



Biodiversity Observations for Decision-Making



Mike Gill

GEO BON Co-Chair

UNEP WCMC Fellow

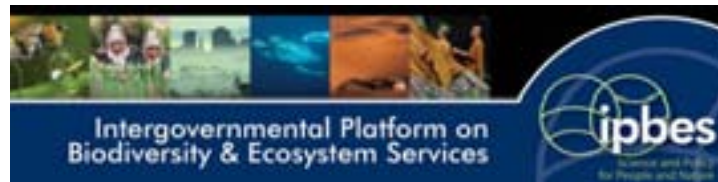
Spatial Data Workshop, Montreal, Canada
10.12.2017

www.geobon.org

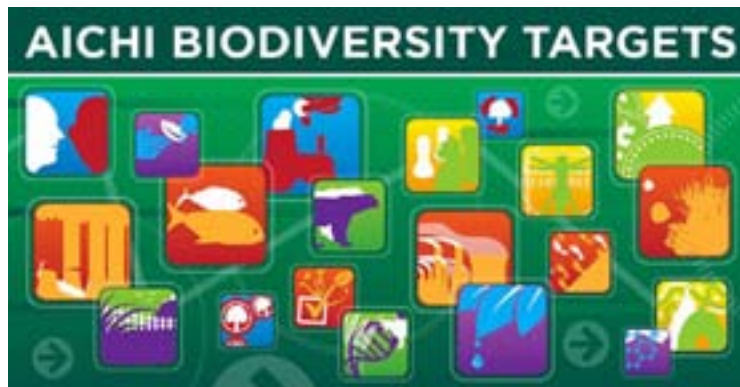
Political Commitment for Biodiversity



United Nations Decade on Biodiversity



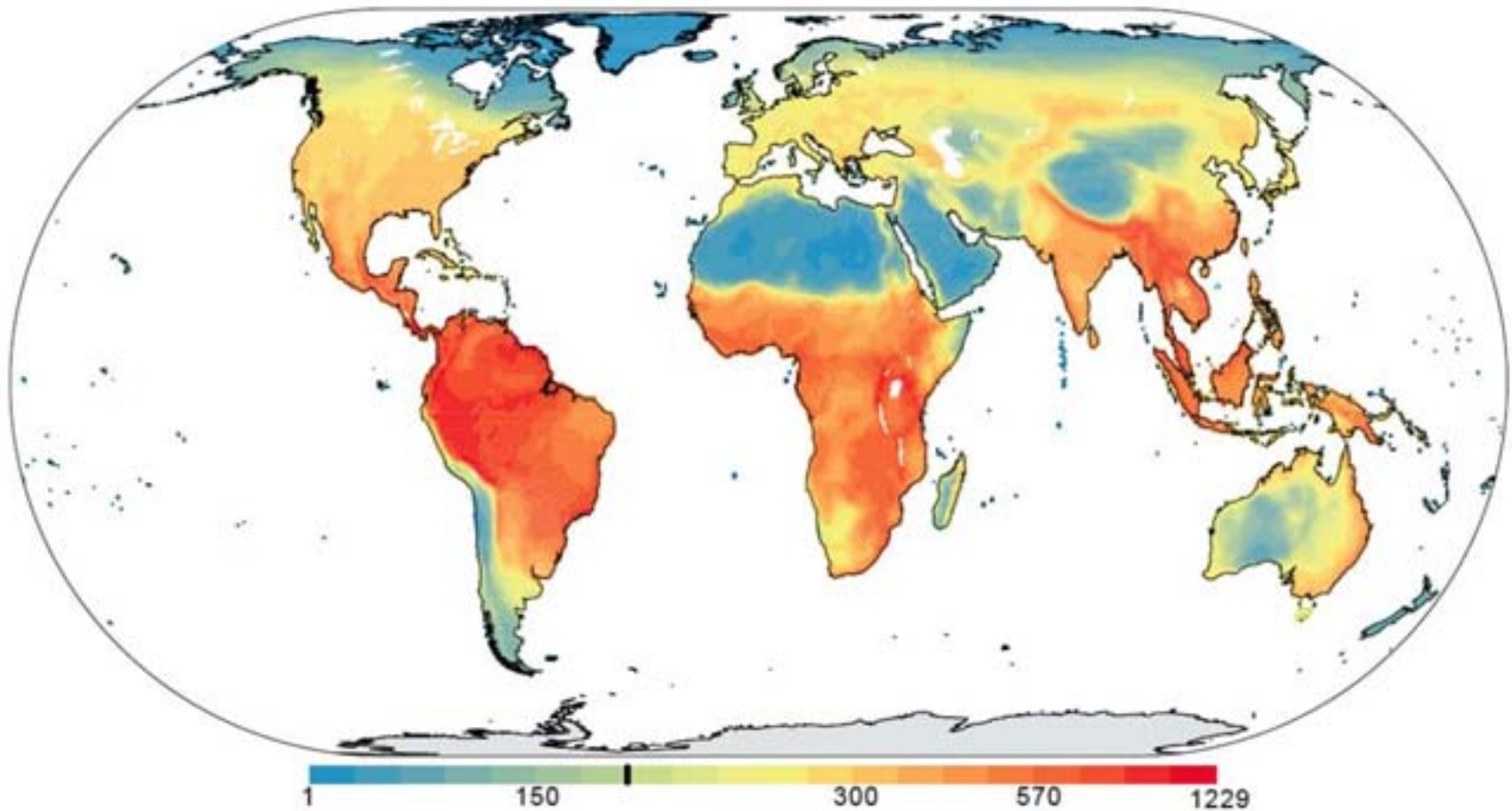
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SUSTAINABLE DEVELOPMENT GOALS



The paradox: spatial gaps in monitoring

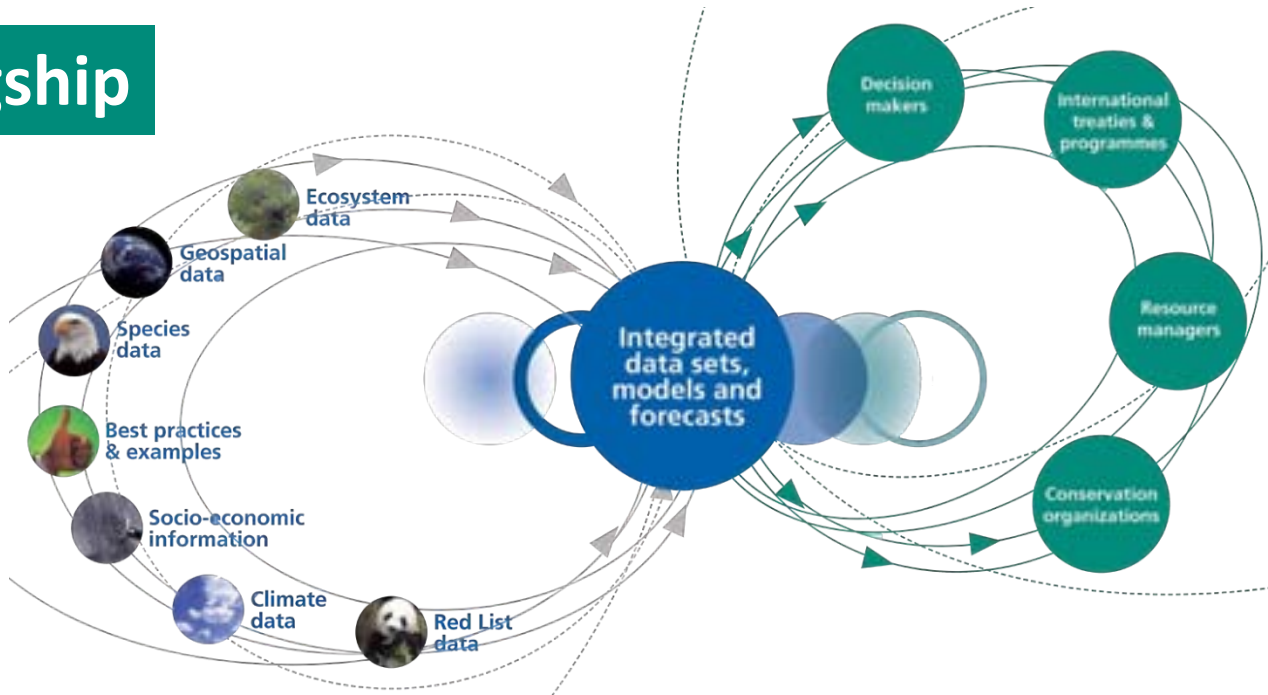


What is GEO BON?

Mission

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

GEO Flagship



Vision

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

A Global Partnership



Convention on
Biological Diversity



iDiv



UNIVERSITY OF AMSTERDAM



ITC
UNIVERSITY
OF TWENTE



International
Long Term
Ecological
Research



USGS
science for a changing world



esa



MOL
MAP OF LIFE

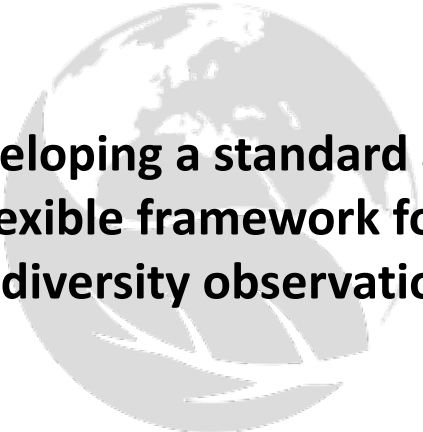


SASSCAL

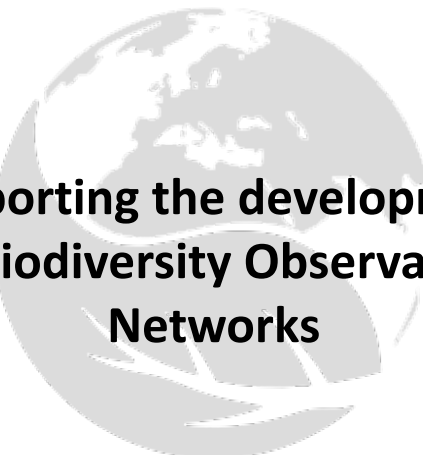
Southern African
Science Service Centre for
Climate Change and
Adaptive Land Management



GEO BON: Improving Coordination and Delivery of Biodiversity Observations



Developing a standard and flexible framework for biodiversity observations



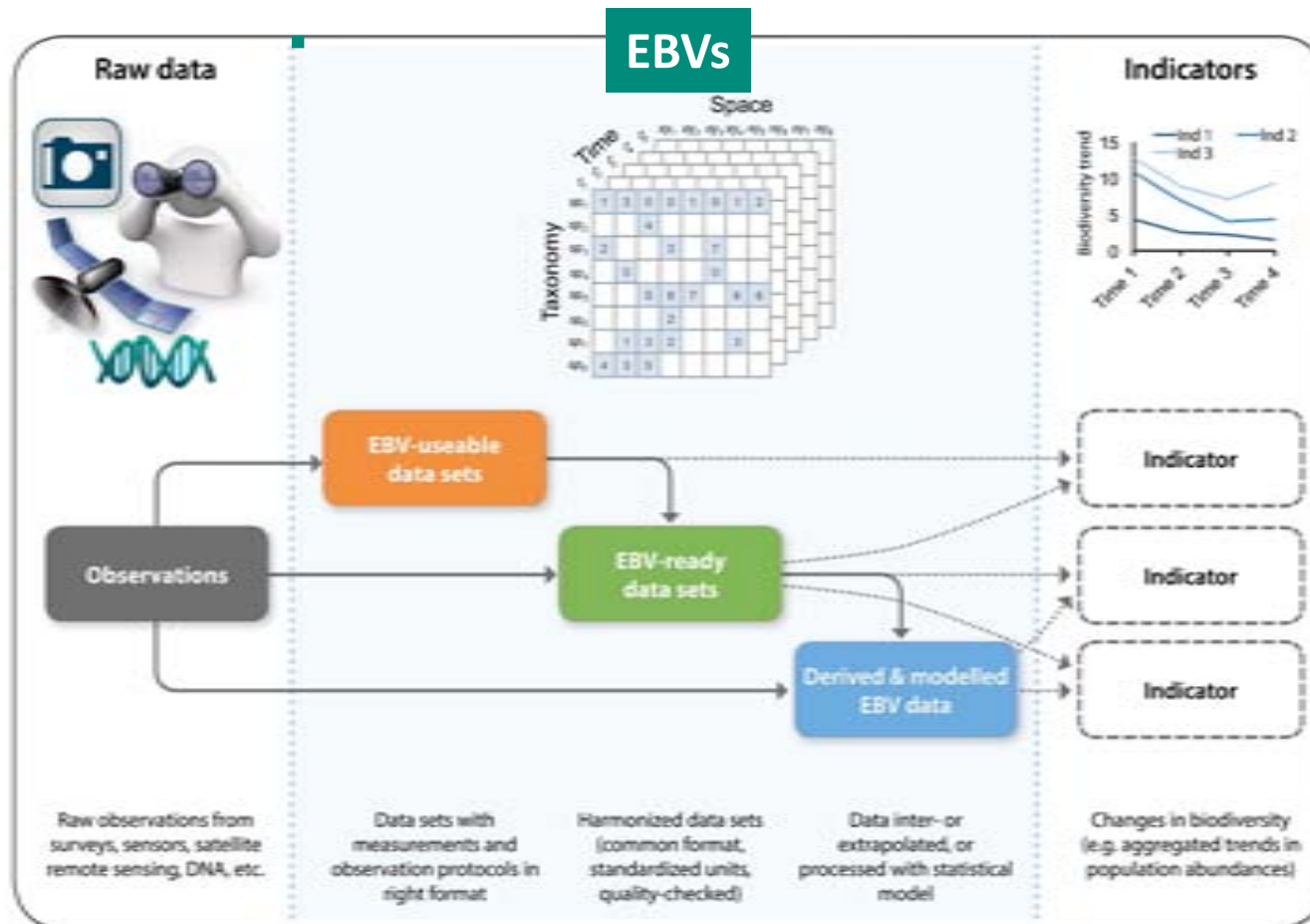
Supporting the development of Biodiversity Observation Networks



Producing Policy Relevant Outputs

Standard and Flexible Framework for Biodiversity Observations: the Essential Biodiversity Variables

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



Users

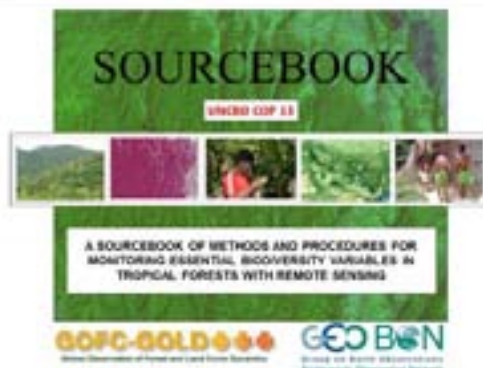
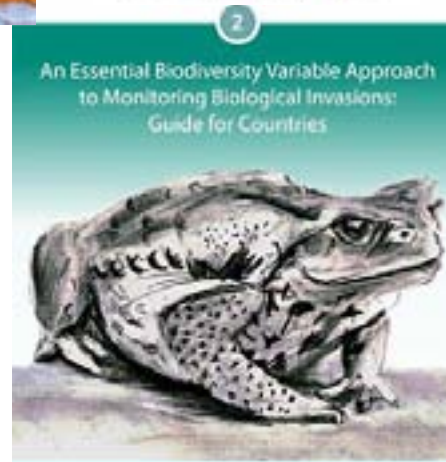
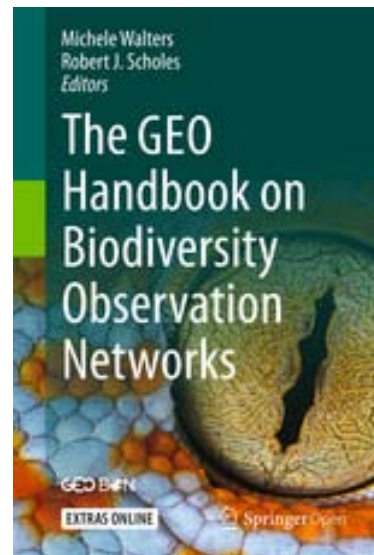
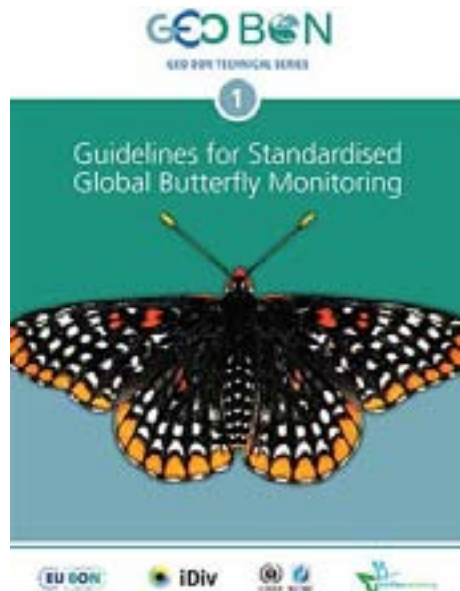
National Governments



CBD

SUSTAINABLE DEVELOPMENT GOALS

Developing a standard and flexible framework for biodiversity observations (EBVs)



TRACKING BIODIVERSITY

Ten variables

Proposed variables for satellite monitoring of progress towards the Aichi Biodiversity Targets.

Species populations

- Species occurrence

Species traits

- Plant traits (such as specific leaf area and leaf nitrogen content)

Ecosystem structure

- Ecosystem distribution
- Fragmentation and heterogeneity
- Land cover
- Vegetation height

Ecosystem function

- Fire occurrence
- Vegetation phenology (variability)
- Primary productivity and leaf area index
- Inundation

Supporting the Development of User-Driven Observation Networks

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

National and Regional BONs & Pilots

BON Design Manual



Thematic BONs
Marine BON (MBON)
Freshwater BON (FWBON)



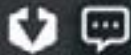
BON in a Box



BON in a Box: Improving Observation Capacity

GEO BON

BON IN A BOX Latinoamérica Region



Monitoreo

BON IN A BOX



Herramientas de
monitoreo
para necesidades
específicas

Better information on the status, trends and drivers of biodiversity change is needed to assist governments in developing more effective and timely policy responses. There are many **excellent tools, protocols and software** in use that facilitate effective biodiversity monitoring but these are not easily discoverable or available to all regions of the planet. As well, current efforts to monitor biodiversity are not interoperable, thereby limiting our ability to detect change and the underlying mechanisms driving change in biodiversity.

BON in a Box aims to serve 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.

BON in a Box is a **regionally customizable** and continually updated online toolkit for facilitating the start-up or enhancement of national or regional biodiversity observation systems

LA CAJA

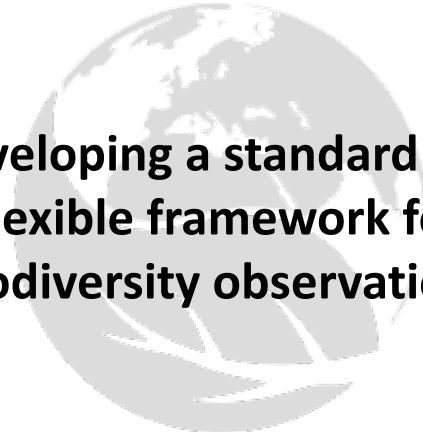
PÚBLICO

MOTIVO

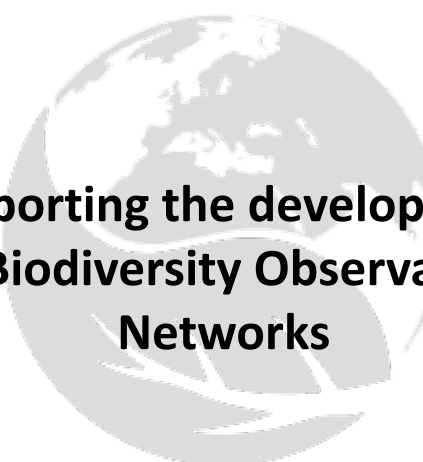
MANEJO

GEO BON

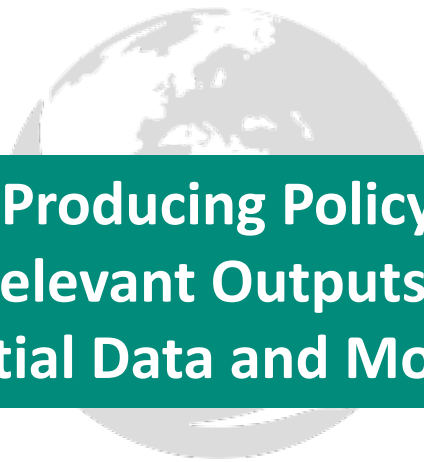
GEO BON core focus



**Developing a standard and
flexible framework for
biodiversity observations**



**Supporting the development
of Biodiversity Observation
Networks**



**Producing Policy
Relevant Outputs –
Spatial Data and Models**

Policy relevant outputs



Convention on
Biological Diversity

SUSTAINABLE DEVELOPMENT GOALS



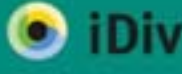
GEO BON

Global Biodiversity Change Indicators

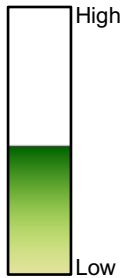
Model-based integration of remote-sensing & in situ observations
that enables dynamic updates and transparency at low cost



EBV model-based indicators: Integrating in situ and remote sensing observations

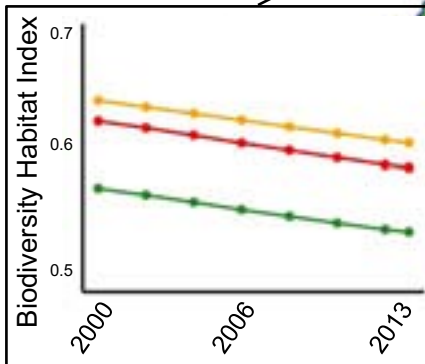
 Species Habitat Indices 			 Essential Biodiversity Variables: Species distributions Ecosystem extent and fragmentation
 Biodiversity Habitat Index 			Essential Biodiversity Variables: Ecosystem extent and fragmentation Taxonomic diversity
 Species Protection Index 			Essential Biodiversity Variables: Species distributions Ecosystem extent and fragmentation
 Protected Area Representativeness & Connectedness (PARC) Indices 			Essential Biodiversity Variables: Ecosystem extent and fragmentation Taxonomic diversity
 Global Ecosystem Restoration Index 			Essential Biodiversity Variables: Ecosystem extent Net primary productivity
 Species Status Information Index 			Essential Biodiversity Variables: Species distributions Taxonomic diversity

Biodiversity Habitat Index
(1km grid cells) - 2013

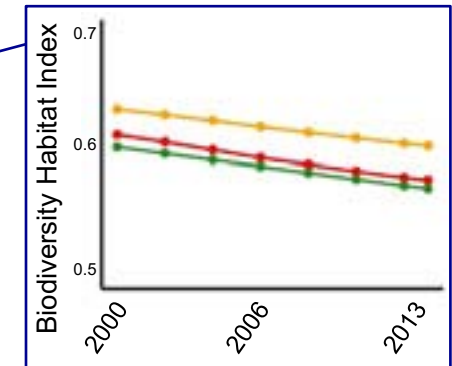


Hansen et al (2013)

Plants
Invertebrates
Vertebrates



Neotropical moist forest biome - Peru



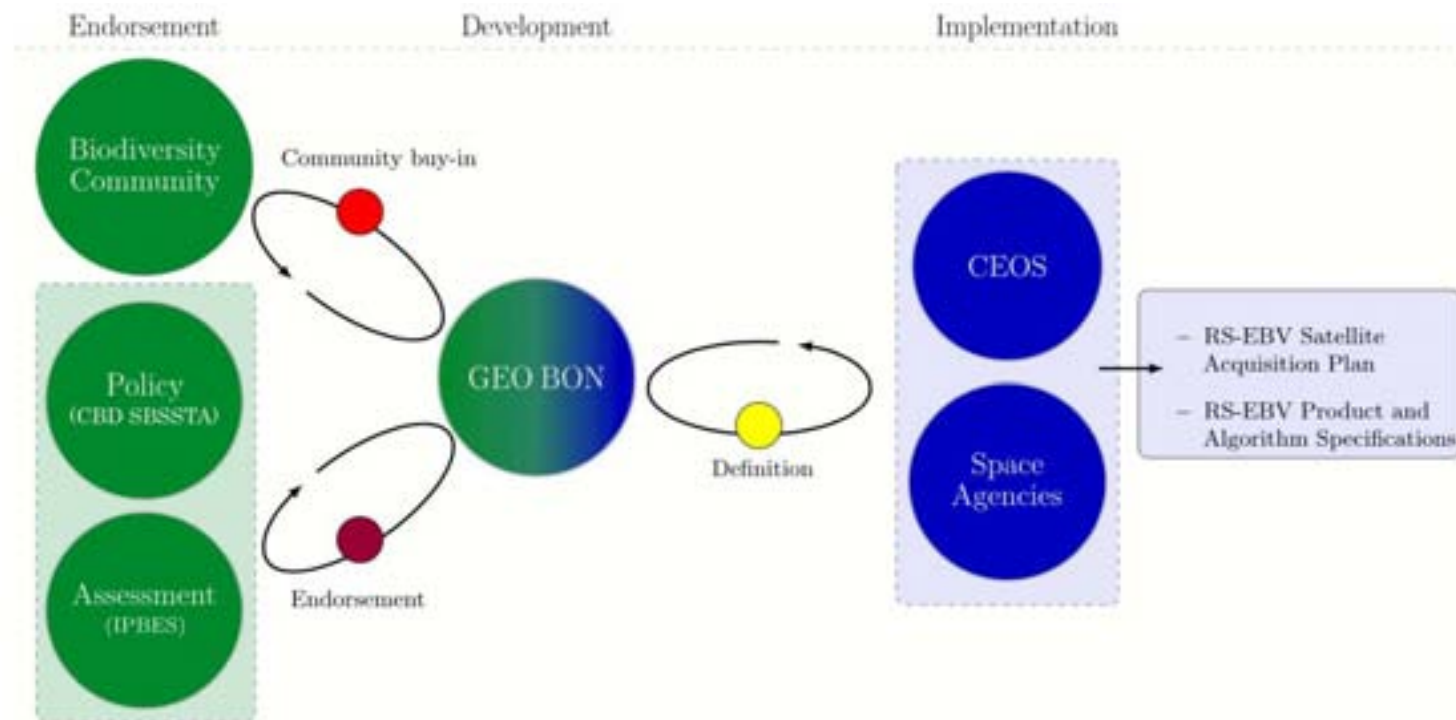
Neotropical moist forest biome - All



Policy relevant outputs: Remote Sensing Task Force



- Identify EBVs that can be produced using Remote Sensing
- Inform CEOS on the requirements for RS biodiversity observations
- Engage with users for feedback and "buy-in"



Delivery of biodiversity related products to end-users



BETA

GEO GROUP ON EARTH OBSERVATIONS

EBV SPATIAL BROWSER

GEO BON

Basemaps

- Basemap Light Carto
- GlobalBaseMap DigitalGlobe

Overlays

- WDPA
- Tree Cover Loss 2014

Map of Europe showing EBV spatial data overlays.

EBV

Based on a consensus process among a diverse body of experts, GEO BON proposes 6 EBV Classes with relevant EBV Candidates. You can view for 4 EBV classes a selection of datasets that closely align to the EBVs framework concept. Our team is continuously updating this list as more datasets become available. If you would like to suggest additional datasets to be included in this dynamic list please contact us at info@geobon.org

Please find more information about EBVs on www.geobon.org/ebvs

- EBV class: Species populations
- EBV class: Species traits
- EBV class: Ecosystem function
- EBV class: Ecosystem structure

geobon.org | OpenStreetMap, CARTO

WORK IN PROGRESS

BIP Dashboard: Visualization of Biodiversity Indicators – Global to Regional to National to Watershed

The Biodiversity Indicators Dashboard provides analysis, **visualization**, and **communication** of datasets on biodiversity status and trends



Human Global Footprint score, watershed scale

<http://dashboard.natureserve.org/>

Merci-beaucoup!



GROUP ON
EARTH OBSERVATIONS

| GEO BON