CDSSG Meeting Report

Summary

The Climate Data from Space Stakeholder Group (CDSSG) held a community workshop on 27th January 2015 in Reading. Its purpose was to summarise the findings of the group to date, and provide recommendations to the UKSA for steps to implement the "seamless supply chain" for climate data from space.

A framework for implementation was proposed at previous meetings (Figure 1), together with a list of key features and requirements that any entity tasked with implementing the seamless supply chain. Key features of this vision in response to the group purpose include:

- sustained operations across multiple data streams (scale benefits);
- a mechanism for forming, maintaining and strengthening links between currently disparate parts of the sector;
- the generation and maintenance of effective links between research, operations and value-added services, possibly via an 'innovation platform' for further downstream services (which themselves would be outside the scope of this entity).

Several key messages emerged from the workshop, which will form the basis for the recommendations of the group to the UKSA:

1. The creation of a new entity designed to implement on a national scale the 'seamless supply chain' represents a unique opportunity to exploit an under-explored part of the space sector.
2. Implementation of the seamless supply chain should be initiated, in the first instance, via an existing entity, possibly the Institute of Environmental Analytics.
3. Continued coordination of the stakeholder group would be required to further refine and manage the pathways to implementation.

Background

In 2014 the UKSA initiated the Climate Data from Space Stakeholder Group, supported by NCEO and coordinated (and currently chaired) by the University of Reading. The key goal in the short term (Q2/3 2015) is to position the UK climate data from space community to play a significant role in the Copernicus Climate Change Service (C3S), by demonstrating capability and facilitating the formation of strong consortia. The long term goal is to develop and demonstrate the "seamless supply chain for climate data from space", creating joined-up UK activity addressing Climate Services, supporting the existing UK Climate Service and providing access to high quality data for UK stakeholders.

During Q1 2015 the group will deliver its recommendations on the strategic implementation plan for the seamless supply chain, building on an evidence base from case studies examining the blockages to, and potential of, full exploitation of space data for climate applications.

Vision

The meeting opened with a recap of the work of the group to date. Group documents, together with minutes from previous meetings, are available from the group web pages at www.nceo.ac.uk/cdssg.php

Previous meetings have evolved some key questions which formed the framework for the meeting agenda:

- What does the 'seamless supply chain' include?
- What key features must an implementation of the supply chain have, and how does this fit into the wider landscape in the UK and internationally?
- What functional shape must a structure which implements the seamless supply chain have? (e.g. to support decision making and financial flows)

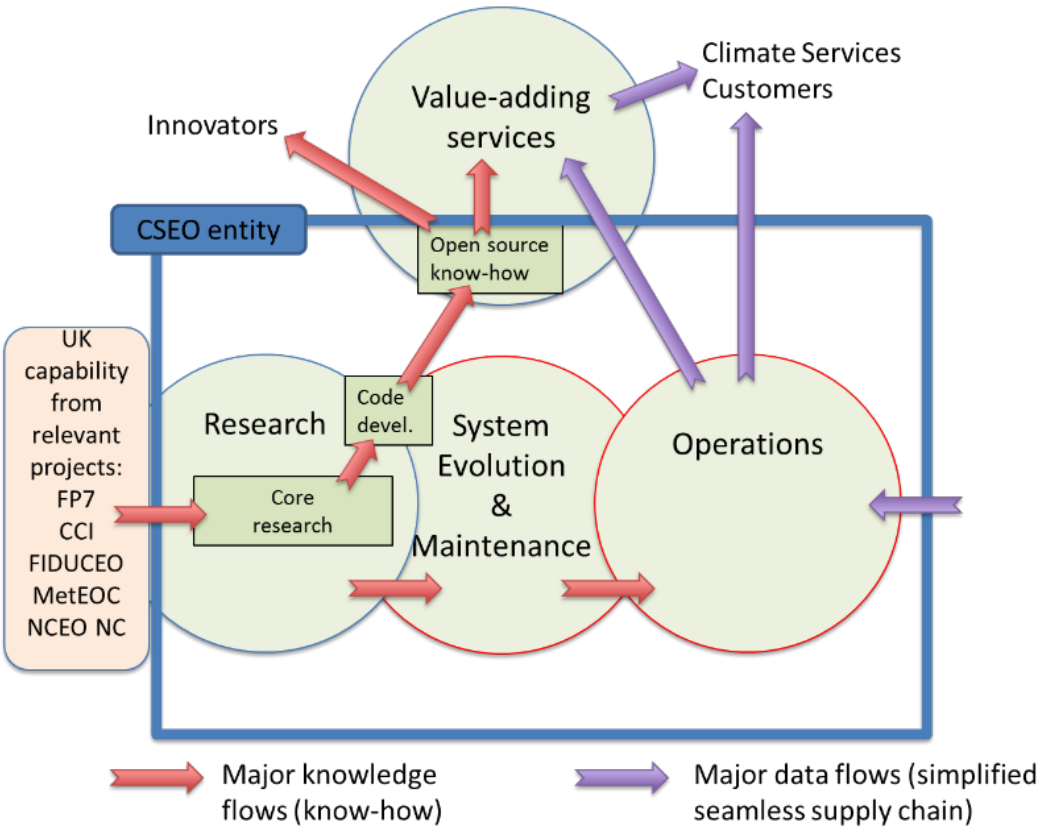

Figure 1: Graphical representation of the EOS4CS vision, in the context of the existing landscape, highlighting key knowledge and data flows.

A framework for implementation was proposed at previous meetings (Figure 1), together with a list of key features and requirements for any entity tasked with implementing the seamless supply chain. These included:

- Provision for sustained operations across multiple data streams (with benefits accruing from economies of scale and shared expertise).
- A mechanism for forming, maintaining and strengthening links between research & development and operations, to provide efficient pathways for system evolution via shared maintenance and resources where possible.
- Effective links between research, operations and value-added services, possibly via an 'innovation platform' for further downstream services which would be outside the scope of this entity. An 'innovation platform' could be seen as analogous to e.g. the iPhone 'app development environment', where basic tools are provided (open source) to the community to facilitate development of saleable apps by both private and publicly funded enterprise.

Discussion at this meeting centred on updating and clarifying this list of features and requirements, such that they could be used as a 'yardstick' against which any proposed solution can be evaluated. The key aims and requirements were identified as:

Aims:

1. Establish a seamless supply chain by federating existing expertise;
2. Address the weak links in the current landscape, which are identified in the three points above.

Requirements for future activity:

- An articulation of the benefits to each stakeholder, and of the relationships to the external context/driver (e.g. C3S);
- A funding model to support sustained operations over 7-10 years;
- A mechanism for continuous dialogue with users and capturing of feedback into system evolution;
- A single institution nominated to act as the shop window/point of contact/bank account.
- Basic services to users that are modular, reusable, open source to catalyse innovation;
- An innovation platform to catalyse growth in external value-adding services with robust, trusted, reusable, open source tools and software.

The group also identified some key opportunities that such a structure might exploit, as well as some current challenges and barriers to implementation, together with possible solutions. Awareness of the wider (UK, European and international) landscape was also identified as key to the success of the proposed structure. Perspectives from industry, academic and agency entities, in terms of the relative importance of the various features of the entity, also informed the discussion.

Landscape

The group understanding was that, to the best of its knowledge, the implementation of a seamless supply chain, in a coordinated fashion on a national scale, is a unique proposal at a national, European and even the wider international scale. Therefore it represents a unique opportunity to exploit an under-explored part of the space sector. An understanding of opportunities, and existing national bodies in related fields was therefore identified as necessary to the success of any structure.

The group identified several organisations focused on value-added products in related sectors. The Environmental Science to Services Partnership is a collaboration of national bodies which exploit environmental science expertise to generate value-added products and services. The IEA and Satellite Applications Catapult also have remits to exploit or accelerate markets in their target sectors. The group was clear that the structure is not designed to compete with existing organisations or businesses – rather that it has the potential to underpin many of them by providing 'upstream' value –added products such as tools for data acquisition and exploration, which could then be used by groups such as the ESSP.

One potential strength of the structure in this context is the ability to bring the UK community together. Breaking down of historic barriers between institutions was identified as a key activity for the proposed structure. If the national focus is on EC funding, or there is poor investment at a national level, there is no incentive to do this, so this UK coordination is vitally important and implies/requires a national framework.

External opportunities were also identified as drivers for this activity, in particular in informing timescales to implementation. Chief among these in a European context are the launch of C3S, and the continued deployment of the ESA Sentinel missions. The need to exploit in a timely fashion existing opportunities informed much of the implementation discussion.

Strengths and opportunities

The proposed structure was identified as providing a co-ordinated approach to the seamless supply chain, with inherent links between academia, agencies and industry. Value-added services provide links to industry and also a potentially strong source of sustained funding. Commonality of resources, such as toolkits and data visualisation capabilities, and sharing of expertise between research and operations were identified as key strengths.

The proposed structure was also identified as having the potential to explore some key opportunities which may currently be under-exploited. It provides a clear methodology for attracting value-added service users, and a mechanism to stimulate growth in this area – for example via the innovation platform. The structure will also facilitate the UK community to cement itself as a leading player in climate services, which will attract inward investment and enable export opportunities of knowledge and services.

Challenges to implementation

The major potential challenge was identified as the initial set-up of such a structure, given especially that a national funding mechanism for the crucial system evolution and maintenance mechanism (linking research to operations) is absent. More detailed discussions of possible solutions for removing these barriers were held in the final session of this workshop, and the resulting recommendations form a key part of the workshop output.

Further possible challenges were identified as potentially complex data and software licencing issues, the ability of any such collaborative entity to react quickly to a fast-changing landscape, and potential disincentives to collaboration within the UK, stemming from increased collaboration with European partners as a response to current EC funding requirements. Currently, a weak euro may also work against the UK in a European context, as sterling is proportionately more expensive.

Perspectives

The varied backgrounds of the stakeholder group resulted in a number of perspectives on how the proposed structure might take shape, and an acknowledgement that any successful entity must be able to support these varying priorities in a neutral fashion, which can be broadly grouped by sector.

Academic perspective

A major challenge to operationalising academic output is the difficulty of securing continued funding for operations, and the non-scalability of the current (research-mode) funding system. There are some barriers to developing value-added products and SLAs, due to the short-term nature of research-mode funding. Some of the benefits of the current system included the very strong link between research and operations, and limited responsibility for the group in terms of liability and licensing/IP issues.

Industry perspective

Several industry stakeholders were keen to stress that, in part for speed of implementation, there would be a preference for a coordinating entity, rather than for a new centre.

Catapult perspective

The Satellite Applications Catapult has a mixed funding model, with income streams from both the private and public sectors. The Catapult had found significant benefit in holding workshops to facilitate the development of the satellite applications market, and that this might also be important for the proposed structure. However, the timescales associated with setting up a catapult or new institution are of the order of years.

Pathways to implementation

The group considered it crucial to make practical progress in a timely fashion, building on the good level of consensus which the CDSSG process to date has built across agency, commercial and academic sectors.

The group also highlighted the importance of bringing the UK community together, and finding a method to break down historic barriers between institutions as key activities for the structure.

Type of entity

The group reviewed several options, namely:

A business stream within a current entity.

Potential benefits include relatively few barriers to start-up (e.g. minimal investment, existing administrative structure). Potential detractors include a possible loss-of-control by stakeholders, and the possibility of limited potential for expansion. Both of these could be addressed during the set-up phase.

A new joint venture.

Potential benefits: Commercial focus, strong awareness of opportunities in the commercial sector. Potential detractors: Neutrality might be practically difficult.

A new institution.

Potential benefits: This is potentially the most flexible and exhaustive option, Potential detractors: it was felt that it would be very costly and time-consuming to set up, and that, given the fast-moving nature of the sector, this might be potentially damaging.

An informal partnership.

Potential benefits: low barrier to set up, easy to form sub-ventures and collaborations within the larger stakeholder group. Potential detractors: administration and coordination unclear, as would be the decision making processes. Therefore, there could be the potential to miss out on opportunities, particularly those which require rapid action.

The group converged on the first option, largely for pragmatic (e.g. timescale to implementation) reasons, and the Institute for Environmental Analytics was identified as a potential umbrella. It was agreed that further clarification in terms of e.g. decision making structure within the IEA would be required were this option to be pursued.

It was also agreed that any structure would need to be explicitly neutral from the point of view of users, and that potentially, a not-for-profit status might be a simple way to encourage trust, especially during the start-up phase.

Governance

EOS4CS needs to be independent and open, governed by its members.

The group felt that the governance structure must achieve at a minimum the following:

- Research-to-operations-to-services pull through.
- Both scientific and operational sustainability (on a 7 to 10 year horizon, bridging the “valleys of death” in the seamless supply chain).
- Be able to respond nimbly to a changing landscape of opportunity on European scale.

Additionally, the ability to grow must be built in to the governance structure. For example, the structure may need to start with a project based approach, but in the long term this was not viewed as addressing the sustainability issues.

Scope

It was felt that the structure would need to be able to develop over time, such that it can become partly or wholly self-sustaining over a (pre-defined) period of time. A phased approach might be appropriate. Building block toolkits, e.g. data converting tools could be useful initially, as foundations for ‘value-adding services’. Initially, case studies (either existing or new) could be a useful focus, as could some real service development. Broadly, the development of the structure could be viewed as having two discrete timescales:

Short-term: – initial practical activities on targeted sectors – for example agriculture or insurance case studies identified as part of the group’s previous work. There is also a need to fit with C3S and other ongoing activities.

Longer-term: A key purpose of the structure is in reducing barriers to entry / market failures in exploitation of space data within climate services across a wider range, complementary to what is done within C3S, Met Office etc. Development of dialogue with these key institutions will be key to developing products and services which are beneficial to the whole community and enable, rather than compete with downstream commercial and institutional activities.

In line with the above scope, it was agreed that the proposed boundaries of the structure (Figure 1) were appropriate to enable innovation in the sector without introducing duplication of activity, i.e. there is a need for

an entity to coordinate and develop capability (at a baseline level) in the value added sector to support external value-added innovations.

Funding mix

The group agreed that it is likely that the funding mix would need to be phased, becoming more self-sustaining over time.

Several of the group's activities already have established funding modes (for example, research, commercial activities, data subscription services, and, in some contexts, operational activities). The funding mechanisms for developing and maintaining links between these activities may be less clear. In particular, the link between research and operations was identified as a potential "valley of death" in pulling through research to operations in a sustainable way – a need to be creative here was identified: foundations, government, EOS4CS member contributions probably all need to be harnessed.

Therefore a 'transactional structure', with a mixture of funding sources and interests was informally seen to be the best fit to the requirements of the structure.

Appendix A – Attendees

Present: Victoria Bennett (CEDA, CEMS, NCEO, STFC), Emily Black(University of Reading (UoR)), John Blower (UoR), Lee Boland (UKSA), Ruth Bounphrey (Lloyd's Register Foundation), Adrian Broad (UKMO), Geoff Busswell (CGI), Stephanie Campbell (DECC), Debbie Clifford(UoR), Geoff Darch (Atkins), Fai Fung (Environment Agency), Derek Greer (Telespazio vega), Steve Groom (PML), Richard Hilton (Satellite Applications Catapult, CEMS), Sophie Isaacs (NERC), Joanne Nightingale (NPL), Claire Macintosh (UoR), Chris Merchant (UoR), John Remedios (NCEO), Elena Tarnavsky (UoR), Josh Vande Hey (University of Leicester), Emma Wooliams (NPL)

Apologies: Hugh Shaffer (Climate KIC), Zof Stott (NCEO)

Appendix B - Agenda

09:15-10:00	**Coffee**	
09:30-10 :00	Introduction to CDSSG (optional)	Debbie Clifford
10:00-10:10	Welcome and introduction to the workshop	Christopher Merchant
10:10-10:40	Case Study Reports	Debbie Clifford
10.40-11:15	Earth observation from Space for Climate Services - vision	Christopher Merchant Geoff Buswell Derek Greer Adrian Broad
11.15-11.45	TAMSAT – A Climate Services Case Study	Emily Black
11:45-13:00	Discussion Session Identifying key requirements for implementation	Debbie Clifford
13:00-14:00	Lunch	
14:00-14:20	Implementation – Issues surrounding possible governance and structure	Richard Hilton
14:20	Discussion session (breakout groups) Practical approaches to implementation	Chris Merchant Debbie Clifford
15.20	Report back and summarise	
15:45	Close.	