DIGITAL EARTH AUSTRALIA
# INDUSTRY STRATEGY

MARCH 2019

# THE OPPORTUNITY

**Digital Earth Australia (DEA) is an Australian government investment focused on increasing the utilisation of Earth Observation data across Australia. It is a program covering fundamental access to data through to outreach and education activities.**

At the core of DEA is a world-class analysis platform for satellite imagery and other Earth Observations (EO). DEA will provide Australian businesses with access to validated, standardised analysis-ready-data (ARD), analytic capability and tools that will allow industry to innovate to produce new products and services, ultimately helping to enhance businesses and be competitive in global markets.

The potential to develop satellite applications and services tailored for the regional and global markets is huge, with recent studies suggesting the geospatial services sector generates US$400 billion in revenue per year globally. In Australia, the Earth Observation market provided $500 million of direct economic benefits to the Australian economy in 2015. By 2025 this is modelled to more than triple to $1.7 billion. This provides a significant opportunity for Australian businesses to capture this value through innovative EO applications. DEA will enable small businesses and industry to more readily access near real time satellite data and derived information to innovate and create new products. This will increase the profitability and productivity of businesses in sectors such as land planning, construction, agriculture and mineral exploration.

The DEA digital infrastructure uses satellite data to detect physical changes across Australia in unprecedented detail. It identifies soil and coastal erosion, crop growth, water quality and changes to cities and regions. 30 years of historical data will be combined with data from an ever-growing range of new satellites, providing regular updates for the entire country at increasingly finer scale.

In May 2018, the Australian Government announced ongoing funding of approximately $13 million a year for the DEA program. To ensure that this investment generates value for Australian businesses, DEA has undertaken extensive industry consultation nationally. The consultation is aimed at understanding the requirements of Australian businesses for Earth observations, data infrastructure, and information products as well as to provide an opportunity for industry to experience DEA first hand. The exercise has resulted in the creation of this industry-backed strategy for DEA.

In funding DEA, the Hon Senator Matthew Canavan said "Our investment in [DEA] will ensure a range of Australian industries have access to data that can help them: tailor their investments, create jobs in target regions, and increase their competitiveness."

This strategy aims to allow Geoscience Australia to invest the program funding in a way that maximises the benefits realised across the Australian economy, and ensure that the market for Australian made EO products and services grows significantly both domestically and internationally.
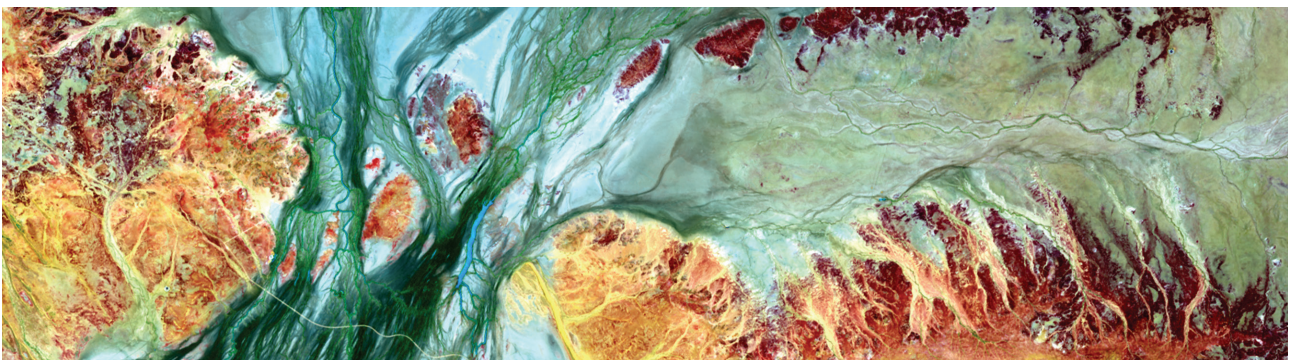
# LISTENING TO THE PRIVATE SECTOR

**DEA was identified by the 2026 Spatial Industry Transformation and Growth Agenda and the Australian Earth Observation Community Plan 2026 as a priority data infrastructure to be included in the nationwide infrastructure framework.**

This was driven by a need by the private sector to have long term certainty in the funding and capabilities of national spatial infrastructures. Taking such insights into consideration, Geoscience Australia (GA) worked with FrontierSI to develop an Industry Strategy that will ensure that DEA will generate value for the Australian

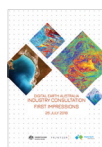spatial industry, key growth sectors within Australia, as well as the wider Australian economy.

This strategy was developed with inputs from over 500 individuals, with engagement and feedback received from interviews, face to face workshops, webinar series, conferences and online feedback. This engagement provided industry a chance to direct the future of DEA investment, but also to receive first hand training and education in the use of existing DEA products and services. Inputs from across these engagements were analysed for themes and opportunities, and provide a strong evidence base for the activities and impacts outlined within this strategy.

**4 WEBINARS**

**500+ INDIVIDUALS**

**250+ IDEAS**

**5 NATIONAL INDUSTRY WORKSHOPS**

**30+ ONE-ON-ONES WITH INDUSTRY LEADERS**

**100+ FACE-TO-FACE AT NATIONAL WORKSHOPS**

**RESOURCES**

DEA INDUSTRY STRATEGY

FIRST IMPRESSIONS REPORT

TRAINING MATERIALS

# STRATEGY ON A PAGE

**DEA Purpose and Objective**

DEA aims to increase the use of EO data and products
by lowering barriers to its exploitation by Australian businesses

| Data and tech | Education | Awareness |
|---|---|---|

**Outcomes**

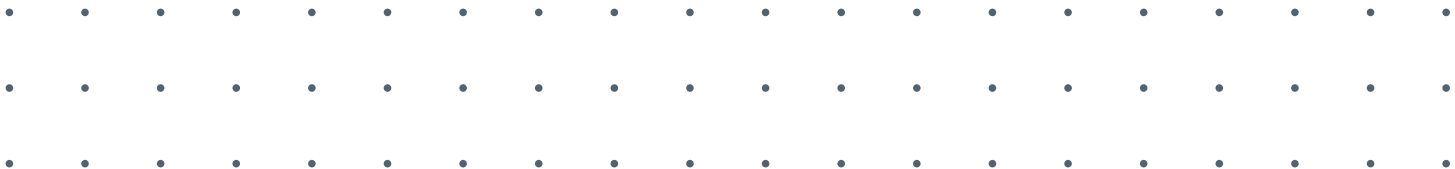| Technology offering that is operational, easy to understand, access, use and integrate | Increased number of EO skilled professionals in Australia | Increased awareness and utilisation of EO data and products in a wider variety of markets |
|---|---|---|

**Areas of Focus**

| Developing technology with industry | Educating and training | Reaching out to Australia |
|---|---|---|
| Jointly develop end user driven EO data, products, and technology that can be readily used and commercialised | Meet and grow the demand for EO-skilled professionals, providing practical training and education opportunities using DEA at the professional, graduate and student level | Promote and advocate EO nationally to create understanding and demand across key Australian industries, while generating community, executive and media awareness of the use and impact of EO |

*Fast prototyping for real time innovation, evidence gathering and continuous strategy improvement and refinement*

**DEA Labs program**

The DEA Labs program will accelerate adoption of EO and DEA technology, supporting the private sector to prototype, test, refine and operationalise solutions that solve real user problems. It will develop use cases, new services and businesses utilising EO data and products in a record time.

| | ![Data and tech icon] Data and tech | ![Education icon] Education | ![Awareness icon] Awareness |
|---|---|---|---|
| | **Developing technology with industry** | **Educating and training** | **Reaching out to Australia** |
| **Guiding principles** | 1. Interoperable technology that can be easily used and integrated<br><br>2. Data that I can trust<br><br>3. Data is available and current<br><br>4. Respond to user problems | 1. Practical real-world learning and education<br><br>2. Target existing professionals in related technical fields<br><br>3. Educate graduates and students on how to use DEA to solve problems on their field<br><br>4. Provide help and support through expert advice | 1. Maximise presence and reach in existing Australian markets<br><br>2. Use real case studies showing the benefits to new users and markets<br><br>3. Leverage well-known organisations to raise awareness<br><br>4. Use traditional and social media to reach outside the space and spatial sectors |

**Activities**

| | | | |
|---|---|---|---|
| **Today**<br><br><br><br><br><br><br><br><br><br>**Tomorrow**<br><br><br><br><br><br><br><br><br><br>**The day after** | D1. Develop a minimum viable technology offering that can be operationally used and integrated by the private sector<br><br>D2. Publish and maintain a single diagram of the DEA technology offering and its maturity status<br><br>D3. Measure the uptake of DEA by the private sector<br><br>D4. Publish end user consumable information on the quality of the DEA produced data to increase trust<br><br>D5. Periodically collect requirements from the private sector to upgrade the DEA offer<br><br>D6. Transition all data and products to an operational cloud-based infrastructure | E1. Expand online resources for training and education<br><br>E2. Create and publish formal support channels<br><br>E3. Develop education-ready use cases for: agriculture, mining, environment<br><br>E4. Create a DEA-focused specialist short course targeted at spatial/IT professionals<br><br>E5. Create a DEA landing page that triages users by experience and application area | A1. Create mechanisms for continuous engagement with the private sector and end users<br><br>A2. Partnerships with influential end user organisations<br><br>A3. Growth-sector driven DEA workshops targeting: agriculture, mining, environment<br><br>A4. Promotion through space and spatial organisations<br><br>A5. Create and implement a plan for the use of traditional and social media, quantifying success<br><br>A6. Establish relationships with industry bodies in adjacent markets |

# THE STRATEGY

The DEA Industry strategy proposes three areas of focus: D) Data and technology, E) Education and training and A) Awareness. To help deliver the strategy, an innovation program – DEA Labs – is proposed that will allow the fast prototyping and testing of ideas to enable an agile, data-driven decision-making approach.
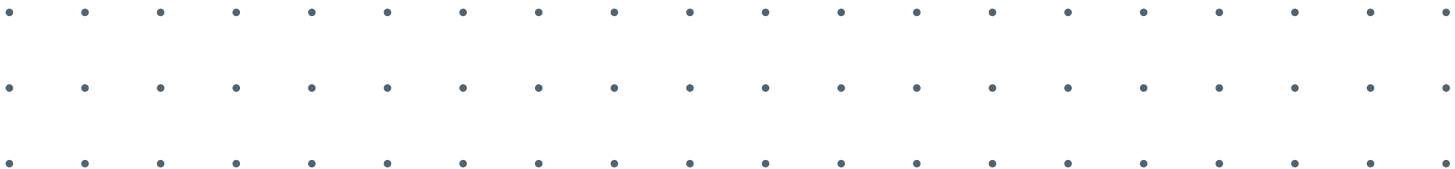
Furthermore, for each area of focus, the strategy defines:

**Guiding principles:** a succinct list of rules that should guide the efforts under each area of focus. These principles encapsulate the key messages and learnings from the consultation, are fundamental to

deliver on the on the DEA objectives and purpose, and should help guide the day-to-day work of those working in the DEA program.

**Activities:** a set of priority activities is proposed for each area of work. Although all activities are important, and many could be executed on immediately, activities have been organised along a timeline looking at what needs to be done "today", "tomorrow", and "the day after" in order to provide a sense of urgency and pace on their execution. The following table provides detail on the motivation for activities selection, and implementation suggestions for some of them.

| D – Data and tech | Implementation suggestions and motivation |
|---|---|
| **D1. Develop a minimum viable technology offering that can be operationally used and integrated by the private sector** | Offer should include at least the following elements, development of which should consider and be linked to identified user archetypes:<br>• DEA provided as a service that allows analytics and access to data ("I don't want to run my own cube") – Archetypes: simple and seeking evidence, discerning and diagnostic<br>• Simple cloud deployable tools that are stable and ready to be used with DEA data ("I want to use my own data") – Archetype: enabling and discerning<br>• Clear pathway to data and products ("I just want to access data and products") – Archetypes: simple and seeking evidence, enabling and interrogating<br>• Clear statements regarding service delivery standards (up time, data currency) |
| **D2. Publish and maintain a single diagram of the DEA technology offering and its maturity status** | Diagram should enable both technical and business decisions to be made regarding use and integration of DEA. Accessible and visual, an example would be an interactive diagram on the website including costing model (i.e. "who pays for what" and T&C). This could include information about IP ownership between GA and the private sector. |
| **D3. Measure the uptake of DEA by the private sector** | Understanding which DEA data, products, tools or services are being used and by who is paramount to track the level of technology adoption by the private sector. This will require the definition of clear metrics (e.g. number of product downloads, number and types of support requests, increase in the number of users of a service, etc.), as well as the implementation of these in a systematic manner that allows to collect data and derive insights from it. |
| **D4. Publish end user consumable information on the quality of the DEA produced data to increase trust** | Information regarding quality, accuracy and validation needs to be published in a way that is consumable and understandable by end users to help drive adoption. Currently a barrier to adoption from end users is the lack of trust ("how do I know this represents my paddock?"). This work should be linked to GA's CalVal (Calibration and Validation of EO data) infrastructure work to ensure quality levels are maintained and increased. |

| D5. Periodically collect requirements from the private sector to upgrade the DEA offer | To ensure that DEA continues to be relevant, up to date and supports the market, conversations with the private sector will need to be targeted, continuous and frequent. This may include:<br>• Dedicated online channel to gather requirements from users<br>• Frequent webinars/newsletters<br>• Engagement with users to test beta features/data<br>• Coordinated community like Earth Observation Australia (EOA) for the private sector<br>• Easy to find support and contact channels<br>• Communication pathways to detail updates and changes |
| --- | --- |
| D6. Transition all data and products to an operational cloud-based infrastructure | Facilitate the access to data by hosting it in the cloud infrastructures where users operate. This will likely require the duplication of data storage across popular cloud infrastructure providers (e.g. Amazon, Google), but will greatly increase adoption and use of DEA data.<br>The full history of ARD is required by the private sector to allow for data science using a large volume of historical data to create new products and services for the future. |

| E – Education and training | Implementation suggestions and motivation |
| --- | --- |
| E1. Expand online resources for training and education | Create easy online resources to help new users understand what DEA is and how to access it. Examples could include:<br>• Develop a 101 on-line training series of videos on how to use DEA<br>• Create a "Start Up" Manual to guide non-expert users<br>• Run more frequent webinar education sessions |
| E2. Create and publish formal support channels | Formalise the current informal support channels for DEA, and provide clear access to this information on the DEA website, including:<br>• Dedicated technical support staff<br>• FAQs with practical next steps for help<br>• Real time support channels (e.g. phone, slack)<br>• Delayed support channels (e.g. dedicated email, contact forms) |
| E3. Develop education-ready use cases for: agriculture, mining, environment | Create education materials for undergraduate degrees grounded in real work use cases. These will be used to help existing spatial students understand the real world impacts of EO, and can also be used to help application sector degrees understand the toolkits available to them.<br>This will ensure new graduates are asking their employers "Why aren't you using DEA?". This strategy has worked well to help initiatives such as AURIN (Australian Urban Research Infrastructure Network) move from research to private industry use, as well as being a long term strategy of ESRI. |
| E4. Create a DEA-focused specialist short course targeted at spatial/IT professionals | Educate related professionals to expand their skillset to include EO management and analysis. Examples of such professionals include data scientists, IT professionals and spatial analysts. Activities recommended include:<br>• Develop micro credential courses with universities<br>• Develop modules within general masters degrees targeted at existing professionals (e.g. MBA, data analytics, masters of IT)<br>• Conference workshops at both spatial and technology related conferences |
| E5. Create a DEA landing page that triages users by experience and application area | Employ a matrix style website design that allows users to be filtered by either applications sectors or technical interest. This will ensure that users are able to find the DEA offer and associated information that is better-suited to them, with the right level of detail, including useful information and EO data in Australia (e.g. users could be guided through a set of questions, or clearly showing the offer, like a telecommunications provider would do with "tv", "mobile", "internet", etc.). |

| A – Awareness | Implementation suggestions and motivation |
|---|---|
| **A1. Create mechanisms for continuous engagement with the private sector and end users** | Ensure end user communities have constant and frequent engagement from DEA to ensure they are progressing down the user funnel: target, awareness, information, engagement, first use, regular use. Mechanisms to achieve this include:<br>• Formal user communities<br>• Outreach and engagement at conferences<br>• Webinars and training sessions<br>• Case studies and promotion |
| **A2. Partnerships with influential end user organisations** | Leverage well known and trusted brands in application industry markets to increase the awareness and adoption of DEA. Using existing trusted brands to promote DEA could help overcome initial trust and awareness barriers. Suggested partners include: Regional Research and Development Corporations, Growth Centres, CRCs (Cooperative Research Centres), Banks, government and private innovation programs, and private companies such as Google, and Amazon. |
| **A3. Growth-sector driven DEA workshops targeting: agriculture, mining, environment** | Coordinate national workshops to understand key drivers, barriers, value and opportunities within application markets for EO. This can be used to help raise awareness of EO within user communities, expose users to simple tools they can use already, create market insights that technology focused organisations can act on, and provide a focus for DEA Labs challenges.<br>In addition to the proposed sectors (i.e. agriculture, mining, environment) importance should be given to banking and the insurance sectors, as they can serve as gateways to reach a broad range of end users and valuable problems. |
| **A4. Promotion through Space and spatial organisations** | Leverage the mailing lists and reach of organisations promoting space and spatial industries to raise awareness and attract companies to use the platform. Examples of these are SSSI, SIBAIGITA, EOA and SIAA (Space Industry Association of Australia).<br>This can be in the form of:<br>• Articles within online and print magazines<br>• Special issue newsletters to spatial organisation mailing lists<br>• Application focused plenaries at national conferences<br>• Workshops associated with national conferences/events<br>• Advocating your early users to promote their success on national stages |
| **A5. Create and implement a plan for the use of traditional and social media, quantifying success** | Creating a social media presence will be key to allowing DEA to connect with key end user communities (for example Ag Chat Oz), as well as accessing and interacting with the open source community. At the moment some individual developers/contributors to DEA and ODC use social media, but the current extend of its success for awareness generation needs to be measured and backed by a clear strategy and core messaging that is consistent across social media platforms. This profile should be associated with, but separate to the general Geoscience Australia social media accounts. |
| **A6. Establish relationships with industry bodies in adjacent markets** | Once the DEA technical offer is mature enough, adjacent markets (such as in the information technology or environment) can be targeted. Establishing relationships with the Australian Information Industry Association (AIIA) or the Environment Institute of Australia and New Zealand (EIANZ) could serve as a top-down approach to reach companies and professionals in these areas. |

# DEA LABS: DOING, GROWING, LEARNING

**DEA Labs will be a small scale, targeted incubator program for the private sector. DEA Labs will help Australian businesses to use satellite data and DEA technologies to solve real world problems through collaboration, the provision of funding and support.**

It will bring together end users and the private sector to innovate and solve challenging real world problems, while helping the DEA Program better align its areas of focus, gather data on impact and closely monitor and measure success.

## SMALL STEPS

In order to better tailor DEA Labs to the needs of the private sector, the DEA Program will test two challenge-based incubation approaches in 2019.

❖ Stream A: a limited tender for solutions to a DEA-defined challenge.

❖ Stream B: an open expression of interest for applications using DEA technologies and/or data to address a real-world use case.

In both streams, projects will have a maximum duration of 6 months and allocation of funding will be decided on an application basis. The selected participants, the outputs of the funded projects and learning from these trials will help inform the design of the DEA Labs program.

The following characteristics currently set the basis for the DEA Labs program:

❖ small, targeted incubator program;

❖ accessed via an application process open to any company regardless of size;

❖ projects target real end user problems and current industry challenges;

❖ project outcomes result in real, measurable end user benefits;

❖ participants agree to publicly share knowledge and information resulting from the project;

❖ collaboration and support provided by DEA;

❖ IP is owned by funding recipients;

❖ DEA Labs program is part of an ecosystem of collaborators, investors, SMEs, industry;

❖ DEA Labs learnings help influence the overall DEA Program direction.

## GETTING INVOLVED IN THE TRIALS

Additional program details and the exact terms and conditions of DEA Labs participation and funding are being developed by Geoscience Australia.

Companies and individuals interested in being involved in the first round of DEA Labs incubator projects should contact dea@frontiersi.com.au.

# SUPPORTING GOVERNEMENT AND WORKING WITH ACADEMIA

**Although the DEA Industry strategy is targeted at the private sector, both government and academia have a key role to play to ensure EO adoption is maximised in Australia.**

**Government as a user:** local and state government, as well as many government agencies are frequent users of EO data due to their unique reporting needs and mandate in areas such as water and environment monitoring. This point was recognised by industry through the consultation, with many companies having government as a client. DEA should consider engaging with government as valuable end users that can bring to the table compelling problems. In addition, several private companies stated that increased usage in state and federal government departments would increase their confidence in using DEA themselves.

**Research to solve complex problems:** EO data has been traditionally exploited by researchers and scientists, where vast amounts of knowledge have been created. Some of the most complex questions and algorithms require dedicated research, and in fact in a knowledge-based economy, research becomes the means of production.[2] To capitalise on the existing knowledge, infrastructures and schemes within the research community, DEA should consider engaging with academia to tackle some of the complex problems that will emerge as part of the DEA program in the EO, analytics, and AI field amongst others. In addition, as many companies do not have internal EO capability, the research sector will be increasingly called upon to support growth and innovation within the private sector.

*2. "How to Set Up and AI R&D Lab", by Foteini Agrafioti, Reprint H04NZ6, published on hbr.org, November 20, 2018.*
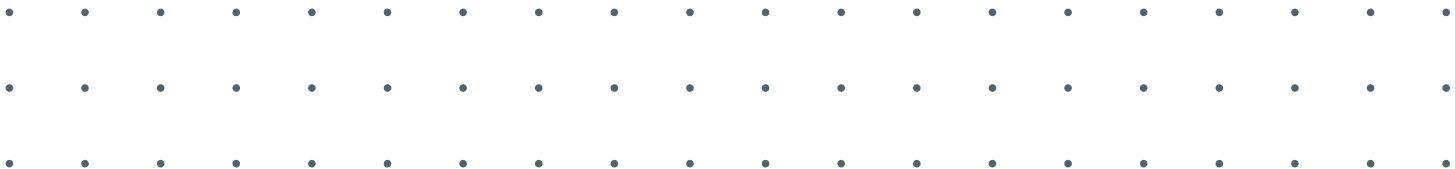
## ACKNOWLEDGMENTS

The DEA Industry Strategy team would like to thank all those who have participated in the consultations so far, for the many great ideas and contributions that have so willingly been provided.

## CONTACT

If you want to know more about Digital Earth Australia, please get in touch at: earth.observation@ga.gov.au or visit: http://www.ga.gov.au/dea

## SUPPORTING RESOURCES

This strategy along with all the resources generated through the Digital Earth Australia Industry Consultation are available at: frontiersi.com.au/opportunities/dea/