

Climate Services Standards and Value

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Briony Turner, Space4Climate

2nd June 2021



UK Research
and Innovation



UKCR projects



PROJECTS

Filter by

THEME **FILTER**

This section showcases UKRI projects and Met Office work packages that are being conducted for the UK Climate Resilience Programme. Click on the tiles to find out more about individual projects/work packages or select from the quick list of project titles below.

Quick Project List

A grid of eight project tiles, each with a representative image and a title. The tile for 'Climate services standards and value' is highlighted with a yellow border. The tiles are:

- Climate information to inform UK decision making (Image: Earth globe with data icons)
- High impact scenarios and storylines (Image: Flooded street with buildings)
- Climate services standards and value (Image: Coastal piers in the sea, highlighted with a yellow border)
- Communication of Uncertainty (Image: Infographic with text and a globe)
- Use and understanding of EuroCORDEX data over the UK (Image: Wind turbine)
- Prototype development – Meeting Urban User Needs (Image: People with umbrellas in the rain)
- Towards forecast-based climate resilience and adaptation in the water sector (Image: Stone building by a river)
- ARID: School Buildings Adaptation, Resilience and Impacts on Decarbonisation in a Changing Climate (Image: Classroom with students)



Overview

Premise for the project

Climate services definition

Progress to date

Future plans and engagement opportunities

Response from stakeholder representative, Briony Turner

Premise for the project



Climate services are a critical component of adaptation*. Decision makers are often dependent upon the insight of specialist climate service providers to understand their hazards, vulnerabilities and exposure, then to turn that understanding into effective action.

A well-functioning climate service can help society to be more resilient to current and future climate threats.

As yet, no standard for climate services exists.

There is also increasing interest in monitoring and valuing climate services. Investing in climate services leads to improved information, which can in turn provide economic, environmental and societal benefits to users, as they lead to positive outcomes from the actions and decisions taken.

Central to project approach is a focus on the user as well as provider of the climate service. Climate services standards need to facilitate and support user needs; effectively engaging the user within their current capacity whether they be a novice or deeply experienced.

*Hansen, J., J. Furlow, L. Goddard et al. 2019. "Scaling Climate Services to Enable Effective Adaptation Action." Rotterdam and Washington, DC.

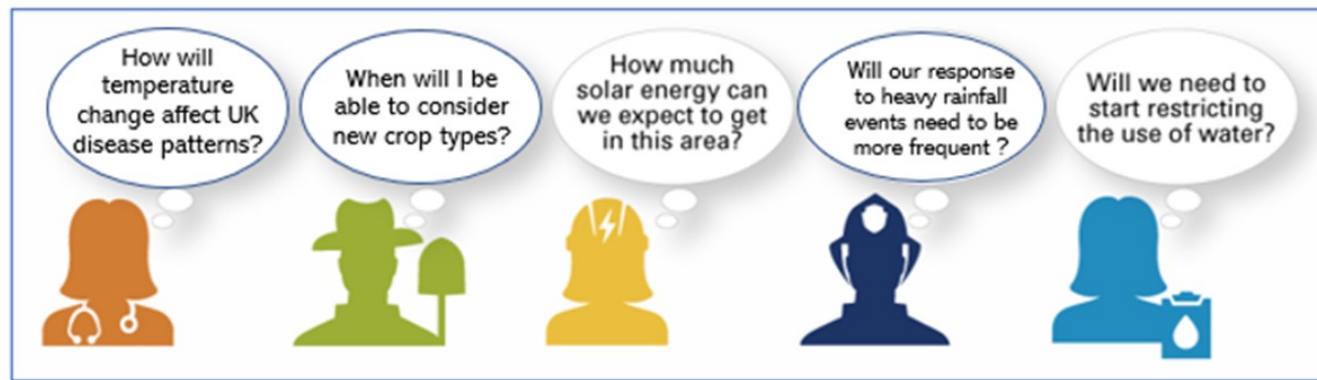
What are climate services?



Climate services involve the production, translation, transfer, and use of climate knowledge and information in climate-informed decision making

Climate services provide climate information to help individuals and organisations make 'climate smart' decisions and that by doing so, provide economic, environmental and societal benefits.

Climate services provide timely, tailored information and knowledge to decision makers (generally in the form of tools, products, websites, or bulletins) to improve their capacity to manage climate-related risk.



Climate services examples and decision-making (adapted from example provided by WMO <https://gfcs.wmo.int/what-are-climate-services>)

Climate services in scope

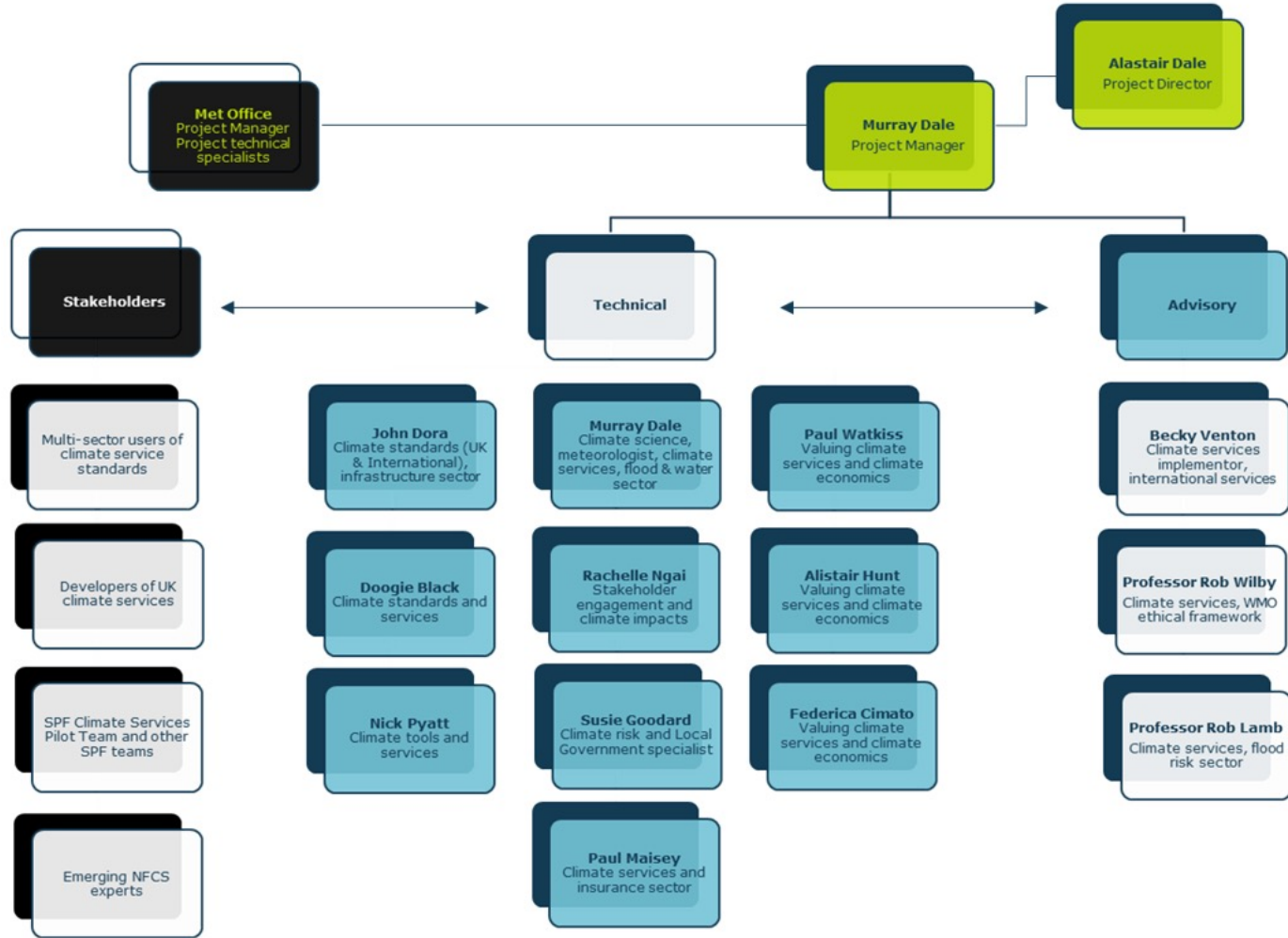
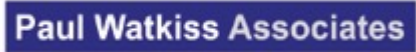


- Climate services for present day risks and opportunities (observations based)
- Climate services for seasonal risks and opportunities (based on climate and weather projections)
- Climate services for longer term risks and opportunities (based on long-range climate model projections)

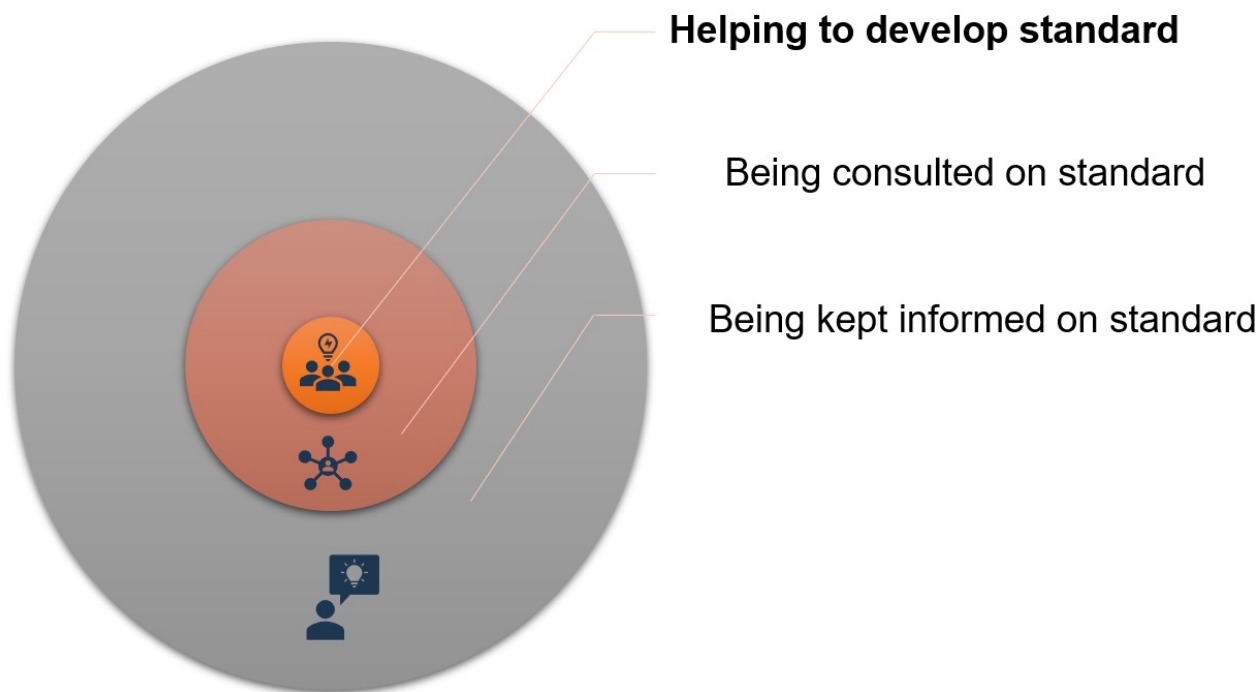


Source: <https://climate.nasa.gov/effects/>

Project Delivery Team



Assembling stakeholder groups



Group	Role
Helping develop	<ul style="list-style-type: none">- Offering text- Periodic meetings to discuss standard evolution- Working drafts in July, December, June 2022- Likely online
Being Consulted	<ul style="list-style-type: none">- Commentary on drafts + text- Send draft of standard as it evolves to provide comment (estimate 4 times over project)
Staying Informed	<ul style="list-style-type: none">- Send updates on standard development (estimate 3 times over project)

Helping to develop the standard

- Atkins
- City of London Corporation
- Committee on Climate Change (CCC)
- European Centre for Medium-Range Weather Forecasts (ECMWF)
- Kent County Council
- Institute of Environmental Management and Assessment (IEMA)
- London Climate Change Partnership
- Met Office
- National Trust
- NHS
- Sniffer
- UKCIP
- University of Leeds
- Yorkshire Water

Being consulted / kept informed

- Adaptation Scotland / Historic Environment Scotland
- Environment Agency
- Farming and Wildlife Advisory Group (FWAG)
- Forestry Commission
- Institution of Mechanical Engineers
- Jacobs
- Met Office
- Network Rail
- Royal Meteorological Society
- S&P Global Ratings
- Transport for London (TfL)
- UK Research & Innovation (UKRI)

First engagement event output

Q1: How should the standard consider the interface between CS users and providers?

Wider theme	General comment	Count of times referenced
Service delivery and accessibility	Accessibility to the service and data outputs / simplicity for ease of use	4
	Constraints affect access, e.g. licences, licence fees, 'tie-ins', aspects that reduce potential for innovation (because of being forced to rely on a key service)	1
	Consider enablers and barriers to use - e.g. restrictions of CS users - ranging from limited technical skills/competency through to lack of budget/resource	2
	Importance of case studies (commercial examples as well as public)	1
	Service continuity is very important (links with recent NIC Resilience work) (includes 1 comment from chat section)	2
	Data updates should be considered in standard	1
	Case studies will be important to make it real and useable (comment from chat section)	2
Quality	Outputs need to be understandable / users know what data are applicable for what use	4
	Quality – providers should be transparent about precision of data sets & uncertainty	4
	Don't have a hierarchical relationship between user and provider (i.e. with provider 'above' user)	1
	Data and output aligned to user need / fit for purpose	2
	Is there a need for proportionality (as for ISO 14092)? (comment from chat section)	1
	Standard should clarify appropriate and not appropriate use of the data (comment from chat section)	1
User-provider inter-action	Relationship between user and provider can become blurred and may not be helpful to distinguish	1
	Onus on users to specify what use data will be put and the quality needed	1
	CSs should be co-created by users and providers (e.g. UKCP18 for water resources) / providers should be required to involve potential users	2
	Don't have a hierarchical relationship between user and provider (i.e. with provider 'above' user)	1
Standard and its use	'Major' users should be convinced to embed the standard in their systems	1
	Standard represents 'best practice'	2
	Being clear on the scope of the term 'services' (in climate services) (i.e. saying what is not included)	1
	criteria that need to be used - traceability, underpinning data quality, quantification of uncertainty, interpretation of data, qualification of those providing the service etc	1

Q2: What would encourage use of this standard?

Wider theme	General comment	Count of times referenced
Useability / relevance	Relevance	1
	Ease of use, accessible	2
	Knowledge that having the standard drives actual change and improvements able to be used by all sizes of organisation - should be flexible enough / fit for purpose	1
	TCFD relevance & experience	2
	How is it updated (standards can go out of date quickly) (comment in chat section)	1
Freedom	Allowing the standard to be used without 3rd party certification (so it's an option)	1
	voluntary but is adopted because it is well drafted and helpful	1
Quality	No ability to "self-certify" must have an independent accreditation	1
	Allows comparison of CS quality	1
Reputation / expectation	Evidence that CS quality is improved when compliant standard	1
	The adoption of the standard by a significant fraction of the "big players" in the field	1
	Government or regulatory expectation	1
	Included in procurement process for tenders	2
Publicity	Competitors selling services advertised as compliant with the BSI Standard	1
	Publicity that the standard exists, raising awareness well promoted	1
Development aspects	User representation on the writing group	1
	Learning lessons from ISO14001	2

Standards framework proposal

Climate Resilient Standards for services and valuing climate

Climate Services

By Climate Sense Ltd

April 2021

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E: business@climatesense.global
W: www.climatesense.global

Climate Sense Ltd is a company registered in
Registered office: Seafields, Dorset, DT2 8NU

Preparatory work

Prior to starting the drafting of the standards, a stakeholder engagement process including questionnaires and a workshop were arranged to engage stakeholders on the concept of the proposed standards.

The Climate Sense team has taken the output of the stakeholder engagement process into account in the development of the standards.

Format of proposed standards

The format proposed is for a framework of standards.

The framework will allow climate services providers to benchmark their performance against different 'use cases', across a range of sectors. Climate services providers would aim to meet a benchmark level of quality. Quality benchmarks can then be used to see the scope of services they provide and then choose service providers that suit their needs. These five parts will be:

Part 1: General - Scope, Normative

Part 2: Requirements, recommendations and guidelines for climate services' users.

Part 3: Requirements, recommendations and guidelines for climate services' providers.

Part 4: Accreditation process.

Part 5: Case studies.

Annexes

NOTE: Whilst there is mention of 'standards', these have been written as if there is one standard.

Outline contents

The outline contents will be used to inform comment. These have been drafted in line with the stakeholder engagement phase.

The outline contents' list for the standard

Foreword

Introduction

PART 1: General - Scope, Normative

- 1 Scope
- 2 Normative references
- 3 Terms and definitions
 - 3.1 Climate services
 - 3.2 Climate-informed decision-making
 - 3.3 Organisational complexity
 - 3.4 Low complexity organisation
 - 3.5 Medium complexity organisation
 - 3.6 High complexity organisation
 - 3.7 Climate-informed decision-making
 - 3.8 Timescale
 - 3.9 Quality index (QIu or QIp)
 - 3.10 Current/ recent past climate
 - 3.11 Seasonal to multi-year
 - 3.12 Long-range
 - 3.13 Observations
 - 3.14 Monitoring
 - 3.15 Maturity
 - 3.16 Assurance
 - 3.17 Interested parties
- 4 Principles

- 4.1 General
- 4.2 Transparency
- 4.3 Traceability
- 4.4 Ethics
- 4.5 Use of existing standards, guidelines
- 4.6 Decision-making
- 4.7 Appropriateness
- 4.8 Relevance
- 4.9 Service delivery
- 5 Assurance framework
 - 5.1 General
 - 5.2 Format of the framework

PART 2: Requirements, recommendations and guidelines for climate services' users.

- 6 Quality of services
 - 6.1 General
 - 6.2 Determining quality requirements
 - 6.3 Assessing quality index ratings
 - 6.4 Methodology for assessing organisational complexity rating
 - 6.5 Quality index for users of climate services
- 7 Records
 - 7.1 Documentary evidence of working

PART 3: Requirements, recommendations and guidelines for climate services' providers.

- 8 Quality of services
 - 8.1 General
 - 8.2 Determining quality requirements
 - 8.3 Assessing quality index ratings
 - 8.4 Methodology for assessing complexity rating
 - 8.5 Quality index for providers of climate services
 - 8.6 Presentation of quality index
 - 8.7 Feedback and learning
- 9 Records
 - 9.1 Documentary evidence of working

PART 4: Accreditation process.

- 10 Generally
 - 10.1 Purpose of accreditation
 - 10.2 Agreement on use of accreditation processes
 - 10.3 Internal accreditation
 - 10.4 Independent accreditation
 - 10.5 Statements of accreditation process used
- 11 Steps in the accreditation process
 - 11.1 Statements of climate services
 - 11.2 Quality index
 - 11.3 Matching QIu with QIp
 - 11.4 Evidence of process and roles and responsibilities
- 11.5 Certification

PART 5: Case studies.

Annexes.

- Annex A (informative) Examples of organisations with low, medium and high complexity
- Annex B (informative) Maturity assessments
- Annex C (informative) Guidelines for users of climate services that employ external resources/consultancies
- Annex D (informative) Table illustrating quality index requirements
- Annex E (informative) Dealing with uncertainty
- Annex F (informative) Impacts: understanding risk, vulnerability and threshold assessments
- Annex Z (informative) Sample Certificate Template

Monitoring & Valuing Methodology

Methodology for Valuing and Monitoring Climate Services to Manage Climate Variability



Deliverable 2 of the contract:

'Climate Resilience – CR20-2 Standards for climate services and monitoring and valuing climate services'

Draft for Review, March 2021.

JBA Consulting (lead), in association with Climate Sense, Paul Watkiss Associates, Professor Rob Wilby, and Becky Venton

- Report sets out approaches for valuation and monitoring climate services
- In process of finalisation
- Three case studies will follow:
 - Historic / observation based services
 - Seasonal forecast services
 - Adaptation services

Outcomes

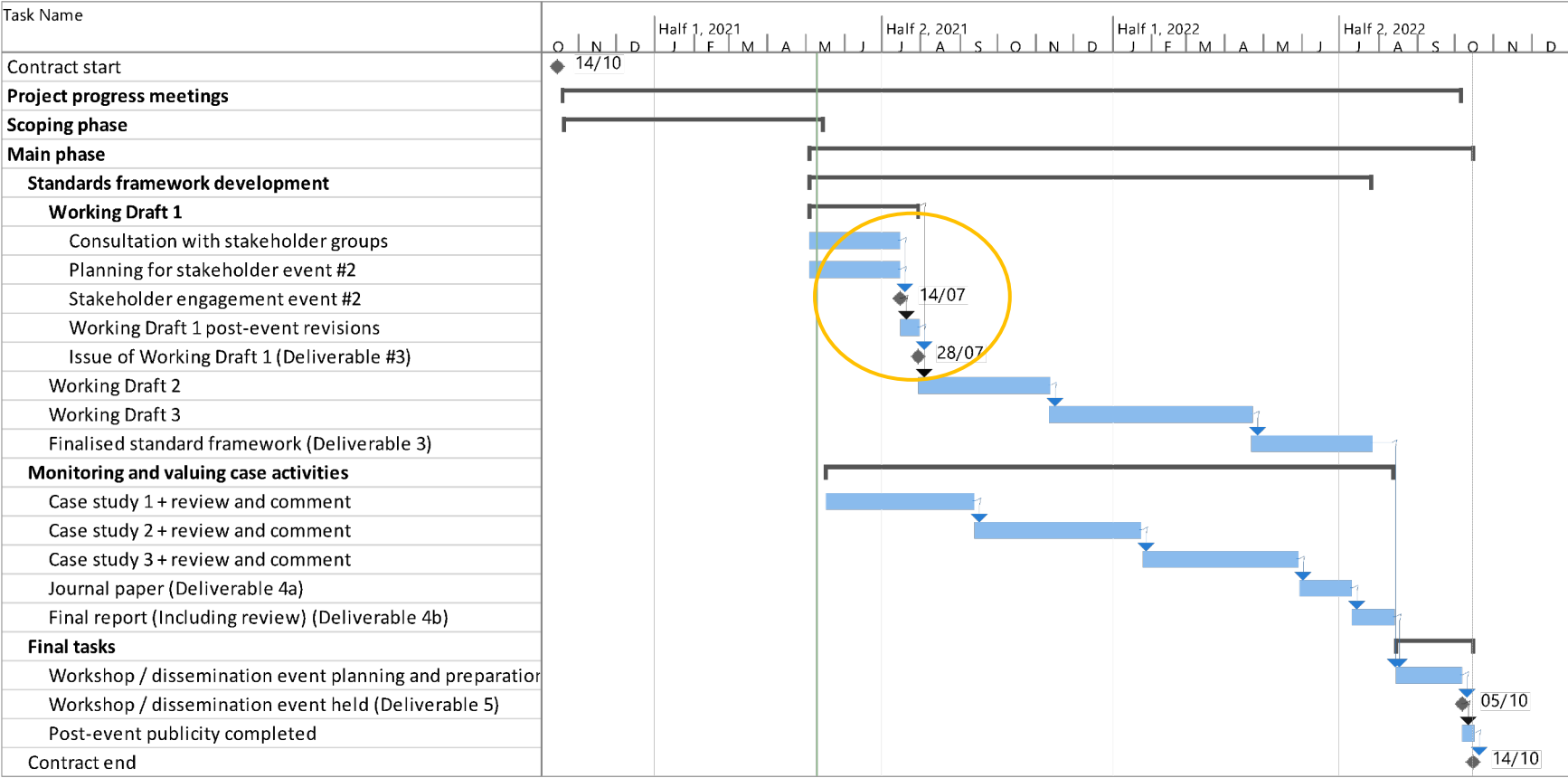


Standard framework for providing quality assurance for users and providers of services

A tested approach for valuing and monitoring climate services



Future plans



Engagement

Stakeholder groups have been established but...

... if you are a climate service user or provider and would like to be involved in helping to develop the standard or being consulted on the standard, or being kept informed:

Please send you details in an email, explaining your reason for wishing to be involved in one of the above capacities, to: Rachelle.Ngai@jbaconsulting.com

While we need to keep these groups to a manageable size, we are keen to hear from others who wish to join.

Intended project benefits



1. Climate service **users feel confident** that a climate service user group has fed into a new standards framework for climate services, thereby enabling more effective and informed decision making and climate risk management when using seasonal forecast and longer term adaptation services.
2. Climate service **providers have an approved, national standards framework** to use when developing new services, or measuring existing services against.
3. Climate service **providers can benefit commercially** by demonstrating that their services are meeting national standards
4. Climate service users and providers have **important information on the value** of climate services that have been tested through the application of case studies.





Perspectives from a stakeholder: Briony Turner, Space4Climate

Climate services standards and value from a data supply chain perspective

Briony Turner, Space4Climate
2nd June 2021



UK Research
and Innovation



SP4CE
CLIMATE

SPACE4CLIMATE: About us



Who we are

Chaired by the UK Space Agency, Space4Climate spans government, industry and academia, uniting those with expertise in the development of satellites, analysis and exploitation of data they gather, and production of quality assured global data and climate services.

Trusted services

Our mission is to ensure a seamless supply of trusted climate intelligence from space so that the UK offers a thriving, supportive environment for the development of quality assured products and services enabling climate-smart decisions, disclosures and climate-sensitive planning.

What we do

We connect UK producers and global users of trusted Earth observation data and actionable space-enabled climate analytics and services. We respond rapidly to emerging needs and develop new opportunities and collaborations. Discover more about our membership activities.

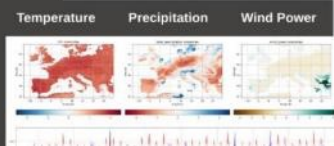
SPACE4CLIMATE: Task Groups



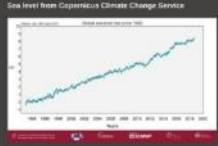
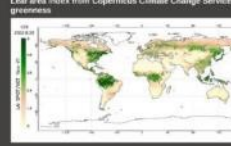
<p>Climate and EO data for international aid and sustainable recovery</p> <p>This Task Group supports project and resource developments in the community through sharing learning, capacity building and augmentation of tools and data products.</p> <p>Task Groups 22 January, 2021</p>	<p>Urban vegetation health and climate resilience Task Group</p> <p>Monitoring urban vegetation health will help support land managers in optimisation of green infrastructure ecosystem and urban climate services.</p> <p>Task Groups 21 January, 2021</p>	<p>Food supply chain climate resilience Task Group</p> <p>The food supply chain Task group will map existing and future capability suitable for use in food supply climate risk disclosure, stress testing, monitoring and decision support.</p> <p>Task Groups 18 January, 2021</p>
<p>Climate Risk Disclosure Task Group</p> <p>Drawing expertise from across the Space4Climate group to explore how best climate satellite data can help the green finance sector make climate informed decisions.</p> <p>Task Groups</p>	<p>Competent Persons Task Group</p> <p>Investigating what the Space4Climate community can do to provide a platform for quality assurance and professional services component of the climate services market.</p> <p>Task Groups 30 July, 2020</p>	<p>Climate Change Initiative Exploitation Task Group</p> <p>Reviewing current value in UK based organisations being generated from CCI and explore data exploitation potential.</p> <p>Task Groups 30 July, 2020</p>

Climate Indexes

Long-term changes in, for example, weather extremes (temperature, precipitation, wind), sea level, greenness expressed as standard deviations from the mean for a reference period

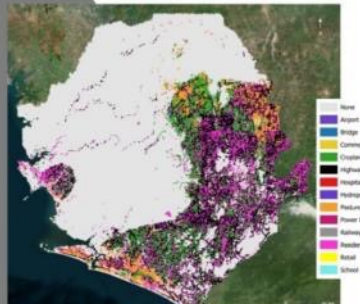


Information can then be used to derive a climate risk index based on historical correlations with economic losses, deaths and injuries

Assets at Flood Risk

Eco:Actuary combines Flood Risk Maps with floodplain maps and a global asset database, to provide maps of asset value at risk on floodplains.



Sierra Leone - Asset with greatest damage cost per pixel.

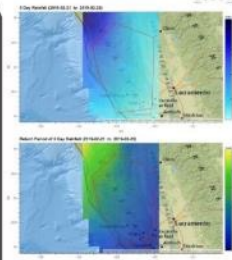
With site specific data estimates of monetary loss can be made

Extreme Rainfall Explorer

EO4SD Rainfall Explorer Telespazio VEGA UK

Analysis of extreme precipitation events for major flood events

- Analysis of long-term daily precipitation from 1979 to NRT at 0.25 degree resolution over global land areas
- Return Period analysis using Generalised Extreme Value distribution
- Highly valued by the climate risk analysts at the World Bank Group



Snapshot of interactive maps generated by the tool for a flood event in United States on 25th February 2015. First map shows the 5 day precipitation amount leading to the start date of the flood. The second map shows the Return Period of the 5 day precipitation.

<http://www.space4climate.com/space-enabled-climate-risk-disclosure-for-the-financial-services-sector/>



www.space4climate.com

@space4climate



SPACE4CLIMATE: Networks we host



<http://meshclimate.net/>

The screenshot shows the Mesh website homepage. At the top left is the 'MESH' logo with the tagline 'Networking for the UK Climate Services Community'. Below the logo is a large image of a group of people. Text on the page describes Mesh as a UK community of individuals involved in climate service provision who network locally. It states that each event is run by volunteers who love to bring people together to share knowledge and grow professional networks. There are two main sections: 'About us' and 'Join Mesh', each with a 'Find out about Mesh' and 'Join the network' button respectively.

MESH Networking for the UK Climate Services Community

Mesh is a UK community of individuals involved in climate service provision who network locally.

Each event is run by volunteers, who love to bring people together to share knowledge and grow professional networks.

About us

The network provides a platform to share achievements and learning, and find other UK based organisations.

[Find out about Mesh](#)

Join Mesh

We welcome everyone with climate expertise who is UK-based – we're run by the community for the community.

[Join the network](#)

The screenshot shows the AQNUK page on the space4climate.com website. The page features the 'SPACE4CLIMATE' logo and navigation links. The main content area has a header image of a person looking at a screen with 'AQNUK' written on it. Below the image is the title 'AQNUK' and a date '20 April, 2020'. The main text describes AQNUK as a community of individuals from academia and practice involved in researching and disseminating information on air quality challenges in the UK. It mentions that AQNUK helps connect researchers from research, policy, industry and the third sector in the UK and abroad with expertise on outdoor and indoor air quality challenges in the UK. There are links for 'Join the community', 'Satellite related activities', and 'History'. A sidebar on the right contains 'Related resources' including 'SAQN' and 'DARE-UK', and a note about satellite data from Pope et al. 2019.

space4climate.com/aqnuk/

SPACE4CLIMATE ABOUT SPACE4CLIMATE UK COMMUNITY S4C PARTNERS CLIMATE SHOWCASE NEWS & EVENTS

AQNUK

20 April, 2020 | Reading time: 5 minutes

Air Quality Network UK

AQNUK is a community of individuals from academia and practice involved in researching and disseminating information on air quality challenges in the UK.

AQNUK helps connect researchers from research, policy, industry and the third sector in the UK and abroad with expertise on **outdoor and indoor air quality challenges in the UK** and impacts on, and from, people, buildings, objects, infrastructure, flora and fauna.

Space4Climate co-founded and helps coordinate AQNUK, issuing quarterly the e-directory to members to help members from different pockets of air quality expertise, including those with expertise in use of emissions data from satellites. across research and practice, find each other.

- Join the community
- Satellite related activities
- History

Join the community

We welcome researchers and practitioners across all sectors, career stages and locations, keen to be part of an evolving knowledge-based community who, with respect to air quality challenges in the UK:

AQNUK
Air quality researchers, [sign up for AQNUK](#)

Related resources:

- [SAQN](#)
- [DARE-UK](#)

Find out more on the role of satellite data:
[Pope et al. 2019. High resolution satellite observations give new view of UK air quality.](#)

UK contribution to the European Space Agency's Climate Change Initiative (CCI) programme

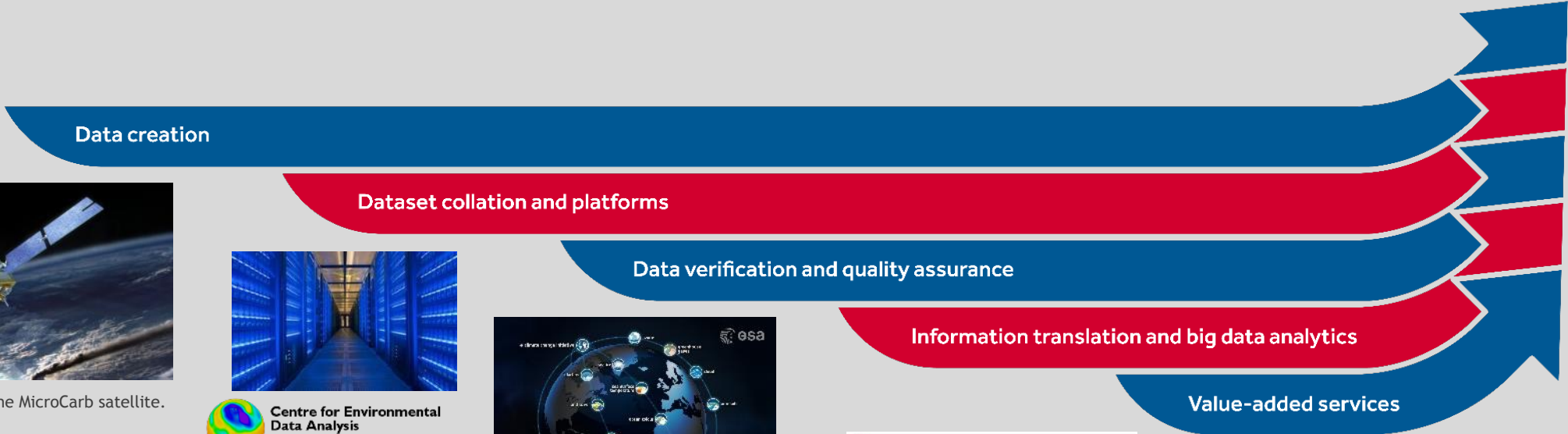


	LAND 	ATMOSPHERE 	CRYSOPHERE 	OCEAN 	CROSS ECV
UK LED	Biomass Land surface temperature	Water vapour	Antarctic ice sheet	Ocean colour Sea surface salinity Sea surface temperature	Climate Modelling User Group (CMUG)
UK INVOLVED	Lakes Landcover Fire (phases 1&2)	Aerosol Greenhouse gases Ozone Cloud	Ice sheets Greenland Glaciers Snow	Sea state Sea level	Sea Level Budget Closure Knowledge exchange REgional Carbon Cycle Assessment and Processes Phase 2 (RECCAP-2)

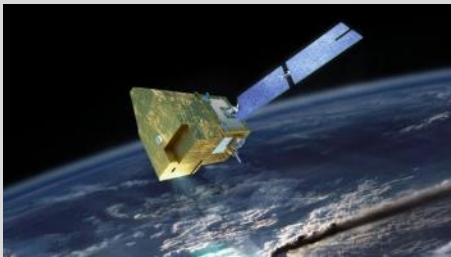
<https://climate.esa.int/en/projects/>

23 23

SPACE4CLIMATE: Climate services



Data creation



Artist's impression of the MicroCarb satellite. Image: CNES.

Dataset collation and platforms



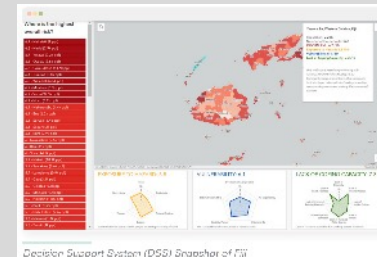
Centre for Environmental Data Analysis

SCIENCE AND TECHNOLOGY FACILITIES COUNCIL
NATURAL ENVIRONMENT RESEARCH COUNCIL

Data verification and quality assurance



Information translation and big data analytics



Decision Support System (DSS) Snapshot of T3

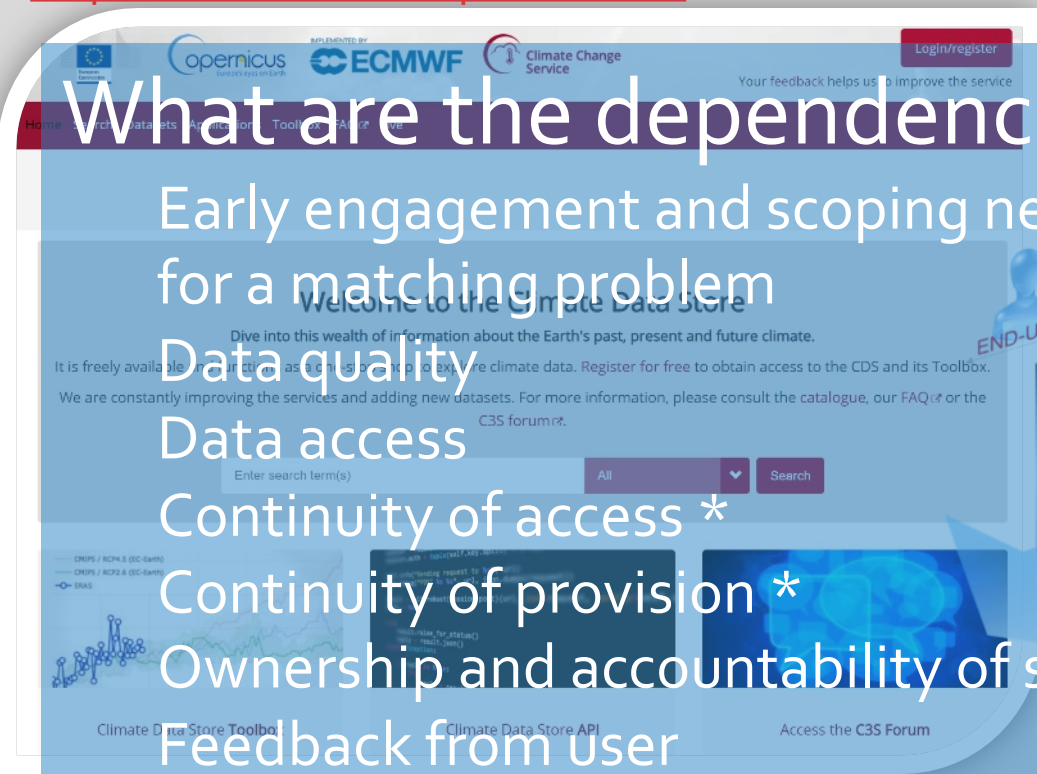
Value-added services



Data supply chain –in/out of climate services professionalisation and valuation?



<https://cds.climate.copernicus.eu>



What are the dependencies of a trusted service?

Early engagement and scoping needs – SERVICE not off-the shelf products that hope for a matching problem

Data quality

Data access

Continuity of access *

Continuity of provision *

Ownership and accountability of service provision

Feedback from user



<https://climate.copernicus.eu/data-action>



Professionalisation of climate services from space

- Space4Climate established a dedicated Task Group in late 2018 to investigate pragmatic route(s) for the UK in the quality assurance of Earth observation climate services.
- It sought to establish if a 'competent persons' approach has benefits and possibilities for UK Earth observation and/or climate products and services. *Competent persons are those who are formally awarded professional status in a certain discipline, receiving Chartered status and designatory letters, which are recognised in law and regulated by professional bodies.*
- We spoke with 10 professional bodies relevant to Earth observation and climate services, who have the power to award Chartered status
- We also spoke with individuals from standards bodies, for their perspectives on maintaining and developing requirements and benchmarks through people.



DATA PARTNERSHIPS



Global
Partnership
for Sustainable
Development Data

- Joint work programme to investigate how partnerships can unlock increased cooperation along the value chain of data-driven climate action, so that data systems are appropriate and inclusive by design, and local perspectives are part of data-driven policy making.
- Findings so far
 - Inclusive data systems and services are not just ethical but make business sense
 - Consideration needed for the appropriateness of data solutions and systems that are designed at the international level but that need to be deployed in specific local contexts
 - Professionalisation not just for individuals and organisations but also for data partnerships delivering climate services
 - Data science, stewardship and data scientists are crucial for development of a code of ethics and regulatory framework
- London Climate Action Week Event: Responsible climate partnerships learning session 29 June
- Please contact us if interested in finding out more about this work:
b.d.turner@reading.ac.uk

Contact details

Website: www.ukclimateresilience.org

Twitter: @UKCRP_SPF

YouTube: UK Climate Resilience programme



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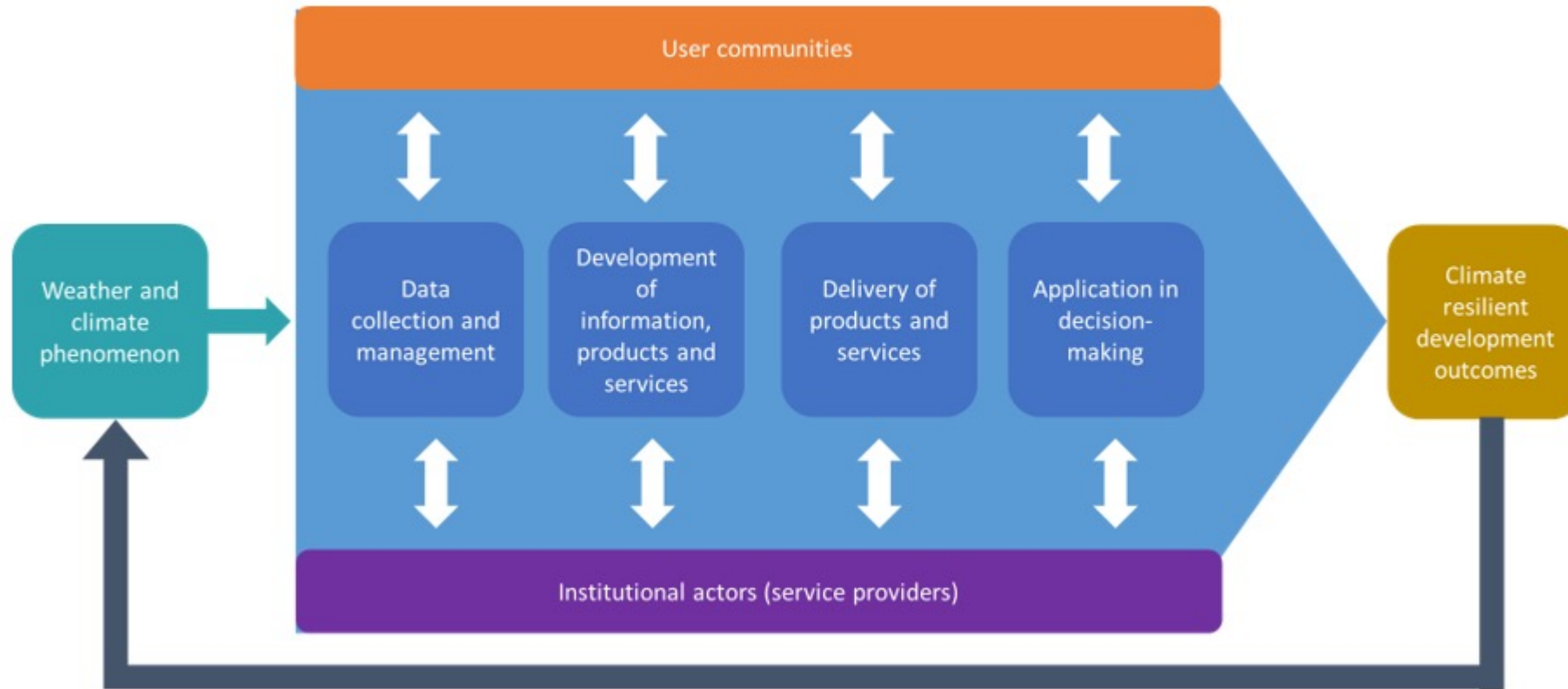


The UK Climate Resilience programme is supported by the UKRI Strategic Priorities Fund.
The programme is co-delivered by the Met Office and NERC on behalf of UKRI partners AHRC, EPSRC, ESRC.



Slides for use
to respond to
questions

Linking climate service providers with users



Questions, answers, discussion



UK Research
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Next webinars:



Wednesday, 16th June, 2021 12.30-13.00

Speaker: Richard Pywell, Centre for Ecology and Hydrology (CEH)

Title: *Monitoring and predicting the effects of Climate Change on crop yields (CROP-NET)*



Wednesday, 30th June, 2021 12.00-13.00

Speakers: Richard Betts and Kathryn Brown

Title: *Findings of the CCRA3 Evidence Report*



Register on our website:

<https://www.ukclimateresilience.org/news-events/climate-resilience-webinar-series-2020-2021/>



**UK Research
and Innovation**



Contact details

Website: www.ukclimateresilience.org

Twitter: @UKCRP_SPF

YouTube: UK Climate Resilience programme



**UK Research
and Innovation**



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