



HISTORIC SEASCAPE
CHARACTERISATION (HSC)

EAST YORKSHIRE TO NORFOLK

SECTION TWO: APPLICATIONS REVIEW
AND CASE STUDIES

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REPORT STRUCTURE

This Project Report for 'Historic Seascape Characterisation (HSC): East Yorkshire to Norfolk' (EH Project 6228) is divided into three sections for ease of use.

Section 1 outlines the project's method implementation. Section 2 outlines an applications review and case studies. Section 3 contains the Character Type text descriptions from both National and Regional perspectives: digital versions of those texts are also linked to the project GIS. This Project Area encompasses two sets of Regional perspectives (East Anglia Region and East Yorkshire to The Wash Region).

This document comprises Section 2 of the Project Report: Applications Review and Case Studies.

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1. INTRODUCTION

This Applications Review is designed to identify and illustrate some of the future roles of Historic Seascape Characterisation (hereafter HSC) and its potential for application to a range of planning and outreach scenarios. The review seeks to show how HSC can enable the historic character of the present coastal and marine seascapes to play its full part in shaping distinctive and legible seascapes for the future. It uses two case-studies from its project area to support the discussion. However before the case studies, the HSC is put into its strategic and policy contexts.

2. LEGISLATIVE BACKGROUND

2.1. EUROPEAN FRAMEWORK AND REGULATIONS

European marine planning policy closely mirrors the UK approach to seeking greater sustainable management of the seas (European Commission 2007a, b, 2008) further highlighting the need for holistic, area-based GIS databases to convey historic cultural character at a strategic level (Hooley 2011).

The key policy frameworks which reflect EU marine planning priorities include the EC Integrated Maritime Policy (European Commission 2007a) and the Marine Strategy Framework Directive (European Commission 2008 #1989) which provides the environmental pillar in support of the Policy.

2.1.1. EU INTEGRATED MARITIME POLICY

The Action Plan for the EU Integrated Maritime Policy (European Commission, 2007b #1988) seeks to coordinate the management of maritime activity using common principles for marine spatial planning and Integrated Coastal Zone Management (ICZM) to achieve an integrated approach to meeting economic, social and environmental commitments. This approach is fundamental to achieving sustainable development and meeting the aims of the Marine Strategy Framework Directive.

2.1.2. EU MARITIME POLICY

EU Maritime Policy (European Commission 2007a, 3.2.3), recognises the need for comprehensive and interoperable mapped information to optimise the effectiveness of marine spatial planning (steps and timetable for implementation are detailed in European Communities 2008). The outputs from the HSC programme are fully in accord with that. Through the EU Maritime Policy it is also recognised that there is a need for integration and involvement of coastal communities in the sustainable management of the marine and coastal environment (European Commission 2007a, 4.3). The HSC text descriptions provide one means by which this is provided, presenting a flexible and accessible resource for education and outreach in initiatives that are developed so as to engage coastal communities with maritime activities.

2.1.3. MARINE STRATEGY FRAMEWORK DIRECTIVE

The Marine Strategy Framework Directive aims to provide the framework for achieving good environmental status for Europe's marine environment (European Commission 2008), tackling the deterioration of Europe's marine environment, the poor knowledge base about that environment and the institutional barriers to addressing these problems that exist at European level.

As is widely recognised, historic processes play an important role in shaping our past and present natural environment at both strategic and detailed level. The EU therefore recognises that the implementation of the Strategy by the Directive needs to include an understanding of the environment's historic cultural dimension in the same manner as is recognised by the UK's Marine and Coastal Access Act 2009. The Directive thus proposes that Member States undertake '*an analysis of the predominant pressures and impacts, including human activity, on the environmental status of those (European marine) waters*' (European Commission 2008, Chapter II, Article 8, 1b).

2.1.4. EUROPEAN LANDSCAPE CONVENTION

Implementation of the European Landscape Convention (ELC), which came into force in the UK in 2007, also highlights the Council of Europe's recognition of the need to take account of cultural landscape during the development of EU Marine Strategy (CoE 2000). The ELC is underpinned by a requirement '*to recognise landscapes in law as an essential component of people's surroundings, an expression of the diversity of their shared cultural and natural heritage, and a foundation of their identity*' (CoE 2000 Article 5). In emphasising the central roles of human perception in defining landscapes and of human activity in creating them, the ELC embodies concepts already at the heart of all historic landscape and seascape characterisation (Clark *et al.* 2004; Hooley 2007). This is clearly expressed in the ELC definition of landscape: '*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*'. English Heritage defines the term 'seascape' following that ELC definition for 'landscape' exactly, understanding seascape as the subset of 'landscape' that has a distinctly marine or maritime perspective and which relates to the coastal and/or marine zones.

The ELC encourages the understanding and management of dynamic landscapes, recognising their diversity and the complex interplays of cultural and natural forces that influence their perception. The ELC's scope and its obligations under Article 6 require ratifying states to identify and analyse the characteristics of their coastal and marine landscapes. HSC offers an effective tool in meeting those obligations by a comprehensive approach using the same principles as applied on land, and capable of informing and being informed by the perceptions of others. The importance of the ELC's concept of 'landscape' as a connective concept, offering a much needed bridge between expert views with people's perceptions of place, has recently been emphasised by the European Science Foundation (ESF 2010). As with the ELC, HSC and HLC recognise that landscape and seascape change is inevitable, often desirable, and needs to be accommodated. English Heritage published an Action Plan for implementing the ELC (English Heritage 2009), seeking more recognition of the historic dimension of landscape in the marine zone, including through the use of HSC and the development of new procedures.

2.2. UK LEGISLATION

European and UK legislation for the management of coastal and marine environmental resources focuses increasingly on an integrated spatial approach to marine planning a priority to be met through the development of coastal and marine databases.

2.2.1. MARINE AND COASTAL ACCESS ACT 2009

The Marine and Coastal Access Act 2009 marks a major step towards implementing that aim in the UK. The Act implements a new strategic, plan-led system of marine planning,

administered for English and UK Controlled Waters by a Marine Management Organisation (MMO), to deliver economic, social and environmental objectives within an integrated approach to the sustainable management of the marine area around the UK (e.g. DEFRA 2009b). The Act responds to increasing pressures on our coasts and seas, and the associated impacts on coastal and marine ecosystems arising from present human activities on land and sea. It allows for the creation of protected Marine Conservation Zones (MCZs) and also introduced a new right of recreational access to coastal land around England.

2.2.2. MARINE POLICY STATEMENT 2011

Following enactment of the Marine and Coastal Access Act, the UK Government has been implementing the Act's marine planning provisions in two stages. The first comprises the development, publication and consultation of an over-arching Marine Policy Statement (MPS) which was published in March 2011 (HM Government *et al.* 2011). The MPS applies to all UK waters. It is the framework for preparing Marine Plans, ensuring consistency across the UK, and provides direction for new marine licensing and other authorisation systems in each UK Administration. It sets out the general environmental, social and economic considerations that need to be taken into account in marine planning. It also provides guidance on the pressures and impacts which decision makers need to consider when planning for, and permitting development in, the UK marine area.

The objectives in MPS are underpinned by *Our seas – a shared resource: High Level Marine Objectives*, which was published in April 2009. A consultation on the MPS and supporting documents closed on 13 October 2010. Parliamentary Scrutiny of the Marine Policy Statement closed on 28 January 2011. The UK Government and Devolved Administrations jointly published the Marine Policy Statement on 18 March 2011. The MPS provides the high level policy context to set the general direction of policy making. The MPS will have a major impact upon the adopted approaches to managing the coastal and marine zone for the foreseeable future. In this respect, the HSC contributes towards meeting various of the MPS objectives as stated in the Appraisal of Sustainability (HM Government 2011) published in light of the MPS consultation process.

2.2.3. MARINE PLANNING 2012 – EAST MARINE PLANS

The second stage in implementing the Marine and Coastal Access Act relates to the development of Marine Plans which will apply the MPS framework at a national, regional and area specific level. In October 2010, the MMO announced the first two English Marine Plans areas: for the East Inshore and Offshore Areas (hereafter East MP) in a process of Marine Plan development expected to be completed in 2021.

The East MP was already in advanced development, open to consultation and a draft vision and objectives was published in March 2012 (MMO 2012), prior to the start of the East Yorkshire to Norfolk HSC project which encompasses a good part of the East MP area and too late to inform the East MP's assessment of seascape character. However HSC certainly does have contributions to make in implementing East MP and will contribute to the Marine Plan's future review. There is more discussion about the HSC, East MP and the MPS objectives in the context of the case studies below.

Data coverage, quality, standards, accessibility and inter-operability will play an important role in the operation of the new system, achieved through the Marine Environmental Data and Information Network (MEDIN) and the UK Marine Monitoring and Assessment Strategy (UKMMAS). Spatial data will play a significant role given the emphasis of the Marine Plans,

giving particular relevance for HSC's objective of informing the long-term sustainable management of the cultural dimension of England's Coastal and Marine environments. HSC has relevance to marine spatial planning contexts well beyond the traditional concerns of heritage management, informing a broad range of applications related to planning our distinctive future seascapes and coastal landscapes. This is already a concern being addressed by Historic Landscape Characterisation, and it is one that has the potential to be addressed by HSC (cf. Turner 2006; Hooley 2011, 2012).

2.2.4. NATIONAL HERITAGE ACT 2002

The National Heritage Act 2002 extended English Heritage's statutory curatorial responsibilities to the 12nm (nautical miles) limit of England's share of UK Territorial Waters. Across most of that area, English Heritage is the sole statutory advisor regarding the historic environment. Beyond that, to the full extent of UK Controlled Waters, English Heritage's Maritime Archaeology Team and Marine Planning Unit also provides historic environment advice on a 'without prejudice' basis to Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) of plans, programmes, licence and development proposals as required by EU Directives. As already demonstrated through the applications of Historic Landscape Characterisation to the management of change on land (Clark *et al* 2004), the implementation of HSC across UK Controlled Waters will be a major advance in enabling English Heritage to meet both its statutory and *de facto* responsibilities relating to the management, research and improved public understanding of, and accessibility to, the historic environment across that area.

3. APPLICATIONS

Historic Seascape Characterisation (HSC) is designed to inform the management of change affecting landscape and seascape through the provision of a heritage specialist's perspective of the character of the historic dimension of the Coastal and Marine environments. It uses the same historic characterisation principles as, and complements, Historic Landscape Characterisation (HLC) located in terrestrial landscapes. The discussion on *Applications* is intended to provide an insight into the ways that HSC can be used in practice.

The key application themes with which HSC are summarised below:

- Management and planning;
- Climate change and the historic environment;
- Development control and marine planning;
- Coastal access;
- Data management;
- Research;
- Outreach and education.

3.1. MANAGEMENT AND PLANNING

3.1.1. ELC/HLC/HSC

The concepts underpinning HLC and HSC strongly mirror the principles underpinning the ELC (English Heritage 2009). The scope of the ELC specifically includes 'marine areas' as well as 'land' and 'inland water' (CoE 2000 Article 2) and, in common with HLC and HSC, the ELC takes an holistic approach: concerning '*landscapes that might be considered*

outstanding as well as everyday or degraded landscapes' (Article 2). HSC and HLC provide the tools which allow English Heritage and local planning authorities to apply the concepts of ELC in their land-use management, spatial planning and development control decisions, such as those associated with major infrastructure projects.

3.1.2. ENGLISH HERITAGE'S MARINE STRATEGY

English Heritage and local planning authorities represent a first point of contact for seeking advice on many proposals for change in the historic environment. The strength of that advice is dependent on having a sound information base on which to base it. HSC contributes substantially towards the needs of English Heritage, in defining the legibility of past processes on seascape character and so as to actively manage the marine historic environment by addressing the following areas:

- Under the National Heritage Protection Plan (NHPP) (English Heritage 2011), Activity 3A1 (Unknown marine assets and landscapes), addressing the present poor baseline understanding of marine heritage assets
- Priorities published in *'Taking to the Water'* (Roberts and Trow 2002);
- Providing a basis for incorporating an area-based understanding of the historic environment and, specifically, historic seascape character in marine planning to meet the requirements of the Marine and Coastal Access Act (DEFRA 2009b) and the Marine Policy Statement (HM Government *et al.* 2011);
- Supporting the development of a European marine planning infrastructure to support sustainable management and development of the marine environment (European Commission 2007a and b);
- Meeting the requirements of the UK to support the European Landscape Convention in recognising the significance of the cultural and natural landscape;
- Contributing towards the policies of ICZM (DEFRA 2008).

HSC contributes towards the needs of the above priorities by providing a strategic level framework for understanding and management of the cultural grain of areas that shapes their distinctiveness, underpinned by the same historic characterisation principles as applied on land.

A broad range of management frameworks exist for the coastal, estuarine and intertidal areas although they often limit themselves to near-shore areas when making assessments below Mean High Water. With the advent of marine planning, it is widely recognised as essential that there needs to be close integration between the land-based and marine planning systems. To that end, English Heritage along with the Inshore Fisheries Conservation Authorities (IFCAs) and the coastal local authorities are responsible for informing initiatives towards the implementation and review of Integrated Coastal Zone Management (ICZM) and Shoreline Management Plans (SMPs), both designed to integrate long-term policy decision-making and strategic planning relating to the coastal zones. That will be assisted by the common principles underpinning HLC and HSC across land and coast to sea.

3.1.3. RAPID COASTAL ZONE ASSESSMENT SURVEYS (RCZAS)

The Rapid Coastal Zone Assessment Survey (RCZAS) programme was developed because in the late 1990s it was clear that the coastal historic environment was under-investigated and records in the various HERs and National Record of the Historic Environment (NRHE) did not provide an adequate evidence base for responding to coastal and shoreline change.

Consequently, English Heritage initiated the national RCZAS programme, which, in its later development, comprises two main phases. Phase 1 is a Desk-Based Assessment that examines the areas under investigation using aerial photographs, LiDAR, historic maps and charts, HERs, the NRHE, and other sources. Phase 2 is a Field Assessment which comprise a rapid walk-over survey. The assessment is designed to verify records from Phase 1, as well as locate and characterise site types not visible from the air. Furthermore, the assessment is intended to determine significance and vulnerability i.e. risk.

The outputs consist of enhanced HER and NRHE records, together with client reports for English Heritage. Results from the RCZAS have already been incorporated into books and research frameworks (e.g. Hegarty and Newsome 2007; Murphy 2009; Ransley *et al.* 2013). The information gained will enable English Heritage to have a better-informed management of the effects of coastal change through the 21st century. It will also provide a data-base for use in further research and in the development control process.

In the study area there have been the following RCZAS surveys indicated by their phase:

- RCZA Brompton to Donna Nook (Phase 1 - Brigham *et al.* 2008; Phase 2 - Brigham and Jobling 2011);
- RCZA Donna Nook to Gibraltar Point (Phase 1 – Jobling and Brigham 2010a; Phase 2 – Buglass and Brigham 2007a);
- RCZA Gibraltar Point to Sutton Bridge (Phase 1 – Buglass and Brigham 2007b; Phase 2 – Jobling and Brigham 2010b);
- RCZA Norfolk Coast (Robertson 2005; Alborne *et al.* 2007).

In the context of RCZAS, HSC stands back to take a broader-brush view of the cultural processes, providing a wider contextualisation of the material detail recorded by the RCZAS. By taking a characterisation approach, HSC and HLC share common underlying principles, which allow the site-specific data provided by RCZAS to be understood within its landscape and seascape contexts. In addition, it arguably creates greater appreciation of the contribution of such site-specific data that informs the character of the present-day landscape.

3.1.4. INTEGRATED COASTAL ZONE MANAGEMENT (ICZM)

Integrated Coastal Zone Management (ICZM) is an approach subject to an EU Recommendation (European Union 2002) and designed to bring together consideration and management strategies to address the many inter-related biological, physical and human issues presently facing these zones. Their cause can be traced to a range of underlying issues related to a lack of knowledge, inappropriate and uncoordinated laws, a failure to involve stakeholders, and a lack of coordination between the relevant administrative bodies (European Commission 2000). ICZM aims to promote a collaborative approach to planning and management of the coastal zone, within a philosophy of governance by partnership with civil society. UK Government action towards ICZM is in line with implementing the EU recommendation for a stock-take and national strategy formulation (European Union 2002).

HSC and HLC provide comprehensive area-based data on the typical historic character of our coastal zone, a context essential to feed into ICZM considerations as it provides a key to understanding coastal distinctiveness, diversity and cultural legibility. Sustainable management through the application of ICZM principles will seek to retain those aspects for future generations to enjoy in their coastal landscapes. HSC could in time, also contribute to the benchmarking of change in coastal character.

The shared principles of HSC and HLC allow overlap between the two approaches in the Coastal and Intertidal zones. This is especially important in the Intertidal zone, as this is the area where the planning responsibilities of local planning authorities and the MMO overlap. In addition, interoperability of HSC and HLC with other forms of seascape and landscape characterisation allow the historic cultural element to be appreciated within the wider suite of data produced for other environmental themes or through more generalised landscape classification. This latter data, such as local authorities' landscape classifications and Natural England's characterisation (<http://www.naturalengland.org.uk/ourwork/landscape>), concentrates on geological and natural elements. The use of all these interoperable data sets fully complements the principles of ICZM by providing a totally integrated view of landscapes and seascapes.

3.1.5. SHORELINE MANAGEMENT PLANS (SMPs)

Shoreline Management Plans (SMPs) provide a large-scale assessment of the risks associated with coastal processes and present a long term policy framework to reduce these risks to people and the developed, historic and natural environment in a sustainable manner. Shoreline Management Plans (SMPs) are developed at a strategic level to provide a basis for developing long-term policies for coastal management.

An English Heritage document *Shoreline Management Plan Review and the Historic Environment: English Heritage Guidance* has been published giving guidance for their implementation from a historic environment perspective (English Heritage 2006).

This amplifies DEFRA's advice that an SMP should '*provide the basis for policies for a length of coast and set the framework for managing risks along the coastline in the future*' and '*identify the best approach or approaches ... over the next 100 years*' (DEFRA 2006).

In the study area there are several SMPs being developed by Coastal Groups consisting of local authorities and the Environment Agency:

- SMP 3 – Flamborough Head to Gibraltar Point;
- SMP 4 –Gibraltar Point to Hunstanton (The Wash);
- SMP 5 –Hunstanton to Kelling Hard (North Norfolk);
- SMP 6 – Kelling Hard to Lowestoft (Kelling to Lowestoft).

While its extensive national coverage comes too late to inform this SMP round, HSC will, with HLC, provide a valuable tool in informing future rounds by providing greater landscape context for these assessments, especially informing the inclusion of the typical cultural processes that have shaped the historic character of the coastal and marine environments covered in each SMP.

From a heritage perspective, while SMPs currently focus primarily on the assessment of risk to individual historic assets along the coast, the inclusion of HSC would place these assessments in a broader regional context, enabling an assessment of threats to the broad character of a coastal landscape, as well as assessing individual sites, analogous to the considerations of both species and habitats in SMP ecological assessments.

DEFRA's revised *Shoreline Management Plan Guidance* (2006) highlights the need for more consistent, integrated datasets, specifically noting the scarcity and inconsistency of data on archaeological potential and value and lack of information on a strategic level. The consideration of historic landscape and seascape character will enhance the SMP assessment of short-, medium- and long-term risks to the coast in each SMP. Furthermore, the HLC and HSC will facilitate a better understanding of the historic processes that have shaped a given

area, including its present typical cultural aspects but also present biodiversity and other 'natural' environmental expressions. It can also indicate the likely ranges of archaeological features corresponding with those processes that may be present, whether or not they have yet been confirmed by actual discoveries. HSC on a strategic level will improve the considered assessment of these issues, with explicit justifications, and will provide a context for site-specific assessments of potential during localised investigations.

3.2. SEASCAPE CHARACTER ASSESSMENT (SCA)

Seascape reflects the relationship between people and place, like landscape, and has a vital contribution to the setting of our everyday lives. It is a product of the interaction of the natural and cultural components of our environment, and how they are understood and experienced by people. Seascape character assessment (SCA) has emerged as a means for assessing, characterising, mapping and describing seascape character. The SCA approach follows similar principles to that of Landscape Character Assessment. Natural England's approach to SCA is part of the strategic and integrated management of England's seas, contributing toward the implementation of the Marine and Coastal Access Act 2009.

The Natural England approach depends on the purpose, scope and scale of the assessment being undertaken and the skills and resources that are available to carry it out. It is open to interpretation and innovation. The publication of *An Approach to Seascape Character Assessment* (NECR105, Natural England 2012a) outlines the methods, techniques and skills involved in SCA and identifies HSC and HLC as core data streams in the desk study stage of SCA (Natural England 2012a, figure 3).

The study area of HSC covered by this report was encompassed by a SCA pilot, commissioned by Natural England and carried out by URS Scott-Wilson: *Seascape Characterisation around the English Coast (Marine Plan Areas 3 and 4 and Part of Area 6 Pilot Study)* (NECR106, Natural England 2012b). Undertaken prior to this HSC project, and too time-limited to permit the levels of stakeholder involvement detailed in the Natural England SCA Approach, it was acknowledged that HSC has 'potential for notable contribution to the understanding of the marine environment' (NECR106, Natural England 2012b, Annex 1, 9).

3.3. CLIMATE CHANGE AND THE HISTORIC ENVIRONMENT

The management of change arising from potential impacts of climate change and its mitigation is a key priority for English Heritage (English Heritage 2008). It is widely recognised that there are many potential impacts from climate change originating from changes in sea level rise, increases in extreme weather conditions, and hydrological changes on the historic landscape, as well as the possible effects of mitigative measures in response to climate change, such as the development of sea defences or renewable energy resources. This also includes practices that are used to alleviate the effects of climate and environmental change, such as flooding pressure, in one area from the potential impact in another through schemes such as DEFRA's Habitat or Bioversity Compensation outlined in *Making space for Nature* (DEFRA 2010). English Heritage recognises that such impacts should always be taken into account when policy is being formulated and is committed to working with others to avoid or minimise any adverse impacts on the historic environment, including landscape and seascape, while delivering the necessary changes.

HSC will provide a valuable resource in informing government agencies on the character of the different parts of the coastal and marine environment during policy making and during the assessment of potential effects of new developments during EIA (through both the 'Cultural Heritage' and the 'Landscape' environmental themes), or through schemes such as DEFRA's Habitat or Bioersivity Compensation (see case study below). Furthermore, HSC has the potential to act as a base-line against which to measure future changes, and in this respect is also useful for assessing past responses to climatic change and identifying what lessons can be learnt.

As well as being a force for change in the historic landscape, climate change also plays an important part in defining the present character of some coastal and marine areas, through the construction of sea defences, renewable energy such as tidal- and wind-farms, and the presence of rapidly eroding coastlines or the reclamation of coastal areas. All of these play a key part in defining the present-day historic cultural character of many of England's coastal landscapes and seascapes.

3.4. DEVELOPMENT CONTROL AND MARINE PLANNING

The government bodies dealing with the management and protection of the different aspects of the marine environment, such as Natural England, English Heritage and the Environment Agency share similar and overlapping responsibilities.

3.4.1. MARINE PLANS

Marine Plans need to take account of the cultural and historic dimensions of the environments they encompass. Similarly, development-led desk-based assessments must take account of the relationships between natural processes and human activity in order to interpret potential risks and impacts of proposed activities, and more generally to plan for sustainable futures.

The working practices for development control in the inter-tidal zone are still being worked on, but are divided between several authorities, including Inshore Fisheries and Conservation Authorities (IFCAs). Here, the authority of the MMO overlaps with the relevant terrestrial planning authority. The terrestrial authority would normally be the higher tier authority (e.g. County Council or Unitary) for strategic developments such as a barrage, a hazard to navigation, minerals extraction, or coastal flooding. Any issues relating to the SMP, in most instances would be the remit of the lower tier authority (e.g. District Council or Unitary). In this zone of overlapping planning systems and overlapping perceptions, HSC provides a maritime perspective which complements the land-based perspective provided by HLC.

3.4.2. INSHORE FISHERIES AND CONSERVATION AUTHORITIES (IFCAs)

There are 10 Inshore Fisheries and Conservation Authorities (IFCAs). The IFCAs replaced sea fisheries committees in April 2011, with an expanded remit to 'lead, champion and manage a sustainable marine environment and inshore fisheries, by successfully securing the right balance between social, environmental and economic benefits to ensure healthy seas, sustainable fisheries and a viable industry'. The duties and powers of the IFCAs are set out in the Marine and Coastal Access Act 2009 (DEFRA 2009b; DEFRA 2011).

IFCAs are funded through local authorities, but report to the Department for Environment, Food and Rural Affairs (DEFRA). Each IFCA manages a district that covers part of the English coast that goes out to 6 nautical miles and its inland boundaries align with those of its

constituent local authorities. IFCA also manage sea fisheries resources in estuaries that fall within their districts.

IFCAs are either a committees or joint committees of the local authorities that fall within an inshore fisheries and conservation district. IFCA committees are made up of the following:

- Representatives from the relevant local authorities.
- An officer from each of the MMO, Environment Agency and Natural England.
- Local people with experience and expertise in the inshore marine area, such as commercial and recreational fishermen, and marine environmental experts.

IFCAs have a significant contribution to make towards the management of inter-tidal and inshore areas which are championed by DEFRA and the Integrated Coastal Zone Management (ICZM) (DEFRA 2008: 23-4). ICZM encourages a process of harmonising the different policies and decision-making structures, and bringing together coastal stakeholders to take concerted action towards achieving common goals. This opens the possibility of integrating the many different interests effectively so as to assess the coast in a holistic way. HSC enables that process to be informed by an area-based understanding of the historic cultural processes, activities and perceptions that have shaped whatever coastal area is under review.

Within the East Yorkshire to Norfolk HSC project area is the Eastern IFCA (<http://www.eastern-ifca.gov.uk/>).

3.4.3. NATIONAL PLANNING POLICY FRAMEWORK

The *National Planning Policy Framework* (NPPF 2012) supersedes the *Planning Policy Statement 5: Planning for the Historic Environment* (PPS5) and provides the new framework guiding the land-based planning system. It gives clear advice that a respect for the character of places is essential for ‘promoting the vitality of our main urban areas’ and ‘supporting thriving rural communities’ (NPPF 2012, Core Planning Principles). That good design for an area should be based on ‘an understanding and evaluation of its defining characteristics’ (NPPF 2012, Section 7 para 58). That it is desirable for new development to make ‘a positive contribution to local character and distinctiveness’ and take ‘opportunities to draw on the contribution made by the historic environment to the character of a place’ (NPPF 2012, Section 12 para 126). HSC and HLC combine along the coast to provide the necessary evidence-base for local character to enable implementation of those sections of the NPPF in a consistent and transparent manner.

3.4.4. ENVIRONMENTAL IMPACT ASSESSMENT

Since 2007 the extraction of marine minerals has been controlled through the *Environmental Impact Assessment and Natural Habitats (Extraction of Minerals by Marine Dredging) (England and Northern Ireland) Regulations 2007*, which incorporates the requirements of European Community EIA Directive 85/3337/EEC and the European Habitats Directive 92/43/EEC (<http://marinemanagement.org.uk/works/minerals/>). This replaced control through the informal process of ‘Government View’ (GV) requiring the operator to obtain a positive GV before the Crown Estate, as owner of the seabed, granted a commercial licence permitting extraction. However, GV measures have been largely replaced by the licensing regime in Part 4 of the Marine and Coastal Access Act 2009.

Currently, the Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2011 transpose the EU EIA and Habitats Directives into UK law. The Marine Works

Regulations (MWR) formalise the procedure for the consideration of applications to extract marine aggregate in England and Wales and when they entered into force in 2011 the Environmental Impact Assessment and Natural Habitats (Extraction of Minerals by Marine Dredging) (England and Northern Ireland) Regulations 2007 were repealed.

As such, since the MCAA 2009 entered into force in 2011 all applications are for 'Marine Licences' formalised under this single regime.

As stipulated in the historic environment guidance published by COWRIE (Wessex Archaeology 2007), developers of offshore renewable energy schemes are under the same obligation to undertake EIA as the aggregate industry. The COWRIE guidance specifies the need to review baseline information as part of this process, recommending a broad study area encompassing sources such as Strategic Environmental Assessments and HLC where available. The COWRIE Guidance was published before several significant developments affecting landscape and seascape considerations for EIA. As a result, of the various EIA Environmental Statement (ES) input themes, the Guidance's consideration of the historic environment for EIA is exclusively under the 'Cultural Heritage' input (as noted on p28). It makes brief passing references to 'landscape' at 5.12 but does not note 'Landscape' as a separate environmental theme for Environmental Statement input. The Guidance makes no reference to the ELC and while mentioning HLC, it touches only briefly on 'seascape': its publication pre-dated finalisation of the HSC method and only anticipates HSC as a future development.

With the ELC now in force in the UK and both HLC and HSC coverage now approaching complete coverage across England's land, coast and seas, there is ample opportunity now to complement the COWRIE guidance with EIA ES inputs on the 'Landscape' theme for marine development proposals, informed by use of HLC and HSC accompanied by visual impact assessment and Seascape Character Assessment (SCA).

In addition to informing English Heritage's advice during the production of environmental statements, as well as relevant planning authorities, HSC is available for use by developers to provide initial baseline information for informing scoping studies, indeed this has been one of the more frequent applications of completed HSC databases in the past few years (D. Hooley pers comm. [19/07/2013]). Later refinement of development proposals may well require more detailed HSC assessment, as already happens with HLC for some developments on land. In similar manner, HSC can inform curators and archaeological contractors in preparation for desk-based assessments, briefs, and evaluations for development proposals such as offshore windfarms, aggregate license areas, coastal defences or harbour developments.

3.4.5. MARINE PROTECTED AREAS AND MARINE CONSERVATION ZONES

By international agreement, the UK Government has committed to establishing a network of Marine Protected Areas (MPAs) around England's coasts by 2012. The Marine and Coastal Access Act 2009 provides the legislative framework to do this through the designation of Marine Conservation Zones (MCZs) a new designation which supersedes the Marine Nature Reserve (MNR) designation.

MCZs are areas that have been designated for the purpose of conserving marine flora or fauna, marine habitats or types of marine habitats or features of geological or geomorphological interest. MCZs and MPAs are intended to provide protection for species and habitats considered of national value that cannot be protected under European law (DEFRA 2008: 65). Particularly relevant to HSC are Sub-sections 7 and 8 in Section 117 'Grounds for designation of MCZs' in the Marine and Coastal Access Act:

(7) In considering whether it is desirable to designate an area as an MCZ, the appropriate authority may have regard to any economic or social consequences of doing so;

(8) The reference in subsection (7) to any social consequences of designating an area as an MCZ includes a reference to any consequences of doing so for any sites in that area (including any sites comprising, or comprising the remains of, any vessel, aircraft or marine installation) which are of historic or archaeological interest.

The Government's deliberations over the MCZ recommendations currently remain on-going (July 2013) (<https://www.gov.uk/government/consultations/marine-conservation-zones-consultation-on-proposals-for-designation-in-2013>) but HSC can contribute to MCZ designation in several ways. It can contribute directly to the social consequences of such designation referred to in subsection 117(8) by providing the cultural context in which known sites of historic or archaeological interest are embedded: the background against which their interest and, if applicable, their heritage designation, has been adjudged and which may well be directly pertinent to the inherent setting and survival of the site of such interest themselves.

In a broader sense and of direct relevance for HSC, and for the landward perspective of HLC, under the Nagoya Protocol for Biodiversity in October 2010, the UK Government made the commitment in its 2020 targets that the global network of Marine Protected Areas (MPAs) will be 'integrated into the wider landscape and seascapes'. HSC has the potential to help the government meet its 2020 objective with MCZs if it can be fed directly into the necessary consultation process. The confirmation of the Nagoya commitment for the UK came from DEFRA's Minister Richard Benyon MP in January 2011 (Hansard: <http://www.publications.parliament.uk/pa/cm201011/cmhansrd/cm110119/text/110119w0001.htm#11011955000020>). However, the UK's domestic contribution to that global network by establishing a coherent network of MCZs has only been partly successful. There was a commitment from DEFRA in 2011 to implement the MCZ network resulted in the establishment of four Regional MCZs, identifying 127 areas for conservation (MCZs). The Regional MCZ in the East Yorks to Norfolk HSC project area was *Net Gain*, which used the completed HSC coverage for north eastern coasts and seas (Merritt and Dellino-Musgrave 2009) as one of its data sources.¹ In 2012, after wide consultation with especially from JNCC and Natural England, only 31 of the 127 have been endorsed by DEFRA. From the original 127, 7 were located in the study area. Though none were endorsed in the first round of designation, all 7 are being considered further. These include:

- NG 2 - Cromer Shoal Chalk Beds;
- NG 4 - Wash Approach;
- NG 5 - Lincs Belt;
- NG 6 - Silver Pit;
- NG 7 – Markham's Triangle;
- NG 8 - Holderness Inshore;
- NG 9 - Holderness Offshore.

Although MCZs are not being designated on the basis of any historic or archaeological interests, the Marine and Coastal Act 2009 specifies that any sites which are of historic or archaeological interest located within MCZs are to be considered during the designation process. Therefore, HSC can contribute to advising DEFRA on these aspects of its responsibility.

¹ (<http://webarchive.nationalarchives.gov.uk/20120502152708/http://www.netgainmcz.org/>)

As HLC and HSC directly address cultural landscape and seascape issues, underpinned by common principles and directly in accord the ELC Articles and definitions throughout land, coast and sea, the extensive coverage by HSC and HLC databases will make a major contribution in providing a framework and content for MCZs' landscape/seascape integration

Characterisation of the marine and coastal landscapes is similarly central to the development of Management Plans for other conservation zones such as AONBs and Natural Reserves. The close relationship between the historical and natural environment is well recognised by curators of the coastal and marine environment. The impact of human activities over time can affect a wide range of aspects of the natural environment including biodiversity, the movement of sand along beaches and dunes, or the change in habitats along rivers and estuaries. In the same way, coastal and marine habitat management is also a cultural action whose historic environment effects need to be taken into account. Just as the effects of human's management have left a cultural imprint on the *environment* everywhere, so too that cultural imprint has shaped the cultural perceptions in our minds of *landscape* and, where it involves the sea, the *seascape*.

3.5. COASTAL ACCESS

The Marine and Coastal Access Act 2009 fulfilled the government's commitment to establish a new framework for managing the demands that are put on our seas by human agencies, as well as to improve marine conservation, and open up access for the public to the English coast. In particular, the Act contains provisions for creating an access route around the English coast. It places a duty on the Secretary of State and Natural England to secure a long distance route (the English coastal route) and land available for open-air recreation accessible to the public around the coast of England. In doing so the Marine and Coastal Access Act amends existing legislation – namely the National Parks and Access to the Countryside Act 1949 and the Countryside and Rights of Way (CRoW) Act 2000.

The Marine and Coastal Access Act provides for public access on foot to certain types of land including areas of open land comprising mountain, moor, heath, down, and registered common land, It also increases protection for Sites of Special Scientific Interest (SSSI) and strengthens wildlife enforcement legislation, and provides for better management of Areas of Outstanding Natural Beauty (AONB). Some forms of land are exempt from the rights of access, depending on the nature of their usage, such as railways, golf courses quarries and aerodromes. Under the Coastal Access Scheme, under which Natural England is implementing the Act's coastal access provisions, HSC provides a valuable resource both in the planning the coastal access route and in informing the information provision for the route's users. The HSC GIS, used in conjunction with baseline data required for route-planning, will highlight the breadth of character through which the route is being planned, provide information on what that character comprises, and help identify optimal situations where information for route users would be most beneficial in raising awareness of the cultural and historical landscape and seascape through which the route passes. The Character Type text descriptions produced in conjunction with the HSC GIS offer a useful resource in the development of public information for users along the route. The coastal access provision gives a major opportunity to stimulate people's thoughts about their landscape and seascape perceptions that come together at the coast

3.6. DATA MANAGEMENT

HSC seeks to reflect best practice for data management and is compiled in accordance with Guidelines for English Heritage Projects involving GIS (Froggatt 2004). English Heritage is also working closely with the Marine Environmental Data Information Network (MEDIN) alongside other partners from the private and public sector, towards a set of agreed “public good” goals (see <http://www.oceannet.org/>). These aim to:

- Provide a data management and access framework for the UK marine data community;
- Develop marine data management standards, and protocols;
- Contribute to the marine component of the geospatial strategy for the UK;
- Recommend actions and map progress towards achieving coordination of management of UK Marine Data.

HSC contributes towards MEDIN objectives by addressing these major government priorities:

- Marine data will be made accessible to the community in a format that is useful for all stakeholders;
- Marine geospatial analysis will be undertaken through data enhancement and improving data quality which will enable integration of natural and historical environments datasets to allow informed decisions towards development control caseworks.

3.7. RESEARCH

Within the study area, there have been two Archaeological Research Frameworks, in some cases also updated:

- East Midlands – Lincolnshire coast and part of the The Wash (Cooper 2006; Knight *et al.* 2012);
- East of England– Norfolk coast and part of The Wash (Glazebrook 1997; Brown and Glazebrook 2000; Medlycott 2011);
- Yorkshire (although this excludes South Humberside and which is not included in East Midlands document) – (Roskams and Whyman 2005, 2007).

In addition to the terrestrial research frameworks outlined above, there is also two complimentary marine research frameworks:

- North Sea Prehistory Research and Management Framework (NSPRMF) (2009);
- A Maritime Archaeological Research Agenda for England (Ransley and Sturt 2013).

The latter project produced a resource assessment and research agenda for England’s maritime and marine historic environment, which is the first, key stage in developing a full research framework. The research framework provides a coherent overview of previous research into England’s maritime, marine and coastal archaeology, which will enable long-term strategic planning, inform policy and provide a statement of agreed research priorities within which researchers can shape and seek funding for projects.

The need for further work in both underwater and intertidal environments, particularly for the understanding of prehistoric submerged landscapes, is clearly set out in both sets of documents. Such work would have an iterative relationship with HSC, broadening the basis of its assessments and enhancing their confidence levels, while the HSC provides a more generalising perspective giving context to the site-based perspectives’ HSC and detailed site-based research have a mutually beneficial relationship that build on each other’s

understanding. HSC also has particular value in providing a strategic level perspective of the character of the coastal and marine environment for education and public-awareness raising.

HSC has considerable potential for use in conjunction with other cultural and natural environmental themes, for example in the implementation of the Natural Environment White Paper (which will become a major driver for the use of HLC and HSC databases), but also with other heritage related data such as that within the Marine ALSF database produced by ABPMer (<http://www.marinealsf.org.uk/>), and desk-based research, to assess gaps and coverage in research themes across England's Coastal and Marine zones. The provision of an area-based cultural heritage output which is interoperable with other GIS databases will enable the recognition of correlations and disparities between datasets which could not previously be viewed together, thereby opening new potential areas for research.

3.8. OUTREACH AND EDUCATION

Raising levels of public understanding, engagement and appreciation of the historic cultural dimension of the marine environment are some of the main aims of both HSC and HLC. As such they align closely with the inclusive approach to landscape embodied by the European Landscape Convention (ELC) which requires ratifying states 'to recognise landscapes in law as an essential component of people's surroundings, an expression of the diversity of their shared cultural and natural heritage, and a foundation of their identity' (CoE 2000 Article5).

In line with that, HSC can serve as a framework and resource for outreach and improving public awareness of the marine historic environment. The Character Type texts in particular provides a valuable educational resource tool, consistently structured and in comprehensible language, conveying information on the historic character of everyone's familiar or favourite areas of the coast and sea. HSC carries the message that everywhere has historic character: the typical and commonplace as well as the rare and the special: all that is familiar and distinctive, whether highly valued or not, has relevance and is covered by HSC and HLC. It has meaning for everyone who inhabits, uses or has any engagement with the coast or the sea

Following the consolidation of England's national HSC database, its main outputs, the GIS mapping and its linked Character Type texts, are to be curated and made widely available to users both in the professional community and among the interested public through English Heritage's Heritage Data Management services. Digital products from its contributory projects will also made available on the Archaeological Data Service (ADS) website, where many are already hosted (<http://archaeologydataservice.ac.uk/archives/view/seascapes/>).

The non-technical texts about HSC's Character Types provide a valuable resource as an educational tool, improving access to information on the historical character of the coastal and marine environment. Such character assessment provides the evidence base for the many roles for the character of place identified in the NPPF. It enriches the perception and understanding of place and the role of heritage in giving it distinctiveness among local communities. In doing so, it better enables such communities to make informed inputs to shaping their local areas, which lies at the heart of the NPPF and the wider provisions of the Localism Act 2011. The coastal access provisions of the Marine and Coastal Access Act 2009 will present an opportunity for using HSC and HLC as an information resource on the multiple landward and maritime cultural perspectives that bear on the planned coastal access route, such information being disseminated both by the traditional static information boards but more imaginatively perhaps through information resources provided online or through mobile phones. Information provision along the route would have even greater effectiveness if linked to national resources or to local educational and community based initiatives

designed to enhance local communities' current awareness of the landscape and seascape character and perceptions of the areas in which they live and work, for example in Landscape Partnership Scheme projects.

4. CASE STUDIES

HSC is designed to inform the positive management of change affecting the seascape from an archaeological perspective of the character of the coastal and marine environment's historic dimension. The two case-studies presented in this report have been selected in consultation with English Heritage to provide examples of applications based on scenarios from the project that help to illustrate the way that HSC can positively enhance the marine activities, such as the marine planning process.

The applications review presented above provides context for the case studies. These case studies demonstrate two detailed scenarios associated with coastal and marine areas:

- HSC in the context of the East Marine Plan: outlining positive management of the Offshore Region historic seascape using the vicinity of the Hornsea windfarm proposal as an example;
- HSC as a tool informing the mitigation of climatic and environmental change: examining the influence of the past on present and future coastal defences and habitat types using the North Norfolk Coast as an example.

Furthermore, these two studies are examples in *contested seascapes*: the presence, varied interests and roles of different stakeholders in utilising the coastal and marine environment. It is critical that the coastal and marine environment's sustainable development accommodates as many voices as possible in the valorisation of seascape – in the legitimisation of space for many who contribute to its sense of space and character (after Bender 1998). Landscape and seascape in general, and HLC and HSC in particular, have the potential to act as a common medium and mediator between different interests, while emphasising the historic dimension of the coastal and marine environments – how humans have shaped and continue to be shaped by the interactions of past and present cultural and natural forces. HSC therefore can be seen as a tool for bridging boundaries between disciplines in the production of more positive set of relationships. In this manner, HSC opens a process of communication which promotes informed and inclusive decision-making with a greater chance of acceptability and sustainability as a result.

4.1. CASE STUDY 1: EAST MARINE PLAN AREAS: RESPONSES TO OFFSHORE WIND FARM PROPOSALS

4.1.1. BACKGROUND

Marine Plan areas are intended to translate the Marine Planning Statement (MPS) into detailed policy and guidance for particular areas. DEFRA have already established the 11 marine plan areas, and which should be completed by 2021. Before each plan is started a Statement of Public Participation is prepared, setting out how and when stakeholders will be engaged in the plan making. The justification for the Marine Plan areas is that there is huge demand on space for marine activities and designations, especially in shallower waters such as coastal zones and estuaries. A well-designed planning system allows the Marine Plan areas to be shaped according to a clearly set out vision, range of policies and objectives in the MPS (HM Government *et al.* 2011):

In order to do this, it is necessary to go through stages of (spatial and non-spatial) analysis that start with some broad-scale choices (options) that address a key issue that can drive change. Then look at any implications of those choices for other key issues and then formulating responses to any implications as well as any further implications that may arise as a result of these responses. Through this process options are developed and

become more detailed and, as part of it, some may be ruled out or amended significantly from their starting point. This is to better address the key issues, vision and objectives.²

The East Marine Plan area (hereafter East MP) was the first to be initiated in April 2011 and is expected to be ready for Secretary of State's approval later in 2013. The area covered by the East MP area is from Flamborough Head in the north to Felixstowe in the south. Two areas make up the East MP area:

- The East Inshore area (No. 3);
- East Offshore area (No. 4).

The East Inshore and East Offshore plan areas were selected as the first in England for a number of reasons which include:

- Major predicted changes in the footprint of activities, particularly offshore wind energy but also marine protected areas, and potentially extractive industries such as aggregates, that are in progress and planned for the region.
- Opportunity to address how best to sustainably manage such changes in a way that takes into account the competing uses, concerns of the local coastal community, and environmental interests of the areas; together with the range of communities, including less well-off areas that will benefit from economic confidence in sustainable development.
- The potential for Marine Plans to contribute to achieving sustainable development in the face of these challenges and changes, taking into account existing activities, multiple pressures, the receiving environment and the varying aspirations of different interests.

Marine Plans need to integrate with a range of existing strategic plans. Rather than duplicate plan information and policies, marine plans will signpost other plans where appropriate and will only cover the same ground where the marine plans are adding new information.

A draft East MP has been presented (*Draft vision and objectives for East marine plans* (MMO March 2012)) and commented on (*Draft vision and objectives for East marine plans: Update* (MMO May 2012)). Several documents have been presented correlating with the High Level Marine Objectives (DEFRA 2009a) and the Marine Policy Statement (HM Government *et al.* 2011):

- Achieving a sustainable marine economy;
- Ensuring a strong, healthy and just society;
- Living within environmental limits;
- Promoting good governance;
- Using sound science responsibly.

To aid in this process a Seascape Characterisation Assessment was conducted by URS Scott Wilson consultants. Although intended as a pilot for the Natural England SCA Approach, due to time constraints it did not consider the limited coverage of historic seascape characterisation available at that time (this current HSC project fills that gap in coverage) and did not engage in the appropriate level of stakeholder engagement (NECR105, NECR106; Natural England 2012a, 2012b). Those shortfalls were later addressed in another consultation

² (http://marinemanagement.org.uk/marineplanning/areas/east_options.htm). [Accessed 8/3/2013].

process initiated by the MMO before the SCA was finally drawn into the East MP preparation process (MMO July 2012). As the MMO indicated in October 2012:

The MMO are working with English Heritage to ensure the work carried out in the East Inshore and East Offshore areas (to look at historic seascape characterisation) is included as part of the evidence base for marine plans. This will be taken forward as a separate activity that will feed into the overall marine planning evidence base.³

This situation will not recur: HSC has been completed and is currently (July 2013) informing South MP preparation and national coverage by HSC will be complete by the end of 2013, well in advance of all further Marine Plan preparation.

The SCA approach was identified as one of the sources for implementing the East MP, as derived from assessing the East MP *Draft vision and objectives for East marine plans* (MMO March 2012). While the SCA by URS Scott-Wilson fed into the strategy after further consultation, the potential of HSC is also recognised in helping shape a more bottom-up, informed characterisation.

As such, identifying some of the key objectives is one step towards recognising some of the ways that an informed, bottom-up characterisation like HSC can contribute more effectively in meeting the MPS's and more locally situated East MP objectives (**highlighted** text as key markers):

- Objective 3: To help **realise the potential** of offshore wind energy generation.
- Objective 6: To recognise the **value of heritage assets**, recognising **temporal changes** which may adjust the value of the asset and ensuring that any development is in character with the local area, so as not to be to the detriment of existing design.
- Objective 7: To help ensure a healthy, resilient and adaptable marine ecosystem in the East plan areas including to **deliver biodiversity objectives** and to provide benefits to people in a way that respects environmental limits.
- Objective 8: To help ensure that biodiversity in or dependent upon the East plan areas is **protected, conserved** and where appropriate **recovered and loss** has been **halted**.
- Objective 9: To help ensure that marine protected areas and other sites designated for conservation **meet their objectives in a way that guides decisions** on licence applications and management of on-going activities and takes account of implications for delivering other objectives across the East plan areas.
- Objective 10: To support measures that help **adaption to climate change** in the plan areas and **contribute to measures to mitigate** climate change.
- Objective 12: To ensure the **best available evidence base** to support development and review of marine planning in the East plan areas.

These East MP objectives are assessed in light of HSC's coastal and marine environments and their association with one of the major forces for change in the East MP: offshore wind energy proposals, one of which comprises the Hornsea area Round 3 Offshore Wind Farm proposal.

4.1.2. *HORNSEA ZONE OFFSHORE WIND FARM PROPOSAL*

The Hornsea zone has the potential to provide enough electricity to meet approximately 4% of all electricity demand in the UK which equates to power for approximately 3 million

³ Seascape character area assessment. East Inshore and East Offshore marine plan areas (Oct 2012), 2.

homes. The UK goal for renewable electricity generation is approximately 30%. Hornsea's offshore generation could account for approximately 12% of that target. The total zone area is 4,735 km² and lies between 31km and 190km off the East Yorkshire coast. Water depths across the zone are predominantly between 30 and 40m, with maximum depths to 70m.

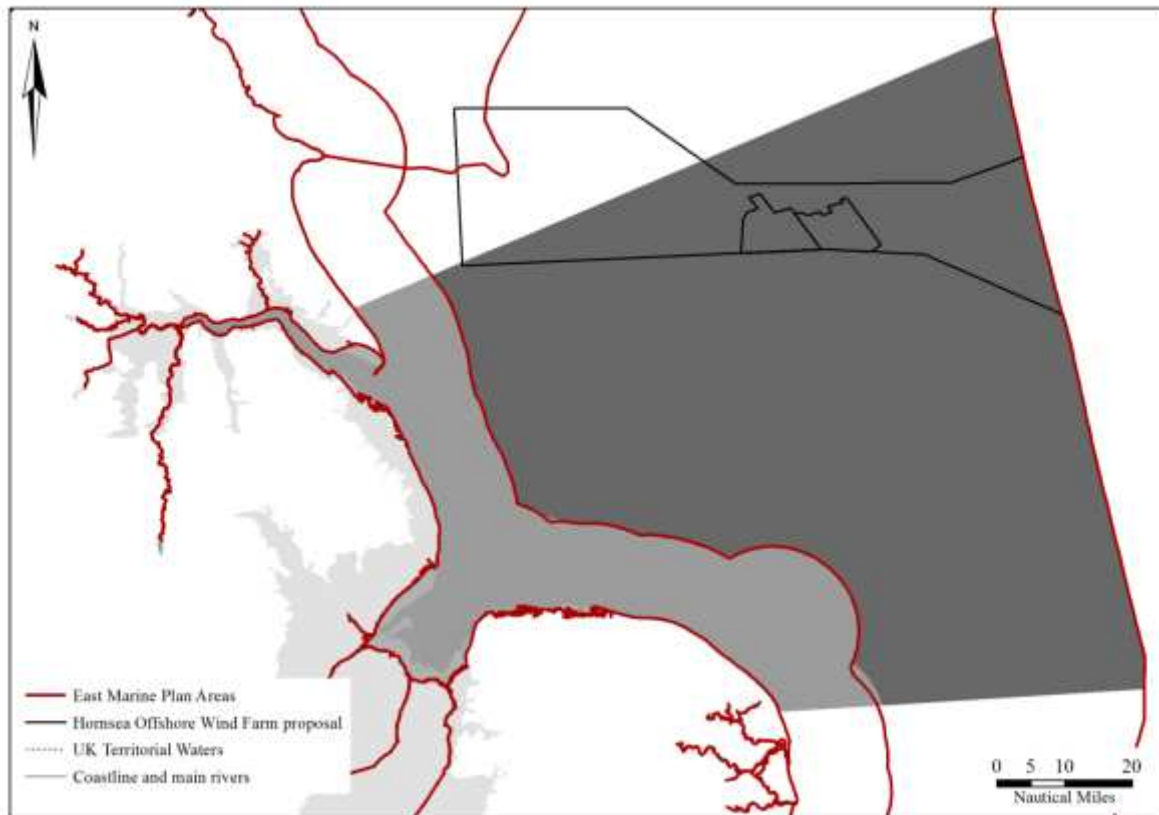


Figure 2.1. Hornsea Wind Farm proposal and East MP areas within the East Yorks to Norfolk HSC project

The scheme consists of several projects divided into distinctive phases of consultation. Each project will have a different impact assessment and consultation process (e.g. Project One, phases 1-4).

- Project One, the first development in the Zone, will comprise of up to three wind farm arrays. Project One will have a combined capacity of up to 1.2 gigawatts (GW). The offshore wind turbines for Project One will be located in the centre of the Hornsea Zone, covering an area of approximately 407km². Depending on the rated capacity of the turbines selected (between 3.6 and 8 megawatts (MW) each), the estimated number of wind turbines will be between 150 and 332. The nearest turbine will be at least 103km from the East Riding of Yorkshire coast. Wind turbines used for Project One will have a maximum rotor diameter of 178m, maximum hub height of 120m, and maximum rotor tip height of 200m. SMart Wind is proposing to transmit the electricity generated via buried, High Voltage (HV) cables using either Direct Current (DC) or Alternating Current (AC).⁴
- Project Two, the second development in the Zone, will have a combined capacity of up to 1.8 gigawatts (GW). The offshore wind turbines for Project Two will be located in the centre of the Hornsea Zone, adjacent to Project One. Depending on the rated

⁴ Quoted from <http://www.smartwind.co.uk/project1.aspx> [Accessed 9/4/2013].

capacity of the turbines selected (between 5 and 15 megawatts (MW) each), the estimated number of wind turbines will be between 80 and 360. The nearest turbine will be at least 89km from the East Riding of Yorkshire coast. SMart Wind is proposing to transmit the electricity generated via buried, High Voltage (HV) cables using either Direct Current (DC) or Alternating Current (AC).⁵

4.1.3. ENVIRONMENTAL STATEMENT

The Environmental Impact Assessments (EIA) Regulations implement the EIA Directive and also apply to all nationally significant infrastructure projects (NSIPs). The Hornsea Offshore Wind Farm project is considered to be a NSIP, requiring development consent under the Planning Act 2008 by the Planning Inspectorate.

The Environmental Statement (ES) is a requirement of the EC EIA Directive in respect of such an application and must contain information on a wide range of environmental aspects that the development might impact on, such as coastal processes, bathymetric surveys, benthic communities, fish populations, landscape, as well as archaeological and historic remains. That information is given in the ES under a series of environmental themes specified in the EIA Directive Article 3. The key roles under which HSC can contribute are the themes of 'landscape' and 'cultural heritage'. Apart from being a statutory requirement, from a developer's point of view careful preparation of an ES and consultation on its drafts will provide a number of benefits to a project:

1. A useful framework within which environmental considerations and design development can be drawn in and interact
2. Environmental analysis may indicate ways in which the project can be modified to avoid or mitigate possible adverse effects
3. Thorough environmental analysis and provision of comprehensive information allows the consenting authorities to reach a decision more rapidly.

The impact on the Coastal and Marine environments resulting from Project One has been assessed in a draft Environmental Statement (ES) according to marine planning requirements (3 volumes – www.smartwind.co.uk; SMart Wind 2012a, 2012b, 2013), detailing the impact of the development on the environment, including the archaeology and seascape in the offshore area (SMart Wind 2012a, Chapters 10 and 11) and on the inshore and coastal zones (SMart Wind 2012b, Chapters 4 and 5).

In preparing for the draft ES one of the *England's Historic Seascapes* pilot projects was used in the assessment (MoLAS 2009), although the response suggested that the magnitude of impact of the operation of the wind farm on the historic character of the Well Hole Character Area – identified by MoLAS – would be medium on an area of low sensitivity. The overall effect on historic seascape character would therefore be minor (SMart Wind 2012a, Chapter 11 (11.6.111): 49).

However, given that MoLAS adopted a different approach to the national HSC programme (as reported in Section 1 of this report), a reassessment of that impact is outlined here; not to replace the Environmental Statement offered by SMart Wind, but to reassess it in light of the now finalised national HSC methodology subsequently developed and now in use by English Heritage.

⁵ Quoted from <http://www.smartwind.co.uk/project1.aspx> [Accessed 9/4/2013]. No information on future Projects is offered, and is probably dependent on the capacity of Projects One and Two.

4.1.4. HSC AND EIA SCOPING AND SCREENING

Historic Seascape Characterisation will be valuable to the applicants and their historic environment consultants during the initial assessment or desk-based study for the applicant's EIA scoping report. English Heritage were consulted during the Project One consultation process, and HSC was identified as assisting English Heritage in informing and framing their response to the consultation in local, regional and national contexts. As discussed above in the Applications Review part of this Project Report Section 1 (4.3 and 4.4), the HSC GIS output provides a strategic level characterisation of the cultural dimension of the coast and the marine zone; its character type hierarchy reflects national, regional and local scales of perception. In addition to coastal land, these are mapped at the main marine levels of their expression: sea surface, water column, sea floor and sub-sea floor. The approach allows the user to select the scale and level of data relevant to their queries. The database incorporates the necessary transparency in its assessment, with confidence ratings attached to the HSC character assessments themselves.

As also reported in Section 1 (4.4), Character Type text descriptions are linked to the HSC GIS and they provide an overview of coastal and marine historic cultural character in the region. The texts also identify some of the current forces for change and pressures on historic seascape character and suggest some potential avenues for further research or management strategies. Hence HSC provides benchmark information with which to recognise both that all areas have distinctive landscape and/or seascape character, and that the seascape is managed more positive when there is an understanding of that character. Beyond the compilation of the baseline HSC, values can, and usually need to, be ascribed at a later stage, in the context of a proposal for change or one of HSC's other applications. Relevant to such value ascription are the considerations set out in English Heritage's *Conservation Principles for the Sustainable Management of the Historic Environment* (English Heritage 2008). But as baseline information, it should be understood that HSC itself is value-neutral and designed to be a positive force in informing change, recognising that landscape and seascape are products of change, that change needs to happen, and that well-informed and sustainable landscape and seascape change can and should respect and retain cultural distinctiveness and legibility for future generations wherever possible. How far that distinctiveness and legibility is actually retained in decision-making is clearly a matter for the planning process, but HLC and HSC ensure that information on the character of the cultural dimension in the present-day is available to inform that process. Historic cultural landscape and seascape character cannot be 'lost' as such, only modified or changed to a differing character. In some circumstances, society may view such changes as desirable, in others, not.

The EIA process requires the collation of a broad range of documentary and digital resources to provide baseline information for making an informed assessment. The initial compilation of this considerable quantity of data can obscure the overall picture, making it 'difficult to see the wood for the trees'. The strategic level overview of cultural time-depth in the present provided by HSC offers a valuable framework connecting and giving context for those detailed inputs to EIA assessment.

The structure of the HSC output, comprising the GIS database and Character Type text descriptions, corresponds well with providing an EIA's first stage assessment of the broad activities and key features dominating the marine and coastal environments. It meets the key aims and objectives of the EIA process by:

1. Providing a firm basis for making a first stage assessment of the character of human cultural and historic activity within an EIA area.
2. Enabling the area-based consideration of landscape and seascape character in the EIA process, interoperable with consideration of other cultural and environmental aspects
3. Providing a resource for identifying available data sources required for making more detailed assessments of potential impacts of activities within EIA study areas
4. Providing context for understanding other, predominantly point-based, data sources relating to the historic environment which also feed into the assessment such as HER data
5. Providing context for making preliminary assessments of the need for further research and data gathering

As outlined earlier in this Report Section, HSC highlights dominant patterns of historic cultural expression in the present-day, which include the recurring presence of infrastructure features, concentrations in wrecks and obstructions, mapped palaeoenvironmental features such as palaeo-channels (where data is available). Furthermore, HSC describes the processes and roles of these features in producing specific human activities that manifest themselves in present seascape character. As such, the HSC output provides valuable contextual information at a broad-brush scale and supports and compliments more detailed analysis of specific features.

Cultural heritage inputs to EIAs have traditionally been focussed on point data, collating wrecks, obstructions and reported losses from different repositories including the NHRE and UKHO databases. Use of HSC will enable such traditional inputs to gain contextualisation within the ES's coverage of the 'landscape' environmental theme, especially if followed up with a character sensitivity assessment as most ES's will require, providing a basis for making fuller, more rounded statements of effects on the typical and commonplace historic character of marine environment, as well as the rare and the special, everywhere, in the different levels of the marine environment (sea surface, water column, etc.) and at various scales of perception.

The structure of HSC, with four marine levels and three scales of perception facilitates its use as a contextual framework for the higher resolution assessment of other datasets bearing on activities, resources and potential impacts across different levels of the marine environment: the level and scales relevant to assess and manage risk for activities on the sea surface will inevitably differ from those relevant for the same on the sea floor.

4.1.5. CASE STUDY 1 SCENARIO

In this Case Study, the proposed Hornsea Offshore Wind Farm area was reviewed using this project's HSC to illustrate how the data might be used. The scenario is based on the archaeological study area outlined in the Environmental Statement (SMart Wind 2013). It should be noted that only a part of the proposed development area is covered by the project being reported on here; the other sector is covered by the SeaZone (Merritt and Dellino-Musgrave 2009). A series of stages is suggested.

4.1.5.1. STAGE 1: CONFLATED LAYER

The first step would be to look at the HSC GIS conflated layer which gives a 2-D representation of the whole area. Looking first at the Broad Character Types then moving to more detail through the Character Types and Sub-character Types will give a general

impression of the HSC within the development zone and allows the user to become familiar with the dominant character types and the dominant historic processes they represent.⁶

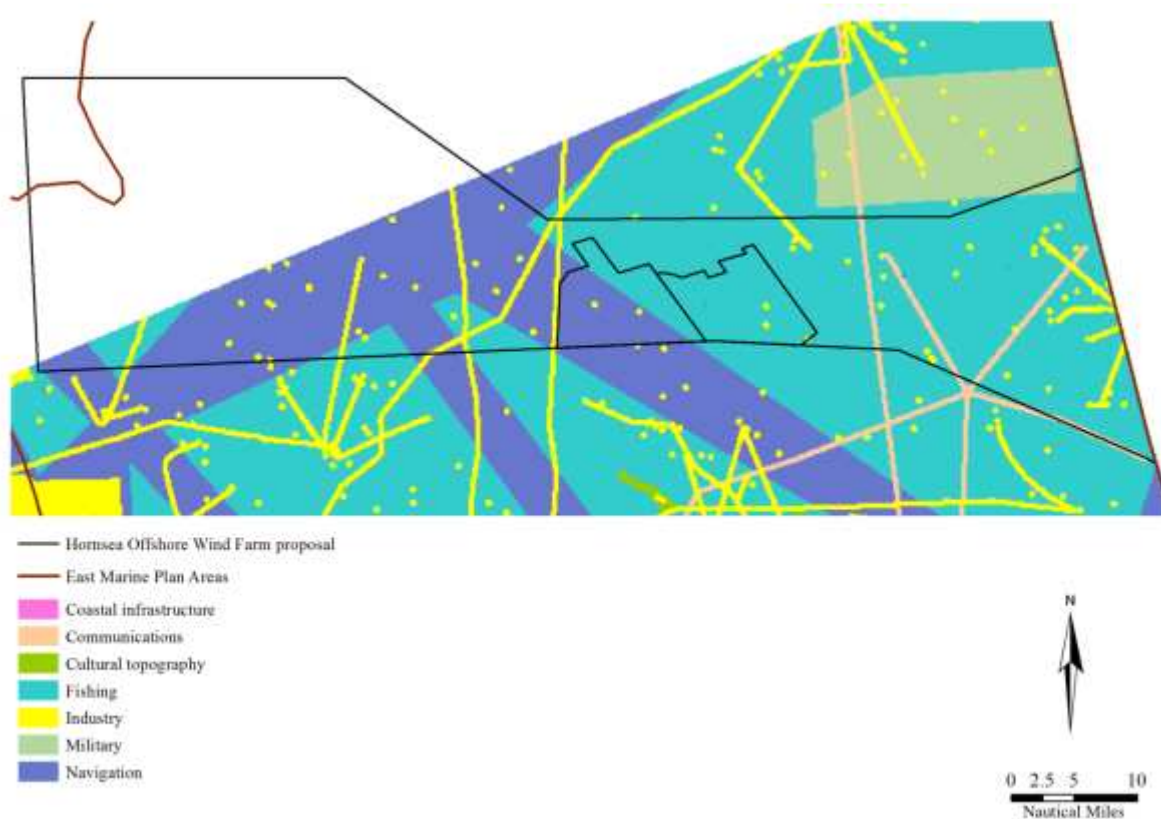


Figure 2.2. Broad types, Conflated.

In the conflated layer, the present-day dominant historic character in western part of the proposal area is related to **Navigation**- *Navigation activity*, principally Navigation routes. This reflects the present-day commercial shipping activity related to the transportation of goods to and from the Humber and from Europe to the Scottish ports. There are also some known earlier Navigation routes dating to the post medieval period that constituted a part of the present-day routes, but these were located closer to the shore and not necessarily consistently evident in the offshore zone where Hornsea is largely located. Furthermore, the dominant historic character in eastern part of the proposal area is related to **Fishing** - *Fishing*, principally related to Bottom trawling, Drift netting and some Longlining. The North Sea fishing grounds have been exploited for many hundreds of years, and in more recent times have been an important spawning ground for herring. The Drift netting in particular has contributed to the wealth of the region, especially the fishing town of Grimsby. Another dominant present-day character is **Industry**, related to Hydrocarbon pipelines and Hydrocarbon installation (gas platforms). What is more **Communication**, Submarine telecommunications cable is also evident, though the main activity area lies outside of the Hornsea area. In the context of these two latter character types, HSC's portrayal of Navigation activity is superseded in its conflated mapping. The development in the proposal

⁶A hierarchy is represented by the text formatting for each type of character: **Broad Types**, *Type*, Sub-type.

area will affect present-day seascape character by introducing a new type; namely Renewable energy installation (wind) as well as related infrastructure such as Submarine power cable.

4.1.5.2. STAGE 2: DETAILED APPRAISAL

The next stage would be to begin the more detailed appraisal. This involves assessing the impact of the wind farm proposal and determining which levels of the marine tier, in particular, are likely to be affected. Physically, turbines will extend from the sea floor through all levels and therefore can be expected to affect the historic character of each. Additionally the infrastructure required to support the turbines; cables, sub stations etc. are likely to affect the marine, intertidal and coastal areas too as they are laid or buried and built in order to bring the energy generated to shore. The user will identify issues that may arise from the analysis of each vertical level and horizontal zone expressed by the HSC layers (Sea surface, Water column, Sea floor and Sub-sea floor in the HSC database) and highlight particular aspects relevant to the EIA scoping report and to the environmental themes to be considered for any updates to the ES in the EIA process, or for the development of Project Two and any future ones.

Those aspects are discussed briefly in the following sub-sections, drawing on both an examination of the HSC GIS database and its accompanying Character Type texts. Those texts are structured consistently according to criteria that include an introduction on 'Defining/Distinguishing Attributes and Principal Locations' followed by 'Historical Processes', 'Values and Perceptions', 'Condition and Forces for Change', 'Rarity and Vulnerability' and 'Sources'. Their accessible language should render them readily comprehensible to professionals in fields other than the historic environment. The Character Type and Sub-character Type descriptions used in the following sections are derived from the texts to be found in the Section 3 of this Report.

Sea surface

At the Sea surface, the present dominant historic character in the proposal consists of Navigation routes as well as *Fishing* (Bottom trawling, Drift netting and some Longlining). Navigation routes are principally associated with the transportation of goods to and from Europe and Britain and are of a commercial type. However, the routes are themselves probably part of a much earlier network of shipping routes in both sail (earlier than post medieval) and steam (early modern) vessels. The *Fishing* activities represent several different periods. Bottom trawling is a more recent phenomenon post-1900, operated by commercial trawlers. Drifting netting has longer time-depth, known about in these waters at least since the AD 11th century, although the activity continued until the slow demise of the herring shoals and the amalgamation and switch from drift trawls to commercial trawls. The small area of Longlining in the proposal area relates to recent activity, mainly from the 1930s onwards, indicated by Albert Close's fishing chart.

Other historic character types on the Sea surface that may be affected by any wind proposal relate to the *Energy industry*, specifically Hydrocarbon carbon installation (gas). While they are abundant in the area, there is a low state of activity; many of the active installations are located elsewhere in the North Sea.

It is unlikely that the development will alter the character of the dominant Broad type *Energy industry*, rather it will change it from Hydrocarbon installation (gas) to Renewable energy installation (wind) instead.

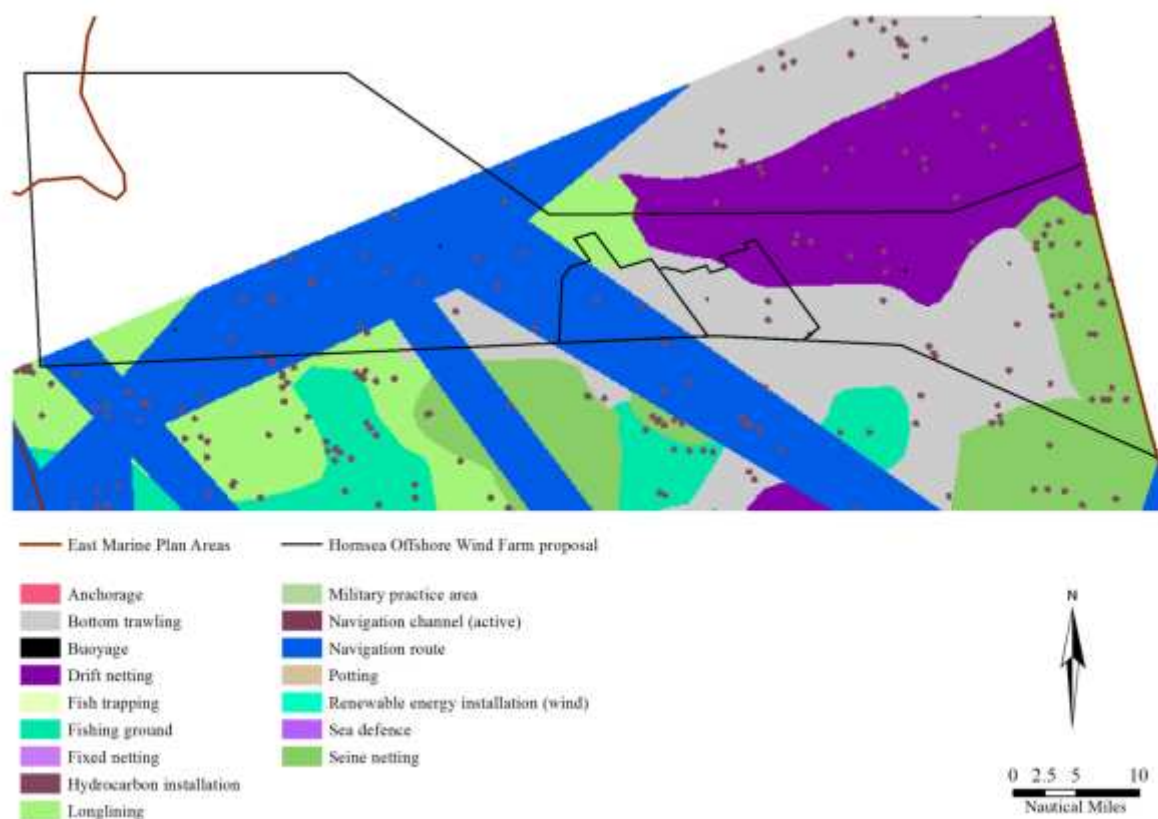


Figure 2.3. Sub-character types, Sea surface.

Water column

At the Water column level, the present dominant character across most of the proposal area is related to *Fishing*; some activity has a long time-depth from at least 11th century, if not earlier. There is also Hydrocarbon installation (gas), but as explained in Sea surface the likely effect on character is minimal, representing a change in *Energy industry* type rather than altering historic seascape character per se. Commercial fishing, especially Bottom trawling, represents an activity that is more recent in date, as well as Longlining and Seine netting. These activities may also have left material remains that impinge on the Water column; fishing gear from Bottom trawling, particularly around the Well Bank and part of the Easternmost Rough areas and the western area of the proposal area described as ‘catchy’.

The other historic seascape character *Fishing* activity here is Drift netting, located in the vicinity of the Outer Silver Pit, as well as Skate Hole and Botney Cut, which clip the proposal area. Historically, these areas have been rich in herring but also other fish species such as cod and haddock. Although activity is concentrated to relatively fewer vessels than in the past, the effect of the wind farm proposal would displace them, or set exclusion zones for these historically traditional fishing activities. This would alter the seascape character within the proposal area. Furthermore, this may have economic and social consequences on shore that would also affect historic character.

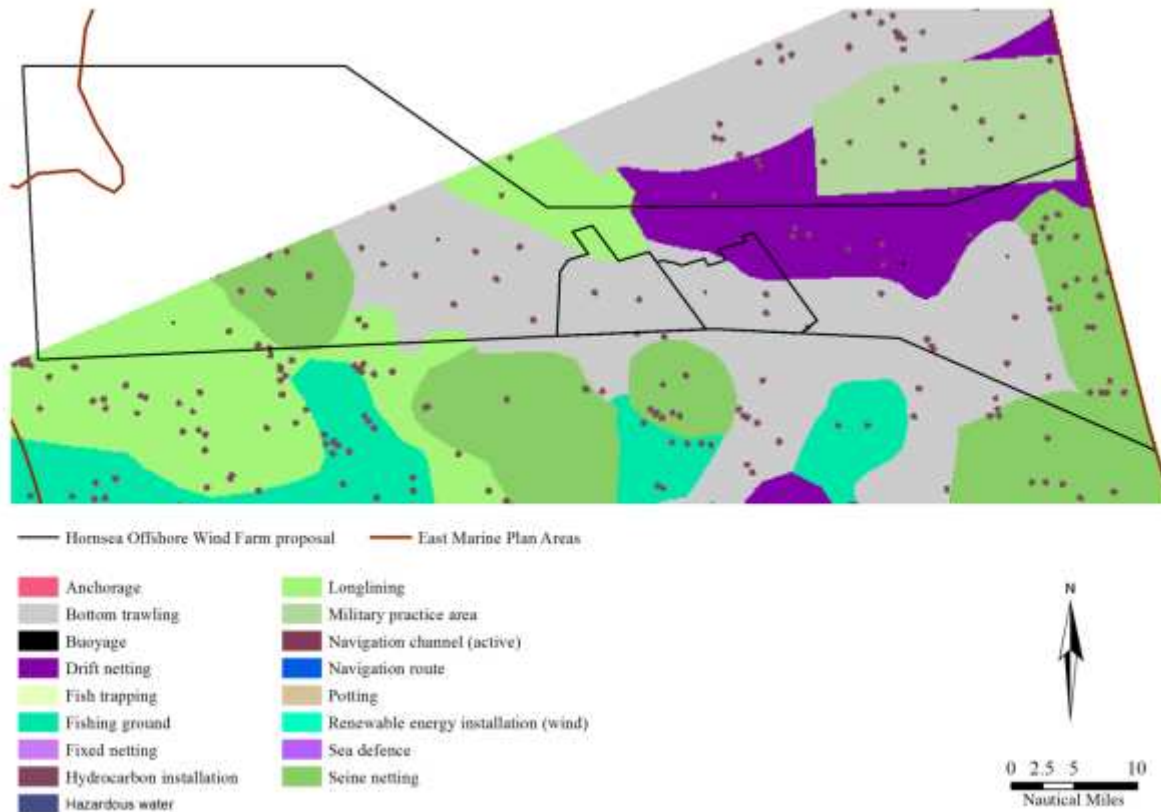


Figure 2.4. Sub-character types, Water column.

Sea floor

Much of the historic seascape character on the Sea floor will reflect the activities occurring in the marine levels above (Sea surface and Water column). For example, *Fishing* and *Energy industry*, as well as *Navigation*. In addition, Telecommunications also has a presence, as does *Cultural topography*.

Fishing is a dominant character within this level, especially Bottom trawling which may leave gear on the sea floor. There may also be netting from other activities in the Water column that might be hazardous for wind farm development. Although uncharacterised at this HSC’s scale, Hazardous water is an indirect effect of the activities at other levels, and although not materially present in the characterisation, it is a potential affect that any development would have to mitigate.

Energy industry, along with *Fishing*, is another dominant character of the Sea floor level. Whereas in the levels above, Hydrocarbon installation (gas) was present, on the Sea floor other Sub-character Types are expressed; for example Hydrocarbon pipeline and Hydrocarbon field (gas). While there are many platforms, not all of them have been expressed with their corresponding hydrocarbon field at the strategic scale of this HSC. A change in the industry type, as suggested, would not alter the character as such, although there may be a spatial difference between the two energy activities that would need to be scrutinised. The physical effect of the wind turbines and the related infrastructure on the Sea floor would increase the size of the character area associated with *Energy industry* character in those areas of concentrated development such as Projects One and Two.

Navigation, although prevalent in the Sea surface level, is unlikely to impinge on the Sea floor, although there is some potential for physical wreckage, perhaps associated with earlier shipping. In the proposal area there are no recorded data that relate to known wrecks, although there is inevitably a potential for them to be found during development.

Telecommunications, represented by Submarine telecommunication cable stretches into the proposal area, primarily in the eastern area, connecting different hydrocarbon platforms: the Stratos (BT) 00S, now out of service. Furthermore, there is also the Norsesea Coms (Norseacom) line connecting Britain and the Nordic countries. It is unlikely that the wind farm development will alter the *Telecommunications* character, although the laying of additional cables, and other infrastructure such as Submarine power cable will need to be monitored as it will potentially affect present historic seascape character.

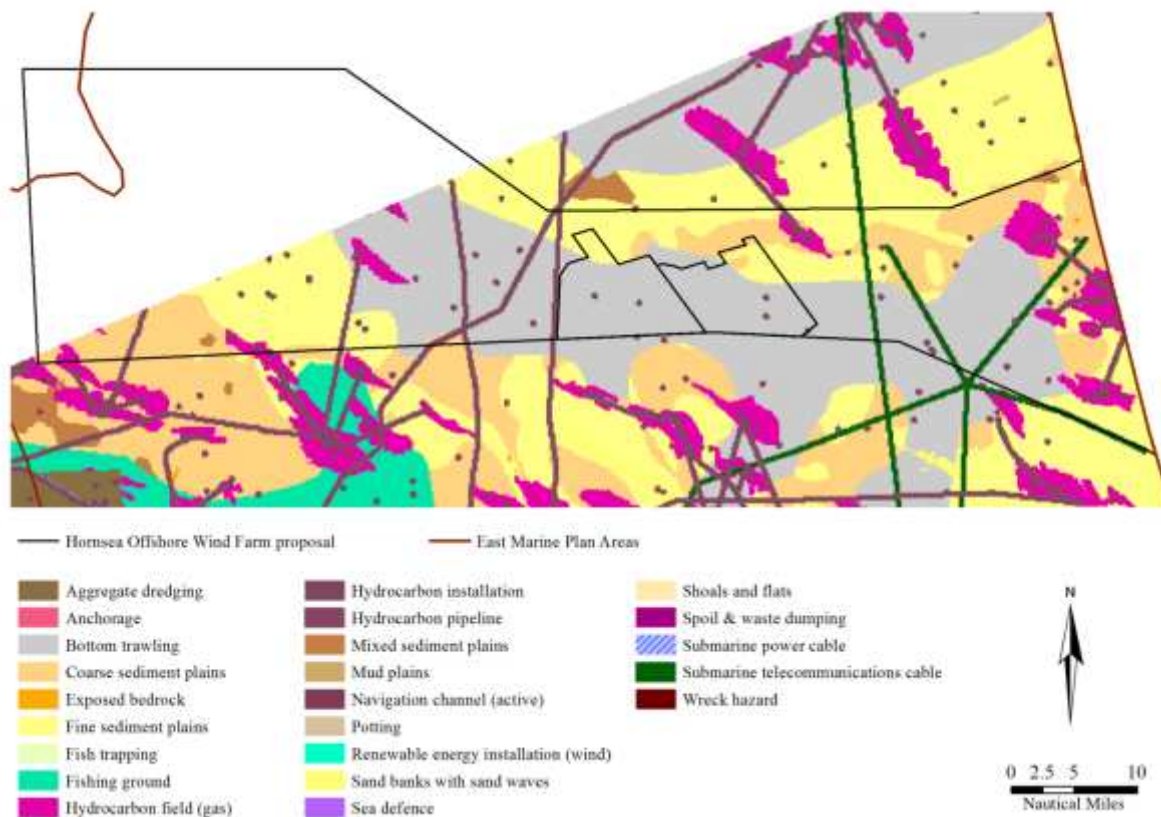


Figure 2.5. Sub-character type, Sea floor.

Cultural topography – a mix of Fine sediment plains and Coarse sediment plains – are important spawning grounds. This Character Type’s expression is closely affected by other marine activities and by natural processes, such as sediment transportation derived from climatic variation, as well as by direct human activities such as intrusive fishing and offshore developments. Furthermore, the sea floor sediments within the Cultural topography in this region are likely to cover significant prehistoric remains so that any disturbance may have a detrimental effect on their preservation. Wind farm installations will produce some changes in the flow of sediment within the development area. The alteration in sediment flow may therefore be potentially damaging to any prehistoric remains which the new flow regime reveals. Such remains are represented in the HSC in the Palaeolandscape expressions among the Previous character types and in the Sub-sea floor level.

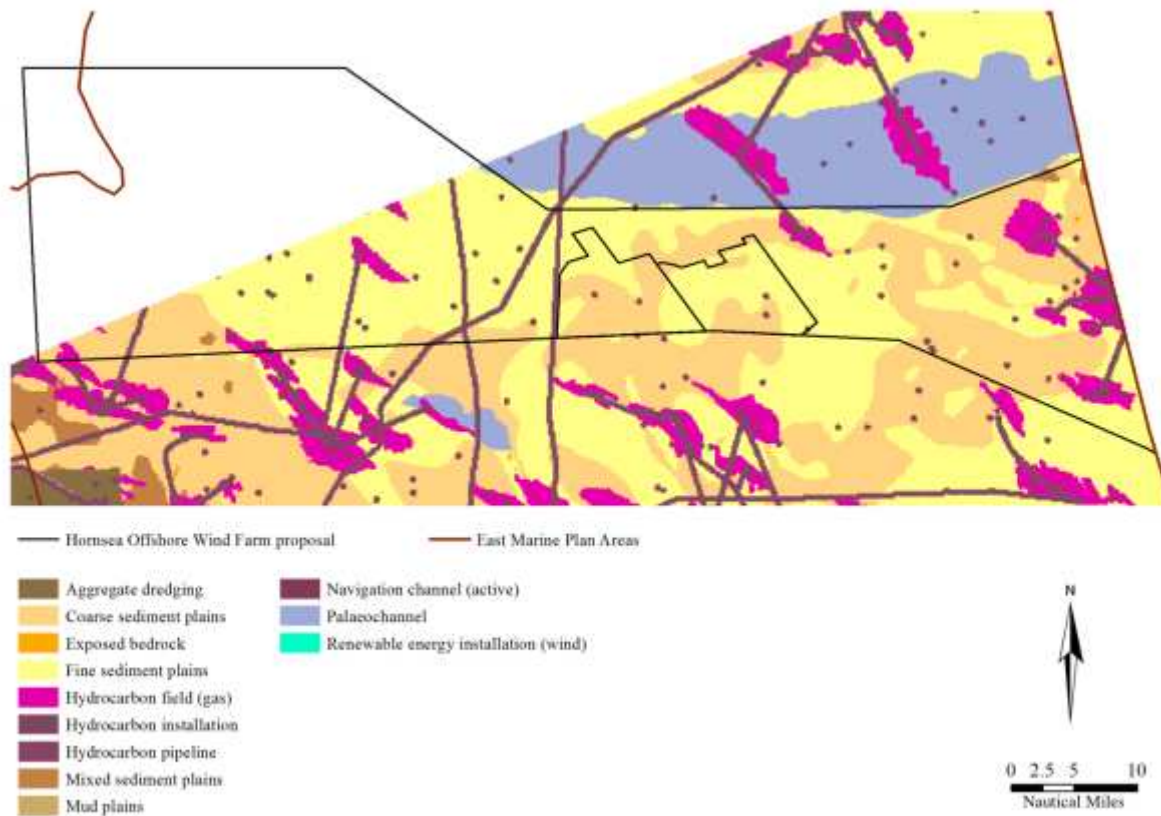


Figure 2.6. Sub-character types, Sub-sea floor.

Sub-sea floor

There is some similarity between the character of Sub-sea floor and Sea floor levels. At the northern edge of the proposal area, however, and not expressed across the proposal area at this level are the internationally important buried prehistoric land surfaces which are likely to preserve prehistoric artefacts and features from the Mesolithic. These are expressed as a Previous character type: Palaeolandscape component, rather than present-day historic character. The Palaeolandscape component is the result of a gradual sea level rise and inundation of the land, a submerged former terrestrial landscape which has been the focus of much research and public interest in recent years (Gaffney *et al.* 2007, 2009). Any wind farm development in the proposal area would have to consider the mitigation needed in order to minimise the impact or to put in place practices for recovery.

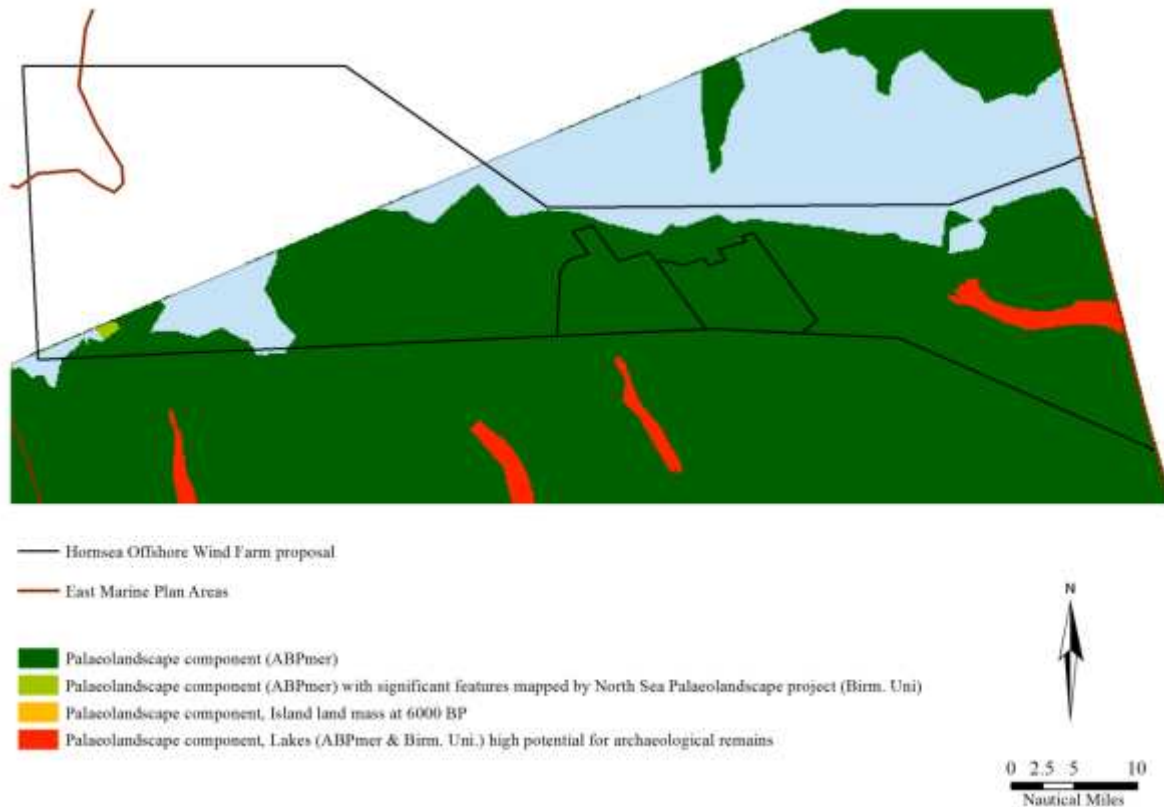


Figure 2.7. Previous character type.

4.1.6. Key documents

- Offshore data Cf. <http://www.4coffshore.com/offshorewind/>
- Anglo-Dutch Offshore Wind Energy Cf. <http://www.nwea.nl/anglo-dutch-offshore-wind-energy-event-den-haag>
- Crown Estates, UK Offshore Wind Report 2012 - <http://www.thecrownestate.co.uk/media/297872/UK%20offshore%20wind%20Report%202012.pdf>
- Hornsea, Smart Wind - <http://www.smartwind.co.uk/>

4.2. CASE STUDY 2: COASTAL DEFENCE AND MITIGATING CLIMATIC AND ENVIRONMENTAL CHANGE

As indicated earlier in this Section of the Report, the management of change arising from potential effects of climate change and its mitigation are key priorities for English Heritage. This second case study explores HSC as a tool for mitigating or adapting to the effects of climatic and environmental change and implementing the policies that underpin strategic policies and decision-making. This is focused on the practices that are used to alleviate the effects of climate and environmental change, such as taking out of regular agricultural use or other forms of enclosure land used to alleviate flooding pressure, as well as extending a policy of ‘no active intervention’ along coastlines susceptible to sea erosion. This might be achieved through two measures:

1. *Habitat re-creation and habitat restoration.* *Habitat re-creation* is compensating for loss of habitat in areas approved for development. This may involve *habitat restoration* (DEFRA 2010), compensating for the loss of land in one area because of development, by re-creating and reverting land back into former, historic forms. For example, the deliberate flooding of land, and reverting it from reclaimed wetland into former saltmarsh. This might also involve possible compensation associated with damage to or loss of heritage assets. The latter was examined by the Humber wetland project, which assessed the effects of hydrological change such as dissection on archaeological remains (Van de Noort 2004);
2. The active management of coastline, which is related to four different types of interventions through which SMP policies are implemented:
 - a. No active intervention
 - b. Hold the line
 - c. Managed realignment
 - d. Advance the line

The modification of an area’s character so as to reduce potential effects of, say, increased flooding as a response to climate change, is the central tenet of *offsetting* schemes such as DEFRA’s Habitat or Biodiversity Compensation. DEFRA’s Habitat or Biodiversity Compensation is outlined in *Making space for Nature* (DEFRA 2010), now replaced by the Natural Environment White Paper *The Natural Choice: securing the value of nature* (HM Government 2011), as well as in Shoreline Management Plans (DEFRA 2006 e.g. Environment Agency 2010).

These two measures are assessed in conjunction with HSC in the North Norfolk SMP (5) area in the following sections of this report. The information within each HSC project contributes to the understanding that many features of the natural environment are strongly influenced by cultural activities, of one sort or another, and all are cultural perceived. This is not only useful for shaping habitat or biodiversity compensation schemes, but also for assessing the risk and effect on heritage assets and the modifications and changes incurred to an area of historic seascape character. This might involve decisions about what land is available for development or loss, what historic character might be altered in particular areas, and what cultural services might flow from altering land from one character to another. With this in mind, there are two mutually important ways in which HSC can contribute towards the decision-making process for offsetting.

The first is associated with understanding the longer-term processes and effects of change that have resulted from climatic and environmental fluctuations. This includes being able to identify areas whose character is the product of past human management of environments

susceptible to quick change, such as former wetland, tidal marsh or sea identified by HSC as *Reclaimed land* and areas that are largely the result of singular environmental forces; although the distinction between the two is often blurred. For example, the characterisation of *Flood and erosion defence* (*Sea defence* and *Flood defence*) can lead to a more informed decision-making process about which parts of a shoreline might benefit most from active or non-active intervention, as well as those areas in which change will not substantially alter historic character. Furthermore, the context of change in the present can also be assessed against historic evidence for changes as a result of the processes of attrition and reclamation through the embedded seascape character derived from old maps and charts. For example, all along the Lincolnshire and Norfolk coasts, as well as parts of the Humber, considerable land denudation from sea erosion has occurred resulting in considerable loss of settlement and related features such as field systems and military coastal defences.

The second aspect that HSC can contribute towards during the decision-making process for offsetting is related to providing a better contextual understanding of the coastal and intertidal land that will be affected, in terms of loss in historic character and potential damage to archaeological remains. As the RCZAS demonstrated, much of the coastline within the project area has a high density of archaeological sites failure to adopt an appropriate mitigation strategy in advance of offsetting would result in severe loss to the recorded archaeological resource (cf. Brigham *et al.* 2008; Jobling and Brigham 2010a; Buglass and Brigham 2007b; Robertson 2005; Alborne *et al.* 2007). But HSC, in conjunction with HLC for coastal land, can take a broader perspective, offering an understanding of the cultural processes which the recorded remains reflect in that area, along with the typical suite of material remains which relate to such processes and may yet lie undiscovered in such areas.

4.2.1. NORTH NORFOLK COAST AND INTERTIDAL ZONE

The Case Study area is the section of shoreline for which the North Norfolk Coast SMP describes the plan and sets the policies. For the North Norfolk SMP, this is the shoreline area from Old Hunstanton up to the end of the shingle ridge at Kelling Hard. The historic character of the area has played a vital role shaping the coastline and in developing the plan.

The North Norfolk coastline stretches over 75 kilometres. It faces the North Sea with tidal patterns that are in the main (but not exclusive) control of sedimentary processes that lead to the coastline's distinctive physical features. The general drift along the coast is towards the west created by weak but frequent storm events. There are reversals in the drift caused by seasonal variations and north east storm surges.

There are three major control points along the shoreline: Gore Point (associated with the River Hun outfall), Scolt Head Island and Blakeney Point. The coast has therefore been divided into three units referred to as 'super-frontages'. These super-frontages are mainly independent, but there are important interactions within them, and they have been used to assess coastal processes and developing policy.

The interaction with the neighbouring SMP for the Wash (to the west of this SMP) is limited. The general direction of sediment transport is towards the west along the North Norfolk coast past Hunstanton into the Wash. The interaction with the neighbouring Kelling to Lowestoft SMP (to the east of this SMP) is also limited because the boundary was chosen to coincide with a drift divide. There is, however, sediment transport across this divide. The exact processes are uncertain, but there is probably transport in both directions, depending on sediment type, tidal flow direction and storm events.

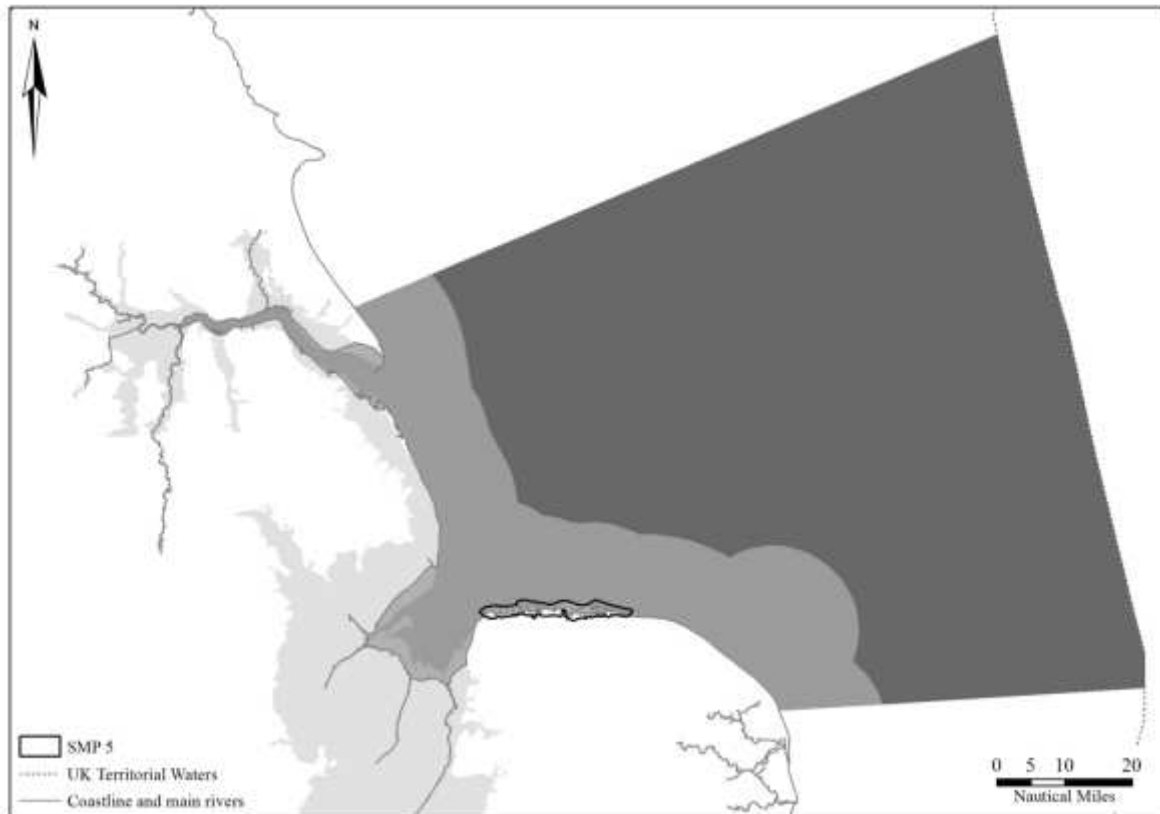


Figure 2.8. North Norfolk Shoreline Management Plan (SMP 5).

The three super-frontages are discussed below.

- Super-frontage 1: from Old Hunstanton dunes (SMP boundary) to Thornham, at the western end of Brancaster Bay. Within this super-frontage the processes along the shoreline take place from east to west. The ebb estuary of River Hun influences Gore Point which in turn can be seen as a control point for the ‘bay’ formed by the Old Hunstanton dunes. The tidal prism is currently restricted by the reclaimed land between Thornham and Holme-next-the-Sea.
- Super-frontage 2: from the western end of Brancaster Bay to the eastern end of Stiffkey Bay. Scolt Head Island is the main physical feature in this unit. Its two ends are control points for the bays on either side - Brancaster Bay and Holkham Bay. In the long term, there is a chance that Scolt Head Island will continue to roll back towards land and may even reattach to the land. This would have a big influence on the area directly behind Scolt Head Island and also on the neighbouring bays. The tidal prism is currently restricted by various reclaimed areas behind the barrier coast. Warham and Stiffkey marshes east of Wells-next-the-Sea form a typical ‘open coast’ and are not greatly affected by how the neighbouring frontages are managed.
- Super-frontage 3: from the western end of Blakeney Spit, near Stiffkey, to the eastern end of the Cley to Salthouse shingle ridge at Kelling Hard (SMP boundary). Blakeney Spit is the main feature and, as for Scolt Head Island, it is possible that the current process of rollback will eventually cause its western tip to reattach to the land. The eastern end is characterised by the Cley to Salthouse shingle ridge in front of brackish marshes. The tidal prism is currently restricted by various reclaimed areas behind the barrier coast.

4.2.1.1. HISTORIC CHARACTER AND THE DEVELOPMENT OF THE COASTLINE

The development of the landscape in response to the effects of the sea and cultural activity has created new land – reclaimed from the sea through geomorphological processes – and established a series of settlements and other activities such as agricultural activity and land reclamation that have derived from a direct association with the sea as a resource. These features are reflected in the historic seascape character of the region, especially the coast and inter-tidal zone. Past perceptions of the landscape in its associations with the sea are also represented by special activities, such as the construction of prehistoric monuments like Holme I (or Seahenge) and Holme II within the inter-tidal zone, or close to it (Brennard and Taylor 2003; Watson 2005). The historic seascape has had a strong presence in the shaping of the physical and cultural landscape, and this is represented in the mapping of historic character. For example, it has been suggested that the barriers of Scolt Head Island and Blakeney Point are relatively young (Environment Agency 2010), being further out to sea than others, with Scolt Head developing as a spit from Holkham and Blakeney Spit developing as a response to land reclamation – shown in their formation states on William Faden’s map of Norfolk 1797 (Macnair and Williamson 2010). The reclamation process arguably generated a series of barriers by limiting drift along the shoreline and restricting sediment transport rates perpendicular to the shore. If this is the case, any measures that are implemented in response to SMP will need to consider the culturally-driven land reclamation as well as that resulting from natural processes. HSC types show the changes that have occurred to the Navigation channels (disused) that made places such as Cley-next-the-Sea and Blakeney, medieval ports and regional trading centres.

Many of the settlements along the North Norfolk coast have developed from small fishing settlements (Fox 2001) and had access and had relatively good harbours in the past. For example, records for settlement character type Cley-next-the-Sea date back to the medieval period when St. Mary’s church was built during the 13th century. Next door, Blakeney was once a medieval port and had been ranked as one of the most important ports in England. However, the port began to lose its importance into the 17th century as land reclamation increasingly dominated the shoreline. This had the effect of reducing the navigability of the channels which were important in securing harbouring and fishing activities, as well as hindering European connections. Brancaster’s historic quay was built in the 1700s, and used by local fishing vessels and larger cargo ships, although trade began to decline in the late-19th century.

Some areas in North Norfolk were the some of the earliest in the post medieval period to be reclaimed from the sea for agricultural use, using dykes and ditches. There are several areas along the coastline of Norfolk where there is good survival of sea banks, both in protecting the land from sea encroachment, but also in assisting land reclamation. Two of the main documented reclamations were at Cley-next-the-Sea during the 17th century. Before these reclamations, Cley had been a trading port but it ended up one mile inland after the reclamation. There was also a significant area of saltmarsh reclaimed at Burnham Overy. This process started in 1639 and was completed in 1859 with the building of the Wells sea wall extending from south to north along the harbour channel.

In understanding the historical processes that have shaped the area, a better understanding can be established to assess the effects that the SMP and offsetting policies will have on the area’s historic character and heritage assets. Furthermore, understanding the historic character of the coastal and marine land and seascape will help to direct positive management that is embedded in the cultural legibility of the present place that has an antecedent historical basis:

the past informing future change. The role of HSC in SMP implementation and future review is discussed.

4.2.1.1. INSHORE

Conflated

At the Conflated level, the present-day Inshore is characterised by **Navigation** and **Fishing**. **Navigation** consists of Navigation routes, as well as *Navigation hazards* – Shoals and flats. Historically the routes to and from the North Norfolk coast have been associated with local fishing in the North Sea, especially herring and, immediately close to shore, potting. Shell fish species have been and still are particular prevalent. The Navigation routes have also been associated with the transportation of goods and materials to and from Europe and the Norfolk coast. These activities, both fishing and the transportation of cargo resulted in sporadic and distributed wrecks, in the vicinity of the harbours such as Hunstanton, Brancaster, Wells, Burnham, Cley and Blakeney.



Figure 2.9. Broad HSC character types in the Inshore zone at the Conflated level.

Other **Navigation** features associated with Maritime safety such as *Buoyage* are also present in the Inshore zone, identified from SeaZone as well as old Admiralty charts. The time-depth associated with *Buoyage* is directly correlated to the other navigation activities. The *Shoals and flats* around the western part of the North Norfolk coast are hazardous and have led to a number of recorded wrecks, although not enough to be represented at the strategic level

offered by the HSC. Instead, the risk is indicated through the potential effect of the *Shoals and flats* character type.

Fishing activities in the area immediately off the shore have historically been associated with Shellfish collection and Shellfish dredging but also lobster Potting, and home fishing (*Fishing ground*). However, the dominant character is Potting. Present-day activities are more concentrated in particular areas close to shore, where the underlying Sea floor is rocky for the trapping of species such as lobster and crab.

Any shore line changes are unlikely to have an effect on these marine activities, although alterations in coastal and inter-tidal activities may have a knock-on effect in the Inshore zone.

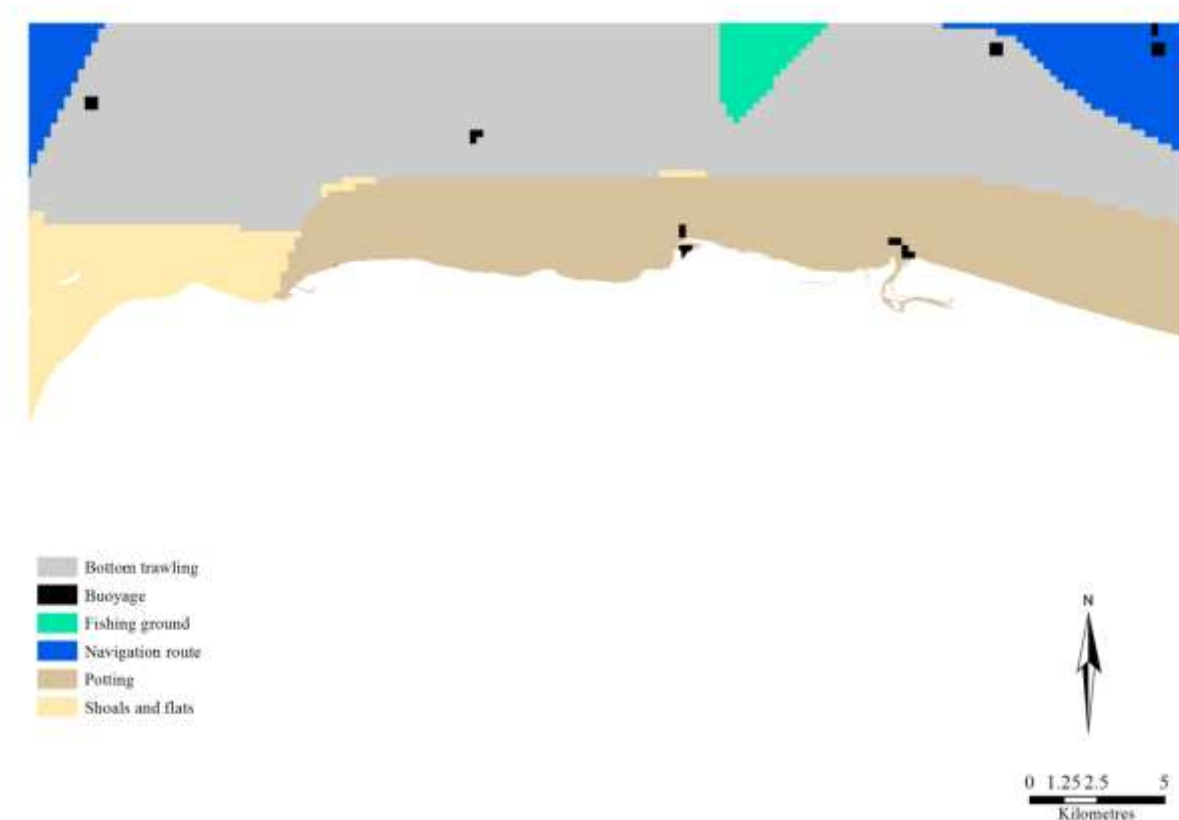


Figure 2.10. Sub-character type HSC character types in the Inshore zone at the Conflated level.

4.2.1.2. INTER-TIDAL

The inter-tidal zone, lying between the High Mean Water and Low Mean Water is an archaeologically and historically rich seascape. The inter-tidal has been modified through time in terms of new types of constructions. These correlate possibly with the ways in which the zone was understood by past people. For example, the construction of monuments like Seahenge that drew on the potential liminal location, as well as fluid and shifting effects of the tides, that the zone created. In later periods, the gradual erosion of the coastline, and removal of material from the shore, have begun to view the zone in less opportunistic ways. Furthermore, the inter-tidal zone is characterised also by areas of Saltmarsh, Sandy foreshore, Mudflats, and Dunes, with the occasional Sandflats, Shingle and Rocky foreshores. A Wildlife watching area is located on the western side, although other areas within the Inter-tidal zone are also nature reserves or protected sites.

The area has also been subject to considerable coastal attrition, and this has been measured from the 1880s. The area has also been subjected to the creation of new land, reclaimed from the sea; areas such as Scolt Head Island which have caught the western movement of sediment partly as a result of the close-to-shore land reclamation from the 17th century around Wells and Blakeney.

Changes to the shore line and the implementation of SMP, will result in some change in character that should be sensitive to maintaining its historic seascape character. This will alter the physical historic character of the coast, as well as alter seascape/landscape perception for stakeholders. Therefore changes should be influenced by, and better balanced in terms of, conserving the distinctive cultural character of the place, of whose understanding HSC provides a key resource.



Figure 2.11. Sub-character HSC character types within the Inter-tidal zone.

4.2.1.3. COASTAL

The coastal zone is characterised in a number of different ways, and the seascape character is relatively diverse. The western area comprises Dunes, Reclamation from sea, from tidal marsh as well as from wetland. Moving east, there are areas of Wetland, and Wildlife watching, and a large area of Saltmarsh. Further onshore, there are considerable Daymarks indicated on late-19th century and early-20th century Admiralty charts. This includes features such as churches with towers, with spires, beacons, as well as woodland. A series of Railway lines connected Wells and Holkham, and Hunstanton with major regional centres such as Norwich and Peterborough, although the decommissioning of the these tracks in the 1960s has led to them becoming recreational features or re-used by turning them into roads. Littered

in the area immediately positioned to the shore and areas of reclaimed land are numerous Flood and Sea defence features.

Furthermore, there are several areas with strategically placed WW2 defensive areas across the coastline expressed as Previous character. These remains hint at the importance of this area to protect this area of England from coastal invasion from Europe. Furthermore, settlements that have had a long-term presence along the coast have also been characterised with their time-depth elements represented. For example, Hunstanton, Brancaster, Wells, Burnham, Cley and Blakeney were all harbours during the post medieval period, but probably had much earlier origins, starting off as small, localised fishing settlements.

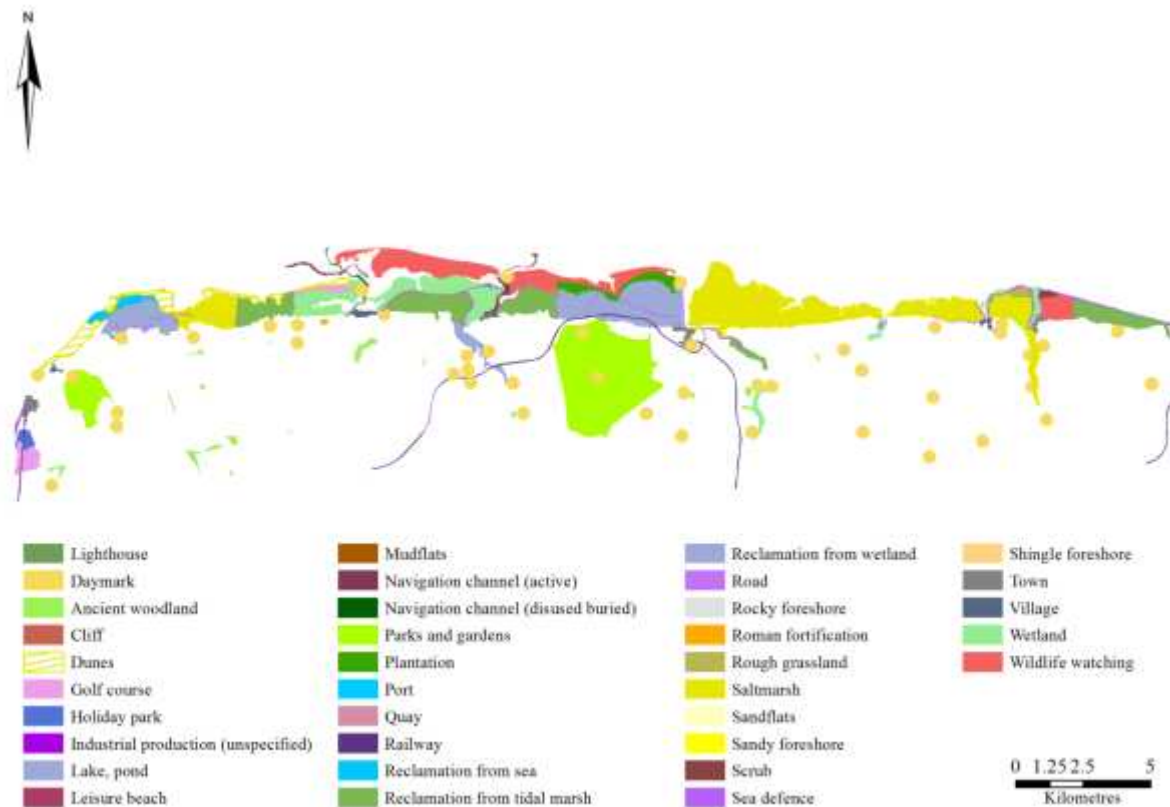


Figure 2.12. Sub-character HSC character types in the Coastal zone.

4.2.2. THE EFFECTS OF SHORELINE MANAGEMENT PLAN (2) AND OFFSETTING

The major emphasis in the SMP is on ensuring the biodiversity of the coast, ensuring that any non-active intervention is offset by investment in other areas of the coastline. However the application of policies within an SMP is also influenced by cultural factors with a historic dimension, notably the occurrence of coastal settlement areas, military establishments, and other features that have a historic character. The primary roles of the HSC in respect of SMP is to help define the effects on the historic environment and on historic land-/seascape character of any maintenance of the status quo, non-intervention or active intervention resulting from its policy applications. The HSC assessment is strategic and broad but has the advantage of comprehensive coverage, going beyond the simple identification of specific sites and the assessment of the loss to specified heritage assets. Instead, HSC can help to assess the overarching effects of changes in character resulting from different interventions, enabling positive management to take place if so desired.

4.2.3. KEY DOCUMENTS

- DEFRA's *Making Space for Nature: A review of England's Wildlife Sites and Ecological Network* (2010)
- DEFRA's *Biodiversity Offsetting Pilots Technical Paper: the metric for the biodiversity offsetting pilot in England* (2012)
- EA's *National Flood and Coastal Erosion Risk Management Strategy for England*
- <http://www.environment-agency.gov.uk/research/policy/130073.aspx>
- EA's *Investing in the future. Flood and coastal risk management in England* (2009)
- <http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geho0609bqdf-e-e.pdf>
- EA/DEFRA's *National flood and coastal erosion risk management strategy for England* (2011)
- <http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geho0711btze-e-e.pdf>
- EA's *Managing flood and coastal erosion in England* (2011-2012)
- <http://www.environment-agency.gov.uk/research/library/publications/144594.aspx>
- (Schemes) <http://www.environment-agency.gov.uk/research/planning/118129.aspx>
- EA's *Shoreline Management Plans (SMPs)*
- <http://www.environment-agency.gov.uk/research/planning/104939.aspx>
- *North Norfolk Shoreline Management Plan* (SMP 5) and <http://www.eacg.org.uk/smp5>
<http://www.eacg.org.uk/docs/smp5/the%20smp%20main%20report.pdf>

5. CONCLUSION

The *Applications Review* outlined in this report is designed to identify and demonstrate some of the roles for Historic Seascape Characterisation and its potential for application to various planning and outreach scenarios in this project's areas. The review has sought to illustrate how HSC can enable the historic character of our present coastal and marine seascapes to play its full part in shaping culturally distinctive and legible seascapes for the future.

The review of HSC applications also illustrates the roles of HSC for a broad range of contexts taking account of current policies and legislation, government priorities and the needs of stakeholders in the marine and historic environment. In order to contextualise the discussion, the review considered the relevance of HSC to a range of national and international government contexts including UK Legislation, marine planning infrastructure and the responsibilities of English Heritage, EU Marine Policy and the European Landscape Convention, and the effects of climate change on the historic environment and our perceived landscape. The review is accompanied by case-studies which applied HSC to two scenarios.

The review highlights the roles of HSC in delivering baseline information at a strategic level, providing valuable context and extending the principles of historic characterisation to inform the sustainable management of change, spatial planning and public engagement concerning our coastal and marine seascape.

REFERENCES

Alborne, J., Massey, S., and Tremlett, S. 2007 *The Archaeology of Norfolk's Coastal Zone. Results of the National Mapping Programme*. Norfolk Landscape Archaeology.

- Bender, B. 1998 *Stonehenge: Making Space*. Oxford: Berg.
- Brennand, M. and Taylor, M. 2003. The Survey and Excavation of a Bronze Age Timber Circle at Holme-next-the-Sea, Norfolk, 1998-9. *Proceedings of the Prehistoric Society* 69, 1-84.
- Brigham, T., Buglass, J., and George, R. 2008 *Rapid Coastal Zone Assessment Yorkshire and Lincolnshire: Bempton to Donna Nook Phase 1*. Hull: Humber Field Archaeology.
- Brigham, T. and Jobling, D. 2011 *Rapid Coastal Zone Assessment Yorkshire and Lincolnshire: Brempton to Donna Nook Phase 2*. Hull: Humber Field Archaeology.
- Brown, N. and Glazebrook, J. (eds.) 2000 *Research and Archaeology: a framework for the Eastern Counties, 2. Research agenda and strategy*. East Anglian Archaeology 8.
- Buglass, J. and Brigham, T. 2007a *Rapid Coastal Zone Assessment Yorkshire and Lincolnshire: Donna Nook to Gibraltar Point*. Hull: Humber Field Archaeology.
- Buglass, J. and Brigham, T. 2007b *Rapid Coastal Zone Assessment Yorkshire and Lincolnshire: Gibraltar Point to Sutton Bridge*. Hull: Humber Field Archaeology.
- Clark J. Darlington J. and Fairclough G., 2004. *Using Historic Landscape Characterisation: English Heritage's review of HLC Applications 2002-03*, English Heritage and Lancashire County Council, London and Preston
- CoE 2000. *European Landscape Convention*. Council of Europe, http://www.coe.int/t/dg4/cultureheritage/heritage/landscape/default_en.asp
- Cooper, N. (ed.) 2006 *The archaeology of the East Midlands. An archaeological resource assessment and research agenda*. Leicester Archaeology Monographs No. 13. Leicester: University of Leicester Archaeological Services.
- DEFRA, 2006 *Shoreline Management Plan Guidance*. Volume 1: Aims and Requirements and Volume 2: Procedures. London: DEFRA.
- DEFRA 2008 *A strategy for promoting an integrated approach to the management of coastal areas in England*. London: DEFRA.
- DEFRA 2009a *Our Seas – a shared resource. High level marine objectives*. London: DEFRA.
- DEFRA 2009b *Marine and Coastal Access Act*. <http://www.legislation.gov.uk>
- DEFRA 2010 *Making Space for Nature: a review of England's wildlife sites and ecological network*. (Report by Lawton, J.H., Brotherton, P.N.M., Brown, V.K., Elphick, C., Fitter, A.H., Forshaw, J., Haddow, R.W., Hilborne, S., Leafe, R.N., Mace, G.M., Southgate, M.P., Sutherland, W.J., Tew, T.E., Varley, J., and Wynne, G.R.). London: DEFRA.
- DEFRA 2011 *Inshore Fisheries and Conservation Authorities: vision, success criteria and high-level objectives*. London: DEFRA.
- English Heritage 2005 *Discovering the Past, Shaping the Future, Research Strategy, 2005-2010*. London: English Heritage.
- English Heritage 2006 *Shoreline Management Plan Review and the Historic Environment*. London: English Heritage.
- English Heritage 2008 *Conservation Principles for the Sustainable Management of the Historic Environment*

- English Heritage 2008 *Climate change and the Historic Environment*. London: English Heritage.
- English Heritage 2009 *The European landscape Convention – The English Heritage Action Plan for Implementation*. London: English Heritage.
- English Heritage 2011 *National Heritage Protection Plan (NHPP)* London: English Heritage
- ESF 2010 *Landscape in a Changing World. Bridging Divides, Integrating Disciplines, Serving Society*. European Science Foundation, Science Policy Briefing 41
- Environment Agency 2010 *North Norfolk Shoreline Management Plan*. [No pub ref]
- European Commission 2007a *An Integrated Maritime Policy for the European Union*, COM (2007) 575 final. Brussels, 10.10.2007.
- European Commission 2007b *An Integrated Maritime Policy for the European Union*, SEC (2007) 1278. Brussels, 10.10.2007.
- European Commission 2008 *Establishing a Framework for Community Action in the Field of Marine Environmental Policy*. Marine Strategy Framework Directive.
- European Union 2002 Recommendation of the European Parliament and of the Council of 30 May 2002 Concerning the Implementation of Integrated Coastal Zone Management in Europe. *Official Journal of the European Communities* (2002/413/EC).
- Fox, H. S. A. 2001 *The Evolution of the Fishing Village: Landscape and Society Along the South Devon Coast, 1086-1550*. Oxford: Leopard's Head Press.
- Gaffney V., Thomson K. and Fitch S. (eds.) 2007 *Mapping Doggerland: The Mesolithic Landscapes of the Southern North Sea*. Oxford: Archaeopress.
- Gaffney V., Fitch S. and Smith, D. 2009 *Europe's Lost World. The rediscovery of Doggerland*. Council for British Archaeology 160.
- Glazebrook, J. (ed.) 1997 *Research and Archaeology: a framework for the Eastern Counties*, 1. Resource assessment. East Anglian Archaeology 3.
- Hegarty, C. and Newsome, S. 2007 *Suffolk's Defended Shore. Coastal Fortifications from the Air*. London: English Heritage/Suffolk County Council.
- HM Government 2011 *The Natural Choice: securing the value of nature*. London: TSO.
- HM Government, Northern Ireland Executive, Scottish Government and Welsh Assembly Government 2011 *UK Marine Policy Statement*. London: TSO.
- Hooley D. 2007 England's Historic Seascapes – archaeologists look beneath the surface to meet the challenges of the ELC, *Landscape Character Network News* 26 (Winter 2007), 8-11.
- Hooley D. 2011 What have we done? Mapping the historic cultural processes that shape our coastal and marine environment, *Wadden Sea Ecosystem* 26:133-138 (<http://www.waddensea-secretariat.org/news/symposia/ISWSS-2009.html>).
- Hooley D. 2012 Enabling the character of England's past shape its sustainable future, in Harnow, H, Cranstone, D, Belford P and Høst-Madsen, L (eds), *Across the North Sea: Later Historical Archaeology in Britain and Denmark, c. 1500-2000 AD*. Odense: Univ Press of Southern Denmark
- Jobling, D. and Brigham, T. 2010a *Rapid Coastal Zone Assessment Yorkshire and Lincolnshire: Donna Nook to Gibraltar Point*. Hull: Humber Field Archaeology.

- Jobling, D. and Brigham, T. 2010b *Rapid Coastal Zone Assessment Yorkshire and Lincolnshire: Gibraltar Point to Sutton Bridge*. Hull: Humber Field Archaeology.
- Knight, D., Vyner, B. and Allen, C. 2012 *East Midlands Heritage. An updated research agenda and strategy for the Historic Environment of the East Midlands*. University of Nottingham and York Archaeological Trust.
- Macnair, A. and Williamson, T. 2010 *William Faden and Norfolk's Eighteenth Century Landscape*. Windgatherer.
- Medlycott, M. 2011 *Research and Archaeology Revisited: a revised framework for the East of England*. East Anglian Archaeology 24.
- Merritt, O. and Dellino-Musgrave, V. 2009 *Historic Seascape Characterisation (HSC): Demonstrating the Method. Part 1: Implementing the Method. Final Report for English Heritage*. SeaZone Solutions Ltd.
- MMO 2012 *Draft vision and objectives for East marine plans: Update*. MMO.
- MoLAS 2009 *England's Historic Seascapes: Withernsea to Skegness Pilot Study. Report for English Heritage*. London: Museum of London Archaeology Service.
- Murphy, P. 2009 *The English Coast. A History and a Prospect*. London: Continuum.
- Natural England 2012a *An approach to Seascape Character Assessment NECR105*. London: Natural England.
- Natural England 2012b *Seascape Characterisation around the English Coast (Marine Plan Areas 3 and 4 and Part of Area 6 Pilot Study) NECR106*. London: Natural England.
- NPPF 2012 *National Planning Policy Framework*. London: Department for Communities and Local Government.
- NSPRMF 2009 *North Sea Prehistory Research and Management Framework (NSPRMF) 2009* Amersfoort.
- Ransley, J. and Sturt, F. (eds.) 2013 *People and Sea: A Maritime Archaeological Research Agenda for England*. London: CBA/English Heritage.
- Roberts P. and Trow S. 2002 *Taking to the Water: English Heritage's Initial Policy for The Management of Maritime Archaeology in England*. London: English Heritage.
- Robertson, D. 2005 *Norfolk Rapid Coastal Zone Archaeological Survey. Assessment report and updated project design*. Norfolk Archaeological Unit.
- Roskams, S. and Whyman, M. 2005 *Yorkshire Archaeological Research Framework: resource assessment*. York: University of York.
- Roskams, S. and Whyman, M. 2007 *Yorkshire Archaeological Research Framework: research agenda*. York: University of York.
- SMart Wind 2012a *Project Two Scoping Report*. SMart Wind
- SMart Wind 2012b *Project Two Scoping Opinions*. SMart Wind
- SMart Wind 2013 *Project Two Phase 1 Consultation Document*. SMart Wind
- Turner, S. 2006 Historic Landscape Characterisation: a landscape archaeology for research, management and planning, *Landscape Research* 31(4), 385-398.
- Van de Noort, R. 2004 *The Humber wetlands. The archaeology of a dynamic landscape*. Bollington: Windgather.

Watson, C. 2005 *Seahenge: An Archaeological Conundrum*. Swindon: English Heritage.

Wessex Archaeology 2007 *Historic Environment Guidance for the Offshore Renewable Energy Sector*. Cowrie Ltd (January 2007).