How does ecological risk relate to commercial risk?

Welcome

Sir Partha Dasgupta FRS

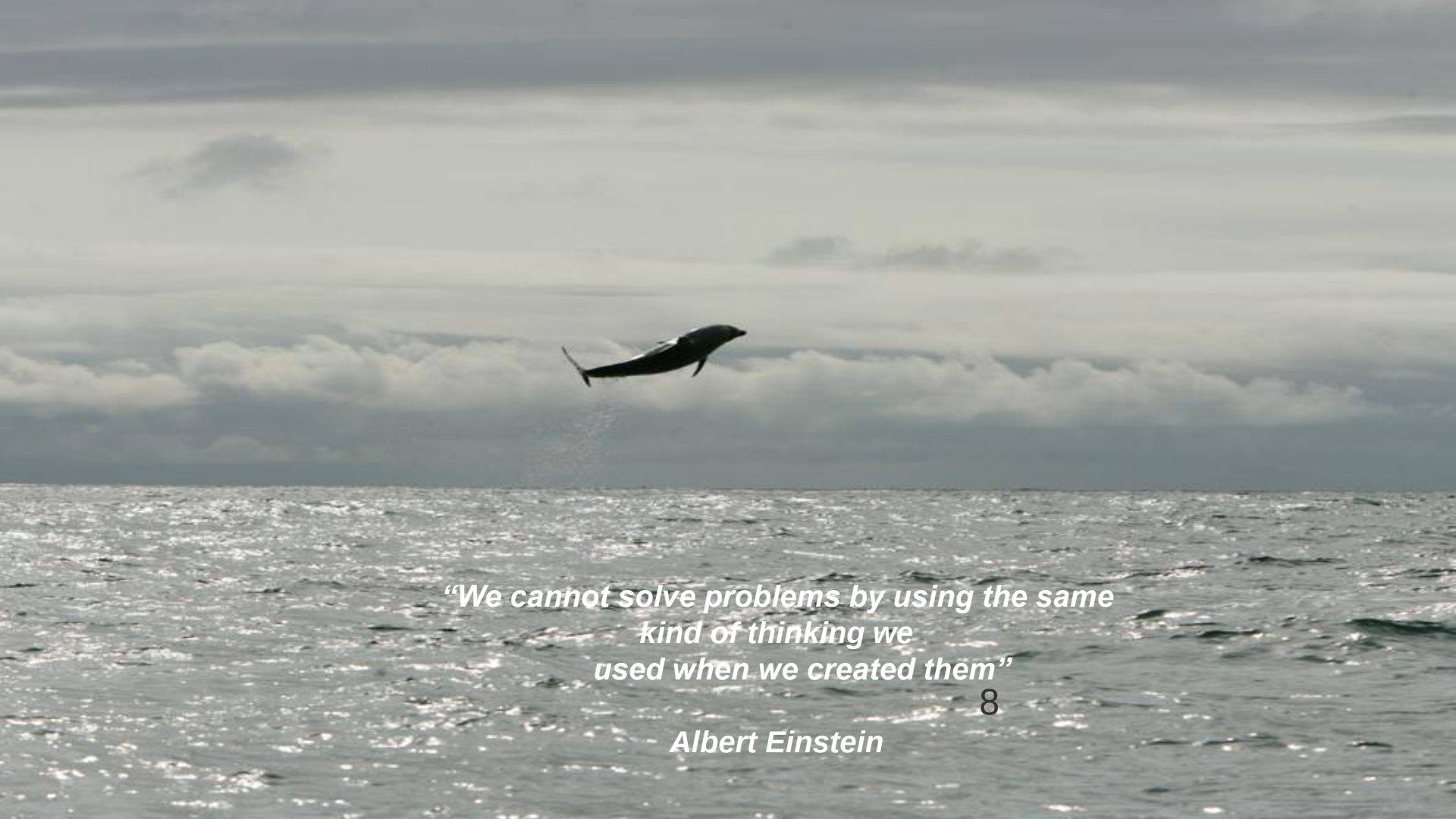
THE ROYAL SOCIETY

Investment and supply chain perspectives on the causes of and responses to nature loss

Chair: Dr Sally Uren OBE
Dr Helen Crowley
Snorre Gjerde

THE ROYAL SOCIETY

	End of life	Use phase	TIER 0 Stores, warehouses, offices	TIER 1 Assembly	TIER 2 Manufacturing	TIER 3 Raw material processing	TIER 4 Raw material production	TOTAL
AIR EMISSIONS								8% €48M
	10 T	2 249 T	3 947 T	989 T	1 744 T	1 918 T	6 347 T	17 204 T
GHGs								37% €206M
	8 814 TCO_2	229 711 TCO_2	477 398 TCO_2	154 548 TCO_2	243 006 TCO_2	265 671 TCO_2	1 002 842 TCO_2	2 381 991 TCO_2
LAND USE								31% €172M
	0 Ha	194 Ha	3 081 Ha	3 287 Ha	3 242 Ha	1 722 Ha	288 146 Ha	299 673 Ha
WASTE								6% €35M
	3 807 T	48 415 T	122 578 T	156 838 T	243 259 T	79 051 T	37 932 T	691 879 T
WATER CONSUMPTION								6% €35M
	4 dam^3	3 530 dam^3	16 374 dam^3	5 591 dam^3	6 688 dam^3	5 127 dam^3	18 617 dam^3	55 977 dam^3
WATER POLLUTION								12% €67M
	0 T	141 T	563 T	89 T	88 T	324 T	3 085 T	4 290 T
TOTAL IN MILLIONS	0,2% €1	7% €39	14% €77	5% €28	8% €43	9% €53	57% €322	100% **€562M**


“We cannot solve problems by using the same
kind of thinking we
used when we created them”
Albert Einstein

THANK YOU

Photo credits & thanks:
Julie Larsen Maher, WCS
David Lees,
Stuart Anstee, S+A
Howard Rosenbaum, WCS
Beth Wald

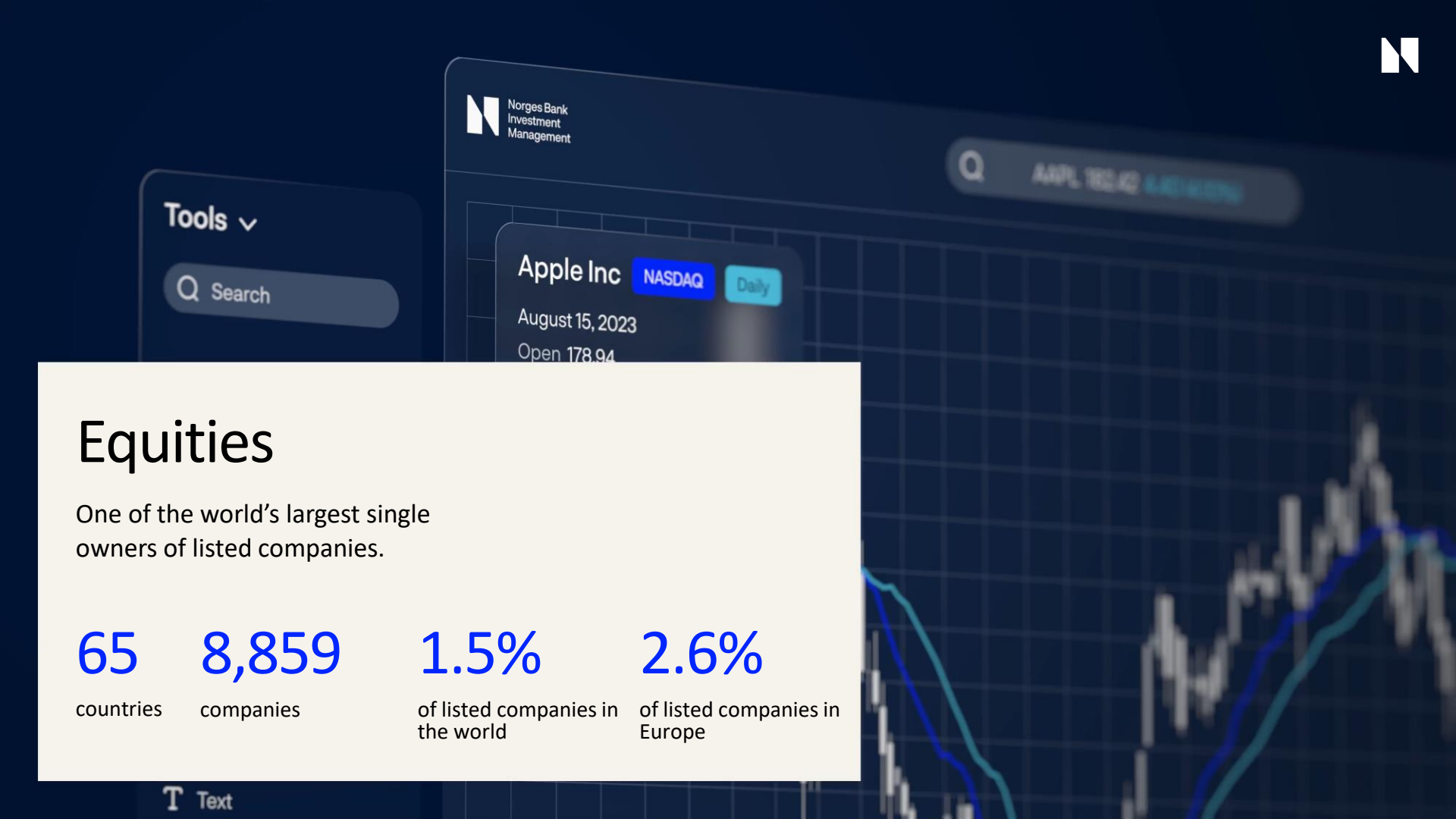
Norges Bank Investment Management

04.10.2024

Nature risk – an investor viewpoint

The Royal Society's seminar on ecological and commercial risk

Snorre Gjerde – Lead Investment Stewardship Manager
Norges Bank Investment Management



Equities

One of the world's largest single owners of listed companies.

65
countries

8,859
companies

1.5%
of listed companies in the world

2.6%
of listed companies in Europe

Building standards to promote well-functioning markets

Clear positions and expectations


Norges Bank Investment Management

Corporate sustainability reporting

Position paper

Norges Bank Investment Management position

1. The board should ensure that company reporting reflects all material sustainability risks and opportunities. Disclosures should cover all financially relevant sustainability matters and account for any significant environmental and social consequences of company operations.
2. The board should provide shareholders with quantitative sustainability information on a regular basis. Sustainability disclosures should include indicators of exposure, management and performance, and be reported at least annually, including in financial statements as appropriate.
3. The board should base corporate sustainability reporting on established international frameworks and standards. The board should as a starting point consider the industry specific SASB metrics and base broader disclosures on the GRI[1].

Frameworks & standards

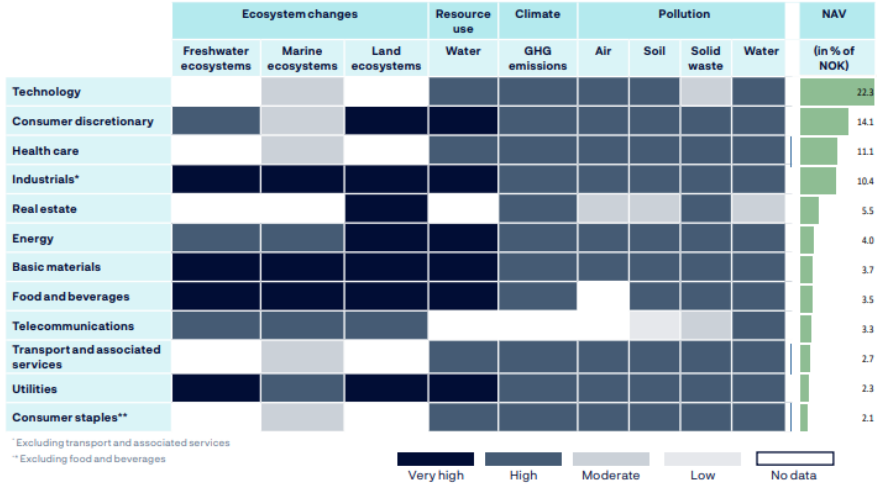
ISSB

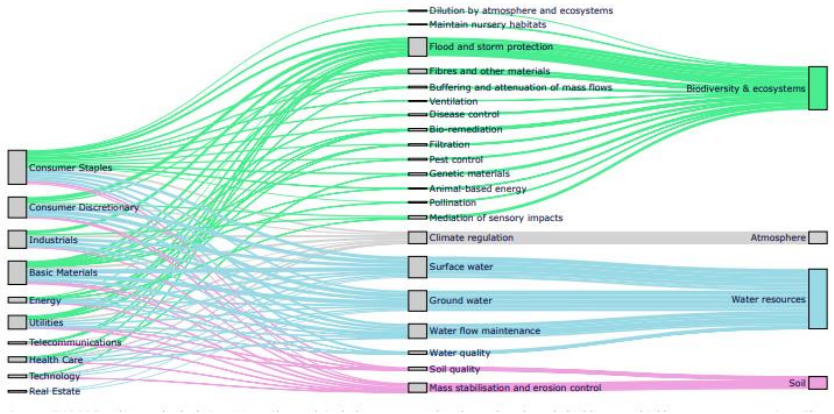
TNFD Taskforce on Nature-related Financial Disclosures

Consultation on the GRI Biodiversity Standard Exposure Draft

Letter to the Global Sustainability Standards Board, 28 February 2023.

Analysing portfolio impacts and dependencies on nature





Sector impacts on ecosystems

Source: ENCORE and internal calculations

Note: Heatmap illustrates the maximum materiality rating in each sector. Sectors sorted by Net Asset Value in NOK for NBIM's equity portfolio as per 31.12.2023.

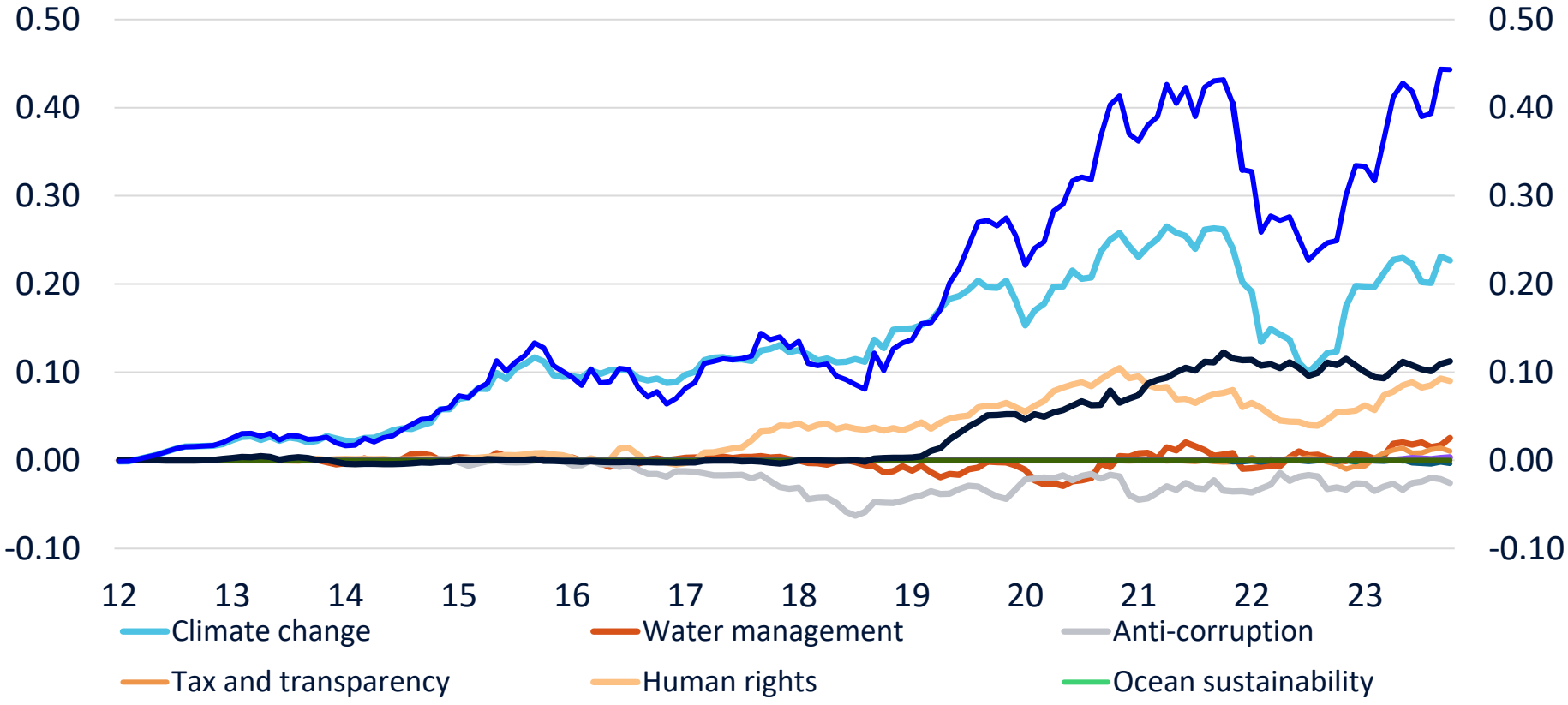
Sector dependencies on ecosystems

Source: ENCORE and internal calculations.

Note: Chart only includes processes that depend moderately, highly or very highly on ecosystem services. The thickness of the lines represents the number of processes

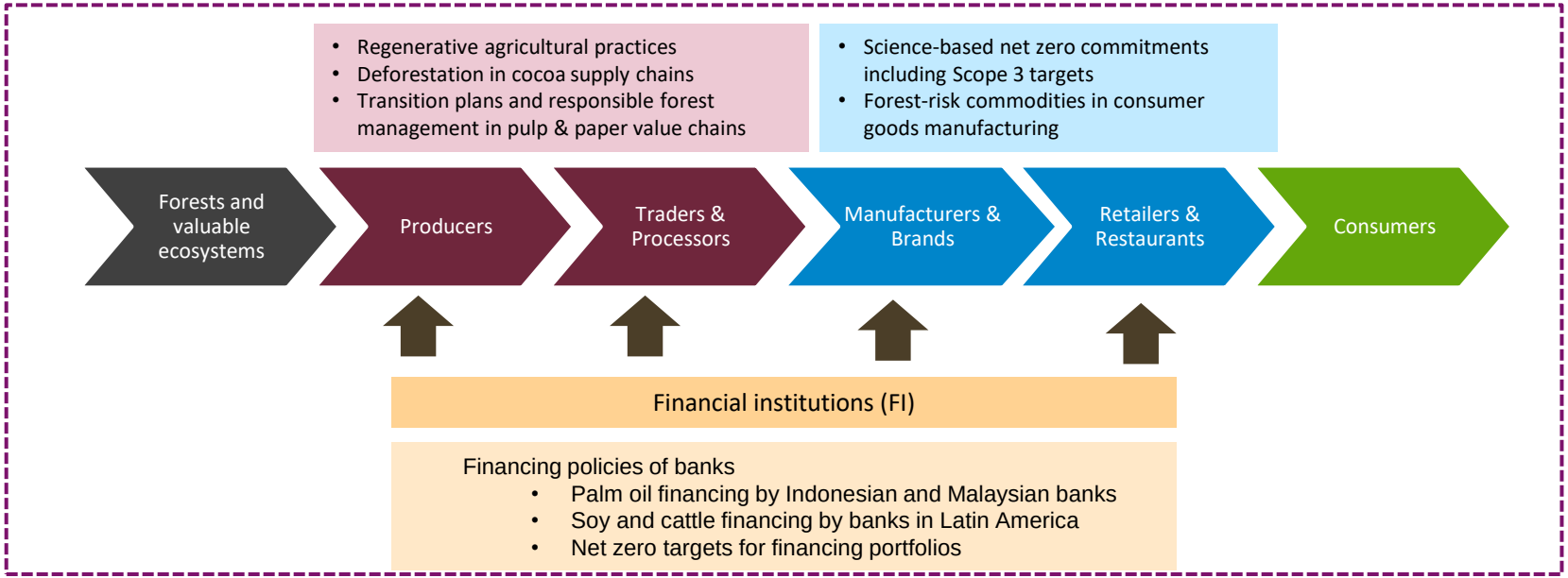
Portfolio adaptations to ensure resilience

Return impact of risk-based divestments on the equity reference portfolio. Measured in dollars. Percentage points.



Engaging across industries and value chains

Focal topics in proactive dialogues on deforestation risk



09.10.2024

Norges Bank
Investment
Management

Metrics for business use: What is and is not possible?

Neil Burgess, Chief Scientist

UN environment programme

WCMC

Metrics – what are we trying to measure?

Metrics : What changes do we envisage in Business through use of metrics

Faster,

Better,

More accurate,

Understanding of Biodiversity Risk

Enhanced,

More accurate,

And more insightful,

Understanding of Biodiversity Dependency

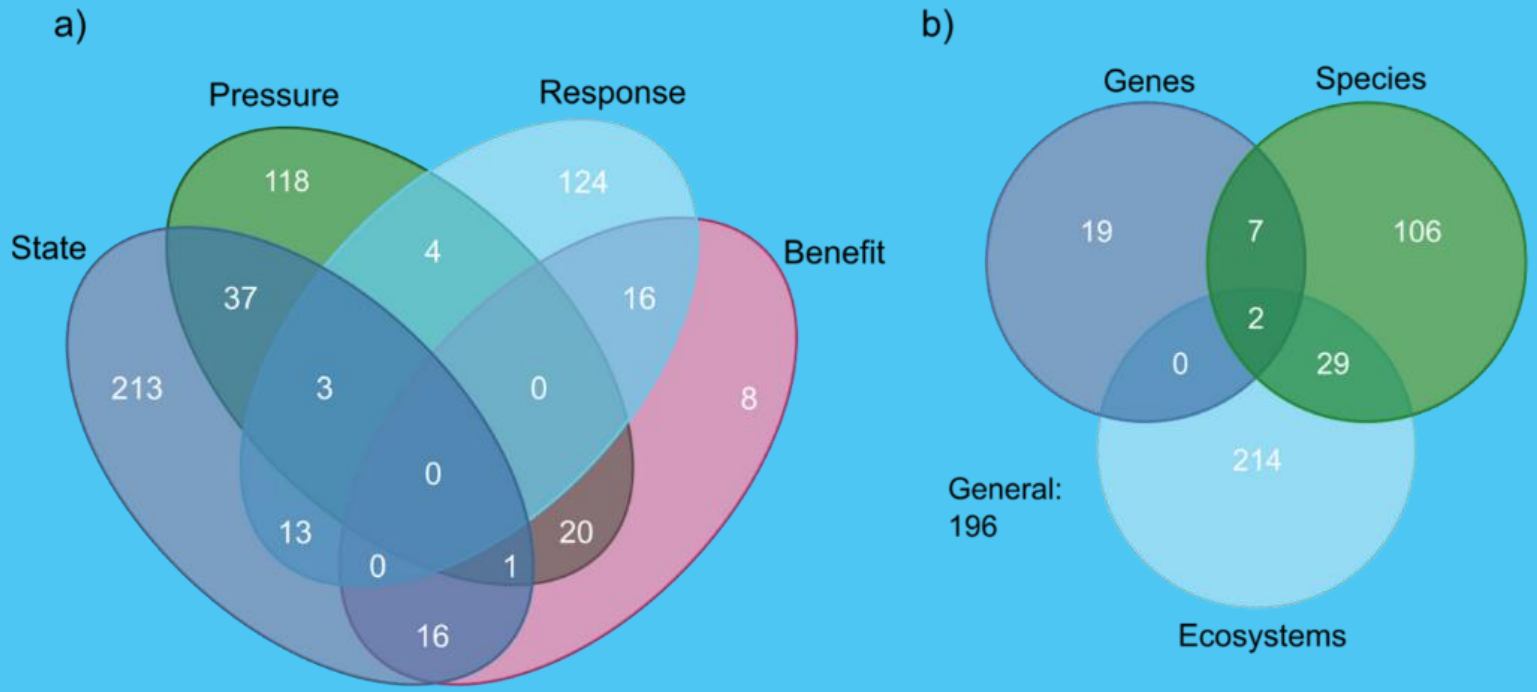
Accountability,
Transparency,
Ambition,
Through clear target setting

Responding,
Action,
Reporting,
Using established guidance (TNFD, SBTN, EUDR …)

Our Terrestrial Metrics "Database"

Metric	Responsible Institution	Time series (e.g. 1985-2019)	Frequency of update (e.g. annually, monthly)	Static (S) or Temporal (T) Data Layer, or Not Available /Applicable (N	Pressure (P), State(S), Response (R), Benefit (B)	Genes (G), Species (S), Ecosystems, General	Top-down (T), Bottom-up (B), Neither (0), Unknown (U) [State metrics only]	Significance (S), Intactness (I), Neither (0), Unknown (U) [State metrics only]	Business Use	Global indicator can be disaggregated for national use (Y/N)	National data aggregated to form global indicator (Y/N)	National Methodology Available (Y/N)	SDG indicator (Y/N)	CBD GBF indicator (headline, component, complementary)	Indicator used to measure other MEAs or processes (e.g. Ramsar, IPBES, CMS)	Disaggregated by sex or gender-specific	Citation	Resource 1	Resourc
Biodiversity Hotspots Revisited		2016		S	S	S,E	T	S	N					N			Michael Hoffman, Kellee Koenig, Gill Bunting, Jennifer Costanza, & Williams, Kristen J. (2016)	https://zenodo.org/record/3261807#.YlffVyjMKUk	
Biodiversity Impact Metric (BIM)	Cambridge Institute for	-	-	S	S	S,E	T	S,I	Y	N	N	N	N	N	N	N	University of Cambridge I	https://www.cisl.ca	https://w
Biodiversity Indicator and Reporting System (BIRS) Index	IUCN	-	-	S	S	GENERAL	B	S,I	Y					N			IUCN (2014). Biodiversity	https://portals.iucn.org/library/r	
Biodiversity Intactness Index	Natural History Museum (UK)	1900-2010 (global) 2000-2014 (tropical forest)	1900-2010 (global) 2000-2014	T	S	S	T	I	Y	Y	N	Y	N	Complementary	IPBES	N	Newbold, T. et al. (2016) 'Has land use pushed terrestrial biodiversity beyond the planetary boundary? A	https://www.sciencedirect.com/science/article/pii/S0065250417300284	https://w indicator ndicators ersity-intactnes
Biodiversity Intactness Index Change 2000-2015	UNEP-WCMC, University College London, Natural History Museum, Imperial College	2000 - 2015	v1	T	S	S,E	T	I	Y					N			Newbold, T., Hudson, L.N., Arnell, A.P., Contu, S., Palma, A.D., Ferrier, S., Hill, S.L.L., Hoskins, A.J.		
Biodiversity Metric 4.0	Natural England & UK	-	-	S	S	S,E	B	I	Y					N			Natural England and oth	https://nepubprod.app	http://ne
Biodiversity Performance Index (BPI)	Center for Sustainable	-	-	S	S	S,E	T	I	Y					N			McElroy, M.W. and A. V	https://www.researchgate.net/p	
Biofuels Development Potential Index		2019		S	P	GENERAL			Y?					N			Oakleaf, James; M. Kennedy, Christina; Baruch-Mordo, Sharon; Gerber, James; C. West, Paul; Johnson	https://doi.org/10.6084/m9.figshare.c.4249532.v2	
Biomass Carbon Stock of Global																	Xia, J. et al. Spatio-Temporal Patterns and		

How many Terrestrial Metrics = 573



How many are for business use?
= 23+

- Agrobiodiversity Index (ABDI)
- Biodiversity Impact Metric (BIM)
- Biodiversity Indicator and Reporting System (BIRS) Index
- Biodiversity Intactness Index
- Biodiversity Intactness Index Change 2000-2015
- Biodiversity Performance Index (BPI)
- Biofuels Development Potential Index
- Ecosystem Integrity Index (EII)
- GLAD Deforestation Alerts
- IFC PS6 Natural and Modified Habitat Screening Layer
- IUCN Rarity-Weighted Richness
- LBI (Long Term Biodiversity index)
- Mean regional bird diversity (cSAR)
- Mean Species Abundance (MSA)
- NatureMap: Rarity-weighted richness
- Number of companies publishing sustainability reports
- Number of companies that have incorporated the BioTrade Principles & Criteria into their business practices
- Potentially disappeared fraction (PDF)
- Protected area coverage
- Red List Index
- SEED Biocomplexity Index
- Species Threat Abatement and Restoration Metric
- Water Risk Filter
- Change in habitat area
- Change in habitat condition

Missing

- Genetic changes
- Benefits to people

Key messages: Scientists can help businesses to understand what metrics are best suited to measuring and managing their nature related risks, the reliability of the data that underpins these metrics, and where new technologies can help address current measurement challenges.

Towards a Handful of Terrestrial Metrics for Business and Country use = 16?

	Genes	Species	Ecosystems
e	EDGE	STAR	Extent of natural
ificance)		RLI	RLE
e	-	LPI	BII/EII
ctness)			MSA/ PDF/cSAR
	-	$STAR_T$	HFI
	-	$STAR_{T \text{ and } R}$	PA coverage
		GSSI	
nefits	-	-	Forest Carbon Flux

Edge of Existenc e

Red List Index

Living Planet Index

Species Threat Abatement and Restoration metric

Status of

Red List of Ecosyste

Biodivers ity Intactnes s Index

Species Abundan ce

Human Footprint Index

Ecologic al Integrity Index

y Disappe

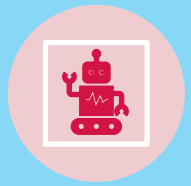
countrysi de Species Area Relation shin

What next for Metrics?

INCREASING IMPORTANCE OF NATIONAL METRICS,

WIDER UPTAKE OF BUSINESS METRICS,

AGREEING A MINIMUM SET OF METRICS FOR GOVERNMENT AND BUSINESS



AUTOMATION OF METRIC CALCULATION THROUGH USE OF TECHNOLOGY,

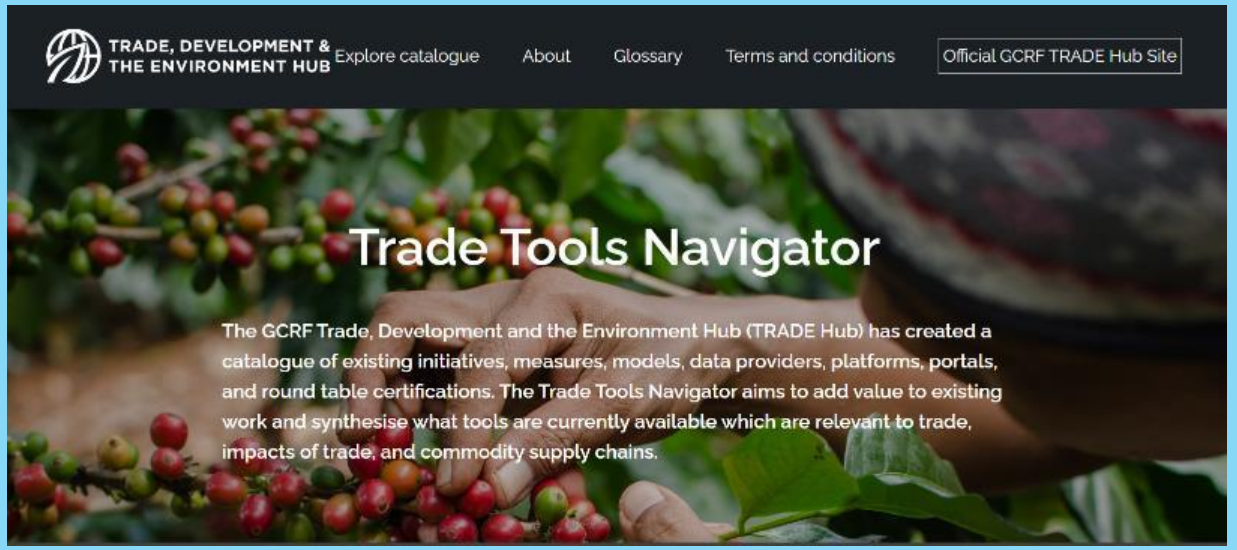
SOLVING CHALLENGE OF SUSTAINABLE FUNDING FOR METRIC PRODUCTION AND DISSEMINAT

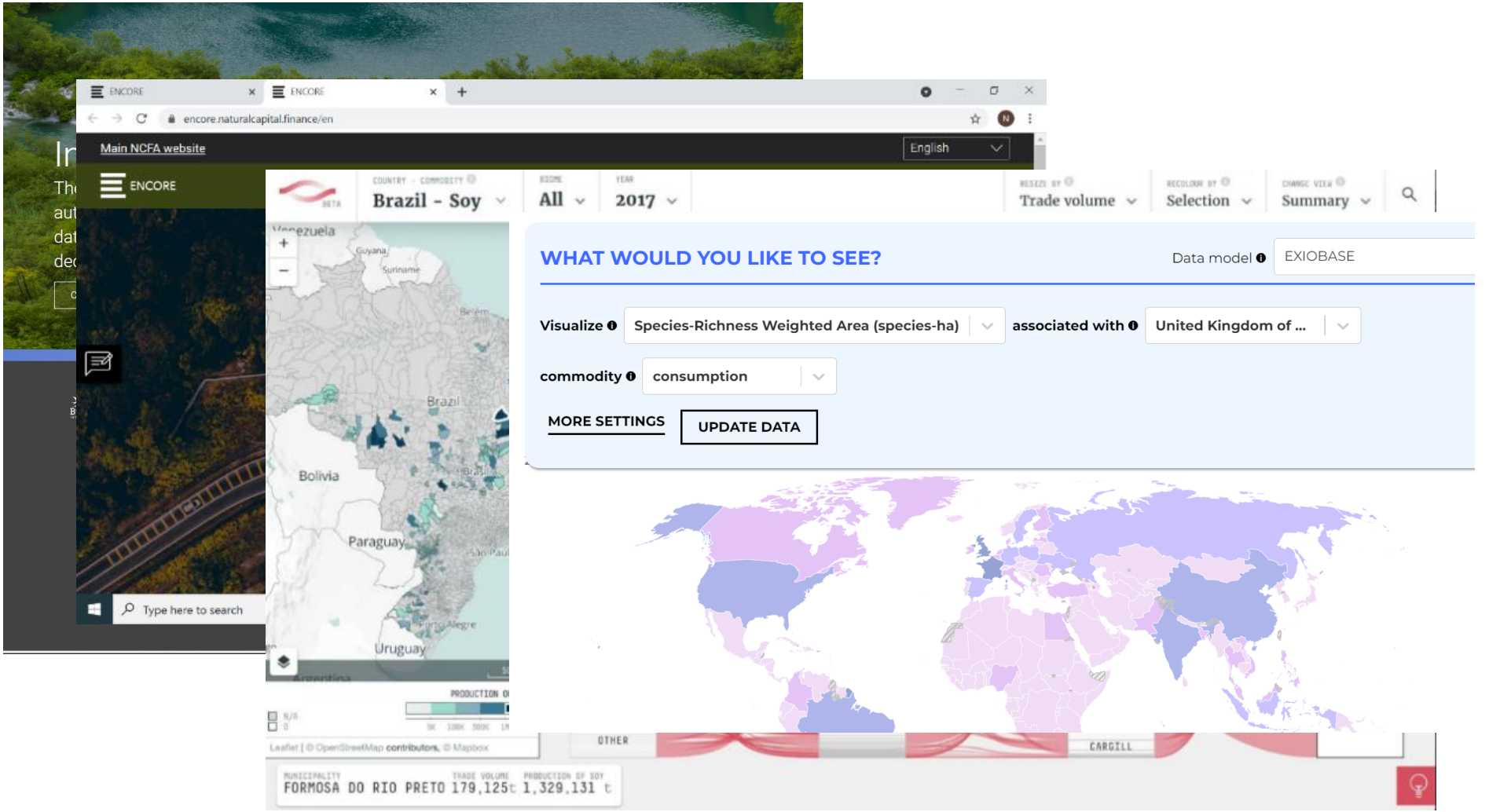
Making metrics available : Review of all global nature-related online systems

Unique ID	Online system name	Typology	Platform/Portal/Real time analysis/Tool	State, Pressure, Response, Benefits (S,P,R,B), multiple (M), generic (G)	Main stated users (G=government, B=business, C=Civil society / NGO, G=generic)	Keywords / theme	Intended users	URL	URL Simple
1	Access to Nutrition Foundation (ATNF)	Other - initiative/orga	Platform					https://accesstonutrition.org/about-us/	accesstonutrition.org/about-u
2	Agrodeal		Platform			Trade; Sustainable business		https://agrodeal.org/en/	agrodeal.org/en/
3	AGWater Challenge		Platform					https://www.ceres.org/sites/default/files/f	ceres.org/sites/default/files/f
4	AI for Earth		Portal			Earth observatio	Science and Research	https://www.microsoft.com/en-us/ai/ai-for	microsoft.com/en-us/ai/ai-for
5	Allen Coral Atlas	Data source				Earth observation		https://allencoralatlas.org/	allencoralatlas.org/
6	Alliance for Zero Extinction (AZE)	Other - initiative/orga	Platform					https://zeroextinction.org/the-alliance/part	zeroextinction.org/the-allianc
7	Amphibian Species of the World		Platform			Species observations / taxonomy		http://research.amnh.org/vz/herpetology/a	research.amnh.org/vz/herpeto
8	AmphibiaWeb		Platform			Species observations / taxonomy		https://amphibiaweb.org/	amphibiaweb.org/
9	AquaMaps	Data source	Platform			Ocean; Species observations / taxonomy		https://www.aquamaps.org/main/home.ph	aquamaps.org/main/home.ph
10	ArcGIS Living Atlas of the World	Data source	Platform			Earth observation		https://livingatlas.arcgis.com/en/	livingatlas.arcgis.com/en/
11	Arctos Data Portal		Portal					https://arctosdb.org	arctosdb.org
12	ARIES (Artificial Intelligence for Ecosystem Services)	Flexible analysis platf	Tool			Natural capital /	Science and Research	http://aries.integratedmodelling.org/	aries.integratedmodelling.org
13	Association for Supply Chain Management		Platform			Sustainable business; Trade		http://www.apics.org/about/overview	apics.org/about/overview
14	Atlas of Economic Complexity		Data visualization of global trade flows (export and import)C			Trade		http://atlas.cid.harvard.edu	atlas.cid.harvard.edu
15	B Impact Assessment	Other - initiative/orga	Platform					https://bimpactassessment.net/node/464	bimpactassessment.net/node
16	Benefit Transfer Toolkit		Portal or tool				Governments	https://my.usgs.gov/benefit-transfer/	my.usgs.gov/benefit-transfer/
17	Biodiversity Heritage Library	Library/catalogue	Portal			Species observations / taxonomy		https://www.biodiversitylibrary.org/	biodiversitylibrary.org/
18	Biodiversity Indicator Partnership Dashboard	Decision-support tool	Platform				Governments; Industry; NGOs	https://www.bipindicators.net/	bipindicators.net/
19	Biodiversity Literature Repository	Other - repository	Portal					http://biolitrepo.org/	biolitrepo.org/
20	Biodiversity Monitoring Transect Analysis (BIOTA) in Africa							https://www.biota-africa.org/reg_discipline	biota-africa.org/reg_discipline
21	Biological Collection Access Service	Data source	Portal			Species observations / taxonomy		https://www.biocase.org/index.shtml	biocase.org/index.shtml
22	BISE - Biodiversity Information System for Europe		Portal			Species observat	Governments	https://biodiversity.europa.eu/	biodiversity.europa.eu/
23	Bonsucro	Other - initiative/orga	Platform			Trade; Sustainable business		https://www.bonsucro.com/what-is-bonsuc	bonsucro.com/what-is-bonsuc
24	Business for Water Stewardship network	Other - initiative/orga	Platform			Sustainable business		https://businessforwater.org/about	businessforwater.org/about
25	Carbon Trust	Other - initiative/orga	Portal			Sustainable business		https://www.carbontrust.com/about-us/	carbontrust.com/about-us/
26	CASEarth (Big Earth Data Platform)		Platform			Earth observation		http://www.casearth.com/	casearth.com/
27	Catalogue of Life	Library/catalogue	Platform			Species observat	Governments; Industry; NGOs	http://www.catalogueoflife.org	catalogueoflife.org

2024 Master List | Climate-toolbox-Tool | MH Comb | Resources | Climate-toolbox-Platform-ZDer

Initial Results: At least 1500 nature related online systems




ENCORE
ENCORE
encore.naturalcapital.finance/en
Main NCFA website
English
ENCORE
Brazil - Soy
All
2017
Trade volume
Selection
Summary
WHAT WOULD YOU LIKE TO SEE?
Data model
EXIOBASE
Visualize
Species-Richness Weighted Area (species-ha)
associated with
United Kingdom of ...
commodity
consumption
MORE SETTINGS
UPDATE DATA
Venezuela
Guyana
Suriname
Brazil
Bolivia
Paraguay
Uruguay
Type here to search
OTHER
CARGILL
FORMOSA DO RIO PRETO 179,125t 1,329,131 t

What’s next for nature-related online systems?

- Clarity of users and their needs
- Automation of all calculations
- Re-usable technology modules
- Aligning functionality to user-needs
- Sustainable funding models

Natural History Museum

Data availability and use

Andy Purvis

andy.purvis@nhm.ac.uk

About the Natural History Museum

The Natural History Museum is home to one of the world's most important collections of over **80m objects from the natural world**, and the data held within these specimens is vital to informing solutions to the planetary emergency.

More than 350 scientists and 170 PhD students work tirelessly to put this data to use, from publishing hundreds of papers a year that contribute towards global scientific debate, to creating a pioneering index to measure biodiversity change, to understanding how to sustainably source the minerals and rare earths needed to transition away from fossil fuels.

We also welcome **millions of people** through our doors and engage millions more online, giving us a **unique platform** to educate, inspire and mobilise a global community to positive action.

The Museum's mission is to create advocates for the planet, and we're looking for like-minded partners to join us on this vital mission.

Why should I care about biodiversity loss?

Why should I care about biodiversity loss?

Global risks ranked by severity over short term (2 years) and long term (10 years)

Source

World Economic Forum Global Risks Perception Survey 2023-2024.

One index to rule them all? A simple thought experiment

Scenario 1: *All critically endangered species go extinct*

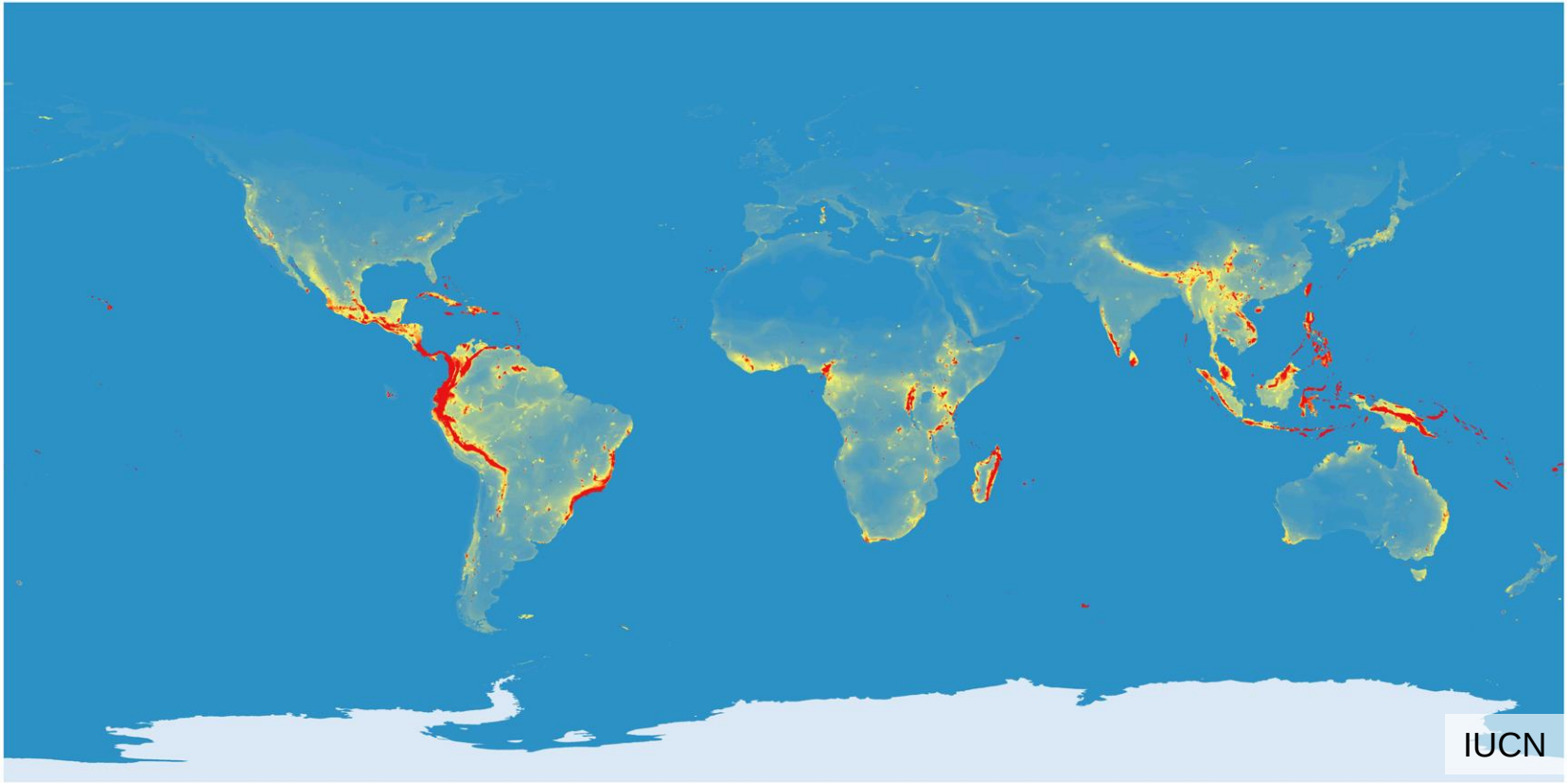
- Extinction measures flash red
- Ecosystem health measures only slightly affected!
- Global socioeconomic system **only slightly affected** (in the short-medium term, anyway)

Scenario 2: *All species are reduced/increased to the smallest population size and geographic spread needed for them not to qualify as threatened*

- Extinction measures go green!
- Ecosystem health measures flash deep red
- Global socioeconomic system **melts down completely**

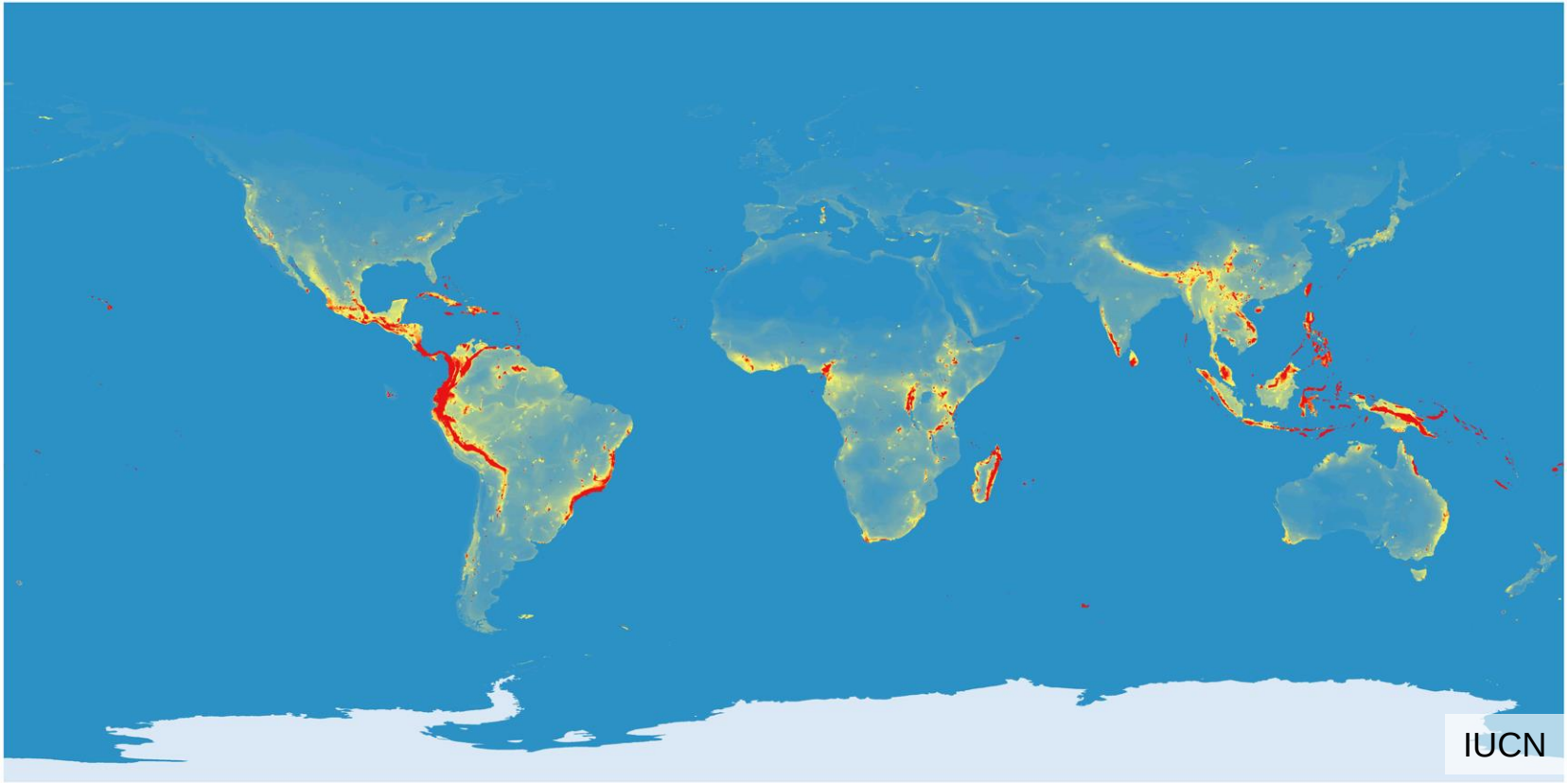
Any indicator combining these two dimensions has an (implicit or explicit) ‘exchange rate’ between extinctions and human wellbeing

What should I care about, in terms of preventing extinctions?
These are the concentrations of species that have narrow distributions
Where the MOST IMPORTANT areas are doesn't change hugely rapidly

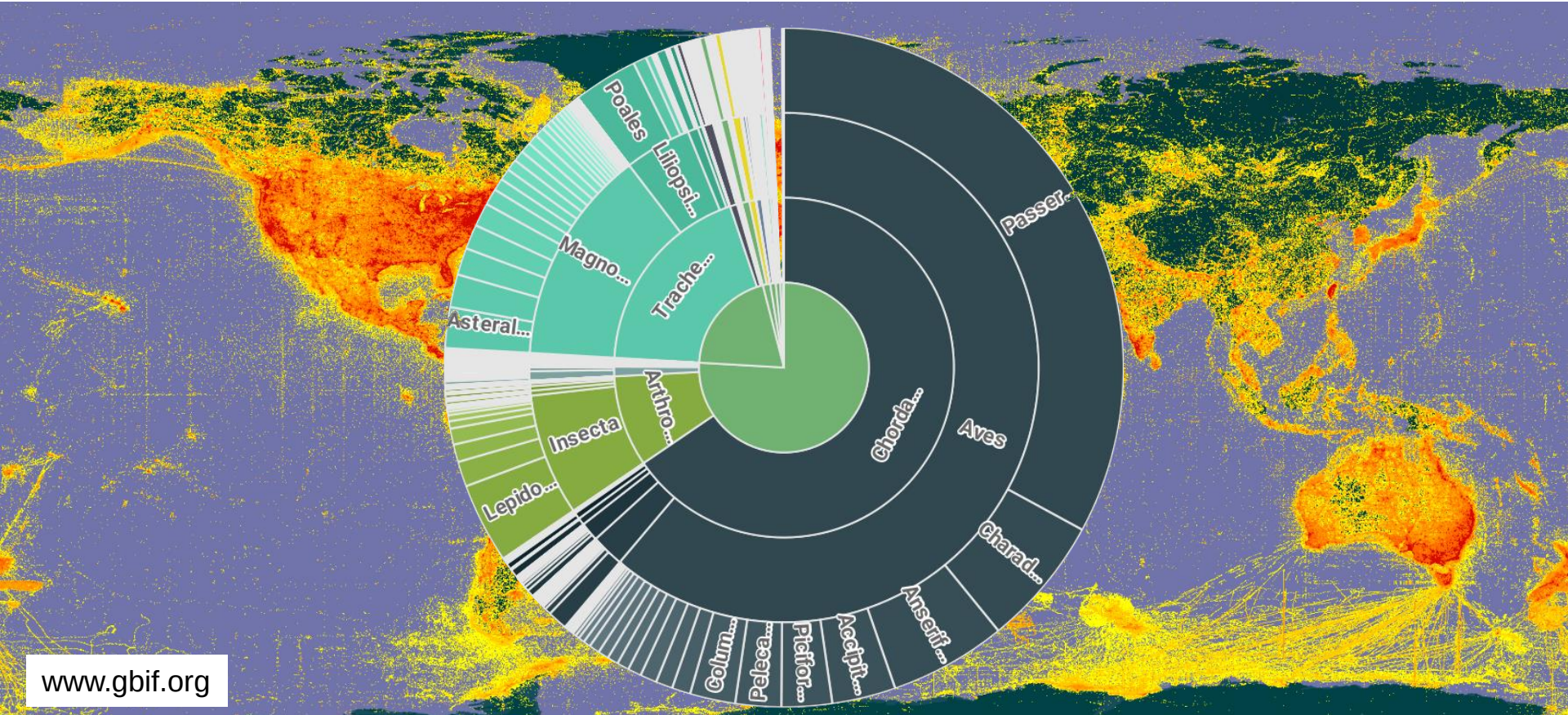


What should I <u>do</u>, in terms of preventing extinctions?

1. Don’t invest in nature-depleting activities in the visible bits of the map
2. De-intensify activities in, and restore, those places (e.g., STAR metric)



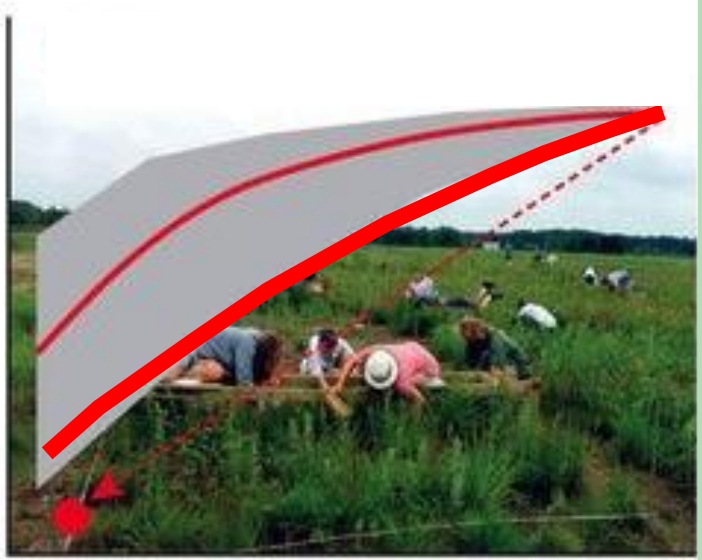
Decision-grade data are derived very carefully from very biased raw data
Such work *has to* be painstaking and uses huge expertise – so **has to be funded**
(The collection of raw data needs secure funding too)



What should I care about, in terms of ecosystem health?

Ecosystem multifunction

(resource capture, biomass production, decomposition, nutrient recycling)



Biological diversity

(variation in genes, species, functional traits)

Kinds of ecosystem services

- Habitat creation and maintenance
- Pollination and seed dispersal
- Regulation of air quality
- Regulation of climate
- Regulation of ocean acidification
- Regulation of freshwater quantity & quality
- Formation and regulation of soils
- Regulation of hazards and extreme events
- Regulation harmful organisms & processes
- **Energy**
- **Food & feed**
- **Materials & assistance**

} **Material goods**

- Medicinal, biochemical & genetic resources
- Learning & inspiration
- Physical & psychological experience
- Supporting identities
- Maintaining future options

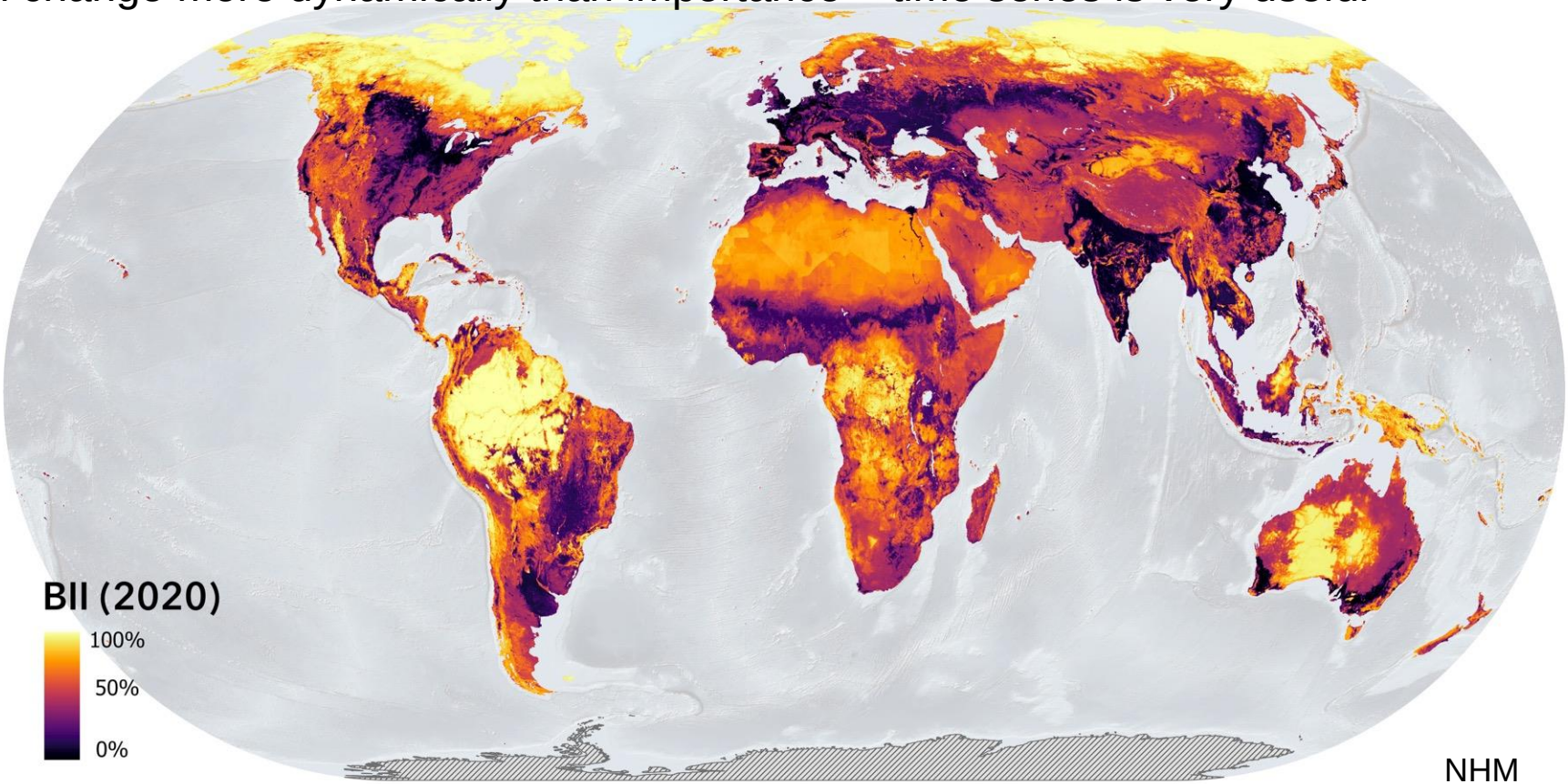
modified from Cardinale et al. 2012 *Nature*

IPBES Global Assessment 2019

What should I care about, in terms of ecosystem health?

Ecosystem health matters (almost) everywhere people do anything

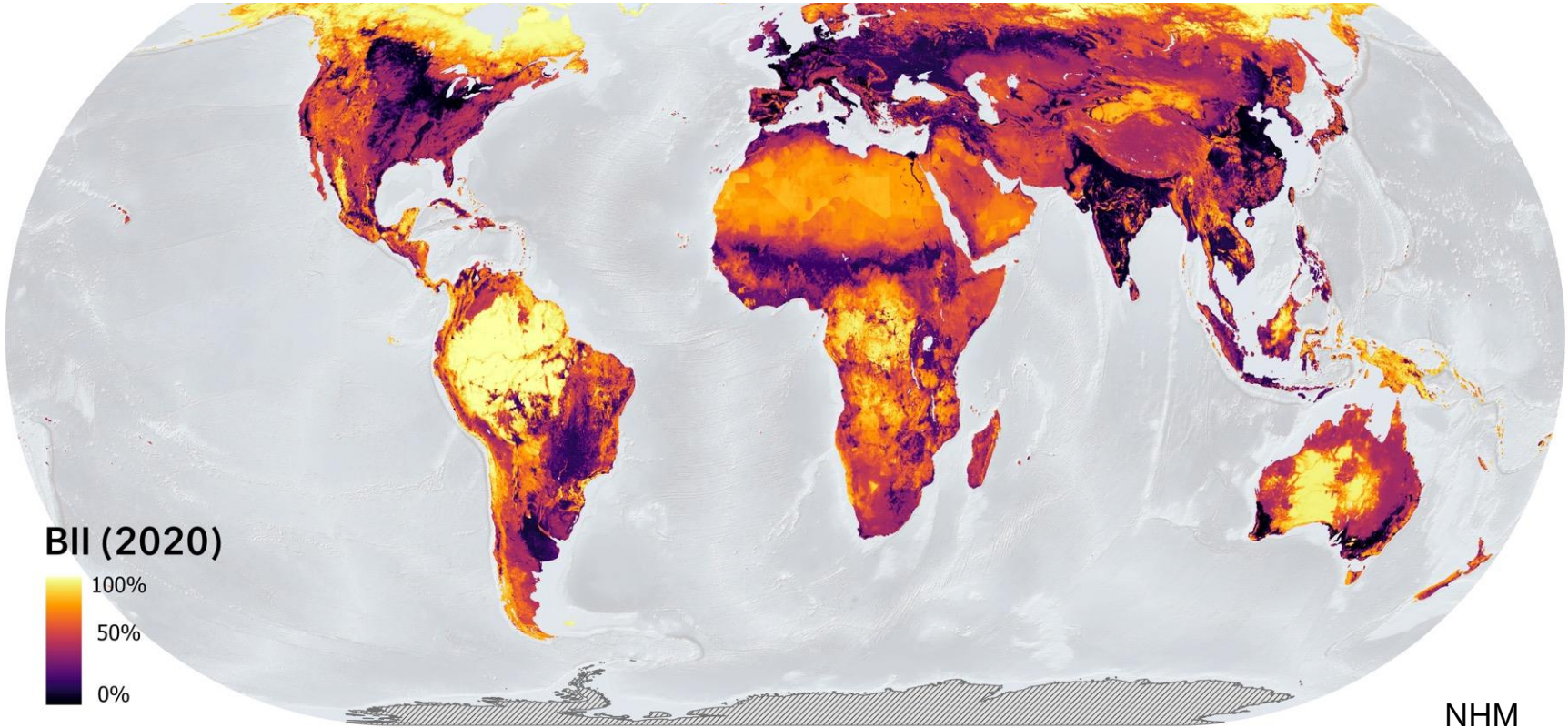
It can change more dynamically than importance – time series is very useful



NHM

What should I <u>do</u>, in terms of ecosystem health?

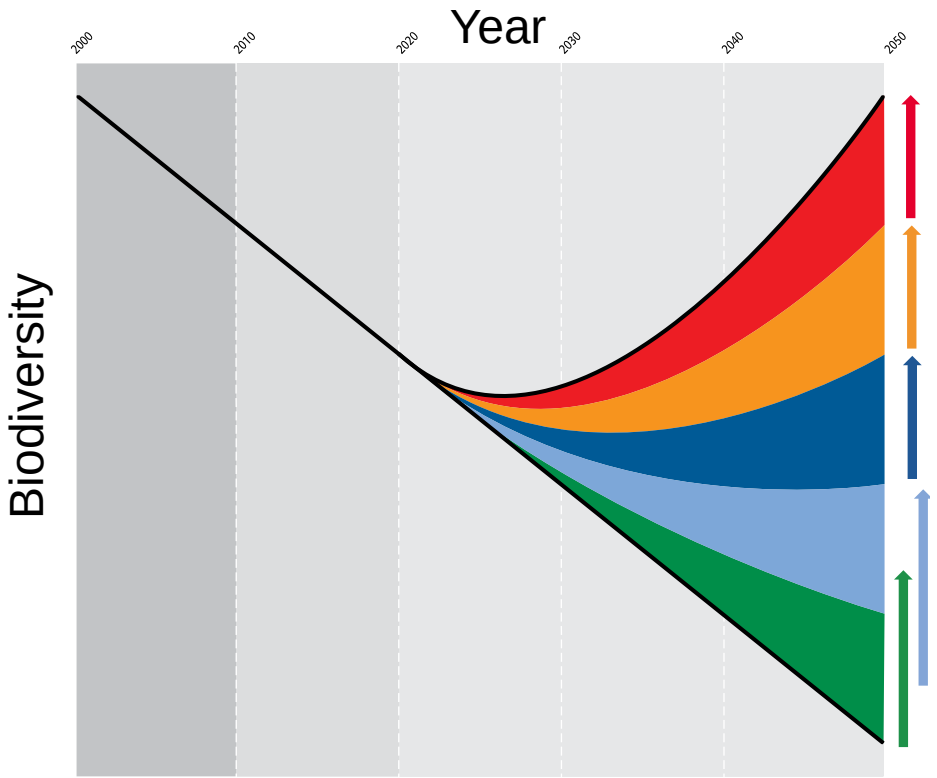
1. De-intensify activities in unhealthy systems where people rely on local ecosystem services
2. Divest from businesses that are poor stewards of ecosystem health
3. Invest in actions that are **nature-positive**



NHM

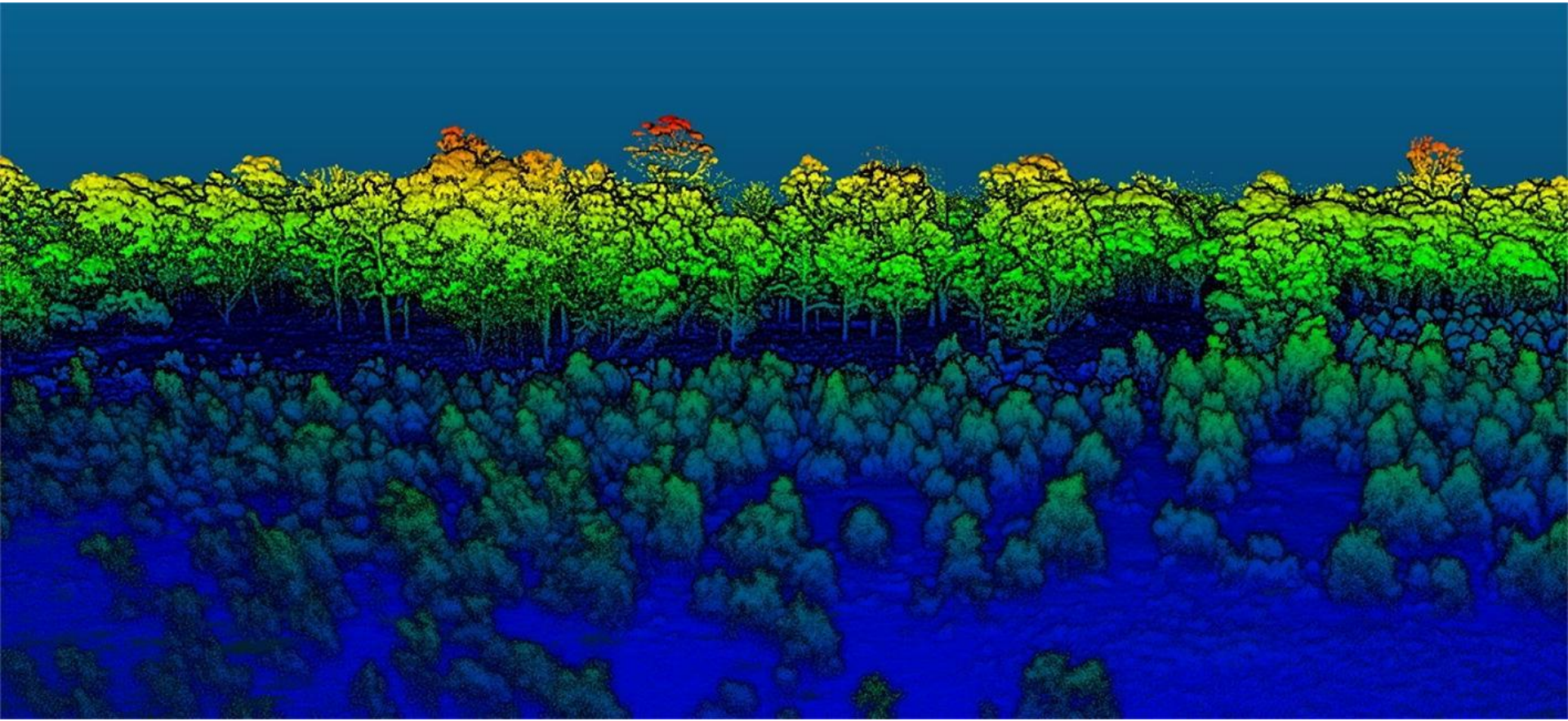
Defining nature-positive

Actions are nature-positive if they improve the expected overall global status of biodiversity relative to counterfactuals without them



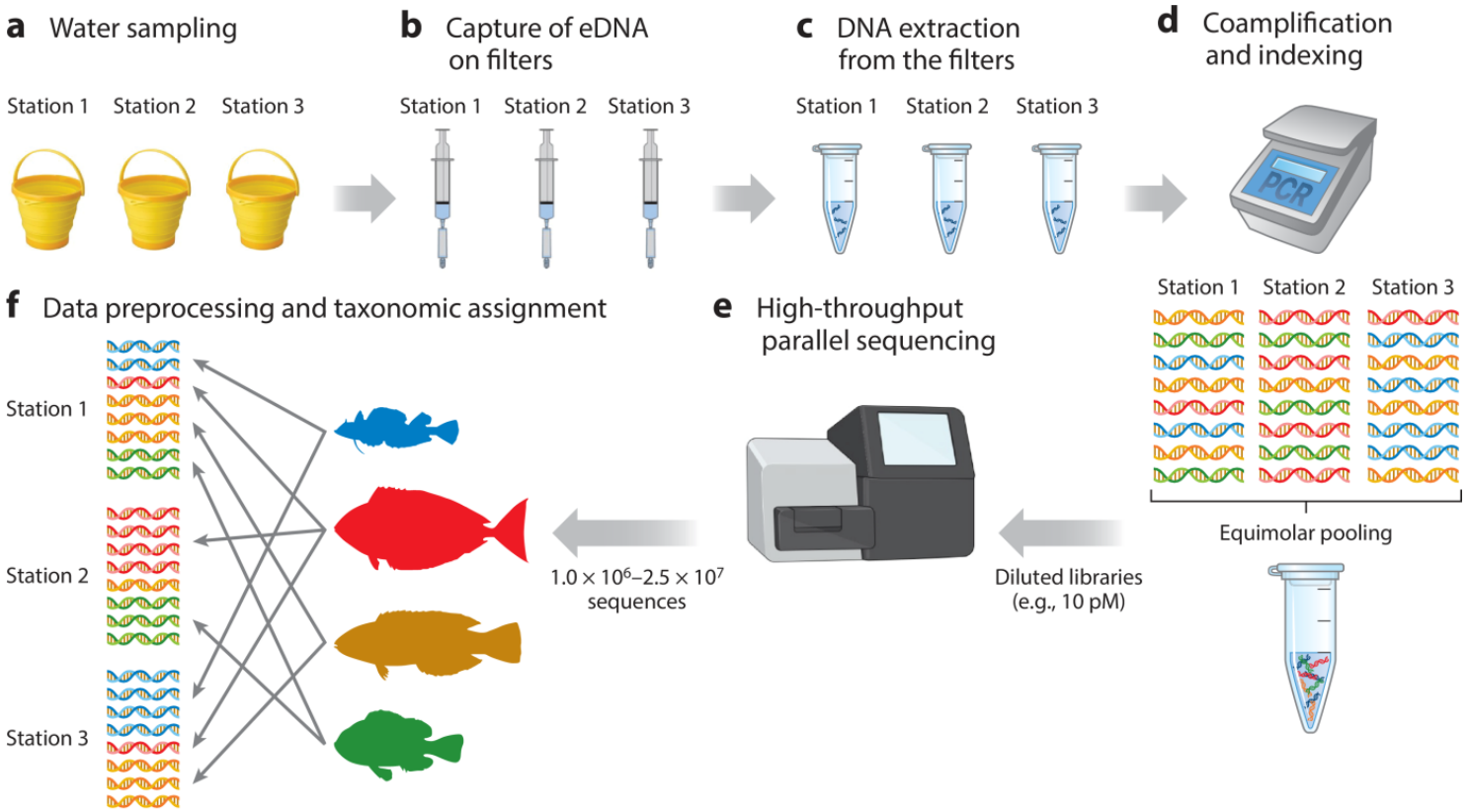
- Has to be the expected value
  - Requires a model
- Has to be global
  - Or with constraints to stop offshoring (i.e., effectively global)
- Biodiversity: At least 2 dimensions:
  - Species persistence – extinction is a tragedy
  - Ecosystem health – we depend on it
- Has to be vs counterfactuals
  - Or organisations have to fix society's mess, not just their own

Verifying nature-positive: ‘bottom-up’ monitoring with new technologies



Camaretta et al. 2020 *New Forests*

Verifying nature-positive: ‘bottom-up’ monitoring with new technologies



Miya M. 2022
Annu. Rev. Mar. Sci. 14:161–85

Miya 2022 *Ann Rev Marine Sci*

Verifying nature-positive: ‘bottom-up’ monitoring with new technologies

Automated **M**onitoring of **I**nsects (**AMI**) system

Long-term monitoring of moths at scale

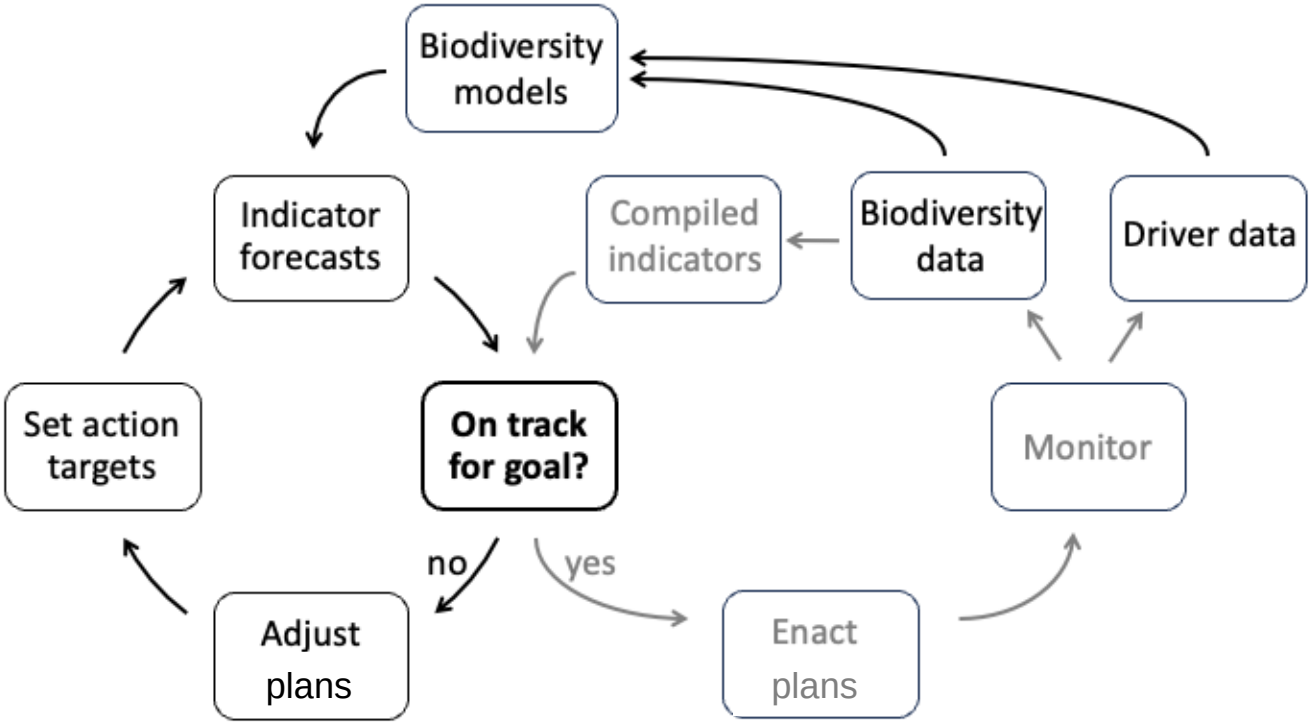
- UV/white lighting for attracting moths
- Hi-res cameras to image moths
- AI identifies individuals to species level

UKCEH/Grace Skinner

Combining models and monitoring gives us a ‘sat-nav’ for nature

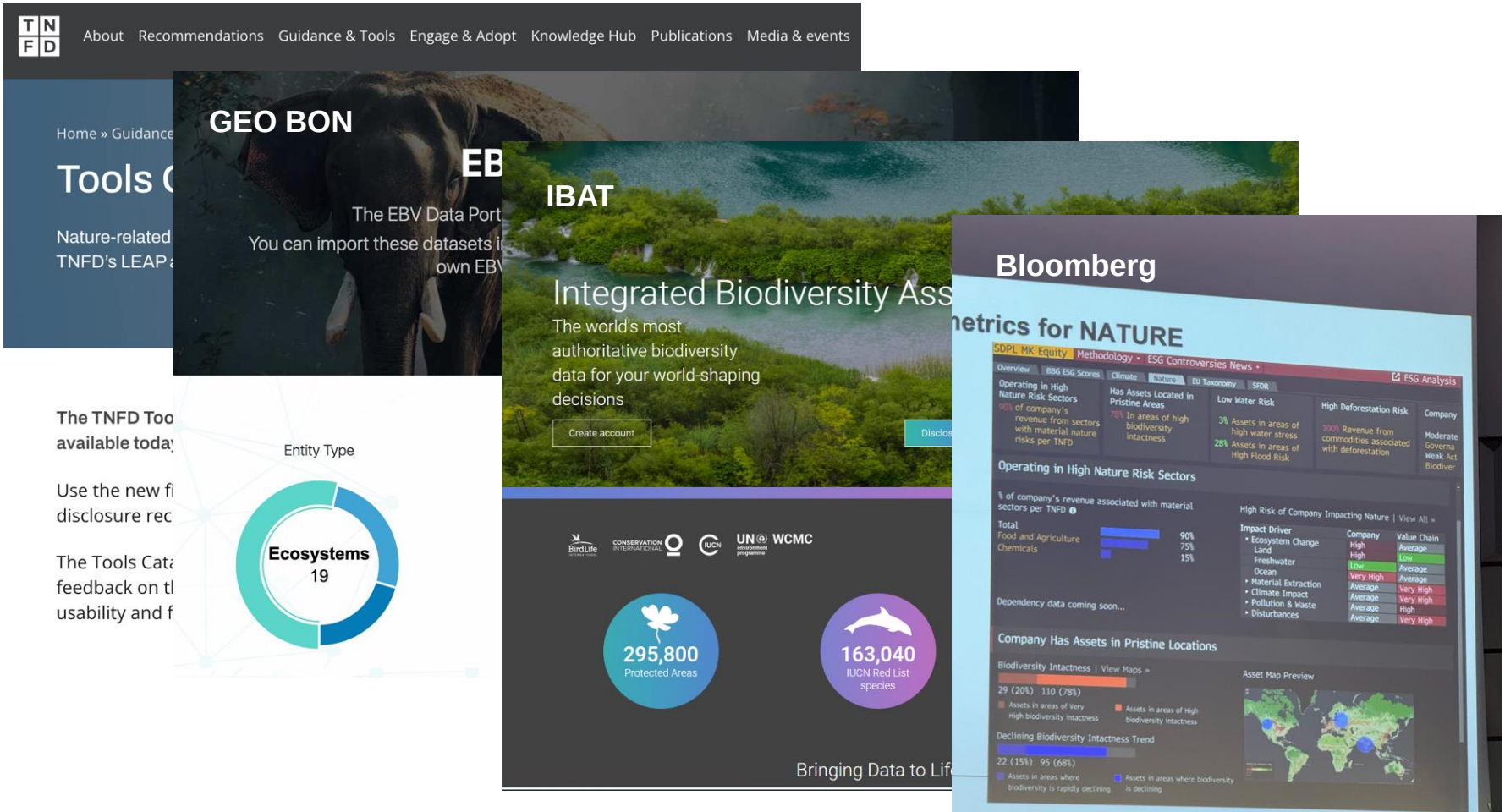
Need to monitor drivers as well as biodiversity

Relies on data being available to improve the models



Purvis, in revision, *Phil Trans R Soc B*

Data platforms (a selection)



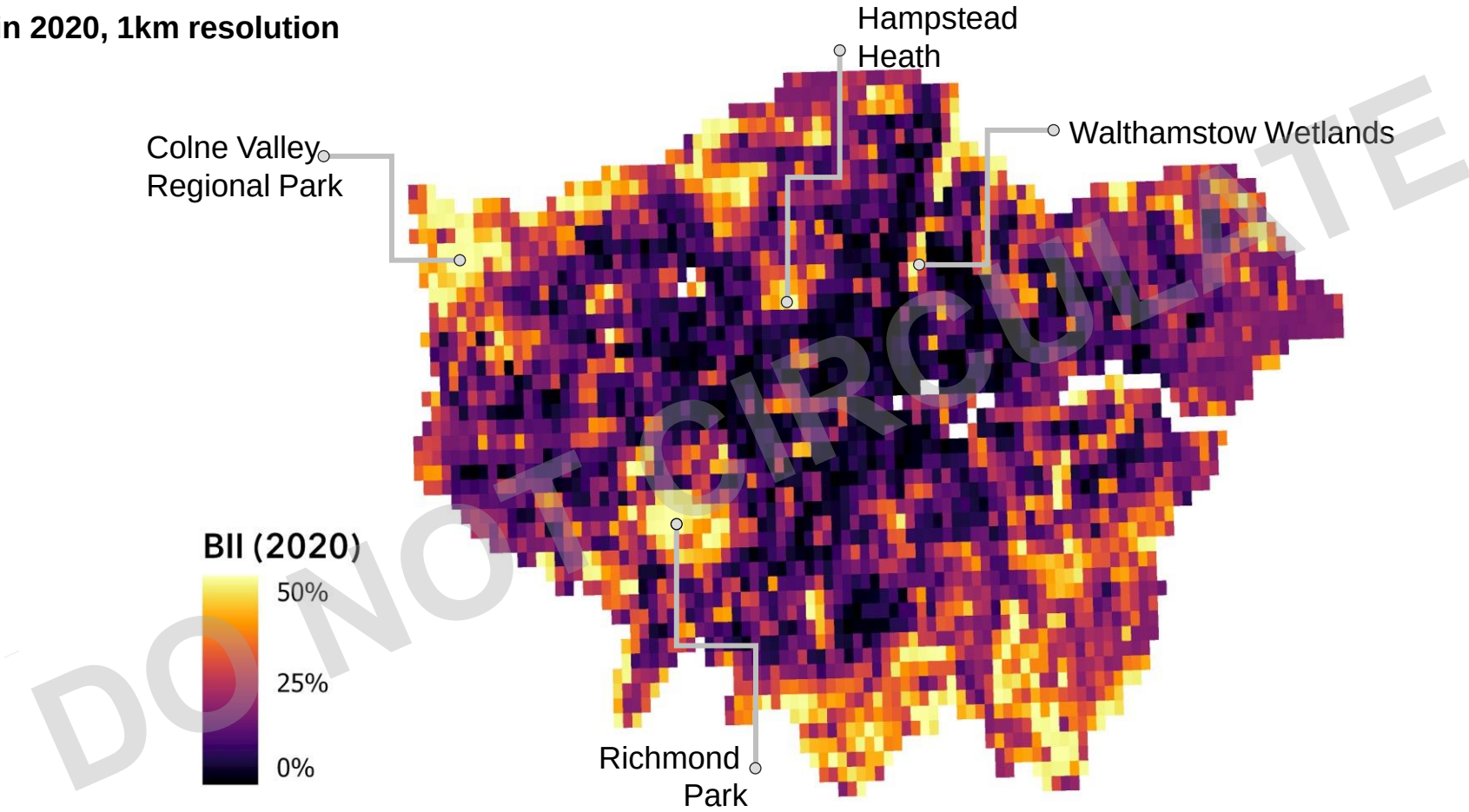
What should I do? Take-home messages

1. Use data whose methodologies are transparent, peer-reviewed and coherent
2. Remember the pitfalls of ‘hybrid’ indicators or indices
3. To reduce extinctions: mitigate existing activities in important areas; don’t invest in new activities there
4. To maintain ecosystem health: mitigate activities in damaged ecosystems on which people depend; divest from poor stewards; invest in nature-positive actions
5. Monitor to verify gains – and contribute to data repositories
6. Accept that decision-grade data do cost money: you won’t get what you don’t pay for

Natural History Museum

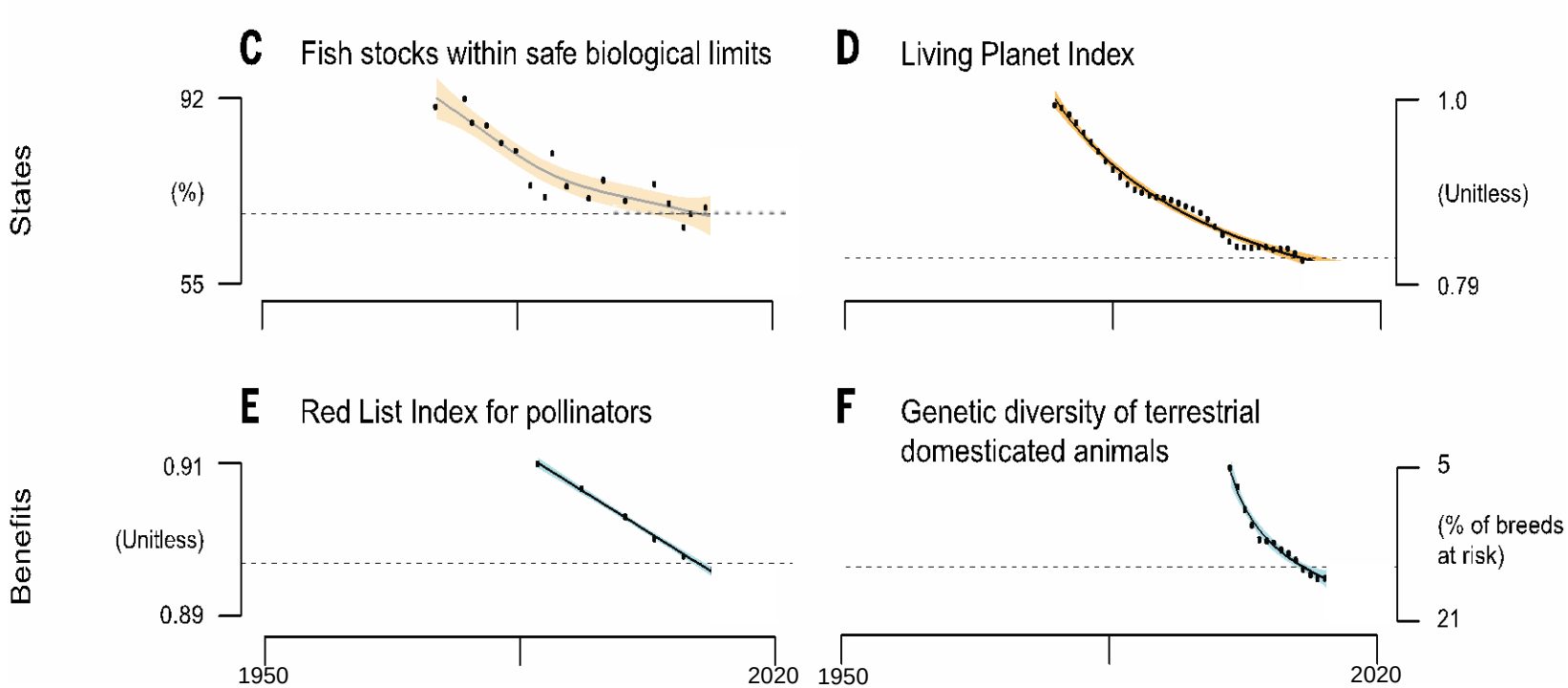
Thank you

BII in 2020, 1km resolution



De Palma et al. (2024 and in prep.)

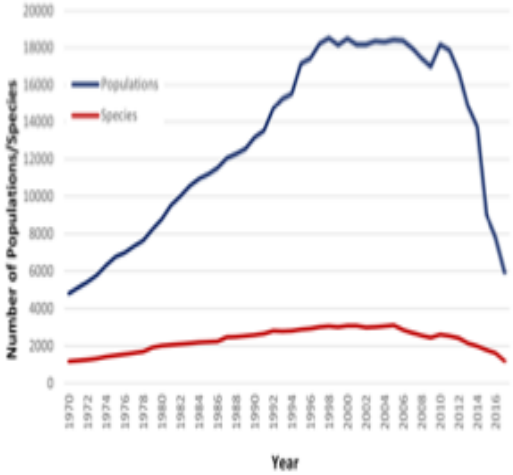
Compilation-based indicators look backwards in time
If compiled from public databases, will lack spatial resolution
Model-based indicators permit spatial resolution



Tittensor et al. 2014 *Science*

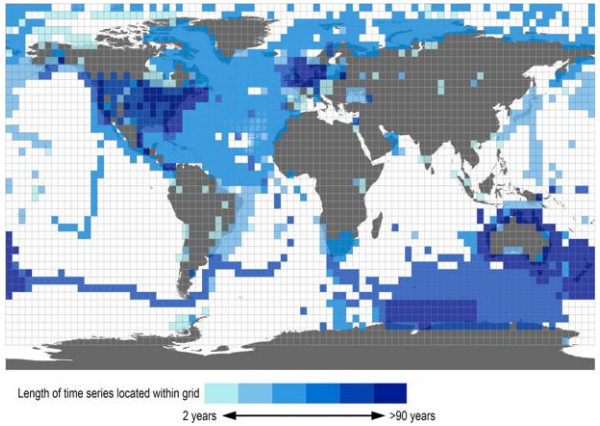
Data behind ‘top-down’ dynamic indicators are also very imperfect

Population time series (since 1970)



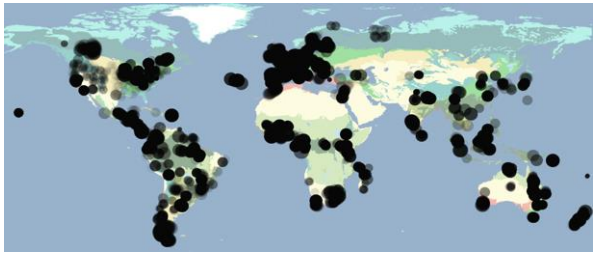
Living Planet Index/ZSL

Assemblage time series (since 1870)



BioTime

PREDICTS/BII database



54,000 sites, 104 countries, 74,000 species

PREDICTS/NHM

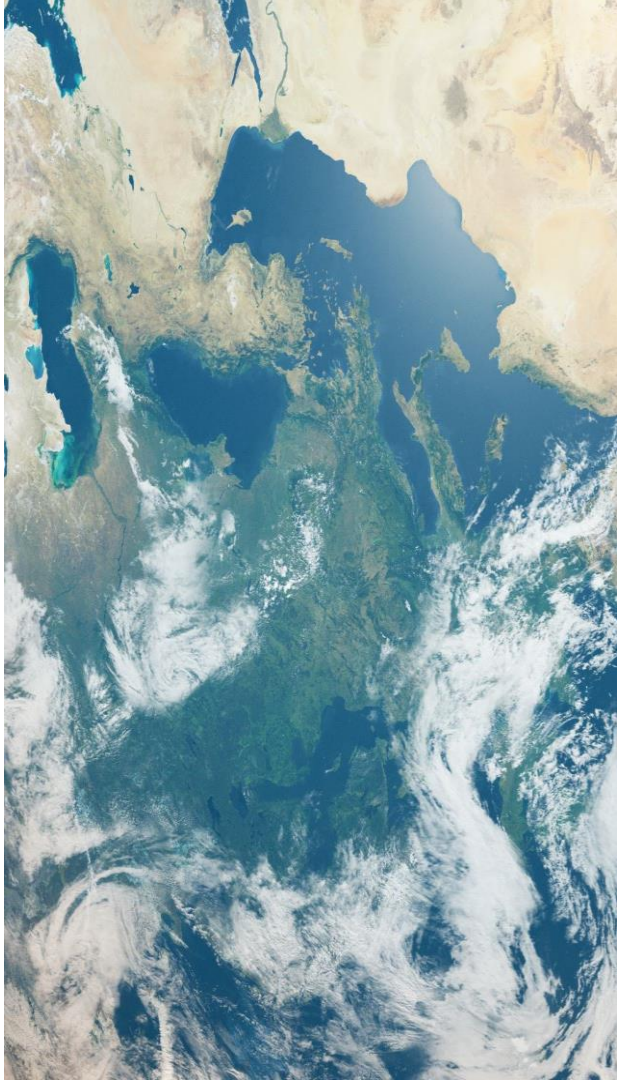
Compiling and analysing such data into useful indicators is painstaking, highly skilled work, which needs to be funded

Global Policy Goals: a multilateral approach for a sustainable future

Ana Maria Hernandez Salgar

Introduction

- Global crises: biodiversity loss, climate change, pollution
- Interconnection: Human health, peace, and economic stability
- Policy frameworks: SDGs, Paris Agreement, Kunming-Montreal Global Biodiversity Framework
- Guiding science: IPBES, IPCC, Global Resources Outlook



Global Environmental Challenges

Biodiversity Loss:

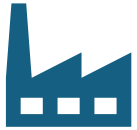
1 million species threatened with extinction (IPBES)

Impacts on SDGs 14 (Life Below Water), 15 (Life on Land), and 2 (Zero Hunger)

Climate Change:

Failure to meet Paris Agreement targets (IPCC)

Threats to SDG 13 (Climate Action), 1 (No Poverty), 8 (Decent Work)



Pollution:

Environmental degradation from industrial activities (GRO)

Impact on SDGs 3 (Health), 6 (Water), 12 (Sustainable Consumption)

Interconnection between nature, climate and people

Climate Change impacts on biodiversity (IPCC)

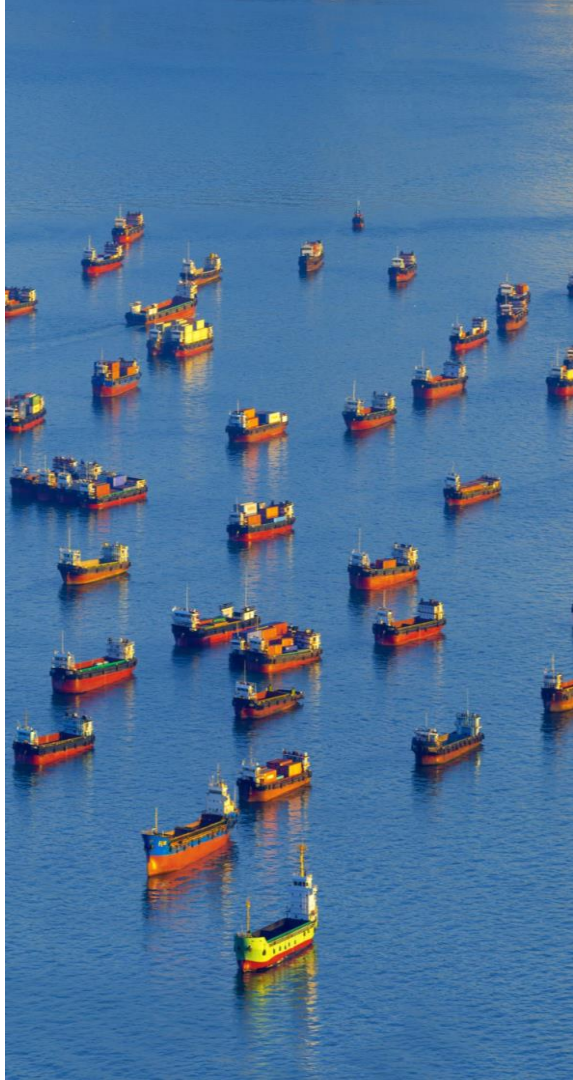
- Biodiversity loss worsens climate vulnerability

Ecosystem services:

- Regulation of climate, food security, water purification (IPBES)
- Connection to human health (SDG 3) and economic productivity (SDG 8)

Pollution's effects on ecosystems and health:

- Air and water pollution (GRO)
- Implications for SDGs 6, 3, and 12



Main policy frameworks for nature, climate and people

Kunming-Montreal Framework Goals:

- Goal A: Halt biodiversity loss (30% land/sea by 2030) – SDGs 14, 15
- Goal B: Ecosystem services for food, water, and climate – SDG 2, 6, 13
- Goal C: Equitable access for Indigenous Peoples (SDGs 10, 5)
- Goal D: Financial resources and partnerships (SDG 17)

Paris Agreement: Critical for SDG 13 (Climate Action)

- Net-zero emissions by 2050
- Nature-based solutions for climate mitigation

Business Risks Due to Ecological Breakdown

Supply Chain Disruptions:	Physical Risks from Climate Change:	Regulatory Risks:	Reputation and Consumer Preferences:	Transition Risks:
•Impact on agriculture, fisheries, forestry. Resource scarcity and production risks (SDG 12)	•Extreme weather disrupting operations (IPCC). Damage to infrastructure and assets	•Stricter environmental regulations. Financial risks from non-compliance (Paris Agreement, Kunming-Montreal Framework)	•Growing demand for sustainable practices. Impact on brand reputation and market share	•Shift to low-carbon, nature-positive economy. Risks for fossil fuel-dependent industries (IPCC)

Measuring Progress and Metrics

-Biodiversity Health Metrics:

- Species population trends (IPBES)
- Habitat integrity and ecosystem service assessments (SDG 14, 15)

Carbon Emissions:

- Tracking emissions to meet Paris Agreement targets (SDG 13)

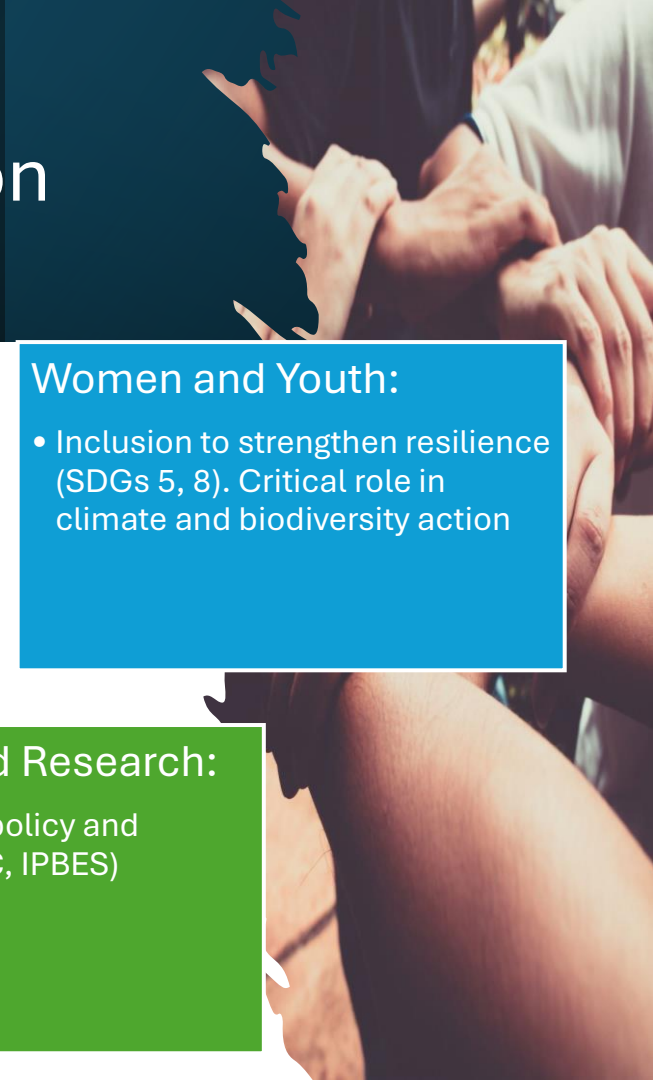
Resource Efficiency:

- Monitoring resource use and waste (SDG 12, GRO)

Business Impact Metrics:

- ESG metrics for business risk assessment (IPCC)
- Transparency in reporting environmental impacts

Building Partnerships for Action



Whole-of-society, whole-of-government approach:

- Engagement with all sectors: public, private, and civil society

Indigenous Peoples and Local Communities (IPLCs):

- Guardians of biodiversity (IPBES). Central to achieving SDGs 10, 16

Women and Youth:

- Inclusion to strengthen resilience (SDGs 5, 8). Critical role in climate and biodiversity action

Private Sector:

- Adopting sustainable practices and aligning with global frameworks (SDGs 12, 17)

Academia and Research:

- Science-based policy and innovation (IPCC, IPBES)

Conclusion

Path forward: Integrating biodiversity, climate, health, and peace goals.

The role of private sector:

- Understanding risks and opportunities in sustainability
- Aligning with global frameworks for long-term resilience

Call to Action:

- Collaboration across all sectors and stakeholders
- Achieving transformative change in line with the SDGs, Paris Agreement, and Kunming-Montreal Framework

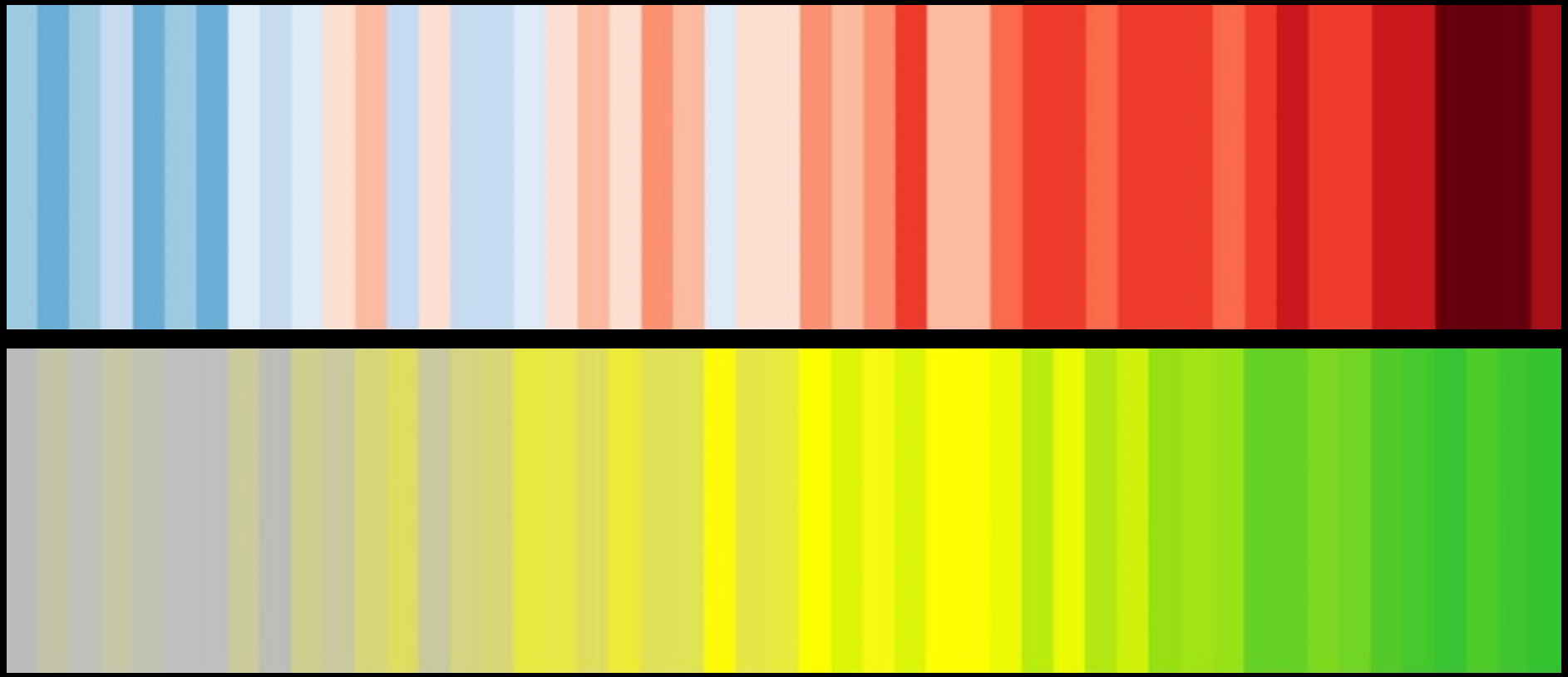
NATURE POSITIVE BY 2030

From tipping to turning point

Measuring Nature Positive outcomes between rigour and practicality

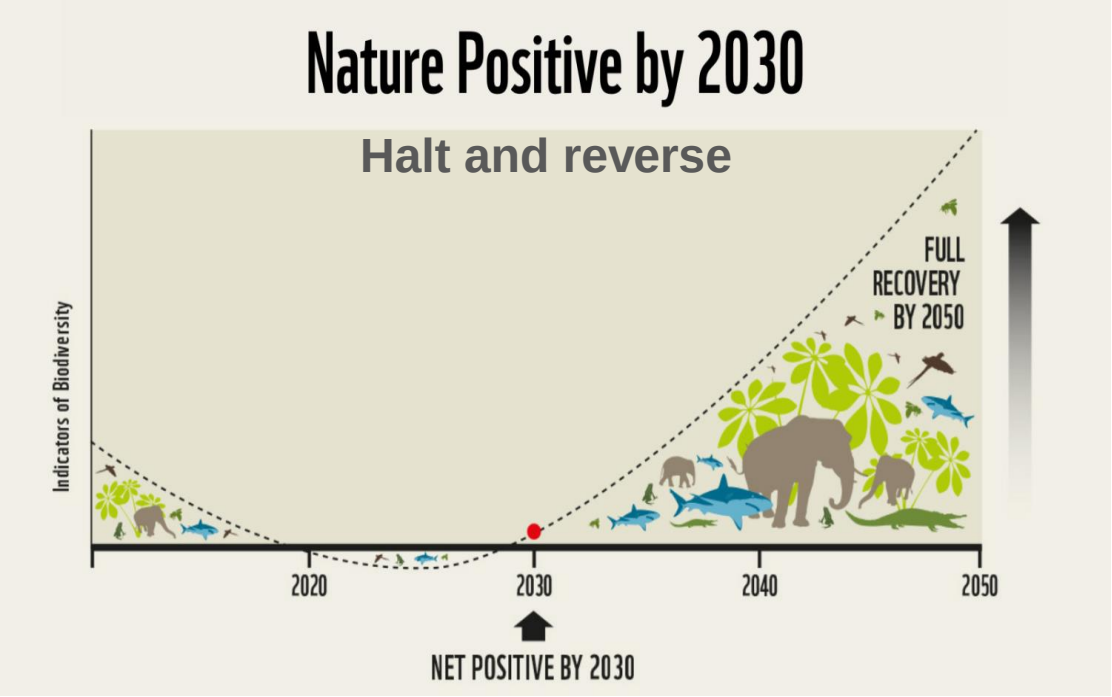
Marco Lambertini
Convener, Nature Positive initiative

Global warming & Biodiversity loss 1970-2018

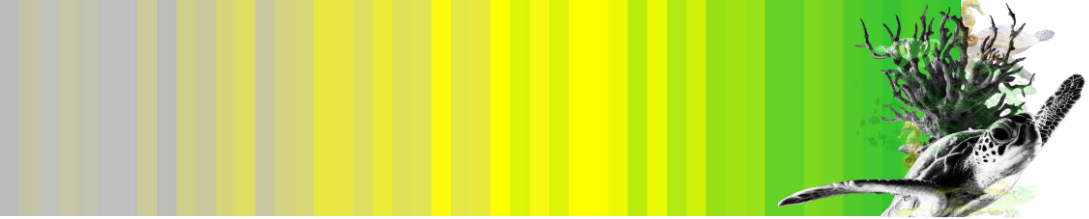


Nature Positive: the Global Goal for Nature

A common definition : 'Halt and Reverse Nature Loss by 2030 on a 2020 baseline…' – codified in the Global Biodiversity Framework



NATURE POSITIVE INITIATIVE



NATURE POSITIVE INITIATIVE

Building Consensus on State of Nature Metrics to Drive Nature Positive Outcomes

Marco Lambertini, Convenor, Nature Positive Initiative

To drive nature positive outcomes we need a common set of metrics to measure the state of nature and how it is recovering over time.

But…

We lack Consensus on a small set of credible, practical and affordable **state of nature metrics** across scales, users and geographies

We lack clarity and **confidence** to begin the journey and accelerate nature positive outcomes

So…

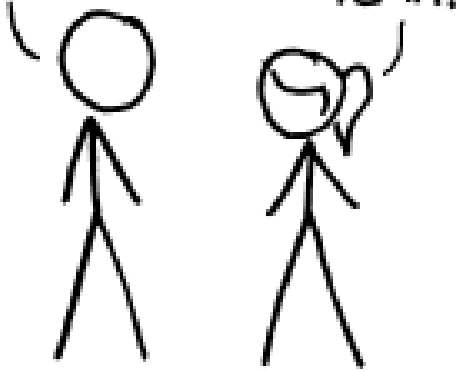
We need a tool to **drive** and **track progress** towards halting and reversing biodiversity loss - the GBF mission

We need to **ensure accountability** and **recognition** along the journey towards genuine nature positive **outcomes**

HOW STANDARDS PROLIFERATE:
(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC)

SITUATION:
THERE ARE
14 COMPETING
STANDARDS.

14?! RIDICULOUS!
WE NEED TO DEVELOP
ONE UNIVERSAL STANDARD
THAT COVERS EVERYONE'S
USE CASES.



SOON:

SITUATION:
THERE ARE
15 COMPETING
STANDARDS.

Users and Use Cases

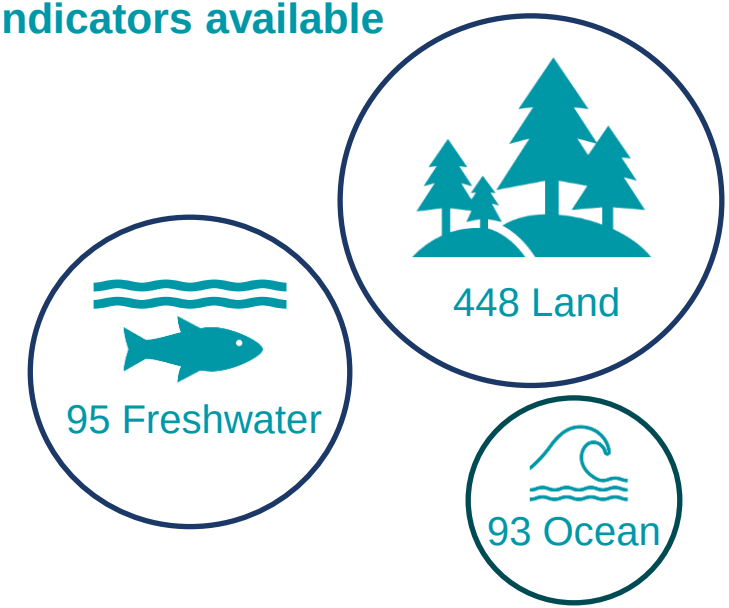
This framework can be applied by both state and non-state actors.

Type of user	Scale
Corporate	Site
Financial institution	Landscape
Government	Value chain or portfolio
Other land managers (e.g. IPLC)	Company
	Sector

Private sector Use cases	Other Use cases
Voluntary disclosure (e.g. TNFD, GRI)	National governments
Target setting & tracking (e.g. SBTN)	Cities and sub-national governments
Compliance (e.g. CSRD or EUDR)	Aligning financial flows (e.g. MDBs)
Assurance providers	NGOs, IPLCs
Corporate and FI strategies	??

We cannot measure all the complexity of biodiversity…

Over 600 metrics & indicators available



… leading to:

- **Complexity**
- **Confusion**
- **Paralysis**
- **Excuse for inaction**

Essential criteria

1. **Credible & Science-based**
2. **Practical & Responsive**
3. **Affordable**
4. **Assurable**

A State of Nature metrics framework with a small set of indicators and metrics

NATURE POSITIVE INITIATIVE

What is in scope of this project

In scope

- ✓ **Geography**: universal – scale, site, landscape and national
- ✓ **The actor/user**: government, individual business entity, financial institution and investment portfolio, and value chains
- ✓ **Terrestrial metrics**

Out of scope

- × Target setting
- × Social benefits
- × Value chains/traceability recommendations
- × Broader sector-specific guidance

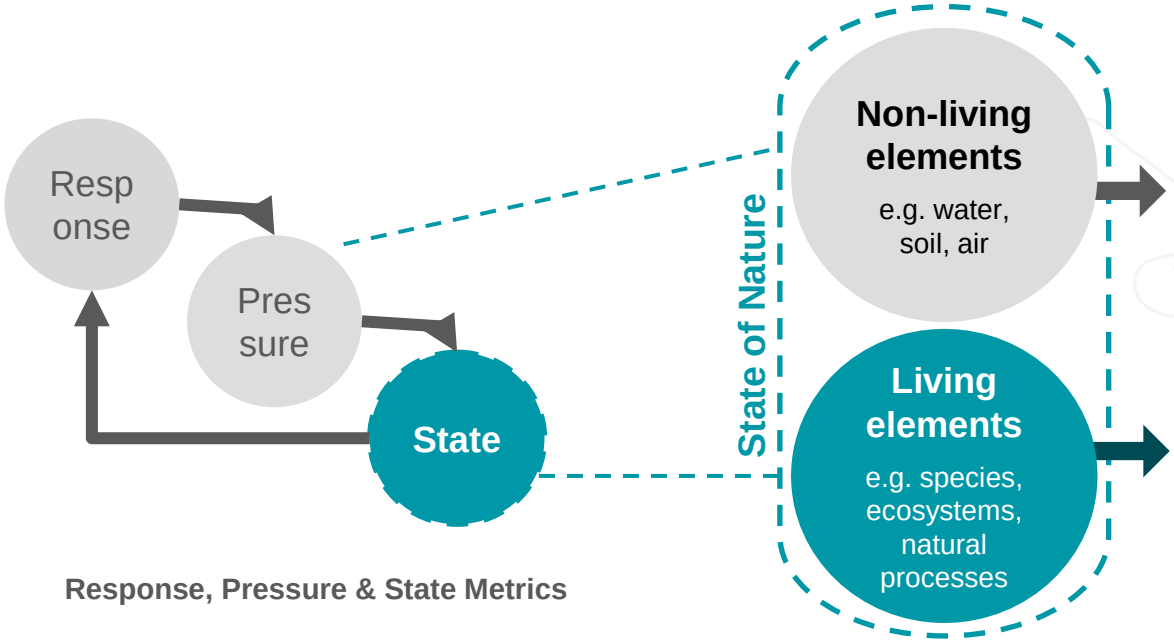
Next phase

- ➢ How to include **Natural Processes/Ecosystem Services**
- ➢ Incorporation of **traditional and indigenous knowledge metrics**
- ➢ **Guidance on Contribution versus Attribution** to be developed

NATURE POSITIVE INITIATIVE

...so we are focusing on key elements of living nature.

This initiative focuses on state of nature metrics across biodiversity on land, freshwater and sea

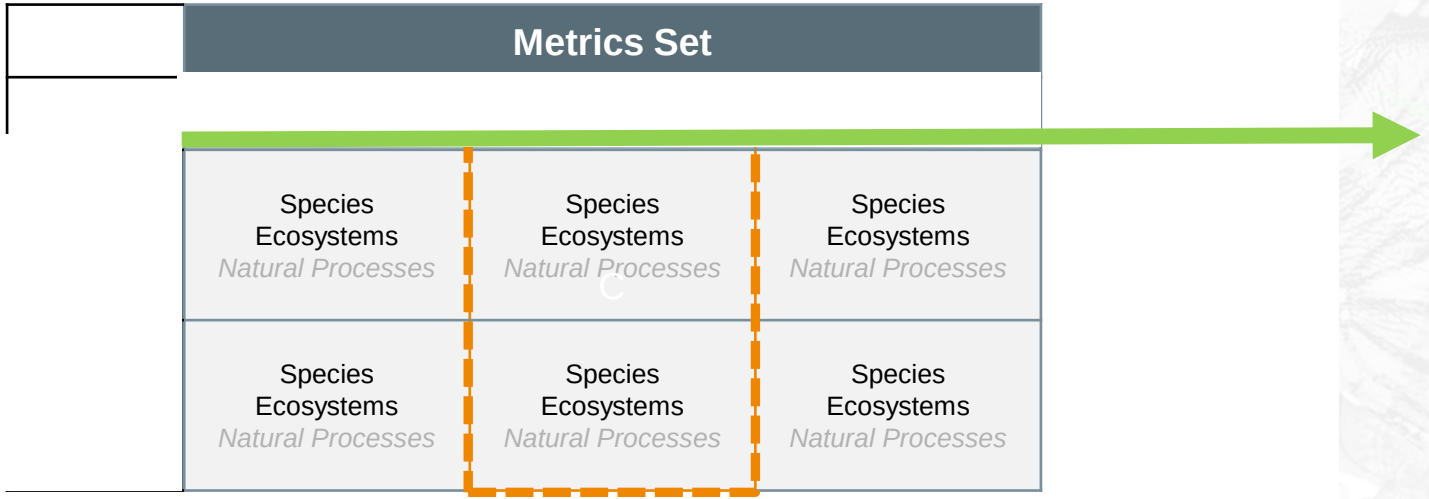


Pressure and response metrics are more developed, with clear links between human impacts and mitigation interventions

Metrics of living elements of nature (biodiversity) are key to verify whether ultimately nature is in recovery or decline

NATURE POSITIVE INITIATIVE

The State of Nature Metrics Framework



4 Universal metrics

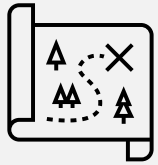
5 (up to) Case-specific metrics

NATURE POSITIVE INITIATIVE

NATURE POSITIVE INITIATIVE

Universal Indicators

- **Extent** of natural ecosystems



- **Condition** of natural ecosystems

- Landscape **intactness**

- **Extinction risk**

Case-specific Indicators

- **Extent** of highly **threatened ecosystems**
- **Condition** of highly **threatened ecosystems**
- **Proportion** of **semi-natural habitat**
- **Condition** of **semi-natural habitat**
- Population **Abundance**

Proposed Indicator and Metric Framework

		Indicators (IND)	State of Nature (SON) Metrics		
			Entry-level	*Standard*	*Advanced*
Universal	Ecosystem	Ecosystem Extent & Classification (IND 1)	SON E1	SON S1	SON A1
		Ecosystem Condition (IND 2)	-	SON S2	SON A2
		Landscape Intactness (IND 3)	SON E3	SON S3	SON A3
	Species	Species Extinction Risk (IND 4)	SON E4	SON S4	SON A4
	Natural processes	*Planned for future integration*			
Case-specific	Ecosystem	Extent of highly-threatened ecosystems (IND 5)	SON E5	SON S5	-
		Condition of highly-threatened ecosystems (IND6)	SON E6	SON S6	-
		Proportion of natural or semi-natural habitat (IND 7)	SON E7	SON S7	SON A7
		Condition of semi-natural habitat (IND 8)	-	SON S8	SON A8
	Species	Species Population Abundance (IND 9)	SON E9	SON S9	SON A9
	Natural processes	*Planned for future integration*			

Metrics most users should adopt

What changes across the metrics maturity scale?

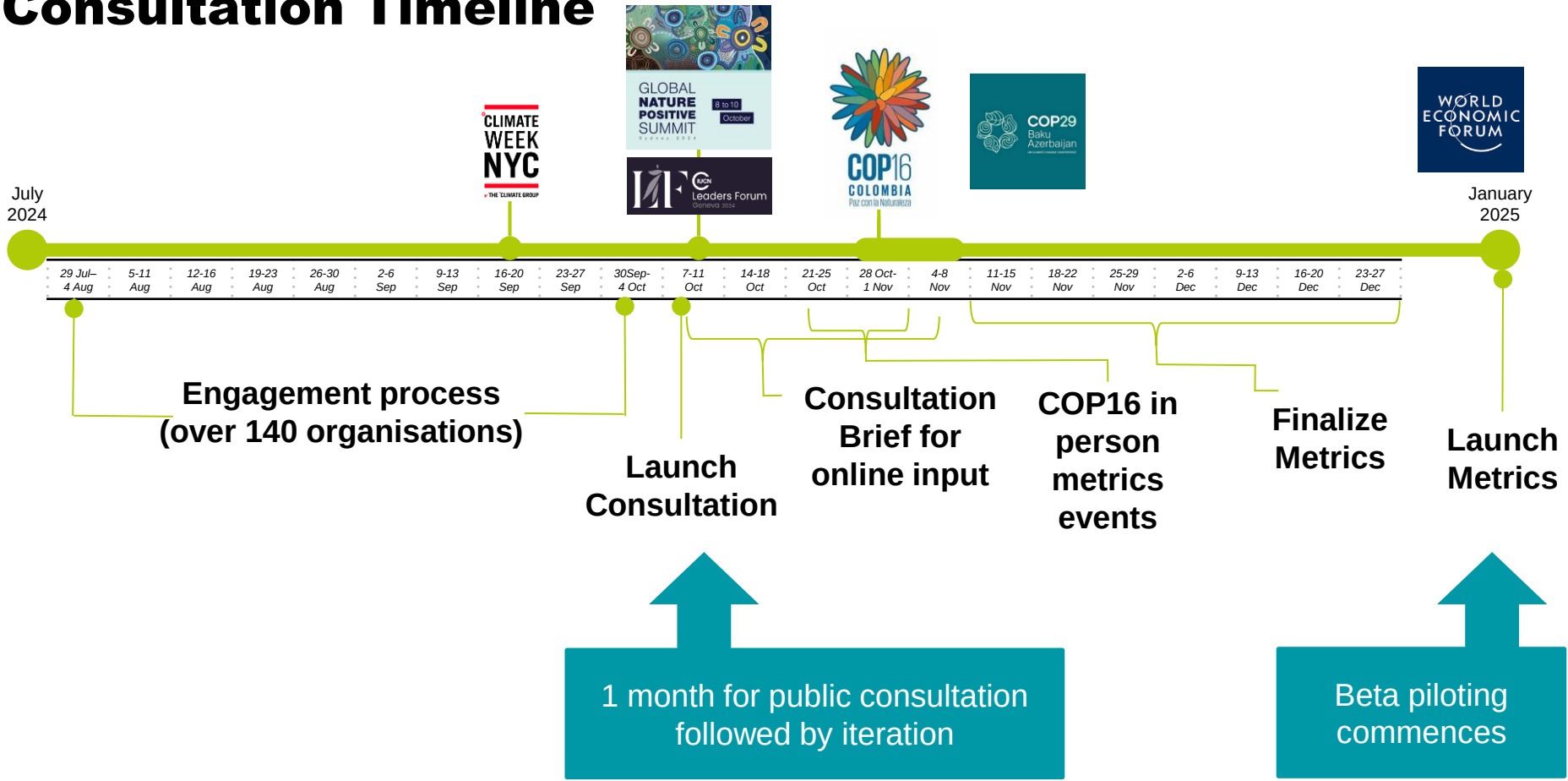
As users advance through the “Metrics Maturity Scale” they should report on a greater level of granularity

Example: Ecosystem Extent (Change and Classification) (IND1) - Individual

Maturity	Metric	Metric Descriptor	Guidance on data Capture		
			Spatial Resolution	Ecosystem classification level	Age of data
Entry-level	**Change in ecosystem extent**	# and % of loss, gain and net change for each ecosystem extent (ha/year)	<30m	GET level 3	<18 months
Standard	**Change in ecosystem extent with ground-truthing**			GET level 4	
Advanced	**Change in ecosystem extent at high resolution and with ground-truthing**		<10m	GET level 5 or 6	<6 months

* GET: Global Ecosystem Typology

Consultation Timeline



Join

THE NATURE POSITIVE FORUM

to stay connected

Building Consensus on State of Nature Metrics to Drive Nature Positive Outcomes

Join the State of Nature/Nature Positive metrics online consultation

Bridging the Gap

Heather Tallis

Senior Fellow, University of California, Santa Cruz

TARGET 14: Integrate Biodiversity in Decision-Making at Every Level

Priorities & Mechanisms for Greater Collaboration

- Focus collaborations on the science needed to change core business
- Mechanisms to supercharge science-business-policy interface

Focus on Science Needed to Change **Core Processes**

Core processes have huge effects on business – changing them is a fast track to reducing risk

- Sourcing Decisions
- Offerings
- Risk analyses
- Benefit cost analyses

Sourcing Connections to Nature - In Space

Have models to analyze sourcing options

Collaborate on spatial data - and relevant aspects of nature

Offerings of Ecological Awesomeness

Risk Analyses

Collaborate on embedding habitat changes in risk models

Reef loss (present 50 yr storm)

Climate Change 2050 (0.5m slr + future 50 yr storm)

Flooding in Caye Caulker, Belize

Prof. Michael Beck
Center for Coastal Climate Resilience

Benefit Cost Analyses

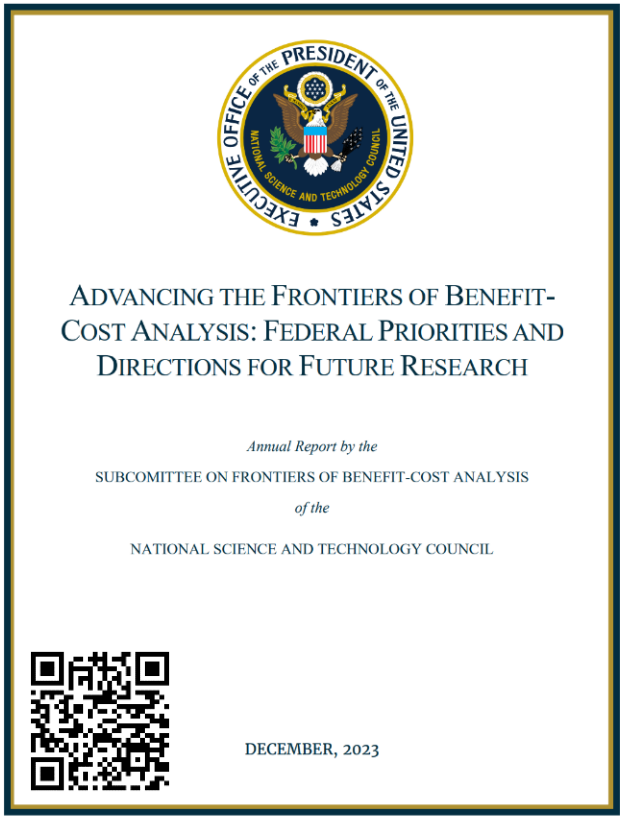
Much ecological risk is overlooked in typical BCAs – including ecosystem services helps

Connections Between BCA and Ecosystem Services

Collaborate on knowledge gaps:

- **Ecosystem Services**
- Carbon storage and sequestration in coastal marine habitats and soils
- Riverine, coastal management effects on flood risk and return to normalcy following storms

- **Wildfire and Extreme Events**
- Attribution of wildfire effects to specific management options (fuels management, preparedness, etc)
- Data on relationship between wildfire characteristics (intensity, acreage etc) and wildfire costs



Mechanisms for Collaboration:

How do we get more scientists & economists to be like doctors?

Barriers to More Collaboration

- Mismatch in **timeframes**
- People in key **roles** lack skills to consider ecological risk & opportunity
- **Incentives** don't reward collaborations on core processes

Mechanisms to Match Timeframes

Any need for translation can mean death

- **Rapid problem-solving partnerships**
  - between scientists, business and government—around specific decisions
  - 6 months or less

The Nature Conservancy

INSTITUTE ON THE ENVIRONMENT
UNIVERSITY OF MINNESOTA
Driven to Discover

BISA Borlaug Institute for South Asia

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security CCAFS

CIMMYT International Maize and Wheat Improvement Center

Mechanisms to Match Timeframes

$20M advance purchase agreement to scale up Happy Seeders

AGRICULTURE AND ENVIRONMENT

Fields on fire: Alternatives to crop residue burning in India

Farmer profit can be increased and air quality improved

By P. Shyamsundar[1], N. P. Springer[2], H. Tallis[1], S. Polasky[2,3], M. L. Jat[4], H. S. Sidhu[5], P. P. Krishnapriya[6], N. Skiba[1], W. Ginn[1], V. Ahuja[7], J. Cummins[8], I. Datta[9], H. H. Dholakia[10], J. Dixon[11], B. Gerard[12], R. Gupta[13], J. Hellmann[2], A. Jadhav[14], H. S. Jat[4,15], A. Keil[1], J. K. Ladha[16], S. Lopez-Ridaura[12], S. P. Nandrajog[17], S. Paul[17], A. Ritter[17], P. C. Sharma[15], R. Singh[18], D. Singh[19], R. Somanathan[20]

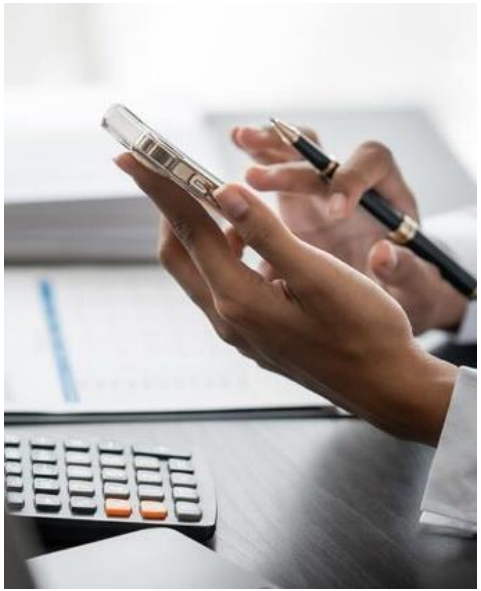
a rice-wheat cropping system (~4.1 million ha). Concerns over groundwater withdrawals have led to a planting cycle that allows the rice crop to benefit from monsoon rains. This cycle creates a short period (~10 to 20 days) to harvest rice, manage rice crop residue, and plant wheat. Many of the 2.5 million farmers in northwestern India prepare for wheat planting by burning an estimated 23 million metric tons of rice residue in their fields (*12*).

India's national government recognizes both the air pollution risks and the crucial role of crop residue burning. Despite federal and state regulations since 2014 and related advisories and bans, directives against burn-

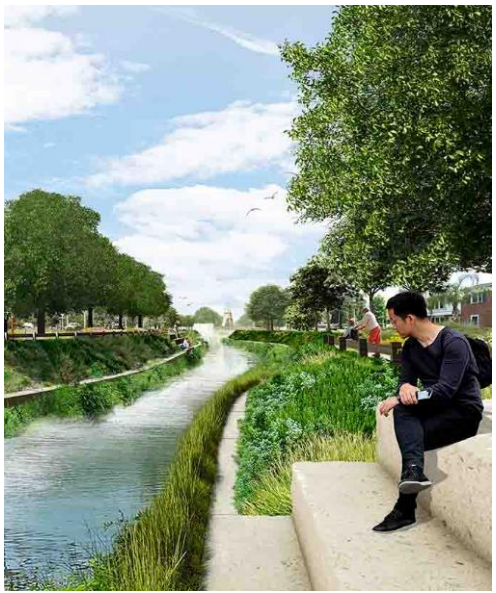
Collaborate to Upskill Workforce

LAWYERS

BUDGET OFFICERS



ENGINEERING



CONSTURCTION & MAINTENANCE

Incentives for Collaboration on Core Processes

Incentives to engage scientists on core practice changes

recognition, funding, promotion

Incentives for businesses for core practice changes

credits, goals, prizes

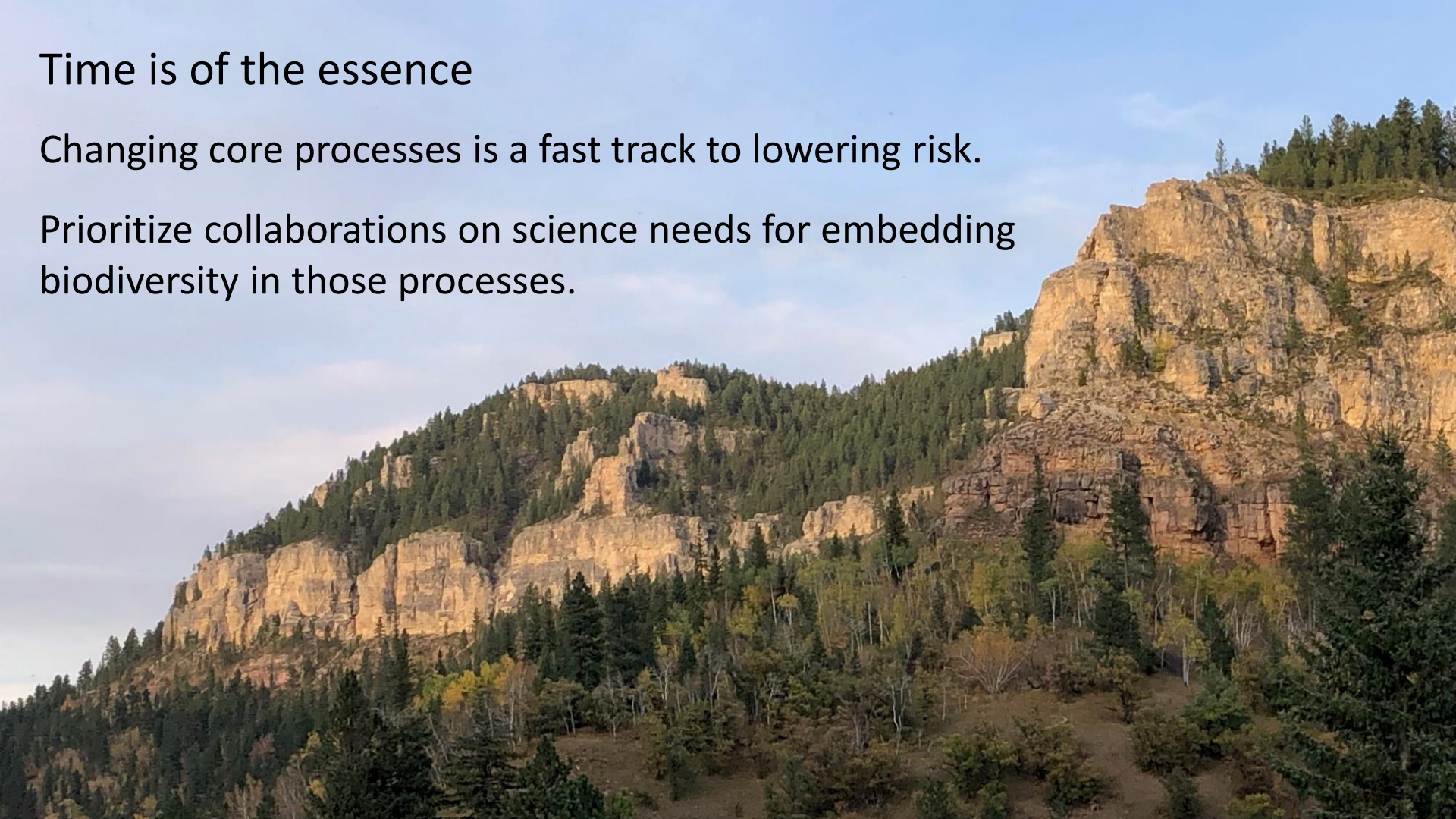
Incentives for Science-Business Collaboration

Incentives for Science-Business Collaboration

Time is of the essence

Changing core processes is a fast track to lowering risk.

Prioritize collaborations on science needs for embedding biodiversity in those processes.



Final reflections

Sir Partha Dasgupta FRS

THE ROYAL SOCIETY

The Global Impact Inequality:

$$Ny/\alpha > G$$

$Ny/\alpha > G(S)$

N: population
y: per capita income
α: efficiency with which Nature's goods are converted into GDP
S: Nature's stock
G: Nature's regeneration rate (it is a function of S)

Current ratio of LHS to RHS is 1.7 (possibly a lot higher)