



Developing Essential Biodiversity Variables and Biodiversity Observation Networks



Laetitia M. Navarro, PhD GEO BON Executive Secretary German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig



www.geobon.org



GEO BON in a nutshell

Mission

Improve the **acquisition**, **coordination** and **delivery** of biodiversity observations and related services to users including decision makers and the scientific community.



Vision

A global biodiversity observation network that contributes to effective management policies for the world's biodiversity and ecosystem services.

GEO IN NUMBERS



A Global, Coordinated, Comprehensive and Sustained System of Observing Systems "Countries have borders, Earth Observations don't"

A Global Partnership

The network in numbers

± 500 members in 66 countries and 341 Institutes

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GEO BON core focus

Outputs

Developing the Biodiversity Observation Networks

Structure and governance

GEO BON core focus

The Essential Biodiversity Variables

EBVs: Minimum set of measurements, **complementary** to one another, that can capture major dimensions of biodiversity **change**.

EBVs are:

- ✓ Biological and policy relevant
- ✓ Sensitive to change
- ✓ Biological state variables
- ✓ Generalizable across realms
- ✓ Scalable
- ✓ Feasible

Genetic Composition e.g. Allelic diversity

Species Populations e.g. Species distribution

Species Traits e.g. Body size, phenology

Community Composition e.g. Species interactions

Ecosystem Structure e.g. Ecosystem extent

Ecosystem Functions e.g. Disturbance

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Developing the Essential Biodiversity Variables

Challenges and opportunities for EBV development

Challenges

- Consultation processes on-going to agree on and prioritize lists of EBVs in the different classes
- Spatial and taxonomic bias in biodiversity observation → Gaps identification
- Lack of within species temporal variation observation (e.g. traits)

Challenges and opportunities for EBV development

Opportunities

- Popularization of next generation sequencing, metagenomics (eDNA), and hyperspectral remote sensing
- increased data collection (e.g. citizen science), sharing, and integration
- Development of modelling approaches that combine species observations with remotely sensed environmental data

Developing workflows for the production of EBVs

Kissling et al., (2017) Biological Reviews

Developing workflows for the production of EBVs

Kissling et al., (2017) Biological Reviews

Data standards for interoperability

GEO BON core focus

Building a Network of National, Regional and Thematic BONs

Contribute to the **collection** and **analysis** of **harmonised biodiversity observations**, the development of integrated and interoperable **biodiversity monitoring programs**, the adoption of **data standards**.

Supporting the development of BONs – BON development process

ENGAGEMENT

- Create an Authorizing Environment
- ② Establish design and implementation team

ASSESSMENT

- ③ User needs assessment and choice of regional assessment units
- (4) Inventory of data, tools and platforms

Decision and Policy makers

DESIGN

- Focal Ecosystems, Conceptual Models, EBVs and Primary Observations
- 6 Data collection Methods
- ⑦ Sampling Framework
- 8 Data management, Analysis and Reporting

IMPLEMENTATION

Navarro et al. (2017) Current Opinion in Environmental Sustainability

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Supporting the development of BONs – BON development process

Navarro et al. (2017) Current Opinion in Environmental Sustainability

Supporting the development of BONs – BON in a Box

GEO BON

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BON IN A BOX

Improving **Capacity** for **Biodiversity** Conservation

a Box) is a customizable and continually updated toolkit. It provides access to the latest biodiversity observation design, data collection protocols, and dat management, analysis and reporting tools. It serves as a technology transfer and capacity building mechanism to ensure you have access to the best and most up-to-date tools and technologies for building a biodiversity observation system.

BON in a Box (Biodiversity Observation Network in

BON in a Box connects tools users and developers to promote ongoing tool improvements and the development of new tools. The goal is to lower the threshold for the start-up or enhancement of a biodiversity observation networks and support more effective conservation actions through the improved supply of quality biodiversity data. BON in a Box is a Group on Earth Observations -Biodiversity Observation Network initiative and the development of this Latin American regional version was led by Colombia's Alexander von Humboldt Institute.

BON IN A BOX Latinoamerica Region

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GEO BON core focus

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Policy relevant outputs: Supporting users' reporting needs

Representativeness &

Species Status

Information Index

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Connectedness (PARC) Indices

Global Ecosystem

Restoration Index

EBV based indicators: Integrating in situ and remote sensing observations for open access & real-time indicators

Essential Biodiversity Variables: Ecosystem extent and fragmentation Taxonomic diversity

Species distributions Ecosystem extent and fragmentation

Essential Biodiversity Variables: Species distributions Ecosystem extent and fragmentation

Essential Biodiversity Variables:

Essential Biodiversity Variables: Ecosystem extent and fragmentation Taxonomic diversity

Essential Biodiversity Variables: Ecosystem extent Net primary productivity

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Essential Biodiversity Variables: Species distributions Taxonomic diversity

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Global Biodiversity Change Indicators

Model-based integration of remote-sensing & in situ observations that enables dynamic updates and transparency at low cost

Supporting decision-making

The **Beijing 2018 call on biodiversity observations for post-2020 decision-making:** "We call on the Parties to the CBD to step up efforts on the collection, analysis and delivery of biodiversity observations [...]".

Participation in the CBD COP 14, including with two main side-event submitted: "From biodiversity data to reporting" (co-organized with GBIF Sec. and NatureServe) "Global Biodiversity Change Indicators" (Presentation of the GBCIs and their applications to parties, Presentation of the EBV portal)

Thank you

For more information: <u>www.geobon.org</u> @GEOBON_org

www.geobon.org GEO BON • German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Deutscher Platz 5a, 04103 Leipzig, Germany • info@geobon.org