

The role of GEOSS in monitoring ecosystems and their services

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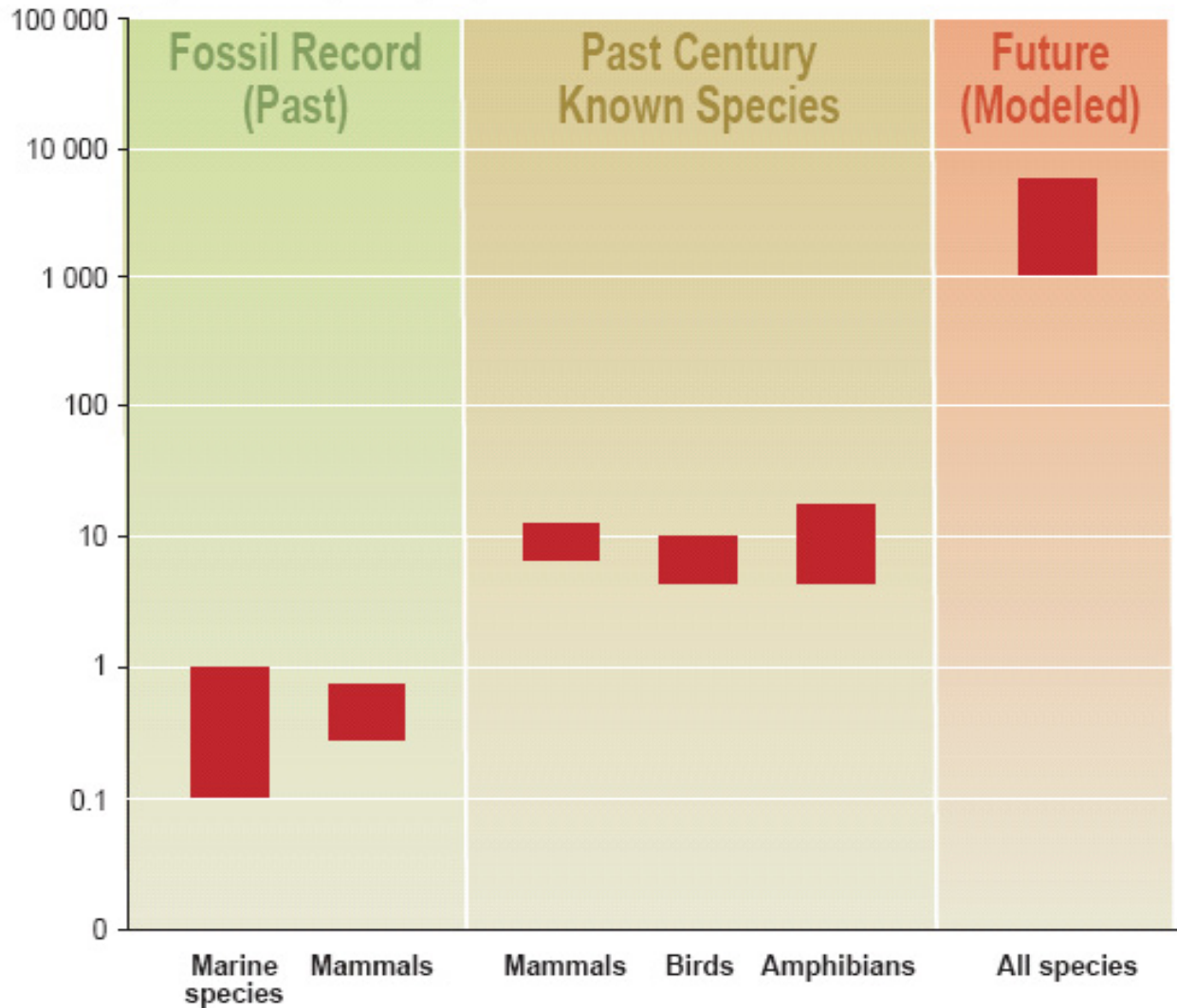
The logo for the Council for Scientific and Industrial Research (CSIR) of South Africa. It features the letters 'CSIR' in a bold, blue, sans-serif font. The 'C' is a large, rounded shape, and the 'S' is a smaller, more compact shape. The 'I' is a simple vertical bar, and the 'R' is a stylized, rounded shape. The logo is positioned in the bottom right corner of the slide, above the tagline.

our future through science



Biodiversity

Extinctions per million species per year



Sources: Millennium Ecosystem Assessment.



Ecosystem services

	Status
Air quality regulation	↓
Climate regulation – global	↑
Climate regulation – regional and local	↓
Water regulation	+/-
Erosion regulation	↓
Water purification and waste treatment	↓
Disease regulation	+/-
Pest regulation	↓
Pollination	↓
Natural hazard regulation	↓
Cultural Services	
Spiritual and religious values	↓
Aesthetic values	↓
Recreation and ecotourism	+/-

Source Millennium Ecosystem Assessment

The economics
& of ecosystems
& biodiversity

LIVING BEYOND OUR MEANS



NATURAL ASSETS AND HUMAN WELL-BEING

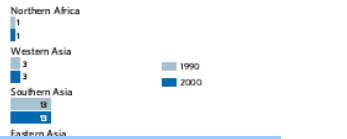
Goal 7 Ensure environmental sustainability

TARGET
Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources

Most countries have committed to the principles of sustainable development and to incorporating them into their national policies and strategies. They have also agreed to the implementation of relevant international accords. But good intentions have not resulted in sufficient progress to reverse the loss of our environmental resources.

Forests are disappearing fastest in the poorest regions

Proportion of land area covered by forests, 1990 and 2000 (Percentage)



Environmental sustainability means using natural resources wisely and protecting the complex ecosystems on which our survival depends. But sustainability will not be achieved with current patterns of resource consumption and use. Land is becoming degraded at an

“Absence of well-documented, comparable, time-series information for many ecosystem features ... pose significant barriers” (MA 2005)



ECOSYSTEMS AND HUMAN WELL-BEING

Biodiversity Synthesis



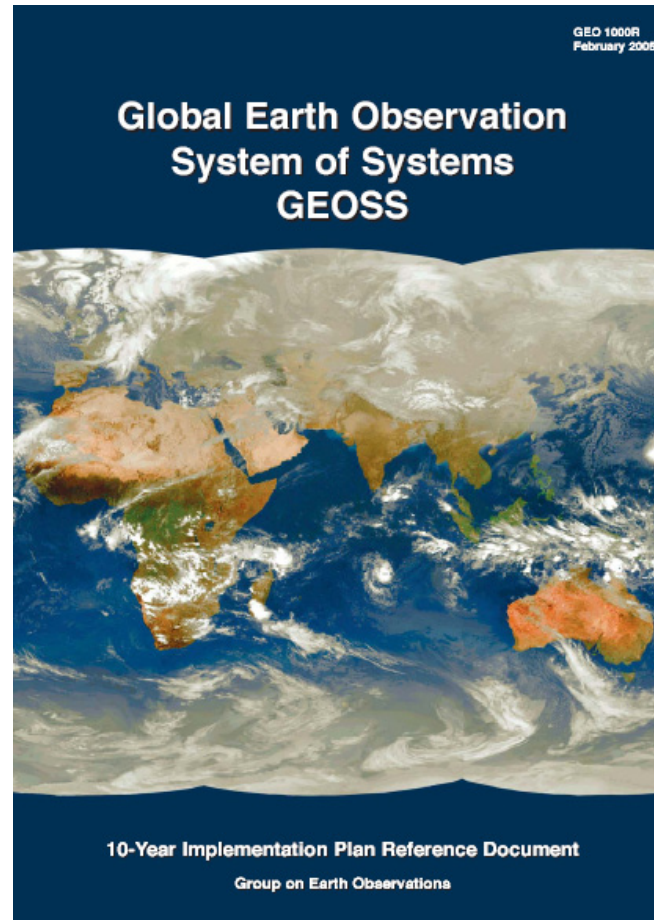
SOUTH AFRICA'S NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN

Global Biodiversity Outlook 2





The need for monitoring systems



4.1 Disasters

4.2 Health

4.3 Energy

4.4 Climate

4.5 Water

4.6 Weather

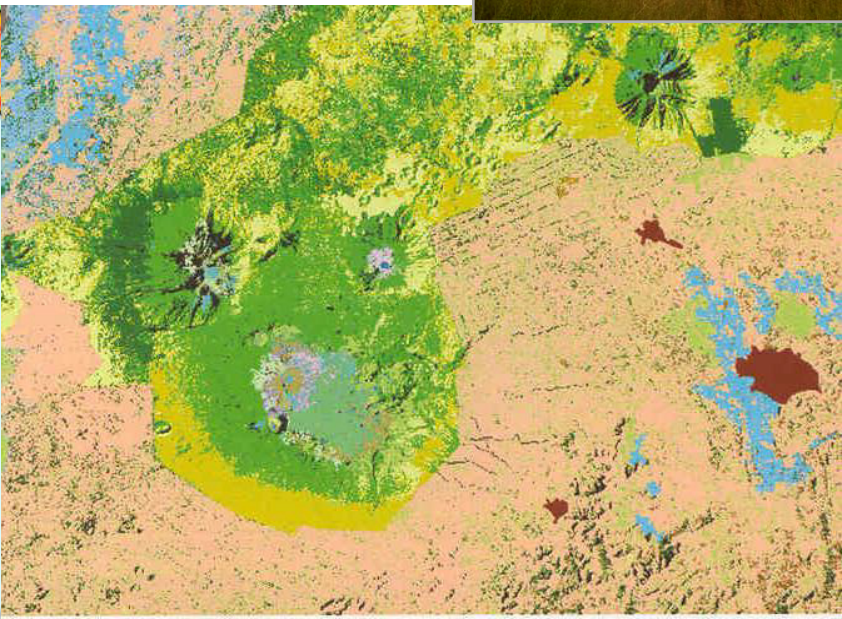
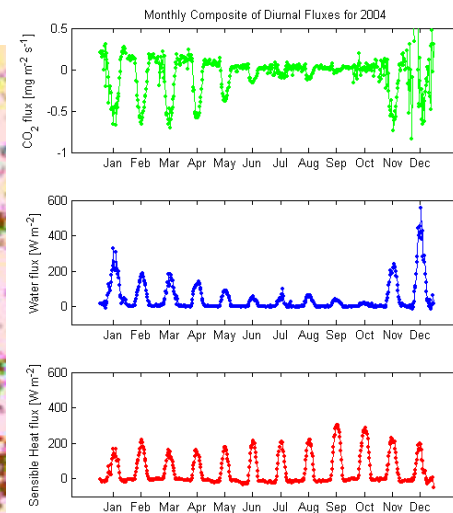
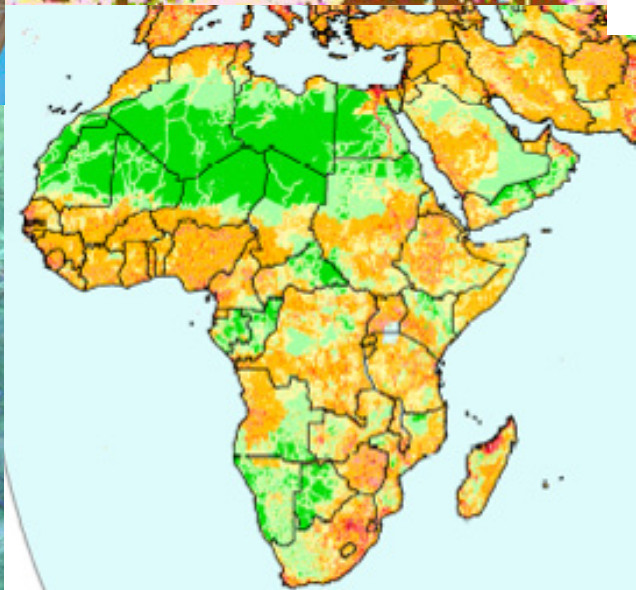
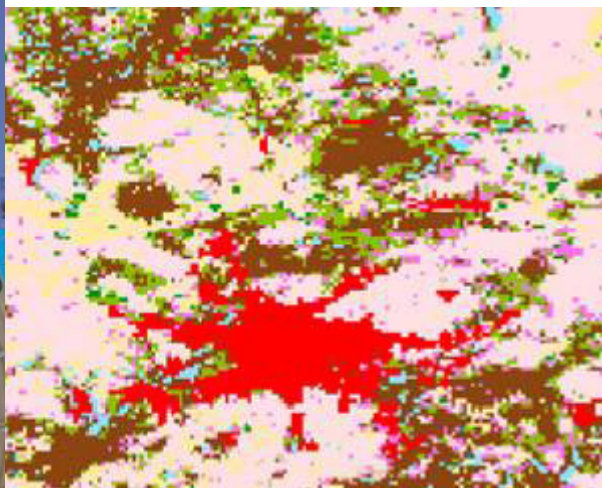
4.7 Ecosystems

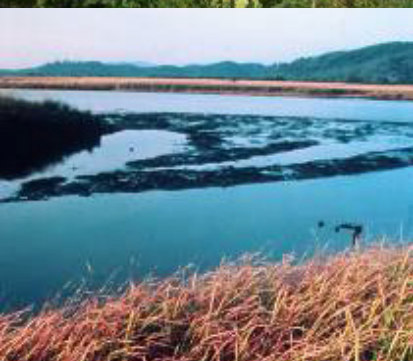
4.8 Agriculture

4.9 Biodiversity

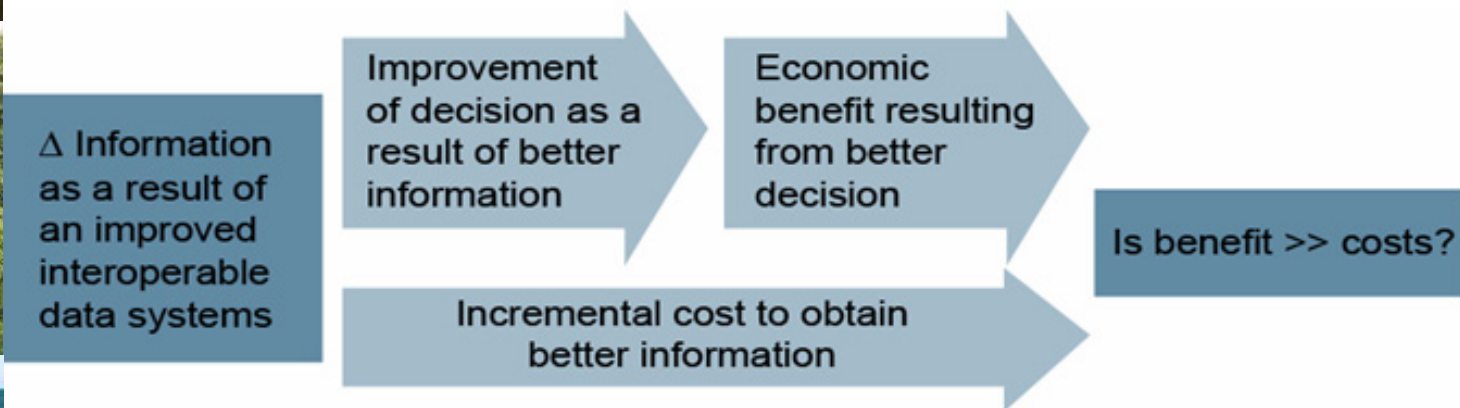
4.10 Commonalities

Progress

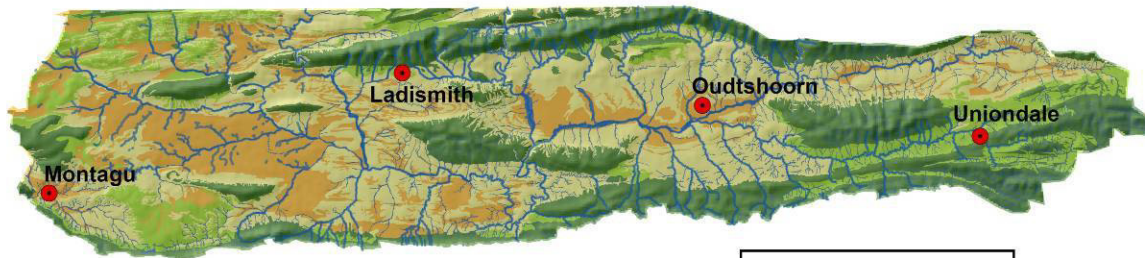
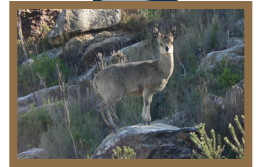
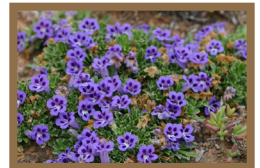
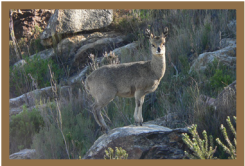











How much is enough?



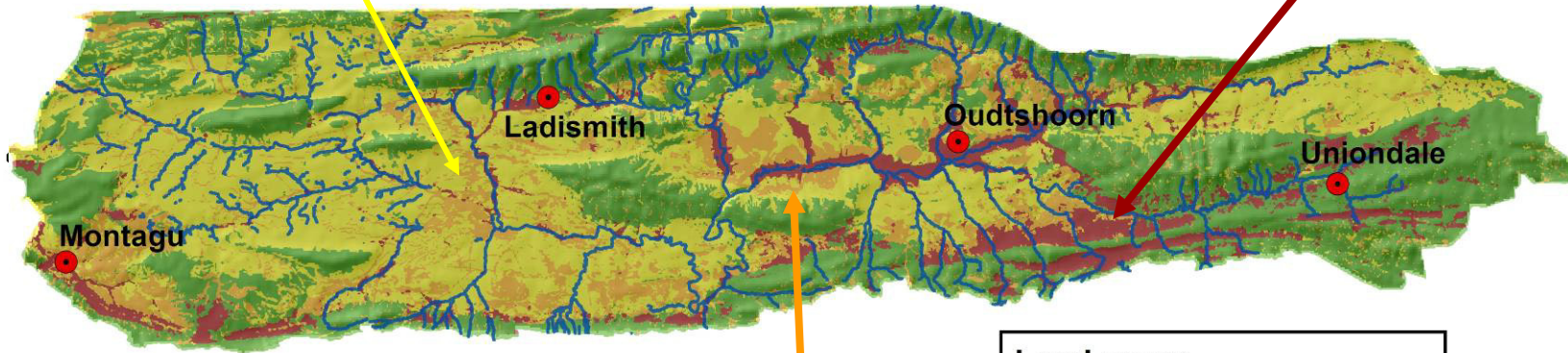
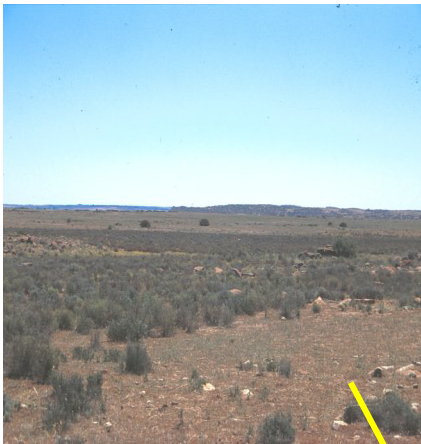
What is the shape of the cost-benefit relation?
Can global collaboration reduce the cost or increase the benefit?
What variables are most sensitive to increased accuracy?



0 25 50 75 100 Kilometers







Biomes	
	Fynbos
	Renosterveld
	Succulent Karoo
	Thicket
	Riverine
	Rivers
	Towns

Landcover



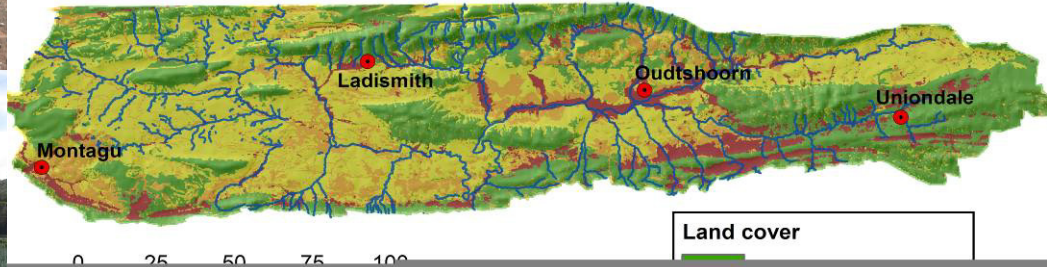
0 25 50 75 100 Kilometers

Land cover

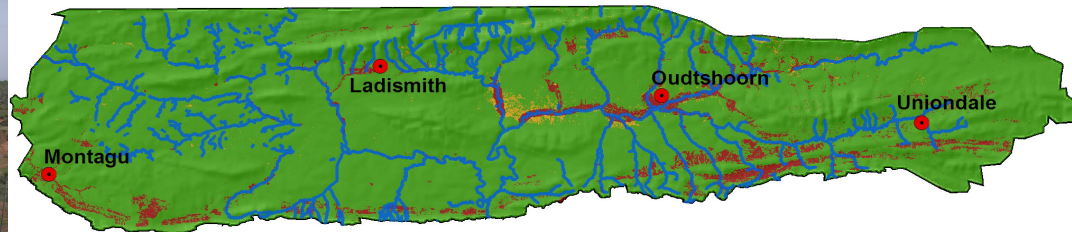
-  Pristine
-  Moderately degraded
-  Severely degraded
-  Transformed
-  Rivers
-  Towns



Data scenarios

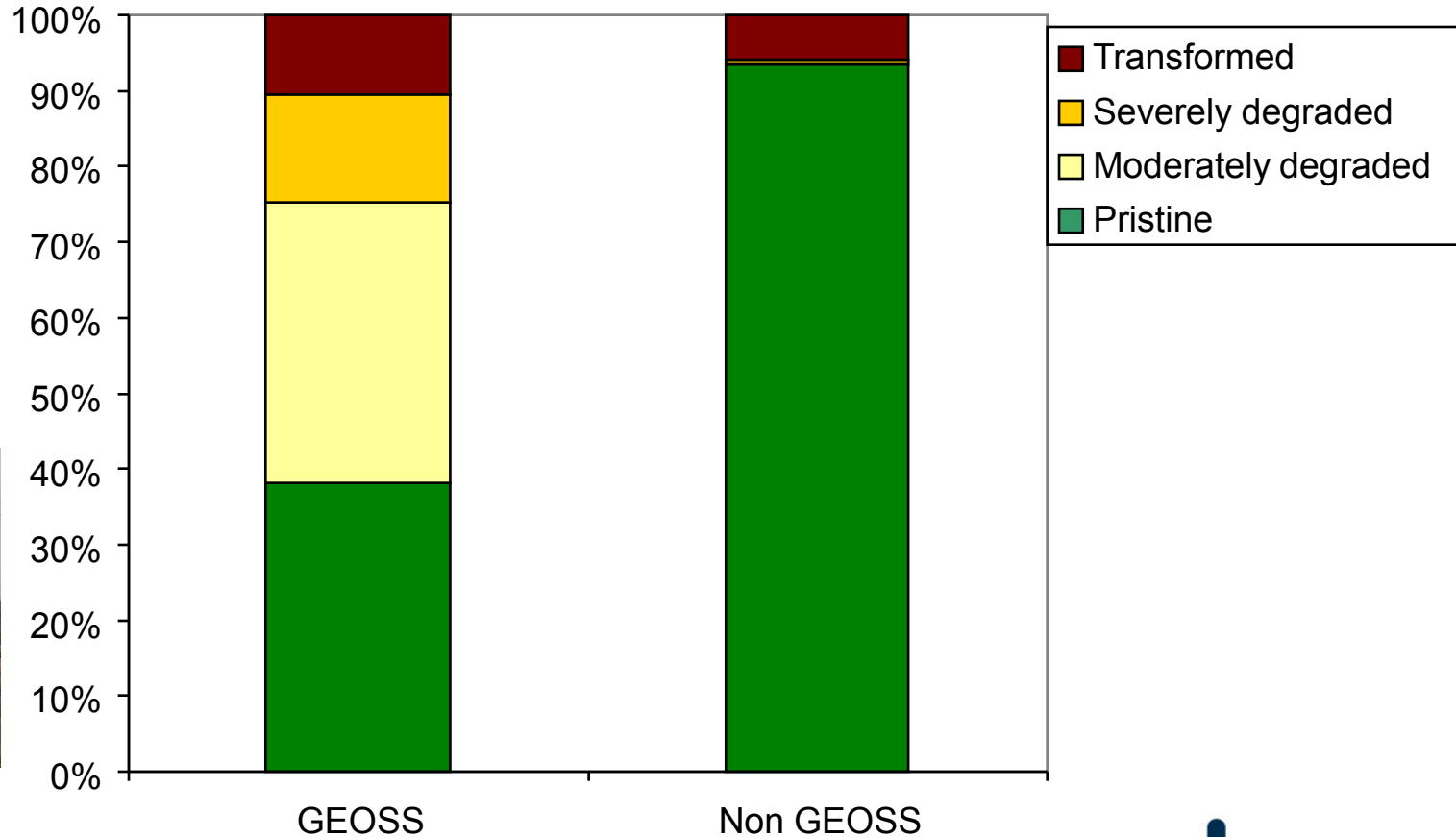


= GEOSS



= Non GEOSS

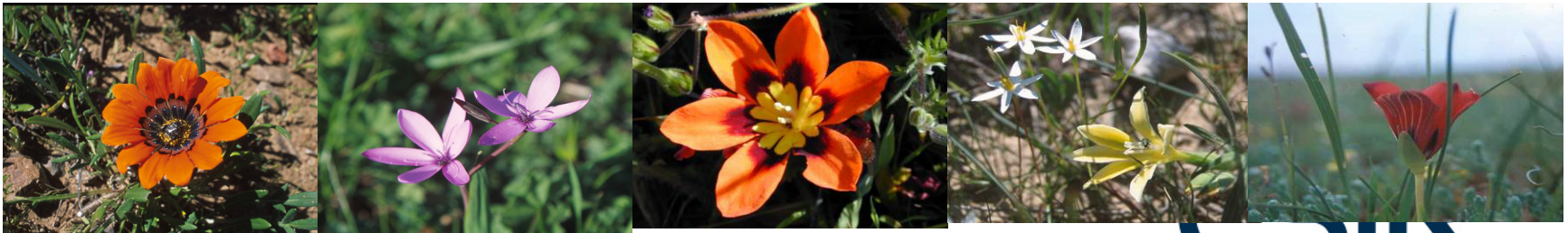
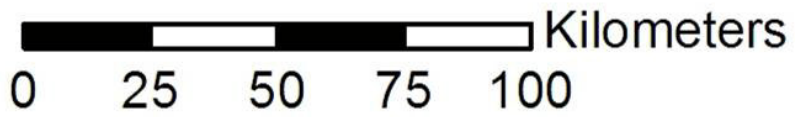
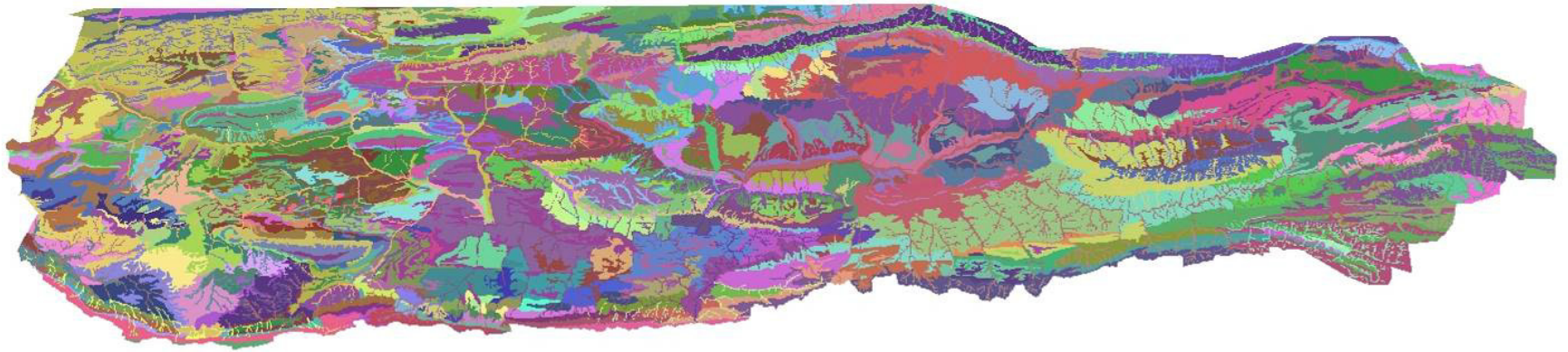
Land cover situation



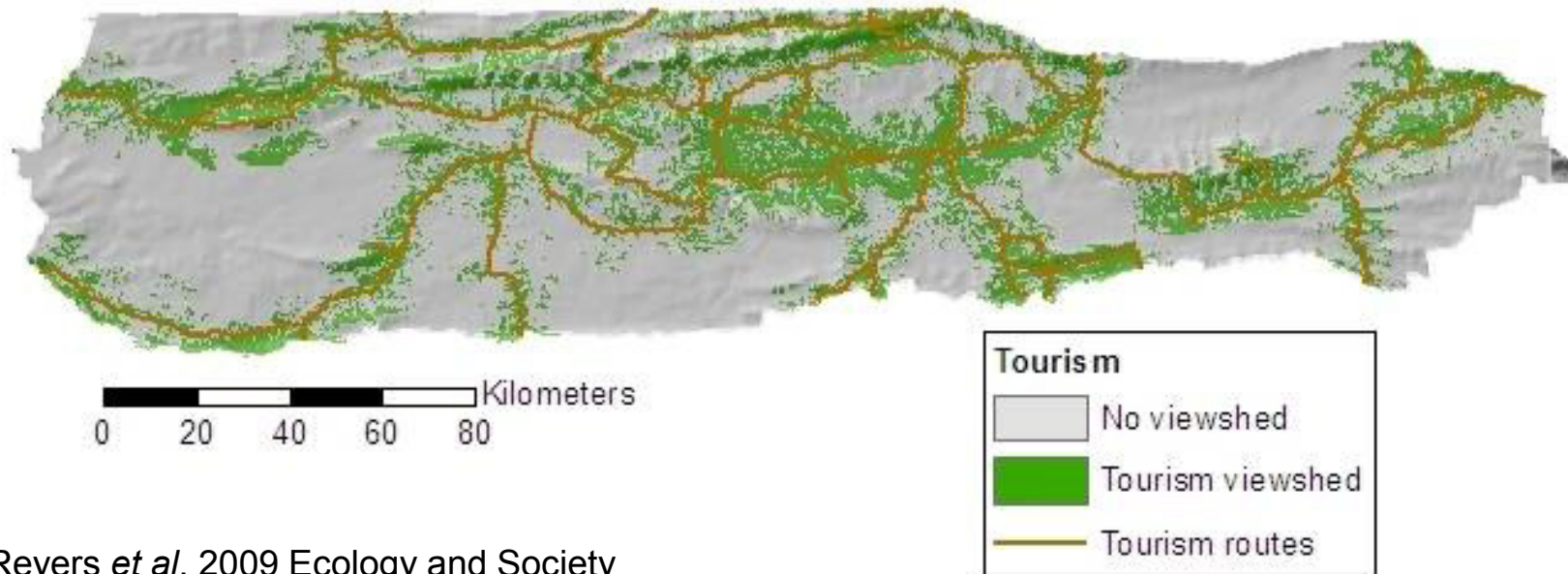
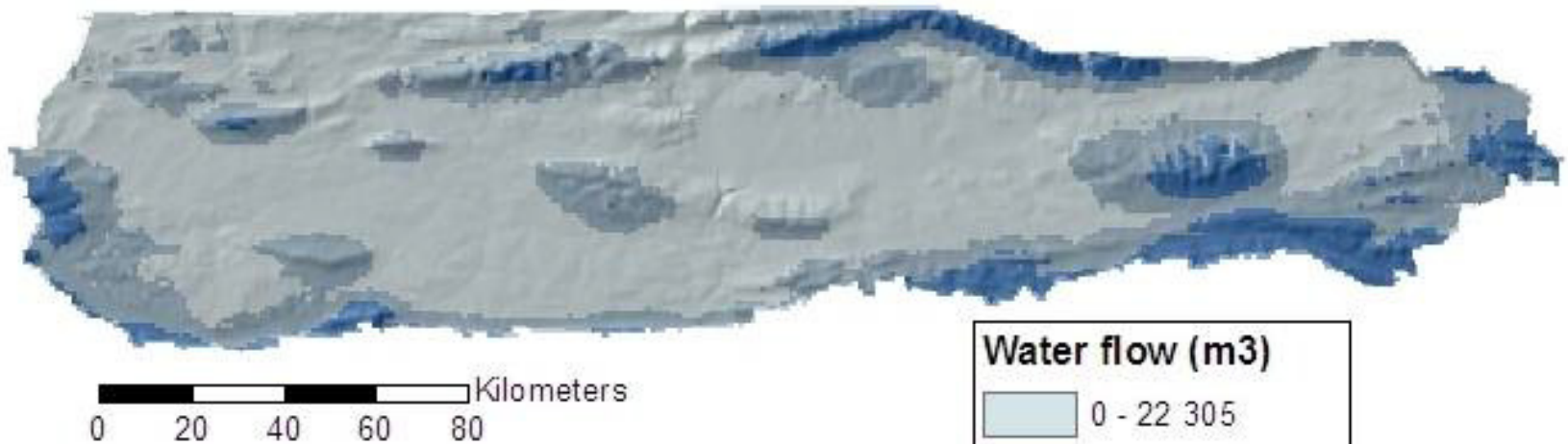
Consequences of land cover change



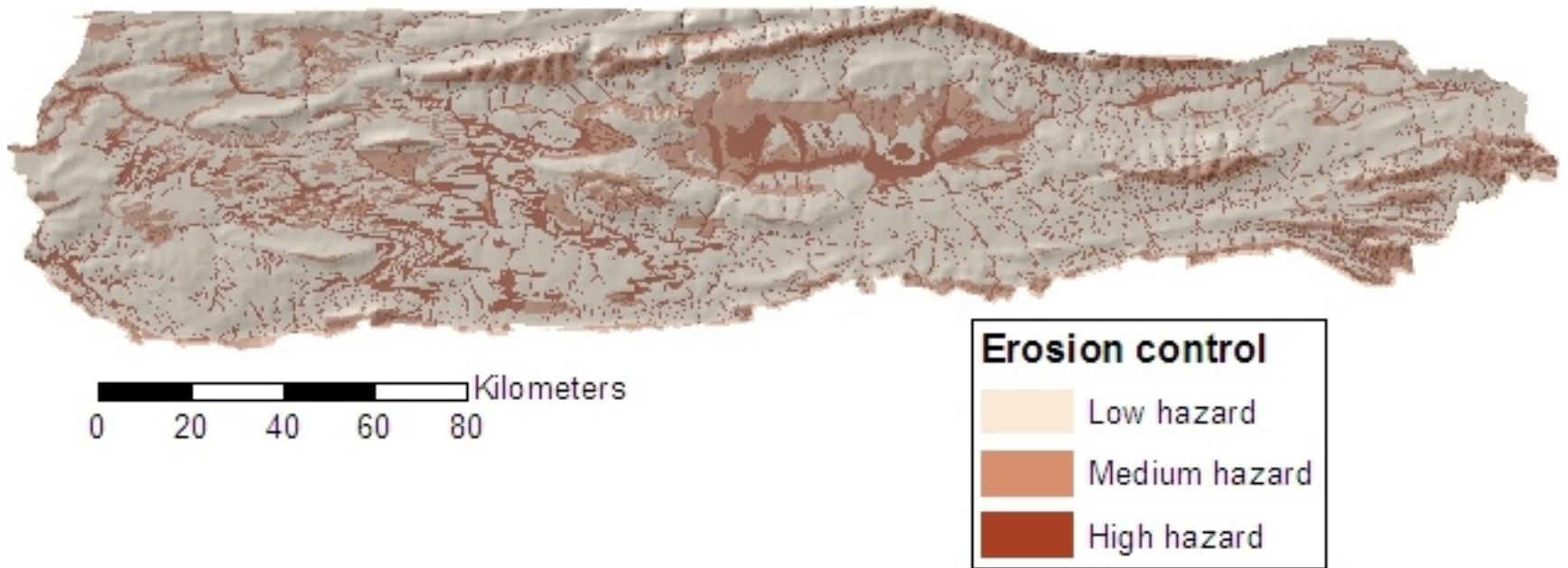
Biodiversity



Ecosystem services



Erosion control

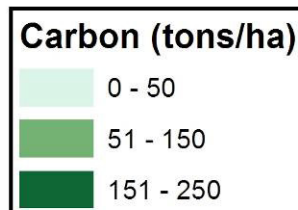
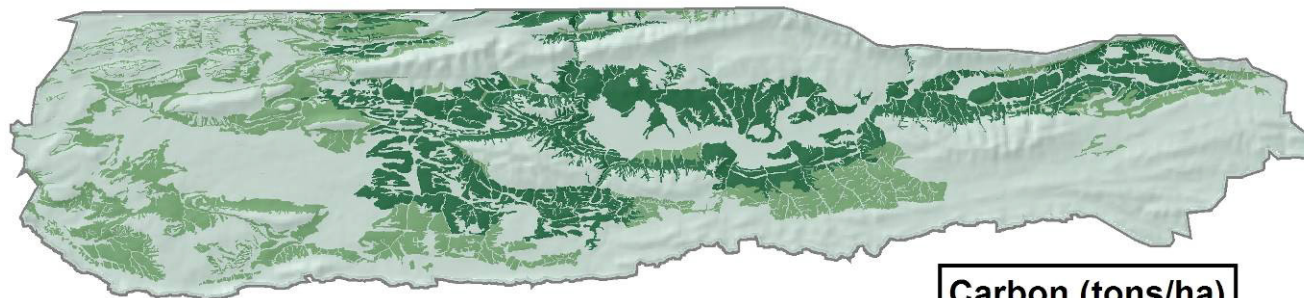


Land cover impact matrix

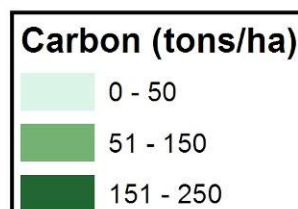
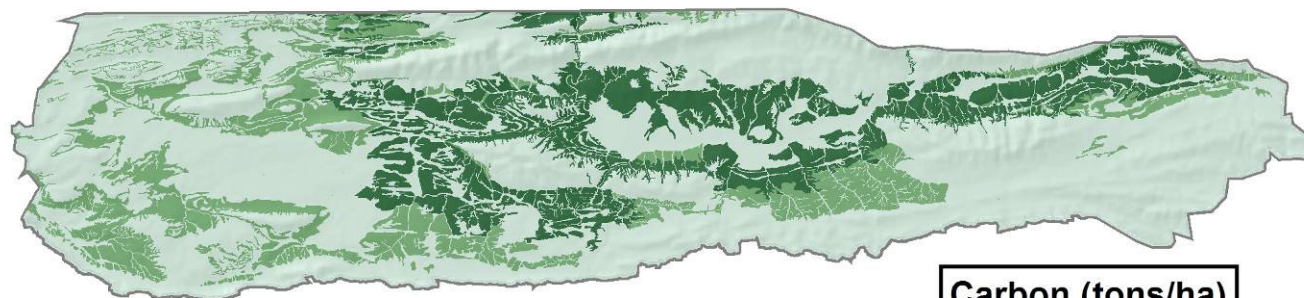
Habitat type	Forage production (ha/LSU)		
	Pristine	Moderately degraded	Severely degraded
A	140	180	210
B	60	80	120
C	54	70	90
D	140	180	210
E	108	140	160
F	72	95	110
G	75	90	100
H	66	85	100
I	70	90	100

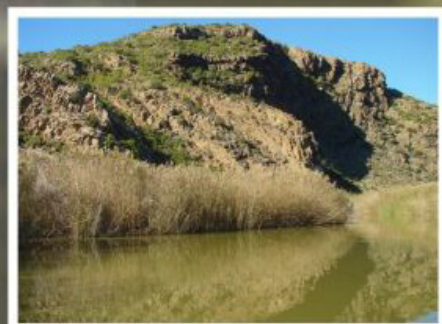


Original

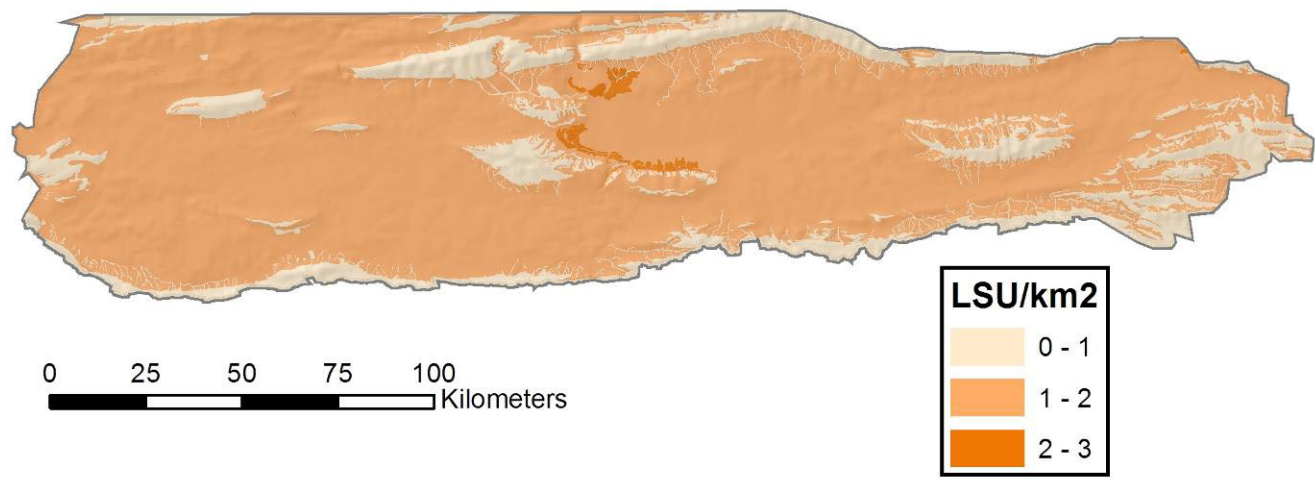


Current (Non GEOSS)

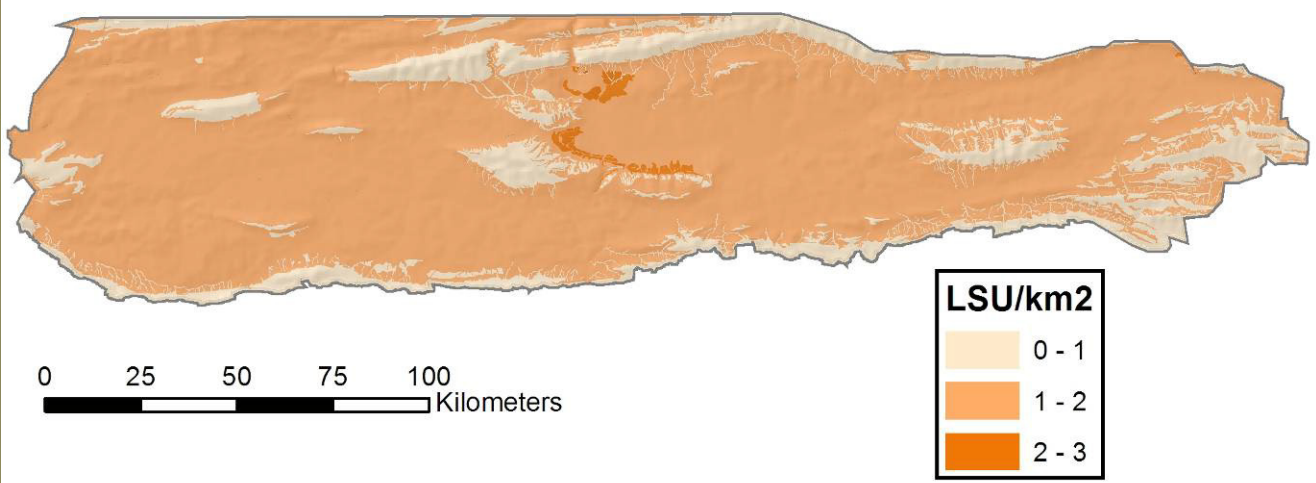




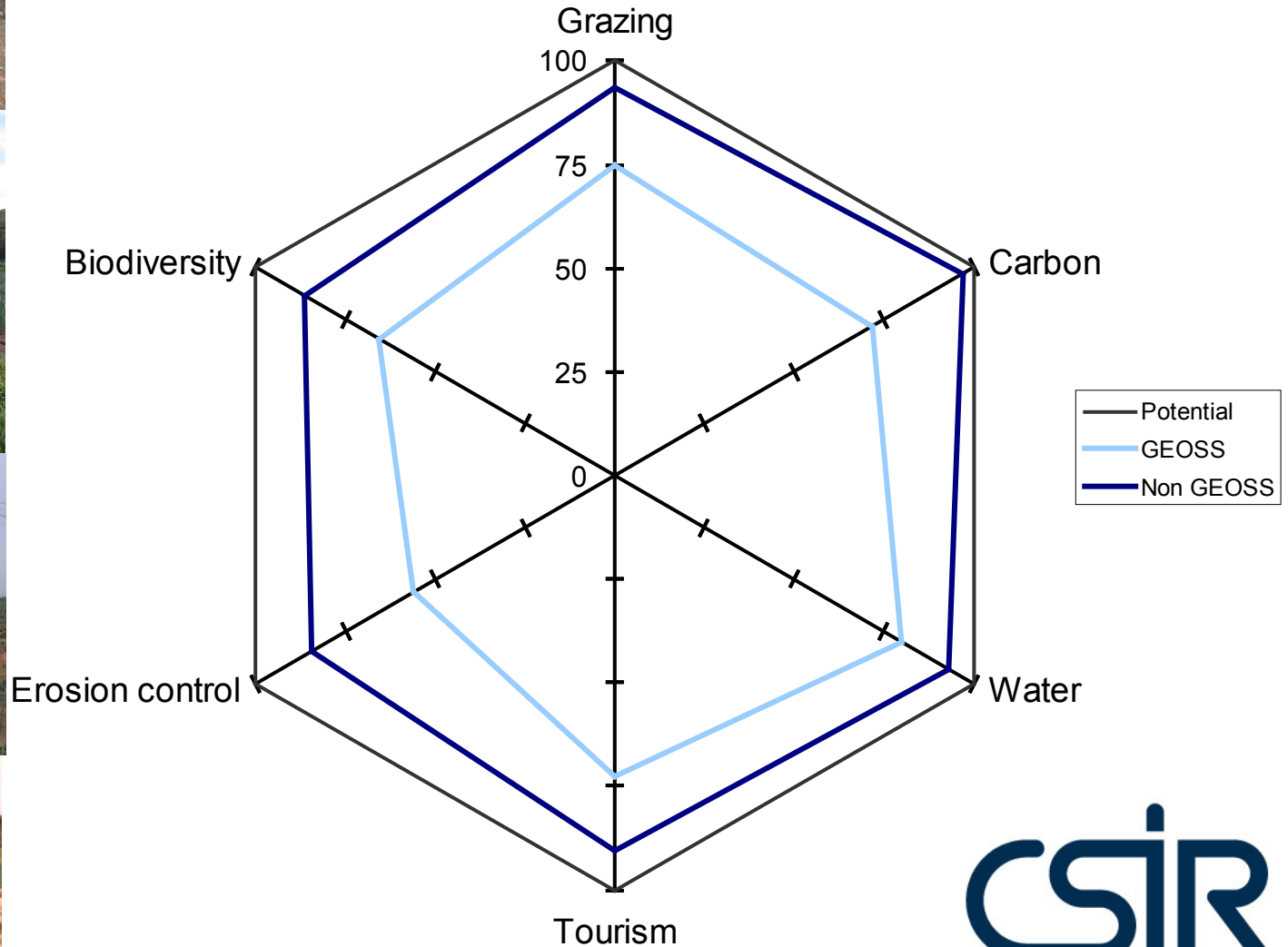
Original



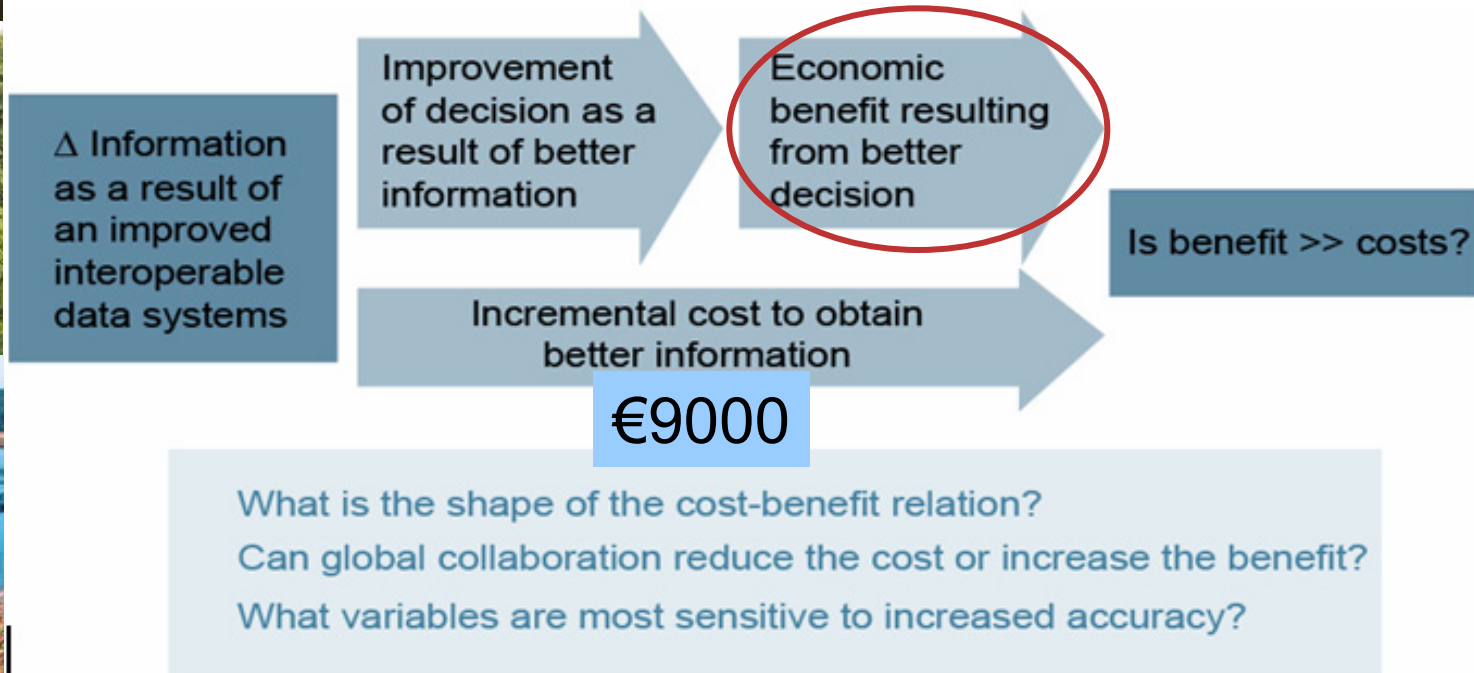
Current (Non GEOSS)



Ecosystem service changes



Benefit assessment

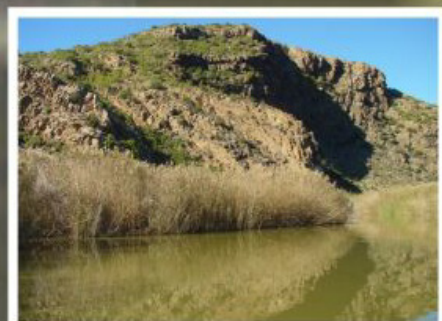


Quantifying the benefits

- Costs of not knowing / inaction / wrong action
- € 2000 / ha restoration costs = € 500 million
- € 25 million storm damage costs

Conclusion

- Small strategic investments = large effects
- Inability to quantify benefits – key obstacle



Thank you

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