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BIG DATA
& Data Science for Official Statistics

BILBAO 2024

Informing Climate Change and
Sustainable Development Policies
with Integrated Data

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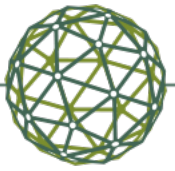
A Global Picture on Data of Biodiversity Observation and Monitoring

Andrés Mármol-Guijarro

12th June 2012

EUROPABON

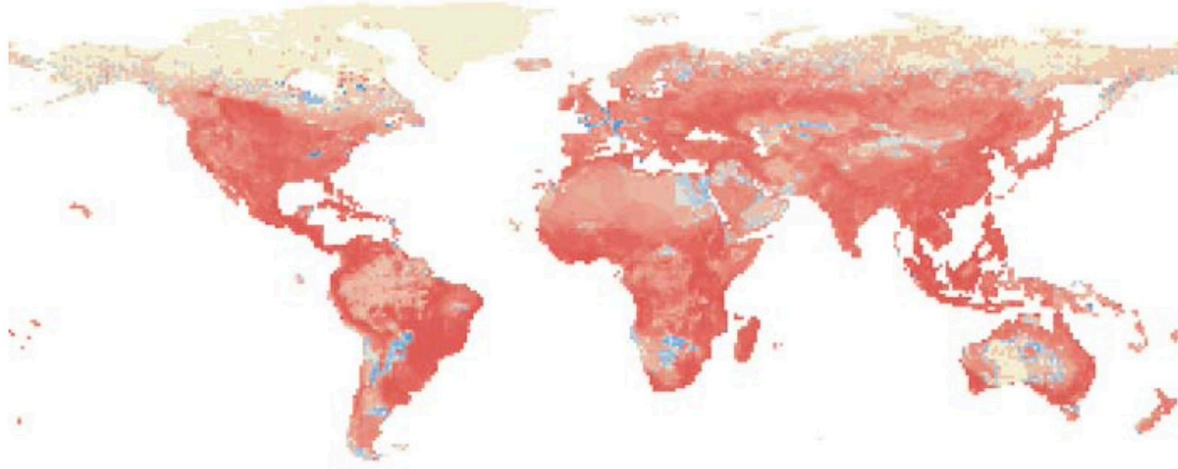




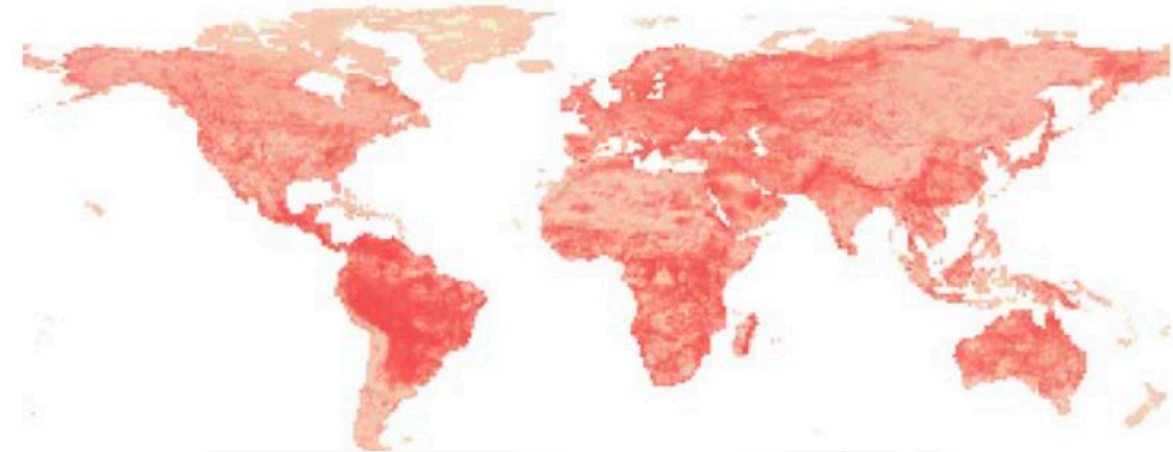
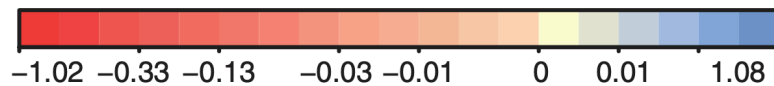
Why to monitor biodiversity? (Global biodiversity trends)

Projection 2050 under Land Use and Climate Change
Global Sustainability Scenario

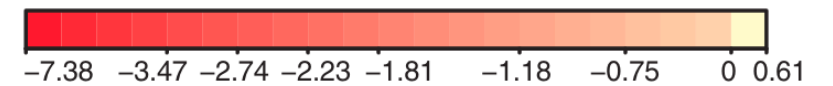
Historical trend species lost 1900 - 2015



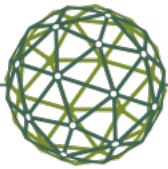
% spp. decade⁻¹



% spp. decade⁻¹

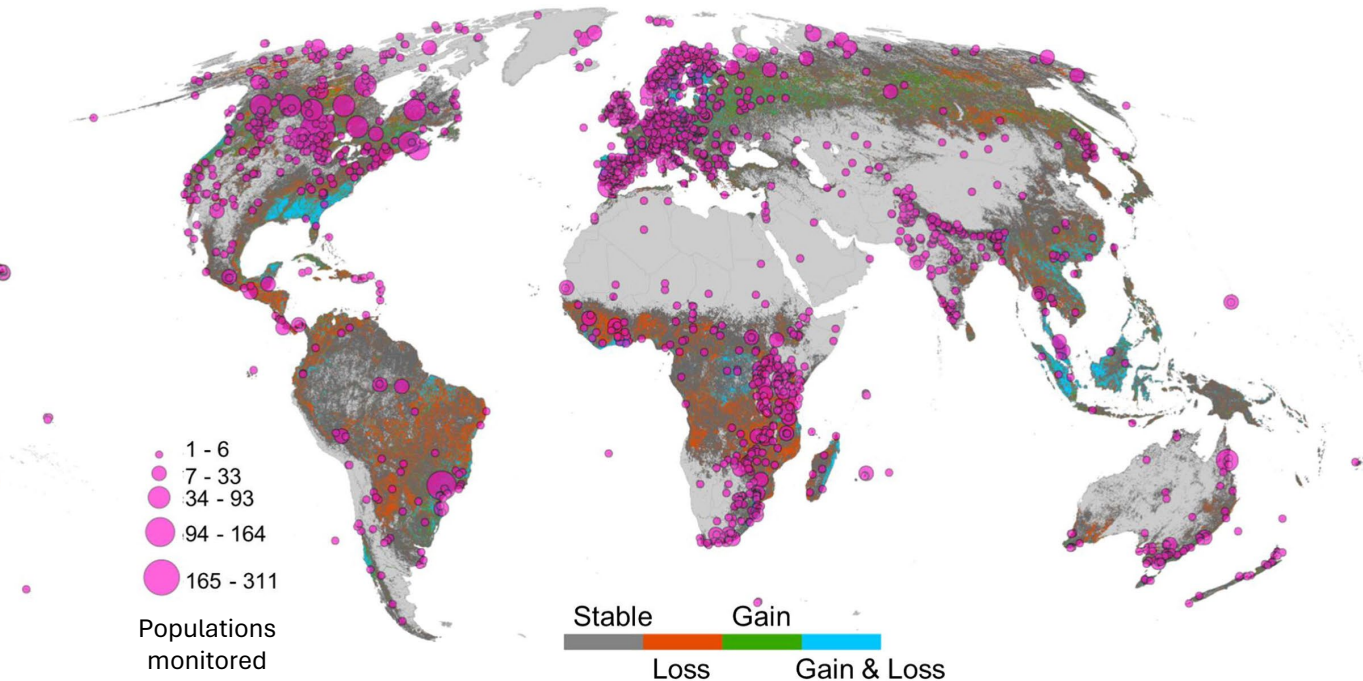


Pereira *et al.* (2024) *Science*



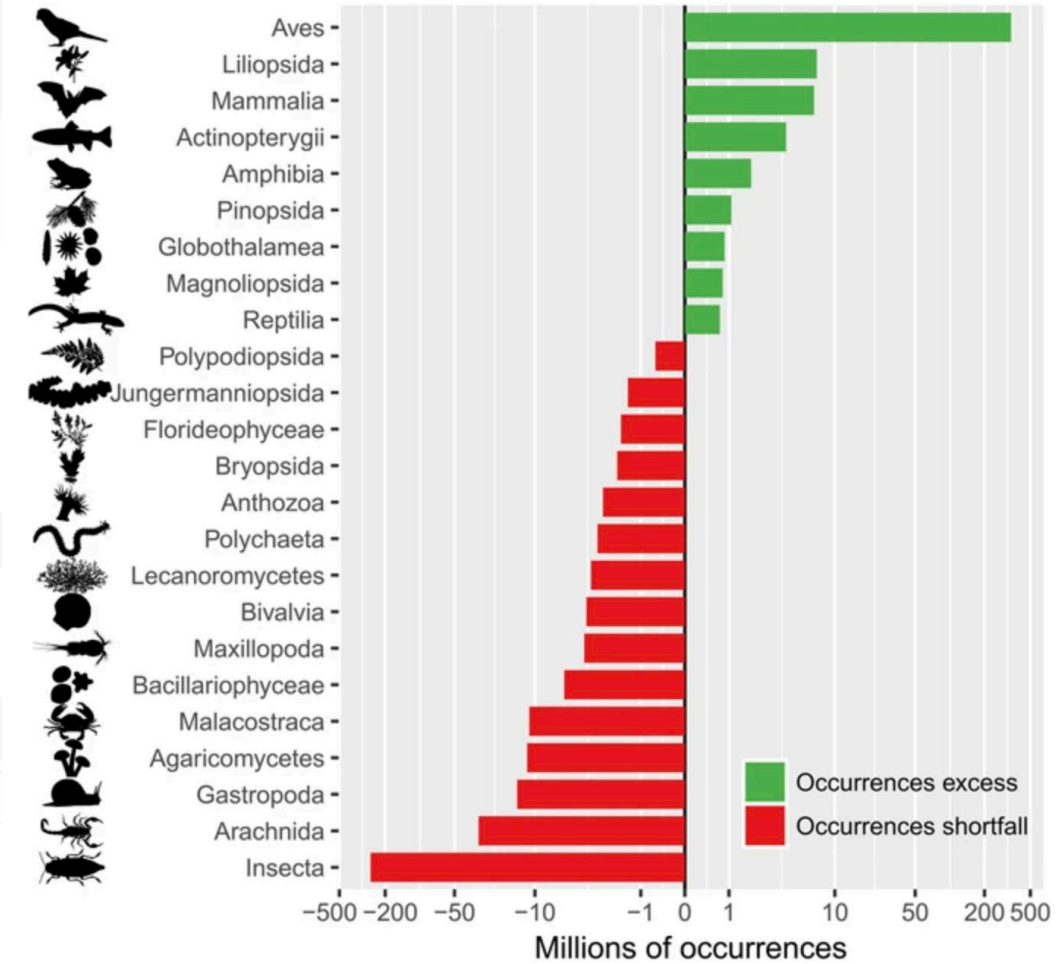
Shortfalls in existing Biodiversity Data

Monitoring effort – Spatial coverage

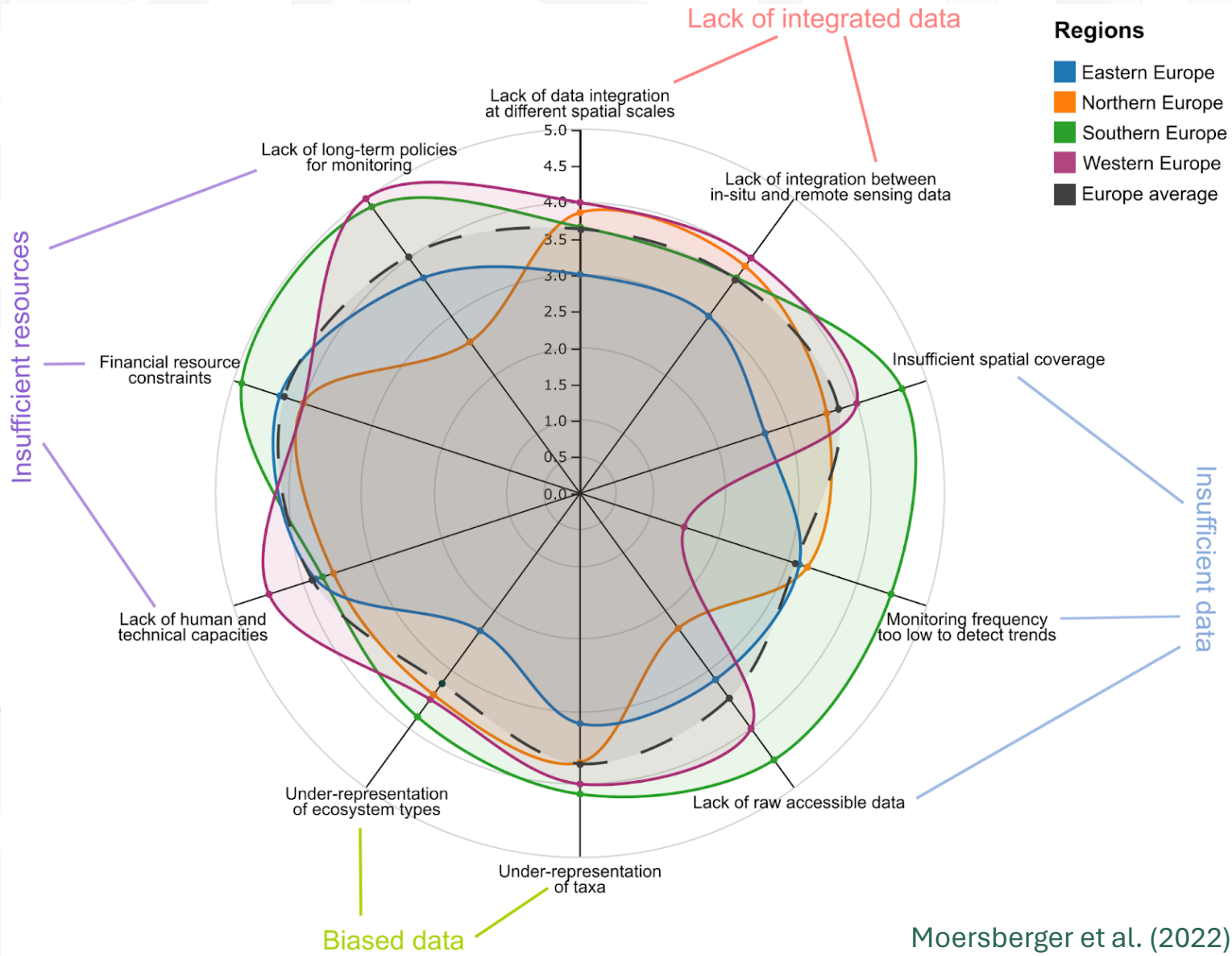
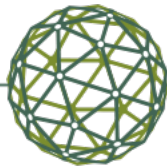


Proença et al. (2017) Biol. Con.

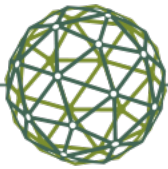
Taxonomic Bias



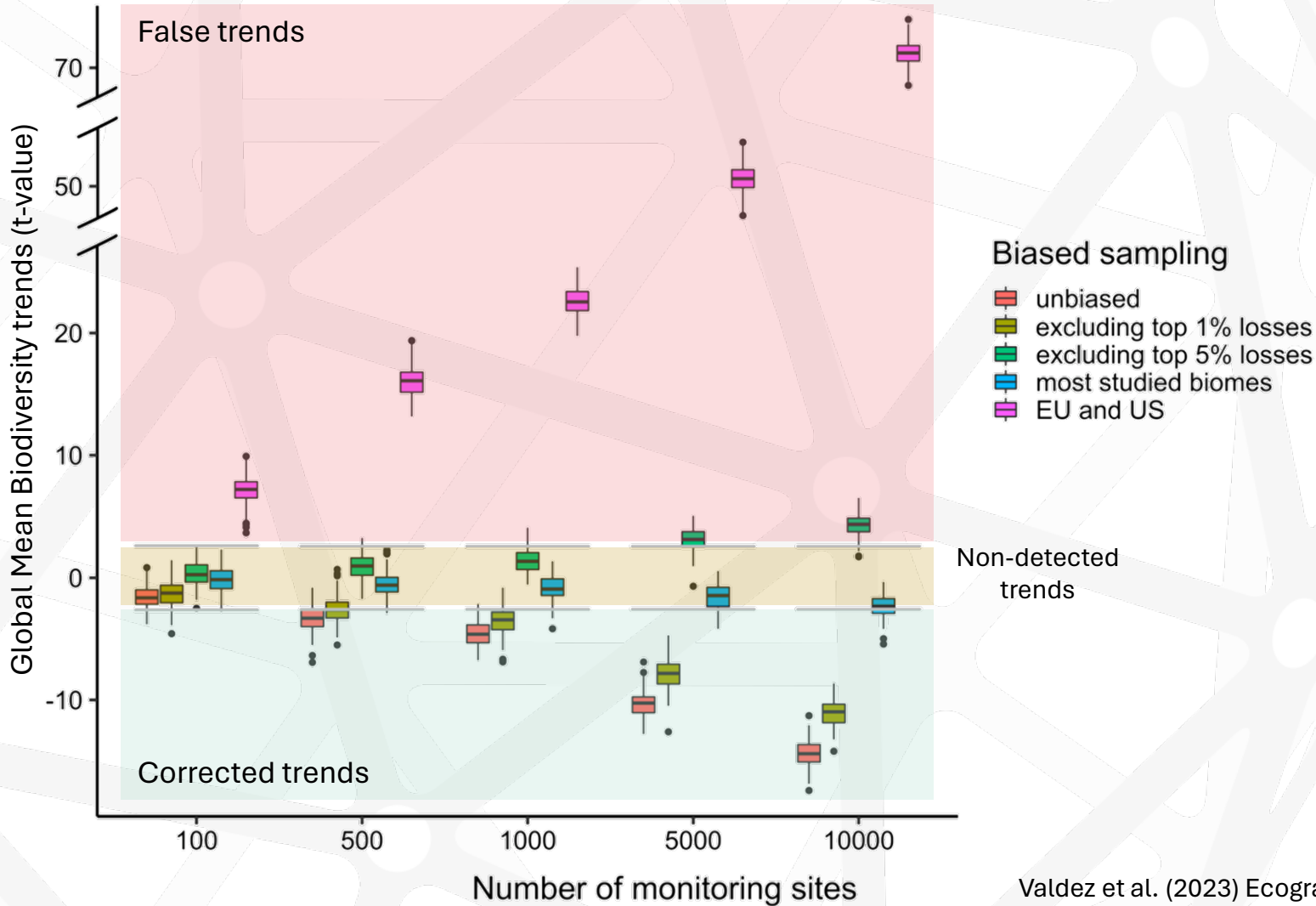
Troude et al. (2017) Scientific Reports



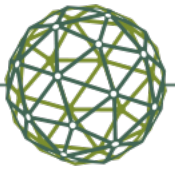
Moersberger et al. (2022)



Shortfalls in existing Biodiversity Data



Valdez et al. (2023) *Ecography*



The Essential Biodiversity Variables (EBV) Data Framework for Biodiversity Data

Standardised and coordinated Biodiversity Monitoring



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Minimum set of variables capturing major dimensions of biodiversity

Species-focused



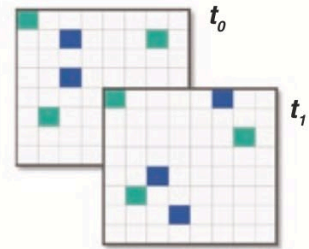
Genetic composition Species populations Species traits

Eco-system-focused

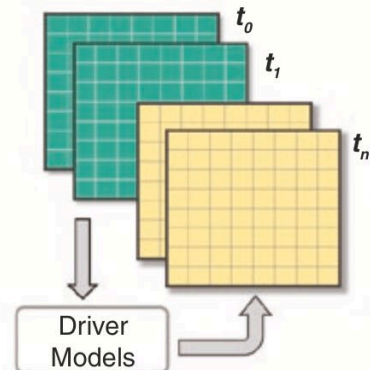


Community composition Ecosystem function Ecosystem structure

In-situ observations



Remote sensing observations and modeled drivers

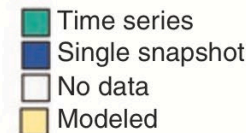
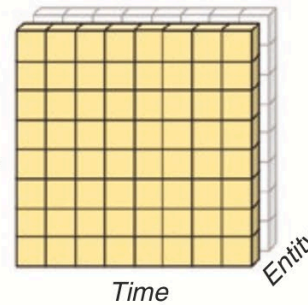


Calibration and Validation
(State variable)

Biodiversity model

Spatiotemporal predictors

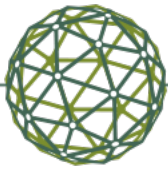
Estimated EBV



- (1) Where and how to monitor?
- (2) How to integrate data?
- (3) What models to use?

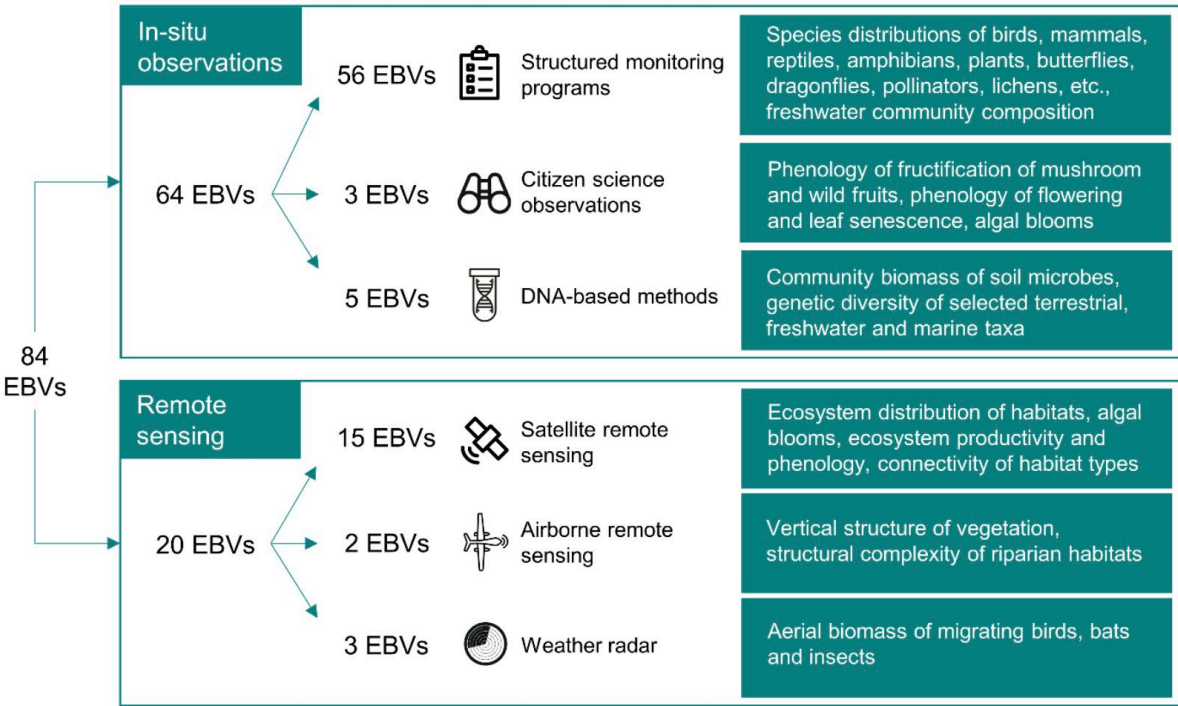
- (1) Which EBV are policy relevant?
- (2) What taxa and ecosystems?
- (3) What spatial and temporal resolution?

Fernández N. et al (2020) in Remote Sensing of Plant Biodiversity

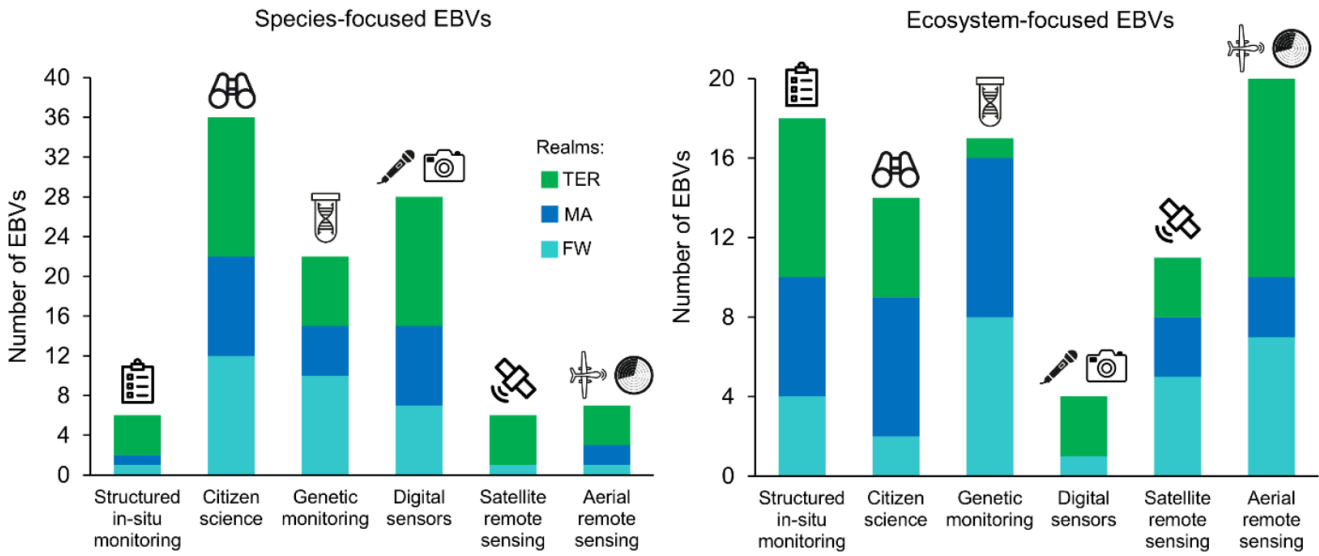


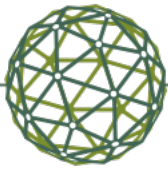
The role of emerging (and not so emerging) monitoring techniques

Primary monitoring techniques



As supplementary approaches



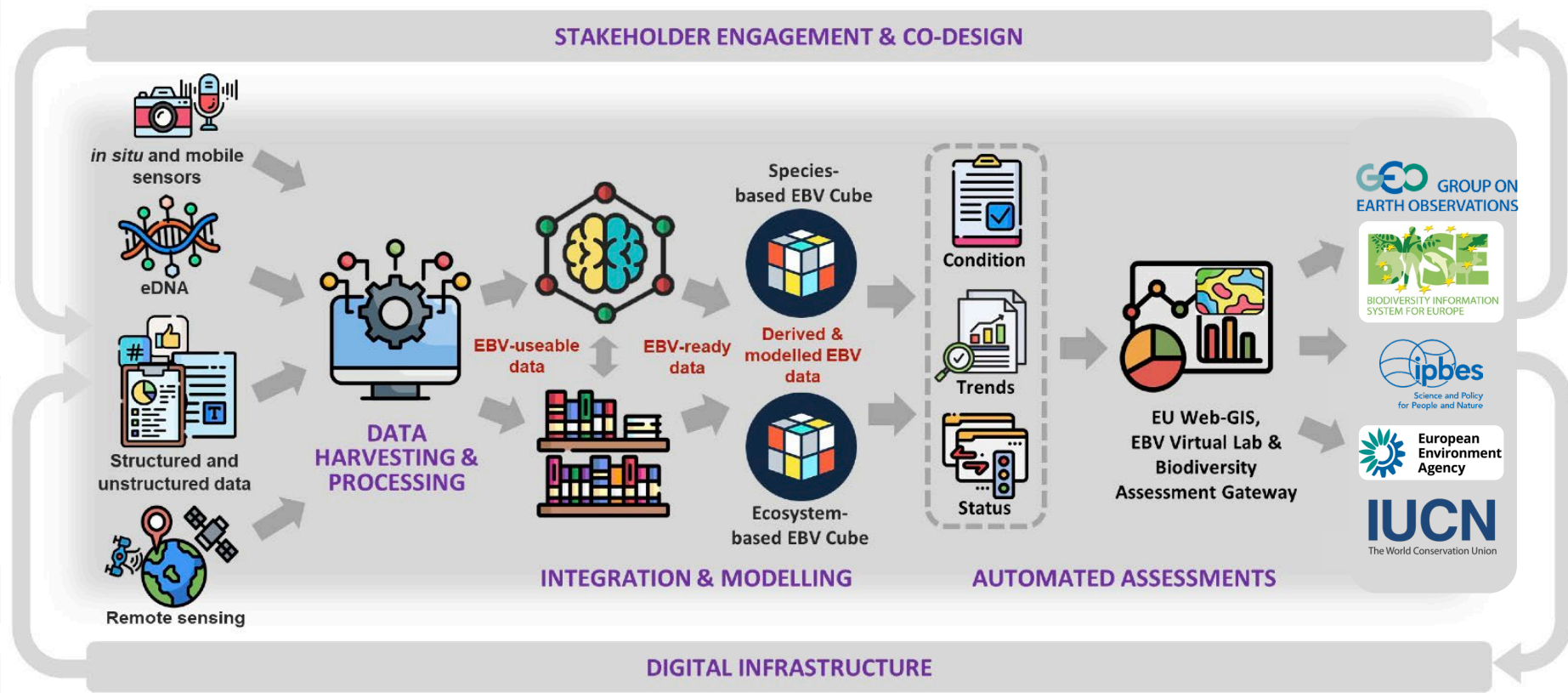


Biodiversity monitoring needs coordination

Assessment of users and policy needs, data gaps, models and tools

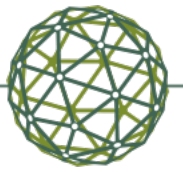
Coordinating existing Biodiversity monitoring schemes

Support: Funding opportunities, collaboration, reporting



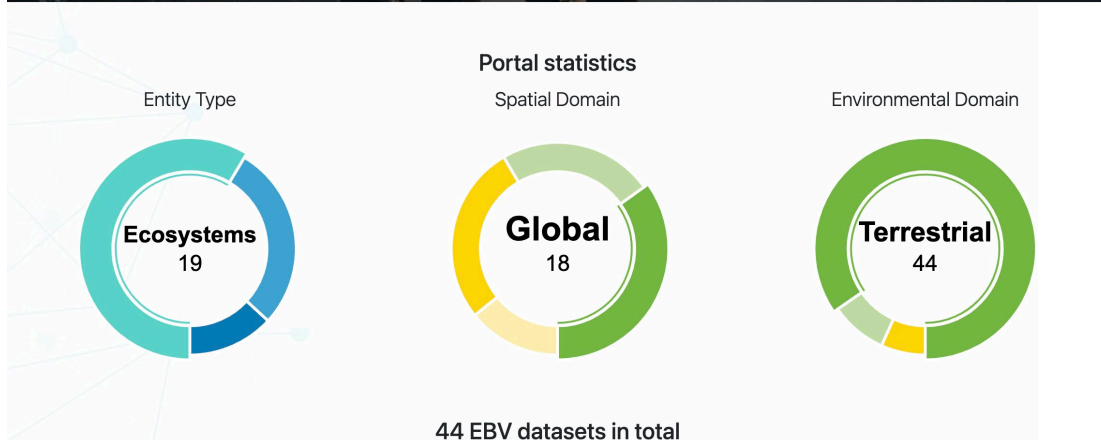
EBV Data Portal

Fernández M. et al. (in prep)



Findable, accessible, interoperable, reusable products: EBVs Data Portal

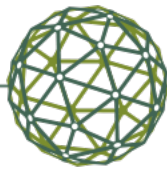
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Findable, accessible, interoperable, reusable products

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Europa Biodiversity Observation Network: integrating data streams to support policy Sort by: Publication date newest

Edited by Henrique Pereira, Jessica Junker, Andres Marmol-Guijarro, Joachim Maes

Observations are key to understand the drivers of biodiversity loss, and the impacts on ecosystem services and ultimately on people. Many EU policies and initiatives demand unbiased, integrated and regularly updated biodiversity and ecosystem service data. However, efforts to monitor biodiversity are spatially and temporally fragmented, taxonomically biased, and lack integration in Europe. EuropaBON aims to bridge this gap by designing an EU-wide framework for monitoring biodiversity and ecosystem services. EuropaBON harnesses the power of modelling essential variables to integrate different reporting streams, data sources, and monitoring schemes. These essential variables provide consistent knowledge about multiple dimensions of biodiversity change across space and time. They can then be analyzed and synthesized to support decision-making at different spatial scales, from the sub-national to the European scale, through the production of indicators and scenarios. To develop essential biodiversity and ecosystem variables workflows that are policy relevant, EuropaBON is built around stakeholder engagement and knowledge exchange (WP2). EuropaBON will work with stakeholders to identify user and policy needs for biodiversity monitoring and investigate the feasibility of setting up a center to coordinate monitoring activities across Europe (WP2). Together with stakeholders, EuropaBON will assess current monitoring efforts to identify gaps, data and workflow bottlenecks, and analyse cost-effectiveness of different schemes (WP3). This will be used to co-design improved monitoring schemes using novel technologies to become more representative temporally, spatially and taxonomically, delivering multiple benefits to users and society (WP4). Finally, EuropaBON will demonstrate in a set of showcases how workflows tailored to the Birds Directive, Habitats Directive, Water Framework Directive, Climate and Restoration Policy, and the Bioeconomy Strategy, can be implemented (WP5).

This collection only admits publications that are a direct product of the EuropaBON project.

doi [10.3897/rio.coll.145](https://doi.org/10.3897/rio.coll.145)

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EVW Workflows

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<https://doi.org/10.3897/arphapreprints.e128042>

Europa Biodiversity Observation Network:
Proposal for an EU Biodiversity Observation Coordination Centre (EBOCC)

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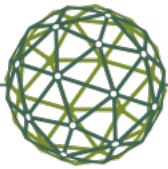
European Commission | Horizon 2020 European Union Funding for Research & Innovation

Europa Biodiversity Observation Network:
User and Policy Needs Assessment

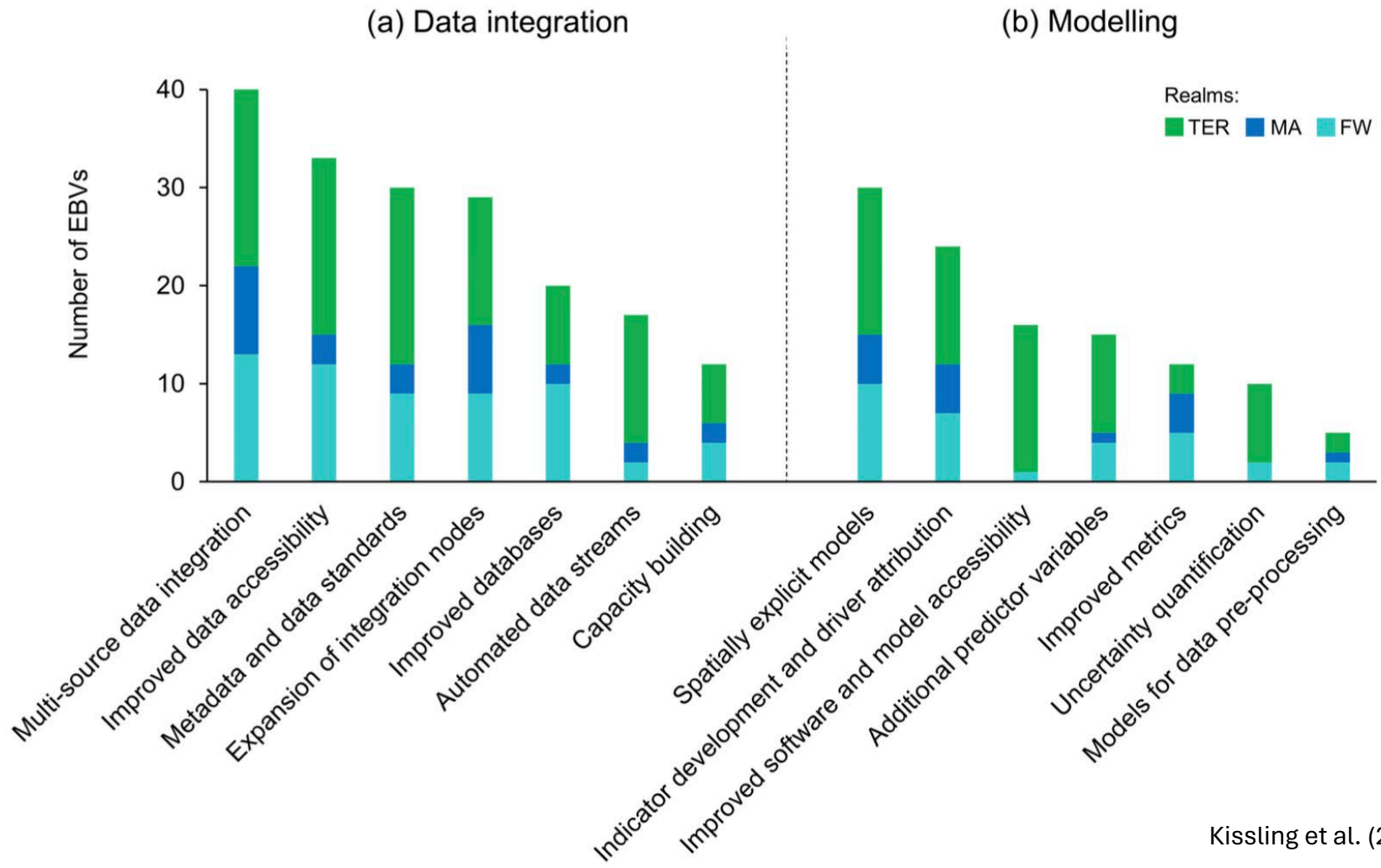
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<https://doi.org/10.3897/arphapreprints.e84517>



What is next...



Kissling et al. (2024)

THANK YOU



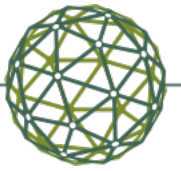
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