

TRIGNET: STATUS OF SOUTH AFRICA'S GNSS BASE STATION NETWORK

***CHIEF DIRECTORATE: NATIONAL GEOSPATIAL INFORMATION
(CDNGI)***



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CDNGI: ORGANISATIONAL CONTEXT

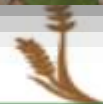
The **Chief Directorate** is located within the **Branch: National Geomatics Management Services (NGMS)**.

The NGMS is a Branch within the **Department of Agriculture, Land Reform and Rural Development**.



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CDNGI: PRODUCTS & SERVICES

- National Control Survey System;
- National Aerial Imagery Acquisition Programme;
- National Topographic Surveying;
- National Digital Elevation Model;
- National Land Cover;
- National and Ancillary Mapping;
- Professional and Advisory Services.



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NATIONAL CONTROL SURVEY NETWORKS

- Precise Levelled network benchmarks – [La](#)
- Trigonometrical Beacons - [Hartebeesthoek](#)
Referenced to the [International Terrestrial Reference Frame 2011](#) ([ITRF 2011](#)), which is 7 March 2011
[Hartebeesthoek radio astronomy telescope's ITRF 1994.0](#) (1 January 1994), were used.
- Town Survey Schemes – ([Horizontal and Vertical](#))
- TrigNet – Continuously Operating Reference Stations ([ITRF 2014 \(2018.18\)](#)), which is 7 March 2018
- SAGeoid2010 Model – [Hybrid Geoid](#).



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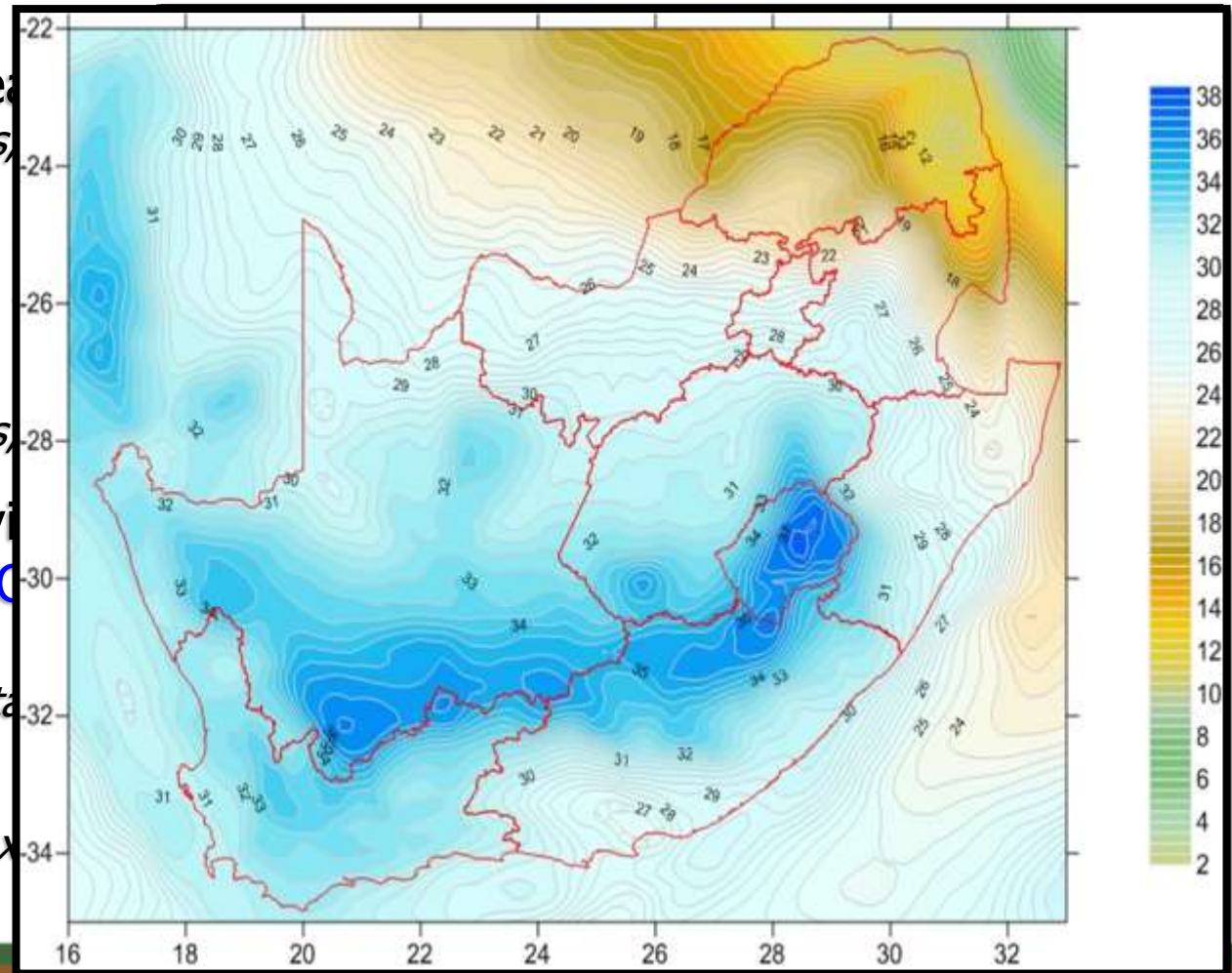
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NATIONAL CONTROL SURVEY NETWORKS

- Trigonometrical Bea
 - 29,437 monuments
- Town Survey Mark
 - 133 TSM Schemes,
- Benchmarks:
 - 20,430 monuments
- TrigNet Global Naviga
 - station network – (CORS):
 - 57+ Operational Sta
- Geoid Model:
 - SAGeoid2010 (2.5' x



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TRIGNET: RSA'S CORS GNSS NETWORK

- Proposed in 1997, approved in 1998 and installation commenced in 1999;
- **1999-2003:** Post Processing data provided **via post and email**;
- **2003-2006:** Post Processing data provided **via FTP website**;
- **2006:** Added **Real-Time data** services, **via internet**.



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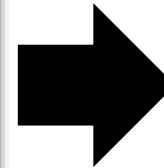
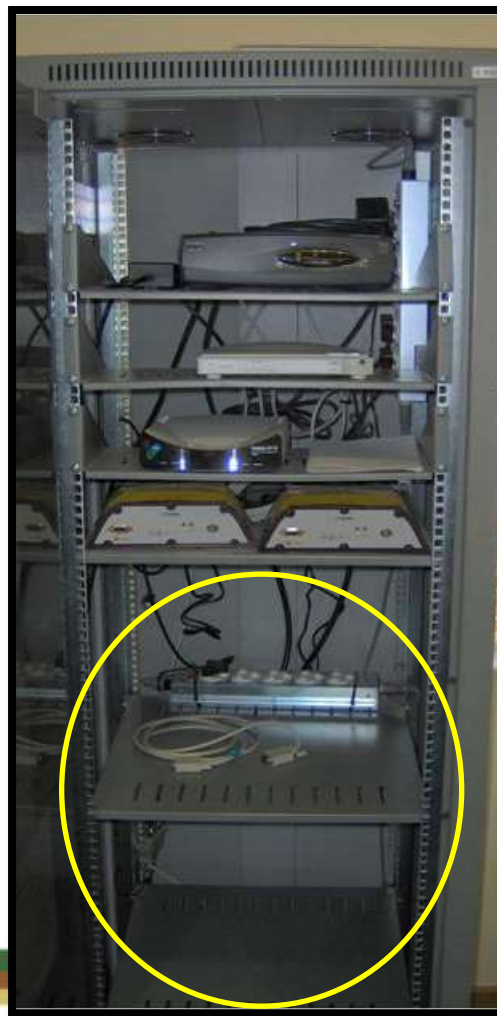
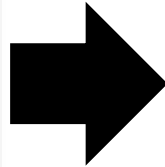


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TRIGNET: TECHNOLOGY EVOLUTION



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TRIGNET: RSA'S CORS GNSS NETWORK

- South Africa's CORS GNSS network, **TrigNet**, will have its data line and internet infrastructure replaced with wireless and fibre in this financial year;
- **TrigNet** stations are being maintained on an ad-hoc basis to ensure the continuity of the service.

www.trignet.co.za and <ftp://ftp.trignet.co.za>



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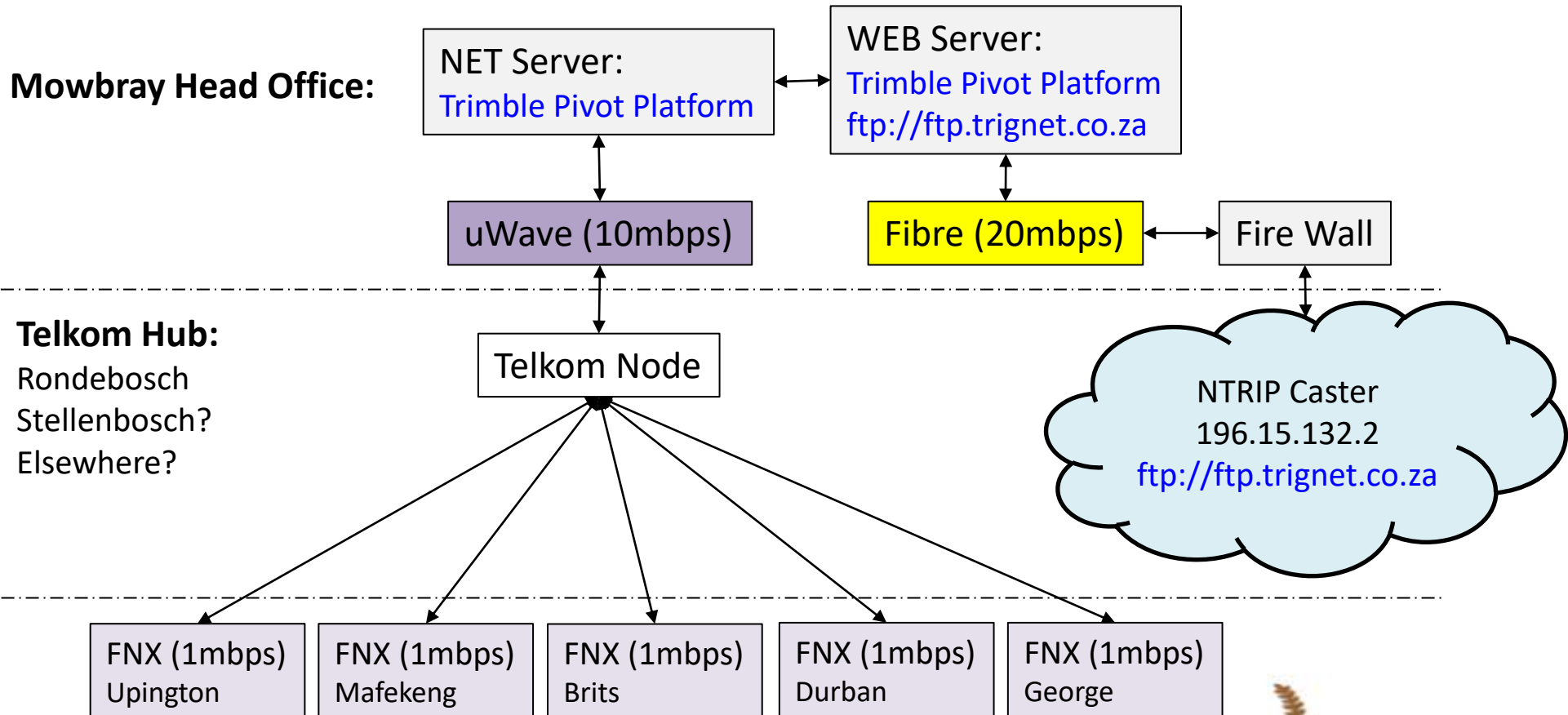


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TRIGNET: RSA'S CORS GNSS NETWORK



Remote TrigNet sites (68):



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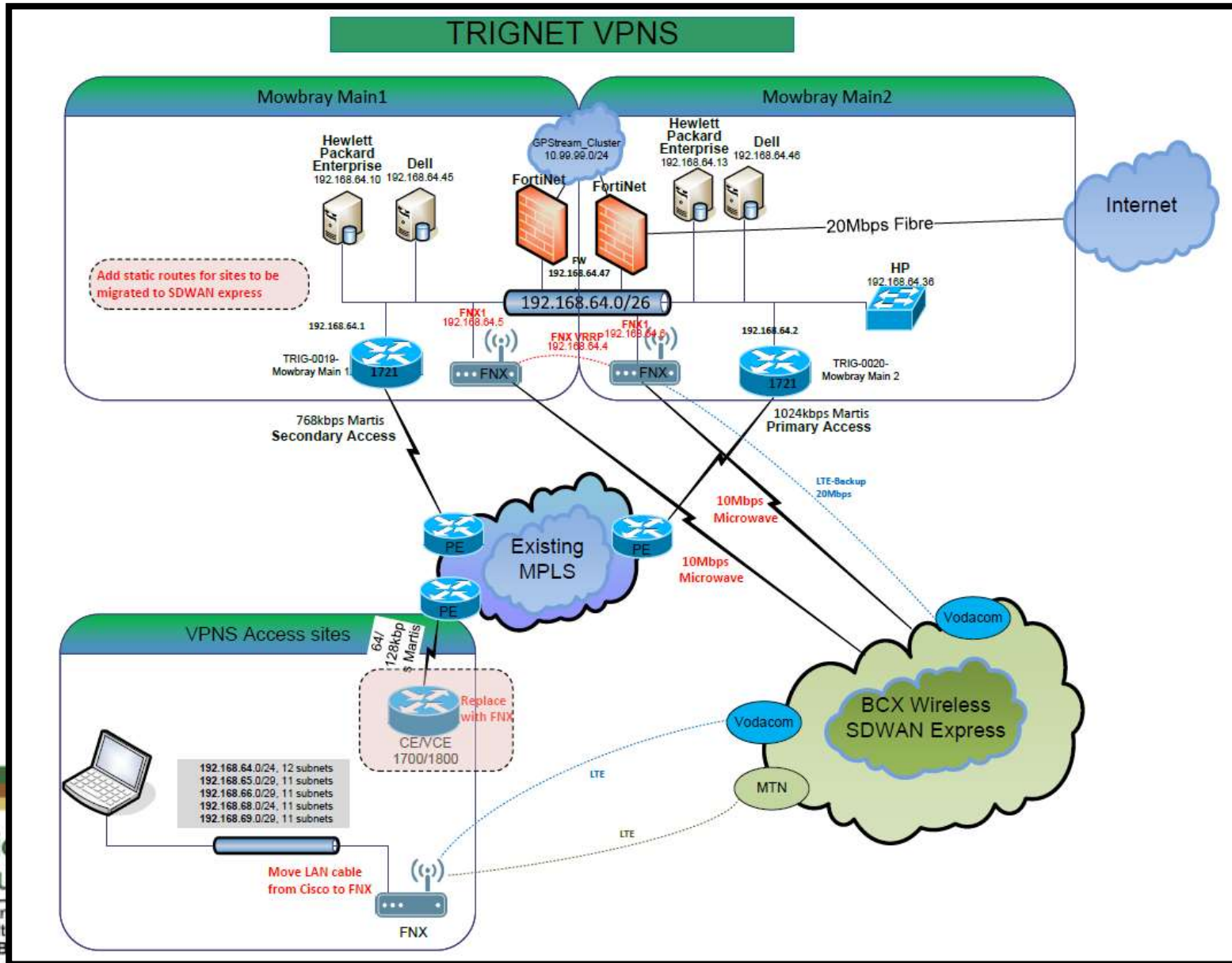


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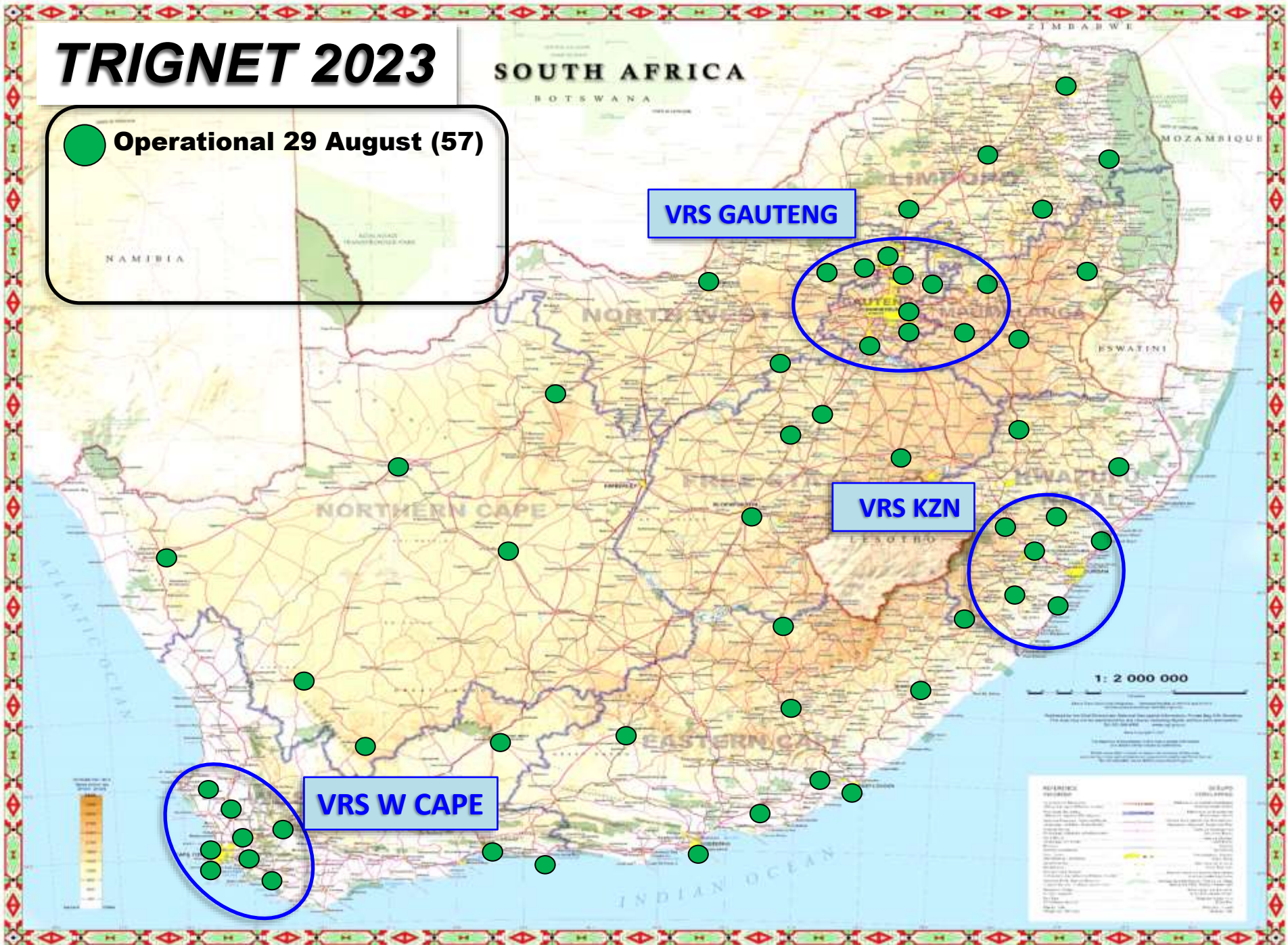
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TRIGNET: RSA'S CORS GNSS NETWORK



TRIGNET 2023

 Operational 29 August (57)



VRS GAUTENG

VRS KZN

VRS W CAPE

TRIGNET 2023



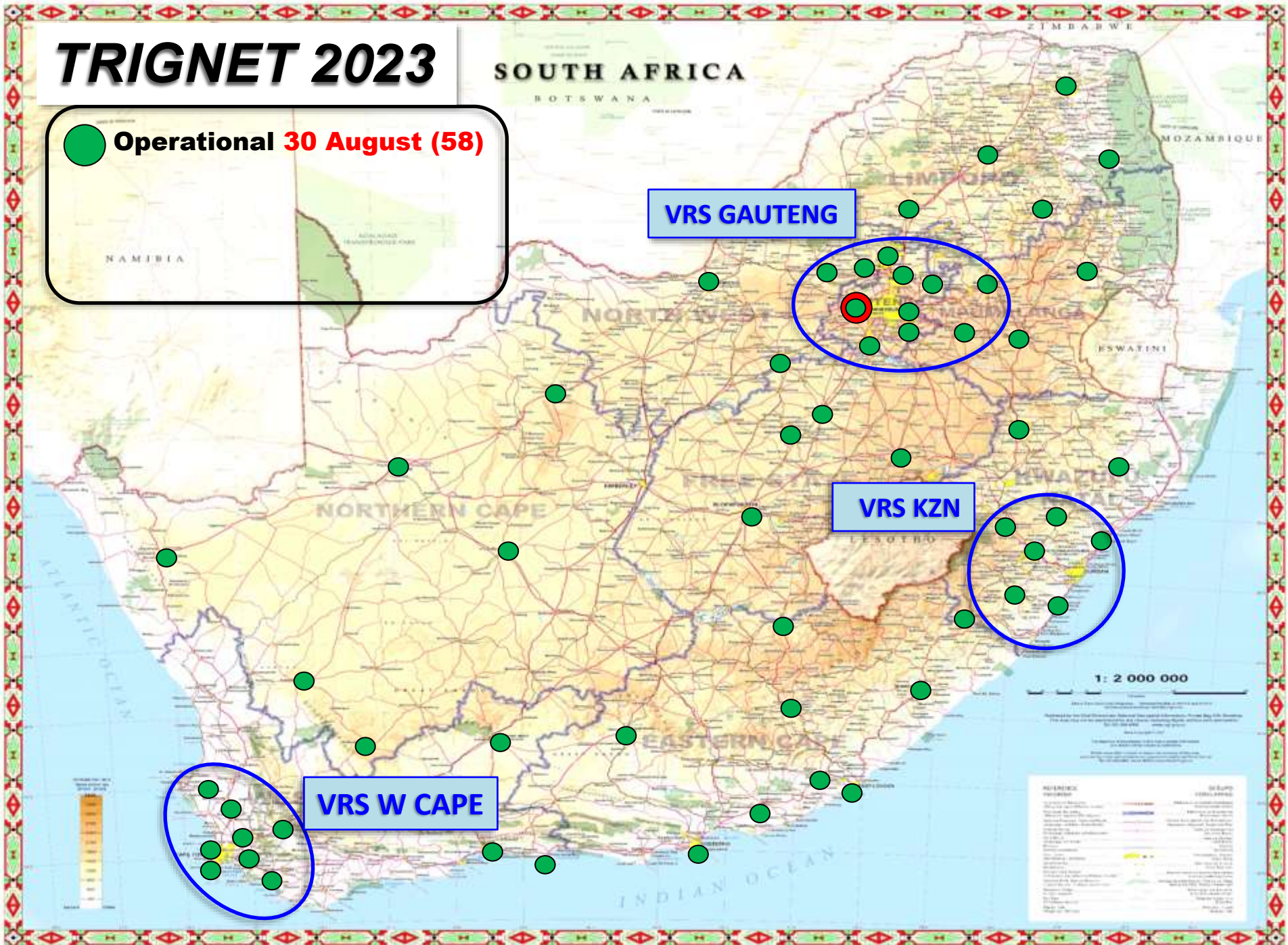
Operational 30 August (58)

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VRS GAUTENG

VRS KZN

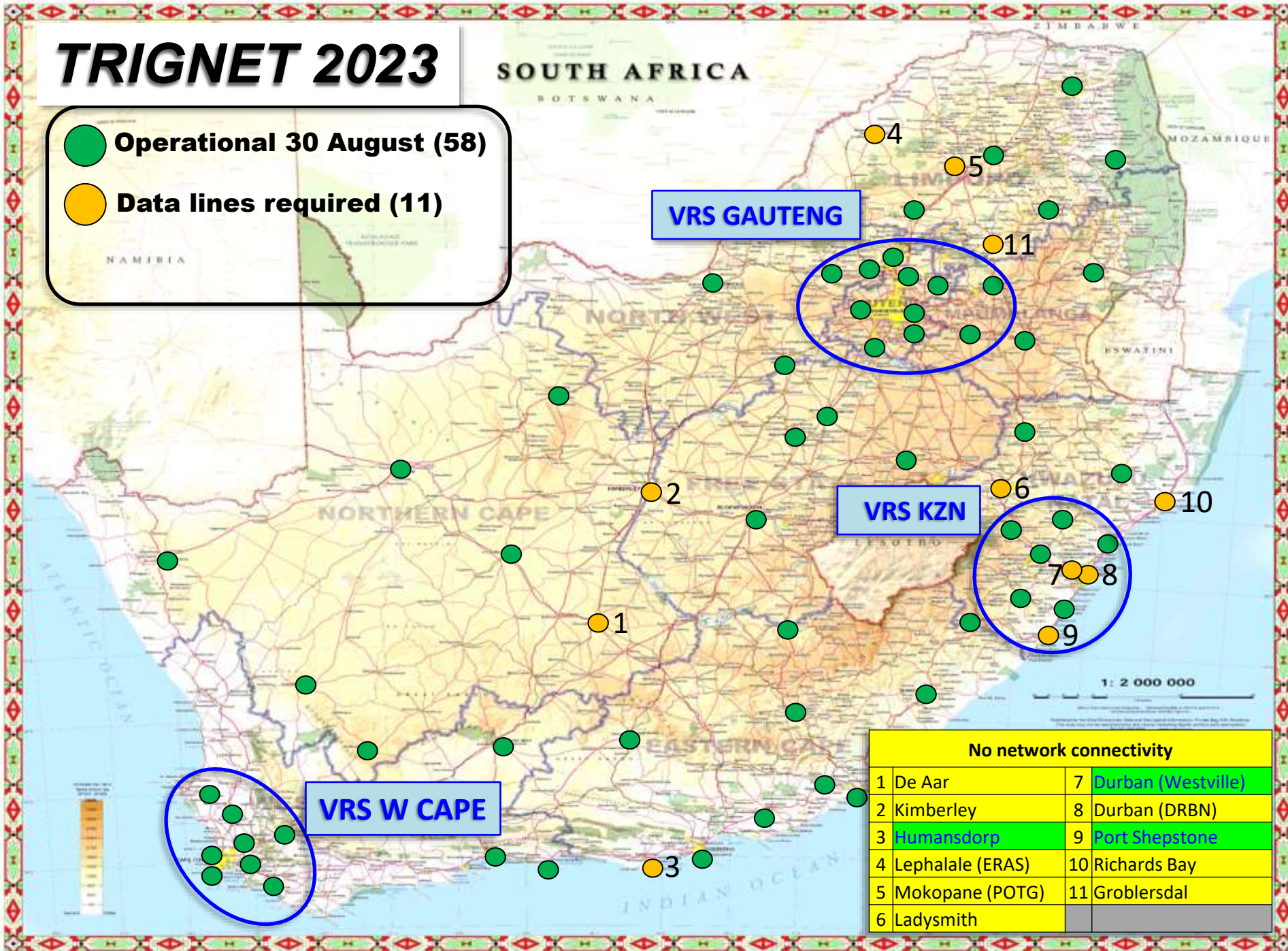
VRS W CAPE



TRIGNET 2023

Operational 30 August (58)

Data lines required (11)



No network connectivity	
1 De Aar	7 Durban (Westville)
2 Kimberley	8 Durban (DRBN)
3 Humansdorp	9 Port Shepstone
4 Lephalale (ERAS)	10 Richards Bay
5 Mokopane (POTG)	11 Groblersdal
6 Ladysmith	

TRIGNET 2023/4

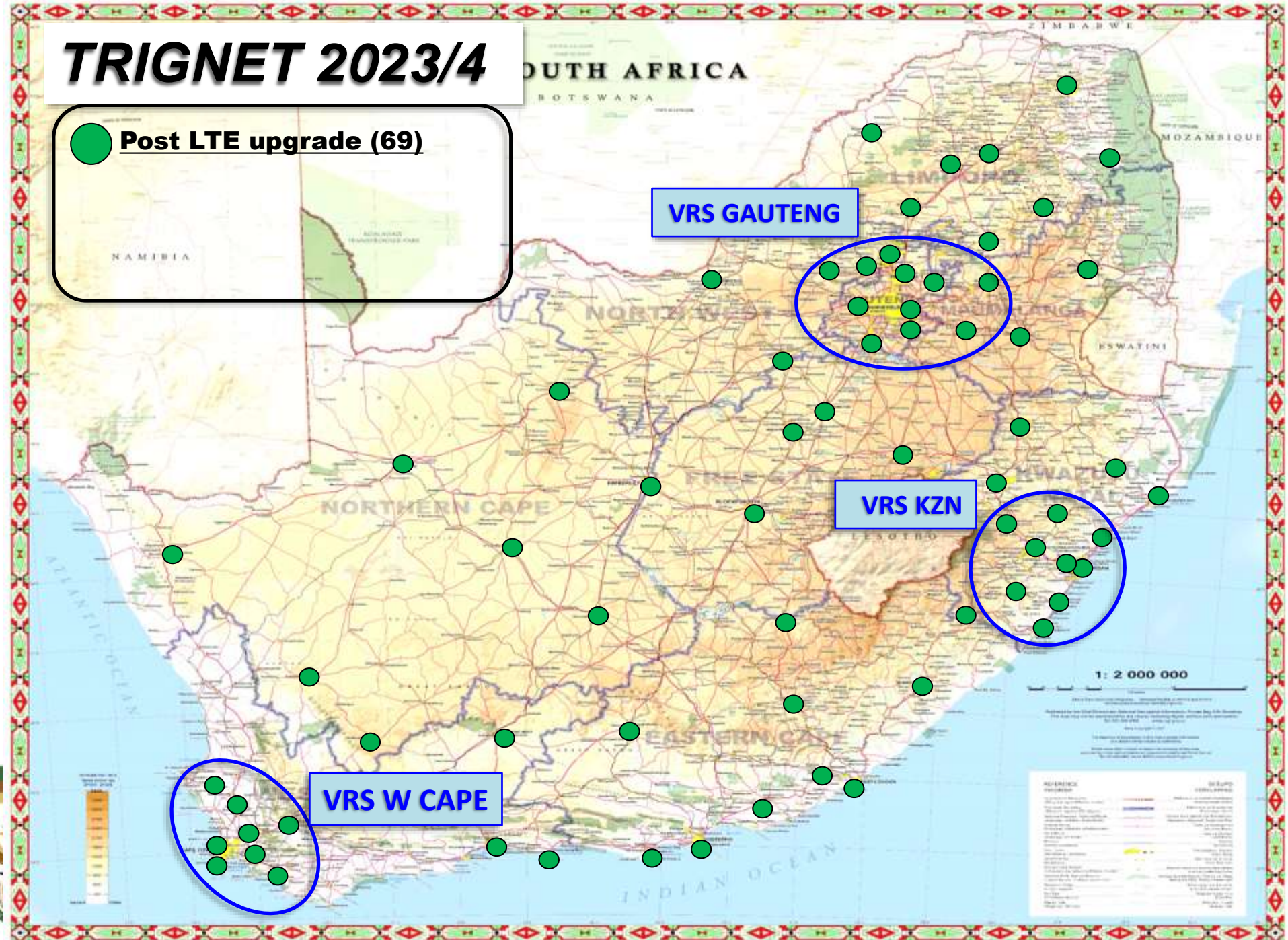


Post LTE upgrade (69)

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TRIGNET 2024...

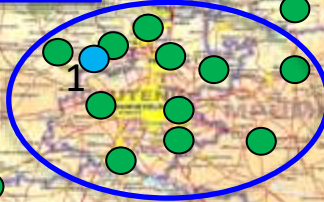


Operational (69)



Proposed sites (10)

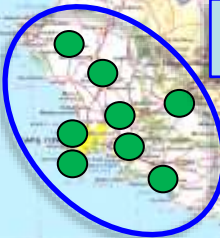
VRS GAUTENG



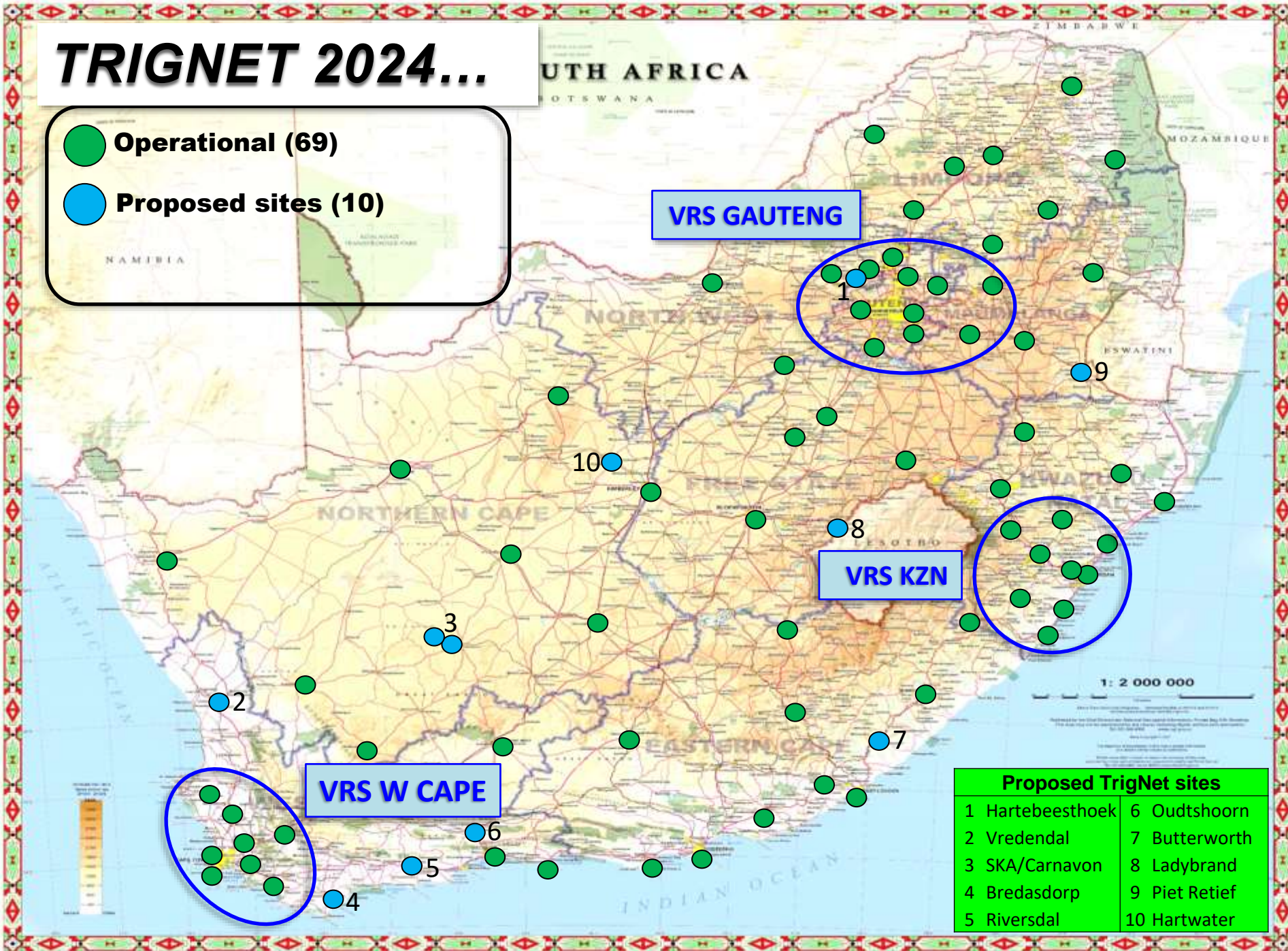
VRS KZN



VRS W CAPE

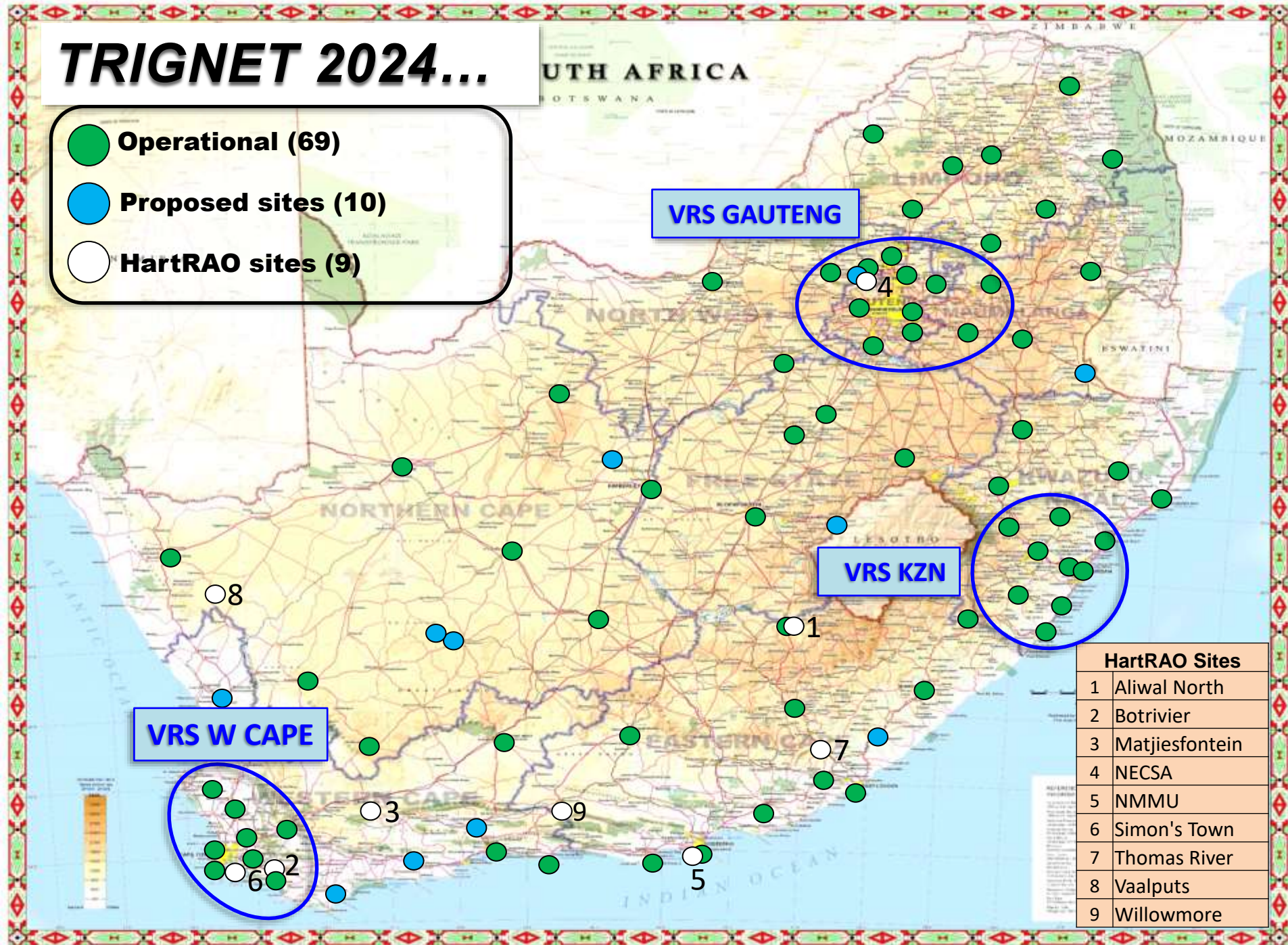


Proposed TrigNet sites	
1 Hartebeesthoek	6 Oudtshoorn
2 Vredendal	7 Butterworth
3 SKA/Carnavon	8 Ladybrand
4 Bredasdorp	9 Piet Retief
5 Riversdal	10 Hartwater



TRIGNET 2024...

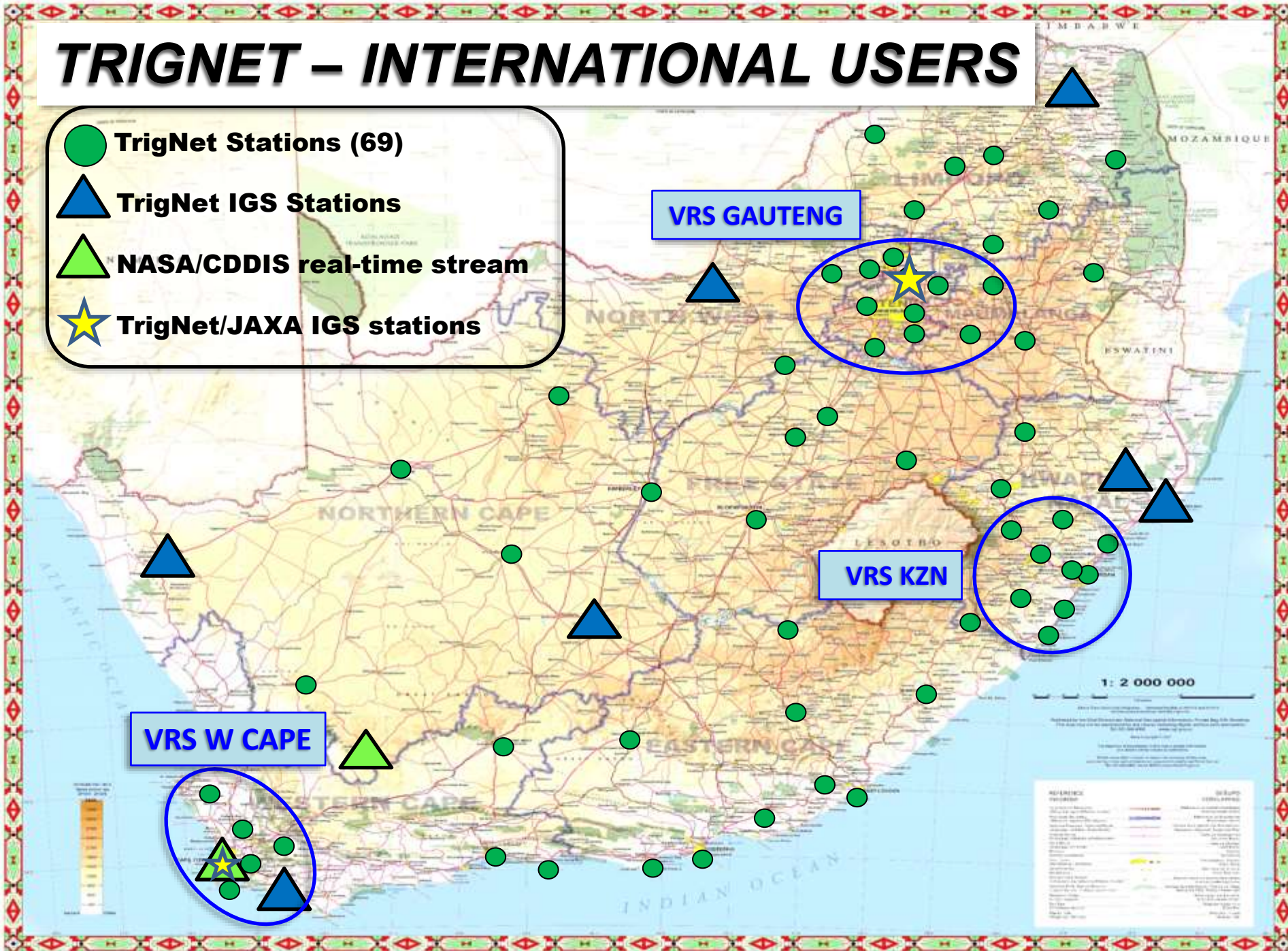
- Operational (69)
- Proposed sites (10)
- HartRAO sites (9)



HartRAO Sites	
1	Aliwal North
2	Botrivier
3	Matjiesfontein
4	NECSA
5	NMMU
6	Simon's Town
7	Thomas River
8	Vaalputs
9	Willowmore

TRIGNET – INTERNATIONAL USERS

- TrigNet Stations (69)
- ▲ TrigNet IGS Stations
- ▲ NASA/CDDIS real-time stream
- ★ TrigNet/JAXA IGS stations



TRIGNET – NATIONAL USERS (SANSA)



TrigNet Stations (69)

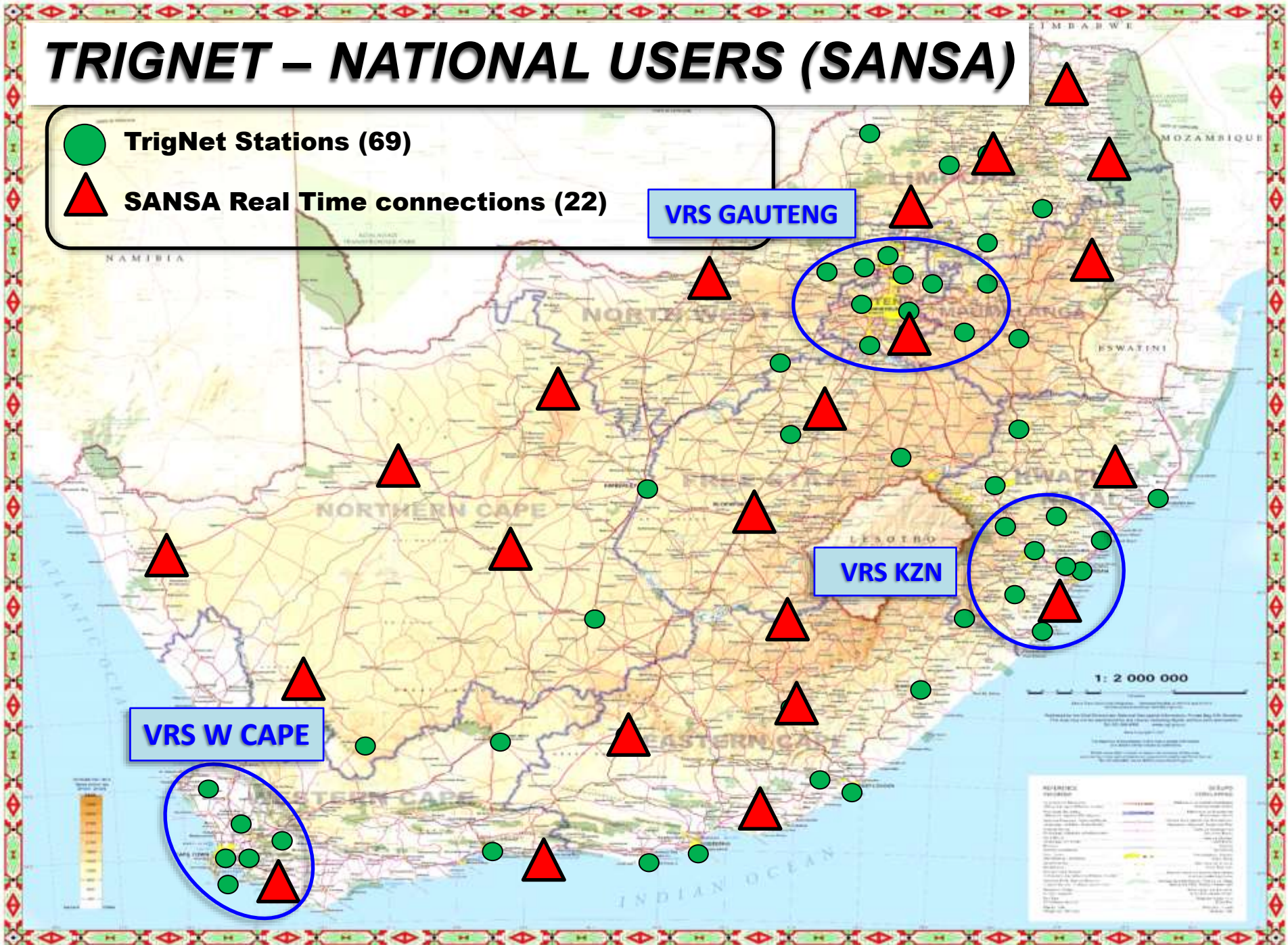


SANSA Real Time connections (22)

VRS GAUTENG

VRS KZN

VRS W CAPE



TRIGNET: SANSA TOTAL ELECTRON CONTENT

- **SANSA** uses **TrigNet** data to generate near-real-time Global Navigation Satellite System (GNSS) products over Southern Africa;
- The GNSS product presented hereafter is the **Total Electron Content (TEC)** Map over the Southern African Region;
- The near-real-time TEC map is important for space weather monitoring and analyzing the impact of geomagnetic storms within the ionosphere;
- The ionosphere is responsible for attenuation and signals delay between transmitters and receivers during such storm conditions, which result in navigation and positioning errors.

Courtesy of Dr. Matamba, SANSA Space Science, Hermanus



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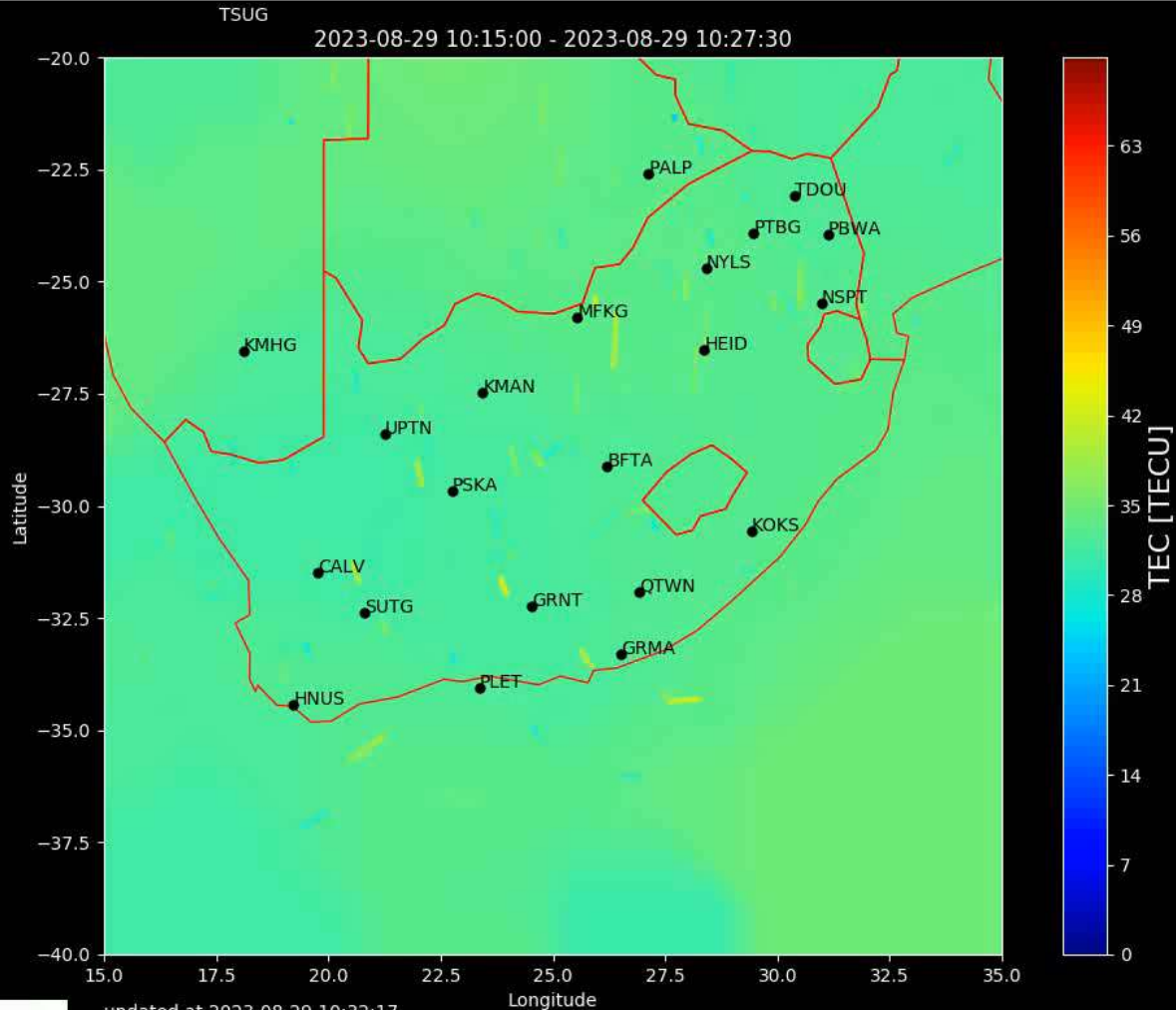


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CD:NGI Contacts and URLs

1. CD:NGI contact details - Cape Town office:

Tel: (012)1 658 4300

Fax: (012)21 689 1351

2. Client Care contacts: NGIclientcare@dalrrd.gov.za

3. Data can be accessed through:

geoportal:

<http://www.cdngiportal.co.za/cdngiportal/>

website: <https://ngi.dalrrd.gov.za>

4. Product Distribution Contacts

Email: sales@dalrrd.gov.za or ngi@dalrrd.gov.za

Tel: 021 658-4493/2/4/5



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Thank you!



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