

FRONTIER **S** >  
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2022-23

**ANNUAL REPORT**

**We know where.**



## ACKNOWLEDGEMENTS

FrontierSI would like to make the following acknowledgements:

- Australian Aboriginal and Torres Strait Islander peoples as the traditional custodians of the land across Australia where our services are located. We also pay our respects to Elders past and present.
- Māori as tangata whenua and Treaty of Waitangi partners in Aotearoa New Zealand.
- Image contributions by the broader FrontierSI team and the spatial information research community.

**FrontierSI would like to acknowledge its Partners for their ongoing support and collaboration:**

### Core Partners

- Australian Geospatial Intelligence Organisation, Department of Defence
- Curtin University
- Department of Resources, Queensland
- Geoscience Australia
- NSW Department of Customer Service, Spatial Services
- Queensland University of Technology
- RMIT University
- University of Canterbury

### Support Partners

- Department of Health, Western Australia
- Land Information New Zealand
- University of New South Wales

### Industry Support Partners

- Woolpert
- Business Aspect
- HG Digital
- Fugro
- Geoscape Australia
- GHD
- Mercury Project Solutions
- NGIS Australia
- Omnilink
- Orbica
- Photomapping Services
- Position ++
- Position Partners
- Spatial Vision
- The Industrial Sciences Group
- Symbios

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All currency is quoted in Australian dollars (\$AUD) unless otherwise stated.

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# MESSAGE FROM THE CHAIR

**I am pleased to present the FrontierSI Annual Report for 2023. On June 30, 2023 FrontierSI celebrated five years since transitioning from the CRC for Spatial Information.**

This year, FrontierSI continued to evolve our business model, refresh our governance and deliver on our vision to be the lead social enterprise in Australia and New Zealand driving location-based innovation, whilst also supporting the growth and impact of the space and spatial sector in our region and beyond. In the face of challenging global and market conditions, our team proudly maintained a focus and steadfast resolve, to collaborate with our partners and stakeholders, to help solve big societal, environmental and economic problems using our space and spatial expertise.

Highlights for FY23 include:

- Renewed commitment to FrontierSI from across our partner base
- The creation of our Launching Leaders Inclusive Intern Program
- Redesign of our operating model to actively progress core and transformational initiatives
- The commercialisation and scale up of our Value Australia spin-out
- Building capacity to continue to serve our partners by introducing focused plans to reach priority sectors
- The release of the 2030 Space and Spatial Roadmap with our industry partners

Thanks to my fellow directors for your insights and support this year and to our CEO, Dr Graeme Kernich and the executive team for your dedicated leadership. I am proud to Chair the board of this remarkable organisation and work with so many talented people from across the space and spatial sectors in Australia and New Zealand. Together with our staff and the executive team, the board has set an ambitious strategy and will continue to focus on delivering positive, measurable impact for our environment, society and economy.

On behalf of the board and the executive team, I thank outgoing board director Professor Wendy Lawson for her service. Wendy approached her role with passion and commitment over many years, admirably representing our New Zealand partners and academic perspectives more broadly. I would also like to welcome our newest director, Professor Ian Wright. Ian's experience as Deputy Vice-Chancellor (Research & Innovation) at University of Canterbury, along with years of science and governance experience, are welcome additions to our board.

It is truly a privilege to lead this organisation and collaborate with our partners and stakeholders, without which none of our achievements are possible. We look forward to continuing to work with you over the coming years. Thank you for continuing to support our purpose and our people.

*Gillian Sparkes*

**Dr Gillian Sparkes AM**  
Board Chair



# MESSAGE FROM THE CEO

**This was a significant milestone year as a business, reaching five years of operation as FrontierSI, and 20 years as an organisation.**

When transitioning from the CRC SI to FrontierSI in 2018, one of the primary drivers for continuing was the unique and realised value in the model and proven mechanisms for collaborative focused problem-solving that we enabled. Across our 5 years as FrontierSI, the methods and activities we utilise have changed and evolved, but our models of collaborative problem-solving endure and continually improve. It is only through the effort, commitment, collaboration and openness of our partner base with universities, industry and government that we succeed, and we look forward to continuing to grow our impact together into the future.

At FrontierSI, we have evolved over the past year to change and improve our ability to focus and actively invest in both the identification and solving of long-term, large problems with a location-based element. Recognising the challenges that lie ahead in Australia and New Zealand, but also globally, arising from accelerating changes in our climate, geopolitical instability, supply chain disruptions, and the continued recovery from the global pandemic, we see a strong and continued role for a social enterprise such as ours to provide clarity, focus, investment and a collaborative vehicle for organisations to work together to make a significant difference in solving these challenges. We continue to be relevant, and we continue to deliver value.

When combined with the rise of new AI techniques, and the increasing connectivity available between people, our society and our environment, the need for transformational thinking and action in location-based technology has never been more apparent. Last year we released a new strategy, underpinned by a fresh purpose to *anticipate and solve big problems using space and spatial expertise*. Recognising

that transformation is only achievable by combining vision with action and collaboration, we have worked throughout 2022-23 to achieve our purpose through:

## **Transformational Initiatives**

To ensure we maintain a well-balanced approach to addressing short-term priorities with longer term, over the horizon challenges, we created a new business function aimed at developing transformational initiatives.

This new approach complements our existing capabilities and priority sectors, but adds new mechanisms for problem definition, resourcing and solving. Our consultation with partners and other stakeholders this year have created a wealth of transformational ideas in core technology innovations and major opportunities to accelerate problem-solving in specific growth sectors. Recognising that transformation involves people as much as technology, we ran our first Launching Leaders program, an inclusive intern program targeted at improving diversity and inclusiveness across our sector.

## **Driving impact further downstream**

The past three years have seen significant investment into creating operational spatial infrastructure such as Positioning Australia, Digital Earth Australia and the many digital twin programs at the state and national level. FrontierSI, together with our partners, have been proud to play a substantial role in helping to define, create, scale and support the case for many of these major infrastructure programs.

One of the major challenges facing us all now is ensuring that these investments translate into social, environmental and economic impact with critical users across our region. In collaborating with our partners, we are focused on achieving impact in critical problem areas in our priority sectors – Natural Resource Management and Climate Change, Resources, Defence, Property and Planning, Health, and Infrastructure.



We are proud to have been recognised for this focus on end-user impact, with awards across this year for research commercialisation, environment and sustainability, innovation and international partnerships. Along with many of our staff and partners achieving individual recognition across the year, these awards are an important recognition of the role of collaboration in achieving true impact.

### Scaling new ideas into real world solutions

FrontierSI have continued our strong role in helping to translate innovative ideas into real world products and solutions. At the start of this year, we commercialised our innovative land and property valuation platform, Value Australia, in partnership with UNSW and PEXA. Across this year, we continued to support the scaling up of the Value Australia business through supporting existing products into the market, as well as the continued creation of new products and services across the valuation sector.

FrontierSI has grown our partnership with Digital Earth Africa to leverage the Open Data Cube and machine learning expertise work from Digital Earth Australia and played a critical science and product leadership role across the initiative, with a particular focus on supporting the coastline mapping and impact analysis, as well as supporting the transition of the program to a new home with the South African National Space Agency.

Supporting our long-term focus on uplifting the use and impact of insights from Earth Observation data more broadly, FrontierSI played a critical role in providing both training sessions and sponsorship for the Indigenous Mapping Workshops, hosted by our good friends at Winyama.

We have further scaled the adoption of photogrammetry techniques in the health sector with the growth in use and applicability of our Cliniface 3D facial analysis platform. Now updated to include a wider variety of baseline facial features and population-specific reference ranges, including those of Aboriginal Australians, the platform has been downloaded by more than 250 users across the globe.

FrontierSI have been working in partnership with GA and LINZ for well over a decade now in identifying, defining, and solving the critical positioning technology challenges across our region. In 2022-23 this has focused on supporting the operation and adoption of the major SouthPan program of work, as well as the continued development of the open source Ginan platform, which has just reached a major milestone with the release of the 2.0 version of the solution.



### Advocating for industry

FrontierSI together with other key space and spatial organisations has played a leadership role in the development and release this year of the [2030 Space+Spatial Industry Growth Roadmap](#) which highlights the critical role the space and spatial sectors have in both driving growth in our key economic sectors, as well as planning and mitigating the effects of a changing climate on our natural and built environments, and our lives. It outlines the steps required to realise an integrated space and spatial ecosystem through nine stated key objectives, associated actions and action champions. It also highlights that space and spatial technologies are an essential component of economic growth and important to lifting productivity.

We are proud to play a strong role in implementing many of the actions within this plan, particularly as they relate to Position, Navigation and Timing technology.

**“FrontierSI have continued our strong role in helping to translate innovative ideas into real world products and solutions.”**

Graeme Kernich, CEO

### Renewing and Evolving Partnerships

After five years of operation under our initial partnership model, we were encouraged to have the support from our partners to continue to work together in the years ahead through new partner agreements with our government and university partners. Recognising the flexibility required for us to focus on delivering more impact in the downstream uses of space and spatial technology, we worked closely with our industry partners to create a new model of collaboration which culminated in creating our new Space and Spatial Industry Network.

With this year serving as a reminder of the strength of collaboration, the importance of thinking and acting for the long term, and the strong role of our research and innovation ecosystem in Australia and New Zealand, FrontierSI are both ready and excited to work towards creating a better future with our partners.

I would like to thank our committed and talented staff for their dedication, ideas and efforts, as well as acknowledging and thanking both our board and our partners for their guidance, leadership and enthusiasm across the past year.

**Dr Graeme Kernich**  
Chief Executive Officer



# VISION, PURPOSE AND VALUES

## Our Vision

To be the lead social enterprise in Australia and New Zealand driving location-based information.

## Our Purpose

To anticipate and solve large problems using our space and spatial expertise.

## Our Values

- Collaboration
- Future-focused
- Agility
- Integrity
- Communication.



## Strategic Enablers

Enable an organisation to execute its strategy more efficiently and effectively, aligning the company more closely with its objectives.

### People

Provide leadership & professional development opportunities to build internal capabilities and skills needed for future growth, through development and recruitment.



### Systems & Processes

Improve internal processes for innovation and scale by nurturing an environment of continual experimentation, learning and adaptation.



### Culture

Strengthen culture and reinforce FrontierSI values – To make FrontierSI an employer of choice with a well engaged professional team where staff are culture advocates, industry leaders, maintaining retention and being flexible by design.



### Governance

Exemplifying good governance, collegiality and operating within a climate of respect, trust and candour is a priority for FrontierSI. Our Board will challenge and guide with optimism, embrace the contest of ideas, model organisational values and set the tone from the top.



# STRATEGIC PLAN 2022-2027

In 2022-2023 FrontierSI focused on refining how we achieve impact through our new strategy. This has led to the creation of a new Transformational Initiatives function, and a focus on defining and growing impact in our high priority user sectors.



Last year FrontierSI established a new strategy which cements us as a partner-focused research and innovation organisation, that aims to grow the spatial sector.

FrontierSI intends to contribute to greater future impact and growth. This will be through strengthening our role in spatial innovation and advisory with government, and the application of spatial to the identified industry sectors of spatial, space, natural resources management, defence, health, mining and resources, infrastructure and property.

We have adopted a three-part approach to develop FrontierSI:

1. Cement core spatial capabilities and services to address the evolving needs of our partners;
2. Increase utilisation of capabilities to new government and end-user partners; and
3. Formulate large collaborative transformational initiatives to solve identified problems.

Through this approach we will continue to address the research and innovation needs of our partners. We will broaden the use of spatial data in the industry and the community, and enable the growth of the space industry and optimise the use of data throughout to achieve our purpose. We will continue to:

- Be a research and innovation organisation which defines, formulates and delivers services within our technical expertise areas of positioning, geodesy, analytics, spatial infrastructures and space advisory

- Build a strong reputation and track record in the development and delivery of multi-disciplinary research and innovation initiatives through industry-government-university collaborations.
- Solve partner challenges. We would not have existed without the foresight of our partners. FrontierSI is predicated on solving partner challenges and is strongly aligned to contributing to the delivery of partner strategies.
- Have strong relationships and be a trusted advisor to government and the Space and Spatial sectors through successful research and innovation initiatives developed over many years.
- Consider collaboration our core skillset. We bring the right teams together and are experts with strong industry networks. We draw on the expertise and capabilities of our university and industry partners to provide the complex and varied skills required to solve identified problems.
- Act impartially. This impartiality is tightly guarded and demonstrates our ability to advise openly about risks associated with various products, solutions and vendors without preferencing any proprietary solution.
- Co-fund and invest in industry development and problem-solving activities with our partners. We are passionate and committed to the better use of space and spatial technologies to drive a more sustainable economy, environment and society.
- Focus on the long-term challenges where both collaboration and space and spatial technology are key to realising value and impact.

## Strategic Goals

High level intentions that will help define our Objectives to realise our Vision.





# RESEARCH AND INNOVATION APPROACH

## POSITIONING AND GEODESY



To improve positioning technologies accuracy & reliability.

## DATA INFRASTRUCTURES



To improve the integration and maintenance of spatial data to make it discoverable, accessible and usable.

## SPATIAL ANALYTICS



Turning rich data sets, and the location information linking them, into useable knowledge and actionable decisions.

## SPACE ADVISORY



To support space mission development through connection to end users, leveraging spatial, data, and positioning capabilities.

Our collaborative team has extensive space and spatial expertise in positioning and geodesy, data and infrastructures, spatial analytics, and space advisory. This expertise can assist any sector, from space to health and resources, to improve location-based information and increase data accessibility for improved decision support and service delivery.

We are a trusted advisor, facilitator and collaborator and have a depth of experience delivering multi-party, multi-disciplinary collaborative R&D projects both locally and internationally. Through our extensive partner network, we can access the right expertise to meet the needs of each individual project, holding us in a unique position within the market.

FrontierSI provides the connection point, research services, expertise, technology, and collaborative model for our partner network to access, develop and apply space and spatial research development and innovation project outcomes into impactful and innovative solutions. Together with our partners, we have transformed research outcomes into meaningful changes across several industries.

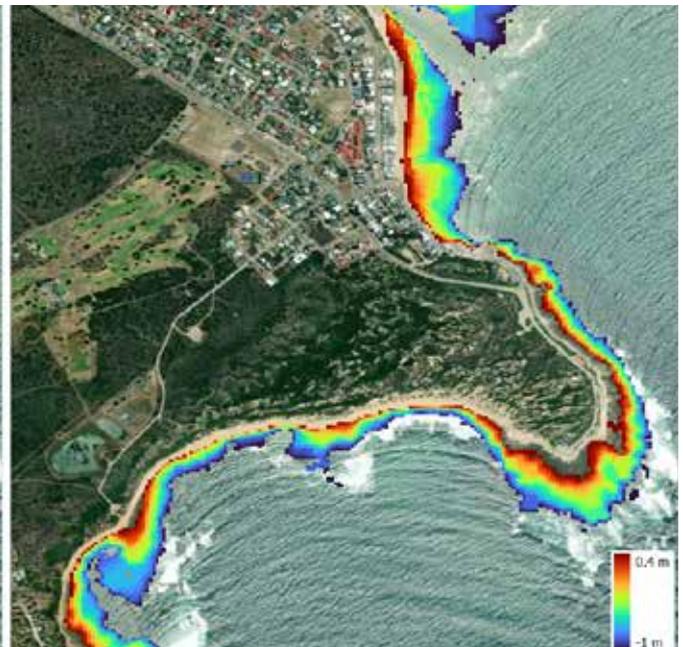
## OUR CAPABILITIES

### Project Facilitation

Responsively facilitating the formulation and delivery of complex projects which require collaboration between organisations. This draws upon our ability to connect drivers and insights from different organisations, extensive networks internationally and our expertise in delivering multi-sectoral and multi-partner projects. This includes our ability to create, manage and monitor quality outsourcing and subcontracting services which enhance solution delivery. Through our outsourcing capabilities, FrontierSI offers efficient and effective access to a highly specialised and expert resource base. The scalability through our networks vastly enhances our ability to deliver the required solutions and business outcomes.

### Collaborative Applied Research

We have 20 years' experience in creating and managing collaborative teams of academic, private sector and government professionals to solve challenging innovation and R&D spatial problems of varying scales. We help to breakdown organisational, jurisdictional, and technology silos to deliver results and realise value for all project stakeholders. We have staff accredited in a variety of project management approaches to ensure that the right approach is used for each problem. Often these are large-scale, complex, multi-jurisdictional initiatives. Our projects range from deep technical research through to proof-of-concepts and demonstrators.





### **Advisory Services**

Through our inhouse expertise as well as industry and university partnerships, we provide independent and trusted expert advice in space and spatial industry strategy, business strategy, data and spatial infrastructures strategy, innovation programs, technology due diligence, industry and technology trends, mission design, new markets assessment and economic analysis.

### **Industry Engagement and Outreach**

We conduct workshops, reviews and industry consultations across both technology and end-user markets to uncover new strategic insights and directions for our partners.

We have co-organised national and international business networking events and business exchanges. These extensive outreach efforts raise awareness of new technologies and their potential benefits,

leading to the increased adoption of space and spatial technology and funding of new large-scale initiatives. Our global linkages and networks beyond ANZ connect our partners to leading global research and innovation.

### **Technology Development**

We bring ideas to life, straddle the divide between cutting edge research and commercially scalable solutions to bring our partners' ideas to market. We help our industry and government partners navigate the constantly changing digital environment by rapidly prototyping new ideas to explore feasibility and strategic fit. We join forces with our partners to provide an innovative, competitive edge in project bids. We play at the leading edge of technology, providing expertise in design, development, prototyping, and testing. We also offer software development capabilities and technical Geographic Information System (GIS) services.

### **Professional Training**

We provide training, capacity building, up-skilling, and professional development courses directly and through our partners. Through our research, we deliver postgraduate and postdoctoral education and training.



# OUR IMPACT

## 1. Our Work

### Our Investment

As a purpose-driven organisation, FrontierSI invests to grow the space and spatial industries in many ways, including supporting industry initiatives, knowledge sharing and directly funding projects to stimulate learning and adoption of new technologies and techniques. Key examples of our investment this year include:

- Co-funding three Digital Twin Projects in the fields of health, flood risk management and urban liveability and sharing the learnings widely. The projects were selected in 2020 and FrontierSI contributed \$300,000 in total. Each of these projects successfully developed skills in the research community, demonstrated the opportunities for Digital Twin, and led to further opportunities for project partners. The three projects were:
  - AusEnHealth in collaboration with Queensland University of Technology, Qld Department of Natural Resources, Mining and Energy, Curtin University, Geoscience Australia, WA Department of Health, and NGIS, as well as stakeholders Australian University Research Infrastructure Network (AURIN), Victorian Environmental Protection Authority and Terrestrial Ecosystem Research Network and National Environmental Prediction System (TERN).
  - Liveable City Digital Twin Pilot with UNSW, Data 61, NSW Spatial Services, Aurin, Astrolabe and QLD DNRME.
  - Towards a National Digital Twin for Flood Resilience in New Zealand with University of Canterbury, LINZ, and the NZ National Institute of Water and Atmospheric Research.

- Funding the “Concordance Project” – a proof of concept undertaken with NSW Department of Customer Service, Spatial Services to demonstrate and explore whole-of-government location-based reporting - see [Partnership enhancing whole-of-government location-based reporting – Spatial Services \(nsw.gov.au\)](#). Working with KurrawongAI, FrontierSI developed methods to perform the conversion between geographies and demonstrated their impact through an online proof-of-concept. The project assessed and recommended the best approach to achieve a more consistent and high-quality solution for location-based reports across NSW and potentially at a national level.
- Funding the creation, management and administration of many projects across the Data Analysis, Positioning, and Spatial Infrastructure themes.

FrontierSI has also invested in internal capabilities to lead Transformative Initiatives. The function, led by the Deputy CEO, has been active in advocating for [PlanTech](#) – the use of technology, particularly spatial technologies, to improve the planning lifecycle in Australia. Working with the Planning Institute of Australia, UNSW and RMIT, FrontierSI is exploring the opportunities for a significant initiative to support this critical industry transformation.



## Positioning Adoption

FrontierSI with Geoscience Australia and partner Universities have been driving the adoption of positioning technologies including Ginan, SBAS, and 5G positioning.

### Ginan

FrontierSI has been working collaboratively with Geoscience Australia (GA), Curtin University, the University of Newcastle and many others to enhance Ginan. Ginan is Geoscience Australia's Global Navigation Satellite System (GNSS) analysis centre software that delivers a real-time positioning correction service through open-source software, and additional positioning products to enable precise point positioning for Australian industry and users.

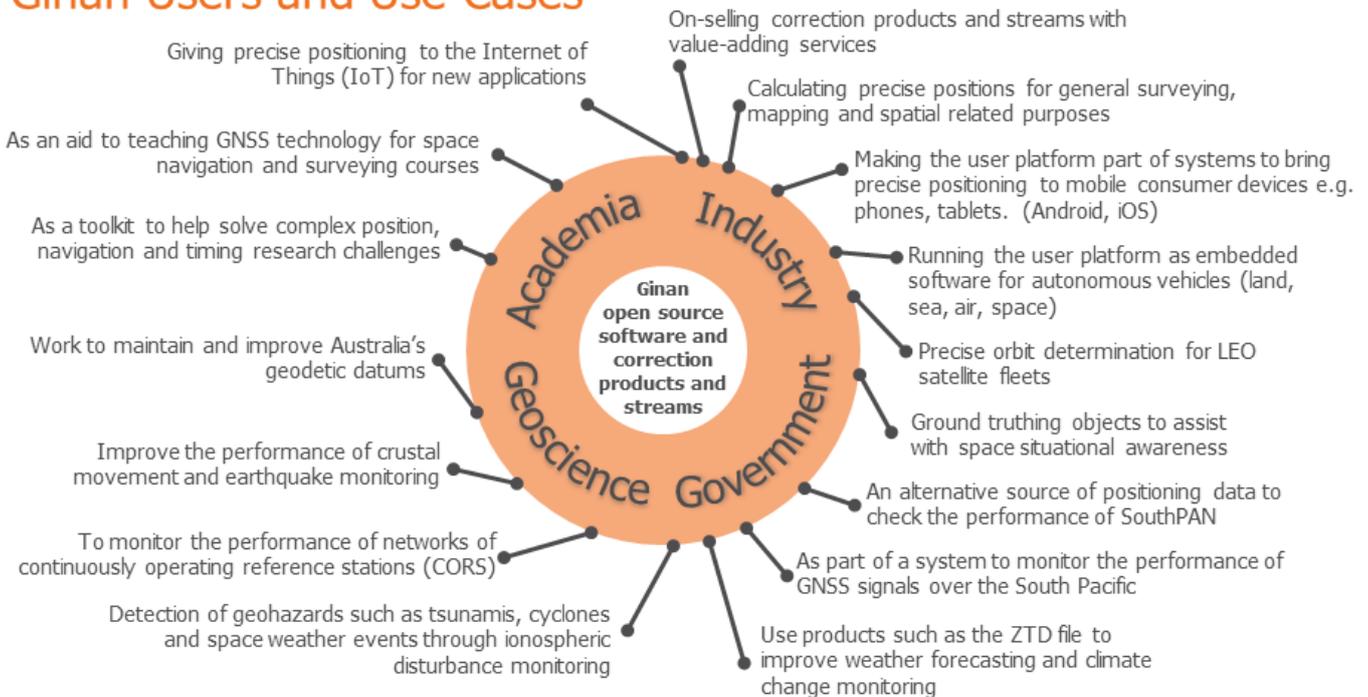
Ginan is an essential component of an operational National Positioning Infrastructure Capability and supports the vision of "instantaneous GNSS positioning, anywhere, anytime, with the highest possible accuracy and the highest possible integrity". It helps deliver accurate, reliable, and instantaneous positioning across Australia and its maritime zones and lowers the barriers to accessing advanced high precision positioning technology in Australia. This enables the Australian industry to progress and allows for innovation across all sectors such as agriculture, transport, emergency management, mining, engineering and logistics.

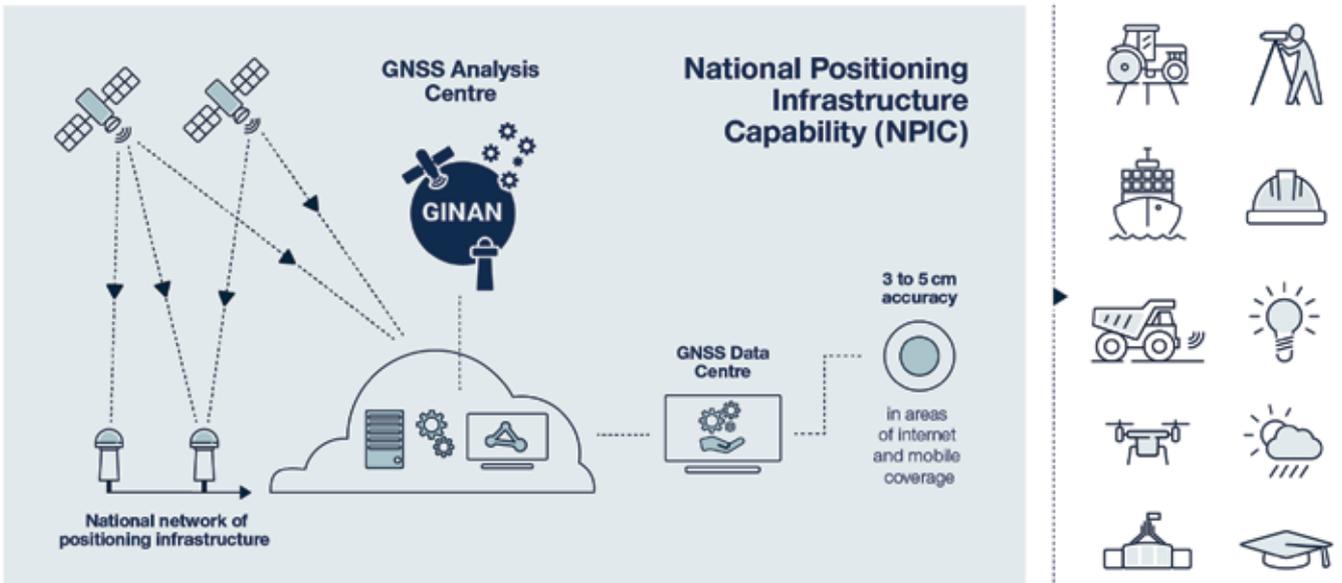
FrontierSI were further engaged by GA to establish a series of case studies demonstrating precise positioning capability. The Australian Institute of Marine Science (AIMS) were selected as the demonstration partner for a Ginan case study to investigate the suitability, benefits, and challenges of using Positioning Australia products.

This included testing Ginan for surveying, mapping, and positioning of objects of interest on-land, on the surface, and underwater. The case study demonstrated real-time centimetre to decimetre accuracy through a range of test scenarios, both in-flight and aboard a surface vessel in motion.

Results were thoroughly analysed to provide recommendations on precise positioning solutions tailored towards the future capability development for the AIMS ReefWorks test ranges. Throughout each of the tested scenarios, Ginan showed promising capability as an open-source alternative to existing precise positioning solutions, and as an all-in-one, open-source solution for operations where communications infrastructure cannot be guaranteed.

## Ginan Users and Use Cases





### SouthPAN

The Southern Positioning Augmentation Network, known as SouthPAN was recently launched by [Geoscience Australia \(GA\)](#) and [Toitū Te Whenua Land Information New Zealand \(LINZ\)](#) and has been delivering early Open Services since September 2022. This is the operational implementation of the Satellite-Based Augmentation System (SBAS) Test-bed conducted from 2017-2020, which provides augmentation services for United States Global Positioning System (GPS) and European Union Galileo Global Navigation Satellite System (GNSS) constellations. [Lockheed Martin Australia](#) is operating SouthPAN, the first government-owned Satellite-Based Augmentation System in the Southern Hemisphere.

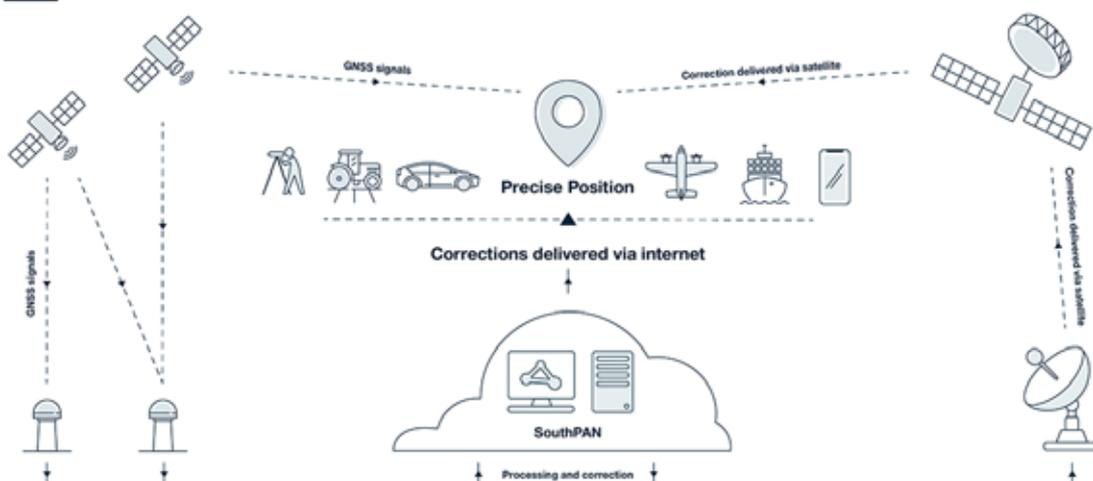
SouthPAN provides instant, accurate, and reliable positioning across all of Australia and New Zealand – including in regional and remote areas. Users benefit from 10-centimetre accurate satellite positioning, up to

50 times more accurate than the 5-10 metres available from GPS and Galileo. SouthPAN allows industry in Australia and New Zealand to increase safety, boost productivity and drive innovation across utilities, construction, resources, agriculture, and many other industries.

Users are now able to integrate SouthPAN early Open Services with existing equipment to create and enhance positioning service offerings for end-users. SouthPAN services are open-access and are available throughout Australia and New Zealand’s land and maritime zones, overcoming gaps in mobile and internet coverage.

With early Open Services live, the GA and LINZ teams are now working towards full Open Service capability and certified Safety-of-Life Services by 2028. FrontierSI will continue to collaborate with GA and LINZ in the better use of positioning services across Australia and New Zealand.

### SouthPAN





### 5G Positioning Testbed

Precise positioning of consumer and business devices to within 10cm is now possible through 5G, however potential users are often unable to access this due to technology, infrastructure and device interoperability barriers. Through improved transmission technology, 5G will deliver increased bandwidth and high-speed data streaming, alongside new features included in 3GPP releases allowing delivery of high-accuracy positioning to 5G connected devices, unlocking a plethora of commercial and consumer opportunities, and helping to realise potentially billions of dollars of benefits to Australia.

FrontierSI led the 5G Industry testbed project using the Optus network to demonstrate the economic benefits of precise positioning. The project delivered a world first collaborative demonstration of 5G's precise positioning capabilities made possible within the latest release of the 3GPP standard and showcased the benefits to a myriad of small business across Australia.

The trial was part of an overall project funded by the Commonwealth Government and demonstrated applications of precise positioning using 5G for agriculture (remote fertiliser management and farm robotics and vineyard management), augmented reality, drone flight, plus a showcase of the 5G kit through a scooter challenge demonstration. The primary outcome of this project was the operational precise positioning service delivered over the Optus 5G network.

At the annual Asia Pacific Spatial Excellence Awards, held in conjunction with Locate23, the '5G Precise Positioning Testbed (demonstrating the economic benefits of 5G)' received the International Partnership award and the JK Barrie award for bringing together a number of global companies to demonstrate and measure 5G across several agricultural and transport applications.

## Data Cube Projects

### Digital Earth Australia

Digital Earth Australia (DEA) is a key piece of public data infrastructure that uses satellite data to detect physical changes across Australia in unprecedented detail. A key goal of DEA is enabling Australian industries to exploit the full value of Earth Observation (EO) information to grow their business. It offers Australian private industry access to stable, standardised data, from which it can innovate to produce new products and services and be competitive in global markets. DEA unlocks the potential we know satellite imagery and data hold by simplifying both data access and analysis.

FrontierSI led a DEA market research project to address awareness and education gaps in an initial set of five major Australian industry sectors (Agriculture, Mining/Extractive Industry, Financial Services/Insurance, Urban Planning, and Infrastructure Development), and establish mechanisms through which GA could appropriately and actively engage those sectors to maximise the uptake of both EO and DEA products and services. In October 2022, the market research report for the urban planning sector was released: [Planning to Benefit from Earth observation Report](#).

The opportunities for Earth observation (EO) data to drive improved planning outcomes and efficiencies within Australia's urban planning industry are extensive. Its potential as evidence for decision making is transformative, there are significant operational efficiencies to be gained, and it can benefit the entire cohort of professionals who work to plan, design, and construct our future cities. However, there is currently a gap in knowledge and awareness between technology providers and potential users which inhibits adoption of EO-derived knowledge and applications. This report is a step towards bridging this gap and encouraging urban planning and EO professionals to explore together the new opportunities which EO data and analytics make possible.

### Digital Earth Africa National Land Cover and Crop Type Mapping

FrontierSI collaborated with the United Nations [Food and Agriculture Organisation](#) (FAO) and [Digital Earth Africa](#) (DE Africa) to develop a prototype automated Land Cover and Crop Mapping workflow to assist the [Hand-In-Hand \(HIH\) Initiative](#). The Office of the Chief Statistician at the FAO led the initiative, to support the implementation of nationally-led programmes to accelerate the eradication of poverty, end hunger and malnutrition, and reduce inequalities, utilising existing and novel approaches, data sources, platforms, and analytical tools to drive agricultural innovation.



One of the challenges to achieving these HIH goals was the lack of available data, including limited resources to collect, analyse, and disseminate agriculture statistics regularly. A viable and effective solution is the use of Earth Observation (EO) to assist in the collection of timely and consistent data at local, regional and national scales. With this potential comes challenges such as data access, storage, pre-processing and analysis of large temporal datasets.

DE Africa is a platform that provides reliable and timely access to analysis-ready EO data to support sustainable development. It removes the burden of data storage and pre-processing from users, provides a platform to perform intensive cloud processing, utilises pre-prepared analysis workflows, as well as supporting users to modify or develop workflows for their own needs.

To assist the FAO and the HIH initiative, FrontierSI developed an adaptable land cover mapping workflow within DE Africa and tested it for two countries in Africa, Rwanda and Mozambique, taking input from users and adjusting the method to suit the environment and application needs of in-country users. A critical component of the project was to build capacity in the selected countries to use and adapt the workflows. This was achieved on two levels, through webinars to raise awareness of the capability of EO data to support land cover and crop mapping and through technical workshops.

This work was presented at the [African Association of Remote Sensing of the Environment International Conference](#) held in Rwanda.

## EOCSI

The Earth observation for Climate Smart Innovation project (EOCSI) supported Australian businesses to develop new Open Data Cube (ODC) prototypes for markets in South-East Asia in order to grow the Earth observation (EO) industry and see EO data driving decision making across our region to support climate resilience. The project was a collaboration between Geoscience Australia, CSIRO, FrontierSI and Symbios.

This project supported three phases of activity. In phase one, a Hackathon brought together participants from across both Australia and South-East Asia to explore their climate smart innovation ideas using EO science and the EASI platform, across five days of networking, keynote presentations and EASI technical sessions.

In phase two, groups undertook an intensive six-week prototype development program including training in user-centred design, EO data sourcing, EASI technical training, business skills workshops, business culture workshops and B2B matching. This culminated in a phase three showcase event which focused on business concept refinement, with two groups interested in commercialisation.

For many of the participants, the skills they learnt through participating in this project have fundamentally improved their capacity to use Earth observation data for climate smart innovation. These impacts will continue to flow into the work they do professionally, particularly in conjunction with the networks they have built across both Australia and South-East Asia through this project.

## 2. FrontierSI – Leaders in Spatial

Delivering value to our Partner network and the broader space and spatial community remains our highest priority. We continue to take a leadership role in educating our partners and colleagues via our involvement in committees, conferences, and industry webinars and workshops.

Over the past 12 months, FrontierSI has played critical industry roles including:

### Space+Spatial Industry Growth Roadmap 2023

The [2030 Space+Spatial Industry Growth Roadmap](#) was officially launched at the Australian Space Discovery Centre in Adelaide in March 2023 outlining recommendations about how Australia's space and spatial industries can develop to better impact the nation's well-being. FrontierSI played a key role in the development of the roadmap, which was the product of extensive and industry-wide consultation over two years. The roadmap frames nine key objectives and accompanying actions to accelerate growth of both industries working together in the national interest. The recommendations aim to address critical national challenges by focusing on actions such as improving coordination, strategy development and capability through either organisation with accountability or project champions aligned with the objectives.

### State of The Market Report

FrontierSI's [State of the Market](#) report on communication technologies used for the mass-market delivery of Global Navigation Satellite System (GNSS) corrections, prepared as part of the Positioning Australia program, reviews how Precise Positioning using GNSS is currently delivered in Australia and identifies technologies that can increase adoption of mass-market users. The report presents a review of communication technologies, standards and protocols, outlines future directions and benefits, and much more.

### UK-Australia Cal-Val Space-Bridge Report

The [final report of the UK-Australia Cal-Val Space-Bridge project](#) was released. The preliminary phase of the project confirmed that there are exciting opportunities for collaboration between UK and Australia in Earth observation calibration and validation showcasing the niche and complementary capabilities of both countries. The report, which FrontierSI contributed to, led by our partner Symbios together with Assimila (UK), confirmed the exciting opportunities for collaboration between UK and Australia in Earth observation calibration and validation.



## XXVII Fig Conference, Poland, September 2022

The XXVII FIG Congress in Poland is touted as the largest and most prestigious conference of surveying and geospatial professionals in the world and has been convening for close to 150 years. This year's theme, "Volunteering for the future – Geospatial excellence for a better living", aimed to highlight that geospatial and related disciplines are now being seen in a much broader context and becoming more integrated in the well-being of society.

At this year's conference, FrontierSI took an active role with Eldar Rubinov, Luis Elneser and Kathryn Salm attending the in-person conference, and Roshni Sharma coordinating several events (virtually) from Australia. FrontierSI is grateful that we continue to be given the opportunity to showcase our skillset and expertise to our space and spatial colleagues around the globe.

## Staff Recognition

Congratulations to Alex Linossier, who was awarded the Rising Star of the Year in the Australian Space Awards 2023. Alex is an engineer who is passionate about making a positive and lasting impact on the world. He's worked in large and small industry, governmental organisations, research institutions, and volunteer organisations/NGOs, with a huge range of people to solve technical, project management and systems engineering problems. At FrontierSI, we're excited that Alex is an active part of our Space team, tackling new initiatives with confidence, energy and skill.



Congratulations also to Dr Caitlin Adams, who received the award for Early-Career Contribution to the Development of the Australian Earth Observation Community and its Capabilities at the Earth Observation Australia 2022 ceremony. Dr. Caitlin Adams completed her PhD in Astrophysics in 2019 at Swinburne University of Technology and joined FrontierSI as a data scientist, transitioning her experience from looking out at the Universe to looking in at our planet.



In her work at FrontierSI, she focuses on enabling better use of Earth observation data across the public and private sectors. Key to this is Caitlin's passion for educating and supporting others. In her work with the Digital Earth Australia program, Caitlin has developed and delivered high quality documentation, examples, and live workshops, enabling people to better leverage freely available satellite imagery. Caitlin specialises in the application of machine learning to Earth observation data, having collaborated with the Victorian government to build a state-wide map of tree extent from aerial imagery, and worked with Digital Earth Africa to map crop types in Africa from satellite imagery.

Value Australia, a pioneering initiative within the PEXA Group and a collaboration between FrontierSI and UNSW, proudly emerged as the winner of the prestigious Award for Research Commercialisation at the 2023 Cooperative Research Australia Awards for Excellence in Innovation held in Adelaide.

Recognised alongside UNSW and PEXA, our achievement lies in successfully introducing AI-assisted property valuations technology to the Australian market, reshaping the industry by meticulously analysing complex data sets. This award acknowledges our ability to translate research into a business venture, creating lasting societal value and new economic opportunities. We express gratitude to Cooperative Research Australia and our partners, PEXA and UNSW City Futures Research Centre, as well as our dedicated employees.



## IN MEMORIAM

### Peter Woodgate

FrontierSI was deeply saddened by the sudden and tragic passing of Peter Woodgate prior to Christmas. As CEO of FrontierSI's predecessor organisation, the Cooperative Research Centre for Spatial Information, Peter was a recognised visionary and leader of the spatial industry in Australia and around the world.



Across 40 years, Peter left a lasting impact across the spatial industry, and over the last 5 years provided a similar catalyst for growth, innovation and change in our budding space industry. His career spanned many influential government and academic roles, but for us his most influential role was as founding CEO of the CRC for Spatial Information, a role he held until close to our transition into FrontierSI in 2018. Peter's recent history has been as an influential board member across a range of sectors, including Geoscape, AURIN, SmartSatCRC, Canthera Discovery, and Charles Sturt University.

Peter's enthusiasm and dedication to developing and improving the spatial industry was unrivalled as evidenced by his significant leadership roles and lasting influence. His substantial legacy will live on through the many key spatial initiatives that grew through his influence and direction, as well as the numerous people who developed professionally and personally as a result of his guidance, friendship and mentorship.



The creation of a fifth executive role to focus on Transformational Initiatives led to the appointment of **Paula Fiévez** (top right) in the role of Chief Business Officer in October 2022, joining **Graeme Kernich** (Chief Executive Officer) (second from left), **Kate Williams** (Chief Delivery Officer) (top left), **Patricia Sturgess** (Chief Operating Officer) (middle) and **Phil Delaney** (Deputy CEO and Transformation Executive).

# PEOPLE AND CULTURE

As a service-based organisation our staff are critical. Staff health and well-being is a top priority.

Ongoing initiatives such as flexible working conditions, Employee Assistance Program support, and team-based activities to promote social connection and health, are a key feature of how we operate and support our staff. This year we also introduced paid volunteering days for all staff, an initiative which has already been highly valuable to many of our staff and their communities. Pleasingly, not only has a high staff retention rate been maintained, we have also attracted a number of new, high calibre staff to our organisation ending the year with 38 full time and part-time staff.

FrontierSI formally operates within a functional structure divided into four key areas:

- **Business Development/Partner Engagement/Communications**
- **Operations and Internal Development**
- **Innovation and Project Delivery**
- **Transformational Initiatives**

Business development, partner engagement and communications staff are employed across Australia (Melbourne, Perth, Brisbane and Hobart) and New Zealand (Christchurch). In addition, senior FrontierSI staff contribute to business development through a range of networking and outreach activities. A Communications Manager is employed to deliver communications and

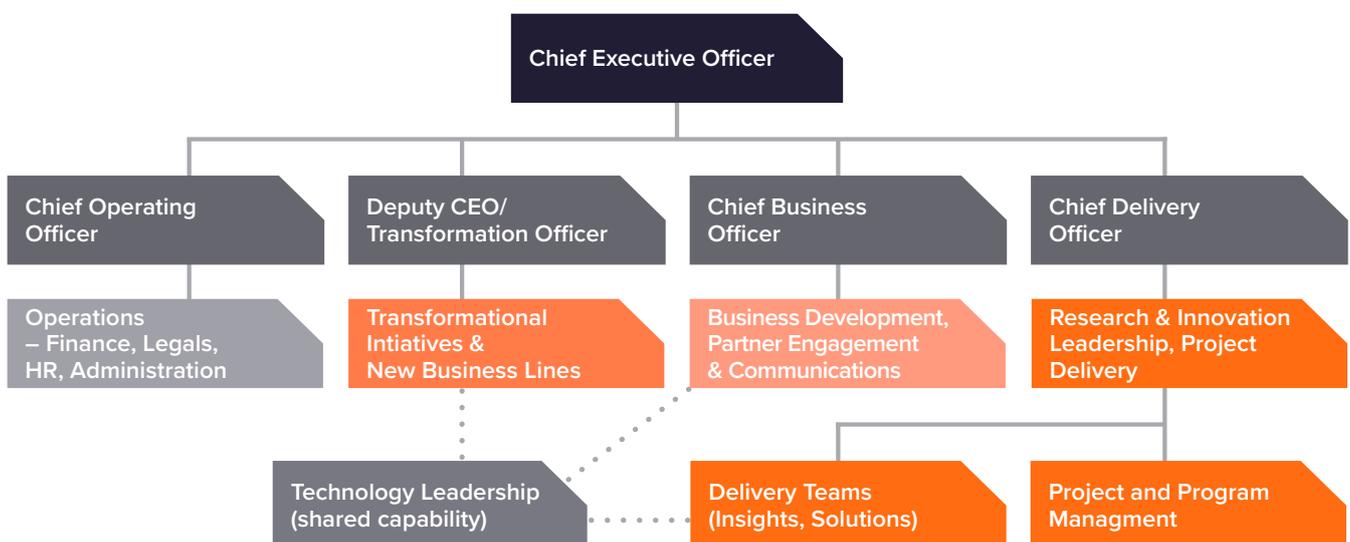
marketing activities via a variety of mediums, working in collaboration with the Business Development team to drive opportunities and enhance our brand.

Specialist science and engineering expertise in our space and spatial discipline areas are a valuable arm of our organisational structure. These discipline leaders provide FrontierSI with insights into industry trends and program-related issues and can be seconded at a strategic level to provide input into evaluation of new initiatives.

In-house staff specialist geospatial capability and service delivery has been progressively built to fulfil the anticipated service delivery requirements on current and future projects. Maintaining an internal core capability ensures corporate knowledge is not lost over time. FrontierSI also scales resourcing via securing capability within partners, and where specialist capability is needed beyond the partner base, via external providers.

- **Five-member executive** combining operational skills, industry experience, and leadership.
- **Four functions** covering (1) Delivery, (2) Business Development, Partnerships and Communications (3) Business Transformation and (4) Operations.
- Continued growth in project delivery requires a **scalable delivery structure** focused on technology leadership, project and program management, and a range of delivery teams themed around specific technical capabilities.
- **The Business Transformation** function oversees the development of new capability development and lines of business for FrontierSI.

## FrontierSI Structure





**54%  
MALE**



**46%  
FEMALE**

**89%  
RETENTION RATE**



**68%  
FULL TIME**



**32%  
PART TIME**

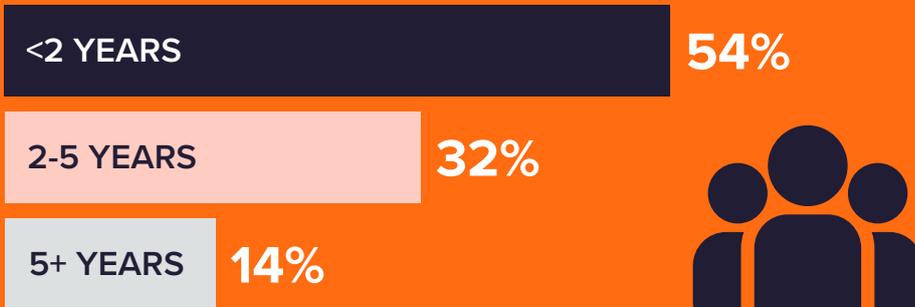
**STAFF  
LOCATION**



**30%  
STAFF WITH  
MASTERS  
QUALIFICATIONS**



**STAFF TENURE (YEARS)**



**24%  
STAFF WITH PhD  
QUALIFICATIONS**



## Diversity and Inclusion

At FrontierSI, we aim to bring the best people together to anticipate and solve large problems using our space and spatial expertise. We know that to do this, we need to create a work culture which is inclusive, that brings together diverse talent from different backgrounds, locations and experiences, and provides the conditions for them to flourish with psychological safety. We understand that we must go beyond equality to equity, that creating belonging takes hard work over time to sustain a strong culture, and that inclusion is a shifting goal that must be maintained.

We also understand that as technical experts working within a human context to solve complex, multistakeholder problems, we need to be aware of the unconscious biases that we have, or they will be replicated endlessly and scaled widely. FrontierSI's Diversity & Inclusion Committee work with the whole staff body to create internal and outward-facing initiatives for partners which provide a benchmark for awareness of unconscious biases in technology.

In our 2023 index of inclusion and belonging survey, we received validating feedback from the staff body on this:

**“I feel really accepted by the FrontierSI community, everyone is quite well educated on the importance of diversity, and so welcoming and friendly.”**

**“I feel like Frontier’s commitment to diversity is prominent and progressive compared to previous roles.”**

**“The staff at Frontier are very respectful and creative.”**

**“While there is always work to do, this organisation is working hard on D&I issues, and realising benefits of positive change.”**

**“I’m so pleased that we have incredible women with scientific backgrounds in our organisation, and that it feels normal. Thank you for hiring incredible women.”**

In 2022-2023, we have demonstrated our commitment to diversity, equity, inclusion and belonging across a range of initiatives, including:

- Launching and successfully running the inaugural round of the ‘Launching Leaders’ paid internship program to provide work experience opportunities to students who may traditionally face barriers to entering the industry. Our three interns were Rebecca Thomas, James Weppner and Zih-Hong Lin.
- Engaging expert external facilitators to conduct D&I training for our staff, including topics such as communicating for inclusion, our individual understanding of diversity, equity and inclusion, and the paradox of inclusion.
- Become organisational members of the Diversity Council of Australia, and making use of the multitude of member resources and events which this provides for.
- Established a Volunteer Leave program for our staff, encouraging and supporting them to contribute to their wider community through voluntary activities.

- Funding and participating in the 2023 Indigenous Mapping Workshop, where our staff undertook knowledge sharing and facilitated technical sessions on Earth Observation using Digital Earth Australia.
- Promoting the SSSDLN Accord and the results of the Space, Surveying and Surveying Diversity Leadership Network (SSSDLN) Inclusion@Work Report.

We have tracked our progress by benchmarking the state of diversity within our workforce against the sector and having achieved an industry leadership position in relation to pay parity, gender equality and flexible work practices. Within our 2022-2023 workforce, we are pleased to note that we are exceeding the average spatial sector statistics regarding several key benchmarks for diversity – gender pay parity, female representation across the entire staff body as well as the Executive and Board level, flexible working arrangements, and age demographics across the workforce.

We acknowledge that this does not mean that the work is done, and our internal Diversity & Inclusion Committee are working hard to both measure and monitor a range of diversity metrics across the workforce over time, as well as on several new initiatives which address building greater inclusion and equity across policies and procedures, technical and business development approaches, working with partners, and strengthening our inclusive staff culture.

Spatial Sector <sup>1</sup>	FrontierSI in 2022-23
Gender pay gaps in key roles	Average hourly rate <b>pay parity</b> achieved in 2022-23
<b>25%</b> Female representation	<b>46%</b> Female employees Leadership – <b>Executive 60%</b> Female and <b>Board 33%</b>
<b>17%</b> of private sector organisations with a gender equality or flexibility strategy	<b>32%</b> staff work part time <b>30%</b> of employees work entirely remotely and remainder work in a hybrid fashion with access to an office space. <b>50%</b> of employees have caring duties for either children or adults <b>at least 20%</b> of employees identify as not heterosexual, as well as employees who identify as non-binary
<b>17%</b> of workforce > 55 yrs	<b>13%</b> employees > 55 yrs
Limited evidence of employees from non-Anglo and indigenous backgrounds and employees with disability	<b>25%</b> of employees are from non anglo backgrounds <b>60%</b> of employees have lived and or worked overseas for greater than 6 months at some point in their life <b>4%</b> of employees identify as having neurodiversity or a neurodiverse history

<sup>1</sup> 2026 Agenda Diversity and Inclusion Action Plan.

# PROJECT DELIVERY

In 2022-23, FrontierSI led, formulated, brokered, and delivered solutions with government, industry, and university partners within a portfolio of 63 projects. 35 projects were completed, 28 new projects commenced and FrontierSI began 2023-24 with an active project portfolio of 32 projects with cumulative funding value in excess of \$13M.

FrontierSI exists to solve partner challenges and our portfolio reflects the deep level of engagement we have with each organisation within our partner network. Our projects engaged 72 project partners with each of our university and government partners involved in multiple initiatives. Maintaining alignment with partner and stakeholder strategies and initiatives across our project portfolio is an ongoing priority, both in assessing the activities to pursue and in determining how we deliver.



## Positioning and Geodesy Project Portfolio

Project Title	Key Sectors	Status	Collaborators
Ongoing Development of the Multi GNSS Analysis Centre Software (Ginan)	Government	Ongoing	GA
Ionospheric modelling for the Analysis Centre Software and National Positioning Infrastructure	Government	Ongoing	GA, RMIT
Provision of SBAS Specialist Research & Technical Capability	Government	Ongoing	GA, LINZ
Calibration of Signal Power, and their utilisation from ground tracking networks for constellation monitoring	Government	Ongoing	GA, UTAS
Positioning Australia – Accelerating Industry Adoption	Whole of Economy	Ongoing	GA, Curtin, Positioning Insights, AIMS
Ginan QA Demo	Government	Completed	GA
5G Precise Positioning Testbed	Whole of Economy	Completed	GA, Positioning Partners, Optus, Ericsson, Acil Allan, Kondinin Group, Platfarm
Developing low earth orbit GNSS data analysis capability for Ginan	Government	Ongoing	GA, Curtin, UoN
A scoping study and ‘gap’ analysis for the development of a national hydroid model ("AUSHYDROID")	Government	Completed	AGO, Curtin, GA, BOM, WATransport
AGIG GNSS Data Integration	Government	Completed	AGIC
5G Optus Tech Demo	Whole of Economy	Commenced and Completed	Ericsson, Optus
Improving Transport Services through SouthPAN	Government	Commenced	DTP Victoria



## Data Analytics Portfolio

Project Title	Key Sectors	Status	Collaborators
Provision of Market Research for continuation of DEA Industry Strategy	Government	Completed	GA
AusSeabed Data Hub Component Development	Government	Ongoing	GA
Cliniface, The Answer Machine (Pilbara Faces Stage 2)	Government	Ongoing	Curtin, PCH
The Australian Housing Data Analytics Platform	Built Environment	Completed	UNSW
Cliniface – Landmarking the Extreme	Health	Ongoing	CAHS, Curtin
Vietnam Earth Observations Market Study	Space and Spatial	Completed	Symbios, CSIRO
Land Cover for Digital Earth Africa and UN FAO	Environment	Completed	GA, UN FAO
Enabling Crop Analytics at Scale in Africa	Environment	Completed	GA, Tetratech, RCMRD
QLD TMR Spatial Labs	Government	Completed	QLD TMR, Mapizy, Veris, ARRB, UoW
Cliniface Takada Protocol Phase 1	Health	Ongoing	Curtin, Takeda, SingHealth
UK GRIP Agroclimate Study	Government	Completed	Symbios
Open Data Cube Training and Business Engagement for South East Asia	Government	Completed	GA, Symbios
QLD Gravity Scoping Study	Resources	Completed	QDoR
ConnectEO European Trade Mission	Government	Completed	EARSC
WA Bayesian Health Insights	Health	Ongoing	WA DoH, QUT
Prioritising GDV inspection using ensemble models and near real-time monitoring Phase 1 and 2	Environment	Completed	GA, Curtin, Roy Hill, BHP, Rio Tinto, FMG, DWER, Atlas Iron, DBCA
Open Geospatial Consortium (OGC) Testbed-18 + Collaboration	Space and Spatial, Government	Commenced and Completed	OGC, Curtin, DELWP, NSW DCS
ReLAB Humanitarian Study	Health	Commenced and Completed	Nossal
EO for .id consulting	Built Environment	Commenced and Completed	.id consulting
QLD Industry Report Value Extraction	Resources	Commenced and Completed	QDoR, QUT, ASA
DE Africa Science Support 2022-23	Government	Commenced and Completed	GA, DE Africa

## Data Analytics Portfolio *continued*

Project Title	Key Sectors	Status	Collaborators
State of the Environment Targeted Stocktake and Capability Analysis for Biodiversity	Environment	Commenced and Completed	DELWP
Vegetation Mapping for the Murray-Darling Basin Authority	Environment	Commenced	MDBA, NGIS
Australian Geospatial Intelligence Organisation (AGO) Analytics Labs 2022	Government	Commenced	AGO, UoW
Dynamic Vicmap	Government	Commenced	DELWP, RMIT, SmartSat CRC
SmartSatCRC EO Hub	Government	Commenced	SmartSat CRC, NGIS
Fairy Circle Identification Study	Government	Commenced and Completed	GA
DEA Waterbodies temporal attributes	Government	Commenced and Completed	GA, NHRA
Development of Reef 2050 Integrated Monitoring and Reporting Program Data Manage System	Environment	Commenced	UTAS
Integration of Digital Earth and IoT for water quality monitoring	Environment	Commenced	SmartSat CRC, Curtin

## Spatial Infrastructures Portfolio

Project Title	Key Sectors	Status	Collaborators
Liveable City Digital Twin Pilot: Analytics for agile decision making	Government	Completed	Spatial Services NSW, QUT, Business Aspect
Towards a National Digital Twin for Flood Resilience in New Zealand	Environment	Ongoing	LINZ, UC
Development of a Public Health Atlas for WA	Health	Ongoing	WA DoH, Spatial Vision
Van Kirap Portal Demonstrator (follow on from Pacific Climate Intelligence Platform)	Environment	Ongoing	NGIS, CSIRO
QLD Data and Future Economic Opportunities Strategy	Government	Completed	QDoR, Woolpert, QUT, Urbanism, Acil Allan
RMIT Digital Twin Support	Built Environment	Commenced and Completed	RMIT
QLD Data and Future Economic Opportunities Strategy	Government	Commenced	Queensland Department of Resources

## Spatial Infrastructures Portfolio *continued*

Project Title	Key Sectors	Status	Collaborators
NSW Location Based Reporting Framework	Space and Spatial	Commenced and Completed	NSW DCS, Kurrawong AI
GIS Infrastructure Development Support	Built Environment	Commenced and Completed	PEXA
Cadastre Address Modernisation	Space and Spatial	Commenced	QDoR, Business Aspect, Kurrawong AI
WISE Women in STEM	Space and Spatial	Commenced	She Maps
Research Hub for Resilient and Intelligent Infrastructure Systems	Built Environment	Commenced	UNSW
Victorian Innovation Digital Twin Program	Government	Commenced	DELWP, WSP

## Space Portfolio

Project Title	Key Sectors	Status	Collaborators
A Proof of Concept and feasibility study utilising space technologies to advance the aquaculture markets in Western Australia remote and regional areas (OysterQual)	Agriculture and Natural Resources	Completed	SmartSat CRC
UK Space Bridge – CalVal	Space and Spatial	Completed	Symbios, SmartSat CRC
Technical Feasibility and Implementation Plan for an Australian Data Quality and Integrity Monitoring Facility	Space and Spatial	Ongoing	GA, ANU
National Space Missions Scoping	Space and Spatial	Completed	UNSW, Space Agency
BoM CDF Study	Space and Spatial	Commenced and Completed	UNSW Canberra, BoM
GEO Satellite Investment for EO	Space and Spatial	Commenced and Completed	BoM, Shoal Group, Symbios
Multi-Mission Imager CDF	Environment	Commenced and Completed	Space Agency, UNSW
Planning and Engagement Support for the AusCalVal Facility	Space and Spatial	Commenced	CSIRO, Symbios



# UTILISATION AND COMMERCIALISATION

FrontierSI and UNSW spun out the [Value Australia](#) company in 2022, with PEXA Group then taking a 70% share in the company. The commercialisation of this innovative AI technology in property valuations took out the top spot at the [2023 Cooperative Research Australia Awards](#) for Excellence in Innovation as the winner of the Award for Research Commercialisation. This activity serves as an excellent example of FrontierSI's management of IP, which is guided by the following principles:

- Facilitation of rapid uptake (and capability) by end-users and stakeholders for national benefit.
- Innovative use of IP including all FrontierSI Core Partners having a licence to use IP for internal research purposes.
- Endeavouring to make prior decisions about the commercial potential of investments in IP from research. Where an impact maximising an outcome of public good is sought or where there was no commercial uptake (and no national security or privacy issues) then the IP will be placed into the public domain.
- Operating an end-user uptake pathway with an emphasis on partnering SMEs and government organisations, supported by research providers. Appropriate consideration is also given to the needs of corporate participants.

# PARTNERSHIPS, STAKEHOLDERS AND COLLABORATORS

Collaboration is at the very core of FrontierSI's operating model, and our partnerships are a pivotal enabler.

Collaboration is written into our **constitution**, "to strengthen collaborative links between industry, academic and government in ANZ, and internationally"; it is highlighted in our **values**, "we are solutions-driven and achieve high quality outcomes through collaboration, being open-minded and embracing inclusion, working together as a team internally, and with our partners and clients"; and it is called out as one of our four **strategic goals** "to build and **strengthen partnerships**". Our model for ongoing sustainability is predicated on solving partner challenges by drawing on the expertise of our university and industry support partners.

We have continued to play an active coordination and innovation role with some of our government partners and their key programs. The Digital Earth Africa program built on the success of Geoscience Australia's Digital Earth Australia and strengthened by partnerships with African governance and in-country expertise with the aim of translating Earth observations into insights that will support sustainable development. Together with Business Aspect we have assisted Queensland Department of Resources to progress priority cadaster and address modernisations activities.

The commercialisation of Value Australia with the University of New South Wales has been an exceptional exemplar of the success that can be achieved when the best teams come together to develop innovative end-user driven solutions.

We have provided networking opportunities for our partners through face-to-face forums in Queensland and New Zealand and continued our Connect, Share and Learn Series to showcase project outcomes and share lessons learned. Our partner managers and technical staff provided support to government partners through strategic and technical advice and worked with our delivery partners to formulate and deliver impactful projects to address partner challenges.

Looking ahead to 23/24 we will implement our revised partner model that will see us continue to strengthen our ecosystem and partner network focusing on growing mutually beneficial relationships, reviewing our industry and university partner mix to meet anticipated future demand, and advancing deep and sustaining relationships with end-user sectors.

Once again, it has been a pleasure collaborating with partners, supporting partners, advising partners and learning from partners. We are proud and grateful to have maintained a solid partner base in 2022-23 and we look forward to another successful year of collaboration ahead.

FrontierSI would like to acknowledge its Partners for their ongoing support and collaboration >

## Core Partners



## Support Partners



## Industry Support Partners



## Key Stakeholders & Collaborators

Success comes when teams across disciplinary, organisational, cultural, and international boundaries work together. We are solutions-driven and achieve high quality outcomes through collaboration.

### AMIRA Global

**Status: Memorandum of Understanding**

AMIRA is an independent global not-for-profit organisation representing members from the resources industry seeking to enhance, sustain and deliver transformational research and development, innovation and implementation to the benefit of society.

### ANZLIC (The Australia-New Zealand Land Information Council)

**Status: Spatial Organisation (Research & Innovation Collaborator)**

ANZLIC (The Spatial Information Council) is the peak intergovernmental body in Australia and New Zealand providing leadership on all aspects of spatial service delivery and information. ANZLIC is a key stakeholder for FrontierSI. Half of ANZLIC's members are FrontierSI partners, and FrontierSI's strategy is highly aligned with the 2020-24 ANZLIC strategy.

### AusSeabed

**Status: Program Collaborator**

AusSeabed is a national seabed mapping coordination program aimed at improving the awareness, coverage, quality, discoverability, and accessibility of seabed mapping data through coordination and collaboration in the Australian region.

### Australian Space Agency

**Status: Joint Statement of Strategic Intent and Cooperation**

The Australian Space Agency and FrontierSI share the goal of developing a globally respected Australian space industry to deliver the benefits for Australians that will flow from the advancement of the space and spatial sectors. FrontierSI has a critical role making the information from space usable for downstream industry sectors including the agriculture, health, mining, built infrastructure, transport, energy, defence, and environmental sectors.

### Cooperative Research Centre Association

**Status: Member**

The Cooperative Research Centre for Developing Northern Australia (CRCNA) is investing funds over ten years to support industry-led research collaborations to develop new technologies, products and services which address industry issues in Northern Australia within three initial focus areas: Agriculture and food (including aquaculture, horticulture, and forestry); Northern Australia health service delivery; and Traditional Owner-led business development.

### Earth Observation Australia

**Status: Member**

Earth Observation Australia aims to provide a national base for regular communication and coordination of earth observation data collection, distribution, access, product and service development, delivery, calibration and validation activities across all relevant federal and state government agencies, research agencies, universities, private sector and non-government organisations.

### European Association of Remote Sensing Companies (EARSC)

**Status: Strategic relationship through Memorandum of Understanding**

EARSC and FrontierSI are cooperating on the promotion of Earth Observation (EO) technology use and supporting collaboration and exchange between companies in Europe and Australia which offer EO-related products and services.

### Group on Earth Observations

**Status: Participating Organisation**

FrontierSI has been an active member of the Group on Earth Observations (GEO) Community since 2017 through our participating organisation status. GEO is a partnership of more than 100 national governments and more than 100 participating organisations that envisions a future where decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations. The GEO community focuses on three global priority engagement areas: the [United Nations 2030 Agenda for Sustainable Development](#), the [Paris Agreement](#), and the [Sendai Framework for Disaster Risk Reduction](#).

## ICSM

### Status: Research and Innovation Collaborator

The Intergovernmental Committee on Surveying and Mapping (ICSM) was established in 1988 and membership is comprised of senior representatives of surveying and mapping agencies. In 2002, ICSM became a Standing Committee of ANZLIC – the Australian and New Zealand Spatial Information Council. ICSM's core function is to coordinate and promote the development and maintenance of key national spatial data including geodetic, topographic, cadastral, street addressing, tides & sea level, and geographical names.

## Open Geospatial Consortium

### Status: Memorandum of Understanding and OGC member

In 2020, FrontierSI re-signed a Memorandum of Understanding with the global not-for-profit geospatial organisation, Open Geospatial Consortium (OGC). The OGC community creates free, publicly available geospatial standards that enable new technologies. OGC and FrontierSI are committed to connecting communities and technology within and across domains. OGC and FrontierSI work together on joint activities to reach out, innovate and educate at national, regional and international levels.

## SIBA GITA / Geospatial Council of Australia (GCA)

### Status: Stakeholder

SIBA GITA is the peak body representing the Spatial Industry. SIBA GITA is a unified network throughout Australasia, working together to build a more innovative, entrepreneurial and prosperous Australia.

## Smart Cities Council

### Status: Australian Innovation Partner

FrontierSI ratified a strategic partnership with Smart Cities Council (Australia/New Zealand) as an Australian Innovation Partner, in June 2020. They are a network of leading companies advised by top universities, laboratories and standards bodies.

## SmartSat CRC

### Status: Strategic Partnership (as Core Participant)

FrontierSI is a core partner of the SmartSat CRC where we apply our expertise to strengthen the connection between space and spatial and establish a demand-driven, thriving space industry.

SmartSat CRC comprises some of our industry partners and involves some of our key university partners RMIT, Curtin University, QUT and UNSW.

## SSSI

### Status: Stakeholder

The Surveying & Spatial Sciences Institute (SSSI) is the national peak body catering for professionals who make up the spatial information industry throughout Australia and New Zealand. SSSI gives a voice to members of the spatial science community in both the national and international arena.

## UNGGIM – Private Sector Network

### Status: Founding Member

The value and utility of geospatial information in society and the world economy has been recognised by the United Nations through the establishment of the United Nations Global Geospatial Information Management (UN-GGIM). Through CRCSI, FrontierSI became a founding member in the UNGGIM-PSN in 2016.

## 2026 Spatial Industry Transformation and Growth Agenda

### Status: Coordinator and Participant

FrontierSI (formerly the CRC for Spatial Information) together with SIBA/GITA led the development and implementation of the 2026 Spatial Industry Transformation and Growth Agenda, which aims to transform and realise the potential of the local spatial industry and see it recognised as an underpinning element of the Australian digital economy.

## 2030 Space and Spatial Industry Roadmap

### Status: Participant in the Strategic Steering Committee and Working Group

The Space and Spatial Industries are both classified as emerging industries and are both growing substantially faster than the national economy. An opportunity exists to coordinate the collaboration of these mutually dependent industry sectors, develop the synergies between them and substantially accelerate the growth of these industries and create thousands of new, high value jobs.

## Industry Memberships



# GOVERNANCE AND MANAGEMENT

**Spatial Information Systems Research Limited (SISR), trading as FrontierSI is an unlisted public company limited by guarantee.**

SISR has status as a not-for-profit charitable organisation under Subdivision 50-B of the Income Tax Assessment Act 1998 and section 123E of the Fringe Benefits Tax Assessment Act 1986.

FrontierSI is governed by a skills-based board who is responsible for the overall governance, management, and strategic direction of the organisation. Within a governance framework which is supported by a four Board Committee structure, the six-member Board is comprised of a mix of independent and partner representative members including an independent Chair. Following the resignation of Prof Wendy Lawson in October 2022, Prof Ian Wright was appointed as the new University Representative Board director effective August 2023.

Board focus in 2022-23 was on implementation oversight of a new business strategy and operating model, approved following an external review in the prior year. With a view to ensuring that FrontierSI continues to provide value to its partners and is positioned for sustainable growth, the Board provided input and guidance in the development of growth sector plans and the progression of longer-term strategic initiatives.

To ensure a governance structure which is aligned to the contemporary needs of the business, a governance review was also undertaken, culminating in an amended Constitution effective 1 July 2023, with key amendments including reverting to a default company membership structure comprising the Chair and independent directors, and a Board composition comprising only non-executive directors.

## 2022-23 Board & Committee Meetings

	Board		Finance, Risk and Audit Committee		Strategy & New Initiatives Committee		Remuneration Committee		Nominations Committee	
	Eligible	Attended	Eligible	Attended	Eligible	Attended	Eligible	Attended	Eligible	Attended
<b>Number of meetings held</b>	5		3		4		2		0	
<b>Gillian Sparkes</b>	5	5			4	4	2	2		
<b>Graeme Kernich</b>	5	5			4	4				
<b>Chris Thomas</b>	4	4	2	2	3	3				
<b>Michelle McLean</b>	5	5	3	3			2	2		
<b>James Johnson</b>	5	5			4	4				
<b>Paul Farrell</b>	5	4			4	4	2	2		
<b>Wendy Lawson</b>	2	2								
<b>Steve Jacoby</b>					3	3				
<b>Wayne Poole</b>			3	3						
<b>Melanie Plumb</b>	5	5	3	3	4	4	2	2		

### Notes:

1. Wendy Lawson resigned from the Board on October 29th, 2022.
2. The Board approved Steve Jacoby appointment to SNIC on 19th August 2022.
3. The Nominations Committee did not meet formally but managed the director recruitment process in late 2022 under direct guidance of the Board.
4. Wayne Poole, Senior Manager, Strategic Modelling, Business Advisory at Core Partner RMIT is a member of FRAC.
5. Melanie Plumb is the appointed Company Secretary.

## FrontierSI Board



**GILLIAN SPARKES**  
Chair  
(Independent)



**CHRIS THOMAS**  
Deputy Chair  
(Independent)



**MICHELLE MCCLEAN**  
(Independent)



**JAMES JOHNSON**  
(Government Partner  
Representative)



**WENDY LAWSON**  
(University Partner  
Representative)



**PAUL FARRELL**  
(Industry Partner  
Representative)



**GRAEME KERNICH**  
CEO & Managing Director



**MELANIE PLUMB**  
Company Secretary



## COMMUNICATIONS

### We continued to build the awareness of FrontierSI's work through multiple communications strategies.

Social media, direct marketing and several media initiatives continued to grow with the scheduling of consistent, branded content on project impacts, outreach and thought leadership activities. Our communications efforts were rewarded with exceptional results on social media including nearing 3,000 followers on LinkedIn – which continues to be our primary voice to industry – with close to 1000 new followers gained in the financial year, with over 75,500 impressions. Our newsletter also continued to play a crucial role in communicating our thought leadership position, reaching more than 2,100 subscribers across 11 published issues throughout the year and 6,300 unique opens.

Our mailing data base connects to 5,679 contacts on a regular basis for invitations to various showcase events.

FrontierSI were very active in outreach and provided numerous networking opportunities for our people and partners and we extended the FrontierSI brand beyond space and spatial as a result. We had very active representation at the annual Locate conference with 3 industry leadership workshops and 4 presentations. We continued our Connect, Share and Learn networking series to connect partners, share learnings and activate collaboration.

FrontierSI presented at multiple international and national conferences showcasing project outcomes and demonstrating leadership in the space and spatial sectors as keynote speakers and invited panellists. Key industry papers were also published further cementing our leadership role in the sector.



## Outreach Activity



FrontierSI staff supporting the Winyama Indigenous Mapping Workshop.



AHDAP's Colouring Melbourne Urban Walkability Index provides multidimensional data of Australian cities.



Drone testing.



Presentations on Zero-Cost Sub-Meter GNSS Accuracy using the Southern Positioning Augmentation Network.

# FINANCIALS

FrontierSI had a successful year with the Commercialisation of the Value Australia Project contributing to the total comprehensive profit result of \$4m, against a budgeted deficit of \$686k.

We reinvested \$0.7m of our surpluses into new projects. This funding went towards co-funding of projects with partners as well as funding the initial planning stage of some transformational initiatives.

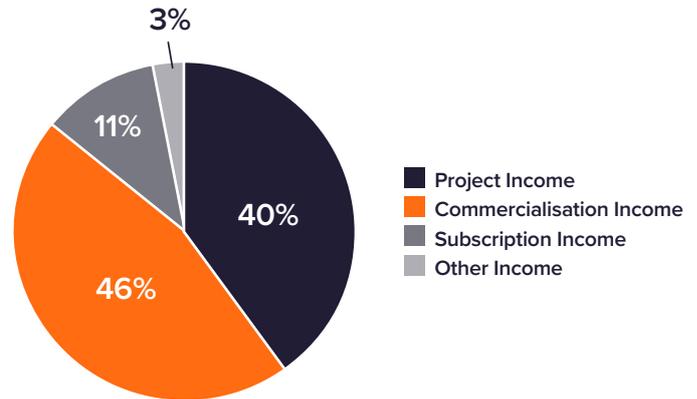
We have implemented a new project management system to improve the financial reports for projects as well as to help manage the resource requirements of the delivery team.

## 2022-23 Income

Project Income	\$5,798,000
Subscription Income	\$1,452,000
Other Income	\$388,000
Commercialisation Proceeds	\$5,000,000
<b>Total Income</b>	<b>\$12,638,000</b>
<b>Budget</b>	<b>\$11,105,000</b>

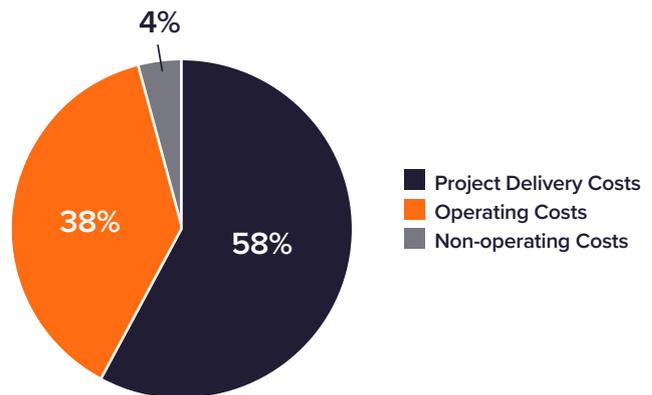
## 2022-23 Financial Year Highlights

- ✓ Total income of \$12.6m, including net proceeds from Commercialisation of Value Australia of \$5m.
- ✓ Reinvested \$0.7m of surpluses into new projects.
- ✓ Delivered overall project margins of 23% compared to budget of 20%.
- ✓ Finished 2022-23 with Net Equity position of \$11.4m including \$9m of funds in reserve.



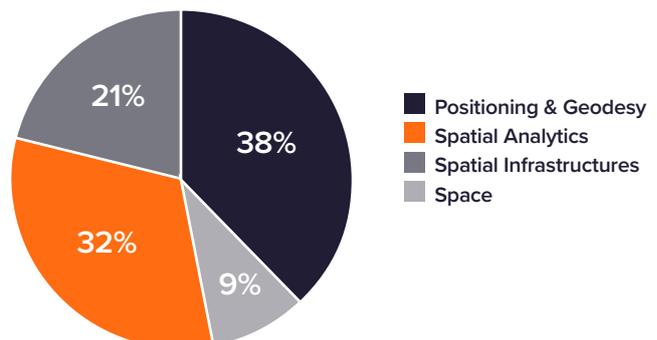
## 2022-23 Expenditure

Project Delivery Costs	\$5,038,000
Operating Costs	\$3,269,000
Non-Operating Costs	\$333,000
<b>Total Expenditure</b>	<b>\$8,640,000</b>
<b>Budget</b>	<b>\$11,791,000</b>



## 2022-23 Project Portfolio Allocation

Positioning & Geodesy	\$1,895,000
Spatial Analytics	\$1,636,000
Spatial Infrastructures	\$1,073,000
Space	\$434,000
<b>Total Expenditure</b>	<b>\$5,038,000</b>





# GLOSSARY

## FrontierSI Partners

<b>AGO</b>	The Australian Geospatial-Intelligence Organisation, Department of Defence
<b>RMIT</b>	RMIT University
<b>Curtin</b>	Curtin University
<b>UC</b>	University of Canterbury
<b>QUT</b>	Queensland University of Technology
<b>GA</b>	Geoscience Australia
<b>UNSW</b>	University of New South Wales
<b>DOH WA</b>	Department of Health, Western Australia
<b>LINZ</b>	Land Information New Zealand
<b>Spatial Services NSW</b>	Spatial Services, Department of Customer Service, NSW
<b>QDR</b>	Department of Resources, Queensland

## Project Partners, Collaborators and Technical Terms

<b>ACS</b>	Analysis Centre Software
<b>AI/ML</b>	Artificial Intelligence/Machine Learning
<b>AHDAP</b>	Australian Housing Data Analytics Platform
<b>ANZLIC</b>	Australia & New Zealand Spatial Information Council
<b>ANU</b>	Australian National University
<b>APSEA</b>	Asia Pacific Spatial Excellence Awards
<b>ARRB</b>	Australian Road Research Board
<b>ASA</b>	Australian Spatial Analytics
<b>AURIN</b>	Australian Urban Research Infrastructure Network
<b>AusCalVal</b>	Australia Calibration and Validation project
<b>AusEnHealth</b>	Australian Environmental Health
<b>AusHYDROID</b>	A scoping study and 'gap' analysis for the development of a national hydroid model
<b>B2B matching</b>	Meeting of companies to create new collaborations and innovative synergies
<b>BOM</b>	Bureau of Meteorology
<b>CAHS</b>	WA The Child and Adolescent Health Service
<b>CEO</b>	Chief Executive Officer
<b>Cliniface</b>	3D facial visualisation, measurement and analysis software
<b>CORS</b>	Continuously Operating Reference Station
<b>CSIRO</b>	Commonwealth Scientific and Industrial Research Organisation
<b>CRC</b>	Cooperative Research Centre
<b>CRCNA</b>	Cooperative Research Centre for Developing Northern Australia
<b>DBCA</b>	WA Department of Biodiversity, Conservation and Attractions
<b>DELWP</b>	Victorian Department of Environment, Land, Water and Planning
<b>DPT Victoria</b>	Department of Transport and Planning Victoria
<b>D&amp;I</b>	Diversity and Inclusion
<b>DE Africa</b>	Digital Earth Africa
<b>DEA</b>	Digital Earth Australia
<b>Digital Twin</b>	Virtual representation that serves as the real-time digital counterpart of a physical object or process
<b>DWER</b>	WA Regulation ( <i>DWER</i> ), we support Western Australia
<b>EARSC</b>	European Association of Remote Sensing Companies
<b>EASI</b>	Earth Analytics Science and Innovation

<b>EO</b>	Earth Observation
<b>EOCSI</b>	Earth observation for Climate Smart Innovation
<b>FAO</b>	Food and Agriculture Organisation
<b>FMG</b>	Fortescue Metals Group
<b>FRAC</b>	Finance Risk and Audit Committee
<b>FSFD</b>	Foundation Spatial Data Framework
<b>GEO</b>	Group on Earth Observations
<b>Ginan</b>	The Geoscience Australia Positioning Toolkit formerly known as ACS (Analysis Centre Software)
<b>GIS</b>	Geographic Information System
<b>GITA</b>	Geospatial Information and Technology Association
<b>GNSS</b>	Global Navigation Satellite Systems
<b>HIH</b>	Hand-in Hand Initiative
<b>ICSM</b>	Intergovernmental Committee on Surveying and Mapping
<b>IoT</b>	Internet of Things
<b>LEO</b>	Low Earth Orbiter
<b>LINZ</b>	Land Information New Zealand
<b>MDBA</b>	Murray-Darling Basin Authority
<b>NHRA</b>	Natural Hazards Research Australia
<b>NGOs</b>	Non-Governmental Organisations
<b>NPIC</b>	National Positioning Infrastructure Capability
<b>ODC</b>	Open Data Cube
<b>OGC</b>	Open Geospatial Consortium
<b>OysterQual</b>	A Proof of Concept and feasibility study utilising space technologies to advance the aquaculture markets in Western Australia remote and regional areas
<b>PCH</b>	Perth Children's Hospital
<b>Plan Tech</b>	The use of technology, particularly spatial technologies, to improve the planning lifecycle in Australia
<b>PPP</b>	Precise Point Positioning
<b>QA</b>	Quality Assurance
<b>QLD TMR</b>	Queensland Department of Transport and Main Roads
<b>QUT</b>	Queensland University of Technology
<b>RCMRD</b>	Regional Centre for Mapping of Resources for Development
<b>SBAS</b>	Satellite-Based Augmentation System
<b>SIBA</b>	Spatial Industries Business Association
<b>SISR</b>	Spatial Information Systems Research Ltd
<b>SME</b>	Small to Medium Size Enterprise
<b>SouthPAN</b>	The Southern Positioning Augmentation Network
<b>SNIC</b>	Strategy and New Initiatives Committee
<b>SSSI</b>	Surveying & Spatial Sciences Institute
<b>TERN</b>	Terrestrial Ecosystem Research Network
<b>UN-GGIM</b>	United Nations Global Geospatial Information Management
<b>UTAS</b>	University of Tasmania
<b>VanKIRAP</b>	Operational version of a web-based Climate Information Services Portal for Vanuatu
<b>TERN</b>	Terrestrial Ecosystem Research Network
<b>UAV</b>	Unmanned Aerial Vehicle
<b>UM</b>	University of Melbourne
<b>UoW</b>	University of Wollongong
<b>VanKIRAP</b>	Operational version of a web-based Climate Information Services Portal for Vanuatu

WE EXIST TO  
BRING THE BEST  
PEOPLE TOGETHER  
TO SOLVE THE  
MOST COMPLEX  
PROBLEMS.





# FRONTIER S I >

We know where.

[frontiersi.com.au](http://frontiersi.com.au)

