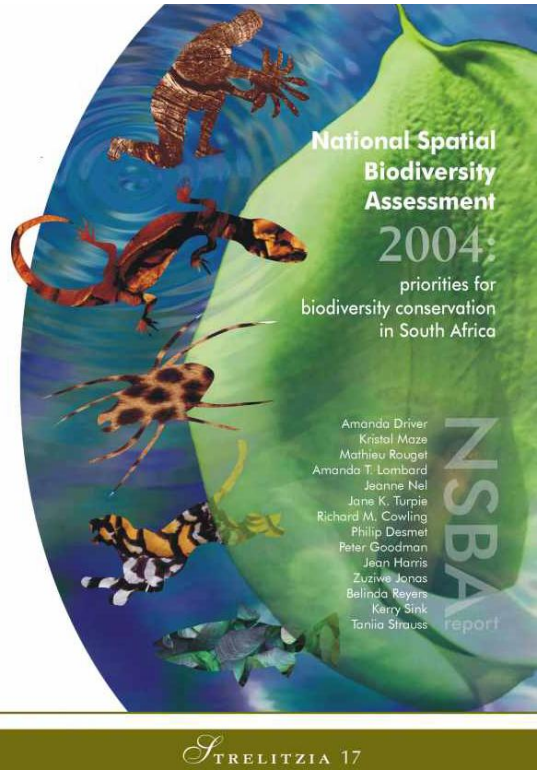
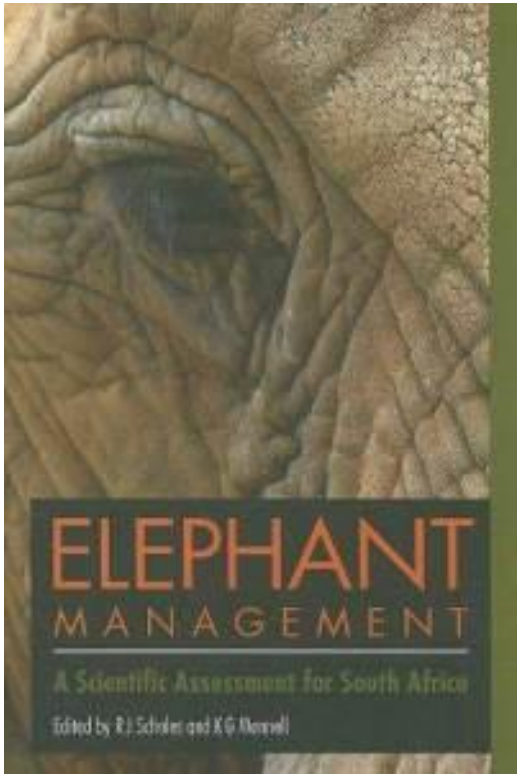
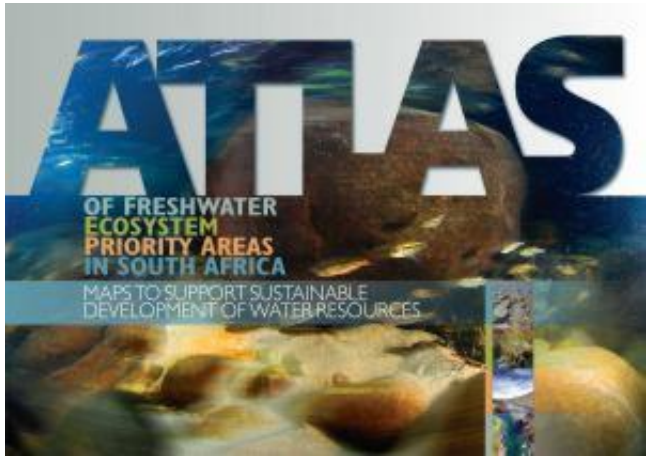
South African Assessment Update

Belinda Reyers, Jeanne Nel, Patrick O'Farrell, Luthando Dziba, Nadia Sitas, Ilse Kotzee, Maike Hamann, Odi Selomane, Tracey Cumming, Mandy Driver

ProEcoServ
Project for Ecosystem Services







The possibilities and pitfalls presented by a pragmatic approach to ecosystem service valuation in an arid biodiversity hotspot

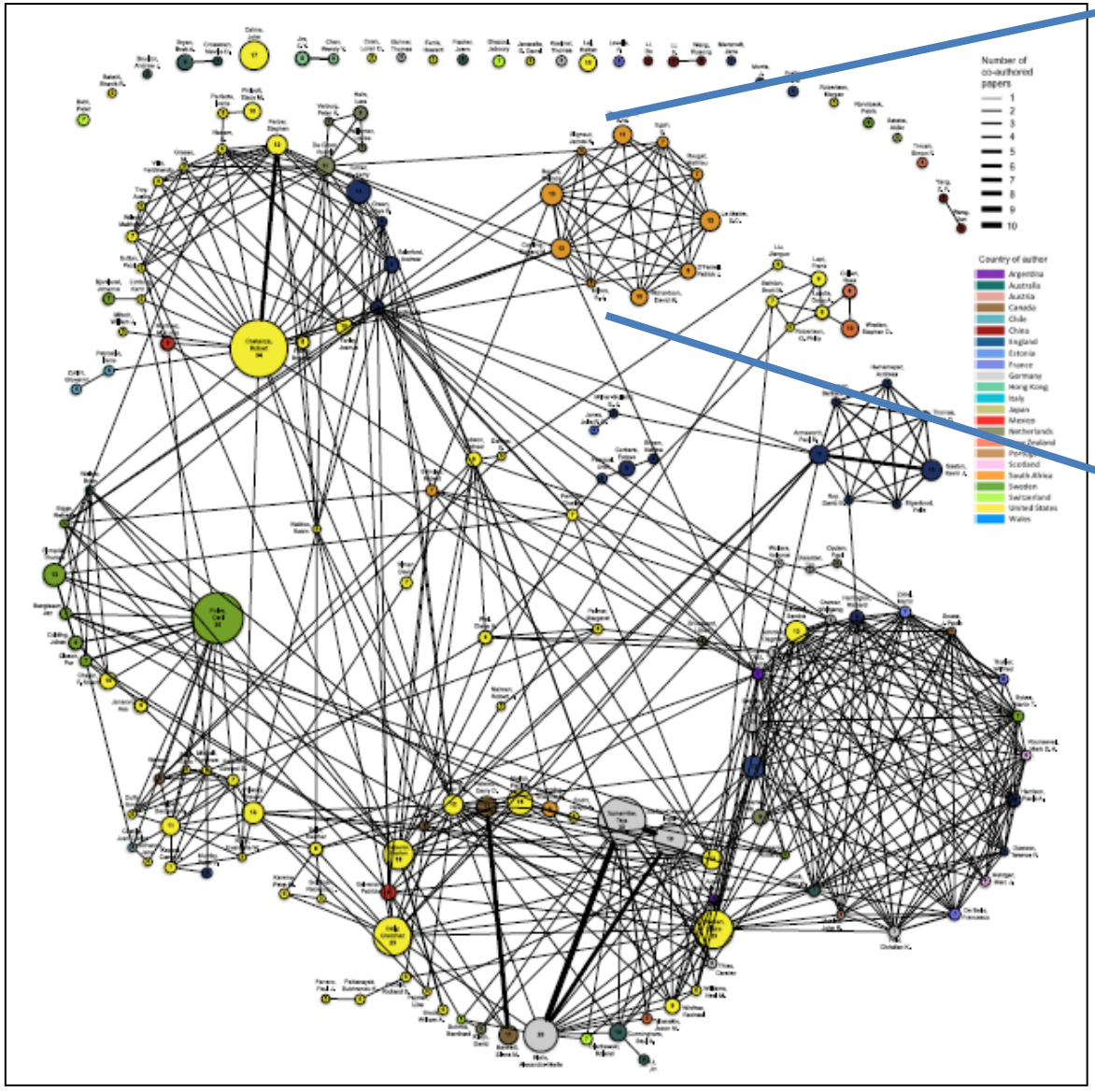
P.J. O'Farrell [a]
B. Egoh [e], A.

Identifying priority areas for ecosystem service management in South African grasslands

Benis N.

Ecosystem Services, Land-Cover Change, and Stakeholders: Finding a Sustainable Foothold for a Semiarid Biodiversity Hotspot

Belinda Reyers [1], *Patrick J. O'Farrell* [1], *Richard M. Cowling* [2], *Benis N. Egoh* [3], *David C. Le Maitre* [1], and *Jan H. J. Vlok* [4]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Australia
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China
England
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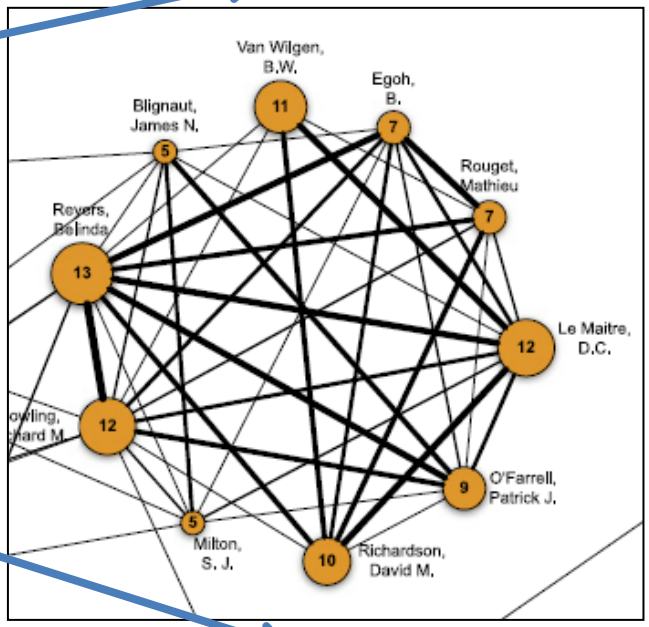
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Rouget, Mathieu
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Reyers, Belinda
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Le Maitre, D.C.
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O'Farrell, Patrick J.
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Milton, S. J.
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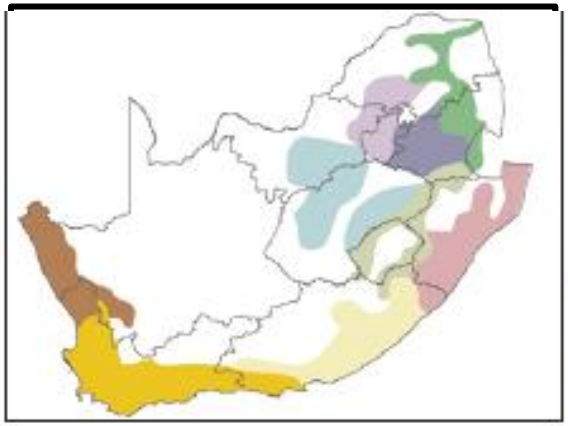
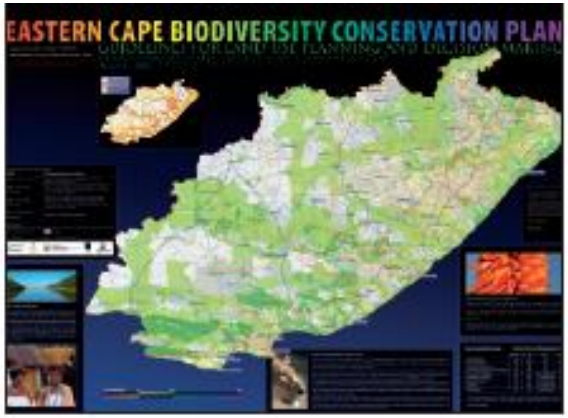
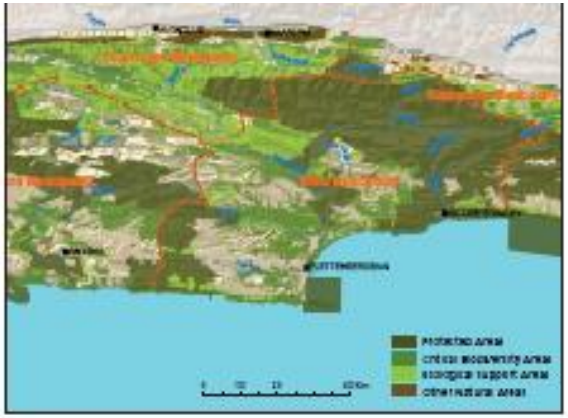
Richardson, David M.

Scales & Sectors







- Environmental
- Conservation
- Water
- Agriculture

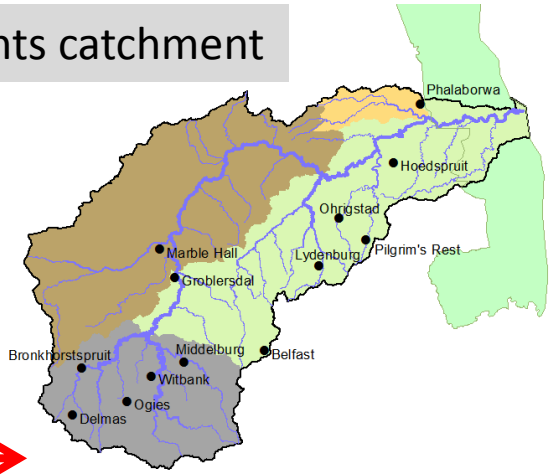
A scientific assessment applies the judgment of experts to existing knowledge to provide scientifically credible answers to policy relevant questions

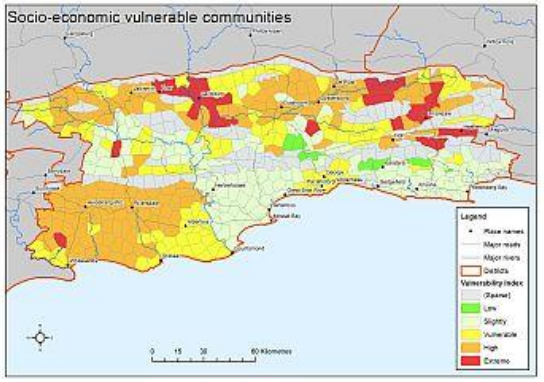
DESIGNING ASSESSMENTS FOR POLICY & PRACTICE

ProEcoServ pilots

1. National

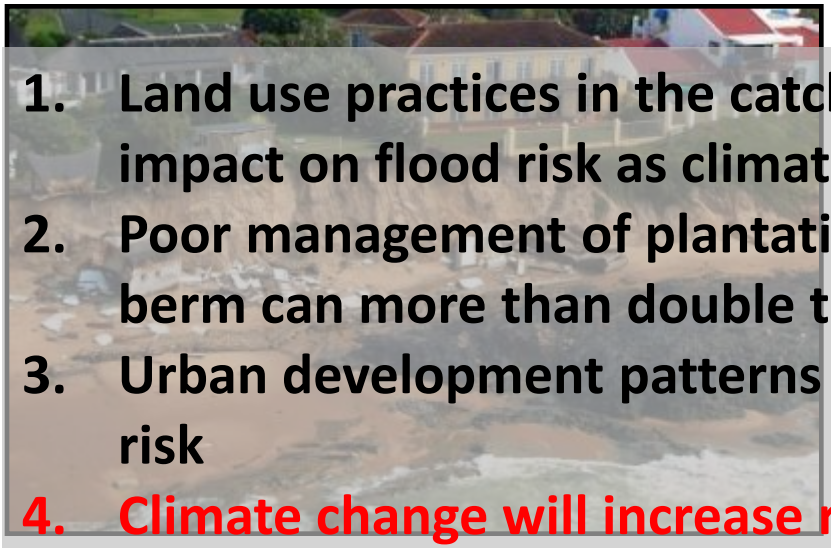
2. Olifants catchment

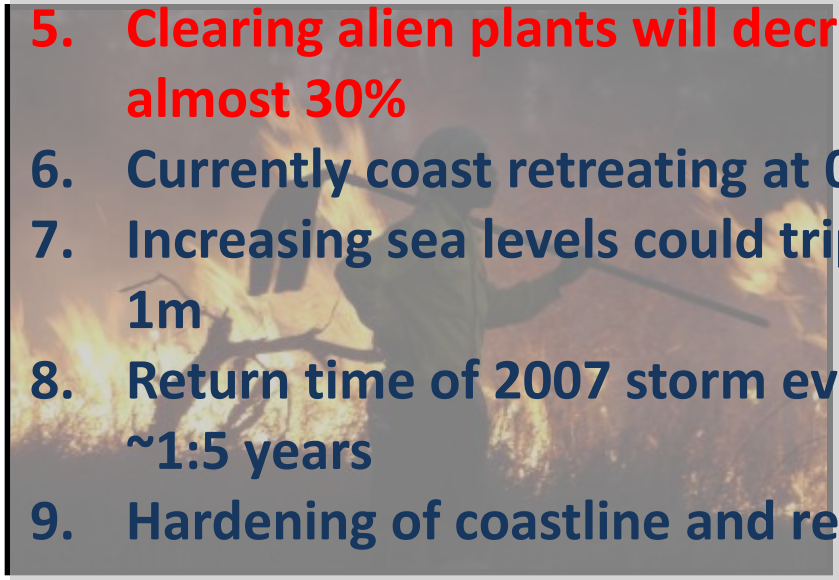




3. Eden District Municipality

1. Eden District:
Risk, regulating services & disaster management



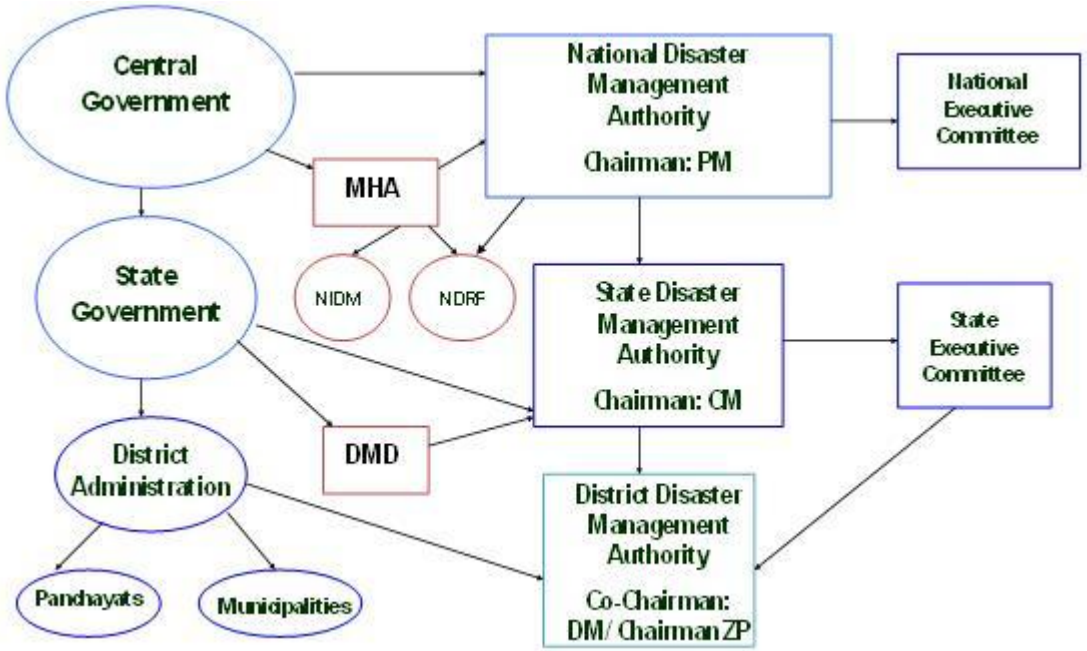



1. Land use practices in the catchment have just as much of an impact on flood risk as climate change.
2. Poor management of plantations, wetlands, rivers & estuary berm can more than double the risk of flood
3. Urban development patterns are putting more properties at risk
4. Climate change will increase risk of large, hard to control fires
5. Clearing alien plants will decrease areas under high fire risk by almost 30%
6. Currently coast retreating at 0.3m year in Mossel Bay
7. Increasing sea levels could triple this by 2050 – wave run up = 1m
8. Return time of 2007 storm event reduced from ~1:30 years to ~1:5 years
9. Hardening of coastline and removal of foredune increases risk

Drivers of change: leverage points

Little influence	More influence
Temperatures	Alien plants
Wind	Managing wetlands & estuary mouth
Sea level	Hardening of the coastline
? Population density	Dune management
? Timber price	Catchment integrity

Risk, regulating services & disaster management



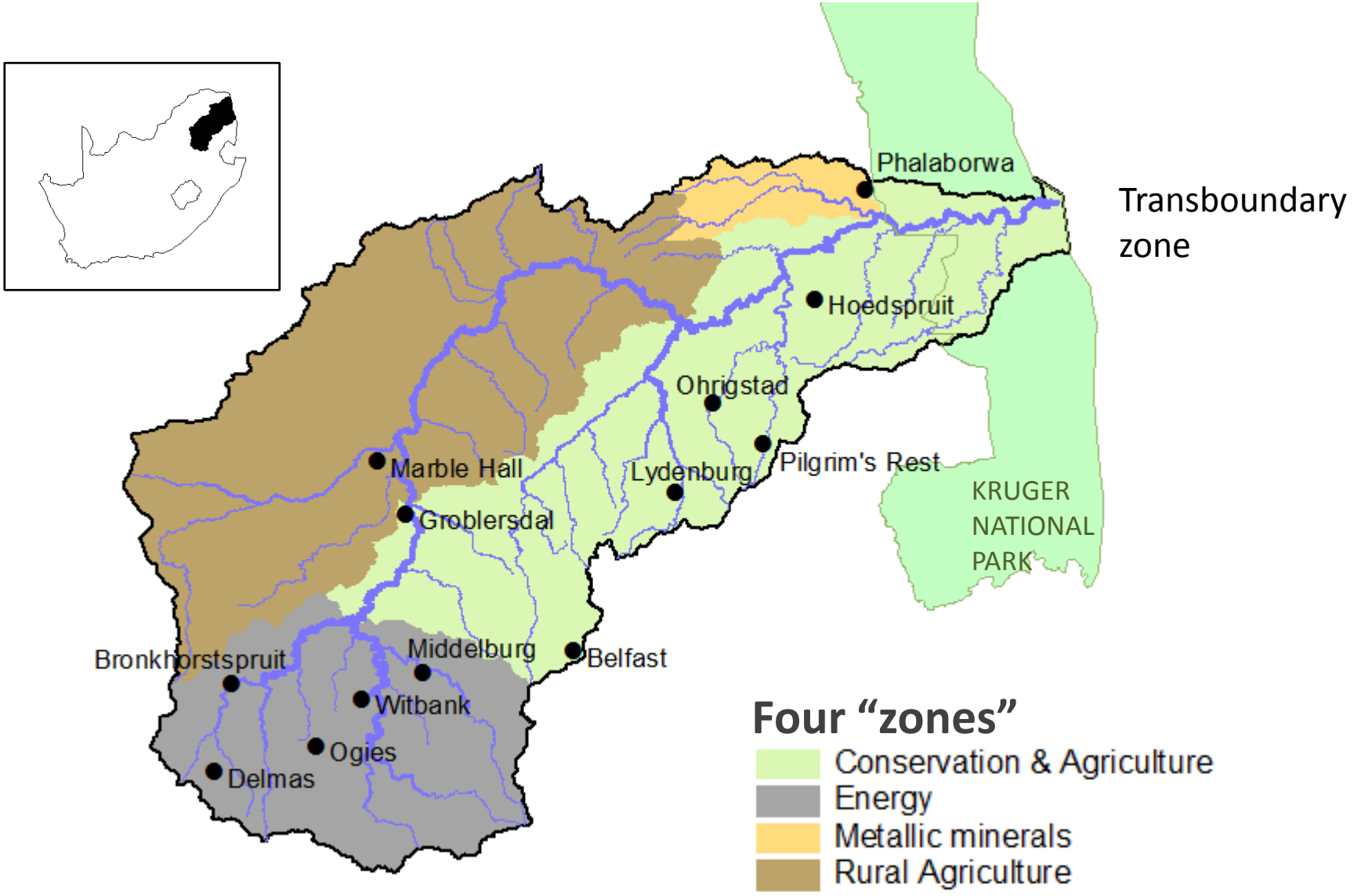
Introduction: A policy framework for disaster risk management in South Africa

South Africa's disaster risk management context

South Africa faces increasing levels of disaster risk. It is exposed to a wide range of weather hazards, including drought, cyclones and severe storms that can trigger widespread hardship and devastation. In addition, South Africa's extensive coastline and proximity to shipping routes present numerous marine and coastal threats. Similarly, our shared borders with six southern African neighbours present both natural and human-induced cross-boundary risks, as well as humanitarian assistance obligations in times of emergency.

In addition to these natural and human-induced threats and despite ongoing progress to extend essential services to poor urban and rural communities, large numbers of people live in conditions of chronic disaster vulnerability – in underserved, ecologically fragile or marginal areas – where they face recurrent natural and other threats that range from drought to repeated informal settlement fires.

The Olifants catchment



Transboundary zone

Extreme example of multiple pressures

Mining

- SA 5th largest coal producer in the world
- 90% from the Witbank coal fields

Sewage

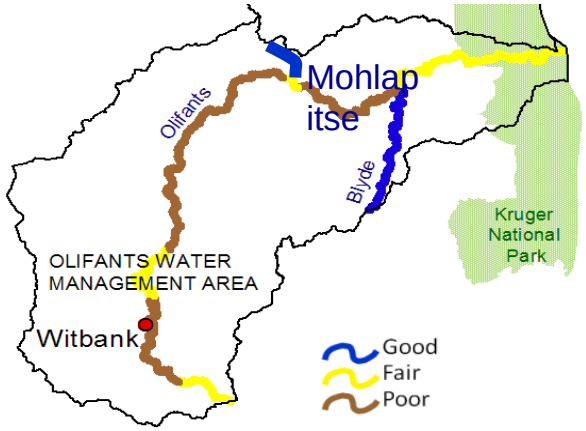
- 55% in ***drastic*** need of improvement

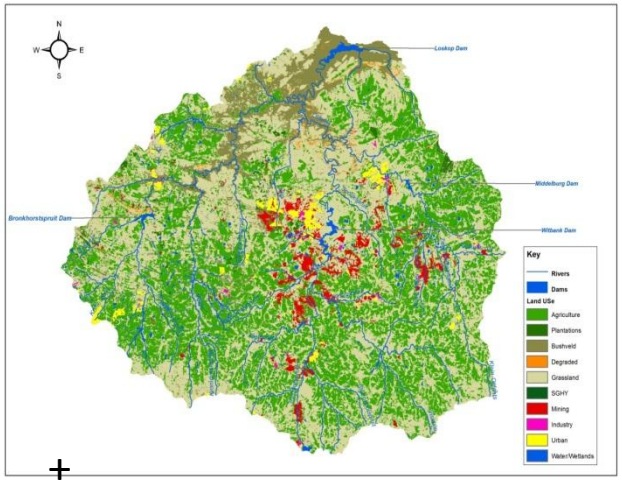
Crop Production

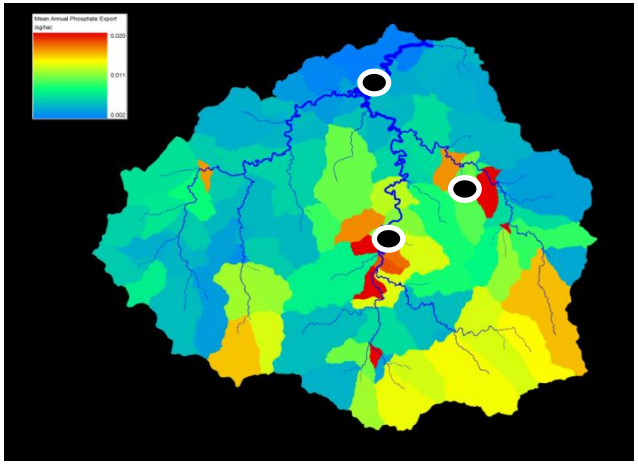
- 2nd largest irrigation scheme in SA
- R1 billion export market
- Grows 65% of vegetables of a major food company

Livestock Production

- Intensive feedlots
- 4 x more animals than humans
- Lots of animal waste



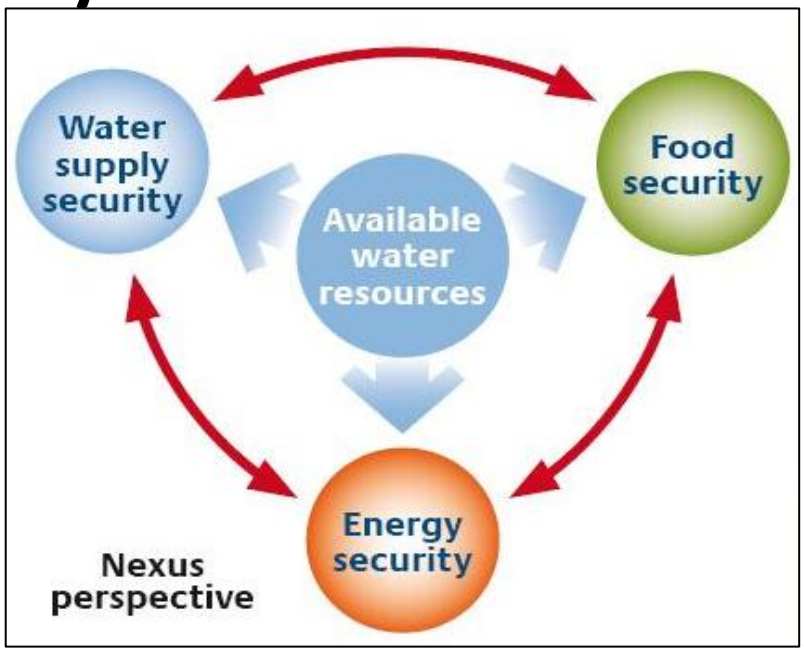


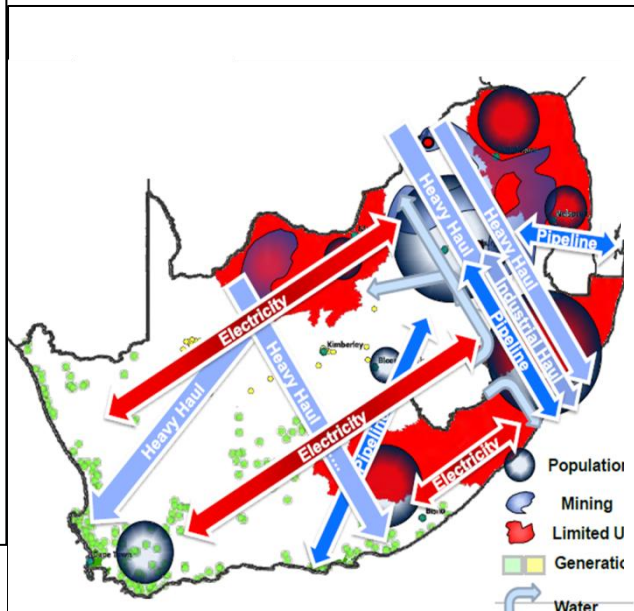


Assessment results

- Healthy **tributaries** dilute pollutants of downstream hard-working rivers
- A 1 mg/l national standard at **sewage works** can reduce loads by ~40% in dams
- Cobble and bedrock streams are particularly **sensitive** to phosphorus
- Sewage works, cattle drinking points and feedlot location are key for **restoration**
- Switch from fertilizer to **microbes**
- Make better use of **artificial wetlands**
- **Evaporation ponds** for sewage works

National scale policy environment





R4 trillion

R573 billion for water infrastructure

R30 billion to rehab abandoned mines

National assessment layers

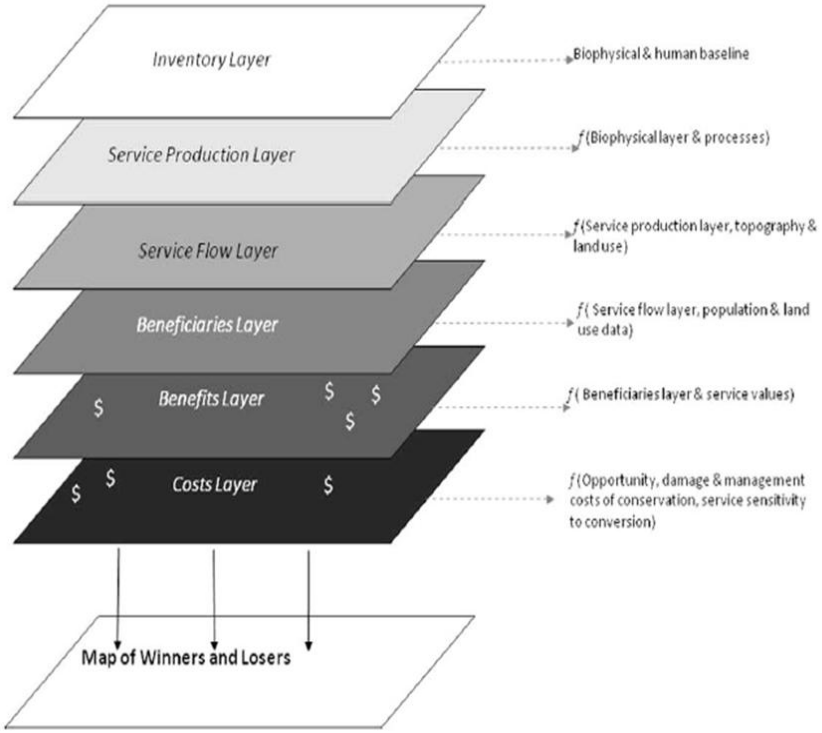


Figure 2. Series of sequential mapping exercises for assessing ecosystem services across a landscape

Fisher et al. 2011. Measuring, modeling and mapping ecosystem services in the Eastern Arc Mountains of Tanzania. Progress in Physical Geography 35: 595–611

Water supply/towers

Drought mitigation

Erosion control

Livestock production

Flood regulation

Water purification

Framework

Key drivers of the production function *(those within our control and those not)*

Map of potential ecosystem service delivery *(natural conditions)*

Supply response relationships *(how does potential delivery change in response to changing key drivers)*

Scenarios of change *(quantify what this means for beneficiaries/target audience)*

Map of beneficiaries or target audience needs *…..national and/or sub-national*

Mainstreaming tools and practical guidelines *(what can you do with the drivers to improve sustainability and benefits)*

EROSION CONTROL | DROUGHT PROTECTN

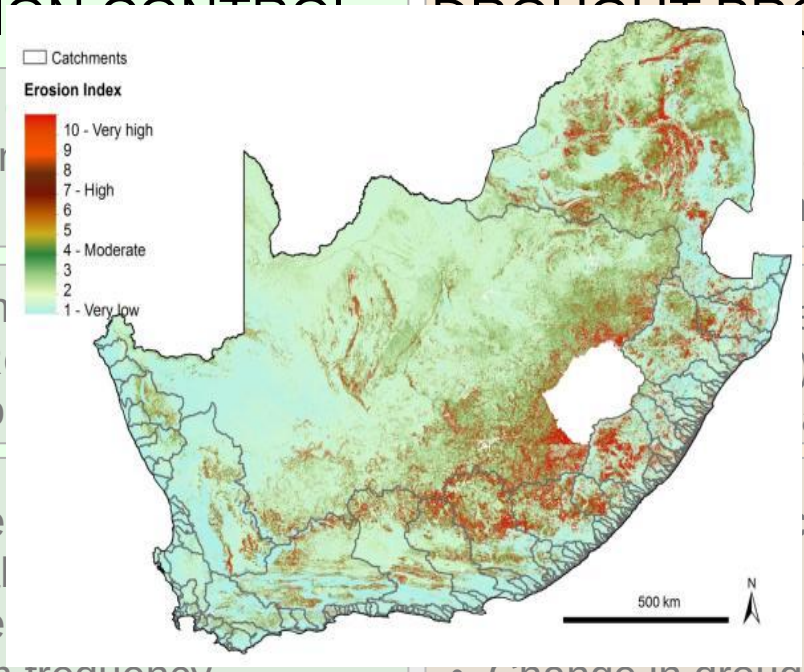
Rainfall, … ty, slope, lan… atchment … d cover

- Poten… eflow; (Le R…)
- Pull o… ary stats

- Change … cover permeal…
- Change … or storm frequency
- Change in drought

- S… d (… BA)
- N… by s… ity) (f…

- D…
- V… r…
- …



EXAMPLES ON USE OF MAP

- Dam sedimentation (water security)
  - Dam sedimentation rates under different land cover scenarios
  - Which areas would be good to keep intact above major dams
- Local example
  - Metropol urban water supply risk (water security)
  - Manalana wetlands and subsistence farmer (food security)

Process

- Analysis of opps & constraints
- Stakeholder workshops for process & champions
- Develop Tools / Product
- Guidelines & training
- Uptake assessment

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Project for Ecosystem Services