

# Earth Observation data and future challenges

Defra partners with CGI to exploit Earth Observation data and prepare for future challenges.

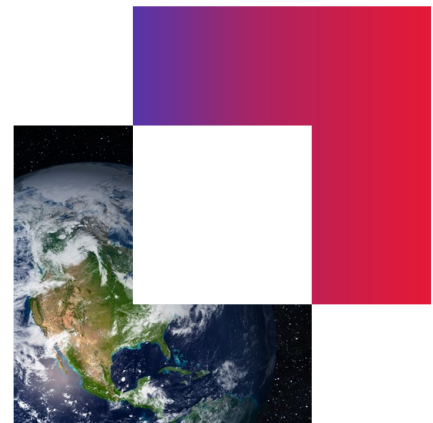
The Department for Environment Food & Rural Affairs (Defra) is the UK Government department responsible for safeguarding our country's natural environment, supporting our world-leading food and farming industry, and sustaining a thriving rural economy. Defra faces unprecedented demands on its resources whilst also facing the uncertainty of a vastly changed operational landscape post-Brexit.

Defra requires 'Analysis Ready Data' (ARD) for everything from simple visualisations to complex machine learning algorithms; with processing costs limiting Defra's ability to exploit this data, a joint validation project with the UK Government's advisor, the Joint Nature Conservation Committee (JNCC), identified the need for a specialist partner to deliver a cost-effective solution.



Analysing imaging data from the European Space Agency SENTINEL satellite system, Defra calculated that 70% of the cost of using this critical resource was in the initial processing of the raw data. Defra's central Data Programme, whose motto is, "Process Once, Use Everywhere", identified a key saving in building a facility to automatically generate ARD.

With over 30 years' experience developing software and networks for space, industry and government, CGI was engaged to leverage its breadth of knowledge and deep domain expertise to offer Defra an intelligent, cost-effective solution to harness the crucial Sentinel data and process, produce and disseminate ARD.



## CGI working with Defra

- Delivered Defra wide data service
- Automated complex data processing
- Required expertise in software engineering, remote sensing and data sharing portals
- Uses MS Azure to process large data volumes efficiently
- Built on open source / open standards

## The solution

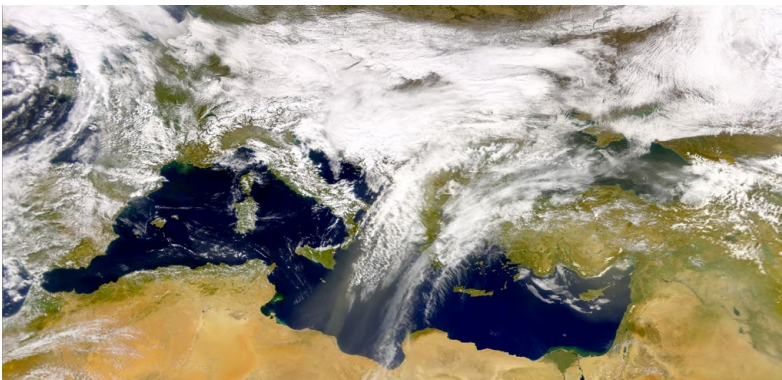
Working closely with Defra and the JNCC, CGI identified the main project challenges as automating the processing of Sentinel data to produce ARD, cost-effective storage of large amounts of this data, and producing a flexible, single-source of ARD, easily accessible by a wide audience.

Because of their long-standing collaboration with numerous government departments and agencies, CGI innately understood the need for any solution to embrace the UK Government's digital agenda, in particular the use of open architecture and cloud-based systems.

After an initial analysis, CGI were able to recommend a public hyperscale cloud provider (MS Azure) as the most cost-effective and flexible solution to store and access large amounts of imaging data.

The next challenge was to automate the processing of raw Sentinel data; this involved complex and challenging problems such as correcting atmospheric and meteorological issues; again, CGI was able to integrate an existing UK-based solution, developed at Aberystwyth University.

Once the automated data processing chain had been implemented, the next challenge was to address the cost of storing large volumes of the ARD produced. CGI experts were able to design and recommend a further MS Azure solution, reducing costs of ARD storage by over 90%.



## The benefits

Using the latest open-source architecture, tools and cloud-based solutions, CGI was able to develop and deploy the alpha product in just 3 months. This intelligent solution to a complex set of challenges now gives Defra timely, reliable and cost-effective access to the critical, analysis-ready satellite data it requires to aid it in safeguarding our environment.

There are already a number of important Defra projects underway as a result of CGI's success in enabling the full use of ARD; these include illegal forest felling detection, assessing water pollution and quality due to road run-offs, houses or farmland; it will also play a major part in the UK and Overseas Territory (OT) Governments' Blue Belt Programme which aims to protect over 4 million square kilometres of marine environment across the UK OTs.



## About CGI

### Insights you can act on

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world.

We are insights-driven and outcomes-based to help accelerate returns on your investments. Across 21 industry sectors in 400 locations worldwide, our 77,000 professionals provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally.

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