



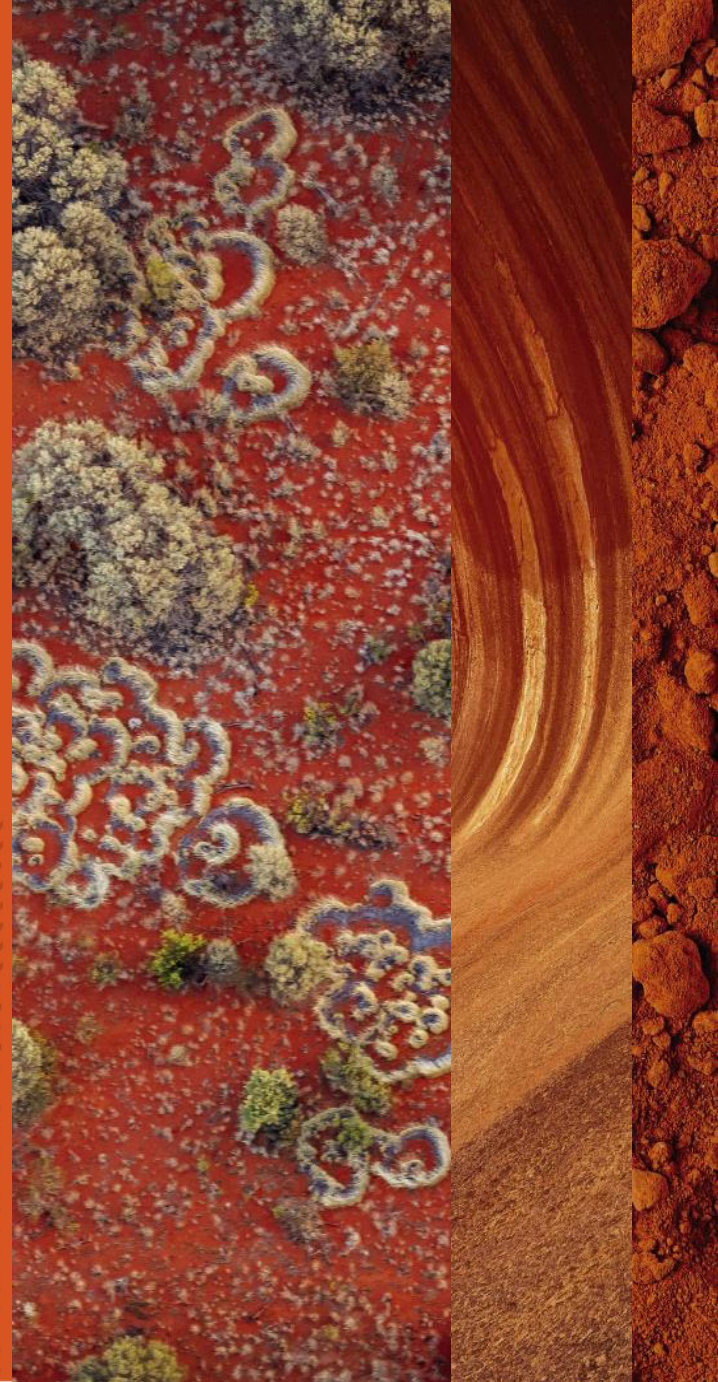
Australian Government
Geoscience Australia



POSITIONING
AUSTRALIA

Positioning Australia

Dr John Dawson, Director of Positioning

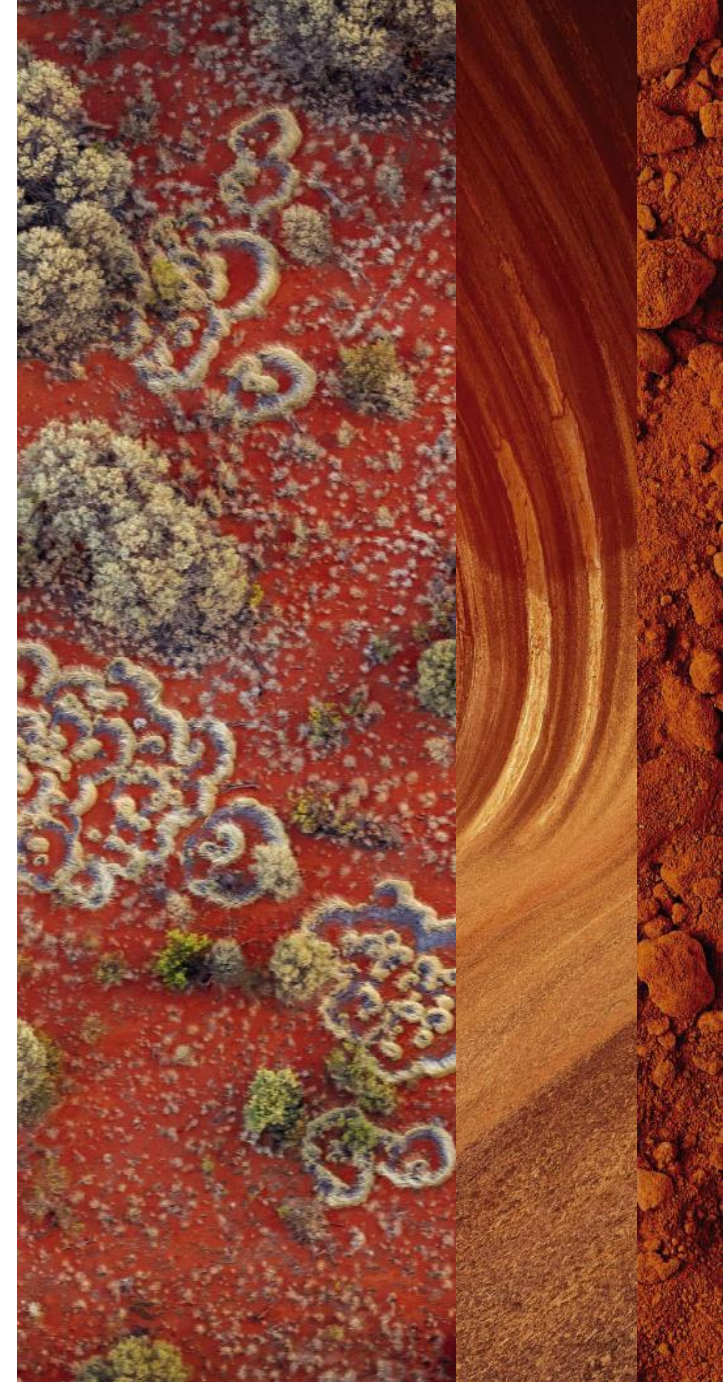


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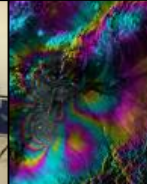




Our Mission

We exist to **enable** Australia to **progress and thrive** by providing the **infrastructure for better positioning technology**.

This will **enhance accuracy and reliability** for Australia, allow **potential for innovative technologies** across industries and **accelerate economic growth**.



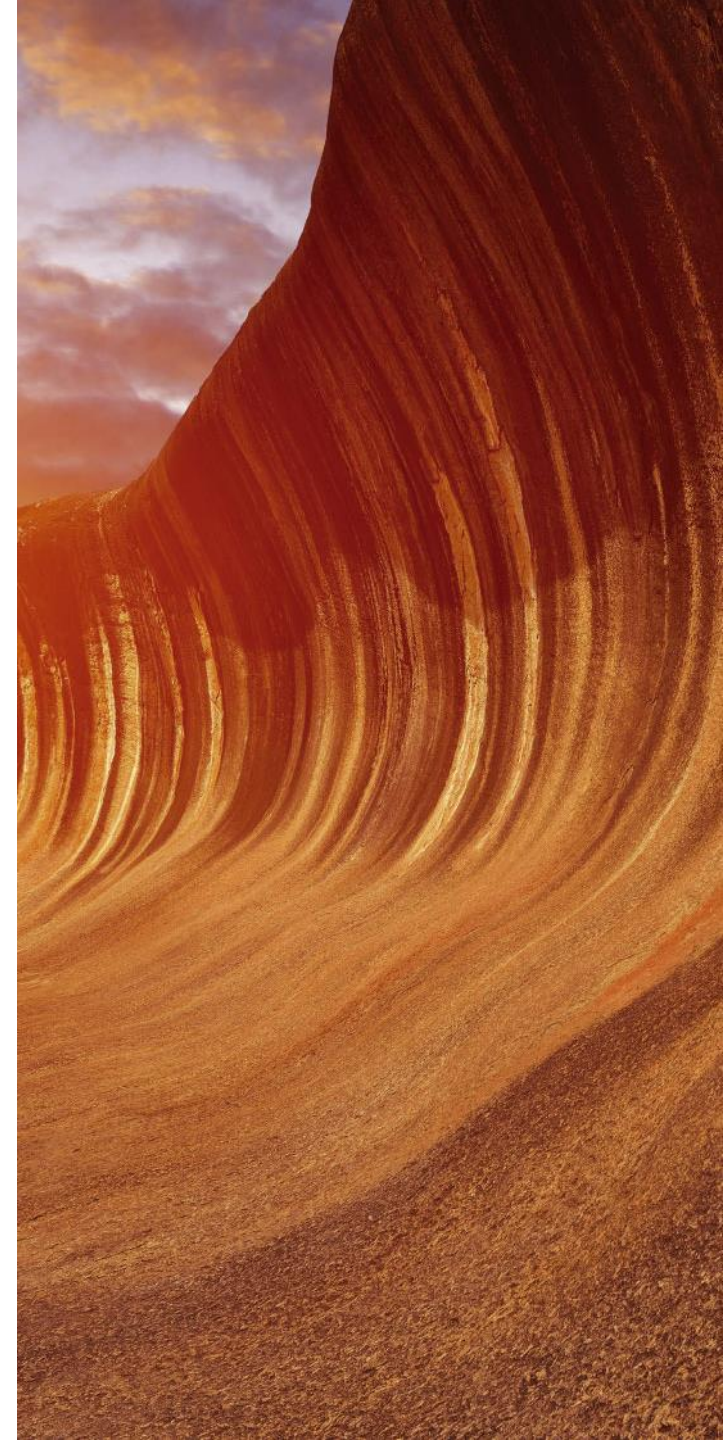
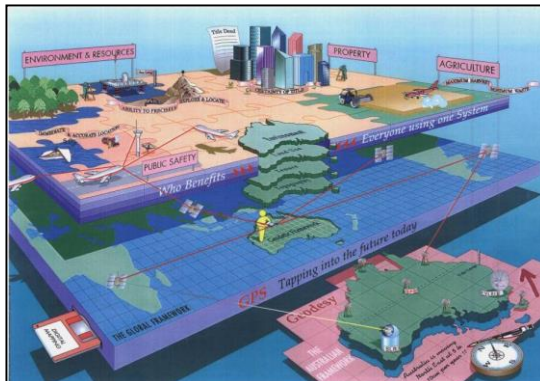
Our Program

VLBI	SLR	GNSS	Gravity	Radar	Calibrate	Survey	SBAS	Coordination
								

Datum Definition
Contribute to the ITRF

Products and Services
Ensure user access to
the ITRF and Geocentric
Datum of Australia

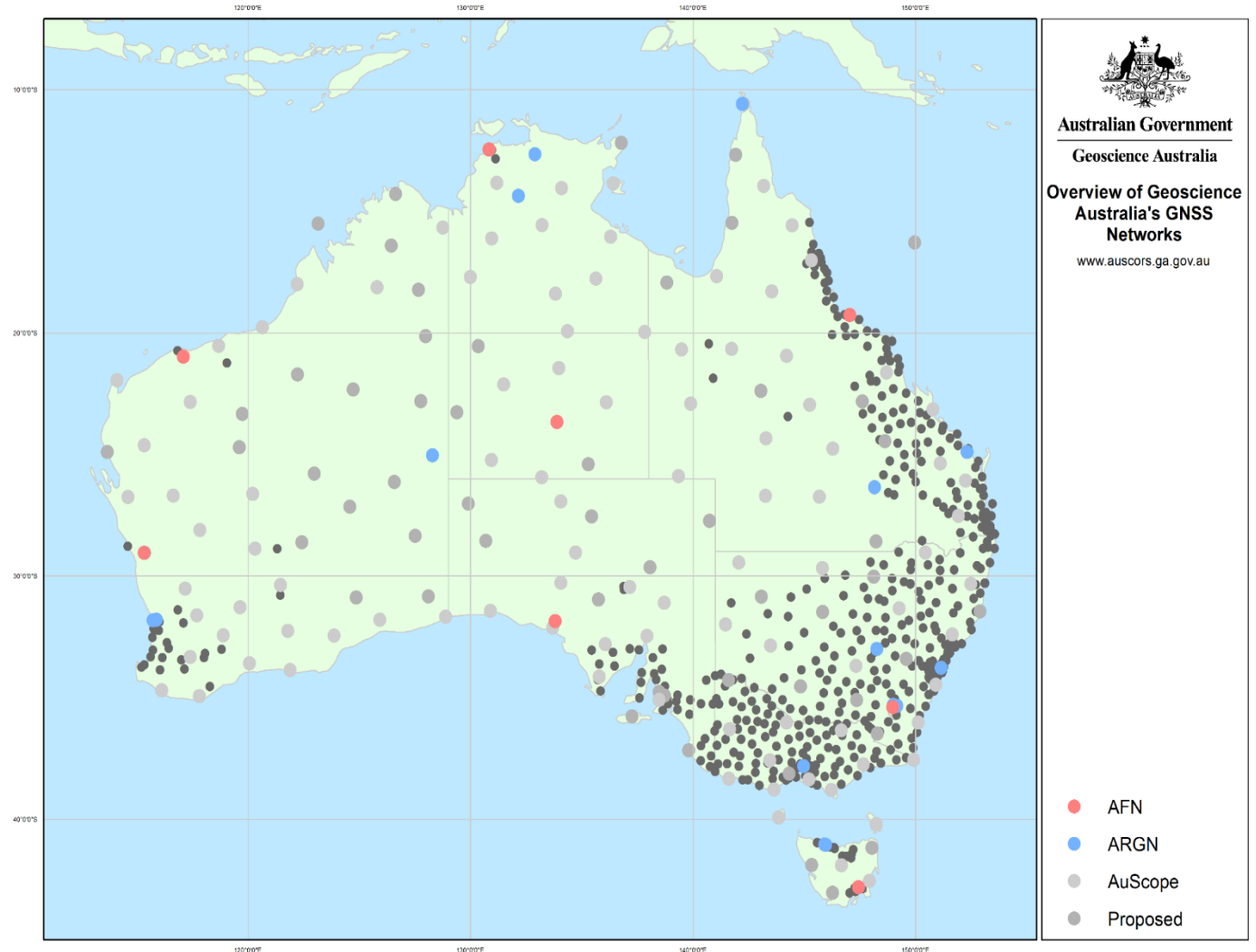
An effective national
positioning capability



National GNSS CORS Infrastructure

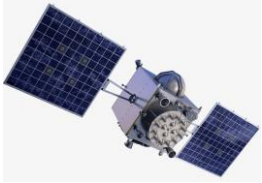
GNSS CORS

- Multi-GNSS
- Coverage includes Australia, Antarctica and South Pacific
- 130 upgraded national CORS
- 70 new additional national CORS
- Open/free access to data including real-time from 500 CORS (national and state)
- Caster infrastructure engineered in Cloud for greater scalability
- Site meta-data managed through e-Geodesy standard
- National system of coordination



Open Source GNSS Software

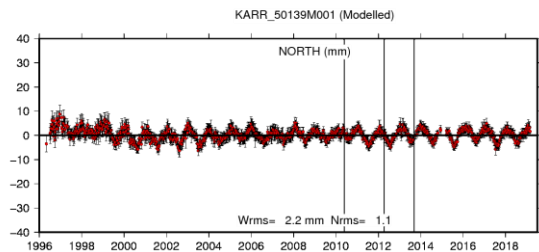
Network Platform



User Platform



Combination Platform



Capabilities

- PPP-RTK algorithm (integer ambiguity resolved precise point positioning)
- Precise orbit and clock determination
- Designed to be fully multi-GNSS capable
- Undifferenced-uncombined approach
- Developed with real-time operations objectives

Release

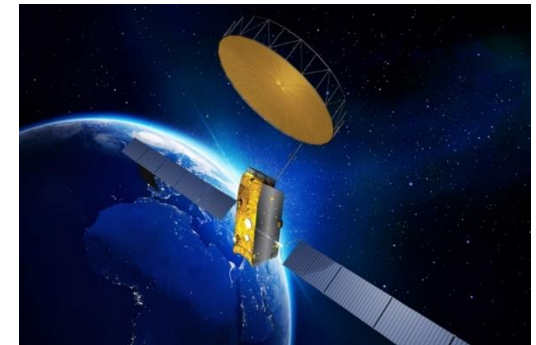
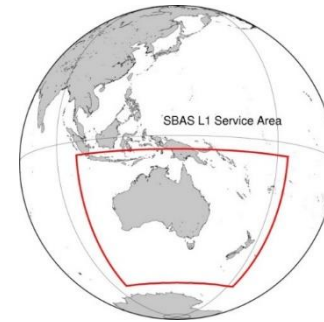
- Planned for early 2020

Satellite Based Augmentation System (SBAS)

SBAS

- Southern Positioning Augmentation Network (SPAN)
- Jointly funded Australian and New Zealand SBAS Program
- Inmarsat 4F1
- New payloads to come
- Active test program continuing (PRN122) until July 2020

- Request-For-Tender: Jan 2020
- Contract: September 2020



SPAN Services

SBAS (aviation use)

- L1 SBAS
- WAAS, EGNOS
- GPS only
- Sub-metre accuracy



DFMC SBAS (aviation use in the future)

- L1/L5 and E1/E5a SBAS
- GPS and Galileo
- Sub-metre accuracy



Precise Point Positioning

- GPS and Galileo Precise Satellite Clocks and Orbits
- 10cm service
- Open access



SBAS Economics Benefits

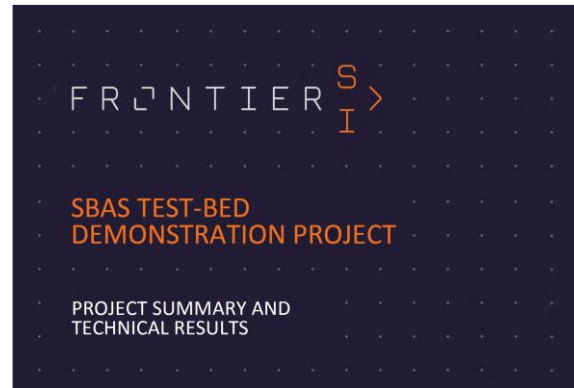
SBAS Test-Bed Trial and Economic Analysis completed

- > FrontierSI, EY, Inmarsat, Lockheed Martin, GMV
- > Land Information New Zealand
- > 10 Industry Sectors
- > 27 Projects
- > 45 Applications
- > What is the value of SBAS technology?

- > \$6+ billion over 30 years



SBAS Test-Bed Reports



<https://frontiersi.com.au/project/satellite-based-augmentation-system-test-bed/>

Australia and New Zealand SBAS

LIVESTOCK MONITORING: SAVE \$100 PER DAIRY COW

every year with virtual fencing
and 6 million sellable Australian
sheep valued at \$80 million



INCREASE OF 1866 SUCCESSFULLY COMPLETED

medical helicopter rescue missions
in remote locations



FORESTRY: AVOIDANCE OF 2700 HEALTH AND SAFETY INCIDENTS



PRECISION AGRICULTURE:

Improve the efficient spraying of nutrients,
chemicals and water by 1-7%



International Cooperation

New Zealand

- > Australia and New Zealand Joint SBAS Program – Southern Positioning Augmentation Network (SPAN)
- > Close cooperation on national geodesy and other geospatial areas

Japan

- > QZSS collaboration, exchange of data, infrastructure sharing and mutual support
- > Collaborative research into the QZSS Emergency Warning System

US

- > US AUS Civil Space Dialogue in November 2018
- > US-Australia bilateral cooperation related to GNSS-based Tsunami early warning system

Europe

- > Information sharing meeting in Canberra

International Cooperation

Pacific Islands

- > GNSS CORS operations in Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

China

- > University of Wuhan – Beidou Cooperation

United Kingdom

- > Information sharing meeting in Canberra

International Committee on GNSS (ICG)

- > Consideration being given to hosting ICG in the future



International Cooperation

SBAS Interoperability Working Group (SBAS IWG)

- > Australia hosted SBAS IWG in Brisbane, Australia, 11-13 of June 2019
- > The purpose of the SBAS IWG is to ensure full interoperability of SBAS
- > Australia has been tasked to take the lead on liaison between the SBAS-IWG and the ICAO Navigation Systems Panel on Precise Point Positioning (PPP) services



Upcoming Meetings

- > IGNSS2020 which is an opportunity for ICG workshop on PPP



IGNSS

IGNSS2020 - The Multi-GNSS Decade - All Systems Go!

Sydney, Australia, 5 - 7 February 2020

www.ignss2020.unsw.edu.au

