

Sound, innovative and connective monitoring
for the Wadden Sea area

A SOCIO-ECONOMIC ANALYSIS OF THE INTERNATIONAL WADDEN AREA

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This report focuses in particular on the following socio-economic issues:

- population development including migration
- employment structure and growth
- attractiveness of the natural environment measured by a Hotspotmonitor survey and complemented by an explorative study on the housing prices of recreational homes

Keywords: Wadden Sea, socio-economic data, demography, employment, housing, Hotspotmonitor



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<http://www.walterwaddenmonitor.org> (forthcoming URL)

CONTENT

1	INTRODUCTION	1
1.1	The Wadden Sea	1
1.2	Definition of the Wadden Sea Region by the CWSS.....	2
1.3	Definition of the Wadden Sea Region in this report	2
2	DEMOGRAPHIC DEVELOPMENT OF THE WADDEN AREA	4
2.1	Preliminary details about the statistical spatial demarcation	4
2.2	Population in the Wadden area: 1 million inhabitants and a declining trend ...	4
2.3	Increase of elderly people, decrease of all other demographic groups	5
2.4	Population development in Wadden area relative to national developments ..	7
2.5	Migration: German Wadden area outperforms the Dutch and Danish	11
3	EMPLOYMENT AND UNEMPLOYMENT IN THE WADDEN AREA	15
3.1	Employment growth: mixed performance across the trilateral area	15
3.2	Specialisation in the Wadden area: tourism, navy and more	17
3.3	Job growth of the past decade	19
3.4	Unemployment: weak performance of the Dutch and German mainland coast	22
4	ATTRACTIVITY OF NATURAL PLACES IN THE TRILATERAL WADDEN AREA	25
4.1	Between socio-economics and ecology: the value of nature	25
4.2	The Hotspotmonitor survey for attractive natural areas	25
4.3	Wadden: a strong Hotspot of natural attractivity in all three countries	28
4.4	Strong attractivity differences especially along Wadden mainland coast	33
4.5	Attractivity of the Wadden: strongest across Germany	38
4.6	An estimated 14 million ‘fans’ for the trilateral Wadden area	41
4.7	Prices of recreational homes – Sylt is number one	42
5	DISCUSSION AND CONCLUSIONS	48
5.1	Main findings.....	48
5.2	Policy issues: paradoxical attractivity and local versus (inter)national policy perspective.....	48
5.3	Monitoring lessons	50
6	REFERENCES	51
7	APPENDICES	54
	Appendix I: Wadden area boundaries and existing socio-economic monitoring .	54
	Appendix II: Productivity growth in NUTS-3 Wadden areas.....	57
	Appendix III: Population development.....	58
	Appendix IV: Screenshots Hotspotmonitor	61
	Appendix V: Data recreational homes – prices (vraagprijs) and square meters living surface (woonoppervlak).....	64

1 INTRODUCTION

This sketch is produced as part of the ‘Wadden Sea Long-Term Ecosystem Research’ (WaLTER) project.¹ WaLTER is an initiative of a number of institutes and organisations to carry out long-term measurements and research in the Wadden Sea area. WaLTER aims to develop a well-founded monitoring plan for the Wadden area and to set up a data portal which allows for important data to be more accessible. The WaLTER project is divided into several workpackages. This sketch is part of Workpackage 3: socio-economic concepts and monitoring. In effect, Workpackage 3 analyses spatial, economic and social development models and examines current monitoring practices and the monitoring demands arising from actual and potential areas of friction between the disciplines of economy and ecology.

The WaLTER project is primarily focused on the Netherlands. However, the conceptual exploration performed in Workpackage 3 has shown that there is much to learn from multi-scale monitoring (Daams and Sijtsma, 2013). And for this reason a trilateral socio-economic analysis of the Wadden area is now undertaken (compare Arndt et al., 2004).

The purpose of this report is to analyse the current socio-economic situation and the recent developments taking place for the trilateral Wadden Sea region.

1.1 The Wadden Sea

The Wadden Sea (Dutch: Waddenzee, German: Wattenmeer, Danish: Vadehavet) is an intertidal area in the south eastern part of the North Sea. It stretches from Den Helder in the Netherlands in the southwest, passes along the North Sea coast of Germany, to Blåvands Huk in Denmark, along a total length of approximately 500 km and a total area of about 10.000 km² (approximately 2.000 km² inhabited islands and 8.000 km² comprising the Wadden Sea) (Kabat et al., 2012; Reise et al. 2010).

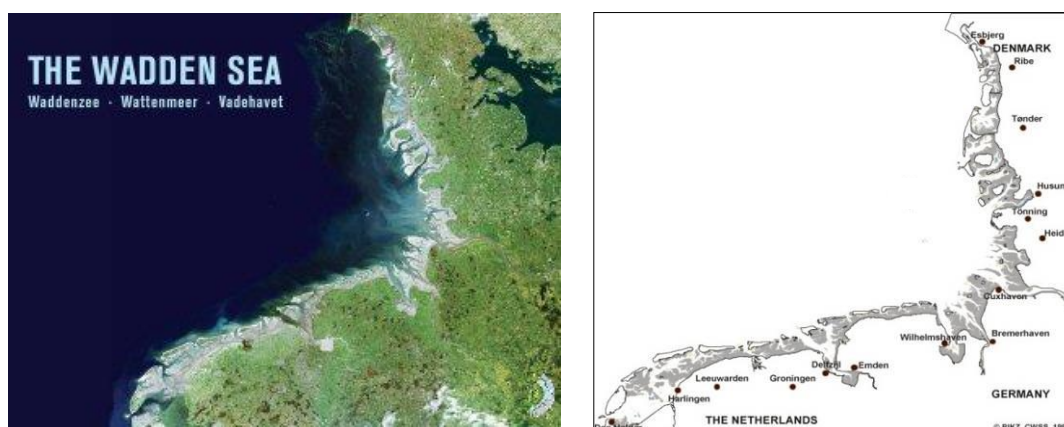


Figure 1-1: The Wadden Sea

The Wadden Sea is an international natural and cultural area shared by Denmark, Germany and the Netherlands which forms a shallow body of water with tidal flats and wetlands (see figure 1-1). On the one hand, the area has been intensively shaped by humans but on the other, it is one of the most valuable nature areas in Europe, and even worldwide. Its natural value has been recognised internationally:

¹ <http://www.walterwaddenmonitor.org> (forthcoming URL) and <http://www.walterproject.nl>

in 2009 the German and Dutch Wadden Sea areas were designated as a UNESCO World Natural Heritage site. The Danish Wadden Sea area is also expected to receive UNESCO natural heritage status in the near future. We note at the outset of our study that the protection status of the trilateral Wadden Sea area is therefore a complicated matter but one of paramount concern.²

1.2 Definition of the Wadden Sea Region by the CWSS

The Common Wadden Sea Secretariat (CWSS) has implemented a relatively broad spatial demarcation by focusing on *Provincies* (NUTS-2) in the Netherlands, on *Kreise* (NUTS-3) in Germany, and on *Kommuner* (LAU-1) in Denmark. As of 2012, over 3.5 million inhabitants live in this expansive Wadden Sea Region, which extends over an area of some 22.000 km². Germany has the lion's share of the area (63%), 30% falls within Dutch territory, and 7% belongs to Denmark. The broader Wadden Sea Region is home to several regional centres, including Bremerhaven, Wilhelmshaven, Emden, Groningen, Leeuwarden, and Esbjerg, but is mainly characterised by a rural structure with low population density (total area: 162 inhabitants per km²) (see appendix I: figure 1-3). The nearby cities of Hamburg, Bremen and Oldenburg also convey impacts on the region.

1.3 Definition of the Wadden Sea Region in this report

The broad spatial definition of the CWSS is logical because the urban centres definitely play a role in the Wadden area. However, the definition is less logical for several other reasons. First, because these broader areas do not consider themselves to be part of the Wadden area: no inhabitant of the city of Groningen or Leeuwarden for instance would consider him/herself as a resident living in the Wadden area. Second, although at the Dutch policy level the provinces play a role, it is generally mainly the municipalities near the coast which really identify themselves as Wadden area. Third, from a statistical and monitoring perspective, to include major cities (as with using larger NUTS-3 or NUTS-2 areas) within the demarcation has a major downside: due to their size, these cities dominate every development and every trend.

In order to stay closer to the inhabitant-experienced reality of the Wadden area and to the policy reality, and so as to prevent statistical and monitoring domination by bigger cities, in this report we take a somewhat different spatial approach than that of the CWSS. We analyse a much more spatially-specific area nearer to the coast and we focus on the municipality and parish level of the entire Wadden area for the Netherlands, Germany and Denmark. Whenever possible we use the smallest regional demarcation (LAU-2) for all countries (see figure 1-2).

² The Danish Wadden Sea is designated as a National Park (Nationalpark Vadehavet). The German Wadden Sea is designated both as National Park and as UNSECO Biosphere Reserve and consists of three areas: the Nationalpark/UNESCO Biosphärenreservat Schleswig-Holsteinisches Wattenmeer, Nationalpark/UNESCO Biosphärenreservat Hamburgisches Wattenmeer, and Nationalpark/UNESCO Biosphärenreservat Niedersächsisches Wattenmeer). The Dutch Wadden area contains three National Parks (*Nationaal Park Duinen van Texel*, *Nationaal Park Schiermonnikoog*, and *Nationaal Park Lauwersmeer*).

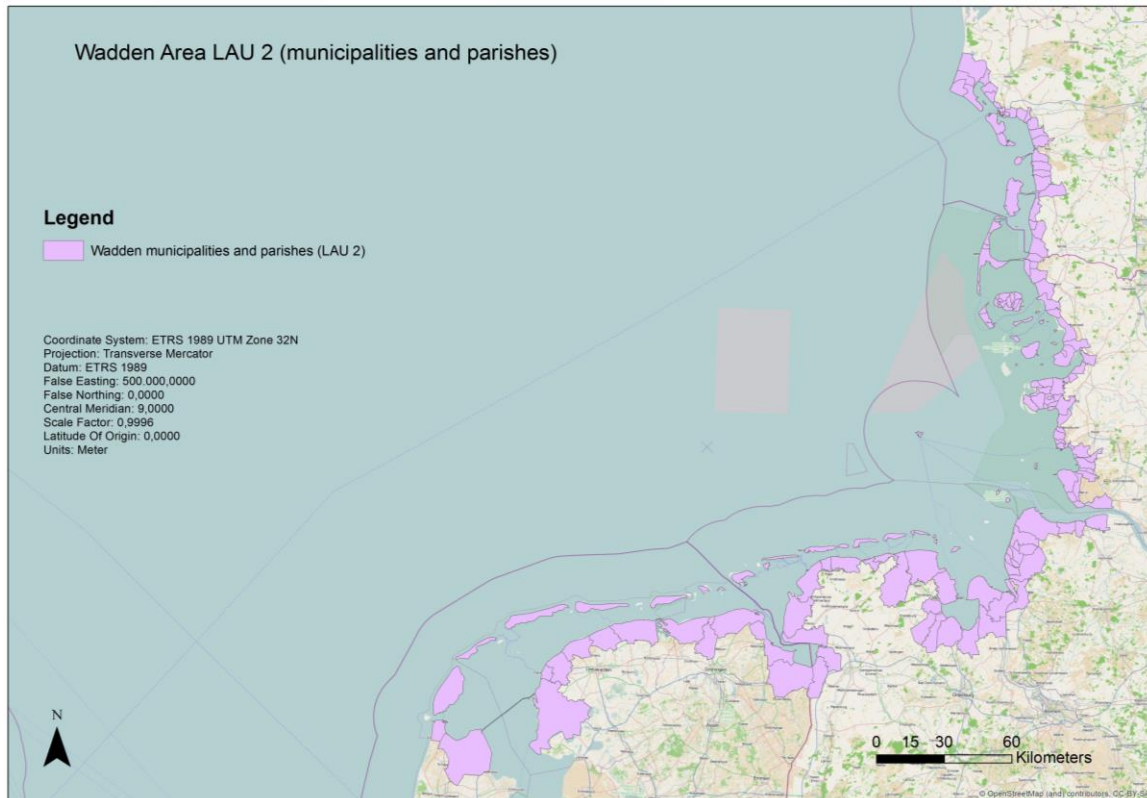


Figure 1-2: Demarcation of the Wadden area (LAU-2 classification) (see also footnotes p. 4)

In particular, we distinguish between the coastal area on the mainland in the three countries and the Wadden islands themselves. Although we focus on this spatial specific approach, we do not agree that analysis should take place at this level only. In our view a spatial specific analysis needs to be combined with data and monitoring at higher spatial levels, (i.e. the spatial level of CWSS) in order to better understand the bigger picture of the Wadden area (Daams and Sijtsma, 2013). This is critical, especially since various economic phenomena that we identify are not statistically observed at municipality levels; these are phenomena such as output or economic growth, investment, and structural development. In these cases, phenomena should be studied at a higher level of spatial aggregation: at the NUTS-3 or NUTS-2 level. However, this ideal combination of multi-scale spatial analysis is not carried out in this report, here we focus on the – basic – spatial specific approach.

2 DEMOGRAPHIC DEVELOPMENT OF THE WADDEN AREA

2.1 Preliminary details about the statistical spatial demarcation

In this analysis the total Wadden area will be identified in terms of the so-called Local Administrative Units of order 2 (LAU-2) of EUROSTAT. These LAU-2 areas comprise 176 LAU-2 areas directly bordering the Wadden coast and the Wadden islands (see figure 1-2).³ Including the islands, at the Dutch side the Wadden area consists of 19 LAU-2 areas, or municipalities,⁴ the German Wadden area comprises 124 LAU-2 areas (also municipalities), and the Danish Wadden area consists of 33 LAU-2 areas (or parishes, a smaller unit than municipality). Dutch municipalities have experienced some large rescheduling, and hence revisions in size. In Germany, the municipalities are part of a highly detailed regional demarcation, like 'Länder', 'Kreise', and so on, than in the Netherlands and Denmark. German municipalities are fairly small, particularly in Schleswig-Holstein.

Specifically, the Wadden area includes 20 inhabited islands (5 in the Netherlands, 12 in Germany and 3 in Denmark). A few German and Danish Wadden islands sometimes consist of several LAU-2 classes; in these cases they are aggregated to give a total for the entire island, whereas all five Dutch Wadden islands are already classified as five separate LAU-2 areas (municipalities). Uninhabited islands of the three countries are not taken into consideration as there is limited human activity.

2.2 Population in the Wadden area: 1 million inhabitants and a declining trend

As of January 1 2013 in the total Wadden area, based on these LAU-2 areas (mainland plus islands) of the Netherlands, Germany and Denmark taken together, there live approximately 1 million inhabitants (see table 2-1).⁵ The number of inhabitants on the Wadden islands in all three countries on January 1 2013 stood at about 78.000. Moreover, the average annual population growth between 2002 and 2013 was negative for all areas and islands of all three countries.

Also in January of 2013, (including the islands) there were about 270.000 persons living in the Wadden area in the Netherlands (27%), roughly 660.000 in the German Wadden area (65%), and some 80.000 (8%) in the Danish Wadden area. When we next consider the population of all Wadden islands, we obtain a similar breakdown

³ These units for Denmark are in fact parishes ('Sogne'), but have the same so-called LAU-2 classification, according to Eurostat, as German 'Gemeinde' and Dutch 'gemeenten'. Danish 'Kommuner', which can loosely be translated as municipalities, are in fact, according to the Eurostat regional demarcation system, part of the more aggregated, and hence larger, LAU-1 classification. Based on the formal Eurostat classification, we should use data at LAU-2 for all three countries. Despite the more comparable semantics, political entities (i.e. presence of a mayor, city council, local elections, financial autonomy, and so on) and the fact that statistical data are sometimes difficult to obtain at LAU-2 areas in Denmark, our aim is to focus on the LAU-2 areas whenever available.

⁴ The Netherlands witnessed major revisions in the municipal areas (and hence population) in the Wadden area in 2010 onwards. These revisions imply that new municipalities (for example, SW Fyslan and Noorderkroon), will border the Dutch Wadden Sea with only a small part of their new surface. See the two large municipalities in the Netherlands in figure 1.2 bordering on both the Wadden Sea and the IJsselmeer. For the relevant municipalities these revisions were 'calculated back' to the 'old' municipality demarcations of the period before 2010. The implication here is that 19 municipalities are situated in the Dutch Wadden area for 2002-2013.

⁵ Table 2-1 clearly shows that Eurostat classification of areas as LAU-2 means that the Danish Wadden area is fairly small and has relatively few inhabitants.

of percentages: about 29% live on the Dutch Wadden islands, 66% live on German islands, and 5% live on Danish islands.⁶

Table 2-1: Population in 2013 and average annual population growth in 2002-2013 of the Wadden area (of LAU-2 classification) and the Wadden islands

	Inhabitants (1-1 2013)		Average annual percentage population growth 2002-2013 (%)
	Absolute	share (%)	
Wadden area			
NL	268849	26.6	-0.29
DE	662489	65.5	-0.31
DK	80136	7.9	-0.10
All Wadden area	1011474		-0.29
Wadden islands			
NL	22903	29.3	-0.10
DE	51315	65.7	-0.28
DK	3892	5.0	-0.16
All islands	78110		-0.22

Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies

2.3 Increase of elderly people, decrease of all other demographic groups

Next we consider the population development between (January 1 of) 2002 and 2013 by gender and age in each of the 176 local areas at the LAU-2 classification of the Wadden area. We start our study with the population in absolute terms and the development in age groups of the population over the entire period (2002-2013) in the Wadden area to achieve a better understanding of the actual level and shares of the population by age group.

Table 2-2 presents the population on January 1 2013 by age group in the Wadden area and the islands, divided as population of working age (between 15 and 64), elderly (65 years and older), youngsters (below 15), along with the development of these groups between 2002 and 2013. As expected, the German Wadden area and islands have the most inhabitants and Denmark has the least. Furthermore, where table 2-1 shows a falling population over the entire area and on the islands between 2002 and 2013, table 2-2 indicates that this is due to the decline in the population of 15 and 64 years old persons, but especially in the population of 15 years of age and younger. It is noteworthy that the number of pensioners in the areas has risen steadily in both the Wadden area and on the islands, but in particular in the Dutch Wadden area and on the Danish islands. The elderly group in the German Wadden area and islands is relatively small, but here the number of youngsters has declined sharply. Clearly, this implies that persons of a working age and their children have left the area and the islands; in fact, we observe a negative net migration out of the area while the elderly remain.

⁶ This similar population division of the total areas and islands of the three Wadden countries points towards choosing a similar LAU-2 classification in all countries.

Table 2-2: Population on January 1, 2013 and population growth between 2002-2013 in the Wadden area and on the Wadden islands (based on LAU-2 classification)

	Population by age group at 1 Jan 2013 (x 1000)				Average annual population growth by age group 2002-13 (%)			
	total	15-64	> 64	< 15	total	15-64	> 64	< 15
NL								
Wadden area	268.9	171.8	51.5	45.6	-0.29	-0.71	2.56	-1.32
Wadden islands	22.9	14.5	4.7	3.7	-0.10	-0.60	3.28	-1.44
DE								
Wadden area	662.5	426.0	159.9	83.1	-0.31	-0.51	1.70	-2.39
Wadden islands	51.3	33.4	12.6	5.3	-0.28	-0.74	2.48	-2.55
DK								
Wadden area	80.1	51.3	16.1	12.7	-0.10	-0.36	2.29	-1.56
Wadden islands	4.0	2.3	1.1	0.6	-0.16	-1.29	4.07	-1.57

Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies

Figure 2-1 below depicts the share of ageing in the population of the Wadden area, including the Wadden islands, and total country shares of the three countries bordering the Wadden Sea for the period 2002-2013. Ageing in the German Wadden area is by far the highest, where in 2013 almost 25% of all inhabitants are pensioners. Next in line is Germany as a whole, where about 20% of the population are pensioners, and this percentage in 2013 is nearly the same as that of the Dutch and Danish Wadden areas in 2013. Ageing is lowest in Denmark and the Netherlands, with about 17%. Figure 2-1 also shows that ageing in Germany and the German Wadden rose steepest in the period before 2010, while strong rises in ageing occurred much later in the Dutch and Danish areas (after 2010). Similar figures are found for populations of other age groups, e.g. youngsters, and for the percentage growth in population (total or by age group). To keep these figures orderly, we will estimate the population of various groups in the Wadden area and on the islands as the local percentage minus the national percentage population for these groups.

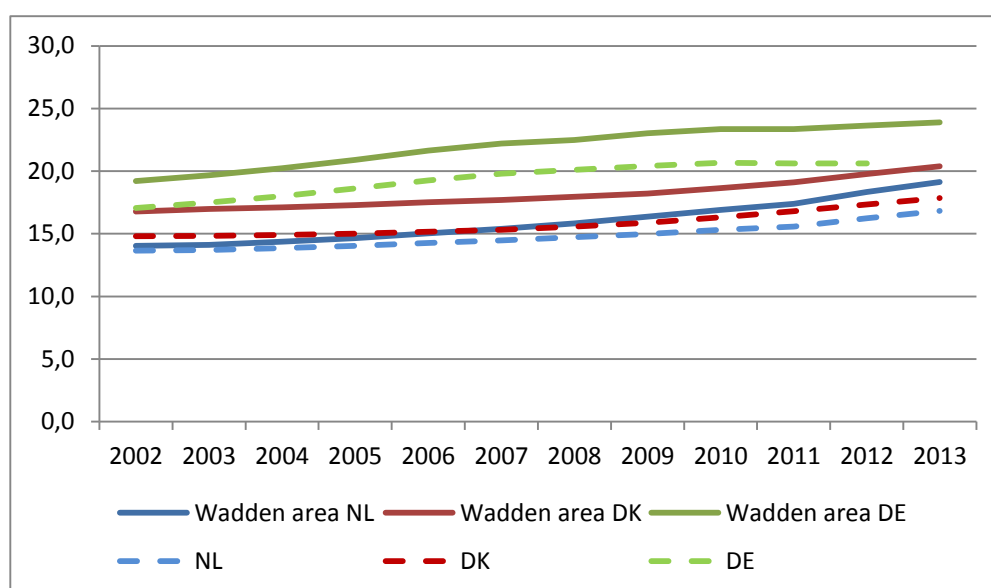


Figure 2-1: Ageing (inhabitants over 64 years of age as % of total population) (Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies)

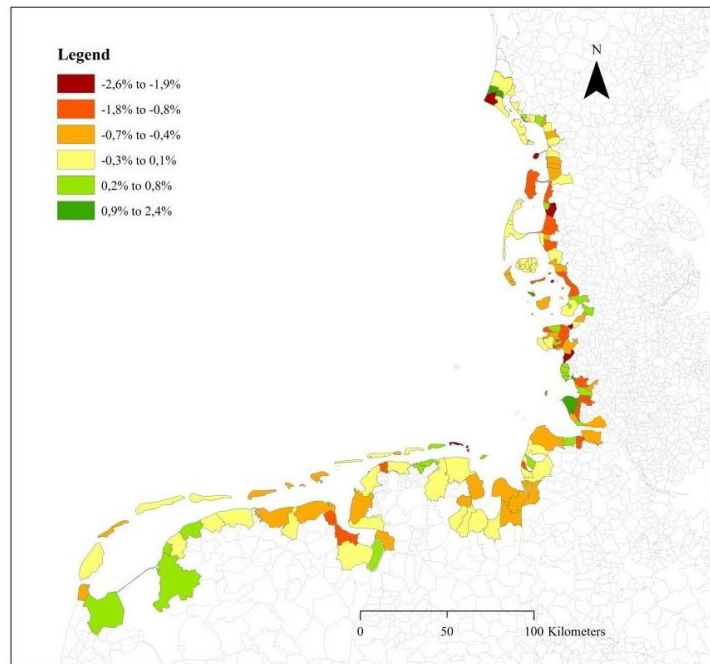


Figure 2-2: Average annual percentage population growth between 2002-2013 in the Wadden area (LAU-2)

Figure 2-2 plots the average annual percentage population change in the LAU-2 areas of the Wadden area during the period 2002-2013. It indicates that the surface area of Dutch municipalities is comparatively large and that the population of municipalities (LAU-2) in the western-most provinces in the Netherlands, Noord-Holland and Friesland, have on average increased. Moving farther east, the population of many Dutch municipalities in the neighbouring province of Groningen has fallen over that period. As we continue eastward, the map shows a mixed pattern of population growth. First, the dimensions of the LAU-2 areas in the German and Danish Wadden areas are much smaller. Second, and possibly as a result of being smaller, although some municipalities in the German Wadden area are growing, many others have a decreasing population. The same situation applies for the population of the parishes in the Danish Wadden area.

Box 1: Demographic developments and related initiatives

Several projects and initiatives focus on demographic change in the Wadden area. On the German Hallig Hooge a project was initiated using volunteers for many different tasks on the island (see <http://hooge.de/content/hand-gegen-koje.html-0>). In the German Landkreis Leer a project with the Dutch municipality focused on the outmigration of young people (see <http://www.ndr.de/regional/niedersachsen/oldenburg/abwanderung105.html>). In another project, a scholarship for young doctors was provided to address the increasing lack of doctors (see <http://www.ndr.de/regional/niedersachsen/oldenburg/aerztmangel127.html>)).

2.4 Population development in Wadden area relative to national developments

We consider below all data pertaining to the Wadden area and the Wadden islands in relation to national data for each of the three countries bordering the Wadden Sea. However, this implies that we automatically assume that these three national situations are comparable in terms of population composition by gender and age.

Population composition by age is more or less comparable for the Netherlands and Denmark, but the German population is much more aged than in the other two countries (see also Broersma, Noback and van Dijk, 2013). Therefore, ageing in the German Wadden area, compared to Germany as a whole, may be less than the ageing in the Wadden area, in relative terms, of the other two countries, because ageing for Germany as a whole is higher than in the Netherlands and Denmark. The numbers of the population composition should thus be considered with care. Using another numéraire, like the sum of the population by age in all three countries, would not help since Germany would still show a much larger population than the other two countries.

Taking all this into account, figure 2-3 presents the rate of ageing for the period 2002-2013 in all three Wadden areas (including the islands) relative to their national rates of ageing. This figure clearly reveals that ageing has grown the most in the Dutch Wadden area relative to national the growth. In 2011 it has surpassed even the relatively high share of the population over age 64 in the German Wadden (relative to national ageing). However, when we examine the ageing situation at the Wadden islands, a different situation emerges in figure 2-4. Again, compared to the national situation, ageing is now highest and fastest growing on the Danish islands, reaching a level in 2013, which is 10 percentage points higher than the Danish national rate of ageing. At the Dutch and German islands ageing rates relative to national ageing are similar, both in levels and in growth, and are comparable to ageing trends in the Wadden area as a whole.

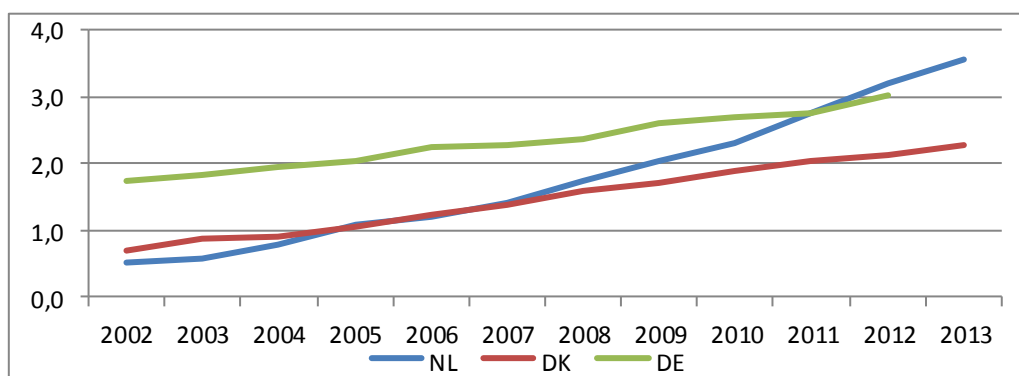


Figure 2-3: Rates of ageing in Dutch, German and Danish Wadden areas, compared to their respective national rates of ageing (Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies)

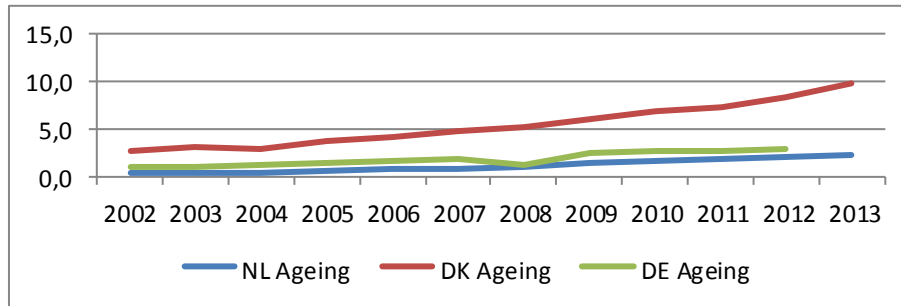


Figure 2-4: Rates of ageing only in the Dutch, German and Danish Wadden islands, compared to the respective national ageing rates (Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies)

Another area of concern is the so-called ‘rate of rejuvenation’ in all three Wadden areas, which is measured as the shares of the population under 15 years of age relative to their national rates. A positive rate means a higher share of youngsters in the total population of the Wadden area in relation to the national share, while a negative rate means a lower share of youngsters in the Wadden area in relation to national shares. Next to ageing, i.e. the rising share of elderly, it is expected that there will be fewer younger persons to replace these elderly persons, and this indeed poses a problem for the area. The rates of rejuvenation are averaged and shown in figure 2-5.

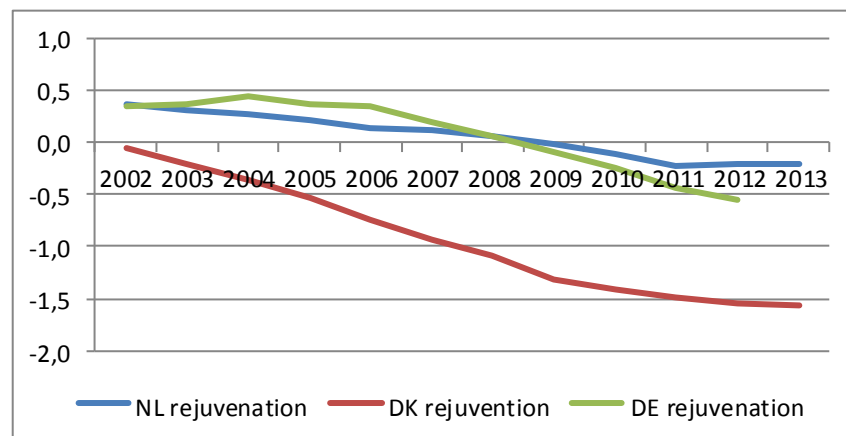


Figure 2-5: Rates of rejuvenation for all three Wadden areas compared to national rates (Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies)

We can clearly observe that ageing patterns in figure 2-3 are the opposite of the ageing patterns in figure 2-5. In the figure above, all rates of rejuvenation drop between 2002 and 2013 in all three areas compared to national rates. The rate for the Danish Wadden area descends the most, i.e. lower than the national rate over the entire period. Rejuvenation in the German and Dutch Wadden areas is nearly the same and their rejuvenation is still higher than their national rates in the first decade of the 21st century but from about 2010 on, the national rate of rejuvenation becomes larger than rates in the Wadden area. The cause for this drop in the Wadden area is that birth rates are consistently lower there than nationally, and

many families with children have moved away from the Wadden area (discussed later).

Figure 2-6 shows rejuvenation rates for the Wadden islands only, in relation to national rates. This figure shows that rejuvenation at the German and Danish Wadden islands is situated continuously below national rates, while for the Dutch islands the rejuvenation rate is about the same as nationally but worsens after 2007. Figure 2-6 depicts that between 2002 and 2013, rejuvenation has taken place at a consistently slower rate than nationally, particularly in the Dutch Wadden area, where it fell 1 percentage point between 2002 and 2013, while in Germany and Denmark it dropped less: by about one-half of a percentage point.

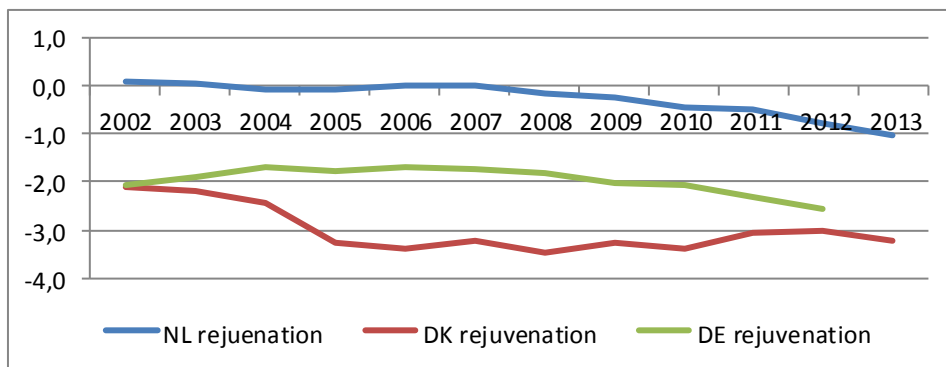


Figure 2-6: Rates of rejuvenation specifically for the Wadden islands compared to national rates (Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies)

The working age population shares are depicted graphically in figure 2-7 (i.e. population of 15-64 as a percentage of the whole population) in the Wadden area in relation to the national share of the working age population; this share is lower than the national in that fewer persons age 15-64 reside in the Wadden area than nationally.

When we examine figure 2-8, (overleaf) we notice the relative shares of the working age population (15-64) specifically for the Wadden islands. Here, Dutch and German shares are falling slowly to reach a lower growth rate than nationally in 2013: by a -1 percentage point for the German Wadden area, and roughly -3 percentage points for the Dutch Wadden area. Figure 2-10 highlights that the relative share for the Danish Wadden islands falls most strikingly from about 1 percentage point below the Danish population working age share in early 2000s, to about -7 percentage points below this national share in 2013.

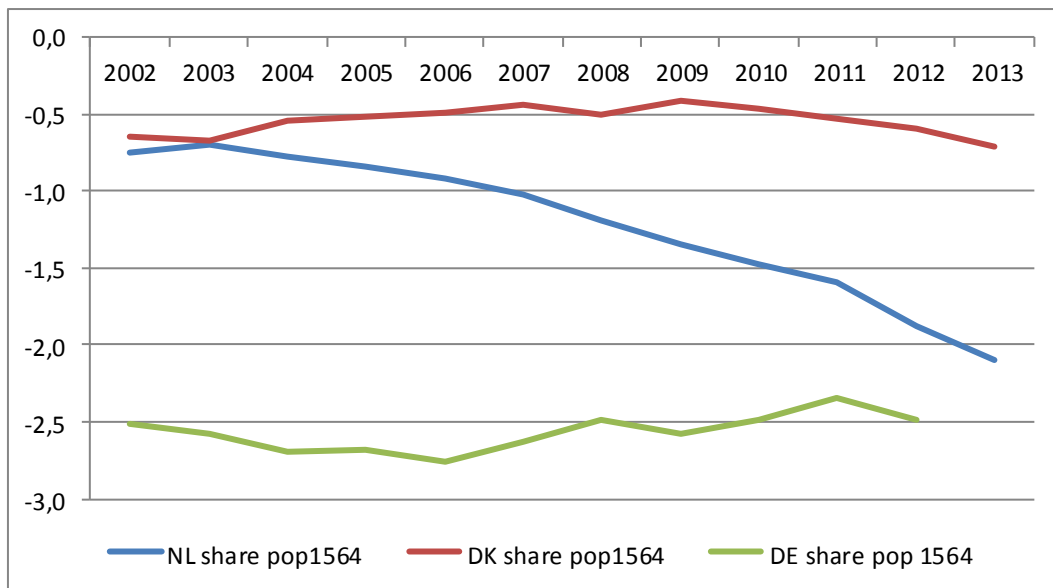


Figure 2-7: Share of population of working age (15-64) in the three Wadden areas (the whole area including mainland and islands), compared to national shares (Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies)

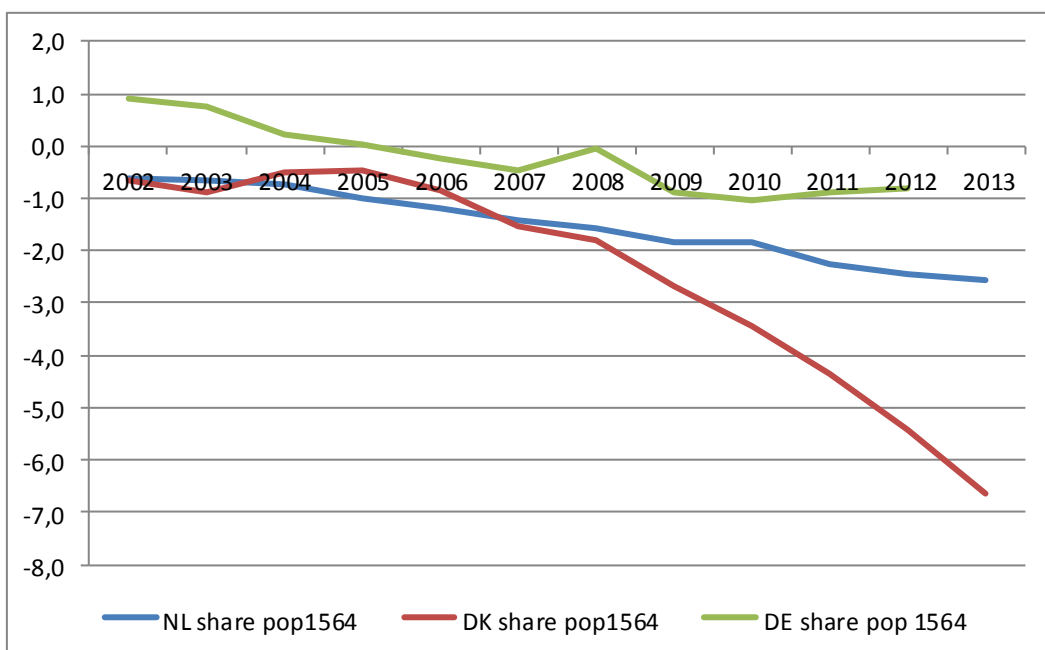


Figure 2-8: Share of population of working age (15-64) specifically on Wadden islands compared to national shares (Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies)

2.5 Migration: German Wadden area outperforms the Dutch and Danish

The next step in our sketch is to give an overview of the population development, both in terms of net migration in the Wadden area and on the Wadden islands.⁷ The

⁷ Again, we choose to analyse population developments at the LAU-2 classification for actual demarcations in accordance with Eurostat. It is noteworthy too, that these data on births, deaths and migration refer to the entire year, not to one specific date (as with population on January 1 in the previous section). Therefore, the reference period stops in 2012.

total of national and international net migration is considered, i.e. the result of both national and international in- and outmigration. In rank of importance, compared to births and deaths, migration appears to play a significant role with regard to the change in population. Moreover, births and deaths hardly have an immediate effect on the working population (i.e. age 15-64), which is also an important measure of viability of an area. In other words, migration may be quite a clear indicator of the attractiveness (or unattractiveness) of an area as a place to live. Bijker and Haartsen (2012) have looked into migration processes to popular and less popular rural areas in the Netherlands. They find that it is often a mixture of housing characteristics, physical qualities of the environment, personal reasons, and low house prices which influence the decision to move to a less popular area (see also Bijker et al., 2012).

To get a feel for the size of the migration flows into and out of the Wadden area, table 2-3 shows the in- and out-migration of the Wadden area in all three countries in 2011. The Dutch and Danish Wadden area witnessed a net migration outflow in 2011 of almost 950 and 470 persons, respectively. The German Wadden area, on the other hand, had a net migration *inflow* of about 870 persons in 2011. Note that the size of the migration flows is about the same in the Netherlands and Denmark, while it is over three times as large for the German Wadden area. What is also clear is that the gross migration flows are much larger than the net result. Recent research by Bijker (2013), suggests that for relatively unpopular areas in terms of the net result of migration, it may be more rewarding to analyse and monitor the gross in-migration in particular. Understanding this in-migration flow may give the best clues for policy making. Such a detailed analysis is not performed here, we turn our attention to the net result of migration in relation to the net national results. Table 2-3 not only shows in- and out-migration for the entire Wadden area (coast plus islands) but also for islands. Where the entire Dutch and Danish Wadden area had more out- than in-migration, the islands all had higher in- than out-migration (with the exception of the Dutch islands which were on balance). Therefore, on the islands the population has increased due to a net inflow of migrants, so it is particularly the Wadden coast on the mainland where people are moving out, and hence the population is in decline.

Table 2-3: Domestic and international in- and out-migration of the Wadden area in the three countries, 2011

	In-migration	Out-migration	Net migration
Dutch Wadden area	9357	10311	-954
German Wadden area	36854	35984	870
Danish Wadden area	9261	9646	-385
Dutch Wadden islands	1081	1081	0
German Wadden islands	2438	2379	59
Danish Wadden islands	105	87	18
Netherlands (x 1000)	380	361	19
Germany (x 1000)	4698	4418	280
Denmark (x 1000)	359	335	24

Source: Eurostat

Figure 2-9 shows the total net migration rates of the three Wadden areas relative to the national migration. Net migration in the Dutch and Danish Wadden areas is below zero and falls slightly between 2002 and 2012. This can be interpreted as low rates of in-migration into these Wadden areas and high rates of out-migration, which is increasing steadily during the past decade. This increase refers to domestic migration rates especially, since international migration into and out of the Wadden areas is limited. Hence, regarding the Netherlands and Denmark, more people move out of the Wadden area towards other areas in these countries than people move into the Wadden area. For the German Wadden area, figure 2-9 tells another story. It shows that relative rates of net in- and outmigration are more in balance with each other, that is, net rates of in-migration of the German Wadden area is more or less the same as the net national immigration rate, and likewise for rates of out-migration. Also we find that international migration rates are larger in Germany than in the other two countries.

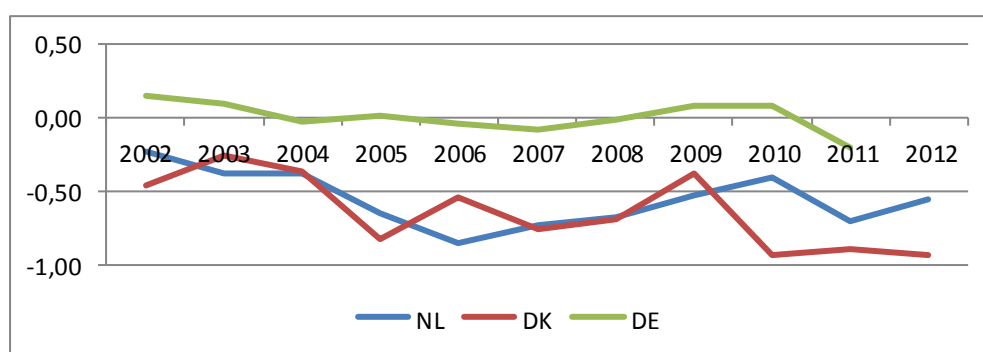


Figure 2-9: Net migration rate (international and domestic) of Wadden area compared to national net migration rate, 2002-2012 (Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies)

Figure 2-10 exhibits the developments of net migration specifically for the Wadden islands for the three countries between 2002 and 2013. We find a negative net migration rate here, as in figure 2-9 for the Netherlands and Denmark. In other words, the total national net migration surpasses that of the Wadden islands, thus yielding negative values. Domestic net migration on the Dutch and German Wadden islands is negative throughout most of the period 2002-2012; more people left the islands to live elsewhere in the Netherlands and Germany than people who moved in from another place. The same situation holds for international migration. For the Danish Wadden islands in figure 2-10, we see basically the same story, even though the island of Fanø still retains some of its positive net migration halfway through the period 2002-2012. Nevertheless, on all the Danish islands we observe a compellingly negative net migration rate that is larger and more volatile than the Dutch and German islands. This volatile nature relates to the fact that the Danish islands are thinly populated, and hence due to the denominator effect, large rates of migration may be observable; whereas the net migration rate is closest to zero for the German islands.

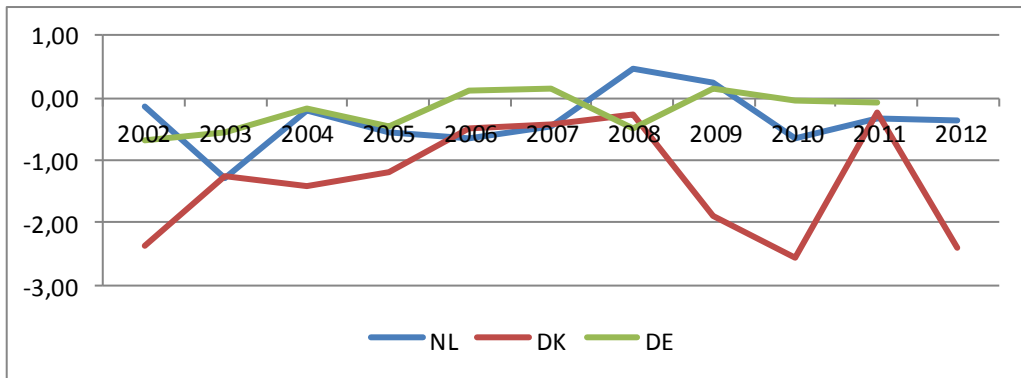


Figure 2-10: Net migration rate (international and domestic) of Wadden islands relative to national net migration rates, 2002-2012 (Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies)

3 EMPLOYMENT AND UNEMPLOYMENT IN THE WADDEN AREA

3.1 Employment growth: mixed performance across the trilateral area

After having examined population and population characteristics in the previous section, we now turn to employment within the Wadden area and on the islands for the period 2002-2011. Levels and changes in employment depend on how employment is defined and in our case two basic definitions are most often cited. First, employment can be defined as the number of employed persons living in an area,⁸ and the second definition of employment corresponds to the number of jobs located in an area.⁹ Despite which employment definition we use, we must still consider employed workers who live in the Wadden area but who occupy a job outside the area, as well as account for jobs located in the area which are occupied by workers living outside the Wadden area. In short, commuting is still an issue here. Moreover, by looking at the municipality level, this implies that Dutch and German employment is at the LAU-2 level, but Danish municipalities (and thus employment therein) are at the LAU-1 level. In this section we only examine employment in terms of actual number of jobs in the Wadden area and the islands. The employment in terms of total employed labour force living in the area can be found in appendix II.

Table 3-1: Jobs in 2011, average annual job growth 2002-2011, share jobs over industries 2011 inclusive of all Wadden areas

		Jobs in 2011 x 1000	Job growth 2002-2011 annual %	Percentage of jobs in 2011 by sector				
				agric.	manuf.	Tourism	edu.	health
NL	Wadden area	103.1	0.8	6,8	10,4	6,2	5,5	13,9
	Wadden islands	12.9	0.8					
	Netherlands	8483.5	1.2	7,7	4,1	25,7	4,8	7,3
DE	Wadden area	249.2	0.7	5,8	18,2	7,8	3,0	14,1
	Wadden islands	24.7	0.0					
	Germany	29134.1	0.5	7,0	2,5	36,5	1,5	11,7
DK	Wadden area	98.9	-0.4	5,6	14,7	3,6	7,3	18,9
	Wadden islands	1.0	-0.7					
	Denmark	2600.0	-1.0	1,3	2,1	11,0	8,8	17,1
				2,7	8,7	3,2	8,4	19,6

Source: LISA (Netherlands), national and regional German statistical agencies, Statistics Denmark

⁸ This corresponds to the definition of the employed labour force, which is determined in the so-called Labour Force Survey (LFS) held in all European countries. In order to better compare between countries, Eurostat publishes a unified definition of the employed labour force for all European countries as number of persons, age 15-64 years, who work at least 1 hour per week. National statistical agencies may apply different definitions. Denmark and Germany use the same definition, but the Netherlands defines employment as number of persons, age 15-64 years of age, who work at least 12 hours per week. Eurostat data are however not available at municipality level, as the LFS is based on a relatively small survey. Hence, small areas (small municipalities) are not adequately filled and data may be missing as a consequence.

⁹ At present, there is no restriction on working hours as with the LFS, but most statistical agencies only count the number of jobs of employees and do not count the self-employed. Self-employed have only recently been registered. Moreover, although this jobs survey is larger than the LFS, observations of jobs by industry in small municipalities are still missing.

Table 3-1 gives an overview of the jobs in 2011 in the entire Wadden area: the Wadden islands and their respective countries, average annual job percentage growth between 2002 and 2011, and share of jobs in a number of industries in 2011. About 1.2% of all jobs in the Netherlands are located in the Wadden area; in the German Wadden area this is a mere 0.8%; but in the Danish Wadden area the job rate rises almost to 4%; this high percentage for Denmark is due to the fact that the Dutch and German areas are defined as (small) LAU-2 areas bordering the Wadden Sea, while the Danish Wadden is defined as the (larger) LAU-1 area. Table 3-1 also displays that the average annual job growth between 2002 and 2011 is positive in the Dutch and German Wadden, where job growth is below national job growth in the Dutch case but higher in the German case. On the islands, job growth is below national job growth in both countries. Conversely, in Denmark and the Danish Wadden, the number of jobs declines between 2002 and 2011, the average annual percentage fall in jobs is largest in Denmark as a whole, but smallest in the Danish Wadden area. Finally, table 3-1 sets out the share of jobs for a selection of industries. The share of jobs in agriculture is smallest in Germany and the German Wadden area, while it is about the same for the Dutch and Danish Wadden. We can, however, observe that manufacturing assumes a relatively large share of jobs in Germany and the German Wadden area, with about 1 in every 5 jobs, and is particularly due to the larger municipalities like Emden, with a manufacturing share in total employment of about 40%. In other sectors, table 3-1 shows that the share of tourist jobs is very high at the Wadden islands, particularly those of the German and Dutch. Jobs in education are also relatively high in the Danish Wadden area, but low on the German side. Approximately 15-20% of jobs are in health care, and only on the Dutch islands is this share significantly lower, at 7,3% (for additional information, see Broersma, 2009 and Broersma and Van Dijk, 2005).

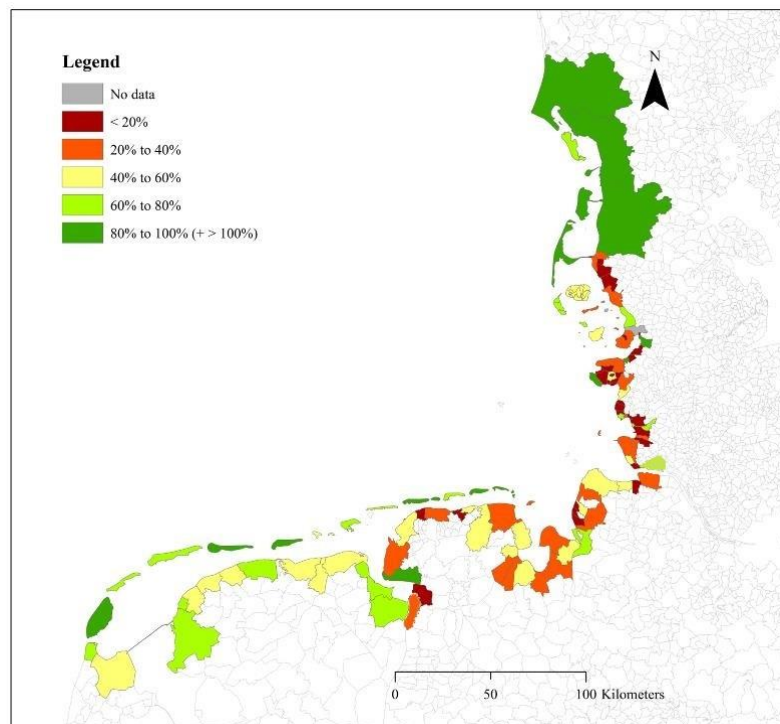


Figure 3-1: Employment function (jobs as percentage of the number of inhabitants – men and women – between 15 and 64 years of age) per municipality, 2011

3.2 Specialisation in the Wadden area: tourism, navy and more

Employment is defined here as the number of jobs located in the municipalities bordering the Wadden Sea and on the Wadden islands. In this case, the regional demarcation in all countries is the same in terms of (municipalities), but in terms of Local Administrative Unit (LAU) it is not, because as mentioned earlier, Danish municipalities are LAU-1 aggregation, and Dutch and German municipalities are LAU-2. The issue of municipal revisions also plays a role: in both Denmark and the Netherlands municipalities have been susceptible to substantial municipal reclassification over the past years. Therefore, in our accounting of the number of Wadden jobs for the Netherlands, we adjust the latest employment data to the 'old' municipal division.¹⁰ In the case of Danish Wadden jobs we simply use the larger LAU-1 municipal classification.

As a first step we examine the share of the number of jobs by industry in the Wadden area, minus the national share of industry jobs in 2011. These figures highlight the dominant industries in the Wadden area (islands) relative to the national, so we are able to distinguish types of jobs which are predominantly located in the Wadden areas and on the islands. Figure 3-2 gives the employment structure of jobs in the three countries' Wadden areas compared to the national structure in 2011. Similarly, figure 3-3 shows the relative employment structure specifically for the Wadden islands of the three countries.

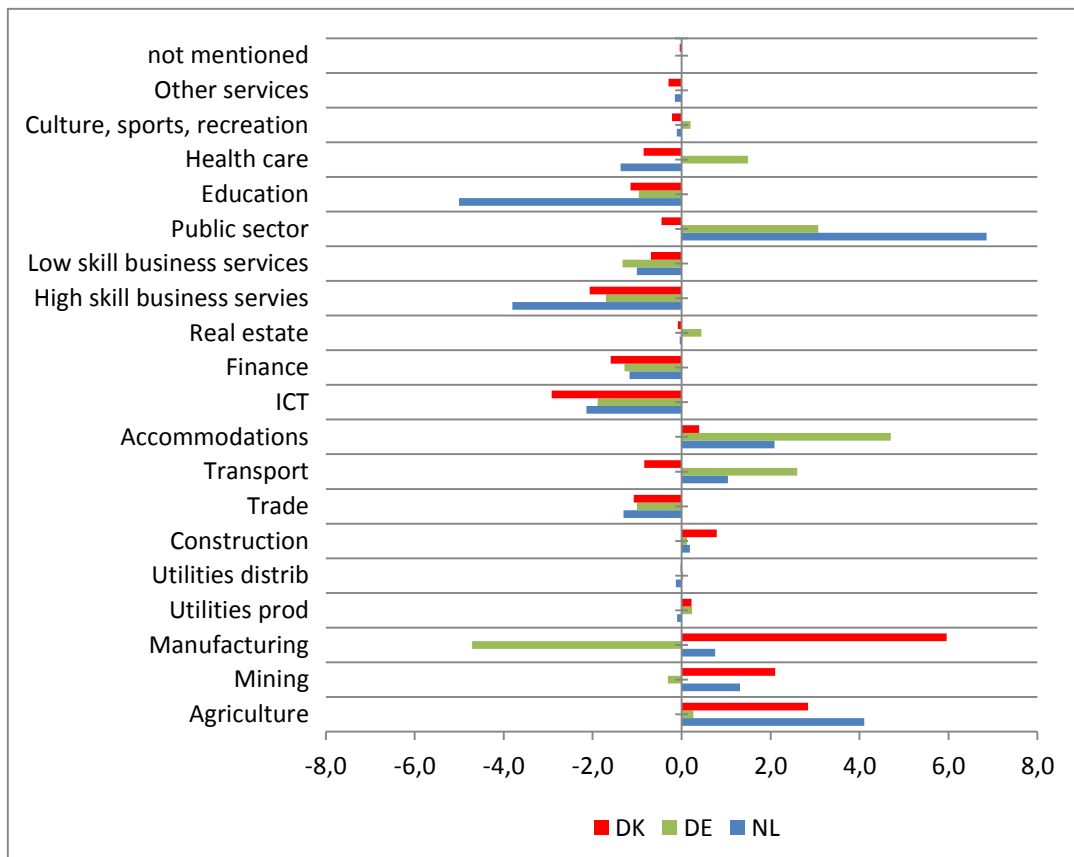


Figure 3-2: Employment structure of jobs in the Wadden area compared to national structure, 2011 (Source: LISA (Netherlands), national and regional German statistical agencies, Statistics Denmark)

¹⁰ Particularly for the Netherlands, in municipalities with only a small area bordering the Wadden area, (i.e. SW Fryslan), the number of jobs has been readjusted to include the number of jobs in close proximity to the Wadden Sea. For this we have calculated the share of jobs in the 'old' municipality close to the Wadden Sea and in the enlarged, new, municipality. This makes it more comparable to the population data. Population data are available at a lower level than municipalities.

Figure 3-2 shows that in the Dutch and Danish Wadden areas agriculture in particular is a sector with relatively many jobs compared to national shares; whereas agriculture in the German Wadden has about the same share as its national counterpart. Another eye catching difference is that, in Germany, relatively few jobs are in manufacturing, but for Denmark this share is much higher than its national share. This finding may in part be related to the fact of relatively large Danish municipalities (at LAU-1).

Figure 3-2 shows that the shares of jobs in commercial and non-commercial services (from 'Trade' and above) are below national shares, apart from some noteworthy exceptions in the Dutch and German Wadden areas: First, jobs in the transport sector in the Wadden area of these two countries is larger than seen in the national numbers; this finding is likely to be due to the numerous jobs in the transport system in the Wadden areas that ferries tourists to and from the various islands. Second, and more pronounced, are the large shares of jobs in the accommodations industry, particularly in the German area. Since the islands are included in this figure, and are known to have a major tourist industry, this also raises the employment share for the entire Wadden area. Most noteworthy, however, is the extremely high share of government sector jobs in the Dutch Wadden area due to the high numbers of defence personnel stationed at the naval base of Den Helder. Similarly, the large number of government sector employees in the German Wadden area is due to a naval base in Wilhelmshaven and navy-related activities in Bremerhaven and Nordholz. If these naval jobs were to be omitted from the Dutch and German data, the government sector would resemble the Danish figure, and thus be below their national shares.

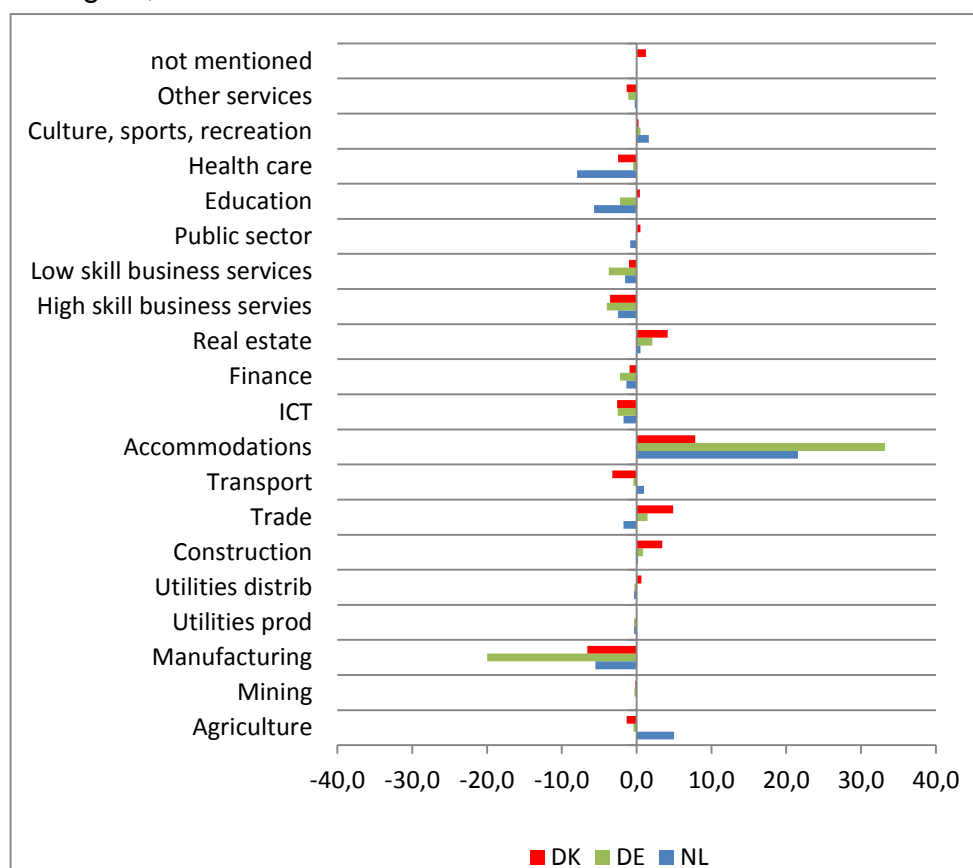


Figure 3-3: Employment structure of jobs on the Wadden islands compared to national structure, 2011 (Source: LISA (Netherlands), national and regional German statistical agencies, Statistics Denmark)

It is not crystal clear as to why the share of jobs in education in figure 3-2 is lower in the Dutch Wadden area compared to the other countries, as corroborated in table 2-3. But it is known that many municipalities in the north of the Dutch Wadden have few inhabitants, consequently the number of secondary and tertiary institutions of education is, as expected, very low there. Many schools in the Dutch Wadden area are concentrated in larger municipalities away from the coast. Given that our Danish employment data are at LAU-1 level the number of schools is largest in Denmark and lowest in Germany.

The employment structure of the Wadden islands in all three countries is set out in figure 3-3. Agriculture still retains importance on the Dutch islands, whereas agriculture in the German Wadden has about the same share as its national counterpart. Manufacturing meanwhile is relatively unimportant on the islands of the three countries in our study, but especially on the German islands. What concerns us most however, is the immense importance of the tourist industry, particularly on the German and Dutch islands. Here, one in every three to five jobs is in the accommodations industry, nearly four times higher than on the Danish islands, which by itself substantially exceeds the national share by almost 10 percentage points. Thus, we can see that the tourism industry, which is very important throughout the Wadden islands, is particularly important on the German and Dutch islands. All five Dutch Wadden islands received about 570.000 (longer¹¹) holidays during 2012 representing approximately 7% of all holidays spent in the Netherlands. The share of holidays spent on the Danish Wadden islands is expected to be much lower than those spent on the Dutch islands;¹² and we find that the share of inhabitants on the Danish Wadden islands for the same period is a mere 0.07% of all national inhabitants during 2012, but was twice as large (0.14%) on the Dutch islands. As far as tourism in the German Wadden area is concerned, the high share of accommodations on the islands is not supported by tourist data for the islands. However, the EU-study in footnote 14 points out that tourism in the entire German Wadden area at NUTS-3 level is relatively high.

3.3 Job growth of the past decade

Figures 3-4 to 3-6 depict the annual percentages of job growth graphically over a 9 year period in the Wadden area, on the Wadden islands, and nationally, respectively, in all three Wadden countries between 2002 and 2011. Here, we no longer depend on changes in definition of industry classifications. Figure 3-4 shows the job growth for the Dutch cases: between 2004 and 2008 national job growth exceeded both the Dutch Wadden area and islands. After 2008, job growth on the Dutch islands remained relatively high until years 2010 and 2011, at which time the current severe recession struck job growth for the Netherlands as rates hovered around zero. The case for job growth in the German Wadden area, the islands, and for Germany as a whole between 2002 and 2011, is depicted in figure 3-5. The employment growth rate in the Wadden area closely resembles national job growth

¹¹ Longer than one weekend.

¹² There is no comparable data for the Danish islands. When we compare it to the number of holidays in the much larger area of south-western Jutland (i.e. bordering the Wadden coast), we count 524.000 holidays in 2012. Although this area is much larger than the Danish islands by themselves, the number of holidays spent there is fewer than those spent only on the Dutch islands, 570.000 in 2012. It is therefore safe to say that holidays spent on the Danish Wadden islands are in fact much smaller than those spent at the Dutch islands. See http://www.northsearegion.eu/files/repository/20130903150857_3-1-3-WaddenSeaBaselinePartIFactsandFiguresFinal20062012.pdf

in Germany as a whole. Growth on the German islands remains within the same range except for a very steep drop in the number of jobs in 2008. Despite the current recession, job growth in the German area is still positive, with a growth rate of about 2 percent in 2011.

Lastly, figure 3-6 provides job growth rates for the Danish areas. Here, we also see that job growth in the Wadden area and Denmark as a whole are similar, just as we have observed in the previous figure for Germany. After 2006 we notice strong (particularly) negative fluctuations in job growth on the Danish Wadden islands; this means that the island of Fanø in relation to jobs is only distinguished for Denmark at the LAU-1 (municipality) level. In fact, it seems from figure 3-6 that the current recession struck the Danish labour market earlier than it affected the other two countries and areas. Denmark had already witnessed three years of job losses in 2011.

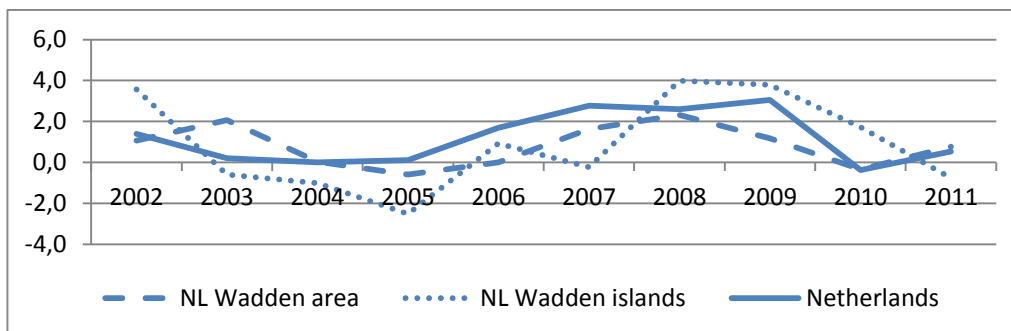


Figure 3-4: Percentage job growth in the three areas of the Netherlands, 2002-2011 (Source: LISA)

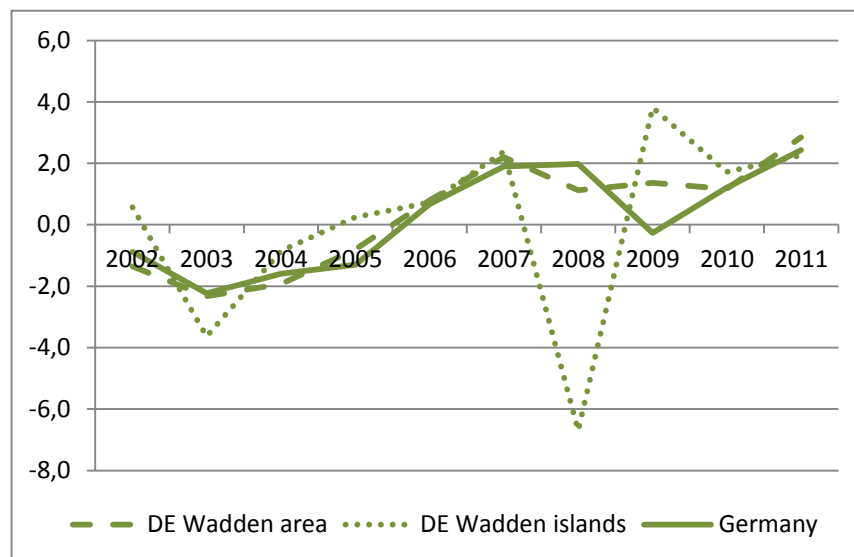


Figure 3-5: Percentage job growth in the three areas of Germany, 2002-2011 (Source: Statistik der Bundesagentur für Arbeit)

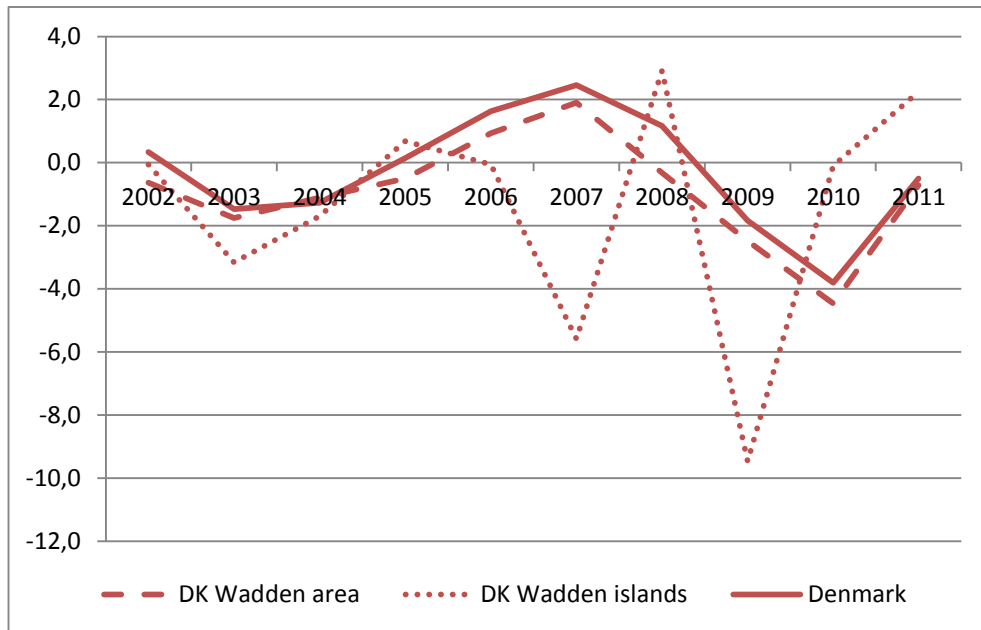


Figure 3-6: Percentage job growth in the three areas of Denmark, 2002-2011 (Source: Statistics Denmark)

Over the period 2002 to 2011 we find a negative average annual job growth rate in the Wadden area and on the Wadden islands relative to national job growth, except for the German Wadden area. Hence, jobs in the Wadden area and on the islands are being created at a slower pace than at national level, indicating a vulnerable labour force over the past decade. (See appendix II). The average annual percentage job growth rates between 2002 and 2011 of the Wadden area and Wadden islands relative to national job growth is graphically set out in figure 3-7. Indeed, job growth was below the national levels, particularly in Danish areas. Only the German Wadden area shows a slightly higher job growth rate than Germany as a whole, thus verifying that the mainland coast of Germany performs relatively well within the Wadden area.

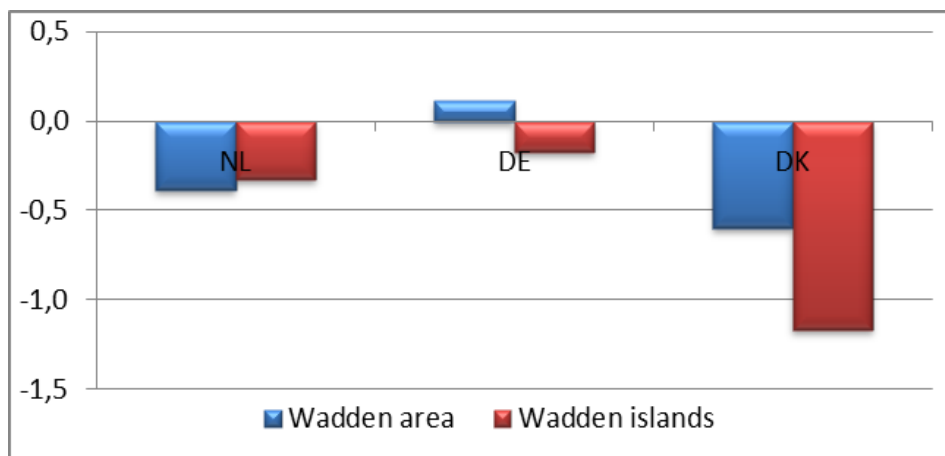


Figure 3-7: Average annual percentage growth rate of employment for the Wadden areas compared to national job growth rates in the three countries, 2002-2011 (Source: Statistics Denmark, UWV (Netherlands), Bundesagentur für Arbeit (Germany))

3.4 Unemployment: weak performance of the Dutch and German mainland coast

Unemployment is defined as the number of persons looking for a job for 1 hour or more per week.¹³ In order to make an adequate comparison between unemployment rates among municipalities and different countries, we have scaled the unemployment data using the population between 15 and 64 years of age.¹⁴ Figure 3-8 provides unemployment rates, i.e. unemployment as a percentage of the population of 15-64 years of age, for the period 2006-2012. A number of differences in figure 3-8 stand out. First, the unemployment rate is highest in Germany, but has a declining growth path starting at nearly 9% in 2006, and falling to less than 6% in 2012. In the Netherlands, conversely, we find a more or less constant unemployment rate at about 5% between 2006 and 2012. In Denmark, the unemployment rate between 2006 and 2012 increased slightly from 4% to almost 5%. We find that, despite the economic crisis, no real sign was apparent in any of the examined countries that unemployment was on the rise. Only recently have quarterly data become available, and it is there that we observe unemployment rising substantially.

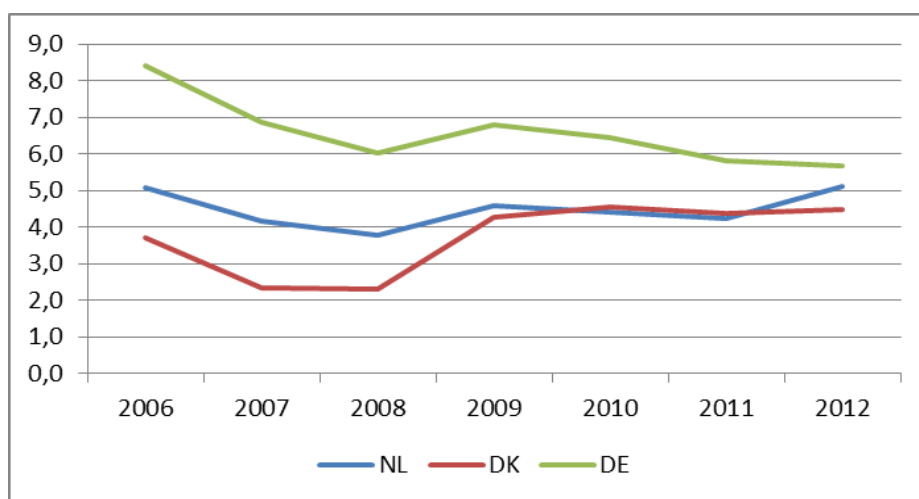


Figure 3-8: Unemployment as percentage of the population age 15-64 in the Netherlands, Germany and Denmark (Source: Statistics Denmark, UWV (Netherlands), national statistical agency Germany)

In the follow up to this paper, we will analyse the unemployment rates of the Wadden area and the Wadden islands relative to the national unemployment rates in order to assess whether these areas have better or worse unemployment rates than national ones. Figure 3-9, with its relative unemployment rates of the various Wadden areas (including the islands), shows that in the Danish Wadden area unemployment is below national, while in the areas of the two other countries, Denmark lies above the national rates. This result again may partly be due to

¹³ Particularly for the Netherlands, this definition differs from that which is most often used there: persons searching for work for at least 12 hours per week. The other two countries have the same definition as the one used here.

¹⁴ The usual scaling factor is the labour force in an area, defined as number of inhabitants between 15-64 years of age having a job or wanting one, and are (actively) searching for a job (for at least 12 hours per week for the Netherlands, and for at least 1 hour per week for Germany and Denmark). This labour force is based on the Labour Force Surveys of each country, which are relatively small; in other words, small areas (i.e. small municipalities) are not adequately filled and thus may be missing. Therefore, instead of labour force, we use population of a working age between 15-64 years as a scale factor for unemployment, since population by age is sufficiently available in small municipalities. In this way unemployment between the three countries can still be compared adequately.

Danish municipalities (at LAU-1) being larger than municipalities (at LAU-2) of the other countries. Furthermore, in the Dutch and Danish Wadden areas, figure 3-9 shows that unemployment rates rise slightly compared to national. Even though the German Wadden area ostensibly has a relatively high unemployment rate, it is as we can observe, on a declining growth path. It is also worth noting that, after 2009/2010, the regional component of unemployment in the Wadden area of all countries, i.e. the regional minus national unemployment rates, began to rise. Hence, the economic crisis has had a stronger negative effect on unemployment in the Wadden area than on the nation as a whole. Surprisingly, figure 3-10 indicates that the regional component of the unemployment rate on all islands in the three countries is negative, i.e. they all have lower unemployment rates than national. On the German islands this is especially the case. Also in figure 3-10 after 2009/2010, this regional component is slowly starting to rise, indicating that the economic crisis had been worse on the islands than it was nationally. This may be caused by the fall in tourism spending.

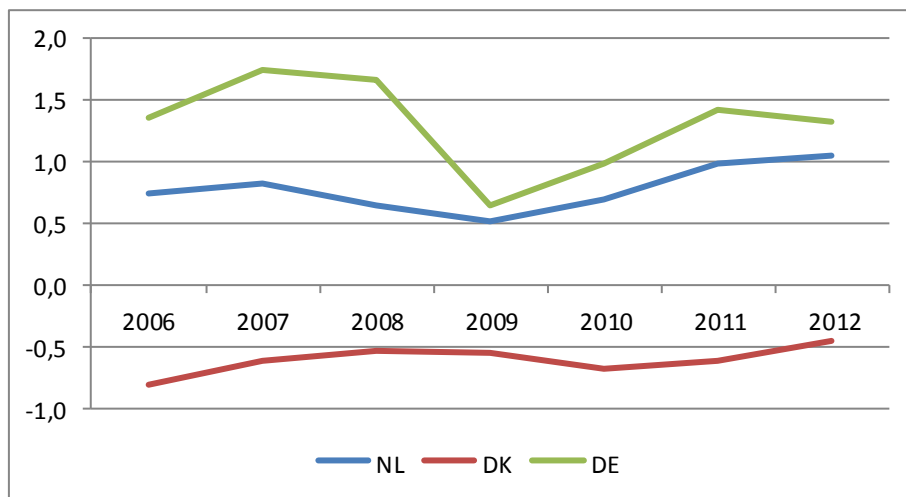


Figure 3-9: Unemployment rates in the Wadden area (including the islands) in the three countries, compared to their respective national unemployment rates (Source: Statistics Denmark, UWV (Netherlands), national statistical agency Germany)

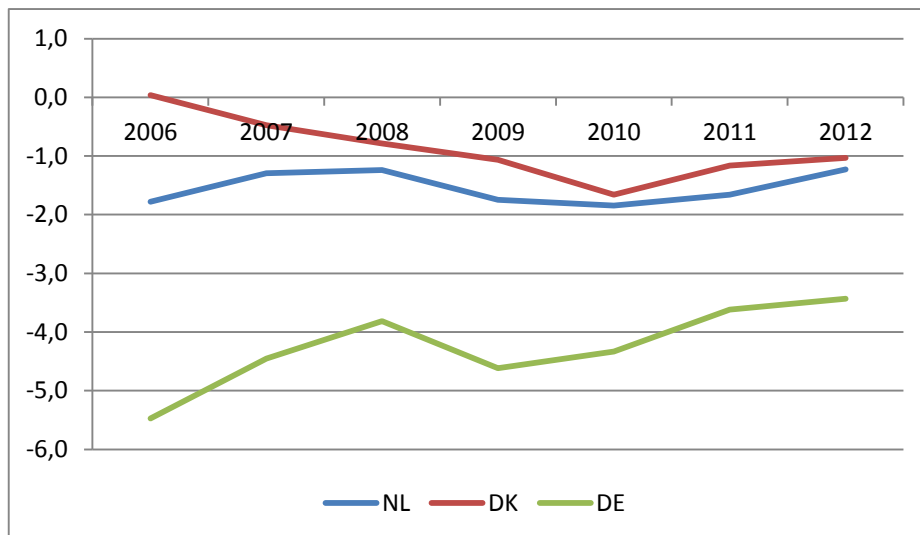


Figure 3-10: Unemployment rates on the Wadden islands of the various countries compared to their respective national unemployment rates (Source: Statistics Denmark, UWV (Netherlands), national statistical agency Germany)

Box 2: Economy – unemployment in Landkreis Schleswig-Holstein

One-third of the unemployed population in Schleswig-Holstein is over 50 years of age, although firms that employ older people receive a wage subsidy for 36 months.

http://www.ndr.de/fernsehen/sendungen/s-h_magazin/media/shmag25865.html

4 ATTRACTIVITY OF NATURAL PLACES IN THE TRILATERAL WADDEN AREA

4.1 Between socio-economics and ecology: the value of nature

The Wadden area must seek a balance between various forms of socio-economic development on the one hand and ecological protection on the other. The tourism sector is of course in between both worlds, in that it is an economic sector closely connected to the ecological and nature values. However, quantification and monitoring of the tourism sector and its activities as such is not that easy trilaterally, since systematic and comparable data on tourism nights for instance are not easy to find. Furthermore, even if these data can be found, it is far from clear as to what the role of the natural environment is for the touristic attractivity (see for example, Mehnen et al., 2013a and Mehnen et al., 2013b). To tackle this (general) problem and provide a straightforward and standardised way to measure the attractivity of natural areas, the University of Groningen, together with the Netherlands Environmental Assessment Agency and Wageningen University have developed the so-called 'Hotspotmonitor' (Sijtsma et al, 2013, Sijtsma et al, 2012a; De Vries et al. 2013). As part of the WaLTER project, and with the support of the Wadden Academy, a trilateral survey using the Hotspotmonitor tool was conducted in Denmark, Germany and the Netherlands. Through the market research bureau GfK and software developer de Ontwikkelfabriek, a spatially spread and representative selection of 7.500 citizens of the three countries was asked to mark their favourite places (Hotspots) on local, regional, national, and world level. The results shone a bright light on the national and international importance of the Wadden area and teased out the differences in appreciation of different parts of the Wadden coast and the Wadden islands. We discuss these results below. This information is certainly valuable in and of itself, and we will give ample attention to this below. However, this information can also be used to further expand on the relation between the ecology and economy of the Wadden area. As an example of the relation to the economy, this chapter presents an analysis of the prices of recreational homes in the Wadden area and its relation to the Hotspotmonitor results.

4.2 The Hotspotmonitor survey for attractive natural areas

The Hotspotmonitor (<http://www.hotspotmonitor.eu/>) is a web-based survey tool which builds on Google maps. The Hotspotmonitor is connected to the SoftGIS approach (Brown and Kyttä, 2014; Kyttä, 2011), the 'value mapping' technique (Raymond and Brown, 2007) and to the trend to integrate the possibilities of GIS in Cost-Benefit-Analysis (see Bateman et al., 2005; Sijtsma et al. 2013). The ongoing aim of the Hotspotmonitor is to gather 'hotspots of landscape experience', places with high attractiveness in general, and attractiveness for specific experiences (peace and quiet, biking, bird watching, etc.). The Hotspotmonitor was designed to measure preferences for places with or related to nature or water and therefore limits respondents' possible answers. The central question for respondents in the Hotspotmonitor is the following:

'Which places do you find very attractive, valuable or important? And why?'

To limit the answers to places related to nature/water, the Hotspotmonitor instructs respondents as follows: 'places may be places both within and outside a city or

village. The only condition is that it should be places with green, or water or nature. You can think of a place in a park, by a lake, at the sea, in the forest, near cows in the meadow, in a tulip field, a place to watch birds, etc. It doesn't matter whether they are places you never visit or if they are places you visit frequently.' The current 2.0 version of the Hotspotmonitor is a first international version to include local, regional, national, and newly worldwide Hotspots; it is available in English, Dutch, Danish, and German. Figure 4-1 shows a screenshot of the Hotspotmonitor at the local level.

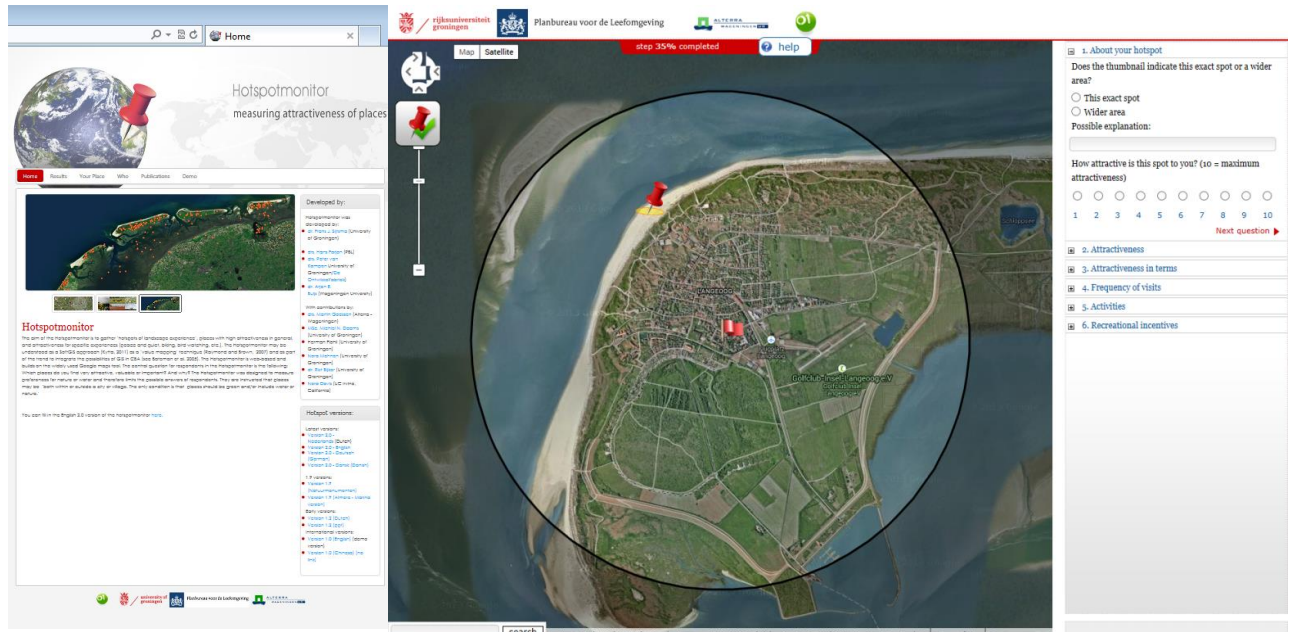


Figure 4-1: Hotspotmonitor 2.0 (international version) (Source: www.hotspotmonitor.eu)

The aim of the Hotspotmonitor research is to:

examine the value and attractiveness of landscapes, or seascapes especially of the Wadden Sea region, based on the judgment of inhabitants in Germany, the Netherlands and Denmark.

The survey was set up to be representative for the three national populations; respondents were therefore invited to participate from across all three countries. A balance was sought between a minimum number of respondents per country, a reflection of the size of the overall population in all three countries, and the available budget. This resulted in about 1.300 respondents from the Netherlands, 5.200 from Germany and 1.000 from Denmark. The respondents were equally spread across the country: about 1/12 from every one of the 12 Dutch provinces, 1/16 from every one of the 16 German Bundesländer, and 1/5 from every one of the 5 Danish regions. Figure 4-2 sets out the distribution pattern of the 7.500 participants over the three countries.

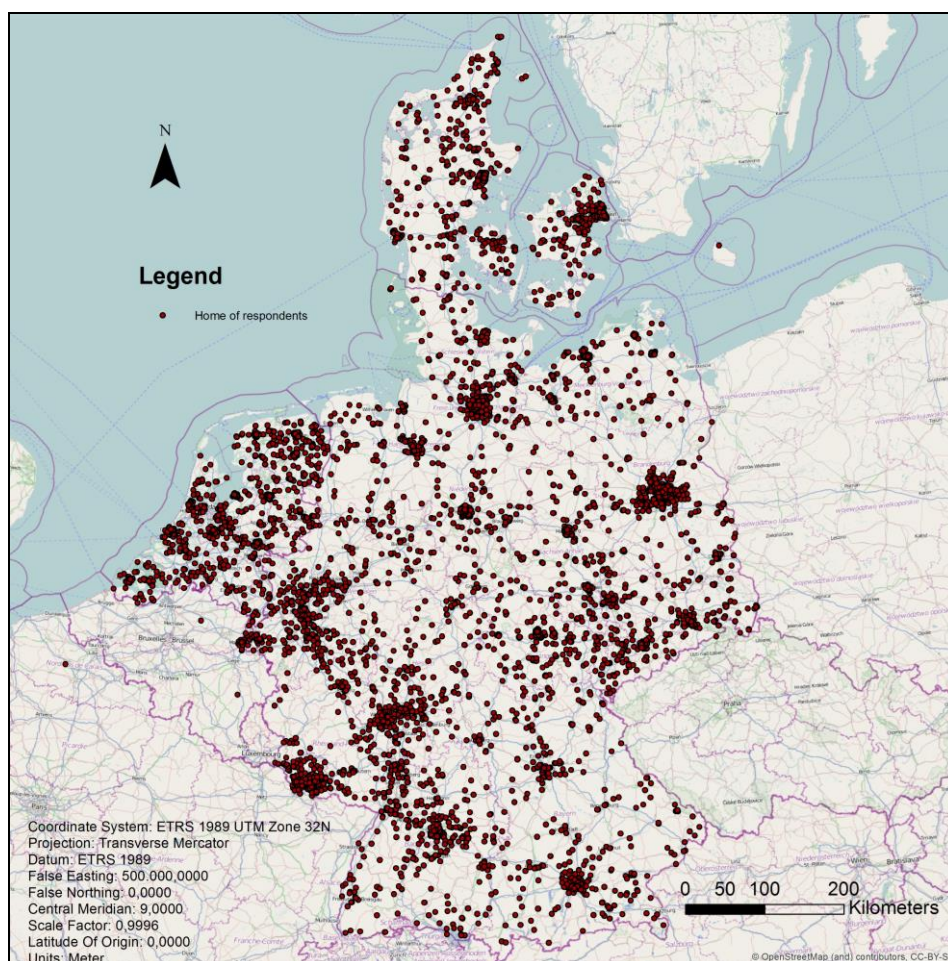


Figure 4-2: Home of participants (n = 7656)

The respondents first had to mark the approximate location of their home and then mark four attractive valuable or important places on an online map. This resulted in the following attractive places being marked from the three countries.

Table 4-1: Number of respondents and markers

Attractive natural places	NL	DE	DK	total
Respondents	1316	5275	1065	7656
Markers	5264	21100	4260	30624

Figure 4-3 verifies that respondents represent all age classes and are equally spread across men and women.

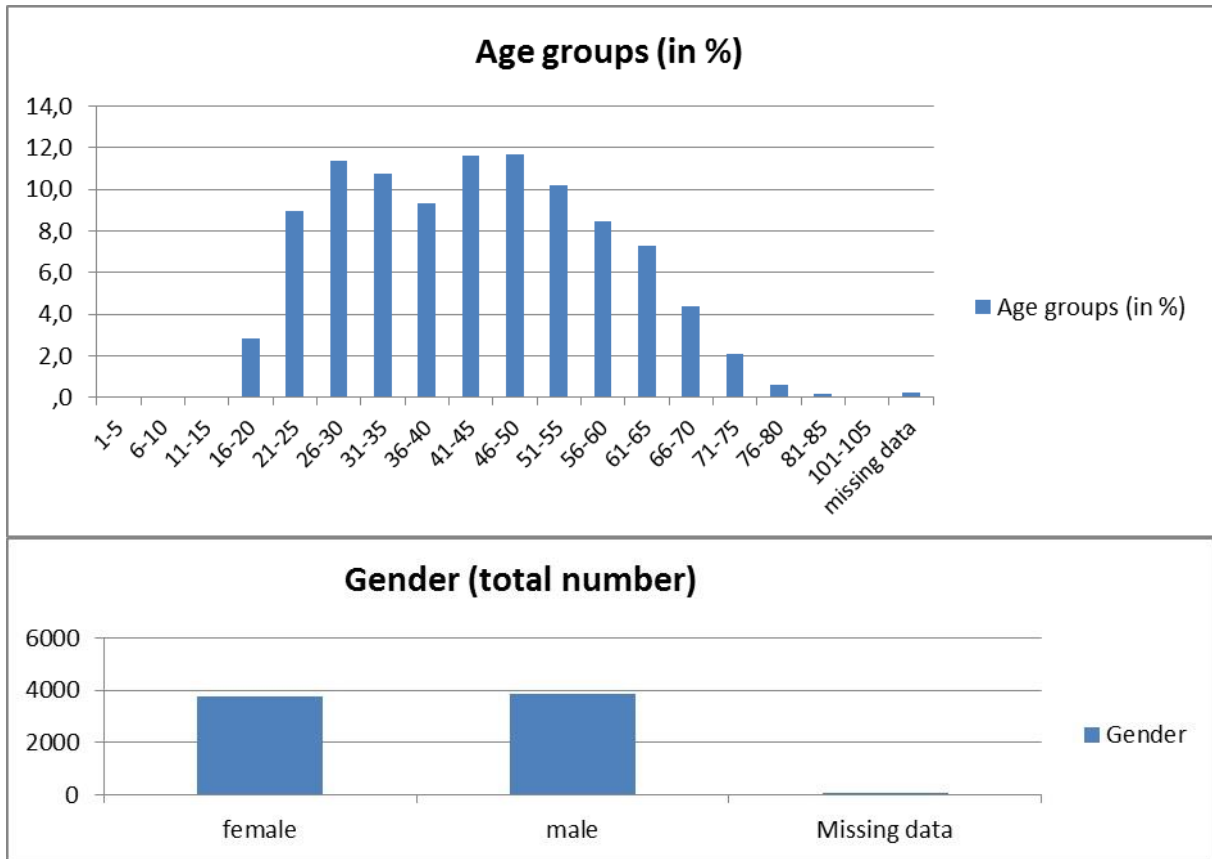


Figure 4-3: Age and gender characteristics of the respondents

4.3 Wadden: a strong Hotspot of natural attractivity in all three countries

The attractive places marked by the respondents in figure 4-4 are at national level. First, as an overview, a map is shown of all three countries. The attractivity of the coast lines is clearly observable and the Wadden area is part of this too.

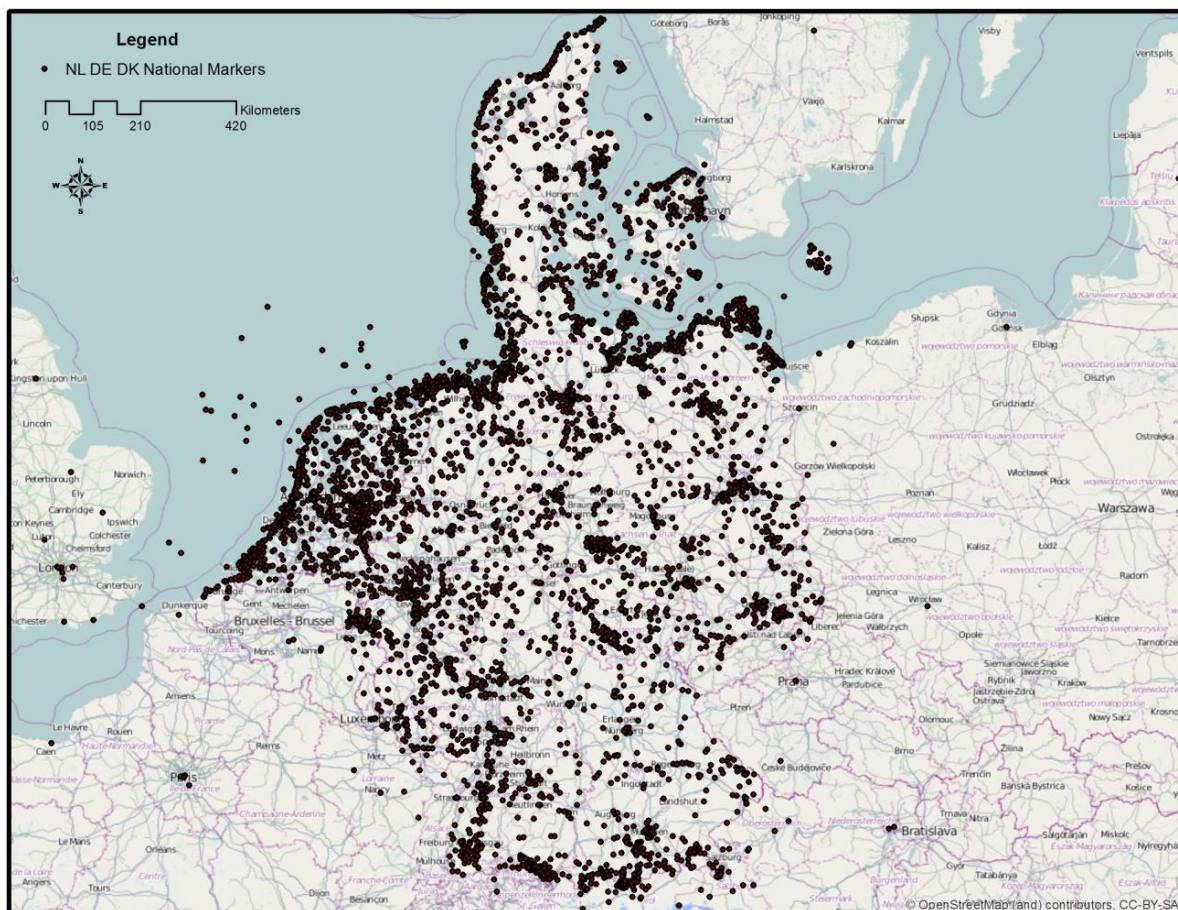


Figure 4-4: National Hotspots of all participants in the Netherlands, Germany and Denmark

The three maps (figures 4-5 to 4-7) zoom in at national level separately for the three countries and show only the markers only inside each respective country. Several respondents, especially from Germany, have marked a place outside the country boundaries, which is technically allowed within the software. For our analysis here we have selected only markers within country borders.

In the Netherlands the coastal areas are highly appreciated and also for instance, the Veluwe and the hilly southern Limburg. In the Wadden area, the Wadden Islands are very heavily marked, while the Wadden Sea also has some markers. At the mainland coast only the area of the Lauwerslake (Dutch: *Lauwersmeer*) is considered as very attractive and valuable as a nature area; the rest is hardly marked.

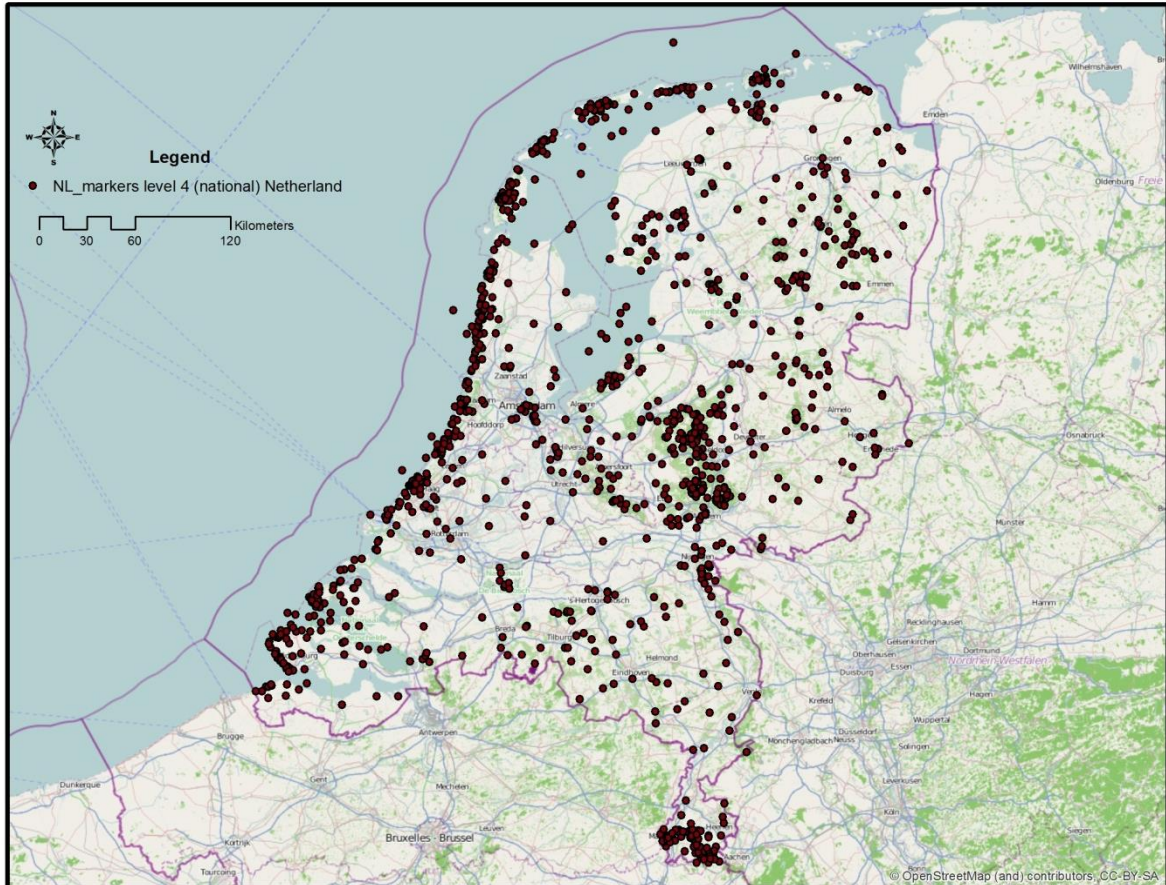


Figure 4-5: National Hotspots of Dutch participants

The German map shows several Hotspots of attractivity. The German respondents highly value the coastal areas, particularly the Baltic Sea coast and the North Sea coast. But the mid-range mountain areas such as the Harz and Thuringian Forest are also deemed as very attractive places. The Alps and the alpine foothills and the area around the Bodensee have a high national importance.

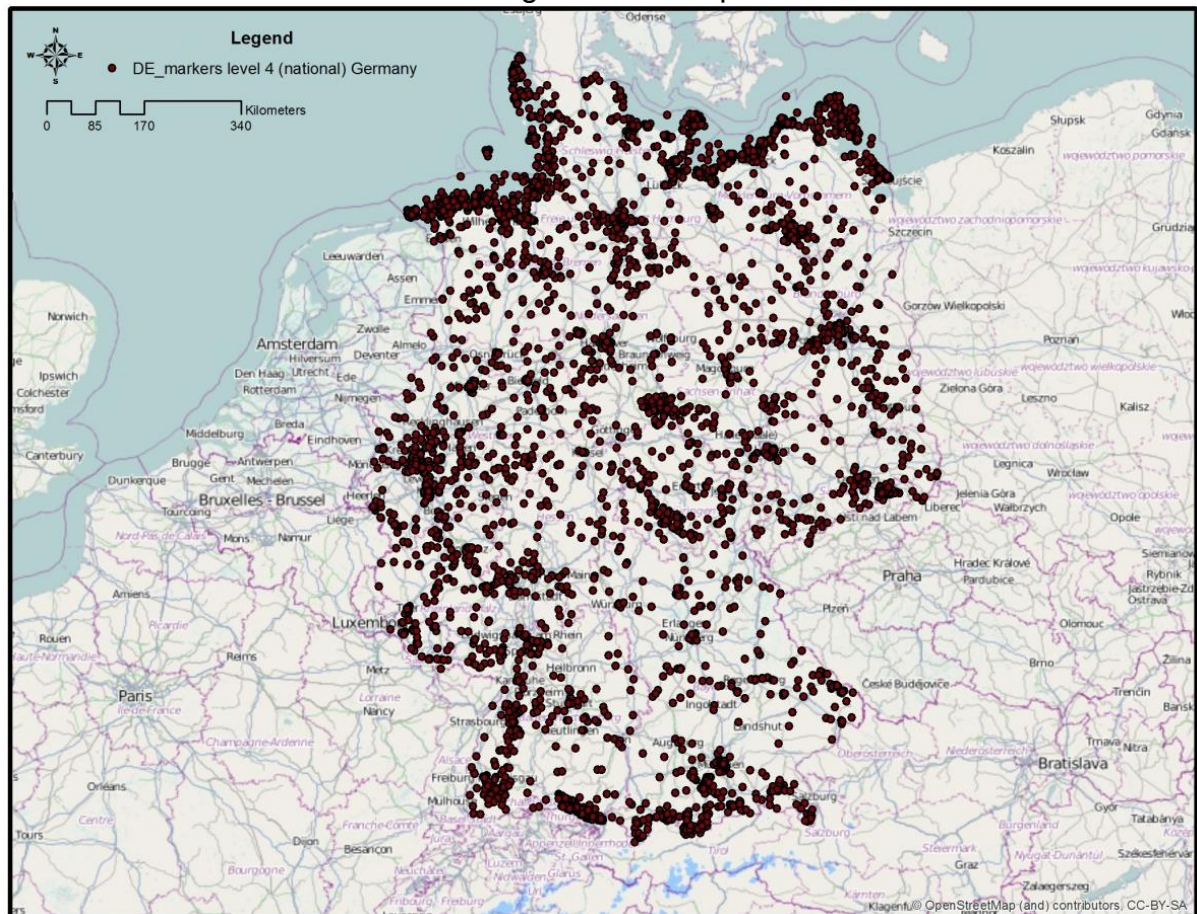


Figure 4-6: National Hotspots of German participants

At national level the whole North Sea Coast of Denmark is of significance for the Danish participants. The nature area to the south of Silkeborg is also highly valued as one of the largest woodlands in Denmark. One can therefore conjecture that, for Denmark, the coastline and the different forests and woodlands are appreciated equally but differently.

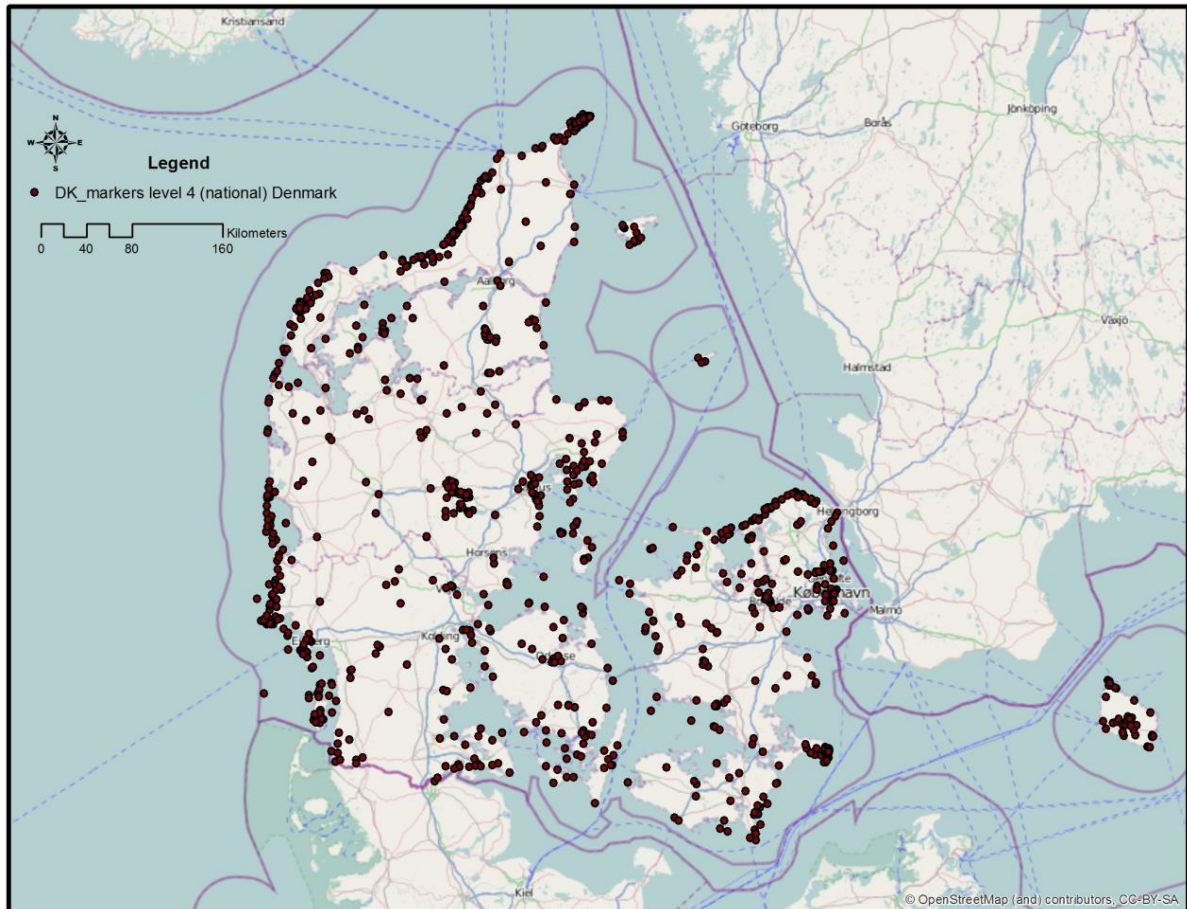


Figure 4-7: National Hotspots of Danish participants

4.4 Strong attractiveness differences especially along Wadden mainland coast

We have observed that the Wadden islands are regarded by respondents as highly attractive throughout the trilateral area. But the Hotspotmonitor also gathers specific descriptions in respondents' own words on the attractiveness of their preferred place(s). A few responses of people who marked the Wadden area have been given by:

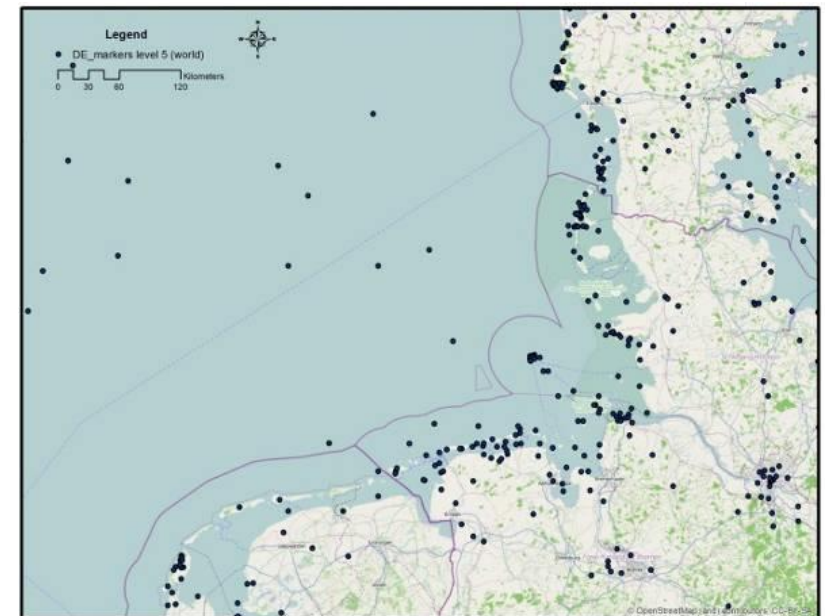
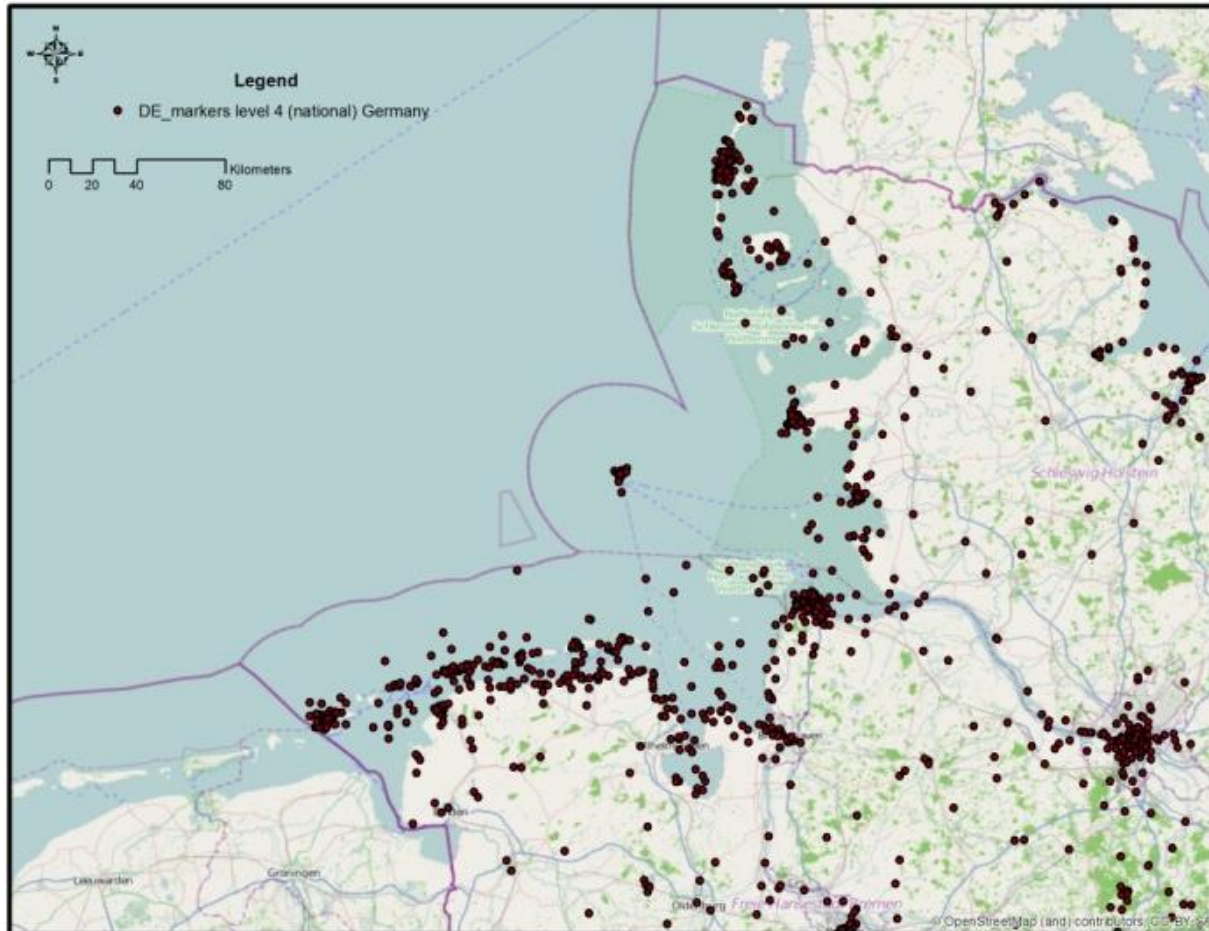
- A 21-25 year old woman (User-ID 500) had placed a marker in the German Wadden Sea near the island Juist. For that marker she stated that she meant a wider area that she visits a few times a year. She has finished her studies at a University of applied science and has no children. She wrote "unique Wadden Sea" (own translation).
- A 41-45 year-old man (User-ID 28) had marked a place on the German Wadden island Sylt and stated that he meant that exact place, which he visits a few times a year. He has a general qualification for University entrance (Abitur). He expressed: "Most beautiful place at the North Sea, Wadden Sea, tide, pure nature" (own translation).
- Another man (User-ID 245) 41-45 years old, with a university degree, with 2 or more children) marked a wider area in the Wadden Sea, which he visits yearly. He likes the whole Wadden Sea, including the landscape and stated "Great air, always pure breath of fresh air, pure recreation" (own translation).
- The respondent with (User-ID 542) is also male and in age group (41-45). He has a University degree and a small child. He marked at national level an actual place in the Wadden Sea and wrote: "Wadden Sea, unique landscape". He visits that place yearly.

With regard to the mainland, the scenery of the coastline of Lower-Saxony is much more appreciated than those of Schleswig-Holstein, the Netherlands and Denmark. This could be due to the long history of seaside resorts along the German East Frisian coast. On both the mainland and the islands, the first seaside resorts opened during the 19th century. Today, small villages and harbour towns in the region continue to attract high numbers of tourists who deeply value the special landscape.

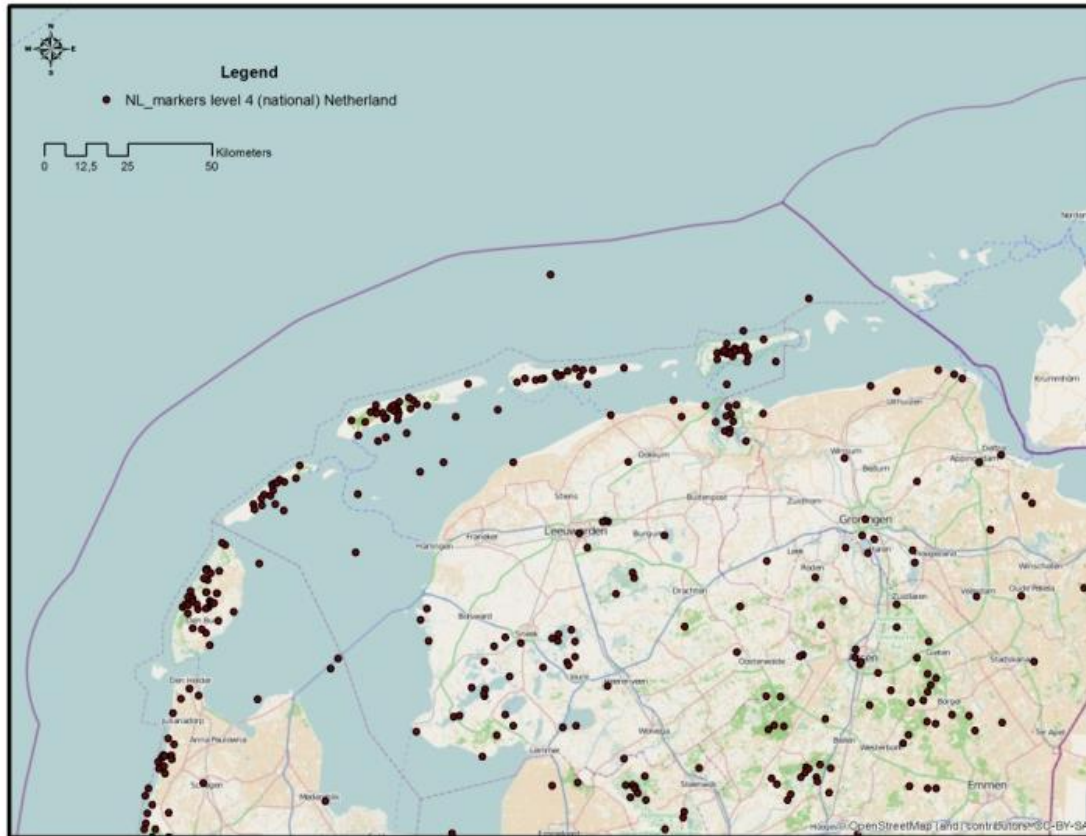
We can zoom in even closer to the Wadden area within the respective countries, starting with Germany.

Figure 4-8: Wadden Hotspots

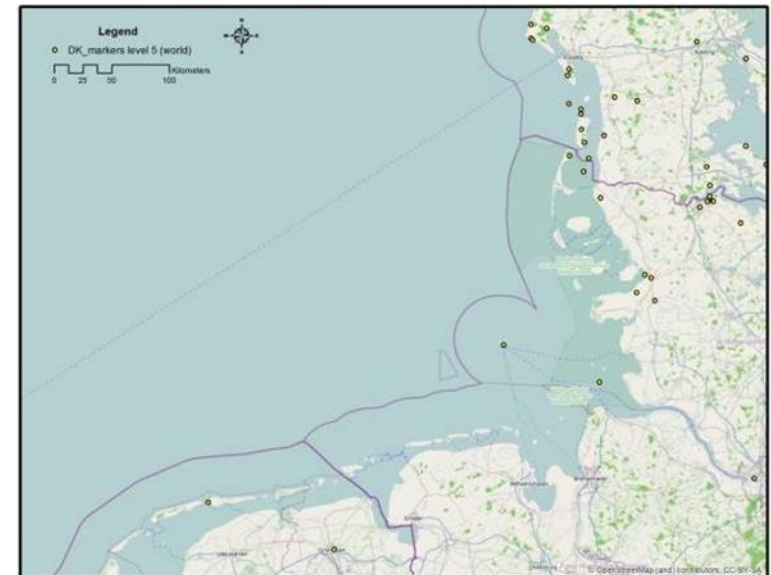
German survey: National level markers (A - left) and World level markers (B - right)



Dutch survey: National level markers (C - left) and world level markers (D - right)



Danish survey: National level markers (E - left) and world level markers (F - right)



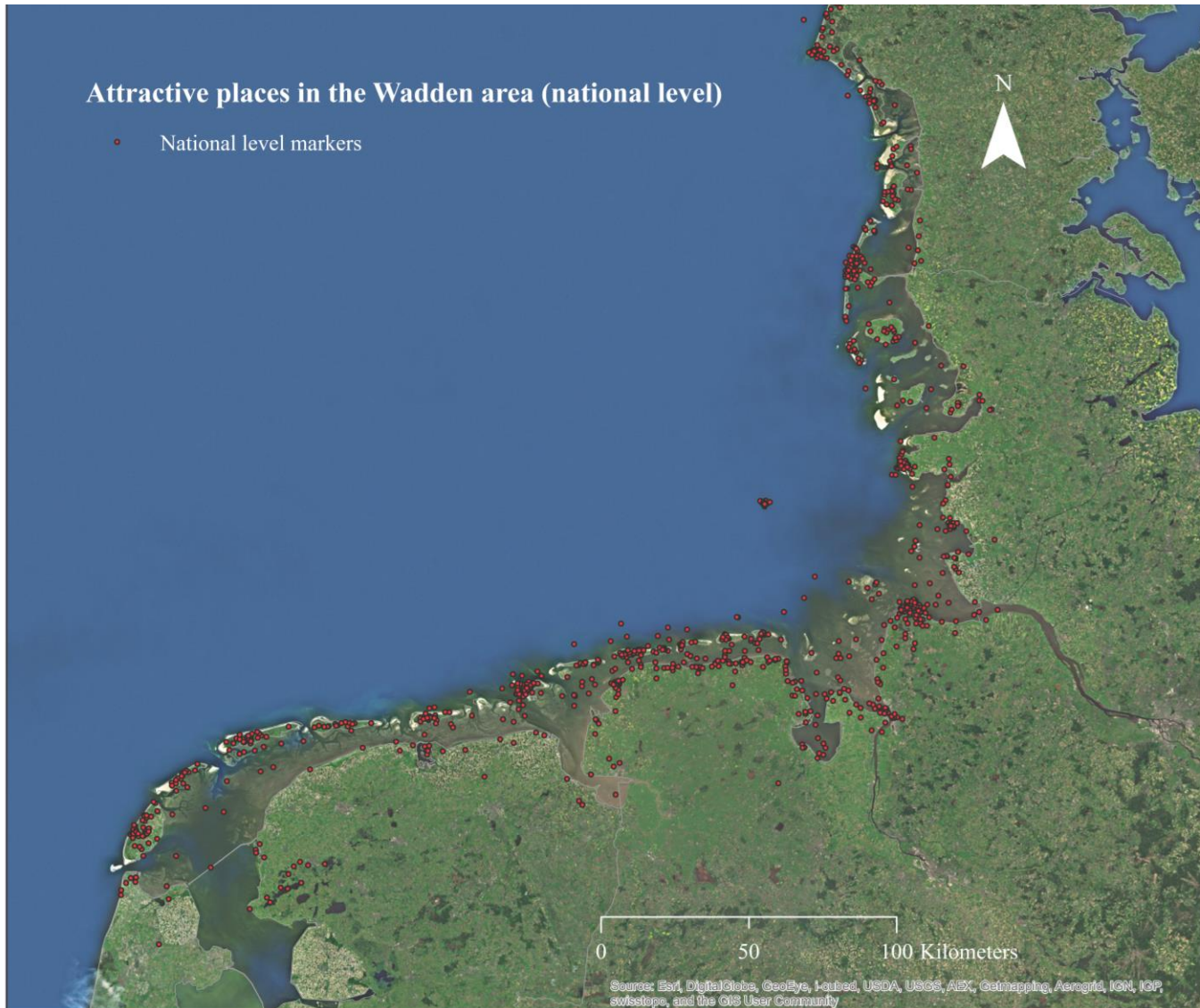


Figure 4-9: National Hotspots of all respondents: The islands are clear Hotspots of attractiveness everywhere

The map in Figure 4-9 gives an overview of results of 'attractive places in the Wadden area' as selected through the survey with the Hotspotmonitor. It shows the combination of Dutch, German and Danish people who have marked natural places indicated by red dots that they find attractive, valuable or important at a national scale. The map confirms that the attractiveness is not evenly spread across the Wadden area; the islands are apparent Hotspots of attractiveness everywhere, but they too differ in intensity. More differentiation is visible at the mainland coast. The Dutch coast is hardly marked, with the exception of the Lauwerslake area. The German coast in Niedersachsen, however, contains many highly appreciated areas. Similar to the mainland Dutch coast, the mainland coast in Schleswig Holstein and Denmark is hardly appreciated.

4.5 Attractivity of the Wadden: strongest across Germany

The dataset also contains the location of the homes of the respondents, so we can also analyse the intensity of appreciation and take note of the areas where respondents live. For this purpose we consider the people who have placed their markers within the Wadden area: either in the sea, on the island or in the mainland coast. Hence, we combine two definitions, the municipalities and parishes as defined in section 1.3 and the Wadden Sea based on the trilateral cooperation area (exact demarcation see Appendix I). For all 12 provinces in the Netherlands, all 16 Länder in Germany and all 5 regions in Denmark, we then calculate how many national markers are placed in the Wadden area, and express it as a percentage of the respondents from that province, land or region. Figure 4-11 shows these results. We can observe that the share of people marking the area near the Wadden area as very attractive and valuable national place is highest: about 30% is recorded for the Dutch provinces Drenthe, Fryslân and Groningen, while in Bremen it rises above 50% (see figure 4-10). The farther away respondents live from the Wadden area, the more the relative appreciation decreases. Nevertheless, when we examine the figure trilaterally, we notice strongly different patterns.

Above all for Germany, we see that the appreciation is much deeper throughout the country than in both the Netherlands and in Denmark. In Germany at the blue national marker map, a strong appreciation is visible in Nordrhein-Westfalen (18,3%), Rheinland-Pfalz (16,9%); and even in Saarland, nearly 500 km away from the Wadden. But 15,1% of respondents still choose a place within the Wadden area as a highly attractive natural location. This is a higher percentage than in the Netherlands in Overijssel (14,2%) at approximately 100 km distance from the Wadden. In Denmark the distance decay is also much stronger than in Germany. This general picture is also shown for the international attractiveness map (see figure 4-9). When Dutch, German and Danish people pinpoint an attractive natural place at the world level, some respondents still place a marker in the Wadden area (linking the urban and the rural: compare Sijtsma et al. 2012b). Again, this attractiveness seems to be stronger – i.e. more visible as distance increases - in Germany than in the other two countries. Several areas in the Netherlands and in Denmark receive 0% attractiveness ratings, but not in Germany: Even in the Bayern attraction is still positive at 1.9%.

4.6 An estimated 14 million ‘fans’ for the trilateral Wadden area

The percentages shown in Figure 4-10 can be used to *estimate* the total amount of Dutch, German and Danish people who find the Wadden area to be an attractive, valuable or important place on a national scale. The percentages in the figures – from the Hotspotmonitor survey – of marks in the Wadden area are applied to the populations of the different provinces, Länder and regions, and summed to national totals and an overall total.

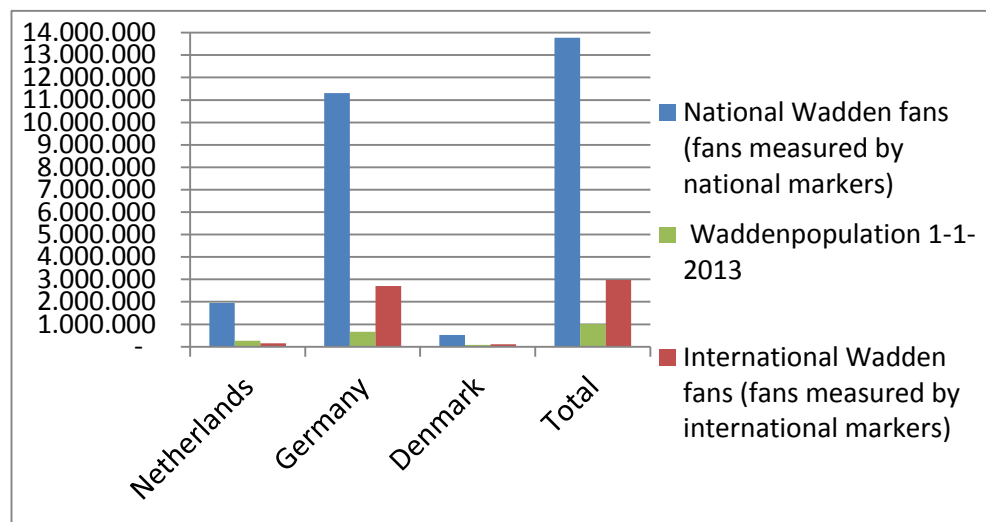


Figure 4-12: The estimated amount of Wadden ‘fans’ in the different countries and the total trilateral Wadden area – compared to the inhabitant population of the Wadden area

As we can notice in figure 4-12, the overall total is 14 million ‘fans’ for the three countries altogether. The figure also estimates the Netherlands as host to some 2

million fans, Germany to over 11 million, and Denmark to around 0,5 million, respectively, 14%, 82%, and 4% of the total number of fans.

From a governance standpoint, it is interesting to compare this to the number of inhabitants of the regions. Since the number of inhabitants in the Wadden area is around 1 million (see also table 2-1), we calculate 14 times more Wadden fans than Wadden inhabitants. In the Netherlands the factor of fans/inhabitants is x7, in Germany x17, while in Denmark we record x7. Therefore, in order to achieve balanced governance involving all stakeholders (Mehnen, 2013) it would be reasonable to connect these 'fans' more closely to the area.¹⁵

4.7 Prices of recreational homes – Sylt is number one

We have thus far discussed the attractivity of the Wadden area as measured by the Hotspotmonitor. At the start of this chapter we explained that this tool has been developed to better understand the links between socio-economics and ecology. In this final section we will explore an aspect of that relationship. The University of Groningen has initiated a research on the market value of recreational homes in the area (Sietses, 2014). The study analysed the list prices and the characteristics of 631 recreational homes as they appeared on:

- Funda (NL) (#212)
- Immowelt (DE) (#167)
- Boliga (DK) (#252)

In Appendix V the list prices and square metre living space are shown for the different sets. In figure 4-12 we focus on the (list) price per square metre, a common indicator in real estate studies. The figure graphically depicts average square metre prices of recreational homes in the Netherlands, Germany and Denmark – averaged separately for the Wadden Islands and the mainland coast area. Prices at the German islands are highest: nearly 6000 Euro per m², compared to nearly 4000 at the Dutch Islands, and 2600 at the Danish islands. Prices at the mainland coast are lowest in Germany, even lower than at the Danish and Dutch coast.

¹⁵ In an ongoing research project of the University of Groningen entitled 'Sympathy for the commons' web-based experiments are set up to achieve this aim for different nature areas.

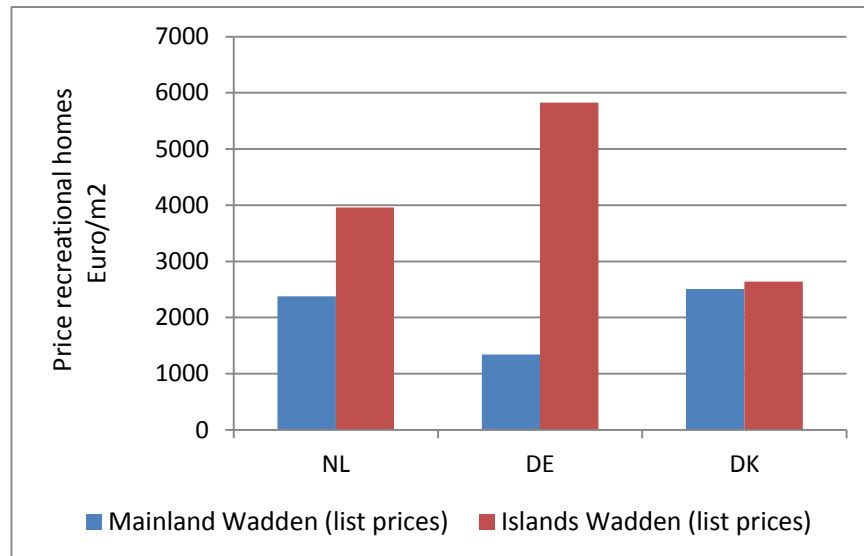


Figure 4-13: Average square metre prices of recreational homes in the Netherlands, Germany and Denmark – averaged separately for the Islands and the mainland coast area.

A series of maps, Figures 4-14 to 4-17, is set out below which plot average price/m² for the different administrative units at the locations of recreational homes. We also show Hotspot markers on these maps, and a clear relation can be seen: high densities of Hotspot markers are connected to high real estate prices; low densities correspond to low real estate prices.

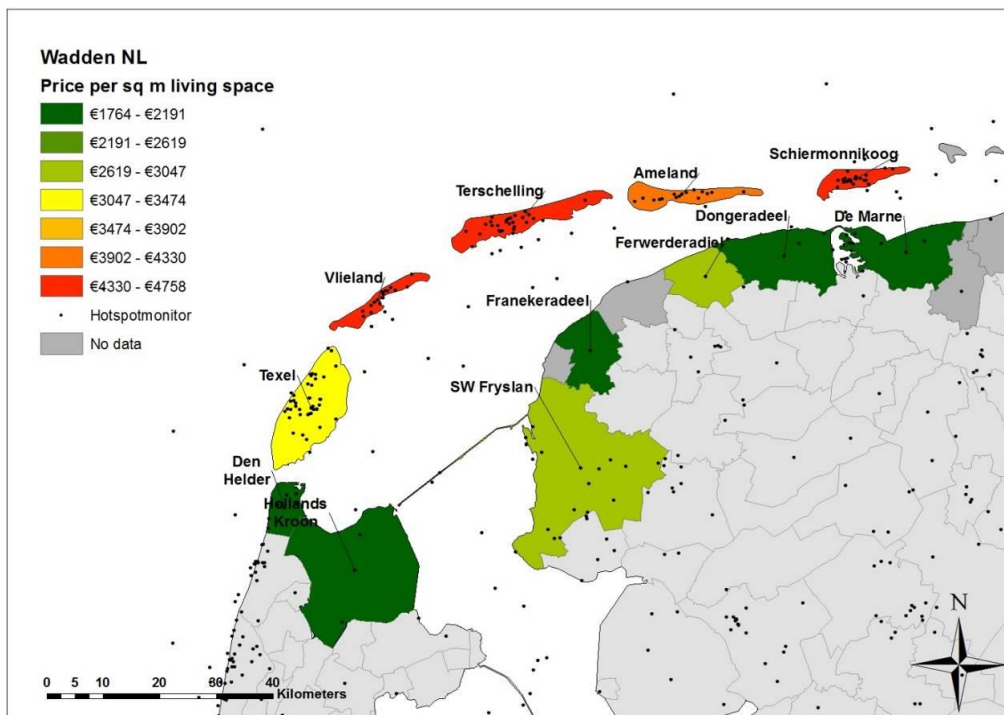


Figure 4-14: Average square metre prices of recreational homes in the Netherlands combined with (national level) Hotspot markers

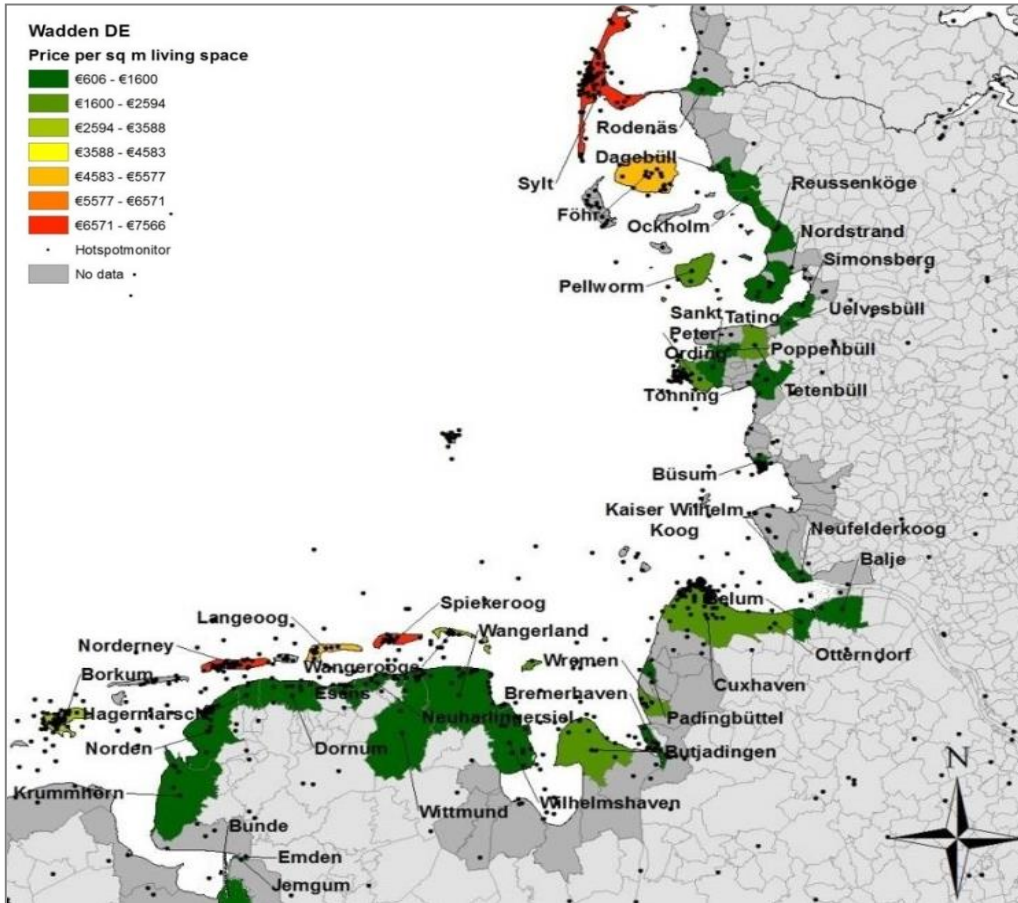


Figure 4-15: Average square meter prices of recreational homes in Germany combined with (national level) Hotspot markers

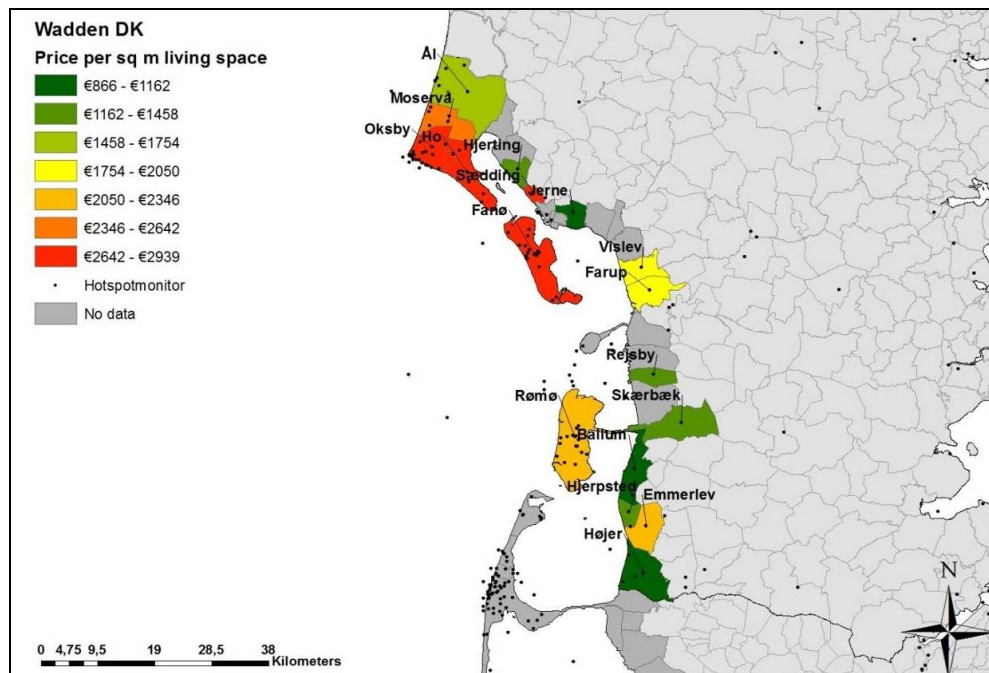


Figure 4-16: Average square meter prices of recreational homes in Denmark combined with (national level) Hotspot markers

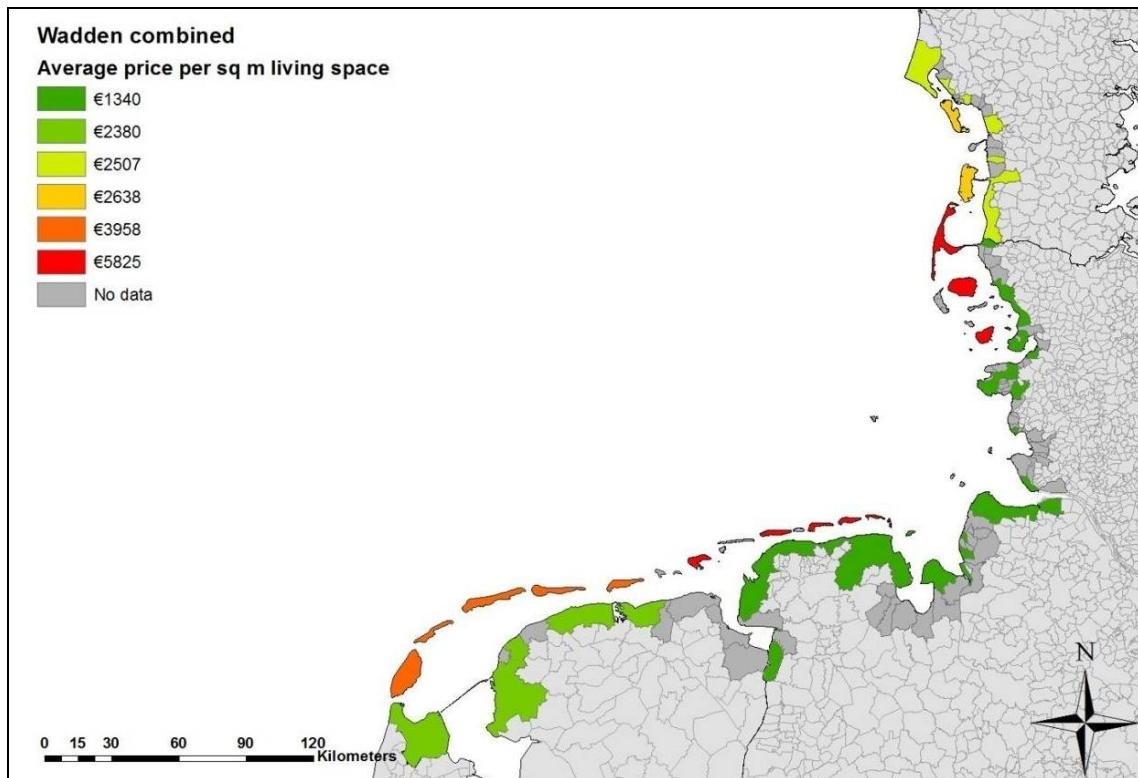


Figure 4-17: Average square meter prices of recreational homes in the international Wadden area (NL, DE & DK)

The maps above illustrate the spatial patterns of recreational housing prices. A clear relation is often found with the Hotspotmonitor data: at the locations where the natural surroundings are marked intensely as attractive or valuable, at these locations the recreational house prices expressed as a price per m² is highest; showing the value of the real estate price as an indicator. However, this monitoring variable of price per square metre also has strong limitations. One may for instance wonder why the Niedersachsen mainland coast shows relatively low prices compared to other mainland coastal areas, but has been deemed highly popular by the Hotspot markers. The implication here is that the price of recreational homes is not merely dependent on the natural attractiveness of its surroundings. We suggest that price is also dependent on spatial policy, on institutional housing market characteristics (e.g. ease of financing, tax rates), and on supply and demand factors. We find too, that these factors all differ per country. More in-depth analysis is needed in order to adjust for many of these aspects.

Here only an initial step is taken. We compare the list prices of recreational homes with an *indicator* for the 'average price level in the housing market' of the respective countries. Using data from Hána et al. (2013), we show the price per m² of newly built homes in the different countries and in their capital cities (Amsterdam, Berlin and Copenhagen). This comparison is not quite 'pure' because not only are all existing recreational homes in a different category than newly built family homes, but there is also a difference between the list prices of recreational homes and the transaction prices of newly built homes. However, our comparison can serve as a first try to better understand country differences.

Figure 4-18 shows that the average absolute price level in Germany is much lower than in Denmark and the Netherlands. But Wadden area price levels are higher everywhere. The Wadden mainland coast is mostly slightly above the country average. However, one can also see that the price level at the Wadden islands is

higher than the price levels in all three country capitals. Once again, the German Wadden islands perform extremely well. For further verification of their performance, price levels of newly built homes in a selection of two major European cities: London and Paris are also given. As we saw for Germany in figure 4-15, the Wadden island of Sylt has a price level of around 7000 Euro per m²: a figure well below Inner London but higher than Outer London; and a figure nicely in-between central Paris and the Paris region.

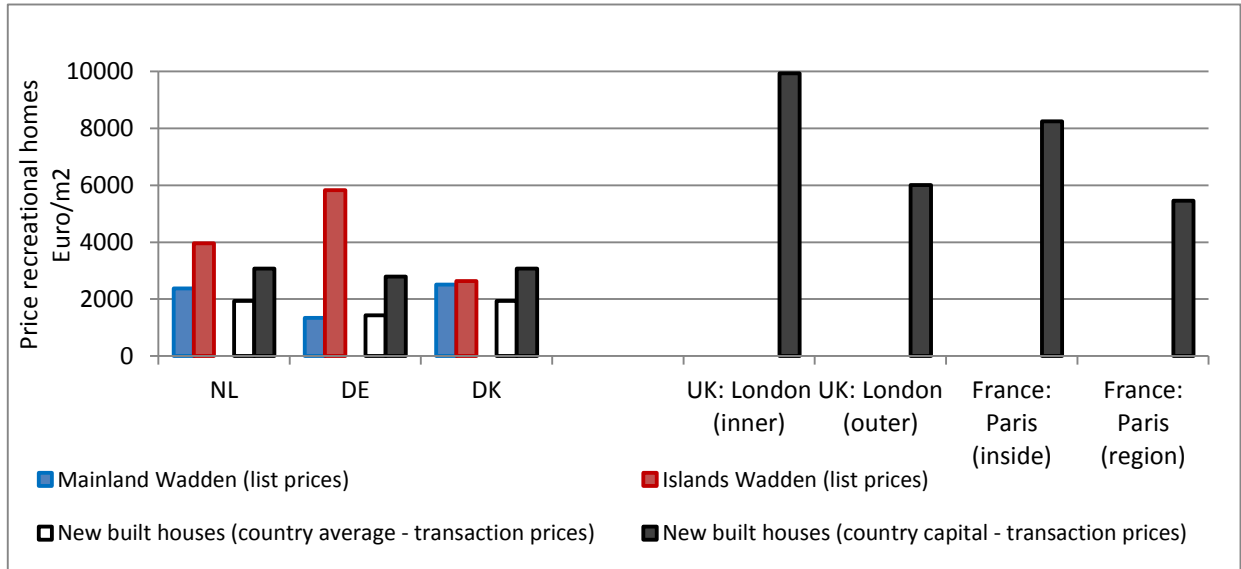


Figure 4-18: Average square meter (list) prices of recreational homes in the Wadden area (Islands and mainland coast) of the Netherlands, Germany and Denmark compared to the average newly built regular (transaction) house price for the different countries and the average in the country's capital. For comparison data are also shown for London (newly built) and Paris (older dwellings) (Source: Hána et al., 2013; Sietses, 2014)

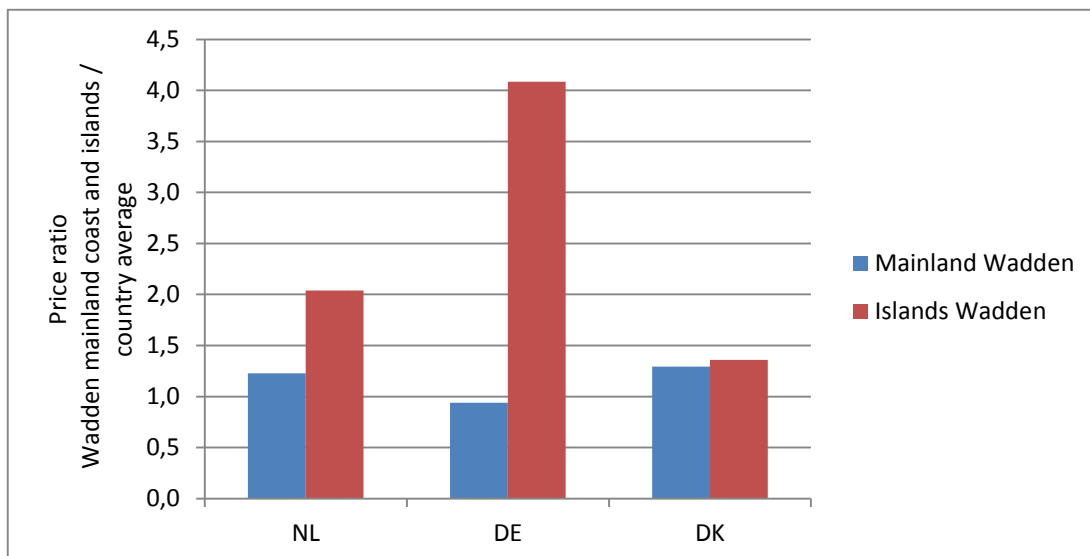


Figure 4-19: Ratio of average square meter (list) prices of recreational homes in the Wadden area (Islands and mainland coast) of the Netherlands, Germany and Denmark and the average newly built regular (transaction) house price for the different countries (Source: see figure 4-18)

Lastly, figure 4-19 shows the ratio of Wadden prices (recreational homes) and the country average (for newly built homes). The Wadden mainland coast is mostly at or slightly above the country average (ratio 1 to 1,2). However it also shown that the price level at the Wadden islands is much higher than average levels for all three countries, except Denmark. Here again, the figure shows that the German Wadden islands perform extremely well.

5 DISCUSSION AND CONCLUSIONS

5.1 Main findings

In this report we have focused on a spatially narrow definition of the Wadden area and performed a basic socio-economic analysis. Four major issues were analysed: population, employment, natural attractiveness of the Wadden, and recreational housing prices.

- We found a population in the Wadden area of around 1 million inhabitants showing a declining trend of -0,3% per year over the last decade (see Table 2-1). We recorded an increase of elderly people and a decrease of all others. For migration the German mainland coast outperforms both the Netherlands and Denmark.
- Employment growth shows a mixed performance across the trilateral area, Denmark especially has performed rather weakly. Along the coast many areas record low employment (figure 3-1). In the Wadden area as a whole manufacturing takes a bigger share of employment than tourism (table 3-1). The Wadden islands certainly have a large share of tourism jobs, and in several coastal cities the navy is a large employer.
- The Wadden area is a strong Hotspot of natural attractivity in all three countries, and highly appreciated for its natural beauty (figure 4-9). The islands are deemed very attractive everywhere, but strong differences occur along the Wadden mainland coast (figure 4-8 A to F and figures 4-5 until 4-7). The attractivity of the Wadden is strongest across Germany; even in the most southern parts of Germany a substantial group of respondents have marked the Wadden area as an attractive, valuable or important natural place (figure 4-10). In the three countries together, we have estimated around 14 million fans of the Wadden area (figure 4-11). The Netherlands are estimated to host about 2 million fans, Germany over 11 million and Denmark around 0,5 million. If we compare number of fans with number of inhabitants (nearly 1 million), we count 14 times more Wadden fans than Wadden inhabitants. In the Netherlands the factor of fans/inhabitants is x7, in Germany x17, while in Denmark we record x7.
- A clear relation is visible in our analytical comparison of Hotspots between natural attractiveness and square meter prices. The Wadden Islands show higher prices of recreational homes than the mainland coast everywhere, but the difference is modest in Denmark. The German Wadden Islands especially show very high prices – comparable to metropolitan square meter prices of the Paris region and outer London.

5.2 Policy issues: paradoxical attractivity and local versus (inter)national policy perspective

- From a policy perspective the Wadden area is somewhat paradoxical; it is clearly an extremely attractive area on a national (and international) scale due to its natural beauty, and this is also reflected in tourism jobs and (recreational) housing prices. However, in terms of local population and local employment, the region's performance is modest to weak: its attractivity to

people and the creation of jobs is far from strong. Only the islands have an economy dominated by tourism. But even when we consider the very narrowly defined Wadden region of this report, tourism employment at the coast is relatively modest. Whereas at the mainland coast of the Netherlands, Germany and Denmark, the manufacturing sector is stronger than tourism. Here lies a clue to the paradox: the area is very attractive (to tourists) but tourism simply does not generate sufficient numbers of (local) jobs (Sijtsma et al. 2012a). Local employment driven policy may attempt to reverse the decline in population and employment. The region may seek to attract new business and maintain existing ones. However, as a relatively unpopular location for many activities compared to other agglomerations, and due to its being tied to nationwide labour standards on minimum wage etc., the Wadden area may have difficulty developing a niche to attract visitors and inhabitants nearby densely built-up cities. Using a relative competitive advantage of (environmental) space policy makers may try to host activities which face greater environmental restrictions in the more agglomerated regions. From this perspective it may come as no surprise that for instance, the Dutch Wadden coastal area has recently witnessed the arrival of large windmills, a waste burning plant in Harlingen, and a coal-fired power plant in Eemshaven.

- From a national and international standpoint, local employment and local population development may not be an important policy concern, since the major urban agglomerations represent the measure of national performance. However, at national and internationally scale, the natural attractiveness of the Wadden area is a major (national) contributor to citizen well-being. Moreover, the natural beauty and value of the area is acknowledged by a considerable number of 'fans': 14 million people in the three countries.
- The tension between the local focus on (hard) employment needs and the national focus on the (softer) appreciation is not a theoretical dilemma. It is a real governance challenge, which is reflected in for instance, the fierce debate surrounding the coal fired power plant proposal in Eemshaven. Locally, this is a huge investment in a harbour and region that has performed weakly for decades. However, the touristic sector is heavily against the power plant. Local tourism entrepreneurs from a.o. at the island of Borkum strongly protest fearing a serious drop in attractiveness for tourists, or put another way, for some of the 14 million 'fans'. Nevertheless, from a governance perspective, it would be interesting to reconsider the so-called mere local character of the protests to ask why no governance structure exists to account for 14 million people. The Sympathy for the Commons project of the University of Groningen aims to set up online communities in order to instigate further direct involvement.
- Thinking through this dilemma of a region that has great attractiveness based on natural amenities but a relatively weak competitive position in competing economically with other regions, one may think of new policy strategies that combine the natural attractiveness with more employment. Given the region's already strong position in attracting/keeping elderly people it seems that a combination of recreation with elderly care (in line with the German 'Kurorte' tradition) might have strong potential.

5.3 Monitoring lessons

- In this report we have defined the Wadden area in a spatially narrow sense in which focus has been placed on the municipalities directly bordering the Wadden area. In our view this is a necessary perspective towards understanding the Wadden area, although one may of course discuss its exact operationalisation. We maintain that it is of great importance to have important socio-economic data readily available and regularly assessed. Furthermore, it seems logical to connect this type of work with the Trilateral Monitoring and Assessment Programme. However, the socio-economic reality of the Wadden area also involves many linkages to a much wider area. It will be crucial to work with a combined multi-scale monitoring of the area, from LAU 2 level to NUTS 1.
- Given the findings of our study here on the performance of the Wadden, it seems essential to assess the quality of the links between the narrowly defined Wadden area and the wider region(s) and countries. The Hotspotmonitor research discussed in this work can assist with such monitoring and we recommend that this type of research be conducted on a regular basis.
- But there are more pressing issues in need of this type of monitoring. The first is liveability monitoring. Which elements in the Wadden area are pull and keep factors for migrants and inhabitants? And where do people work, go to school, purchase goods and services and how do they evaluate these (sometimes relatively large) distances? In the WaLTER project an international pilot is being set up to realize a PPGIS tool that allows this type of monitoring which includes an interactive panel of local residents. Members of panels can then assess and discuss various liveability issues relating to this monitoring.
- In terms of the wider economy, value chain monitoring of economic activity across the Wadden area is imperative. Where do resources for the economic activities derive from? To which markets are products sold? Where are key players located in the value chain (e.g. head offices): are they within or outside the Wadden area? Are the main competitors local, regional or (inter)national? Within the WaLTER project a pilot project will be performed to determine how to set up this type of monitoring process. The pilot project will also include, as with the liveability monitoring, a panel of entrepreneurs reflecting on business climate and other issues in relation to this monitoring.

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- Population on 1 January by broad age groups and sex - NUTS 3 regions [demo_r_pjanaggr3] AGE From 15 to 64 years

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Figures and pictures

Pictures on cover page: Sijtsma

Figure 1-1: The Wadden Sea – Source: Common Wadden Sea Secretariat (www.waddensea-secretariat.org) and Turnhout et al., 2008

Figure 1-3 (Appendix I): The broader Wadden Sea Region – Source: Common Wadden Sea Secretariat (www.waddensea-secretariat.org) & Wadden Sea Forum (www.waddensea-forum.org)

Pictures on rear page: Mehnen

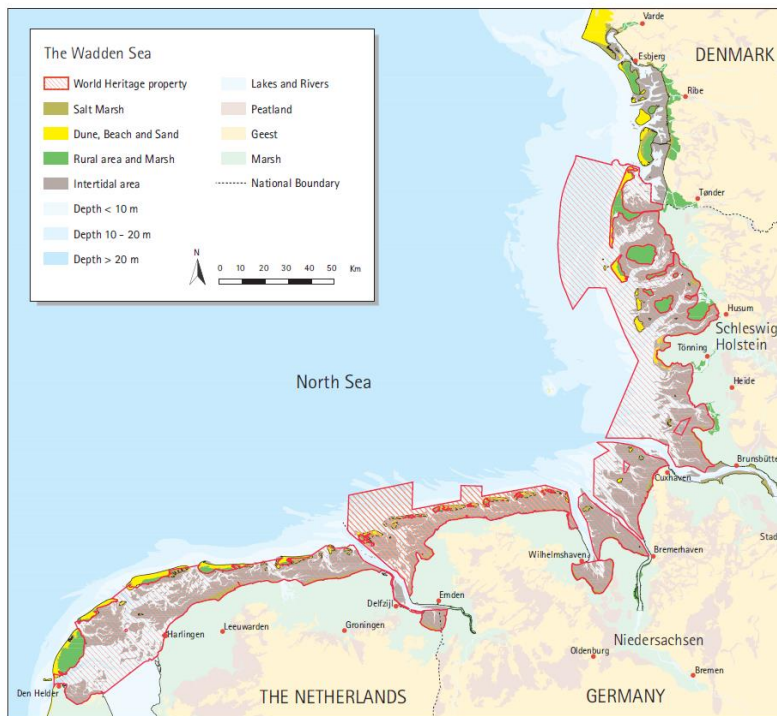


Figure 1-2: UNESCO World Heritage site
 (Source: http://whc.unesco.org/en/list/1314/multiple=1&unique_number=1866)

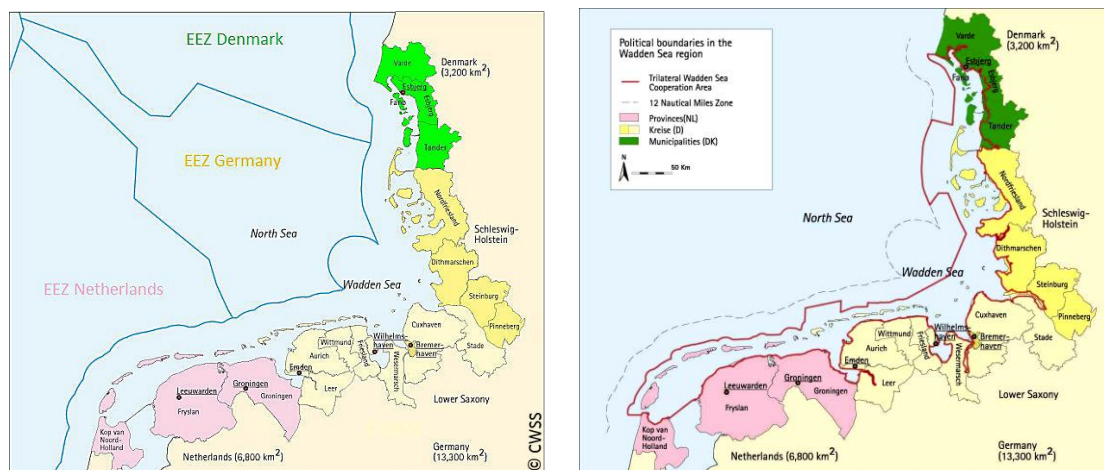


Figure 1-3: The Wadden Sea region demarcation used by the Common Wadden Sea Secretariat

Existing socio-economic monitoring systems and programs

The most important international socio-economic monitoring system is known as the Trilateral Monitoring and Assessment Program (TMAP). Other interesting national or regional examples include the Dutch Monitor Fryslân, and the German Database and Map program for the municipalities of Lower Saxony or socio-economic monitoring program SÖM Watt.

International socio-economic monitoring systems

The socio-economic Trilateral Monitoring and Assessment Program (TMAP) focuses on the trilateral Wadden Sea region and gathers data predominantly on biodiversity. The aim of the TMAP is to provide a scientific assessment of the status and development of the

Wadden Sea ecosystem and assess the status of implementation of the trilateral targets of the Wadden Sea Plan. Under human use parameters, the common package lists fishery, recreational activities, agriculture, and coastal protection. Under the topic 'Recreational Activities' three criteria are recorded as boats at sea, number of guided tours, and civil air traffic.

The sustainability Indicator tool for the Wadden Sea region was developed by the Wadden Sea Forum (WSF) with regard to preserving, maintaining and fostering development in the Wadden Sea Region (<http://www.waddensea-forum.org/Specialissues/Indicator-tool1.html>). The WSF has assessed data from 2003-2010 in accordance with the sustainability of the Wadden Sea region. A set of about 33 indicators on a multi-level system provides data on developments/changes since 2003 with regard to e.g. demography, labour market, economic resilience, tourism, air quality, etc. All indicators are valid and comparable on a trilateral scale, allowing us to develop a unique assessment of sustainability in the entire Wadden Sea Region. The WSF has also developed a planning portal (http://gis.eucc-d.de/waddengis_mapfish/index.htm), which focuses on existing and partially planned activities in coastal and off-shore areas. This so-called WaddenGIS contains a wide range of uses, facilities and protection demands.

Another important reference is the European Atlas of the Seas (http://ec.europa.eu/maritimeaffairs/atlas/maritime_atlas/).

National, regional and local socio-economic monitoring systems

The socio-economic monitoring program (SÖM Watt) detects changes and trends in population structure and economy within the German national park region of Schleswig-Holstein, optimising visitor information, visitor guidance, care of visitors, and protection of sensitive areas. SÖM Watt takes into account the interests of the inhabitants and visitors to the region in order to improve acceptance for the implementation of protection measures for the national park.

The Dutch Monitor Fryslân (<http://www.monitorfryslan.nl/>) is a digital database with actual statistical data and numbers referring to Fryslân and the Frisian municipalities. Figures, tables and maps are available and visualise current trends and developments. The data comes from Frisian and national sources. The Monitor Fryslân is funded by the province of Friesland and was developed by Partoer, a Dutch bureau and the Institute for Social Economic Issues in Friesland, the Netherlands. Its major themes are population, economy, work and income, demographic changes (youth and aging), and housing.

The German Database and Map program for the municipalities of Lower Saxony (<http://www.nls.niedersachsen.de/Applet/Prognose/start.htm>) appear in the form of interactive maps with different indicators at the municipality level. Data on public budgets, forecasting of population development, demographics, employment, housing development, business and income, and income tax can be obtained.

Appendix II: Productivity growth in NUTS-3 Wadden areas

In the report we analysed the Waddenregion using a narrow spatial definition. Above we noted that really a multi-scale analysis is needed. In this appendix we will discuss one indicator on a higher spatial scale. Output, i.e. regional GDP and employment, i.e. number of hours worked, are examined in this section in order to determine a measure of labour productivity, viz. GDP per hour worked. For a better comparison, we look at the percentage growth rate in regional GDP per hour worked relative to national growth in GDP per hour. Figure 2-1 presents the average annual labour productivity growth rates between 2007 and 2010 of the NUTS-3 regions bordering the Wadden coast, minus national productivity growth rates. In fact, this is the smallest regional demarcation for which it is possible to calculate regional labour productivity. Assuming that regional and national GDP price deflators are the same implies that regional – relative to national – productivity growth will be in constant prices.

In the NUTS-3 calculation generally, the Wadden regions have shown lower productivity growth than their respective national levels; regional minus national productivity growth on average was negative. Dutch and Danish Wadden regions all showed lower productivity growth than their national growth levels. Only two German Wadden regions clearly indicated productivity growth rates strongly ahead of Germany as a whole, i.e. Emden and Wesermarsch.¹⁶ The other German regions had productivity growth rates at or below the national rate. This measure of regional labour productivity growth gives an indication of regional competitiveness compared to national, as productivity growth corresponds to factors such as schooling, capital intensity and innovation. In figure 2-1 one can notice that these indicators of the Wadden area are lower than at national levels. So in general terms, the Wadden area in all countries can be seen as less competitive, less highly skilled, and less innovative than at national levels.

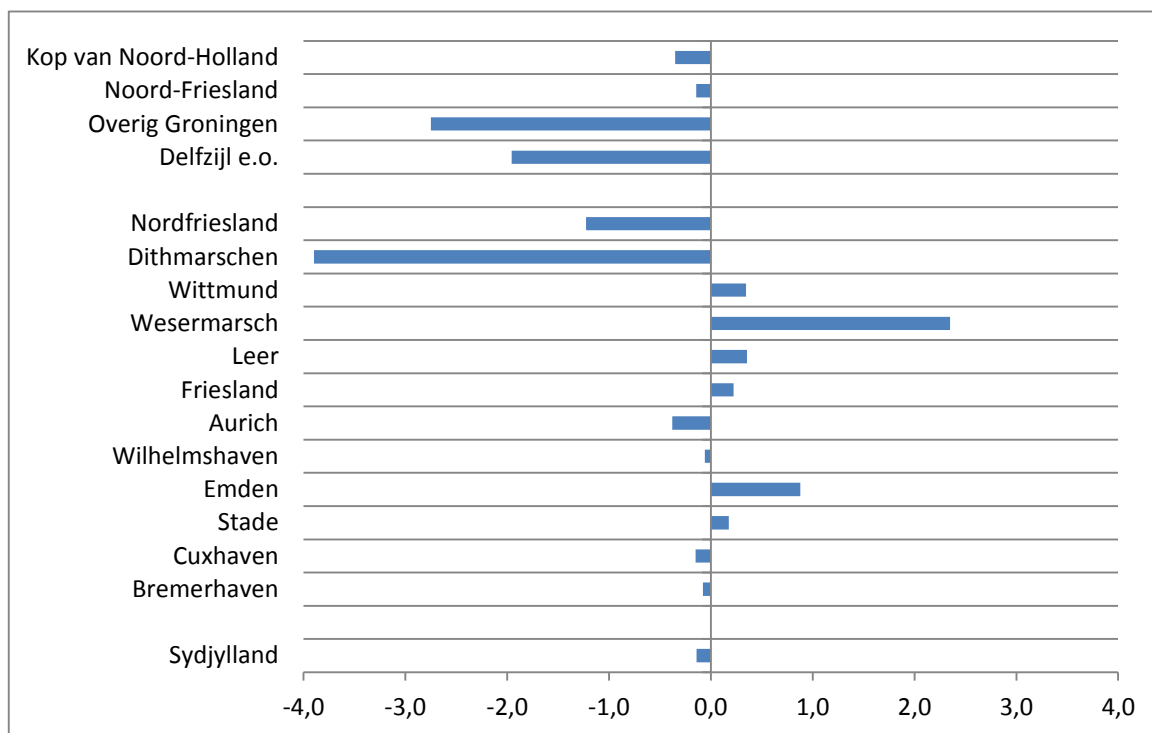


Figure 2-1: Average annual productivity growth in NUTS-3 Wadden regions compared to national, 2007-2010 (Source: Eurostat)

¹⁶ Apart from harbour activities in both NUTS-3 areas, Emden also has an important automobile industry (VW) and Wesermarsch incorporates a major airplane factory. These activities correspond with high levels of innovation and automation and require educated workers. In other words, productivity growth in these regions is expected to exceed national productivity growth in this case (for Germany as a whole).

Appendix III: Population development

In this appendix we give an overview of the population development in terms of births and deaths for the Wadden area (islands).¹⁷ Table A1 shows an overview of the births, deaths, and net migration in 2012 (except for Germany where they refer to 2011) both in absolute numbers and in share of the population at the beginning of the year. We see in table A1 that only the Dutch Wadden area still has a positive number of births over deaths. However, it also indicates declining populations in all areas. Denmark has a negative net migration balance, so not only do deaths exceed births, but on average people also leave the area; the latter point also holds for the Dutch Wadden. However, for the German Wadden area and the islands, a positive net migration balance is evident, therefore more people are settling in than moving out.

Table A1: Population development Wadden areas and islands, 2012

	absolute numbers in 2012 (x 1000)				As share of population of 2012 (%)			
	population	births	deaths	net migration	birth rate	death rate	net migration rate	
NL								
Wadden area	256.2	2.7	2.3	-0.8	1.05	0.89	-0.31	
Wadden islands	24.0	0.2	0.2	-0.03	0.92	0.88	-0.12	
DE								
Wadden area	647.6	4.6	8.3	0.9	0.71	1.28	0.14	
Wadden islands	51.8	0.3	0.6	0.1	0.56	1.07	0.27	
DK								
Wadden area	80.4	0.7	0.8	-0.4	0.90	0.98	-0.44	
Wadden islands	3.9	0.02	0.05	-0.08	0.43	1.25	-1.91	

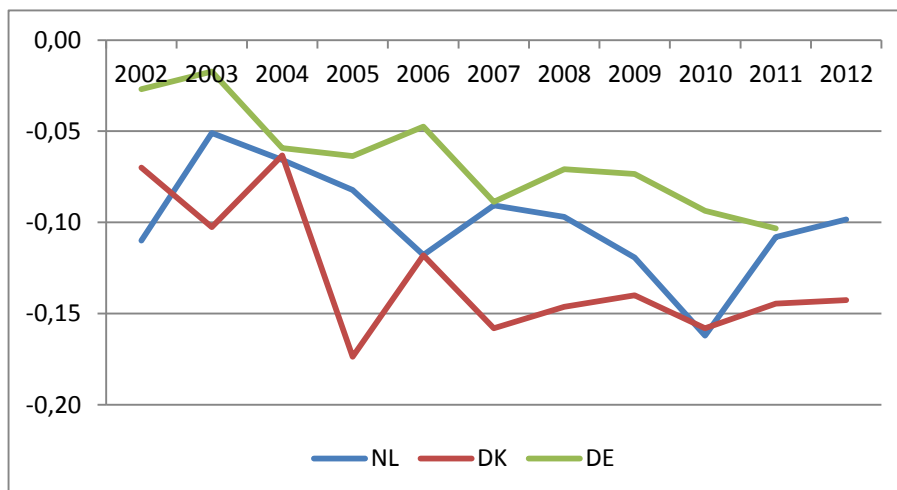
Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies

Figure A1 shows the relative (i.e. compared to national) birth rates of the Wadden areas in the three countries. Clearly, birth rates are below national rates in all three country Wadden areas. That Germany has the least negative birth rate has more to do with low birth rates nationwide than high birth rates in the German Wadden. This strong denominator effect (in which the national birth rate appears) has caused this relatively high birth rate in the German Wadden area.

The birth rate of the Wadden islands in particular lies even further below national rates, as figure A2 reveals. Now we find a marked difference between the Dutch and German rates on the one hand, and Danish ones on the other. The Dutch and German islands have birth rates of about 0.2 percentage points below national rates, while the birth rate at the Danish islands lies at about 0.5 percentage points below the national rate. In other words, the relative birth rate is lower on Danish islands than on Dutch and German islands. Moreover, figure A2 also shows for all Wadden islands that the gap between birth rates at these islands and national birth rates is slowly widening between 2002 and 2013. Although national birth rates may be low, as in Germany, birth rates at the Wadden islands are even lower.

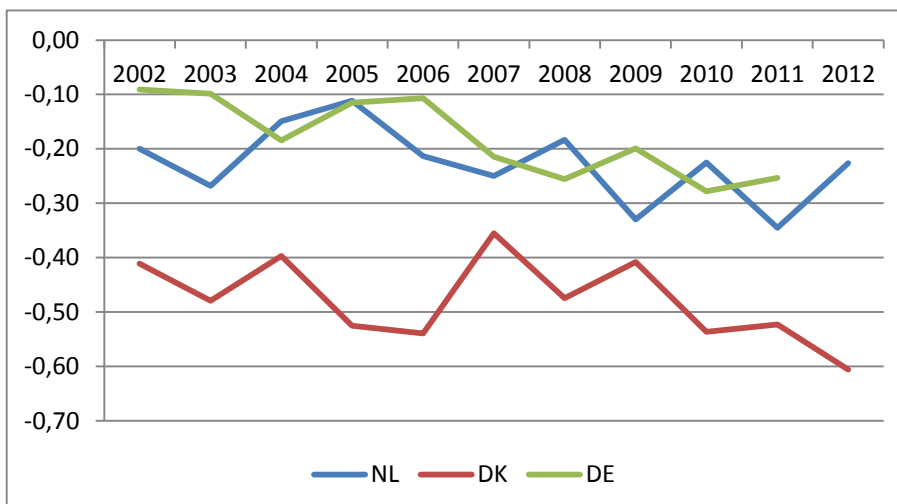
¹⁷ Again, we choose to analyse the population developments at the LAU-2 classification for actual demarcations according to Eurostat. Furthermore, these data on births, deaths and migration refer to the entire year and not to one specific date (as with population on January 1 shown in an early discussion above), so the reference period ends in 2012.

Figure A1: Birth rates in the three country Wadden areas compared to national birth rates



Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies

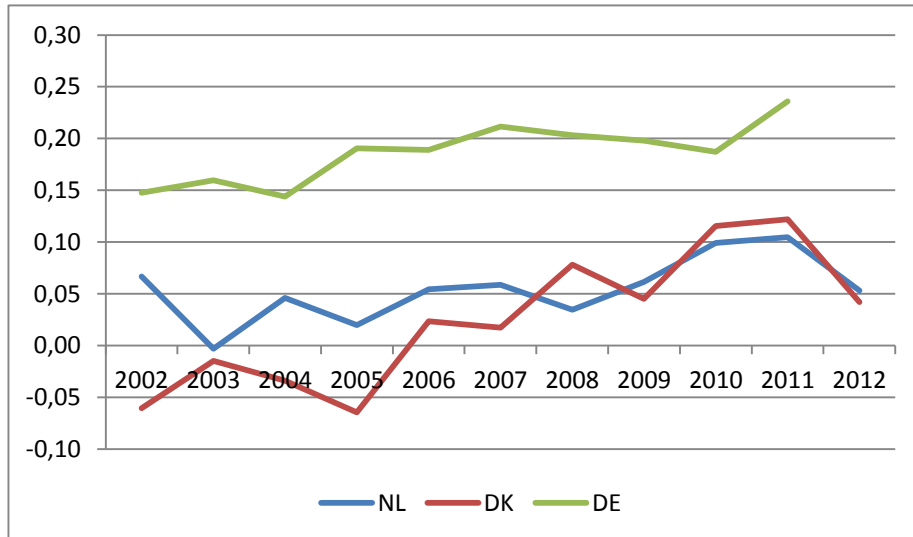
Figure A2: Birth rates on the Wadden islands compared to national birth rates



Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies

Lastly, in figure A3 the relative death rates for the total Wadden areas are given for the three countries. Again, this is the reverse trend of the birth rates in figures A1 and A2. Death rates are larger in the Wadden area than in national ones. Figure A3 also indicates that death rates in the Wadden area grow faster than national ones. This is obviously related to the higher numbers of ageing in the Wadden area (and islands), as shown in table 2-2. Particularly in figure A3 we notice that the death rate of the German Wadden area relative to the national death rate is much higher than the Netherlands and Danish Wadden areas. Despite a possibly high national death rate as a result of a large ageing population, in the German Wadden area the death rate itself is even above this national death rate. In fact, it is 3 to 4 times higher than in the other Wadden areas. This high and rising relative death rate necessitates further study. For policy makers one way to put population growth back on track is to encourage people to move into this area, but to achieve this will require the creation of sufficient possibilities for living and working in that area.

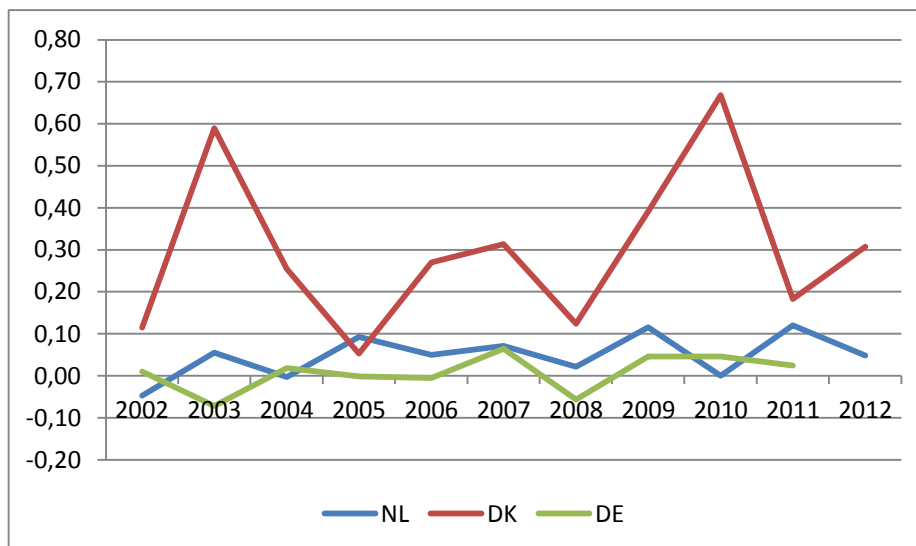
Figure A3: Death rates in the Wadden areas compared to national death rates



Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies

Figure A4, which depicts the relative death rates on all Wadden islands of the three countries, also shows a particular pattern. Here the death rate on the Danish Wadden islands stands out, both in level and changes therein, compared to levels and patterns on the islands of the other two countries. In fact, death rates on the German and Dutch islands are nearly the same, at on average, a 0.5 percentage point above their respective national rates. However, the death rate on the Danish Wadden islands is significantly higher (5 to 6 times higher) and much more volatile, but this may be attributable to the low population density on the Danish islands.

Figure A4: Death rates on the Wadden islands compared to national death rates



Source: Statistics Netherlands, Statistics Denmark, national and regional German statistical agencies

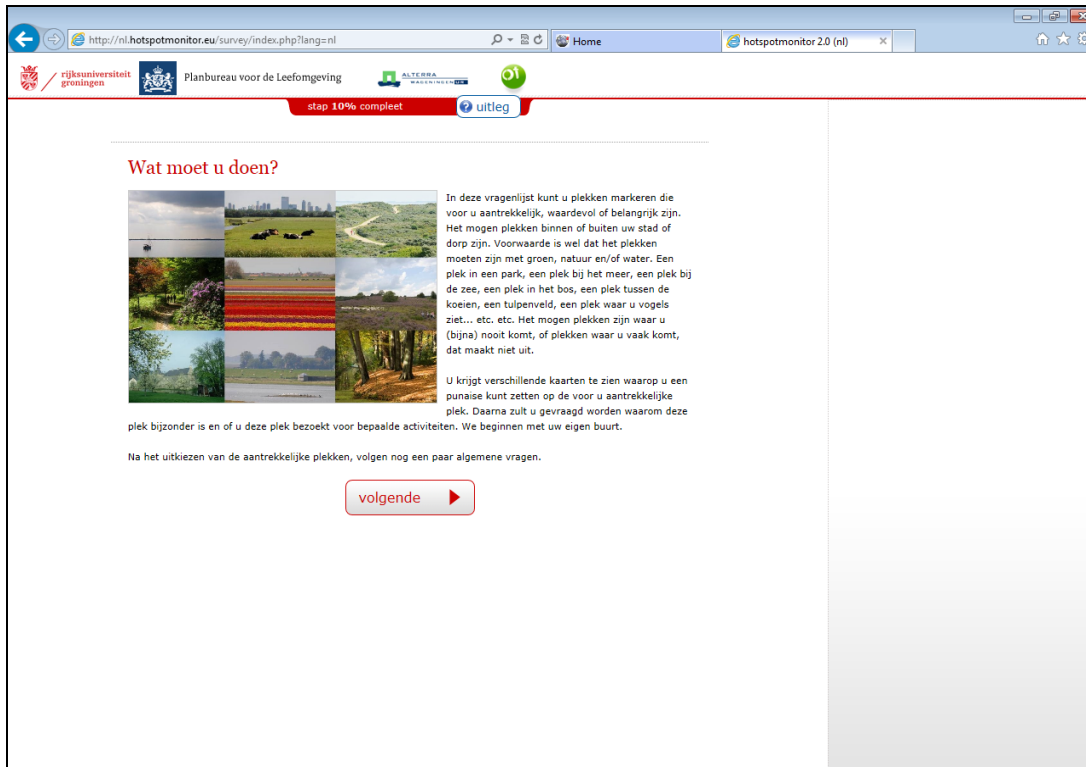
Appendix IV: Screenshots Hotspotmonitor

The screenshot shows the Dutch version of the Hotspotmonitor 2.0 website. The browser address bar displays 'http://nl.hotspotmonitor.eu/'. The header includes logos for the University of Groningen, PBL Netherlands Environmental Assessment Agency, and Alterra. The main heading is 'Hotspotmonitor meet aantrekkelijke plekken'. Below the heading is a grid of six landscape images. The text asks: 'Wat vindt u hele aantrekkelijke, voor u waardevolle of belangrijke plekken? En waarom? In deze "Hotspotmonitor" kunt u uw eigen aantrekkelijke plekken op een kaart aangeven. Vervolgens kunt u aangeven waarom u deze plekken aantrekkelijk vindt.' Below this is a form with the label 'Eerst uw postcode' and a text box with the instruction: 'Om de enquête te starten, dient u eerst hieronder uw postcode in te voeren en te drukken op de knop "verder". U wordt dan vanzelf doorgestuurd naar de vragenlijst.' A 'Verder' button is located at the bottom of the form.

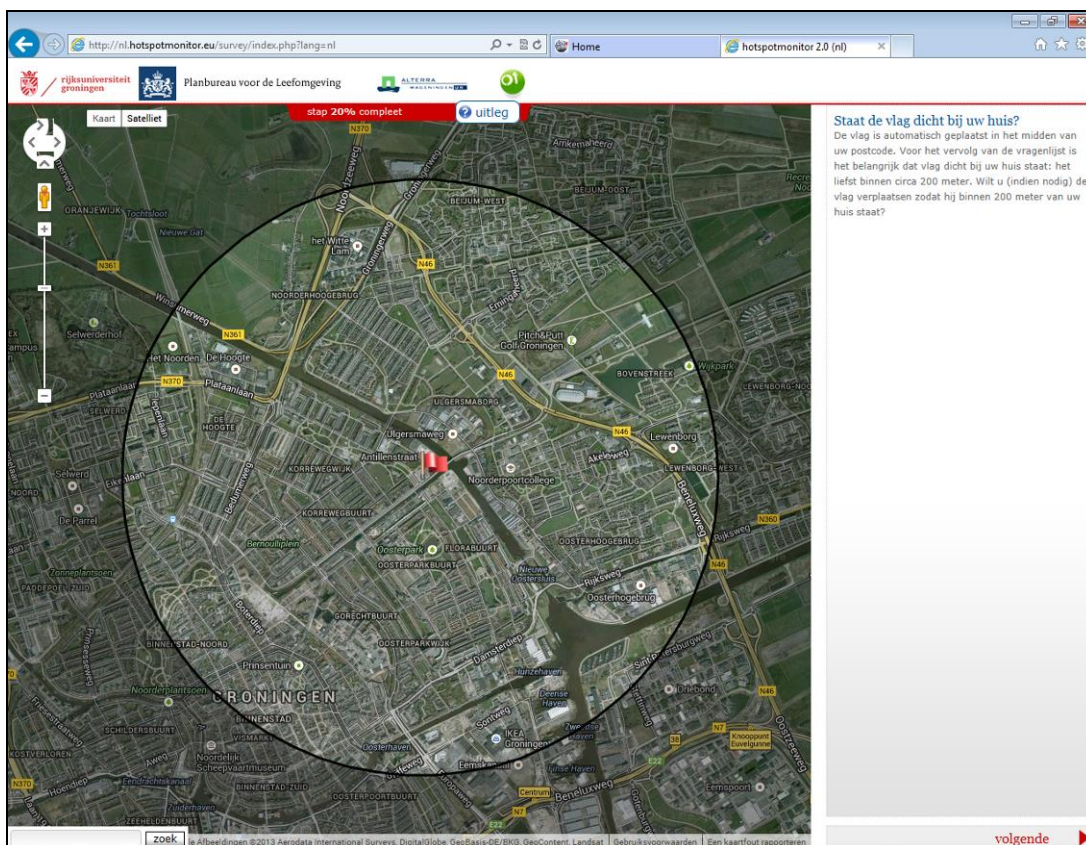
The screenshot shows the German version of the Hotspotmonitor 2.0 website. The browser address bar displays 'http://de.hotspotmonitor.eu/'. The header includes logos for the University of Groningen, PBL Netherlands Environmental Assessment Agency, and Alterra. The main heading is 'Der Hotspotmonitor erfasst und misst attraktive Orte'. Below the heading is a grid of six landscape images. The text asks: 'Welche Orte sind für Sie sehr attraktiv, wertvoll oder wichtig? Und warum? In diesem "Hotspotmonitor" können Sie Ihre Lieblingsorte auf einer Karte markieren. Außerdem können Sie angeben, warum Sie diese Orte attraktiv finden.' Below this is a form with the label 'Beginnen Sie mit Ihrer Postleitzahl' and a text box with the instruction: 'Um die Umfrage zu starten, geben Sie hierunter Ihre Postleitzahl ein und klicken dann auf die Schaltfläche "Weiter". Sie werden automatisch zum Fragebogen weitergeleitet.' An example is provided: 'z.B. "13353 Berlin, Wedding, Müllerstraße" oder "80539 Universität München"'. A 'Weiter' button is located at the bottom of the form.

The screenshot shows the Danish version of the Hotspotmonitor 2.0 website. The browser address bar displays 'http://dk.hotspotmonitor.eu/'. The header includes logos for the University of Groningen, PBL Netherlands Environmental Assessment Agency, and Alterra. The main heading is 'Hotspotmonitor måler attraktive steder'. Below the heading is a grid of six landscape images. The text asks: 'Hvilke steder finder du meget attraktive, værdifulde eller vigtige? Og hvorfor? På denne "Hotspotmonitor" kan du udpege dine egne attraktive steder på et kort. Derefter kan du angive, hvorfor du finder disse steder attraktive.' Below this is a form with the label 'Først dit postnummer' and a text box with the instruction: 'For at starte spørgeskemaet, skal du først indtaste dit postnummer herunder og derefter trykke på knappen "Næste". Derefter bliver du automatisk sendt videre til spørgeskemaet.' A 'Næste' button is located at the bottom of the form.

Starting page HSM in Dutch, German and Danish



Instruction page of the Dutch HSM



Home of a respondent (in Dutch)

Please note:

Every respondent places 4 markers. Four markers –for highly appreciated natural places at four spatial levels.

- > Local (<2km from home)
- > Regional (<20 km from home)
- > National (within own country)
- > Global (anywhere in the world)

See below screenshots of the questions asked in the HSM at each of the four spatial levels:

1. About your hotspot

Does the thumbnail indicate this exact spot or a wider area?

This exact spot
 Wider area

Possible explanation:

How attractive is this spot to you? (10 = maximum attractiveness)

1 2 3 4 5 6 7 8 9 10

Next question ▶

2. Attractiveness

Please indicate in your own words what makes this exact spot attractive to you.

Next question ▶

3. Attractiveness in terms

This spot is attractive to me because... (choose multiple options if you wish)

of the green/nature

variation in the landscape

nature can have it's free course

unique flora/fauna

it's like looking into the past

there are few people around

the silence

recreational options

few signs of civilization

the open space

everything in the landscape fits together

farming in the area

the water

Next question ▶

4. Frequency of visits


How often do you visit this spot?


Daily
 Weekly
 Monthly
 Few times a year
 Yearly
 Rarely
 Never
 Other (please specify)


Next question ▶


5. Activities


What activities do you engage in at this spot? (Click on the icons that apply)


Cycling 


Walking 

Touring 

Nature watching 

Watersport 

Other sport 

Sunbathing playing 

Other (please specify)

Next question ▶

1. About your hotspot

2. Attractiveness


3. Attractiveness in terms


4. Frequency of visits


5. Activities


6. Recreational incentives


Please indicate why you use this spot for recreational activities

 Outings with family, friends or relatives

 Recharging the batteries; relaxing outdoors

 Discovering and learning about nature or culture

 Roaming freely in nature; identifying trees, flowers or birds

 Because of the sporting challenge

Other (please specify)

Appendix V: Data recreational homes – prices (vraagprijs) and square meters living surface (woonoppervlak)

Table A-V-1: Overview of number of cases used in the research on housing prices of recreational houses

	Wadden Islands	Wadden mainland coast	Recreational Apartments	(Single family) Recreational Houses	Total
NL	112	100	31	181	212
DE	66	101	58	109	167
DK	132	120	20	232	252
Total	310	321	109	522	631

The cases come from housing websites: Funda (NL) (#212), Immowelt (DE) (#167), Boliga (DK) (#252). Period mid 2013.

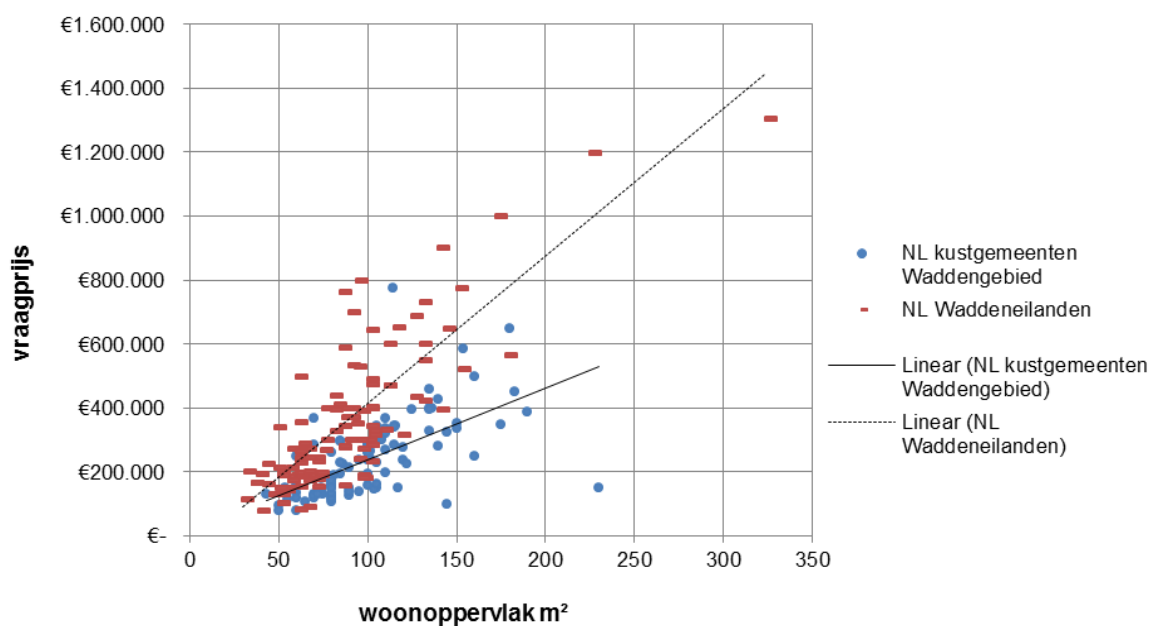


Figure A-V-1: Prices versus square meters living surface of recreational homes in the Dutch Wadden area. (Source: Sietses, 2014).

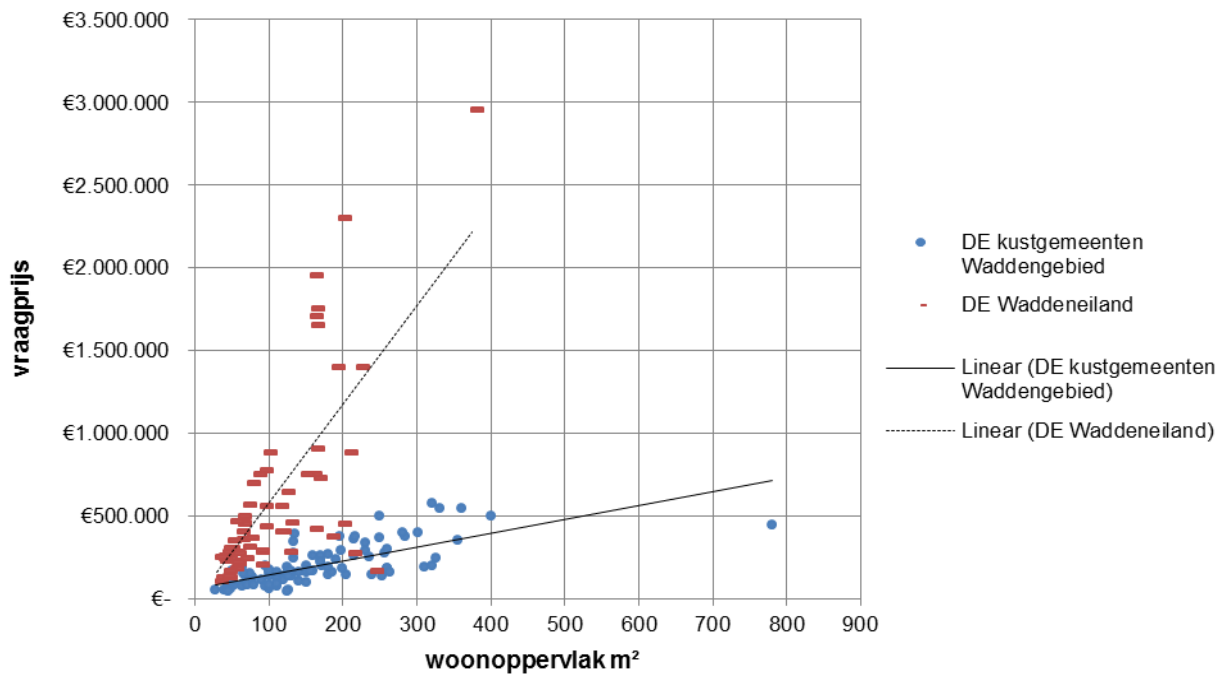


Figure A-V-2: Prices versus square meters living surface of recreational homes in the German Wadden area. (Source: Sietses, 2014)

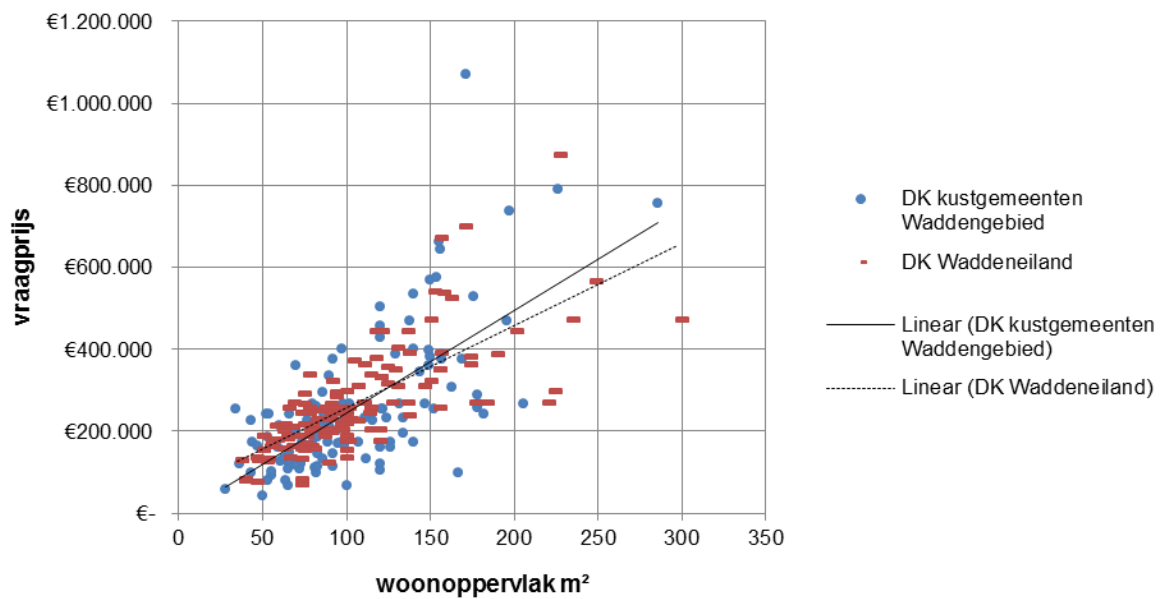


Figure A-V-3: Prices versus square meters living surface of recreational homes in the Danish Wadden area. (Source: Sietses, 2014)

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