

Imagery Statement of Direction



Ensuring high-resolution imagery data supports service delivery and innovation for Australia and New Zealand and helps address our most pressing environmental, social and economic challenges

About EDIWG

Elevation, Depth, and Imagery Working Group

The Elevation, Depth and Imagery Working Group (EDIWG) sits under the Intergovernmental Committee on Surveying and Mapping (ICSM) to provide a standing panel of experts on high-resolution earth observation data drawn from Australia and New Zealand government departments.

The purpose of the EDIWG is to provide an inter-jurisdictional forum to:

- Develop, maintain, and promote nationally consistent standards, policies, and best practice guidelines that help ensure consistency in the capture, maintenance, management, dissemination of EDIWG data themes;
- Implement activities that progress EDIWG focus areas as endorsed by the ICSM Executive Board;
- Enhance collaboration between government, research, and industry;
- Identify future initiatives and gaps in standards for earth observation and derivative products;
- Represent and work with other committees and working groups as required to enhance collaboration and information sharing between ICSM committees;
- Identify future initiatives and standards and collaborate on outcomes.

EXECUTIVE SUMMARY

Across Australia and New Zealand, the critical role that high resolution geospatial imagery plays in supporting government services, emergency response, and scientific research continues to grow. As a result, government stores of imagery data are also growing rapidly, and the management of this “big data” presents several challenges.

This Imagery Statement of Direction looks ahead to 2030 as the first milestone for the ICSM’s Elevation, Depth, and Imagery Working Group (EDIWG) “100-year roadmap for imagery.” In this period, we have prioritised activities to resolve significant challenges in the management of geospatial imagery, informed by a broad network of professionals across industry and academia.

EDIWG has established nine objectives under three comprehensive goals that promote collaboration, ensure quality and consistency, and support the ethical and responsible use of imagery data across jurisdictions.

Develop standards for the full data life cycle for imagery

Understand the current and future trends of imagery, ensuring capture, storage, and delivery meet wide range of end-user needs.

Standardise imagery contracts and data sharing agreements across Australia and New Zealand to improve end-user outcomes.

Guide imagery acquisition and business models to be fair, sustainable, and coordinated across multiple levels of government.

Prepare for innovative technologies and future uses

Optimise digital imagery systems across jurisdictions and take into account the rate of expansion and use.

Consider imagery’s role in digital supply chains for emerging 3D technologies, and as source inputs into AI and ML processes.

Preserve historic imagery archives so that they are well-documented, digitised, stored appropriately, and available to users to access and analyse.

Ensure imagery data is used to uphold our values

Jurisdictions have clear guidelines and legal definitions of privacy and ethical usage of imagery data.

Barriers to access for First Peoples are reduced to support practical land management of Country, as well as for cultural and spiritual connection.

Imagery is used to plan for and mitigate the effects of climate change, and support sustainable development in Australia and New Zealand.

Over 160 years ago, the first image was taken of the earth for mapping purposes. It had taken only twenty years from Daguerre's pioneering invention for people to understand how powerful photographic technologies would be for visualising and comprehending places.

Since then, people have attached cameras to literally anything and everything that soared above the ground - hot air balloons, pigeons, kites, rockets, airplanes, zeplins, drones, satellites and more. These photographs provide rich, emotive records of places and landscapes, with a wide appeal that is unique across geospatial data themes.

Today, high-resolution imagery from aerial and satellite sources (also referred to as orthoimagery) is used to support almost every dimension of government and public sector service delivery across Australia and New Zealand. Current and historic imagery provides critical information for planning, environmental research and protection, major construction, mineral exploration, precision farming, risk and insurance, asset management, transport, recreational gaming, and more.

With emerging technologies like geo-AI and machine learning, high-resolution imagery is also being used to create and maintain other foundation spatial datasets with increasing speed and accuracy.

This Statement of Direction outlines EDIWG's views on the key challenges facing government use of imagery, and the activities that need to be prioritised over the coming decade to ensure that this rich digital resource continues to serve the widest possible variety of users.



Vision

The Intergovernmental Committee on Surveying and Mapping (ICSM) aims to support Australian and New Zealand Governments to survey, access, standardise, manage, analyse and share high resolution imagery to improve service delivery, spur innovation, create economic value, and support place-based insights to answer our most pressing environmental challenges.

Goals

By 2030, EDIWG aims to achieve the following:

01 Develop standards for imagery's full data life cycle

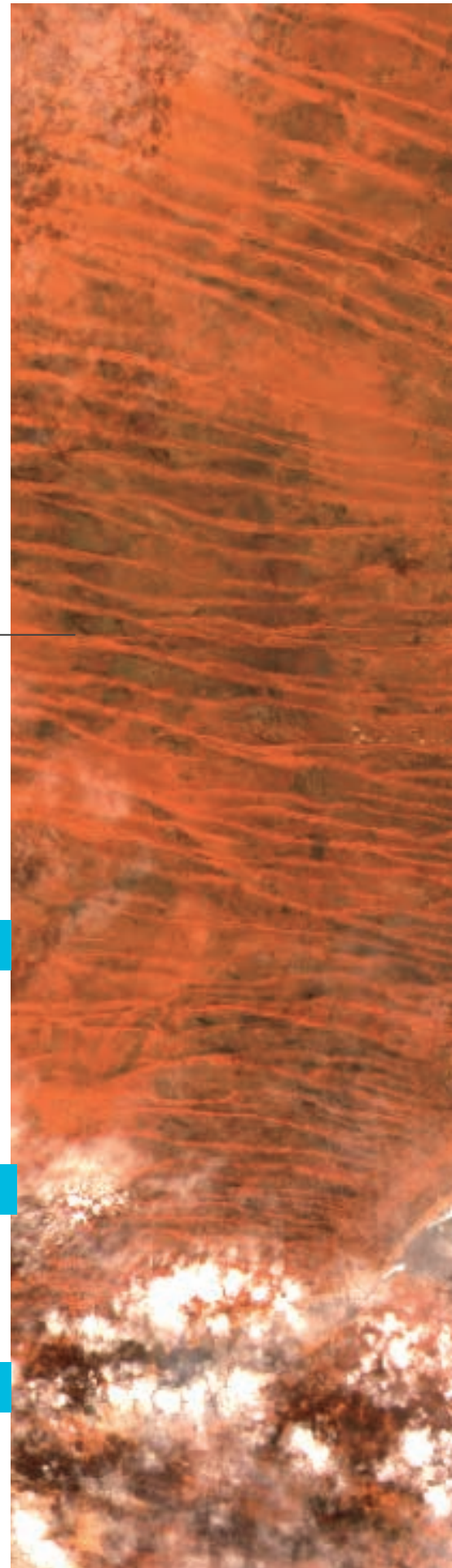
Drive the development and adoption of imagery standards **across the full data lifecycle** ensuring data is captured and managed strategically.

02 Prepare for innovative technologies and future uses

Prepare government for the future use of its imagery holdings, to unleash its potential.

03 Ensure imagery is used to uphold our values

Imagery supports human rights and human safety, and is used to plan for and mitigate the effects of disasters and climate change in Australia and New Zealand.



**DEVELOP
STANDARDS FOR
THE FULL DATA LIFE
CYCLE FOR
IMAGERY**

01



Develop standards for the full data life cycle for imagery



EDIWG members will drive the development and adoption of imagery standards across the full data lifecycle ensuring data is captured and managed strategically.

Government stores of geospatial imagery are textbook examples of a "Big Data" problem, having all of the intrinsic attributes of volume, velocity, variety, veracity, and value.

Volume - The size of imagery stores is growing exponentially as higher resolutions and more frequent surveys become standard. This necessitates migration to cloud environments and raises the stakes for standardised storage formats, structures, and naming conventions.

Velocity - Whether used to visualise projects in progress, or map the extents of disasters, many users now expect a near real-time service for imagery.

Variety - User requirements vary across many dimensions. Some requirements are met by large-scale, lower resolution satellite imagery, while others require daily high-resolution imagery of a small area surveyed by drones.

Veracity - Socially, we are conditioned to believe what we see in photographs. When imagery shows a difference or lack of topological consistency with other geospatial datasets, it's usually not the imagery that gets repositioned. High-accuracy, high-resolution, frequent imagery surveys set a challenge for the maintenance regimes and downstream accuracy and resolution of other foundation spatial datasets.



At the same time, as we move into 3D and 4D visualisation through web platforms and digital twins, it becomes more important than ever that underlying datums and transformation mechanisms are standard, consistent, and well documented.

Value - While imagery is a core digital resource used and reused across all disciplines and levels of government, acquisitions are often still viewed within the siloed dimensions of individual projects. Benefits that could be delivered through reuse are not consistently factored into procurement terms, and complex market and commercial factors challenge government buyers. Additionally, business models for imagery programs vary widely across jurisdictions and introduce a range of externalities.

These are not classic "spatial problems" but rather require analysis and input from other information management disciplines, technologists, and commercial, legal, and procurement experts to ensure a secure foundation for our common digital resources.

Objectives

Looking to 2030, EDWIG members aim to resolve a few of these priority issues, informed by a broader network of professionals, and to prepare Australia and New Zealand to tackle what one member has called "[our 100-year roadmap for imagery](#)."



01 Understand

Understand the current and future trends of imagery, ensuring capture, storage, and delivery meet wide range of end-user needs.

02 Standardise

Jurisdictions have standardised imagery survey contracts across Australia and New Zealand for defined end-user outcomes.

03 Coordinate

Guide government imagery acquisition and management business models to be fair, sustainable, coordinated across multiple levels of government, and designed to meet end-user needs ensuring discoverability and accessibility.

Understand



Understand the current and future trends of imagery, ensuring capture, storage, and delivery meet wide range of end-user needs.

To deliver on this objective, EDIWG will deliver the following:

The Value of Imagery

So that ANZLIC and other members of the spatial community understand the use of imagery across all disciplines and levels of Government, EDIWG will socialise this Statement of Direction widely for comment, and will report regularly on delivery of objectives. Additionally, EDIWG will seek opportunities to partner on research to improve understanding of the broader economic benefit of imagery to jurisdictions.

Storage Challenges

Analyse the 15-year jurisdictional impact of storing and delivering imagery, addressing the challenges posed by higher resolution, higher frequency surveys.

Impacts of Drone Imagery

Develop a portfolio of use cases from jurisdictions that demonstrate the benefits and challenges of drone imagery capture, storage and delivery including legal issues.



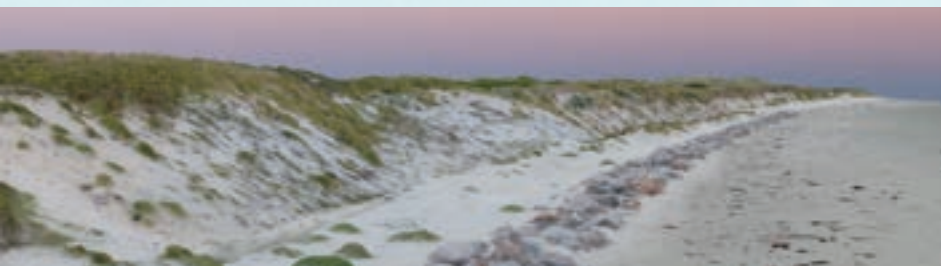
Use Case: Citizen Science Drone Monitoring of the impacts of Storm events on beaches

In a world-first initiative, the Victorian Coastal Monitoring Program in DEECA partnered with Deakin University, the University of Melbourne, the Earth Systems and Climate Change Hub of the National Environmental Science Program, and local citizens to empower communities to predict how beaches respond to storms and rising sea levels.

Since the initiative started, over 450 beach drone surveys have been collected with the total shoreline extent surveyed at approx. 900 km. The processed data is then stored in an online commercial service, PropellerAero, as Orthophotos (3D image) and Digital Surface Models, both these outputs are in TIFF file format. Total size of all processed survey data stored on Propeller is up to 2 Terabytes, but the total size of the raw data is much larger (10's of TB).

Trained in the use of lightweight drones, citizen scientists across Victoria's coast produce 3D models that precisely measure shoreline change following storms and surge events, delivering precise and accurate data for researchers and managers in a cost-effective and scalable manner. The data informs coastal management and policy decisions, and engages local communities in management activities.

Drones enable rapid surveying of beach volumes and therefore provide critical information for determining the dynamism of beaches, and fast assessment of changes in the volume, height, and extent of sediment, and other features, including beach wrack or dune vegetation.



A 3D model of the beach and rock protection at Port Fairy Beach created by citizen scientists.

Standardise



Jurisdictions have standardised imagery survey contracts across Australia and New Zealand for defined end-user outcomes.

Consistent contractual terms across jurisdictions benefit buyers as well as suppliers. It means that governments can engage collective buying power through terms that protect the long-term interests of the communities they serve. For suppliers, consistency reduces their time in reviewing and assessing differing terms, and socialising drafts with them will provide a forum to transparently discuss the purpose and impact of alternative positions.

To deliver on this objective, EDIWG will deliver the following:

Contracts and IP Options

Develop standardised procurement contracts for imagery that enable flexibility but ensure quality, accuracy, and mandatory metadata and format requirements are met. Contracts will develop a standard set of IP options that provide a preferred option enabling imagery sharing across all levels of government (including Commonwealth).

Standard Data Sharing Agreements

Develop and promote standard data-sharing agreements and cost-recovery terms between jurisdictions and Commonwealth agencies (as has been done by Australia's Department of Defense), and clarify the conditions under which "emergency terms" are enacted that permit sharing of otherwise restricted imagery.



Use Case: State and Territory Coordinated Imagery Programs

The coordinated imagery acquisition programs of the ACT and Queensland Governments provide a useful comparison of the breadth of opportunities and challenges of Australia's human and physical geography and climates, jurisdictional governance requirements, and supply market capacity and capabilities.

In 2018, the ACT Government recognised the need for a consistent approach to imagery acquisition and licensing. Following on from adhoc captures and imagery subscription licensing, a single contract to capture seasonal imagery (four times per year) over the urban extent and annually over the entire ACT was established. As part of this contract ACT staff also receive unlimited access to the contractors imagery subscription service.

The move has reduced costs across ACT Government and has ensured a solid foundation of regular imagery that other projects can build on going forward (utilising change detection, machine learning etc).

This project has delivered extraordinary value to the ACT Government. It has allowed the ACT Government to access imagery both publicly through ACTmapi but also privately through web services and MetroMap (there are currently 400 ACT Government MetroMap Users). It has also assisted in reducing fieldwork (especially during COVID) and provided an accurate image of the progress of major projects across ACT.

Access to up-to-date imagery is essential to assisting during emergencies, from the initial phone call to 000 where incident responder can locate the caller and identify access points using the latest Imagery, to using the imagery to report or investigate an incident.

In contrast, the Queensland Government's current spatial imagery program is a flagship of cross-government collaboration continuing a long tradition of coordinated imagery acquisition across the state since 1949.

At over eight times the geographic size of both the ACT and Victoria combined, Queensland is a large, decentralised state which is constantly challenged with the currency and maintenance of state-wide detailed authoritative, dependable spatial information for government-wide decision-making.

The business purposes for digital imagery range from state-wide (e.g., vegetation management, valuations, forest management), regional level (e.g., bush fire management, flood, mineral exploration) to project (e.g., road re-alignment, new housing developments) which require different resolutions and capture extents.

Due to supply market constraints on acquisition timeframes and cost, satellite imagery provides the only option for coverage of more than 75% of Queensland with the remaining 25% capable of being captured by traditional aerial techniques under the Spatial Imagery Services Program's (SISP) five-year rolling program.

The use of high-resolution satellite imagery, which is traditionally supplied by internationally based commercial suppliers with restrictive access conditions and high costs imposed by the suppliers, has been limited. Weather also limits the availability of imagery due to the complexity of acquisition in vast tropical and sub-tropical regions (e.g., cloud-cover) for significant portions of the year.

Despite these challenges, SISP and the QSat initiative (satellite imagery) bring together over 70 agencies from all tiers of government, government-owned corporations, and natural resource management groups to deliver broad licencing, a dependable and trustworthy source of spatial imagery to many core government applications while reducing duplication, storage, and expenditure.

The availability of near-daily high-resolution satellite imagery has seen improved business outcomes for 26 state and local government entities encompassing over nine hundred (900) individual users. Together, SISP and QSat imagery is also provided as web services and forms a critical, publicly accessible base layer for the Queensland Globe – itself accessed by nearly 500 000 unique IP addresses across all tiers of government, industry and academia which results in nearly 700 million web service requests annually.

Contributing agencies collaboratively work together and financially contribute to the Program with the Department of Resources' providing coordination of requirements, strategically developing the commercial supplier market, and operationally managing the program of work.

Working through Pre-qualified Supplier Arrangements, Resources has been able to streamline government procurement processes, guide the commercial supply market in maintaining de-risking strategies, and continually test the international market for emerging imagery technologies and business models delivering improved public value.

Coordinate



Guide government imagery acquisition and management business models to be fair, sustainable, coordinated across multiple levels of government, and designed to meet end-user needs ensuring discoverability and accessibility.

To deliver on this objective, EDIWG will deliver the following:

Business models

Jurisdictions will share their business models, including analyses and costings, and review alternative approaches to handling challenges, pain points and externalities. Outcomes and any identified gaps will be shared with ANZLIC for considering and developing any strategic interventions to ensure imagery sources are secure and continue to meet end-user needs.

Implement cloud storage guidelines

Engagement with IT and technology professionals to develop and implement nationally agreed guidelines on cloud storage & cloud delivery formats, and a file naming convention linking to a federated catalogue system.

Review trade-offs of subscription services

Jurisdictions will share information on the benefits and challenges of imagery subscription based services (aerial and satellite), and seek to clearly articulate where these services are best suited to meet user needs.



The move to cloud storage

The Queensland Department of Resources has responsibility for the management of the State Remotely Sensed Image Library under the Survey and Mapping Infrastructure Act (2003).

During 2021, the Department undertook a comprehensive risk assessment into the use of cloud storage resulting in the commencement of migration from government on-premises tape storage to commercial cloud infrastructure.

The library archive collection covers over 90 years of Queensland's imagery program and project activities by State and Commonwealth agencies and has proven to be an invaluable asset for the State, providing photographic records of natural and human impacts to the land and coastal waters of the state.

The on-premises environment was provisioned in 2006 and had seen continued exponential growth with imagery from multiple sensor types and origins including high-resolution satellite imagery, orthorectified digital aerial imagery, drone imagery, point cloud data, and 3D reality models.

Several factors have driven the decision to migrate to a cloud-based storage environment. The key strategic driver for the initiative was to unlock the data's potential by increasing availability and use, maximising customer and stakeholder value while leveraging an average 50% per Terabyte annual cost saving when stored on commercial cloud infrastructure.

Publicly available online discovery, access, and visualisation tools such as the Queensland Globe, QImagery, and QSpatial have increased the pressure for timely access to the archive data which could only be achieved using cloud infrastructure.

Modernisation of data formats, the emergence of new capture techniques, the continuing national progression towards a dynamic datum and the emergence of new and innovative applications for historic data are driving new requirements for the archive to be accessible to a scalable data processing environment.

Recent developments in Queensland Government policy and use of drones are challenging the current single repository approach due to the increased capability of individuals within State Government to acquire imagery. Resources is being challenged to extend beyond the operation of a single archive to a federated approach where individual groups or agencies can manage imagery datasets remotely within their systems and business processes, while security, chain of custody, discovery and metadata are managed in the Resources maintained library.

PREPARE FOR INNOVATIVE TECHNOLOGIES AND FUTURE USES

02



Prepare for innovative technologies and future uses



Prepare government for the future use of its imagery holdings, to unleash its potential.

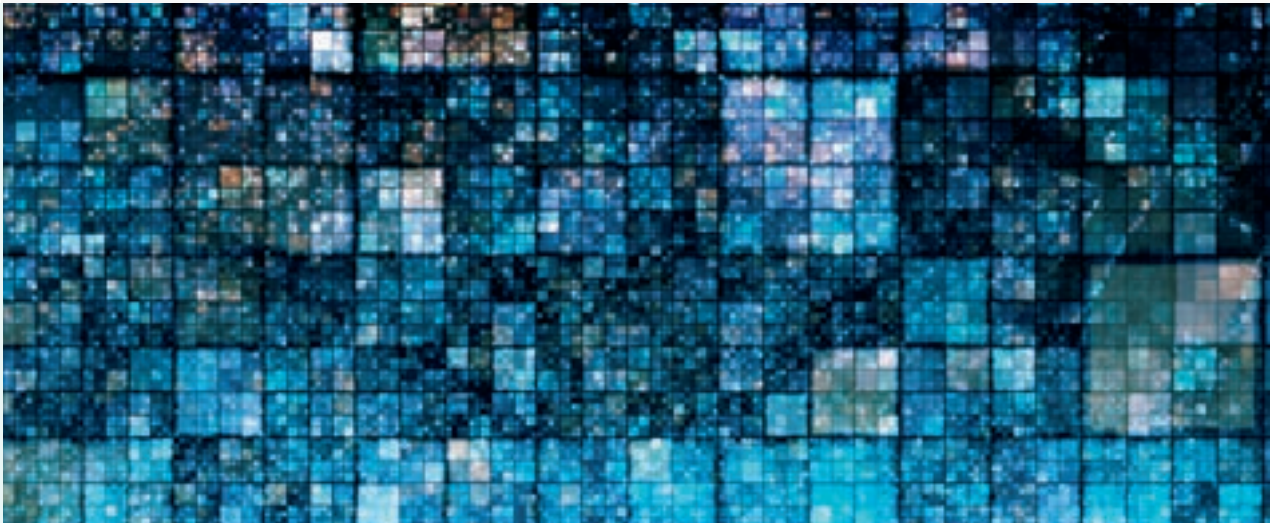
Imagery is a key element of the Fourth Industrial Revolution, where the intersection of digital technologies with the physical world will unlock huge opportunities. Whether it is through the integration of imagery in spatial digital twins, place-based augmented and virtual reality technologies, or in advanced geospatial analytics and machine learning, imagery is already playing a role in a range of emerging technologies.

As "records of the real world," imagery provides evidence of the scope and scale of change in our dynamic environments, and the ability to reference back to historic imagery collections taken in the last century adds enormous value to our understanding of the processes underlying these changes.

However, to realise the potential benefits, several preconditions must be met. First, imagery must be digitised and stored in standardised ways that support automation. This storage also needs to be efficient and take into account that the data's useful life may be in the hundreds of years. Finally, imagery needs to be easy to access and share – especially during emergencies and natural disasters.

Lessons that have already been learned by jurisdictions with regards to their foundation spatial data need also now to be applied to use cases further down the supply chain so that governments can develop, document, and share analytics and algorithms – as well as the training datasets that make them useful in the first place.

Objectives



01 Optimise

Digital imagery systems are optimised across jurisdictions and take into account the rate of expansion and use.

02 Consider imagery's role in digital supply chains

Imagery is readily utilised in emerging 3D technologies, and as source inputs into AI and ML processes.

03 Preserve

Historic imagery archives are well-documented, digitised and stored appropriately, and available to users to access and analyse.

Optimise



Digital imagery systems are optimised across Jurisdictions and comprehend the rate of expansion and use.

To deliver on this objective, EDIWG will deliver the following:

Efficiency

Clear guidance on how jurisdictions should plan for the expansion of their digital imagery systems and the storage of by-products.

EDIWG members continue to share forward acquisition plans to maximise opportunities for collaborative investment with the Commonwealth.

Cloud Storage

Standard operating procedures for federating digital imagery systems and transforming imagery data into cloud-friendly formats such as Cloud Optimised GeoTIFFs (COGs).

Discoverability

Develop a repository for sharing code and analytics on imagery processing (including QA) and the derivation of associated by-products.

Collaborate with the ELVIS Working Group on the development of their roadmap, considering the case for extending ELVIS for restricted government to government discovery and sharing of current and historic imagery data.

Elvis - Elevation and Depth - Foundation Spatial Data



Imagery's role in digital supply chains



Imagery is readily utilised in emerging 3D technologies, and as source inputs into AI and ML processes.

To deliver on this objective, EDIWG will deliver the following:

Metadata for ML

Collaborate with the ICSM's Metadata Working Group on the development of metadata standards for machine-learning derived datasets, as well as training datasets from imagery.

Archive of Training Datasets

Document and share imagery training datasets for use in machine learning algorithms.

Imagery as an Elevation Source

Share information on the use of imagery derived digital surface models (DSM's) to infill high-resolution elevation models where LiDAR is unavailable.



Preserve



Historic imagery archives are well-documented, digitised and stored appropriately, and available to users to access and analyse.

All jurisdictions hold unique and irreplaceable collections of historic imagery (taken in the pre-digital era with film) that have been painstakingly scanned and digitised over the last decade. Significant work still lays ahead to georeference these digitised frames and make them as easy to discover and use as modern aerial imagery. However, persistent funding and resourcing shortages plague these labors-of-love and delay the benefits this data can deliver to a host of research, policy, and planning domains.

To deliver on this objective, EDIWG will deliver the following:

Modern Digital Archives

EDIWG will work with ANZLIC to support strategic initiatives that will recognise the unique value of historic imagery under state and national records management plans, with ongoing funding sought to maintain and improve digital archives

Accessibility

Jurisdictions will develop and share with their best-practice georeferencing strategy for the digitisation of historic imagery.



Use Case: Historic Imagery

No imagery sensor or survey process can capture the past. Therefore, irrespective of the original intent of any imagery capture process, aerial imagery acquired in the past provides a visual record of what may have been occurring at a geographic location at a particular point in time. The information captured may be of interest long into the future and for purposes far beyond the imagination of its original aerial surveyors.

As imagery from a single capture begins to age, its value does not diminish; it may indeed be a unique and irreplaceable record, or it may add to the value of a series. Imagery is not purely static – it lives on a continuum where value can be derived through the application of different analysis techniques and actions.

When imagery from multiple disparate sources is aggregated under a standardised framework, both the extent of geographic coverage and confidence in time-series information for a location can be enhanced and the quality of subsequent interpretation and analysis can be fundamentally improved. In aggregate, imagery offers the opportunity for an exponentially increased value to be derived over the use of a single capture in isolation (Data Value Chain).



Sutherland Point NSW 1950 (above) to 1980 (right),
from NSW Historical Imagery Online Portal



Information interpreted from imagery projects held in Queensland's State Remotely Sensed Image Library has proven to be a valuable asset for the State, providing records of the changes that have occurred on the land over time, as well as records of particular land use activities. Both the reliance on the Library's historical imagery content in supporting cold-case Queensland Police Service investigations – often in regional and unassuming locations – and the broad-scale mapping of remnant (original) vegetation by the Queensland Herbarium are widely-recognised examples.

Using digitised historic aerial photography, provided openly via the QImagery application, commercial organisations have leveraged this imagery to perform historical terrain model reconstruction for erosion and mine remediation/rehabilitation work; and generate previous land use reports for the real estate industry to identify the risk of contaminated land.

A national audit conducted by the ICSM PCTI Historical Imagery Working Group in 2017 identified several challenges and opportunities to enhance the preservation of and access to historical (aerial) imagery collections and the spatial data infrastructure supporting its delivery.

Major efforts to digitise thousands of large-format-film-based historic aerial photography records continue to be advanced by many jurisdictions however, nationally, the task is still years from completion and continues to face a complex environment of funding constraints, aging specialist equipment and its associated technical workforce, and is ever hastened by the continual and permanently irreversible degradation of the old film base due to vinegar syndrome.

The next phase of historic imagery maintenance activity is also underway involving the georectification and mosaicking of the individual photographic frames into 2D and 3D spatial products suitable for providing data intelligence and analytics in a common framework. The development of standards to support accepted tolerances in geometric registration processes looking backward in time at changing landscape features, and the provision of web services and shared access and discovery infrastructure remain ongoing issues for coordinated action.

When completed, spatial imagery time-series datasets back to the 1920's and 30's over large areas of Australia and potentially suitable for machine-based analysis will be achieved.



**ENSURE IMAGERY
DATA IS USED TO
UPHOLD OUR
VALUES**

03



Ensure imagery data is used to uphold our values



Imagery supports and safeguards human rights, and is used to plan for and mitigate the effects of climate change in Australia and New Zealand.

No data is neutral – it reflects the priorities of those who collect and manage it. An urban–rural divide is already at play impacting which regions have imagery surveys and which do not. When this data is then used in machine learning processes and other analyses to inform policy or drive investment, there are risks that inequality becomes further ingrained in communities.

As technologies mature, they also need to be constantly reassessed for any new ethical or privacy risks they may pose, and how these can be mitigated to protect human rights.



Imagery supports a third of the UN's Sustainable Development Goals – 2, 6, 9, 11, 14, and 15.

Objectives



01 Respect privacy

Jurisdictions have clear guidelines and legal definitions of privacy and ethical usage of imagery data.

02 Reduce barriers to access

Traditional Owners and First Peoples can access imagery to support practical land management of Country, as well as for cultural and spiritual connection.

03 Ensure Sustainability

Imagery is used to plan for and mitigate the effects of climate change, and support sustainable development in Australia and New Zealand.

Respect privacy



Jurisdictions have clear guidelines and legal definitions of privacy and ethical usage of imagery data.

To deliver on this objective, EDIWG will deliver the following:

Contribute to Reviews of the Privacy Act

Through ANZLIC, EDIWG will inform responses to the Australian government's planned review of the Privacy Act 1988 to ensure that it is fit-for-purpose in the context of imagery surveys.

Ensure downstream ethical usage

Develop common definitions and policies for the ethical use of government imagery data that can be written into contracts with resellers and researchers, and which aligns the usage of imagery with the Australian Government's AI Ethics Framework.

Privacy Impact Assessment

Publish a Privacy Impact Assessment for imagery which articulates whether and how government imagery data can impact privacy, and how these impacts should be mitigated.



Reduce barriers to access



Traditional Owners and First Peoples can access imagery to support practical land management of Country, as well as for cultural and spiritual connection.

To deliver on this objective, EDIWG will deliver the following:

Develop Resources

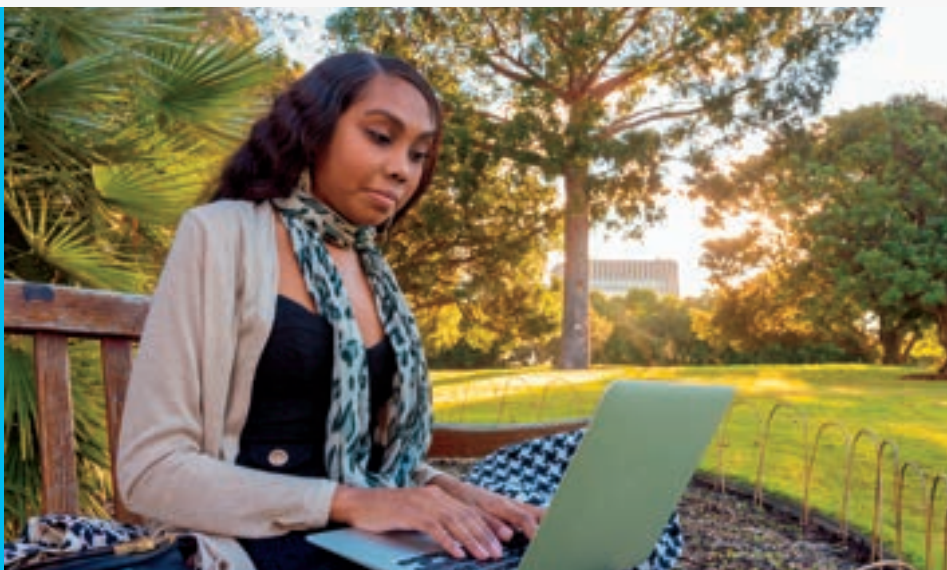
Develop information for each jurisdiction on how Traditional Owner's can access imagery find support on usage, and coordinate on survey programs.

Provide Examples

Provide examples of how IP for imagery can be shared or given, where appropriate, to Traditional Owners to support self-determination.

Support Opportunities

Jurisdictions will seek opportunities to support knowledge sharing and skills uplift with First People's to support their management of and connection to country.



Use Case: Healthy Country AI Partnership



The Healthy Country AI program is an award-winning, world-first partnership between Indigenous Traditional Owners and rangers, the Australian Government's National Environmental Science Program, CSIRO, Microsoft, Parks Australia, the University of Western Australia and Charles Darwin University.

Co-developed with Traditional Owners, the program has been empowering Aboriginal land managers to respond to environmental challenges, equipping them to use ethical AI and modern science with their knowledge of country to survey species and habitats of cultural and ecological significance.

Healthy Country AI is tackling a range of complex environmental issues, such as its work in World Heritage-listed Kakadu National Park where, under the direction of Indigenous Traditional Owners and rangers, drones capture video footage which is then labelled and interpreted using a combination of Indigenous knowledge, Microsoft AI, and visualisation.

The models allow rangers to regularly survey large areas that are difficult to access and removes the need for people to review thousands of hours of imagery and video to count animals and identify invasive grasses.

Using this approach, rangers have rapidly assessed the impact of reducing para grass weed spread on the abundance of culturally-important magpie geese on Kakadu's Nardab floodplain. In 2018, only 50 magpie geese were counted. Nine months later, improved land management through these techniques resulted in more than 1,800 returning to the wetlands.

The Healthy Country AI partnership shows how emerging technologies and geospatial imagery can support adaptive management on country to solve complex environmental problems, create jobs and care for significant species and habitats

Ensure Sustainability



Imagery is used to plan for and mitigate the effects of climate change, and support sustainable development in Australia and New Zealand.

Australia's 2022/23 Budget committed to designing and launching four satellites as part of a \$1.16 billion 16-year national earth-observation mission. This mission will fill significant coverage gaps across the region and provide data that will be critical for understanding and managing the impacts of climate change and natural disasters. It also offers an opportunity for EDIWG to support further research that leverages high resolution imagery data and integrates it with research utilising with satellite data at lower resolution or utilising different spectral bands.

To deliver on this objective, EDIWG will deliver the following:

Work with the ANZ research and space community

EDIWG will work with the ANZ research and space community to explore opportunities to leverage government's high-resolution imagery collections in the calibration and modeling of lower resolution satellite data, particularly in support of climate and environmental research, and collaborate with the Australian Space Agency on joint initiatives to improve skills and capability.



Further Resources

**Spatial Digital Twins –
Global Status,
Opportunities, and Way
Forward**

World Geospatial Industry
Council, April 2022

[Link to download](#)

**Australia's AI
Action Plan**

Commonwealth of Australia,
June 2021

[Link to download](#)

**Australia in Space: a
decadal plan for
Australian space
science 2021–2030**

Australian Academy of
Science, 2022

[Link to download](#)

**Digital
Innovation:
Australia's \$315B
Opportunity**

AlphaBeta Advisors,
Commissioned by CSIRO and
Data61, September 2018

[Link to download](#)

**Future Trends in
Geospatial
Information
Management**

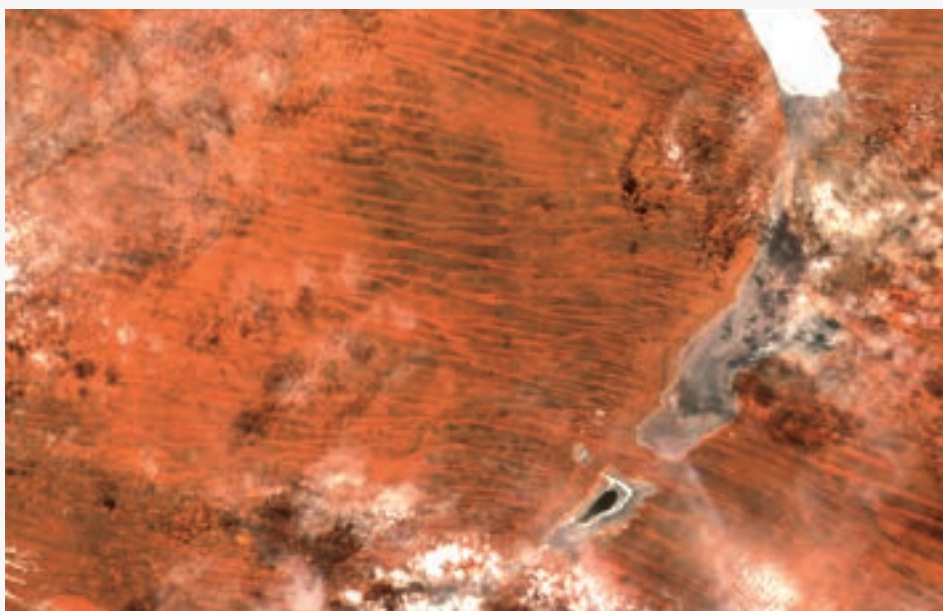
UN– GGIM Committee of
Experts on Global Geospatial
Information Management,
2020, Third Edition 2020

[Link to download](#)

**DEA Harvesting
the benefits of
Earth
observation
report**

Frontier SI, August 2020

[Link to download](#)



Thank You

Because collaboration on national solutions is achieved through sharing information, experience and resources.

The EDIWG welcomes everyone that has an interest in participating and contributing to our activities and promoting the value of foundational spatial data.

Please send an email to the Chair listed below to comment on the Imagery Statement of Direction, or to find out more about getting involved in the Group's activities.



Email

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Website

<https://www.icsm.gov.au>