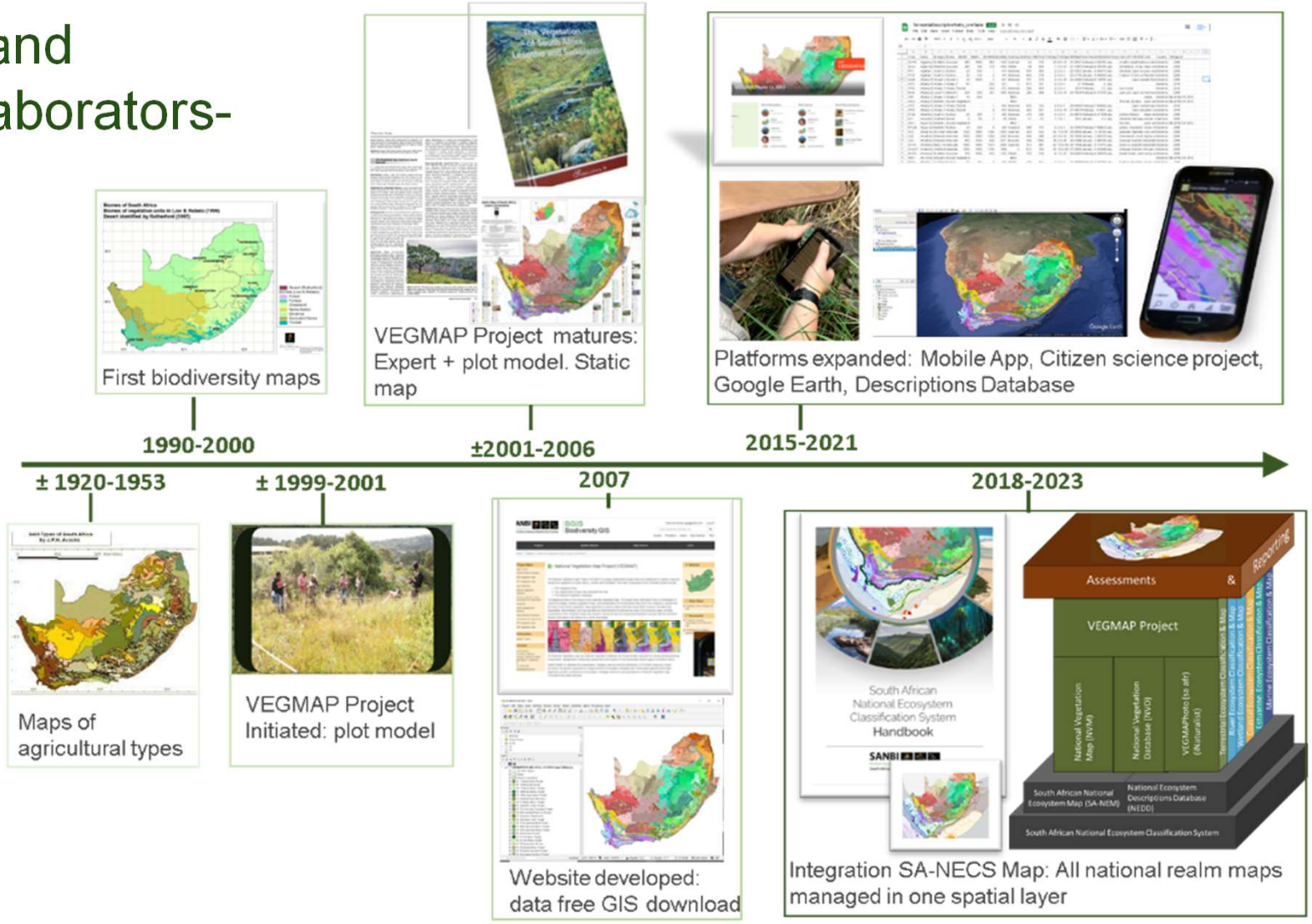
South Africa's role in the Global Ecosystem Typology and Global Ecosystems Atlas

SANBI
Biodiversity for Life
South African National Biodiversity Institute

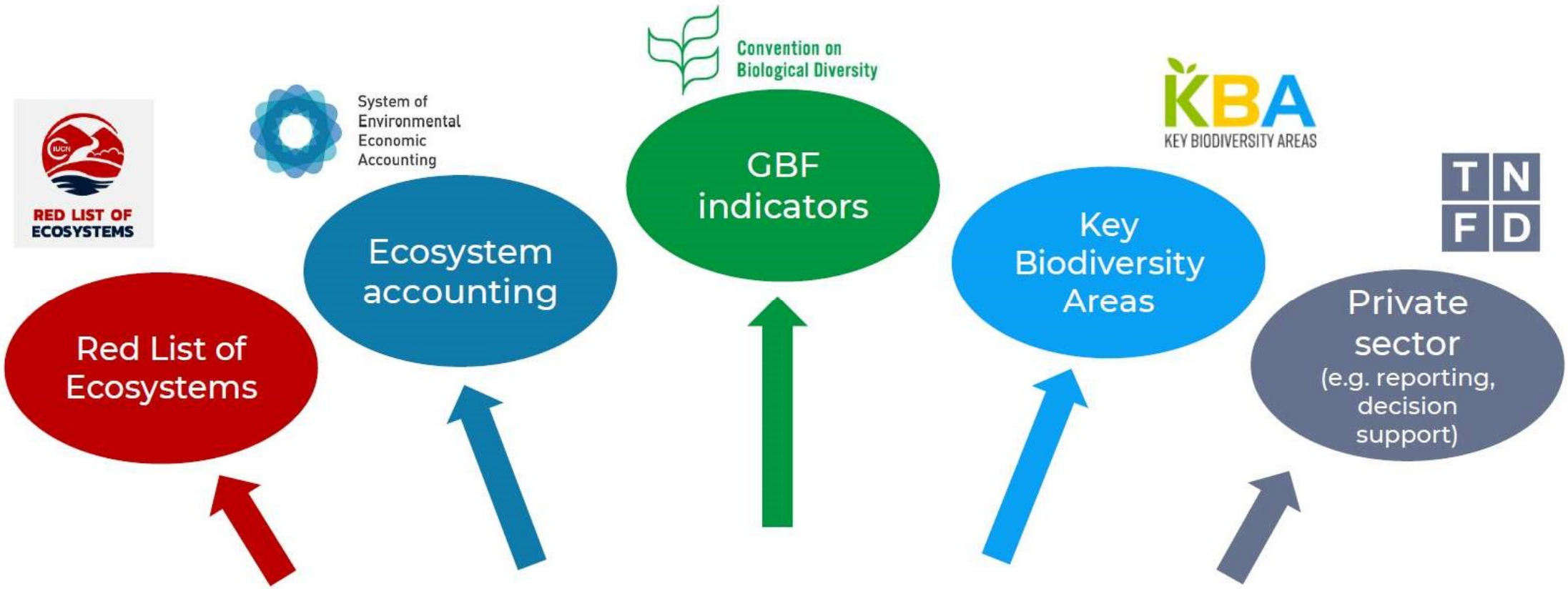
Global Ecosystem Typology

GLOBAL ECOSYSTEMS ATLAS

A history of ecosystem mapping and classification work in South Africa with local and international collaborators- good for pilot



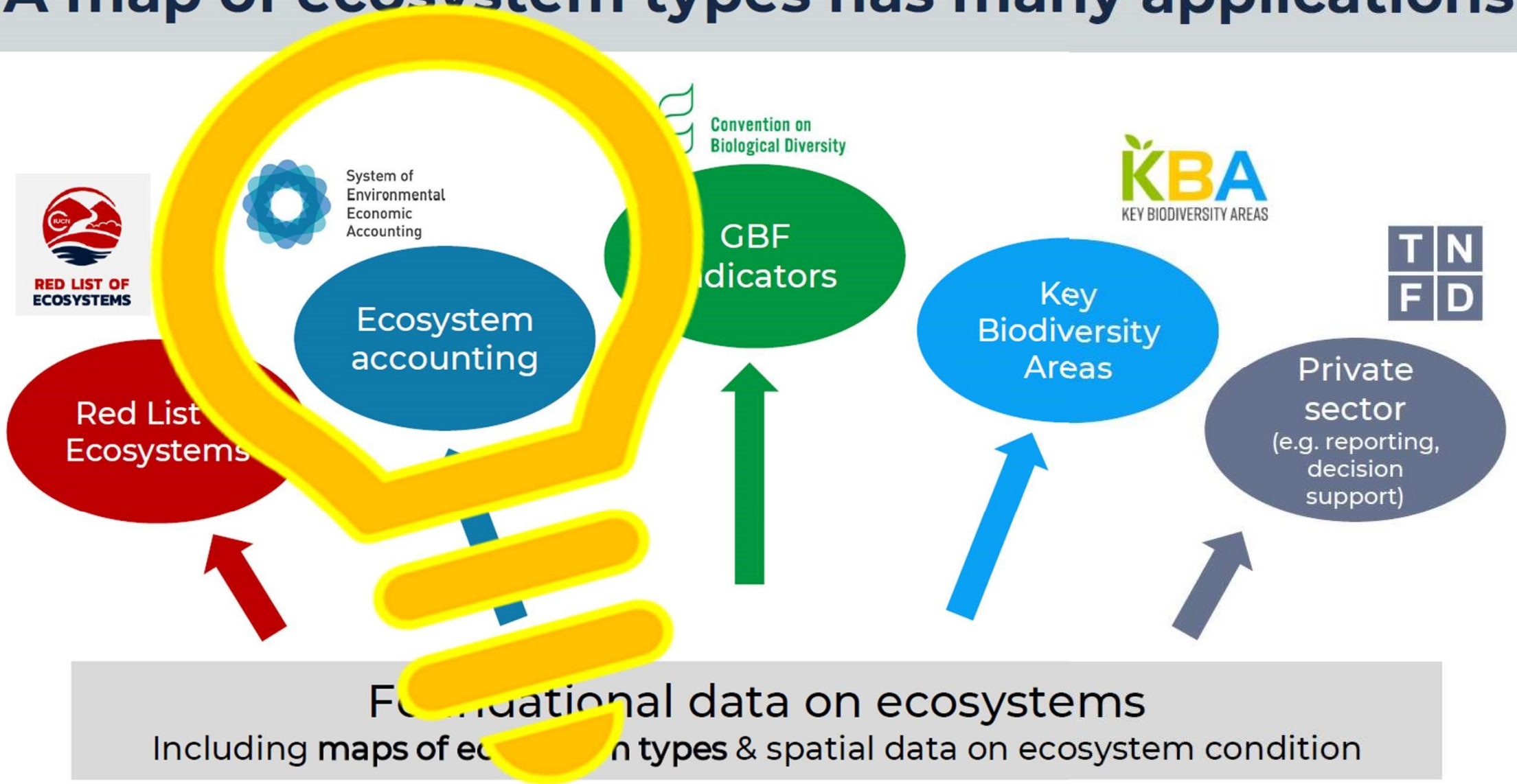
A map of ecosystem types has many applications



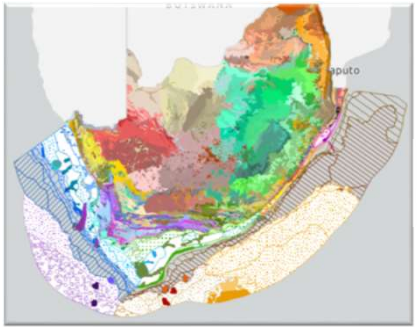
Foundational data on ecosystems

Including **maps of ecosystem types** & spatial data on ecosystem condition

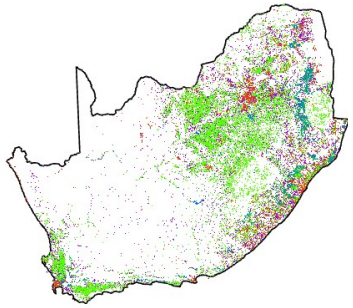
A map of ecosystem types has many applications



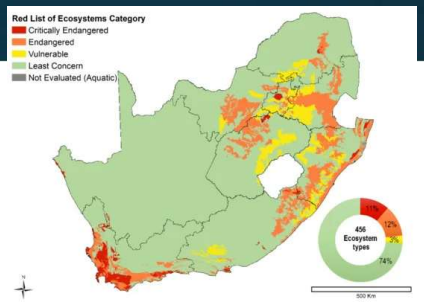
Red List of Ecosystems

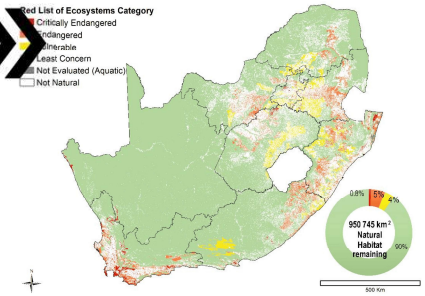


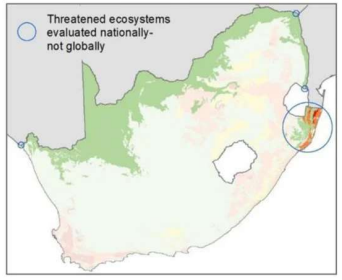
Ecosystem Maps foundational historical baseline



SALCLU Anthropogenic loss







Ecosystem accounting

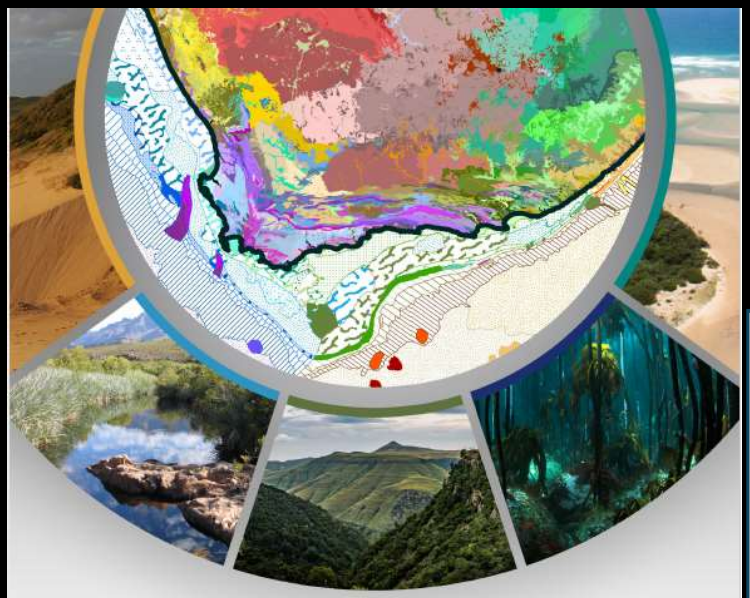
Table 16. Land account for biomes, 1990–2014, in hectares

	Broad land cover classes (tier 1)	Natural or semi-natural	Cultivated	Built-up	Waterbodies*	TOTAL
Albany Thicket	Opening stock 1990	3 301 140	161 521	51 474	16 696	3 531 331
	Additions to stock	44 432	23 941	8 605	5 375	82 353
	Reductions in stock	36 008	29 256	8 295	8 823	82 353
	Net change in stock	8 424	-5 315	339	-3 448	
	Net change as % of opening	*0.3%*	*-3.3%*	*0.7%*	*-20.7%*	
	Unchanged (opening - reductions)	3 265 132	132 665	43 208	7 873	
	Unchanged as % of opening	*98.9%*	*81.9%*	*83.9%*	*47.2%*	
	Turnover (additions + reductions)	80 440	53 197	16 871	14 198	
	Turnover as % of opening	*2.4%*	*32.9%*	*32.8%*	*85.0%*	
	Closing stock 2014	3 309 564	156 606	51 813	13 248	3 531 231

	Broad land cover classes (tier 1)	Natural or semi-natural	Cultivated	Built-up	Waterbodies*	TOTAL
Desert	Opening stock 1990	617 970	861	7 265	111	626 207
	Additions to stock	1 142	769	505	4	2 420
	Reductions in stock	1 260	395	654	111	2 420
	Net change in stock	-118	374	-149	-107	
	Net change as % of opening	*0.0%*	*43.4%*	*-2.1%*	*-96.4%*	
	Unchanged (opening - reductions)	616 710	466	6 611	0	
	Unchanged as % of opening	*99.8%*	*54.1%*	*91.0%*	*0.0%*	
	Turnover (additions + reductions)	2 402	1 164	1 159	115	
	Turnover as % of opening	*0.4%*	*135.2%*	*16.0%*	*103.6%*	
	Closing stock 2014	617 852	1 235	7 116	4	626 207

	Broad land cover classes (tier 1)	Natural or semi-natural	Cultivated	Built-up	Waterbodies*	TOTAL
Forest	Opening stock 1990	391 845	50 988	6 718	12 967	462 518
	Additions to stock	24 900	4 818	2 921	1 403	34 042
	Reductions in stock	7 689	18 228	1 527	6 598	34 042
	Net change in stock	17 211	-13 410	1 394	-5 195	
	Net change as % of opening	*4.4%*	*-26.3%*	*20.8%*	*-40.1%*	
	Unchanged (opening - reductions)	384 156	32 760	5 191	6 369	
	Unchanged as % of opening	*98.0%*	*64.3%*	*77.3%*	*49.1%*	
	Turnover (additions + reductions)	32 589	23 046	4 448	9 001	
	Turnover as % of opening	*8.3%*	*45.2%*	*66.2%*	*61.7%*	
	Closing stock 2014	409 056	37 578	8 112	7 772	462 518

- Skowno, A.L.; Monyeki, M.S. South Africa's Red List of Terrestrial Ecosystems (RLEs). Land 2021, 10, 1048. https://doi.org/10.3390/land10101048



South African National Ecosystem Classification System Handbook

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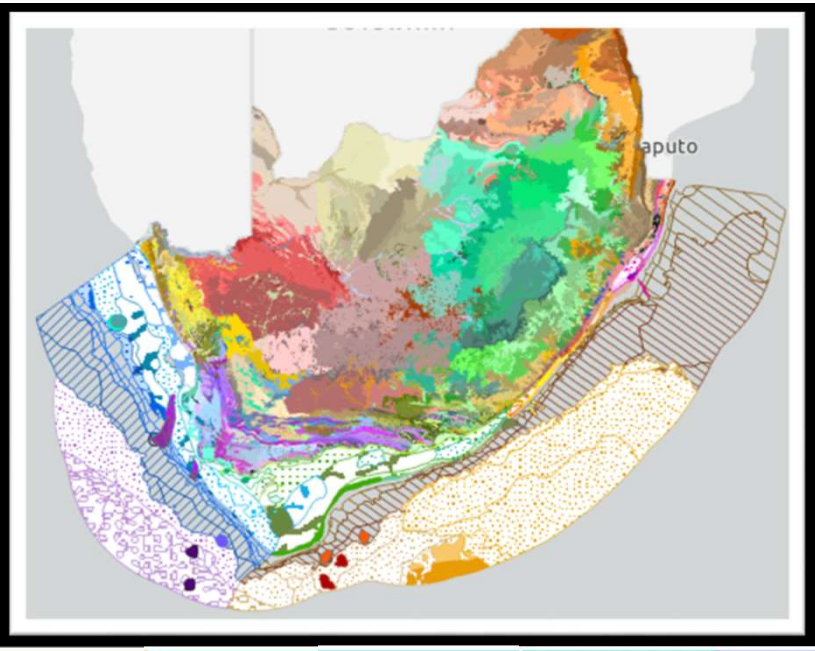
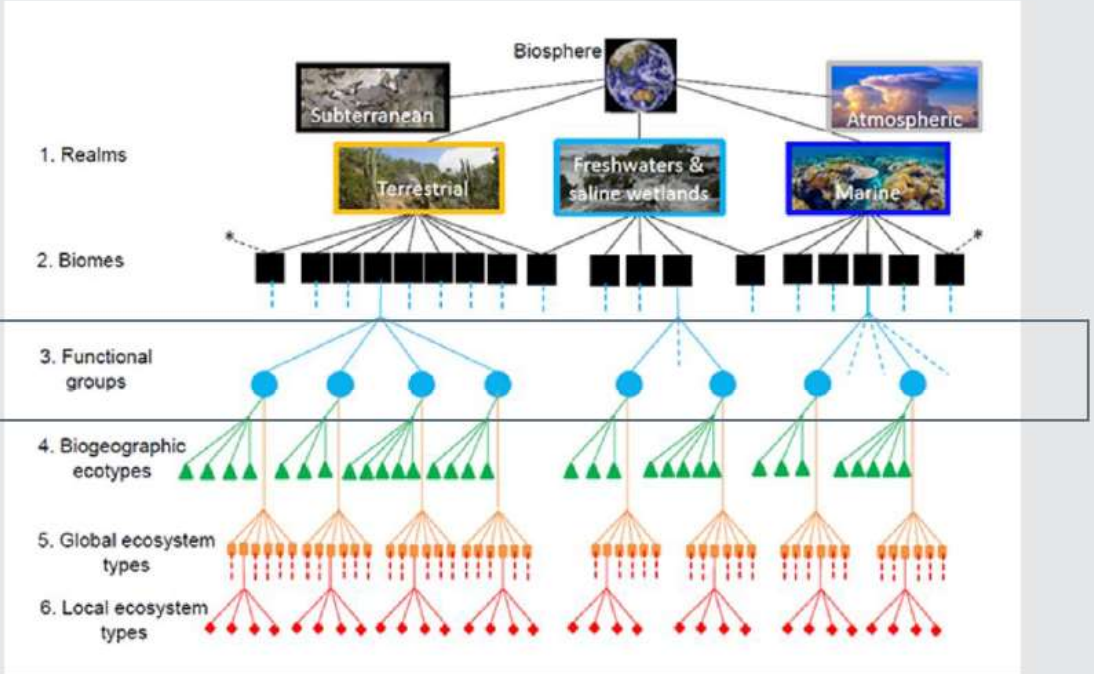


	Terrestrial	Inland wetlands	River	Estuarine	Marine
	Level	Level	Level	Level	Level
Macroscale	Realm	Realm	Realm	Realm	Realm
	Biome	[Biome]	[Biome]	[Biome]	[Bathome]
					Ecoregion
	Bioregion	Regional setting	Ecoregion level 1	Biogeographical zone	Bathyregion
Mesoscale		HGM type		Functional type	Substratum
	Ecosystem Type[§] (1:3 000–250 000)	**Wetland Type** (1:2 000–50 000)	**River Type** (1:50 000–1:500 000)	**Ecosystem Type** (1:2 000–10 000)	Ecosystem Type (< 1:3 000–250 000)
Microscale	Vegetation subtype	*Hydrological Regime	River flow	Estuary name, ID, EFZ†	
		[Δ]Other descriptors	Geomorphic zone		

The Global Ecosystem Typology is a **hierarchical classification** with six levels



5 Realms (level 1)

25 Biomes (level 2)

110 Ecosystem functional groups (level 3)

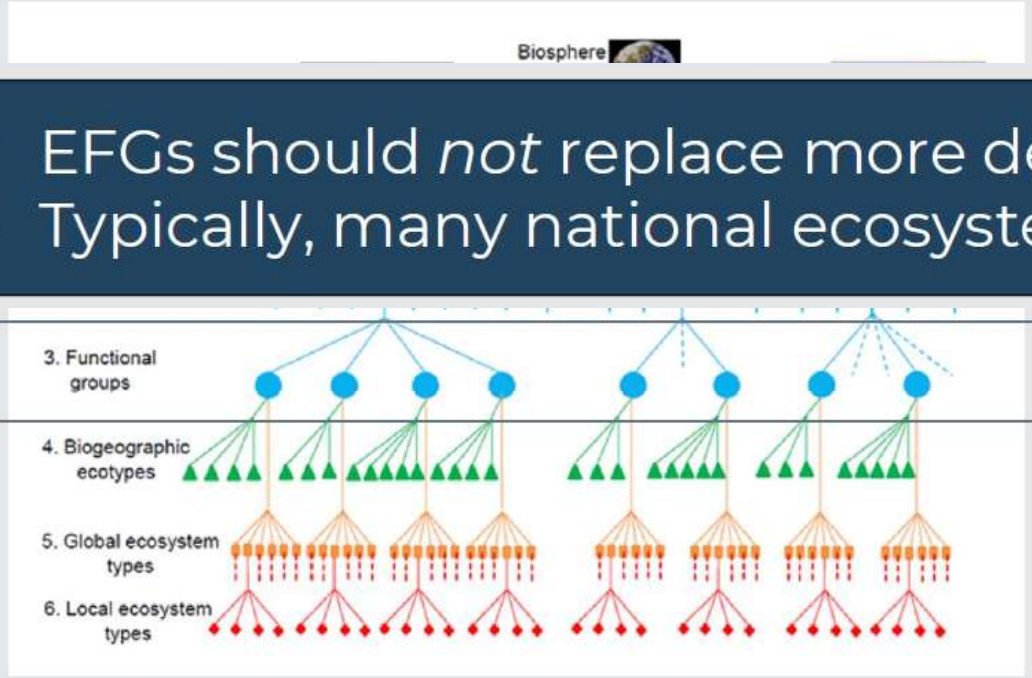
National ecosystem classifications typically at level 5/6

Global Ecosystem Typology

www.global-ecosystems.org

Number of EFGs in a country varies depending on size of the country and its diversity of ecosystems. **On average, the number of EFGs per country is around 20.** National ecosystem classifications are usually much more detailed than EFGs.

The Global Ecosystem Typology is a **hierarchical classification** with six levels



- EFGs should *not* replace more detailed national ecosystem types
- Typically, many national ecosystem types will fall within one EFG

110 Ecosystem functional groups (level 3)

National ecosystem classifications typically at level 5/6

Global Ecosystem Typology

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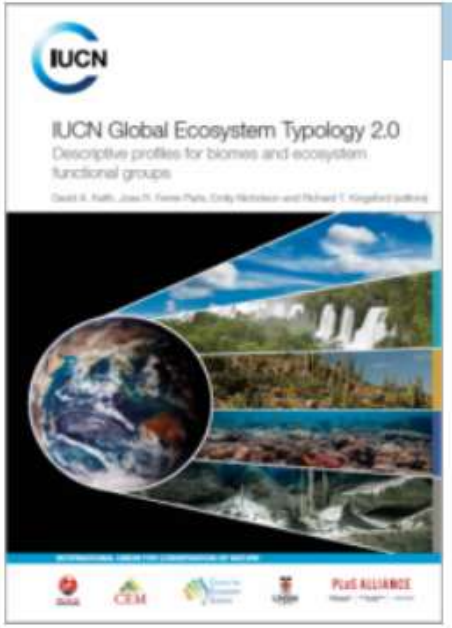
IUCN Global Ecosystem Typology 2.0

Complete Title: IUCN Global Ecosystem Typology 2.0 : descriptive profiles for biomes and ecosystem functional groups



IUCN Publication

Editor(s): Keith, David A. | Ferrer-Paris, José R. | Nicholson, Emily | Kingsford, Richard |

Publisher:
IUCN |

Organization(s): IUCN | IUCN Commission on Ecosystem Management (CEM) | IUCN Global Ecosystem Management Programme |

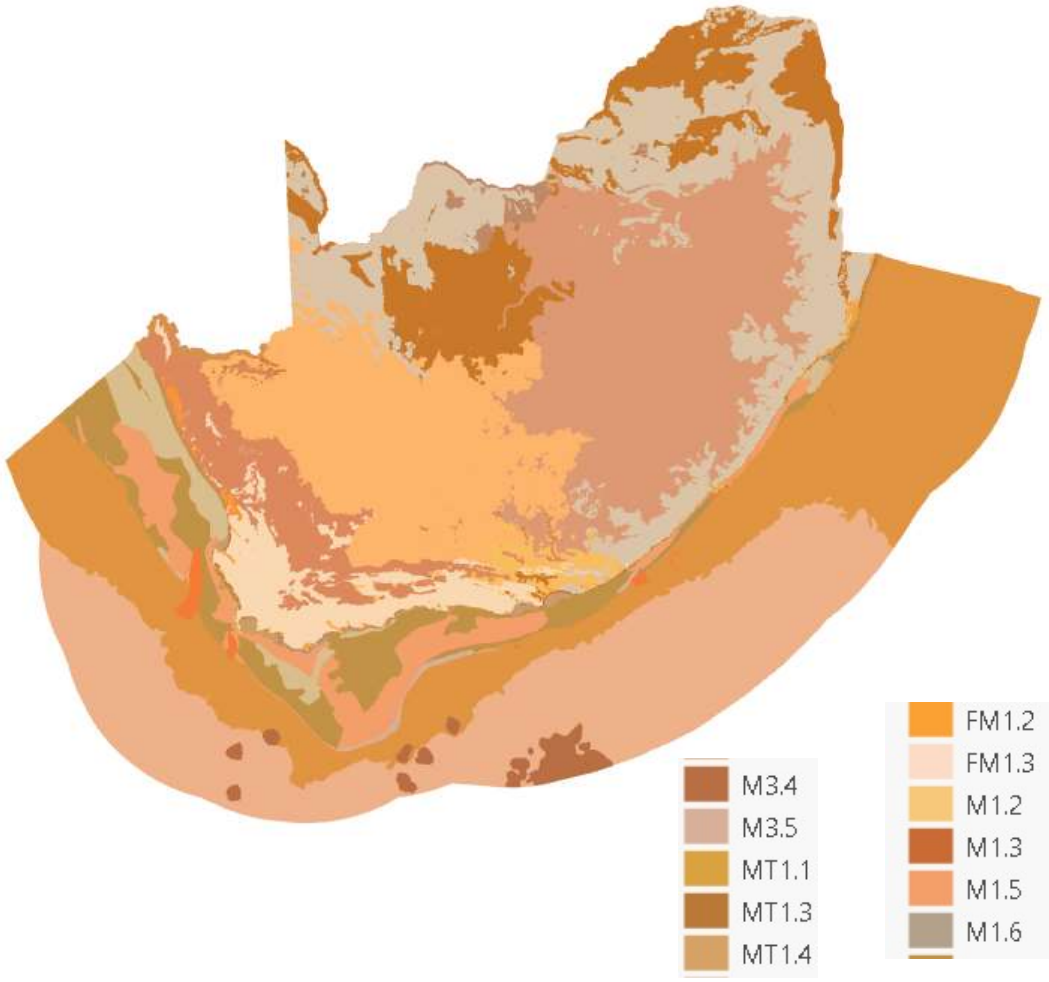
Abstract:
Ecosystems are critically important components of Earth's biological diversity and as the natural capital that sustains human life and well-being. Yet all of the world's ecosystems show hallmarks of human influence, and many are under acute risks of collapse, with consequences for habitats of species, genetic diversity, ecosystem services, sustainable development and human well-being. The IUCN Global Ecosystem Typology is a hierarchical classification system that, in its upper levels, defines ecosystems by their convergent ecological functions and, in its lower levels, distinguishes ecosystems with contrasting assemblages of species engaged in those functions. This report describes the three upper levels of the hierarchy, which provide a framework for understanding and comparing the key ecological traits of functionally different ecosystems and their drivers. An understanding of these traits and drivers is essential to support ecosystem management.

SA is a pilot for cross-walking national maps to the IUCN Global Ecosystem Typology (IUCN-GET)

The IUCN GET defines a hierarchy of ecosystems types across all realms to which national ecosystem types can be cross-walked or matched.

This is important because it (i) respects national data; and (ii) seeks to harmonise national data to a common scheme for global reporting.

South Africa has been working with the IUCN-GET team since 2020 to cross-walk our ecosystem types in all realms with the developing global typology as a pilot. We are also helping the IUCN team to develop guidance for the process globally.



A	B	C	F	G	H	I	J	
Realm (GET L1)	Code	EcosystemType (GET Level 5/6)	Biome (GET L3)	Estuary_Name	T_Status2018_20	ICUN-GET2018b	1stDraft_IUCN_FG_2024	Ecos
Terrestrial	Gh3	Xhariep Karroid Grassland	Grassland		LC		T4.5	Exte
Terrestrial	SVcb23	Polokwane Plateau Bushveld	Savanna		LC		T4.2	Mod
Terrestrial	Dg1	Noms Mountain Desert	Desert		LC		T5.5	Mos
Terrestrial	SVs4	Ngongoni Veld	Savanna		VU		T4.2	Dens
Terrestrial	SKs4	Richtersveld Sandy Coastal Scorpionstailveld	Succulent Karoo		LC		T5.2	Sligh
Terrestrial	FFs20	Tsitsikamma Sandstone Fynbos	Fynbos		LC		T3.2	A rel
Terrestrial	FRa2	Swartland Alluvium Renosterveld	Fynbos		VU		T3.2	River
Terrestrial	AZi5	Bushmanland Vloere	Azonal Vegetation		LC		T5.1	Flat
Terrestrial	AZi7	Tanqua Wash Riviere	Azonal Vegetation		LC		T5.2	Deep
Terrestrial	Gh11	Vredefort Dome Granite Grassland	Grassland		CR		T4.5	Sligh
Terrestrial	AZa6	Albany Alluvial Vegetation	Azonal Vegetation		EN		T4.1	Two
Terrestrial	SVs1	Thukela Valley Bushveld	Savanna		LC		T4.2	Ofte
Terrestrial	NKl2	Eastern Lower Karoo	Nama-Karoo		LC		T5.1	Plain
Terrestrial	SVcb7	Norite Koppies Bushveld	Savanna		LC		T4.2	A lo
Terrestrial	NKb5	Kalahari Karroid Shrubland	Nama-Karoo		LC		T5.1	Low
Terrestrial	FFs22	South Rooiberg Sandstone Fynbos	Fynbos		LC		T3.2	Stee
Terrestrial	Gd6	Drakensberg-Amathole Afromontane Fynbos	Grassland		LC		T4.5	Stee
Terrestrial	FRs2	Nieuwoudtville Shale Renosterveld	Fynbos		CR		T3.2	Flat
Terrestrial	FFs14	South Sonderend Sandstone Fynbos	Fynbos		CR		T3.2	Stee
Terrestrial	SKv13	Prince Albert Succulent Karoo	Succulent Karoo		LC		T5.2	Flat
Terrestrial	SVcb19	Limpopo Sweet Bushveld	Savanna		LC		T4.1	Plain
Terrestrial	Gs1	Northern Zululand Mistbelt Grassland	Grassland		EN		T4.5	Gent
Terrestrial	Dg3	Richtersveld Sheet Wash Desert	Desert		LC		T5.5	Slop
Terrestrial	SVs5	KwaZulu-Natal Sandstone Sourveld	Savanna		EN		T4.2	Shor
Terrestrial	Gm17	Barberton Montane Grassland	Grassland		LC		T4.5	This
Terrestrial	SVl2	Nwambyia-Pumbe Sandy Bushveld	Savanna		LC		T4.1	Flats
Terrestrial	Gm11	Rand Highveld Grassland	Grassland		VU		T4.5	High
Terrestrial	SKr16	Umdaus Mountains Succulent Shrubland	Succulent Karoo		LC		T5.2	Mou
Terrestrial	Gh2	Aliwal North Dry Grassland	Grassland		LC		T4.5	Brok
Terrestrial	FFs8	South Hex Sandstone Fynbos	Fynbos		LC		T3.2	Rugg
Terrestrial	Gm24	Northern Escarpment Afromontane Fynbos	Grassland		LC		T4.5	The
Terrestrial	SKv2	Swartruggens Quartzite Karoo	Succulent Karoo		LC		T5.2	Hilly
Terrestrial	FRs7	Montagu Shale Renosterveld	Fynbos		LC		T3.2	Undu
Terrestrial	NKh2	Blouputs Karroid Thornveld	Nama-Karoo		LC		T5.1	An o

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Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria : version 2.0

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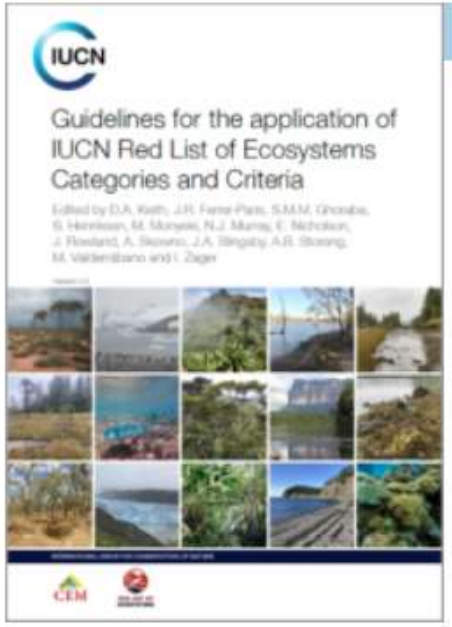

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Publisher:

IUCN |

Organization(s): IUCN Commission on Ecosystem Management (CEM) |

Abstract:

The IUCN Red List of Ecosystems is the global standard for ecosystem risk assessment and a framework for monitoring the status of the world's ecosystems. It is part of the growing toolbox for assessing risks to biodiversity and aims to support conservation, resource use and management decisions by identifying ecosystems most at risk of biodiversity loss. By targeting a level of biological organisation above species, the IUCN Red List of Ecosystems complements The IUCN Red List of Threatened Species™ in supporting biodiversity conservation decision-making and action. The IUCN Red List of Ecosystems Categories and Criteria are designed to be widely applicable across ecosystem types and geographical areas, transparent and scientifically rigorous, and easily understood by policy makers and the public.

https://portals.iucn.org/library/node/51533

Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria : version 2.0

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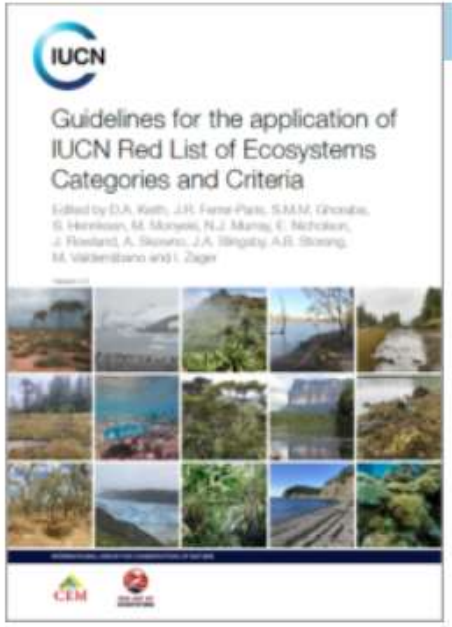

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South African Co-authors

https://portals.iucn.org/library/node/51533

GLOBAL ECOSYSTEMS ATLAS

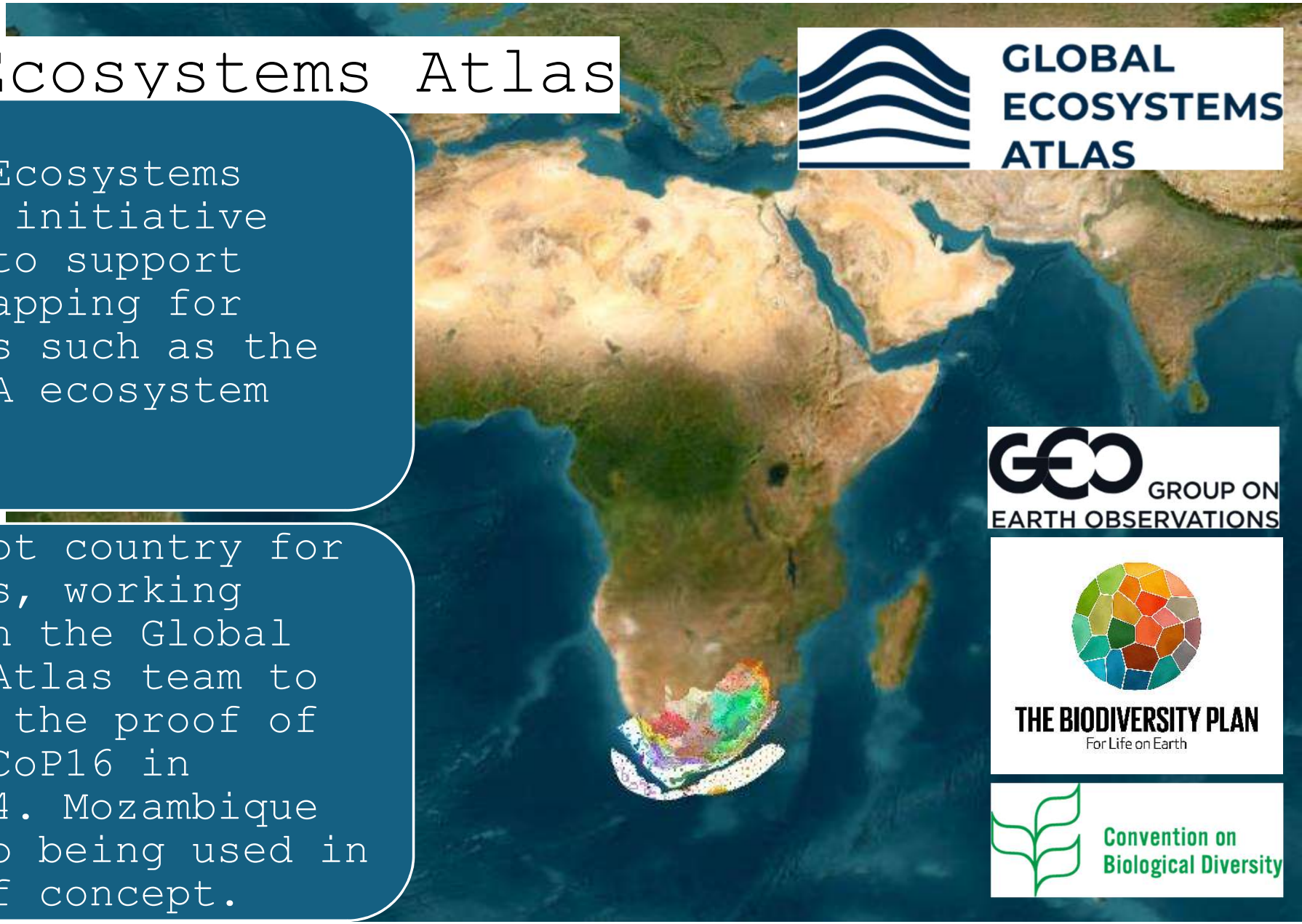
However, there is currently no **trusted common** reference on world's ecosystems.

This is a major need for **measuring** and **monitoring** ecosystem **extent** and **change.**

Global Ecosystems Atlas

The Global Ecosystems Atlas is an initiative that seeks to support ecosystem mapping for applications such as the GBF and SEEA ecosystem accounting

SA is a pilot country for this process, working closely with the Global Ecosystems Atlas team to demonstrate the proof of concept by CoP16 in October 2024. Mozambique data is also being used in the proof of concept.



Global Ecosystems Atlas

The Global Ecosystems Atlas is an initiative that seeks to operationalise the process of ecosystem mapping for the GBF. Using a bottom-up approach of collating and harmonising national and regional ecosystem maps, and cross-walking to

of concept.

- The Atlas will retain information from national ecosystem maps
- Countries should retain their national ecosystem classification/typology
- Cross-walking national ecosystem types to the ecosystem functional groups (Level 3) of the Global Ecosystem Typology requires an initial investment of effort, with many benefits nationally and globally

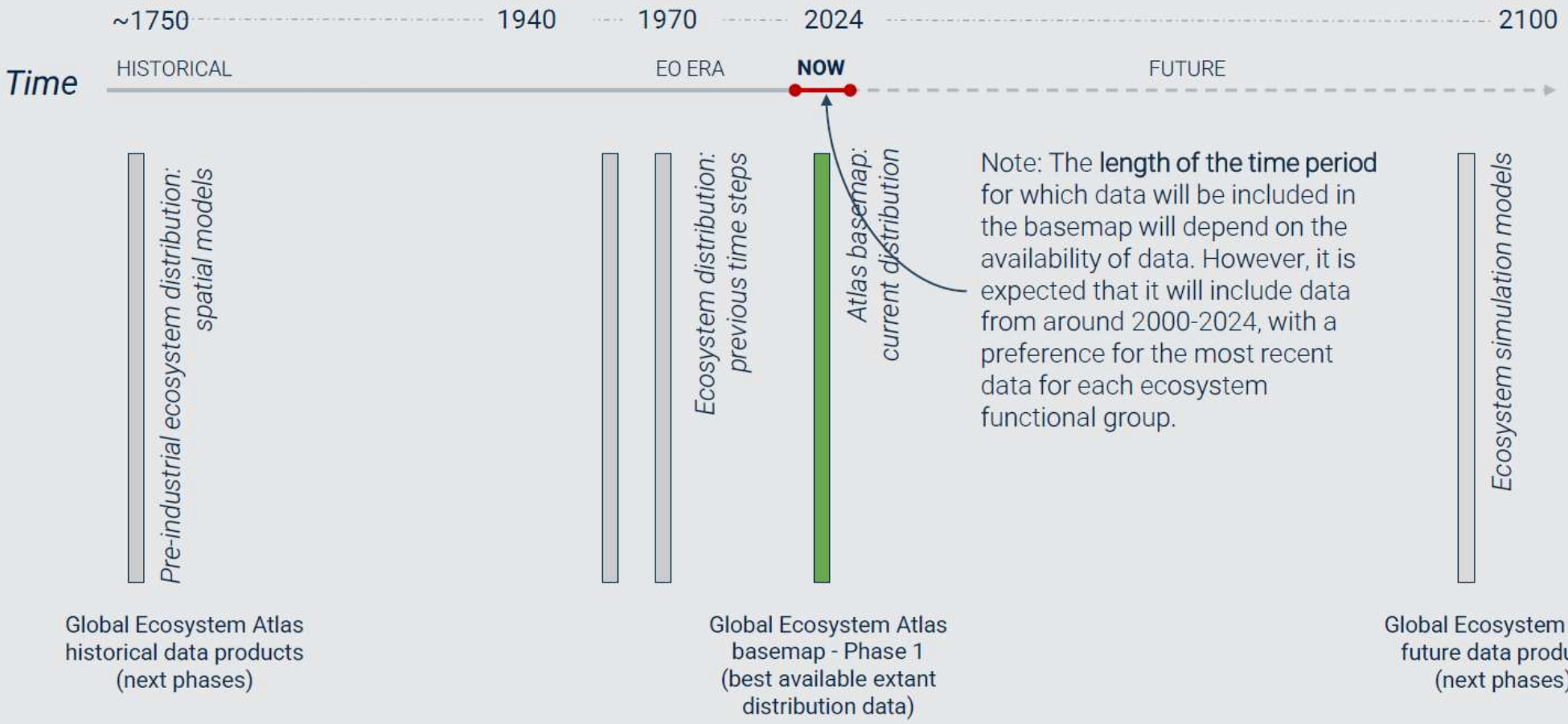
- Lessons will be shared further with other SBAPP Regional Project partners creating an enabling environment for the inclusion of more countries in the Global Ecosystems Atlas project.

GLOBAL ECOSYSTEMS ATLAS

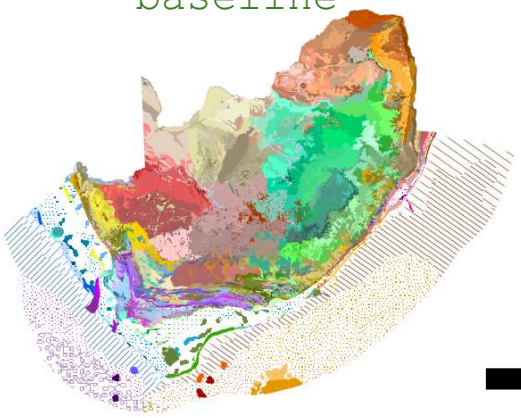
THE BIODIVERSITY PLAN
For Life on Earth

Convention on Biological Diversity

Handling the issue of time



Ecosystem Maps
foundational
historical
baseline



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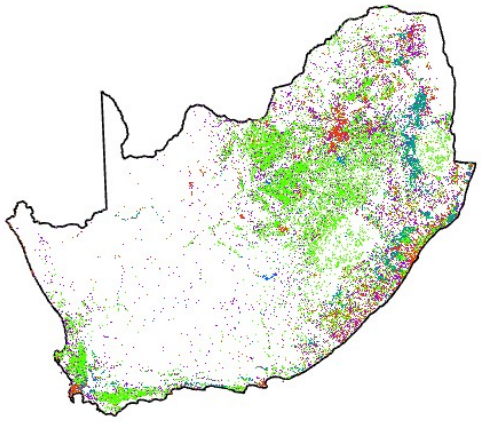
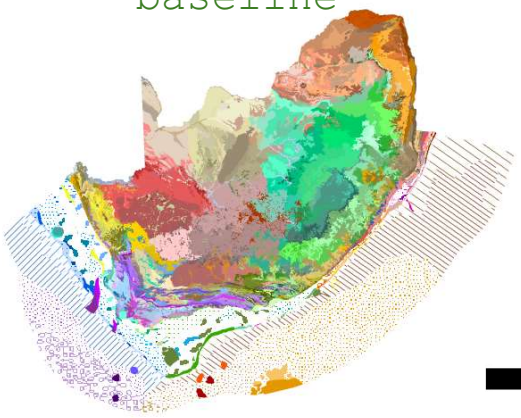
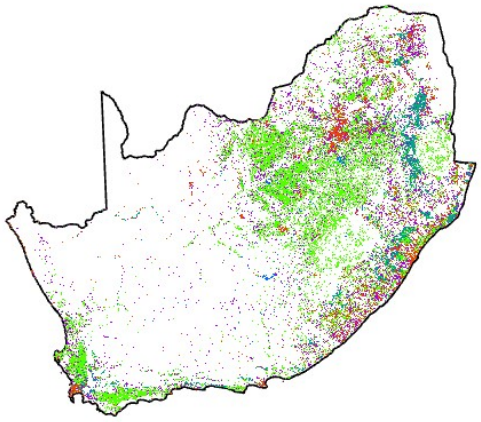
SALCLU
Anthropogenic
baseline

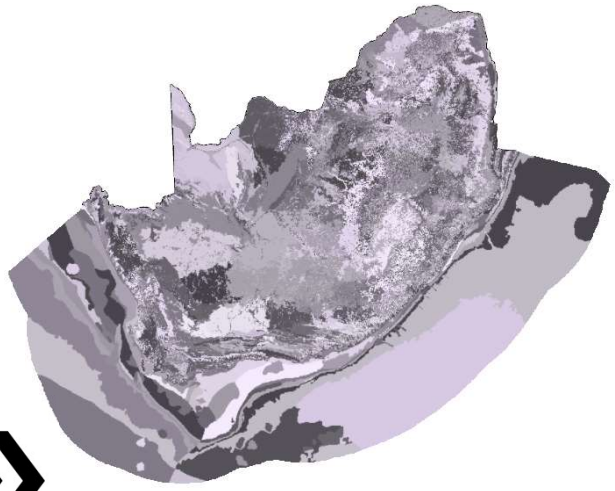


Ecosystem Maps foundational historical baseline



SALCLU Anthropogenic baseline





Global Ecosystem Atlas Contemporary extent with GET codes

4 broad groups of countries

A Countries that already have a national ecosystem map with an institutional home

e.g. Colombia, South Africa, Mozambique, Chile, Myanmar

B Countries that have embarked on developing a national ecosystem map, from a lot of existing but partial/scattered spatial data on ecosystems

e.g. Canada, Australia

C Countries that have embarked on developing a national ecosystem map "from scratch"

e.g. Malaysia, Namibia, Maldives

D Countries that have no national ecosystem map and no resources/intent to develop one (rather want to use global data)

e.g. ...

s

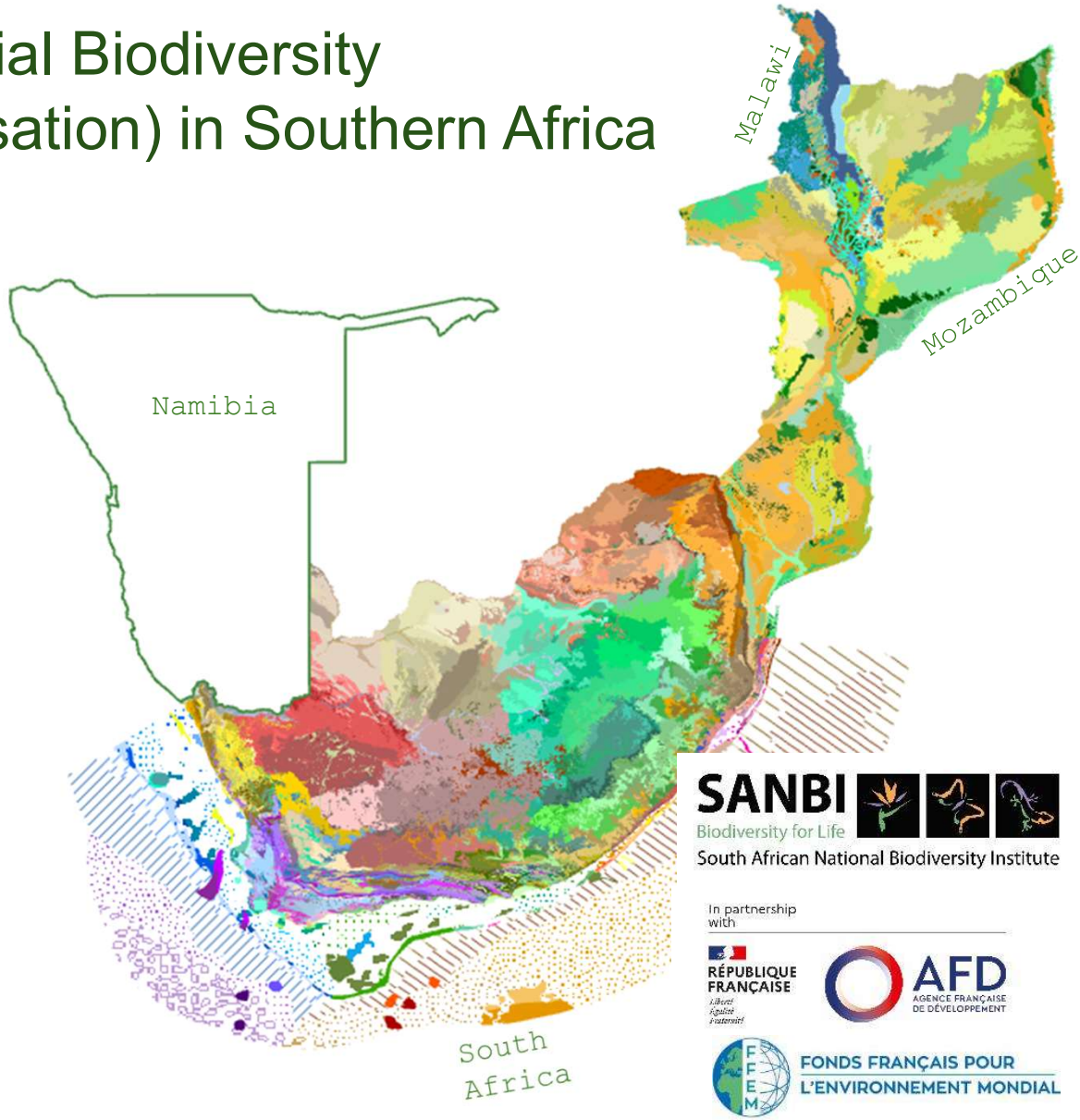
SBAPP Regional Project (Spatial Biodiversity Assessment, Planning and Prioritisation) in Southern Africa

SANBI is the Lead Implementing Agency for a regional project with Namibia, Mozambique and Malawi funded by French donors.

Major objectives of this project are to improve ecosystem mapping and assessment across all four countries.

This will enable us to support better landuse planning (GBF Target 1), restoration (GBF Target 2) and protected areas planning (GBF Target 3)…

and to be better able to track GBF Goal A Headline Indicators: A1 Red List of Ecosystems, A2 Extent of natural ecosystem types, T1 Percent of land and seas covered by biodiversity-inclusive spatial plans, T3 Coverage of protected



SANBI
Biodiversity for Life
South African National Biodiversity Institute

In partnership with

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

AFD
AGENCE FRANÇAISE DE DÉVELOPPEMENT

FEM
FONDS FRANÇAIS POUR L'ENVIRONNEMENT MONDIAL

The Atlas is more than just a map

Data products

- **Basemap** of ecosystem functional groups
- **Catalogue** of maps of ecosystem types
- To come: Time series of ecosystem extent, ecosystem condition

Web presence/interface

- **Explore** basemap online
- **Download** basemap map
- **Link** to underlying national & global maps
- **Apply** analytical tools

Analytical tools

- **Extent** of ecosystem functional groups
- **Protection level** of ecosystem functional groups
- Reporting on **Red List of Ecosystem** status
- **More** to come

Resources for countries

Including:

- **Guidelines** for developing a national map of ecosystem types
- **Tools for cross-walking** to the Global Ecosystem Typology
- **Training datasets** for ecosystem functional groups

Support to countries

- Partnership approach
- Embedded in national institutions
- Facilitating access to new data and technologies
- **Starting with the Maldives in 2024/5**

Possible role for regional centres

- Context-specific support for low- & medium capacity countries to create national ecosystem maps

Network of ecosystem mapping practitioners

- Facilitating learning and sharing of approaches

Consortium of partners

Community of users

Connecting people!

Thank you

With thanks to Mandy Driver for sharing her GEA slides

South Africa support the goals of the Global Ecosystem Typology & Global Ecosystems Atlas and are committed to ensuring national and regional data is well considered in ecosystem elements of the GBF.

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