

Identifying risk and opportunities resulting from multiple activities under a changing climate: A case study in the South and East Marine Plan Areas, UK.

Silvana Birchenough^{1*}, Simon Jude², Andrew Gill², Stephen Dye¹, Paul Buckley¹, Bryony Townhill¹ and John, K. Pinnegar¹.

¹ The Centre for Environment, Fisheries and Aquaculture Science, Pakefield Road, Lowestoft, NR33 0HT, UK.

² Cranfield Institute for Resilient Futures, School of Water Energy and Environment, Building 53, Cranfield University, Cranfield, Bedfordshire, MK43 0AL

***Corresponding author.** Tel.: +441502-527786; fax +441502-513865.

E-mail address: silvana.birchenough@cefas.co.uk

Abstract

The UK Marine Policy Statement requires that the use of the marine area is adequately planned and regulated. This implies that marine plans need to take into account the potential effects of climate change. In addition, marine plans must contain information about overarching climate change policies and should consider appropriate climate change mitigation and adaptation measures. It is acknowledged that seas around the UK have been highlighted as a “hot spot” of marine climate change, having warmed by more than 1°C over the past 40 years. This rate of increase is more rapid than almost anywhere else on Earth. The combined changes in storminess and ocean acidity has prompted considerable interest among scientists as well as concern among policy makers and industry. It is clear that aquatic organisms and industries are sensitive to climate change; however, the level of knowledge concerning marine climate change impacts is still limited when compared with terrestrial systems. This work aimed to support marine planning, producing appropriate temporal and spatial scales assessments for the East Inshore and Offshore Marine Plan Areas. Our analysis has considered which sectors will be likely to be at risk or to benefit from the effects of climate change, as well as documenting what the impact may be. This assessment has addressed where conflicts between sectors may arise as a result of changing use patterns in response to the impact of climate change. The overall work provides specific recommendations at potential climate change effects across sectors for the East Inshore and Offshore Marine Plan Areas and South Inshore and Offshore Marine Plan Areas with targeted climate adaptation and mitigation advice. We believe, this work has wider applications for several marine areas, particularly on the context of the EU MSFD, where there is a need to understand ‘*prevailing conditions*’ to ensure that marine systems are used in a sustainable manner.

Key words: Marine Spatial Planning, climate change, risks, opportunities, human activities.