

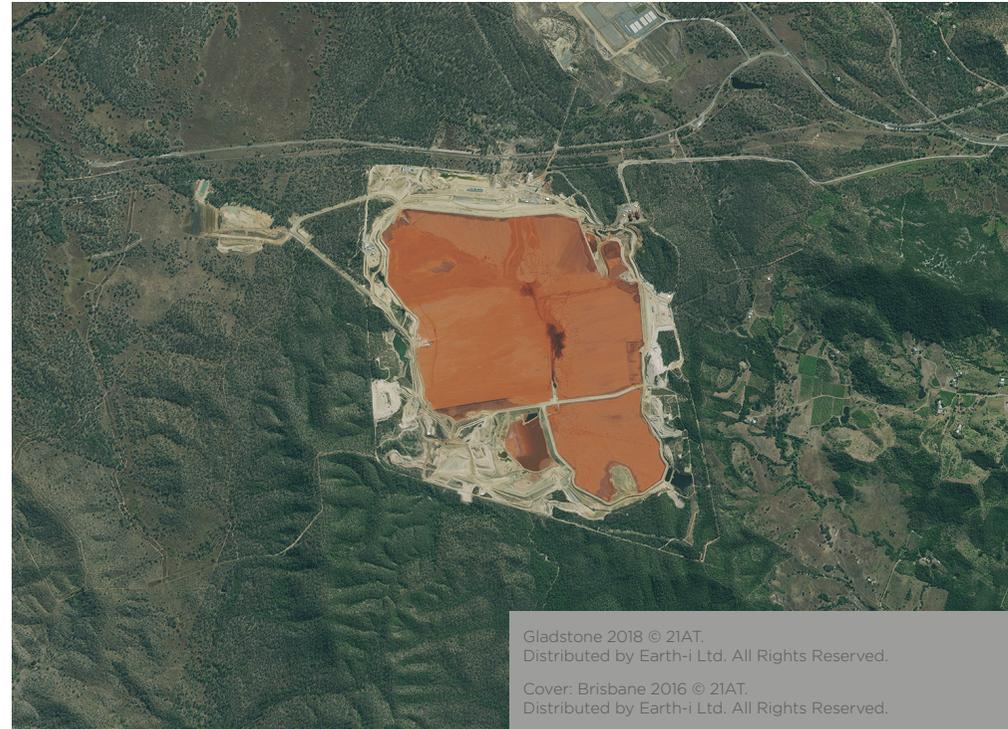


ACCESSING
THE REAL
VALUE IN
LOCATION
DATA - FROM
SPACE

Given that everything happens somewhere, geospatial data can put National Mapping and Cadastral Agencies (NMCA) at the very forefront of economic and social development. As part of a national geospatial information strategy, it has the power to change lives by tackling poverty, improving social cohesion, and securing the environment for future generations.

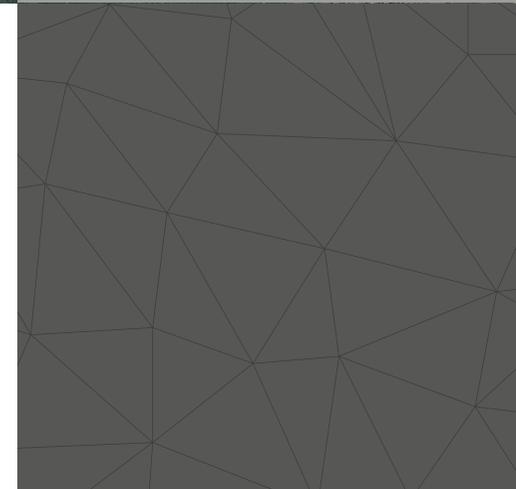
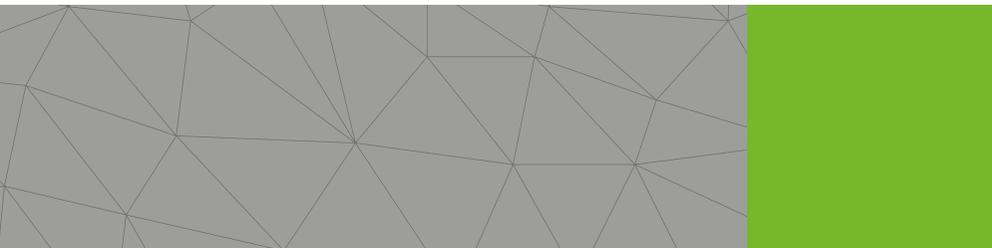
For all those reasons and more, access to very high-resolution (VHR) satellite data and the formation of a National Spatial Data Infrastructure (NSDI) is an aspirational goal that many countries are actively pursuing. A VHR dataset is highly effective for land boundary identification, monitoring land use and improving land classification. It is also apparent that low or medium resolution data is no longer the industry standard for an optimal NSDI, as the level of information that can be derived is simply not detailed enough.

But while modern geospatial frameworks can provide the infrastructure to do this, creating a fit-for-purpose NSDI and updating it accurately can still be a challenge. The Earth-i mapping solution meets these needs and helps NMCAs drive change for their organisation.



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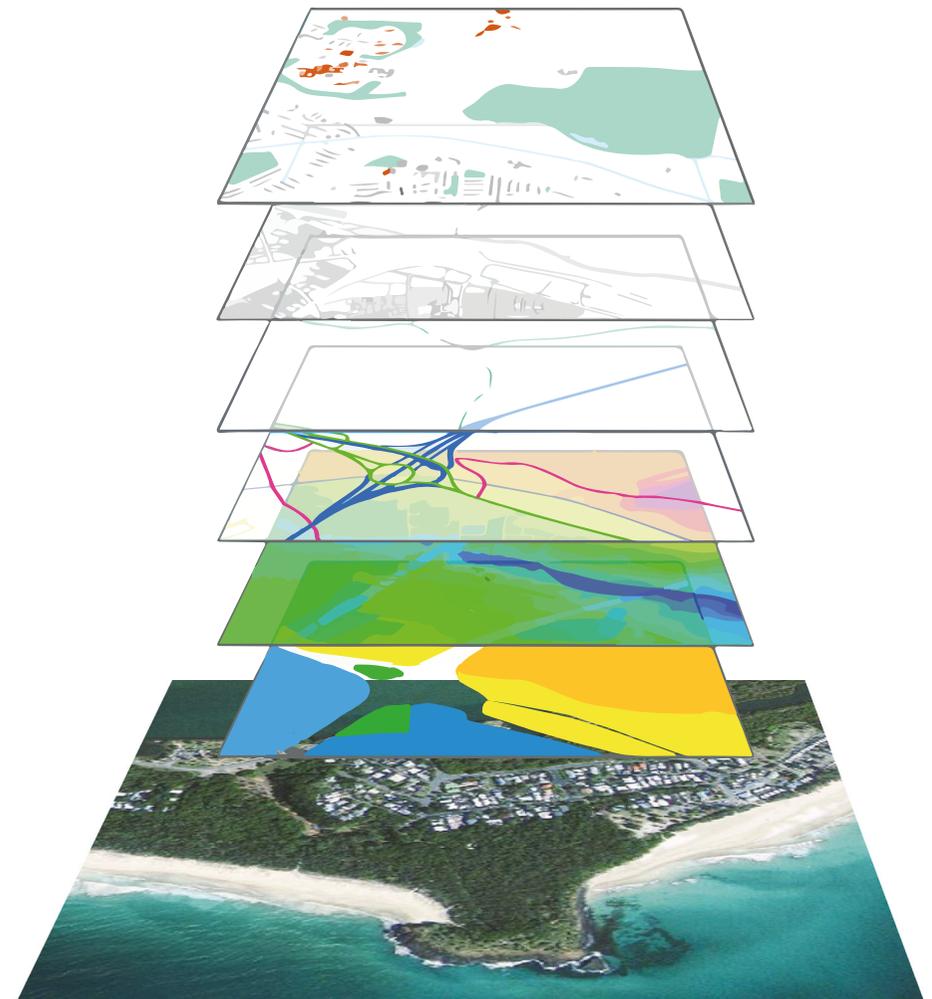


The need for a modern data stack

Traditionally, the way Earth Observation (EO) data has been collected, delivered and priced has often presented challenges for NMCAs. Today, factors such as the rapid advancement of EO technology present an opportunity for all nations to build a spatial data framework that's inclusive, accurate and - crucially - affordable.

In particular, innovations in EO satellite technology are bringing new momentum in the evolution towards 'digital' formats of spatial databases which increasingly rely on satellites as a primary source. The collection, dissemination and management of satellite data is now a key strategic goal for all NMCAs.

EO data can and should be the foundation of a modern data stack - built up from multiple layers of geospatial data, recording and analysing land-use and characteristics to empower policy and decision-making. We understand the opportunities and the constraints facing NMCAs in achieving this goal. As an EO data service, our focus is to help you access VHR satellite data, and ensure it's collected and delivered at a frequency and cost that's fit-for-purpose.



How different parts of land registration meet the requirements of a fit-for-purpose NSDI



Improving access to VHR satellite data

Earth-i delivers a service that supports the recommendation from the International Federation of Surveyors* (FIG) and the World Bank to ensure land administration strategies are fit-for-purpose. That includes how the data is collected, the delivery strategy it supports and making sure the cost of satellite data acquisition is within reach of an NMCA's budget.

How do we deliver this?

VHR EO data was once the preserve of government-owned satellites or contracts. But innovation in satellite technology and the commercialisation of space have fundamentally changed the way NMCAs can now access VHR EO data and build a geospatial strategy around this rapidly expanding information source. Earth-i's access to a range of commercial constellations of smaller, lower-cost satellites have made EO data a practical and more attractive option than ever before.

*Source reference: Published by International Federation of Surveyors (FIG)/World Bank Publication No. 60



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A new approach to satellite data

There are three key capabilities that make the satellites we utilise suitable for building a geospatial data stack for an effective NSDI strategy: Wide-area coverage, VHR imagery and frequent revisits to any location on Earth for optimal data collection.

Earth-i's geospatial data service delivers the capabilities and characteristics an NMCA requires to underpin a successful land administration strategy:

Greater coverage

Covers all of the territory within a nation, state or province, facilitating **inclusive**, comprehensive decision-making and effective planning across a territory.

Improved detail and clarity

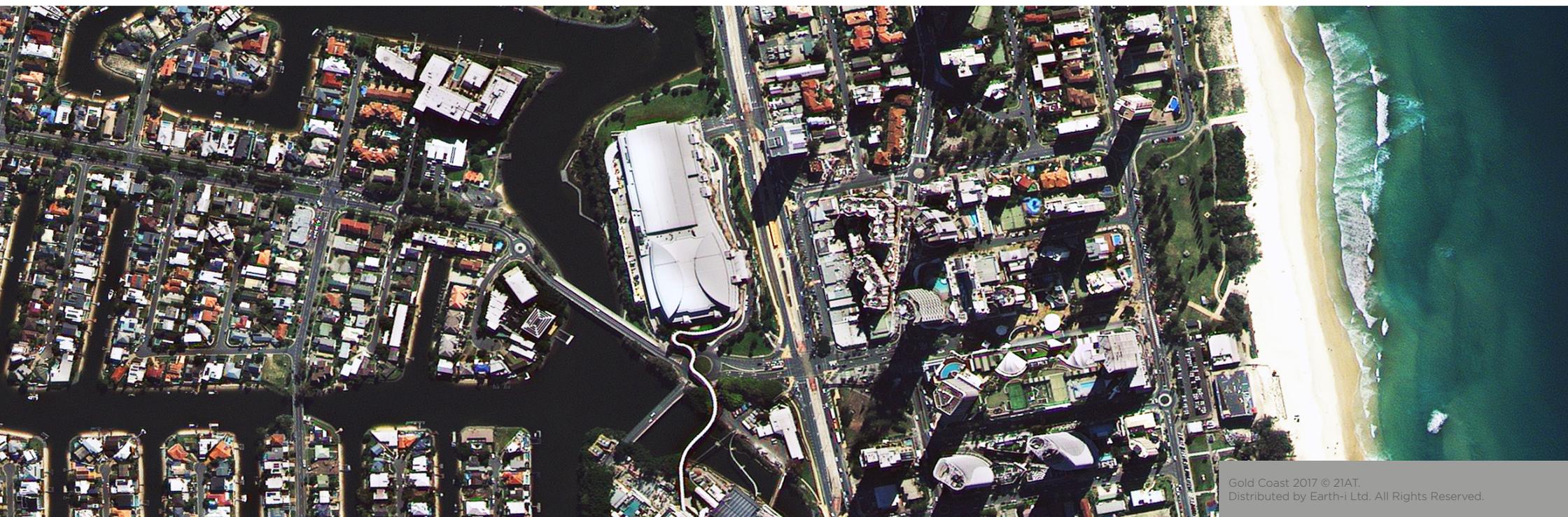
Data that is as **accurate** as possible, meeting the fit-for-purpose criteria and therefore deemed reliable by users.

Assured higher frequency collection

Attainable data acquired from satellites with available, dedicated capacity, and within actionable timeframes, for both the original collection and subsequent updates.

More affordable costs

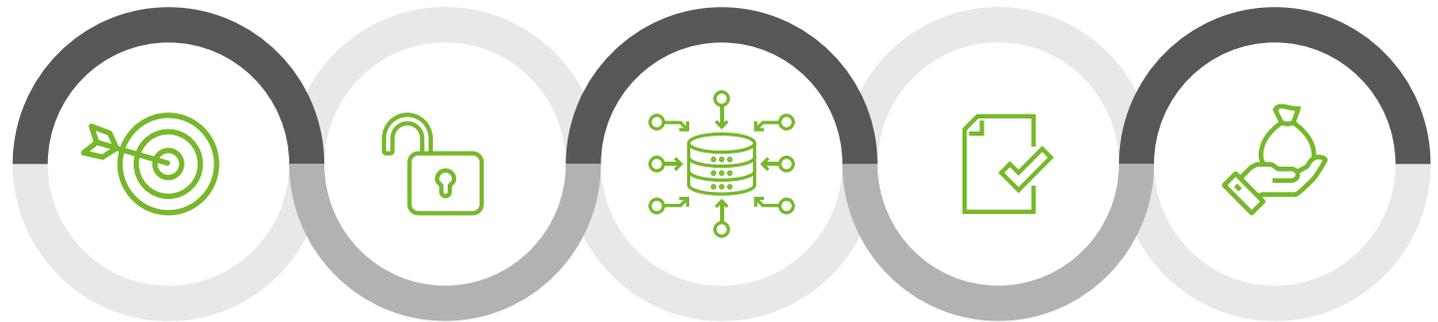
Costs that are **affordable** and proportionate to the benefits agencies can derive from them.





The Earth-i data difference

The best way to gain a complete understanding of where we can support your organisation is to look at where the Earth-i data difference can add strategic value.



Accurate

Accuracy in your imagery is important. Earth-i specialises in VHR data at sub-1m resolution to unlock details and insights that are hard to identify at lower levels of resolution.

- Fleet of very high resolution satellites from DMC3, KOMPSAT and SuperView constellations
- Very high resolution data at 40cm, 50cm and 80cm pixel sizes
- Identify land features and use, such as land boundaries for higher cadastral accuracy
- Use of reference data for high positional accuracy of imagery
- Targeted investigation and monitoring of specific areas



Accessible

Earth-i offers a fully independent commercial service free of restrictions on access. As a result our service is more flexible and responsive to your needs.

- No anchor tenancies to restrict access*
- Free from priority tasking by governments
- Focused on your project and easy to do business with
- Global coverage delivers national mapping on a frequent basis
- See our Queensland **Case Study** as an example

*On DMC3 and Vivid-i Constellations



Aggregated

Working with Earth-i offers a data acquisition service that is fully managed on your behalf. Simply talk to us about your goals and leave the data sourcing to us.

- Comprehensive acquisition planning from a portfolio of sensors
- Earth-i acts as an aggregator of data from a range of satellite options
- Full data acquisition and management service
- Coverage opportunities maximised
- Integration of Sentinel or LandSat data if required



Actionable

Earth-i delivers a complete data solution with image processing and web-enabled data delivery, with flexible licensing that is fit-for-purpose for your intended end users.

- Data delivered fully processed, ortho-rectified and with meta-data
- Data can be provided via Web Mapping Services (WMS)
- Seamless, colour balanced mosaics for one continuous image map
- Integration with other data sets to enable a complete information solution
- Multiple licensing options to create a fit-for-purpose solution to meet your end-user needs



Affordable

Earth-i will tailor our solutions to your budget to make sure you get value for money while still delivering an optimal and sophisticated solution based on VHR data.

- Consultative approach to understand your goals in the context of your available resources
- VHR data at competitive pricing
- Wide area mapping at VHR offers great value for money
- Integration of free data sources
- Build a sophisticated data stack within budget for an optimal solution

Powerful insights in high-resolution

The very high-resolution data captured from Earth-i's satellites can deliver a significant advantage in comparison with medium and low-resolution data from other sources - and at a comparable price point.

- Highest resolution available (sub1m)
- Wider area coverage
- Frequency



Low (10m)



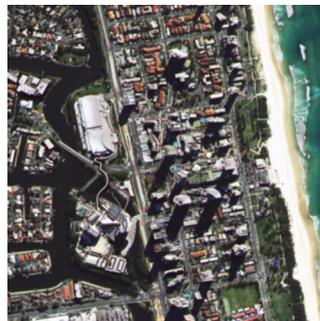
High (3m)



Very high (<1.0m)



Low (10m)



High (3m)



Very high (<1.0m)

Resolution	Application	What can be seen at this resolution?
Low (10m)	Agriculture, forestry, land management	<ul style="list-style-type: none"> • Settlement blocks, significant or isolated buildings • Crop areas, forests • Major hydrology network, large dams • Coarse flood mapping • Vegetation wind breaks
High (3m)	Local area mapping, regional hydrology management mapping, object identification	<ul style="list-style-type: none"> • Industrial building complexes, large water tanks, dams • Airports, golf courses • Tree clusters • Major road network, bridges • Field boundaries, hydrology networks
Very high (<1.0m)	Detailed rural mapping, urban, semi-urban mapping, object identification	<ul style="list-style-type: none"> • Single trees in sparse tree cover density • Minor road networks • Roof outlines of urban housing • Crowd assemblages • Detailed flood mapping • Identify number of trucks in a mine or shipping port • Natural disaster damage assessments • Identify cars, planes, trucks, small bodies of water, solar panels



Analytics and insights

Earth-i is more than a data service. In addition to advanced data processing we offer a range of analytical services to generate the insights from satellite imagery that will meet specific geospatial needs or challenges.

These services include:

Land use classification

Creating a clear picture from VHR imagery of how land is being used to ensure your cadastre is accurate.

Feature extraction

Identifying specific features from VHR data such as buildings, infrastructure, industry, mining activity and natural features of interest or concern.

Boundary identification

Detecting clear boundaries between properties, often only visible from VHR data.

Vegetation health monitoring

Utilising multi-spectral analysis, including near infrared to analyse and monitor the health of critical areas of vegetation.

Change detection

Monitoring change in activity or features of any target area of interest or concern by utilising the frequency of satellite data collection.

Forestry monitoring

Leveraging the level of detail available from our satellites to measure and monitor the health of forests, forest cover and human activity impacting forested areas.

Environmental monitoring

Applying the combination of high-frequency revisits, VHR data and multispectral analysis to measure and monitor the health of both rural and urban environments.



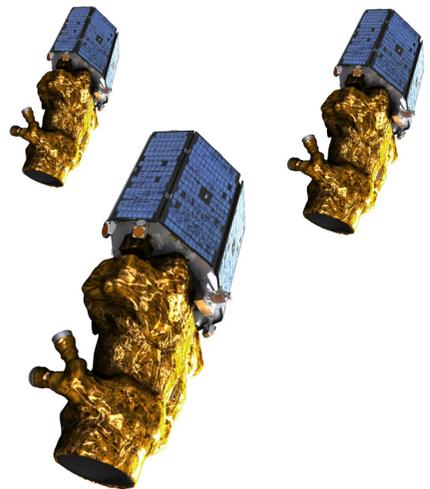
Our satellite options

Earth-i prides itself on the effectiveness of our EO data and it's thanks to a fleet of VHR EO satellites that we can provide the quality of service we do.

Here is a quick look at Earth-i's fleet;

DMC3

DMC3 is a constellation of three identical EO satellites manufactured in Britain by Surrey Satellite Technology Ltd, and operated by 21st Century Aerospace Technology. With three identical sensors orbiting Earth at 650km and 33 minutes apart, the DMC3 constellation is perfectly suited to rapid data collection and the wide area coverage required for building base maps. The very high-resolution data provides the level of detail needed to identify features, objects, activity and change anywhere on the Earth's surface, everyday.



KOMPSAT 2, 3, 3A, 5

KOMPSAT satellites give you access to very high-resolution data and imagery from a diverse range of sensors, from optical satellites to a SAR satellite. Working with our partners, SI Imaging Services, we deliver a range of data capture, processing and analytical services.

KOMPSAT 2



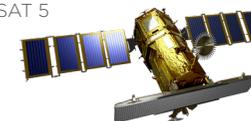
KOMPSAT 3



KOMPSAT 3A

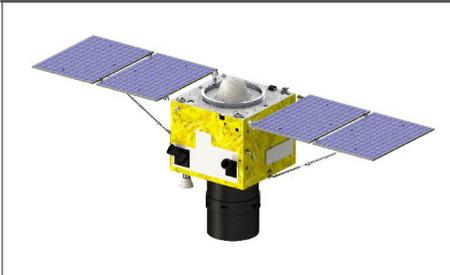


KOMPSAT 5



SuperView

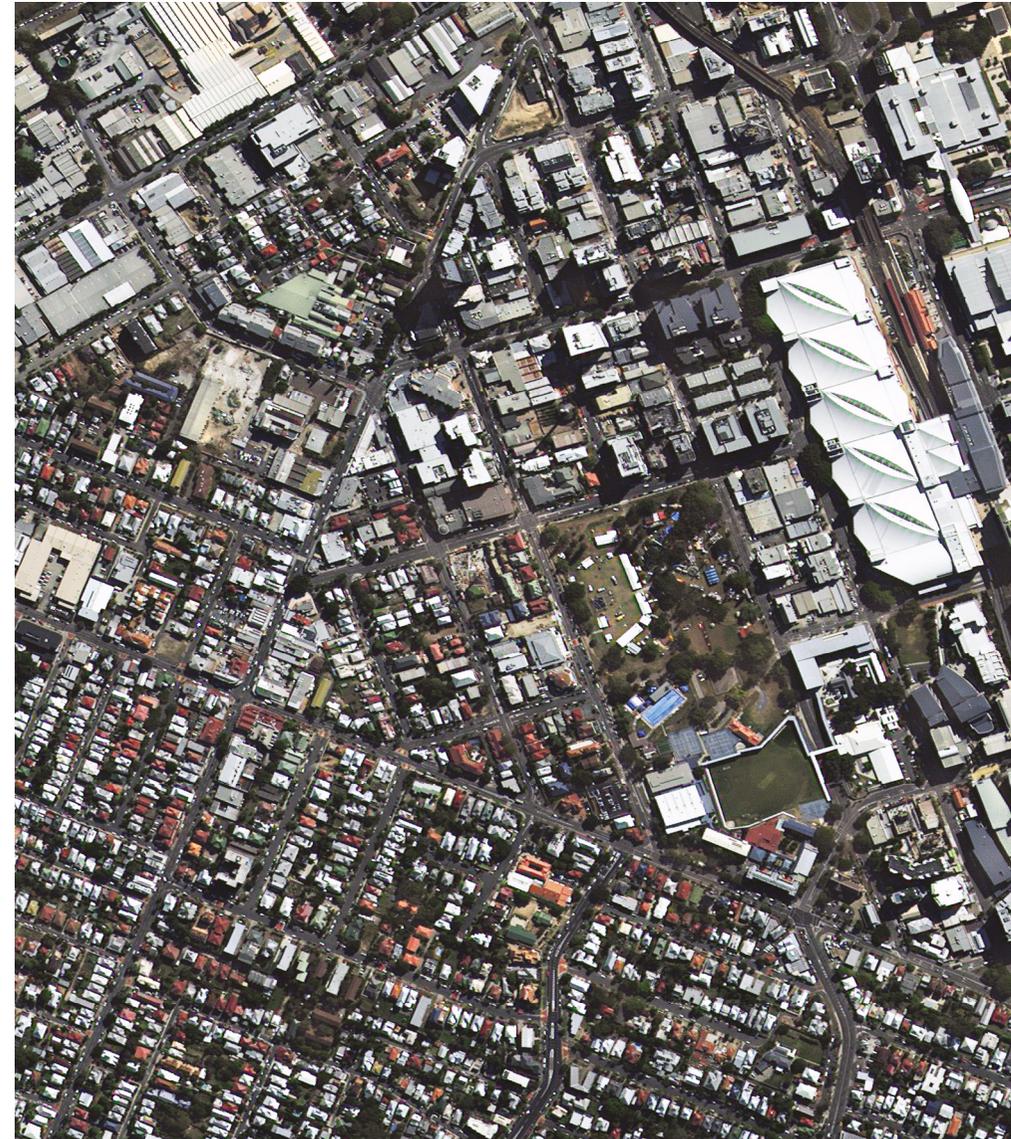
The SuperView Constellation consists of four highly agile, optical satellites which are phased 90 degrees from each other and are orbiting at 530km above the Earth. The constellation offers rapid, large-area collection with multiple collection modes, including stereo imaging, for the creation of elevation models. The satellites offer very high-resolution data (40cm resolution) which provides highly detailed imagery for identifying land use, vegetation cover and analysing change.



From 2019

The Vivid-i Constellation

With a planned launch in 2019, Vivid-i is Earth-i's own constellation of VHR satellites. Following the successful launch in January 2018 of VividX2, the prototype for the constellation, Earth-i is bringing new capabilities and expanded data options for NMCA clients. Vivid-i will deliver full colour high definition video and imagery from space, with very high frequency revisits, at multiple times of day. The constellation will enable applications beyond wide area mapping, such as asset monitoring, border surveillance and complex 3D modelling of urban areas. Vivid-i will consist of at least 15 satellites which will improve revisit frequency to multiple times of day to any location on Earth.



Earth-i commitment to NMCAs

Earth-i sees each of its client relationships as a unique collaboration. We strive to ensure we're providing the best service by following these three commitments:

- 1 To consult** - Earth-i consults closely with agencies at the start of the engagement to understand needs and goals
- 2 To advise** - Earth-i offers strategic advice on optimising data acquisition, the integration and application of EO data into existing GIS platforms and portals, and maximising the benefits to be derived from EO data
- 3 To support** - Earth-i supports all clients for ongoing technical and operational queries beyond the point of delivery of our datasets and services

Earth-i can provide an integrated, end-to-end service that will ensure you get the support you need across these four progressive steps:

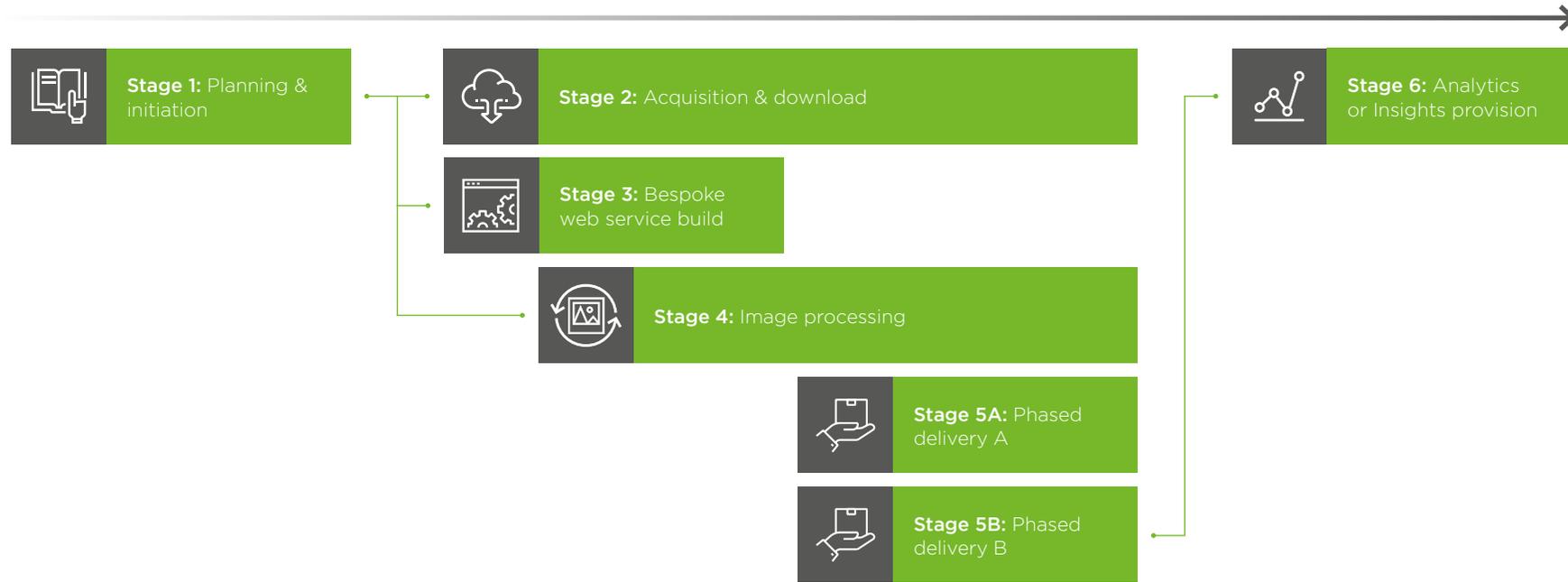
- **Starting the journey:**
Improve base mapping, cadastral capabilities and value
- **Creating momentum:**
Reduce the timescales of EO data capture and use
- **Supporting wider initiatives:**
Drive strategic GIS and NSDI to reach economic, municipal, agricultural and environmental goals
- **Long-term geospatial data benefits:**
Build regional and national economic and societal growth through actionable insights and a modern geospatial data stack

No matter where you are in your process to harness the power of geospatial data, we have the capability to support your goals and advance your geospatial data capture and provision.





The Earth-i service model



A typical project implementation plan

Stage 1: Planning & initiation

- Feasibility and weather assessments
- Detailed cloud modelling
- Imagery collection plan
- Service design and processing plan
- Kick-off meeting

Stage 2: Acquisition & download

- DMC3 constellation tasked
- Constellation collects imagery across entire nation
- Imagery downloaded from the satellites

Stage 3: Bespoke web service build

- OGC Compliant WMS and WMTS service built to customer specifications
- Service, load, response and acceptance testing

Stage 4: Image processing

- Imagery processed in parallel to ongoing acquisitions
- Individual scenes can be processed and delivered within 3-5 days from date of acquisition, depending on the level of processing desired
- Colour balanced
- Ortho-rectified
- Configured for upload to WMS/WMTS
- Mosaicking

Stage 5: Phased delivery

- A. Processed data delivered directly to customer in phase A
- B. Processed data uploaded to web service (WMS/WMTS) in phase B
- For single scenes or sub-sets of the full data coverage, deliveries can occur in parallel to the processing as an ongoing update during the project

Stage 6: Analytics or Insight provision

- Processed data used to derive a range of information products from data analytics to insights and modelling



**Click here to find out
how Earth-i is helping
Queensland, Australia
harness the power of its
location data**

Get in touch with Earth-i for more information on how we could work with your organisation.

Telephone: +44 (0)333 433 0015
Email: enquiries@earth.co.uk
Web: www.earth.space

Earth-i Ltd
10 Nugent Road, Surrey Research Park,
Guildford, GU2 7AF, United Kingdom