Australian Government
Geoscience Australia

Australia's PNT Program

Dr John Dawson

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NPI NATIONAL POSITIONING INFRASTRUCTURE CAPABILITY

Our Vision

- An integrated national positioning capability to accelerate the adoption and development of location-based technology and applications in Australia

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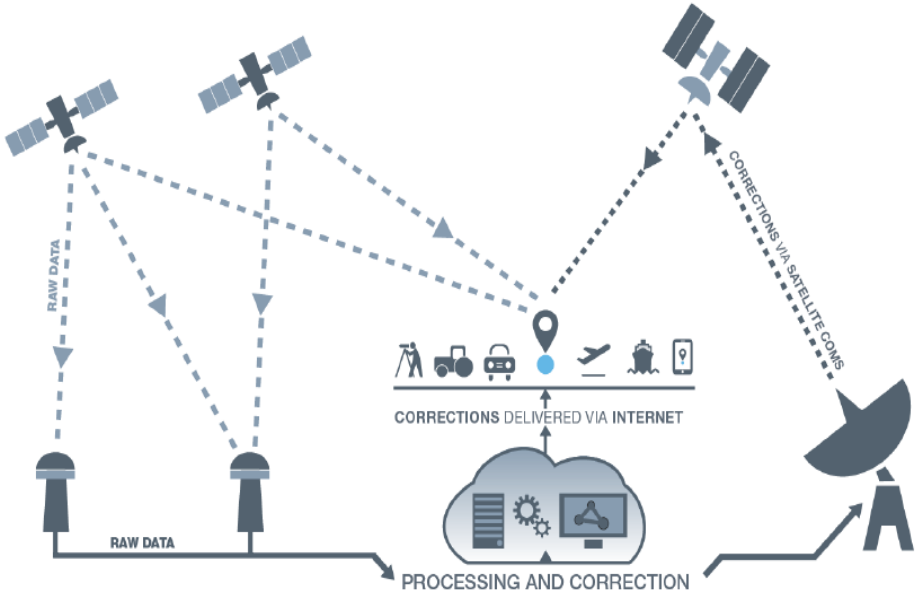
NPI NATIONAL POSITIONING INFRASTRUCTURE CAPABILITY

Australia's effort focussed on two main themes:

- GNSS ground infrastructure
- Satellite delivered GNSS services

AUSTRALIA'S NETWORK OF
GNSS GROUND STATIONS



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NPI NATIONAL POSITIONING INFRASTRUCTURE CAPABILITY

AUSTRALIA'S NETWORK OF
GNSS GROUND STATIONS

Ground Infrastructure

- CORS Network Upgrade
- Multi-GNSS tracking
- Multi-GNSS analysis
- Open access of real-time GNSS Data
- International cooperation

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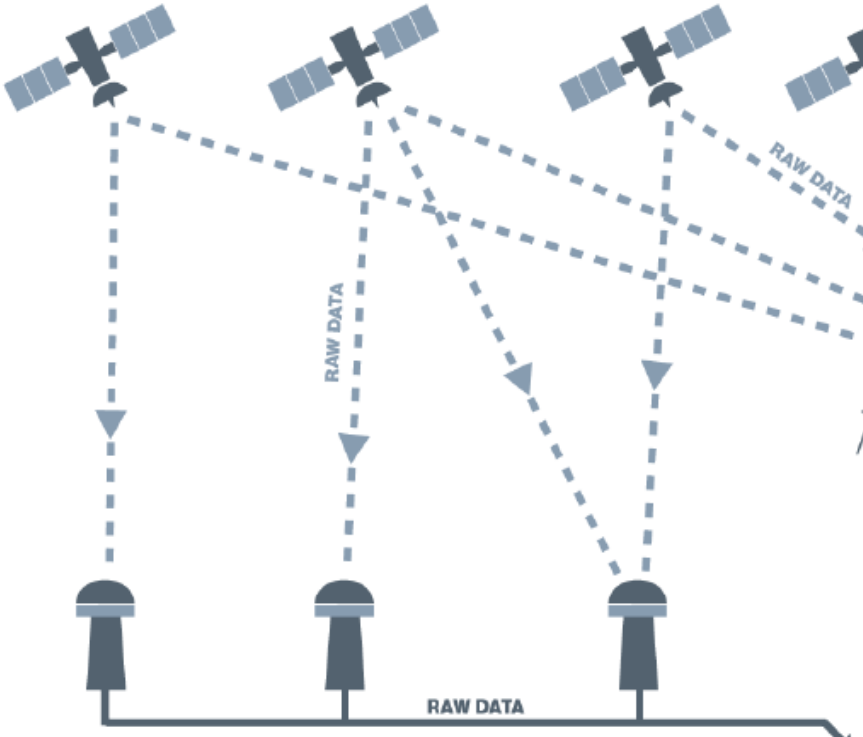
NPI NATIONAL POSITIONING INFRASTRUCTURE CAPABILITY

MOBILE COVERAGE

AUSTRALIA'S NETWORK OF **GNSS GROUND STATIONS**



3 CENTIMETRES ACCURACY IN AREAS WITH INTERNET/MOBILE COVERAGE

CORRECTIONS DELIVERED VIA **INTERNET**

PROCESSING AND CORRECTION

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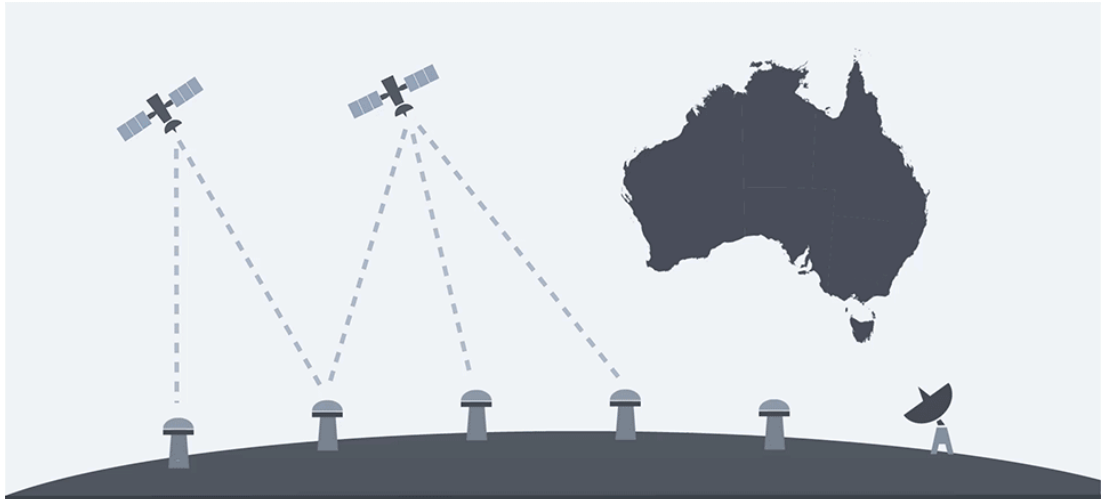
NPI NATIONAL POSITIONING INFRASTRUCTURE CAPABILITY



GNSS software development

- GNSS biases, satellite orbits and clocks in real-time
- Atmospheric products
- Operational software to support the IGS and government partners
- Open source to support business development

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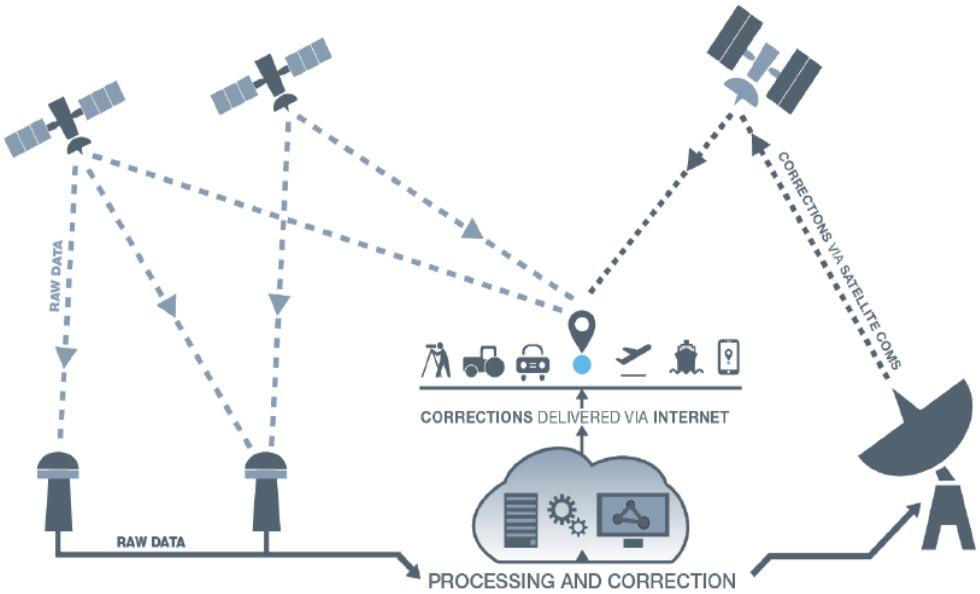
NPI NATIONAL POSITIONING INFRASTRUCTURE CAPABILITY



Satellite delivered PNT services

- Geoscience Australia
- Lockheed Martin
- GMV
- Inmarsat
- Land Information NZ

SBAS Testbed Outcome

- Economic benefits analysis derived from 30+ projects and 10 industry sectors: road, rail, aviation, maritime, agriculture, spatial, resources, utilities, construction and consumer

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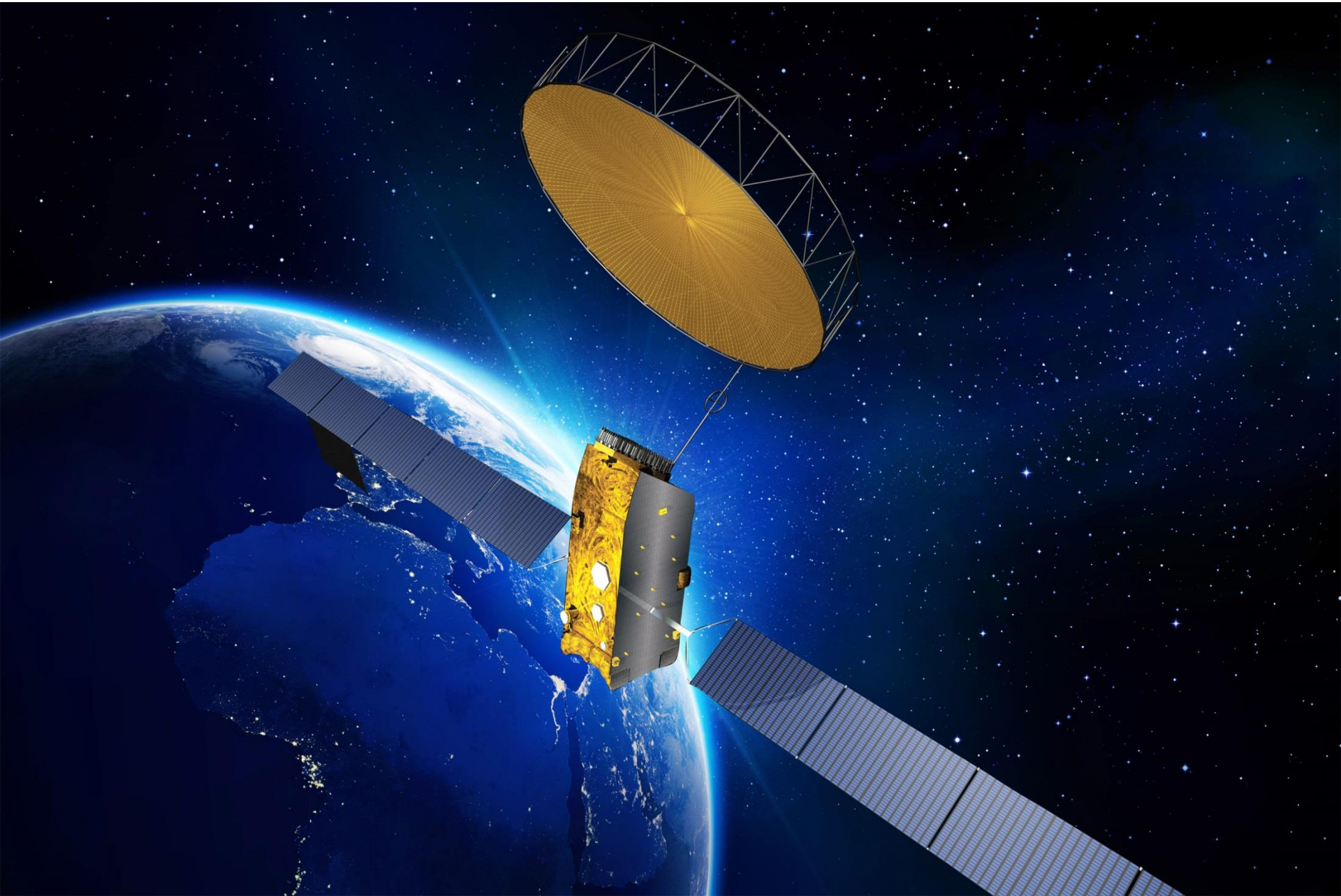
SBAS: Inmarsat 4F1 GEO Satellite



SBAS: Ground Station, Uralla NSW

Maritime

- Close quarters positioning for improved port operations
- Under keel clearance monitoring for improved productivity
- Safer navigation
- Tracking of container movements in intermodal container terminal

Agriculture – livestock

- Virtual fencing for strip grazing
- Behavioural modelling to enable early disease detection
- Quantification of reproductive relationships
- Intelligent analytics of herd dynamics to identify social relationships
- Intelligent analytics and modelling to increase efficiency of pasture use by tracking feeding zones

SBAS Test-bed Signal Status

- PRN 122
- 0.5 metre accuracy
- RTCA DO-229D
- No ranging data

- 0.1 metre accuracy
- Precise Point Positioning (PPP) GPS corrections on L1

- RTCM DFMC WG62 GAL GPS SBAS MOPS v0.3.8 10 Mar 2017
- PPP GPS+Galileo corrections on L5

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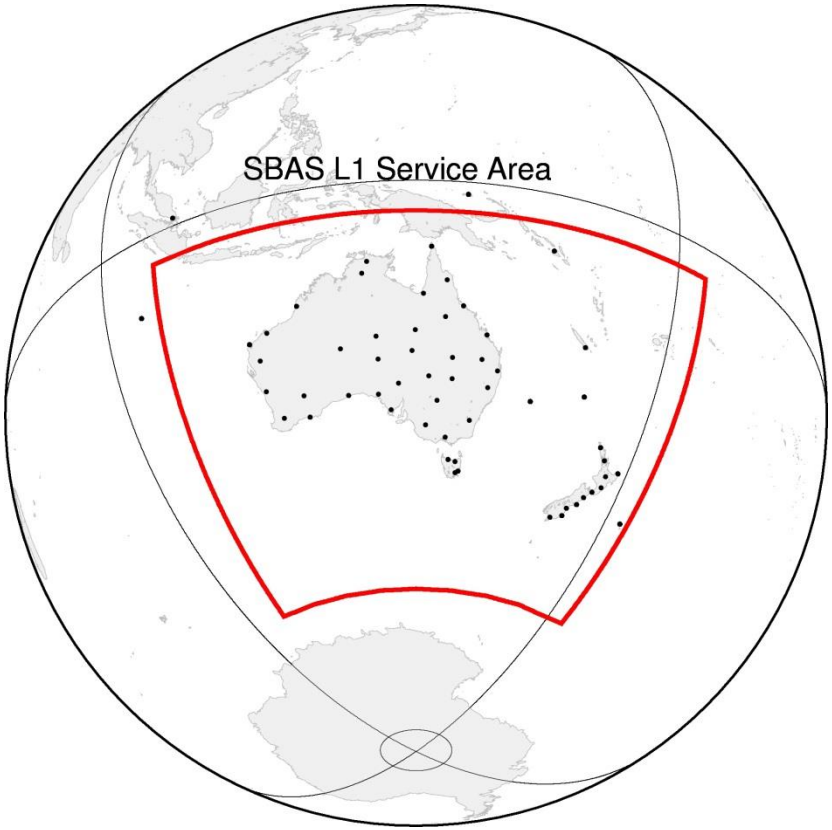
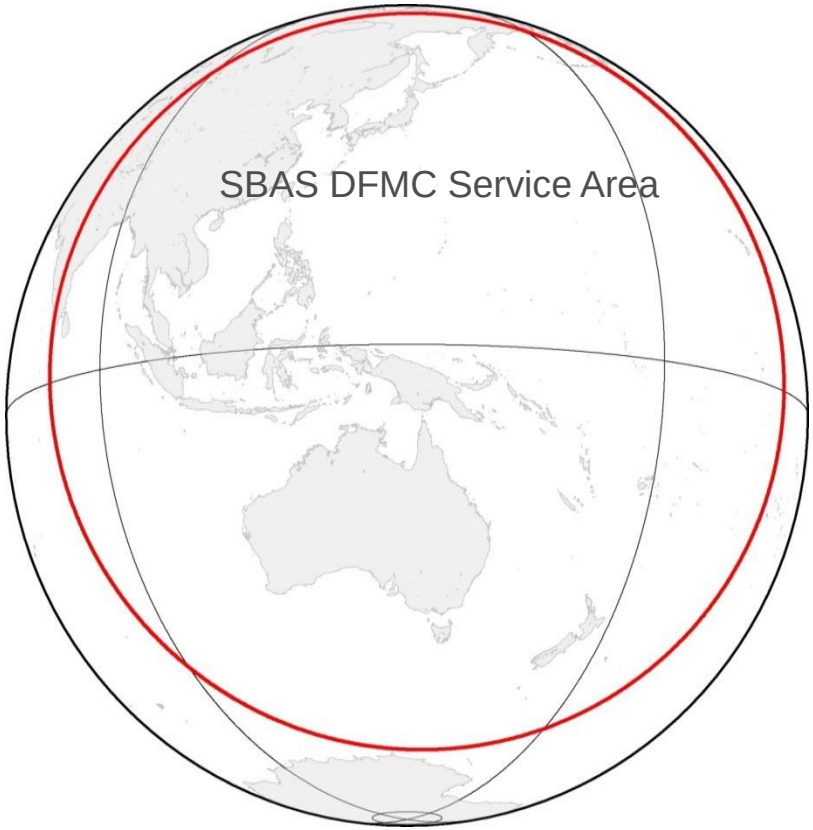
SBAS – coverage and service areas





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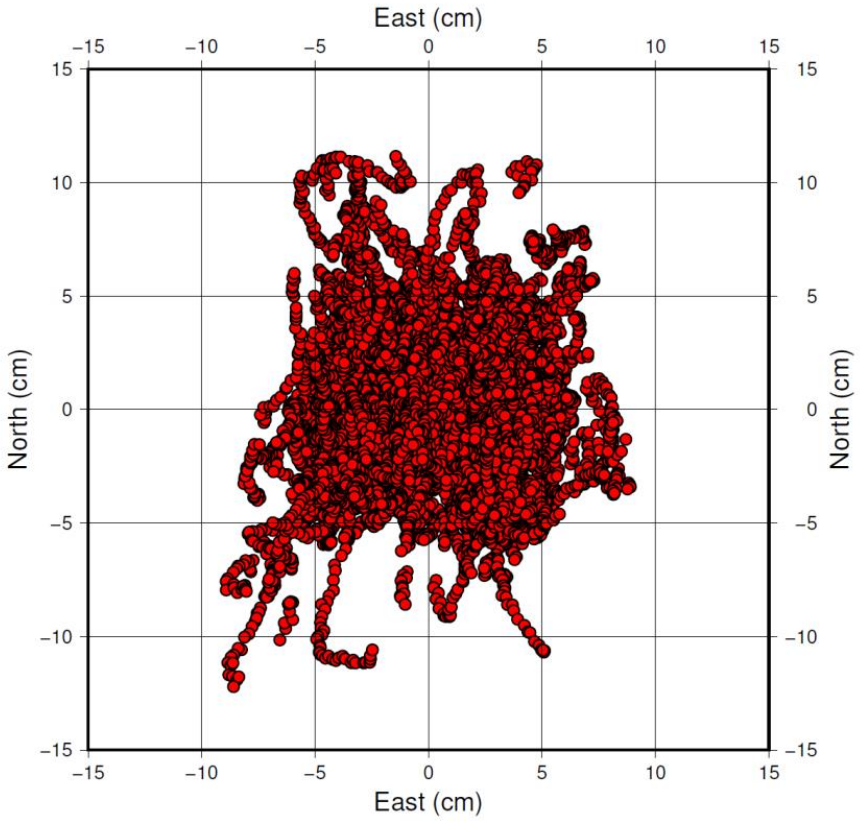
SBAS Trial Performance (PPP)

Precise Point Positioning (PPP)

- PPP after convergence
- 7cm uncertainty (95% CL)
- Convergence times 20 to 120 minutes
- Static setup

- Tested – rapid convergence
- Tested – gap bridging



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More Information

http://www.ga.gov.au/scientific-topics/positioning-navigation/positioning-for-the-future/

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