Celsius 1.5 – IAIA International Symposium

27 September 2022 CTICC Cape Town

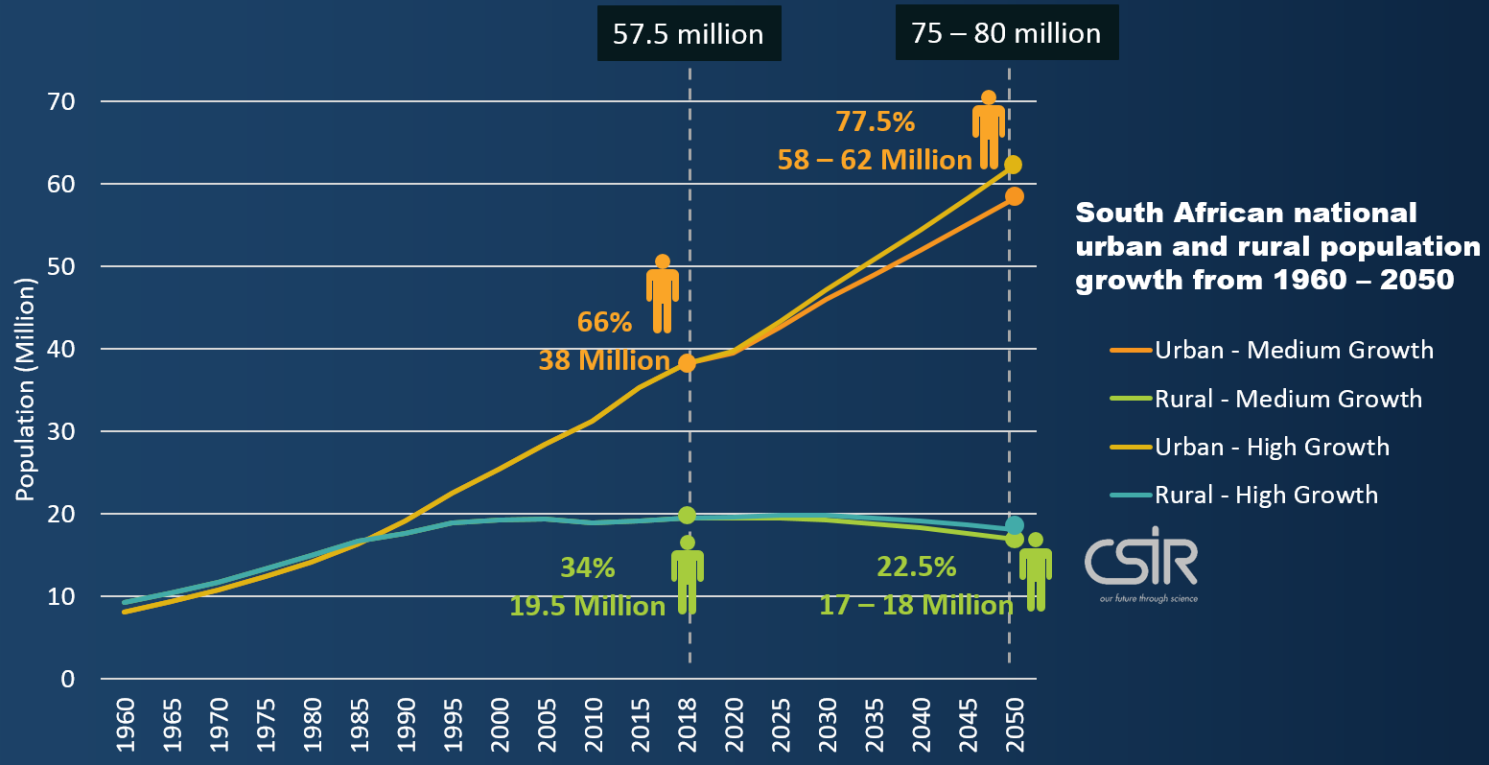
The Green Book online tool: Towards climate resilient settlements

Melanie Lück-Vogel, Amy Pieterse, Willemien van Niekerk, Gerbrand Mans

Council for Scientific and Industrial Research CSIR

Project partners since 2016

Population growth 1960-2050



Projected population growth 2011–2050

Percentage growth from 2011 to 2050

7.4%

Limpopo

34.4%

Gauteng

1.8%

Northern Cape

North West

6.1%

8.1%

Mpumalanga

eSwatini

KwaZulu -Natal

19.4%

Free State

1.2%

Western Cape

11.7%

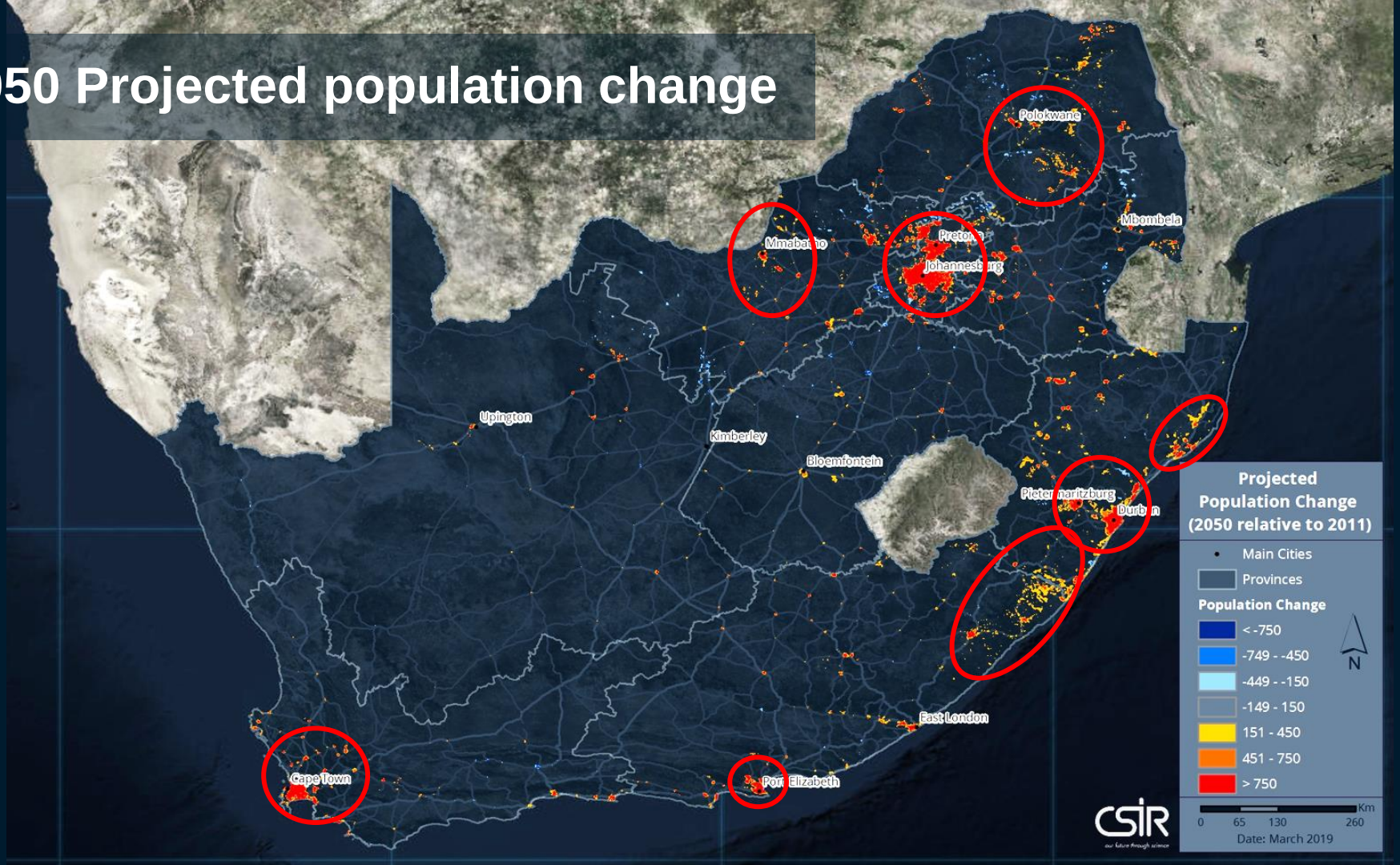
Eastern Cape

10.7%

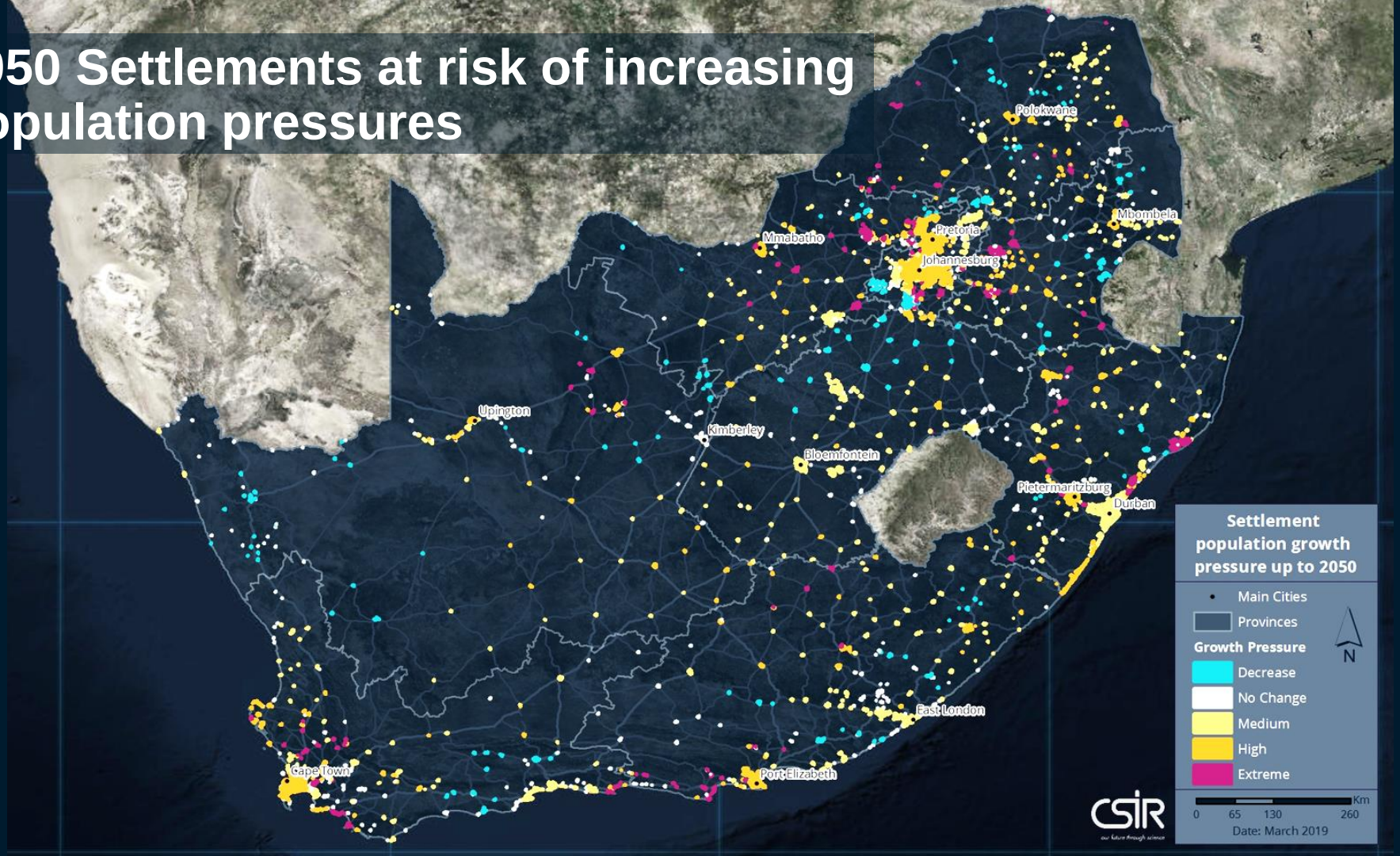
CSIR

our future through science

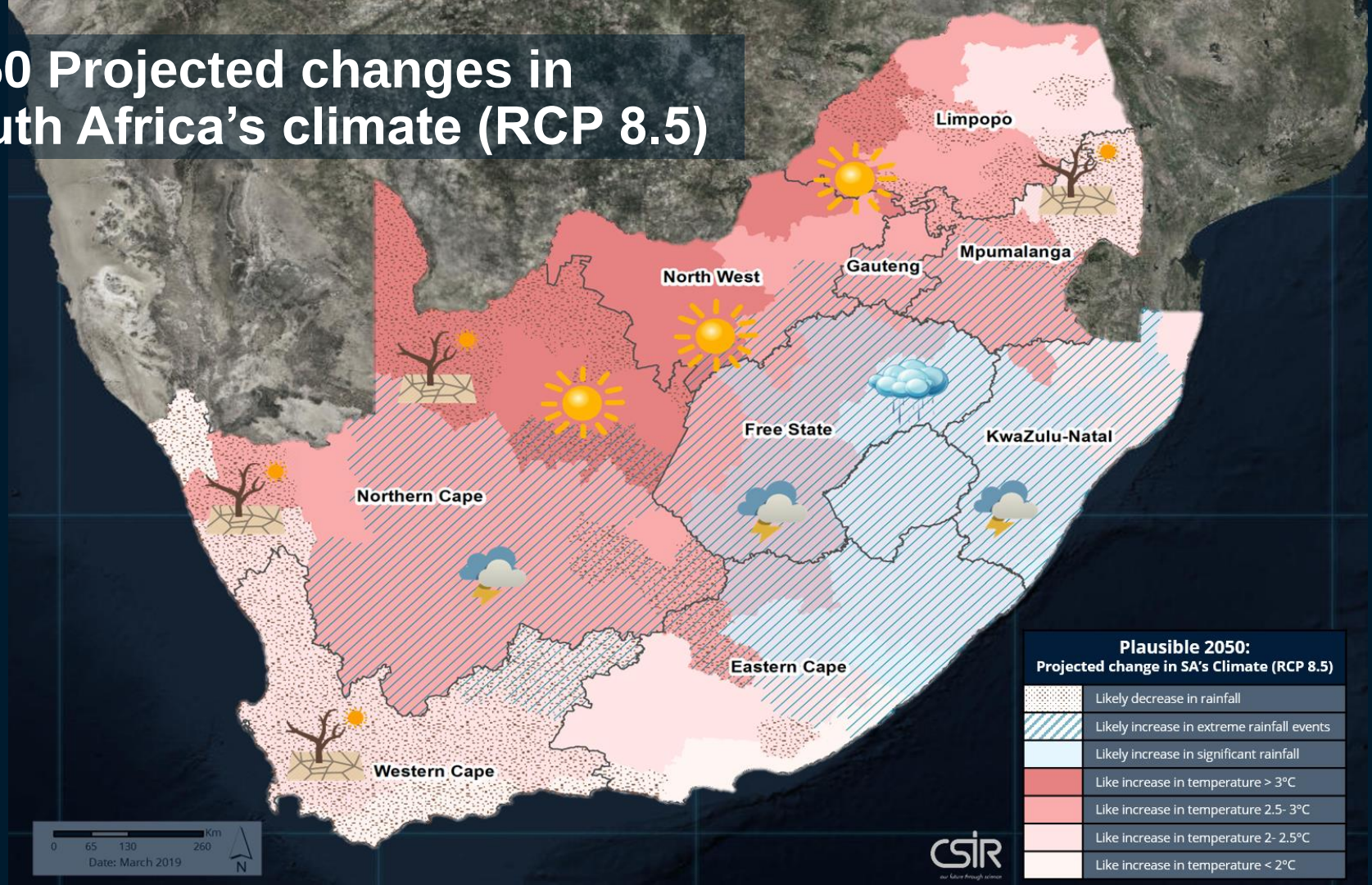
2050 Projected population change



2050 Settlements at risk of increasing population pressures



2050 Projected changes in South Africa's climate (RCP 8.5)



THE URBAN CONTEXT

Extreme weather events are becoming more frequent and intense with climate change

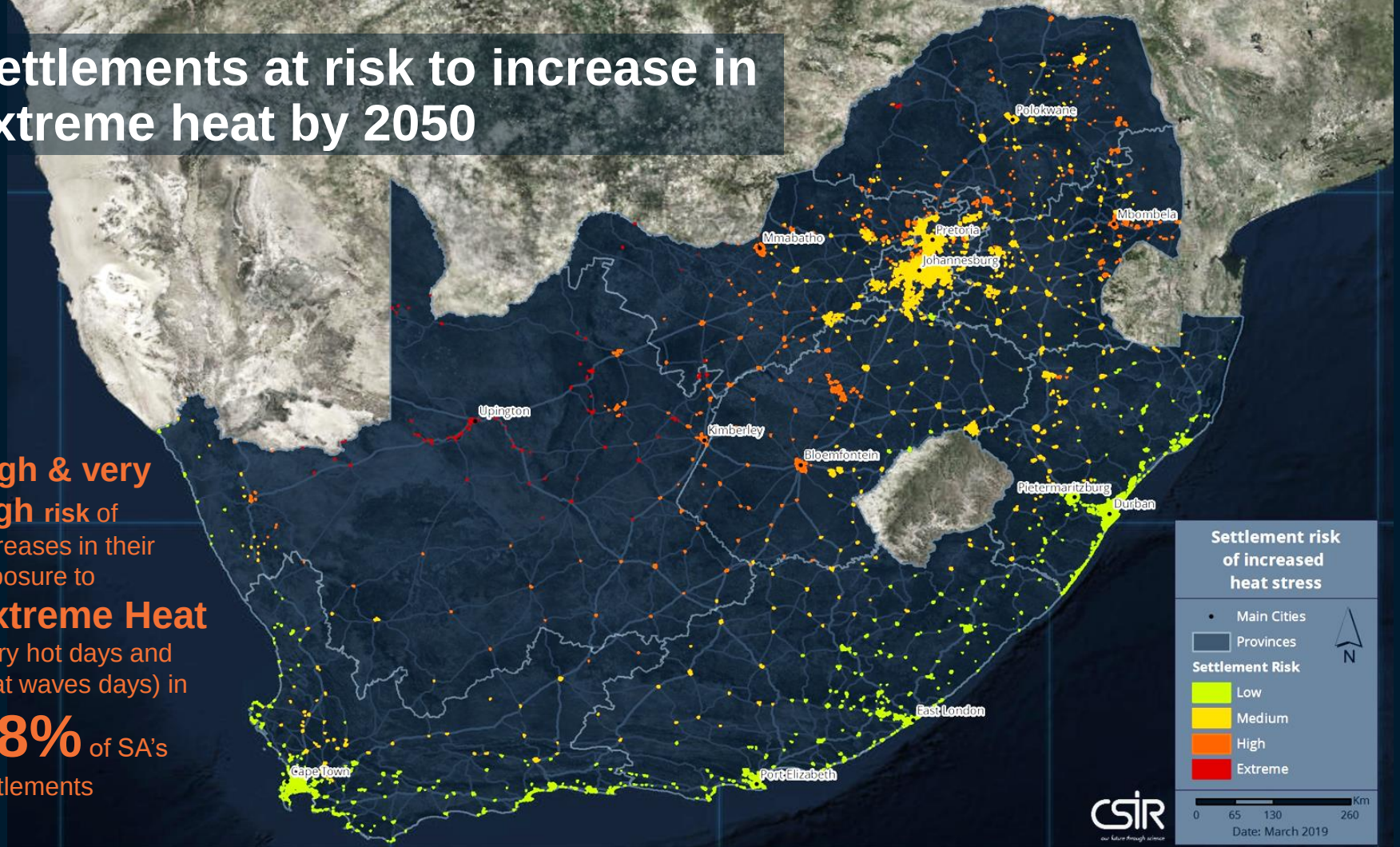
+

Growing & urbanising population will continue to place pressure on cities and local government

=

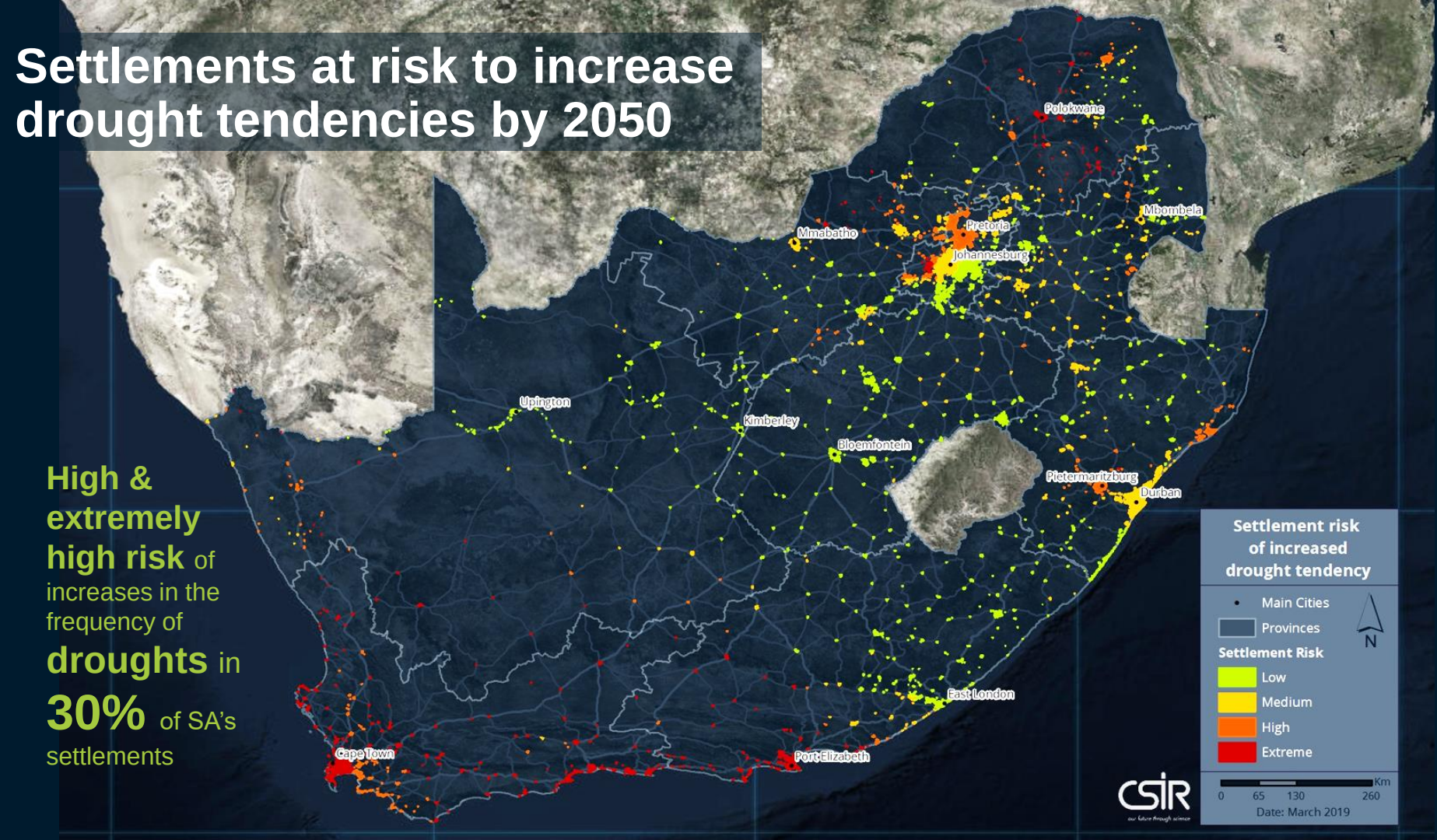
Exacerbate vulnerabilities and place more people, infrastructure and ecosystems at risk

Settlements at risk to increase in extreme heat by 2050



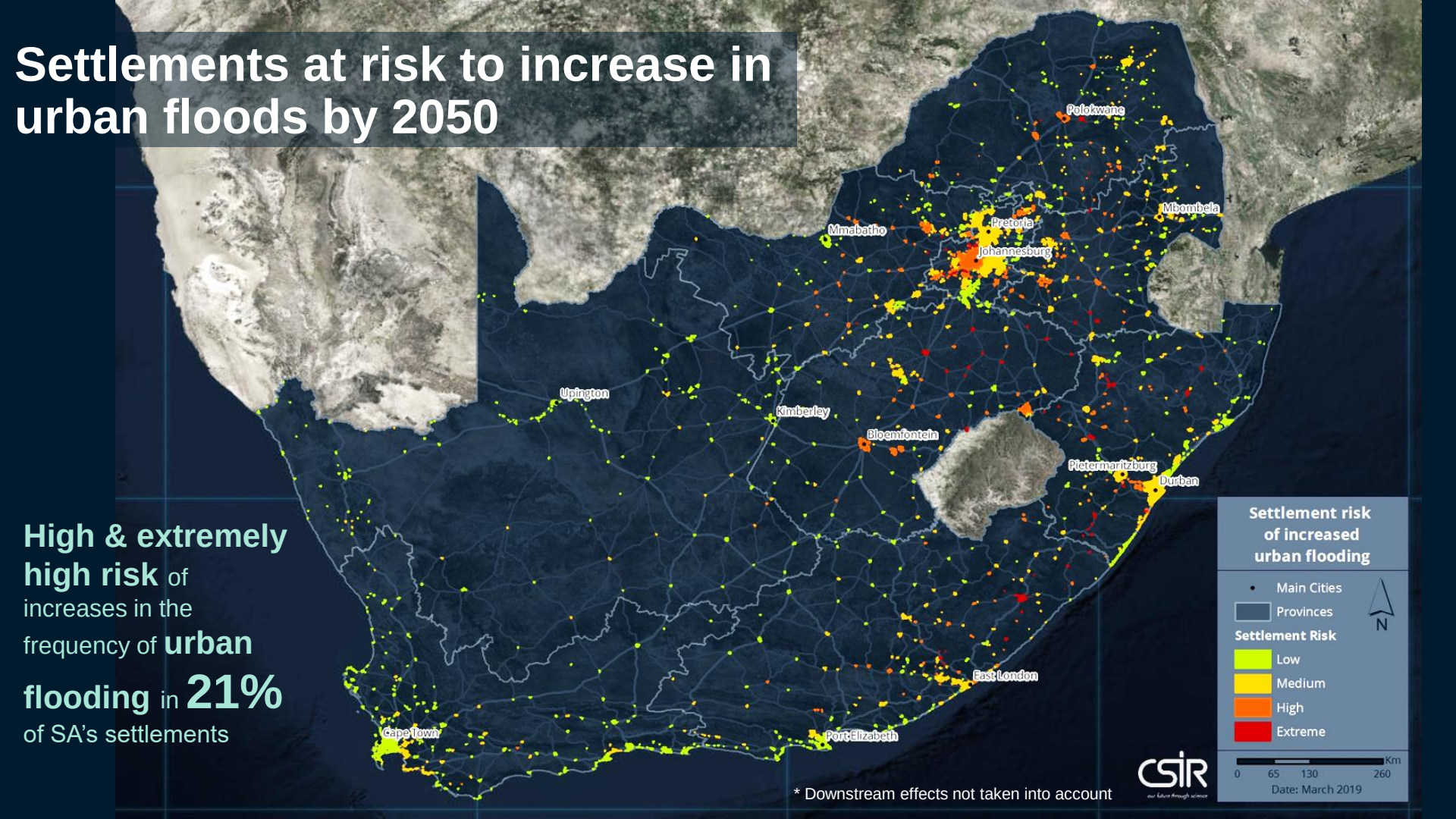
High & very high risk of increases in their exposure to **Extreme Heat** (very hot days and heat waves days) in **28%** of SA's settlements

Settlements at risk to increase drought tendencies by 2050



High & extremely high risk of increases in the frequency of **droughts** in **30%** of SA's settlements

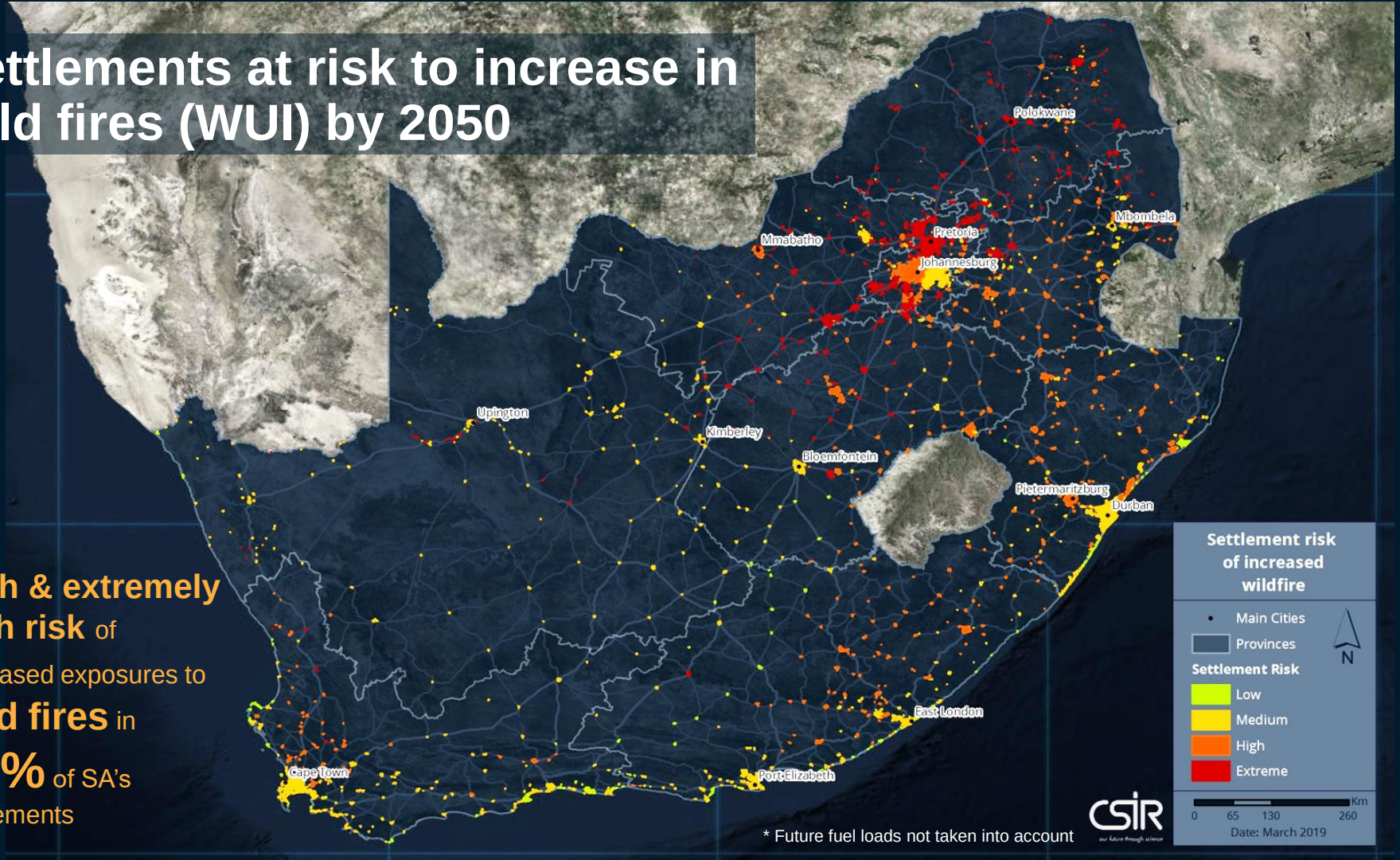
Settlements at risk to increase in urban floods by 2050



High & extremely high risk of increases in the frequency of **urban flooding** in **21%** of SA's settlements

* Downstream effects not taken into account

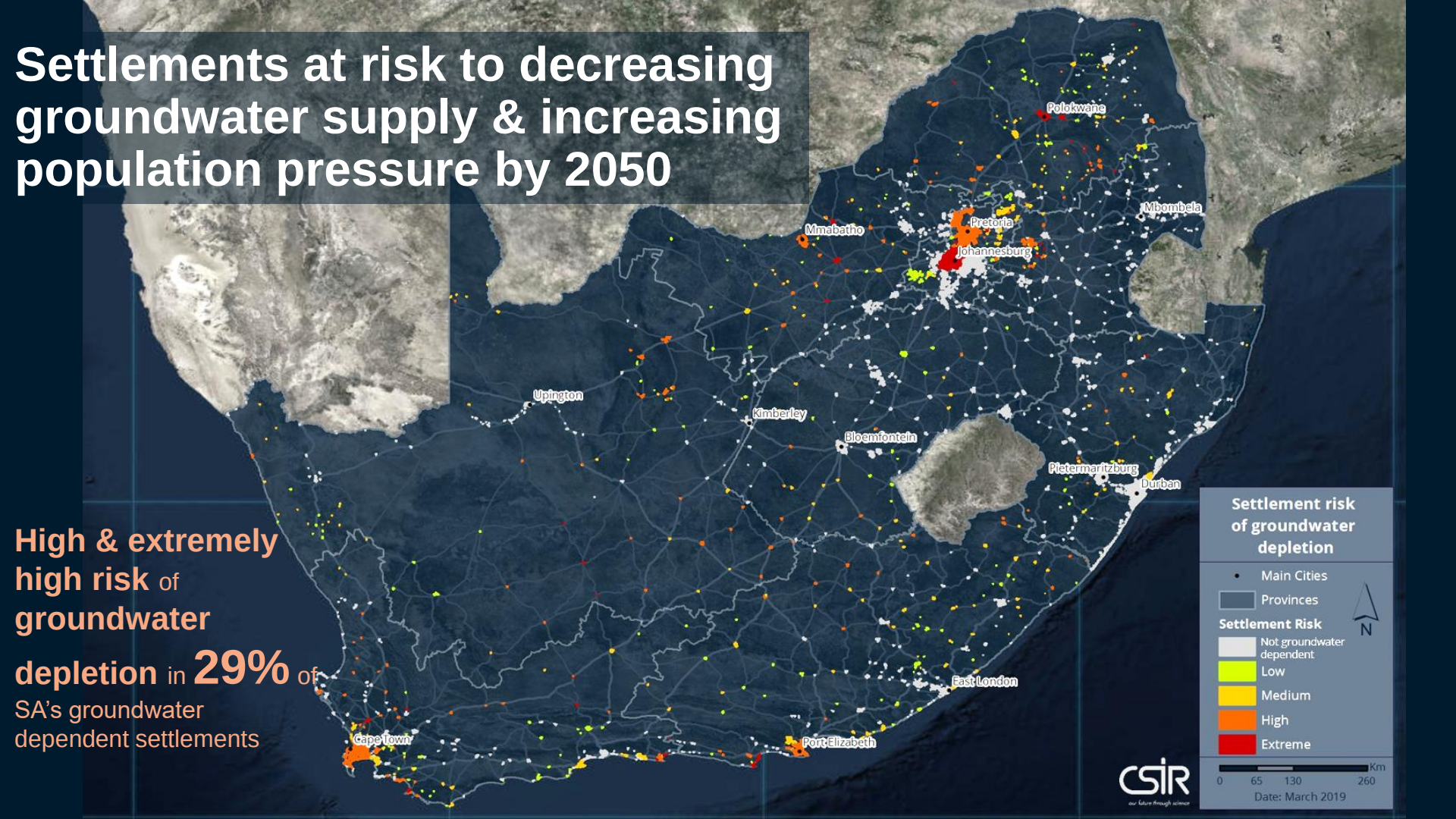
Settlements at risk to increase in wild fires (WUI) by 2050



High & extremely high risk of increased exposures to **wild fires** in **60%** of SA's settlements

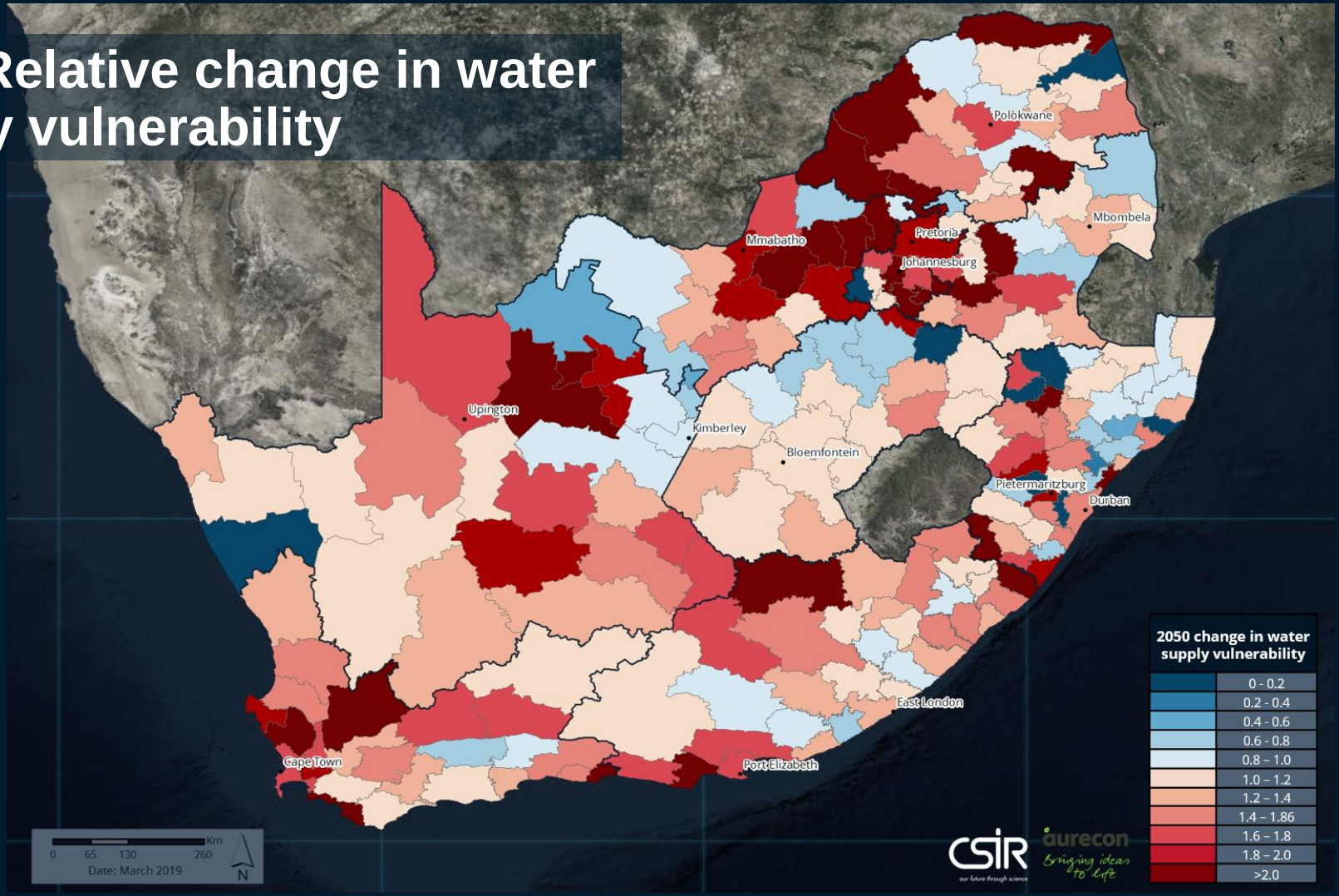
* Future fuel loads not taken into account

Settlements at risk to decreasing groundwater supply & increasing population pressure by 2050



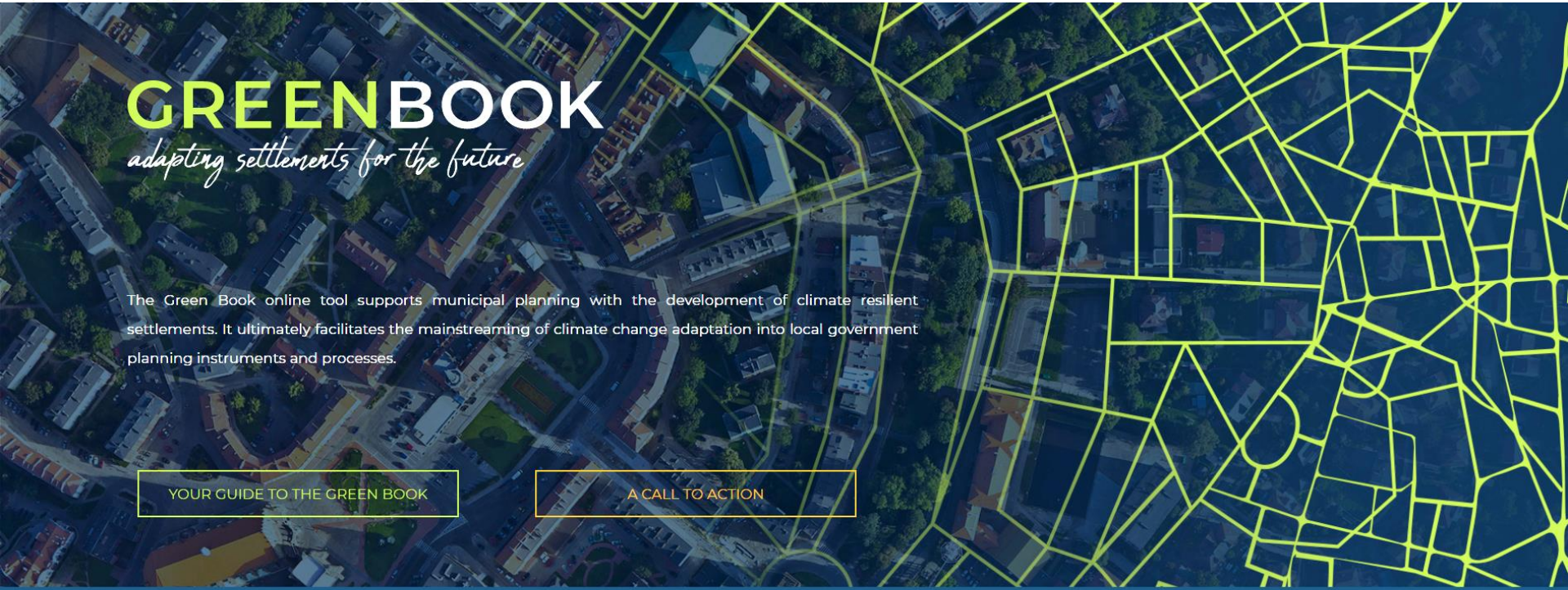
High & extremely high risk of **groundwater depletion** in **29%** of SA's groundwater dependent settlements

2050 Relative change in water supply vulnerability



https://greenbook.co.za/

GREEN BOOK ONLINE PLANNING SUPPORT SYSTEM



BACKGROUND TO THE GREENBOOK

- The GreenBook is a multi-disciplinary, open-access **planning support system** that provides **evidence** to South African municipalities to adapt their **cities and towns** to current and future climate change impacts based on their risk assessment.

- Initially co-funded by the IDRC and the CSIR (2016-2019), and in partnership with the NDMC. With more partners coming on board since 2019.

213 In-depth, current, and future (2050) climate risk and vulnerability profile for every municipality in the country

81 Planning-related climate change adaptation actions

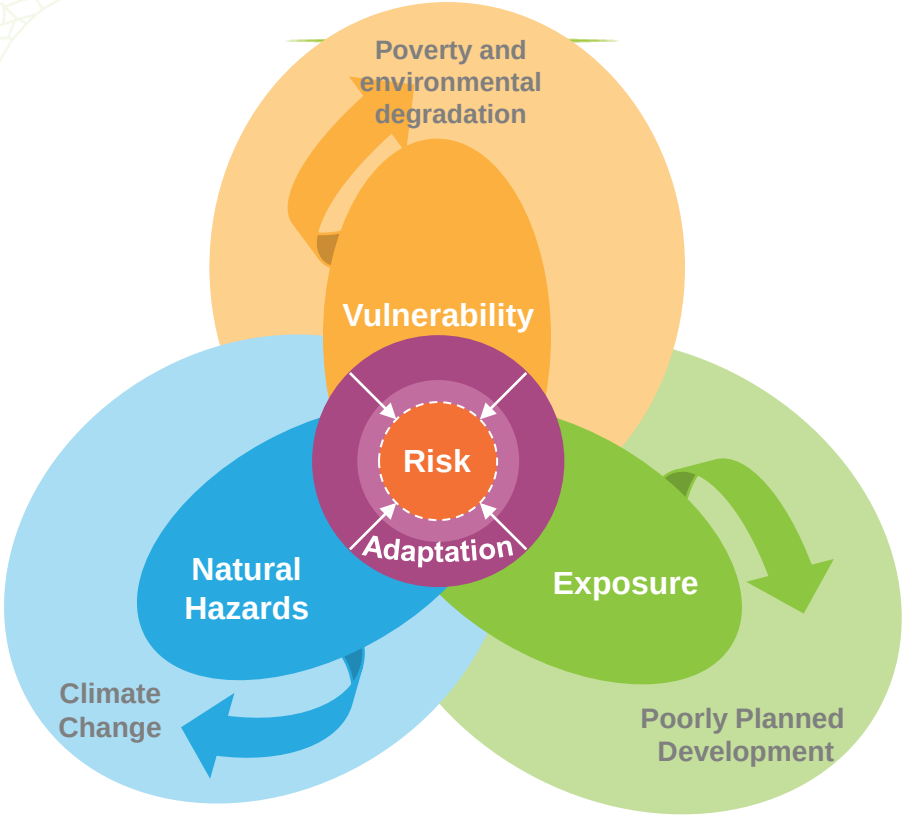
11 National climate change impacts contextualised in narrated story maps

www.greenbook.co.za

CSIR
Touching lives through innovation

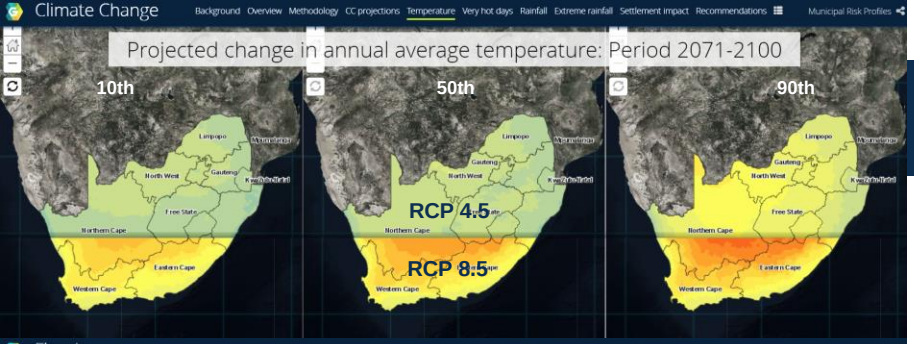
INTERDISCIPLINARY RESEARCH DESIGN

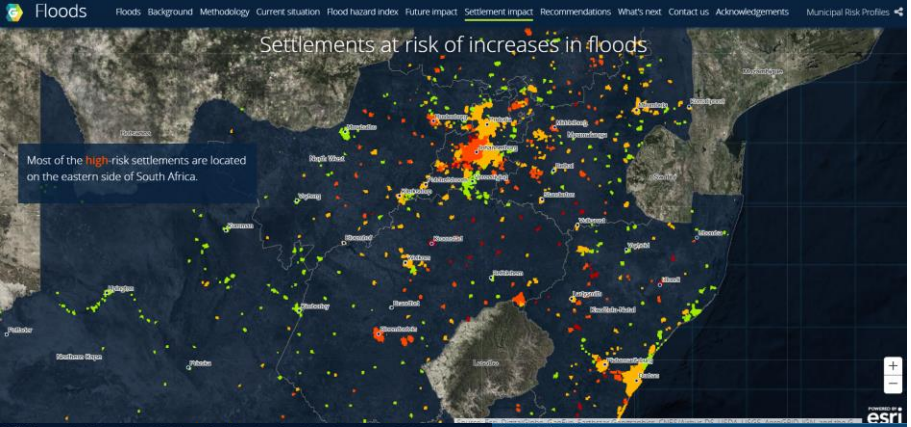
More than 50 scientists of difference disciplines involved.

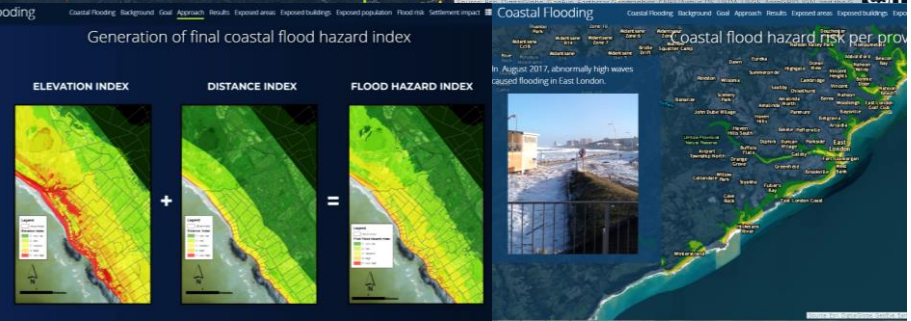


Elements of the GREENBOOK

CSIR
Touching lives through innovation







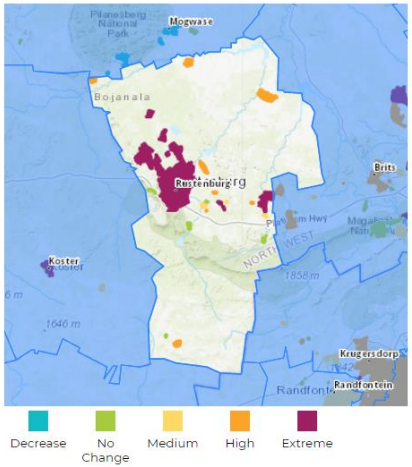
STORY MAPS

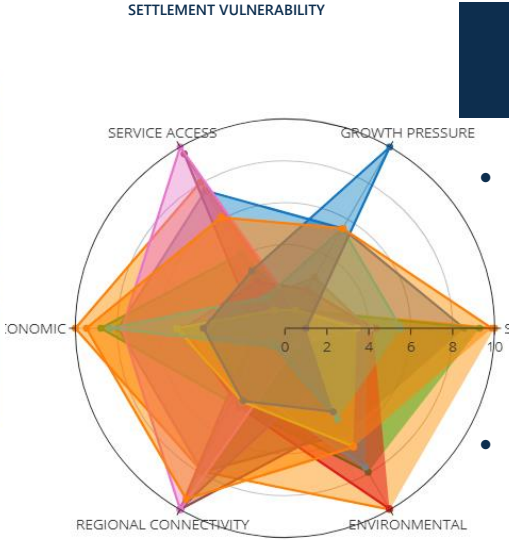
- 11 Interactive story maps to communicate the research methodologies and main findings from the research streams.
- Developed using the ESRI Story Map application which allowed a narrative around scientific findings to be supported by custom maps, images and statistics.
- Story maps for climate change, flooding, wildfire, coastal flooding, urban growth, settlement vulnerability, surface water, groundwater, drought, the economy, and agriculture.

https://greenbook.co.za/story-maps.html

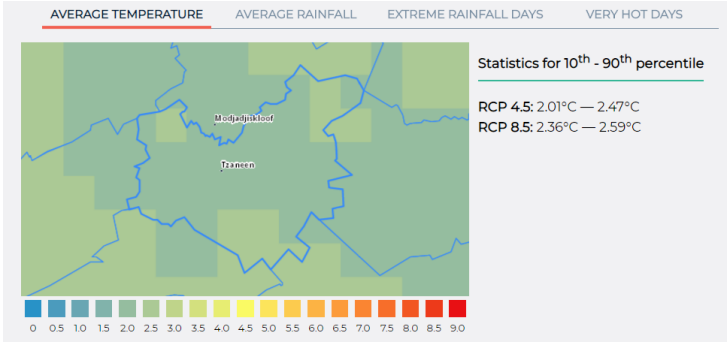
https://riskprofiles.greenbook.co.za/

RISK PROFILE TOOL





- Combines scientific evidence produced from multiple domain-specific research streams into interactive, composite profiles covering current and future (2050) climate risks, impacts and vulnerabilities for all municipalities in South Africa and their settlements.
- Uses different data communication methods to distil information to be relevant to local municipal actors, and to support evidence-based planning and decision-making.



GREENBOOK

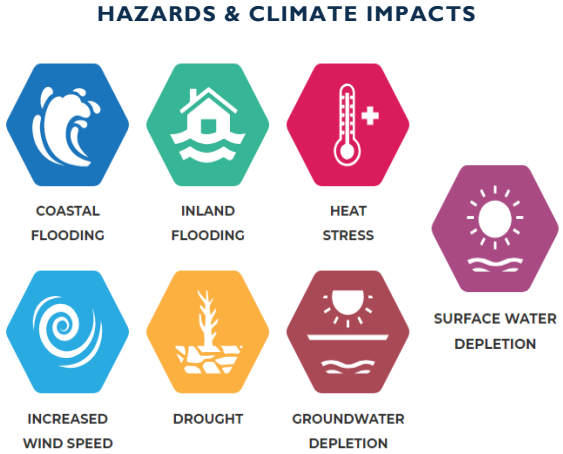
ADAPTATION ACTIONS TOOL

- Provides 81 different planning and design actions for municipalities to adapt their settlements and environments.

https://adaptationactions.greenbook.co.za/

ADAPTATION ACTIONS TOOL

- Provides 81 different planning and design actions for municipalities to adapt their settlements and environments.
- Users can filter through the list of adaptation actions by climate risk, impact, adaptation strategy, or planning function.



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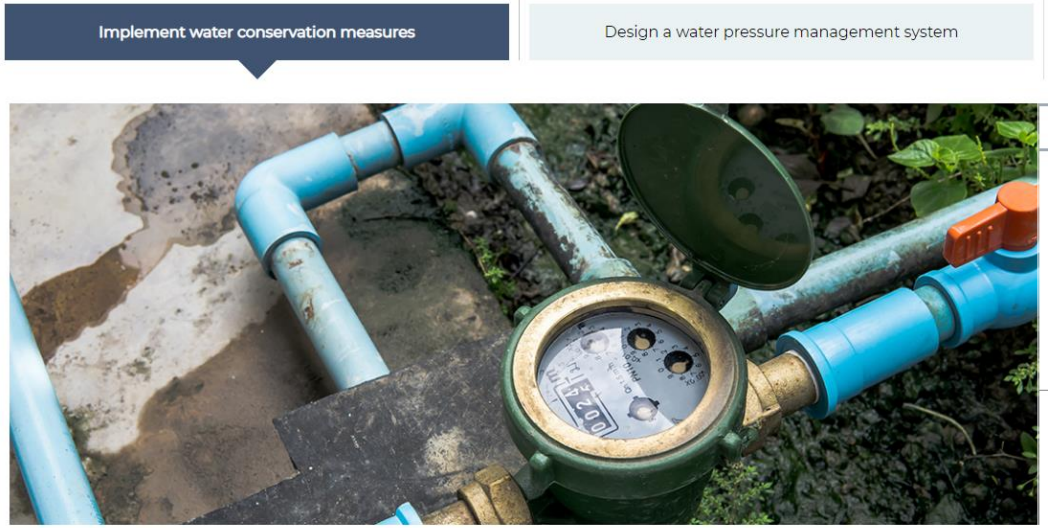
ADAPTATION ACTIONS TOOL



- Provides access to 81 different planning and design actions for municipalities to adapt their settlements and environments.
- Users can filter through the list of adaptation actions by climate risk, impact, adaptation strategy, or planning function.
- Descriptive information on what the adaptation action entails, its benefits and co-benefits, possible costs and implications, and an image is provided for each adaptation action.
- Interlinkages between adaptation actions are highlighted and users are able to identify multiple actions that are able to support each other when implemented.

GREENBOOK

https://adaptationactions.greenbook.co.za/

METROVIEW

- GreenBook MetroView provides spatialised and quantified climate risk, vulnerability, and demographic evidence, linked to place-based climate response measures.
  - Climate Risk & Vulnerability Profile
  - Climate Actions Tool
- Supports communication and analysis of evidence to assist practitioners, policymakers, and decision-makers to effectively inform and add value to climate change adaptation.
- Openly accessible through an online planning support system.
- City of Tshwane pilot.

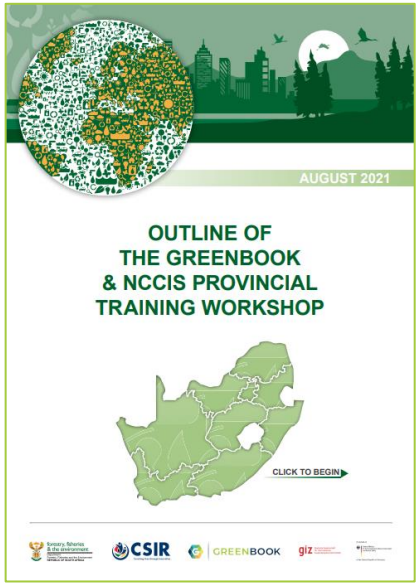
Risk & Vulnerability Profile: https://tshwane-riskprofile.greenbook.co.za

Climate Actions Tool: https://tshwane-climateactions.greenbook.co.za/

GREENBOOK TRAINING

Green Book training events aim to build enduring capacity in all spheres of government (and beyond) to proactively adapt South African settlements to the impacts of hydro-meteorological hazards. Mainstreaming climate change adaptation into sector plans and policies are critical to build resilience, and reduce the exposure of people, infrastructure, buildings, and the environment to the long-term impacts of climate change and severe weather events.

GO TO EVENTS & RESOURCES



TRAINING

- Duration: 2 days, is paid for by clients and partners.
- Focusses on awareness raising about the climate risks associated with a changing climate, and the need for adaptation.
- The GreenBook planning support tools are demonstrated in detail.
- The concept of mainstreaming is explained, and obstacles and guidelines toward mainstreaming are provided.

Eastern Cape Climate GreenBook & NCCIS training DATA PACKAGES

Alfred Nzo District Municipality	Amathole District Municipality	Buffalo City Metropolitan Municipality	Sarah Baartman District Municipality
Chris Hani District Municipality	Joe Gqabi District Municipality	Nelson Mandela Bay Metropolitan Municipality	O.R. Tambo District Municipality

https://greenbook.co.za/green-book-training.html.

GREENBOOK 3.0: THE FUTURE STORY

- Several gaps have been identified and will be addresses in the future:
  - changes in the underpinning science of climate models (i.e., IPCC AR6);
  - probabilities of extreme event occurrences under different scenarios;
  - coastal flood risk and erosion modelling;
  - the impact of climate change on health, food security and the energy sector;
  - green infrastructure as adaptation strategy;
  - and a decision-model around adaptation efforts based on evidence.

GREENBOOK
adapting settlements for the future

Thank you

Melanie Lück-Vogel
mluckvogel@csir.co.za

on behalf of the Green Book Team