

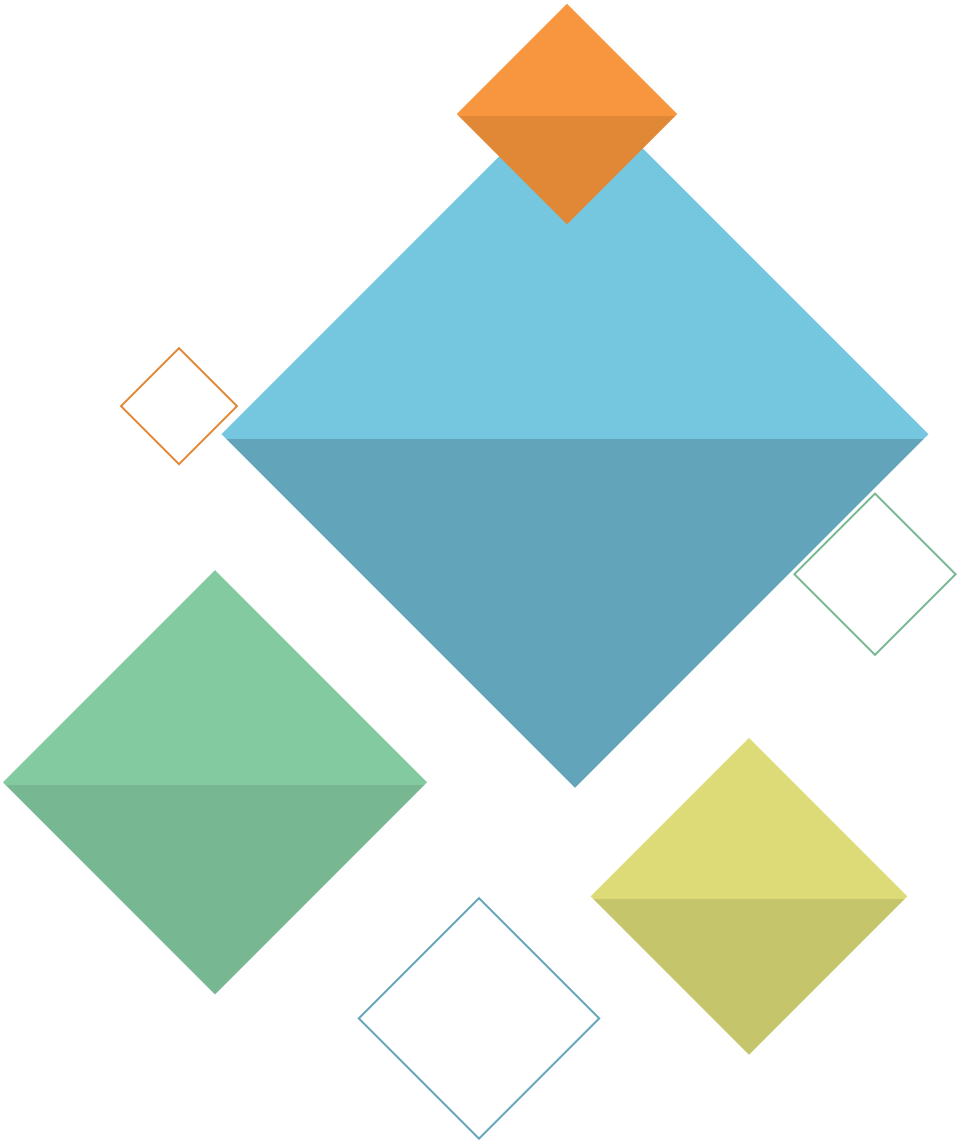
MONITORING AND IMPACT ASSESSMENT

of the MapBiomas Brazil Network

2025

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 **1**

Reveal

3 questions · 11 indicators

 **2**

Make accessible

3 questions · 16 indicators

 **3**

Inform decisions

3 questions · 15 indicators

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MapBiomass

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GLOSSARY

Initiative Initiatives are the major mapped subjects. The current initiatives on MapBiomass are Land Use Land Cover, Fire Scars, Water, Soil, Climate and Degradation. Each initiative has specific mapping methods and periodicity.

Platform Platforms are the primary channels for accessing, visualizing, querying, and downloading MapBiomass data. The main MapBiomass platform is structured into thematic modules that provide information on different land use and land cover topics, enabling users to explore, analyze, and download data through an integrated environment.

Module Modules are specialized sections of the MapBiomass Platform that provide data, analyses, and tools focused on specific topics. While integrated into the main MapBiomass Platform, each module offers additional information and functionalities beyond land use and land cover mapping, enabling users to explore themes such as deforestation, urban infrastructure, pasturelands, agriculture, mining, water resources, and fire.

Monitor Monitors are specialized MapBiomass platforms dedicated to specific themes. They provide more detailed information and are updated more frequently, allowing continuous monitoring of indicators and processes. By offering deeper analytical capabilities and more timely data, Monitors support knowledge generation and data-driven decision-making.

Product Products are datasets, which can be made available in different ways, such as maps, reports, fact sheets, websites or modules on the platform, among others. Each initiative has one or more products. For instance, the 30-m and 10-m maps of land use and land cover are two products of the same initiative. Some of the products are default for the initiative such as a dashboard to access any data set created.

Cross-cutting themes Cross-cutting themes are those mapped by a specific team across all biomes, such as agriculture, pastureland, coastal zones, and urban areas.

LULC (Land Use and Land Cover) The core subject of MapBiomass, referring to the classification of natural habitats and physical materials on the earth's surface and how humans utilize that land. It reveals the transformations of the territory over time.

ATBD (Algorithm Theoretical Basis Document) A technical document that provides a detailed description of the methodology used to generate specific datasets. It is essential for transparency and peer understanding of the mapping process.

Global Accuracy A metric obtained by comparing reference points with the mapped class to indicate the overall reliability of a map.

Time Series A sequence of annual maps that allow for the analysis of land change over a historical period.

RAD (Annual Deforestation Report) A consolidated report that uses MapBiomass Alerta data to provide transparency on deforestation events and state enforcement actions. It assesses the proportion of deforested areas that have legal authorizations or enforcement actions.

MapBiomass Alerta This initiative validates public deforestation alerts from various institutions using high-resolution imagery. These alerts provide detailed information used by government and financial institutions to identify illegal activities.

Embargo An administrative sanction that restricts the use of a rural property due to environmental infractions. MapBiomass monitors which states make these notices publicly available through its Fiscalization Monitor.

CAR (Rural Environmental Registry) The public electronic registry for rural properties in Brazil. MapBiomass Alerta provides overlay information on the CAR to identify where deforestation is occurring.

API (Application Programming Interface) A tool that allows registered institutions and individual users to query and download MapBiomass data automatically for integration into other platforms.

Embeddings A high-level technological innovation which represents complex data features to improve the efficiency and quality of automated classification.

On-the-fly Mapping A technological advancement that, as applied in MapBiomass, uses Google Earth Engine (GEE) as a server to generate maps and area calculations instantly on the public platform.

GEE (Google Earth Engine) The cloud-based platform used by the network for large-scale geospatial processing and data hosting.

SICOR (Rural Credit and Proagro Operations System) SICOR is a database managed by the Central Bank of Brazil that records rural credit and agricultural insurance operations under Brazil's National Rural Credit System, supporting financial oversight, policy implementation, and verification of environmental and geographic compliance of financed rural properties.

Presentation

MapBiomass is an international collaborative network dedicated to mapping land cover, land use, and natural resources across the tropics and subtropics. Our mission is to generate consistent time series of maps and data that are useful, up-to-date, accurate, comprehensive, and relevant to local contexts, helping to advance the conservation and sustainable management of natural resources and climate change mitigation.

MapBiomass began in Brazil in 2015, producing annual land use and land cover maps through a multi-institutional network of NGOs, universities, and technology companies (<https://mapbiomas.org>). Since then, the initiative has expanded to other countries, always through networks of local institutions. This international expansion has been accompanied by the development in Brazil of additional MapBiomass initiatives focused on deforestation alerts, water, fire, soil, pasture, irrigation, degradation, coastal reefs, urban areas, atmosphere, climate risk, and mining.

As a network, we are committed to generating data, methods, tools, and information that improve the understanding, analysis, and decision-making needed for the conservation and sustainable management of natural resources. As a collective, however, we do not produce analyses, interpretations, or judgments about specific situations. MapBiomass members may do so individually or through their own institutions, but not on behalf of the network. Likewise, when responding to requests for information on land use and land cover, we provide factual information derived from data generated by the network. When publishing reports or technical notes, we do not take positions on public policies or specific projects. This principle is clearly expressed in MapBiomass’s purpose:

MAPBIOMASS’ PURPOSE

- ◆

1

Reveal the transformations in the Brazilian territory through science and with precision, agility, and quality.
- ◆

2

By making knowledge about land use and land cover accessible,
- ◆

3

we seek to inform public, private, and civil society decision-makers to promote the conservation and sustainable management of natural resources and to address climate change.

Each part of the purpose is one component of the assessment. Select a part to open it.

The impacts resulting from the use of MapBiomass data are therefore generated primarily and indirectly by its users. These include scientists; decision-makers and managers in federal, state, and municipal institutions; civil society organizations; financial institutions; journalists; consultants; justice officials; and students, among many others. The wide range of themes currently mapped by MapBiomass Brazil — and the equally diverse ways in which these data are used — makes assessing the network’s impact particularly challenging. In addition, the nationwide scale of data generation makes it difficult to apply the statistical methods commonly used for conventional impact evaluations.

In this context, we developed **nine guiding questions** to assess whether we are fulfilling our purpose, identify what MapBiomass Brazil is doing well and where improvements are needed, and guide our future development. We then created a system of **42 indicators** to help answer these questions. This assessment is intended both to guide the continued strengthening of MapBiomass Brazil and to support the network’s expansion to other countries, while providing a starting point for other initiatives to develop their own monitoring and evaluation systems.

This document presents the methods and results of the assessment of MapBiomass Brazil’s activities, applications, and indirect impacts in 2025. It also highlights a selection of new technological solutions and case studies illustrating how MapBiomass data are being used by different users.

OVERVIEW OF METHODS

We divided the MapBiomass’ purpose into three components which were further subdivided into 3 domains each and defined questions to assess whether these domains are being well implemented, as follows:

Each domain was assessed by a variable number of indicators. In this first version of the evaluation system, we primarily used internal records, information provided directly by partner institutions, papers submitted to the MapBiomass User Summit and the MapBiomass Award, answers of participants in events registration forms, internet search, and scientific databases. Based on this information, we also organized a portfolio of the most prominent cases of application of MapBiomass data and their respective results. In cases where data was available for years prior to 2025, historical information is presented.

Open the summary map ›

1

Reveal the transformations in the Brazilian territory through science and with precision, agility, and quality

"MapBiomass' as a reference for data of LULC"

2

Making knowledge about land use and land cover accessible

"free and open access data, easy to find, access and use"

3

Inform public, private, and civil society decision-makers to promote the conservation and sustainable management of natural resources, and address climate change.

"Users generate impact using MapBiomass data"

1A

RELIABILITY

Is MapBiomass updated, consistent, complete and available?

5 ind.

1B

SCIENCE BASED

Are the data and processes scientifically sound?

4 ind.

1C

BEST TECHNOLOGY AVAILABLE

Are we continuously developing and implementing the appropriate best in class available technology?

2 ind.

2A

DATA AVAILABILITY AND ACCESS

Has MapBiomass data been accessed extensively?

6 ind.

2B

COMMUNICATION

Are different key users aware of and informed about MapBiomass data?

6 ind.

2C

COOPERATION AND SUPPORT

Are we reaching key stakeholders/ users to provide guidance and support on how to better access and use the LULC data?

4 ind.

3A

PUBLIC SECTOR

Are MapBiomass data informing decisions, policies and practices in the public sector, including executive, legislative and justice?

7 ind.

3B

PRIVATE AND FINANCIAL SECTORS

Are MapBiomass data informing decisions, investments and practices in the private and financial sectors, including infrastructure, banks, agribusiness, and farmers?

5 ind.

3C

ACADEMY & CIVIL SOCIETY

Are MapBiomass data informing scientific research, communication, advocacy and other actions from the academy and civil society?

3 ind.

11
indicators

16
indicators

15
indicators

The assessment at a glance

3 components of MapBiomass’ purpose · 9 guiding questions · 42 indicators. Select a component, a question or an indicator to open its page.

1

REVEAL

Reveal the transformations in the Brazilian territory through science and with precision, agility, and quality

1A RELIABILITY

Is MapBiomass updated, consistent, complete and available?

◆ 1A1	Updates delivered on schedule	88.2%
◆ 1A2	Platform availability (SLA)	99%
◆ 1A3	Published methodology	79.5%
◆ 1A4	Code published on GitHub	34.1%
◆ 1A5	Downloadable or processable data	100%

1B SCIENCE BASED

Are the data and processes scientifically sound?

◆ 1B1	LULC global accuracy	89.5%
◆ 1B2	Accuracy assessment	34.6%
◆ 1B3	Methods in peer-reviewed papers	65%
◆ 1B4	Articles citing MapBiomass	5206

1C BEST TECHNOLOGY AVAILABLE

Are we continuously developing and implementing the appropriate best in class available technology?

◆ 1C1	Innovations implemented	7
◆ 1C2	Technology innovation groups	13

2

MAKE ACCESSIBLE

Making knowledge about land use and land cover accessible

2A DATA AVAILABILITY AND ACCESS

Has MapBiomass data been accessed extensively?

◆ 2A1	Active users	749,410
◆ 2A2	Download-page accesses	60,078
◆ 2A3	Alerta reports issued or downloaded	53,704
◆ 2A4	API users and queries	1,621
◆ 2A5	Platforms integrating MapBiomass data	43
◆ 2A6	Satisfaction with data availability	—

2B COMMUNICATION

Are different key users aware of and informed about MapBiomass data?

◆ 2B1	Factsheets published	77.1%
◆ 2B2	Products corrected after publication	16.7%
◆ 2B3	Social media followers	135.2 thousands
◆ 2B4	Mainstream media mentions	18,112
◆ 2B5	Influencer mentions	7
◆ 2B6	Stakeholder awareness	—

2C COOPERATION AND SUPPORT

Are we reaching key stakeholders/ users to provide guidance and support on how to better access and use the LULC data?

◆ 2C1	Cooperating institutions	107
◆ 2C2	User emails answered	97.1%
◆ 2C3	People trained	409
◆ 2C4	Satisfaction with support	—

3

INFORM DECISIONS

Inform public, private, and civil society decision-makers to promote the conservation and sustainable management of natural resources, and address climate change.

3A PUBLIC SECTOR

Are MapBiomass data informing decisions, policies and practices in the public sector, including executive, legislative and justice?

◆ 3A1	State agencies using data	96
◆ 3A2	Federal agencies using data	40
◆ 3A3	Public institutions accessing via API	279
◆ 3A4	Justice-agency actions in deforestation alerts	1,588
◆ 3A5	Municipalities on the dashboard	—
◆ 3A6	States publishing infractions	21
◆ 3A7	Deforestation with permit or action	64.6%

3B PRIVATE AND FINANCIAL SECTORS

Are MapBiomass data informing decisions, investments and practices in the private and financial sectors, including infrastructure, banks, agribusiness, and farmers?

◆ 3B1	Rural credit screened with data	95.1%
◆ 3B2	Private-sector agreements	7
◆ 3B3	Companies & banks using data	97
◆ 3B4	Public credit with deforestation alerts	20.52%
◆ 3B5	Rural credit denied	1.8 billion reais

3C ACADEMY & CIVIL SOCIETY

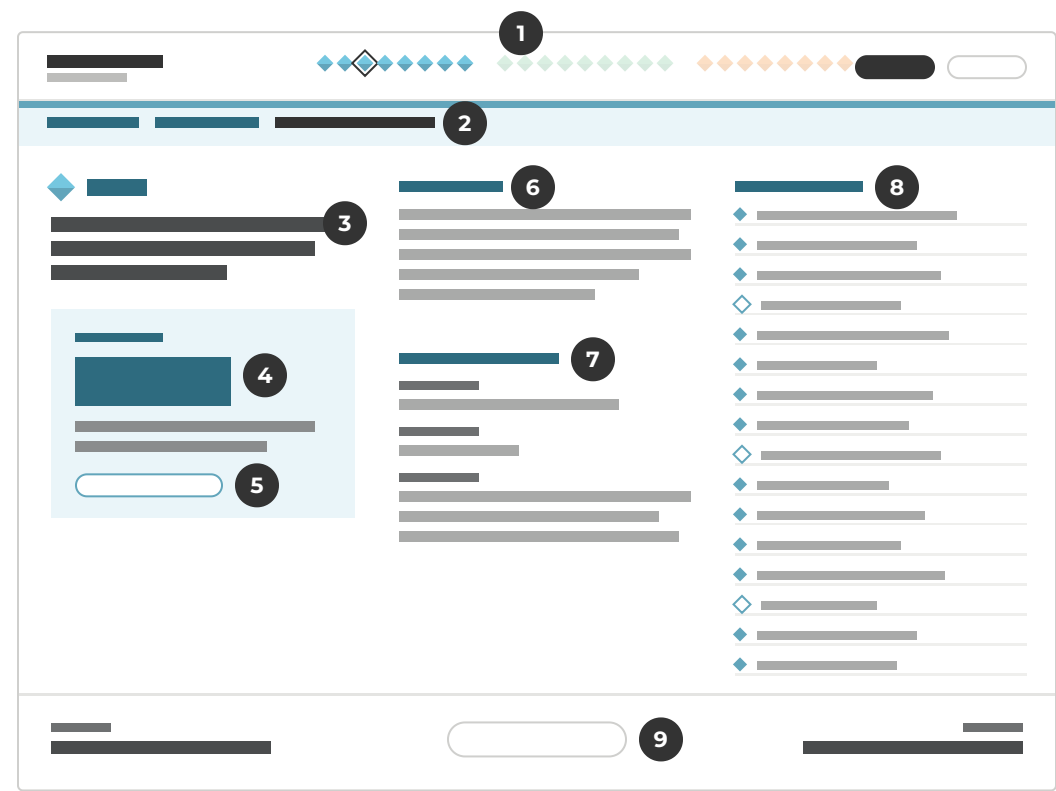
Are MapBiomass data informing scientific research, communication, advocacy and other actions from the academy and civil society?

◆ 3C1	Citations of MapBiomass papers	3214
◆ 3C2	Citations vs. analogous products	135%
◆ 3C3	Civil society organizations	69

◆ Measured ◆ Partial coverage ◆ Not measured in 2025

How to read an indicator page

All 42 indicators share the same page structure. Learn it once, then move freely between components, questions and indicators — the bar at the top always shows where you are.



- 1

Locator
All 42 indicators as diamonds, grouped by component and question. The outlined diamond is where you are; select any diamond to jump there.
- 2

Breadcrumb
Component › Question › Indicator, in the component's colour. Select a level to open its overview.
- 3

Code and title
What is being measured, with its code (e.g. 1A3).
- 4

Result 2025
The headline value and what it refers to.
- 5

Status
Whether the 2025 result is complete, partial or not yet measured.
- 6

Definition
Why the indicator matters and what it captures.
- 7

Method
Data collection method, data collection frequency and calculation method, as in the report.
- 8

Supporting data
The tables and figures of the report, with the page reference; long tables continue on the next page.
- 9

Previous • Map • Next
Read in sequence or return to the summary map at any time.

READING THE CODE

2

Component

B

Guiding question

3

Indicator

2B3 = Component 2, question B (Communication), indicator 3 (Social media).

COLOUR = COMPONENT

- 1 • Reveal

1A • 1B • 1C
- 2 • Make accessible

2A • 2B • 2C
- 3 • Inform decisions

3A • 3B • 3C

DIAMOND = STATUS OF THE RESULT

- Measured

full 2025 result
- Partial coverage

only part of the scope measured
- Not measured in 2025

method in development

COMPONENT 1 OF MAPBIOMAS' PURPOSE

1

Reveal the transformations in the Brazilian territory through science and with precision, agility, and quality

"MapBiomass' as a reference for data of LULC"

MapBiomass is committed to producing robust and updated environmental data, guided by the principles of open and collaborative science, and making it readily accessible online. Across all its initiatives, teams strive to use the most up-to-date technologies and methodologies to ensure the highest possible quality of results. Additionally, to guarantee transparency, it is essential to assess and openly communicate the uncertainties associated with MapBiomass maps and datasets as well as clearly stating the methods used.

3 GUIDING QUESTIONS • 11 INDICATORS

1A

RELIABILITY

Is MapBiomass updated, consistent, complete and available?

◆ 1A1 ◆ 1A2 ◆ 1A3 ◆ 1A4 ◆ 1A5



1B

SCIENCE BASED

Are the data and processes scientifically sound?

◆ 1B1 ◆ 1B2 ◆ 1B3 ◆ 1B4



1C

BEST TECHNOLOGY AVAILABLE

Are we continuously developing and implementing the appropriate best in class available technology?

◆ 1C1 ◆ 1C2



1A

RELIABILITY

Is MapBiomas updated, consistent, complete and available?

In this domain we explore how much a user can trust that, when searching for MapBiomass data, they will find the platform functioning, with up-to-date data, validated methodologies, and that they will be able to download the data or perform their own analyses online.

THIS DOMAIN INCLUDES 5 INDICATORS:

1A1 Percentage of Initiatives, Modules and Monitors with Periodic Updates Delivered on Schedule **88.2%**
Measured

1A2	Percentage of time the platforms were available to users (SLA)	99%
		Partial coverage

◆ 1A3	Proportion of initiatives, themes, and monitors with published methodology (ATDB/method on the website)	79.5% Measured
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◆ 1A4	Proportion of initiatives, themes and monitors with codes published at GitHub	34.1%	Measured
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1A5 Percentage of datasets available for download or online processing **100%**
Measured

1A1 1A · RELIABILITY

Percentage of Initiatives, Modules and Monitors with Periodic Updates Delivered on Schedule

RESULT

88.2%

of initiatives, modules and monitors had periodic updates delivered on schedule

Measured

DEFINITION

All MapBiomass data must be updated annually. This is important both to ensure the usefulness of the data in its applications and for the continuous process of improving the quality of the data provided. This indicator measures the extent to which MapBiomass data is updated.

DATA COLLECTION METHOD

Internal record

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

The percentage of initiatives, modules and monitors updated in 2025 was recorded. Initiatives, modules or monitors launched in 2025 were not included (Atmosphere, Climate Risk, Recovery Monitor, Mining Monitor, Watershed Monitor).

SUPPORTING DATA

Report p. 10

Initiatives, modules and monitors	2025
LULC* 30 m	yes
LULC 10 m	no
Deforestation	yes
Secondary vegetation	yes
Agriculture module	yes
Mining module	yes
Fire module	yes
Pasture module	yes
Water module	yes
Soil module	yes
Degradation module	no
Coral Reefs module	yes
Urban module	yes
Fire monitor (monthly)	yes
Alert (weekly)	yes
Rural Credit Monitor	yes
Fiscalization Monitor	yes

*LULC = Land Use and Land Cover

◆ 1A2 1A · RELIABILITY

Report p. 11

Percentage of time the
platforms were available to
users (SLA)

RESULT
The LULC platform was online

99%
of the time

◆ Partial coverage

DEFINITION

The availability of MapBiomass platforms and monitors is essential to ensure continuous access to data, analyses, and decision-support tools. This indicator measures the percentage of time that these digital products remained operational and accessible to users throughout the year. Periods of unavailability resulting from system failures, infrastructure issues, or maintenance activities are tracked and minimized to ensure a reliable user experience.

DATA COLLECTION METHOD

Availability data are collected through a continuous monitoring and observability framework implemented across MapBiomass platforms and monitors. The framework combines infrastructure monitoring, application performance monitoring (APM), centralized logging, health checks, and automated alerting systems operating on cloud and application environments. These systems continuously measure service availability, response status, system performance, database

*LULC = Land Use and Land Cover

operations, and API accessibility. All availability events, including outages, incidents, and maintenance windows, are automatically recorded and consolidated to support uptime calculations and service-level reporting.

DATA COLLECTION FREQUENCY

Continuous monitoring, consolidated annually for reporting purposes.

CALCULATION METHOD

Availability is calculated as the percentage of total time during which the platform remained operational and accessible to users, excluding periods of planned maintenance when applicable. For 2025, availability records are available only for the LULC Platform, with monitoring data collected beginning on August 13, 2025. A comprehensive monitoring framework covering all MapBiomass platforms and modules will be fully implemented in 2026.

1A3 1A · RELIABILITY

Proportion of initiatives, themes, and monitors with published methodology (ATDB/method on the website)

RESULT

79.5%

of initiatives, themes, and monitors have a published methodology.

Measured

DEFINITION

Making available the methods used to generate data is essential for its reliability and for the user to understand not only how the data was generated, but also to interpret it correctly and to suggest improvements. All methods used in MapBiomass must be available to the user, either through the Algorithm Theoretical Basis Document (ATBD), which consists of a detailed technical document describing the methodology used, or through a description of the method on the website. This indicator measures the extent to which methods are available to users, penalizing the value if the published method is not up-to-date.

DATA COLLECTION METHOD

Internal record

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Each initiative, theme and monitor received a value of 1 when the method is published and updated, 0.5 when published but not updated or incomplete, and zero when not published. The percentage is calculated by summing the values and dividing by the number of rows in the following table.

SUPPORTING DATA

Report p. 12

Initiatives, modules and monitors	Published method (ATBD, method web page)
LULC 30 m	1,0
LULC 10 m	1,0
Deforestation	1,0
Secondary vegetation	1,0
Biomes and cross cutting themes	1,0
Agriculture module	0,5
Pasture module	1,0
Fire - col. 4	1,0
Mining module	1,0
Water module - col. 4	1,0
Soil module - col. 3	0,5
Degradation module	1,0
Coral Reefs module	1,0
Urban module	0,5
Atmosphere module	0,0
Climate risk	1,0
Alert	1,0
Rural Credit Monitor	1,0
Fiscalization Monitor	0,5
Mining Monitor	0,5
Recovery Monitor	1,0
Watershed Monitor	0,0

1A4 1A · RELIABILITY

Proportion of initiatives, themes and monitors with codes published at GitHub

RESULT

34.1%

of initiatives, themes, and monitors have published codes.

Measured

DEFINITION

GitHub is a cloud-based platform that enables developers to store, manage, track changes, and collaborate on code projects. The codes used to produce all MapBiomass data should be available in GitHub in order to guarantee transparency, reproducibility, and potential improvements to the methods by users. This indicator measures the extent to which codes are available to users, penalizing the value if the published code is incomplete or not up-to-date.

DATA COLLECTION METHOD

Internal record

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Each initiative, theme and monitor received a value of 1 when the code is published and updated, 0.5 when published but not updated or incomplete, and zero when not published. The percentage is calculated by summing the values and dividing by the number of rows in the following table.

SUPPORTING DATA

Report p. 13

Initiatives, modules and monitors	Code published (Github)
LULC 30 m	0,5
LULC 10 m	0,5
Deforestation	0,5
Secondary vegetation	0,5
Biomes and cross cutting themes	1,0
Agriculture module	0,5
Pasture module	0,0
Fire - col. 4	1,0
Mining module	0,0
Water module - col. 4	0,0
Soil module - col. 3	1,0
Degradation module	1,0
Coral Reefs module	0,0
Urban module	0,0
Atmosphere module	0,0
Climate risk	1,0
Alert	0,0
Rural Credit Monitor	0,0
Fiscalization Monitor	0,0
Mining Monitor	0,0
Recovery Monitor	0,0
Watershed Monitor	0,0

*LULC = Land Use and Land Cover

1A5 1A · RELIABILITY

Percentage of datasets available for download or online processing

RESULT

100%

of the datasets were available for download or online processing from at least one data source.

Measured

DEFINITION

In addition to viewing and consulting the data on the platform, it is important that the user can download the maps or process them online to perform their own analyses. Depending on the data, it can be made available for download or online processing through the platform, website, as an asset in Google Earth Engine, or via API. This indicator measures whether MapBiomass data is available for the user to perform their own spatial analyses from at least one data source.

DATA COLLECTION METHOD

Internal record

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Each item received a value of 1 when available for download or online processing in that source, and zero when it was not. The "total" value is equal to one if the dataset is available in at least one source. The percentage is calculated by summing the values of the "Total" column and dividing by the number of rows (datasets).

SUPPORTING DATA

Report p. 14

Initiatives, modules and monitors	Platform	Website	GEE	API	Total
LULC 30 m	1	1	1	1	1
LULC 10 m	1	0	1	1	1
Deforestation	1	0	1	1	1
Secondary vegetation	1	0	1	1	1
Agriculture module	1	0	0	1	1
Pasture module	1	0	0	0	1
MapBiomass Fire - col. 4	1	0	0	1	1
Mining module	1	0	0	1	1
Water module - col. 4	1	0	0	1	1
Soil module - col. 3	1	0	1	1	1
Degradation module	1	0	0	1	1
Coral Reefs module	1	0	1	1	1
Urban module	1	0	0	1	1
Fire monitor (monthly)	0	0	0	1	1
Alert (weekly)	1	1	0	1	1
Rural Credit Monitor	0	0	0	1	1
Atmosphere module	1	0	0	0	1
Climate risk module	1	0	1	0	1
Recovery Monitor	0	0	0	1	1
Fiscalization Monitor	1	0	0	0	1
Mining Monitor	1	0	0	0	1

*LULC = Land Use and Land Cover

1B

SCIENCE BASED

Are the data and processes scientifically sound?

In this domain we explore how scientifically grounded MapBiomass data are in terms of accuracy, whether the methods used are validated through peer review in scientific journals, and to what extent MapBiomass data, methods, and results are used as a reference in the scientific literature, reflecting their importance and reliability.

THIS DOMAIN INCLUDES FOUR INDICATORS:

1B1 Land Use Land Cover Global Accuracy (Legend Level 2) Comparing to other Maps **89.5%**
Measured

1B2 Proportion of Initiatives and Products with Accuracy Assessment **34.6%**
Measured

1B3 Proportion of MapBiomass' Initiatives, Modules and Products with Scientific Papers Published (Method) **65%** Measured

184 Number of Scientific Articles that Cite MapBiomass **5206**
Measured

1B1 1B · SCIENCE BASED

Land Use Land Cover Global Accuracy (Legend Level 2) Comparing to other Maps

RESULT

MapBiomass had

89.5%

of global accuracy at the second legend level (21 classes) in 2025

Measured

DEFINITION

Global accuracy is obtained by comparing reference points with the mapped class, indicating the reliability of the map. This indicator measures the extent to which Land Use Land Cover MapBiomass data is accurate and compares its reliability to other similar data available to users as declared by its providers.

DATA COLLECTION METHOD

Internal record. Estimated using random reference points, as described in <https://brasil.mapbiomas.org/iniciativas-e-produtos/metodologia-mapbiomas/analise-de-acuracia/>

DATA COLLECTION FREQUENCY

Annual

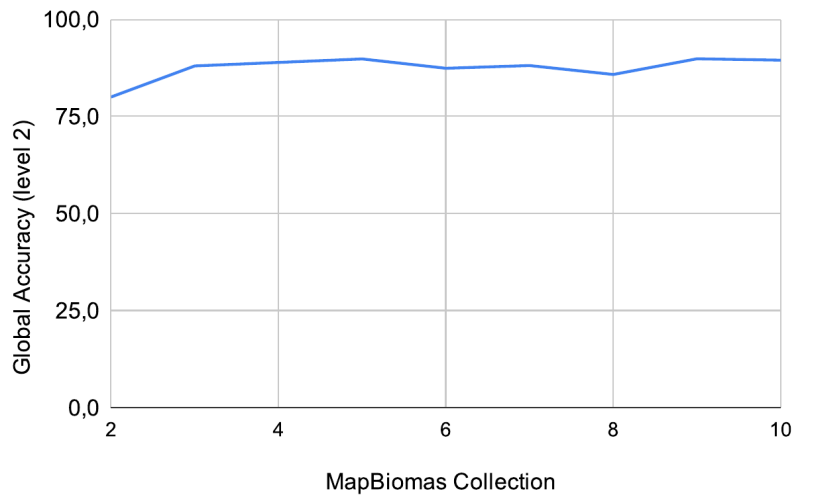
CALCULATION METHOD

Global accuracy It is calculated by the ratio between the number of correctly classified samples and the total number of samples.

SUPPORTING DATA

Report p. 16

Global accuracy at legend level 2 of MapBiomass Collections



Global Accuracy of other similar data as declared by its providers.

	N° of classes	Year	Region	Accuracy
ESA (1)	11	2021	Global	76.7%
TerraClass Amazônia (2)	9	2022	Brazilian Amazon	93.9%
TerraClass Cerrado (3)	10	2022	Brazilian Cerrado	90.9%
Global LULC (4)	12	2019	Global	78.3%

(1) <https://esa-worldcover.org/en/about/about>;
(2) <https://www.terraclass.gov.br/acuracia-amz> ;
(3) <https://www.terraclass.gov.br/acuracia-cer> ;
(4) <https://iopscience.iop.org/article/10.1088/1748-9326/ac46ec>

◆ 1B2 1B · SCIENCE BASED

Proportion of Initiatives and Products with Accuracy Assessment

RESULT

34.6%

of MapBiomass datasets have accuracy assessment.

◆ Measured

DEFINITION

Accuracy assessment is important to estimate the map reliability. This can be done through random points interpreted by analysts or through comparison with maps provided by other institutions. This indicator measures MapBiomass' progress in validating the dataset it provides, penalizing the value if the estimate is not up-to-date or was made based on secondary data.

DATA COLLECTION METHOD

Internal record.

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Each item received a value of 1 when validated with reference points, 0.5 when validated with maps from other sources or is outdated, and zero when it was not validated yet. The percentage is calculated by summing the values and dividing by the number of rows (datasets).

SUPPORTING DATA

Report p. 17

Datasets	2025
LULC 30 m	1,0
LULC 10 m	0,0
Deforestation	0,0
Secondary vegetation	0,0
Coral Reefs	0,0
Agriculture - irrigation and number of cycles	0,5
Urban - intra-urban vegetation	0,0
Soil	1,0
Fire	0,5
Water	0,5
Mining	0,5
Pasture	0,5
Fire monitor	0,0

◆ 1B3 1B · SCIENCE BASED

Proportion of MapBiomass' Initiatives, Modules and Products with Scientific Papers Published (Method)

RESULT

65%

of the initiatives, modules, and products had their methods and results published in scientific articles.

◆ Measured

DEFINITION

When publishing scientific articles, both the methods and the results undergo a peer review process. Publication, therefore, lends scientific legitimacy to the method and the product. This indicator measures the proportion of MapBiomass data whose methods and results have been evaluated and accepted in peer review processes in scientific journals, penalizing the value when only a specific region is addressed in the article.

DATA COLLECTION METHOD

Internal record.

CALCULATION METHOD

Each item received a value of 1 when the scientific paper covers the entire monitored area; 0.5 when the paper covers a specific region and zero when no scientific paper describing the methods was published yet. The percentage is calculated by summing the values and dividing by the number of rows.

SUPPORTING DATA

Report p. 18

Products/Modules/Initiatives	2025
LULC 30m	1,0
LULC 10m	0,0
Amazon	1,0
Caatinga	1,0
Cerrado	1,0
Atlantic Forest	1,0
Pantanal	1,0
Pampa	1,0
Deforestation	0,0
Secondary vegetation	0,5
Coastal Zone	1,0
Soil	0,0
Fire	1,0
Water	0,5
Degradation	0,0
Mining	1,0
Agriculture	1,0
Alert	0,0
Pasture	1,0
Urban	0,0

◆ 1B4 1B · SCIENCE BASED

Number of Scientific Articles that Cite MapBiomass

RESULT

A total of **5206** articles

articles cited MapBiomass from 2017 to 2025 (1364 in 2025 only).

◆ Measured

DEFINITION

The citation of MapBiomass in scientific articles reflects its importance in scientific advancement, whether through the direct use of its data or simply as a reference for approaches, methods, or discussion of results. This indicator measures the presence of MapBiomass data and methods as a reference in the scientific literature.

DATA COLLECTION METHOD

Database search

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

The Scopus and Google Scholar databases were consulted, and the keywords "MapBiomass" and the citation to the article by Souza Jr et al. 2020 were used. The overlaps are evaluated by assessing the title and DOI of the results. Duplicates are excluded from the count.

SUPPORTING DATA

Report p. 19

Year	N° per year	Accumulated
2017	9	9
2018	28	37
2019	101	138
2020	240	378
2021	458	836
2022	745	1581
2023	930	2511
2024	1331	3842
2025	1364	5206

1C

BEST TECHNOLOGY AVAILABLE

Are we continuously developing and implementing the appropriate best in class available technology?

In this domain, we explore the extent to which MapBiomass has made technological advances considering the most advanced and recent technologies and the efforts undertaken to achieve them.

Number Methodological/Technological Innovations Implemented

7

Measured



Number of Groups and Initiatives for Generating, Testing and Implementing New Technologies within MapBiomass or In Which MapBiomass Participates

3

Measured

Number Methodological/Technological Innovations Implemented

1. Embedding usage in Sentinel map generation
2. On-the-fly mapping using GEE as a server
3. Workspace for data, asset, and legend management
4. On-the-fly area calculation on the public platform
5. GIF generation on the platform
6. On-the-fly cross-theme analysis generation on the platform
7. Public API for land use and land cover data

The quality of the data and the efficiency in its delivery depend on the constant innovation of the methods and tools used by the network. This indicator reflects the main methodological and technological innovations implemented by MapBiomás Brazil in the current year.

Internal record

Annual

Major innovations were counted by the technical and technological coordinations.

Measured

◆ 1C2

1C · BEST TECHNOLOGY AVAILABLE

Report p. 22

Number of Groups and Initiatives for Generating, Testing and Implementing New Technologies within MapBiomass or In Which MapBiomass Participates

RESULT

13 groups focusing on generating new methodologies and technologies were active in 2025.
Working groups considered in 2025:

1. Embeddings for Sentinel Classification
2. Landsat Feature Maps
3. MapBiomass AI - New Platform
4. AI Alert - RAD Website
5. Technology for Platform Development
6. Beta Tester Google Group for Embeddings
7. Beta Tester Group for Integration of GEE and BigQuery
8. Above Ground Biomass
9. Atmosphere
10. Climate Risk
11. Degradation
12. Fire
13. Water

DEFINITION

The number of groups creating and disseminating new methods and technologies in which MapBiomass teams are involved reflects the MapBiomass network's efforts in the continuous production of innovations, as well as the network's contributions and exchanges with external groups. This indicator reflects the participation of network members in both internal and external active groups focused on generating new methodologies and technologies.

DATA COLLECTION METHOD

Internal record

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Groups were counted by the technical and technological coordinations.

◆ Measured

2

"free and open access data, easy to find, access and use"

To achieve the network's purpose, the data needs to be extensively understood and accessed, which requires the network to invest efforts in communicating the data and results, establishing cooperations with other institutions, and guiding users.

2A

➤

Has MapBiomass data been accessed extensively?

◆ 2A1 ◆ 2A2 ◆ 2A3 ◆ 2A4 ◆ 2A5 ◇ 2A6

2B

➤

Are different key users aware of and informed about MapBiomass data?

◆ 2B1 ◆ 2B2 ◆ 2B3 ◆ 2B4 ◆ 2B5 ◇ 2B6

2C

➤

Are we reaching key stakeholders/ users to provide guidance and support on how to better access and use the LULC data?

◆ 2C1 ◆ 2C2 ◆ 2C3 ◇ 2C4

GUIDING QUESTION · COMPONENT 2

2A

DATA AVAILABILITY AND ACCESS

Has MapBiomass data been accessed extensively?

In this domain, we explore different metrics of data access, as well as the availability of MapBiomass data from other institutions and user satisfaction with data availability.

THIS DOMAIN INCLUDES SIX INDICATORS:

2A1	User analytics and statistics for each module	749,410 Measured
2A2	Download statistics for factsheets, statistics, reports, tables, infographics and other products	60,078 Partial coverage
2A3	Number of MapBiomass Alerta reports issued or downloaded	53,704 Measured
2A4	Number of API users and number of queries via API	1,621 Partial coverage
2A5	Known number of other platforms that display or integrate MapBiomass data	43 Measured
2A6	Level of users' satisfaction with data availability	Not measured in 2025

◆ 2A1 2A · DATA AVAILABILITY AND ACCESS

User analytics and statistics for each module

RESULT

The total number of active users of websites in 2025:

415,000

The total number of active users of platforms/monitors in 2025:

334,410

The grand total of active users in 2025:

749,410

◆ Measured

DEFINITION

Active users in Google Analytics 4 (GA4) represent the number of unique, engaged visitors to a website or app within a specified time frame. An "active" user is defined as someone who has initiated an engaged session (lasted >10 seconds, had a conversion, or 2+ pageviews) or was a new user. This indicator informs the number of active users visiting MapBiomass websites and platforms during the year.

DATA COLLECTION METHOD

User analytics data are collected through Google Analytics, which continuously tracks user interactions across MapBiomass platforms, modules, and monitors. The system automatically records metrics such as users, sessions, page views, engagement, traffic sources, geographic distribution, and navigation patterns. Data are aggregated through analytics dashboards and reports, providing insights into platform usage, user behavior, and audience reach throughout the reporting period.

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

The value for Platform MapBiomass Brazil includes the Mining Monitor and Platform MapBiomass Water includes the Watershed Monitor.

SUPPORTING DATA

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User analytics and statistics for each module (active users)	
Platform MapBiomass Water	17,000
Platform MapBiomass Alert	122,000
Platform MapBiomass Brazil	172,000
Recovery Monitor	1,000
Rural Credit Monitor	18,000
Fire Monitor	4,410
Website MapBiomass Alerta	38,000
Website MapBiomass Brasil	377,000

**Download statistics for
factsheets, statistics, reports,
tables, infographics and other
products**

60,078

Partial coverage

Downloads of factsheets, reports, statistical summaries, tables, infographics, and other knowledge products provide an indication of how MapBiomass information is being accessed and utilized by different audiences. Beyond measuring website traffic, this indicator reflects users' interest in obtaining and using MapBiomass data, analyses, and communication materials. The indicator measures the number of accesses to download pages and download actions associated with MapBiomass knowledge products throughout the year.

Download statistics are collected through web analytics tools and internal monitoring systems implemented across MapBiomass websites and digital platforms. These systems track user interactions with download pages and downloadable resources, recording access events and download actions for factsheets, reports, statistical tables, infographics, and other products. Data is consolidated through analytical dashboards and internal reports for annual reporting.

Annual

The indicator is calculated by aggregating access and download events from webpages that provide downloadable content across the MapBiomass ecosystem, including thematic platforms, monitors, and the MapBiomass Alerta website. The monitoring of MapBiomass Alerta website, however, will be implemented in 2026 Eligible products include factsheets, reports, statistical summaries, tables, infographics, and other publicly available knowledge products.

Report p. 25

Item	Accesses
Statistics	5355
Collection Maps	16316
Legend Codes	12662
Highlights (Download + Menu Item)	601
Infographics	3212
Wall Map	327
MapBiomass Fire	2319
Rural Credit Monitor	487
Urban Module	395
Landsat Mosaic	460
Reference Maps	3715
Infrastructure	6127
Validation Points	223
Layer Table	2136
10 Meters	2100
Fire Monitor	1511
MapBiomass Degradation	321
MapBiomass Soil	1268
MapBiomass Cocoa	543

Number of MapBiomas Alerta reports issued or downloaded

53,704

Measured

Report p. 26

MapBiomass Alerta reports provide detailed information about validated deforestation alerts, including geographic location, affected area, land use history, satellite imagery, and supporting evidence. This indicator measures the number of reports accessed or downloaded by authenticated users through the MapBiomass Alerta platform and API services, reflecting the effective use of alert information by institutions and other registered users.

Data are collected through the authenticated access systems of the MapBiomass Alerta platform and API services. Users accessing reports through logged-in environments are uniquely identified, allowing the platform to accurately record report views, downloads,

and API requests associated with specific alerts. These events are automatically registered in internal databases and consolidated through monitoring and analytics systems, ensuring precise measurement of report usage by authenticated users.

Annual

The indicator is calculated as the total number of report access, download, and retrieval events performed by authenticated users through the MapBiomass Alerta platform and API services during the reporting period. Multiple accesses to the same alert report are counted as independent usage events.

Number of API users and number of queries via API

1,621

Partial coverage

Users from registered institutions	692
Individual unregistered users	929

Application Programming Interfaces (APIs) enable users and institutions to access MapBiomass data programmatically and integrate it directly into their own systems, platforms, dashboards, workflows, and analytical tools. This indicator measures the number of authenticated API users and the number of API queries performed on MapBiomass platforms. It provides an indication of how MapBiomass data are being incorporated into external applications and decision-making processes, expanding the reach and practical use of the information beyond the MapBiomass interfaces.

API usage data are collected through the MapBiomass API management and monitoring systems. Access to the APIs requires user authentication through individual credentials or access tokens, allowing each request to be associated with a specific user or

The indicator is calculated based on authenticated API usage records. The number of API users corresponds to the number of unique authenticated users or institutions that performed at least one API request during the reporting period. For 2025, only data from the MapBiomass Alerta API were available. Comprehensive monitoring of all MapBiomass APIs will be implemented in 2026.

Report p. 27

Known number of other platforms that display or integrate MapBiomass data

43 known platforms

present or use MapBiomass Brazil data in their analyses. There are two platforms that cannot be disclosed due to confidentiality requirements imposed by the partner institution.

Measured

Various platforms in the public, private, and civil society spheres reproduce MapBiomass data or integrate the data into indexes and other analyses. The number of platforms that use MapBiomass data demonstrates its usefulness, credibility, and provides insights into the number of users who indirectly access the data. This indicator monitors the number of known public or internal platforms from other institutions that present or use MapBiomass Brazil data in their analyses.

Knowledge gained through contacts with partners, the MapBiomass Award, the MapBiomass User Summit, and search on the internet.

Annual

Simple count of public and private platforms known to use or display MapBiomass data. It may be an underestimate.

Report pp. 28–30

Table on the next page >

◆ 2A5

Known number of other platforms that display or integrate MapBiomass data

Supporting data · continued (2/4) · Report pp. 28–30

Platform name	Public access or internal platform?	Website
WebGIS - PNCF	public	https://principal.users.earthengine.app/view/pncf
Plataforma Ecológico Econômica de Pernambuco	public	https://plataformaecope.cprh.pe.gov.br/
Sistema de Informações Geográficas Ambientais do Estado de Goiás - SIGA Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável - SEMAD Governo do Estado de Goiás	public	https://siga.meioambiente.go.gov.br/#/
Infraestrutura de Dados Espaciais do Sistema Estadual de Meio Ambiente e Recursos Hídricos de Minas Gerais	public	https://visualizador.idesisema.meioambiente.mg.gov.br/
Sistema de Estimativas de Emissões e Remoções de Gases de Efeito Estufa (SEEG)	public	https://plataforma.seeg.eco.br/
Trase - Impact indicators map	public	https://trase.earth/explore/spatial-data/map
Observatório Socioambiental (beta)	public	https://staging.social.vps1.geodatin.com/analises-socioambientais
BRLUC	public	https://brluc.cnpma.embrapa.br/
Impactos econômicos, sociais, humanos e ambientais da recuperação de pastagens degradadas no Brasil	public	https://impactosdarpd.gppesalq.agr.br/#complete-results
GERADE (ICMBio)	internal	
SireneJud (CNJ - Conselho Nacional de Justiça)	public	https://sirenejud.cnj.jus.br/mapa/geral
OTCA, ORA, ARO	public	https://otca.maps.arcgis.com/apps/instant/portfolio/index.html?appid=158700f681ea44dca835430d3299b4ba
Species Link	public	https://specieslink.net/search/
Observatório da Restauração	public	https://observatoriodarestauracao.org.br/app
Produzindo Certo (GO)	internal	https://www.produzindocerto.com.br/plataforma/
Natureza On	public	https://www.naturezaon.com.br/

◆ 2A5

Known number of other platforms that display or integrate MapBiomass data

Supporting data · continued (3/4) · Report pp. 28–30

Platform name	Public access or internal platform?	Website
Semeia	internal	
Agroideal	public	http://www.agroideal.org/
Living Atlas	public (with restrictions for free accounts)	https://livingatlas.arcgis.com/en/home/
FAO	public	https://openforis.org/solutions/whisp/
AMA (RAISG)	public	https://ama.raisg.org/
Araticum: Articulação pela Restauração do Cerrado	public	https://araticum.lapig.iesa.ufg.br/
SoilHive	public	https://soilhive.ag/
PronaSolos	public	https://geoportal.sgb.gov.br/pronasolos/
ISRIC Data Hub	public	https://data.isric.org/
Select Dataset	public	https://www.selectdataset.com/
Portal GeoPR	public	https://geopr.iat.pr.gov.br/portal/home/index.html
SAFMAPS	public	https://www.safmaps.com/
Serrapilheira	public	https://biodiversidade.solved.eco.br/
Global Forest Watch Pro	Paid access - private sector clients	https://pro.globalforestwatch.org/
CCAL	public	http://www.carboncal.org.br/
Observatorio do codigo florestal / termometro	public	http://www.observatorioflorestal.org.br/
Painel de Monitoramento do Desmatamento no Tocantins - MPTO - Ministério Público do Tocantins	public	https://storymaps.arcgis.com/stories/ca3768747cdc4274bade5ed9179bed0d
IDE Sisema MG - Geovisualizador da Infraestrutura de Dados Espaciais do Sistema Estadual de Meio Ambiente e Recursos Hídricos de Minas Gerais.	public	IDE Sisema: https://visualizador.idesisema.meioambiente.mg.gov.br/
Geoportal SEDAM-RO	public	https://geoportal.sedam.ro.gov.br/

Supporting data • continued (4/4) • Report pp. 28–30

Platform name	Public access or internal platform?	Website
Sistema de Mapeamento da Fragilidade Ambiental de Santa Catarina	public	https://gee-epagri.projects.earthengine.app/view/smfa-sc
Sistema de Mapeamento da Aptidão Climática e Fisiográfica	public	https://gee-epagri.projects.earthengine.app/view/aptclim
IPS	public	https://ipsbrasil.org.br/pt/explore/mapa
Painel PCI Poduzir, Conservar e Incluir	public	https://www.cladigitalassets.com/e https://pcimt.org/monitoramento/
CHOVE-CHUVA Earth observation platform	public	https://www.nature.com/articles/s41598-026-36640-w ; https://www.sco.chove-chuva.org/en/
Observatório Social	public	https://observatorio-social-1-uesc.hub.arcgis.com/pages/d72f7d8ccdba4cb0ac280060952ddcbd

2A6

2A · DATA AVAILABILITY AND ACCESS

Report p. 31

Level of users' satisfaction with data availability

RESULT

Not available for 2025. Will be implemented in 2026.

DEFINITION

User perception is important in evaluating the efficiency of data delivery. This indicator will estimate the user's perception of the ease of accessing and downloading data on the platform using a categorical variable.

DATA COLLECTION METHOD

Forms or interviews with key users (to be defined).

DATA COLLECTION FREQUENCY

To be defined

CALCULATION METHOD

To be defined

Not measured in 2025

GUIDING QUESTION · COMPONENT 2

2B

COMMUNICATION

Are different key users aware of and informed about MapBiomass data?

In this domain, we explore MapBiomass' efforts to inform users and to disseminate data in a reliable and easily understandable way, measures of MapBiomass' presence in the media, and how much the population knows about MapBiomass.

THIS DOMAIN INCLUDES SIX INDICATORS:

◆	2B1	Proportion modules and products with fact sheet documentation published for the most recent collection	77.1% Measured
◆	2B2	Proportion of communication products that were corrected after publication	16.7% Measured
◆	2B3	Social media metrics	135.2 thousands Measured
◆	2B4	Number of publications in the mainstream media	18,112 Measured
◆	2B5	Number of publications by influencers using/ referencing MapBiomass	7 Partial coverage
◇	2B6	Level of stakeholder awareness / knowledge of MapBiomass	— Not measured in 2025

2B1 2B · COMMUNICATION

Proportion modules and products with fact sheet documentation published for the most recent collection

RESULT

77.1%

of biomes, themes, modules or initiatives have made factsheets available in 2025.

Measured

DEFINITION

Factsheets are informational materials that summarize key findings, including statistics, maps, and graphs, from a mapping, module, or monitor. This indicator measures the proportion of biomes, cross-cutting themes, modules, and initiatives that have made factsheets available, penalizing the value if the factsheet is not up-to-date.

DATA COLLECTION METHOD

Internal record

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Each item receives a value of 1 when it has an updated and published factsheet during the year, 0.5 when it has a published but not updated factsheet, and zero when no factsheet has yet been published. The percentage is calculated by summing the values and dividing by the number of items.

SUPPORTING DATA

Report p. 33

Biomes/Themes/Modules/Initiatives	Factsheet
Brazil LULC	1
Amazônia	1
Caatinga	1
Cerrado	1
Mata Atlântica	1
Pampa	1
Pantanal	1
Coastal Zone	0
Mining	0
Agriculture/Silviculture	1
Pasture	1
Urban areas	0
Soil	1
MapBiomass Alert	1
Degradation	0
Fire	1
Water	1
Atmosphere	1
Archaeological sites	1
Climate risk	0
Mining module	1
Rural Credit Monitor	0,5
Recovery monitor	1
Fiscalization Monitor	1
Fire monitor	1

Proportion of communication products that were corrected after publication

16.7%

of communications products were corrected after publication

Measured

This indicator measures the consistency of the information provided by MapBiomass Brazil to the media. If we have to correct the data, the consistency will be low, and this will cause friction for the users. Our goal is to minimize any need for correction.

Internal record

Annual

Each biome, theme, module, or initiative received a value of 1 when the information in your promotional material needed to be corrected after publication (regardless of the number of media outlets) and zero if it did not need to be corrected. The percentage is calculated by summing the values and dividing by the number of items.

Report p. 34

Biomes/Themes/Modules/Initiatives	Correction
Brazil LULC	1
Amazônia	0
Caatinga	1
Cerrado	0
Mata Atlântica	0
Pampa	0
Pantanal	0
Mining	0
Agriculture/Silviculture	0
Pasture	0
Soil	0
MapBiomass Alert	0
Fire	0
Water	0
Atmosphere	0
Archaeological sites	0
Mining module	1
Recovery monitor	0

Social media metrics

Between 2023 and 2025 the total number of followers of MapBiomass in social media increased from 91,7 thousands to

135.2 thousands

The number of posts mentioning MapBiomass increased from 833 to

869

MapBiomass' presence and visibility on social media over time reflects the extent to which its data is reaching the general public, especially younger people. This indicator monitors the number of followers of the MapBiomass Brazil network and the number of posts mentioning MapBiomass data on social media.

Social media monitoring.

Annual

Extracted directly from social media platforms.

Number of followers (in thousands)

Followers	2023	2024	2025
Instagram	34,6	50,5	56,9
LinkedIn	26,7	37	43
X	11,2	11,6	11,6
Youtube	12,4	15,2	16,3
Facebook	6,8	7,1	7,4
Total followers	91,7	121,4	135,2

Number of posts (not available for 2024)

Followers	2023	2025
Instagram	226	266
LinkedIn	183	209
X	223	209
Youtube	NA	24
Facebook	201	161
Total posts	833	869

◆ 2B4 2B · COMMUNICATION

Number of publications in the mainstream media

RESULT

The annual number of induced and spontaneous news that mention MapBiomass data increased from 8,362 to

18,112

between 2023 and 2025.

◆ Measured

DEFINITION

News reports in the media are an important way to disseminate MapBiomass data, generating awareness and social control over the environmental issues addressed by MapBiomass. This indicator monitors MapBiomass' presence in the media, considering both news generated by press releases (induced) and spontaneous news, based on data, platforms or dissemination materials from MapBiomass Brasil.

DATA COLLECTION METHOD

Internal record and media monitoring.

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Tracking via daily clipping service for MapBiomass mentions, supplemented by manual Google searches and journalist contact to capture missed radio and TV coverage.

SUPPORTING DATA

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Followers	2023	2024	2025
Total induced	6,547	10,031	7,100
Total spontaneous	1,815	9,680	11,012
Grand total	8,362	19,711	18,112

◆ 2B5

2B · COMMUNICATION

Number of publications by influencers using/ referencing MapBiomass

RESULT

7 mentions

of MapBiomass Brasil data by influencers were recorded on social media in 2025

◆ Partial coverage

DEFINITION

Influencers are verified profiles that disseminate science and data-driven information, primarily on Instagram. They have a high potential for disseminating information to the general public. This indicator monitors mentions of MapBiomass Brasil data by influencers on social media. The 2025 figure is likely underestimated. The full monitoring will be implemented in 2026.

DATA COLLECTION METHOD

Social media monitoring.

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Tracking publications made by influencers/channels with over 100 thousand subscribers.

SUPPORTING DATA

Report p. 37

Influencer	Publications
Hugo Gloss	1
Nuncavi1cientista	1
Leticia Colins	1
InfoVerde Sustentabilidade	1
Paulo Jubilut	1
Hugo Fernandes	1
Geopanoramas	1

2B6

2B · COMMUNICATION

Report p. 38

Level of stakeholder awareness / knowledge of MapBiomass

Not measured in 2025

DEFINITION

This indicator aims to estimate the degree of familiarity of the population with MapBiomass and the data it provides.

DATA COLLECTION METHOD

To be defined. A specialized consulting firm will be hired to conduct this survey.

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

To be defined

GUIDING QUESTION · COMPONENT 2

2C

COOPERATION AND SUPPORT

Are we reaching key stakeholders/ users to provide guidance and support on how to better access and use the LULC data?

In this domain, we explore MapBiomass' interaction with other institutions, responses to users demands, and users satisfaction with MapBiomass' technical support.

THIS DOMAIN INCLUDES FOUR INDICATORS:

◆ 2C1	Number of institutions with cooperation (formalized and non-formalized)	107 Measured
◆ 2C2	Percentage of answers to questions and demands of users	97.1% Measured
◆ 2C3	Number of people trained on how to use MapBiomass	409 Measured
◇ 2C4	Users' satisfaction with MapBiomass' technical support	— Not measured in 2025

Number of institutions with cooperation (formalized and non-formalized)

Cooperation with

of which 34 were formalized and 28 were active in 2025.

Measured

Members of the MapBiomass network collaborate with institutions in a variety of ways. Informal interactions include meetings, participation in events (whether MapBiomass events or those of external institutions), working groups, and other informal collaborations. Formal collaborations may include technical cooperation agreements (TCAs), supporting users, data use agreements, and funding for approved research projects. This indicator monitors the number of institutions with which MapBiomass interacts, whether through formalized cooperation or not.

Internal record.

Annual

Count the number of formal documents of cooperation such as Technical Cooperation Agreements (ACT), Memorandum of Understanding (MOU) and others. The informal cooperations are informed by the network members.

Report pp. 40-41

Institutions with cooperation formal active in 2025	Number
Banks	4
Federal Agencies	5
State Agencies	7
Civil Society Organizations & Research Institutes	3
Private Companies & Associations	7
Multilateral/Regional Organizations	2
Total	28

◆ 2C2 2C · COOPERATION AND SUPPORT

Report p. 40

Percentage of answers to questions and demands of users

RESULT

619 email messages

were received in 2025

97.1%

were answered

◆ Measured

DEFINITION

The contact email is an important communication channel between users and the network. Through it, users ask questions, point out inconsistencies in data and platforms, and make various requests. This indicator monitors the percentage of messages received in the contact email that were answered.

DATA COLLECTION METHOD

Internal record.

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Each issue has a different resolution timeframe, and some demands can only be fully met after the production of the new data collection. Therefore, the initial response to the demand was considered, not the final solution. Invitations to events, press requests, MapBiomass Alert requests, job/opportunity searches, and messages from the international MapBiomass network were not included in the calculation.

◆ 2C3

2C · COOPERATION AND SUPPORT

Report p. 41

Number of people trained on how to use MapBiomass

RESULT

409

people participated in the training sessions, and the publicly available recordings have been viewed over

900

times

DEFINITION

MapBiomass provides training tailored to the needs of partner institutions. This training focuses on helping users to understand MapBiomass data and how to access and use it on their specific areas of interest. This indicator monitors the number of actual or potential users who have received training in person or online on accessing and using MapBiomass Brasil data.

DATA COLLECTION METHOD

Internal record.

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Simple count. Internal MapBiomass network training sessions and lectures are not considered, only events for external audiences named as training, workshops, or similar.

◆ Measured

2C4 2C · COOPERATION AND SUPPORT

Report p. 42

Users' satisfaction with MapBiomass' technical support

RESULT

Not available for 2025. Will be implemented in 2026.

DEFINITION

User perception is important in evaluating the quality and speed of technical support for accessing and using data offered by the MapBiomass network, whether through direct contact with the teams or via the contact email. This indicator estimates, through a categorical variable, user satisfaction with the support offered by the MapBiomass Brazil network for accessing and using the data.

DATA COLLECTION METHOD

Forms or interviews with key users (to be defined)

DATA COLLECTION FREQUENCY

To be defined

CALCULATION METHOD

To be defined

Not measured in 2025

COMPONENT 3 OF MAPBIOMAS' PURPOSE

3

Inform public, private, and civil society decision-makers to promote the conservation and sustainable management of natural resources, and address climate change.

"Users generate impact using MapBiomass data"

This component seeks to quantify the extent to which MapBiomass data is applied by public, private, and civil society institutions, and to monitor certain metrics that, while influenced by various external factors, can provide insights into mechanisms that either facilitate or hinder MapBiomass users from achieving the expected impacts.

3 GUIDING QUESTIONS · 15 INDICATORS

3A

PUBLIC SECTOR

Are MapBiomass data informing decisions, policies and practices in the public sector, including executive, legislative and justice?

◆ 3A1 ◆ 3A2 ◆ 3A3 ◆ 3A4 ◆ 3A5 ◆ 3A6 ◆ 3A7

>

3B

PRIVATE AND FINANCIAL SECTORS

Are MapBiomass data informing decisions, investments and practices in the private and financial sectors, including infrastructure, banks, agribusiness, and farmers?

◆ 3B1 ◆ 3B2 ◆ 3B3 ◆ 3B4 ◆ 3B5

>

3C

ACADEMY & CIVIL SOCIETY

Are MapBiomass data informing scientific research, communication, advocacy and other actions from the academy and civil society?

◆ 3C1 ◆ 3C2 ◆ 3C3

>

3A

PUBLIC SECTOR

In this domain, we explore the use of MapBiomass data in different spheres of the public sector, including its use in actions to combat deforestation. Additionally, we monitor the transparency of states regarding punitive actions and the regression (or progress) of illegal deforestation without punitive action from the state.

◆ **3A1** Number of state agencies that use MapBiomass data

96
Measured

◆ **3A2** Number of federal agencies that use MapBiomass data

40
Measured

 3A3 Number of public institutions using api or platform powered by MapBiomas

279
Partial coverage

◆ **3A4** Activities done by justice agencies (state and federal) that used MapBiomas data

1,588
Measured

3A5 Number and percentage of municipalities that had consolidated data consulted on the dashboard

Not measured in 2025

◆ **3A6** Number of states that make publicly available infraction reports and/or embargoes

21
Measured

◆ **3A7** Percentage of deforested area with authorization/permit or law enforcement action

64.6%
Measured

◆ 3A1 3A · PUBLIC SECTOR

Number of state agencies that use MapBiomass data

RESULT

96state institutions

report using or having used MapBiomass data, of which

19are Justice agencies.

◆ Measured

DEFINITION

The number of state public institutions using MapBiomass data is indicative of the network's contribution to data access for decision-making, policy formulation, and management at the state level, and therefore to the likely increase in these institutions' capacity for the conservation and sustainable management of natural resources. This indicator monitors the number of state institutions that report using or having used MapBiomass data.

DATA COLLECTION METHOD

Internal records, User Summit, MapBiomass Award, and event registration forms (when they include questions about data usage).

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Institutions from all states were considered separately, even when they operate in related areas. For example, Naturatins and Semarh are two environmental institutions in the state of Tocantins, but they have different responsibilities and were counted separately. This indicator is cumulative because in some cases it is not possible to know if the institution continues to use the data.

SUPPORTING DATA

Report pp. 44–45

State	Institution
AC	IMAC - Instituto de Meio Ambiente do Acre
AC	Sema/AC - Secretaria de Estado do Meio Ambiente
AC	TCE-AC via ATRICON - Associação dos Membros dos Tribunais de Contas
AL	Ima/AL - Instituto do Meio Ambiente de Alagoas
AM	Ipaam/AM - Instituto de Proteção Ambiental do Amazonas
AM	Sema/AM - Secretaria de Estado de Meio Ambiente do Amazonas
AP	Sema/AP - Secretaria de Estado do Meio Ambiente do Amapá
BA	Inema/BA - Instituto do Meio Ambiente e Recursos Hídricos
BA	Sema/BA - Secretaria de Meio Ambiente da Bahia
CE	Semace - Superintendência Estadual do Meio Ambiente do Ceará
CE	Empresa de asistencia Tecnica e Extensão Rural do Ceará - EMATERCE
DF	Ibram/DF Brasília Ambiental
DF	Sema/DF - Secretaria de Estado de Meio Ambiente do Distrito Federal
ES	Idaf/ES - Instituto de Defesa Agropecuária e Florestal do Espírito Santo
GO	Semad/GO - Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável

Table continues on the next page ›

◆ 3A1 Number of state agencies that use MapBiomass data

Supporting data · continued (2/3) · Report pp. 44–45

State	Institution
MA	Sema/MA - Secretaria de Estado do Meio Ambiente e Recursos Naturais
MG	IEF/MG - Instituto Estadual de Florestas de Minas Gerais
MG	Semad/MG - Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável
MG	Emater MG
MT	Sedec/MT - Secretaria de Estado de Desenvolvimento Econômico do Estado de Mato Grosso
MT	Corpo de Bombeiros Militar do Estado do Mato Grosso
MT	Sema/MT - Secretaria de Estado de Meio Ambiente de Mato Grosso
PA	Semas/PA - Secretaria de Estado de Meio Ambiente, Clima e Sustentabilidade
PA	Corpo de Bombeiros Militar do Pará
PB	Semas/PB - Secretaria do Meio Ambiente e Sustentabilidade da Paraíba
PB	Sudema/PB - Superintendência de Administração do Meio Ambiente do Estado da Paraíba
PE	CPRH/PE - Agência Estadual de Meio Ambiente de Pernambuco
PI	Semarh/PI - Secretaria do Meio Ambiente e Recursos Hídricos do Piauí
PR	IAT/PR - Instituto Água e Terra
RJ	SEAS/RJ - Secretaria de Estado do Ambiente e Sustentabilidade do Rio de Janeiro
RJ	INEA/RJ - Instituto Estadual do Ambientedo Rio de Janeiro

State	Institution
RN	Idema/RH - Instituto do Desenvolvimento Sustentável e Meio Ambiente do Rio Grande do Norte
RO	Sedam/RO - Secretaria de Estado do Desenvolvimento Ambiental de Rondônia
RO	TCE-RO - Tribunal de Contas do Estado de Rondônia
RR	Femarh/RR - Fundação Estadual do Meio Ambiente e Recursos Hídricos de Roraima
RR	INSTITUTO DE TERRAS E COLONIZAÇÃO RORAIMA - ITERAIMA
RS	Fepam/RS - Fundação Estadual de Proteção Ambiental Henrique Luis Roessler
RS	Sema/RS e Fepam
SC	IMA/SC - Instituto do Meio Ambiente de Santa Catarina
SC	Semae/SC - Secretaria de Estado do Meio Ambiente e da Economia Verde
SC	Epagri/SC - Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina
SE	Adema/SE - Administração Estadual do Meio Ambiente
SP	CDHU/SP - Companhia de Desenvolvimento Habitacional e Urbano do Estado de São Paulo
SP	Cetesb/SP - Companhia Ambiental do Estado de São Paulo - Jundiaí/SP
SP	Semil/SP - Secretaria de Meio Ambiente, Infraestrutura e Logística do Estado de São Paulo
SP	IPA /SP - Instituto de Pesquisas Ambientais da Semil/SP

◆ 3A1

Number of state agencies that use MapBiomass data

Supporting data · continued (3/3) · Report pp. 44–45

State	Institution
TO	Naturatins/TO - Instituto Natureza do Tocantins
TO	Semarh/TO - Secretaria do Meio Ambiente e Recursos Hídricos do Tocantins
	Batalhões de Polícia Ambiental da Polícia Militar from all 27 states/FD
	19 Ministérios Públicos Estaduais*
	Consórcio Amazônia Legal - CAL (AC, AP, AM, MT, MA, PA, RO, RR, TO)

3A2 3A · PUBLIC SECTOR

Number of federal agencies that use MapBiomass data

RESULT

40 federal institutions

report using or having used MapBiomass data.

Measured

DEFINITION

The number of state public institutions using MapBiomass data is indicative of the network's contribution to data access for decision-making, policy formulation, and management at the federal level, and therefore to the likely increase in these institutions' capacity for the conservation and sustainable management of natural resources. This indicator monitors the number of federal institutions that report using or having used MapBiomass data.

DATA COLLECTION METHOD

Internal records, User Summit, MapBiomass Award, and event registration forms (when they include questions about data usage).

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Secretariats and divisions within a federal agency can be counted separately if they have distinct responsibilities and use data differently. Public banks were included in indicator 3B3. This indicator is cumulative because in some cases it is not possible to know if the institution continues to use the data.

SUPPORTING DATA

Report pp. 46–47

Institution
ANA - Agência Nacional de Águas e Saneamento Básico
Anatel - Agência Nacional de Telecomunicações
ANEEL - Agência Nacional de Energia Elétrica
CENSIPAM - Centro Gestor e Operacional do Sistema de Proteção da Amazônia
Câmara dos Deputados
Comissão da Água (Congresso)
Comissão de Meio Ambiente (CMA) do Senado Federal (SF)
Embrapa
FIOCRUZ - Fundação Osvaldo Cruz
FUNAI - Fundação Nacional dos Povos Indígenas
IBAMA Cenima - Centro Nacional de Monitoramento e Informações Ambientais
IBAMA - DiPro/Fiscalização
IBAMA - DBFlo/Recuperação.
IBGE
ICMBio
Instituto de Pesquisas Jardim Botânico do Rio de Janeiro
INCRA - Instituto Nacional de Colonização e Reforma Agrária
INSA - Instituto Nacional do Semiárido
IPEA - Instituto de Pesquisa Econômica Aplicada
IPHAN - Instituto do Patrimônio Histórico e Artístico Nacional
MAPA - Ministério da Agricultura e Pecuária SDR - Secretaria de Desenvolvimento Rural

Supporting data • continued (2/2) • Report pp. 46–47

Institution
MDA - Ministério do Desenvolvimento Agrário e Agricultura Familiar
MDIC - Ministério do Desenvolvimento, Indústria, Comércio e Serviços
MDS - Secretaria Nacional de Segurança Alimentar e Nutricional
MIDR - Ministério da Integração e Desenvolvimento Regional
MCTI - Ministério da Ciência Tecnologia e Inovação
Ministério das Cidades
MME - Ministério de Minas e Energia
Ministerio do Planejamento e orçamento
MMA-SBIO - Secretaria Nacional de Biodiversidade, Florestas e Direitos Animais
MMA-SMC - Secretaria Nacional de Mudança do Clima
MMA-SNPCT - Secretaria Nacional de Povos e Comunidades Tradicionais e Desenvolvimento Rural Sustentável
MMA-SQA - Secretaria Nacional de Meio Ambiente Urbano e Qualidade Ambiental
MPF - Ministério Público Federal /PGR
MPI - Ministério dos Povos Indígenas
Casa Civil - Secretaria de Articulação e Monitoramento
SERPRO - Serviço Federal de Processamento de Dados
SFB - Serviço Florestal Brasileiro
TCU - Tribunal de Contas da União
IBAMA -PREVFOGO- Centro Nacional de Prevenção e Combate aos Incêndios Florestais

◆ 3A3

3A · PUBLIC SECTOR

Report p. 48

Number of public institutions using api or platform powered by MapBiomass

RESULT

279 public institutions

connected to download data via the MapBiomass Alerta platform API

◆ Partial coverage

DEFINITION

Given that access to data via API is typically done by users who regularly apply the data, the number of public institutions accessing data via API provides complementary information about the use of MapBiomass data by public institutions, including those that have not directly contacted the MapBiomass team or participated in network events. This indicator monitors the number of public institutions that downloaded data via the MapBiomass platform API, including universities, during the year.

DATA COLLECTION METHOD

Internal records.

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Only data from the MapBiomass Alerta Platform was monitored in 2025. The full monitoring will be implemented in 2026.

Activities done by justice agencies (state and federal) that used MapBiomas data

The balance of results from the Mata Atlântica em Pé Program in 2025 reported the monitoring of

Allowing the identification of more than

14,000 hectares of illegal deforestation

Two major programs carried out by justice agencies to combat deforestation use MapBiomas data: 1) "Amazônia Protege" (Amazon Protects), led by the Federal Public Prosecutor's Office; and 2) "Mata Atlântica em Pé" (Standing Atlantic Forest), carried out by the State Public Prosecutor's Offices of the Atlantic Forest biome in collaboration with state environmental agencies. Together, they represent important examples of the indirect impact exerted by users of the data produced by the network. This indicator informs the number of enforcement operations carried out under these two programs during the year.

Consultation with the States and Federal Public Prosecutor's Offices
and RAD (Annual Deforestation Report)

Annual

Information from partner institutions. Information regarding Amazônia Protege is pending.

Report p. 49

Measured

RESULT

Not available for 2025.

Given that it is very difficult to capture the use of MapBiomass data at the municipal level, the number of accesses to the "Overview territories" module, which will be launched in 2026, will be monitored as a proxy for data use in analyses at that scale. This indicator will monitor the number of accesses to the "Overview territories" module.

Internal record.

Annual

This monitoring will begin once the "Overview Territories" module is available.

✦ Not measured in 2025

◆ 3A6 3A · PUBLIC SECTOR

Number of states that make publicly available infraction reports and/or embargoes

RESULT

21 states

made publicly available infraction reports and/or embargoes in 2025 (AC, AM, AP, BA, CE, DF, ES, GO, MG, MS, MT, PA, PB, PI, PR, RO, RR, RS, SC, SP and TO).

◆ Measured

DEFINITION

Since 2020, MapBiomass Alerta has been disclosing which states publicly release infraction notices and embargoes in the Annual Deforestation Report and uses this information to evaluate each state's actions in combating deforestation. The launch of the Law Enforcement Monitor in 2022 gave even more visibility to this information. Although it is not possible to establish a causal relationship, it is expected that the publication of this information by MapBiomass and the comparisons highlighted in reports and seminars are a strong incentive for states to make their actions to combat deforestation public. This indicator monitors the number of federative units that have active transparency for embargoes and infraction notices.

DATA COLLECTION METHOD

Information from the Law Enforcement Monitor and Annual Deforestation Report.

DATA COLLECTION FREQUENCY

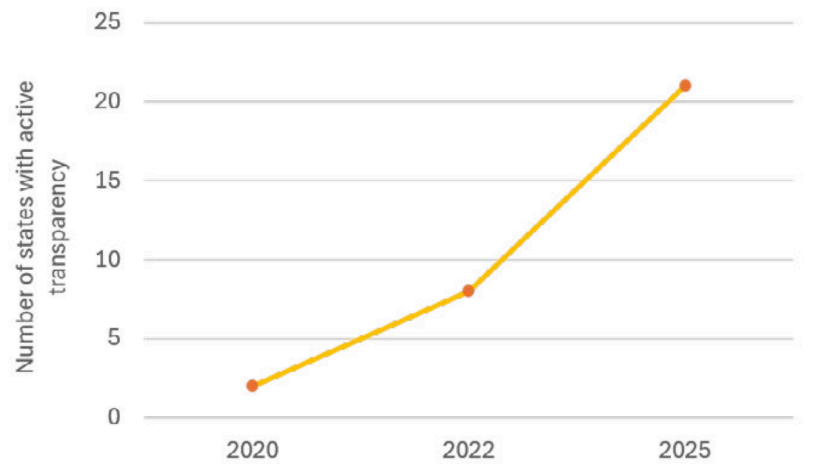
Annual

CALCULATION METHOD

States that provide up-to-date, complete, and online data on infraction notices and embargoes were considered to have active transparency.

SUPPORTING DATA

Report p. 51



◆ 3A7 3A · PUBLIC SECTOR

Report p. 52

Percentage of deforested area with authorization/permit or law enforcement action

RESULT

Over the past seven years (2019-2025),

64.6%

of all deforested areas in the country overlaps spatially with an authorization and/or enforcement action.

DEFINITION

As public authorities increase their control over deforestation, the proportion of deforested areas that had either authorization or an enforcement action should increase. This indicator will assess the proportion of deforestation that has been authorized or that has been subject to some form of enforcement action, since the inception of MapBiomass Alerta.

DATA COLLECTION METHOD

The data used is the one published on RAD (Annual Deforestation Report)

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Law enforcement agencies can take time to issue the sanctions and update their data portals, due to technical, legal, and administrative processes. Therefore, embargoes captured now might be related to deforestation events that were detected in previous years. For this reason, this indicator is always calculated considering the aggregation of the last few years, starting in 2019 until the most recent (timeframe of the MapBiomass Alerta Initiative).

◆ Measured

GUIDING QUESTION · COMPONENT 3

3B

PRIVATE AND FINANCIAL SECTORS

Are MapBiomass data informing decisions, investments and practices in the private and financial sectors, including infrastructure, banks, agribusiness, and farmers?

In this domain, we explore the application of MapBiomass data by private companies and banks, with a focus on its use in evaluating rural credit. Additionally, we monitor the occurrence of deforestation on rural properties that received credit and the adoption of environmentally sustainable practices in the private sector.

THIS DOMAIN INCLUDES FIVE INDICATORS:

◆ 3B1	Percentage of total rural credit in Brazil that is granted using MapBiomass data to avoid deforestation	95.1% Measured
◆ 3B2	Number of private sector agreements targeting sustainable environmental practices in Brazil	7 Measured
◆ 3B3	Known number of private companies and banks that use MapBiomass data for business planning or management	97 Measured
◆ 3B4	Percentage of public rural credits with deforestation alerts (before or after transfer)	20.52% Measured
◆ 3B5	Value of rural credits denied due to the use of MapBiomass data	1.8 billion reais Partial coverage

◆ 3B1 3B · PRIVATE AND FINANCIAL SECTORS

Report p. 54

Percentage of total rural credit in Brazil that is granted using MapBiomass data to avoid deforestation

RESULT

95.1%

of rural credit with public funds is granted using MapBiomass data.

◆ Measured

DEFINITION

Preventing those who deforest the land from receiving rural credit is extremely important to curb this practice. Several financial institutions use MapBiomass data to assess the granting of rural credit. This indicator measures the portion of rural credit with public funds associated with a polygon that is granted using MapBiomass data.

DATA COLLECTION METHOD

Contact with financial institutions and rural credit monitor

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

The use of MapBiomass data by each financial institution is evaluated through direct contact with the network team, and the value is calculated based on the ratio between the credit these institutions provide and the total credit available as financing for agricultural activity in the Rural Credit and Proagro Operations System (Sicor), in combination with other open databases, consulted in the Rural Credit Monitor.

◆ 3B2 3B · PRIVATE AND FINANCIAL SECTORS

Number of private sector agreements targeting sustainable environmental practices in Brazil

RESULT

By 2025, seven agreements on good environmental practices involving private institutions were in effect.

◆ Measured

DEFINITION

Definition - With the increased availability of data on environmental problems and growing public awareness of these issues, the private sector is expected to become more inclined to establish agreements related to good environmental practices. This indicator monitors the existence of agreements involving private institutions in Brazil aimed at environmentally sustainable practices that used MapBiomass data in their formulation and/or that use data to monitor their compliance.

DATA COLLECTION METHOD

Contact with partners, media search.

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Count. The agreements need to be valid, but they don't need to have been signed in the year of the evaluation.

SUPPORTING DATA

Report p. 55

AGREEMENTS CONSIDERED IN 2025

Programa Carne Legal - The Brazilian Cattle Agreement (Programa Carne Legal / Meatpacking TAC), established in 2009 by the Federal Public Prosecutor's Office, requires participating slaughterhouses to source cattle only from suppliers that comply with environmental and social criteria, including no illegal deforestation, no overlap with protected areas, and no use of forced labor.

Moratória da Soja - The Soy Moratorium is a voluntary sector agreement established in Brazil in 2006 under which major grain traders committed not to purchase soybeans produced in areas of the Amazon biome that were deforested after the agreed cutoff date, helping reduce commodity-driven deforestation.

Pacto pela restauração da Mata Atlântica (private sector and civil society) - The Atlantic Forest Restoration Pact is a multi-stakeholder initiative launched in 2009 that brings together governments, NGOs, research institutions, and private-sector partners to promote large-scale ecological restoration across the Atlantic Forest.

Livestock traceability - Febraban - The Brazilian Federation of Banks (FEBRABAN) Self-Regulatory Rule SARB No. 026/2023 establishes guidelines for FEBRABAN's signatory financial institutions to incorporate cattle supply chain traceability and socio-environmental compliance into rural credit risk assessment and lending decisions.

Supporting data · continued (2/2) · Report p. 55

Produzindo Certo - Producing Right is a Brazilian socio-environmental intelligence initiative created by the NGO Aliança da Terra that supports farmers, ranchers, and supply-chain companies through technical assistance, field assessments, and digital monitoring tools to improve traceability, regulatory compliance, and sustainable agricultural production.

Amolar Network (Instituto do Homem Pantaneiro) - The Amolar Network is a collaborative conservation initiative coordinated by the Instituto Homem Pantaneiro that brings together civil society organizations, research institutions, local communities, and private partners to promote biodiversity conservation, fire prevention, and sustainable development in the Pantanal.

Boi na Linha - a multi-stakeholder initiative created in 2019 by the Imaflora in partnership with the Federal Public Prosecutor's Office (MPF) to strengthen socio-environmental compliance, traceability, and transparency in the cattle supply chain across the Brazilian Amazon, helping promote a beef sector free from deforestation and other environmental irregularities. (boinalinha.org)

◆ 3B3

3B · PRIVATE AND FINANCIAL SECTORS

Report p. 56

Known number of private companies and banks that use MapBiomass data for business planning or management

RESULT

97

private companies or banks

report using or having used MapBiomass data

◆ Measured

DEFINITION

The use of environmental data by private companies and banks is expected to increase these institutions' ability to plan and manage their businesses in an environmentally responsible manner. This indicator monitors the known number of private institutions and banks that report using or having used MapBiomass data.

DATA COLLECTION METHOD

Internal records, User Summit, MapBiomass Award, and event registration forms (when they include questions about data usage).

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Count. This indicator is cumulative because, in some cases, it is not possible to know if the institution continues to use the data. Even so, it may be underestimated, since there may be companies that use the data but have not yet contacted the MapBiomass network.

◆ 3B4 3B · PRIVATE AND FINANCIAL SECTORS

Percentage of public rural credits with deforestation alerts (before or after transfer)

RESULT

In 2025,

20.52%

of the volume of credit with public funds was allocated to areas with deforestation alerts.

◆ Measured

DEFINITION

The proportion of rural credit granted with deforestation alerts is a measure of access to rural credit by those who commit deforestation. This indicator monitors the percentage of rural credit volume granted with public funds to rural properties that have had deforestation alerts, both within and outside the financing period. The volume of MapBiomass data used for this purpose in financial institutions scaled up in 2023.

DATA COLLECTION METHOD

Rural Credit Monitor

DATA COLLECTION FREQUENCY

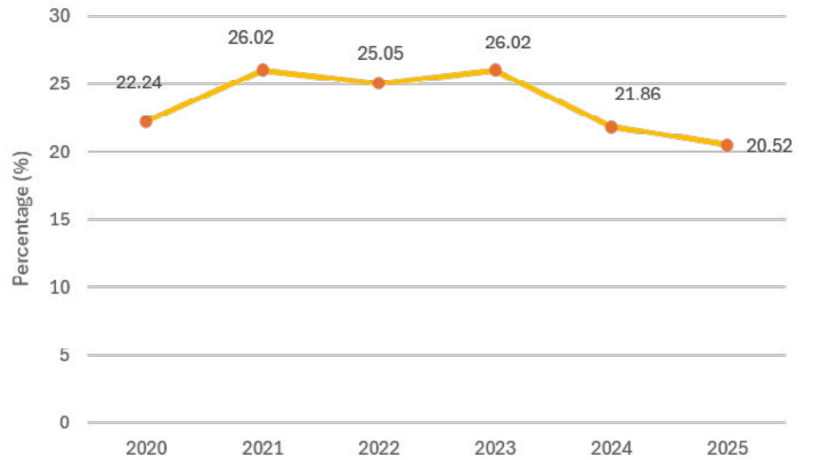
Annual

CALCULATION METHOD

Percentage of the volume of credit granted that presented deforestation alerts. Credits that are denied, including those due to environmental restrictions, are not included in the total volume considered.

SUPPORTING DATA

Report p. 57



◆ 3B5 3B · PRIVATE AND FINANCIAL SECTORS

Report p. 58

Value of rural credits denied due to the use of MapBiomass data

RESULT

Two financial institutions responded to the inquiry, providing data for the period of 2023 and 2024 which, when combined, result in a total of

1.8 billion reais

in rural credit blocked in operations that detected deforestation alerts on the applicant rural properties.

◆ Partial coverage

DEFINITION

The volume of rural credit denied to deforesters due to the use of MapBiomass data represents a network impact, punishing and discouraging rural landowners who carry out or intend to carry out activities harmful to the environment. This indicator monitors the volume of credit denied to those responsible for deforestation due to the use of MapBiomass data, considering the institutions that provide this information.

DATA COLLECTION METHOD

Contact with financial institutions and Annual Deforestation Report (RAD).

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Information provided by financial institutions. This indicator is likely underestimated, because we used for calculations only the two financial institutions that responded to the data consultation for the Annual Deforestation Report (RAD). Other institutions may use the deforestation data for blocking credit, but do not disclose this information.

3C

Are MapBiomass data informing scientific research, communication, advocacy and other actions from the academy and civil society?

In this section, we explore the use of MapBiomass data in civil society and science, seeking to understand the relative contribution of MapBiomass to studies on land use and land cover mapping.

◆ **3C1** Number of citation to MapBiomass papers

3214
Measured

◆ **3C2** Citations of MapBiomas in scientific papers compared to citations of analogous products available from other institutions

135%
Measured

◆ **3C3** Number of civil society organizations that use MapBiomass data

69
Measured

◆ 3C1

3C · ACADEMY & CIVIL SOCIETY

Report p. 60

Number of citation to MapBiomass papers

RESULT

MapBiomass has 29 scientific papers, which had

3214 citations by December 2025

DEFINITION

The number of citations to scientific articles from MapBiomass is a proxy for the importance of the articles to the scientific community. This indicator monitors the number of citations to MapBiomass articles in academic research.

DATA COLLECTION METHOD

Search in the OpenAlex database.

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

Count. OpenAlex may include citations in book chapters, dissertations, reviews, preprints and articles.

◆ Measured

◆ 3C2 3C · ACADEMY & CIVIL SOCIETY

Citations of MapBiomass in scientific papers compared to citations of analogous products available from other institutions

RESULT

135%

more citations of MapBiomass land use and land cover in the Cerrado and Amazon biomes compared to TerraClass in 2025

◆ Measured

DEFINITION

Comparing the number of citations to MapBiomass with available analogous data provides insights into the relative importance of MapBiomass for scientific production related to the specific topic. This indicator estimates the importance of MapBiomass to the scientific literature compared to available analogous products.

DATA COLLECTION METHOD

Search in the Scopus database

DATA COLLECTION FREQUENCY

Annual

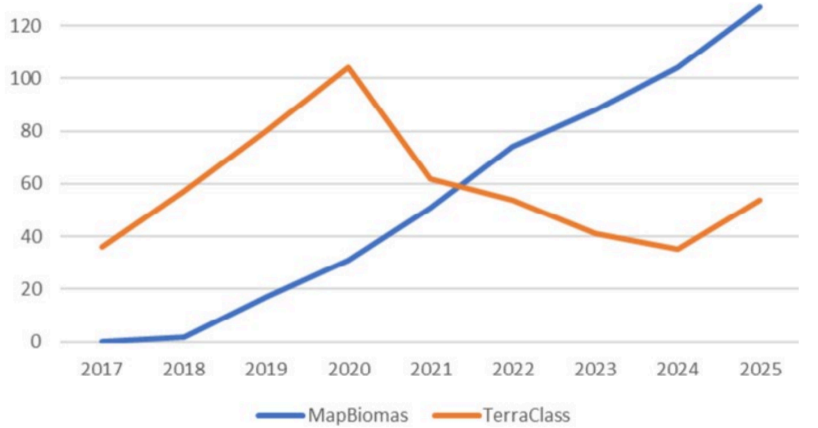
CALCULATION METHOD

Count. The Scopus database may underestimate the total number of citations, but we expect that this fact does not influence the comparison between products. In Brazil, TerraClass is the product most similar to MapBiomass LULC data, but is available for the Amazon and Cerrado biomes only. Therefore, for MapBiomass we used the keywords MapBiomass (or the MapBiomass reference paper), and Brazil (or Brasil) and Cerrado (or Amazon or Amazônia) and LULC (or land cover or land use or land change). For TerraClass all papers citing TerraClass or its reference paper were counted.

This may underestimate the number of citations to MapBiomass as, for instance, papers addressing regions in the Amazon may not cite the biome name in the abstract, title or keywords (used by Scopus search), among other cases. All citations available in Scopus were considered, including book chapters and conference papers.

SUPPORTING DATA

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◆ 3C3

3C · ACADEMY & CIVIL SOCIETY

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Number of civil society organizations that use MapBiomass data

RESULT

69civil society organizations

report using or having used MapBiomass data.

DEFINITION

The use of MapBiomass data by civil society organizations is expected to increase their own ability to generate impact. This indicator monitors the number of civil society organizations that report using or having used MapBiomass data.

DATA COLLECTION METHOD

Internal records, User Summit, MapBiomass Award, and event registration forms (when they include questions about data usage).

DATA COLLECTION FREQUENCY

Annual

CALCULATION METHOD

This indicator is cumulative because, in some cases, it is not possible to know if the organization continues to use the data. Even so, it may be underestimated, since there may be organizations that use the data but have not yet contacted the MapBiomass network.

◆ Measured

INDICATORS HIGHLIGHTS

Report pp. 63–64

1

FIRST COMPONENT OF MAPBIOMAS' PURPOSE
Reveal the transformations in the Brazilian territory through science and with precision, agility, and quality

1A RELIABILITY

Is MapBiomass updated, consistent, complete and available?

The updating of data, the availability of the LULC platform, and the provision of data for download or online processing are being carried out with excellence.

- ◆ 1A1 • 88.2%
- ◆ 1A2 • 99%
- ◆ 1A5 • 100%

Most initiatives, themes, and monitors have published methods through ATBD or website, but the proportion of published codes on GitHub is low and needs improvement.

- ◆ 1A3 • 79.5%
- ◆ 1A4 • 34.1%

1B SCIENCE BASED

Are the data and processes scientifically sound?

The overall accuracy of the LULC data is comparable to or better than the stated accuracy of the main analogous products available, especially considering the larger number of classes in the MapBiomass mapping (21 classes).

- ◆ 1B1 • 89.5%

The proportion of initiatives/products with updated accuracy assessments is low and needs improvement.

- ◆ 1B2 • 34.6%

More than half of the MapBiomass data have had their methods reviewed and approved through peer-review processes in scientific journals, but more effort is still needed in this activity.

- ◆ 1B3 • 65%

Since 2023, more than 1000 articles have cited MapBiomass annually in the scientific literature.

- ◆ 1B4 • 5206

1C BEST TECHNOLOGY AVAILABLE

Are we applying the appropriate best in class available technology?

The network maintains internal innovation groups dedicated to exploring new technological approaches and actively participates in external technology communities and beta-testing programs, including initiatives promoted by Google and the Google Earth Engine ecosystem.

- ◆ 1C2 • 13

These collaborative efforts have enabled the implementation of several technological innovations, including the adoption of Embeddings for satellite image analysis and classification, the creation of a dedicated working group to develop Feature Maps for Landsat imagery based on Embedding technologies, and the advancement of on-the-fly mapping approaches powered by Google Earth Engine. Together, these initiatives strengthen MapBiomass' ability to process large-scale geospatial data, accelerate map production, improve classification performance, and expand access to near real-time environmental information.

- ◆ 1C1 • 7

INDICATORS HIGHLIGHTS

2 SECOND COMPONENT OF MAPBIOMAS' PURPOSE

Making knowledge about land use and land cover accessible

2A DATA AVAILABILITY AND ACCESS

Has MapBiomass data been accessed extensively?

◆ 2A1 · 749,410

◆ 2A3 · 53,704

43 platforms from other institutions present or use MapBiomass Brazil data in their analyses, disclosing the data to their own audiences.

2B COMMUNICATION

Most biomes, cross-cutting themes, modules, and initiatives have made factsheets available regarding the latest data produced.

The number of MapBiomass followers in social media reached 135,000 in 2025 and more than 18,000 news articles mentioned data from MapBiomass.

◆ 2B4 · 18,112

2C COOPERATION AND SUPPORT

MapBiomass has trained over 400 people in 2025 and some training recordings were viewed over 900 times.

MapBiomass has interacted with over 100 institutions in 2025, having active formalized collaborations with 28 of them.

The MapBiomass team responds to virtually all messages received through the contact email address.

INDICATORS HIGHLIGHTS

Report pp. 63–64

3

THIRD COMPONENT OF MAPBIOMAS' PURPOSE

Inform public, private, and civil society decision-makers to promote the conservation and sustainable management of natural resources, and address climate change.

3A PUBLIC SECTOR

Are MapBiomass data informing decisions, policies and practices in the public sector, including executive, legislative and justice?

MapBiomass data is or has been used by 96 state agencies and 40 federal agencies.

◆ 3A1 · 96

◆ 3A2 · 40

In 2025, MapBiomass Alerta data was downloaded by 279 public institutions via API.

◆ 3A3 · 279

The number of states that provide information on infraction notices and embargoes has increased from 2 to 18 since 2020. Although it is not possible to state that MapBiomass Alerta and the Inspection Monitor are responsible for the increased transparency in the availability of this information, it is likely that the publication of this information by MapBiomass and the comparisons highlighted in reports and seminars are a strong incentive for states to make their actions to combat deforestation public.

◆ 3A6 · 21

3B PRIVATE AND FINANCIAL SECTORS

Are MapBiomass data informing decisions, investments and practices in the private and financial sectors, including infrastructure, banks, agribusiness, and farmers?

95.1% of rural credit with public funds in Brazil is granted using MapBiomass data.

◆ 3B1 · 95.1%

97 private companies or banks report using or having used MapBiomass data.

◆ 3B3 · 97

Considering only the two financial institutions that responded to the question posed by MapBiomass team, a total of 1.8 billion reais in rural credit was blocked in operations that detected deforestation alerts on the applicant rural properties in 2023 and 2024, due to the use of MapBiomass data.

◆ 3B5 · 1.8 billion reais

3C ACADEMY & CIVIL SOCIETY

Are MapBiomass data informing scientific research, communication, advocacy and other actions from the academy and civil society?

The 29 scientific articles published by the MapBiomass Brazil team have already received more than 3200 citations.

◆ 3C1 · 3214

69 civil society organizations report using or having used MapBiomass data.

◆ 3C3 · 69

CASES OF NEW TECH SOLUTIONS, PARTNERSHIPS AND INVENTIONS

Satellite Embedding from Alphaearth

MapBiomass has solidified its position at the forefront of remote sensing technology by serving as a beta tester for the Google Satellite Embedding from Alphaearth. This strategic participation allowed the network to integrate state-of-the-art machine learning representations into its production workflow, specifically for the 10m annual land use and land cover (LULC) maps produced with Sentinel imagery. By being an early adopter and testing the technology against the complex environmental dynamics of the Brazilian territory, MapBiomass not only contributed to the refinement of these advanced embeddings but also ensured its mapping processes remain "best-in-class".

The implementation of these embeddings is recognized as one of the seven major methodological innovations of 2025, directly enhancing both the precision and agility of the network's output. This technology enables more sophisticated feature extraction from Sentinel data.

Related:

1C1 · 7

1C2 · 13

Plataforma Socioambiental

The Socio-environmental Observatory (<https://www.observatoriosocioambiental.com.br/>) is a civil society forum that aims to inform, qualify, and guide the debate on social impacts associated with commodity production in Brazil. Its main tool, the Socio-environmental Platform, gathers and makes available data on human rights violations, deforestation, and the expansion of large-scale industrial agriculture. The partnership for the Plataforma Socioambiental (<https://plataforma.observatoriosocioambiental.com.br/>) represents a direct application of MapBiomass' technological infrastructure, specifically leveraging its Public API and high-resolution LULC (Land Use and Land Cover) datasets to power external decision-making tools. By providing four decades of annual land-use data MapBiomass serves as the foundational environmental engine for the platform. This technical integration allows the Observatory to ingest massive datasets on deforestation and land change directly into the platform, enabling a seamless digital bridge between raw environmental science and territorial advocacy.

This collaboration is an example of how MapBiomass fulfills its purpose of "revealing transformations" while allowing users to generate the final social impact. While MapBiomass provides the objective, "science-based" data layers—such as fire scars, water surface, and deforestation alerts—it is the partnership with the Observatory that adds the critical layer of human rights and social context. By crossing MapBiomass' precise environmental records with data on violence in the field, the platform transforms spatial statistics into a powerful tool for socio-environmental justice, proving that free and open access data is a catalyst for institutional transparency and civil society empowerment.

Related:

1C1 · 7

2A5 · 43

CASES OF APPLICATIONS OF MAPBIOMAS DATA

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SEEG - Greenhouse Gas Emissions and Removals Estimating System

SEEG is an initiative of the Climate Observatory — a network of over a hundred civil society organizations.

Case: SEEG (<https://plataforma.seeg.eco.br/>) is Brazil's leading independent platform for monitoring greenhouse gas emissions, supporting public mitigation policies and ensuring transparency to society regarding the country's emissions reduction trajectories. SEEG users include public authorities and policymakers, the private sector, NGOs and civil society, the press, educators and researchers. Nationally, seven states – AL, BA, GO, MG, PB, RJ and SP – currently have cooperation agreements with SEEG and use its data as a basis for their emissions inventories and climate policies.

How we contribute: To estimate annual emissions from agriculture and land use and land cover changes, SEEG uses MapBiomass data on land use and land cover, deforestation, secondary vegetation, and fire.

Related:

◆ 2A5 · 43

◆ 3C3 · 69

Carbon Potential - Banco do Brasil

Banco do Brasil (BB) is the oldest bank in Brazil (founded in 1808) and a major financial institution in Latin America, primarily state-owned. It is a cornerstone of the Brazilian financial system, often acting as an agent for public policies.

Case: The project developed a technological solution to identify rural properties in the Legal Amazon with high carbon sequestration potential. This data was used to create five sustainability indices that combine biomass, deforestation risk, and restoration potential, all based on mathematical and ecological models. The result is a tool that allows for spatial analysis, risk prediction, and prioritization of areas for participation in the carbon credit market, aligned with the Brazilian Emissions Trading System.

How we contribute: To achieve this, the tool integrated data from MapBiomass Soil, the Rural Environmental Registry, and deforestation alert systems, including MapBiomass Alerta.

Status: By July 2025, the project had already contributed to the reforestation and conservation of 760,000 hectares and is easily scalable.

Related:

◆ 3B3 · 97

Certification of Municipal Sustainable Management (“Selo Caixa Gestão Sustentável”)

Caixa Econômica Federal is a major Brazilian public financial institution, ranked among the largest banks in the country and Latin America. Established as a government-owned corporation (empresa pública) with administrative autonomy, it acts as a primary agent for public policies in Brazil, focusing on social development, housing, and infrastructure.

Case: Recognition created by Caixa Econômica Federal for municipalities that present public indicators demonstrating the application of good Governance and Social and Environmental Responsibility (ESG) practices in local public management. Applicants are evaluated using 21 indicators, classified into 4 aspects: Environmental, Social, Governance, and Climate. Certification strengthens the credibility of local government, encourages the adoption of more efficient public policies, and generates concrete benefits for the population, promoting fairer, more resilient, and sustainable cities. Certified municipalities obtain preferential treatment when securing financing.

How we contribute: Data on deforestation and vegetation cover from MapBiomass are used in climate-related indicators. 286 municipalities have already received the certification.

Related:

◆ 3B3 · 97

CASES OF APPLICATIONS OF MAPBIOMAS DATA

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Preventing deforesters from receiving credit

The Brazilian National Bank for Economic and Social Development (BNDES) is the main financing instrument of the Federal Government for long-term investments in all segments of the Brazilian economy. It is a federal public company associated with the Ministry of Development, Industry, Trade, and Services, acting as one of the largest development banks in the world.

Case: The BNDES provides credit to rural producers in 95% of all municipalities in the country, through a partner network of 70 financial institutions and has a rule not to contract rural credit operations whose final beneficiary has current embargoes listed by the Brazilian Institute of Environment and Renewable Natural Resources (Ibama).

What we did: MapBiomass has been in partnership with BNDES since 2023. We've provided both technical support and data from MapBiomass Alerta, including overlay information on Rural Environment Registry (CAR - Cadastro Ambiental Rural).

Status: In June 2025 BNDES reached a volume of R\$ 806.3 million in financing avoided for rural producers who had properties with signs of illegal deforestation.

See more at: [https://agenciadenoticias.bndes.gov.br/detalhe/noticia/BNDES-chega-a-marca-de-R\\$-8063-mi-de-credito-evitado-a-proprietarios-de-terras-com-indicios-de-desmatamento-ilegal/](https://agenciadenoticias.bndes.gov.br/detalhe/noticia/BNDES-chega-a-marca-de-R$-8063-mi-de-credito-evitado-a-proprietarios-de-terras-com-indicios-de-desmatamento-ilegal/)

Related: 3B1 · 95.1%

3B5 · 1.8 billion reais

The case of Law 15.228/2025 — “Pantanal Statute”

This law resulted from the collaboration between SOS Pantanal, a Brazilian non-profit organization dedicated to the conservation and sustainable development of the Pantanal biome, the world's largest tropical wetland, with the Mato Grosso and Mato Grosso do Sul state governments

Case: In 2025, a law was passed establishing a legal framework for the use, conservation, and protection of the Pantanal. The law defines guidelines for sustainable exploitation, biodiversity conservation, environmental services, sustainable tourism, among others. The Pantanal is therefore the second Brazilian biome to have specific federal legislation.

How we contribute: The drafting and motivation behind this law explicitly considered monitoring data on land use, water, and natural vegetation, deforestation alerts validated by MapBiomass Alerta as well as the MapBiomass Technical Note published in 2023 concerning deforestation in the Mato Grosso do Sul state to justify the urgency of regulation due to the strong impact of environmental changes. The data helped to legally substantiate the need for specific protection for the biome, contributing to transforming scientific evidence into public policy.

See more at: <https://sospantanal.org.br/pantanal-e-o-segundo-bioma-brasileiro-a-ter-uma-legislacao-federal-especifica/>

Related:  **3A · PUBLIC SECTOR**

CASES OF APPLICATIONS OF MAPBIOMAS DATA

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Operação Mata Atlântica 2025 from the Prosecutor's Office

Case: Deforestation enforcement operation coordinated by the Public Ministry of Paraná involving 17 states with the Public Prosecutors Offices and environmental state agencies in the Atlantic Forest Law region.

What we did: MapBiomass Alerta were used to select areas of deforestation to be monitored during the operation. Specific material for the field operations were prepared.

Status: In 2025, up to September, more than 12,000 hectares of deforestation were inspected, generating more than R\$116 million in fines. Some states were still going to carry out actions and consolidate the year's data.

Related:

◆ 3A4 · 1,588

Protected Land Project from the Public Ministry of Bahia State

Case: The Protected Land Project is an initiative of the MPBA (Public Prosecutor's Office of the State of Bahia) to combat illegal deforestation and promote environmental recovery and conservation and climate justice, using data from the MapBiomass Alerta platform.

What we did: Issuance of more than 5,000 customized reports for the Public Prosecutor's Office of the State of Bahia.

Status: The project has already resulted in nearly 700 civil investigations initiated, 130 Terms of Adjustment of Conduct signed, and the creation of 87 Private Natural Heritage Reserves, protecting more than 3,100 hectares of native vegetation in the Caatinga and Cerrado biomes. In addition, it has raised R\$ 3.5 million in environmental compensation, allocated to the Fund for the Defense of Fundamental Rights (FDDF).

Related:

◆ 3A4 · 1,588

◆ 3A1 · 96