

# Natural England Research Priorities for UKRI's Sustainable Management of Marine Resources (SMMR) Programme

Natural England (NE), as part of the Defra group, has been closely involved with the development of the Defra (group) Research Priorities that are summarised in the accompanying document on the SMMR website. That document provides a comprehensive list of all marine-related evidence needs of interest to Defra and so to Natural England. This NE Research Priorities for UKRI's SMMR Programme document follows the same broad structure as the Defra (group) Research Priorities document on the SMMR website, and replicates the research needs identified there, but here we highlight those which are of particular interest to Natural England, modify slightly the wording of some of these to reflect NE's particular interests, and in some cases provide additional detail on specific topics and approaches that have become increasingly important and are of particular interest to Natural England now. For clarity, differences from the Defra group Research Priorities document are indicated by ***italicised bold*** font.

Researchers interested in gaining a fuller understanding of Natural England's interests should make contact in the first instance with Ginny Swaile (Principal Specialist in Specialist Services and Programmes): [Ginny.Swaile@naturalengland.org.uk](mailto:Ginny.Swaile@naturalengland.org.uk)

***Clean and Safe seas:*** We need to protect the marine environment from pollution and improve measures to reduce impacts by better process, methods, novel technology and communication to support marine policy. Research is required to:

- Determine the socio-economic costs of (plastic) litter on marine wildlife, ecosystems and maritime industries and the costs incurred from changing to other materials, including the potential benefits to be made from new industries including SMEs;
- Understand the full benefits of offshore renewables and identify and mitigate their environmental impacts by establishing socio-economic evidence to provide information to influence marine policy and development decisions.
  - i. ***Improve the degree of certainty around the predicted (and actual) magnitude of the cumulative impacts of offshore renewable energy developments on key receptors (including cetaceans, seabirds, migratory fish, benthic communities etc.) in order to better understand the scale of those impacts and so the level of mitigation or compensation required.***
  - ii. ***Explore opportunities for colocation of marine activities to reduce overall impact and better work around activity displacement issues.***
- Understand current and future risks from chemical and microbial contaminants of emerging concern and pollution including, marine plastic litter, emergencies (e.g. oil spills), and man-made underwater noise;
- ***Increase understanding of the impact of land based activities on marine habitats and species – e.g. marine eutrophication and associated impacts on biodiversity, productivity and carbon storage. Linking land and sea and exploring multi-sector catchment scale planning and associated funding routes.***

*Healthy and biologically diverse seas:* There is a need for evidence on the distribution, health, function and resilience of marine ecosystem services as well as their value.

Research questions include:

- What are the social, economic and cultural impacts of marine policy, management and interventions on stakeholders and coastal communities?
- ***How can marine policy and management provide positive impacts on health and wellbeing?***
- How ecologically, economically, socially and culturally effective are marine protected areas and how can these factors be used to improve design and effectiveness?
- How can we monitor and evaluate the ecological, social, economic, and cultural costs and benefits of marine protected areas?
- Using climate-smart management, how do we best protect marine biodiversity (***habitats and species***) that might change as a result of climate change ***and create more resilient marine ecosystems?***

*Productive seas:* The UK's ambition is for sustainable development in the marine sector while increasing its productivity. Research is needed to:

- Assess socio-economic information to support and incentivise a change to secure the long-term sustainability of seafood exploitation whilst reducing the environmental impact of exploitation;
- Develop innovative technologies and foster industry and business engagement to support sustainable fisheries and aquaculture, offshore energy production, maritime transport, carbon sequestration and blue carbon, and recreation;
  - i. **Improve the ecological evidence base needed to gauge the extent to which delivery of more sustainable management of forage fisheries will lead to improvements in the environmental status of key species groups such as seabirds and cetaceans in the face of impacts on these groups predicted to arise from offshore renewable energy production.***
  - ii. **Identify and gather evidence to resolve the societal, cross-sectoral interest, legal, policy, regulatory, financial and ecological issues that must be addressed in considering whether measures that deliver a more ecosystem-based approach to management of forage fisheries could be delivered as part of compensatory measure packages to facilitate consenting of future offshore renewable energy developments.***
  - iii. **Improve understanding of societal attitudes to resolving the potential trade-off between the contribution to delivery of Net Zero through significant further offshore renewable energy development and the scale of predicted impacts arising from those developments, in combination with those arising from other marine industry sectors – eg fisheries, on the marine environment, including key receptors such as cetaceans and seabirds.***
- Integrate fisheries monitoring in a systems approach to manage and maintain sustainable productivity, integrate marine planning systems to protect habitats and species, and reduce the industry's costs to enable economic development;
- Improve fish stock assessments over a greater range of species and improve management of freshwater, migratory and marine fisheries, and protected species.
- How do we put together economic, social and cultural factors in a framework to assess the value of services provided by the marine environment and the **impacts and** cost associated with environmental degradation?

*Ocean and Coastal processes*: Effective measures for adaptation and mitigation to climate change risks are needed to be developed by research to:

- Further our understanding of how climate change is affecting the health of the ocean, **and key inshore habitats** and how to mitigate the multiple stresses it causes?
- How do we differentiate between anthropogenic and non-anthropogenic impacts and mitigate for them to ensure effective protection of the marine environment?
- **Explore the contribution of habitat mosaics and the indirect role of some habitats in carbon sequestration.**
- **Look at the impacts of anthropogenic activities on existing carbon stocks and their ability to depress habitat quality and impede future carbon sequestration.**
- **Explore options for activities management to maximise carbon storage and biodiversity enhancement whilst maintaining socio-economic value.**
- Assess how marine protected areas can act as nature-based solutions to the effects of climate change by sequestering carbon.
- What social and economic opportunities do marine nature-based solutions to climate change and climate resilience offer?