Historic Seascape Characterisation (HSC)

Hastings to Purbeck and Adjacent Waters

Section 1: Project Method Implementation

March 2011

In partnership with

SeaZone

MARITIME ARCHAEOLOGY

Historic Seascape Characterisation (HSC)

Hastings to Purbeck and Adjacent Waters

Version 1.2

21st March 2011

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PROJECT NUMBER: 5736			DOCUMENT REF:		
Draft 1.1	KD	OM			21/03/2011
Draft 1.1	KD	VDM, OM	DH		28/01/2011
	Originated	Checked	Reviewed	Authorised	Date
Purpose / Description					

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Report Structure

The Project Report for 'Historic Seascape Characterisation: Hastings to Purbeck and Adjacent Waters' is divided into three sections for ease of use. The first section outlines the project's method implementation, the second section outlines an applications review and case studies, and the third section contains printed versions of the Character Type text descriptions from national and regional perspectives.

This document comprises Section 1 of the 'Historic Seascape Characterisation: Hastings to Purbeck and Adjacent Waters': Project Method Implementation.

EXECUTIVE SUMMARY

The Hastings to Purbeck and Adjacent Waters Project (commissioned in December 2009 and completed in February 2010) is one of the four projects commissioned to implement the HSC National Method across a range of areas in English waters.

The project successfully extends the implementation of the national HSC Method (Tapper 2008), across a substantial area of England's coasts, seas and adjacent UK Controlled Waters. The worked example provided by this project builds on the consolidation and initial implementation of the national HSC Method, as outlined in the Project Brief (English Heritage 2009).

The project resulted in a GIS-based characterisation of the project area, extending from Hastings, Kent, to Purbeck, Dorset, along the coast and seaward across adjacent waters to the Median Line with France. The characterisation comprises the project's output HSC GIS and a series of national and regional perspective Character Type text descriptions linked to that GIS. Several images have been included in this report to illustrate the overall results of the characterisation but these are not 'the HSC characterisation': that is a functional GIS database whose mapping responses will accord with the multiplicity of potential queries defined by a user's needs. The project's products have been delivered to English Heritage in the format as specified in the Project Brief. A printed version of the linked texts can be found in Section Three of the Project Report.

This document comprises section 1 of the 'Historic Seascape Characterisation: Hastings to Purbeck and Adjacent Waters' project method implementation report.

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1. INTRODUCTION

The HSC Hastings to Purbeck and Adjacent Waters Project represents one of the four projects commissioned towards the end of 2009 to implement England's national method for Historic Seascape Characterisation (HSC) across a range of areas in English waters. Together with an initial implementation project across north eastern coasts and seas in 2008-9, these projects' outputs form contributions towards an eventual national HSC database for England to be held by English Heritage.

Throughout this Report, 'landscape' is defined, in accordance with the European Landscape Convention as: 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'(Council of Europe 2000, Article 1). 'Seascape' is defined here as a subset of landscape which includes the sea, and/or areas of land whose character is perceived to be distinctly maritime.

The robust national method for HSC is attribute-led, defining areas that share similar and repeating historic character as Historic Seascape Character 'Types', allowing historic trends and processes to inform and frame the broader sustainable management of change through marine spatial planning, outreach and research projects.

The HSC approach takes a holistic view of the historic seascape which, among many other benefits, facilitates comparison with other comprehensive environmental databases, gives it greater meaning and connectivity with the landscape and seascape perceptions of others, and allows it to provide context for the often 'point-based' datasets available for the marine zone. The resulting product is designed to enable more culturally-informed management of the marine environment and raise public awareness of the historic cultural dimension of the sea.

This document constitutes a project report produced by SeaZone and MA Ltd detailing the application of the national HSC method along and off the south coast, between Hastings and Purbeck and its adjacent waters. This project complies with MoRPHE guidelines (English Heritage 2006), and successfully extends the implementation of the national HSC Method (Tapper 2008). This project builds on the consolidation of the national HSC Method, as outlined in the Project Brief (English Heritage 2009).

2. BACKGROUND

2.1 Historic Landscape and Seascape Characterisation

HLC is a method of assessing and classifying an archaeologist's view of the historic cultural landscape as an aid to informing the management of the historic environment. The approach brings together historic and natural environmental datasets in a GIS format to enable the assessment of 'Types' of landscape character and the areas in which they are expressed. This method encourages the interpretation of data in a manner transcending their individual expressions, identifying recurring trends which characterise the historical and cultural landscape.

The landscape is characterised by HLC according to the recurrent 'Types' which reflect the dominant historic cultural processes shaping our perceptions of an area's present character. It is designed to inform a broad range of applications including spatial planning, conservation and wider approaches to coastal and marine management which recognise the positive contributions for all in understanding and maintaining the cultural legibility of the world we inhabit.

HLC has being applied across England in a breadth of contexts, including county based HLC, urban HLC, AONBs and National Parks. To date HLC has been completed across over 75% of England's land area.

HSC draws on the same core principles as underpin HLC (Clark et al 2004,, Tapper 2008) to produce a characterisation of the marine and coastal historic landscape.

2.2 Characterising the Marine Zone

The HSC Method, while maintaining the historic characterisation principles also used in HLC, recognises the need for different expressions of those principles in the coastal and marine environment.

The coastal zone to landward and seaward of mean sea level is an area of overlapping, not abutting, terrestrial and maritime perceptions, demanding assessment of both landward and seaward perspectives by HLC and HSC respectively. This requires interoperability between the overlapping HSC and HLC coverage.

The marine environment presents various distinct differences from land for historic character assessment. HSC has adapted its expression of historic characterisation principles to take these into account. Some of the key aspects of the coastal and marine landscape relevant to this include:

- The differing manner by which we perceive 'landscape' in the marine zone from on land

- The strongly tiered three-dimensionality of the sea, whose character in each of its multiple vertical levels can vary greatly for any given area. The character of the sub-sea floor, sea floor, water column and sea surface all need to be understood in their own right.

- The dynamism of the marine environment: the inter-tidal and marine zone is dynamic and often changing due to physical processes such as currents, tidal range and sediment mobility. One of the knock-on effects of that, combined with the tiered three-dimensionality, is to produce complex spatial relationships within and across marine levels, between the sites of cultural activity and their material imprints.

With a rapidly increasing pace and range of coastal and marine development, and with the Marine and Coastal Access Act 2009 (Defra 2009) providing the legislative framework for forward-looking, plan-led sustainable management of the marine and coastal zone, the benefits of having HSC in place are clear.

The application of HSC to the coastal and marine environment was piloted by English Heritage through the ALSF-funded 'England's Historic Seascapes Programme', first in Liverpool Bay and waters off the Fylde (Wessex Archaeology, 2006), then in four further areas extending seawards from: Scarborough to Hartlepool; Withernsea to Skegness; Southwold to Clacton, and the Solent and the Isle of Wight (see http://ads.ahds.ac.uk/catalogue/projArch/alsf/seascapes.cfm). The experience from the five pilot projects was brought together and appraised in 2007-8, eventually consolidated to give the national HSC method published in 2007-8 (Tapper 2008).

Recognising the seascape character variation potentially present at differing levels in the marine environment, and the presence of HSC on land, the HSC Method Statement provides the following classification has been prescribed within the recorded attributes (Tapper 2008):

- Sub-sea floor HSC: identifying the dominant historic character beneath the sea floor veneer

- Sea floor HSC: identifying the dominant historic character within or directly on the sea floor veneer,
- Water column HSC: identifying the dominant historic character across the vertical height of the water column
- Sea surface HSC: identifying the dominant historic character of the surface of the sea
- Coastal land HSC: identifying those areas of coastal land above MLW which have a distinctly maritime historic character, whether in common with, or differing from, their dominant character from a land-based perspective.
- Previous historic character (recorded where information bearing on it is available)

The time depth of the assessed marine historic character is recorded in the attributes in two main ways: by recording in the 'Period' attribute the date at which an area adopted its present character, and by recording multiple expressions of 'Previous HSC' for a given area where evidence is available on that (Tapper 2008, 3.3.2).

Similarly, the contrast between the spatial expressions of Character Types and the available and appropriate mapping frameworks for the coastal, intertidal and marine zones has been recognised and accommodated within the national HSC Methodology (Tapper 2008) by mapping expressions of coastal and intertidal Character Types using polygons, whereas below MLW, Character Type expressions are held in a vector grid mesh. This approach has also encouraged a more seamless overlap between HLC and HSC by matching the extents of character polygons between the two datasets above MLW where possible.

3. AIMS & OBJECTIVES

The HSC: Hastings to Purbeck Project's Aims and Objectives, as specified by English Heritage (English Heritage 2009), are outlined below.

3.1 Project Aims

The overall aim of the project is to carry out, using the national method for HSC, a GIS-based characterisation of the area of the Hastings to Purbeck as defined by English Heritage (2009, section 4), for England's coastal and marine zones to the limit of UK Controlled Waters.

The overall aim of the project has been broken down by English Heritage (English Heritage 2009) into more specific aims as follows:

- To follow the national HSC method to create a GIS-based characterisation of the historic and archaeological dimension of present seascapes across the full extent of the project area, at a scale appropriate to national strategic level applications, in a manner and using a GIS compatible with other projects contributing to a national HSC database, thereby forming an exemplar for future HSC projects

- To demonstrate how the application of HSC produces a framework of understanding which will structure and promote well-informed decision-making relating to the sustainable management of change and conservation planning affecting the historic environment in the coastal and marine zones, with particular reference to impacts from marine aggregates extraction

- To ensure that application of HSC produces a GIS-database fully compliant with the principles of HLC, with the present and anticipated user-needs of English Heritage and with available standards for data content, management, inter-operability and accessibility developed to meet the implications of the Marine and Coastal Access Bill

- To structure, inform and stimulate future research programmes and agendas relating to the coastal and marine historic environment

- To improve the awareness, understanding and appreciation of the historic dimension of the coastal and marine environment to its professional and non-professional users

3.2 Project Objectives

The objectives for the project have been defined by English Heritage (English Heritage 2009) as follows:

- To produce a GIS-based characterisation of the historic and archaeological dimension of the present seascapes across the full extent of the specified project area, using the established national HSC method, adopting at least a national perspective for its descriptions, and coordinating its marine HSC with a national data framework to be advised by English Heritage

- To analyse and interpret the project's HSC database to identify contexts and applications in the project area typifying those which the HSC approach is designed to inform, as noted in the national HSC Method Statement (Tapper 2008), with particular reference to English Heritage's curatorial responsibilities and influences for the sustainable management of change, the provisions of the Marine and Coastal Access Bill, and UK commitments arising from the European Landscape Convention

- To document those HSC contexts and applications in the project area by description, including scenario examples as appropriate. Those contexts will include the role of HSC in informing the marine aggregates extraction licensing process

- To document from the project area, by description and by case study, the close interrelationships between historic and natural environment character and the advantages of inter-operability between historic and natural environment spatial datasets.

- To document from the project area the potential of the HSC for raising public awareness and understanding of the coastal and marine historic environment.

- To produce a database of referenced structured texts relating to Character Types assessed during the characterisation and supplemented by imagery from the Project Area.

- To produce an Archive and a Project Report documenting all aspects of the project's application of the national HSC method.

- To detail in the Project Report's method statement the specific tasks and aspects of implementing the national HSC methodology across the project area, including

records of the sources and data-sets supporting each stage of the characterisation and noting the inter-relationship between HSC and HLC where the latter has been undertaken within the project area, to meet the needs of transparency and to assist future updates against the initial benchmark characterization

- To disseminate information on the progress and results of the project through the internet and through professional and popular publications and other media

4. STUDY AREA

The overall area to which the national HSC method has application comprises the whole of England's coastal zone (land and sea), England's share of UK territorial waters, and adjacent UK Controlled Waters (English Heritage 2009).

Within that overall area, this project is limited to a sector off England's south coast and incorporates the area of the Solent and Isle of Wight HSC pilot project carried out in 2006-7 (see http://ads.ahds.ac.uk/catalogue/archive/ehssolent_eh_2007/). This overall project area completes coverage by HSC of all licensed and application areas for marine aggregates dredging in the Crown Estate's South Coast, Owers Bank and East English Channel Regions (http://www.thecrownestate.co.uk/dredge_areas_statistics) (**Figure 1**). It is recognised that the boundaries of this project area reflect administrative and practical constraints, and do not reflect any division in the continuum of the historic environment.

- The eastern lateral extent of this project area is defined by a line extending SSE from the East Sussex coast near Hastings at N50°53'00", E00°41'00", to the point where longitude E01° 00' 00" intersects with the UK Continental Shelf Limit at the Median Line with French waters. Across the inter-tidal zone and on land, the eastern extent of this project area is defined by a straight continuation NNW of the line defining its eastern marine extent.

- The seaward limit of this project area is the limit of UK Controlled Waters, here following the Median Line with French waters, as defined in the UK Continental Shelf Act 1964 as subsequently amended.

- The western lateral extent of this project area is defined south from the Isle of Purbeck by longitude W02°00' 00" to the point where it meets the Median Line with French waters. North of the Isle of Purbeck, the western extent of the project area encompasses the full area and coastal zone of Poole Harbour.

- The landward extent of the project area reaches at least the OS-mapped line of Mean High Water (MHW) but in accordance with the national HSC methodology, it continues landward beyond that line to avoid any arbitrary truncation of HSC polygons and to accommodate inland areas perceived, from a maritime perspective, as possessing distinctively maritime character. This may result in the inclusion of some areas on land which are discontinuous with MHW, for example to accommodate prominent inland areas serving as navigational daymarks, producing HSC polygons separate from the main body of the characterisation.

Figure 1: Map showing extent of Hastings to Purbeck Project Area and initial trial area

Subject to accommodation of inland areas perceived as possessing distinctive maritime character, estuaries within the project area have been included to their rivers' and tributaries' Normal Tidal Limits.

The Hastings to Purbeck area has long been recognised for its distinctive marine and intertidal historic character. The offshore area, which is now underwater but, intermittently for much of the Pleistocene period would have been part of the terrestrial landscape, has experienced multiple inundations. These multiple inundations and changing environmental conditions had an impact on the potential for human occupation and therefore on the historic character of this area (MA Ltd, 2007).

Britain's island status has resulted in a maritime character that is interwoven into all aspects of social, economic, political and technical development. With trade and transport links with continental Europe established from the Bronze Age, a reliance on seafaring is a factor which continues through to the present day. Alongside the use of the marine zone for trade it has been necessary to develop and rely on technologies and techniques for maritime warfare. These activities and their associated coastal infrastructure have left a rich legacy of historic and present maritime character expressed in the Hastings to Purbeck current landscape/seascape (MA Ltd, 2007).

The Hastings to Purbeck area has been the focus of a range of other projects which inform and interface with HSC. Those taken into consideration during the project were:

- Rapid Coastal Zone Assessment Survey (RCZAS) (http://www.english-heritage.org.uk/professional/advice/advice-by-topic/marine-planning/shoreline-management-plans/rapid-coastal-zone-assessments/)

- Protected Wrecks Act (PWA) Contract (http://www.wessexarch.co.uk/projects/marine/pwa/index.html)
- Mystery Wreck (http://www.hwtma.org.uk/flower-of-ugie)
- Wrecks on the Seabed (http://www.wessexarch.co.uk/projects/marine/alsf/wrecks_seabed/index.html)
- Navigational Hazards (http://www.bournemouth.ac.uk/caah/maritimearchaeology/projects/alsf_navhazards.html)
- Submerged Palaeo-Arun & Solent Rivers: Reconstruction of Prehistoric Landscapes (http://ads.ahds.ac.uk/catalogue/archive/palaeoarun_eh_2007/?CFID=573996&CFTOKEN=39545028)
- Bouldnor Cliff Analysis Phase (http://www.hwtma.org.uk/Bouldnor-Cliff)

5. METHODOLOGY

The project, commissioned on the 9th December 2009 and completed in February 2010 was undertaken in accordance with MoRPHE guidelines (English Heritage 2006).

The project method was divided by English Heritage into five execution stages, described as follows:

- Stage 1: Setting Up and Familiarisation
- Stage 2: Characterisation of Initial Trial Area
- Stage 3: Characterisation of full project area
- Stage 4: Data Analysis and Review of Applications
- Stage 5: Preparation of Project Products and Dissemination

A revised working draft of the HSC Method Statement (Tapper 2010), building on the practical experience from the initial HSC implementation project, was used as the basis for applying the national HSC methodology, while working in close communication with staff from the English Heritage Characterisation team.

The method was initially applied to a trial area (**Section 7.2.1**) as agreed at the Project Inception Meeting. The trial area encompassed both rural and urban coastal landscapes, and covered a substantial area of intertidal and marine areas. The application of the method to the trial area provided the project team with the opportunity to further familiarise themselves with the HSC characterisation process and logistical challenges of applying HLC to the coastal and marine environment in a new area.

Challenges arising during the application of the method have been described chronologically as far as possible, distinguishing where necessary between issues arising during the initial Trial Area method application and during ensuing characterisation of the full project area.

5.1 Stage 1: Project Set Up and Familiarisation

5.1.1 Setting Up

Staff required for the project were already in post within SeaZone and MA Ltd, removing any time constraints relating to recruitment. Data hardware and software required for

the project are held in-house by both organisations, and no additional cost was therefore charged.

An Inception Meeting between core English Heritage staff and project team members was held at English Heritage's offices in Waterhouse Square, London on 29th January 2010 to discuss protocols and practicalities of the project and the extent of a trial project area.

The meeting provided an opportunity to discuss protocol and lines of communication, data acquisition, project publicity and dissemination, modes and levels of liaison with the other three concurrent HSC projects to ensure consistency of approach.

The trial area for the project was also discussed in the meeting. An initial area proposed by the project team (encompassing part of the Solent) was considered too large and complex. A more suitable area was then selected - to the east of the Isle of Wight encompassing part of West Sussex (area as shown in **Figure 1**). The date for submission of the trial area was agreed as March 31st 2010, to coincide with date of next Steering Group meeting.

The start of the project was widely disseminated in January 2010 at the start of the project (and prior to the Inception Meeting). The list of stakeholders was agreed with English Heritage before the dissemination email was sent and included coastal fora, central and local government, and representatives from environmental and marine agencies, academic organisations, Harbour Authorities and local history and civic societies. The start of the project was also announced via the SeaZone and MA Ltd websites (www.seazone.com, www.maritimearchaeology.co.uk).

5.1.2 Familiarisation

The familiarisation of the project team took place by assessing the relevant bibliographic references, acquiring core data, and undertaking relevant GIS familiarisation.

The assessment of relevant bibliographic references mainly comprised the following:

- Using Historic Landscape Characterisation (Clark et al, 2004)
- HSC: Demonstrating the Method, project brief, English Heritage (English Heritage 2008)
- England's Historic Seascapes: Solent and Isle of Wight (HWTMA, 2007)
- England's Historic seascapes (Hooley, 2004)
- What have we done? Mapping the Historic Cultural Processes that Shape our Coastal and Marine Environment (Hooley, 2009)
- England's Historic Seascapes, Historic Seascape Characterisation (HSC). National HSC Method Statement (Tapper, 2008)
- England's Historic Seascapes: Consolidating the National Method (Tapper & Johns, 2008)
- England's Historic Seascapes, Scarborough to Hartlepool and Adjacent Marine Zone. Historic Seascapes Characterisation Method (Tapper et al, 2007)

Core data was collated during the initial stages of the project to ensure that data suppliers were given adequate time to supply the project's requirements. Contact was made with the relevant HERs (Dorset, Hampshire, Isle of Wight, West Sussex, East Sussex) to introduce the project and discuss the data required.

With specialist experience in the application of the HSC method, technical support and GIS training was provided from SeaZone to the MA Ltd HSC assessor. Other MA Ltd staff supported the HSC assessor during familiarisation with the method and applications of HSC products.

5.2 Stages 2 & 3: Characterisation

5.2.1 Introduction

The methodology compiled from the consolidation of five previous HSC projects was applied as specified in the national HSC Method Statement (Tapper 2010) to meet the requirements of English Heritage to implement the method across the coastal, intertidal and marine areas lying between Hastings and Purbeck.

The characterisation phase of the method statement was broken down to reflect individual tasks within the method, as described in the method statement of the Project PD. The characterisation phase of the project (of both the initial trial area and the full project area) is described under the following sub-headings:

- Data Collation
- Data Preparation
- GIS Development
- Database Development
- Character Assessment
- Development of Character-type Text Descriptions

5.2.2 Data Collation

The emphasis during collation of core data for the project was placed on datasets that currently or will, when completed, have consistent national coverage. Emphasis was also placed on those available in digital formats, treating more localised or hard-copy source data available as supplementary.

The information gathered to produce the text descriptions for Character Types was based on desk-based research.

The basic requirements for data collated were that:

- Sources are relevant and consistent
- Core dataset coverage is national (or at least regional)
- Sources are treated in a consistent manner and even-handed way, following the clearly-stated workflow in the HSC Method Statement; and are used to reflect time-depth and past change
- Standard terminologies are used to maintain clarity, meeting MIDAS Heritage/INSCRIPTION requirements
- Consistent assessment and capture of historic seascape character is deployed
- Common 'perception scale(s)' are established – that is, the scale at which characterisation is expected to be read and applied

Data issues such as limited coverage, accuracy and recording biases were taken into account during the collation of data and application of the method. Marine data and records of archaeological evidence tend to be concentrated towards shallow, intertidal and coastal areas. The level of accuracy and degree of bias is variable, dependent on the method used to gather the data and purpose for which the data was gathered. Finally, the integration of non-digital resources may be time consuming so data was gathered in a digital format where possible.

A list of core data sources was identified for the purpose of the project (**Table 1**) based on Tapper 2008 and English Heritage 2008. These are datasets which are available on a national scale and provided the core data on which the HSC Hastings to Purbeck project was applied.

Table 1 – Core Data Identified for the Hastings to Purbeck Project

Data group	Format	Feature Types	Datasets	Supplier
Admiralty charts	digital	Points, polygons, polylines	Bathymetry, navigational hazards, navigational channels	SeaZone Hydrospatial
Historical charts, views and sailing directions	Paper based/digital	Raster images	Navigational features, offshore development, intertidal peat beds	UKHO archives, NMM, local museums
Ordnance Survey maps	Digital	Points, polygons, polylines		English Heritage, Ordnance Survey
Historic maps	Digital	Raster images	1st Edition, 2nd Edition and modern Ordnance Survey maps	English Heritage, Landmark, Ordnance Survey
SeaZone Hydrospatial	Digital	Points, polygons, polylines	- Bathymetry & elevation (BE), - Natural & physical features (NP) - Structures & obstructions (SO) - Socio-economic & marine use (SE) - Conservation & environment (CE) - Climate & oceanography (CO) - Wrecks (W))	SeaZone Solutions Ltd.
Adjacent County HLCs	Digital	polygons		Local Authorities
Aerial photographs	Digital	Raster images		Local Authorities
Fisheries data	Digital	Points, polygons, raster images, paper charts	Fishing grounds, fishing snags	CEFAS (outside 6nm), Sea Fisheries Committees (within 6nm), JNCC, Kingfisher charts, Finding Sanctuary, Balanced Seas, NMR, Misc. fishing charts
Offshore Industry	Digital	Points, polygons, polylines	Aggregate extraction areas, oil and gas installations	UK Deal, JNCC, SeaZone hydrospatial
Environmental data and land classifications	Digital			Natural England/JNCC/MAGIC database, CEFAS, BGS (www.searchmesh.net/webGIS.)

English Heritage supplied OS MasterMap and historic Landmark data where possible. Historic Environment Records (HER) data, RCZASs and HLCs were requested from local

authorities where available (see below for issues concerning the acquisition of HER data).

Supplementary datasets identified included local and regional datasets, point data and data which is not currently available in a digital format (**Table 2**). These are datasets which are not consistently available nationally to inform all historic landscape and seascape characterisation, but which provide fine-tuning to local and regional character variation during the interpretation of character and, later, the compilation of text descriptions.

Table 2 - Supplementary Data Identified for the Hastings to Purbeck Project

Data group	Format	Feature Types	Datasets	Supplier
NMR	Digital	Points, polygons	Monument records, maritime records	English Heritage
HERs and SMRs	Digital	Points, polygons	Monument records, maritime records	Local Authorities
Palaeo-environmental data	Digital/paper	various	Peat beds, palaeo-channels,	Birmingham University, HER/SMR, BGS
Geomorphology	Digital	raster	Coastal geomorphology	FutureCoast (DEFRA)
Seabed sediments	digital	polygons	Sediment type	SeaZone Hydrospatial
Offshore solid geology	digital	polygons	Bedrock type	SeaZone Hydrospatial
Morphology	Digital	raster	Coastal morphology	FutureCoast
Tidal range	Digital	Raster Images	Sea level model	DTI
Sea level index points	various	various	Sea level model	Various
Tides & Currents	Digital	Points, polygons, polylines	Tides and currents	SeaZone Hydrospatial
Shipping Data and Navigational Hazards	Digital	Polygons, Raster	Navigational hazards, England's Shipping, ANATEC, RYA,	Bournemouth University, English Heritage, ANATEC

Data group	Format	Feature Types	Datasets	Supplier
			DfT	
Documentary sources	Hard copy, Digital	various		Various: libraries, Record Offices, Museum libraries, online websites

The collation of documentary resources played a key role in the character assessment and the development of Character Type text descriptions. A wide range of documentary sources were assessed. Data gathering was streamlined using the design of the database structure to guide the assessor in the level of information required. Data was entered directly into the database during desk-based research.

The list of core and supplementary sources given in the HSC Method Statement guided the collation of data for the project. Additional data sources relevant to the project area included the following:

- Finding Sanctuary (www.finding-sanctuary.org)
- Balanced Seas (www.balancedseas.org)
- Waterlands data from ABPmer (Goodwyn et al, 2010), used to inform the Cultural Topography: Palaeolandscape Character Type
- South Coast Regional Environmental Characterisation (James et al, 2010)

The time pressure required to collate such a broad range of resources was considerable and work on this was started in the first stages of the project during the initial Set-up and Familiarisation phase.

The responsibility for gathering data for the project was divided between SeaZone and MA Ltd to optimise efficiency during the early stages of the project. SeaZone used in-house knowledge of data management and experience gained during previous HSC projects to gather core and suplementary digital datasets which are available on a national scale, allowing MA Ltd to focus on collating regional scale information while seeking support from local authorities and interest groups in informing the HSC process. The datasets collated by SeaZone are highlighted in **tables 1** and **2**.

Additional sources for leisure and commercial shipping identified during the *HSC: Demonstrating the Method* project included Royal Yachting Association (RYA) data. However, this data was not used due to lack of further funding available to purchase the time-limited licence for the RYA dataset.

The principle local sources of data collated by MA Ltd related to the county and unitary authority HERs, which contain historic buildings data, information on archaeological sites and finds. Relevant HERs (Dorset, Hampshire, Isle of Wight, West Sussex, East Sussex) were initially contacted in December 2009, in advance of the stakeholder dissemination email with an introduction to the project. This was followed up shortly after the Inception Meeting with a more specific request for data (and included a shapefile of the project area). The data required included county HLCs and any addition HER data that fell within the project area polygon up to 5km inland.

Data collation was undertaken using the same approach as that employed for the *HSC Demonstrating the Method* project (Merritt, 2009).

6.2.2.1 Navigation

Data relating to navigational activities was collated from a broad range of sources including Anatec, SeaZone Hydrospatial, historic maps and charts, HLC, OS MasterMap, sailing directions, the Aggregate Levy Sustainability Fund (ALSF) England's Shipping (Wessex Archaeology, 2003) database and Department for Transport (DfT) Shipping Density data. Once extracted, data from each source was divided between the following groups of information as follows:

Shipping:
The shipping route related datasets including Anatec, England's Shipping and DfT Shipping Densities. The DfT shipping density polygons were limited to 100km offshore. As the project extends to the outer limits of UK Controlled Waters, data from Anatec and the historic shipping routes network from the England's Shipping project GIS were used as a guide to extrapolating the routes out to the limit of the project area. These were superimposed with the DfT polygons. Where the routes from multiple sources coincided, centre lines were drawn through the middle of routes and buffered to match the breadth of routes displayed in the DfT data.

Ferry routes recorded in Hydrospatial were extracted and reclassified.

Navigational channels:
Modern defined navigational channels are recorded under S-57 charting standards and were provided as part of SeaZone Hydrospatial. All channel-related data including channel marker buoys, navigational lines, recommended route centrelines, and traffic separation zones were extracted from Hydrospatial so that they could be viewed as a group.

Anchorages:
Anchorages are recorded in modern and historic charts. The anchorage areas recorded in S-57 were extracted from SeaZone Hydrospatial while ALSF Navigational Hazards and historic charts were used as sources for gathering historical records of anchorages.

6.2.2.2 Ports, Docks and Harbours

Formal 'harbour areas' reflect the water on the approaches to a harbour or dock: although administrative areas, their regulations control activity within them. These are defined in Hydrospatial under S-57 and were therefore extracted and reclassified. Coastal features relating to the shipping industry, such as docks, dockyards, shipyards, boat yards, etc were defined using a combination of modern and historic OS mapping and HLC to identify the extents and ages of different parts of ports and harbours.

6.2.2.3 Maritime Safety

Safety Areas:
Safety areas are provided as part of SeaZone Hydrospatial and are mapped by the UKHO under S-57 charting standards. The features were therefore extracted from SeaZone Hydrospatial and given descriptive attributes.

Safety Services and Features:
OS MasterMap, sailing directions and coastal views, HER and RCZA data, historic charts and maps, and SeaZone Hydrospatial were used in combination to identify maritime safety features along the coast such as daymarks, lighthouses and beacons, coastguard and lifeguard stations. The features were digitised from the geo-referenced historic charts and maps and extracted from SeaZone Hydrospatial. The resulting datasets were then compared to remove duplicates and given descriptive attributes in preparation for the prescriptive phase of the analysis.

6.2.2.4 Hazards

Information on navigational hazards was sourced from a broad range of resources including SeaZone Hydrospatial, ALSF Navigational Hazards data (Merritt, 2007), historic charts and sailing directions, NMR wrecks and obstructions, HER data and OS MasterMap.

Wrecks and obstructions:

The UKHO and NMR both hold extensive wreck data repositories. They hold a separate list of wrecks in the UKHO wrecks database, as well as a list of sites recorded in S-57. The NMR hold records of known wrecks, fishermen' fastenings, and reported losses. In addition, local authorities hold some wreck data while some sites are also depicted on historic charts.

SeaZone Hydrospatial contains both the S-57 records and UKHO records, many of which are duplicates of each other. Further duplicates exist between SeaZone Hydrospatial and the NMR wrecks database.

All wreck data therefore had to be viewed together and compared to isolate as many duplicates as possible. First, the Hydrospatial wrecks were separated into two layers, one for S-57, the other for UKHO wrecks. Duplicates were removed from SeaZone Hydrospatial by looking at the distances between S-57 and UKHO wrecks identified as the same. All wrecks identified as likely duplicates were then removed. The remaining S-57 wrecks were combined with the UKHO wrecks to form a single dataset.

The methodology used to clean the wreck data was repeated to deal with obstructions. Once a cleaned, single layer of points had been produced for wrecks and obstructions respectively, the *Density Analysis* tool in the ArcGIS *Spatial Analyst* extension was used to identify areas where densities in wrecks existed, employing the methodology described in the Demonstrating the Method project report (Merritt, 2009).

Dangerous wrecks and protected wrecks were extracted from SeaZone Hydrospatial using NMR wrecks as a reference to ensure all sites were identified.

Natural hazards:

Rock outcrops and drying areas were identified by comparing rocky and sandy foreshore areas recorded in OS MasterMap and depth areas in SeaZone Hydrospatial. The ALSF Navigational Hazards project GIS contains a series of historically mapped hazards which have been related to their modern equivalents (Merritt, 2007). That project reviewed a broad range of historical charts for the entire English coast and was therefore considered to sufficiently comprehensive to cover historic records of navigational hazards for the purposes of this HSC project. The characterisation of navigational hazards and the original point data collated from geo-referenced historical maps and charts during the development of the project output were used to support the characterisation.

Water turbulence data is recorded in SeaZone Hydrospatial as well as having been recorded as part of the ALSF Navigational Hazards project (Merritt, 2007). The output from both sources was combined into a single dataset and re-attributed.

Submerged rock were identified using a combination of querying out shallow depth areas and comparing the results to attribute queries on rocks in Hydrospatial, OS MasterMap, ALSF England's Shipping points and historical maps and charts.

Rock outcrops, defined as areas within the intertidal zone which are permanently exposed or visible at low water are represented on Ordnance Survey maps and were therefore drawn from OS MasterMap.

6.2.2.5 Industry

Data on marine-located industry was collated from a range of sources including UK Deal, SeaZone Hydrospatial and Joint Nature Conservation Committee (JNCC). As each dataset contains a range of industrial features, all features of potential relevance to the character of the coastal and marine landscape were extracted into separate datasets. For instance, pipelines displayed as polylines were extracted into one shapefile while well-heads recorded as points were recorded as a separate dataset. This approach enabled features displayed as points or polylines to be buffered to produce polygons in order to integrate them with equivalent datasets from other sources.

Extractive industries:
Licensed aggregate dredging areas were taken from data supplied by the Crown Estate.

Mines and quarries were mapped on land, where a maritime character was identified, using OS MasterMap, supported by historical maps, HER and NMR records, documentary sources and HLC where available.

Spoil dumping grounds are recorded on modern navigational charts to delineate areas where spoil resulting from dredging, drilling or waste has been deposited on the seabed. These areas recorded in S-57 and were therefore extracted from SeaZone Hydrospatial. UK DEAL data was compared with the results to ensure all areas had been identified.

Energy Industry:
All marine features relating to hydrocarbon extraction, including well-heads, pipelines, and oil and gas fields are recorded by UK Deal and included in SeaZone Hydrospatial. The features were queried out into separate groups, depending on the geometries. Hydrocarbon installations, recorded as points, were given a 500m buffer and pipelines, depicted as polylines, were given a 250m buffer.

6.2.2.6 Fishing

Data on fishing activities was drawn from a wide range of sources, some directly bearing on the extent and character of the fishing industry, others providing proxy information. These included regional Sea Fishery Committee (SFC) fishing sightings, JNCC, CEFAS, historic charts and documentary sources.

CEFAS provided the results of a recent study to interpret the density of fishing activities of different gear types from Vessel Monitoring System (VMS) data (Lee et Al., 2010). The data was interpreted to produce a series of character polygons which were circulated to all HSC project teams with the agreement of CEFAS (Pers. Comm. J. Lee).

An extensive coverage of data on fishing activities (including aquaculture) was provided by the South Coast Regional Environmental Characterisation project. All fishing data was brought together and compared to identify areas where the results coincided. A characterisation of fishing activities within the project area was produced using the VMS interpretations and REC data where possible, supported by CEFAS data on fishing pressures and documentary sources, where necessary.

6.2.2.7 Transport

Transport systems were documented through their extraction from OS MasterMap, SeaZone Hydrospatial and the review of HLC, NMR and HER records, and documentary sources.

6.2.2.8 Military

Character areas relating to military activity were drawn from a wide range of sources including OS MasterMap, SeaZone Hydrospatial, historic maps and charts, NMR, HER and HLC data and documentary sources.

Ordnance Dumping grounds and military practice areas in inshore and offshore areas were extracted from SeaZone Hydrospatial. Military practice areas include a range of activities including submarine practice areas. These were extracted as a single group and differentiated during the descriptive attribution of the areas.

Coastal and intertidal military areas such as airfields, military bases, military coastal defences, fortifications, firing ranges, dockyards, etc were defined using OS MasterMap and HLC polygons were available. SeaZone Hydrospatial, HER and NMR data and historical maps were used to assess suitable extents reflecting both present and previous historic character.

6.2.2.9 Settlements

The extents of towns and villages were defined using historical maps and HLC, HER and NMR data. Where available the contiguous extent of urban areas were interpreted from existing HLCs, supported by mod4ern and historic mapping. Where necessary, character areas were constructed or edited using OS MasterMap for the present HSC and derived from 1st or 2nd Edition Ordnance Survey mapping for the previous character.

6.2.2.10 Cultural Topography

Palaeo-environmental data for coastal areas can be drawn from historic maps and charts which in some cases record submerged forests or peat deposits. However, the majority of data was drawn from the results of the MEPF Waterlands project undertaken by ABPmer (Goodwin et al, 2010).

Environmental datasets help inform the characterisation of areas of cultural topography which, although they employ 'natural environment' terminologies for ease of popular recognition and simplicity, also have clearly definable human cultural dimensions: these are the unstated and often overlooked cultural aspects of what are often termed 'semi-natural environments'. Cultural influences are often directly responsible for the evolution of these areas over centuries or millennia (Tapper 2008): they are certainly responsible for their management in the present and future. But more widely still, these areas have been culturally used, and still are, for a breadth of purposes, including economic resource gathering and now often for including low intensity leisure and recreation, and their contributions to coastal aesthetic qualities. Most such areas have had place-names bestowed on them while many are designated as a reflection of the values people attached to their ecological, scenic and other qualities.

In coastal and intertidal areas, cultural topography character areas such as salt marshes, coastal rough ground, cliff, mudflats, and dunes, amongst others were identified using a range of sources including OS MasterMap, historic maps and charts, Natural England's GIS Digital Boundary Datasets, aerial photographs and documentary sources. Aerial photographs proved particularly useful in identifying such areas in the current landscape and seascape, along with the use of desk-based research into place names and the review of areas defined by Natural England.

Cultural topography for inshore and offshore areas was documented primarily using UKSeaMap, BGS seabed sediments (SBS250) and JNCC data. UK SeaMap is "an interpreted broad scale map of the dominant seabed and coastal features (termed "Marine Landscapes") based on geological, physical and hydrographical data" produced by JNCC.

These datasets were brought together in a single data frame and assessed to identify areas where patterns of human activity have impacted in various ways to create the distinct cultural topography we perceive today on land and at sea.

5.2.3 Data Preparation

Data preparation was undertaken as outlined in both the national HSC methodology (Tapper 2010) and the Project Brief (English Heritage 2009).

A shapefile was provided by English Heritage specifying the extent of the project area. From this, 'Location' areas were defined for the coastal and intertidal, inshore and offshore zones. These are delineated as specified by the UK Hydrographic Office (UKHO) for the intertidal and marine zone, and the Ordnance Survey (OS) for the coastal zone. The coastal zone is defined as the area topographically lying above MHW. The intertidal zone is defined using the intertidal area represented in OS MasterMap which reflects the area from Mean High Water (MHW) to Mean Low Water (MLW) as defined by the Ordnance Survey. Inshore waters are defined between LAT and the 12nm limit, and offshore reflects the area beyond the 12nm limit to the outer extent of the project study area. This dataset was used to attribute HSC polygons using their centroids, as specified in the HSC Method Statement.

Before the data processing was initiated, a vector grid of cells (polygons) covering the marine zone below Mean Low Water (MLW) was created to provide a basis for the offshore HSC polygon layer. A grid cell size of 250m x 250m was employed across the entire marine area. The grid was generated using the Grid creation tool developed during the Demonstrating the Method project (Merritt, 2009).

The project methodology specifies that all data will be referenced to British National Grid coordinates (OSGB36) as it is comparable with English land-based data including HLC projects. However SeaZone consider the use of a WGS84 compliant datum below MLW as best practice for marine GIS, at least in the vicinity of the coast of the UK, because, strictly speaking, the OSGB36 datum does not exist offshore. The project work was therefore undertaken using a WGS84 based and Transverse Mercator projected Coordinate Reference System (CRS). The WGS84 / UTM Zone 31N CRS (EPSG: 32631) was suitable for this project. Data was delivered referenced to British National Grid as required by the project terms of reference. Datum transformations between OSGB36 and WGS84 were undertaken using a version of the OSTN02 transformation that has been extended for use beyond its normal 10km offshore limit.

All data was compiled into a standardised format and CRS as defined above to make it interoperable during the GIS development. The data will be collated to meet English Heritage standards of best practice. The resolution for data capture was determined by the scale at which the data will be viewed and the scale at which it was originally displayed. All newly digitized data was captured at a scale of at least 1:25,000 as recommended in the "Guidelines for English Heritage Projects Involving GIS" (Froggatt 2004) and the AHDS GIS guide to Good Practice (http://ads.ahds.ac.uk/project/goodguides/gis/).

Data capture was undertaken in accordance with *MIDAS Heritage* standards as published in "MIDAS – The UK Historic Environment Data Standard" (English Heritage 2007) which outlines the standards for data information on the historic environment Data was gathered by source with attribute structure guided by the 'Area' and 'Map Depiction' information groups advocated by *MIDAS Heritage* 2007.

MIDAS Heritage complies with this data standard which is used by the GIgateway™ metadata service run by the Association for Geographic Information (AGI) and also to the UK e-Government Metadata Standard (e-GMS) which is based on Dublin Core. It is designed for use in GIgateway™, and for other metadata applications in the UK. All output GIS files were documented using the UK GEMINI Discovery Metadata Standard, and shall be encoded according to ISO 19139.

5.2.4 GIS Development

The methodology applied to the trial area and full project area was applied in line with the guidance provided in the national HSC Method Statement (Tapper 2010).

The development of the project GIS was supported where necessary by the tools produced by SeaZone. These include a vector grid creation tool, a data preparation tool and a tool to transfer attributes to facilitate auto-population of fields.

The use of the grid creation tool ensured that output grids between the HSC project areas will be interoperable, whether they are generated for different areas or for different sizes of grid cells.

Based on the HSC Method Statement (Tapper 2008 and 2010), the topological requirements for the project are as follows:

- Polygons are to be discrete (No overlaps)
- Polygons are to be contiguous (No gaps)
- All attributes are to be filled in where possible with 'NA' used for empty entries as Appropriate
- Every feature (point, arc, polygon, region, etc) should have at least one attribute record.
- There should be no slivers, dangles, knots or cross-overs.
- Multi-part polygons are acceptable; they should have one set of attributes associated with them

The original grid which spanned the whole project area was extremely large and caused issues with processing the data effectively on the project computers. It was therefore decided to split the grid into two sections, East and West. Once the grid was split, work continued with few problems

5.2.5 Character Assessment

The HSC method was carried forward using a multi-mode approach, encouraging the application of a consolidated hierarchy of types where possible, while enabling further consolidation of the character type list where appropriate. The character assessment was undertaken following the GIS workflow diagram published in the HSC National Method (Tapper, 2008 and 2010).

In the first instance, during data collation, features from each dataset were reviewed for their applicability in defining seascape character and each feature was given a set of descriptive attributes.

Following this initial descriptive phase of characterisation, polygons were grouped by their character sub-type, were one was already available to be prescribed, and consolidated into the levels reflecting the different dimensions of the marine environment (Coastal, Sea Surface, Water Column, Seabed Surface, Seabed Sub-surface). Where a suitable Character Sub-type was not already defined, a new Sub-type and definition was circulated to the English Heritage Characterisation Team and the

other concurrent HSC project teams for comment and approval for addition to the HSC Character Type list.

The features were then consolidated into a single shapefile per Character Sub-Type and these were combined into a single data layer. For the marine area, this was done by feeding data into the vector grid using a combination of spatial selection and attribute population. Attributes were populated using a combination of prescriptive and descriptive attribution. Each dataset was classified to reflect its dominant character within the marine tier. Where overlaps in features or activity polygons were found to exist within a tier, the HSC assessor identified the dominant activity and this was used to populate the attributes of that area. Once each marine tier was populated, the HSC assessor identified the dominant character between the different marine tiers in the marine zone in order to populate the Coastal and Conflated Sub-Character Type. A prescriptive attribution process was then applied to automatically populate the Character Type and Broad Character Type based on the classification hierarchy structured around the Sub-Character Types.

The output of the GIS development for the marine zone was a single layer of discrete vector grid cells which have been reclassified to reflect a single Sub-Character Type assessed as dominant for each marine tier.

For the coastal and intertidal areas, HLC polygons were used as the foundation for building the character polygons where possible, re-using pre-existing geometries where appropriate. The coverage of HLC was complete across the coastal and intertidal zones in the project area. Each HLC was reviewed individually in the context of OS MasterMAP, HER data, aerial photographs and historical maps to assess character polygons felt to have a marine character. Each polygon was then reclassified to populate the coastal and conflated HSC attributes as well as their previous character in the context of the data reviewed. New Character Types were proposed where thought necessary. A dominance assessment was applied to the coastal and intertidal areas where necessary.

Once the characterisation of the coastal, intertidal, and marine zones were respectively completed, the three areas were combined into a single layer of polygons reflecting digitised polygons for the coastal and intertidal areas, and a vector grid for the marine area.

The project GIS was structured using the following structure, in line with the amendments made to the HSC Method Statement following the HSC Demonstrating the Method project (Tapper 2010) (**Table 3**).

Table 3 - Attribute field structure outlined in the National HSC Method Statement (Tapper 2010)

Attribute Name	Alias	Description and guidance, terminology	Population Method	Format	Width
PolygonID	PolygonID	Unique reference number for HSC polygon/grid cell	Automated by GIS software	numeric	10
NAME	Name	Name of area or topographic identifier, local or popular name	manual	string	100
CC_BDTY	Coastal and Conflated Broad	Broad Character Type (present, dominant; national strategic level). Landward (above MHW) this will record	automated	string	100

Attribute Name	Alias	Description and guidance, terminology	Population Method	Format	Width
	Character Type	coastal land HSC, whereas seaward it will record the 'conflated' HSC as derived from the marine levels.			
CC_TY	Coastal and Conflated Character Type	Character type (present, dominant; regional level). Landward (above MHW) this will record coastal land HSC, whereas seaward it will record the 'conflated' HSC as derived from the marine levels.	automated	string	100
CC_SBTY	Coastal and Conflated Sub Character Type	Sub-character type (present, dominant; local level). Landward (above MHW) this will record coastal land HSC, whereas seaward it will record the 'conflated' HSC as derived from the marine levels.	manual	string	100
CC_PRD,	Coastal and Conflated HSC Period	Benchmark period of origin of the area represented in the polygon or cell. Recorded for present historic character. Landward (above MHW) this will record coastal land HSC, whereas seaward it will record the 'conflated' HSC as derived from the marine levels.	manual	string	50
CC_SRC	Coastal and Conflated HSC Source	Sources used to identify present and previous historic character. Attribute values to record supplier, date, precise GIS file name. To include reference to the scale of original data used. Landward (above MHW) this will record coastal land HSC, whereas seaward it will record the 'conflated' HSC as derived from the marine levels.	manual	string	250
CC_CNF	Coastal and Conflated HSC Confidence	Degree of certainty/confidence of HSC interpretation of present historic character. Landward (above MHW) this will record coastal land HSC, whereas seaward it will record the 'conflated' HSC as derived from the marine levels.	manual	string	25
CC_NTS	Coastal and Conflated HSC Notes	Further background information on history of the polygon. Expansion on information recorded at broad character and sub-character levels.	manual	string	250
CC_LINK	Coastal and Conflated HSC Link	URL hyperlink to **Character Type** texts and multi-media. Landward (above MHW) this will record coastal land HSC, whereas seaward it will record the 'conflated' HSC as derived from the marine levels.	manual	string	250
SBFLR_SBTY,	Sub sea-floor HSC sub-type	Present and dominant historic character of the sea-bed (recorded at sub-character, character and broad character levels)	manual	string	100
SBFLR_TY	Sub sea-floor HSC type		manual	string	100

Attribute Name	Alias	Description and guidance, terminology	Population Method	Format	Width
SBFLR_BDTY	Sub sea-floor HSC broad-type		manual	string	100
SBFLR_PRD	Sub-sea floor HSC Period	Benchmark period of origin of the area represented in the polygon cell.	manual	string	50
SBFLR_SRC	Sub-sea floor HSC Source	Sources used to identify historic character. Attribute values to record Supplier, Date, precise GIS file name. To include reference to the scale of original data used.	manual	string	250
SBFLR_CNF	Sub-sea floor HSC Confidence	Degree of certainty/confidence of HSC interpretation of present historic character.	manual	string	25
SBFLR_NTS	Sub-sea floor HSC Notes	Further background information on history of the polygon. Expansion on information recorded at broad character and sub-character levels.	manual	string	250
SBFLR_LINK	Sub-sea floor HSC Link	URL hyperlink to **Character Type** texts and multi-media	manual	string	250
SFLR_SBTY,	Sea-floor HSC sub- type	Present and dominant historic character of the sea-floor (recorded at sub-character, character and broad character levels)	manual	string	100
SFLR_TY,	Sea-floor HSC type		manual	string	100
SFLR_BDTY	Sea-floor HSC broad- type		manual	string	100
SFLR_PRD	Sea-floor HSC Period	Benchmark period of origin of the area represented in the polygon cell.	manual	string	50
SFLR_SRC	Sea-floor HSC Source	Sources used to identify historic character. Attribute values to record Supplier, Date, precise GIS file name. To include reference to the scale of original data used.	manual	string	250
SFLR_CNF	Sea-floor HSC Confidence	Degree of certainty/confidence of HSC interpretation of present historic character.	manual	string	25
SFLR_NTS	Sea-floor HSC Notes	Further background information on history of the polygon. Expansion on information recorded at broad character and sub-character levels.	manual	string	250
SFLR_LINK	Sea-floor HSC Link	URL hyperlink to **Character Type** texts and multi-media	manual	string	250
WTRCL_SBTY	Water Column HSC sub-type	Present and dominant historic character of the water-column (recorded at sub-character, character and broad character levels)	manual	string	100
WTRCL_TY	Water Column		manual	string	100

Attribute Name	Alias	Description and guidance, terminology	Population Method	Format	Width
	HSC type				
WTRCL_BDTY	Water Column HSC broad-type		manual	string	100
WTRCL_PRD	Water Column HSC Period	Benchmark period of origin of the area represented in the polygon cell.	manual	string	50
WTRCL_SRC	Water Column HSC Source	Sources used to identify historic character. Attribute values to record Supplier, Date, precise GIS file name. To include reference to the scale of original data used.	manual	string	250
WTRCL_CNF	Water Column HSC Confidence	Degree of certainty/confidence of HSC interpretation of present historic character.	manual	string	25
WTRCL_NTS	Water Column HSC Notes	Further background information on history of the polygon. Expansion on information recorded at broad character and sub-character levels.	manual	string	250
WTRCL_LINK	Water Column HSC Link	URL hyperlink to **Character Type** texts and multi-media	manual	string	250
SSRFC_SBTY,	Sea-surface HSC sub-type	Present and dominant historic character of the sea-surface (recorded at sub-character, character and broad character levels)	manual	string	100
SSRFC_TY,	Sea-surface HSC type		manual	string	100
SSRFC_BDTY	Sea-surface HSC broad-type		manual	string	100
SSRFC_PRD	Sea-surface HSC Period	Benchmark period of origin of the area represented in the polygon. Recorded for present historic character levels and previous historic character	manual	string	50
SSRFC_SRC	Sea-surface HSC Source	Sources used to identify historic character. Attribute values to record Supplier, Date, precise GIS file name. To include reference to the scale of original data used.	manual	string	250
SSRFC_CNF	Sea-surface HSC Confidence	Degree of certainty/confidence of HSC interpretation of present historic character.	manual	string	25
SSRFC_NTS	Sea-surface HSC Notes	Further background information on history of the polygon. Expansion on information recorded at broad character and sub-character levels.	manual	string	250
SSRFC_LINK	Sea-surface HSC Link	URL hyperlink to **Character Type** texts and multi-media	manual	string	250

Attribute Name	Alias	Description and guidance, terminology	Population Method	Format	Width
PRVS_SBTY1, 2 etc	Previous HSC Type (1-∞)	Previous historic character for which evidence is available. Recorded for multiple time-slices on basis of source dataset.	manual	string	100
PRVS_PRD1, 2 etc	Previous HSC Period	Benchmark period of origin of the area represented in the polygon. Recorded for present historic character levels and previous historic character	manual	string	50
PRVS_SRC1, 2 etc	Previous HSC Source	Sources used to identify previous historic character. Attribute values to record Supplier, Date, precise GIS file name. To include reference to the scale of original data used.	manual	string	250
PRVS_CNF1, 2 etc	Previous HSC Confidence	Degree of certainty/confidence of HSC interpretation of previous historic character.	manual	string	25
PRVS_NTS1, 2 etc	Previous HSC Notes	Further background information on history of the polygon. Expansion on information recorded at broad character and sub-character levels.	manual	string	250
PRVS_LINK1, 2 etc	Previous HSC Link	URL hyperlink to **Character Type** texts and multi-media	manual	string	250
CA1, CA2 etc	Character Area (1-∞)	Unique character area	manual	string	100
LCTN	Location	General location (eg. Offshore marine, inshore marine, estuary, coast etc)	manual	string	50
AREA	Shape_Area	Area in map units (usually metres square) covered by polygon.	automated	string	9.9
CELL_SZ	Cell/grid size	Size of grid used for marine zone (eg. 100mx100m, 500mx500m etc)	manual	numeric	5
CRT_DT	Creation Date	Date of dataset /polygon creation/completion	manual	string	10
CRTR	Creator	Name of the person/organisation who compiled the HSC	automated	string	250

Each attribute field is described in further detail in the national HSC Method Statement (Tapper 2010: paragraphs 3.2.5.1. to 3.2.5.20.), encouraging the application of a repeatable methodology.

Time depth is reflected in the character assessment through the differentiation between present HSC (reflected in Coastal and Conflated attributes and within each marine tier) and previous HSC within the attributes, and the recording of a benchmark period reflecting the origin of the activity represented for each of the tiers and the conflated character groups. All HSC polygons will be given a confidence rating as specified in the Method Statement (Tapper 2008 and 2010).

5.2.6 Development of Character Type Text Descriptions

Text based descriptions were developed for each Character Type using the structure proposed in the national HSC Method (Tapper 2008 and 2010) under the following headings:

- Introduction: defining/distinguishing attributes and principal locations
- Historical processes; components, features and variability
- Values and perceptions.
- Research, amenity and education
- Condition and forces for change
- Rarity and vulnerability
- Sources

The balance of information agreed during the *Demonstrating the Method* project was repeated for this project's area, as the 'Southern England region', using the National Perspective Text descriptions for England, and available Regional Perspective texts as a guide.

Draft National perspective Character Type texts were compiled in liaison with the other concurrent HSC projects to ensure these texts were developed with a nationally-consistent content. The National perspective Character Type texts were first drafted by the Hastings to Purbeck project team drawing on expressions in the Southern England region. The texts were then forwarded to the other project teams who added comment and information on Character Type expressions drawn from their own areas. The texts were then substantially revised and edited by English Heritage and re-issued to all the concurrent projects to provide consistent copy across them all for these texts.

Feedback was sought from English Heritage during the early stages of writing the regional text descriptions, with the delivery of some sample texts at the end of the trial phase of the project. Comments received from English Heritage at this stage allowed the level of detail and balance of information to be discussed and agreed before the main body of texts are generated.

Images were collected from across the Southern England region, ensuring that each Character Type was represented. The feature type text descriptions were structured in a compressed pdf format which enabled them to be hyperlinked directly to polygons within the GIS.

The national and regional perspective text descriptions for each Character Type are contained within **Section 3** of the project report

5.3 Stage 4: Applications Review

The Applications Review, outlined in the second section of this project report, is designed to identify and demonstrate some of the actual and potential capabilities of HSC and its application to a range of planning scenarios.

The review of HSC applications has been approached in the following two ways:

The first part of the application review considers the wider applications of HSC, looking at some areas of relevance for the approach in UK and EU contexts.

The second part of the application review uses exemplars to assess the roles that HSC can have in the context of heritage management and planning. Based on discussions with English Heritage, two case-studies were identified: 1) the Marine and Coastal

Access Act 2009, within the particular context of the southern England region; and 2) the C-Scope Dorset Coast Landscape and Seascape Character Assessment (http://www.dorsetforyou.com/index.jsp?articleid=389409). These two case studies provide an analysis of how HSC can inform these initiatives.

5.4 Stage 5: Project Products and Dissemination

The output of the project outlined in the Project Brief is described below, to include the products specific to the tender submitted by SeaZone

- Project Report
- Mapped GIS, Project Database and Linked Texts
- Archive

The Project Report is delivered in five CDs to English Heritage on completion of the project. Any additional copies requested will be available at an additional cost per copy in line with standard MA Ltd and SeaZone fees. The report has been divided into three sections. The first section documents the project's implementation, the second outlines the application review and case-studies, and the third contains printed versions of the Character Type texts.

Five copies of the GIS, associated database and linked character text descriptions are to be delivered alongside the agreed draft of the project report in a "ready to load" format.

The project archive, comprising the Project Brief, Project Design, Project Report, the GIS and associated structure and relevant correspondence will be delivered to the NMR.

The project's development was disseminated via the SeaZone and HWTMA/MA Ltd websites through the development of an HSC project page to document the project's progress. The webpage contained a hyperlink to the English Heritage HSC pages.

A flier was developed for distribution at appropriate events and for inclusion in invitations to the stakeholder seminar.

Further dissemination of the project was undertaken via HWTMA/MA Ltd's active involvement in fora such as the Solent Forum, SCOPAC and the Dorset Coast Forum.

The HSC GIS generated by this project covers many Character Types, Sub-types and their attributes, expressed across a large physical area. A series of images have been included below to illustrate the expression of Character Types at each marine level and in a conflated map. However, as for any GIS, the database can be queried on a multiplicity of combinations of the attributes and generate a range of mapping tailored to suit the needs of the enquirer. The mapping below cannot convey that flexibility or the use of the mapping in conjunction with the linked text descriptions produced by the project.

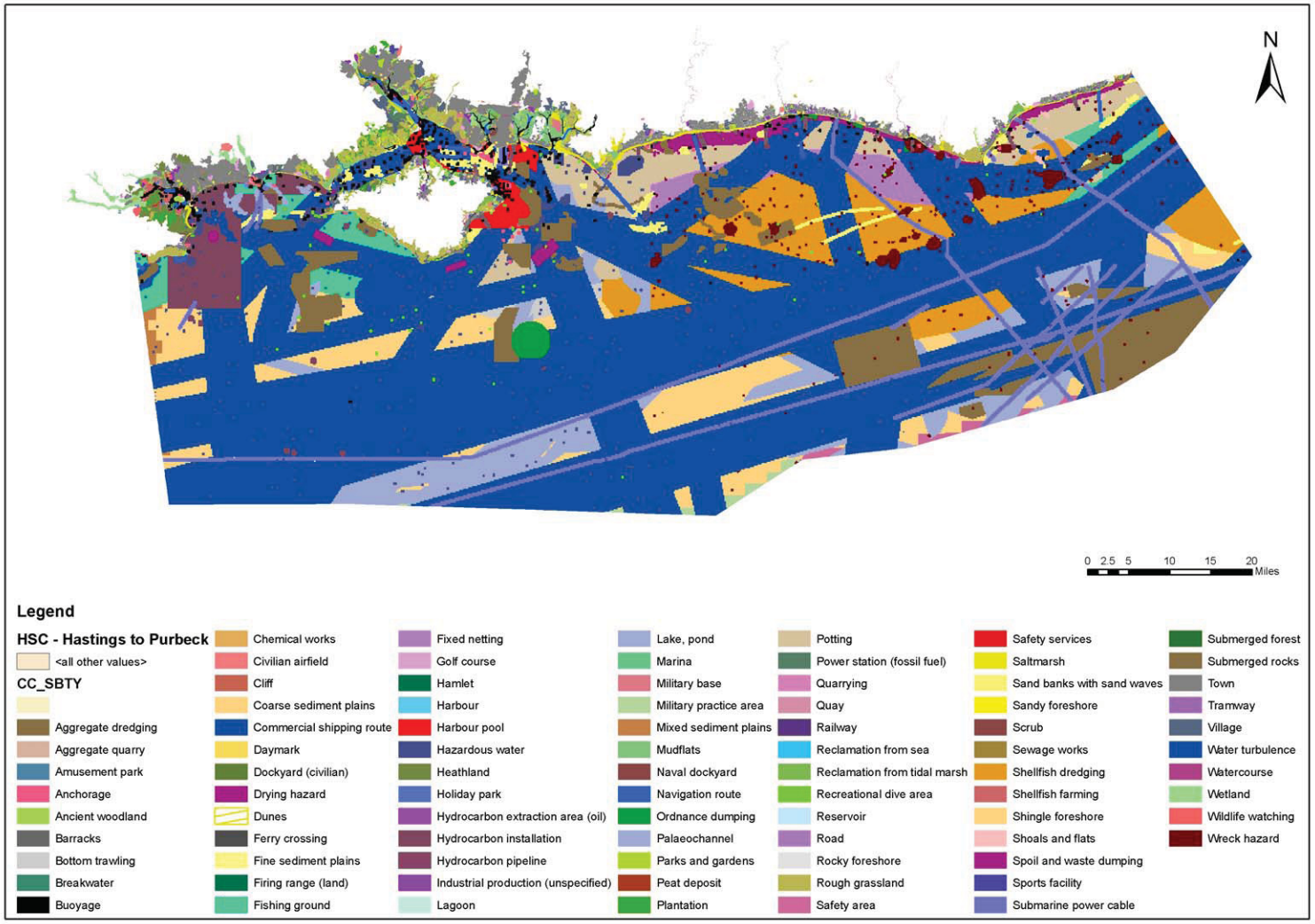

Figure 2: HSC showing Coastal and Conflated Sub-character Types

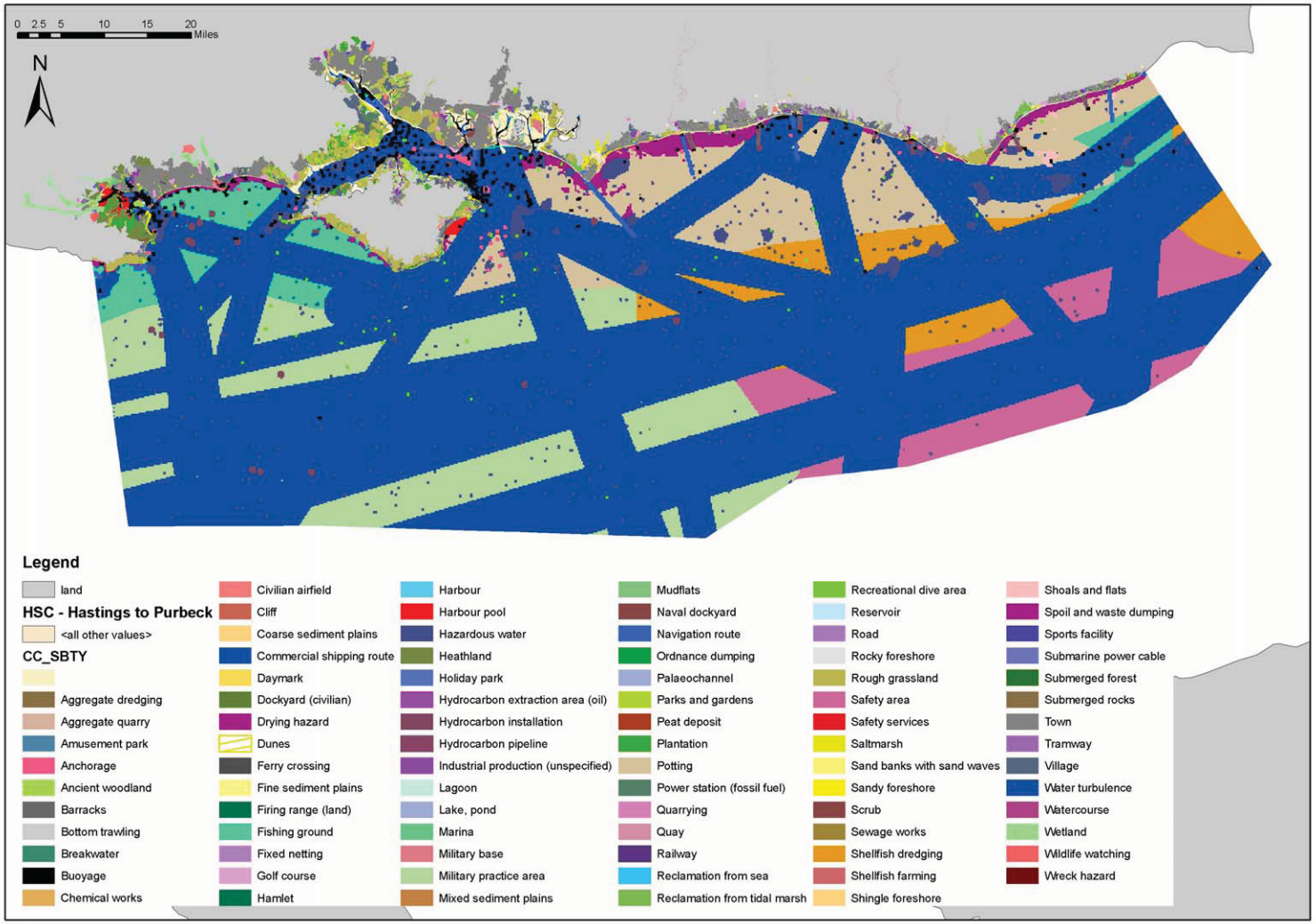

Figure 3: HSC showing Sub-character Types on the Sea Surface

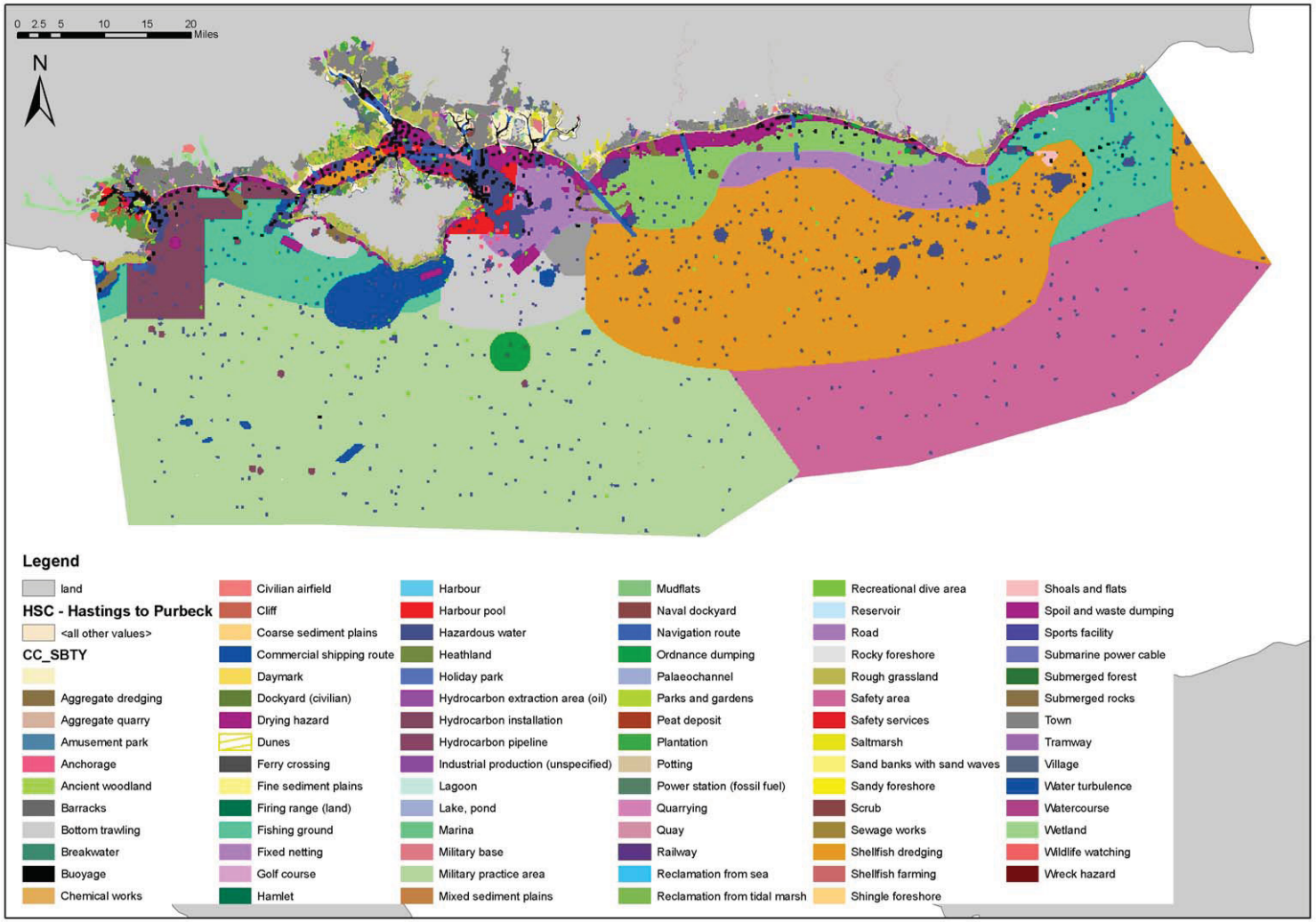

Figure 4: HSC showing Sub-character Types in the Water Column

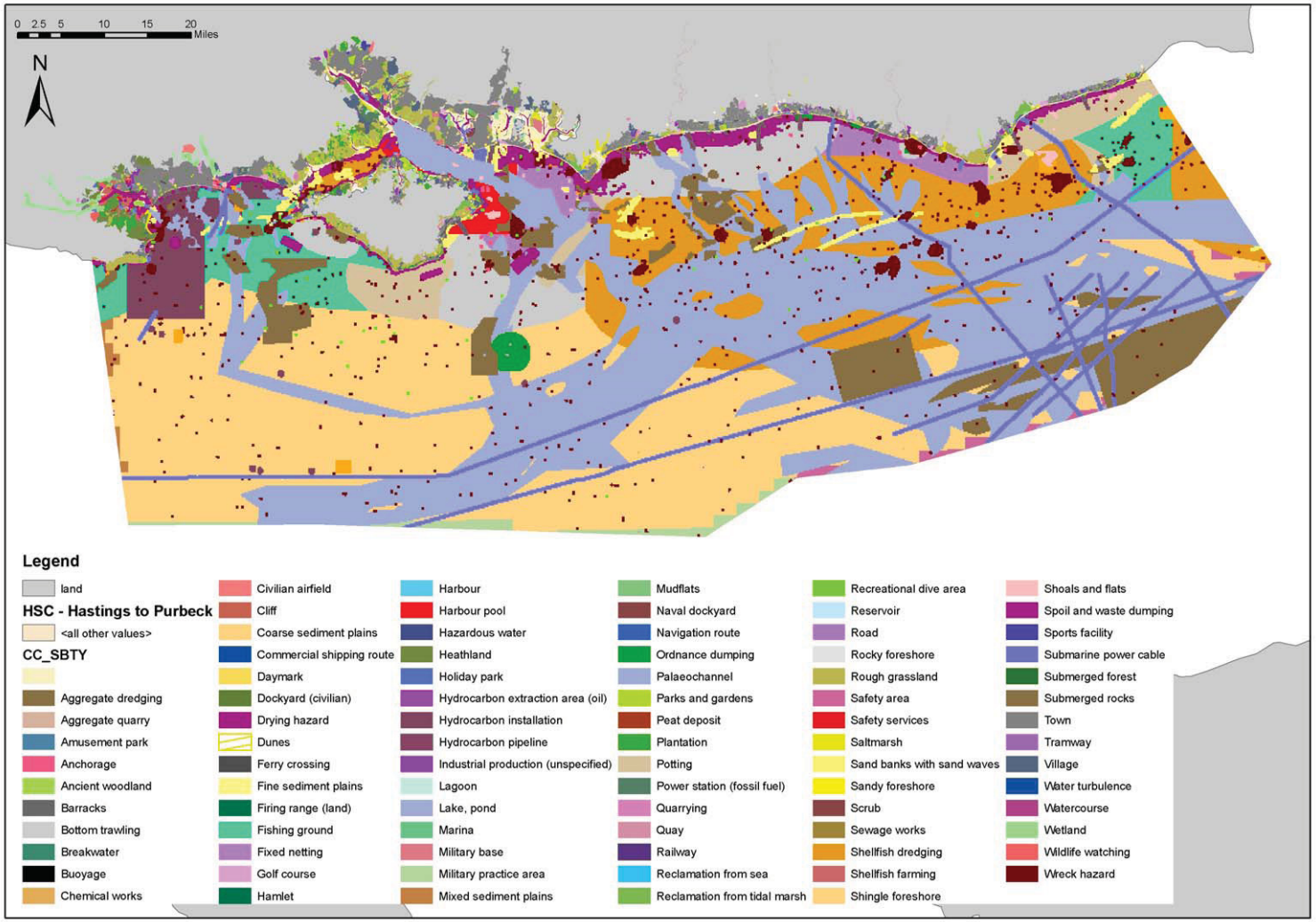

Figure 5: HSC showing Sub-character Types on the Sea Floor

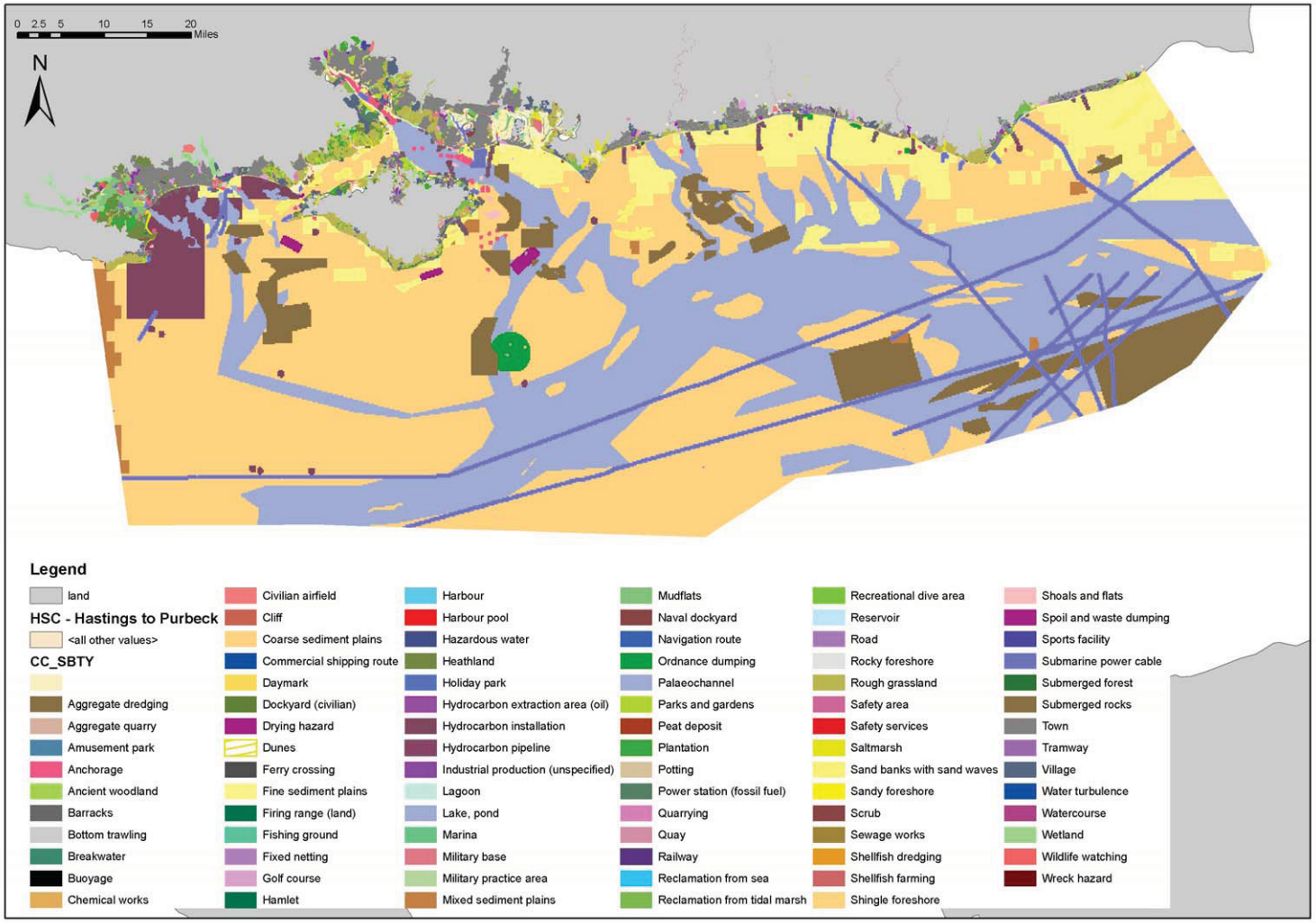

Figure 6: HSC showing Sub-character Types on the Sub-sea Floor

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7. ABBREVIATIONS

ADS – Archaeological Data Service

ALSF – Aggregate Levy Sustainability Fund

BGS – British Geological Survey

CRS – Co-ordinate Reference System

Defra – Department for the Environment, Food and Rural Affairs

EH – English Heritage

EU – European Union

HER – Historic Environment Record

HLC – Historic Landscape Characterisation

HWTMA – Hampshire & Wight Trust for Maritime Archaeology

HSC – Historic Seascape Characterisation

MHW – Mean High Water

MLW – Mean Low Water

OS – Ordnance Survey

OSGB36 – Ordnance Survey Great Britain 1936, the geographic datum of British National Grid

UKHO – United Kingdom Hydrographic Office

SEA – Strategic Environmental Assessment

SMR – Sites and Monuments Record

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