CHAPTER 9.

Portsmouth and Thames Gateway: Coastal Environmental Resources and Users

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1. Introduction

The two SECOA study sites in the UK are Thames Gateway and Portsmouth. Both are located in southeastern England, which is the most prosperous and dynamic region in the UK, although they represent contrasting socio-economic and environmental systems.

Portsmouth is a compact coastal urban region which occupies a highly constrained physical site. The city has a long history of development, related to the historical role of the port as both a naval and commercial hub. It has developed mostly on Portsea Island, which is surrounded by two estuarine basins - Portsmouth and Langstone harbours. A low ridge of hills effectively marks the northern and landward edge of the city. The present day City of Portsmouth constitutes a unitary (single tier) administrative region of 6,019 ha, of which 4,028 ha is land with a further 1,991 ha in the two harbours. It had an estimated population of 200,000 in 2008.

The Thames Gateway region is far larger, and more complex than the Portsmouth case study area. It was established under National Regional Planning Policy Guidance as a regional framework for development of housing and economic activities, and to accommodate much of the development pressures in the relatively congested south eastern region of the UK. An average of more than 6,000 new homes have been built per year since 2000, mainly in areas previously dominated by derelict industrial and commercial land. Thames Gateway stretches some 70 kilometres along the Thames Estuary from Isle of Dogs and London Docklands, near the centre of London, to Southend in Essex (north) and Sheerness in Kent (south). Unlike Portsmouth, which is a unitary local authority, Thames Gateway cuts across the boundaries of 18 local government areas. In environmental terms, it covers part of the tidal Thames. About 1.45 million people live in the Thames Gateway, occupying about 111,247 ha of mainly low-lying floodplains. The majority of these are heavily protected against tidal and river floods, although there are still some areas that are less well defended.

The Thames Estuary is protected from flooding by the Thames Tidal Defences which consists of nine major barriers (including the Thames Barrier), many smaller barriers and gates, and over 300 km of walls and embankments which provide a 1 in 1000 year standard of protection from tidal flooding through to 2070 – the highest standard of flood protection in the UK. Other flood defences provide a standard of protection less than 1 in 1000 year from sea

flooding (open coast and tidal estuary) and equal to or less than 1 in 100 years from fluvial (river) flooding. The Thames Estuary 2100 plan – a comprehensive study of the tidal Thames - includes forecasts of possible change over time due to rising sea levels and suggests ways of managing sea level rise over the next 150 years.*

Despite these striking contrasts, the two study areas have in common high population densities on low-lying flood-risk areas, with urban development exerting long and continuing pressures on the natural environment. The management of flood risk is a major issue in both areas, where the maintenance of flood defences is of paramount importance at present and represents an economic and environmental challenge for the future. The risk of flooding already constrains existing plans for further development and regeneration in the study areas. The impacts of climate change and sea level rise are expected to increase flood risk and the cost of maintaining/upgrading flood defences and, at the same time, aggravates the loss of natural habitats due to coastal squeeze. Resources and resource users in these two contrasting case studies are considered in this report against this background of intense, but dynamic, human-natural relationships.

2. Materials and Methods

The chapter draws on material from a range of sources. Maps and other visual materials were drawn from European and UK national sources (for example, European Environment Agency and Ordnance Survey). Where available, datasets supplied and verified by the UK Office of National Statistics - for example, census data – were used to provide supporting evidence. Where raw data was unavailable, or had been analysed and appropriately reported on using the relevant geographies, evidence was drawn from alternative sources. These include central UK government departments (for example, the Department for Communities and Local Government [DCLG], and the Department for Transport [DFT]); Executive Agencies (for example, the Environment Agency and Natural England); local authorities (and work commissioned by local authorities); and academic sources including books and journal articles.

* See www.environment-agency.gov.uk/research/library/consultations/106100.aspx. References to Portsmouth's and PUSH's (Partnership for Urban South Hampshire) environmental strategies including the Strategic Flood Risk Assessment can be found at http://www.push.gov.uk/work/sustainability-and-social-infrastructure/contentstrategic-flood-risk-assessment.htm.

Where relevant, descriptive data was drawn from "grey" industrial/commercial and civil sources.

The two case study areas are quite distinct in terms of their geographical, administrative and natures. Portsmouth is a physically discrete long-established coastal city. By contrast, Thames Gateway is a regional framework for development rather than an established urban centre, encompassing (unevenly) 18 local authority areas located across three government regions.

Data for the Portsmouth case study was, for the most part, available from conventional sources and was suitably bounded. However, the diverse physical and administrative nature of the Thames Gateway study area made it necessary on occasion to look beyond conventional sources to, for example, analyses produced by economic development delivery partnerships. One particular (although minor) issue with regard to socio-economic analysis of the Thames Gateway was the occasional lack of „fit" between the Thames Gateway area(s) and data corresponding to relevant local authority boundaries.

3. Overview of Resources in the Case Studies

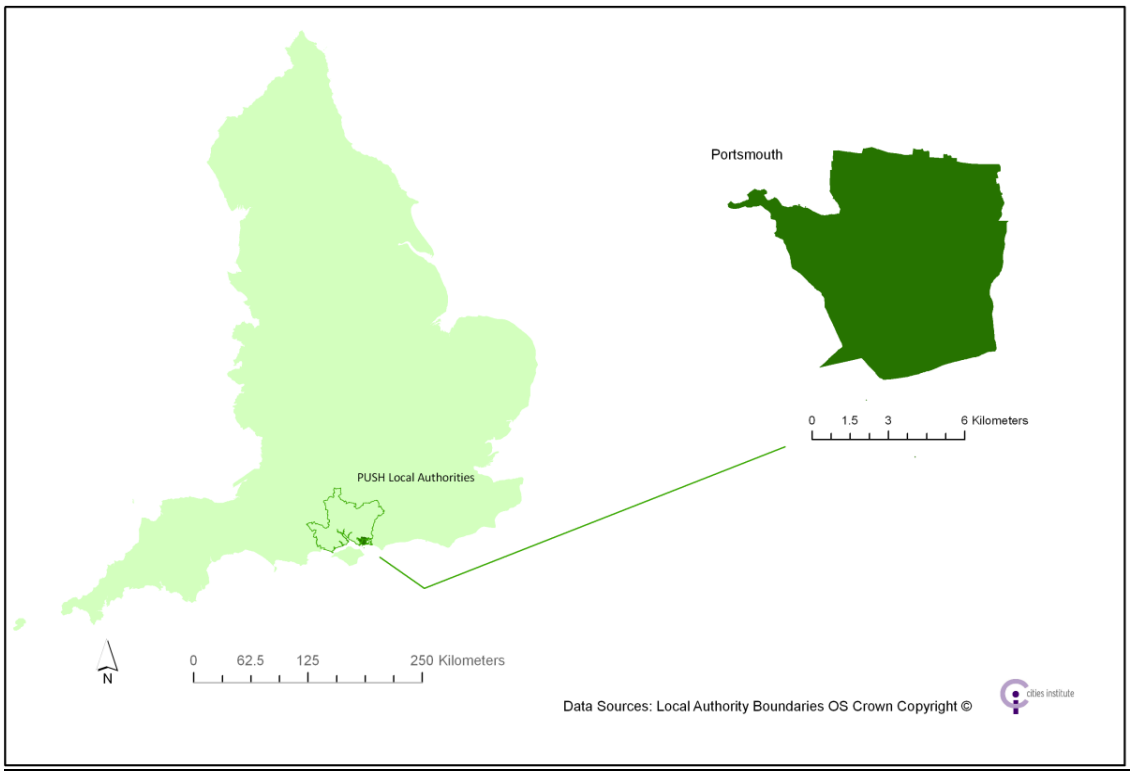
3.1 Case study 1 – Portsmouth

3.1.1 Geographical and historical overview

Portsmouth is located in the county of Hampshire on the southern coast of England, approximately 112km south west of London. Most of the city lies on Portsea Island, bordering the Portsmouth Harbour in the west and the Langstone Harbour in the east.

Historically, Portsmouth's development has been heavily based on its coastal location. It has been an important naval port for centuries (construction of the first docks started in 1212), and today economic activities in the area include shipbuilding, the commercial port and waterfront regeneration related to retailing, leisure and tourism.

Figure 9.1. UK Regional City Case Study: Portsmouth.



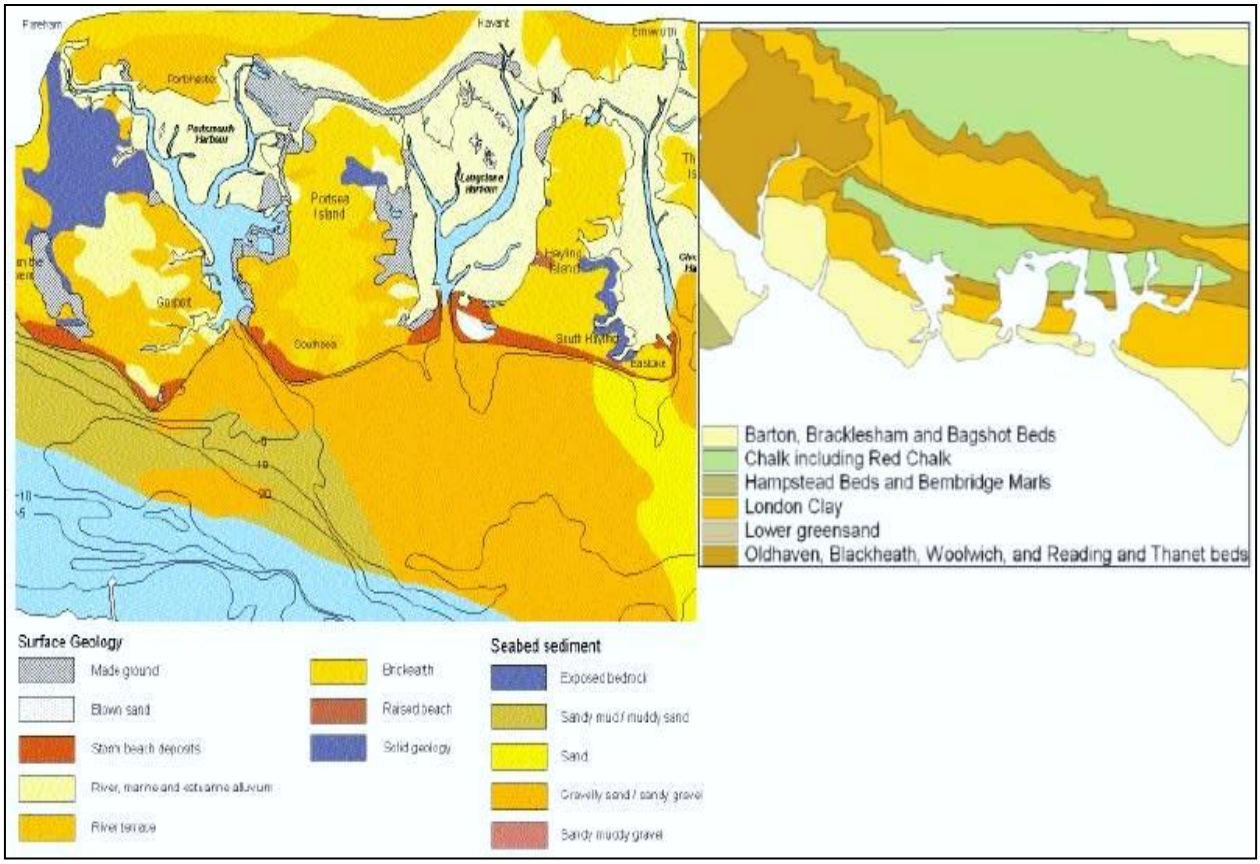
3.1.2 Bio-physical resources

3.1.2.1 Area and typography

The Solent estuarine system is formed by rias - river valleys drowned since the Pleistocene by rising sea levels. Both Portsmouth and Langstone harbours show a steep slope delimited by the antecedent cliff line of the raised beach formed by the Ipswichian glaciations in the north and the narrow harbour entrances, which are about 20m below sea-level in the south (West, 2010).

The geology of the area is dominated by Tertiary clays and sands in the lower areas of the Hampshire Basin (Figure 2) and Cretaceous chalk forming the higher grounds. These sediments record a change in environments from marshy mudflats to more open, marine conditions (Natural England, 2010).

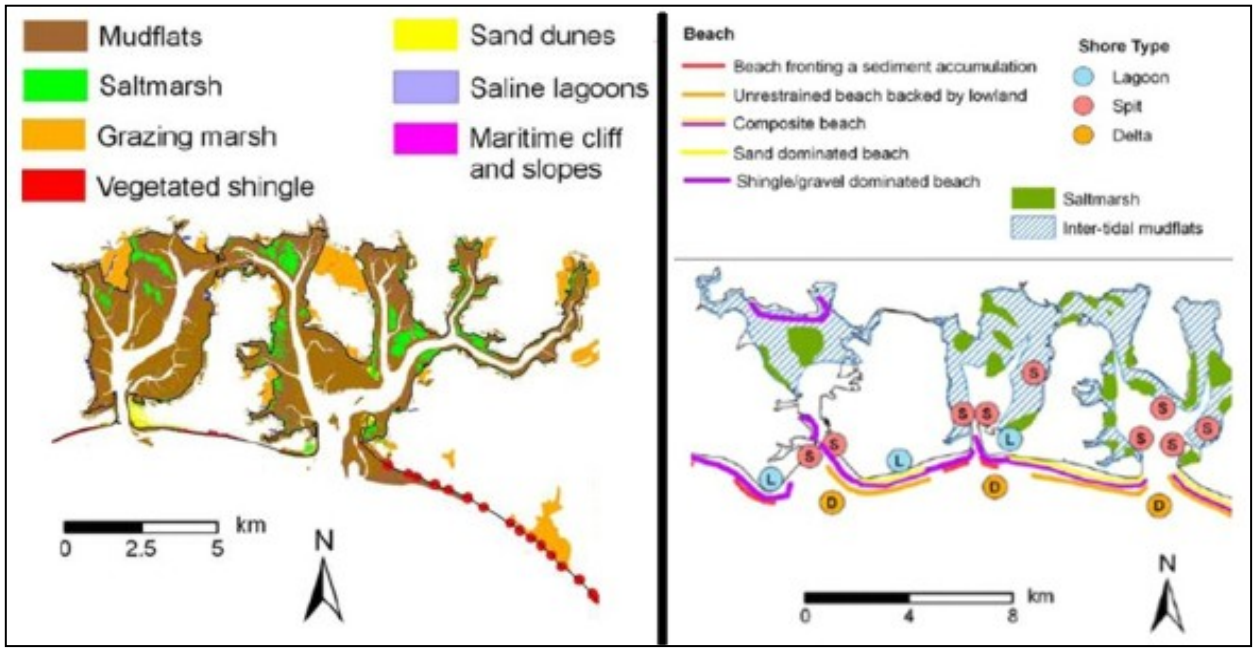
Figure 9.2. Recent (left) and hard rock (right) geological map of the north Solent (modified from North Solent Shoreline Management Plan, 2010).



3.1.2.2 Coastal ecosystems

The coastal geomorphology in this area is highly variable due to changes in coastline orientation, exposure/sheltering, elevation and geology. Coastal processes in the Solent estuarine system are complex due to the combination of open coast and harbours that are partially sheltered by the Isle of Wight. Human activities have altered the functioning of natural processes by affecting the sediment budget through flood and coastal defence works (the entire Portsmouth coastline is protected by coastal defences), controlling river drainage/flow, and dredging for navigation purposes and aggregates extraction.

Figure 9.3. The main geomorphologic features and coastal habitats around Portsmouth.



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As the majority of coastal defences in the north Solent are fronted and backed by European designations, their maintenance must comply with European environmental legislation. The intertidal areas (mudflats and salt marshes) surrounding Portsea Island receive national and international conservation designations, including Ramsar, Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Sites of Special Scientific Interest (SSSI). Each designation recognises a separate set of criteria that distinguish the sites as of high conservation value.

Salt marshes grew rapidly in the area between the 1880s and late 1920s; although rapid erosion, land reclamation and coastal squeeze have subsequently threatened these environments (see Table 9.1). Between 1971 and 1984, approximately 2.5km² of intertidal area was reclaimed in Portsmouth Harbour.

Table 9.1. Area and % loss of salt marsh in Portsmouth and Langstone harbours.[*]

Portsmouth Harbour

Year	Area (Ha)	Data Source	Period	Total loss		Loss excluding reclamation	
				% loss	% loss per year	% loss	% loss per year
1946	269	CCO					
1971	183	CCO	1946-1971	32	1.3	20	0.8
1984	52	CCO	1971-1984	71	5.5	54	4.1
2002	43	CCO	1984-2002	17	0.9	17	0.9
2005	47	CCO	2002-2005	-8	-2.7	-8	-2.7
			1946-2005	83	1.5	68	1.0

Langstone Harbour

Year	Area (Ha)	Data Source	Period	Total Loss		Loss (excluding reclamation)	
				% loss	% loss per year	% loss	% loss per year
1946	438.0	CCO					
1963	256.5	CCO	**1946-1963**	41.4	2.4	41.4	0.1
1971	123.0	CHaMP	**1963-1971**	52.0	6.5	51.3	6.4
1984	81.2	CCO	**1971-1984**	34.0	2.6	32.4	2.5
2001	75.3	CHaMP	**1984-2001**	7.2	0.4	7.2	0.4
2002	72.5	CCO	**2001-2002**	3.7	3.7	3.7	3.7
			1946-2002	83.4	1.5	82.6	1.5

The recent history of the saltmarshes in the region has been complex, particularly regarding the role of *Spartina* species. Following a hybridisation event between a native species and an introduced American species, a new species of *Spartina* (*S. anglica*) arose in the late 19th century in Southampton Water (Ayres & Strong, 2001). This species rapidly colonised mudflats, converting them into saltmarsh with accelerated rates of sediment accretion, reducing the available mudflat habitats wherever the plant became established. More recently, in some areas including within the Portsmouth case study area, areas of saltmarsh have declined due to die-back of *S. anglica*, associated with rotting of the rhizomes but whose ultimate cause is unknown (http://www.issg.org/database/species/ecology.asp?fr=1&si=76; Garbutt & Wolters, 2008). If current rates of loss continue, salt marshes may disappear by 2093 in Portsmouth Harbour and by 2010 in Langstone Harbour (Cope *et al*, 2008).

[*] Source: Cope & Gorczynska (2007).

Table 9.2. Factors likely to induce wetland loss (modified from North Solent Shoreline Management Plan, 2010).

Factor	Comment
Wave action	Increases in significant wave height and frequency of storm surges may produce stressed vegetation on the seawards edges of the saltmarshes, clifflets, erosion stacks and hollows, abrasion platforms, and fragmented saltmarsh islands.
Sea level rise and climate change	Rising sea levels and increased storminess would produce higher water level resulting in the saltmarshes being inundated for longer durations more frequently.
Water logging of estuarine soils	Poorly drained sediments would result in water-logging of the marsh soil causing the development of anaerobic conditions in the mud surrounding the root system
Vegetation dieback	Concentrations of plant toxins increase as a result of organic matter building up and reduced flushing. This reduces ability of the saltmarsh to bind the sediment through the root network and to trap sediment through the vegetation. This causes slumping and erosion, and the conversion of vegetated saltmarshes to tidal flats/plains or open water.
Lack of sediment supply	A lack of fine-grained sediment supply, either through the retention of eroded sediments, or from other sources, would prevent the saltmarshes from accreting vertically to keep pace with rising sea levels.
Tidal currents	Velocity, duration and direction, ebb dominant in Western Solent.
Bathymetric changes	Sub-tidal erosion and northward migration of palaeolandscape cliffs in the main Western Solent Channel (personal communication HWTMA)
Human impacts	Growth and decline of the saltworking industry, changes in land use management within river catchments, building of hard sea defences causing coastal squeeze; ship-generated waves, dredging and construction of marinas and berths.
Natural loss	Decline in vigour and adaptivity of the vegetation
Coastal squeeze	Under rising sea levels, saltmarshes and other estuarine habitats and ecosystems would naturally migrate landward. This is often prevented however due to the presence of static coastal and flood works (such as sea walls and embankments), and the proximity of urban and coastal developments. This restriction on habitat migration results in the erosion and degradation of these natural flood defences. The loss of saltmarsh area fronting the sea defences allows greater wave action on the shoreline and sea defences and increases the risk of flooding and coastal erosion.

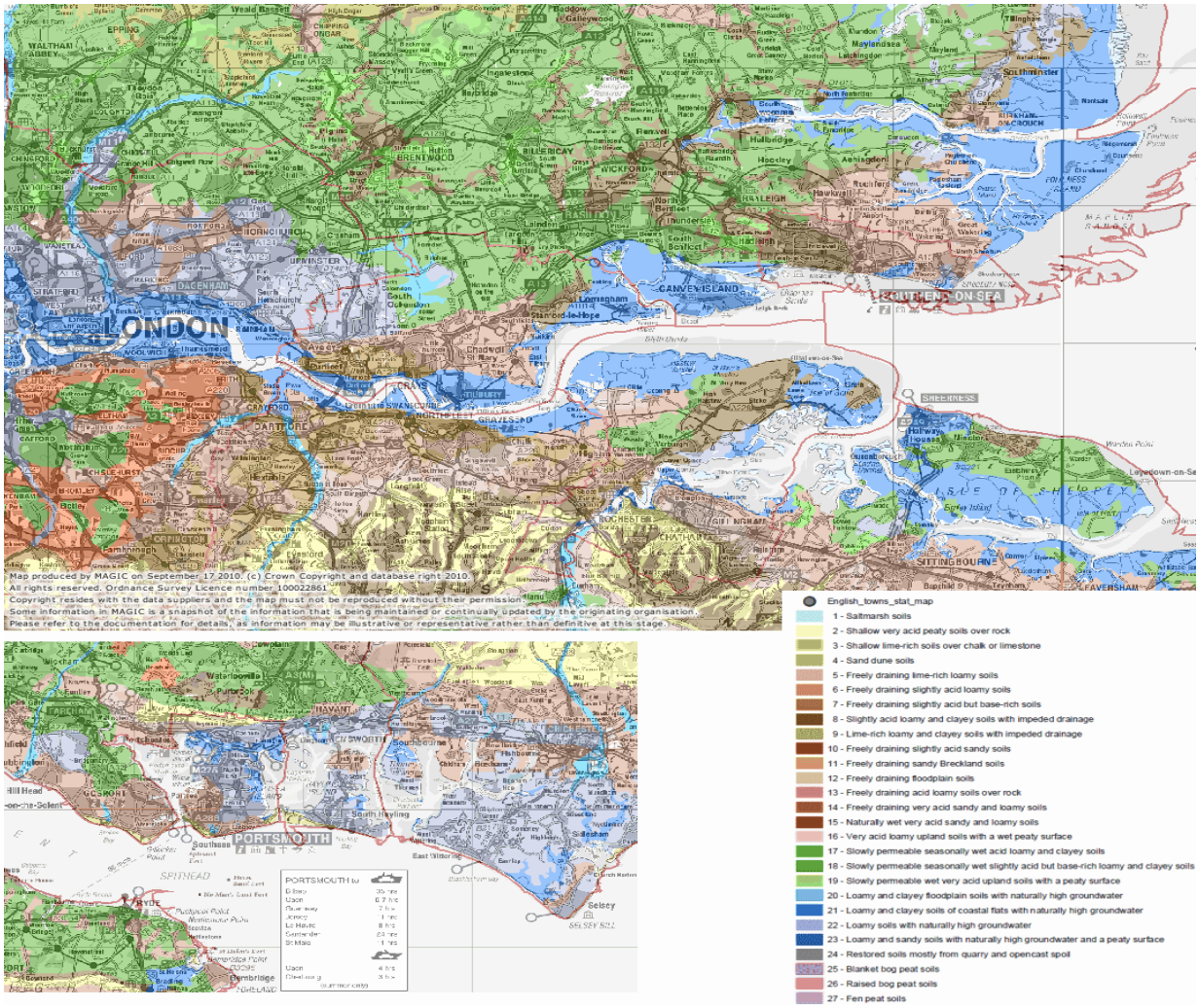
The open coast is formed by gravel barrier beaches showing low gradient sandy foreshores, which are currently relatively starved of sediment. Sediment supply is essential for

the maintenance of both intertidal and open coast environments, with transport around the harbour mouths complex due to tidal currents and the presence of ebb tidal deltas (North Solent Shoreline Management Plan, 2010).

3.1.2.3 Soil and land-uses

Soils in Portsmouth are largely loamy with naturally high groundwater, freely draining slightly acid loamy soils present at the margins of Portsmouth harbour (Figure 4).

Figure 9.4. Distribution of soil types in Southern England.[*]

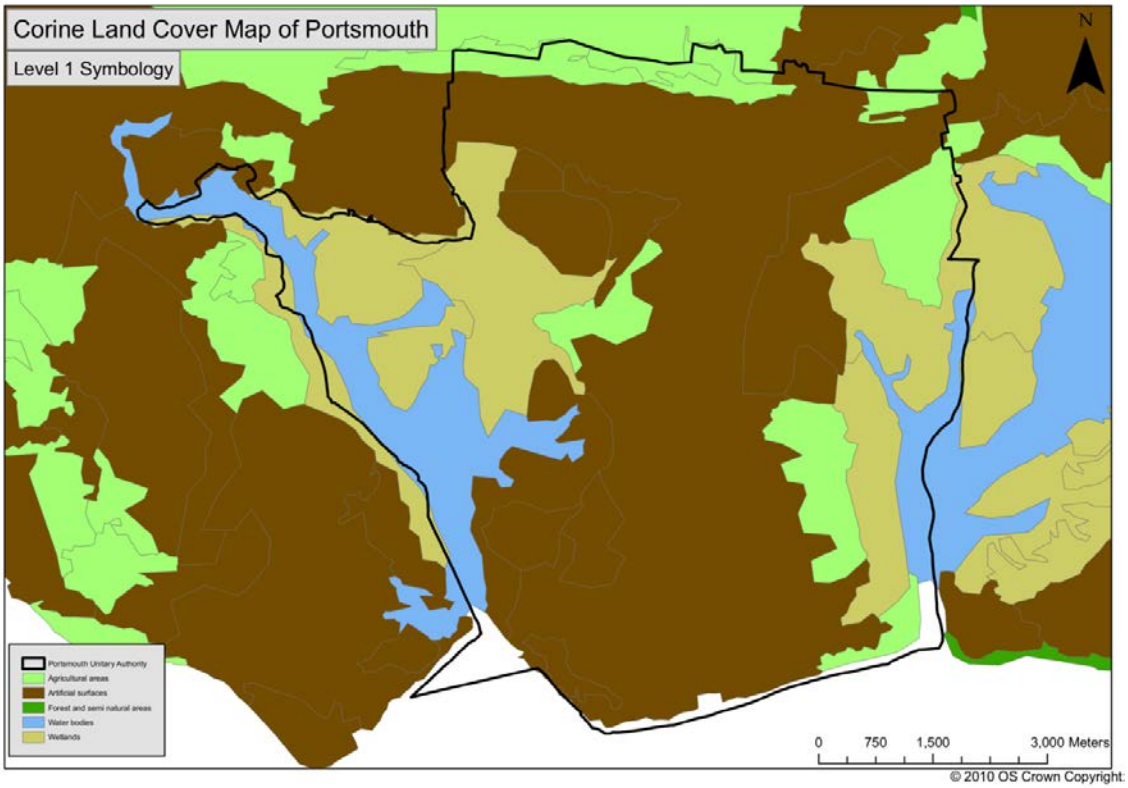


[*] From Magic Soilscape, © Crown Copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 100022861). Source: www.magic.gov.uk/datadoc/metadata.asp?datasetname=Soilscape%20(England).

The land cover visualised at Corine Level 1 symbology (Figure 5) is overwhelmingly dominated by the development of the built environment in this core urban location, despite small areas of agricultural land within the city's administrative boundary. Two significant bodies of water and their associated wetlands constitute unusually high degree of constraint on urban development within a narrow peninsular.

There is limited availability of brown field land - 12 hectares within the local authority boundary, of which 67% is already in use but available for redevelopment. 92% is deemed suiTable 9.for housing growth (DCLG 2008).

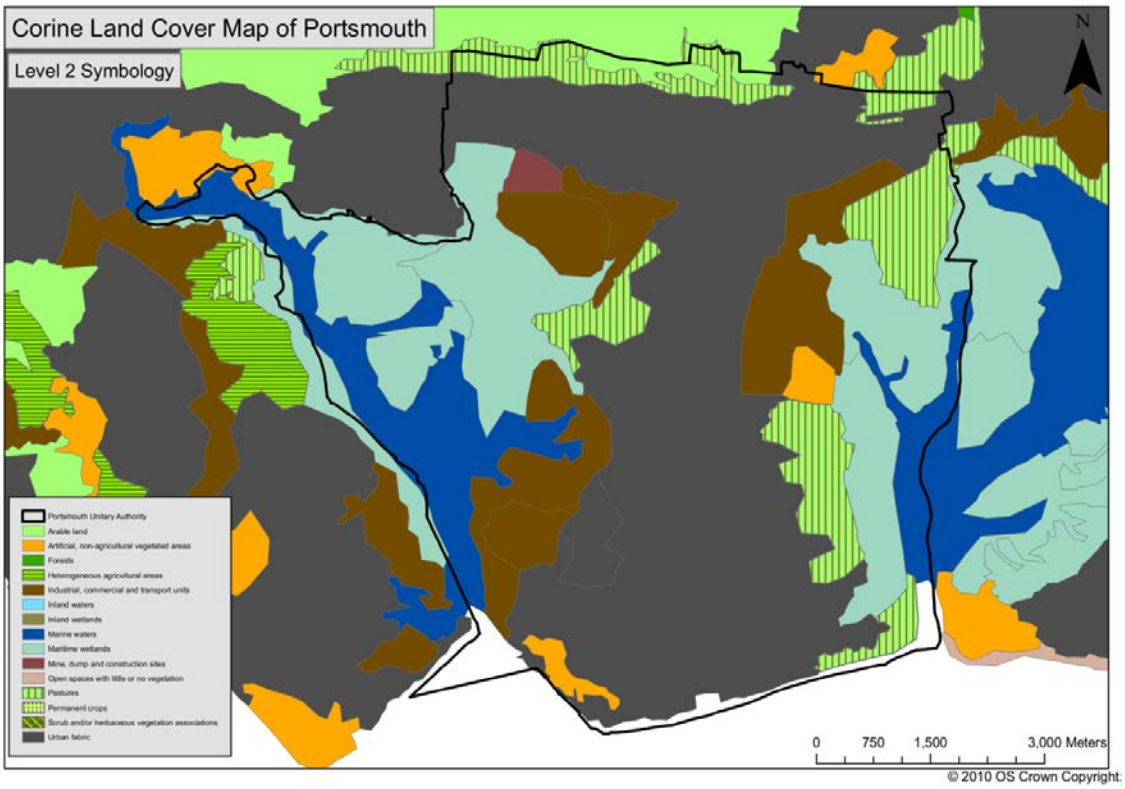
Figure 9.5. Corine Land Cover Map of Portsmouth – Level 1 Symbology.[*]



Corine Level 2 symbology (Figure 6) identifies specific areas of industrial and commercial activity - most commonly located in close proximity to the coast and harbour areas, and thus adjacent to marine wetlands and intertidal flats. There is one key site on the waterfront to the north and west of the city currently designated for waste disposal and dumping. Two areas of artificial surface for recreational use lie adjacent to areas of undefined agricultural land.

[*] Prepared by cities institute using CORINE landcover data, Eyropean Environment Agency 2010.

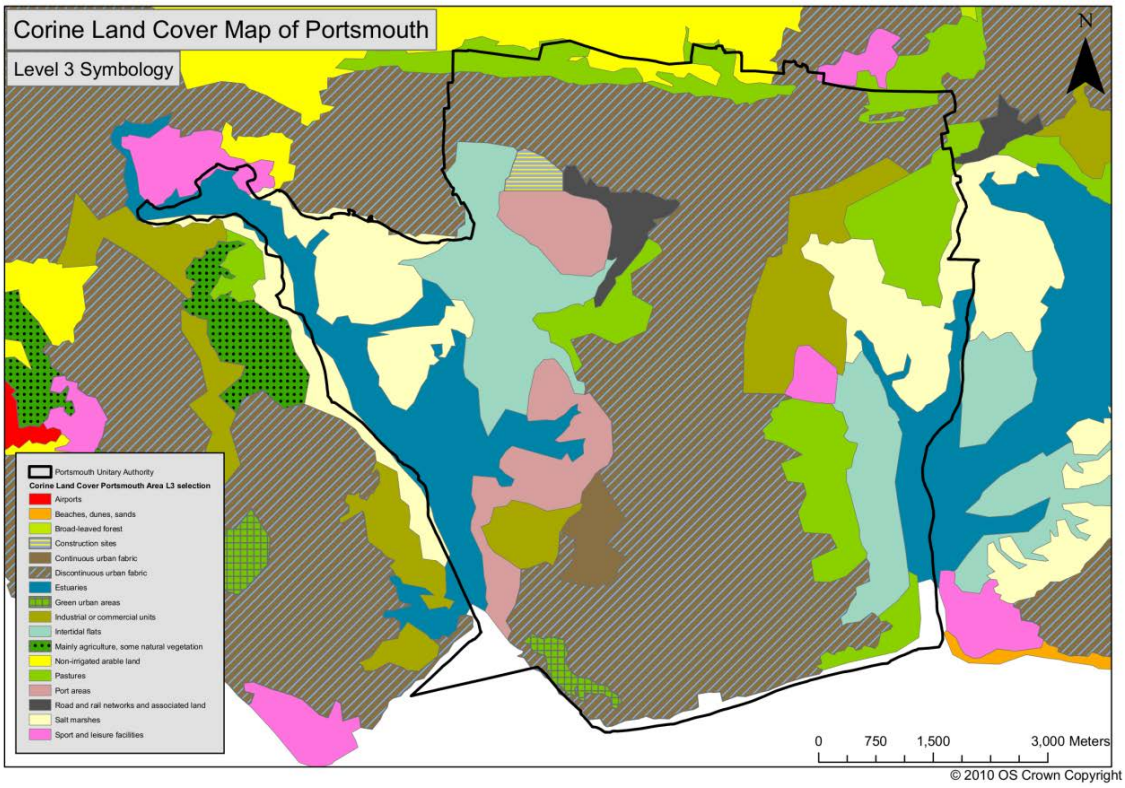
Figure 9.6. Corine Land Cover Map of Portsmouth – Level 2 Symbology.[*]



Corine Level 3 symbology (Figure 7) shows the core of the city clearly surrounded by less dense urban development. There are number of specific sports and recreational open spaces, often bordering agricultural land and the coast. Portsmouth Harbour provides a significant resource for activities such as sailing and angling, and access to wildlife but it is at or near its capacity for recreational use (Portsmouth City Council, 2000).

[*] Prepared by cities institute using CORINE landcover data, European Environment Agency 2010.

Figure 9.7. Corine Land Cover Map of Portsmouth – Level 3 Symbology.[*]



The 2001 General Landuse Database (Table 9.3) indicates that domestic buildings and gardens account for nearly 20% of land use. Roads use over 10% of available land - a level which is almost as high as that for London (11%). Portsmouth lacks green space (23% compared to 35% for London) but has an over-representation of water (30%). The high density of development plays a major formative role in terms of both resources and competing users.

[*] Prepared by cities institute using CORINE landcover data, European Environment Agency 2010.

Table 9.3. Landuse in Portsmouth and England.

Landuse		
	Portsmouth	England
Domestic Buildings	7.13	1.1
Gardens	12.30	4.1
Non-Domestic Buildings	4.22	0.6
Road	10.17	2.3
Rail	0.38	0.1
Path	0.71	0.1
Greenspace	22.77	88.0
Water	29.26	2.2
Other	8.44	1.3
Source: GLUD 2001		

3.1.3 Freshwater and access to water

The city enjoys a small supply surplus of fresh water (Environment Agency, 2004), although Environment Agency projections suggest that by 2025 this will be replaced by 'approximate balance' between supply and demand. All water sources are groundwater based, and the potential for additional abstraction from surface waters is very limited (Ove Arup & Partners Ltd, 2009). It is predicted that climate change may reduce summer rainfall by between 15-60% by the 2080s, which is likely to increase the frequency of drought in the south east region of the UK (Portsmouth LDF & LTP, 2005).

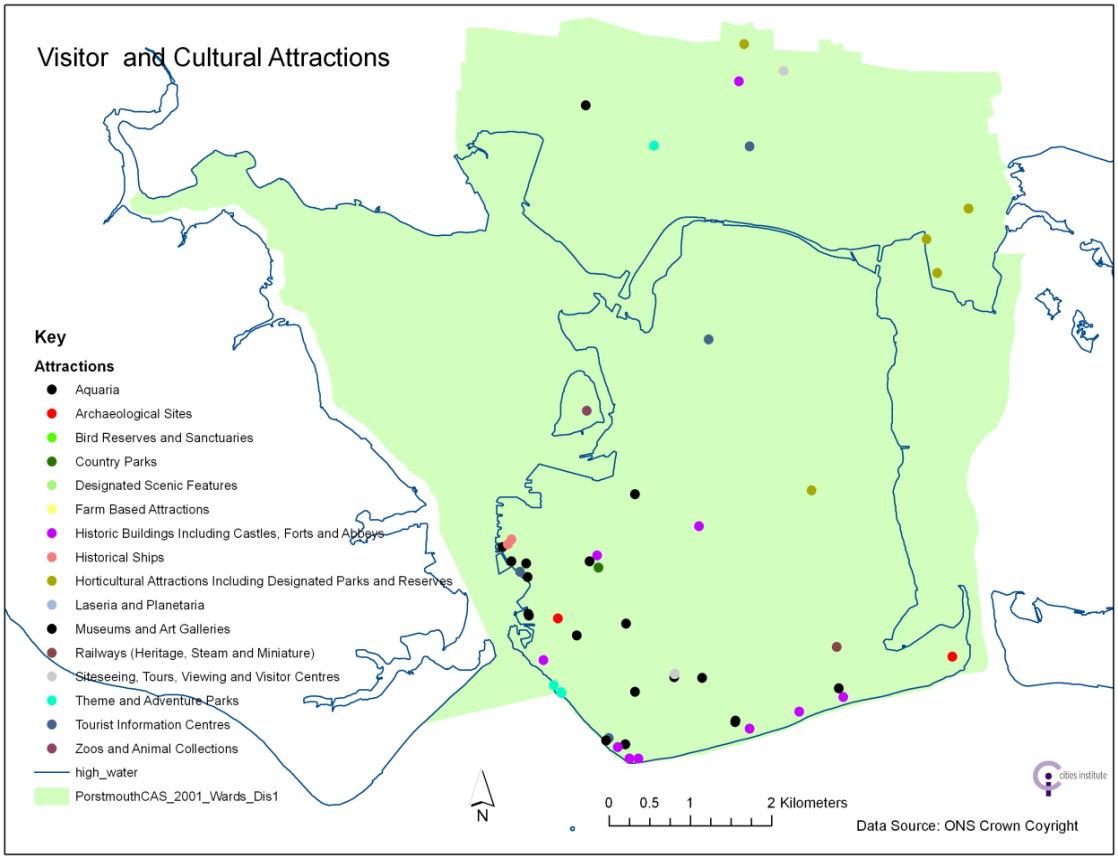
3.1.4 Cultural and social resources

3.1.4.1 Important cultural features

The main visitor attractions in Portsmouth are Gunwharf Quays; the seafront; and the historic Royal Naval Dockyards and the historic ships HMS Victory, the Mary Rose and HMS Warrior (Tourism South East 2008). The Naval History Museum and a Sea Life Centre are also key destinations, and a range of museums and cultural facilities supports local cultural development (Figure 8). The protection of the historic urban landscape of Portsmouth has been a priority, and there are currently 24 Conservation Areas within the city - in particular protecting the seafront, which covers 375 hectares. In 2006 Portsmouth hosted 4.6 million

visitors – which represents a substantial three-fold increase compared to 1988 (1.5 million) (Portsmouth Key Tourism Facts and Figures); they are largely concentrated on the waterfront areas.

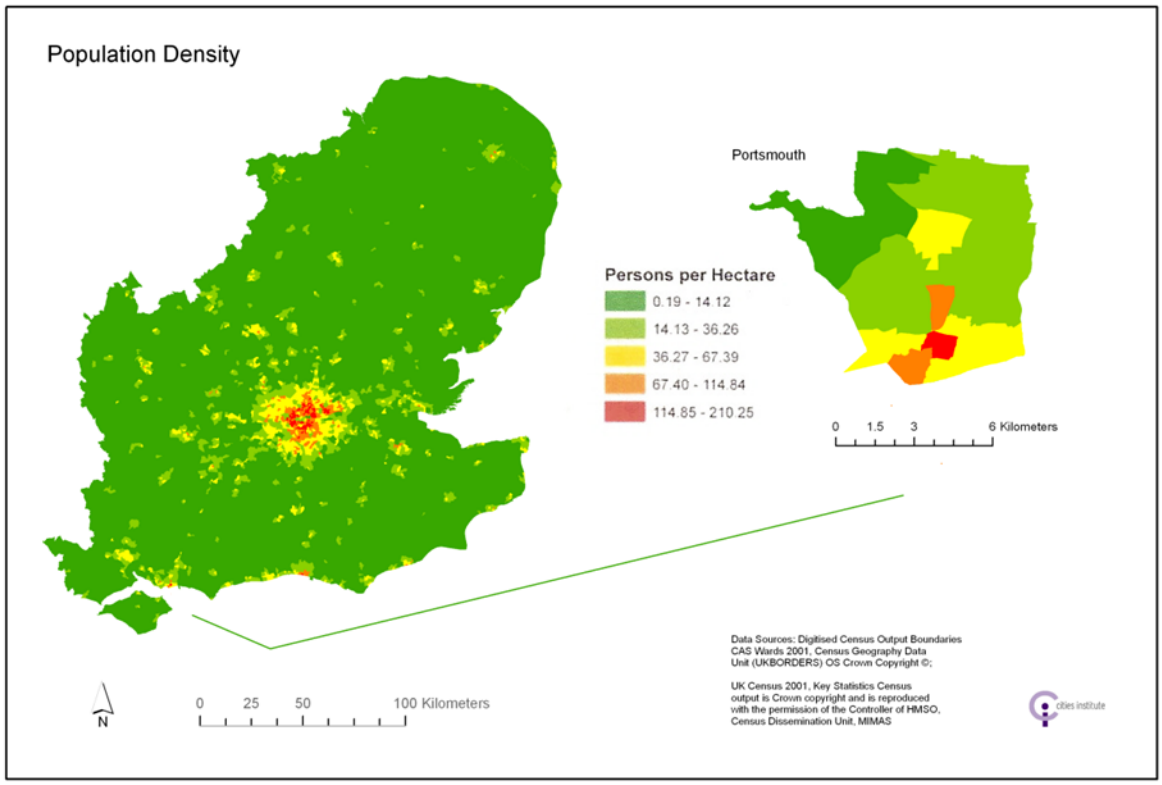
Figure 9.8. Visitor and Cultural Attractions.



3.1.4.2 Important social features

Portsmouth is one of the most densely populated urban areas in Southern England (Figure 9). One city ward, Central Southsea, has a population density of 137 people per hectare - a rate similar to neighbourhoods in inner London. Outside this core population densities are similar to those for outer urban and suburban localities elsewhere in the South East of England.

Figure 9.9. Population density in Portsmouth.



Portsmouth broadly reflects the same urbanisation and counter-urbanisation trends as the rest of the UK. The population declined by 14,600 people (over 7%) during the 1970s, with this trend continuing, although with less intensity, in the 1980s. The decline stopped in the 1990s and the population stabilised at around 185,000. Population growth returned between 2001 and 2009 when the population grew sharply by over 15,000, around 8% (Table 9.4) (Office of National Statistics, MYPE, 1971,1981,1991,2001).

Figure 9.10. Population 1971-2009.[*]

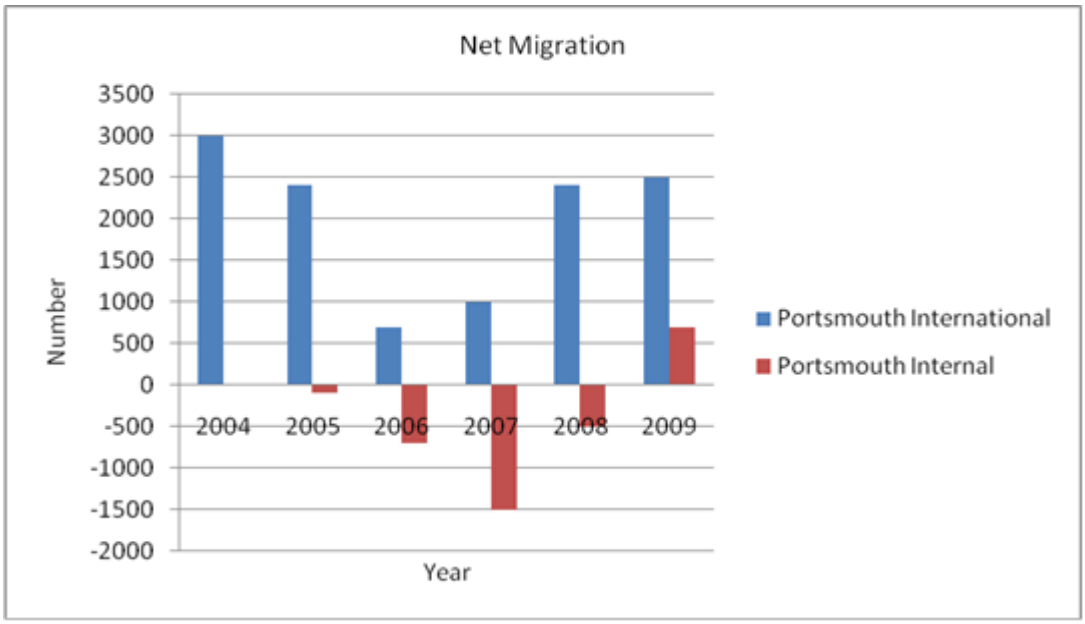
Table 9.4. Population change 1971-2009.[*]

Population Change in Portsmouth			
		Change	%Change
1971	206,000		
1981	191,400	-14,600	-7.09
1991	186,800	-4,600	-2.40
2001	188,000	1,200	0.64
2009	203,500	15,500	8.24

Net migration, particularly international migration in the 2000s, has contributed to this reversal of population decline. Internal migration from elsewhere in the UK did not begin to recover until 2009. Annual net migration (combined internal and external) is now approximately 3.4% (see Figure 11). There is a high level of internal movement within Portsmouth - 16.8% of Portsmouth residents had a different address in the year before the 2001 Census, compared with 12% nationally (Portsmouth City Council, 2003-4). Students are over-represented in the population (11.5%), indicating an increasing number of mobile and temporary residents within the city.

[*] Data Source: Office of National Statistics (1971, 1981, 1991, 2001, 2009).

Figure 9.11. Net Migration.[*]



The gender composition of Portsmouth's population matches that of England (Table 9.5). The age structure (Table 9.6) is also similar with only slightly higher proportions of younger people, including children (under 15 year olds) and those age 16-29.There are, however, proportionately fewer people in the core working age population (between 20-64 years old). Proportions of those of retirement age are similar to the national percentage.

Table 9.5. Population by Gender.

Population by Gender					
	All	Male	%	Female	%
Portsmouth	186701	92042	49	94659	51
England	49138831	23922141	49	25216687	51
					Source: Population Census 2001

Table 9.6. Population by Age.

Population by Age									
	All	0-15years	%	16-29years	%	30-64years	%	65years and over	%
Portsmouth	186701	36131	19.35	41255	22.10	80622	43.18	28673	15.36
England	49138831	9901575	20.15	8630210	17.56	22799035	46.4	7808011	15.89
								Source: Population Census 2001	

[*] Data Source: Office of National Statistics (various years), Local Area Migration Indicators.

A predominantly white population, Portsmouth is significantly less ethnically diverse than the rest of England with less than 3% with Asian ethnicity and under 1% Black Minority Ethnic (Table 9.7). Recent international migration has added to the social diversity of the population, but is not adequately captured by the available statistical data for the period after 2001.

Table 9.7. Population by Ethnicity.

Population by Ethnicity											
	All	White	%	Mixed	%	Asian	%	Black	%	Chinese	%
Portsmouth	186701	176882	94.74	1859	1.00	4555	2.44	942	0.50	2463	1.32
England	49138831	44679365	90.92	643441	1.31	2248107	4.58	1132528	2.30	435434	0.89
Source: Population Census 2001											

The city has a slightly lower proportion of working age residents with no qualifications (27%) than England (29%).

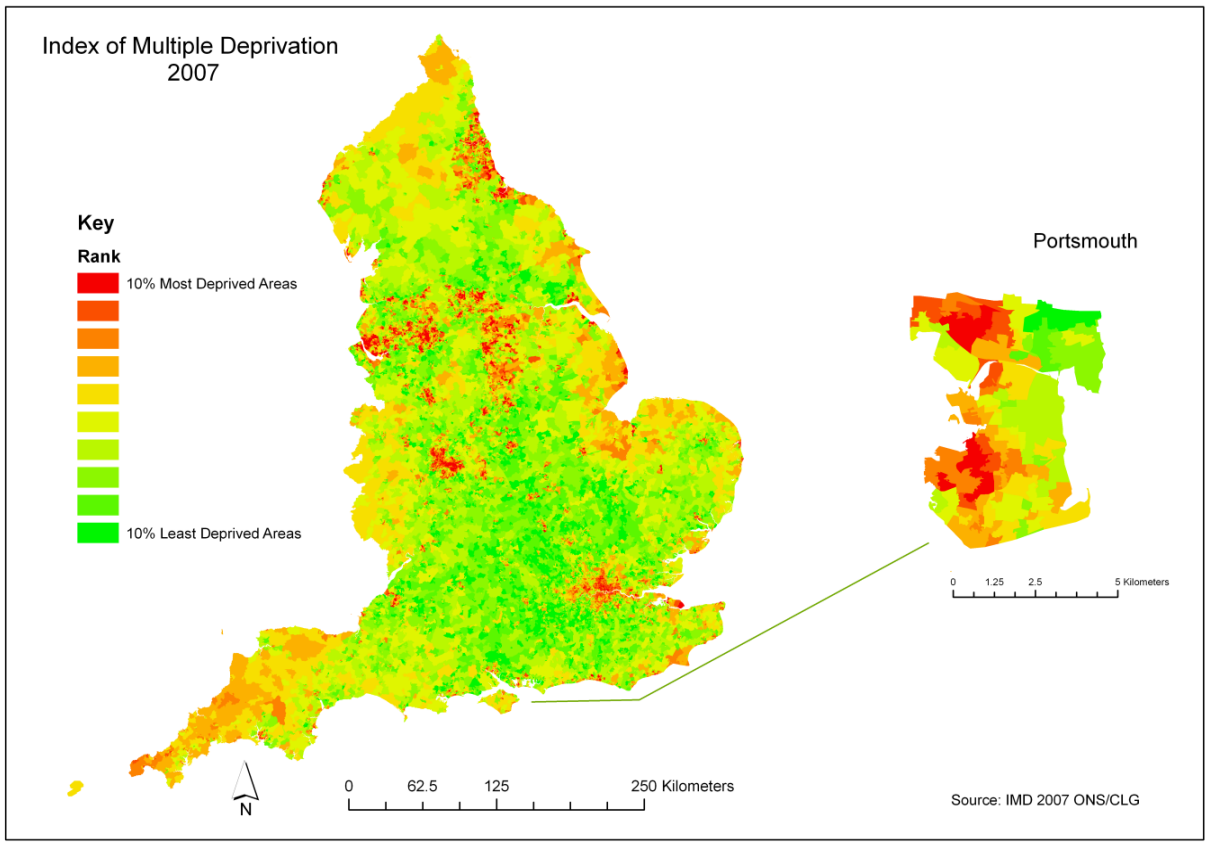
Housing tenure is significant in the UK in terms of access to resources, as well influencing residential mobility. Portsmouth has lower levels of owner occupation (64.8%) and a higher proportion of private renting than England as a whole (Table 9.8). This reflects the local housing tenure structure in which higher levels of temporary residents (including students) have fostered a demand for private rented accommodation. Social renting is slightly higher than the national rate.

Table 9.8. Housing Tenure.

Housing Tenure			
	% Owner Occupation	%Social Renters	%Private Renters
Portsmouth	64.8	18.5	13.2
England	71.2	17.9	10.9
Source: Census 2001			

Portsmouth experiences high social, economic and environmental deprivation (Figure 12) geographically concentrated in areas to the west of the city and close to areas of past industrial and port activity. This reflects the historical legacy of spatial concentration of poverty and inequality; and the uneven distribution of service provision, access to educational and housing resources, and access to better living environments.

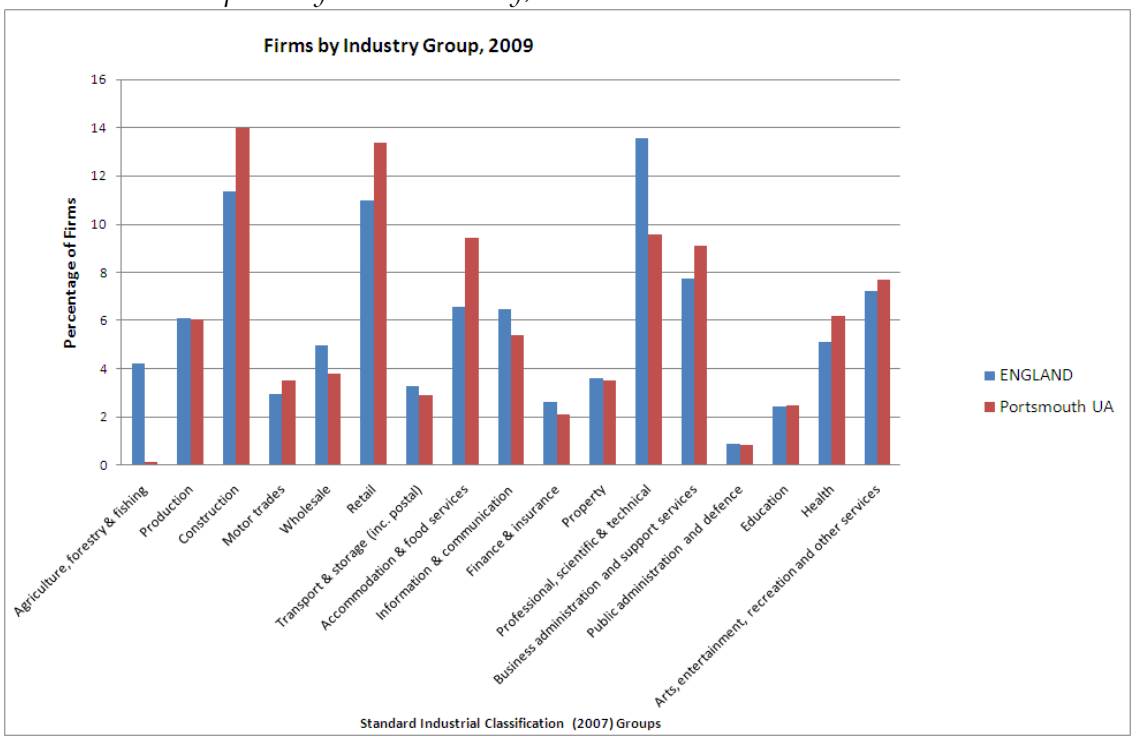
Figure 9.12. Index of Multiple Deprivation 2007 (per Super Output Area, the smallest statistical geographical unit) in Portsmouth.



3.1.4.3 Important economic features

Historically the economy of Portsmouth has been influenced by the presence of the Royal Naval Dockyards. This continues to have an effect, although Portsmouth's industrial structure is now dominated by firms in construction and in the service sectors (see Figure 13). There was significant change in the city's employment structure between 1998 and 2008 with loss of jobs in manufacturing (approximately 4,000 jobs) and wholesale (in excess of 2,000 jobs) as well as in finance and the core public services. The sectors that experienced job growth were those relating to the property and hotel and leisure industries and community and personal services (including creative, cultural and lifestyle services).

Figure 9.13. Percentage share of firms in England and Portsmouth (source: Office for National Statistics, PAYE based Enterprises by Local Authority).[*]



Higher professionals and large employers are slightly under-represented, whilst the pattern of occupations in manufacturing or routine occupations, and in small firms, is similar to England as a whole

Table 9.9. Working Age Population by Occupation.

Working Age Population by Occupation

	All people aged 16 - 74	Large employers and higher managerial occupations	%	Higher professional occupations	%	Lower managerial and professional occupations	%	Intermediate occupations	%	Small employers and own account workers	%
Portsmouth	135628	4256	3.14	6225	4.59	23973	17.68	12835	9.46	8255	6.09
England	35532085	1243918	3.50	1816038	5.11	6656918	18.73	3366757	9.48	2479470	6.98

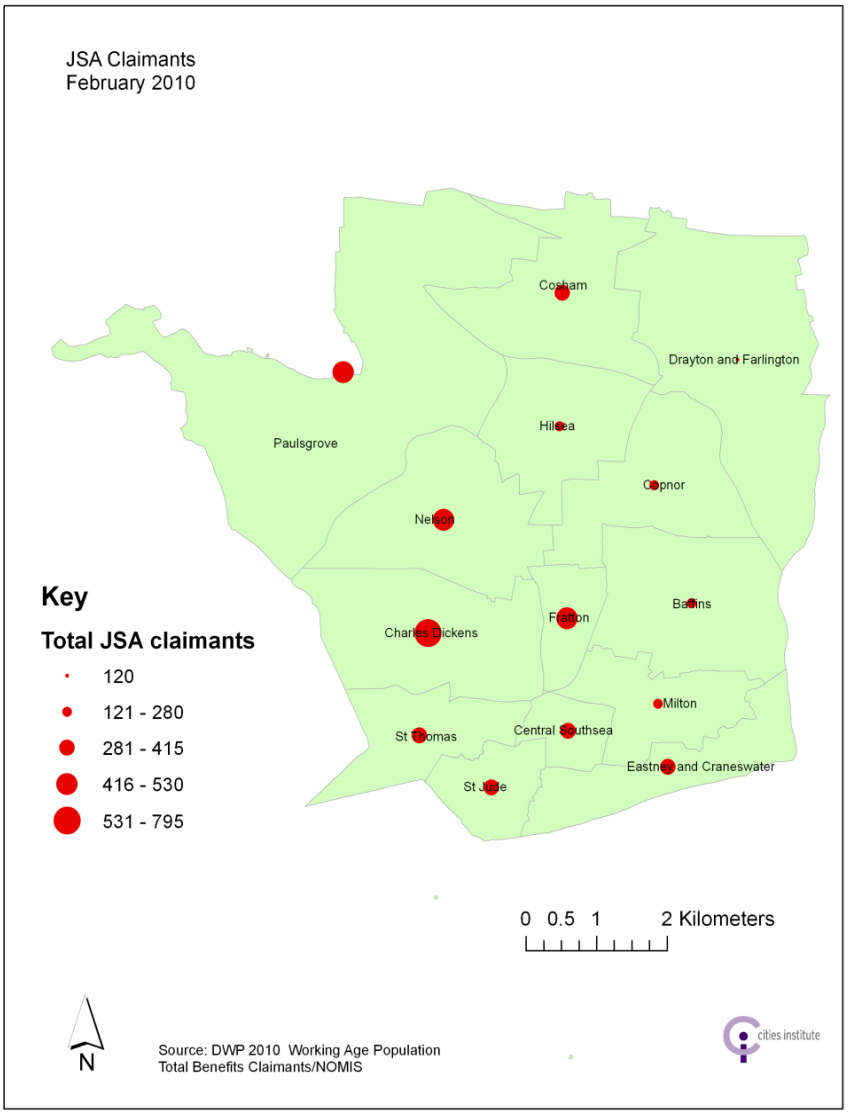
Lower supervisory and technical occupations	%	Semi-routine occupations	%	Routine occupations	%	Never worked	%	Long-term unemployed	%	Full-time students	%	Not classifiable for other reasons	%
10581	7.80	16521	12.18	12818	9.45	3007	2.22	1216	0.90	15002	11.06	20939	15.44
2526120	7.11	4139698	11.65	3203761	9.02	964978	2.72	359731	1.01	2498729	7.03	6275967	17.66

Source: Population Census 2001

[*] Data Source: Inter Departmental Business Register 2009, used under license, Crown Copyright

The percentages of those who have never worked or who are long-term unemployed reflect the national pattern. 3.7% of the working age population currently claims Job Seekers Allowance, a state benefit for those currently out of work and looking for a new job. This is similar to the national rate (3.8%), although this figure masks pockets of job stress, unemployment and reliance on state benefits, especially in the central city wards. In February 2010 there were over 5,000 Job Seekers Allowance claimants in Portsmouth, most aged under 34 and nearly 30% young people aged between 18 and 24. 15% of JSA Claimants live in one ward - Charles Dickens - in the core of the city, an area of extreme deprivation. This pattern illustrates the socio-spatial divisions within this city (Figure 14).

Figure 9.14. Job Seekers Allowance claimants by ward: February 2010

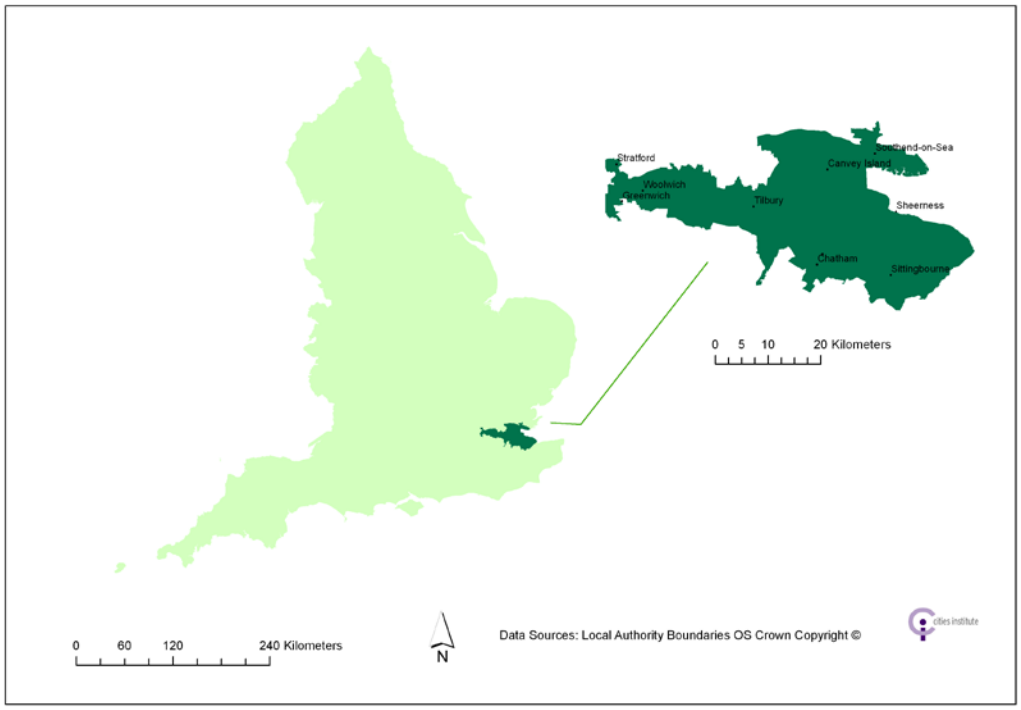


3.2 Case study 2 – Thames Gateway

3.2.1 Geographical and historical overview

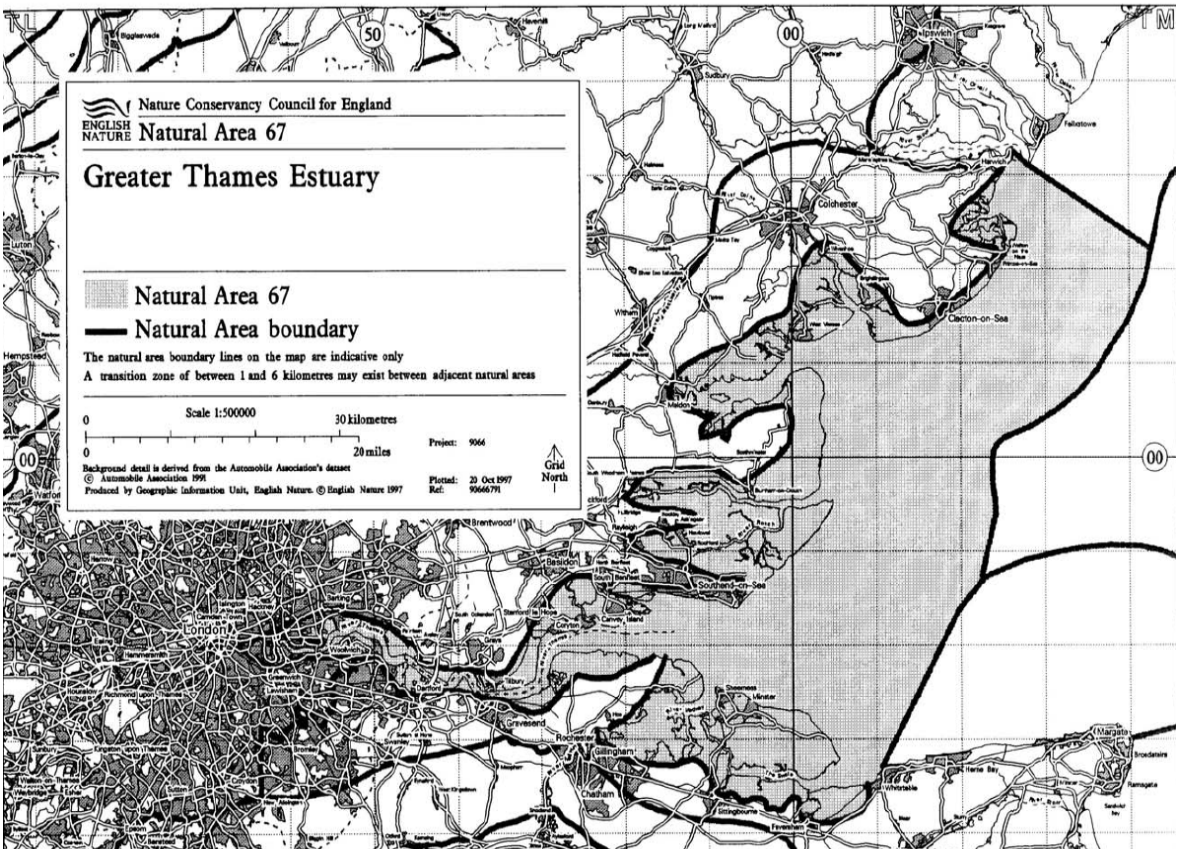
The spatial extent of the Thames Gateway was set out in National Regional Planning Policy Guidance (DTR, 2001) as part of the regional spatial strategy for the development of the south east of England. This designated Development Area reflects past governments' policy priorities - namely identifying areas of brownfield land (previously developed land) which could be made available for new housing and infrastructure development. It covers over 100,000 hectares and stretches over 64 kilometres along the Thames Estuary from Isle of Dogs and London Docklands, near the centre of London, to Southend in Essex (north) and Sheerness in Kent (south).

Figure 9.15. Thames Gateway.



The Thames Gateway occupies a substantial proportion of the Greater Thames Estuary, designated as a Coastal Natural Area by English Nature (1997), the UK government Agency responsible for nature conservation, now re-named Natural England. Figure 16 indicates the extent of the Greater Thames Estuary Natural Area, and demonstrates its wider reach beyond the Thames Gateway.

Figure 9.16. Greater Thames Estuary Natural Area.



3.2.2 Bio-physical resources

3.2.2.1 Area and typography

The coast is largely characterised by shallow water abutting low-lying and flat land above mean high water. The region was just south of the southern-most extent of the glacial ice sheet that covered much of the UK until the end of the Quaternary. The area's coasts remain subject to continual deposition and erosion processes, though modification of the coast by human activity has substantially changed its nature and the influences of such agents upon it. Today, it is dominated by low slope angle and thus by flat lands - normally or frequently inundated by tidal water or flood.

3.2.2.2 Coastal ecosystems

Coastal ecosystems in the Thames Gateway are often dominated by tidal mudflats at lower levels, with saltmarshes at higher tidal levels. Both have highly individual physical characteristics, and associated biota.

Figure 9.17a. Distribution of Thames estuary inter-tidal sediments (substrate)[Thames Partnerships].

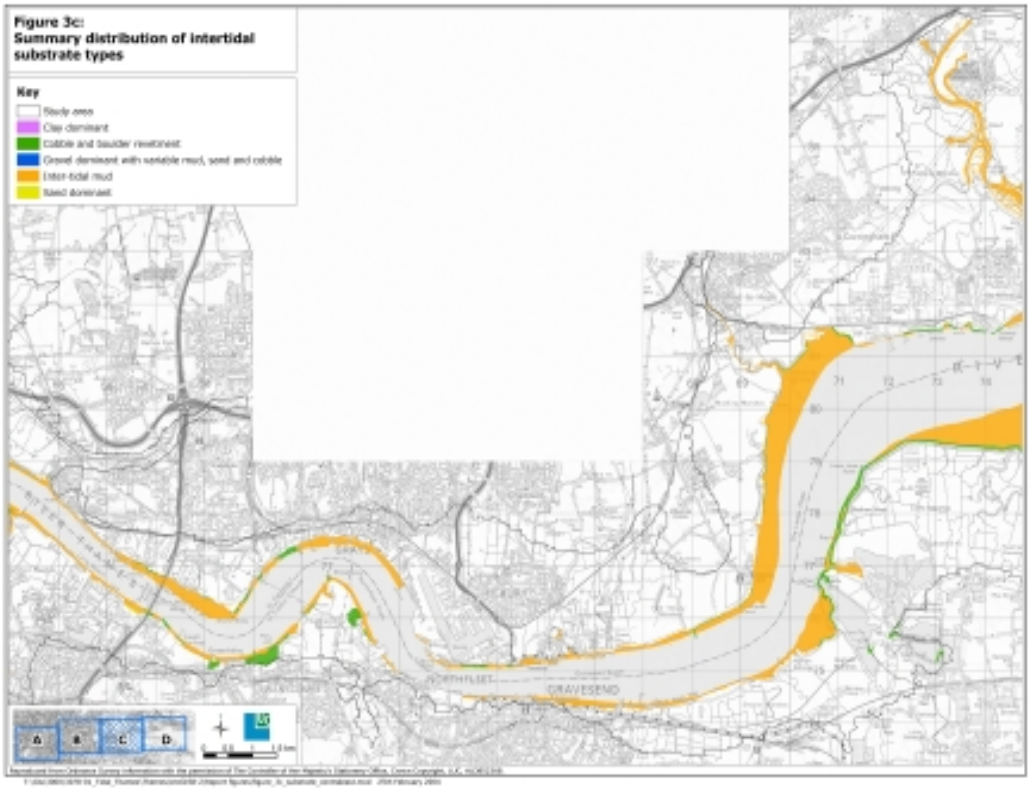


Figure 9.17b. Distribution of Thames estuary inter-tidal sediments (substrate)[Thames Partnerships].

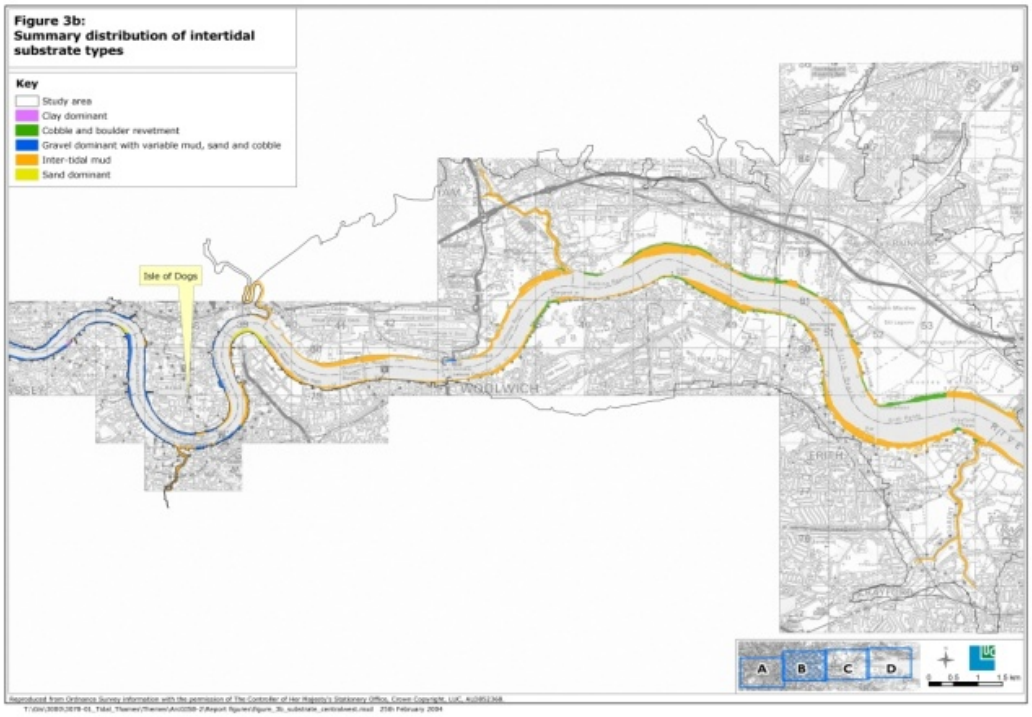
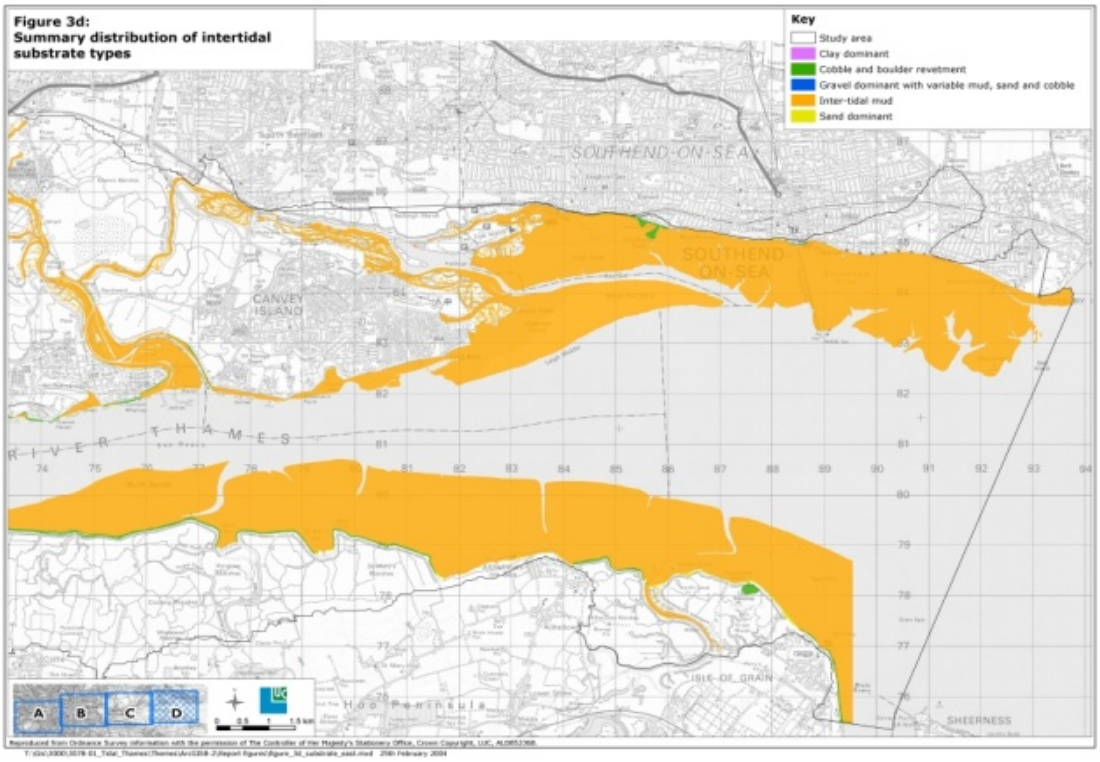


Figure 9.17c. Distribution of Thames estuary inter-tidal sediments (substrate)[Thames Partnerships].



Mudflats are conspicuous in the seascape of the lower reaches of the Thames and in sheltered parts of the adjacent Essex and Kent coasts, but are largely absent or restricted in extent as one moves upstream along the Thames towards London (see Figure 17). The mudflats are inhabited by dense populations of photosynthetic micro-organisms that are highly significant contributors to the biological productivity of the ecosystem. These organisms form the basis of food webs that support populations of invertebrates - fed upon in their turn by a range of fish during high tides, and by birds at low tides.

The saltmarsh plant community is most widely distributed in the eastern sectors of the area - a trend emphasised by rising sea levels and the development of hard sea defences, and development of land immediately landwards of them. This has resulted in the steady reduction in the area of mudflat and saltmarsh, which is limited to the region between sea defences and deeper water (i.e. coastal squeeze). Table 9.10 indicates the scale of loss within the region to 1997.

Table 9.10. Losses of saltmarsh in the Greater Thames Estuary (English Nature, 1997).

	Original area (ha)	Total area lost (ha)	Loss (ha) to reclamation	Loss to erosion	% of original area eroded
Hamford Water	876.1	170.6	1.2	169.4	19.3
Colne	791.5	97.7	5.2	92.5	11.7
Blackwater	880.2	200.2446.7	-	200.2	22.7
Dengie	473.8	146.1	-	46.7	9.9
Crouch	467.1	105.6	22.1	124.0	26.5
Thames (Essex)	365.9	17.5	22.3	83.3	22.8
Thames (Kent)	77.8	198.3	3.2118.2	14.3	18.4
Medway	843.8	61.6	3.4	180.1	21.3
Swale	377.0			58.2	15.4
Total	5153.2	1044.3	75.6	968.7	18.8

In the eastern areas of the Thames Gateway are extensive areas of low-lying flat land that were saltmarsh before sea defence construction, but that became grazing land characterised by freshwater and terrestrial plant communities. These became important habitats for a range of plant, invertebrate and bird species (English Nature, 1997) although changing agricultural practices and drainage schemes have substantially reduced the grazing marshes.

3.2.2.3 Marine ecosystems

The mudflats have a high biological productivity, with very high population densities of a relatively small number of invertebrate species that feed the birds and some fish species.

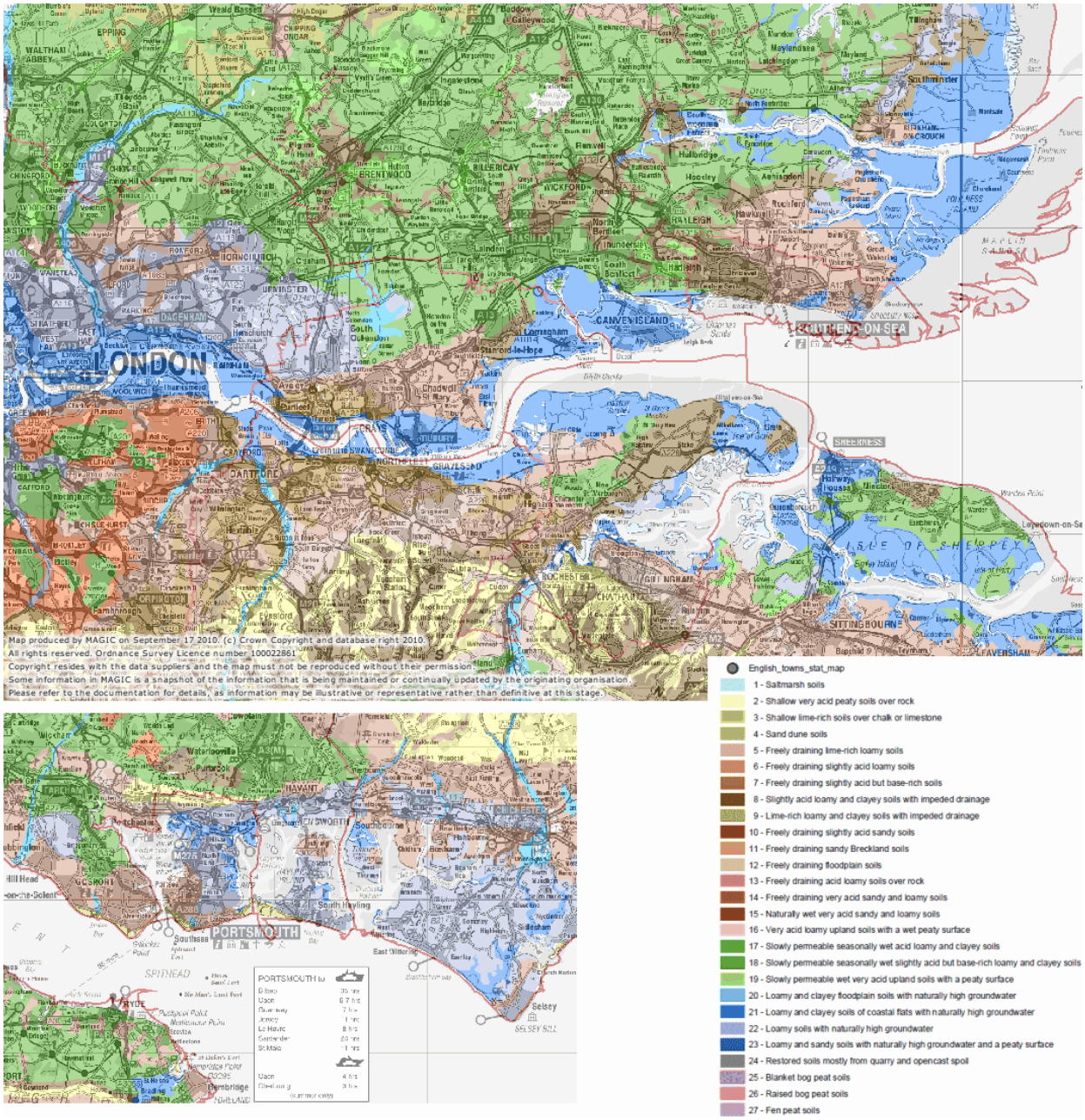
Diverse invertebrate communities exist in the eastern parts of the area, where water salinity is more fully marine. *Cerastoderma edule* (the cockle) occurs extensively - especially along the north coast in the vicinity of Southend, where it is exploited commercially. Many typical fish species are to be found in this ecosystem. Improving water quality has seen Salmon (*Salmosalar*) re-introduced to the Thames, and Spratt (*Clupea sprattus*) occur seasonally in the eastern sectors of the region.

Now restricted and protected, Eelgrass (*Zostera* sp.) is a group of four grass species, specifically and uniquely adapted to the low intertidal and sub-tidal zones, occurring in sheltered waters in sand/mud substrates.

3.2.2.4 Soil and land uses

Along the Thames Gateway, soils are derived from intertidal alluvial mud, which overlay the London Clay, and have been extensively drained for agricultural purposes. In the flood plain, loamy and clayey soils of coastal flats with naturally high groundwater dominate, while freely draining lime-rich loamy soils are common in the easternmost areas and loamy soils with naturally high groundwater (Figure 18).

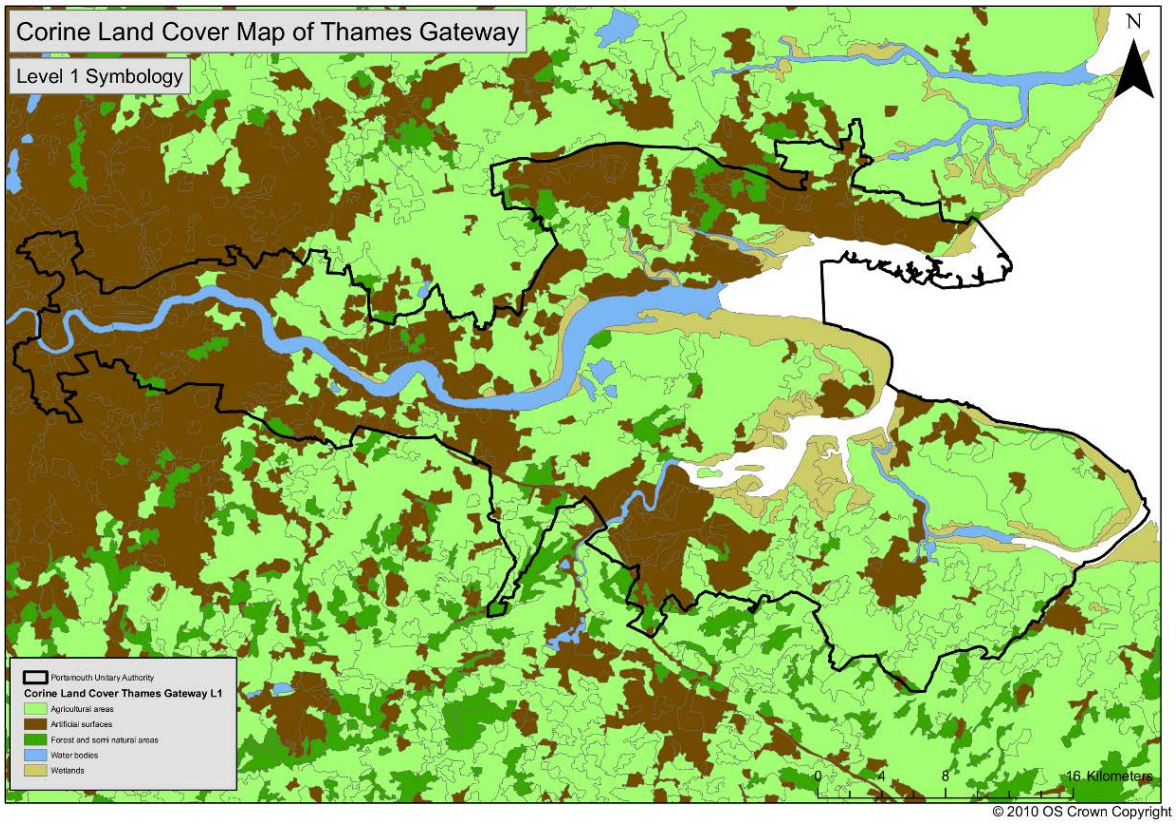
*Figure 9.18. Distribution of soil types in Southern England.**



The land use profile of the Thames Gateway study area is less dense than the urbanised pattern seen in London. Corine Land Cover (2000) at Level 1 symbology (Figure 19) shows the extent of urbanisation.

* From Magic Soilscape, © Crown Copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 100022861). Source: www.magic.gov.uk/datadoc/metadata.asp?datasetname=Soilscape%20(England).

Figure 9.19. Corine Land Cover Map of Thames Gateway – Level 1 Symbology.[*]



Corine Level 2 symbology (Figure 21) shows a distinction between urban fabric and industrial or commercial land - much of which is now derelict or available for redevelopment. Of the 3,150 hectares of brownfield land in the Thames Gateway (approximately 20% of all brownfield land in the south east of England), 2,058 hectares are considered suiTable 9.for housing development (Table 9.11, Figure 20).

Between 2001 and 2005 an estimated 5,151 dwellings per year (net additions) were completed in the Thames Gateway with over 80% built on brownfield sites or reused buildings.

[*] Prepared by cities institute using CORINE landcover data, European Environment Agency 2010.

Table 9.11. Previously Developed Land(a).

Previously Developed Land				
	Vacant and Derelict land	Land in Use	Available Brownfield Land	%Total Brownfield Land
Land	Hectares			
Thames Gateway	1141	2009	3150	
Essex sub region	135	373	508	6.9
Kent sub region	791	1112	1903	18.4
London sub region	215	523	739	22.9
Land for Housing				
Thames Gateway	912	1146	2058	
Essex sub region	80	254	334	6.8
Kent sub region	696	520	1216	22.6
London sub region	136	371	507	26

Source: DCLG (Local Authority reports) 2004; The State of the Gateway: A baseline for evaluating the Thames Gateway Programme

Figure 9.20. Previously Developed Land (b).

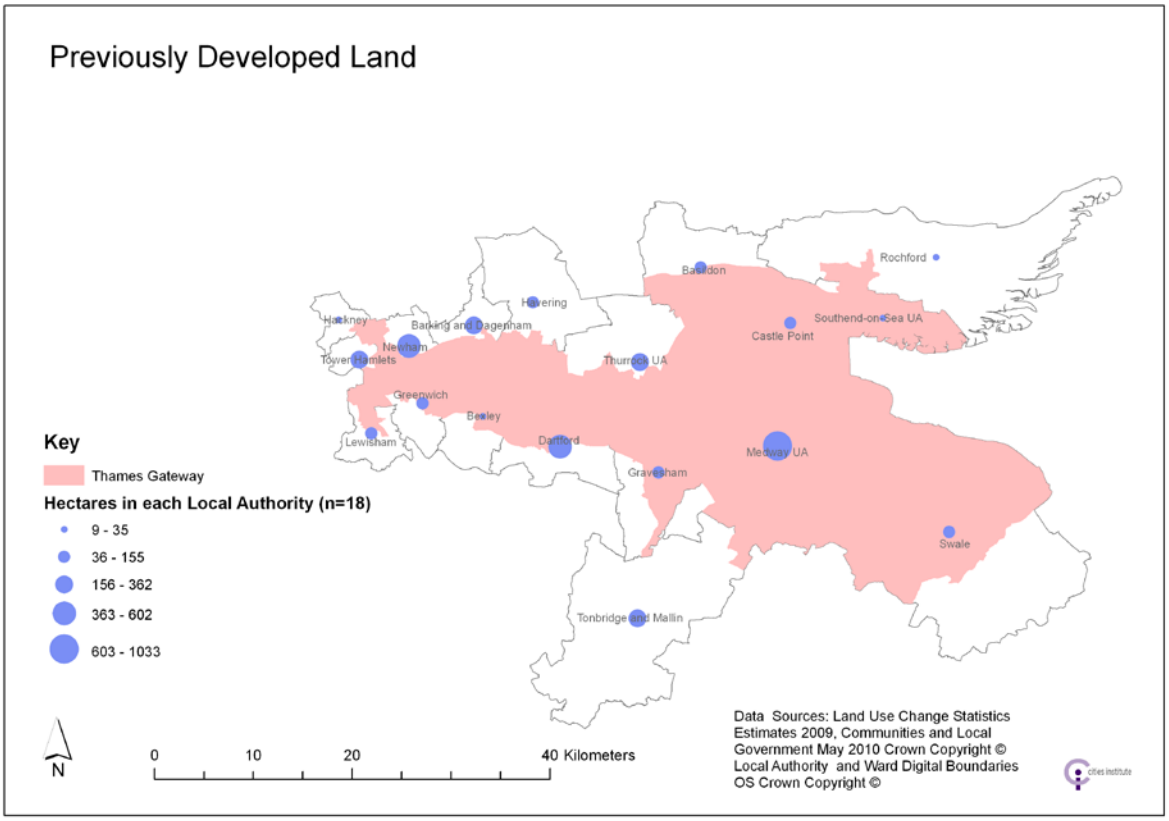
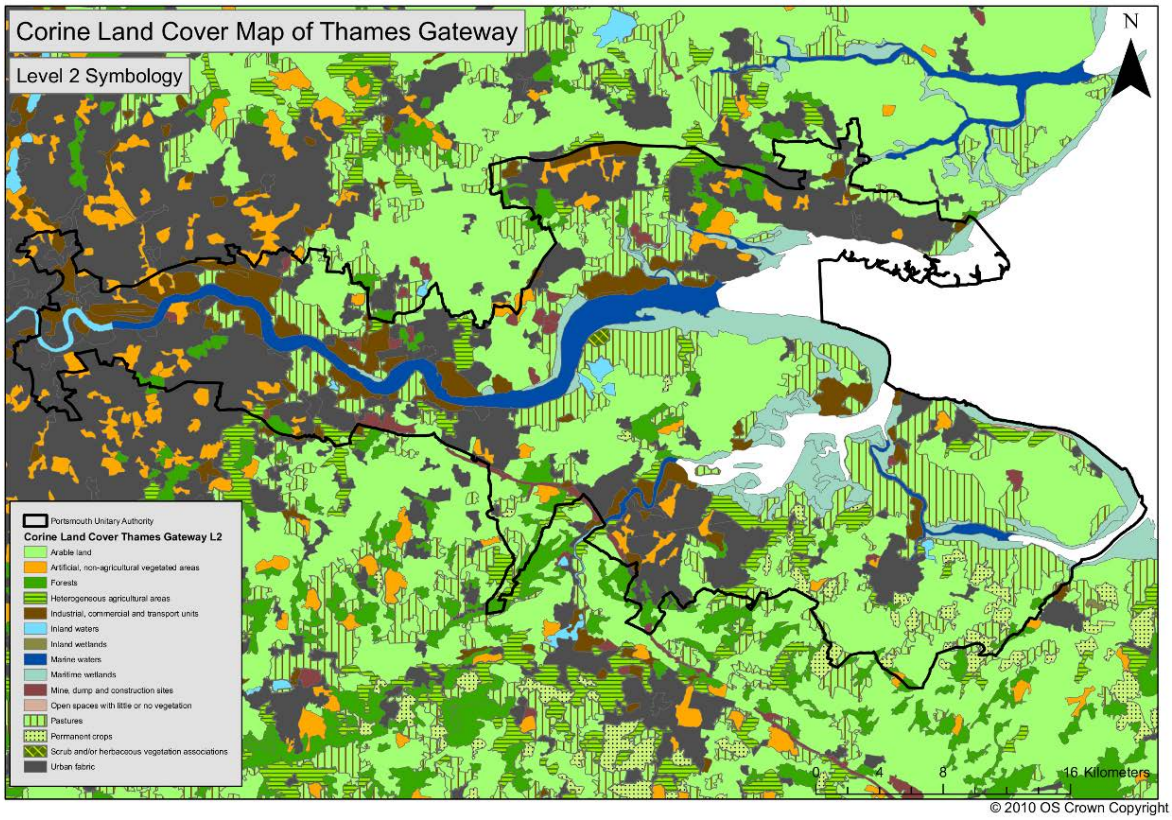


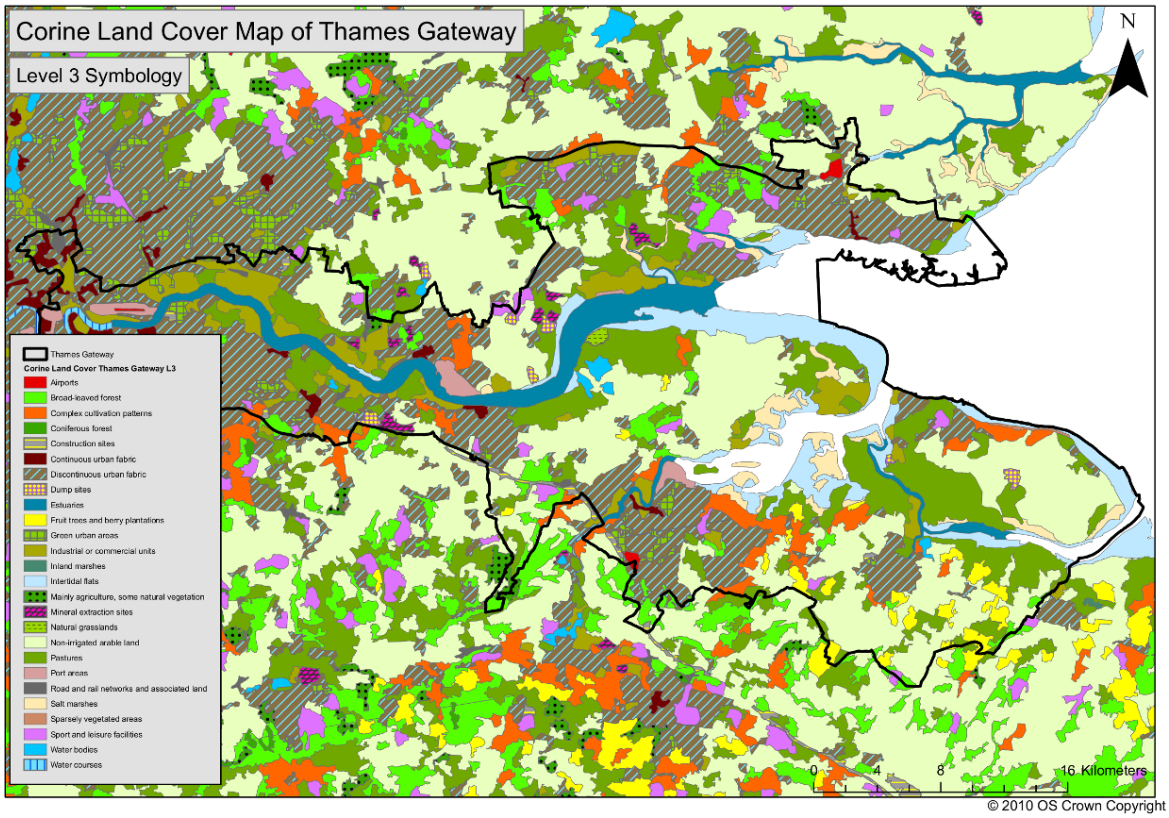
Figure 9.21. Corine Land Cover Map of Thames Gateway – Level 2 Symbology.[*]



Much of the port capacity of London has been reduced or eliminated in recent decades, so that this is now minimal in the upper reaches of the Gateway. However, new port capacity has been developed in the eastern part of the area, and large scale commercial port areas can be identified at Tilbury on the north of the Thames and on the Medway in Kent at Corine Level 3 symbology (Figure 22).

[*] Prepared by cities institute using CORINE landcover data, European Environment Agency 2010.

Figure 9.22. Corine Land Cover Map of Thames Gateway – Level 3 Symbology.[*]



The 2001 General Landuse Database (Table 9.12) indicates that 60% of land in the Thames Gateway is designated Green space. Large parts are protected against development. Approximately 14% of land is used for domestic buildings and gardens.

Table 9.12. Land Use.

Landuse			
	Thames Gateway	London	England
Domestic Buildings	3.3	5.6	1.1
Gardens	10.4	14.6	4.1
Non-Domestic Buildings	2.3	6.1	0.6
Road	5.5	11	2.3
Rail	0.5	1.5	0.1
Path	0.3	0.5	0.1
Greenspace	60.6	35.2	88
Water	12.5	13.6	2.2
Other	4.8	11.8	1.3
Source: DCLG GLUD 2001			

[*] Prepared by cities institute using CORINE landcover data, European Environment Agency 2010.

3.2.2.5 Freshwater and access to water

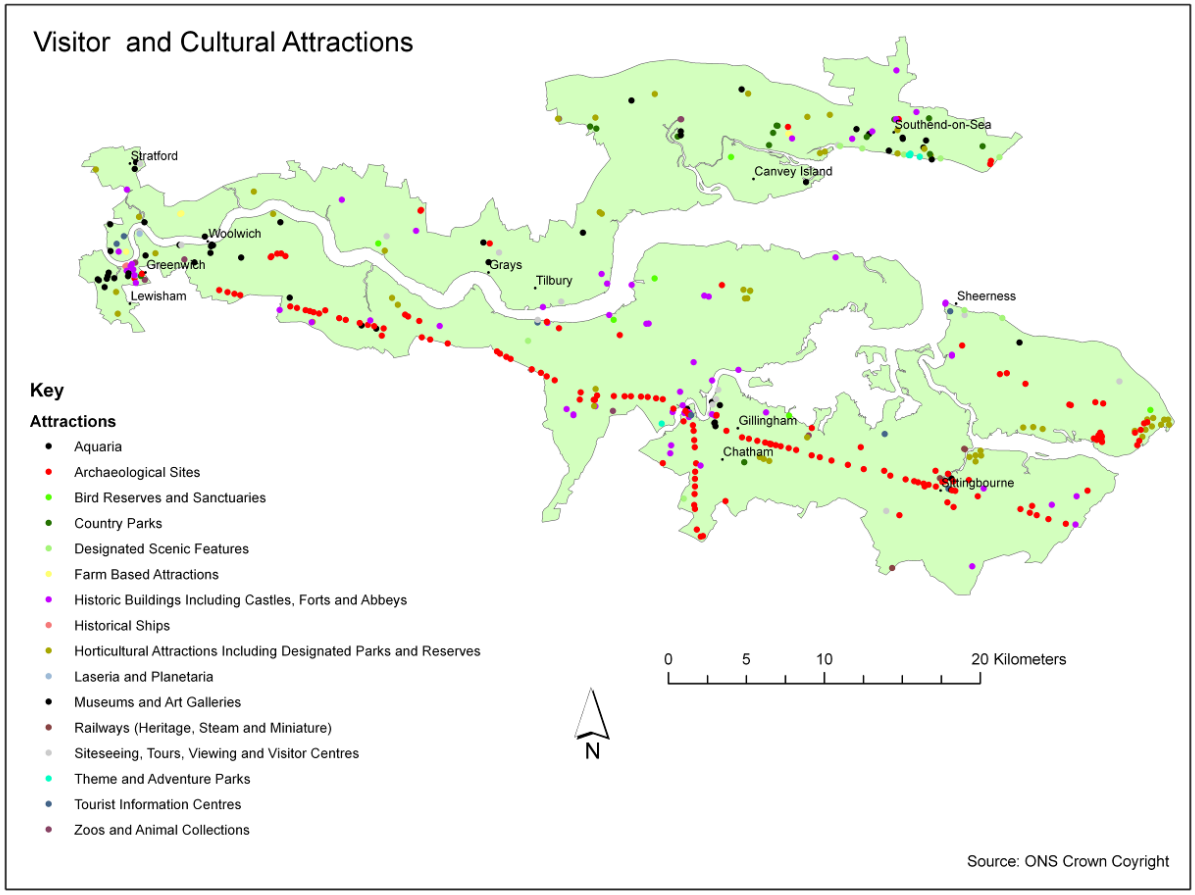
In 2007 in the south east 4,162 billion litres of water were abstracted from the environment, of which 36% was for public water supply, 44% for the electricity industry, 8% for industry, 12% for aquaculture and 1% for agriculture (Environmental Agency, 2010).

The south east and London have been classified as under serious water stress (Environmental Agency, 2008), with most of the region showing a supply-demand deficit - worst in the area of Greater London. In 2008/09, domestic water consumption per capita was 156 litres per day in the south east (161 litres in London), with a reduction to 130 litres per day by 2030 needed to avoid shortage of supply in the future (Environmental Agency, 2010). Although water companies are planning to meter (charge for actual usage) 78% of households by 2020, population growth and climate change are expected to add to the increasing pressure on water resources resulting in at least a 35% reduction in river flow by 2050.

3.2.2.6 Important cultural features

Thames Gateway hosts varied cultural and visitor attractions including 158 archaeological sites, over 100 museums, historic buildings and heritage attractions such as railways and trails. There is an established network of tourist offices and visitor facilities (see Figure 23), and local museums and libraries support local cultural development. The area is overshadowed by London as a tourist destination, and there is little evidence that there is any substantial overspill of visitors from London into the Thames Gateway. Most attractions are relatively small- or medium-scale. Greenwich and the O2 dome in the eastern region are two major destinations. Historically important destinations for day visitors and overnight tourists, such as Southend, have seen sharp declines in recent decades.

Figure 9.23. Visitor and Cultural Attractions.



3.2.2.7 Important social features

There are approximately 1.45 million people living in 600,000 households in the Thames Gateway (CLC, 2006). However, within these, population is concentrated in a number of key settlements on the Thames and in the Medway estuary (see Figure 24).

Figure 9.24. Population Density.

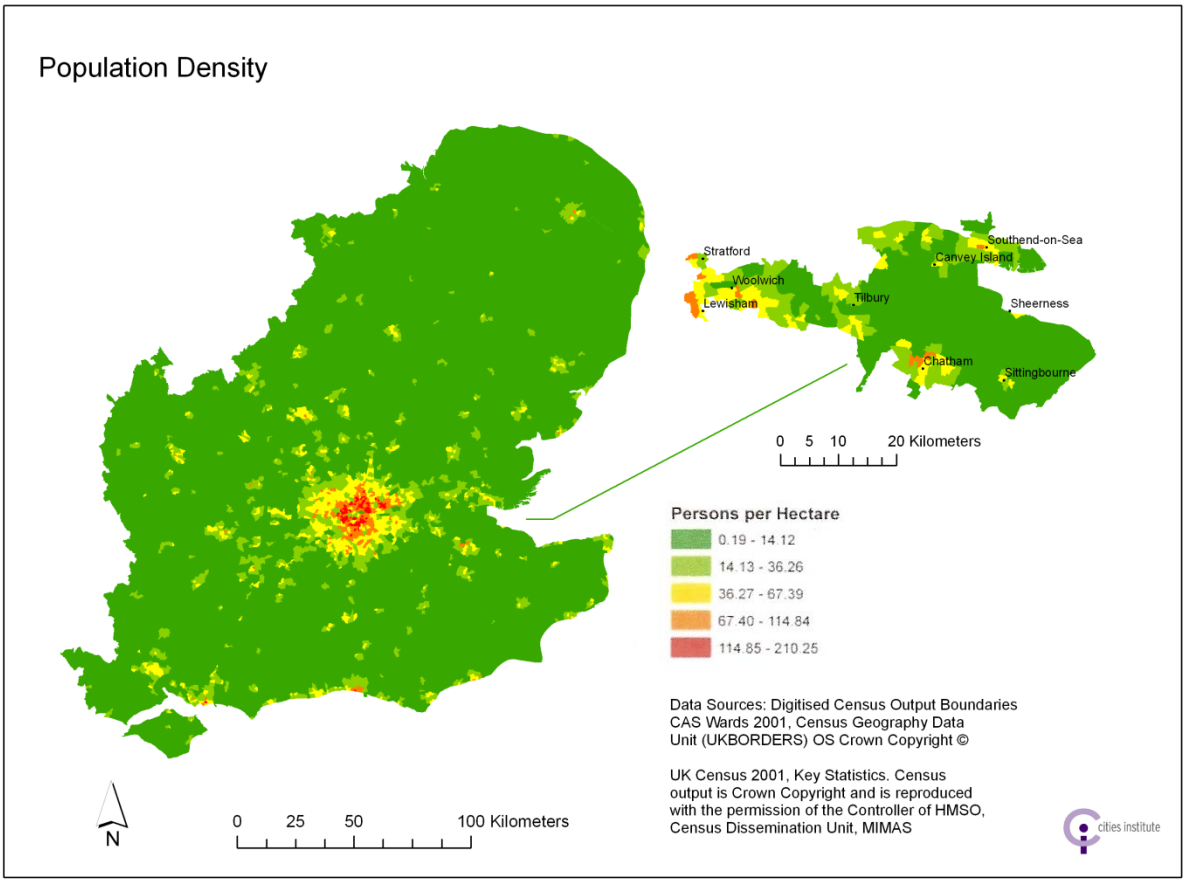
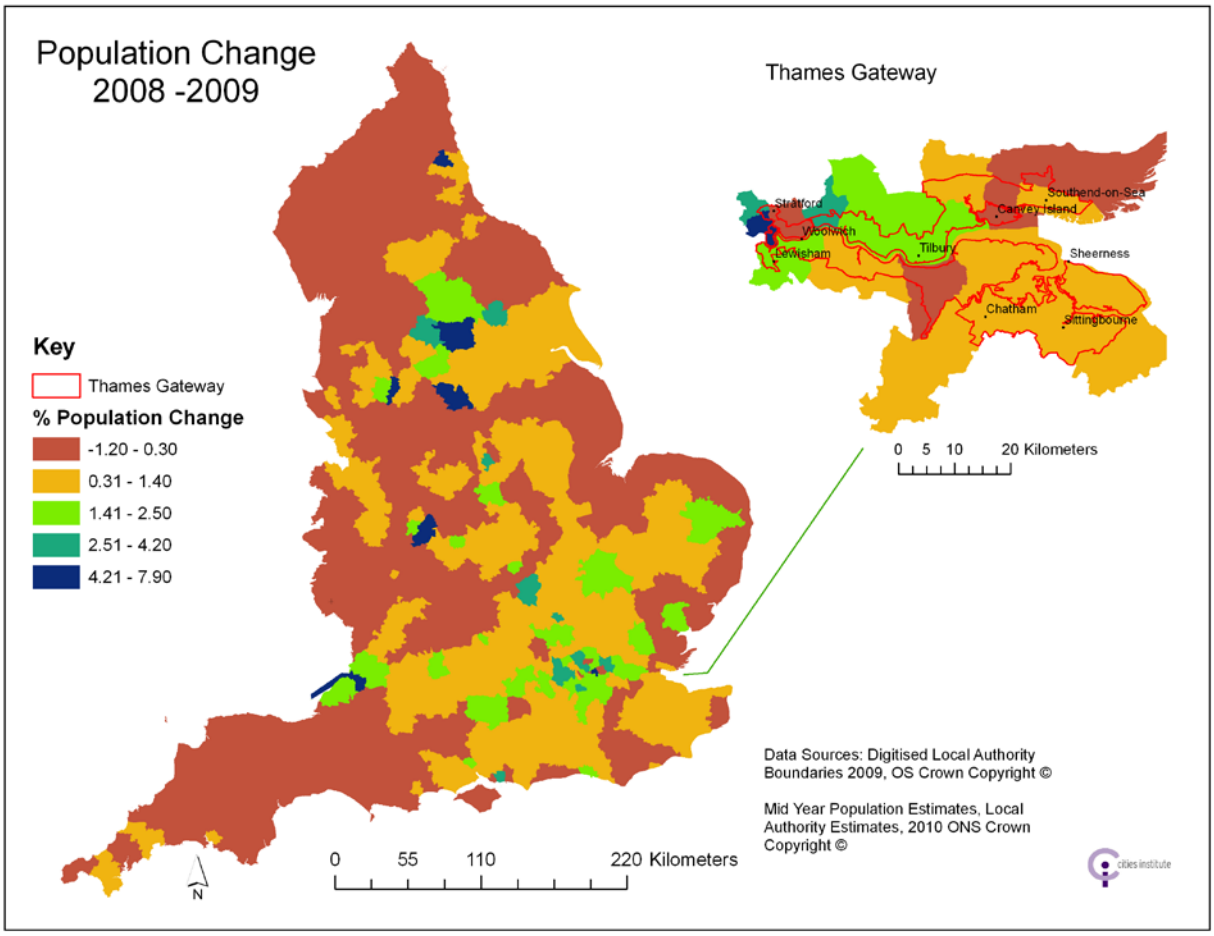
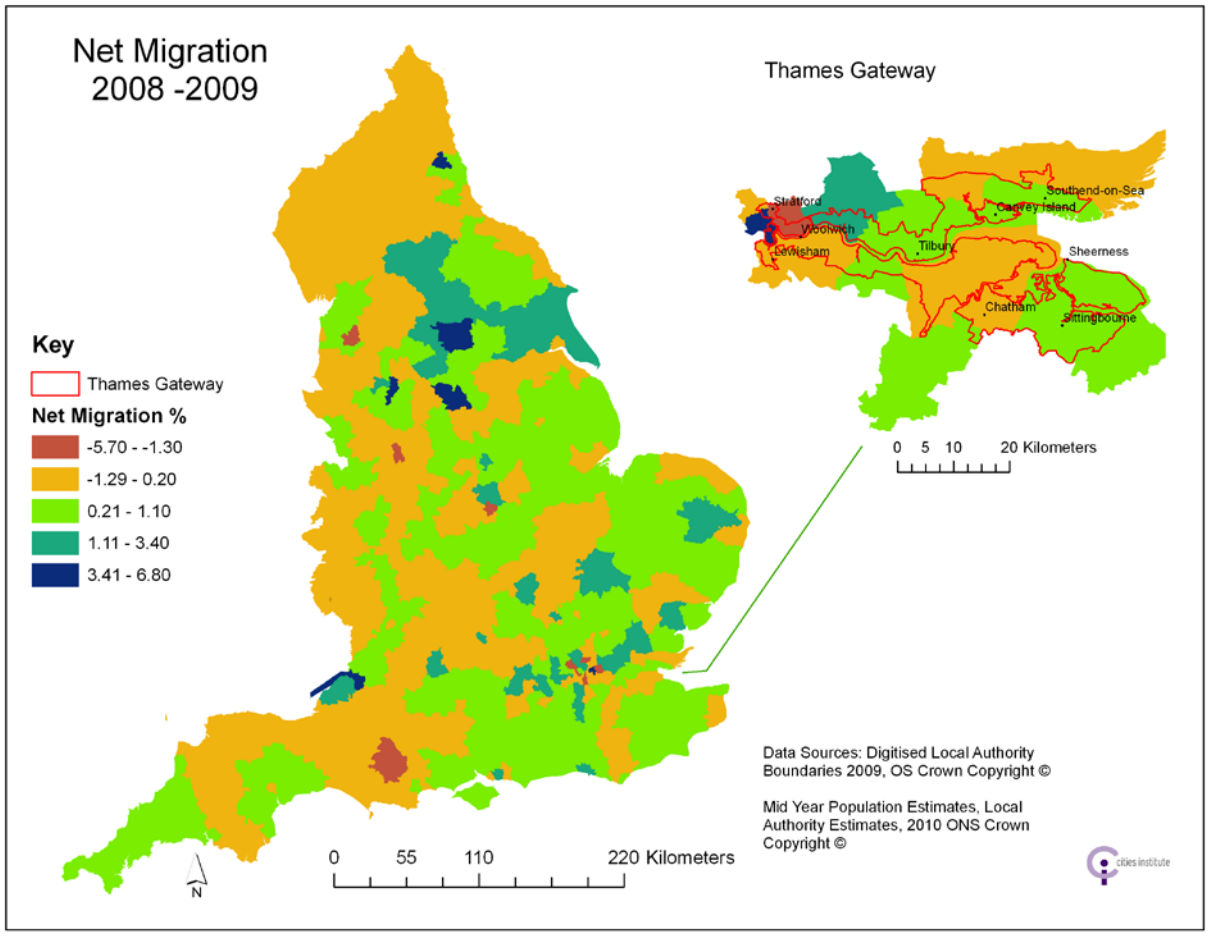


Figure 9.25. Population Change.



Whilst the rate of population change across the Thames Gateway was steady from 1981 to 2001 net migration increased significantly - particularly in the 1990s when levels reached +10,000 per annum in the year 1998-9. Between 2008-2009 that the highest levels of net migration were found in the London sub region (Figure 26).

Figure 9.26. Net Migration.



Gender composition in the Thames Gateway mirrors that of England as a whole (Table 9.13). Age distribution shows that the Thames Gateway tends to be younger than nationally (Table 9.14).

Table 9.13. Population by Gender.

Population by Gender					
	All	Male	%	Female	%
Thames Gateway	1450128	705508	49	744620	51
England	49138831	23922141	49	25216687	51
					Source: Population Census 2001

Table 9.14. Population by Age.

Population by Age									
	All	0-15years	%	16-29years	%	20-64years	%	65years and over	%
Thames Gateway	1450128	318441	22	273499	19	661799	45.6	196389	13.54
England	49138831	9901575	20	8630210	18	22799035	46.4	7808011	15.89
									Source: Population Census 2001

Ethnically, Thames Gateway is more diverse than England as a whole with a higher percentage of people of Black and Chinese origin (Table 9.15). There was a 5% increase in Black and Minority Ethnic residents between 1981 and 2001, driven largely by the population dynamics of London (DCLG, 2006).

Table 9.15. Population by Ethnicity

Population by Ethnicity											
	All	White	%	Mixed	%	Asian	%	Black	%	Chinese	%
Thames Gateway	1450128	1264547	87	23299.00	1.61	63714	4.39	78977.00	5.45	19574	1.35
England	49138831	44679365	91	643441.00	1.31	2248107	4.58	1132528.00	2.30	435434	0.89
										Source: Population Census 2001	

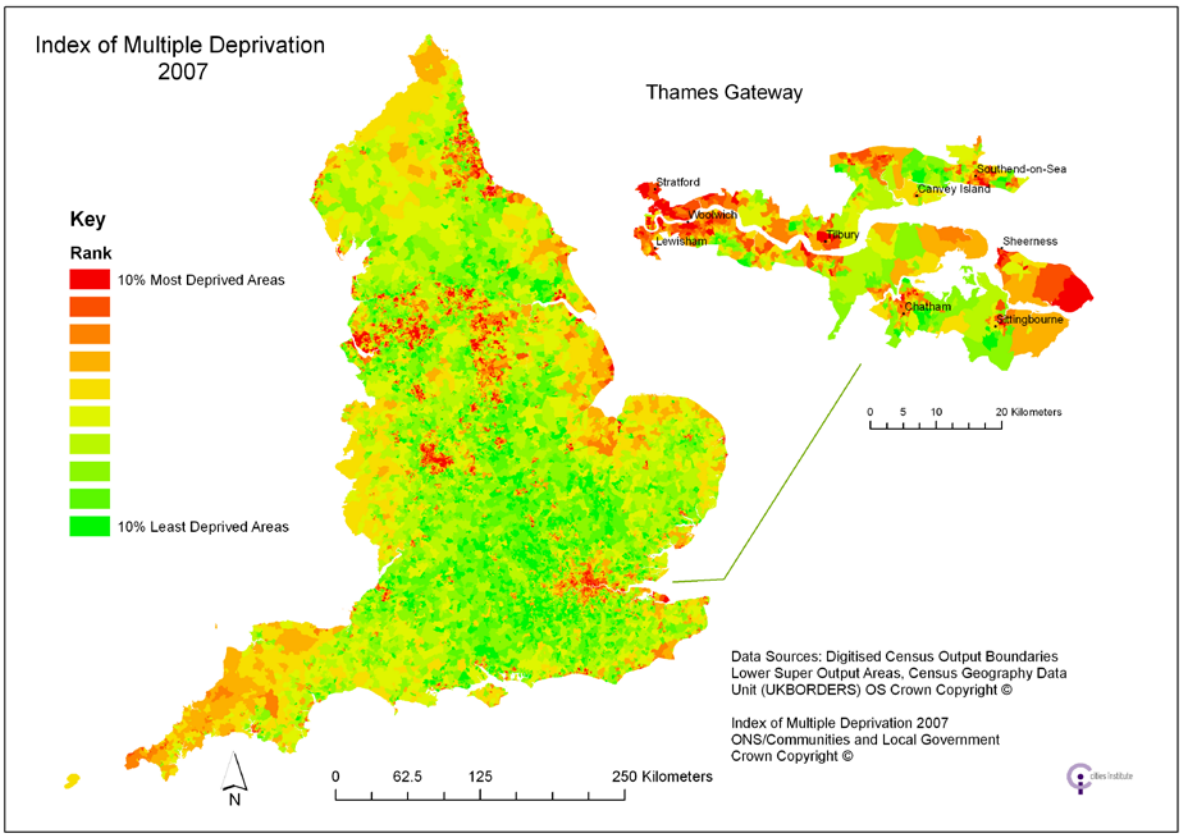
Thames Gateway has a higher proportion of residents with no qualifications (31.6%) than London (22%) or England (29%). However the percentage of secondary school pupils in Thames Gateway leaving school with no qualifications (3.6%) is lower than both London (4.3%) and England (4.6%). There are lower levels of owner occupation and a higher proportion of social renting in Thames Gateway than in England as a whole (Table 9.16).

Table 9.16. Housing Tenure.

Housing Tenure			
	% Owner Occupation	%Social Renters	%Private Renters
Thames Gateway	67.2	22.7	10
England	71.2	17.9	10.9
London	58.4	25.5	16.2
			Source: Census 2001

Significant pockets of the most severe (and long standing) deprivation in the whole of England can be found in the Thames Gateway (Figure 13). These are found mostly in the London sub region, but also in North Kent and North Essex - emphasising the high degree of social polarisation in this region.

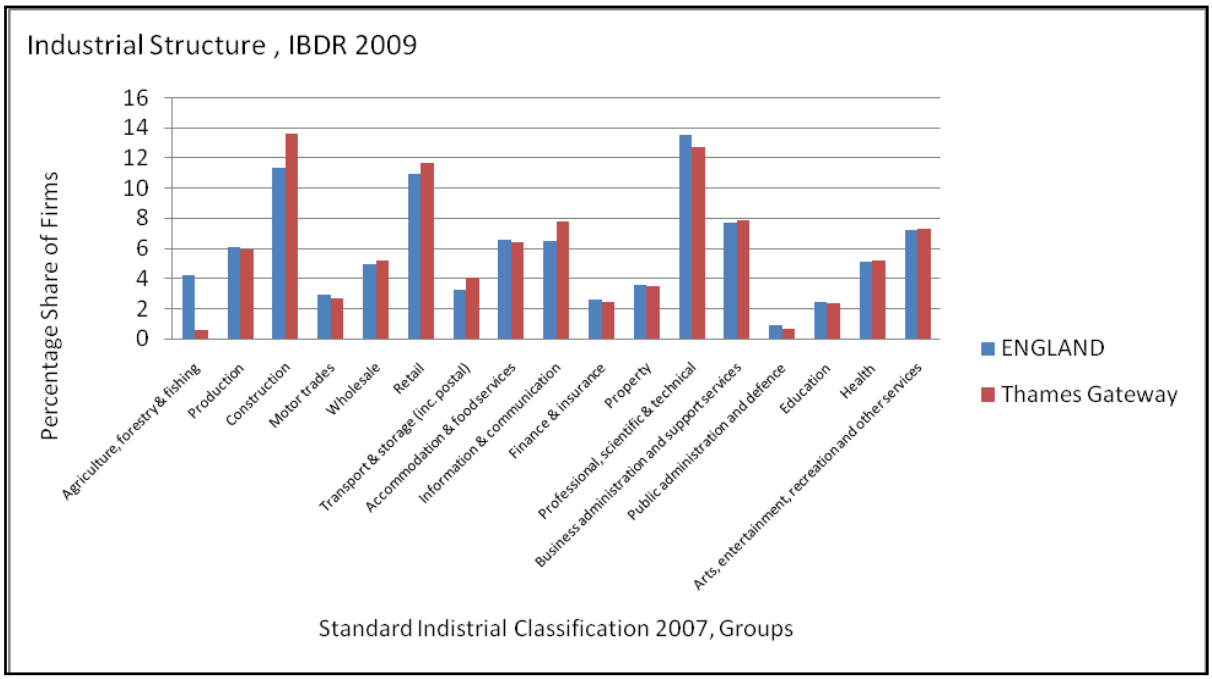
Figure 9.27. Index of Multiple Deprivation 2007.



3.2.2.8 Important economic features

The industrial structure (Figure 28) is dominated by firms in three sectors –construction; retail; and professional, scientific and technical industries which, together, make up almost 50% of the VAT registered firms in the area (despite employing only 5% of Thames Gateway employees).

Figure 9.28. Firms by Industry Group, IDBR 2009.[*]



18% of residents working in Thames Gateway are in lower managerial and professional occupations, with relatively high percentages of semi-routine workers (Table 9.17). Higher professional occupations are better represented in the London sub region (Hamnett, 2003).

Table 9.17. Working Age Population by Occupation.

National Statistics Socio-Economic Classification													
	All people aged 16 - 74	Large employers and higher managerial occupations	%	Higher professional occupations	%	Lower managerial and professional occupations	%	Intermediate occupations	%	Small employers and own account workers	%	Lower supervisory and technical occupations	%
Thames Gateway	1040031	29055	2.79	42352	4.07	190301	18.30	117252	11.27	70250	6.75	79768	7.67
England	35532085	1243918	3.50	1816038	5.11	6656918	18.73	3366757	9.48	2479470	6.98	2526120	7.11

Semi-routine occupations	%	Routine occupations	%	Never worked	%	Long-term unemployed*	%	Full-time students	%	Not classifiable for other reasons	%
129653	12.47	94965	9.13	34238	3.29	13286	1.28	64491	6.20	174420	16.77
4139698	11.65	3203761	9.02	964978	2.72	359731	1.01	2498729	7.03	6275967	17.66

Source: Population Census 2001

[*] Data Source: Office of National Statistics (2010).

Over 3% of the working age population have never worked and 1.3% are deemed long-term unemployed. Currently, 4.02% of the working age population are claiming Job Seekers Allowance - higher than the percentage for England (Table 9.18).

Table 9.18. Job Seekers Allowance Claimants.[*]

Claimants: Job Seekers Allowance: February 2010 (Revised)				
	Number of JSA Claimants	Total Working Age Population	% Working Age Population Claiming JSA	% Total Population within the TG study area
Tonbridge and Malling	1,580	73,723	2.14	3.54
Rochford	1,210	51,693	2.34	9.22
Castle Point	1,780	54,784	3.25	100.0
Bexley	4,800	144,469	3.32	63.06
Dartford	2,120	61,522	3.45	70.78
Havering	5,270	148,954	3.54	11.04
Swale	3,220	83,870	3.84	79.62
England	**1,304,990**	**33,670,780**	**3.88**	
Basildon	4,560	112,109	4.07	57.67
London	**219,070**	**5,362,019**	**4.09**	
Gravesham	2,610	63,221	4.13	87.70
Thurrock	4,360	103,704	4.20	84.37
Medway	7,340	167,970	4.37	97.86
Thames Gateway Local Authorities	**95,820**	**2,106,235**	**4.55**	**48.53**
Southend-on-Sea	4,840	103,049	4.70	94.39
Greenwich	7,230	152,605	4.74	62.14
Lewisham	8,940	187,224	4.78	29.65
Barking & Dagenham	6,480	112,176	5.78	11.73
Tower Hamlets	10,080	172,740	5.84	26.26
Newham	9,830	161,448	6.09	26.09
Hackney	9,550	150,974	6.33	4,88

[*] Data source: Department of Work and Pensions.

4. Overview of Users in the Case Studies

4.1 Case study 1 – Portsmouth

4.1.1 Inhabitants/households

Portsmouth had an estimated population of 203,503 people in 2009 (ONS, 2009) which shows an increase from 188,437 in 2001. The average household size was 2.28 persons, although projections suggest that this will fall to 2.1 persons by 2026 indicating a need for additional housing development (Portsmouth City Council, 2009). This reflects recent migration trends and changes in patterns of co-residence.

There is a lack of building capacity in the city's urban areas within Flood Zones 1 and 2 (flood risk less than 0.5% for tidal flooding and 0.1% for river flooding) to accommodate housing growth targets for Portsmouth of 14,700 new houses by 2026. The relatively young population, including substantial numbers of students, is a source of significant demand both for particular types of housing and leisure activities.

4.1.2 Tourism establishments

Major tourism establishments include those such as Gunwharf Quays and the historic Royal Naval Dockyard, museums, theatres, cathedrals and Portsmouth Football Club. In 2008 Portsmouth hosted 628,000 tourist trips involving an overnight stay and an estimated 7.4 million tourism day trips (Tourism South East, 2008b). Their impact is magnified by the concentration of tourism attractions, and the constrained site of the city. In 2008, tourism overall was worth £471.2 million to Portsmouth, supporting 7,464 FTE (full time equivalent jobs) and 10,142 actual jobs. Visitors to Portsmouth tend to be from older age groups, with 42% aged 55 and over (Tourism South East Research Unit, 2008a).

4.1.3 Restaurants/café/snack establishments

There are approximately 510 facilities within Portsmouth's hospitality industry including restaurants, cafes and accommodation facilities (Table 9.19). 31% of food provision is within the 'fast food' or 'take away' category, which reflects provision in UK cities.

Table 9.19. Hospitality Industry in Portsmouth

Hospitality Industry in Portsmouth	
Restaurants	109
Cafes, Snack Bars and tea Rooms	43
Fast Food Delivery Services	3
Fast Food Take Aways	96
Fish and Chip Shops	28
Internet Cafes	2
Pubs, Bars and Inns	125
Banqueting Facilities	1
Camping and Caravan Sites	5
Guest Houses	42
Hostels	3
Hotels, Motels and Country House Hotels	38
Self Catering Facilities	12
Timeshare Developments	0
Youth Hostels	3
Total	**510**
Source: OS Crown Copyright	

4.1.4 Industrial, trading and commercial establishments

As with all UK cities, the economy is largely based on service activities with only modest numbers of jobs in manufacturing. In 2007, Portsmouth was home to 6,779 businesses employing 97,500 people. Of these, 23% were in distribution, hotels and restaurants; 19% were in banking, finance and insurance; and 11 per cent were in engineering and manufacturing (Portsmouth City Council, 2010). Although nearly 10% of Portsmouth firms are in the professional, science and technical industries, this lags behind the national level of nearly 14%. However 33.74% of employment is in Portsmouth is in the public services, and this has grown by 21.18% over the same period. The city has become a key service centre, although primarily public sector-orientated (Portsmouth City Council, 2004).

Entrepreneurial activity for Portsmouth for 2008, as measured by new business registrations per 1,000 head of adult populations, was 43.0 compared to 60.0 for South East region as a whole (Portsmouth City Council, 2010). This confirms the impression of a city whose economy lags some of the dynamism of the surrounding South East Region – the most dynamic in the UK.

4.1.5 Fishing fleet and farming

Portsmouth is considered a major port (UK Sea Fisheries Statistics, 2008) with the value of all species landed for 2008 valued at £2.4m. However, no vessels are recorded by administration port for Portsmouth, with only 37 people recorded as being employed in the

fishing industry in the 2001 census (Office of National Statistics, 2001a). Portsmouth harbour is reported as supporting around 30 boats, using a variety of fishing methods outside the harbour (Gray, 1995).

According to statistics from the 2001 Census 337 people – 0.39 per cent of the workforce – worked in agriculture, hunting and forestry in Portsmouth (Office of National Statistics, 2001b). It is at best a marginal activity.

4.1.6 Ports

Portsmouth Harbour is a naval port and home and maintenance base for the Royal Navy. The number of Royal Navy ships now based in Portsmouth has decreased, but the facilities are once again being used to build and repair boats - not only for the Royal Navy but also foreign navies and commercial ventures.

In 2009 the various services located at the Continental Ferry Port carried over 10 million passengers, 1.5 million vehicle units and a quarter of a million freight units (Portsmouth Commercial Port, 2009)) (Table 9.20). A new passenger terminal is scheduled for completion in 2011.

Table 9.20. Roll-on-roll-off (RORO) and other ferry services.[*]

Isle of Wight Car Ferry	
Vehicle Units	971,260
Passengers	2,495,971
Isle of Wight Passenger Ferry	
Passengers	1,357,782
Isle of Wight Hovercraft Service	
Passengers	849,150
Gosport Ferry Passenger Service	
Passengers	3,534,248
Continental and Channel Island Services	
Vehicle Units	687,093
Freight Units	264,446
Passengers	2,225,377

[*] Source: From Portsmouth Commercial Port – Port Statistics 2009.

Provisional statistics suggest that, in total, 0.44 million tonnes of freight was handled at the port in the second quarter of 2010 – significantly down on the figure for the equivalent quarter in 2009 (DT, 2010).

Cruise ships made a total of 23 calls during 2009, accounting for 12,000 cruise passengers, and 25,500 vessels entered or left Port Solent Marina. The Marina covers 84 acres, which includes shops, restaurants, pubs leisure facilities, other services and homes.

4.1.7 Energy production companies

The wider South Hampshire region has a Cleantech cluster of 600 firms, generating £1.2 billion for the local economy, some of which are located in the Portsmouth city region (http://www.invest-in-portsmouth.co.uk/index.php?id=41). Cleantech is new technology and related business models that offer competitive returns for investors and customers while providing solutions to global challenges. The Portsmouth city region has been ascribed great potential to further develop its energy and environmental technology sectors, particularly in terms of marine energy and other renewables, marine pollution control, geothermal, water & waste water treatment, air pollution control, and also in terms of other new clean technologies in house building etc.

4.1.8 Environmental groups

Portsmouth is either home to or covered by branches of national and international groups either devoted to environmental causes, or to causes with environmental associations. These include RSPB (the Royal Society for the Protection of Birds), the World Development Movement, Friends of the Earth, Oxfam, and CPRE (Campaign to Protect Rural England).

Local groups include: Portsmouth Climate Action Network (PCAN), a voluntary group concerned about the man-made climate change; Portsmouth Environmental Forum, an independent group hosted by Portsmouth City Council which seeks to make sure that decision-makers take green issues into account, Isle of Wight Wildlife Trust, the Solent Protection Society, which seeks to ensure the ecological and environmental well-being and wise management of the Solent area and the Portsmouth Sustainability Action Group, which is chaired by Portsmouth City Council and pulls together landowners, employers and voluntary

groups in leading a coordinated approach to climate change mitigation and adaptation in Portsmouth (http://www.portsmouth.gov.uk/living/13069.html).

Community groups: Portsmouth is home to a variety of different minority ethnic communities, with associated community organisations. Some women's groups are also ethnically defined. Other community groups and multi-cultural, and a range of multi-cultural welfare projects is run by the local authority in conjunction with local groups. Community associations also represent the many faith groups active in Portsmouth. Besides such groups, Portsmouth is also home to nearly 30 community centres, fulfilling a range of functions in their localities.

4.1.9 Second home owners

According to the 2001 census 0.4 per cent of homes in Portsmouth (340) were either second homes or holiday accommodation, against an average of 0.7 per cent for England and Wales (Office of National Statistics, 2001c). A subsequent estimate (National Statistics consultation document - Second Residences [2005]) suggested that by 2005 approximately 1.0 per cent of homes were second residences.

4.2 Case study 2 – Thames Gateway

4.2.1 Inhabitants/households

The Thames Gateway population of approximately 1.45 million people (DCLG, 2006) has been forecast to grow by approximately 8% by 2018, against UK projections of 7.3% (Jones Lang Lasalle, 2009). Government plans for development of the Thames Gateway aspire to the development of a total of 160,000 new homes by 2016 (DCLG, 2007). This area remains one of the prime foci for development - not only in the south east, but in the whole of the UK.

Table 9.21. Household Spaces – Thames Gateway Local Authorities.[*]

Region	Local authority	Usual resident pop'n 2001	Household spaces and accommodation type All	Household spaces and accommodation type With residents
London	Barking & Dagenham	163,944	68,378	67,273
	Bexley	218,317	91,729	89,451
	Havering	224,248	93,980	91,722
	Lewisham	248,922	109,448	107,412
	Greenwich	214,403	95,835	92,788
	Newham	243,891	93,782	91,821
	Tower Hamlets	196,106	80,781	78,530
	Hackney	202,824	88,446	86,042
Essex	Basildon	165,668	70,843	69,207
	Castle Point	86,608	35,810	35,279
	Rochford	78,489	32,773	31,952
	Thurrock	143,128	59,416	58,485
	Southend-on-Sea	160,257	74,310	70,978
Kent	Dartford	85,911	36,028	35,240
	Gravesham	95,717	39,137	38,266
	Swale	122,801	51,316	49,257
	Medway	249.488	102,892	99,566
	Tonbridge & Malling	107,561	43,907	42,743

4.2.2 Tourism establishments

The London and North Kent sub-regions in particular are home to major tourism establishments – both actual and potential. In London, Greenwich is a World Heritage Site, with famous landmarks including the National Maritime Museum, the Royal Observatory, and Sir Christopher Wren's Old Royal Naval College. Greenwich peninsula is home to the 02 - a 23,000 capacity arena for music and sporting events, that also accommodates leisure and retail facilities. Over nine million people visit Greenwich each year, with tourism worth £532 million to the local economy annually and contributing around 25% of all jobs locally (www.greenwich.gov.uk).

The Olympic Park at Stratford includes the main stadium for the 2012 London Olympic Games and Paraplegic Olympics. The Games have been ascribed the potential to generate an

[*] Source: Figures taken from 'Census 2001: Key Statistics for local authorities in England and Wales' KS01' - tables KS01 'Usual resident population' and KS16 'Household spaces and accommodation type'.

estimated £2.1 billion in additional tourism benefits (2006 prices) over the period 2007-17, although such estimates are contentious and problematic (DCMS, 2007).

The North Kent sub region has a number of major tourism establishments, mostly related to its location on the River Thames. In Medway (which has applied for World Heritage status) these include Rochester castle and cathedral, historic buildings in the town centres; dockyards and industrial sites at Chatham, and Dickens World near Chatham (Shared Intelligence, 2009). In North Kent, the Bluewater shopping centre attracts 27 million visits a year, emphasising the importance of retailing as a form of leisure in the UK (KCC, 2009). In south Essex, seaside towns such as Southend are considered to have a strong cultural and creative offer (EEDA, LDA & SEEDA, 2008) with further development of beach, resort, tourism and facilities a priority.

4.2.3 Restaurant/café/snack establishments

Within the Thames Gateway there are approximately 2,896 hospitality facilities (Table 9.22). Restaurants, cafes and pubs are located within the main settlements and where population density is highest, with additional clusters in traditional holiday and day-tourism destinations, such as Canvey Island (cafes and fast food) and Southend-on-Sea (with a wider mix of restaurants and fast food). The Medway towns show a significant development of restaurants, cafes and food based-enterprises with a high representation of traditional pubs and inns - also the case within the semi-rural areas of North Kent. In terms of accommodation, hotels predominate in the London sub-region of Thames Gateway.

Table 9.22. Hospitality industry in Thames Gateway.

Hospitality Industry in Thames Gateway	
Restaurants	689
Cafes, Snack Bars and tea Rooms	331
Fast Food Delivery Services	25
Fast Food Take Aways	701
Fish and Chip Shops	195
Internet Cafes	27
Pubs, Bars and Inns	582
Banqueting Facilities	11
Camping and Caravan Sites	60
Guest Houses	117
Hostels	10
Hotels, Motels and Country House Hotels	111
Self Catering Facilities	34
Timeshare Developments	1
Youth Hostels	2
Total	**2896**
Source: OS Crown Copyright	

4.2.4 Industrial and commercial/trading establishments

Although the Thames Estuary was once the key for the export and import of goods to London and the Greater South East and the hub of a thriving manufacturing sector, these sectors have long been in decline. Moreover, while there are some booming areas, notably Canary Wharf which is at the heart of the redevelopment of Docklands, many parts of the Gateway have been considered slow in making the transition to "a modern knowledge-based, primarily service sector driven economy." (EEDA, LDA & SEEDA, 2008).

In response, government has worked with Regional Development Agencies to identify sectors of the economy with potential for growth:

- financial and business services
- creative industries and the cultural sector
- environmental technologies and services
- high-value-added, technology-led manufacturing
- sustainable construction (DCLG, 2007).

Four locations in the Thames Gateway have been identified for growth – Ebbsfleet Valley in north Kent, Stratford and the Lower Lea Valley, and Canary Wharf (both London), and London Gateway in south Essex. Canary Wharf has been identified as an international financial and business service centre, with forecasts suggesting that further expansion of financial and business services could result in an additional 150,000 jobs by 2016.

The London Gateway port development has been ascribed the potential of creating 14,000 jobs (9000 by 2016), with opportunities for "global partnering in innovation and learning" and to become "a demonstration centre for renewable energy technologies" (EEDA, LDA & SEEDA, 2008).

4.2.5 Fishing fleet and farming

Thames Gateway has very little in the way of a fishing industry (Table 9.23). However, offshore of the outer Thames estuary (outside the Thames Gateway area) the southern North Sea is an important and productive area for fisheries. Leigh-on-Sea, situated in the south Essex sub region is an important landing port for cockles (Thames Estuary Partnership, 2005). Although oysters (*Ostrea* and *Crassotrea*) have traditionally been reared on the Essex and north Kent coasts, fisheries are not located within the boundaries of the Thames Gateway.

Table 9.23. Employment in Fishing – Thames Gateway.[*]

Sub region	Local authority	Industry of employment (%) Fishing
London	Barking & Dagenham	0.02
	Bexley	0.01
	Havering	0.01
	Lewisham	0.01
	Greenwich	0.00
	Newham	0.01
	Tower Hamlets	0.00
	Hackney	0.01
Essex	Basildon	0.01
	Castle Point	0.02
	Rochford	0.02
	Thurrock	0.01
	Southend-on-Sea	0.03
Kent	Dartford	-
	Gravesham	0.01
	Swale	0.02
	Medway	0.01
	Tonbridge & Malling	0.01

Based on CORINE level 3 land cover data, the Thames Gateway is comprised of nearly 24.51 per cent non-irrigated arable land; 16.20 per cent pastures; 1.5 per cent fruit trees and berry plantations; and 0.15 per cent land principally occupied by agriculture, with significant areas of natural vegetation (www.eea.europa.eu/publications/COR0-landcover). Some 0.20 - 2.03 per cent of those working in each local authority area relevant to the Thames Gateway were employed in farming.

[*] Source: Figures taken from 'Census 2001: Key Statistics for local authorities in England and Wales' KS01' - Table 9.KS11a 'Industry of Employment'.

Table 9.24. Employment in Farming – Thames Gateway.[*]

Region	Local authority	Industry of employment (%) Agriculture, hunting and forestry
London	Barking & Dagenham	0.30
	Bexley	0.39
	Havering	0.43
	Lewisham	0.30
	Greenwich	0.29
	Newham	0.20
	Tower Hamlets	0.19
	Hackney	0.28
Essex	Basildon	0.62
	Castle Point	0.58
	Rochford	1.58
	Thurrock	0.63
	Southend-on-Sea	0.58
Kent	Dartford	0.80
	Gravesham	1.05
	Swale	2.03
	Medway	0.74
	Tonbridge & Malling	1.58

4.2.6 Ports

The Thames Gateway is home to many port and related facilities that have evolved over centuries. Major ports include the Port of London, which stretches along the Thames and includes wharfs, docks, terminals and other facilities. These include the Port of Tilbury in south Essex - the UK's third largest container port – and the London Gateway Port development at Thurrock in south Essex (www.pla.co.uk).

[*] Source: Figures taken from 'Census 2001: Key Statistics for local authorities in England and Wales' KS01' - Table 9.KS11a 'Industry of Employment'.

Medway Ports, which comprises the Port of Sheerness and Chatham Docks in north Kent (www.medwayports.com). Sheerness - one of the UK's most significant ports for importing cars, timber and fresh produce – has been earmarked for redevelopment. Chatham Dock handles in excess of 1 million tonnes of cargo a year (Jones Lang Lasalle, 2009). London Thamesport, also in north Kent, is one of the UK's busiest container ports. In 2009 London was the second busiest port in the UK in terms of tonnage (DT, 2009).

4.2.7 Energy production companies

A range of major companies operates energy production facilities located in the Thames Gateway.

E.On operates power stations at Kingsnorth (dual-fired – 1,940MW) and Grain (oil - 1,380MW). Scottish Power operates a 793MW combined cycle gas turbine (CCGT) power station at Damhead Creek at Kinsgnorth in north Kent, and is currently developing plans for a new 1000MW station at the same site. Scottish and Southern Energy operates Medway power station (gas - 690 MW), located on the Isle of Grain. npower operates Tilbury power station (coal - 1,131MW), to the east of Tilbury Docks in Essex and Littlebrook power station in North Kent (oil – 1,245 MW) .

The London Array is currently being developed by the consortium of E.ON, DONG Energy and Masdar. When complete, it will comprise up to 341 offshore wind turbines situated in the outer Thames estuary and generating up to 1,000MW of electricity. It is expected to become the world's largest offshore wind farm.

4.2.8 Environmental groups

Thames Gateway has been a focus for both national and international groups with environmental interests. Wildlife charity Buglife took Thurrock Development Corporation to Court on the grounds that it had failed to protect the Marshes, whilst the Friends of North Kent Marshes works with local communities and groups such as the RSPB (the Royal Society for the Protection of Birds) as they develop visitor sites. Wildlife Gateway has been created by the Wildlife Trusts in Thames Gateway as part of their commitment to high quality regeneration which. CPRE (Campaign to Protect Rural England) is also a keen commentator on development in the Gateway.

4.2.9 Community groups

The sixteen local authorities whose collective boundaries encompass the Thames Gateway area are each home a variety of minority ethnic communities with associated community organisations. At the sub regional level, reports from the Thames Gateway London Partnership (TGLP, 2006) suggest that that there are 20,000 community and voluntary organisations in the London Thames Gateway alone – not including social enterprises and housing associations.

4.2.10 Second home owners

According to the 2001 census (see Table 9.25) approximately 0.2 per cent of homes in the local authority areas in which the Thames Gateway is located were either second homes or holiday accommodation, against an average of 0.7 per cent for England and Wales. A subsequent estimate (Office for National Statistics, 2005) suggested that by 2005 approximately 1.0 per cent of homes in the UK were second residences.

Table 9.25. Household Spaces – Thames Gateway.[*]

Region	Local authority	Pop'n 2001 census KS1	Household spaces and accommodation type 2001 census KS16	Household spaces and accommodation type 2001 census KS16	Household spaces and accommodation type 2001 census KS16
			All	With residents	Second homes/holiday accommodation
London	Barking & Dagenham	163,944	68,378	67,273	46
	Bexley	218,317	91,729	89,451	139
	Havering	224,248	93,980	91,722	123
	Lewisham	248,922	109,448	107,412	178
	Greenwich	214,403	95,835	92,788	156
	Newham	243,891	93,782	91,821	125
	Tower Hamlets	196,106	80,781	78,530	500
	Hackney	202,824	88,446	86,042	115

[*] Source: Figures taken from 'Census 2001: Key Statistics for local authorities in England and Wales' KS01' - tables KS01 'Usual resident population' and KS16 'Household spaces and accommodation type'.

Essex	Basildon	165,668	70,843	69,207	87
	Castle Point	86,608	35,810	35,279	27
	Rochford	78,489	32,773	31,952	67
	Thurrock	143,128	59,416	58,485	79
	Southend-on-Sea	160,257	74,310	70,978	205
Kent	Dartford	85,911	36,028	35,240	36
	Gravesham	95,717	39,137	38,266	56
	Swale	122,801	51,316	49,257	382
	Medway	249,488	102,892	99,566	467
	Tonbridge & Malling	107,561	43,907	42,743	144
Total			1,136,458		2,673

4.3 Overview of resource conflicts

4.3.1 Portsmouth

Portsmouth's key resource conflicts – both current and future – lie in competition for natural resources in the context of a dense and rising population, planned expansion of the housing stock, a strong and growing tourist economy with a coastal focus, and a susceptibility to flooding exacerbated by rising sea levels as a consequence of climate change (Table 9.26).

Portsmouth's population density is very high – partly due to revived inward migration - with targets for additional growth in housebuilding in the years to 2016. However, suiTable 9.space is heavily constrained by its site and by historical development, meaning that planners must look beyond the urban core. Thus, the spatial demands of economic, housing, recreational and associated infrastructural development threaten the partial or complete loss of natural environments and recreational space. Parts of the city are at a significant risk from flooding. Locating new development outside flood risk areas is acknowledged as the most efficient way of managing flood risk, but there is not enough suiTable 9.capacity in Portsmouth to do this if building targets are to be met.

Land reclamation for development has been a significant cause of the loss of intertidal habitat in Portsmouth Harbour, and the building of 'hard' coastal defences in the context of rising sea levels presents similar challenges through 'coastal squeeze' as habitats are prevented

from migrating inland in the face of rising sea levels. This creates a conflict for conservation, as many intertidal areas surrounding the city receive national and international conservation designations, and compensatory habitat for that lost is both scarce and expensive.

The city's tourism industry – which saw the numbers of visitors triple between 1988 and 2006 and has been the focus of extensive urban development – is economically significant in an area of high social deprivation. However, it also adds to the burden on natural resources – including land for the disposal of waste - and presents additional requirements in terms of protecting infrastructure from the sea (thus undermining the recreational value of the coast for tourists).

Table 9.26. Users and resources – key conflicts: Portsmouth.

Resources / Users	Coastal ecosystems	Marine ecosystems	Soil and land	Fresh water	Cultural features	Social features	Economic features
Inhabitants/ households	Sea defence/ coastal squeeze Sewage effluent Disturbance Trampling		Additional housing Landfill waste sites Pressure on recreational spaces	Pressure on water supplies	Local recreational demands	Rising population – claims on housing	
Tourism Establish-ments	Sea defence/ coastal squeeze Coastal recreation Sewage effluent Disturbance Trampling		Landfill waste sites Pressure on tourism spaces	Demands of hotels	Pressure on particular sites		Spatially polarised
Restaurants etc	Sea defence/ coastal squeeze		Landfill waste sites	Pressure on water supplies		Local versus visitor usage	
Industrial/ commercial	Sea defence/ coastal squeeze Water-borne pollution		Brownfield versus greenfield development Landfill waste Sites	Pressure on water supplies			Changing employment bases Non complementary land uses
Fishing	Bait-digging						
Farming	Agricultural run-off/ Eutrophica-tion						

Ports	Sea defence/ coastal squeeze Potential pollution				Coexistence with tourism sites		Decline in port based industries
Energy production							
Env. groups	Sea defence/ coastal squeeze		Conservation	Conserva-tion	Conserva-tion		Sea defence/ Coastal squeeze
Community groups					Local cultural facilities	Social polarisation	
Second home owners	Sea defence/ coastal squeeze					Limited impact on housing supply	

4.3.2 Thames Gateway

The Thames Gateway's key resource conflicts lie in competition for natural resources in the context of extensive urban regeneration and a susceptibility to flooding exacerbated by rising sea levels as a consequence of climate change (Table 9.27).

The Thames Gateway has been designated a national priority for urban regeneration to allow the continued expansion of Greater London. Besides the construction of new homes, major investments include high speed rail links to central London, an improved network of public transport, the Olympic Park and supporting infrastructure, and the development of a port and business park - the London Gateway. Proposals for a Thames Gateway Bridge drew strong opposition from environmental groups concerned about air quality and additional traffic, whilst the area's significant and expanding power industry has seen public conflict with environmental groups over the continued use of coal as a source for energy.

Thames Gateway occupies mainly low-lying flood plains, which are heavily protected against tidal and river floods. The management of flood risk is a major issue, where the maintenance of flood defences is of paramount importance at present and represents an economic and environmental challenge for the future. 56% of land selected for redevelopment is within the floodplain, and further development in flood risk areas – combined with the effects of climate change and accompanying sea level rise - will increase the number of people and properties at risk from flood events.

As well as increasing flood risks, the impacts of climate change and sea level rise are expected to aggravate the loss of natural wetland habitats due to coastal squeeze. This creates a conflict between the conservation of habitats and the management of flood risk, as the

maintenance or upgrade of flood defences are not permitted if expected to impact negatively on the Thames Gateway's legally protected coastal habitats.

Table 9.27. Users and resources – key conflicts: Thames Gateway.

Resources / Users	Coastal ecosystems	Marine ecosystems	Soil and land	Fresh water	Cultural features	Social features	Economic features
Inhabitants/ households	Sea defence/ coastal squeeze		Loss of grazing pasture	Pressure on water supplies	Local recreational demands		
Tourism Establishments				Demands of hotels			Spatially polarised
Restaurants etc			Landfill waste sites	Pressure on water supplies		Local versus visitor usage	
Industrial/ commercial	Sea defence/ coastal squeeze		Brownfield versus greenfield development Landfill waste Sites	Pressure on water supplies			Changing employment bases Non-complementary land uses
Fishing							
Farming			Loss of grazing pasture	Future irrigation needs			
Ports	Sea defence/ coastal squeeze Potential pollution	Potential pollution					Decline in port based industries
Energy production	Sea defence/ coastal squeeze						
Env. groups	Sea defence/ coastal squeeze		Conservation				Sea defence/ Coastal squeeze
Community groups					Local cultural facilities	Social polarisation	
Second home owners	Sea defence/ coastal squeeze					Limited impact on housing supply	

5. Conclusions

Both cities face challenges rising from the relationships between urban development, human mobility and environmental changes. However, the sites, development histories and environmental settings also mean that these are articulated differently, as are policy responses.

Whereas Portsmouth is a tightly constrained city, bounded by rias that are busy harbours, Thames Gateway is a planning region that was created to provide a framework for urban regeneration and a focus for new development to the east of London. Whereas Portsmouth is a unitary local authority, Thames Gateway, which cuts across the territories of 16 different local authorities, and sits in the shadow of London at least in economic terms, is a long, large and diverse sub-region.

There are marked differences also in the biophysical features of the two case studies. The Solent estuarine system is formed by rias, and coastal processes are complex due to the combination of open coast and harbours that are partially sheltered by the Isle of Wight. Thames Gateway coast is largely characterised by shallow water abutting low-lying and flat land above mean high water. Both have been significantly modified over time by human activity. There are especially acute concerns about the long term losses of salt marshes in Portsmouth harbour, as a result of climate change, but the development of hard sea defences, and development of land immediately landwards of them, has also led to a steady reduction in the area of mudflat and saltmarsh in Thames Gateway.

Portsmouth harbour includes one of the four largest expanses of mudflats and tidal creeks on the south coast of Britain, It has internationally important populations of mud-snails, shrimps and wading birds and wildfowl. Other than in the highly developed London sub-region, coastal ecosystems in Thames Gateway are dominated by tidal mudflats at lower levels that may be exposed at low tide, with saltmarshes at higher tidal levels. The mudflats are inhabited by dense populations of photosynthetic micro-organisms that are highly significant contributors to the biological productivity of the ecosystem. Saltmarshes at the uppermost elevations are often used as roosting areas for wading birds and wildfowl at high tide, whilst terrestrial birds use saltmarshes as feeding areas. A large range of invertebrate species also inhabits this ecosystem.

Given the importance of the ecosystems at both sites, the intertidal areas (mudflats and salt marshes) are protected by national and international conservation designations, including Ramsar, Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Sites of Special Scientific Interest (SSSI).

Turning to demographic and socio-economic features, Portsmouth had an estimated population of 200,000 in 2008, and its population has been increasing again since 2000 after several decades of stagnation or decline. Internal migration, international migration, and a large student population (11.5% of the total) have contributed to this renewed demographic dynamism as well as to the city having a relatively young age. There is a high population density. In contrast, approximately 1.45 million people live in Thames Gateway, and this is forecast to increase by 8% by 2018, that is at above the national average growth rate.

While both case studies are relatively prosperous by the standards of the UK as a whole, they also contain areas of very high social, economic and environmental deprivation. The unemployment rate in Portsmouth is similar to the national average, but there are pockets of higher unemployment and reliance on state welfare benefits in the central city wards. The city is predominantly white with a relatively small ethnic minority population, despite recent inward international migration. Given the scale and economic diversity of the region, Thames Gateway includes both some of the more prosperous and some of the poorest areas in the UK: the latter are found mostly but not only in the London sub region.

In terms of land use, Portsmouth is dominated by the built environment within its highly constrained peninsular setting. There is only limited availability of brown field land, and severe difficulties in accommodating development pressures. Portsmouth lacks green spaces. The land use profile of the Thames Gateway study area is very mixed. While there is continuous development along the upper Thames in eastern London, there are extensive areas of agricultural land in the eastern sub regions: 60% of the region is designated Greenspace. Thames Gateway has one fifth of all the brownfield land in the South East region of the UK, and much of this is available for development: over 80% of recent additions to the stock of housing have been built on brownfield sites or have reused buildings.

Southeastern England has relatively low rainfall by UK standards. Portsmouth currently has a small surplus of freshwater, but this is likely to become more problematic as climate change may reduce summer rainfall by between 15-60% by the 2080s. Per capita water consumption levels may have to be significantly reduced to avoid future supply shortages in the face of population growth and climate change.

Portsmouth has recently developed its socio-cultural resources and now has a cluster of waterfront heritage attractions which attracted some 4.6 million visitors in 2006. Thames Gateway is overshadowed by London as a tourist destination, and most attractions are

relatively small- or medium-scale, with the exception of Greenwich in eastern London, which attracts an estimated 9 million visitors annually (although relatively few stay overnight).

The main users in both cities include different population groups, in context of increasing and socially diverse populations, recent net migration, and relatively young age structures. There are also substantial tourist numbers in particular locations – in the waterfront zones in Portsmouth, and in Greenwich and the Medway towns in Thames Gateway. The tourism streams are diverse and include both (relatively older) cultural tourists and visitors, and (younger) night-time economy participants. There are diverse employers, ranging from small service establishments to major manufacturing enterprises, but the economic structures of both cities are changing rapidly.

As would be expected, a range of international and national conservation bodies are represented in the two case studies, involving the public, private and voluntary sectors. Their focus is mainly on the protected coastal areas, and on historic cultural and industrial sites, many of which are directly connected to estuarine, coastal and harbour sites. There are also a very large number of local conservation groups throughout both regions. Although these are too numerous to have been listed in detail in this report, they will be addresses in more detail in later project outputs.

6. References

Ayres, D. R. & Strong, D. R. (2001) Origin and genetic diversity of *Spartina anglica* (Poaceae) using nuclear DNA markers. American Journal of Botany 88, pp.1863-1867

Clark, D. & Sizeland, F. 2010. Portsmouth City – Key Data Sheet 2010. [Online] Available at: http://lists.port.ac.uk/pipermail/pbs-staff/archivesprivate/attachments/20100312/9cfd80f4/attachment-0001.pdf.

Cope, S. & Gorczynska, M. (2007) Aerial Photography Report, Portsmouth Harbour (Southeast Strategic Regional Coastal Monitoring Programme TR 12).

DCLG (2006) The State of the Gateway: a Baseline for Evaluating the Thames Gateway Programme (London: Department of Communities and Local Government).

DCLG (2007) Thames Gateway Delivery Plan, London: Department of Communities and Local Government.

DCLG (2008) Previously-developed Land that may be Available for Development: England 2007 (London: Department of Communities and Local Government : Results from the National Land Use Database of Previously-Developed Land)

DCMS (2007). Winning: A Tourism Strategy for 2012 and Beyond (London: Department of Media, Culture and Sport).

DTR (2001) Regional Planning Guidance for the South East (RPG9) (London: Department of Transport and the Regions).

DT (2009)Transport Statistics Bulletin: Provisional Port Statistics (London: Department for Transport).

DT (2010). Transport Statistics Bulletin: Provisional Quarterly Port Statistics Q2 2010 (London: Department of Transport).

English Nature (1997) Greater Thames Estuary Coastal Natural Area Profile (Sheffield: English Nature)

Environment Agency (2004) State of the Environment Report (London: Environment Agency).

Environment Agency (2008) Water Resources in England and Wales - Current State and Future Pressures. Available from: http://publications.environment-agency.gov.uk/pdf/GEHO1208BPAS-e-e.pdf , accessed on 02/09/2010.

Environment Agency (2010) State of the Environment - South East England, 49p. Available from: http://www.environment-agency.gov.uk/research/library/publications/34103.aspx, accessed on 02/09/2010.

EEDA, LDA & SEEDA (2008) Thames Gateway Economic Development Investment Plan (London: East England Development Agency,London Development Agency and South East Economic Development Agency)

Garbutt, A. & Wolters, M. (2008) Applied Vegetation Science http://nora.nerc.ac.uk/3278/1/2008_Restoration_chronosequence_AVS.pdf

Gray, M. J. (1995) The Coastal Fisheries of England and Wales, Part III: A Review of their status 1992-1994 (London: Ministry of Agriculture, Food & Fisheries, Fisheries Research Technical Report No. 100, pp.52-53).

Greenwich Council. 2004. Greenwich: a place to visit – tourism strategy 2004-10. [Online]

Available at: http://www.greenwich.gov.uk/Greenwich/YourCouncil/TheBorough/GreenwichProfile/Tourism.htm, accessed 25/9/2010.

Hamnett, C. (2003) *Unequal City* (London: Routledge).

Hampshire County Council. 2010. Demographic facts and figures for Portsmouth. [Online]Available at: http://www3.hants.gov.uk/factsheet_2009_-_la_level_-_portsmouth-2.pdf, accessed on 22/10/2010.

Jones Lang Lasalle (2009) The Thames Gateway: Business without Boundaries (London: Jones Lang Lasalle).

KCC (2009) Kent and Medway Tourism Development Framework. Canterbury: Kent County Council).

Natural England (2010) England's Geology, Hampshire. Available online: http://www.naturalengland.org.uk/ourwork/conservation/geodiversity/englands/counties/area_ID16.aspx, accessed in 06/09/2010.

North Solent Shoreline Management Plan, 2010. Appendix C Baseline Process Understanding, C.1 ASSESSMENT OF SHORELINE DYNAMICS. Available online: http://www.northsolentsmp.co.uk/media/adobe/o/s/C1_Coastal_Processes_Literature_Review_(final_draft).pdf, accessed on 06/09/2010.

Office of National Statistics (1971,1981,1991,2001) Mid Year Population Statistics (London: National Office of Statistics)

Office of National Statistics (2001a) Census Key Statistics for Portsmouth - KS11 – Industry of Employment Statistics (London: national Office of Statistics).

Office of National Statistics (2001b) Neighbourhood Statistics Industry of Employment – All People [KS11A] Statistics (London: National Office of Statistics)

Office of National Statistics (2001c) Census Key Statistics for Portsmouth - KS16 – Household space and composition type (London: Office of National Statistics)

Office of National Statistics (2001d) Census Key Statistics for Portsmouth – Table 9.KS01

Office of National Statistics (2005) Consultation Document. The 2011 Census: Initial View on Content for England and Wales - Second Residences (London: Office for National Statistics).

Office of National Statistics (2010) Local Authority Inter departmental Business Register VAT and PAYE registration data, 2010 (London: Office for National Statistics)

Ove Arup & Partners Ltd (2009) Portsmouth Water Ltd Outage Assessment Plan: Final Water Resources Management Plan 2009 (Leeds: Over, Arup & Partners Ltd).

PLA (2009) Annual Review (London: Port of London Authority).

Portsmouth City Council (2000) Portsmouth Harbour Plan Review 2000 (Portsmouth: Portsmouth City Council).

Portsmouth City Council (2003-4) Statistics Newsletter 2003-4 (Portsmouth: Portsmouth City Council).

Portsmouth City Council (2004) Local Futures The State of the District: Portsmouth 2004 (Portsmouth: Portsmouth City Council).

Portsmouth City Council (2009) Annual Monitoring Report 2009 (Portsmouth: Portsmouth City Council).

Portsmouth City Council (2010), Portsmouth Key Statistics (updated May 2010) (Portsmouth: Portsmouth City Council).

Portsmouth Commercial Port (2009) Port Statistics 2009 (Portsmouth : Portsmouth Commercial Port).

Portsmouth LDF & LTP (2005) Sustainability Appraisal, Coast & Water. Available from: http://www.portsmouth.gov.uk/media/Appx_3_Scoping_Baseline_water.pdf, accessed on 10/09/2010.

Shared Intelligence (2009) Thames Gateway Kent Economic Development Strategy consultation draft (London: Shared Intelligence).

Thames Estuary Partnership (2005) State of the Thames Estuary Report Consultation Draft (Phase I) (Peterborough: UK Environment, Thames Estuary Partnership/Royal Haskoning, pp100-107).

TGLP (2006) A Strategy for Building a World-class Third Sector in the London Thames Gateway; Building a World-class Third Sector Workforce in East London (London: Thames Gateway London Partnership).

Tourism South East (2008a) The Economic Impact of Tourism: Portsmouth 2008. (Eastleigh: Tourism South East Research Unit).

Tourism South East (2008b) Portsmouth Destination Benchmarking Visitor Survey 2008 Final Report (Eastleigh: Tourism South East).

UK Sea Fisheries Statistics (2008) http://marinemanagement.org.uk/fisheries/statistics/annual2008.htm. Accessed 16/8/2010

Visit Portsmouth (2007) Portsmouth Key Tourism Facts and Figures 1988-2006 (Portsmouth: Visit Portsmouth).

West, I. M. (2010) Solent Estuaries - Introduction: Geological Field Guide. Internet site: www.soton.ac.uk/~imw/Solent-Introduction.htm. Version: 14th January 2010.

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ABSTRACT: Both Portsmouth and Thames Gateway face challenges relating to the changing relationships between urban development, human mobility and environmental changes. However, the sites, development histories and environmental settings of the two urban areas mean that these are articulated very differently in terms of both resources and stakeholder interests. Given the importance of the ecosystems at both sites, the intertidal areas (mudflats and salt marshes) are protected by national and international conservation designations, but a combination of development pressures and climate change constitute major threats to these areas. In Portsmouth, migration and an increasing student pressure underlie a renewed demographic dynamism, but the land available for new housing and economic development is highly constrained by its site and planning regulations. Thames Gateway is a large diverse region that has been designated as the major focus for urban development in the South East of the UK, and it is accommodating above average population increases through extensive programmes of house building on brown field land. The distinctive spatial and temporal distribution of increasing tourism and leisure functions add to the pressures in both areas, but especially Portsmouth. These demographic and construction pressures are generating conflicts over the availability of recreational spaces, water, waste disposal and energy. Inevitably, such conflicts are being played out in context of intense social and territorial inequalities that are reflected in the distribution of power and the way in which issues are formulated.

KEYWORDS: Portsmouth, Thames Gateway, urban flood risk, regeneration, housing density, stakeholders, local resources.

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Annex I.