Mind the gap – challenges in crossing the boundaries of research, policy and management

Challenges to Evidence-Based Policy-Making: Recent Research and Personal Reflection

Presentation to the South African Network for Coastal and Oceanic Research (SANCOR) Annual Forum, Wednesday 15 June 2016, Nelson Mandela Metropolitan University, Port Elizabeth.

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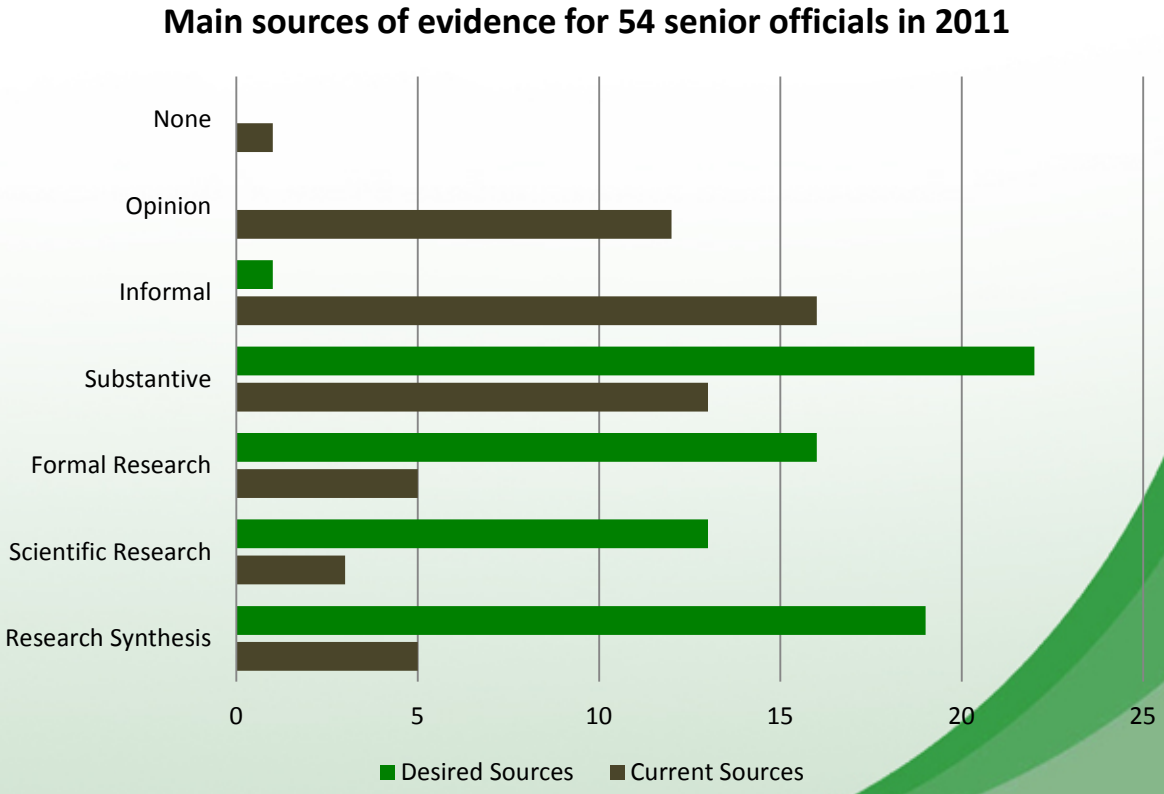
Presentation Overview

- Some research findings –
  - Evidence-based Policy-Making in South Africa
  - The Barriers to the use of evidence in policy making
  - The Facilitators for the use of evidence in policy making
  - four primary models believed to increase knowledge exchange among scientists and decision-makers
- Personal reflection – extracts from my presentation to the SESYNC Pursuit on Climate Vulnerability Mapping Workshop, 17-19 February 2016, Annapolis, Maryland, USA

Evidence-based Policy-Making in South Africa

- DPME and UCT's Evidence-Based Policy Making course aimed at convincing strategic leaders and top management in the public service around the importance of evidence
- However, officials appear to recognise the need for better evidence, but are simply not using it - so what is the problem?



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Paine Cronin, G. & Sadan, M. (2015). Use of evidence in policy making in South Africa: An exploratory study of attitudes of senior government officials, *African Evaluation Journal* 3(1), Art. #145, 10 pages.

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The Barriers to the use of evidence in policy making

"Throughout the knowledge exchange literature, conventional approaches to knowledge exchange (i.e.- linear pipeline models of communication) and cultural differences between scientists and decision-makers have been well established as key factors undermining effective knowledge exchange among the two groups. More recently, however, a new suite of evidence suggests that a range of other barriers also exist, and in some cases, compound and reinforce existing issues."

Chris Cvitanovic. 18 November 2015. Four strategies for improving knowledge exchange among scientists and decision-makers. http://www.researchtoaction.org/2015/11/

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"[Zambian parliamentary staff] …scored poorly on most areas of the test. For example, only one in five was able to pick from a list the correct definition of a randomised controlled trial (RCT)…".

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A quick test – What is a dilatory motion in Parliament?

A dilatory motion interrupts the business under discussion and can only be introduced by the Member who is speaking.

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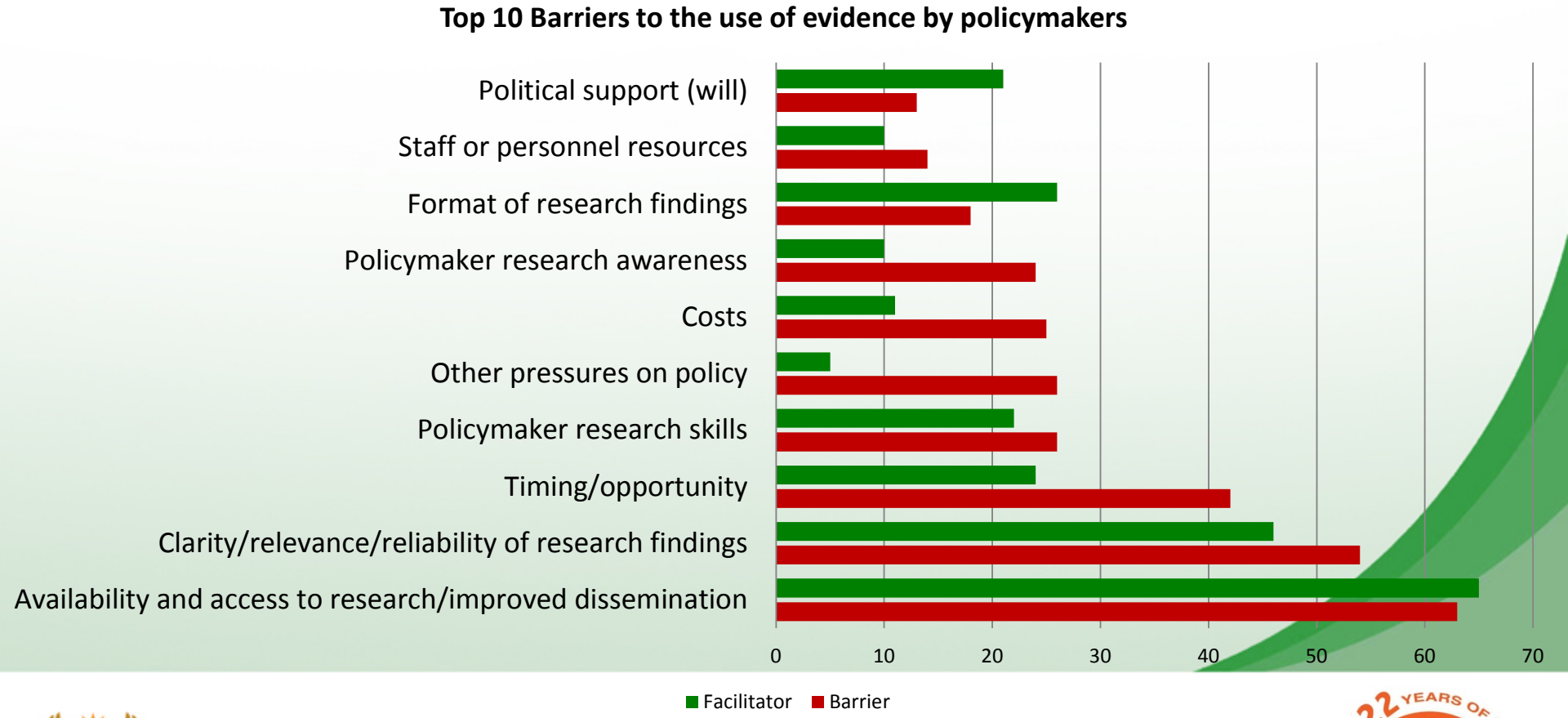
The Barriers to the use of evidence in policy making (Cont.)



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Oliver, K., Innvar, S., Lorenc, T., Woodman, J. & Thomas, J. (2014). A systematic review of barriers to and facilitators of the use of evidence by policymakers. *BMC Health Services Research*, **14**:2

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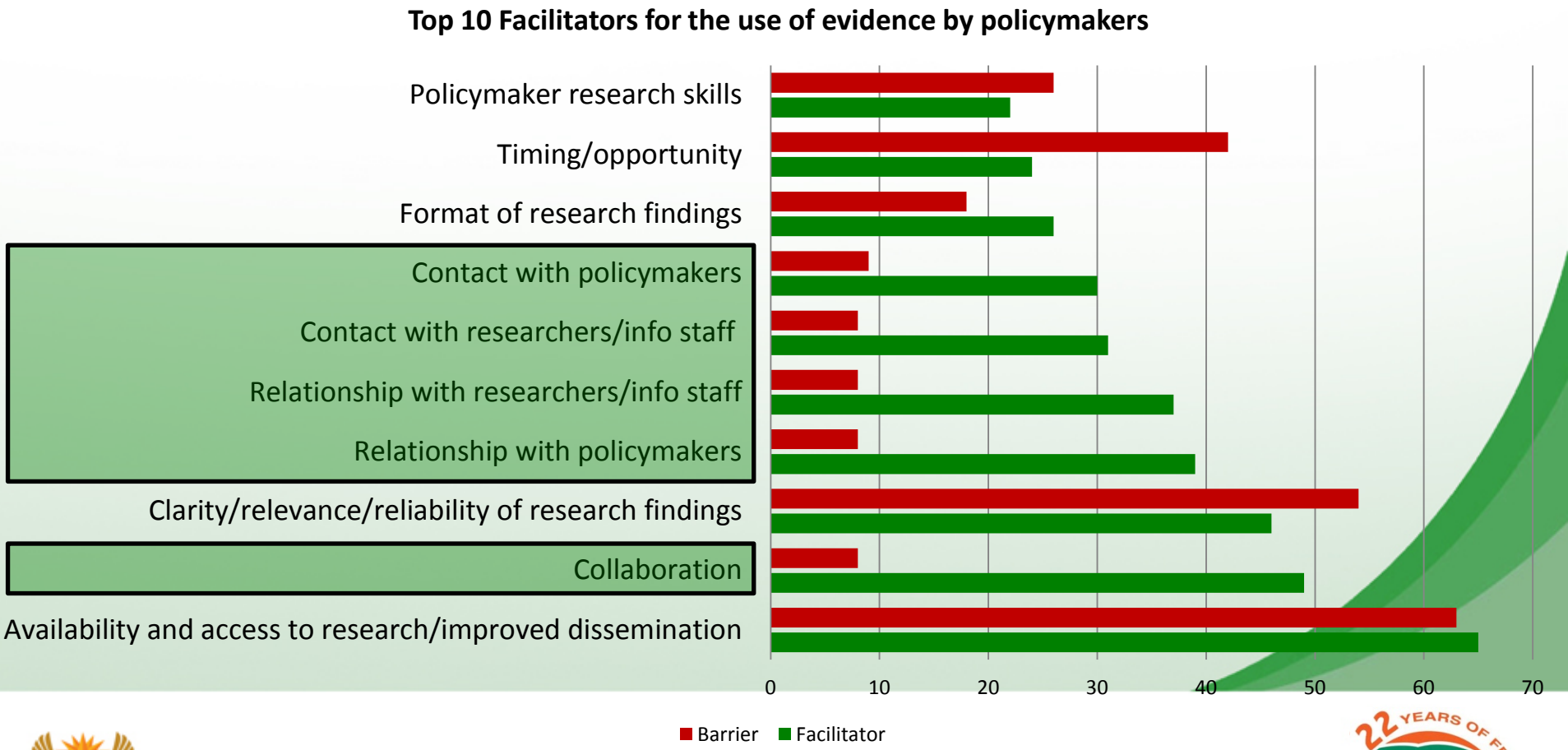
The Facilitators for the use of evidence in policy making



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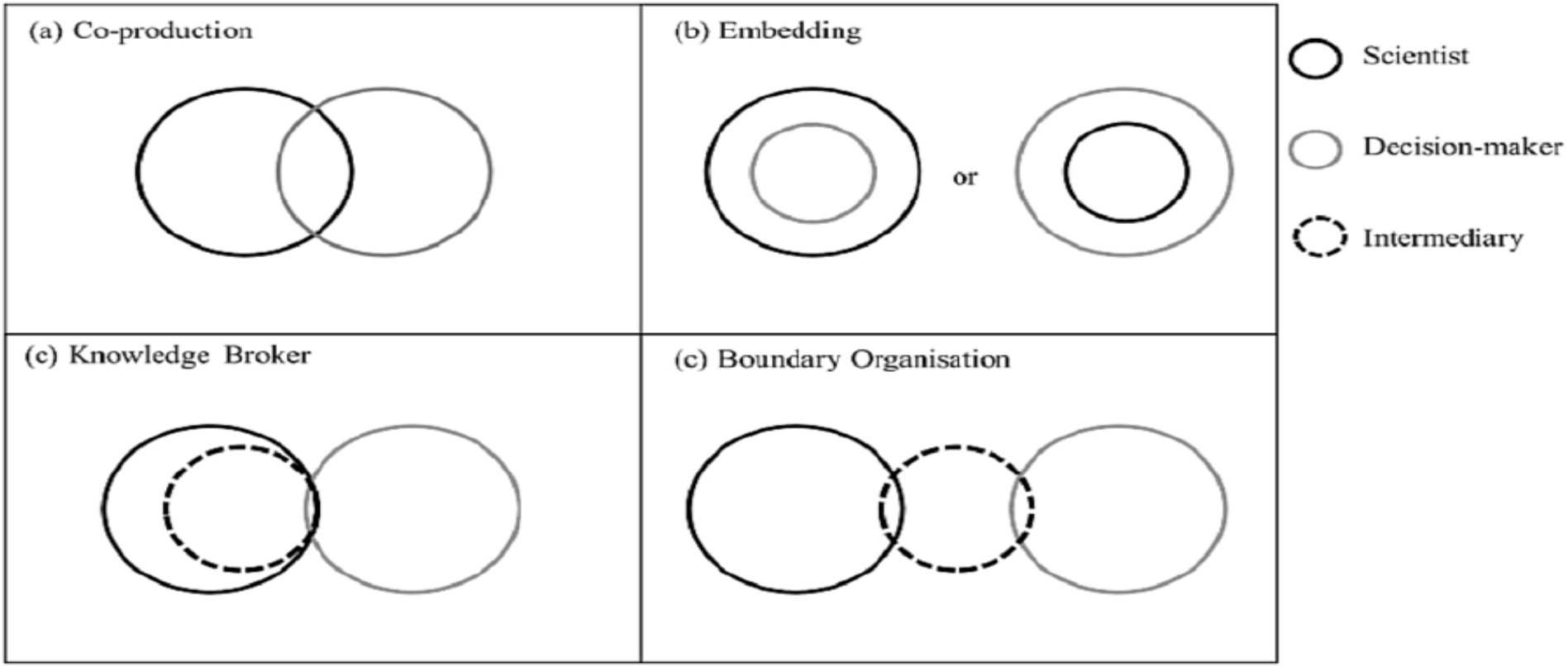
A systematic review of barriers to and facilitators of the use of evidence by policymakers

"Studies in this area continue to be mainly written by and for researchers, with a lack of attention given to the policy process or policymakers' priorities. Most studies asked researchers about their perspectives. Where mixed populations were included, the researchers often outnumbered the other participants. Involving policymakers in designing and writing a study which looks at these issues in conjunction with barriers and facilitators may be fruitful. Until then, it is hard to defend academics from the charge of misunderstanding policy priorities or processes – a charge first made explicit over 20 years ago."

Oliver, K., Innvar, S., Lorenc, T., Woodman, J. & Thomas, J. (2014). A systematic review of barriers to and facilitators of the use of evidence by policymakers. *BMC Health Services Research*, **14**:2

Conceptual diagram outlining the four primary models believed to increase knowledge exchange among scientists and decision-makers



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Cvitanovic, C., Hobday, A.J., van Kerkhoff, L., Wilson, S.K., Dobbs, K & Marshall, N.A. (2015). Improving knowledge exchange among scientists and decision-makers to facilitate the adaptive governance of marine resources: A review of knowledge and research needs. *Ocean & Coastal Management*, 112, August 2015, Pages 25–35.

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Climate Vulnerability Mapping – Decision maker needs

Using Maps for Informed Decision Making and Evidence-based Policy-Making – What seems to work best in South Africa

Presentation to the SESYNC Pursuit on Climate Vulnerability Mapping Workshop, 17-19 February 2016, Annapolis, Maryland, USA.

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Vulnerability Mapping

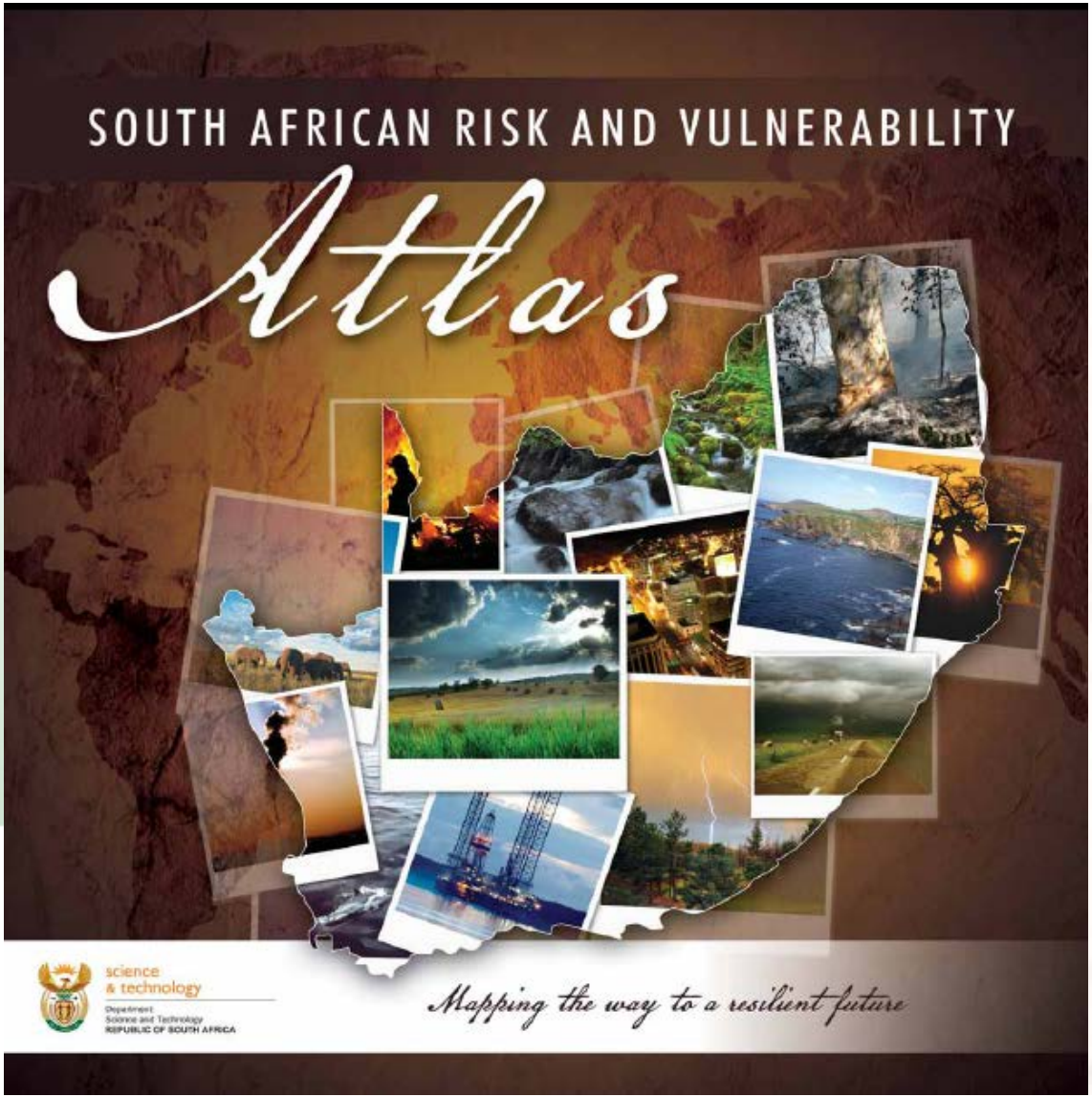

Table of Contents

Question 1 - What are the main questions that you face in your work for which vulnerability mapping might provide answers?

- Where do we prioritise scarce resources to build resilience?
- Who is most affected?
- Where do we get the biggest bang for our buck?
- Where must we prioritise food production / stop conflicting land-use (especially mining)?
- Where should we invest in extreme weather event mitigation infrastructure investment or restoration (both traditional and ecological infrastructure)?
- Where should we restrict development?
- Where should we prioritise emergency response capacity (heat-stress, malaria outbreaks, storm-surges, floods, droughts, etc.)?
- Where would moving a community be the most efficient and effective climate change response?
- Where should we expand the conservation estate to allow migration corridors?

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- Where would moving a community be the most efficient and effective climate change response?
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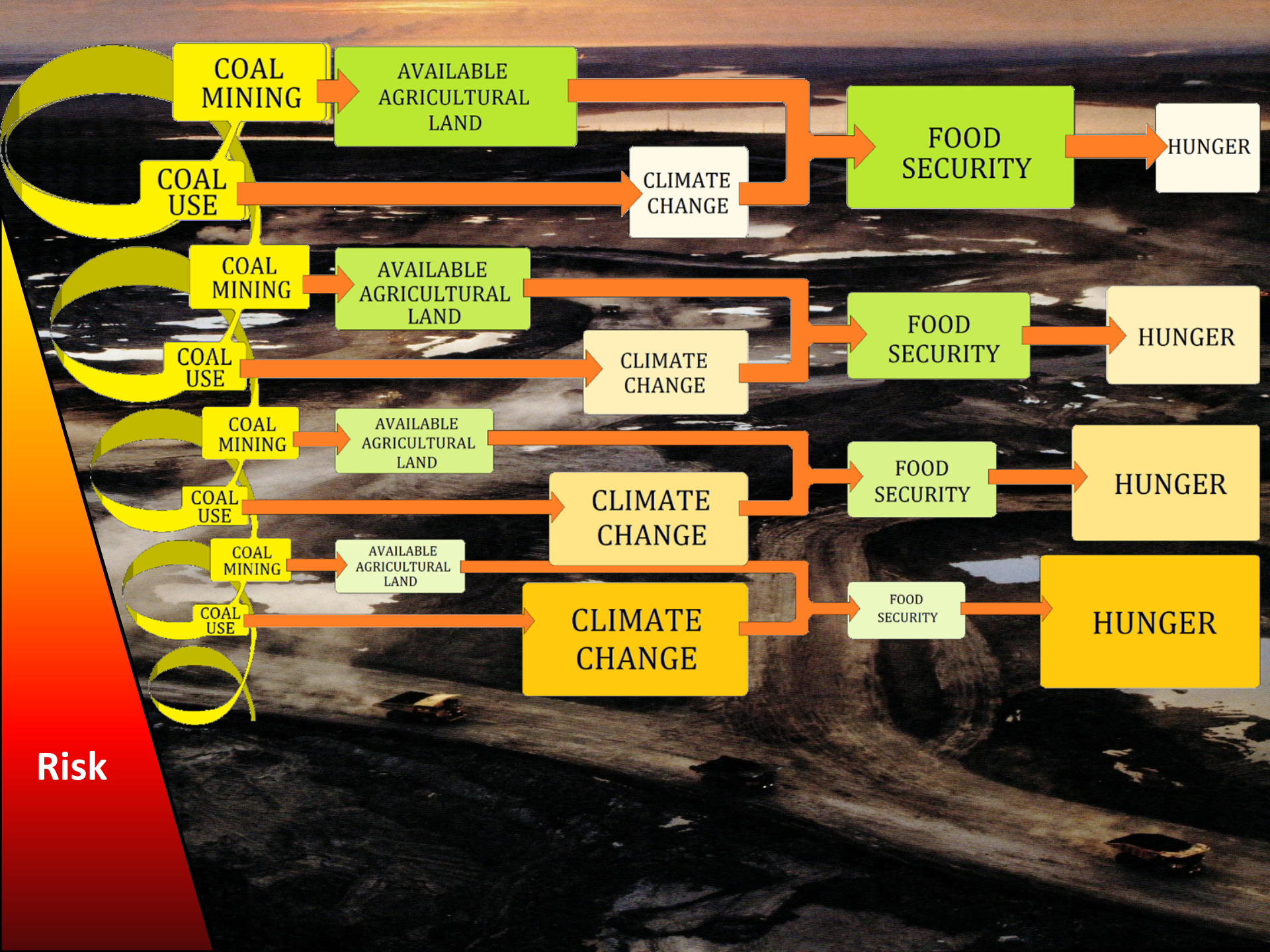
What must we change in response to change?

Question 2 - Have you used vulnerability maps in decision making contexts?

- The “optimal land use” debate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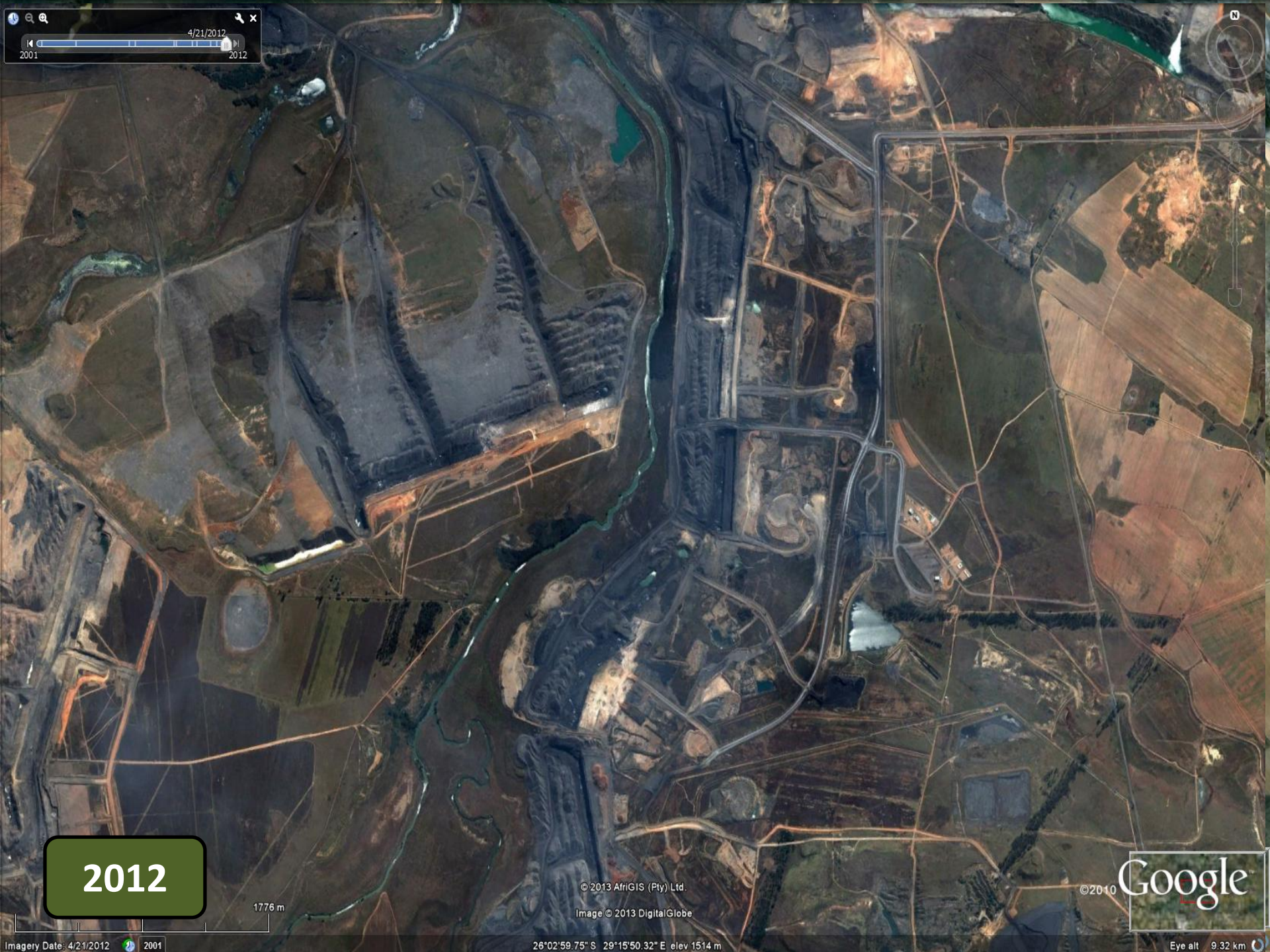
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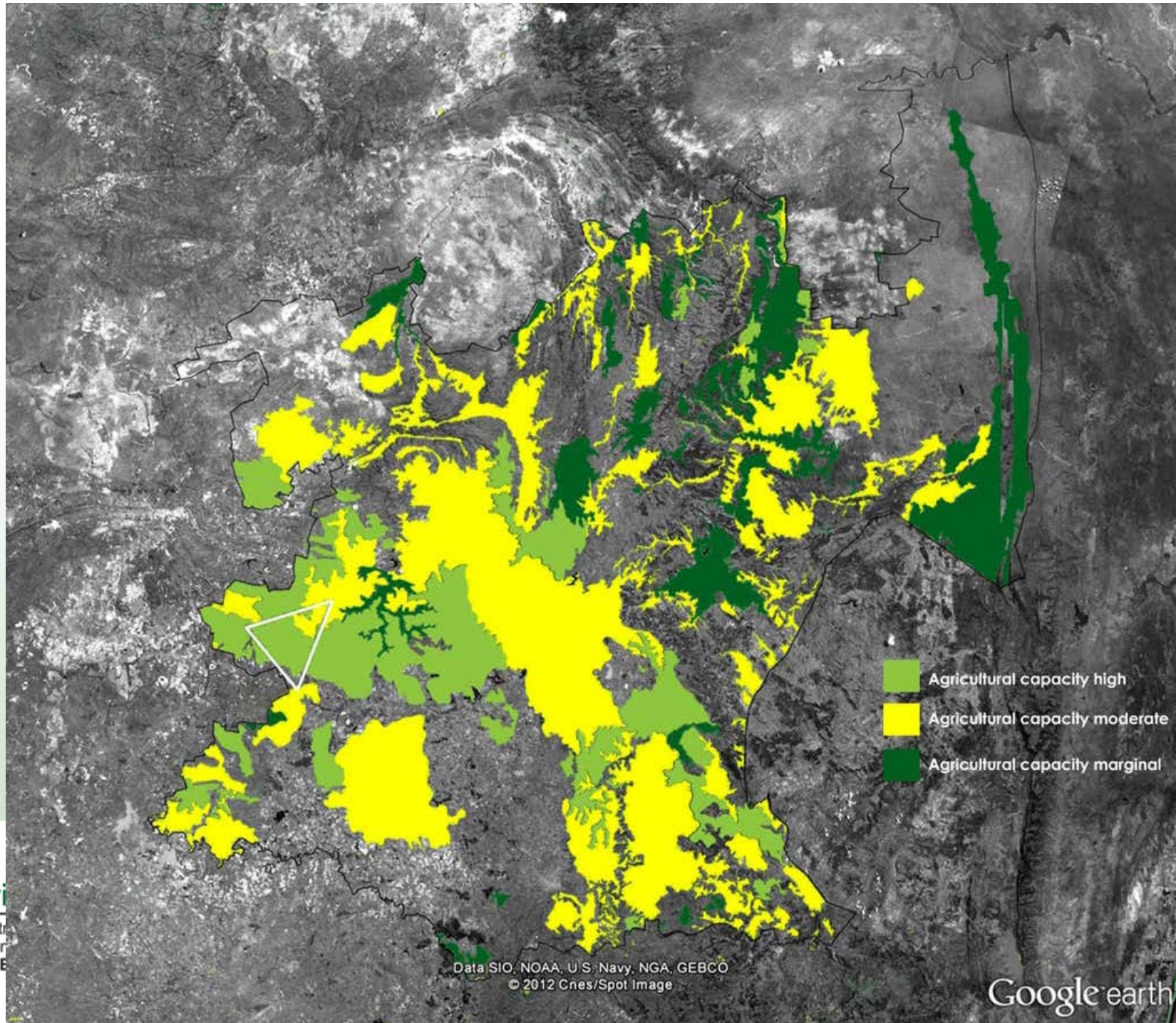

Graphics adapted from presentation by Gerhard van der Burgh, Bureau for Food and Agricultural Policy (BFAP), April 2013, delivered to the AgriSA Mining and Agriculture Conference on 9 April 2013

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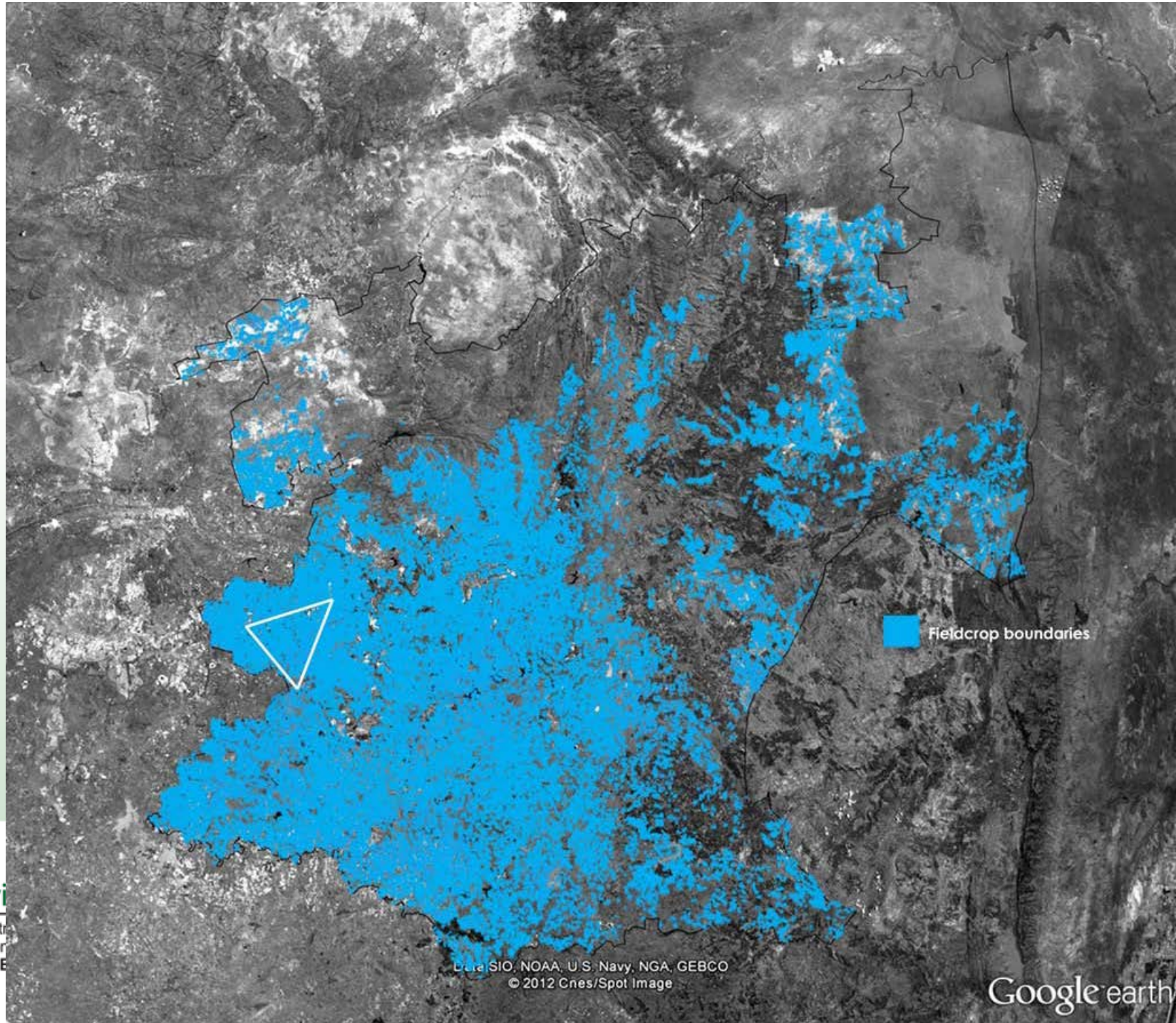

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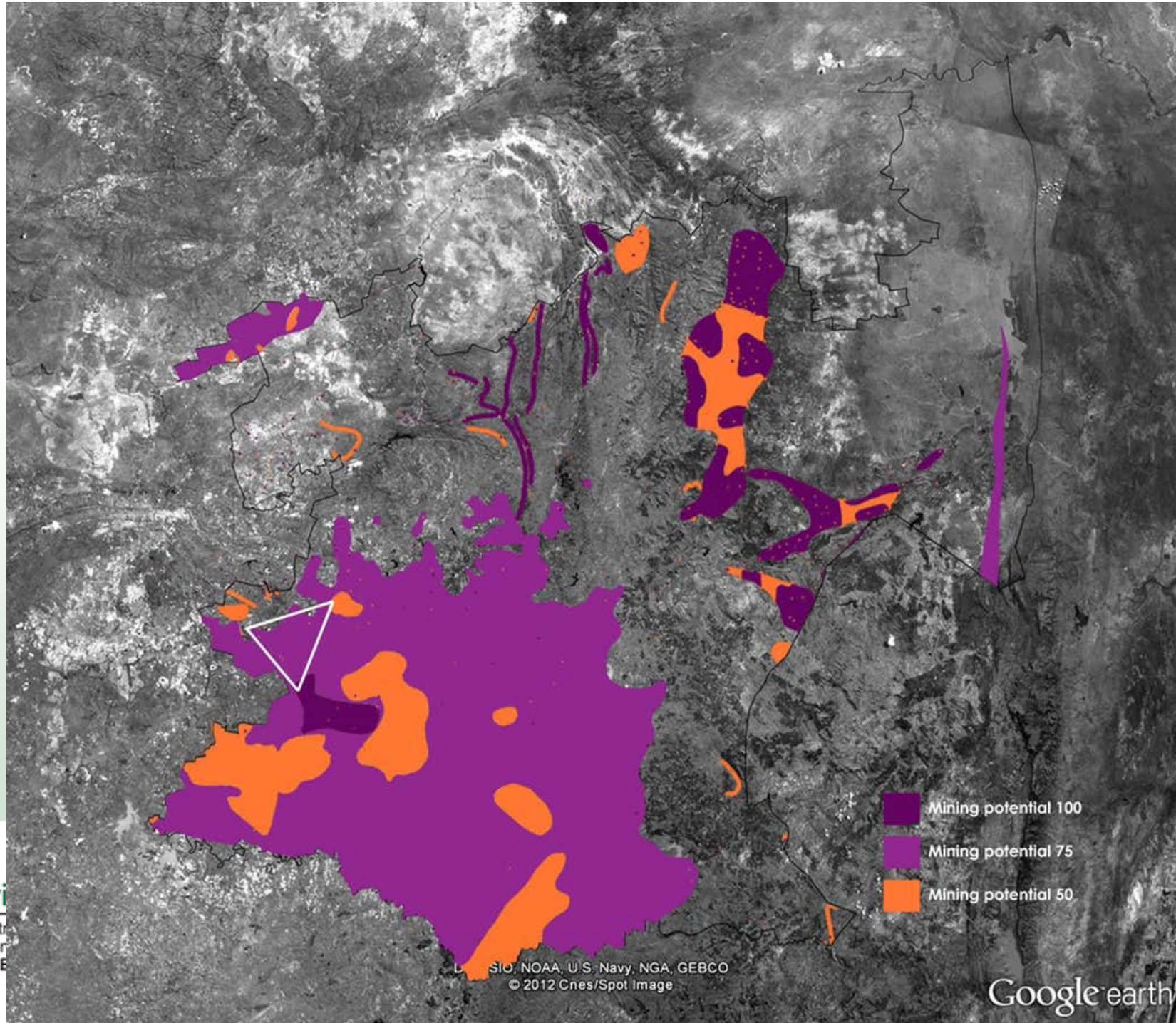

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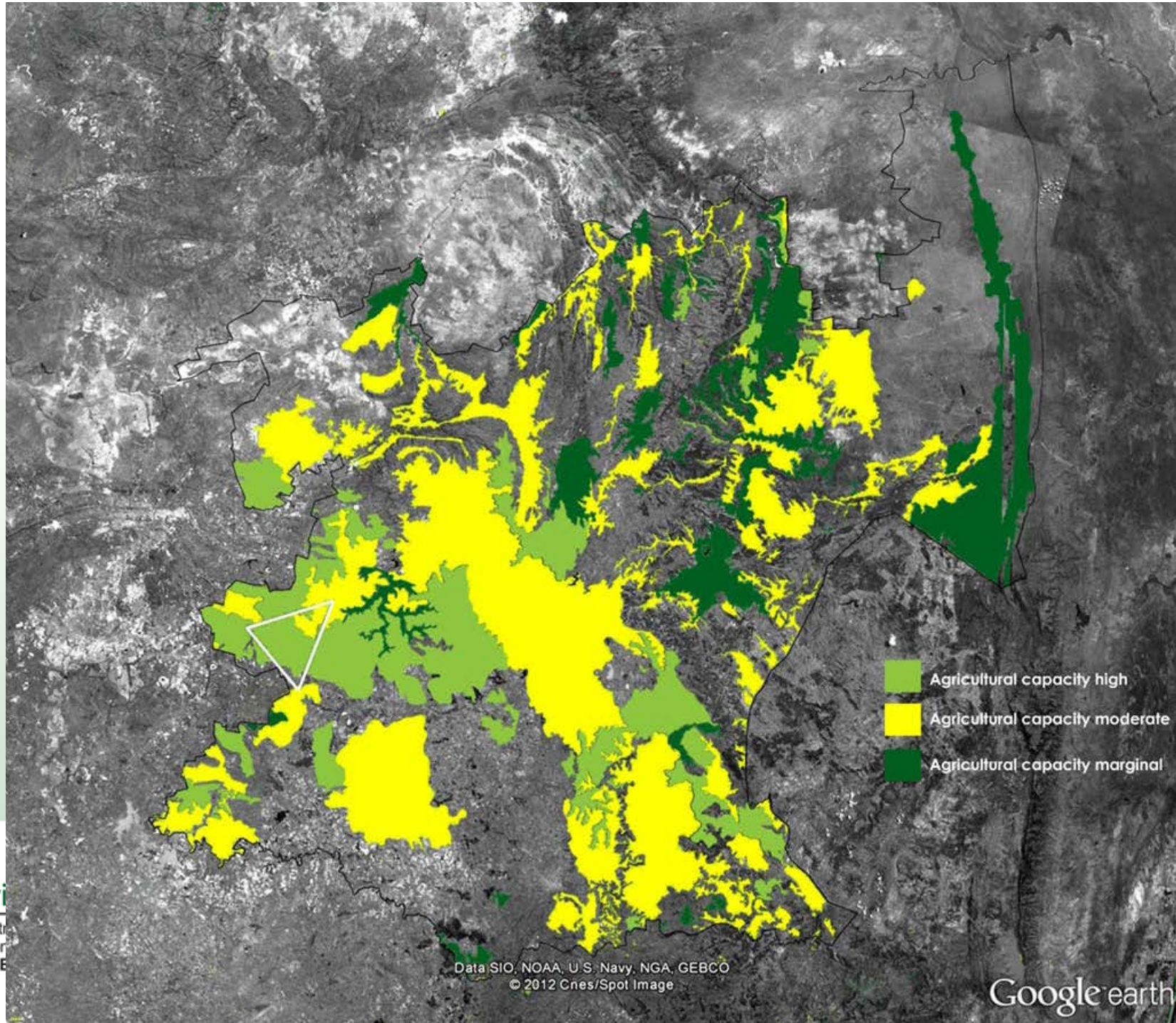

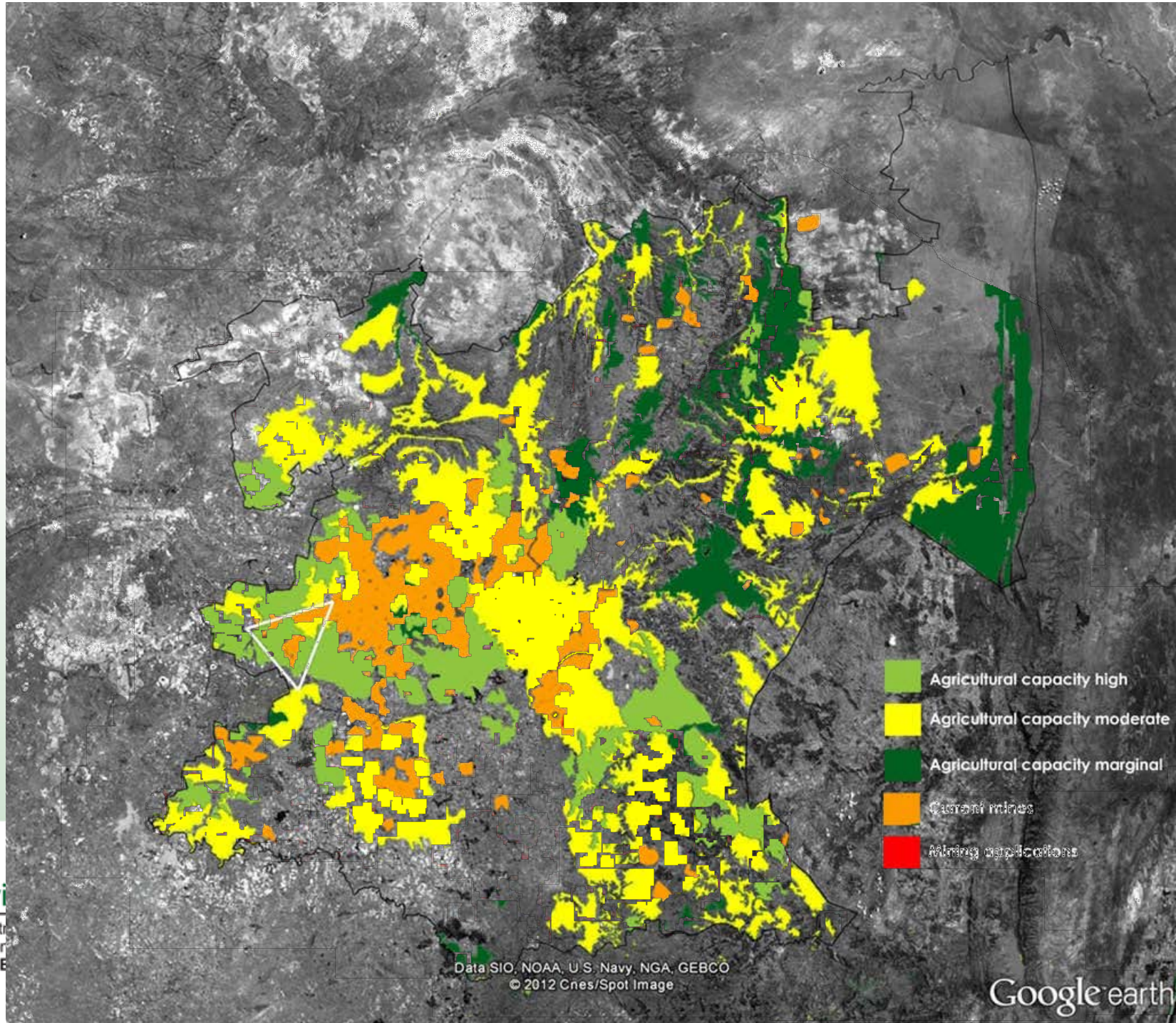

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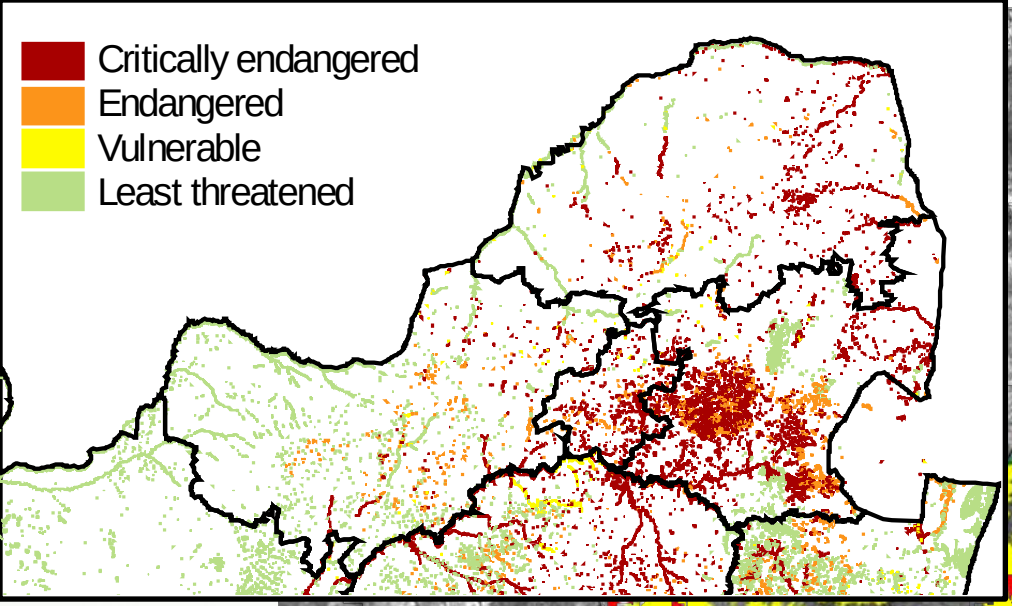

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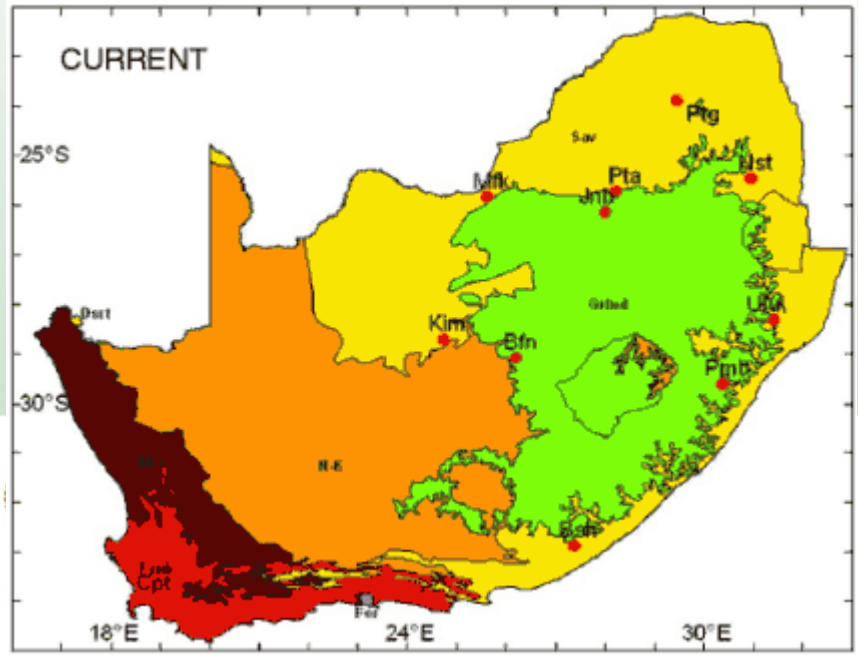
Question 3 - How have the maps helped or hindered decision making (benefits / potential dangers?)

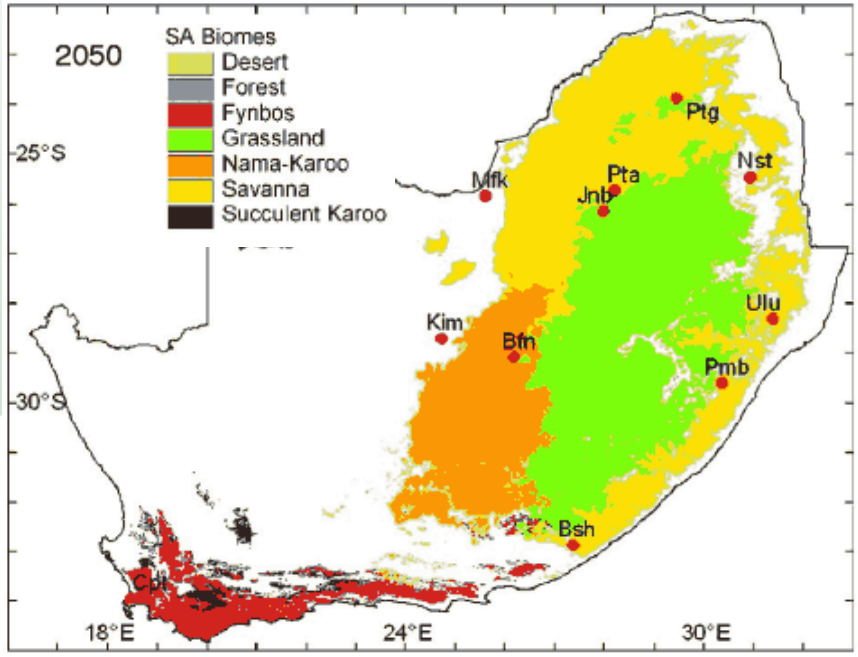
- Action vs. Alarmism vs. Complacency
- Static vs. animated – “seeing the change”
- Clarity vs. Confusion
- Familiarity vs. Alienation

http://www.sanbi.org/

The biomes of South Africa as mapped in the year 2000



The biomes of South Africa in the year 2050
Predictions are based on climate changes brought on by an increase in the concentration of atmospheric carbon dioxide to 550 ppm



White areas represent climatic conditions not encountered in South Africa today

Question 4 - How important is it for maps to be based on recent data?

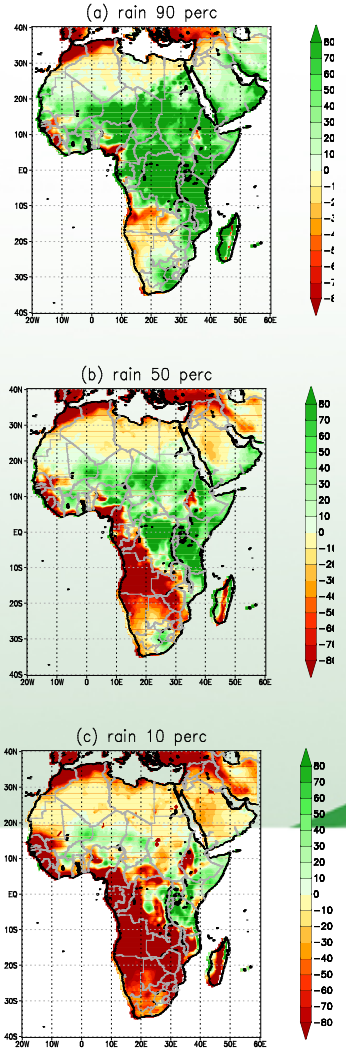
- The “climate change dry-run” example

South Africa in midst of 'epic drought'

05 NOV 2015 00:00 | AZAD ESSA

South Africa is facing its worst drought since 1982, with more than 2.7-million households facing water shortages across the country.

Lennox Mabaso, spokesperson for the Department of local government in KwaZulu-Natal, told Al Jazeera that the drought, concentrated in provinces of Free State and KwaZulu-Natal, was beginning to impact on livelihoods and draining the economy.



Projected changes in rainfall (mm) over Africa for 2071-2100 relative to 1961-1990

Engelbrecht et al., 2015; ERL 10: 085004

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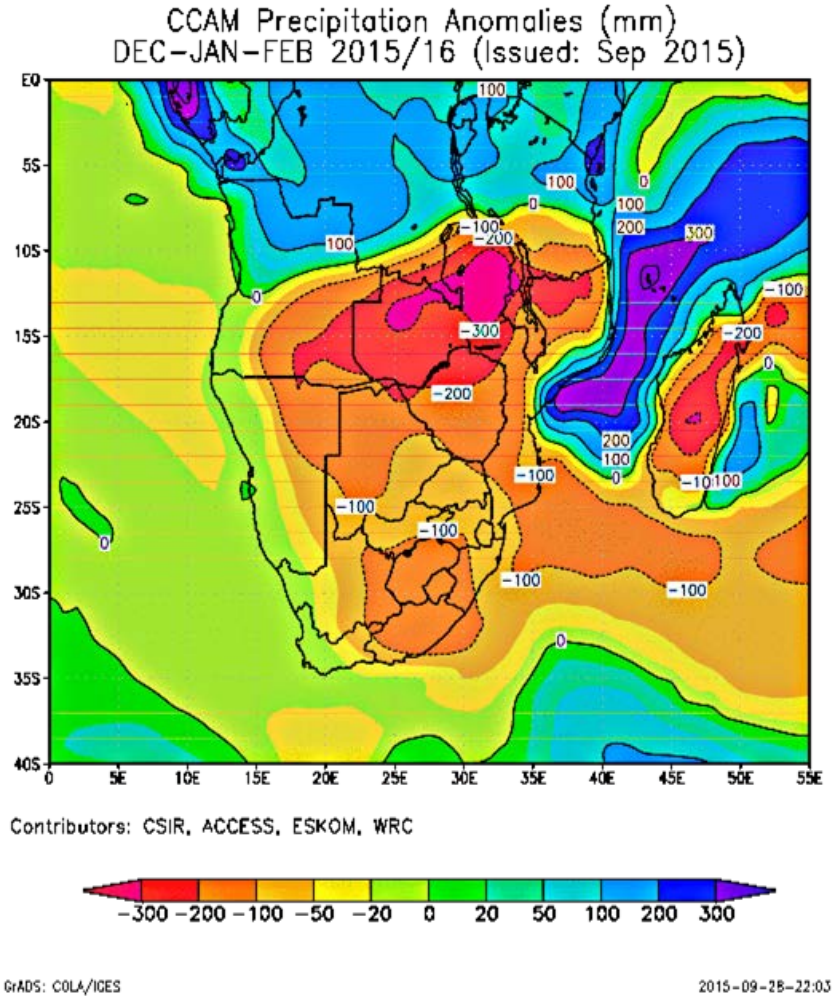

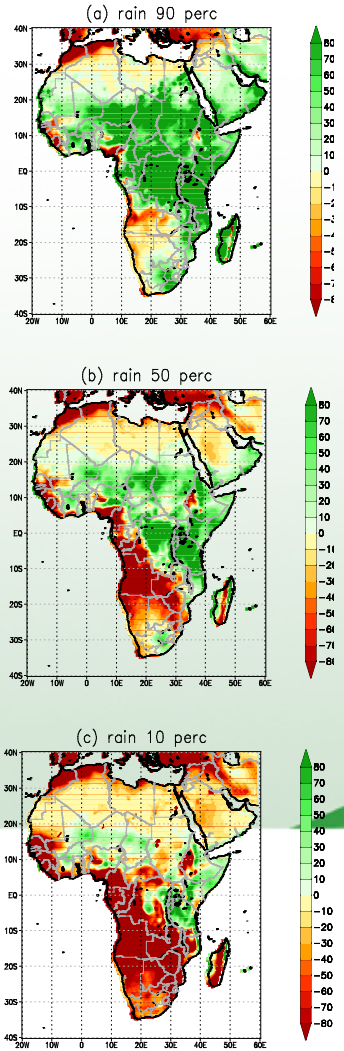

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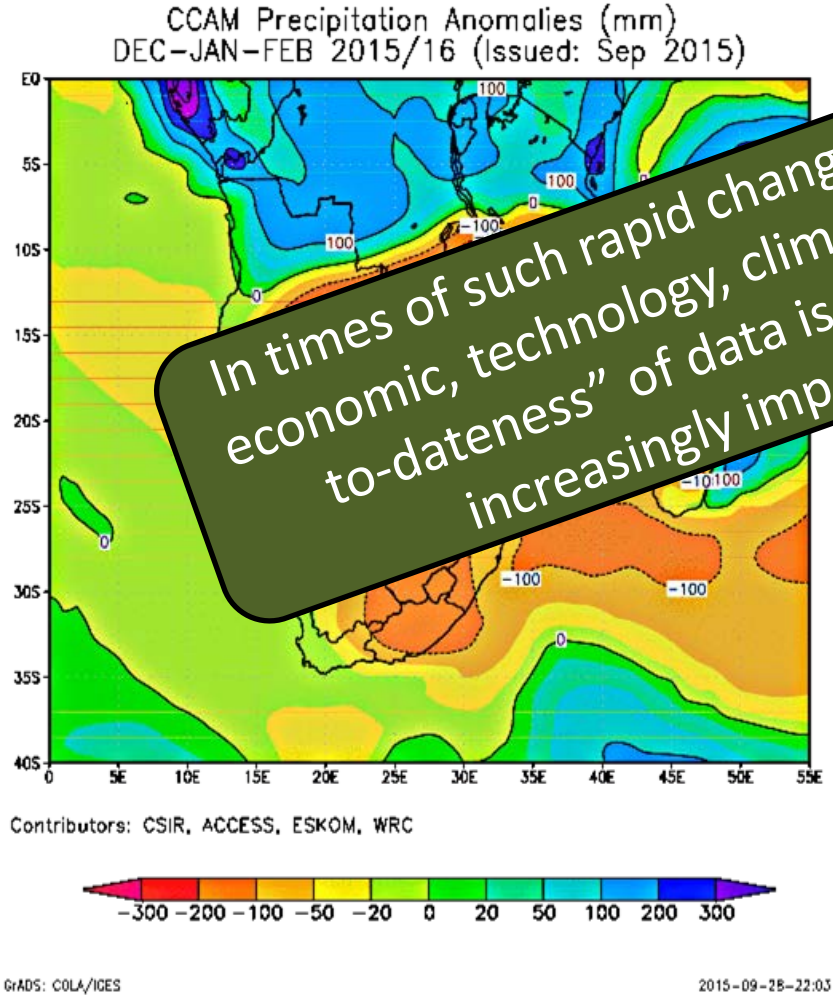
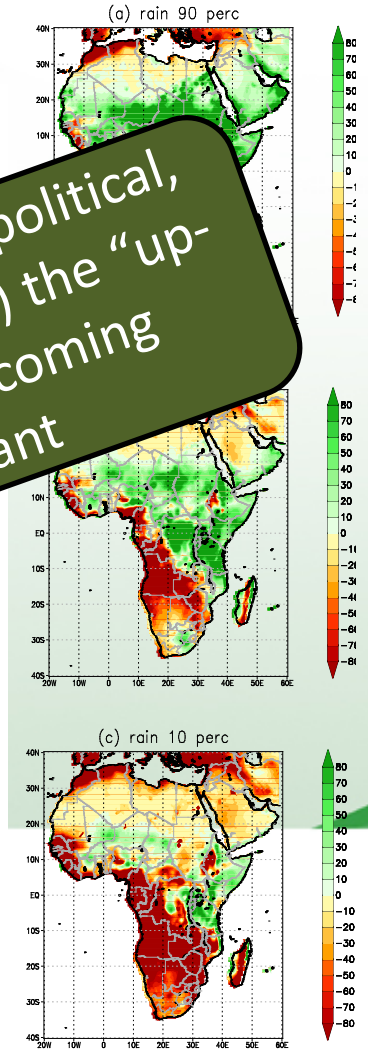


In times of such rapid change (political, economic, technology, climate) the “up-to-dateness” of data is becoming increasingly important



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Engelbrecht et al., 2015; ERL 10: 085004

Question 4(b) - Are you more interested in maps based on Big Data or a single recent survey that shows current patterns of vulnerability and resilience and/or trends?

Maps must simply be "fit for purpose"

Question 5 - How important is it to you that uncertainty in maps is clearly portrayed?

In 1988, psychologists Shelly Taylor and Jonathon Brown published an article making a somewhat disturbing claim that positive self-deception is a normal and beneficial part of most people's everyday outlook. They suggested that average people hold cognitive biases in three key areas:

- first, viewing themselves in unrealistically positive terms;
- second, believing they have more control over their environment than they actually do; and
- third, holding views about the future that are more positive than the evidence can justify.

IRRATIONAL OPTIMISM

If you think you're well-adjusted, you're deluding yourself

Most people think of "the mentally disordered" as a delusional lot, holding bizarre and irrational ideas about themselves and the world around them. A mental disorder is supposed to be, after all, an impairment or distortion in thought or perception. For most of modern psychology's history, the experts have agreed that realistic perceptions are essential to good mental health. Recent research, however, has challenged this widely held, commonsense notion.

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Consider eating disorders. It's generally been believed that an unrealistically negative body image is an important factor in the self-abuse that characterizes anorexia and bulimia. A 2006 study at the University of Maastricht in the Netherlands, however, came to a very different conclusion. In the study, groups of normal and eating-disordered women were asked to rate the attractiveness of their own bodies. They were then photographed from the neck down, and panels of volunteers were brought in to view the photos and rate the women's appearances objectively. The normal women, as it turned out, evaluated themselves much more positively than the panels did, while the self-ratings of the eating-disordered women were in close agreement with the objective ratings. The eating-disordered subjects, in other words, had a more realistic body image than the normal women.

"So tell me, madam, how long have you been suffering these cheerful feelings?"

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Question 5 - How important is it to you that uncertainty in maps is clearly portrayed?

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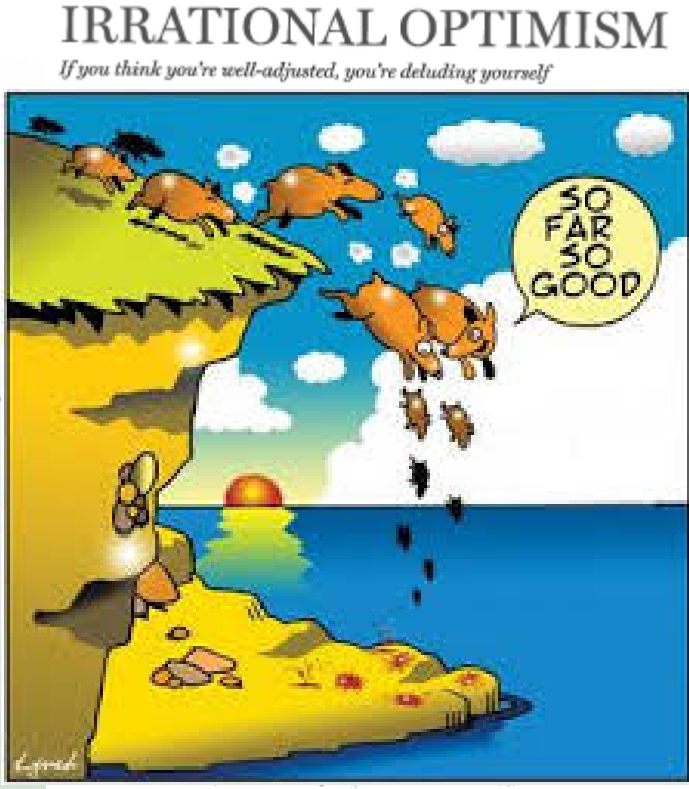

You say that scientists are 95% certain that human activity is causing climate change, tell us about the 5% - could the scientists be wrong?

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Question 5 - How important is it to you that uncertainty in maps is clearly portrayed?

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- first, viewing th… terms;
- second, be… their enviro…
- third, holding… more positive…

Policy-makers and policy-shapers are often more interested in the reputation of the source than scientific certainty

…ol over …actually do; and

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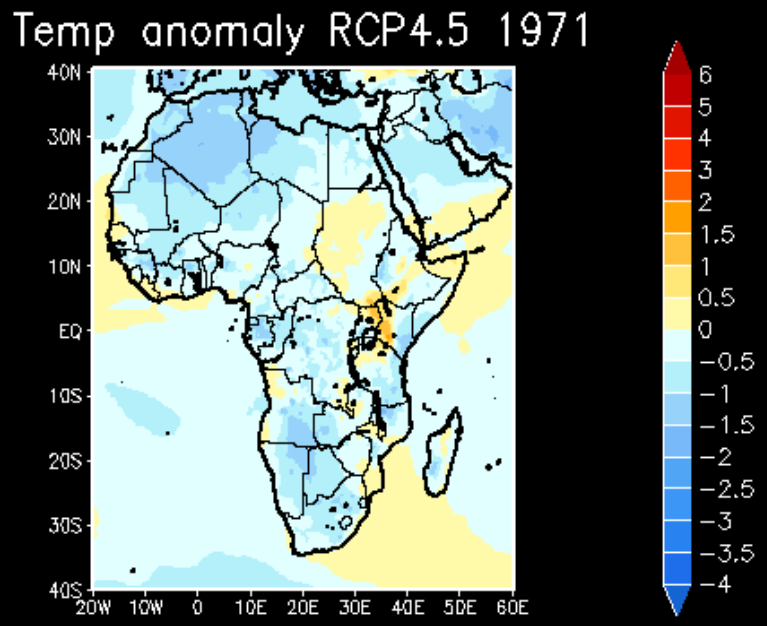
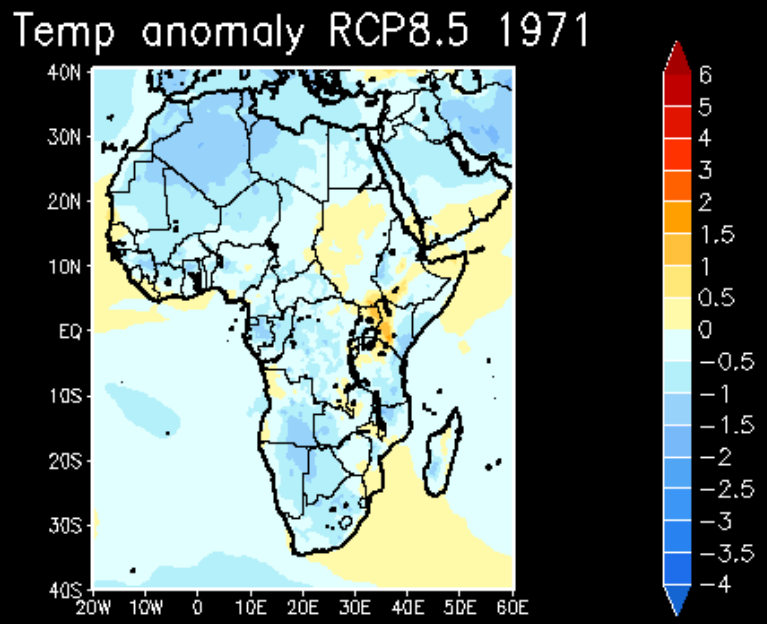
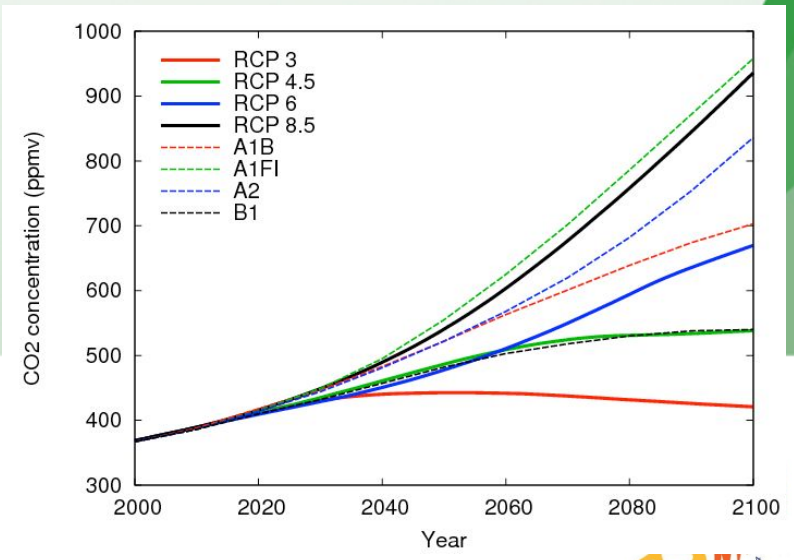
Question 6 - Can you point to examples of what you would say are attractive, useful and easily understandable maps?

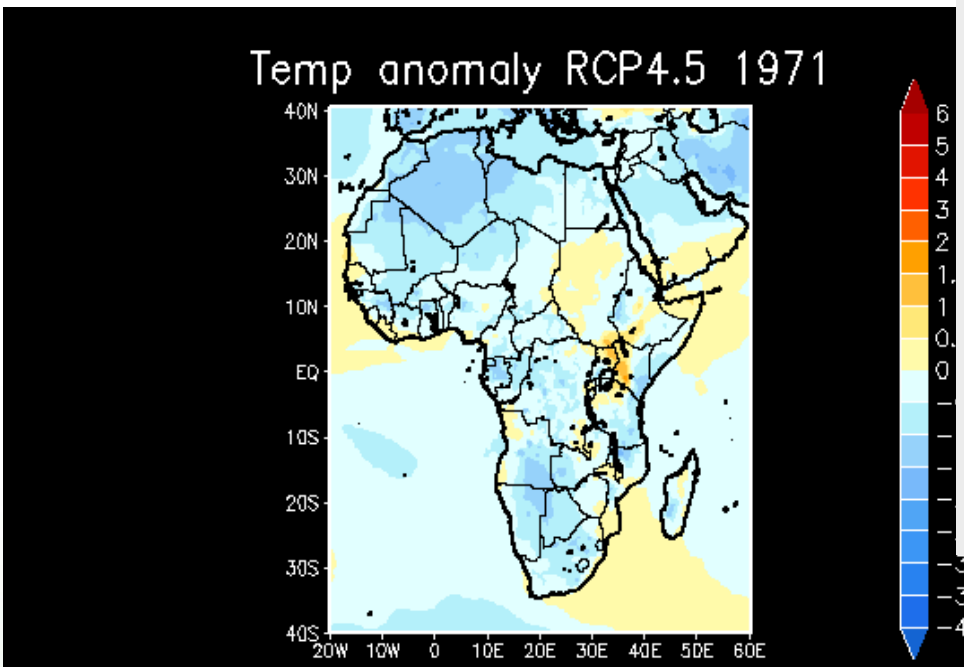




CSIRO-CSIR collaboration: 0.5° resolution global climate change downscalings for CORDEX using CCAM

Downscaling various CMIP5/AR5 CGCMs for different RCPs





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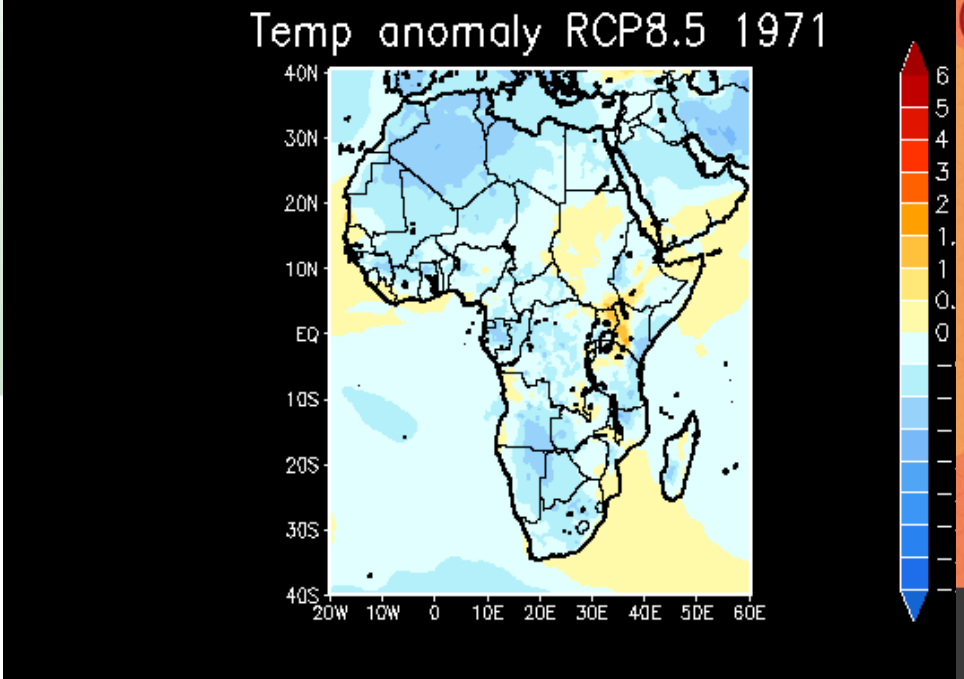
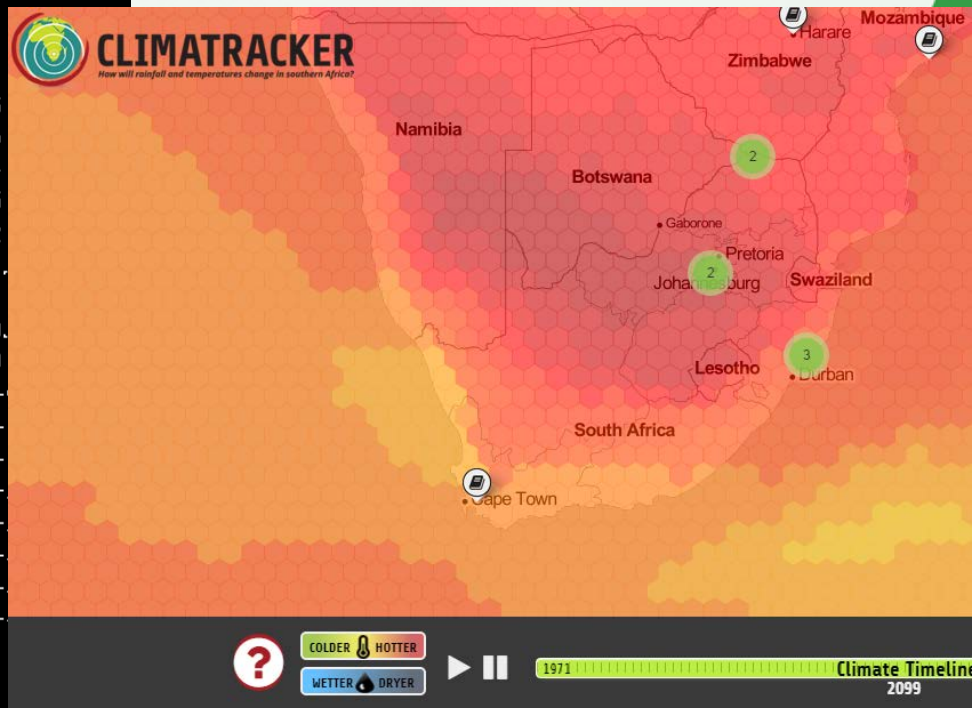
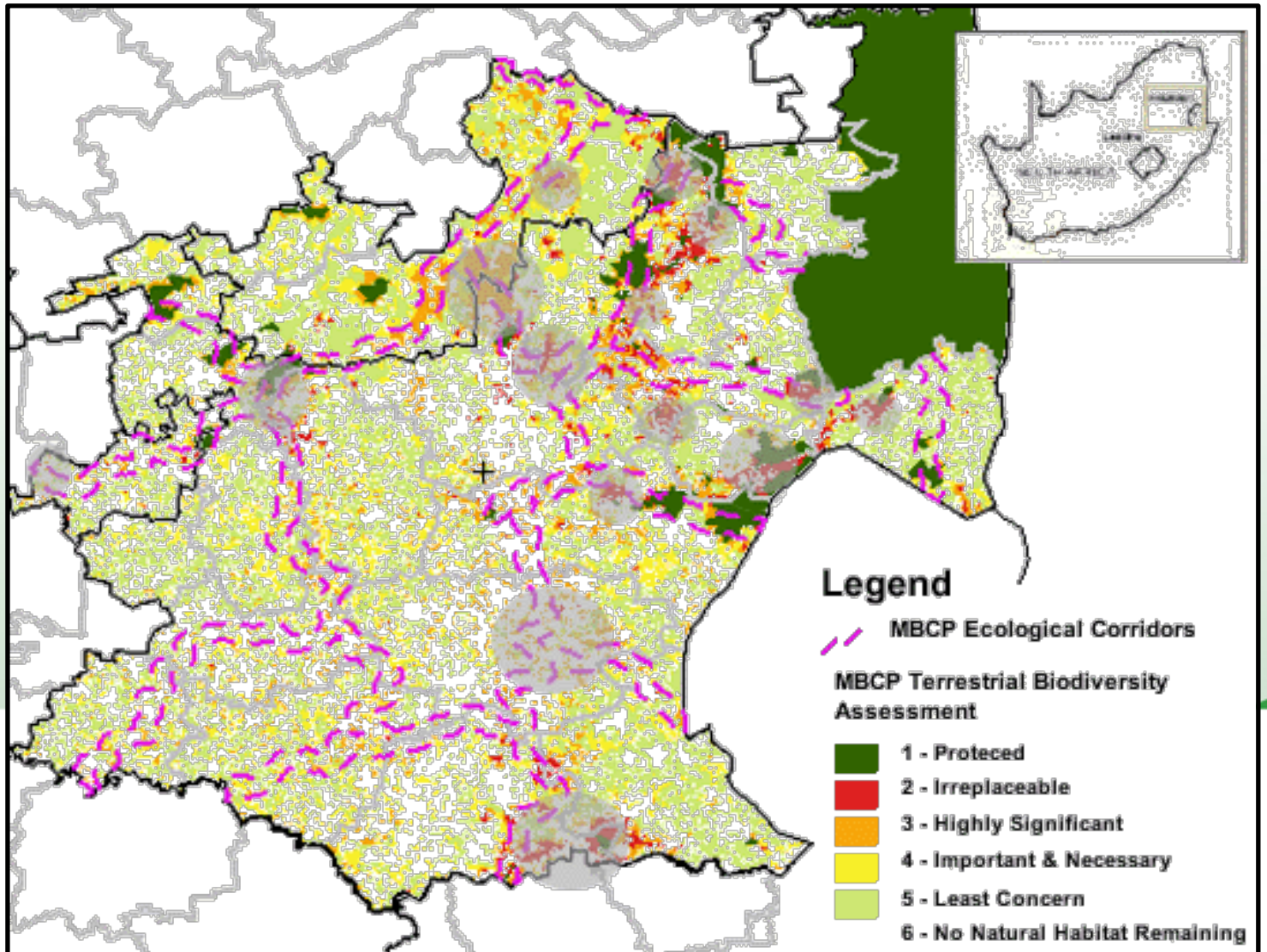
https://climatracker.oxpeckers.org/

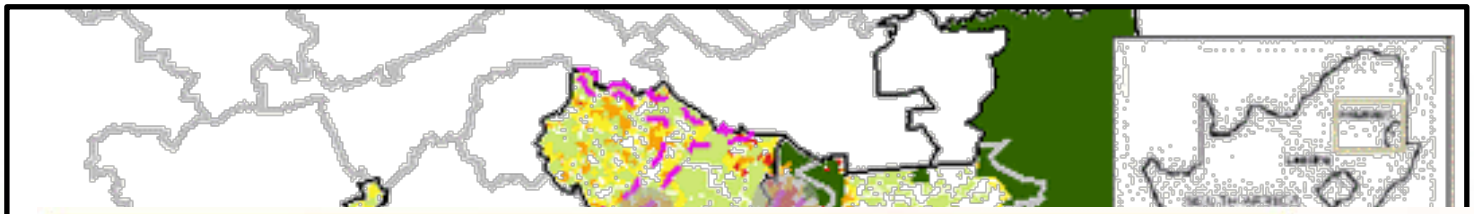


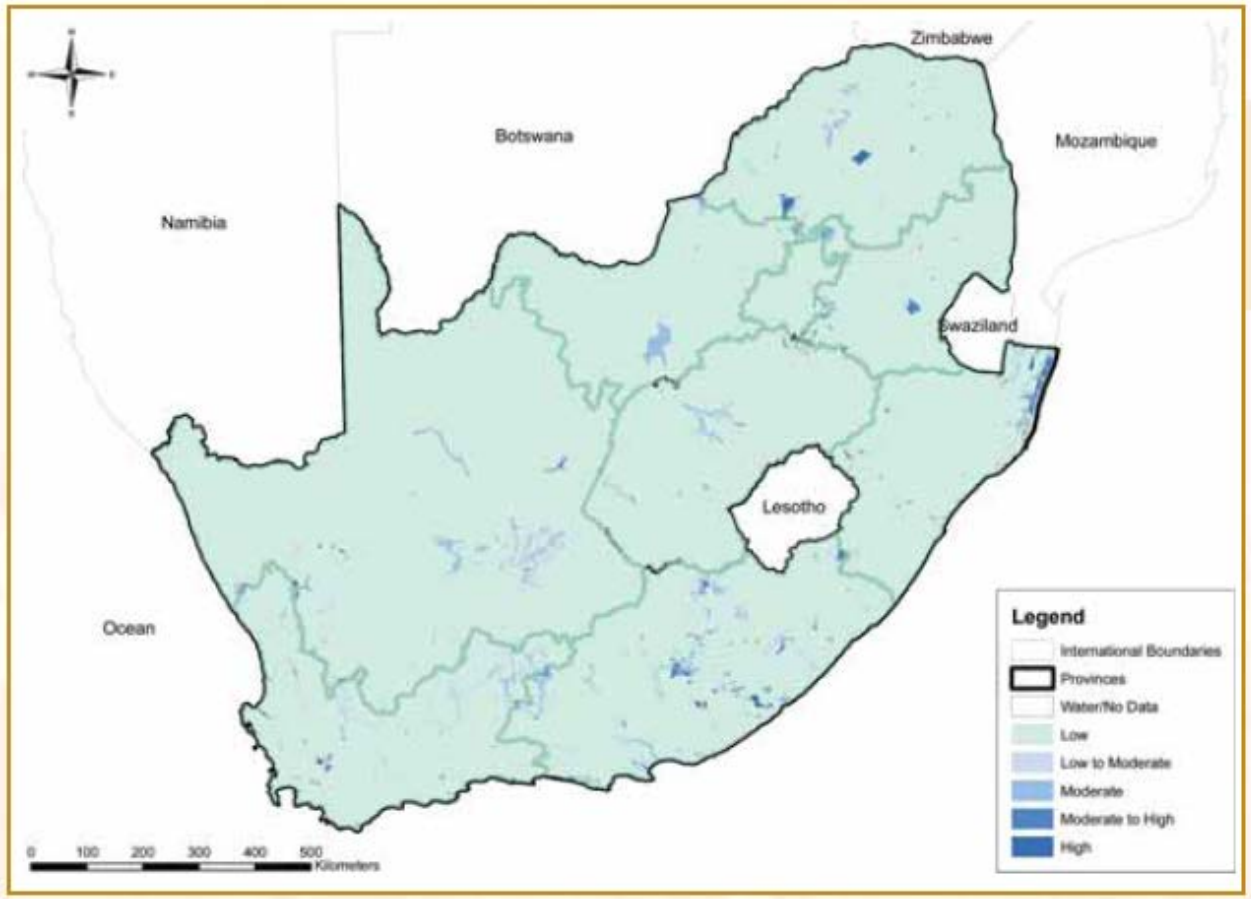


Question 7 - Can you point to examples of unattractive or difficult to interpret maps?



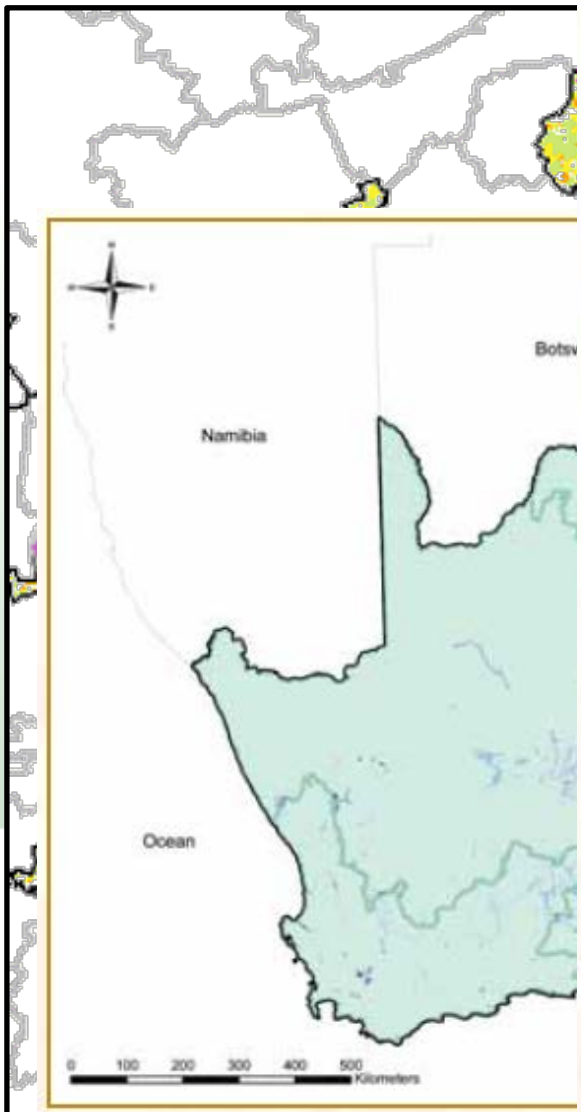
Question 7 - Can you point to examples of unattractive or difficult to interpret maps?

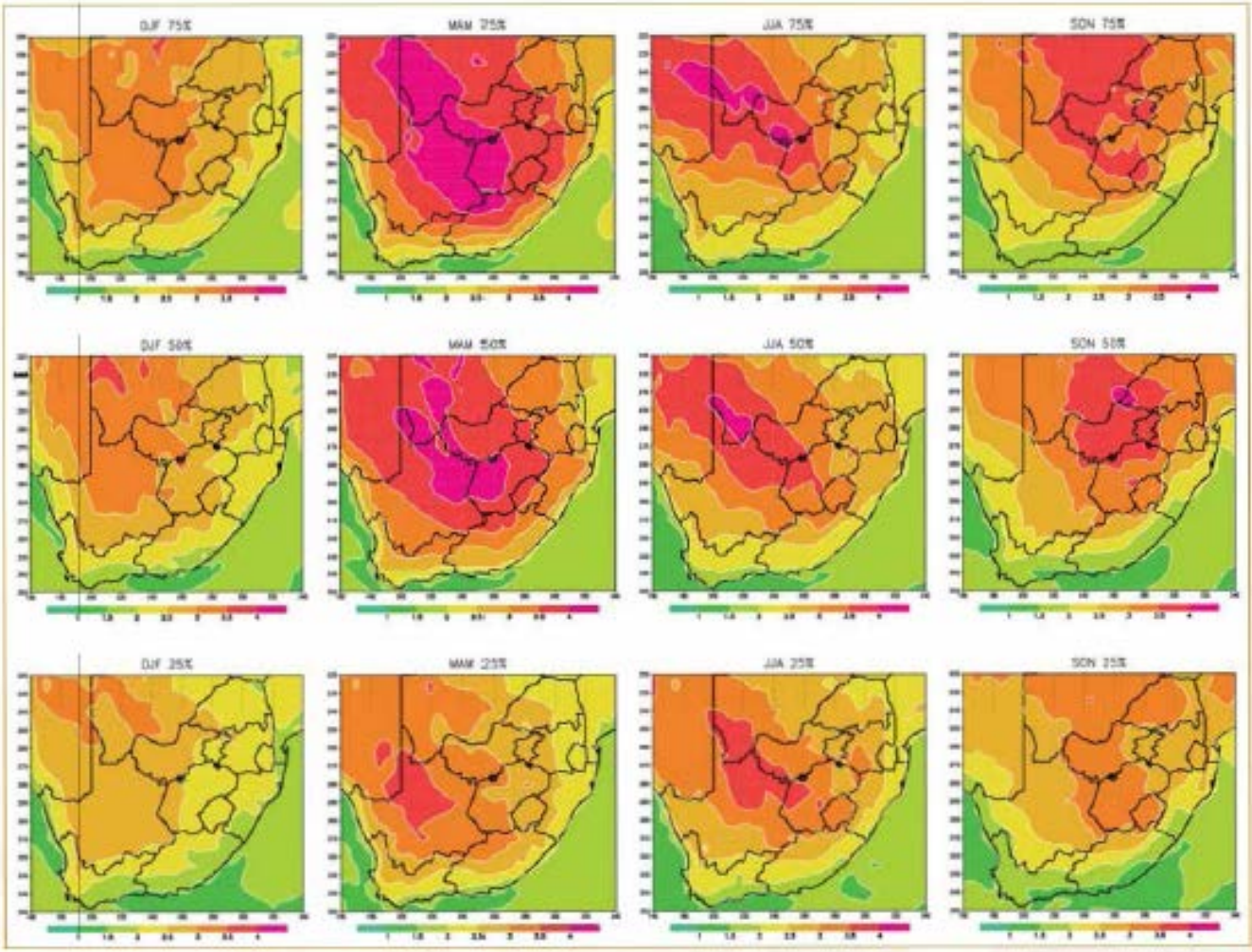




Map 2.4: Flood risk in South Africa. Source: AGIS (2001).

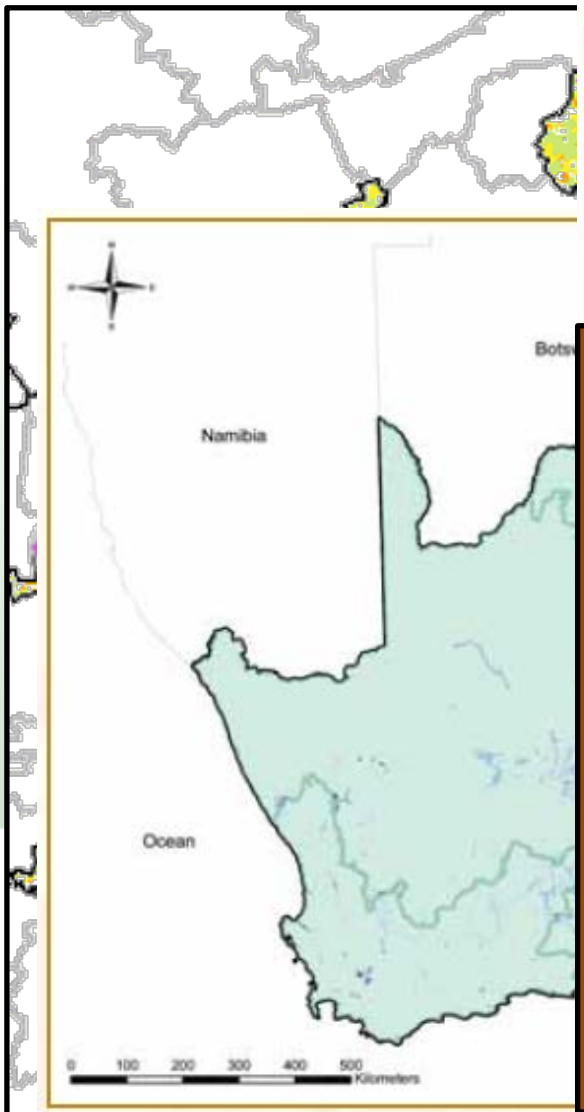
Question 7 - Can you point to examples of unattractive or difficult to interpret maps?

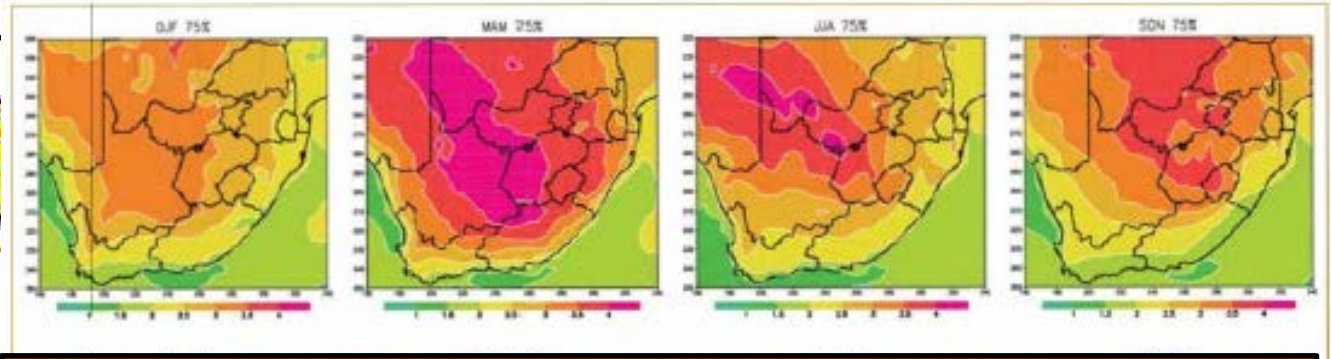




Map 3.1: Projected seasonal temperature change (°C) by a dynamic regional climate model for the period 2070-2100 vs 1975-2005 under the A2 SRES scenario. The upper row shows the change in the 75th percentile (calculated separately for each model grid point) of the simulated seasonal temperatures over the period 2070-2100 relative to 1975-2005 time series. The middle and bottom rows are similar, but represent the change in the median and 25th percentile of the seasonal temperatures respectively. Data source: WRC, UP.

Question 7 - Can you point to examples of unattractive or difficult to interpret maps?





Map 3.1: Projected seasonal temperature change (°C) by a dynamic regional climate model for the period 2070-2100 vs 1975-2005 under the A2 SRES scenario. The upper row shows the change in the 75th percentile (calculated separately for each model grid point) of the simulated seasonal temperatures over the period 2070-2100 relative to 1975-2005 time series. The middle and bottom rows are similar, but represent the change in the median and 25th percentile of the seasonal temperatures respectively. Data source: WRC, UP.

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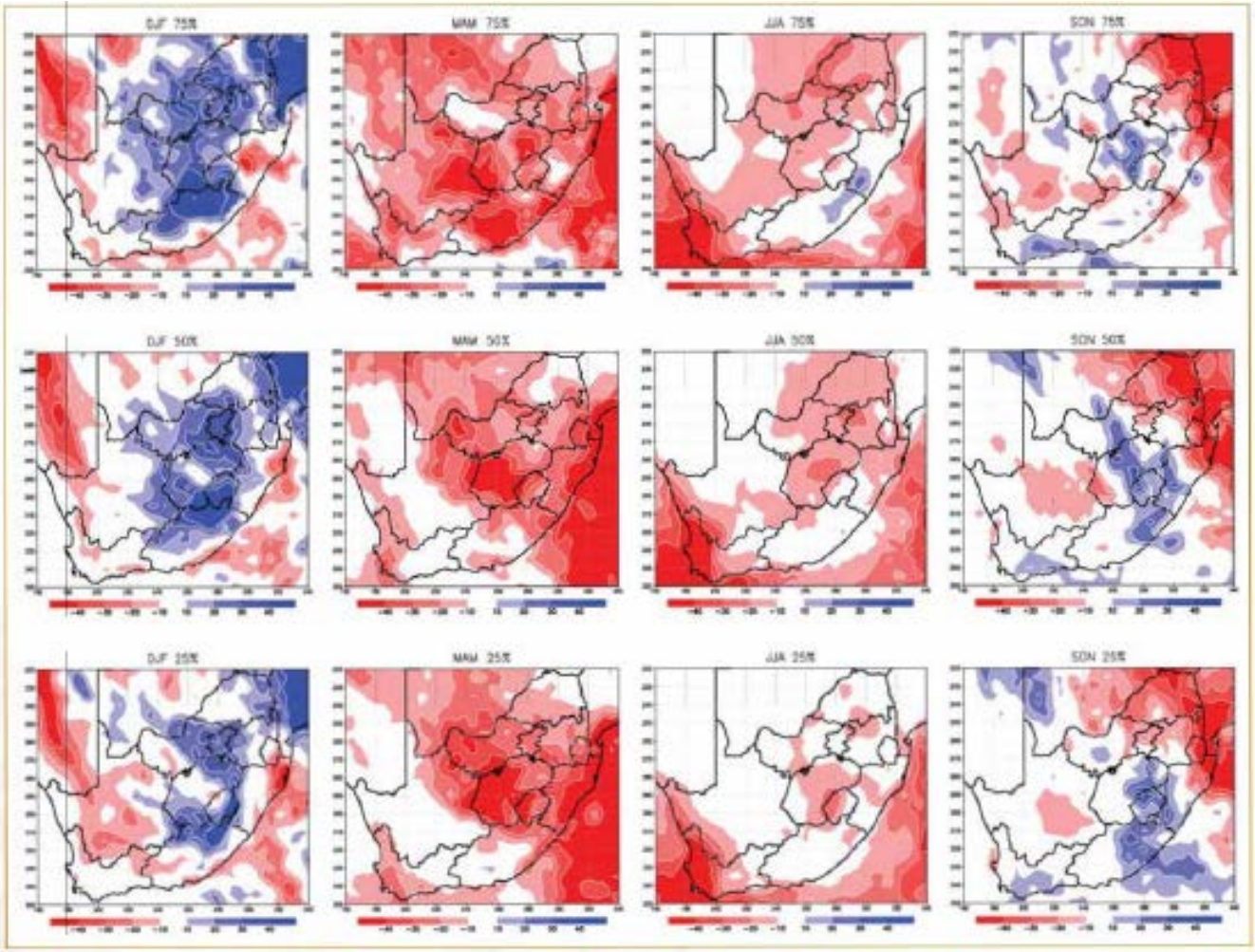
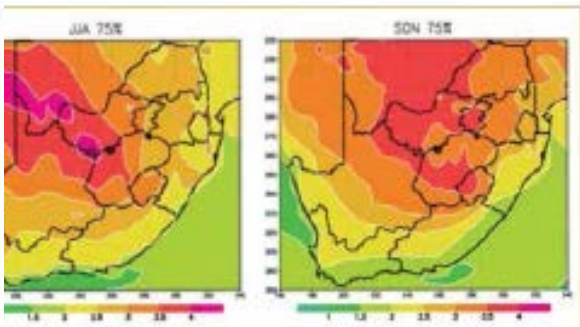


Map 3.2: Projected seasonal rainfall change (mm) by a dynamic regional climate model for the period 2070-2100 vs 1975-2005 under the A2 SRES scenario. The upper row shows the change in the 75th percentile (calculated separately for each model grid point) of the simulated seasonal rainfall totals over the period 2070-2100 relative to 1975-2005 time series. The middle and bottom rows are similar, but represent the change in the median and 25th percentile of the seasonal rainfall totals respectively. Data source: WRC, UP.



perature change (°C) by a
for the period 2070-2100
scenario. The upper row
h percentile (calculated
point) of the simulated
period 2070-2100 relative
ddle and bottom rows are
in the median and 25th
ratures respectively. Data

CHANGE IS IN THE AIR

Ecological trends and their drivers in South Africa

Authors: Nicola Stevens, William Bond, Timm Hoffman and Guy Midgley

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REPUBLIC OF SOUTH AFRICA

NRF National Research Foundation | SAEON South African Environmental Observation Network

CONTENTS

Cover photograph: Timm Hoffman

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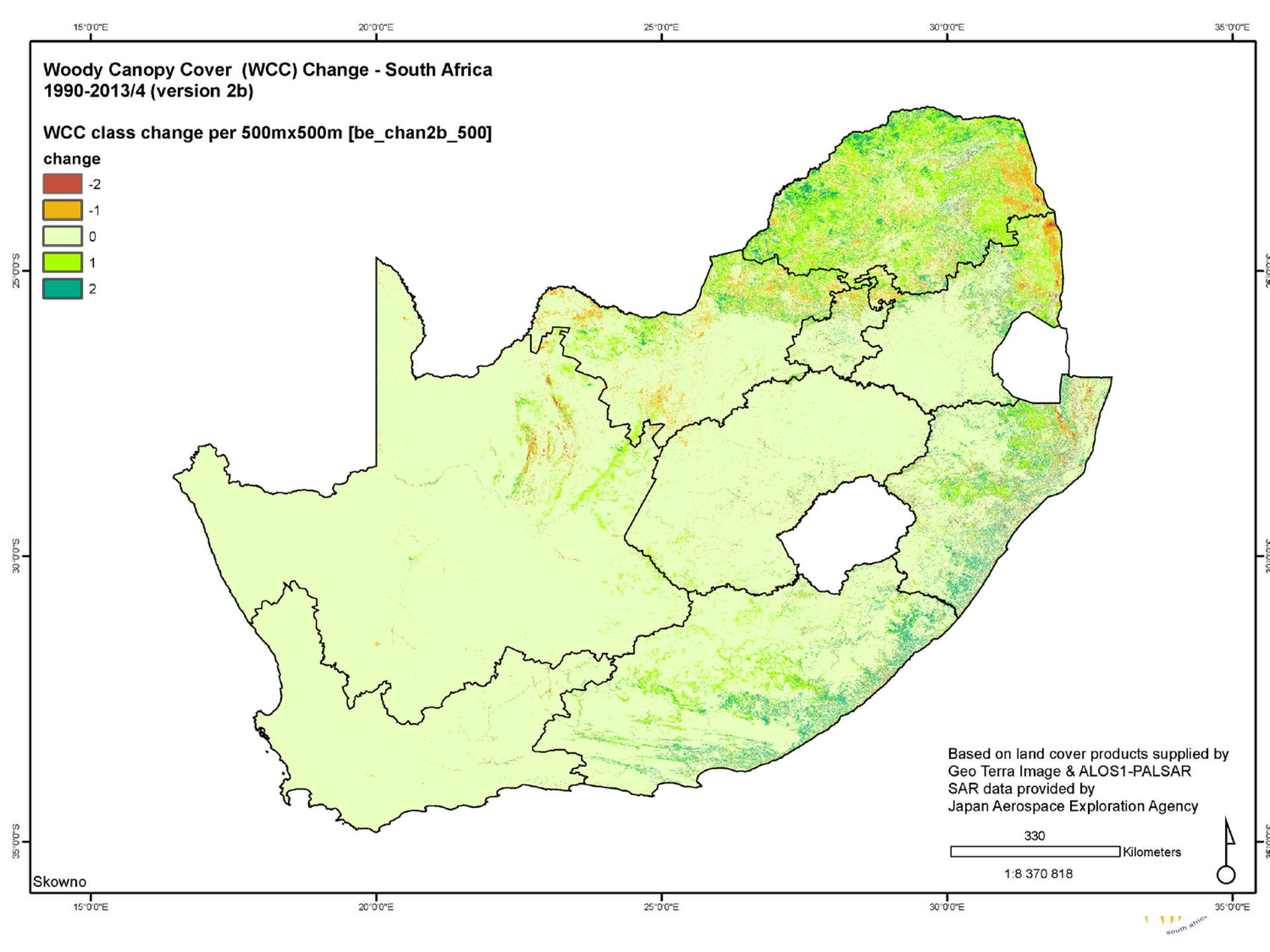
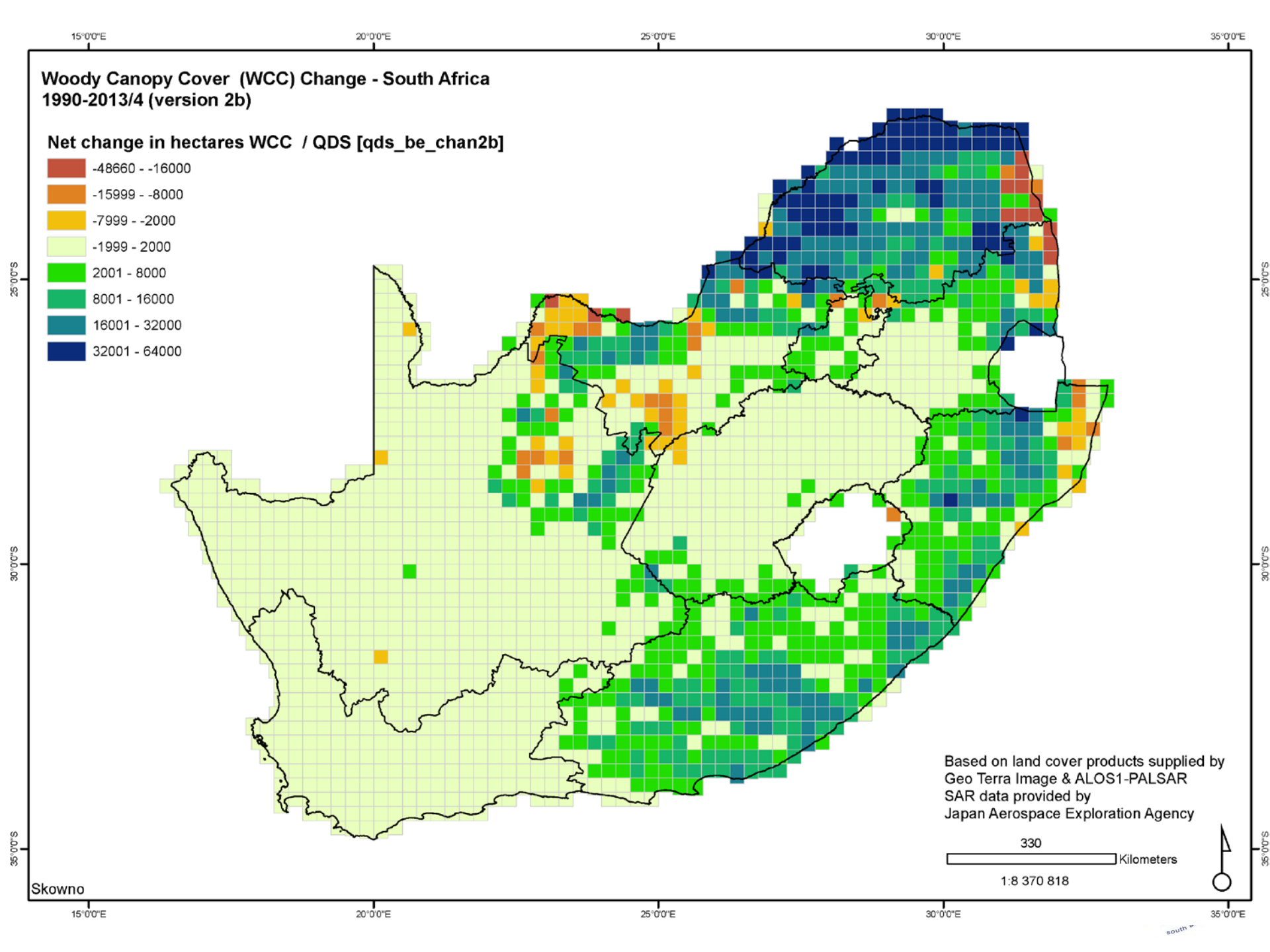
Figure 15: *Woody plant cover has increased on all the slopes and mountain tops at this site near Ntabankulu in the Eastern Cape. This pattern is repeated across areas of South Africa particularly at sites where old cultivated fields have been abandoned. [Photos: Top by Alexander du Toit, 1922; bottom by James Puttick, 2011]*


Woody Canopy Cover (WCC) Change - South Africa
1990-2013/4 (version 2b)
WCC class change per 500mx500m [be_chan2b_500]
change
-2
-1
0
1
2
15°0'0"E
20°0'0"E
25°0'0"E
30°0'0"E
35°0'0"E
25°0'0"S
30°0'0"S
35°0'0"S
Based on land cover products supplied by
Geo Terra Image & ALOS1-PALSAR
SAR data provided by
Japan Aerospace Exploration Agency
330
Kilometers
1:8 370 818
Skowno


Woody Canopy Cover (WCC) Change - South Africa
1990-2013/4 (version 2b)
Net change in hectares WCC / QDS [qds_be_chan2b]
-48660 - -16000
-15999 - -8000
-7999 - -2000
-1999 - 2000
2001 - 8000
8001 - 16000
16001 - 32000
32001 - 64000
15°0'0"E
20°0'0"E
25°0'0"E
30°0'0"E
35°0'0"E
25°0'0"S
30°0'0"S
35°0'0"S
Based on land cover products supplied by
Geo Terra Image & ALOS1-PALSAR
SAR data provided by
Japan Aerospace Exploration Agency
330
Kilometers
1:8 370 818
Skowno

Conclusions

- Maps should assist in answering the question - What must we change in response to change?
- In times of such rapid political, economic, technological and climate change the “up-to-dateness” of data is becoming increasingly important.
- Maps must be “fit for purpose” – they should be an attempt to inform a specific policy question – The science-policy dialogue includes a policy-science dialogue
- Policy-makers and policy-shapers are often more interested in the reputation of the source than typical scientific expressions of certainty and confidence
- Maps need to be attractive AND impactful and have increased impact if they are animated or illustrate change (before (what is our vulnerability now) → after (how vulnerable will we be in 20?? → change (what is the change from now till then))

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22 YEARS OF FREEDOM
south africa 1994 - 2016