

Scotland Beyond Net Zero

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Scottish Government **Areas of Research Interest (ARIs)**

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What are ARIs?

- Areas of Research Interest set out information on research themes or topics integral to the achievement of a government department's medium to long-term objectives
- More than 20 UKG departments and public bodies have published at least one ARI
- Work is now underway in SG to publish ARIs
 - various policy areas, covering scientific, technological, social and economic research topics and methods



How can this make a difference?

- Strategic approach to utilising research and development programmes to develop and deliver policies & provide robust evidence base
- Platform for engagement and collaboration with academics, research councils, innovation centres and private industry to address research needs
- It will guide research funding / prioritisation, enable collaboration between researchers, and provide insights which can guide the policymaking agenda
- Potential return on this time investment is substantial, as it influences external R&D community to produce high quality, policy-orientated evidence

SG ARI publications: Some examples

Marine

Key research questions:

1. Ocean Change

- How do multiple climate change stressors (acidification, warming, deoxygenation) impact Scottish marine and freshwater ecosystems across different spatial and temporal scales, including effects of changing geomorphology?
- How do changing ocean circulation patterns affect Scottish marine ecosystems?
- How can we improve access to and integration of existing data while enhancing monitoring of future climate change impacts in offshore regions?
- What are the potential impacts of sea level rise on Scotland's marine ecosystems and sectors?

2. Carbon Sequestration

- How can we improve carbon sequestration through protection and restoration of blue carbon habitats, including planning of new blue carbon areas in coastal zones?
- What are the most effective approaches for blue carbon projects at a local, regional, and national scale?
- How can we better integrate blue carbon into climate policy?

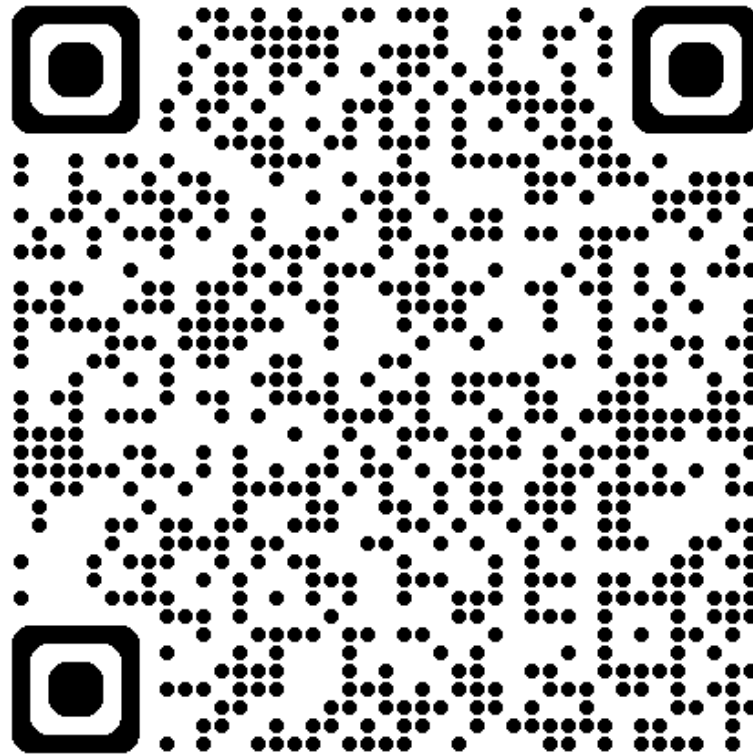
ENRA Strategy

A draft strategy for the Environment, Natural Resources and Agriculture (ENRA) Research Programme from 2027-32 is open for [public consultation](#). The draft strategy includes [Areas of Research Interest](#).

1. What tools and new technologies can we plan to develop and improve to safeguard Scottish plant health, relevant for arable, forestry and natural environment?
 - What is the role for surveillance innovations?
 - How can technology including satellites, LIDAR scans, drones, robotics, big data, modelling and AI be used?
 - What new diagnostic technologies can be developed?
 - What is developing in the science of pest and pathogen interactions?
 - What are the emerging challenges for economically important crops and endemic diseases?

ARI engagement opportunities

- ARIs currently being developed within Net Zero, Education, Communities, Economy and Social Care
- Published ARIs will appear on [gov.scot hub](#) and [UK-wide searchable database](#)
- Promotion via [Scottish Policy and Research Exchange](#)
- Some teams may choose to commission research directly
- Alignment with ARIs should strengthen grant applications to external funders



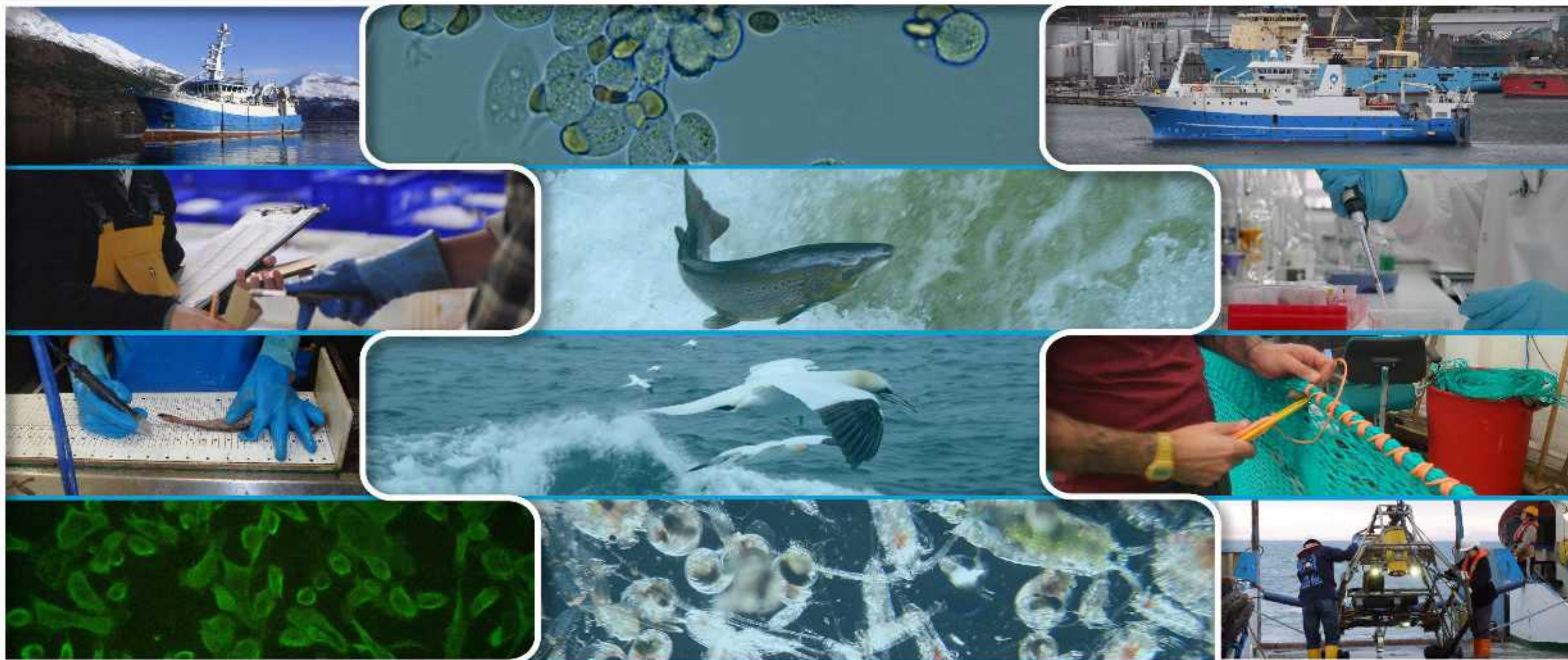
Welcome Tackling the Climate Emergency

Scottish Government Marine & Freshwater Areas of Research Interests (ARIs)



Scottish Government
Riaghaltas na h-Alba

Marine Directorate

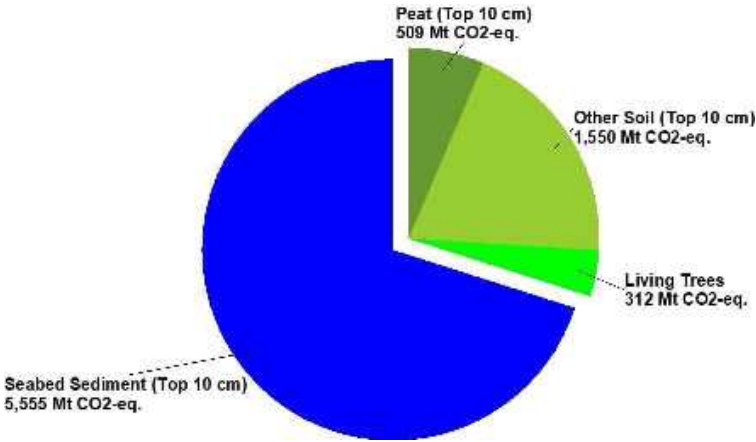


Importance of the Marine Environment in Achieving Net Zero

Ocean Acidification and Warming

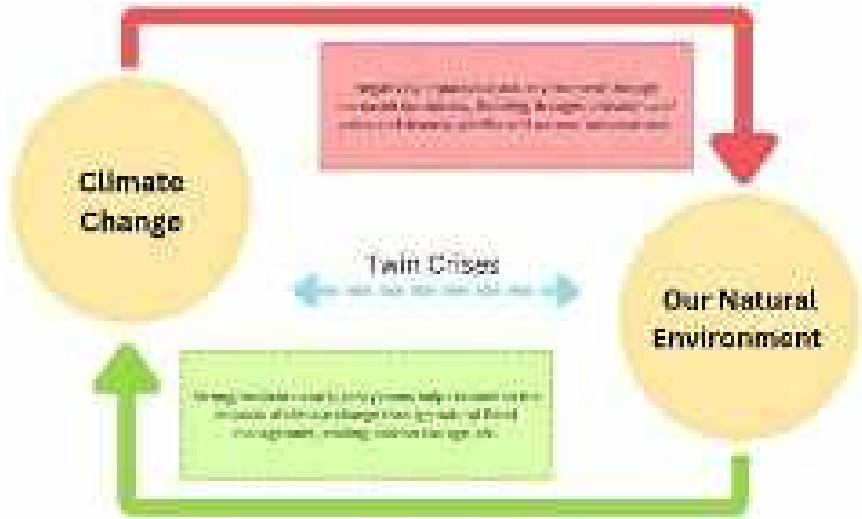


Carbon Sequestration



Ecosystem Resilience

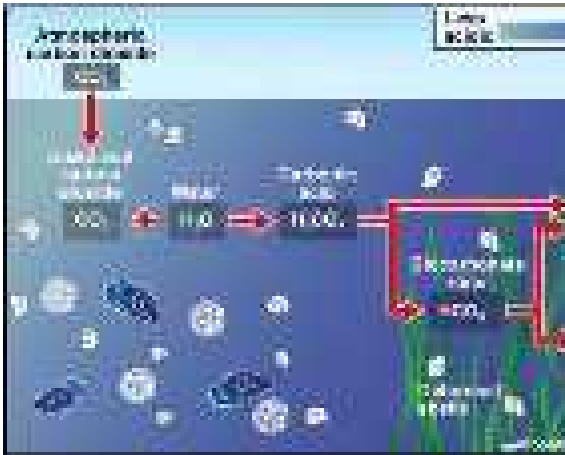
Marine Directorate



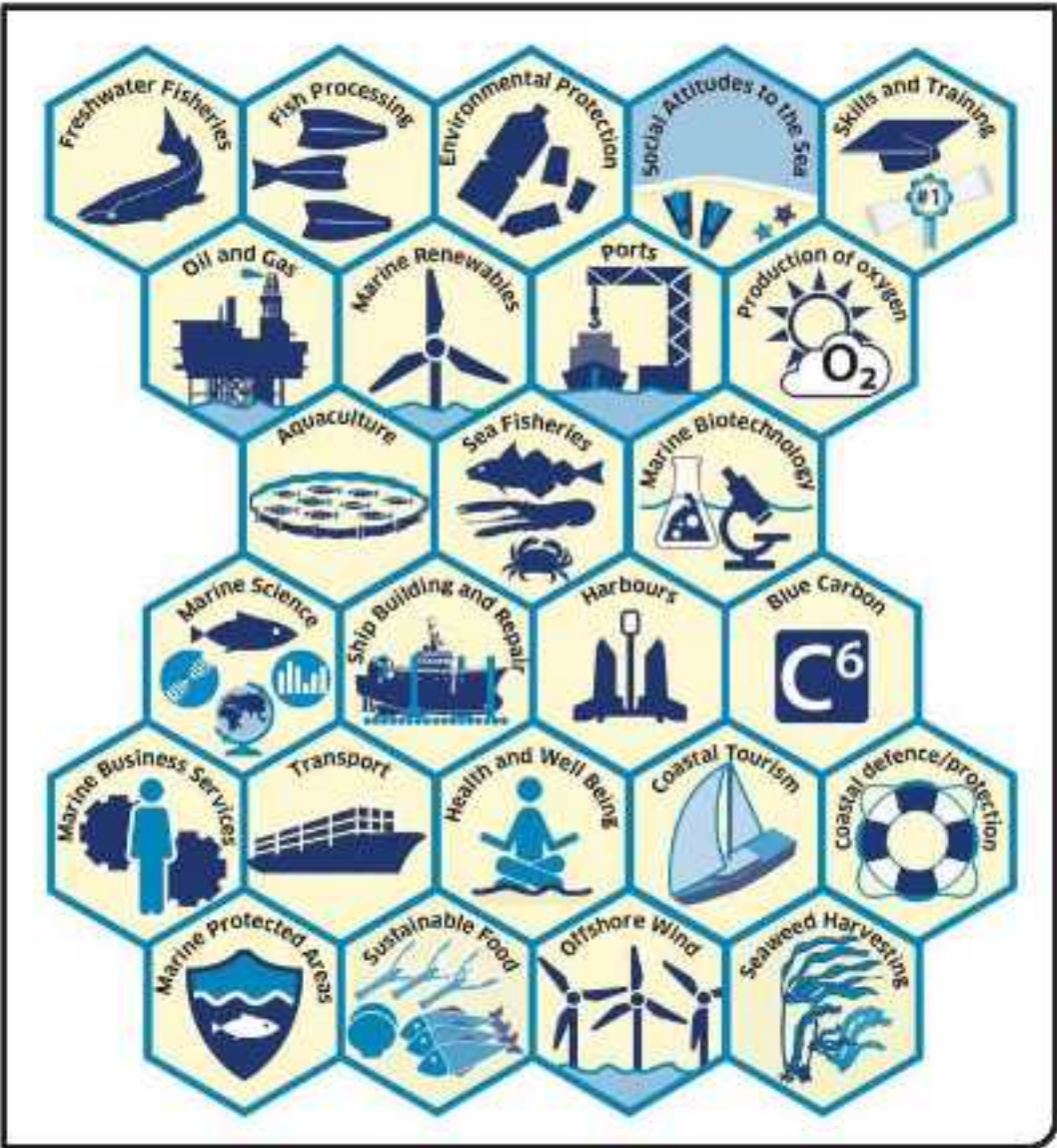
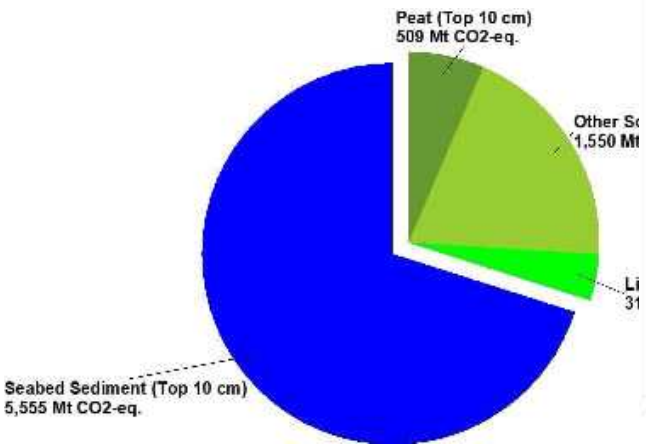
Nature-based solutions and Ecosystem Scale Change



Importance of the Marine Environment



Carbon Sequestration



Solutions and Change



ARI development

- Identifying policy evidence needs
- Refined through consultation with MASTS, HEIs, ALBs, Freshwater groups
- >100 questions
- >Half are related to climate change and net zero



Background & Framework

- **The Blue Economy Vision**

- Clean, healthy, safe, productive and biologically diverse marine environments
- Meeting long-term needs of nature and people
- Aligned with UK Marine strategy

- **Legislative Framework**

- Climate Change (Scotland) Act: Net Zero by 2045
- Marine (Scotland) Act
Balancing demands on Scotland's seas.
- Nature Positive: Halt biodiversity loss by 2030, reverse by 2045



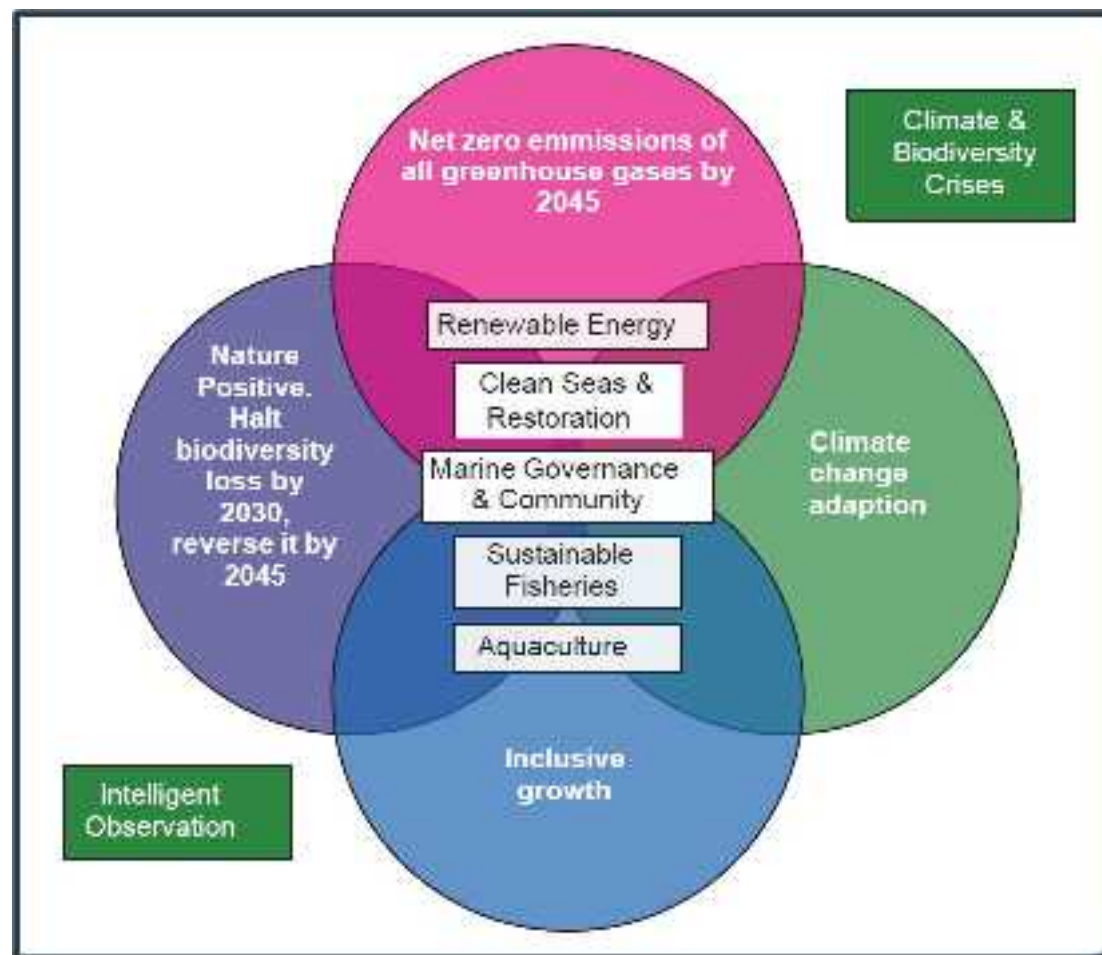
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Marine Directorate

Blue Economy Vision	ARI	CEFAS	ICES
Resilience to Climate Change	Climate Change & Biodiversity	Climate Change	Marine Ecosystems Science
Healthy Marine Ecosystems	Clean Seas and Restoration	Ecosystem Resilience Water Quality	Conservation & Restoration Science
Innovative & Competitive Marine Sectors Leadership in Sustainable Blue Foods	Renewable Energy Sustainable Fisheries Aquaculture	Energy Transition Aquatic Food Supply	Impacts of Human Activities Food From the Sea
Equal Access to Ocean Benefits	Marine Governance & Community	One Health	Sea & Society
Ocean Literacy and Awareness	Intelligent Observation	System Monitoring	Observation & Exploration of the Seas & Oceans Emerging Techniques & Technologies

Seven ARI themes span the science evidence needs of the **Marine and Offshore Wind Directorates** and **Scottish Government agencies**.

- Climate & Biodiversity Crises
- Clean Seas & Restoration
- Renewable Energy
- Sustainable Fisheries
- Aquaculture
- Marine Governance & Restoration
- Intelligent Observations



Theme 1. Climate & Biodiversity Crises

1. Ocean Change
2. Carbon Sequestration
3. Ecosystem Resilience
4. Nature-based solutions & Ecosystem Scale Change

Theme 2. Clean Seas & Restoration

1. Marine Use Impacts
2. Cumulative Stressors
3. Marine Pollution
4. Enhancement and Transformation

Theme 3. Renewable Energy

1. Assessing and managing Impact
2. Environmental Monitoring
3. Industry Integration
4. Environmental enhancement

Theme 4. Sustainable Fisheries

1. Marine Fisheries
2. Freshwater Fisheries
3. Socio-economic and Interaction Management

Theme 5. Aquaculture

1. Environmental Monitoring
2. Aquaculture Production, Fish Health and welfare
3. Industry-Environment Interactions
4. Ecosystem and Community Enhancement

Theme 6. Marine Governance

1. Marine Protected Areas
2. Stakeholder Integration
3. Policy Design and Implementation
4. Systemic Change

Theme 7. Intelligent Observations

1. New Technologies
2. Enduring Data Integration
3. Transformation Monitoring

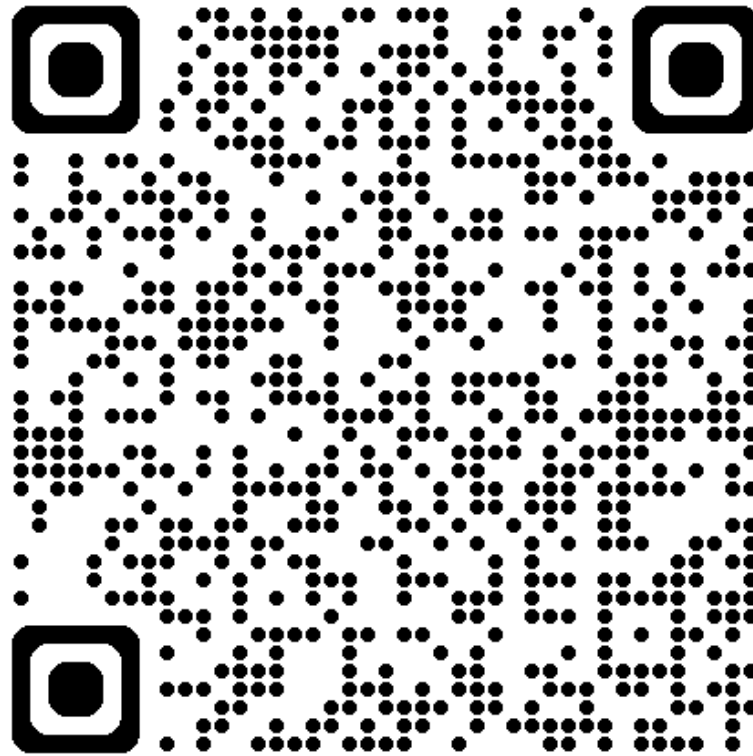
Further Information

- ARI Marine & Freshwater available at:

- <https://www.gov.scot/publications/areas-research-interest-marine-freshwater> Short url: <https://tinyurl.com/ARMarineFW>

Email ARMarineFW@gov.scot





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