



**Coast-R
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UNIVERSITY
of HULL

Energy &
Environment Institute

Coast-R Network May Webinar

Co-benefit solutions for resilient coasts

Dr Marta Meschini, University of Liverpool and Dr Elina Apine, University of St Andrews

Ocean literacy strategies for engaging communities

Dr Emma McKinley, Cardiff University

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Co-benefit solutions for resilient coasts

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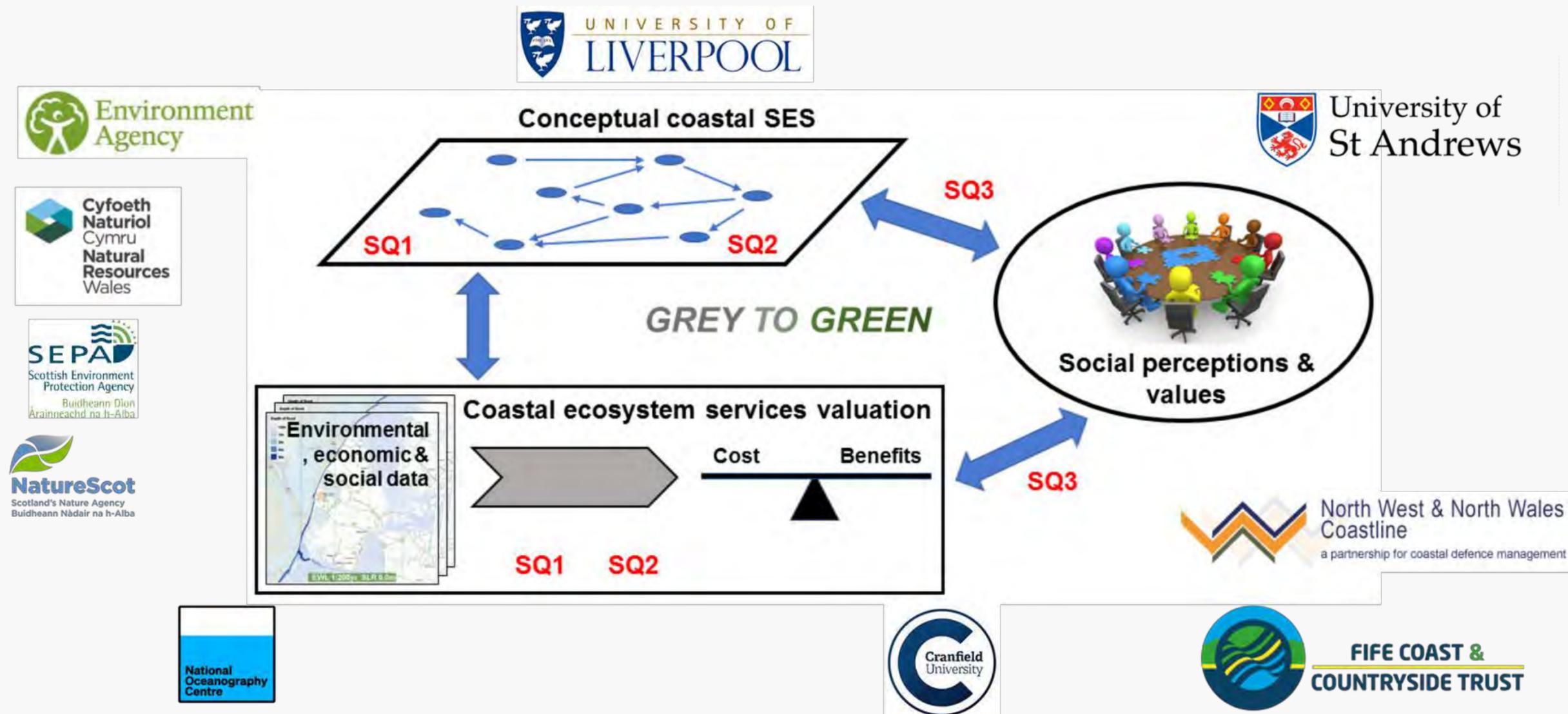
Enhancing the DPSIR+ Framework for Effective Engagement and Collaboration in Coastal Management

Marta Meschini, University of Liverpool
Elina Apine, University of St Andrews

14 May 2025
Coast-R Webinar

Resilient Coasts: Optimising Co-Benefit Solutions

Co-Opt explored what is required to support the required transition from hard 'grey' defences to softer 'green' solutions in coastal and shoreline management



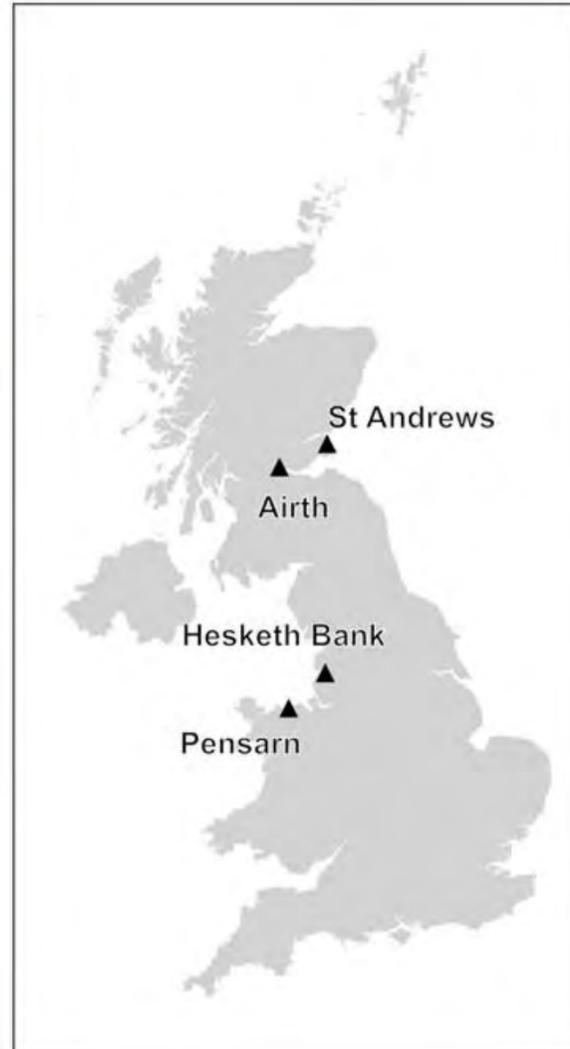
Resilient Coasts: Optimising Co-Benefit Solutions



Airth



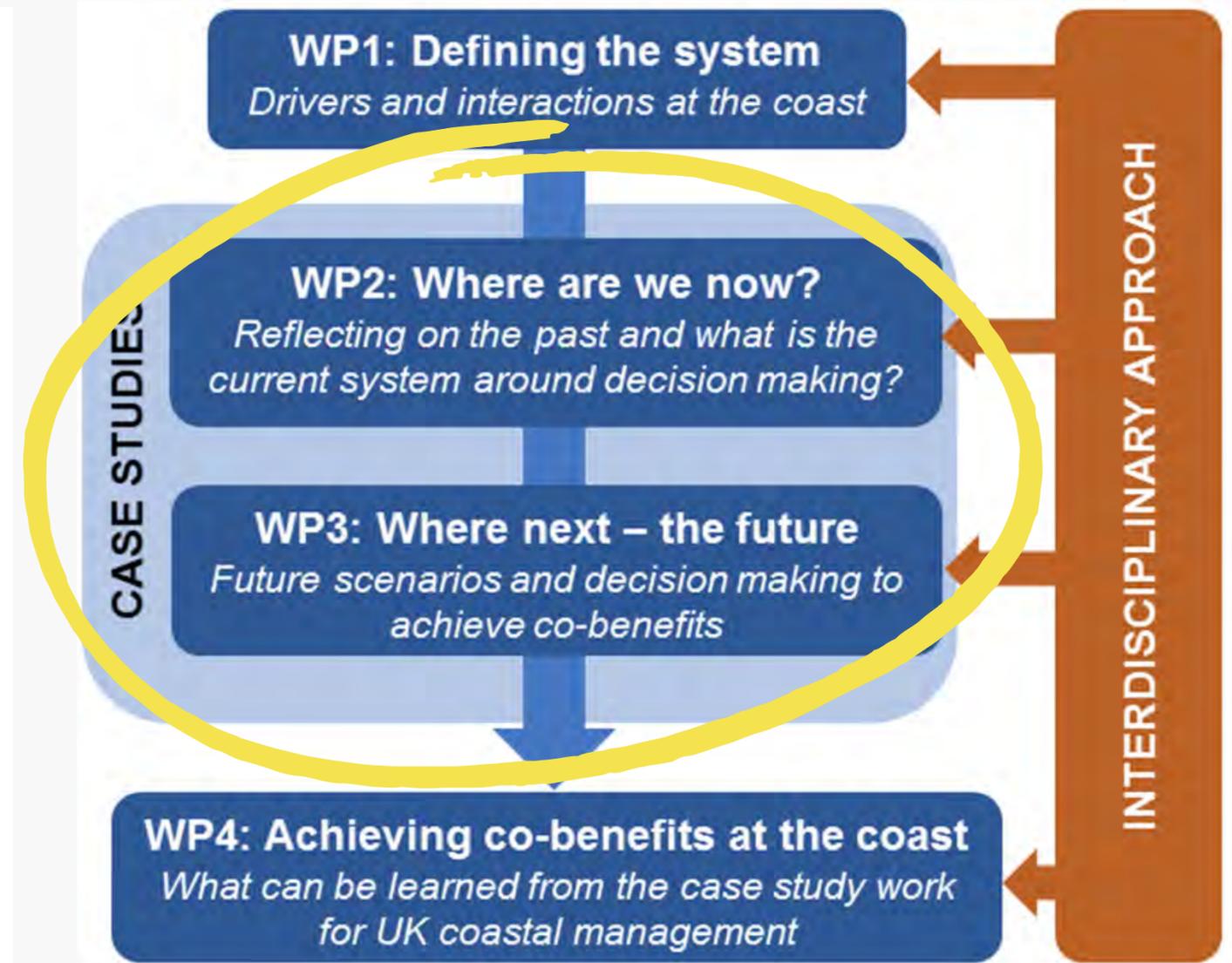
Pensarn



St Andrews



Hesketh Bank



Historical framework **Where were we?**

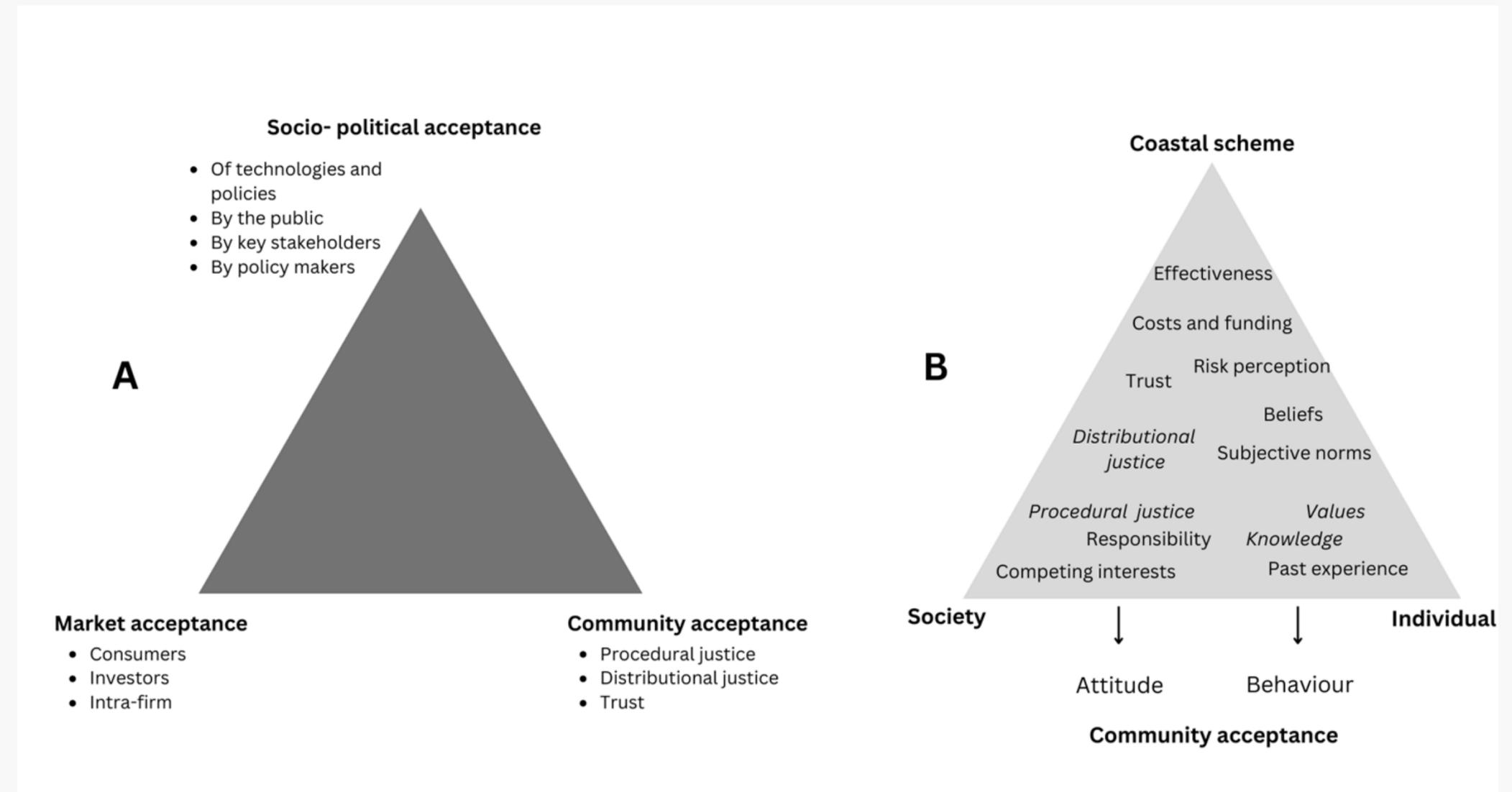
- Review of academic and grey literature, and archive materials
- Provided an overview of the historical and geographical context of the case study sites
- Highlighted changes over time



Social acceptance

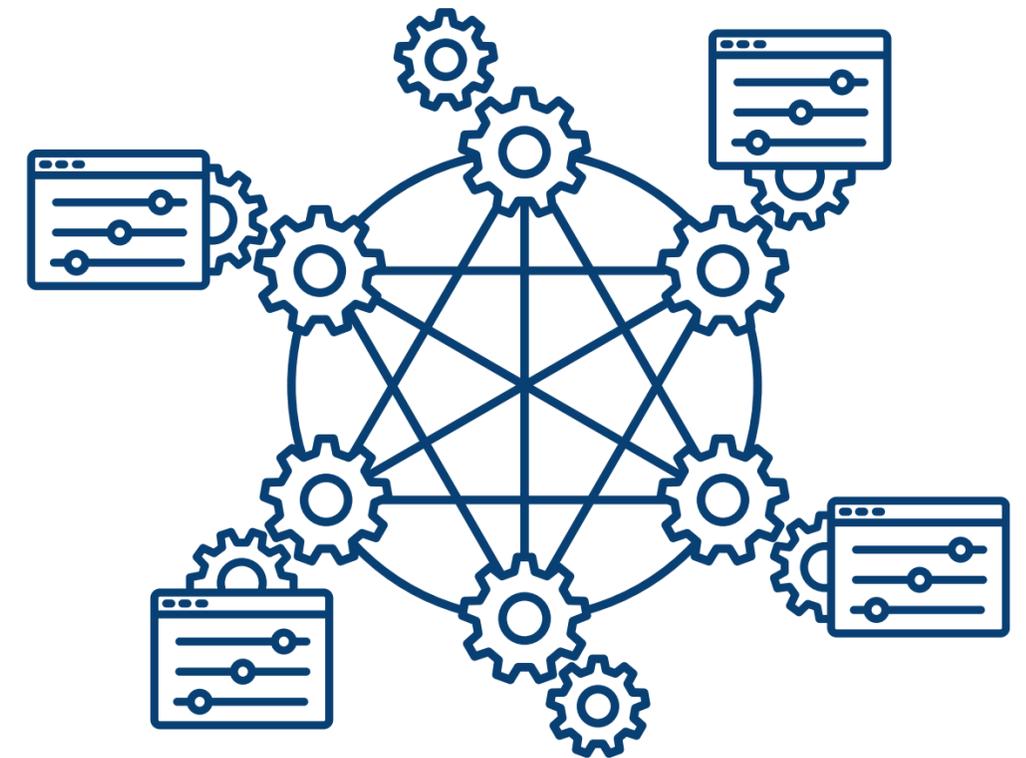
- Mixed method approach (questionnaire survey and focus groups) to explore what factors influence social acceptance of green schemes for coastal flood protection in case study sites
- Social acceptance is an attitude or behaviour towards coastal schemes on either local level (community acceptance) or broader, socio-political level

Where are we now?



Soft systems methodology **Where are we now?**

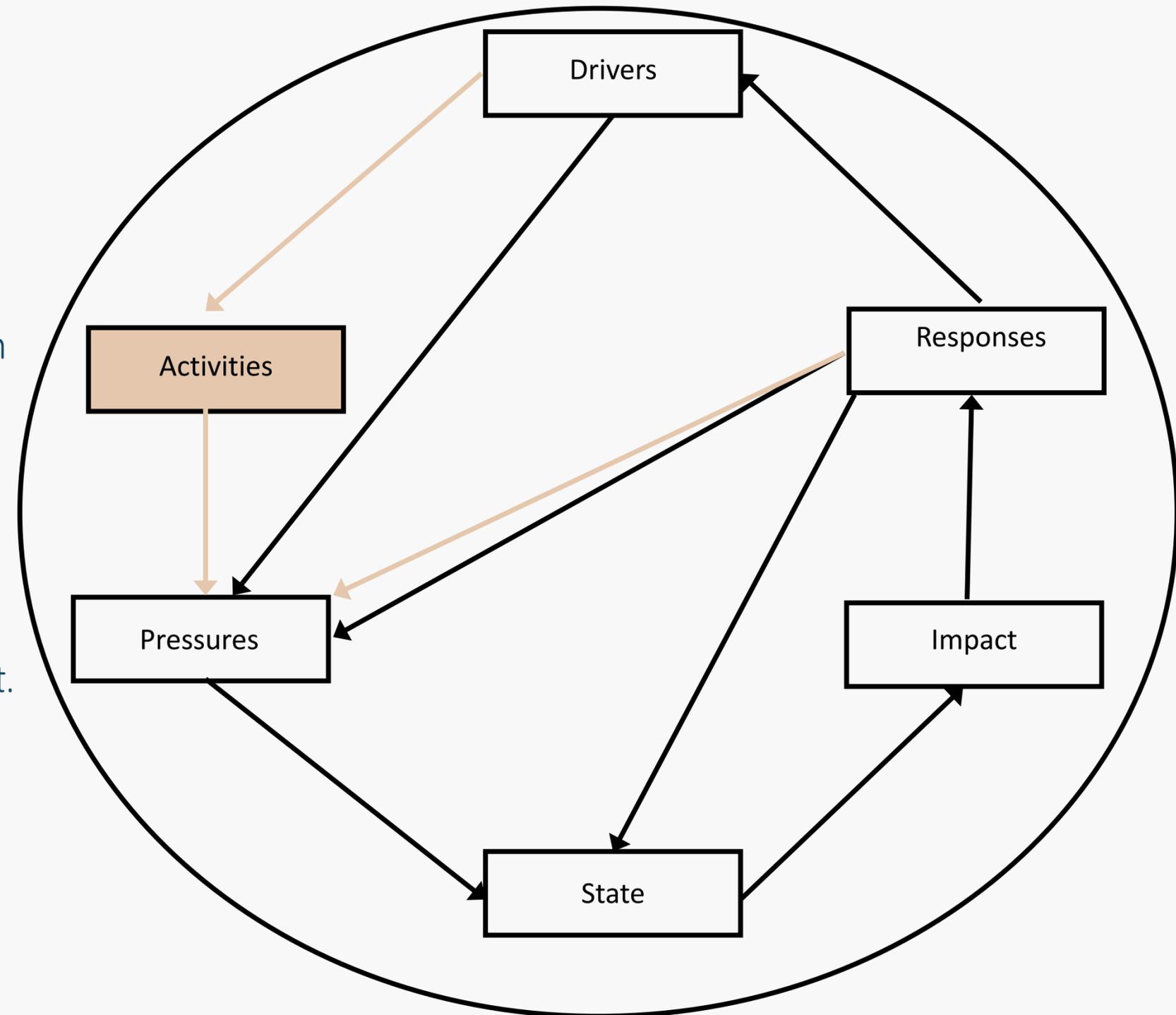
- It acknowledges that the real world is complex and messy and does not function like a system but recognises that it is useful to think about a complex set of human activities as though they were a system.
- SSM builds on ‘systems thinking’ and consists of a series of collaborative exercises (usually seven steps)
- One of the steps include describing “root definition” of the system by identifying, for example, who is part of the system, who is affected, and what the system is trying to do.



Where next and how?

Driver-Pressure-State-Impact-Responses (DPSIR) Where next and how?

- Developed in 1995 by the European Environment Agency (EEA) based on the Pressures-State-Response (PSR) model
- Identifies cause-effect relationships between human and natural systems
- Various modifications and coupling with other concepts
- Often terms lack precision and semantic agreement.



DPSIR+

Temporal dynamics

Historical framework

Shows how pressures, impacts, and responses evolve over time

Social acceptance

Plays a pivotal role in the practical implementation and sustainability of environmental interventions

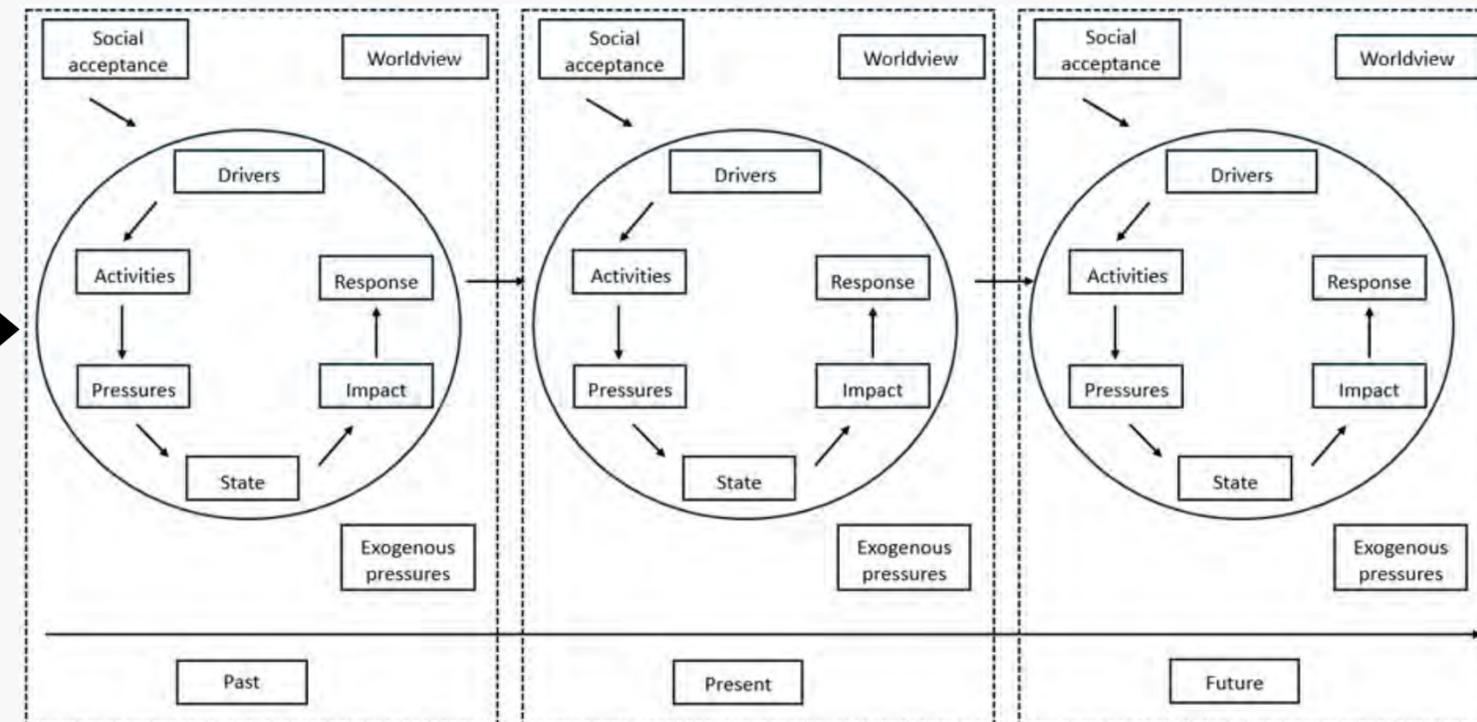
Systems context

Soft systems methodology

Essential for addressing environmental issues that transcend local or regional boundaries

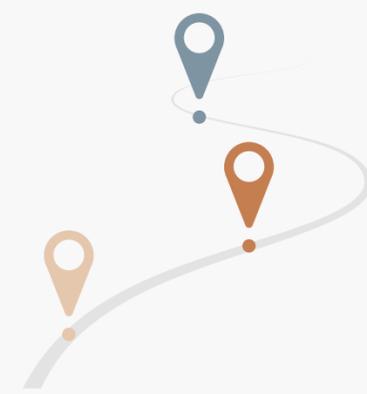
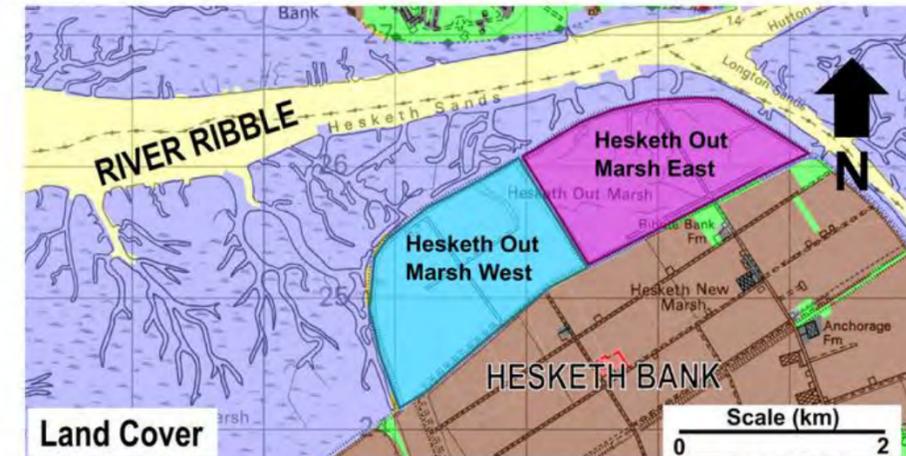
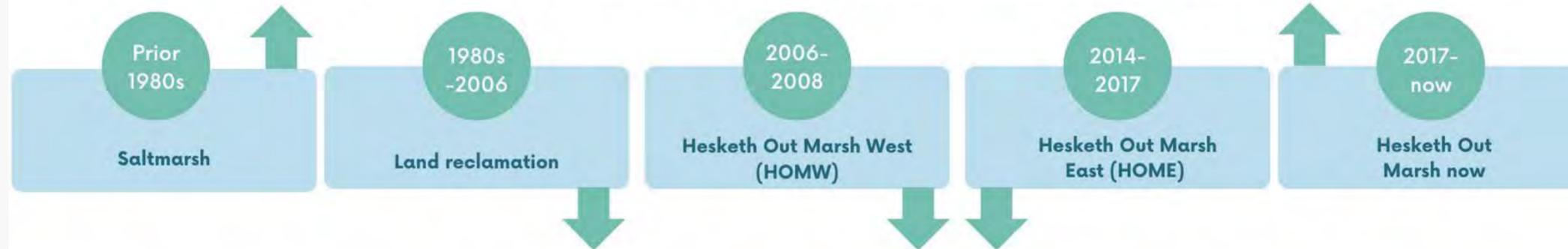
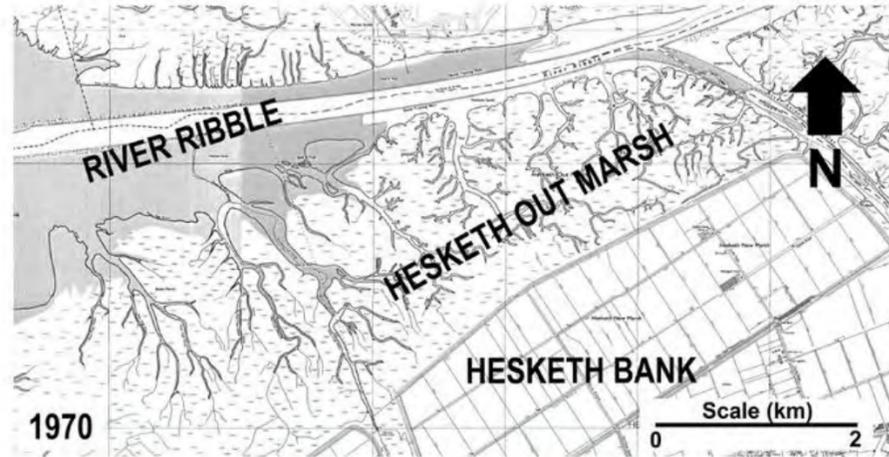
DPSIR

DPSIR+



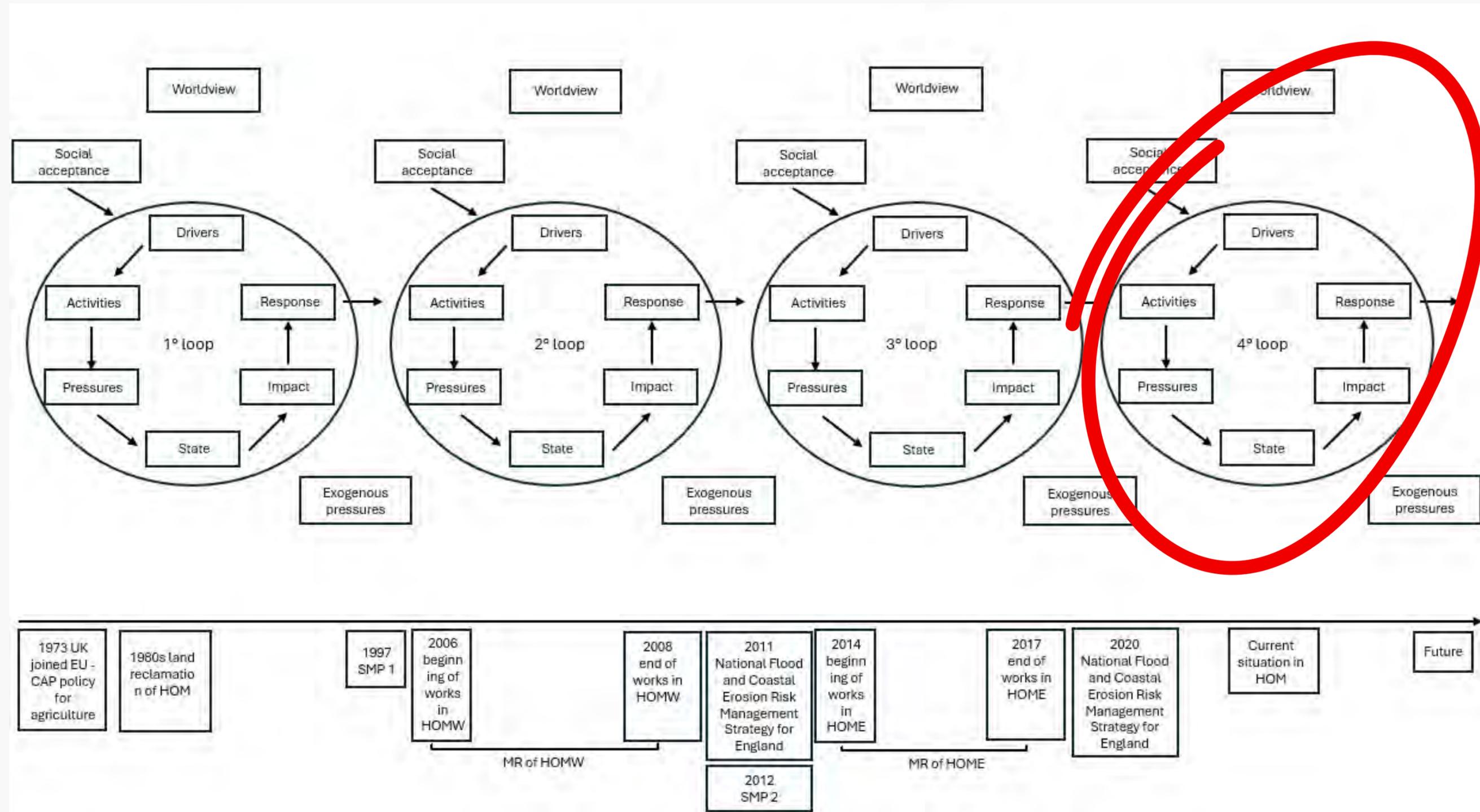
Testing the DPSIR₊

Hesketh Out Marsh history



Many thanks to our colleague Amani Becker for creating this image

Hesketh Out Marsh history





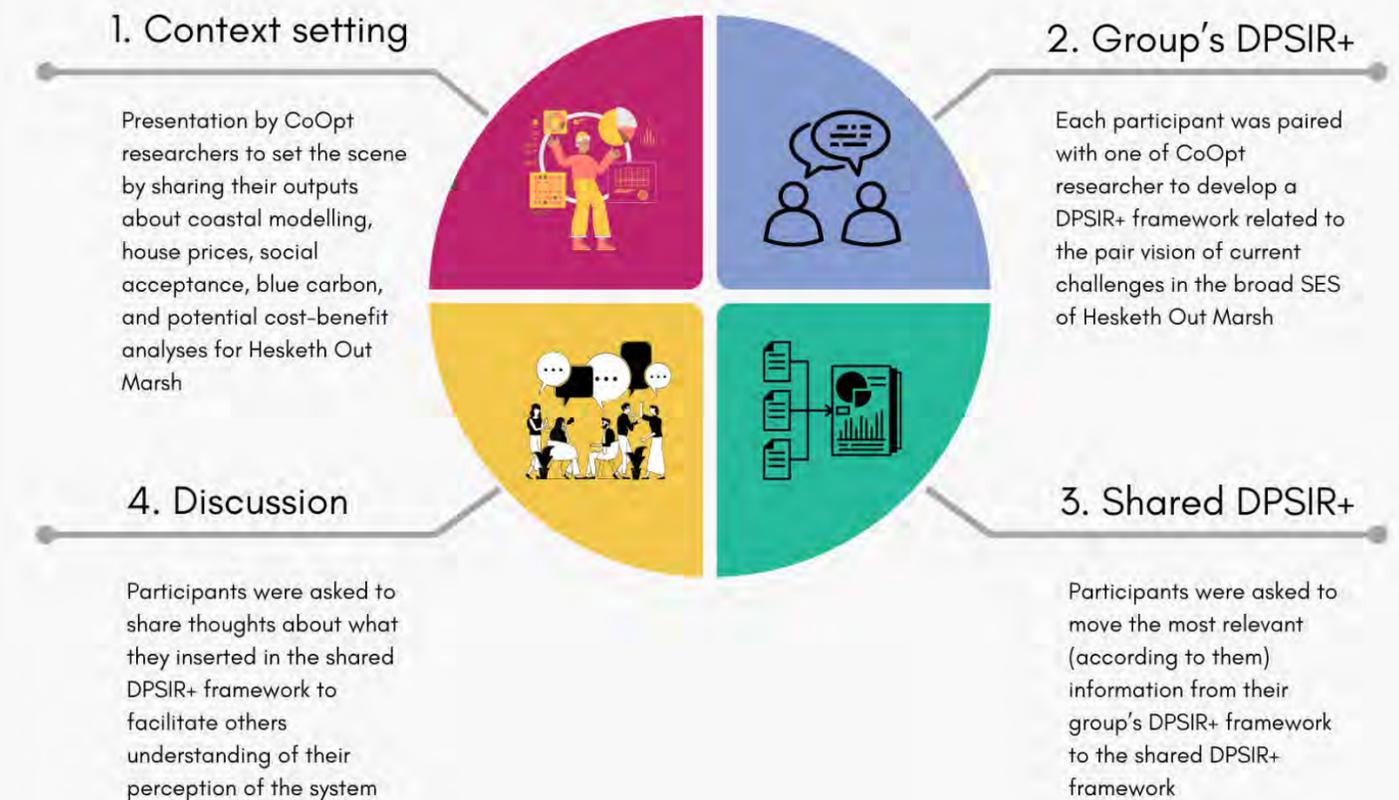
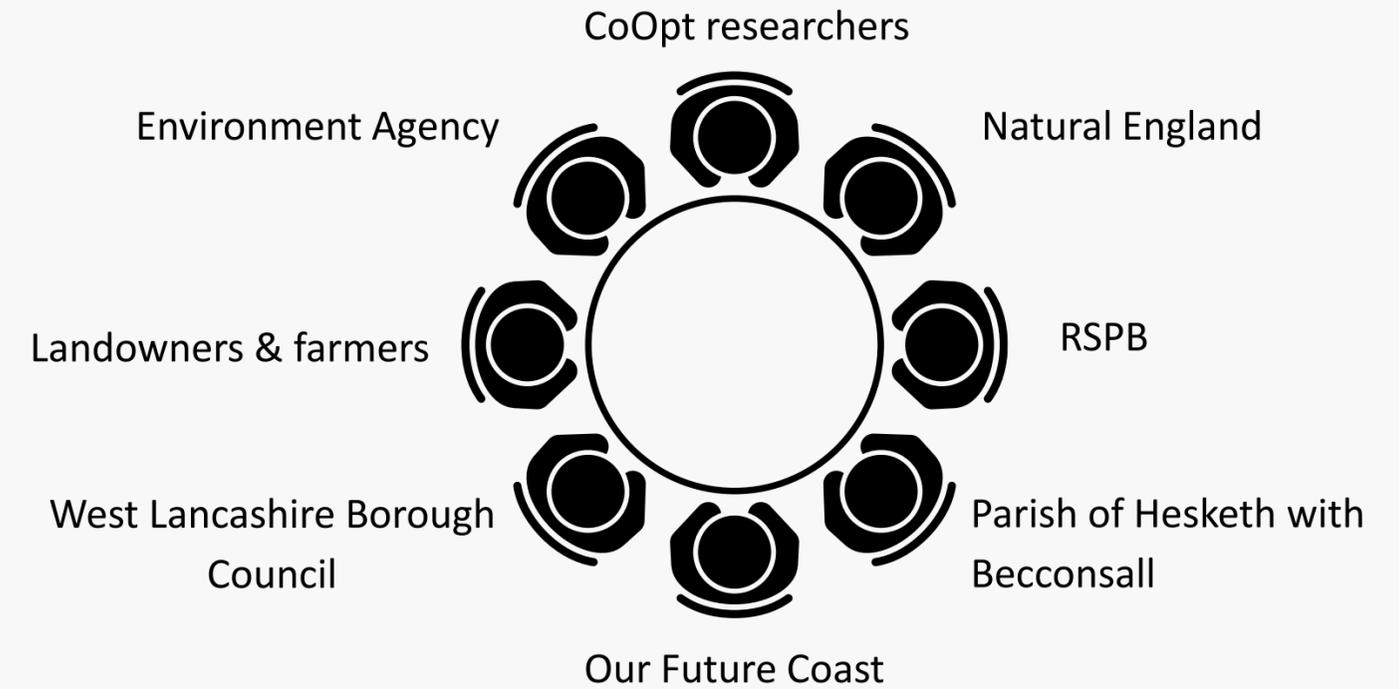
Hesketh workshop

What: create a shared understanding and knowledge of the current situation in Hesketh Out Marsh and identify next steps to address current challenges

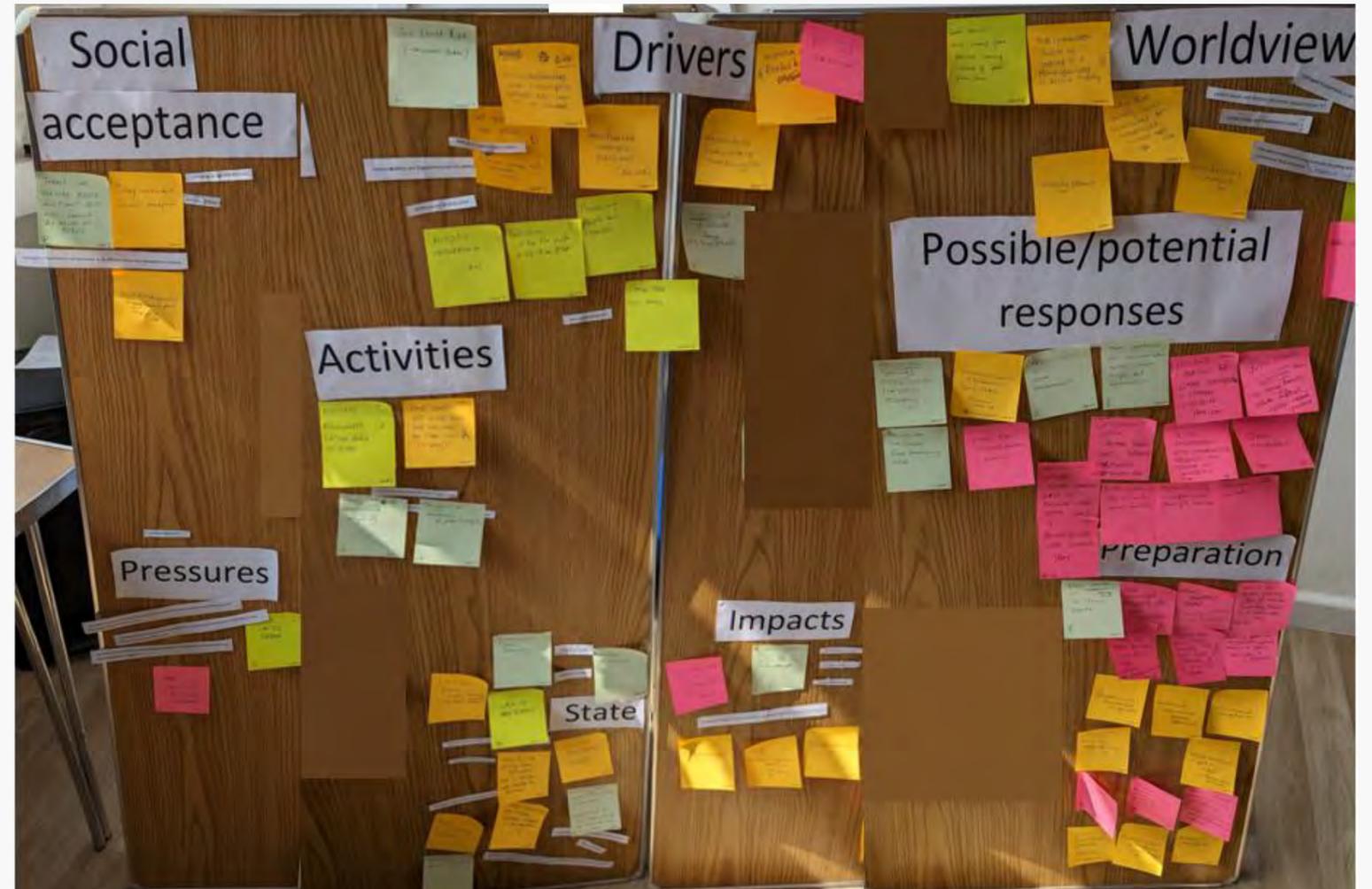
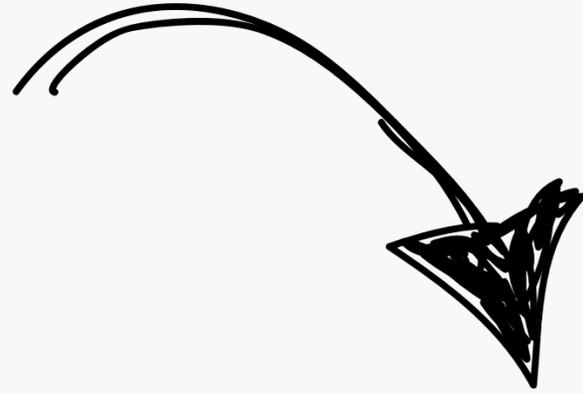
Where: Hesketh Bank community centre

Why: previous activities within the project highlighted there are some challenges in the area

How: using DPSIR+ to test if the framework can be used as a practical tool for a more inclusive and equitable decision-making process



Results



Lessons learnt



DRIVERS

- supermarket pricing, low-cost food and reduction in workforce post-Brexit
- increased rainfall and extreme events, net gain and net zero policies
- housing crisis, house development



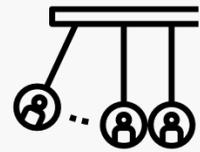
PRESSURES

- lack of maintenance of main rivers, watercourses and outfalls
- pressure on the drainage system due to the housing development that leads to overflow/overcapacity in the system



STATE

- siltation of outfalls
- responsibilities regarding flood risk management at Hesketh Out Marsh are fragmented and not always clear



IMPACT

- flooding of farmlands, wildlife disturbance,
- increased flood experience and managed realignment not being perceived as effective in the current state
- decline in public trust in management efforts



RESPONSES

- recognition of the importance of farmland for regional and national food security
- need to switch from a sector/field-based approach to a system-based approach
- need for improved governance, enhanced collaboration among stakeholders, better public engagement, and increased funding for flood protection and wastewater treatment initiatives



SOCIAL ACCEPTANCE

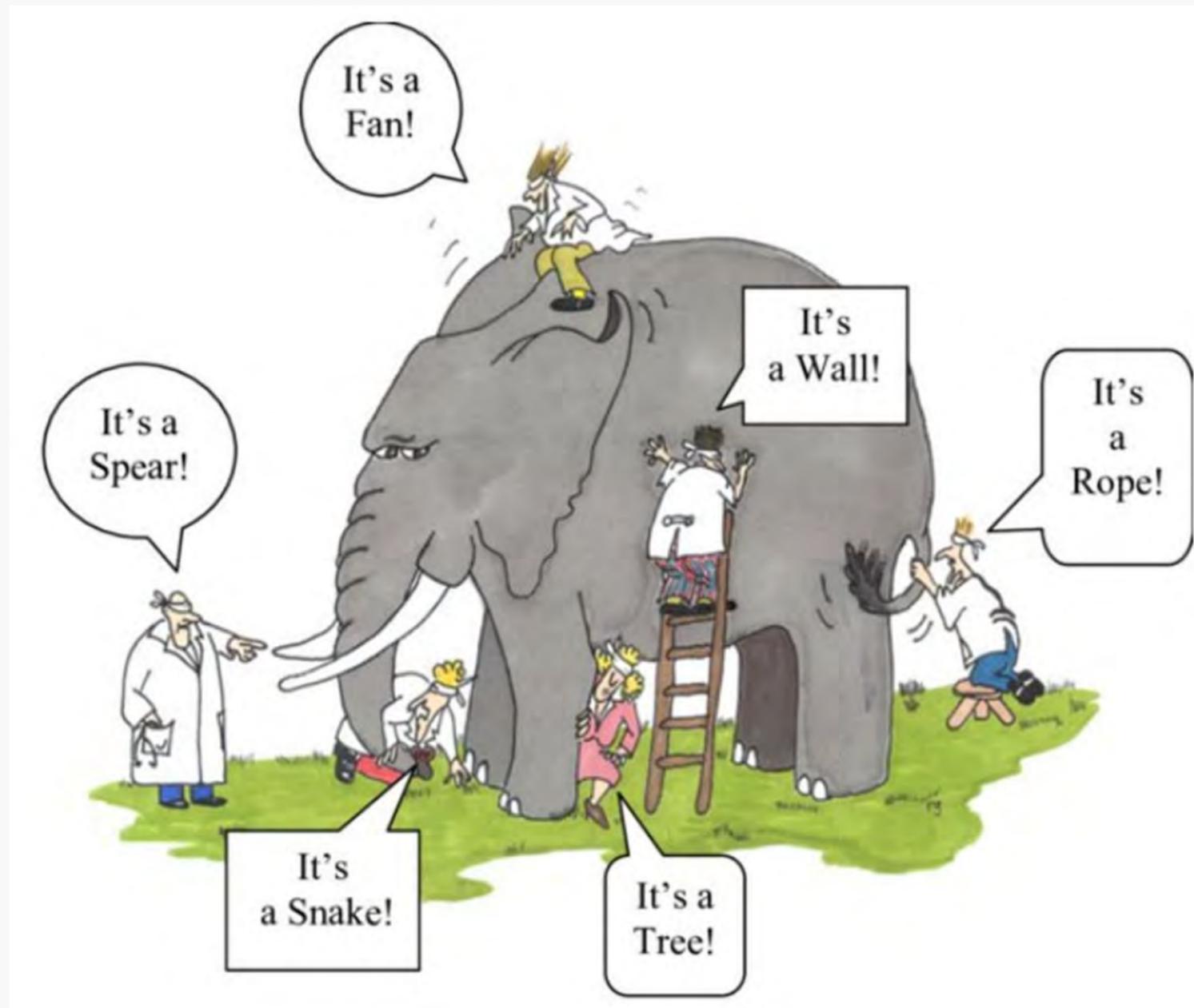
- existence of misperceptions regarding nature-based solutions (e.g., their flood protection efficiency and the time required for establishment)
- community's reluctance to engage, due to negative past experiences as a contributing factor.



WORLDVIEW

- current funding schemes and planning processes do not effectively support the implementation of nature-based solutions
- desire to see a shift towards a Worldview that meaningfully involves communities in decision-making processes

And so what?



*“And so these men... disputed loud and long,
each in his own opinion,
exceeding stiff and strong,
Though each was partly in the right,
and all were in the wrong!”*

John Godfrey Saxe

The Blind Man And The Elephant

- different perceptions of the same system
- need to engage different stakeholders (including communities) and include local knowledge in the decision-making process
- DPSIR+ as a practical tool to enable locally-led decision-making

Thank you



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Hesketh workshop report



CoOpt project's outputs





DPSIR+ definitions

Drivers (D)	Related to sectoral trends and policy drivers such as population growth, and net zero policies
Activities (A)	Human activities to address the drivers (Elliott et al., 2017)
Pressures (P)	Mechanisms or human activities that are directly and negatively affecting the environment
State (S)	The observable change in the natural environment as a consequence of the pressures
Impacts (I)	Changes in the state of the natural system that affect both the natural and human systems.
Responses (R)	Human actions to respond to the drivers and pressures that caused the state change.
Preparatory measures (M)	Practical actions to minimise the impacts of future activities and pressures
Exogenous pressures	Unpredictable events (e.g. storms) that impact the system
Social acceptance	Refers to the values and perceptions local community holds at the time of the activity
Worldview	Is the set of values and the outlook which informs how people see the issue, for this framework it's related to global issues and global policies where these values are reflected



Coast-R
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Ocean literacy strategies for engaging communities

Dr Emma McKinley, Cardiff University

#CoastRNetwork

Ocean Literacy: Developing Strategies for engaging coastal communities in England and Wales

Emma McKinley
Cardiff University
TRACC





The United Nations
Decade of Ocean Science
for Sustainable Development
(2021-2030)



“Ocean science is broad: it **encompasses natural and social science disciplines, local and indigenous knowledge**, it includes the science-policy and science-innovation interfaces, as well as technology and infrastructure...**An equally transformational part of the Decade is about us and our relationship with the ocean”**

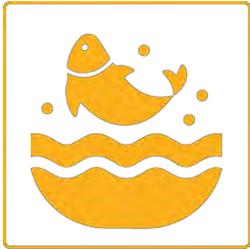




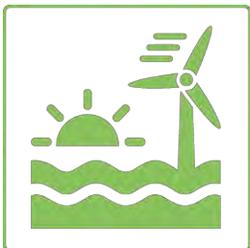
Understand and beat marine pollution



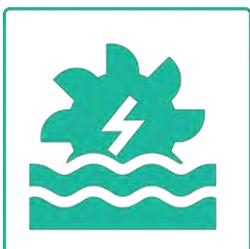
Protect and restore ecosystems and biodiversity



Sustainably nourish the global population



Develop a sustainable, resilient and equitable ocean economy



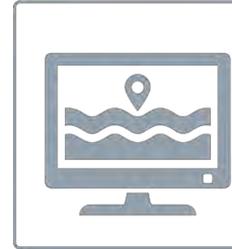
Unlock ocean-based solutions to climate change



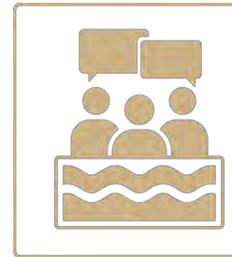
Increase community resilience to ocean and coastal risks



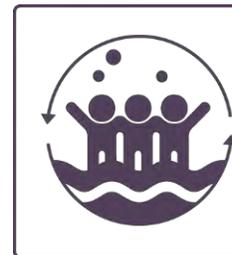
Sustainably expand the Global Ocean Observing System



Create a digital representation of the ocean



Skills, knowledge, technology and participation for all



Restore society's relationship with the ocean



Ambition, Action, Impact:
The Ocean Decade
Pathway to 2030

Consolidated Outcomes of the Vision 2030 Process



The United Nations
Decade of Ocean Science
for Sustainable Development
(2021–2030)



The Evolution of Ocean Literacy – in one slide!

Ocean Literacy is...

... an understanding of the ocean's influence on you—and your influence on the ocean.

Knowledge

Communication

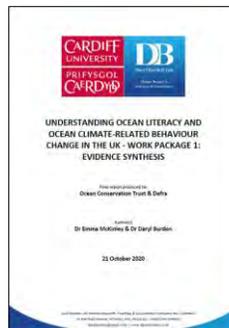
Behaviour

The 7 principles of Ocean literacy

- The Earth has one big ocean with many features
- The ocean and life in the ocean shape the features of the Earth
- The ocean is a major influence on the weather and climate
- The ocean makes the Earth habitable
- The ocean supports a great diversity of life and ecosystems
- The ocean and humans are inextricably interconnected
- The ocean is largely unexplored



McKinley et al. 2023



Challenge 10

Restoring society's relationship with the ocean

Ensure that the multiple values and services of the ocean for human wellbeing, culture, and sustainable development are widely understood, that society-ocean connections are strengthened, and that there is increased motivation, capability, and opportunity for people across **all sectors of society**, to make decisions and **behave in ways that ensure a healthy ocean**.

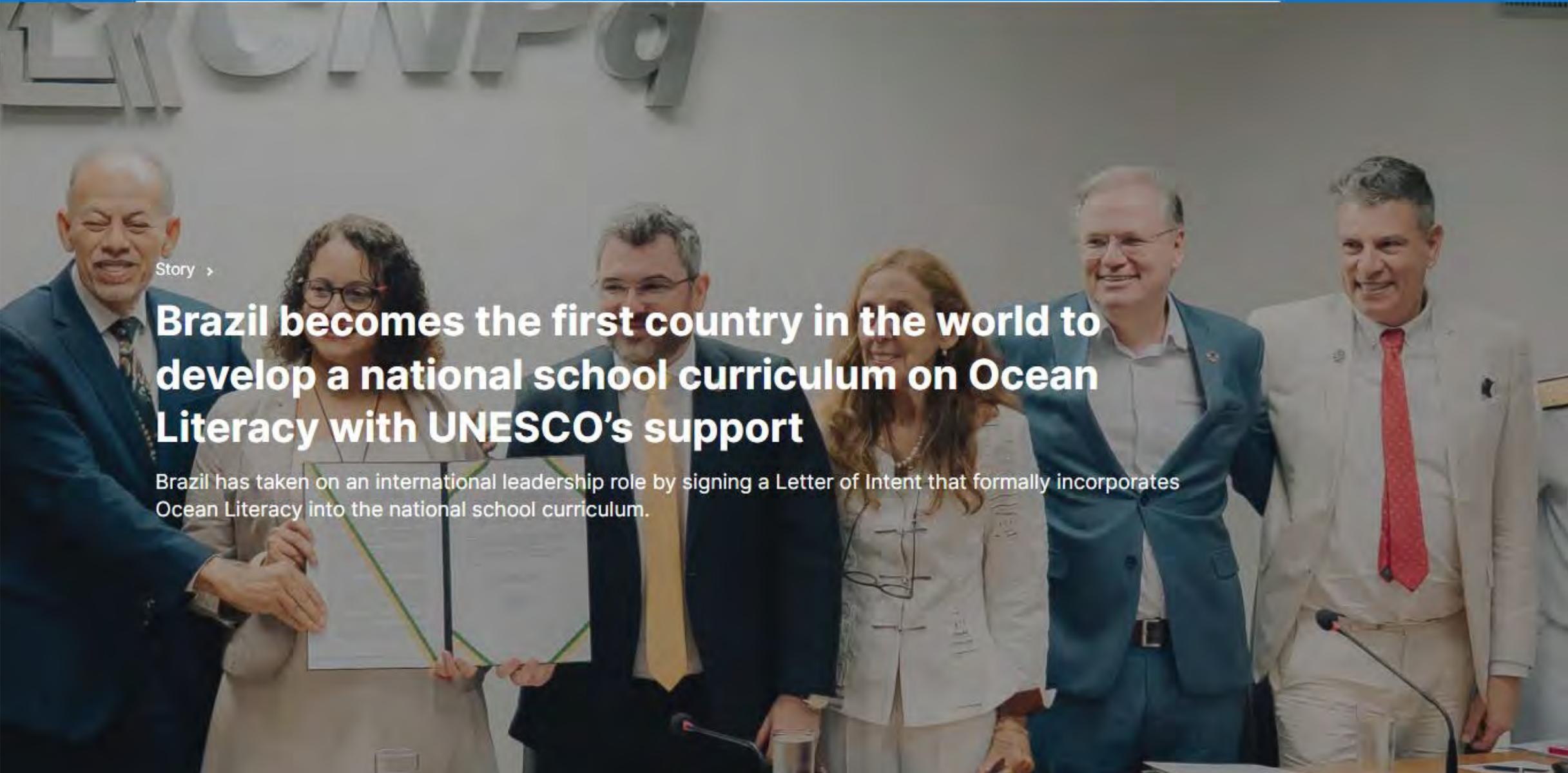


Ocean literacy is an outcome – a society that understands, values, and cares for the ocean.

The ocean community needs to inspire and generate the **motivation, capability, and opportunity** for people across society to make decisions and behave in ways that ensure a healthy ocean, to sustain all life—current and future.

Information sharing alone is not enough to drive the societal transformations required at scale.



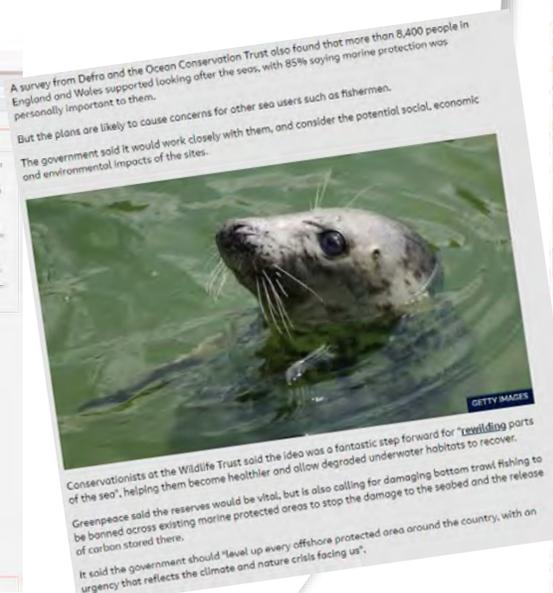
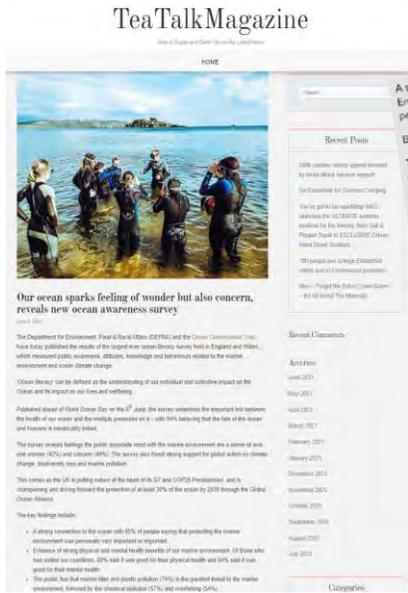


Story 

Brazil becomes the first country in the world to develop a national school curriculum on Ocean Literacy with UNESCO's support

Brazil has taken on an international leadership role by signing a Letter of Intent that formally incorporates Ocean Literacy into the national school curriculum.

- Carried out Feb-March 2021 and 2022
- England and Wales (2021/ 2022), Scotland and N Ireland (2022)
- Over 14,000 respondents, including non-coastal communities across the UK.
- Topics on ocean knowledge, emotions, values, concerns, behaviors and more!
- Second OL Report published Nov 2022



Public grasps threat to ocean even as leaders fail to meet targets, poll finds

Survey to mark World Oceans Day finds 94% in England and Wales believe the fate of oceans and humans is inextricably linked



The beach at Brixham, East Sussex. The poll found 94% of people who visited the coast last year said it benefited their mental health. Photograph: Jan Sarris/Corbis/Outerstock

As people mark World Oceans Day today, an overwhelming 94% of people in England and Wales believe the fate of the oceans and humans are inextricably linked, while more than half rate global ocean health as "poor or very poor", according to a government survey.

The online survey of 8,000 people, carried out for the Department for Environment, Food & Rural Affairs (Defra) and the Ocean Conservation Trust this year, reveals the depth of public understanding of the link between the health of the oceans and the multiple pressures upon them. A catalogue of devastating reports in recent years has revealed overfished ke, disappearing habitats and ubiquitous pollution, as well as the inuing impact of the climate crisis. A United Nations report last year d the world had failed to meet a single target to stem the destruction of fe and ecosystems, and that 60% of coral reefs were under threat.

...ough there has been progress in some regions, the proportion of marine populations that are overfished has increased in the past decade to a third of the total, and many non-target species are threatened because of unsustainable levels of bycatch, while plastic waste and excess nutrients have been found to be at levels damaging to ecosystem function and biodiversity.





Partneriaeth Moroedd
ac Arfordiroedd Cymru
Wales Coasts and
Seas Partnership



Y Môr a Ni

Learning from Ocean Literacy in Wales

- International and national emphasis on ocean literacy.
- One of three priority areas of work for Wales's Coasts and Seas Partnership.
- Over two years of collaborative work to date, bringing together a broad range of researchers, practitioners and policy colleagues from across Wales.





Developing Y Môr a Ni

JUNE 2022

Initial workshops held to explore how to build ocean literacy in Wales

JUNE 2022 –
SEPTEMBER 2023

Establishment of working group to co-develop *Y Môr a Ni*

SEPTEMBER 2023 –
DECEMBER 2023

Draft *Y Môr a Ni* reviewed by wider Wales Coasts and Seas Partnership

JANUARY AND
FEBRUARY 2024

National engagement events for *Y Môr a Ni*

MARCH - OCTOBER
2024

Further refinement of draft strategy and development of resources

JANUARY 2025

Publish *Y Môr a Ni* as a framework to support further action to build ocean literacy in Wales

Co-developing the Ocean Literacy Strategy for Wales

Co-identified priorities:

- Developing a vision and strategy for building ocean literacy in Wales
- Building a base of champions, creating a network of skilled and informed people.
- Enabling information sharing, effective communication and collaborative working.





Partneriaeth Moroedd
ac Arfordiroedd Cymru
Wales Coasts and
Seas Partnership



Y Môr a Ni

Y Môr a Ni

Ocean Literacy Strategy for Wales 2025

Prepared by the Welsh Ocean Literacy Coalition,
part of the Wales Coasts and Seas Partnership



Ariennir gan
Lywodraeth Cymru
Funded by
Welsh Government



Six Action Areas

Access and Experience

Ocean Literate Policy

Ocean Literacy Leadership and champions

Knowledge and Skills

Communities and Culture

Network and Capacity Building



B: Ocean literate policy

Marine and coastal environments can often be out of sight and out of mind for policy makers, leading to a political landscape that is not appropriately focused on the value of our coastal spaces. Effectively embedding marine and coastal considerations within relevant policy and management frameworks, systems and decisions will ensure more sustainable outcomes for the marine and coastal area and the communities that rely on them.

Outcome
Welsh policy frameworks, systems and decisions effectively consider and address relevant marine and coastal issues.

Objectives

- Strengthen understanding of marine issues across public sector organisations and the Senedd.
- Promote ocean literacy and embed marine and coastal considerations in strategic and local decision making.

Actions in this area include to:

- Inform and engage Members of the Senedd on issues regarding coasts and seas, for example, through a cross party group.
- Join up policy areas across Welsh Government with a marine and coastal remit.
- Work with organisations and public bodies to identify and develop appropriate guidance and support needed to enable them to better reflect marine and coastal issues within their plans and programmes.
- Develop targeted materials highlighting the varied role of marine and coast in supporting environmental, social and economic outcomes in Wales.

D: Knowledge and skills

Enabling informed decision-making is critical at every level (local, regional and national, across-sectors, disciplines and cultures). Whilst knowledge does not necessarily equal behaviour change, it is essential to understand how behaviour and decisions connect people with their impact on the ocean, coast and wider environment.

Outcome
People in Wales are equipped with the knowledge and skills required to engage effectively with marine and coastal issues.

Objectives

- Develop resources to build knowledge and skills around the marine and coastal area.
- Develop knowledge and skills to support access to jobs in marine and coastal sectors.

Actions in this area include to:

- Develop appropriate resources, aligned to the Curriculum for Wales, to increase knowledge of marine and coastal issues.
- Provide training for teachers and other practitioners in using relevant resources.
- Explore opportunities to put in place or promote relevant apprenticeships / paid internships / placements / industry partnerships to support access to maritime careers.

Co-developing an Ocean Literacy Strategy for England





Vision for the future

What does an Ocean Literate
England look like?

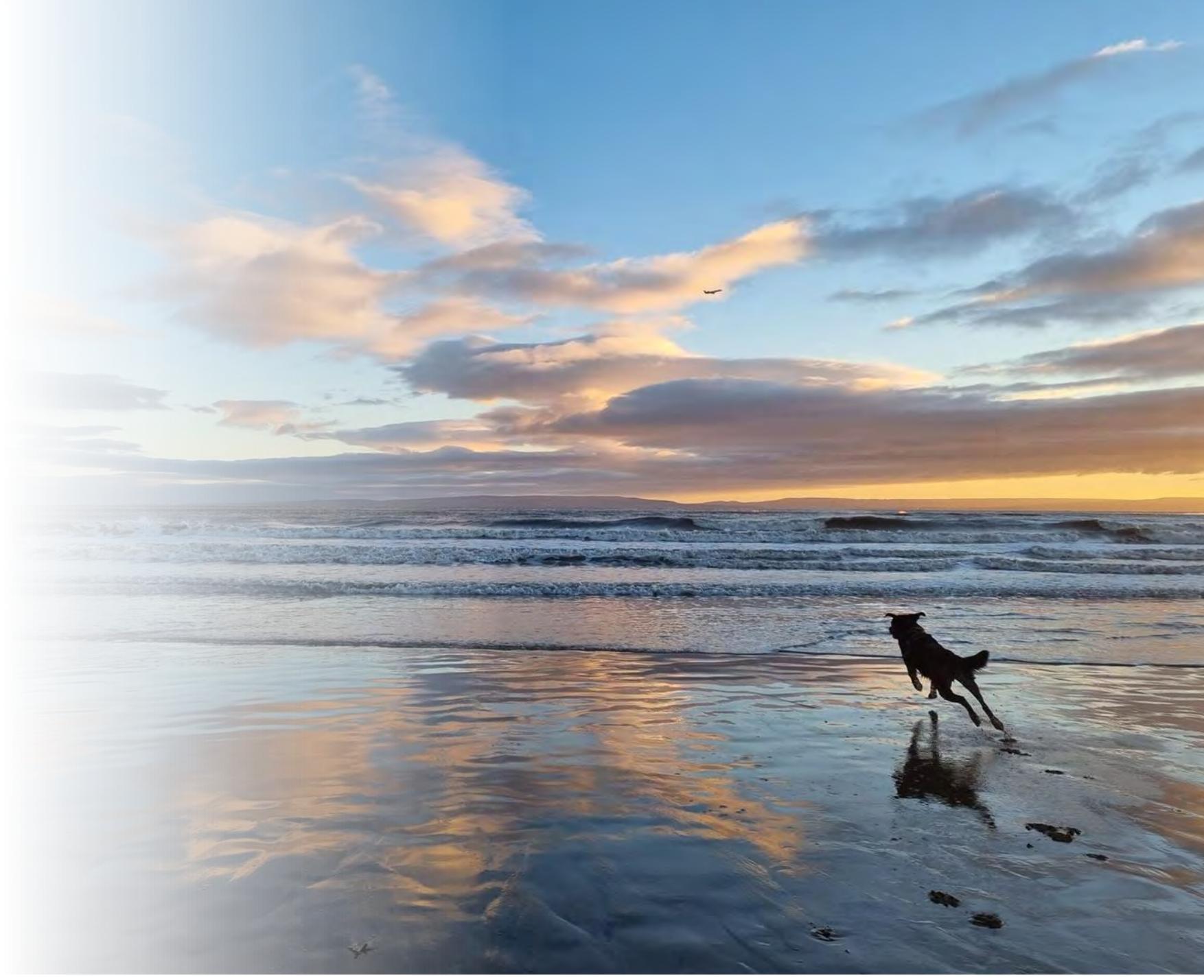


Mapping Ocean Literacy across England



Looking to the future

- What are the challenges?
- Who is missing?
- What are the priorities for OL in England?







Early themes from initial workshops:

- Develop understanding and capacity around ocean literacy as a policy tool
- Need to identify enablers and barriers
- Ensure inclusivity, equity and accessibility.
- Create agency and empowerment
- Focus on whole society approach

Summary and Next Steps

- Ongoing review and analysis of workshop feedback and begin drafting of an Ocean Literacy Strategy for England
- Next phase of co-design and review with the English OL community.
- Continued delivery of Y Mor A Ni in Wales – website coming soon!
- Consider how we can work collaboratively across the UK.
- Explore the concept of Ocean Literacy in the context of resilient coastal communities through TRACC.



Diverse Marine Values



Department for Environment Food & Rural Affairs



marinescotland

Thank you!

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**Coast-R
Network**

Our next Webinar takes place on 17 September 2025

Introduction to infrastructure for Port cities And Coastal Towns network – iPACT

Prof Robert Nicholls, Tyndall Centre for Climate Change Research, University of East Anglia

Coastal Connections : Systems and Synergy

Dr Dawn-Marie Walker and Dr Edilson Arruda, University of Southampton

Sustainable Development in Port Cities

Dr Toby Roberts, University of Southampton

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