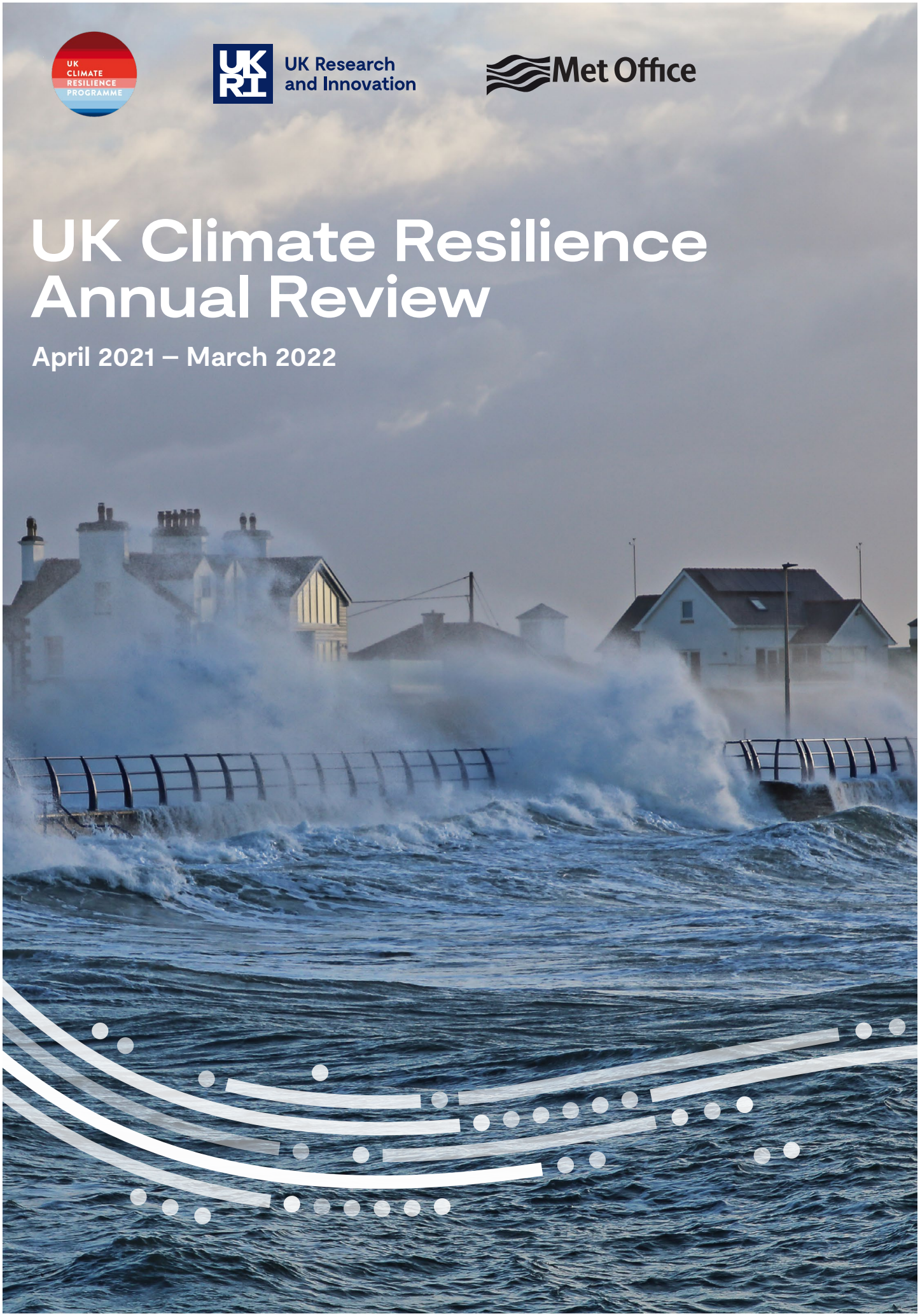
UK CLIMATE RESILIENCE PROGRAMME

UK Research and Innovation

Met Office

UK Climate Resilience Annual Review

April 2021 – March 2022



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EXECUTIVE SUMMARY

The UK Climate Resilience programme brings together fragmented climate research and expertise and undertakes robust, multi-, and inter-disciplinary climate risk and adaptation research to build UK capacity for resilience to climate variability and change. It will also ensure the UK is well positioned to exploit the opportunities of adaptation and green growth.

The programme is jointly led by UKRI and the Met Office and has £18.6m of funding to achieve three main objectives:

1. Characterising and quantifying climate-related risks

2. Managing climate-related risks through adaptation

3. Co-producing climate services

This review covers the period from April 2021 to March 2022. It is an opportunity to celebrate successes and reflect on learning to ensure continual improvement of the programme and maximise benefits from achieving the objectives.

UKCR programme has seen considerable development with key milestones.

APRIL 2021	• Second call for UKRI funded Embedded Researchers launched • First COP26 focused UKCR webinar
MAY 2021	• Second COP26 focused UKCR webinar • Met Office organised a Climate Science Conference with UKCR presence • Climate Exp0, the COP26 Universities network virtual conference involved UKCR researchers
JUNE 2021	• UKCR presentation to the Government's CCRA project board
JULY 2021	• UKCR presentation to the Government's National Strategy Implementation Group • UKCR climate information workshop • WP2 Extreme Samples
SEPTEMBER 2021	• Virtual UKCR Programme Assembly
NOVEMBER 2021	• UKCR present at COP26 events in both Green and Blue zones • Second Embedded Researcher cohort announced • Launch of the Climate Risk Indicators web tool
FEBRUARY 2022	• Last paper of the Special Issue on UK Climate Risk Assessment and Management published (includes seven SPF funded papers and 12 in total)
MARCH 2022	• Two UKCR webinars on the IPCC WGII report – Impact, Adaptation and Vulnerability • Building of insight paper teams

The top programme successes were identified as

- Development of climate support services and tools
- Communication and community building and development
- Scientific advancement and publications

The key lessons that should be taken into consideration for future learning were identified as

- The programme's response to COVID-19 and COP26
- Data management and information planning
- Flexibility of research
- Collaborative working
- Media response

Overall, the programme management team and the Champions are pleased with how the programme has progressed over the last year. Particularly good progress has been made in building the climate resilience community through virtual communications, such as the webinar series, virtual fora, and the Champions activities and project exposure at the COP26 conference in Glasgow in November 2021.

INTRODUCTION

Background and purpose

This document provides a review of the UK Climate Resilience (UKCR) programme, and captures the headlines on successes, lessons learned and progress towards the aims from April 2021 to March 2022.

The purpose of the Annual Review is to help inform the programme-level analysis of the UKCR programme to promote accountability, and to provide enough time for lesson learning and course correction throughout the remainder of programme.

Approach

> “ The review is focused on two areas: programme management and the delivery of outcomes and benefits relating to the programme’s strategic objectives.

The review is focused on two areas: programme management and the delivery of outcomes and benefits relating to the programme’s strategic objectives. The programme was reviewed against evaluation questions, adapted from the end-of-programme evaluation questions, as set out in the Monitoring & Evaluation Plan (M&E plan). The initial research calls were awarded before the Science Plan and M&E Plan were developed, consequently these were not designed to specifically address the programme’s legacy items. We have used programme documents such as meeting minutes, the risk register, and finance reports, alongside monitoring data from quarterly reporting, monthly dashboards, Researchfish and the Met Office to support the review process where necessary.

Audience

This Annual Review is intended for all stakeholders to gain a better understanding of the programme and the progress that has been made over the period April 2021 to March 2022. The review will also enable the Programme Board (PB) and programme team to learn lessons about the design and management of the programme, informing:

- discussions on potential improvements in the management and delivery of the UKCR Programme; and
- the development of similar programme approaches and other interventions in the future.

NOTABLE PRESS COVERAGE

Both Met Office and UKRI-owned communication channels have promoted the programme since the launch. The Met Office and NERC /UKRI websites have dedicated sections for the SPF UK Climate Resilience programme including; latest news and funding opportunities, and the dedicated UKCR website contains more content in regards to the projects, blogs, webinars etc. The other main channels utilised are the Met Office Science, UKRI, and UKCR twitter pages that amplify the messages and news. Events and stakeholder engagement have also been important for promoting the programme and progressing towards the aims.

The most notable items of press coverage during the review period are listed below:

- Nigel Arnell's work on Climate indicators[1]
  - Nigel Arnell's article 'COP26: what would the world be like at 3°C of warming and how would it be different from 1.5°C?' featured on The Conversation website.
  - Online article by the University of Reading featured on Phys.org website detailing the climate indicators website.
  - News article on the 'Impacts of climate change on Reading by 2040 as COP26 ends', written by Brad Young, featured on the Reading Chronicle website.
- 'Community Climate Resilience Through Folk Pageantry'[2]
  - Dr Jenna Ashton discussed her project on BBC Radio 3 podcast 'Green Thinking'. More information can be found on the University of Manchester website.
- Future drainage [3]
  - Online article written by Newcastle University featured on The Smart Water Magazine website. This item was posted following a press release from Newcastle University.
- Risky Cities: Living with Water in an Uncertain Future Climate [4]
  - Article detailing the Risky Cities performance at COP26 written by Chloe Rabinowitz on the Broadway World website.
  - Article detailing the Risky Cities performance at COP26 written on the Marketing Humber website.

Although the majority of the programme press coverage has been positive, the publication of 'The Shared Socio-Economics Pathways (SSPs)'[5] led to significant press attention from a number of media outlets including for the Daily Mail, Times, Daily Express, and Spectator. All these articles reported the paper's findings in a negative light, partly through misunderstanding of the purpose of the study. One article in Business Green was more balanced. This unexpected negative attention led the programme management and Champion teams to review the programme processes and responses to negative press coverage and identifying projects which may be contentious in the future. Although negative in coverage, these articles led to increased website traffic and Google searches, increasing the programme's reach and engagement with the public. It is notable that the most watched video on the UKCR YouTube channel is titled "What is climate resilience?"; this is one of the first videos produced but gained significant viewings in the wake of this media coverage.

1. NERC grant NE/S016481/1: Climate Risk Indicators: developing indicators of climate risk using UKCP18 to support risk assessments and enhance resilience
2. NERC grant GR-AH/V003186/1/E: Community Climate Resilience through Folk Pageantry
3. NERC grant GR-NE/S017348/1/E: FUTURE-DRAINAGE: Ensemble climate change rainfall estimates for sustainable drainage
4. NERC grant GR-AH/V00395X/1/E: Risky Cities: Living with Water in an Uncertain Future Climate
5. **Project title**: Project title: Development and provision of UK socioeconomic scenarios for climate vulnerability, impact, adaptation and services research and policy (DN420214) Principal investigator Jon Stenning

PROGRAMME SUCCESSES

> “The SSPs recognise the interrelation between physical climate change and its effects on socio-economic activity, providing decision makers with context to determine the course and implementation of future climate change mitigation and adaptation.

The programme achieved many successes and highlights throughout the review period. Below are the key successes identified by the programme team and Champions (in no particular order).

Development of climate support services and tools

The Met Office funded project for UK Shared Socioeconomic Pathways (UK-SSPs) has enabled the development of a set of five UK-SSPs that are consistent with globally established SSPs. The SSPs developed by this research outline plausible socioeconomic future outlooks up to the year 2100. The SSPs recognise the interrelation between physical climate change and its effects on socio-economic activity, providing decision makers with context to determine the course and implementation of future climate change mitigation and adaptation.

The ‘Enhancing the resilience of the water sector to drought events: climate service pilots’ (eFLaG) project[6] has developed a high-quality enhanced future flows database of future river flows, groundwater levels and recharge, which can be used to coordinate a national approach to providing resilience to drought conditions and the security of UK water resources as the climate changes. The research has been tailored to the UK water industry, with the research co-developed with industry leaders and regulatory partners.

The Future Drainage project has produced updated guidance on urban drainage design and methods for urban surface water risk assessments. The project uses very high-resolution climate projections and flood models.

The Climate Risk Indicators project launched its website which shows interactive projections for a wide range of policy relevant climate risk indicators such as extreme heat, agriculture, wildfires, and hydrological systems. The project uses the new UKCP18 climate projections to estimate current and future climate risks facing the UK and will be available to assist decision makers, for informed climate resilience and adaptation policy to be made.

Communication and community building and development

- The programme and its Champions were involved in several events and activities at the COP26 conference in November 2021. These activities include:
  - Steering Committee members Richard Millar (Climate Change Committee (CCC)) and Andrew Carr (Defra) who took part in the roundtable discussion on tracking a moving target: How to measure progress and policy effectiveness in adapting to climate change. This roundtable was hosted by Defra and the Organisation for Economic Co-operation and Development (OECD).
  - The Risky Cities project co-led a performance of spoken word, poetry, music, and a short film as part of the "On the Edge" event in the Green Zone.
  - The programme's projects were mentioned in a discussion organised by Defra, the CCC, the University of Exeter, the Foreign, Commonwealth and Development Office (FCDO), Met Office and the Adaptation Research Alliance (ARA) on COP26: Climate Risk and Adaptation: How we understand and respond to climate change hazards. Which was held in the UK Pavilion in the Blue Zone.
  - Suraje Dessai participated as a panellist on the Met Office Science Pavilion panel discussion on Harnessing Climate Science and Adaptation.
  - Kate Lonsdale was a speaker at the IPCC-WMO-UKMO Pavilion on a session organised by the Champions on "Building resilience in a low carbon world". The session was moderated by Defra's chief scientist, Gideon Henderson, and also included a response from Andrew Carr (Defra).
  - Webinars have consistently held high numbers throughout the year and include talks from researchers and non-academic users.

Virtual forums have high engagement numbers from projects and early career researchers, meaning that networking within the UKCR funded projects is supported, and new collaborations are facilitated.

> "The programme website attracts on average just over 1,400 new users every month with a bounce-back rate of between 64-66%.

- Social media
  - The programme website attracts on average just over 1,400 new users every month with a bounce-back rate of between 64-66%. The most views in one day were on Monday 17 January 2022, which coincided with national press coverage of the UK-SSPs.
- Social media development
  - Twitter statistics show that the programmes' top engagement tweet over this review period was on 12 November 2021. This tweet promoted Nigel Arnell's climate risk indicators website, gaining 3,396 impressions, 165 engagements, 71 link clicks; 54 detail expands and 14 Likes. November 2021 had the highest impressions at 27.9K. The top tweet was the announcement of Future Drainage webinar.
  - Over this review period the most viewed videos on the programme's YouTube channel were "what is climate resilience?" (280 views) and 'UK-SSPs - overview of the products' (124 views).

6. Project title: Climate Service prototype development: enhancing the resilience of the water sector to drought events (DN420192) Principal investigator Jamie Hannaford
7. NERC grant GR-AH/V00395X/1/E: Risky Cities: Living with Water in an Uncertain Future Climate

> “This scheme fosters close collaboration and community building between the embedded researchers and host organisations such as national government departments, local government, third sector and private organisations.

- Programme activities and events throughout the year have been consciously planned to coincide with events to the outside world such as COP26, publication of CCRA and IPCC reports.
- The second cohort of Embedded Researchers were announced in November 2021. This scheme fosters close collaboration and community building between the embedded researchers and host organisations such as national government departments, local government, third sector and private organisations. The seven new projects were awarded from a total fund of £370k. The projects funded range from a wide variety of sectors including tourism, churches, climate adaptation planning and strategies, stochastic weather generators, and the arts.

Scientific advancement and publications

- The programme continues to regularly release publications of the project outputs. Notable examples include:
  - High resolution climate model simulations of estimated changing risk of extreme rainfall were developed by Cotterill *et al.* 2021[7]. Findings from the study have led to the development of a new rainfall index (R50mm_OND) which represents the number of days during October to December that have precipitation above 50mm. This data will hopefully be used to inform the development of effective strategies and reduced climate risks and impacts in the future.
  - Programme research into managing extreme weather and climate change on UK agriculture[8] was published by Rebecca Wheeler and Matt Lobley[9] alongside the CropNet Demonstrator tool, which provides a real-time crop and grass yield monitoring and modelling service for the UK.
  - The work of William Keat *et al.* 2021[10] on urban heat island effects on heat stress and heat-related mortality. This project uses convection permitting model simulations to produce climate information at city scales for present day and future temperature extremes.
- The programme has produced urban climate services for several UK cities. Urban factsheets have been developed by the Met Office Climate services pilot work packages. The initial project focussed on Bristol, but the process used to produce this factsheet has been upscaled to produce bespoke city packs for different localities. These factsheets assist local decision making and contingency planning, focusing on health, infrastructure, and water. Urban factsheets have to this date been produced for Bristol, Belfast, Exeter, Glasgow, Kirklees, Leeds, and London City.

7. Increase in the frequency of extreme daily precipitation in the United Kingdom in autumn, Cotterill et al. 2021. Journal of Weather and Climate Extremes, Volume 33.
8. Wheeler & Lobley 2021. Managing extreme weather and climate change in UK agriculture: Impacts, attitudes and action among farmers and stakeholders. Journal of Climate Risk Management, Volume 32.
9. **Project title**: Monitoring and predicting the effects of climate change on crop yields. NERC grant ref: NE/S01702X/1
10. Keat et al. 2021. Climate change over UK cities: the urban influence on extreme temperatures in the UK climate projections. Journal of Climatic Dynamics, Volume 57, pages 3583–3597.

PROGRAMME LESSONS

Recording lessons from the review period is an important part of reflecting on progress so far and informing future decisions. Below are the key areas we can take learning from that have been identified by the programme team and Champions (in no particular order).

> "The COVID-19 pandemic has proven that scientific advancement can be accelerated in the face of threats to society. When international collaboration is strong and proactive, solutions and technological advances can be made.

COVID-19 and COP26

- "The COVID-19 pandemic has proven that scientific advancement can be accelerated in the face of threats to society. When international collaboration is strong and proactive, solutions and technological advances can be made." A salient lesson from the pandemic is also that mitigation, resilience, and adaptation are all important. Delays in response to threats can be costly both economically and on a societal/human level; however, early action can also be politically difficult to implement.
- The programme continues to communicate and work well despite COVID-19 restrictions and delays. Most programme meetings are still held virtually. This format has been beneficial, as it has removed the barriers of location and travel of attendees which had previously occurred before the COVID-19 pandemic.
- COP26 highlighted the fact that climate resilience and mitigation can be localised, but ultimately it is a global issue, needing political leadership and commitment, just like the response needed for COVID-19. It is important to inform and engage with not only decision makers but also the public. The activities undertaken by the programme at COP26 focused on engaging both the scientific community and the public through panels, discussions, and arts performances. All these activities have also been made available online, in order to increase reach and impact.

Data management and information planning

- The initial programme delivery plans would have benefitted from a clear structured approach to data management and information storage of the programme outputs. As the programme enters its final year, the need for effective data storage and data legacy is becoming a more pressing concern. The programme has a wealth of information that will need to be held securely and in an ordered and accessible format.
- The strategy for scaling up of climate services was not clearly outlined at the start of the programme; this has led to some teething issues in scaling up bespoke climate services to a wider audience.
- To maximise Google searches for the programme website and to increase traffic, a more effective layering of the website may have generated a higher visitor rate to the site.
- The programme website will become static at the end of March 2023 when the programme officially ends. The static status of the website so soon after the programme's close may impede continuing legacy and community development. Maintenance and custodianship of the website and all the information contained within it needs to be decided upon prior to the programme's closure. A detailed plan for website closure should have ideally been included in the programme planning stages.

Flexibility of research

- Researchers would like clearer grant guidelines and greater flexibility. Many grant holders would like more clarification on their ability to adapt and modify their projects

as they progress and evolve. The change protocols are not always clear, especially around changes to project scope and budget. Better communication is needed to let researchers know that changes to the project scope are possible. The use of project breakpoints which allow projects to temporarily stop or pause, could be invaluable, allowing PIs time to reassess and adapt their plans.

Collaborative working

- There has been successful collaboration between UKRI, the Met Office, and the Champions over the review period. Monthly programme catch-up meetings in addition to the Steering Committee and Programme Board meetings have allowed greater communication between all parties. Regular meetings have facilitated closer working relationships and for a forward focused approach.
- Greater integration and flexibility of the joint funding pots between UKRI and Met Office would allow greater project agility and cross project collaboration.
- "The Embedded Researcher scheme has improved stakeholder engagement between higher education institutions (HEIs) and the private and public sectors, allowing scientific advancement and a strong climate resilience community to be formed and nurtured."
- Early career researchers (ECRs) have been used to implement legacy items and to write end of programme insight papers. The deployment of the ECRs has been of great value, but this late-stage utilisation of their skills does reflect a missed opportunity to use their skills at earlier phases of the programme.
- The Steering Committee continues to provide a wealth of invaluable advice and guidance to the programme; however, greater utilisation of the expertise within the committee is needed to steer projects needing advice. Engagement of committee members with projects has not always been well executed, so refinement in the process of pairing these groups is required.
- Now that the programme is entering its final year, the frequency and timing of Steering Committee meetings needs to remain appropriate and reflect the needs of the programme as it transitions into the end and closure phase.

"The Embedded Researcher scheme has improved stakeholder engagement between higher education institutions (HEIs) and the private and public sectors, allowing scientific advancement and a strong climate resilience community to be formed and nurtured.

Media response

- The programme's response to controversial/contentious media scrutiny has been developed since the publication of negative news articles relating to the UK-SSPs project in January 2022. A set of FAQs has been developed and is easily accessible to the press/media as well as the creation of a standardised response statement with links to the Met Office and UKRI press offices.
- Whilst working across many organisations, it is essential that messages are coherent and consistent and that all organisations can remain agile and respond quickly and efficiently when the need arises. A united and consistent approach to press response is essential when addressing any negative media coverage.
- Although the programme received negative press coverage in January 2022 over the release of the UK-SSPs, the extra programme exposure led to increased traffic on the programme website, Twitter, and YouTube accounts. Google searches relating to climate resilience were dramatically increased.

PROGRAMME CASE STUDIES

This selection of case studies highlights successful areas of the programme and illustrates the breadth of good stories there are to tell.

Embedded Researchers

The Embedded Researcher scheme funded two cohorts of researchers to co-develop a piece of work on a host organisation's research question. This has given researchers the opportunity to bridge the academic - practice divide in a variety of sectors and communities. The first cohort of embedded researchers' projects have been positive, building close links with their hosts and creating a wealth of useful outputs, although the COVID-19 pandemic prevented the original intention that they were to spend a considerable period physically in the organisation. In a couple of cases, researchers felt this meant that the work became more like a more traditional research contract. Part of the intention of this scheme was that the work could flex as understanding across the practice – academic knowledge streams deepened ensuring that initial assumptions could be challenged, and outputs made more relevant. The second cohort of embedded researchers were awarded their projects in November 2021. More information on the Embedded Researcher scheme can be found in the case study.

> "All these tools have furthered the climate resilience community and have given decision makers the services and tools needed to enable better planning and adaptation strategies to climate change in the UK.

Climate Services and tools

Over the past year the programme's climate support tools have continued to develop and progress. The most notable examples are UK-SSPs, Future drainage, eFLaG, and the urban heat maps. All these tools have furthered the climate resilience community and have given decision makers the services and tools needed to enable better planning and adaptation strategies to climate change in the UK. A summary of the advances in the programme's climate services and tools can be found in the case study.

Programme visibility and activities at COP 26

The programme had significant visibility at COP26, with the programme Champions taking part in several panel discussions and running a joint event on "Building resilience in a low carbon world" with the Future Climate For Africa (FCFA) programme. The programme was also represented by several funded researchers including OpenCLIM, CLANDAGE, and the Risky Cities project, who performed a production called 'On the Edge'. The project led by Dr Briony McDonagh performed the piece which showcased young people's anxiety to climate uncertainty through spoken word, poetry, music, and a short film. A summary of the programme's events and presence at COP26 can be found in the case study.

ANNUAL PROGRAMME EVALUATION

The annual programme evaluation and narrative against legacy items indicate how the programme team and Champions feel the programme has progressed towards the aims. The annual evaluation questions were developed with direct links to the programme legacy items.

The programme legacy items can be found in the Monitoring and Evaluation Framework.

What has been the progress of the research towards bringing about a step change in climate change risk assessment capability?

Many UKRI and Met Office projects have contributed to this; for example, the OpenCLIM[11] integrated assessment model, and the eFLaG project which has created a high-quality enhanced future flows database of future river flows, groundwater levels and recharge. OpenCLIM needs to continue to work closely with government departments and other key audiences to ensure expectations of the outputs are realistic and that, as far as possible, the outputs are relevant and usable.

> “The programme has been instrumental in developing mature climate services.

What has been the progress of the programme towards bringing about a developing and maturing climate service enterprise?

The programme has been instrumental in developing mature climate services. Several climate services developed by the programme are now in their delivery stages. The Future Drainage project has produced updated guidance on urban drainage design and methods for urban surface water risk assessments using very high-resolution climate projections and flood models. The OpenCLIM project, has drawn together existing climate models of risks and impact. OpenCLIM provides an open-access platform that the climate science community can use to assess the impacts and adaptations on biodiversity, agriculture, infrastructure, and urban areas.

The process and thinking of upscaling climate services such as the city packs is ongoing, as are the mechanisms needed for the climate services to reach a wider audience. Community awareness of the services available is under continual review.

What has been the progress of the programme towards bringing about a vibrant climate resilience research community with better integration between academic and non-academic partners and research users?

To grow a community of interacting researchers, practitioners, and policymakers in climate resilience, the Champion team have continued over this review period to engage with both academic and non-academic partners. Over the past year the webinar series and virtual fora have continued to attract academics, policy makers, and commercial partners as participants, and also as lead speakers. The programme’s Steering Committee provides a cross-section of the climate resilience community, including academics, Government agencies, climate organisations, and policymakers from the devolved Governments lending both academic and non-academic expertise and perspective to the programme’s design, implementation, evaluation, and communication. The Champions activities and increased

11. OpenCLIM NERC grant ref: NE/T0139321/1.

visibility at COP26, allowed the programme's reach to be extended to new audiences. COP26 also helped the Champions to forge new links with other climate programmes both here in the UK and internationally.

The continuation of the programme's relationships with academics, industry and Governments has been facilitated by the programme's Embedded Researchers maintaining their relationships with their host organisations and other relevant contacts. The programme has also formed close links with the CS-N0W programme over this review period. The CS-N0W programme will hopefully build upon this programme's legacy.

What has been the progress of the programme towards bringing about more effective mainstreaming of climate research findings into updated guidance and standards?

> "The synthesis of the outputs of several projects have begun to provide updated national guidance standards, policy regulations, and standards for good practice.

The synthesis of the outputs of several projects have begun to provide updated national guidance standards, policy regulations, and standards for good practice. Examples of projects include: Future Drainage's work feeding into uplift factors[12]; erosion of critical infrastructure[13]; the JBA project providing recommendations on starting points for standards[14]; Climacare having potential to influence design of care buildings[15]; and E-flag[16], and UKSSP[17] aiming to become a standard dataset.

What has been the progress of the research towards improving decision making in national planning processes e.g. CCRA, NAP?

Although the programme had not been expected to support CCRA, it has remained engaged with the CCRA process over this review period through the journal Special Issue on "UK Climate Risk Assessment and Management" and UKCR presentation to CCRA project board. (Annex A) The Climacare and MAGIC[18] projects are to consider the implications on this progress further over the programme's final year. It is acknowledged that the programme is better suited to support the CCRA than the NAP. Future research should be focussed towards improving the NAP and the NAP process.

What has been the progress of the programme towards ensuring that it is easier to bring climate risks into decision making for public, private and third sector decision makers as they have access to relevant, accurate, timely and tailored information?

This is the fundamental work of the programme, ensuring relevant and accurate information is available to all audiences. Over this review period, the programme has successfully delivered a range of climate services and tools which are designed to provide decision makers of climate risks at both regional and national scales. Examples of these services and tools include the Climate risk indicators interactive website by Nigel Arnell, published UK-SSPs, eFLaG's enhanced future flows database, and the Urban heat mapping to name but a few.

12. NERC grant refs: NE/S017348/1 and NE/V004166/1.
13. NERC grant ref: NE/S01697X/1
14. **Project title**: Review of climate resilience mainstreaming into regulatory and voluntary standards, national guidance, and other sectorial/industry codes of practice (DN420232) Principal Investigator: Murray Dale
15. NERC grant ref: NE/S016767/1
16. **Project title**: Climate Service prototype development: enhancing the resilience of the water sector to drought events (DN420192) Principal investigator Jamie Hannaford
17. **Project title**: Development and provision of UK socioeconomic scenarios for climate vulnerability, impact, adaptation and services research and policy (DN420214) Principal investigator Jon Stennin
18. **Project title**: NERC grant ref: NE/T01394X/1/E

Communication of climate risks with public, private, and third sector organisations has been achieved through programme newsletters, Twitter, and the webinar series. Progress is still needed to facilitate greater interaction and engagement with the third sector over the programme's final year. Upcoming events in the programme's calendar, including the UK Climate Resilience showcase in September 2022 and the final programme conference in March 2023 will help foster closer interaction and engagement with this group.

Overall

Overall, the programme management team and the Champions are pleased with how the programme has progressed over the last year. Particularly good progress has been made in developing and maturing climate services and bringing about more effective mainstreaming of climate research findings into updated guidance and standards. This is demonstrated in the advances in the climate services and tools generated by the programme's projects.

LEGACY ITEMS

The programme objectives of i) Characterising and quantifying climate-related risks, ii) Managing climate-related risks through adaptation and iii) Co-producing climate services will result in a lasting legacy through the following outcomes.

1. A step change in future Climate Change Risk Assessment capability, including, through improved UK spatial modelling of climate-related risks, characterisation of interdependent risks and representation of adaptation strategies in integrated assessment models of impact and adaptation.
2. Enhanced capability and understanding of climate hazard and risk, through consideration of past, present day and future risks to the UK, including understanding robustness of methods, single and multi-hazard events, and producing high-end scenarios for national stress testing. This will enhance the UK's current decision relevant climate scenarios from other sources such as UKCP18 and CMIP6.
3. Strengthened understanding of how people, organisations and policy scales are adapting and how system scale interactions can act to incentivise adaptive behaviour, remove barriers, and avoid maladaptation.
4. Consistent set of UK socio-economic scenarios for national, regional, and local risk planning and research.
5. UK roadmap for the future development and implementation of climate services addressing the roles of public and private sectors. This provides the UK response to the Global Framework for Climate Services.
6. Grow the community of interacting researchers, practitioners, and policymakers in climate resilience.
7. Synthesis of findings across the programme to provide updated national guidance standards, policy regulations and good practice.

FORWARD LOOK

- Preparation for COP27 and NAP3
- The webinar series will continue.
- Programme synthesis activities including the publish of programme insight papers in a Palgrave pivot book March 2023.
- End of programme evaluation.
- UK Climate Resilience Showcase on the 10-11 October 2022.
- UK Climate Resilience Conference 1-2 March 2023.
- End of programme report March 2023.

UK Climate Resilience SPF Programme

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