

Derivation of Resource Areas (RAs) for the Welsh National Marine Plan

16th March 2022

1. Background

To describe the distribution of natural resources that could support future sector development, the Welsh National Marine Plan (WNMP) identifies Resource Areas (RAs) for certain sectors. These are broad areas that describe the distribution of a particular resource that has the potential to be used or is used by certain marine sectors (eg. aggregates, aquaculture or marine energy). RAs have been identified by a process of evidence collection and interpretation. RAs will change as part of marine planning as understanding improves and further evidence becomes available and/or sector technologies develop.

In addition to RAs, showing the full spatial extent of natural resources of relevance to a sector, the WNMP allows for the identification of Strategic Resource Areas (SRAs) for certain sectors. SRAs will describe and safeguard (through activation of WNMP policy SAF_02) discrete areas of natural resource with realistic potential to support future sustainable use. The identification and safeguarding of SRAs will help ensure the potential resource interests of sectors are taken into account at an early stage by others, facilitating proactive dialogue between sectors and preventing potential sterilisation of a resource.

2. Aggregates RA

The aggregates resource area includes the Key Resource Areas (KRA) identified by The Crown Estate, which have the following definition as defined by The Crown Estate (2014):

The construction-aggregate and nourishment-aggregate components of the 2014 Marine Minerals KRA has been predominantly created from the BGS Resource Assessment Study. This project, commissioned by the Marine Minerals Team, and undertaken in 2012 and 2013 identified at a high level the spatial distribution of the aggregate available on the UK seabed. The outputs were mineral distribution GIS layers and associated reports, classifying mineral resources into five commercially relevant groups, combined with an assessment of aggregate volume and density.

For the construction aggregate element of the 2014 Marine Minerals KRA the nationally important 'fine aggregate (coarse sand)' and 'coarse aggregate' are used to define the core of the KRAs in England and Wales. Due to general abundance and low strategic importance, 'aggregates suitable for fill' have not been included in the KRAs and spatial areas of the last category of nationally important 'fine aggregate (fine sand)' has been selectively included on the south and Welsh coasts. These regions are defined as being of higher importance due to the uniformity or quality of the deposits at specific locations.

The data from the BGS study has been reworked by RH-DHV, The Minerals and Infrastructure Managing Agent, using knowledge of industry sediment fraction requirement to create the nourishment element of the 2014 Marine Minerals KRA. All five classes identified by BGS were reclassified based on the sedimentary parameters of the resource and then re-categorised into

sand deposits and gravel deposits that would be suitable for beach nourishment. This work focused on English and Welsh waters because these coastlines are where the near-term nourishment opportunities exist.

After consultation with the Managing Agent and the operational Licensee, it was determined that the current Lease and Exploration and Option agreement for evaporate mining contain sufficient resource to comfortably sustain extraction operations beyond the 2030 time horizon of this review. The evaporate element of the 2014 Marine Minerals KRA has therefore been defined using the extent of the current agreements and so does not necessarily represent a comprehensive view of evaporate resource opportunity on the UKCS.

The footprints of these elements were combined to form the spatial extent of the updated Marine Minerals KRA. It should be noted that in many places the construction-aggregate and nourishment-aggregate resources were coincident.

The aggregates RA also includes prospective coarse sand and gravel resource areas, and areas known to contain important sand and gravel resources (see Bide et al. 2013). These areas extend beyond The Crown Estate's Key Resource Areas.

Bide, T.P., Balson, P.S., Mankelow, J.M., Shaw, R.A., Walters, A.S. and Campbell, E. (2013). The Mineral Resources of Welsh Waters and the Irish Sea. British Geological Survey Open Report, OR/12/097. 26pp. <http://nora.nerc.ac.uk/502140/>

3. Aquaculture RA

The Aquaculture RA was derived predominantly from a study by ABPmer (2015), 'A Spatial Assessment of the Potential for Aquaculture in Welsh Waters' commissioned by the Welsh Government. The project required the development of spatial data layers to highlight potential aquaculture areas based on suitable natural resources and other marine uses. The areas identified as having suitable natural resources for cultivation of bivalves and macroalgae have been included in the Aquaculture RA.

In addition to the areas identified by ABPmer areas were identified by the Welsh Government using "expert judgment" as possible resource areas. These additional areas were identified based on local knowledge but may not be comprehensive. The Aquaculture RA is based on areas with the potential for cultivation of bivalves on the seabed, trestles or suspended cultivation on ropes, lanterns or other structures, and on the potential for cultivation of macroalgae in medium exposure areas.

As well as identifying resource areas for bivalve cultivation, ABPmer (2015) identified potential natural resource areas for the cultivation of finfish and crustaceans. However, these were not thought to be viable at present and thus were not specifically included in the RA. Nevertheless, it is possible that areas of the Aquaculture RA as defined above could be used for cultivation of finfish or crustaceans if deemed viable. At present, the aquaculture RA does not specifically include areas that may be suitable for ranching (i.e. where the animal is cultivated for only part of its lifecycle before being released) though there may be potential for ranching in Welsh waters.

ABPmer (2015). A Spatial Assessment of the Potential for Aquaculture in Welsh Waters.

<https://gov.wales/sites/default/files/publications/2018-05/assessment-of-the-potential-for-aquaculture.pdf>

4. Tidal range energy RA

The tidal range RA is based on a maximum depth of 25 m and a mean spring tidal range of greater than 5 m. These are the criteria used in the OESEA3 (DECC, 2016). The tidal range RA was defined using data from the Atlas of UK Marine Renewable Energy Resources (ABPmer, 2008). The Crown Estate's tidal range Key Resource Areas (The Crown Estate, 2013) were defined based on slightly different criteria: mean (spring and neap) tidal range greater than 4 m and maximum depth of 25 m. However, the resulting area is broadly similar to that used in the OESEA3.

ABPmer (2008). Atlas of UK Marine Renewable Energy Resources. Date of access (01/12/2015)

<http://www.renewables-atlas.info/>

Department of Energy and Climate Change (2016). UK Offshore Energy Strategic Environmental Assessment. OESEA Environmental Report. Future Leasing/Licensing for Offshore Renewable Energy, Offshore Oil & Gas, Hydrocarbon Gas and Carbon Dioxide Storage and Associated Infrastructure. 613p. <https://www.gov.uk/government/consultations/uk-offshore-energy-strategic-environmental-assessment-3-oesea3>

The Crown Estate (2013). UK wave and tidal key resource areas project. Technical methodology report.

5. Tidal stream energy RA

The tidal stream energy RA was derived largely from The Crown Estate's (TCE's) Key Resource Areas (KRAs) (The Crown Estate, 2013) and areas defined in the Marine Renewable Energy Strategic Framework (RPS, 2011). TCE areas were based on a minimum mean peak spring current of 1.5 m/s and a minimum depth of 5 m (The Crown Estate, 2013). The MRESF dataset was created by RPS (2011) to show potential tidal stream and wave energy resource areas in Welsh waters. Device requirements applied included maximum distance from shore (5 km), minimum mean spring peak current velocity (1.5 m/s) and depth (10-120 m). The MRESF and TCE KRAs were merged to form the tidal stream energy RA.

RPS (2011). Marine Renewable Energy Strategic Framework. Approach to sustainable development. Report by RPS to the Welsh Assembly Government. 98p.

<https://gov.wales/marine-renewable-energy-strategic-framework>

The Crown Estate (2013). UK wave and tidal key resource areas project. Technical methodology report.

The Crown Estate (2014). KRA definition extracted from GIS metadata.

6. Wave energy RA

The wave energy RA was derived from the Atlas of UK Marine Renewable Energy Resources (ABPmer, 2008) and from areas defined in the Marine Renewable Energy Strategic Framework (MRESF) (RPS, 2011). The MRESF dataset represents the areas with most potential for wave energy developments in Welsh waters, as identified by RPS (2011) using renewables atlas data as well as additional inshore modelling. Device requirements applied include maximum distance from shore, depth and wave characteristics (Table 2). Several device type categories were identified. Devices were also categorised into wholly submerged and surface piercing types. Resource areas were mapped for six categories

based on location (nearshore or offshore) and device type (oscillating water column, single point/buoy, multi buoy, attenuators and over-topping collectors). No resource areas for attenuators were identified in Welsh waters. Overall, to define the areas a minimum wave power of 10 kW/m was used with a minimum depth of 10 m.

Areas shown in the Atlas of UK Marine Renewable Energy Resources to have a mean wave power ≥ 15 kW/m were included in the resource area. This area combined with those identified by MRESF was used to identify the wave resource area. Small, isolated areas of resource off Strumble Head and Caldey Island were excluded from the RA due to large data gaps in these inshore areas. The Crown Estate's wave energy Key Resource Area was also defined using UK Renewables Atlas data, based on a minimum annual mean wave power of 20 kW/m, minimum water depth of 20 m and maximum water depth of 200 m (The Crown Estate, 2013), and is encompassed within the wave energy RA.

Table 2. Wave energy device requirements as reported by RPS (2011).

Requirement Device	Mean wave power (kW/m)	Mean significant wave height (m)	Mean wave period (s)	Distance to shore (km)	Depth (m)
Oscillating Water Column (OWC). Nearshore.	9	No data	No data	0-2	10-50
Single point/buoy. Nearshore.	20	1-7.5	5	0.5-8	30-100
Multi buoy. Offshore.	No data	1.8-10	No data	3-20	20-100
Single point/buoy. Offshore.	15-70	1.8-5	No data	2-20	20-100
Attenuators. Offshore.	25-55	0.5-7	-	5-50	30-100
Over-topping collector. Offshore.	16	No data	No data	5-25	20

ABPmer (2008). Atlas of UK Marine Renewable Energy Resources. Date of access (01/12/2015)

<http://www.renewables-atlas.info/>

The Crown Estate (2013). UK wave and tidal key resource areas project. Technical methodology report.

The Crown Estate (2014). KRA definition extracted from GIS metadata.