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Using secondary data to examine economic trends in a subset of sectors in the English marine economy: 2003–2011

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ABSTRACT

Concerns over the impact of economic activities on the marine resource have led to many national ocean policies and international agreements for sustainable development. To guide these policies, information on the physical attributes and processes of the marine system and its associated economic activities, such as fishing, maritime transport, shipbuilding, etc. must be accommodated within a single framework. However, economic data on the activities linked to the marine resource is often incomplete or non-existent. Recent literature has focused on developing national economic indicators for the marine sector. To date, these indicators have tended to reflect national level trends; overall output, employment, and household income associated with the marine sector. Recognising the importance of micro-level indicators that capture temporal trends in the marine sector, this paper uses data on a subset of marine sectors, namely fishing, aquaculture, processing, shipbuilding, maritime transport and construction provided in the Office of National Statistic's Business Structure Dataset. Dividing the trend data into two timeframes 2003–2007 and 2008–2011 provides an additional insight on the performance of the marine sector with the global economic recession as a backdrop. This paper found that whilst employment in the marine sector decreased in England since 2008, output from marine based products and services have increased. The paper further found that overall, whilst the subset of sectors representing the English marine sector in the BSD under-performed relative to other sectors during 2003–2007 (or the global boom years), the sector grew faster in the post global recession compared to other English industrial sectors.

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1. Introduction

As the global productivity of land resources reach the limits of economic and ecological exploitation, the value of the oceans as a resource for economic development has become more prominent [1]. Human activities in the world's oceans and coasts are at an unprecedented scale and expanding rapidly [2,3]. The oceans have become a focal point for new activities including wind and wave power, marine biotechnology, marine technology and other enterprises [1,4,5]. Marine management as a policy framework has always contained an element of concern about the type and level of economic activity associated with the use of ocean resources [6]. However, to date the information needs of policymakers and managers has focused on data about the marine resource itself rather than the economic environment in which it is used [6,7]. The increasing human pressure on marine resources, the failure to date of single-sector marine policies to achieve sustainable resource use [3] and the impetus on marine spatial planning [8] has meant that marine managers now recognise that economic data are indispensable to the management and conservation of the ocean resource [9,10].

In practice, this means that policymakers and planners involved in marine management require techniques capable of estimating the impact of the marine sector at the national, regional and local level [11,26]. Policy analyses conducted to support marine management have increasingly incorporated assessments of marine-related economic activity. These assessments can be divided into three strands [6,26]. The first strand consists of research on the economic importance of the marine resource to the economy and the need for management of this economic activity [4,5,12,13]. The second strand involves the development of a sustainability framework that incorporates economic, societal and environmental concepts of sustainability for marine management [5,14]. A common theme of this research is the need for adaptive, ecosystem-based approaches to sustainable development that will maintain the capacity of ecosystems to support goods and services valued by society [14]. The third strand focuses on coastal resilience and the maintenance of coastal economic activities in the face of economic [15,16] and climate change [6]. Economic studies have examined both the levels of

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economic activity at risk from coastal flooding [17] and the economic damages of storm events [18].

To date, these assessments have used national level, cross-sectional indicators of economic activity such as gross domestic product (output), gross value added (GVA), employment and income estimates associated with marine resource activity [6]. However, such analysis only provides a snapshot of the marine sector at one specific period in time. It fails to measure the performance of the sector across time and during periods of economic change. To create adaptive, holistic based approaches to sustainable marine development, policymakers and planners require temporally referenced data on marine activities. To provide such an analysis, consistent economic trend data are required for each sub-sector [6]. The benefit of using trend data is that actual long-term changes in economic activities related to the marine sector can be used to inform marine policy.

To examine the performance of the English marine economy across time this paper proposes the use of an annual enterprise-level dataset available through the Office of National Statistic's Virtual Microdata Laboratory. The Business Structure Dataset (BSD) contains data on a number of subsectors within the marine economy, [5] specifically fishing, aquaculture, processing, maritime transport, shipbuilding and construction. This analysis will focus on economic activity associated with this subset of the marine activities, specifically output and employment between 2003 and 2011. To gain a perspective on the performance of the marine sector in comparison to the overall economy and within the context of global economic recession, the data analysis is divided into two timeframes, 2003–2007 (pre-global economic recession, pre-recession) and 2008–2011 (post-global economic recession, post-recession). This analysis does not aim to examine the impact of the current global recession on the performance of the subset of marine sectors within the BSD. Instead this analysis examines the output and employment performance of these subsectors over an eight year period with a view to using this information to inform future marine management policies as a backdrop. This paper is structured as follows; Section 2 provides an overview of the data used in this paper, the Business Structure Dataset. Section 3 provides an analysis of the performance of the English marine sector between 2003 and 2011, and pre-recession (2003–2007) and post-recession (2008–2011). Section 4 places the finding of this paper within the context of current global trends and offers insights into how the English marine sector may develop in the future. Section 5 offers a discussion on how an economic analysis of the marine sector based on trend data can be used to develop sustainable economic and social policy for the marine resource as a whole. Section 6 offers concluding comments.

2. Data

2.1. Business Structure Dataset

The Interdepartmental Business Register (IDBR) is a comprehensive database of UK businesses, drawn from administrative data sources [19].The IDBR draws upon a number of administrative datasets including the Her Majesties Revenue and Customs (HMRC), Dunn and Bradstreet, Office of National Statistics surveys and Companies House. The use of the IDBR for research by a wider audience is restricted for two reasons. First, access is highly restricted due to the inclusion of highly confidential HMRC data. Second, it is difficult to perform historical analysis on the data. Whilst the register is updated at regular intervals a regular set of reference changes are not made. This makes it difficult to build a longitudinal picture of businesses over their lifecycle. To resolve these issues the Business Structure Dataset (BSD) is produced. The BSD is an annual snapshot the IDBR with the Virtual Microdata Laboratory hosted by the Office of National Statistics [19]. The BSD 'snapshot' is taken every March and includes data on enterprises and local units. Of interest to this paper is that the consistency of IDBR reference numbers throughout time enables the BSD to form a longitudinal dataset.

The number of variables found in the BSD is small relative to other data sources. However, the BSD has extensive coverage, since any organisation registered for VAT or PAYE is included [19]. Of interest to this paper is that the BSD contains enterprise level data by SIC code (2003 and 2007) on key economic indicators for the marine sector; including turnover or output, employment (including owners), employees (excluding owners) and number of enterprises. A spatial variable Government Office Region is also included in the BSD. Within the BSD, each enterprise is allocated a unique reference number and the BSD is designed to ensure that enterprise reference numbers consistently identify enterprises over time [20]. The Business Structure Dataset is now increasingly used for academic and government studies [19]. Examples include research on job creation and destruction in small firms [20], agglomeration spillovers across UK cities [21] and the organisational structure of Businesses in the UK [22]. Access to the BSD was gained via the Virtual Microdata Laboratory hosted by the Office of National Statistics.

Accessing the BSD via the Virtual Microdata Laboratory, eight years of economic data was used including from 2003 to 2011. Using the Standard Industrial Codes (SIC) for 2003 (years 2003–2006) and 2007 (years 2007–2011), 11 marine sectors were identified within the BSD. Enterprises that were coded as inactive within the BSD were excluded from the analysis. Table 1 provides

Table 1
Matched 2003 and 2007 SIC codes for the marine sector.

SIC 2003 code	SIC 2003 description	SIC 2007 code	SIC 2007 description
5010	Fishing	3110	Marine fishing
5020	Fish farming	3210	Marine aquaculture
15201	Freezing of fish	10200	Processing and preserving of fish, crustaceans and molluscs
15209	Other fish processing and preserving	10200	Processing and preserving of fish, crustaceans and molluscs
61101	Passenger sea and coastal water transport	50100	Sea and coastal passenger water transport
61102	Freight sea and coastal water transport	50200	Sea and coastal freight water transport
71221	Renting of passenger water transport equipment	77341	Renting and leasing of passenger water transport equipment
71229	Renting of other water transport equipment	77342	Renting and leasing of freight water transport equipment
35110	Building and repairing of ships	33150	Repair and maintenance of ships and boats
35110	Building and repairing of ships	30110	Building of ships and floating structures
35110	Building and repairing of ships	33200	Installation of industrial machinery and equipment
35120	Building and repairing of pleasure and sporting boats	33150	Repair and maintenance of ships and boats
35120	Building and repairing of pleasure and sporting boats	30120	Building of pleasure and sporting boats
15201	Freezing of fish	10200	Processing and preserving of fish, crustaceans and molluscs
15209	Other fish processing and preserving	10200	Processing and preserving of fish, crustaceans and molluscs
45240	Construction of water projects	42910	Construction of water projects

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