

## Location and boundaries

This Marine Character Area (MCA) encompasses the shallow waters of Tremadog Bay, nestled between the Llŷn Peninsula and the Snowdonia coast in north-west Wales.

- It includes the tidal extents of the Glaslyn and Dwyryd estuaries, up to the High Water Mark.
- The MCA is characterised by shallower waters (informed by bathymetry) and markedly lower wave climate/wave exposure compared with the surrounding MCAs.
- The rocky reef of Sarn Badrig forms the southern MCA boundary, with associated rough, shallow waters as marked on the Marine Charts.
- The coastal areas which form the northern boundary of the MCA are contained within NLCAs 4: Llŷn and 5: Tremadoc Bay.

## Key Characteristics

Key Characteristics
A <b>sweeping, shallow bay with wide sandy beaches</b> , and a distinctive swash-aligned coastal landform at Morfa Harlech. To the north, the <b>rugged coastal peak of Moel-y-Gest</b> is a prominent landmark.
<b>Extensive intertidal area</b> at the mouth of the Dwyryd estuary, with a <b>meandering channel</b> running through it, and continuing inland. <b>Ynys Giffan</b> is located in the estuary.
<b>Shallow mud and sand substrate</b> overlying Oligocene and Permo-Triassic sedimentary rock with a <b>diverse infaunal community</b> . Traditionally, mariners used sounding leads on to follow the 'muddy hollow' from off St Tudwal's East to Porthmadog fairway buoy.
Includes part of the designated <b>Lleyn Peninsula and the Sarnau SAC</b> , recognised for its <b>reefs, shallow inlets and estuaries</b> .
Extensive <b>intertidal habitats and river channels designated SAC and SSSI</b> (Morfa Harlech and Glaslyn) provide <b>important bird feeding</b> and overwintering sites and habitat for rare plants and insects.
<b>Intertidal peat deposits</b> at Criccieth, the mouth of Afon Dwyfor, at Afon Wen, and Carreg y Defaid <b>provide evidence for inundated ancient landscapes</b> .
<b>Nursery grounds for commercially important demersal fish</b> including sole and plaice.
The <b>rocky reef of Sarn Badrig</b> forms the southern boundary to this MCA and supports a <b>diverse reef community</b> .
A fairly <b>sheltered seascape with weak to moderate tidal currents</b> . Wave action generates <b>little disturbance</b> .
Glaslyn and Dwyryd <b>estuaries flow into the sea</b> . The marine environment is strongly influenced by the <b>relatively high water temperatures and turbidity</b> associated with Tremadog Bay.
<b>Numerous wrecks</b> are found along Sarn Badrig, including the <i>Notre Dame de Boulogne</i> , a schooner which was carrying 70 tons of slate from Porthmadog to Poole.
<b>Lifeboat stations</b> are located at Criccieth, Abersoch and Pwllheli.
<b>Harlech Castle</b> , a World Heritage Site, overlooks the beach and bay from the east, whilst Criccieth Castle forms a prominent historical feature overlooking the bay from the north.
<b>Military seascape</b> – off Pwllhelli there is <b>former bombing range</b> (demolished targets noted as still lying on seabed), associated with the former Penrhos Airfield.
<b>Recreational and fishing boats</b> seen accessing Porthmadog harbour and Pwllheli. There is <b>limited fishing activity</b> of light otter trawling and potting.
Tourism and recreation are important uses, with <b>recreational boating, watersports, sea angling</b> and <b>popular beaches</b> .
A <b>relatively enclosed MCA</b> with views of the Llŷn AONB to the north and the Gwynedd coastline (including the rising mountains of Snowdonia National Park) to the east.
<b>Long views</b> across the length of the sweeping bay create an <b>open quality and large scale</b> . Weather and season have strong influences on the perceptual qualities of the area.

## Natural Influences

This MCA covers the shallow waters of Tremadog Bay, bounded to the south by the rocky reef of Sarn Badrig and enclosed to the west by the Trwyn Cilan headland on the Llŷn Peninsula. The shallow bay is fed from the east by the Dwyryd and Glaslyn Estuaries, and is framed by the jutting peninsula of the Llŷn AONB to the north and the mountains of Snowdonia National Park to the east. The shelter provided by the surrounding mountainous landforms means that the bay is more protected from the full force of the Atlantic weather when compared to the large-scale Cardigan Bay to the south (MCAs 15, 16 and 17).

As a result these waters are fairly sheltered with weak to moderate tidal currents, warmer waters and shallow mud and sand habitats which support a diverse range of European-designated marine flora and fauna. All of the marine area is designated as part of the wider Llyn Peninsula and the Sarnau SAC – of primary importance for its breeding population of bottlenose dolphins. Shallow bays and sheltered headlands provide important feeding areas for adults and calves. Important populations of otters in the Glaslyn estuary system also underpin the international designation. Basking sharks and leatherback turtles can be spotted in the waters – turtles migrating in the summer from the tropics to feast on barrel jellyfish in the bay. The MCA also provides nursery grounds for commercially important demersal fish and feeding grounds for sea birds.

The calmer conditions in these waters also result in the distinctive muddy seabed which overlays a seabed of mudstone, siltstone and slate. As with much of Cardigan Bay to the south, there is evidence of inundated landscapes in the form of intertidal peat deposits. The rocky, glacial ridge of Sarn Badrig (St. Patrick's Causeway) provides a natural barrier between Tremadog and Cardigan Bay and extends south westwards for 20 kilometres from Shell Island, forming the southern boundary of this MCA.

Most of the surrounding coastline is composed of sandy or gravelly beaches, rather than the cliffs characteristic of the western side of the Llŷn Peninsula, where the erosive processes of the sea are more powerful. Sand dunes are located to the north and south of Abersoch. Many areas along the coast are designated SSSIs for their nationally important intertidal and marine habitats and species.

Within the Dwyryd Estuary that enters the eastern part of the MCA, the rounded unbridged tidal island of Ynys Giffan is a prominent feature. There are extensive salt marshes, sand flats, mud and dune systems found at Morfa Harlech, which is also designated a SSSI and NNR for its biological and geomorphological features. The Glaslyn Estuary meets the sea at Morfa Harlech.

St Tudwal's Islands (Ynysoedd Tudwal) are located to the south of Abersoch on the Llŷn Peninsula. There is a lighthouse located on the western island, while the eastern island has the remains of a priory. The islands are also noted for their biodiversity interest, and are covered by multiple designations including SAC, SPA and SSSI. The heath-covered headlands are important for rare plants and are also feeding grounds for chough. A breeding population of grey seals is also found on the Islands.



St Tudwal's Island © John Briggs

## Cultural/social influences

This is a rich cultural landscape, with layers of evidence for human occupation and interaction with the sea over millennia. The entire eastern coastline, including the Glaslyn/Dwyrdd Estuaries, is designated as an integral part of wider Landscapes of Outstanding Historic Interest.

Tremadog Bay was a strategically important defensive location in the wider region. The ruins of Harlech Castle (part of the Castles and Town Walls of Edward I World Heritage Site) occupy a prominent position on a promontory overlooking the bay, considered to be one of the finest examples of late 13th century and early 14th century military architecture in Europe. The castle was constructed by Edward I during his invasion of Wales and played an important role in several wars, including the Wars of the Roses and the English Civil War. There is a water-gate leading down a flight of steps, as the sea originally came further inland. This provided a defensive advantage with people and supplies able to enter and leave the castle via boat. Criccieth Castle also overlooks the bay from the headland between the two beaches at Criccieth. This fortification was originally constructed in the 13<sup>th</sup> Century by Llywelyn the Great of Gwynedd and was altered heavily following its capture by various English forces. The bay is also said to be part of the legendary Cantre'r Gwaelod, an ancient sunken kingdom often described as a 'Welsh Atlantis' (also associated with the wider Cardigan Bay).

The harbour at Porthmadog was created following the construction of a sea wall, the Cob, by William Madocks (his name influencing the new harbour's name). The sea wall diverted the flow of the Afon Glaslyn, creating a natural harbour able to accommodate large ships, resulting in a flourishing ship building industry and supplied slate from Snowdonia worldwide in the 19<sup>th</sup> century. During this time, pilots were stationed at Porth Fechan/Carreg-Wen-Fach to provide the essential local knowledge to safely navigate the Porthmadog Bar. Anchorages were located in the shelter of St Tudwal's islands, where vessels would wait on the tide to proceed across the bar to quays at Porthmadoc. Documented shipping losses associated with the slate trade in and out of Porthmadog are numerous, and include the *Notre Dame de Boulogne*, a schooner which ran onto the causeway in 1924. One side of the wooden hull remains on the seabed, pinned down and preserved by its overlying slate cargo. Other located remains include the wreck on Warren Beach, believed to be the *Fossil*, driven ashore in 1889.

Other wrecks are concentrated around Sarn Badrig, forming the southern MCA boundary. A notorious navigational hazard, the sarn is marked by flashing cardinal lights. Historically, mariners used sounding leads on entering the shallow waters of the MCA, both for measuring water depth and observing changes in sediment. Historic patterns of shipping activity reflect the Admiralty advice to use a sounding lead to follow a 'muddy hollow' to within a mile of Porthmadoc fairway buoy, and not to stray into water less than seven fathoms in depth. The vessel would then be guaranteed to be at least two miles from Sarn Badrig.



*Afon Glaslyn sea wall © John Briggs*

The bay also has a close and ongoing link with military use. Penrhos airfield (near Pwllheli) was an RAF base which was used as a bombing training school from 1937 to 1946 and targets were located on the seabed off Pwllheli (demolished targets are still lying in situ). Aircraft losses include *North American Harvard N7105* which spun into the sea off Pwllheli after attacking the target on 12 September 1939. A former Butlins holiday camp at Hafan Y Mor Holiday Park opened in 1947 on the former site of two military camps. Today much of the bay remains licenced as a Military Practice and Exercise Area.

Modern use of the waters in the bay generally revolves around tourism and fishing. The bay provides nursery grounds for commercially important flatfish including sole and plaice, although fishing for these is limited to relatively small vessels because of the physical characteristics of the bay. Tourism has been popular in this area since the 19<sup>th</sup> century, and related development is found in the small settlements of medieval origin, along with large conspicuous caravan and chalet parks on the coast. Portmeiron is a unique village of Italianate architecture, designed and built by Sir Clough Williams-Ellis between 1925 and 1975, which remains a popular tourist destination. Watersports, including surfing and sailing, are very popular in the bay due to its calm waters and include yacht racing in the summer. The National Sailing Academy is located at Pwllheli Marina and there are also slipways at Abersoch. Due to the popularity of these waters, there are also numerous lifeboat stations to oversee the safety of sea-users, including at Criccieth, Abersoch and Pwllheli.

## Aesthetic and perceptual qualities

The high elevation of the surrounding landform give a sense of enclosure, with the mountains of Snowdonia National Park framing views to the north and east and the conical Llŷn Mountains visible to the north-west.



*Looking over part of St Tudwal's West Island and Tremadoc Bay to Snowdonia © John Briggs*

From the estuarine section of this MCA there are views of the wooded foot-hills of Snowdonia, which also form a prominent hinterland backdrop. Steep wooded slopes are also found either side of the Dwyryd further inland, resulting in a more enclosed landscape. The peak of Moel-y-Gest is a prominent coastal peak which rises to 263 metres above Porthmadog. In turn, the sheltered waters of the MCA itself provide an essential setting to the protected landscapes of the Llŷn AONB and Snowdonia National Park.

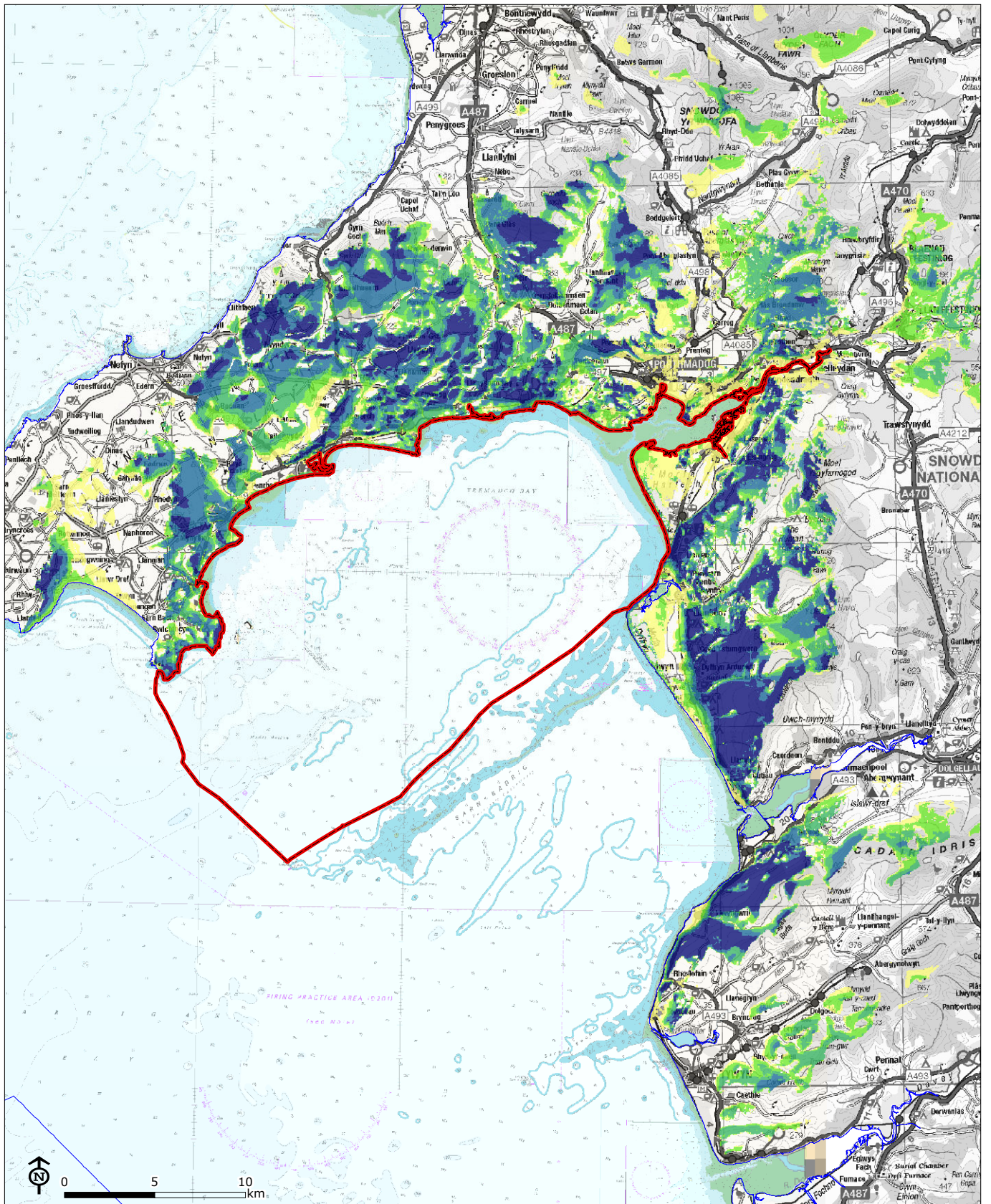
The rocky foreshores, pebble beaches and swash aligned sandy beaches are popular with visitors, bringing colour and movement to the landscape during the summer months. Prominently sited caravan parks dotted along the coastline stand out against the naturalistic backdrop of the coast and rising mountains behind. Waves breaking on Sarn Badrig identify the southern edge of the MCA, standing in contrast to the general calm waters of the bay.

There is clear intervisibility between this MCA and the wider Cardigan Bay (MCAs 15, 16 and 17) as well as the distinctive form of the Llŷn Peninsula and Bardsey Island (MCA 13). The flashing Cardinal Mark at the westerly end of Sarn Badrig provides orientation at night, and contributes to the night-time seascape. The lighthouse on the more western of St Tudwal's Islands is also a prominent lit feature. There are reports of mirages caused by weather systems within the bay.

*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.*



- 14: Tremadog Bay and Dwyrdd Estuary
- 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

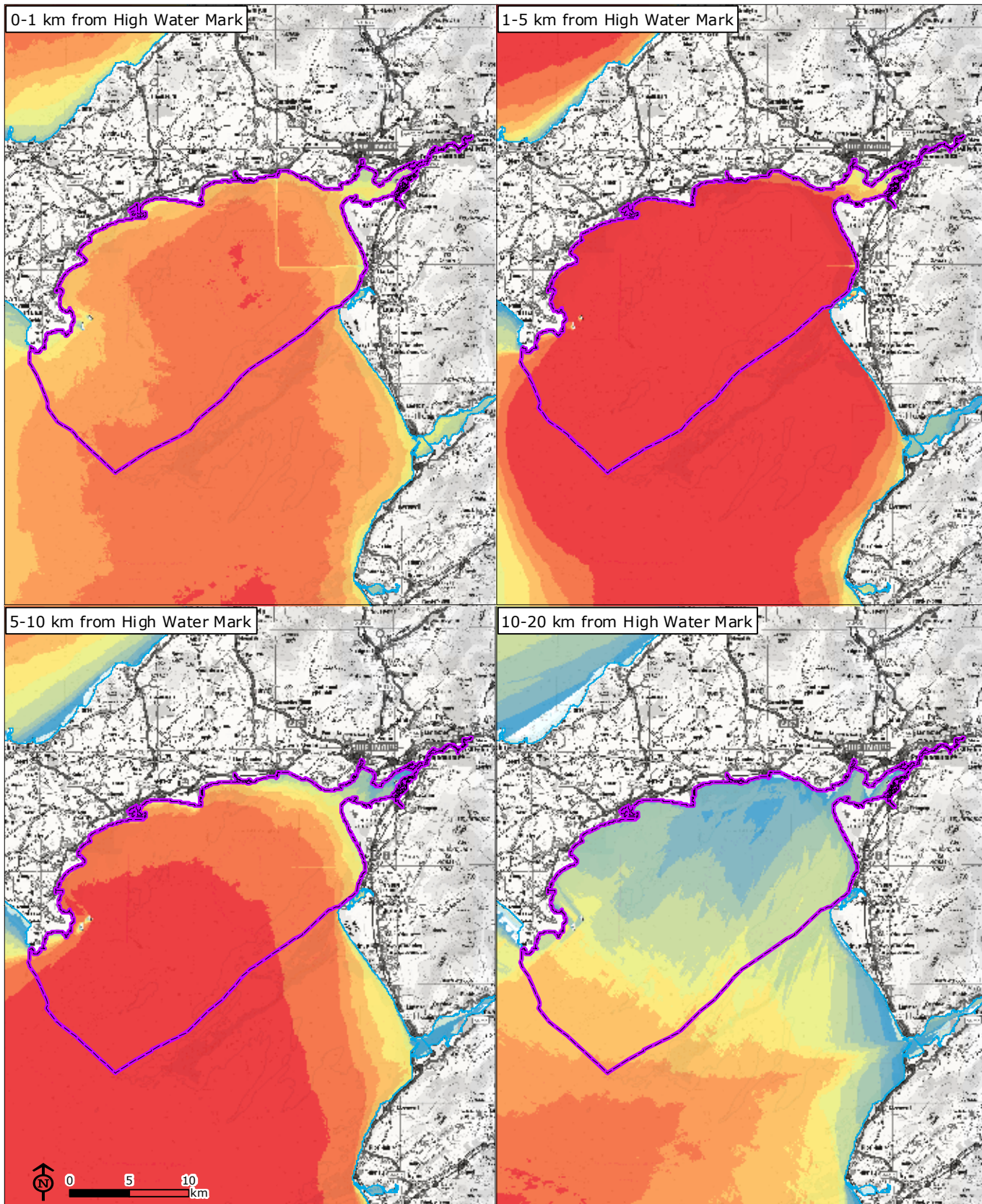
**Land with Views of:  
MCA 14: Tremadog Bay  
and Dwyrdd Estuary**

Source: LUC, NRW, OceanWise



Map Scale @ A4: 1:300,000

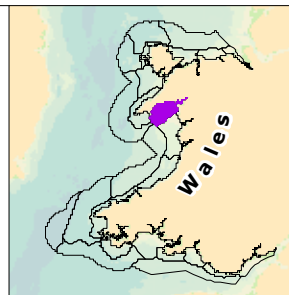




- 14: Tremadog Bay and Dwyryd Estuary
- Wales Inshore Marine Plan Area

**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 14: Tremadog Bay and Dwyryd Estuary**



Map Scale @ A4: 1:460,000

CB: EB:Goosen\_V LUC/LON 6262-00\_022\_VRM\_Maps\_DDP\_Sea\_Visibility\_ 27/05/2015  
 © Crown copyright and database rights 2015 Ordnance Survey 100019741