



Reproductibilité en écologie

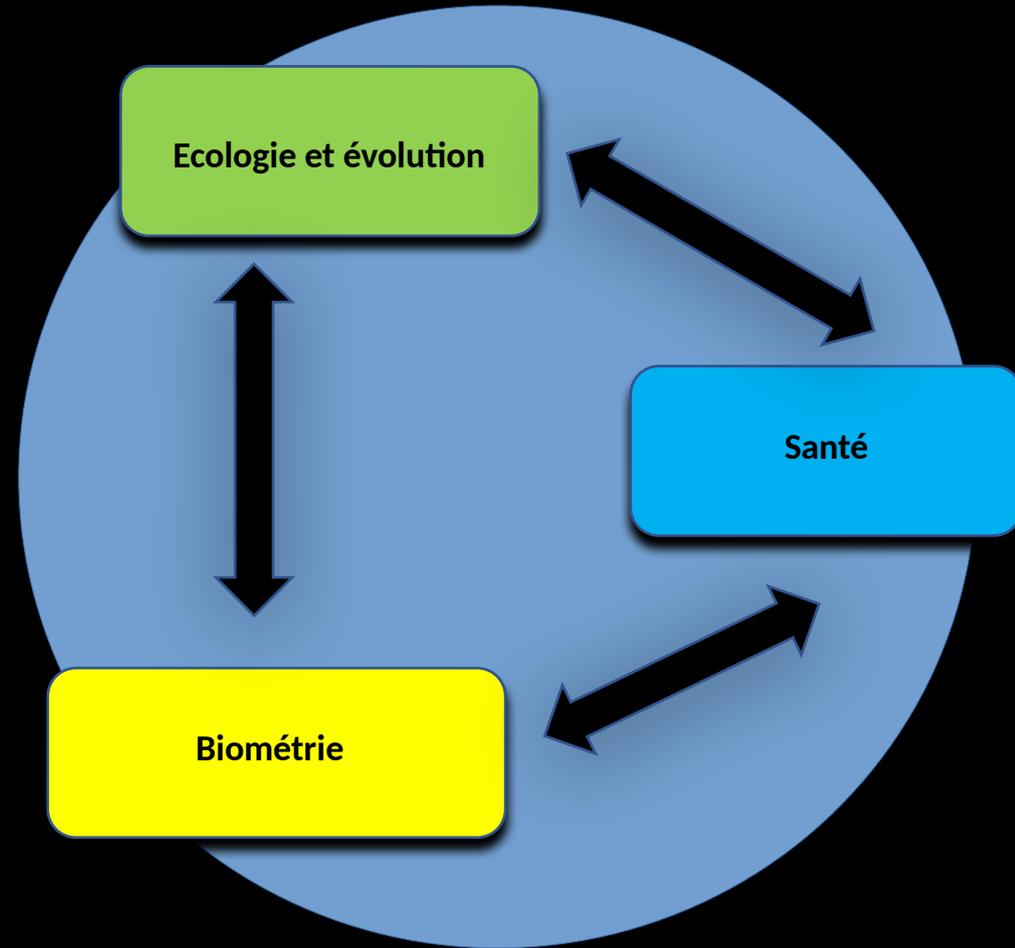
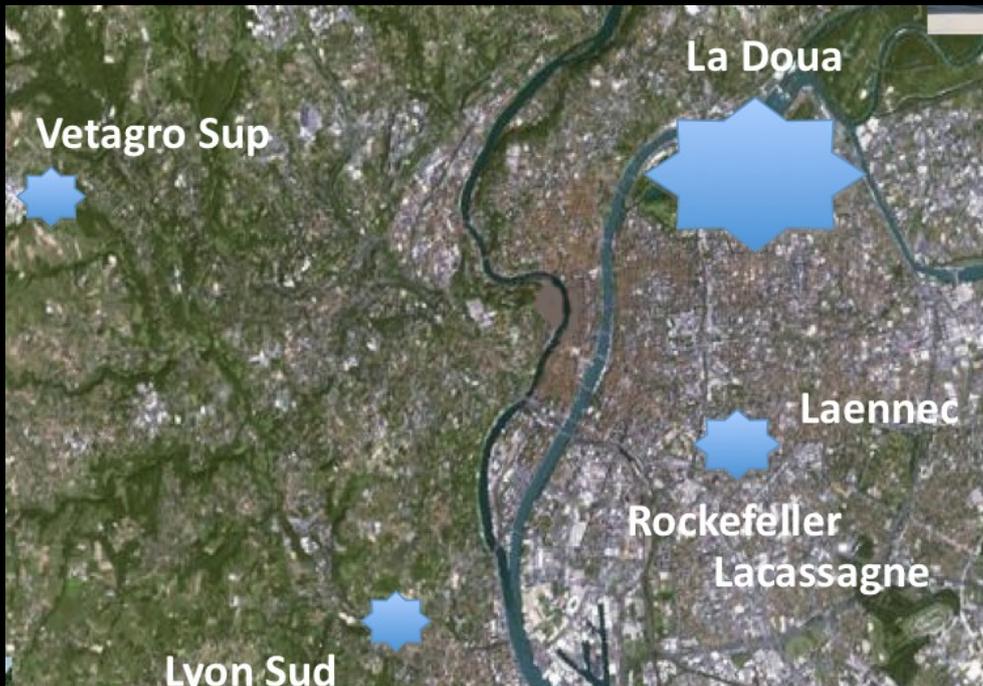
Stéphane Dray

4 avril 2024

Reproductibilité en Sciences - SFRI Graduate Initiatives



LBBE



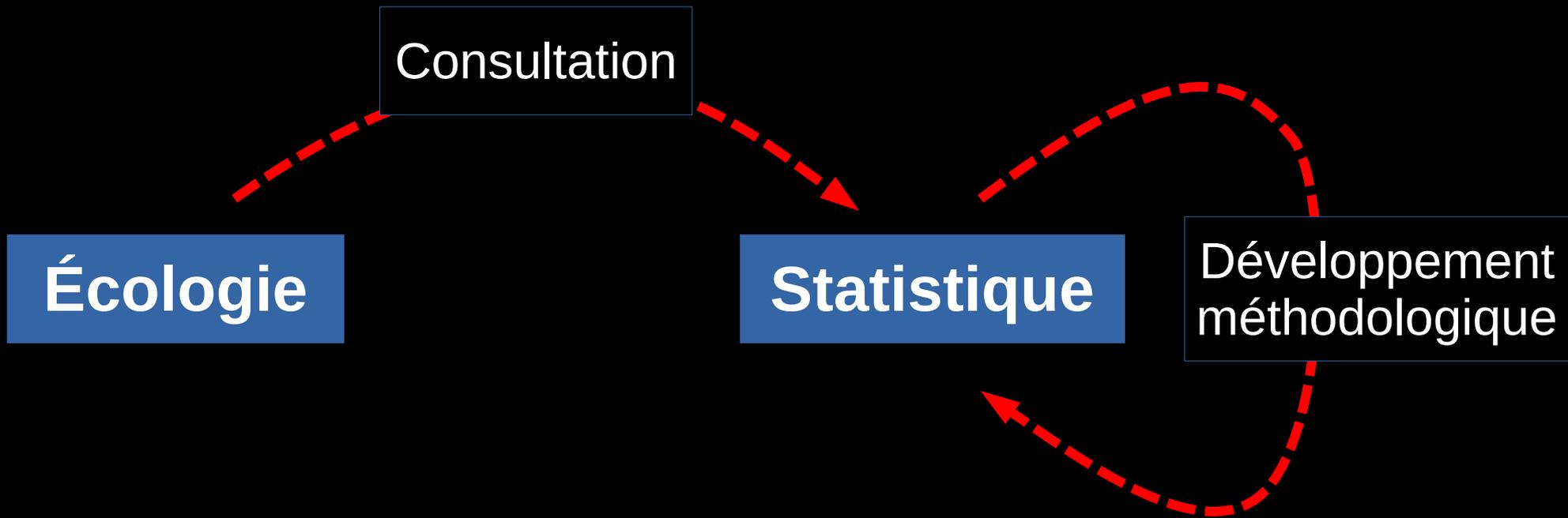
Consultation

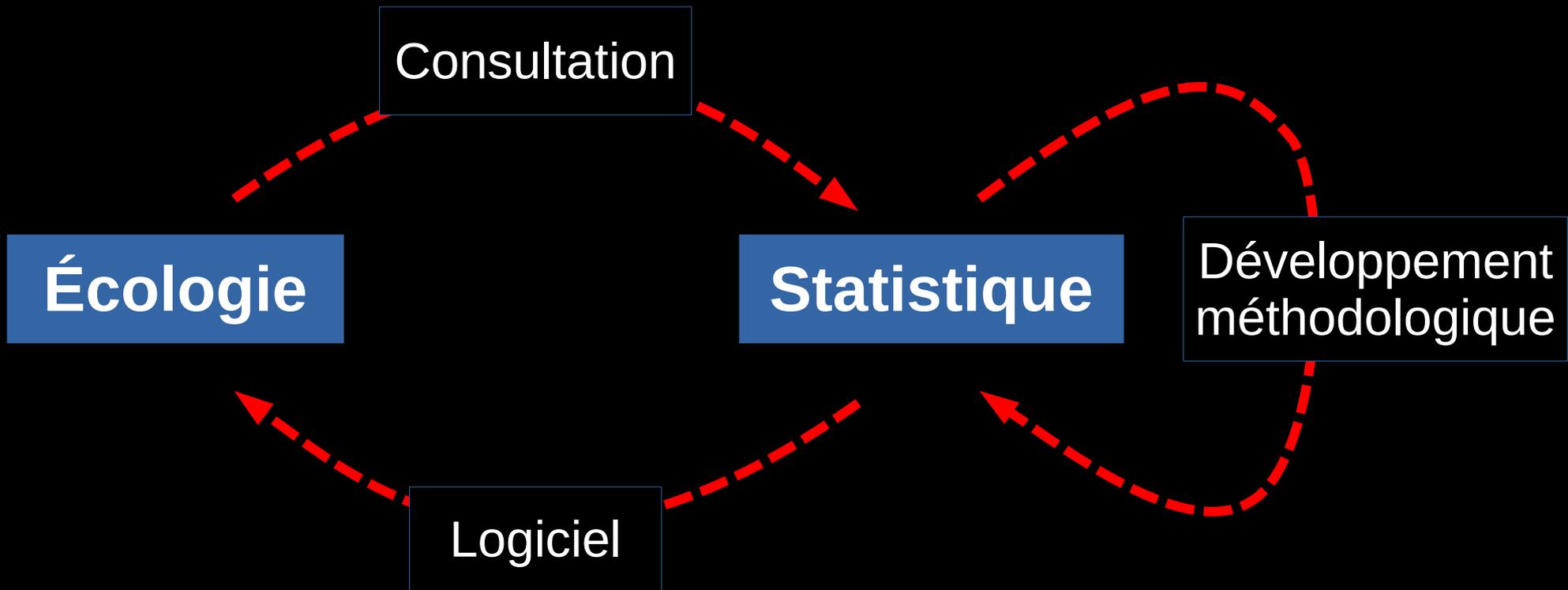
```
graph TD; E[Écologie] -.-> C[Consultation]; C -.-> S[Statistique];
```

The diagram illustrates a consultation process. At the top center is a white rectangular box with the word "Consultation" in black text. Below this box, two blue rectangular boxes are positioned horizontally. The left box contains the word "Écologie" and the right box contains the word "Statistique", both in white text. A red dashed arrow originates from the bottom of the "Consultation" box and points towards the "Statistique" box, indicating a flow of information or consultation from the central concept to the statistical field.

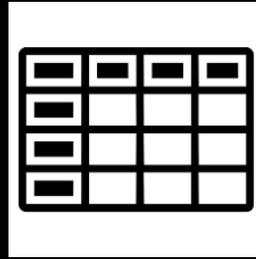
Écologie

Statistique





Données



Articles



Consultation

Écologie

Statistique

Développement
méthodologique

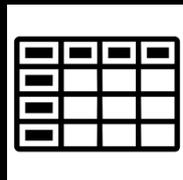
Logiciel



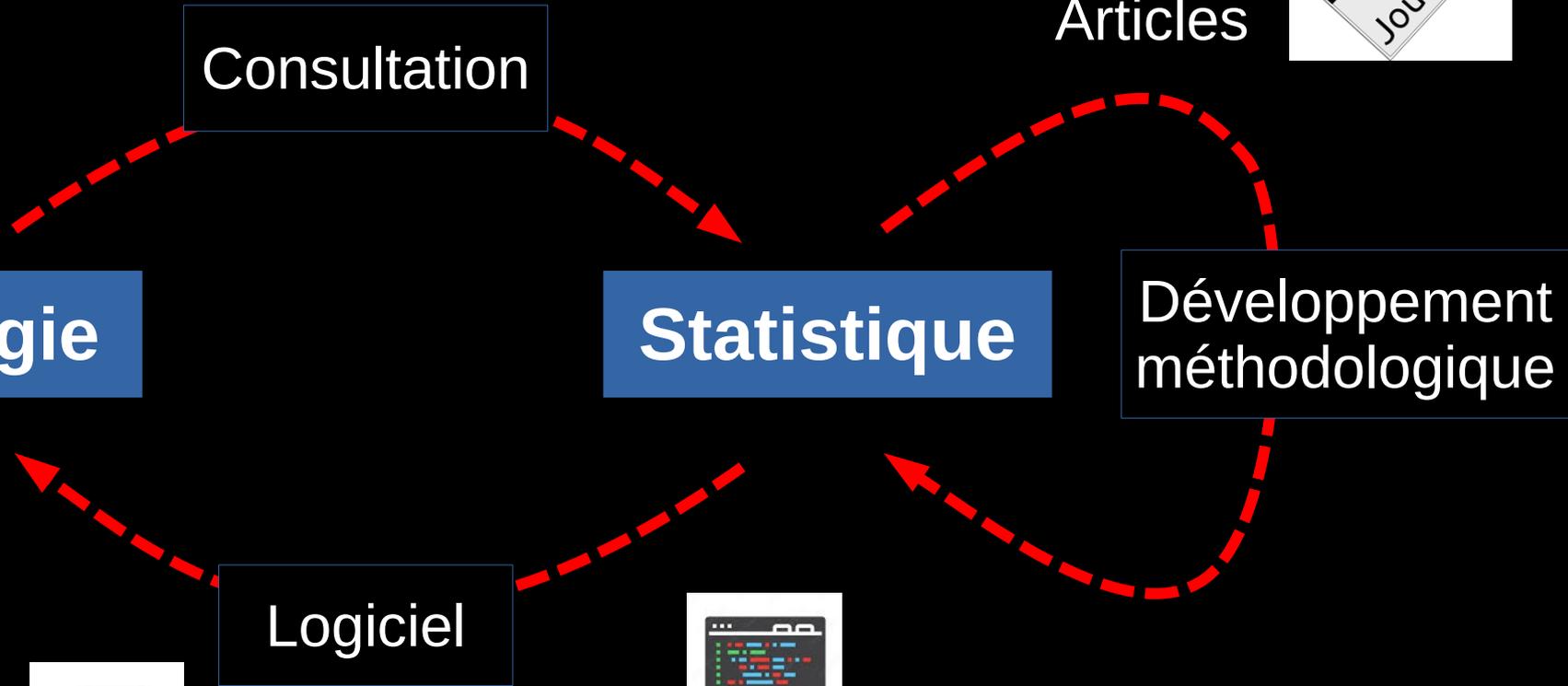
Tutoriels



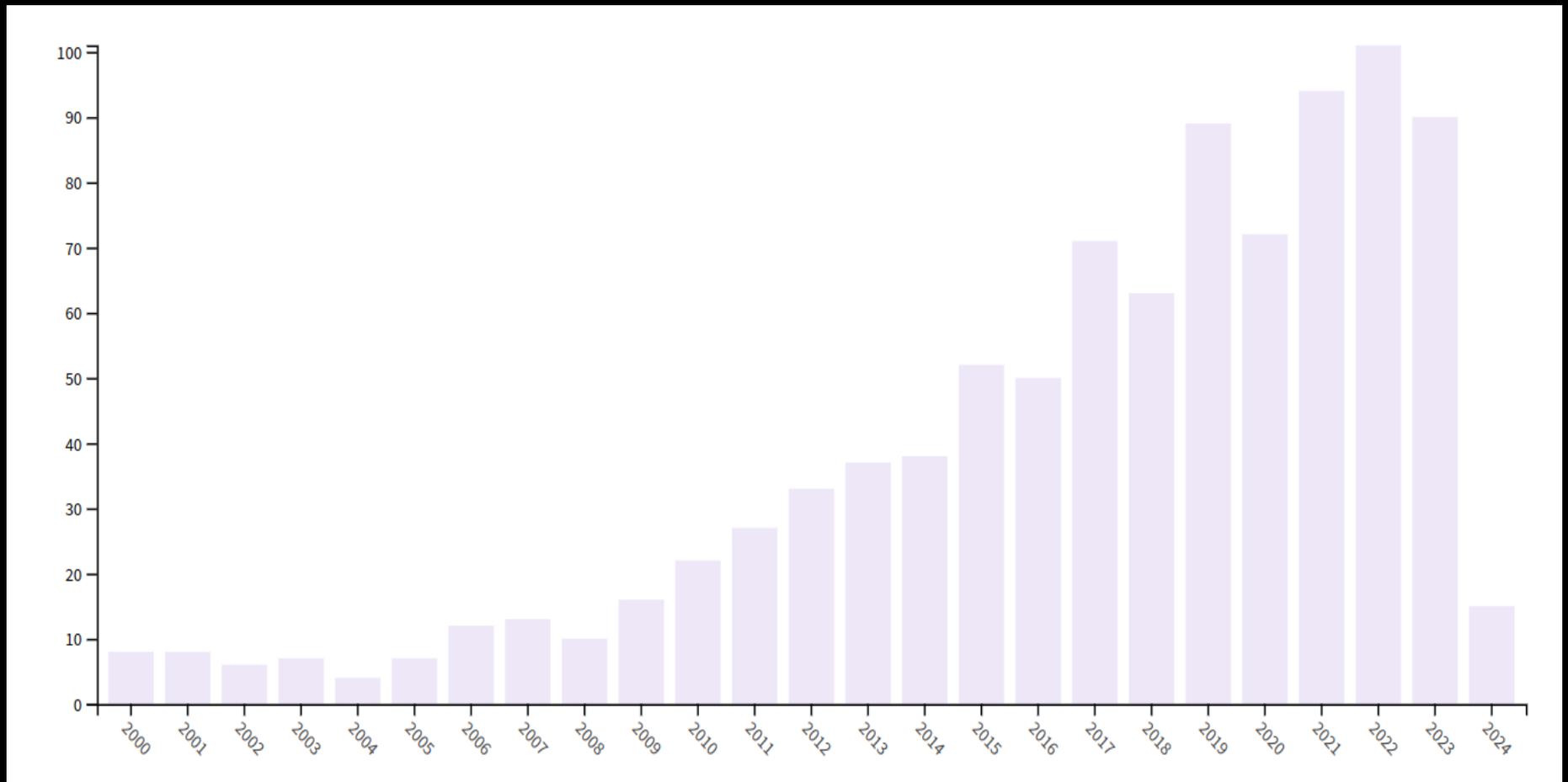
Code &
documentation



Données « jouet »



Un intérêt croissant



WoS (2/04/2024): (reproductibility OR repeatability) AND ecology

Reproducibility trial: 246 biologists get different results from same data sets

Wide distribution of findings shows how analytical choices drive conclusions

University investigation found prominent spider biologist fabricated, falsified data

Co-authors of now-retracted papers from Jonathan Pruitt were sent summarized findings that the scientist violated McMaster University's research integrity policy

VIEWPOINT

Reproducibility in ecology and evolution: Minimum standards for data and code

Ecology and Evolution Open Access WILEY

methods.blog



[Home](#) [Top blog posts](#) [Contributors](#) [About](#)

Search

Posted on [December 19, 2013](#) by [Samantha Ponton](#)

[← Previous](#) [Next →](#)

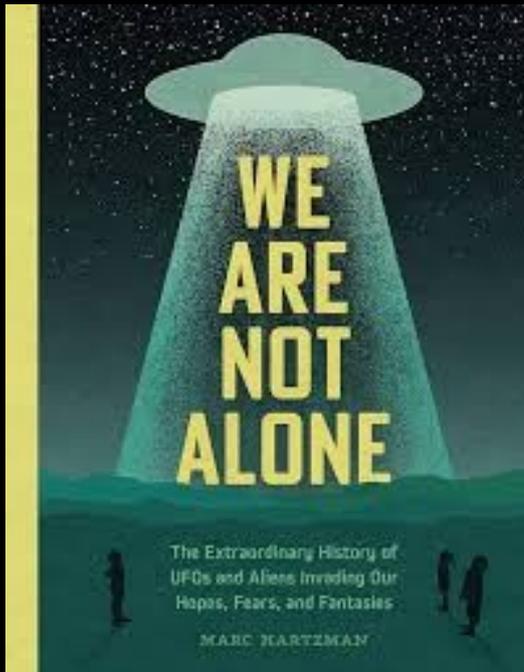
Data archiving mandate

Until now, *Methods* and the other [BES Journals](#) have recommended that authors should archive any data associated with their papers; **from 6th January 2014, this will be required for publication.**

The thinking behind this is that all raw data should be preserved in a usable form for future generations of researchers; a third-party should be able to reproduce a study independently and perform their own analyses, thus minimizing the time and energy

Motivations

Répétabilité

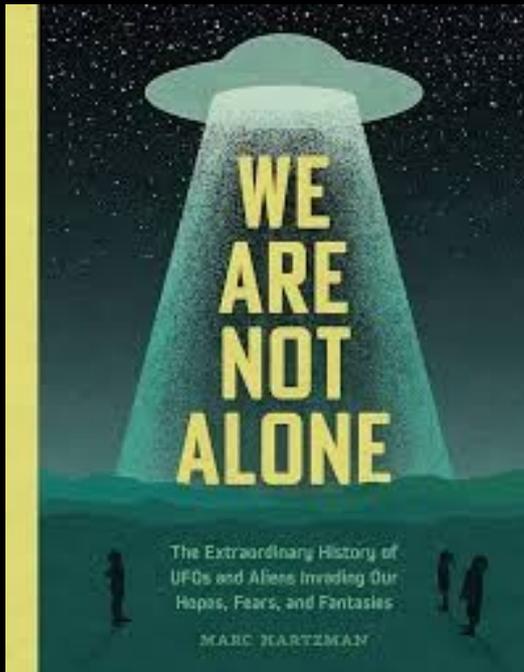


Reproductibilité

Collègues, experts,
financeurs, utilisateurs,
gestionnaires, etc.

Motivations

Répétabilité



Ultimate chocolate cake
★★★★★ (881 ratings) By Angela Nilson [Magazine subscription - 3 issues for £2](#)

Prep: 30 mins - 40 mins Cook: 1 hr - 1 hr, 30 mins Plus baking and cooling time

Indulge yourself with Angela Nilson's heavenly moist and fudgy chocolate cake - perfect for celebrations - birthdays, weddings, christenings - any excuse!

Share: [Facebook](#) [Pinterest](#) [Twitter](#) [Google+](#) [Email](#)

Nutrition:

Calories	541	Protein	6g	Fats	55g	Carbs	35g	Saturated fats	20g	Sugar	40g	Salt	0.51g
----------	-----	---------	----	------	-----	-------	-----	----------------	-----	-------	-----	------	-------

 Additional info: [Without recipe](#)

Ingredients

- 200g good quality dark chocolate, about 60% cocoa solids
- 200g butter
- 1 tbsp instant coffee granules

Method

1. Butter a 20cm round cake tin (7.5cm deep) and line the base. Preheat the oven to fan 140C/conventional 160C/gas 3. Break 200g good quality dark chocolate in pieces into a medium, heavy-based pan. Cut 200g butter

Alternative recipes

- The ultimate Chocolate cake
- The ultimate Chocolate cake



Reproductibilité

Ultimate chocolate cake
★★★★★ (881 ratings) By Angela Nilson [Magazine subscription - 3 issues for £2](#)

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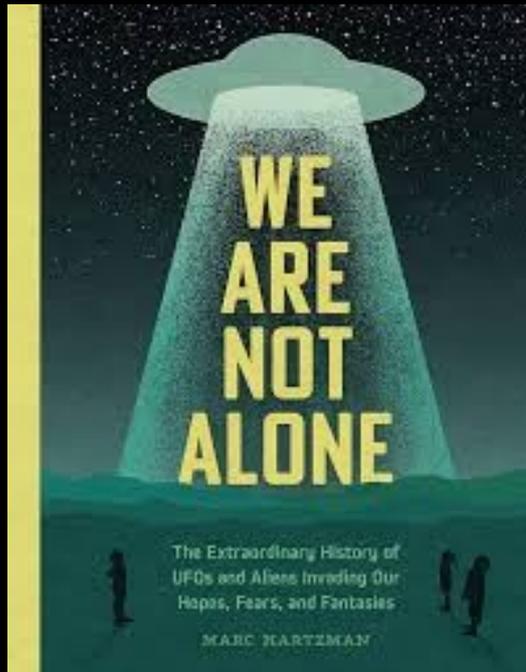
- The ultimate Chocolate cake
- The ultimate Chocolate cake



Collègues, experts, financeurs, utilisateurs, gestionnaires, etc.



Principes



Répétabilité

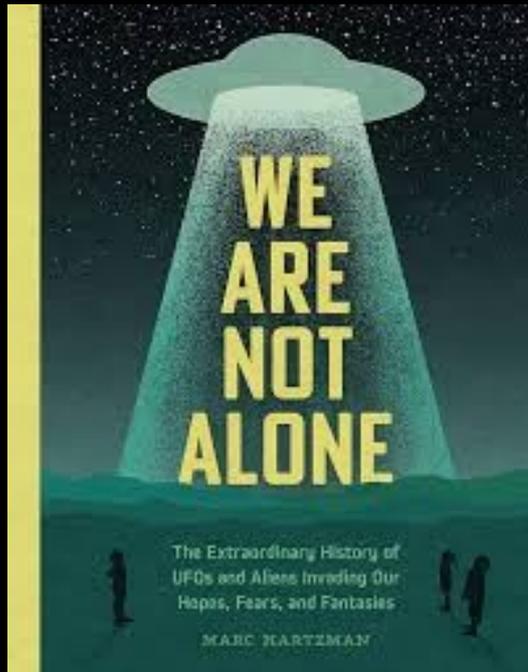
Décrire avec détails le design d'acquisition de données (e.g., expérimental) et analytique ; qualité des sorties (taille d'effet)

Reproductibilité

Partage des données et du code

Collègues, experts, financeurs, utilisateurs, gestionnaires, etc.

Intérêt



Collègues, experts,
financeurs, utilisateurs,
gestionnaires, etc.

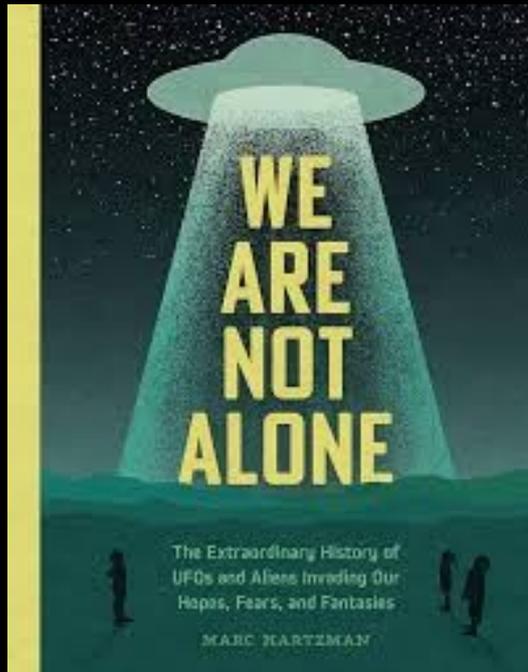
Répétabilité

- Transparence, traçabilité
- Accumulation de preuves
- Méta-analyse

Reproductibilité

- Transparence
- Lutte contre la fraude
- Amélioration de l'évaluation
- Gain de coût via le partage de données et de code
- Meilleur taux de citation

Difficultés



Collègues, experts,
financeurs, utilisateurs,
gestionnaires, etc.

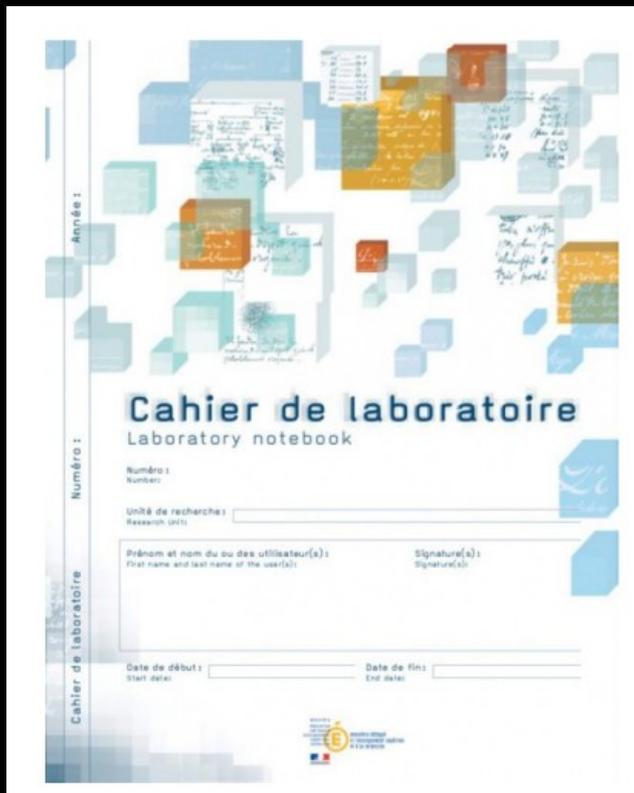
Répétabilité

- Mauvaises pratiques (HARKing, p-hacking)
- Organismes vivants
- Contexte des suivis de terrain (environnemental, spatial, temporel)
- Enjeux sociétaux

Reproductibilité

- Pérennité (logiciel et système)
- Accessibilité
- Suivi à long terme
- Enjeux sociétaux

Cahiers de laboratoire



HOME FEATURES SCREENSHOTS DOCUMENTATION CONTACT



eLabFTW

a free and open source electronic lab notebook

Designed by researchers, for researchers, with usability in mind.

stem to track your experiments and versatile database.

Experiments

Filter status: Order by: Sort: 15

Experiment list:

- Some microscopy experiment (Next step: analyze data)
- Another experiment
- Making fake experiments to do a screenshot
- Looking at cells
- A failed experiment
- 无标题
- Senza titolo
- lock unlock
- mathjax I
- が無効になっています。
- Processing of Sample #392A
- analysis of sample #2343 from this
- mathjax test $\frac{d}{dt} x^2 = x^3 + x^2$
- Model test

Experiments

Tags: project SIMA, videl1

Date: 20200430 Status: Success

Title: Some microscopy experiment

Experiment

File Edit View Insert Format Tools Table

Goal: Show what an experiment looks like for [elabftw.net](#).

Sample #	Concentration	Absorbance	Density	Something
1	20 µM	0.289	3.4	102
2	30 µM	0.193	4.1	139

You can have **math** too.

And use **italics**, underline like you would do in a normal text processing application. Have some mathjax: $(x^y)^z$ is $5(x^y)^z$, and $x^{(y^z)}$ is $5x^{(y^z)}$.

This is a list:

- List item 1
- List item 2
- Now show an image in the text

POWERED BY TINY

Partage & archivage de données

- requête personnelle
- sites personnels (drive, etc)
- annexes d'articles
- dépôt github
- sites pérennes (Zenodo, Dryad, etc)

Public Data Archiving in Ecology and Evolution: How Well Are We Doing?

Dominique G. Roche^{1,2*}, Loeske E. B. Kruuk^{1,3}, Robert Lanfear^{1,4}, Sandra A. Binning^{1,2}

and reanalysis? We surveyed 100 datasets associated with nonmolecular studies in journals that commonly publish ecological and evolutionary research and have a strong PDA policy. Out of these datasets, 56% were incomplete, and 64% were archived in a way that partially or entirely prevented reuse. We suggest that cultural shifts facilitating clearer bene-

→ Reproductibilité dès la soumission

Les suivis à long terme

Opinion

Archiving Primary Data:
Solutions for Long-Term
Studies

- Connaissance du contexte
- Réduit les collaborations
- Compétition avec doctorants
- Réduction du nombre de suivis
- Coût de la production
- Fitness du producteur

Letter

A Balanced Data
Archiving Policy for
Long-Term Studies

→ Embargo plus longs ?

Un exemple de partage



Global Change Biology (2011) 17, 2905–2935, doi: 10.1111/j.1365-2486.2011.02451.x

TRY – a global database of plant traits

The global spectrum of plant form and function

Article en 2016

The global spectrum of plant form and function: enhanced species-level trait dataset

Article de données en 2022

Code – éviter le clic-boutons

- requête personnelle
- sites personnels (drive, etc)
- annexes d'articles
- dépôt github
- sites pérennes (Zenodo, Dryad, etc)

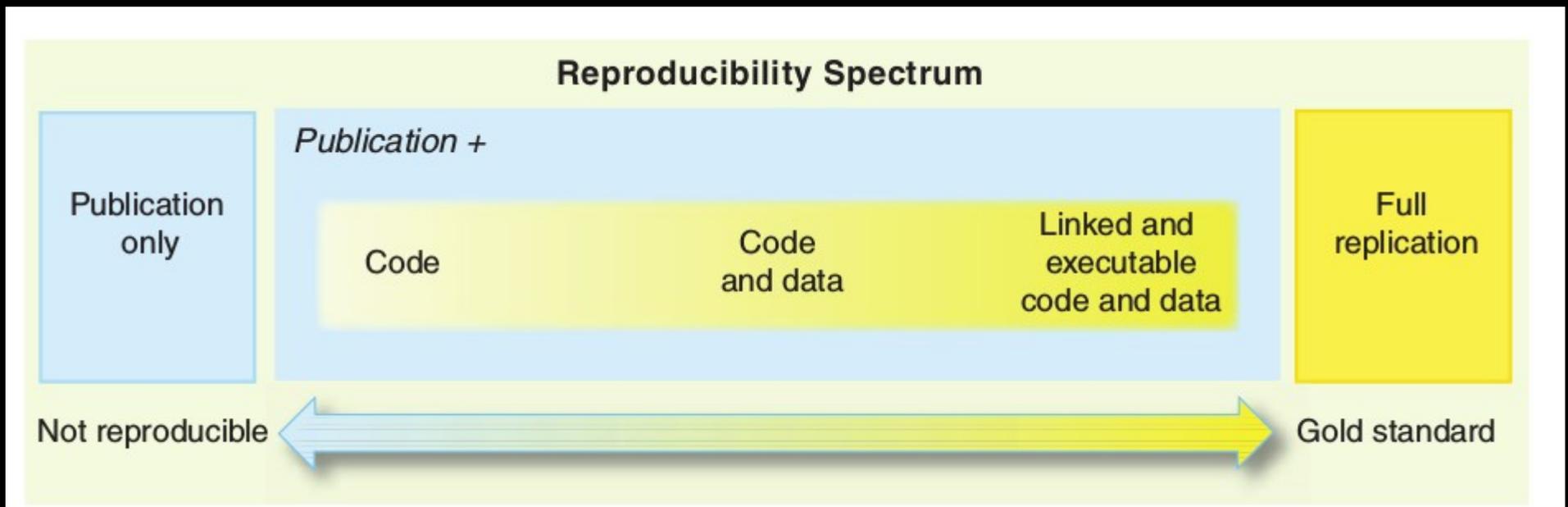


- fonctions, scripts
- ensemble de packages
- documentation riche
- environnement évoluant

- Reproductibilité dès la soumission
- Suivi des évolutions, reproductibilité évolutive

Programmation lettrée

Reproducible Research (RR) is the practice of distributing, along with a research publication, all data, software source code, and tools required to reproduce the results discussed in the publication. As such the RR package not only describes the research and its results, but becomes a complete laboratory in which the research can be reproduced and extended.



Introduction

How It Works

Code Chunks

Inline Code

Code Languages

Parameters

Tables

Markdown Basics

Output Formats

Notebooks

Slide Presentations

Dashboards

Websites

Interactive Documents

Cheatsheets

Output Formats

Set the `output_format` argument of `render` to render your `.Rmd` file into any of R Markdown's supported formats. For example, the code below renders `1-example.Rmd` to a Microsoft Word document. You can try it out [here](#) on RStudio Cloud.

```
library(rmarkdown)
render("1-example.Rmd", output_format = "word_document")
```

Viridis Demo

The code below demonstrates two color palettes in the `viridis` package. Each plot displays a contour map of the Maunga Whau volcano in Auckland, New Zealand.

Viridis colors

```
image(volcano, col = viridis(200))
```

Magma colors

```
image(volcano, col = viridis(200, option = "A"))
```

R Markdown script

```
10 title: "Outbreak Situation Report"
11 date: "2020-01-01"
12 output: word_document
13
14 --- {r setup, echo=FALSE}
15 pacman::p_load(tidyverse, janitor, incidence2, flextable)
16 incident <- rpo::report_borne_disease("case_incidence", "incident_cleaned.rds")
17
18 This report is for the Incident Command team of the fictional outbreak of EboA cases.
19 *No of * format: row[location]state[hospitalization_status] "N/A" there have
20 been * row[location]state[hospitalization_status] "N/A" there have
21 been * row[location]state[hospitalization_status] "N/A" there have
22 been * row[location]state[hospitalization_status] "N/A" there have
23
24 # Summary table of cases by hospital
25
26 {r, echo=FALSE, out_height="75%"}
27 flextable::flextable(
28   incident %>% summarise(
29     hospitalization_status = sum(hospitalization_status == "N/A", na.rm=T),
30     deaths = sum(outcome == "death", na.rm=T),
31     recovered = sum(outcome == "Recovered", na.rm=T),
32     others = sum(outcome == "Other", na.rm=T)
33   )
34 )
35
36 # Epidemic curve by age
37
38 {r, echo=FALSE, warning=FALSE, message=FALSE, out_height="75%", out_width="100%"}
39 # Create data frame
40 age_outbreak <- incidence(
41   incident,
42   data_source = data_source, # date of onset for cases
43   interval = "week", # week by aggregation of cases
44   groups = age_group
45 )
46 # Plot
47 plot.age_outbreak ~ x, fill = age_cat, col_lax = none, title = "Epidemic
48 curve by age group"
```

Word

Outbreak Situation Report

This report is for the Incident Command team of the fictional outbreak of EboA cases. No of format: row[location]state[hospitalization_status] "N/A" there have been * row[location]state[hospitalization_status] "N/A" there have been * row[location]state[hospitalization_status] "N/A" there have been * row[location]state[hospitalization_status] "N/A" there have

Location	State	Hospitalization Status	Deaths	Recovered	Others
...

Epidemic curve by age group

HTML

Outbreak Situation Report

This report is for the Incident Command team of the fictional outbreak of EboA cases. No of format: row[location]state[hospitalization_status] "N/A" there have been * row[location]state[hospitalization_status] "N/A" there have been * row[location]state[hospitalization_status] "N/A" there have been * row[location]state[hospitalization_status] "N/A" there have

Location	State	Hospitalization Status	Deaths	Recovered	Others
...

Epidemic curve by age group

Powerpoint

Outbreak Situation Report

This report is for the Incident Command team of the fictional outbreak of EboA cases. No of format: row[location]state[hospitalization_status] "N/A" there have been * row[location]state[hospitalization_status] "N/A" there have been * row[location]state[hospitalization_status] "N/A" there have been * row[location]state[hospitalization_status] "N/A" there have

Location	State	Hospitalization Status	Deaths	Recovered	Others
...

Epidemic curve by age group

PDF

Outbreak Situation Report

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Location	State	Hospitalization Status	Deaths	Recovered	Others
...

Epidemic curve by age group

Suivi de version

The screenshot shows the GitHub interface for the repository 'adeverse / adespatial'. At the top, there are navigation links for Code, Issues (4), Pull requests, Actions, Projects, Wiki, Security, and Insights. The repository is public and has 3 branches and 10 tags. The commit history shows a recent update by 'aursiber' 5 days ago. The file list includes folders like .github, R, data, inst, man, pkgdown/favicon, src, vignettes, and files like .Rbuildignore, .gitignore, DESCRIPTION, NAMESPACE, README.md, and _pkgdown.yml. The right sidebar contains 'About' information, 'Releases' (10), and 'Contributors' (9).

adeverse / adespatial Public Notifications

<> Code Issues 4 Pull requests Actions Projects Wiki Security Insights

master 3 Branches 10 Tags Code

aursiber Update information on how to obtain the binary package for the ... c0cfcf4 · 5 days ago 367 Commits

.github	Rename a file	6 months ago
R	Add zero.policy and style when calling mat2listw	3 months ago
data	Changed Tiahura data set: site x species table; added an ...	3 years ago
inst	Remove dependencies to maptools that will be deprecate...	2 years ago
man	Correct and complete a few latex markers	6 months ago
pkgdown/favicon	Initiate a new website using pkgdown	3 years ago
src	Change the way to get BLAS declarations	7 months ago
vignettes	Remove dontrun in examples and restore grahical para...	6 months ago
.Rbuildignore	Initiate a new website using pkgdown	3 years ago
.gitignore	Initiate a new website using pkgdown	3 years ago
DESCRIPTION	Update the GitHub repo af 'adespatial': 'adespatial' now ...	3 months ago
NAMESPACE	Change global @import statements in the documentati...	2 years ago
README.md	Update information on how to obtain the binary packag...	5 days ago
_pkgdown.yml	Update the style of the website	3 years ago

About
Multivariate Multiscale Spatial Analysis
adeverse.github.io/adespatial/
Readme
Cite this repository
Activity
Custom properties
32 stars
5 watching
6 forks
Report repository

Releases 10
v0.3-22 Latest
on Oct 13, 2023
[+ 9 releases](#)

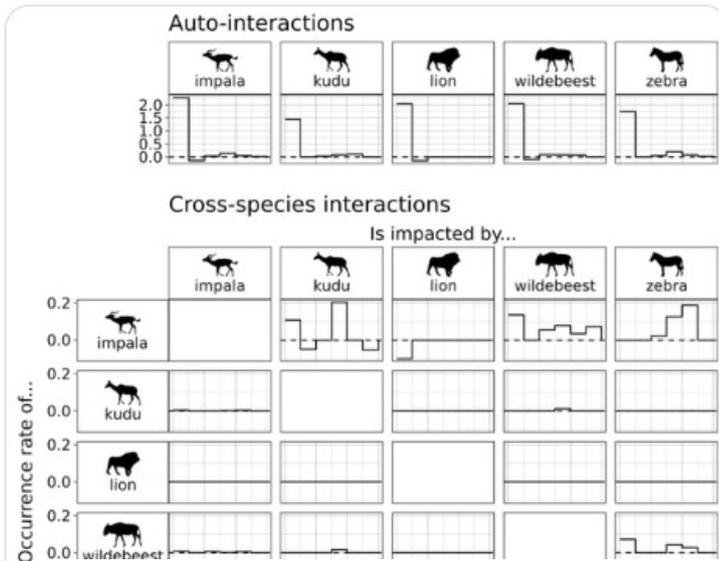
Contributors 9

Un exemple



Lisa Nicvert @lisanicvert · Apr 2

Yay! Our article "Using the multivariate Hawkes process to study interactions between multiple species from camera trap data" has just been published in the April issue of @ESAecology 😊
[dx.doi.org/10.1002/ecy.42...](https://doi.org/10.1002/ecy.42...) @JanBuffel @SnapshotSafari @UPWildlife



Open Research

DATA AVAILABILITY STATEMENT

Data and code (Nicvert et al., 2023) are available on Figshare at <https://doi-org.docelec.univ-lyon1.fr/10.6084/m9.figshare.24552157.v5> .

FIGU
functions
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and ero
Zimien

- camtrapHawkes-v.2.0.0
 - R
 - analyses
 - data
 - figures
 - man
 - outputs
 - .Rbuildignore
 - .gitignore
 - DESCRIPTION
 - Dockerfile
 - LICENSE.md
 - NAMESPACE
 - README.md
 - UnitEvents_0.0.8.tar.gz
 - camtrapHawkes.Rproj
 - camtrapHawkes_1.0.0.pdf
 - install_dependencies.R

The screenshot shows a GitHub repository page for 'camtrapHawkes'. The browser address bar shows 'github.com/LisaNicvert/camtrapHawkes'. The page content includes a README with the following text:

Using the multivariate Hawkes process to study interactions between multiple species from camera trap data

This repository contains the code and data to reproduce the analyses and figures from the following article:

Nicvert, L., S. Donnet, M. Keith, M. Peel, M. J. Somers, L. H. Swanepoel, J. Venter, H. Fritz, and S. Dray. in press. Using the Multivariate Hawkes Process to Study Interactions between Multiple Species from Camera Trap Data. Ecology. <https://doi.org/10.1002/ecy.4237>

The dataset published in this repository is a subset of the larger dataset described in Pardo et al. (2021) (see data/camtrap_data/README.md for more details).

To run the analyses, you can install the packages via R (Linux and Mac OS users) or via Docker (Linux, Mac OS and Windows users). The installation procedure is detailed in the [Packages installation](#) section.

Contents

- analyses/ contains all scripts to reproduce the analyses of the article.
- R/ contains the R functions developed for this project (as a R package).
- camTrapHawkes_1.0.0.pdf contains the PDF documentation of the functions written in R/.
- data/ contains the camera trap data and species silhouettes used for plotting.
- figures/ contains the high-quality figures used in the article generated by the analyses.
- man/ contains the .Rd documentation for the functions written in R/.
- outputs/ contains the outputs generated during the analyses.
- DESCRIPTION contains the project metadata (author, date, dependencies, etc.)

Lisa Nicvert

Coût de la RR ?

Gaspard Dussert

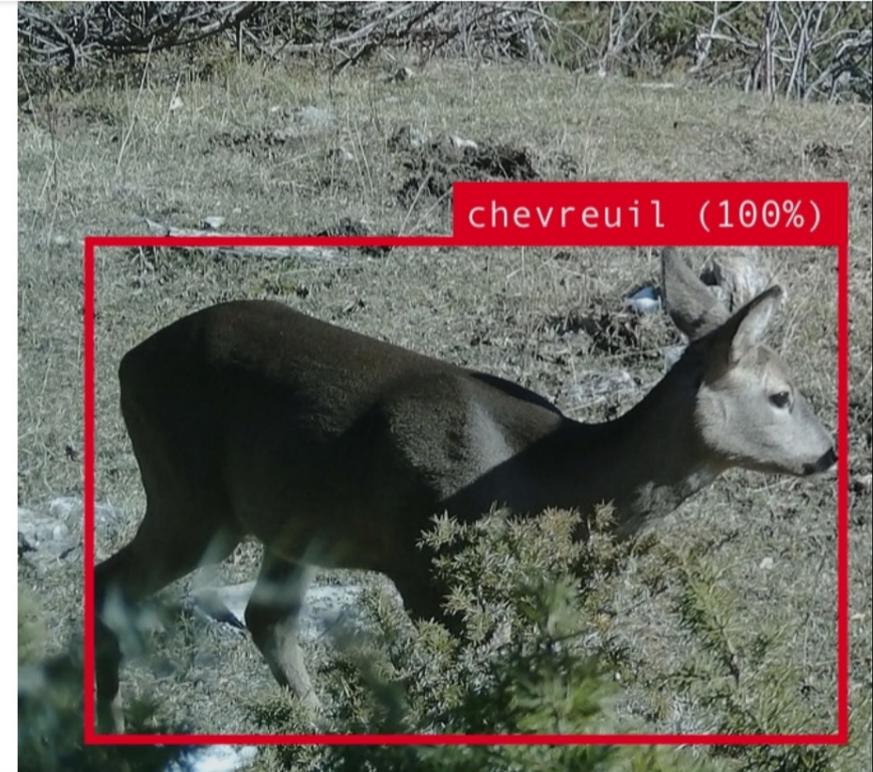
Mammifères ▾ Oiseaux ▾ Macro Paysages

Photographie



DeepFaune

Accueil Données et Modèle Logiciel Partenariat Equipe Contact



Quelques actions

- Formation CESAB – GDR EcoStat
 - Aurélie Siberchicot
- PCI – PCI Journal
- COMPUTO
 - <https://computo.sfds.asso.fr/>
- Projet de nouvelle revue en « diamond o. a. »
 - Financé par nos structures
 - Processus d'évaluation transparent
 - Reproductibilité dès la soumission