

APBON 19th Web Seminar
Dec. 14th. 2023 10:00-12:00

Terrestrial EBVs on a National Scale

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Information on the status and trends of biodiversity

- Information on the status and trends of biodiversity is needed for evaluating KM-GBF and achieving the nature-positive society
- **Essential Biodiversity Variables (EBVs)**
 - Conceptualized by GEO BON (Pereira et al. 2013, Navarro et al. 2017)
 - EBVs serve as biodiversity metrics integrating space, time, and either raw or predicted data to formulate indicators.
- **Issues:**
 - **Data Accessibility:** Scattering existing data as Metadata for EBV
 - **Data Gaps:** Data variation in sampling protocols, spatial and temporal extent, and resolution
 - **Data Conversion:** Difficulty in primary (raw) data to indicators



EBVs on a National Scale

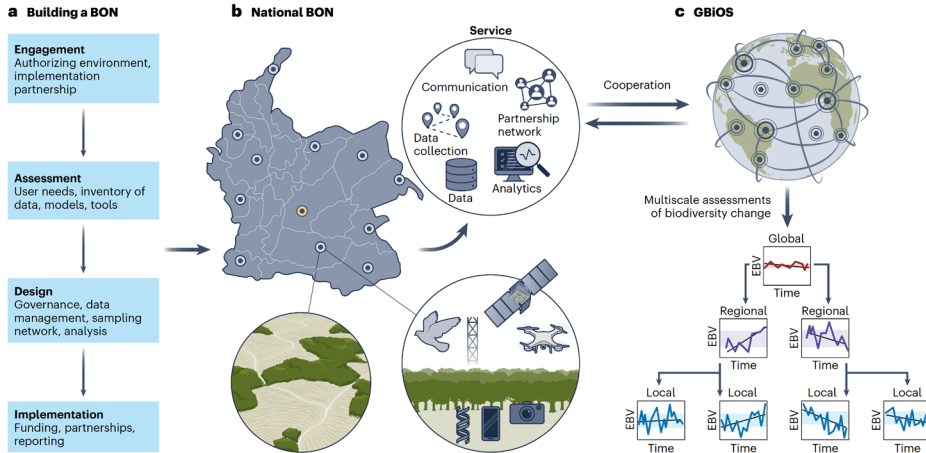
GBIOS, Gonzalez et al. 2023

Comment

<https://doi.org/10.1038/s41559-023-02171-0>

A global biodiversity observing system to unite monitoring and guide action

Andrew Gonzalez, Petteri Vihervaara, Patricia Balvanera, Amanda E. Bates, Elisa Bayraktarov, Peter J. Bellingham, Andreas Bruder, Jillian Campbell, Michael D. Catchen, Jeannine Cavender-Bares, Jonathan Chase, Nicholas Coops, Mark J. Costello, Maria Dornelas, Grégoire Dubois, Emmett J. Duffy, Hilde Eggertmont, Nestor Fernandez, Simon Ferrier, Gary N. Geller, Michael Gill, Dominique Gravel, Carlos A. Guerra, Robert Guralnick, Michael Harfoot, Tim Hirsch, Sean Hoban, Alice C. Hughes, Margaret E. Hunter, Forest Isbell, Walter Jetz, Norbert Juergens, W. Daniel Kieling, Cornelia R. Klein, Yuan Li, Rabea Brian Laura



Finland, Vihervaara et al. 2017



Contents lists available at ScienceDirect

Global Ecology and Conservation

journal homepage: www.elsevier.com/locate/gecco



Original research article

How Essential Biodiversity Variables and remote sensing can help national biodiversity monitoring



Petteri Vihervaara, Ari-Pekka Auvinen, Laura Mononen, Markus Törmä, Petri Ahlroth, Saku Anttila, Kristin Böttcher, Martin Forsius, Jani Heino, Janne Heliölä, Meri Koskelainen, Mikko Kuussaari, Kristian Meissner, Olli Ojala, Seppo Tuominen, Markku Viitasalo, Raimo Virkkala

Table 1

Links between Finnish Biodiversity indicators and Essential Biodiversity Variables. Abbreviations: Forests (FO), Mires (MI), Baltic Sea (BS), Inland waters (IW), Farmlands (FA), Alpine habitats (AL), Shores (SH), Rocky and esker habitats (RE), and Climate change (CC). Indicators with names in blue on the left column are under preparation. EBV sub-classes marked in red are additions suggested by the authors. An asterisk (*) refers to a monitoring scheme at risk of being discontinued. Question mark (?) relates to some uncertainty in the correspondence of the biodiversity indicator and EBV.

Primary purpose
Secondary purpose or proxy
 Could be used as a proxy (higher uncertainty)

	Essential Biodiversity Variables																									
	Genetic composition	Species populations	Species traits	Community composition	Ecosystem structure	Ecosystem function																				
Finland Biodiversity Indicators	Co-insect diversity	Alpine diversity	Population genetic differentiation	Breed and variety diversity	Species distribution	Population abundance	Populations structure by age/size class	Phenology	Body mass / biomass	Natal dispersal distance	Migration behaviour	Demographic traits	Physiological traits	Taxonomic diversity	Species interactions	Functional diversity	Habitat structure / condition	Ecosystem extent and fragmentation	Ecosystem composition by functional type	Net primary productivity	Secondary productivity	Decomposition	Nutrient retention	Carbon sequestration	Water filtration & retention	Disturbance regime
FO: Dead wood																										
FO: Forest fragmentation																										
FO: Forest age structure																										
FO: Tree species composition																										
FO: Forest birds																										
FO: Wildlife richness																										
FO: Forest vegetation																										
MI: Fragmentation of pristine mires																										
MI: Dead wood on mires																										

UK, Boyd et al. 2023



Original Article | [Open Access](#) | [CC BY](#)

An operational workflow for producing periodic estimates of species occupancy at national scales

Robin J. Boyd, Thomas A. August, Robert Cooke, Mark Logie, Francesca Mancini, Gary D. Powney, David B. Roy, Katharine Turvey, Nick J. B. Isaac

First published: 16 April 2023 | <https://doi.org/10.1111/brv.12961>

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ABSTRACT

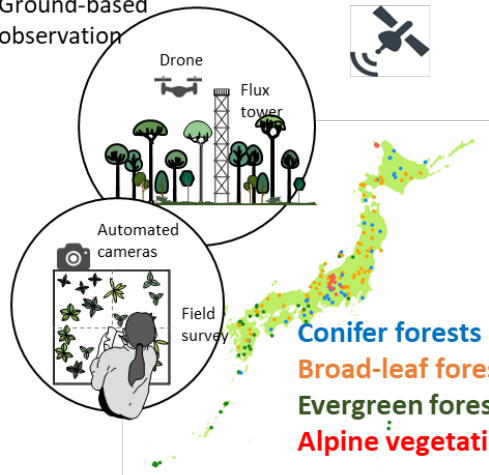
Policy makers require high-level summaries of biodiversity change. However, deriving

Mapping the EBVs on terrestrial ecosystems at the National Scale



Integration of observation data in Japan

Ground-based observation



RS-based observation



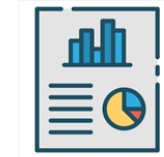
Mapping EBVs



Exploring biodiversity & ecosystem services hotspots and current trends in biodiversity

National reports

NBSAP, CBD National reports, Japan Biodiversity Outlook



Global reports

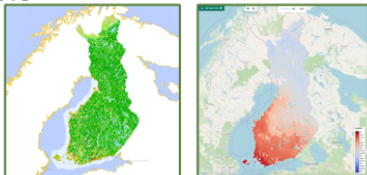
IPBES, IPCC, Global Biodiversity Outlook



Information & data sharing, discussion

EBVs-studies in Finland

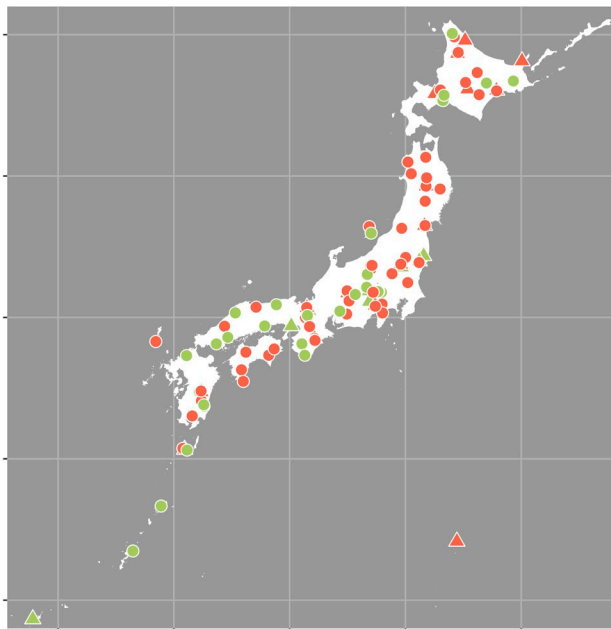
Mapping frameworks, Data sets, models (Vihervaara et al. 2017; Skidmore et al. 2021)



Change in forest species composition

Analysis on the census data of 191 plots
over up to 50 years

Map of Forest Plots

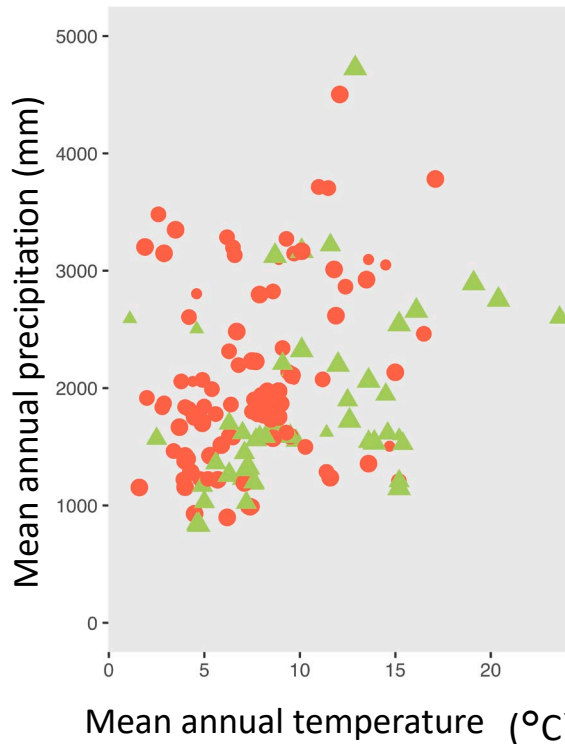


Old growth forest
(≥ 150 yrs)

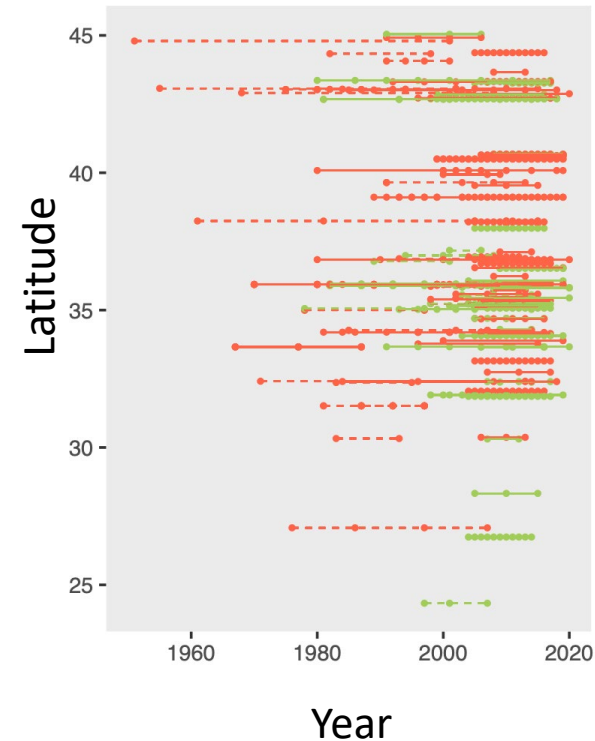
Secondary forest
(< 150 yrs)

Census
Species, tree size (DBH), (position)

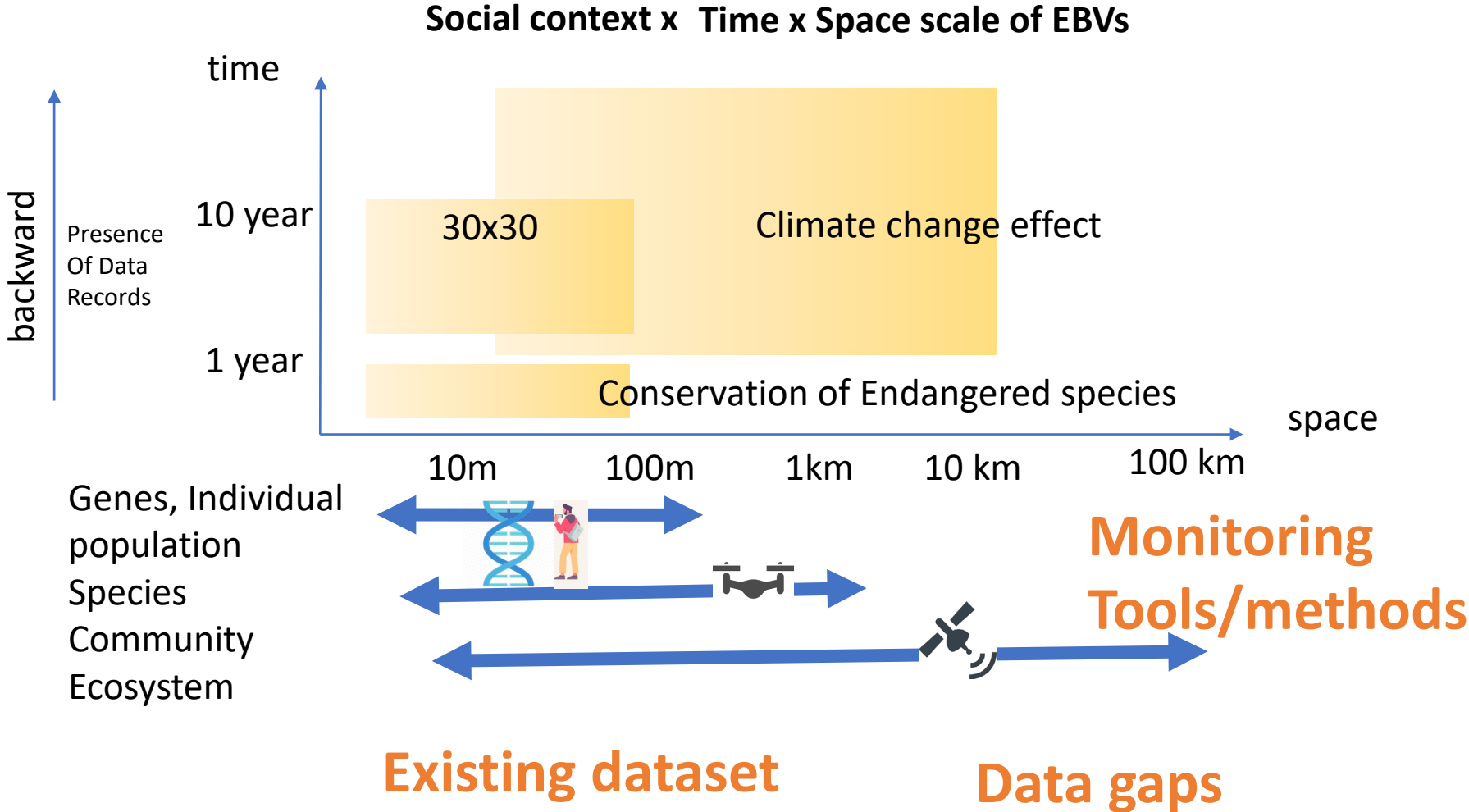
Climatic Condition



Monitoring periods



Social context x EBVs



Symposium at ESJ



The 71st Annual Meeting of the Ecological Society of Japan (16th-21st March 2024)

Date and Time: 10-12am, 20th Mar. 2024

Venue: Yokohama National University and Online

ER Symposium “Advancing Observation and Assessment in Terrestrial Ecosystems with Essential Biodiversity Variables: Insight into Achieving the Global Biodiversity Framework”

Yayoi Takeuchi, Hibiki Noda (NIES, Organizers)

Introduction to the Symposium: What Are Essential Biodiversity Variables, and How Will Those Contribute to Achieving the Goals of the KM-GBF?

Petteri Vihervaara (SYKE)

Operationalization of Essential Biodiversity Variables for harmonized biodiversity monitoring – perspectives from Finland and Europe

Kristin Böttcher (SYKE)

Ecosystem phenology and productivity EBVs – case studies on pest species modelling and habitat mapping in Finland.

Lea Végh (NIES)

EBVs at multiple scales – Combining field surveys and remote sensing for forest monitoring.

Jamie M. Kass (Tohoku Univ.)

Predicting and mapping ecosystem services using biodiversity models and remote sensing data

Thank you!

