords, keywords plus)

Logical and Boolean  
Operators

Both depend on  
the bibliographic  
sources

Example with the Agri-TE project:  
What is the effect of agricultural practices on biodiversity at the global level?

# The search string

## My search string

**TS=** ((biodiversity OR soil fauna OR birds OR butterflies)

AND (tillage OR fertilizers **OR** pesticides )

AND (croplands OR forest)

**AND** (species richness OR biomass OR Shannon's diversity)

AND (meta-analyses))

**Exact Expression**  
"soil fauna"

**Truncations**  
pesticide\*, pesticide\$

**Exclusion**  
NOT (medical science OR  
economics)

**Thematic**  
soil fauna OR (earthworms  
OR spiders OR collembola OR  
springtails)

### Beware of database variations in the search equation!!!

- Some use a different language for searching
- For example, \$ instead of \*.
- Additional options (inside or nearby)
- Help files are useful!
- Check the options
- Seek specialist help if necessary
- SAVE EVERYTHING

# The search string

4

## Test the search string

### My search string

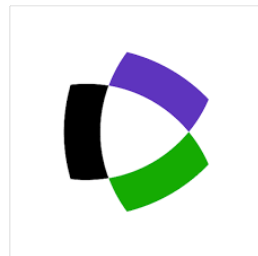
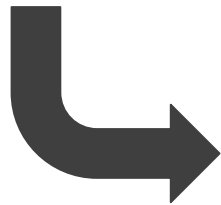
**TS=** ((biodiversity OR soil fauna OR birds OR butterflies)

AND (tillage OR fertilizers **OR** pesticides )

AND (croplands OR forest)

**AND** (species richness OR biomass OR Shannon's diversity)

AND (meta-analyses))



200 results is not enough!  
20,000 results is too much!  
Refinement needed...

# The search string

## My search string

**TS=** ((biodiversity OR soil fauna OR birds OR butterflies)  
AND (tillage OR fertilizers **OR** pesticides )  
AND (croplands OR forest)  
**AND** (species richness OR biomass OR Shannon's diversity)  
AND (meta-analyses))

5

## Refine the search string

Iterative process that can (must?) be long

Ex: Foo et al. (2021)

|   |   |   |
|---|---|---|
| Initial search string<br>159 results                    | 1 | <i>TS = ( ( ( "terminal investment" OR "reproductive effort" OR "fecundity compensation" ) AND ( "immune challeng*" OR "immunochalleng*" OR "infect*" ) ) NOT ( load OR human OR people ) )</i>   |
| Add inclusion terms<br>4,360 results                    | 2 | <i>TS = ( ( ( "terminal investment" OR "reproductive effort" OR "fecundity compensation" OR "reproductive compensation" OR "fitness" ) AND ( "immune challeng*" OR "immunochalleng*" OR "infect*" OR lipopolysaccharide OR lps OR phytohemagglutinin OR pha OR "sheep red blood cells" OR srbc OR implant OR vaccin* ) ) NOT ( load OR human OR people ) )</i>  |
| Edit inclusion term<br>493 results                      | 3 | <i>TS = ( ( ( "terminal investment" OR "reproductive effort" OR "fecundity compensation" OR "reproductive compensation" OR "reproductive fitness" ) AND ( "immune challeng*" OR "immunochalleng*" OR "infect*" OR lipopolysaccharide OR lps OR phytohemagglutinin OR pha OR "sheep red blood cells" OR srbc OR implant OR vaccin* ) ) NOT ( load OR human OR people ) )</i>   |
| Add inclusion terms<br>2,489 results                    | 4 | <i>TS = ( ( ( "terminal investment" OR "reproductive effort" OR "fecundity compensation" OR "reproductive compensation" OR "reproductive fitness" OR "reproductive investment" OR "Life History Trade-Off*" OR "life history" ) AND ( "immune challeng*" OR "immunochalleng*" OR "infect*" OR lipopolysaccharide OR lps OR phytohemagglutinin OR pha OR "sheep red blood cells" OR srbc OR implant OR vaccin* ) ) NOT ( load OR human OR people ) )</i>   |
| Change inclusion term<br>1,819 results                  | 5 | <i>TS = ( ( ( "terminal investment" OR "reproductive effort" OR "fecundity compensation" OR "reproductive compensation" OR "reproductive fitness" OR "reproductive investment" OR "Life History Trade-Off*" OR <del>"life history"</del> OR "trade off" ) AND ( "immune challeng*" OR "immunochalleng*" OR "infect*" OR lipopolysaccharide OR lps OR phytohemagglutinin OR pha OR "sheep red blood cells" OR srbc OR implant OR vaccin* ) ) NOT ( load OR human OR people ) )</i>   |
| Delete inclusion term<br>1,155 results                  | 6 | <i>TS = ( ( ( "terminal investment" OR "reproductive effort" OR "fecundity compensation" OR "reproductive compensation" OR "reproductive fitness" OR "reproductive investment" OR "reproductive success" OR "Life History Trade-Off*" OR <del>"trade off"</del> ) AND ( "immune challeng*" OR "immunochalleng*" OR "infect*" OR lipopolysaccharide OR lps OR phytohemagglutinin OR pha OR "sheep red blood cells" OR srbc OR implant OR vaccin* ) ) NOT ( load OR human OR people ) )</i>   |
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| Add exclusion terms<br>1,141 results                    | 8 | <i>TS = ( ( ( "terminal investment" OR "reproductive effort" OR "fecundity compensation" OR "reproductive compensation" OR "reproductive fitness" OR "reproductive investment" OR "reproductive success" OR "Life History Trade-Off*" OR "Phenotypic Plasticity" ) AND ( "immune challeng*" OR "immunochalleng*" OR "infect*" OR lipopolysaccharide OR lps OR phytohemagglutinin OR pha OR "sheep red blood cells" OR srbc OR implant OR vaccin* ) ) NOT ( load OR human OR people OR men OR women OR infant* OR rat OR rats OR mouse OR mice OR pig* OR pork OR beef OR cattle OR sheep OR lamb* OR chicken* OR calf* OR horse* ) )</i>  |
| Final search string<br>1,567 results<br>(~10% hit rate) |   | <i>TS = ( ( ( "terminal investment" OR "reproductive effort" OR "fecundity compensation" OR "reproductive compensation" OR "reproductive fitness" OR "reproductive investment" OR "reproductive success" OR "Life History Trade-Off*" OR "Phenotypic Plasticity" ) AND ( "pre-copulatory NEAR/5 trait*" OR "sexual NEAR/5 weapon*" OR "sexual NEAR/5 ornament*" OR "post-copulatory NEAR/5 trait*" OR "ejaculate quality" OR "sperm quality" OR "mating effort" OR "parental care" ) AND ( "immune challeng*" OR "immunochalleng*" OR "infect*" OR lipopolysaccharide OR lps OR phytohemagglutinin OR pha OR "sheep red blood cells" OR srbc OR implant* OR vaccin* OR nylon OR sephadex ) ) NOT ( load OR human OR people OR men OR women OR infant* OR rat OR rats OR mouse OR mice OR pig* OR pork OR beef OR cattle OR sheep OR lamb* OR chicken* OR calf* OR horse* OR infective ) )</i> |

Pilot 100 papers to check hit rate, 6% hit rate. Continue refining.

# The search string

## My search string

**TS=** ((biodiversity OR soil fauna OR birds OR butterflies)  
AND (tillage OR fertilizers **OR** pesticides )  
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**AND** (species richness OR biomass OR Shannon's diversity)  
AND (meta-analyses))

5

## Refine the search string

Iterative process that can (must?) be long

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| Add inclusion terms<br>2,489 results   | 4 | <i>TS = ( ( ( "terminal investment" OR "reproductive effort" OR "fecundity compensation" OR "reproductive compensation" OR "reproductive fitness" OR "reproductive investment" OR "Life History Trade-Off*" OR "life history" ) AND ( "immune challeng*" OR "immunochalleng*" OR "infect*" OR lipopolysaccharide OR lps OR phytohemagglutinin OR pha OR "sheep red blood cells" OR srbc OR implant OR vaccin* ) ) NOT ( load OR human OR people ) )</i>  |
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Pilot 100 papers to check hit rate. 6% hit rate. Continue refining.

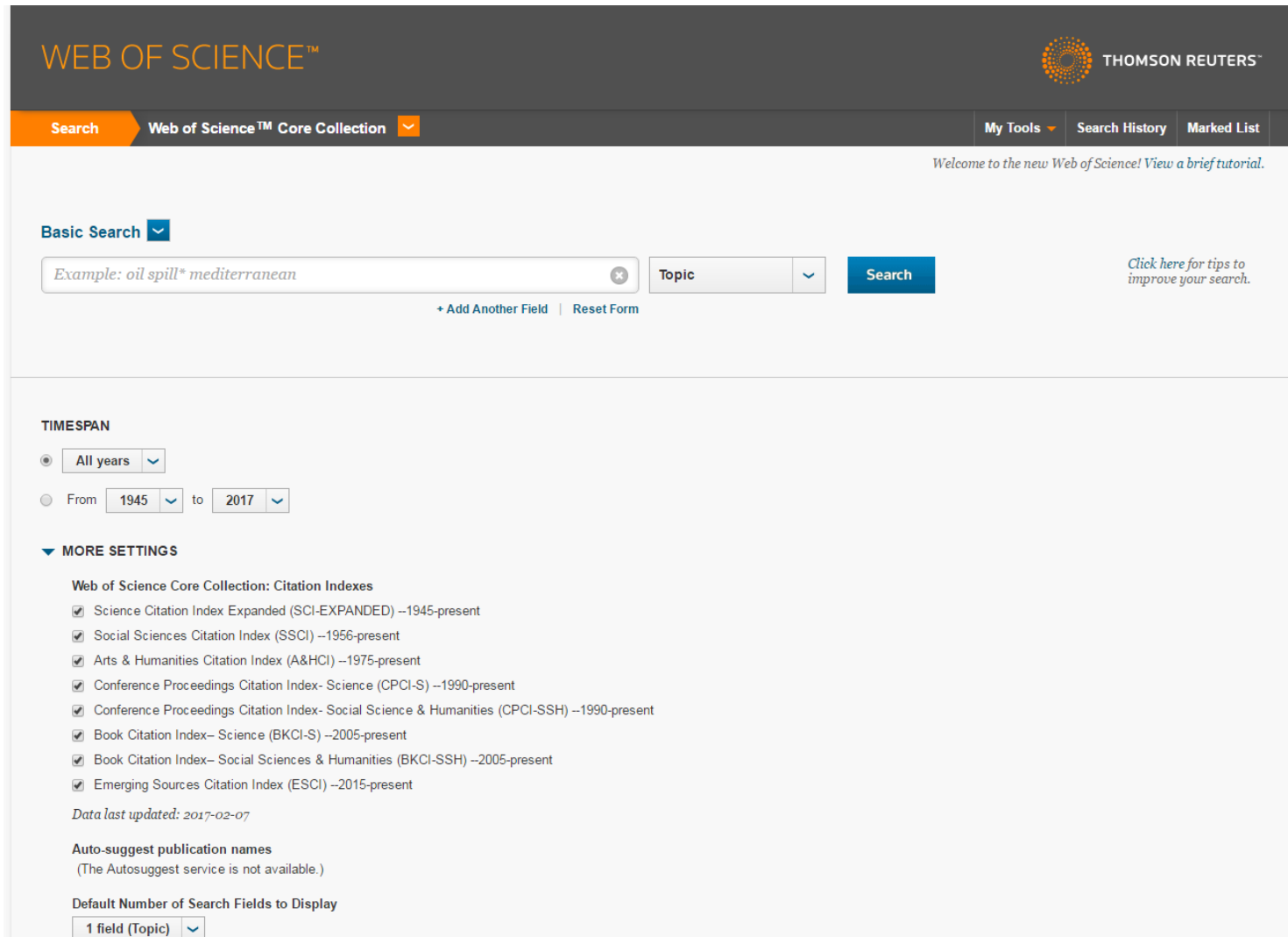
Final search string


|   |  |  |
|---|--|--|
| Final search string<br>1,567 results<br>(~10% hit rate) |  | <i>TS = ( ( ( "terminal investment" OR "reproductive effort" OR "fecundity compensation" OR "reproductive compensation" OR "reproductive fitness" OR "reproductive investment" OR "reproductive success" OR "Life History Trade-Off*" OR "Phenotypic Plasticity" OR "pre-copulatory NEAR/5 trait*" OR "sexual NEAR/5 weapon*" OR "sexual NEAR/5 ornament*" OR "post-copulatory NEAR/5 trait*" OR "ejaculate quality" OR "sperm quality" OR "mating effort" OR "parental care" ) AND ( "immune challeng*" OR "immunochalleng*" OR "infect*" OR lipopolysaccharide OR lps OR phytohemagglutinin OR pha OR "sheep red blood cells" OR srbc OR implant* OR vaccin* OR nylon OR sephadex ) ) NOT ( load OR human OR people OR men OR women OR infant* OR rat OR rats OR mouse OR mice OR pig* OR pork OR beef OR cattle OR sheep OR lamb* OR chicken* OR calf* OR horse* OR infective ) )</i> |
|---|--|--|



## Bibliographic databases

- Web of Science
- Scopus
- Agricola
- AGRIS (FAO)
- Academic Search Premier
- Biological Abstracts
- CAB Abstracts
- etc.


# Example with web of science





**WEB OF SCIENCE™**  THOMSON REUTERS™

**Search** Web of Science™ Core Collection  My Tools  Search History Marked List


Welcome to the new Web of Science! View a brief tutorial.



**Basic Search** 

Example: oil spill\* mediterranean  **Topic**  **Search** [Click here for tips to improve your search.](#)

[+ Add Another Field](#) | [Reset Form](#)

**TIMESPAN**

All years 

From   to  


**MORE SETTINGS**

**Web of Science Core Collection: Citation Indexes**

- Science Citation Index Expanded (SCI-EXPANDED) --1945-present
- Social Sciences Citation Index (SSCI) --1956-present
- Arts & Humanities Citation Index (A&HCI) --1975-present
- Conference Proceedings Citation Index- Science (CPCI-S) --1990-present
- Conference Proceedings Citation Index- Social Science & Humanities (CPCI-SSH) --1990-present
- Book Citation Index-- Science (BKCI-S) --2005-present
- Book Citation Index-- Social Sciences & Humanities (BKCI-SSH) --2005-present
- Emerging Sources Citation Index (ESCI) --2015-present

Data last updated: 2017-02-07

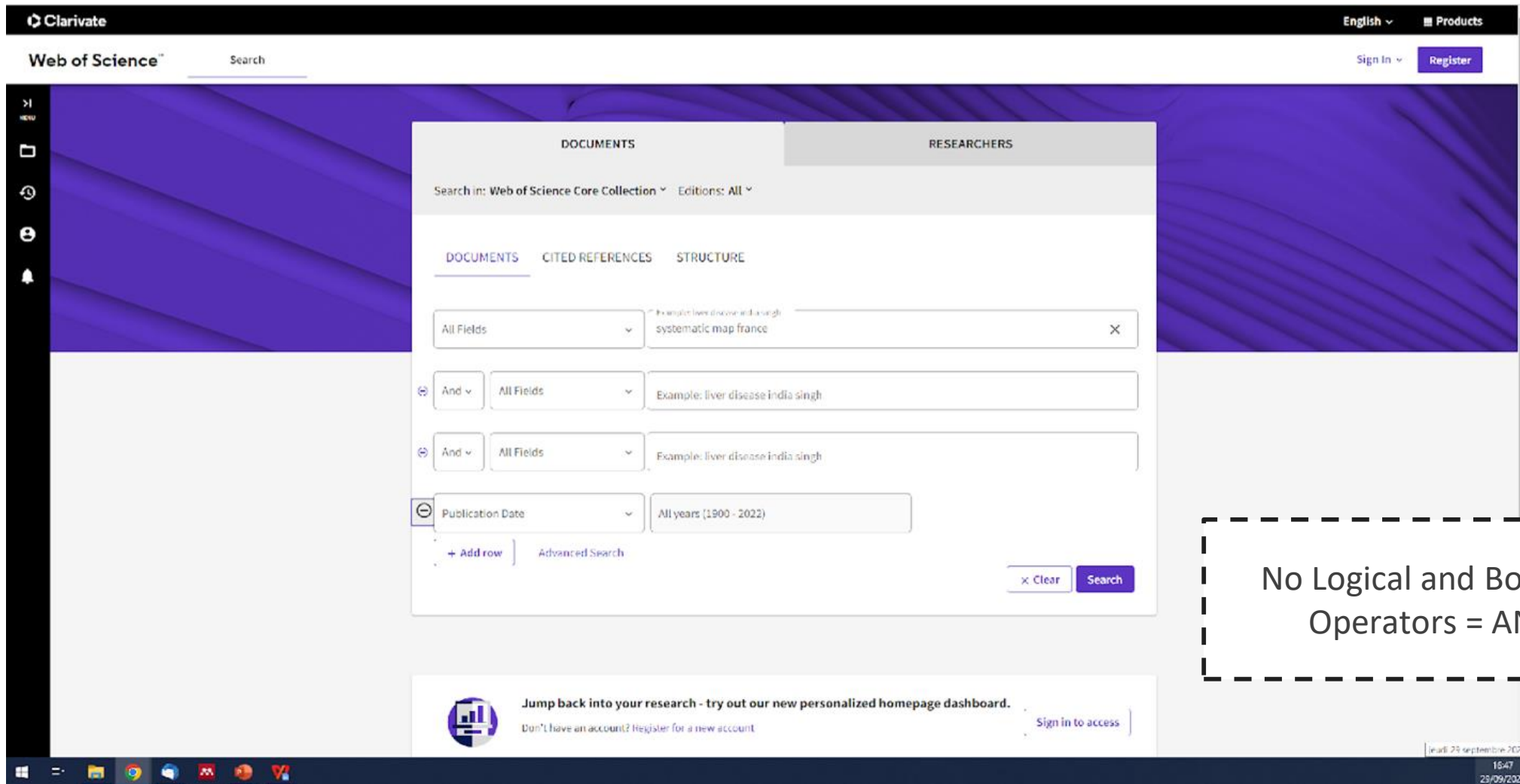
**Auto-suggest publication names**  
(The Autosuggest service is not available.)

**Default Number of Search Fields to Display**  
 



# Example with web of science

<https://www.webofscience.com/wos/woscc/basic-search>



The screenshot shows the Web of Science search interface. At the top, there is a navigation bar with the Clarivate logo, language selection (English), and a Products menu. Below this, the 'Web of Science' logo and a search bar are visible. On the right side of the search bar, there are 'Sign In' and 'Register' buttons. The main search area is divided into 'DOCUMENTS' and 'RESEARCHERS' tabs. Under the 'DOCUMENTS' tab, there are sub-tabs for 'DOCUMENTS', 'CITED REFERENCES', and 'STRUCTURE'. The search criteria are displayed as follows:

- Search in: Web of Science Core Collection (dropdown) Editions: All (dropdown)
- Field: All Fields (dropdown) Value: systematic map france (input field with clear button)
- Operator: And (dropdown) Field: All Fields (dropdown) Value: Example: liver disease india singh (input field)
- Operator: And (dropdown) Field: All Fields (dropdown) Value: Example: liver disease india singh (input field)
- Operator: Publication Date (dropdown) Value: All years (1900 - 2022) (input field)

At the bottom of the search area, there are '+ Add row' and 'Advanced Search' buttons. On the right side, there are 'x Clear' and 'Search' buttons. Below the search area, there is a promotional banner: 'Jump back into your research - try out our new personalized homepage dashboard. Don't have an account? Register for a new account. Sign in to access'. The bottom right corner shows the date and time: 'jeudi 29 septembre 2022 16:47 29/09/2022'.

No Logical and Boolean Operators = AND





# Example with web of science

Clarivate English Products

Web of Science™ Search Sign In Register

DOCUMENTS RESEARCHERS

Search in: Web of Science Core Collection Editions: All

DOCUMENTS CITED REFERENCES STRUCTURE

All Fields

+ Add row + Add date range Advanced Search x Clear Search

Jump back into your research - try out our new personalized homepage dashboard. [Sign in to access](#)

Don't have an account? [Register for a new account](#)

Université Pierre et Marie Curie Institution Image

# Example with web of science

The screenshot displays the Clarivate Web of Science interface. At the top, the search bar contains the query "systematic map france (All Fields)", which is highlighted with a blue box. Below the search bar, the results are summarized as "2,139 results from Web of Science Core Collection for:". To the right of the search bar are buttons for "Analyze Results", "Citation Report", and "Create Alert".

On the left side, there is a sidebar with navigation icons and a "Refine results" section. The "Refine results" section includes a search box for "Search within results..." and a "Filter by Marked List" section. Under "Quick Filters", several options are listed with their respective counts: "Highly Cited Papers" (46), "Review Article" (206), "Early Access" (13), "Open Access" (1,254), and "Enriched Cited References" (85). The "Authors" section is also visible, listing authors like "Ado, Peter" (44), "Natali, P." (35), "Polenta, G." (34), "Baccigalupi, C." (34), and "Piazanoni, F." (33).

The main results area shows a list of publications. The first result is "Mapping of Soils and Land-Related Environmental Attributes in France: Analysis of End-Users' Needs" by Richenda-Ranges, A.C., Amouys, D., and Volty, M. It has 10 citations and 41 references. The second result is "KPIs for Software Ecosystems: A Systematic Mapping Study" by Entous, F., Pricler, S., and Le Gall, E. It has 12 citations and 44 references. The interface also includes a "Sort by: Relevance" dropdown and a pagination indicator showing "1 of 43" results.



# Example with web of science

DOCUMENTS CITED REFERENCES STRUCTURE

Title

+ Add row + Add date range Advanced Search

Clarivate Web of Science™ Search

Result for systematic map ... Results for systematic map france (Title)

**3 results from Web of Science Core Collection for:**

Publications You may also like...

Refine results

Search within results...

Filter by Marked List

Quick Filters

- Review Article 1
- Open Access 1

Authors

- Show Researcher Profiles
- Bispo, Antonio 1
- Saby, Nicolas P.A. 1
- Moncel, Marie-Helene 1
- Briand, Olivier 1
- Reulle, Yves 1

See all >

Publication Years

0/3

Sort by: Relevance < 1 of 1 >

- 1 Systematic surveys of a valley between Rhone and Loire Rivers (France). Mapping of the human occupation at the end of the Acheulean?

[Moncel, M.H. / Arzoulay, J. and Bois, Y.](#)

Nov-dec 2017 | ANTHROPOLOGIE 121 (5), pp.426-450

Systematic surveys on the Rhins valley, a little tributary of the Loire River (South East France), have yielded little assemblages for more than 20 years. The number of open air localities totals at that moment 28. The assemblages are composed for the most of bifaces, cores, including many Levellois cores, and flakes. Although the number of pieces varies in localities, data recorded for more th

[Show more](#)

[Context Sensitive Links](#) [Full Text at Publisher](#) ...

40 References

Related records
- 2 The Early Stage of the COVID-19 Outbreak in Tunisia, France, and Germany: A Systematic Mapping Review of the Different National Strategies

[Laffel, Z. / Baboubi, E. \(-\) / Balthaz-Tondier, M.](#)

Aug 2021 | INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH 18 (15)

The multitude of national strategies used against the COVID 19 pandemic makes it necessary to review and synthesize them in order to identify potential gaps and shortcomings, and to help prioritize the future control efforts. This systematic mapping review is aimed at identifying the coronavirus pandemic management strategies adopted by France, Tunisia, and Germany during the early stage of the COV

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1 Citation

59 References

Related records

# Example with Scopus



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AND

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To ensure your safety we only index quality

## Web search tools

- Google
- Ecosia
- Bing
- DuckDuck Go

....

!!! Depend of connection  
parameters!!!!



# Example with Publish or Perish



# Harzing's Publish or Perish (Windows GUI Edition) 8.2.3883.8074

File Edit Search View Help

My searches

- Trash

| Search terms                      | Source         | Papers | Cites  | Cites/year | h   | g   | hi,norm | hi,annual | hA | acc10 |
|-----------------------------------|----------------|--------|--------|------------|-----|-----|---------|-----------|----|-------|
| (marine OR coastal OR ocean) A... | Google Scho... | 500    | 132703 | 5529.29    | 155 | 361 | 92      | 3.83      | 55 | 278   |

< >

No search selected [Help](#)

Select an existing search to inspect or modify it, or click one of these buttons to create a new search.

- Crossref\*
- OpenAlex\*
- Google Scholar\*
- Scopus\*\*
- Google Scholar Profile\*
- Semantic Scholar\*\*
- PubMed\*
- Web of Science\*\*\*

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\* Free data source  
\*\* Free registration required  
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| Cites | Per year | Rank | Authors | Title | Year | Publication | Publisher |
|-------|----------|------|---------|-------|------|-------------|-----------|
|-------|----------|------|---------|-------|------|-------------|-----------|

< >

**Citation metrics** [Help](#)

Publication years:  
Citation years:  
Papers:  
Citations:  
Cites/year:  
Cites/paper:  
Authors/paper:  
h-index:  
g-index:  
hI,norm:  
hI,annual:  
hA-index:  
Papers with ACC >= 1,2,5,10,20:

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# Example with Publish or Perish



# Harzing's Publish or Perish (Windows GUI Edition) 8.2.3883.8074

File Edit Search View Help

My searches  
Trash

| Search terms                      | Source         | Papers | Cites  | Cites/year | h   | g   | hI,norm | hI,annual | hA | acc10 |
|-----------------------------------|----------------|--------|--------|------------|-----|-----|---------|-----------|----|-------|
| (marine OR coastal OR ocean) A... | Google Scho... | 500    | 132703 | 5529.29    | 155 | 361 | 92      | 3.83      | 55 | 278   |

Google Scholar search [Help](#)

Authors:  Years:  0 -  0

Publication name:  ISSN:

Title words:

Keywords:

Maximum number of results:  Include:  CITATION records  Patents

Citation metrics [Help](#)

Publication years: 1997-2021  
 Citation years: 24 (1997-2021)  
 Papers: 500  
 Citations: 132703  
 Cites/year: 5529.29  
 Cites/paper: 265.41  
 Authors/paper: 3.65  
 h-index: 155  
 g-index: 361  
 hI,norm: 92  
 hI,annual: 3.83  
 hA-index: 55  
 Papers with ACC >= 1,2,5,10,20:  
 493,476,396,278,168

Tools

- [Online User's Manual](#)
- [Frequently Asked Questions](#)
- [Training Resources](#)
- [YouTube Channel](#)
- [Become a PoP Supporter](#)

| Cites                                     | Per year | Rank | Authors                | Title                                  | Year | Publication                   | Publis |
|---|----------|------|------------------------|--|------|-------------------------------|--------|
| <input checked="" type="checkbox"/> h 184 | 15.33    | 1    | SR Cooley, HL Kite...  | Ocean acidification's potential to ... | 2009 | Oceanography                  | JSTOR  |
| <input checked="" type="checkbox"/> h 417 | 34.75    | 2    | H Mooney, A Larig...   | Biodiversity, climate change, and e... | 2009 | Current opinion in ...        | Elsevi |
| <input checked="" type="checkbox"/> h 413 | 19.67    | 3    | CM Duarte              | Marine biodiversity and ecosystem...   | 2000 | Journal of experimental m...  | Elsevi |
| <input checked="" type="checkbox"/> 51    | 4.64     | 4    | KMA Chan, M Ruck...    | Characterizing changes in marine ...   | 2010 | F1000 biology reports         | ncbi.n |
| <input checked="" type="checkbox"/> h 200 | 33.33    | 5    | C Hattam, JP Atkin...  | Marine ecosystem services: linking...  | 2015 | Ecological ...                | Elsevi |
| <input checked="" type="checkbox"/> 56    | 9.33     | 6    | RK Turner, M Scha...   | Coastal zones ecosystem services       | 2015 | Valuation of Ecosystem Ser... | Spring |
| <input checked="" type="checkbox"/> h 272 | 22.67    | 7    | SR Palumbi, PA San...  | Managing for ocean biodiversity t...   | 2009 | Frontiers in Ecology ...      | Wiley  |
| <input checked="" type="checkbox"/> h 319 | 29.00    | 8    | EF Granek, S Polask... | Ecosystem services as a common l...    | 2010 | Conservation ...              | Wiley  |
| <input checked="" type="checkbox"/> 42    | 21.50    | 9    | ID Lee, CC Hicks, C... | What matters to whom and why?          | 2010 | Ecosystem services            | Flow:  |

Paper details [Help](#)

Select a paper in the results list (to the left of this pane) to see details.

# Example of search strings depending on the bibliographic sources

|                         | Name           | Search field  | Search string  | Search hits | Date of search (DD/MM/YYYY) |
|-------------------------|----------------|---|--|-------------|-----------------------------|
| LITERATURE DATABASES    | Web of science | TS  | ((marine OR coast* OR ocean OR sea OR littoral OR maritime) AND (species OR biodiversity OR ecosystem OR ecological) AND ("ecosystem service\$" OR "contribution to people" OR "ecosystem function\$" OR "ecosystem process" OR "landscape service\$" OR "disservice\$" OR "provisioning service\$" OR ((provision OR production OR exploitation) AND (food OR fisher* OR macroalgae\$ OR molecules)) OR "biomass for nutrition" OR "biomass for materials" OR "genetic materials" OR "raw materials" OR "maintain* food webs" OR "life cycle maintenance and habitat protection" OR "habitat provision" OR "nursery function" OR "regulation service\$" OR "climate regulation" OR "carbon sequestration" OR "weather regulation" OR "atmospheric composition and conditions" OR "air quality regulation" OR "coastal protection" OR "water retention" OR "nutrient regulation" OR "nutrient cycling" OR "pathogen regulation" OR "pest and disease control" OR "mediation of waste" OR "mediation of mass" OR "cultural service\$" OR "intellectual interaction" OR "physical interaction" OR "experiential interaction\$" OR tourism OR recreation OR amenity OR aesthetic OR heritage OR symbolic OR "cognitive effect\$" OR "knowledge production" OR education) AND (dynamic\$ OR impact\$ OR effect\$ OR variation\$ OR interaction\$ OR evolution OR change\$)). | 17329       | 20/07/2021                  |
|                         | Scopus         | TITLE-ABS-KEY   | ((marine OR coast* OR ocean OR sea OR littoral OR maritime) AND (species OR biodiversity OR ecosystem OR ecological) AND ("ecosystem service\$" OR "contribution to people" OR "ecosystem function\$" OR "ecosystem process" OR "landscape service\$" OR "disservice\$" OR "provisioning service\$" OR ((provision OR production OR exploitation) AND (food OR fisher* OR macroalgae\$ OR molecules)) OR "biomass for nutrition" OR "biomass for materials" OR "genetic materials" OR "raw materials" OR "maintain* food webs" OR "life cycle maintenance and habitat protection" OR "habitat provision" OR "nursery function" OR "regulation service\$" OR "climate regulation" OR "carbon sequestration" OR "weather regulation" OR "atmospheric composition and conditions" OR "air quality regulation" OR "coastal protection" OR "water retention" OR "nutrient regulation" OR "nutrient cycling" OR "pathogen regulation" OR "pest and disease control" OR "mediation of waste" OR "mediation of mass" OR "cultural service\$" OR "intellectual interaction" OR "physical interaction" OR "experiential interaction\$" OR tourism OR recreation OR amenity OR aesthetic OR heritage OR symbolic OR "cognitive effect\$" OR "knowledge production" OR education) AND (dynamic\$ OR impact\$ OR effect\$ OR variation\$ OR interaction\$ OR evolution OR change\$)). | 24051       | 20/07/2021                  |
| ONLINE SEARCH ENGINE    | Google Scholar | keywords  | (marine OR coastal OR ocean) AND (species OR biodiversity OR ecosystem) AND "ecosystem services" AND change  | 300         | 22/07/2021                  |
| ORGANIZATIONAL WEBSITES | FAO            | Language: "English"   | fishery  | 50          | 27/08/2021                  |
|                         | UNESCO         | Filter: language: "English" - source: "UNESCO" - AuthoCorporate-en-s: "Intergovernmental Oceanographic Commission" - nature of content: "guide" AND "manuals and handbooks" | marine ecosystem service   | 50          | 19/08/2021                  |
|                         | UNEP           | Filters: "Reports and publications" AND "Publication" AND "Report", "Ecosystems and biodiversity" AND "oceans and seas"   | marine ecosystem service   | 50          | 19/08/2021                  |
|                         | US NOAA        |   | ecosystem service  | 15          | 19/08/2021                  |
|                         | EEA            |   | marine ecosystem service   | 7           | 19/08/2021                  |
|                         | IUCN           |   | ecosystem service  | 32          | 27/08/2021                  |



# The test list

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**Test-list : studies that you wish to include in your systematic review and which you know meet the inclusion criteria.**

- Discuss the list (involve partners/co-authors/colleagues) to construct it and then consolidate it
- Extract metadata
- Order of magnitude, ca. 30 items

**Interest : verify the capacity of a research equation to capture studies corresponding to the aim of our systematic review.**

- Calculate the miss rate = the % of items belonging to the test list not captured by the equation

It must be minimized, ie the equation must approach 100% of the captured test-list... Refinement possible.

# The test list

## Example of test list

Campagne et al. (2023)

| DOI           | References      |                                     | Retrieved by WOS | Retrieved by Scopus | Retrieved by google scholar |
|---------------|-----------------|-------------------------------------|------------------|---------------------|-----------------------------|
| 10.3389/fevc  | Belgrano et al. | Mapping and evaluating marine p     | 1                | oui                 |                             |
| 10.3389/fma   | Cavanagh et     | Future risk for Southern Ocean E    | 2                | oui                 |                             |
| 10.3354/mej   | Cheung, W.V     | Application of macroecological th   | 3                | oui                 |                             |
| 10.1093/ices  | Cheung, W.V     | Integrating ecophysiology and pl    | 4                | non                 | oui                         |
| 10.1016/j.glo | Cinner et al.   | Vulnerability of coastal communi    | 5                | oui                 |                             |
| 10.1016/j.eco | Cook et al. (2  | Towards marine ecosystem base       | 6                | oui                 |                             |
| 10.5670/ocea  | Cooley et al.   | Ocean acidification's potential to  | 7                | oui                 |                             |
| 10.1088/174   | Cooley, S.R.    | Anticipating ocean acidification's  | 8                | oui                 |                             |
| 10.1111/gcb.  | Fernandes, J.   | Modelling the effects of climate c  | 9                | oui                 |                             |
| 10.1007/978   | Marcos et al.   | Reviewing the ecosystem service     | 10               | oui                 |                             |
| 10.1002/Ino.  | Orcutt et al.   | Impacts of deep-sea mining on m     | 11               | oui                 |                             |
| 10.1890/070   | Palumbi, S.R.   | Managing for ocean biodiversity t   | 12               | oui                 |                             |
| 10.1007/s11   | Roessig et al.  | Effects of global climate change c  | 13               | non                 | non                         |
| 10.1016/j.jnc | Roncin, N., A   | Uses of ecosystem services provi    | 14               | oui                 |                             |
| 10.1126/scie  | Worm B., E.B    | Impacts of biodiversity loss on oc  | 15               | oui                 |                             |
| 10.1016/j.oce | Kermagoret,     | How does eutrophication impact      | 16               | oui                 |                             |
| 10.17159/saj  | Arabi, S., Naf  | Impacts of marine plastic on ecos   | 17               | oui                 |                             |
| 10.2307/234   | Depellegrin,    | Integrating ecosystem service val   | 18               | oui                 |                             |
| 10.1016/j.eco | Broszeit, S., E | What can indicators of good envi    | 19               | oui                 |                             |
| 10.1371/jour  | Pendleton, L.   | Estimating global "Blue Carbon" e   | 20               | oui                 |                             |
| 10.1042/ETL   | Hall-Spencer,   | Ocean acidification impacts on co   | 21               | oui                 |                             |
| 10.1016/j.ma  | Potts, T., Bur  | Do marine protected areas delive    | 22               | oui                 |                             |
| 10.1016/j.jer | Lemasson, A.    | Linking the biological impacts of c | 23               | oui                 |                             |
| 10.3389/fma   | Pouso, S., Bo   | An Interdisciplinary Approach for   | 24               | oui                 |                             |
| 10.1016/j.oce | Song, J., Zhar  | Changes in ecosystem services va    | 25               | oui                 |                             |
| 10.1016/j.en  | Yim, J., Kwor   | Analysis of forty years long chang  | 26               | oui                 |                             |
| http://www.   | Hicks, C.C., M  | Trade-offs in values assigned to e  | 27               | oui                 |                             |
| 10.1016/B97   | Leenhardt, P    | The Role of Marine Protected Are    | 28               | NOT in WoS          | non                         |
| 10.1007/s10   | Selim, S.A., B  | Direct and indirect effects of clim | 29               | NOT in WoS          | oui                         |
| 10.3391/ai.2  | Katsanevakis    | Impacts of invasive alien species   | 30               | NOT in WoS          | oui                         |
|               |                 |                                     |                  |                     |                             |
|               |                 |                                     | 25 out of 30     | 28 out of 30        | 29 out of 30                |
|               |                 |                                     | 83,3%            | 93,3%               | 96,7%                       |
|               |                 |                                     | Only in WOS      |                     |                             |
|               |                 |                                     | 25 out of 27     |                     |                             |
|               |                 |                                     | 92,6%            |                     |                             |

## Complementary measures of the efficiency of the equation

- **Miss-rate** : thanks to the test-list, must be minimized
- **Hit-rate** : Percentage of relevant articles, calculated on a sample (for example, on 100 randomly selected results)  
→ aim for at least **10%**
- **Number of results** : Aim for between 1000 and 3000.

Adapt depending on the search engine used and/or the strategy employed.



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SUR LA BIODIVERSITÉ



Thank you for your attention !!!

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**Bienvenue**



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