Implementing ecosystem accounting in South Africa: Reflections on the role of data and science

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with acknowledgements to many colleagues

SEEA Ecosystem Accounting as Enabler of Data and
Model Integration to Improve Decision-Making
UN WORLD DATA FORUM

26 April 2023

Core partners for ecosystem accounting in South Africa

← National Statistical Office

- Leads Natural Capital Accounting
- Compiles and publishes SEEA Central Framework accounts
- **Publishes** natural capital accounts

← Government agency under Ministry of Environmen

- Mandate includes monitoring & reporting on the state of ecosystems
- **Data owner** for several key data layers for ecosystem accounts
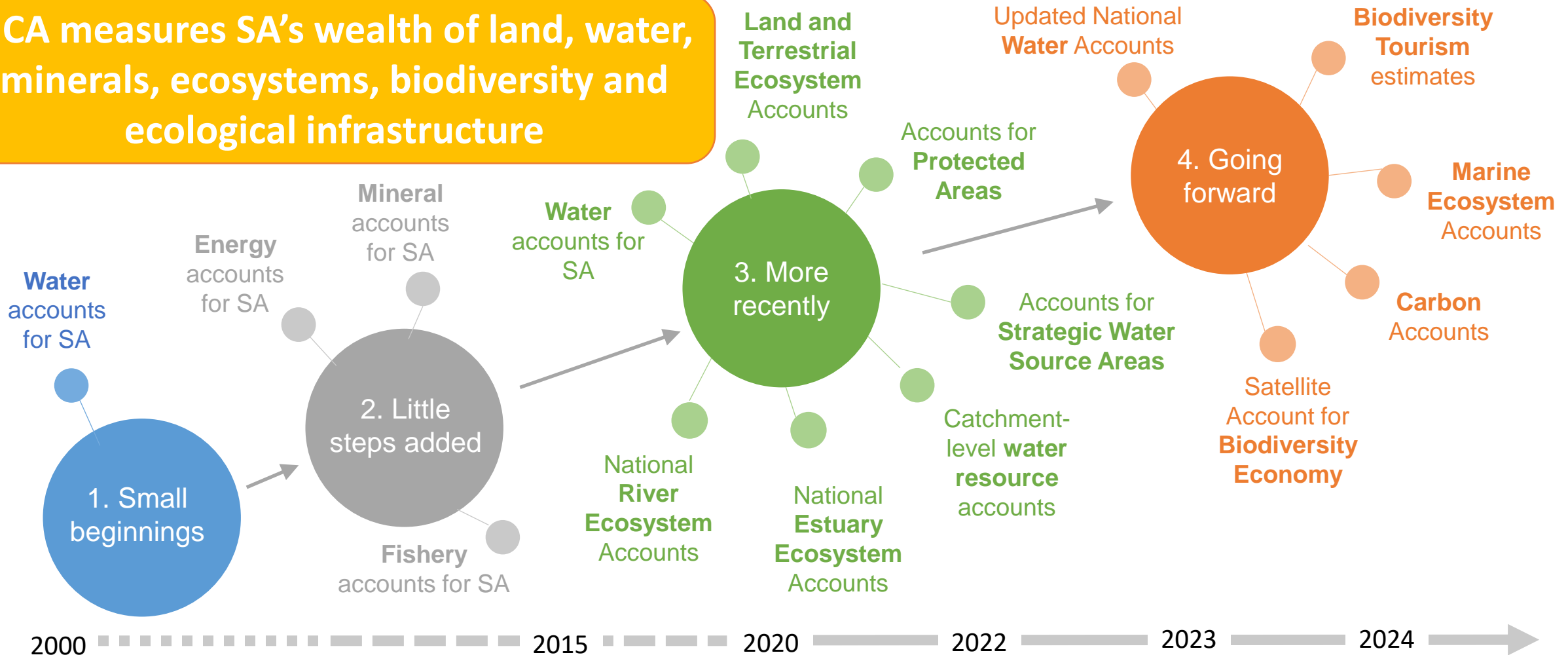- **Compiles** SEEA ecosystem accounts

← Ministry of Environment

- Key user of ecosystem accounts
- **Data owner** for some key data layers for SEEA ecosystem accounts

Ecosystem accounting forms part of Natural Capital Accounting

NCA measures SA's wealth of land, water, minerals, ecosystems, biodiversity and ecological infrastructure

Water accounts for SA

Energy accounts for SA

Mineral accounts for SA

Water accounts for SA

Land and Terrestrial Ecosystem Accounts

Updated National **Water** Accounts

Biodiversity Tourism estimates

1. Small beginnings

2. Little steps added

3. More recently

4. Going forward

Accounts for **Protected Areas**

Marine Ecosystem Accounts

Fishery accounts for SA

National **River Ecosystem** Accounts

National **Estuary Ecosystem** Accounts

Catchment-level **water resource** accounts

Accounts for **Strategic Water Source Areas**

Carbon Accounts

Satellite Account for **Biodiversity Economy**

2000   2015   2020   2022   2023   2024

From early beginnings with national water accounts in 2000, momentum for NCA has grown.
Since 2014, donor funded projects have helped to increase capacity, especially for ecosystem accounting.

# *Natural Capital* series launched by Stats SA in 2020

Which ecosystem types are under pressure from which land uses?

Accounts for **Land and Terrestrial Ecosystems** (released Dec 2020)
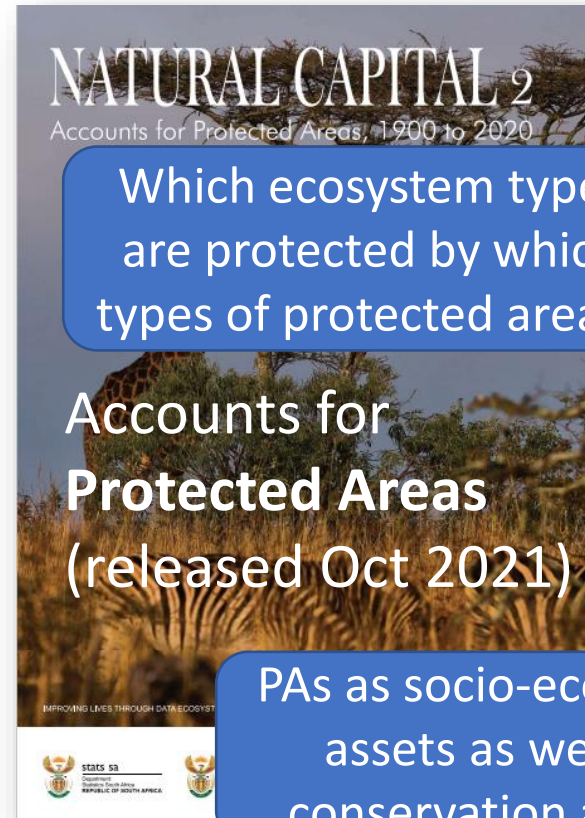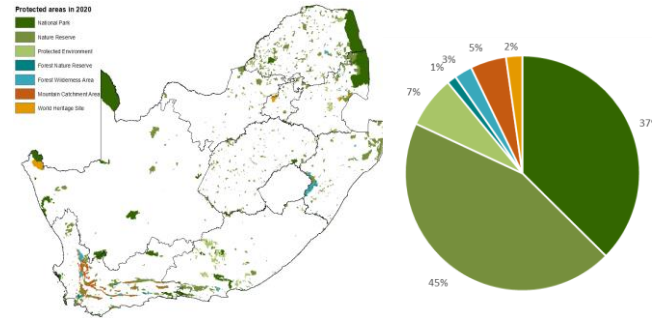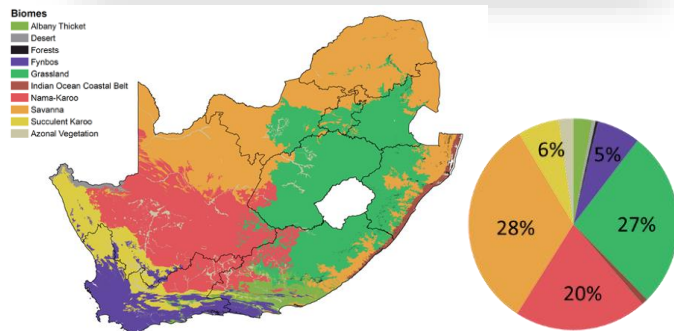
Which ecosystem types are protected by which types of protected areas?

Accounts for **Protected Areas** (released Oct 2021)

PAs as socio-economic assets as well as conservation assets

Catchments that feed SA's major dams
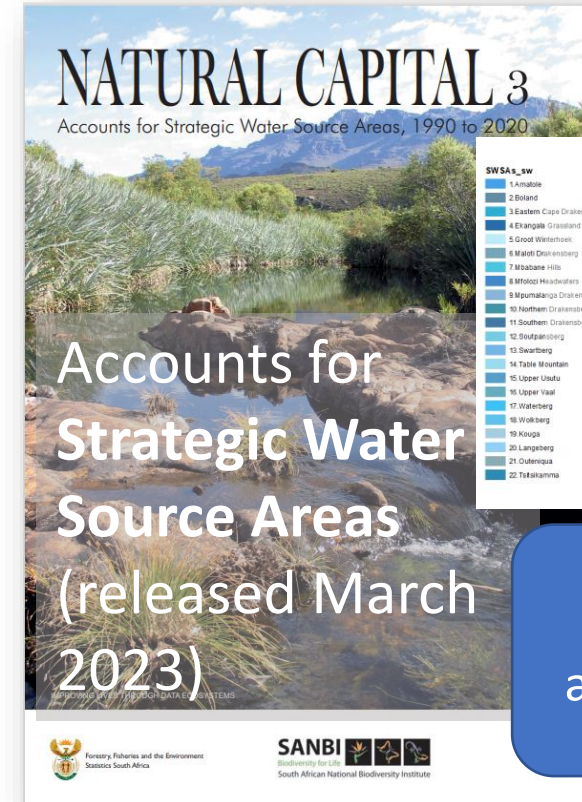
Accounts for **Strategic Water Source Areas** (released March 2023)
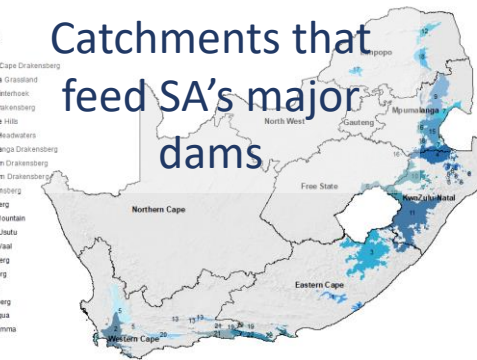
Ecological infrastructure assets for water security

SANBI contributes best available science, spatial data layers, and expertise

	National Park	Nature Reserve	Protected Environment	Forest Nature Reserve	Forest Wilderness Area	Mountain Catchment Area	World Heritage Site*	Not protected	Total	Total protected (ha)	Total protected (%)
Opening stock 2010	**4 083 942**	**4 238 881**	**101 860**	**128 167**	**277 433**	**559 422**	**214 236**	**112 362 512**	**121 966 453**	**9 603 941**	**7,9%**
Additions to stock	-	284 947	194 042	15 298	-	3		-	494 290		
Reductions in stock	-	-3	-	-	-			-494 287	-494 290		
Net change in extent	-	284 944	194 042	15 298				-494 287	-	494 287	
Net change as % of opening	*0,0%*	*6,7%*	*190,5%*					*-0,4%*	*0,0%*	*5,1%*	
Closing stock 2015	**4 083 942**	**4 523 825**	**295 902**							**10 098 228**	**8,3%**
Opening stock 2015	**4 083 942**						**214 236**	**111 868 225**	**121 966 453**	**10 098 228**	**8,3%**
Additions to stock	134 965					3	38 959	-	1 182 456		
Reductions in stock	-			-	-	-	-	-1 182 456	-1 182 456		
Net change in extent	134 965				1	3	38 959	-1 182 456	-	1 182 456	
Net change as % of opening	*3,3%*		*171,4%*	*1,6%*	*0,0%*	*0,0%*	*18,2%*	*-1,1%*	*0,0%*	*11,7%*	
Closing stock 2020	**4 218 907**	**5 022...**	**803 018**	**145 791**	**277 434**	**559 428**	**253 195**	**110 685 769**	**121 966 453**	**11 280 684**	**9,2%**

Outputs of accounts include tables, maps, graphs, indicators

2020
9,2%
of the mainland protected
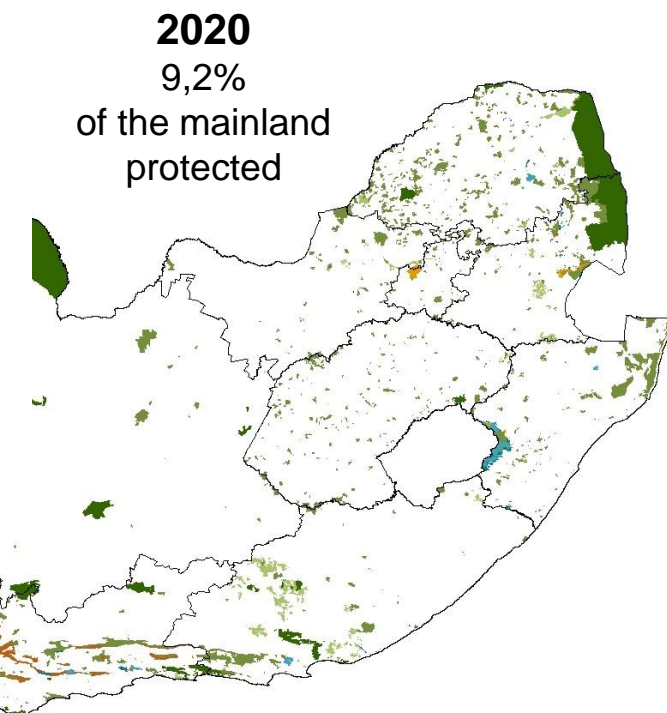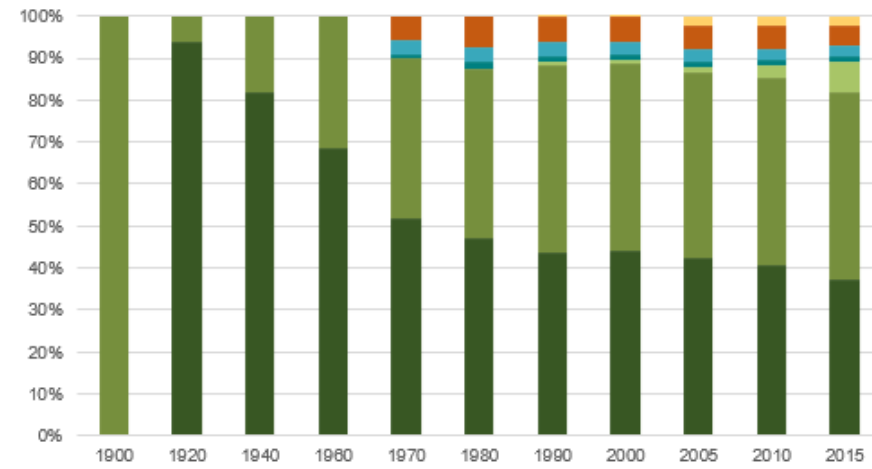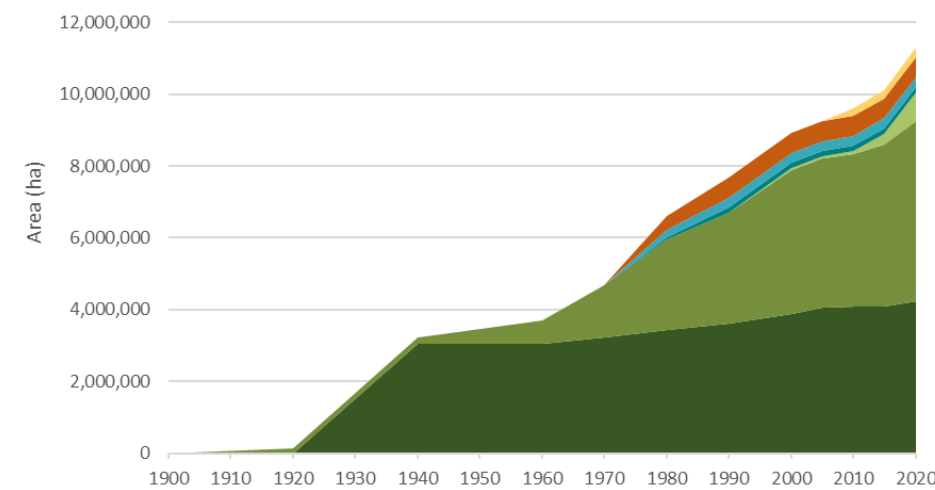
Example:
Accounts for Protected Areas, 1900 to 2020

- National Park
- Nature Reserve
- Protected Environment
- Forest Nature Reserve
- Forest Wilderness Area
- Mountain Catchment Area
- World Heritage Site

First National NCA Forum
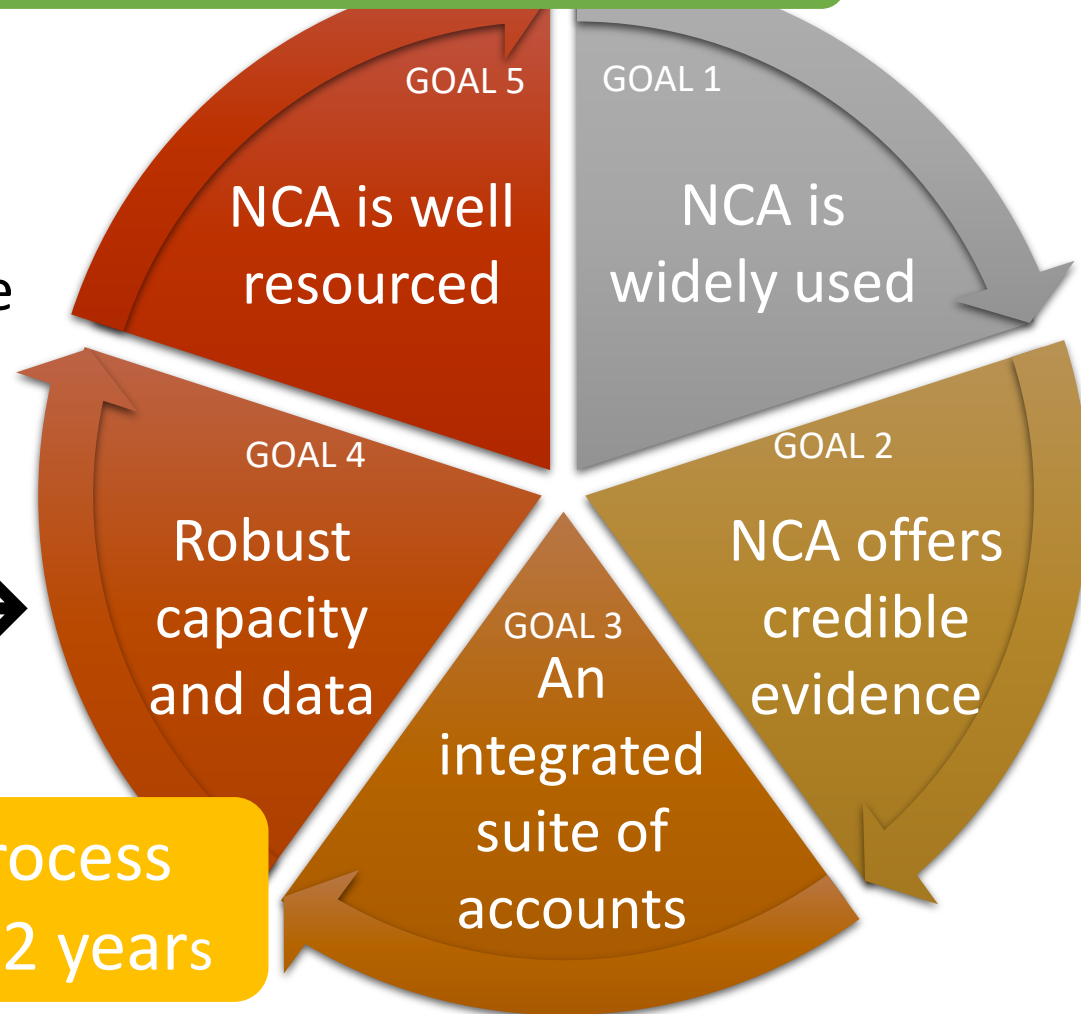July 2019

National NCA Strategy
A ten-year strategy for advancing NCA in SA

Published by Statistics South Africa in June 2021

Vision

Natural capital accounting is **widely used** to provide **credible evidence** for **integrated planning and decision-making**, in support of the **development needs** of the country
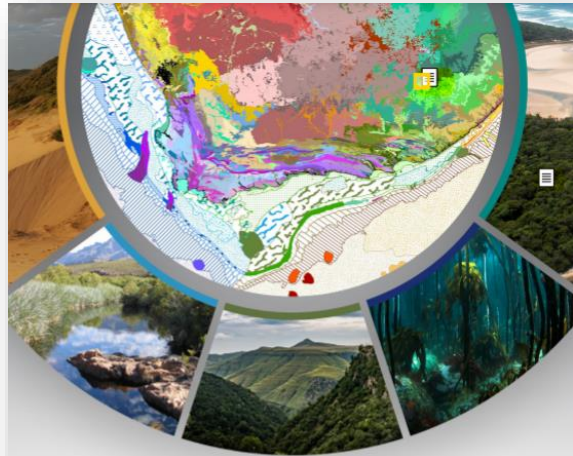
5 inter-related **goals** →

GOAL 5
NCA is well resourced

GOAL 1
NCA is widely used

GOAL 2
NCA offers credible evidence

GOAL 3
An integrated suite of accounts

GOAL 4
Robust capacity and data

Intensive co-development process with range of stakeholders over 2 years

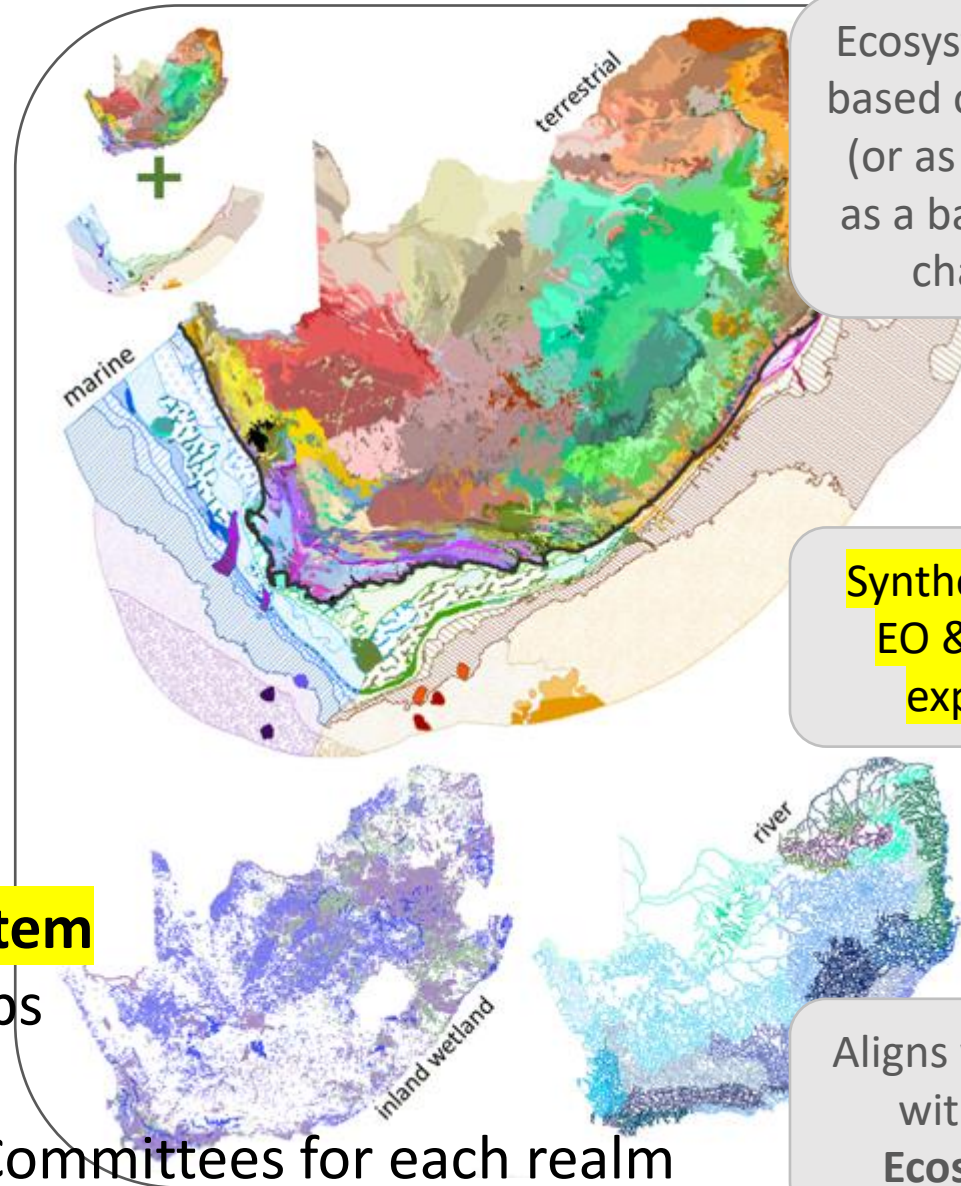# Good science on ecosystems underpins good ecosystem accounts

South African National Ecosystem Classification System Handbook
SANBI
Biodiversity for Life
South African National Biodiversity Institute

Classification & mapping of **ecosystem types** – the foundation for all ecosystem accounts

Ecosystem types mapped based on **historical extent** (or as close as possible), as a baseline for tracking change over time

Synthesises field survey, EO & other data, and expert knowledge

Aligns well (not perfectly) with IUCN's **Global Ecosystem Typology**

SA National Ecosystem Classification System
- Nested hierarchical classification & maps
- Used for multiple applications
- Governed by Ecosystem Classification Committees for each realm

Spatial assessment of **ecological condition**

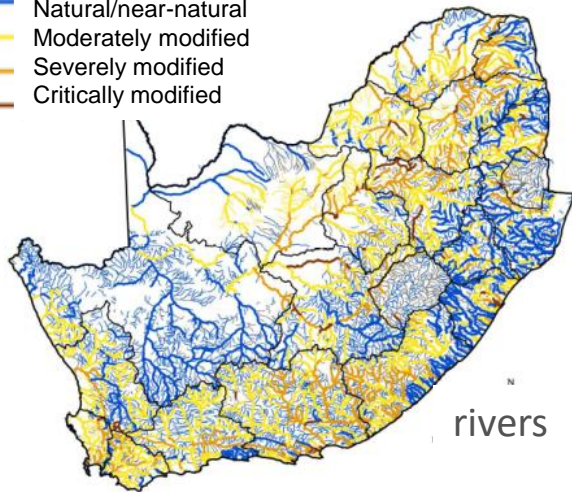Natural/near-natural
Moderately modified
Severely/critically modified
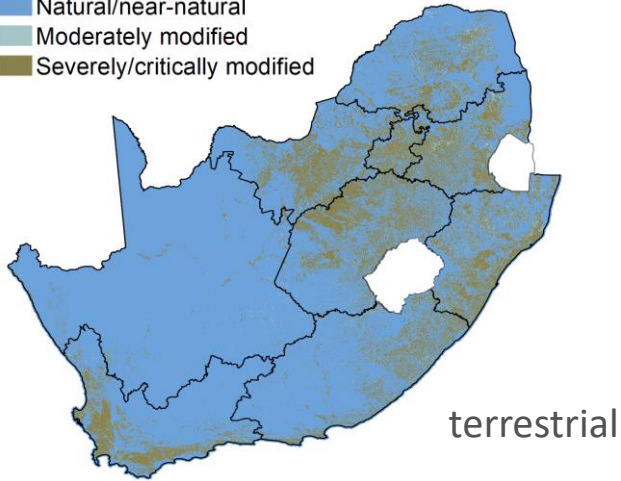
terrestrial

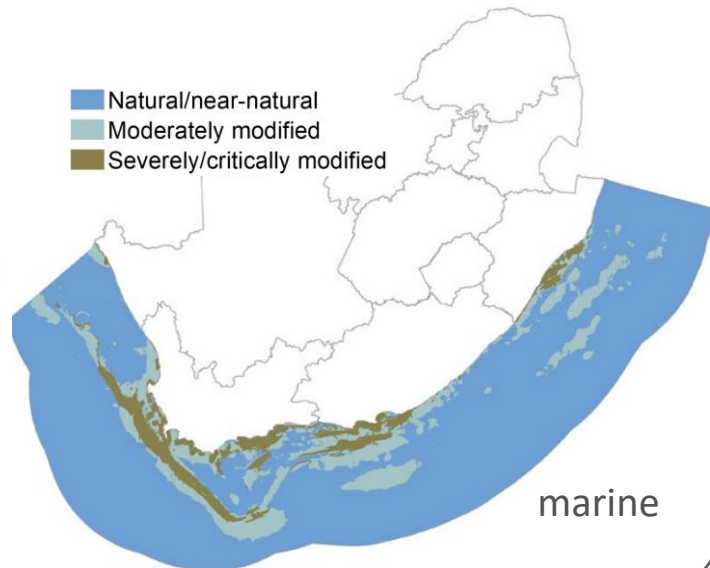Natural/near-natural
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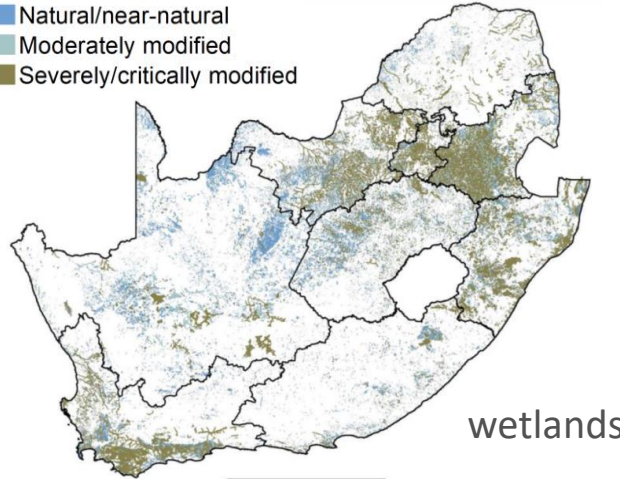
wetlands

Natural/near-natural
Moderately modified
Severely modified
Critically modified

rivers

Natural/near-natural
Moderately modified
Severely/critically modified

marine

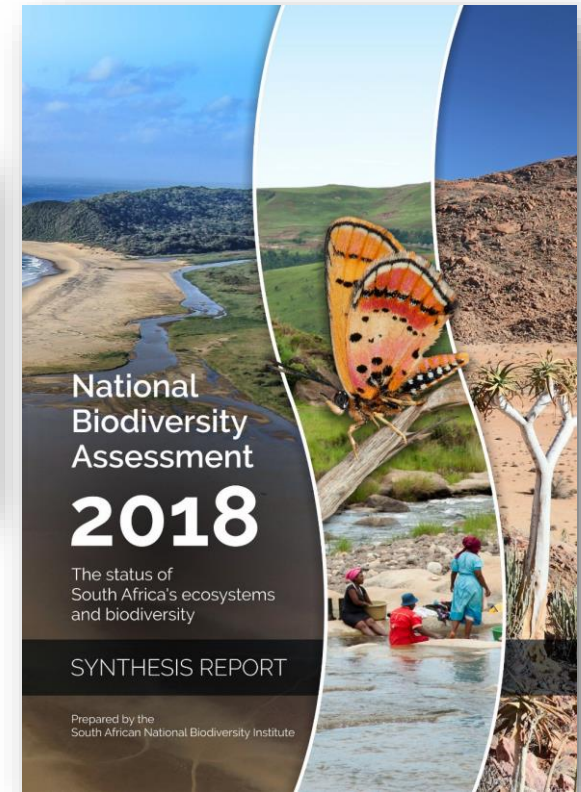2004

2011

National Biodiversity Assessment 2018

The status of South Africa's ecosystems and biodiversity

SYNTHESIS REPORT

Prepared by the South African National Biodiversity Institute

From **National Biodiversity Assessment**

- Includes spatial assessment of ecosystem condition
  → **Synthesises many spatial datasets**
- Aiming for more frequent updates

Three lessons on spatial data for ecosystem accounting

- Investing in foundational spatial data on ecosystems pays dividends
  - Progress is iterative and often uneven across realms

- Nothing beats a good national spatial data layer, agreed by ecosystem scientists
  - Helps to have a national organisation with a mandate to convene scientists and curate data layers

- Good enough science is usually good enough
  - We are pragmatists not purists, working within resource and data constraints

Essential ingredients for developing **good enough spatial data layers** for ecosystem accounting

Large volumes and growing rapidly

Essential for sense-making of both EO & field data, avoiding shallow inference

EO data & other environmental variables

Context-specific ecological knowledge – the **human element**

Also administrative data in some cases

Field data (e.g. from surveys, citizen science)

Patchy, not always current; Requires targeted investment

The whole is more than the sum of the parts
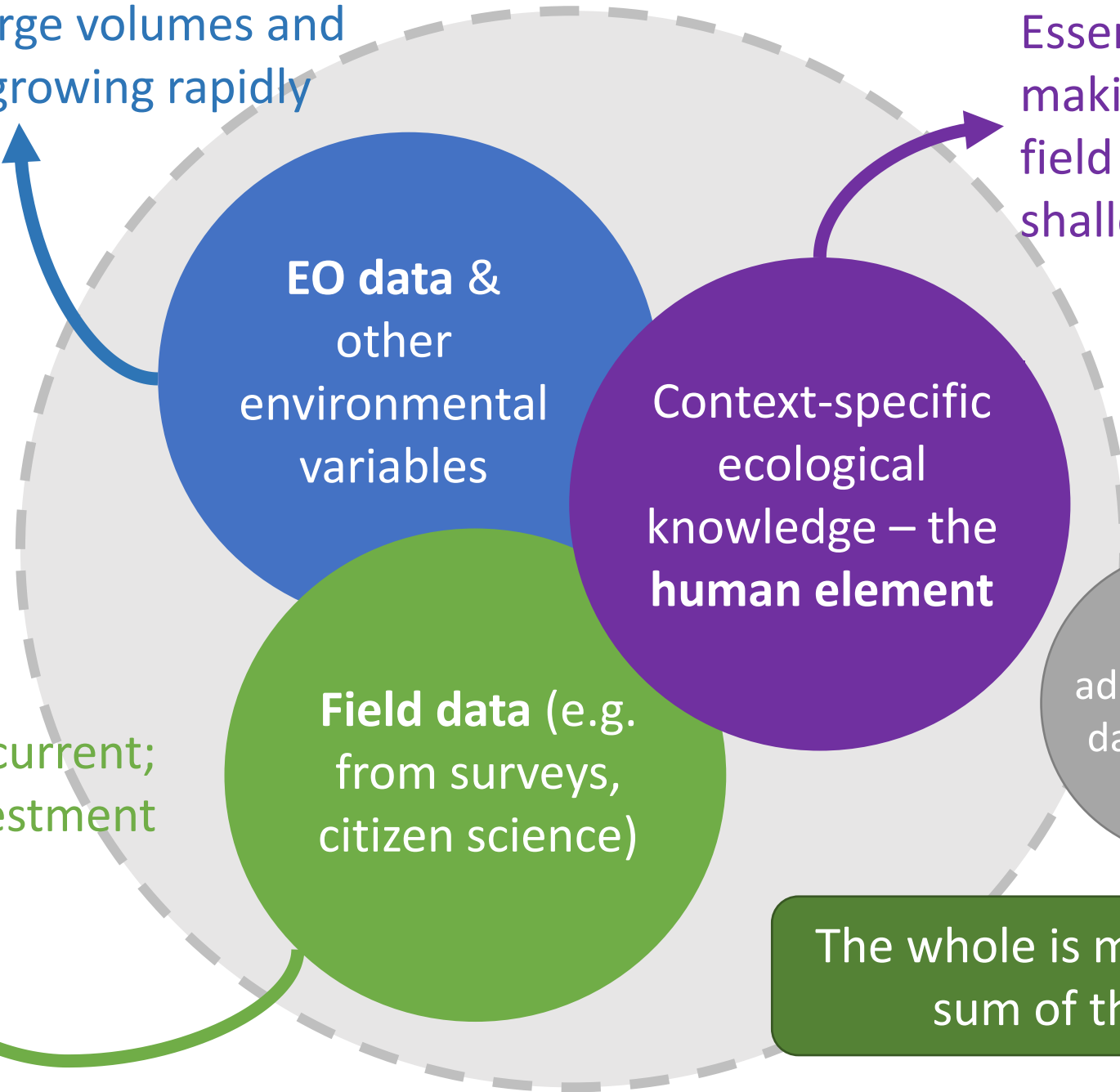
Natural Capital Accounting involves...
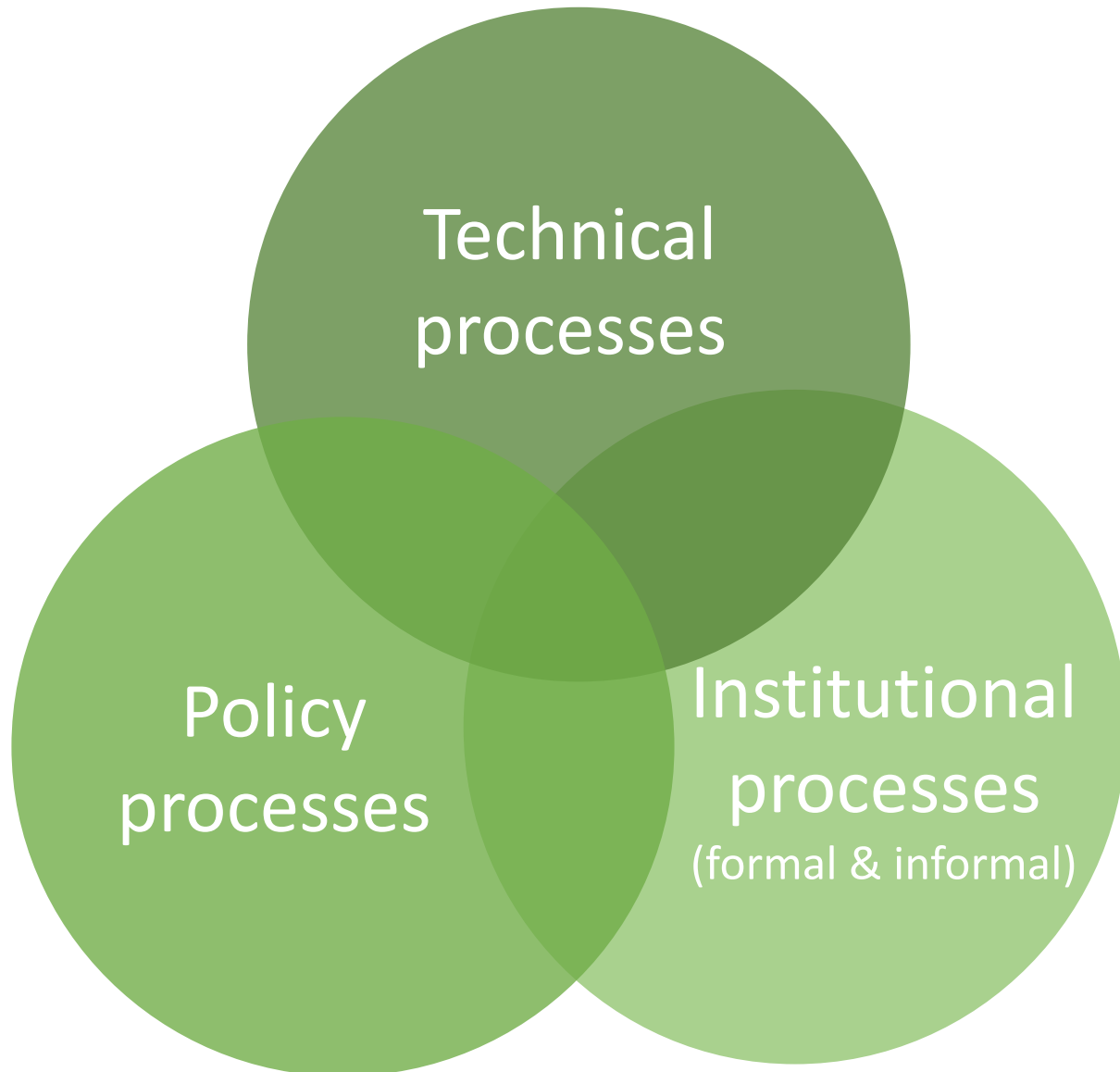
All three of these are equally important

Long-term production of accounts requires institution building at the national level, including institutional arrangements for regular production of time series data layers

Takes time and patience!