

Evolution towards an Open Science Institute

Open science lab for biodiversity, Datamanagement, Biometry, Methodology and Quality Assurance, Library & information, Analytical lab
INBO & EVINBO

Dimitri Brosens & Bart Goossens



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2023/05/31



INBO: The Research Institute for Nature and Forest

A scientific Institute from the Flemish Government

- **MISSION:**

The Research Institute for Nature and Forest (INBO) is the **independent research institute** of the Flemish government that underpins and **evaluates biodiversity policy and management** by means of **applied scientific research, data and knowledge sharing**.

- **VISION:**

INBO wants to be the point of contact in Flanders to provide **evidence-based support for nature policy and its implementation** in dialogue with partners from society, science, policy and management.

The Research Institute for Nature and Forest (INBO) is the Flemish research and knowledge centre for nature and its sustainable management and usage. As prominent scientific institution, the INBO works in the first instance for the Flemish authorities.

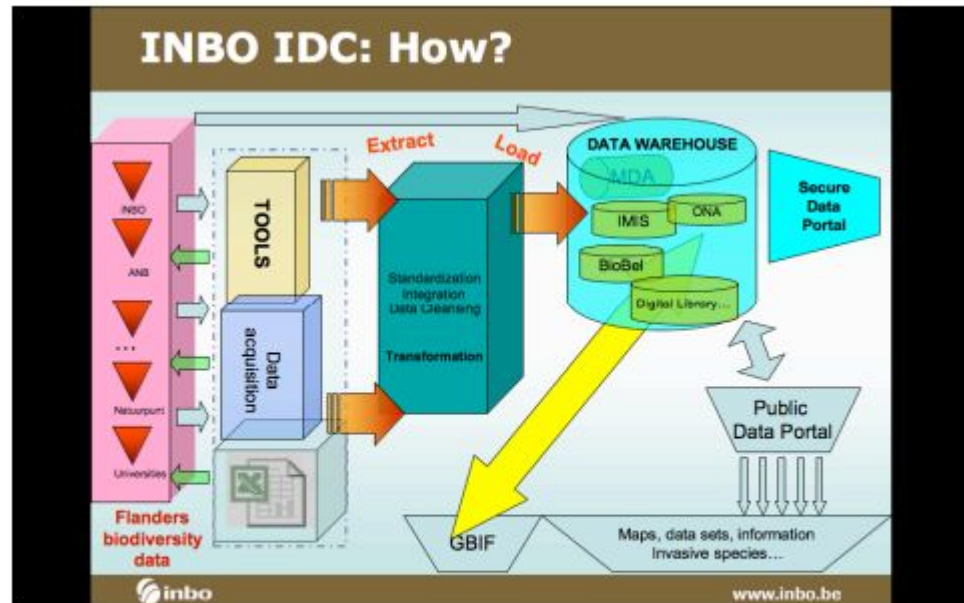
EVINBO: Own Capital of INBO

A scientific Institute in INBO

- Through its Own Capital, INBO can **accept research contracts that are financed externally**. Within this context the Own Capital performs contracts for the Flemish and local authorities, Belspo, universities, organisations for nature management, forestry, agriculture, hunting and fisheries, EU, INTERREG, LIFE+, etc.
- Such international scientific collaborations strengthen INBO's international image and allow us to **extend our network**. They make it possible to exchange data, develop transnational monitoring instruments and build up and share knowledge and expertise.
- The Own Capital's staff and projects function in symbiosis with the INBO staff and policies.

Article

Roadmap to an information & data center
(IAMSLIC, 2010) Goossens, Bart ; Brosens, Dimitri



The IDC is structured into three teams with specific roles. Of course the IDC will only be effectively operational when there is good interaction and cooperation between these teams.

ROADMAP TO AN INFORMATION & DATA CENTER

Bart Goossens and Dimitri Brosens

Research Institute for Nature and Forest
Klipiekstraat 25
Brussels, Belgium

Abstract: The need for open information recourses becomes inevitable in a modern scientific world. The INBO, Research Institute for Nature and Forest, a scientific institute of the Flemish government decided to develop a Data Resource and Information Centre for all terrestrial biodiversity data in the Flemish region. The development of a modern data centre requires an integration of many different and unforeseen tools. The Data centre story faces integration of the library, assessment and finding old forgotten datasets, data policy implementation, metadata & data indexing and acquisition and co-operative effort between most of the Flemish Institutions and universities. The final goal will be to connect the data centre with the Global Biodiversity Information Facility and to create a gateway for communicating and sharing biodiversity data on the Internet.

Keywords: Information; Biodiversity; Data; Indexing; Metadata; Flanders.

Roadmap to data & information centre

- The roadmap cleared the **path for our open access** policy in the research institute



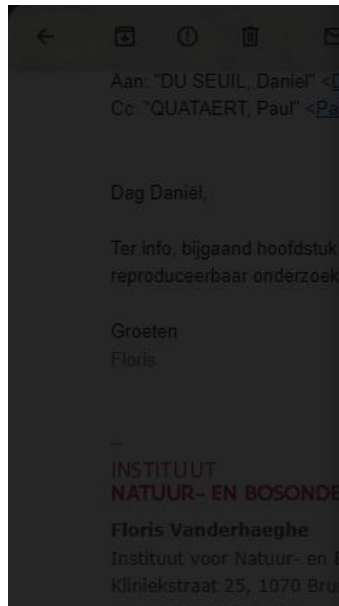
Roadmap to data & information centre

- The roadmap gradually **pushed us** in the direction of becoming an **open data institute**



Roadmap to data & information centre

- INBO as open data institute pushed us in the direction of becoming an **open science institute**



1

Practicing Open Science

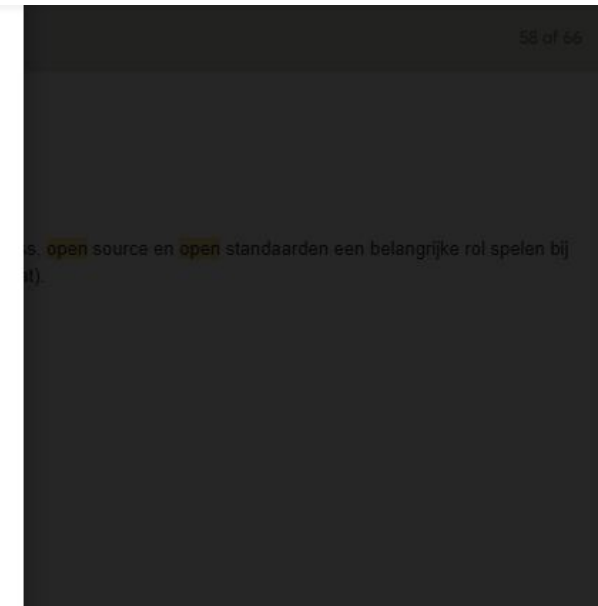
Luis Ibanez
Kitware, Inc.

William J. Schroeder
Kitware, Inc.

Marcus D. Hanwell
Kitware, Inc.

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Chapter

Practicing Open Science
By Luis Ibanez, William J. Schroeder, Marcus D. Hanwell
Book
Implementing Reproducible Research
Edition 1st Edition
First Published 2014
Imprint Chapman and Hall/CRC
Pages 40
eBook ISBN 9781315373461

Article

Roadmap to an information center
(IAMSLIC, 2010) ; Brosens, Bart ; Brosens, Dimitri

Evolution towards an Open Science Institute

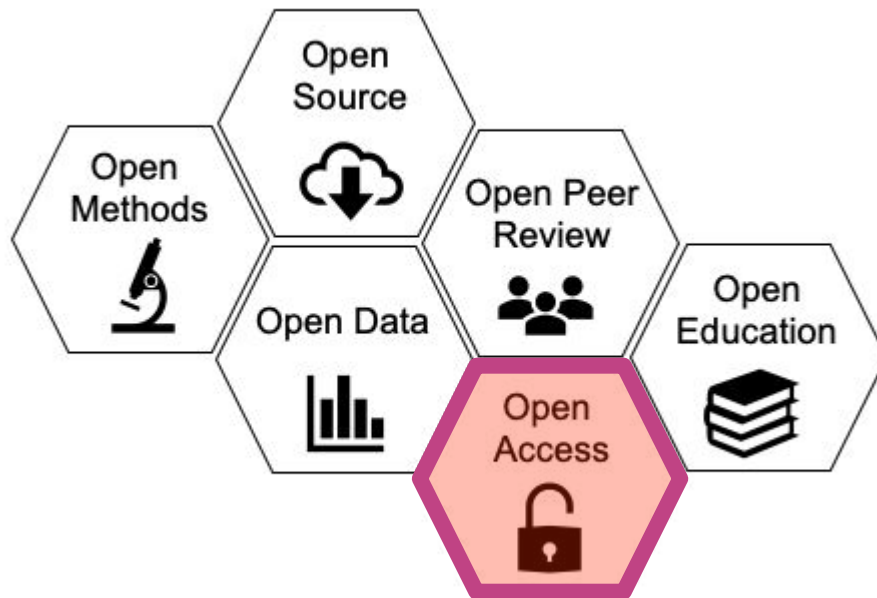
- Phase 1: Evolution to an Open Access Institute (2006-2017)
- Phase 2: Evolution to an Open Data Institute (2009 - 2023...)
- Phase 3: Evolution to an Open Science Institute (2014 - 2023...)

Occurrence data at the INBO
Opening up our data publication workflow

RESEARCH INSTITUTE
NATURE AND FOREST

Peter Desmet & Dimitri Brosens

Phase 1: Evolution to Open Access (2006 - 2017)



Open Access

- Active promotion since 2009
- Installation of IMIS CRIS system and Marine Data Archive for INBO(2009-2014)
- Installation of PURE (2012)
 - First FRIS portal & EWI support
- INBO policy since 2017

The INBO Open Access Policy

The policy applies to all A1 articles where an INBO/EV INBO researcher is the initiator of the research output (which usually translates as first or last author).

A researcher will select, on the basis of his or her research criteria, the journal in which he or she wishes to publish

INBO strongly recommends to include open-access magazines in this selection.

If a researcher chooses a subscription magazine, OA policy is subject to the following condition:

Green road OA for postprints within 2 years after publication must be allowed.

If a researcher opts for an open-access journal, OA policy will be subject to the following condition:

The magazine must be included in the **Directory of Open Access Journals (DOAJ)**.

The magazine must allow publication under a **Creative Commons Attribution (CC-BY)** license.

If the researcher publishes in a subscription magazine, he/she will deposit the article via **green road OA**:

Immediately after publication compulsory deposit in the institutional repository **PURE**

Deposit a minimum of postprinting and, if possible, publisher's version (no pre-prints)

PURE makes the article available in accordance with the publisher's conditions (e.g. after embargo).

If the researcher publishes in an OA magazine, the OA cost can be borne by INBO.

a budget has been set aside for article processing charges (APC) that can be deployed throughout the organisation, flexibly and with responsibility for the research teams

Immediately after publication compulsory deposit in PURE

There is no financial contribution from the INBO or EV INBO for hybrid OA.

There is **(pro)active support of researchers from the library and the data management team** on OA policies.

This page is published under a Creative Commons Attribution license. You can cite it as: Goossens B, Desmet P, Du Seuil D (2017) Open Access Policy. Instituut voor Natuur- en Bosonderzoek (INBO). <https://www.inbo.be/en/open-access-policy>




Phase 2: Evolution to an Open Data Institute (2009 - 2023)



GOOSSENS, Bart <Bart.GOOSSENS@inbo.be>

to Dimitri ▾

Dit zou nog's wat zijn.... Iets samen doen rond **open data** and libraries ;-)

<http://www.libereurope.eu/news/liber-41st-annual-conference-tartu-estonia-27-30-june-2012-call-for-papersposters>



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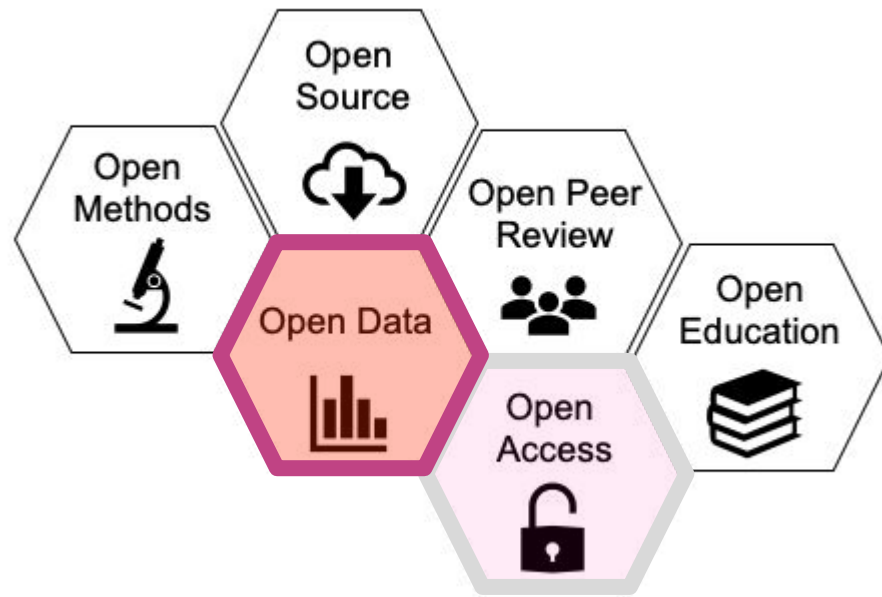
Bart.Goossens@inbo.be

www.inbo.be



Vlaanderen
is wetenschap

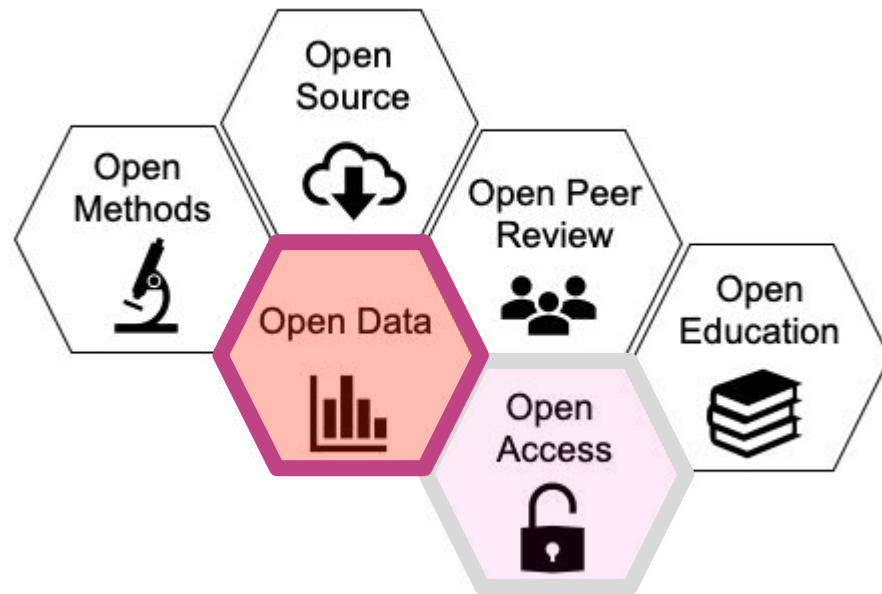
Phase 2: Open data (2009 - 2023)



- 2009
 - Twelve Strategic Goals
 - INBO manages and discloses [Biodiversity] data
 - Team: IDC (information & data centre)
 - 1 FTE for data publication (BBPF)
- 2010
 - INBO became a [GBIF](https://www.gbif.org) data publisher
 - 432 different licences in use on www.gbif.org
 - “open data “ was not yet used (by us) as a term

GBIF is the
Global Biodiversity Information Facility
and advocates free and open access to
biodiversity data

Phase 2: Open data (2009 - 2023)



- 2011
 - acknowledgement of the importance of metadata, but not the license on the data

Resource Title [Florabank1 - A grid-based database on vascular plant distribution in the northern part of Belgium \(Flanders and the Brussels Capital region\)](#)

Basic Metadata

The resource title and description are required. The resource's three main contact's must also be described here: Resource contact, resource creator and metadata provider. For each contact you must supply at least a last name, a position or an organisation before you can make the resource public. The person(s) or organisation(s) responsible for the creation of the resource as it appears in the IPT and for effectively publishing the resource should add themselves as an associated party with role 'publisher'.

Title*

Florabank1 - A grid-based database on vascular plant distribution in the northern part of Belgium (Fland

Description*

Florabank1 is a database that contains distributional data on the wild flora indigenous species, archeophytes and naturalised aliens) of Flanders and the Brussels Capital Region. It holds about 3 million records of vascular plants, dating from 1800 till present. Furthermore, it includes ecological data on vascular plant species, redlist category information, Ellenberg values, legal

Metadata Language

English

Resource Language

English

Type

Occurrence

Subtype

Observation

Resource Contact

Section

[Basic Metadata](#)

[Geographic Coverage](#)

[Taxonomic Coverage](#)

[Temporal Coverage](#)

[Keywords](#)

[Associated Parties](#)

[Project Data](#)

[Sampling Methods](#)

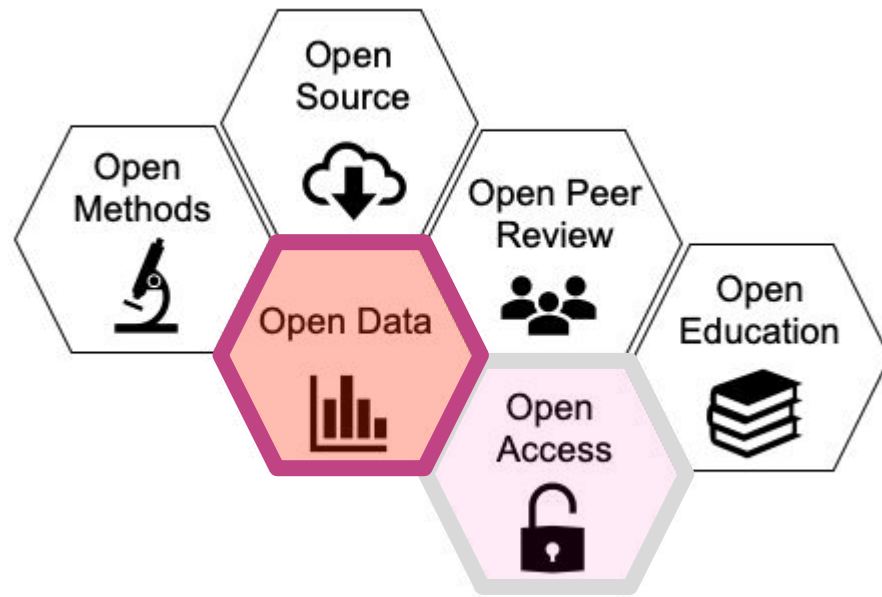
[Citations](#)

[Collection Data](#)

[External links](#)

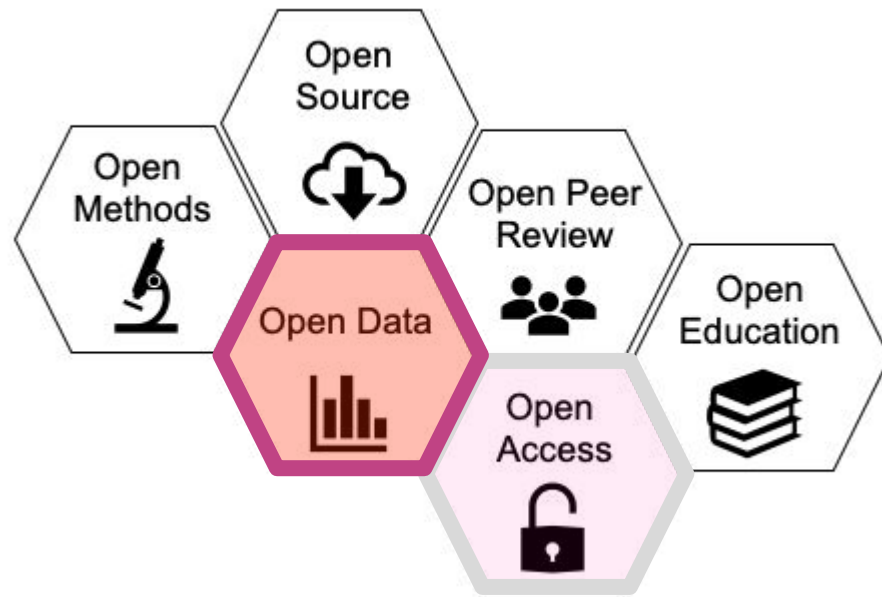
[Additional Metadata](#)

Phase 2: Open data (2009 - 2023)



- 2011
 - standardization is important, but not the license on the data
 - For our biodiversity data we used and still use
 - The standard: **DwC**
 - The format: **DwC-A**
 - The Licence: **CC-BY-NC** -> **CC0 & CC-BY**

Phase 2: Open data (2009 - 2023)



- 2012-2013
- Start of the Lifewatch Team (EVINBO)
 - More and more datasets published
 - The format DwC-A
 - Licence: CC-BY-NC
- Dataset **metadata** working group for **PURE**
- Open data makes his appearance in Flanders (regional government)
- We figured out that our published data is not optimal usable

Update **Open Data** Dag - Vlaamse overheid - 15 juni 2012

Van Herreweghe, Noël -noel.vanherreweghe@bz.vlaanderen.be-

Update **Open Data** Dag - Vlaamse overheid - 15 juni 2012

- Keynote: Andrew Stott (UK) - **Open Data** - best practices in Europe and key challenges facing the European Union
- Plenaire sessie - Citadel on the Move: Geert Mareels, Andrew Stott, Julia Glidden: Enabling Smart City Services through **Open Data**, Mobile Applications and Common **Data** Formats
- Plenaire sessie - Chris Taggart (UK) - Andrew Stott (UK) - Bart Rousseau (Stad Gent) / Chair: Julia Glidden (UK) - **Open** Discussion: How to apply lessons learned from the UK and the world

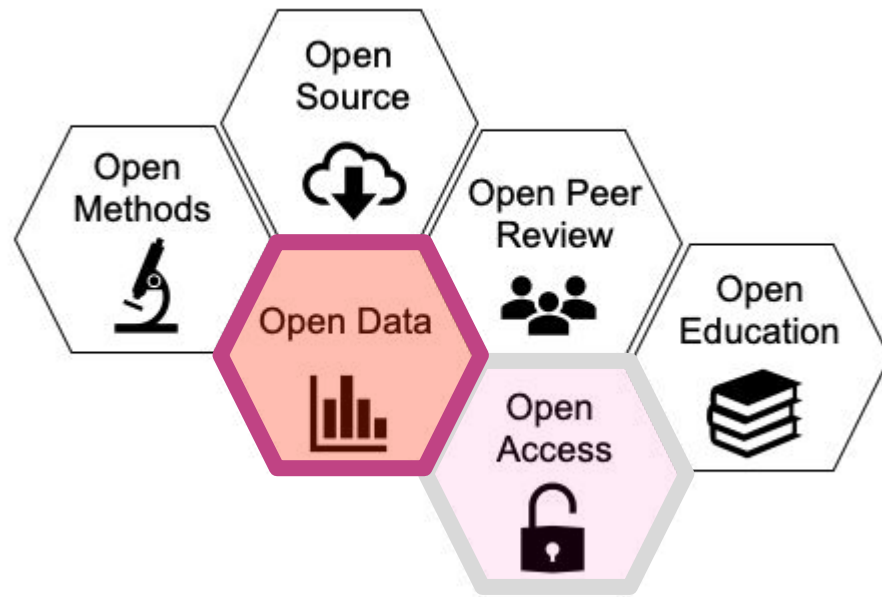


ANDREW STOTT
OPEN DATA DAG
15 JUNI 2012





Phase 2: Open data (2009 - 2023)



- 2013-2014
 - This triggered GBIF to change their licences policy. From 'whatever' to 3 valid options
 - CC0
 - CC-BY
 - CC-BY-NC

Data licensing

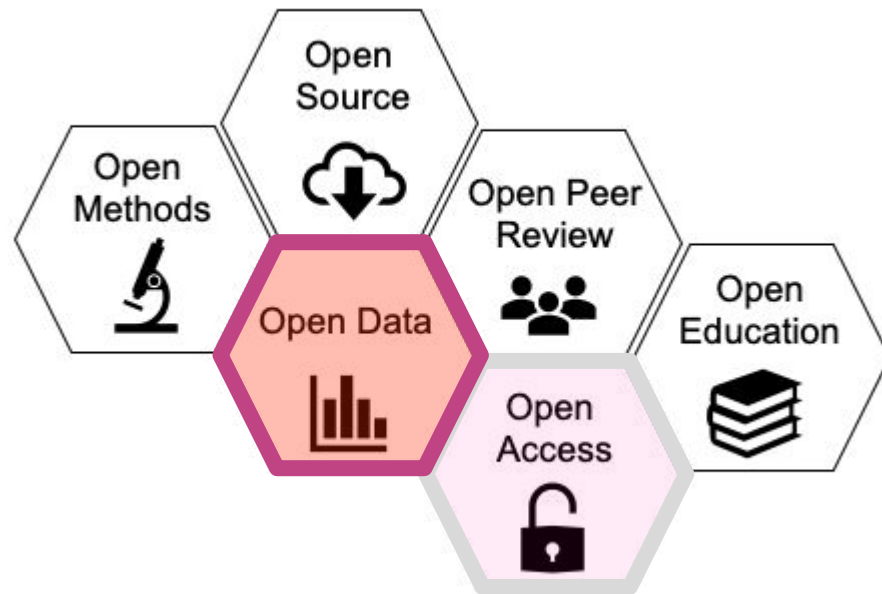
In 2014, following a community-wide consultation, the GBIF Governing Board established a general policy to "ensure that all species occurrence datasets within the network are associated with digital licenses equivalent to one of...three choices supplied by Creative Commons":

- **CC0**, under which data are made available for any use without restriction or particular requirements on the part of users
- **CC BY**, under which data are made available for any use provided that attribution is appropriately given for the sources of data used, in the manner specified by the owner
- **CC BY-NC**, under which data are made available for any use provided that attribution is appropriately given and provided the use is not for commercial purposes

As of August 2016, all open-access species occurrence datasets on GBIF.org carry standardized, machine-readable licences. These changes improve transparency and reproducibility and support GBIF's mission to promote free and open access to biodiversity data.

GBIF provides its open-access infrastructure to support scientific understanding and improve biodiversity and conservation outcomes. We will continue to promote attribution (CC BY) as the standard practice for citing GBIF-mediated data, believing that it reflects an established norm that the communities we serve use to cite original work.

Phase 2: Open data (2009 - 2023)



- 2013-2014
 - INBO encouraged the use of
 - OPEN License (CC0)
 - Norms for data use
- INBO signed the “Bouchout declaration’ on the free and open use of digital resources about biodiversity



The free and open use of digital resources about biodiversity and associated access services; Licenses or waivers that grant or allow all users a free, irrevocable, world-wide, right to copy, use, distribute, transmit and display the work publicly as well as to build on the work and to make derivative works, subject to proper attribution consistent with community practices, while recognizing that providers may develop commercial products with more restrictive licensing.

Policy developments that will foster free and open access to biodiversity data;
Tracking the use of identifiers in links and citations to ensure that sources and suppliers of data are assigned credit for their contributions;

An agreed infrastructure, standards and protocols to improve access to and use of open data;
Registers for content and services to allow discovery, access and use of open data;

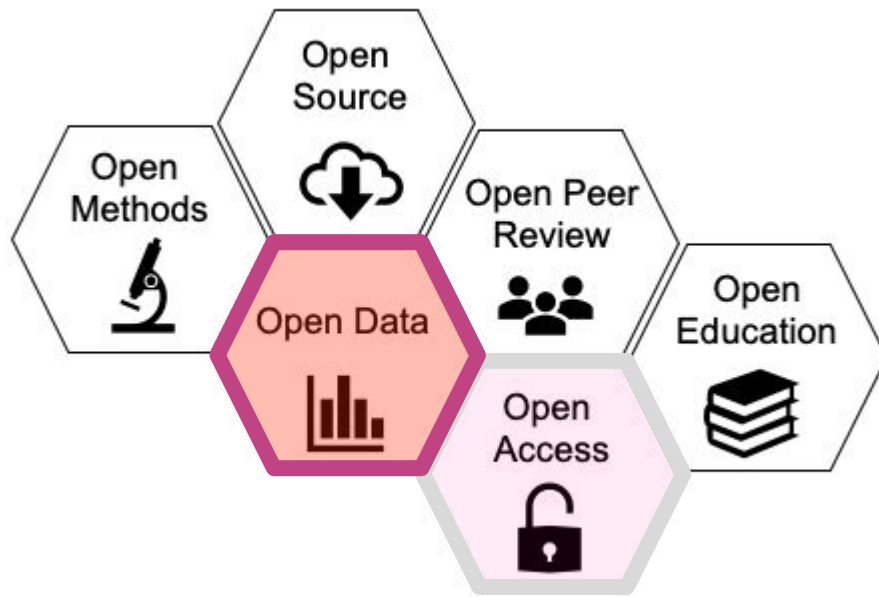
Persistent identifiers for data objects and physical objects such as specimens, images and taxonomic treatments with standard mechanisms to take users directly to content and data;

Linking data using agreed vocabularies, both within and beyond biodiversity, that enable participation in the Linked Open Data Cloud;

Dialogue to refine the concept, priorities and technical requirements of Open Biodiversity Knowledge Management;

A sustainable Open Biodiversity Knowledge Management that is attentive to scientific, sociological, legal, and financial aspects.

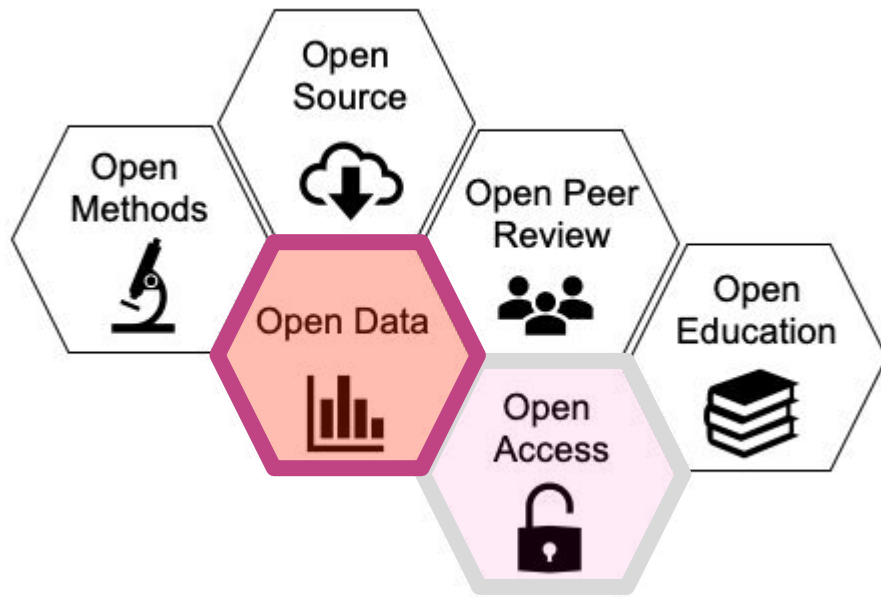
Phase 2: Open data (2009 - 2023)



- 2014
 - Norms for Data Use published
 - Start of a data policy in INBO

The screenshot shows the 'Norms for data use' webpage. The header features the title 'Norms for data use' and a navigation menu with 'CONTACT INFO' and 'Contact INBO'. The main content area is divided into sections: 'Rationale' and 'Norms'. The 'Rationale' section states that in 2015, INBO adopted an open data policy to publish biodiversity data as open data. The 'Norms' section is titled 'Give credit where credit is due' and explains the importance of citing sources in scientific research, including a link to the GBIF best practices on data citation.

Phase 2: Open data (2009 - 2023)



- 2014
 - Norms for Data Use published
 - Start of a data policy in INBO

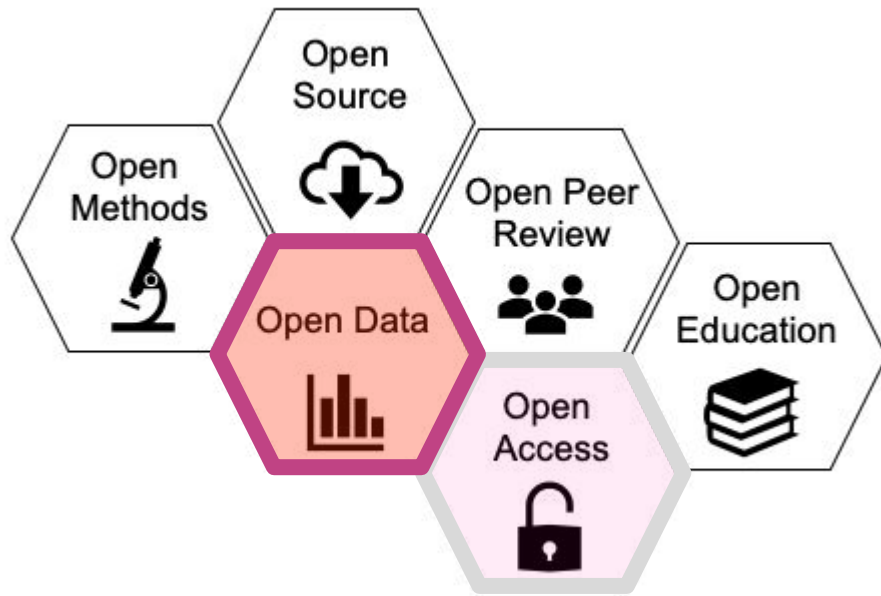
Give credit where credit is due

Respect the CC0 waiver

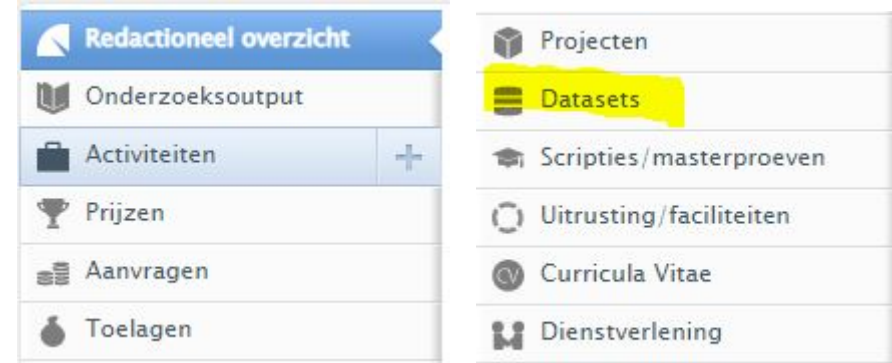
Be responsible

Get in touch

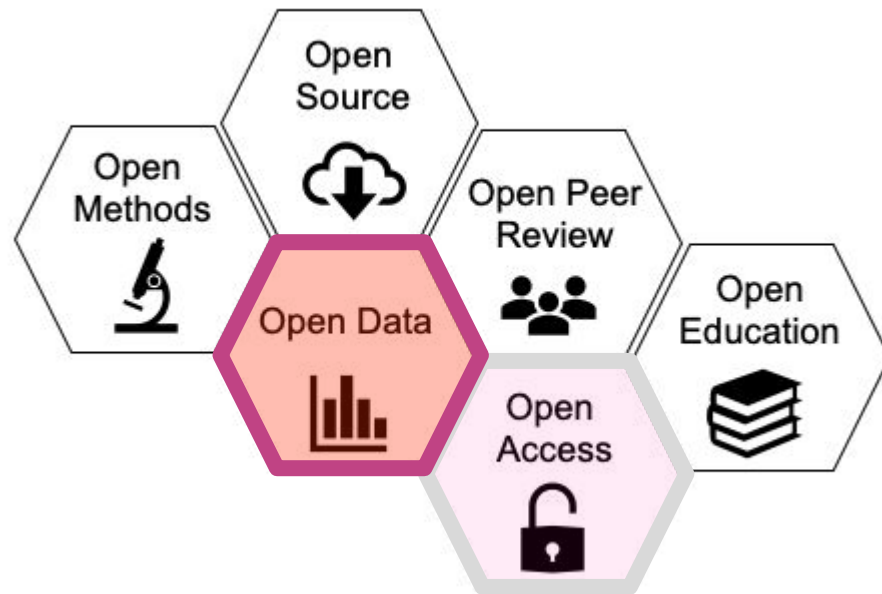
Phase 2: Open data (2009 - 2023)



- 2015
 - Datasets module active in **PURE**



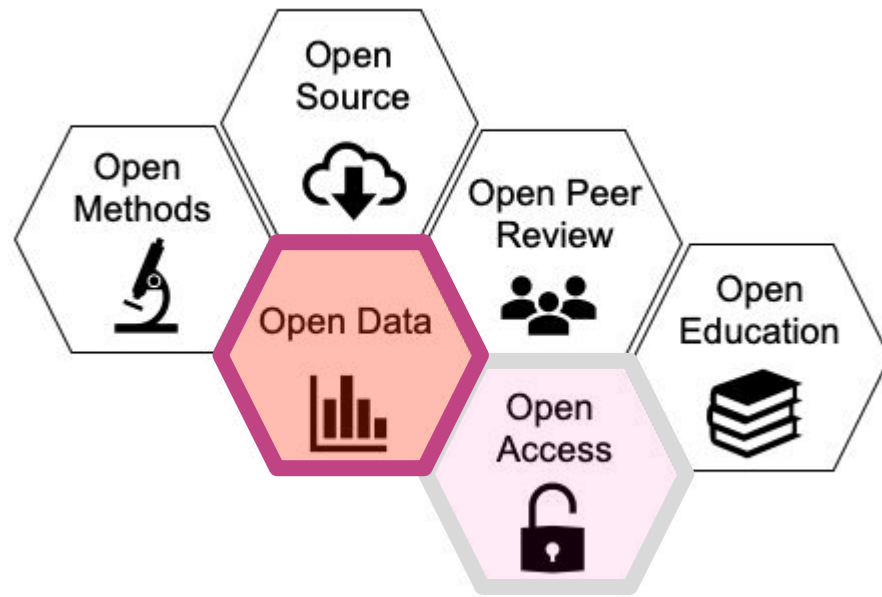
Phase 2: Open data (2009 - 2023)



- 2015
 - Approval of the INBO open data policy

1. All scientific data for which the (EV) INBO is (co-)owner are covered by this policy and can be published as open data, excluding legal exceptions.
2. Data are eligible for publication at the earliest 12 months after collecting.
3. Raw data will be published.
4. Result data associated with a scientific article, report, or advice will be released with the publication.
5. Data are published as open data, as defined by the Open Definition, under the Creative Commons Zero waiver.

Phase 2: Open data (2009 - 2023)



- 2015
 - Approval of the INBO open data policy

6. Published datasets reference the INBO norms for data use.

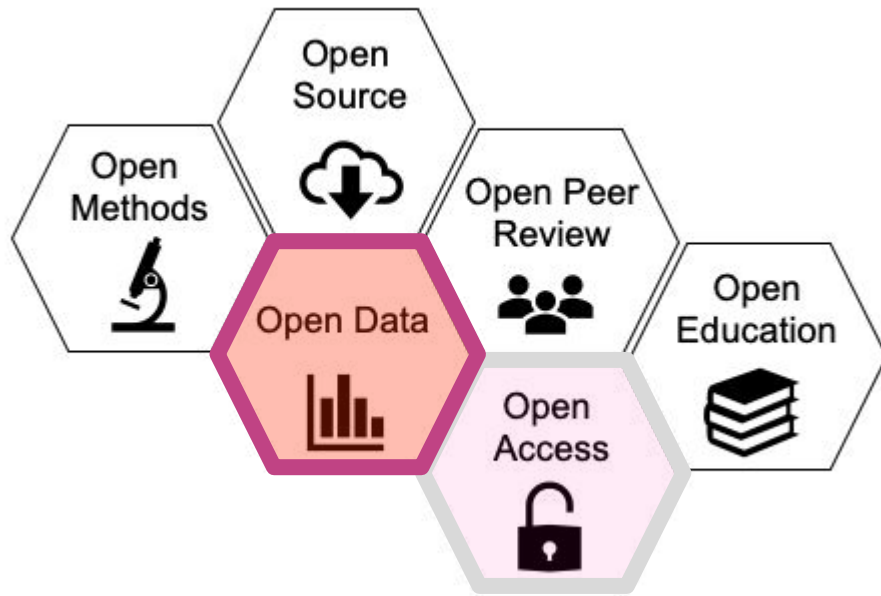
7. Published data are sufficiently documented with metadata. -> and documented in PURE

8. All upcoming research projects require a data management plan (DMP).

9. Researchers apply the open data policy.

10. The INBO Information & Data Center supports researchers in the application of the open data policy.

Phase 2: Open data (2009 - 2023)



- 2015 Official issues with the INBO open data policy
 - Only Flemish Open Licence was allowed
 - Exception granted
 - Now CC0 is also approved by the government of Flanders

Standaard:Gratis Open Data Licenties

Gratis Open Data Licenties (Vlaamse Overheid) (Voorkeurstitel)

Beschrijving

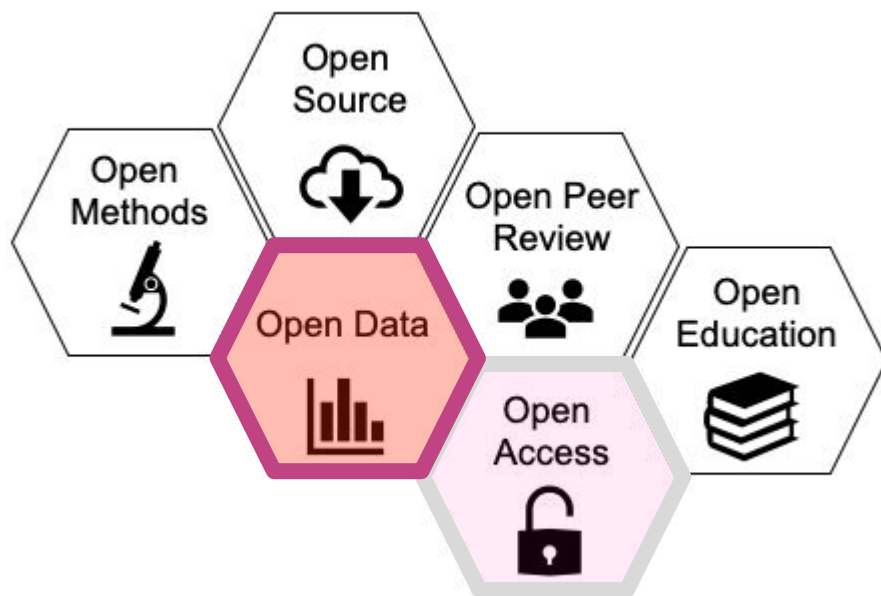
Deze licentie omvat de voorwaarden voor het hergebruik van datasets in het bezit van een instantie die als 'open data' gratis ter beschikking worden gesteld. Door 'product', aanvaardt de licentienemer de voorwaarden van de Licentie. Dit tegen billijke vergoeding en voor niet commercieel gebruik.

Documentatie

Beheerder	Overheid Vlaanderen
Specificatie	PDF over licentie v 1.0 PDF over licentie v 1.2
Documentatie	De licentie
Persistent ID	



Phase 2: Open data (2009 - 2023)



PUBLISHER | SINCE MAY 3, 2010

Research Institute for Nature and Forest (INBO)

ABOUT METRICS [HOME PAGE](#)

12,022,506 OCCURRENCES 22,248,021 HOSTED OCCURRENCES 96 DATASETS 796 CITATIONS

RESEARCH INSTITUTE NATURE AND FOREST

Description: The Research Institute for Nature and Forest (INBO) is a scientific institute of the Flemish Government in Belgium. INBO has resulted from the merger of the Institute for Forestry and Game Management and the Institute of Nature Conservation on January, 1st 2006.

Endorsed by: Belgian Biodiversity Platform

Installations: INBO IPT

Technical contact: Dimitri Brosens

Country or area: Belgium

Hosting: 122 datasets (8 publishers• 2 countries)

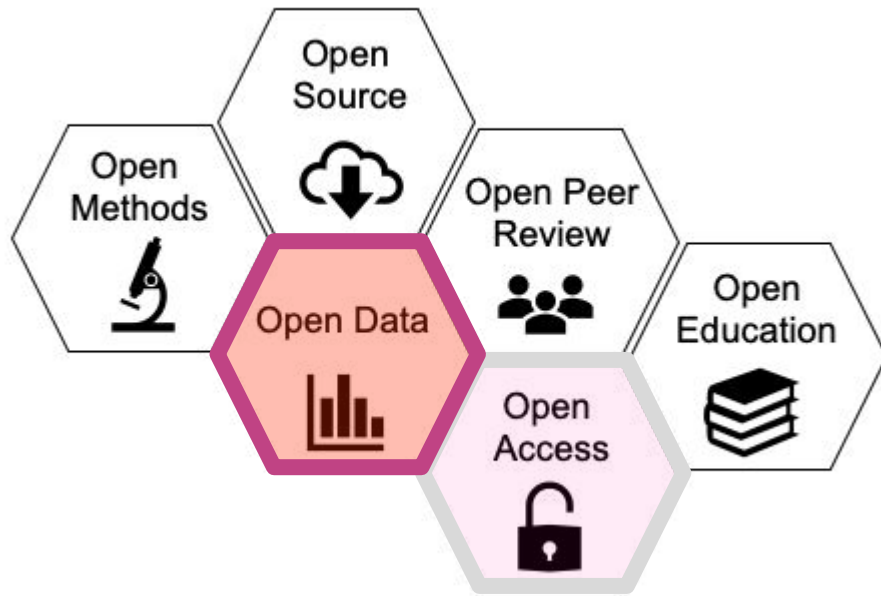
[Download activity report](#)

© OpenStreetMap contributors

CONTACTS

Research Institute for Nature and Forest (INBO) Kliniekstraat 25 Brussels 1070 Belgium http://www.inbo.be	Dimitri Brosens Technical point of contact Dimitri.BROSENS@INBO.BE
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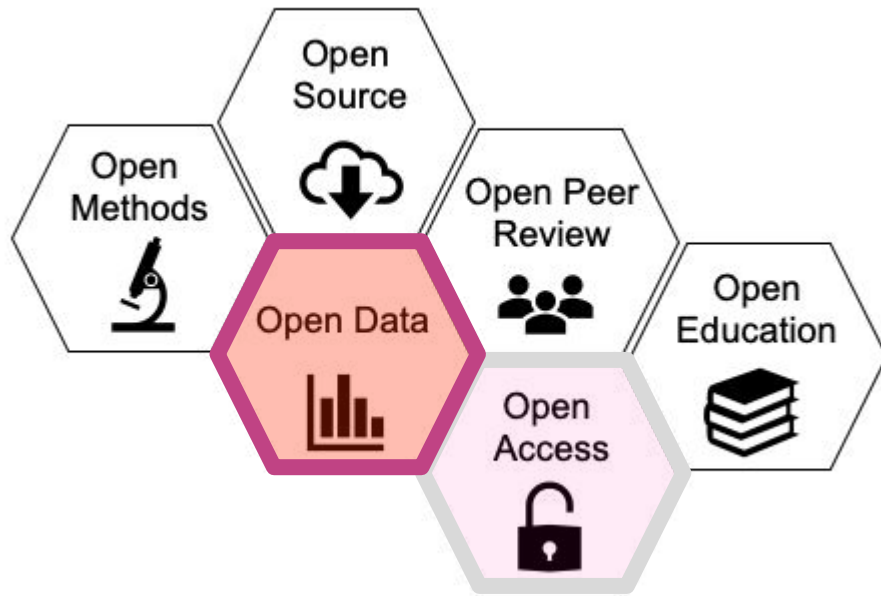
Phase 2: Open data (2009 - 2023)



The screenshot shows the Zenodo interface for the Research Institute for Nature and Forest (INBO). The search results are as follows:

- March 9, 2022 (20220309)** Dataset Open Access
Occurrence cubes for non-native taxa in Belgium and Europe
Oldoni, Damiano; Groom, Quentin; Adriaens, Tim; Davis, Amy J.S.; Reyserhove, Lien; Strubbe, Diederik; Vanderhoeven, Sonia; Desmet, Peter.
Description This package contains aggregated occurrence data ("occurrence cubes") for non-native taxa in Belgium and Europe. These occurrence cubes were generated by grouping species occurrence data from the Global Biodiversity Information Facility (GBIF) by year (year), 1x1km spatial EEA.
Uploaded on March 9, 2022
3 more version(s) exist for this record
- May 4, 2020 (habitat springs_2020v2)** Dataset Open Access
Distribution of the Natura 2000 habitat type 7220 (Cratoneurion) in Flanders and Brussels Capital Region, Belgium (version 2020)
Oosterlynck, Patrik.
The dataset is a geospatial collection of points that correspond with the presence or absence of the Natura 2000 habitat type 7220 (Petrifying springs with tufa formation (Cratoneurion)) in springs and streaming water segments in the Flemish and Brussels Capital Region, Belgium. The d
Uploaded on May 4, 2020
2 more version(s) exist for this record
- June 27, 2022 (v1)** Dataset Open Access
Survey data Agro-ecological farming in Protected Areas
Lauwers, Laura; Dumortier, Myriam.
"Produce better, eat well" is the subtitle of the Good Food Strategy of the Brussels-Capital Region. Can (sub)urban protected areas

Phase 2: Open data (2009 - 2023)



Explore data |

Who we are | What we do | Join us | Help | Login

Flanders

Search

Start Over

Flanders

Institution > Research Institute for Nature and Forest

Limit your search

1 - 8 of 8

Subject Area

AFLP	2
Alien invasive species	1
Callosciurus erythraeus	1
Eradication	1
Lithobates catesbeianus	1
Rodentia	1
Rodents	1
Sciuridae	1
more »	

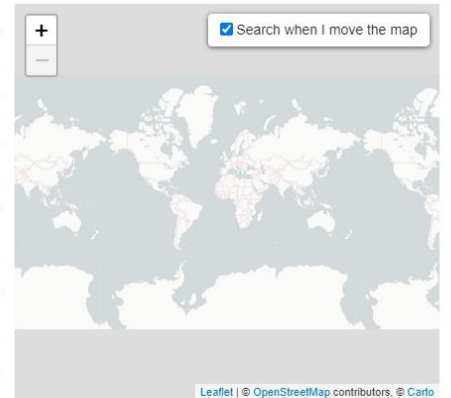
Geographical Location

Journal

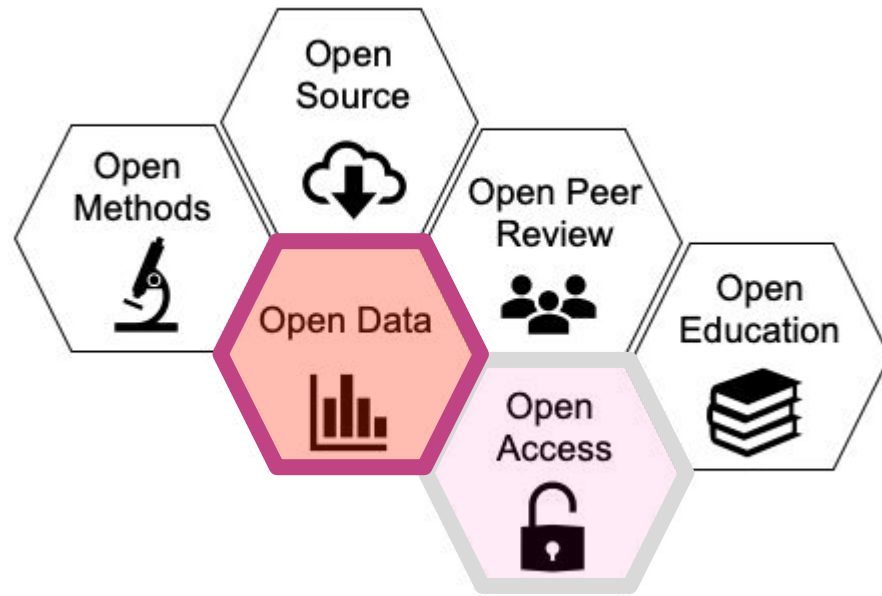
Institution

Research Institute for Nature and Forest	8
Ghent University	4
KU Leuven	3

1. Data from: Microclimate limits thermal behaviour favourable to disease control in a nocturnal amphibian
2. eDNA quantification to evaluate bullfrog management
3. Dietary composition and overlap among small- and medium-sized carnivores in Flanders, Belgium
4. Data from: Interspecific hybridisation and interaction with cultivars affect the genetic variation of *Ulmus minor* and *U. glabra* in Flanders
5. Data to: Enjoying tranquility - Development of ground vegetation after cessation of management in forests on loamy soils in Flanders (Belgium)
6. Data from: Successful eradication of a suburban Pallas's squirrel *Callosciurus erythraeus* (Pallas 1779) (Rodentia, Sciuridae) population in Flanders (northern Belgium)
7. Data from: Dispersal constraints for the conservation of the grassland herb *Thymus pulegioides* L. in a highly fragmented agricultural landscape
8. The impact of data quality filtering of opportunistic citizen science data on species distribution model performance: dataset used for Maxent modelling.



Phase 2: Open data (2009 - 2023)

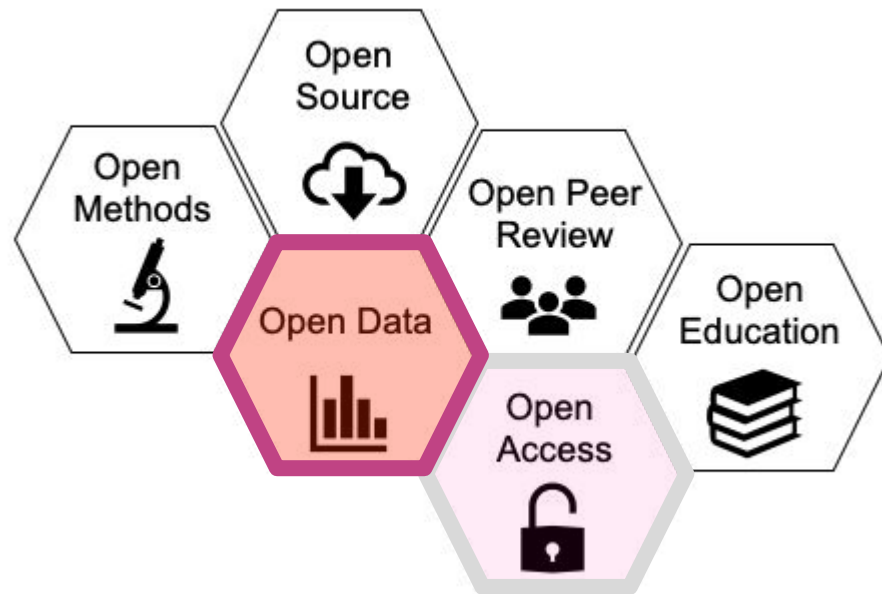


The screenshot shows the homepage of the Research Institute for Nature and Forest (INBO) Expert Portal. The header features the INBO logo and the text 'INSTITUUT NATUUR- EN BOSONDERZOEK' next to a photograph of a plant. Below the header, the main content area includes a search bar with the text 'Welcome to Research Institute for Nature and Forest' and a search icon. Below the search bar, there is a navigation menu with the following items:

- Profiles (297)
- Research units (24)
- Equipment (1)
- Projects (525)
- Research output (9308)
- Datasets (191)
- More (173)

Below the navigation menu, the text reads: 'Research Institute for Nature and Forest Expert Portal' followed by a paragraph: 'INBO's expert portal contains the online collection of our scientists' published research material. You can find researchers, articles, books, reports, dissertations, projects, datasets and other outputs. Most publications are also available as full-text downloads, if copyright permits. The individual researchers' expertise can also be consulted here.'

Phase 2: Open data (2009 - 2023)



- 2017
 - FLAMES AWARD 2017
 - (INBO Open Data Policy)

INBO (open data policy)

Since 2011, the Flemish institute INBO (Instituut Natuur- en bosonderzoek) can be seen as a pioneer in its efforts to make observational data freely available to the public. The INBO is officially an **open data institute** since 2015.

The whole process of publishing the scientific data of which INBO is (co-)owner is well organized. For instance, data sets of species observations are cleaned and documented, and can be requested using the platform GBIF (Global Biodiversity Information Facility).

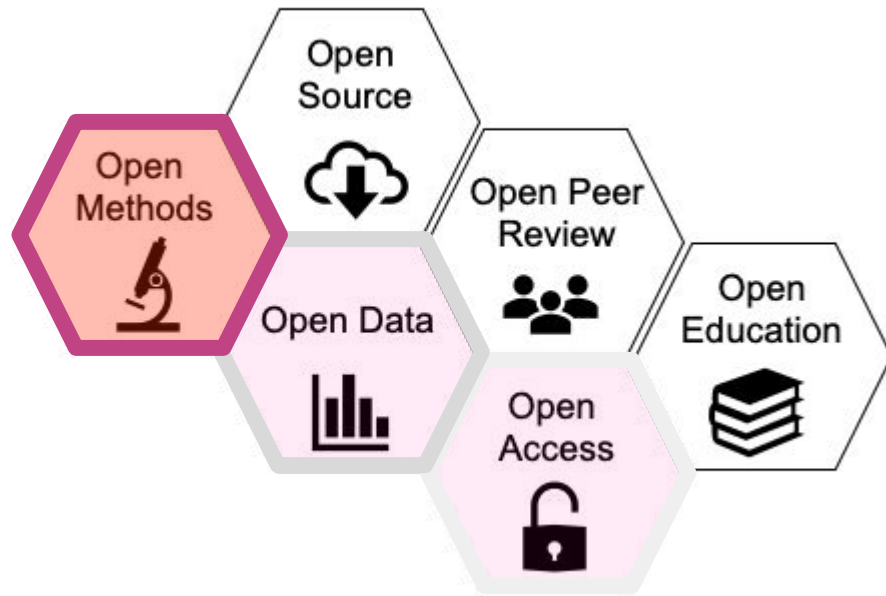
In the scientific community, publishing research data as open data fits in the larger transition to open access and open source. The INBO hopes its open data policy will contribute towards more transparent, accessible and eventually reproducible research in Flanders concerning nature and biodiversity.

Currently the **INBO is working on the transition into an open science institute** at which not only the data sets, but all scientific information (e.g. R-code of statistical analyses) is freely available. Therefore, researchers are encouraged to work with tools and platforms such as R Markdown and GitHub.

All information on the open data policy is clearly described on the website:

www.inbo.be/en/open-data-policy

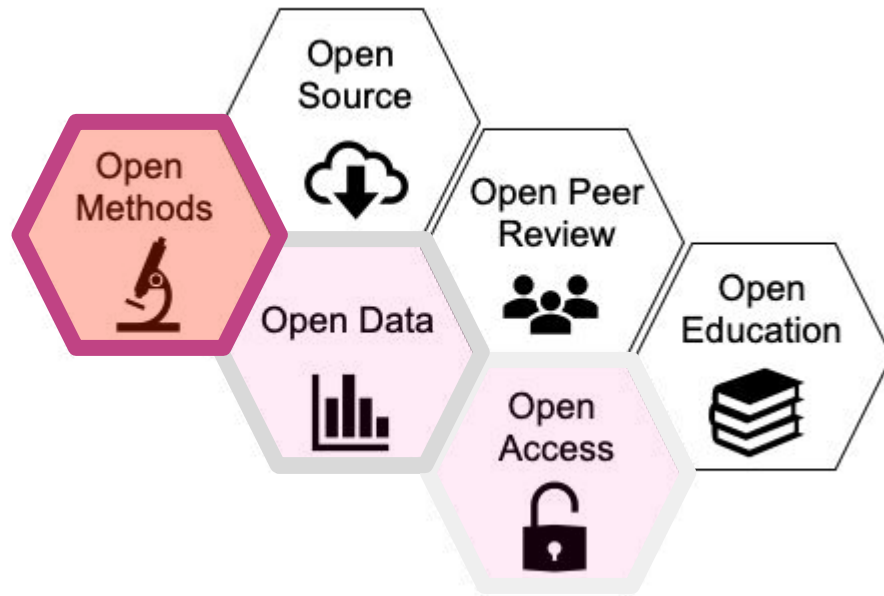
Phase 3: Open Science (2014 - 2023)



- 2014
 - Our first steps in Open Science
 - Team Lifewatch

Occurrence data at the INBO
Opening up our data publication workflow

Phase 3: Open Science (2014 - 2023)



- 2014
 - Opening Github account with Lifewatch Team

Our publication workflow
Is not rocket science

Create GitHub repository
github.com/LifeWatchINBO

Document issues
For data and metadata

Write metadata
As a data paper, in Markdown

Migrate to production
Copy/pasting

Publish & register
And relax...

LifeWatchINBO / vis-inland-occurrences

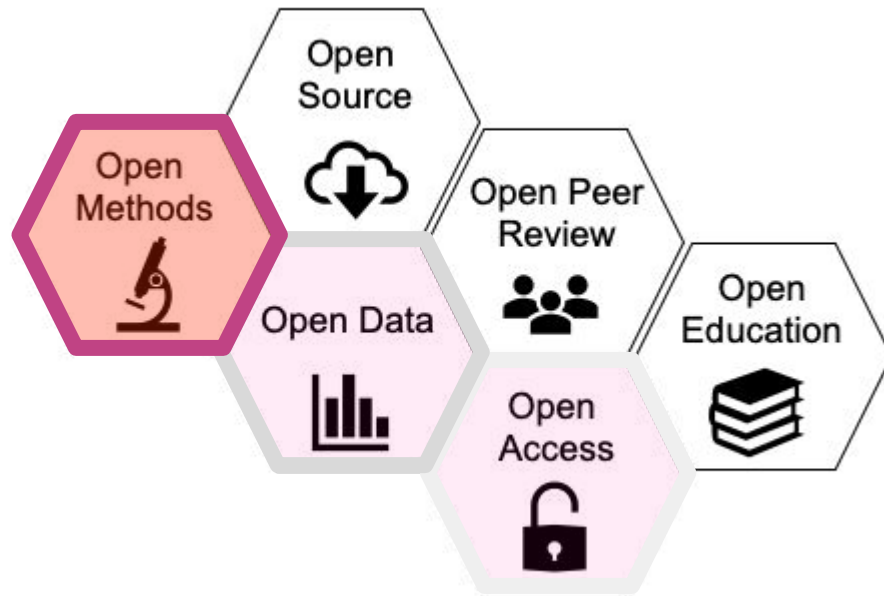
Write metadata As a data paper, in Markdown

Document issues For data and metadata

Migrate to production Copy/pasting

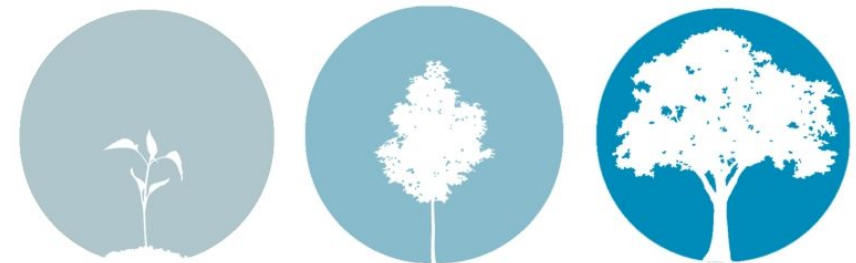
Publish & register And relax...

Phase 3: Open Science (2014 - 2023)

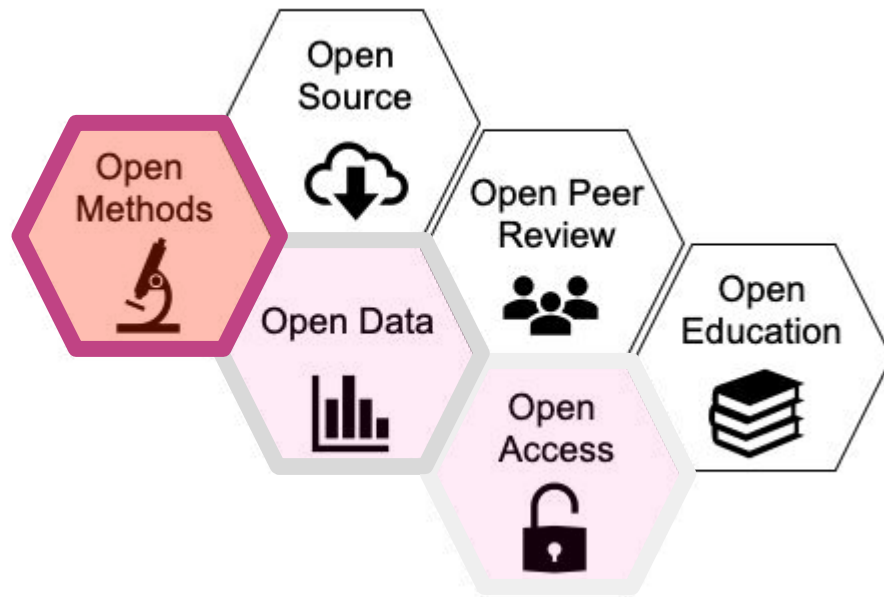


- 2015
 - EBR conference & workshops
 - Extra force in the Lifewatch team
 - a self-taught open science geek
 - A Lifewatch team with 3.6 FTE (open) data specialists
 - Data carpentry workshop

EMPOWERING
BIODIVERSITY RESEARCH



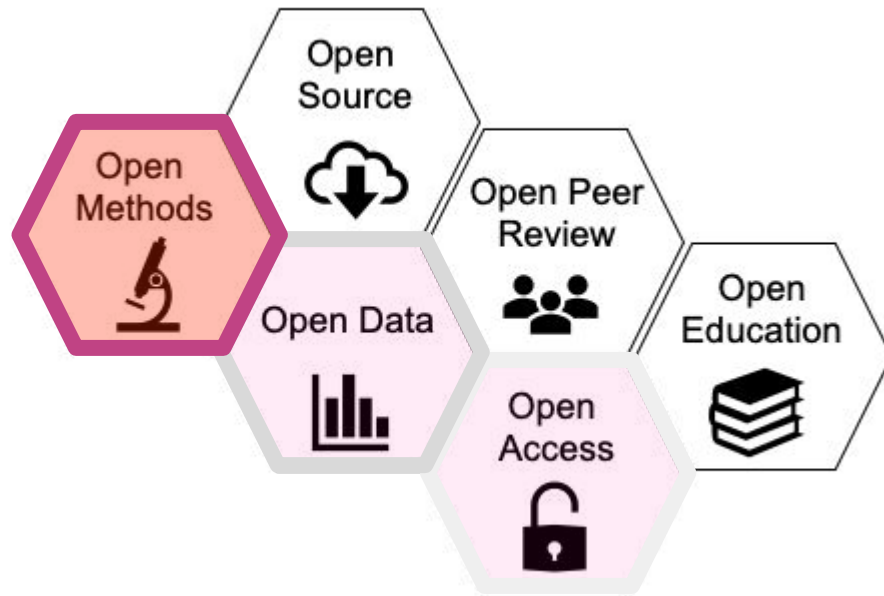
Phase 3: Open Science (2014 - 2023)



- 2016
 - Initiated **more collaboration** with
 - BMK (Biometry, Methodology and Quality Assurance)
 - AND IDC (Information and data centre)
 - Start of an **INBO** Open Science traject
 - INBO Github

The screenshot shows the GitHub profile for the Research Institute for Nature and Forest (INBO). The profile header includes the organization name, a description: "Open source, data and science initiatives of the Research Institute for Nature and Forest (INBO)", and a "Follow" button. Below the header, there are navigation tabs for Overview, Repositories (177), Projects (11), Packages, Teams (23), and People (104). The "Pinned" section displays two repositories: "coding-club" (Public) and "tutorials" (Public). The "Repositories" section lists several repositories, including "vespa-watch", "macro-moths-msci", "backoffice-wild-analyse", and "prj_bosvitaliteit". On the right side, there is a "People" section with a group of profile pictures, a "Top languages" section showing R, HTML, Java, and TSQL, and a "Most used topics" section with tags like "oscbio", "package", "rstats", and "natura2000".

Phase 3: Open Science (2014 - 2023)



- 2017
 - R Coding Clubs (Launch Jan 2018)
 - Improving R skills of INBO - employees

INBO Coding club

Introduction

Welcome to the INBO coding club, a peer-learning R-group. In January 2018, inspired by other examples, some enthusiastic researchers at the Research Institute for Nature and Forest (INBO) started a coding club at INBO.

It required a mission to be trustworthy:

The INBO Coding Club unites all ecologists, researchers and coders who want to develop their (R) programming skills in a pleasant and supportive environment in order to replace the fear for coding with inspiration and motivation to learn.

So, what does this mean?

The coding club is for everyone who wants to learn more about programming and data analysis in R with a specific focus on ecological and environmental topics. We aim for an environment where we experiment together, share code and learn from each other. Everyone has an equal say and can express themselves freely. We are convinced that everyone can learn from each other, irrespective of the experience.

Everyone who is eager to learn is invited, as we think learning together is more effective and just more fun. We focus on the skills which improve our data management and data analysis to do research more efficiently.

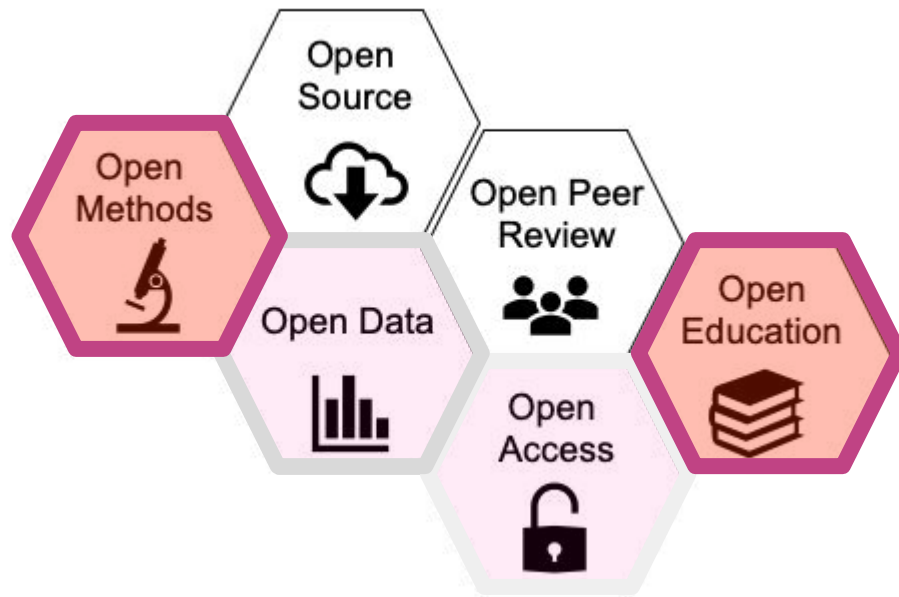


INBO coding club: share digital skills in a welcoming environment

[View the Project on GitHub](#)
inbo/coding-club

Home Getting started Sessions

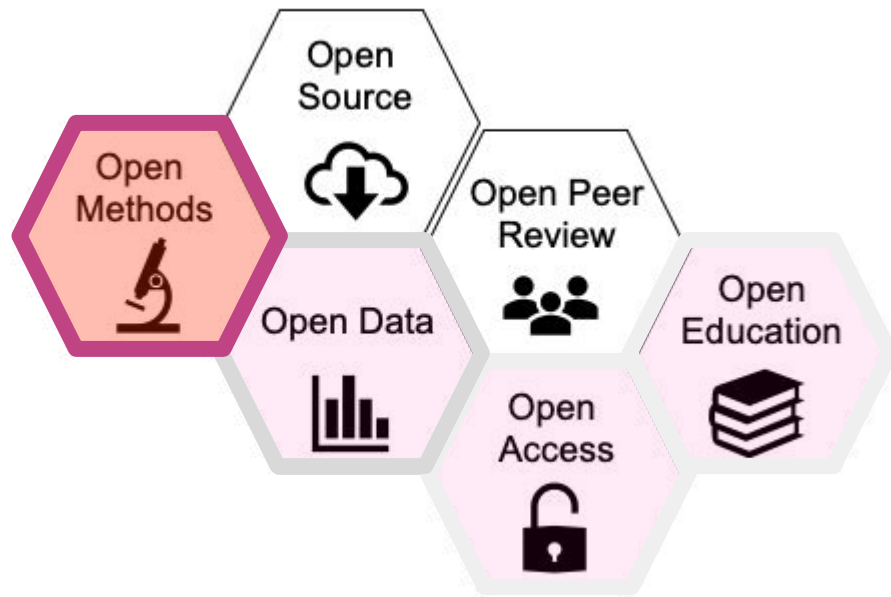
Phase 3: Open Science (2014 - 2023)



- 2017
 - Launch of INBO tutorials website

The screenshot shows the INBO Tutorials website. At the top left is the logo for the Research Institute Nature and Forest (INBO). Below it is a search bar. A navigation menu on the left includes links for HOME, ARTICLES, TUTORIALS, CREATE TUTORIAL, INSTALLATION + CATEGORIES, and REPOSITORY. The main content area is titled 'Tutorials' and lists several articles with their dates and titles: 'Set up Zenodo - GitHub integration' (2022, Dec 22), 'Get species checklist data from GBIF with rgbif' (2022, Dec 09), 'rgbif: Multiple values' (2022, Jun 21), 'Git and GitHub Authentication on Windows' (2022, Jun 16), 'Using WFS services in R' (2022, Apr 19), and 'Using WMS services in R' (2022, Apr 08). A 'Tags' section at the bottom lists terms like analysis, analysis of variance, api, bibliography, biodiversity, and bioRad.

Phase 3: Open Science (2014 - 2023)



- 2017
 - DMP kick off
 - dmponline.be

Welcome to DMPonline.be

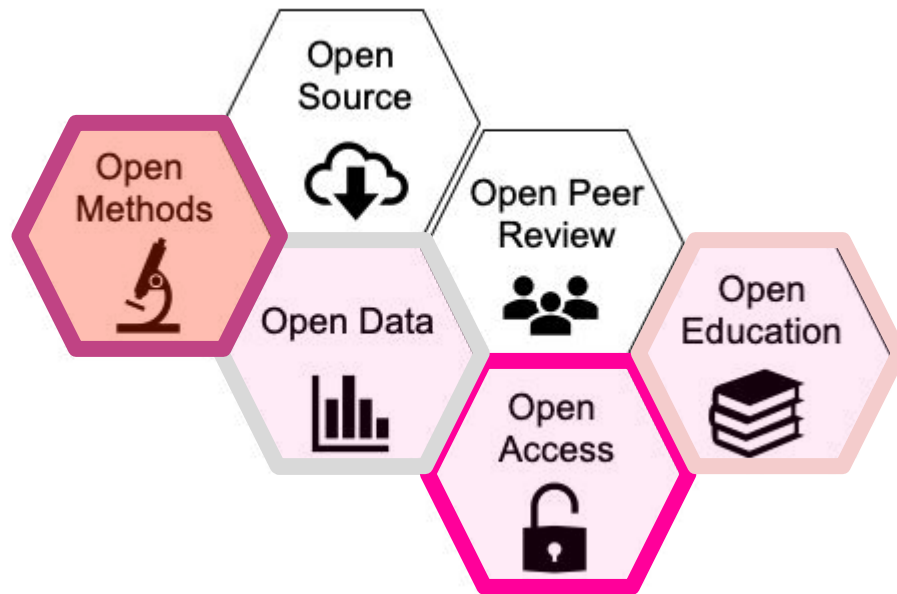
We can help you write and maintain data management plans for your research.

This instance of DMPonline is provided by the DMPbelgium Consortium, which was founded in 2017 by:

- Instituut voor Natuur- en Bosonderzoek
- Université Libre de Bruxelles
- Universiteit Antwerpen
- Universiteit Gent
- Universiteit Hasselt
- Vrije Universiteit Brussel
- Wetenschappelijk Instituut Volksgezondheid – Institut Scientifique de Santé Publique (Sciensano)

In 2018 they were joined by:

Phase 3: Open Science (2014 - 2023)



- 2017
 - TrIAS project Kick off
 - Our 1st Open Science Project

The screenshot shows the OSFHOME interface for the 'Tracking Invasive Alien Species (TrIAS)' project. The header includes the OSFHOME logo and navigation links for Metadata, Files, Wiki, Analytics, and Registrations. The main content area displays the project title, a list of contributors, creation and update dates, and the project description: 'Building an open data-driven framework to support policy on invasive species'. A Wiki section features the TrIAS logo and the text 'Tracking Invasive Alien Species'. On the right, there are sections for Citation, Components (with 'No components to display'), and Tags (including 'invasive species', 'open data', 'open science', and 'reproducible science').

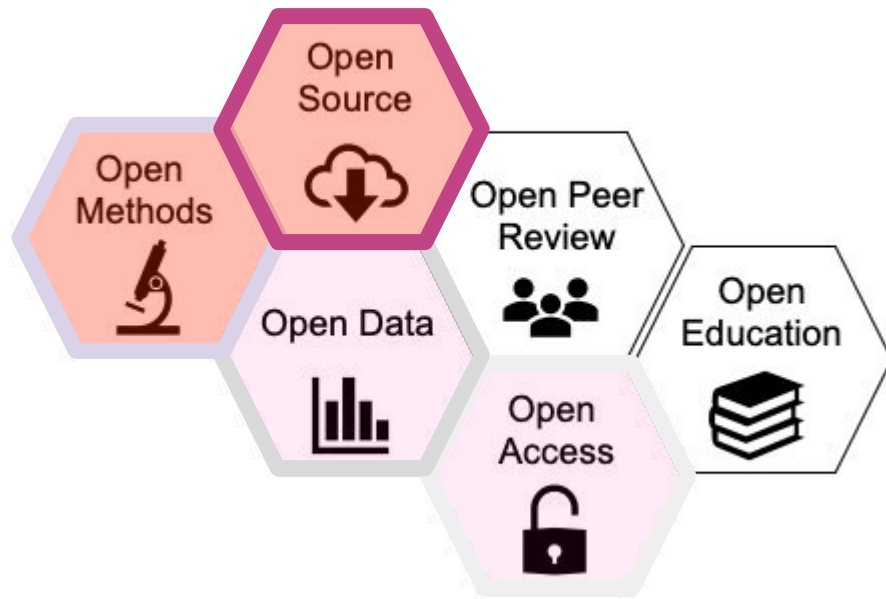


Start managing your projects on the OSF today.

Free and easy to use, the Open Science Framework supports the entire research lifecycle: planning, execution, reporting, archiving, and discovery.

[Create an Account](#) [Learn More](#) [Hide this message](#)

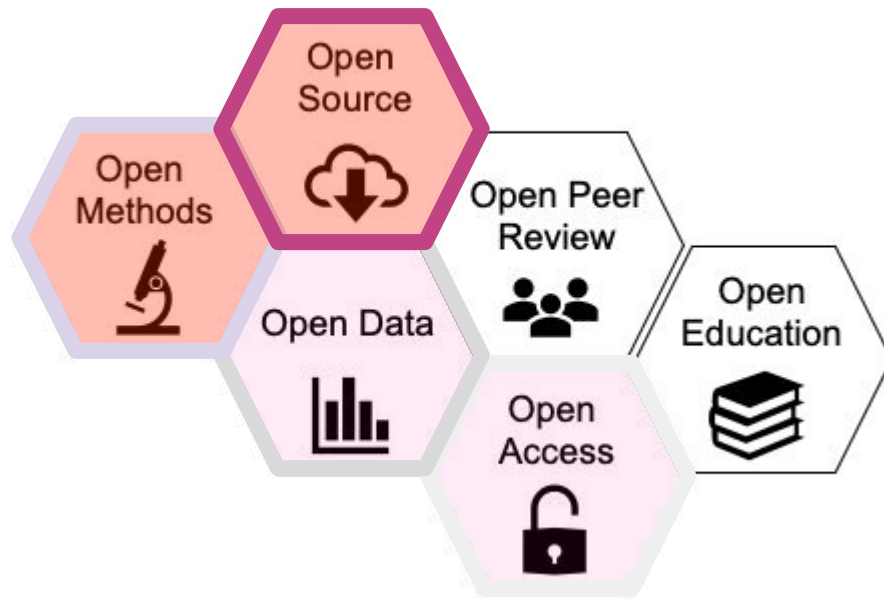
Phase 3: Open Science (2014 - 2023)



- 2017
 - First INBO R Open package published
 - wateRinfo

The screenshot shows a web page for a tutorial. At the top, there is a search bar and a navigation menu with links: HOME, ARTICLES, TUTORIALS, CREATE TUTORIAL, INSTALLATION + CATEGORIES, and REPOSITORY. The main content area displays the title 'wateRinfo: Download time series from multiple stations/variables' and the author 'Stijn Van Hoey'. Below the title, there is a link to the vignette and a URL: https://docs.ropensci.org/wateRinfo/articles/download_timeseries_batch.html. At the bottom, there is a 'Tags' section with the following tags: analysis, analysis of variance, api, bibliography, biodiversity, bioRad, bookdown, checklist, ci, r, vignette, wateRinfo.

Phase 3: Open Science (2014 - 2023)



- 2018
 - INBO team wins Ebbe Nielsen Challenge on open science and open data (cfr TriAS project)
 - Checklist recipe

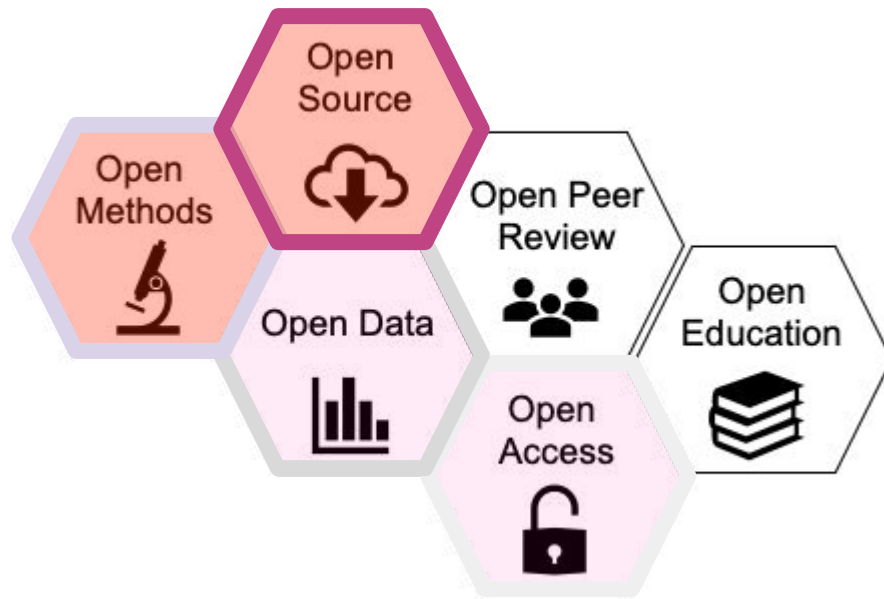
INBO team wint GBIF Ebbe Nielsen Challenge

17-10-2018
Brussel, Kilkenny

Vandaag reikt de Global Biodiversity Information Facility (GBIF) in Kilkenny, Ierland aan drie medewerkers van het Instituut voor Natuur- en Bosonderzoek de [Ebbe Nielsen Challenge prijs](#) uit. De Ebbe Nielsen Challenge belooft breed inzetbare oplossingen en innovaties voor open science en open data rond biodiversiteit. GBIF centraliseert miljoenen gegevens rond biodiversiteit die door iedereen geraadpleegd kunnen worden.

Lien Reyserhove, Damiano Oldoni en Peter Desmet ontwikkelden "Checklist recipe", een routine in de programmeertaal R waarmee soortenlijsten gepubliceerd kunnen worden op een transparante, open, en herhaalbare wijze. Iedereen kan het programma gebruiken en aanpassen naar eigen noden. De "Checklist recipe" wordt nu al ingezet voor het project TriAS (<http://trias-project.be>) om een open inventaris op te bouwen van de invasieve soorten die in België gevonden worden.

Phase 3: Open Science (2014 - 2023)

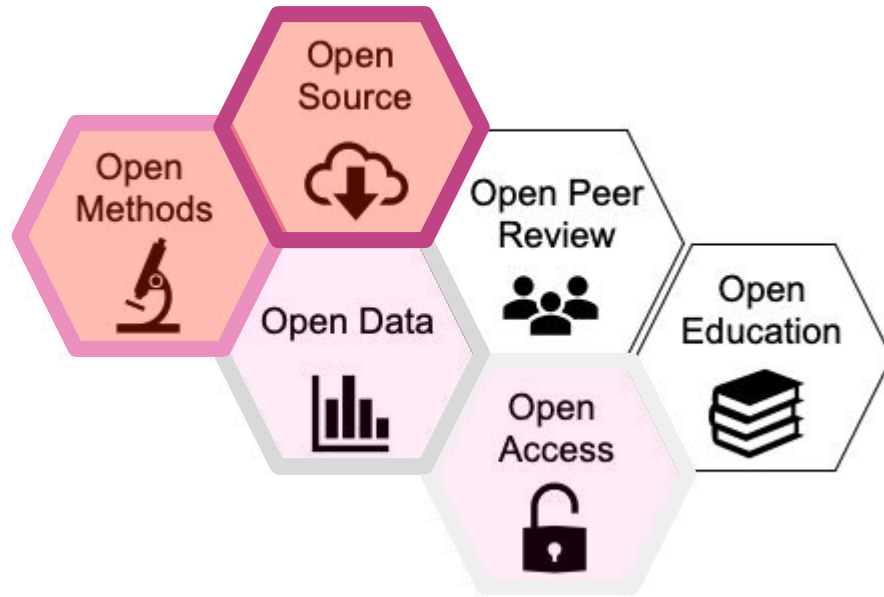


The screenshot shows a GitHub repository page for 'trias-project / checklist-recipe'. The repository is a public template. The main content area displays a commit history table:

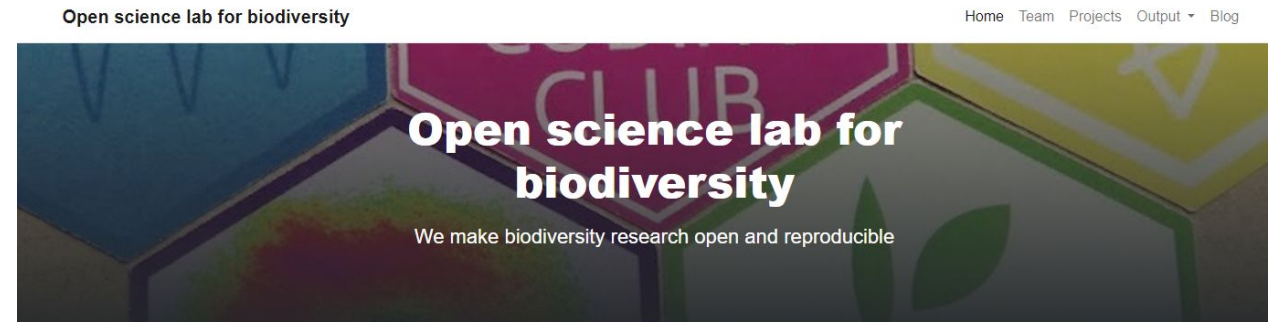
Commit	Message	Time
peterdesmet	Move src above data	on Apr 14, 2022 (142 commits)
	Use write_csv instead of write.csv	5 years ago
	Revert "Add a description with links to the dwc_mapping"	last year
	Move Rproj.user to top	4 years ago
	Update license holders	5 years ago
	Move src above data	last year
	Move .Rproj to root + use here() for file paths	5 years ago

Below the commit history, there is a section for the README.md file, titled 'Checklist recipe'. The README content states: 'This is a template repository for standardizing thematic species checklist data to Darwin Core using R. As a'.

Phase 3: Open Science (2014 - 2023)



- 2019
 - Start Oscibio



👉 We are the Open science lab for biodiversity, an externally funded team at the Research Institute for Nature and Forest (INBO). We aim to make biodiversity research open and reproducible.

We offer technical support to the [research projects](#) we participate in, e.g. the Belgian Biodiversity Platform, LifeWatch, TRIAS and GloBAM. Our support is mainly focused on data management, [open data publication](#) and research software development. We ❤️ open science, so our approach is open by default, international and community-oriented.

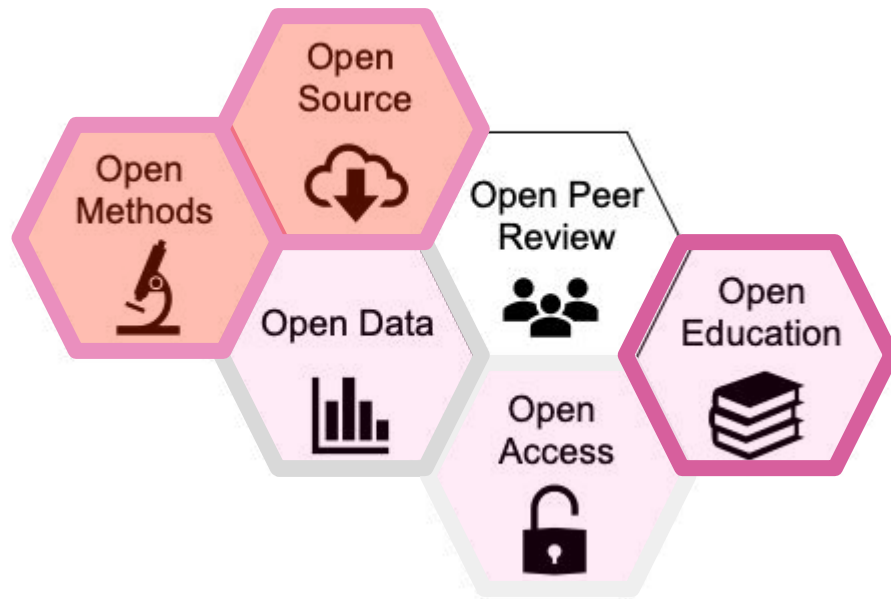
Interested to work with us? Get in touch.

Contact us

Follow us



Phase 3: Open Science (2014 - 2023)



- 2019
 - More organisation wide cooperation on open science
 - Evinbo teams and INBO teams
 - First Open Science Newsletter in INBO

Open Science nieuwsbrief - december 2019

[View this email in your browser](#)

Nieuwsbrief
Open Science

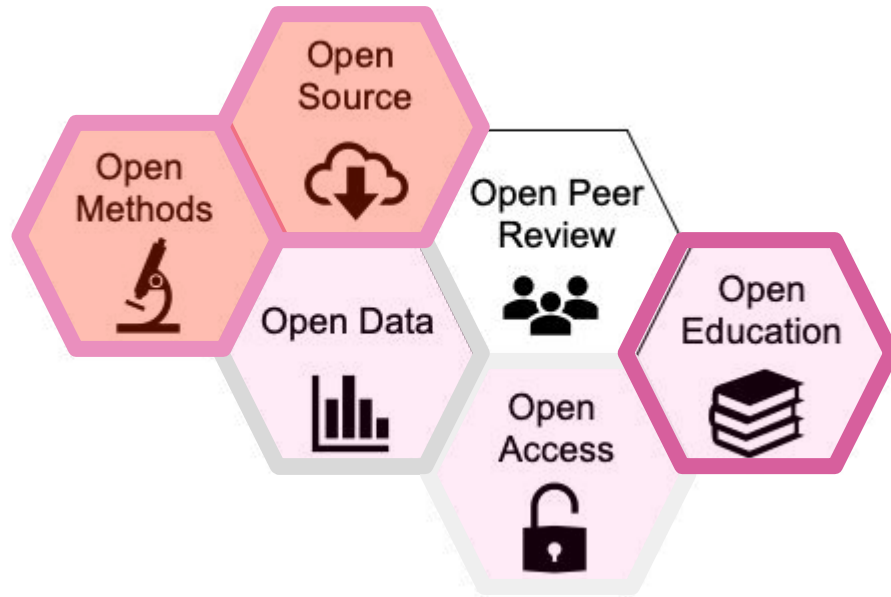
INSTITUUT
NATUUR- EN BOSONDERZOEK

Deze **nieuwsbrief** is een kanaal van en voor iedereen die met onderzoeksactiviteiten bezig is op het INBO!

De klemtoon ligt op **open** onderzoek & **open** methoden - kwestie van mee te zijn en elkaar te helpen omtrent deze evolutie in de wetenschappelijke gemeenschap. Je kunt dus je eigen aankondigingen, mededelingen, tips, demo's, ... in de **nieuwsbrief** kwijt!

Het Analytisch Laboratorium heeft daarnaast een specifieke rubriek.

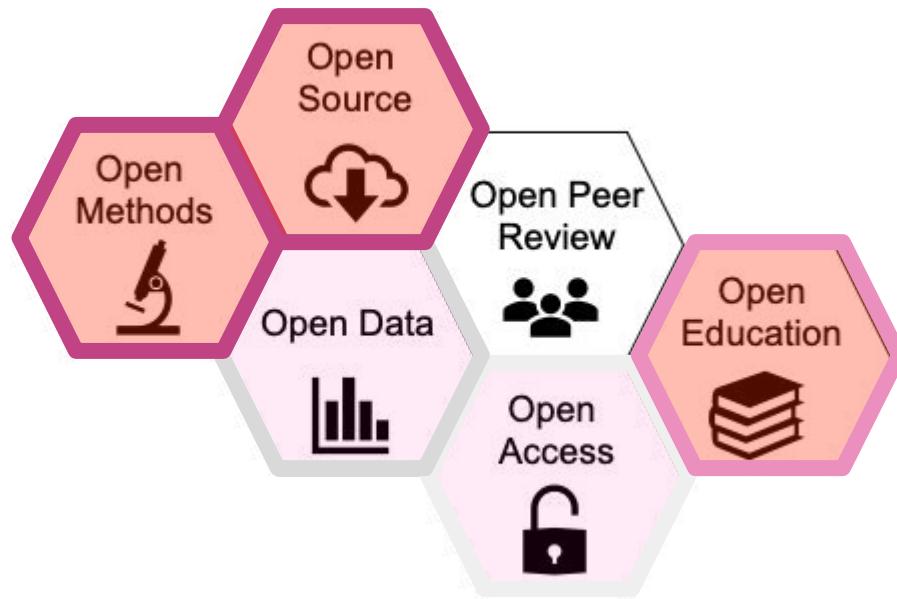
Phase 3: Open Science (2014 - 2023)



- 2019
 - INBO position paper
 - INBO embraces the model of Open and Transparent research!



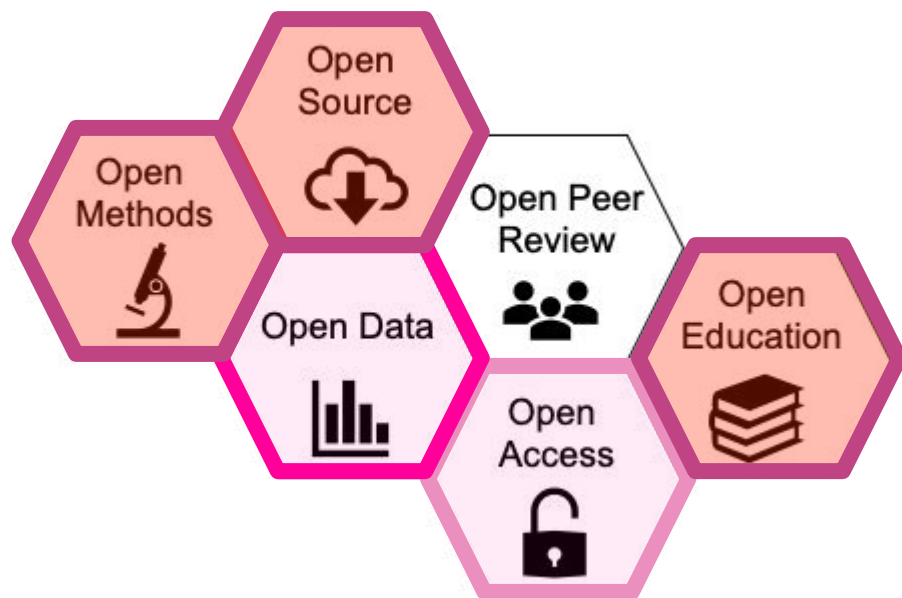
Phase 3: Open Science (2014 - 2023)



- 2019
 - “Open Science: towards a qualitative and transparent research cycle” announced in “Beslist weten”
 - Defined the “Open Science Targets”
 - Open Science “Trekking & aanspreekpunten”
 - champions & contact points



Phase 3: Open Science (2014 - 2023)



- 2020
 - Start FOSB (Flemish Open Science Board)



DEPARTEMENT
ECONOMIE
WETENSCHAP &
INNOVATIE

[Bekijk de Webversie](#)



Flemish **Open Science** Board (FOSB) opgericht

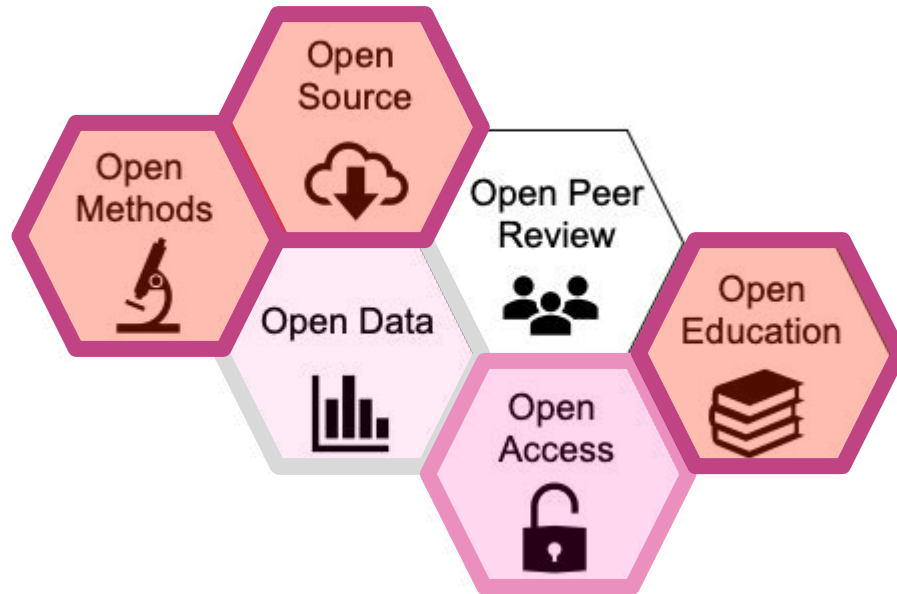
Op initiatief van Vlaams minister Hilde Crevits keurde de Vlaamse Regering voor het kerstverlof het Vlaams beleidsplan **Open Science** en de oprichting **Open Science** Board goed. Ondertussen werd de Flemish **Open Science** Board (FOSB) tijdens de "kick off meeting" van 21 februari opgericht. De FOSB heeft als mandaat het uitzetten van het beleid rond **Open Science** en de minister te adviseren m.b.t de besteding van de middelen die hiertoe worden ingezet.

[>> Lees meer](#)



Vlaanderen
is wetenschap

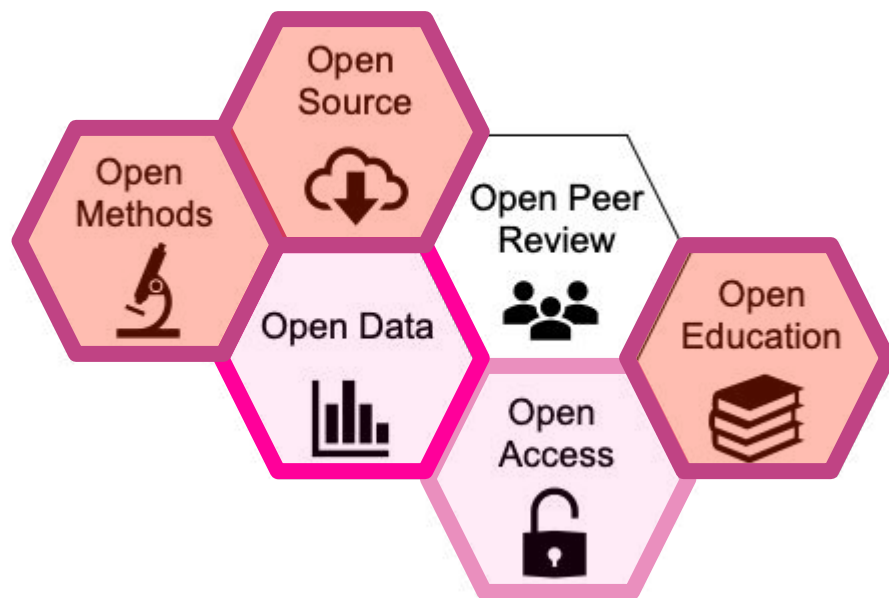
Phase 3: Open Science (2014 - 2023)



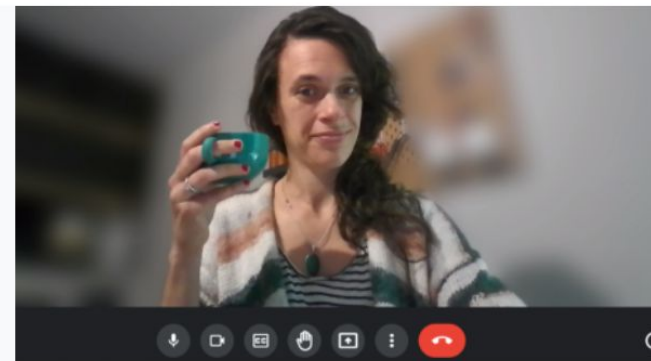
- 2021
 - Our first Open Science Café
 - Organised by **INBO**
 - OSD report
 - Open Science Targets in INBO

The screenshot shows the INBO website header with the logo and name 'INSTITUUT NATUUR- EN BOSONDERZOEK'. The navigation menu includes Home, Profiles, Research units, Equipment, Projects, **Research output**, and Datasets. A search bar is visible on the right. The main content area features the title 'Open Science bij het INBO: naar een kwaliteitsvolle en transparante onderzoekscyclus: Een overzicht van de INBO Open Science Doelen voor projecten - versie 1.1' by Floris Vanderhaeghe, Aaike De Wever, Lien Reyserhove, Peter Desmet, Thierry Onkelinx, Bart Goossens, Saskia Wanner, Gerrit Genouw, Lymke Janssens, Francis Turkelboom, and Toon Van Daele. The report is categorized under 'Biometry, Methodology and Quality Assurance, Datamanagement, Open science lab for biodiversity, Library and Information Management, Nature & Society, Analytic Laboratory, Communication and Planning'. The research output is identified as 'Book/Report > Reports of Research Institute for Nature and Forest'. On the right side, there is a badge indicating '1264 Downloads (Pure)' and a circular icon with the number '3'.

Phase 3: Open Science (2014 - 2023)



- 2022
 - FOSB Data steward in function

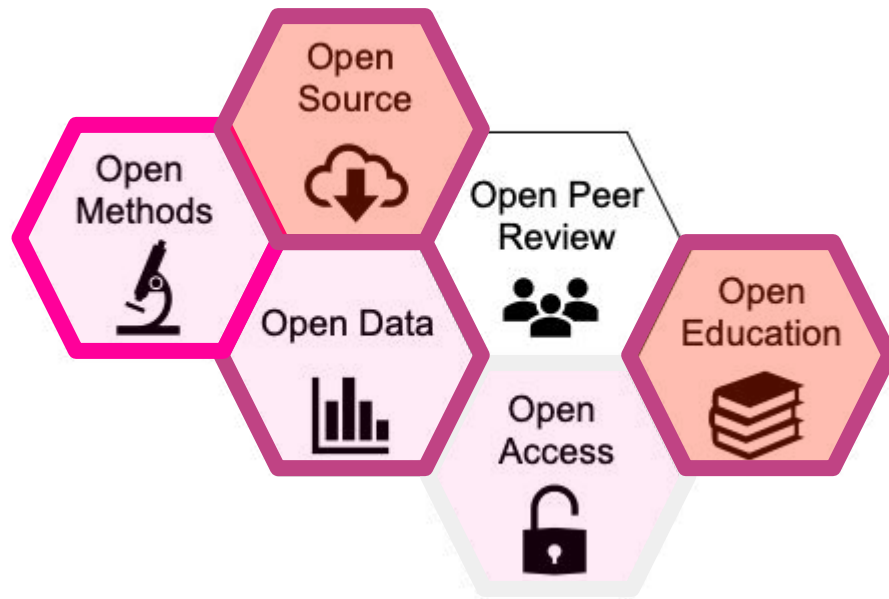


Data stress? Vraag het aan de data steward!

Geen idee hoe je je data publiceert op Zenodo of GBIF? Word je gek van al die data standaarden, repositories of licenties? Zeggen begrippen zoals DOI, ORCID of FAIR je maar weinig? Word je om een data management plan gevraagd? Geen paniek: je staat er niet alleen voor! Als data steward voor het INBO help ik je graag met al je vragen!

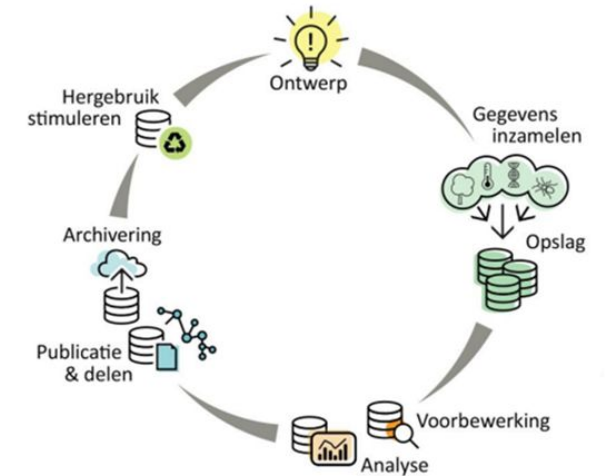
Data steward? Data steward!

Phase 3: Open Science (2023) Where are we now?



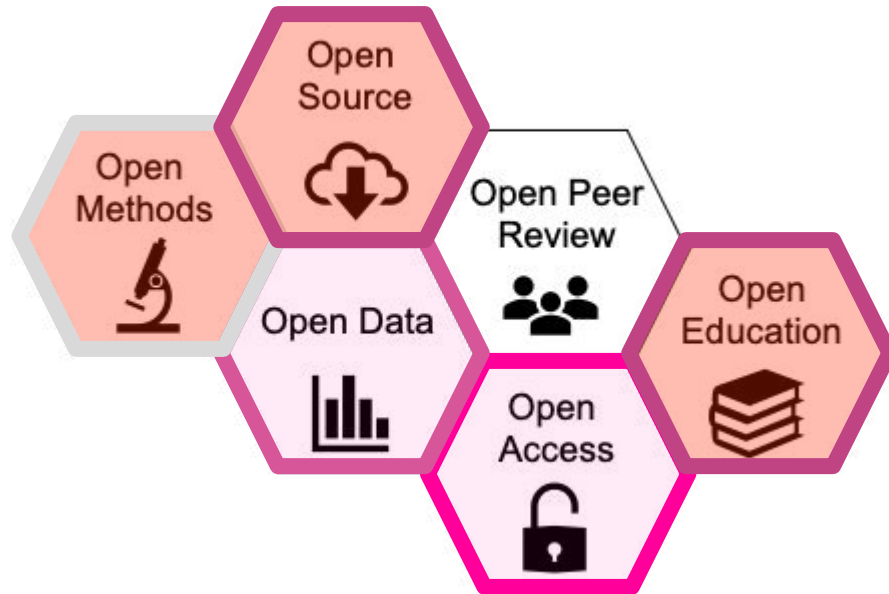
INBO aims to work as **much as possible** in accordance with the **methods of open and reproducible research** - Open Science for short - in order to achieve **solid and demonstrable scientific quality**.

Open Science as Guidance



Phase 3: Open Science (2023) Where are we now?

Open Science Targets

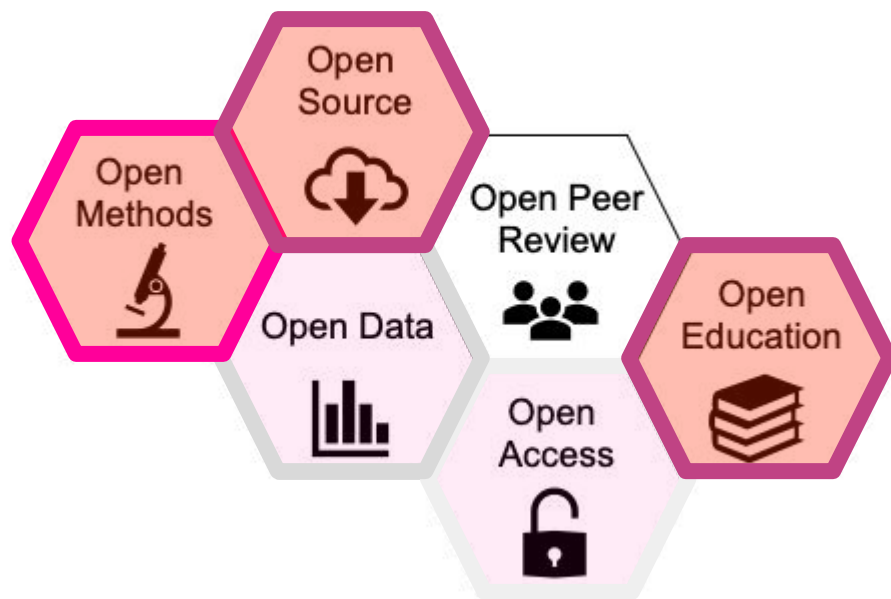


- In the **Design of the research**
 - Find the **Relevant Research Question**
 - Create a communication plan
 - Make the research Question is sharp and clear
 - The research is relevant with the research question and well documented
 - The research is aligned with the research results
 - All the 'Data' phases in the research cycle are documented in a **DMP**
 - Revision is foreseen



Phase 3: Open Science (2023) Where are we now?

Open Science Targets

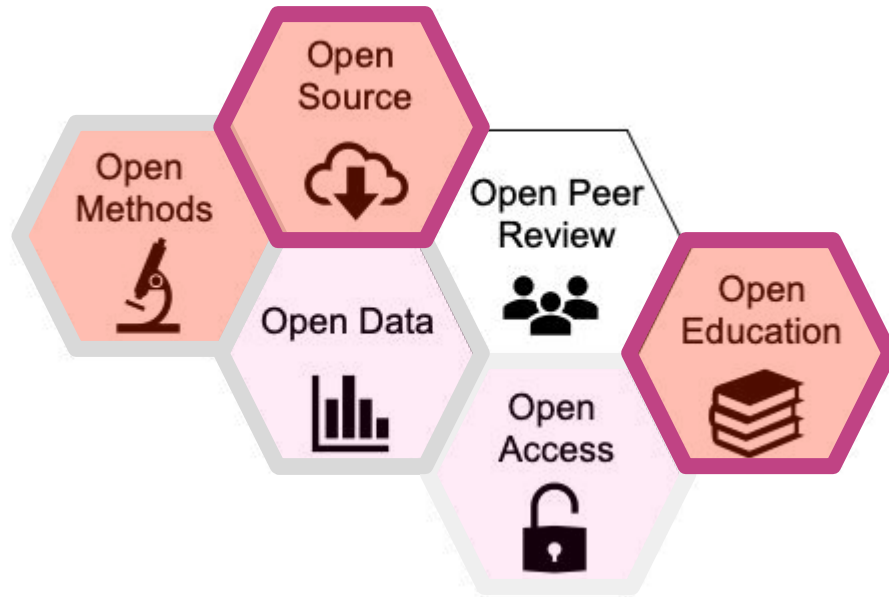


- During **Data collection**

- Data collection through **well defined protocols**
- Automatic data collection when possible
- **Existing data is (re)used** when possible
- Validation procedures are in play
- Measurement biases are understood and documented

Phase 3: Open Science (2023) Where are we now?

Open Science Targets

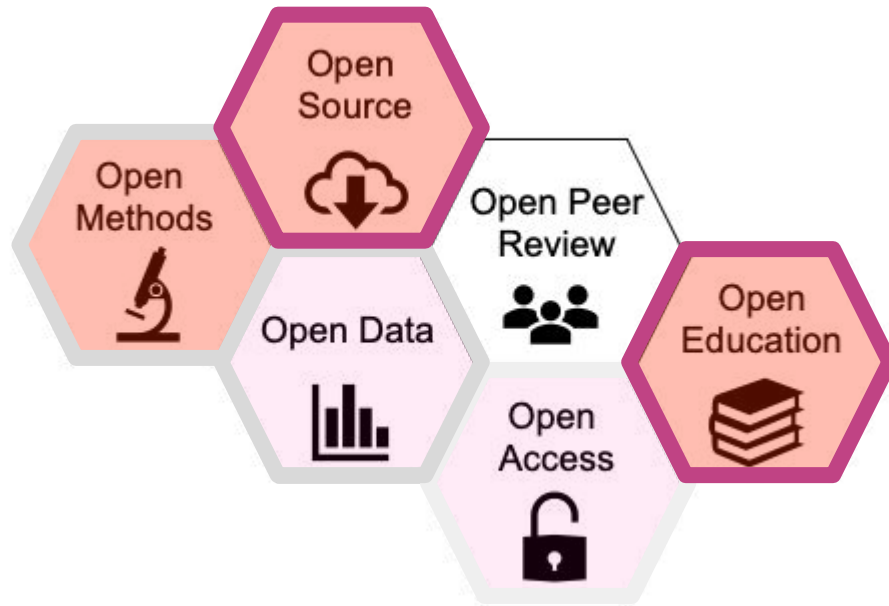


- During **Data storage**

- Data is well organised, documented and stored
 - Use **DMP**
 - **Metadata**
 - Be aware of sensitivities (GDPR...), sensitive data

Phase 3: Open Science (2023) Where are we now?

Open Science Targets

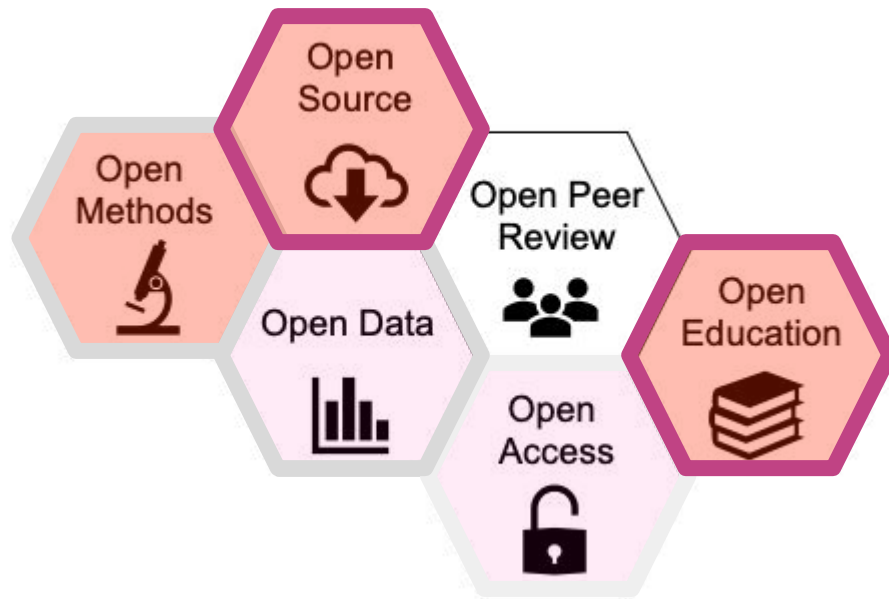


- **Pre Data analysis**

- Data validation is reproducible
 - fixed validation rules
- Data transformation is reproducible
 - scripted data workflow

Phase 3: Open Science (2023) Where are we now?

Open Science Targets

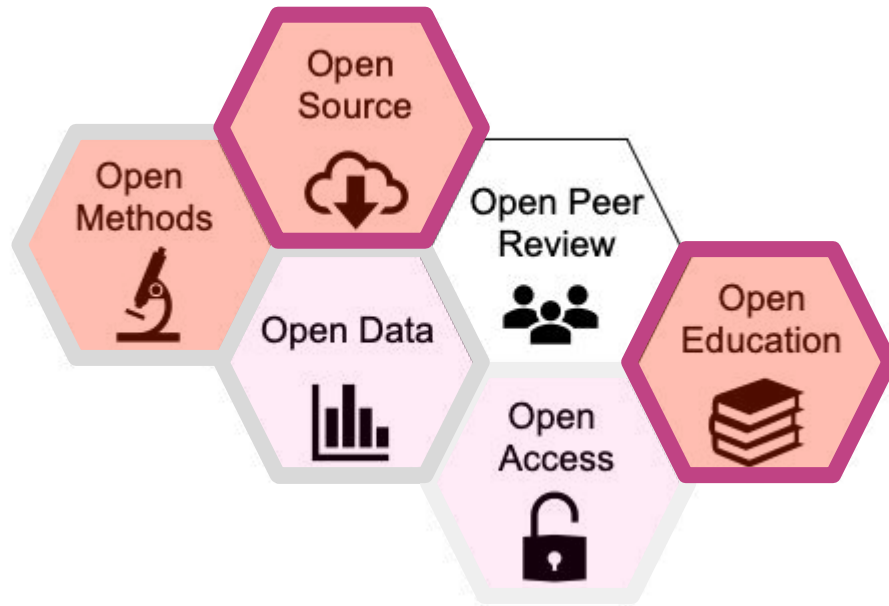


- During **Data Analysis**

- Data analysis is adequate and correct
- Analyse workflow is open and reproducible
- A versioning system is used (git)
 - Code and scripts are kept

Phase 3: Open Science (2023) Where are we now?

Open Science Targets



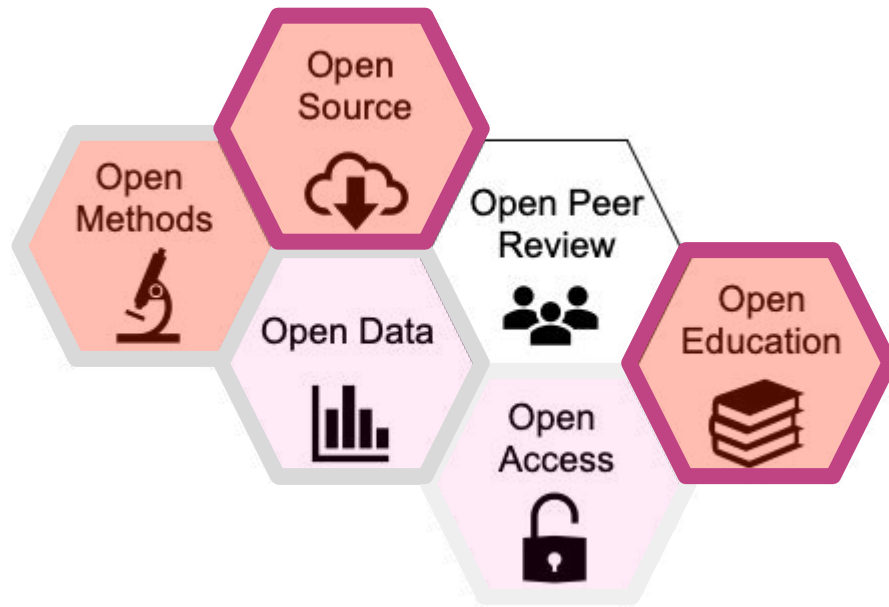
- **Data sharing**

- Data is published as open data
- FAIR principles are followed
- Open source code (scripts)
- Open protocols



Phase 3: Open Science (2023) Where are we now?

Open Science Targets



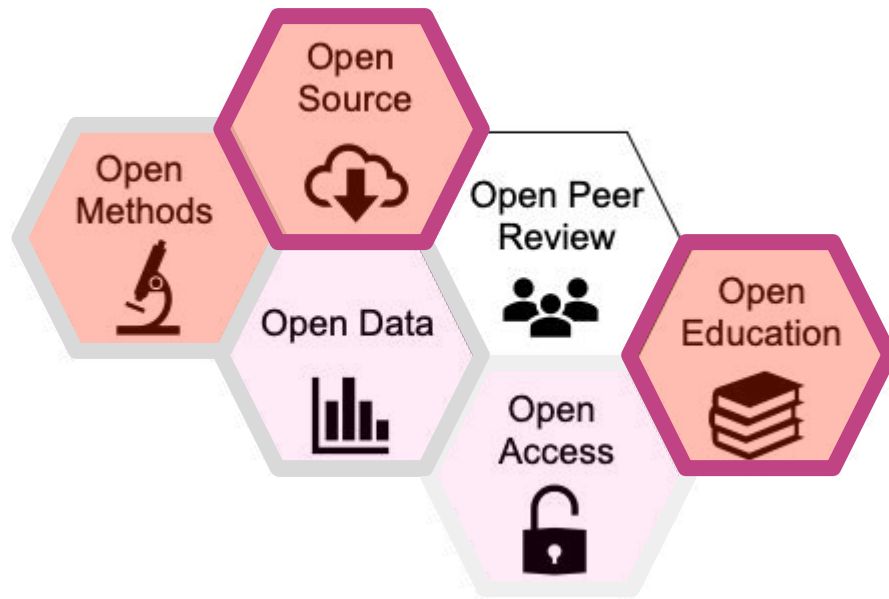
- **Publications**

- Published as open access
- Correct citations of sources (DOI...)
- Use of Orcid ID's

A screenshot of an ORCID iD profile for Dimitri Brosens. The profile shows the ORCID logo, the name 'Dimitri Brosens', and the ORCID iD '0000-0002-0846-9116'. The profile is set to 'English' and 'Dimitri Brosens'. The profile is currently set to 'Public'. The profile includes a section for 'Websites & social links' with a link to the 'Belgian Biodiversity Platform Research Institute for Nature and Forest profile page'. The profile also has an 'Activities' section with a 'Collapse all' button. The 'Employment (3)' section is expanded, showing a 'Sort' button.

Phase 3: Open Science (2023) Where are we now?

Open Science Targets

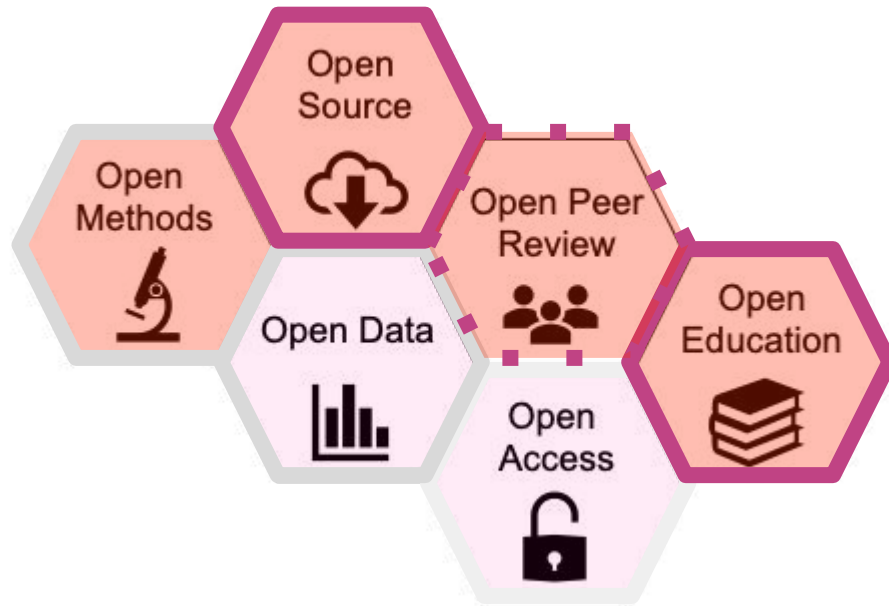


- **Archiving**

- all documents and achieved sustainable and made open in an efficient way
- all data will be archived
- all samples are archived
- all protocols are archived
- all source code is archived

Phase 3: Open Science (2023) Where are we now?

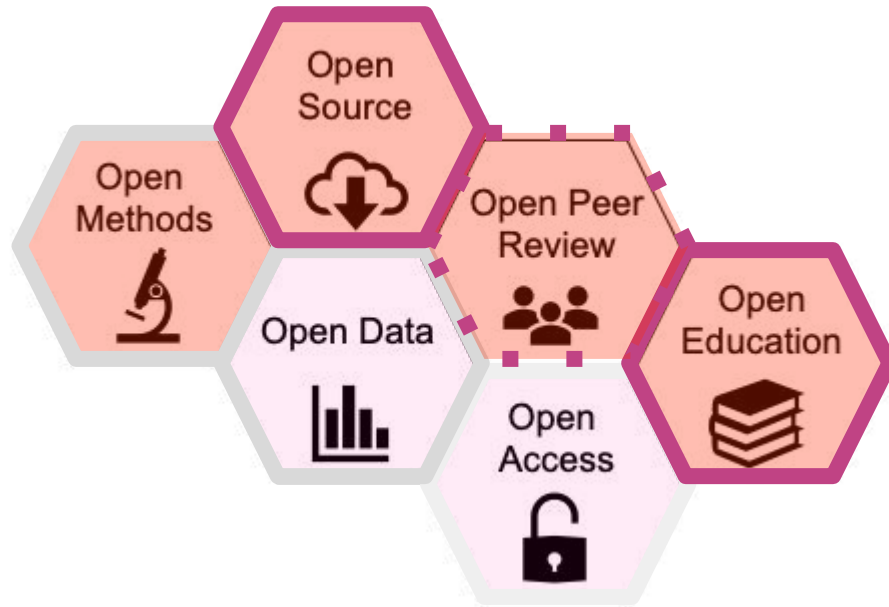
Open Science Targets



- **Stimulate Reuse**

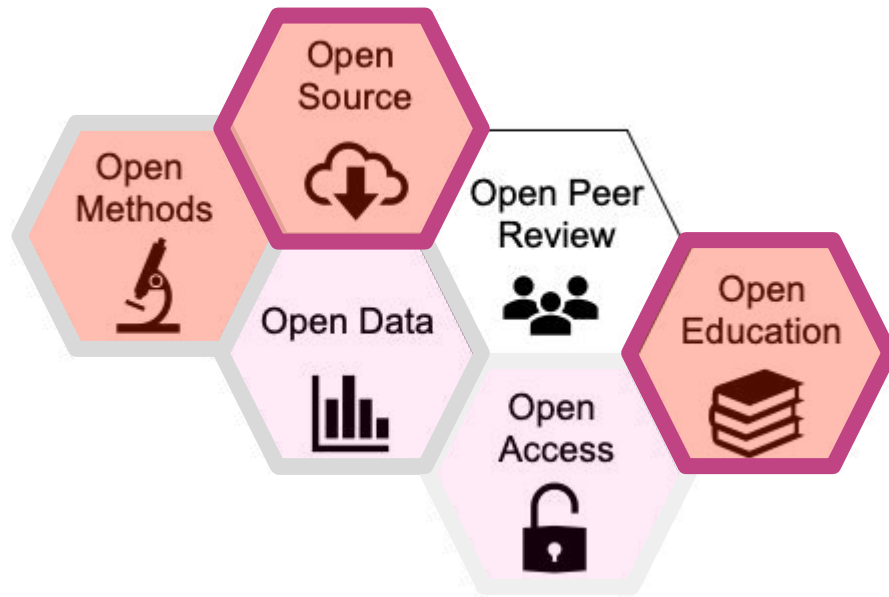
- Create opportunities for internal and external reuse of all resources

Phase 3: Open Science (2023), INBO Rationale



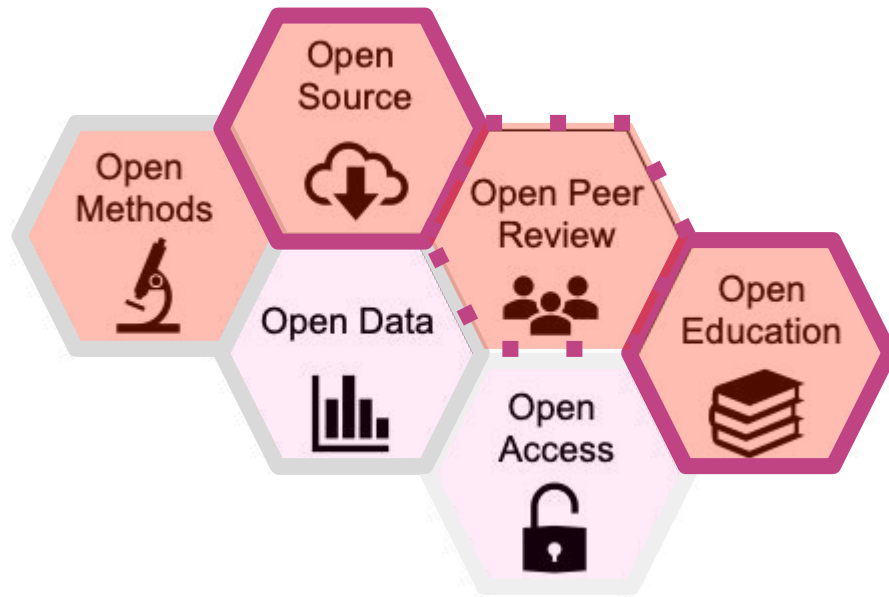
- **Openness and reproducibility** are not in themselves a guarantee of quality. They are, however, a **necessary precondition** in order to **demonstrate quality**. They are also necessary in order to **facilitate internal and external cooperation** so that results can be further **improved** and follow-up steps can be taken.

Phase 3: Open Science (2023), INBO Rationale



- In an **open collaboration culture**, every scientist can and may give feedback or contribute improvements: the scientific community and the scientific objectives are central. Personal credits arise as a result of contribution to the system, and by opening up data, methods and/or research results.

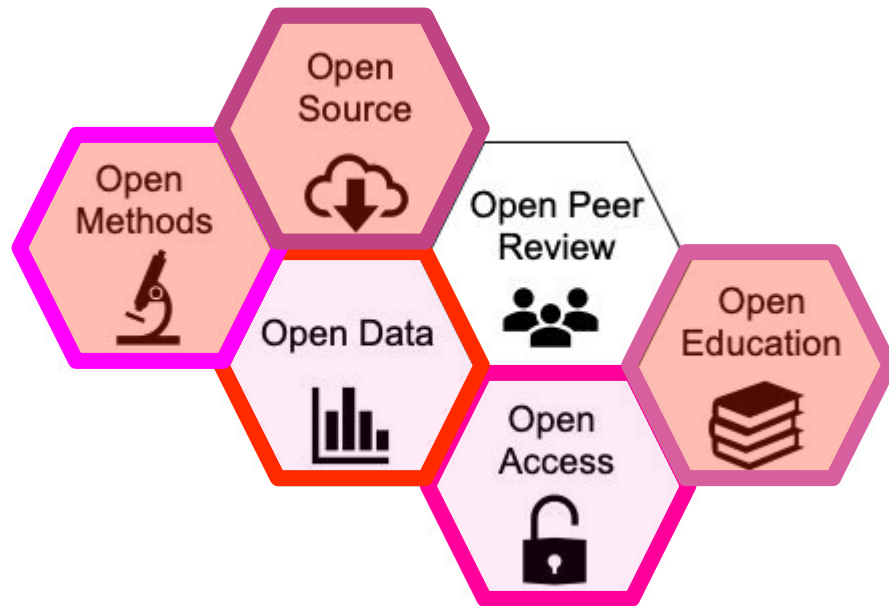
Phase 3: Open Science (2023), INBO Rationale



- In a forward-looking scientific practice, the **scientific community has insight and control over all aspects of the research chain.**
- Methods are open and maximally owned by the community, which thus achieves a high degree of independence.

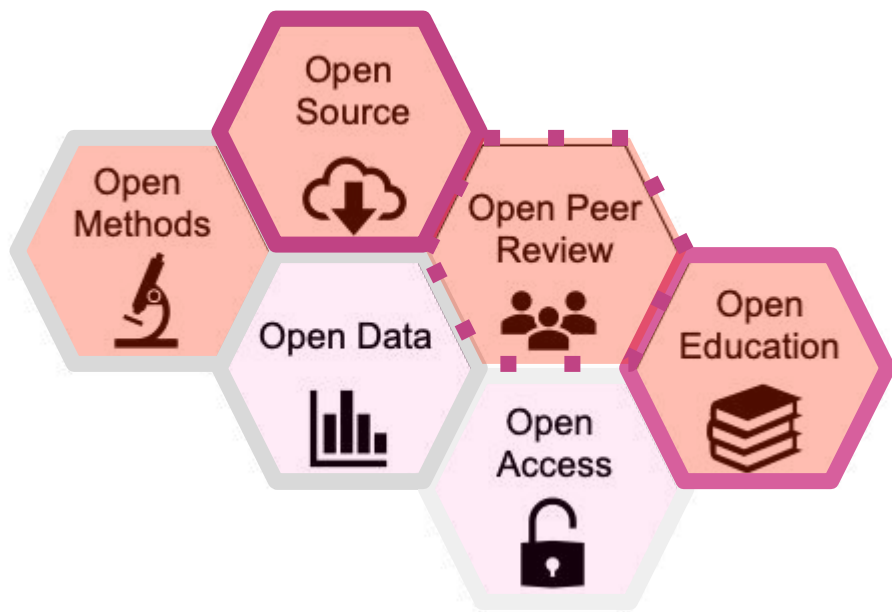


Phase 3: Open Science (2023), INBO Rationale

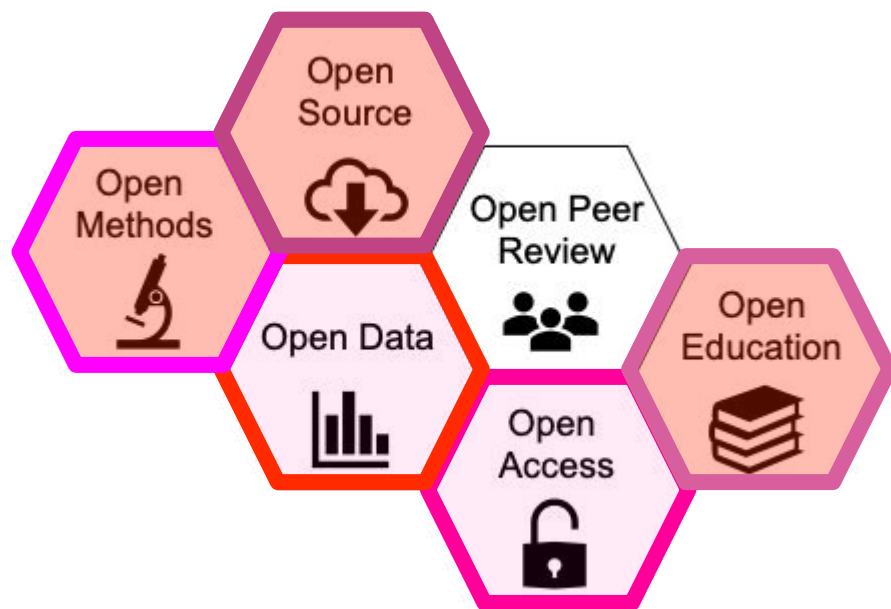


- Transparency and sharing are evidences for a public body like INBO.
- By pursuing Open Science goals, we consistently apply this principle in our research practice and are progressive in our approach.

Phase 3: Open Science (2023), INBO Rationale



Phase 3: Open Science (2023), INBO Rationale



34 results | Relevance > | Export search results

Your concept search for 'open science' did not have any results. Showing results instead for 'open science' as free text search

FOSB - Implementation of Flemish Open Science Board goals

Brosens, D., Desmet, P., De Wever, A., Milotic, T., Reyserhove, L. & Pollet, M.

1/09/20 → 31/12/24

Project: Evinbo

Open Science - Towards a high-quality and transparent research cycle

Wils, C., Van Gossum, P., Casaer, J., Breine, J., Genouw, G., Brosens, D., Vanermen, N., Van Daele, T., Goossens, B., Pauwels, I., Janssens, L., Leyssen, A., Thoonen, M., Desmet, P., Turkelboom, F., Vanderhaeghe, F., Cox, K., Adriaens, T., Van Calster, H., Thomas, A., Vanden Borre, J., Onkelinx, T., De Dobbelaer, T., Milotic, T., Oldoni, D., Wanner, S., Pollet, M., Piesschaert, F., Carmen, R. & De Wever, A.

1/01/20 → 31/12/35

Project: own initiative (position paper)

Develop and increase in-house expertise in data collection, data processing and model building

Bauwens, D., Lommelen, E., Vanderhaeghe, F., Genouw, G., Jansen, I., Quataert, P., Verschelde, P., Onkelinx, T., Van Daele, T., Westra, T., Van Calster, H., Carmen, R. & Langerart, W.

1/01/11 → 31/12/24

Project: Scientific support

Increasing understanding of alien species through citizen science

Adriaens, T., D'hondt, B., Reyserhove, L., Casaer, J. & Hillaert, J.

3/07/18 → 1/07/23

Project: Evinbo

Brussels Environment Species 3 - Short and midterm management of the species database of Brussels Environment

Oldoni, D.

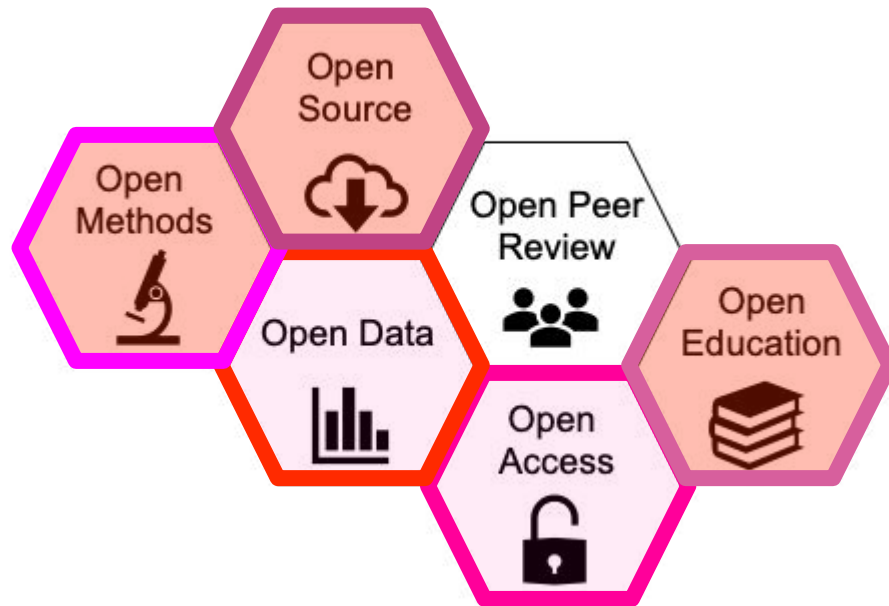
1/01/23 → 31/12/23

Project: Evinbo



Vlaanderen
is wetenschap

Phase 3: Open Science (2023), INBO Rationale



GloBAM - Global Biomass flows of Aerial Migrants

[Desmet, P.](#), Van Hoey, S. & Noé, N.

1/04/19 → 31/12/22

Project: Evinbo

GBIF technical guide to publishing camera trap data

[Desmet, P. & Reyserhove, L.](#)

1/01/22 → 30/06/23

Project: Evinbo

Brussels Environment Species 2 - Development of the Brussels Environment Species Database

[Desmet, P., Noé, N. & Oldoni, D.](#)

1/01/20 → 31/03/21

Project: Evinbo

TrIAS - Tracking Invasive Alien Species

[Adriaens, T., Desmet, P., Demolder, H., Devisscher, S., Van Hoey, S., Verzelen, Y., Van Landuyt, W., Speybroeck, J., D'hondt, B., Oldoni, D. & Reyserhove, L.](#)

1/01/17 → 31/12/21

Project: Evinbo

Belgian Biodiversity Platform

[Mortelmans, D., Brosens, D., Popa, F., Keune, H., Demeyer, R., Jacobs, S. & Heck, A.](#)

13/04/13 → 31/12/24

Project: Evinbo

LifeWatch

[Aelterman, B., Goossens, C., Fostier, C., Van den Bergh, E., Azijn, K., Pollet, M., Desmet, P., Van Hoey, S., Milotic, T., Noé, N., Oldoni, D., Reyserhove, L., Casaer, J., Cools, N., De Dobbelaer, T., Pauwels, I., Spanoghe, G., Stienen, E., Verhelst, P. & Wouters, J.](#)

1/01/12 → 31/12/24

Project: Evinbo

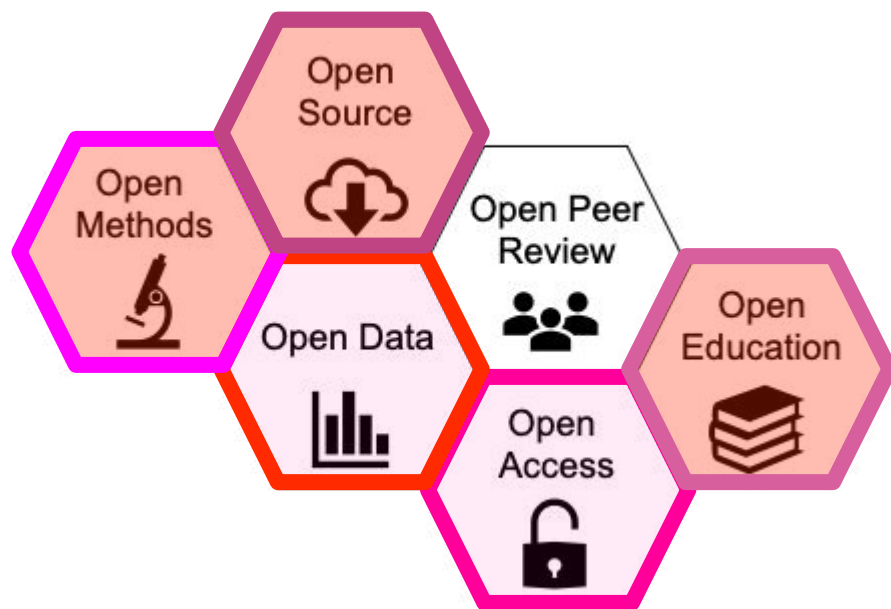
CROW - Communicating RAVen to the Outside World

[Desmet, P. & Noé, N.](#)

1/01/18 → 31/12/22



Phase 3: Open Science (2023), INBO Rationale



[MOVE2GBIF - Mobilizing animal GPS tracking data to Movebank and GBIF](#)

Desmet, P.
1/06/21 → 31/12/22
Project: Evinbo

[ESAS to EMODnet Biology](#)

Desmet, P. & Reysenhove, L.
1/12/21 → 17/04/23
Project: Evinbo

[CATREIN - Camera trap research infrastructure for LifeWatch](#)

Desmet, P., Casaer, J., Vercammen, J., Neukermans, A., Vernailen, J., Van Hoey, S., Boone, N., Devisscher, S., Milotic, T., Pallemarts, L., Oldoni, D. & Dupont, S.
2/01/17 → 31/12/24
Project: Evinbo

[Vespa-Watch - Invasion monitoring of Asian hornet with beekeepers and the public](#)

Van Hoey, S., Adriaens, T., Desmet, P., Devisscher, S. & Schoonvaere, K.
1/06/18 → 31/12/19
Project: Evinbo

[KLIVEG - Effects of environment & climate on vegetation in LTER areas](#)

Milbau, A., Verstraeten, A., Neiryck, J., De Dobbelaer, T., Van der Auwermeulen, B., Louette, G., Smesman, E., Cools, N., De Vos, B., Milotic, T. & Raman, M.
1/10/16 → 31/10/26
Project: Legally bound

[Vespa-Watch - Invasion monitoring of Asian hornet with beekeepers and the public](#)

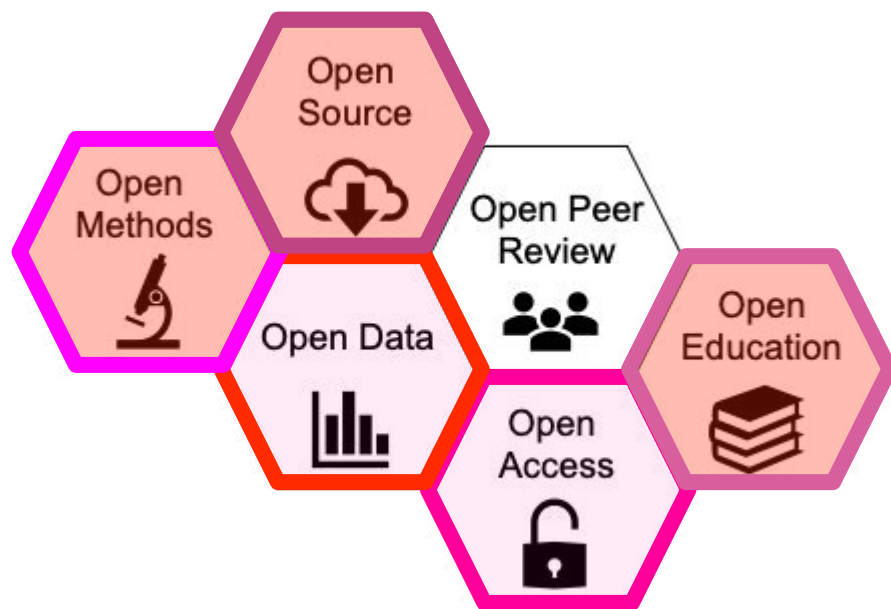
Adriaens, T., Desmet, P., Devisscher, S., Noé, N., Hillaert, J., D'hondt, B., Neukermans, A., Huysentruyt, F. & Dupont, S.
1/01/20 → 31/12/25
Project: Legally bound

[Best practice for humane rodent control](#)

Huysentruyt, F., Baert, K., Casaer, J., Van Den Berge, K., Cartuyvels, E. & Noé, N.
1/02/20 → 30/04/21



Phase 3: Open Science (2023), INBO Rationale



Monitoring and evaluation of adaptive game management Drongengoed

Casaer, J., Pollet, M., Pallemaerts, L. & Dupont, S.

1/01/22 → 31/12/31

Project: *coöperation agreement*

MICA - Management of Invasive Coypu and muskrAt in Europe

Adriaens, T., Vernailen, J., Schamp, K., Neukermans, A., Huysentruyt, F., Baert, K., Verzelen, Y., Casaer, J., Devisscher, S., D'hondt, B., Cartuyvels, E., Brosens, D., Desmet, P., Noé, N. & Dupont, S.

2/09/19 → 29/12/23

Project: *Evinbo*

ESAS - Inventory report on revitalizing the ESAS-database for the North Sea

Desmet, P., Vanermen, N., Stienen, E., Milotic, T. & Reyserhove, L.

1/05/20 → 31/05/21

Project: *Evinbo*

Development of the local conservation status (LSVI) habitat types calculation module

Van Hoey, S., Van Spaendonk, G., Lommelen, E., Van Hove, M., Oosterlynck, P. & Paelinckx, D.

1/01/18 → 31/12/24

Project: *Scientific support*

Development of a standard methodology for determining soil biodiversity in Flanders

De Vos, B., Mergeay, J., De Bruyn, L., Van Daele, T. & Brosens, D.

1/01/15 → 31/12/19

Project: *Demand*

From cameratrap to GBIF

Casaer, J., Desmet, P., Van Hoey, S. & Milotic, T.

3/09/19 → 30/06/21

Project: *Evinbo*

SPRING Flanders

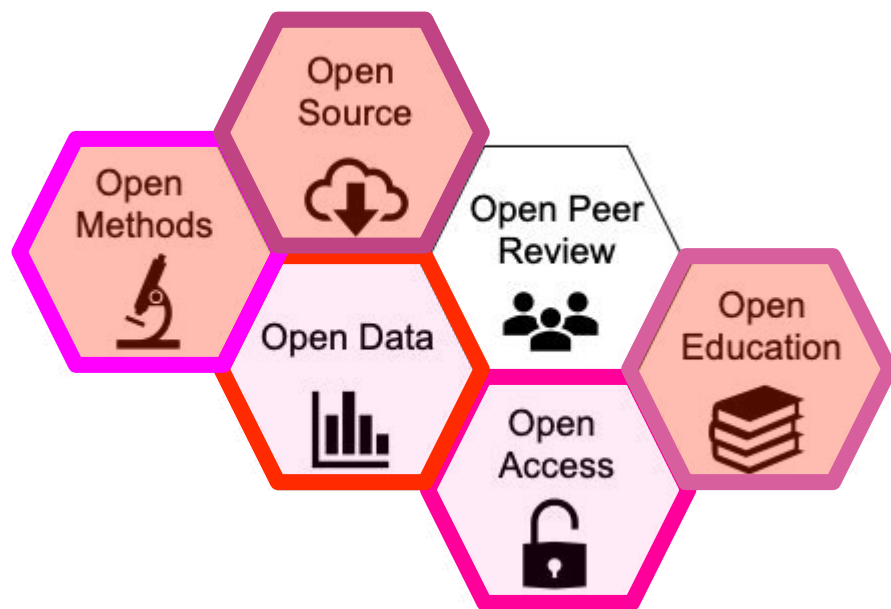
Pollet, M., Van de Meutter, F., Berleenge, F., Brosens, D., Gelaude, E., Jocqué, M., Milotic, T., Neukermans, A., Reyserhove, L., Schamp, K. & Vanden Houten, J.

29/04/22 → 31/12/23

Project: *Evinbo*



Phase 3: Open Science (2023), INBO Rationale



B-Cubed - Biodiversity Building Blocks for policy

Adriaenssens, V., Adriaens, T., Desmet, P., Oldoni, D., Onkelinx, T., Reyserhove, L., Van Calster, H., Van Daele, T., Van den Broeck, F., Vanderhaeghe, F. & Langerart, W.

1/03/23 → 30/09/26

Project: *Evinbo*

RIPARIAS - Reaching Integrated and Prompt Action in Response to Invasive Alien Species

Adriaens, T., Desmet, P., D'hondt, B., Oldoni, D., Reyserhove, L., Hillaert, J., Devisscher, S., Noé, N., Van Asbroeck, R. & Huybrechts, P.

1/01/21 → 1/09/26

Project: *Evinbo*

DiSSCo Flanders

De Cuyper, B., De Vos, B., De Wever, A., Vanden Broeck, A., Vander Mijnsbrugge, K., Veltjen, E., Pollet, M. & Huysentruyt, F.

1/01/21 → 31/12/24

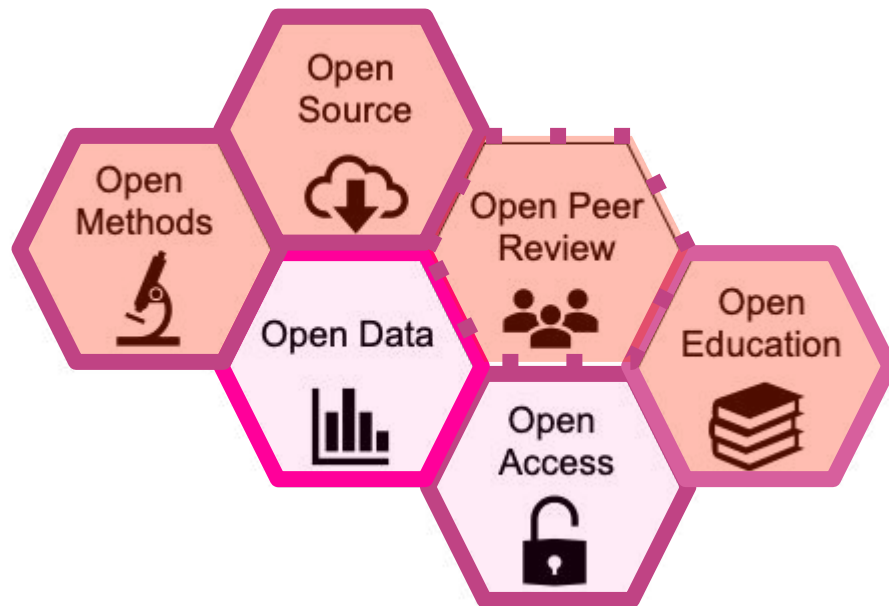
Project: *Evinbo*

Area analyses: scientific support for the formulation of area visions concerning remediation measures per special protection zone-habitat (SBZ-H) subzone

Vriens, L., De Beck, L., Lommaert, L., Thoonen, M., Boone, N., Van Braeckel, A., Leyssen, A., Hennebel, D., Maes, D., Adriaens, D., Van Oost, F., De Blust, G., Jacobs, I., Ruymen, J., Van Uytvanck, J., Wouters, J., Vanden Borre, J., Mergeay, J., Scheers, K., Decler, K., Vandekerkhove, K., De Keersmaeker, L., Froidmont, M., Wackenier, M., Oosterlynck, P., Gyselings, R., Guelinckx, R., Provoost, S., De Saeger, S., Spanhove, T., Mertens, W., Van den Bergh, E., Vught, I., Van Daele, T., Pollet, M., Van de Meutter, F., De Bie, E., Herr, C., Denys, L., Raman, M., Van Hove, M., De Knijf, G., Op De Beeck, J., Debusschere, K., Van Calster, H., Packet, J., Thomaes, A., Vanderhaeghe, F., De Becker, P., Vandevoorde, B., Dhaluin, P., Verstraeten, A., Paelinckx, D., De Braekeleer, A., Desmet, P., Van Ryckegem, G., van Vesseem, J., Tamsyn, W., Hendrickx, P. & Kumpen, M.

26/10/15 → 31/10/18

Project: *Legally bound*



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