



Solutions Focused Approaches to Marine Management and Policy

Final Report for the Sustainable Management
of UK Marine Resources (SMMR) Programme
2021 -2025

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Executive Summary

The Sustainable Management of UK Marine Resources (SMMR) programme has paved the way for transformative change in UK marine governance. Through cross-sectoral collaboration, innovative tools, and inclusive knowledge systems, it helped reshape how the UK values, manages, and protects its marine resources. These efforts are essential for building a more sustainable, resilient, and equitable future for the UK's coastal environments and society.

The programme addressed pressing challenges facing the UK's coastal and marine environments through six interdisciplinary research projects, running from 2021 to 2025. SMMR brought together scientists, policymakers, industry, communities, and the public to bridge the gap between science and policy, informing and influencing UK marine policy and fostering innovative, sustainable approaches to managing marine resources.

The £12.4 million initiative was supported by the Strategic Priorities Fund and co-funded by the Natural Environment Research Council (NERC) and the Economic and Social Research Council (ESRC).

With a focus on collaborative and policy-relevant research, SMMR was centred around three core themes:

- 1 UNDERSTANDING THE VALUES ASSOCIATED WITH THE MARINE ENVIRONMENT**
- 2 BUILDING TOOLS TO SUPPORT MANAGEMENT**
- 3 DESIGNING INTERVENTIONS TO SUPPORT POLICY**

Each project addressed at least two of these themes, guided by priorities set by policy stakeholders. The fund supported research tackling the complex interplay between ecological sustainability, economic development, and social equity in coastal zones.

Importance of the UK Coastal Environment

The UK's 17,000 km of coastline is home to diverse and productive ecosystems that provide vital services including biodiversity support, carbon sequestration, and nursery grounds for fish and shellfish. Coastal areas are key to national economic prosperity, supporting fisheries, tourism, shipping, and renewable energy. These regions are also culturally significant, offering recreational, heritage, and well-being benefits. However, they face mounting pressures from climate change, development, and pollution - requiring adaptive, inclusive and evidence-led management.



Project Highlights and Key Impacts

- **Co-Benefit Solutions for Resilient Coasts (Co-Opt)** advanced nature-based coastal management by supporting the transition from hard 'grey' infrastructure to softer 'green' solutions. Co-Opt produced tools and evidence now being used to guide UK coastal adaptation policies and foster inclusive decision-making.
- **Integrating Diverse Marine Values into Management** demonstrated how participatory and creative social research can embed differing local and cultural perspectives into marine governance. While structural policy challenges persist, the project offers a scalable model for more inclusive marine policy design.
- **Marine Spatial Planning Addressing Climate Effects (MSPACE)** developed innovative spatial planning tools that incorporate climate resilience into marine management. Outputs from this project are already influencing national and international policy, placing climate change at the forefront of marine planning.
- **Pyramids of Life (PoL)** explored the impact of consumer choices on marine ecosystems through system modelling and stakeholder engagement. Its outcomes are shaping national fisheries policy and raising public awareness around sustainable seafood.
- **Restoration of Seagrass for Ocean Wealth (ReSOW)** contributed significantly to seagrass restoration in the UK, producing practical toolkits and evidence for policymakers and practitioners. Though still evolving, its work strengthens the capacity for ecological restoration nationwide.
- **Resilience of Coastal Communities (ROCC)** pioneered a resilience, wellbeing, and sustainability nexus for marine governance. It delivered tools like the MaPTA trade-off model and established lasting partnerships with coastal communities, offering a blueprint for just and adaptive marine futures.



Introduction

Background

The coastal and marine environments of the UK are of immense importance to both science and society, playing a crucial role in ecological, economic, and cultural domains.

Stretching over 17,000 km, the UK's coastline encompasses a diverse range of habitats, including estuaries, salt marshes, sand dunes, cliffs, mud flats and rocky shores. These ecosystems support a wide array of biodiversity, providing essential services such as water purification, carbon sequestration, and nurseries for fish and shellfish.

For society, the UK's coasts hold significant economic and cultural value. They support industries such as fishing, tourism, and shipping, contributing billions to the national economy and providing employment to thousands. Tourism draws millions of visitors to the UK's shoreline annually, generating income for local communities and promoting regional development. The UK marine environment is also vital for renewable energy, particularly offshore wind, which contribute to the UK's efforts to reduce greenhouse gas emissions and ensure energy security.

Culturally and recreationally, the shoreline holds a special place in British life. Waterfront areas are sites of heritage, leisure, and identity, with many coastal towns and communities having historic importance. The natural beauty and recreational opportunities offered by beaches and coastal paths promote physical and mental well-being, encouraging outdoor activity and community engagement.

However, the coastal environment faces increasing pressures from development, pollution, and climate change. Coasts are on the frontline of anthropogenic impacts, such as sea-level rise, coastal erosion, pollution, and extreme weather events. Balancing human use with environmental protection is a key challenge. Scientific research plays a vital role in informing sustainable coastal management, allowing scientists to monitor environmental change and develop strategies for adaptation and mitigation - ensuring that these habitats continue to provide their valuable services. However, to be effective this work must encompass the knowledge and expertise of local populations.

The Sustainable Management of UK Marine Resources (SMMR) Programme

The Sustainable Management of UK Marine Resources (SMMR) Programme was established in 2019 by UK Research and Innovation (UKRI) through the Natural Environment Research Council (NERC) and the Economic and Social Research Council (ESRC). It was designed to support interdisciplinary management of coastal systems and respond with methodologies to deal with emergent challenges.

The programme focused on a variety of challenges arising from coastal issues and has adopted a transdisciplinary approach to seeking solutions

to these issues. This highly strategic funding produced significant advances in methodologies and approaches to understanding, managing and predicting future change, as well as tools to address these challenges. With a specific focus on improving our understanding of societal perspectives and behaviours concerning the marine environment, SMMR-funded projects have helped integrate this knowledge into systems-based approaches that inform effective decision-making for marine management and policy development.



"The supply of marine resources is finite, yet demand continues to grow. SMMR has brought together researchers focused on both sides of this equation - resource availability and societal demand - to find a better balance. Its legacy lies in building a dynamic, interdisciplinary community capable of addressing these long-term challenges."

- Professor Sir Ian Boyd,
Chair of the SMMR Strategic Advisory Group

The SMMR Programme was supported by a Champions Team led by Prof David Paterson and Dr Mark James, and a Strategic Advisory Group led by Professor Sir Ian Boyd. The £12.4 million Programme supported six major research projects addressing critical marine research gaps and uniquely involved policy stakeholders throughout the programme lifecycle, from project development through to initiation and delivery. The funded projects focused on areas such as integrating diverse values into marine management, developing climate-smart spatial management strategies, and enhancing the resilience of marine ecosystems and generated a diverse array of management and policy-relevant outputs (see infographic below). This report details the main outputs and outcomes from each of the six funded research projects and signposts readers to further information and resources.

Project Outputs

Restoration of Seagrass for Ocean Wealth (ReSOW)

THEMES

- Mapping Habitat Suitability and Ecological Value
- Social Perceptions and Cultural Value
- Policy and Governance



KEY OUTPUTS

- CEEDS Tool
- UK's First National Seagrass Ocean Accounts Framework

Resilience of Coastal Communities (ROCC)

THEMES

- Mapping Current Evidence at the Nexus of Resilience, Wellbeing and Sustainability
- Responding to Change and Disturbance in the Past and Present
- Policy and Decision-Making for Resilience to Change in the Future



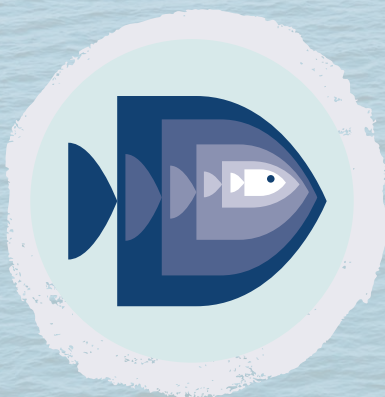
KEY OUTPUTS

- Resilience Exhibition
- Voices of the Exe Trail
- Trade-Off Tool

Pyramids of Life: Working with Nature (PoL)

THEMES

- Influencing Fisheries Management
- Shifting Behaviour and Promoting Sustainability
- Connecting Theory, Data and Policy



KEY OUTPUTS

- Interactive Management App for the Celtic Sea
- Consumer Research to Support Policy and Behaviour Change

Integrating Diverse Values into Marine Management

THEMES

- Capturing and Communicating Diverse Values
- Participatory Engagement Across Scales



KEY OUTPUTS

- Transdisciplinary Methods Guide
- Podcast Series

Marine Spatial Planning Addressing Climate Effects (MSPACE)

THEMES

- Climate-Smart Planning Tools and Evidence
- Stakeholder Engagement and Scenario Co-Development
- Policy Influence and International Recognition



KEY OUTPUTS

- ASPACE Tool
- Climate-Smart Early Warning System

Co-Benefit Solutions for Resilient Coasts (Co-Opt)

THEMES

- Social Acceptance of Nature-Based Solutions (NBS)
- Building a Common Understanding of Coastal Systems
- Integrating Trade-offs and Co-benefits into Decision-Making Processes



KEY OUTPUTS

- Community-Led Coastal Adaptation Workshops
- Cross-Sector Relationship Building

Co-Benefit Solutions for Resilient Coasts (Co-Opt)

Principal Investigators

Dr Laurent Amoudry (National Oceanography Centre), Dr Anil Graves (Cranfield University), Dr Leonie Robinson/Prof Richard Dunning (University of Liverpool) and Dr Tim Stojanovic (University of St Andrews).

Project Partners

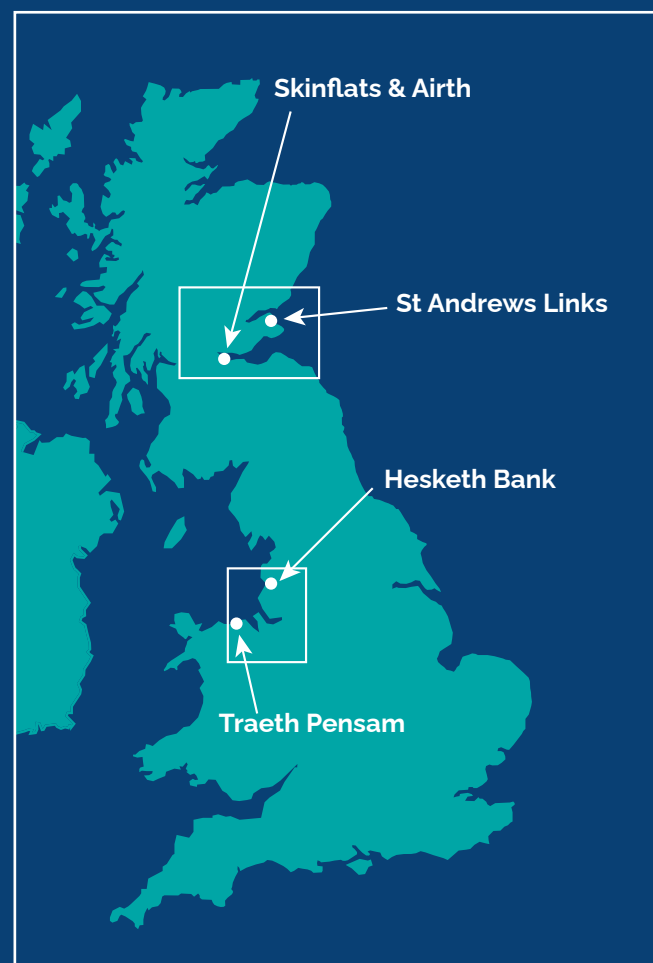
National Oceanography Centre (NOC), Cranfield University, University of Liverpool, University of St Andrews.

Introduction

The UK's coasts provide essential ecosystem services and support millions of livelihoods, but they also pose a substantial risk to society. Coastal flooding and erosion are increasing threats, with over 1.8 million homes at risk in England alone. These hazards will intensify with climate change, particularly due to unavoidable sea level rise.

At the same time, the UK's legally binding commitment to reach net zero carbon emissions by 2050 necessitates more sustainable, adaptive approaches to coastal protection. Traditional 'grey' defences - concrete walls, embankments, and revetments - are increasingly unlikely to be cost-effective or resilient under future conditions. Softer, nature-based solutions (NBS) such as managed realignment and habitat restoration offer multifunctional benefits but remain underutilised, hindered by fragmented public support, complex social dynamics, and inadequate policy frameworks.

The Co-Opt project was established to address the challenges associated with the transition from grey to green coastal infrastructure.



Locations of the four UK case studies: Airth (Firth of Forth), Hesketh Out Marsh and Ribble Estuary, West Sands in St Andrews, and Traeth Pensarn.

Social Acceptance of Nature-Based Solutions (NBS)

AIMS

- Understand public and stakeholder perceptions of nature-based coastal adaptation strategies at both national and local scales.
- Identify barriers to the implementation of NBS caused by social or cultural resistance and provide evidence on where and why acceptance of NBS diverges across geographic and demographic contexts.

IMPACT

- **Knowledge Generation:** Research found strong national-level support for NBS, with the majority of the respondents favouring 'green' solutions over hard infrastructure. Local-scale studies revealed significant variation in acceptance, highlighting the influence of context-specific concerns such as land use and livelihoods. Resistance from farmers - particularly regarding managed realignment - shed light on tensions between environmental planning and private land interests, emphasizing the need for sensitive compensation and negotiation strategies.
- **Improved Stakeholder Engagement:** This evidence is being used to inform targeted engagement strategies in both policy and practice contexts, and supports the development of more nuanced approaches to implementing NBS where stakeholder buy-in is critical.

Integrating Trade-offs and Co-benefits into Decision-Making Processes

AIMS

- Investigate how to frame and integrate trade-offs and co-benefits into real-world decision-making processes for coastal adaptation.
- Test deliberative workshop formats as a tool to facilitate complex decision-making involving multiple perspectives and constraints.

Building a Common Understanding of Coastal Systems

AIMS

- Facilitate dialogue and mutual learning between academics, policymakers, practitioners, and community members on coastal systems.
- Identify and reconcile differences in terminology, priorities, and knowledge systems across disciplines and sectors.
- Develop processes and tools to promote a shared understanding of coastal systems for collaborative decision-making.

IMPACT

- **Collaborative Learning:** Workshops brought together diverse stakeholders to establish common ground and terminology.
- **Practical Guidance:** Outputs include a published set of recommendations on co-producing shared knowledge of coastal systems and managing differing priorities.
- **Cross-sector Relationship Building:** The workshops succeeded in connecting stakeholders who had previously not communicated directly, fostering new relationships and aligning objectives.

IMPACT

- **Cross-Sectoral Dialogue:** Workshops created a neutral space for dialogue, addressing a critical gap in existing governance structures. Both events received strong positive feedback and generated requests for ongoing engagement.
- **Direct Policy Influence:** In Airth, the workshop led to tangible policy change, with a new option for intertidal habitat creation now included in the draft Falkirk Coastal Strategy 2025.
- **Shaping Local Management Decisions:** In Hesketh, Co-Opt insights directly informed the Our Future Coast project (a Defra-funded Flood and Coastal Resilience Innovation Programme initiative), supporting the design of practical, innovative flood resilience measures for the North West of England.



Images from the community-led coastal adaptation workshops.

KEY PROJECT OUTPUT: COMMUNITY-LED COASTAL ADAPTATION WORKSHOPS.

The Co-Opt project convened two deliberative workshops in Airth (Scotland) and Hesketh Out Marsh (England) to support place-based coastal decision-making. These events brought together diverse national, regional, and local stakeholders to examine project-generated data, improve transdisciplinary understanding, and address real-world coastal management challenges. The workshops revealed substantially differing viewpoints around the implementation of NBS, despite broad appreciation for the evidence presented. Key challenges identified included the need for:

- **Better integration of system complexity and interactions, e.g. multiple types of flooding.**
- **Improved treatment of uncertainty in planning.**
- **More nuanced consideration of future scenarios in the design of soft defences.**

Key Policy Recommendations:

1

Address Grey Bias in Financing:

The way finances are allocated for projects is still often biased towards grey solutions (i.e. hard engineering) due to existing rules and assessment used.

2

Acknowledge that Decisions are Made Under Uncertainty:

Since it's impossible to eliminate all unknowns when making decisions, it's crucial to account for different types of uncertainties: those due to randomness (aleatoric), those due to a lack of knowledge (epistemic), and those related to how our own understanding influences the situation (reflexive).

In Summary

The Co-Opt project has made a substantial contribution to the development of sustainable, nature-based approaches to coastal management in the UK. Through its interdisciplinary framework and place-based case studies, it has generated new knowledge, tools, and policy-relevant insights that support the transition from hard 'grey' infrastructure to softer, 'green' solutions.

While several key outputs are still being taken forward, Co-Opt has already provided crucial evidence to inform coastal adaptation strategies, engaged directly with policy and community stakeholders, and created a foundation for more resilient, inclusive coastal decision-making across the UK.



Integrating Diverse Values Into Marine Management

Principal Investigators

Prof Steve Fletcher (University of Portsmouth) and Prof Tim Acott (University of Greenwich).

Project Partners

University of Portsmouth, University of Greenwich, Cardiff University, University of Liverpool, University College London, University of the Highlands and Islands, Marine Conservation Society, New Economics Foundation, Howell Marine Consulting, Ocean Conservation Trust, Company of Makers.

Introduction

The Diverse Marine Values project sought to revolutionise how marine governance in the UK understands and integrates a broad spectrum of ecological, socio-cultural, and locally-held values. Traditionally, marine policy has prioritised economic and environmental metrics, often marginalising less tangible values such as cultural heritage and lived community experiences. This project aimed to bridge that gap by creating a transdisciplinary framework that harmonises scientific, social, arts-based and community-based knowledge systems.

Through mixed-methods research, extensive community engagement, and institutional collaboration, Diverse Marine Values has worked to surface lesser-heard voices, explore challenges in policy inclusion, and build capacity for more holistic and inclusive governance. The overarching vision is a marine policy system that recognises and respects the diverse values people hold for their coastal and marine environments, ultimately supporting sustainable, equitable, and place-based marine management.

KEY PROJECT OUTPUT: TRANSDISCIPLINARY METHODS GUIDE

A forthcoming guide will document the Diverse Marine Values project's approach to integrating arts-based and traditional social science methods in marine governance. Designed for use by policymakers, practitioners, and researchers, it offers practical guidance on implementing creative, inclusive strategies for surfacing community values and applying them within decision-making processes. This resource, supplemented by a podcast series, will support efforts to embed transdisciplinary thinking and values-based engagement in marine management across the UK.

Capturing and Communicating Diverse Marine Values

AIMS

- Surface underrepresented community voices in marine governance.
- Bridge the gap between stakeholder values and policy processes.
- Develop inclusive methodologies that inform real-world decision-making.

IMPACT

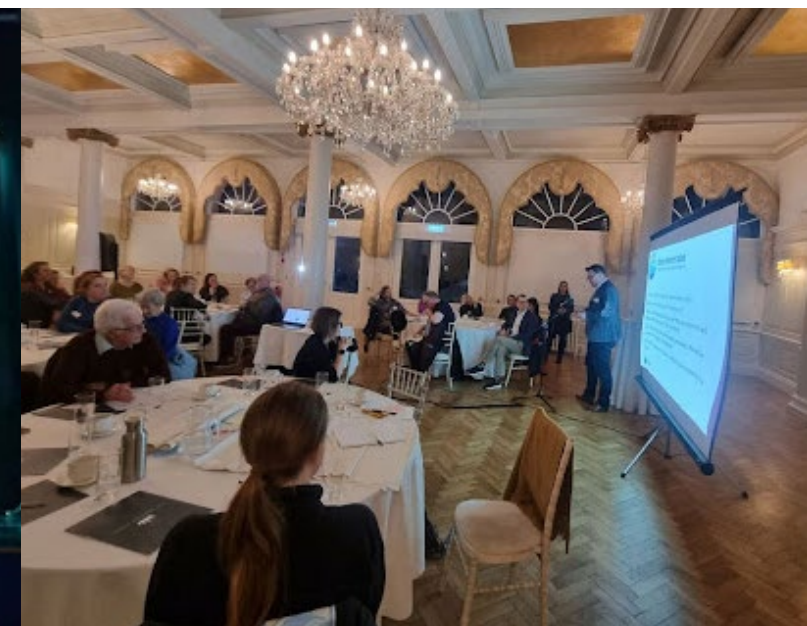
- **Integrating Art and Science for Ocean Engagement:** The project combined creative and conventional research approaches to capture both quantitative data and qualitative cultural values. Arts-based methods included Community Voice Method (CVM), legislative and forum theatre, digital storytelling, and photo essays. These were complemented by over 900 ocean literacy survey responses, institutional capacity workshops, and in-depth interviews. This integrated approach allowed the team to explore stakeholder perspectives across diverse geographies: urban (Portsmouth), catchment (Chepstow) and island (Shetland). Through immersive workshops and performances, communities were empowered to articulate their relationships with marine environments, and engage in co-created governance conversations.
- **Grounding Marine Values in Practice:** The team developed a series of evidence reports examining six marine decision case studies across the three research sites to examine opportunities for the incorporation of more diverse marine values. These case studies helped ground the project's values framework in real-world policy contexts.

Left image: Shetland Arts Performance

This picture captures a performance by Shetland Arts youth group following a week-long marine-focused children's theatre workshop in April 2023. This workshop provided a platform for wider and more accessible sharing of research findings, not bound by literacy, jargon or expert knowledge. The youth group continued to construct their performance in the absence of the researchers, who returned in December to capture the impact of this process.

Right image: CVM film screening and workshop

This photograph captures a Portsmouth CVM film screening and workshop that took place in March 2024. This event was attended by stakeholders, including local authorities and residents, conservation groups, tourism and trade organisations. The film titled 'Tides of Change' was screened, and discussions followed. This was an important event for the project as it created local awareness and impact for attendees through open dialogue, capturing a range of intangible values and a variety of opinions. Portsmouth City Council found it to be so valuable, they requested an additional screening specifically for Councillors for later in the year.



Participatory Engagement Across Scales

AIMS

- Understand place-specific marine values through participatory arts-based research..
- Identify governance challenges and opportunities for policy integration.

Exhibition: Echoes of the Shore, new horizons for marine research and management

The exhibition curated by researchers at the University of Portsmouth combines the research of partners across 12 universities and marine organisations showing how a diverse range of research methods have been used to reveal community-held marine values across three test-site locations: Portsmouth, Chepstow and the Shetland Islands as part of the Diverse Marine Values project. The content of this exhibition is an assemblage of these research approaches, processes and findings, and their inherent characteristics, which make them well-suited for marine management. This immersive exhibition displayed how arts-based research methods can be used to enhance marine decision-making and ocean literacy through more inclusive and engaging processes, exploring new horizons for marine research and management.

IMPACT

- **Multi-Level Engagement to Surface Marine Values:** Stakeholder engagement involved over 180 local participants and policy stakeholders including MMO, Defra, Natural England, and devolved government marine directorates. This multi-level approach helped generate a holistic understanding of marine values across communities and institutions. Highlights included:
 - A theatre-based youth engagement programme in Shetland, culminating in a community performance developed independently by young participants.
 - Portsmouth's CVM film screening, which inspired local policy dialogue and led to a dedicated council screening supporting the city's 'Motion for the Ocean'.
 - The immersive "Echoes of the Shore" exhibition, showcasing findings from all test sites and demonstrating the power of arts-based approaches in marine management.
- **Educational Outreach Through Performance:** The project's theatre workshops were integrated into academic curricula, engaging MSc students at the University of Portsmouth and a wide range of public audiences at conferences and community events.



KEY PROJECT OUTPUT: PODCAST SERIES

This eleven-episode podcast series shares reflections and lessons from the Diverse Marine Values team on practicing transdisciplinary marine research. Featuring interviews with researchers and practitioners, the series offers insights into the challenges, breakthroughs, and unexpected outcomes of using participatory and creative research methods to shape policy. Designed for a broad audience, the podcast provides a behind-the-scenes look at what it takes to co-create inclusive ocean governance.

Key Policy Recommendations:

- 1 Integrate Diverse Values into Decision-Making:**
Move beyond economic valuation to consider cultural, ecological, and community-held values.
- 2 Build Structural Capacity for Transdisciplinarity and Co-Creation:**
Embed inclusive engagement and creative methodologies into institutional marine governance frameworks. Empower communities through participatory methods like CVM and theatre to meaningfully shape policy outcomes.
- 3 Reform Governance Structures:**
Address the fragmentation of marine policy that hinders the inclusion of diverse marine values.

In Summary

The Diverse Marine Values project has demonstrated that integrating participatory methods with rigorous arts-based and social research can reshape marine governance. Its success lies in bridging local knowledge and national policy processes, from influencing Portsmouth's ocean initiatives to supporting the development of England's Ocean Literacy Strategy. This work reveals both opportunities and challenges: while the tools and methods to incorporate diverse values exist and are effective, structural barriers remain entrenched. Fragmented policy landscapes and dominant economic paradigms still limit the uptake of alternative value systems. However, the project provides a replicable model for breaking down those barriers.



Marine Spatial Planning Addressing Climate Effects (MSPACE)

Principal Investigators

Prof Ana Queirós (Plymouth Marine Laboratory), Dr Océane Marcone (PML), Dr Simon Mair (University of York), Dr Marija Sciberras (Herriot Watt University), Prof Gina Reinhardt (University of Essex), Dr Susan Kay (PML), Prof Matt Frost (PML), Dr Philip Boulcott (Marine Scotland Science), Dr Liz Talbot (PML), Prof Nicola Beaumont (PML), Dr Kate Morris (Herriot Watt University) and Dr Alberto Roca Florido (University of York).

Introduction

Marine Spatial Planning (MSP) in the UK is evolving to meet the growing need for climate-resilient management of marine space. Traditionally non-spatial in design, marine planning has shifted toward spatial approaches to better guide licensing, resolve cross-sectoral conflicts, and support policy objectives. The MSPACE project was conceptualised to bridge a critical implementation gap: while UK marine plans have long included climate change objectives, they lacked practical mechanisms for incorporating nature-based climate change adaptation and mitigation evidence in decision-making.

MSPACE sought to embed climate-smart decision-making in marine planning by collaborating directly with policy and industry stakeholders, including those with statutory responsibilities for MSP across the UK. The project focused on co-developing tools and evidence that enable integration of climate change considerations into real-world marine planning processes. Its outputs are designed to help future planning decisions better support the sustainable use, conservation, and climate resilience of marine ecosystems and sectors across the UK's Exclusive Economic Zone.

Project Partners

University of Essex, University of York, Heriot-Watt University, Joint Nature Conservation Committee (JNCC), Centre for Environment, Fisheries and Aquaculture Science (CEFAS), Agri-Food and Biosciences Institute, Marine Scotland, Marine Climate Change Impacts Partnership (MCCIP), Marine Management Organisation (MMO), Natural Resources Wales, Seas the Opportunity, Eastern England Fish Producers Organisation, Scottish Pelagic Fishermen's Association, Ørsted.

KEY PROJECT OUTPUT: ASPACE

The Artificial Intelligence-Assisted Spatial Planning and Climate Evidence (ASPACE) tool is the flagship deliverable of MSPACE co-developed with our stakeholders. ASPACE is an interactive web-based platform that enables marine planners and stakeholders to:

- Create and compare alternative spatial management scenarios.
- Compare climate modelling data, economic analyses, and social value metrics for explored scenarios.
- Score scenarios against ecological, economic, and social criteria.

The tool will be publicly available from the end of 2025. It is expected to be a key enabler of climate-smart marine planning in the UK and beyond.

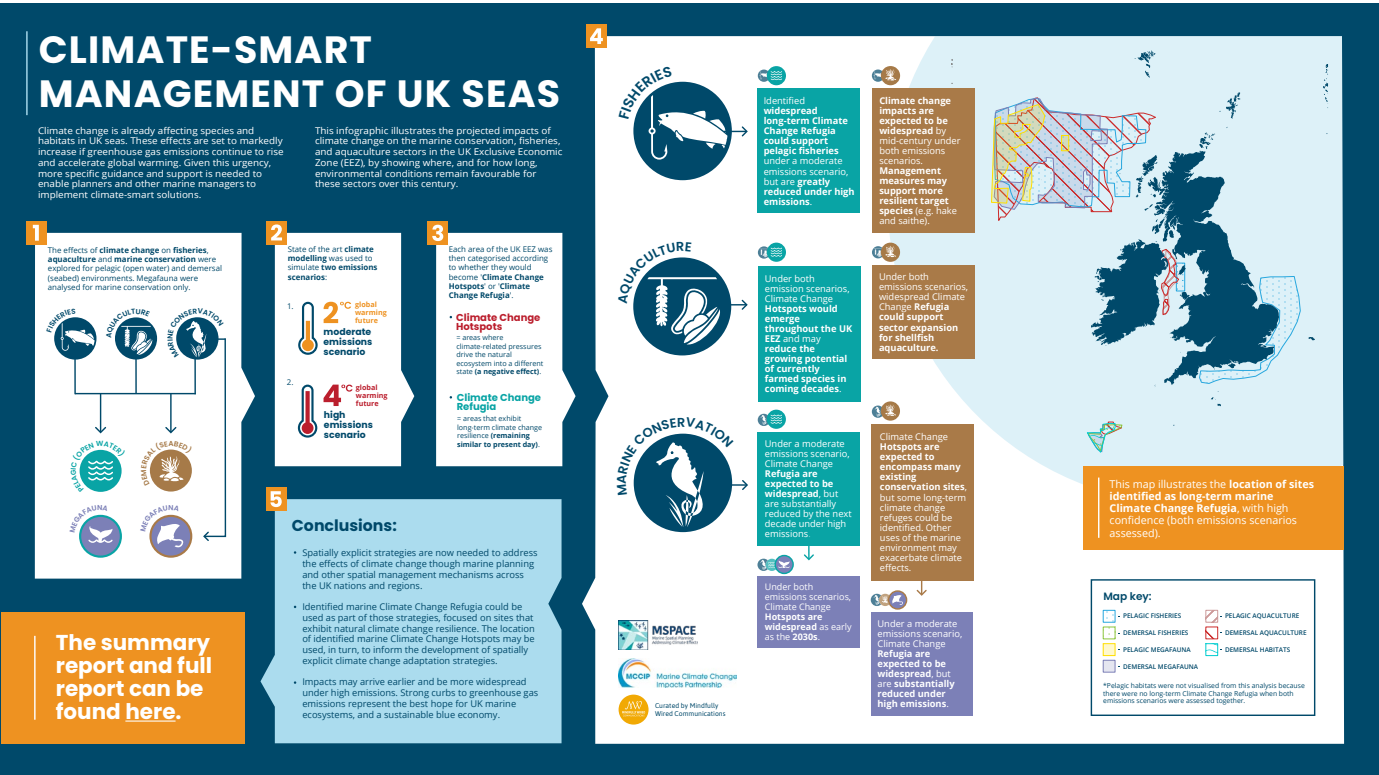
Climate Smart Planning Tools and Evidence

AIMS

- Translate climate change evidence into formats usable within marine planning.
- Identify areas that qualify as climate refugia and hotspots relevant to marine conservation, fisheries, and aquaculture.
- Support the co-creation of alternative marine planning scenarios aligned with ecological, economic, and social priorities.

IMPACT

- **Early Warning System:** MSPACE developed a nationally relevant climate-smart Early Warning System for MSP. The system highlights future spatial dynamics of marine species and habitats under climate change, identifying marine climate change refugia and vulnerable hotspots. Created in collaboration with the MCCIP, MMO, Orkney Islands Council, DAERA, NRW and industry partners, the system supports proactive planning for sectors such as conservation, aquaculture, and fisheries. Its outputs are publicly available through the MCCIP website and include a technical report, geospatial data, a policy summary, webinar, and an infographic.
- **Economic Modelling Innovation:** MSPACE produced the UK and Selected Regions Marine Focused Input-Output Tables (UK+SRMFIOT v.1) - a novel economic modelling tool that supports integrated planning by quantifying the economic footprint of marine sectors under management scenarios. When used in conjunction with climate change evidence to explore alternative management scenario effects (as done in MSPACE) it enables planners to explore sectoral trade-offs, assess future viability, and promote a balanced blue economy. Its outputs include a publicly available report and a scientific journal article published in Sustainable Development.



The infographic developed to explain the development and utility of the climate-smart Early Warning System for marine spatial planning.

Stakeholder Engagement and Scenario Co-Development

AIMS

- Ensure MSPACE tools and outputs are co-produced with, and are usable by, the marine planning community and adjacent regulatory bodies and practitioners.
- Support collaborative creation and exploration of future marine planning scenarios.

IMPACT

- **Co-Design Workshops:** Between 2023-2025, MSPACE held numerous dedicated hybrid workshops across the UK Nations to gather insights from Marine Spatial Planning communities and stakeholders on marine planning, key sectors and climate change. The workshops offered a valuable opportunity to co-design MSPACE's work as the project progressed, and helped build a community of practice in climate-smart marine planning centred around MSPACE activities. Reports from initial case-study workshops detail insights gained at an early stage. The co-delivered workplan has already informed policy and marine plan reviews.

Policy Influence and International Recognition

AIMS

- Influence national and regional marine policy through applied research and co-developed evidence.
- Contribute to international dialogues and frameworks for climate-smart marine spatial planning and position the UK as a global leader in adaptive, climate-resilient ocean governance.

IMPACT

- **Shaping UK marine policy and planning processes:** MSPACE co-developed evidence that has informed the MMO's East Marine Plan review, advised Defra and JNCC on new MPA designations in England, supported DEFRA's development of Fisheries Management Plans for the Celtic Sea and Western Channel, informing the Crown Estate's strategic marine planning activities, and is working with Orkney Islands Council, DAERA and Welsh Government on future solutions for climate change adaptation and mitigation in their national and regional waters.
- **Becoming an international best-practice case study:** MSPACE's work has been featured in the UNESCO-IOC's forthcoming MSP global guidance and endorsed by the UN Ocean Decade as a flagship Action. The MSPACE project team has participated in UN advisory boards and international MSP forums, and contributed to global research on climate-smart MSP through ICES collaborations and published opinion pieces.

Professor Ana Queirós (far right) representing the MSPACE project at the United Nations Ocean Conference (UNOC).



Key Policy Recommendations:

1

Make UK Marine Plans Spatial:

Marine plans in the UK must be empowered with spatial authority to directly influence sectoral decisions and licensing processes, enabling effective implementation of climate-smart policies.

2

Integrate Marine Planning into Sectoral Policy:

Marine planning should be a central driver of climate adaptation across all marine sectors. Closer coordination between planning authorities, Defra, National Energy and Climate policy and industry regulators is essential.

3

Build a UK Community of Practice:

Establish a UK-wide platform for knowledge-sharing, data integration, and coordinated action on climate-smart MSP across UK nations and regions.

In Summary

MSPACE is building the foundations for a more adaptive and resilient marine planning system in the UK. Through deep stakeholder engagement, co-developed research and policy products, innovative modelling, and the development of ASPACE, the project has brought climate change to the heart of marine planning. While the full impact of MSPACE is still unfolding, its outputs are already being adopted by national and regional policy agencies and influencing international marine spatial planning guidance. MSPACE demonstrates how science-policy collaboration can drive transformative change, equipping the UK to meet its marine climate resilience goals with evidence-based, socially-attuned spatial planning.



Pyramids of Life (PoL)

Principal Investigators

Prof Jon Pitchford, University of York, Dr Gustav Delius (University of York), Dr Michaela Schratzberger (Cefas), Dr Murray Thompson (Cefas), Dr Silvia Ferrini (UEA), and Dr Rosalind Bark (UEA).

Introduction

Sustainable fisheries aim to meet present-day seafood needs without compromising the health of marine ecosystems or the livelihoods they support. Yet achieving this balance remains challenging due to rising consumer demand, ecological complexity, and policy frameworks that often focus on single species rather than whole ecosystems.

The Pyramids of Life (PoL) project set out to address these challenges through an innovative core concept: combining ecological biomass pyramids with pyramids of human need and environmental pressure. By linking trophic dynamics and energy flows in marine ecosystems to societal values and

Project Partners

Centre for Environment, Fisheries and Aquaculture Science (Cefas), University of York, University of East Anglia, University of Roehampton, Waitrose, Seafish, National Federation of Fishermen's Organisations, Scottish Pelagic Fishermen's Association, Kent and Essex IFCA.

consumer behaviour, the project provided a new lens for understanding sustainability and for influencing policy and practice.

Through data synthesis, participatory research, and interdisciplinary modelling, the project aimed to create robust, accessible tools and narratives to support sustainable, nutritious, and affordable seafood systems.

Public-facing web page for the Interactive Management App for the Celtic Sea.



KEY PROJECT OUTPUT: INTERACTIVE MANAGEMENT APP FOR THE CELTIC SEA

PoL developed a web-based, user-friendly app designed to support stakeholders such as fishers, policy-makers, and local managers to explore the ecological outcomes of different fishing scenarios. The app integrates gear- and size-specific data with species interactions, enabling users to assess impacts on the ecosystem under various management options. This tool bridges the gap between robust ecological modelling and accessible decision-making, providing an innovative platform to visualise trade-offs and support Fisheries Management Plan development. Co-developed with MMO and Defra, it is already being applied in the Celtic Sea FMP process and offers a model for broader application in UK fisheries governance.

Influencing Fisheries Management

AIMS

- Embed ecological realism in UK fisheries management using the PoL framework.
- Inform the development of Fisheries Management Plans (FMPs) through co-developed evidence and decision-support tools.

IMPACT

- **Consumer Insights to Inform Policy and Practice:** Working closely with MMO and Defra, PoL contributed directly to the development of the Celtic Sea FMPs. The project co-created ecosystem-scale models that account for interlinked pelagic and demersal species, grounded in robust species-level parameterisation. Importantly, PoL developed an open-access, user-friendly app (see 'Key Project Output' box above) to allow non-specialists to explore fishing scenarios and ecological outcomes interactively.
- **Shaping Policy with Ecosystem-Informed Scenarios:** Evidence from PoL scenarios has been considered in draft policy documents, setting a new precedent for ecosystem-informed fisheries planning in the UK.

Shifting Behaviour and Promoting Sustainability

AIMS

- Understand and influence consumer choices around seafood.
- Foster trust and sustainability through behavioural nudges, public outreach, and policy engagement.



IMPACT

- **Consumer Research to Support Policy and Behaviour Change:** PoL conducted extensive consumer surveys and nudge experiments across three UK universities, followed by a national rollout. Findings are informing both academic publications and policy-facing materials, including briefs for catering managers and strategic stakeholders.
- **Leading Stakeholder Dialogue and Public Outreach at ENVECON 2024:** At ENVECON 2024, the UK's flagship environmental economics conference, PoL led a plenary session uniting stakeholders from the Marine Management Organisation (MMO), National Federation of Fishermen's Organisations (NFFO), and the Marine Conservation Society (MCS). The team also delivered community outreach in collaboration with the Ocean Conservation Trust, National Marine Aquarium, Eden Project and York Festival of Ideas. Three animations have been developed to translate key sustainability principles for wider public audiences.

Connecting Theory, Data and Policy

AIMS

- Integrate ecological, economic, and nutritional data into practical fisheries guidance.
- Develop policy-relevant indicators and frameworks rooted in ecosystem understanding.

IMPACT

- **Advancing Ecosystem Monitoring in Fisheries Policy:** PoL provided evidence to OSPAR and ICES, supporting the adoption of feeding guild assessments as indicators of ecosystem status. Similar metrics are now embedded in the Celtic Sea fisheries management app used by Defra and the MMO.
- **Counterfactual Analysis of Sustainable Fisheries:** In parallel, PoL conducted a counterfactual analysis of late-2010s fisheries scenarios, showing how alternative strategies could have improved sustainability and nutritional outcomes without revenue loss. This work bridges theory and practice, offering tangible illustrations of more balanced, resilient harvesting approaches.

Prof Jon Pitchford (third from right) representing the Pyramids of Life project on a panel at ENVECON 2024.



Key Policy Recommendations:

1

Embed Ecological Models in Fisheries Policy

Move beyond a single-species frameworks to integrated, ecosystem-based management tools.

2

Support Behavioural Interventions for Consumers:

Encourage policy that enables retailers and institutions to nudge consumers toward more sustainable seafood.

In Summary

PoL offered a holistic framework for visualising and quantifying how consumer choices cascade through fishing pressure to shape ecosystems. From shaping national fisheries policy to testing consumer nudges and launching public outreach, the project exemplifies the power of interdisciplinary, stakeholder-driven research. While some outputs are still maturing, the project has already influenced policy through its modelling and tools, supported international indicator development, and begun shifting public and industry conversations around seafood. As the UK moves toward more adaptive, resilient ocean governance, PoL offers a compelling example of how systemic thinking, broad partnerships, and creative communication can fuel change.



Research students reviewing the outcome of a Q-methodology consumer-behaviour survey exploring the supply and consumption of fish.

Restoration of Seagrass for Ocean Wealth (ReSOW)

Principal Investigators

Dr Claire Evans (National Oceanography Centre), Dr Leanne Cullen-Unsworth (Swansea University), Dr Richard Unsworth (Swansea University), Prof James Bull (Swansea University), Prof Danny Campbell (University of Stirling) and Dr Richard Lilley (Project Seagrass).

Project Partners

Project Seagrass, the National Oceanography Centre, the Marine Management Organisation, Natural Resources Wales, the Environment Agency, the Global Oceans Accounts Partnership, the Centre for Climate, the Environment and Chronology, Natural England and the Scottish Coastal Communities Network and the Universities of Cardiff, Swansea and Stirling.

Introduction

Seagrass is a critical marine ecosystem, playing a crucial role in supporting coastal biodiversity, water quality, and climate change mitigation. However, it has been rapidly depleted since the industrial revolution, with losses of up to 95% in some areas. Restoring seagrass beds across their historical range would not only reap significant benefits for national biodiversity, but could also make significant headway towards meeting the UK's legislative obligations and

targets for ecosystem restoration, on which meaningful progress has yet to be made. ReSOW's primary goal was to develop a practical pathway for seagrass restoration to achieve the UK's biodiversity targets by addressing critical knowledge gaps.

NATIONAL BIODIVERSITY COMMITMENTS

The UK has committed to a number of legally binding National Biodiversity Targets, which include restoring and/or creating over 500,000 hectares of wildlife-rich habitat by 2042 in England. This is an addition to the commitment the government has made to meet the Convention on Biological Diversity's 30 by 30 target: to ensure that by 2030 at least 30% of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration.



Mapping Habitat Suitability and Ecological Value

AIMS

- Accurately determine the current distribution of seagrass populations and identify suitable locations for restoration, considering both environmental and socio-economic factors.
- Quantify the role of seagrass in providing essential ecosystem services like blue carbon sequestration, supporting biodiversity and fisheries, and contributing to food security.



IMPACT

- **Improved Seagrass Mapping:** Enhancements to methods for mapping seagrass using optical satellite imagery revealed a more complete picture of the extent of seagrass habitat in the UK, a necessity for effective conservation and restoration planning.
- **Habitat Suitability Models:** Models are now available to identify optimal locations for seagrass restoration, considering current and future environmental conditions under climate change.
- **Carbon Hotspot Maps:** Areas within seagrass ecosystems with high carbon storage and sequestration capacity have been mapped to guide carbon-focused restoration efforts.
- **Fisheries Resident Index:** An index was created to assess the role of seagrass in supporting commercially important fish species.

KEY PROJECT OUTPUT: COASTAL ECOSYSTEM ENHANCEMENT DECISION SUPPORT TOOL (CEEDS TOOL).

This comprehensive online mapping tool shows seagrass distribution, habitat suitability, carbon hotspots, fisheries data, marine protected areas and data on societal values. It allows users to visually appraise the health of seagrass populations, understand the success of different restoration projects and identify promising sites for future restoration or conservation. A beta version is currently accessible, with further layers to be added. The decision support tool has garnered significant interest and is being adapted for practical use by organisations such as The Crown Estate.



Social Perceptions and Cultural Value

AIMS

- Investigating the general public's awareness and appreciation of seagrass, including their willingness to support restoration efforts.

IMPACT

- Understanding of Public Awareness and Perceptions:** Social research undertaken by the team revealed that although public awareness of seagrass itself might be limited, there is a clear appreciation for coastal biodiversity and a willingness to pay for its restoration, especially among those who actively use the coast.

Policy and Governance

AIMS

- Understanding the political challenges and obstacles associated with seagrass restoration.
- Strengthening stakeholder commitment to seagrass restoration through stakeholder engagement and policy influence.

IMPACT

- Knowledge Exchange:** Through workshops and consultations, ReSOW fostered knowledge exchange and cross-sectoral discussions among stakeholders. These illuminating discussions outlined the political challenges and obstacles associated with seagrass restoration, such as licensing issues and conflicting coastal uses, and how these relate to management and governance.
- Policy Influence:** ReSOW engaged actively with policymakers through the delivery of policy briefs and participating in discussions on sustainable marine policies to promote a policy narrative that supports seagrass restoration as a nature-based solution for climate resilience and marine biodiversity enhancement.
- Outreach and Global Representation:** ReSOW's impact extended to international stages, with project findings presented at high-level events including COP28, the All-Party Parliamentary Group (APPG) for the Ocean, the Global Dialogue on Ocean Sustainability in Bali and the International Seagrass Biology Workshop in Naples.



KEY PROJECT OUTPUT: UK'S FIRST NATIONAL SEAGRASS OCEAN ACCOUNTS FRAMEWORK.

Recently supplied to the Office of National Statistics (ONS), the Seagrass Ocean Accounts represents a holistic accounting of the ecosystem services provided by seagrass habitats, covering carbon sequestration, fisheries support, and cultural values. This framework, developed in consultation with the Global Ocean Accounts Partnership and the ONS, aligns with the UN-endorsed System of Environmental-Economic Accounting (SEEA). It serves as a benchmark for future assessments, providing a critical tool for sustainable marine policy. The creation of the world's first national seagrass accounts framework positions the UK as a leader in natural capital accounting.

Key Policy Recommendations:



Address Barriers to Restoration:

Bottlenecks hindering seagrass restoration, such as complex licensing processes and conflicting coastal uses, must be actively addressed.



Increase Financial Investment in Restoration and Protection:

Increased financial support for seagrass restoration initiatives is crucial, alongside efforts to address the root causes of seagrass loss, such as poor water quality. Alongside this, holding polluters accountable for negative impacts on seagrass health is essential for long-term success.

In Summary

The ReSOW project has significantly advanced the understanding and practical application of seagrass restoration in the UK. New outputs from the project are continuing to be produced and refined, meaning its full impact has not yet been realised, but it has already succeeded in providing valuable evidence and toolkits to policymakers and practitioners working to strengthen and support capacity for seagrass restoration in the UK.



Resilience of Coastal Communities (ROCC)

Principal Investigators

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Project Partners

Marine Management Organisation, Natural England, Cornwall Council Historic Environment Team, Cornwall Rural Community Charity, Sole of Discretion, Devon Maritime Forum, Exe Estuary Management Partnership, National Maritime Museum Cornwall, Kaleider, Mindfully Wired, A-side.

Introduction

Coastal communities are facing an era of rapid and uncertain change. Climate and ecological pressures, post-Brexit transitions, and the social and economic impacts of the Covid-19 pandemic have all highlighted the vulnerability of stakeholders and communities that depend on the sea. The Resilience of Coastal Communities (ROCC) project set out to understand how marine resource-users (such as fishers, coastal tourism businesses, and maritime community groups) experience and respond to these changes, and how resilience can be supported in effective and equitable ways.

ROCC focused on the trade-offs that lie at the heart of marine policy and planning: between environmental goals and community wellbeing,

between short-term stability and long-term sustainability, and between different visions of the future. The project worked closely with stakeholders across the UK to explore how decisions are made, how resilience is understood in practice, and how it could be strengthened without increasing inequality or undermining other important social and cultural values, including marine sustainability. Bringing together social research, policy analysis, and practitioner-led pilots, ROCC aimed to generate new evidence and practical tools that help policymakers and communities navigate complex trade-offs and support thriving, adaptable coastal communities.

Conceptualising and Mapping Current Evidence at the Nexus of Resilience, Wellbeing and Sustainability

AIMS

- Develop a new 'nexus approach' to marine policy and management that encompasses the responses of diverse marine resource-users to disturbance events; how their resilience intersects with their wellbeing and engagement with sustainability, and what they value as important for maintaining and improving nexus outcomes.
- Map evidence gaps and hotspots in UK marine research on human resilience and its links to wellbeing and sustainability.

IMPACT

- **Resilience nexus concept:** A conceptual paper and graphic to centre resilience in marine policy and planning alongside human wellbeing and sustainable use of marine resources.
- **Systematic evidence mapping:** Production of a policy brief and online interactive map of existing research on resilience, human wellbeing and marine sustainability around the UK coast.



Graphic developed to explain the 'Resilience Nexus' concept to policy makers and public audiences.

Responding to Change and Disturbance in the Past and Present

AIMS

- Assess how marine users have responded to threats and change over the past 50 years, with a view to establishing how the past may influence present-day responses and how human values shape resilience to change.
- Explore how marine users build resilience to emerging threats and a rapidly changing world.
- Understand the trade-offs that marine users experience between their resilience, their wellbeing and their impact on the marine environment.

KEY PROJECT OUTPUT: RESILIENCE EXHIBITION.

Resilience is an evocative, multi-media exhibition on the resilience of Cornwall's coastal communities - past, present and future - at the National Maritime Museum Cornwall. It is expected to engage over 100,000 visitors to the museum, and has been complemented with an invitation only launch event for participants, artists and partners, and a subsequent policy event for national, regional and local policy stakeholders.



IMPACT

- **Community and Public Engagement:** Over 200 hours of oral history data collected in six communities in southwest and northeast England (Looe, Fowey, Exmouth, Appledore/Bideford, Whitby, Withernsea) were brought to life through two major community and public engagement outputs: the Resilience Exhibition and Voices of the Exe Trail (see 'Key Project Output' boxes). Data were archived in research and public repositories to ensure access for future generations of researchers, historians, journalists and interested members of the public. The data were also integrated into a Local Council arts initiative in Exmouth, and the trail was recognised as an exemplar in the East Devon District Council's developing Placemaking Policy.
- **Collaboration with Natural England:** A new collaboration to understand how human values are impacted by disturbance and shape resilience to change, with Natural England adapting ROCC's oral history approach and protocols to collect data in two sites in northeast England.
- **Understanding Present-Day Responses to Change:** Knowledge generation on present responses to change and disturbance through: a survey of 55 fishers and 74 marine tourism operators across the Southwest UK, workshops with a range of practitioner organisations, and interviews with 24 people who participated in the survey.
- **Practitioner-Led Pilot Projects: The development of three practitioner-led pilot projects:**
 - A). Young Fishers Network to provide mentoring, training, recognition and support to young fishers.
 - B). LIFE Accreditation film to showcase the potential for new marketing app and accreditation label to support fishers' resilience and wellbeing through ethical, low-impact fishing.
 - C). Blue Doughnut to downscale doughnut economics and identify a safe and just space for small-scale fisheries.
- **Policy and Research Impact:** The research informed a policy brief on the impacts of regulatory change on resilience in fisheries, a report cited in parliamentary questions by MP Rachel Gilmour, and a keynote presentation on Transdisciplinary Research at the ICES Annual Science Conference.

Resilience exhibition hosted by the National Maritime Museum Cornwall.

KEY PROJECT OUTPUT: VOICES OF THE EXE TRAIL.

Voices of the Exe is a 2-mile walking trail along the Exe Estuary and Exmouth waterfront. The trail shares the audio stories of ten families who have a deep connection to the Exe Estuary and surrounding landscape. The trail is centred on a vibrant central mural celebrating the past, present and future of the community and is designed to be experienced in the coastscape, by scanning QR codes on trail markers and listening in situ as you walk along the estuary. The trail's audio stories provide insights into how community members who live and work with the water are navigating change in their lives and livelihoods.



The above trail map uses What3Words, a global addressing system that divides the world into 3m x 3m squares, each identified by a unique combination of three words for precise and easy location sharing.

Map of the Voices of the Exe Trail, a 2-mile walking trail along the Exe Estuary and Exmouth waterfront.

Policy and Decision-Making for Resilience to Change in the Future

AIMS

- Explore how trade-offs are made in existing marine policy and planning approaches.
- Develop a participatory decision-making framework that can be used to tackle difficult decisions, find synergies and reduce the risk of inequitable trade-offs for different groups and objectives.



IMPACT

- **Knowledge Generation:** Increased understanding of current approaches to decision-making through interviews with policy makers across marine planning, licensing, conservation, fisheries, heritage and coastal adaptation.
- **Tool Development and Testing:** Development, piloting and launch of the Marine Planning and Trade-off Analysis Tool (MaPTA) in active policy settings (see 'Key Project Output' box below).
- **Contributions to National Policy Initiatives:** Contributed to Defra, MMO and Natural England initiatives on: (i) Developing Indicators for Resilience of English Fisheries; (ii) Cultural Values of the Morecambe Bay Cockle Fishery, and; (iii) Developing a Repository for Fisheries Oral Histories. Policy briefings were also produced on 'Participatory Trade-off Analysis for UK Fisheries Management Plans' and 'Making more just marine trade-off decisions in England'.

KEY PROJECT OUTPUT: THE MARINE PLANNING AND TRADE-OFF ANALYSIS TOOL (MAPTA).

MaPTA is a low-tech decision-support tool designed to lead stakeholders through a step-by-step process to identify the trade-offs arising from management interventions. It can be used by management teams and/or with stakeholders in participatory settings to illuminate the acceptability of different trade-offs, and to identify response options to address potentially harmful or unacceptable outcomes. MaPTA was applied in a management setting by MMO to evaluate trade-offs associated with proposed management measures in the Lyme Bay Sole Fishery. It was also applied in a participatory setting with commercial fishermen, co-led by Plymouth Fishing and Seafood Association, to deliberate trade-offs associated with changes to the Authorisation system and bycatch limits under the new Bass Fisheries Management Plan. Reports co-developed with implementing partners have been circulated across MMO and FMP partners.

Key Policy Recommendations:

1

Streamline and Integrate Marine Policy Frameworks

Innovate with more streamlined and integrated policy to reduce the regulatory 'pressure' on marine users to increase their adaptive capacity in the face of multiple, intersecting challenges.

2

Support Human Agency and Adaptive Capacity

Develop tailored support for marine users to nurture flexibility and human agency as the two most important pillars of adaptive responses, and facilitate access to social support networks and organisations to support their coping responses.

3

Define Thresholds and Improve Trade-Off Transparency

Establish thresholds for unacceptable trade-offs that breach environmental boundaries as well as social foundations, and employ deliberative trade-off tools (like MaPTA) to improve the transparency and acceptability of decisions.

In Summary

The ROCC project has established a powerful foundation for transforming the integration of resilience, wellbeing and sustainability into UK marine policy and practice. By applying a novel 'nexus approach' and working closely with coastal communities, ROCC has generated tools, knowledge and relationships that will continue to shape more inclusive and adaptive marine governance. Outputs such as the MaPTA trade-off tool, pioneering oral history archives, and practitioner-led pilot projects are already informing policy and community initiatives, with further uptake anticipated across regulatory and heritage sectors. Looking ahead, ROCC's participatory frameworks and interdisciplinary insights offer a critical pathway for addressing the complex trade-offs and systemic pressures facing marine resource-users - supporting more just, resilient and sustainable coastal futures in the UK.



Conclusion

The UK coastal environment is a critical asset. Its ecological richness, economic contributions, and cultural significance make it a priority for conservation and research. Protecting and understanding this environment - and the people who live and work in it - is essential for building a sustainable and resilient future for the UK.

The SMMR programme focused on a variety of challenges arising from coastal issues and adopted a multidisciplinary approach to seeking solutions to these issues. This highly strategic funding has produced significant advances in methodologies and approaches to understanding, managing and predicting future change and how to address these challenges.

The outputs of the programme represent a significant effort to bridge the gap between marine science and policy, fostering a collaborative environment to address some of the most complex challenges facing the UK's marine resources. By integrating diverse perspectives and developing innovative tools, the programme has generated a wealth of knowledge and delivered many of the interventions needed to ensure that UK policy makers are able to improve the marine environment, evaluate trade-offs under different management scenarios, and produce sustainable and resilient outcomes for current and future generations.

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"SMMR achieved something I don't think previous marine funding programmes have done in the UK. It fostered the highest quality transdisciplinary research on our own shores and then built a community around that. Before SMMR, researchers from fields like the social sciences and the arts seemed to struggle to find their place in our major research initiatives. Now they work alongside our already world-leading natural science research community, not as an afterthought but as equals. There will be many future marine issues that challenge us, but I'm confident SMMR has dramatically increased the UK's capacity to address these. SMMR may have finished, but its legacy is a truly world class transdisciplinary research community ready to continue making a difference."

Edd Hind-Ozan (Defra)





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