



BIODIVERSITY BUILDING BLOCKS FOR POLICY

D1.8 Sustainability report

Version 1 29/08/2025

Version 2 14/07/2026

Author(s): Jonas Depecker, Laura Abraham, Stefaan Pijls,
Maarten Trekels, Nikol Yovcheva, Quentin Groom



Funded by
the European Union

Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the EU nor the EC can be held responsible for them.



Prepared under contract from the European Commission

Grant agreement No. 101059592

EU Horizon Europe Research and Innovation Action

Project acronym:	B3
Project full title:	Biodiversity Building Blocks for policy
Project duration:	01.03.2023 – 31.08.2026 (42 months)
Project coordinator:	Dr. Quentin Groom, Agentschap Plantentuin Meise (MeiseBG)
Call:	HORIZON-CL6-2021-GOVERNANCE-01
Deliverable title:	Sustainability report
Deliverable n°:	D1.8
WP responsible:	WP1
Nature of the deliverable:	Report
Dissemination level:	Public
Lead partner:	MeiseBG
Recommended citation:	Depecker, J. <i>et al.</i> (2025). <i>Sustainability report</i> . B3 project deliverable D1.8
Due date of deliverable:	Month 30
Actual submission date:	Month 30

Deliverable status:

Version	Status	Date	Author(s)
1.0	Draft	24 April 2025	Jonas Depecker (MeiseBG)
1.1	Draft	26 June 2025	Jonas Depecker, Laura Abraham, Stefaan Pijls, Maarten Trekels, Quentin Groom (MeiseBG), Nikol Yovcheva (Pensoft)
1.2	Draft review	28 July 2025	Nikol Yovcheva (Pensoft)
1.3	Review	18 August 2025	Peter Desmet (EV INBO), Duccio Rocchini (UNIBO)
1.4	Final review	28 August 2025	Quentin Groom (MeiseBG)
1.4	Final v1	29 August 2025	Jonas Depecker (MeiseBG)
2.0	Update	14 July 2026	Jonas Depecker (MeiseBG), based on consortium input





Table of contents

Table of changes to the Sustainability report	5
Key takeaway messages	6
Executive summary	7
Non-technical summary	8
List of abbreviations	9
1. Introduction	10
1.1. Project	10
1.2. Scope and objectives of the deliverable	10
1.3. Task planning and execution	10
1.4. Relation to other tasks and deliverables	11
1.4.1. D1.2 and D1.9 Plan for Exploitation, Dissemination and Communication	12
1.4.2. D1.3 Data Management Plan	12
1.4.3. D3.3 FAIR data products and interoperability with the Essential Biodiversity Variables Data Portal	13
1.5. Document structure	13
2. Setting the scene of sustainability	14
2.1. Vision and definition of sustainability for the B3 outputs	14
2.1.1. B3's scientific sustainability	14
2.1.2. B3's technical sustainability	14
2.1.3. B3's financial sustainability	15
3. Governance and stakeholder roles	16
4. Project outputs to sustain	17
4.1. Description of the project's outputs	17
5. Sustainability plan per output type	20
5.1. Primary outputs	20
5.1.1. Infrastructure	20
5.1.2. Software packages	21
5.1.3. Specifications	21
5.1.4. Analyses	22
5.2. Secondary outputs	22
5.2.1. Websites	22
5.2.2. Tutorials	22
5.2.3. Training	23
5.3. Complementary outputs	23
6. Sustainability actions	23
6.1. Actions already taken	23
6.1.1. Exploitation, dissemination, and communication	23
6.1.2. Collaborations	24
6.2. Future plans	24





6.2.1. Accessibility on a long-term	24
6.2.2. Functionality, maintainability and impact on a long term	24
7. Monitoring and risk management	25
7.1 Monitoring	25
7.1.1. KPIs	25
7.2. Risk management	28
7.2.1. Maintenance risks	28
7.2.2. Technical risks	28
8. Outlook	28
9. Acknowledgements	29
10. References	29
11. Annex	32
11.1. Questionnaire 1	32
11.2. Summary of the workshop	33
11.2.1. Overview of the workshop	33
11.2.2. Introduction	33
11.2.3. Brief review of the questionnaire	34
11.2.4. Discussion	35
• First topic	35
• Second topic	36
• Third topic	36
• Fourth topic	36
11.2.5. Conclusion and Actionpoints	37
11.3. Overview of outputs	38





Table of changes to the Sustainability report

Date	Section(s)	Type of update	Content
June – July 2026	Section 1.4.2.	Content	Clarification on the outline of intellectual property management in the Data Management Plan
June – July 2026	Section 2.1.3.	Content	Addition of a more comprehensive assessment of financial sustainability
June – July 2026	Section 4.1.	Editorial	Removing duplicated content
June – July 2026	Section 5.1.1.	Content	Update on the usage statistics of the Species Occurrence Cube download service
June – July 2026	Section 5.1.1.	Editorial	Rephrased the section to improve structure and readability
June – July 2026	Section 5.1.1.	Content	Elaboration on Dockerisation of the Species Occurrence Cube download service
June – July 2026	Section 5.1.2.	Content	Clarification regarding Dockerisation of B3 software
June – July 2026	Section 6.2.3.	Content	Added a project that will build further upon the outputs of B3
June – July 2026	Section 7.1, 7.1.1, and associated post-project checklist	Content	Update of the post-project checklist and associated KPI's
June – July 2026	Spreadsheet providing an overview of the B3 outputs(Annex 3)	Content	Elaborating the contact information and integrating email addresses to ensure clear tracking and follow-up





Key takeaway messages

- To ensure long-term sustainability and maximise the impact of its outputs, the B3 project has developed a dedicated sustainability report.
- The sustainability report consists of six main sections - setting the scene of sustainability (Chapter 2), governance and stakeholder roles (Chapter 3), project outputs to sustain (Chapter 4), sustainability plan per output type (Chapter 5), sustainability actions (Chapter 6), and monitoring and risk management (Chapter 7).
- The B3 outputs to sustain can be categorised into eight main output types: (i) analyses, (ii) briefs, reports, and publications, (iii) infrastructure, (iv) software packages, (v) specifications, (vi) training, (vii) tutorials, and (viii) websites.
- The various output types are divided into primary, secondary, and complementary sustainability levels, each accompanied by a dedicated plan and specific actions to support their long-term sustainability.
- Post-project monitoring will be ensured through a set of well-defined KPIs and proactive risk management, including appropriate mitigation measures.
- The sustainability report was updated following the second external evaluation, with refined content and updated metrics, outputs, and post-project KPIs.¹

¹Added in the Sustainability report update 1, June – July 2026





Executive summary

The D1.8 Sustainability report outlines the long-term strategy to ensure the continued use, accessibility, and impact of the B3 (Biodiversity Building Blocks for policy) project outputs beyond the project's end in August 2026. Developed under Task 1.8 within Work Package 1, this deliverable identifies key project outputs and provides tailored sustainability plans that span scientific, technical, and financial dimensions.

The B3 project aims to modernise biodiversity monitoring by developing cloud-based tools, workflows, and indicators. To preserve the relevance of these outputs, the report defines a unified sustainability vision based on stakeholder consultation, a consortium-wide questionnaire, and a dedicated workshop.

Currently, a total of 148 project outputs were identified and classified into primary (e.g., infrastructure, software packages, specifications, and analyses), secondary (e.g. tutorials, training, and websites), and complementary (e.g. briefs, reports, and publications) categories, with specific sustainability actions assigned to each type. Notably, primary outputs like infrastructure and software packages will receive prioritised support, with maintenance ensured through open-source practices, long-term archiving, and community engagement. Key outputs will remain accessible on platforms such as GitHub, Zenodo, and institutional websites.

The report emphasises collaborations—with sister projects like AD4GD and FAIRiCUBE, and platforms such as GEO BON and the European Green Deal Data Space—as vital to ensuring the integration and discoverability of B3 outputs. Risk management strategies are also detailed, covering issues such as personnel turnover and technical obsolescence (e.g., link rot, software dependencies), with mitigation through version control, persistent identifiers, and containerisation.

A monitoring framework supported by Key Performance Indicators (KPIs) will help track sustainability post-project, and the report will be updated near the project's conclusion to reflect further developments and partnerships.

Following a recommendation from B3's second external evaluation, the sustainability report was updated in June – July 2026 by refining the sections on business models, intellectual property management, and software containerisation. In addition, the report was updated to include the latest usage statistics of the Species Occurrence Cube download service, a revised overview of all B3 outputs, and an updated post-project checklist together with its associated KPIs. The changes introduced by the updates are highlighted in green, with corresponding dates provided in the footnotes.¹





Non-technical summary

The B3 Sustainability report outlines how the project's results will remain useful, accessible, and impactful even after the project ends in August 2026. The B3 project (Biodiversity Building Blocks for policy) focuses on improving how biodiversity is monitored by developing online tools, data workflows, and indicators that can help inform policies.

This report was created to make sure that the tools and knowledge developed by B3 will not be lost but continue to benefit researchers, policymakers, and other users. To do this, the project team collaborated with stakeholders and experts through a survey and workshop to develop a shared plan for sustainability.

Currently, a total of 148 project outputs have been identified and categorized into the following groups:

- 1) Primary outputs: infrastructure, software packages, specifications, and analyses;
- 2) Secondary outputs: tutorials, training materials, and websites.
- 3) Complementary outputs: briefs, reports, and publications

Each type of output has a specific plan to ensure it remains accessible and up-to-date. Primary outputs, such as software packages, will receive higher priority for maintenance. Many of these tools will stay available on platforms like GitHub, Zenodo, and university or research institute websites.

The report also highlights the importance of collaborating with other projects and platforms, such as AD4GD, FAIRiCUBE, GEO BON, and the European Green Deal Data Space, to help make B3's outputs easier to find and use in the future.

To address possible risks—such as changes in staff or outdated technology—the project is taking steps like using permanent links, tracking software versions, and storing environments in a way that others can reuse.

Lastly, a set of Key Performance Indicators (KPIs) will be used to monitor the continued use and impact of B3's outputs after the project ends. The report will also be updated near the end of the project to reflect new partnerships and sustainability efforts.

Following a recommendation from B3's second external evaluation, the sustainability report was updated in June – July 2026 by refining the sections on business models, intellectual property management, and software containerisation. In addition, the report was updated to include the latest usage statistics of the Species Occurrence Cube download service, a revised overview of all B3 outputs, and an updated post-project checklist together with its associated KPIs. The changes introduced by the updates are highlighted in green, with corresponding dates provided in the footnotes.¹





List of abbreviations

AD4GD	All Data 4 Green Deal
API	Application Programming Interface
B3	Biodiversity Building Blocks for policy
BMD	Biodiversity Meets Data
CBD	Convention on Biological Diversity
DMP	Data Management Plan
DOI	Digital Object Identifier
EBVs	Essential Biodiversity Variables
eDNA	Environmental DNA
eLTER	Long-Term Ecosystem Research in Europe
ESA	European Space Agency
EU	European Union
FAIR	Findable, Accessible, Interoperable, Reusable
FAIRiCUBE	F.A.I.R. Information Cubes
GBIFS	Global Biodiversity Information Facility
GEO BON	Group on Earth Observations - Biodiversity Observation Network
GRIIS	Global Research Infrastructure for Scientific Support
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
(EV) INBO	(Own Capital of the) Research Institute for Nature and Forest
KPIs	Key Performance Indicators
MeiseBG	Meise Botanic Garden
NextBON	Next Generation Biodiversity Observation Network ¹
OneSTOP	OneBiosecurity Systems and Technology for People, Places and Pathways
PEDCOM	Exploitation, Dissemination, and Communication Plan
PENSOFT	Pensoft Publishers
SQL	Structured Query Language
USAGE	Urban Data Space for Green Deal
VITO	Flemish Institute for Technological Research
WP	Work Package





1. Introduction

1.1. Project

Biodiversity is changing more rapidly than ever before, increasing the urgency for reliable, up-to-date information to support decision-makers in evaluating policy options. Effective biodiversity monitoring is essential to address this need (Niemelä, 2000).

The project Biodiversity Building Blocks for Policy (henceforth B3) seeks to transform biodiversity monitoring from a disconnected, labour intensive activity into an agile, rapid, and responsive process at a global level. This transformation will be achieved by providing easy access to tools in a cloud computing environment, in real-time, and on-demand, with state-of-the-art prediction models of biodiversity, that will output models and indicators of biodiversity status and change. In order to do so, B3 will develop the infrastructure, workflows, tools, knowledge products, and indicators for biodiversity monitoring. Importantly, these outputs will be built with long-term sustainability in mind, ensuring they remain impactful, functional, accessible, and maintainable long after the project concludes.

1.2. Scope and objectives of the deliverable

To ensure the long-term sustainability of the outputs, the continued functionality, accessibility, and maintainability and impact of the outputs have been explicitly defined as a strategic objective of the B3 project (cf. objective 1.6). To reach the set objective, deliverable “D1.8 Sustainability report” of the B3 project was developed under Task 1.8 “Sustainability report” led by MeiseBG within work package 1 (WP1) “Stakeholder engagement, communication and dissemination” which is led by Pensoft, and was due in Month 30 (August 2025) of the project.

1.3. Task planning and execution

The sustainability report was developed following the timeline outlined in figure 1 and was based on a consortium-wide consultation process. A detailed sustainability questionnaire of 18 questions (available in Annex) was distributed to B3’s partners. The questionnaire collected information on how sustainability is defined, addressed during the project, maintained after the project, and the broader implementation context. Partners contributed to the establishment of the sustainability report by submitting thorough answers to the questions asked in the questionnaire, and by identifying project outputs. The questionnaire had nine respondents distributed among six project partners. Furthermore, the questionnaire formed the base for a two-hour workshop (summary available in Annex) centred around the sustainability of the project, organised on the 21st of May 2025. The workshop had 17 attendees from nine project partners. Following the workshop, an overview of the different B3 outputs was compiled and shared with the partners, along with a request to complete the columns on: “sustainability level”, “horizon of time to maintain”, “best solution to maintain”, and “risk of disappearing”. Once completed, the overview was reviewed and discussed in a follow-up meeting attended by 11 participants from six project partners. Prior to its submission, the sustainability report was shared with all 12 project partners for review. The initial version was submitted in Month 30 of the project (August 2025). A revised version will be submitted toward the end of the project.





As outlined in the first version of the B3 sustainability report and in line with the recommendations from B3's second external evaluation, the report was updated between June and July 2026. A table of changes is provided on page 5. The update is based on the planned revision of the report, feedback from the second external evaluation, and a consortium-wide discussion held in June 2026, along with the input gathered during that period. Partners were asked to revise the B3 output overview and post-project checklist, and to provide additional input on the business plan, IP management, Dockerisation, usage statistics, and new projects and opportunities building further on B3.¹

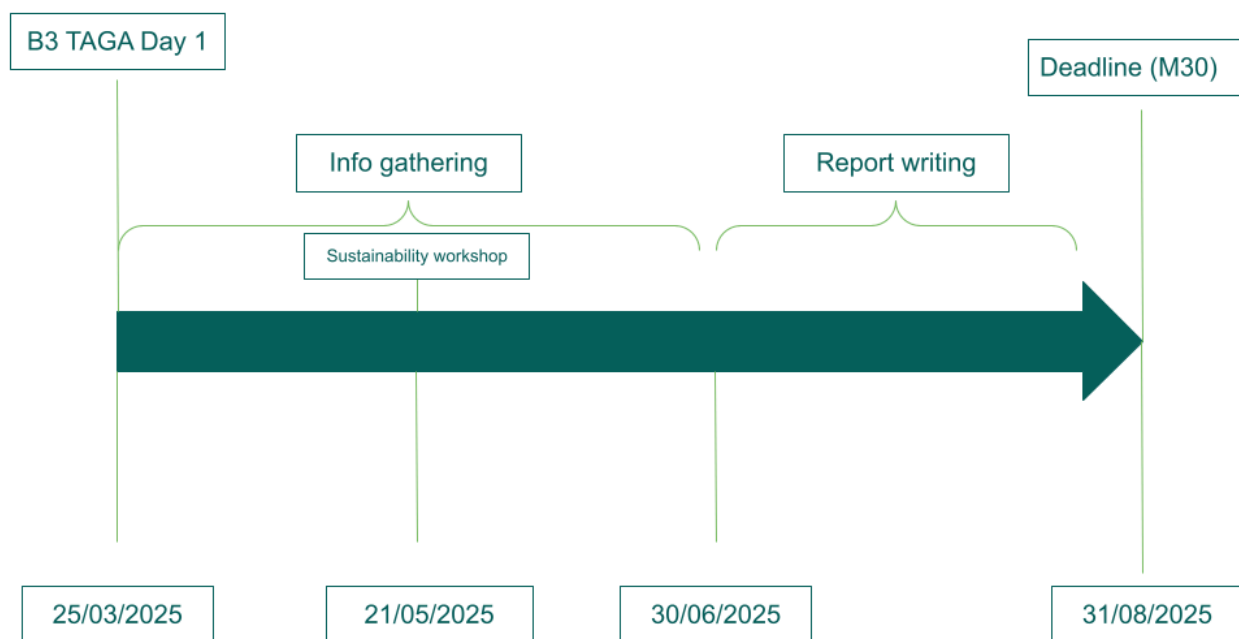


Figure 1: Timeline of Task 1.8 - sustainability report. The timeline begins with “B3 TAGA Day 1,” the first day of the third Annual General Assembly in Leipzig, which served as the informal kick-off for Task 1.8.

1.4. Relation to other tasks and deliverables

Deliverable 1.8, the “Sustainability report,” builds upon the outcomes of the various work packages (WPs) within B3 and is therefore inherently connected to all B3 WPs, deliverables, and tasks. However, the sustainability report has particularly strong ties to three key deliverables in WP1: D1.2 “Plan for Exploitation, Dissemination and Communication,” D1.3 “Data Management Plan,” and D1.9 “Updated Plan for Exploitation, Dissemination and Communication.” and one key deliverable in WP3: D3.3 “FAIR data products and interoperability with the Essential Biodiversity Variables Data Portal.”. While the sustainability report provides a comprehensive view of all B3 outputs, certain sustainability aspects are already addressed in the aforementioned deliverables.





1.4.1. D1.2 and D1.9 Plan for Exploitation, Dissemination and Communication

The Exploitation, Dissemination, and Communication Plan (PEDCOM) was initially developed in Month 6 of the project as Deliverable D1.2 under WP1 (Yovcheva & Metodiev, 2023). It was subsequently revised in Month 22 as Deliverable D1.9 within the same WP (Yovcheva, 2024). The primary objective of the PEDCOM is to maximise the impact of the B3 project outcomes and facilitate long-term knowledge exchange by providing a strategic framework for dissemination, exploitation, and communication activities. This framework plays a crucial role in ensuring stakeholders are aware of the project's activities, receive its results in a timely and appropriate manner, and have the potential to offer feedback and exploit them. The PEDCOM contains detailed information on:

- Stakeholder groups
- B3's Key Exploitable Results
- Tools and channels for exploitation, dissemination, and communication
- An implementation plan, including KPIs

1.4.2. D1.3 Data Management Plan

The Data Management Plan (DMP) was initially developed in Month 6 of the project as Deliverable D1.3 under WP1 and subsequently updated in Month 26 and Month 40.¹ (Yovcheva *et al.*, 2023). The primary objective of the DMP is to ensure the findability, accessibility, interoperability, and reusability of the B3 research data and other research outputs. This plan thereby contributes to the aim of B3 to promote the transparent and collaborative nature of scientific research by making research data openly available to the scientific community and society at large. It further serves as the sustainability framework for the data generated and utilised in the B3 project, providing a complementary contribution to the overarching sustainability report

The DMP contains detailed information on:

- Data collected, generated, and reused in B3
- FAIR (Findable, Accessible, Interoperable, Reusable) data
- Allocation of resources
- Data security
- Intellectual property management
- Ethics

As outlined in the DMP, the majority of the B3 outputs are released under the CC BY and MIT licences, ensuring their reusability and enabling potential commercialisation by third parties. This open licensing approach further enhances the impact of the B3 outputs.¹





1.4.3. D3.3 FAIR data products and interoperability with the Essential Biodiversity Variables Data Portal

The report on FAIR data products and interoperability with the Essential Biodiversity Variables Data Portal was developed in Month 30 of the project as Deliverable 3.3 under WP3 (Estupinan-Suarez *et al.*, 2024). The primary objective of this deliverable is to improve the FAIRness of B3 geospatial outputs. In addition, it provides insights on strengthening B3's future development and data-sharing practices, highlighting how the B3 approach supports greater interoperability across research domains. Finally, the report examines the contribution of B3 outputs to the development of the European Green Deal Data Space.

The report contains detailed information on:

- Increasing interoperability between the essential biodiversity variables data ecosystem and species occurrence cubes products
- Data mobilisation workflow
- Consolidating the B3 FAIR approach
- FAIR awareness within B3
- Future perspectives

1.5. Document structure

The sustainability report begins with a brief introduction to the B3 project, outlining the report's scope and objectives, and clarifying its role as Deliverable 1.8 within the broader framework of project tasks and deliverables. The introduction is followed by a presentation of the project's sustainability vision and a definition of sustainability in relation to the B3 outputs. The report then explains how the sustainability approach is adapted to align with the various governance structures and stakeholder roles involved. Subsequent sections provide a detailed description of the project's outputs, each accompanied by a tailored sustainability plan. The report also outlines specific sustainability actions, as well as mechanisms for monitoring and risk management, including the use of KPIs to track progress and ensure accountability. **The changes introduced by the updates are highlighted in green, with corresponding dates provided in the footnotes.¹**





2. Setting the scene of sustainability

2.1. Vision and definition of sustainability for the B3 outputs

Sustainability refers to the capacity of B3 products, services, and outcomes to remain scientifically relevant, technically functional, and financially supported over time, thereby ensuring their long-term use, accessibility, and impact for at least five years after the project's end.

2.1.1. B3's scientific sustainability

Scientific sustainability is achieved by:

- Enabling reproducible, peer-validated research through version-controlled, well-documented workflows, and data products.
- Integrating evolving scientific standards (e.g., EBVs) and new data sources (e.g., eDNA) into interoperable frameworks.
- Ensuring products are reused and built upon by both internal teams and external stakeholders, including future projects.
- Regularly updating products based on new research, feedback, and software/tooling advances.

2.1.2. B3's technical sustainability

Technical sustainability is achieved by:

- Developing open-source and FAIR-compliant software
- Designing modular software with clear APIs and scalable architecture
- Maintaining robust documentation, onboarding resources, and user support (e.g., GitHub Issues and forums).
- Ensuring long-term maintainability through automated testing, containerisation (e.g., Docker).
- Tracking and analysing software usage to inform future developments.





2.1.3. B3's financial sustainability

Financial sustainability is secured through:

- Embedding maintenance roles within partner institutions and ensuring diversified funding sources (e.g., institutional budgets, grants, service contracts, and training).
- Incorporating B3 products into long-term institutional monitoring/reporting workflows.
- Creating cost-sharing agreements and contingency budgeting mechanisms.
- Actively pursuing follow-up funding (e.g., EU grants and COST actions) and low-cost maintenance strategies.

Alternative funding models—including in-kind contributions as well as national and international funding—were considered to support the scientific and technical sustainability of the B3 project, but were ultimately not pursued. A second approach based on revenue generation was also explored, but was deemed unsuitable because it largely conflicts with B3's open science principles and the expectations of the community. Research funding continues to be the primary source of support.

In response to the recommendations from B3's second external evaluation concerning the long-term sustainability of reliance on research funding and the potential tensions between commercialisation and open science principles, a more comprehensive assessment of financial sustainability has been undertaken as part of the updated sustainability report.

Firstly, the assessment revisited the potential for sustaining B3 through in-kind contributions and national and international research funding. However, in line with the previous conclusion, it does not represent a viable long-term sustainability strategy and will therefore not be pursued.

Secondly, following the recommendation from the second external evaluation, the potential for commercialisation (previously referred to as revenue generation) of B3 outputs has been examined in greater detail. The commercialisation potential of each output is closely linked to its level of technical and organisational maturity, as reflected by its (technical) readiness level. Among the B3 outputs, the Species Occurrence Cube download service has been identified as the highest-priority output and is categorised as infrastructure (see Section 5.1 for a detailed description of outputs and output categories). While this output has the highest level of readiness for commercialisation, its integration into the core GBIF infrastructure makes commercialisation neither necessary nor desirable as a long-term financial sustainability strategy. Instead, its long-term financial sustainability will depend on GBIF's established governance and funding model. As an international, membership-based research infrastructure, GBIF is primarily financed through annual financial contributions from its participant countries and organisations, complemented by project-based funding for innovation and in-kind contributions from its global network of partners. In addition, GBIF is increasingly exploring opportunities to engage the private sector through the Taskforce on Nature-related Financial Disclosures (TNFD).¹





The TNFD is a global initiative that provides a framework for organisations and capital providers, including banks, multinational corporations, and consultants, to assess and report their dependencies and impacts on nature (TNFD, 2026). Standardised global biodiversity data are essential for this purpose and are provided in part by GBIF. This emerging demand has the potential to strengthen private-sector engagement with GBIF, thereby contributing indirectly to the long-term financial sustainability of GBIF and the B3 outputs that have been integrated into its core infrastructure. In addition to the Species Occurrence Cube download service, several other B3 outputs, including gcube, dubicube, b3gbi, the Virtual Suitability Cube, and the B3 Documentation Website, have been further developed to a higher level of readiness and will be published on the recently launched EU Innovation Platform. This platform can support the potential commercialisation of these outputs by acting as an innovation accelerator. It enhances commercialisation by making fragmented outputs more visible as market-ready assets, matching innovations with appropriate support mechanisms, facilitating partnerships and technology transfer, improving access to investors and markets, and enabling scaling beyond initial validation stages (EU Innovation Platform, 2026). The remaining B3 outputs remain at the proof-of-concept level and require further development before they can be commercially deployed. Ongoing work on these outputs is being advanced through collaborations within the B3 project, as well as through larger initiatives and broader strategic frameworks, as described in section 6.

An alternative pathway for software development and commercialisation is provided through the MIT License under which the software is released. As a permissive open-source license, it allows unrestricted use, modification, distribution, and commercialisation of the software, provided that the original copyright notice and license text are included in all copies or substantial portions of the software. This licensing approach also enables third parties—public or private—to further develop and build on the software independently of the B3 consortium, creating a foundation for broader reuse, uptake, and long-term impact.¹

3. Governance and stakeholder roles

During the development of the PEDCOM, six key stakeholder groups were identified: policy and governance, organisations, the scientific community, data collectors, industry and practitioners, and the general public (Yovcheva & Metodiev, 2023). A comprehensive description of these stakeholder groups is provided in Yovcheva and Metodiev (2023). While the dissemination, exploitation, and communication of the various B3 outputs should be tailored to each stakeholder group, the sustainability of these outputs is primarily determined by their nature and content, rather than by the specific stakeholders they target. Although various stakeholder-specific sustainability pathways were considered during the workshop, it was ultimately concluded that a single, unified sustainability approach is suitable for all stakeholder groups.





4. Project outputs to sustain

Before developing the plan to ensure the long-term sustainability of the B3 outputs, it was first necessary to identify and categorise all relevant outputs. Through a consortium-wide consultation process, a comprehensive overview was compiled, currently identifying a total of 148 distinct outputs. This overview is a living document, which will be regularly updated as new outputs are produced and validated. **As part of the sustainability report update, the overview was revised and updated.**¹ The complete document is available to all project partners, while a snapshot for stakeholders may be accessed in the annex. The overview includes, for each output, descriptors covering: the responsible party, the type of output, current maintenance status, publication status on the documentation website, (expected) delivery date, source code URL, documentation URL, assessed sustainability level, expected maintenance horizon, recommended archiving solution for the source code or output, and the best approach for continued maintenance beyond the project's duration. Table 1 presents the definitions and explanations for each of these descriptors.

4.1. Description of the project's outputs

Based on their nature and content, the B3 project outputs can be categorised into eight main categories:

- 1) Analyses: processes of systematically inspecting, cleaning, transforming, and modeling data to discover useful information, draw conclusions, and support decision-making, including the development of workflows;
- 2) Infrastructure: set of foundational software components, systems, and services that are essential for building, running, managing, and maintaining software applications. It forms the technological backbone that supports the functioning and development of higher-level software;
- 3) Software packages: software applications and structured collection of functions, datasets, documentation, and sometimes compiled code that extends the functionality of a programming language (e.g. R and Python);
- 4) Specifications: resources that outline best practices, guidelines, standards, or other high-level instructions for the project. These are typically static and do not include executable code but may include links or references to repositories or tools;
- 5) Training: recorded video or audio sessions that capture live demonstrations, discussions, or knowledge-sharing events. These may also include accompanying materials like slides or links to tools;
- 6) Tutorials: step-by-step guides or procedures designed to achieve a specific outcome. These can be project-specific workflows or generalised tutorials that teach users how to perform a task;





- 7) Websites: collection of related web pages and digital content that are hosted on a server and accessible via the internet through a web address (URL).
- 8) Briefs, reports, and publications: formal written outputs that communicate the progress, findings, methods, or outcomes, including deliverable and milestone reports, policy briefs, and scientific publications.

Additionally, the maintenance status of each output has been described following a standardised development and usability status (repostatus.org, 2025):

- 1) Concept: minimal or no implementation has been done yet, or the repository is only intended to be a limited example, demo, or proof-of-concept;
- 2) WIP: initial development is in progress, but there has not yet been a stable, usable release suitable for the public;
- 3) Suspended: initial development has started, but there has not yet been a stable, usable release; work has been stopped for the time being but the author(s) intend on resuming work;
- 4) Abandoned: initial development has started, but there has not yet been a stable, usable release; the project has been abandoned and the author(s) do not intend on continuing development;
- 5) Active: the project has reached a stable, usable state and is being actively developed;
- 6) Inactive: the project has reached a stable, usable state but is no longer being actively developed; support/maintenance will be provided as time allows;
- 7) Unsupported: the project has reached a stable, usable state but the author(s) have ceased all work on it. A new maintainer may be desired;
- 8) Moved: the project has been moved to a new location, and the version at that location should be considered authoritative. This status should be accompanied by a new URL.





Table 1: Definitions and explanations for all descriptors used in the B3 outputs overview.

Descriptor	Definition
Title	Title/description of the output
Responsible	Who is the responsible for the output post-project
Responsible email	Email addresses of responsables for the output post-project ¹
Secondary point of contact	Indication of the secondary point of contact
Secondary point of contact email	Email addresses of the secondary points of contact ¹
Type	Categorisation of the type of output
Maintenance status	Indication of development status per output, and therefore its usability and support
Published on the documentation website	Indication whether the output is published on the documentation website
(Expected) delivery date	(Expected) date of the delivery of the output
Source code URL	Link to the source code
Documentation website URL	Link to the landing page of the output on the documentation website
Sustainability level	Classification of the output's sustainability level as primary (driving change in secondary outputs), secondary (typically not initiating any changes in other output), or complementary (formal written outputs that communicate the progress, findings, methods, or outcomes).
Horizon of time to maintain	Indication of the maintenance time horizon for the output
Best solution to archive the source code or output	Proposed best practice for archiving the source code/output
Best solution to further maintain the code or output post-project	Proposed best practice for ongoing maintenance of the code/output post-project





5. Sustainability plan per output type

As previously mentioned, the sustainability of the B3 outputs is primarily determined by their nature and content, supported by a unified sustainability approach applicable to all stakeholder groups. However, the sustainability plan is customised for each output type. Depending on the type, each output is assigned one of three sustainability levels.

- 1) Primary output: products that mainly offer new functionality or information. While they often rely on (external) dependencies, their main driver for change are decisions/insights by their contributors. This level generally includes outputs such as infrastructure, software packages, specifications, and analyses. Primary outputs are the main focus of the sustainability plan, as they can provide new and long-term value.
- 2) Secondary output: products that are mainly referencing or clarifying primary output. These products mainly undergo changes or updates when the associated primary product is modified. This level generally includes outputs such as training, and tutorials, and websites.
- 3) Complementary output: products that enhance, disseminate, or communicate the value of primary and secondary outputs, without necessarily being directly required for their function. These outputs support understanding, awareness, and broader impact of the project's work. This level generally includes outputs such as reports, scientific publications, policy briefs, and other dissemination materials.

5.1. Primary outputs

In general, primary outputs are the main focus for sustainability after the project concludes. However, within this category, outputs can be prioritised based on their relative importance. The infrastructure is considered the highest-priority output and will receive the most attention in terms of post-project maintenance, followed closely by software packages, specifications, and analyses. The following sustainability plan outlines the maintenance approach for each output, based on input provided by developers and contributors who were actively involved with these outputs.

5.1.1. Infrastructure

Within the B3 project, there is one main output characterised as “infrastructure” which is the Species Occurrence Cube download service (Blisset *et al.*, 2025). This output has been integrated into GBIF’s data infrastructure as a service that is accessible in the user interface and in the API, and powered by a SQL download function. **Since its launch in March 2025, 2,357 users from 121 countries have made at least one cube query through the GBIF website. Considering all SQL queries, 2,626 users from 124 countries have submitted 12,022 queries, demonstrating broad international uptake, although usage is concentrated among a relatively small number of highly active users. Being part of an established organisation in GBIF, as core infrastructure provides the best chance of long-term sustainability, with the service expected to be supported for ten years or more. Its maintenance, and by extension, the maintenance of the B3 output, will be managed by the GBIF Secretariat as part of the core GBIF work programme.**





Additionally, the software has been developed openly and proven to be portable, as demonstrated on the Microsoft Azure public cloud with a generic Spark cluster, further mitigating risk and providing opportunity for another provider to continue the service should GBIF cease to exist. Because the software is designed to run on a distributed Spark cluster, it is not suitable for full Dockerisation, but can be Dockerised when running on a Kubernetes-backed Spark cluster, as GBIF does for the live service. The source code has been archived on Zenodo.¹

5.1.2. Software packages

The majority of the B3 outputs are classified as “software packages”, with for example the gcube R package (Langeraeert, 2025), pygbif in Python (pygbif, 2025), and the B3 general biodiversity indicators Graphical User Interface (b3gbi-gui, 2025). The source code for these packages, developed during the B3 project, has been and will continue to be archived on Zenodo for long-term preservation. Code that is intended for ongoing use and development is, and will continue to be, published in public repositories on GitHub, where it will be maintained for at least five years. Maintenance of these outputs will follow an open source approach, grounded in transparency, community involvement, and collaborative development. This includes public issue tracking, open contributions, updates in response to dependency changes, and open licensing, ensuring the software remains accessible, reusable, and adaptable by the broader scientific and technical community. Furthermore, the b3verse is a modular suite of nine R packages developed within the B3 project to support biodiversity indicator workflows based on occurrence cubes, covering data acquisition, cube simulation, processing, indicator calculation, and uncertainty assessment (Langeraeert *et al.*, 2025). It is openly available via a dedicated R-universe and GitHub, with snapshot versions archived on Zenodo, and includes the b3data package providing example datasets in Frictionless Data Package format for accessibility and sustainability (Langeraeert *et al.*, 2025). Finally, as most of these outputs are proof-of-concept software libraries rather than standalone deployable services, Dockerisation is not currently considered necessary for their long-term sustainability. If these tools evolve, Dockerisation can readily be adopted to facilitate reproducible deployment, portability across computing environments, and long-term operational sustainability.¹

5.1.3. Specifications

Outputs of the B3 project that are categorised as “specifications” include specifications on invasibility and suitability (Cortès Lobos *et al.*, 2024), dissimilarity (MacFadyen *et al.*, 2024a) and invasibility (MacFadyen *et al.*, 2024b) cubes and their production. Since these specifications are primarily text-based and any errors do not affect system functionality, they do not require ongoing maintenance. All specifications produced during the project will remain accessible to stakeholders. The reference version of each specification will be archived on Zenodo and made available via the official B3 websites to ensure long-term accessibility.





5.1.4. Analyses

Outputs of the B3 project that are categorised as “analyses” include scripts to explore the conditions that determine the reliability of models, trends, and status comp-unstructured-data and workflows for using B3 for deep learning (comp-unstructured-data, 2025; Ryckewaert, 2025). These outputs are regarded as complete upon delivery, having achieved their intended results, and do not require ongoing maintenance after the project concludes. However, to ensure reproducibility, limited maintenance, such as updating dependencies, may be necessary and will be the responsibility of the designated responsible. If such updates are not feasible, appropriate mitigation strategies (cf. snapshots) for managing outdated dependencies will be implemented. Furthermore, within five years post-project, additional analyses may be produced if necessary and feasible, based on the monitoring of the primary outputs. The source code will be available on GitHub and the outputs will be archived on Zenodo, ensuring accessibility for all stakeholders.

5.2. Secondary outputs

Similar to the primary outputs, secondary outputs can also be prioritised according to their relative importance. In this context, websites are considered the highest-priority secondary outputs, followed by tutorials and training. Yet, these outputs should only be revised when the associated primary outputs require it.

5.2.1. Websites

Within the B3 projects, two main outputs were identified as “website”. The first is the general B3 website (<https://b-cubed.eu/>). At the conclusion of the project, this website will be transitioned into a legacy version that summarises the main results and provides redirects to relevant publications and repositories. The legacy website will remain accessible under the same domain name to ensure continuity and ease of access. It will require minimal maintenance, which will be handled by Pensoft for at least five years after the end of the project.

The second website is the B3 documentation site (<https://docs.b-cubed.eu/>). As a technical reference and educational resource for the B3 project, it will require more ongoing maintenance than the general B3 website, as it may need to incorporate new information, updated specifications, tutorials, and technical documentation even after the project has concluded. This maintenance will be handled by MeiseBG and INBO. However, the process remains straightforward, as the site is hosted for free and indefinitely on GitHub Pages.

5.2.2. Tutorials

Outputs of the B3 that are categorised as “tutorial” include introductions to spatial data analysis and species distribution modeling, and data mobilisation from GBIF to the EBV data portal (Estupinan-Suarez & Quoss, 2024; MacFadyen, 2024a; MacFadyen, 2024b). These tutorials are maintained for the same period as their corresponding primary outputs. They do not need regular updates and should only be revised when changes to the primary outputs make it necessary. Nevertheless, their ongoing functionality will be monitored. Each tutorial’s reference version will be archived on Zenodo and GitHub, with redirects provided via the B3 websites to ensure continued access for all stakeholders.





5.2.3. Training

The B3 project outputs classified as "training" include both courses and workshops. These trainings are time-bound and only conducted during the B3 project period due to pragmatic implementation constraints. As a result, they do not require ongoing maintenance after the project concludes. However, all training materials delivered during the project will remain accessible for all stakeholders. The courses are hosted on [YouTube](#), which offers indefinite video storage, while the workshops are archived on GitHub, also ensuring long-term availability. The B3 website will provide redirects to the training materials, as well as other relevant resources, to improve discoverability by all stakeholders. Additionally, this is complemented by formal B3 reporting under WP1, which documents training and outreach activities and ensures they align with the project's long-term sustainability objectives. If deemed necessary and feasible, a new training, either as a course or a workshop, can be developed and made available, rather than updating existing ones. However, we anticipate that the updated specifications and tutorials will adequately address all future needs.

5.3. Complementary outputs

The B3 project outputs classified as "complementary outputs" include deliverable and milestone reports² (e.g., Abraham *et al.*, 2024), scientific publications (e.g., Kumschick *et al.*, 2025), policy briefs (e.g., Schleidt *et al.*, 2025), and other dissemination material (e.g., Hui *et al.*, 2024). These outputs are considered complete upon delivery and do not require active maintenance after the project's conclusion. Accessibility should, however, be guaranteed for all stakeholders. This is guaranteed through archiving these documents in a designated collection on [Zenodo](#), and publishing in [bioRxiv](#) (e.g., Langerhaert *et al.*, 2024), and scientific journals (e.g., Keet & Hui, 2025). Additionally, redirects via the B3 websites will ensure continued access for all stakeholders.

6. Sustainability actions

As outlined above, the sustainability of B3 outputs is supported by a community-driven model, with ongoing maintenance ensured through an open source approach. In this context, fostering an active and engaged community is essential to achieving long-term sustainability.

6.1. Actions already taken

From the very beginning, the B3 project has aimed to foster an active and engaged community through effective exploitation, dissemination, and communication of the B3 outputs, and by nurturing collaborations.

6.1.1. Exploitation, dissemination, and communication

A strategic framework for the dissemination, exploitation, and communication of B3 outputs has been established by the PEDCOM (cf. section 1.4.1.), to which we refer to for more details.

²For a more detailed overview of the PEDCOM, the DMP, and the report on FAIR data products and their interoperability with the Essential Biodiversity Variables Data Portal, please refer to Section 1.4.





6.1.2. Collaborations

During the B3 project, regular meetings were held with coordinators from sister projects such as AD4GD, FAIRiCUBE, and USAGE, to ensure alignment within the context of the European Green Deal Data Space. In addition, collaboration also extended to more regional initiatives within MeiseBG, including DiSSCo Flanders 2.0. These collaborations played a crucial role in supporting the sustainability of B3's outputs by fostering (i) knowledge exchange, (ii) network expansion, and (iii) increased visibility and credibility. Firstly, regular exchanges with sister projects enabled the sharing of best practices, lessons learned, and technical expertise. Implementing these best practices enhanced product maintainability, which in turn improved their sustainability. Secondly, close collaboration significantly broadened the network of stakeholders involved with B3. This expanded community not only provided valuable feedback, but also strengthened engagement and support around the project's results. Finally, these partnerships significantly enhanced the visibility and credibility of B3's outputs, helping to attract new stakeholders and potential investments. Such broadened engagement is vital for sustaining outputs developed through an open-source approach, where active community involvement is key to ensuring continued relevance and long-term impact.

6.2. Future plans

The deliverable D1.8 "Sustainability report" for the B3 project was due in Month 30 (August 2025). However, with 12 months of project time remaining beyond this deadline, actions and developments related to sustainability are still actively progressing. This ongoing work provides an opportunity to further refine the sustainability plan and update the report towards the end of the project.

6.2.1. Accessibility on a long-term

During the remaining project period, greater emphasis will be placed on enhancing the discoverability of the B3 project and its outputs. This will include thorough documentation of all outputs, with comprehensive README files, accessible code snippets, and clearly defined procedures for both archiving and continued maintenance. In addition, project websites will be transitioned into legacy versions to ensure long-term accessibility. These efforts are essential to ensure that outputs remain easily discoverable, both through conventional search methods and modern tools such as Artificial Intelligence.

6.2.2. Functionality, maintainability and impact on a long term

The remaining project time will also be used to integrate the B3 project and its outputs into larger initiatives and broader strategic frameworks, ensuring alignment within the context of the European Green Deal Data Space. To this end, other Horizon European projects such as OneSTOP (OneSTOP, 2025) and BMD (BMD, 2025) are already incorporating B3 outputs into their activities, **while NextBON is scheduled to launch in autumn 2026 and will build directly on the outputs of B3 (NextBON, 2026).**¹ In addition, coordination meetings will be scheduled with VITO to explore how B3 results can be integrated into TERRASCOPE, Belgium's national Copernicus data and processing platform. Further discussions with ongoing Horizon Europe projects, such as OBSGESSION and SAGE, will ensure that the methodologies and biodiversity knowledge of B3 are taken into account in future developments.





In parallel, discussions will be pursued to align B3 outputs with the goals and infrastructure of GEO BON, as well as integrate the developed FAIR workflows into the CBD and IPBES reporting. These efforts aim to strengthen the positioning of the B3 project, not only within the context of the European Green Deal Data Space, but also in international reporting and assessment of biodiversity. Additionally, work will be undertaken to frame and adapt the B3 outputs for integration into more commercially oriented platforms, such as Google Earth Engine and the Microsoft Planetary Computer, resulting in a potential bigger uptake of B3 products and results.

7. Monitoring and risk management

The sustainability of B3 outputs can only be ensured if both the outputs and sustainability measures are monitored after the project's completion, supported by effective risk management.

7.1 Monitoring

To support the sustained monitoring of B3 outputs, a post-project checklist has been developed as a living document through a consortium-wide consultation process. **As part of the sustainability report update, the post-project checklist was revised and updated and will continue to be updated on a regular basis.**¹ For each output, the checklist includes descriptors specifying: the responsible party, potential risks of maintenance loss, presence of a maintainer, availability of the source code, whether the source code is archived, the functionality of the repository URL after the project, and the operational status of the software post-project. Table 2 provides definitions and explanations for each of these descriptors.

7.1.1. KPIs

The post-project checklist can also be translated into a clearly defined set of KPIs, outlined in table 3, to support the ongoing monitoring of B3 outputs after the project's conclusion. **As the checklist is updated, the associated KPIs are likewise revised and continuously monitored to ensure sustained performance tracking.**¹ Each KPI is also coupled to one of three strategic objectives: (i) accessibility, (ii) functionality, and (iii) maintainability and impact. As with the PEDCOM, the KPIs for the sustainability of B3 were selected based on the S.M.A.R.T. criteria (Doran, 1981):

- Specific: is the KPI specific enough?
- Measurable: do we have a way of measuring it?
- Achievable: do we have the resources to achieve it?
- Realistic: is it a sound goal?
- Timely: what is the expected timeline?





Table 2: Definitions and explanations for the descriptors in the post-project checklist.

Descriptor	Definition	Usage
Title	Title/description of the output	
Responsible	Who is the responsible for the output post-project	Evaluation column. Should be used as a checklist per year
Status of responsible	Did the actual person confirm the identity of the responsible party?	Evaluation column. Should be used as a checklist per year
Risk of maintenance loss	Estimation of the risk of maintenance loss, from low to high	Evaluation column. Should be used as a checklist per year
Is there a maintainer?	Status indicating whether a designated maintainer exists for the output	Evaluation column. Should be used as a checklist per year
Is the source code available?	Status indicating whether the source code is available in a repository	Evaluation column. Should be used as a checklist per year
Is the source code archived?	Status indicating whether the source code is archived	Evaluation column. Should be used as a checklist per year
Is the website URL still functional post-project?	Status indicating whether the URL to the website for each output is still active	Evaluation column. Should be used as a checklist per year
Is the software still functional post-project?	Status indicating whether the software is currently functional or non-functional based on test case results	Evaluation column. Should be used as a checklist per year





Table 3: Set of Key Performance Indicators (KPIs) for the monitoring of the sustainability of the B3 outputs.

KPI	Description	Target	Strategic objective
Availability of project outputs online	Tracks whether tools, data, and documentation remain accessible via repositories or websites	100% availability maintained	Accessibility
Archival completeness	Percentage of outputs properly archived with metadata and persistent identifiers	100% of outputs archived	Accessibility
Link stability	Percentage of functional links of outputs	≥ 95% valid links annually	Accessibility
Responsibility	Percentage of outputs with a designated responsible	100% of outputs have a designated responsible	Functionality
Uptime of hosted services	Monitors the availability and performance of any hosted tools or services	≥ 99% uptime	Functionality
Functionality of the software	Percentage of software still functional post-project, verified by executing test cases	≥ 90% of the software is functional post-project	Functionality
Limited high risk of maintenance loss	Percentage of outputs with high risk of maintenance loss	≤ 5% with high risk of maintenance loss	Maintainability and impact.
Number of use cases	Measures the ongoing use of B3 tools, datasets, or platforms through citations, references, GBIF metrics, and downloads	≥ 50 use cases annually	Maintainability and impact.
Number of contributions from external users (i.e. non-project partners)	Tracks open-source contributions or community feedback through GitHub and GBIF metrics	≥ 25 contributions annually across all outputs	Maintainability and impact.





7.2. Risk management

The sustainability of B3 outputs is subject to several key risks, especially after the conclusion of the funding period. These include the risk of loss of maintenance responsibility as well as various technical challenges that may affect long-term accessibility, usability, and impact of the B3 outputs.

7.2.1. Maintenance risks

An important risk to the sustainability of the B3 outputs is the potential loss of maintenance due to changes in personnel or individuals leaving the institution. As outlined in the post-project checklist, B3 outputs can be classified into three main categories based on their risk of maintenance loss: low, medium, and high. The risk is considered low when maintenance responsibility is community-based; medium when it is institutionally based; and high when it depends on an individual. These risks can be mitigated by implementing appropriate backup solutions at the institutional or project level, thereby supporting the long-term sustainability of the outputs.

7.2.2. Technical risks

Other risks to the sustainability of the B3 outputs are more technical, including link rot and the decay of dependencies. Firstly, link rot – the process by which hyperlinks become inaccessible or no longer lead to the originally intended content over time – represents a significant potential risk to the long-term sustainability of B3 outputs. However, this risk is mitigated through the use of persistent identifiers (such as DOIs) and by archiving the outputs. Additionally, regular reviews using the post-project checklist, combined with timely updates of links, further reduce the impact of link rot. Secondly, the decay of dependencies – the process by which external components (such as software libraries) that an output relies on become outdated, unsupported, incompatible, or no longer maintained over time – represents a considerable potential risk to the long-term sustainability of B3 outputs. However, this risk is mitigated by archiving working environments using containers (such as Docker), selecting carefully considered and reliable dependencies, and thoroughly documenting all dependencies along with their specific versions.

8. Outlook

In conclusion, the B3 sustainability report presents a clear and well-structured strategy to support the long-term preservation and impact of the project's outputs beyond the end of the funding period. It defines a coherent vision of sustainability specific to the B3 outputs, identifies which outputs should be sustained, and outlines tailored sustainability actions for each output type. The report also provides an outlook on future opportunities for continued collaboration. To ensure its continued relevance and effectiveness, the sustainability report will be updated toward the end of the project, offering a more detailed overview of planned collaborations with other initiatives.





9. Acknowledgements

We would like to thank the researchers who actively participated in the making of the sustainability report for the B3 project. Great appreciation goes to the reviewers of the task.

10. References

Abraham, L., Hendrickx, L., Groom, Q., Yovcheva, N., Langeraert, W., Rocchini, D., Dove, S. (2024). Hackathon results. B3 project deliverable D1.7.

b3gbi-gui. (2025). <https://github.com/b-cubed-eu/b3gbi-gui>

Blisset, M., Robertson, T., and Desmet, P. (2025). Occurrence cube functions (cube-0.3.1). Zenodo. <https://doi.org/10.5281/zenodo.14973380>

BMD – Biodiversity Meets Data. (2025). <https://doi.org/10.3030/101181294>

comp-unstructured-data. (2025). <https://github.com/b-cubed-eu/comp-unstructured-data>

Cortès Lobos, R.B., Di Musciano, M., Martini, M., and Rocchini, D. (2024). Specification for suitability cubes and their production. <https://docs.b-cubed.eu/guides/suitability-cube/>

Doran, G. T. (1981). There's a S.M.A.R.T. Way to Write Management's Goals and Objectives. *Management Review*, 70, 35-36

Estupinan-Suarez, L. M., and Quoss, L. (2024). EBVcube/B-Cubed_data_mobilisation: B-Cubed data mobilisation for species listed in EU regulations (v1.0.0). Zenodo. <https://doi.org/10.5281/zenodo.13798783>

Estupinan-Suarez, L. M., Quoss, L., Langer, C., Ocegüera, E. and Pereira, H. M. (2024) FAIR data products and interoperability with the Essential Biodiversity Variables Data Portal. B3 project deliverable D3.3.

EU Innovation Platform (2026). EU Innovation Platform. <https://euiip.sbo.services.ec.europa.eu/home>¹

Global Biodiversity Information Facility (GBIF). <https://gbif.org>

GitHub. <https://github.com>

Hui C., MacFadyen S., Visser V., Groom Q., and Isaac N.J.B. (2024). Editorial: Biodiversity informatics: building a lifeboat for high functionality data to decision pipeline. *Frontiers in Ecology and Evolution*. 12:1386917. <https://doi.org/10.3389/fevo.2024.1386917>

Keet, J-H., and Hui, C. (2025). One-hectare fine-scale dataset of a fynbos plant community in the Cape Floristic Region. *Data in Brief*. 59. 111334. <https://doi.org/10.1016/j.dib.2025.111334>

Kumschick, S., Journiac, L., Boulesnane-Genuant, O., Botella, C., Pouteau, R., and Rouget, M. (2025). Mapping potential environmental impacts of alien species in the face of climate change. *Biological Invasions*. 27:43. <https://doi.org/10.1007/s10530-024-03490-4>





Langeriaert, W. (2025). gcube: Simulating Biodiversity Data Cubes (1.3.7). Zenodo. <https://doi.org/10.5281/zenodo.15390043>

Langeriaert, W. Breugelmans, L., Desmet, P., Dove, S., Kumschick, S., MacFadyen, S., Seebens, H., Trekels, M., Yahaya, M.M., Van Daele, T. (2025). MS29: Version 0.1 of the b3verse R package suite publicly available. <https://b-cubed-eu.r-universe.dev/builds>

Langeriaert, W., Barhdadi, W., Brosens, D., Cortès, R., Desmet, P., Di Musciano, M., Earl, C., Govaert, S., Huybrechts, P., Martini, M., Rodrigues A.V., Veeken, A., Yahaya, M.M., and Van Daele, T. (2024). Unveiling ecological dynamics through simulation and visualization of biodiversity data cubes. <https://doi.org/10.37044/osf.io/vcyr7>

MacFadyen, S. (2024a). An introduction to spatial data analysis for conservation ecology in R. <https://docs.b-cubed.eu/tutorials/spatial-data-analysis-r/>

MacFadyen, S. (2024b). An introduction to species distribution modelling in R. <https://docs.b-cubed.eu/tutorials/species-distribution-modelling-r/>

MacFadyen, S., Trekels, M., Yahaya, M., Landi, P., and Hui, C. (2024a). Specification for dissimilarity cubes and their production. <https://docs.b-cubed.eu/guides/dissimilarity-cube/>

MacFadyen, S., Yahaya, M., Landi, P., and Hui, C. (2024b). Specification for invasibility cubes and their production. <https://docs.b-cubed.eu/guides/invasibility-cube/>

NextBON - Next Generation Biodiversity Observation Network (2026). <https://cordis.europa.eu/project/id/101287608>¹

Niemelä, J. (2000). Biodiversity monitoring for decision-making. Annales Zoologici Fennici pp. 307-317.

OneSTOP – OneBiosecurity Systems and Technology for People, Places and Pathways. (2025). <https://doi.org/10.3030/101180559>

pygbif. (2025). <https://pygbif.readthedocs.io/en/latest/index.html>

Repostatus.org. A system for describing the status of software repositories. Available at: <https://www.repostatus.org>

Ryckewaert, M. (2025). DeepMaxent - A neural networks using maximum entropy principle for Species Distribution Modelling. <https://github.com/Ryckewaert/deepmaxent>

Schleidt, K., Serral, I., de la Vega, D., Maso, J., Jetschny, S., Groom, Q., Beber, R., Bastin, L., Estupinan-Suarez, L. M., and Matheus, A. (2025). Policy Brief: Unlocking The Full Potential Of The Green Deal Data Space. Zenodo. <https://doi.org/10.5281/zenodo.15649164>

TNFD (2026). Taskforce on Nature-related Financial Disclosures. <https://tnfd.global/>¹

Yovcheva, N. et al. (2023). Data Management Plan. B3 project deliverable D1.3.

Yovcheva, N., and Metodiev, T. (2023). Plan for Exploitation, Dissemination and Communication. B3 project deliverable D1.2.





Yovcheva, N. (2024). Updated Plan for Exploitation, Dissemination and Communication (PEDCOM). B3 project deliverable D1.9.

Zenodo. <https://zenodo.org>





11. Annex

11.1. Questionnaire 1

Table S1: overview of the questions in the questionnaire

Question number	Question
Q1	What is the horizon of time in mind for the sustainability of the B3 products?
Q2	Provide a list of bullet points on how you define sustainability. This in scientific, technical, and financial terms.
Q3	Provide a list of headings on how you envision the outline of the sustainability report.
Q4	Please provide a list of the projects and outcomes that your institution has created and are responsible for, which are not yet included in the products list available.
Q5	From these outcomes, which are the key points to be maintained?
Q6	How can the dissemination/awareness of the community on the functionality that B3 represents be maintained at the moment?
Q7	For each product, what do you think is the best practice to guarantee sustainability?
Q8	How can continuing usability of the software be ensured? What do you assess as the main risks and how should this be managed? How can the compatibility of software with new versions of OS, libraries,... be ensured?
Q9	How can the application of the B3 outcomes be broadened?
Q10	How can the functionality of the software be maintained? Will it be possible for users to request enhancements?
Q11	How to track the use of the B3 outcomes?
Q12	Do we need to ensure that the hardware during the project is available after the project?
Q13	Do we need someone who is responsible for the sustainability of the outcomes post-project?
Q14	Please provide a list of bullet points on what you consider as the main hurdles for the sustainability of the outcomes post-project
Q15	How can the dissemination/awareness of the community on the functionality that B3 represents be maintained post-project?
Q16	Please provide your point of view on extra funding or other projects to continue the development of the outcomes
Q17	Should there be a difference in the way we support endusers? Scientific community, international organisation, policymakers, private, and commercial...
Q18	What is your point of view on commercial options? For example paid-for services such as consulting, training, subcontracting, and implementation of special features.





11.2. Summary of the workshop

When: Wednesday 21/05/2025 13h - 15h

Where: online

Attendance: 17 participants

11.2.1. Overview of the workshop

Time	Theme
13:00 - 13:05	Introduction
13:05 - 13:15	Brief review of the questionnaire
13:13 - 14:30	Discussion centred around 4 main topics
14:30 - 15:00	Conclusion

11.2.2. Introduction

B3 will create a large number of workflows, software and other outputs that should remain applicable and relevant after the project ends. We will create a plan for the long term (5-10y) technological and scientific sustainability of B3 outputs (Task 1.8). Each of the partners involved will support the creation of a common vision and document of how the software and workflows are to be maintained. The result will be captured in a deliverable, D1.8, named sustainability report, of type document, report, with the dissemination level public and due Month 30 of the project. In coordination with the lead of WP1, Nikol Yovcheva, the leaders of Task 1.8, Stefaan Pijls and Jonas Depecker, have established a timeline for the task's completion. This timeline is presented in Figure S1. Following the timeline, a first workshop on the sustainability of B3 was organised on May 21st 2025 and which was based on a questionnaire sent out two weeks before. The workshop started off with an introduction in which sustainability was defined and the workplan of the task was outlined.



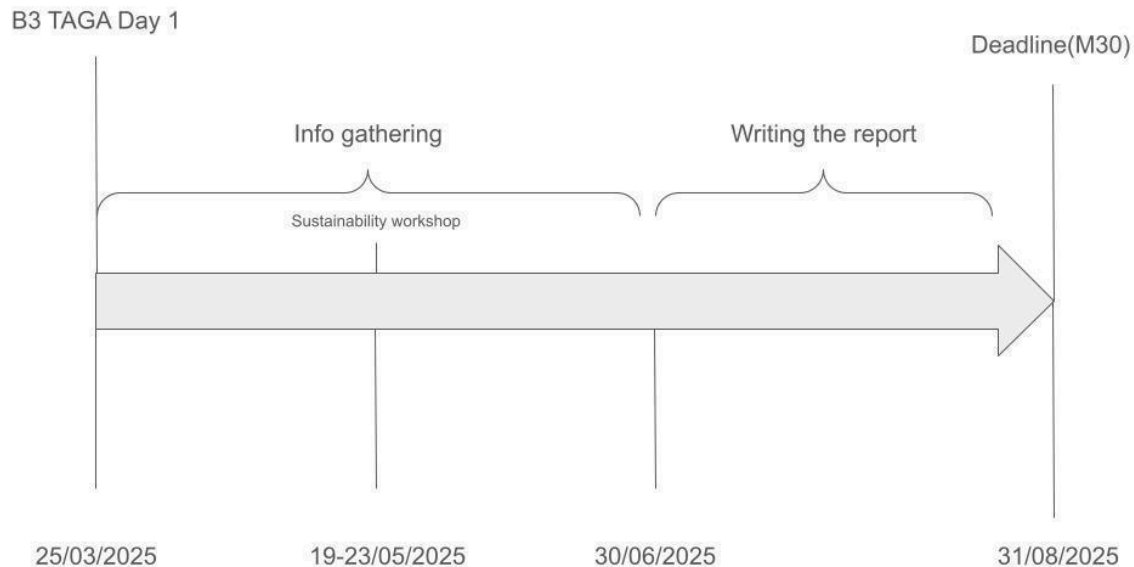


Figure S1: Timeline for the completion of Task 1.8, Sustainability Report

11.2.3. Brief review of the questionnaire

The second part of the workshop focussed on reviewing the answers collected from the questionnaire. The answers can be found via the following link: [link to answers of the questionnaire](#). The main trends were outlined and further discussed. During this discussion, the need to identify which products actually have to be sustained was highlighted. This list of products will serve as the foundation for determining the most suitable sustainability approach for each item, as well as the appropriate time horizon for its support. Furthermore, this list of products will be one of the main components of the sustainability report. During the discussion, following additional points were raised:

- Integration of cloud components and storage of cubes.
- Possible workflows to provide analysis ready cubes.
- Consideration of sustainability in different scenario's. For example, what if a product becomes highly popular.





11.2.4. Discussion

The discussion part of the workshop was centred around four main topics and was completed with two additional topics.

- First topic

“How can the dissemination/awareness of the community on the functionality that B3 represents be maintained at the moment and how does this link to post-project (academic and policy)?”.

Following points were raised during the discussion of the first topic:

- The dissemination, communication, documenting, and publishing will be established during the project and will still all be there when the project ends. Continuation will depend on future projects.
- Part of maintenance and dissemination is and will be done by GBIF as they offer the service.
- GBIF already has a community that they engage with.
- There is an element of sustainability in the services provided by GBIF that is captured in the way that GBIF functions as an organisation.
- The need of a graphical representation of the different products was highlighted
- The case studies will be the hardest to maintain.

For now, the efforts made toward awareness and dissemination are considered sufficient. Several projects are already utilising various components of the B3 products. These components will continue to be used and integrated into different projects. While the B3 name may eventually fade, its products will persist. In most cases, their use and impact will remain trackable.





- Second topic

“For each product, what do you think is the best practice to guarantee sustainability? And outcomes to be maintained.”

Following points were raised during the discussion of the second topic:

- R dependencies do not govern a major risk as snapshots can be made that will guarantee sustainability. This is if you can't remake the results.
- If you want to reuse the workflows, authors will have to be contacted to fix issues with dependencies.
- All products should be properly archived.
- Discoverability is a key element and can be aided through the B3 website.
- Documentation is also key, also through non-technical papers and output.

- Third topic

“How to track the use of the B3 outcomes?”

Points raised during the discussion of the third topic:

- Interactions with the users through github requests, or github issues popping up.
- GBIF will keep an eye on metrics and will track B3 output.
- People really reaching out is more important and interesting.

- Fourth topic

“Do we need someone who is responsible for the sustainability of the outcomes post-project? What is your point of view on commercial options? For example paid-for services such as consulting, training, subcontracting, and implementation of special features.”

Points raised during the discussion of the fourth topic:

- Not possible to provide in-kind.
- Per product, one contactpoint should be assigned together with an overall contactpoint.
- A project-level or institutional-level back-up is desired.
- Collaborations and new projects will be key for sustainability





11.2.5. Conclusion and Actionpoints

Based on the discussion during the workshop following action points were raised to be key for the establishment of the sustainability report:

- Make a graph visualising the linkages between the different products.
- Make a spreadsheet outlining the different products, with columns indicating the contactpoint and the risk of losing.
 - check in with Laura on the existing table
 - check in with INBO for reference format example
- Define criteria for sustainability.
- Get a better insight in the global case study



11.3. Overview of outputs

WP + task	Title	Responsible	Responsible email	Secondary point of contact	Secondary point of contact email	Type [1]	Maintenance status [2]	Published on the documentation website? [yes/Today/Not applicable]	Expected delivery date	Source code URL	Documentation website URL	Sustainability level	Horizon of time to maintain	Best solution to archive the source code / output	Best solution to further maintain the code / or post-project
WP3 T3.1	B-Cubed software development goals	Pieter Huybrechts	pieter.huybrechts@rbo.be	Peter Desmet	peter.desmet@rbo.be	Specifications	Inactive	Yes	delivered	https://github.com/b-cubed-software/development	https://docs.b-cubed-software.com/development	Primary	5 years	Publication in RIO + Zenodo, as part of documentation website: https://doi.org/10.5281/zenodo.1954904	open source approach
WP2 T2.1	Specification for species occurrence cubes and their production	Peter Desmet	peter.desmet@rbo.nc	Mathew Blisset	mbisset@gbl.org	Specifications	Inactive	Yes	delivered	https://github.com/b-cubed-software/specifications	https://docs.b-cubed-software.com/specifications	Primary	5 years	Zenodo, as part of documentation website: https://doi.org/10.5281/zenodo.1952903	open source approach
WP2 T2.2	GBIF SQL download API	Mathew Blisset	mbisset@gbl.org	Tim Robertson	t.robertson@gbl.org	Infrastructure	Active	Yes	delivered	https://github.com/b-cubed-software/gbl-api	https://docs.b-cubed-software.com/gbl-api	Primary	10 years	Zenodo: https://doi.org/10.5281/zenodo.1957733	Infrastructure only be maintained by GBIF. Secretariat open source approach
WP1 T1.4	FAQ helpdesk	Laura Abraham	laura.abraham@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Training	WIP	Not applicable	31/07/2026			Secondary			
WP4 T4.5	goube R package	Ward Langerest	ward.langerest@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Software package	Active	Yes	delivered	https://github.com/b-cubed-software/goube	https://docs.b-cubed-software.com/goube	Primary	5 years	Zenodo: https://doi.org/10.5281/zenodo.1956566	open source approach
WP1 T1.4	An Introduction to spatial data analysis for conservation ecology in R	Sandra MacFadyen	macfadyen@sun.ac.za	Quentin Groom	quentin.groom@meiseobotanigarden.be	Tutorial	Active	Yes	delivered	https://docs.b-cubed-software/spatial-data-analysis	see source	Secondary	2 years	Github	open source approach
WP1 T1.4	An Introduction to species distribution modelling in R	Sandra MacFadyen	macfadyen@sun.ac.za	Quentin Groom	quentin.groom@meiseobotanigarden.be	Tutorial	Active	Yes	delivered	https://docs.b-cubed-software/species-distribution-modelling	see source	Secondary	2 years	Github	open source approach
WP1 T1.4	An Introduction to ecological modelling with Google Earth Engine	Sandra MacFadyen	macfadyen@sun.ac.za	Quentin Groom	quentin.groom@meiseobotanigarden.be	Tutorial	Active	Yes	delivered	https://docs.b-cubed-software/ecological-modelling	see source	Secondary	2 years	Github	open source approach
WP4 T4.1	vsoube: Virtual Suitability Cube	Rocio Beatriz Cortés	rocio.cortezbos@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Software package	Active	Yes	delivered	https://github.com/b-cubed-software/vsoube		Primary			open source approach
WP4 T4.1	Specification for suitability cubes and their production	Rocio Beatriz Cortés	rocio.cortezbos@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Specifications	Active	Yes	30-11-2025	https://docs.b-cubed-software/suitability-cubes	see source	Primary	5 years	Github	open source approach
WP4 T4.1	Specification for dissimilarity cubes and their production	Sandra MacFadyen	macfadyen@sun.ac.za	Quentin Groom	quentin.groom@meiseobotanigarden.be	Specifications	Active	Yes	30-11-2025	https://docs.b-cubed-software/dissimilarity-cubes	see source	Primary	5 years	Github	open source approach
WP4 T4.1	Specification for invisibility cubes and their production	Sandra MacFadyen	macfadyen@sun.ac.za	Quentin Groom	quentin.groom@meiseobotanigarden.be	Specifications	Active	Yes	30-11-2025	https://docs.b-cubed-software/invisibility-cubes	see source	Primary	5 years	Github	open source approach
WP4 T4.2	Specification for the production and analysis of dissimilarity cubes	Sandra MacFadyen	macfadyen@sun.ac.za	Quentin Groom	quentin.groom@meiseobotanigarden.be	Software package	Active	Yes	3-6-2025	https://github.com/b-cubed-software/analysis	https://docs.b-cubed-software/analysis	Primary	5 years	Zenodo: https://doi.org/10.5281/zenodo.1954244	open source approach
WP4 T4.3	invismapr for the production and analysis of network invisibility cubes	Sandra MacFadyen	macfadyen@sun.ac.za	Quentin Groom	quentin.groom@meiseobotanigarden.be	Software package	Active	Yes	31-7-2025	https://github.com/b-cubed-software/invismapr	https://docs.b-cubed-software/invismapr	Primary	5 years	Zenodo: https://doi.org/10.5281/zenodo.1954242	open source approach
WP4 T4.4	Using B3 for deep learning	Diego Marcos	diego.marcos@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Analysis	Active	Todo		https://github.com/rbo/B3deepLearning		Primary	5 years	github	open source approach
WP3 T3.3	Data mobilization from GBIF to the EBIF data portal	Lina Estupians	lina.estupians@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Tutorial	Active	Yes	31-8-2024	https://github.com/EBIFcube/GBIF-to-EBIF	https://zenodo.org/record/13729743	Secondary	2 years	Github+ Zenodo	open source approach
WP4 T4.5	Scripts to explore the conditions that determine the reliability of models, trends and status computation-structured-data	Ward Langerest	ward.langerest@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Analysis	Inactive	Yes	delivered	https://github.com/b-cubed-software/computing-structured-data	https://docs.b-cubed-software/computing-structured-data	Primary	0 years	Zenodo	open source approach
WP5 T5.1	l3gbl	Shawn Dove	shawn.dove@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Software package	Active	Yes	delivered	https://github.com/b-cubed-software/l3gbl	https://docs.b-cubed-software/l3gbl	Primary	5 years	Zenodo: https://doi.org/10.5281/zenodo.19543309	open source approach
WP5 T5.2	pndicatorR	Lissa Bruegemans	lissa.bruegemans@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Software package	Active	Yes	delivered	https://github.com/b-cubed-software/pndicatorR	https://docs.b-cubed-software/pndicatorR	Primary	5 years	Zenodo (done)	open source approach
WP5 T5.3	implicator	Mukhtar Yahya	26485613@sun.ac.za	Quentin Groom	quentin.groom@meiseobotanigarden.be	Software package	WIP	Yes	delivered	https://github.com/b-cubed-software/implicator	see source	Primary	5 years	Zenodo (done)	open source approach
WP5 T5.4	dubcube	Ward Langerest	ward.langerest@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Software package	Active	Yes	delivered	https://github.com/b-cubed-software/dubcube	https://docs.b-cubed-software/dubcube	Primary	5 years	Zenodo: https://doi.org/10.5281/zenodo.1954247	open source approach
WP1 T1.4	Courses on YouTube Empowering Biodiversity Monitoring Through Data Cubes: Techniques & Applications for Open Science	Sandra MacFadyen	macfadyen@sun.ac.za	Quentin Groom	quentin.groom@meiseobotanigarden.be	Training	Active	Not applicable	delivered	https://www.youtube.com/watch?v=4Y7T1H048nU	Available on the https://docs.b-cubed-software.com/empowering-biodiversity-monitoring-through-data-cubes-techniques-applications-for-open-science	Secondary	0 years	Github and YouTube	NA
WP3 T3.3	Go see a Docker! First help with containerizing	Quentin Groom	quentin.groom@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Tutorial	Inactive	Not applicable		https://github.com/QuentinGroom/GoSeeADocker		Secondary	0 years	Gid+U (done), contact Christophe Van Nesselrooy	open source approach
WP4 T4.5	Unveiling Ecological Dynamics Through Simulation and Visualization of Biodiversity Data Cubes	Ward Langerest	ward.langerest@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Tutorial	Active	Not applicable		https://github.com/b-cubed-software/unveiling-ecological-dynamics-through-simulation-and-visualization-of-biodiversity-data-cubes		Secondary	0 years		open source approach
WP4 T4.5	Targets workshop	Ward Langerest	ward.langerest@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Tutorial	Active	Not applicable		https://github.com/b-cubed-software/targets-workshop		Secondary	0 years		open source approach
WP1 T1.4	EBICube: Enhancing Biodiversity Data Sharing with Interoperable Geospatial Standards	Lina Estupians	lina.estupians@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Tutorial	Inactive	Not applicable		https://github.com/EBICube/EBICube		Secondary	0 years	Github	open source approach
WP1 T1.4	How to Package Your Functions: From Standalone to R Packages	Damiano Oldoni	damiano.oldoni@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Tutorial	Inactive	Not applicable		https://github.com/b-cubed-software/how-to-package-your-functions-from-standalone-to-r-packages		Secondary	5 years		open source approach
	Databricks webinar	Quentin Groom	quentin.groom@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Tutorial	Active	Not applicable		https://cheatsheets.databricks.com/cheatsheets/databricks-webinar		Secondary			open source approach
WP3 T3.2	How to build a species occurrence cube from a GBIF checklist	Damiano Oldoni	damiano.oldoni@rbo.nc	Quentin Groom	quentin.groom@meiseobotanigarden.be	Tutorial	Inactive	Yes		https://github.com/b-cubed-software/how-to-build-a-species-occurrence-cube-from-a-gbif-checklist	https://docs.b-cubed-software/how-to-build-a-species-occurrence-cube-from-a-gbif-checklist	Secondary	5 years	Zenodo, as part of documentation website	open source approach

D1.8 Sustainability report



WP + task	Title	Responsible	Responsible email	Secondary point of contact	Secondary point of contact email	Type [1]	Maintenance status [2]	Published on the documentation website? (Yes/Not applicable)	(Expected) delivery date	Source code URL	Documentation website URL	Sustainability level	Horizon of time to maintain	Best solution to archive the source code / output	Best solution to further maintain the code / output post-project
	b3alen	Maarten Trekels	maarten.trekels@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be			Yes		https://github.com/maarten-trekels/b3alen	https://docs.b-cubed.eu/software/b3alen/readme			Zenodo	open source approach
WP4 T4.1	sustainabilitycube	Rocio Beazir Corles	rocie.beazir@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Software package	Active	Yes	delivered	https://github.com/maarten-trekels/b3alen	https://docs.b-cubed.eu/software/b3alen/readme	Primary		Zenodo	open source approach
WP1 T1.6	Policy brief on FAIR indicators	Yanina Sica	yanina.sica@gmail.com	Quaden Groom	quentin.groom@meisebotanicijardin.be	Briefs, reports, and publications	Active	Not applicable	delivered	https://zenodo.org/record/1917247		Primary			open source approach
WP6 T6.1	Trends and status of biodiversity at Ramsar sites	Shawn Dove	shawn.dove@rohm	Quaden Groom	quentin.groom@meisebotanicijardin.be	Analysis	WIP	Todo	end of project	https://github.com/b-cubed/puvsd4mrtm		Primary	0 years	Zenodo	open source approach
WP5 T5.5	b3verse	Ward Langeraeert	ward.langeraeert@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Specifications	Active	Yes	delivered	https://github.com/b-cubed/puvsd4mrtm	https://docs.b-cubed.eu/quads/b3verse/	Primary	5 years	Zenodo https://doi.org/10.5281/zenodo.1074100	open source approach
WP5 T5.5	b3data	Ward Langeraeert	ward.langeraeert@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Other	Active	Yes	delivered	-	https://docs.b-cubed.eu/quads/b3data/	Primary	2 years	Zenodo https://doi.org/10.5281/zenodo.1074100	open source approach
WP5 T5.5	Scripts used to create the b3data frictionless data package	Ward Langeraeert	ward.langeraeert@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Analysis	Active	Yes	delivered	https://github.com/b-cubed/pub3data-scripts	https://docs.b-cubed.eu/quads/b3data/	Primary	2 years	Zenodo https://doi.org/10.5281/zenodo.1074100	open source approach
WP5 T5.5	b3verse: A collection of R packages to work with occurrence cubes	Ward Langeraeert	ward.langeraeert@quaden.groen	Peter Desmet	peter.desmet@inbo.be	Tutorial	Active	Yes	delivered	https://github.com/b-cubed/puvsd4mrtm	https://docs.b-cubed.eu/quads/b3verse/	Secondary	5 years	Zenodo, as part of documentation website: https://docs.b-cubed.eu/quads/b3verse/	open source approach
WP5 T5.5	b3data: Data resources for the b3verse	Ward Langeraeert	ward.langeraeert@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Tutorial	Active	Yes	delivered	https://github.com/b-cubed/puvsd4mrtm	https://docs.b-cubed.eu/quads/b3data/	Secondary		Zenodo, as part of documentation website: https://docs.b-cubed.eu/quads/b3data/	open source approach
WP3 T3.2	Download a species occurrence cube from GBIF.org	Peter Desmet	peter.desmet@inbo.be	Quaden Groom	quentin.groom@meisebotanicijardin.be	Tutorial	Inactive	Yes	delivered	https://github.com/b-cubed/puvsd4mrtm	https://docs.b-cubed.eu/quads/b3data/	Secondary	3 years	Zenodo, as part of documentation website: https://docs.b-cubed.eu/quads/b3data/	open source approach
	Converting GBIF data cubes in cloud-native data formats	Maarten Trekels	maarten.trekels@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Tutorial	Active	Yes		https://docs.b-cubed.eu/quads/b3data/	see source	Secondary			open source approach
WP3 T3.2	B-Cubed documentation website	Peter Desmet	peter.desmet@inbo.be	Samme Govaert	samme.govaert@inbo.be	Website	Active	Yes	delivered	https://github.com/b-cubed/puvsd4mrtm	https://docs.b-cubed.eu/quads/b3data/	Secondary	5 years	Zenodo https://doi.org/10.5281/zenodo.1064503	Maintained by INFO
WP3 T3.2	b3doc	Samme Govaert	samme.govaert@inbo.be	Peter Desmet	peter.desmet@inbo.be	Software package	Active	Yes	delivered	https://github.com/b-cubed/pub3data	https://docs.b-cubed.eu/quads/b3data/	Primary	5 years	Zenodo https://doi.org/10.5281/zenodo.1064503	open source approach
	Living Planet Symposium 2025 demo	Lina Estupians	lina.estupians@inbo.be	Quaden Groom	quentin.groom@meisebotanicijardin.be	Tutorial	Active	Not applicable	delivered	https://github.com/b-cubed/pub3data	https://docs.b-cubed.eu/quads/b3data/	Secondary			open source approach
	BioSpace25 demo	Maarten Trekels	maarten.trekels@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Tutorial	Active	Not applicable	delivered	https://github.com/b-cubed/pub3data	see source	Secondary			open source approach
WP1 T1.4	b-cubed-workshops	Quaden Groom	quentin.groom@inbo.be	Quaden Groom	quentin.groom@meisebotanicijardin.be	Training	Active	Not applicable		https://github.com/b-cubed/pub3data		Secondary	0 years	GitHub	NA
WP4 T4.5	Scripts that compare aggregated cubes with structured monitoring schemes in South Africa	Katelyn Faulkner	k.faulkner@santia	Quaden Groom	quentin.groom@meisebotanicijardin.be	Analysis	Active	Not applicable		https://github.com/b-cubed/pub3data	https://docs.b-cubed.eu/quads/b3data/	Primary			open source approach
WP5 T5.4	Scripts to explore calculation, interpretation and visualisation of uncertainty related to indicators based on biodiversity data cubes	Ward Langeraeert	ward.langeraeert@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Analysis	Inactive	Not applicable	delivered	https://github.com/b-cubed/pub3data	https://docs.b-cubed.eu/quads/b3data/	Primary	0 years	Zenodo https://doi.org/10.5281/zenodo.1074100	open source approach
WP6 T6.1	Generalized Additive Models (GAMs) for rccoon in Europe	Damiano Oldoni	damiano.oldoni@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Analysis	Inactive	Not applicable	delivered	https://github.com/b-cubed/pub3data		Primary	0 years	Zenodo	open source approach
WP6 T6.1	Workflow to create an European GRIS checklist based on national GRIS checklist	Damiano Oldoni	damiano.oldoni@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Analysis	Abandoned	Not applicable	delivered	https://github.com/b-cubed/pub3data		Primary	0 years	Zenodo	open source approach
WP1 T1.7	B-Cubed Hackathon	Laura Abraham	laura.abraham@inbo.be	Quaden Groom	quentin.groom@meisebotanicijardin.be	Training	Inactive	Not applicable		https://github.com/b-cubed/pub3data		Secondary			open source approach
WP5 T5.1	B-Cubed General Biodiversity Indicators Graphical User Interface	Shawn Dove	shawn.dove@rohm	Quaden Groom	quentin.groom@meisebotanicijardin.be	Software package	WIP	Not applicable	delivered	https://github.com/b-cubed/pub3data		Primary	2 years	Zenodo	open source approach
WP5 T5.5	Scripts to explore the streamlining and integration of software (with focus on R packages) related to the calculation of indicators based on biodiversity data cubes	Ward Langeraeert	ward.langeraeert@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Analysis	Inactive	Not applicable	delivered	https://github.com/b-cubed/pub3data	https://docs.b-cubed.eu/quads/b3data/	Primary	0 years	Zenodo	open source approach
	fourpy	Quaden Groom	quentin.groom@inbo.be	Quaden Groom	quentin.groom@meisebotanicijardin.be	Analysis	Active	Not applicable		https://github.com/b-cubed/pub3data		Primary		Zenodo (done)	open source approach
	GBIF-Cubes: Species Occurrence Cube Portability	Taimur Khan	taimur.khan@utd	Quaden Groom	quentin.groom@meisebotanicijardin.be	Software package	Active	Not applicable		https://github.com/b-cubed/pub3data		Primary			open source approach
	Interoperable eLTER Standard Observation variables for Biosphere	Laura Abraham	laura.abraham@inbo.be	Quaden Groom	quentin.groom@meisebotanicijardin.be	Software package	Active	Not applicable		https://github.com/b-cubed/pub3data		Primary			open source approach
WP1 T1.2	B-Cubed website	Nikol Stoykova	n.stoykova@inbo.be	Quaden Groom	quentin.groom@meisebotanicijardin.be	Website	Active	Not applicable	delivered	https://b-cubed.eu/	Not relevant	Secondary	5 years	NA	Maintained by Persoft
	ebcube	Ward Langeraeert	ward.langeraeert@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Software package	Active	Yes		https://github.com/EBI-Velvet/ebcube	https://portal.ebi.ac.uk/ebcube/	Primary	5 years	GitHub	open source approach
WP2 T2.3	rgbif	John Waller	jwaller@gbif.org	Matthew Blissett	mblissett@gbif.org	Software package	Active	Yes	delivered	https://github.com/rgbif/rgbif	https://docs.b-cubed.eu/quads/b3data/	Primary	5 years	Zenodo https://doi.org/10.5281/zenodo.1064503	open source approach
WP2 T2.3	pygbif	John Waller	jwaller@gbif.org	Matthew Blissett	mblissett@gbif.org	Software package	Active	Yes	delivered	https://github.com/rgbif/rgbif	https://docs.b-cubed.eu/quads/b3data/	Primary	5 years	Zenodo https://doi.org/10.5281/zenodo.1064503	open source approach
WP6 T6.1	trial	Damiano Oldoni	damiano.oldoni@quaden.groen	Quaden Groom	quentin.groom@meisebotanicijardin.be	Software package	Active	Yes	16/01/2026	https://github.com/b-cubed/pub3data		Primary	5 years	Zenodo https://doi.org/10.5281/zenodo.1064503	open source approach
	Unlocking The Full Potential Of The Green Deal Data Space	Katharina Schiedt	Kath@DataCove	Quaden Groom	quentin.groom@meisebotanicijardin.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.5281/zenodo.1064503	https://b-cubed.eu/ebcube/	Complementary	0 years	Archiving on Zenodo	Publication



D1.8 Sustainability report



WP + task	Title	Responsible	Responsible email	Secondary point of contact	Secondary point of contact email	Type [1]	Maintenance status [2]	Published on the documentation website? (yes/No/Not applicable)	(Expected) delivery date	Source code URL	Documentation website URL	Sustainability level	Horizon of time to maintain	Best solution to archive the source code / output	Best solution to further maintain the code / output post-project
	M10. Preliminary criteria for data quality and species characteristics for estimating species status and trends	Emma Cartuyvels	emma.cartuyvels@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	D5.3 Indicators on Impacts of Alien Taxa	Mukhtar Yahaya	26485613@sun.ac.za	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M21. Code to calculate general indicators of biodiversity change	Shawn Dove	shawn.dove@hottel.com	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M12. Code testing for predictive habitat suitability modeling	Rocio Beatriz Cortés	rocie.cortesobos@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	D1.3 Data management plan v2	Nikol Stoykova	n.stoykova@pennco.com	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M20. Design of R packages for indicator calculation	Ward Langeraeert	ward.langeraeert@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M2. Training Materials	Laura Abraham	laura.abraham@pennco.com	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M9. Searchable and versioned documentation website	Quintin Groom	quintin.groom@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	D4.2 Report on deep learning development	Alexis Joly	alexis.joly@inria.fr	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M06. Design of data and indicator robustness measures	Ward Langeraeert	ward.langeraeert@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	D2.3 Occurrence cube service	Matthew Blissett	mblissett@pbl.org	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	One-hectare fine-scale dataset of a fynbos plant community in the Cape Floristic Region	Jan-Hendrik Keet	keetjan@pbl.org	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	Applying the maximum entropy principle to neural networks enhances multi-species distribution models	Maxime Rychkewat	maxime.rychkevat@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
WPI T1.8	Sustainability Report	Jonas Depecker	jonas.depecker@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	D1.8 Updated Plan for Exploitation, Dissemination and Communication (PECCOM)	Nikol Stoykova	n.stoykova@pennco.com	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M7. First quality assessment report of B3 software	Lissa Bruegelmans	lissa.bruegelmans@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M10. Selection of the monitoring and inventory projects: selection of species (groups), spatial and temporal extent	Ward Langeraeert	ward.langeraeert@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M20. Established list of essential biodiversity variables and indicators to be implemented	Shawn Dove	shawn.dove@hottel.com	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M17. Deep learning algorithms for deep learning using B3 and associated open data	Alexis Joly	alexis.joly@inria.fr	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M11. Code development for predictive habitat suitability modeling	Rocio Beatriz Cortés	rocie.cortesobos@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	Mapping potential environmental impacts of alien species in the face of climate change	Sabrina Kumschick	sabrinakumschick@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M23. Code to calculate the indicators of phylogenetic diversity	Louise Hendrickx	louise.hendrickx@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M6. Software has been tested by partners and feedback is collected	Peter Desmet	peter.desmet@inbc.com	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M6. First user generated species occurrence cube is available and citable	Matthew Blissett	mblissett@pbl.org	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M1. Delivery of a training strategy for B3	Sabrina Kumschick	sabrinakumschick@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	D1.7 Hackathon results	Laura Abraham	laura.abraham@pennco.com	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	D5.2 Phylogenetic Diversity	Lissa Bruegelmans	lissa.bruegelmans@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	Effective biodiversity monitoring requires FAIR data and FAIR models for FAIR indicators (Findable, Accessible, Interoperable, and Reusable)	Yanina Sica	yanina.sica@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	Unravelling ecological dynamics through simulation and visualization of biodiversity data cubes	Ward Langeraeert	ward.langeraeert@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	M10. Interoperability strategy document	Lina Estupinas	lina.estupinas@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	Selection potential from invasive alien species	Martin Philippe-Lesaffre	martin.philippe@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	Under the mantra: "Make use of colorblind friendly graphs"	Duccio Rocchini	duccio.rocchini@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	An analysis of sex ratios using a biodiversity data cube	Quintin Groom	quintin.groom@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	On the mathematical properties of spatial Rax's Q to compute ecosystem heterogeneity	Duccio Rocchini	duccio.rocchini@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication
	D1.5 Alignment of B3 with European Biodiversity Initiatives: Insights from EU policy	Lina Estupinas	lina.estupinas@quintin.groom	Quintin Groom	quintin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library/cubed-b-cubed-eu-library	Complimentary	0 years	Archiving on Zenodo	Publication



D1.8 Sustainability report



WP + task	Title	Responsible	Responsible email	Secondary point of contact	Secondary point of contact email	Type [1]	Maintenance status [2]	Published on the documentation website? (yes/Today/Not applicable)	(Expected) delivery date	Source code URL	Documentation website URL	Sustainability level	Horizon of time to maintain	Best solution to archive the source code / output	Best solution to further maintain the code / output post-project
	Mapping impacts of alien species on biodiversity in the face of climate change	Sabrina Kumschick	sabrinakumschick@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.21203/rs.3.rs-4437291/v1	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Phenological Diversity Trends with Remote Sensing Datacubes	Elliot Shale	shale@uni-marburg	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.37744/oxf.jpub.0068	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	D1.6 International Science-Policy Landscape Analysis	Yamina Sica	yamina.sica@gmail	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	A kernel integral method to remove biases in estimating trait turnover	Guillaume Latorbe	glatorbe@ed.ac.uk	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1111/2011.210X.14245	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	D3.1 Quality requirements for software	Pieter Huybrechts	pieter.huybrechts@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	D2.2 Occurrence cube implementation	Matthew Blissett	mblissett@pbf.org	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Editorial: Biodiversity informatics: building a future for high functionality data to decision pipeline	Chui Sun	chui@sun.ac.za	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1111/2011.210X.14245	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Considerations for developing and implementing a safe list for alien taxa	Sabrina Kumschick	sabrinakumschick@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1003/bowebad118	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Occurrence cubes for non-native taxa in Belgium and Europe	Damiano Oldoni	damiano.oldoni@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1003/bowebad118	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	M22: Design of the phylogenetic indicators	Louise Hendrickx	louise.hendrickx@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1003/bowebad118	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	IPBES Invasive Alien Species Assessment: Summary for Policymakers	Helien Roy	helien@on.ac.uk	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.5913/zenodo.7430922	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	M38: Code of Conduct for meetings	Laura Abraham	laura.abraham@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Aquatic view of spatial bias in modelling the distribution of species and their diversity	Duccio Rocchini	duccio.rocchini@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1038/s41185-023-00014-5	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	USE: Uniformly sampling pseudo-absences within the environmental space for applications in habitat suitability models	Daniela De Risi	daniela.de.risi@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1111/2011.210X.14245	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	D1.1 Promotional material	Nikol Stoykova	n.stoykova@penco	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	D1.2 Plan for Exploitation, Dissemination and Communication	Nikol Stoykova	n.stoykova@penco	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	D1.3 Data Management Plan	Nikol Stoykova	n.stoykova@penco	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	B-Cubed: Leveraging analysis-ready biodiversity database and cloud computing for timely and actionable biodiversity monitoring	Peter Desmet	peter.desmet@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1038/s41185-023-00014-5	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	D2.1 Specification for species occurrence cubes and their production	Peter Desmet	peter.desmet@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1038/s41185-023-00014-5	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Disentangling the relationships among abundance, invasiveness and invasibility in trait space	Guillaume Latorbe	glatorbe@ed.ac.uk	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1101/2023.03.28.534538	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	A kernel integral method to remove biases in estimating trait turnover	Guillaume Latorbe	glatorbe@ed.ac.uk	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1101/2023.03.28.534538	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	The status of biological invasions and their management in South Africa in 2022	Tsungai Zengeya	t.zengeya@sarbi	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1101/2023.03.28.534538	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	DASCO: A workflow to downscale alien species checklists using occurrence records and to re-allocate species distributions across realms	Hanno Seebens	hanno.seebens@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1038/s41185-023-00014-5	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Policy-relevant indicators for invasive alien species assessment and reporting	Melodie McGeoch	melodie.mcgeoch@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1101/2023.03.28.534538	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	A Regional Earth System Data Lab for Understanding Ecosystem Dynamics: An Example from Tropical South America	Lina Estupinana	lina.estupinana@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1101/2023.03.28.534538	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Holistic understanding of contemporary ecosystems requires integration of data on domesticated, captive and cultivated organisms	Quentin Groom	quentin.groom@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1101/2023.03.28.534538	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Data integration enables global biodiversity synthesis	Mason Heberling	heberlingm@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1101/2023.03.28.534538	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	A global-scale screening of non-native aquatic organisms to identify potentially invasive species under current and future climate conditions	Lorenzo Vilizzi	lorenzo.vilizzi@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1101/2023.03.28.534538	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	The Status of Biological Invasions and their Management in South Africa in 2019	Tsungai Zengeya	t.zengeya@sarbi	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1101/2023.03.28.534538	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Convolutional neural networks improve species distribution modelling by capturing the spatial structure of the environment	Benjamin Deneu	benjamin.deneu@quentin.groom	Quentin Groom	quentin.groom@meisebotanischgarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://doi.org/10.1101/2023.03.28.534538	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication



D1.8 Sustainability report



WP + task	Title	Responsible	Responsible email	Secondary point of contact	Secondary point of contact email	Type [1]	Maintenance status [2]	Published on the documentation website? (yes/Today/Not applicable)	(Expected) delivery date	Source code URL	Documentation website URL	Sustainability level	Horizon of time to maintain	Best solution to archive the source code / output	Best solution to further maintain the code / output post-project
	A workflow for standardizing and integrating alien species distribution data	Hanno Seebens	hanno.seebens@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Earth system data cubes unravel global multivariate dynamics	Miguel Mahecha	miguel.mahecha@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Occurrence cubes: a new paradigm for aggregating species occurrence data	Damiano Oldoni	damiano.oldoni@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Occurrence Cubes: A new way of aggregating heterogeneous species occurrence data	Damiano Oldoni	damiano.oldoni@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Horizon Scanning to Predict and Prioritize Invasive Alien Species With the Potential to Threaten Human Health and Economies on Cyprus	Judey Phyllon	jyph@ceh.ac.uk	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Appropriate uses of EICAT protocol, data and classifications	Sabrina Kumachick	sabrinakumachick@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Challenges in producing policy-relevant global scenarios of biodiversity and ecosystem services	Isabel Rosa	i.rosa@bangor.ac.uk	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	How citizen scientists contribute to monitor protected areas thanks to automatic plant identification tools	Pierre Bornet	pierre.bornet@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	A conceptual map of invasion biology: Integrating hypotheses into a consensus network	Martin Enders	enders.martin@gm	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Achieving the Full Vision of Earth Observation Data Cubes	Steve Kopp	skopp@esri.com	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Empowering Citizens to Inform Decision-Making as a Way Forward to Support Invasive Alien Species Policy	Quentin Groom	quentin.groom@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Improved standardization of transcribed digital specimen data	Quentin Groom	quentin.groom@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Consistency of impact assessment protocols for non-native species	Pablo González-Moreno	p.gonzalez-moreno@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Essential biodiversity variables for mapping and monitoring species populations	Walter Jetz	walter.jetz@yale.edu	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Participatory coastal management through elicitation of ecosystem services preferences and modelling driven by coastal science	Javier Martínez-López	javier.martinez@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	How to predict fine resolution occupancy from coarse occupancy data	Quentin Groom	quentin.groom@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Indicators for monitoring biological invasions at a national level	John Wilson	john.wilson2@gmail.com	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Building essential biodiversity variables (EBVs) of species distribution and abundance at a global scale	Daniel Kissling	wdkissling@gmail.com	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Tracking Invasive Alien Species (TriAS): Building a data-driven framework to inform policy	Sonia Vanderhoeven	s.vanderhoeven@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Seven Recommendations to Make Your Invasive Alien Species Data More Useful	Quentin Groom	quentin.groom@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Working with population totals in the presence of missing data: comparing imputation methods in terms of bias and precision	Thierry Onkelinx	thierry.onkelinx@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	No saturation in the accumulation of alien species worldwide	Hanno Seebens	hanno.seebens@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	A Catalogue of Marine Biodiversity Indicators	Heliana Teixeira	heliana.teixeira@univ-groen	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication
	Mapping the impact of alien species on marine ecosystems: the Mediterranean Sea case study	Stelios Katsanevakis	stelios@katsanevakis.eu	Quentin Groom	quentin.groom@meisebotaniciagarden.be	Briefs, reports, and publications	Inactive	Not applicable	delivered	https://b-cubed.eu/library	https://b-cubed.eu/library	Complimentary	0 years	Archiving on Zenodo	Publication

