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A Socio-Economic Profile of Coastal Regions in Ireland

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Stephen Hynes and Niall Farrelly

Abstract

In order to develop a policy framework and guidelines for improving a national approach to the management of Irish coastal regions and associated resources one first needs to be able to define what is meant by 'a coastal region' in an Irish context and secondly to know how the socio-economic characteristics of Irish coastal populations differ from the national perspective. This paper contains a range of official socio-economic statistics, from a range of existing statistical domains, compiled for the first time in terms of Irish coastal regions. These coastal regions are defined at a number of alternative levels of spatial aggregation. The compilation of such data is also important when one considers the recommendations of the European Council and Parliament concerning the implementation of Integrated Coastal Zone Management and the requirements of policies such as Integrated Maritime Policy for the European Union and the EU Marine Framework Strategy Directive.

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Introduction

"Carry your well-planed oar until you come to a race of people who know nothing of the sea, whose food is never seasoned with salt, strangers all to ships with their crimson prows and long slim oars, wings that make ships fly. And here is your sign—unmistakable, clear, so clear you cannot miss it:
When another traveller falls in with you and calls that weight across your shoulder a fan to winnow grain, then plant your bladed, balanced oar in the earth and sacrifice fine beasts to the lord god of the sea, Poseidon —"

(Odyssey 11: 138-49, 800BC)

As with many other European member states, the coastal regions of Ireland have been subject to increasing pressures from the country's rapid economic development in recent years. This development has had consequential economic and environmental implications for present and future generations of Irish citizens and for Irish coastal communities in particular. In order to develop a policy framework and guidelines for improving a national approach to the management of these coastal regions and associated resources one first needs to be able to define what is meant by 'a coastal region' in an Irish context and secondly be able to quantify how the socio-economic characteristics of Irish coastal populations and regions differ from a national perspective. This paper contains a range of official socio-economic statistics, from a range of existing statistical domains, compiled for the first time in terms of Irish coastal regions. These coastal regions are defined at a number of alternative levels of spatial aggregation. The compilation of such data is also important when one considers the recommendations of the European Council and Parliament concerning the implementation of Integrated Coastal Zone Management and the requirements of policies such as Integrated Maritime Policy (IMP) for the European Union and the EU Marine Framework Strategy Directive.

In December 2007 the European Council endorsed the Integrated EU Maritime Policy, which brings together the different policy areas relating to maritime activities and the coastal environment. The Integrated EU Maritime Policy emphases the fact that an integrated governance framework for maritime affairs is required where horizontal planning tools cut across sea-related sectoral policies and joined up policy making. In particular, the following three tools have been highlighted in the policy document as requiring particular attention: (1) maritime surveillance which is critical for the safe

and secure use of marine space; (2) maritime spatial planning which is a key planning tool for sustainable decision making and (3) a comprehensive and accessible source of data and information.

The third tool above is of particular relevance to the research presented in this paper. The availability of wide range of easily accessible data on natural and human-activity in coastal regions is the basis for strategic decision-making on maritime policy. In an earlier Green Paper on maritime policy (COM(2006) 275 final), the European Commission proposed a new European Marine Observation and Data Network (EMODNET) that would improve the availability of high quality coastal and marine related data. Given the vast quantity of data collected and stored all over Europe for a wide variety of purposes, the establishment of an appropriate coastal specific data and information infrastructure was seen to be of utmost importance. Given the positive response of stakeholders to the Green paper recommendations, the European Council took steps in the form of the 2007 Integrated EU Maritime Policy towards the establishment of EMODNET in order to improve the availability of high quality data.

Also, since 1995, concern about the state of Europe's coastline has led to a number of EU initiatives, which build on the concept of integrated coastal zone management (ICZM). ICZM attempts to balance the needs of development with protection of the very resources that sustain coastal economies. The concept also takes into account the public's concern about the deteriorating environmental, socio-economic and cultural state of the European coastline. Recommendation of the European Parliament and the Council concerning the implementation of Integrated Coastal Zone Management in Europe (2002/413/EC) requires information on existing coastal population and socio-economic trends and on the environmental effects of policies and financial instruments directed towards coastal management. This, obviously, requires the collection of related coastal socio-economic data. Finally it should also be noted that data infrastructure that delivers better access to coastal data will allow Member States to better meet their obligations under the EU Marine Framework Strategy Directive. Indeed, this Directive requires, as part of the ‘Initial Assessment’, an economic and social analysis of EU Member States' coastal regions and marine waters.

Work on the compilation of relevant coastal and marine socio-economic related data across Europe has already begun. For example, an action group on "improving sectoral (ocean and coastal) socioeconomic data at regional and EU-level" was created by the European Unions main statistics gathering organisation, Eurostat, in 2008. The purpose of this action group was to bring together outside stakeholders and relevant Commission services to work on developing the required range and quality of socio-economic data at regional and EU-level (Eurostat 2009). Eurostat envisage that an area of its database could be dedicated to the presentation of coastal socio-economic data, compiled from a range of its already existing statistical portals, at the NUTS 3 level of aggregation for all relevant EU member states. This paper supplements this work by Eurostat by providing a discussion of the relevant literature involved in the defining and characterisation of the 'Coastal Region' and 'Coastal Economy', the theoretical background of measures such as gross domestic product (GDP) and gross value added (GVA), and provides details on sources, assumptions, and limitations of the data available in Ireland that allows for the socio-economic characterisation of Irish Coastal regions.

Defining Coastal Regions

The coastal region or zone can be defined as a meeting point of land and sea. The Commission on Marine Science Engineering and Resources (1969) defined the coastal zone as "*a region of transition between the land and the sea. Such activities as urban development, pollution of streams, and maintenance of recreation areas may affect the coastal area …… a coastal zone management system must, therefore, grapple with a great diversity of related and other conflicting activities*". This definition is not particularly concrete in terms of the boundaries of the coastal zone. Indeed, as can be seen from the quote at the start of this paper humans have been trying for a long time to accurately define what the boundaries of the coastal region are. In the passage from Homer's Odyssey, reproduced above, Odysseus is instructed to go inland with an oar until he meets someone who does not recognise what the oar is. At this point Odysseus will have reached the inland boundary of his island home's coastal zone. A definition of the inland boundary of a country's coastal region continues to be a hard to measure feature of the land-sea interface to this day.

There is relatively little controversy concerning the definition of the off-shore boundary of a coastal zone. In most countries the seaward limit is written into law as the maximum reach of that country's jurisdiction. In Ireland's case this might be the territorial sea limit of 12 nautical miles or the 200 nautical mile exclusive fishery limit or perhaps the potential outer continental shelf limit of 634 nautical miles. The definition of the inland boundary of a coastal region however can range from those that include any area with a maritime climate no matter what distance inland, or those that that include entire watersheds to those that simply include the immediate strip of shoreline adjacent to the coast. As highlighted by Lamacchia and Bartlett (2003) and Davis (1992) and adopted for use on coastal boundaries within the EU-Demonstration Programme on Integrated Coastal Zone Management 1997-1999 (Humphrey and Burbridge 1999) coastal boundary criteria can be organized in to 3 main categories: (i) geometrical-linear criteria, (ii) legal-administrative criteria (iii) and ecological-natural system criteria. Utilitarian and perception based boundary definitions could also be added to this list.

As Penning-Rowsell (1993) points out, the range of definitions available for inland coastal zone boundaries raises difficulties between those who prefer to use an ecological-natural system based boundary to those who prefer a legal/administrative/economic boundary consistent with government jurisdictions. Often there may not be much of a relationship between these distinctions. Although it has been argued that coastal zone management should be based on a broad ecosystem approach (Hilderbrand 1989; King 2003 and Green 2009) the analyst may need to go further inland in defining the coastal region in order to incorporate all the economic and social impacts of coastal activities on inland areas. The OECD recommend that the boundaries of a coastal region should be defined depending on the purpose at hand, i.e. the inland boundary should extend as far inland as necessary to achieve the objectives of coastal management (OECD 1993).

As previously mentioned there are numerous definitions of the term coastal region or zone in the literature that one might use in attempting to examine the socio-economic characteristics of the coastal regions of Ireland. We could for example take the maritime climate approach. The Marine West Coast climate is found on the west coast of mid-latitude continents. Its geographic location places it in the path of westerly

winds from the ocean that bring cloudy skies, much precipitation, and mild temperatures (Scott, 1996). The distribution of the climate is greatly influenced by the orientation of mountain systems in both North America and Europe. A significant difference in the climate situations at Vancouver and Galway, both Marine West Coast climates, arises from location, local topography, and ocean current influence (Christopherson 2005 and IPCC 2007). If we were to include the areas of Ireland with this maritime climate in our definition of coastal region we would have to include the entire country. A similar result would be had if we used the entire watershed approach to defining coastal regions. Once again the whole of Ireland would be included in the area of land that water flows across as it moves toward the Irish coasts shoreline.

An alternative definition of a coastal region that we might use is that of Eurostat. Eurostat defines EU coastal regions as standard statistical regions (NUTS level 3[1]), which have at least half of their population within 50 km of the coast (Eurostat 2009). As can be seen from figure 1 this includes most of the area of Ireland except for four counties in the center. Although someone who has lived all their life in Cavan town or in counties Roscommon or Carlow may recognise what an oar is, it is doubtful they would consider themselves living in a coastal region. We could also employ a perception based coastal definition where the inland coastal boundaries is based on the visual distance from the sea or some historically perceived boundaries based on historical charts or a Utilitarian based definition which is perhaps based on the distance workers along the sea front commute to work. Both of these definitions are difficult to measure. Also, these latter two definitions do not facilitate the achievement of our objective which is to collect useful statistics on coastal regions for use by policymakers, in accessible pre-existing data portals.

[1] The Nomenclature of Territorial Units for Statistics (NUTS) was established by Eurostat more than 30 years ago in order to provide a single uniform breakdown of territorial units for the production of regional statistics for the European Union.

- Figure 1 here

An approach more suited to our needs of examining the population and market activity of Ireland's coastal regions is the approach adopted by the American based National Ocean Economics Program (NOEP). In this case the coastal region definition relies on a spatial aggregation approach extending inland from the shorelines of the ocean. The definitions of alternative coastal levels of spatial coastal aggregation are based on zip code and county boundaries (NOEP 2007). Colgan (2007), in a review of the NOEP framework, outlined a number of categories, starting with the shore-line and proceeding in an inland direction. The area nearest the shore is defined by the NOEP as shore-adjacent zip codes (the "near shore") while "Coastal counties" are counties defined by the U.S. Geological Survey as within estuarine drainage areas. The NOEP framework also subdivides watershed counties into coastal zone counties (those in which state coastal zone management programs are functional) and upland counties. It further divides coastal zone counties into shore adjacent and non-shore adjacent counties.

The NOEP framework also distinguishes between the coastal economy and the ocean economy. The Ocean Economy is defined as the economic activity, which indirectly or directly uses the ocean as an input. The Coastal Economy is defined as all activity, which takes place in the coastal areas and includes all economic activity in the coastal region; the sum of employment, wages, and output in the region. In this paper we are only concerned with the coastal economy and the socio-economic characteristics of Ireland's coastal regions. The definition of Ireland ocean economy is something that has previously being attempted by Shields et al. (2005). The ocean economy can be considered a sub section of the coastal economy. A number of other international studies have also previously focused on the economy of various regions as influenced by the oceans. A number of these studies have been done at the sub-county or state level (Moller and Fitz 1994 and Kildow et al. 2005) while others have been done at the multi-state and national level (Colgan and Plumstead 1993; Statistics New Zealand 2006; and IFERMER 2007). Studies on the socio-economic activities in

larger marine ecosystems and international comparisons have also been undertaken (Mandale et al. 2000; Goldsmith 2005 and Hoagland and Jin 2006).

Finally it should be noted that the inland boundary of a country's coastal region or economy could simply be confined to some arbitrary distance from the coast. For example, in a major report by the European Environment Agency (EEA 2006) on the changing face of Europe's Coastal Regions and also in the coastal profiling work of Gallego (2006) and Carreau and Gallego (2007), 10 kilometres is taken as the inland boundary of the coastal zone. However, as the EEA report points out, depending on the distance used to classify a coastal zones extent inland, estimates of coastal population and economy statistics may differ substantially. Also, any statistics given will only be estimated (rather than actual) based on national or regional statistics as no statistics agency in the world collects data broken down using a distance metric. Regional specific socio-economic statistics are generally always collected based on administratively defined jurisdictions.

In the next section we define a number of definitions for Irish Coastal regions following the tiered spatial approach of the NOAP framework. The next section also reviews the data available at each level of spatial analysis. Section 4 then presents a socioeconomic profile of Ireland's coastal regions and estimates the value of economic activity using 2 alternative methodologies for each of the coastal regional tiers employed in the analysis. Finally, section 5 discusses future work in terms of defining the ocean rather than the coastal economy in Ireland and the implications of using the alternative spatial scales in terms of strategic decision-making on coastal and maritime policy.

Defining Irelands Coastal Regions: Methodology and Data

In this paper we are concerned with defining the Irish coastal region and its associated economic activity in such a manner that coastal socio-economic data may be compiled from a range of already existing statistical portals available at a national and European level. This would suggest that a number of the possible definitions of coastal regions discussed in the previous section will not be of use given our objective. In particular the 'distance' approach does not lend itself to the extraction of statistics from existing

data sources. Although the Maritime climate and Watershed approaches facilitate the compilation of data for the coastal region of Ireland it does so because these definitions of a coastal region include the entire country. This means that national statistics routinely collected by such agencies as the Central Statistic Office on the economy and the population could be simply used. Once again however this is too broad a definition to be of use in integrated coastal zone management or for use in effective decision-making on coastal and maritime policy.

Therefore, following on from the discussion in the last section and the spatial approach of the NOAP framework, the definition of Ireland's Coastal Region and Coastal Economy is drawn up on the basis of a tiered approach of geography extending inland from the shorelines of the oceans and seas surrounding the Republic of Ireland. As shown in Figure 2, the definitions of alternative tiers are based on electoral districts, county boundaries and EU NUTS III regions. The following categories are used starting with the shore-line and proceeding in an inland direction:

Shoreline Electoral Districts: establishments or population located in an electoral district (ED) that is immediately adjacent to an ocean or sea, included estuaries and bays. Of the 3400 EDs in the country, 628 are Shoreline Electoral Districts

Coastal County: establishments or population located in a county that has a shoreline of any length adjacent to an ocean or sea, included estuaries and bays. 15 of the 26 counties in the Republic of Ireland are Coastal Counties.

European NUTS III Coastal Region: a standard statistical regions (EU NUTS level 3), where at least half of the population is within 50 km of the shoreline. This is the Eurostat definition of a coastal region and in the Irish case would include 7 of the 8 NUTS 3 regions in Ireland, the Border, the West, Dublin, the Mid-East, the Mid-West, the South East and the South West. Only the four counties of the Midlands NUT 3 region are excluded from this definition.

- **Figure 2 here**

Using a Geographical Information System (GIS), Electoral Districts (EDs) boarding the sea were extracted from a shape file containing the complete 3440 EDS in the country. Although one can simply select EDs touching the coastline manually in a GIS software package it would require a great deal of time and effort to do so as there are 630 of them. Therefore this was done by using and ERSI grid file in the software package ArcMap that contained a boundary map of Ireland with associated information on the distance (in kilometres) to the coast of every grid referenced pixel within the map. A boundary map of ED was then overlaid on top of this grid file. Using this joint GIS database EDs were then selected that were in a 10km distance of the shoreline boundary of the Republic of Ireland but which were not on the boundary with Northern Ireland.

- Figure 3 here

Next this selection was manually assessed and any ED found in the selection within the 10 km distance but with no sea border was removed. Also the 2 EDs boarding Northern Ireland but still on the coast were added back in to complete the selection of Shoreline Electoral Districts. The extraction of the 15 coastal counties and the 7 NUTS 3 regions that define the more aggregated coastal tiers was a more straight forward process. These were simply selected manually from the relevant county GIS layers based on the fact that they bordered the seas around Ireland. Figure 3 displays what each of the coastal tiers look like in a GIS framework. The bottom green layer represents the NUTS 3 coastal region and is partially covered by the Coastal County layer (the cream layer) which in turn is partially covered by the top Shoreline ED layer (the blue layer).

The definitions for coastal regions were defined as such because a lot of data is collected in Ireland based on these different administrative and political jurisdictions. Table 1 displays a summary of the socio-economic data that is available in existing data portals in Ireland that can be extracted at the different levels of spatial aggregation. Much of this data is collected by the Irish Central Statistics Office and published on an annual basis in its numerous statistical releases. The Census of Population and the Census of Agriculture are only collected by the CSO on a 5 and 10 year basis respectively but provide information at all levels of spatial aggregation

from national down to ED. This data is freely available on the CSO website (www.cso.ie).

As outlined in table 1, the Census of Population 2006 provides data on population, employment, principle economic status, occupation and housing growth. The objective of the Census of Agriculture is to identify every operational farm in the country and collect data on agricultural activities undertaken on them (CSO 2000). The scope of the agricultural census in 2000, the last time it was conducted, was all farms, where the agricultural area used for farming was at least 1 hectare. The census of agriculture classifies farms by physical size, economic size, economic type and geographical location. Extracting this data from both censuses, for the coastal areas of Ireland, is critical to understanding the overall socio-economic dimensions of the coastal and ocean areas and how, in terms of agricultural activity, the local environmental and topological conditions along the coast lead to a different agricultural profile. Since the Census of Population and the Census of Agriculture data is presented as reported by the CSO, the methodological issues involved in collecting this data are the same as those of all census data and are not elaborated upon here but the interested reader is advised to read CSO (2006).

- Table 1 here

Other datasets that allow for the possible extraction of coastal statistics down to the ED level include the Failte Ireland's tourism related data, An Post Geo Directory and the National Farm Survey (NFS). The An Post Geo Directory is the complete database of buildings in the Republic of Ireland. From it, one can extract, for example, information on the number of units of accommodation in the coastal regions. The NFS is collected as part of the Farm Accountancy Data Network of the European Union (FADN). In line with FADN (FADN 2005), the main objectives of the NFS is to determine the financial situation on Irish farms by measuring the level of gross output, costs, income, investment and indebtedness across the spectrum of farming systems and sizes (Connelly et al. 2006). This data can be aggregated to the national and NUTS 3 level based on national and regional weights provided by the CSO. Although the NFS is not representative at the county or ED level, the Teagasc spatial microsimulation model, SMILE, which statistically matches the NFS to the Census of

Agriculture can provide estimated figures at the county and ED level for these same variables (Hynes et al., 2009).

In terms of household income statistics and regional GDP figures the data available at the alternative coastal area definitions is limited. Regional estimates of Gross Domestic Product at market prices and Gross Value Added (GVA) at basic and factor prices (by sector and region) can only be extracted from CSO releases for the highest aggregated coastal tier - EU Coast (NUT3). Information on total and disposable household incomes, wages and salaries, social benefits and other transfers, rent of dwellings and net interest and dividends of households can be extracted from CSO data portals for the coastal county level of spatial aggregation but even then come with the warning that "the county estimates should be interpreted with caution because the underlying data are not always sufficiently robust. They should be regarded as indicative of relative levels rather than as accurate absolute figures" (CSO 2009).

Finally, an affluence index has been developed by Haase and Pratschke (2008), which assigns a score to EDs in Ireland in relation to their relative level of deprivation. The Haase and Pratschke Index uses three dimensions of affluence/disadvantage to comprise their index. These are 'Demographic Profile', 'Social Class Composition' and 'Labour Market Situation', each of which uses several census based indicators such as age, educational level attained, skill or social class of the head of the household, the average number of persons per room, and male and female unemployment rates and others, from which an Index Score is derived. A full description of the Index and how it is constructed is available on www.pobal.ie. The Haase and Pratschke provide both an Absolute and a Relative Index Score. In order to remove national trends from the index scores and to highlight differences in their relative values, the Relative Index Score has been rescaled by the authors to have a mean of zero and standard deviation of ten at each census date. The standard deviation is set to ten for each wave so that the Relative Index Scores provides a standardised measurement of relative affluence or deprivation in a given area at a specific point in time. Therefore, the relative index for 2006 shows the position of any given ED relative to all other EDs, or any given county to all other counties in that year. This index is freely available to download from the above website and is used

here to examine how coastal communities compare to the national average in terms of their level of social, economic and education attainment deprivation.

Socio-Economic Characterisation of Coastal Regions in Ireland

The length of the Irish coastline is estimated to be approximately 7,700km. In comparison, the length of the coastline for the entire 22 EU Member States with a sea border is estimated to be 184,659 km. The EU coastal regions are occupied by 199 million citizens who account for 43% of the total population of the EU and equates to an average population density of 100 inhabitants per km². The population density (inhabitants per km²) is highest on the islands of Malta, followed by Belgium and the Netherlands. The lowest population densities are to be found in Estonia, Sweden and Finland.

- Table 2 here

The population density in coastal regions of Ireland in comparison is relatively low. This density changes however depending on what definition of the Irish coast one uses. At the EU coast (NUTS3) level of aggregation the population density is 59 inhabitants per km². At the coastal county definition it is 73 inhabitants per km² while at the shoreline ED level it is 79 inhabitants per km².As one might expend the density of the population increases the more confined the regional definition is to the coastline. Also, as can be see from table 2, the EU coastal area in Ireland, the coastal counties and the shoreline EDs account for 94, 80 and 25 per cent of the nation population respectively.

- Table 3 here

Table 3 displays some socio-economic characteristics of Irish coastal communities at the alternative spatial scale coastal definitions. All of the information in table 3 is based on the Census of Population 2006. It is interesting to note that the unemployment rates for males and females does not vary dramatically either across coastal definition or from the nation average for total EDs, counties or NUTS 3 region (national averages in brackets). A similar story can be told in terms of the percentage

of people with primary education levels only, third level education and in the occupational categories of higher and lower professionals and semi and unskilled manual workers. The unemployment rates displayed in table 3 are based on the individuals own assessment of his or her principle economic status. This self assessed rate is higher than the annual unemployment rates calculated by the CSO which are based on the Labour Force Survey (LFS) or the unemployment rates which are based on the number of people who have signed up as unemployed on the Live Register. The LFS rate of unemployment for 2006 for males and females was approximately 4.2 and 4.5 per cent respectively.

- Figure 4 here

While none of the characteristics reviewed in table 3 vary by any significant degree on average either across coastal definitions or away from the national averages, they do vary in terms of the spread of the distribution of each variable across the regions within the alternative spatial scales. This becomes very evident if we display some of the variables from table 3 on maps using GIS techniques. Figure 4 shows male and female unemployment rates at the Shoreline ED and Coastal County spatial definitions. On average the rates are similar but if we look at the range there are considerable differences. At the coastal county level, male unemployment rates range from 6% in Co. Meath to 14% in Co. Donegal while at the Shoreline ED level the range is between a massive 56% for some of the island EDs off Donegal to 1% in a small number of EDs along the coast. The range at the NUTS 3 level is much smaller with only a fluctuation of 4% between the 7 NUTS 3 coastal regions in Ireland. A very similar pattern is evident for females with a variance of 0.6, 1 and 22 at the NUTS 3, Coastal County and shoreline ED definitions respectively.

- Figure 5. here

This variation within the coastal region definitions is also very evident when we take a closer look at the Haase & Pratschke Relative Affluence Indicators reported in table 3. The relative index score represent the position of a region relative to all other

regions at that spatial scale in 2006 in terms of demographic profile; social class composition; and labour market situation. While it would appear that on average there is little difference in the Affluence scores across the alternative definitions, once again it is very evident from Figure 5 that there is considerable variation within each coastal definition and this variation increases the narrower the definition of coastal region. At the coastal county level, counties Donegal, Mayo and Leitrim display the lowest affluence levels while Dublin and its neighbouring counties of Meath and Wicklow display the highest affluence levels. A similar pattern is seen at the EU coastal definition with the BMW region having the lowest relative affluence score and Dublin and the Mid-East the highest. Once again, there is less deviation in the scores however between the NUTS 3 coastal regions compared to between the coastal counties.

At the shoreline ED Level, areas of relative deprivation are to be found, once again in the Border and West regions, with high levels of disadvantage visible in EDs to the west of Mayo and in parts of Donegal. Outside these two counties, the deprivation in shoreline EDs is more dispersed in nature than at the higher aggregated spatial scales, but nevertheless affects EDs in Louth, Galway, and the EDs straddling the Kerry-Limerick border. Galway is an interesting example of where shore EDs display a much larger spread in relative affluence scores compared to higher coastal tier definitions and was something that was reflected upon in the in the 2008 Galway Socio-Economic Profile, produced by Galway County Council (2008) and also discussed in MackenWalsh (2009). In Galway, the shoreline EDs have relative affluence scores that range from -36 in the west of the county, which indicated EDs that are extremely disadvantaged, to approximately 20 in what would be considered affluent EDs in and surrounding Galway city. This pattern of rural coastal EDs having a lower relative affluence score compared to their urban counterparts is also a phenomena that, in general, holds true across all shoreline EDs. Indeed, the dominance or not of cities and urban areas in the shoreline EDs and at the county level is driving to a large extent the within variable variance of the socio-economic characteristics.

The information available on the economic activity at the alternative coastal definitions is less readily available than the census based statistics reviewed above. Information on household earnings is available at the Coastal EU tier and Coastal

County tier but not at the Shoreline ED level. Data on Gross Domestic Product at basic, factor and market prices is available only at the Coastal EU (NUTS 3) regional level. However, one can still produce estimates of coastal GDP at the lower spatial scales based on the population size at the alternative tiers and the GDP per head figures for the NUTS 3 region that the coastal county or Shoreline ED is based in. Table 4 below presents some summary statistics for household income at the county level.

- Table 4 here

At the level of the Coastal EU regions, the Dublin region had the highest disposable income per person (€23,226), being 12.3% above the State average in 2006. According to CSO statistics the comparable figure in 2000 was 16.4% (CSO, 2006). The disposable income per person of the Boarder region was the lowest of all the coastal NUTS 3 regions at 9.1% below the State average in 2006 (€18,848). Of the eight NUTS 3 areas in the country only the Midlands region was marginally worse being 9.4% below the State average. At the coastal county level, the coastal counties with an average disposable income per person equal or in excess of the state average were Dublin, Limerick, Wicklow and Meath. At the lower end of the scale there were 5 coastal counties with disposable incomes per person below 90% of the State average (Donegal, Leitrim, Mayo, Wexford and Kerry). Only Donegal recorded disposable incomes per person below 80% of the State average. Table 4 also presents statistics on total household income and the value of compensation for employee and self employed persons at the coastal county level.

- Table 5 here

Table 5 above displays the available statistics for coastal regions on Gross Domestic Product (GDP) and Gross Value Added (GVA) at basic prices. As stated by the CSO (2006), GDP measure the value of the goods and services (or part thereof) which is produced within a region or country. GDP valued at market prices includes taxes charged and excludes the value of subsidies provided. GVA at basic prices on the other hand excludes product taxes and includes product subsidies. It measures the value of goods and services produced in a country or region less the cost of the

materials and services used in their production brought in from outside the region. This is an important consideration because the profits of multinational companies are included in the calculation of GDP. Much of this profit is accrued to non-residents and these companies often use a large proportion of materials and services in their production processes brought in from outside the country which add nothing to the level of National Income.

The GDP (valued at market prices) of the Coastal EU (NUTS 3) regional economy in Ireland (€170,234 million) accounts for 96% of all production activity in the state. At this NUTS3 coastal area level, the Dublin region had the highest GVA per person (basic prices) in 2006 at 40.9% above the State average (€51,588). Once again the Border region accounts for the lowest GVA per person in any of the coastal EU regions of Ireland being 27.5% below the State average (€26,545). It is interesting to note from table 5 however that of all the coastal regions, the Border area has the third highest value in terms of GVA (at Basic Prices) from the Agriculture, Forestry and Fishing Sector. They significantly lag behind overall in economic terms however because of the fact that the bulk of GVA comes from the Market and Non Market Services sector activity and to a lesser extent the Manufacturing, Building and Construction sectors. As can be seen from table 5 and figure 6, of all coastal EU regions the Border region has the second lowest share of GVA in these sectors, only the Mid West has a lower combined share in these sectors (although the midlands region has the lowest GVA per person and on aggregate across all sectors).

- Figure 6 here

Although not readily available from any data portal, we can still produce estimates of the value of the coastal economy at the lower spatial scales. Based on the population size at the alternative tiers and the GDP per head figures for the NUTS 3 region that the coastal county or Shoreline ED is based in, this author estimates that the value of the Coastal County economy is approximately €151,317 million while the equivalent estimate of value of the Shoreline ED economy is €44,394 million. Both the coastal County and Shoreline ED regions show economic contributions that are larger relative to their land area. While the Coastal Counties make up 69% of land area, it accounts for an estimated 85% of the economic activity in the state. The Shoreline EDs takes

up only 20% of land area and has economic activity accounting for approximately 25% of the total value of production in the State.

The value of the coastal county economy could also be estimated based on the share of the value added in production by the labour located in the coastal counties. For example, in order to estimate a coastal county's share of the GDP valued at market prices of the Coastal EU regional economy, the proportion of the GDP for a given county could be also be calculated based on the proportion of total NUTS 3 wages and salaries paid in that county. Using the proportion of total NUTS 3 wages and salaries paid in a coastal county should give a truer reflection of the economic activity at the coastal county level for 2 main reasons; firstly, wages and salaries measures the value of employment by place of work, not by place of residence and secondly, unlike GDP figures which is only available at the coastal NUTS 3 level, data on employment wages and salaries is available at the county level from the CSO. Since wages and salaries accounted for 58% of GDP at factor cost in Ireland in 2006 (European Commission, 2007), this method is seen as providing a reasonable approximation of coastal counties' contribution to the relevant NUT3 GDP. Based on this methodology we calculate the value of the coastal county economy to be €149,371 million which is only 2% lower that the estimate derived using per capita GDP. This implies that at the coastal county level the residence of the coastal population is highly correlated with the place of work, or in other words, the size of the population in a coastal region is proportional to the volume of economic activity taking place in the same region (at least at the coastal county level of aggregation).

In terms of economic activity in Irish coastal areas, agriculture, fishing and tourism are obviously key components especially outside the main urban centres in the coastal zone. The importance of primary agriculture to the Irish economy has reduced in recent years, in line with the trend in all industrialised countries. Nonetheless, it remains important, accounting for 2.3% of GDP at factor cost, in 2006. Furthermore, the Agri-Food industry is one of the country's largest home-grown industries accounting for an 8.1% share of GDP. Employment in the sector accounts for 8.1% of total employment or 163,400 jobs (Department of Agriculture and Food 2007). The regional distribution of the Agri-Food processing sector is crucial for maintaining employment and growth in rural areas. The National Farm Survey (NFS) produced by

Teagasc estimates that average farm income (excluding off-farm income) was €22,459 in 2005 although there are large variations depending on the size of the farm and system of farming (Connelly et al. 2006). Full-time farms, as defined by Teagasc, had an average farm income of €40,485 and part-time farms, €11,372 in 2005[2].

- Table 6 here

In Ireland, the NUTS 3 coastal region contains 90% of all farm holdings in the State. As can be seen from table 6 the average farm incomes (estimated from the RERC SMILE spatial farm level microsimulation model) at the Coastal EU, Coastal county and Shoreline ED spatial levels in 2005 was €21,708, €21,866 and €19,744 respectively. At the 2 higher spatial coastal tiers average family farm income is estimated to be statistically equivalent to the national average. At the Shoreline ED level it is estimated to be approximately 13% less than the national average which may reflect the more marginal agricultural land types to be found along the vertical axis of the Irish coastal zone especially along the Western seaboard.

In 2006 the agricultural, fisheries and forestry sector in the Irish EU coastal region contributed €2360 million in gross valued added, or 93% of the gross value added produced by the agricultural, fisheries and forestry sector in the entire State. The proportion of land in the coastal regions used for agricultural production purposes decreases the lower one goes in terms of the coastal spatial scale ranging from approximately 63% at the Coastal EU definition to 55% at the Shoreline ED definition. The density of livestock units per hectare is also a decreasing function of the spatial scale of the coastal definition used.

- Table 7 here

In terms of primary fishing activities in the coastal regions it does not really matter which coastal tier we examine as the activity can refer to any of the levels of spatial aggregation. As shown in table 7, 1,717 persons declared in the 2006 Census of Population that their main occupation was in fishing or fishing related industries.

[2] For comparative purposes we use 2005 NFS figures here as the figures available at lower spatial coastal scales are based on a microsimulation model that uses 2005 base NFS data (see Hynes et al., 2009 for further discussion)

Only 16 of these were resident outside the coastal NUTS regions. Over 55% of these individuals resided in just 2 of the coastal EU regions; the border and the South West regions which reflects the strong fishing tradition of counties Donegal and Cork in particular. The value of total sea fish landings in 2004 in all Irish ports was €140 million.

- Table 8 here

As noted earlier the Irish coastal economy is driven by the provision of services. Shipping and marine transport are one of the most important services provided. In 2006, marine transport accounted for over 90% of Ireland's imports and exports by volume and, as shown in table 8, resulted in trade worth almost €70 billion. The transport of persons is another important service provided by the shipping industry. Over 3 million passengers travelled by boat to and from Ireland in 2006. Cruise ship tourism is also a growing area within the shipping services that generates significant revenue for local coastal economies around Ireland. In 2006, there were 137 cruise ship visits to Irish ports, involving 105,748 passengers (CSO statistics). A survey by Dublin Tourism in 2006 estimated that the average spend per disembarking passenger was €113, not including accommodation. In all, cruise passengers spend between €35 million and €55 million a year in Dublin, a considerable tourism boost considering that the cruise ship industry was hardly in existence in Irish waters 15 years previously.

- Table 9 here

In order to get an idea of how important tourism is in the coastal regions of Ireland we can examine information on accommodation that is available from Failte Ireland for the Coastal County level and within the An Post Geo Directory for the Shoreline ED level of analysis. As can be seen from table 9 the 15 coastal counties account for 84, 88 and 83 per cent of the total number of hotels, guest houses and B&Bs in the country respectively. At the NUTS 3 level, over 90% of all these categories of accommodation are to be found in the Irish EU coastal regions. Also according to figures from the An Post Geo Directory, across all types of available accommodation, 46% of the national total number of units is to be found at the Shoreline ED level, 82% at the coastal county level and 95% at the Coastal EU region level. The huge

share of accommodation units at the Shoreline ED level demonstrates how important the sea and the coastal shore are in Ireland from a tourism perspective.

- Figure 7 here

Tourism is also one of the major economic sectors in coastal regions across the EU with a total of 96,000 hotel units located in the EU NUTS3 coastal areas (Eurostat 2009). It can be seen from figure 7 that although the share of hotels, guesthouses and B&Bs at the EU coastal level in Ireland account for over 95% of all accommodation of this type in the entire country the distribution of this accommodation is not evenly spread across the coastal regions. Counties Kerry and Cork in the South West region make up a disproportionally large share compared to other regions with approximately 20% of all hotel units in the state, 31% of all guesthouses and 26% of all B&Bs. The Mid-East region on the other hand, which comprises of counties Kildare, Wicklow and Meath, only accounts for 8, 4 and 7% of the accommodation types respectively. It is also worth noting that the CSO estimate that Irish residents spend €1348 million on domestic travel in the coastal EU (NUTS 3) regions of Ireland in 2006 which accounted for approximately 98% of total domestic expenditure on domestic travel in that year. Unfortunately, information on the expenditure of foreign visitors in the coastal regions of Ireland is not readily available from the CSO data portals at any level of spatial aggregation.

Conclusions

The establishment and adoption of an Integrated Maritime Policy for the European Union (2007) was in recognition of the importance of the maritime and coastal economies to European Member States. Under the policy, EU countries and regions have set-up governance structures to ensure that policies related to the seas are no longer developed in isolation and take account of connections and synergies with other policy areas (EU Commission 2009). The EU Integrated Maritime Policy also highlights the fact that reliable indicators and statistics at the coastal level (e.g. county or ED) required for planning and development are still relatively unavailable (DG MARE 2009). This paper has demonstrated how it is possible to compile a comprehensive range of socio-economic statistics, from existing statistical domains,

for a country's coastal regions. In our case we have done so for the Irish coast at the NUTS 3, county and shoreline ED levels of spatial aggregation.

This paper collated coastal statistics down to the shoreline ED level from CSO data sources such as the Census of Population, Census of Agriculture and general statistical releases, the Failte Ireland's tourism related data, the An Post Geo Directory the National Farm Survey (NFS) which is collected by Teagasc and Eurostat statistics. One interesting result in the paper was the fact that the coastal population density changes significantly depending on what definition of the Irish coast one uses. The Irish EU coast (NUTS3) definition was found to have a population density 25% less than that at the shoreline ED level. It was also interesting to note that many of the Census of Population based socio-economic variable analyses were found not to vary dramatically either between coastal definition or from the nation average. That said the within coastal definition variance of these same variables was significant. The dominance or not of cities and urban areas, in the shoreline EDs and at the county level in particular, was driving to a large extent the within variable variance of the socio-economic characteristics. The GDP (valued at market prices) of the Coastal EU (NUTS 3) regional economy in Ireland was found to be approximately €170,234 million which accounts for 96% of all production activity in the state. It was also estimated that the value of the Coastal County economy is approximately €151,317 million while the equivalent estimate of the value of the Shoreline ED economy is €44,394 million.

Since this paper deals with socio-economic data, the information is presented using political rather than natural boundary definitions. This may be an issue in terms of analysing societal and economic drivers of change in some natural coastal boundary. The EU Water Framework Directive, for example, defines 'River Basin Districts', which coincide with river catchment boundaries, as the most appropriate scale for assessment and governance. While Geographical Information Systems may be used to overlay the coastal socio-economic data developed here on to a natural coastal boundary definition, such as a river basin district, the integration of geopolitical scales and associated information on human activities with environmental change constitutes a major area for further research.

Another area for future research is in defining the Ocean as opposed to the Coastal Economy for Ireland. The value of the coastal economy derived in the previous section includes all economic activity that takes place in the coastal region while the Ocean Economy only the economic activity, which indirectly or directly uses the ocean as an input. This would not be done using data freely available in existing data portals but would require the collection of primary data from the relevant marine industries. Finally it should be noted that although we have collated a large amount of information for coastal regions of Ireland, this is not intended to be an exhaustive socio-economic assessment but rather a examination of how we might define such regions for Ireland and what the implications of such coastal definitions are for the assessment of the socio-economic characteristics of Irish coastal areas.

Availability and easy access to a wide range of natural and human-activity data on the oceans and coastal regions of Europe is the basis for strategic decision-making on coastal and maritime policy. Much data has been collected on the natural resources both on and off the Irish coasts (Wheeler et al. 2001 and Geoghegan and Fitzpatrick 2004). This paper is the first however to compile socio-economic data for Irish coastal regions. The development of such a coastal information system should be used to inform regulating, management and decision making in relation to development activities along the coastal stretches of Ireland. Scientists, regulators and commercial bodies need such data if they are to contribute towards a sustainable development of the maritime and coastal economy that is in harmony with coastal and marine ecosystems. The coastal information system developed in this paper should also provide a template for other European States to follow that could potentially facilitate the construction of a European wide coastal information system as envisaged under the EU Integrated Maritime Policy.

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Tables

Table 1. Official Statistics availability at the Alternative Coastal Definitions

Data Type	Data Source	Year	Shoreline ED	Coastal County	EU Coast (NUT3)
Socio-Economic Data in coastal regions					
Population	Census of Population	2006	√	√	√
Gender Breakdown	Census of Population	2006	√	√	√
Ages and Marital Status	Census of Population	2006	√	√	√
Education Qualifications	Census of Population	2006	√	√	√
Housing Statistics	Census of Population	2006	√	√	√
Age Dependency/Lone Parent Ratio	Census of Population	2006	√	√	√
Affluence Index Score	Haase & Pratschke (2008)	2006	√	√	√
Labour market in coastal regions					
Principal Economic Status	Census of Population	2006	√	√	√
Employment and Unemployment Rates	Census of Population	2006	√	√	√
Occupations and Industries	Census of Population	2006	√	√	√
Economic Data on Coastal Regions					
Gross Domestic Product	CSO Data	2006			√
Gross Value Added by Sector	CSO Data	2006			√
Household Income	CSO Data	2006		√	√
Wages and Saleries	CSO Data	2006		√	√
Primary Sector Data					
Sea Fish Landings by Port	CSO Data	2004	√	√	√
Total Number of Farm Holdings	Census of Agriculture	2000	√	√	√
Utilised Agricultural Area	Census of Agriculture	2000	√	√	√
Land in Agricultural Use	Census of Agriculture	2000	√	√	√
Livestock Density	Census of Agriculture	2000	√	√	√
Total Crops and Pasture	Census of Agriculture	2000	√	√	√
Gross Margin per Farm	NFS/SMILE Model	2006	√	√	√
Family Farm Income	NFS/SMILE Model	2006	√	√	√
Secondary Sector Data					
Maritime Transport of Goods and Passengers	Eurostat	2006			√
Tertiary sector Data					
Hotels, Guest Houses and B&B (Statistics on Rooms and Bed numbers)	Failte Ireland	2006		√	√
Accommodation Units	An Post Geo Directory	2006	√	√	√

Table 2. Irish and European Coast: Main Facts

	Unit	Ireland	European Coastal
Total Area (NUTS3)	km2	69,999	1,772,768
% of EU Coastal Area	% of EU Coastal	3.95	100
Length of Coastline	km	7,711	184,659
Population Statistics			
Shoreline ED Population	1000 inhabitants	1,093	86,000*
Coastal County Population	1000 inhabitants	3,514	
EU Coast Population (NUT3)	1000 inhabitants	4,186	199,353
Shoreline ED - % of Total Pop.	% of National or EU Coastal	24.64	1.2
Coastal County - % of Total Pop.	% of National or EU Coastal	79.67	4.1
EU Coast (NUT3) -% of Total Pop.	% of National or EU Coastal	94.35	4.9

*This figure is from Carreau and Gallego (2006) and represents the estimated population living in the 0–10 km EU 25 coastal zone and is based on 2001 census data.

Table 3. Socio-Economic Characteristics of Irish Coastal Communities

	Shoreline ED	Coastal County	EU Coast (NUT3)
Males Unemployed Age 15+	23,886	79,403	91,534
Females Unemployed Age 15+	15,115	52,304	60,677
Males Unemployment Rate (%)	9.4 (7.7)	9.5 (8.9)	8.7 (8.6)
Females Unemployment Rate (%)	7.8 (7.2)	8.4 (8.4)	8.1 (8.2)
% primary education only	22.3 (22.6)	19 (19.7)	19.3 (19.5)
% third level education	29.2 (25.4)	30 (28.1)	29.3 (28.6)
% higher and lower professionals	34.2 (32.9)	32.3 (31.6)	32.5 (32.1)
% semi and unskilled manual workers	19.2 (19.1)	19.2 (19.6)	19.1 (19.2)
Age Dependency Ratio	33.8 (33.8)	31.7 (32.2)	31.9 (32.1)
Lone Parents Ratio	17.4 (15.6)	22 (20.8)	20.3 (20.1)
Affluence Index Score	-0.1 (.0006)	1.6 (1.0)	1.8 (1.5)

* National average across all EDs, all counties and all NUTS 3 regions in Ireland are in the brackets in the 3 columns respectively.

Table 4. Coastal County Income, 2006

	Compensation of Employees (€ Million)*	Income of Self Employed (€ Million)	Total Household Income (€ Million)	Total Income per Person (€)	Index of Total Income per Person (State=100)	Disposable Income per Person (€)
State	71874	13108	109084	25728	100	20678
Donegal	1683	479	3004	20399	79.3	17252
Leitrim	378	103	644	22230	86.4	18542
Louth	1843	279	2765	24850	96.6	20482
Sligo	945	184	1469	24130	93.8	19751
Galway	3562	765	5664	24450	95	19934
Mayo	1618	429	2733	22069	85.8	18336
Dublin	24676	3358	35346	29773	115.7	23226
Meath	3011	553	4305	26437	102.8	20818
Wicklow	2222	406	3301	26156	101.7	20670
Clare	1698	349	2614	23558	91.6	19098
Limerick	3075	475	4690	25484	99.1	20741
Waterford	1672	354	2647	24517	95.3	20121
Wexford	1756	483	2992	22710	88.3	18873
Cork	7926	1511	12199	25347	98.5	20529
Kerry	1768	506	3013	21545	83.7	17926

*(i.e. Wages and Salaries, Benefits in kind, Employers' social insurance contribution)
The CSO indicates that these county estimates should be interpreted with caution because the underlying data are not always sufficiently robust. They should be regarded as indicative of relative levels rather than as accurate absolute figures

Table 5. Coastal Gross Value Added (GVA) at Basic and Market Prices, 2006

	GVA per head, Basic Prices (€)	Indices of GVA per head, Basic Prices (State=100)	GDP at Market Prices (€Million)	GVA at Basic Prices - Agriculture, Forestry and Fishing (€Million)	GVA at Basic Prices - Manufacturing, Building and Construction (€Million)	GVA at Basic Prices, - Market and Non Market Services (€Million)
State	36,608	100	177,285	2530	53,145	100,809
Border	26,545	72.5	14,201	466	4,652	7,416
West	27,451	75	12,990	288	4,204	6,974
Dublin	51,588	140.9	69,954	88	12,887	48,772
Mid-East	28,366	77.5	15,402	238	5,945	7,412
Mid-West	31,855	87	13,136	289	4,618	6,688
SE	26,745	73.1	14,078	464	4,592	7,370
SW	42,952	117.3	30,473	527	14,182	12,189

Table 6. Agriculture in Coastal Regions, 2005

	Unit	Shoreline	Coastal County	EU Coast
Total Number of Farm Holdings	Farm Units	26,625	98,036	126,270
Farms as % of National Total	%	19	70	90
Utilised Agricultural Area	Hectares	738,251	3,055,105	3,928,446
Land in Agricultural Use	%	55	62	63
Livestock Density	Livestock Units per farm	40	48	47
Total Crops and Pasture	Hectares	669,942	2,937,716	3,821,326
Gross Margin per Farm	€ per farm	34,463	38,416	38,092
Family Farm Income	€ per farm	19,744	21,866	21,708

Source: Total Crops and Pasture and Gross Margin per Farm are estimated based on the 2005 RERC SMILE model. All other figures are based on the 2000 Irish Census of Agriculture.

Table 7. Sea Fish Landings by Port, 2004

	Persons aged 15 years and over at work in the fishing and fishing related industries, 2006	Live Weight of Sea Fish Landings (Tonnes)*	Value of Sea Fish Landings (€ '000)*
State	1,717	189,292	140,647
Border	449	114,621	42,478
West	273	6,086	10,088
Dublin	106	4,888	8,067
Mid-East	48	5,005	2,002
Mid-West	45	200	561
SE	276	18,012	17,134
SW	499	26,179	33,047
Midlands or, for Fish Statistics, Minor Irish ports not included in NUT3 figures above	16	13,718	26,037

Source: CSO Statistics 2004. *Oysters, clams and farmed mussels are not included

Table 8. Maritime Transport of Goods and Passengers 2006

	Ireland	EU Coastal Country Average
Seaborne passengers embarked and disembarked in ports ('000)	3,207	18,480
Gross weight of seaborne goods handled in ports (million tonnes)	53.3	174.4
Exports through Irish Ports (€ million)	44,163	33,043
Imports through Irish Ports (€ million)	25,298	38,279

Source: Eurostat statistics.

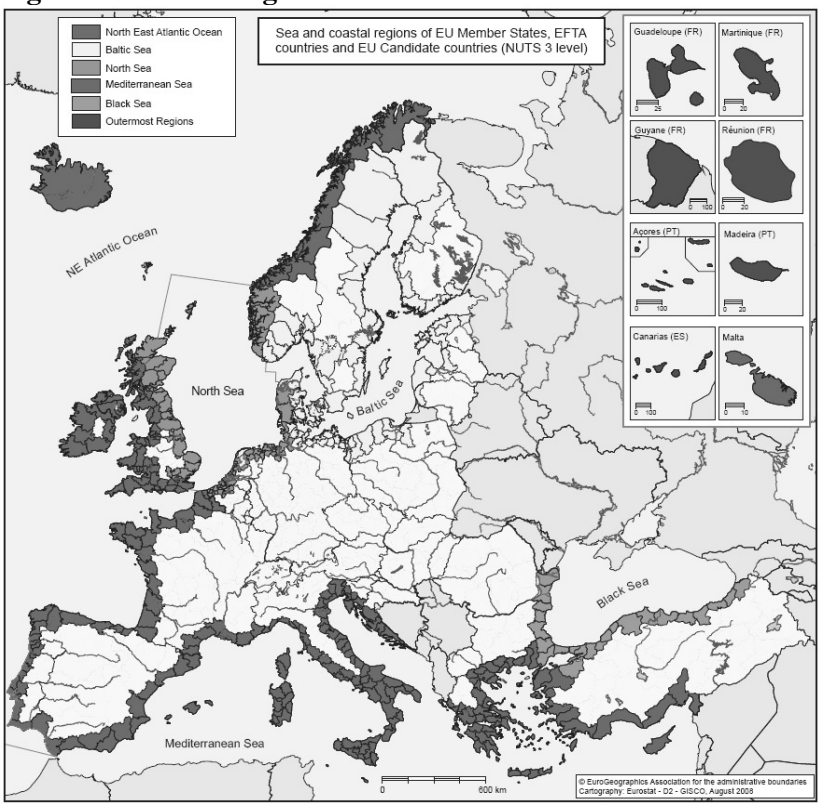
Table 9. Hotels, Guest Houses and B&Bs Located in Coastal County Regions, 2006 and Total Available Accommodation Units in Alternative Coastal Tiers

	Hotels		**Guesthouses**		**B&Bs**	
County	***Premises***	***Rooms***	***Premises***	***Rooms***	***Premises***	***Rooms***
Clare	42	2,269	36	321	225	922
Cork	80	3,712	45	538	372	1,502
Donegal	58	2,440	19	189	172	728
Dublin	137	13,897	58	975	219	824
Galway	79	4,012	37	364	349	1,567
Kerry	78	4,985	83	939	442	1861
Leitrim	7	251	6	50	38	150
Limerick	23	1,529	6	72	77	328
Louth	12	657	7	50	33	147
Mayo	42	1,550	17	166	189	804
Meath	14	442	7	56	49	185
Sligo	17	909	4	44	83	344
Waterford	30	1,561	17	172	105	433
Wexford	31	1,288	10	108	119	497
Wicklow	31	1,083	6	91	114	452
National (Coastal & Non Coastal Counties)	812	45,873	409	4,632	3,110	12,908
Coastal Tier	**Shoreline ED**		**Coastal County**		**EU Coast (NUTS3)**	
Total Accommodation Units Available	3,315		5,856		6,831	
% of National Accommodation	46		82		95	

Total Accommodation Premises figures from the An Post Geo Directory

Figures

Figure 1. Coastal Regions of the EU



Source: Eurostat, GISCO

Figure 2. Irish Coastal Regions Defined by Political Jurisdictions Extending Inland

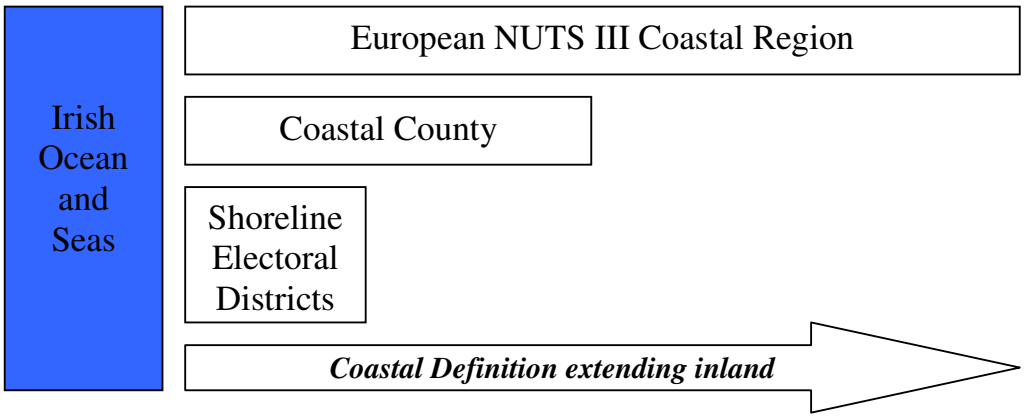


Figure 3. GIS Categorisation of Alternative Coastal Tiers

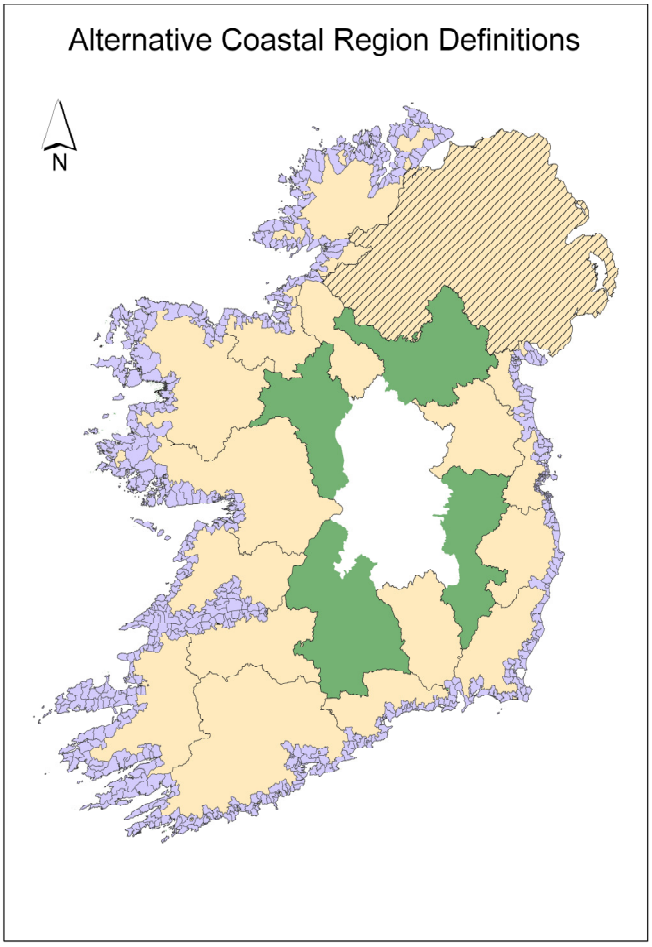


Figure 4. Coastal County and Shoreline ED Unemployment Rates

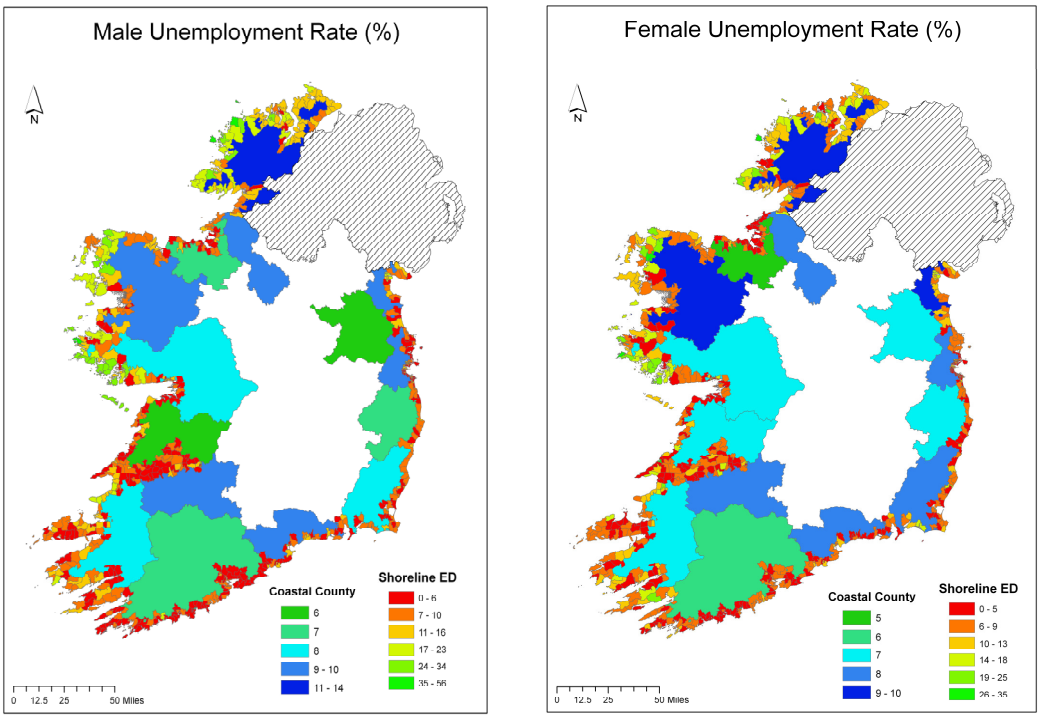


Figure 5. Relative Affluence Scores at Alternative Coastal Definitions, 2006

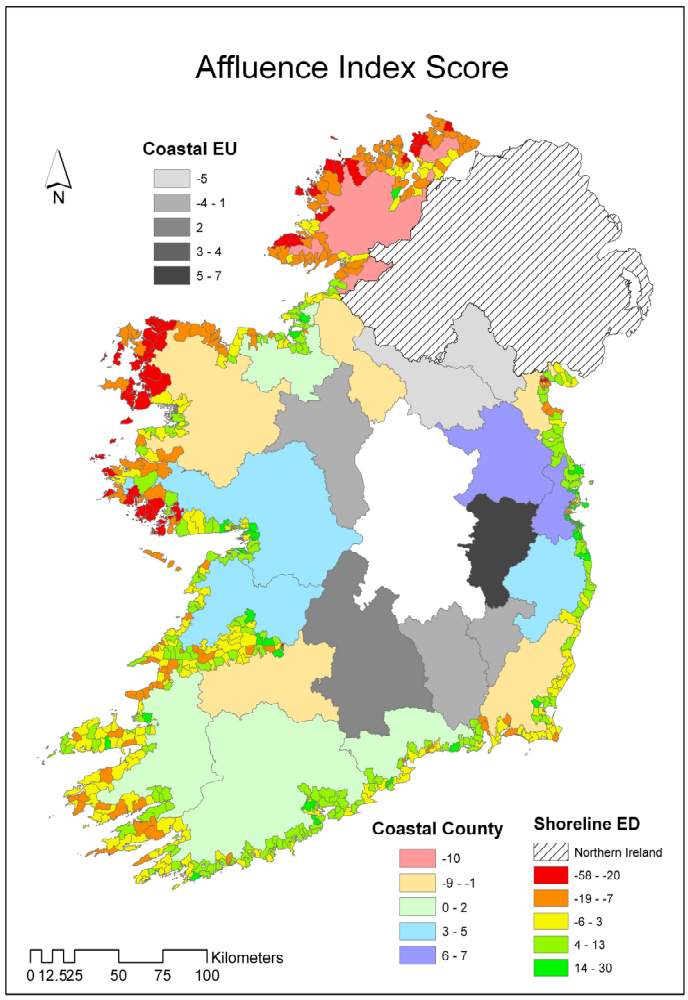


Figure 6. Coastal regions GVA at basic prices by sector, 2006

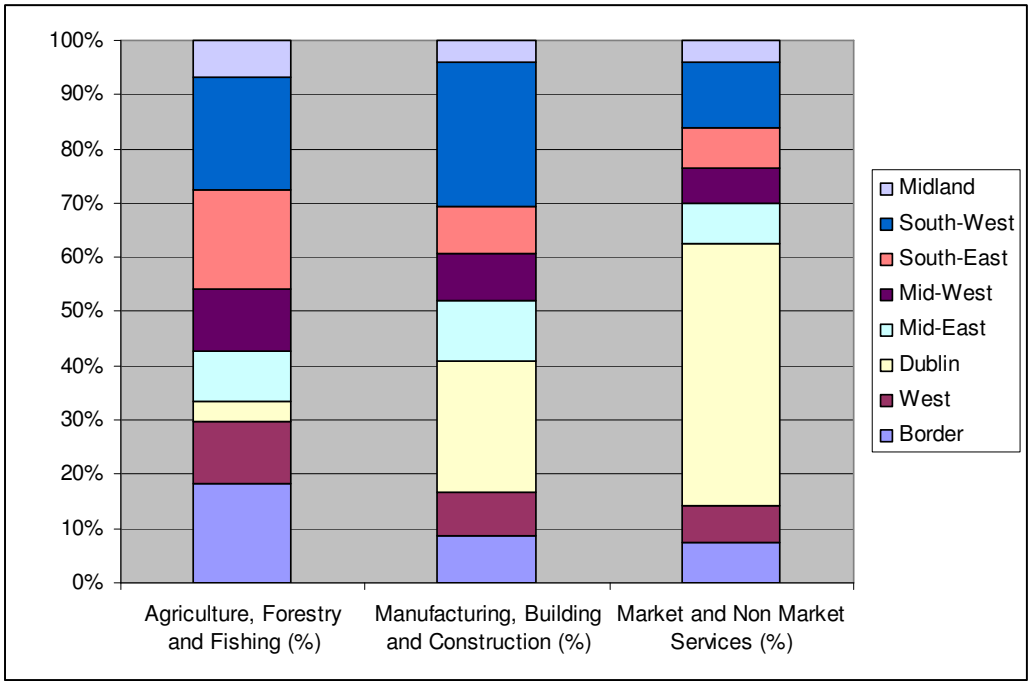
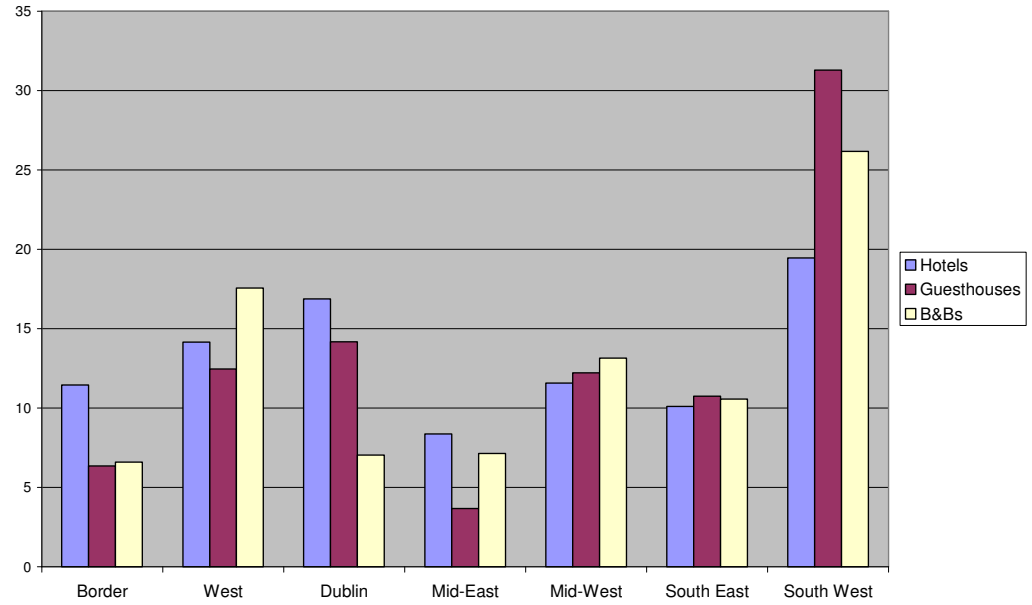


Figure 7. Share of Hotels, Guesthouses and B&Bs Located in Coastal NUTS3 Regions, % of National Figure, 2006

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