SANSA Space Operations and SEWA Activities

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Systems Technician
19 May 2026
South African National Space Agency (SANSA)

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Our Mandate

The South African National Space Agency (SANSA) was established in December 2010, though South Africa's engagement with space research dates back several decades. The country contributed to early international space efforts in the latter half of the 20th century

The legislative mandate of SANSA was established through the SANSA Act 36 of 2008, promulgated on December 3, 2010, as a schedule 3A public entity under the Department of Science and Innovation (DSI). The mandate includes:

- Promoting and using space and fostering cooperation in space-related activities
- Encouraging research in space science
- Advancing scientific engineering through human capital development
- Creating an environment conducive to industrial development in space technologies

DSTI

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Programs

Earth Observation Programme

Space Operations Programme

Space Science Programme

Space Engineering Programme

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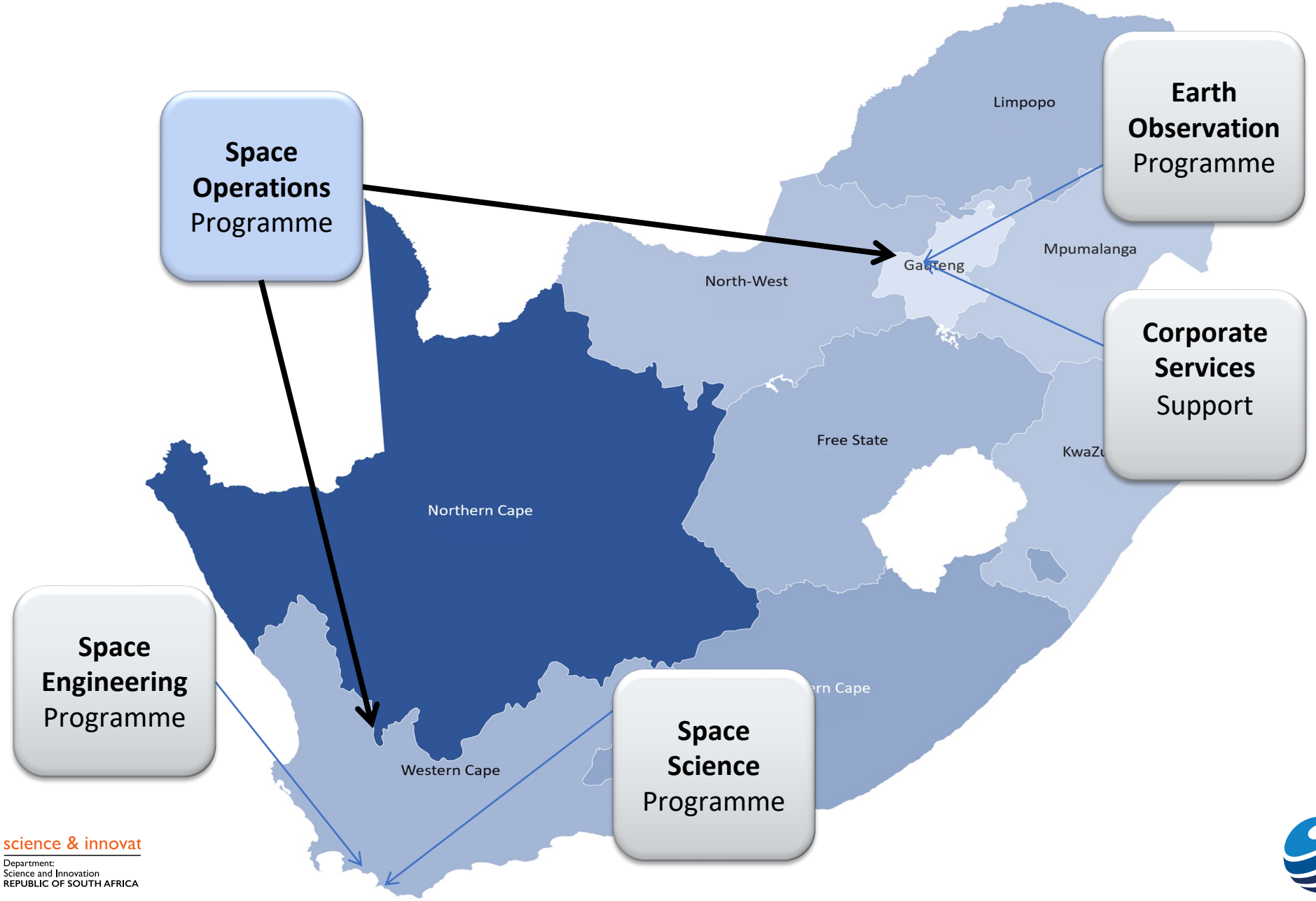

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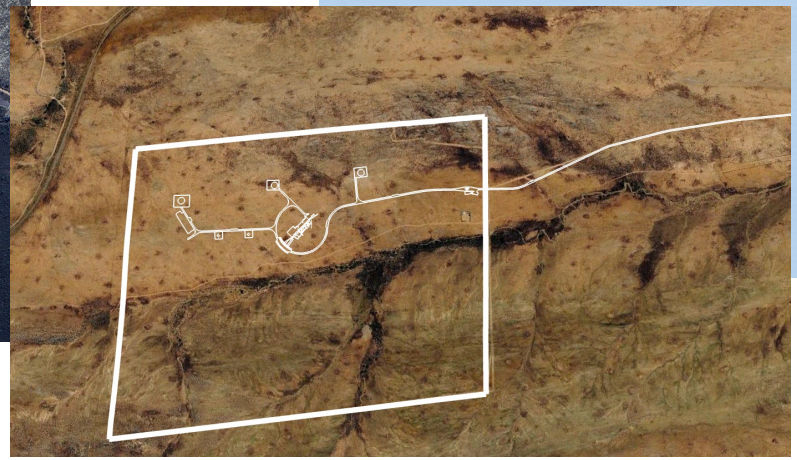
SuperDarn Radar Antarctica

Instrumentation network

Hartebeeshoek Ground station

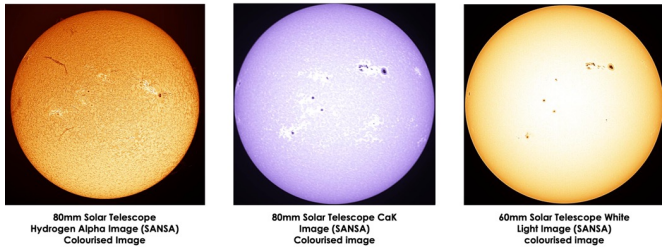
Space Science Hermanus

Houwteq AIT Facility



Matjiesfontein Ground station (under construction)

Solar telescope (under construction)



Early images from Solar telescope

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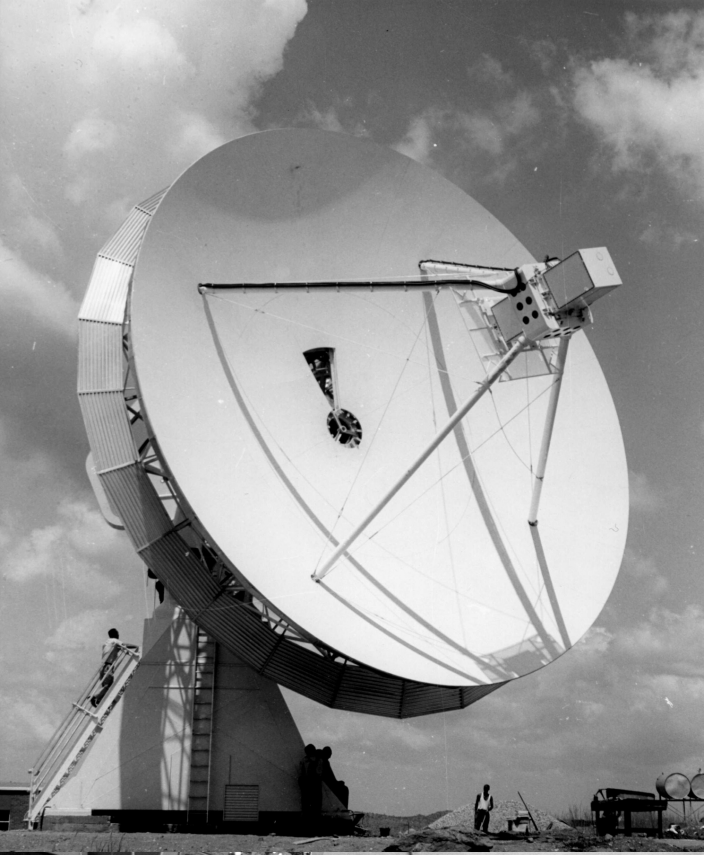
SANSA Infrastructure

Space Operations



History

- 1958 Esselinpark (Vanguerd)
- 1960 Minitrack moved to HBK
- 1963 12M antenna
- 1975 NASA terminate
- 1977 First Meteosat
- 1983 Part of the CNES network
- 1998 Hughes Ku band Contract
- 2006-2010 Unprecedented growth
- 2011 Move to SANSA
- 2023 New Matjiesfontein Deep space site

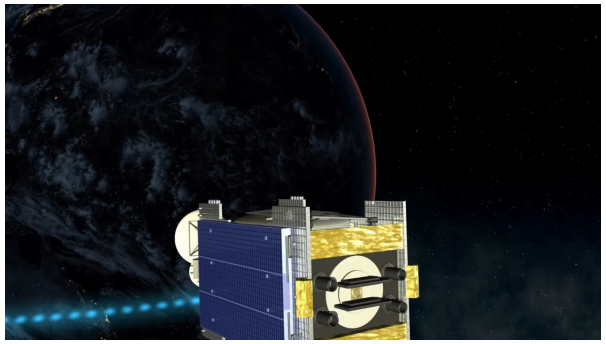
Value chain: TOSS, IOT & hosting services

SANSA as a whole – Vision , Mission & Strategy

SANSA Space Operations – Vision, Mission & Strategy

Launch vehicle support	LEOP and TOSS Support	IOT Support	Routine Operations	Hosting	End of life De-orbiting
• Lift off to separation • Position the satellite safely in the correct orbit • Critical operation	• LEOP: from satellite separating (from the launch vehicle) until satellite is safely positioned in its nominal orbit • Critical operation • Space Exploration	• IOT campaign measures the accuracy and stability of the satellite • Assessing the quality of the signals • Results gathered will set a benchmark throughout the satellites' operational life	• Monitoring TM (currents, voltages, temperatures, status data, etc.) measured by on-board instruments • Daily supports • Normal operations • 24x7 • Space Exploration	• Hosting of space related infrastructure • Providing maintenance to third party assist • On-call support for emergency maintenance	• Manoeuvre satellite from normal position to de-orbit phase • The satellite needs to burn out or send to graveyard orbit • Critical operation

Make sure each and every Value Add is accounted for



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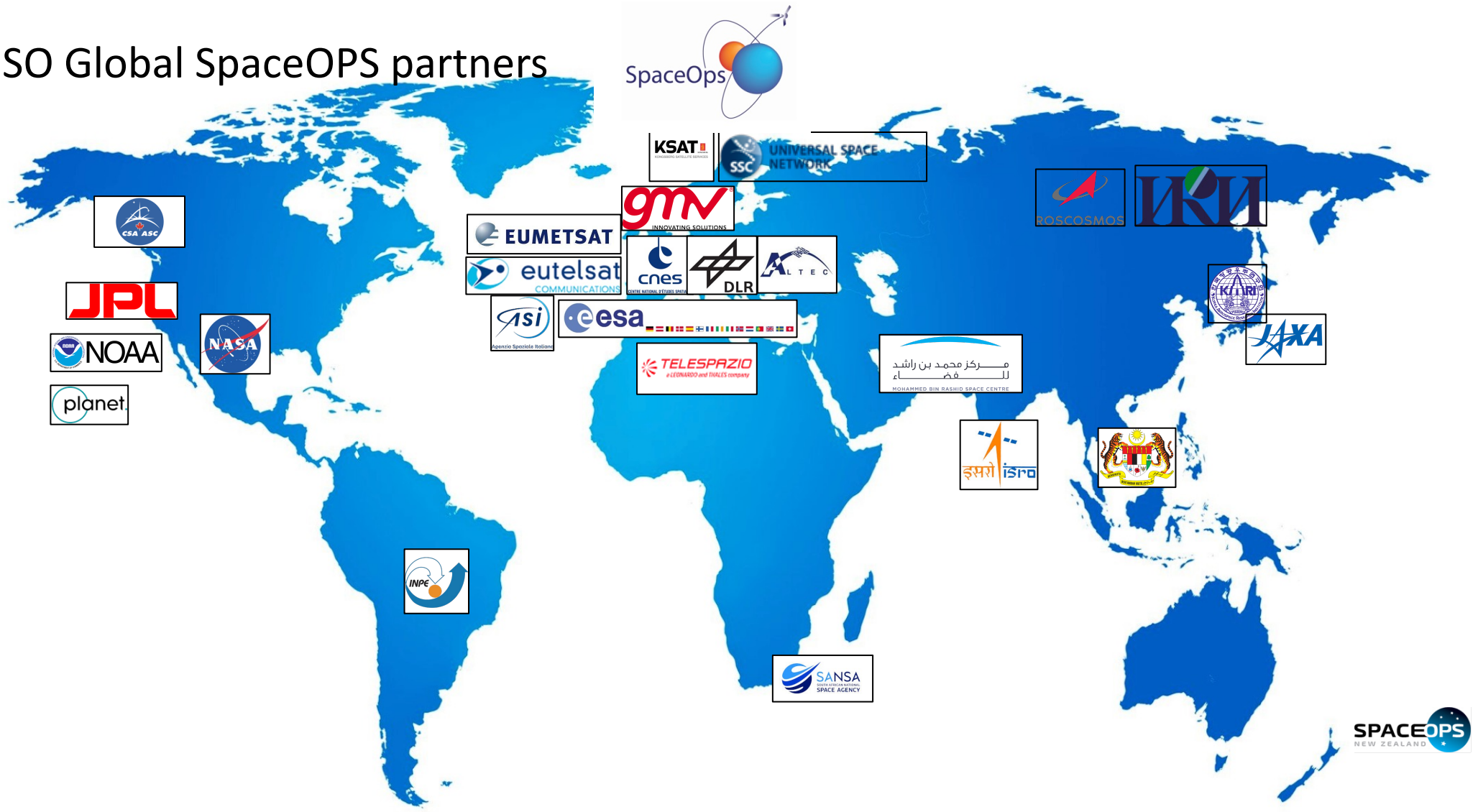
SANSA SO Global SpaceOPS partners



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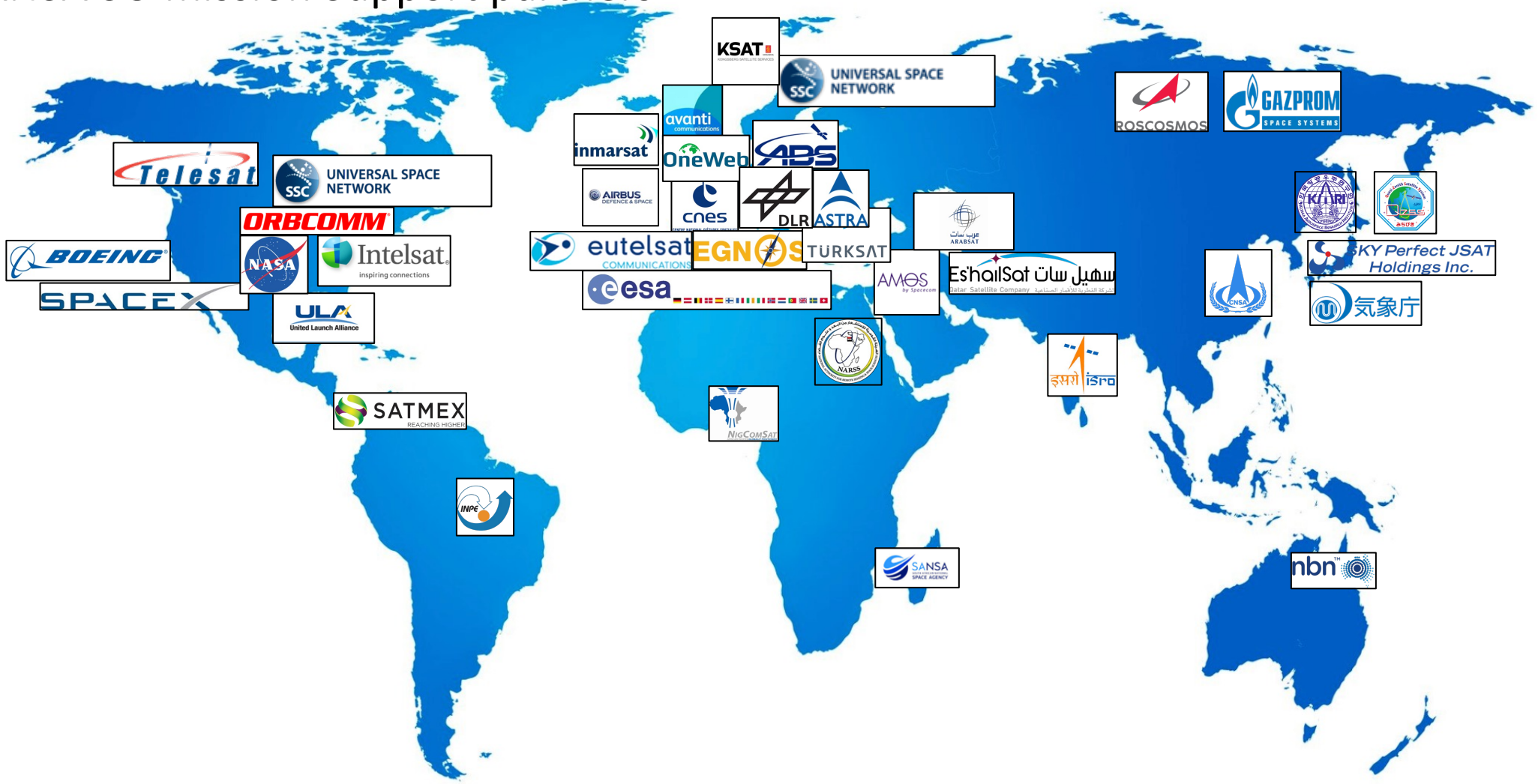
SANSA SO mission Support partners



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Telemetry, Tracking & Command

- 61 years operational, reputation as top-quality service provider
- Over 650 s/c supported since 1984
- Frequency Bands: VHF/UHF, L, S,C, Ext C, X, Ku, DBS, KA
- 93 Antennas
- 24 x 7 operations and monitoring
- Very reliable Teleport hosting
- Mission operations for Africa
- Mobile support
- First full IOT facility in Africa
- Only Deep space station in Africa

SEWA RARS antenna at SANSA SO

RARS Satellites for Disaster Early Warning

Polar-orbiting sounder platforms accessible via the WMO Regional ATOVS Retransmission Service, and their contribution to SANSA's Disaster DST modules.

PLATFORM	OPERATOR	RARS SENSORS	ATMOSPHERIC VARIABLES	DISASTER EARLY-WARNING USE
Metop-B / Metop-C	EUMETSAT	AMSU-A, MHS, IASI	Temperature & humidity profiles; hyperspectral IR (8 461 channels); trace gases (CO, O_3, SO_2)	Severe weather, flood QPF, wildfire smoke / CO tracking, volcanic SO_2
NOAA-19 (POES)	NOAA	AMSU-A, MHS	All-weather microwave T & humidity profiles	NWP boundary conditions feeding flood & severe-weather modules
Suomi-NPP	NASA / NOAA	ATMS, CrIS	All-weather T/Q profiles; hyperspectral IR (~1 305 channels)	Tropical systems, thunderstorm risk, atmospheric instability indices
NOAA-20 / NOAA-21 (JPSS)	NOAA	ATMS, CrIS	T/Q profiles, atmospheric composition, derived stability indices	Multi-hazard NWP support - flood, severe weather, fire weather
FY-3D / FY-3E	CMA (China)	MWTS-2, MWHS-2, HIRAS	Microwave T/Q profiles, hyperspectral IR (early-morning orbit)	Diurnal coverage gap-filling for tropical & severe-weather monitoring

Flood Early Warning
Improved QPF from sounder-assimilated NWP

Severe Weather Nowcasting
CAPE & stability indices for storm risk

Wildfire Weather Support
Boundary-layer T/Q and smoke composition

Drought & TPW Monitoring
Atmospheric moisture trends from soundings

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Operational Applications within the Disaster DST

RARS-derived atmospheric products feed each hazard module of the DST, improving forecast skill and lead time for operational decision-making.

Flood Early Warning

RARS soundings strengthen NWP inputs and quantitative precipitation forecasts (QPF)

Improved rainfall fields feed the national Flood Risk Index pipeline.

Earlier, more reliable flood alerts via the Flood Monitoring DST

Severe Weather Nowcasting

Derived stability indices (CAPE, lifted index, K-index) from sounder profiles

Supports thunderstorm, hail and lightning risk assessment

Short-range DST alerts to National Disaster Management Center (NDMC), provinces and emergency services

Wildfire Weather Support

Lower-atmosphere temperature and humidity profiles refine fire-weather inputs

Complements active-fire detection feeding CEOS Wildfire activities

Pre-positioning of resources during high fire-danger windows

Drought & Water Vapour Monitoring

Total precipitable water (TPW) trends from sounder retrievals

Sub-seasonal atmospheric moisture context for drought DST modules

Cross-links with rangeland, biodiversity and water-quality monitoring

Integration: RARS Data Flow into the Disaster DST

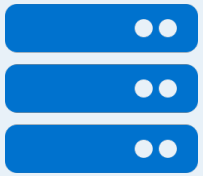
From regional reception to operational hazard products, a four-stage pipeline.

01

Receive

Polar-orbiter sounder data acquired via regional RARS dissemination - minimising latency over southern Africa.

02



Process

Profile retrievals, stability indices and TPW derived; assimilation-ready products generated for NWP and nowcasting.

03

Ingest

Products ingested into the DST stack - PostGIS, Google Earth Engine pipelines and the Django backend.

04

Operate

Hazard layers, risk indices and alerts surfaced via Leaflet.js dashboards to DFFE, NDMC and provincial users.

Operational value: Earlier, higher-confidence hazard intelligence delivered to disaster stakeholders - DFFE, NDMC, provincial disaster management centres and the SANSA EO operational pipeline, strengthening South Africa's national early warning and response posture.

Operational Use Case: AI Flood Early Warning

RARS-derived atmospheric data powering the SANSA EcoAI Environmental Intelligence platform — from satellite overpass to province-level alert.

From RARS observation to actionable alert

01 — RARS sounder ingestion

Metop IASI and JPSS ATMS/CrIS deliver T/Q profiles, TPW and stability indices over South Africa.

02 — NWP & QPF refinement

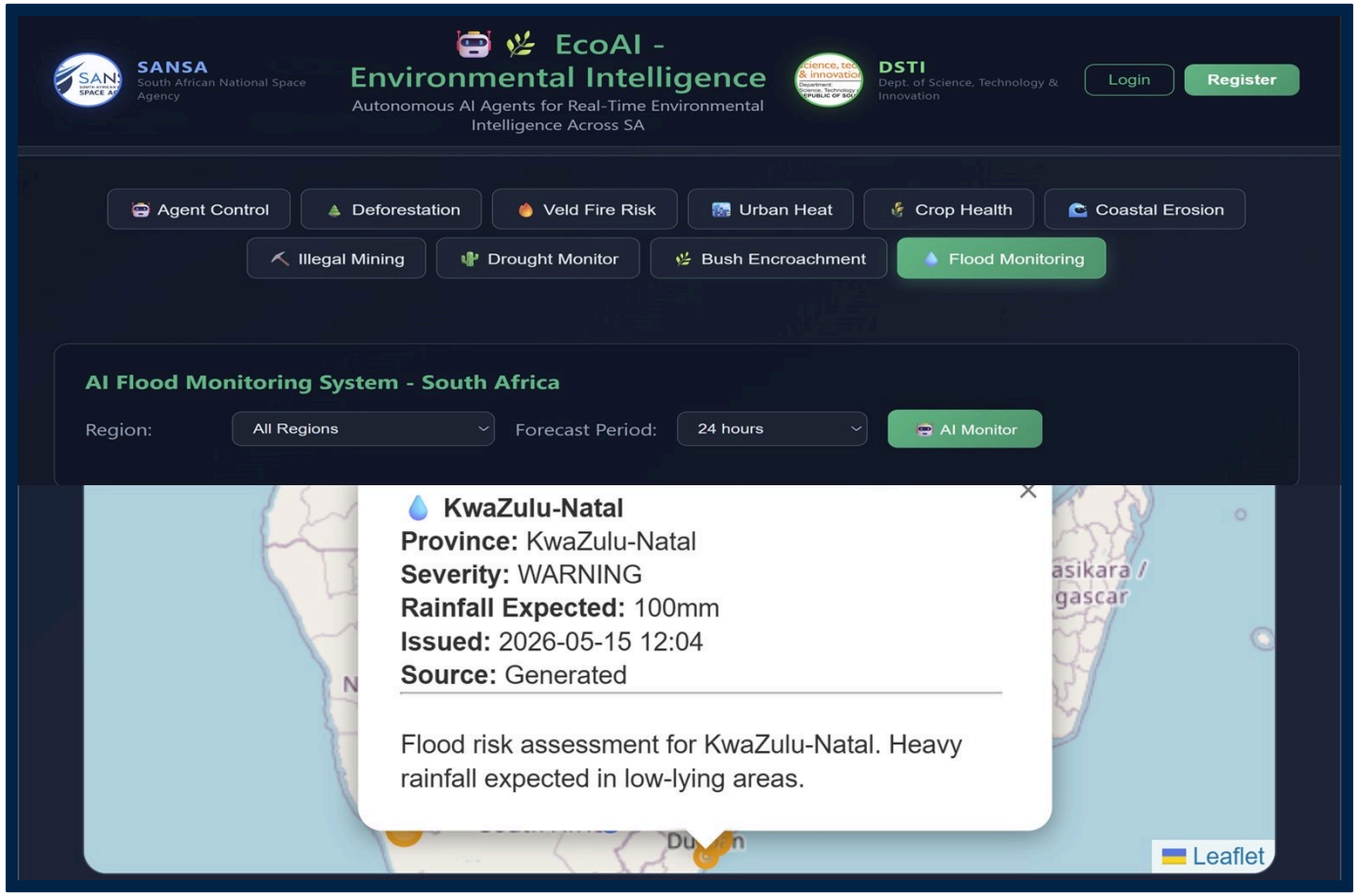
Sounder data assimilated into numerical weather prediction sharpens rainfall forecasts.

03 — AI flood-risk assessment

EcoAI agents fuse atmospheric, hydrological and geospatial layers into a province-scale risk view.

04 — Operational early warning

Severity, expected rainfall, timing and location pushed to NDMC, provinces and emergency services.



Live warning: KwaZulu-Natal — 100 mm rainfall expected · issued 2026-05-15 12:04 SAST.

Thank you

For more information on SANSA Space Operations facilities and capabilities, please contact:

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