

Location and boundaries

This Marine Character Area (MCA) comprises the Welsh part of the Severn Estuary, stretching from the national border with England to the western fringes of Barry.

- The marine area is coincident with the majority of the Severn Estuary SAC (Wales) and full extent of the marine plan area. Its south western boundary broadly follows bathymetry, with the aim of excluding the deepest parts of the inshore channel.
- The MCA also includes all of the Severn Estuary SPA, Ramsar and SSSI within the inshore and intertidal zones.
- It meets the coast in the west to be coincident with NLCA 35: Newport, Cardiff and Barry (developed coastline which spreads out from Cardiff Bay).
- The MCA is also consistent with how the Estuary is spatially defined for the purposes of coastal navigation (e.g. Imray, 2008). The MCA excludes a small section of 'Welsh' waters along and at the mouth of the River Wye, which would be picked up by the adjacent English marine plan area.

Key Characteristics

Please note that the Bristol Channel continues into English Waters under the jurisdiction of the Marine Management Organisation as indicated in the map above. This MCA profile focuses on the area of the Estuary found within Welsh waters.

Key Characteristics
Expansive funnel-shaped Severn Estuary , sitting at the mouth of four major rivers (the Severn, Wye, Usk and Avon).
The immense tidal range of the estuary is second only to the Bay of Fundy in Canada. The status of the tide has a significant bearing on perceived character.
Soft Triassic and Jurassic rocks exposed along the shore , creating a wide rocky intertidal area. Elsewhere the shore is defined by extensive tidal flats .
Mud, sand and gravel sediments deposited in the Holocene period producing a varied sea bed of flats and bars , with associated shallow waters and numerous shoals presenting hazards to navigation.
Flat Holm island (SSSI and LNR) forms a gateway feature in the west – an outcrop of harder limestone rising out of the surrounding sediments. Steep Holm forms a similar ‘twin’ feature in English waters to the south.
Estuary important for the interpretation of coastline dynamics and land-forms, and also past changes in sea level, sediment supply, climate and river flow.
Strong tidal streams and turbidity producing biological communities characteristic of the extreme physical conditions of liquid mud and tide-swept sand and rock .
Tidal flats, saltmarshes and the extensive wet grasslands are of international importance for wintering waterfowl and migratory birds .
Some of the richest and most diverse populations of non-exploited fish in the UK – sea lamprey and twaite shad populations considered to be larger than in any other estuary.
MCA’s rich natural resources exploited by humans for millennia , with evidence dating back to the earliest hunter-gatherers roaming what was previously a much larger coastal plain (prior to sea level rise around 6,000 BC).
Long history of coastal reclamation , embankments and ditches, notably the extensive Gwent and Wentlooge levels
Long-standing strategic importance for international trade and maritime navigation , particularly as ports on both sides of the Bristol Channel expanded from the medieval period onwards. Cardiff, Newport and Barry still retain important port functions .
Numerous ship wrecks found on the sea floor, particularly in the west – including examples mined and sunk during WWII.
Local trawlers catch plaice, turbot, whiting and rays from the MCA’s sandbanks. Recreational charters and beach-based fishing are important economic activities.
Salmon, eels and trout fished commercially and recreationally in the rivers feeding the estuary, including through the traditional method of putcher fishing (medieval intertidal fishtraps are located at Goldcliff, West Pill and Caldicott).
Flat coastline backed by the Wales Coastal Path , affording long views into the Bristol Channel. Cars travelling along the M4 via the Severn Bridge also overlook the area.
Views to major commercial, port and industrial development at Cardiff and Avonmouth, as well as the two road bridges , contrasting with the open, empty vistas characterising the Gwent Levels .

Seascape's open character affording strong **intervisibility with the Somerset coastline**, including Portishead, Clevedon and Weston-super-Mare. The higher hill summits of the Quantock Hills AONB and Exmoor National Park form a distinctive upland backdrop.

Estuary's classic funnel shape and south-west orientation make it **susceptible to extreme weather conditions (including storm surges)** sweeping in from the east Atlantic.

Natural Influences

This Marine Character Area (MCA) comprises the south-west orientated Severn Estuary, fed by the major rivers of the Severn, Wye, Usk and Avon. The estuary expands in width from the mouth of the River Severn as it flows westwards to meet the Bristol Channel just south of Barry; creating a classic funnel shape. The funnelling effect of the adjacent land (the South Wales coastline to the north and the North Somerset coast of England to the south) has a profound effect on the physical conditions and overall character of this MCA.

This includes in particular the strength and range of the tides – the coastal geometry builds up the largest tidal bore in the UK further up the estuary, and it boasts the second highest tidal range in the world (between 12 and 14 metres). The strong tidal streams combined with the gradient of the seabed and thick mud, sand and gravel sediments produce waters of high turbidity with an opaque brown coloration. Constantly shifting sediments and water depths present further hazards to navigation. Entrance channels to the main ports at Cardiff and Newport are maintained by dredging due to the constant transportation and build-up of sediment. The marine sediments found in the estuary support the national construction industry, with large areas licenced for dredging.

The estuary is backed by a low, flat depositional coastline of soft Triassic and Jurassic rocks, creating a wide rocky intertidal area in the east including expansive tidal flats. The rocks are visible in cliffs from Penarth westwards, including the prominent coastal headlands of Penarth Head and Lavernock Point with wave-cut platforms at their base. The coastal hinterland is defined by the flat expanses of reclaimed levels and wetlands east of Cardiff (Wentlooge and Caldicot), separated from the water by a five metre high coastal bund of medieval (or earlier) origin. The coastline becomes more gently undulating in the west, as it abuts the Vale of Glamorgan.

Flat Holm Island – an outcrop of harder limestone rising out of the surrounding sediments – forms a gateway feature into the estuary from the Bristol Channel. Designated as SSSI and a Local Nature Reserve, the island is valued for its coastal grassland, maritime cliff and associated ledges and crevices, specimens of wild leek, and its breeding colony of lesser black-backed gulls. The island's prominent lighthouse warns of the dangers associated with the surrounding submerged shelves, shoals and strong tidal streams. Steep Holm forms a similar 'twin' feature in English waters to the south.

The unique conditions of the estuary today give rise to internationally important habitats with much of the MCA falling within the Severn Estuary Special Area of Conservation (SAC), along with large sections of the intertidal zone also designated as a Special Protection Area (SPA), Ramsar site and Site of Special Scientific Interest (SSSI). The tidal flats, saltmarshes and wet grasslands are home to large numbers of overwintering and migratory birds, including at Newport Wetlands (RSPB reserve), whilst complex biological communities are associated with the tide-swept expanses of sand, mud and rock. The estuary's waters support the richest and most diverse populations of non-exploited fish in the UK – sea lamprey and twaite shad populations are considered to be larger than in any other estuary.

Cultural/social influences

Past human activities have long been governed by the vast tidal range within the Severn Estuary, which has seen major and minor fluctuations in the heights and range of tides since the last glaciation caused by variations in both the land and sea level. Behind the present course of the estuary, the man-made levels landscape of the Gwent, Wentlooge

(and Somerset) Levels reflects man's evolving and often precarious relationship with these circumstances over the last ten thousand years. Because of recurrent phases of inundation and alluviation, there is a proven potential for extensive, buried, waterlogged, archaeological and environmental deposits belonging to the earlier landscapes, which extend beyond the seawalls and banks into the intertidal mudflats. These include the remains of Neolithic/Bronze Age settlement sites, as evidenced by human footprints, lithic finds, butchered animal bone, brushwood trackways and roundhouses (e.g. in the vicinity of Collister Pill). The wider area is recognised as of international importance for its uniquely rich archaeological and historical resource – the Gwent Levels is registered as a Landscape of Outstanding Historic Interest in Wales.

The long-standing relationship between local communities and the estuary complex is also evidenced by small, traditional landing places for cross-channel trade; servicing communities such as Peterstone, Goldcliff, Rumney and Redwick and also associated with early medieval ship finds. Intertidal fishtraps from the same period are found at Goldcliff, West Pill and Caldicott, with the traditional method of putcher fishing continuing to be practiced. Local fishing fleets and recreational charters continue to exploit the rich marine resources, trawling the sand banks for plaice, turbot, whiting and rays – whilst beach netting and angling occurs along the coastline, particularly west of the Usk.

The importance of the area for maritime trade burgeoned from the medieval period onwards; particularly following the Industrial Revolution which transformed Cardiff into one of the largest coal ports in the world (the coal sourced from the valleys supplied the Naval fleet). The import and export of goods and raw materials along the estuary fed the expansion and wealth of Cardiff, Newport, Bristol and Gloucester. The pattern of ship wrecks illustrate both the dangerous navigational conditions and the estuary's role as a maritime traffic route (with losses associated with the Cardiff approaches and hazards such as the Aldridge Shoal and Lavernock Point). Barry is a long-established pilot station for the Severn Estuary and Bristol Channel; the nearby Barry Roads remaining a focus for shipping movements and the harbour providing safe temporary refuge in heavy weather.

As well as trade and exploitation of the area's natural resources, the strategic role of the estuary as a key entry point into Britain by sea has long been recognised. Both the Roman and Viking fleets made approaches via the Bristol Channel and Severn Estuary and occupied the wider area. Both Flat Holm and Steep Holm islands were fortified in the 1860s as a defence against invasion, forming part of a line of defences, known as Palmerston Forts, built across the Bristol Channel to protect the approaches to Bristol and Cardiff – these were enhanced in the 20th century to serve the two World Wars. In 1887 Marconi used Flat Holm in his first radio transmission across the water to Lavernock Point. Ship wrecks associated with the two World Wars provide a legacy of the area's role in more recent conflicts – vessels involved in D-Day embarked from Cardiff, Barry and Newport.

Today, the MCA retains its long-standing role in marine transportation, with Avonmouth (Bristol) now expanded to be one of the UK's major ports. Although Cardiff and Newport's port functions have declined since their 19th century peak, they still play an important role in the import and export of a range of products including containers, steel, aggregates forest products and dry and liquid bulks. Cardiff sees around 2.1 tonnes of goods pass through its port each year, Newport 1.5 million tonnes and Barry – a small port which supports the region's chemical industry in particular – 281,000 tonnes (ABP Ports, 2015).

The capital's maritime setting has been transformed since the creation of Cardiff Bay in 2000 – an impounded area of water contained by a kilometre long dam built between Penarth and Cardiff docks to hold back the powerful tides. This has created a modern

focus and sense of vitality to the south of the city, with commercial, residential, government and leisure uses – including landmark buildings such as the Millennium Centre.

The coastal backdrop to this MCA is characterised by its mixture of rural, urban and industrial land uses. The two Severn bridges, mainline rail and the M4/48 corridors, docks, Uskmouth Power Station and vertical industrial structures (including pylons and wind turbines at Avonmouth) form prominent skyline features when viewed from the marine area. There are a number of outfalls into the Severn Estuary from storm water discharges, sewage treatment works, industry and power station cooling waters.



Sandy beach at Barry

The MCA supports a range of coastal and water-based recreational opportunities, with specific destinations such as the traditional seaside resort of Barry (with designated bathing waters) and the upmarket Victorian town of Penarth with its pier and promenade - previously marketed as 'The Garden by the Sea'. The coastline is traversed by the Wales Coast Path, skirting a small distance inland in places around inlets and estuary mouths. Day trips to Flat Holm from Barry to view wildlife and its wealth of heritage features, along with other sightseeing cruises give visitors from both sides of the estuary an opportunity to experience the seascape and its wide vistas from the water.

Aesthetic and perceptual qualities

The orientation and channelled nature of the MCA make it susceptible to extreme weather conditions sweeping in from the Atlantic, including storm surges. During these periods a sense of danger and relative wildness can pervade despite the proximity of settlement and associated 'safety'. Numerous navigation markers, including white and red light buoys and fog horns guide vessels around the submerged sand bars, rocks and spits - the flashing lights contributing to the night-time character of the area and its skylines, including when viewed from the Somerset coastline.

The flat coastline and its open character afford expansive views across and beyond the MCA, including to Bristol, Portishead, Clevedon and Weston-Super-Mare, Hinkley Nuclear Power Station as well as the uplands of the Quantock Hills AONB and Exmoor National Park. Cars travelling along the two Severn Bridges also overlook the area and the wider

Bristol Channel (MCA 28); it forms a charismatic maritime gateway into Wales from England. When viewed from the Somerset coast, the South Wales uplands and the Brecon Beacons provide a dramatic backdrop rising above the flat coastline and open water – conveying a contrasting sense of remoteness as well as strong visual unity with the upland landscapes to the south.



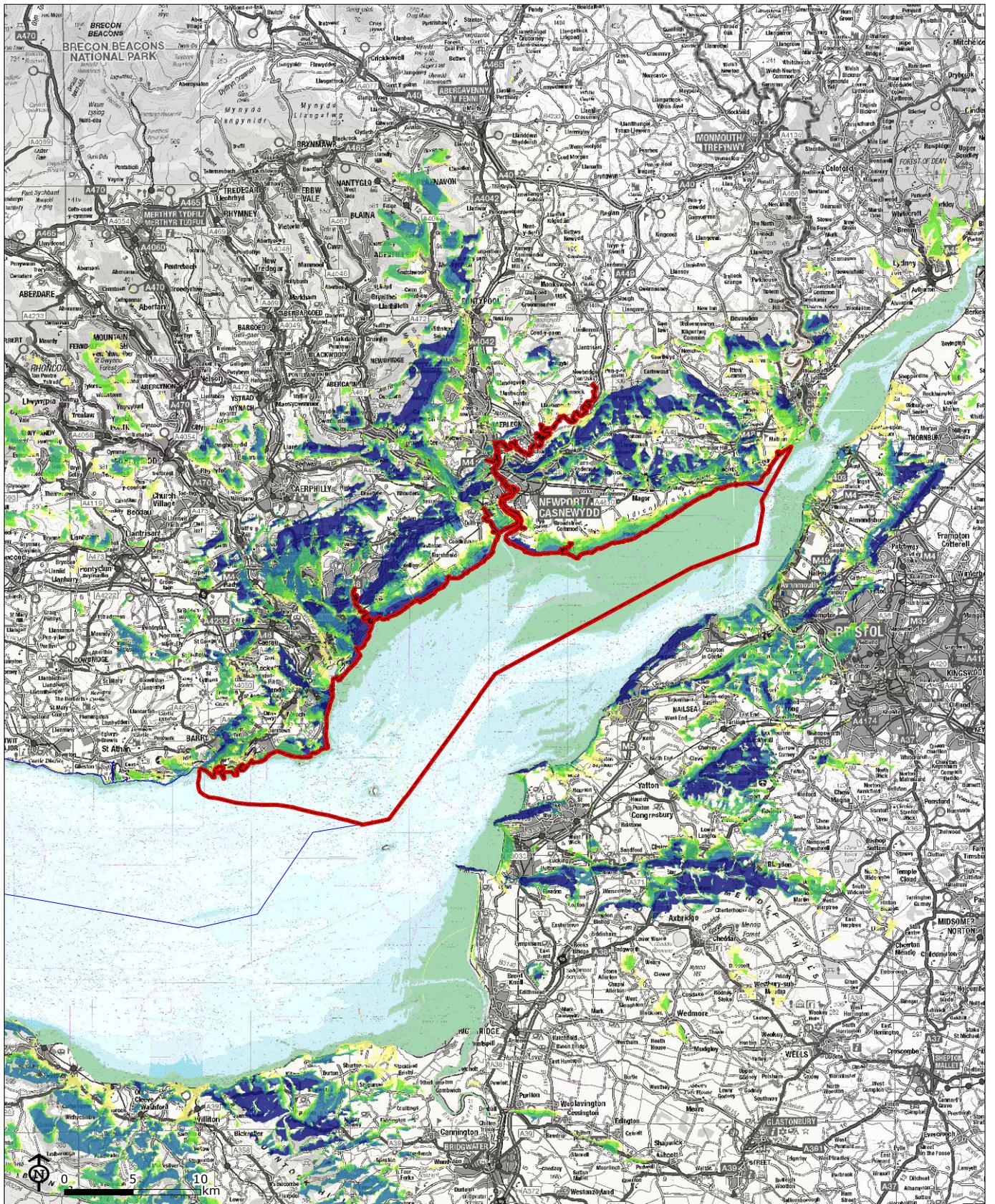
Intertidal mudflats and the flood defences fringing the estuary

Despite the influence of industrial and urban coastal development, havens of tranquillity and a sense of being ‘close to nature’ are provided by the expansive wetlands of the Gwent and Wentlooge Levels and the intertidal mudflats and shores of the estuary – all closely accessible via the Coast Path yet not visible more widely from adjacent reclaimed land because of the sea embankment. The smells and sounds of the estuary and its associated birdlife stand in stark contrast to the sounds of road traffic, views of development and glimpses of large-scale container ships travelling to and from the major ports.

The Visual Resource Maps (VRM) that follow provide a more detailed spatial representation of the visibility of this MCA from the surrounding land in Wales. Please refer to the technical report for an explanation of how these maps were generated and how they should be interpreted.

The first map shows land with views to this MCA, the darker shading indicating land where from which more of this MCA is visible.

The second map shows sea visible from land, the warmer colours being areas of sea that are visible from more places on land. This comes from a national assessment of Wales so the results do not relate specifically to this MCA, whose boundary is overlaid for location only. The four individual versions show how the results vary depending on how far inland hypothetical viewers are located.

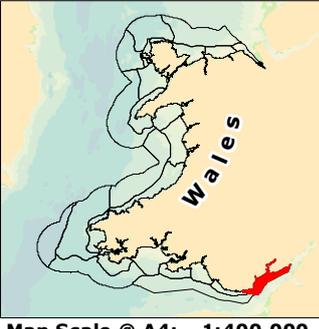


29: Severn Estuary (Wales)

Wales Inshore Marine Plan Area

Land with sea views (Percentile)

- < 20 (Lowest)
- 21 - 40
- 41 - 60
- 61 - 80
- 81 - 100 (Highest)



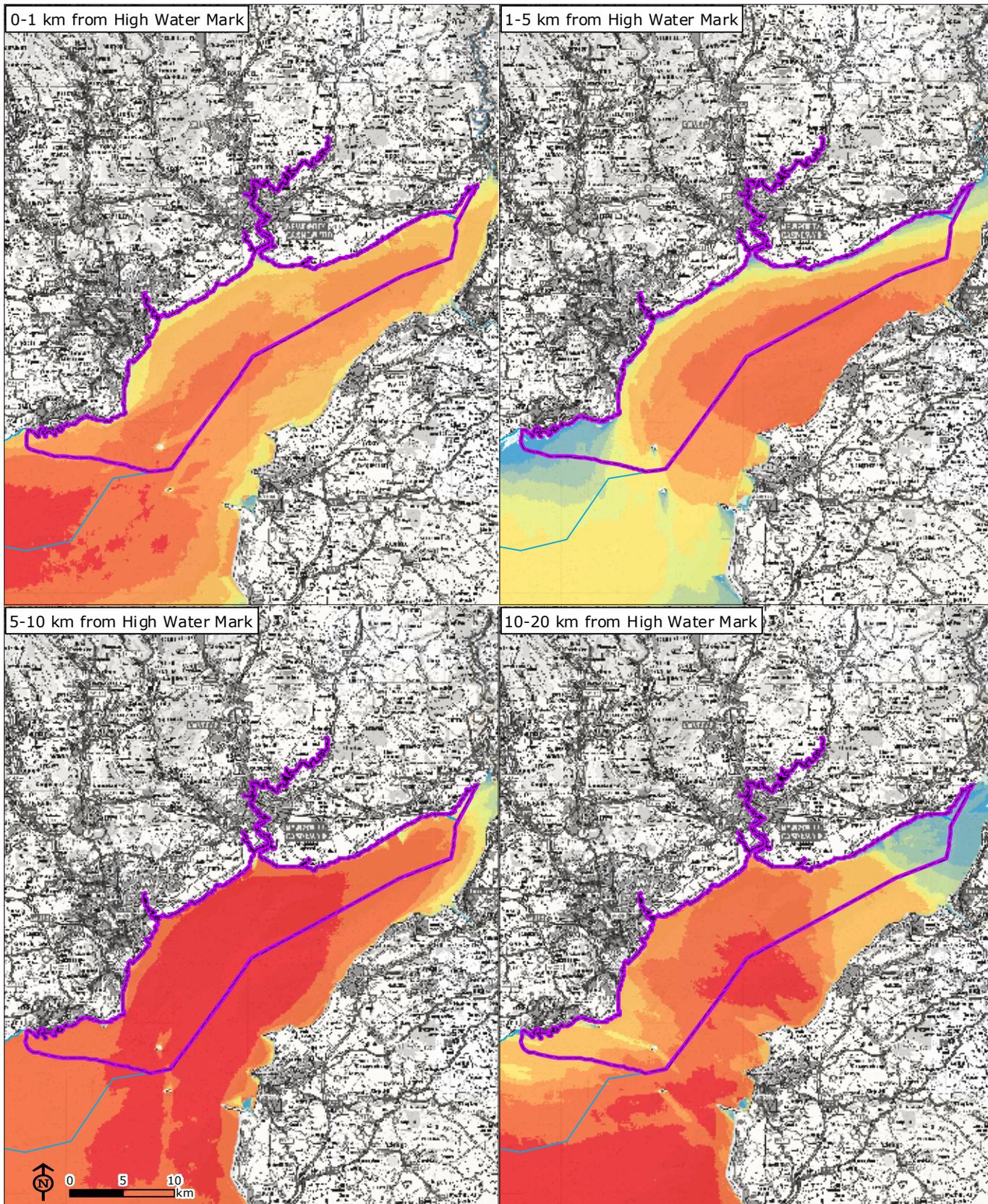
Wales National Seascape Assessment

Land with Views of: MCA 29: Severn Estuary (Wales)

Source: LUC, NRW, OceanWise

LUC

Map Scale @ A4: 1:400,000



- 29: Severn Estuary (Wales)
- Wales Inshore Marine Plan Area

Visibility of sea from land (percentile)

<10 (Lowest)	51-60
11-20	61-70
21-30	71-80
31-40	81-90
41-50	91-100 (Highest)



Wales National Seascape Assessment

Relative Visibility of the Sea Surface from Viewers on Land
MCA 29: Severn Estuary (Wales)



Map Scale @ A4: 1:530,000