



Strategic Implementation Plan: Earth Observation

July 2015

Earth Observation Strategic Implementation Plan 2015-2017

Version 1 July 2015

Context

This plan sets out the UK Space Agency EO activities. This should be seen in the context of the EO Strategy 2013-2016, the UKSA Corporate Plan 2015/16 and the National Space Policy.

This is a working document first published in July 2015. Progress will be reported to the Earth Observation Advisory Committee and this plan will be periodically updated by UKSA on advice and consultation with the community. The plan outlines the priority activities as foreseen and can be subject to change dependant on resources and political priorities.

All comments and questions can be addressed to the EO team on uksaot@ukspaceagency.bis.gsi.gov.uk

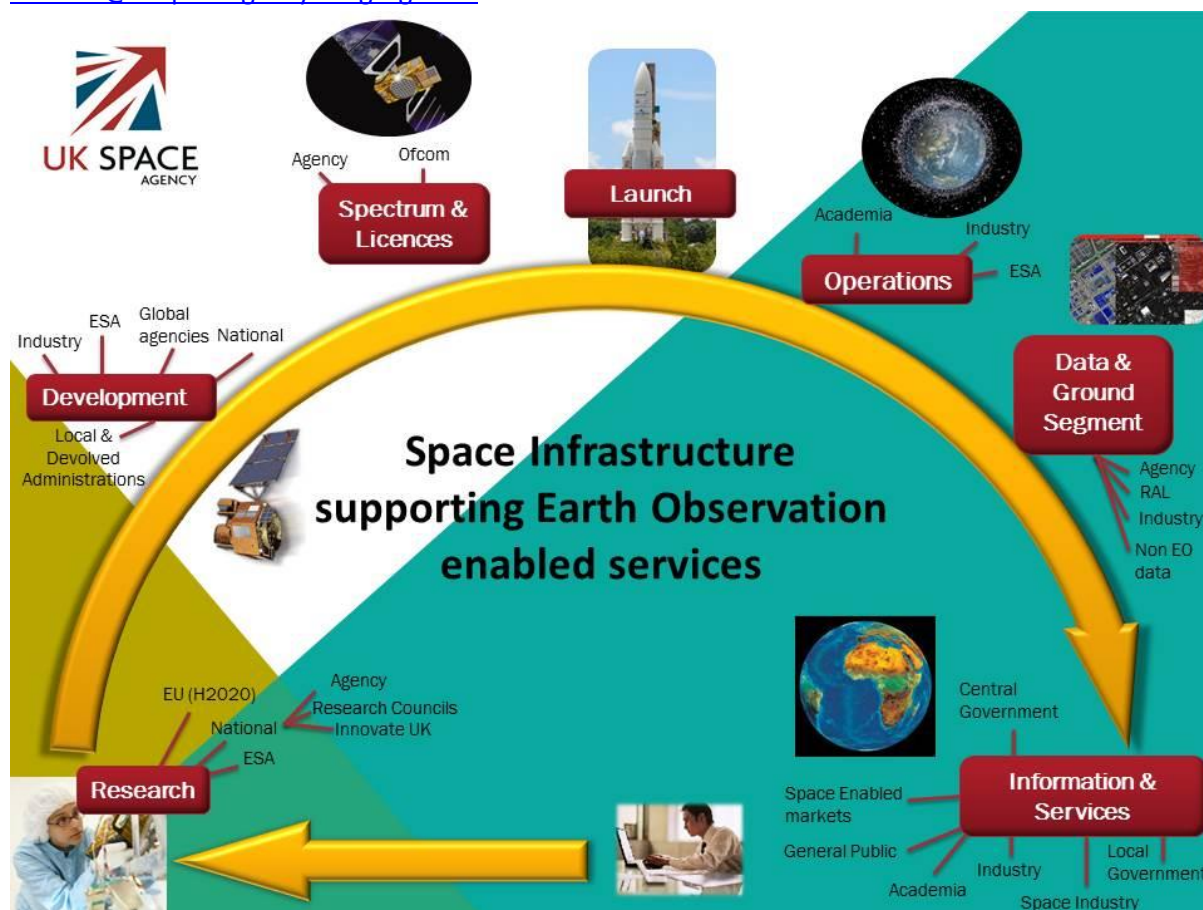


Figure 1: To realise the potential of Earth Observation from space, it must be integrated with non-EO data and that user requirements drive the development of the infrastructure.

Introduction: Earth Observation the road ahead

From mapping to weather forecasting, flood management to forestry, Earth Observation (EO) from space is already a critical capability on which society depends. Earth Observation is a key component of the UK Space Agency's drive to make the UK 'the place for space' and has been identified as a key market which must be captured in order for the UK space sector to grow to 10% of the global market by 2030. The space community is changing, with the rise of 'New Space' or Space 2.0 in all areas, operations, platform construction and launchers and, in common with the whole sector, Earth Observation has to determine how to respond to these changes and capture the opportunities that are on offer

To meet growth goals, Earth Observation must be part of a wider space policy, which itself must be integrated into the wider economy, government policy and everyday life.

Globally, the economic context remains challenging and there are many social and environmental stresses on the planet. Earth Observation must respond to this, and cannot simply rely on its inspiration value to make the case for investment in space. A national agency and the space industry has to earn its place in society – it must be relevant to society's needs.

Space activity can no longer be seen as simply about more missions and more technology. Space is on the threshold of offering mankind routine, seamless global interconnected infrastructure and services that enhances our quality of life (Figure 1). This is about bringing space down to Earth and the UK putting this opportunity at the heart of the space strategy. This is reflected in two UK Space Agency policy themes. Firstly, driving down the cost of access to space, establishing a UK spaceport; continuing innovative work on small satellites and cubesats; and secondly maximising the exploitation of the satellite infrastructure and using the data and information to build a space enabled economy. Earth Observation activities should be seen in this context.

Future opportunities range from everywhere, anytime on the move broadband to climate services from space. Through the European Union Copernicus¹ programme, a pipeline of global data is being built, and the UK is investing in the facilities to make it accessible and thereby useful to everyone in the UK. However, the 'big data' challenge for the EO community is also to link up with wider initiatives and to build business opportunities with entrepreneurs and the financial environment. A venture capital fund is already proposed to help take start-up companies on to the next level. This will build on existing tools such as the business incubator centre at Harwell and ESA's Integrated Applications Promotion Programme.

¹ For more information visit the EU Copernicus homepage at <http://www.copernicus.eu>

The UK EO community needs to be exploiting what is being put into place to realise the enormous potential that Earth Observation has for driving economic growth and generating a positive societal impact.

The UK Space Agency Role

The Agency will:

- support Industry and academia to help drive forward science and technology.
- partner with entrepreneurs with new business models that challenge thinking beyond traditional approaches.
- hold a dialogue with citizens and across government to explain how space matters to everyday lives
- foster the growing interest across government -including in the great potential for Earth Observation to help in the delivery of government policy and services.
- form mutually beneficial partnerships with other nations, not only in straightforward cooperation in projects but also in regard to establishing agreements for international standards and common positions in international conventions.

The UK Space Agency Earth Observation Team

In 2015 the UK Space Agency EO Team was brought together in the Growth Directorate (Figure 2) and one overall action plan (attached as Table 1) covers EO missions and programmes (upstream satellites and technology), ground segment and data (downstream) and the elements to the space enabled services for users (Figure 1).

Overall the objectives of the EO team in the UK Space Agency are to:

- Lead policy and strategy and spearhead international relations for Earth Observation
- Use public finances and other government tools to grow the Earth Observation sector fostering development of tools, technologies and applications at national, European and International levels.

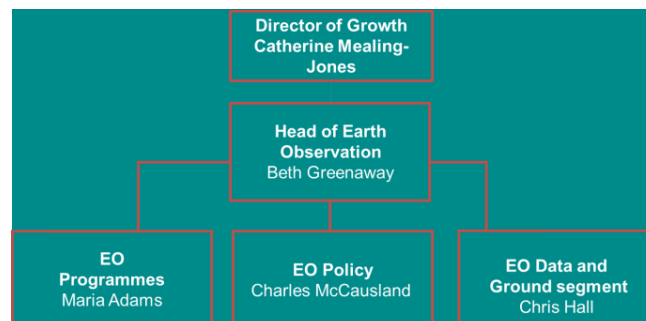


Figure 2 The UK Space Agency EO core team from June 2015. UK Space Agency colleagues from Applications, Space for Smarter Government Programme, International Partnership in Space Programme, National Space Technology Programme and international teams also work on EO issues.

In the critical period 2015-2017 the priority actions are:

Climate change: in the light of UK government priorities to remain at the forefront of climate science and services, act to ensure the UK space sector is able to take advantage of and offer expertise to this major societal challenge. This is the year of COP 21, and for this reason, global space agencies are preparing to re-double their efforts to use Earth Observation as a vital tool in understanding climate change – the need to take satellite data and turn it into useful information for policy makers – reliable science, long term observations and effective use of all of the tools at our disposal such as investment in the Climate Change programme of the European Space Agency (ESA) . Almost half of the key climate parameters identified by the Global Climate Observing System (GCOS), and required to sustain the work of the UN framework convention on climate change are observed globally from space. The UK is and wants to remain at the forefront of these efforts

Securing a good outcome for Earth Observation in the **UK Government Spending review 2015** and proactively establishing UK priorities for EO at the **ESA Ministerial 2016 (CMIN16)**. This will need to strike a balance between the UK having a leading role in both the fundamental EO instrument development, operational programmes and in the emerging applications that EO science is developing to achieve societal benefit impacts.

Ensuring the **ground infrastructure and data flows** are sustainable and that real operational applications and services can be built using Earth Observations

Preparing the pathway for the **longer term strategy** of realising the potential contribution of Earth observation in the UK goal to gain a 10% share of the global market from space estimated at £40bn per year by 2030. Identifying what skills, industrial and academic capability and business landscape will be required to reach those ambitious targets and what should the UK Government do to help.

Delivering in partnership.

Whilst the UK Space Agency has a role to play in Earth Observation, there are many others that make a significant contribution. These include, but are not limited to; other public sector bodies, Government Departments and their agencies such as Department of Environment Food and Rural Affairs , Department of Energy and Climate Change, Cabinet Office and Ministry of Defence, the Met Office, Defence Science and Technology Laboratory, UK Trade and Investment, Innovate UK, academics through research councils and industry both directly and through Satellite Applications Catapult, and trade bodies such as UK Space and British Association of Remote Sensing, as well as bodies such as European Space Agency and the EU.

Table 1 EO Strategic Implementation Plan 2015-2017 Version 1 July 2015

A. Define and Lead EO strategy and policy development
B. Enable growth of the EO and related sectors
C. Position UK as a global leader in use of EO in applications and services
D. Sector sponsor for the EO community (nationally and internationally)

Shading relates to the priority areas above. Performance Indicators (PIs) for which the UK Space Agency EO Team is responsible are highlighted in red. PIs which will include EO contributions but are led by others are highlighted in yellow.

Action ID	Outcome	Output	Action
A1	Ensure UK is proactive in Europe and policy lines are reflected in implementation of current and development of new European EO programmes and return on UK investment in ESA is secured.	<p>UK briefs are clear and transparent to the team, the UKSA Executive Board and stakeholders and are consistent with national policy.</p> <p>The GEO return from UK investment is realised.</p> <p>Ensure that the UK achieves its priorities for the European Centre for Space Applications and Telecommunications (PI 4.24)</p>	<p>Coordinate UK lines for:</p> <ul style="list-style-type: none"> • ESA Council Boards and committees IPC AFC and Council • Create briefs and UK lines and participate in PBEO and DOSTAG • Lead Space element of the EU Copernicus committee • Industrial focal point at EUMETSAT • Represent UK position at extraordinary PBEO meetings and workshops in prep for C-Min 16 • Coordinate with Met Office UK lines in prep for EUMETSAT meetings and determine Met Office user priorities for relevant programmes at ESA C-Min 16 • Establish UK priorities for Earth Explorer 8 (EE8) by consultation with NERC and User Consultation meeting • Take a proactive role with ESA to make it clear where UK could offer a leading role. Clarify UK priorities with ESA and industry and ensure that the key UK roles on the ESA Biomass mission are maintained in both the science and industrial aspects (PI 4.20) Ensure that industry secures a leading role on

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			<p>this mission, with emphasis on the instrument.</p> <ul style="list-style-type: none"> • A plan which reflects UK priorities for the European Centre Space Applications and Technology (ESCAT) period from 2016 onwards defined in partnership with ESA by end Q4
A2	Embed national ground segment capabilities within the evolving European ground segment solution and create a vision and plan for sustainability.	<p>ESA Ground Segment strategy agreed by UK.</p> <p>The evolution of the Commission Copernicus Ground Segment is visible and acceptable to the UK.</p> <p>The UK is able to leverage from key national assets</p>	<p>Work with national stakeholders to ensure the EU strategy lines up to meet national plan expectations</p> <p>Ensure UK interests are coordinated and communicated in Europe:</p> <ul style="list-style-type: none"> • UK to influence the European ground segment groups and gains an understanding of other Member States infrastructure • organise a European Commission visit to Harwell to familiarise with existing national collaborative ground segment and its potential capability for Copernicus and host a Ground Segment Coordination Body meeting in Harwell • Input EO perspective to coordinate UK implementation: Develop a national plan to coordinate investment in ground segment, infrastructure and technology centres of excellence (PI 3.15)
A3	Clear UK vision and Strategy for EO growth and innovation 2017-2040	Publish document by March 2017	Consult, draft and consult again before release of the strategy
B1	Ensure a strong case for EO in the CSR and C-MIN16 which enables a growth of UK strengths over the short, medium		<p>Achieve the best value for money outcome for UK Space Sector from the next Spending Review (KPI 1.5)</p> <p>Consult EO community and advise EOAC (4</p>

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	and long term.		<p>Sept) on timetable/plans for the following:</p> <ul style="list-style-type: none"> • Set UK EO C-MIN priorities (from CSR outcome) • Progress UK priorities within ESA (for C-MIN16) • Be proactive in driving ESA's evaluation criteria and review of EOEP 4 consultation with UK community (EOAC) and set out EOEP5 priorities • Business cases (including UK priorities for ESA C-Min 16) produced to support the Agency's proposed investment programme
B2	Develop a strategic understanding of government role in reducing the barriers to growth of EO	<p>Summary of barriers</p> <p>Action plan to EOAC</p> <p>Shared understanding of the potential and limitations based on instrument/platform sizing</p>	<p>After sounding and discussion/debate, produce action plan with innovation and growth as a priority including a pipeline for investment tool</p> <p>Commission a review of cube, small and large EO satellite opportunities and limitations</p>
B3	Improve evidence on the value added of the UK Space Agency to the UK economy (KPI 1.2)	<p>Report on the impacts of the UK Space Agency's activities on the UK economy, reflecting the views of industry stakeholders and other government departments by the end of Q3</p> <p>An estimate of the added value of public sector investment in EO tools and technologies</p>	<p>Consult economists and seek specific social and environmental parameters.</p> <p>Gather the evidence needed for the business case and other investments in EO.</p> <p>Create an evaluation Strategy for the value added of EO to UK economy, working with others to define what evidence is needed, sources and timescales for EO.</p>
B4	Generate growth in the UK economy by the provision of Sentinel data to the academic and industrial	Produce an interim assessment of the economic impact of take up of Sentinel /Copernicus data on applications development by	Work with the Satellite Applications Catapult to ensure there are suitable metrics in place on the new Sentinel Data Access Portal

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	community (PI 4.25)	the end of Q4	
B5	EO Instrumentation Programme (CEOI) fits national policy, growth and science and technology objectives over the short medium and long term	Deliver an excellent national EO instrumentation programme and maintain progress against cost and schedule (PI 4.14)	<ul style="list-style-type: none"> Ensure that all projects arising from CEOI Calls 7 and 8 come to a successful conclusion by end of Q1 2016 (PI 4.14) Commission a review of the CEOI programme (calls 1-6). Provide recommendation to UKSA Executive Board on future direction of the programme
B6	Ensure the EU Research programme Horizon 2020 is a funding mechanism suitable for UK participation and ensure maximum UK engagement	Alignment of programme content with UK priorities and strategically influence the EO content of the H2020 space programme on an annual basis	<p>Coordinate community response and strategically influence the H2020 plans and calls as appropriate</p> <p>Publish the opportunities – see community actions and use Climate Data from Space Stakeholder Group (CDSSG)</p>
C1	Position the UK at the leading edge for exploitation of climate services from space (PI 2.8)	<p>Demonstrate capability of operational supply by Q4</p> <p>Clear UK CCI proposal sent to ESA and a new CCI programme agreed by all MS at ESA C-MIN 16</p>	<p>Chair the Climate Data from Space Stakeholder Group (CDSSG) to enable UK to leader climate services and technologies (space elements)</p> <ul style="list-style-type: none"> Ensure ECMWF are fully aware of UK potential for operational climate services Initiate CCI extension Determine the UK priorities for the CCI programme using expert knowledge from CDSSG and DECC. Complete draft and discuss with ESA and ECSAT. Secure UK contribution to EUMETSAT Jason C/S funding Give government view on IGS Climate Services Roadmap development alongside stakeholders Liaise with DECC, FCO and CNES to develop an agenda valuable for UK interests at a France / UK meeting on Space and Climate

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			<ul style="list-style-type: none"> Secure UK position at International meetings related to COP21.
C2	Maximise use and uptake of EO in applications and services	EO is a key element in the Applications Strategy	Work with Head of Applications and Space for Smarter Government Programme to remove the barriers to growth of the EO applications and services sector and to address UK needs from the Disaster Charter
D1	EO team and the UKSA visible and approachable to stakeholders	<p>Plan to ensure open exchange of ideas and dialogue with key organisations and community groups</p> <p>EO communication strategy to ensure success and impact is communicated to public and all stakeholder</p>	<p>Create a plan for participation in activities of core stakeholders such as Catapult, CEOI, UK EOF, UK Space/BARSC, NHP, CDSSG, SSGP, KTN, RSPSOC etc, the UK Space Conference and regular catch ups with key stakeholders e.g. DECC Defra, Nerc, Met Office, NCEO etc</p> <ul style="list-style-type: none"> Create and maintain a database of people, skills and expertise Improved web presence Create core comms material, press releases, media
D2	UK has sound advice from the community for EO matters	EOAC committee functions well and provides timely advice and support to UKSA on EO issues	<p>Provide support for the Chair and the secretariat for the Earth Observation Advisory Committee. Meetings quarterly.</p> <p>Papers and requests for advice provided to EOAC with at least 5 working days for comments where possible.</p> <p>Engage with the wider community at an annual event such as the EO Town Hall</p>
D3	Coordinated international activities	International activities progresses the national EO strategy	Work with International team on an ongoing basis to ensure national EO narrative, policy lines and UK strengths are clear and that IPSP team and projects compliments other EO activities and avoids duplication.
D4	Maintain commitments to Disasters Charter agreement to support national and	Continue UK membership of the Disasters Charter	Ensure UK lines are coordinated with Cabinet Office and NHP for Charter Board meetings

Action ID	Outcome	Output	Action
	international disaster response		
D5	Coordination of worldwide public sector interests in EO.	Activities in CEOS aligned to ensure participation reflects national strategic priorities and generates value to the UK by maintaining excellence in EO science and technology and applications reputation	<p>Represent UK at CEOS annual Plenary meetings and other meetings as appropriate</p> <p>Maintain UK reputation on calibration and validation by NPL to lead the WGCV IVOS</p> <ul style="list-style-type: none"> • Host WGISS 40 in Harwell Leading this activity and arranging the meeting. Explore possibility of linking integrating CEMS with the GEO data portal • Raise UK profile in the CEOS WG Climate Task a member of CDSSG to participate and work closely to ensure technical and policy lines are clear for each meeting • Work with Defra (including through NCEO) and NERC to coordinate and align UK efforts in GEO and CEOS • Review the activities of the GEO/CEOS joint activities of GFOI and GEOGLAM groups, consult with UK stakeholders, and establish plans for participation if appropriate

