

HABITABLE FUTURES

THE GREENBOOK: EVIDENCE-BASED ADAPTATION

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science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA



GREENBOOK
adapting settlements for the future



CSIR
Touching lives through innovation

OVERVIEW OF GREENBOOK



- The GreenBook (www.greenbook.co.za) is a multi-disciplinary, open-access tool that supports South African municipalities with assessing their current and likely future (2050) climate risk, and with adapting settlements to climate change and its impacts.
- The GreenBook thus strengthens the capacity and capability of the South African State to reduce the risk for disaster losses in settlements and to build long-term resilience.
- The GreenBook consists of a unique combination of planning support tools, climate actions, story maps, and guidelines: an in-depth, current, and future (2050) climate risk and vulnerability profile for every municipality in the country (213 profiles); MetroViews for 3 metropolitan cities, numerous (81) adaptation actions; and contextualises the national climate change impacts in 11 narrated story maps.
- Initially co-funded by the IDRC and the CSIR (2016-2019), and in partnership with the NDMC.
- More partners came on board in the roll-out and training, and further development of the GreenBook (2019).



GREENBOOK OBJECTIVES



1. Raise awareness of the possible impacts of climate change on settlements and the value of adaptation, thus promoting the agenda of climate adaptation specifically in local government.
2. Build enduring municipal capacity to access and interpret information from the GreenBook, including information on climate change, population change, vulnerability, climate hazards, and adaptation.
3. Build capacity to be able to integrate or mainstream climate information from the GreenBook into broader planning frameworks, and existing planning instruments.

GREENBOOK RESEARCH DESIGN

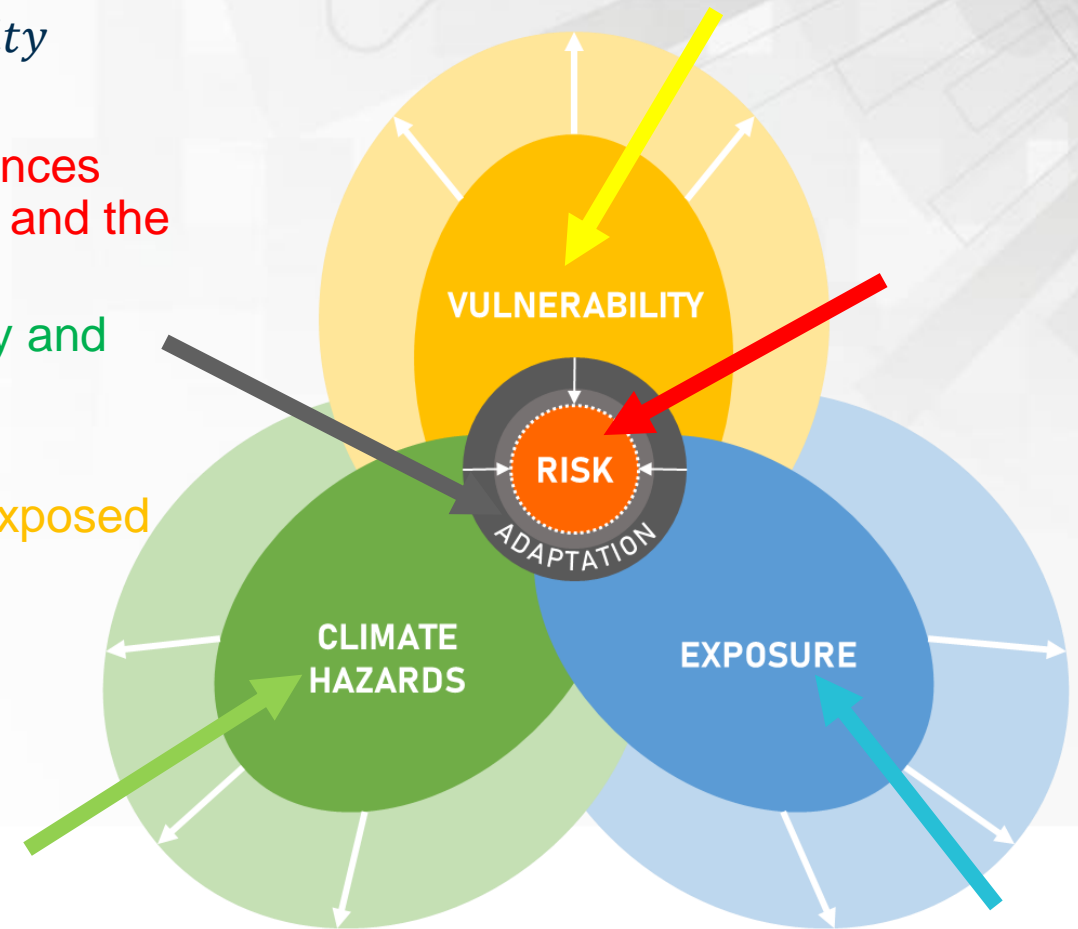


Risk equation = Hazard × Exposure × Vulnerability

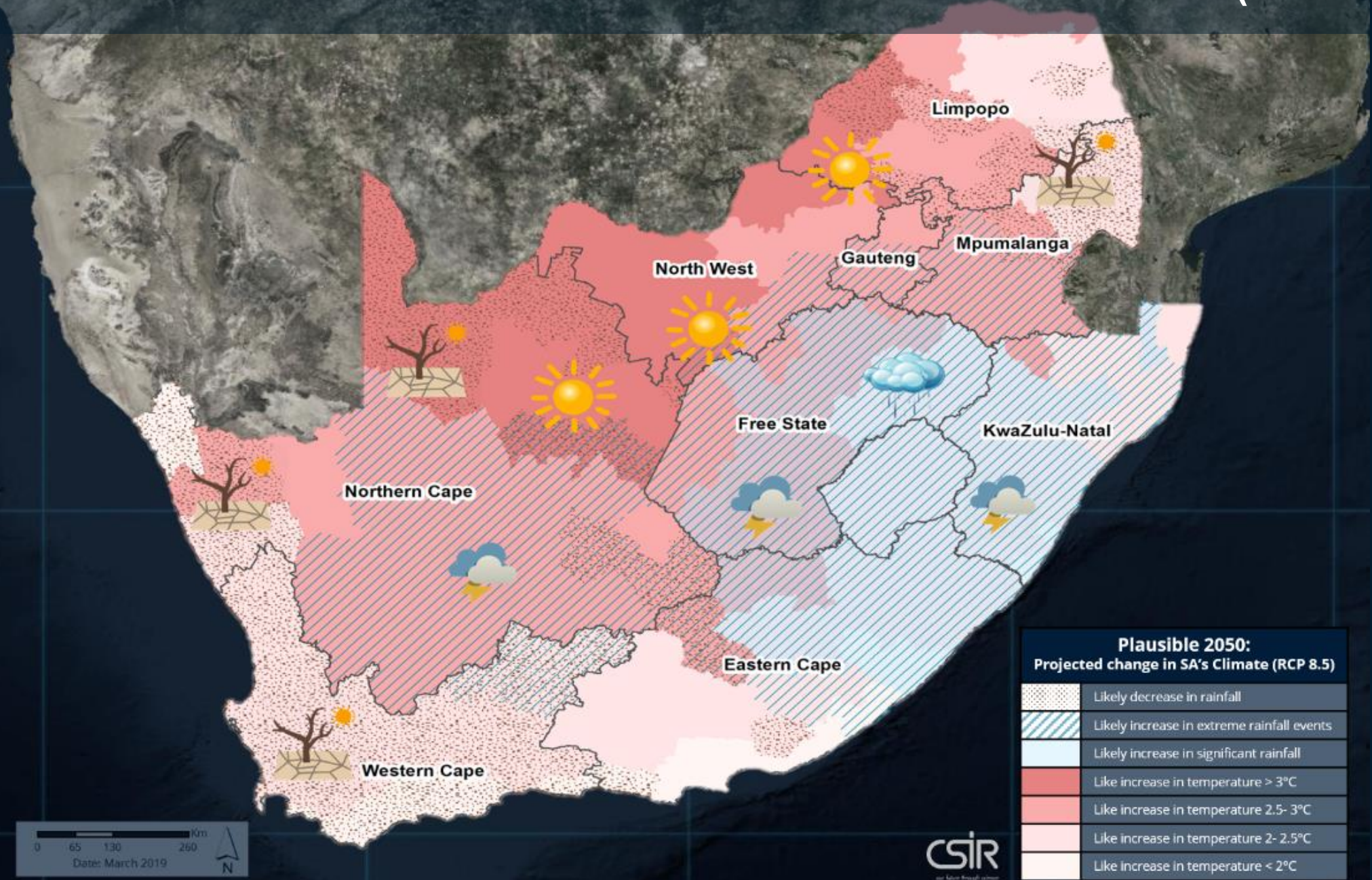
- Climate risk implies the potential for adverse consequences resulting from the interaction of vulnerability, exposure, and the likelihood of a hazard to occur.
- Climate hazards are driven by natural climate variability and anthropogenic climate change.
- (Un)planned development drives exposure.
- Vulnerability is the inherent characteristics that make exposed elements more or less likely to be negatively impacted.

Vulnerability = Sensitivity / Capacity

- Adaptation to address risk
 - > Reduce exposure
 - > Reduce vulnerability and build capacity



2050 PROJECTED CHANGES IN SOUTH AFRICA'S CLIMATE (RCP 8.5)



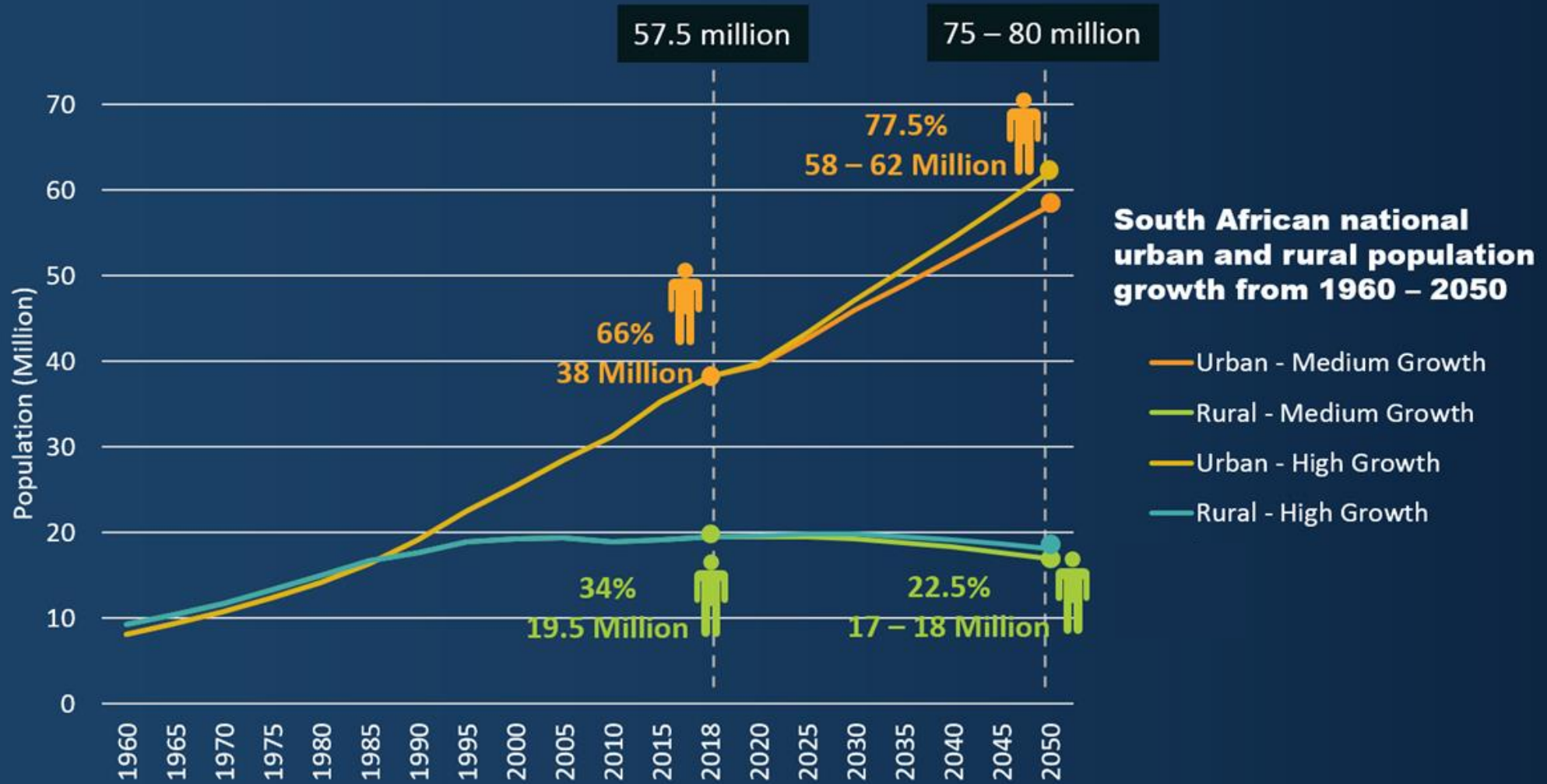
Plausible 2050:
Projected change in SA's Climate (RCP 8.5)

	Likely decrease in rainfall
	Likely increase in extreme rainfall events
	Likely increase in significant rainfall
	Like increase in temperature > 3°C
	Like increase in temperature 2.5- 3°C
	Like increase in temperature 2- 2.5°C
	Like increase in temperature < 2°C

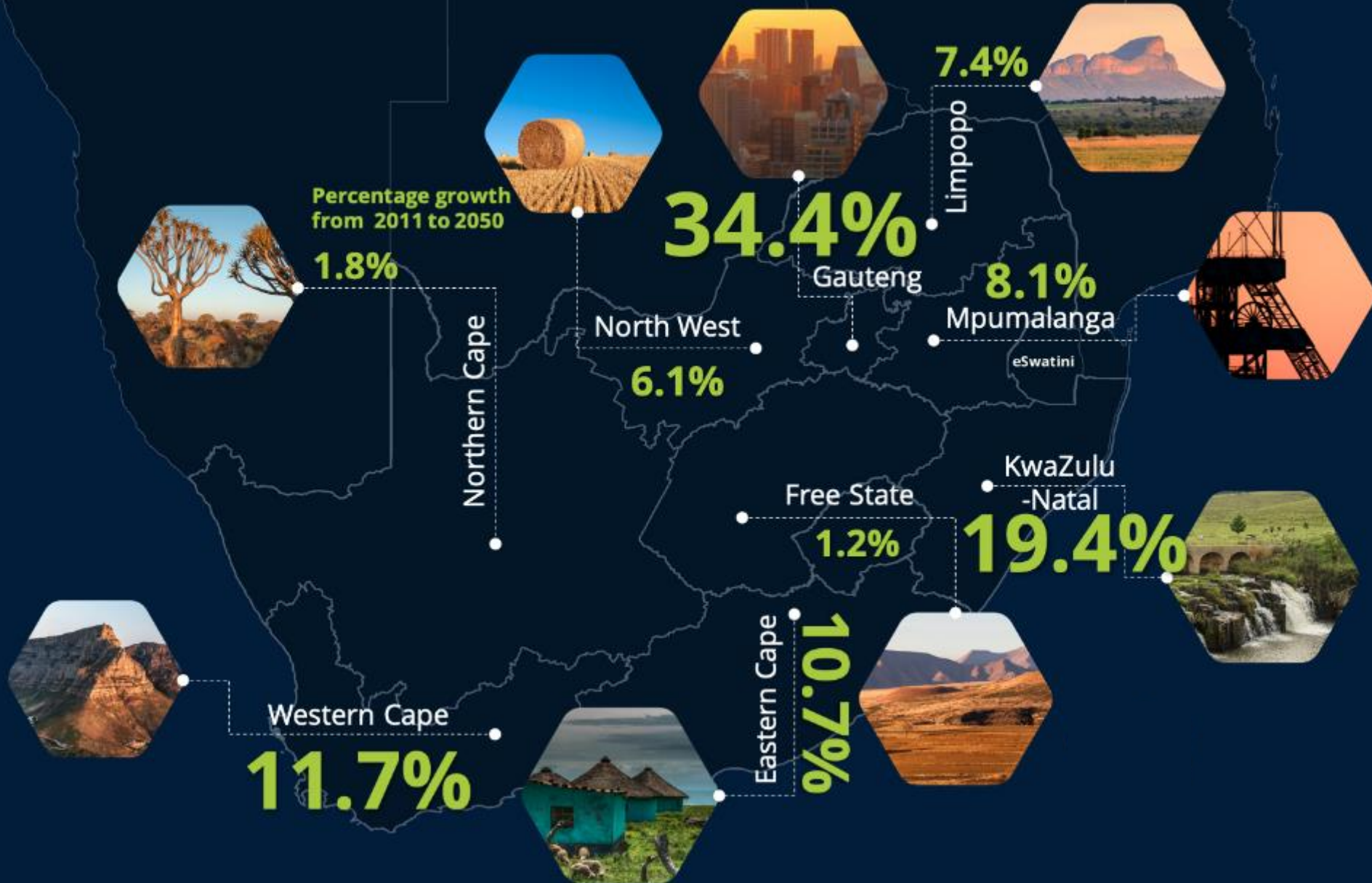
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Date: March 2019



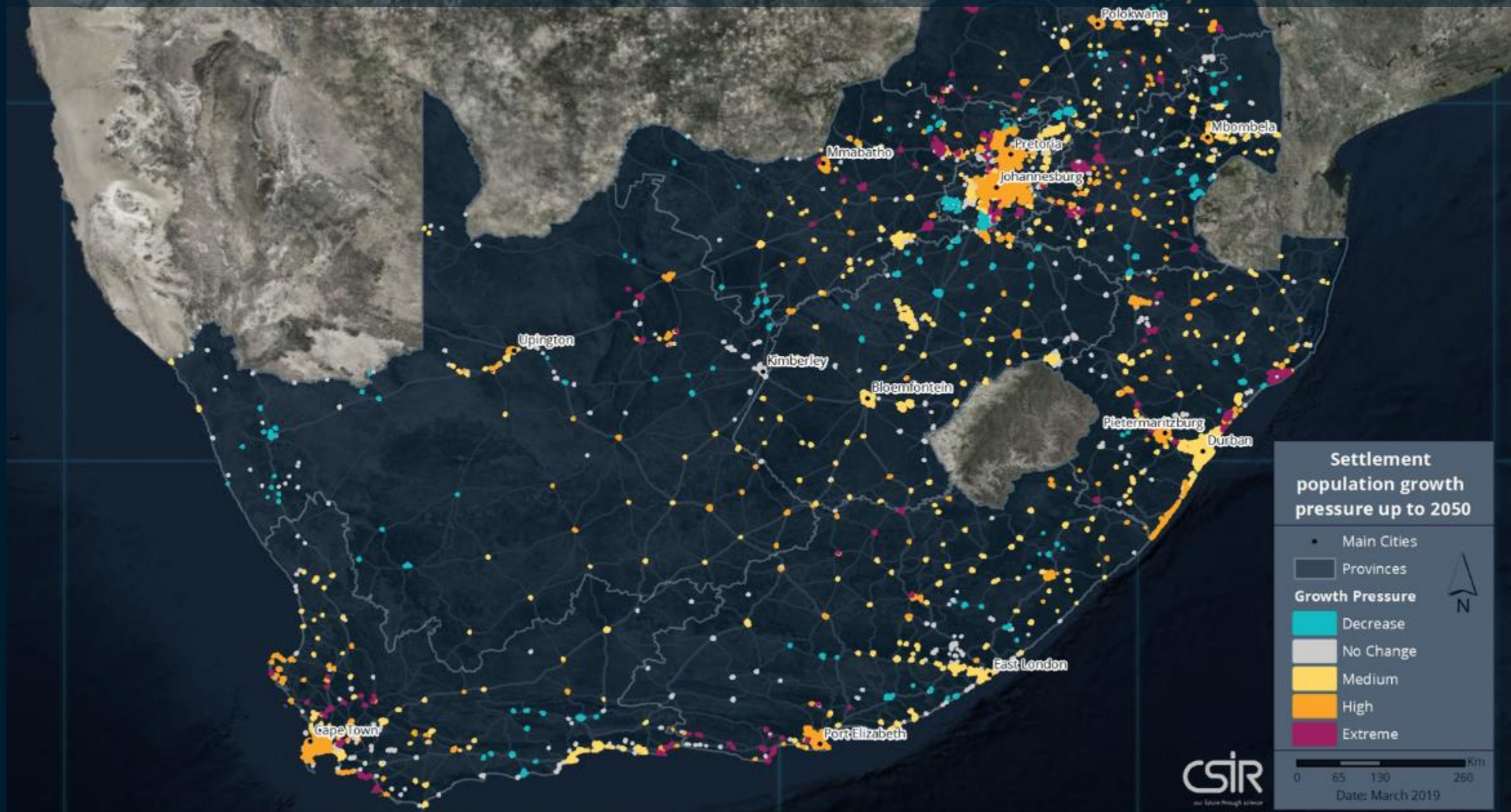
SOUTH AFRICA'S URBAN FUTURE



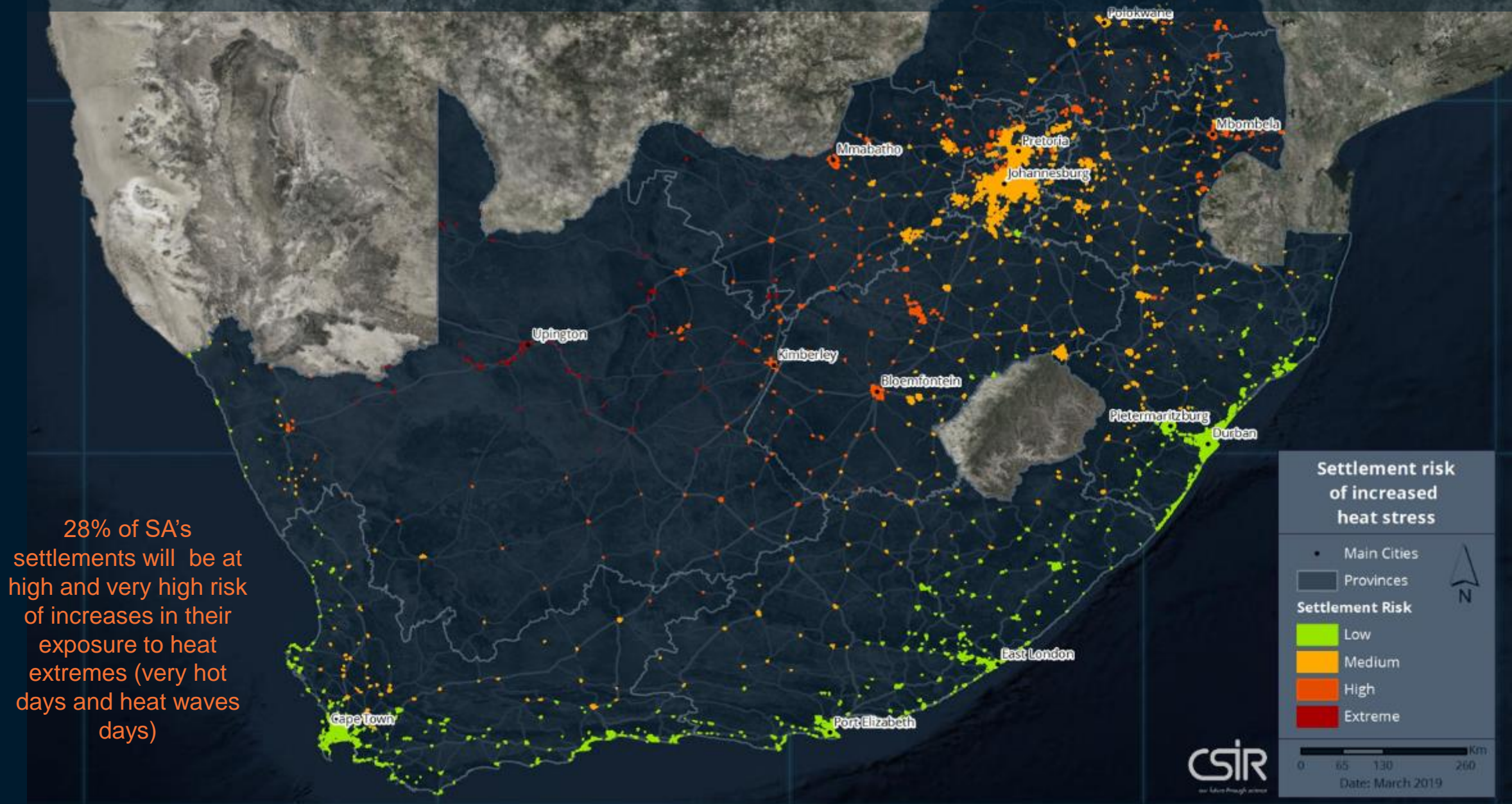
SOUTH AFRICA'S URBAN FUTURE



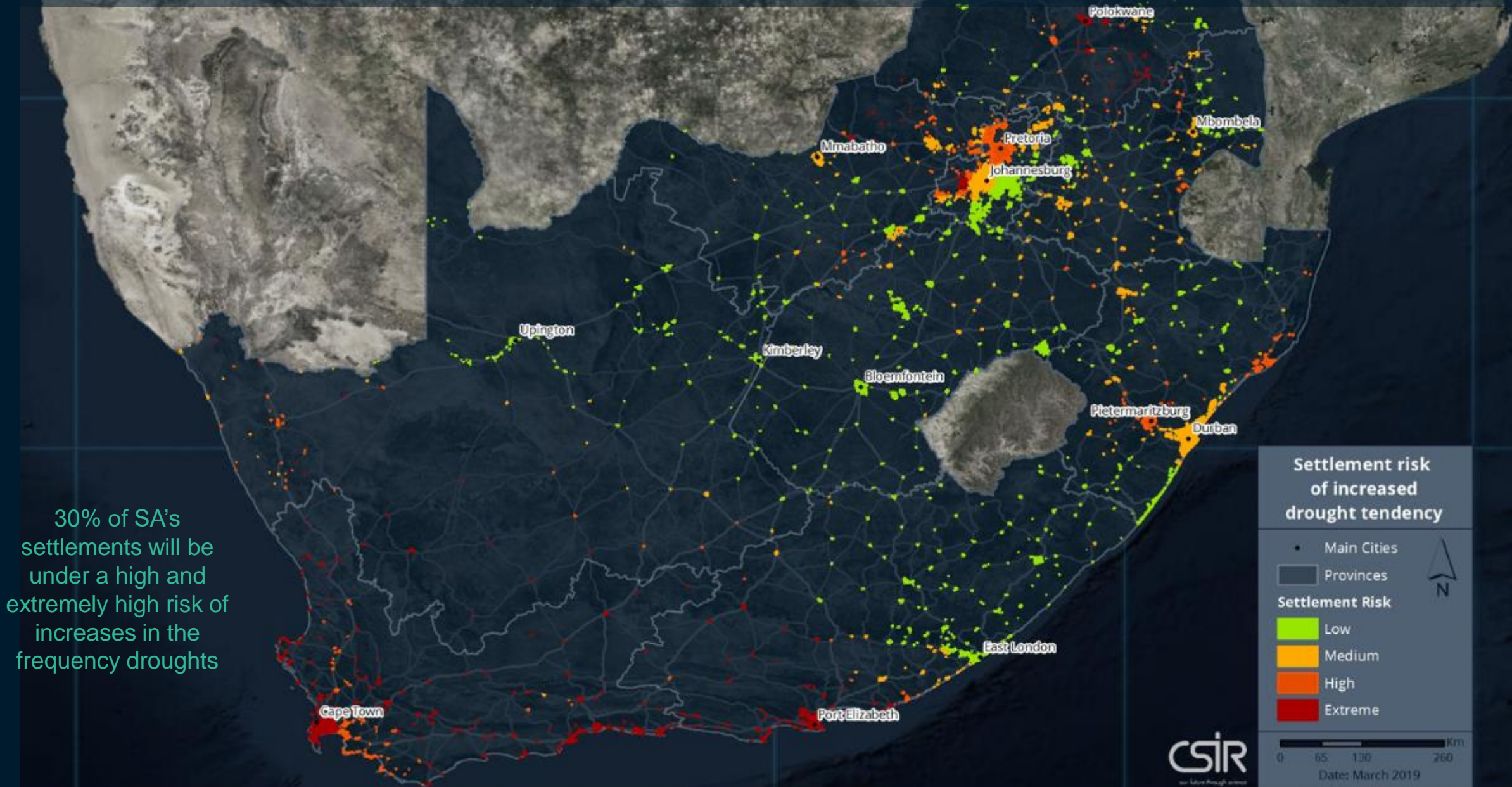
POTENTIAL INCREASE OF POPULATION GROWTH PRESSURE IN SETTLEMENTS BY 2050 (RELATIVE GROWTH)



POTENTIAL INCREASE IN EXPOSURE OF SETTLEMENTS TO HEAT EXTREMES BY 2050



POTENTIAL INCREASE IN EXPOSURE OF SETTLEMENTS TO DROUGHT TENDENCIES BY 2050



30% of SA's settlements will be under a high and extremely high risk of increases in the frequency droughts

Settlement risk of increased drought tendency

- Main Cities
- ▭ Provinces

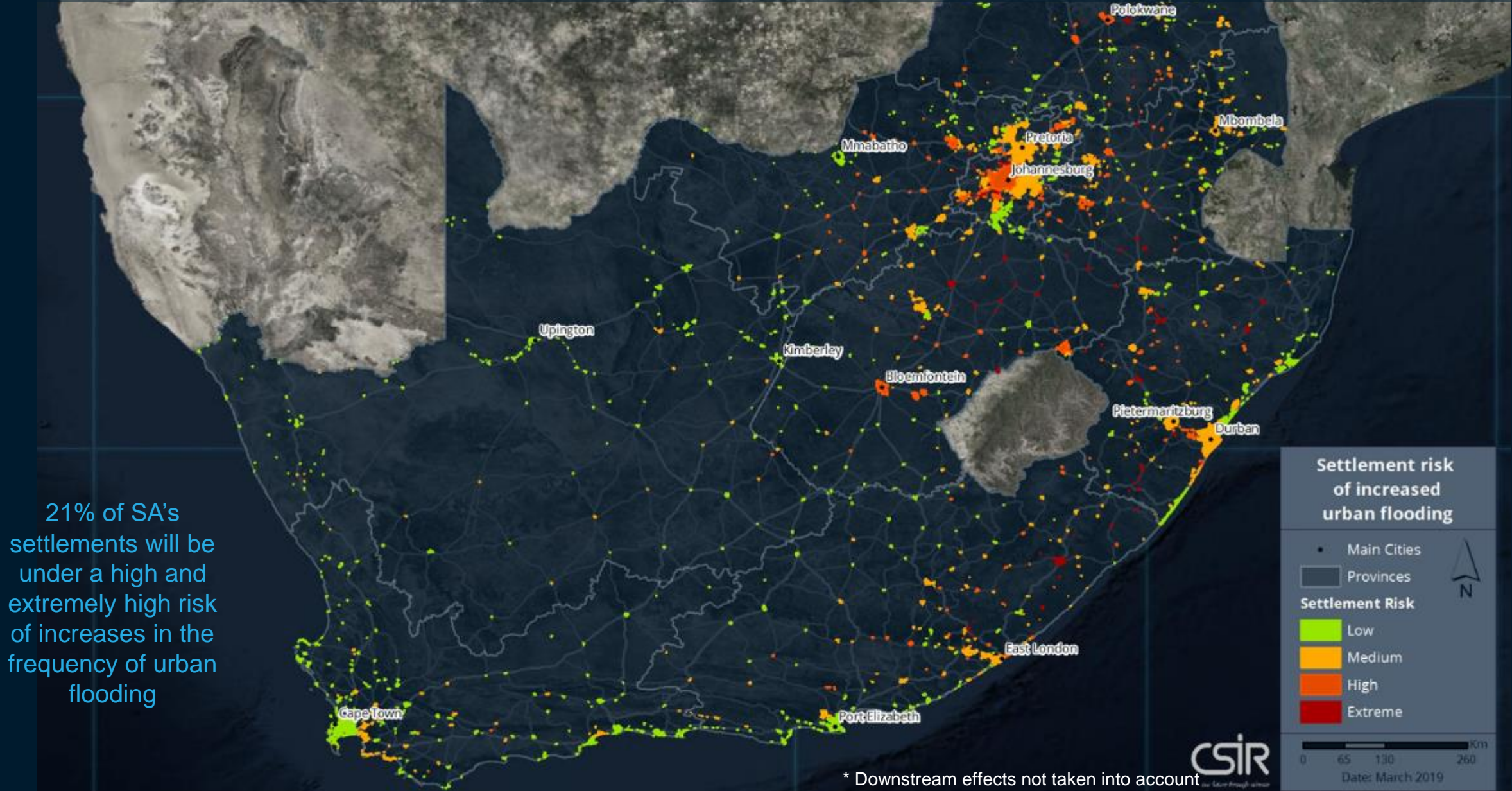
Settlement Risk

- Low
- Medium
- High
- Extreme

0 65 130 260 Km

Date: March 2019

POTENTIAL INCREASE IN EXPOSURE OF SETTLEMENTS TO SURFACE WATER FLOODING BY 2050



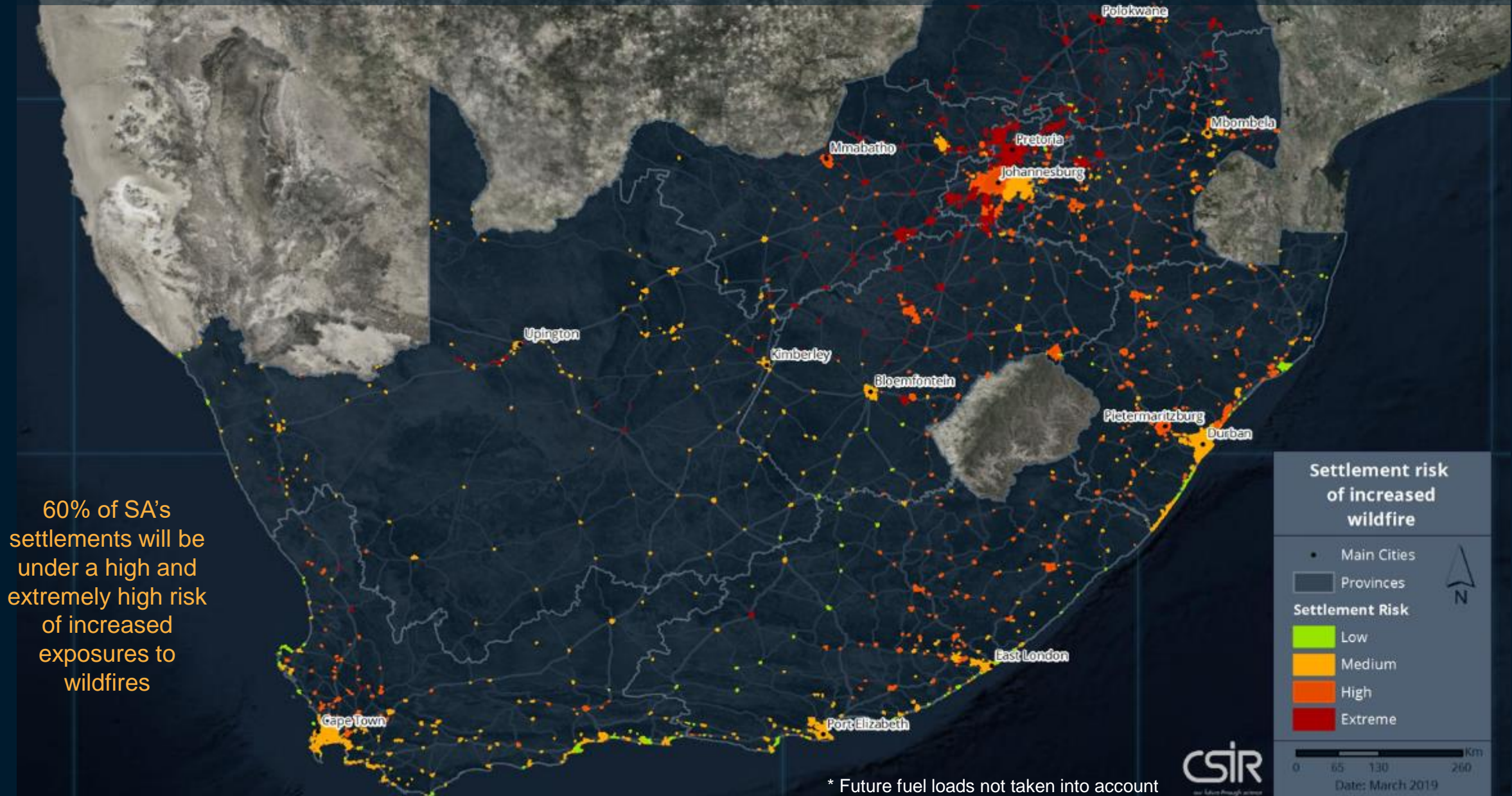
21% of SA's settlements will be under a high and extremely high risk of increases in the frequency of urban flooding

* Downstream effects not taken into account



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Date: March 2019

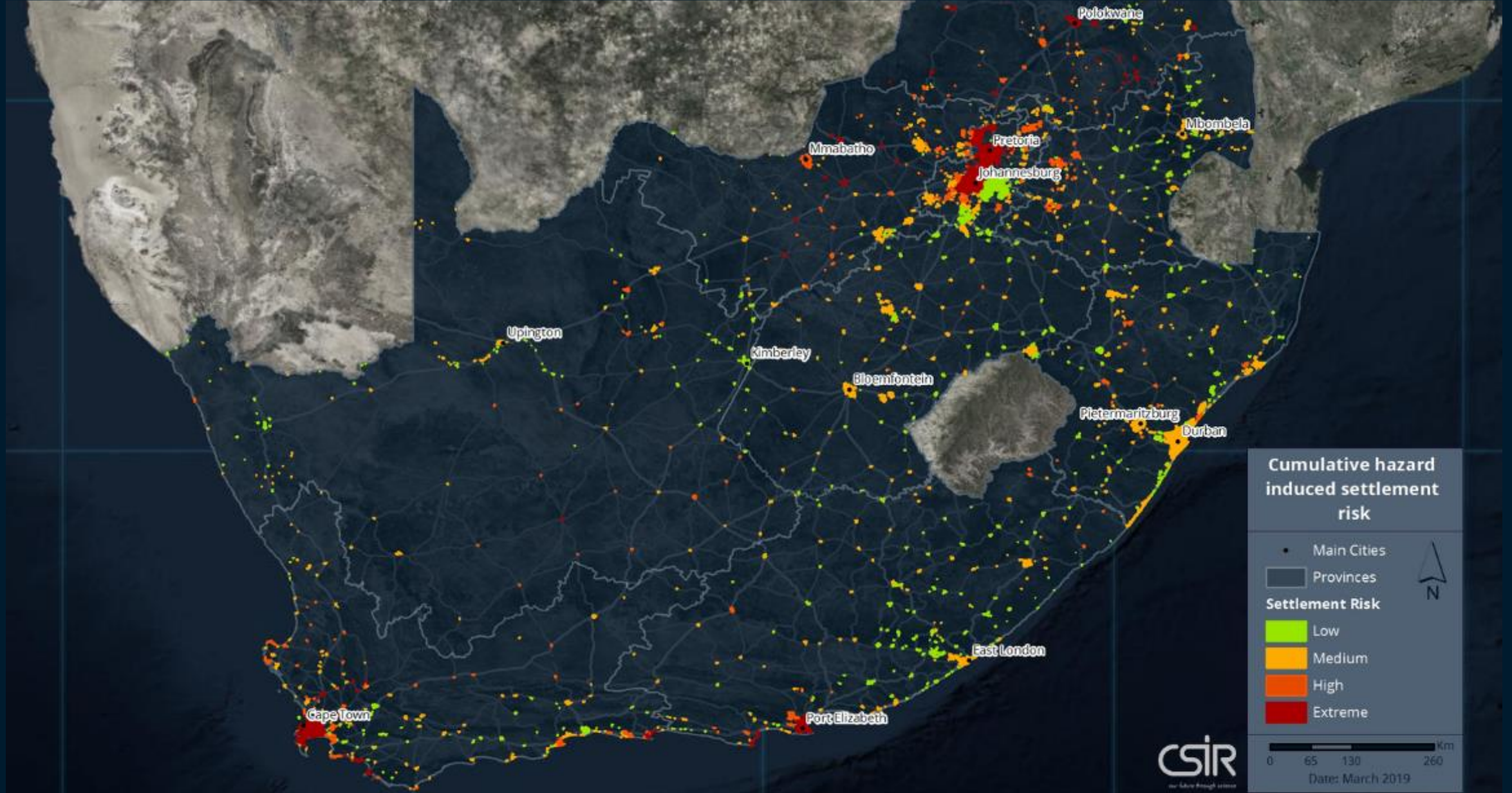
POTENTIAL INCREASE IN EXPOSURE OF SETTLEMENTS TO WILDFIRES BY 2050



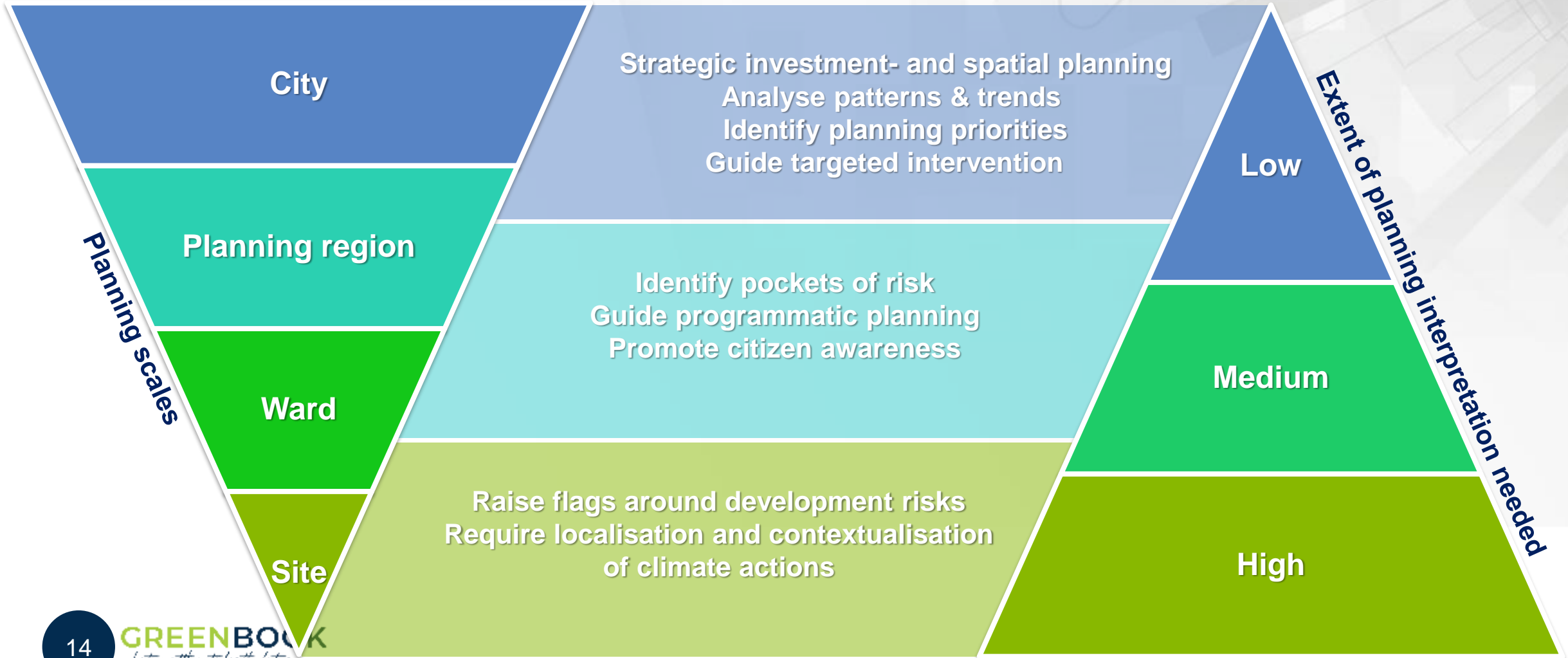
* Future fuel loads not taken into account



POTENTIAL INCREASE IN POPULATION GROWTH PRESSURE + EXPOSURE OF SETTLEMENTS TO MULTIPLE CLIMATE-RELATED HAZARDS BY 2050



APPLICATION POTENTIAL OF THE GREENBOOK



APPLICATION POTENTIAL OF THE GREENBOOK



- Collectively, these components strengthen the capacity of the State to develop resilient settlements in the face of climate change.
- The climate risk data, maps, and information in the GreenBook raise awareness among local municipalities about current and future (2050) climatic changes in South Africa.
- It fosters a shared understanding of the potential climate impacts on settlements and the critical decisions needed to respond effectively.
- Spatialised climate-related risk and vulnerability data guide long-term strategic planning, decision-making, investment targeting, and spatial- and land-use planning.
- This data anchors the adaptation process in scientific evidence, highlighting the climate risks each municipality in South Africa is likely to face by 2050.

APPLICATION POTENTIAL OF THE GREENBOOK



- The GreenBook offers local municipalities a range of strategies and actions to address climate risks.
- It provides guidance on mainstreaming climate considerations into local plans and tools, and on integrating data with actionable steps.
- The MetroView tool further supports climate-responsive, spatially targeted planning and investment in complex metropolitan cities.
- It is a valuable resource for training and raising awareness across city departments, and it serves as key evidence for developing Climate Response Strategies or Climate Action Plans.
- Expert interpretation and contextualisation are essential to link specific spaces or risk zones with appropriate actions or interventions for effective implementation.



GREENBOOK

adapting settlements for the future

www.greenbook.co.za

The GreenBook supports government in South Africa with adapting settlements to the impacts of climate change by providing an online repository of downscaled, baseline and future, municipal climate risk data and insights as well as adaptation information to be integrated into broader settlement planning.

[YOUR GUIDE TO THE GREENBOOK](#)

[A CALL TO ACTION](#)

The background is a dark blue gradient with abstract white and light blue geometric shapes, including circles, lines, and a grid pattern, creating a modern, digital aesthetic.

Thank you for your attention!
www.greenbook.co.za

MEASURABLE IMPACT OF THE GREENBOOK



- 38 data requests from consultants, government departments, students etc.
- 24 district municipalities trained on the GreenBook (108 local municipalities).
- 14 district municipalities received planning support (66 local municipalities).
- 17 local municipalities received planning support (GIZ project)
- 3 MetroView profiles developed.
- 24 academic journal article citations.
- 23 strategies, reports, and plans referencing the GreenBook.
- 77K website visits.