



Toitū Te Whenua
Land Information
New Zealand



SouthPAN

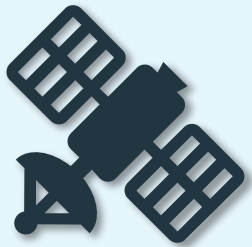
Matt Amos – Technical Director





SouthPAN

Southern Positioning Augmentation Network (SouthPAN)



Satellite Based
Augmentation
System (SBAS)



Improved accuracy,
reliability and
availability of
GNSS



Designed for
Safety-of-life
operations



NZ & AUS
Government
Partnership

An investment in New Zealand's critical positioning infrastructure

Global Navigation Satellite Systems (GNSS) supports positioning, navigation and timing and plays a critical role in the world we live in.

A vast array of devices and systems rely on data from GNSS to provide services we have come to rely on.

SouthPAN forms part of New Zealand's critical positioning infrastructure.



SouthPAN History



Satellite Based Augmentation System (SBAS)





L1 SBAS

Traditional SBAS

 **< 1 metre**

 **95% confidence level**

- Delivered on L1 signal
- Augments GPS L1 C/A



DFMC SBAS

Dual Frequency Multi Constellation
Next generation SBAS

 **< 1 metre**

 **95% confidence level**

- Delivered on L5 signal
- Augments GPS L1 C/A + L5, and Galileo E1 + E5a



PVS

Precise Point Positioning via
SouthPAN

 **10-20 cm**

 **95% confidence level**

- Delivered on L5 signal
- Augments GPS L1 C/A + L5, and Galileo E1 + E5a
- Transitioning to new L5b channel 2027/28



L1 Safety-of-Life

Highly reliable and available SBAS
that can be used for aviation
operations – from 2028

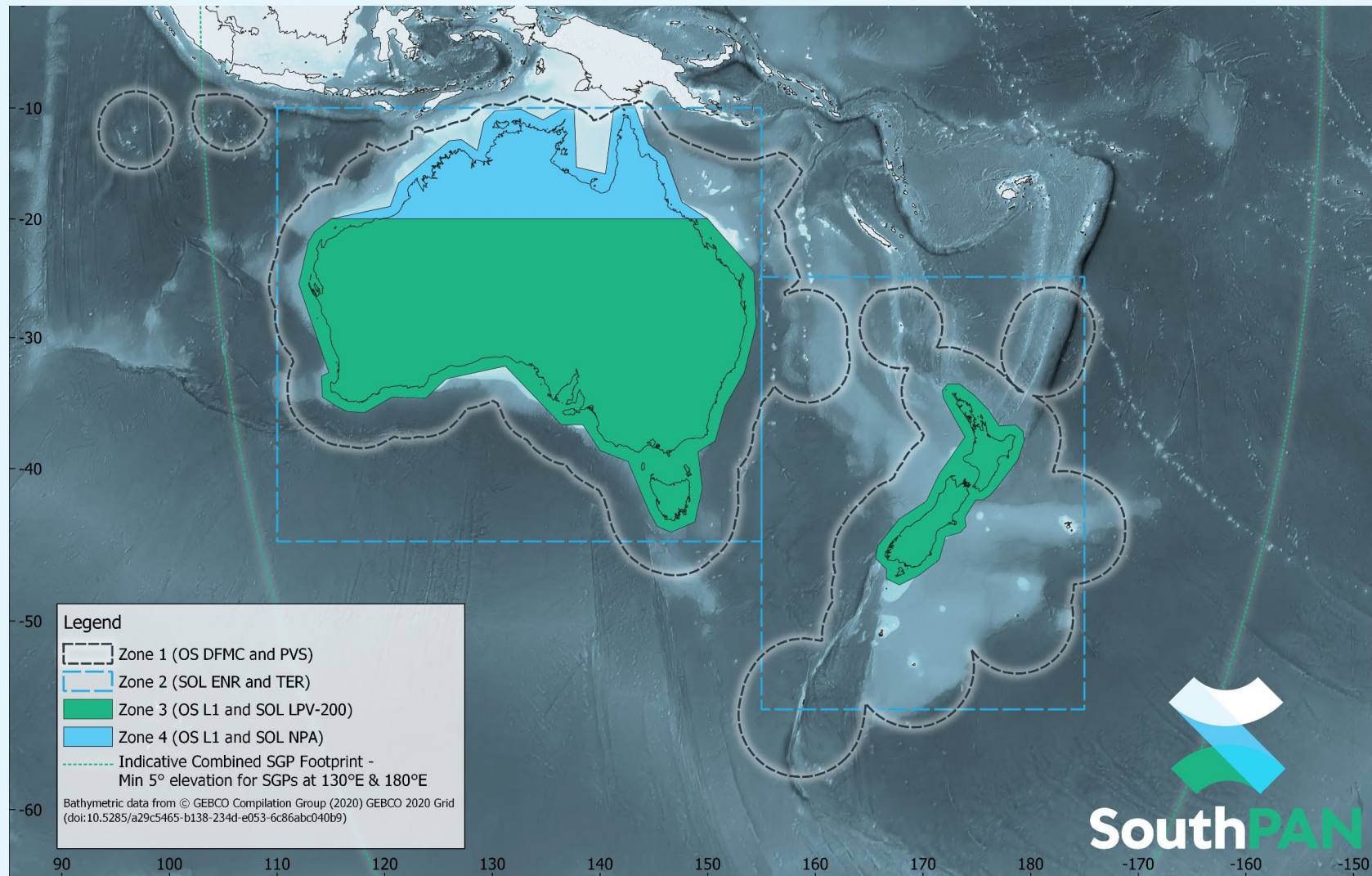
 **< 16 m horiz**
< 4 m vert

 **99.9% confidence level**

 **Provides integrity
information for aviation use**

- Delivered on L1 signal
- Augments GPS L1 C/A

SouthPAN Services



SouthPAN Beneficiaries



Geospatial



Mapping applications
Rural cadastral surveys
Accurate data collection in remote regions

Road



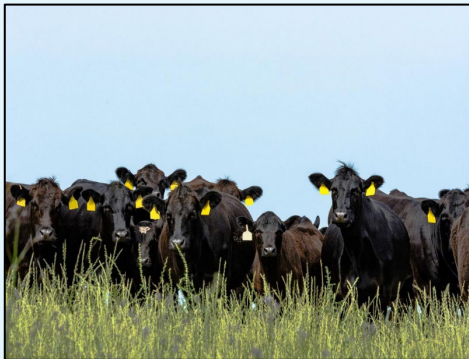
Cooperative Intelligent Transport Systems
Regulatory vehicle speed determination
Real-time road pricing

Aviation



Approach procedures with vertical guidance (APV)
Helicopter procedures
UAV/Drone operations

Agriculture



Virtual fencing for strip grazing
Disease outbreak monitoring
Nutrient/water optimisation
Tracking feeding zones for pasture management

Forestry



Precision Forestry
Mapping
Forest Infrastructure
Forest Health & Management

Rail



Advanced train management systems
Track surveys
Track worker and track vehicle safety systems

Case Studies



IGS



- **IGS** – directing machinery in geotechnical examinations
- **Scion** - optimising forest management
- **Page Bloomer** - enabling precision agriculture capabilities

Case Study: Insitu Geotechnical Services



- **Reduce costs** - Saved clients money by reducing risk of undetected latent conditions through improved modelling resolution and preventing geotechnical investigations and rectifications.
- **Improved service delivery** - Enabled teams to streamline workflows and reduce downtime which has supported improvements in productivity, efficiency and keeping down costs.
- **More reliable data** - Reduced uncertainty of finding, marking and testing locations to sub-metre accuracy, creating more reliable datasets for clients.
- **Country wide access** - Access Australia-wide, real-time, open-source positioning, including remote locations, helping to overcome gaps in mobile and internet connectivity.

“SouthPAN helps us deliver on our mission to reduce geotechnical uncertainty”

Mark Chapman, Managing Director & Geotechnical Engineer, IGS



'Beryl', an IGS purpose-built rig conducting onsite testing at Melbourne's Iconic Queen Victoria Gardens



'Minni' by IGS, conducting in situ sampling over water near Parliament House in Canberra



'Mad Mack' by IGS, a soft terrain rig operating remotely in challenging onsite terrain

Case Study: Scion



- **Enhanced accuracy and quality of data** - Enables Scion to better detect and address anomalies in seedling communities while ensuring the presence of healthy, rich, indigenous biomaterials that further enhance the surrounding ecosystem.
- **Improved productivity** - Enabled Scion field crews to collect data 3-5x faster, plus make the final location data available within minutes compared to days, previously.
- **Improved efficiency** - Reduce time in the field by decreasing point acquisition from 3 minutes down to 20-30 seconds
- **Reduced costs** - Field crews can perform precision forestry tasks faster, often with results that are indistinguishable from more expensive 'high-grade' systems.

“A quicker, more precise location in less time, requiring little to no post-processing”

Petter Massam, Scion



Scion field crew mapping with SouthPAN



Scion UAV utilising SouthPAN for high-definition forestry mapping and nursery monitoring



Forest site monitored and mapped by UAVs

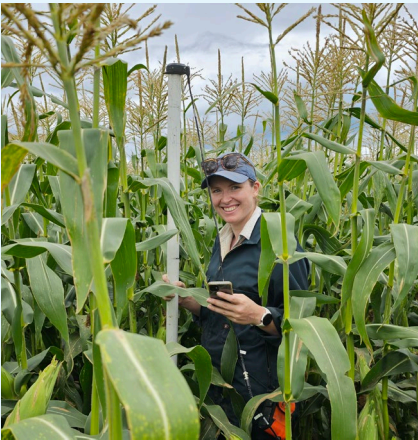
Case Study: Page Bloomer



- **Repeatability** - Enables field crews to reliably return to exact locations year after year at their trial and research sites.
- **More accurate mapping and recording** - Location of buried infrastructure such as tile drains, irrigation hydrants and pipes to within a shovel-width.
- **Improved productivity** - Helps to prevent missed or repeated rows during spraying, which helps to mitigate crop damage and loss due to disease outbreak.
- **Improved efficiency** - Field crews have saved hours when locating missing, displaced or buried markers, avoiding costs associated with repeating expensive work.

“The integration of SouthPAN into our workflow has significantly boosted efficiency...”

Dan Bloomer, Page Bloomer



SouthPAN enabled receiver is used to locate sampling points in maize crops, often growing up to 3 metres tall.

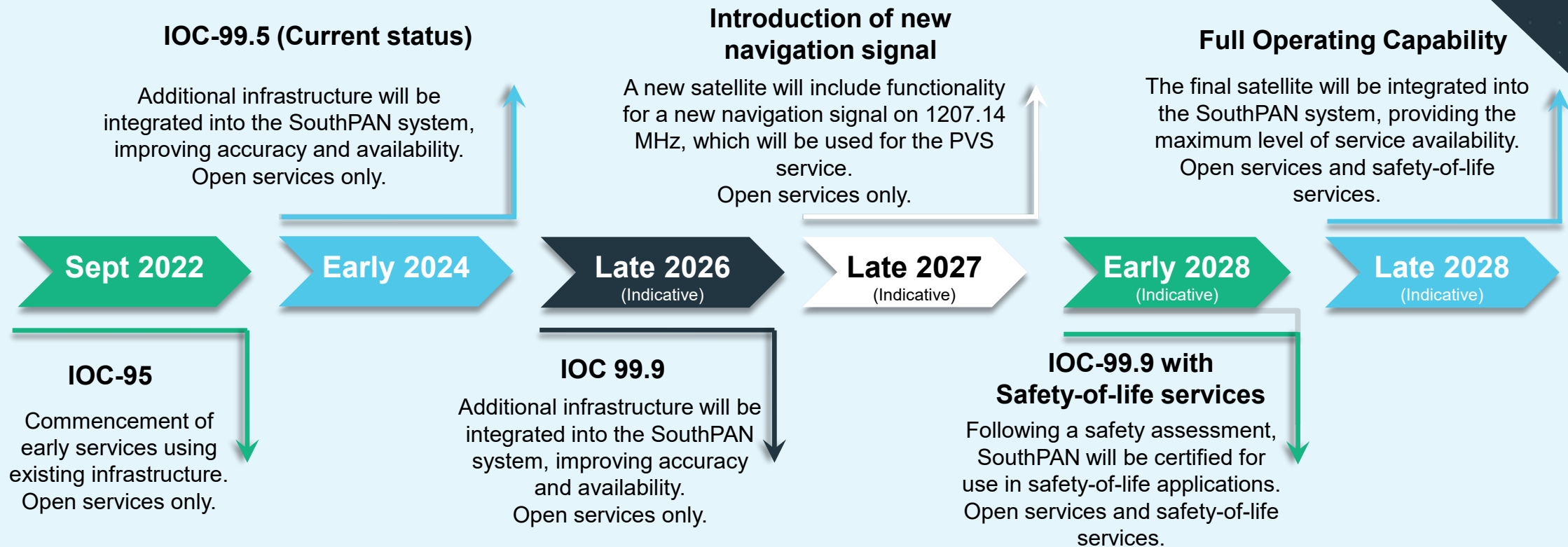


SouthPAN enabled 'rut-meter' towed by a quad bike allows Page Bloomer to accurately map rates of rut development

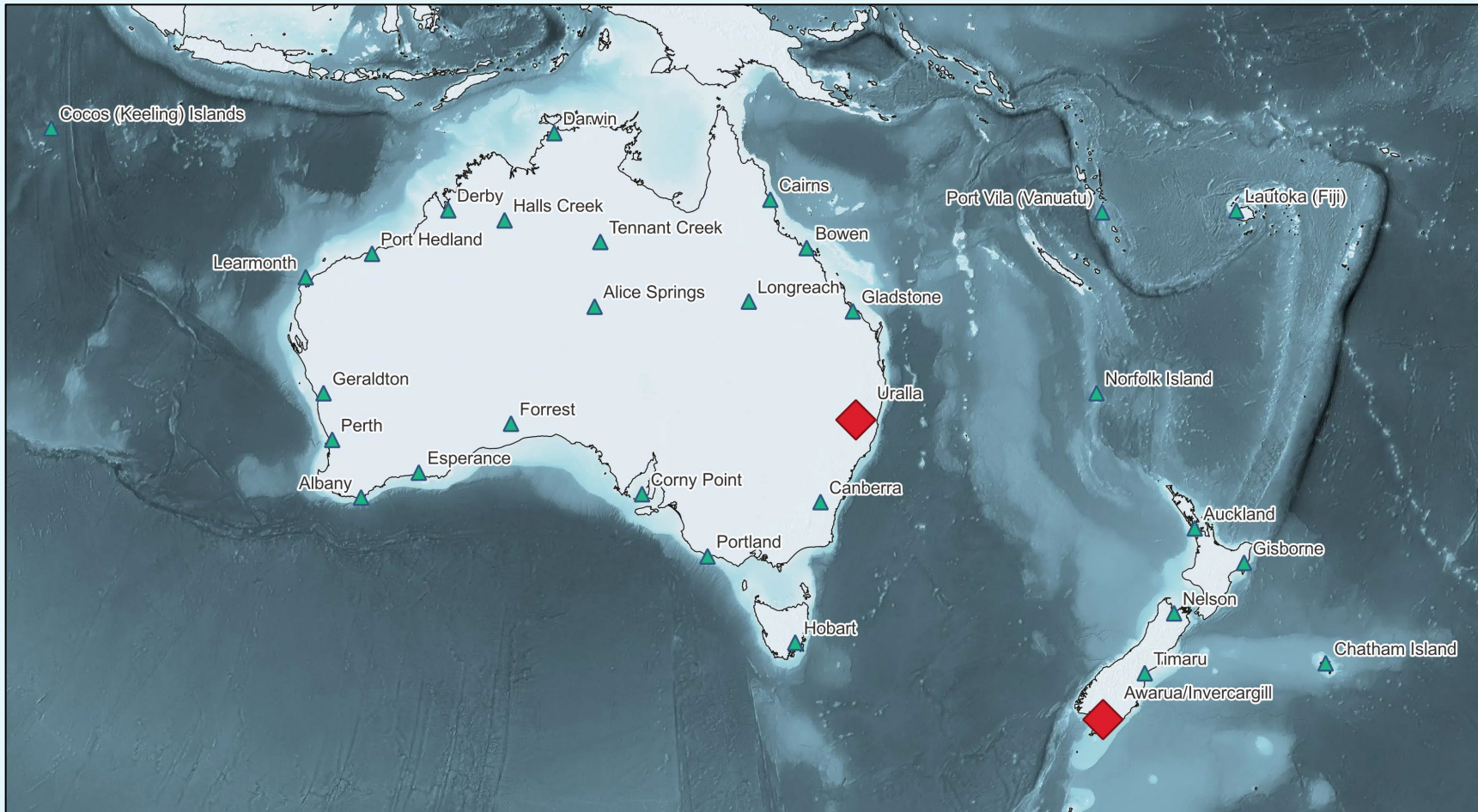


SouthPAN helps keep track in vineyards and orchards, shown here mapping the location of puddles and other hazards

Development Roadmap



SouthPAN Infrastructure



Awarua Uplink Facility



More Information

Contact or visit:

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