



# ACSG

AUSTRALIAN CENTRE FOR  
SPACE GOVERNANCE

# TRUTH IN DATA: RESPONSIBLE GOVERNANCE OF EARTH OBSERVATION DATA

## Workshop report

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On Monday the 14<sup>th</sup> of August 2023, the Australian Centre for Space Governance (ACSG) hosted the **Truth in Data: Responsible Governance of Earth Observation Data** workshop. Chaired by Dr Cassandra Steer, Australian National University Institute of Space's (ANU InSpace) Deputy Director-Mission Specialist and founder of the ACSG, the workshop aimed to facilitate discussion between a range of experts in government, industry, and academia on the responsible governance of data from Earth observation (EO) satellites.

Twenty-five key stakeholders representing the public and private sector all took part in the workshop. Attendees' expertise included biotechnology, law enforcement, data regulation, space governance, consulting, environmental protection, defence and security. Representatives from Geoscience Australia, the ANU/Optus Bushfire Research Centre of Excellence, the Centre for Entrepreneurial Agri-Technology, FrontiersSI, Symbios, and CSIRO delivered presentations on how EO data is critical to their respective industries, and what the national and global risks are with respect to ensuring truth in that data.

## Key Emerging Themes

The primary themes to emerge from the workshop were: 1) the general failure to fully appreciate EO data as critical infrastructure, despite enormous national dependencies; and, 2) the high risks associated with Australia's ongoing dependency on foreign and commercial EO data providers, regarding data quality, data interference, and loss of service.

EO data brings \$3.2 billion into Australia's GDP, while Australia spends approximately \$100 million per year on EO data.<sup>i</sup> Some of this data is provided for free through various arrangements, accessed through an EO satellite "timeshare" arrangement with partners in Europe or the US, or purchased from commercial providers.

With respect to foreign government providers, there is a risk that Australians could lose access to this critical data if those nations were to find they were in a situation requiring them to prioritise their own data needs over Australia's, or if their satellite capabilities were interfered with due to geopolitical

tensions or armed conflict. Moreover, there is a dramatic rise of commercial vendors to the extent that EO data is globally 95% commercial and is estimated to become 97%

commercial in the coming years.<sup>ii</sup> When providers are not government owned, issues arise over the calibration of the EO satellite instrumentation for accuracy and validating the data. In some cases, commercial vendors have been found to engage in fraud or deepfakes to get past regulation requirements. This can lead to serious risks for the sectors which depend on that data for their operations and for national security.

Throughout the day, discussion focussed on these risks, especially in light of the recent decision of the Australian government to cancel the planned National Space Mission for Earth Observation, which would have provided sovereign critical infrastructure for the nation's economy and national security. Aside from the need for sovereign Earth observation satellite capabilities, proposed governance solutions to these risk issues included: 1) providing a detailed risk analysis of commercial, operational, and security implications for various Australian sectors; 2) certification of commercial vendors that verifies their calibration and validation efforts; and, 3) constructing a globally-leading calibration and validation (CAL/VAL) body in Australia that performs this task.

## Truth in Data: Issues Discussed

A few crucial issues emerged from the workshop, including the risks associated with lack of sovereign EO data and the increasing reliance on commercial vendors. These concerns were raised over the course of several presentations involving a wide variety of industries and sectors.

A session titled "Observing Earth: Sectors, economies, and the human component"

**“EO data supports a range of national priorities: climate & disaster response, national security, regional partnership security, food security, housing, intelligence gathering, maritime domain awareness, as well as primary industries such as agriculture and mining.”**

emphasised that EO data is critical infrastructure both nationally and globally. Economic and operational dependencies for sectors such as agriculture, mining and fishing were highlighted, as were national security dependencies such as maritime domain awareness and traditional intelligence, surveillance, and reconnaissance (ISR) activities. In addition, 50% of the world's climate data comes from EO satellites, emphasising how critical space capability is for that sector. The utilisation of EO data in legal proceedings during investigations and as evidence in the courtroom were also outlined, especially as the Queensland government appears to be a world leader in using EO data to prosecute illegal logging and water theft.<sup>iii</sup> Indigenous communities frequently rely on EO data for Native Title claims,

and to augment management of waters and lands, including tracking fauna and accessing up to date information about flora and water health.

**“The opportunities for Indigenous Australians to engage with EO infrastructure is a story of strength that deserves to be told more often.”**

Indeed, the opportunities for Indigenous Australians to engage with EO infrastructure is a story of strength that deserves to be told more often. This includes the work of the Centre for Appropriate Technology in Alice Springs—which owns and operates a ground station for EO data for Geoscience Australia, CSIRO and US partners<sup>iv</sup>—and the collaboration between CSIRO, Geoscience Australia, and Indigenous rangers in northern Australia which manages the ground sensors necessary for calibrating EO satellite instrumentation.

The existing and potential uses for EO data in the agricultural and environmental sectors were highlighted in the following presentations, as well as bushfire analysis and a range of climate change impacted bioregions, wherein specific satellite capabilities are needed but often not supplied by commercial vendors. This included a detailed explanation of the OzFuel technology being developed at the Australian National University as

part of the national Resilience Mission.<sup>v</sup> This EO instrumentation is tailored specifically to monitor eucalyptus vegetation for its potential “fuel load” for bushfires. Since existing EO instrumentation globally is not tailored to eucalypt forests, this provides a national critical infrastructure with application in the Asia Pacific region and in the west of the United States.

Another presentation detailed the need for data curation for farmers and the agritech sector to effectively understand the impact of climate change on their operations. EO data can not only augment the speed with which crop cultivation can be tested, it can also assist in the accurate, time-saving, cost-saving and waste-saving practices of farmers in their sowing, irrigation, and fertilisation activities. This has positive benefits for the environment as well. Emphasised throughout was the importance of matching data sets and increasing access to data for farmers.

Following from this issue, a presentation on “Gauging the quality of EO data” highlighted the imperfections often seen in datasets with respect to processing and application. The critical importance of integrity of data was raised, in particular security concerns such as ensuring the trustworthiness of providers of data, and their ability to harden against deliberate interferences. An additional concern was raised around Australia's dependence on commercial providers: there is no control over who else has access to the data being gathered in great detail about its food security and primary industries, thus potentially creating a secondary vulnerability.

In a session on “Lessons from AI governance and data governance”, a dialogue emerged between experts around adjacent areas of data policy and

**“The workshop explored strategies to engage policymakers and government agencies effectively, emphasising the need to ‘speak their language’ and frame discussions around policy priorities and national resilience.”**

governance. Questions were posed as to the implications of poor data quality for machine learning and AI decision-making, in particular given that EO data can be processed using machine learning. Existing, parallel debates in other data governance areas were outlined surrounding how to manage quality assurance and whose responsibility this is. Is it the responsibility of commercial providers to ensure and guarantee sufficient calibration and validation, or should there be a regulatory or certification procedure put in place by government agencies seeking to purchase this data? The potential risks of attempting to govern data quality assurance through policy or regulation were discussed, including the pushback that often comes from the commercial space sector, based on a default position that deregulation is better. It was pointed out that baseline regulation can be helpful in providing clarity for operators, end users, and even investors. However, baseline regulation also often leads to operators seeking to “get around” the legislation. Policies and guidelines which are values-based may be more effective.

The final discussion focussed on the problem of reaching a policy audience. Attendees agreed that the importance of EO satellites and the data they provide as critical infrastructure appears not to be reaching decision-makers. Those with experience in EO data governance were able to provide examples of global reports generated over the years to demonstrate how specific sectors depend on EO data, what the economic impacts are, and how to increase end user uptake of the data. However, these reports do not appear to have led

to an adequate understanding of the issues in Australia or elsewhere. The session concluded with a discussion on barriers faced by those working on big data governance, EO governance, and AI governance when it comes to reaching a policy audience.

## Next Steps

The ACSG will be continuing the line of inquiry discussed at this workshop through a policy paper series, podcasts, and blogs. These offer avenues to expand the discussion on the importance of governance solutions surrounding these issues. There is an ACSG-led public survey forthcoming to identify how Australians think about space technologies, investment in space, and dependencies on Earth observation satellites. The ACSG is also partnering with the ANU National Security College on a multi-sector exercise to demonstrate the real and widely felt impacts of poor quality EO data on a range of sectors and industries critical to our economy and national wellbeing.

The ACSG will host a future government workshop on the risk of our dependencies on foreign and commercial providers, which will directly engage with policymakers on the matters that have been discussed throughout the workshop. These matters include the rise in risk to data quality, interference and loss of service regarding EO data, and the importance of regulating the sector by means of a national CAL/VAL institution.<sup>vi</sup>

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<sup>i</sup> Deloitte, “Economics of Earth observation: An economic study into the Australian Earth observation sector”, 2021 <https://www.deloitte.com/au/en/services/economics/perspectives/economics-earth-observation.html>

<sup>ii</sup> Symbios, CEOS Missions, Instruments, Measurements and Datasets: The CEOS Database”, 2021 <http://database.eohandbook.com/about.apsx> <http://database.eohandbook.com/about.apsx>

<sup>iii</sup> Ray Purdy and Denise Leung, “Evidence from Earth Observation Satellites: Emerging Legal Issues” (Brill, 2012) <https://brill.com/edcollbook/title/19567>; a report is also

forthcoming from the ACSG which will cover the last 10 years on how EO data is used in the courtroom in Australian courts.

<sup>iv</sup> <https://www.ga.gov.au/news/40-years-of-landsat-in-australia>

<sup>v</sup> <https://inspace.anu.edu.au/activity/missions/ozfuel>

<sup>vi</sup> There are opportunities to engage with the ACSG on this line of research and advocacy. Several of the experts attending have indicated a desire to remain engaged and to contribute. For anyone interested in taking part, please contact us at: [contact@spacegovcentre.org](mailto:contact@spacegovcentre.org).