

WP23_25: GEO Biodiversity Observation Network

1264,253

Basic Information

Full title of the Initiative

GEO Biodiversity Observation Network

Short Title or Acronym

GEO BON

Current category in the 2020-2022 GWP

GEO Flagship

Proposed category in the 2023-2025 GWP

GEO Flagship

Points of Contact

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Purpose

Objective

GEO BON is a large international network of experts and a community of practice using biodiversity observations and technologies to monitor biodiversity change. This knowledge is used for decision-making in many sectors, including the conservation and sustainable use of biodiversity and ecosystem services.

Please provide a short description of the Initiative

Over the last 15 years GEO BON has established a global network and community of practice for biodiversity observations and has become an internationally recognized key provider of knowledge to national and international organizations, in particular to the Secretariat and Parties to the UN Convention on Biological Diversity. More than 2200 members in 135 countries and territories are currently using GEO BON workflows to support more effective and timely conservation, management and sustainable use of biodiversity. GEO BON is entering a new phase of activities with a main objective focused on coordinating and implementing a global biodiversity observation system (GBiOS). GBiOS will be designed to fill large gaps in taxonomic, geographic, and temporal coverage of biodiversity monitoring. GEO BON will achieve this by creating a coordinated network of BONs and other monitoring schemes, thereby coordinating the flow of information that use essential variables to monitor trends and enrich the models used for proactive planning and the conservation of biodiversity

worldwide. The deployment of GBiOS will enhance engagement from local to national levels and generate the enabling environment needed to curb biodiversity loss and reduce risks to humans as a result.

Why is this Initiative needed?

The global biodiversity crisis predicts we are on a road to a global species extinction event equivalent to a mass extinction which is impacting ecosystems and the many benefits nature provides to humans. In order to understand how our actions are affecting biodiversity, we must be able to detect and monitor patterns of biodiversity change. Although biodiversity observation systems do exist, there are large geographic and taxonomic biases in where and how these efforts are taking place. At this time, accurate estimates of biodiversity trends are unavailable for large regions of the Earth's land and oceans.

A coordinated system is needed to collate, standardize and harmonize the numerous biodiversity observation data and initiatives to bring out understanding of biodiversity change into focus. A global biodiversity observing system is needed to attribute changes in biodiversity to drivers of biodiversity loss and guide policy towards slowing or preventing negative trends.

What evidence is there to support this need?

Recent scientific assessments indicate that over 1 million species are threatened with extinction, while two-thirds of the world's ecosystems and the benefits they provide to society are now significantly degraded (Global Assessment Report on Biodiversity and Ecosystem Services, IPBES 2019). The large geographic and taxonomic biases in the global and national biodiversity data repositories can be addressed with a coordinated global biodiversity monitoring system. The design of this system can support evidence-based decision making.

Is this Initiative open to participation by representatives of any GEO Member, Participating Organization, and GEO Associate?

Yes

Are you aware of other projects or initiatives at a global or regional scale (both in GEO and externally) that provide similar products or services?

Yes

Please describe.

There are thousands of national and subnational monitoring schemes for populations worldwide that are meeting regional and local needs but there is little coordination among them. Other global observation systems (e.g. GCOS, GOOS) provide similar products and services in the climate science and oceanography communities. The global forest watch project is an example of a project with similar aims for this ecosystem type.

How is this Initiative unique?

GBiOS will be a comprehensive and integrated network of BONs and other monitoring schemes operating at local and regional scales that are interconnected to provide a global picture of where, why and how fast biodiversity is changing for the purpose of guiding conservation action to protect nature and the ecosystem benefits it provides.

Please identify the most important actual and/or intended outputs (products, services, etc.) produced by the Initiative, along with their intended and/or actual users. This list does not need to be comprehensive but should identify the outputs which are most used and are expected to have the greatest potential impact.

Output	Status	Users	Additional info
National BONs	Regularly updated	AmeriGEO, AOGEO, CBD Parties	
List of of indicators for national reporting under UN CBD	Regularly updated	CBD Parties, UNSEEA, EO4EA	https://geobon.org/ebvs/indicators/
Data to EBVs to indicators for decision making	Regularly updated	GEO Mountains, GEO Wetlands, CBD Parties	
GBIOS (as a network of BONs)	Planned	CBD Parties, GEO community	

If needed, please provide additional comments or explanation to accompany the outputs table

- no answer given -

What kinds of decisions are the outputs of this Initiative primarily intended to support?

Policy-based action in biodiversity conservation, restoration and spatial planning would be supported by the monitoring science and methods we propose via BONs. Essential biodiversity variables provide a firm basis for indicator development and calculation.

How will these decisions benefit from the outputs of this Initiative?

The outputs of GBIOS will provide standardized, accurate and up-to-date biodiversity information required by policy and national and local level decision-makers across all sectors (environment, agriculture, finance).

What kinds of impacts (for example, reduced loss of life, monetary savings, conservation of biodiversity, etc.) are anticipated as a result of the use of the outputs of this Initiative?

Biodiversity conservation and sustainable use of its resources.

Has this Initiative been asked to provide specific information (for example, reports, data, services) on an ongoing basis to an international convention, organization, or other multilateral body?

Yes

Please identify the requesting organization.

Secretariat of the United Nations Convention on Biological Diversity (CBD).

Describe the nature of the request.

Advance a shared understanding of the post-2020 global biodiversity monitoring framework and its indicators through virtual webinars organized for Parties to the CBD and stakeholders of the post-2020 global biodiversity framework (GBF) (CBD notification attached).

Support in providing scientific expertise on goal A of the post-2020 GBF

Provide scientific advice and implementation support for the post-2020 GBF and its monitoring framework. GEO BON is mentioned in CBD/SBSTTA/REC/24/2 and CBD/SBI/REC/3/8 (attached).

Please provide supporting documentation of the request.

- [ntf_2022_001_webinars_en.pdf](#) ([link](#))
- [sbi_03_rec_08_en.pdf](#) ([link](#))

Technical Synopsis

Please provide a brief description of the methods used by the Initiative to produce its (actual or planned) outputs.

Essential biodiversity variables (EBVs) and derivation framework developed by GEO BON, have been endorsed by the Convention on Biological Diversity (Decision XI/3). Essential Biodiversity Variables serve to harmonize biodiversity observation data and define a minimum set of essential measurements to capture the multiple dimensions of biodiversity change. Since they are derived from raw biodiversity data and measurements, EBVs can be used to report on biodiversity status and trends and have an important role in biodiversity monitoring initiatives and informing conservation decisions and policies.

Biodiversity Observations Networks (BONs) are developing, applying and testing the concepts, methods and tools to implement and enhance operational networks; collecting observations and providing data to the community and users. In this capacity, they are recipients of the outputs of the EBV Working Groups (e.g. EBV monitoring frameworks and tools) but also contributors via the development and contribution of useful tools for EBV generation and application at national, regional and thematic scales. This two way interaction via the GEO BON network serves to continually improve the process by which BONs are designed and implemented.

Knowledge-to-Action Hubs: Engaging and operationalizing GEO BON's full potential requires crossing organizational (e.g. GEO BON Secretariat, BONs, Task Forces) and functional (e.g. academic or administrative expertise) boundaries. To do this, we are developing and implementing several Knowledge-To-Action hubs to create a sustained focus for engagement among GEO BON's members and partners. Knowledge-To-Action hubs will lead to the co-development and co-production of sustained knowledge and tools. GEO BON's K2A hubs are to be organized by the GEO BON Secretariat and serve as international hubs of communication aimed at engaging GEO BON's members in order to provide anyone with information about biodiversity monitoring. GEO BON's K2A hubs will share and exchange experience and information among experts, users, and partners in order to accelerate actions. They are to be contact points that link the user community (strategic partners, local communities) with the knowledge production teams organized within GEO BON (e.g. Working Groups, BONs, Task Forces), and are open-ended entities with short, mid and long-term goals, answering to immediate requests while maintaining stakeholder relationships over the long-term.

If you would like to provide further details on the technical methods, you may upload one or more documents here.

- no supporting documents provided -

Are there any significant scientific or technical challenges that need to be resolved by the Initiative during the 2023-2025 period?

Yes

Please describe these challenges and the steps being taken to solve them.

Digital Innovation: is needed to guide and simplify the task of translating raw monitoring data into EBV datasets. Data workflows and pipelines will aid in harmonizing and standardizing many biodiversity datasets and algorithms for data analysis.

Engagement: scientific and social engagement is challenging due to constrained schedules and personal work programmes. GEO BON's Knowledge-To-Action hubs aim to reduce these constraints.

Integration with informatics infrastructure: gathering and accessing biodiversity data across platforms and databases. The EBV portal and BON-in-a-Box aim to resolve this.

Does the Initiative expect to complete any key new outputs, improvements to existing outputs, or improvements to the methods of producing outputs, in the 2023-2025 period?

Yes

Please describe these new outputs or improvements.

GEO BON is developing the blueprint for GBiOS (Global Biodiversity Information System). The first working version of the BON-in-a-Box platform will be tested and piloted in summer 2023. Improvements to the EBV portal (<https://portal.geobon.org/home>) are ongoing.

Please identify the key tasks that must be implemented to ensure delivery of these changes, with target dates for completion.

Task	Task description	Expected completion (month/year)
BON-in-a-Box 2.0	Upgrade of the existing platform to allow for the development of new BONs and improvement of the existing ones	August/2023
GBiOS blueprint	Project description including cost and engagement plan	December/2023

Resources

Have all resources required to implement the Initiative's planned work in the 2023-2025 period been secured?

- Gap in financial resources

What is the estimated funding gap for the 2023-2025 period?

US\$ 1M (minimum; just to maintain the current Secretariat of 4 people; not including the costs of GBiOS or any other project or participation in relevant meetings).

What actions is the Initiative taking to obtain the required resources?

Fundraising in the philanthropic/private sector

Please list all financial and non-financial contributions to the Initiative (other than in-kind, voluntary participation by individual contributors) having a value of more than USD 50,000.

Contributing Organization	GEO Status	Type of Resource	Value	Currency
Montreal International		Financial	100000	Canadian \$
FRQ		Financial	150000	Canadian \$
Microsoft		Financial	500000	US \$

Lessons from the 2020-2022 Period

Were all planned activities for the 2020-2022 period implemented as expected?

No

Please describe which activities were delayed or not implemented and how has this

affected plans for 2023-2025.

A number of EBVs have been developed and finalized. Most have been published but we are collating the final list of publications per Working Group.

Most BONs and WGs are operational. New BONs (EuropaBON and Omic BON) were endorsed while one BON (AmericasBON) lost its leads and support and is not functional at this time.

BON-in-a-Box implementation was expected for early 2023, but a six-month delay has been incurred because of contract negotiations.

Were there any key challenges faced by the Initiative in the 2020-2022 period?

Yes

Please describe.

The GEO BON Secretariat moved from Leipzig (Germany) to Montreal (Canada) at the end of 2020. A new team had to be hired in the new location. The website and other files had to be securely transferred. The team had to quickly learn existing procedures and protocols and get to know the many active work groups and members in GEO BON's network.

Were there any impacts or changes to operations due to COVID-19?

Yes

Please describe.

COVID-19 prevented any in-person meetings, including daily activities performed in the office. The entire Secretariat was hired during 2021-2022 and had to work from home for most of this time which hindered its work (team building). COVID-19 also hindered member engagement and knowledge exchange. There were some delays in achieving some deliverables as the entire network saw its members switching to work from home and adjusting to new realities.

Please describe the key changes proposed for the 2023-2025 period, for example, new projects, new areas of focus, or adjustments to the activity governance.

The new strategic plan is now in an advanced state and under review by the Implementation Committee. This plan will be accompanied by new implementation and communications strategy, a fundraising strategy, and a collaboration and governance structure.

Major upgrade of the BON-in-a-Box toolkit is underway. This will culminate in a new interface for the online platform (<https://geobon.org/bon-in-a-box/>).

A detection and attribution framework for biodiversity change is being developed. A symposium was held at the World Biodiversity Forum (2022) on the topic.

Knowledge-to-action hubs are being implemented. The first one will focus on indicators of biodiversity change to be included in the post-2020 global biodiversity framework. The second hub will focus on BON development to respond to the growing interest for national biodiversity monitoring networks.

The establishment of GBiOS as a primary GEO BON project.

Does the Initiative have outputs (products, services, etc.) available to users now, even if only on a pilot or testing basis?

Yes

Please provide any available information describing this usage (for example, user statistics, results of user testing) and/or feedback from users (for example, user comments, evaluations).

Policy information documents: CBD/SBSTTA/24/INF/31, CBD/WG2020/4/INF/2/REV2,

CBD/ID/OM/2022/1/INF/2 and science briefs (<https://geobon.org/science-briefs/>)

GEO BON indicators for the post-2020 GBF monitoring framework details for Parties on indicators (<https://www.cbd.int/doc/c/815b/9afa/941a22fc6c8760acbf3ab6a3/geobon-headline-indicators-en.pdf>)

EBV portal: shared ecosystem and national EBV datasets (<https://portal.geobon.org/home>)

BON-in-a-Box: online toolkit for facilitating the start-up or enhancement of national or regional biodiversity observation systems (<https://geobon.org/bon-in-a-box/>). BON-in-a-Box serves as a technology transfer mechanism that allows countries access to the most advanced and effective monitoring protocols, tools and software thereby lowering the threshold for a country to set up, enhance or harmonize a national biodiversity observing system.

Webinars (recordings available on GEO BON's YouTube channel): supporting the implementation of EBV indicators (ecosystem extent and integrity, genetic diversity, and species populations and area-based conservation, updated monitoring framework and associated information documents), describing the essential ecosystem service variables (<https://geobon.org/documents/webinars/>)

Webpage (<https://geobon.org/>)

Scientific publications (<https://geobon.org/documents/scientific-publications/>)

Please provide supporting documentation if available.

- no supporting documents provided -

Do you have evidence of any impacts that have occurred in part as a result of using the outputs of the Initiative (for example, policy decisions taken, behaviour changes by users, risks mitigated)?

Yes

Please provide examples, with evidence where available.

Incorporation of national biodiversity monitoring into CBD post-2020 global biodiversity framework text Indicators in post-2020 global biodiversity monitoring framework

Increased engagement around biodiversity monitoring and the role GEO BON can play as knowledge provider

The GEO BON website received >10K hits for its policy briefs (June 2022)

Several countries are engaging with GEO BON secretariat for knowledge on BON establishment (e.g. Canada).

Current discussions on funding GBiOS with the private sector (due to sustained efforts to highlight the importance of biodiversity monitoring)

National use of EBV development and Indicators for national decision making support and toolkits: species extinction risk assessments, ecosystem assessment (e.g., GEO BON - NatureServe Partnership and Colombia BON).

Please provide supporting documentation if available.

- no supporting documents provided -

Have there been any internal or external reviews or evaluations of the Initiative since 2019?

Yes

Please provide a copy of the report, if available.

- no supporting documents provided -

Please indicate any GEO Work Programme activities with which you have ongoing collaboration.

- AMERIGEO - Americas Group on Earth Observations
- AOGEO - Asia-Oceania Group on Earth Observations
- EO4EA - Earth Observations for Ecosystem Accounting
- GEO-LDN - GEO Land Degradation Neutrality
- GEO-WETLANDS - GEO Wetlands
- GEO-MOUNTAINS - Global Network for Observations and Information in Mountain Environments
- BLUE-PLANET - Oceans and Society: Blue Planet

Please indicate any additional GEO Work Programme activities with which you would like to establish new collaborations.

- AFRIGEO - African Group on Earth Observations
- EO4SDG - Earth Observations for the Sustainable Development Goals
- GEO-CITSCI - GEO Citizen Science
- GEO-EV - GEO Essential Variables
- GEOGLAM - GEO Global Agricultural Monitoring
- GEO-ECO - GEO Global Ecosystems
- GFOI - Global Forest Observation Initiative

Stakeholder Engagement and Capacity Building

Are there specific countries or organizations that your Initiative would like to engage?

Yes

Please list these countries, regions or organizations.

African region, philanthropic organizations engaged in biodiversity knowledge and conservation.

What are your plans to engage them?

Contact GEO Sec for help in this regard (once the new strategic plan is approved by the Implementation Committee).

Does your Initiative engage users in the work of the Initiative (for example, consultation, testing, co-design)?

Yes

Please briefly describe the Initiative's approach to engaging users.

GEO BON is updating its online platform for BON development (BON-in-a-box; <https://geobon.org/bon-in-a-box/>) with a set of tools and a friendly interface to allow users to collaborate on developing new BONs or enhancing existing BONs. During this project, users are involved in co-design and testing the platform. Indicator development. We engage relevant partners in the utility, calculation and communication of the indicators (e.g. Map of Life).

Does the Initiative have a user engagement strategy or similar kind of document?

No

Are there categories of users that are not represented at this time, but you would like to engage?

Yes

Please list these user categories or regions.

Private sector, philanthropic organizations, local and indigenous community organizations.

What are the plans for further engagement of users in the Initiative?

All Hands Meeting at the end of 2022, surveys, call for volunteers for specific topics.

Does the Initiative have a documented capacity development strategy?

No

Please describe the approach to capacity development that is being implemented by the Initiative?

Various Working Groups and BONs are conducting capacity development on specific topics as part of their work plan without coordination from the GEO BON Secretariat. In the last year the Secretariat was involved in a series of webinars to support the implementation of the post-2020 global biodiversity framework highlighting the workflows and indicators developed by the GEO BON community.

Are there any commercial sector organizations participating in this Initiative?

Yes

Please list the commercial sector organizations.

Organization name	GEO Member/PO/...	Country in which the organization is based	City in which the organization is based
Microsoft			

Are there opportunities for commercial sector uptake of the outputs of the Initiative?

Yes

Please describe these opportunities.

Companies are starting to report on their impact on biodiversity in the context of lowering their footprint and providing sustainable products and services. GBiOS will provide a framework to facilitate reporting in the private sector.

Is there already commercial uptake occurring?

Yes

Please describe the nature of this uptake and the relevant commercial sector organizations.

Microsoft has provided funding to two initiatives: EBVs in the cloud (<https://geobon.org/geo-bon-microsoft-ebvs-on-the-cloud/?highlight=EBVs+cloud>), BON-in-a-Box (<https://geobon.org/bon-in-a-box/>) - the latter being a vital component of GBiOS.

Are there opportunities for further commercial sector participation in the Initiative?

Yes

Please describe these opportunities.

We have engaged with the World Economic Forum to explore how the financial sector can get involved in GBiOS development.

Does the Initiative have a plan for commercial sector engagement?

No

Governance

Please describe the roles of each of the key leadership positions, as well as any team structures involved in day-to-day management.

GEO BON has a consensus based form of governance with a light administrative support structure including management committee (co-Chairs and Secretariat), implementation committee and advisory board.

Co-Chairs: prepare the strategic plan, work with the secretariat staff, engage with GEO BON membership and raise funds. Co-Chairs are responsible for ensuring that work activities correspond with the strategic plan and implementation plan.

Daily management is ensured by the GEO BON Secretariat, hosted by the Quebec Centre for Biodiversity Science at McGill University (Montreal, Canada). The team consists of four members: Executive Secretary (overseeing product delivery, technical materials, administrative matters and engaging with group leads and external partners), Science Officer (developing scientific materials and engaging with the network on scientific matters), Scrum Master and Developer (coordinating the development of the GEO BON website and members portal and acting as scrum master for BON-in-a-Box), and Communications and Engagement Officer (coordinating communication materials, communication channels, engagement with the GEO BON members).

Is there a steering committee or other governance bodies that advise the Initiative but are not involved in day-to-day management?

Yes

Please describe the roles of each body. If there are multiple governance bodies, please describe the relationships among them (such as through a governance structure diagram).

Advisory Board: composed of experts and leaders in GEO BON's relevant partner organizations. The board provides strategic direction and feedback on GEO BON's planned activities.

Implementation Committee: composed of ~50 co-leads of GEO BON's working groups, task forces and biodiversity observation networks. The committee is tasked with implementing the deliverables of GEO BON, approving the budget and nominating and electing GEO BON chairs.

- no supporting documents provided -

What methods does the Initiative use to communicate with its participants?

- Email / e-newsletters
- Regular conference calls
- Website
- Regular events
- Other

Please describe.

Social media (Twitter, Facebook). Surveys through Google forms.

Please describe the key risks that could delay or obstruct the completion of the planned activities and outputs of the Initiative, along with any actions taken to mitigate these risks.

Description of the hazard	Description of the possible impacts	Scale of impact	Likelihood of occurrence	Mitigation measures
Insufficient funding	Secretariat team affected, delay in conducting new activities	Severe	Possible	Fundraising efforts in-progress
Insufficient time dedicated by key members to GEO BON activities	Delay in delivering outputs	Moderate	Possible	Call for volunteers within the larger GEO BON community

What methods are used by the Initiative to monitor its effectiveness?

- Informal discussions with users / beneficiaries
- User or beneficiary surveys
- Website statistics
- Consultations or events
- Other

Please describe.

Feedback from key stakeholders; annual review of activities (internal)

Would the Initiative be interested in assistance from the GEO Secretariat for developing an impact plan?

Yes

How are the results of the monitoring and evaluation activities shared with participants and the wider GEO community?

Progress is presented at various GEO meetings and going forward an annual report will be shared with GEO Canada (as the Secretariat is currently based in Montreal). Since 2021, a GEO BON Highlights Report has been shared with all our members and posted on our website.

Are any monitoring or evaluation activities required by funders/contributors?

No

Participants

Please list the active individual participants in the Initiative

First name	Last name	Email address	Member	Org
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Other information

Please provide any other comments or information that was not included in the previous sections, but you would like to appear in the Implementation Plan.

GEO BON is currently finalizing its new strategy (2022-2026). This Implementation Plan will be updated accordingly by the end of 2022.

- no supporting documents provided -

Co-Editor Management

List of co-editors for this initiative

- no answer given -