

Natural Capital Accounting & Valuation of Ecosystem Services in South Africa

Forum on NCA, Beijing, China

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Department:
Statistics South Africa
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SANBI

Biodiversity for Life

South African National Biodiversity Institute



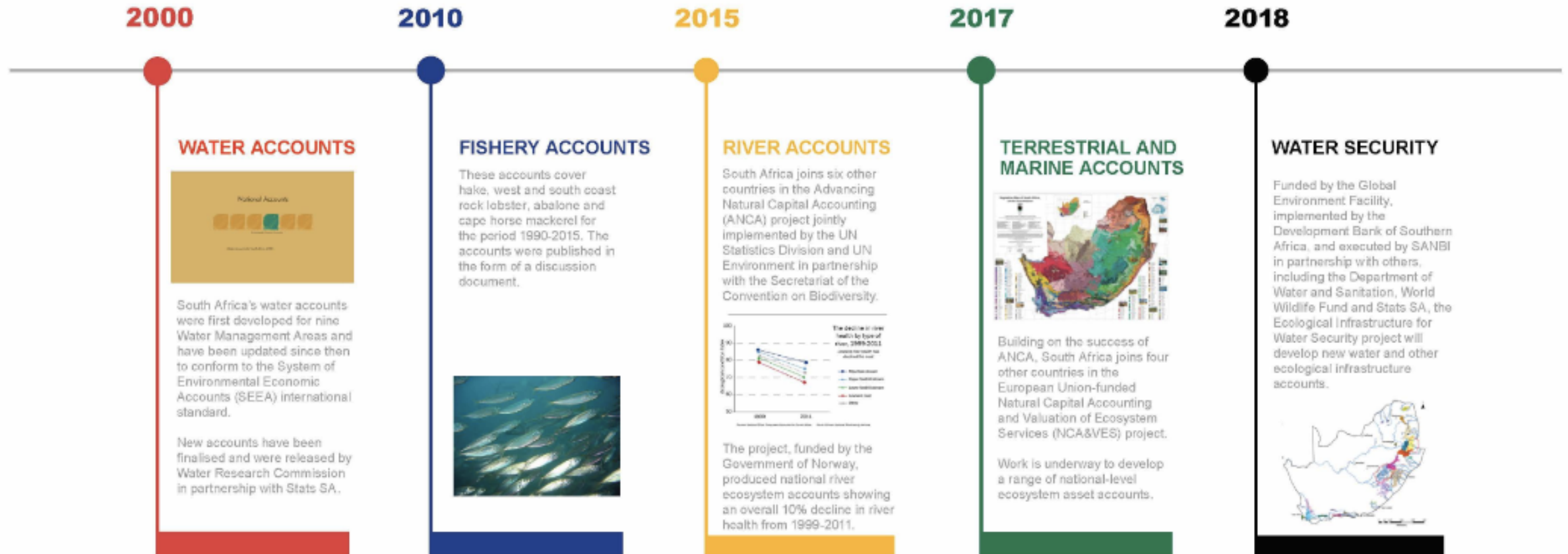
United Nations



System of
Environmental
Economic
Accounting

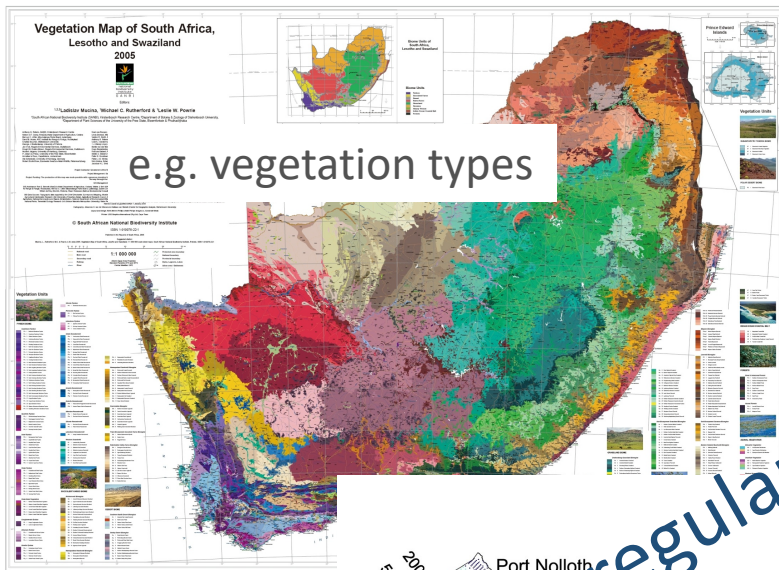


NCA in South Africa: a timeline

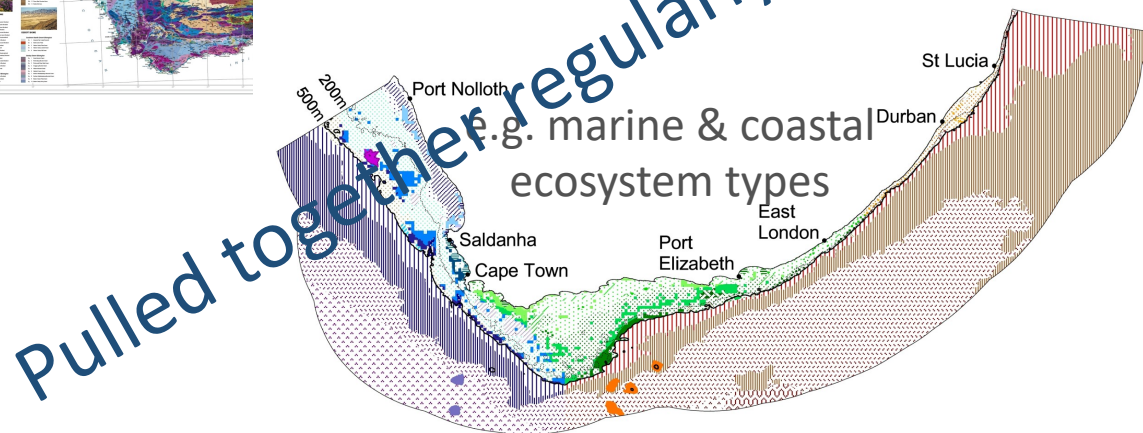
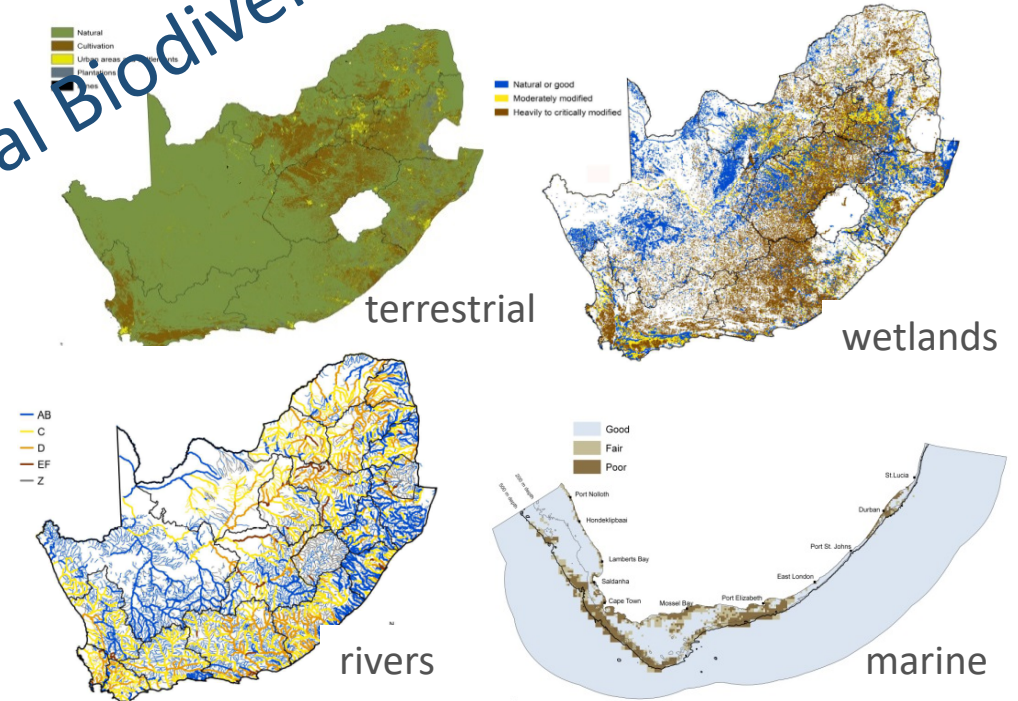


Ecosystem accounting work draws on decades of biodiversity science

→ Classification & mapping of ecosystem types



→ Maps of ecological condition



Pulled together regularly for the National Biodiversity Assessment

Also now have *time series* land cover for the first time
→ 1990 and 2014 available, and 2018 just released

New National Land Cover datasets for South Africa

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The new **2018** South African National Land Cover (NLC) dataset, with 73 information classes, will be available soon from **DEA** and **DRDLR**.

The new 2018 NLC data is comparable to the 1990 and 2013/14 NLC's, providing a time series for landscape change detection.

The 2018 NLC data is generated from 20m resolution satellite imagery and contains 73 land-cover/use classes.

Access details will be posted shortly

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CSIR

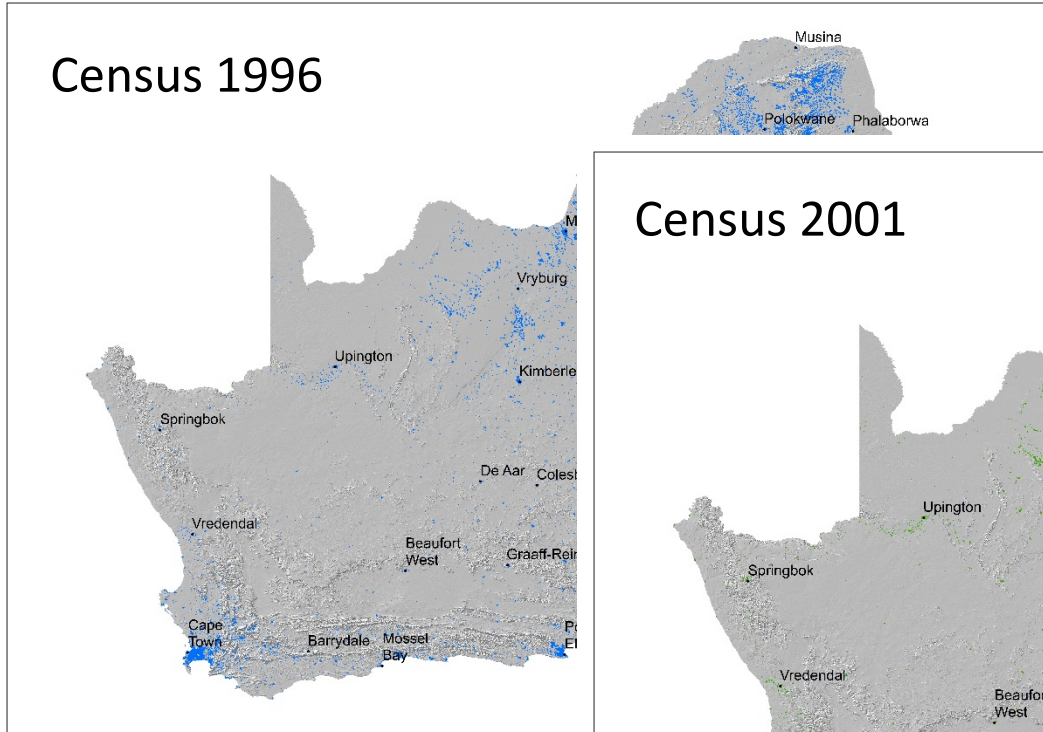
GEO TERRA
IMAGE

Commitment from DEA to produce National Land Cover every two years

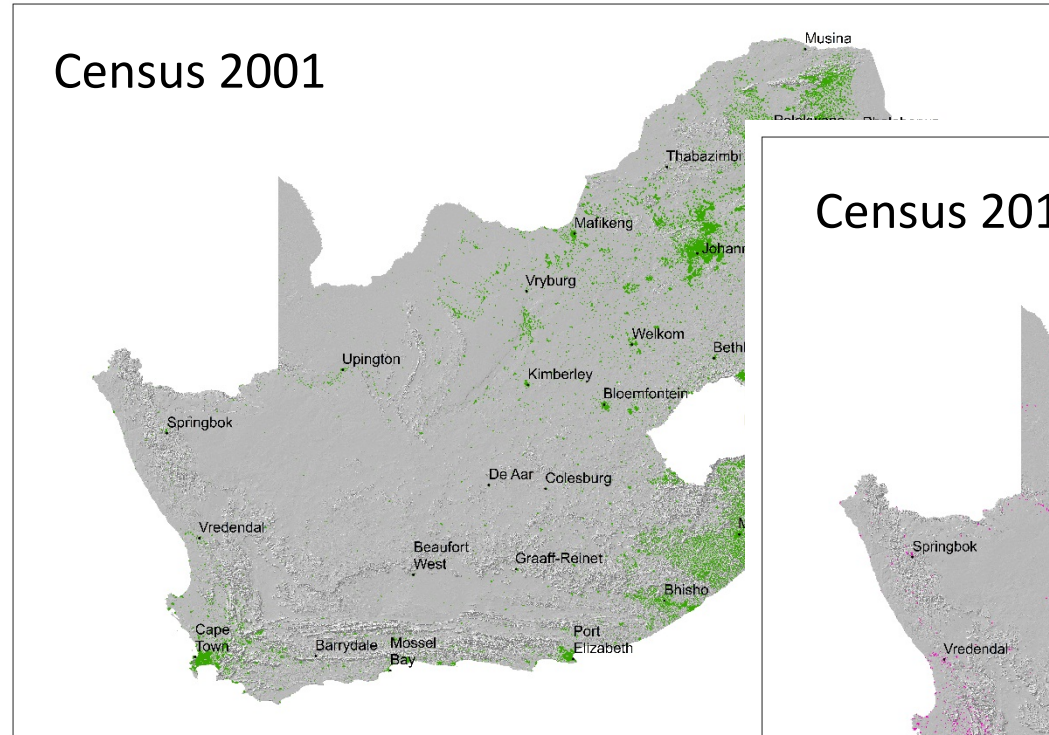


SA has a long history of spatially detailed population census data

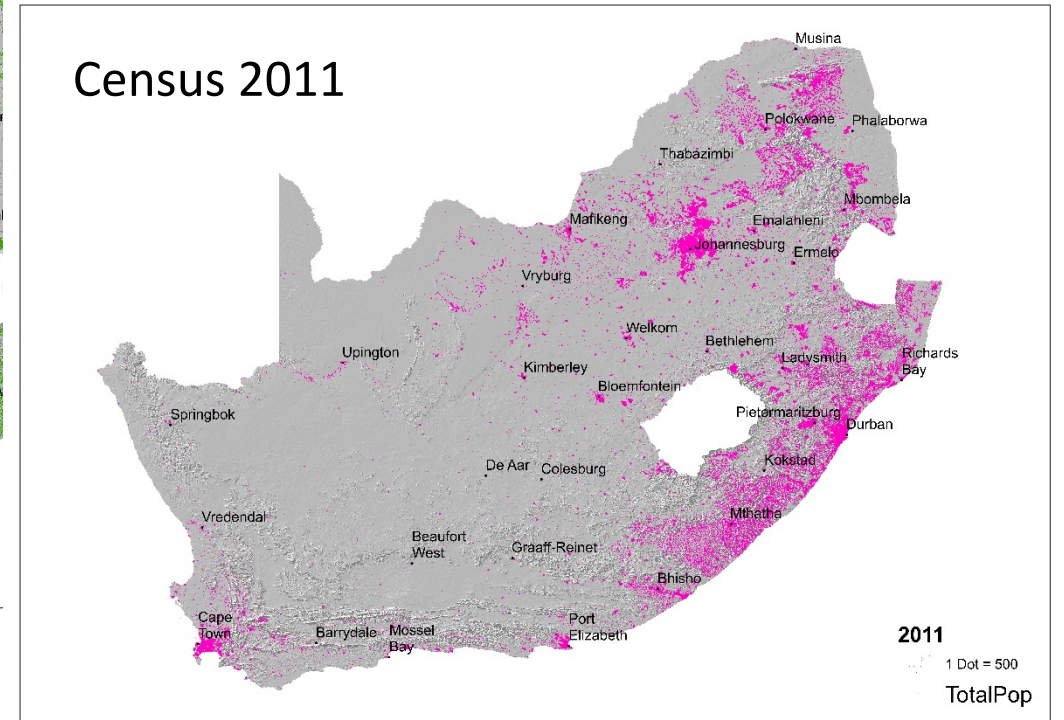
Census 1996



Census 2001



Census 2011

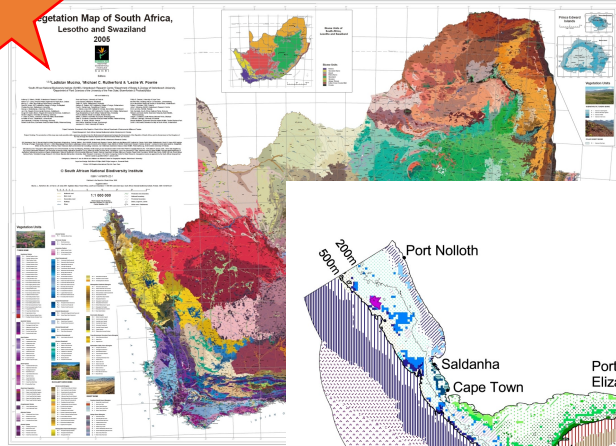


→ Powerful basis for making links between environment and people

Accounts to be produced in NCA&VES Project in South Africa

National

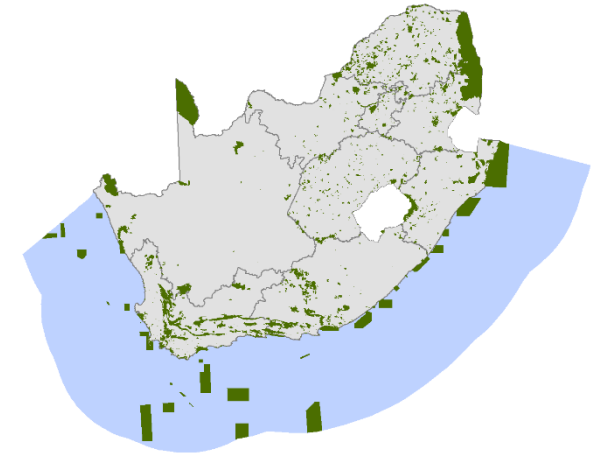
National ecosystem asset accounts – terrestrial & marine, extent & condition



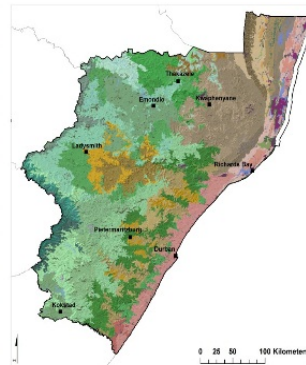
Species accounts – rhino, cycads



Protected area accounts – terrestrial & marine



Sub-national

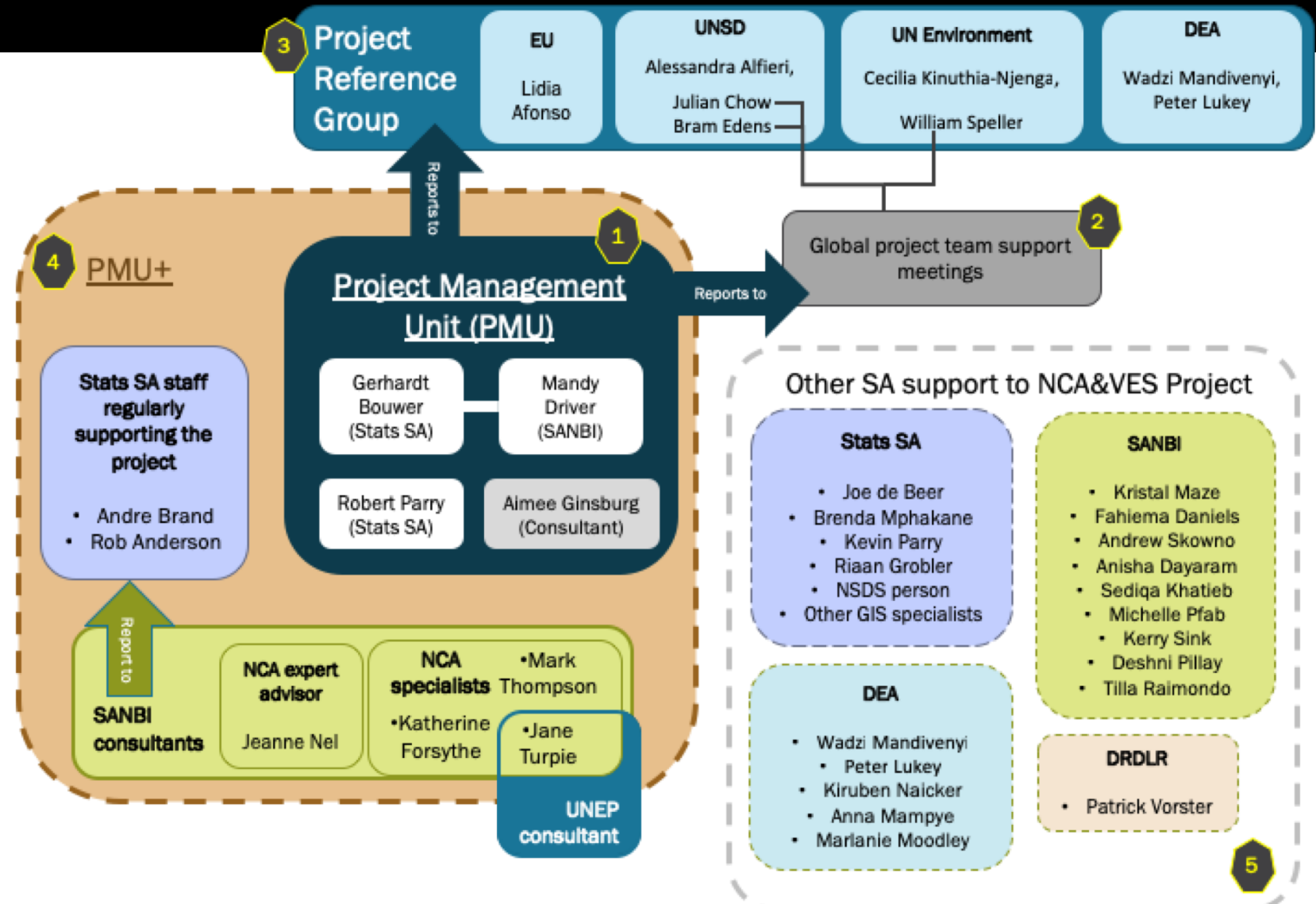


KZN: Full suite of ecosystem asset and ecosystem service accounts

City-regions: land and ecosystem accounts for selected metros

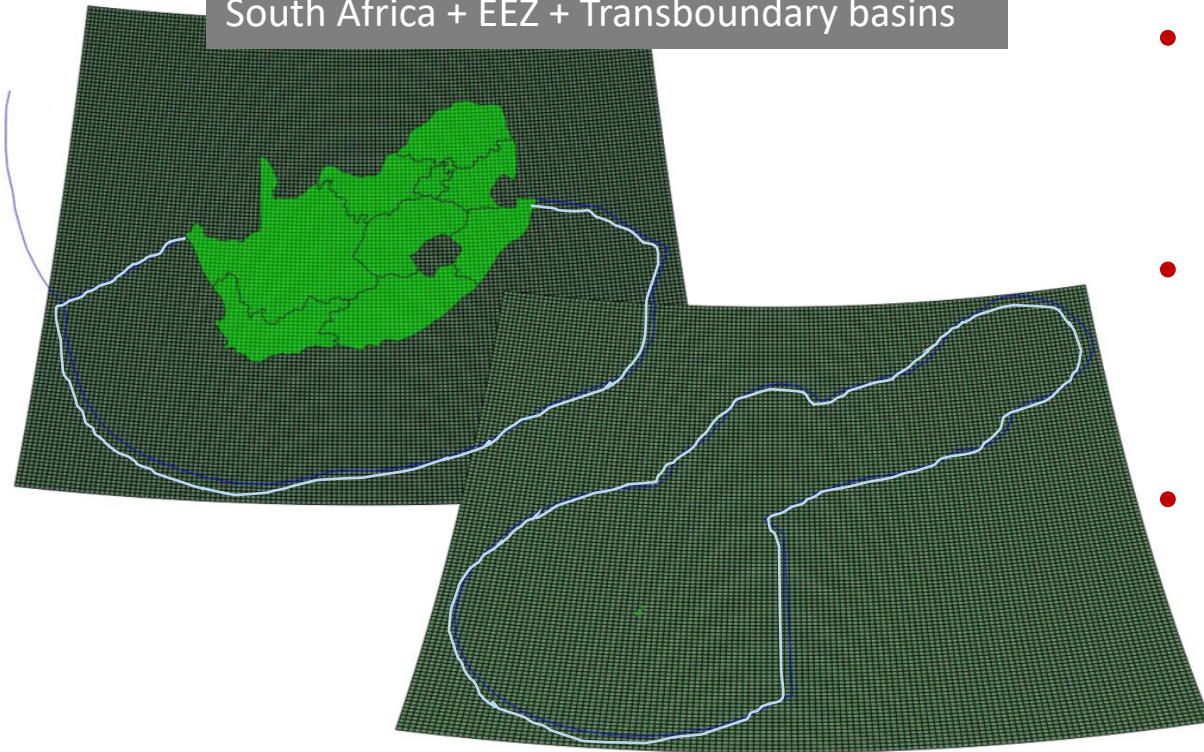


Institutional arrangements for the project



Basic spatial units for ecosystem accounting

BSU 1 (728 million 100m cells):
South Africa + EEZ + Transboundary basins



BSU 2 (624 million 100m cells):
South Africa's Prince Edward Islands + EEZ

- Broad stakeholder consultation
- The BSU is a unit for analysis – all data gets synthesized in a 100m grid (can be scaled up or down).
- Assigned cells to administrative units (country, provinces, municipalities, enumerator areas)
- To be adopted as a strategic national dataset
 - Presented to Committee on Spatial Information data subcommittee
 - BSU Projection registered on the EPSG Geodetic Parameter Dataset

National land accounts

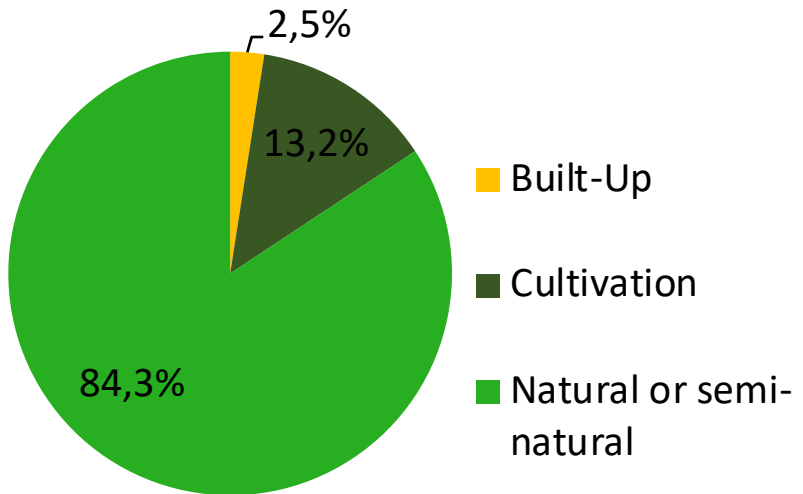
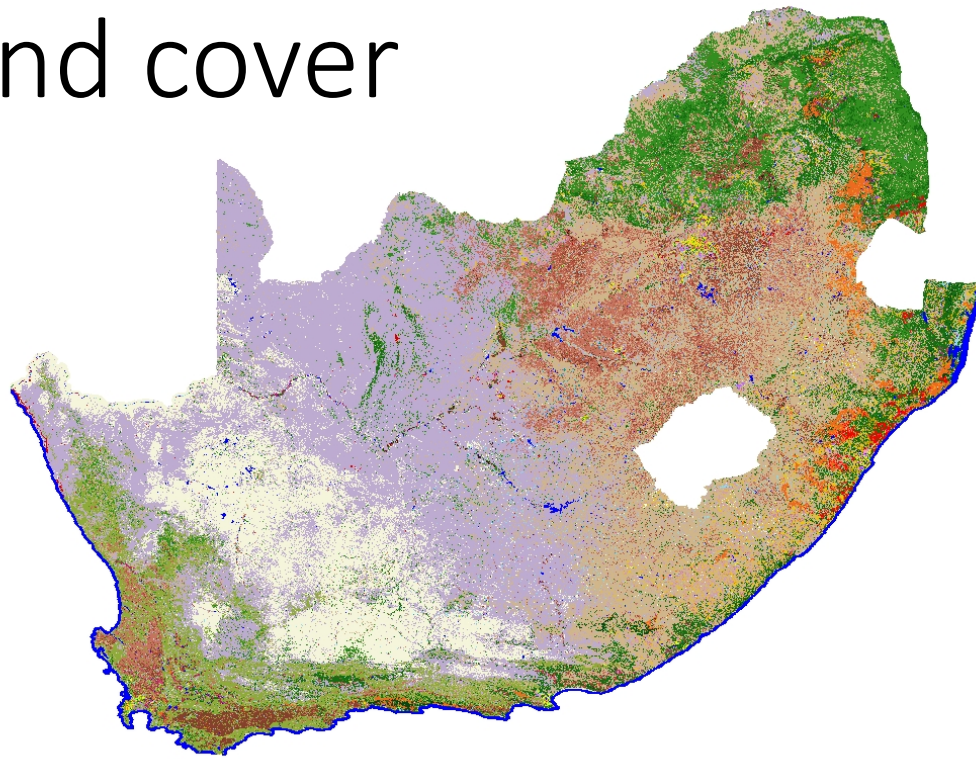
- Draft with the terrestrial mainland areas of SA included at this stage; accounting for area
- Based on national land cover, methodology tested in one province through ANCA Project (2015)

Draft land accounts

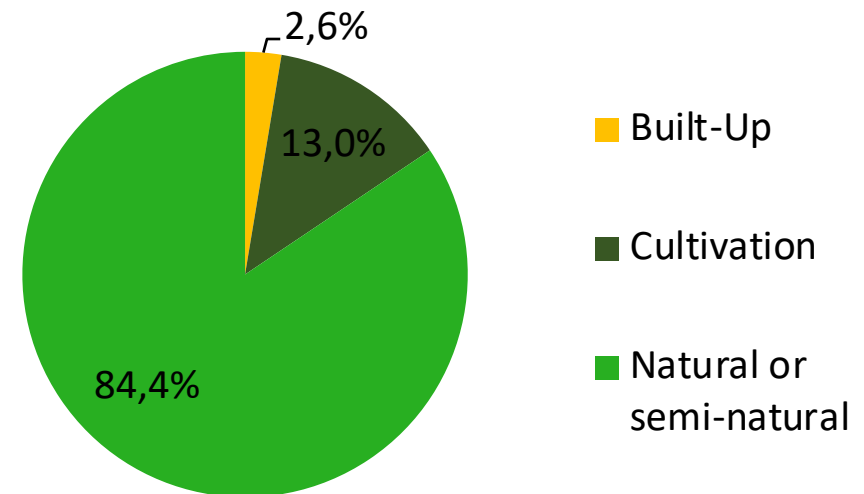
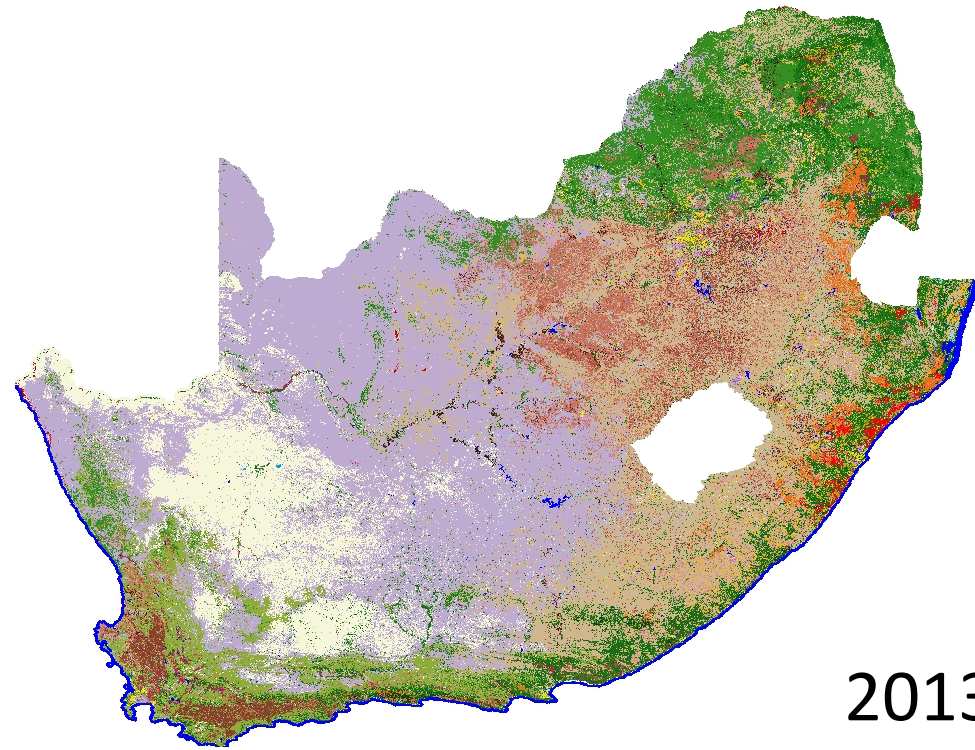
Land cover classes (Tier 1)	Natural/Semi-natural		Water	Cultivated				Built		
Land cover classes (Tier 2)	Natural/Semi-natural vegetation	Bare/ Eroded land	Water	Commercial crops	Subsistence crops	Orchards & vines	Plantations	Urban	Mines	TOTALS
Opening Stock	87 025 400	13 684 616	2 096 528	11 873 834	1 945 395	454 245	1 882 552	2 733 549	270 334	121 966 453
Additions to stock	29 544 636	2 630 034	386 130	5 680 442	1 312 353	312 200	737 149	1 136 140	189 571	41 928 655
Reductions in stock	27 292 186	4 056 100	1 061 982	6 092 138	1 291 330	233 265	772 678	982 386	146 590	41 928 655
Net change in stock	2 252 450	(1 426 066)	(675 852)	(411 696)	21 023	78 935	(35 529)	153 754	42 981	
Net change as % of opening stock	2.6%	-10.4%	-32.2%	-3.5%	1.1%	17.4%	-1.9%	5.6%	15.9%	
Extent of stable opening stock	59 733 214	9 628 516	1 034 546	5 781 696	654 065	220 980	1 109 874	1 751 163	123 744	
<i>Stability as % of opening stock</i>	68.6%	99.1%	101.8%	212.0%	33.6%	96.9%	59.0%	626.7%	45.8%	
Total turnover of opening stock	56 836 822	6 686 134	1 448 112	11 772 580	2 603 683	545 465	1 509 827	2 118 526	336 161	
<i>Turnover as % of opening stock</i>	65.3%	142.4%	136.1%	986.9%	133.8%	240.6%	80.2%	965.1%	124.4%	
Closing stock	89 277 850	12 258 550	1 420 676	11 462 138	1 966 418	533 180	1 847 023	2 887 303	313 315	121 966 453

Land cover

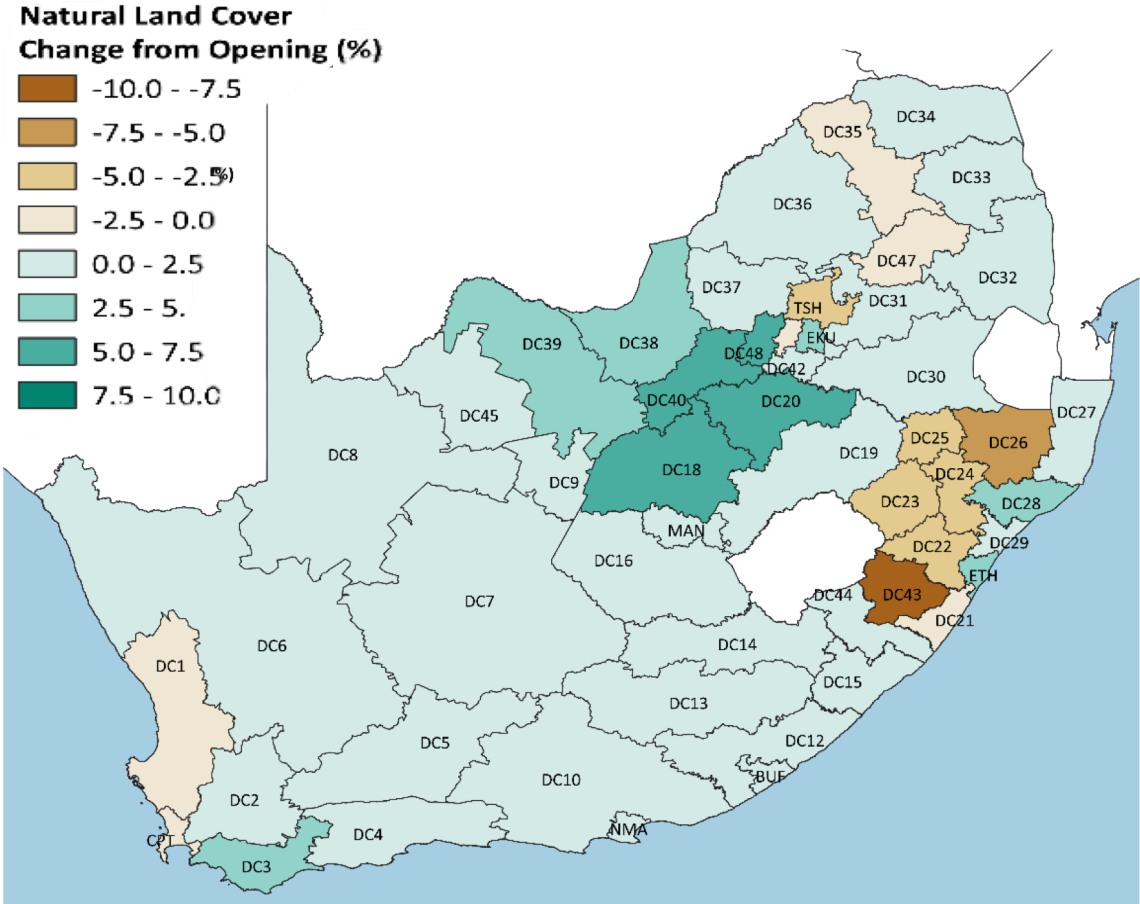
1990



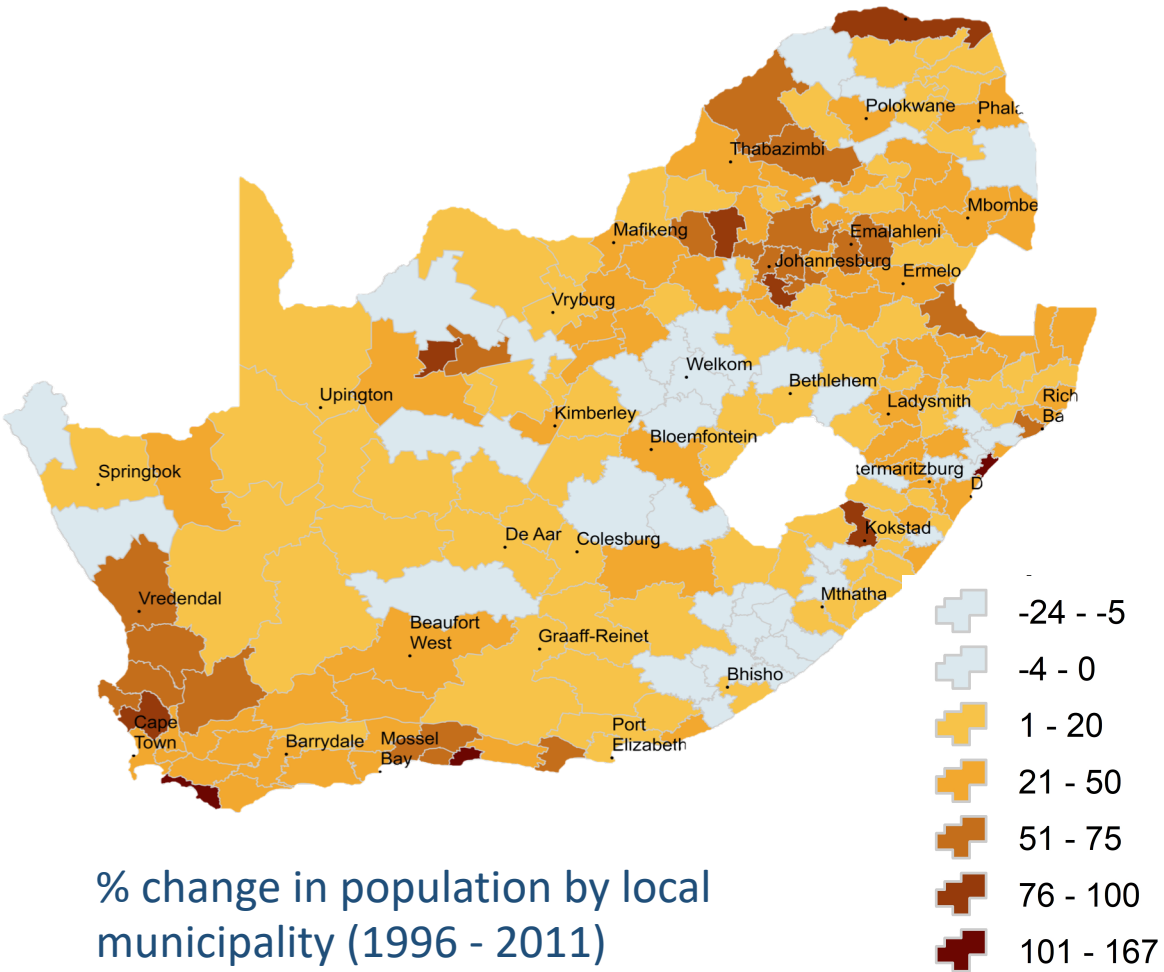
2013/14



Natural/semi-natural land cover



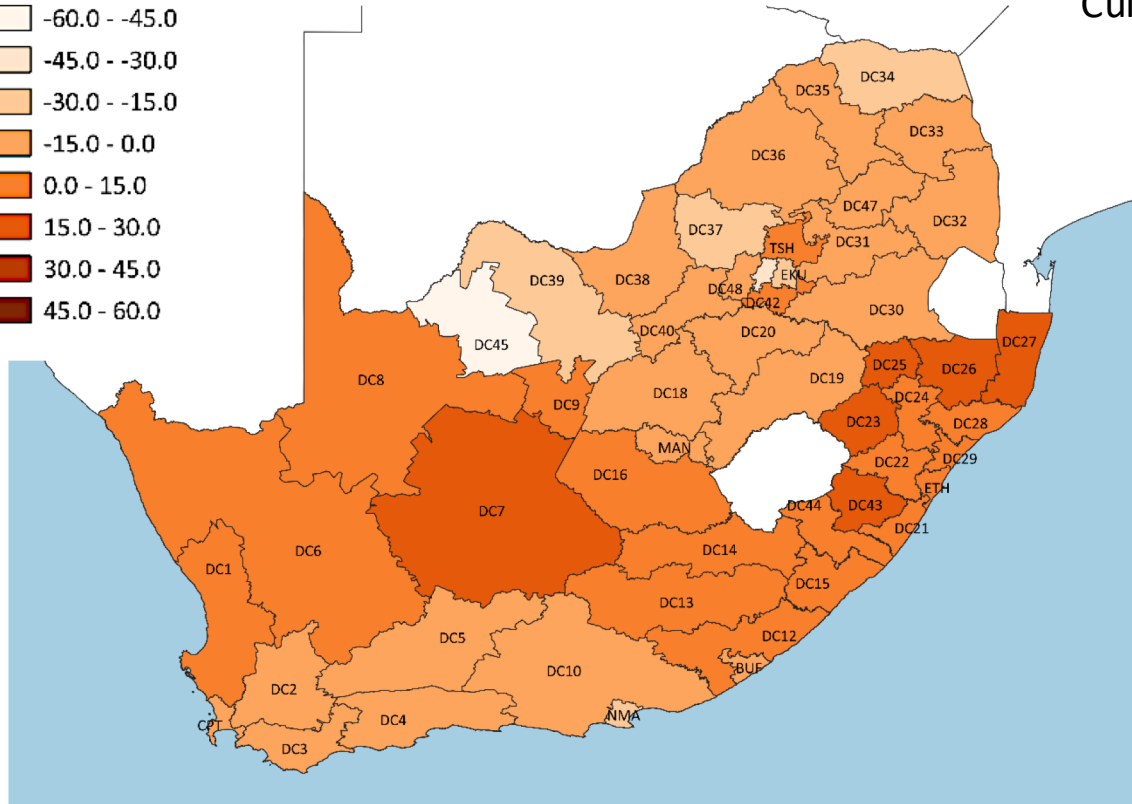
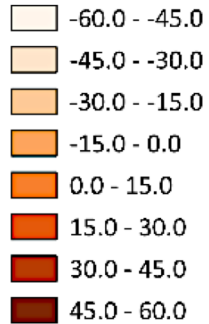
Net change as % of opening stock of natural/semi-natural land cover by district municipality (1990-2013/14)



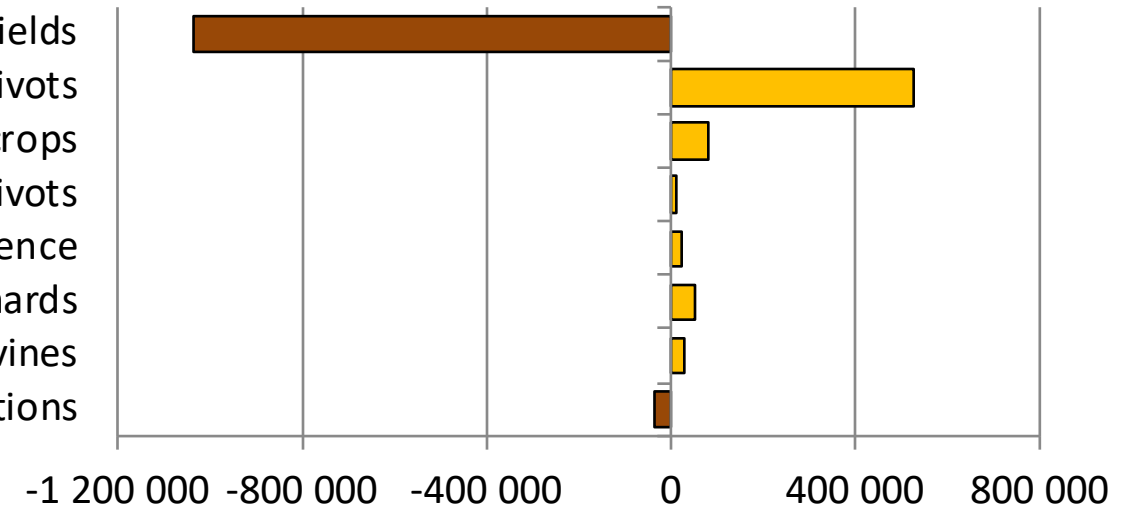
% change in population by local municipality (1996 - 2011)

Cultivated land cover class

Cultivated Land Cover
Change from Opening (%)

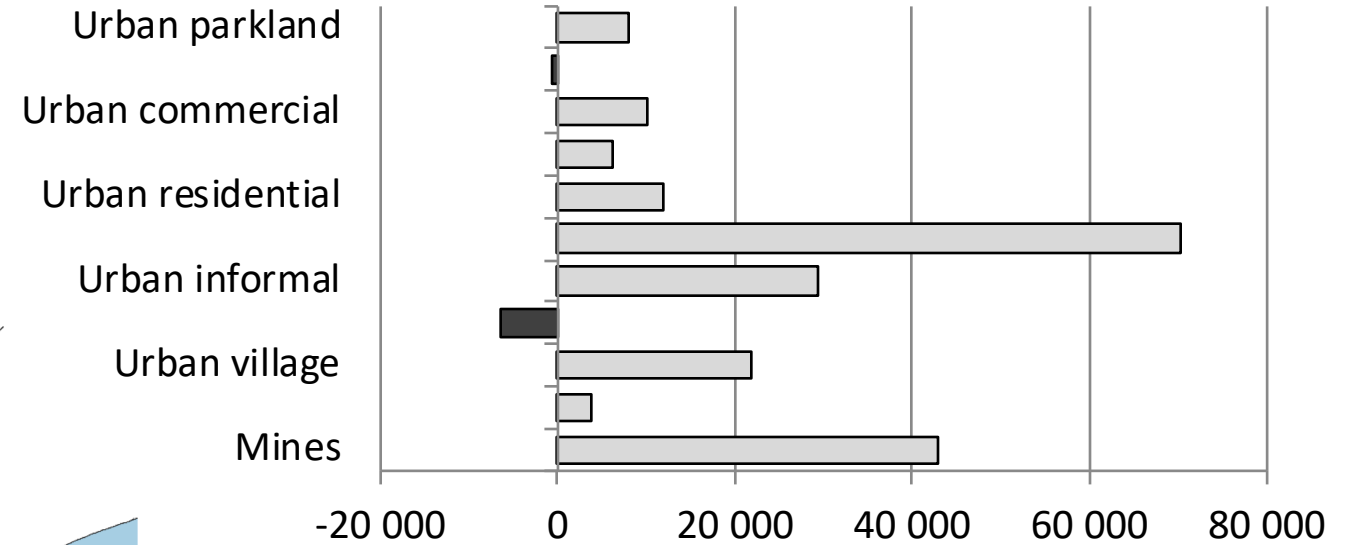
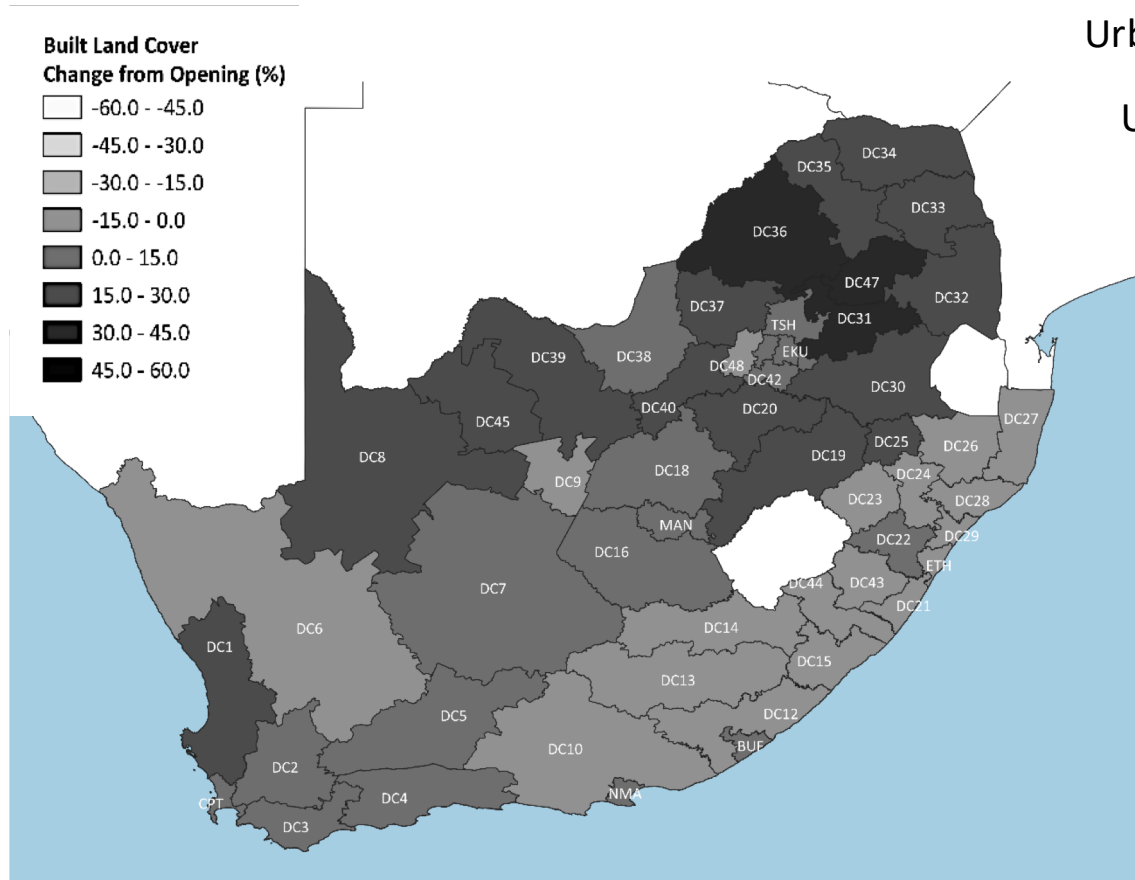


Cultivated commercial fields
Cultivated commercial pivots
Cultivated sugarcane crops
Cultivated sugarcane pivots
Cultivated subsistence
Cultivated orchards
Cultivated vines
Plantations



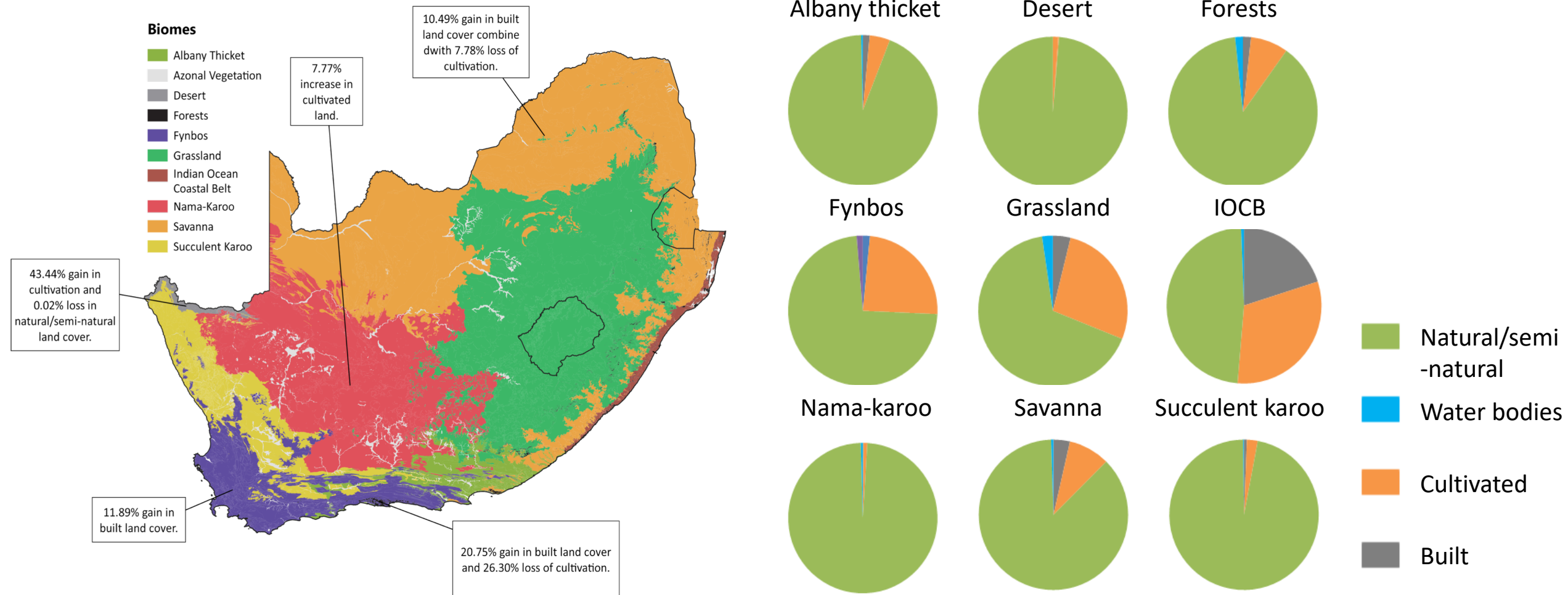
Net change (hectares) in cultivation land cover classes
(tier 3) between 1990 and 2013/14

Built land cover



Net change (hectares) in built land cover classes (tier 3)
between 1990 and 2013/14

National terrestrial ecosystem extent account

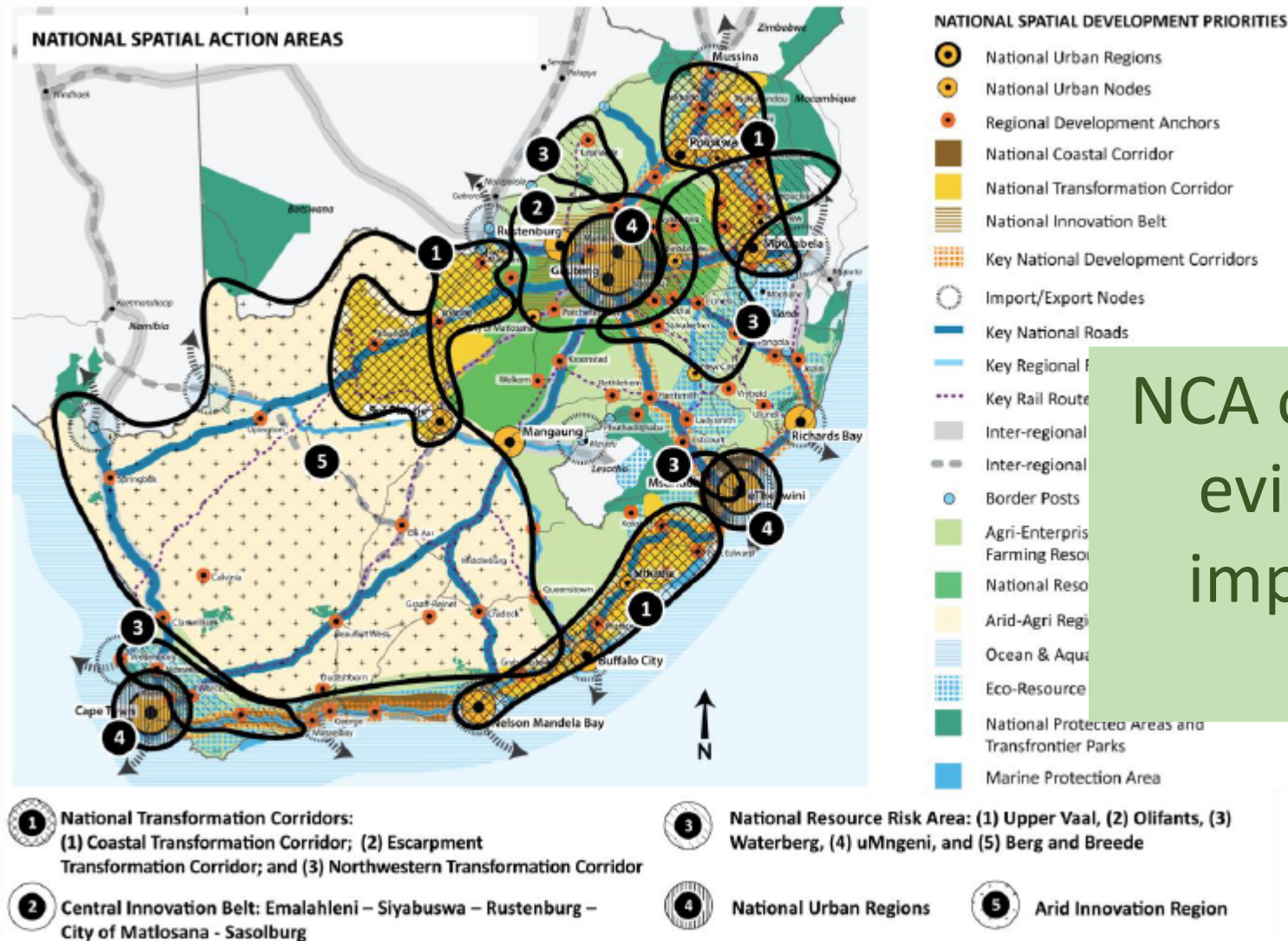


National Spatial Development Framework (NSDF)

Includes:

- Natural Resource Risk Areas

NCA can provide systematic evidence of progress in implementing the NSDF over time

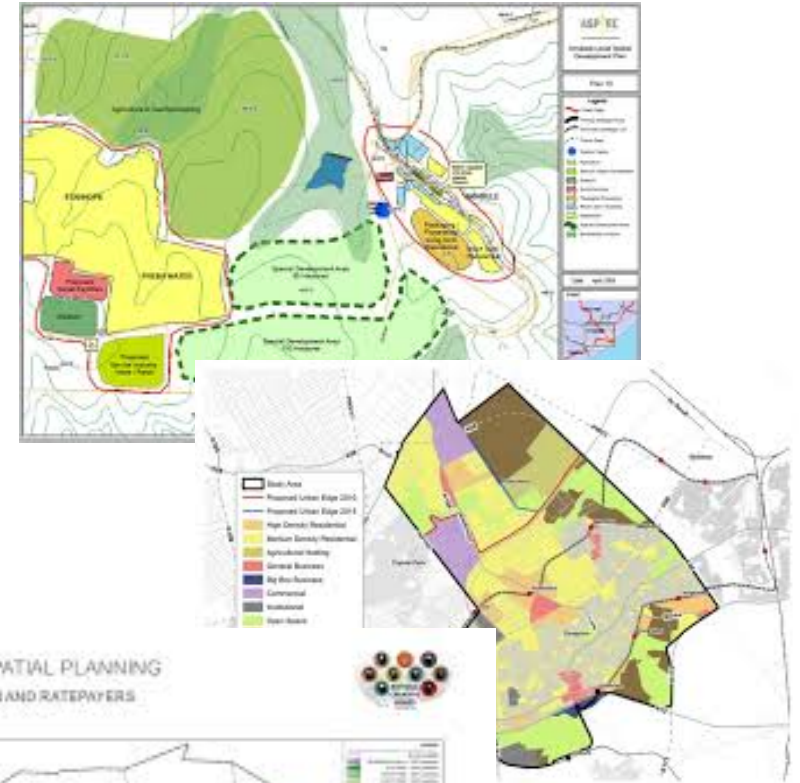


Municipal land-use planning

Supporting implementation of
the Spatial Planning & Land Use
Management Act (SPLUMA)

→ Including Municipal Spatial
Development Frameworks

NCA can provide detailed
spatial information to
support municipalities



Investment in ecosystem restoration

Environmental public works programmes in South Africa create thousands of work opportunities every year

NCA can help answer key questions:

→ Which ecosystems are priorities for intervention?

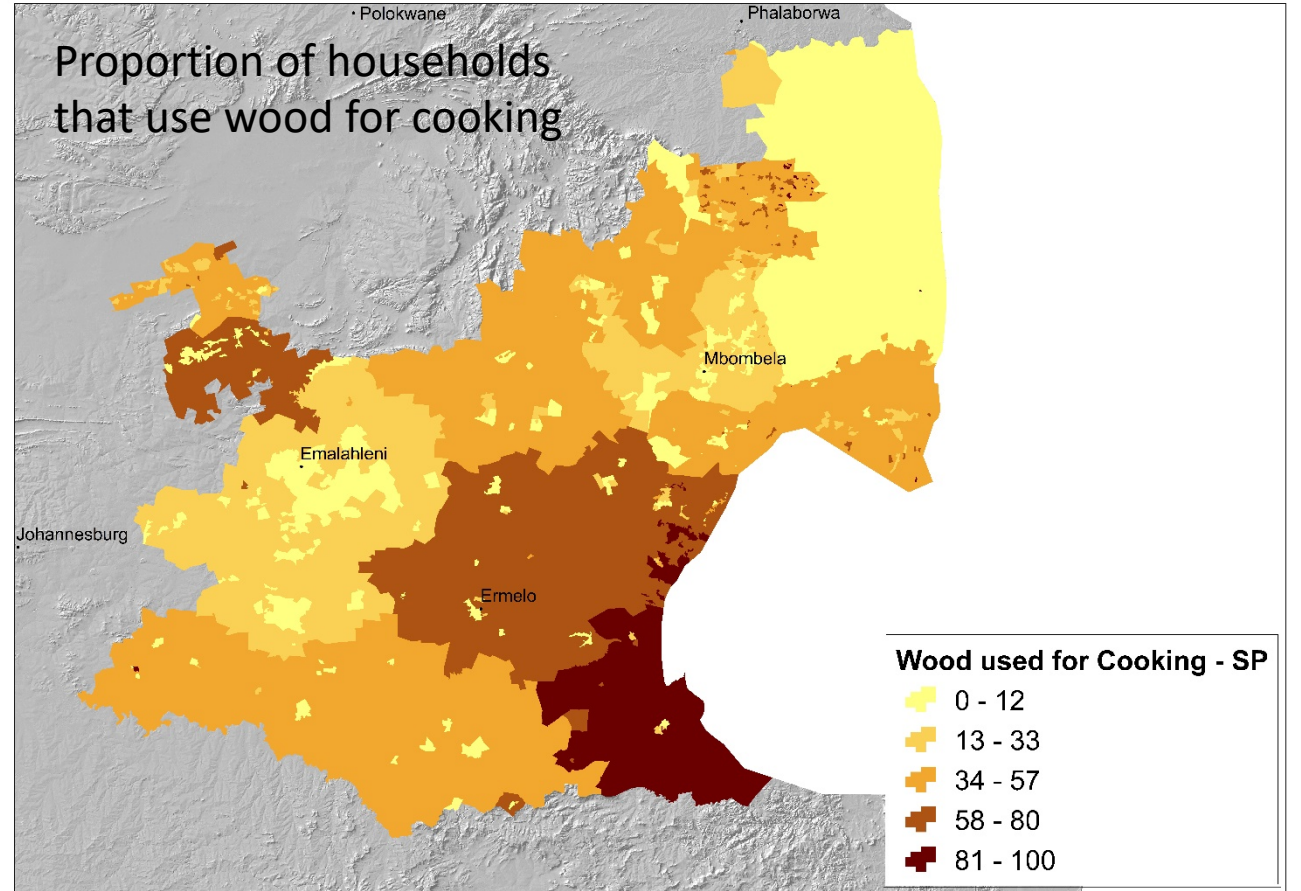
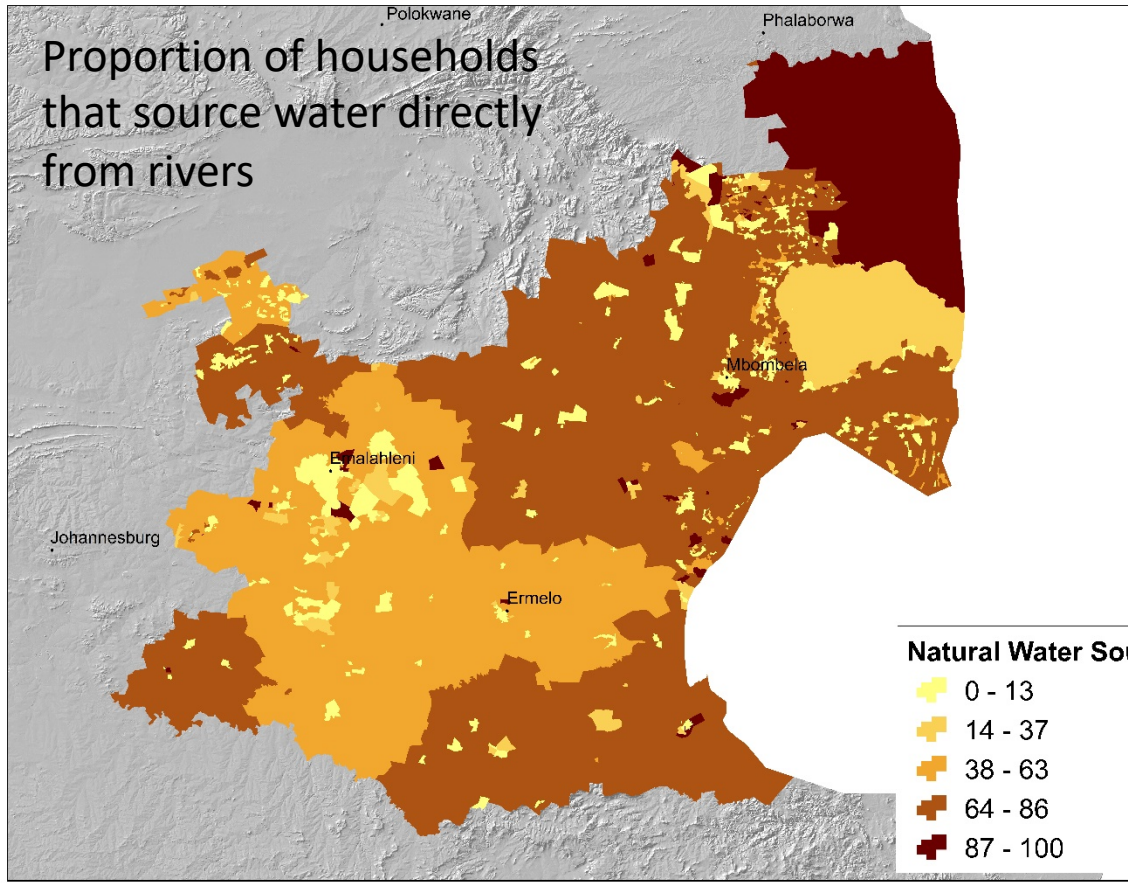
→ What is the return on investment?



e.g. Wetland restoration
through Working for Wetlands Programme

Photo: Ellen Elmendorp

Mpumumalanga – direct reliance of people on natural resources



Protected area & city region asset accounts

- Both are still under development
- Will draw from the national land and ecosystem asset accounts
- Engagement with stakeholders

Species accounts in SA

- Accounts for species or groups of species of special concern
- Criteria: public interest, current threats and time series population data available.
- Two groups chosen through consultation with SANBI and the national Scientific Authority for CITES
 - Black and White Rhino
 - Cycads plant group
- Non-spatial because of limited spatial data and issues around confidentiality

Cycads

- Most threatened plant group in the world
- Account for threat status (all 38 species)
- Population account (12 spp. that are traded)

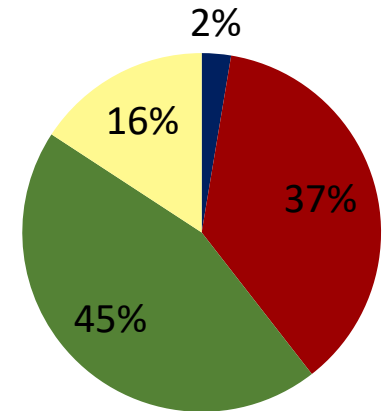


Cycad Threat Status Account (all spp)

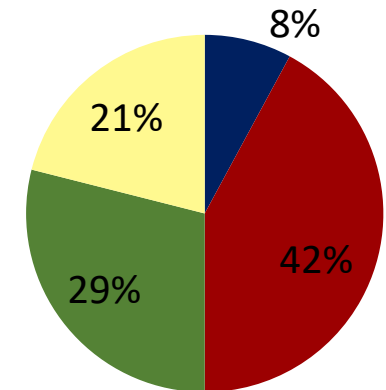
■ Extinct/Extinct in the Wild

Cycad Threat Status	Extinct/Extinct in the Wild	Critically Endangered/Endangered	Vulnerable	Not threatened/Rare/Least Concern	Total Species
Opening stock 1996	1	14	17	6	38
Re-evaluations of threat status	0	2	8	2	12
Threat status improved	0	0	4	0	4
Threat status worsened	0	2	4	2	8
Closing stock 2009	3	16	11	8	38
Net change since 1996	+2	+2	-6	+2	0

1996



2009

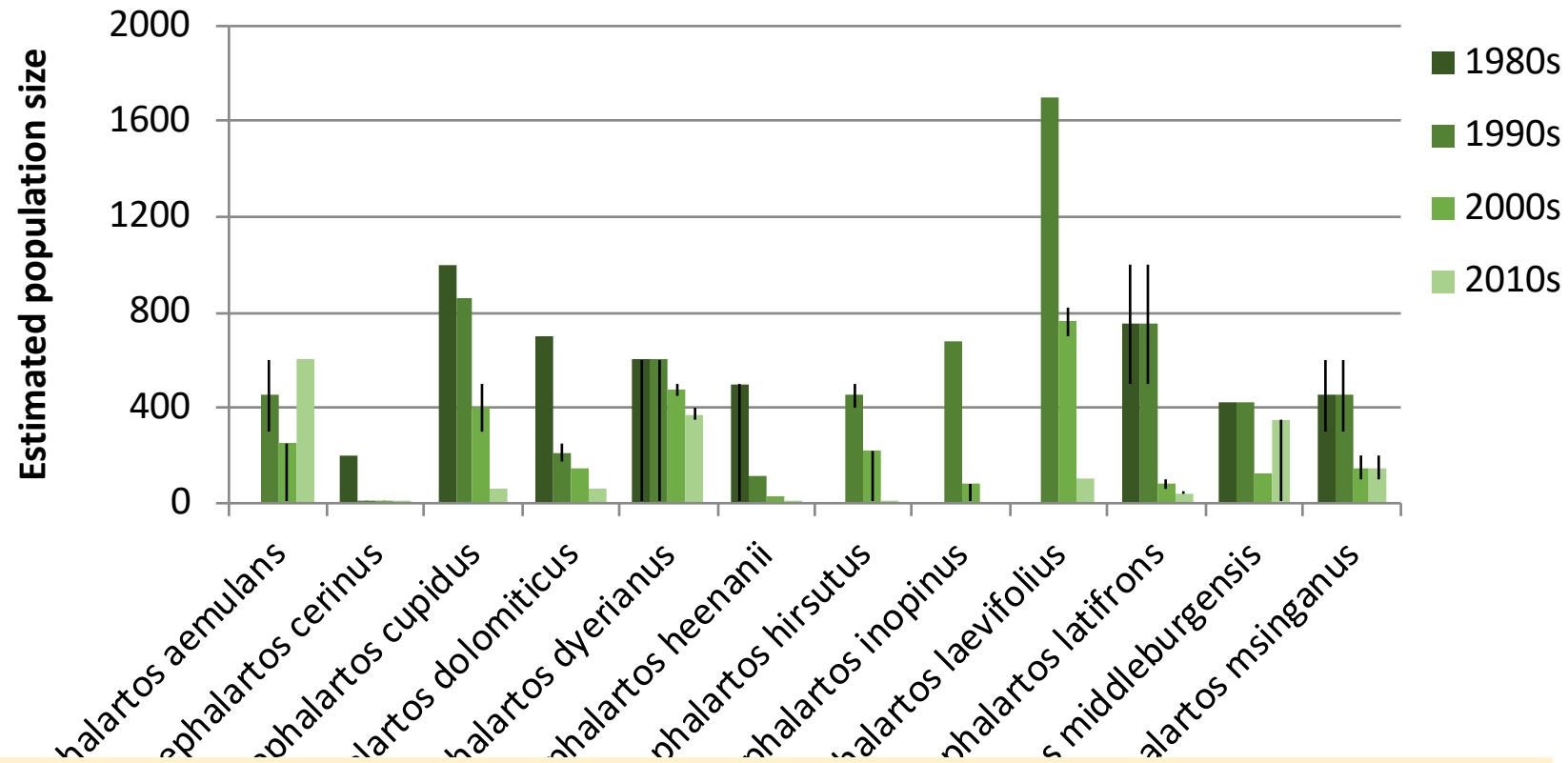


Cycad Population Account

	Ngotshe cycad	Waxen cycad	Blyde River cycad	Wolkberg cycad
Historical Reference	No estimate	No estimate	No estimate	No estimate
Opening stock 1970s	Not yet described	12 (single pop.)	120 (single pop.)	Not yet described, later estimated at 700
Closing stock 1980s	Not yet described	200	1000	80 (single pop.)
Change (numbers of plants)	N/A	N/A	N/A	N/A
Change (%)	N/A	N/A	N/A	N/A
Closing stock 1990s	300-600	<10	861	175-250
Change (numbers of plants)	N/A	-190	-136	-450-525
Change (%)	N/A	-95%	-14%	-64-75%
Closing stock 2000s	<250	No update	300-500	151
Change (numbers of plants)	-50-350	N/A	-361-561	-24-99
Change (%)	-17-58%	N/A	-42 -65%	-14-40%
Closing stock 2010s	600	0-5	62	58
Change (numbers of plants)	+350	N/A	-238-438	-57
Change (%)	+140%	N/A	-79-88%	-38%
Net change since opening/earliest full estimate (numbers of plants)	+0 to 300	-195 to -200	-958	-662
Net change since opening/earliest full estimate (%)	+0-200%	-97-100%	-94%	-92%
Population remaining since opening/earliest count (%)	100-200%	0-3%	6%	8%

Estimates per decade between 1970s-2010s from most recent/complete count during that period

Cycad Population Account: change 1980-2010



- 11/12 species population estimates are lower today than they were in before.

Thank you for listening

Acknowledgements to:



ANCHOR
research & monitoring