State of the Coast of the Southern North Sea:

an indicators-based approach to evaluating sustainable development in the coastal zone of the Southern North Sea.

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SAIL is a partnership of regional and local authorities, maritime organisations, and coastal and maritime agencies, working together for the sustainable development of the Southern North Sea coastal region.

SAIL is een partnerschap van regionale en lokale overheden, maritieme organisaties, kustgebonden en mariene instanties. Zij werken samen aan de duurzame ontwikkeling van het Zuidelijke Noordzeegebied.

SAIL est un partenariat des autorités locales et régionales et des agences côtières et maritimes qui travaillent ensemble sur le sujet d'un développement durable de la Zone Sud de la Mer du Nord.

Colofon

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NWE ENO INTERREG IIIB NORTH WEST EUROPE

Foreword

by Alex Midlen, Chairman of SAIL

Are the coasts and inshore waters of the Southern North Sea moving further towards, or away from, a more sustainable future, and at what pace? Is the coastal zone different from non-coastal areas? If it is, in what ways is it different and by how much? Are observed differences significant enough to warrant separate policies for the coast and the introduction of different management strategies?

In an attempt to answer these and similar questions, Schéma d'Aménagement Intégré du Littoral (SAIL), in partnership with the Flanders Marine Institute, has produced the first *State of the Coast of the Southern North Sea*. Indeed, the report is the first example of an indicators-based assessment of the state of the coast of any regional sea in Europe.

The use of coastal and marine indicators in evaluating the sustainable development of the coast was pioneered by the SAIL partners back in 1999. A set of environmental, economic and social indicators was drawn up and over the next three years, data were sourced and collected in Essex, Thames and Kent in England, in Nord-Pas de Calais in France, in West Flanders in Belgium and in Zeeland in The Netherlands. However, it was not until SAIL entered into a collaboration with the Flanders Marine Institute in 2002, co-funded by the EU INTERREG IIIB Community Initiative, that a systematic programme of data identification, collation, measurement and transformation was implemented.

The results of that process are gathered together in this report. The maps, graphs and commentary reveal a region rich at one and the same time in both clarity and ambiguity (and in some cases, obscurity) and where observation and explanation flow back and forth as constantly as the tides themselves.

It is not the purpose of this report necessarily to interpret the information contained in its pages. That debate properly lies with the coastal and estuary partnerships, and with the local and regional authorities and coastal and maritime agencies, that have evolved in response to growing concerns about the state of the coastal environment, the coastal economy and the well-being of coastal communities.

Having said that, we are delighted that the State of the Coast of the Southern North Sea will enhance that debate by better informing decision-makers about what is happening on the coast and thus improving the quality of decision-making for the benefit of all.

The creation of information-rich partnerships is a basic aim of the SAIL initiative and a central tenet of the EU Integrated Coastal Zone Management Recommendation agreed by the Council of Ministers, the Commission and the European Parliament in 2002. The Recommendation encourages each coastal Member State and Candidate Country to establish a benchmark for its coast in order to monitor the effectiveness of coastal planning and management.

SAIL is proud to offer the *State of the Coast of the Southern North Sea* as its response to the EU ICZM Recommendation on behalf of the regions bordering the Southern North Sea.

Voorwoord

Alex Midlen, Voorzitter SAIL

Zijn onze kustzones en kustwateren in de Zuidelijke Noordzee op weg naar een meer duurzame toekomst, of gaan we juist de verkeerde richting uit? En hoe snel grijpen die veranderingen plaats? Is het kustgebied verschillend van het hinterland? En zo ja, op welke manier en hoe sterk verschillen ze van elkaar? Zijn deze verschillen van die aard dat ze een specifiek beleid voor de kust met eigen doelstellingen en strategieën verantwoorden?

Door het tot stand brengen van de *State of the Coast of the Southern North Sea* (Toestand van het Kustgebied in de Zuidelijke Noordzee) tracht het 'Schéma d'Aménagement Integré du Littoral (SAIL)' in samenwerking met het Vlaams Instituut voor de Zee, deze en andere vragen het hoofd te bieden. Dit rapport is meteen een eerste voorbeeld van een evaluatie van de toestand van het kustgebied op niveau van een regionale zee in Europa, aan de hand van indicatoren.

Het gebruik van indicatoren voor het evalueren van een duurzame ontwikkeling in kust - en mariene gebieden is niet nieuw voor SAIL. Reeds in 1999 selecteerden de SAIL - partners een set socio-economische en milieu-indicatoren en gedurende de daaropvolgende drie jaren werden gegevens verzameld in Essex, Thames en Kent in Engeland, in Nord-Pas de Calais in Frankrijk, in West-Vlaanderen in België en in Zeeland in Nederland. Het was echter pas in 2002 dat, in samenwerking met het Vlaams Instituut voor de Zee en dank zij de co-financiering van het EU INTERREG IIIB Initiatief, een systematisch proces van verzamelen, beschrijven, omzetten en gezamelijk verwerken van gegevens van start ging.

Een deel van de resultaten van dit proces zijn in voorliggend rapport samengebracht. De kaarten, grafieken en teksten onthullen een regio die duidelijke signalen kan uitsturen, maar waar de informatie ook dubbelzinning (en soms onduidelijk) lijkt te zijn. Observatie en verklaring vullen elkaar voortdurend aan zoals de beweging van de getijden.

Het is niet de bedoeling om de informatie uit dit rapport te interpreteren of te verklaren. Dit soort debat wordt het best gevoerd bij de partnerschappen en in samenspraak met het lokale bestuursniveau alsook met de agentschappen voor het beheer van kust- en mariene aangelegenheden. Deze organisaties zijn immers ontstaan als antwoord op de steeds groeiende aandacht voor het milieu en de economie van kustgebieden en de levenskwaliteit van hun bevolking.

Het rapport *State of the Coast of the Southern North Sea* heeft wel tot doelstelling een ruim debat te stimuleren door een betere informatiestroom tot stand te brengen en zodoende een verdere verbetering in de besluitvorming in de hand te werken, ten dienste van alle groepen die betrokkenen zijn bij kustbeheer.

Het creëren van partnerschappen die steunen op goede en objectieve informatie is een basisdoelstelling van het SAIL - initiatief, maar ook een centrale doelstelling van de EU Aanbeveling voor het implementeren van een Geïntegreerd Beheer van Kustgebieden (GBKG), goedgekeurd door de Raad van Ministers, de Commissie en het Europese Parlement in 2002. De Aanbeveling spoort de lidstaten en toetredende landen aan om een nulmeting of een 'toestand van de kust' uit te voeren om van daaruit de effectiviteit van de planning en het beheer in kustgebieden te monitoren.

Het is voor SAIL een eer om de *State of the Coast of the Southern North Sea* voor te stellen als respons op de EU Aanbeveling voor het implementeren van een Geïntegreerd Beheer van Kustgebieden, van de Regio's rondom de Zuidelijke Noordzee.

Avant-propos

par Alex Midlen, Président de SAIL

Les côtes et les eaux littorales de la mer du Nord méridionale se rapprochent-elles ou s'éloignent-elles d'un avenir plus durable, et à quel rythme? La zone côtière est-elle différente des zones non côtières? Si oui, de quelles manières et dans quelle mesure? Les différences observées sont-elles suffisamment significatives pour justifier des politiques distinctes pour la côte et l'adoption de stratégies de gestion différentes?

Pour tenter de répondre à ce type de questions, Schéma d'Aménagement Intégré du Littoral (SAIL) a produit en partenariat avec l'Institut flamand de la mer (VLIZ) le premier *State of the Coast of the Southern North Sea (Rapport sur l'état du littoral de la mer du Nord méridionale).* En effet, ce rapport est le premier exemple d'évaluation basée sur des indicateurs, de l'état du littoral d'une région maritime européenne.

Les partenaires SAIL furent les premiers, en 1999, à utiliser des indicateurs côtiers et marins pour évaluer le développement durable du littoral. L'on dressa une liste d'indicateurs environnementaux, économiques et sociaux et au cours des trois années suivantes, l'on a recherché et réuni des données dans l'Essex, la région de la Tamise et le Kent en Angleterre, au Nord-Pas de Calais en France, en Flandre occidentale en Belgique et en Zélande aux Pays-Bas. Cependant, il fallut attendre que SAIL entre en collaboration avec l'Institut flamand de la mer en 2002, co-fondé par l'initiative européenne EU INTERREG IIIB, pour qu'un programme systématique d'identification, de collation, mesure et transformation de données soit mis en oeuvre.

Les résultats de ce processus sont réunis dans ce rapport. Les cartes, graphiques et commentaires révèlent une région à la fois riche en clarté et en ambiguïté (et dans certains cas en obscurité) et où les observations et explications affluent et refluent sans cesse, comme les marées.

L'objectif de ce rapport n'est pas nécessairement d'interpréter les informations qui y figurent. Ce débat est de la responsabilité des partenariats côtiers et estuariens, des autorités locales et régionales et des agences côtières et maritimes, qui ont évolué en réponse à l'inquiétude grandissante concernant l'état de l'environnement côtier, l'économie côtière et le bien-être des communautés côtières.

Ceci dit, nous sommes ravis que le Rapport sur l'état du littoral de la mer du Nord méridionale rehaussera ce débat en informant mieux les décideurs sur ce qui est en train de se passer sur le littoral et en améliorant ainsi la qualité du processus décisionnel dans l'intérêt de tous.

La création de partenariats instructifs est un objectif de base de l'initiative SAIL et un principe fondamental de la Recommandation européenne sur la gestion intégrée des zones côtières (GIZC) approuvée par le Conseil des Ministres, la Commission et le Parlement européen en 2002. La Recommandation incite chaque Etat membre côtier et pays candidat à établir une référence pour son littoral afin de surveiller l'efficacité de la planification et la gestion côtières.

SAIL est fier de présenter le Rapport sur l'état du littoral de la mer du Nord méridionale en réponse à la Recommandation européenne GIZC de la part des régions bordant la mer du Nord méridionale.

SAIL indicators for sustainable development in the Southern North Sea corresponding to the stated goals of the EU ICZM Recommendation.

Goals	Nr	Indicator	Measurement	Page
To control, as appropriate further development of the undeveloped coast	1	Population density and age structure	Number of inhabitants per km²	5
			Percentage of the population in age class 0-20 and age class +60	
	2	Area of built-up land	Percentage of built-up land by distance from the coastline	9
	3	Demand for road travel on the coast	Average number of vehicles on coastal motorways and major roads	13
	4	Pressure for coastal and marine recreation	Number of berths and moorings for recreational boating	17
To protect, enhance and celebrate natural and cultural diversity	5	Change to significant coastal and marine habitats and species	Number of Red List coastal area species	23
			Population estimates/census for the harbour porpoise, common seal and tern species in the Southern North Sea	
			Area of specified coastal habitat	
	6	Area of land and sea protected by statutory designations	Area protected for nature conservation, landscape or heritage	31
	7	Effective management of designated sites	Rate of loss of, or damage to, protected areas	37
	8	Loss of cultural distinctiveness	Number of local products with European PDO/PGI/TSG or regional quality labels	39
To promote and support a dynamic and sustainable coastal economy	9	Patterns of sectoral employment	Full time, part time and seasonal employment per sector	45
	10	Economic importance of ports	Number of incoming and outgoing passengers per port	51
			Proportion of goods carried cross-channel by rail and by truck	
			Proportion of goods carried by short sea routes	
			Volume of goods handled per port	
			Direct added value of ports	
	11	Significance of Tourism	Number of overnight stays in tourist accommodation	57
			Occupancy rate of bed places	
	12	Sustainable Tourism	Number of tourist accommodations holding EU Eco-label	61
			Number of overnight stays per resident	

SAIL indicators for sustainable development in the Southern North Sea corresponding to the stated goals of the EU ICZM Recommendation.

GUIDELINES FOR THE READER

The Flanders Marine Institute (VLIZ) has developed a website http://www.vliz.be/projects/SAIL to support an interactive quest for data, metadata and information on the State of the Coast of the Southern North Sea. It includes a description of the methodology used, individual fact sheets, an interactive mapping tool and interface to query data at the level required (sub-region, districts, municipalities or sampling stations).

In the following pages references are included to identify sources and describe temporal and geographic coverage, methodology and definitions.

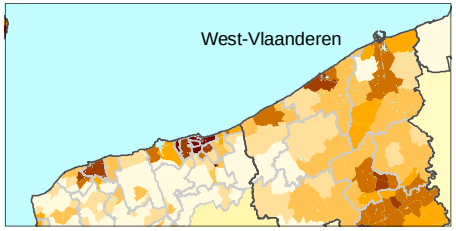
In the search for reliable data, priority has been given to official sources, such as government statistics and national or European data gathering programs, in order to enhance comparability at the international level and allow for benchmarking.

Time series are often interrupted because of changes in sampling and calculation methods, or by changes in the purpose and context (e.g. recording absolute values versus measuring distance to target values). In this case, datasets used for the present analysis go back in time as far as possible without suffering changes in definitions that may lead to erroneous interpretation. The State of the Coast report aims to set a baseline measurement for each indicator and provide a relevant time series to allow for an interpretation in terms of sustainable development. For this first inventory, relevant time series could not be constructed for all indicators.

Maps mainly represent latest years' data. In some cases 'latest year' for one sub-region differs from the most recent sampling year in another sub-region. This is clearly stated in the key.

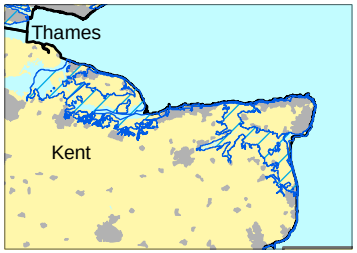
Data is collected for three different types of geographical references;

Type 1 data is collected at the level of the smallest administrative unit: the commune or municipality (F, NL, B) or ward (UK), corresponding with the European nomenclature NUTS 4 (NUTS 5 in France). Data are aggregated for higher levels: NUTS 3 or districts and NUTS 2 or sub-regions. (In France, NUTS 4 is the district level, NUTS 3 the Département and NUTS 2 refers to the Région Nord-Pas de Calais.) Type 1 refers to all communes (gemeentes) in the Provinces of Zeeland (The Netherlands) and West-Vlaanderen (Belgium) and the area of the Syndicat Mixte de la Côte d'Opale in the Région Nord-Pas de Calais (France), and the wards or Super Output Areas (SOA) of the sub-regions of Kent, Essex and Greater London in the UK. 'Coast' or 'coastal zone' refers to the average value for the aggregated coastal municipalities and wards. 'Coastal municipalities' are those which have, or had in the past, a border with the coastline. 'Hinterland' or 'non-coastal' refers to the average value for all non-coastal municipalities in the sub-region. This is the case for indicators 1, 2, 9, 11-13 and 18-20.



Type 2 data are point locations or a collection of point locations representing the coastal zone. They mostly consist, for example, of sampling points for traffic intensity, water quality, sea level, climate, air quality, marine litter and marinas. Type 2 applies to indicators 3, 4, 10, 13-17 and 21-26.

Type 3 data are shapes (polygons or polylines). The shape format describes an area in terms of its location, extent and condition; it may refer to a protected area, habitat type or flood zone (indicators 5-6, and 27) or may indicate a status (7).



METADATA

A detailed description of each indicator including data sources, description of data, geographical and temporal coverage, methodology and frequency of data collection, and of data manipulation, can be found in the Metadata section (pages 131-139).

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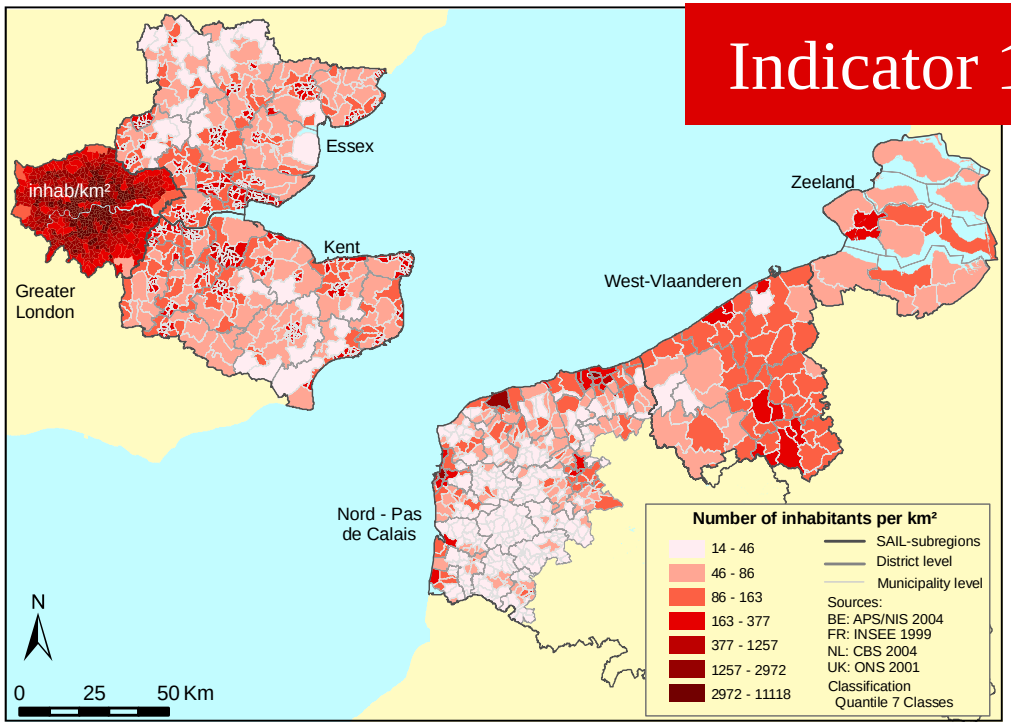
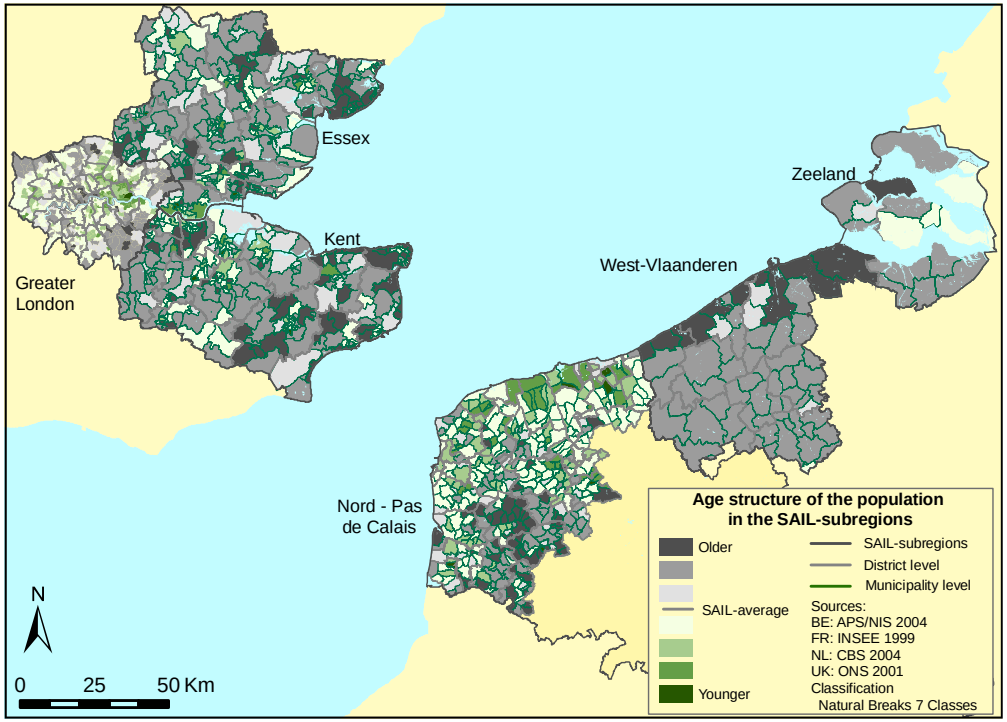
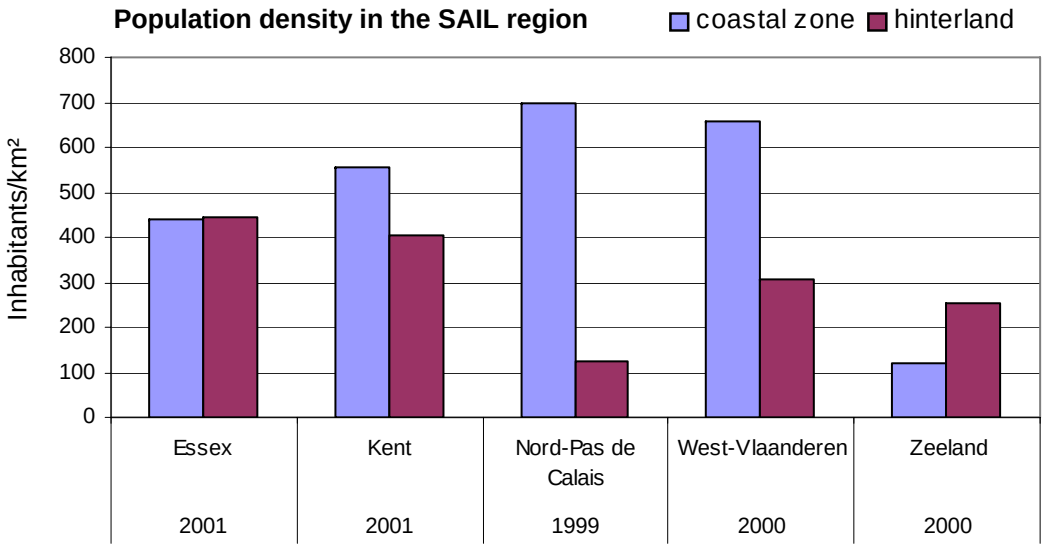
1 To control, as appropriate, further development of the undeveloped coast

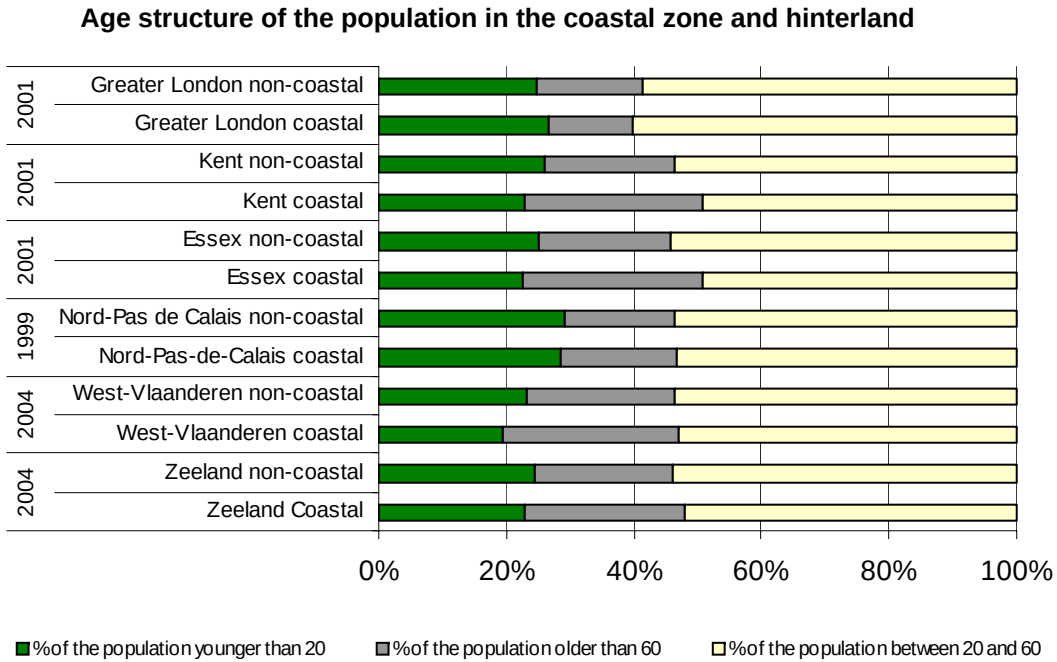
Population density and age structure « » Area of built-up land « » Demand for road travel on the coast « » Pressure for coastal and marine recreation

Indicator 1 Population density and age structure









- *Number of inhabitants per square kilometre*
- *Age structure of the population*

Key Message

- Population density in the coastal zone is twice as high (526 inhabitants per km²) as in the hinterland (254 inhabitants per km²) and is increasing twice as fast.
- Throughout the SAIL sub-regions, the proportion of the population aged 60 and older is higher at the coast than in the hinterland and the trend is on the rise. However, Nord-Pas de Calais has a demonstrably younger coastal population.

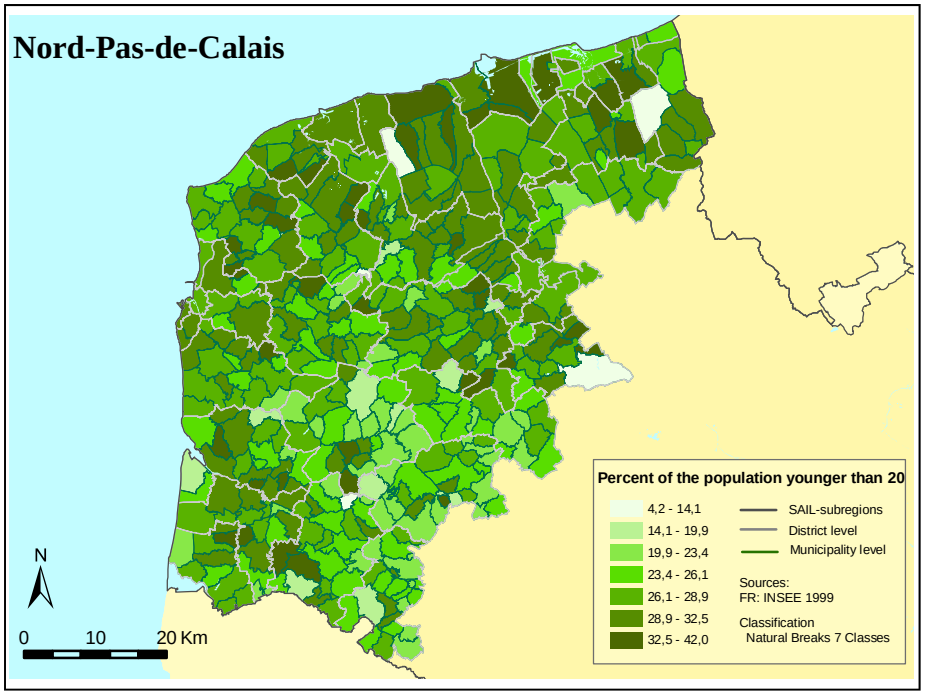
Why monitor population density and age structure?

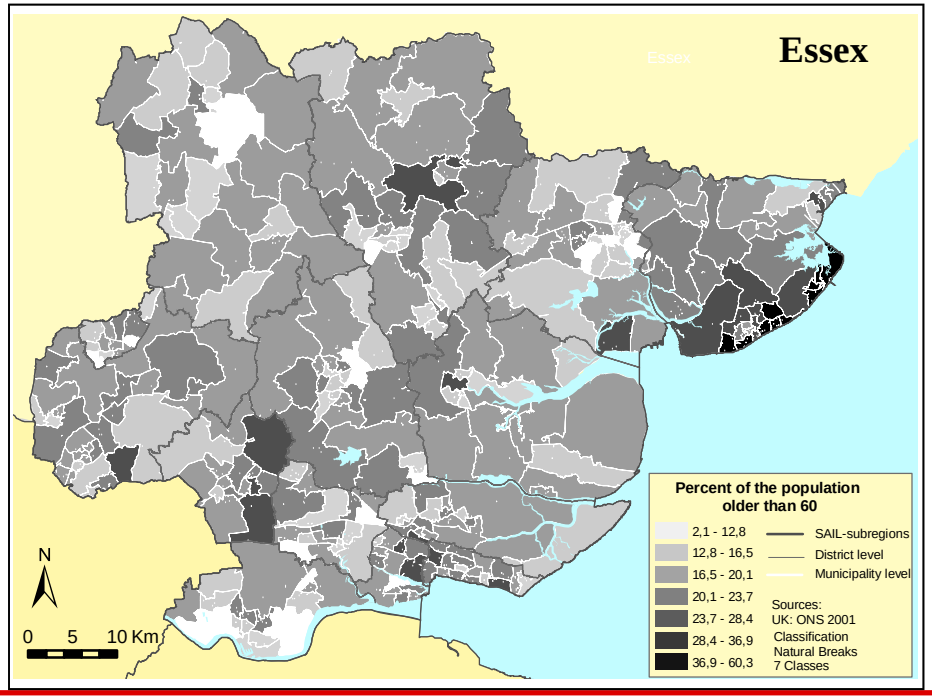
Population density measures the pressure on land from population concentrations and their requirements for land, housing, employment, public services and transport. For planning purposes it is important to determine whether such a demand for land can be accommodated within the coastal zone. A significant proportion of the land is assigned as important for nature conservation purposes and subject to specific regulations. This in turn has an impact on the supply of land and property and thus also on their price.

The age structure of the population adds an extra dimension of information regarding specific age-related demands from user groups within the population. Age structure is an important factor in the dynamics of an economy and a driving mechanism in the social sector.

Where do the data come from?

The source of the population data is the National Census data providers. All countries in the Southern North Sea conduct at least a decennial Census that yields reliable data at the municipality level. However, in some countries additional yearly population data is available at the local level through the population register. This is the case for Belgium and The Netherlands for which annual time series are included.

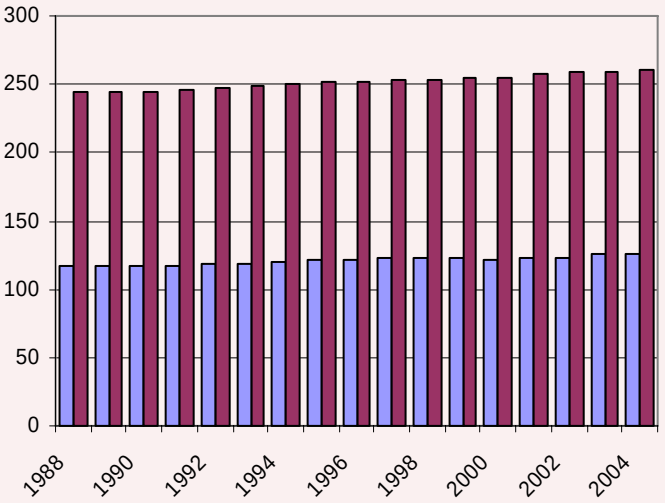




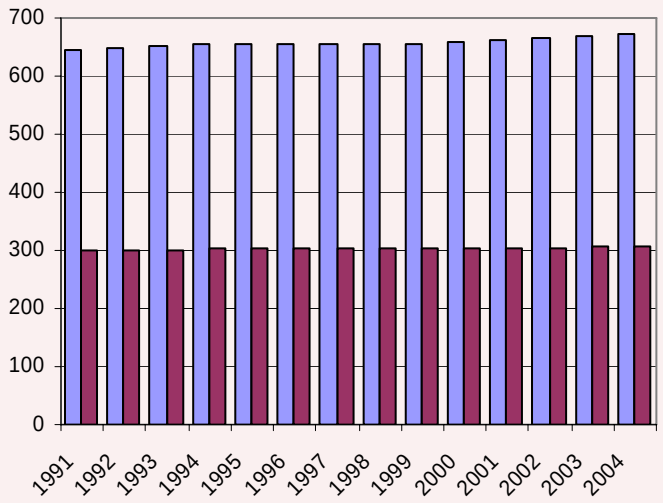
Population density in the SAIL sub-regions (inhabitants/km²)

coastal zone hinterland

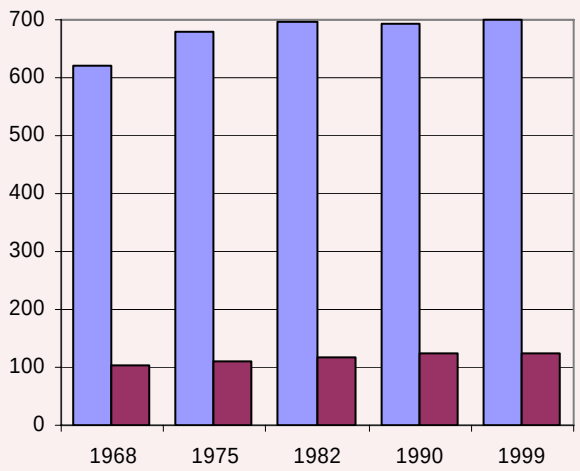
Zeeland



West-Vlaanderen

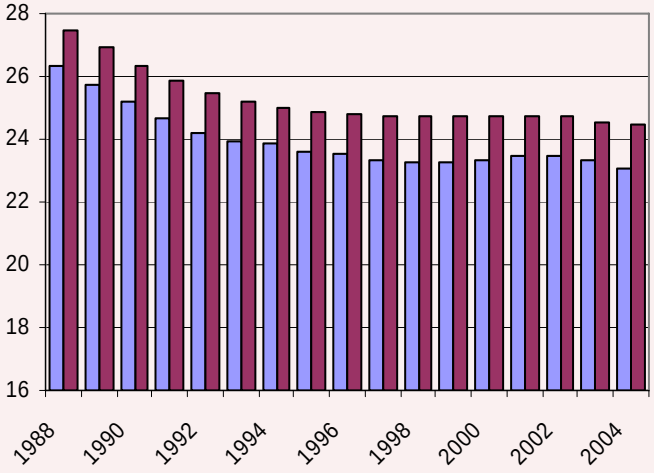


Nord-Pas de Calais

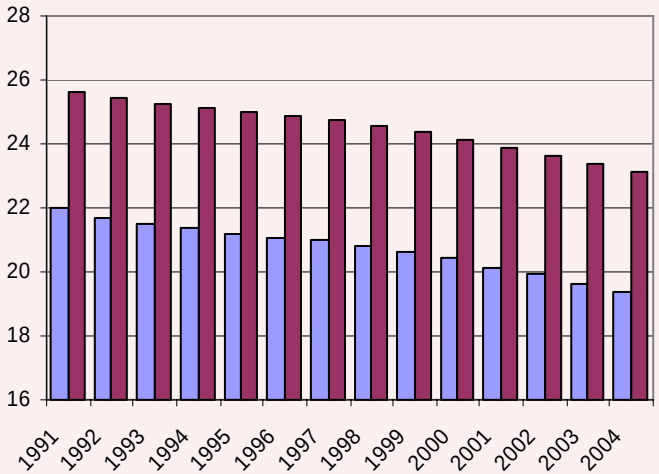


Percentage of the population younger than 20 compared to the total population in the SAIL sub-regions

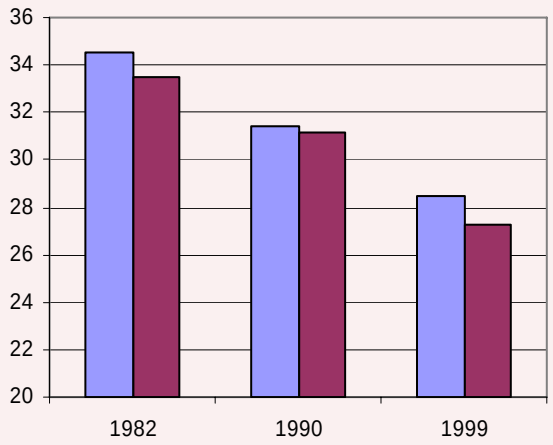
Zeeland



West-Vlaanderen



Nord-Pas de Calais



What does the indicator show?

Population density

The Southern North Sea region has a total population of 16 million inhabitants, of whom 7.2 million live in the Thames and Greater London area. More than 1 out of 10 inhabitants in the SAIL sub-regions lives in a coastal municipality or ward.

Population density in the coastal zone is higher and increasing at a faster pace: from 510 inhab/km^2 in 1990 to 526 inhab/km^2 in 2000 in the coastal zone, compared to 246 inhab/km^2 in 1990 and 254 inhab/km^2 in 2000 in the hinterland. This 'coastal effect' is most pronounced in West-Vlaanderen and Nord-Pas de Calais, where population density at the coast is 6.5 times higher than in the hinterland. Conversely, the coastal municipalities in Zeeland are only half as densely populated as the inland areas.

In Kent, population density is also higher in the coastal wards, with 557 inhab/km² compared to 402 inhab/km² in the hinterland. At the district level, Kent and Essex have higher population densities at the coast, and faster increasing population densities (from 528 and 515 inhab/km² in 1981 to 565 and 572 inhab/km² in 2003 for Kent and Essex, respectively).

The Thames and the Greater London areas both show far greater population densities that have increased considerably over the last 20 years: from 4,313 and 4,379 inhab/km² in 1981 to 4,678 for the Thames area and 4,764 inhab/km² in 2003 for Greater London.

Age structure

In Zeeland and West-Vlaanderen as a whole there is an overall decrease in the proportion of younger people in the population. This trend is even more pronounced at the coast. In West-Vlaanderen, less than 20% of the resident population in the coastal zone is younger than 20. In both regions, the coast attracts older people, with respectively 28% and 25% of the coastal population of Zeeland and West-Vlaanderen being aged 60 or older.

Nord-Pas de Calais has a predominantly younger population which has been slightly better represented at the coast, even though this trend is in decline over the last decennia (from 35% in 1982 to 28% in 1999). Except in specific areas in the northeast, differences in age structure at the coast are less clear in Essex. The coastal district of Tendring has a remarkably older population with more than 33% aged over 60 in 2001 (32% in 1991). This is almost 10% more than the neighbouring district of Southend-on-Sea.

What are the implications for planning and managing the coast?

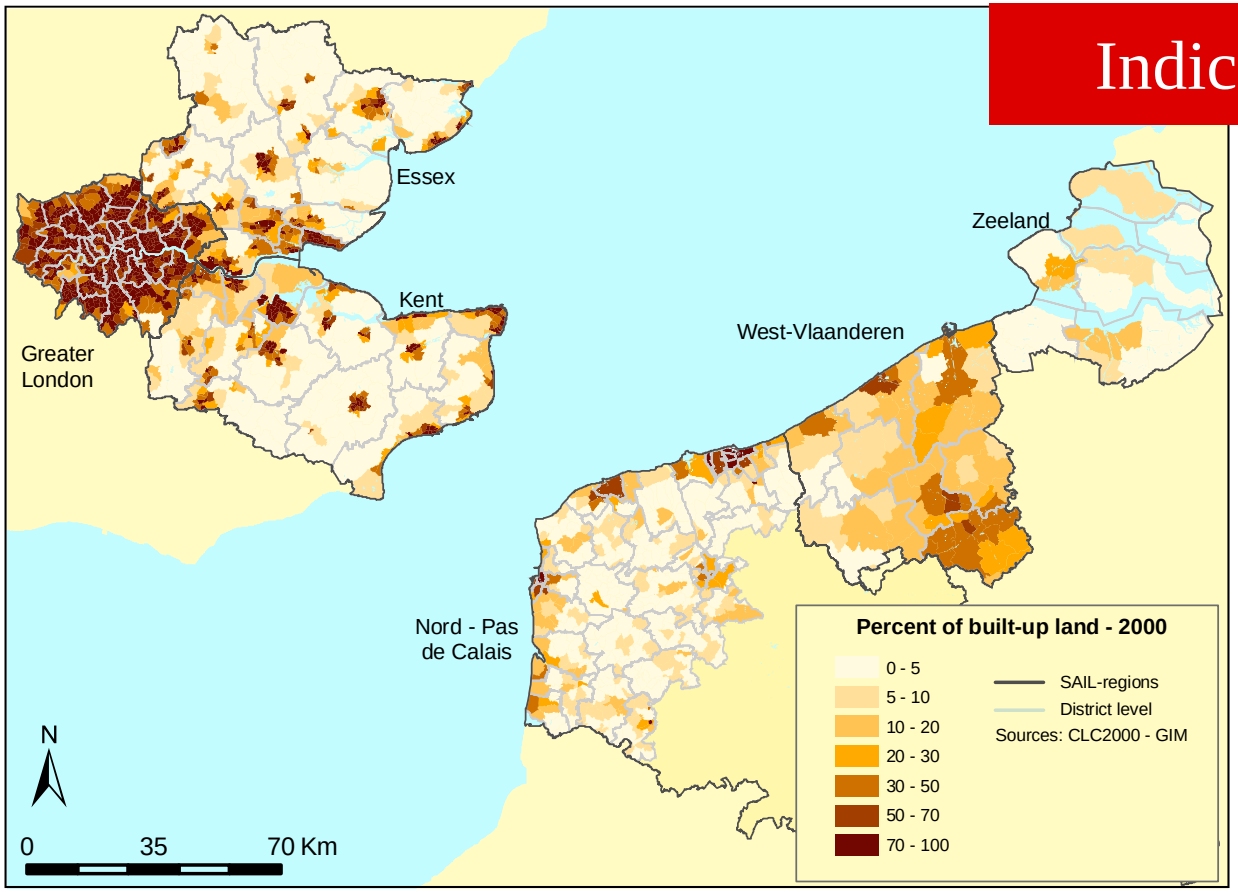
Population density and age structure can be related to national, regional and local development plans. However, targets may only become relevant at the small scale to meet local objectives in spatial planning mechanisms or in relation with other policies (health, equipment, economy). In order to assess sustainability, population density must be interpreted within a wider set of criteria on natural resources, habitat type and priority settings such as Biodiversity Action Plans, Natura 2000 network and so on. Similarly, age structure must be assessed for sustainability within a context of locally relevant criteria. Tendencies such as 'graying of the population' might even be welcomed as an opportunity for local authorities in relation to specific strategies e.g. in tourism. The EU Demonstration Program on ICZM underlined the concern for rapidly increasing populations in coastal zones and its relation with environmental indicators. However, in terms of sustainability the link with socio-economic indicators also needs to be considered, e.g. the number of overnight stays in tourist accommodations in relation to the resident population size as an additional 'population pressure' map.

How reliable is the indicator?

Census surveys are mandatory and generally considered relevant and reliable data sources. Frequency of data collecting is every 10 years. However, Census years do not coincide amongst countries which adds to the difficulty of getting an entire picture of a region for a specific year.

Long-term time series are not always available at the municipality level, for example in the UK, where the number and boundaries of the wards are not stable over time. Also, there is a considerable difference in size in coastal units and municipalities among countries.

Indicator 2 Area of built-up land



Percentage of built-up land in the SAIL sub-regions 1990-2000

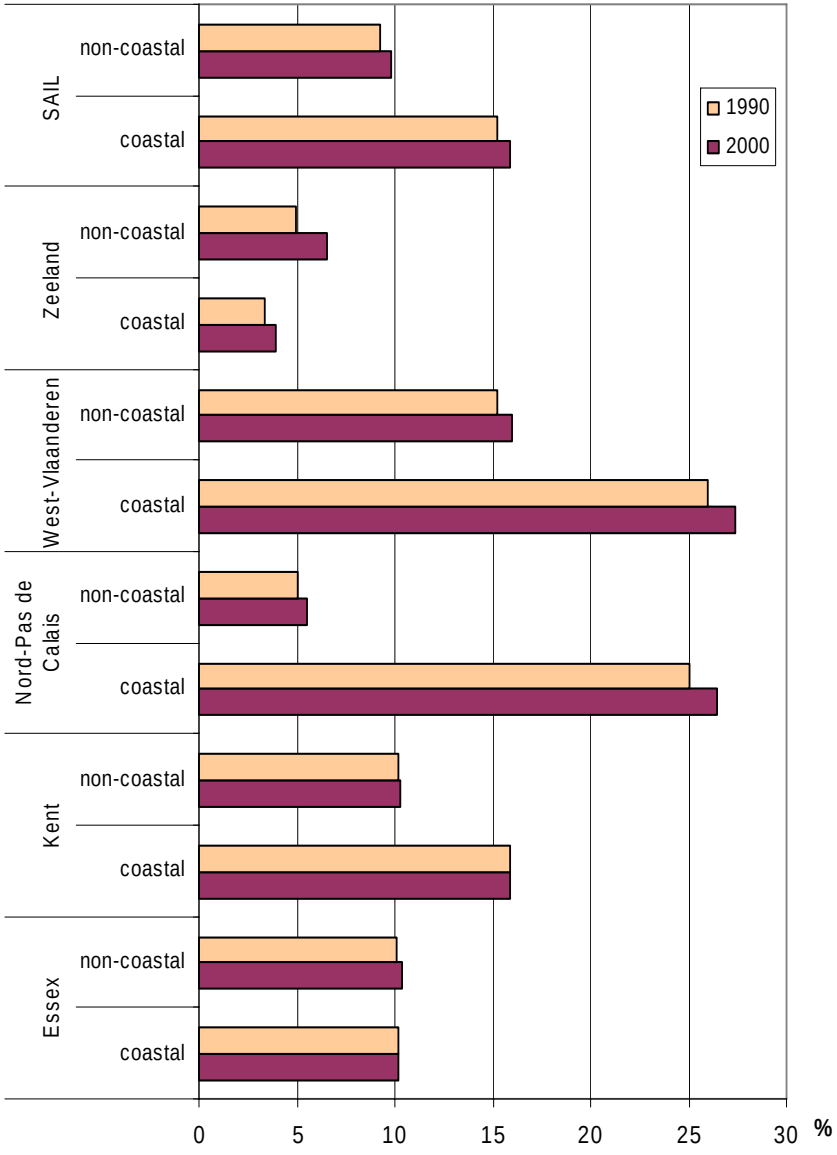


Table: Percentage of built-up land in coastal zones of the SAIL sub-regions

SAIL sub-region	CLC 1990	CLC 2000	Rate of increase
Essex	10.19%	10.19%	0%
Kent	15.85%	15.91%	0.06%
Nord-Pas de Calais	25.09%	26.43%	1.34%
Thames	70.14%	71.17%	1.03%
West-Vlaanderen	26.02%	27.43%	1.41%
Zeeland	3.38%	3.90%	0.52%
SAIL	15.22%	16.95%	0.70%

Key Message

- The area of built-up land in the coastal municipalities of the Southern North Sea region has increased from 15.2% in 1990 to 15.9% in 2000. In spite of this seemingly slow increase over the last decade, the rate of urbanisation in the coastal zone is still higher than in the hinterland.

- This high proportion of occupation, mostly asssociated with the tourism sector, has led to fragmentation of important coastal ecosystems that play a vital role in the protection of both the coast and hinterland.

Why monitor the amount of built-up land?

The extent to which the coast has been built-up over the past several years indicates the degree of pressure on the coast and the likelihood of changes in the future. The intensity and pattern of urban sprawl result from three main factors: economic development, demand for housing by households and rapid changes in their structure, and the extension of transport networks. Land use by urban area has the highest impact on the environment due to 'sealing of soil' and the environmental impact from transport, waste dumping and pollution. The conversion of greenfield sites and the increase of transport networks to connect cities add to the fragmentation and degradation of the natural landscape and loss of biodiversity. Monitoring the area of built-up land by distance from the coastline illustrates the pattern of development. In some coastal zones, development has been characterised by building in a relatively narrow coastal strip, while in others development has spread a considerable way inland.

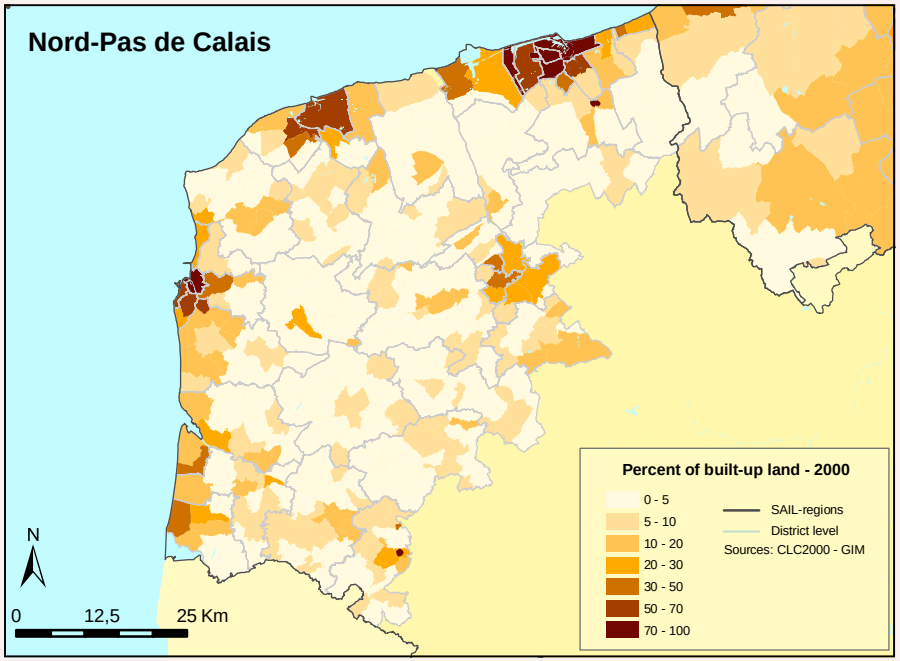
Where do the data come from?

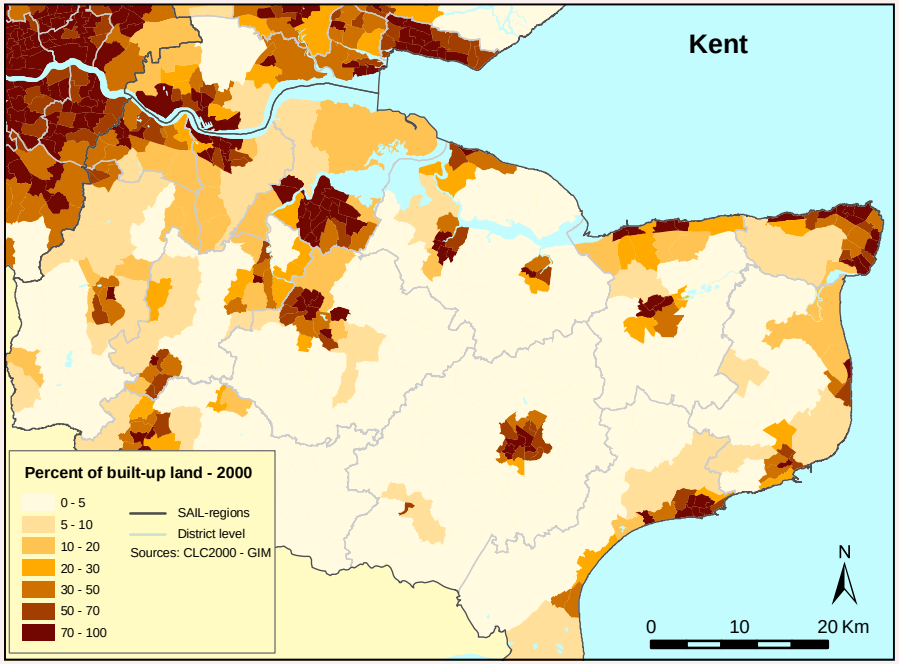
Corine Land Cover (CLC) represents a major mapping effort of land cover in Europe, realised during a period spanning from 1986 to 1995. An update of CLC was conducted in 2000. The rate of increase in built-up land is calculated by subtracting the results of CLC 2000 from CLC 1990. Corine data is based on satellite imagery. The CLC spatial data and metadata are distributed by the European Environment Agency (downloadable). Geographic Information Management (GIM) provided calculations for the SAIL region.

'Built-up land' is defined as the sum of the areas classified as urban fabric, industrial or commercial units, road and rail networks, ports and airports, and sites for mineral extraction, waste and construction.

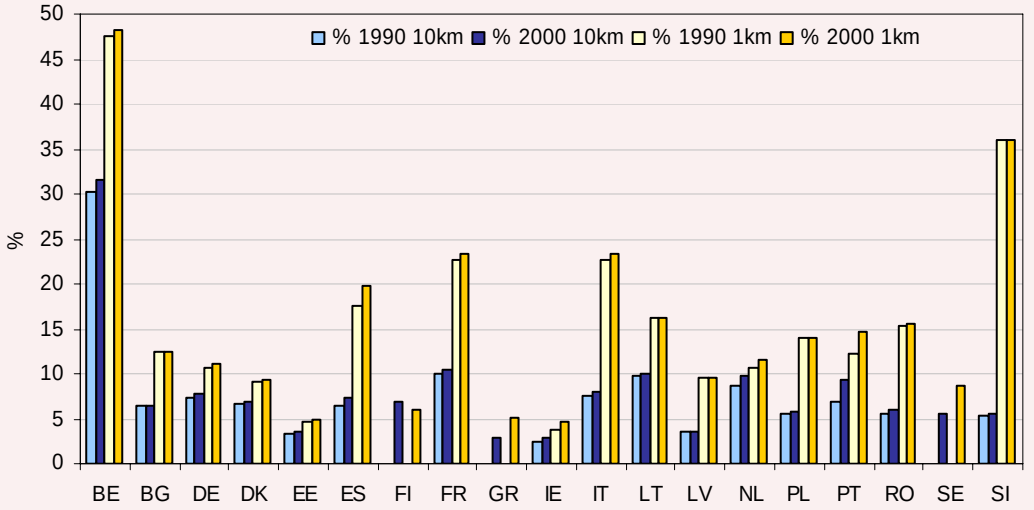
North Kent Coast (Google Earth)

Dunkerque (Nord-Pas-de-Calais) and surrounding coastal zone (Google Earth)

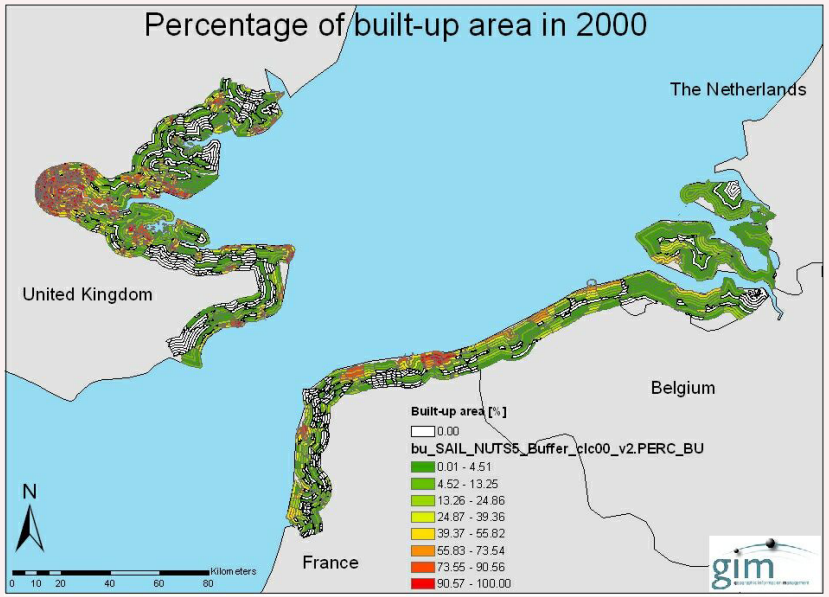




Percentage of built-up land at 1km and 10km distance from the coast, by EU coastal Member State and NUTS3 (CLC 1990 and 2000) *source: EEA*

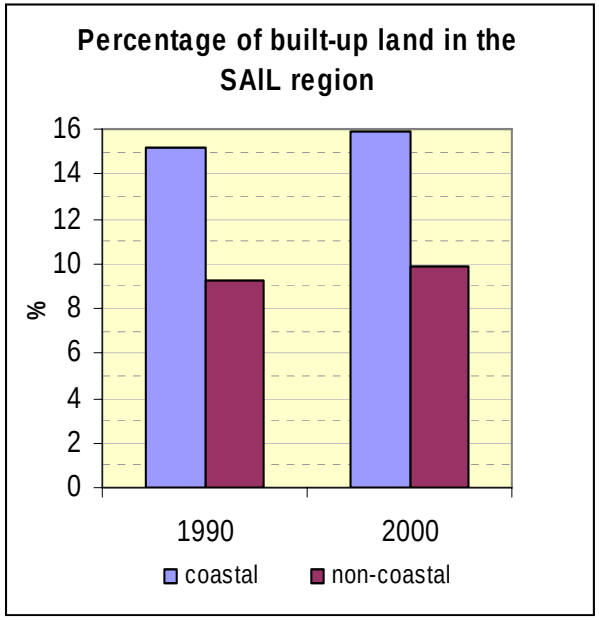


Percentage of built-up land by distance from the coastline, SAIL sub-regions, 2000 (1km buffers, by NUTS5)



What does the indicator show?

The area of built-up land in the coastal zone of the Southern North Sea region has increased from 15% in 1990 to 16% in 2000. In spite of this seemingly slow increase over the last decade, the rate of urbanisation in the coastal zone is still 1.32 times that of the hinterland. The coastal zone of the Southern North Sea is on average more urbanized than the inland areas (16% versus 10%), but there are considerable differences between sub-regions. In fact, most of the increases are localized around poles of development that may be driven by tourism (Thanet-UK, Belgian coast) or port development (Dover, Chatham). The drivers of urbanization at the coast are different to those inland.



Essex and Zeeland are the less urbanized sub-regions (10% and 4% respectively). The percentage of built-up land in the hinterland of Zeeland is higher (7%) and more rapidly increasing compared to the coastal municipalities that border the Southern North Sea.

The Thames area is urbanized for 71% of its area and has also seen a slight increase in urbanization over the last decade (1%). This trend is expected to continue with the development of brownfield sites and in Thames Gateway where approximately 200,000 new houses will be built in the coming years. The coastal zones of West-Vlaanderen (27%) and Nord-Pas de Calais (26%) are highly urbanized. Urbanization is most pronounced in the municipalities of the Côte d'Opale (26%) compared to the rest of Nord-Pas de Calais (5%). Urbanization rates on the Belgian and northern French coasts are the highest of the SAIL region. Furthermore, we must take into account that a significant proportion of new development in coastal zones is characterized by high-rise buildings.

What are the implications for planning and managing the coast?

The EU Recommendation for Integrated Coastal Zone Management urges regions 'To control, as appropriate, further development of the undeveloped coast'. Urban sprawl is one of the major concerns about the state of the coast in Europe. Coastal areas are often confronted with high population densities and a positive net migration balance. Land-take for new built-up areas and transport has been mostly at the expense of agricultural land and to a lesser extent semi-natural areas such as forests and grasslands. By the conversion from greenfield to brownfield development, the potential for recreational use is gradually lost while noise and air pollution, traffic congestion and pressure for further infrastructure are increasing.

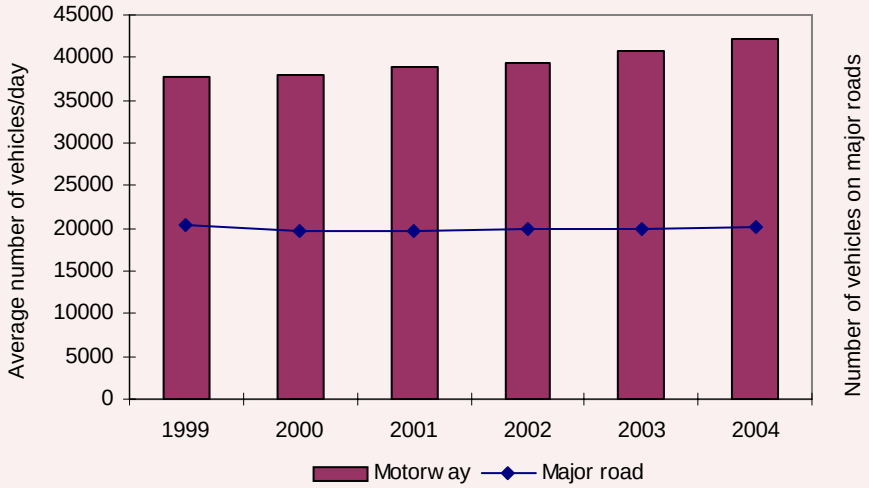
There are no specific targets for land take for urban development at the European level, although different documents reflect the need for better planning to control urban growth. Policies related to land-use issues and spatial planning are generally the responsibility of the local planning authorities. Although subsidiarity rules (the principle that promotes local decision-taking) assign land and urban planning responsibilities to national and regional levels, most European policies have a direct or indirect effect on urban development.

How reliable is the indicator?

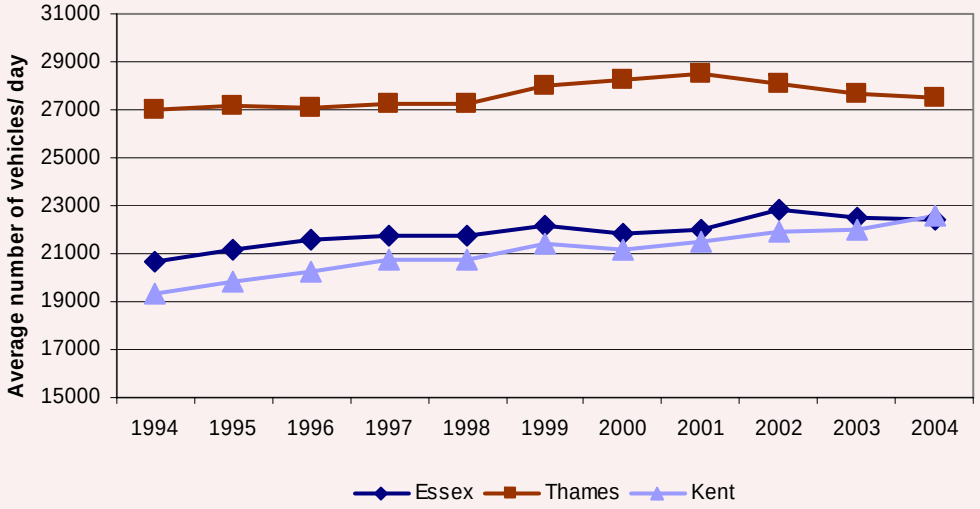
The minimum mapping unit in CLC is 25ha. Therefore an object or habitat type (e.g. dunes or saline lagoons) smaller than 25ha is likely not to be detected and mapped. Hence a severe bias can be expected for small and fragmented habitat types. Similarly, this level of accuracy does not allow detection of the real increase in urban development. Thematic accuracy is higher than 85%, meaning that an area of particular habitat type has 15% chance of being wrongly interpreted under a different habitat type. Hence, CLC is less suitable for the analysis of fragmentary and dispersed features.

Indicator 3 Demand for road travel on the Coast

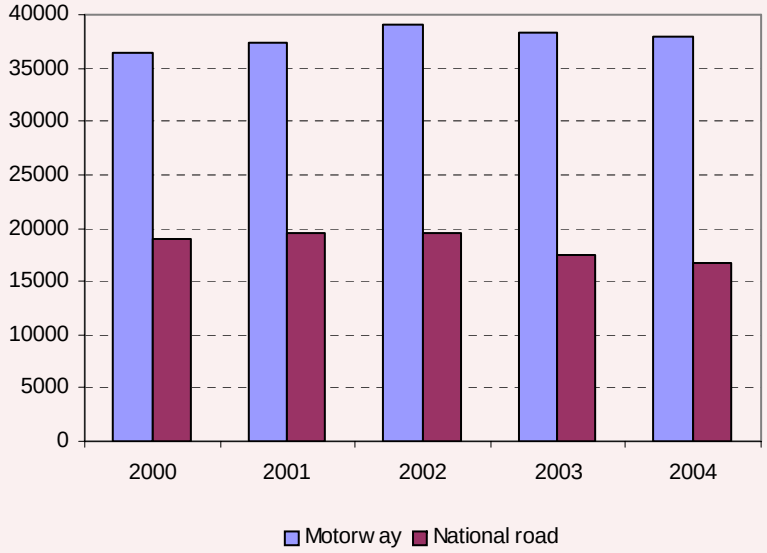
Average number of vehicles on coastal motorways and major roads - West-Vlaanderen (1999-2004)



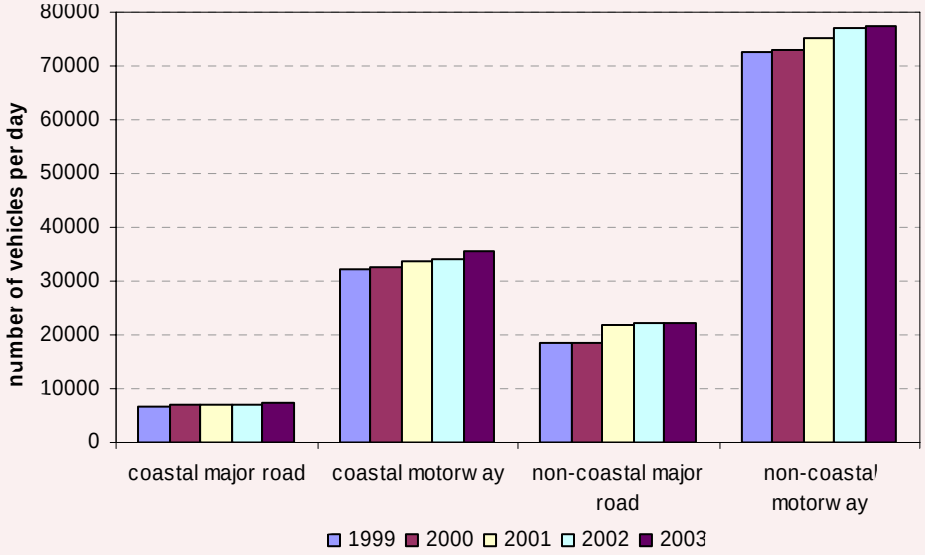
Average number of vehicles on coastal motorways and major roads - UK coastal districts (1994-2004)



Average number of vehicles on coastal motorways and major roads - Zeeland (2000-2004)



Average number of vehicles per day on coastal and non-coastal motorways (autoroutes) and major roads (routes nationales) Nord-Pas de Calais (1999-2003)



Key Message

- Intensity of traffic has remained stable on major roads at the Belgian coast (20,000 vehicles/day in 2004) while it has increased with 15% on motorways since 1999. This is associated with the increase in travel for tourism purposes. Similarly, in Nord-Pas de Calais the number of vehicles on coastal motorways increased from 27,000 to 29,000 vehicles/day) between 1999 and 2003.
- The number of vehicles on coastal motorways and major roads in Kent and Essex has increased between 1994 and 2004, particularly in Kent's coastal districts. Transport of goods between the UK and the continent plays an important role at the coast, which is at times difficult to separate from the traffic generated by tourism.
- In the coastal districts of Zeeland, traffic intensity has increased mainly in Schouwen-Duiveland which is one of the most important areas for tourism at the coast.

Why monitor the demand for road travel on the Coast?

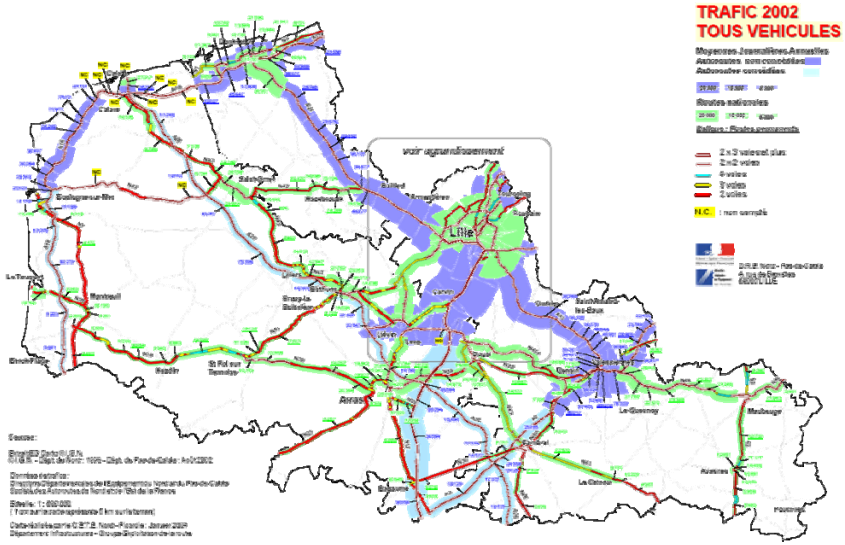
A significant consequence of development at the coast is an increase in the demand for road travel which leads to pressure on existing road space and in turn to the provision of new infrastructure. Road traffic expands to fill the space allocated to it and hence over time congestion, air pollution, noise and the costs associated with maintaining the road network will all rise exponentially. The measurement should alert us to the pace at which the demand for road travel is rising and also tell us whether the issue is greater on coastal motorways and major roads than on inland ones.

Where do the data come from?

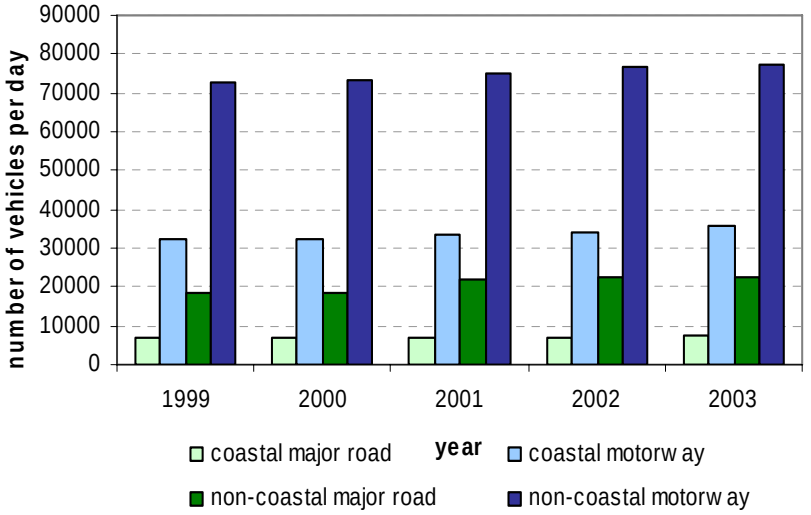
Traffic intensity at permanent measuring stations is collected mostly through national data gathering programs in support of transport policies and decision-making.

The Department for Transport in the UK supplies annual average daily flow (AADF): the average number of vehicles passing a point over a 24 hour period based on the annual average traffic flow. The 'Direction régionale de l'équipement (DRE-Nord-Pas de Calais)' in France, the 'Ministerie van de Vlaamse Gemeenschap - Leefmilieu en infrastructuur (LIN)' in Belgium and the 'Adviesdienst Verkeer en Vervoer - Ministerie van Verkeer en Waterstaat (AVV-RWS)' in The Netherlands, provide yearly averages based on workdays (5 days), weekends (2 days) or weekdays (7 days).

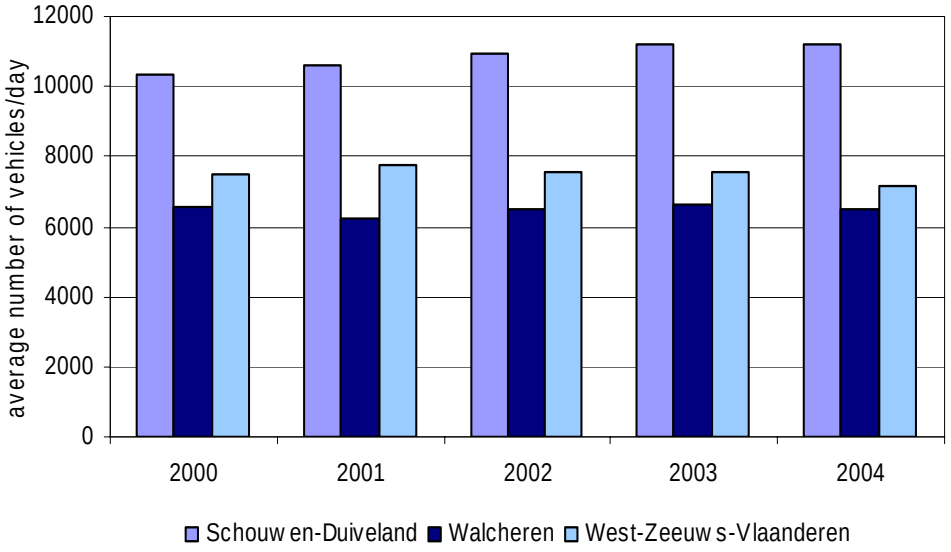
Average number of vehicles/day on coastal motorways (blue) and major roads (green)- Nord-Pas de Calais (DDE Nord and Pas de Calais -2002). SIGALE, Nord-Pas de Calais



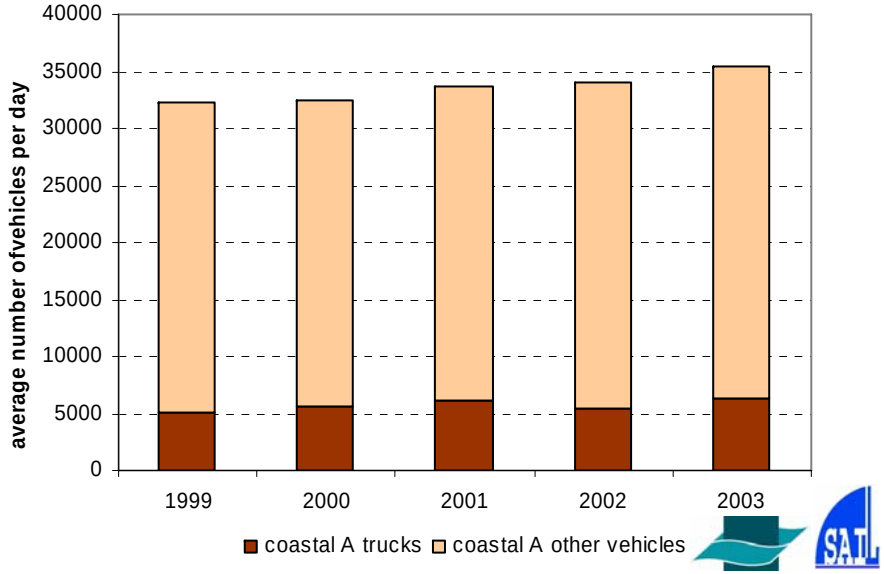
Average number of vehicles/day on coastal and non-coastal motorways (autoroutes) and major roads (routes nationales) Nord-Pas de Calais (CETE Picardie 1999-2003)



Average number of vehicles/day on coastal motorways and major roads, coastal NUTS3, Zeeland (AVV 2000-2004)



Proportion of trucks and other vehicles on coastal motorways (A), Nord-Pas de Calais (CETE Picardie 1999-2003)



What does the indicator show?

In Zeeland, intensity of traffic on major roads in the coastal zone increased mainly in the district of Schouwen-Duiveland, which is one of the main tourist areas at the coast. The overall increase of traffic intensity on motorways in Zeeland between 2000 and 2004 is recorded in the hinterland measuring stations.

Intensity of traffic has remained stable on major roads at the Belgian coast (20,000 vehicles/ day) while it has clearly increased on motorways since 1999 (+15%). This is associated with the increase in travel for tourism purposes (S. Goossens, LIN, Coastal Compass-Belgium).

The number of vehicles on coastal motorways and major roads in Kent districts has increased significantly since 1994. This is the case in Dartford and Gravesham (Thames Gateway) and Swale.

In Nord-Pas-de-Calais, intensity of traffic on coastal motorways is associated with transport between the three coastal cities of Dunkerque, Calais and Boulogne-sur-mer. The increase in traffic is visible on all types of roads in the hinterland, and on motorways in the coastal zone. The increase in transport of goods cannot fully explain the higher number of vehicles on coastal motorways since 1999; while the average number of trucks increased by 23%, the number of personal vehicles on these roads has increased by 7%.

International transport between the UK and the continent plays an important role in both coastal regions and it is difficult to separate from the traffic generated by tourism. However, in specific and highly popular seaside towns such as Le Touquet, where there is no international connection, traffic flow is comparable to that observed in the larger towns of Dunkerque and Boulogne-sur-mer, and even to the larger traffic flow through Calais. This again suggests the important role that tourism can play locally in generating traffic.

What are the implications for planning and managing the coast?

European Resolutions and Advices concerning transport policies (*"Common Transport Policy – Sustainable transport: Perspectives for the Future", December 2000)*, provide broad guidelines for traffic and note that it is mainly national/local transport policies that can effectively achieve targets for more sustainable modes of transport and traffic. Special attention is required for issues that affect the perceived quality of life for the population. Mechanisms to absorb peaks in road traffic during high season in tourism are often a priority for seaside towns. Promoting the use of good alternatives in public transport, strategic location of parking areas and transport to and from beaches and other recreation areas, are major issues for local planners in coastal zones.

The introduction of 'Motorways of the Sea' as a competitive alternative to land transport in the framework of the Trans European Network (TEN), creates the possibility for Member States to set up short sea shipping projects. During their European chair in 2004, The Netherlands proposed the concept of 'Motorways of the Sea' as a quality label for coastal navigation corridors that function well.

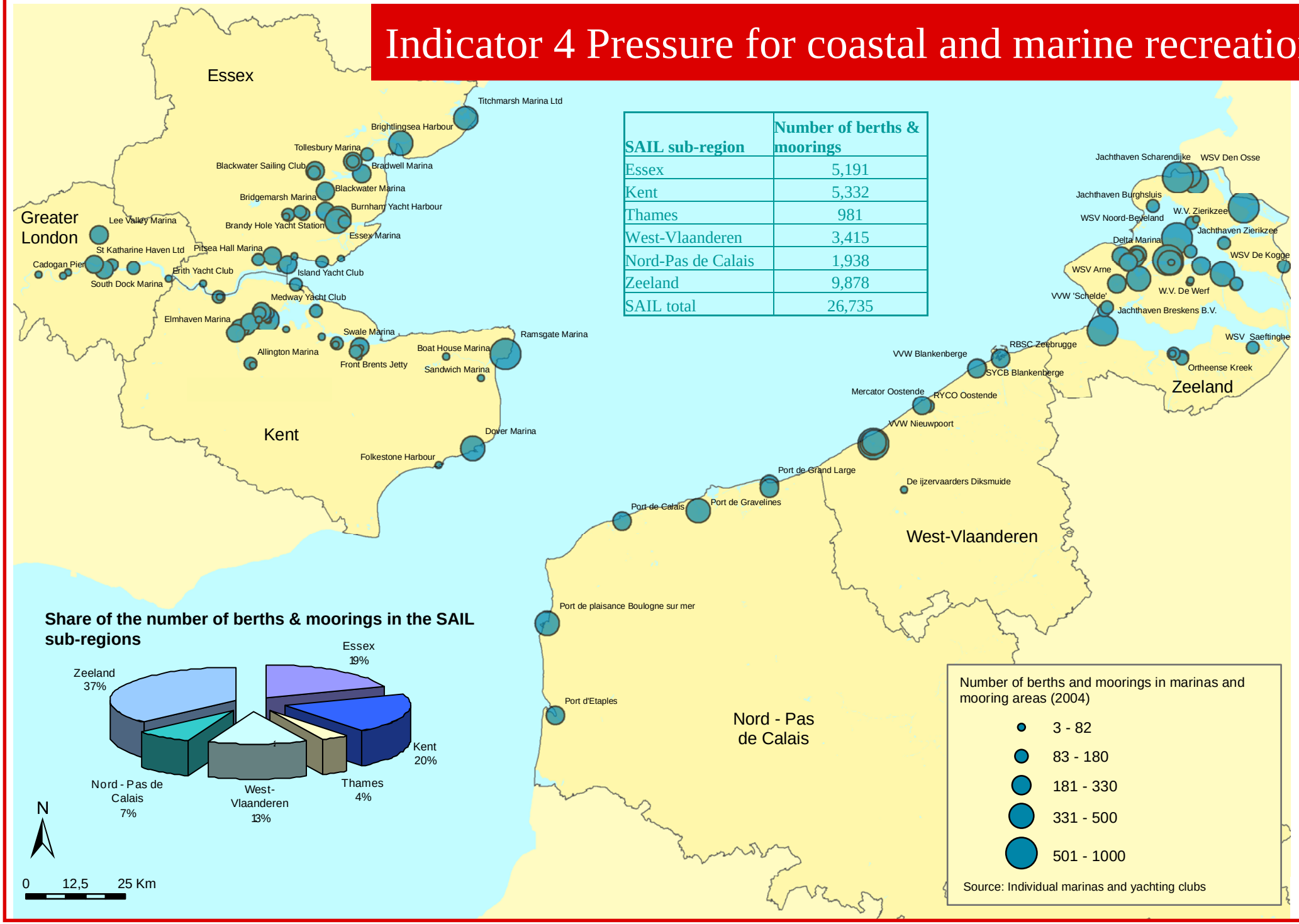
How reliable is the indicator?

Data on traffic intensity are collected from measuring stations. Only data from permanent stations are included in the present study, in order to create a baseline and allow for a future trend analysis. Hence, coastal areas where no permanent measuring stations are installed could not be included in the analysis. The location of these stations does not always fully reflect the traffic over the total length represented by the station, nor the geographic area. The measurement is not an indicator of the environmental impact of road traffic, since it does not account for the type or the quality of the vehicles.

Increase in traffic intensity by transport of goods cannot be separated from an increase in the flow of other types of vehicles (except in Nord-Pas de Calais). Data on seasonal spreading of traffic intensity are needed in order to evaluate the effect of tourism on traffic in coastal zones.

Indicator 4 Pressure for coastal and marine recreation

SAIL sub-region	Number of berths & moorings
Essex	5,191
Kent	5,332
Thames	981
West-Vlaanderen	3,415
Nord-Pas de Calais	1,938
Zeeland	9,878
SAIL total	26,735



Share of the number of berths & moorings in the SAIL sub-regions

Number of berths and moorings in marinas and mooring areas (2004)

- 3 - 82
- 83 - 180
- 181 - 330
- 331 - 500
- 501 - 1000

Source: Individual marinas and yachting clubs

N

0 12,5 25 Km

Key Message

- There are approximately 130 marinas and yacht clubs in the Southern North Sea region, featuring around 27,000 berths and moorings for recreational boating. The province of Zeeland has the highest number of both marinas and berths. The largest marinas are located in Nord-Pas de Calais and West-Vlaanderen.
- The impact on the coast in terms of water pollution and seabed disturbance is expected to be higher where pressure exerted by recreational boating is more important.

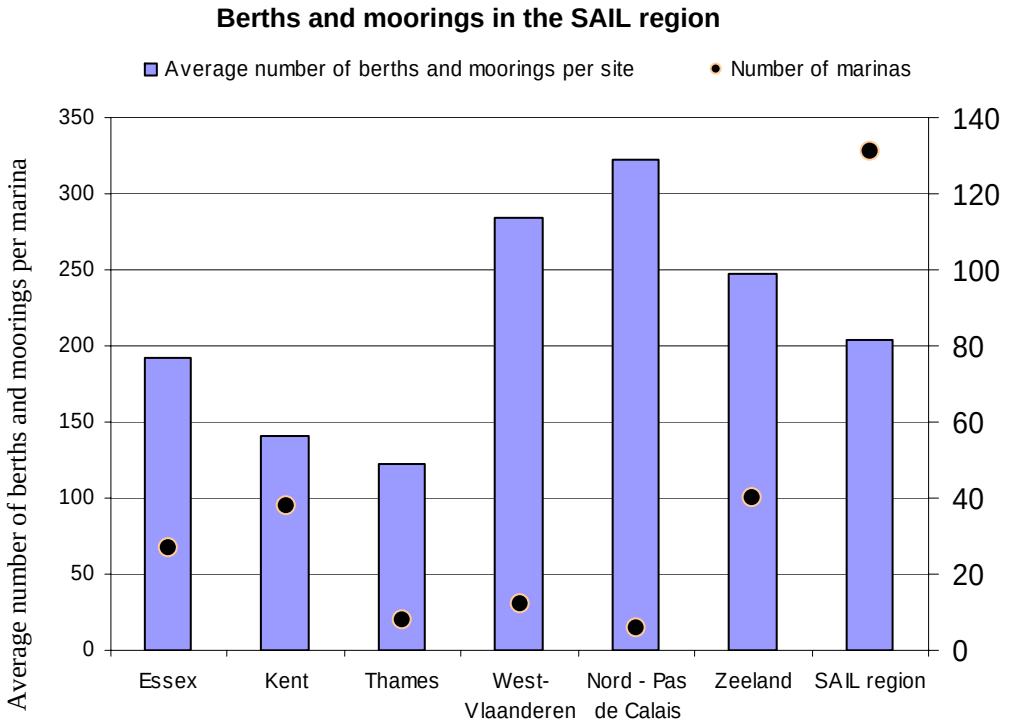
Why monitor the pressure for coastal and marine recreation?

The number of berths and moorings in marinas and yacht clubs is a measure of the pressure exerted on coastal waters by recreational boating. Marinas require additional space, resources and infrastructure. Effects on ecosystems are mainly in terms of chemical pollution (oil, paintings), noise and mechanical disturbance (on sediments and benthic organisms) as well as an eroding effect on the foreshore, especially in estuaries, rivers and canals.

This measurement is needed to (1) monitor the increasing demand for recreational boating and infrastructure around the Southern North Sea; (2) know where the largest concentrations of berths and moorings occur; and (3) know where growth is most significant.

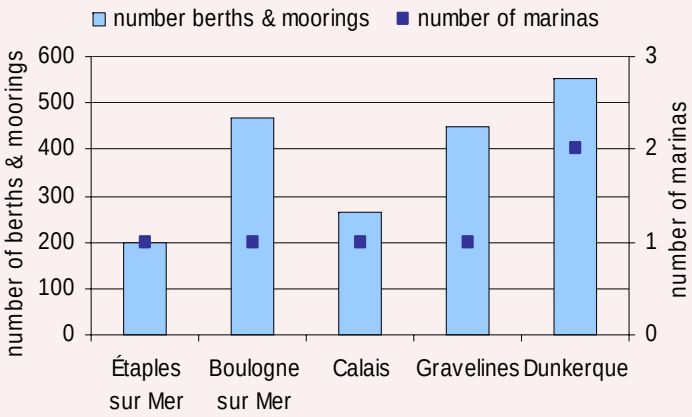
Where do the data come from?

No centralized database or statistics are kept of this measurement. In the absence of national or regional statistics a baseline survey was conducted by contacting ports, marinas and yacht clubs individually. A list of marinas, ports and yacht clubs for the United Kingdom is available from the Royal Yachting Association (http://www.rya.org and http://www.marina-info.com). The Port of London website also provides valuable data on moorings and other services: http://www.portoflondon.co.uk/leisure_river_map/moorings.cfm/site/leisure. For France, the network 'Plaisance Côte d'Opale' at http://www.plaisance-opale.com provides a reference point. In The Netherlands http://www.allejachthavens.nl was used for the present study as an inventory of existing facilities; recently, Deltagids (http://www.deltawaterland.nl) has listed information on marinas in the Dutch Delta area.

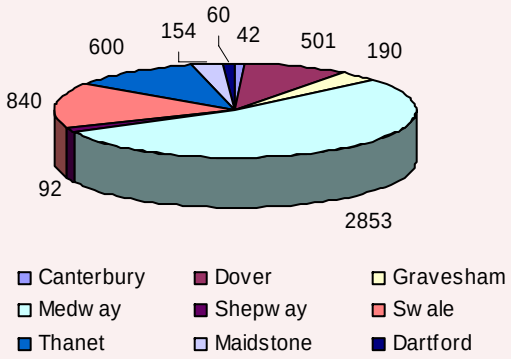


Number of berths & moorings in the SAIL sub-regions (2004)

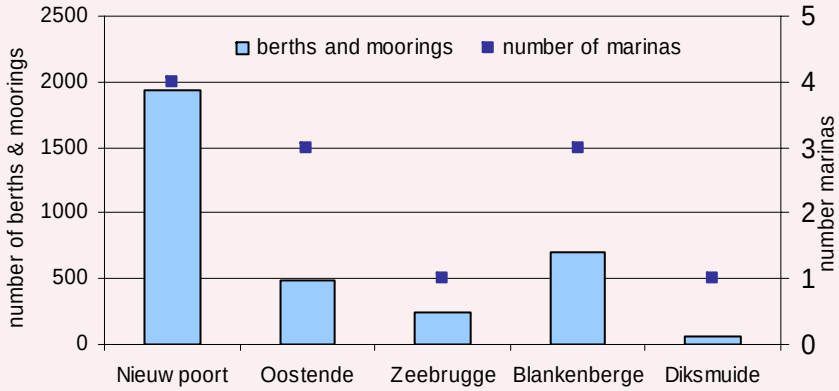
Nord-Pas de Calais



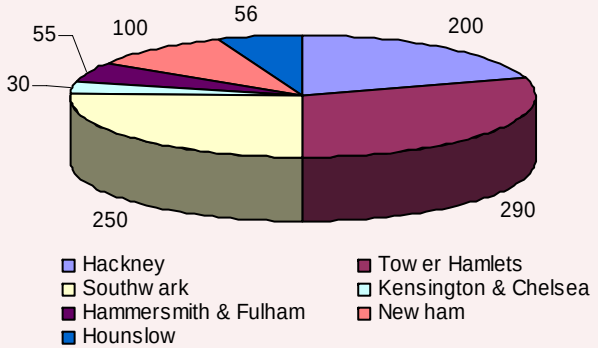
Kent



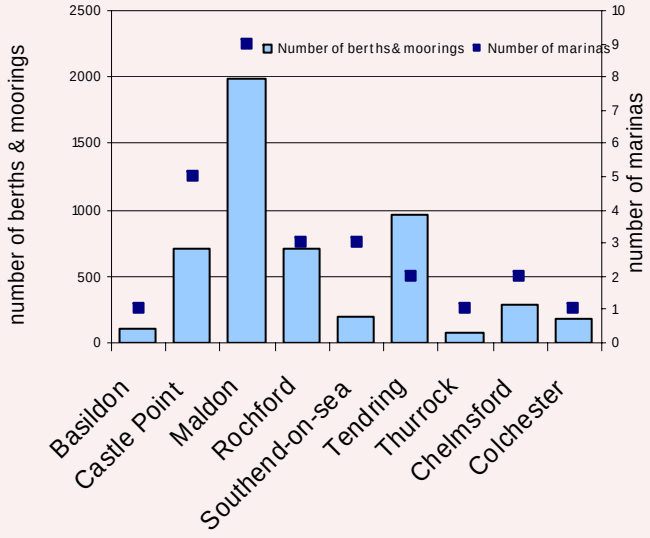
West-Vlaanderen



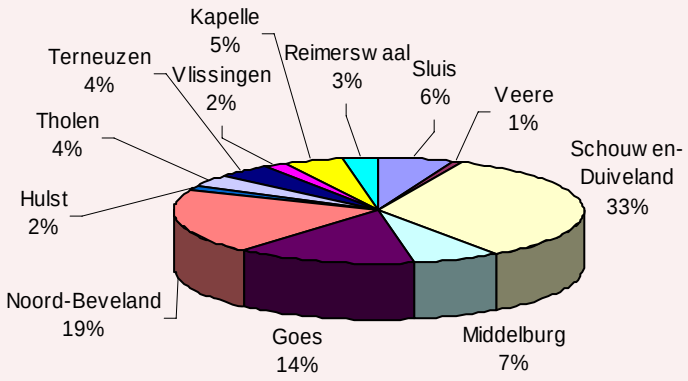
Share of the number of berths and moorings in the Thames area



Essex



Share of berths in Zeeland municipalities (%)



Total number of berths in Zeeland : 9,878

What does the indicator show?

With more than 130 marinas and yacht clubs, and approximately 27,000 berths and moorings, recreational boating is an important activity in the southern North Sea. The province of Zeeland has a 'sea-going' tradition and contributes the highest number of marinas (40-or almost one third of the SAIL total) and berths and moorings (9,878 or 37% of the SAIL total). Kent has a large number of smaller marinas, with more than half of Kent mooring facilities located around the estuaries of the river Medway. In Essex, most of the mooring facilities in marinas and yacht clubs are harboured in the Maldon area (2,000 berths and moorings) and - to a lesser extent - in Tendring. The largest marinas are located in Nord-Pas de Calais and West-Vlaanderen (average of 323 and 285 berths and moorings per marina, respectively). Nieuwpoort at the Belgian coast is by far the largest marina in the region, with nearly 2,000 berths in the complex.

Fig: *detailed map of marinas and number of berths in Zeeland*

Fig: *detailed map of marinas and mooring sites in Kent, Essex and Thames*

What are the implications for planning and managing the coast?

Coastal areas important for recreational boating are generally also important for nature or landscape conservation purposes (Special Areas of Conservation SAC and Special Protection Areas SPA, National Parks). The implementation of the EU Habitats Regulations increasingly restricts the provision of facilities for recreational boating. Some of the major environmental concerns around marinas and mooring areas include the release and bio-accumulation of hazardous substances such as TBT (from antifouling paints) and Poly Aromatic Hydrocarbons (PAHs), as well as marine litter. The implementation of dry stack-storage sites, mainly for safety and protection of the yachts, may in part reduce this impact off-season. However, it may also add to the increasing demand for space in the coastal zone.

According to the Royal Yachting Association's *Planning and Environmental Strategy for Sustainable Boating*, the challenge will be to identify areas that are currently underused and could be more effectively used. Sustainable planning for recreation boating requirements should be included in both strategic regional level and local development plans. It is expected that strategic planning of infrastructure for recreational boating and its efficient use can contribute to reducing congestion, creating new jobs and increasing spending in coastal towns.

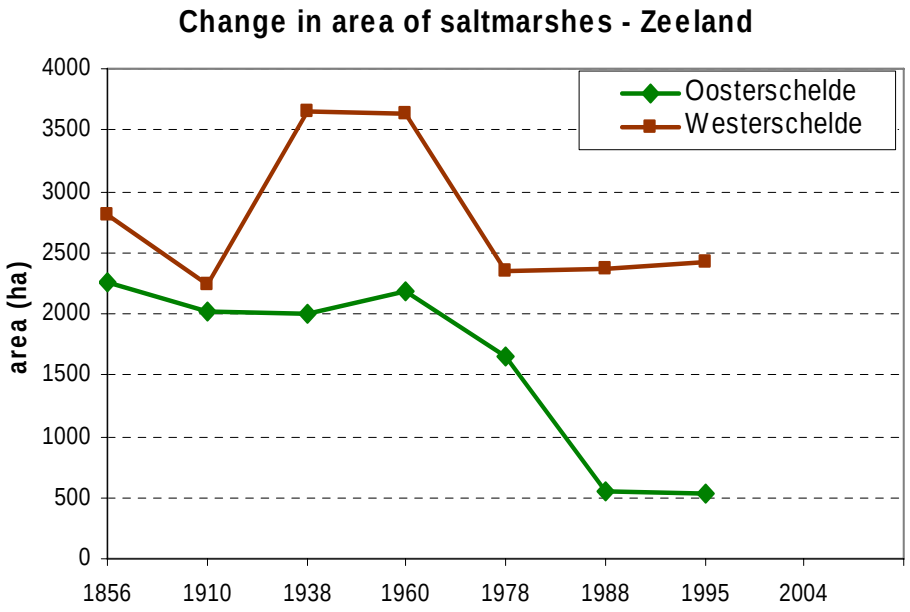
How reliable is the indicator?

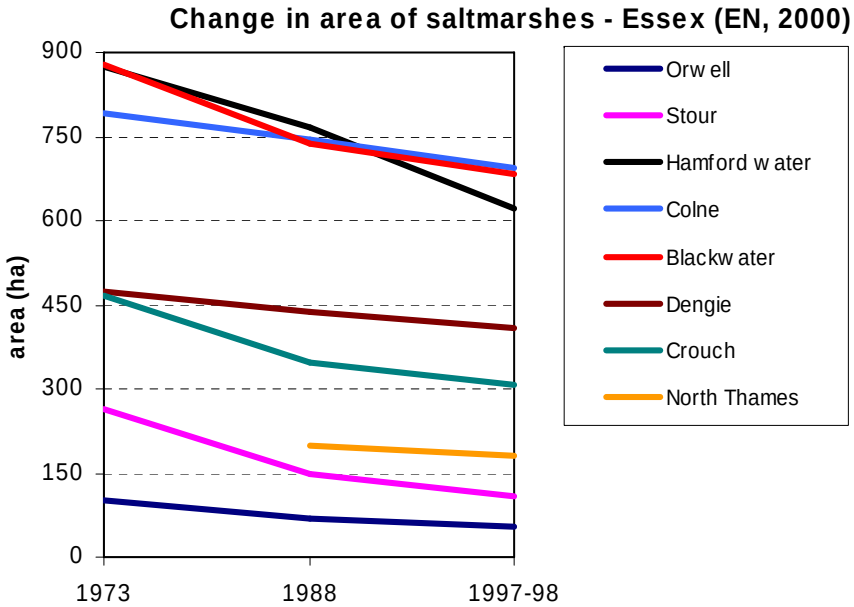
The British Marine Federation (BMF) conducted a survey in 2003 for the British coast, with a response rate varying from 43% to 74%. Mooring numbers for the South East Coast were used to cross-check the data presented here. For the Thames area 526 moorings were reported by the BMF. Although yacht clubs and shipyards were also surveyed, the true number of berths and moorings in Kent and Essex is expected to be underestimated due to the presence of mooring sites. Since mooring areas outside marinas are practically non-existent along the continental coast, data outside the UK is expected to be very reliable.

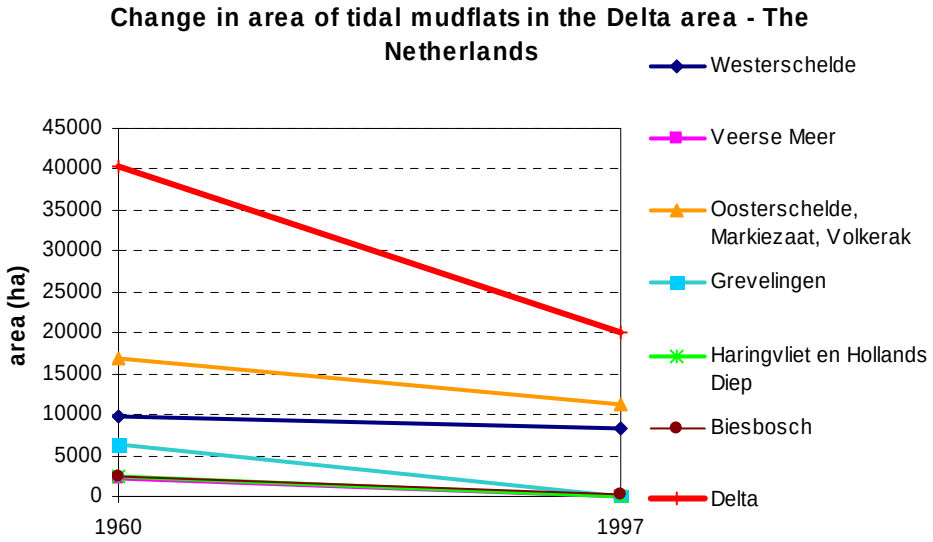
2 To protect, enhance and celebrate natural and cultural diversity

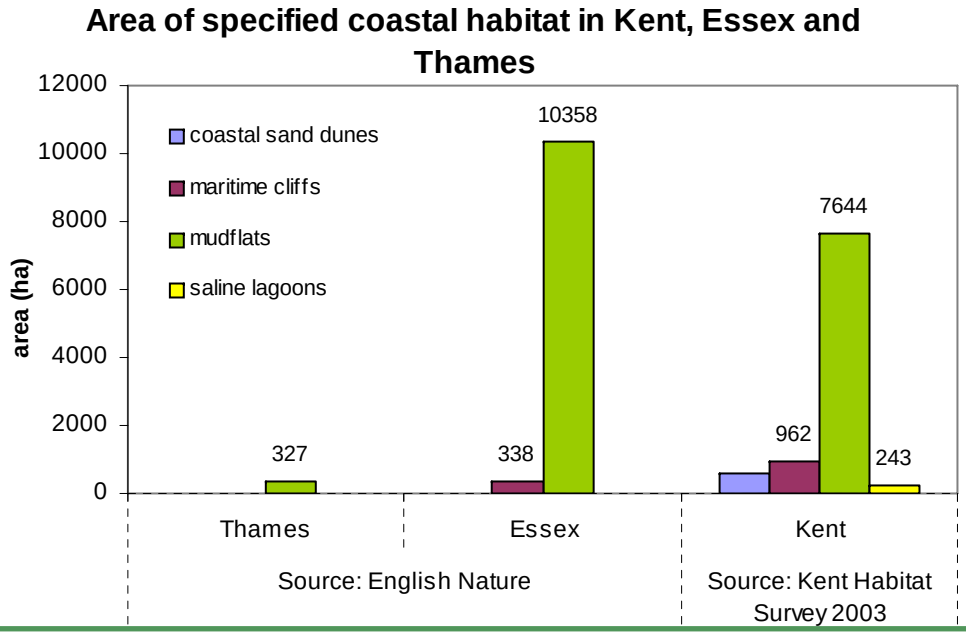
Change to significant coastal and marine habitats and species « » Area of land and sea protected by statutory designations « » Effective management of designated sites « » Loss of cultural distinctiveness

Indicator 5 Changes to significant coastal and marine habitats and species









- ***Trends in area of specified (priority) coastal habitat***
- ***Trends in number of breeding pairs: Common, Sandwich and Little tern***
- ***Population estimates: Common seal and Harbour porpoise in the Southern North Sea***
- ***Number of coast-specific species included in the Red List of species***

Key Message

- Key habitats in coastal zones have declined significantly over the last decades. Salt marshes in Essex have declined to two third of their extent in 1973; in Zeeland they have been reduced by more than 75% of their original extent. Tidal mudflats in Zeeland have declined by 50% over the 1960-1997 period, mainly as a consequence of the Delta works. Nord-Pas de Calais has the largest extent of dunes (8,407ha in 1998) within the SAIL region. The coasts of Thanet (Kent) and Nord-Pas-de-Calais hold an important proportion of the European chalk reef habitat: the largest part is severely affected by erosion.
- It is uncertain to what extent effects of climate change and changes in distribution of prey species are affecting the increase in observations of some of the coastal 'flagship species'.
- In spite of the efforts of halting the loss on Biological Diversity, dozens of 'priority' coastal species are listed as (critically) endangered, vulnerable, or extinct.

Why monitor changes to significant coastal and marine habitats and species?

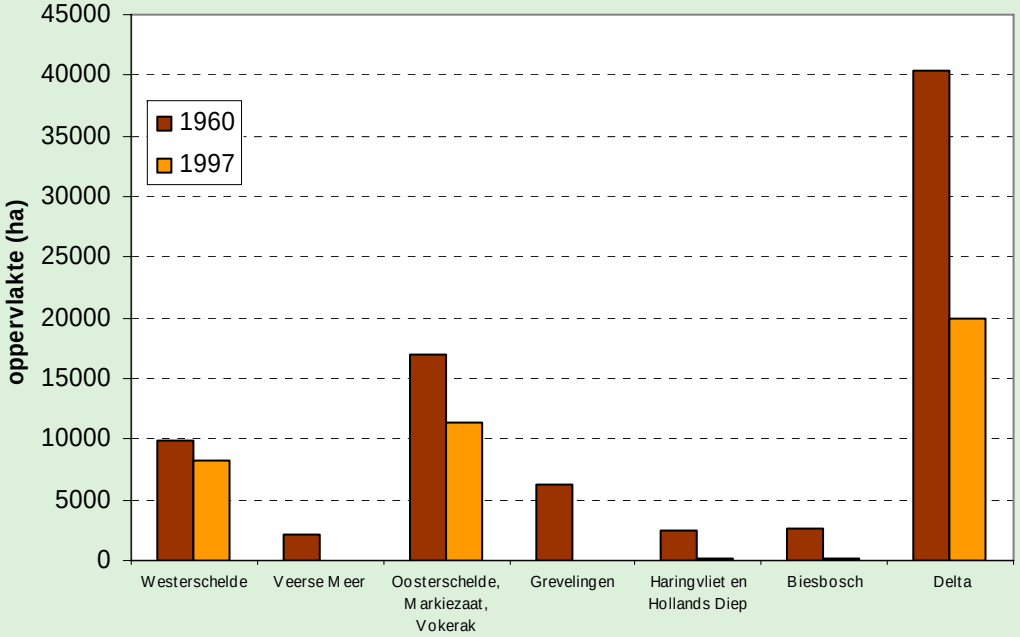
Coastal habitats provide crucial ecosystem functions: mudflats are among the most productive feeding habitats for wading birds and spawning areas for fish and invertebrates. Saltmarshes and coastal lagoons absorb wave energy from the sea and protect lower-lying lands from flooding. Population numbers of species that are characteristic of dynamic coastal habitats are indicators of the general health and functioning of their feeding and breeding sites.

Red Lists can serve different purposes. They provide a signal to authorities about species in danger of disappearing in the absence of proper conservation action. They help to set priorities for implementing conservation measures and monitoring systems. Red Lists are a medium to promote research and help draw the attention of the public to the gradual loss of biodiversity.

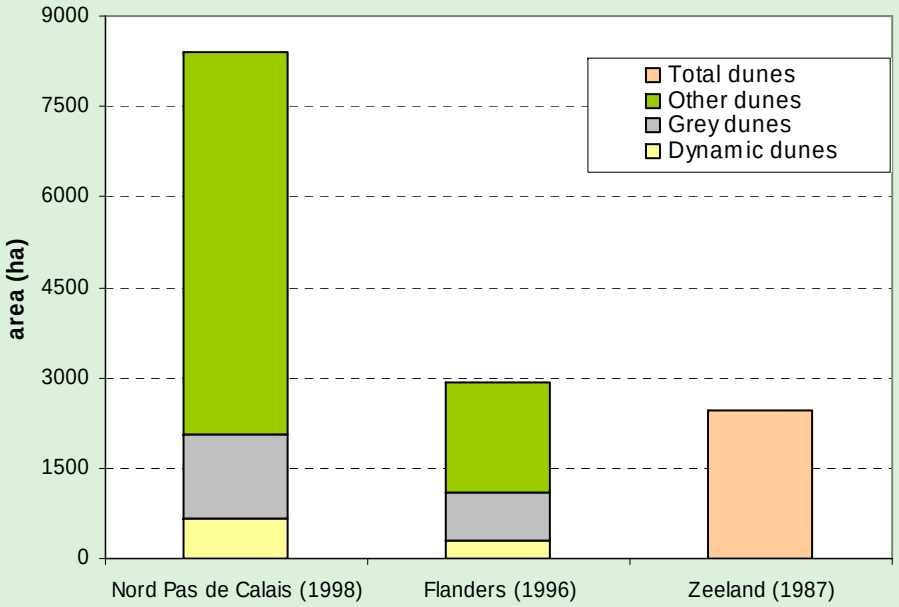
Where do the data come from?

The Kent Habitat Survey (2003) provides estimates of the extent and location of key habitat. Data for Essex and the Thames region are provided by English Nature and range from a variety of sources and years (1988 to 2003). Red Lists for endangered taxa and species in Flanders are provided by the Institute for Nature and Forestry Research - INBO (2003), the Province of Zeeland (Priority species for Zeeland and The Netherlands, 2001), Kent Red Data Book and Biodiversity Action Plan (2003) and Essex Biodiversity Action Plan (2000). Additional sources were consulted for Kent and Medway, and for Nord-Pas de Calais. From these official lists, coast-exclusive and coast-preferential species were selected. Individual expertise, specialized databases and extensive literature search were necessary to fill multiple gaps of information and check contradictory sources, both for species and habitats. Large-scale projects provide population estimates for porpoises (SCANS 1994 and 2005) and seabirds. For the assessment of change in coast-specific habitat, coastal dunes, saltmarshes, maritime cliffs, mudflats, seagrass habitat and saline lagoons were considered.

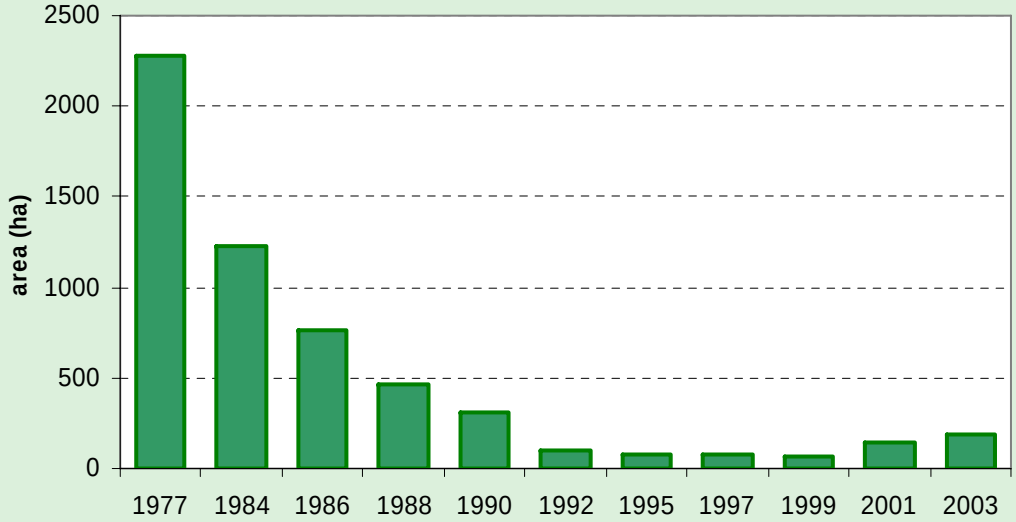
Change in mudflats in the Delta area—The Netherlands (1960-1997)



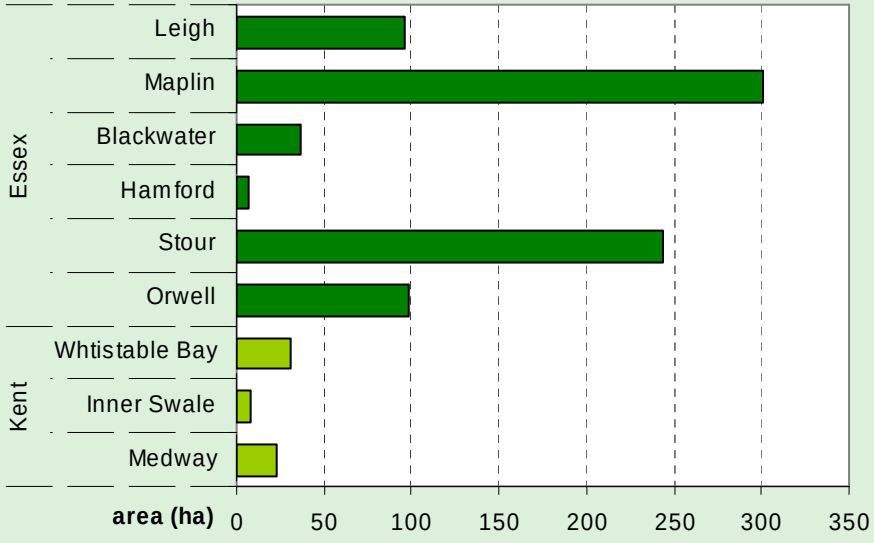
Area of coastal dunes in SAIL sub-regions



Change in Area of Seagrass habitat (Zostera) - Oosterschelde, Zeeland



Area of Seagrass habitat (Zostera) - UK - 1972



What does the indicator show?

COASTAL HABITATS

Essex saltmarshes make up almost 10% of Britain's entire stock. The decline of saltmarsh habitat in Hamford water from 900ha in 1973 to 600ha in 1998 illustrates the general decline of this crucial habitat in Essex. Saltmarshes in the Oosterschelde have been reduced by more than 75% of their original extent (1856). The loss of saltmarshes in Zeeland occurred mainly from the 1960s to 1990 due to the Delta works which have affected the dynamics of tidal processes. In the Westerschelde, the main cause of decline was the claiming of land for polders. The slight increase in saltmarshes in the Westerschelde are mainly due to the deliberate breaching of the dyke at Selenapolder (now Sieperdaschor) in 1990, to extend saltmarsh habitat.

Tidal mudflats provide crucial feeding grounds for populations of wading birds in Essex, Kent and the Delta area in Zeeland. Their biological diversity is unparalleled and they provide a spawning habitat for many invertebrate and fish species. Mudflats have declined by 50% over the 1960-1997 period in the Delta area; most of the 20,000ha lost were located in the Oosterschelde and Grevelingen area.

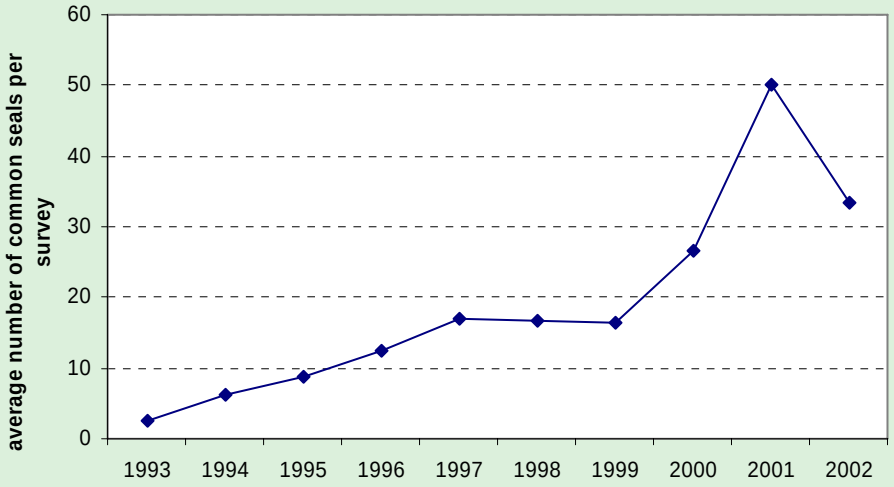
The loss of mudflats in coastal zones is a major concern for the Environment Agency in the UK. It has been estimated that sea level rise will result in a loss of 8,000 to 10,000ha of intertidal flats in England between 1993 and 2013. The most recent estimate of the area of extent mudflats is 10,358ha in Essex (2000) and 7,644ha in Kent (2003). Land claim has been responsible for the removal of up to 80% of mudflats in estuaries.

Dunes may be typified as 'dynamic' (or mobile), 'grey' (or fixed with vegetation) and 'other', but different subcategories exist among reporting sources. In absolute terms, Nord-Pas de Calais has the largest extent of dunes (8,407ha in 1998) within the Southern North Sea region, however the habitat represents only 0.7% of the total area of NPDC. In Zeeland, the 2,466ha of dunes represent 1.4% of the total land area of the Province (1987). In West-Vlaanderen, 90ha of the total area of dunes (2,935 ha) are embryonic, 216ha are dynamic and 801ha are grey dunes (1996). In Nord-Pas de Calais approximately 36ha were lost between 1990 en 1998, mostly to housing.

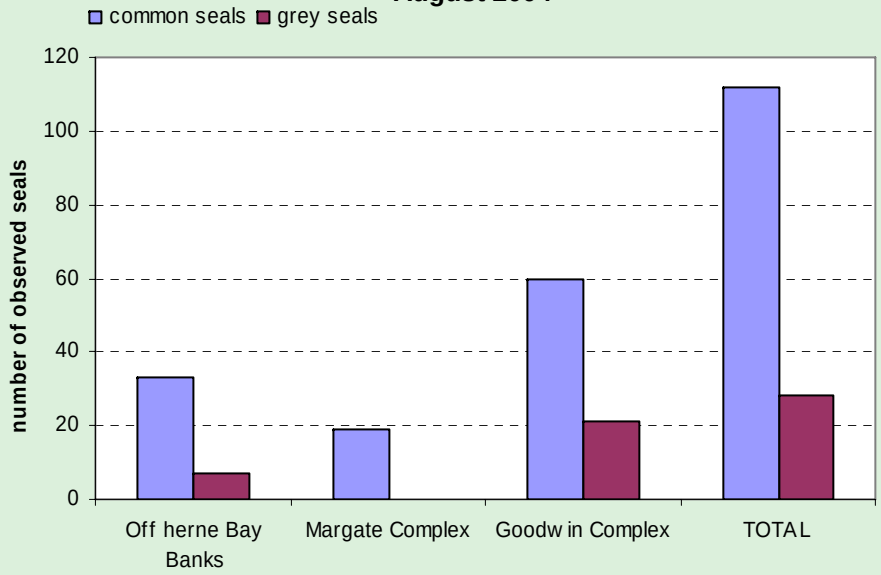
Seagrass beds are formed by two species of *Zostera* in the study area, both of which are considered scarce throughout SAIL region coastal waters. The area of Maplin and the Stour in Essex contained a significant extent of this habitat in 1972 but no current information is available. Between 1987 and 1992 symptoms of a wasting disease affecting several populations appeared in the south of England. The extent of seagrass beds is also sensitive to a range of natural factors. Seagrass beds are strongly dependent on the transitional habitat from salt to freshwater. In the Oosterschelde in Zeeland, seagrass beds have been in decline since 1977; less than 100ha are left from the original 2,278ha.

In Britain, less than 1% of the coastline is formed by chalk cliffs and platforms, yet this includes 75% of the chalk reefs in Europe. Thanet's coast in Kent comprises 12% of these reefs. The entire extent of the chalk cliffs and reefs in Thanet is a Marine Special Area of Conservation. In Nord-Pas de Calais, 25km of the coastline consists of chalk cliffs: the largest part is affected by erosion rates of 10-70cm per year (source: PLAGE, 2003).

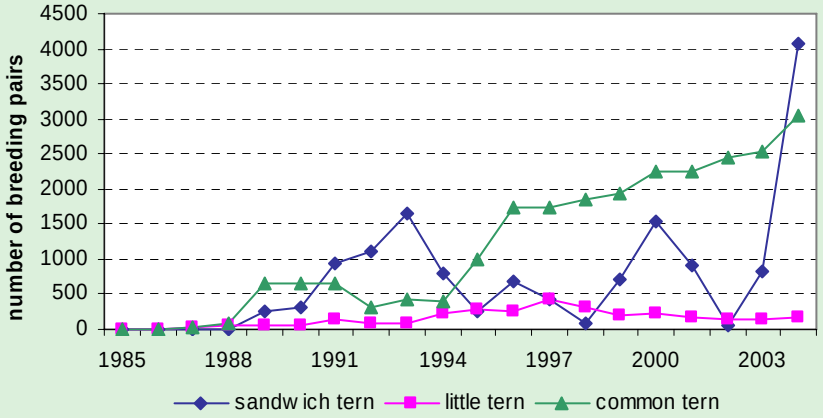
Delta area - The Netherlands - average seal count per survey



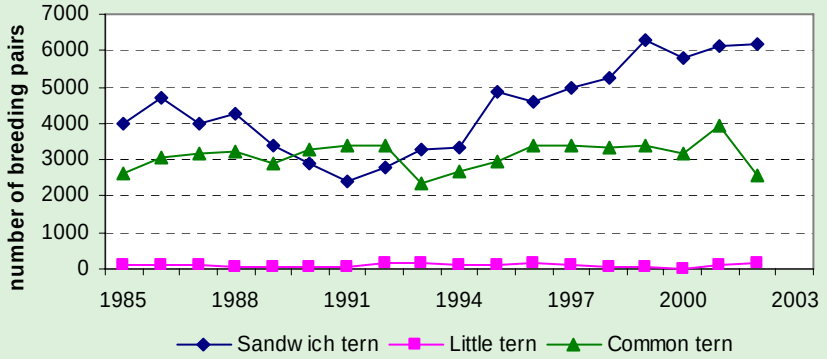
Seals on haul-out sites off the north Kent coast, August 2004



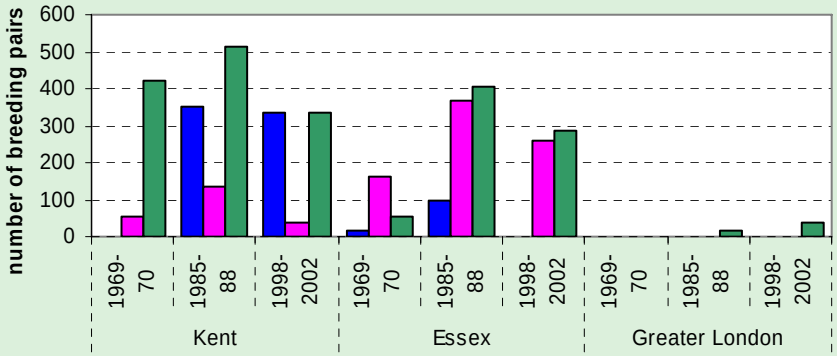
Seabirds Flanders



Seabirds Zeeland



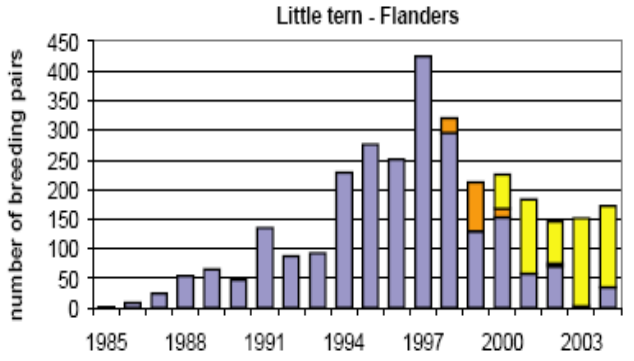
Number of breeding seabirds in the UK SAIL sub-regions



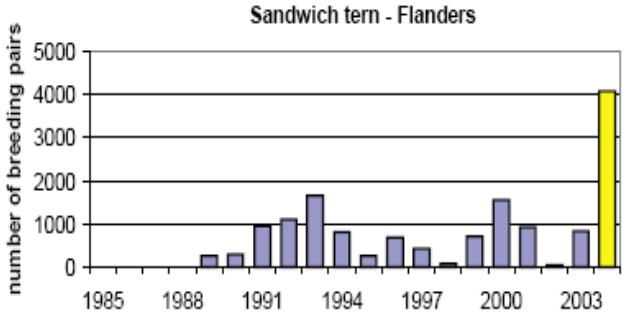
COASTAL SPECIES

Seabirds

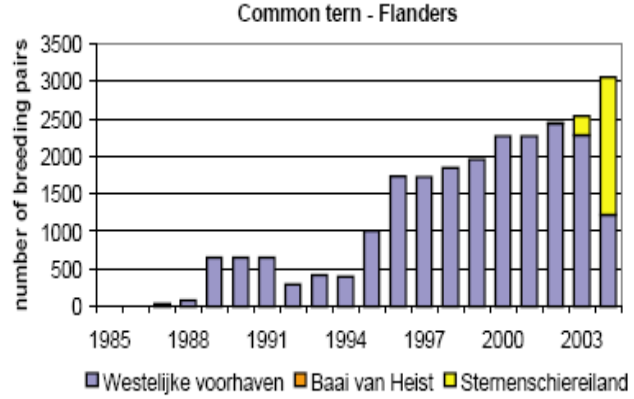
The number of breeding pairs of Common and Sandwich terns at the Belgian coast has increased, while breeding pairs of Little tern have decreased since a peak (425) in 1997. The establishment of a protected breeding site in Zeebrugge in 2000 already shows a clear impact: most of the Common and Little terns and 100% of the breeding pairs of Sandwich terns (4,000) used this area for breeding in 2004.



The number of breeding terns in Zeeland is the highest of the Southern North Sea region. Specifically Common and Sandwich terns breed in high numbers and the population of Sandwich terns is increasing over the period 1985-2003.



Essex and Kent have important populations of breeding terns, especially Little tern. The latest 'Seabird' census (1998-2002) revealed a total number of 1,947 pairs of Little tern in the UK, of which 300 pairs were in Kent and Essex breeding sites.



Harbour porpoises

The large-scale observation efforts on harbour porpoises - and other cetaceans - in the North Sea in SCANS I (1994) resulted in a population estimate of 309,000 (CI: 237,000–381,000). The results of the SCANS II efforts (July 2005) are available in the second half of 2006. Long-term monitoring of sightings of Harbour porpoises along the Dutch coast shows a strong increase since 1996 (34% increase per annum). Important by-catches of Harbour porpoises are documented for the bottom set net fisheries, the bass fishery and the gill and tangle net fisheries in the UK. Based on available population estimates and the target to reduce cetacean by-catch below 1.7% of the estimated population (ASCOBANS 2000), Harbour porpoise by-catch in UK vessels in the North Sea should be less than 500 animals per year.

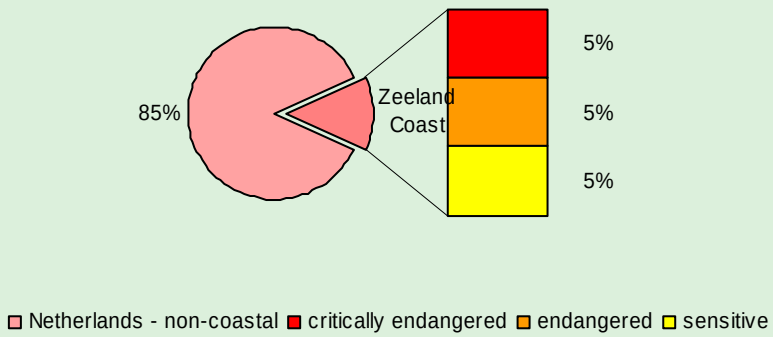
Seals

An increase in the average count of Common seals per survey in the Delta area was recorded between 1993 and 2001 (from 2 to 50 seals). However, it is estimated that the population was cut back by 22,000 in the southern North Sea because of an outbreak of the viral disease *Phocine distemper* in the summer of 2002. During surveys on haul-out sites off the north Kent coast (August 2004) 112 common seals and 28 grey seals were observed. These numbers are thought to represent approximately 60% of the actual population. The total population of the Harbour seal in the UK North Sea is estimated at 19,702 (1994-1999) of which 3,568 are on the English east coast. The total population for the Delta area is estimated at 97 seals (2000). Haul-out behaviour affects the counts significantly in both areas.

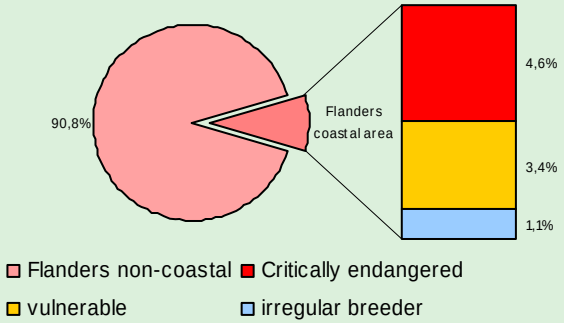
RED LISTS and priority species:

For Zeeland, species from the Red List (RL) with a distribution restricted to or preferential in dunes and tidal area were selected. Fifteen of these 'coastal' mammals on the Red List (15% of total RL mammals) are critically endangered, endangered and sensitive. Nine species of birds on the RL (12%) occur in the coastal area of Zeeland. The largest part is considered endangered. Only 1 of the 35 fishes on the RL is coastal, and actually classified as extinct in Zeeland (Fint, *Alosa fallax*). Thirty one of the 499 vascular plants on the RL in The Netherlands, have their distribution in the coastal zone of Zeeland; 16

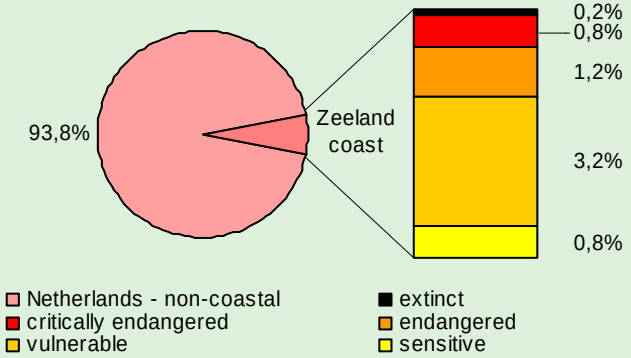
Red list - Mammals - Zeeland coastal



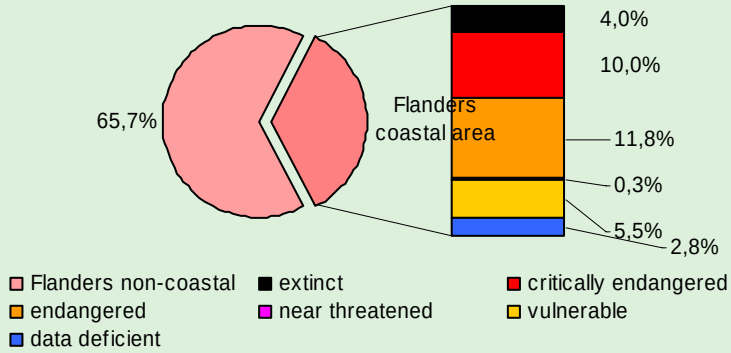
Red List - Birds - Flanders



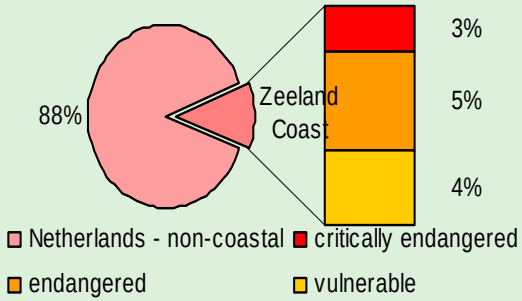
Red List - Higher plants - Zeeland coastal



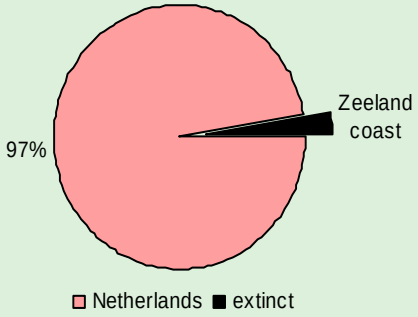
Red List - Higher plants - Flanders coastal area



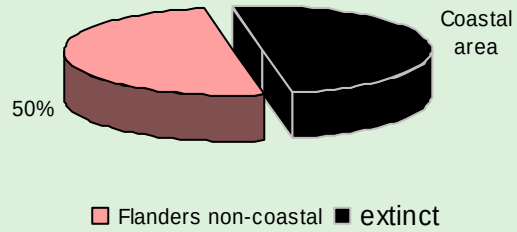
Red list - Birds - Zeeland coastal



Red List - Fish - Zeeland coastal



Red List Flanders - Fish



species are vulnerable and 1 has become extinct. Of all 8 taxonomic groups analyzed, 2 have extinct species (vascular plants and fishes).

In West-Flanders 50% of the RL coastal fish species (8 species) are extinct. Some caution is needed to interpret this data. According to specialists the RL is incomplete for fishes since it does not include rays and sharks. Slightly more than 25% of Red List vascular plants are coastal (137 species), most are 'critically endangered' (40 species or 7%) or 'endangered' (47 species or 9%). Only a small percent of RL breeding birds are exclusively breeding at the coast (8%). This includes the category 'non-permanent breeder'.

From the 3 mammals that are coast-specific in Flanders, 2 are endangered and 1 considered extinct.

The Essex Biodiversity Action Plan (BAP) contains 25 priority species, of which 5 are coast-specific. Special attention is given to Hog's fennel, of which 60% of the national population is found in Essex, and the Bright wave moth which is now thought to be extinct in Essex.

The Biodiversity Action Plan and the Kent Red Data Book provide valuable information on the list of 221 BAP priority species. None of the mammal and bird priority species are considered coastal. Both species of coastal 'BAP' amphibians and reptiles are extinct. Mosses (1 endangered) and lichens (1 vulnerable) in the coastal zones are also considered among the priority species. Of the 2 coast specific flowering plants in the Kent BAP, 1 is extinct.

Two coastal species of the 37 mammals on the RL for Nord-Pas de Calais are considered endangered. The RL for seabirds (102), holds 20 coastal species. Of these, 1 is extinct and 4 endangered. The Sand lizard (*Lacerta agilis*) - the only coastal species on the list of amphibians and reptiles (11) - is extinct in the region. The RL for Nord-Pas de Calais (Kerautret, 2000) is provisory.

What are the implications for planning and managing the coast?

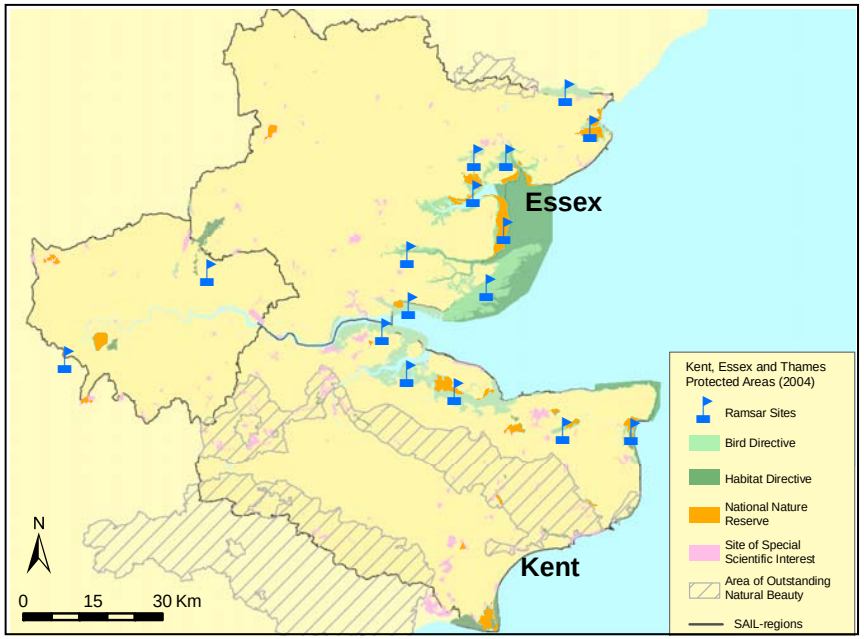
Member states have the obligation to set clear targets for the conservation of identified priority species, through the Habitats Directive, the Convention on Biodiversity and other international conventions. Compliance with these targets for the favourable conservation status of priority species and habitat will be reported on a systematic basis through monitoring, evaluation and reporting schemes implemented under the Habitat Directive.

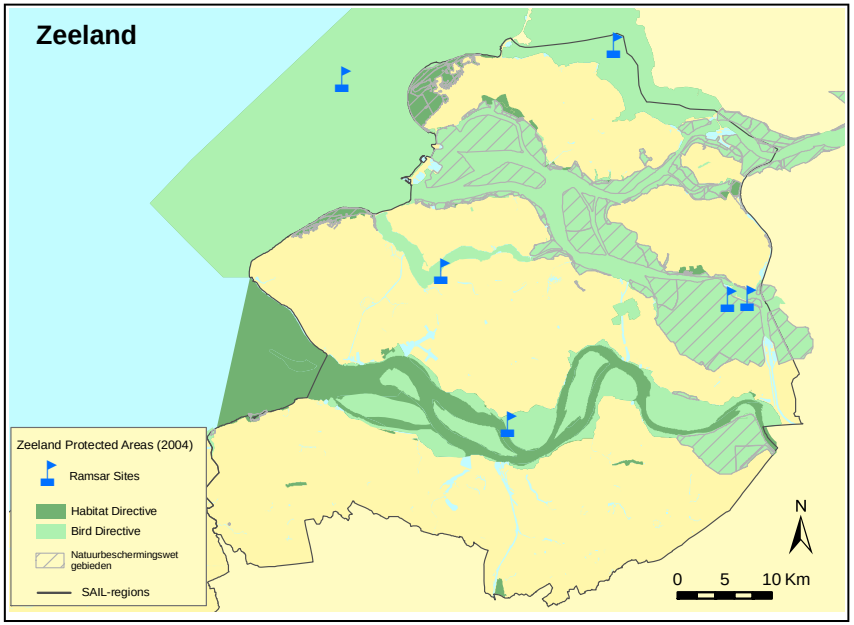
How reliable is the indicator?

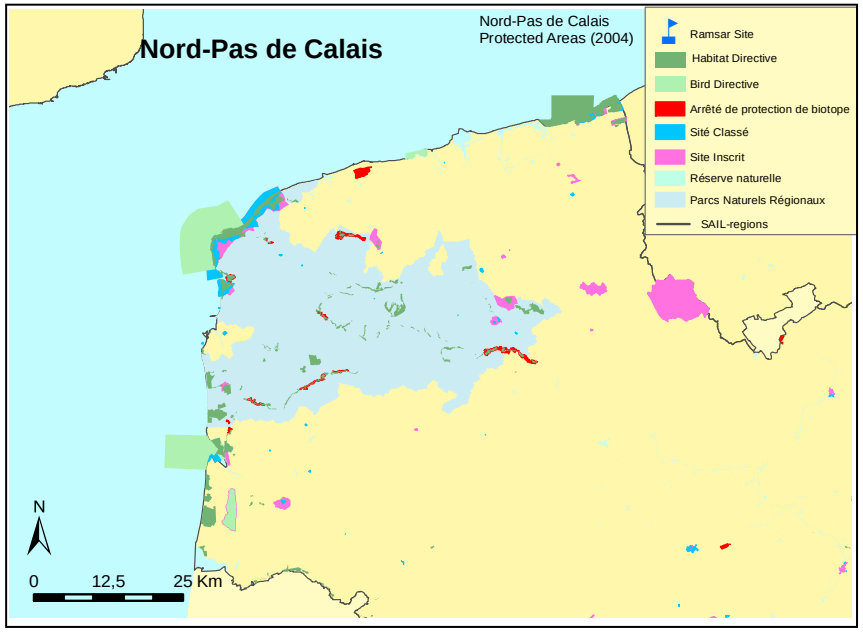
A number of difficulties arise from the use of Red Lists. Not all species that are listed on the national Red Lists belong there according to specialists, while some taxa that are experiencing conservation problems are not included. Where subspecies are hard to determine in the field, discussion centres on the interpretation of the status. The definition of 'coast-specific' and 'coast-preferential' also leaves room for interpretation.

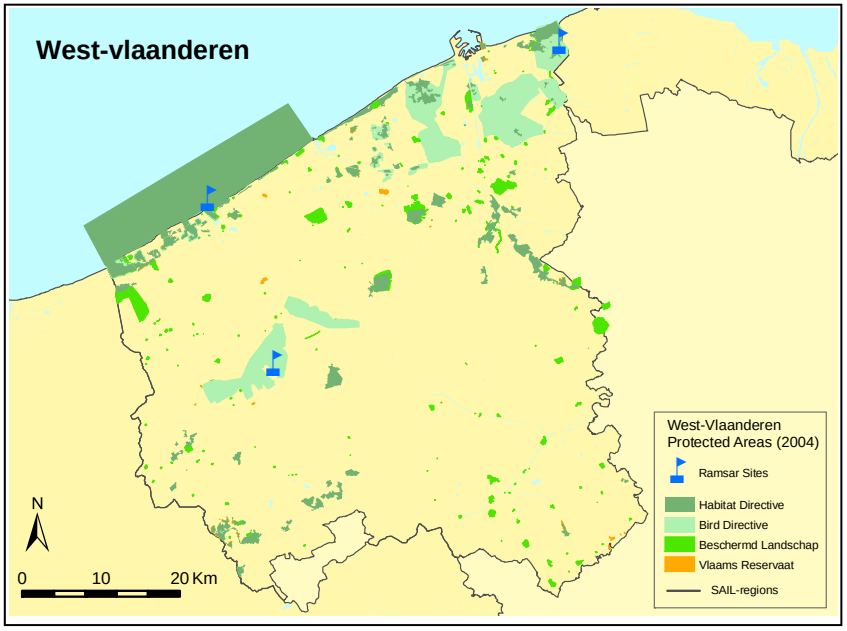
Relevant time series are available for seabird populations. Except for the SCANS effort, most data on seals and porpoises are from observation efforts, and not census data. There is an important disparity in quality and range of the data, which makes comparison among the SAIL sub-regions difficult. Data on coastal habitat are very disperse, often outdated, and the criteria for characterizing and defining habitat differ between regions.

Indicator 6 Area of land and sea protected by statutory designations









- *Area of international statutory designations for nature conservation*
- *Area of European statutory designations for nature conservation (Habitats & Birds Directive areas known as Natura 2000 network)*
- *Area of national and regional statutory designations for nature conservation*
- *Number of statutory designations for the conservation of cultural heritage*

Key Message

- Relatively speaking, the coast is of greater significance than hinterland areas for the protection and conservation of habitats and species of international importance. The Natura 2000 network in the Southern North Sea covers a larger proportion of the coastal area (19%) compared to the hinterland (4%). Zeeland has the largest share of Ramsar Wetland areas and Natura 2000 network in the SAIL region. Natura 2000 sites covers 56% of its coastal zone.
- In Kent and Essex, the coastal zones clearly play a major role in the conservation of priority species and habitats; both European and national statutory designations have a higher percentage of coverage at the coast than in the hinterlands.

Why monitor the area of land and sea protected by statutory designations?

The protection of our natural and cultural heritage is an important objective both at a national and international level. International and European legal frameworks such as the Ramsar Convention (1971), the EU Birds Directive (1979) and the Habitats Directive (1992), oblige Member States to protect areas of land and sea for the conservation of species and habitats which are of EU Community interest.

In addition, the SAIL countries have developed their own system of designations which provide protection to species and habitats that acquire importance at the local and regional scale. Statutory designations are supported by legal commitments and exclude the 'soft' protection provided by spatial planning.

Statutory designations offer some guarantee against undesirable changes in land use or human activities that could reduce the natural or cultural value. If managed properly, they are a tool for maintaining and restoring existing ecosystems and species. Furthermore, protected sites have a socio-educational function and provide possibilities for recreational usage.

This measurement evaluates the relative importance of the coastal zone in achieving the conservation purposes of specified priority habitat and species at the European, national and local level.

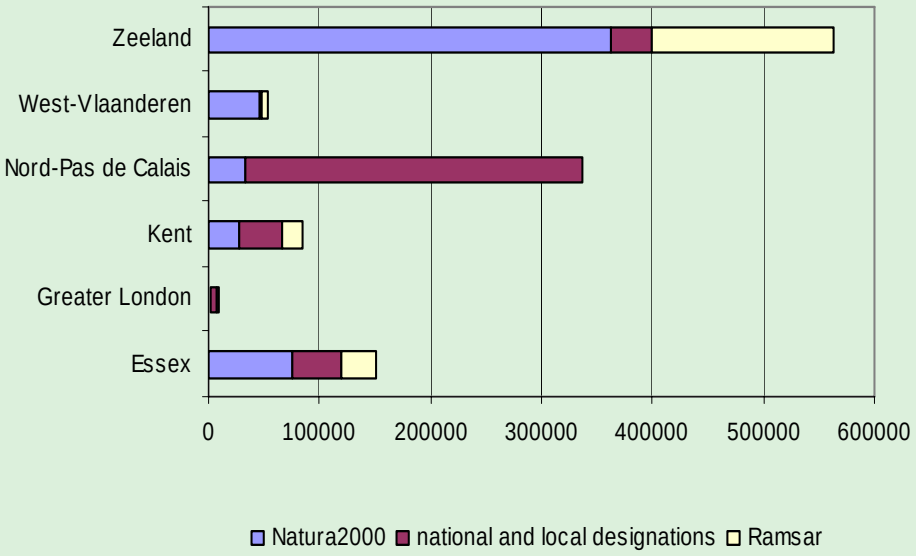
UNESCO Heritage sites in the SAIL region

Name	Date of Inscription	Region
Béguinage de Bruges (Brugge)*	1998	West-Vlaanderen
Béguinage de Kortrijk (Courtrail)	1998	West-Vlaanderen
Belfort en Hallen*	1999	West-Vlaanderen
Canterbury Cathedral, St Augustine's Abbey, and St Martin's Church	1988	Kent
Historic Centre of Brugge*	2000	West-Vlaanderen
Maritime Greenwich*	1997	Greater London
Royal Botanic Gardens, Kew	2003	Greater London
Tower of London*	1988	Greater London
Westminster Palace, Westminster Abbey and Saint Margaret's Church	1987	Greater London

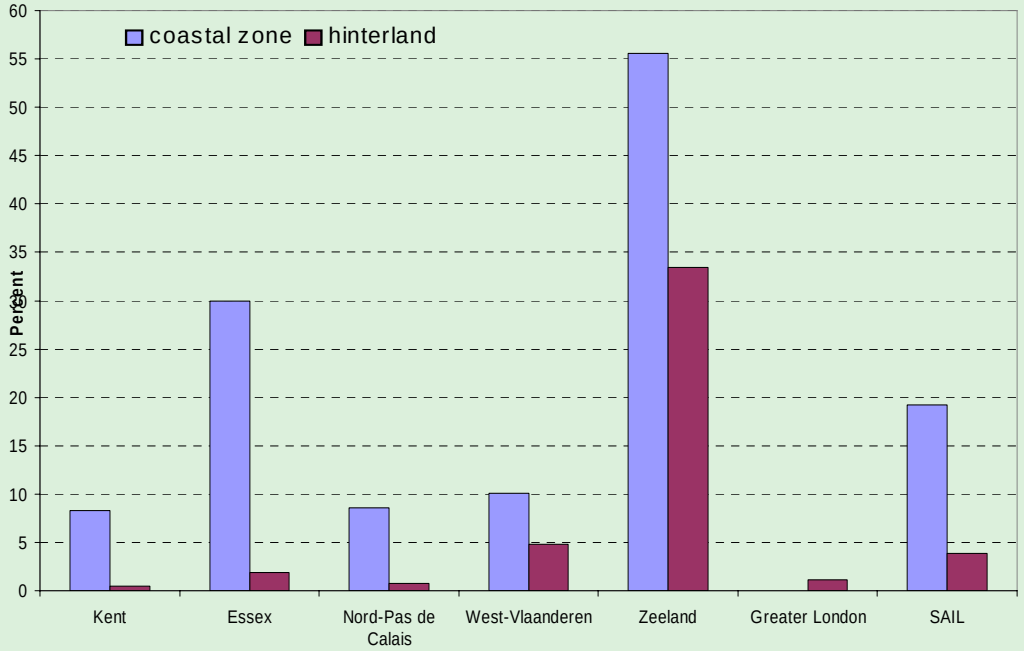
** UNESCO Heritage sites located in the coastal zone*

** Belfort en Hallen*: includes 8 sites in France and Belgium*

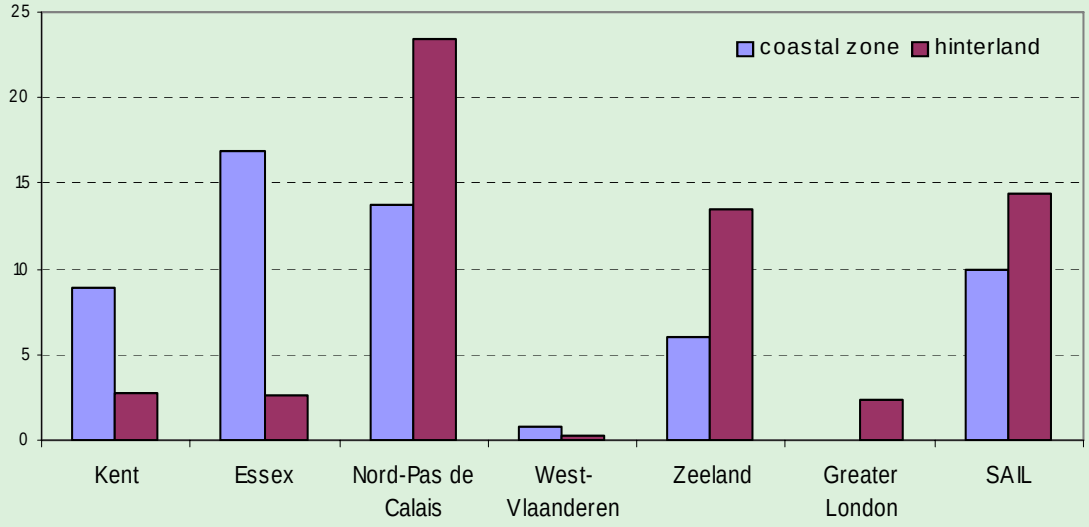
Total area protected (ha) in the SAIL sub-regions by type of designation (2004)



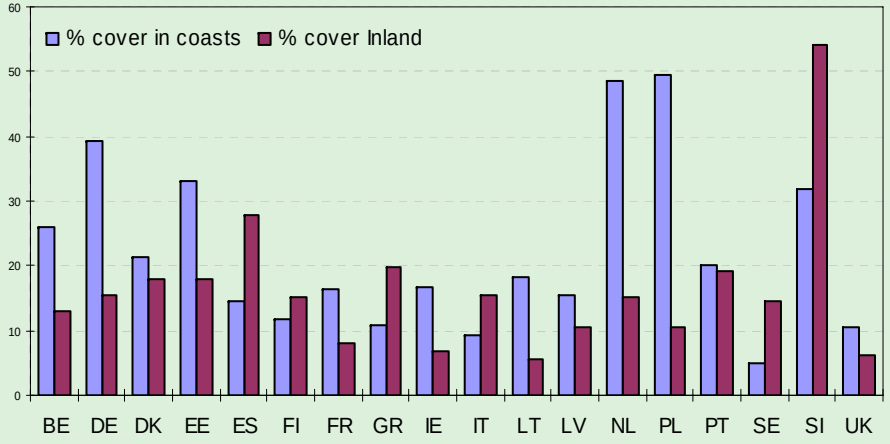
Percentage of coverage by Natura 2000 in the SAIL sub-regions (2004)



Percentage of coverage by national and local statutory designations in the SAIL sub-regions (2004)



Natura 2000 in coastal and inland zones EU countries source: pSCIs and SCIs database, March 2005, ETC/BD



Where do the data come from?

Spatial data for the Natura 2000 network and Ramsar were provided by the national environmental authorities. For further analysis at the SAIL level: English Nature in the U.K., the Dutch Ministry of Agriculture, Nature, Management and Fisheries (MinLNV), the Institute for Nature and Forest Research (INBO) in Belgium, and DIREN-Ministry of Ecology and Sustainable Development in France.

Data for protection categories at the local and regional level were provided by a wide number of officially recognized sources. Due to the differences in definitions and methodologies, an inventory of designations, protection levels and objectives is a helpful tool prior to analysis (see Metadata).

What does the indicator show?

In the Southern North Sea, the total area covered by the Natura 2000 network is 545,489ha (overlapping Habitats and Birds designations). The percentage of the coverage of Natura 2000 in the coastal zone is nearly 5 times higher than in the wider region.

Within the SAIL region, Ramsar sites are mostly located in the marine and coastal zone; 217,685ha are 'marine' wetlands of international importance, while only 3,086ha correspond to wetlands located inland. There are no Ramsar designations located yet in Nord-Pas de Calais, although efforts are underway to expand the Ramsar Somme Estuary in Picardie northwards to include the Bay d'Authie in Nord-Pas de Calais.

The Natura 2000 network of 361,921 ha covers 56% of the coastal zone in Zeeland. It contributes 67% of the total Natura 2000 network in the SAIL region. Nearly half of this area is also protected under the Wetland Convention (165,150ha), 74% of the share in the total Ramsar designated wetlands in the SAIL region.

Regional and national statutory protected areas for nature conservation cover 429,640 ha within the SAIL region. Although Nord-Pas de Calais contributes only modestly to the Natura 2000 network (6%), it accounts for the largest surface area of regionally and nationally protected area with 304,187ha, or 71% of the total regional/national designations in the Southern North Sea.

In Essex, 30% of the coastal zone is protected by Natura 2000 compared to only 2% in the wider sub-region. Except for Kent and Essex, the national and regional statutory protected areas cover a slightly larger proportion of the hinterland (14%) compared to the coast (10%). In the UK, the designation of the EU Natura 2000 is largely based on the national conservation category Site of Specific Scientific Interest (SSSI).

There is a plethora of definitions, categories and procedures for statutory designations for cultural heritage in the countries bordering the Southern North Sea. Many of these designations combine cultural and natural elements in the criteria for eligibility. The "Areas of Outstanding Natural Beauty"(AONB) is an important category in Kent (High Weald and Kent Downs) and Essex (Dedham Vale). In England, 'Heritage Coast' is a specific designation for coastal landscapes; the White Cliffs of Dover are a national symbol. "Site classé" and "site inscrit" in Nord-Pas de Calais (118) also include cultural and natural elements. Protected landscapes in rural and urban (villages) areas are well-represented designations for cultural heritage in Zeeland (14) and West-Vlaanderen (463 elements- 6760ha).

Some of the World Heritage sites (UNESCO) in the Southern North Sea are major tourist attractions; the Tower of London and Westminster Palace, Maritime Greenwich, the Béguinages of Flanders, the Belfort and the historic centre of Bruges, are just a few examples. More than half of these sites are located in the coastal zone.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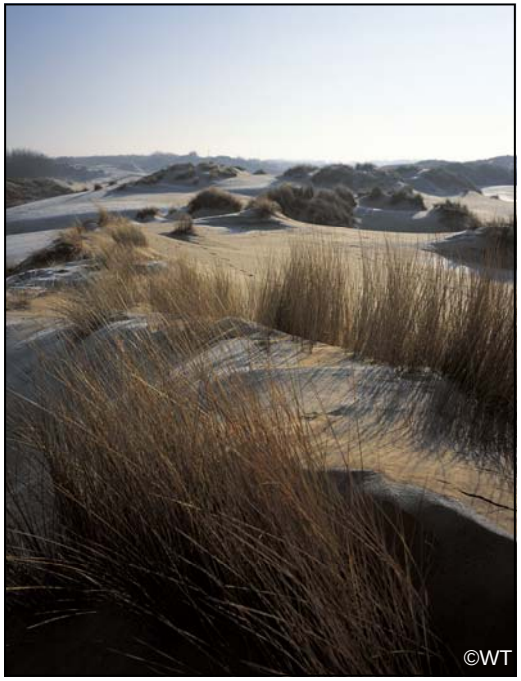
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What are the implications for planning and managing the coast?

The strong legal provisions of the Habitats and Birds Directives oblige Member States to integrate the requirements of the conservation targets. For sites of international significance, designations cannot be modified except in cases of 'overriding public interest'. This has halted further development of coastal and estuarine sites, at least where natural values of priority at the EU level have been identified. Also, the integration of 'Favourable Conservation Status' (FCS), into sectoral policies and the delivery of common criteria for measuring FCS represent an enormous effort to level standards for effective management and conservation of species and habitats of community interest, among Member States.

The area of newly designated habitat has levelled off in Western Europe during the last decade. Increasing demand for intensive land-use has diminished the remaining semi-natural areas available for conservation. On the other hand, concern for biodiversity is becoming more and more integrated into sector policies. Agro-environmental schemes and sustainable forestry policies are new mechanisms that contribute to halt the decline of biodiversity.

The indicator also addresses the 6th Environmental Action Plan and the European Community Biodiversity Strategy, both requiring the protection and conservation of natural and semi-natural habitats and wild animal and plant species.

The World Heritage site, established by the United Nations Educational, Scientific and Cultural Organization (UNESCO) is the best known international system for the protection of cultural heritage. UNESCO seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity. This is embodied in an international treaty called the Convention concerning the Protection of the World Cultural and Natural Heritage, adopted by UNESCO in 1972.

In addition, each country has developed its own system of designation-types for both natural and cultural heritage areas and sites. This allows countries to set their own priorities for protecting local values, while contributing to the implementation of international and EU legal frameworks.

How reliable is the indicator?

The indicator reflects the importance of the coastal zone in achieving conservation purposes at the European, (inter) national and local level. For the purpose of calculating the total area and percentage of coverage of designations, the 'coastal zone' was arbitrarily defined as a buffer of 20km land-and seawards from the coastline.

Official digital shapes of the Natura 2000 network and national/local categories were utilized to calculate the area of designated sites in this coastal buffer. Different designations, established to target different conservation purposes, may overlap in one particular site. Therefore, the area of land and sea protected under cumulative statutory designations may differ from the sum of the totals for each category. The inventory may also be underestimated because the spatial data do not always fully represent the current legal situation of the designations.

Further reading

EEA (2003) Europe's environment: the third assessment. Environment Assessment Reports no 10.

Chape, S. (2003) Monitoring global commitment. World Conservation, no 2:8-9.

http://www.iucn.org/bookstore/Bulletin/Vth-WPC.htm

EC Birds and Habitats Directives

http://europa.eu.int/comm/environment/nature/legis.htm

Ramsar Convention on Wetlands

http://www.ramsar.org

IUCN World Commission on Protected Areas

http://www.uicn.org/themes/wcpa/wpc2003/

Indicator 7 Effective management of designated sites

- ***Habitat and species in Favourable Conservation Status***

Key Message

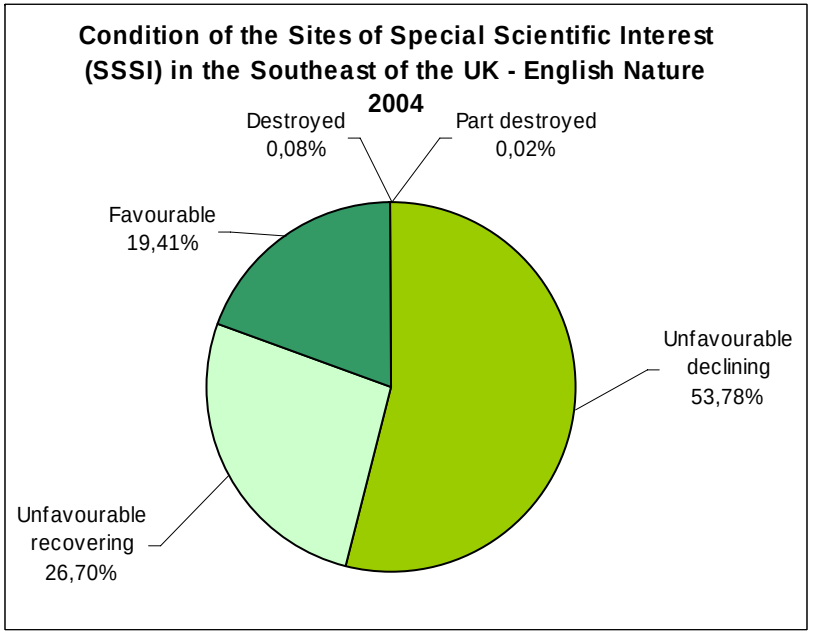
- The delivery of Favourable Conservation Status (FCS) indicates whether the conservation objectives for species and habitats of Community interest are being achieved, both within the Natura 2000 network and in the wider region or country.
- Common standards for monitoring across the EU are needed to enable an assessment of changes in the status of priority habitats or species.
- The first assessment of FCS is being carried out by the EU Member States for the 2001-2006 reporting period.

Where do the data come from?

Member states are required to report every six years on measures implemented in the framework of the directive and an evaluation of the measures taken. All member states have representatives in the 'Habitats' and 'Ornis' Committees, which assist the Commission in the implementation of the Habitats and Birds Directive. The committee members are appointed by AMINAL in Belgium (Nature Division, Flemish Ministry of the Environment), the Ministry of Agriculture, Nature, Management and Fisheries (MinlNV) in the Netherlands, the European Wildlife Division Department of the Environment Transport and the Regions in the U.K. (Department for Environment, Food and Regional Affairs) and the Ministry for Ecology and Sustainable Development in France.

Why monitor the efficient management of designated sites?

By itself, the retention of areas of land and sea for nature conservation will not ensure the protection and enhancement of natural diversity. Specific conservation objectives need to be achieved for priority species and habitat at the local, national and European level. EU Member States are required to adopt measures that maintain or restore natural habitats and species of community interest at a Favourable Conservation Status (Article 2(2) of the 1992 Habitats Directive (92/43/EEC). Hence, the concept of FCS is central to the effective implementation of the EU Habitats Directive. The Directive describes a range of measures to guide Member States in this process. Assessments of habitats and species is be reported at the national level. Periodic evaluations of the condition of sites and species of community interest, such as conducted for the Sites of Special Scientific Interest in the South East of the UK (see graph Condition of the SSSI: coastal and non-coastal, South East UK, English Nature 2004), help to detect the trend in their condition, in spite of or thanks to efficient management being put in place.



What does the indicator show?

So far, no assessments have been reported to the European Commission. The reporting authorities of the countries in the Southern North Sea will deliver a first assessment for the Habitats Directive by 2007 (reporting period 2001-2006). Conservation measures for the delivery of the objectives of the Birds Directive were evaluated in 2005.

In order to evaluate habitat as at Favourable Conservation Status, Member States have to ensure that the habitat's typical species are at FCS. Typical species are interpreted as more than just the species listed in the Annexes to the Directive. They also include all those species that are characteristic of a habitat. To achieve this, Member States have to gather the necessary and up to date scientific data on population dynamics and varying ecological requirements.

Assessments will make reference to European, national and local status of all populations throughout their natural range and genetic variation. Evaluations will be reported as the result of a matrix of scores and ranked as 'favourable', 'unfavourable-inadequate' and 'unfavourable-bad'.

With the exception of marine protected areas, all sites in the UK designated to conserve internationally important wildlife, are based on pre-existing Sites of Special Scientific Interest (SSSI). This means that all sites designated under the Ramsar Convention and the Birds and Habitats directives will also be a SSSI. The South East England Biodiversity Forum target is for all SSSI to be in favourable condition by 2010. An evaluation of the degree of achievement of specific conservation objectives of the SSSI in the South East was carried out in 2004.

What are the implications for planning and managing the coast?

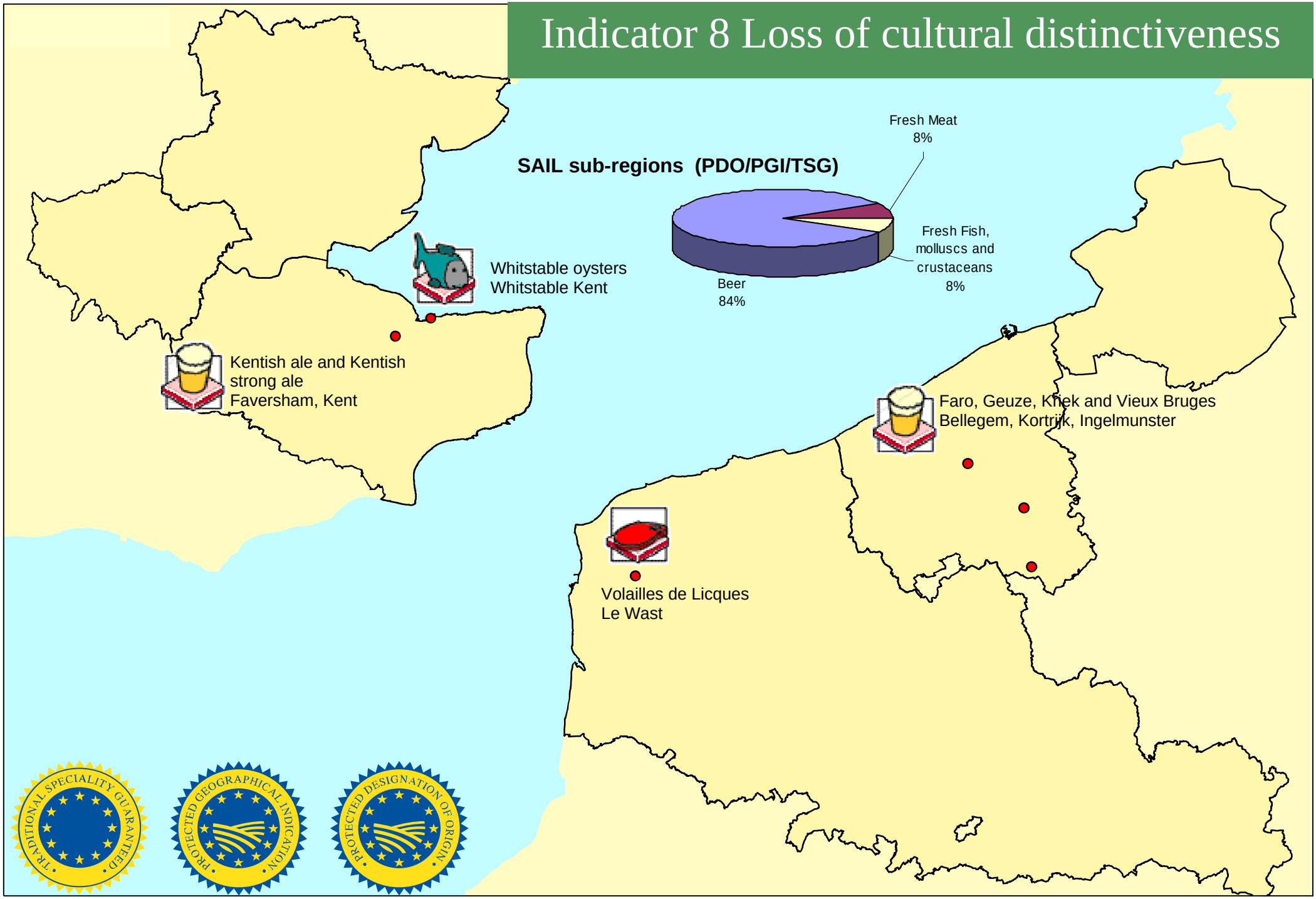
The Habitats and Birds Directives offer a legal basis for common standards and objectives for nature conservation at the EU level. Member states have translated this legal framework into their national legislation and have set targets for the conservation of priority habitats and species. These targets are known as "Favourable Conservation Status".

The legal provisions of the Habitats and Birds Directives are so stringent that Member States will need to integrate ensuring the delivery of favourable conservation status into sectoral policies. The common criteria for monitoring, evaluation and reporting will set standards for all Member States in measuring the effectiveness of management and conservation of species and habitats of community interest.

How reliable is the indicator?

The Birds and Habitats Directives are harnessed with legal provisions for close surveillance of Member States commitments. Considerable financial sanctions are issued to countries that do not deliver according to these standards. An accurate assessment of changes in species and habitats will depend on the ability of the Committees to draw common standards of monitoring across the EU. The definition of 'Favourable Conservation Status' needs to be unambiguous and allow for a clear interpretation or a recommendation on how to implement it. Finally, reliability will depend on rigorous data collection processes being put in place.

Indicator 8 Loss of cultural distinctiveness



- *Number of products protected by European Union schemes* Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) and Traditional Speciality Guaranteed (TSG) *and located in coastal districts, provinces and sub-regions.*
- *Number of products certified by national or regional schemes guaranteeing their quality, authenticity and origin and located in coastal districts, provinces and sub-regions.*

Key Message

- The number of products protected by EU schemes is increasing slowly year by year which suggests a desire to halt the erosion of regional character and distinctiveness.
- Products whose origin and quality are certified by national or regional schemes are far more numerous indicating that local authenticity is a marketable commodity.
- However, there is no evidence that specifically 'coastal' products have a greater or lesser impact in promoting regional identity than do non-coastal products. Indeed, within the SAIL region, only Whitstable oysters are protected by an EU designation.

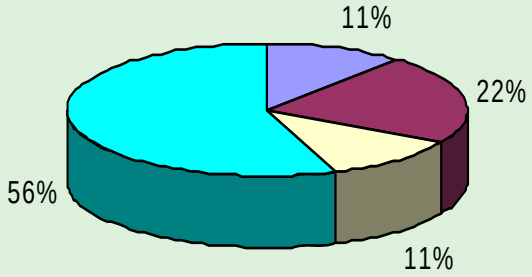
Why monitor loss of cultural distinctiveness?

In the past, coastal regions were more distinct, both from non-coastal areas and from each other, than they are today. Differences would have been observed in how people spoke, in their names, in how they dressed, in their behaviour and beliefs, in what they did for a living and how they did it, in what they ate and drank, in the design of their buildings and in their use of local materials. The exact amount of difference is unknowable (and in any case would have varied from topic to topic and from region to region) but, taken together, such differences would have been enough for regions (and sub-regions) to have their own 'character'. Nowadays, it is argued, those differences are being lost and increasingly places look like everywhere else. This observation is by no means restricted to coastal areas. However, the impact of mass tourism, second homes and urban sprawl is alleged to have eroded the individual character of coastal communities more rapidly than elsewhere. Paradoxically, people in general and tourists in particular are looking increasingly for diversity and distinctiveness rather than similarity and uniformity. Hence, coastal communities are all searching for the unique selling proposition which will entice visitors and foster a sense of belonging among local residents.

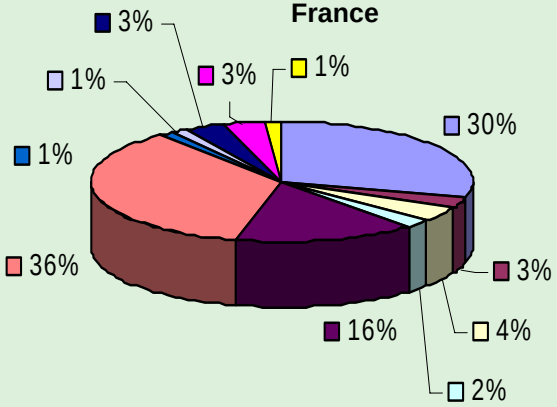
PGO/PGI categories	Belgium		The Netherlands		France		United Kingdom		All SAIL-countries	
	PDO	PGI	PDO	PGI	PDO	PGI	PDO	PGI	PDO	PGI
Cheeses	1	0	4	0	38	4	8	3	55	57
Meat-based products	0	2	0	0	4	0	0	0	6	6
Oils and fats / Olive oils	1	0	0	0	6	0	0	0	7	0
Table olives	0	0	0	0	3	0	0	0	3	0
Fruit, vegetables and cereals	0	0	1	1	9	13	1	0	25	25
Fresh meat (and offal)	0	0	0	0	3	47	3	4	53	57
Bread, pastry, cakes, confectionery, biscuits and other baker's wares	0	0	0	0	0	2	0	0	0	2
Fresh fish, molluscs and crustaceans and products derived therefrom	0	0	0	0	0	2	0	3	0	5
Other products of animal origin (eggs, honey, milk products excluding butter etc.)	0	0	0	0	3	2	1	0	6	6
Other drinks	0	0	0	0	3	2	0	3	5	8
Non-food products and others	0	0	0	0	2	0	0	0	2	0
Beer	0	0	0	0	0	0	0	3	0	3
TOTAL	2	2	5	1	71	72	13	16	166	180

Share of products protected by PDO/PGI/TSG labels in the SAIL countries

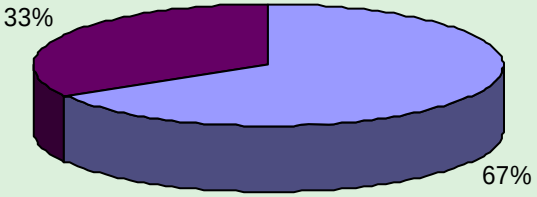
Belgium



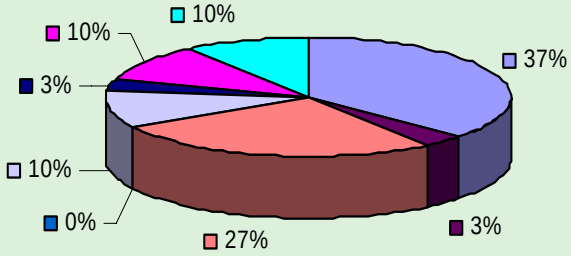
France



The Netherlands



United Kingdom



- Cheeses
- Meat-based products
- Oils and fats / Olive oils
- Table olives
- Fruit, vegetables and cereals
- Fresh meat (and offal)
- Bread, pastry, cakes, confectionery, biscuits and other baker's wares
- Fresh fish, molluscs and crustaceans and products derived therefrom
- Other products of animal origin (eggs, honey, milk products excluding butter etc.)
- Other drinks
- Non-food products and others
- Beer

Where do the data come from?

The EU Protected Food Names Schemes came into force in 1993 and provide for the protection of food names on a geographical or traditional recipe basis, similar to the familiar *appelation d'origine contrôlée* system used for wine. The schemes highlight regional and traditional foods whose authenticity and origin can be guaranteed through an independent inspection system. Once approved, product descriptions including producer information are displayed online at http://europa.eu.int/comm/agriculture/qual/en/prodb_en.htm.

A problem with measuring distinctiveness by reference to products granted PDO, PGI and TSG status is that there are currently so few of them. Hence we need to supplement the number of products in the EU schemes by including products certified by national and regional schemes. All countries have such schemes, most of which use similar criteria for product inclusion as the EU schemes.

We have chosen 'regional products' - clothes, fabrics, furniture, jewellery, artefacts, toys, building materials, and especially food and drink - to represent regional differences because they stand for tradition and character in that they directly link locality and resources with people and know-how. A decline in the number of regional products suggests an erosion of regional character and distinctiveness. Conversely, healthy sales of a range of regional products would indicate, at the very least, a determination to foster a sense of place and the desire to retain cultural differences.

What does the indicator show?

Since the adoption of the regulations for PDO/PGI/TSG labels in 1992, over 650 products have been registered as such. Most articles are cheeses, fresh meat, meat-based products, fruit and vegetables. Other products include olive oil and honey. SAIL countries together have more than 180 products protected by these labels while only 12 are exclusively linked to the Southern North Sea sub-regions. The results for 2005 are summarized in the table.

In Belgium, five products (all beers) are registered as Traditional Speciality (TSG) while the UK has only one so far. In France and The Netherlands there are no products protected by the TSG label. In addition, there are a number of regional quality labels: The Netherlands and Essex have one such label each while Belgium has two, France has three and Kent none. These labels are "Essex for Seafood" in the UK, "Produits du Terroir", "Label Rouge" and "l'Appellation d'Origine Contrôlée" in France, "Het beste van bij ons" and "Streekproduct.be" in Belgium and "Streekeigen Producten Nederland" in The Netherlands. Products associated with the coast or the sea are not explicitly identified as such in the PDO/PGI/TSG system. There is however one clear-cut example: the Whitstable oysters linked to the coastal village Whitstable in Kent.

What are the implications for planning and managing the coast?

The regulations on the protection of geographical indications and designations of origin and on certificates of specific character are at the forefront of European quality policy. They should help to promote rural development, the production of diversified products and increase the competitiveness of products identifiable by quality labels, ensuring their protection. The regulations also have a major economic impact, since only producers from the relevant geographical area will be able to use the name once it has been registered at Community level. The main goals of the European System for developing protected foodstuffs is: (1) to encourage diverse and agricultural production; (2) to protect product names from misuse and imitation; and (3) to help consumers by giving them information concerning the specific character of the products.

How reliable is the indicator?

Although labels such as PGO/PGI/TSG are supposed to protect the gastronomic heritage, culinary traditions, local specialties and ancestral skills of the various regions of the Community, it is difficult to say if they actually reflect the distribution of those qualities among member states.

References

The European project 'Euroterroirs' in 1993 (Conseil National des Arts Culinaires), Les Produits du Terroir in France (http://www.lesproduitsduterroir.com), the *Institut National des Apellation d'origine* (AOC), the 'Westhoek' (http://www.hetbestevanbijons.be) in the province of West-Vlaanderen and 'Streekproduct' in Flanders (http://www.streekproduct.be), all work according to criteria recognizing tradition and historic references. The 'Erkend streekprodukt' initiative in The Netherlands (http://www.erkendstreekproduct.nl) and the initiatives in Kent (http//:www.producedinkent.co.uk: http://www.atasteofkent.co.uk) refer to environmental production schemes. The Study Centre for Traditional Gastronomy has screened the regions of Zeeland, Nord-Pas de Calais and Flanders (http://www.asg.be) by very strict criteria for traditional foodstuffs; however, no recognized label has been developed under this academic exercise.

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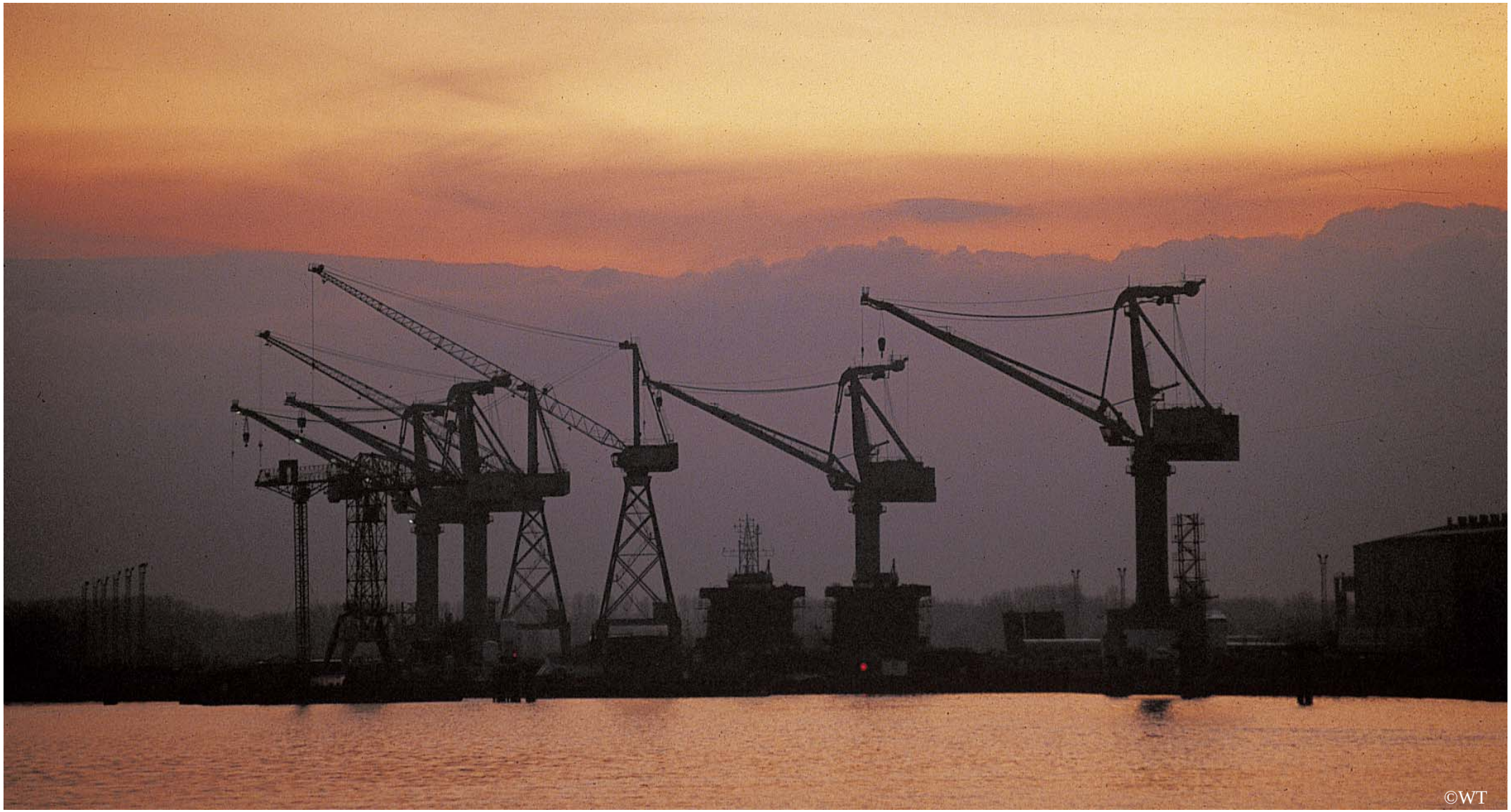
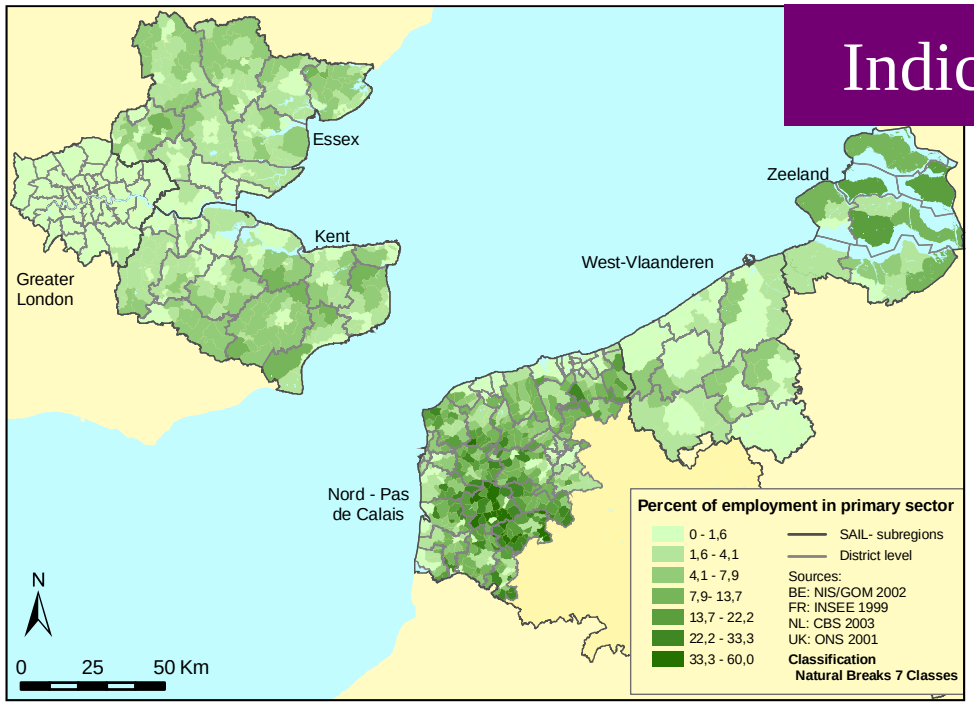
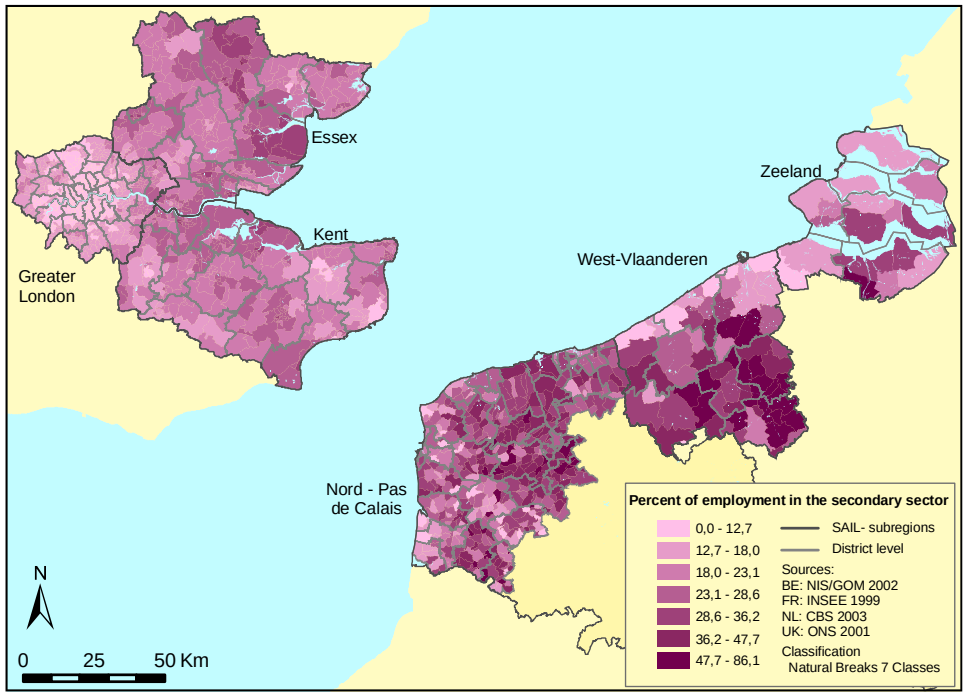
3 To promote and support a dynamic and sustainable coastal economy

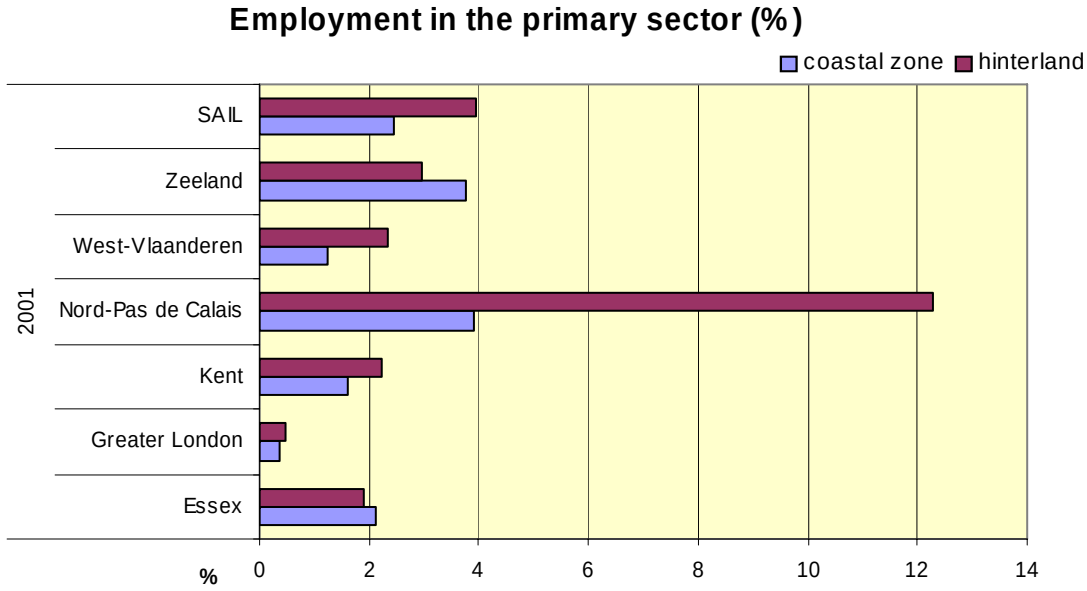


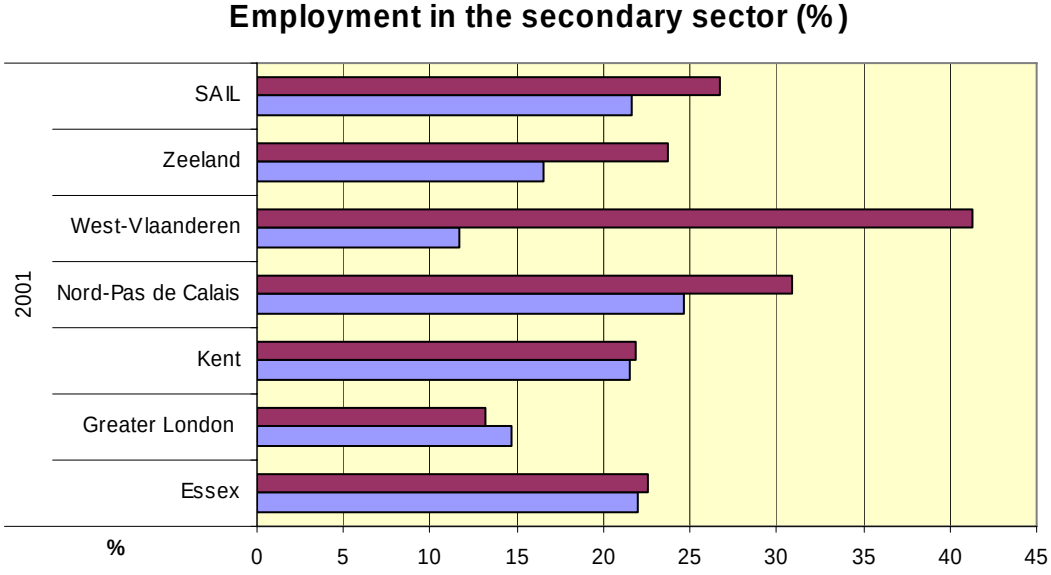
Patterns of sectoral employment « » Economic importance of ports « »
Significance of tourism « » Sustainable tourism

Indicator 9 Patterns of sectoral employment









- *Percentage of employment by economic sector*
- *Percentage of part-time and full-time employment*
- *Employment in fisheries, ports and tourism*

Key Message

- Services and commerce ('tertiary' sector) account for between 40-50% of employment in the coastal zones of the SAIL region.
- Tourism is an important employer at the coast, and can provide up to 30% of the share of local employment. A large proportion of the jobs in this sector are part-time. Tourism generates additional jobs in banking, financial administration, real estate and renting, retailing, etc.
- As is the case for densely populated areas, the so-called non-profit sector (governmental services, health and education) is better represented in the coastal areas of the SAIL sub-regions, compared to the hinterland (30% versus 24%).

Why monitor patterns of sectoral employment?

Planning a dynamic and sustainable economy for coastal communities is a priority in regional strategies. Coastal economies around Europe have seen major changes over the last several decades. In the Southern North Sea, the expansion of shipping and major ports, the proliferation of second homes, pensioner immigration and the seasonal character of tourism are some of the important drivers that act upon the local economy in coastal zones. By following changes in employment in the economic sectors, trends and developing patterns can be detected. Employment in tourism and ports also shows the socio-economic importance of these sectors to the population.

Where do the data come from?

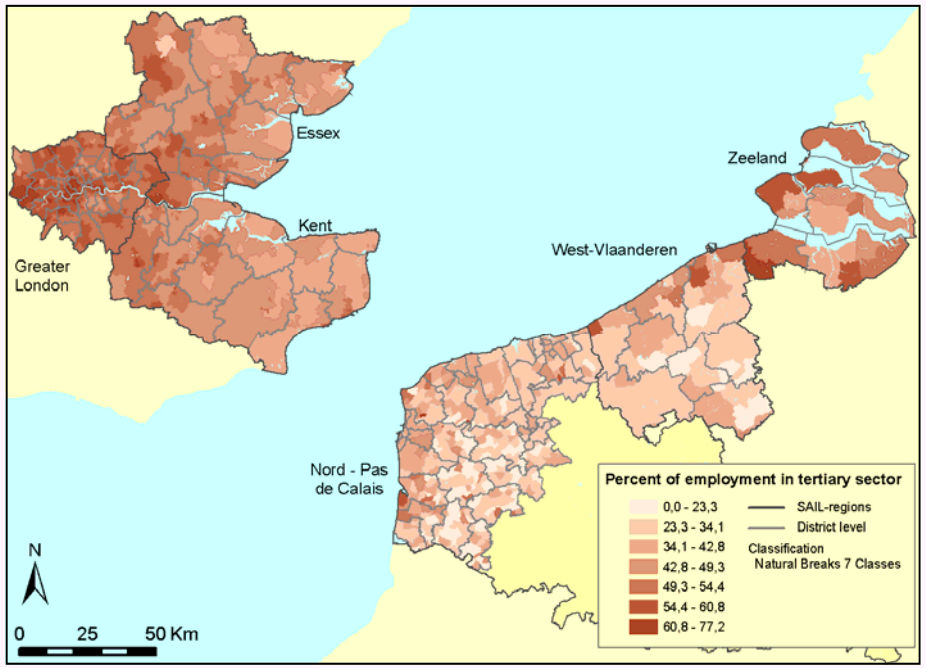
The main sources for sectoral, full-time and part-time employment are the National Census data providers. All countries in the Southern North Sea conduct decennial Census that yield reliable data at the municipality level. In addition, all four countries carry out quarterly labour force surveys which provide figures at the local level. Additional sources for employment in ports were consulted: Nationale Bank van België (B), Nationale Havenraad (NL), DTR and Port of London Authority (UK)). Data for the fisheries sector are collected by RIBIZ (Zeeland), NIS/GOM (B), OFIMER (F) and available for the UK from the ONS and Fisheries Statistics Unit (DEFRA). Data for the tourism sector at municipality level are often scarce and dispersed, as provided by RIBIZ (Zeeland); NIS/GOM (B); Comité Régional de Tourisme/INSEE (F) and Tourism South East, Kent and Essex County Council (UK).

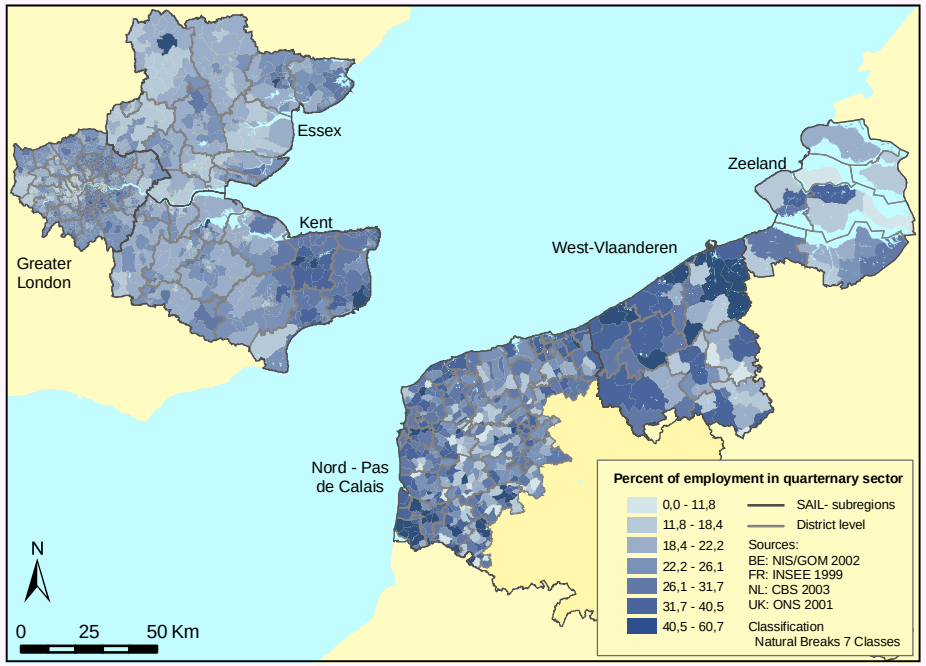
What does the indicator show?

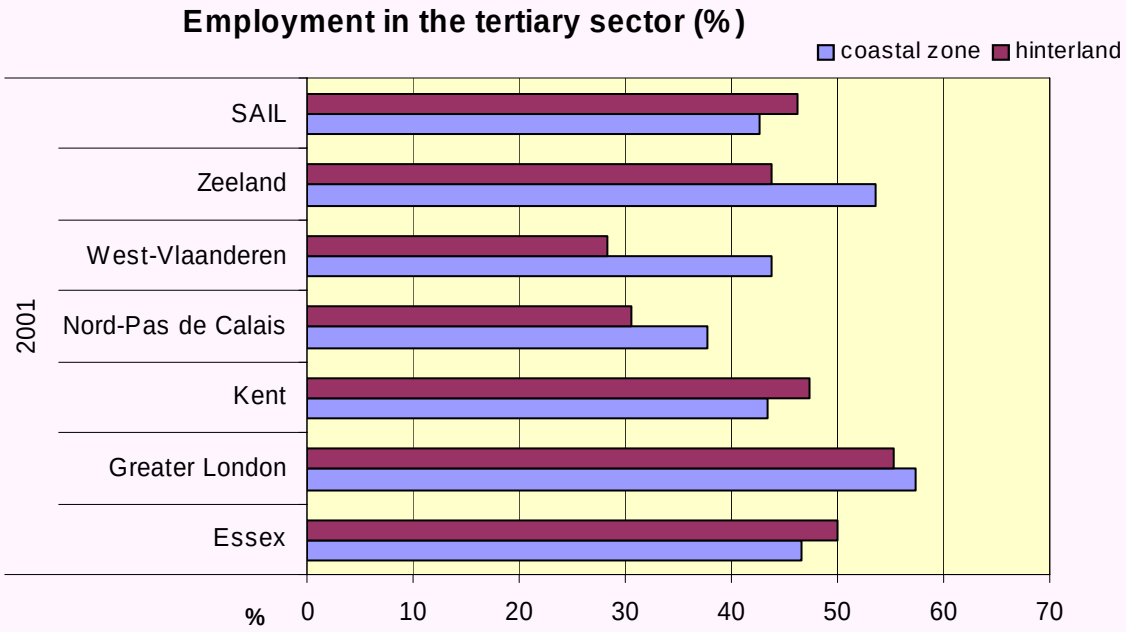
In the Southern North Sea region, employment in the primary sector (agriculture, fishing, forestry and mining) is of less importance in the coastal zone than in the hinterland. However, the average figure for the region is distorted somewhat by the larger percentage of people employed in primary occupations in the hinterland (12%) compared to the coastal zone (4%) of Nord-Pas de Calais.

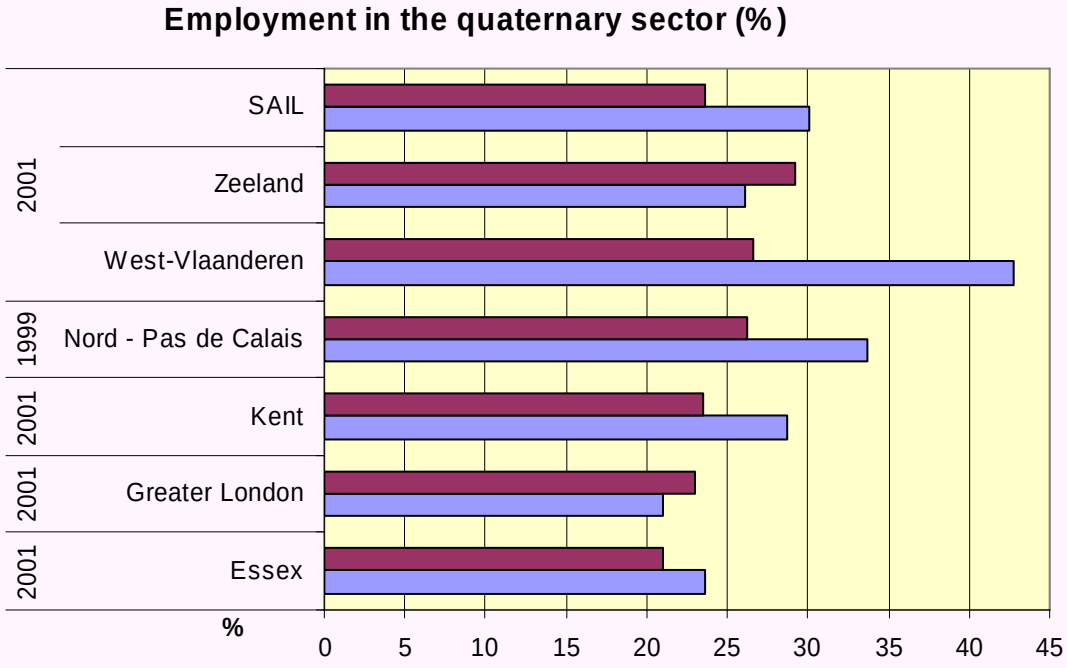
Percentages differ greatly among regions: in Zeeland and Essex primary sector employment is higher in the coastal zone than in the hinterland. In Zeeland these jobs are to a large extent 'coastal' (ports, aquaculture and fisheries), whereas in Essex the jobs in the primary sector are in agriculture. Employment in the primary sector does not exceed 4% of the total working population in any of the coastal zones of the SAIL sub-regions

With less than 0.4% of the active population working in the primary sector, the Thames area accounts for the lowest value observed in the SAIL area. Employment in fisheries does not exceed 1% of the working population in any of the coastal wards in the UK (West Mersea having the highest value of 0.64%). Boulogne-sur-mer, the number one fishing port in France, is home to the largest part of the 1,175 fishermen (2002) of Nord-Pas de Calais.


Essex
Kent
Greater London
Zeeland
West-Vlaanderen
Nord - Pas de Calais
N
0 25 50 Km
Percent of employment in tertiary sector
0,0 - 23,3
23,3 - 34,1
34,1 - 42,8
42,8 - 49,3
49,3 - 54,4
54,4 - 60,8
60,8 - 77,2
SAIL-regions
District level
Classification
Natural Breaks 7 Classes


Essex
Kent
Greater London
Zeeland
West-Vlaanderen
Nord - Pas de Calais
N
0 25 50 Km
Percent of employment in quaternary sector
0,0 - 11,8
11,8 - 18,4
18,4 - 22,2
22,2 - 26,1
26,1 - 31,7
31,7 - 40,5
40,5 - 60,7
SAIL- subregions
District level
Sources:
BE: NIS/GOM 2002
FR: INSEE 1999
NL: CBS 2003
UK: ONS 2001
Classification
Natural Breaks 7 Classes

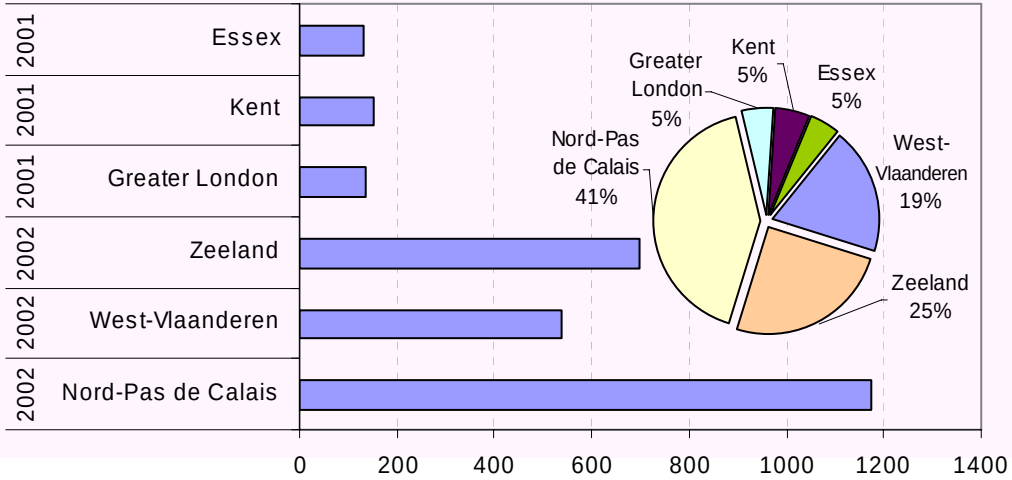

Employment in the tertiary sector (%)
coastal zone
hinterland
2001
SAIL
Zeeland
West-Vlaanderen
Nord-Pas de Calais
Kent
Greater London
Essex
%
0 10 20 30 40 50 60 70


Employment in the quaternary sector (%)
2001
SAIL
Zeeland
West-Vlaanderen
1999
Nord - Pas de Calais
2001
Kent
2001
Greater London
2001
Essex
%
0 5 10 15 20 25 30 35 40 45

Districts with the highest number of fishermen in Kent and Essex are Tendring, Shepway, Colchester and Thanet (38 fishermen in 2001 Census).

In Zeeland, employment in fisheries remained between 600-700 over the period 1995-2004. In West-Vlaanderen, the number of fishermen dropped from 1000 in 1996 to nearly 500 in 2002.

Number of people employed in fisheries and share of the SAIL subregions in the southern North Sea



In all sub-regions except for Greater London and the Thames area, the share of employment in the secondary sector (construction and manufacturing industries) is higher in the hinterland. Especially in West-Vlaanderen there is a substantial difference in the importance of the secondary sector in terms of employment (12% vs 40%). This provides an indication of the importance of the coast for tourism and recreation uses.

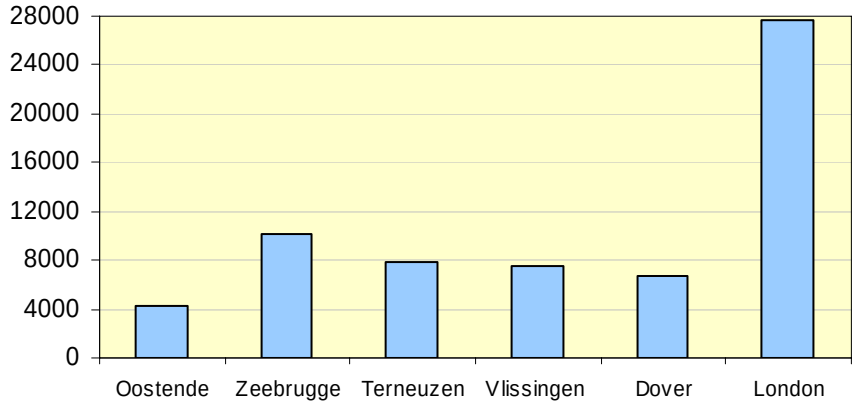
Services and commerce (tertiary sector) account for beween 40-50% of employment in all sub-regions' coastal zones. In all except Kent and Essex, the tertiary sector is a more important employer at the coast than in the hinterland. In this sense, most of the coastal zones follow a pattern observed in more urbanized areas.

Provided that Thames and Greater London are excluded from analysis, employment in the tertiary sector in coastal zones is on average slightly more important than in the hinterland (43% versus 40%).

Employment in ports declined in Zeeland from 17,300 in 1996 to 15,300 in 2002. In the Belgian seaports of Oostende and Zeebrugge, the number of people directly employed fluctuates around 14,000 (1995-2003).

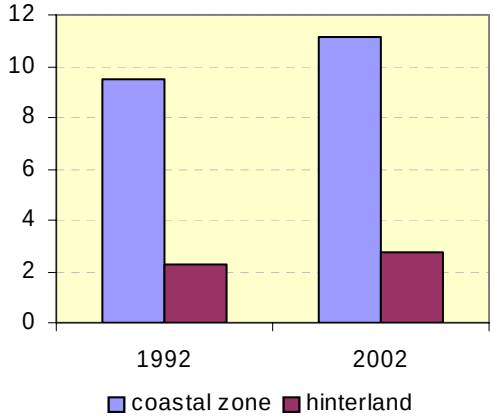
Port of London is one of the most important employers in the SAIL ports. The indirect impact of port employment (service providers to ports) in the third sector is insufficiently documented but may be substantial.

Direct employment in ports

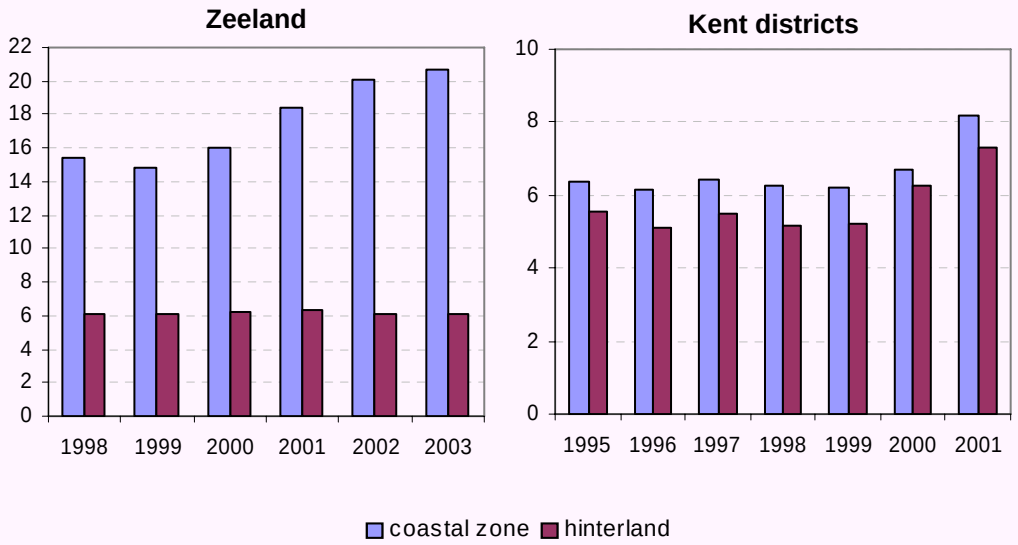


More information and comparable datasets are also needed to evaluate the importance of tourism in the service industry. Datasets refer to employees only or do not take into account seasonal or part-time employment. Estimates from surveys provide only snapshots of this complex industry.

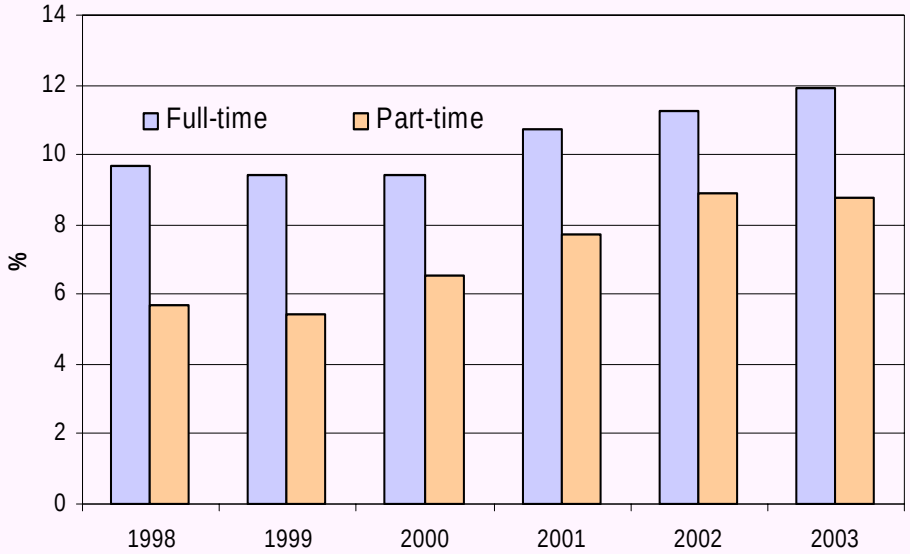
Employment in tourism (%) West-Vlaanderen



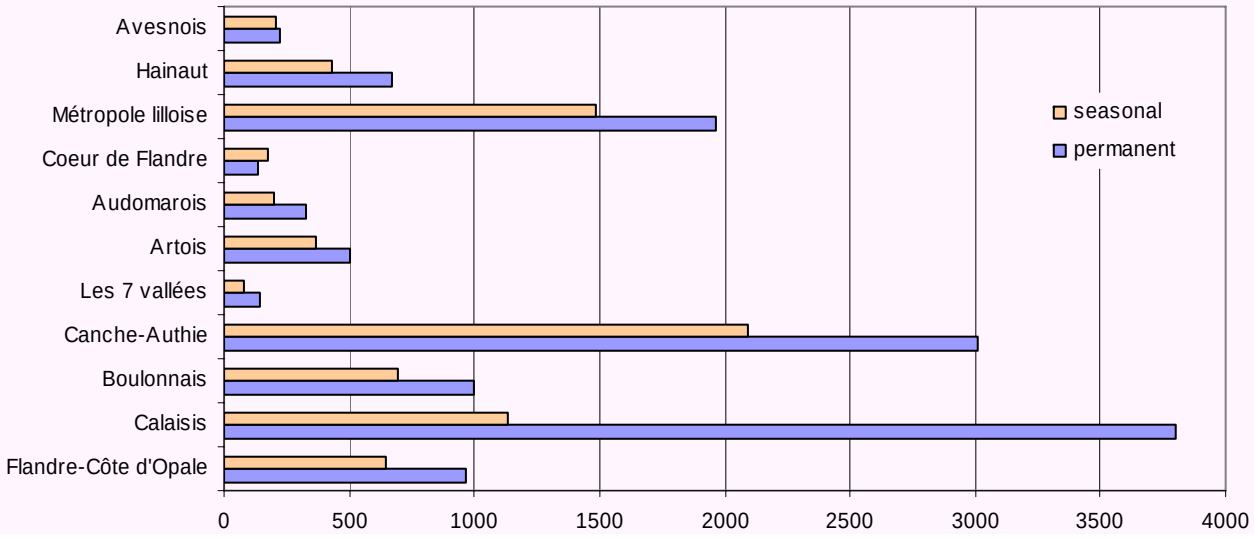
Employment in tourism (%)



Full-time and part-time employment in tourism at the coast - Zeeland (CBS/KvKZ)



Permanent and seasonal employment (numbers) by tourist zone -Nord-Pas de Calais 1999 (CRT / INSEE)



In Nord-Pas de Calais, employment in tourism is highly concentrated at the coast, and to a lesser extent in the regional capital of Lille. The coastal tourist zones of Calais and Canche-Authie accounted for 50% of total regional employment in tourism; 40% of these jobs are seasonal (1999). In 2001, the communes of Le Touquet, Coquelles, Lille and Berck accounted for 42% of total employment in the tourist sector of the region (INSEE/ CRT).

The quaternary sector or so-called non-profit sector (governmental services, health and education) is on average better represented in the coastal areas of the SAIL sub-regions. This is characteristic of more densely populated areas. In West-Vlaanderen (43% versus 27%) and Nord-Pas de Calais (34% versus 26%) the non-profit sector is a particularly important employer in the coastal zone.

Part-time employment is slightly more common in the coastal zones of Nord-Pas de Calais, Kent and Essex, when compared to the hinterland. More detailed datasets are needed to study the relevance of seasonal and part-time employment per economic sector in coastal zones. In Belgium these data are collected by type of industry and cannot be obtained at the municipality level. In the coastal municipalities of Zeeland, 42% of the 5,840 jobs in tourism were part-time (2003).

What are the implications for planning and managing the coast?

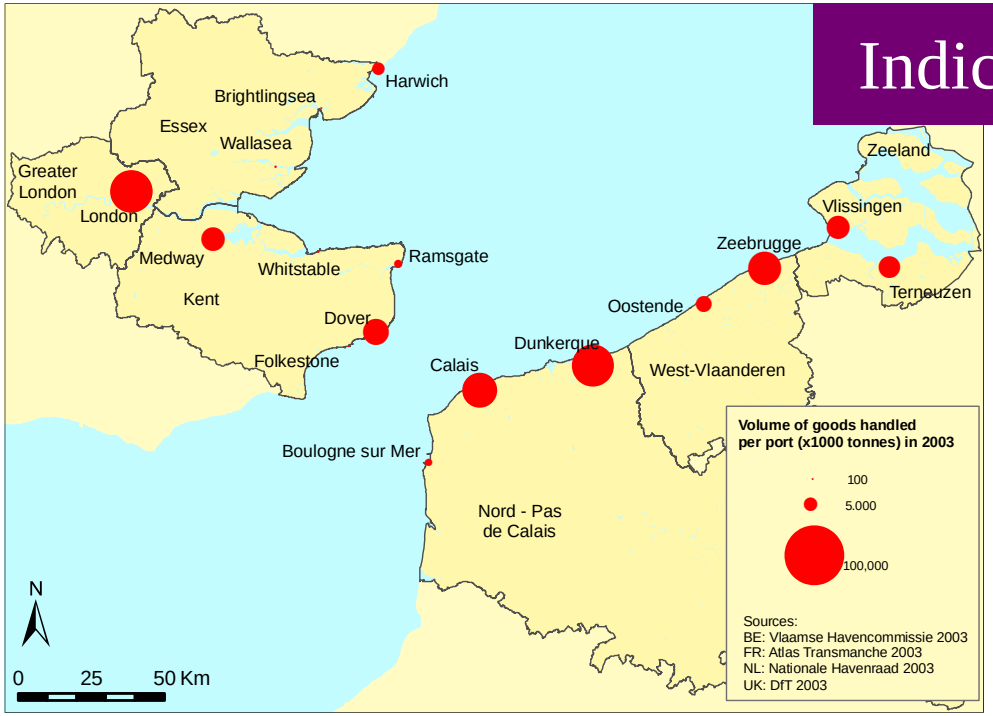
The availability of employment in coastal zones increases the life chances of people living and working in the region. Developing sustainable coastal economies requires a stable economic structure and provides the necessary environment for long-term investment.

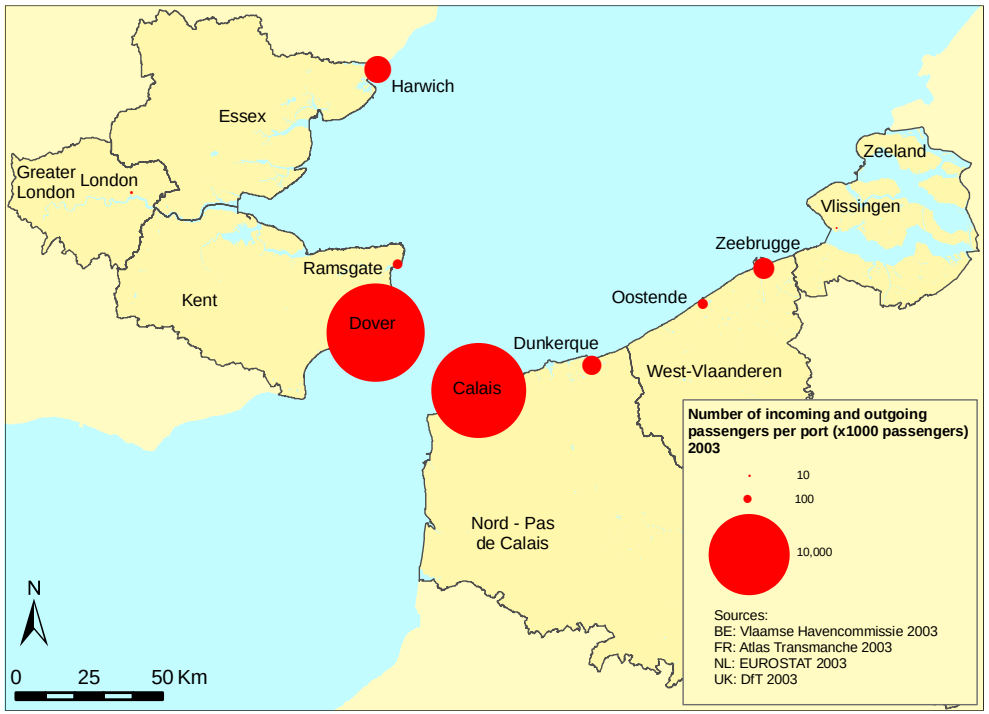
Tourism is an important provider of employment in coastal zones. For this sector, as for other sectors in general, sustainability is translated into policy making by safeguarding its position within the economy. Important steps are being taken towards improving the quality of services, and spreading of the tourism season. The creation of more permanent jobs, with favourable working conditions and salaries is a crucial aspect in this endeavour.

How reliable is the indicator?

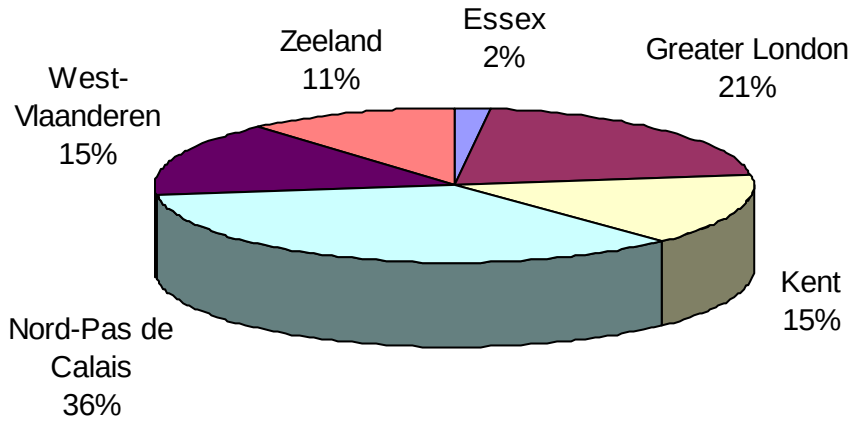
Census data are generally considered relevant and reliable sources. Reliability and accuracy of the additional data vary according to sources and methodologies. The subcategories of economic activities and the weight factor assigned to each branch for estimating employment in tourism for example, are variable. European nomenclature for economic activities NACE (Classification of Economic Activities in the European Community) facilitates the international comparison of socio-economic statistics. Employment in fisheries does not include the processing industry. Full-time and part-time employment are centralized datasets and are not available at municipality level for Belgium. Information on employment in ports is generally provided by the port authorities and refers to the number of employees and/or the number of people working in the industry.

Indicator 10 Economic importance of ports

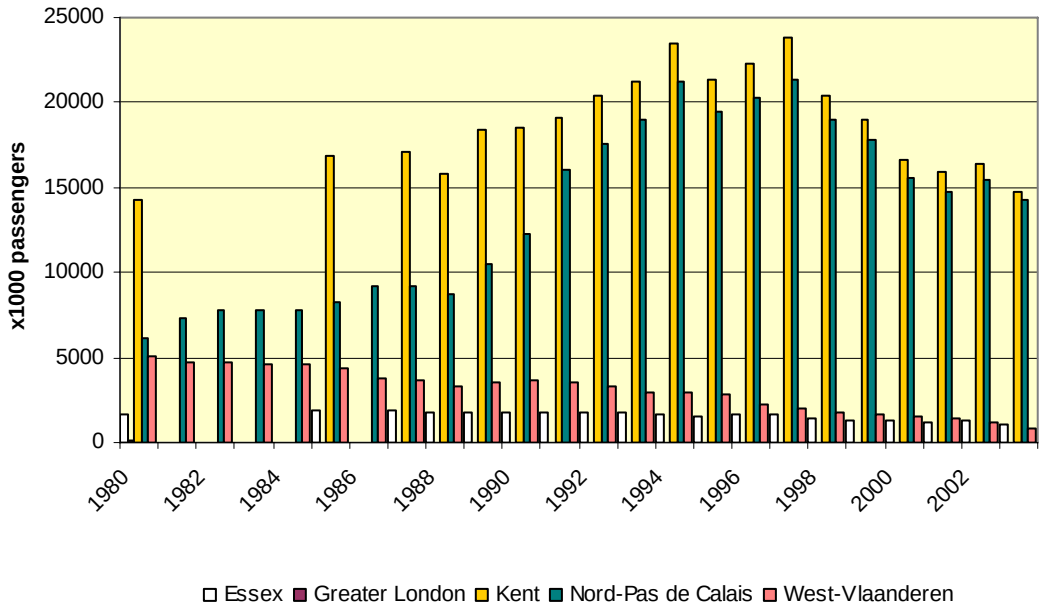




Share of total volume of goods handled in ports of the SAIL sub-regions (2003)



Number of passengers in ports of the SAIL sub-regions (1980-2003)



- *Number of incoming and outgoing passengers per port*
- *Proportion of goods carried cross-channel by rail and by truck*
- *Proportion of goods carried by short sea routes*
- *Volume of goods handled per port*
- *Direct added value of ports*

Key Message

- The total volume of goods handled in ports of the Southern North Sea region has increased by more than 60% over the last twenty years. In 2003, about 250 million tonnes were handled by SAIL ports.
- In spite of the increase in transport by rail (absolute numbers) through the Channel, the proportional importance of truck freight has grown slightly since 1994.
- The ports of Calais and Dover account for the largest share of passenger transport in the Southern North Sea (92% in 2003). Since the opening of the Channel tunnel in 1997, passenger numbers on the Channel link between these two ports have dropped by more than 20%.

Why monitor the economic importance of ports?

Ports constitute an important economic activity in coastal areas. The higher the throughput of goods and passengers year-on-year, the more infrastructure, provisions and associated services are required. These will bring varying degrees of benefit or disadvantage to the local and regional economy and to the environment. Ports are also important for the support of economic activities in the hinterland since they act as a crucial connection between sea and land transport.

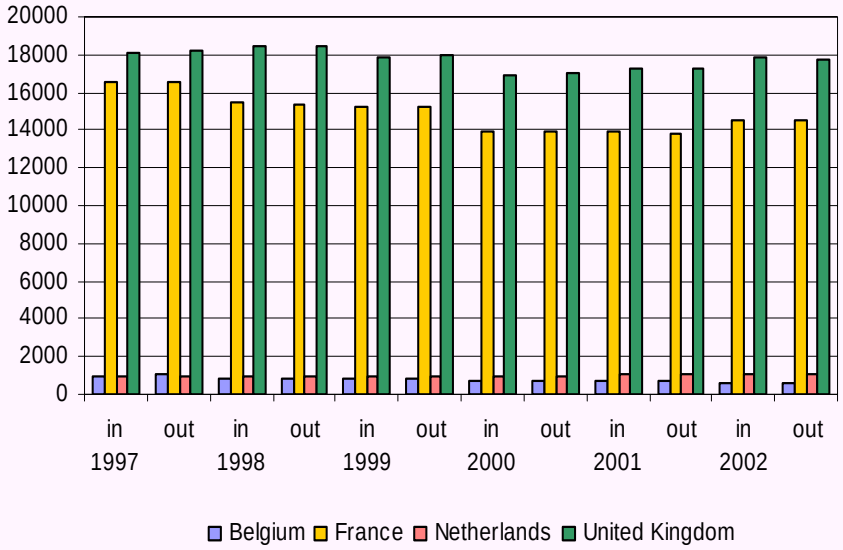
As a supplier of jobs, ports do not only serve an economic but also a social function. However, since cargo nowadays is loaded and unloaded mechanically, the effects of changes in the amount of goods handled on local employment or the demand for port services is difficult to ascertain.

Transport is one of the main sources of NO_x and SO_x and greenhouse gases giving rise to air pollution that can seriously damage ecosystems and public health. The European institutions as well as individual countries have promoted short sea routes heavily over the past twenty years or so, largely because of the environmental advantages of conveying goods by sea rather than by air or road. In those sectors where it competes directly with other means of transport, shipping is by far the most energy efficient form of transport. The indicator helps to understand developments in the freight and passenger transport sectors in response to sectoral policies for sustainable transport and development. The indicator can also be related to trends observed in the impact of transport on the environment. Measurements of this indicator should help us to gain an insight into the vitality of ports and to compare them in terms of (economic) importance.

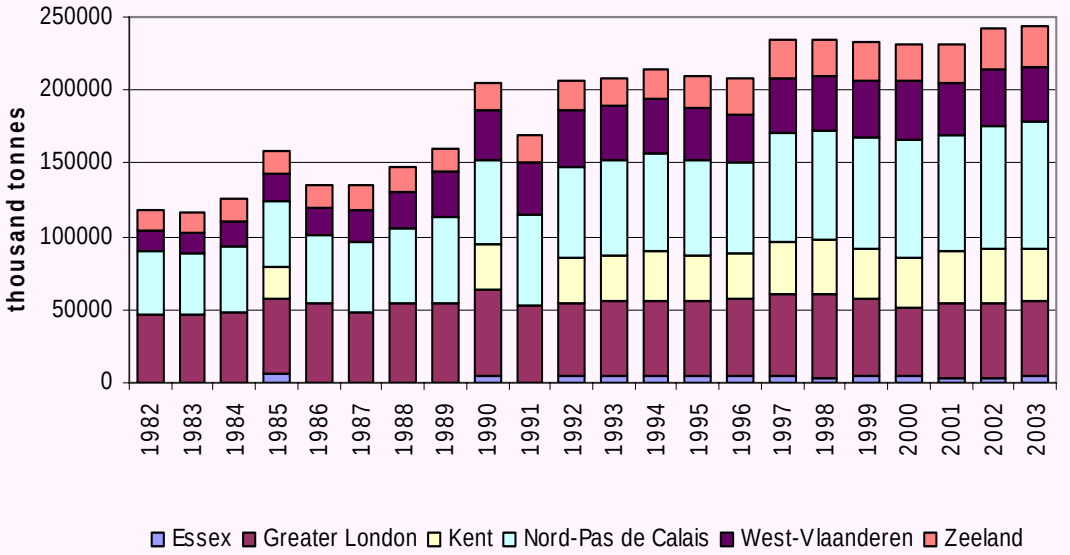
Where do the data come from?

Since 2000, maritime traffic data have been collected on a uniform basis by Member States in accordance with the EU Maritime Statistics Directive (95/64/EC). Member States are required to provide information about goods and passengers moving in and out of European ports. Annual data on the throughput of goods are available for all cargo ports. More details are available for ports handling goods in excess of one million tonnes per year, including type of vessel and type of cargo carried. For passenger ports with less than 200,000 movements, details are not provided.

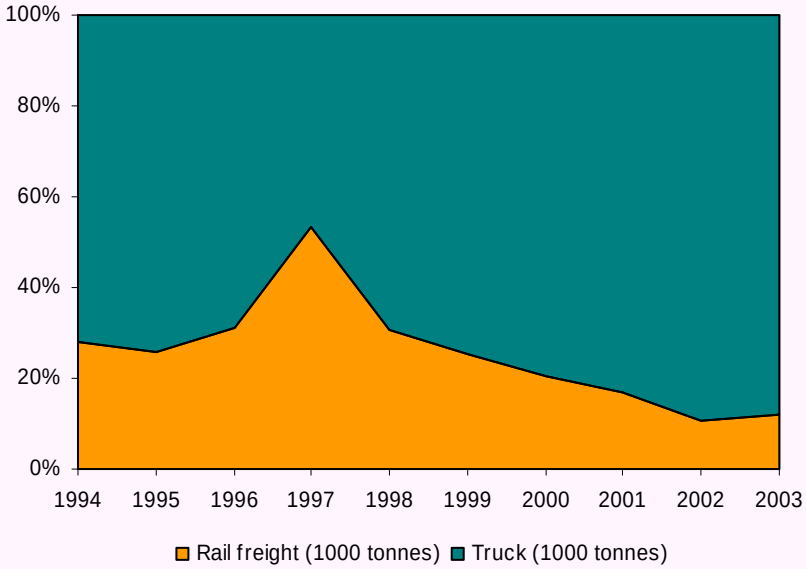
Incoming and outgoing passenger transport in ports of the SAIL countries



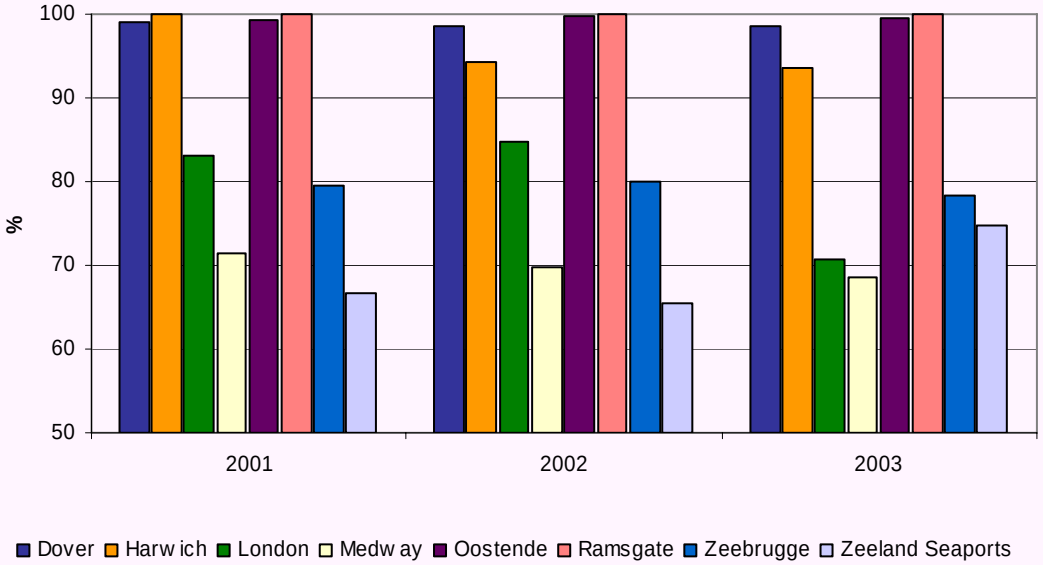
SAIL regions - volume of goods handled



Cross-channel rail and truck



SAIL ports - proportion of short sea shipping per port



The measurements on direct added value of ports and short sea shipping are not available from the EUROSTAT statistics since they do not constitute an obligation for reporting. EUROSTAT compiles returns on short sea shipping from national submissions. For these, and for data about maritime traffic before 2000, a range of transport agencies and national and port authorities in the region were consulted.

What does the indicator show?

Most of the passenger transport in the area of the Southern North Sea takes place between France and the United Kingdom (93%). The ports of Calais and Dover account for the largest share with more than 92% in 2003. In the Zeeland ports, 1997 was a 'peak year' with 7,000 passengers. Zeebrugge and Oostende (Flemish ports) have seen a decline in passenger transport from 5 million passengers in 1980 to less than 825 thousand in 2003. Ramsgate, one of the largest passenger ports in Kent, showed a spectacular decline in the number of passengers from 3.5 million in 1994 to 160 thousand in 1998. This decline was a consequence of the closing of the service to and from Dunkerque, as a result of competition from the Channel Tunnel and the opening of the A16 motorway. Harwich in Essex has remained relatively important with 1 million passengers in 2003. In Nord-Pas de Calais the high number of passengers transported every year is attributed to the port of Calais with as many as 20 million passengers in the year 1997.

Passenger numbers on the Channel link between Calais and Dover notably influence the figures for both the UK and France. Since 1997, passenger numbers on this route have dropped by more than 20%. This is evidently due to the alternative to maritime transport given by the Channel Tunnel. However, both Dover and Calais have been able to stop a further decline as they registered respectively 3.1% and 4.3% more passengers in 2002 than they did in 2001. Although Belgium's passenger transport by sea is much lower in absolute terms, the volumes have obviously also been affected by the alternative of rail transport through the Channel Tunnel, with a fall of more than 40% between 1997 and 2002.

Cross-channel truck freight traffic has increased considerably since 1995 (3.9 million tonnes in 1995 up to 12.8 million in 2003) with a temporary decrease in 1997. Cross-channel rail transport has seen a more modest increase (1.35 million tonnes in 1995-1.74 million tonnes in 2003). However, in spite of the increase in transport by rail in absolute terms, the proportional importance of truck freight keeps growing. The peak in the ratio of cross-channel rail over truck freight transport in 1997 is attributable to a fire, which blocked the tunnel traffic to trucks for over a year.

At the European level, short sea shipping (SSS) is the only mode of transport competing with road transport. In terms of volume it has grown by around a third during 1991-2000 to about 1,270 billion tonne-km, which is comparable with road transport. Insufficient data is available at the port level in order to evaluate the trends of SSS in the SAIL region. For the evaluated SAIL ports, the proportion of short sea shipping has not changed considerably over the last three years.

The total volume of goods handled by Southern North Sea ports has grown by more than 60% over the last twenty years. In 2003, about 250 million tonnes were handled by the SAIL ports. In West-Vaanderen and Zeeland the volume of handled goods has more than doubled since the early eighties. In Kent, Essex and London the trends are less clear while in Nord-Pas de Calais some ports show an increase (Calais, Dunkerque). The volume of goods handled by Boulogne-sur-mer has decreased since 1997.

In Zeeland and West-Vlaanderen, direct added value has increased for most ports, although not spectacularly. The most important ports of those regions in terms of added value are Zeebrugge in West-Vlaanderen and Terneuzen in Zeeland.

What are the implications for planning and managing the coast?

At European level, 3,054 million tonnes of goods were handled in 2002, and 405 million persons are estimated to have passed through EU15 maritime ports in 2002.

Trends in the volume of goods and passengers are generally interpreted for sectoral policy making and analyzed in the cost-benefit studies of port authorities.

The European Commission objectives for achieving sustainable transport are to: (1) bring back the shares of alternative modes (rail, inland waterways, short sea shipping and oil pipelines) to their 1998 levels by 2010 (CTP); (2) generate a shift in transport use from road to rail, and increase water transport (SDS); and (3) reduce the link between economic growth and transport demand (also called 'decoupling').

The need for action with respect to modal split was first acknowledged in the EU Transport and Environment (T&E) integration strategy. In its sustainable development strategy (SDS), the EU has set itself the objective to shift freight from road to alternative modes. In the White Paper on the Common Transport Policy (CTP), the Commission proposes 60 or so measures to reach this objective. In the field of shipping for example, documentary procedures for ships that call at EU ports have been simplified. Additionally, the Commissions strategy for promoting short-sea shipping has been prolonged by Council resolution in February 2000.

'Decoupling' economic growth and transport demand is considered a key action in order to deal with climate change and alleviate health impacts from transport in urban areas. This objective was first defined in the Transport and Environment (T&E) integration strategy and further mentioned in the sustainable development strategy in relation to the reduction of congestion and other negative side effects of transport.

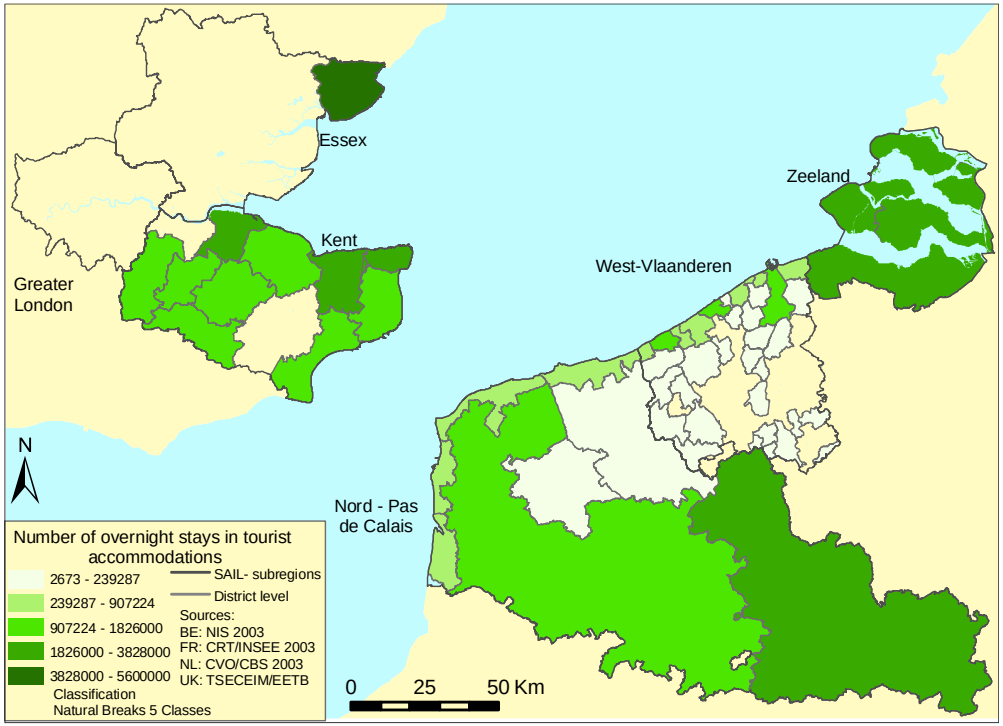
Nevertheless, ports have to compete with other coastal uses. They might also have negative impacts on tourism, landscapes, habitats and ecosystems. Port infrastructures and activities can have visual and noise impacts on the areas in which they are sited and they may cause various forms of pollution. Therefore planning of port expansion and regulation has to be done considering other coastal functions so as to avoid conflict, preserve tourism, and protect biodiversity and natural values.

How reliable is the indicator?

The data on goods and passengers were cross-checked with local sources of information from port authorities. Data for short sea shipping and oil pipelines are based on estimations and the data is not readily accessible for all SSS ports. Since short sea shipping is of great importance in European freight transport, more accurate statistics are needed for the Southern North Sea region.

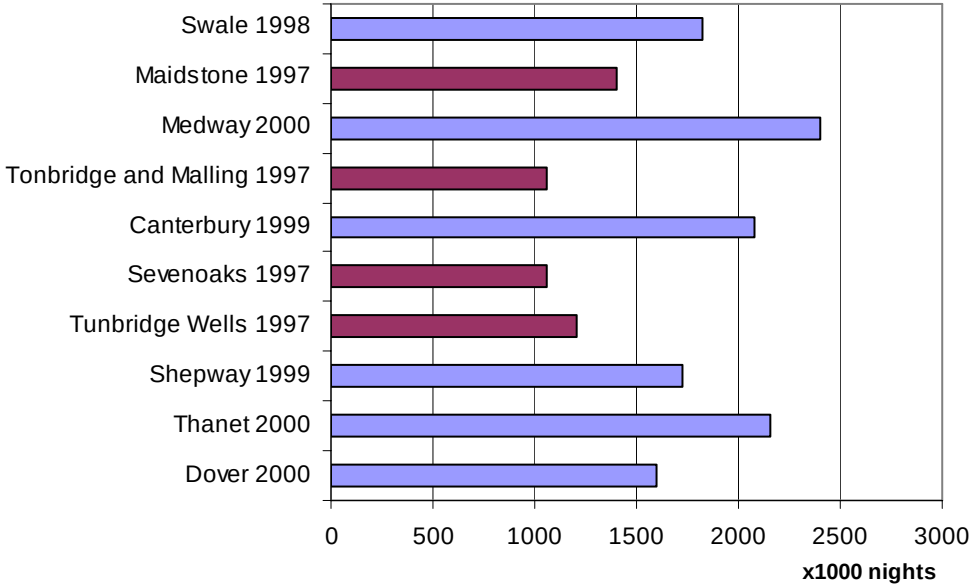
For passenger numbers, counts of cruise passengers are only made in ports where they (dis)embark. Hence, for some ports passenger numbers reflect only part of the total movements and give no indication of the importance of cruise tourism to port economics. Data on added value of ports are difficult to compare since they are collected through different methodologies. The data for added value of ports is incomplete and scattered: there is no data for ports in Nord-Pas de Calais, for the UK only data from 2003 is available.

Indicator 11 Significance of tourism

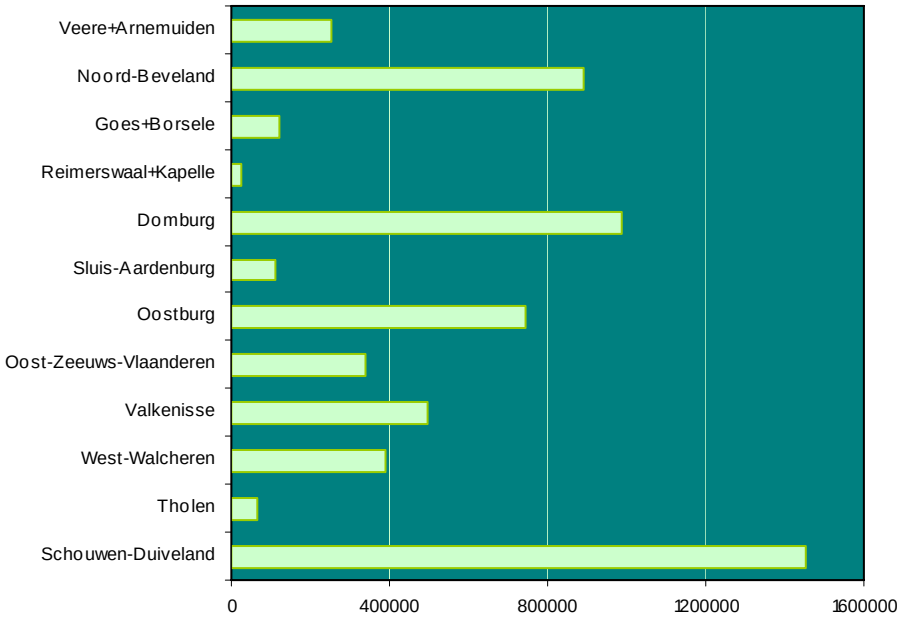


Number of overnight stays in tourist accommodation

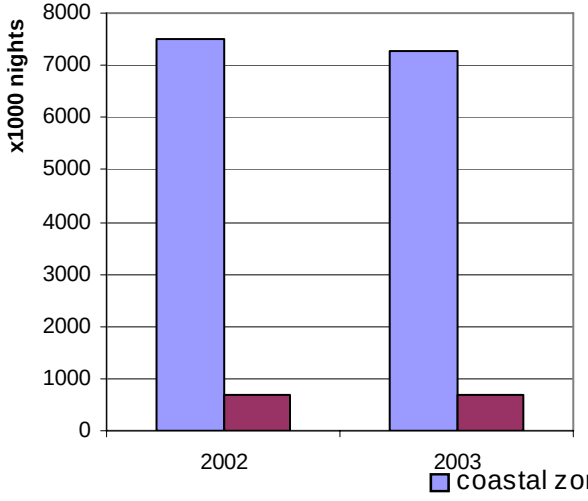
Kent districts (Kent Tourism Facts 2002/2003, KCC)



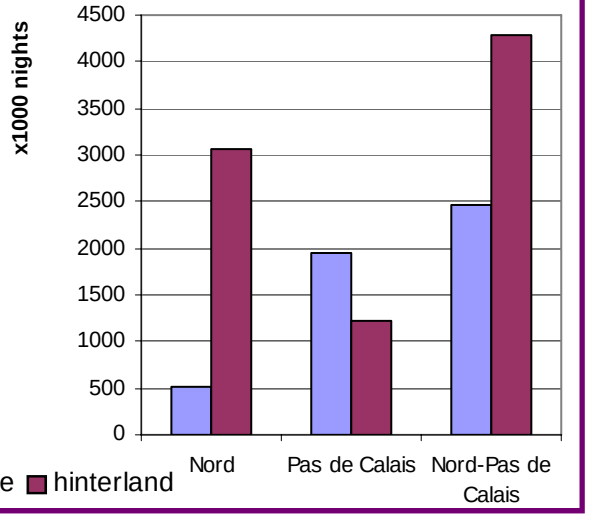
Number of overnight stays, Zeeland (CBS 1995)



West-Vlaanderen (NIS)



Nord-Pas de Calais 2003 (Insee/CRT)



Key Message

- In spite of the importance of tourism to the economy of coastal areas, the data to monitor volume, intensity and spread of tourism over the year is fragmented and of insufficient quality.
- Where reliable data is available, it shows that the number of overnight stays in tourist accommodation at the coast largely exceeds that of the inland areas.
- An important seasonality is observed in bed place occupancy.

Why monitor the significance of tourism?

The number of overnight stays in tourist accommodation is an indication of the economic impact of tourism in coastal towns and municipalities. Residential tourism requires planning for additional infrastructure and services. Together with day tourism, it can represent an important driver in the coastal economy. However, it can also explain some less desirable social and economic side effects for the local population.

Occupancy of bed places provides an indication of the degree to which existing infrastructure and tourist accommodation respond to actual demand. If information on seasonal occupancy is obtained, it can tell us more about how tourism is spread throughout the year. The greater the spread, the more likely employment in the industry will be permanent and services and infrastructure will be used more efficiently.

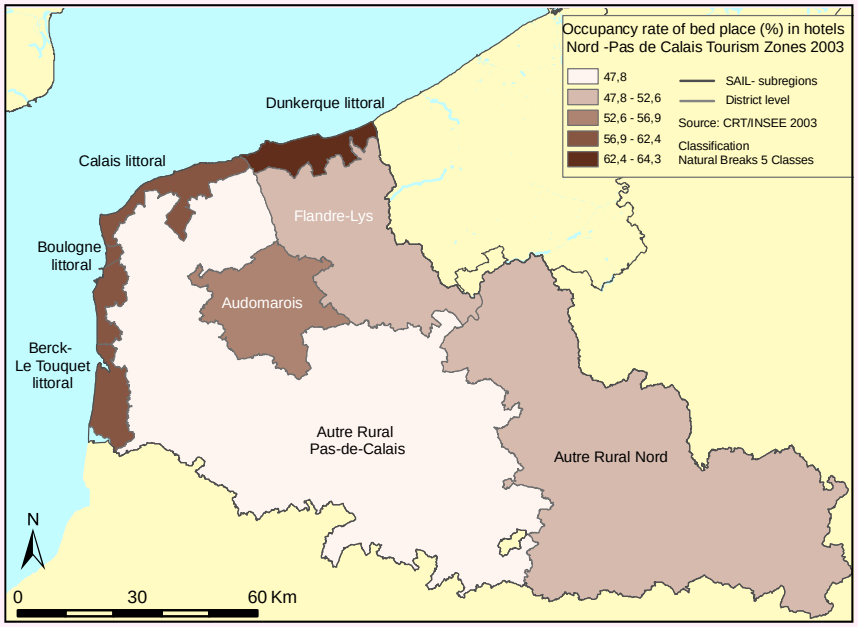
Where do the data come from?

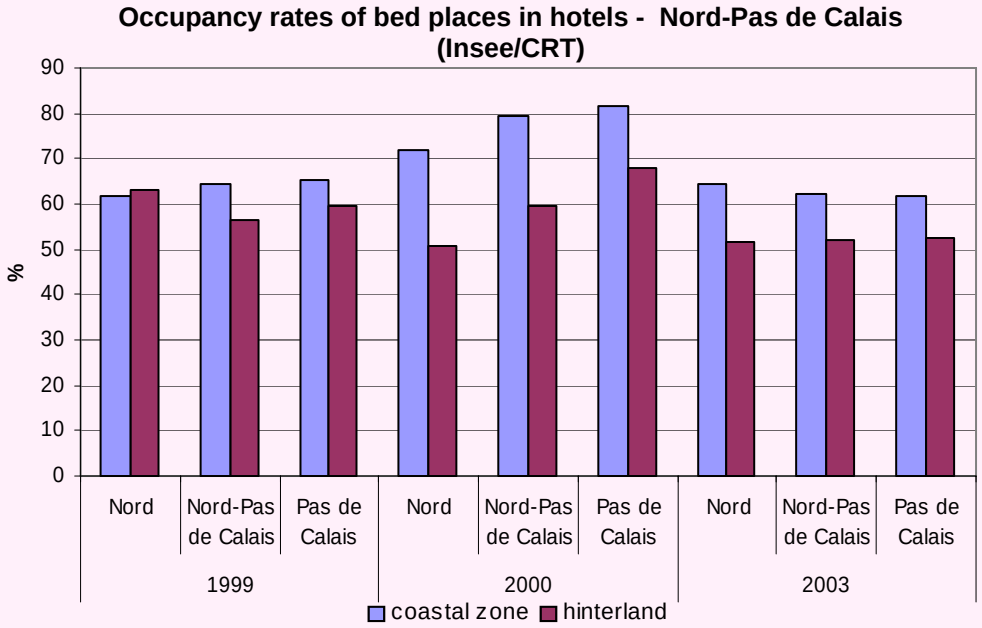
Basic data on tourism are collected by the National Statistics Services (INSEE, ONS, CBS and NIS). Specific studies and surveys are carried out in association with external expertise. The Comité Régional de Tourisme and INSEE publish data on employment, occupancy of bed places, overnight stays, expenditure and others. Continu Vakantie Onderzoek (CVO) and Bureau voor Toerisme Zeeland provide valuable tourism research for Zeeland. In England, data are available at district level from different sources. In West-Vlaanderen, Westtoer and WES follow up on important policy issues in tourism at the coast and other tourist regions in the province. No data are collected yet on occupancy of bed places in Flanders.

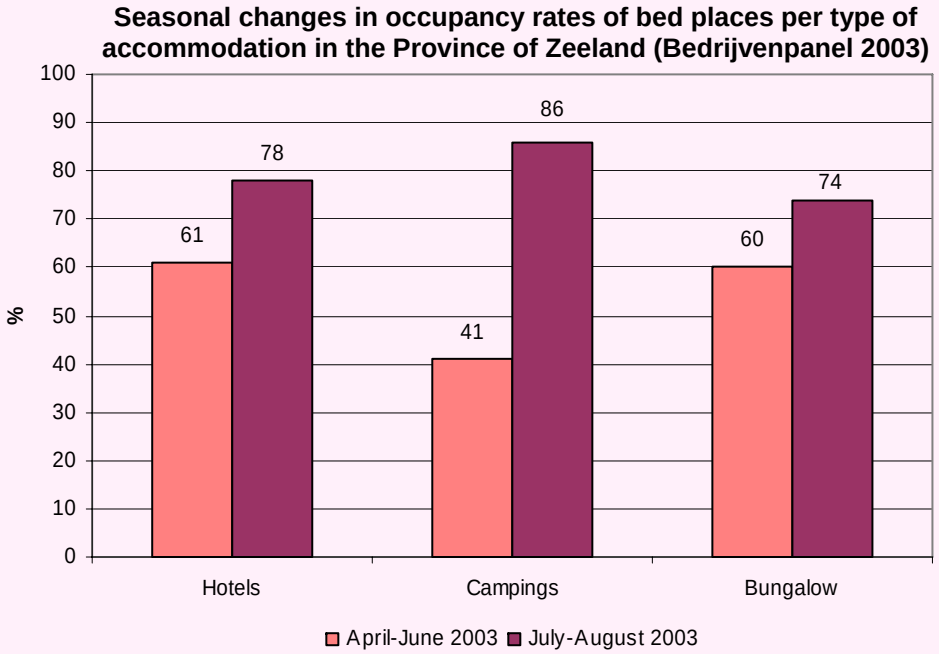
What does the indicator show?

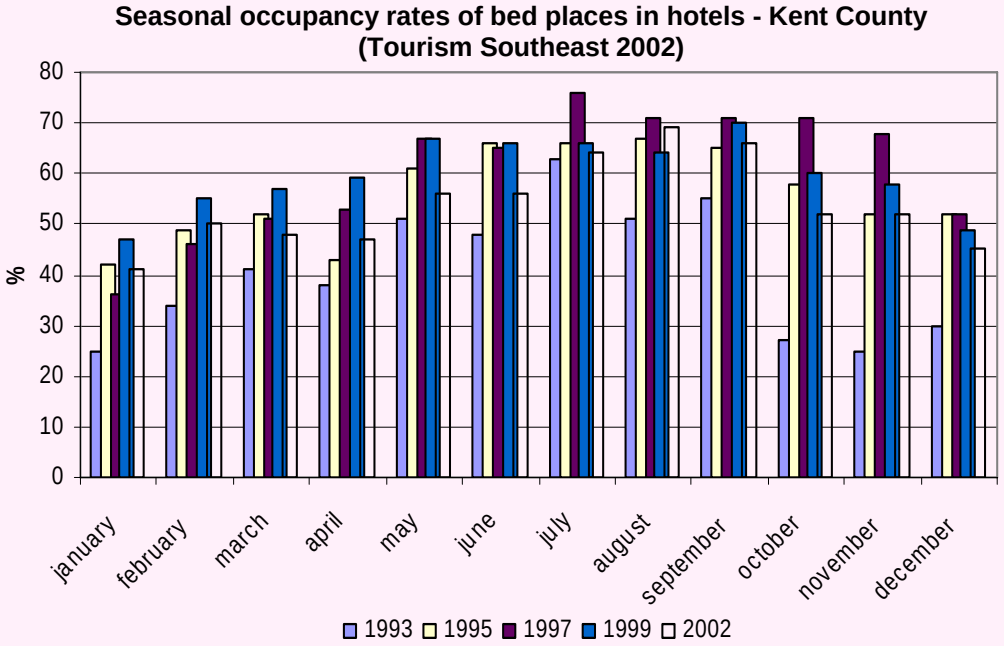
The number of overnight stays in tourist accommodation is only available at the municipality level for West-Vlaanderen and for tourist zones in Nord-Pas de Calais. According to official statistics, the Belgian coast receives 7.5million overnight stays (2003). An additional survey suggests that these figures are far too low and that there is a discrepancy of a magnitude of 2.5. This survey also reveals a decrease in the number of overnight stays of nearly 20% over the last decade: from 21million in 1992 to 17million in 2002.

In terms of number of nights spent, the littoral of Pas-de-Calais is more important than its hinterland and than the littoral of the département Nord (2003).


Occupancy rate of bed place (%) in hotels
Nord -Pas de Calais Tourism Zones 2003
47,8
47,8 - 52,6
52,6 - 56,9
56,9 - 62,4
62,4 - 64,3
SAIL- subregions
District level
Source: CRT/INSEE 2003
Classification
Natural Breaks 5 Classes
Dunkerque littoral
Calais littoral
Flandre-Lys
Boulogne littoral
Audomarois
Berck-Le Touquet littoral
Autre Rural Pas-de-Calais
Autre Rural Nord
N
0
30
60 Km


Occupancy rates of bed places in hotels - Nord-Pas de Calais (Insee/CRT)
%
Nord
Nord-Pas de Calais
Pas de Calais
1999
2000
2003
coastal zone
hinterland


Seasonal changes in occupancy rates of bed places per type of accommodation in the Province of Zeeland (Bedrijvenpanel 2003)
%
61
78
41
86
60
74
Hotels
Campings
Bungalow
April-June 2003
July-August 2003


Seasonal occupancy rates of bed places in hotels - Kent County (Tourism Southeast 2002)
%
january
february
march
april
may
june
july
august
september
october
november
december
1993
1995
1997
1999
2002

Overnight stays in coastal districts in Kent in the late 1990s accounted for around 64% of the total number of stays in the county. The annual numbers of overnight stays in each of the districts of Thanet, Canterbury and Medway exceed 2million.

In Essex, an estimated 884,000 nights were spent in 2002 in the premier coastal resort of Southend-on-Sea, of which 74% are spent at friends and relatives' homes. For the Tendring district, the estimate is 5.6million nights (2000), representing 48% of the total 11.6million nights spent in 2000 in Essex.

In Zeeland, collection of time series on overnight stays at municipality level was interrupted in 1995. In that year, Schouwen-Duiveland catered for nearly 1.5million overnight stays (CBS, 1995). In 2003, visitors spent 3.8million nights in Schouwen-Duiveland. Data are now collected at the Zeeuws sub-region level, however these are too coarse to allow calculating numbers for the coast. Today, tourists spend an estimated 2million nights in the coastal commune of Veere alone. The number of overnight stays in Zeeland varied from 7.1million for both national and international visitors (CBS, 2003) to 11.2million for Dutch overnight stays only. Of these 11.2million, 34% were spent in Walcheren, followed by Schouwen-Duiveland (27%).

For all nights spent by tourists in Europe, 58% are registered in hotels. Camping and caravanning sites rank next with 18% (EEA). In the UK, estimates for the proportion of nights spent at relatives and friends' homes are significant. In the town of Dover, 18% of the estimated overnight trips are spent on a boat. This shows local differences in the importance of type of accommodation, some of which are not reflected in official statistics.

In Kent, 20% of daytrips (6.18million in 1998) were undertaken to the coast. In Tendring, visits to the seaside account for only 10% of all day trips.

Information on occupancy of bed places is not readily available at the local level, except for the tourist zones in Nord-Pas de Calais (hotels, 1999-2003). These data show that occupancy of bed places at the coast is on average 10% higher than in the hinterland. In Zeeland and Kent, occupancy levels per accommodation type are available at the Province/County level only. The occupancy levels in tourist accommodation are still very seasonal, resulting in a high number of empty bed places throughout the year.

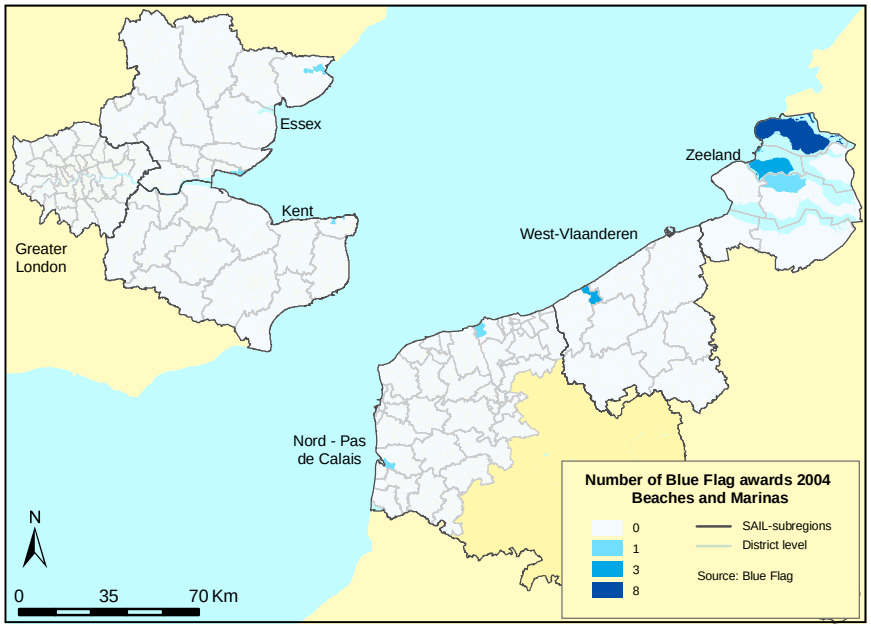
What are the implications for planning and managing the coast?

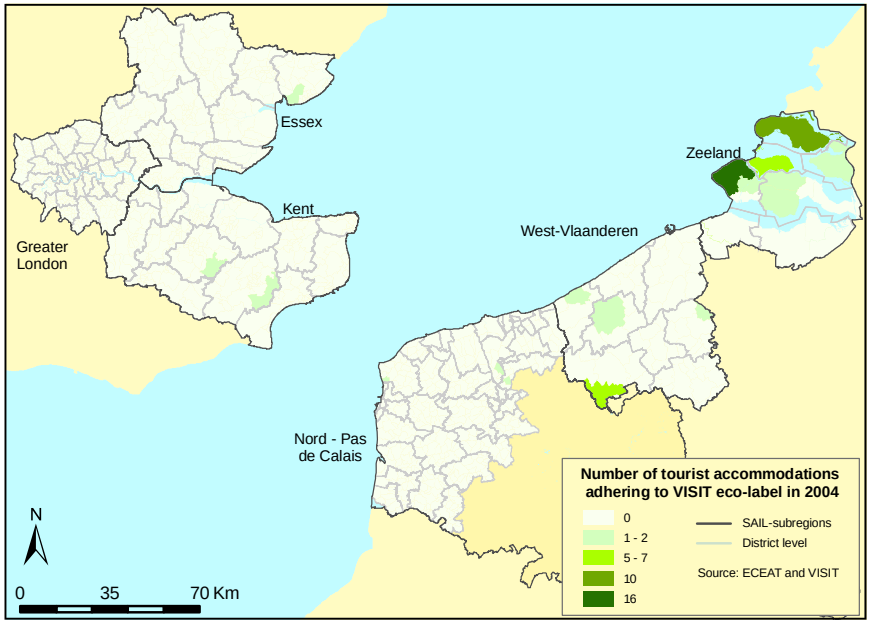
The number of overnight stays by tourists gives an indication of the economic importance of tourism. It also provides a measure of pressure from tourism and tourist accommodation on the environment. The consumption of energy and water, and the problems of wastewater and waste disposal during peak seasons, require additional planning and infrastructure in coastal towns. The maintenance of hotels and tourist accommodation requires energy, regardless of the efficiency in occupation of bed places. Peak-season concentrations of visitors in coastal towns can have a heavy impact on the environment, if not properly managed. Knowledge of the volume of tourism and its impact on local environment and economy is an essential requirement in developing policies and managing tourism in local areas. Nevertheless, such information is not readily available. More detailed local information is needed, including on the seasonal spread in the occupancy of bed places and number of overnight stays.

How reliable is the indicator?

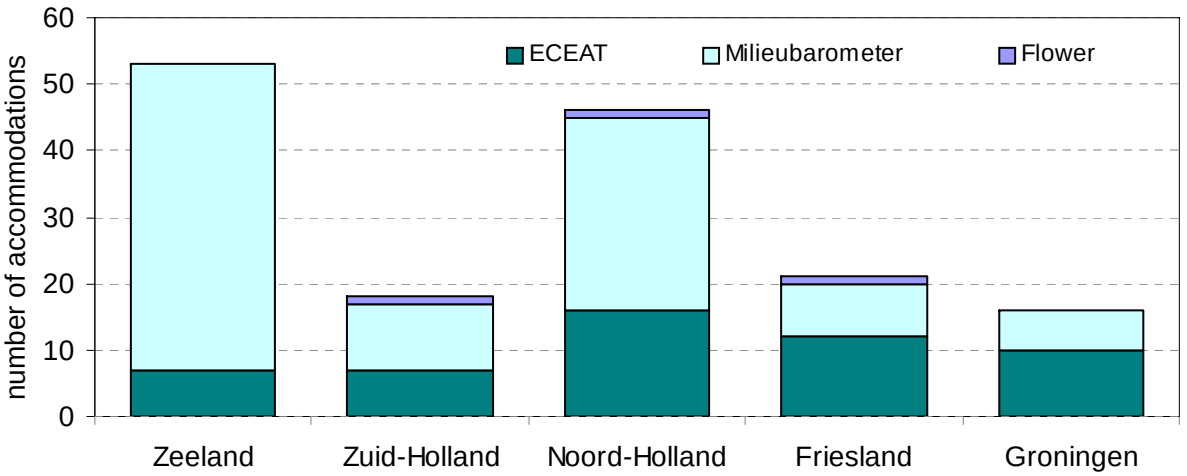
Different categories of accommodation type are taken into account in statistics on total number of overnight stays amongst the SAIL countries and even between local surveys and studies. Furthermore, mostly aggregated data are published, making it difficult to calculate numbers for the coastal zone, let alone making comparisons between SAIL sub-regions. Data are obtained from varying types of sources and methodologies. Given the importance of tourism for many coastal economies, the data are surprisingly scarce and scattered.

Indicator 12 Sustainable tourism





Number of tourist accommodations with European Eco-label in Zeeland and The Netherlands provinces - 2004



Number of Blue Flag Beaches	Year		
	2003	2004	2005
West-Vlaanderen	7	0	0
Nord-Pas de Calais	2	2	3
Kent	6	7	3
Essex	4	4	5
Zeeland	6	10	15

Number of Blue Flag Marinas	Year		
	2003	2004	2005
West-Vlaanderen	2	3	3
Nord-Pas de Calais	2	2	5
Kent	0	0	0
Essex	0	0	0
Zeeland	14	12	11

Sub-regions 2004	Regional label	ECEAT	Total sub-region	Coast
Zeeland ***(Milieubarometer)***	40	7	47	33
West-Vlaanderen ***(Milieubarometer)***	0	8	8	1
Nord-Pas de Calais ***(La Clef Verte)***	1	3	4	1
Kent and Essex ***(Green Business)***	1	2	3	0

- *Number of tourist accommodations with EU Eco-label*
- *Ratio of number of overnight stays to number of residents*

Key Message

- In 2004, 62 tourist accommodations adhered to the European VISIT label in the SAIL region, of which 35 are located in coastal municipalities. A total of 19 marinas (15% of the approximate total of 130) and 26 beaches were awarded a Blue Flag in the SAIL sub-regions.
- There is no tourist accommodation with the EU Flower eco-label in the SAIL region (summer 2005).
- In some of the most popular bathing resorts along the southern North Sea, for each resident living in the area year-round, as many as 135 nights are spent by visitors in tourist accommodation only. Most of these nights are spent during relatively short peak seasons.

Why monitor sustainable tourism?

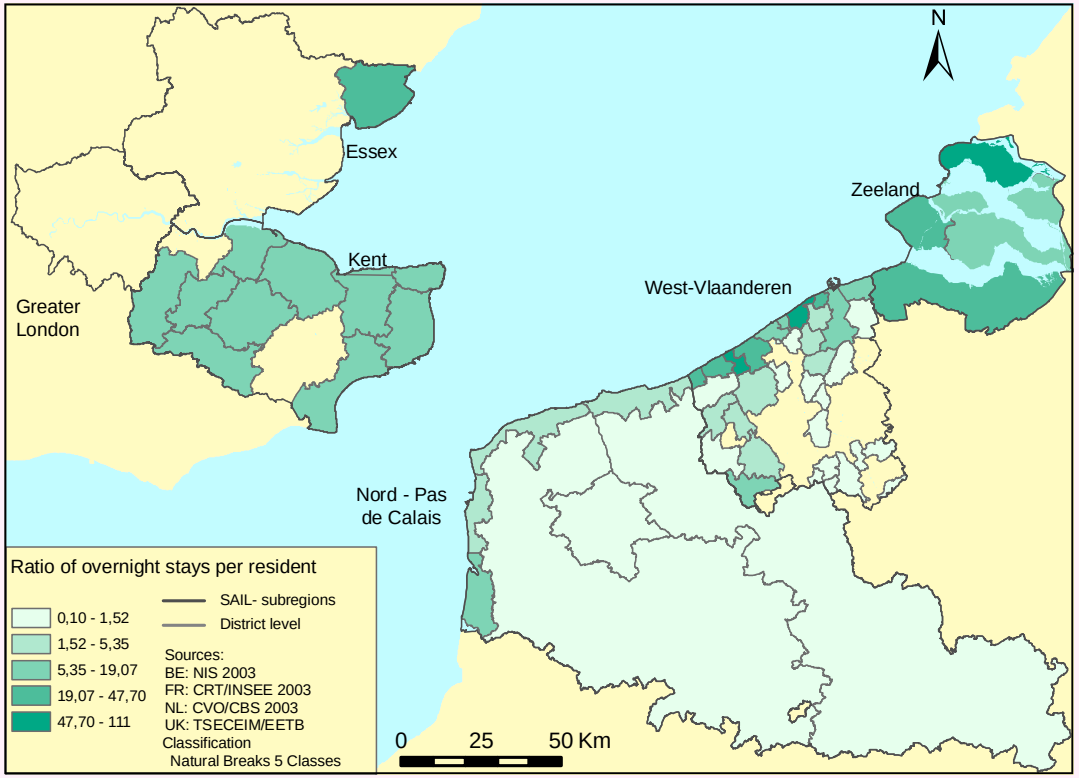
The extent of eco-labelled accommodation at the coast is a measure of on-site implementation of sustainability in tourism. It also indicates how the coast is doing compared to the hinterland, in catering for environmentally friendly tourist services and products. Ecological quality labelling for sustainability has taken off during the last decade and there is a growing awareness of the importance of eco-labels in supporting sustainable coastal economies. The Voluntary Initiative for Sustainability in Tourism – VISIT is the European umbrella for existing national / regional eco-labels in the tourism sector. It is based on common criteria and standards for sustainable use of resources, respect for the environment and local tradition and heritage. The EU eco-label 'Flower' also applies to tourist accommodation. It came into operation in May 2003.

The number of overnight stays per resident gives an indication of the relative social and environmental impact of tourism. Moreover, since tourism at the coast remains a seasonal business, this impact is highly concentrated in a relatively short period.

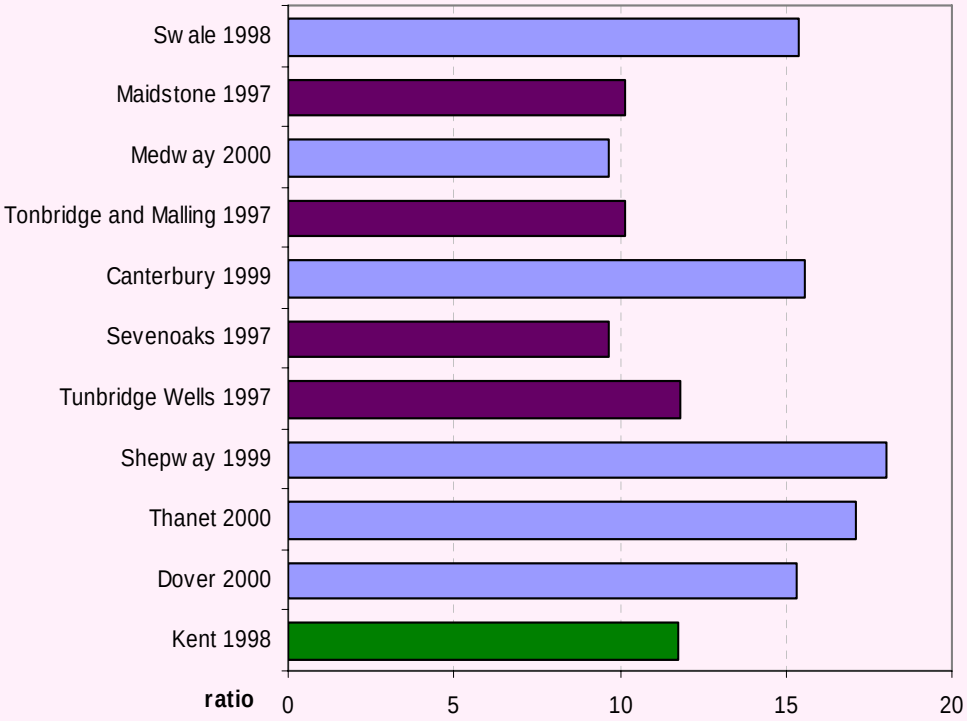
The 'social carrying capacity' is also defined by the type of destination: a ratio of 10:1 in a small coastal village may have a greater impact than a ratio of 100:1 in an established resort.

Where do the data come from?

The EU eco-label 'Flower' (www.eco-label.com) applies among others to tourist accommodation. Blue Flag international launches the names and locations of the awarded beaches and marinas on the Internet before each summer. Data are available at national, regional and local levels (municipalities) (www.blueflag.org). 'La Clef Verte' in France (www.laclefverte.org), 'Milieubarometer' (www.milieubarometer.nl) in The Netherlands and Belgium, and Green Business in the UK (www.greenbusiness.org.uk) are regional labels that have joined VISIT. They represent traditional accommodation while the ECEAT label stands for rural accommodation (European Centre for Eco and Agro Tourism- www.eceat.nl). Number of overnight stays and resident population are provided by both national statistics services and a wide variety of studies and surveys (see metadata 01 and 11).

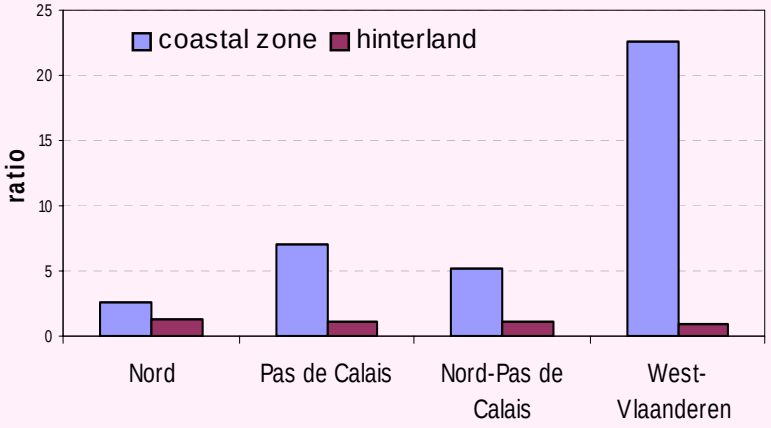


Ratio of overnight stays per resident (x:1), Kent districts and Kent County Council (1997-2000)

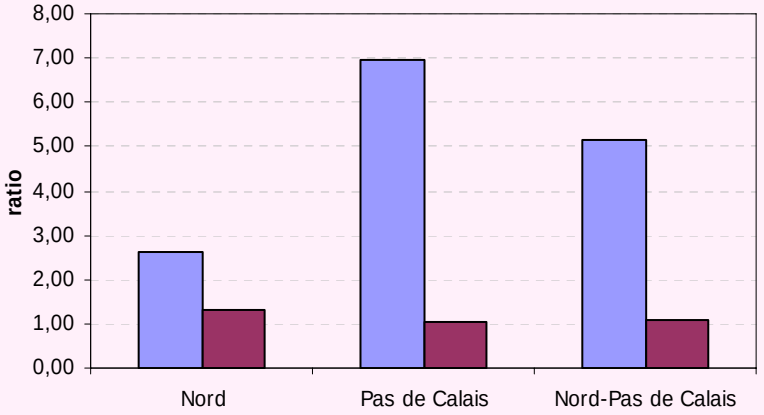


Ratio of overnight stays per resident (x:1), West-Vlaanderen

Nord-Pas de Calais and West-Vlaanderen (2003)



Ratio of overnight stays per resident (x:1), Nord-Pas de Calais (2003)



What does the indicator show?

In 2004, most of the 19 Blue Flag awards for beaches and 26 for marinas in the Southern North Sea were located in the Dutch coastal municipalities of Sluis, Veere and Schouwen-Duiveland. (57% and 58% respectively, of the total Blue Flag awards in the region).

None of the accommodation in the SAIL region adheres to the EU eco-label flower, which became operational in May 2003. Other VISIT labels represented in the Southern North Sea are the Milieubarometer in The Netherlands and Belgium, Green Business in the UK and La Clef Verte in France. The ECEAT label stimulates rural development through the creation of services and accommodation that respect the environment and the conservation of natural and cultural heritage. It is a non-profit organisation that conducts research and draws guidelines for eco-, agro and rural tourism. Twenty ECEAT hotels and sites are located in the southern North Sea sub-regions, of which 6 are in the coastal zone. The highest number are located in Zeeland. This province also has more tourist accommodation awarded the national eco-label 'Milieubarometer' than other Dutch provinces. Five national and regional eco-labels in the Southern North Sea region have joined the European eco-label VISIT for tourist accommodation and beaches and marinas.

On average, for each resident living in one of the coastal districts of Kent, 15 visitor nights are spent. In the tourist zones of Montreuil in Pas-de-Calais this ratio can reach 1:18, but the pressure from tourism is concentrated in popular bathing resorts during summer season. Schouwen-Duiveland has very high ratios (1:130 in the coastal resort of Domburg), while in some coastal municipalities of West-Flanders, ratios are decreasing since peak values that reached ratios of 1:135 in the mid 1990s. As a reference, in the hinterland of The Netherlands the number of overnight stays per resident is on average 4 (data 1997-2004).

What are the implications for planning and managing the coast?

Eco-labels provide the necessary link between socio-economic concerns and environmental protection in coastal regions. They encourage the use of regional products, benefiting the local economy, and help to raise awareness of environmental protection among residents and visitors. The potential benefits are considerable: a hotel with 63 beds adhering to the eco-label criteria saves 17% of its energy costs, and a hotel with 92 beds uses 25% less cleaning agents. Campsites have the advantage of being a reversible form of land use, but problems with waste water collection, treatment, and domestic waste, can arise during overcrowded peak seasons. Here again, eco-labels can mitigate much of the unwanted impact on the environment. The Blue Flag was born in France in 1985. In 2005 a total of 2,442 beaches and 632 marinas were labelled Blue Flags, in 30 participating countries. The award is granted on the basis of compliance with criteria for water quality, environmental management, safety, services and facilities, environmental education and information. A new set of beach criteria came into effect in 2000, extending the criteria to wastewater treatment, Local Agenda 21 activities, and facilities for disabled people. For marinas, consideration is being given to the first steps of introducing an eco-management system.

The Blue Flag works towards sustainable development at beaches/marinas through strict criteria dealing with water quality, environmental education and information, environmental management, and safety and other services. It includes environmental education and information for the public, decision makers and tourism operators.

How reliable is the indicator?

Currently, not all prestigious eco-labels for tourist accommodation operating in the EU have joined the VISIT label. It will also demand further time and effort to increase the adherence of accommodation to the EU Flower eco-label. Local datasets on Blue Flag awards are available from the national focal points only. The quality and availability of time series may vary between the responsible Blue Flag coordinators for each country, as is also the case for the VISIT labels.

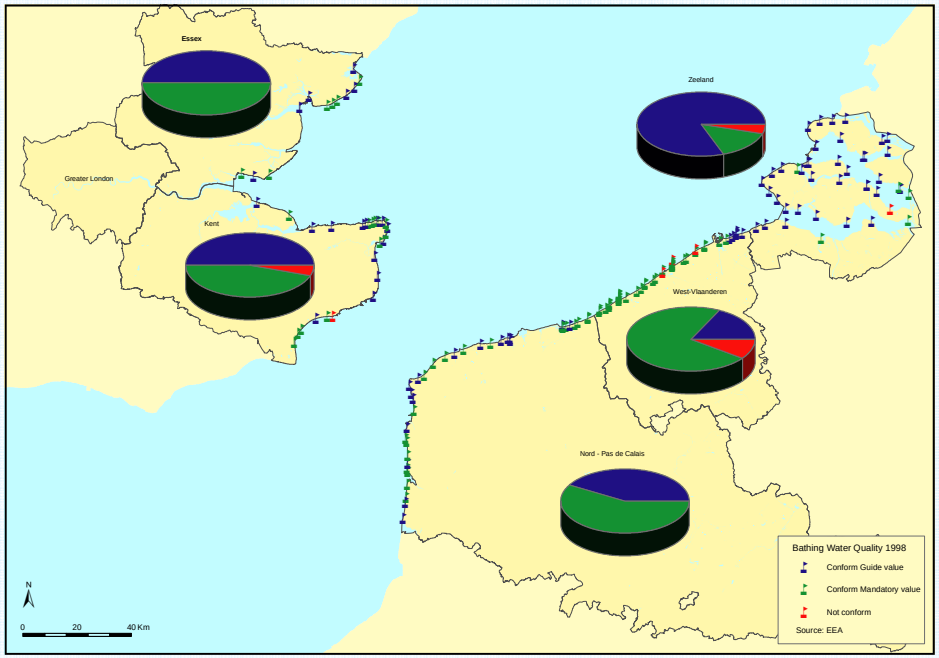
The ratio of overnight stays to number of residents is too coarse at the district level, since tourist pressure at the coast is concentrated in specific bathing resorts. Hence, more data are needed at the local level (seaside towns) in the UK. For a more accurate evaluation of the pressure exerted by tourism, the number of overnight stays spent in second homes and rented property, and the seasonal character of these, should also be taken into account. Finally, we need to know more about the impact of visitors on local landscapes and social/natural environment.

4

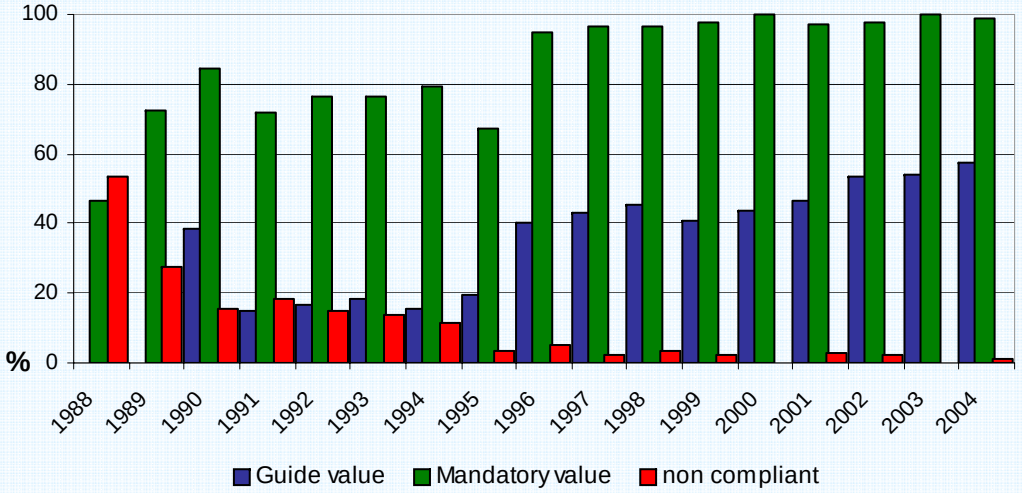
To ensure that beaches are clean and that coastal waters are unpolluted

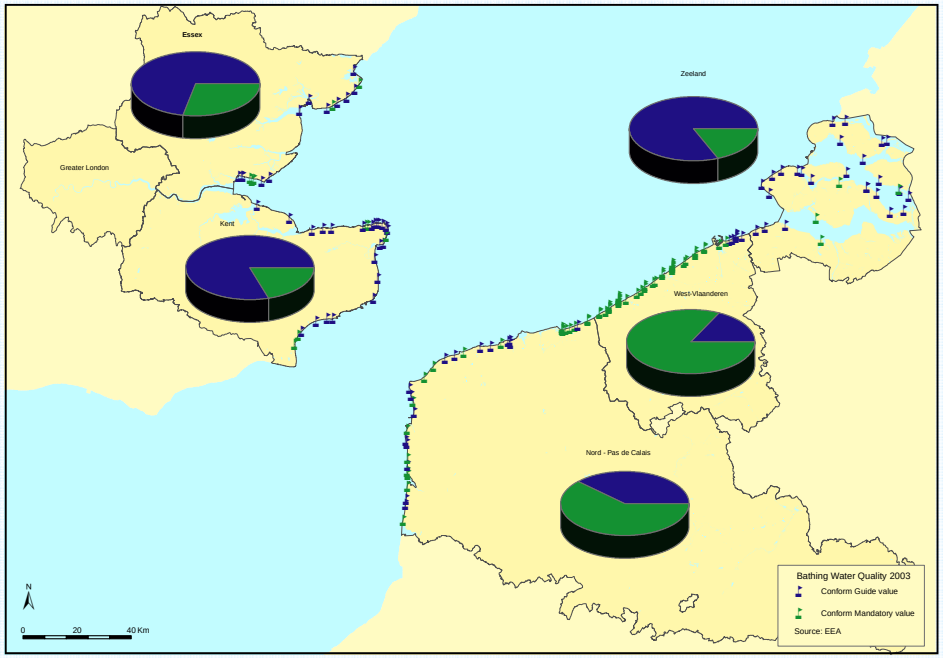
Quality of bathing water « » Amount of marine and coastal litter « »
Concentration of nutrients in coastal waters « » Amount of oil pollution « »
Pollution by hazardous substances

Indicator 13 Bathing Water Quality

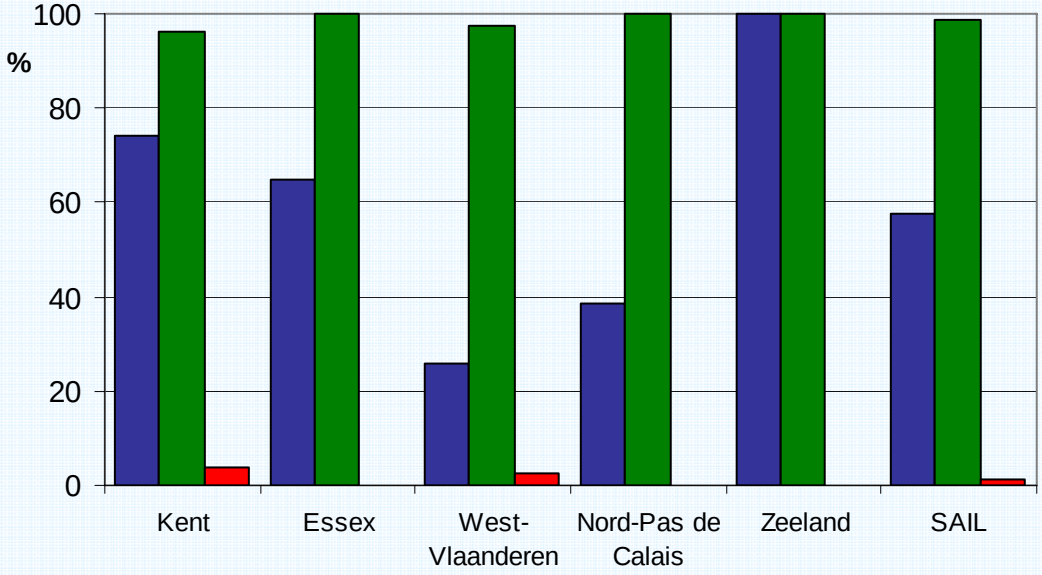


Percentage of bathing waters compliant with the Guide value and the Mandatory value in the SAIL region (1988-2004)





Percentage of bathing waters compliant with the Guide value and the Mandatory value in the SAIL sub-regions 2004



- ***Percentage of designated coastal bathing waters compliant with the Guide value of the European Bathing Water Directive.***
- ***Percentage of designated coastal bathing waters compliant with only the Mandatory value of the European Bathing Water Directive.***

Key Message

- Water quality at designated bathing areas in the Southern North Sea has improved steadily since the mid-1990s.
- In 2004, 98% of the sampled coastal bathing waters within the region complied with the Mandatory value, while 58% of the sites complied with the Guide value, which is 20 times stricter.

Why monitor bathing water quality?

Dirty seawater is a hazard to bathers. Most contaminants are derived from sewage and typically include human excrement, sanitary products, condoms, engine oils, fat balls, detergents, industrial and trade effluent, road surface run-off and stormwater. They commonly cause diarrhoea and gastro-enteritis and, more rarely, life-threatening illnesses such hepatitis A. Dirty water is also a threat to marine life, and a deterrent to holidaymakers and tourists. Measuring the quality of bathing water regularly alerts authorities to the risk to bathers and to the source of any contamination. Warning signs may be posted and, *in extremis*, beaches might be closed. Persistent failure to comply will point to the need to renew sewage treatment works or redesign sewage outfalls.

Where do the data come from?

National and regional authorities sample bathing water at regular intervals during the bathing season. The samples are analyzed and communicated to coastal municipalities in order to safeguard bathers from severe diseases. Member States submit results from sampling designated coastal bathing waters annually to the European Environment Agency which posts them on its website http://europa.eu.int/water/water-bathing/report.html.

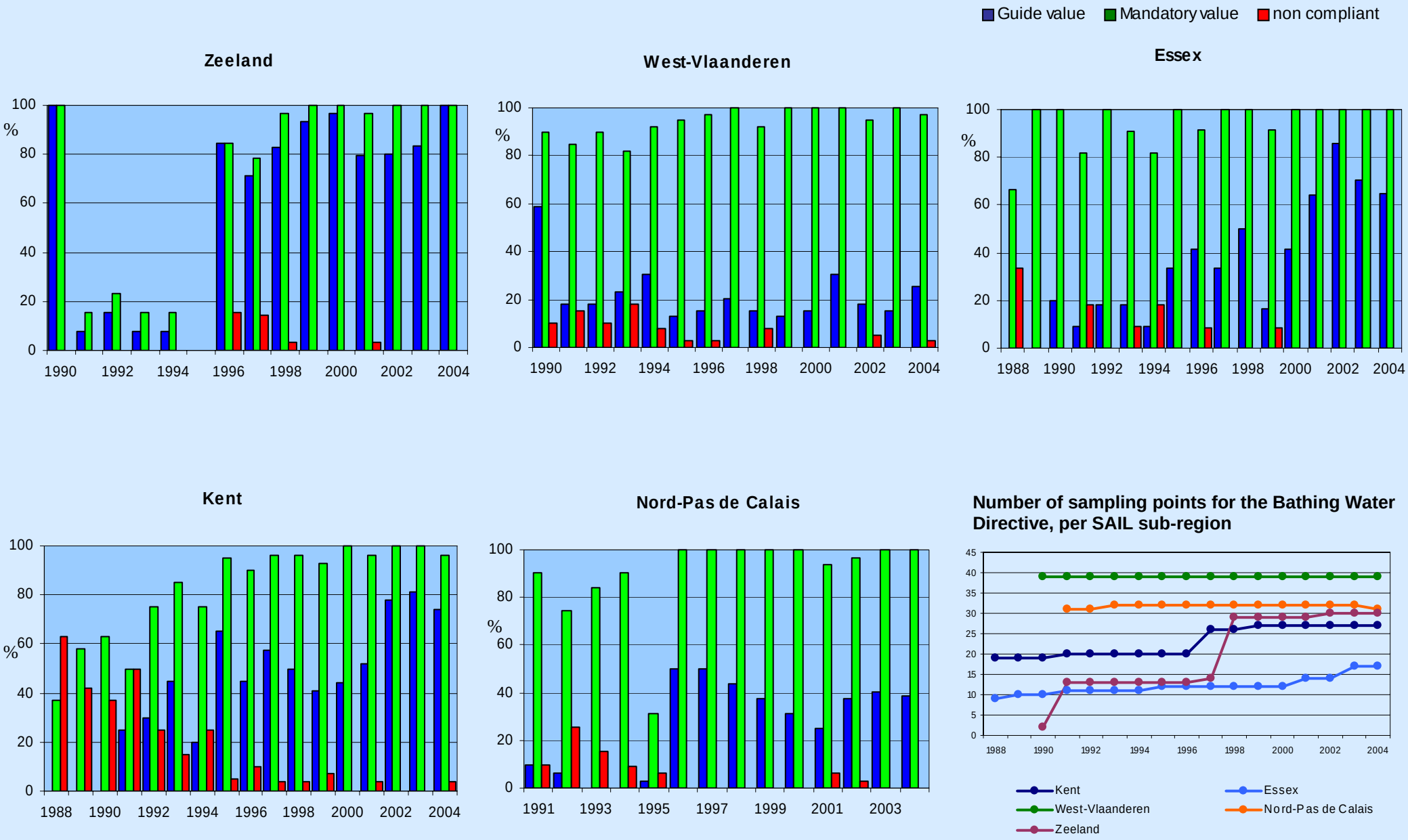
Data are posted for every sampling point and sub-regional, regional, national and all-Europe summaries are available.

What does the indicator show?

Within the SAIL region, efforts to monitor bathing water quality of coastal waters have increased considerably. The number of measuring points has increased steadily over the years from 28 in 1988 up to more than 140 in 2001. In 2004 West-Vlaanderen counted the highest number of measuring points (39) while Essex had the least (17).

In 2004, 98% of the sampled coastal bathing waters within the SAIL region complied with the Mandatory value while 58% complied with the Guide value. In spite of these high rates of compliance with the Mandatory value, at the regional level only 1 of the 5 regions achieved over 80% compliance with the Guide value in 2004: less than 50% of the measuring points in Nord-Pas de Calais (39%) and West-Vlaanderen (26%).

Compliance of bathing waters (%) with Mandatory and Guide values of the EU Bathing Water Quality Directive

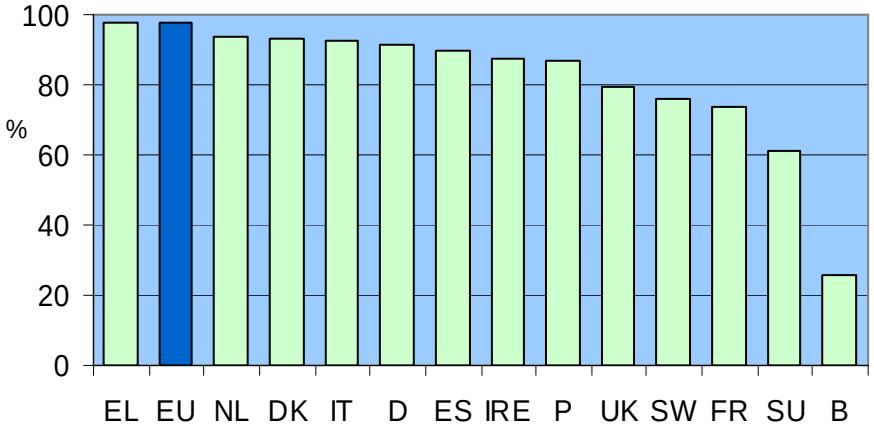


Number of sampling points for the Bathing Water Directive, per SAIL sub-region

These low compliance rates may be due to the input of waters from inferior quality (e.g. agricultural run-off, occasional sewage outfall) or by differences in monitoring methodologies. In Kent and Essex respectively 74% and 65% of the sampling sites were compliant with the Guide value in 2004. Zeeland shows the best results with all sampled sites compliant with both Mandatory and Guide values (2004).

Eight of the 13 European coastal Member States in 2004 achieved over 80% compliance with the Guide value. The long-term trend of rising compliance has been disrupted in a number of countries since 2000.

Compliance with the Guide value of the Bathing Water Directive in European coastal Member States 2004



What are the implications for planning and managing the coast?

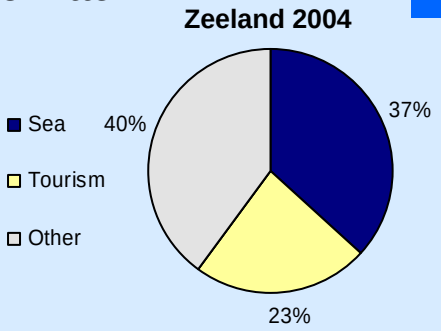
At first sight, the indicator's message to policymakers is clear: regulating the quality of bathing water through the Bathing Water Directive has led directly to an improvement in the state of the environment and reduced the impact of faecal pollution on human health and marine life. While this is true, it is not the whole story. The drive for cleaner bathing waters has been abetted by the Urban Waste Water Directive (91/271/EEC) which has led to significant investment in the upgrading and renewal of urban coastal sewage systems. Both Directives have been supported by the public, environmental NGOs and the tourist industry. The Europa bathing water website receives more than 2 million hits each year as holidaymakers check out possible destinations. Again, the Marine Conservation Society in the UK ships 5,000 copies of its *Good Beach Guide* each year and its website attracts an average of 500 enquiries a day throughout the holiday season. Fulsome public approval of the goal to eliminate faecal pollution coupled with effective regulations all pulling in the same direction have been a potent force for driving up the quality of bathing water. More of the same should be the objective of good management.

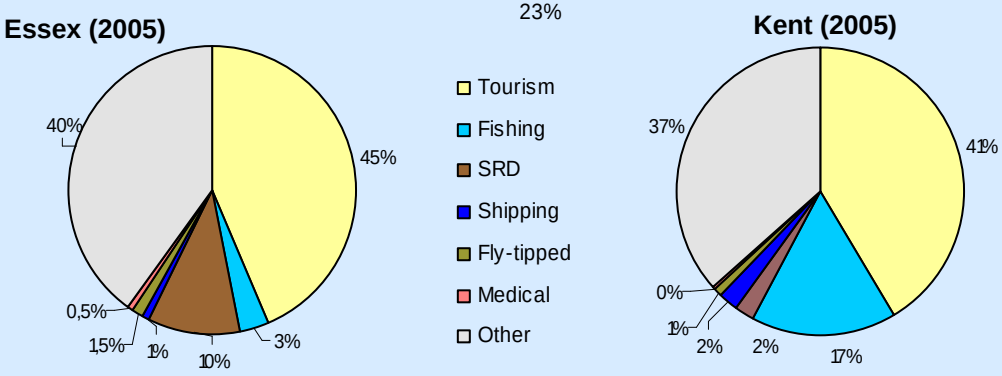
How reliable is the indicator?

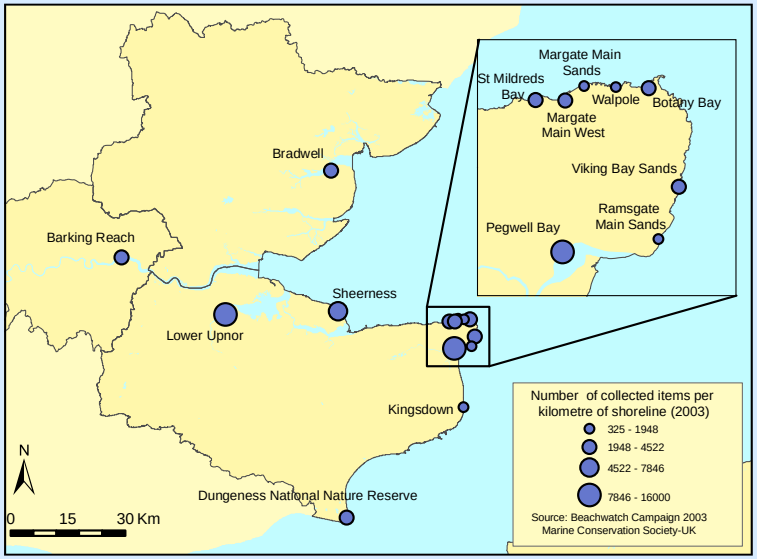
Data are produced to a common methodology across Europe, allowing comparisons to be made between and within countries and regions. There is a demonstrable trend and clear inferences can be drawn about the relationship between the regulations and the result. Caution in the interpretation is recommended where percent of compliance is based on a low number of sampling stations. A higher number of measuring sites can significantly influence the compliance rates.

Indicator 14 Amount of marine and coastal litter

Sources of beach litter

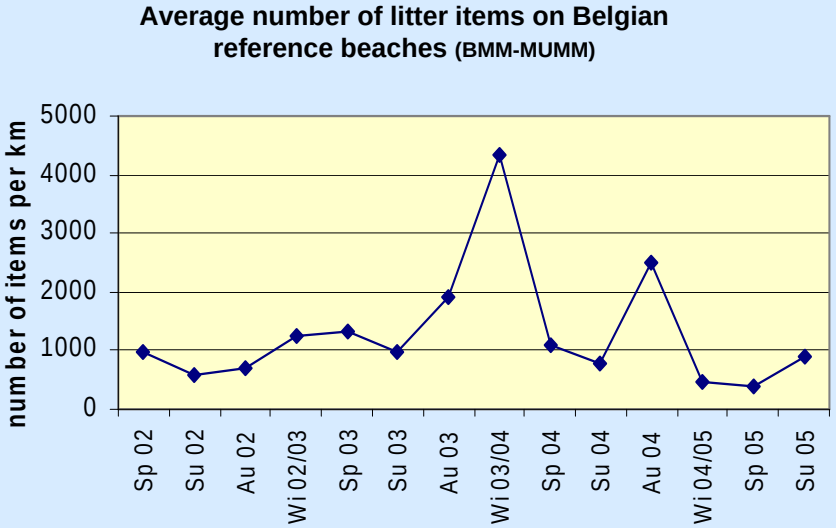


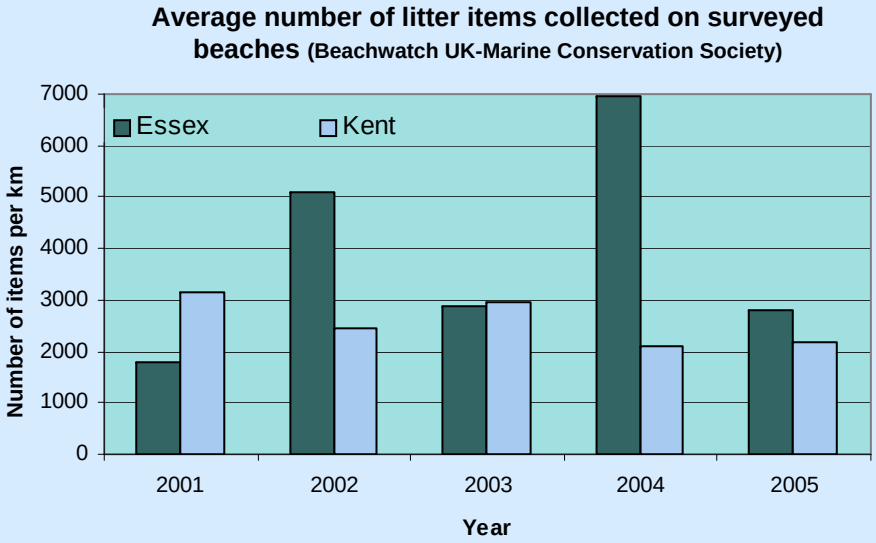




Number of litter items collected on surveyed beaches (Beachwatch UK-MCS)

Numbers of litter items found on beaches





- *Number of items of litter collected per length of shoreline*
- *Type and origin of marine litter*

Key Message

- In spite of the impact of marine and coastal debris and litter on the economy and the environment, data collecting is piecemeal and surveys are largely dependent on the goodwill and enthusiasm of volunteers and NGOs.

- On all surveyed stretches of beach in the Southern North Sea, plastic is the most frequently encountered item contributing as much as 77% of the total amount of debris collected.

Why monitor the amount of marine and coastal litter?

Marine litter causes economic and ecological damage. It is hazardous to marine life and ecosystems. Fulmars live in the open sea and pick up flotsam and jetsam from cargo and fishing activities. In The Netherlands, a survey of beachwashed Fulmars over a five year period (1999-2003) showed that 98% had plastic debris in their stomach contents. Litter poses an additional threat to bathers and beach tourists when it washes ashore. The presence of litter reduces the quality of tourism and the attractiveness of a particular area. Beach-going tourists in Belgium defined 'a clean beach' as 'a beach with no garbage' (56%), and a beach with specifically no man-made garbage like plastic, paper, glass or cans (38%). Beach cleaning requires significant investments on behalf of coastal municipalities. Sources of marine litter are mainly related to waste generated by shipping (fishing and commercial) and tourist and recreational activities. Aside from accidental release of rubbish, most of the marine and coastal litter is avoidable by simple procedures and responsible attitudes. The role of shipping and inadequacies in the ship-to-shore waste delivery procedures is addressed through the EU Directive on Port Reception facilities (Directive 2000/59/EC). Monitoring marine and coastal litter is important to evaluate the impact of and response to policies to reduce marine litter. Data on the origin and type of litter also helps coastal managers to steer awareness campaigns and target the public in the most effective way.

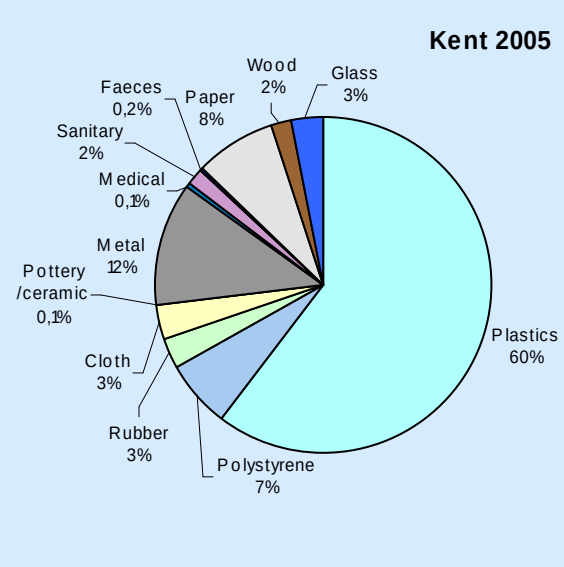
Where do the data come from?

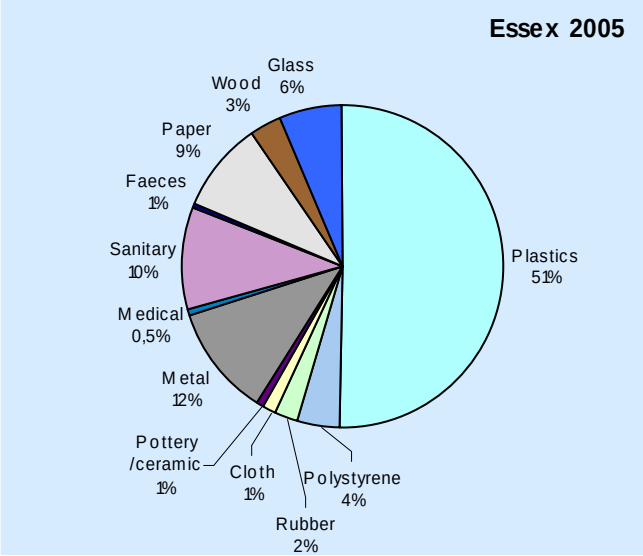
Based on the OSPAR pilot projects on beach litter surveys, the Marine Litter Network collects and provides data on the number and type of litter. These surveys are carried out on particular beaches, of which only 3 are located in the study area: one in Veere (NL) and 2 in Belgium. In some countries, a network of volunteers surveys an important proportion of the beaches annually for litter. These include beaches along the Southern North Sea.

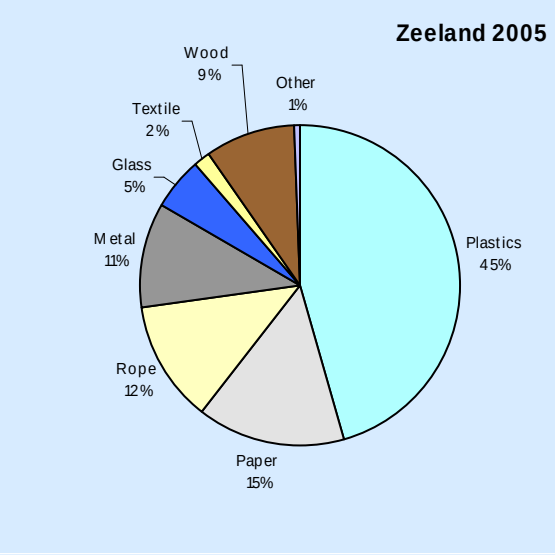
In the UK, Adopt-a-Beach (www.adoptabeach.org.uk) and Beachwatch are coastal environmental initiatives organised by the Marine Conservation Society (www.mcsuk.org), involving local individuals, groups and communities in caring for their coastal environment. Results are analysed and reported in the Beachwatch report, published every February and available from the MCS. In the Netherlands, the OSPAR Pilot Project beach surveys are financed and coordinated by the *RWS Directie Noordzee*. The *Stichting De Noordzee* performs the survey work. In Belgium, the reporting authority for the OSPAR Pilot Project (2000-2006) on Monitoring Marine Beach Litter is the Management Unit of the North Sea Mathematical Models and the Scheldt estuary (MUMM-BMM). *Ecoflandres*, a local NGO for social reinsertion in Nord-Pas de Calais, carries out manual beach cleaning on the beaches around Dunkerque and reports on the weight and volume of the litter collected.

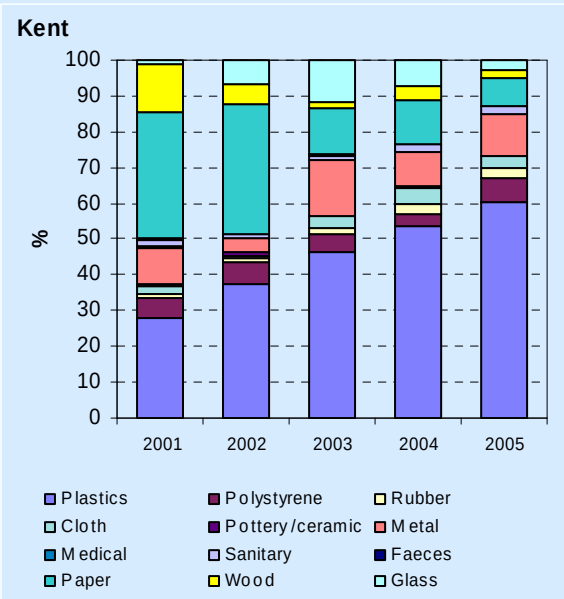
Composition of beach litter

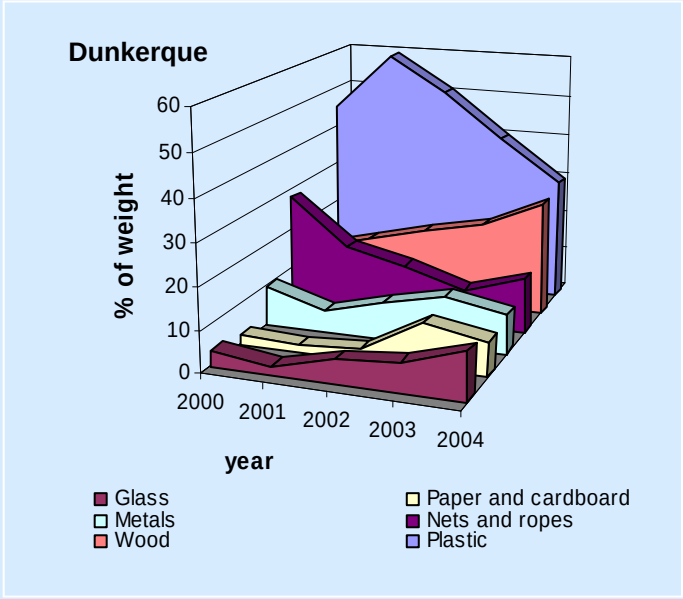
(based on number of items in UK, NL and B; based on weight in F)

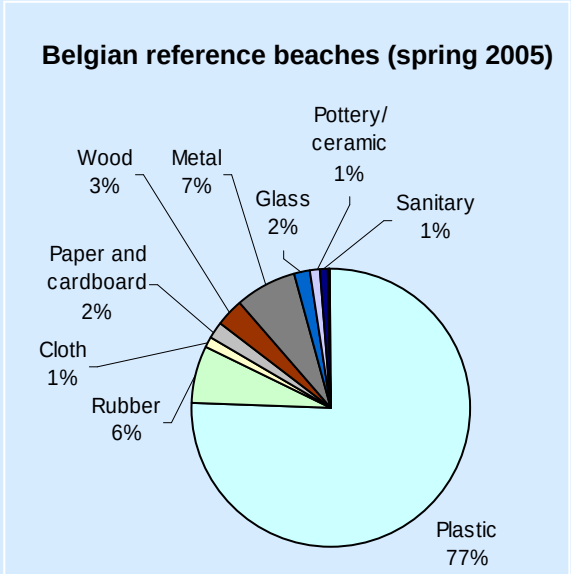












What does the indicator show?

The average number of items collected per kilometre of shoreline ranges from 1,780 to 5,098 in Essex and between 2,460 and 3,142 in Kent (data 2001-2003). Averages for Zeeland range from 97 to 230 (autumn surveys 2000-2002). During OSPAR surveys on Belgian beaches between 2002 and 2005, averages fluctuate around 1,000 items collected per km, with a peak value of 4,340 in 2004.

Plastic is most commonly found everywhere. In Zeeland it accounts for 53% of the items collected by volunteers in 2002, followed by rope (15%) and paper (12%). The Beachwatch 2003 data from the UK confirms this. Plastics are also recorded as the most frequent litter on Belgian beaches (77% of the items). From the manual cleaning of the beaches around Dunkerque (2000-2004), plastic makes up the most important weight component in yearly averages (between 59% and 30%), in spite of its smaller relative weight.

Data on the origin of the litter cannot be compared between regions, since different categories are employed. However, in Zeeland 18% of the debris is recorded as 'tourism-related', while in Kent and Essex tourism is associated with as much as 56% of the total. Hence, it is difficult to draw conclusions regarding the origin of litter that affects cleanliness of a particular beach. Long-term monitoring is necessary in order to detect trends. However, differences in the composition of marine litter can be detected from one region to another. These variations reflect presence of sources of marine litter from activities generating solid wastes that end up as marine litter. Environmental conditions such as currents and tides also affect the results of monitoring.

What are the implications for planning and managing the coast?

In the early 1970s, the amount of litter discharged to the oceans and seas was estimated at 6.4 million tonnes per year. Plastics have now become the most frequent man-made items encountered at sea and on all beaches in the world. This requires enormous financial and logistical efforts in mechanical beach-cleaning on behalf of coastal municipalities and generates undesirable ecological side-effects. Beachcleaners can have negative impacts on relevant ecological processes such as embryonic dune formation.

In 1991, the North Sea was declared a 'Special Area' under Annex V of MARPOL Convention (1988). This 'garbage annex' includes a total prohibition of disposal of plastics in marine and coastal waters designated as 'Special areas'. The European Union has formulated the Directive on Port Reception Facilities (2000/59/EC) to stimulate and enforce proper disposal of ship waste in harbours. The impact of this Directive, implemented in 2002, will probably become visible on a mid-and long-term.

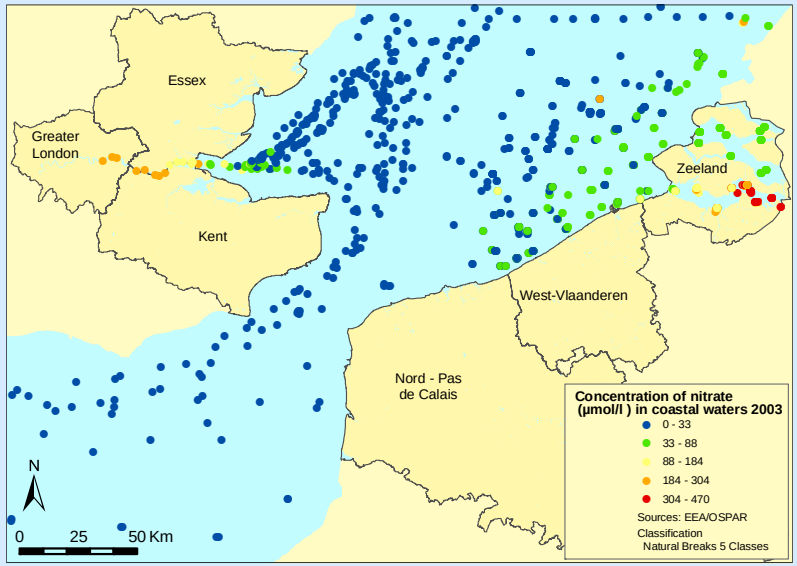
In 2003, the Environmental Ministers of the Contracting Parties to the OSPAR Convention, agreed to do their "utmost to take measures to eliminate the problem of marine litter",

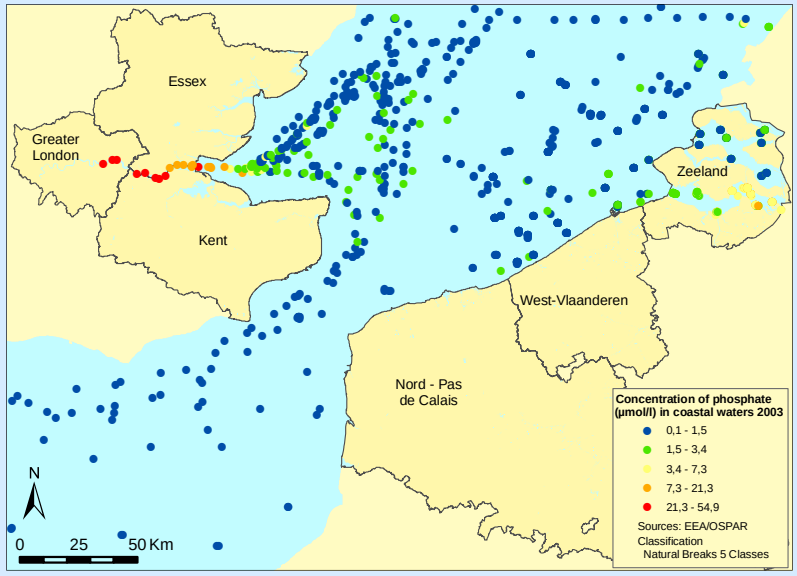
The OSPAR Commission is developing various Ecological Quality Objectives for the North Sea. The OSPAR Pilot Project on Marine Beach Litter (2000-2006) is providing the basis to continue marine litter monitoring as part of the monitoring of the state of the environment in the North Sea. As a result of its discussions, the Steering Group has agreed on the strategic goal to reach levels of close to zero of man-made litter in the marine environment by 2015.

How reliable is the indicator?

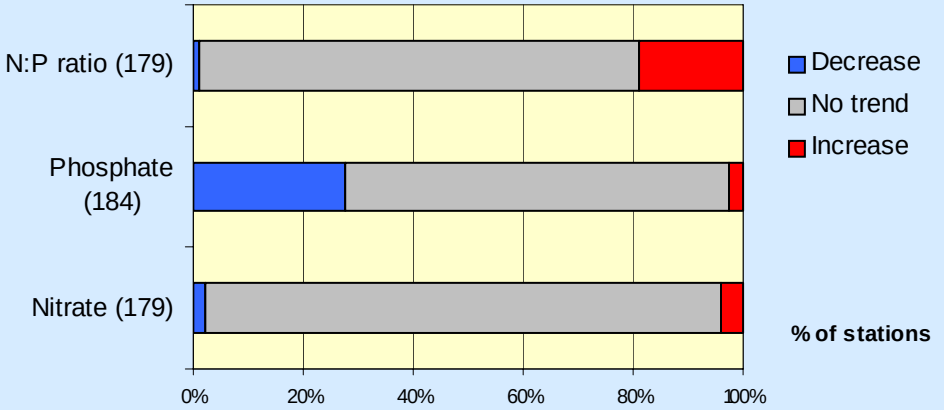
It is difficult to draw conclusions regarding trends in numbers and composition of marine and coastal litter in the absence of long-term datasets. Surveys and monitoring only represent a momentary picture of a highly dynamic situation. The impact of environmental conditions in the days previous to the surveys and monitoring may alter the results of a survey in a particular year. The proximity of disturbing elements (sewage works, poorly managed marinas, ports and tourist facilities) also add to this variability. Further work is needed to attune the categories of litter and origins among countries and data collecting programs. Finally, the number of items collected on surveyed beaches is weather-related and effort-related, and hence observer-dependent.

Indicator 15 Concentration of nutrients in coastal waters

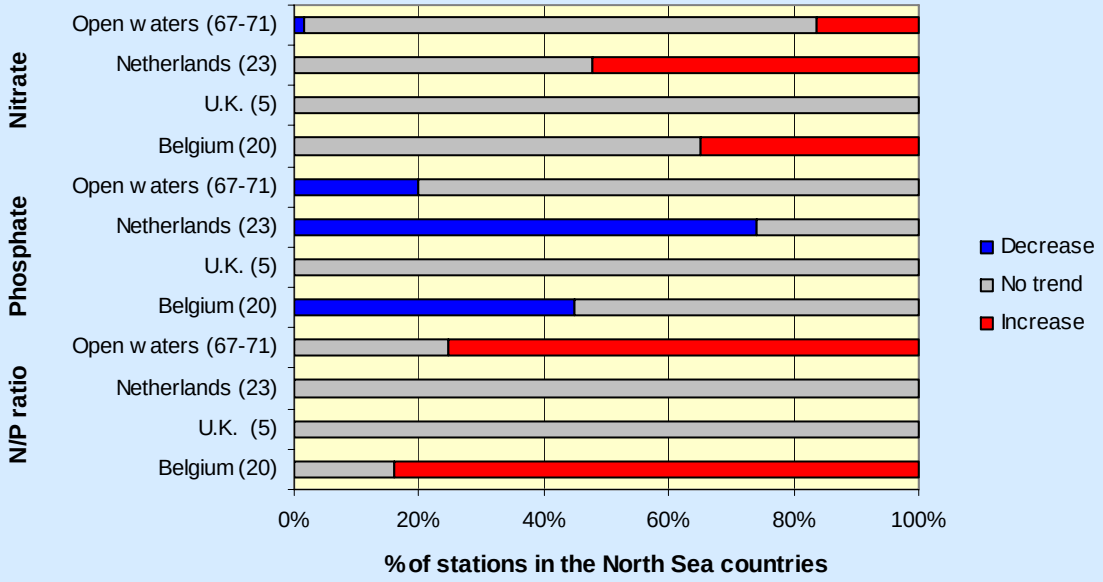




Overall trends in nitrate, phosphate and N:P ratios in the North Sea (1981-2002, EEA)



Trends in nutrient concentrations in open and coastal waters of the SAIL countries (1981-2002)



- *Mean winter surface concentrations of nitrate*
- *Mean winter surface concentrations of phosphate*

Key Message

- No clear trends are observed in the winter surface concentrations of nitrate in the Southern North Sea: in 4% of the stations nitrate concentrations have increased since the 1980s; in only 2% have they decreased. While more than 80% of the stations in the UK were achieving good status during the first half of last decade, this situation has been reversed over the last few years.
- In the Southern North Sea, major reductions in phosphate concentrations are found in Dutch and Belgian coastal waters. Nearly 30% of the stations in the North Sea have reduced phosphate concentrations. This improvement is probably due to increased efforts to reduce riverine loads of phosphate.

Why monitor the concentration of nutrients in coastal waters?

Nitrogen (N) and phosphorus (P) enrichment can cause a series of undesirable effects induced by excessive growth of plankton algae. Algal blooms increase the amount of organic matter that settles to the bottom. The consequent increase in oxygen consumption can lead to oxygen depletion, changes in community structure and death of the benthic fauna, reduced biodiversity and less nurseries for fish.

Eutrophication also increases the risk of harmful algal blooms that may cause discoloration of the water, foam formation, death of benthic fauna, and even shellfish poisoning of humans and birds.

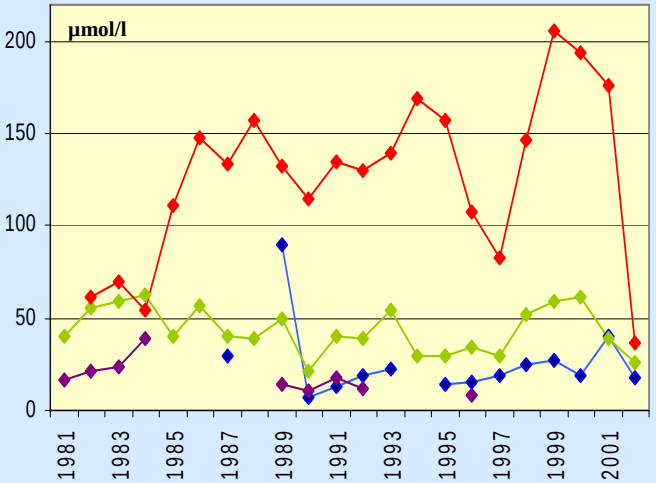
There is a direct relationship between the input of nutrient loads to coastal waters from diffuse and point sources and the concentration of nutrients in coastal waters. Comparing measured nutrient concentrations in coastal waters to the open sea background levels indicates the degree of human-induced nutrient enrichment or eutrophication. In winter, biological uptake and turnover is at its lowest, resulting in the highest inorganic nutrient concentrations. Hence, average winter concentrations are monitored as they are considered to better reflect the problem of eutrofication. The ratio of N/P determines the composition of phytoplankton in coastal waters and is in part responsible for algal blooms.

Where do the data come from?

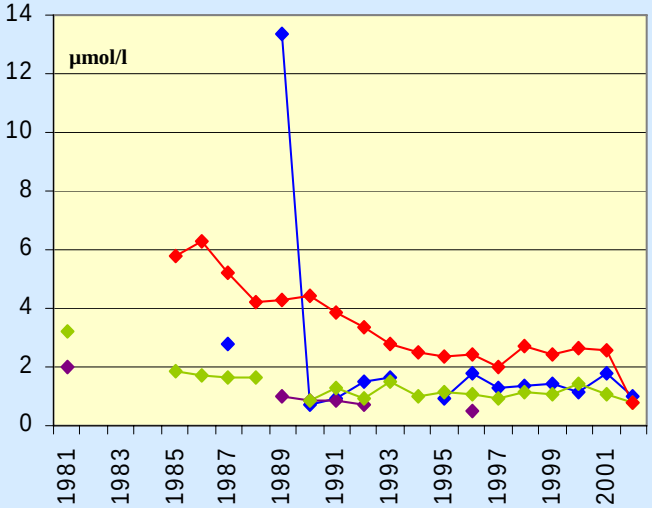
Individual Member States in the Greater North Sea report their monitoring results to OSPAR (the Oslo Paris Commission Secretariat) in the context of the Strategy to Combat Eutrophication. A Common Procedure was adopted in 1997, by which the Contracting Parties assess the eutrophication status of their maritime area. National reports on the first complete application of the Common Procedure were completed in 2002. The International Council for the Exploration of the Sea (ICES) performs monitoring activities in 'open waters' stations. Coastal stations are defined as those located less than 20 kilometres from the coast. The European Topic Centre Water (ETC-Water) compiles and analyzes the data at national and regional sea level.

Run-off from agricultural use accounts for much of the nutrient enrichment of the North Sea

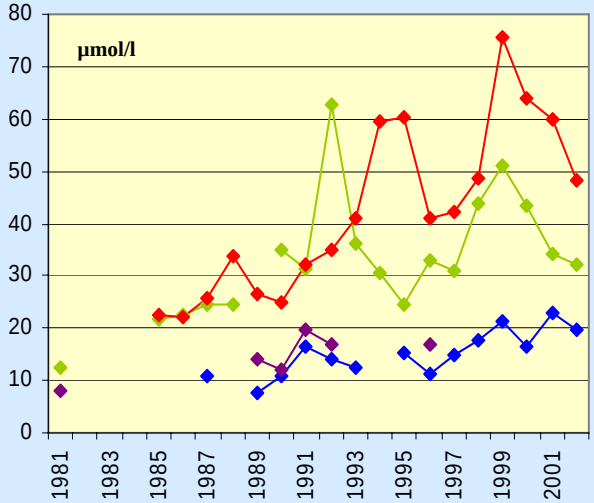
Nitrate concentrations



Phosphate concentrations

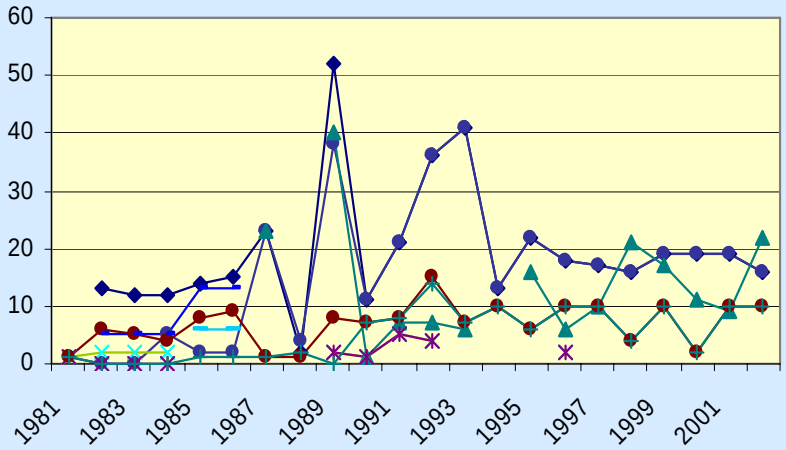


N/P ratio

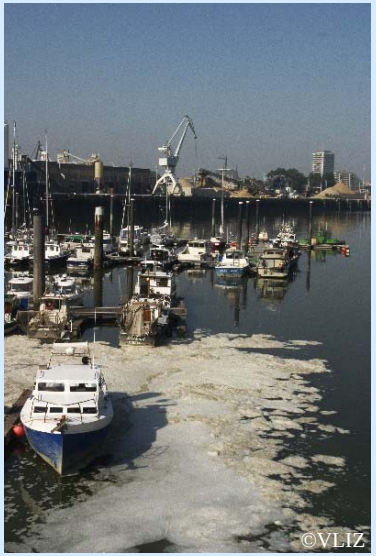


Kent-Essex-Thames — Nord-Pas de Calais — West-Vlaanderen — Zeeland

Number of nutrient sampling stations in the SAIL region (1981-2002)



North Sea - Open Waters Nitrate
North Sea - Open Waters Phosphate
Essex-Kent-Thames (N & P)
Nord-Pas de Calais (N)
Nord-Pas de Calais (P)
Belgium (N)
Belgium (P)
Zeeland (N)
Zeeland (P)



Foam formation resulting from algal blooms

What does the indicator show?

Available time series (1982-2002) indicate no clear trend in winter surface concentrations of nitrate. The variability observed is due to the link between nitrogen loads and highly variable runoff from rivers. Although an improvement in Belgian waters took place in the '90s, and an overall decrease is observed in the Dutch Delta between 1985 (170µmol/l) and 2002 (37µmol/l) nutrient concentrations in Belgian waters and the Dutch Delta area still have 'elevated assessment levels'(>18-30µmol/l). The Westerschelde estuary (between Belgium and The Netherlands) estuary is classified as a 'problem area', both in terms of nutrient enrichment as because of direct and indirect effects of eutrophication. In the UK, average nitrate concentrations have fluctuated around the background value since the early 1990s. While more than 80% of the stations in the UK were achieving good status during the first half the of last decade, this situation has been reversed over the last few years. In 7 out of 179 stations in the North Sea, nitrate concentrations have increased over the study period (1982-2002 EEA).

In the North Sea, nearly 30% of the stations have seen a reduction in phosphate concentrations while an increase has been observed at only five stations. Important reductions in phosphate concentrations are found in the Dutch and Belgian coastal zone. This improvement is probably due to increased efforts to reduce riverine phosphate loads.

As a consequence of the decrease in phosphate and the slight increase in nitrate concentrations, the N/P ratio has increased in 19% of the sampling stations. The N/P ratio, also known as the Redfield ratio, should be as close to 16 as possible to achieve balanced phytoplankton communities.

Most nitrate is generated by leaching from agricultural soils and carried to coastal waters by rivers, mainly during winter/spring. Most phosphate is discharged from sewages and industrial wastewater all year round. The optimal nitrogen to phosphorus ratio is 16:1. Significant deviations from the ratio 16 might indicate nitrogen-limitation or phosphorus-limitation in phytoplankton growth.

What are the implications for planning and managing the coast?

Nutrient enrichment is a widespread problem in European coastal waters. Political targets to reduce eutrophication have focused on load reductions. The EU Nitrate Directive and Urban Wastewater Treatment Directive aim at reducing nitrate loads to eutrophication sensitive areas, mostly from agriculture (leaching soil) and sewage works.

Member countries of the North Sea Ministerial Conference have agreed to 50% reduction of the nutrient load (based on mid-1980 levels) to areas affected by eutrophication.

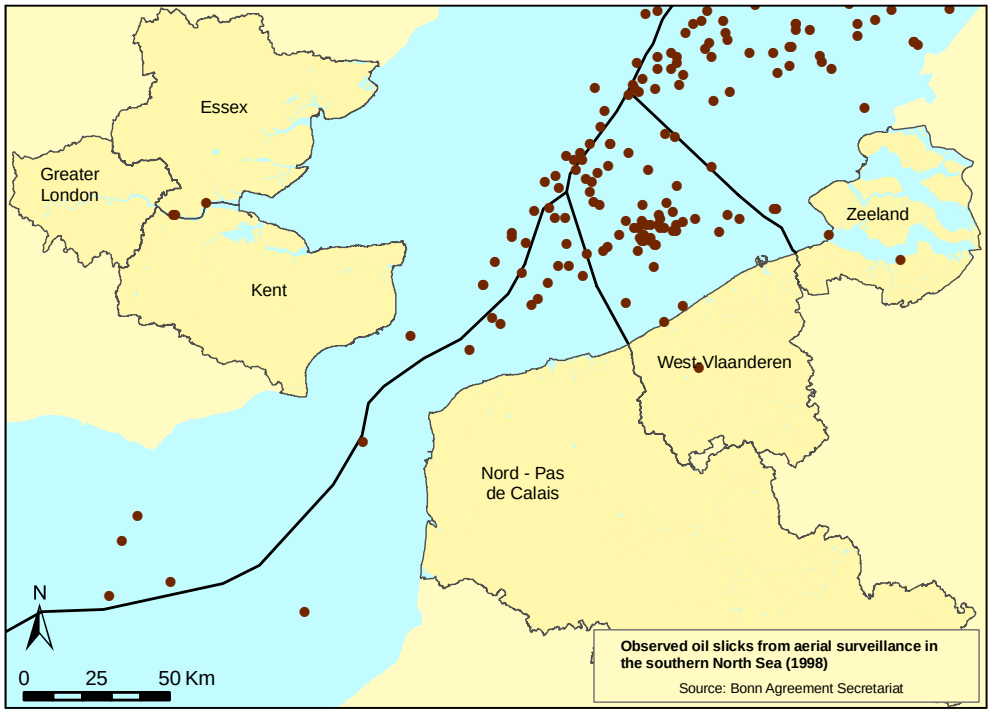
Current knowledge confirms that the colony blooming of phytoplankton species (*Phaeocystis* sp.) cause eutrophication-related problems in the eastern Southern Bight of the North Sea. The blooming has adverse impacts on biological resources, the fishing industry and tourism (through water quality and impact of algal blooms). Colony blooms can be observed as deposits of foam on the beaches or as clogging of fishing nets.

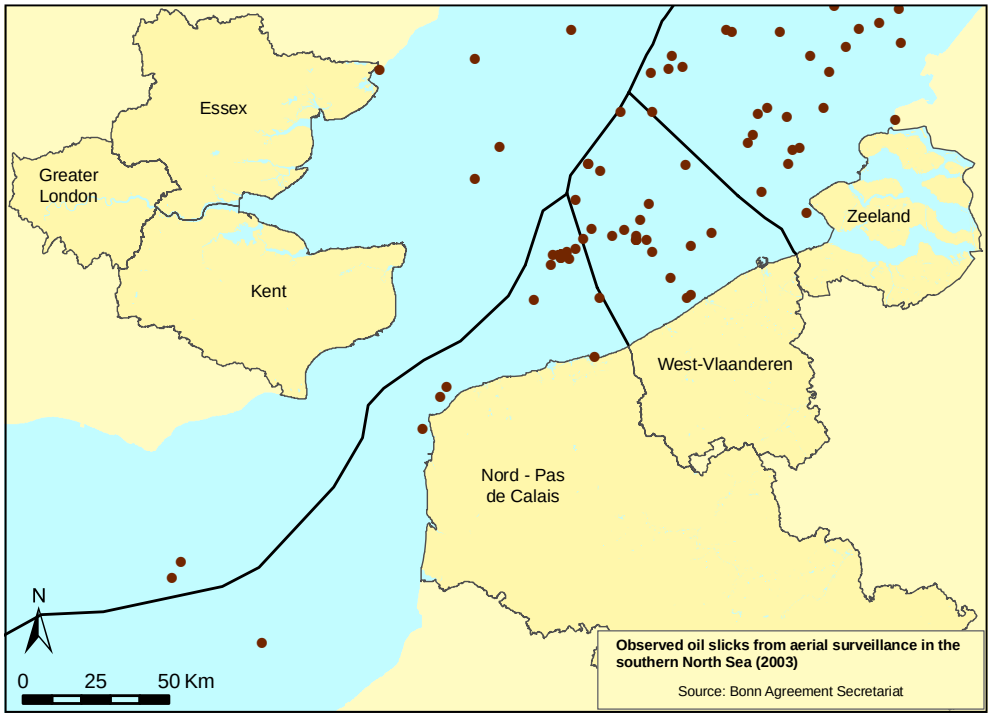
The EU Water Framework Directive (RL 2000/60/EG) also requires Member states to achieve coastal waters of 'good ecological quality' by 2015 and 'good chemical status' by 2015. Target concentrations have been set for nutrients in the different regional seas.

How reliable is the indicator?

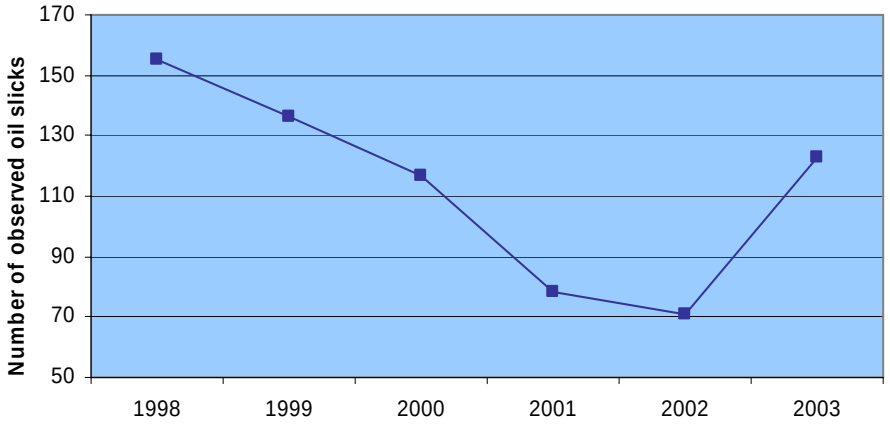
Large spatial and temporal variations are inherent to the datasets used to calculate this indicator at the European level. Datasets and the trend analyses for the North Sea area, however, are considered consistent. It is necessary to obtain longer time series in a larger number of permanent measuring stations to calculate trends for the Southern North Sea. A second field of improvement concerns the methodology for comparing data over different years. More work is needed regarding the influence of varying salinity levels on the measurements and estimations of uncertainty in the data and trends.

Indicator 16 Amount of oil pollution

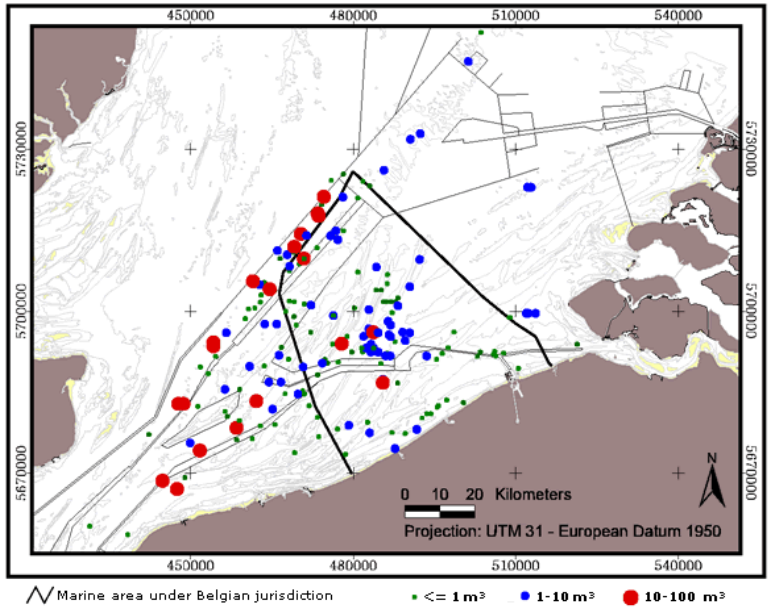




Number of observed oil slicks from aerial surveillance in the Southern North Sea (Bonn Agreement 1998-2003)



Location and extent of oil spills from operational oil pollution in the area under Belgian jurisdiction, 1998-2003 (MUMM-BMM)



- *Number of observed oil slicks from aerial surveillance*
- *Percentage of oiled guillemots*

Amount of oil pollution

Key Message

- The number of oil slicks in the Southern North Sea has decreased since 1998. Yet despite increased efficiency in control and improved port reception facilities for oily wastes from ships, chronic oil pollution remains a threat to marine and coastal ecosystems.
- The proportion of oiled sea birds in the Southern North Sea is decreasing, confirming the trend observed in the aerial surveillance of marine pollution. Still, the target for oil pollution impact on seabirds is far from being reached.

Why monitor the amount of oil pollution?

Every day an average of 250 ships pass through the Channel area along one of the most intensely navigated shipping routes in the world, towards large ports like London, Rotterdam and Antwerp. This intense navigation in the Southern North Sea increases the risk of accidental and operational - also termed chronic - oil pollution.

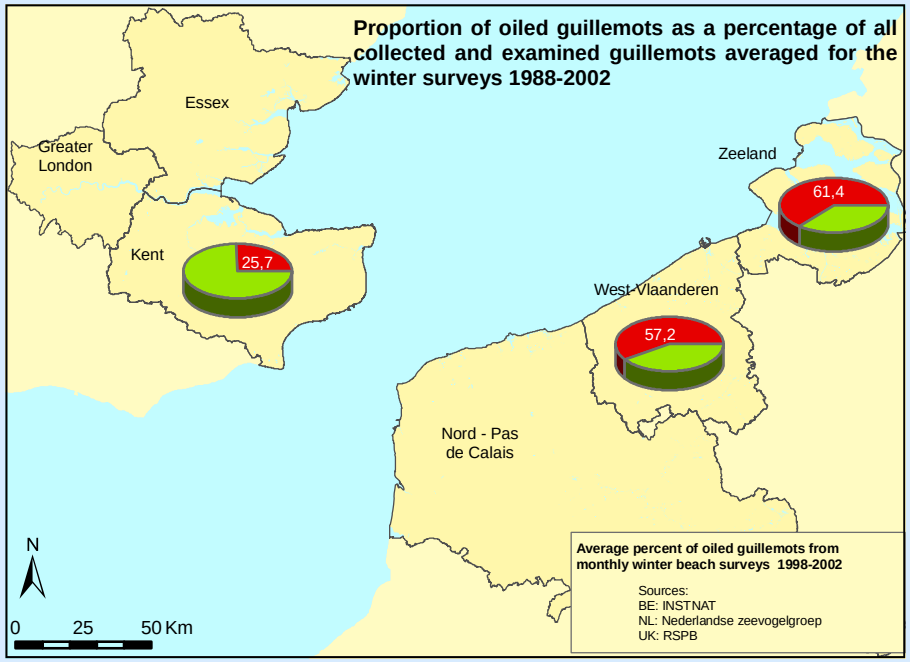
The North Sea has been declared a Special Area under MARPOL Convention Annex I. This means in practice that since August 1999, oil discharges in the North Sea are prohibited and all ships must deliver oily wastes to reception facilities on land. However, illegal discharges from ships, jeopardizing life at sea and in the coastal zone, still occur. Therefore, the eight countries bordering the North Sea cooperate within the Bonn Agreement to detect and prevent marine pollution. Various countries have implemented domestic laws that oblige the polluter to pay, in case of oil spills and oil disasters. This legislation also enters into effect in case of damage to internationally important areas for birds (Ramsar, Habitat Directive) in the North Sea.

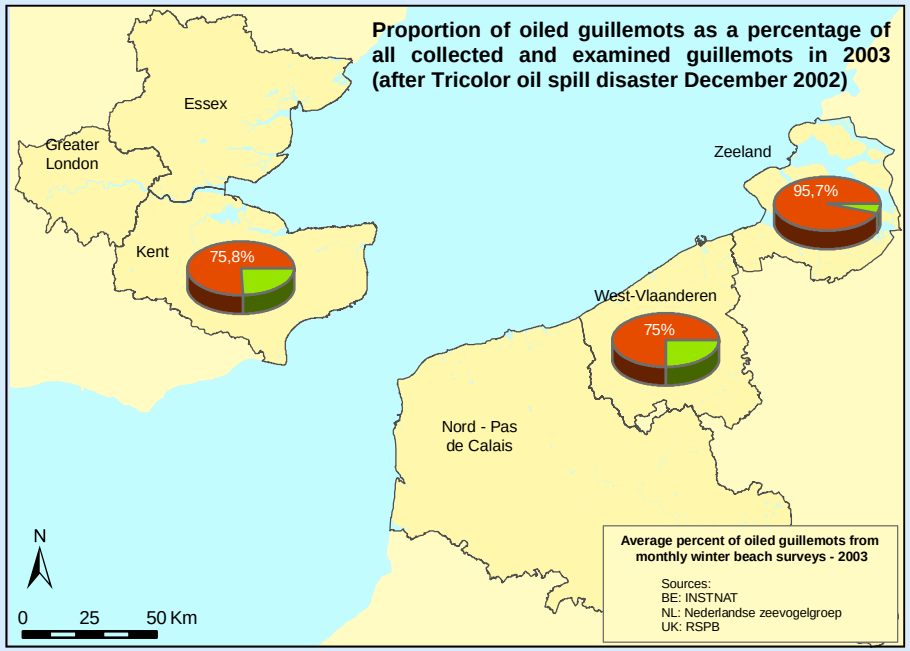
Apart from the aerial surveillance, long-term field research shows that the oil rates of stranded birds (guillemots) provides a good indication of the chronic oil pollution at sea. Data from the monitoring programs on stranded and oiled

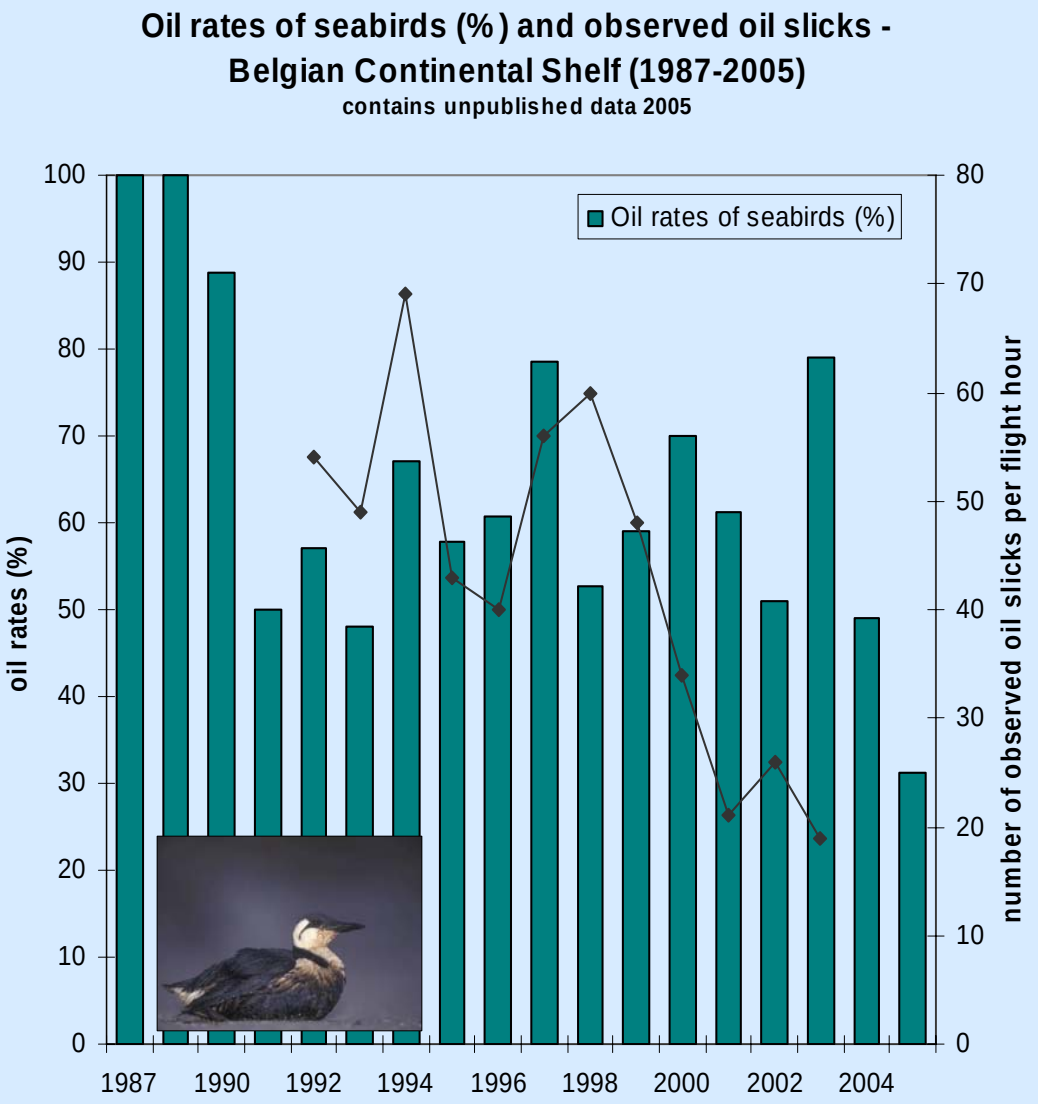
birds have shown that even small oil spills can have a negative impact on local concentrations of seabirds, in particular during migration. The indicator has been selected by the OSPAR Biodiversity Committee to develop an Ecological Quality Objective (EQO) for the North Sea.

Where do the data come from?

The Bonn Agreement Secretariat reports yearly results of aerial surveillance in - and cooperation among - North Sea countries to detect marine pollution. Data are provided by the national authorities responsible for the surveillance programs: the Maritime and Coastguard Agency - MCA (UK), the Management Unit of the North Sea Mathematical Models - BMM (Belgium), the Netherlands Coast Guard Centre (KUWA) and Rijkswaterstaat – North Sea Directorate of the Ministry of Transport, Public works and Water Management (The Netherlands), and the Customs Coast Guard (France). The percentage of oiled guillemots recorded from monitoring dead birds on beach surveys is reported yearly.







Note: Oil rate of seabirds refers to the proportion of oiled guillemots as a percentage of all collected and examined guillemots

Numerous volunteers gather field data through the Royal Society for the Protection of Birds (RSPB-UK), the Dutch Group on Seabirds (Nederlandse Zeevogelgroep) in The Netherlands, and the Institute for Nature and Forestry Research (INBO) in Belgium.

What does the indicator show?

The number of observed oil slicks from aerial surveillance indicates that oil pollution has decreased gradually since 1998, with exception of the events observed in 2003.

A concentration of oil slicks is detected along the axis of the navigation route. Data from the national Belgian monitoring program demonstrate that the largest oils slicks (in m^3) are also concentrated along this route. The negative trend in the number of observed oil slicks may be due to a number of factors. The presence of the aircraft has a deterrent effect but the improved services and facilities in harbours, and the technical developments in the shipping industry, undoubtedly contribute their share. Finally, detection methods have been improved to harness the increasingly strict legislation in support of national efforts to combat oil pollution.

Monthly surveys are carried out during winter months and the number of oiled birds (Common guillemot, *Uria aalge*) from the total number of stranded sea birds is recorded. These 'oil rates' are gradually decreasing in The Netherlands and Belgium since recording first started. In the South East of England, field records since 1980 also suggest that oil rates are in decline. Oil rates are higher during 2003, probably due to residual oil contamination from the Tricolor disaster in December 2002.

Monitoring of stranded seabirds along the North Sea shores started in the 1960s and it has proven a simple and economical method to obtain complementary data on the effect of oil pollution on marine species.

What are the implications for planning and managing the coast?

Various international agreements and domestic laws are in place related to oil pollution. An important proportion has come into force as a consequence of major oil disasters in the past. Aerial surveillance for the detection and control of pollution at sea is an obligation for the countries bordering the North Sea, under the Bonn Agreement. Also, joint international exercises take place during the year. MARPOL is the International Convention for the Prevention of Pollution of the Sea by Oil (London, 1973). It is the most important convention for international cooperation in combating accidental and operational pollution. This cooperation has also led to the appointment of specialized Courts in the North Sea countries, where expertise and coordination capacities are centralized for this area.

Other regulations apply to specific safety measures e.g. the prohibition for mono-hulls transporting diesel to enter European ports (European agency for maritime safety). At EU level, a Directive is being prepared to regulate pollution by ships and the corresponding sanctions that can be applied.

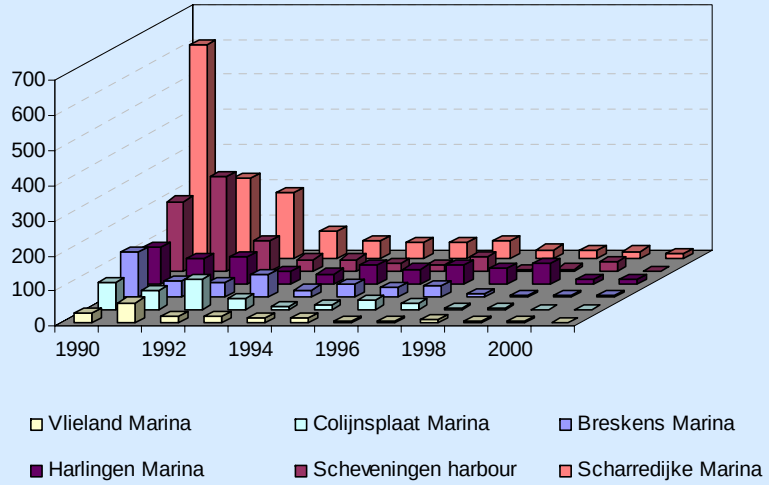
In the case of major oil spills such as the Tricolor (December 2002), concerted action on behalf of coastal authorities is crucial for the mitigation of impact on marine species and habitat.

How reliable is the indicator?

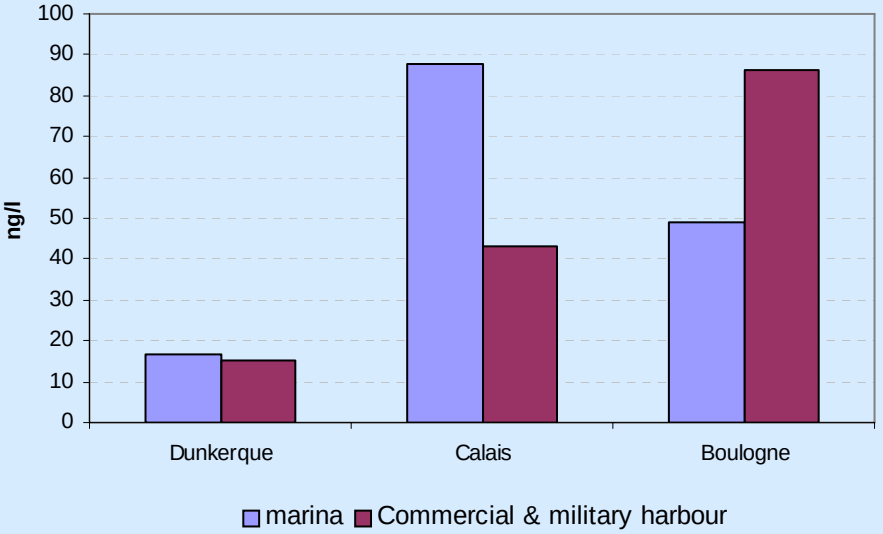
Data gathered as part of the obligations under the Bonn Agreement is collected through reliable surveillance programs with internationally calibrated methodologies and standardized "Bonn flight hours". The number of stranded seabirds collected is effort related. The number of stranded birds may further depend on the wind direction and currents, and other factors that are currently under study (climate change, health of the population) . However, it has been proved that the oil rates are not significantly influenced by the total number of collected birds.

Indicator 17 Pollution by hazardous substances

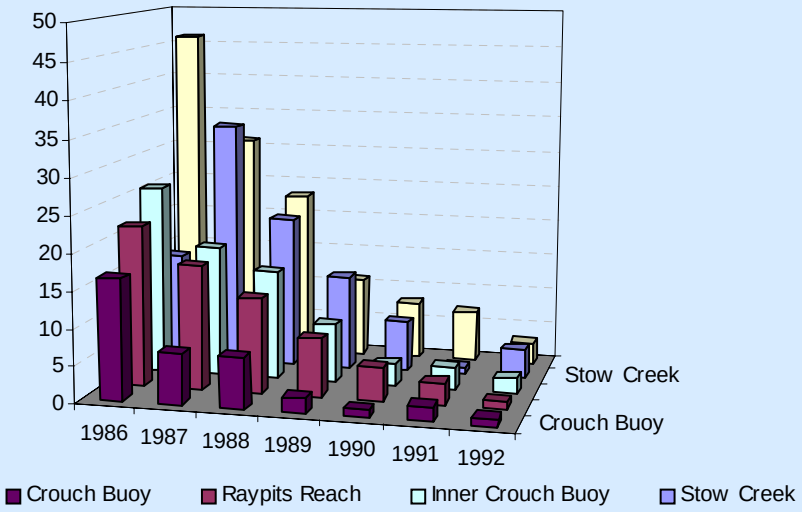
Concentration of Tributyltin TBT (ng/litre) in water, marinas and harbours Zeeland, 1990-2001 (RIKZ 2003)



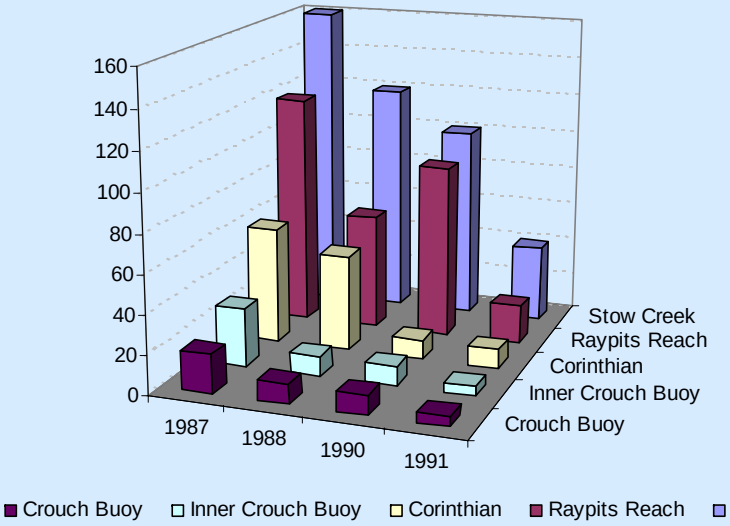
Concentration of Tributyltin (ng/litre) in water - Nord-Pas de Calais 1997 (Michel and Averty 1999)



Concentration of Tributyltin in water (ng/litre) in the Crouch Estuary Essex, 1986-1992 (Waldock et al. 1999)



Concentration of Tributyltin in sediments (µg/kg) in the River Crouch, Essex, 1987-1991 (Waldock et al. 1999)



- *Concentration of Tributyltin in sediments, water column and biota*
- *Concentrations of Polycyclic Aromatic Hydrocarbons (PAHs)*

Pollution by hazardous substances

Key Message

- High levels of TBT concentrations in marinas and ports have declined considerably since historic peaks in the mid 1980s, after a total ban on the use of TBT paints came into effect in 2003.
- Imposex, a biological effect of TBT, is at least partly responsible for the local decimation of populations of marine gastropods (especially dogwhelks) in the Southern North Sea.
- Concentrations of PAHs are highest in estuaries and coastal waters. Common monitoring programs implemented recently will allow for a larger scale evaluation and provide insights into recovery of pollutant-damaged environments.

Why monitor the pollution of hazardous substances?

Paints containing Tributyltin (TBT) have been widely used on boats as an effective and economical method of antifouling since the late 1960s. TBT is most commonly associated with imposex in marine gastropods, whereby female organisms develop male sexual organs, resulting in a decline and final collapse of local populations. In the Bay of Arcachon in France, a clear link between the failure of oyster culture and the input of TBT from leisure craft provided the basis for immediate action on behalf of the French government. Due to the severe and widespread character of the problem, the International Maritime Organisation (IMO) adopted the International Convention on the Control of Harmful Anti-fouling Systems to phase out the application of TBT paints in 2003 and to remove their presence on ships' hulls by 2008. Organotin compounds are on the OSPAR list of priority compounds that require action. Long-term monitoring of TBT-affected areas will provide insights into recovery of pollutant-damaged environments.

Polycyclic aromatic hydrocarbons are ubiquitous environmental contaminants. Their predominant sources are anthropogenic emissions, including petroleum and its products. PAHs reach the marine environment via sewage discharges, surface run-off, industrial discharges, oil spillages and deposition from the atmosphere. PAHs can be acutely toxic to aquatic organisms. Elevated concentrations may present a risk to humans who eat fish and shellfish.

Where do the data come from?

TBT and the effects of organotin compounds are part of the Coordinated Environmental Monitoring Programme CEMP (OSPAR) since 2003. Participating countries are obliged to measure chemical concentrations of TBT in sediments. They must also implement monitoring of the biological effects (imposex) which will increase the availability of comparable time series. Through an extensive literature search for data previous to 2003, the most relevant time series were selected to present the situation in each of the SAIL sub-regions. In the UK, PAHs have been monitored through a network of coastal monitoring stations from the National Monitoring Plan (NMP) since the 1980s. PAHs and TBT are monitored by RWS/RIKZ in The Netherlands, and by BMM-MUMM (sediments and water) and the Department of Sea Fisheries-ILVO (biota) in Belgium. IFREMER is the responsible authority for monitoring aspects of water quality - including PAHs and TBT - in France.

What does the indicator show?

TBT

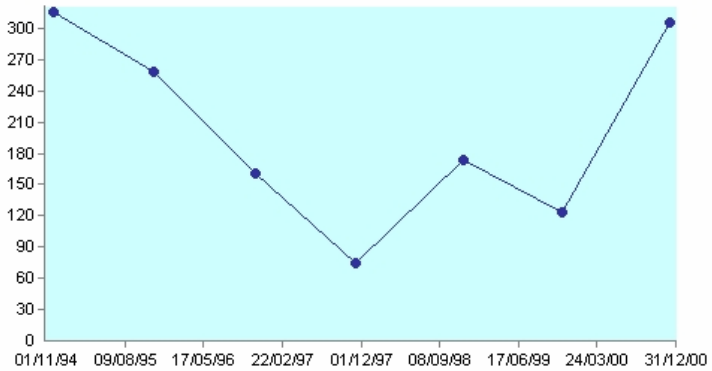
The earliest time series on the presence of TBT in the marine environment are available from the UK, where its use has been banned on small boats since 1987. Highest initial concentrations were found at inner estuary stations in the vicinity of moored yachts, and associated with increased boating activity in spring and summer. Significant decrease in the concentrations of TBT in sediments and water were observed in the Crouch Estuary from 1986 to 1992. Concentrations in sediments at e.g. Stow Creek decreased from 160µg/kg in 1987 to 20µg/kg dry weight in 1991. In 1997 TBT concentrations at these sites were below detection levels. A similar trend was observed in the concentration of TBT in the water column of the Crouch Estuary from 1986 to 1992.

In a study of TBT levels in the water column at marinas and commercial ports in Nord-Pas de Calais, the highest concentration measured in 1997 was 88ng/litre in the Calais marina.

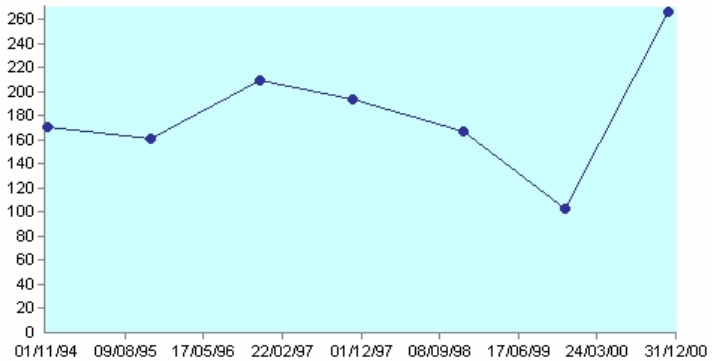
A comparison with TBT levels in French waters in the 1980s show that those of Dutch tidal marinas were at least 6-fold higher, especially for those marinas having a poor water exchange.

PAH concentration in mussels (µg/kg dry weight) 1994-2000 Nord-Pas de Calais (IFREMER)

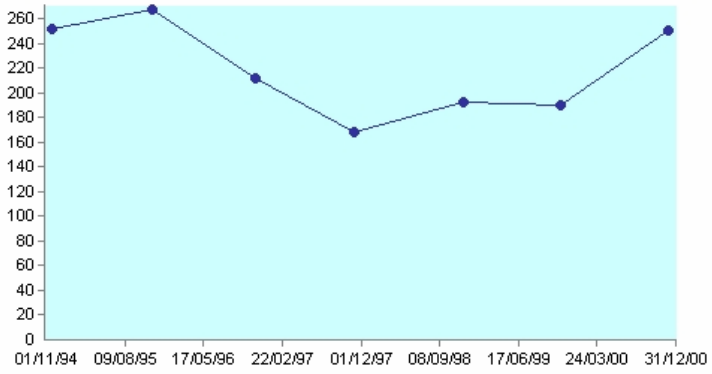
Berck



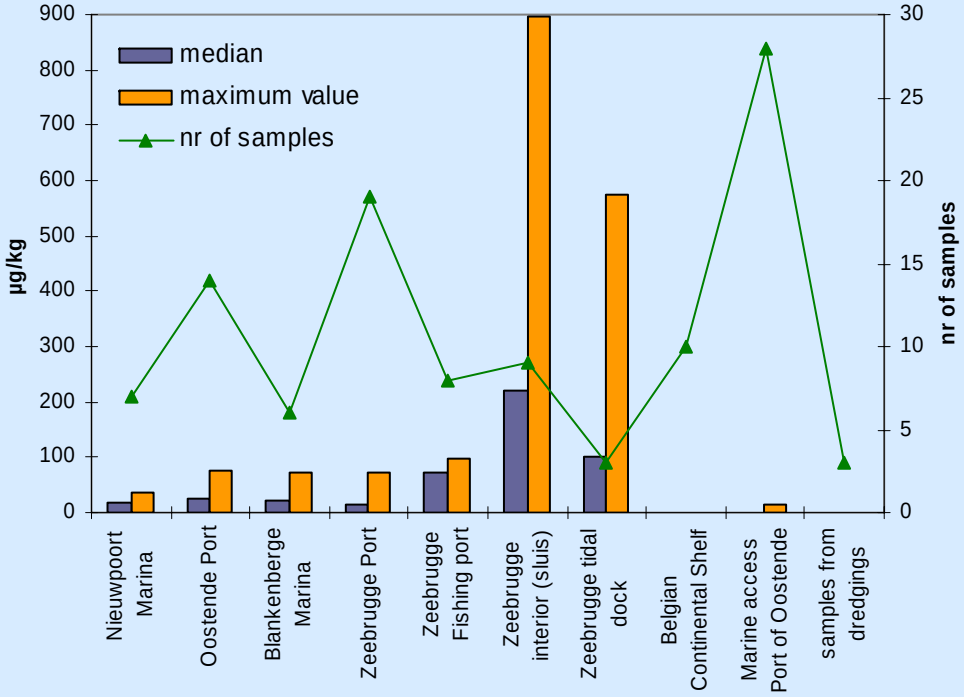
Ambleteuse



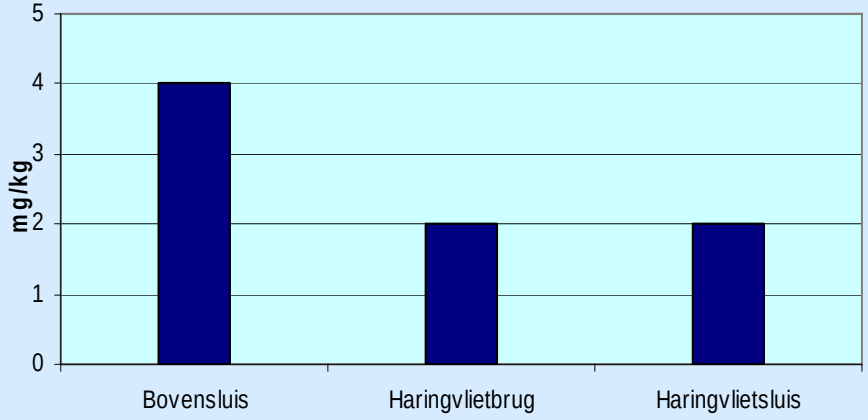
Dunkerque (Oye-Plage)



Concentration of TBT in sediments (µg/kg) dry weight, Belgian Coast (Vyncke and Devolder, 1997)



Concentration of PAHs (sum) in sediments (mg/kg dry weight) in the Delta area, The Netherlands (RIKZ, 1989)



TBT concentrations in water have declined considerably since then - for some marinas from near to 700ng/litre in 1989 to concentrations that are close to detection levels in 2001 (3ng/litre). Even then they may still remain above the Maximal Allowable Level of 1ng/litre.

Maximum concentrations of TBT are found in sediments of intensely navigated areas such as the port of Zeebrugge (895µg/kg dry weight, median 222µg/kg), but median values in sites along the remainder of the coastal marinas and ports are below 100µg/kg d.w. (1997).

In combination with other factors such as damage by fisheries, these high concentrations of TBT are the probable cause of the decline of gastropod populations and the disappearance of dogwhelks along the Belgian coast.

PAHs

Fluoranthene is part of the most toxic fraction of crude oils and is less biodegradable than other PAHs. It is considered representative of chronic contamination by PAHs. Trends in Fluoranthene concentrations (mussels) in Dunkerque (Oye Plage), Boulogne (Ambleteuse) and Berck decreased since the second half of the 1990s but have increased again since 2000. Median values in the three stations are far above the median for the combined sampling at the national level (14µg/kg dry weight in mussels).

Analysis from 45 of the 60 NMP sites around England and Wales indicate total PAH ranging from none detected to 8.5µg/l. The highest concentration of total PAHs in seawater occurs in major estuaries such as the Thames, while PAH concentrations at offshore sites are generally low or undetectable. Total PAH concentrations between 1,000 and 10,000µg/kg were found in sediments at sites in the River Thames.

Coverage of PAH is not exhaustive, and as is the case for evaluation of TBT concentrations and imposex, further developments are ongoing to improve comparability of techniques and methodologies.

What are the implications for planning and managing the coast?

The relation between intensity of navigation and concentration of TBT in biota and sediments has been clearly documented. Since its first description in 1971, imposex has been documented for 150 species of marine snails worldwide. Evidence suggests that there may be effects on the reproduction cycle and immune system of higher taxons. The effect on humans is insufficiently known. The 'TBT story' is another showcase for the importance and the need for integrated planning at all levels, in particular at the coast, where land and sea processes interact. Particular attention to these interactions is required in areas of intense human use, such as ports and marinas.

The case of Tributyltin also demonstrates the need for an international legal system to address the transboundary nature of marine contamination and set common environmental quality standards to be achieved in all coastal systems. The failure to introduce the Pacific oyster in the 1980s in the UK, due to TBT exposure, lead to control of TBT paints and the setting of Ecological Quality targets. The use of TBT has been banned on small boats in the UK since 1987 and the EC Directive (2002/62) prohibits the application or re-application to all EU ships of TBT compounds as biocides in antifouling systems from 1 January 2003.

Some PAHs - such as benzopyrene - are carcinogeous. Pyrene also has endocrine disruptor impact on marine organisms.

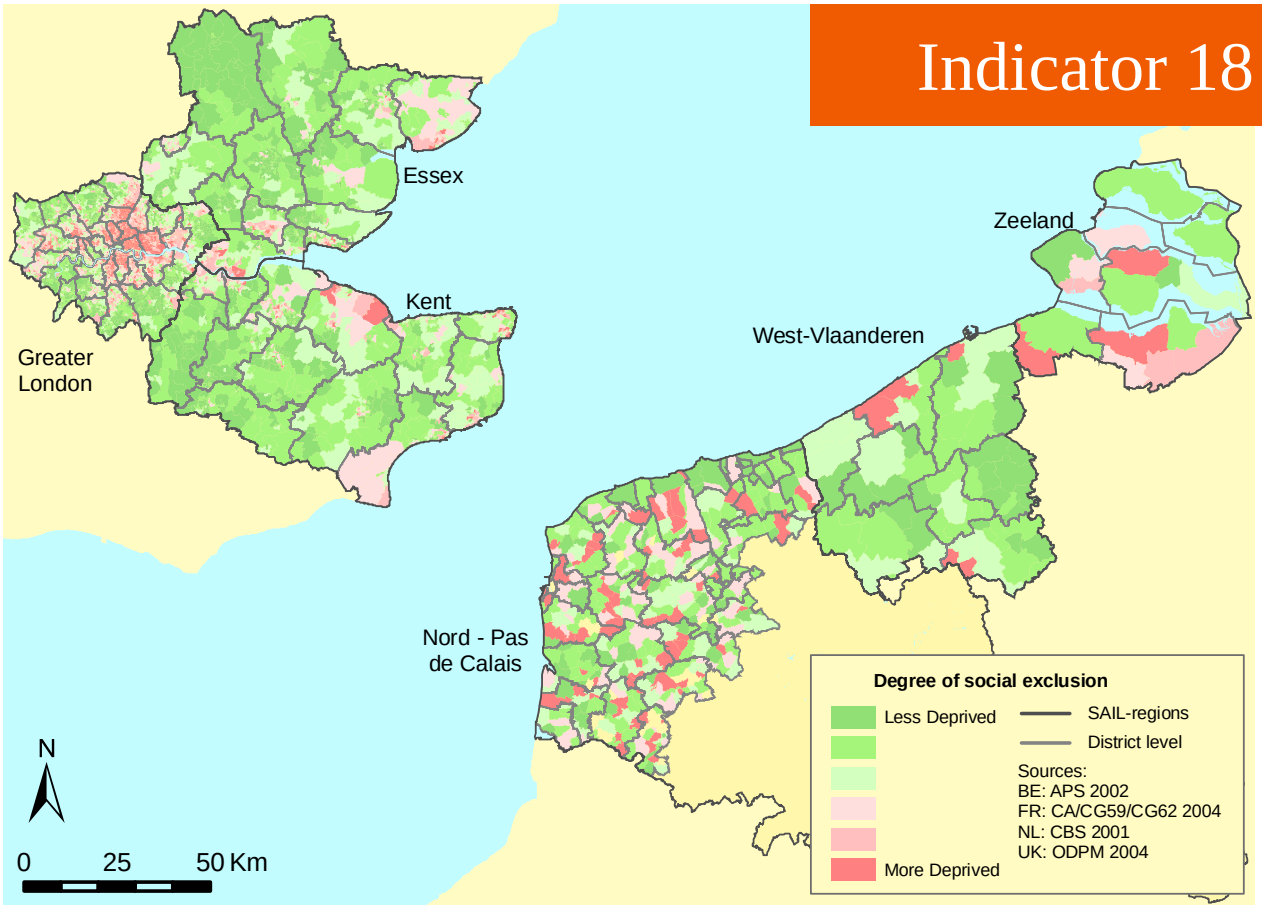
How reliable is the indicator?

The quality of the data is partly defined by the methodology and detection limits of the equipment. Comparability of datasets from national monitoring programmes is defined by inter-calibration in sampling methods and equipment. Uniformity in reporting 'endocrine disruption' and internationaly agreed standardized tests for the evaluation of the disrupting activity of chemical compounds are recent developments. So far, data on PAH and TBT are fragmented and discontinuous. PAH are often reported as total aggregated concentrations for a number of individual compounds. Reported levels under detection limit are sometimes considered '0', for others it is considered equal to detection level. This is of importance for the evaluation of impact on biota, where threshold levels apply.

5 To reduce social exclusion and promote social cohesion in coastal communities

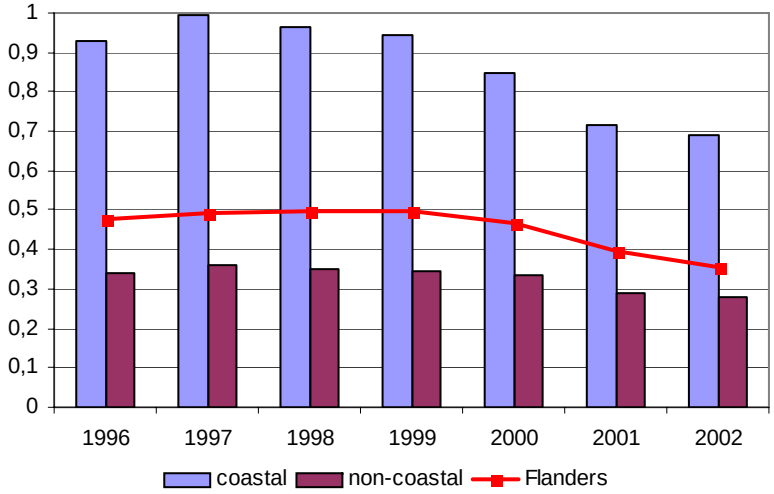
Degree of social cohesion « » Second and holiday homes « » Price of property

Indicator 18 Degree of social cohesion

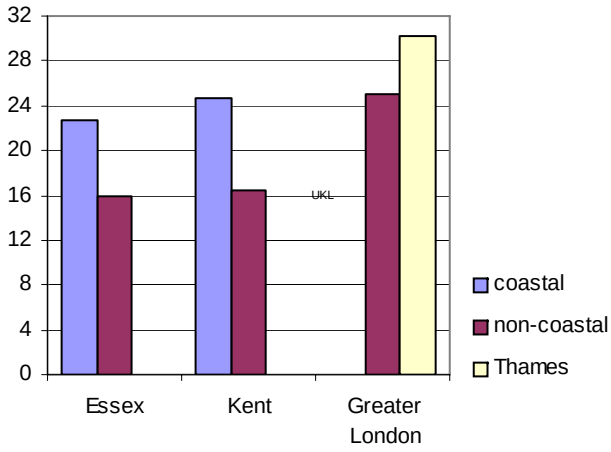


Data cannot be compared directly between countries as they represent different definitions of social exclusion. The values on the map are relative to national averages. Data are aggregated for coastal and non-coastal municipalities.

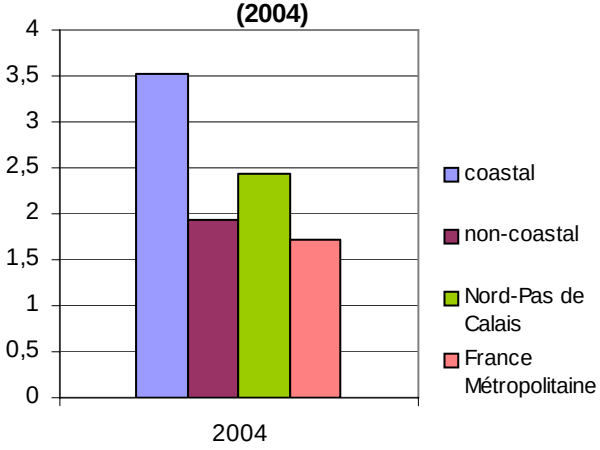
West-Vlaanderen - percentage of the population with minimum allowance



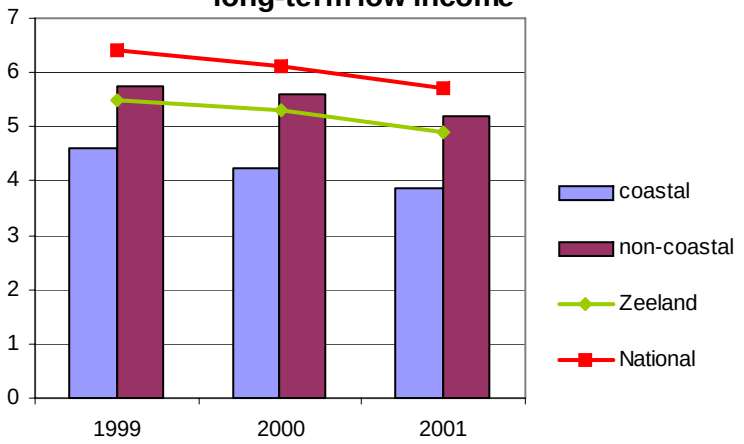
UK-Index of Multiple Deprivation Average Score (IMD 2004)



Nord-Pas de Calais-percentage of the population with minimum allowance (2004)



Zeeland - percentage of households with long-term low income



- ***Unemployment***
- ***Indices of social exclusion per area***
  - ***Index of Multiple Deprivation (IMD) 2004 in the UK***
  - ***Percentage of the population beneficiary of the minimum allowance RMI (Revenu Minimum d'Insertion) in France***
  - ***Percentage of the population receiving the minimum allowance or leefloon in Belgium and percentage of households on long-term (minimum 4 years) low income in The Netherlands***

Key Message

- In all Southern North Sea regions except Zeeland, social exclusion is higher at the coast. For Zeeland and West-Vlaanderen, social exclusion shows a decreasing trend over time in both coastal and non-coastal municipalities.
- In all SAIL sub-regions unemployment is higher in coastal zones except for Zeeland. At SAIL level the coastal areas showed an average unemployment rate of 11% compared to 5% for the non-coastal areas in 2001.

Why monitor the degree of social cohesion?

One of the goals of the EU ICZM Recommendation is to reduce levels of social exclusion and promote social cohesion in coastal communities. 'Deprivation', or 'social exclusion', is a measure of inequality. It is generally a function of low household income but the underlying causes may vary from place to place. Low income could be the result of high unemployment which in turn could be a function of the lack of jobs locally or the unsuitability of the labour force to take whatever jobs are available. Low wages, as a reflection of the structure of a specific economic activity, may also be the cause of depressed household income. Other factors which may affect the degree of social exclusion are the number of elderly residents, the ratio of dependents to wage earners, indices of ill health, environmental deprivation including housing conditions, and so on.

An assessment may indicate whether the observed differences between coastal and non-coastal areas are significant enough to warrant separate policies for the coast and the better targeting of vulnerable groups.

Where do the data come from?

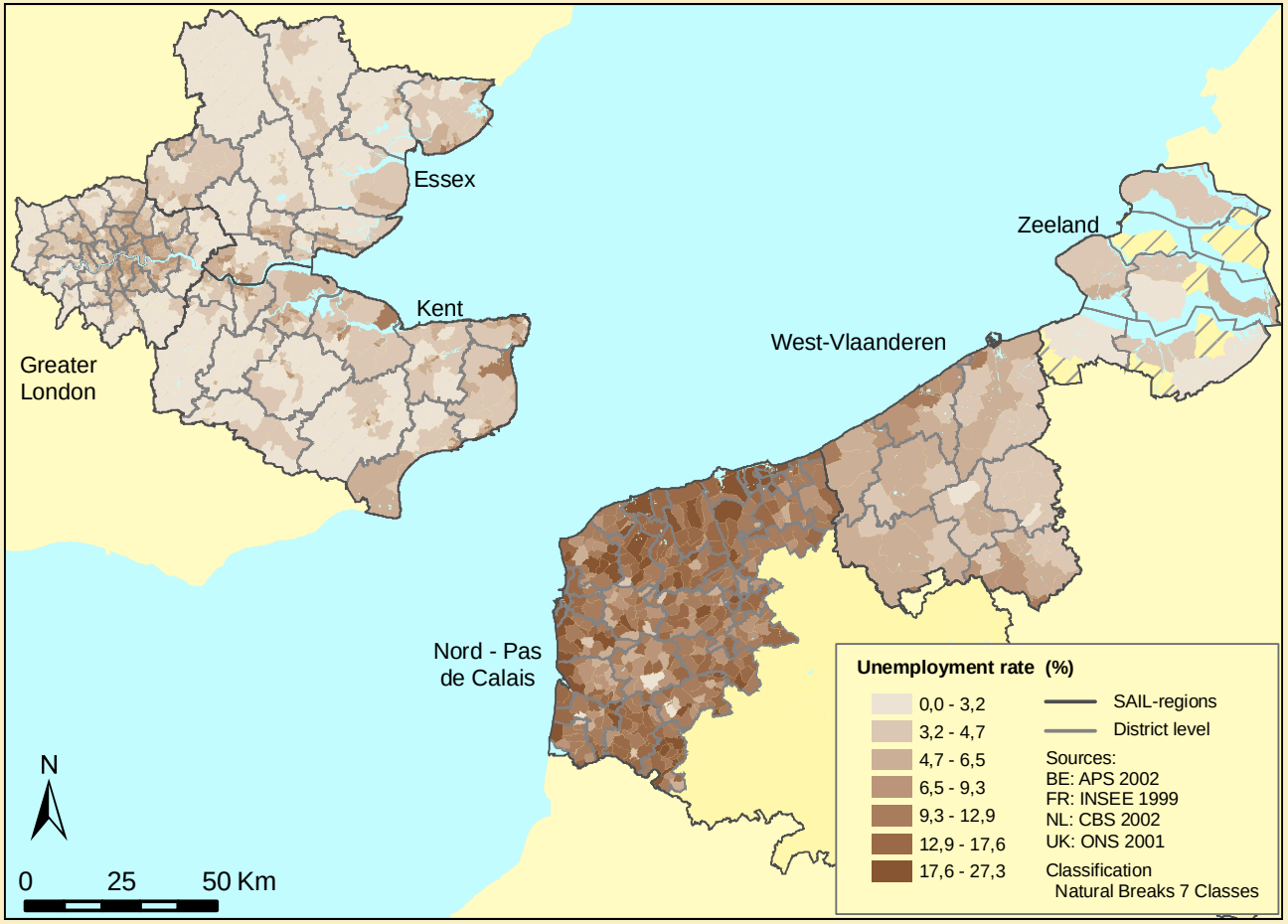
Data on unemployment rates at the local level are obtained from the national Census data providers. National definitions of unemployment are the same, hence comparisons can be made between countries in the Southern North Sea.

Social exclusion data were obtained from different sources, and are often collected through one-off surveys. Since definitions and methodologies differ, the data is not comparable between SAIL sub-regions.

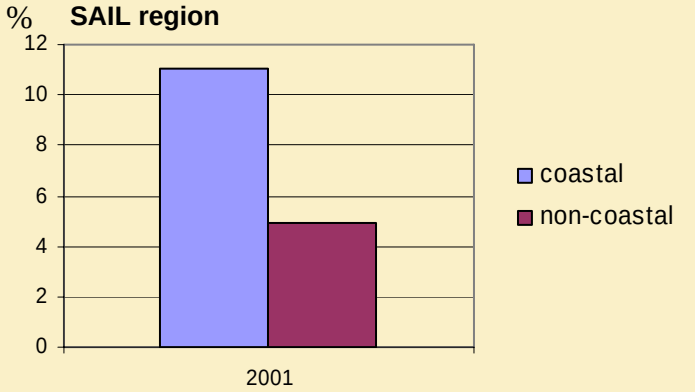
What does the indicator show?

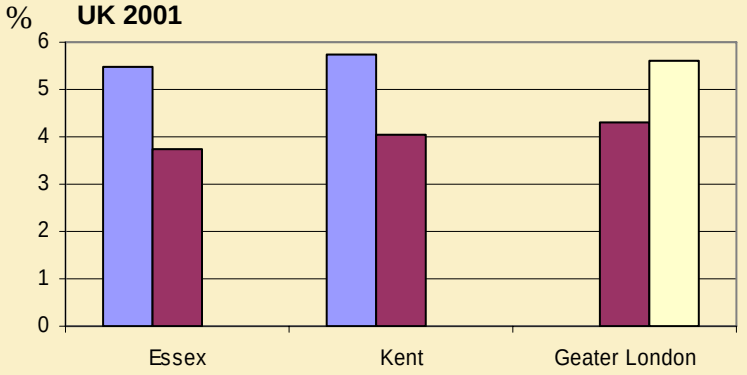
Social exclusion

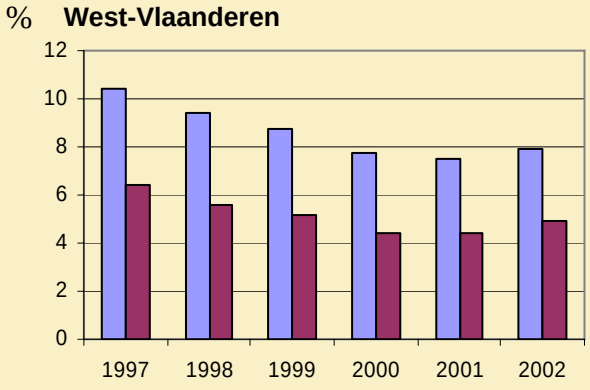
Indices for social exclusion differ from region to region and are therefore difficult to compare. The values from the map are relative to each country's national or regional average of social exclusion. They demonstrate that social exclusion is higher at the coast compared to the hinterland for all regions except Zeeland.

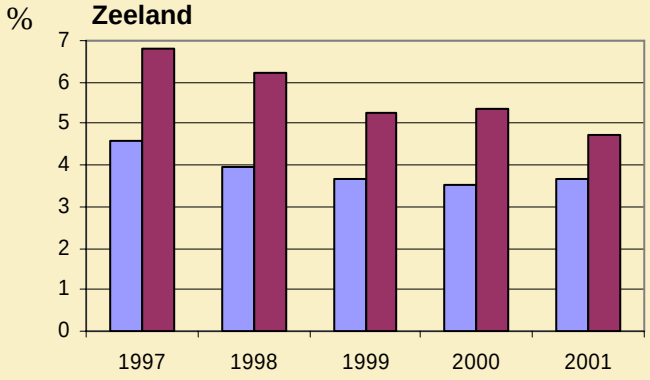


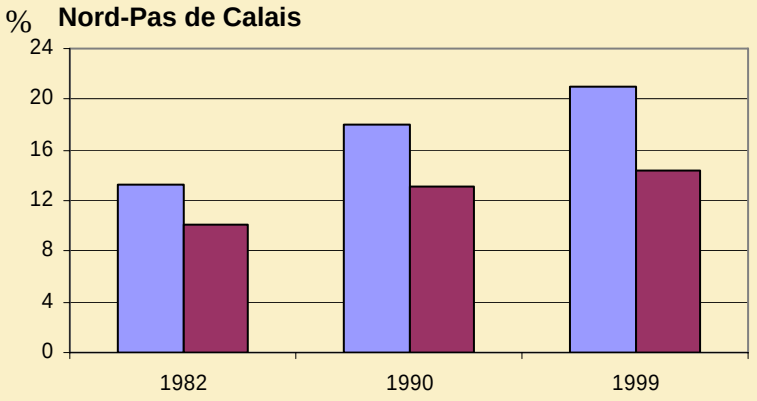
Unemployment in the SAIL region (%)











For the UK, the Index of Multiple Deprivation (2004) takes into account different criteria of social deprivation including income, employment, health deprivation, education and the living environment. Higher levels of social exclusion are observed in the coastal zone and the Thames area in comparison to non-coastal areas of Kent, Essex and Greater London (2004). The Thames area shows the highest levels of social exclusion with an average score of 30.2 (25.1 in Greater London) while the hinterland of Kent shows the lowest average (15.9 versus 22.6 at the coast).

In West-Vlaanderen the percentage of the population that benefited from minimum allowance in 2002 was at least twice as high at the coast compared to the hinterland. However the overall rates have decreased slightly since 1998 in both areas. The region of Nord-Pas de Calais has one of the highest rates of social exclusion at the national level. This is even more pronounced at the coast where 3.5% of the population receives the minimum allowance ensured by government (RMI), compared to 1.9% in the hinterland. Especially in coastal urban areas such as Calais (4.8%) and Dunkerque (6.2%) the rates in 2004 are relatively high, although they have decreased since 1997 (from 9% and 10% respectively).

Unemployment rates

The coastal areas of Kent, Essex, West-Vlaanderen and Nord-Pas de Calais record higher unemployment rates for all sampled years with values as high as 20.9% in the coastal area of Nord-Pas de Calais (1999). In addition, unemployment rates in Nord-Pas de Calais have increased steadily over the years, with coastal unemployment increasing at a faster pace. In 1999 this disparity reached a maximum of 6.6%.

Zeeland is the only region within SAIL where unemployment rates are higher in non-coastal municipalities (4.8% versus 3.7% in 2001), although it has the lowest overall unemployment in the Southern North Sea. Zeeland and West-Vlaanderen show a general decline in unemployment rates while the disparity between coastal and non-coastal areas is apparently decreasing.

Largely influenced by the relative high unemployment rates of Nord-Pas de Calais and West-Vlaanderen, at SAIL level, the coastal areas show an average unemployment rate of 11% compared to 5% for the hinterland in 2001.

What are the implications for planning and managing the coast?

The importance of economic and social coherence within the European Union is recognised by the European Commission, and clearly stated in the goals of the EU ICZM Recommendation. The EC objective-2 programme (€727million in 2000-2006) that targets areas such as coastal zones in economic decline or in need of regeneration, is intended to revitalise tourism, economy and the social and ecological aspects with an emphasis on sustainability.

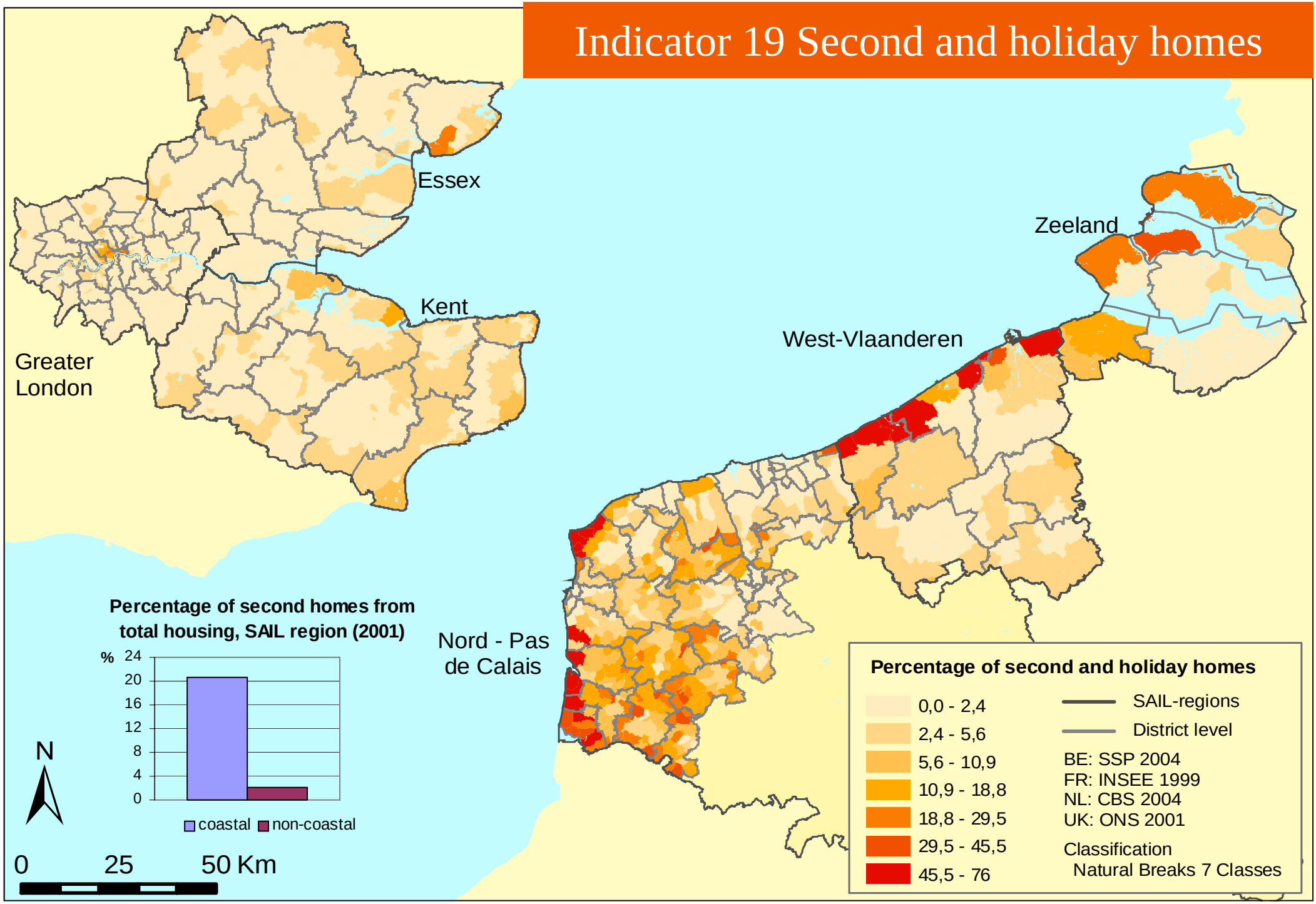
Since coastal regions are often targeted for holiday and retirement and investment purposes, different mechanisms take place in the housing policies and real estate market. These drivers have an impact on affordable housing and living conditions for the local population. Also in some cases, the concentration of second homes and the high proportion of elderly at the coast have an impact on social exclusion. Many of the coastal zone economies have entered a depression compared to more thriving larger urban areas in the hinterland. It is important to measure, according to the best available national definitions of social exclusion, whether higher rates of deprivation are present in coastal zones and whether these are being addressed efficiently in order to build more cohesive and sustainable communities.

How reliable is the indicator?

For the data on social exclusion, Census data (total population, number of households) is combined with data from surveys that can be provided by social security departments or commissioned to Social Research Centres. Since different countries apply different definitions, the measurement may be more or less representative to monitor a complex issue such as social exclusion, and may be more or less sensitive to changes that take place as a response to sustainable development strategies.

The data for unemployment rates at the local level is available from the Census data providers and hence considered relevant and reliable data sources.

Indicator 19 Second and holiday homes



Key Message

- Twenty per cent of residential properties located at the coast in the SAIL region are estimated to be second and holiday homes, while only 2% of all dwellings in the hinterland are used temporarily or for vacations.
- Second homes seem to be a highly localized issue along the coasts of the Southern North Sea, being especially prominent in some localities where the proportion of second and holiday homes can reach 75%. In England, only one ward registers a percentage of second homes above the SAIL average for the coastal zone.

Why monitor second and holiday homes ?

Second homes, together with retirement and other housing pressures, bring significant socio-economic changes. The demand for second and holiday homes at the coast drives up property values, often creating a shortage of affordable housing for residents, who are then forced to move away. In some areas, the high incidence of second and holiday homes may significantly change the drivers of the local economy and affect local identity. Understanding second homes and their secondary effects in tourism-based economies is essential for planning purposes. Good planning requires anticipating issues such as the under-utilization of existent communal infrastructure, the loss of social networks and often increased rates of criminal behaviour.

Where do the data come from?

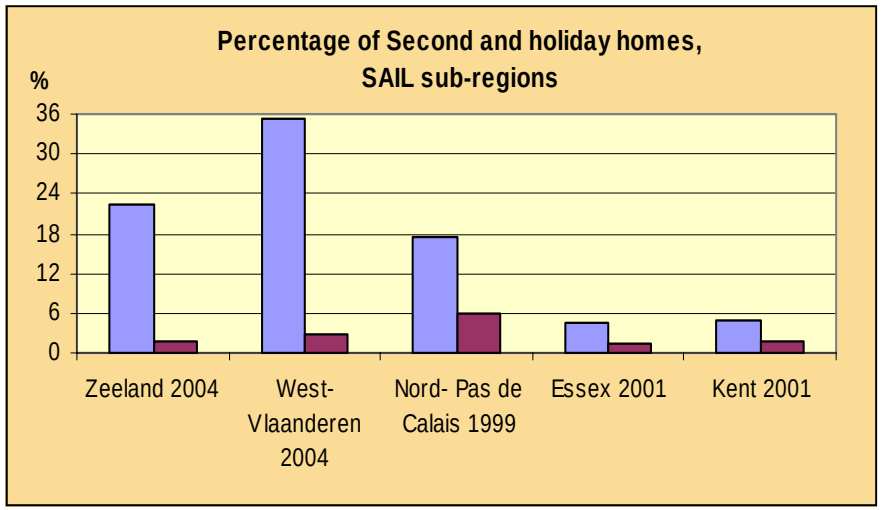
In France, The Netherlands and the UK data on type, occupation and ownership of dwellings are collected in Census events. Categories included in Census data may differ among countries but usually include second homes, vacant homes and holiday homes. Second homes are privately owned dwellings used mainly for vacations. Holiday homes may take the form of chalets or ordinary dwellings, let out for vacations. In Belgium, the data is estimated from combined sources of the land registers (number of dwellings) and the number of households (population register).

Percentage of second homes in coastal and non-coastal municipalities

What does the indicator show?

The percentage of second homes in the coastal zone of the Southern North Sea is strongly influenced by the number of second homes in the département Pas de Calais and the Belgian coast. The area of Merlimont (75%) and Le Touquet in France, and some municipalities at the Belgian coast (Middelkerke-61%) are scarcely populated during winter. In the region Nord-Pas de Calais, the percentage of second and holiday homes has increased from 10% in 1968 to 17% in 1999. In Nord-Pas de Calais alone, second homes increased from 12,280 in 1968 to 32,750 in 1999.

In Kent, Essex and the Thames area, the issue is not generalized (5% in coastal and 2% in non-coastal), but some coastal wards such as St. Osyth and Point Castle (21%) exceed the regional averages. The situation in Zeeland is a true representation of the average in the Southern North Sea region.



What are the implications for planning and managing the coast?

Second homes become an issue when there is a lack of sufficient housing for the local population, when younger and less affluent households have to compete on the market and are often forced to move away. There is a territorial impact associated with the increase in second homes, since these dwellings require an area of land that is not occupied during large part of the year. A high proportion and number of second homes are often found in areas that are popular for retirement, creating the need for services and infrastructure to respond to the demand of an older population. Some coastal municipalities have identified this trend as a competitive advantage in their tourism marketing strategies. In some areas, higher tax levies are introduced to address the problem, and locally some new development plans may even define targets or standards for the proportion of second homes to create healthy living communities.

How reliable is the indicator?

An inherent bias may be introduced in comparing between countries because of different definitions and methodologies applied in national Census. In the UK, experts suggest that as much as 50% of homes counted as 'vacant' are in fact second homes. In France, the different between 'vacant' and 'second' homes is also made in census data, but is not accounted for in the data presented here. Where tax levies on second homes are considerable, the bias in information may be significant. The quality of the estimations on the basis of available housing and number of resident households (Belgium) is influenced by the reliability of the estimator of 'structural vacancy' to account for dynamics of moving and restoring. It is also important to note that results are calculated at the municipality level. However, the percentage of second and holiday homes in the first strip along the coastline is often much higher than the average for the entire municipality.

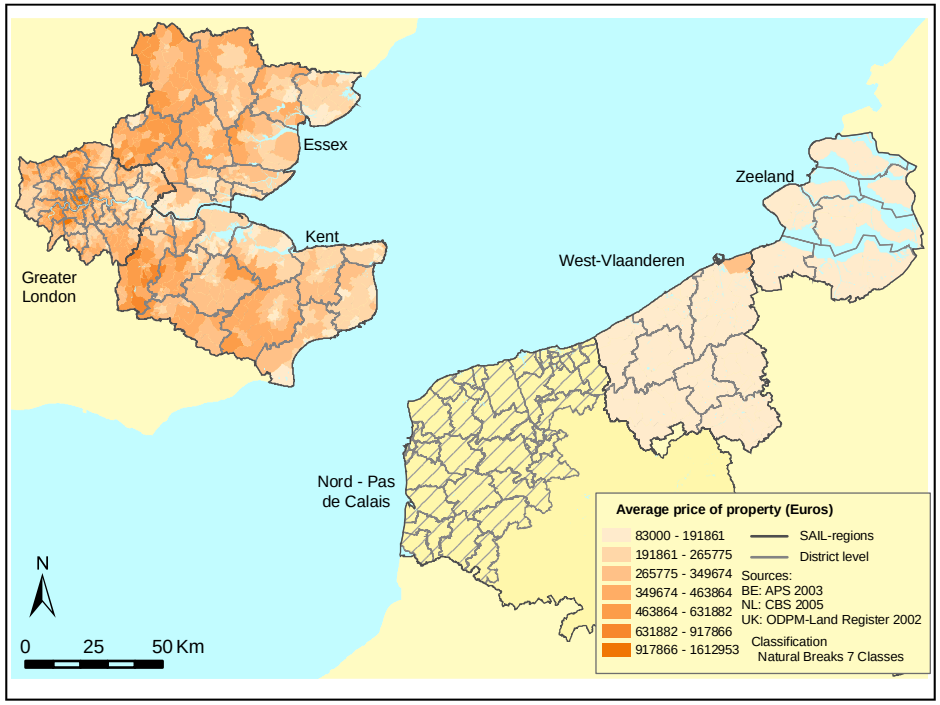
Further reading:

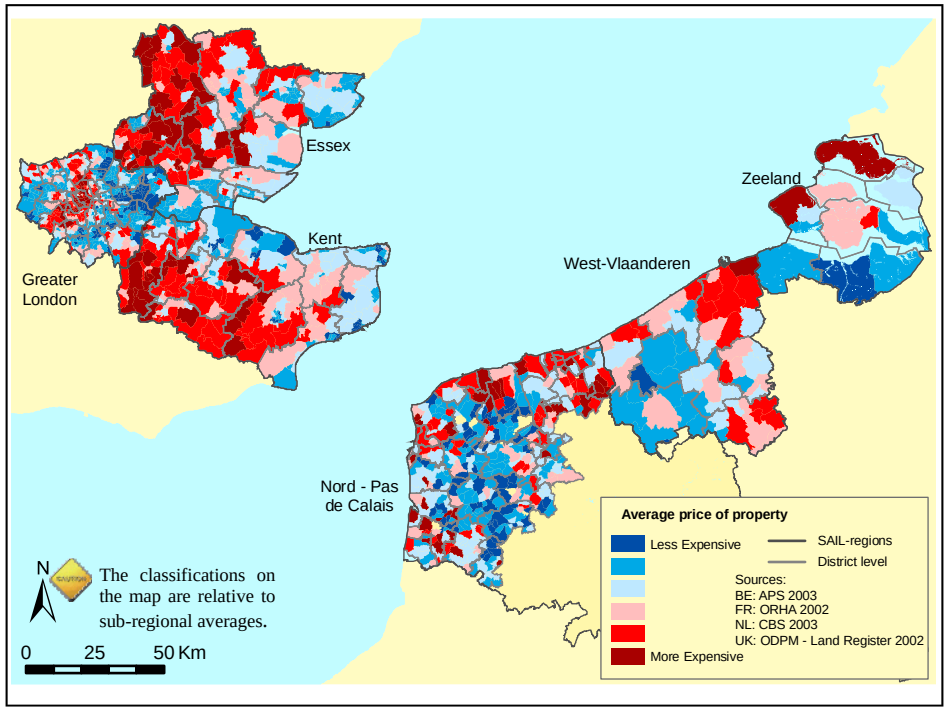
Second Homes in Rural Areas of England: Revised Research Report for the Countryside Agency. Nick Gallent, Alan Mace, Mark Tewdwr-Jones. The Countryside Agency, October 2002.

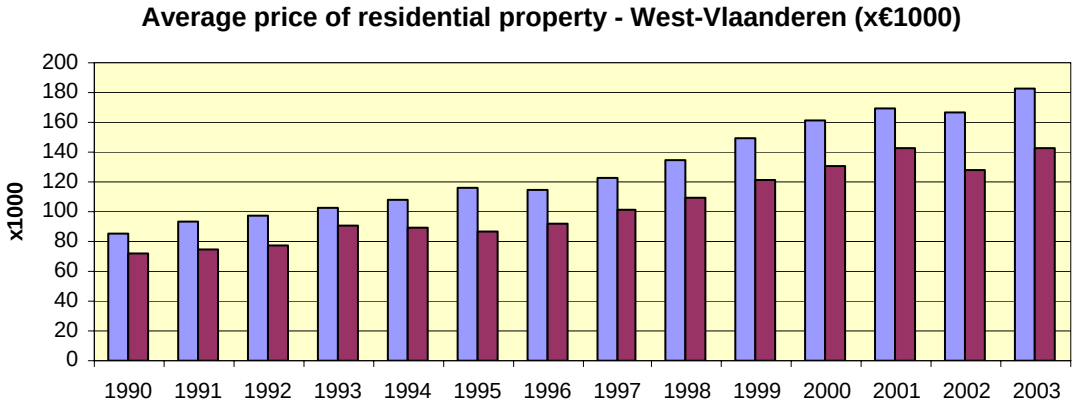
Rural Homes-More than for the Weekend-23 November 2003. press release (website www.countryside.gov.uk)
Controlling Second Homes Through Planning. Nick Gallent, Mark Tewdwr-Jones and Alan Mace. University College London. Second and Holiday Homes and the Land Use Planning System. Leisure Tourism Review reports. 2002.

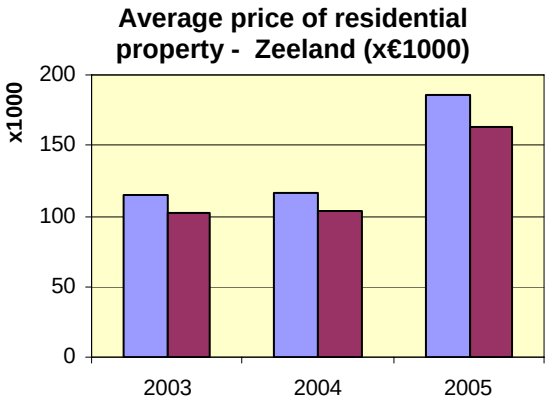
"Leefbaarheidstudie aan de kust " A study of the social quality of life at the Belgian coast. Province of West-Vlaanderen. 2005.

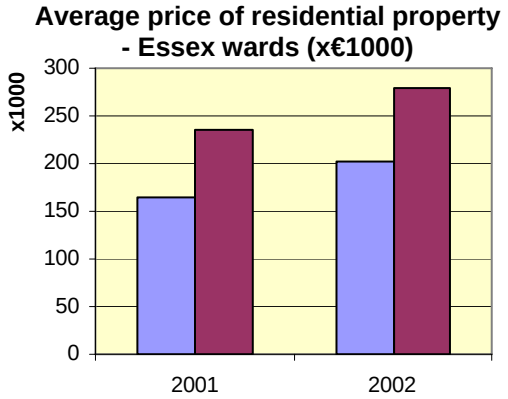
Indicator 20 Price of property

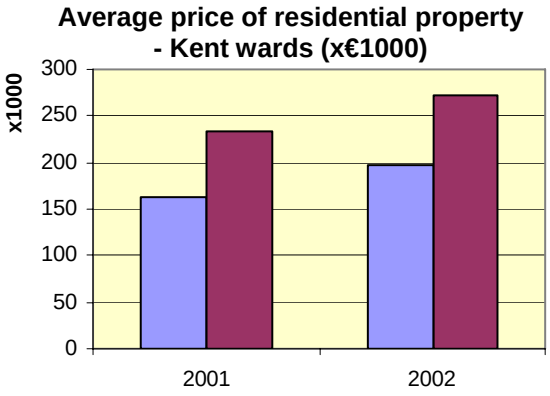


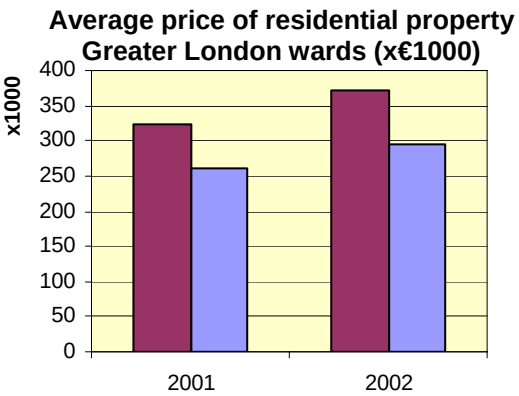












coastal zone hinterland

- *Average price of property*
- *Average price of m² of building lots*

Key Messages

- On the continent there is a premium to be paid for living at the coast. Houses and building land are on average more expensive in the coastal zones of Zeeland, Belgium and in Nord-Pas de Calais than they are in their respective hinterlands.

- In Kent and Essex the price of coastal property is generally inferior to that in the hinterland, although there are substantial differences between particular seaside towns. However, house prices at the coast have been increasing at a faster rate than elsewhere.

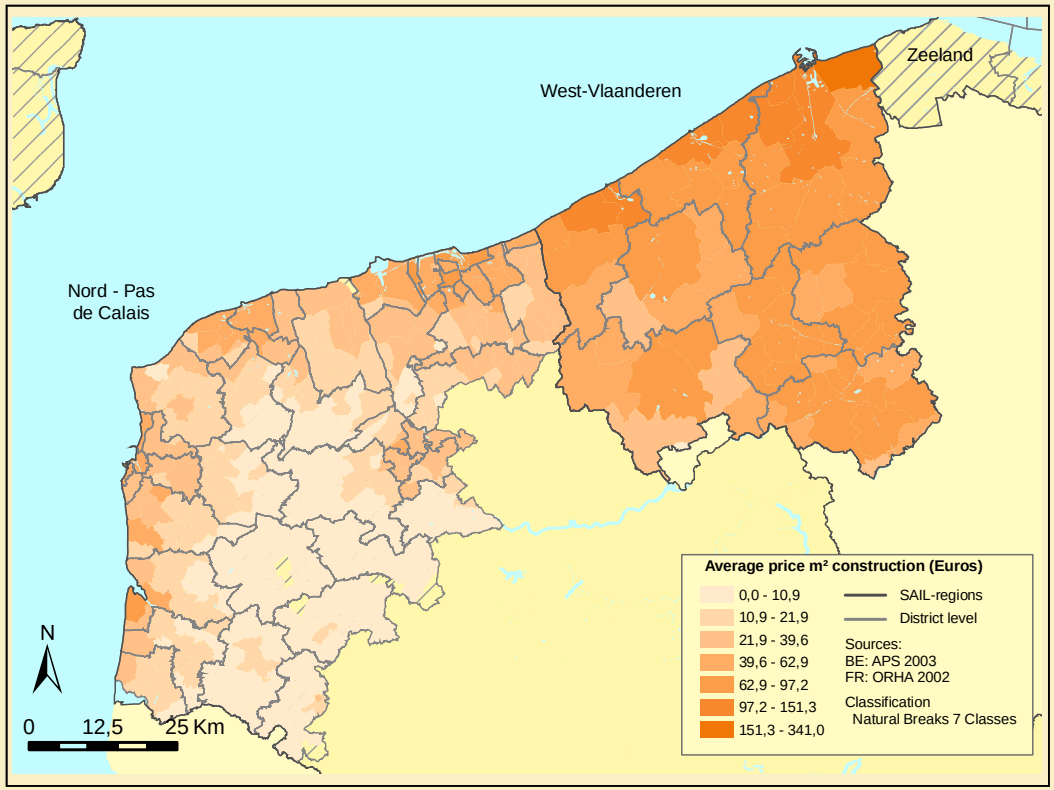
Why monitor the price of property?

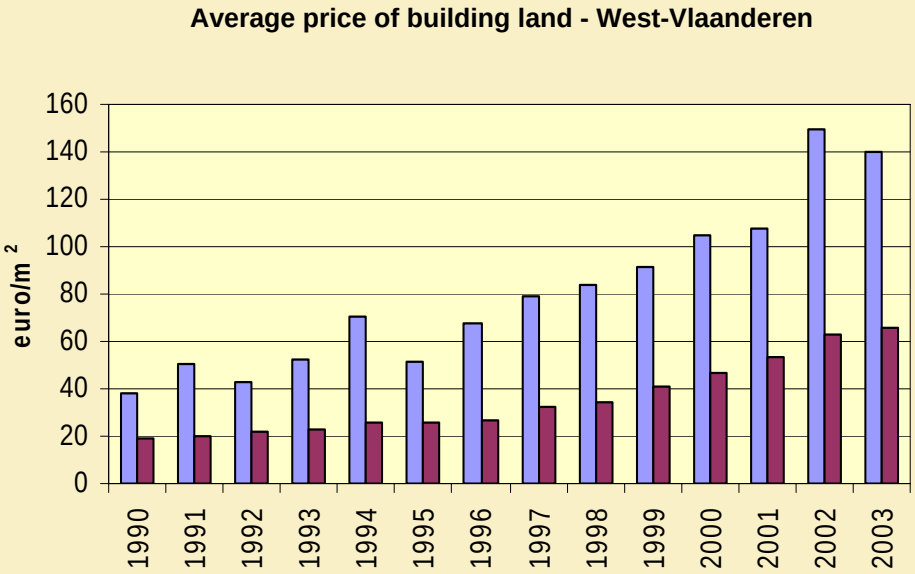
French, Belgian, Dutch or British, most of us like to be near or beside the seaside. A home by the sea is not only an attractive place to live, it is also considered by many as an interesting financial investment.

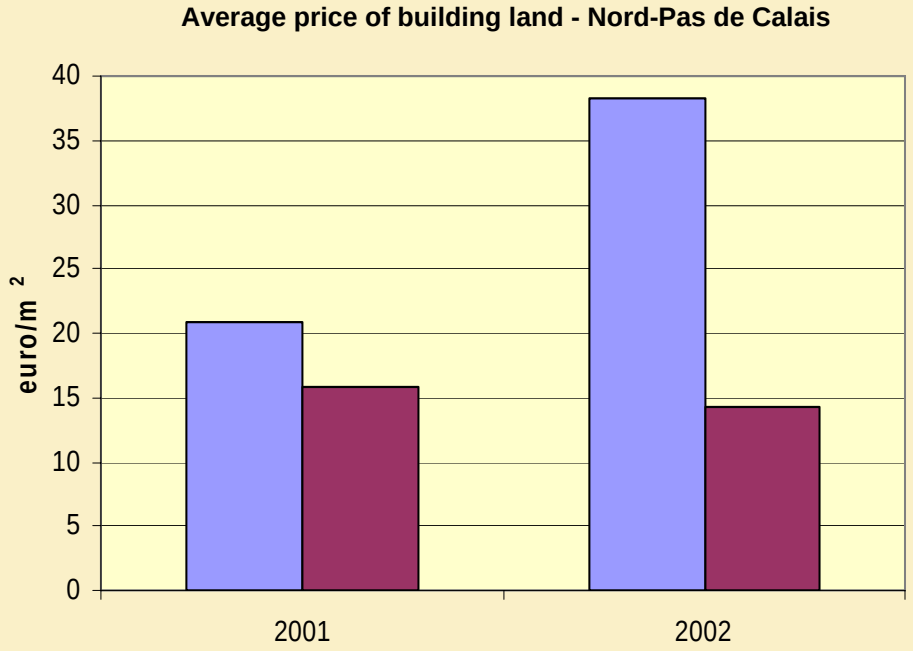
But there is a premium to living at the coast. It is expected that demand for living space at the coast is more intense than elsewhere because of the intrinsic attraction of the coastal environment and that this feeds through into property prices. In fact, it is both the increased demand for first and for second homes that is expected to affect prices in the property market. Hence, unless there is a commensurate increase in the supply of accommodation, prices will inevitably be higher than in non-coastal areas. The increasing demand for second and holiday homes in coastal towns may lead to a situation whereby the low paid and young people in particular are priced out of the coastal housing market. Monitoring the price of property allows us to assess to what degree this scenario can be said to apply throughout the coastal zone.

Where do the data come from?

Data for average price of property is used for official purposes in risk assessment and insurances. It is therefore collected by official sources. In West-Vlaanderen (Administratie Planning en Statiek-APS) and in Nord-Pas de Calais (Observatoire Régional de l'Habitat et de l'Aménagement du Nord-Pas de Calais -ORHA) collect data on the price of m^2 building lot. In the U.K. the data are provided by a survey from the Office of the Deputy Prime Minister (ODPM) which releases data obtained through a survey of the Land Register. For the UK and Belgium, additional data are available on the average price of subcategories (flats, large, small and terraced houses). The data for Zeeland are collected by the Centraal Bureau voor de Statistiek (CBS). Additional data sources are provided by the private sector (Real Estate Associations).







Further reading:

Europe's environment: the third assessment. EEA

Second Homes in Rural Areas of England: Revised Research Report for the Countryside Agency. Nick Gallent, Alan Mace, Mark Tewdwr-Jones. The Countryside Agency, October 2002.

Rural Homes-More than for the Weekend –23 November 2003. press release (website www.countryside.gov.uk)
Controlling Second Homes Through Planning. Nick Gallent, Mark Tewdwr-Jones and Alan Mace. University College London. Second and Holiday Homes and the Land Use Planning System. Leisure Tourism Review reports. 2002.

"Leefbaarheidstudie aan de kust " A study of the social quality of life at the Belgian coast. Province of West-Vlaanderen. 2005

What does the indicator show?

The strong increase in prices of property is affecting particular seaside towns around the Southern North Sea. This trend is often concentrated in popular tourist and holiday areas, which is not reflected in the numbers for the aggregated coastal zone. Commuting distance from London seems to be the main driver of property prices in the UK, largely masking the effect provided by proximity of the sea.

Recent research from Halifax Estate Agents in the UK shows that three-quarters of the more than 100 seaside towns surveyed recorded a price increase above the average for their region over the past three years. Sandwich in Kent is among the fastest risers over the period 2001 – 2004 with an average increase of 104% (from £109,019 to 222,776). Whitstable (Kent) is among the ten fastest risers in the UK coastal towns, with values that have risen from £56,554 in 1995 to 143,040 in 2002 (153% increase). Other popular seaside towns like Margate saw property prices more than double during this period. In Essex on the other hand, only two of the five seaside towns surveyed have outperformed the county increase in prices.

Average price of residential property at the Belgian coast has been rising at a significantly higher rate than in the hinterland since 1990. It more than doubled between 1990 and 2003 (an average increase of €7,500 p.a.). Buying a property at the Belgian coast may cost on average €40,000 more than elsewhere in West-Vlaanderen. In Zeeland a similar increasing trend can be observed between 2003 and 2005. The rather modest differences in values between coast and hinterland may in part be explained by the definition of 'coastal towns' in Zeeland (Veere, Sluis and Schouwen-Duiveland).

In Nord-Pas de Calais and West-Vlaanderen, the value of building land is significantly higher at the coast; building lots at the coast cost €38/m^2 versus €14/m^2 for the hinterland in Nord-Pas de Calais. In West-Vlaanderen building lots cost on average €140/m^2 in coastal municipalities versus €66/m^2 in the hinterland.

The data for individual subcategories of property (flats, large houses and medium-small houses) for the UK and Belgium, confirm the trends and observations described for the average price of property.

What are the implications for planning and managing the coast?

If living at the coast is to be maintained as a healthy mix of social and economic functions, it needs to build on a structural housing policy that takes into consideration local planning strategies. Particularly where young households or socio-economically vulnerable groups are priced out of the market , policies may have to turn to suspending the market process locally by e.g. releasing more land for building, stipulating the proportion of 'affordable' homes in any development, buiding social houses for rent, etc. As an example, spatial planning tools in Wales address the problem by creating a separate category of land use for 'second homes'. This strategy is based on the concept that the ownership of second homes in some coastal towns is jeopardizing the basic right to housing for the local community.

In a study of 71 areas in 10 coastal towns in Belgium, most respondents evaluated access to affordable housing as the worst aspect in their living environment. Retirement also has an effect on the value of property, specifically on smaller houses located near shops and community service providers.

The lack of space for building land and the pressure exerted by competing land uses, including nature conservation, adds to this increase in price of residential property.

How reliable is the indicator?

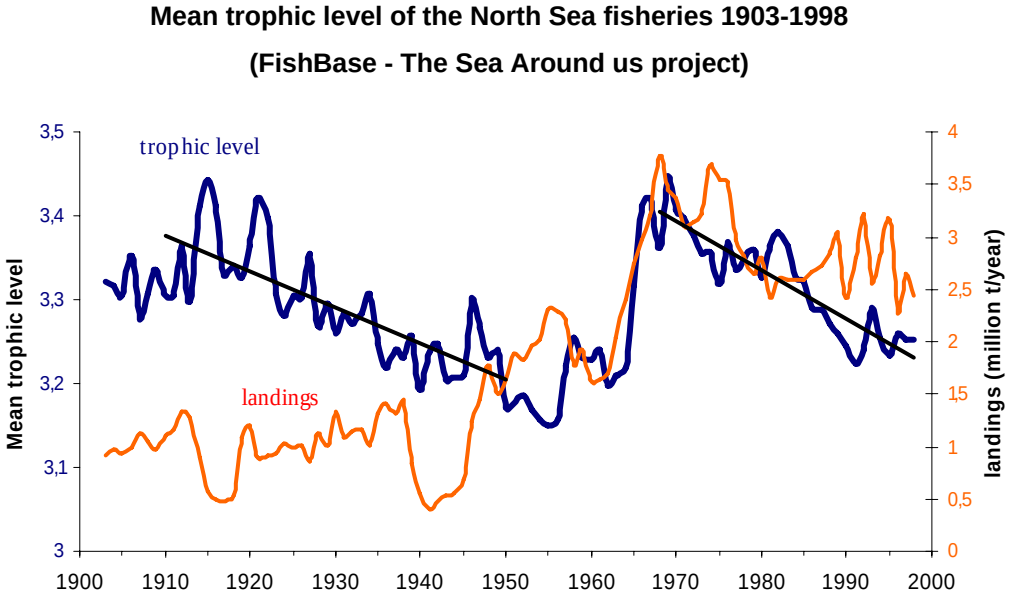
The datasets are based on the price of residential properties that are actually sold during a given year. This may introduce a bias in the average price especially for communes where the number of transactions is limited. Thresholds in volumes of sales to calculate average prices or to protect privacy differ among datasets. The value of property reported in GBP is converted to Euro by the exchange rate at the date of implementation of the Euro currency across Europe (1€ =£0.6255).

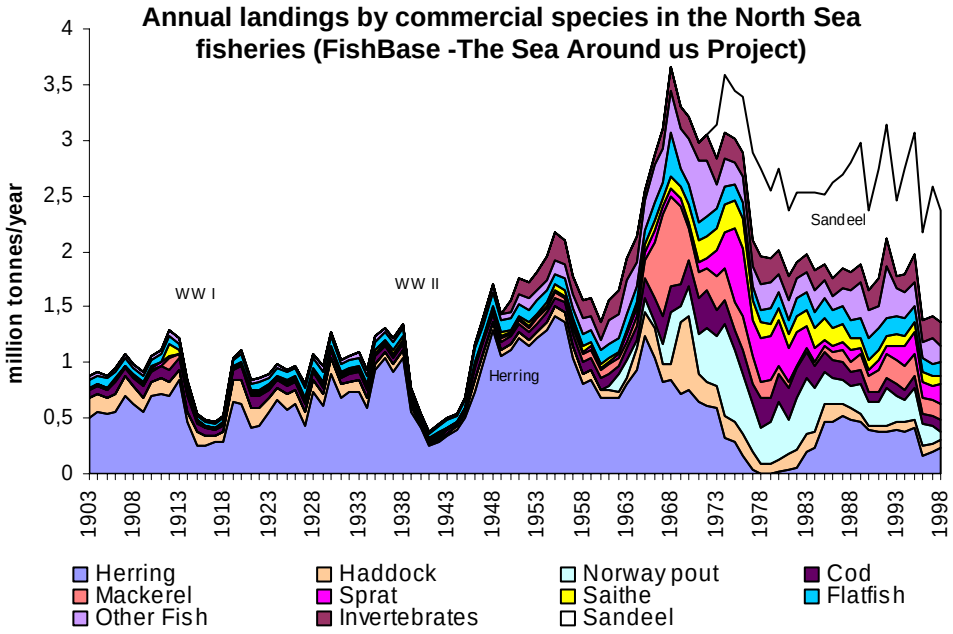
6 To use natural resources wisely

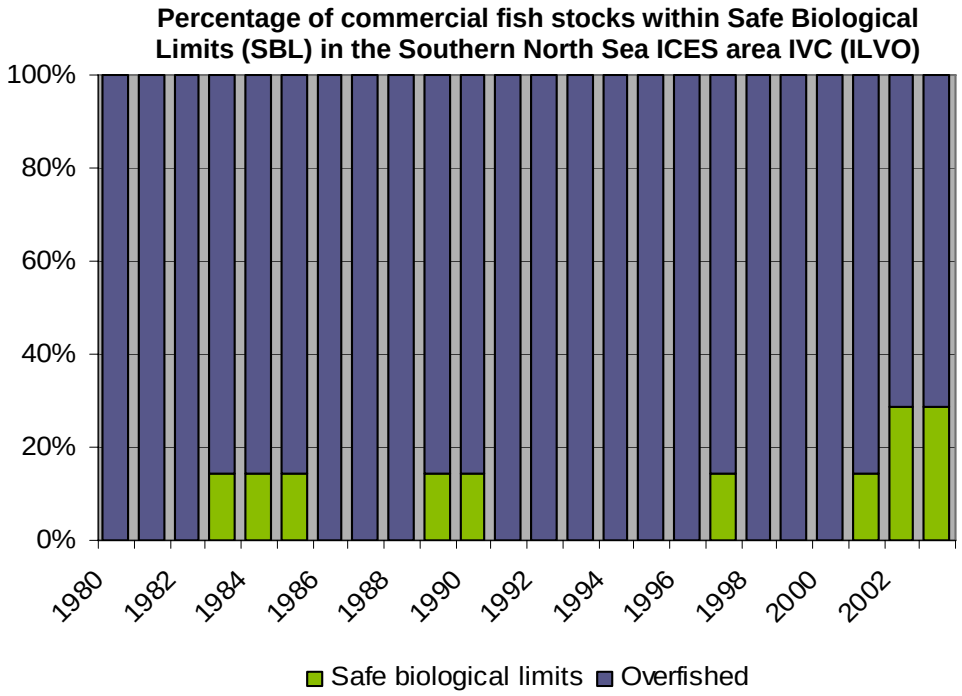
©FR

Fish stocks and fish landings « » Air Quality « »
Renewable energy from coastal resources

Indicator 21 Fish stocks and fish landings







- *Trophic level trends in the North Sea Fisheries*
- *Percentage of commercial fish species within Safe Biological Limits (SBL)*
- *Total values of landed fish of commercially important species*
- *Estimations of discards in fisheries*

Key Message

- Trophic level in the North Sea fisheries has decreased steadily since 1970.
- Since 1980, the proportion of commercial fish stocks within SBL in the (Southern) North Sea has never exceeded 29% in any given year.
- Total landings in fishing ports in the Southern North Sea reach an approximate value of €215million.
- The estimated annual cost of discarding in North Sea fisheries (1999) varied from 70% of total annual landed value in the Dutch case to 42% in the UK whitefish case and 43% in the French *Nephrops* case.

Why monitor fish stocks and fish landings?

The trophic level is the position that an organism occupies in the feeding hierarchy of the food chain. The trophic level of fisheries is the average level at which fisheries obtain their catch within the food chain. When catch effort per unit for species of high commercial interest decreases below economic gain, fisheries tend to move further down in the food chain, and the average trophic level of fisheries decreases gradually. Abrupt changes in the trophic level are generally an indication of sudden changes in target species.

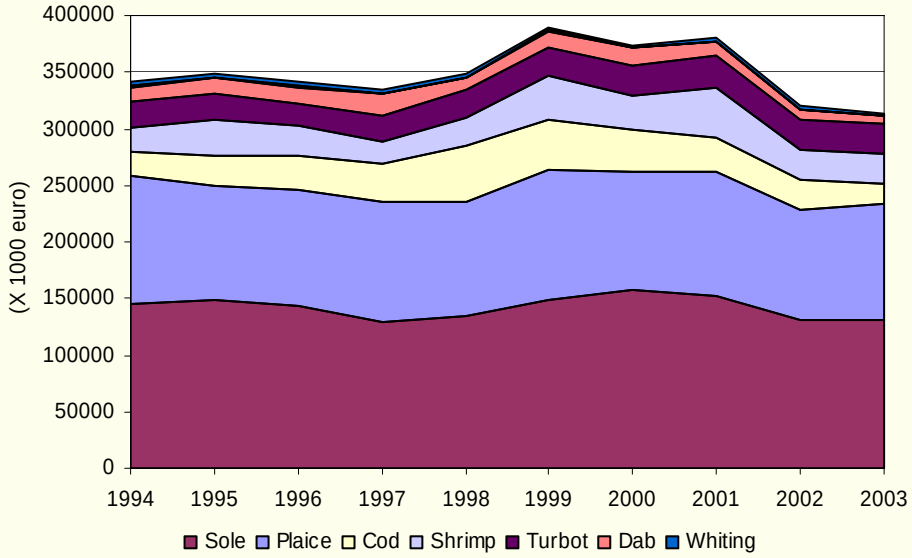
Fishing has a direct impact on the ecosystem by removing organisms from the marine environment. Ideally a fishing impact indicator should include all landings plus catches that are returned as discards. Landings statistics only underestimate the total catch and hence the impact on the environment. Estimation of discards in a particular fishery provides an indication of its environmental and economic efficiency.

The impact of fishing must also be assessed against the state of the stock and its ability to recover. Stocks are 'overfished' or *outside safe biological limits* when the fishing pressure (mortality), exceeds recruitment and growth. The number of stocks within SBL is expressed as a proportion of the total number of commercial stocks for which status has been assessed.

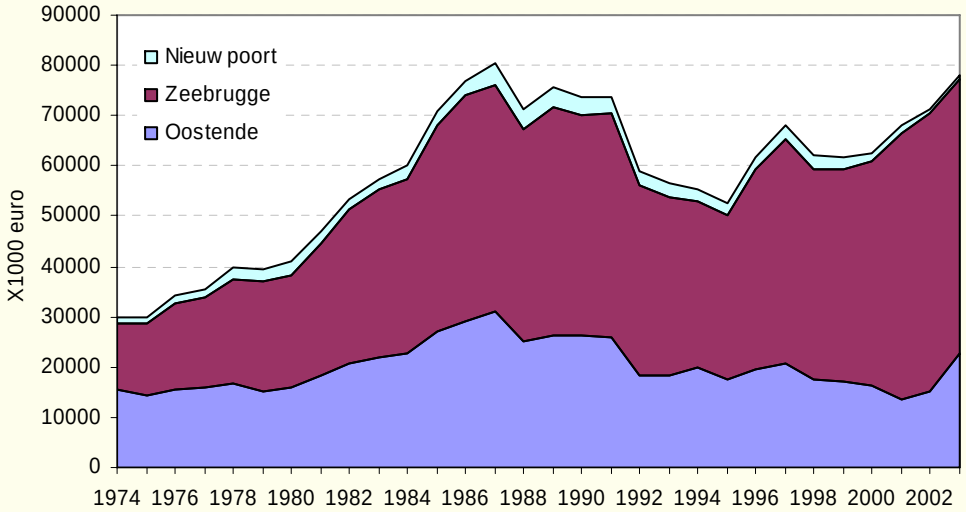
Where do the data come from?

Trophic level trends in the North Sea Fisheries are described and calculated by FishBase and The Sea Around Us Project (http://www.seaaroundus.org). For the northeast Atlantic detailed stock assessments are obtained through the International Council for the Exploration of the Sea (ICES). Data on the percentage of commercial fish species within SBL are supplied by ILVO (Sea FisheriesDepartment), based on ICES data. Values and landings of commercially important species by fishing port are obtained from the Dienst voor Zeevisserij-DVZ (Belgium), Office National Interprofessionel des Produits de la Mer et de l'Aquaculture-OFIMER (F), Department for Environment Food and Rural Affairs (UK), and Centraal Bureau voor de Statistiek (CBS) and individual Fish markets in Zeeland (The Netherlands). Estimations of discards in the shrimp fisheries are the results of PhD research at Ghent University-Belgium (dr. H. Polet-ILVO).

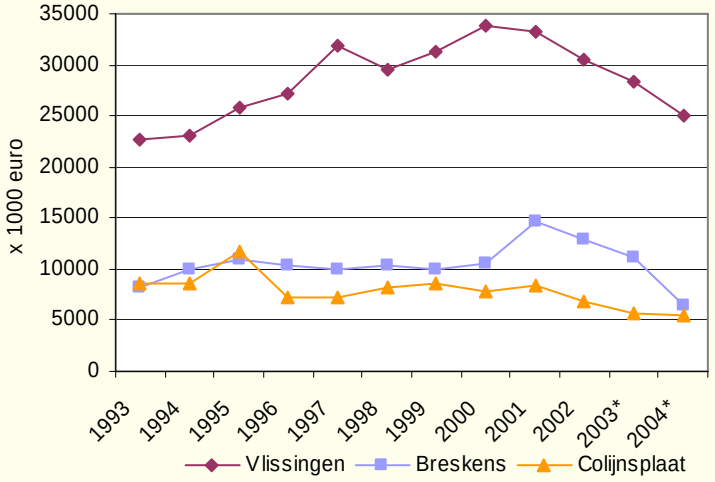
Economic importance (x €1000) of fish landings by species Zeeland (Productschap vis 1994-2003)



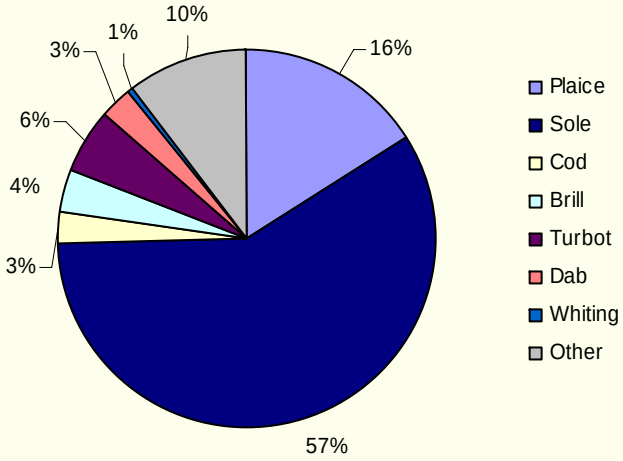
Value of annual landings (x €1000) - West-Vlaanderen (1974-2003)



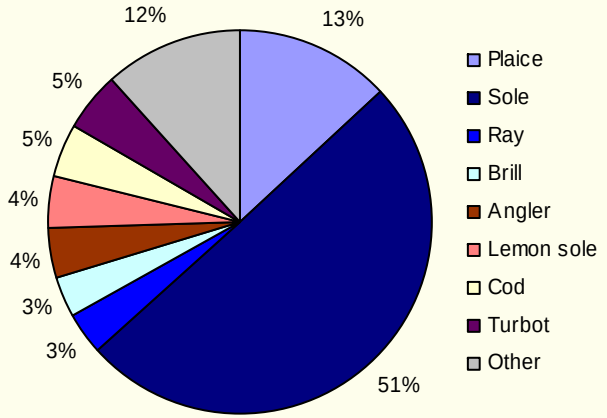
Value of annual landings (x €1000) in fishing ports of Zeeland (1993-2004)



Share of economic importance of fish landings by species-Vlissingen (2004)



Share of economic importance of fish landings by species-Belgian fishing ports (2003)



What does the indicator show?

Trophic level trends in the North Sea Fisheries

The average trophic level of fisheries in the North Sea have gradually decreased by 0.04 points per year since the first half of the 1900s, until the first collapse of the herring stocks. Fisheries then turned to a variety of predator fish species, which explains the sudden increase in the average trophic level in the 1970s. Since 1970 the average trophic level is in decline again (0.06 points per year), due to the strong exploitation of these fish stocks, and specifically because species that are on a lower scale in the food chain (e.g. shrimps, sandeel) are gaining importance in terms of landings.

Percentage of commercial fish species harvested inside Safe Biological Limits

Fisheries are inside Safe Biological limits when the spawning stock biomass (SSB) (the mature part of a stock) is above a biomass precautionary approach reference point (Bpa), or when the fishing mortality (F) (the proportion of a stock that is removed by fishing activities in a year) does not exceed a fishing mortality precautionary approach reference point (Fpa).

The indicator refers to seven commercial fish stocks: the pelagic herring and mackerel and the demersal cod, haddock, whiting, plaice and sole. The evolution of the percentage of commercial fish stocks within SBL (F < Fpa and B > Bpa), reveals a discouraging situation. Since 1980, the number of commercial fish stocks within SBL in the (Southern) North Sea has been maximum 2 out of the 7 (28%). Herring and Haddock fisheries were within SBL between 2002 and 2003. Plaice has been overfished except in 1983-1985 and in 1990. A similar situation is observed in the wider north-east Atlantic: 62-91% of commercial stocks are outside SBL.

Total values of landed fish of commercially important species

Leigh-on-sea and the group of fishing ports of Hastings, Eastbourne and Seaford, are economically the most important fishing ports in the Kent and Essex area. Their landings are worth £2.3 and 2.4million respectively. The most important species in the local economy in terms of value of landings are cockles in Leigh-on-Sea (£2.2million in 2003) followed by sole (£0.7million) at Hastings, Eastbourne and Seaford. In 2003, sole landings are 'top one' income fisheries for most of the fishing areas: Hastings (Hastings, Eastbourne and Seaford), Rye, Hythe (Hythe, Dungeness, Camber), Ramsgate, Maldon (Maldon, Burnham-On-Crouch, Great Wakering, Canvey Island, Southend-On-Sea), Whitstable, West Mersea, Folkestone and Faversham.

Vlissingen is economically the most important fishing port and market in Zeeland. It has an annual turnover of €25-30million. Sixty-five percent of the total income in 2003 was provided by sole. In Breskens 45% of the annual turnover comes from the sole fishery and 30% from shrimp. Sole, plaice cod and shrimp are the most important commercial catches in Zeeland.

The Belgian fishing ports show similar features: sole and plaice provided 64% of income in 2003. Zeebrugge is slightly more important than Oostende; annual turnover in Zeebrugge fluctuates between €15 and 40million. The maximal annual turnover of the three ports together reached €80million in peak year 1987 and €78million in 2003.

Nord-Pas-de-Calais is by far the most important centre for fish products in the Southern North Sea. Boulogne-sur-mer has a total turnover of €85million, which represents 90% of the total regional turnover (2003). Nearly 50% of the value of sales is derived from the landings of squid, sole and plaice.

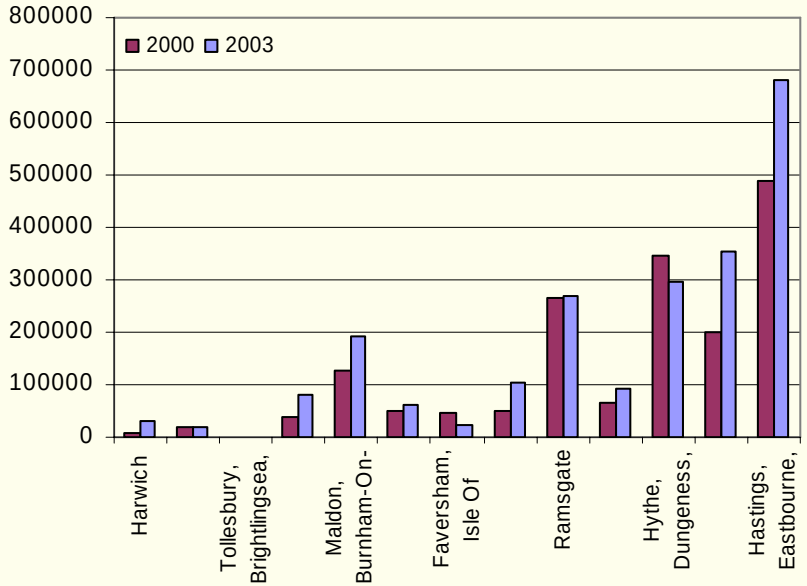
Estimations of discards in North Sea fisheries

The main discard problem in EU fisheries is that of undersized fish. Survey results indicate that over two thirds of the discarded catch in the UK whitefish trawl fishery consists of commercial species, of which undersized fish account for the vast majority (cod 98%, haddock 87% and whiting 97%). The estimated annual cost of discarding in three case studies in North Sea fisheries (1999) varied from approximately 70% of total annual landed value in the Dutch case to 42% in the UK whitefish case and 43% in the French *Nephrops* case.

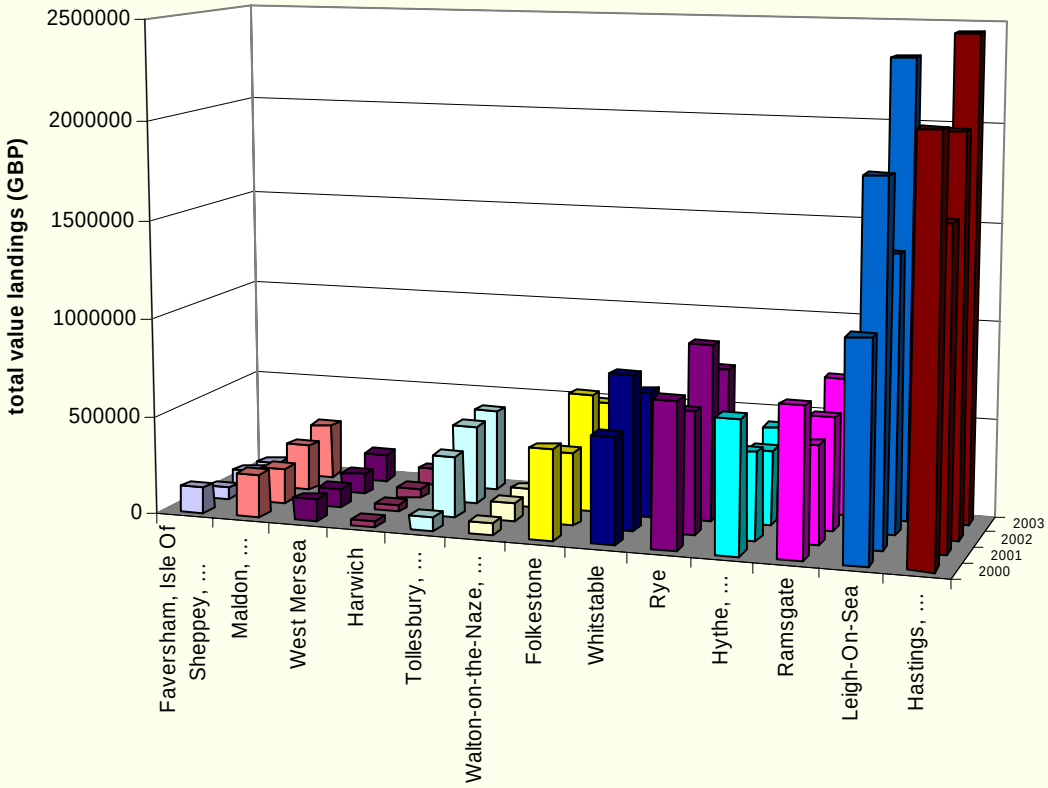
In the UK North Sea trawl fisheries for cod, haddock and whiting, an estimated £47million (€75million) worth of these species was discarded in 1999 (£11million cod, £31million haddock and £5million whiting).

Discard ratios in the North Sea shrimp fishery (*Crangon crangon*) were estimated at 59% (Alversson et al., 1994b).

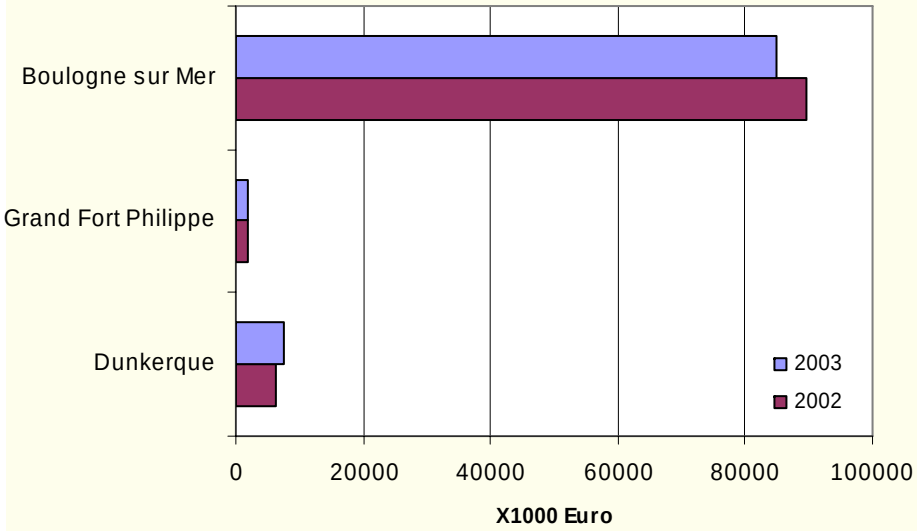
Value of sole landings (GBP) in ports of Kent and Essex



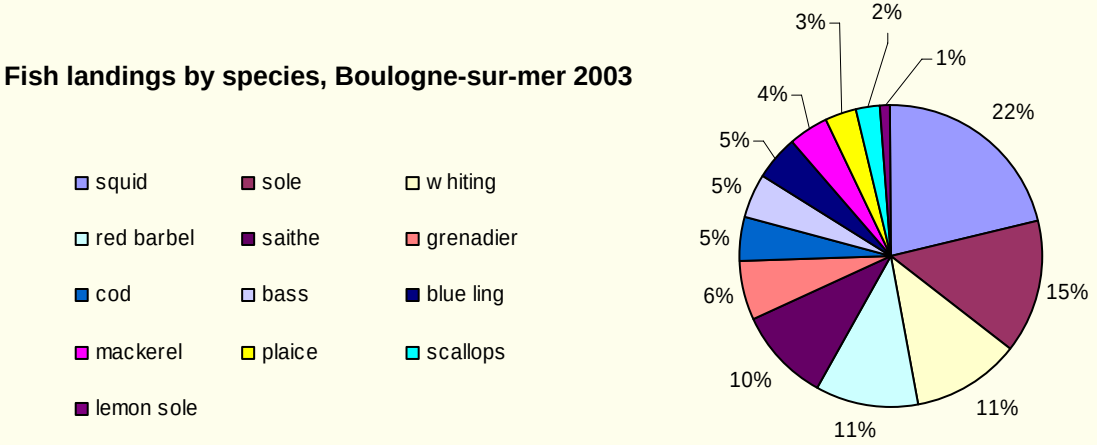
Annual turnover in fishing ports of Kent and Essex (2000-2004)



Annual turnover (x €1000) in fishing ports Nord-Pas de Calais 2002-2003



Fish landings by species, Boulogne-sur-mer 2003



A study concluded in 2003 in Belgian brown shrimp fisheries shows that a higher proportion of the catch is thrown overboard. These discards consist of undersized shrimps, commercial fish and a large variety of non-commercial fish and invertebrate species. On average, the catch consisted of 29% commercial shrimps and the estimated discard ratio was 71% (Polet, 2003).

What are the implications for planning and managing the coast?

Fishing is not only an important sector in the regional economy, it also has a major impact on marine ecosystems. The European Common Fisheries Policy (CFP) (1983) aims to implement management mechanisms for sustainable fisheries while offering stable economic and social conditions. However, the CFP has recognized the need to achieve sustainable fishing while safeguarding vulnerable marine wildlife and habitats as required by European legislation (such as the Habitats Directive).

Sustainable fishing requires balancing natural growth in fish stocks with the total number of fish that are removed yearly by fishing activity. This balance, known as the "maximum sustainable yield", aims to maximise earnings in fisheries while conserving fish stocks for the future. In the North Sea, MSY on fish stocks is obtained and regulated by setting 'Total Allowable Catches' (TACs). Through this mechanism, quotas are determined annually by the Fisheries Council and divided among the countries that fish those stocks. Compliance is ensured by monitoring landings from fishing vessels, and taking into account the discards. Vessels and countries that do not adhere to their agreed quota may suffer economic sanctions and a reduced quota the following year.

Two approaches are used to address unsustainable practices in fisheries: direct restrictions in fishing effort through e.g. the reduction in number of ships or fishing days, and indirect restrictions in terms of the output or catches. The second approach (e.g. catch quota such as the TAC) has shown to be less efficient, in particular in mixed fisheries with more than one target species. The beam-trawler fisheries on plaice and sole commercially valuable catch has to be discarded when TAC for one species has been completed while for the other species it has not.

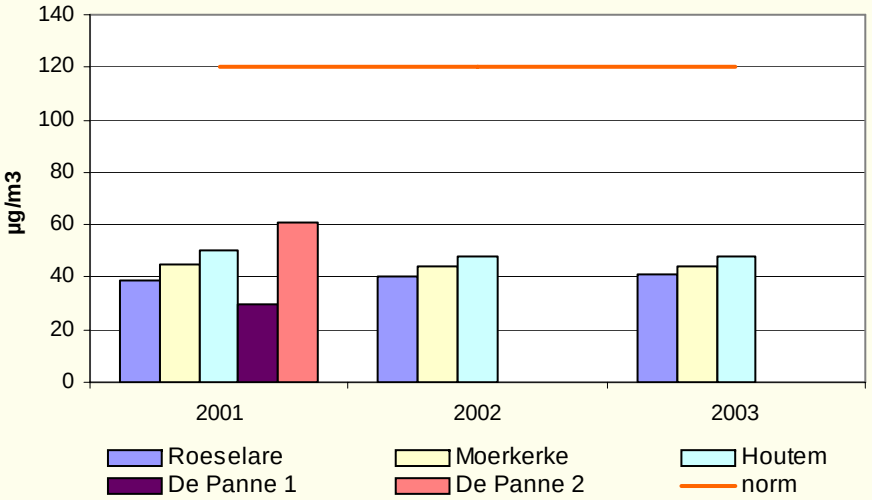
Priorities in the CFP are the introduction of the precautionary approach in setting annual TACs, adjusting catch effort and the size of the fleet to the carrying capacity of the stocks, and introducing environmentally friendly fishing tools and methods.

How reliable is the indicator?

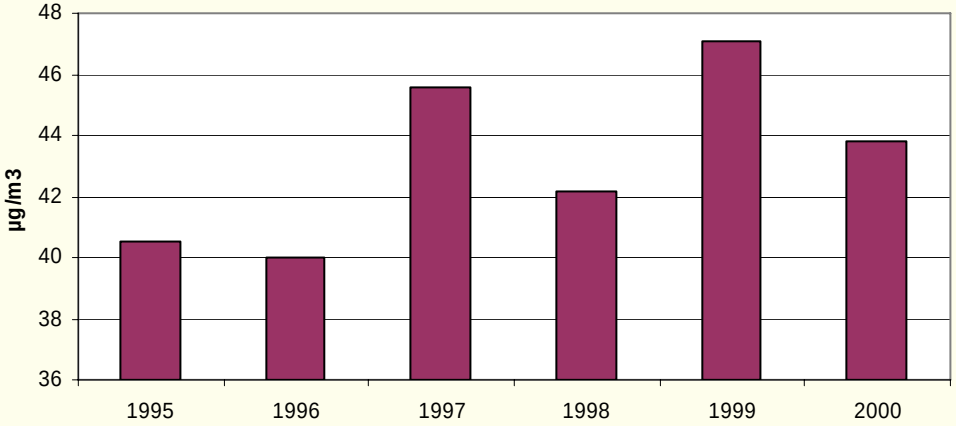
Stock assessments should also be extended to other commercially important stocks, in order to obtain a broader view on the status of fish stocks. In the future, data on recruitment, spawning stock biomass and fishing mortality should also be based on commercial catches and landings along with scientific surveys. Long time data series of landings in Western Europe provide a good indication of changes in landings patterns. Landings however do not include information relating to discards. The ICES recognizes that discard data is variable in its accuracy and availability and that by-catch data for many species (such as marine mammals) is often based on anecdotal and voluntarily collected evidence. New EU legislation regarding collection of discard information and concerted efforts by many groups to study and reduce by-catches should increase both the quantity and quality of information available in the future.

Indicator 22 Air quality

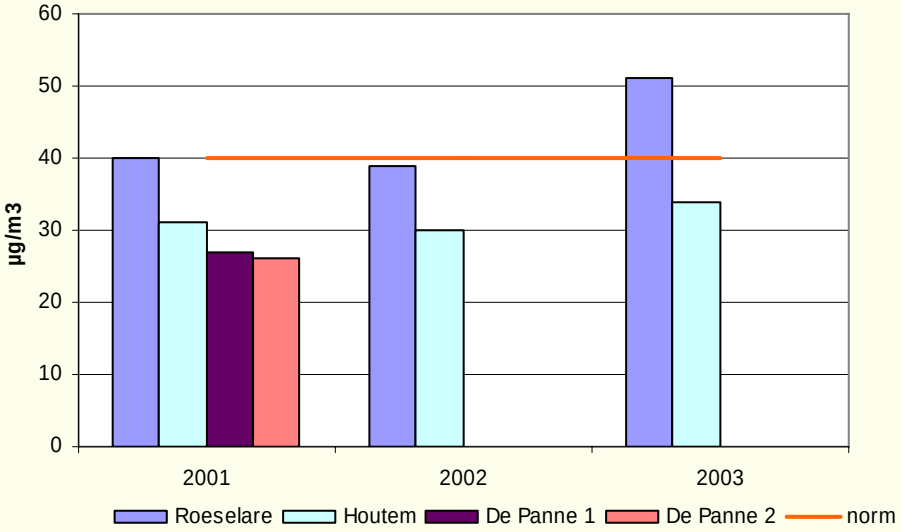
Ozone concentrations (daily average in µg/m³) in West-Vlaanderen (VMM, 2001-2003)



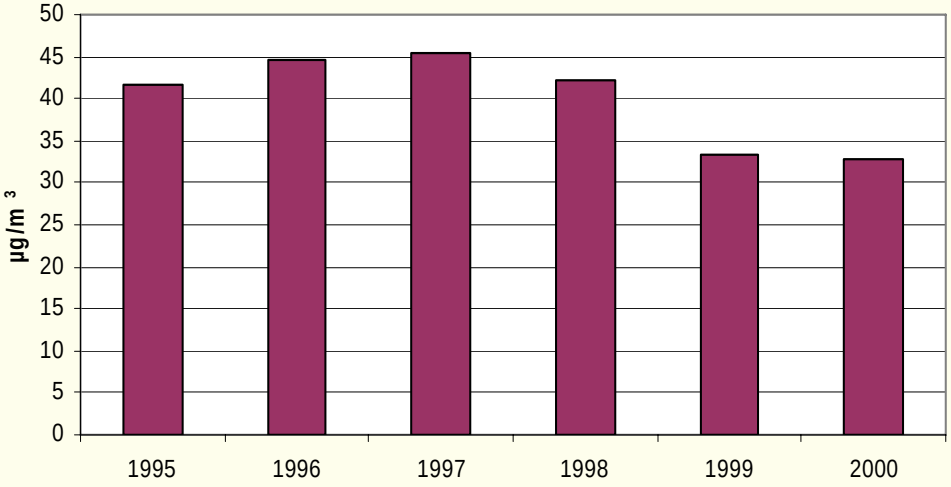
Ozone concentrations (daily average in µg/m³) in Zeeland (LNL, 1995-2004)



PM-10 concentrations (daily average in µg/m³) in West-Vlaanderen (VMM, 2001-2003)



Concentration of PM-10 (daily average in µg/m³) Zeeland (LNL, 1995-2004)



Key Message

- International (CAMP-OSPAR) mandatory monitoring of substances in ambient air in the coastal stations of the Southern North Sea is not fully complied with in all SAIL countries.
- At most monitoring stations, measured concentrations of sulphur dioxide and nitrogen dioxide are below target levels; the levels of ozone and particulate matters, however, still exceed target and critical values in coastal stations.
- Transboundary and coordinated research is needed to enhance comparability and reliability of the monitoring results.

Why monitor air quality?

In the past, an important number of sanatoria and health centres were located along the Southern North Sea coast. Not only seawater but also the healing effect of the pure air attracted people to the seaside to revalidate or heal from lung diseases. After decades of increasing intensity in shipping, port and industrial expansion, and widespread urban development, the impact of contaminants in and along the North Sea has left its mark on air quality. Chronic and acute contamination of ambient air affects human health and deteriorates the natural environment, buildings and cultural heritage sites. It is caused by emissions from both mobile and point sources; these are directly linked to energy consumption, concentrations of industries, density of urban and transport networks and intensity of traffic on land and at sea.

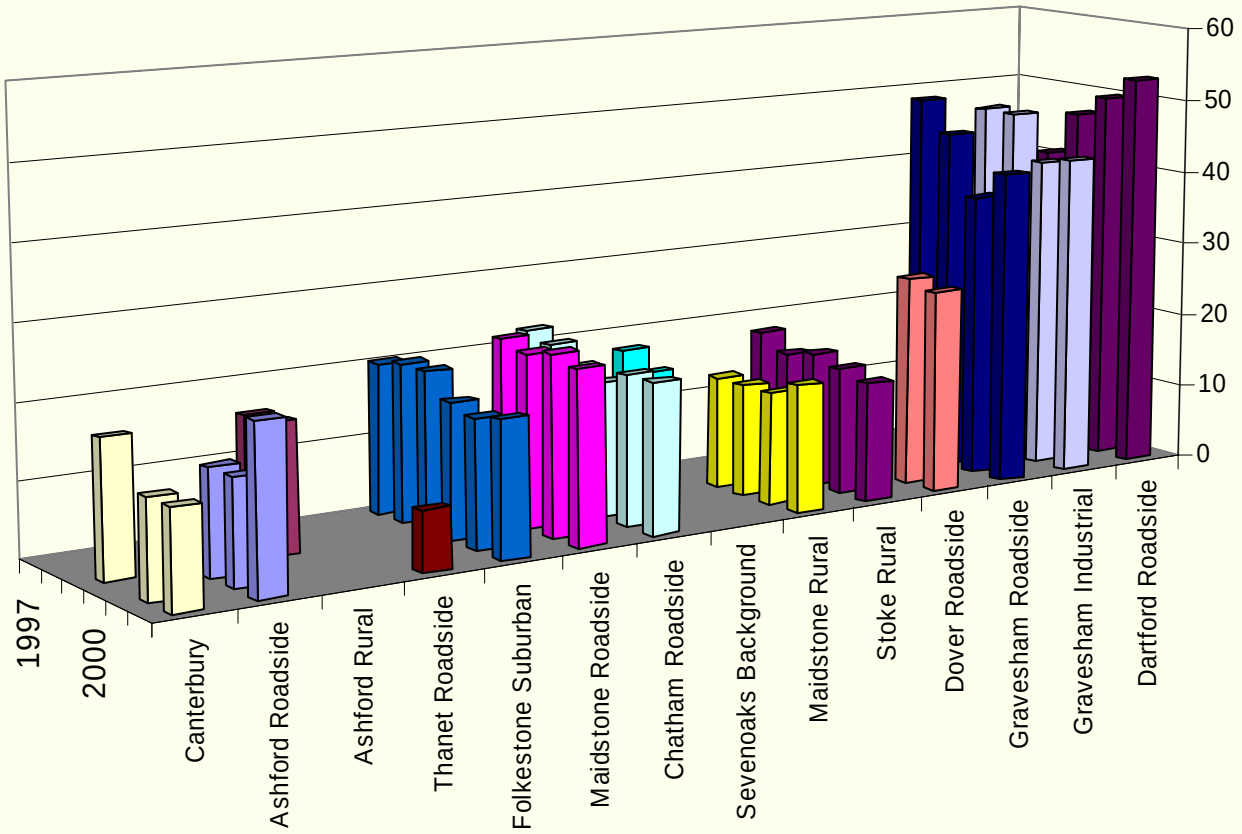
Fine particulates (PM-10) have a diameter less than 10 micrometres and therefore can be carried deep into the lungs, where they may cause inflammation. PM-10 and Ozone are a concern for human health in general, specifically to people with heart and lung diseases. SO_2 and CO are related to acidification processes. Nitrogen may be absorbed by sea water and add to eutrophication and algal blooms.

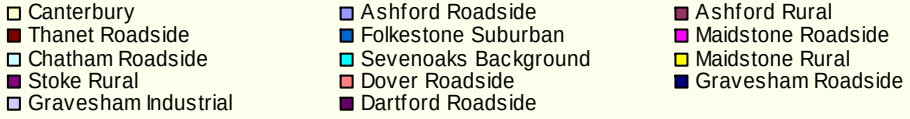
Where do the data come from?

Compliance with the EU Ozone Daughter Directive 2002/3/EC, obliges Member States to report data for the annual reference period. PM-10 data is annually submitted under the Exchange of Information Decision. Responsible authorities in the SAIL countries are the Vlaamse Milieu Maatschappij (VMM) in Flanders, Landelijk Meetnet Luchtkwaliteit (LNL)- Rijksinstituut voor Volksgezondheid en Milieu in The Netherlands; the networks of AREMA, Opal'Air and Hygeos in Nord-Pas de Calais (France). In Nord-Pas de Calais, a number of authorities are responsible for an extensive coverage of local monitoring networks. In the UK, a number of local authority networks have been set up to monitor air quality in Essex (Essex Air Quality Consortium), Kent (Kent Air Quality Monitoring Network) and the London Air Quality Network.

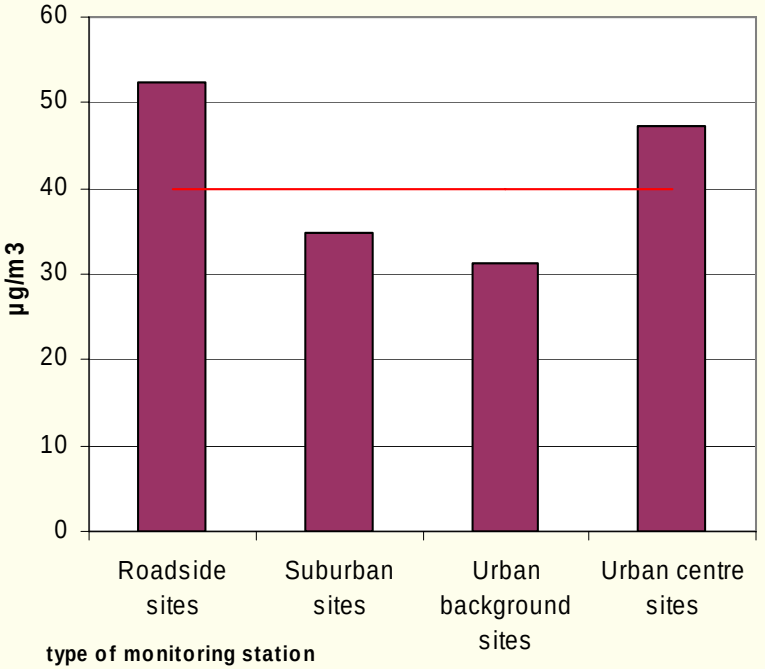
Transboundary cooperation between the monitoring networks of Flanders and Nord-Pas de Calais has enabled valuable comparison and interpretation of air quality and related processes.

Concentration of Particulate Matter PM-10 (µg/m^3) in the UK (Kent Air Quality Monitoring Network, 1997-2002)





Concentration of SO2 (µg/m³) in Kent and the Thames region (Netcen, 2002)



What does the indicator show?

In a modelling study in the Thames corridor (EA, 1993), it was found that 70% of nitrogen dioxide was the result of emissions from motor vehicles. Levels of ozone and PM-10 exceed targets in a number of stations in the Thames area, and also at Stoke in Medway (roadside) station.

The limit value for PM-10 is 50µg/m³ (24 hour average) not to be exceeded for more than 35 days per calendar year, from 2005. The target value for Ozone is 120µg/m³ (maximum daily 8 hour mean), not to be exceeded on 25 or more days per year, from 2010.

PM-10 levels were also found to be particularly high at Dartford and Gravesham roadside stations, and Gravesham industrial site (1997-2002).

In Flanders, measuring stations at the coast record that NO_2, SO_2 and ozone average daily concentrations (µg/m^3) remain below the norm. Sulphur dioxide concentrations are higher at Zeebrugge, although they remain below the norm (120µg/m³). The average daily concentration of particulate matter PM-10 is higher in Roeselare (hinterland) than in coastal stations; it exceeded the norm in 2003. Although the results suggest an increasing trend, longer time-series are needed for interpretation.

In Zeeland, concentrations of PM-10 are close to limit value but seem to be decreasing over the period 1995-2000. Ozone concentrations fluctuate but remain far below target levels.

What are the implications for planning and managing the coast?

Air quality is a transboundary issue; it is therefore addressed by common legislation and norms or target values in the European context. The EU Ozone Daughter Directive 2002/3/EC established target values, long-term objectives, information and thresholds for Ozone. According to this Directive, which amends the former 92/72/EEC, Member States must inform the Commission on a monthly basis of observed exceedences of the information and alert ozone threshold values. Data for the annual reference period must also be reported. The PM-10 data is annually submitted under the Exchange of Information Decision.

Where air quality objectives are unlikely to be achieved, or targets values are frequently exceeded, local authorities may declare specific air quality management areas and/or intensify monitoring.

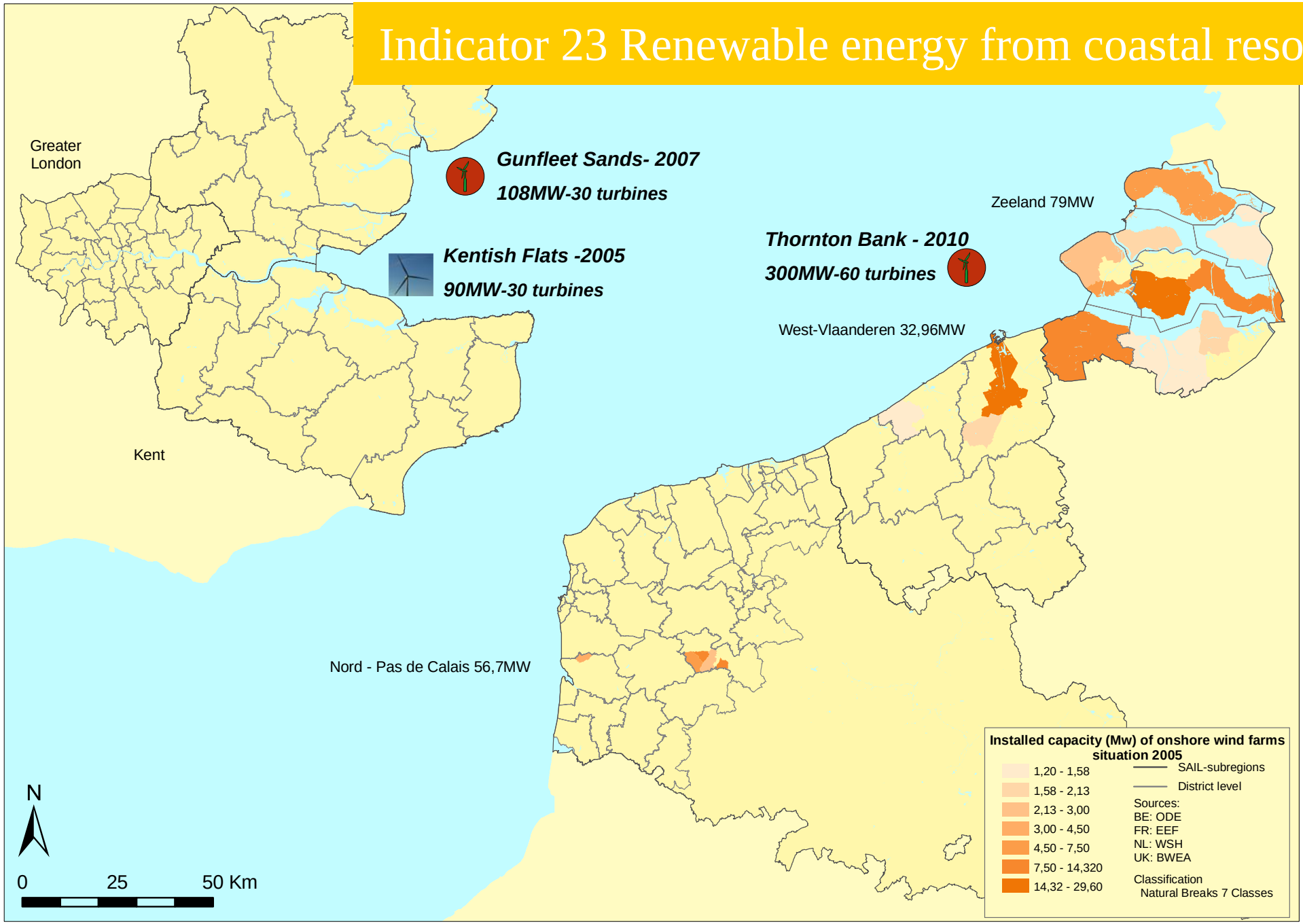
Under the Comprehensive Atmospheric Monitoring Program CAMP for the OSPAR Commission mandatory monitoring is required in coastal stations. In spite of its mandatory status, substances are not monitored in all OSPAR countries. In 2003, only 4 stations in the SAIL region (all located in Belgium) reported required monitoring results. France and the United Kingdom did not submit data for 2003. Transnational cooperation is crucial to assess reliability and to produce comparable results. Although there is a long way still to go, authorities in Flanders and Nord-Pas de Calais coordinate joint air quality research through specific projects (AEROSOL, EXPER/PF) and monitoring networks across the Channel have produced the first transnational databases on air quality, which can be consulted at:

http://hygeos.net1.nerim.net:8080.

How reliable is the indicator?

Meteorological variability is large and high ozone peaks are strongly dependent on weather conditions. Therefore, measuring stations need to monitor ozone concentrations on a regular basis, and geographical coverage of the monitoring network needs to be sufficiently large. Specific instruments applied for the monitoring of particulate matter (Belgium, The Netherlands), is known to underestimate actual concentrations and a correction factor is applied. It is not always clear whether this is consistently done in other monitoring networks. The CAMP-OSPAR monitoring reports on significant difference in quality control between countries.

Indicator 23 Renewable energy from coastal resources



Offshore windfarms in production (2005)

Offshore windfarms under construction

- *Installed capacity (Mw) from offshore wind farms*
- *Installed capacity (Mw) from onshore wind farms*
- *Installed capacity (Mw) from wave and tidal energy*

Key Message

- The Southern North Sea is a longstanding site of energy production being home to six nuclear power stations and numerous oil-, gas-, and coal-fired plants.
- The region is now a focus for the development of renewable sources of energy utilising wind, tidal and wave power.
- By 2010, roughly 2,000MW of installed capacity for generation of electricity by offshore windfarms will have been added to the 140 MW generated onshore in Zeeland, West-Vlaanderen and Nord-Pas de Calais (2005).

Why monitor the renewable energy from coastal resources?

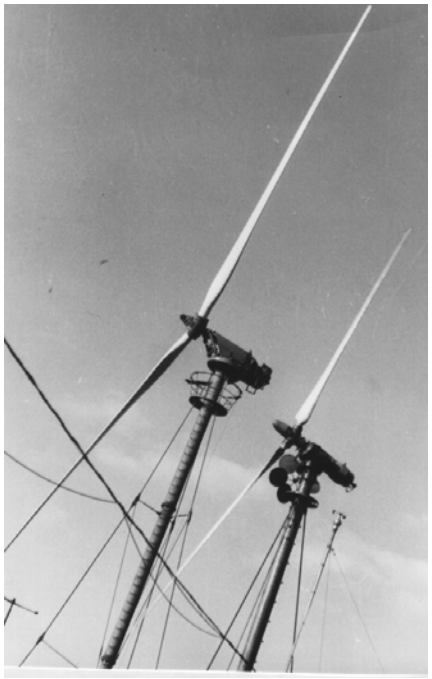
Energy production from renewable sources is generally considered environmentally benign. Increasing the share of renewable energy production is an important step towards achieving a sustainable supply for increasing energy demands. The shift in production from conventional to renewable energy is in part triggered by climate change, as a consequence of global warming through carbon release. It is particularly significant for the Southern North Sea because of the vulnerability of the region to storm surges and rising sea levels. Many countries have therefore set targets as shares of the total energy production to be provided by renewable sources. Wind energy is contributing increasingly towards meeting these ambitious targets. Because coastal regions provide excellent conditions and opportunities for alternative energy production, these activities have to be stimulated and carefully monitored. Installed capacity does not measure the amount of energy (Mwh) actually produced by the installation, but it provides a good measure of the private and public investments, political interest and the relative importance of the coastal zone for eolic and other alternative energy sources.

Where do the data come from?

In Europe, EUROSTAT is responsible for collecting general data on renewable energy from Member States. However, these data do not specify location and capacities of individual stations. Most SAIL countries have private or governmental organizations or producers associations that gather more detailed information. Most of them provide information on wind energy installations and capacities. Main data suppliers include Organisatie Duurzame Energie (ODE) in Belgium, Espace Eolien in France, Wind Service Holland (WSH) in The Netherlands, and the British Wind Energy Association (BWEA).

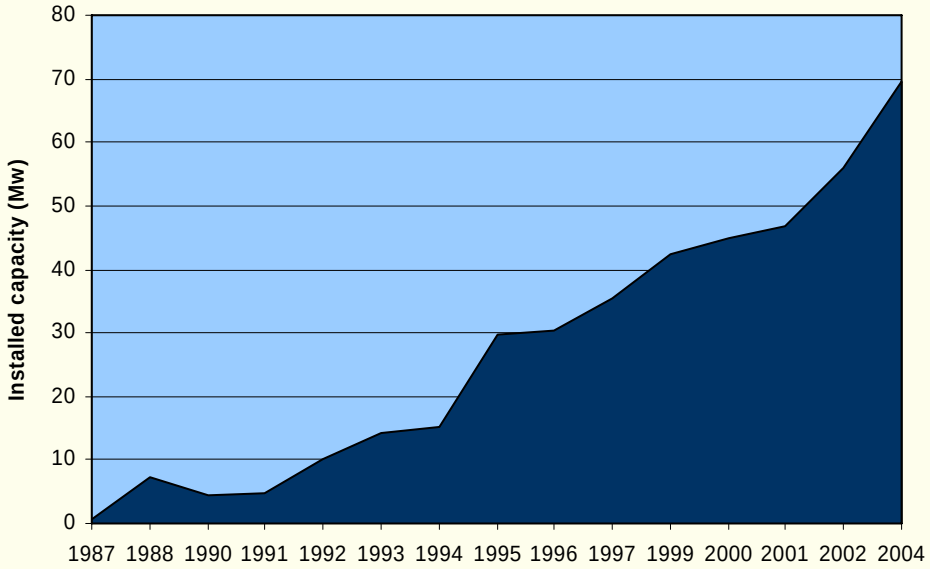
What does the indicator show?

From virtually nothing in 1987 (Zeeland), 1995 (West-Vlaanderen) and 1999 (Nord-Pas de Calais), onshore wind energy capacity in all three sub-regions has increased to 79MW, 33MW and 57MW respectively (2005). More recently, attention has turned to offshore generation. Kentish Flats windfarm began production in late 2005, with the capacity to generate enough electricity annually for 100,000 households. It will be joined in 2007 by Gunfleet Sands off the Essex Coast with a capacity of 108MW and in Belgium in 2010 by Thorntonbank with 300MW and Bligh Bank with 330MW. Licenses have been granted in the UK for a further 300MW installed capacity off Thanet, 500MW at Gabbard sands, and 1000MW at the London Array site which is expected to come onstream by 2011.



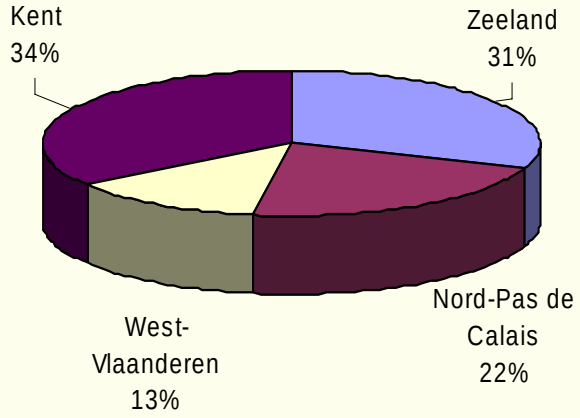
Master plant of all wind utilizing machines (Hütter, 1957)

Capacity (MW) of onshore wind energy production in Zeeland

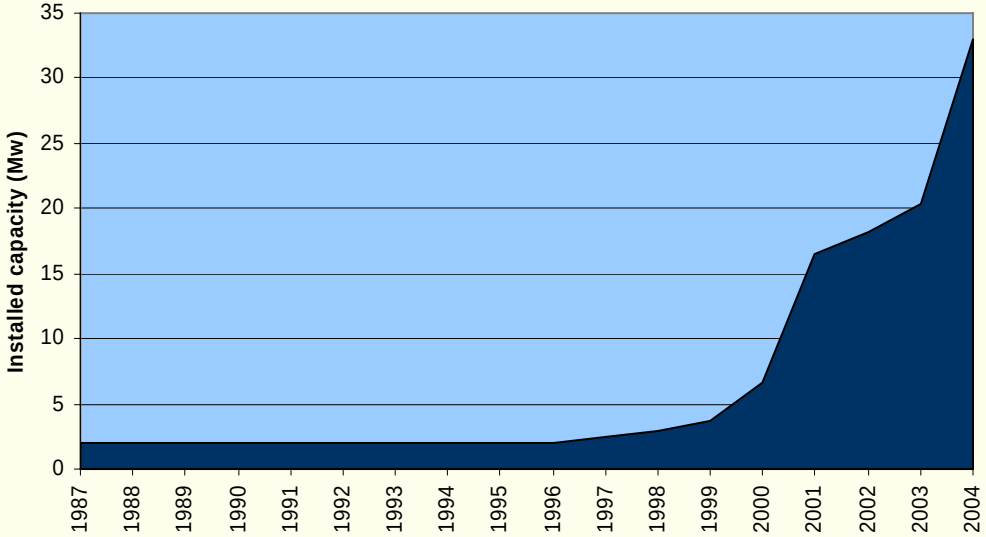


Renewable electricity 2010 targets - percent of gross electricity consumption from renewable sources	
EU (25 countries)	21.0%
EU (15 countries)	22.1%
Belgium	6.0 %
France	21.0%
The Netherlands	9.0%
United Kingdom	10.0%

Shares of onshore and offshore wind energy (installed capacity) in SAIL sub-regions 2005



Capacity (MW) of onshore wind energy production in West-Vlaanderen



What are the implications for planning and managing the coast?

Renewable energy is generally considered environmental benign with very low net emissions of CO_2 per unit of electricity produced. This is especially true for energy production from renewable coastal resources. Coastal areas provide excellent opportunities for harvesting clean energy from wind, tides and waves. Not surprisingly, energy production from renewable coastal sources is considered an important step towards achieving sustainable energy supply for increasing demands. However, the exploitation of renewable energy sources has to compete with other coastal uses. They might also have negative impacts on tourism, land-and seascapes, habitats and ecosystems. Wind, wave and tidal turbines can have visual and noise impacts on the areas in which they are sited, affect wildlife and restrict access to sea or to the coast. Many impacts can be minimised through careful site selection. Planning of new installations has to be done considering other coastal functions so as to avoid conflict, preserve tourism, and protect biodiversity and natural values. A backlash against siting wind turbines on land will inevitably mean that developers will look more to offshore provision. As the sea becomes more crowded, there will be an increasing need to introduce a rigorous marine spatial planning system.

Methods and techniques for production of energy from tidal or wave energy are still in an experimental phase. Some technologies such as wind turbines are already well advanced with many improvements since they were first introduced (increased efficiency and capacity). Another obstacle for renewable energy consists in the access to the electricity grids. The EU directive on the promotion of electricity from renewable energy sources in the internal electricity market (2001/77/EC) addresses this issue requiring Member States to develop clear and transparent policies regarding charges to energy providers. The lack of a guaranteed market of access rights to the grid for smaller generators can restrict the more widespread uptake of renewable energy technologies.

To achieve a higher share of energy from renewable sources, targets have been set at a national and European level. The EU Directive (2001/77/EC) for example sets an indicative target of 22.1% of gross EU-15's (21% for EU-25) electricity consumption from renewable sources by 2010. It requires Member States to set and meet annual national indicative targets consistent with the Directive and national Kyoto Protocol commitments. Flanders in Belgium, is striving towards a 6% share of renewable energy from which 55% from wind (750MW). One third of it should come from offshore installations.

How reliable is the indicator?

Although information on renewable energy production, installed capacity and type of installation at the national level are reported to the EREC (European Renewable Energy Council), data for the regional and local situation are not so readily available or accessible. Relevant differences were found between datasets reported by differing sources. Since reporting generally focuses on a description of the current situation, it is more difficult to construct time series for a particular sub-region.

Link to European Renewable Energy Council:

http://www.erec-renewables.org/sources/wind.htm

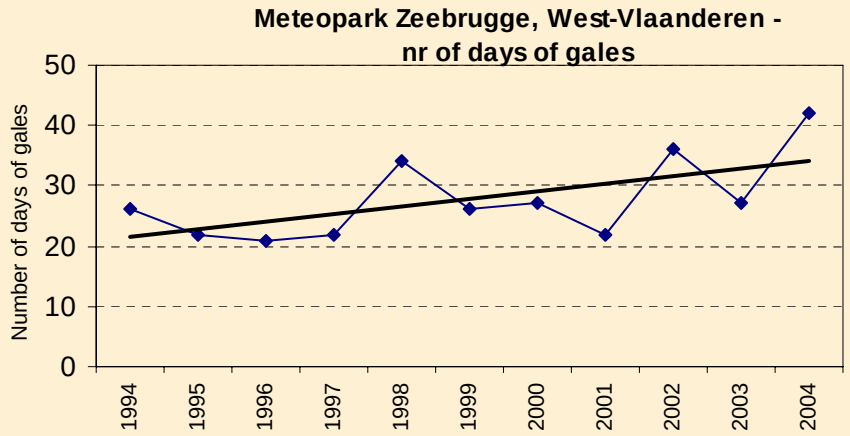
http://www.ewea.org/06projects_events/proj_WEfacts.htm: "Wind Energy - The Facts"

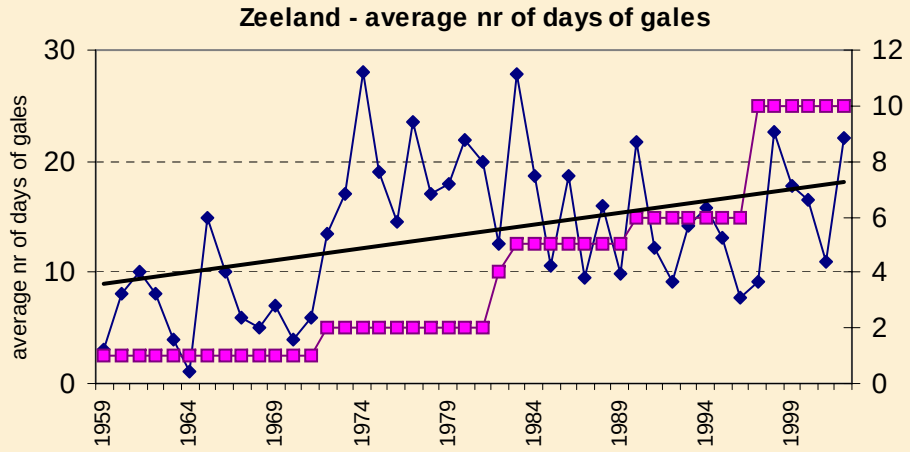
7

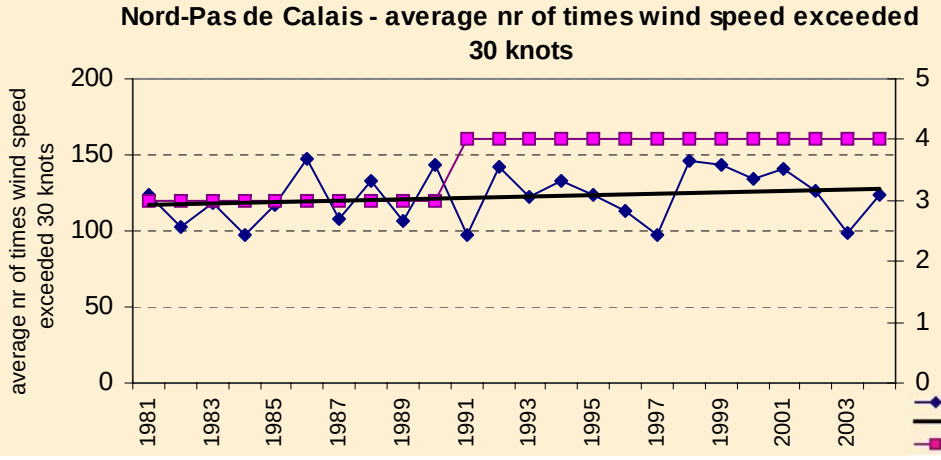
To recognize the threat to coastal zones posed by climate change and to ensure appropriate and ecologically responsible coastal protection

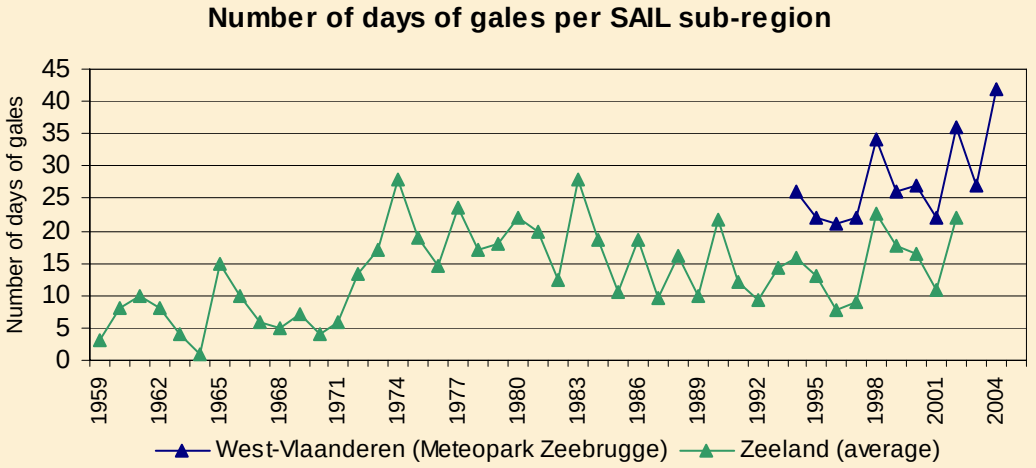
Extreme weather conditions « » Sea level rise « » Coastal erosion and accretion « » Natural, human and economic assets at risk

Indicator 24 Extreme weather conditions









Where do the data come from?

The Hydra project at the KNMI (Royal Meteorological Institute of The Netherlands) focuses on extreme wind speeds. This research supports the National Institute for Coastal and Marine Management (RWS/RIKZ) in assessing the safety levels of Dutch dyke rings, which is a legal obligation. Data on extreme wind speed in Zeeland are available since 1959 for one of the 10 stations (Vlissingen).

The Flemish Agency for Maritime Service &Coast-Division Coast, supplies data for 4 stations in the Belgian coastal zone, both onshore and offshore. The 4 coastal stations administrated by Météo France in Nord-Pas de Calais have registered wind speed since 1981.

Key Message

- A day of gale is defined as any day in which the maximum wind speed is equal to or higher than 30knots (15.432m/s).
- In Vlissingen, the longest recording station for gale activity in the study area, a slightly increasing trend is observed.
- In the absence of a larger number of long-term series, it is difficult to confirm an overall trend in the Southern North Sea. Above all, records confirm the unpredictable nature of storms.

Why monitor extreme weather conditions?

Much of the coastal area in the Southern North Sea is low-lying and therefore vulnerable to the predicted increase in flooding, inundation and erosion. Built-up settlements and coastal frontages are particularly susceptible to storm surges. Most damage to coasts is caused by extremely high sea levels and waves during storm surges. In Zeeland waters, wind is the main source of waves and hence a crucial issue in the assessment of safety levels of Dutch dyke rings. There is a need to monitor the frequency of extreme weather in support of risk assessment and management schemes in coastal zones.

What does the indicator show?

Based on the data collected in the 4 coastal measuring stations in West-Vlaanderen, no trend can be observed since MDK started recording in 1992. The number of days of gales measured at Meteopark-Zeebrugge (the longest time series available) fluctuates between 26 in 1994 to 42 in 2004.

At Météo France stations in Dunkerque and Boulogne (Nord-Pas de Calais), the number of times p.a. that wind speed exceeded 15m/s seems to have remained stable since measuring started in 1981. In Calais, frequency of gales rose from 20 in 1991 to 126 in 2004. The differences in measurements between stations may be partly due to the (inshore or onshore) location of the measuring device. Furthermore, long- time series are needed in order to interpret results: an analysis of wind speed data for 1956-2001 for Dunkerque weather station, showed a decreasing trend in the number and frequency of storm events, although periods of increased storm activity were distinguished (GEODAL Lab, Université du Littoral Côte d'Opale). In Vlissingen, where recording started as early as 1959, a slightly increasing trend is observed. Studies in the UK reveal no clear trends in the long-term. However, between 1988-1997 the highest frequency of gales was recorded since monitoring of gale activity started in 1881.

It is difficult to confirm an overall trend in the Southern North Sea in the absence of a larger number of long-term series. Moreover, an increase in the number of days of gales does not necessarily imply an increase in the number of storms.

What are the implications for planning and managing the coast?

The changes in global climate are likely to be due to a combination of both natural and human causes. The most important of the greenhouse gases is carbon dioxide CO_2, which accounts for an estimated 60% of the enhanced greenhouse effect.

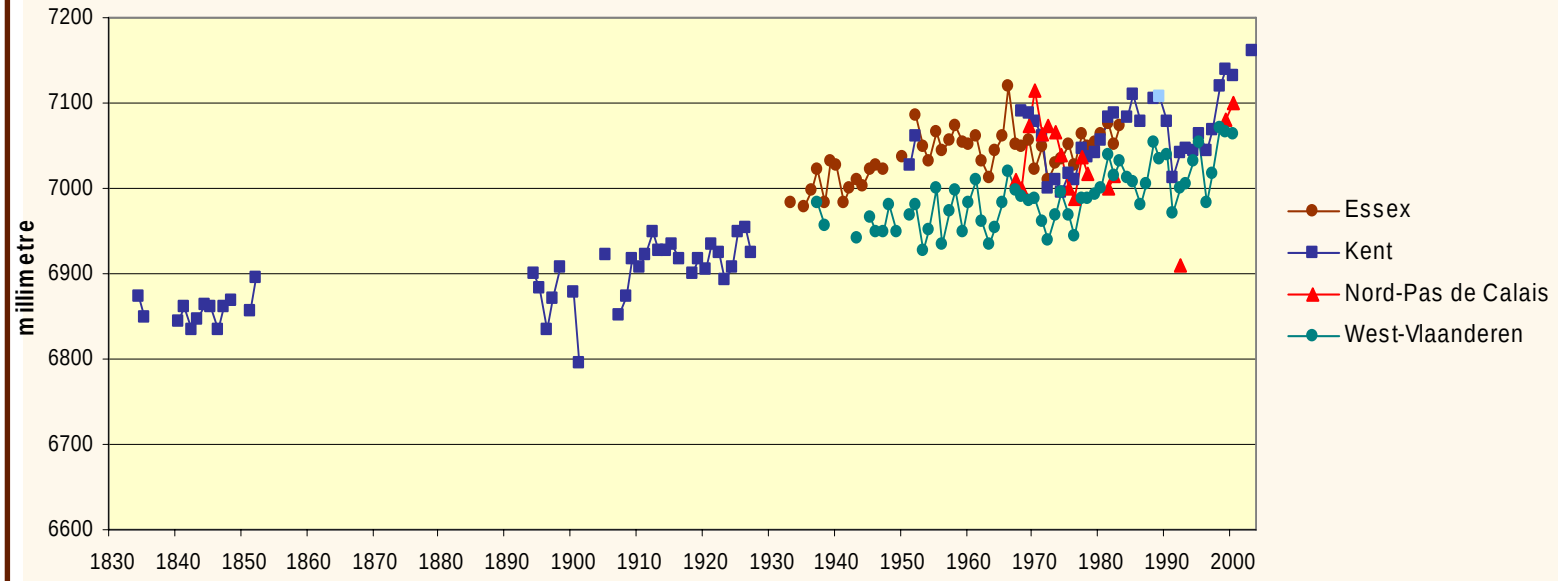
Planning guidance in most EU Member States prescribes that planning authorities must take account of climate change considerations in their development plans. This is needed in terms of mitigating the cause of climate change and adapting to the effects of climate change. Jointly with reliable data on sea level rise and detailed flood risk mapping, the monitoring of extreme weather is crucial information in development plans and risk assessments.

How reliable is the indicator?

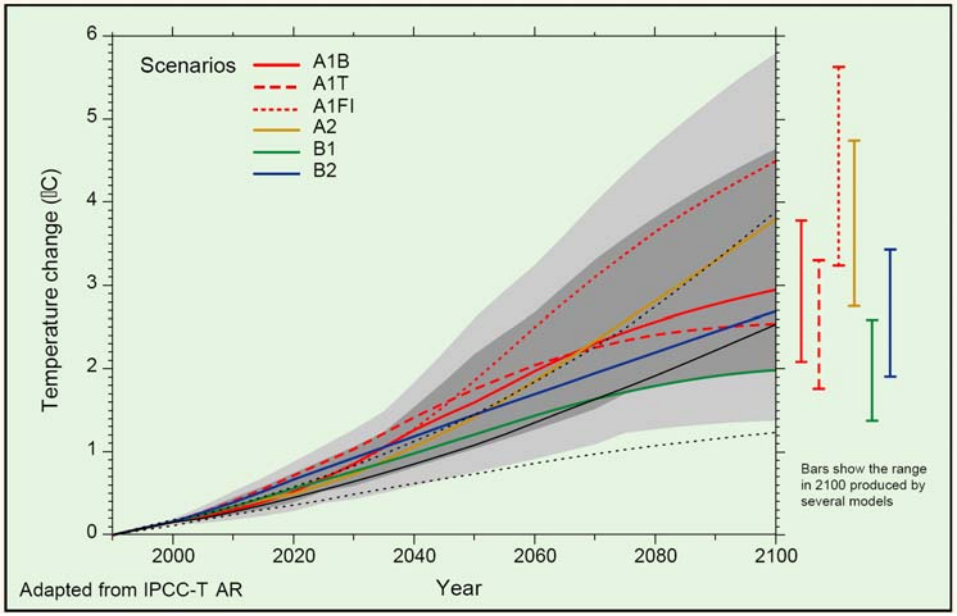
In Zeeland and West-Vlaanderen, the number of days of gales is calculated for maximum wind speed equal or higher than 30knots (15.432 m/s). For Nord-Pas de Calais, statistics are based on wind speed equal to or exceeding 15m/s. The wind-speed measuring device in Le Touquet (Pas de Calais) broke down between 18/04/2003 and 24/06/2003, resulting in 68 consecutive days of missing data. Longer time series in a higher number of coastal stations are needed.

Indicator 25 Sea level rise

Sea level relative to land in Essex, Kent, West-Vlaanderen and Nord-Pas de Calais
Permanent Service for Mean Sea Level (PSMSL) stations with longest time series



Predicted global mean sea level rise by 2100 (IPCC)



Key Message

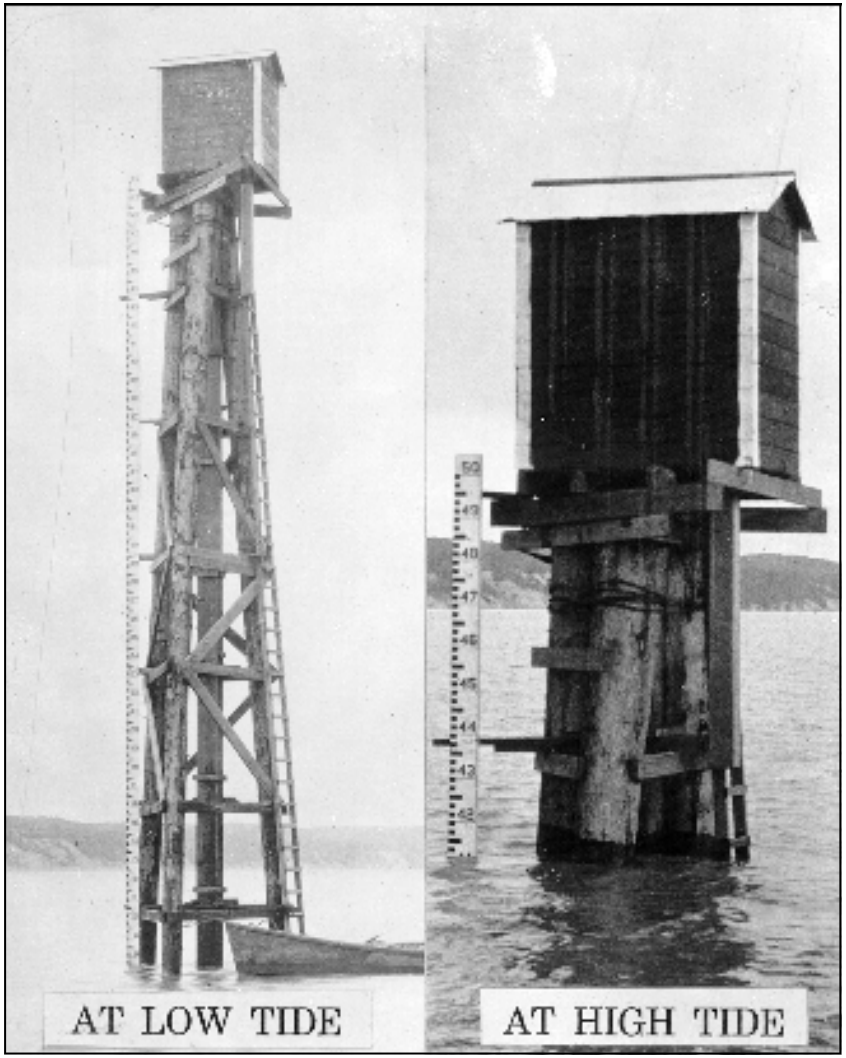
- Each of the longest time series for the sub-regions in the Southern North Sea indicate that the sea has risen relative to land over the last century with values ranging locally from 0.14mm/yr in Nord-Pas de Calais (Dunkerque) to 1.65mm/yr in Kent (Sheerness), depending on the vertical land movement.
- Differences between stations of the same sub-region can be considerable: in Essex averages range from 0.96mm/yr (Harwich) up to 5mm/yr (Walton on the Naze).

Why monitor sea level rise?

It is anticipated that climate change will lead to a rise in global (mean) sea level, primarily because of thermal expansion of ocean water and melting of ice sheets. Coastal areas could face a significant risk of increased flooding, inundation and erosion as a result. An increase in storm frequency, along with climate change, could add to the risk of flooding from sea level rise. In addition, downward or negative vertical land movements in the region add to the threat of flooding from the sea.

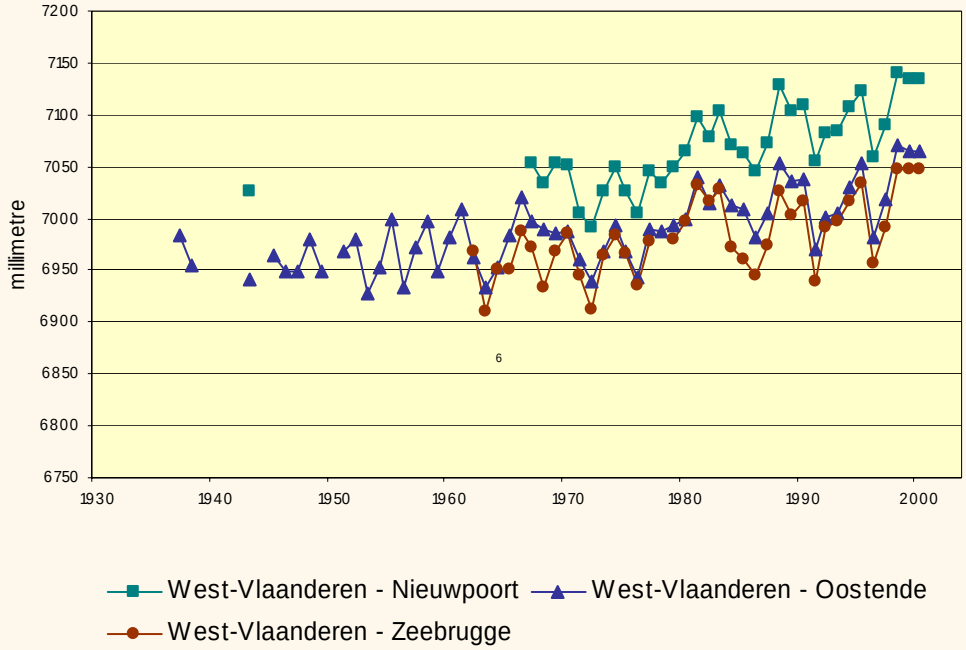
Where do the data come from?

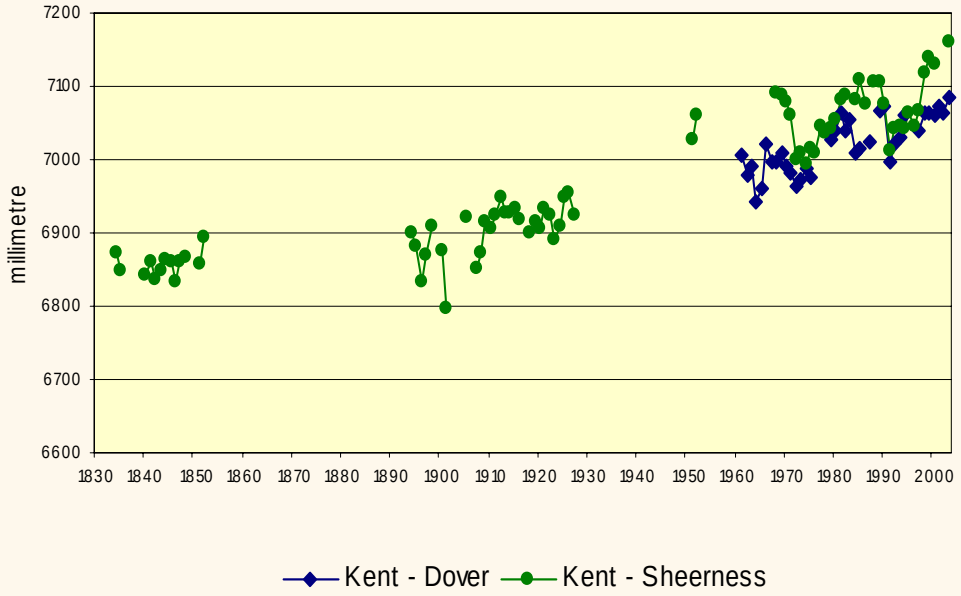
The Permanent Service for Mean Sea Level (PSMSL) receives monthly and yearly mean values of sea level from a global network of tide gauges. Datasets collected and presented here only refer to the 'Revised Local Reference' type (or RLR) because they allow the construction of time series. The RLR data are reduced to a common datum, approximately 7,000mm below mean sea level in order to enhance global comparability. In The Netherlands, data are collected according to a different methodology. RWS/RIKZ monitors sea level rise relative to the *Normaal Amsterdamsch Peil* or NAP.

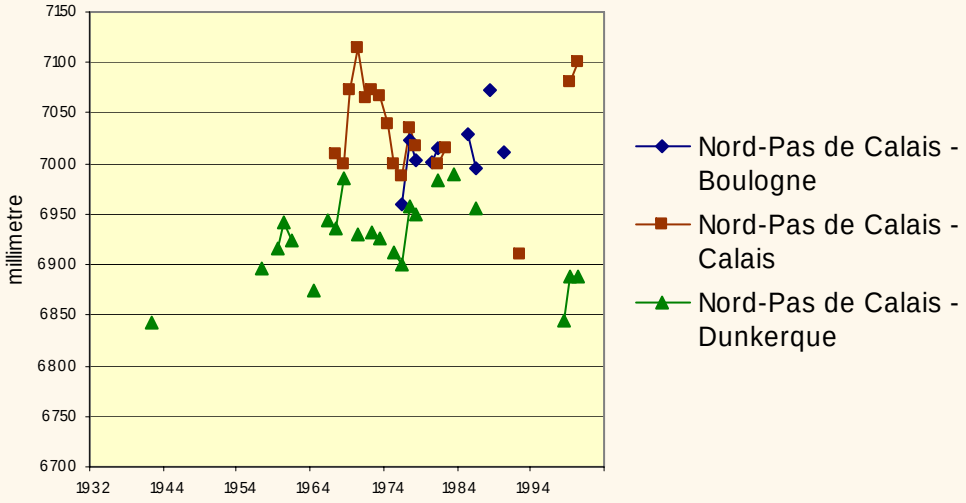


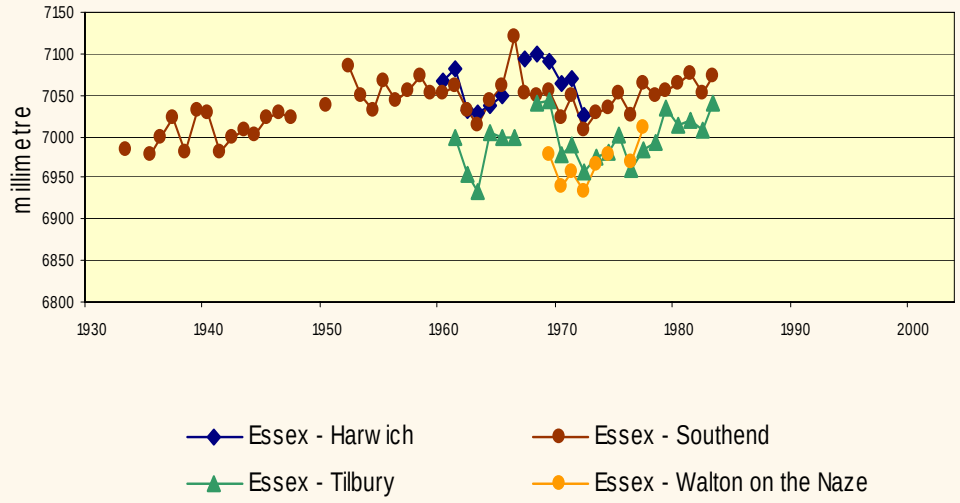
Historic tide gauges

Sea level relative to land in the SAIL sub-regions









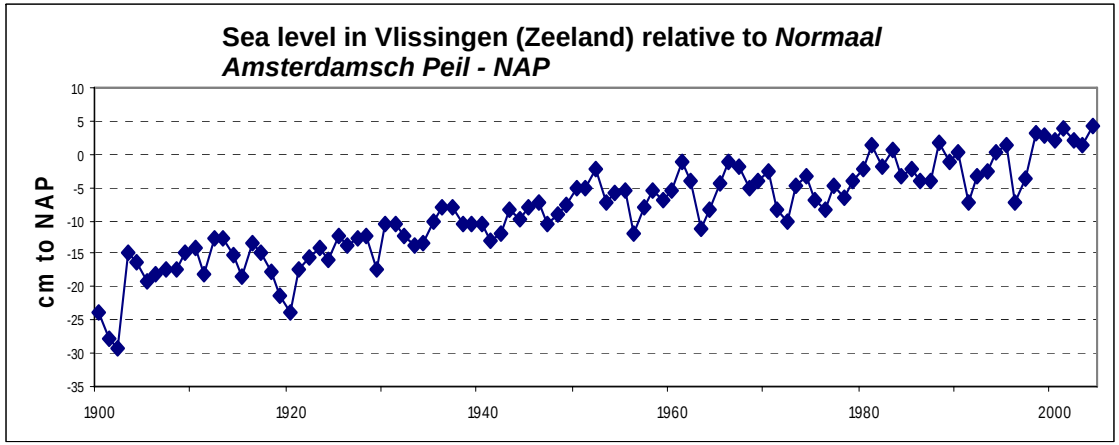
What does the indicator show?

For more than one hundred years, tide gauge stations in the Southern North Sea region have been monitoring tides and sea level relative to land. Data from reliable and relevant time series (RLR) indicate rising sea levels at the longest active gauging station in all 4 subregions. For those stations, relative sea level rise is highest in Sheerness (Kent) with 1.65mm/yr since 1834 and lowest in Dunkerque (Nord-Pas de Calais) with 0.14mm/yr since 1942. Oostende in West-Vlaanderen and Southend in Essex experienced a rise of 1.44mm/yr and 1.2mm/yr respectively since measurements started. Some stations like Boulogne in Nord-Pas de Calais registered highly fluctuating mean sea levels over a relatively short time. In Essex, considerable differences are recorded between the stations of Harwich (0.96mm/yr) and Walton on the Naze (5mm/yr) which are explained partly by local differences in vertical land movement.

According to the measurements in Vlissingen, sea level has been rising steadily since 1900 by an average of 2mm/year in relation to the NAP.

What are the implications for planning and managing the coast?

Global mean sea level has increased by 1.0-2.0mm per year during the 20th century. The Intergovernmental Panel on Climate Change (IPCC) predicts that it will rise further between 14-80cm by the year 2100 as a result of thermal expansion and melting of ice sheets. Coastal areas could face an increasingly significant risk of flooding, inundation and erosion as a result of sea level rise, with or without more frequent and severe storm surges. At present it is not possible to predict the effect of global warming on the storm surge regime affecting SAIL coasts.



Prognosis, adaptive planning and mitigation are increasingly important tools to deal with change and feed into a long-term strategy. A long-term programme of education is to be implemented in those areas where the strategy is to allow for inevitable change.

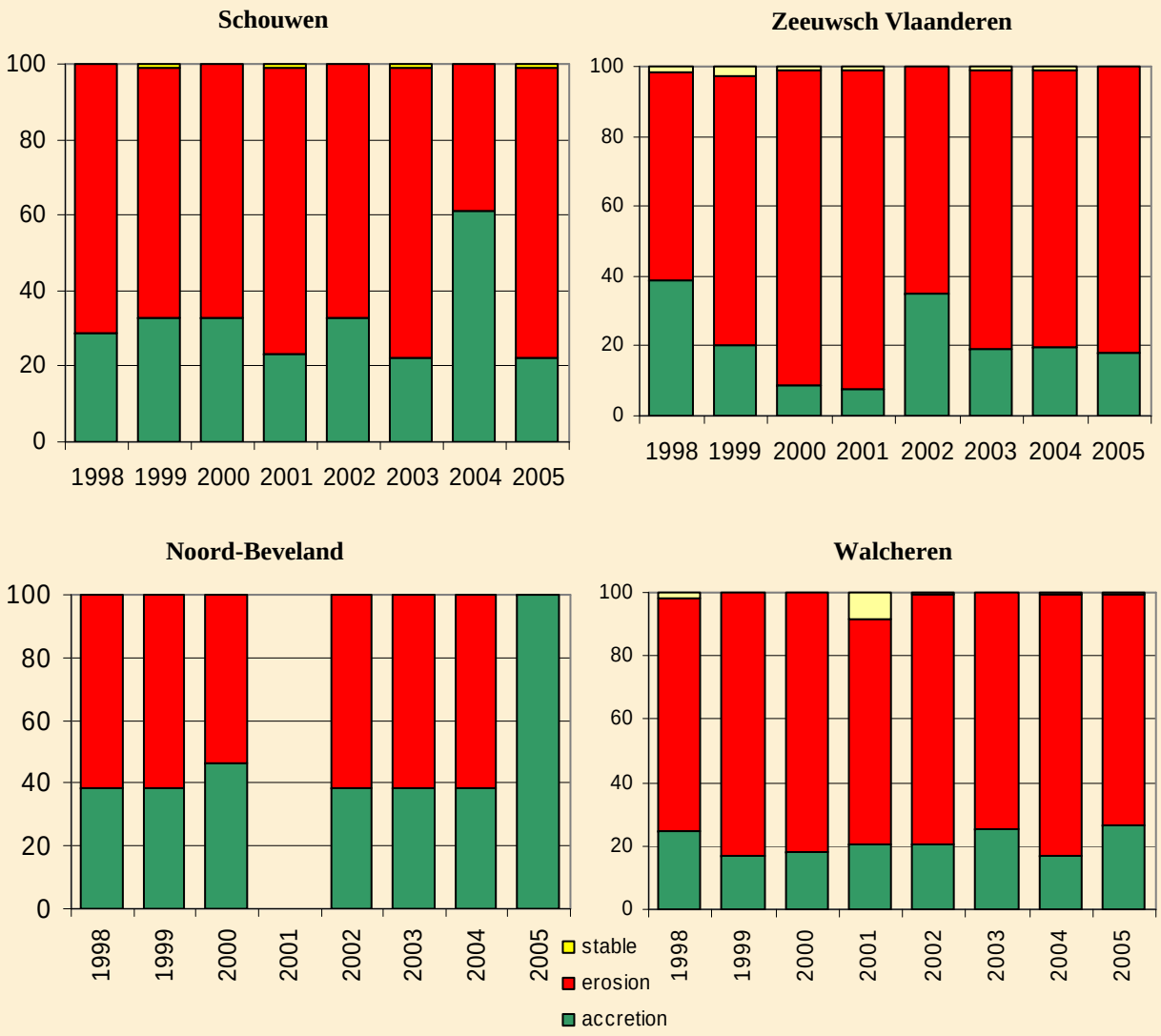
How reliable is the indicator?

Sea level data has been recorded at tide gauge stations over the world for a long time, primarily for tide measurements. Although individual stations are responsible for the quality of the data provided, the PSMSL performs additional quality checks and follows up on each of the stations. For Zeeland no 'RLR' data were available because datasets in The Netherlands are expressed relative to the national level system *Normaal Amsterdamsch Peil (NAP).*

Data source: Permanent Service for Mean Sea Level (PSMSL): http://www.pol.ac.uk/psmsl/datainfo/

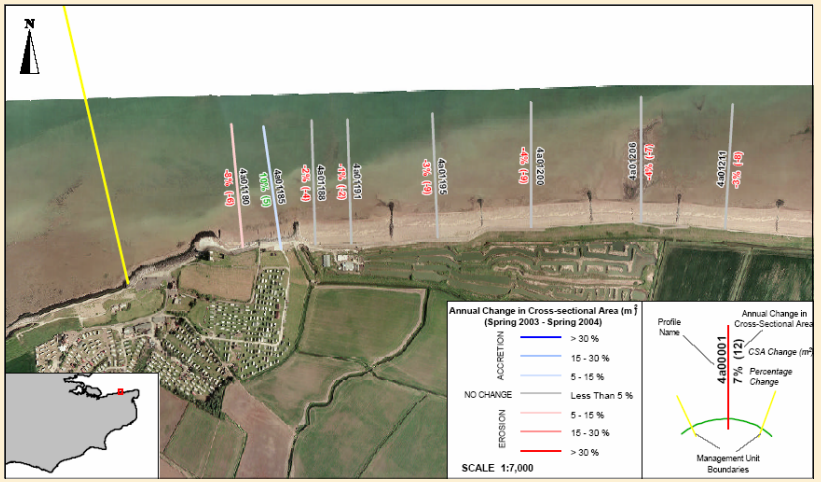
Indicator 26 Coastal erosion and accretion

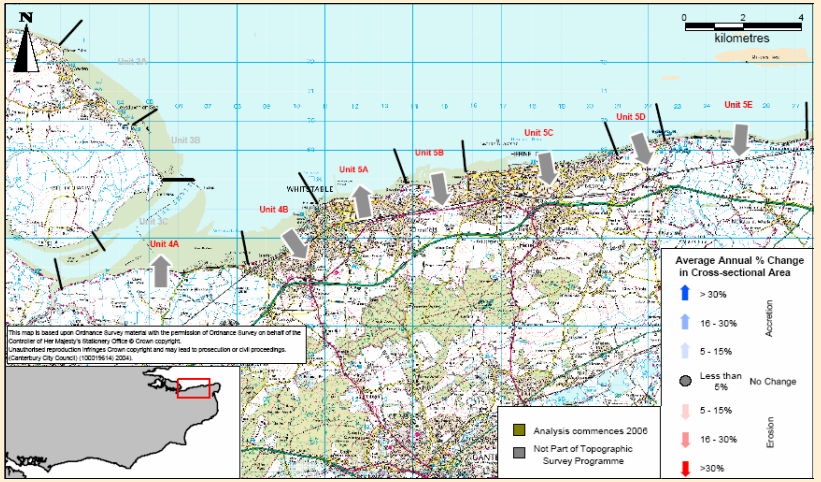
Percent of the coastline that is eroding, accreting or stable Zeeland coastal management units (RWS/RIKZ 2005)



Beach Change summary - Graveney Marsh to Reculver (including Northern Kent Wall) Spring 2003 to Spring 2004

(SECG 2003, courtesy City of Canterbury Council)





Key Message

- Different methods are in place for the evaluation of changes in the morphology of the coastlines and for measuring erosion in the countries bordering the Southern North Sea. The differences are such that comparison is difficult.

- In Nord-Pas de Calais, 90% of the 24 kilometres of chalk cliffs are eroding; erosion will continue affecting two-thirds of the 63 kilometres of coastal dunes. Similarly in Kent, the chalk cliffs of Dover - symbolic of the entire nation - are subject to strong erosion rates.

Why monitor coastal erosion and accretion?

The coast is by nature a dynamic interface between land and sea. Coastal areas perform crucial functions - tidal mudflats and salt marshes absorb wave energy, dunes form a natural flood barrier and a natural filter for drinking water. A range of factors affects the dynamics and the evolution of coastlines, in particular climate. In the last decades, however, infrastructure such as harbours and 'hard' defences interfere with the natural transport of sand, causing coastal erosion further down the coast. Of the 875km coastline that started eroding in the past 20 years, 63% are located less than 30km from coastal areas altered by recent engineering works. Coastal erosion results in loss of land with economic or ecological value, destruction of natural sea defenses and undermining of artificial sea defenses. Besides the local impact of erosion, there is a greater concern for the risks of coastal flooding due to the undermining of coastal dunes and sea defenses. Monitoring the evolution of accretion and erosion, sea level rise and the effects of extreme weather is of crucial importance for developing proper local risk assessment and adequate policies in shoreline management.

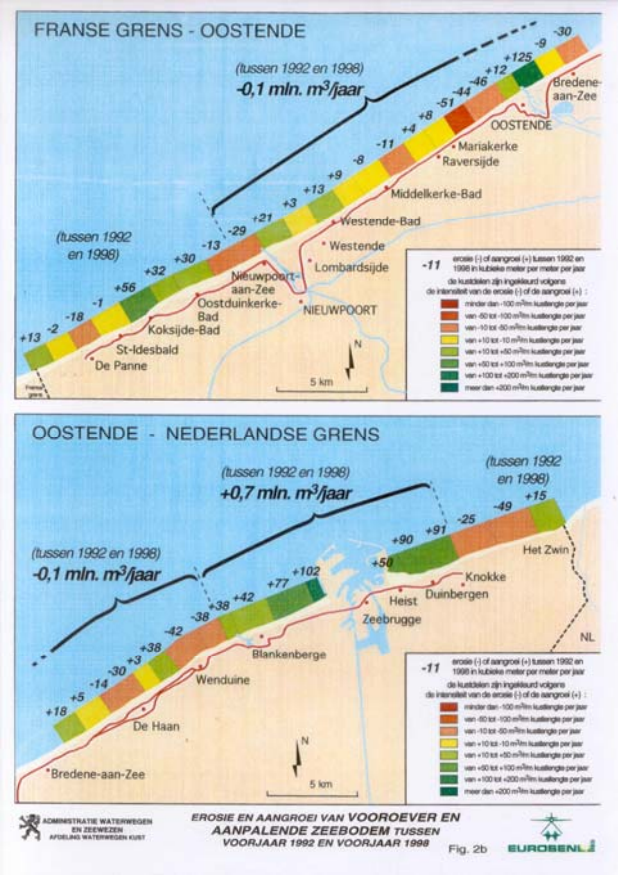
Where do the data come from?

Coastal erosion and accretion is measured in all SAIL countries but different methodologies are employed. The Dutch National Institute for Coastal and Marine Management (RWS/RIKZ) produces annual maps (Kustlijnkaarten) with the position of the coast compared to a baseline (BKL) which is linked to the national grid. The Syndicat Mixte de la Côte d'Opale (SMCO) has carried out studies for the purpose of shoreline management and risk assessment in the coastal zone of Nord-Pas de Calais (Plan Littoral d'Actions pour la Gestion de l'Erosion-PLAGE). In the UK, regional 'coastal groups' comprising local authorities, the national Environment Agency and Natural England have been set up to monitor erosion and propose shoreline management schemes which, if approved, are funded by national government. The Channel Coastal Observatory provides on-line data and information on coastal processes; the website is hosted by New Forest District Council, in partnership with the University of Southampton and the National Oceanography Centre of Southampton. The Flemish Agency for Maritime Service & Coast-Division Coast, is the authority for monitoring coastal processes in Flanders. The EU Eurosion Project provided additional data for the purpose of broad-scale analysis.

What does the indicator show?

Shoreline management plans in Essex (UK) were reviewed from Harwich to Canvey Island in summer 2005. In general, more surveys are needed in order to calculate trends for a significant number of units. From the 54 units located along the South East shoreline from Isle of Grain to Eastbourne, no surveys are planned for 11; analysis for a further 27 units commenced in 2006. A trend is calculated for the remaining 16 units, based on a minimum of 4 surveys. From these, all 16 were considered stable in the sense that overall gain or loss was less than 5% of the actual beach volume; 6 showed a net loss and 8 a net gain. Still, within units large differences occur: 'Graveney Marsh to Reculver' (unit 5C-overall loss of -1.2%) includes a sub-unit where as much as 33% of beach material

Overview of erosion and accretion in management units of the Belgian coast, including the foreshore (MDK, Eurosense 1998)

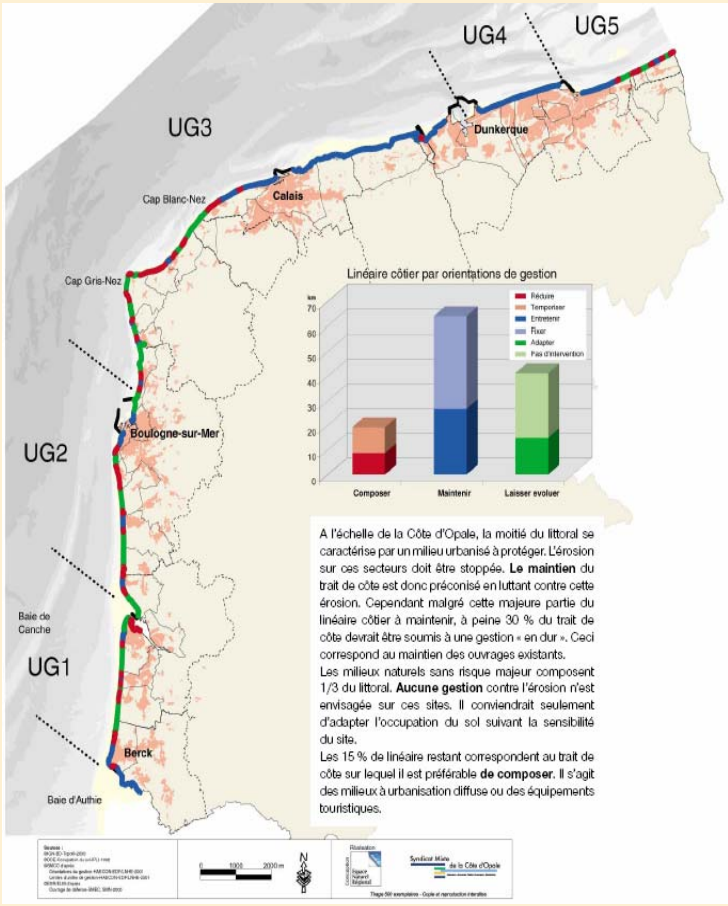


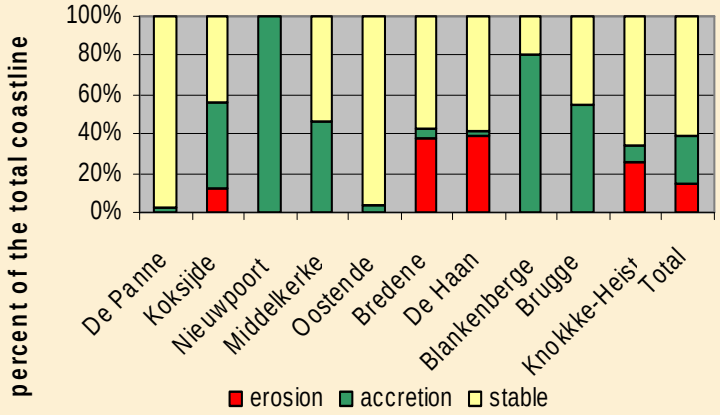
Percent of the coastline (beach) that is eroding, accreting or stable, coastal communes West-Vlaanderen, 1983-1998 (MDK)

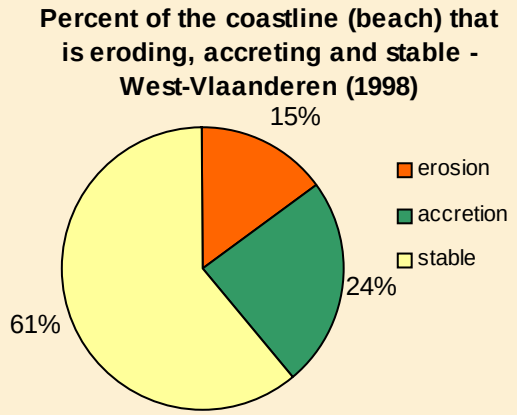
Management options as stated in the *PLAGE* Action Plan for shoreline management (SMCO 2003): Restoring (red), Holding the line (blue), No-action (green)

UG– Unité de Gestion (Management Units)

Source: Syndicat Mixte de la Côte d'Opale, Espace Naturel Régionale







was lost (2004). The Northern Sea Wall in Kent (4.5km) is a specific case for concern, since it protects saline lagoons designated as SSSI. High erosion rates (-7,000m^3/year) were encountered at the Western End of this section during biannual monitoring schemes (Sept 1997-Nov 2002). Results of the benchmarks are fed into the Ordinance Survey national network and serve as a basis for the Strategic Regional Coastal Monitoring Project.

Of the 140km coastline in Nord-Pas de Calais, 40% is protected by constructions (of which 10% dykes and 30% soft protection), while 60% of the coast remains with a 'natural and agricultural' character. Of these, 45% are dunes and 15% are cliffs which are severaly affected by erosion. The PLAGE assessment indicates that 90% of the 24km of chalk cliffs are eroding at rates which range from 10 to 80cm per year. Erosion will continue to affect two-thirds of the 63km of coastal dunes - rates of up to 2.5m/year are expected at particular locations.

In 1990, The Netherlands decided to implement 'the dynamic maintenance of the coastline'. Consequently, the Basal Coastline (BKL) was determined. Where the coastline lies (temporarily) landwards from the BKL (erosion), sand is supplied. A large portion of the coastline in Zeeland is eroding. Except for the management unit of Noord-Beveland to the North, close to 80% of the management units are in retreat. Zeeuws-Vlaanderen is particularly affected. This data is not disconnected with the efforts made with regard to sand suppletion. The Dutch coastline has in any case been maintained overall since 1990, by means of sand suppletion.

In Belgium, about 50% of the 72km coastline has defence works (MDK, 2006). In 1998, 15% of the coastline (beach only) was evaluated as 'in retreat' and 24% in accretion, compared to the situation 1983/1979 (MDK). The beaches located in the central portion and the coastline near the border with Zeeland are particularly affected by erosion. A complementary study (Eurosense) commissioned by MDK (1998) on the dynamics taking place in the foreshore, shows a wider context; data indicate a loss of sediment in the western part (foreshore) as opposed to the foreshore to the east of the harbour of Zeebrugge, where accretion has taken place compared to 1976.

What are the implications for planning and managing the coast?

Erosion is of crucial importance in coastal zone management because it poses a major risk for the populations, investments and protected areas in the lower-lying hinterland. Important European legislation affects policy-making on erosion processes in coastal zones. The Strategic Environmental Assessment (SEA) Directive, which came into effect in June 2004, will force investors and regional authorities to identify and prevent adverse impacts of development proposals on coastal erosion. Both the natural processes and coastal defence policies have an impact on habitats that are designated under the Habitats Directive, the Birds Directive and the Ramsar Convention, and which are particularly well represented in coastal zones (see indicator 6). Reliable information is needed on the (potential) nature and importance of these impacts to inform policy decisions on the legal and funding aspects of coastal defence options and possible habitat replacement, as required by European legislation (Habitat Directive).

In the UK, the likely costs of freshwater and brackish habitat replacement due to predicted loss in the coming 50 years, has been estimated to be in the order of £50-60million. In 1995 the National Rivers Authority (NRA) reported that 80 metres of salt marsh in front of a sea wall would reduce its necessary height from 12 to 3m, representing savings of £5million/km.

How reliable is the indicator?

The concern for the morphological evolution of the coastline varies between Member States and is reflected in the knowledge that MS have of the coastal evolution and the means of evaluation of coastal erosion. As such, interregional comparisons are very difficult to make. Information can be provided by measurement networks (The Netherlands, France and Belgium) or inventories (Great Britain). Nation-wide networks such as in The Netherlands and Belgium do not exist in most EU countries. Long-term series are needed in order to calculate reliable trends. Sand suppletion events affect the monitoring results of the actual erosion processes taking place.

Indicator 27 Natural, human and economic assets at risk

- *Number of people living within the zone at risk from tidal flooding*
- *Area of protected sites within the zone at risk from tidal flooding*
- *Value of economic assets within the zone at risk from tidal flooding*

Key Message

- More than 1.16 million people live in the area at risk of flooding from the sea in the sub-regions of Kent, Essex and Greater London.
- In West-Vlaanderen, 33% of the population lives in the low-lying polders prone to flooding by the sea, while Zeeland consists almost entirely of lowland and its entire population (378,000 inhabitants) lives below sea level.
- The area of statutory designations protected for cultural and natural heritage amounts to 1243km^2 in the area at risk from flooding.

Why monitor the natural, human and economic assets at risk?

Sustainable development in coastal lowlands requires appropriate coastal risk management. Coastal risk management implies the planning and building of coastal defences, flood forecasting and warning, and the preparation of evacuation and emergency plans. In most countries, planning authorities are responsible for ensuring that flood risk is taken into account in development planning. The mapping of annual probabilities of flooding, population numbers and economic values is a key element in achieving this objective.

The consequences of flooding are increasing since population numbers in the coastal zone of the SAIL sub-regions are rising and the economic assets increasing. Since coastal zones are of relatively higher importance for habitats and species of community interest, tidal flooding is also an issue for the loss of biodiversity.

Research shows that public awareness of coastal risks is insufficiently developed. There is a need to translate technical jargon of safety levels into everyday language.

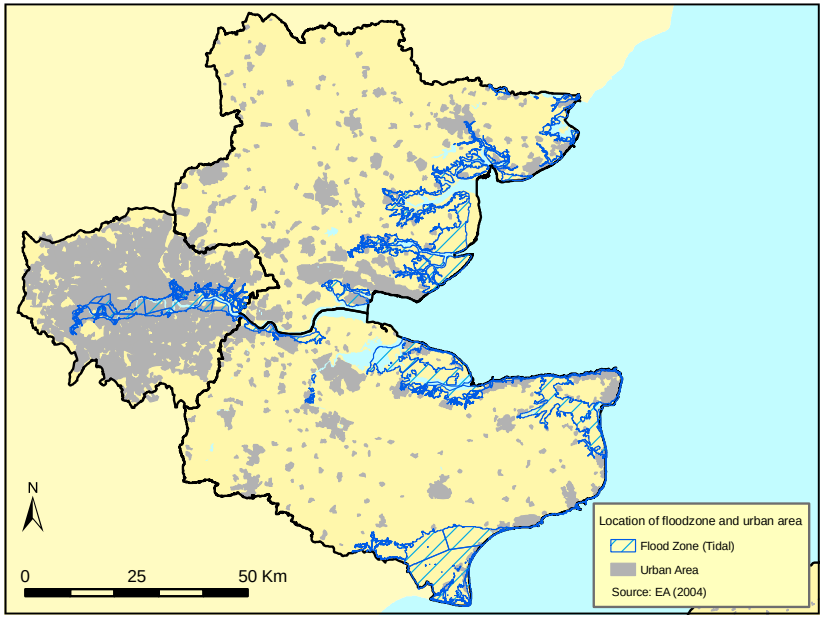
Where do the data come from?

In The Netherlands, risk management in coastal zones is mainly the responsibility of the Ministry of Transport, Public Works and Water Management. The project 'Veiligheid van Nederland in Kaart' delivers revised methodologies for the evaluation of flood risks and the estimation of economic assets outside flood defence systems and dunes(www.vnkproject.nl). The 'Plan Littoral d'Actions pour la Gestion de l'Erosion' (PLAGE), coordinated by the Syndicat Mixte de la Côte d'Opâle, provides similar maps for the coastal area of Nord-Pas de Calais. The 5m contour lines for the low-lying polders prone to flooding in West-Vlaanderen are provided by a detailed map on eco-districts (2002, Ghent University). The Flood Zones for England were actualized by the Environment Agency (EA, 2004).

What does the indicator show?

Flood maps were produced for England (Environment Agency) showing the 1 in 200 and the 1 in 1,000 chance of flooding from the sea in any given year.

An estimated population of 1.16million people live in the flood zone of Kent, Essex and Greater London, including 7% of the total Kent population and 10% of the Essex population.



The entire population of Zeeland (378,348) lives in low-lying areas behind the dike rings. An estimation of the economic assets outside flood defence systems is available for 12 Dutch coastal towns, including Vlissingen (€23million) and Cadzand (€3million) in Zeeland. The estimation of economic assets is based on the value of built property, infrastructure (roads and railways), land use functions, and the yearly direct and indirect added value of the industry. Estimates of the total economic assets for the area inland from the flood defences in Zeeland are not available from this study; these are subject of current research (VNK project). The total value of property in Zeeland is estimated at €35,733million, of which €28,284million refer to housing (VLIZ, based on data from CBS-StatLine 2005).

A substantial part (ca. 400,000 people) of the population of the area covered by the Syndicat Mixte de la Côte d'Opale lives in the lower-lying areas. Risk management schemes have been worked out for individual properties. In West-Vlaanderen, 33% of the population lives in the low-lying polders. No estimations of economic assets in this area are available. However, based on statistics for the number of dwellings and the average price of property for 2003, our rough estimate of the total value of residential property in this area is €55,311million.

The area of statutory designations protected for cultural and natural heritage cover 156km^2 in Kent, 55km^2 in Essex and 4km^2 in the Thames area. The largest area of protected sites is located in Zeeland (845km²), while in Nord-Pas de Calais and West-Vlaanderen, respectively 90 and 92km^2 of Natura 2000 and other statutory designations are located in the area at risk from flooding.

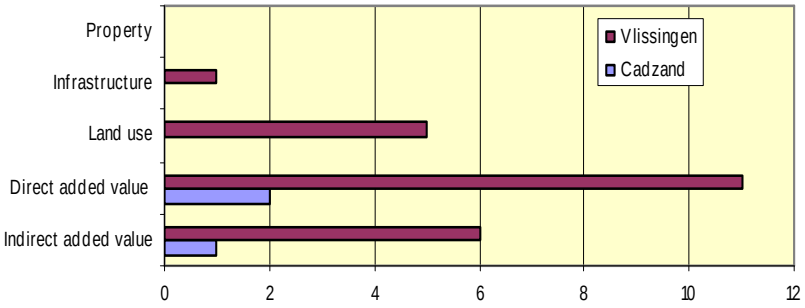
What are the implications for planning and managing the coast?

The lowlands in the SAIL region are threatened by flooding during severe storm surges. In the absence of dike rings, daily water level in one of the lowest points would be nearly seven metres high. Contradictions are observed between planning policy which permits building new structures in the coastal flood plain and the advice given by the protection agencies. In many countries, the conflict is likely to come with the increasing reluctance of insurance companies to insure properties which have been built in at-risk areas. Another important isue related to flooding refers to sites of importance for biodiversity; are we going to save wildlife from natural processes?

A thorough assessment of the safety levels of defence systems against flooding is concluded for the Belgian coast (2005). The safety levels of flood defences and the entire system of dike rings have been recently reassessed in The Netherlands (zwakke schakels). In Kent, the South East Coastal Group works to encourage an integrated, strategic approach to shoreline management.

Different safety levels apply in each country. Since the severe storm surge of 1953 in which nearly 2,000 lives were lost, statutory safety levels are laid down in the Act on Water Defences in The Netherlands. In Zeeland, the highest safety level for flood protection structures in Europe applies (1 in 4,000 chance of flooding).

Economic assets outside of the flood defence system - Zeeland 2005 (mln Euro)



The SAIL countries use different approaches in managing coastal risks, but efforts are underway to work towards common policies and strategies where feasible. The EU INTERREG funded projects COMRISK, SAFECOAST and NARROW ESCAPE, deal with the issue of international coordination.

How reliable is the indicator?

The differences in approaches do not allow for a comparison. COMRISK is a common project of North Sea Region coastal defence authorities that aims i.a. to evaluate common methodologies where feasible and desirable. The project is co-financed by the Community Initiative Programme INTERREGIII B North Sea Region of the European Union. One of its objectives is to integrate coastal risk management into strategies for a sustainable management of the coastal zones in the North Sea Region.

http://www.comrisk.org/COMRISK_SP3_final_report.pdf

Indicator 1 Population density and age structure

1. Data source: UK: *Office of National Statistics;* Belgium: *APS Administratie Planning en Statistiek and NIS (Nationaal Instituut voor Statistiek);* Netherlands: *Centraal Bureau voor de Statistiek CBS-Statline*; France: *L'Institut national de la statistique et des études économiques (Insee)*

2. Description of data: Population density is expressed as the number of inhabitants per km^2

Age structure is measured as the percentage of the total resident population in age class 0-20 (people aged 0 to 19) or *pop20;* percentage of the population in age class 60+ (aged 60 years and older) or *pop60*; percentage of the population in age class 0-20 per age class 60+, or *pop20to60*

3. Geographical coverage: Type 1 (municipality/ward)

4. Temporal coverage: National Census campaigns (UK, B and NL: 2001, France: 1999) Additional datasets have been sampled (UK district level: 1971; 1981, 1991, 2001; France: 1968, 1975, 1982, 1990, 1999; Belgium; yearly basis from 1992; Zeeland: yearly basis from 1988

5. Methodology and frequency of data collection: described in each national Census Metadata. Frequency is every 10 years. B and NL provide annual statistics on population.

6. Methodology & data manipulation: Population density: transform existing measure units for the area of administrative unit to km^2; divide total number of inhabitants by the area of the unit, in km^2.

Pop 20, pop 60: number of inhabitants in age class 0-20 (or 60+) divided by total population, multiplied by 100; Pop20to60: (population in age class 0-20 divided by population in age class 60+), multiplied by 100

DPSIR: P

Indicator 2 Amount of built-up land

1. Data source: Corine Land Cover (CLC) 1990 and CLC 2000 / European Environment Agency EEA-Geographic Information Management N.V. (G.I.M./ CoastWatch project)

2. Description of data: The indicator calculations are based on satellite images according to CLC methodology. The CLC classes are regrouped into a built-up and non-built-up class. Corine classes defined as built-up area include:

- 111 – Continuous urban fabric
- 112 – Discontinuous urban fabric
- 121 – Industrial or commercial units
- 122 – Road and rail networks and associated land
- 123 – Port areas
- 124 – Air ports
- 131 – Mineral extraction sites
- 132 – Dump sites
- 133 – Construction sites

3. Geographical coverage: Type 1 (municipality/ward)

4. Temporal coverage: CLC 1990 was inventoried from 1986 to 1995. An update is provided by CLC 2000, the results of which were released in 2005.

5. Methodology & data manipulation:

The total area of built-up land (sum of the categories 111 to 133) divided by the total land area of the administrative unit and multiplied by 100. The percentage of built-up land is calculated for administration units (Nomenclature d'Unité Territoriale Statistique-NUTS) by NUTS-3, NUTS-4 and NUTS-5. Due to improving methodology, the decrease in minimum mapping unit from 25ha to 5ha has resulted in an increased accuracy in the final product of CLC 2000 versus CLC 1990. References to detailed methodologies are available from the EEA website (indicators).

DPSIR: P

Indicator 3 Demand for road travel

1. Data source: Belgium: Ministry of Flanders-Agentschap Leefmilieu en Infrastructuur (LIN); France: Direction régionale de l'équipement (DRE-Nord-Pas de Calais); The Netherlands: Adviesdienst Verkeer en Vervoer-Ministerie van Verkeer en Waterstaat (AVV-RWS); UK: Department for Transport-UK, Road Traffic

2. Description of data: Data are supplied as annual average daily flow (AADF): the average number of vehicles passing a point over a 24 hour period based on the annual average traffic flow per census point. In Belgium data refer to a 16 hour period (06 to 22 hours).

3. Geographical coverage: Type 2 (point locations)

4. Temporal coverage: Belgium 1999-2004, France: 1999-2003, NL 2000-2004, UK 2003-2004

5. Methodology and frequency of data collection: yearly week averages for permanent measuring stations. Data are also available for weekday averages (from Monday to Friday) or weekend-day averages (Saturday-Sunday). The number and percentage of 'heavy weight' vehicles from the total traffic is available for Nord-Pas de Calais

6. Methodology & data manipulation: from the datasets, only data for the permanent measuring stations are selected. Coordinates of permanent measuring stations are sampled in GIS and measuring stations in the coastal zone are defined as those located within a coastal district (UK) or within the coastal municipalities (NL, F, B).

DPSIR: P

Indicator 4 Pressure for coastal and marine recreation

1. Data source: Harbour masters, administrators and secretariats of marinas.

2. Description of data: The number of berths and moorings (including fixed and swinging moorings) berths for both holders and visitors. The location of the marina (coordinates) and contact information is collected as metadata.

3. Geographical coverage: Type 2: All marinas and ports in the six SAIL sub-regions.

4. Temporal coverage: baseline 2004, plus data on previous years where readily available

5. Frequency of data collection and methodology of manipulation: telephone/mail survey with marinas and Yacht clubs. Additional information and quality check-up is provided by local Port Authorities (Kent Yachting Association). The British Marine Federation kindly cooperated background estimates on number of berths and moorings by larger areas (for comparison). Frequency of data capture suggested: minimum every 5 years. Data is aggregated by commune (district) and sub-region, and linked to Marina coordinates for mapping products.

Remark: A non-quantifiable underestimation is expected for the Essex and Kent region, since mooring areas also occur outside marinas and yacht clubs.

DPSIR: P

Indicator 05 Change to significant Habitat and Species

1. Data source:

RED LISTS:

Belgium: Institute for Nature and Forestry Research (INBO) (Red Lists 2003); NL: Flora en fauna van Zeeland. Nota soortenbeleid (2001), Provincie Zeeland; UK: Kent & Medway Structure Plan: mapping out the future. Draft Supplementary Planning Guidance SPG2: Biodiversity Conservation, September 2003. Essex Biodiversity Action Plan, Kent Biodiversity Action Plan (2003). France: GON (Kerautret, 2000). Fishes: www.fishbase.org and 'De vissen van Nederland', with support of experts Dr. A. Cattrijsse (VLIZ) & J. Coeck (INBO). Birds: E. Stienen. Vascular plants: Dr. W. van Landuyt. Amphibians and Grasshoppers: D. Bauwens. Butterflies: D.Maes (INBO). Sprinkhanen: www.saltabel.org

Nijssen, H.; de Groot, S.J. (1987). Fishes of The Netherlands: systematic classification, historical overview, origins of fish culture, non-indigenous species, determination keys, descriptions, drawings, literature references on all marine and freshwater fish species living in Dutch waters. KNNV Uitgeverij: Utrecht, The Netherlands. ISBN 90-5011-006-1. 224 pp.,

Provoost, S.; Bonte, D. (Ed.) (2004). Animated dunes: a view of biodiversity at the Flemish coast. *Mededelingen van het Instituut voor Natuurbehoud*, 22. Instituut voor Natuurbehoud: Brussel, Belgium. ISBN 90-403-0205-7. 416, ill., appendices pp.

Methodology: UK BAP priority species were selected from the fact sheets (www.kentbap.org.uk) & Kent Red Data Book. NL and B: species that are exclusive to dunes and tidal areas were selected from the list of priority species and status cross-checked with Red List. F: provisory Red Lists provide incomplete data on status of coastal species.

DPSIR: I

SPECIFIED SPECIES:

Porpoises: NL: Kees C.J. Camphuysen – Royal Netherlands Institute for Sea Research (NIOZ). Marine Mammal Database (http://home.planet.nl/~camphuys/Cetacea.html) 1970-2004. Southern North Sea: SCANS (1994) and SCANS II (2006)

Seabirds: NL: Kustbroedvogels in het Deltagebied in 2002. Ministerie van Verkeer & Waterstaat – Directoraat-Generaal Rijkswaterstaat – Rijksinstituut voor Kust en Zee. Rapport RIKZ/2002.021(1979-2002). UK: Seabird 2000. www.jncc.gov.uk (1969/70 - 1985/88 -1998/2002). Flanders: data provided by E. Stienen 1985-2004 (INBO). France: no data

Seals: NL: common seal: aerial surveys of seabirds and marine mammals in the Voordelta 2002/2003. Report RIKZ/2003.046. UK: common & grey seal: English Nature – report number 630. Making Connections: Proceedings of the second North East Kent Coastal Conference, 11 november 2004. English Nature Research Reports. Chapter: Pilot survey of seal haul-out site off of the north Kent Coast – Jon Bramley & Brett Lewis (pp 65-70).

SPECIFIED HABITATS

NL: Dunes: Perspectives in coastal dune management: towards a dynamic approach. Preprints. European workshop and symposium: 7-11 September 1987. Leiden, The Netherlands. (covers only dune areas larger than 100ha). Stichting Duinbehoud (1987). Saltmarsh Oosterschelde: "Verlopend Tij – Oosterschelde, een veranderend natuurmonument". Report RIKZ/2004.028. Saltmarsh Westerschelde: "Historisch overzicht schorareaal in Zuid-West Nederland: oppervlakte schorren in de jaren 1856, 1910, 1938, 1960, 1978, 1988 en 1996". Working paper RIKZ/OS-98.860x. Seagrass Oosterschelde: Rijkswaterstaat MWTL-program (biological monitoring), data will be released on www.zeegras.nl contact-person: Dick de Jong (OSD-RIKZ). Belgium: dunes: data provided by Dr. S. Provoost (1996) INBO. UK: Kent: area of coastal habitat (Kent Habitat Survey 2003), Appendix 8.1: "Habitat Extent in Kent &Medway Structure Plan-mapping out the Future". Draft supplementary Planning Guidance. SPGZ: Biodiversity Conservation, September 2003, Annex 4: Extent of BAP Habitats in Kent. Essex: saltmarshes. English Nature (2003). Essex and Greater London: coastal sand dunes, maritime cliffs, mudflats & saline lagoons. Seagrasses: "Studies on the distribution of Zostera in the outer Thames Estuary". Aquaculture, 12 (1977) 215-227. D.W.Wyer, L.A. Boorman & R. Waters. France: dunes: E. Dubaille (1998, Observatoire du Littoral), SIGALE, Conseil Régional du Nord-Pas de Calais.

DPSIR: S/I

Indicator 06 Area of land and sea protected by statutory designations (see overview table final page)

DPSIR: R

Indicator 07 Effective management of designated sites

1. Data source: National reference points for the Habitat and Ornis Commissions: NL: Dr. M.Lok, B: Dr. E Martens, UK: F: F.Bland, H. Jaffeux and P.Blanchet.

2. Geographical coverage: by country, status by habitat type, status by species

4. Temporal coverage: baseline measurement 2005/2006

5. Methodology and frequency of data collection: annual assessments

6. Methodology & data manipulation: status of priority species and habitat will be evaluated as favourable, unfavourable-bad and unfavourable-inadequate

DPSIR: R

Indicator 8 Loss of cultural distinctiveness

1. Data source: website http://europa.eu.int/comm/agriculture/qual/en/prodb_en.htm, developed and hosted by Directorate-General of the European Commission for Agriculture (DG Agriculture) and lists the number of products under Community legislation as PDO's and PGI's as of May 2001 (units); it indicates category and type of product, as well as information related to the producers association.

2. Description of data: A ***PDO (Protected Designation of Origin)*** covers foodstuffs which are produced, processed and prepared in a given geographical area using recognised know-how. In the case of the ***PGI (Protected Geographical Indication)*** the geographical link must occur in at least one of the stages of production, processing or preparation. A ***TSG (Traditional Speciality Guaranteed)*** does not refer to the origin but highlights traditional character, either in the composition or means of production. Regional labels were selected based on following 5 criteria: (1) The label should apply to (at least) one of the SAIL regions; (2) products should be made with local raw materials (traditional preparation with foreign ingredients are also taken into consideration); (3) products should be generally accepted as traditional and local; (4) products should be prepared according to local/traditional methods; and (5) local product and location of production should correspond. Selected regional labels include: Het beste van bij ons and www.streekproduct.be (Belgium); Les produits du Terroir, Label Rouge, and l'Appellation d'Origine Contrôlée (France); Streekeigen Producten (Nederland); and Essex for Seafood (Essex).

3. Geographical coverage: SAIL countries and SAIL sub-regions. Where feasible, designations are associated with a geographic location instead of the sub-region, or it is indicated whether the product is associated with a coastal area, prime material or tradition.

4. Temporal coverage: baseline 2004

5. Methodology and frequency of data collection: continuous, according to approval of applications

6. Methodology & data manipulation: Lists with PDO/PGI/TSG protected products are downloadable for each country (Belgium, France, The Netherlands and the UK) from the EU DG Agriculture website. For each SAIL country, the number of products is counted by category within each category and where feasible selected as 'coastal'. Lists of products protected under regional quality labels were constructed on the basis of additional literature and extensive search on the Internet.

DPSIR: R

Indicator 9 Patterns of sectoral employment

1. Data source: Sectoral employment data sources: UK: Office of National Statistics; France: INSEE; Belgium: NIS/GOM; The Netherlands: Centraal Bureau voor de Statistiek-Statline. Employment in fisheries data from NL: RIBIZ; UK: ONS; B: NIS/GOM; F: OFIMER. Employment in tourism data from: NL: RIBIZ; UK: ONS; B: NIS/GOM; F:CRT/INSEE. Employment in ports from B: Nationale Bank van België; NL: Nationale Havenraad and data on full-time and part-time employment from UK: ONS; F: INSEE, NL: CBS/KvK Zeeland

2. Description of data: Economic sectors cover fisheries and agriculture (primary), construction and manufactory (secondary), services and profit-sector (tertiary), non-profit sector/education and health (quaternary). Additional data is provided on Fisheries, Ports and Tourism. No data on full-time/part-time available for Belgium at the municipality level.

3. Geographical coverage: Type 1

4. Temporal coverage: UK: employment at the local level is provided by Census 2001 (ONS). Fr: 1999 and previous Census data (INSEE). B: annual data (APS-NIS). NL: annual data (CBS). Fisheries in NL (1995-2001), in B (1996-2002), in F (2000-2002). Tourism: UK districts (1995-2000), F (1999), NL (1998-2003), B (1992 and 2002). Full-time/part-time: NL (1998-2003), UK (2001), F (1999).

5. Methodology & data manipulation: Employment in a specific sector is expressed as a percentage of the total active population, except for the employment in fisheries and ports where absolute numbers are given.

DPSIR: D

Indicator 10 Economic importance of ports

1. Data source: Eurostat; Eurotunnel; Short Sea Shipping (B, UK and NL). F: Atlas transmanche, "Chambre de Commerce et d'Industrie", Port Autonomes. B: Vlaamse Havencommissie, Nationale Bank België, SERV. NL: Nationale Havenraad. UK: Department for transport, Maritime statistics. Kent Tourism Facts 2002/2003. Port of London Authority.

2. Description of data: Number of incoming and outgoing passengers (x1000) does not include cruise passengers in transit, or local ferry services. Total volume of goods handled in ports (x1000 tonnes). Short Sea Shipping refers to the percentage of all goods that are shipped to ports on short distances (mostly other EU ports). Cross-channel rail and truck indicates the percentage of goods that are transported by rail and by truck, from the total goods that are shipped through the Eurotunnel. (modal split).

3. Geographical coverage: Type 2

4. Temporal coverage: number of passengers: 1980-2003, volume of goods: 1982-2004 (Kent and Greater London data from 1965). Cross-channel modal split (1994-2003). Short Sea Shipping (2001-2003).

DPSIR: D

Indicator 11: Volume of Tourism

1. Data source: **Overnight stays:** B: NIS 2002-2003 for all municipalities and 1992-2003 for limited number of municipalities. F:CRT/INSEE: data 2003 for agglomerated communities or tourist zones. NL: CVO/CBS: data 1995 and some agglomerations. CBS-Statline reports overnight stays in the coastal zone as 'North Sea coastal towns', not by municipality. UK: TSE Cambridge Economic Impact Model/KCC, East of England Tourist Board/ECC. Source: Tourism Information Pack (Mrs. Elli Constatatou) for earlier years. Limited data on district level; differences in the year of reporting between districts. **Occupancy rates**: B: No data. F: CRT/INSEE Tourist zones 2003. NL: CVO/CBS-Statline: old datasets for occupancy rates by groups of municipalities in Zeeland, 1995. Occupancy rates are reported at national level 'North Sea coastal towns'.UK: Kent Tourism Facts/KCC. Limited data: only Kent district level data for 1993-2002. For both measurements 'number of overnight stays' and the 'occupancy rate of bed places' data had to be compiled from a wide range of fragmented sources and statistics based on different methodologies

2**. Geographical coverage:** Type 1

DPSIR: R (eco-labels) and P (ratio)

Indicator 12: Sustainable Tourism

Data source: The EU eco-label 'Flower' (www.eco-label.com), Blue Flag international (www.blueflag.org), 'La Clef Verte' in France (www.laclefverte.org), 'Milieubarometer' (www.milieubarometer.nl) in The Netherlands and Belgium and Green Business in the UK (www.greenbusiness.org.uk) all coordinated through www.yourvisit.int. ECEAT - European Centre for Eco and Agro Tourism- www.eceat.nl).

2. Description of data: EU Eco-labels in tourist accommodation are awarded annually on the basis of specific criteria for sustainability and environmentally friendly services and products. Data for previous years is often not (readily) available, or not stored.

3. Geographical coverage: type 1

4. Temporal coverage: Eco-labels: baseline 2003 (Blue flag data 2003 and 2004)

5. Methodology of data manipulation: The extent of the tourist accommodation with EU Eco-labels for each sub-region was calculated from data of adhering Eco-labelling websites. The extent of the accommodation with VISIT eco-label is composed as the sum of those with (1) ECEAT and Green Business labels (for the UK); (2) ECEAT label (Belgium); (3) de milieubarometer and ECEAT (The Netherlands) and (4) Clef Verte and ECEAT (France). The nr of Blue Flag beaches and marinas was requested and downloaded from the Blue Flag website. The ratio of nr of overnight stays to nr of residents was calculated by dividing the nr of overnight stays from indicator 11 with the population density data from indicator 1. Population data for tourist zones were aggregated from indicator 1. In France, population data 1999 was combined with overnight stays 2003. Where tourist zone boundaries do not coincide with administrative units, additional calculations were needed.

DPSIR: R (eco-labels) and P (ratio)

Indicator 13 Bathing Water Quality

1. Data source: European Environment Agency (EEA); Water Quality in the European Union; Bathing Water quality of rivers, lakes and coastal waters, "Tourist Atlas"; Website: http://www.europa.eu.int/water/cgi-bin/bw.pl. Mrs. Pavla Chyska, National expert water data& indicators (pavla.chyska@eea.eu.int)

2. Description of data: The percentage of designated coastal bathing waters compliant with the Guide value, with the Mandatory Value, or not compliant with the Mandatory value (respectively) of the European Bathing Water Directive (guide values for fecal coliforms.)

3. Geographical coverage: Type 2, sampling stations

4. Temporal coverage: 1988-2004

5. Methodology and frequency of data collection: Member States submit results from sampling designated coastal bathing waters annually to the EEA which posts them on its website http://europa.eu.int/water/water-bathing/report.html. Data are posted for every sampling point together with sub-regional, regional, national and all-Europe summaries. Information dates back to 1992 but data for earlier years can be obtained from the organisation in each country responsible for sampling and data collection. Links to these organisations are displayed on the opening page of the website.

6. Methodology of data manipulation: For the required levels (local, sub-regional, regional, national), the number of sampling points are recorded (i) compliant with the Guide value; (ii) compliant with the Mandatory value; (iii) not compliant with the Mandatory value . For sampling year X, values (i-iii) are divided by the total number of sampling points for year X and multiplied by 100. For Nord-Pas de Calais data for 2004 were calculated without one sampling location (Saint-Etienne-au-Mont) for which the data was not available at the time of processing.

DPSIR: S/I

Indicator 14 Amount of coastal and marine litter

1. Data source: NL: RWS/North Sea Directorate). Mr. S. de Jong Jong@dnz.rws.minvenw.nl, Stichting De Noordzee (www.noordzee.org) Mrs. Ike Span: i.span@noordzee.nl

UK: Brian Elliott, UK Maritime & Coastguard Agency (MCA). Brian_Elliott@mcga.gov.uk (www.mcga.gov.uk/). Marine Conservation Society (MCS): Andrea Crump andrea@mcsuk.org MCS: www.mcsuk.org. Beachwatch and Adopt-a-Beach: www.adoptabeach.org.uk (data delivery subject to Users' Agreement)

B: Francis Kerckhof, Management Unit of the North Sea Mathematical Models (MUMM-BMM). f.kerckhof@mumm.ac.be. www.mumm.ac.be

F: Ecoflandres Association. 28 bis, Rue Wisse Morne 59240 Dunkerque ecoflandres@wanadoo.fr, Tjif-tjaf project (C. Willaert and S. Beck).

Mrs. Haydée Dominguez Tejo (2005): data from unpublished thesis ECOMAMA. VUB/RUCA

Marine Litter Net: http://www.marine-litter.net. The OSPAR Pilot Project on Marine Beach Litter: http://www.marine-litter.net/projects/OSPAR_Pilot_Project/ (reference beaches). KIMO: Impacts of Marine Debris and Oil: Economic and Social Costs to Coastal Communities. http://www.zetnet.co.uk/coms/kimo/impact.html

2. Description of data: Number of litter items per unit of length of beach. Remarks: Oil and tar spots, faeces, dead birds, harvesting residues are NOT considered litter (Coastwatch annual report 2002). For The Netherlands types of litter were Plastic, Paper, Rope, Metal, Glass, Textile, Wood and Other while in the United Kingdom litter was classified as Plastics, Polystyrene, Rubber, Cloth, Pottery/ceramic, Metal, Medical, Sanitary, Faeces, Paper, Wood, Glass. Categories for the origin of the coastal litter include: Sea, Tourism, Land, Other (in The Netherlands) and Tourism, Fishing, Shipping related debris (SRD), Shipping, Fly-tipped, Medical, Other (in the UK)

3. Geographical coverage: Type 2, sampled stretches of beach

4. Temporal coverage: NL: 2000-2002, UK: 2001-2003, B: 2002-2005, F: 2000-2004

5. Methodology and frequency of data collection: For sampled locations along the shoreline, the number of items of litter collected per km of shoreline was calculated as the total number of items from sampled units by the length (converted in km) of the sampled units along the coastline. Items of litter were classified in different categories according to origin and type. The number of items in each category was divided by the total number of items to obtain the percent of litter from a certain origin or type.

6. Methodology of data manipulation: number of items per given length of shoreline is transformed to a common unit of 1km. Types of litter (categories) are calculated as a percentage of total number of litter items.

DPSIR: S

Indicator 15 Concentration of nutrients in coastal waters

1.Data source: http://themes.eea.eu.int/specific_media/water/indicators/WEU4,2004.05/index_htm, European Environment Agency-European Topic Centre-Water. OSPAR monitoring program.

2. Description of data: Average winter concentrations of nitrate and phosphate in µmol/litre. Samples are collected at 1m depth. Sampling sites are not stationary throughout the years.

3. Geographical coverage: type 2

4. Temporal coverage: 1981-2002

5. Methodology and frequency of data collection: OSPAR guidelines for monitoring program.

6. Methodology & data manipulation: All coastal (less than 20km from shoreline), and open water stations with coordinates within baseline map are selected for graphs. Because of the limited number of sampling points and long-term data for individual sampling sites, trends are calculated at North Sea level only.

DPSIR: S

Indicator 16 Oil pollution

1. Data source: Bonn Agreement Secretariat Annual Reports (1998-2004). Document BDC 04/2/10-E "Report to the Biodiversity Committee (BDC) 2004" C.J. Camphuysen, (through OSPAR). Royal Society for the Protection of Birds-RSPB (UK), E. Stienen (INBO), T. Mougey (F). K. Camphuysen (NL-NIOZ)

2. Geographical coverage: Type 2

3. Temporal coverage: 1998-2002 (oil spills), since 1960's (NL and B) annual bird beach surveys.

4. Methodology and frequency of data collection: Reports from national flights were taken into account. The average number of oil spills per standardized 'Bonn Agreement flight hour' is reported as one value per country and can not be split up for the area and the sub-regions under study. Volunteers collect beached birds during monthly beach surveys in winter months: the proportion of birds with oiled feathers is recorded.

5. Methodology of data manipulation: Coordinates of the observed oil spills were plotted through GIS (Arcview 9) and classified according to their position in territorial seas (UK, F, B and NL).

DPSIR: P

Indicator 18 Degree of social cohesion

1. Data source: Unemployment data at the commune level is collected in Census events (F and UK). UK: ONS. NL: CBS. B: APS/NIS. F: INSEE. Definitions of Social exclusion differ among countries UK: Office of the Deputy Prime Minister (ODPM). NL: RIOSurvey. F: Conseil Departement Nord – Conseil Departement Pas de Calais, Caisses allocataires (subject to users' agreement).

2. Description of data: Unemployment is expressed as the percentage of the active population that is without a job (official data providers). Social exclusion is interpreted as the number (and percentage) of the population on social welfare (B and F), the percentage of households that dispose of a low income during more than 4 years (NL). The Index of Multiple Deprivation 2004 (UK) is constructed by combining the seven transformed domain scores, using the following weights: Income (22.5%), Employment (22.5%), Health Deprivation and Disability (13.5%), Education, Skills and Training (13.5%), Barriers to Housing and Services (9.3%), Crime and Disorder (9.3%), Living Environment (9.3%).

3. Geographical coverage: Type 1 (Super Output Areas in UK, municipalities in F, B and NL))

4. Temporal coverage: UK: Census 2001, Indices of Deprivation ODPM 2004, NL: CBS-Statline and RIO Survey 1999 and 2001, B: APS/NIS (1996-2002). F: (2004)

5. Methodology and frequency of data collection: Census data (F and UK), annual data (B and NL). Social exclusion annual data (F and B) and surveys (UK and NL)

6. Methodology & data manipulation: The absolute numbers of people beneficiary of welfare (Nord-Pas de Calais and West-Vlaanderen) are taken as nominator, divided by the total population (denominator) and multiplied by 100. In Zeeland the absolute number of households on long-term (minimum 4 years) low income is taken as nominator and divided by the total number of households and multiplied by 100. In the UK, the index is reported as a value and a rank at national level. For comparison of the social exclusion in coastal and non-coastal SAIL areas, the average IMD value of coastal Super Output Areas was compared with the average IMD value of the non-coastal Super Output Areas for Kent, Essex and Greater London. For the other regions the sum of the nominators was divided by the sum of the denominators and the result multiplied by 100 for both coastal and non-coastal (hinterland) municipalities separately. Comparison of unemployment in coastal and non-coastal SAIL areas was calculated at the SAIL and SAIL sub-regional level.

DPSIR: P

Indicator 19 Second and Holiday homes

1. Data source: F: INSEE. B: Steunpunt Sociale Planning, Province West-Vlaanderen. UK: ONS and The Countryside Commission. NL: CBS-Statline.

2. Description of data: The number of second and holiday homes as a percentage of total housing (dwellings).

3. Geographical coverage: Type 1

4. Temporal coverage: 2003-2004 (B), 2001 (UK), 1992-2004 (NL), 1968, 1975, 1982, 1990, 1999 (F)

5. Methodology and frequency of data collection: Most countries collect data on type, occupation and ownership of dwellings in Census events. The categories included in Census data may differ among countries; second homes, vacant homes, holiday homes. Definitions and categories were checked by expert judgments for correct interpretation and cross-checked for benchmarking.

6. Methodology & data manipulation: For the UK, the number of second homes was calculated on the basis of 'second homes' plus half of the 'vacant homes', according to the recommendation of an expert. In some countries this data is not collected through census efforts and needs to be obtained indirectly through tax registers or estimated through other methodologies. In B: the number of households in registrars was compared to number of existent housing units, allowing for a vacancy friction of 3%, and an estimate of second and holiday homes was calculated from the difference between both values.

DPSIR: P

Indicator 20 Average price of property

1. Data source: NL: CBS-Statline. UK: ODPM. B: APS/NIS. F: Observatoire Régional de l'Habitat et de l'Amenagement du Nord-Pas de Calais (ORHA)

2. Description of data: average price of property: NL: all houses. UK and B: average price of flats, large houses, semi-detached houses and terraced houses. F: no data. The average price of m² for construction is available for F and B only.

3. Geographical coverage: Type 1

4. Temporal coverage: UK: 2001-2002. F: 2001-2002. B: 1990-2003. NL: 2003-2005

5. Methodology and frequency of data collection: Census data (F and B). Annual data (B and NL)

6. Methodology & data manipulation: For the SAIL region and sub-regions, the average price of property of coastal communities were summed and divided by the total number of sampled coastal units.

DPSIR: P

Indicator 21 Fisheries

1. Data source: B: Institute for Agriculture and Fisheries Research, Department for Sea Fisheries (ILVO-DvZ) and Service for Sea Fisheries (DVZ). UK: Department for Environment Food and Rural Affairs (DEFRA).

F: Office National Interprofessionel des Produits de la Mer et de l'Aquaculture (OFIMER). NL: Centraal Bureau voor de Statistiek (CBS). International Council for the Exploration of the Sea (ICES). Fishbase (Dr. Pauly and Dr. Froese).The Sea Around Us Project (Dr. V. Christensen). Fishing ports provided data on value of landings (NL). Discards: Economic Aspects of Discarding UK Case Study: Discarding by North Sea Whitefish Trawlers Final Report, January 2001 Prepared for: DG FISH, European Commission and MAFF. By: Rod Cappell, Nautilus Consultants, UK. Partners: LEI-DLO, Netherlands, Cofrepeche, France. Evaluation of By-catch in the Belgian Brown-shrimp fisheries (*Crangon crangon* L.) and of technical means to reduce discarding (2004) (Dr. H. Polet – PhD. Thesis)

2. Description of data: Trophic level of fisheries in the North Sea were obtained from FishBase-The Sea Around Us Project (http://www.seaaroundus.org) and span from 1903 to 1998. Data on the percentage of commercial fish species harvested outside Safe Biological Limits was supplied by ILVO-Sea Fisheries.

3. Geographical coverage: Fishing ports in the Southern North Sea. ICES management area IV/IVc

4. Methodology & data manipulation: Selection of the most important commercial species

DPSIR: S (landings) and I (SBL)

Indicator 22 Air Quality

1. Data source: VMM (B) HYGEOS (F) LNL/LNV (NL) and KAQMN and LAQN (UK)

2. Description of data: concentrations of SO_2, NO_2, Ozone and PM-10. Number of days per year, during which concentrations exceed guidelines and targets.

3. Geographical coverage: Type 2

4. Temporal coverage: UK, F and B: 1988-2004. NL: 1996-2002

5. Methodology & data manipulation: Data are reported as daily values (NL-LML) (UK, F and B in Hygeos) and need to be aggregated as yearly daily values.

DPSIR: S

Indicator 23 Installed capacity of renewable energy from coastal resources

1. Data source: B: Organisatie Duurzame Energie (ODE). F: Espace Eolien France. NL: Wind Service Holland (WSH). UK: British Wind Energy Association (BWEA)

2. Description of data: An extensive search for data and information revealed significant discrepancies in data, between sources. Reliable time series at the local scale are difficult to obtain. All energy sources were examined (tidal, wave, eolic onshore and offshore). Only wind energy is a relevant source of renewable energy production at the time being.

3. Geographical coverage: Type 1 (onshore) and type 2 (inshore/offshore)

4. Temporal coverage: baseline 2004. B: 1987-2004. F: 1991-2004. NL: 1987-2004

5. Methodology of data manipulation: Coordinates of renewable energy production installations were collected and plotted, then aggregated by commune and/or districts.

DPSIR: R

Indicator 24 Extreme weather

1. Data source: Fr: Meteo France: number of days per year on which wind speeds exceeded 15m/s (data are not freely available). NL: KNMI Hydra project www.knmi.nl/samenw/hydra . B: MDK-Coast (Ir. G.Dumon).Data on wind speed is not freely available from MetOffice (UK).

2. Description of data: F: Times series available from 1981 to 2005 for Nord-Pas de Calais; B: 1992 to 2004. NL: 1959 to 2002. For Zeeland data are from ten different stations; there are 4 stations in B and 4 stations in Nord-Pas de Calais.

3. Geographical coverage: Type 2

4. **Methodology and frequency of data collection**: Time series were acquired from Meteorological Institutes: only relevant (coastal) stations were retained for further analysis and the number of days per year with wind speeds greater than 30 knots (154,32 m/s) or 15 m/s for Nord-Pas de Calais, were selected and summed. For the purpose of visualization, data from more than one station were aggregated (averaged) for the sub-region.

DPSIR: S

Indicator 25 Sea level rise

1. Data source: Data source: Permanent Service for Mean Sea Level (PSMSL); website: http://www.pol.ac.uk/psmsl/datainfo/Dr. Sveta Jevrejeva (Dr.) "PSMSL-Proudman Oceanographic Laboratory, Bidston Observatory, Birkenhead, Merseyside CH43 7RA, UK e-mail psmsl@pol.ac.uk

2. Description of data: The indicator is expressed as sea level relative to vertical land movements!PSMSL receives monthly and yearly mean values of sea level from a global network of tide gauges. Collected datasets (for this assessment) are of the 'Revised Local Reference' (or RLR) type allowing construction of time series. The RLR data are reduced to a common datum. For Zeeland no 'Revised Local Reference' data were available because datasets in the Netherlands are expressed relative to the national level system: Normaal Amsterdamsch Peil (NAP). Separate datasets for Zeeland are available on the NAP reference system.

3. Geographical coverage: Type 2

4. Temporal coverage: yearly update

5. Methodology of data manipulation: Datasets from stations in Kent, Essex, West-Vlaanderen, Zeeland and Nord-Pas de Calais were obtained from the Permanent Service for Mean Sea Level (PSMSL) website. Only stations with RLR datasets were further processed, thereby excluding stations from Zeeland. Time series for the retained stations were plotted and the longest available time series for each region were taken as representative for that region: Southend for Essex; Oostende for West-Vlaanderen; Sheerness for Kent and Calais for Nord-Pas de Calais.

DPSIR: S

Indicator 26 Erosion and accretion

1. Data source: NL: RWS/Rijks Institutuut voor Kust en Zee (RIKZ). B: Maritime Service and Coast (MD&K). UK: Canterbury District Council. F: Syndicat Mixte de la Côte d'Opale (SMCO), PLAGE.

2. Description of data: trends in beach profiles over evaluation period (net loss is erosion, net gain is accretion). The criteria to evaluate beach profiles and to define references values of 'stable' vary between countries and methodologies. Ideally, the total beach profile (foreshore, beach and front of the dunes) must be taken into account; this information is generally not available or accessible for non-experts.

3. Geographical coverage: Type 1 and 2.

4. Temporal coverage: F: 2003, UK: 2004. B: 1979-1998. NL: 1998

5. Methodology and frequency of data collection: Systematic measurements from basal coastlines or within shoreline management units following topographical, bathymetric and photogrammetric methods. For a proper trend analysis, the basal coastline needs to be referenced to the national grid.

6. Methodology of data manipulation: UK: calculation of average loss or gain per unit and sub-unit within Shoreline Management Units. Percent of units that are evaluated/eroding/accreting B: Data by management unit, aggregated for 10 coastal nuts5 for 1998 (evaluation period 1979-1998). NL: evaluations by transects (raaien) and aggregated per coastal unit (kustvak). F: evaluation of profile per unit, summed by type of coastline (dunes, cliffs). Where feasible, total length of eroding beach line is divided by the total length of the evaluated coastline and multiplied by 100.

DPSIR: S

Indicator 27 Natural, human and economic assets at risk

1. Data source: B: Maritime Service an Coast (MD&K), University of Ghent (Dr. Antrop). F: Syndicat Mixte de la Côte d'Opâle (SMCO). NL: Veiligheid van Nederland in Kaart (VNK) / Rijkswaterstaat (RWS). UK: Environment Agency (EA)

2. Description of data: F: PLAGE (2003). UK: Flood zones (2004).

3. Geographical coverage: Type 3 (shapes)

4. Methodology and frequency of data collection: Boundaries of Flood zones are subject of continuous improvement, according to national monitoring and research plans and needs.

6. Methodology & data manipulation: The flood zones for F and B were constructed on the basis of the +5 m height contour in the coastal zone. In Zeeland, this comprises the entire territory, except for 'Kop van Schouwen'. These flood zones, in overlay with population density (indicator 1) and the GIS layer for 'settlements' (densely populated areas) allowed estimating approximate population numbers in the flood zone. A similar exercise was done for protected areas, calculating the approximate area (hectares) in the flood zone. Data on economic assets is scarce and collected according to varying methodologies.

DPSIR: S

Indicator 6: Area Protected by Statutory Designations: Overview

Parameter		*UK* **E & K & L** category	type	year	website
Ramsar		Ramsar site	point	sep/04	http://www.ramsar.org/
Natura2000	*Bird*	Special Protection Areas (SPAs)	polygon	mrt/2004	http://www.jncc.gov.uk/ProtectedSites/spa/default.htm
	Habitat	Special Areas of Conservation (SACs)	polygon	mrt/2004	http://www.jncc.gov.uk/ProtectedSites/sac/default.htm
Cultural Heritage		World Heritage	point	nov/04	http://whc.unesco.org/
		Area of Outstanding Natural Beauty (AONB)	polygon	apr/2003	http://www.aonb.org.uk/ http://www.highweald.org/ http://www.kentdowns.org.uk/ http://www.dedhamvalestourvalley.org/
Other national and regional statutory designations		Site of Special Scientific Interest (SSSI)	polygon	apr/2004	http://www.english-nature.org.uk/special/sssi/
		National Nature Reserve (NNR)	polygon	mrt/2004	http://www.english-nature.org.uk/special/nnr/nnr_what.htm
					http://www.jncc.gov.uk/ProtectedSites/directory/default.htm

Parameter		*FR* **NP** category		year (date de dernière mise à jour)	website
Ramsar		Ramsar site	point	sep/04	http://www.ramsar.org/
Natura2000	*Bird*	Zone de Protection Spéciale (ZPS)	polygon	sept/2002	http://natura2000.environnement.gouv.fr/
	Habitat	Sites d'Intérêts Communautaires (SIC)	polygon	okt/02	
Cultural Heritage		Sité Classé (SC)	polygon & point	sept/2002	*http://www.nord-pas-de-calais.ecologie.gouv.fr/v4/scripts/index.asp*
		Site Inscrit (SI)	polygon & point	sept/2002	*http://www.ifen.fr/*
Other national and regional statutory designations		Réserve naturelle (RN)	polygon	sept/2002	
		Réserve naturelle volontaire (RNV)	polygon	sept/2002	
		Parcs Naturels Régionaux (PNR)	polygon	nov/2002	
		Arrêté de protection de biotope (APB)	polygon	sept/2002	
		Réserve Biologique Domaniale (RBD)			
		réserve maritime nationale de chasse, forêts de protection		about DPM	http://www.mer.equipement.gouv.fr/littoral/05_domaine_public_maritime/01_definition/definition.htm#_La_délimitation_du_2

Parameter		*BE* **W** category		year	website
Ramsar		Ramsar site	point	sep/04	http://www.ramsar.org/
Natura2000	*Bird*	vogelrichtlijngebied	polygon	july/00	http://www.instnat.be/ http://www.gisvlaanderen.be/geo-vlaanderen/nl/loketten.asp
	Habitat	habitatrichtlijngebied	polygon	mei/01	
Cultural Heritage		World Heritage	point	nov/04	http://whc.unesco.org/
		beschermd erfgoed	polygon	mrt/01	http://www.monument.vlaanderen.be/
Other national and regional statutory designations		natuurreservaten	polygon	jan/02	http://www.instnat.be/
		bosreservaten	polygon	dec/03	

Parameter		*NL* **Z** category		year	website
Ramsar		Ramsar site	point	sep/04	http://www.ramsar.org/
Natura2000	*Bird*	vogelrichtlijngebied	polygon	dec/01	http://www9.minlnv.nl/servlet/page?_pageid=384&_dad=portal30&_schema=PORTAL30
	Habitat	habitatrichtlijngebied	polygon	mei/03	
Cultural Heritage		beschermde dorp- en stadsgezichten	point**	dec/04	http://www.monumentenzorg.nl/
Other national and regional statutory designations		natuurbeschermingswet gebieden	polygon	2004	http://www9.minlnv.nl/servlet/page?_pageid=412&_dad=portal30&_schema=PORTAL30 and http://zeegis.zeeland.nl/geoweb/Map.aspx?Hoofdgroep=Natuurgebiedsplan

Metadata

State of the Coast of the Southern North Sea:
an indicators-based approach to evaluating sustainable development in the coastal zone of the Southern North Sea.

SAIL is a partnership of regional and local authorities, maritime organisations, and coastal and maritime agencies, working together for the sustainable development of the Southern North Sea coastal region.