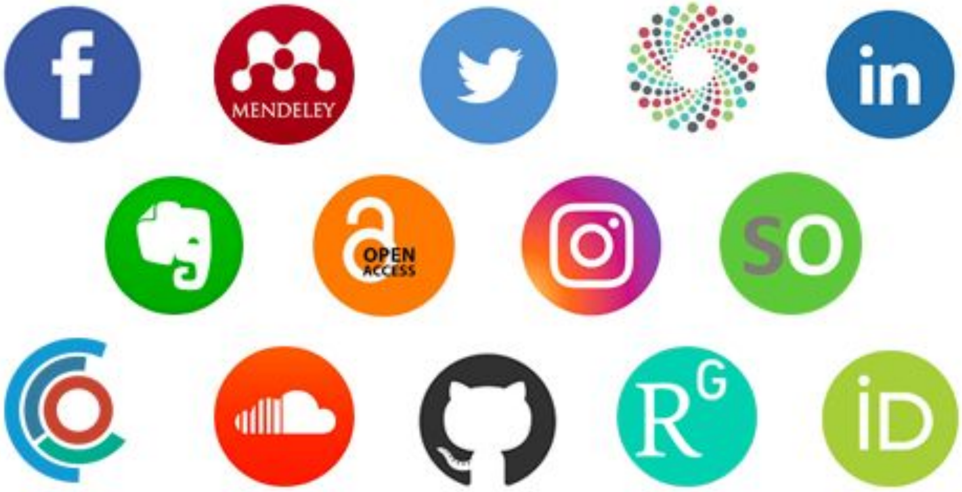
Ciência 2.0

Novos paradigmas da ciência



access2perspectives.com

Alexandre Camargo Martensen

UNICAMP - 10/05/2021

UFSCar *Universidade Federal de São Carlos*
Campus Lagoa do Sino

www.needs.ufscar.br

NEEDS
NÚCLEO DE ESTUDOS EM ECOLOGIA ESPACIAL
E DESENVOLVIMENTO SUSTENTÁVEL

O que é Ciência 2.0?

- **Nova forma de se fazer ciência, baseada na troca de informações e na colaboração**
    - Open research
    - Open science
    - Big data

> "Science happens not just because of people doing experiments, but because they're discussing those experiments"
>
> Christopher Surridge

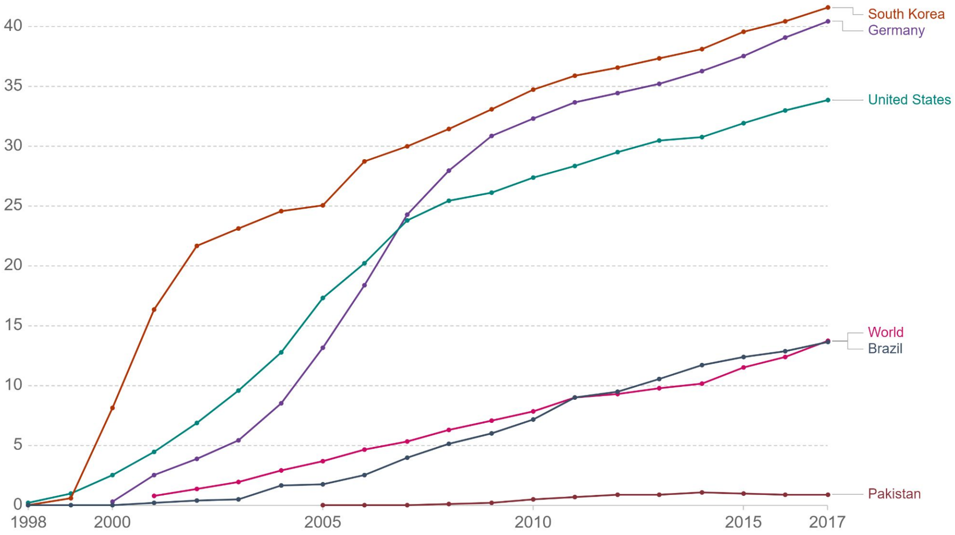
https://www.scientificamerican.com/article/science-2-point-0-great-new-tool-or-great-risk/

Tecnologia de redes - Web 2.0

Broadband subscriptions per 100 people, 1998 to 2017

Our World in Data

Broadband subscriptions refer to fixed subscriptions to high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s.



Source: World Bank

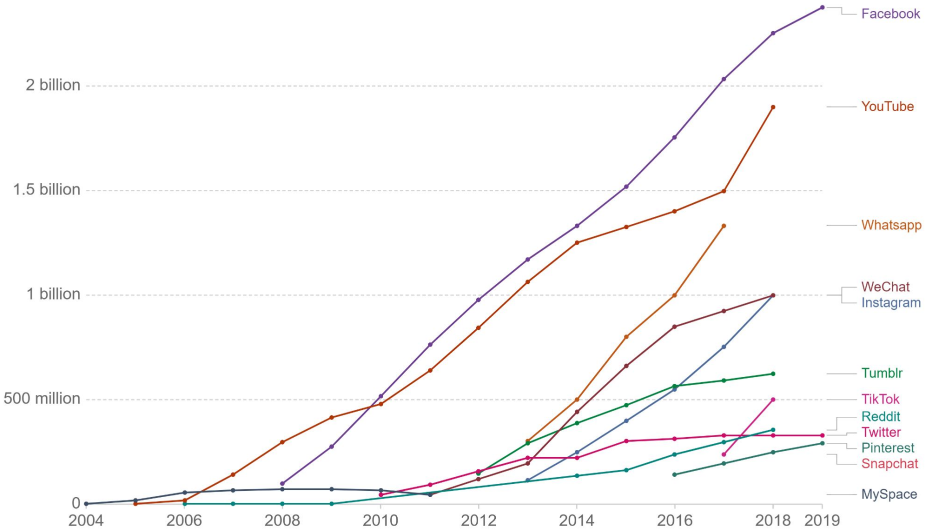
OurWorldInData.org/internet/ • CC BY

Note: For more details on the definition see the sources tab.

Number of people using social media platforms, 2004 to 2019

Our World in Data

Estimates correspond to monthly active users (MAUs). Facebook, for example, measures MAUs as users that have logged in during the past 30 days. See source for more details.



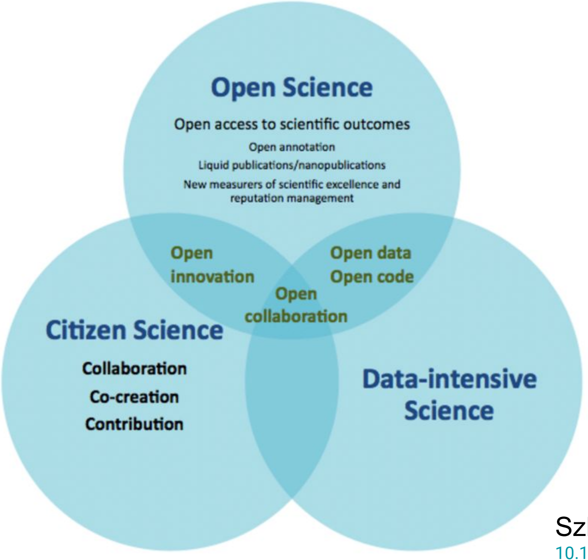
Source: Statista and TNW (2019)

CC BY

https://ourworldindata.org/internet#internet-access

O que é Ciência 2.0?

- **Novas ferramentas de colaboração/comunicação como wikis, blogs, videos, open lab notebooks, gitHub, figShare, pré-prints, live figures, live code (ex. Shiny), data repositories, data-intensive, open reviews...**



Open Science

Open access to scientific outcomes

Open annotation

Liquid publications/nanopublications

New measurers of scientific excellence and reputation management

Open innovation

Open data

Open code

Open collaboration

Citizen Science

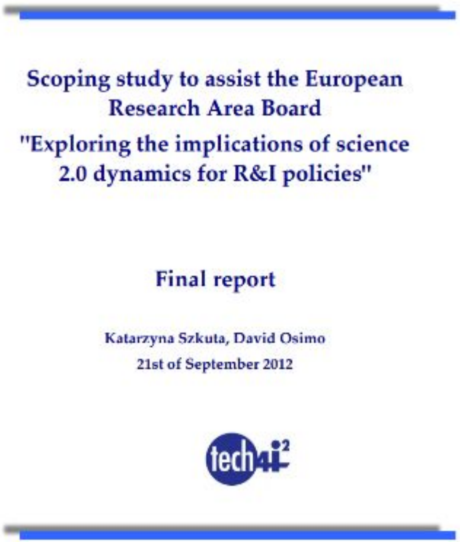
Collaboration

Co-creation

Contribution

Data-intensive Science

Szkuta & Osimo (2012)
10.13140/RG.2.2.35128.03842



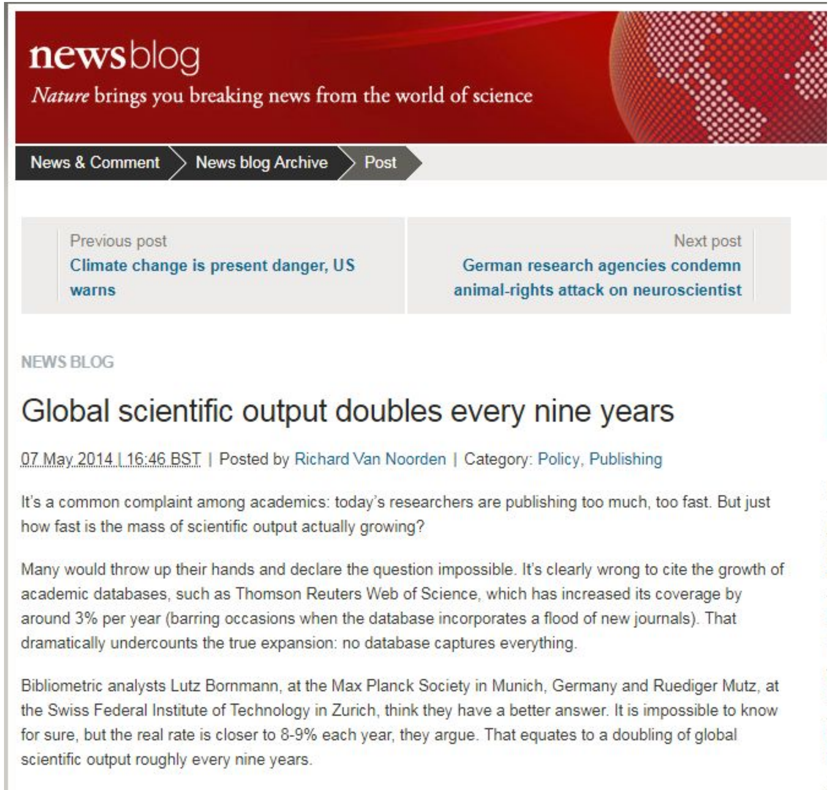
Scoping study to assist the European Research Area Board
"Exploring the implications of science 2.0 dynamics for R&I policies"

Final report

Katarzyna Szkuta, David Osimo
21st of September 2012

tech4i2

Ciência 2.0 oportunidade ou necessidade?



newsblog

Nature brings you breaking news from the world of science

News & Comment > News blog Archive > Post

Previous post
Climate change is present danger, US warns

Next post
German research agencies condemn animal-rights attack on neuroscientist

NEWS BLOG

Global scientific output doubles every nine years

07 May 2014 | 16:46 BST | Posted by Richard Van Noorden | Category: Policy, Publishing

It's a common complaint among academics: today's researchers are publishing too much, too fast. But just how fast is the mass of scientific output actually growing?

Many would throw up their hands and declare the question impossible. It's clearly wrong to cite the growth of academic databases, such as Thomson Reuters Web of Science, which has increased its coverage by around 3% per year (barring occasions when the database incorporates a flood of new journals). That dramatically undercounts the true expansion: no database captures everything.

Bibliometric analysts Lutz Bornmann, at the Max Planck Society in Munich, Germany and Ruediger Mutz, at the Swiss Federal Institute of Technology in Zurich, think they have a better answer. It is impossible to know for sure, but the real rate is closer to 8-9% each year, they argue. That equates to a doubling of global scientific output roughly every nine years.

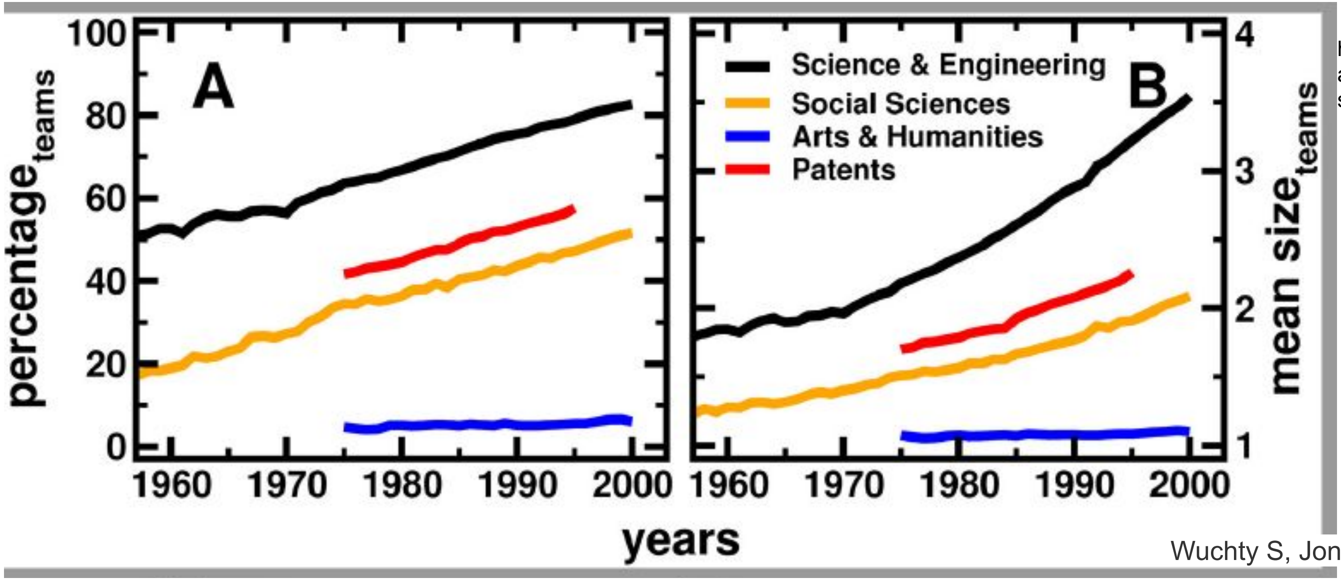
- 8 a 9% de aumento de artigos por ano
- Dobra a cada 9 anos
- 2/min em "Life science" (em 2008)
- Citações sem ler
    - Phantom paper (+ 400 citações): Van der Geer, J., Hanraads, J.A.J., Lupton, R.A., 2000. The art of writing a scientific article. J Sci. Commun. 163 (2) 51–59.
- Resumo, partes do artigo
- Impossível de acompanhar

“O século XXI será o século da complexidade”
Stephen Hawking

“… complex problems need a multi-disciplinary approach to understanding the problem and identifying innovative and holistic approaches to deliver lasting change”

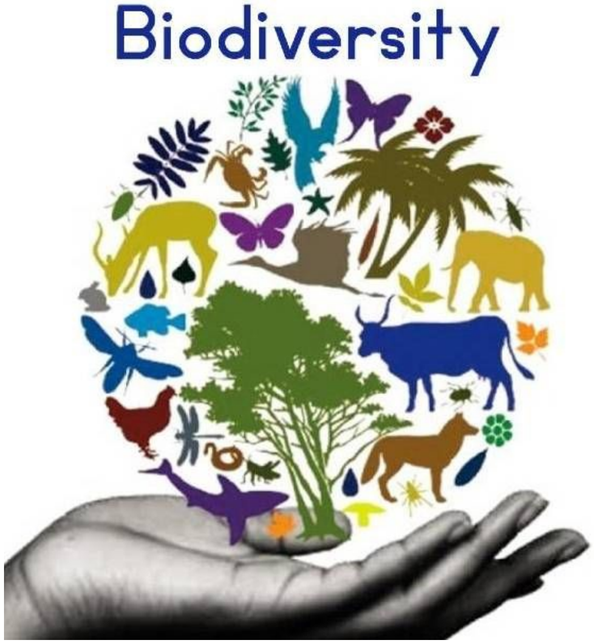
Spencer (2016)

https://www.thersa.org/discover/publications-and-articles/rsa-blogs/2016/08/complex-problems-need-multidisciplinary-solutions

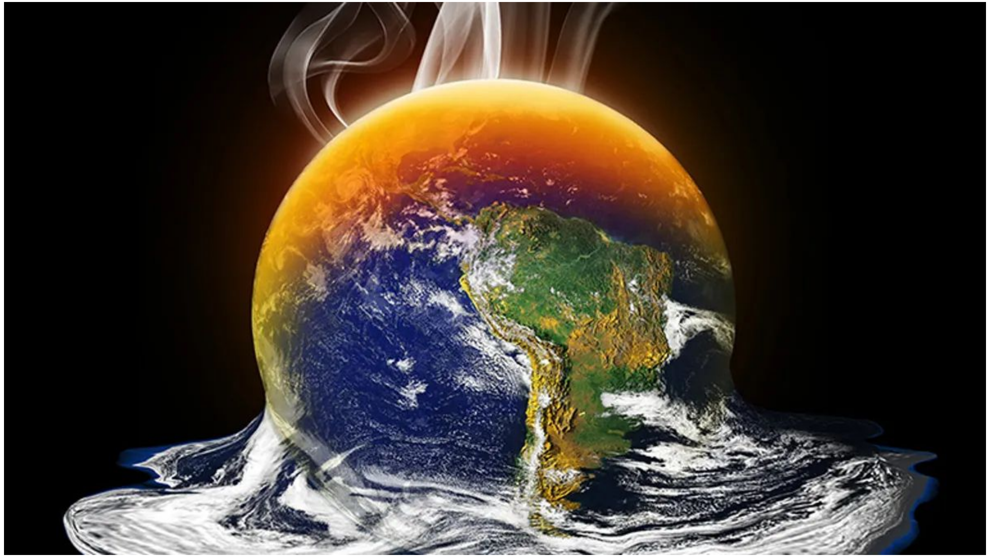


Wuchty S, Jones BF, Uzzi B (2007) Science 316: 1036–1039.

2 dos maiores desafios da humanidade



https://www.safeworldhse.com/2020/04/biodiversity-types-importance-loss-conservation.html



https://www.usatoday.com/story/news/nation/2020/09/10/climate-change-covid-19-does-global-warming-fuel-pandemics/5749582002/

Ciência 1.0 *vs* Ciência 2.0

Ciência 1.0	Ciência 2.0
Pesquisas isolada, dados guardados em computadores pessoais, submetida, revisadas de maneira anônima, publicada	Dados compartilhados assim que obtidos, idéias são compartilhadas e livremente debatidas, intensa colaboração, ampla disseminação (online)
“paywalls”	Abertas
Crédito estabelecido com base na revista, fator de impacto	Crédito estabelecido pelo # citações, # visualizações, # downloads
Artigos tem copyright	Diferentes licenças: domínio público, Creative Commons 3.0, etc.
Financiamento das editoras baseado na “venda” das revistas (acesso à informação)	Financiamentos alternativos
Resumo do processo da descoberta e dos achados	Dados e códigos disponíveis, processo de obtenção dos resultados detalhadamente descrito através de “open lab notebooks”, mídia social, blogs, wikis, etc

Ciência 1.0 *vs* Ciência 2.0

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-	
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	- -
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- **Crédito estabelecido com base na revista, fator de impacto**	- **Crédito estabelecido pelo #citações, #visualizações, #downloads**
- Artigos tem copyright	- Diferentes licenças: domínio público, Creative Commons 3.0, etc.
-	
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-
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-
-
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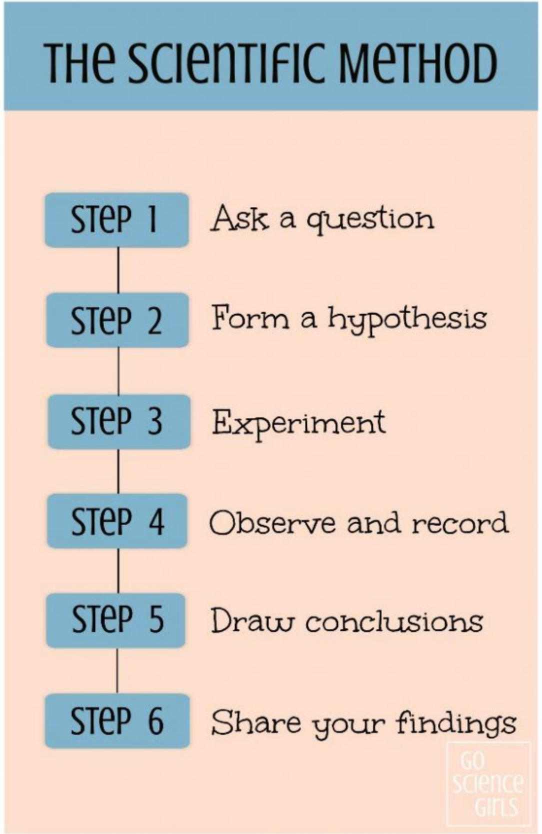
Ciclo científico hipótese *vs* ciência de dados



THE SCIENTIFIC METHOD

STEP 1 Ask a question

STEP 2 Form a hypothesis

STEP 3 Experiment

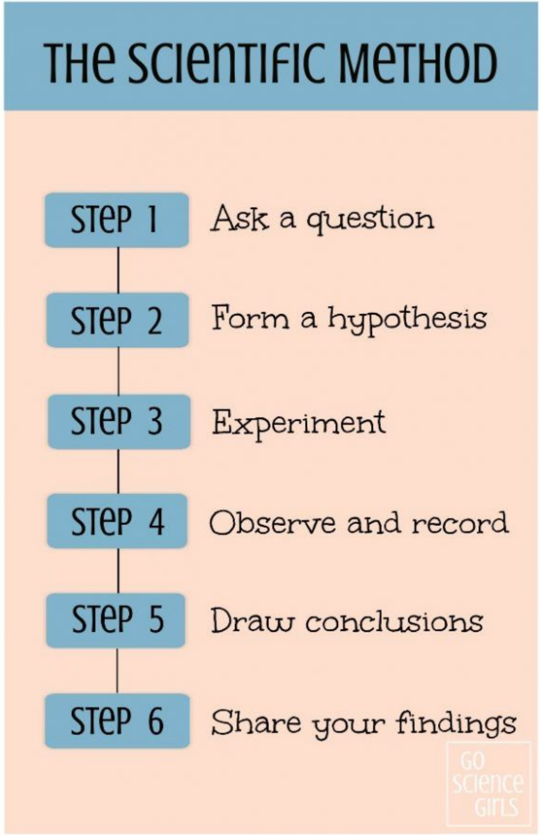
STEP 4 Observe and record

STEP 5 Draw conclusions

STEP 6 Share your findings

1. Como o mundo funciona?
    - Em geral baseado em ciência…
    - Inquietações
    - Necessidades, problemas...

Ciclo científico hipótese *vs* ciência de dados



THE SCIENTIFIC METHOD

STEP 1 Ask a question
STEP 2 Form a hypothesis
STEP 3 Experiment
STEP 4 Observe and record
STEP 5 Draw conclusions
STEP 6 Share your findings

GO SCIENCE GIRLS

2. Hipóteses
   - Nula
   - Diversas hipóteses alternativas que são confrontadas frente aos dados
     - Distribuição dos resíduos
     - Forma da variável resposta

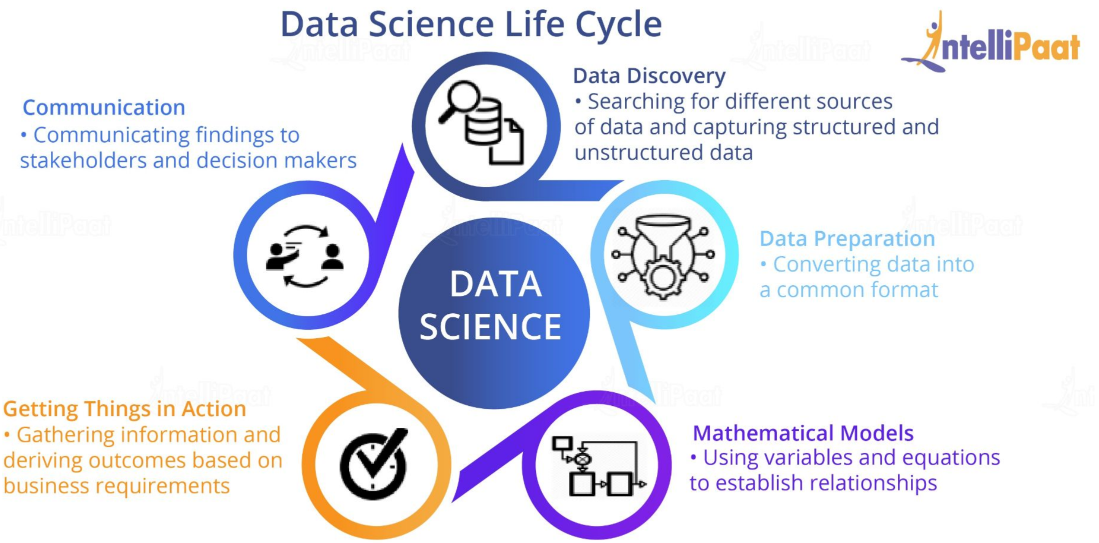
3.4.5.6….

Ciclo científico hipótese *vs* ciência de dados

- Data driven science é diferente!

"Data science provides meaningful information based on large amounts of complex data or big data"

https://www.investopedia.com/terms/d/data-science.asp



Data Science Life Cycle

Data Discovery
- Searching for different sources of data and capturing structured and unstructured data

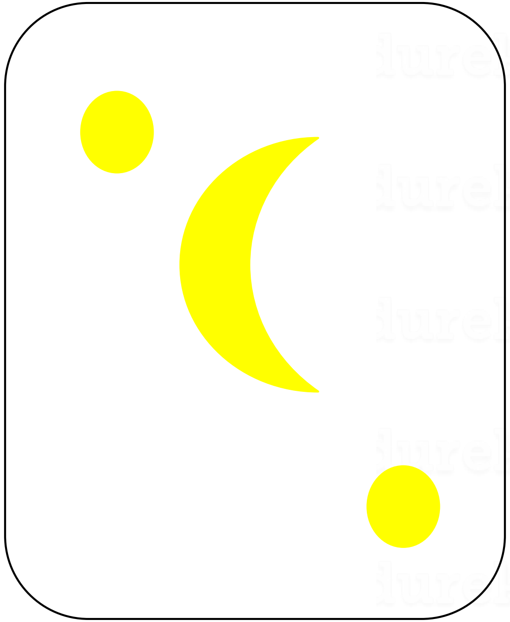
Data Preparation
- Converting data into a common format

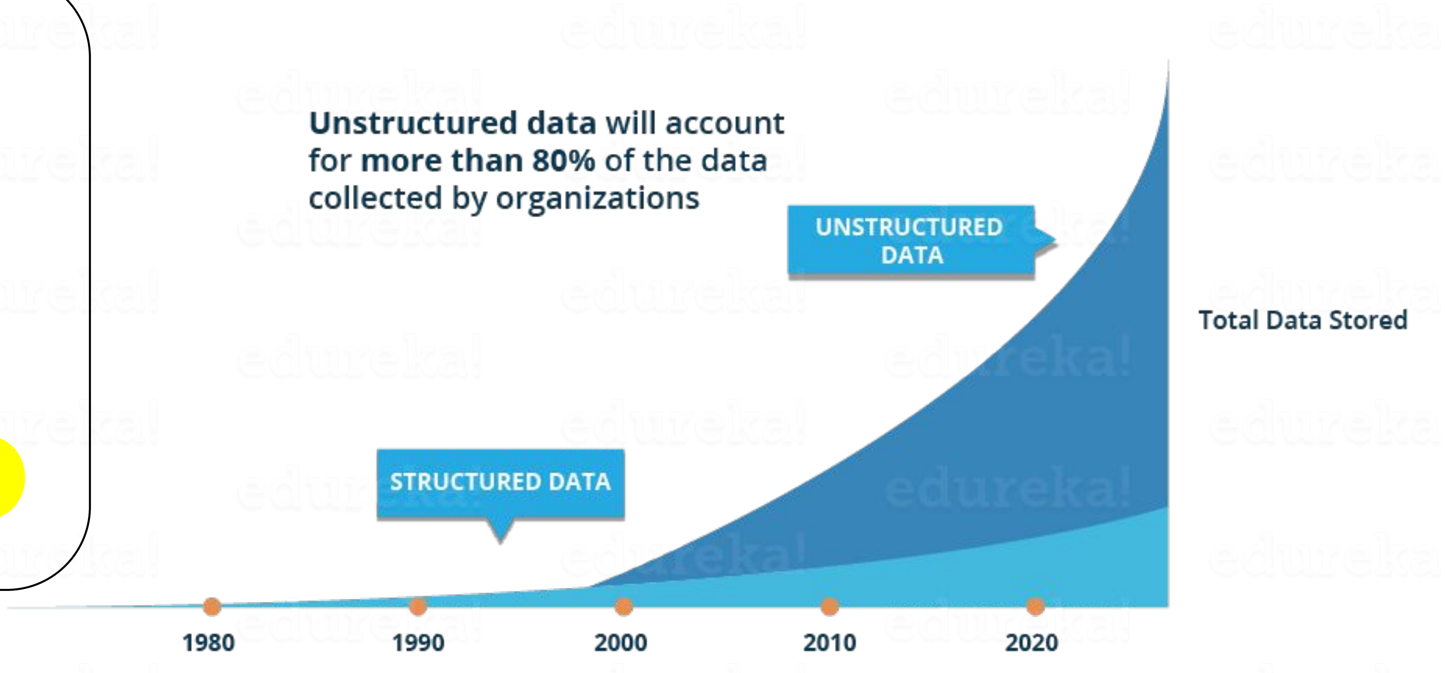
Mathematical Models
- Using variables and equations to establish relationships

Getting Things in Action
- Gathering information and deriving outcomes based on business requirements

Communication
- Communicating findings to stakeholders and decision makers

Ciclo científico hipótese *vs* ciência de dados

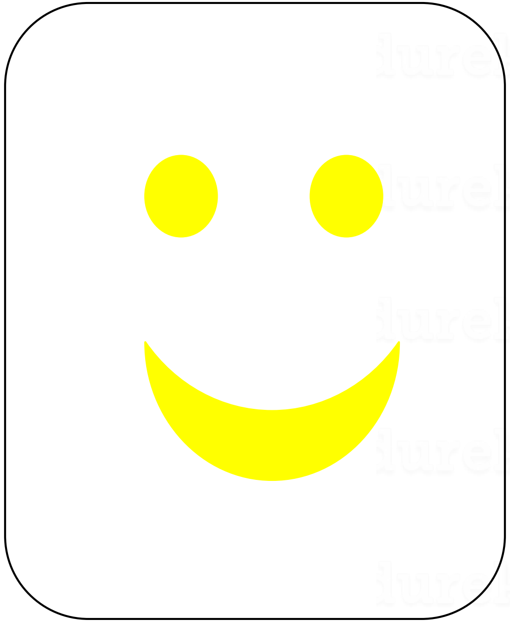


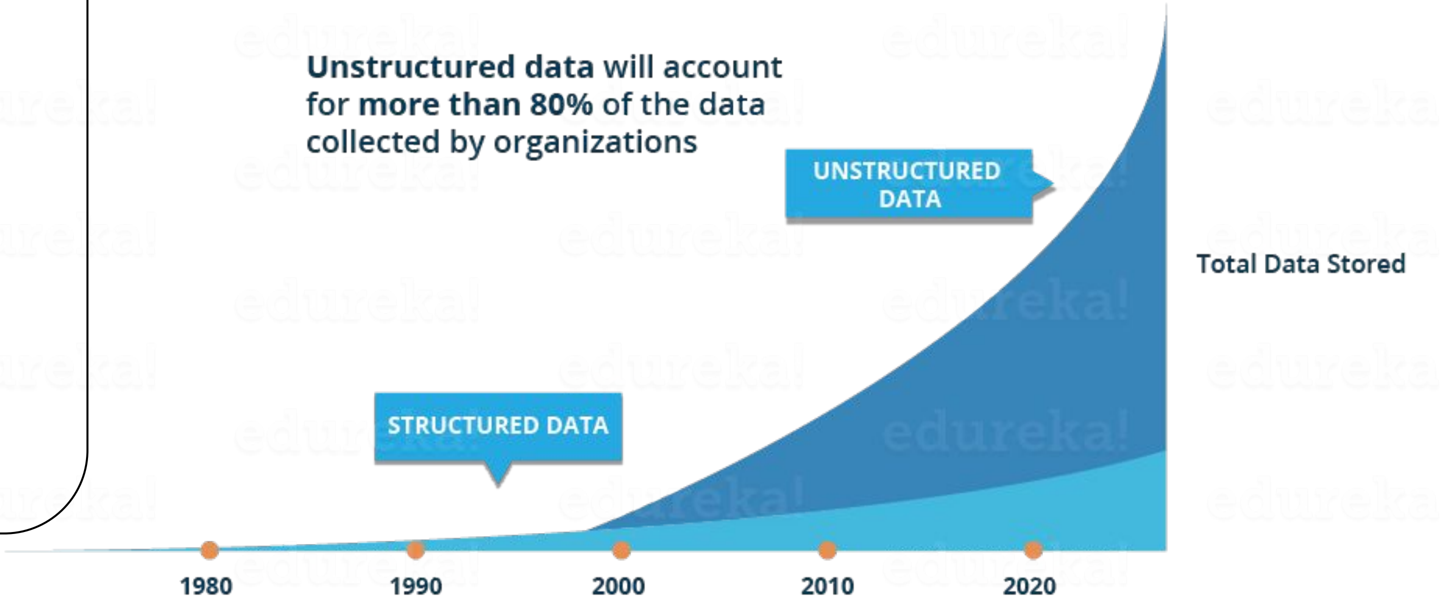


Unstructured data will account for **more than 80%** of the data collected by organizations

https://www.edureka.co/blog/what-is-data-science/

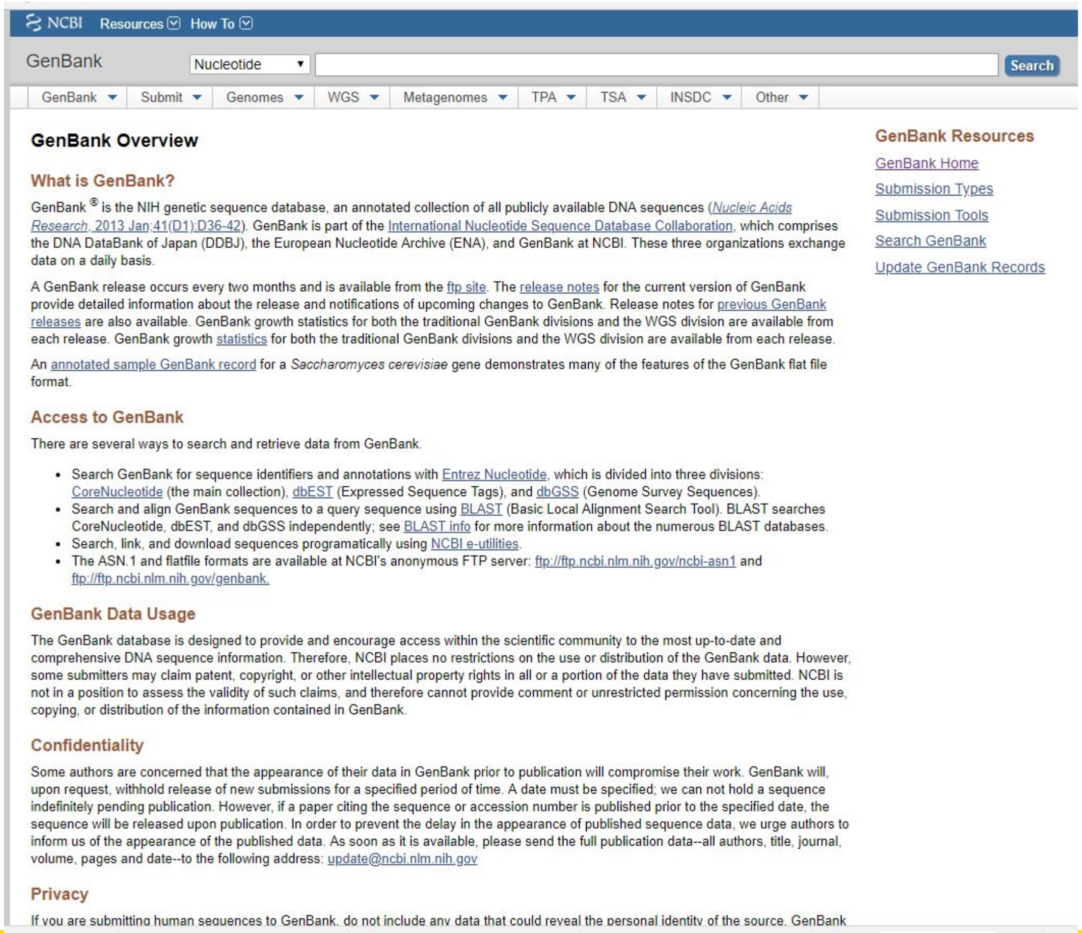
Ciclo científico hipótese *vs* ciência de dados




Unstructured data will account for **more than 80%** of the data collected by organizations
UNSTRUCTURED DATA
STRUCTURED DATA
Total Data Stored
1980
1990
2000
2010
2020

https://www.edureka.co/blog/what-is-data-science/

Dados



GenBank Overview

What is GenBank?

GenBank ® is the NIH genetic sequence database, an annotated collection of all publicly available DNA sequences (*Nucleic Acids Research*, 2013 Jan;41(D1):D36-42). GenBank is part of the International Nucleotide Sequence Database Collaboration, which comprises the DNA DataBank of Japan (DDBJ), the European Nucleotide Archive (ENA), and GenBank at NCBI. These three organizations exchange data on a daily basis.

A GenBank release occurs every two months and is available from the ftp site. The release notes for the current version of GenBank provide detailed information about the release and notifications of upcoming changes to GenBank. Release notes for previous GenBank releases are also available. GenBank growth statistics for both the traditional GenBank divisions and the WGS division are available from each release. GenBank growth statistics for both the traditional GenBank divisions and the WGS division are available from each release.

An annotated sample GenBank record for a *Saccharomyces cerevisiae* gene demonstrates many of the features of the GenBank flat file format.

Access to GenBank

There are several ways to search and retrieve data from GenBank.

- Search GenBank for sequence identifiers and annotations with Entrez Nucleotide, which is divided into three divisions: CoreNucleotide (the main collection), dbEST (Expressed Sequence Tags), and dbGSS (Genome Survey Sequences).
- Search and align GenBank sequences to a query sequence using BLAST (Basic Local Alignment Search Tool). BLAST searches CoreNucleotide, dbEST, and dbGSS independently; see BLAST info for more information about the numerous BLAST databases.
- Search, link, and download sequences programatically using NCBI e-utilities.
- The ASN.1 and flatfile formats are available at NCBI's anonymous FTP server: ftp://ftp.ncbi.nlm.nih.gov/ncbi-asn1 and ftp://ftp.ncbi.nlm.nih.gov/genbank.

GenBank Data Usage

The GenBank database is designed to provide and encourage access within the scientific community to the most up-to-date and comprehensive DNA sequence information. Therefore, NCBI places no restrictions on the use or distribution of the GenBank data. However, some submitters may claim patent, copyright, or other intellectual property rights in all or a portion of the data they have submitted. NCBI is not in a position to assess the validity of such claims, and therefore cannot provide comment or unrestricted permission concerning the use, copying, or distribution of the information contained in GenBank.

Confidentiality

Some authors are concerned that the appearance of their data in GenBank prior to publication will compromise their work. GenBank will, upon request, withhold release of new submissions for a specified period of time. A date must be specified; we can not hold a sequence indefinitely pending publication. However, if a paper citing the sequence or accession number is published prior to the specified date, the sequence will be released upon publication. In order to prevent the delay in the appearance of published sequence data, we urge authors to inform us of the appearance of the published data. As soon as it is available, please send the full publication data--all authors, title, journal, volume, pages and date--to the following address: update@ncbi.nlm.nih.gov

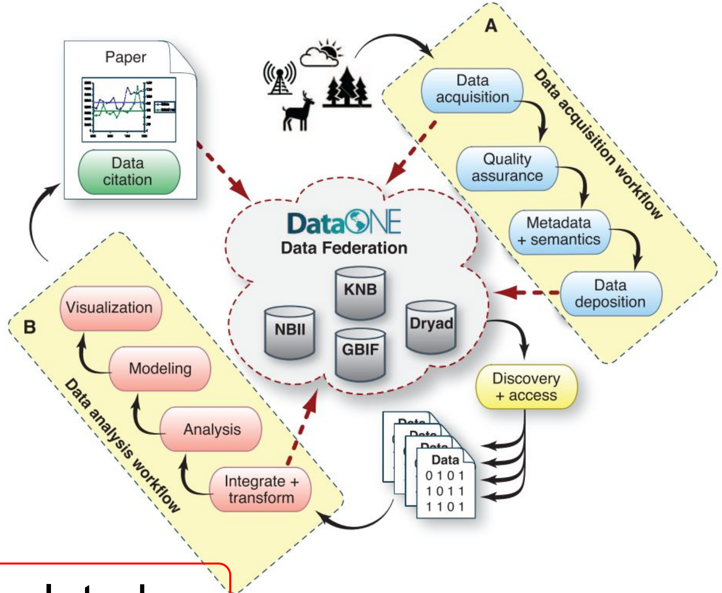
Privacy

If you are submitting human sequences to GenBank, do not include any data that could reveal the personal identity of the source. GenBank

GenBank Resources

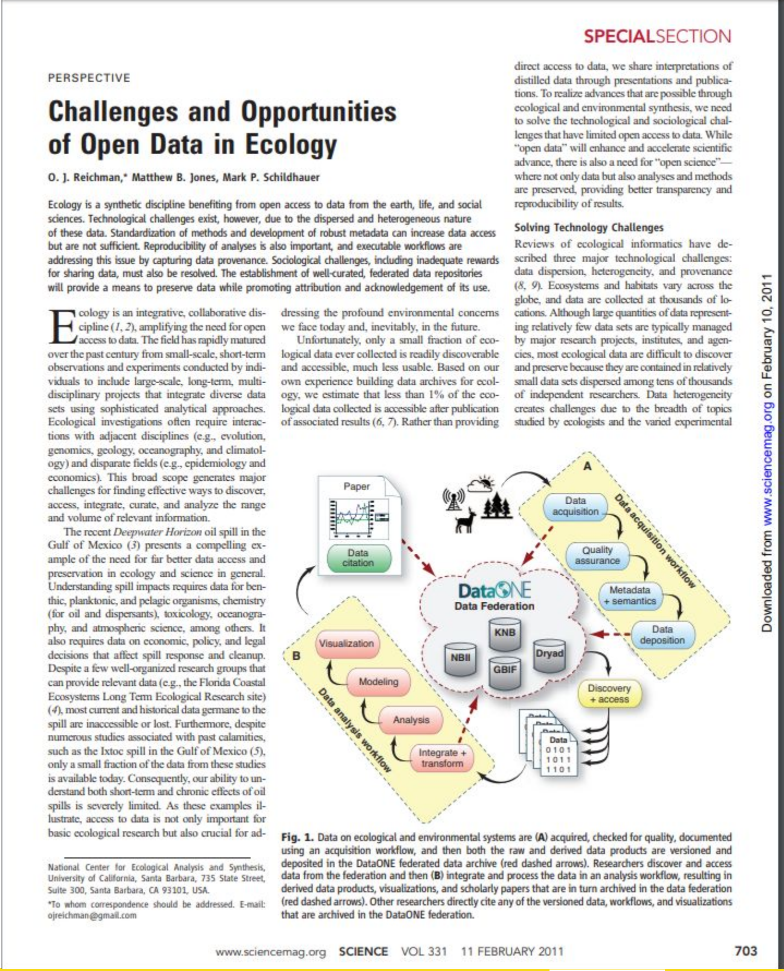
- GenBank Home
- Submission Types
- Submission Tools
- Search GenBank
- Update GenBank Records

Dados



- Dados coletados
- Armazenados (brutos)
- Sistematização e avaliação de qualidade
- Organizados
- Metadados (como obtê-los novamente)
- Armazenados

Disponível



PERSPECTIVE

Challenges and Opportunities of Open Data in Ecology

O. J. Reichman,* Matthew B. Jones, Mark P. Schildhauer

Ecology is a synthetic discipline benefiting from open access to data from the earth, life, and social sciences. Technological challenges exist, however, due to the dispersed and heterogeneous nature of these data. Standardization of methods and development of robust metadata can increase data access but are not sufficient. Reproducibility of analyses is also important, and executable workflows are addressing this issue by capturing data provenance. Sociological challenges, including inadequate rewards for sharing data, must also be resolved. The establishment of well-curated, federated data repositories will provide a means to preserve data while promoting attribution and acknowledgement of its use.

Ecology is an integrative, collaborative discipline (*1*, *2*), amplifying the need for open access to data. The field has rapidly matured over the past century from small-scale, short-term observations and experiments conducted by individuals to include large-scale, long-term, multidisciplinary projects that integrate diverse data sets using sophisticated analytical approaches. Ecological investigations often require interactions with adjacent disciplines (e.g., evolution, genomics, geology, oceanography, and climatology) and disparate fields (e.g., epidemiology and economics). This broad scope generates major challenges for finding effective ways to discover, access, integrate, curate, and analyze the range and volume of relevant information.

The recent *Deepwater Horizon* oil spill in the Gulf of Mexico (*3*) presents a compelling example of the need for far better data access and preservation in ecology and science in general. Understanding spill impacts requires data for benthic, planktonic, and pelagic organisms, chemistry (for oil and dispersants), toxicology, oceanography, and atmospheric science, among others. It also requires data on economic, policy, and legal decisions that affect spill response and cleanup. Despite a few well-organized research groups that can provide relevant data (e.g., the Florida Coastal Ecosystems Long Term Ecological Research site) (*4*), most current and historical data germane to the spill are inaccessible or lost. Furthermore, despite numerous studies associated with past calamities, such as the Ixtoc spill in the Gulf of Mexico (*5*), only a small fraction of the data from these studies is available today. Consequently, our ability to understand both short-term and chronic effects of oil spills is severely limited. As these examples illustrate, access to data is not only important for basic ecological research but also crucial for addressing the profound environmental concerns we face today and, inevitably, in the future.

Unfortunately, only a small fraction of ecological data ever collected is readily discoverable and accessible, much less usable. Based on our own experience building data archives for ecology, we estimate that less than 1% of the ecological data collected is accessible after publication of associated results (*6*, *7*). Rather than providing direct access to data, we share interpretations of distilled data through presentations and publications. To realize advances that are possible through ecological and environmental synthesis, we need to solve the technological and sociological challenges that have limited open access to data. While "open data" will enhance and accelerate scientific advance, there is also a need for "open science"—where not only data but also analyses and methods are preserved, providing better transparency and reproducibility of results.

Solving Technology Challenges

Reviews of ecological informatics have described three major technological challenges: data dispersion, heterogeneity, and provenance (*8*, *9*). Ecosystems and habitats vary across the globe, and data are collected at thousands of locations. Although large quantities of data representing relatively few data sets are typically managed by major research projects, institutes, and agencies, most ecological data are difficult to discover and preserve because they are contained in relatively small data sets dispersed among tens of thousands of independent researchers. Data heterogeneity creates challenges due to the breadth of topics studied by ecologists and the varied experimental

Fig. 1. Data on ecological and environmental systems are (**A**) acquired, checked for quality, documented using an acquisition workflow, and then both the raw and derived data products are versioned and deposited in the DataONE federated data archive (red dashed arrows). Researchers discover and access data from the federation and then (**B**) integrate and process the data in an analysis workflow, resulting in derived data products, visualizations, and scholarly papers that are in turn archived in the data federation (red dashed arrows). Other researchers directly cite any of the versioned data, workflows, and visualizations that are archived in the DataONE federation.

National Center for Ecological Analysis and Synthesis, University of California, Santa Barbara, 735 State Street, Suite 300, Santa Barbara, CA 93101, USA.

*To whom correspondence should be addressed. E-mail: ojreichman@gmail.com

Downloaded from www.sciencemag.org on February 10, 2011

Levantamento e monitoramento da biodiversidade

Métodos tradicionais (dificuldades)

- Espécies ainda não descritas
- Identificação de espécies crípticas
- Complexidade na identificação de jovens, etc
- Falta de especialistas/taxonomistas
- Amostragens não padronizadas (espacialmente, temporalmente, questões climáticas…)
- Técnicas e métodos de amostragens variáveis
- Amostragens invasivas
- Dificuldades cobertura amostral (espacialmente/temporalmente)
- Coleta > triagem > armazenamento > resgate da informação >> processo mecânico, passível de erros humanos
- ...

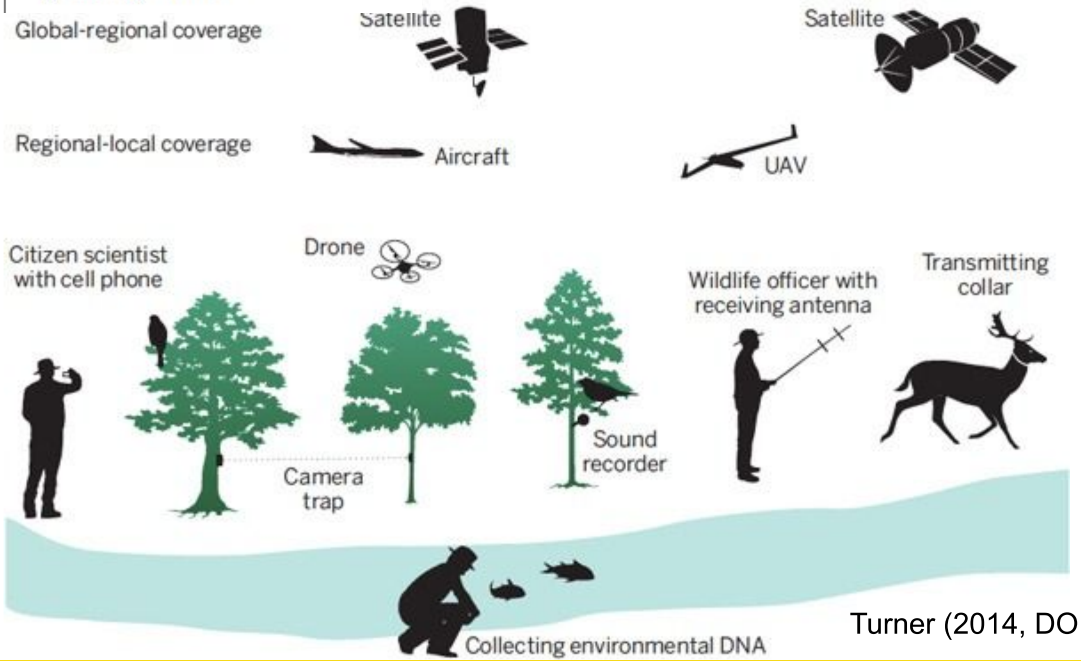
20 anos atrás…

CONSERVATION

Sensing biodiversity

Sophisticated networks are required to make the best use of biodiversity data from satellites and in situ sensors

By **Woody Turner**

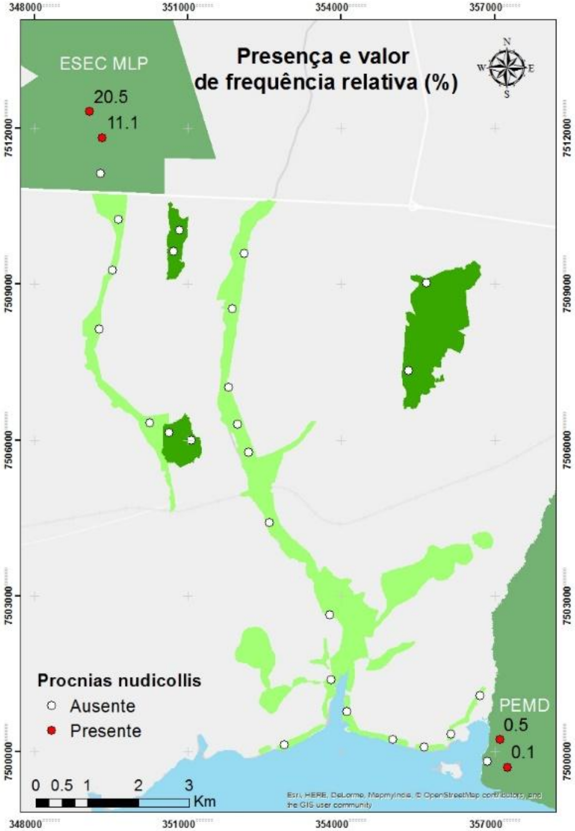

Global-regional coverage
Satellite
Satellite
Regional-local coverage
Aircraft
UAV
Citizen scientist with cell phone
Drone
Wildlife officer with receiving antenna
Transmitting collar
Camera trap
Sound recorder
Collecting environmental DNA

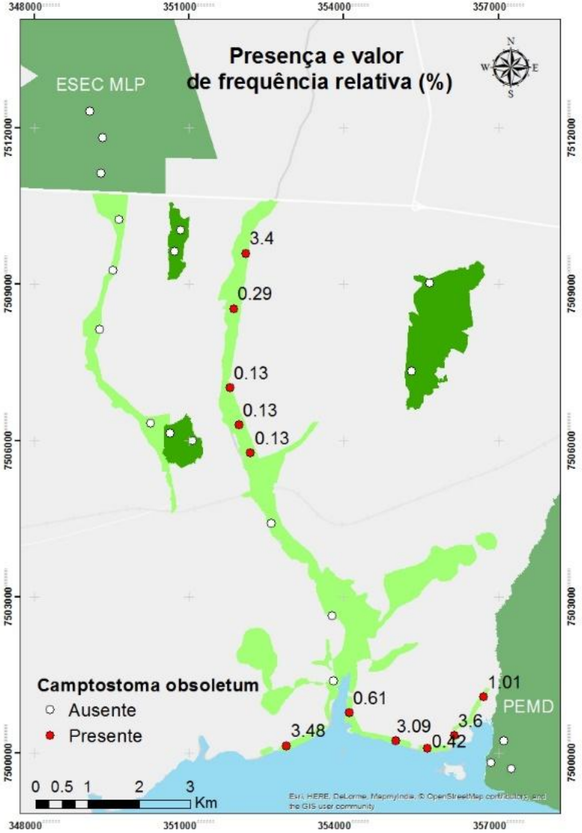
Turner (2014, DOI: 10.1126/science.1256014)

Monitoramento Sonoro

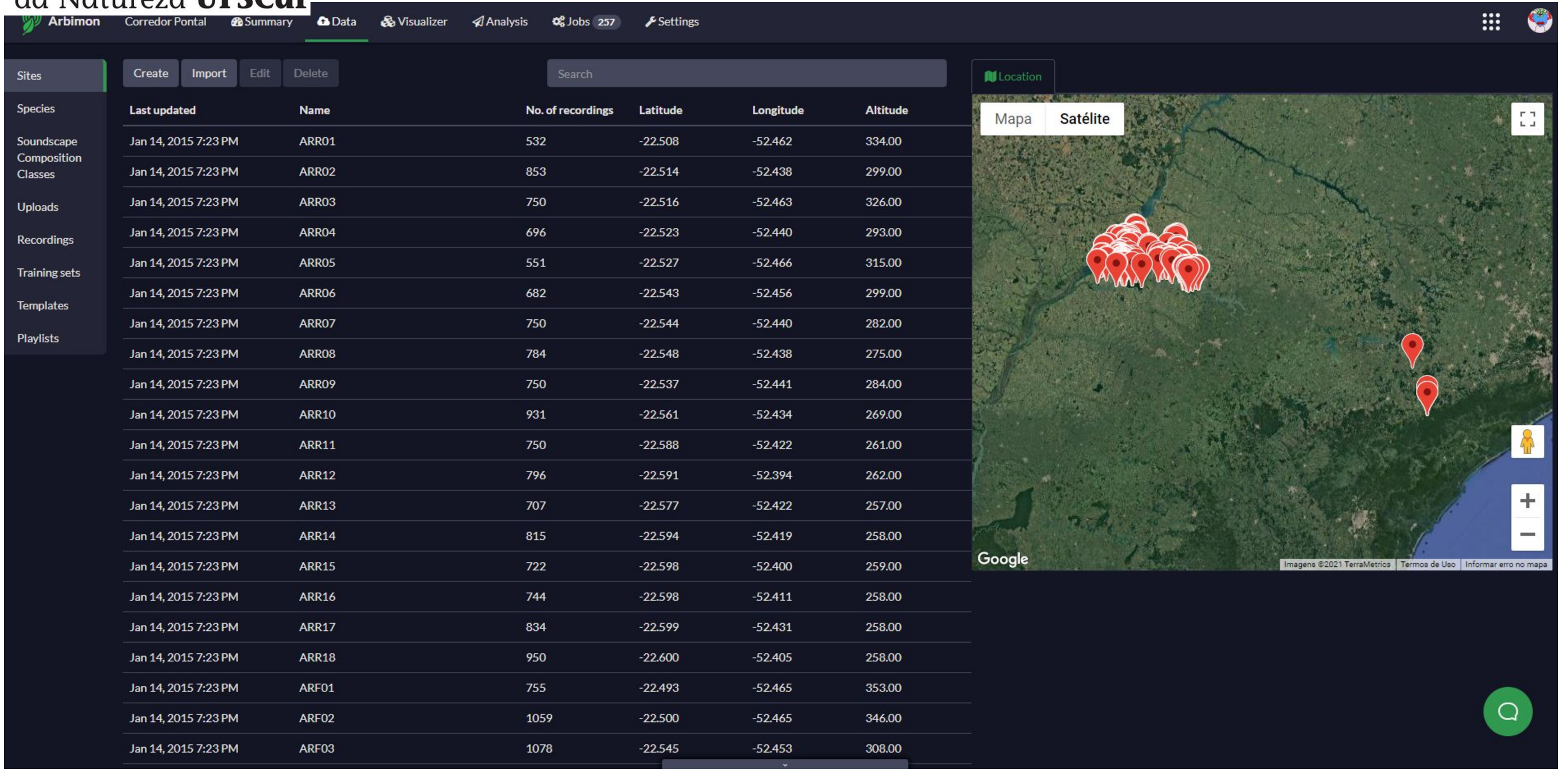
AudioMoth
CUSTOM
USB/OFF
DEFAULT

- Aves
- Anfíbios
- Morcegos
- Macacos


Presença e valor
de frequência relativa (%)
ESEC MLP
20.5
11.1
PEMD
0.5
0.1
Procnias nudicollis
○ Ausente
● Presente
0 0.5 1 2 3 Km
N
S
E
W
348000
351000
354000
357000
7512000
7509000
7506000
7503000
7500000
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

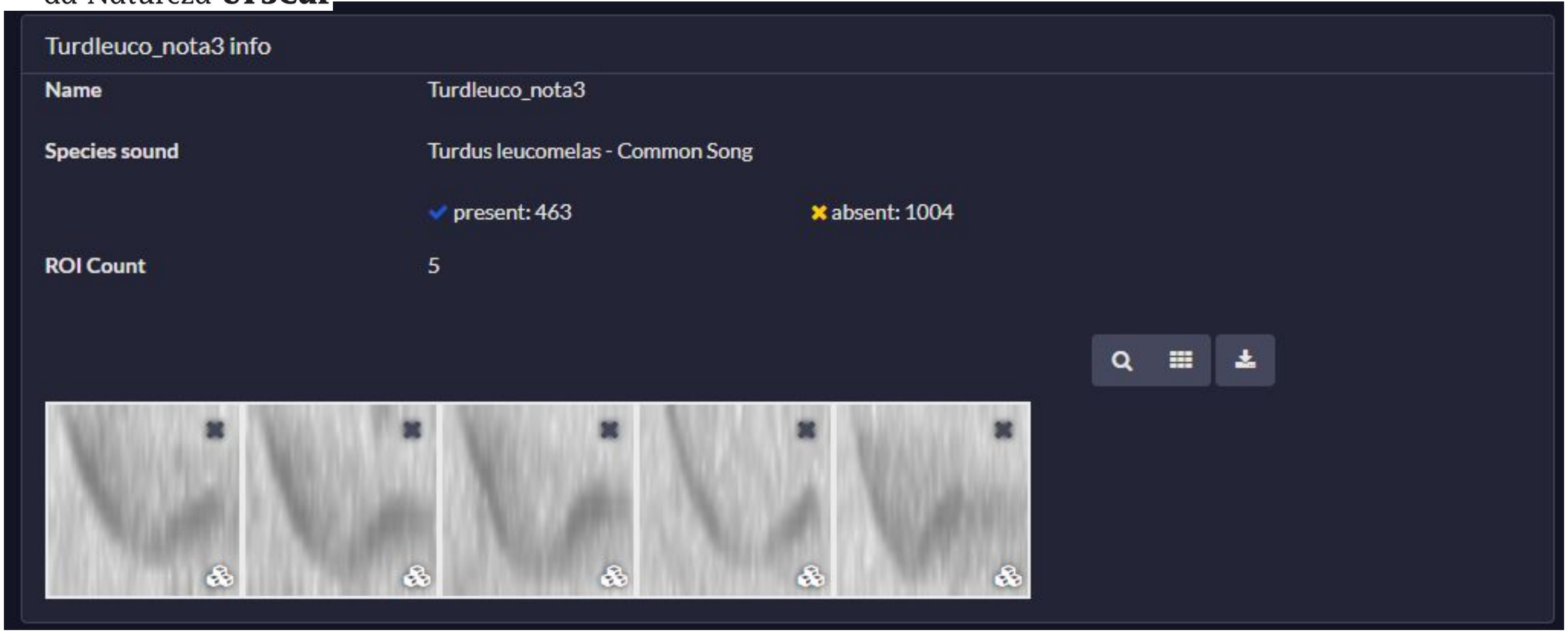

Presença e valor
de frequência relativa (%)
ESEC MLP
3.4
0.29
0.13
0.13
0.13
1.01
0.61
3.48
3.09
3.6
0.42
PEMD
Camptostoma obsoletum
○ Ausente
● Presente
0 0.5 1 2 3 Km
N
S
E
W
348000
351000
354000
357000
7512000
7509000
7506000
7503000
7500000
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Monitoramento Sonoro


Arbimon
Corredor Pontal
Summary
Data
Visualizer
Analysis
Jobs 257
Settings
Sites
Species
Soundscape Composition Classes
Uploads
Recordings
Training sets
Templates
Playlists
Create
Import
Edit
Delete
Search
Location
Mapa
Satélite
Google
Imagens ©2021 TerraMetrics
Termos de Uso
Informar erro no mapa

Last updated	Name	No. of recordings	Latitude	Longitude	Altitude
Jan 14, 2015 7:23 PM	ARR01	532	-22.508	-52.462	334.00
Jan 14, 2015 7:23 PM	ARR02	853	-22.514	-52.438	299.00
Jan 14, 2015 7:23 PM	ARR03	750	-22.516	-52.463	326.00
Jan 14, 2015 7:23 PM	ARR04	696	-22.523	-52.440	293.00
Jan 14, 2015 7:23 PM	ARR05	551	-22.527	-52.466	315.00
Jan 14, 2015 7:23 PM	ARR06	682	-22.543	-52.456	299.00
Jan 14, 2015 7:23 PM	ARR07	750	-22.544	-52.440	282.00
Jan 14, 2015 7:23 PM	ARR08	784	-22.548	-52.438	275.00
Jan 14, 2015 7:23 PM	ARR09	750	-22.537	-52.441	284.00
Jan 14, 2015 7:23 PM	ARR10	931	-22.561	-52.434	269.00
Jan 14, 2015 7:23 PM	ARR11	750	-22.588	-52.422	261.00
Jan 14, 2015 7:23 PM	ARR12	796	-22.591	-52.394	262.00
Jan 14, 2015 7:23 PM	ARR13	707	-22.577	-52.422	257.00
Jan 14, 2015 7:23 PM	ARR14	815	-22.594	-52.419	258.00
Jan 14, 2015 7:23 PM	ARR15	722	-22.598	-52.400	259.00
Jan 14, 2015 7:23 PM	ARR16	744	-22.598	-52.411	258.00
Jan 14, 2015 7:23 PM	ARR17	834	-22.599	-52.431	258.00
Jan 14, 2015 7:23 PM	ARR18	950	-22.600	-52.405	258.00
Jan 14, 2015 7:23 PM	ARF01	755	-22.493	-52.465	353.00
Jan 14, 2015 7:23 PM	ARF02	1059	-22.500	-52.465	346.00
Jan 14, 2015 7:23 PM	ARF03	1078	-22.545	-52.453	308.00

Monitoramento Sonoro



Turdleuco_nota3 info

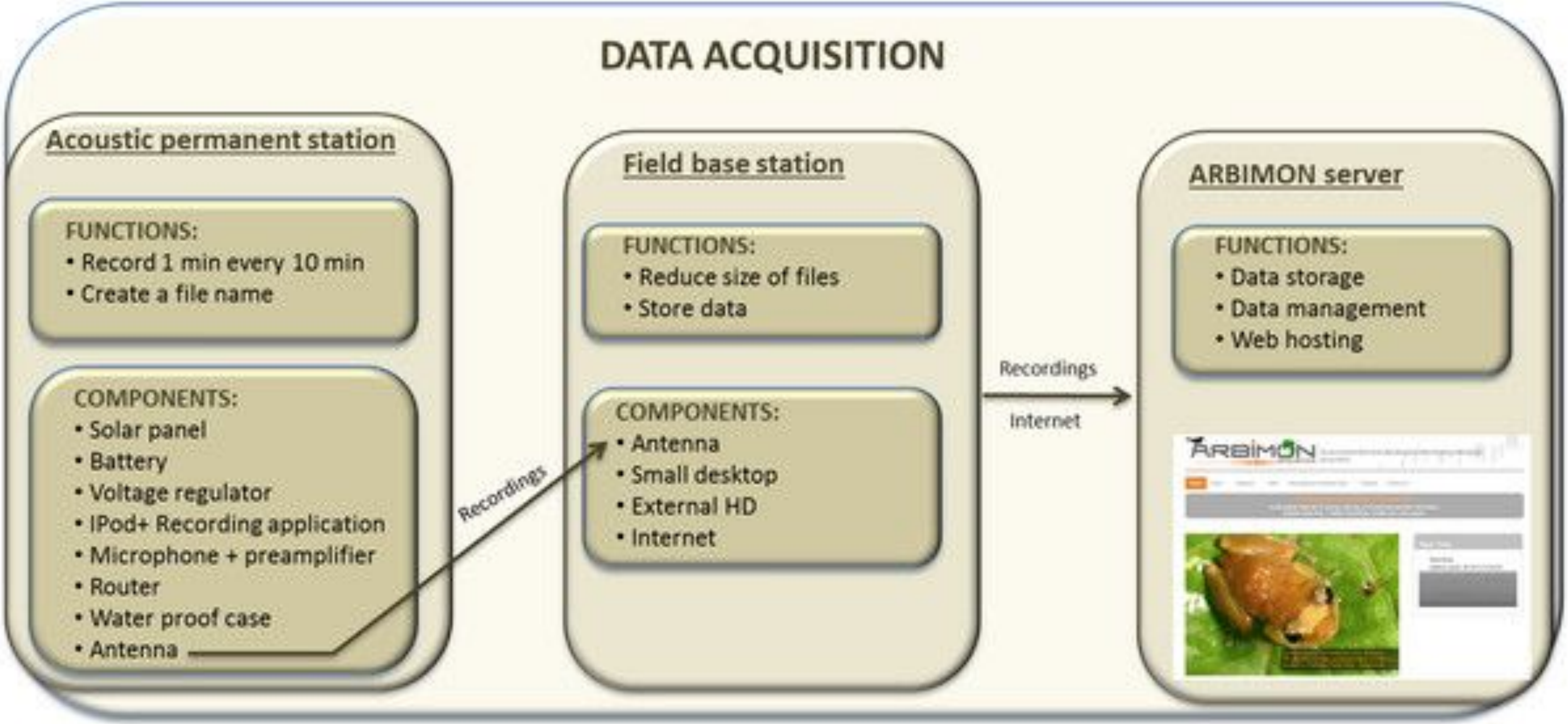
Name Turdleuco_nota3

Species sound Turdus leucomelas - Common Song

✓ present: 463 ✗ absent: 1004

ROI Count 5

Monitoramento Sonoro



DATA ACQUISITION

Acoustic permanent station

FUNCTIONS:
- Record 1 min every 10 min
- Create a file name

COMPONENTS:
- Solar panel
- Battery
- Voltage regulator
- IPod+ Recording application
- Microphone + preamplifier
- Router
- Water proof case
- Antenna

Field base station

FUNCTIONS:
- Reduce size of files
- Store data

COMPONENTS:
- Antenna
- Small desktop
- External HD
- Internet

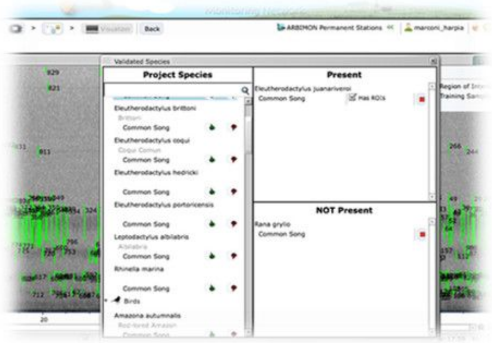
ARBIMON server

FUNCTIONS:
- Data storage
- Data management
- Web hosting

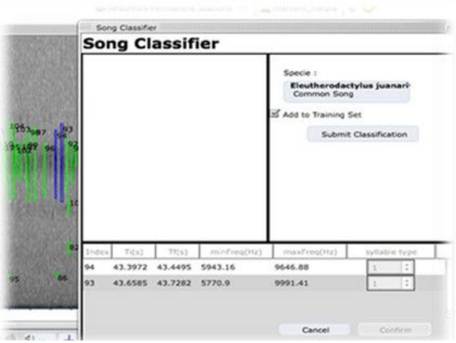
Aide et al. (2013) - https://doi.org/10.7717/peerj.103

Monitoramento Sonoro

1) Species validation

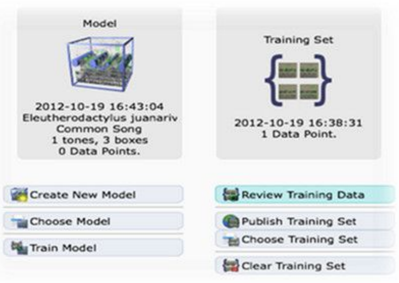

ARBIMON Permanent Stations
marconi_harpia
Back
Validated Species
Project Species
Present
NOT Present
Eleutherodactylus brittoni
Common Song
Eleutherodactylus coqui
Common Song
Eleutherodactylus hedricki
Common Song
Eleutherodactylus portoricensis
Common Song
Leptodactylus albilabris
Common Song
Rhinella marina
Common Song
Birds
Amazona autumnalis
Eleutherodactylus juanariveroi
Common Song
Has ROIs
Rana grylio
Common Song

2) Training data


Song Classifier
Specie :
Eleutherodactylus juanari
Common Song
☑ Add to Training Set
Submit Classification
Cancel
Confirm

Index	Ti(s)	Tf(s)	minFreq(Hz)	maxFreq(Hz)	syllable type
94	43.3972	43.4495	5943.16	9646.88	1
93	43.6585	43.7282	5770.9	9991.41	1

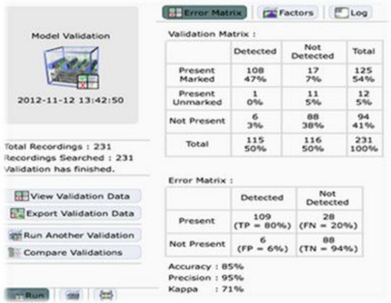
3) Create and training model


Model
Training Set
Create New Model
Choose Model
Train Model
Review Training Data
Publish Training Set
Choose Training Set
Clear Training Set

Model
2012-10-19 16:43:04
Eleutherodactylus juanariv
Common Song
1 tones, 3 boxes
0 Data Points.

Training Set
2012-10-19 16:38:31
1 Data Point.

4) Model validation


Error Matrix
Factors
Log
Model Validation
View Validation Data
Export Validation Data
Run Another Validation
Compare Validations
Run

2012-11-12 13:42:50

Total Recordings : 231
Recordings Searched : 231
Validation has finished.

Validation Matrix :

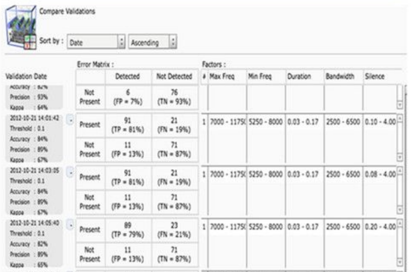
	Detected	Not Detected	Total
Present Marked	108 47%	17 7%	125 54%
Present Unmarked	1 0%	11 5%	12 5%
Not Present	6 3%	88 38%	94 41%
Total	115 50%	116 50%	231 100%

Error Matrix :

	Detected	Not Detected
Present	109 (TP = 80%)	28 (FN = 20%)
Not Present	6 (FP = 6%)	88 (TN = 94%)

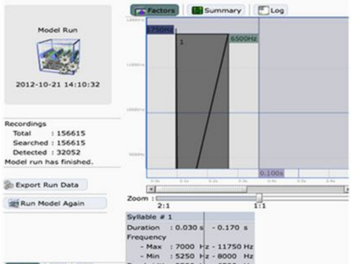
Accuracy : 85%
Precision : 95%
Kappa : 71%

5) Compare validation


Compare Validations
Sort by : Date
Ascending

Validation Date	Error Matrix :	Detected	Not Detected	#	Max Freq	Min Freq	Duration	Bandwidth	Silence
Accuracy : 82% Precision : 93% Kappa : 64%	Not Present	6 (FP = 7%)	76 (TN = 93%)						
2012-10-21 14:01:42 Threshold : 0.1 Accuracy : 84% Precision : 89% Kappa : 67%	Present	91 (TP = 81%)	21 (FN = 19%)	1	7000 - 1175(	5250 - 8000	0.03 - 0.17	2500 - 6500	0.10 - 4.00
	Not Present	11 (FP = 13%)	71 (TN = 87%)						
2012-10-21 14:03:05 Threshold : 0.1 Accuracy : 84% Precision : 89% Kappa : 67%	Present	91 (TP = 81%)	21 (FN = 19%)	1	7000 - 1175(	5250 - 8000	0.03 - 0.17	2500 - 6500	0.08 - 4.00
	Not Present	11 (FP = 13%)	71 (TN = 87%)						
2012-10-21 14:05:40 Threshold : 0.1 Accuracy : 82% Precision : 89% Kappa : 65%	Present	89 (TP = 79%)	23 (FN = 21%)	1	7000 - 1175(	5250 - 8000	0.03 - 0.17	2500 - 6500	0.20 - 4.00
	Not Present	11 (FP = 13%)	71 (TN = 87%)						

6) Run Model over all data


Factors
Summary
Log
Model Run
11750Hz
6500Hz
1
0.100s
Zoom :
2:1
1:1
Export Run Data
Run Model Again

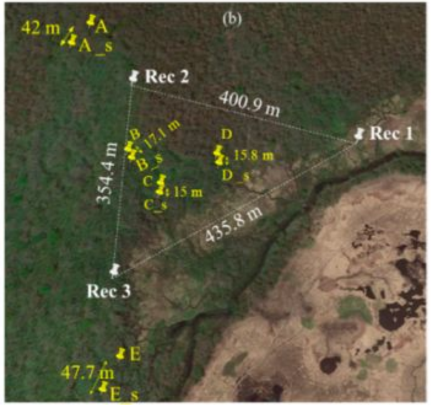
2012-10-21 14:10:32

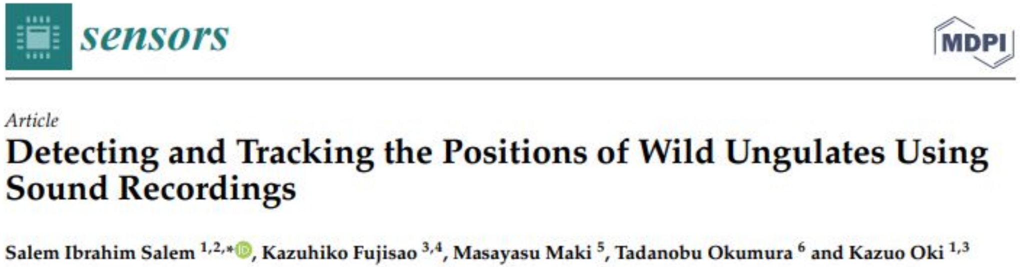
Recordings
Total : 156615
Searched : 156615
Detected : 32052
Model run has finished.

Syllable # 1
Duration : 0.030 s - 0.170 s
Frequency
- Max : 7000 Hz - 11750 Hz
- Min : 5250 Hz - 8000 Hz

Aide et al. (2013) - https://doi.org/10.7717/peerj.103

Monitoramento Sonoro

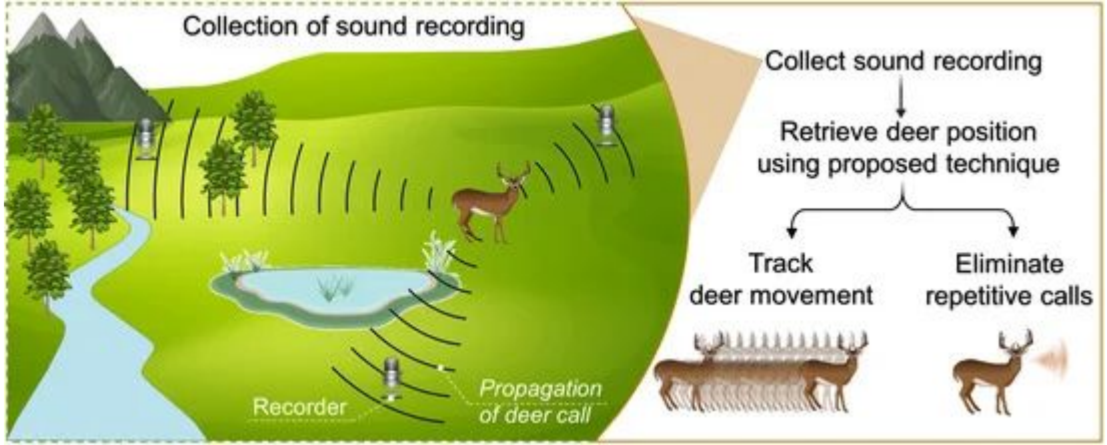

(b)
42 m
A
A_s
Rec 2
400.9 m
Rec 1
354.4 m
B
17.1 m
B_s
D
15.8 m
D_s
C
15 m
C_s
435.8 m
Rec 3
E
47.7 m
E_s

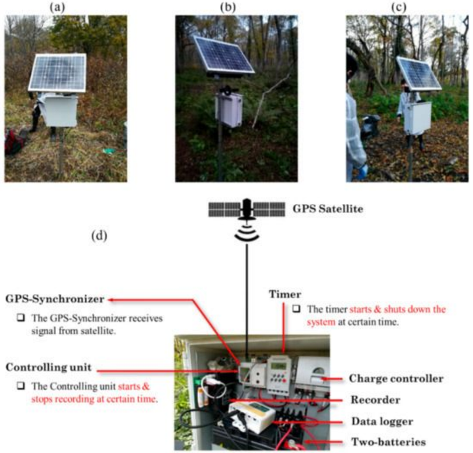

sensors
MDPI

Article

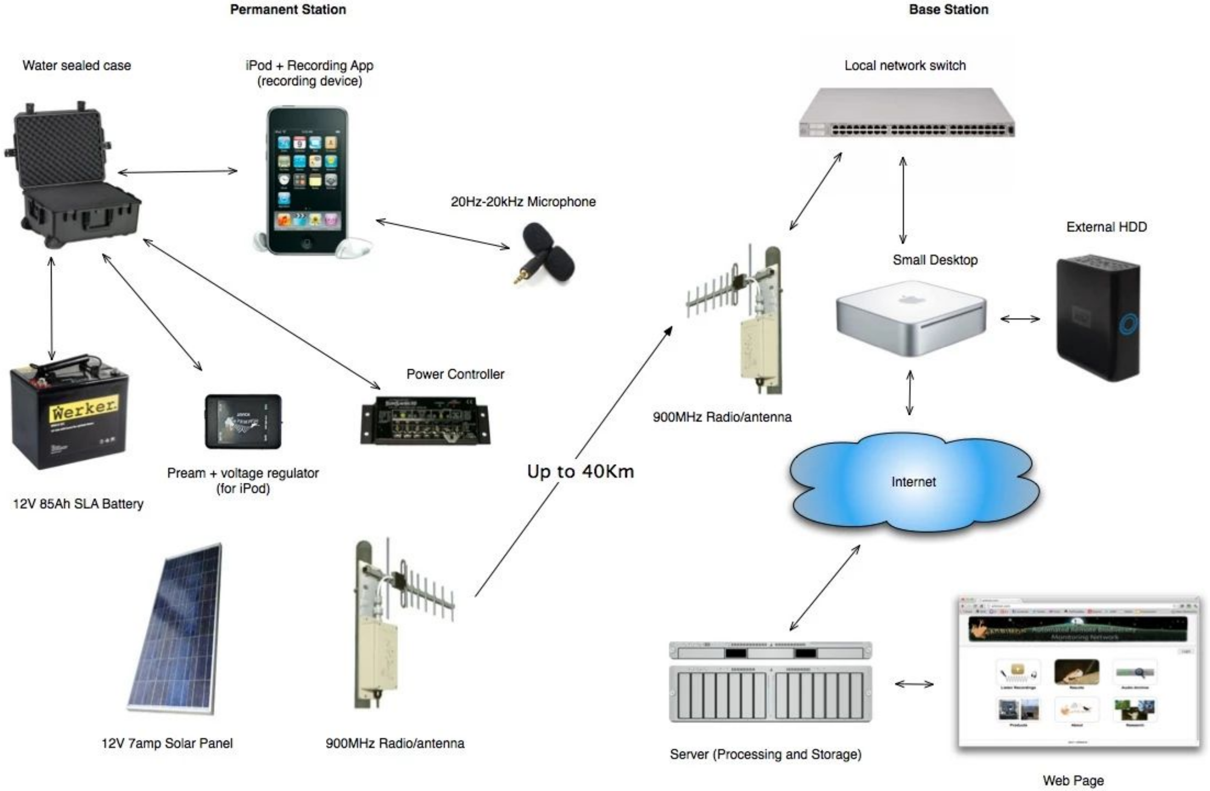
Detecting and Tracking the Positions of Wild Ungulates Using Sound Recordings

Salem Ibrahim Salem [1,2,*], Kazuhiko Fujisao [3,4], Masayasu Maki [5], Tadanobu Okumura [6] and Kazuo Oki [1,3]


Collection of sound recording
Collect sound recording
Retrieve deer position using proposed technique
Track deer movement
Eliminate repetitive calls
Recorder
Propagation of deer call


(a)
(b)
(c)
(d)
GPS Satellite
GPS-Synchronizer
❑ The GPS-Synchronizer receives signal from satellite.
Timer
❑ The timer starts & shuts down the system at certain time.
Controlling unit
❑ The Controlling unit starts & stops recording at certain time.
Charge controller
Recorder
Data logger
Two-batteries

Monitoramento Sonoro em tempo real (Real Time)

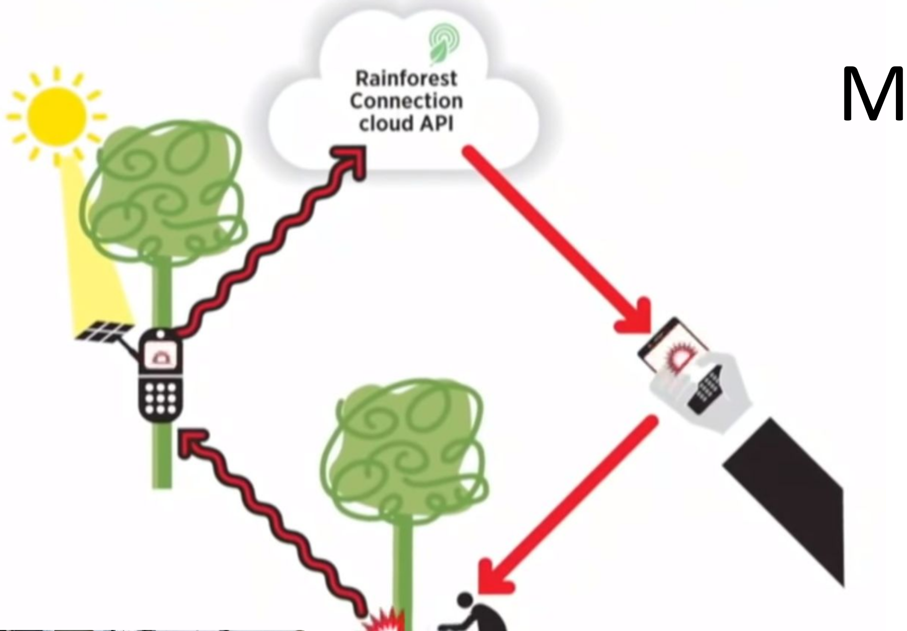

Permanent Station
Base Station
Water sealed case
iPod + Recording App (recording device)
20Hz-20kHz Microphone
Power Controller
12V 85Ah SLA Battery
Pream + voltage regulator (for iPod)
12V 7amp Solar Panel
900MHz Radio/antenna
Up to 40Km
900MHz Radio/antenna
Local network switch
Small Desktop
External HDD
Internet
Server (Processing and Storage)
Web Page

https://newatlas.com/arbimon-wildlife-monitoring/28361

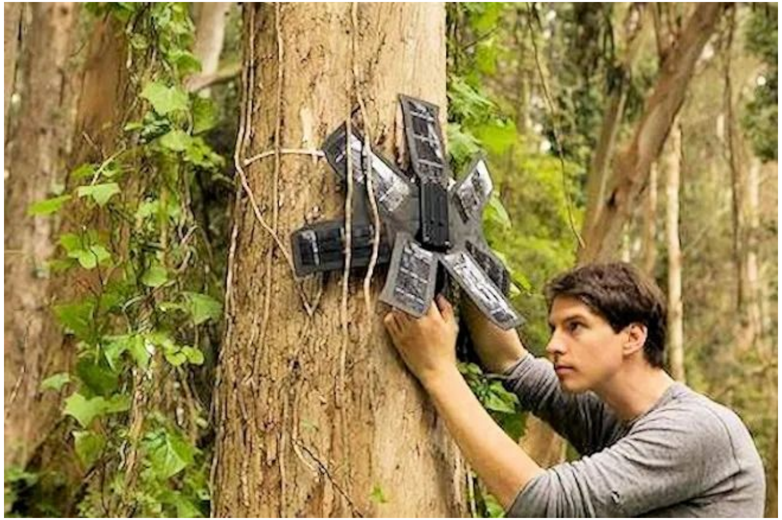
Monitoramento Sonoro
Energia Solar

RAINFOREST
CONNECTION

Monitoramento Sonoro e desmatamento

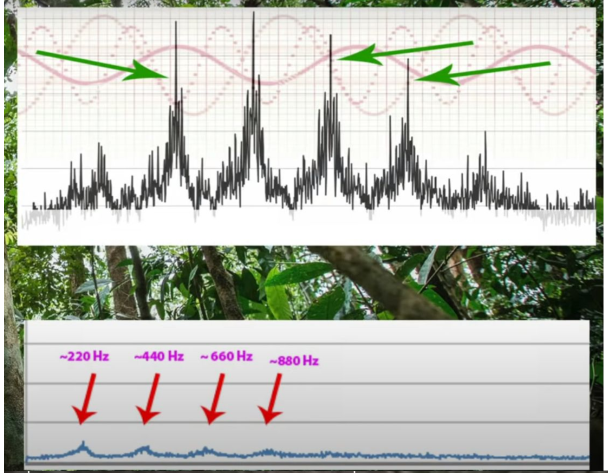

Rainforest
Connection
cloud API

https://youtu.be/xPK2Ch90xWo



Topher White

Monitoramento Sonoro
e desmatamento em tempo real



https://youtu.be/xPK2Ch90xWo

Monitoramento Sonoro
e incêndio florestal em tempo real

Figure 2. Proposed system infrastructure.

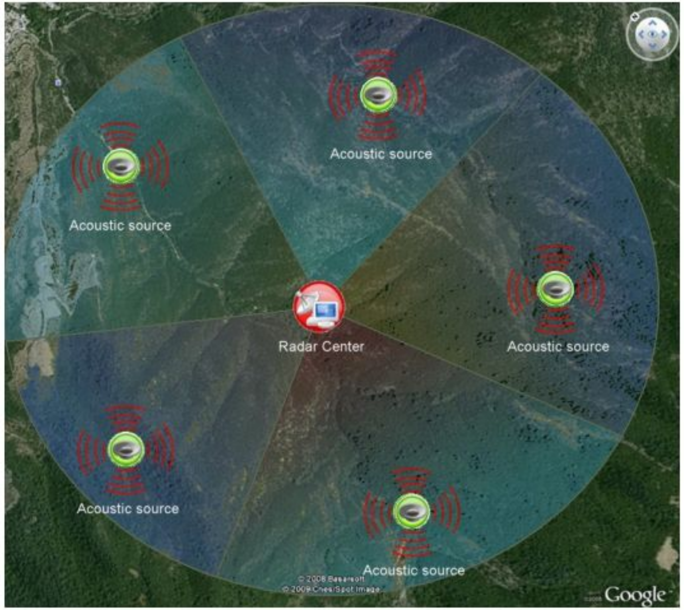
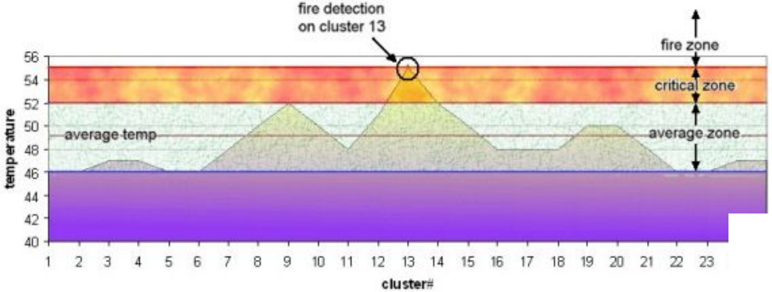
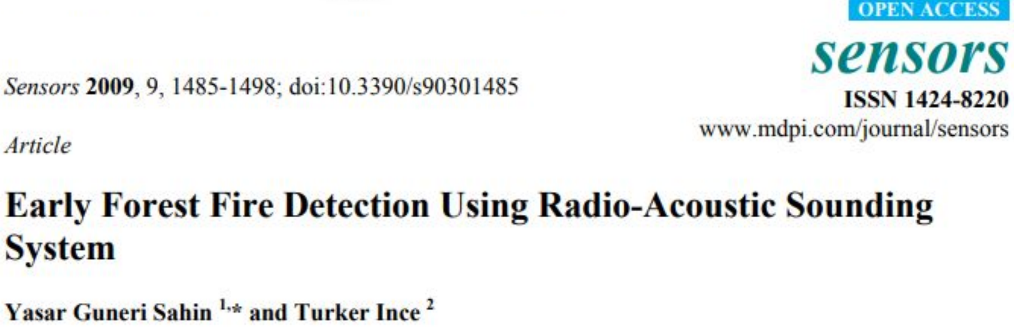

Acoustic source
Acoustic source
Radar Center
Acoustic source
Acoustic source
Acoustic source
© 2008 Basarsoft
© 2009 Cnes/Spot Image
Google

Figure 5. Warm region thermal data spectrum.





OPEN ACCESS
sensors
ISSN 1424-8220
www.mdpi.com/journal/sensors

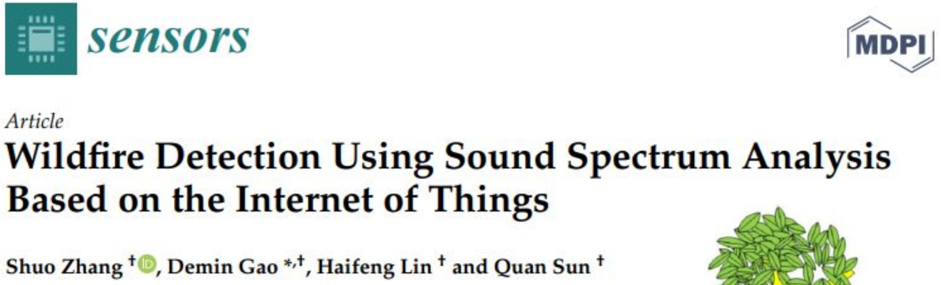
Sensors **2009**, 9, 1485-1498; doi:10.3390/s90301485

Article

Early Forest Fire Detection Using Radio-Acoustic Sounding System

Yasar Guneri Sahin [1,*] and Turker Ince [2]

Monitoramento Sonoro
e incêndio florestal em tempo real



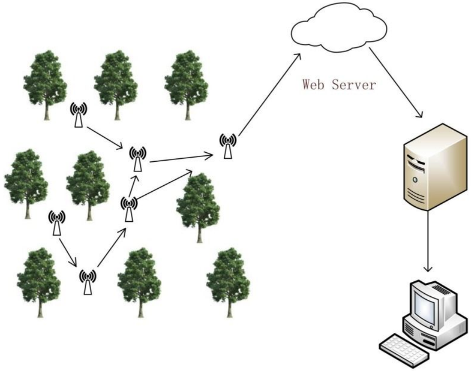
sensors

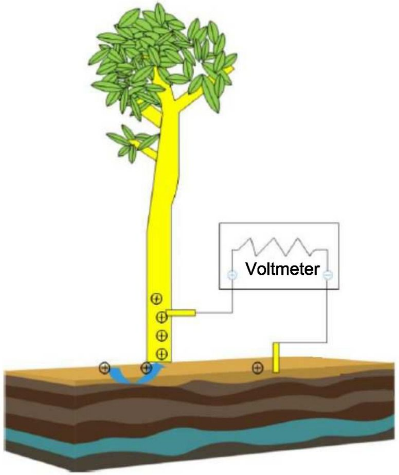
MDPI

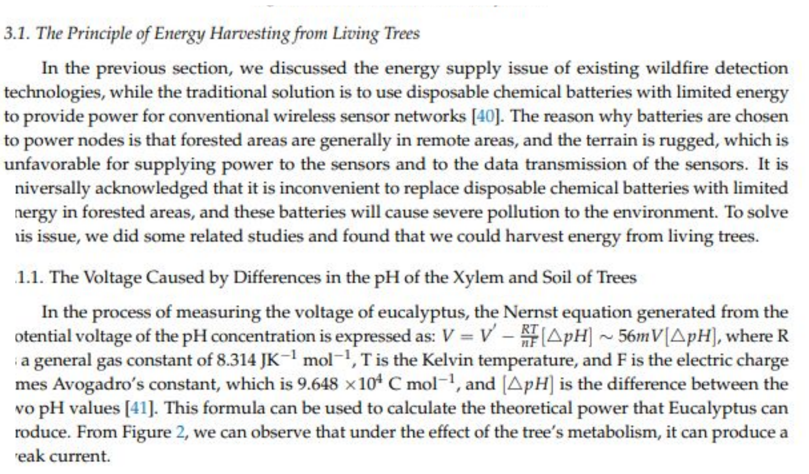
Article

Wildfire Detection Using Sound Spectrum Analysis Based on the Internet of Things

Shuo Zhang [†], **Demin Gao** [*,†], **Haifeng Lin** [†] **and Quan Sun** [†]







3.1. *The Principle of Energy Harvesting from Living Trees*

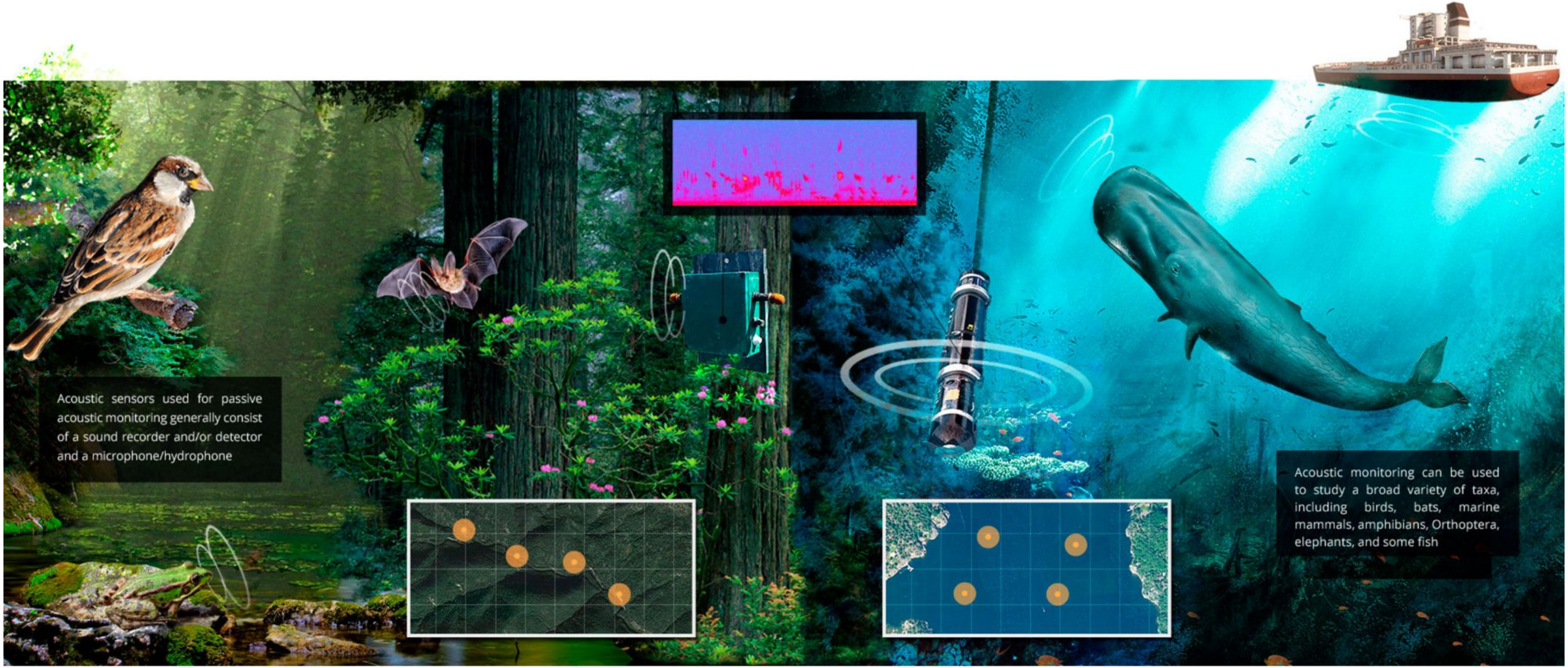
In the previous section, we discussed the energy supply issue of existing wildfire detection technologies, while the traditional solution is to use disposable chemical batteries with limited energy to provide power for conventional wireless sensor networks [40]. The reason why batteries are chosen to power nodes is that forested areas are generally in remote areas, and the terrain is rugged, which is unfavorable for supplying power to the sensors and to the data transmission of the sensors. It is niversally acknowledged that it is inconvenient to replace disposable chemical batteries with limited nergy in forested areas, and these batteries will cause severe pollution to the environment. To solve is issue, we did some related studies and found that we could harvest energy from living trees.

1.1. The Voltage Caused by Differences in the pH of the Xylem and Soil of Trees

In the process of measuring the voltage of eucalyptus, the Nernst equation generated from the otential voltage of the pH concentration is expressed as: $V = V' - \frac{RT}{nF}[\triangle pH] \sim 56mV[\triangle pH]$, where R a general gas constant of 8.314 JK^{-1} mol^{-1}, T is the Kelvin temperature, and F is the electric charge mes Avogadro's constant, which is 9.648 $\times 10^4$ C mol^{-1}, and $[\triangle pH]$ is the difference between the vo pH values [41]. This formula can be used to calculate the theoretical power that Eucalyptus can roduce. From Figure 2, we can observe that under the effect of the tree's metabolism, it can produce a eak current.

doi: 10.3390/s19235093

Monitoramento Sonoro

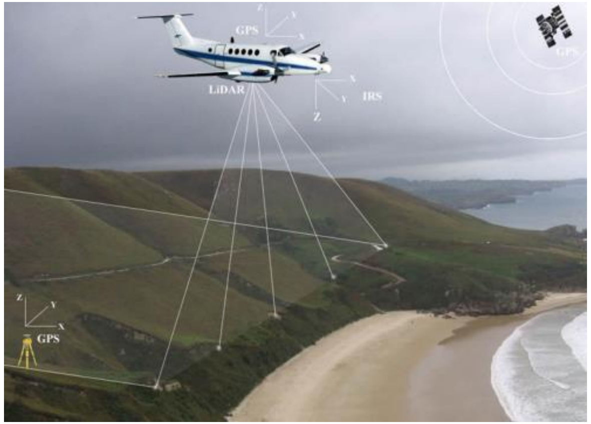


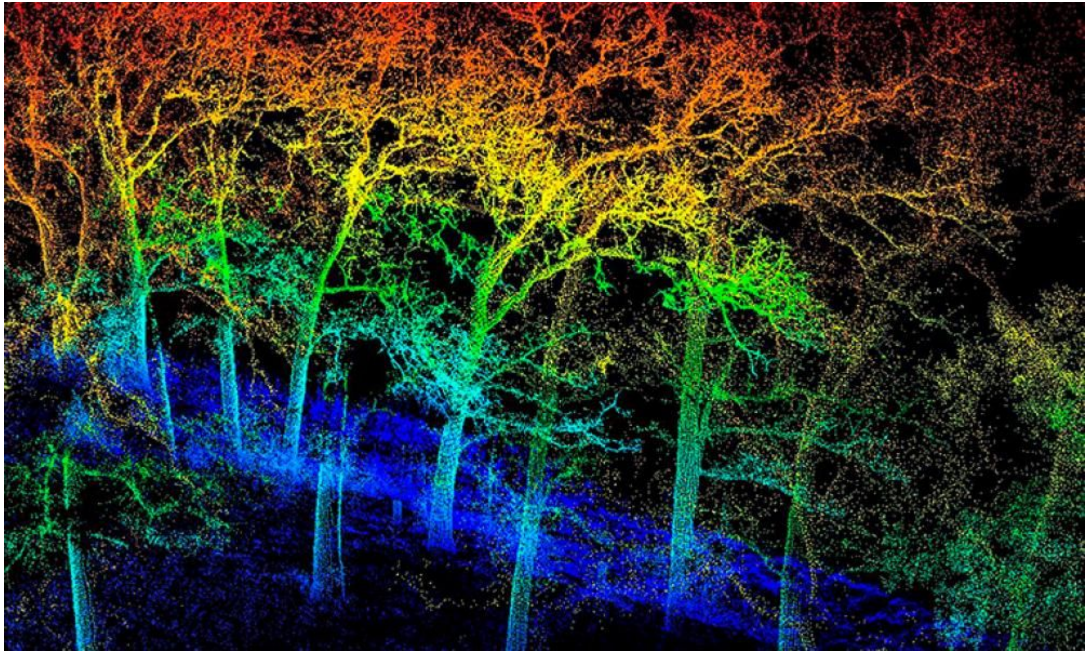
Acoustic sensors used for passive acoustic monitoring generally consist of a sound recorder and/or detector and a microphone/hydrophone

Acoustic monitoring can be used to study a broad variety of taxa, including birds, bats, marine mammals, amphibians, Orthoptera, elephants, and some fish

https://www.wwf.org.uk/project/conservationtechnology

Lidar - Light detection and ranging





https://www.wwf.org.uk/project/conservationtechnology

Lidar

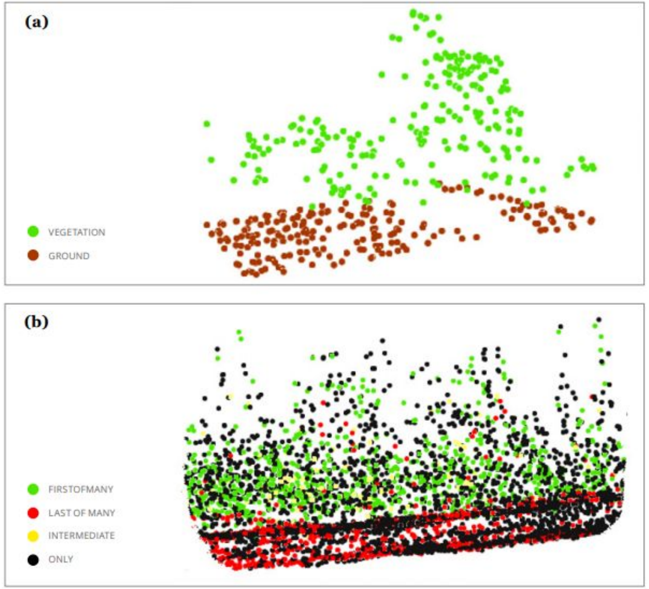


Figure 2.3 LiDAR echoes in point clouds categorized by target (a) or order of return of the echoes (b).

Melin, Shapiro Glover-Kapfer 2017

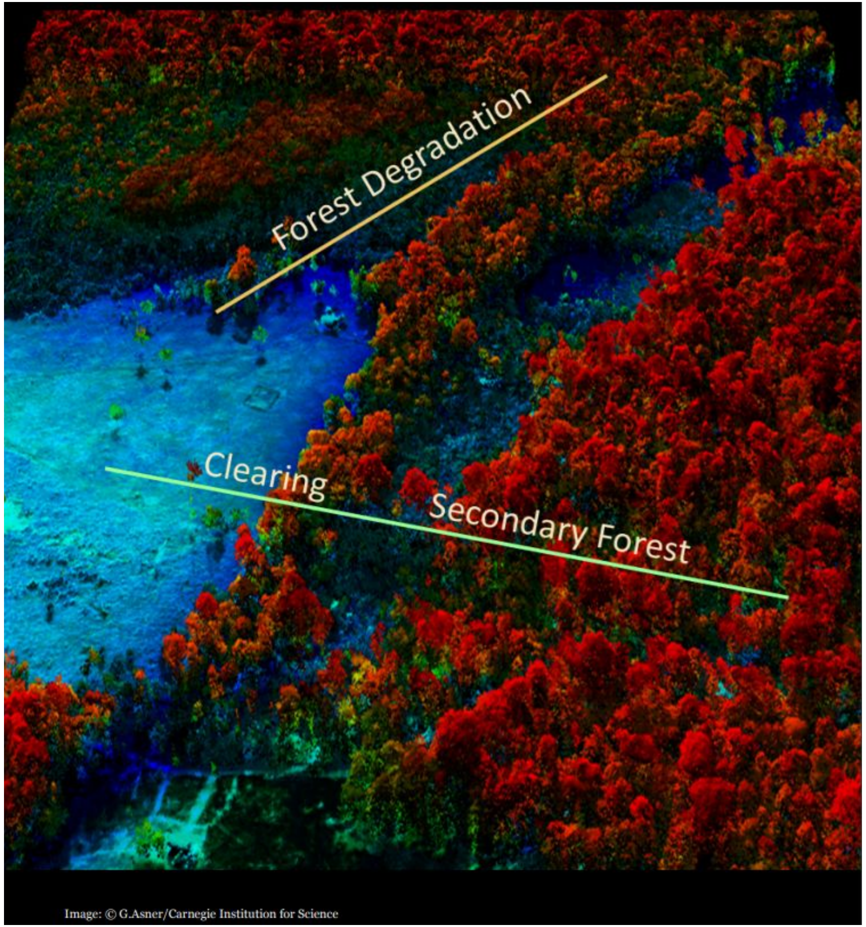
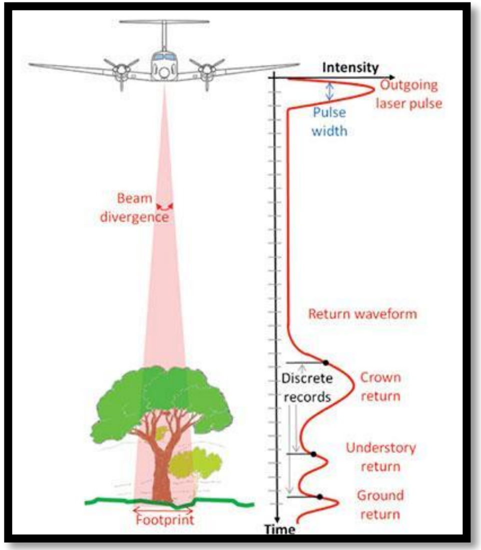

Forest Degradation
Clearing
Secondary Forest

Image: © G.Asner/Carnegie Institution for Science

Corredor do Pontal


Intensity
Outgoing laser pulse
Pulse width
Beam divergence
Return waveform
Discrete records
Crown return
Understory return
Ground return
Footprint
Time

INSTITUTO
DE PESQUISAS ECOLÓGICAS

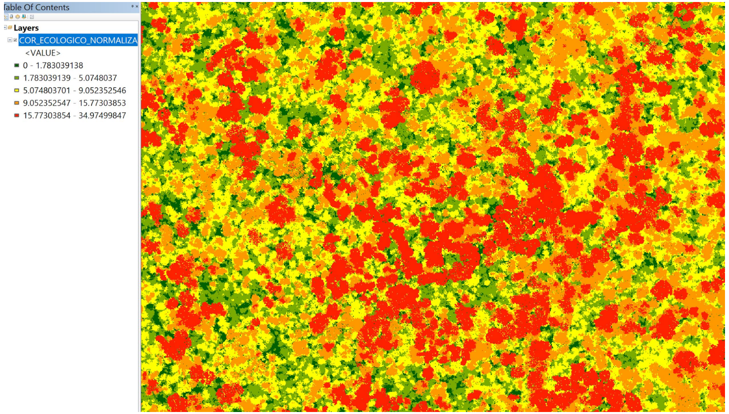


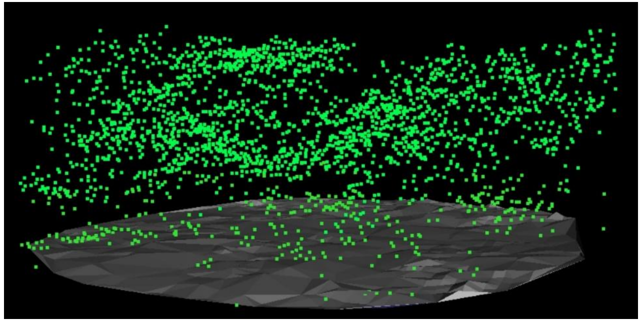
Table Of Contents

Layers

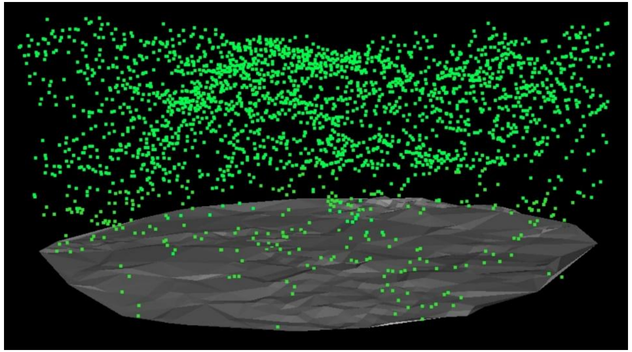
COR_ECOLOGICO_NORMALIZA

<VALUE>

- 🟩 0 - 1.783039138
- 🟩 1.783039139 - 5.0748037
- 🟨 5.074803701 - 9.052352546
- 🟧 9.052352547 - 15.77303853
- 🟥 15.77303854 - 34.97499847



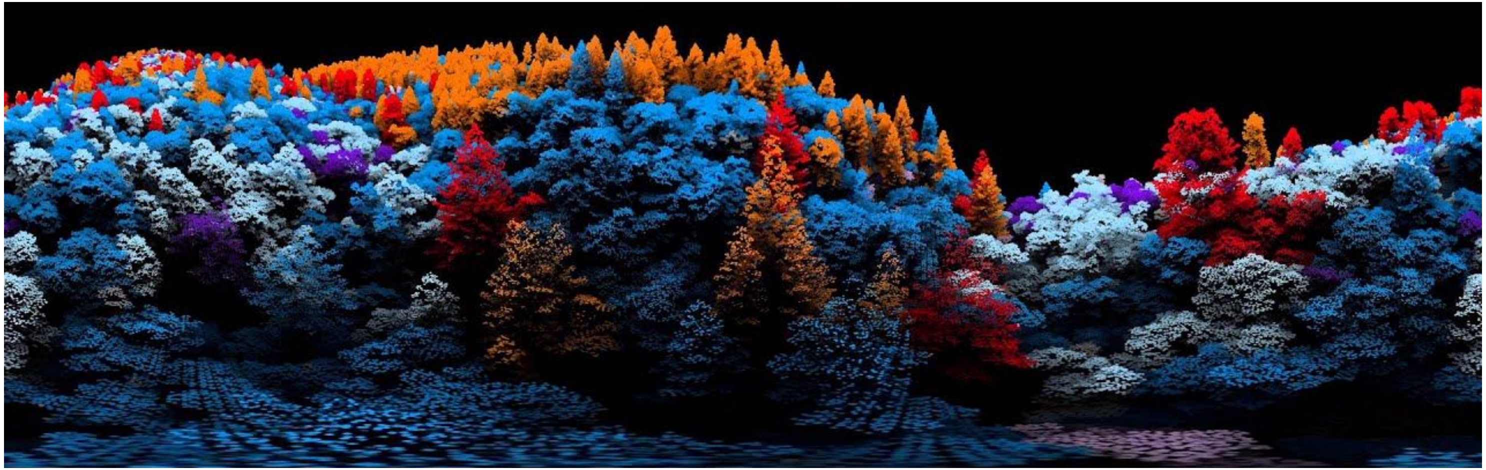
Parcela amostral 20 em Out/2015



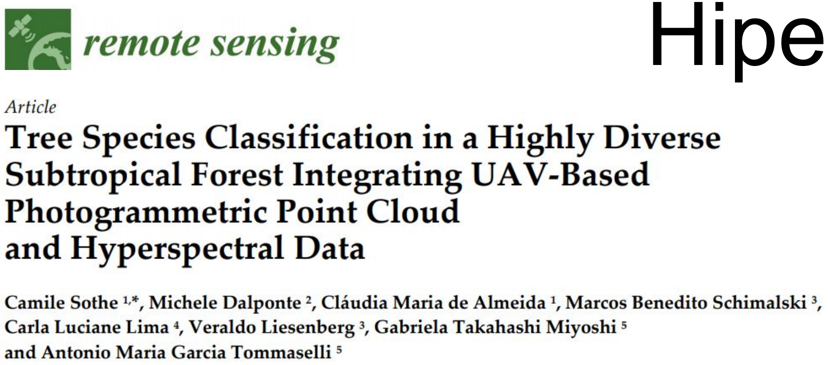
Parcela amostral 20 em Nov/2016

Hiperespectral

- Identificação de espécies vegetais por imagens hiperespectrais



Hiperespectral



remote sensing

Article

Tree Species Classification in a Highly Diverse Subtropical Forest Integrating UAV-Based Photogrammetric Point Cloud and Hyperspectral Data

Camile Sothe [1,*], Michele Dalponte [2], Cláudia Maria de Almeida [1], Marcos Benedito Schimalski [3], Carla Luciane Lima [4], Veraldo Liesenberg [3], Gabriela Takahashi Miyoshi [5] and Antonio Maria Garcia Tommaselli [5]

Remote Sens. 2019, 11, 1338; doi:10.3390/rs11111338

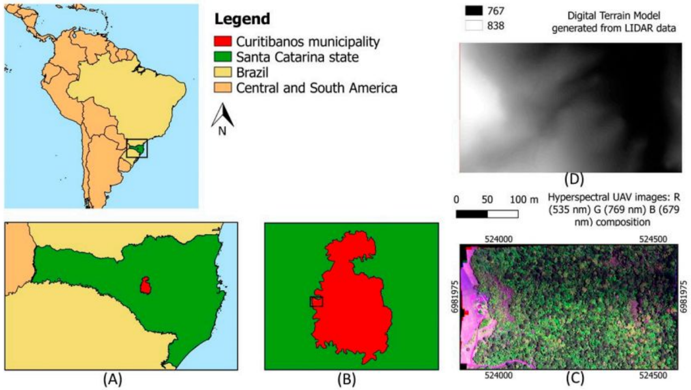

Legend
🟥 Curitibanos municipality
🟩 Santa Catarina state
Brazil
Central and South America
N
767
838
Digital Terrain Model generated from LIDAR data
(D)
0 50 100 m
Hyperspectral UAV images: R (535 nm) G (769 nm) B (679 nm) composition
524000
524500
6981975
(A)
(B)
(C)

Figure 1. Study area location. (**A**) Santa Catarina State. (**B**) Curitibanos municipality. (**C**) Hyperspectral UAV image R (535 nm) G (769 nm) B (679 nm). (**D**) Digital Terrain Model.

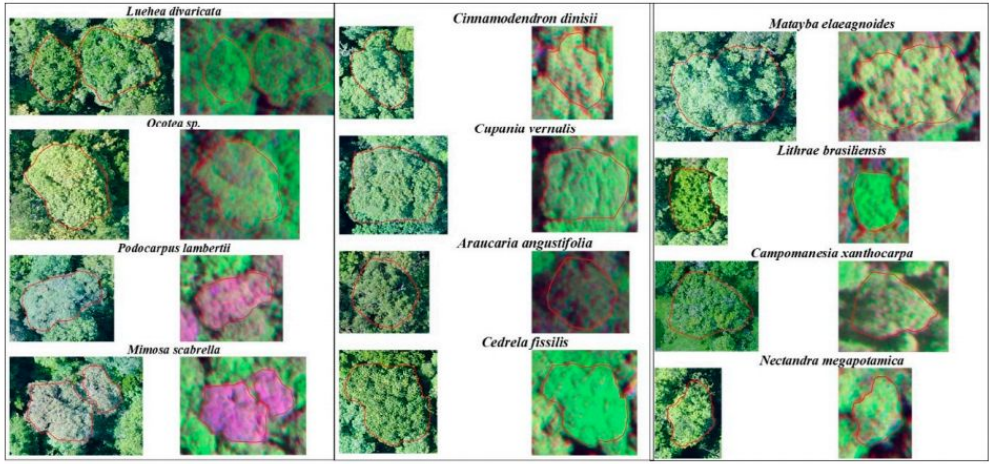
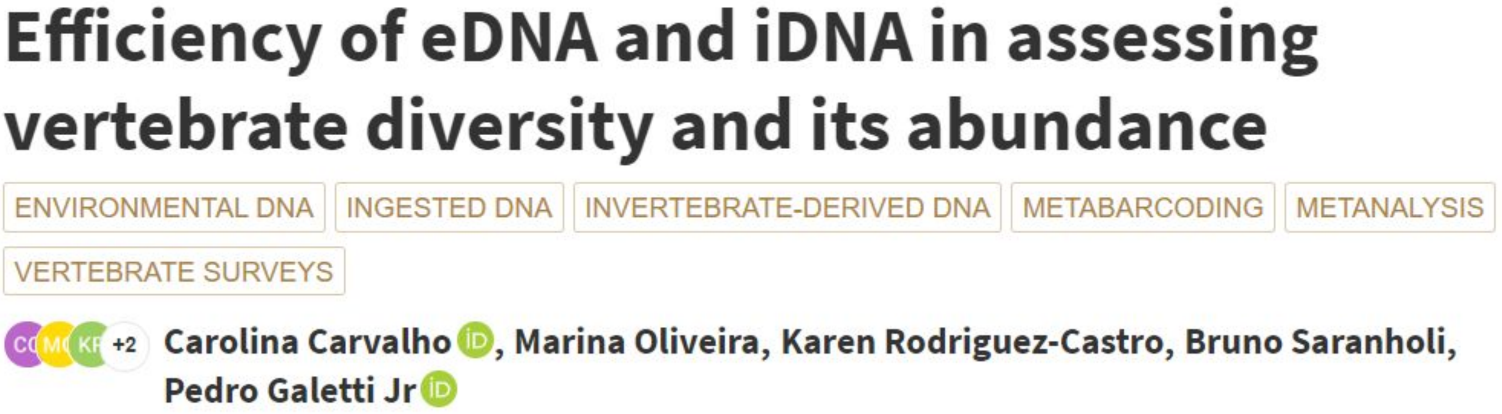

Luehea divaricata
Ocotea sp.
Podocarpus lambertii
Mimosa scabrella
Cinnamodendron dinisii
Cupania vernalis
Araucaria angustifolia
Cedrela fissilis
Matayba elaeagnoides
Lithrae brasiliensis
Campomanesia xanthocarpa
Nectandra megapotamica

Figure 2. Tree species classes delimitated in the unmanned aerial vehicle (UAV)-RGB image and the corresponding UAV-hyperspectral image.

Foi eficiente para a classificação das 12 espécies escolhidas

eDNA/iDNA



Efficiency of eDNA and iDNA in assessing vertebrate diversity and its abundance

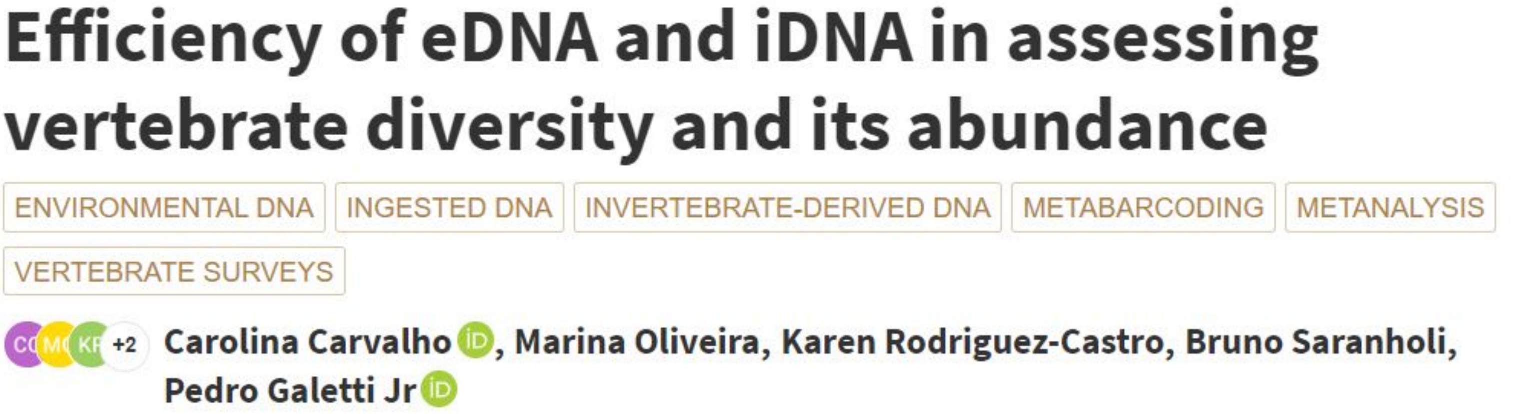
ENVIRONMENTAL DNA | INGESTED DNA | INVERTEBRATE-DERIVED DNA | METABARCODING | METANALYSIS | VERTEBRATE SURVEYS

Carolina Carvalho, Marina Oliveira, Karen Rodriguez-Castro, Bruno Saranholi, Pedro Galetti Jr

DOI: 10.22541/au.161777019.96557508/v1

> “The metanalysis showed that, in general, there is no difference in the number of species detected or number of sites that a target species was detected when using eDNA/iDNA or conventional methods, suggesting that eDNA/iDNA and conventional methods were equally efficient in characterizing the biodiversity.”

eDNA/iDNA



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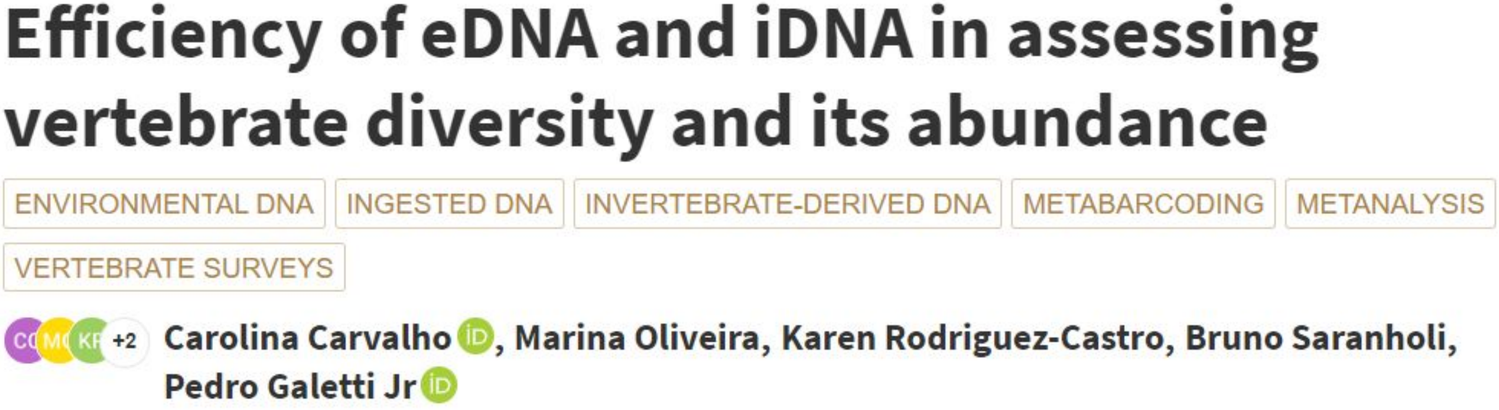
However, for water sampler and fish, separately, the risk of not finding a species was greater using conventional method than eDNA, suggesting that eDNA/iDNA was more efficient in finding the target species.

eDNA/iDNA



Efficiency of eDNA and iDNA in assessing vertebrate diversity and its abundance

ENVIRONMENTAL DNA
INGESTED DNA
INVERTEBRATE-DERIVED DNA
METABARCODING
METANALYSIS
VERTEBRATE SURVEYS

Carolina Carvalho, Marina Oliveira, Karen Rodriguez-Castro, Bruno Saranholi, Pedro Galetti Jr

DOI: 10.22541/au.161777019.96557508/v1

Abundance and biomass showed similar correlation patterns, and there was a positive correlation between eDNA/iDNA and abundance/biomass data, suggesting that eDNA/iDNA can be used as a proxy for abundance and biomass.

Metabarcoding
Metagenômica
DNA Ambiental (e-DNA)

Global Ecology and Conservation 17 (2019) e00547

Contents lists available at ScienceDirect

Global Ecology and Conservation

journal homepage: http://www.elsevier.com/locate/gecco

Review Paper

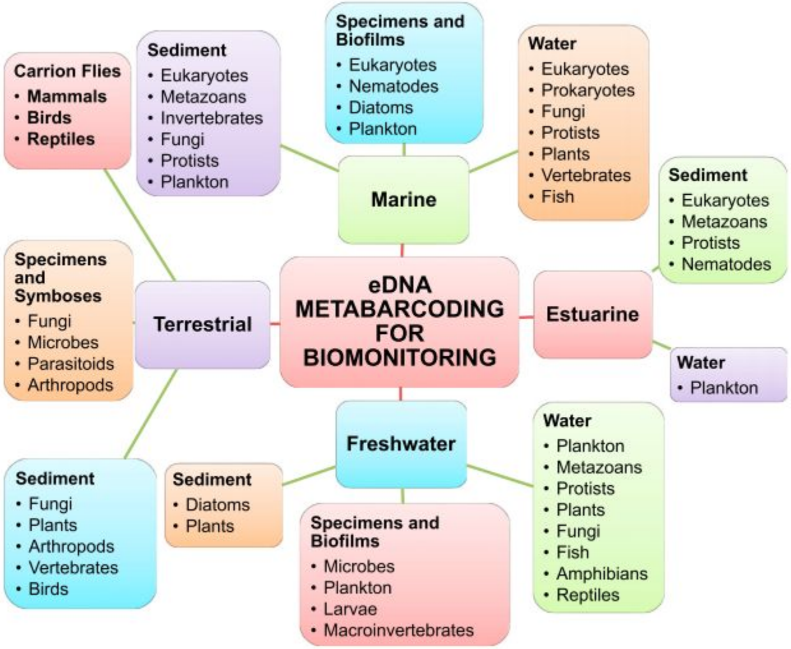
Past, present, and future perspectives of environmental DNA (eDNA) metabarcoding: A systematic review in methods, monitoring, and applications of global eDNA

Krista M. Ruppert [a,*], Richard J. Kline [a,b,**], Md Saydur Rahman [a,b,***]

[a] School of Earth, Environmental, and Marine Sciences, University of Texas Rio Grande Valley, Brownsville, TX, 78520, USA
[b] Department of Biology, University of Texas Rio Grande Valley, Brownsville, TX, 78520, USA

https://doi.org/10.1016/j.gecco.2019.e00547

K.M. Ruppert et al. / Global Ecology and Conservation 17 (2019) e00547



eDNA METABARCODING FOR BIOMONITORING

Marine

Sediment
- Eukaryotes
- Metazoans
- Invertebrates
- Fungi
- Protists
- Plankton

Specimens and Biofilms
- Eukaryotes
- Nematodes
- Diatoms
- Plankton

Water
- Eukaryotes
- Prokaryotes
- Fungi
- Protists
- Plants
- Vertebrates
- Fish

Terrestrial

Carrion Flies
- **Mammals**
- **Birds**
- **Reptiles**

Specimens and Symboses
- Fungi
- Microbes
- Parasitoids
- Arthropods

Sediment
- Fungi
- Plants
- Arthropods
- Vertebrates
- Birds

Estuarine

Sediment
- Eukaryotes
- Metazoans
- Protists
- Nematodes

Water
- Plankton

Freshwater

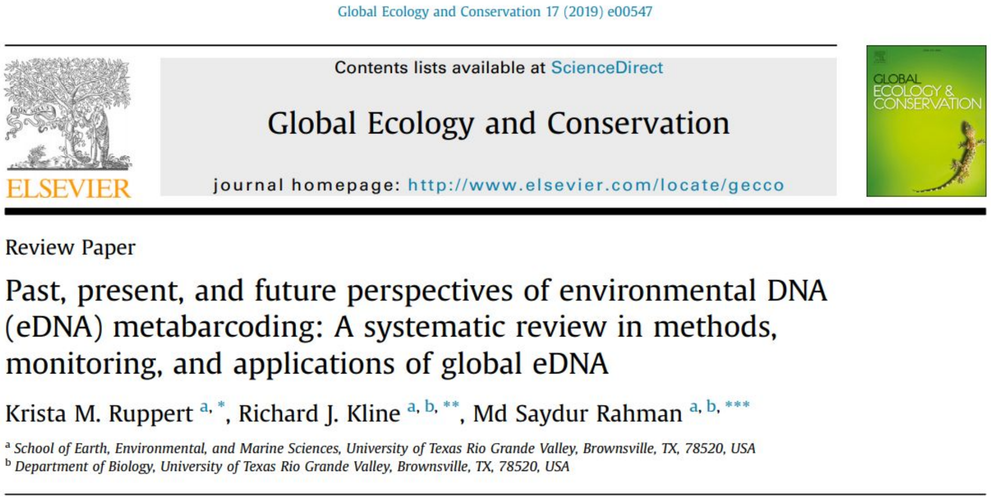
Sediment
- Diatoms
- Plants

Specimens and Biofilms
- Microbes
- Plankton
- Larvae
- Macroinvertebrates

Water
- Plankton
- Metazoans
- Protists
- Plants
- Fungi
- Fish
- Amphibians
- Reptiles

Fig. 1. Schematic diagram of global ecosystem and biodiversity monitoring with environmental DNA metabarcoding.

Metabarcoding
Metagenômica
DNA Ambiental (e-DNA)



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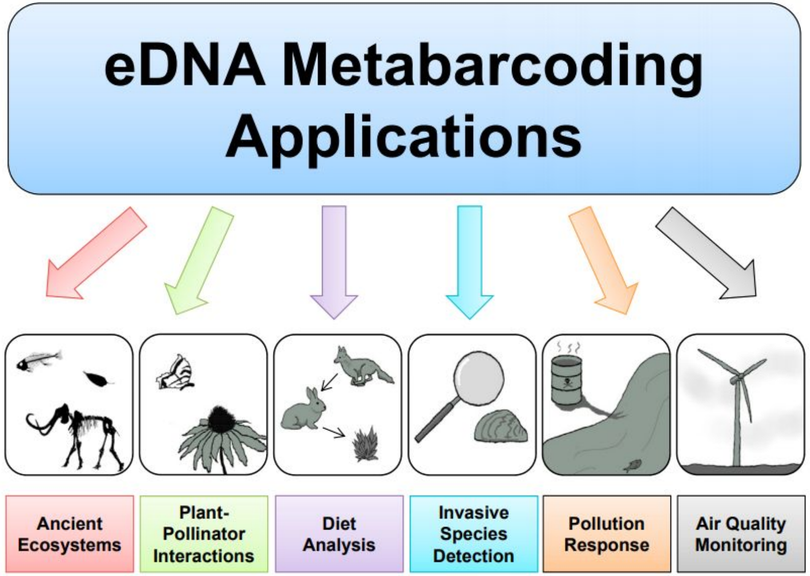
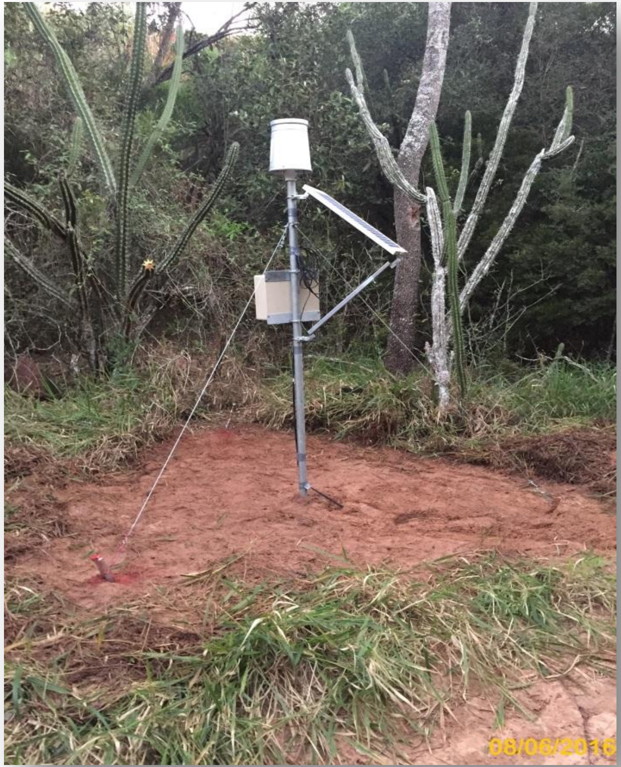

eDNA Metabarcoding Applications
Ancient Ecosystems
Plant-Pollinator Interactions
Diet Analysis
Invasive Species Detection
Pollution Response
Air Quality Monitoring

Fig. 2. Applications of environmental DNA metabarcoding in aquatic and terrestrial ecosystems.

Monitoramento biofísico

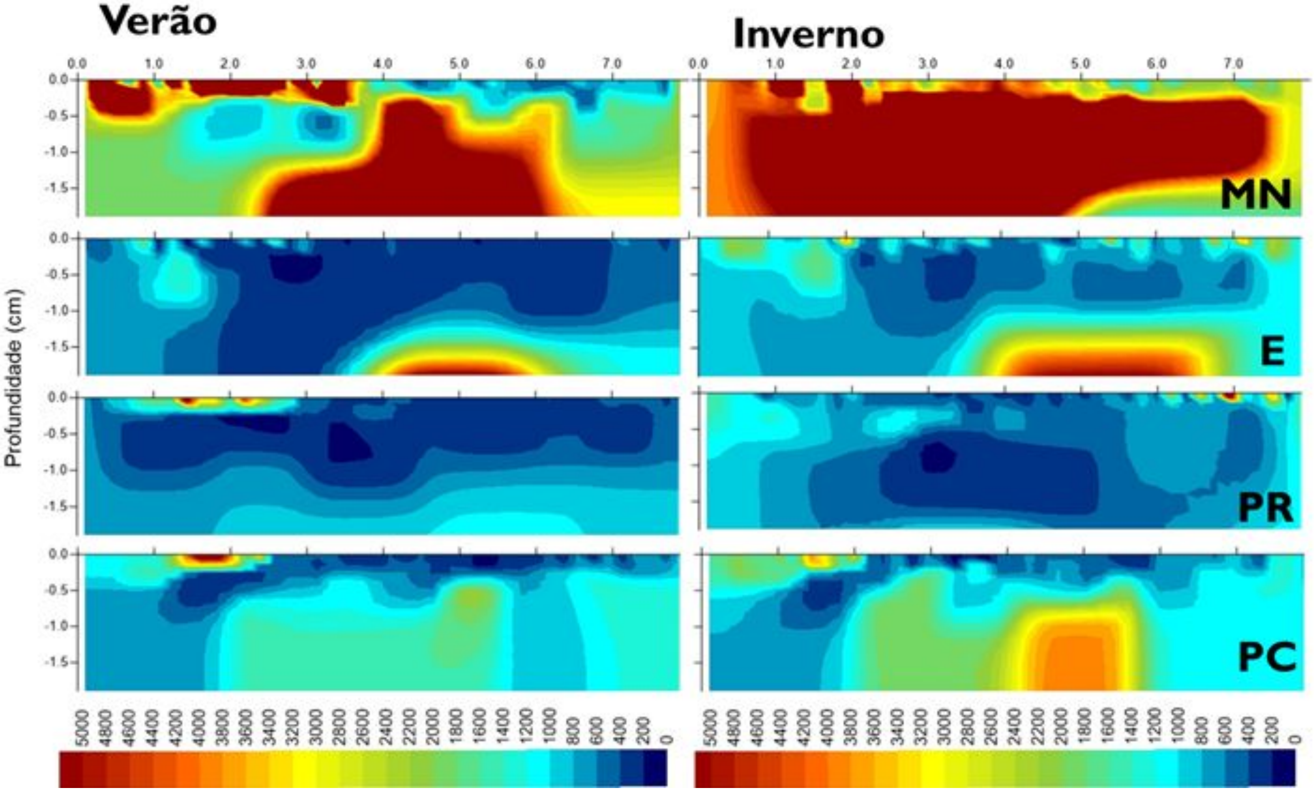


Datalogger
(a cada 10 min)

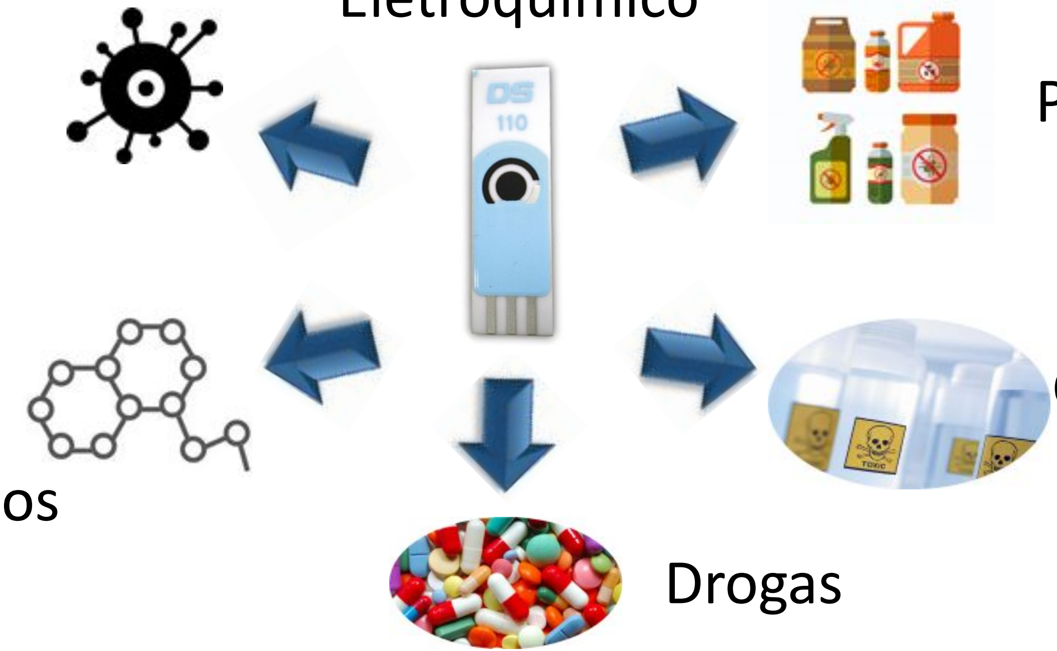
- ☐ Precipitação
- ☐ Turbidez
- ☐ Nível

Monitoramento biofísico

Umidade do solo



Monitoramento biofísico



Sensor
Eletroquímico

Doenças

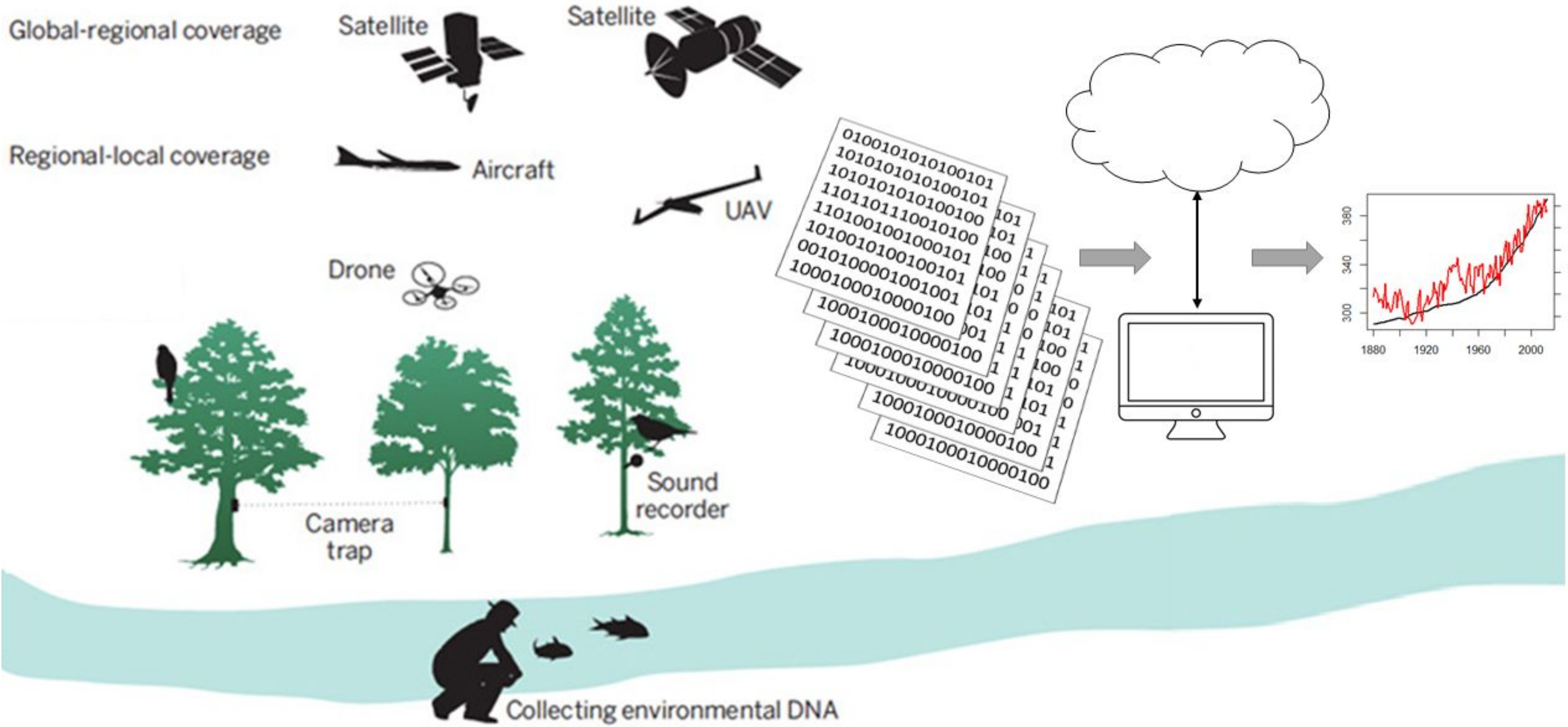
Pesticidas

Hormônios

Componentes
tóxicos

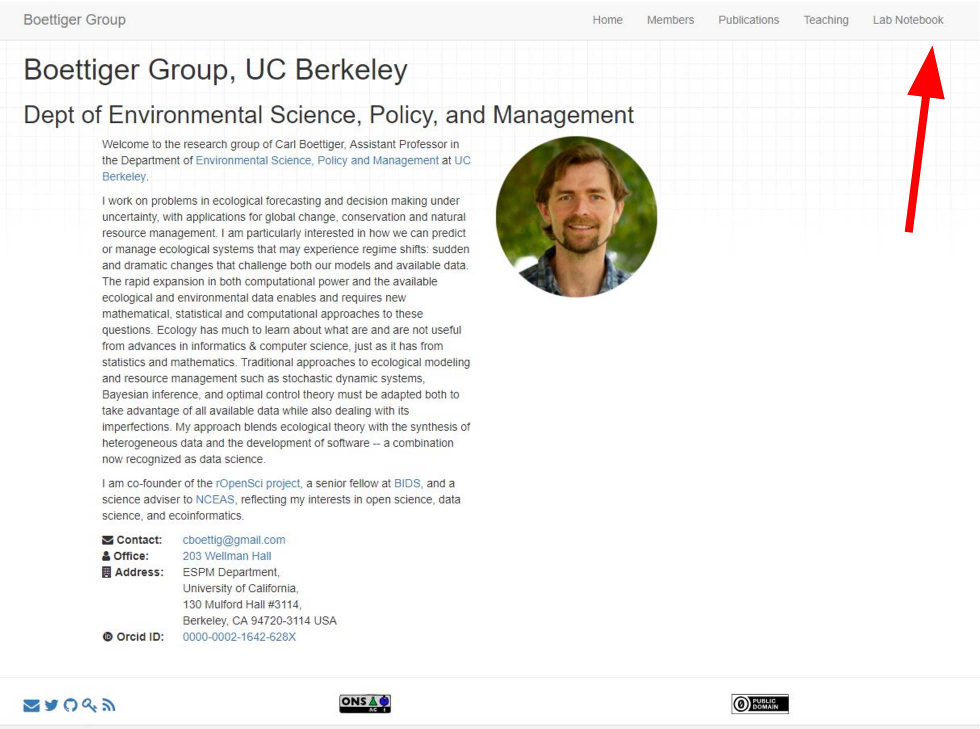
Drogas

Coleta e análise de dados


Global-regional coverage
Satellite
Satellite
Regional-local coverage
Aircraft
UAV
Drone
Camera trap
Sound recorder
Collecting environmental DNA
300
340
380
13.6
14.0
14.4
1880
1920
1960
2000

Adaptado de: Turner, 2014 (Science)

Análise de dados



Boettiger Group, UC Berkeley

Dept of Environmental Science, Policy, and Management

Welcome to the research group of Carl Boettiger, Assistant Professor in the Department of Environmental Science, Policy and Management at UC Berkeley.

I work on problems in ecological forecasting and decision making under uncertainty, with applications for global change, conservation and natural resource management. I am particularly interested in how we can predict or manage ecological systems that may experience regime shifts: sudden and dramatic changes that challenge both our models and available data. The rapid expansion in both computational power and the available ecological and environmental data enables and requires new mathematical, statistical and computational approaches to these questions. Ecology has much to learn about what are and are not useful from advances in informatics & computer science, just as it has from statistics and mathematics. Traditional approaches to ecological modeling and resource management such as stochastic dynamic systems, Bayesian inference, and optimal control theory must be adapted both to take advantage of all available data while also dealing with its imperfections. My approach blends ecological theory with the synthesis of heterogeneous data and the development of software -- a combination now recognized as data science.

I am co-founder of the rOpenSci project, a senior fellow at BIDS, and a science adviser to NCEAS, reflecting my interests in open science, data science, and ecoinformatics.

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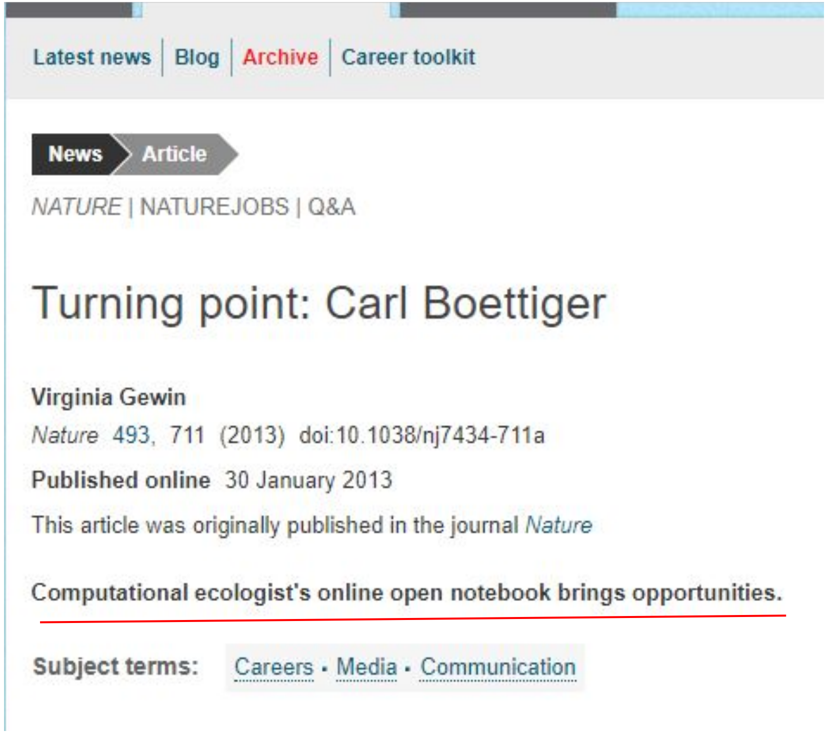
Address: ESPM Department,
University of California,
130 Mulford Hall #3114,
Berkeley, CA 94720-3114 USA
Orcid ID: 0000-0002-1642-628X



NATURE | NATUREJOBS | Q&A

Turning point: Carl Boettiger

Virginia Gewin

Nature 493, 711 (2013) doi:10.1038/nj7434-711a

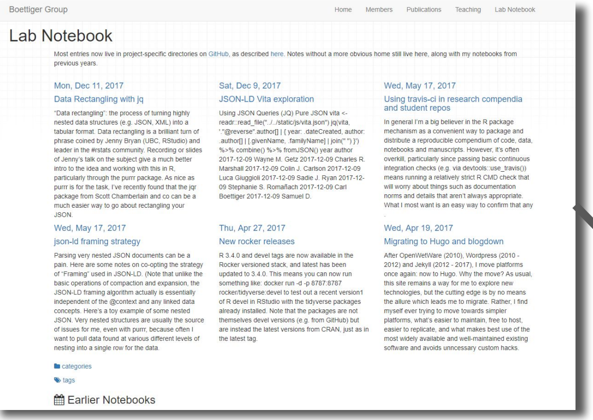
Published online 30 January 2013

This article was originally published in the journal *Nature*

Computational ecologist's online open notebook brings opportunities.

Subject terms: Careers · Media · Communication

Análise de dados



Lab Notebook

Most entries now live in project-specific directories on GitHub, as described here. Notes without a more obvious home still live here, along with my notebooks from previous years.

Mon, Dec 11, 2017

Data Rectangling with jq

"Data rectangling": the process of turning highly nested data structures (e.g. JSON, XML) into a tabular format. Data rectangling is a brilliant turn of phrase coined by Jenny Bryan (UBC, RStudio) and leader in the #rstats community. Recording or slides of Jenny's talk on the subject give a much better intro to the idea and working with this in R, particularly through the purrr package. As nice as purrr is for the task, I've recently found that the jqr package from Scott Chamberlain and co can be a much easier way to go about rectangling your JSON.

Sat, Dec 9, 2017

JSON-LD Vita exploration

Using JSON Queries (JQ) Pure JSON vita <- readr::read_file("../../static/js/vita.json") jq(vita, '."@reverse".author[] | { year: .dateCreated, author: .author[] | [.givenName, .familyName] | join(" ") }') %>% combine() %>% fromJSON() year author 2017-12-09 Wayne M. Getz 2017-12-09 Charles R. Marshall 2017-12-09 Colin J. Carlson 2017-12-09 Luca Giuggioli 2017-12-09 Sadie J. Ryan 2017-12-09 Stephanie S. Romañach 2017-12-09 Carl Boettiger 2017-12-09 Samuel D.

Wed, May 17, 2017

Using travis-ci in research compendia and student repos

In general I'm a big believer in the R package mechanism as a convenient way to package and distribute a reproducible compendium of code, data, notebooks and manuscripts. However, it's often overkill, particularly since passing basic continuous integration checks (e.g. via devtools::use_travis()) means running a relatively strict R CMD check that will worry about things such as documentation norms and details that aren't always appropriate. What I most want is an easy way to confirm that any .

Wed, May 17, 2017

json-ld framing strategy

Parsing very nested JSON documents can be a pain. Here are some notes on co-opting the strategy of "Framing" used in JSON-LD. (Note that unlike the basic operations of compaction and expansion, the JSON-LD framing algorithm actually is essentially independent of the @context and any linked data concepts. Here's a toy example of some nested JSON. Very nested structures are usually the source of issues for me, even with purrr, because often I want to pull data found at various different levels of nesting into a single row for the data.

Thu, Apr 27, 2017

New rocker releases

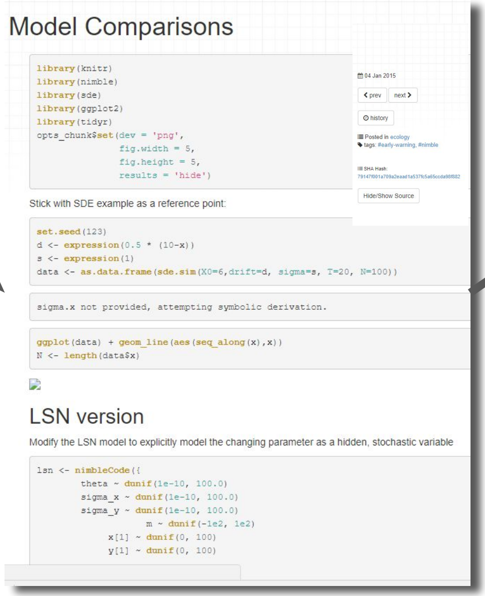
R 3.4.0 and devel tags are now available in the Rocker versioned stack, and latest has been updated to 3.4.0. This means you can now run something like: docker run -d -p 8787:8787 rocker/tidyverse:devel to test out a recent version1 of R devel in RStudio with the tidyverse packages already installed. Note that the packages are not themselves devel versions (e.g. from GitHub) but are instead the latest versions from CRAN, just as in the latest tag.

Wed, Apr 19, 2017

Migrating to Hugo and blogdown

After OpenWetWare (2010), Wordpress (2010 - 2012) and Jekyll (2012 - 2017), I move platforms once again: now to Hugo. Why the move? As usual, this site remains a way for me to explore new technologies, but the cutting edge is by no means the allure which leads me to migrate. Rather, I find myself ever trying to move towards simpler platforms, what's easier to maintain, free to host, easier to replicate, and what makes best use of the most widely available and well-maintained existing software and avoids unncessary custom hacks.

Earlier Notebooks



Model Comparisons

```r
library(knitr)
library(nimble)
library(sde)
library(ggplot2)
library(tidyr)
opts_chunk$set(dev = 'png',
               fig.width = 5,
               fig.height = 5,
               results = 'hide')
```

Stick with SDE example as a reference point:

```r
set.seed(123)
d <- expression(0.5 * (10-x))
s <- expression(1)
data <- as.data.frame(sde.sim(X0=6,drift=d, sigma=s, T=20, N=100))
```

```
sigma.x not provided, attempting symbolic derivation.
```

```r
ggplot(data) + geom_line(aes(seq_along(x),x))
N <- length(data$x)
```

04 Jan 2015

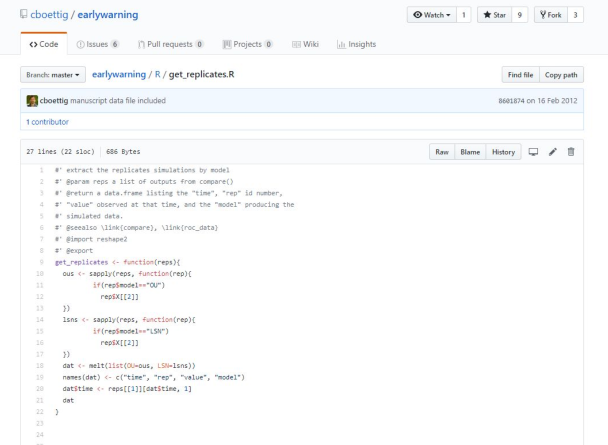
Posted in ecology
tags: #early-warning, #nimble

SHA Hash:
79147f001a709a2eaad1a537fc5a65ccda98f882

LSN version

Modify the LSN model to explicitly model the changing parameter as a hidden, stochastic variable

```r
lsn <- nimbleCode({
        theta ~ dunif(1e-10, 100.0)
        sigma_x ~ dunif(1e-10, 100.0)
        sigma_y ~ dunif(1e-10, 100.0)
                    m ~ dunif(-1e2, 1e2)
             x[1] ~ dunif(0, 100)
             y[1] ~ dunif(0, 100)
```



cboettig / earlywarning

earlywarning / R / get_replicates.R

cboettig manuscript data file included 8601874 on 16 Feb 2012

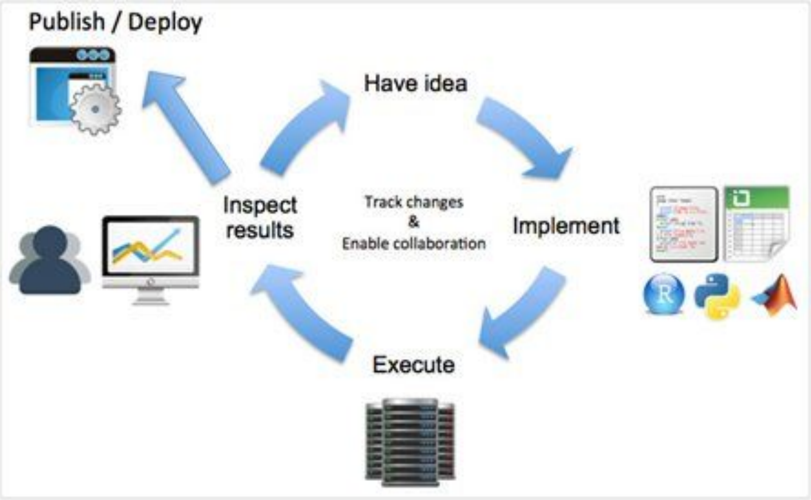
1 contributor

27 lines (22 sloc) | 686 Bytes

```r
#' extract the replicates simulations by model
#' @param reps a list of outputs from compare()
#' @return a data.frame listing the "time", "rep" id number,
#' "value" observed at that time, and the "model" producing the
#' simulated data.
#' @seealso \link{compare}, \link{roc_data}
#' @import reshape2
#' @export
get_replicates <- function(reps){
  ous <- sapply(reps, function(rep){
          if(rep$model=="OU")
            rep$X[[2]]
  })
  lsns <- sapply(reps, function(rep){
          if(rep$model=="LSN")
            rep$X[[2]]
  })
  dat <- melt(list(OU=ous, LSN=lsns))
  names(dat) <- c("time", "rep", "value", "model")
  dat$time <- reps[[1]][dat$time, 1]
  dat
}
```

Análise de dados

- gitHub
- Workflow
- Código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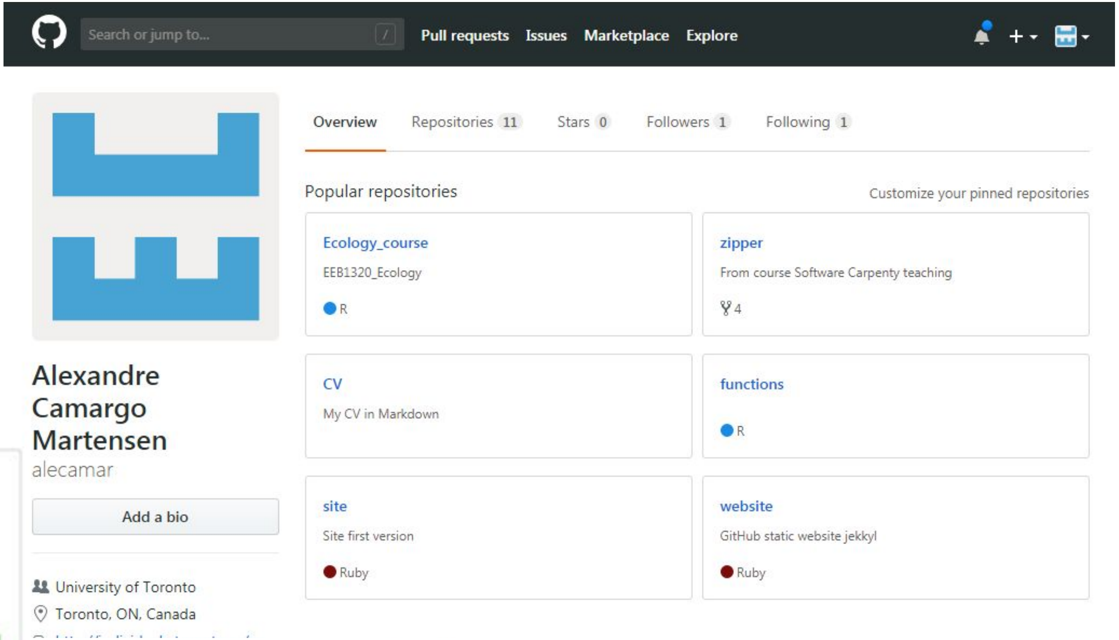
Have idea
Inspect results
Track changes & Enable collaboration
Implement
Execute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CV My CV in Markdown	**functions** ● R
site Site first version ● Ruby	**website** GitHub static website jekkyl ● Ruby

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- Dropbox/Papers
- gDrive + editor
- Markdown
- Word
- LaTex
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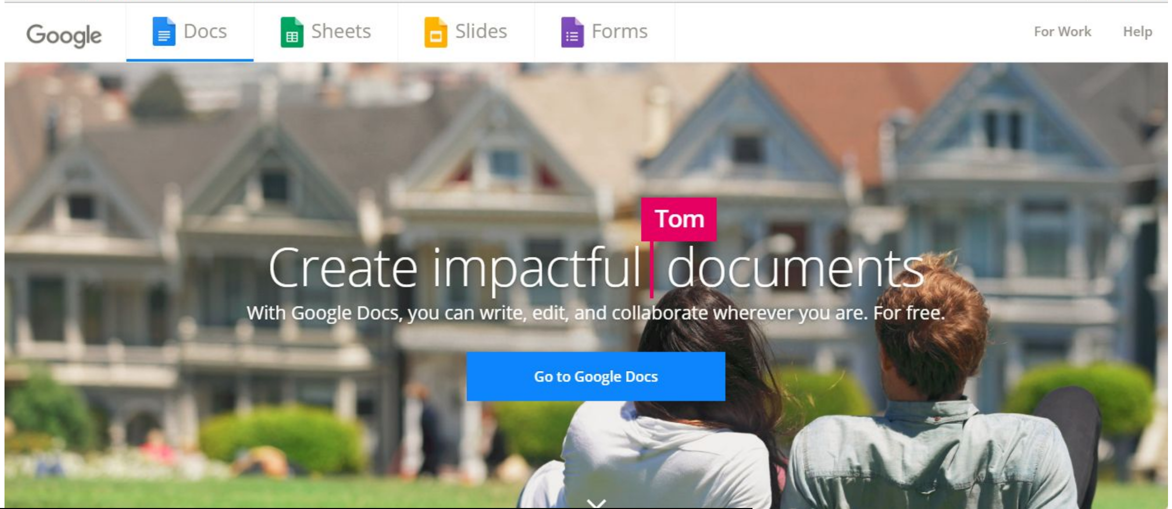
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Slides
Forms
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Tom
Go to Google Docs

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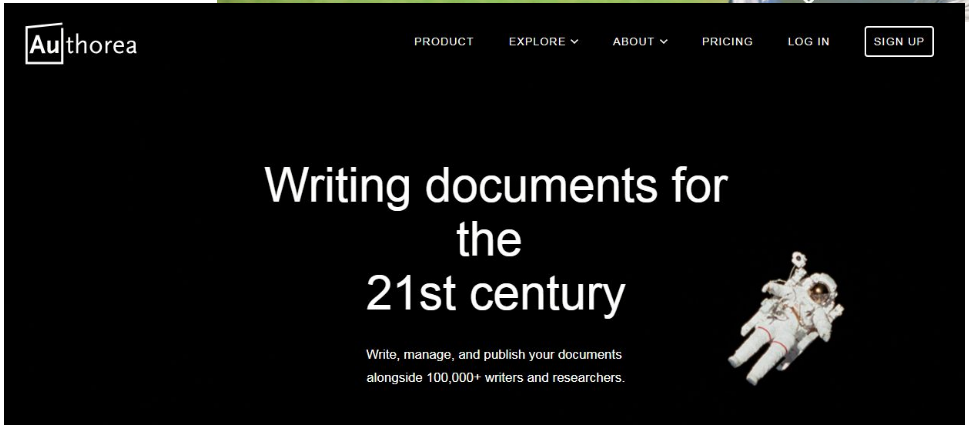
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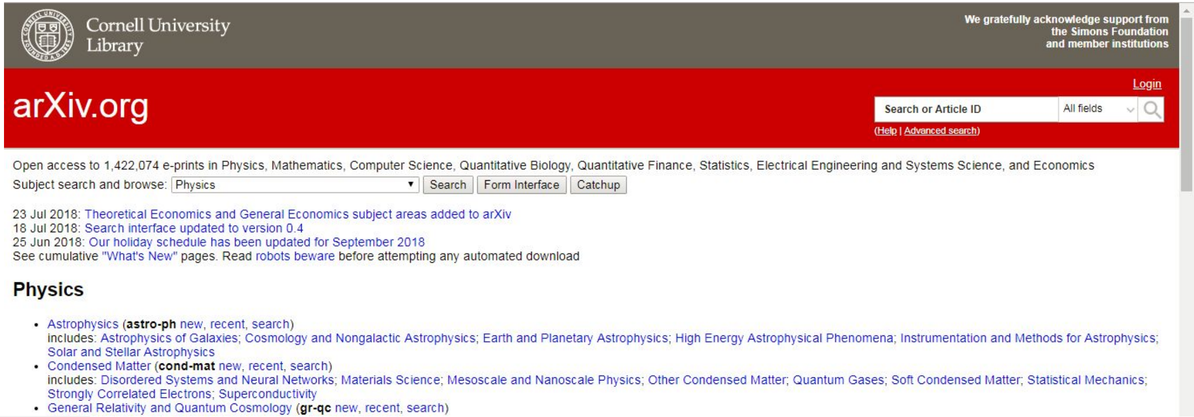

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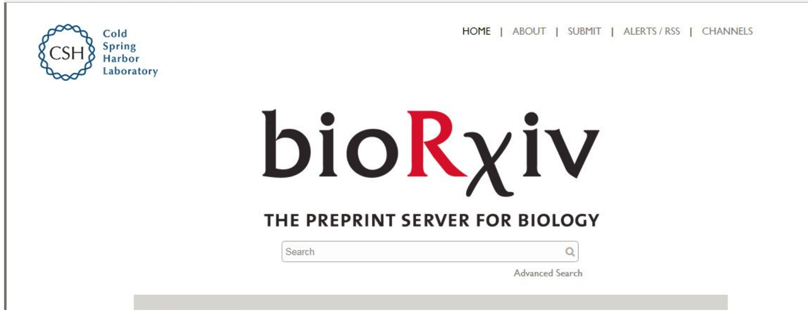
  includes: Astrophysics of Galaxies; Cosmology and Nongalactic Astrophysics; Earth and Planetary Astrophysics; High Energy Astrophysical Phenomena; Instrumentation and Methods for Astrophysics; Solar and Stellar Astrophysics
- Condensed Matter (**cond-mat** new, recent, search)
  includes: Disordered Systems and Neural Networks; Materials Science; Mesoscale and Nanoscale Physics; Other Condensed Matter; Quantum Gases; Soft Condensed Matter; Statistical Mechanics; Strongly Correlated Electrons; Superconductivity
- General Relativity and Quantum Cosmology (**gr-qc** new, recent, search)



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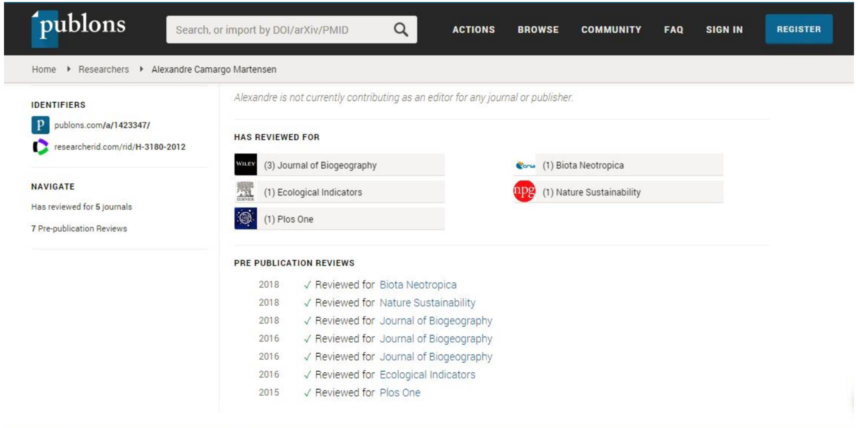
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NAVIGATE

Has reviewed for 5 journals

7 Pre-publication Reviews

Alexandre is not currently contributing as an editor for any journal or publisher.

HAS REVIEWED FOR

(3) Journal of Biogeography

(1) Ecological Indicators

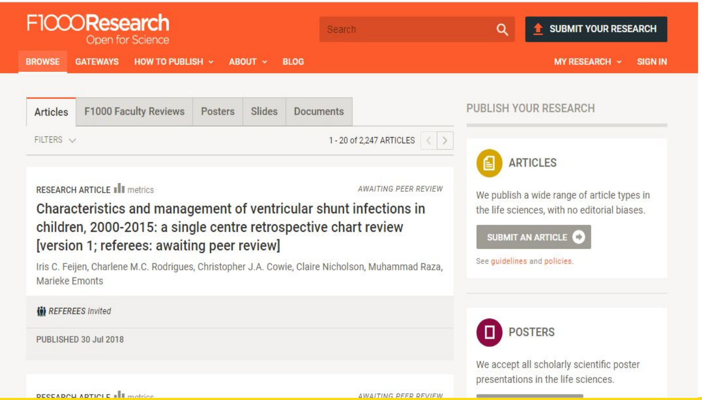
(1) Plos One

(1) Biota Neotropica

(1) Nature Sustainability

PRE PUBLICATION REVIEWS

2018	✓ Reviewed for Biota Neotropica
2018	✓ Reviewed for Nature Sustainability
2018	✓ Reviewed for Journal of Biogeography
2016	✓ Reviewed for Journal of Biogeography
2016	✓ Reviewed for Journal of Biogeography
2016	✓ Reviewed for Ecological Indicators
2015	✓ Reviewed for Plos One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RESEARCH ARTICLE metrics AWAITING PEER REVIEW

Characteristics and management of ventricular shunt infections in children, 2000-2015: a single centre retrospective chart review [version 1; referees: awaiting peer review]

Iris C. Feijen, Charlene M.C. Rodrigues, Christopher J.A. Cowie, Claire Nicholson, Muhammad Raza, Marieke Emonts

REFEREES Invited

PUBLISHED 30 Jul 2018

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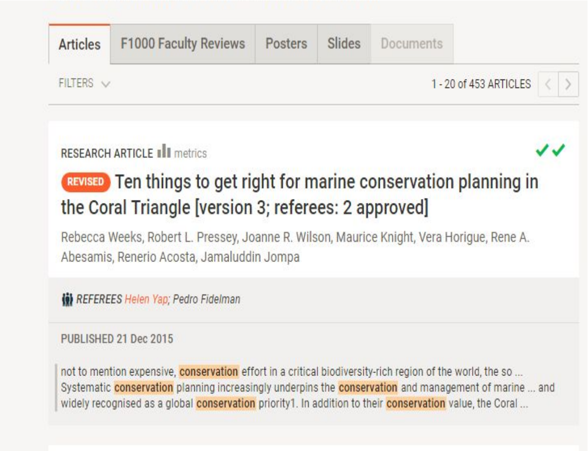
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1 - 20 of 453 ARTICLES

RESEARCH ARTICLE metrics ✓✓

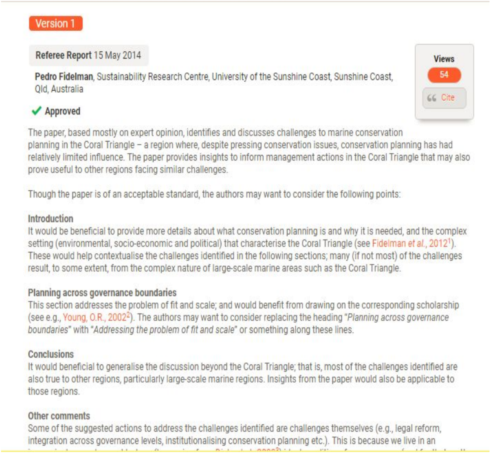
REVISED Ten things to get right for marine conservation planning in the Coral Triangle [version 3; referees: 2 approved]

Rebecca Weeks, Robert L. Pressey, Joanne R. Wilson, Maurice Knight, Vera Horigue, Rene A. Abesamis, Renerio Acosta, Jamaluddin Jompa

REFEREES Helen Yap; Pedro Fidelman

PUBLISHED 21 Dec 2015

not to mention expensive, conservation effort in a critical biodiversity-rich region of the world, the so ... Systematic conservation planning increasingly underpins the conservation and management of marine ... and widely recognised as a global conservation priority1. In addition to their conservation value, the Coral ...


Version 1
Views
54
Cite

Referee Report 15 May 2014

Pedro Fidelman, Sustainability Research Centre, University of the Sunshine Coast, Sunshine Coast, Qld, Australia

✓ **Approved**

The paper, based mostly on expert opinion, identifies and discusses challenges to marine conservation planning in the Coral Triangle – a region where, despite pressing conservation issues, conservation planning has had relatively limited influence. The paper provides insights to inform management actions in the Coral Triangle that may also prove useful to other regions facing similar challenges.

Though the paper is of an acceptable standard, the authors may want to consider the following points:

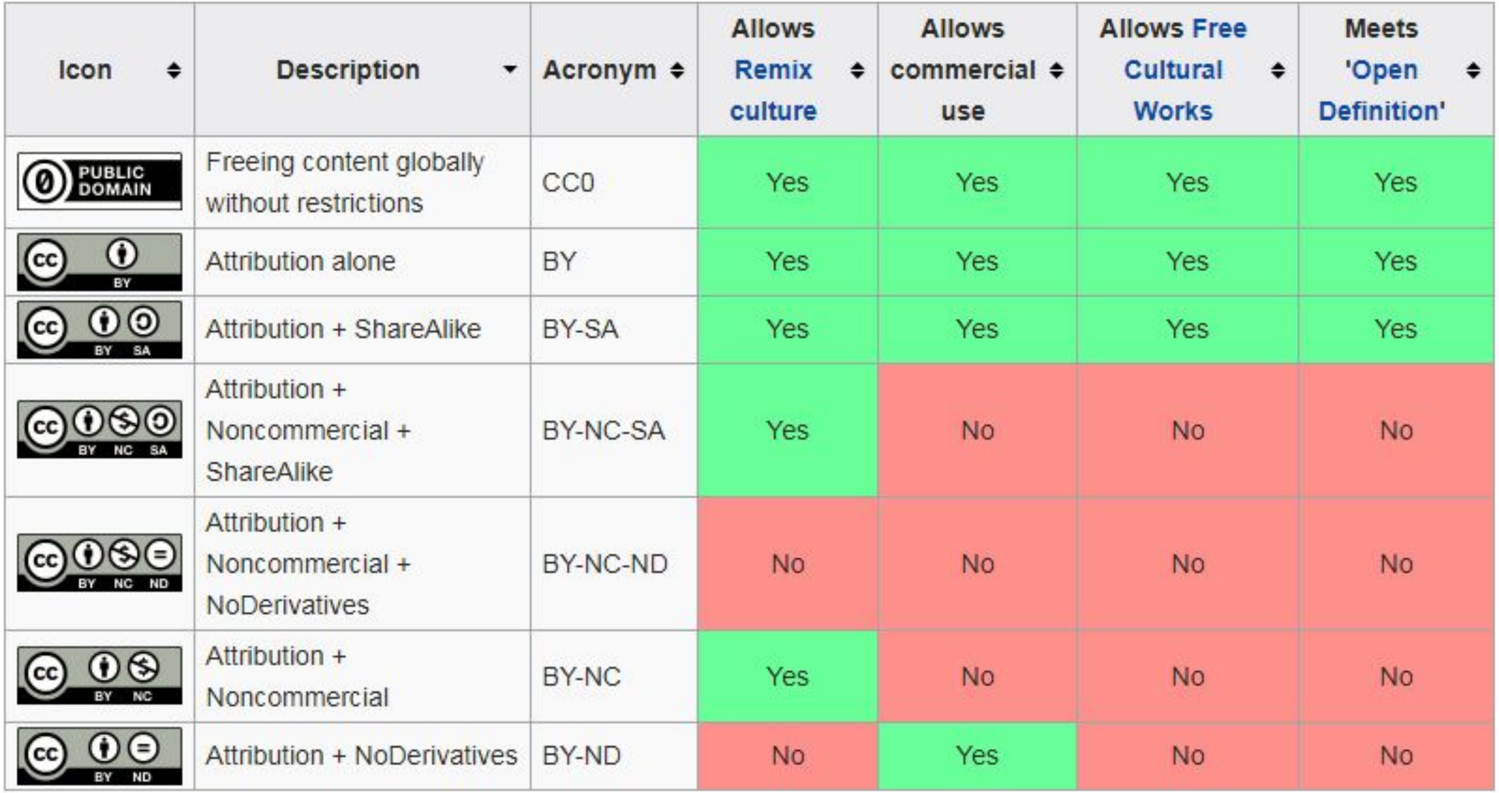
Introduction
It would be beneficial to provide more details about what conservation planning is and why it is needed, and the complex setting (environmental, socio-economic and political) that characterise the Coral Triangle (see Fidelman *et al.*, 2012[1]). These would help contextualise the challenges identified in the following sections; many (if not most) of the challenges result, to some extent, from the complex nature of large-scale marine areas such as the Coral Triangle.

Planning across governance boundaries
This section addresses the problem of fit and scale; and would benefit from drawing on the corresponding scholarship (see e.g., Young, O.R., 2002[2]). The authors may want to consider replacing the heading "*Planning across governance boundaries*" with "*Addressing the problem of fit and scale*" or something along these lines.

Conclusions
It would beneficial to generalise the discussion beyond the Coral Triangle; that is, most of the challenges identified are also true to other regions, particularly large-scale marine regions. Insights from the paper would also be applicable to those regions.

Other comments
Some of the suggested actions to address the challenges identified are challenges themselves (e.g., legal reform, integration across governance levels, institutionalising conservation planning etc.). This is because we live in an

Publicações - Open



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Artigos não são boas ferramentas para divulgar...

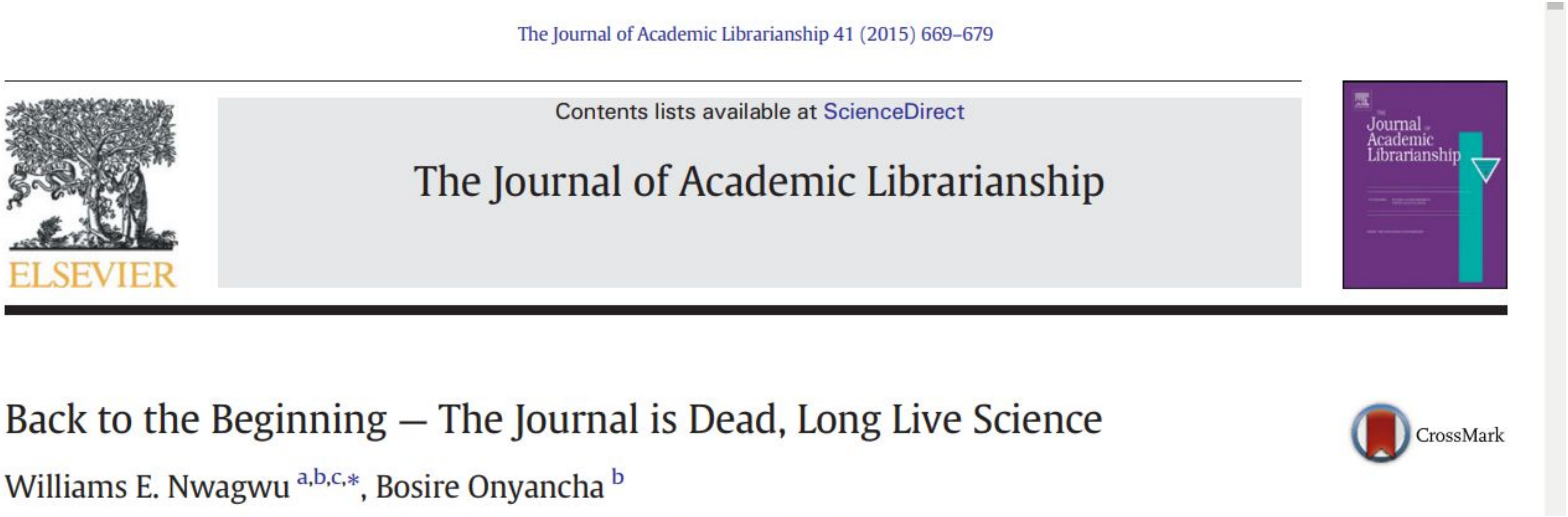
“…the basic means of communicating scientific results hasn’t changed for 400 years. Papers may be posted online, but they’re still text and pictures on a page.”

omic analysis of elongated skulls
ensive female-biased immigration
arly Medieval Bavaria

https://www.theatlantic.com/science/archive/2018/04/the-scientific-paper-is-obsolete/556676/

Publicação

- Futuro...



The Journal of Academic Librarianship 41 (2015) 669–679

Contents lists available at ScienceDirect

The Journal of Academic Librarianship

Back to the Beginning — The Journal is Dead, Long Live Science

Williams E. Nwagwu [a,b,c,*], Bosire Onyancha [b]

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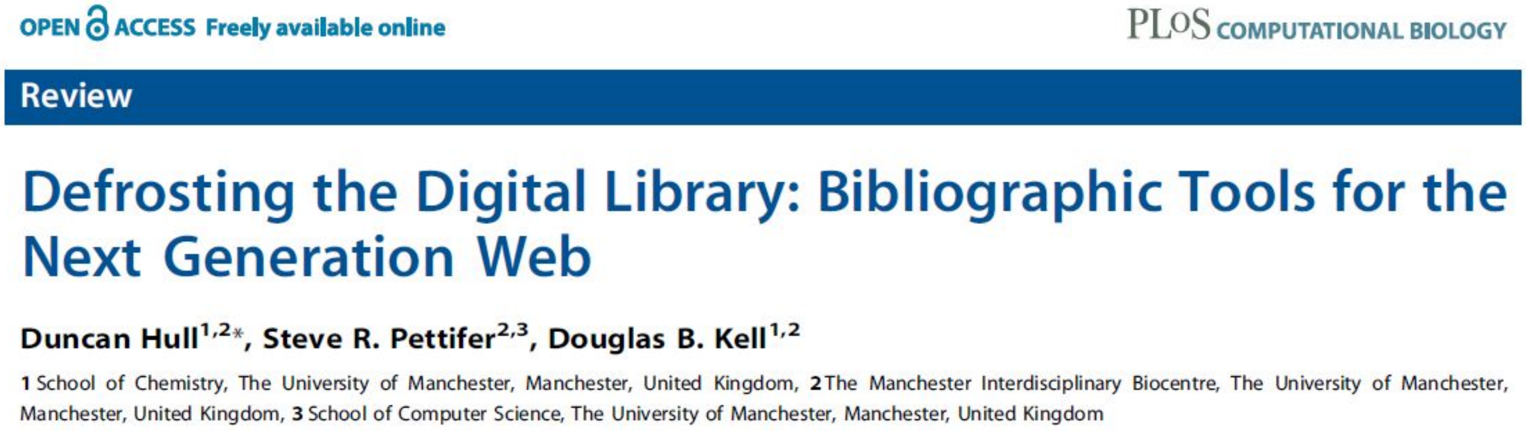

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PLoS COMPUTATIONAL BIOLOGY

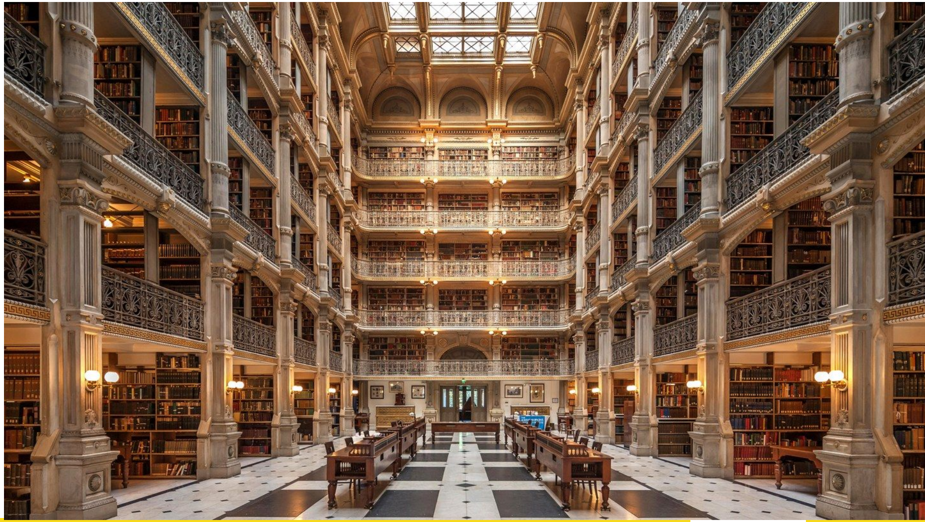
Review

Defrosting the Digital Library: Bibliographic Tools for the Next Generation Web

Duncan Hull[1,2]*, Steve R. Pettifer[2,3], Douglas B. Kell[1,2]

1 School of Chemistry, The University of Manchester, Manchester, United Kingdom, **2** The Manchester Interdisciplinary Biocentre, The University of Manchester, Manchester, United Kingdom, **3** School of Computer Science, The University of Manchester, Manchester, United Kingdom

Bibliotecas são congeladas
Digitais ou físicas



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- ResearchGate
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  - Perguntas e respostas
- F1000
  - Revisões
- Science/Nature/Plos outros
  - Comentários
  - Life figures
  - Wiki like papers
  - Comentários

- Mendeley
  - Grupos de discussão

- ResearchGate

  - Grupos de discussão, recomendações, fazer/responder perguntas

- Academia

- F1000

Encontrando, armazenando, organizando e recuperando

- Google
- Mendeley, Mendeley groups
- RSS
- ResearchGate
- Identificadores (PMID, DOI, ISBN...)
- Identificadores de autores (ORCID, researcherID, CrossRef, OpenID)
- Metadados (RIS, BibTex, etc)
- Semantic Web (machine-readable)
- “wisdom of crowds”

- Dificuldades:
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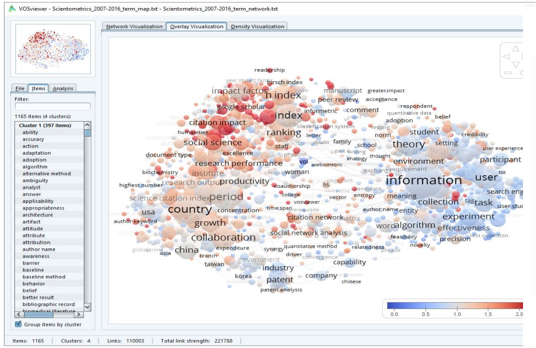
  - Baixar/catalogar publicações citadas em um determinado artigo (CiteULike)
  - Baixar/catalogar publicações de um autor


VOSviewer - Scientometrics_2007-2016_term_map.txt - Scientometrics_2007-2016_term_network.txt
Network Visualization
Overlay Visualization
Density Visualization
File
Items
Analysis
Filter:
1165 items (4 clusters):
Cluster 1 (397 items)
Group items by cluster
impact factor
h index
index
citation impact
social science
ranking
theory
information
user
research performance
productivity
period
country
growth
collaboration
china
citation network
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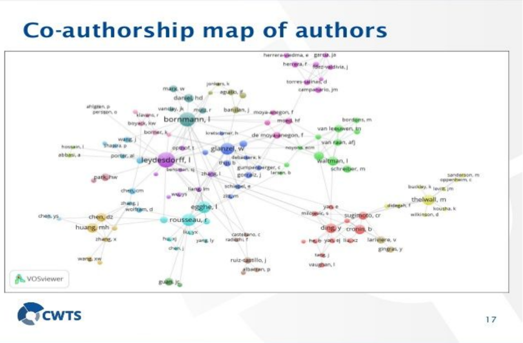
Links: 110003
Total link strength: 221788


Co-authorship map of authors
bornmann, l
leydesdorff, l
glanzel, w
waltman, l
egghe, l
rousseau, r
thelwall, m
VOSviewer
CWTS
17

Vosviewer
CitNetExplored

https://www.slideshare.net/NeesJanvanEck/vosviewer-and-citnetexplorer-software-tools-for-bibliometric-analysis-of-scientific-publications

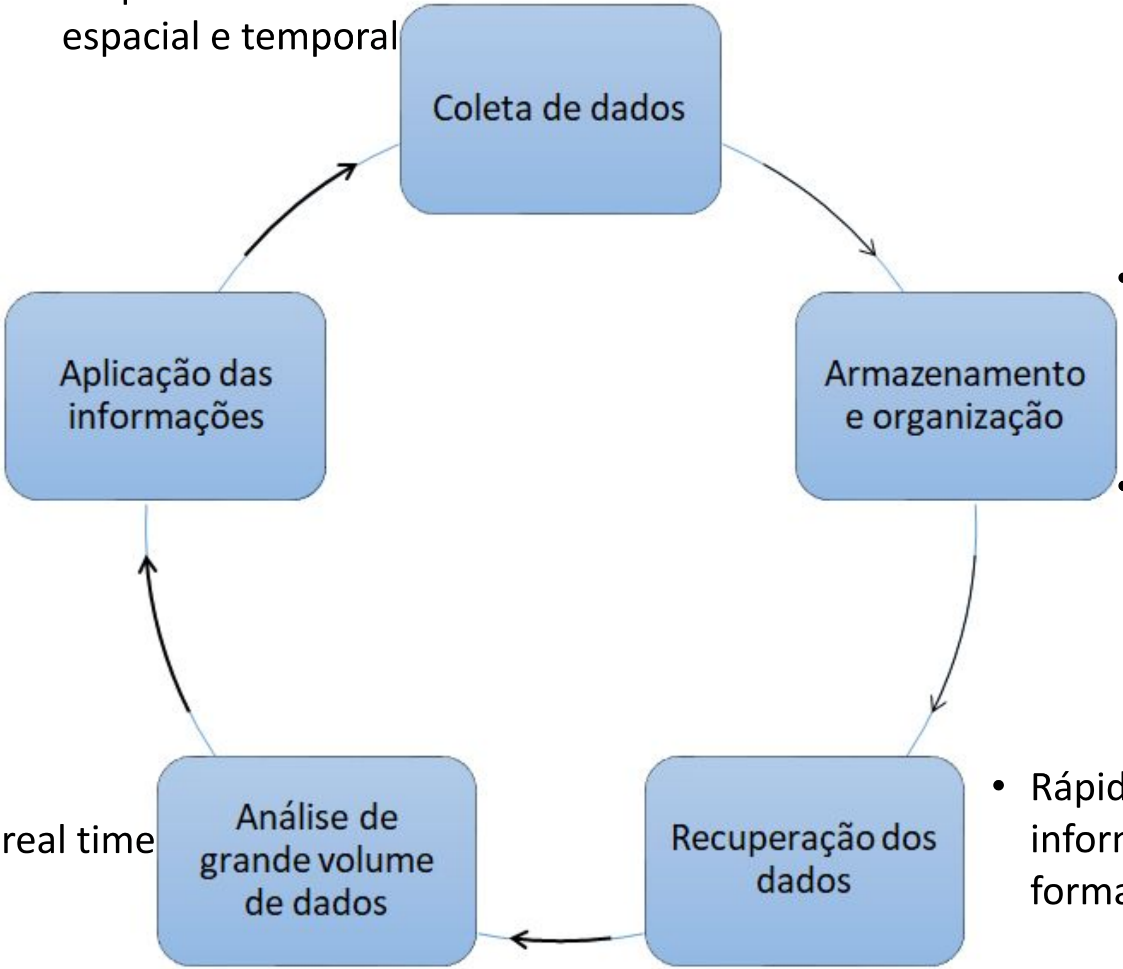
Crédito pelo trabalho

- Bancos de dados/coleta de dados
- Código/Script
- Redação (artigos estão definindo o que cada um fez)
- Publicação não é o fim…
- Revisão, comentários, dados extra, *replies*, *append* numa forma de “wiki”, *dynamic notebooks*
- Divulgação extra-acadêmica

Bibliotecas digitais são congeladas também...

Perhaps the paper itself is to blame. Scientific methods evolve now at the speed of software; the skill most in demand among physicists, biologists, chemists, geologists, even anthropologists and research psychologists, is facility with programming languages and “data science” packages.

https://www.theatlantic.com/science/archive/2018/04/the-scientific-paper-is-obsolete/556676/



- Novas tecnologias
- Ampla cobertura espacial e temporal

Coleta de dados

Armazenamento e organização

- Sons, dados genéticos, informações ambientais, etc
- Nuvem

Recuperação dos dados

- Rápido resgate da informação em formato útil

Análise de grande volume de dados

- Open source
- Open data
- Open protocol
- Open Science em real time

Aplicação das informações

- Áreas prioritárias para a conservação
- Manejo de paisagens
- Monitoramento de impactos
- Manejo de espécies

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STAY
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Opção?

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