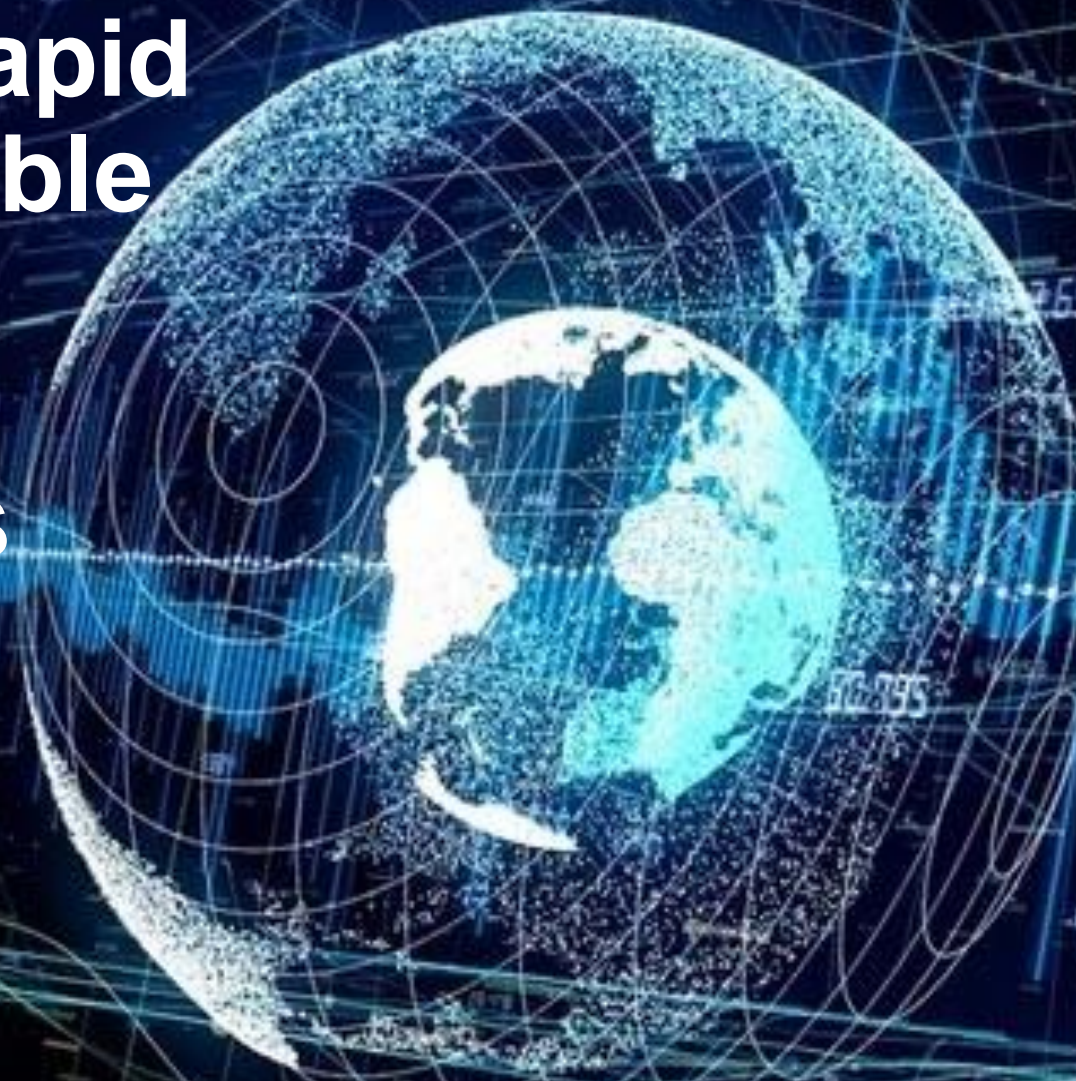


SPACE for NATIONAL DEVELOPMENT

RReTool: Rapid and repeatable tools for monitoring ecosystems



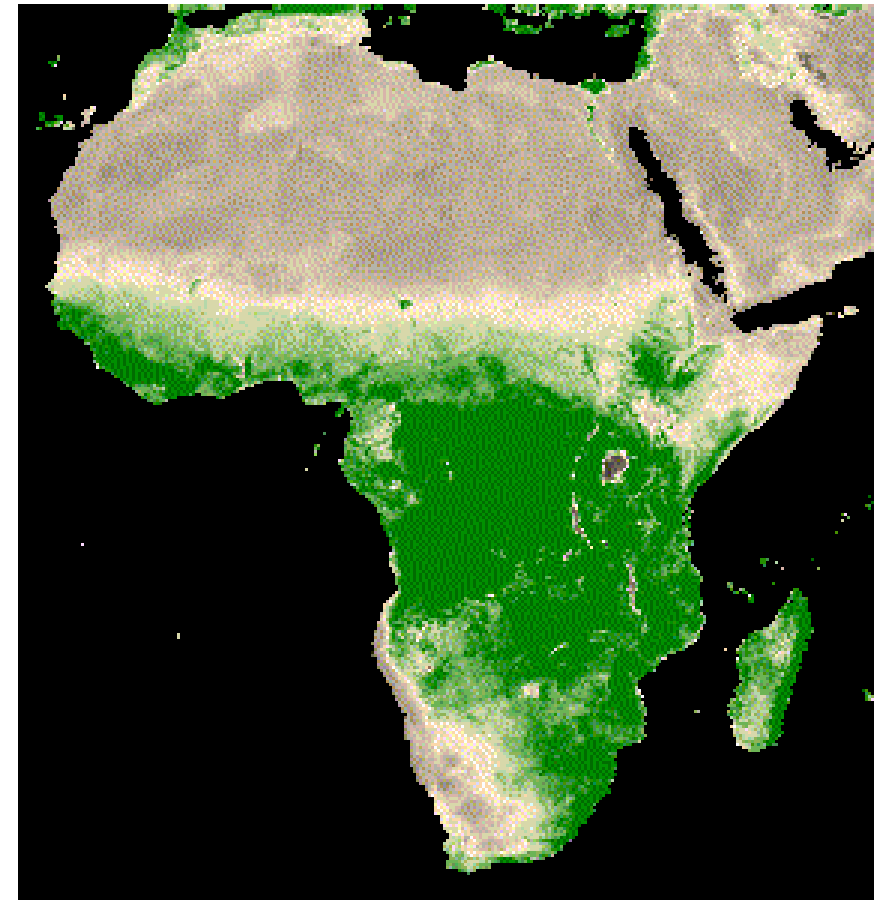
The logo for the National Research Foundation (NRF) features a stylized figure with arms raised, next to the text 'NRF National Research Foundation'. To its right is a large '20' with '1999-2019' underneath. Further right is the logo for SAEON (South African Environmental Observation Network), consisting of the text 'SAEON' above 'South African Environmental Observation Network'.

Jasper Slingsby
Glenn Moncrieff
Vernon Visser
Many Others...

RReTool: Rapid and repeatable tools for monitoring

National and regional requirements:

- Ecosystem threat assessments
 - How much is left?
- Environmental compliance
 - e.g. illegal land cover change
- Protecting water source areas
 - Especially invasive alien species
- Conservation management
- Global change monitoring



RReTool: Rapid and repeatable for monitoring

National and regional requirements:

- Ecosystem threats
 - How many
- Environmental monitoring
 - e.g. illegal mining
- Protecting natural resources
 - Especially water
- Conservation
- Global change

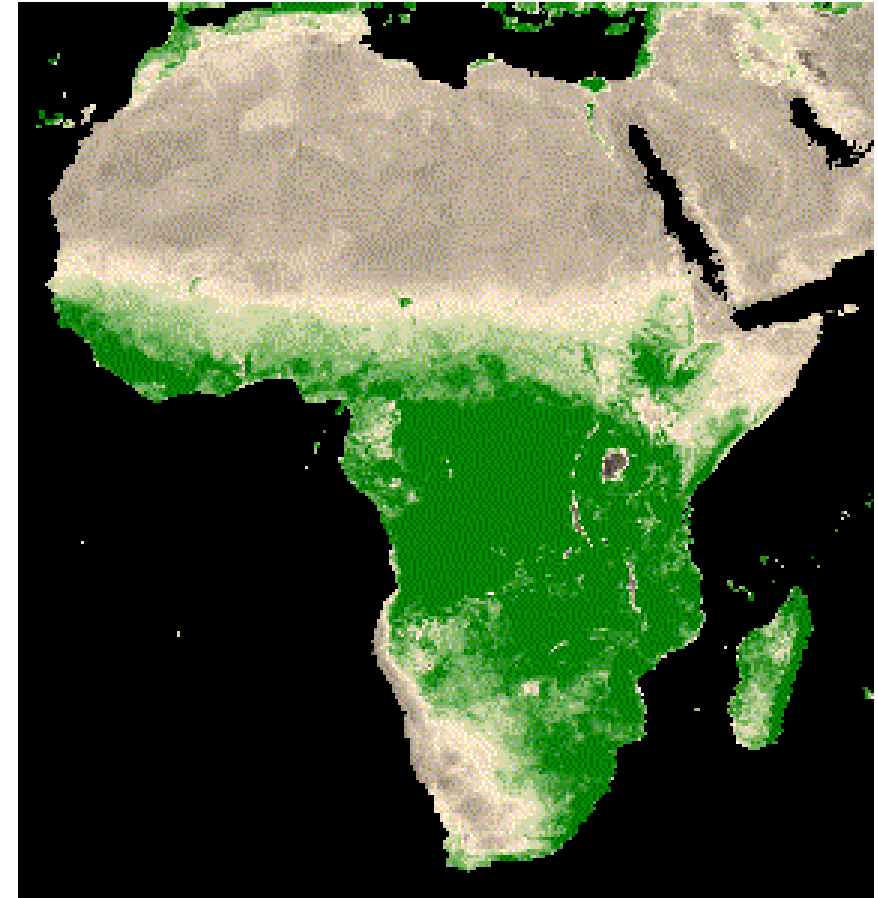
**WE NEED IT NOW!!!
AND
A NEW ONE TOMORROW
AND
THE NEXT DAY ...**



RReTool: Rapid and repeatable tools for monitoring

Our approach:

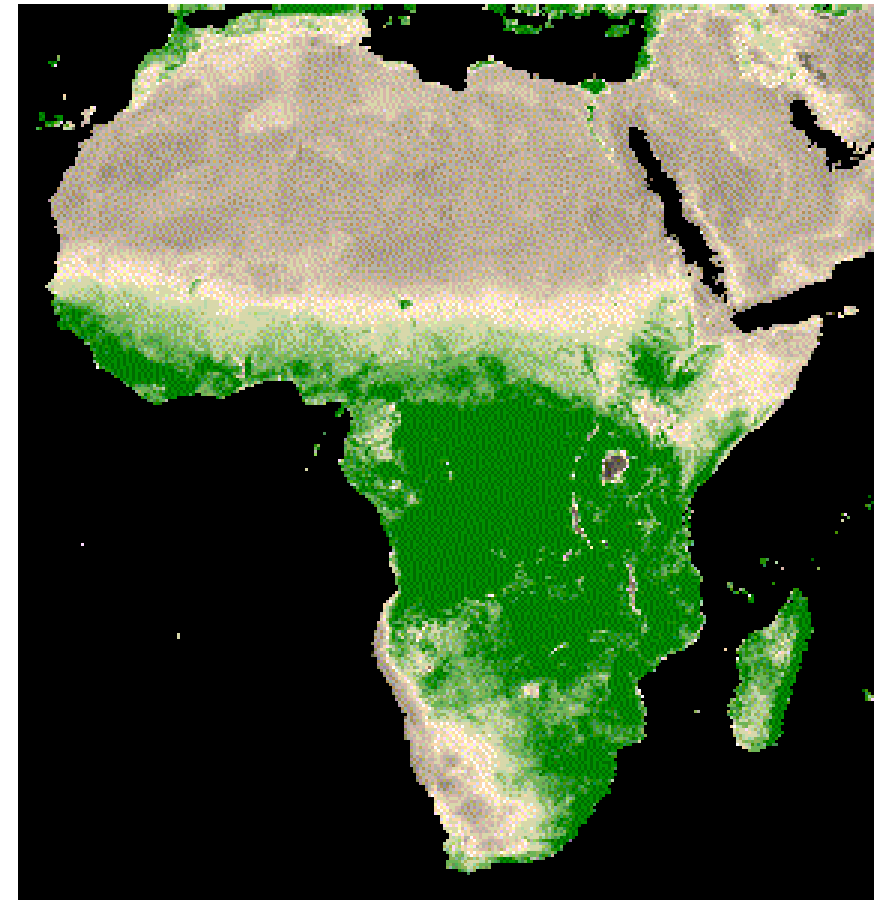
- Repeatable
 - By a non-expert
- Open
 - Free tools
 - Free code
 - Free data
- Partnerships
 - Government
 - Conservation agencies
 - Civil society



RReTool: Rapid and repeatable tools for monitoring

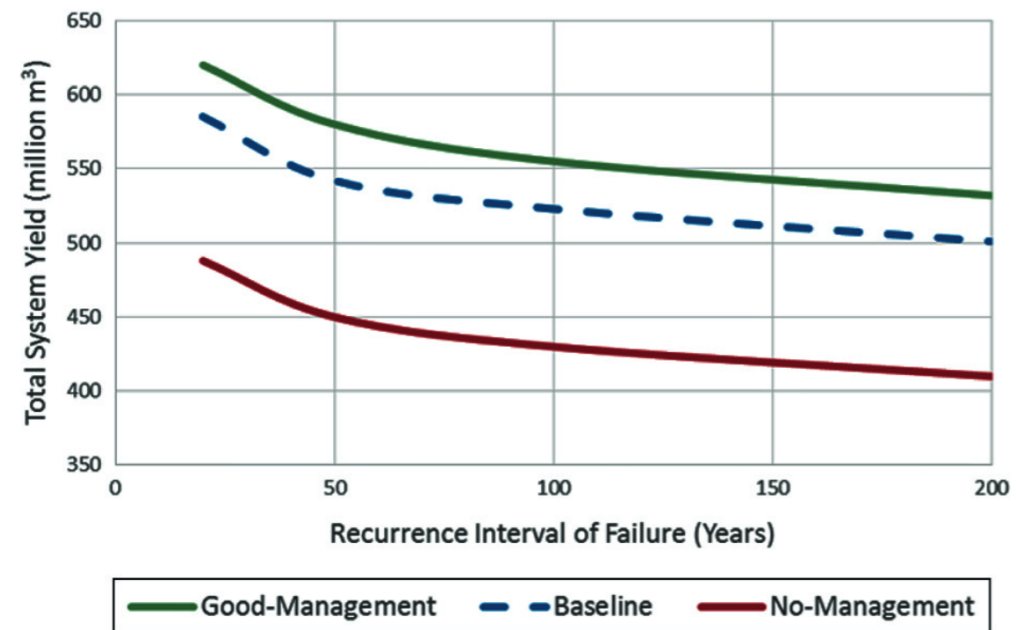
Key projects:

- Change detection:
 - Renosterveld
 - Thicket
 - Fynbos
- Invasive species
 - WCWSS (i.e. water for Cape Town etc)
 - High altitude grasslands



Mapping invasive species: Western Cape Water Supply System (WCWSS)

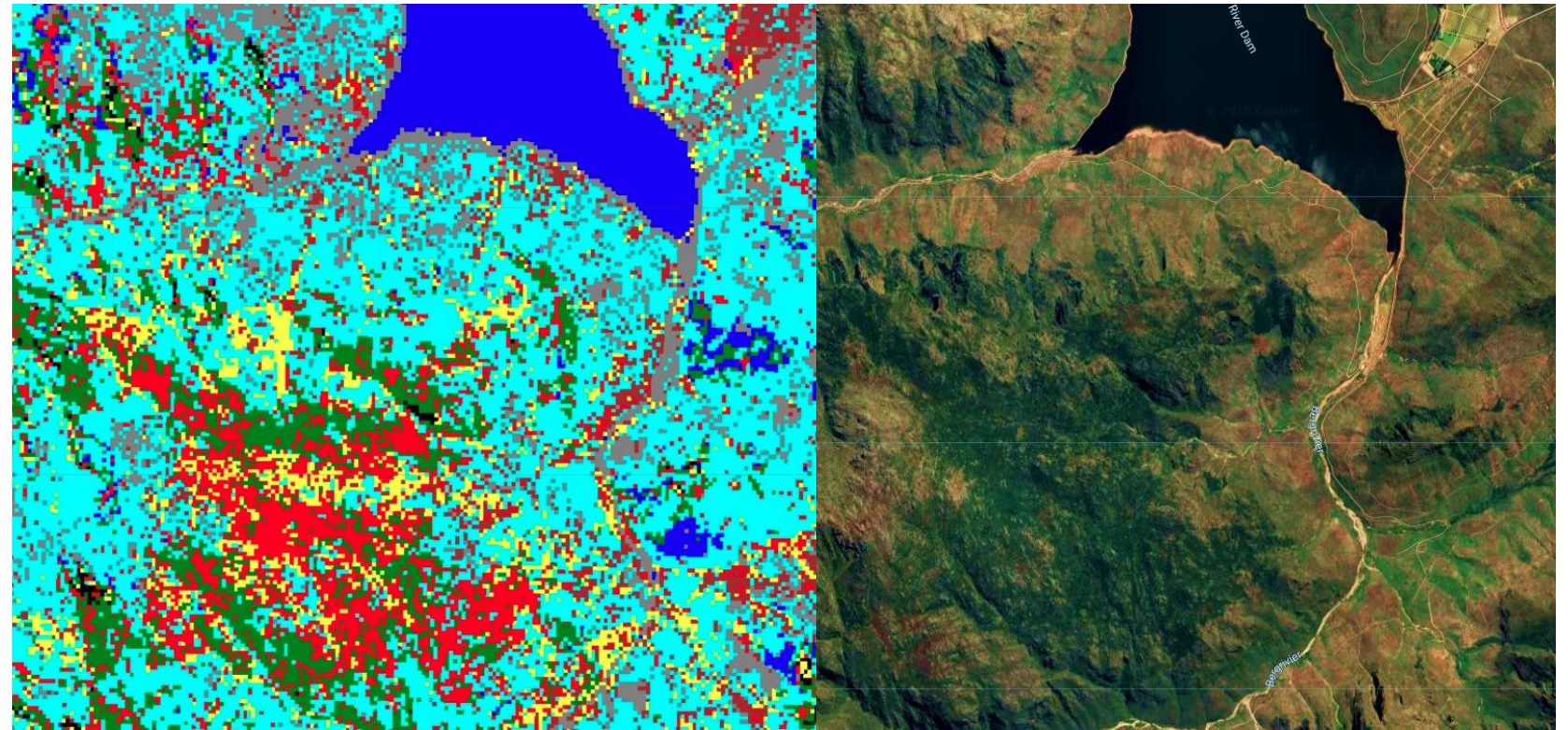
- Invasive plants reduce assured water yield from the WCWSS
 - Current: >38 million m³/year
 - Future: ~130 million m³/year if not managed (~25%!!!)
- Mapping needed to estimate losses and prioritize clearing efforts



Le Maitre et al. 2019 WaterSA

Mapping invasive species: Western Cape Water Supply System (WCWSS)

- Repeatable workflow for mapping density by species at 10m (Sentinel)
- Includes updating cal/val data

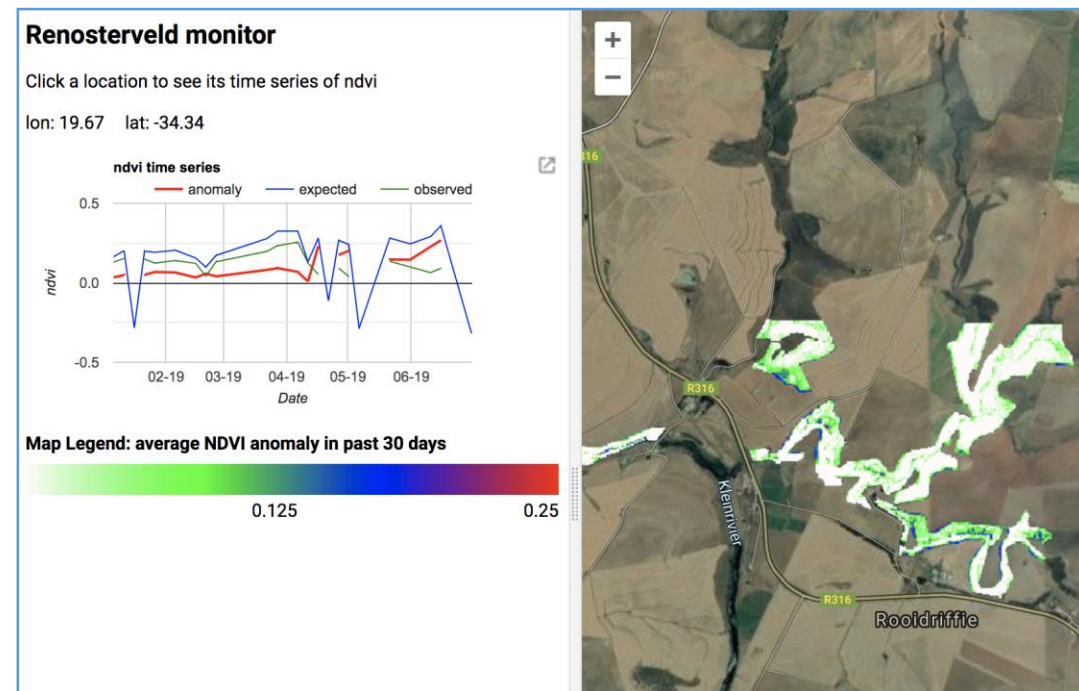


Near-real time change detection: Overberg Renosterveld

- Critically Endangered ecosystems with 5-10% left
- Fastest rate of loss in South Africa
- Ploughing is rife and poorly policed
 - Capacity
 - Awareness
 - Access to farms



Near-real time change detection: Overberg Renosterveld



Partners:

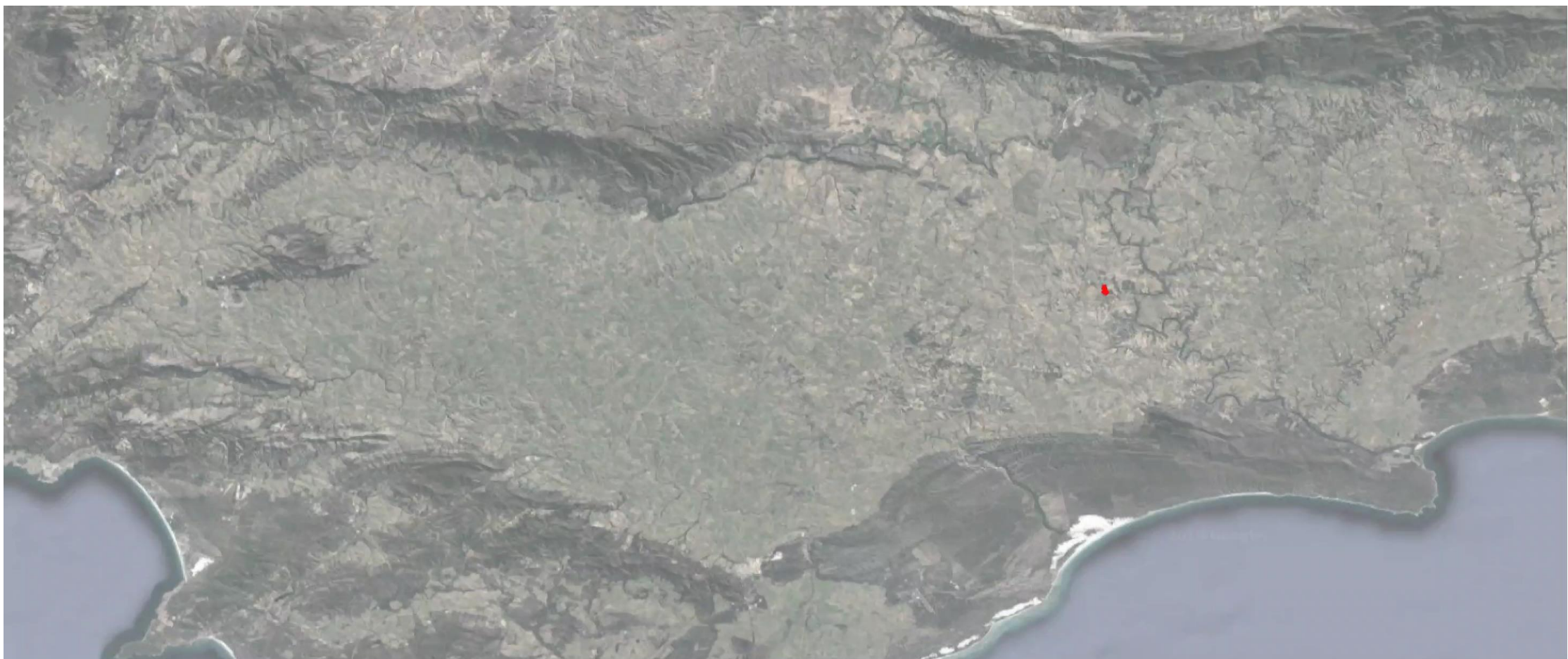


**Western Cape
Government**

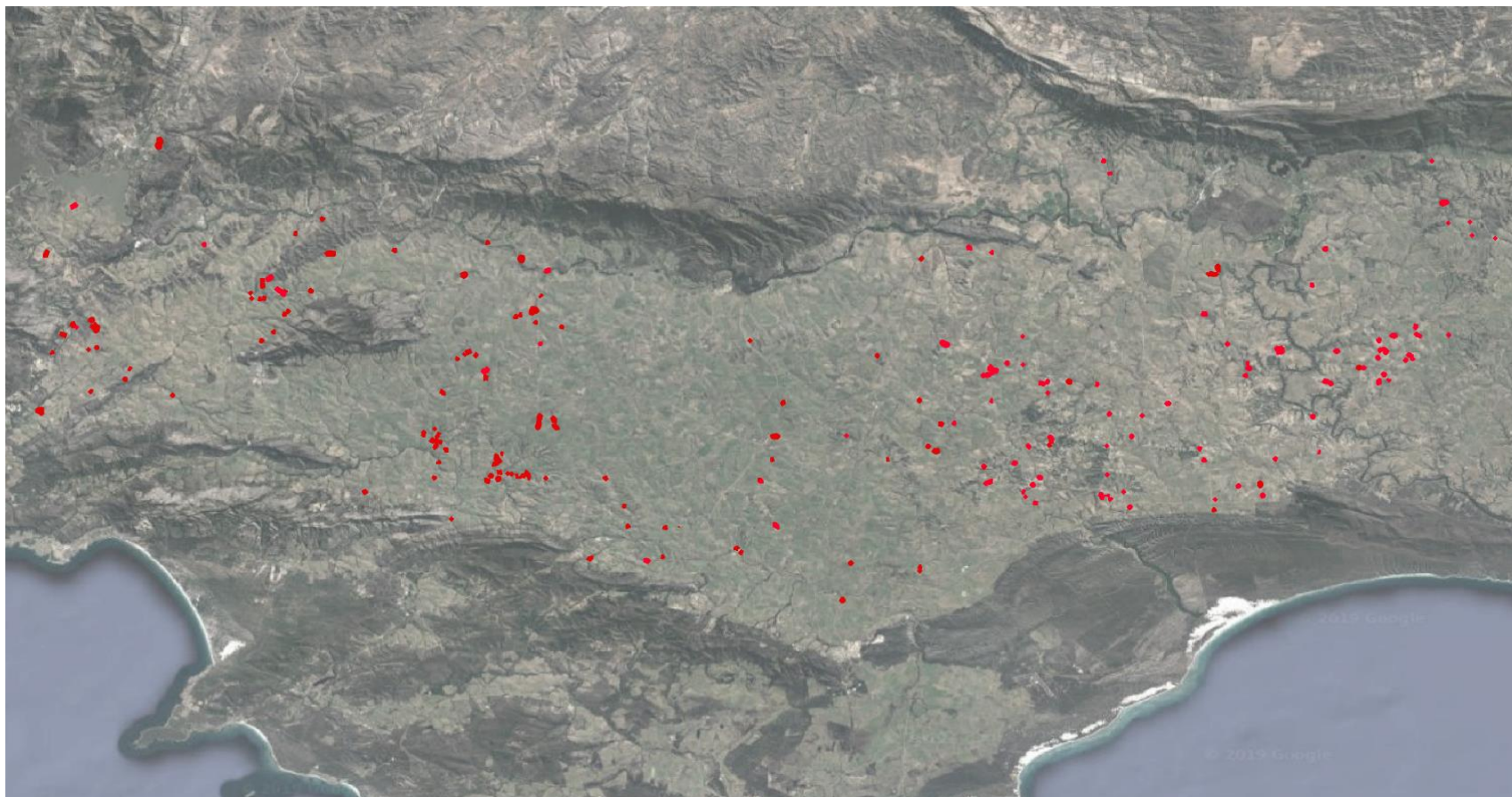
Environmental Affairs and
Development Planning



Near-real time change detection: Renosterveld



Near-real time change detection: Renosterveld



2016 to 2019:

- 326 incidents, 480 Hectares
- 8% of remaining ecosystems! (0.6% of original)

Acknowledgements

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Many to thank!!!



Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA