

## Appendix 5. Sensitivity Maps

The sensitivity maps forming part of this Plan were based on two seabed habitat maps; a detailed, inshore one produced by Dr Justin Dix of the National Oceanography Centre at The University of Southampton using a variety of data sources, including substrate mapping from the [DORIS](#) Study (Appendix x) and, for areas beyond the extents of this data, predicted habitat data from The [MESH](#) (Mapping European Seabed Habitats) project. The MESH data were given a low confidence rating due to scale and because they were derived by predictive modelling.

The second component of the sensitivity maps are the matrices produced by Defra, Natural England and JNCC for estimating the general sensitivity of marine features. The matrix shows the sensitivity of marine habitat features to 40 given pressures, and which human activities cause these pressures. Sensitivity was based on a combination of resistance and resilience of each habitat feature to a pressure benchmark (Table 1).

Table 1. Sensitivity Assessment Scale. Source: Defra Sensitivity Matrices.

	Resistance categories			
Recovery categories	None	Low	Medium	High
Very Low	High	High	Medium	Low
Low	High	High	Medium	Low
Medium	Medium	Medium	Medium	Low
High	Medium	Low	Low	Not Sensitive

Sensitivity was assessed to a pre-determined benchmark for each pressure, and it is important to note that an assessment of not sensitive means that the feature is judged to be not sensitive at the pressure benchmark, it does not mean that the feature would be unaffected by the pressure at different levels of intensity, duration, and magnitude to the benchmark. Assessments marked with an asterix (\*) indicates that the score is at the higher end of a range.

### Methods

#### Preparation of Sensitivity Matrix

The Defra matrix was simplified to remove activities, so that only pressures for each habitat were shown. Numbers were used to represent the textual sensitivity categories. A small extract is shown below.

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Habitat	Emergence regime changes - local	Emergence regime changes (sea level) - regional/national	Introduction of microbial pathogens (disease)	Introduction or spread of non-indigenous species & translocations (competition)
High energy circalittoral rock	3	3	2	8
High energy infralittoral rock	3	3	2	6
High energy intertidal rock	8	2	8	10
Intertidal biogenic reefs	8	10	2	8
Intertidal coarse sediment	2	2	2	2
Intertidal mixed sediments	2	2	2	8
Intertidal mud	8	10	2	8
Intertidal sand and muddy sand	8	10	2	8
Intertidal sediments dominated by aquatic angiosperms	8	10	2	10
Low energy circalittoral rock	3	3	2	8
Low energy infralittoral rock	3	3	2	8
Low energy intertidal rock	8	2	8	8
Moderate energy circalittoral rock	3	3	2	8

### Preparation of Habitat Data

The DORIS-based data contains new habitat categories; areas of bedrock with a thin veneer of sediment. These add more detail to standard EUNIS level 3 Marine Habitat Classification, but to make them fit the sensitivity matrix; they were treated as bedrock categories.

The MESH data uses the European EUNIS habitat classification system. These were translated to Marine Habitat Classification categories using a correlation table on the JNCC website. The habitat boundaries were cut to the coastline and the area of higher resolution DORIS data erased so it would only be displayed where there was not better data.

### Mapping

Each of the processed habitat datasets was joined to the sensitivity matrix and MapBasic processes were written to automatically create maps of the sensitivity to each of the forty pressures. **At the time of going to consultation, the project team were still awaiting sedimentary data for the detailed habitat dataset. This is clearly marked in the Sensitivity Map keys. The final Sensitivity Maps will include the sedimentary data.**

### How to use the sensitivity maps

The accompanying matrix is an adaptation of the Defra matrices. To view the relevant sensitivity maps, identify the activity to be undertaken, follow the column down, and click on the highlighted cell. This will link to a sensitivity map for that given activity and consequent pressure. Policies HME 7, HME 9 and HME 10 identify specific pressures, and for any development that produces these pressures, the relevant Sensitivity Maps must be consulted. These can be found in the matrix rows. **Due to missing sedimentary data, some cells may currently be blank; this will change once the data are received.** The individual maps can also be found below.

**It is important to note that the C-SCOPE sensitivity maps are for guidance only. Decisions on licensing and development will ultimately rely on due process, including where necessary an Environmental Impact Assessment, and require expert judgement on a case-by-case basis. For more information about the matrix and how to interpret it, please read the MCZ Project Sensitivity Matrices [guidance](#).**



## Appendix 5. Sensitivity Maps

Information contained here has been derived from MESH Consortium webGIS data at ([www.searchmesh.net](http://www.searchmesh.net)) which received funding from the INTERREG IIIB NEW programme ([www.nweurope.org](http://www.nweurope.org)).

The Data Owner and MESH consortium accept no liability for the use of this data or for any further analysis or interpretation of the data.

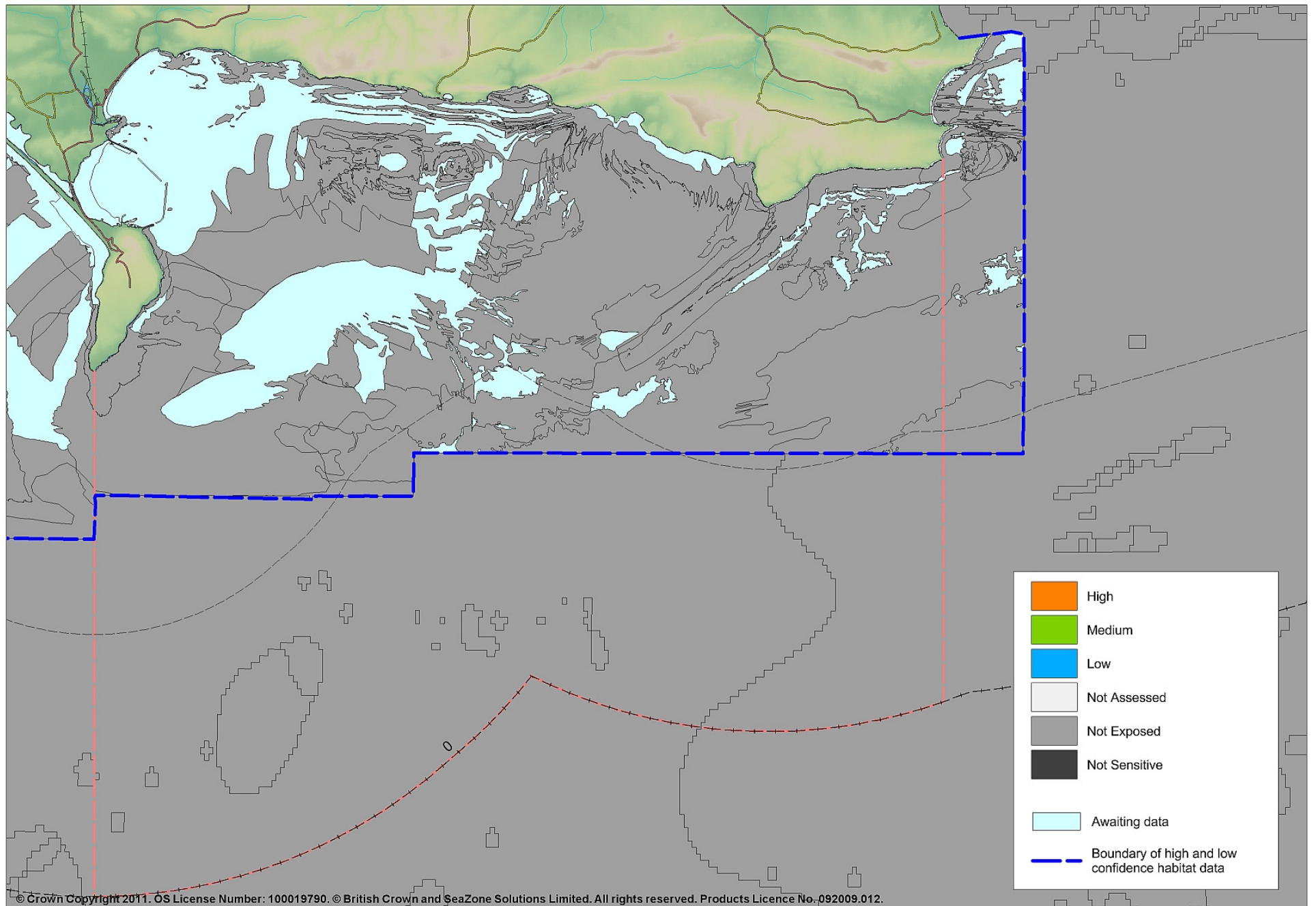


Figure 1 Atmospheric climate change

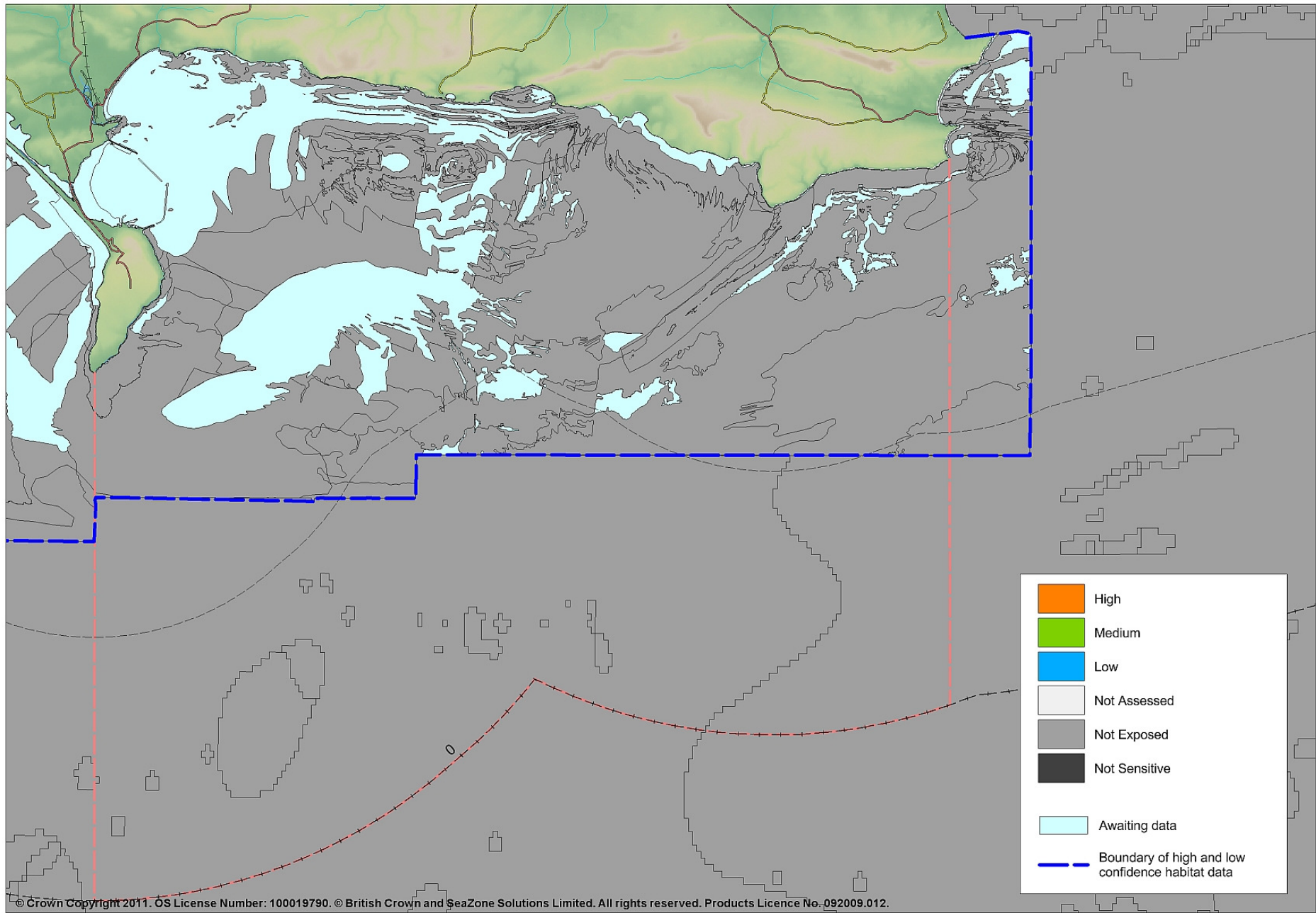


Figure 2 Barrier to species movement (behaviour, reproduction)

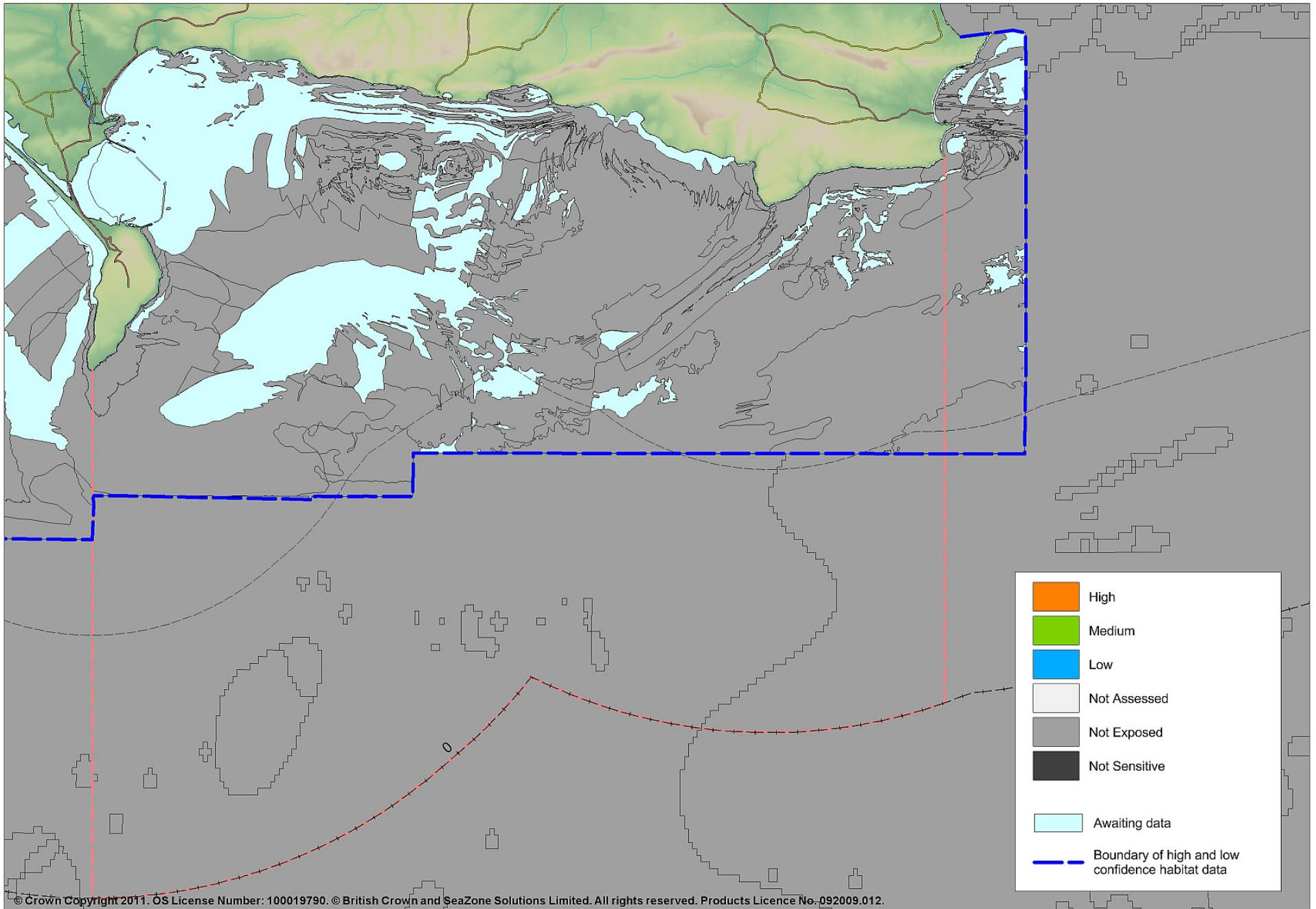


Figure 3 Death or injury by collision

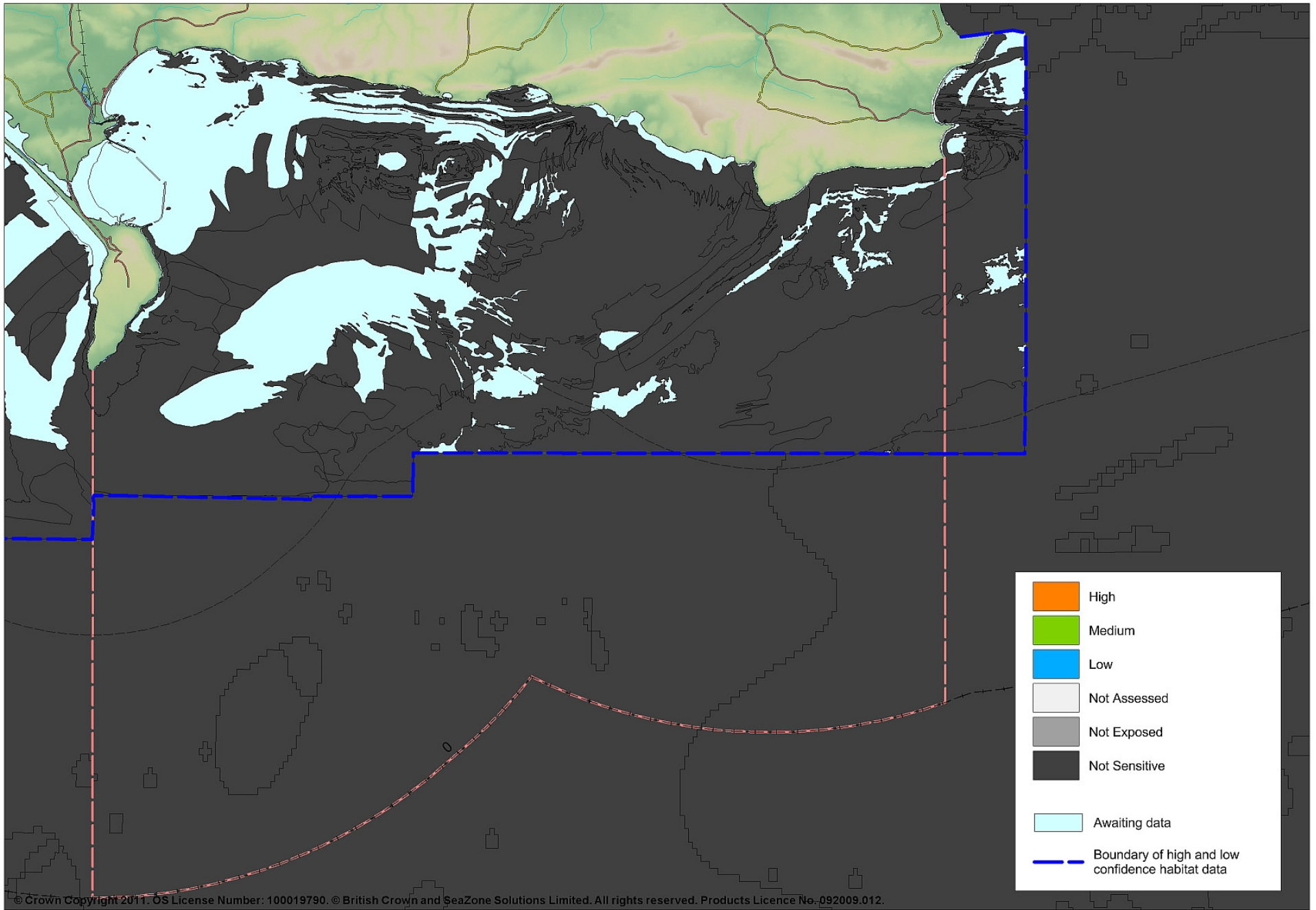


Figure 4 De-oxygenation

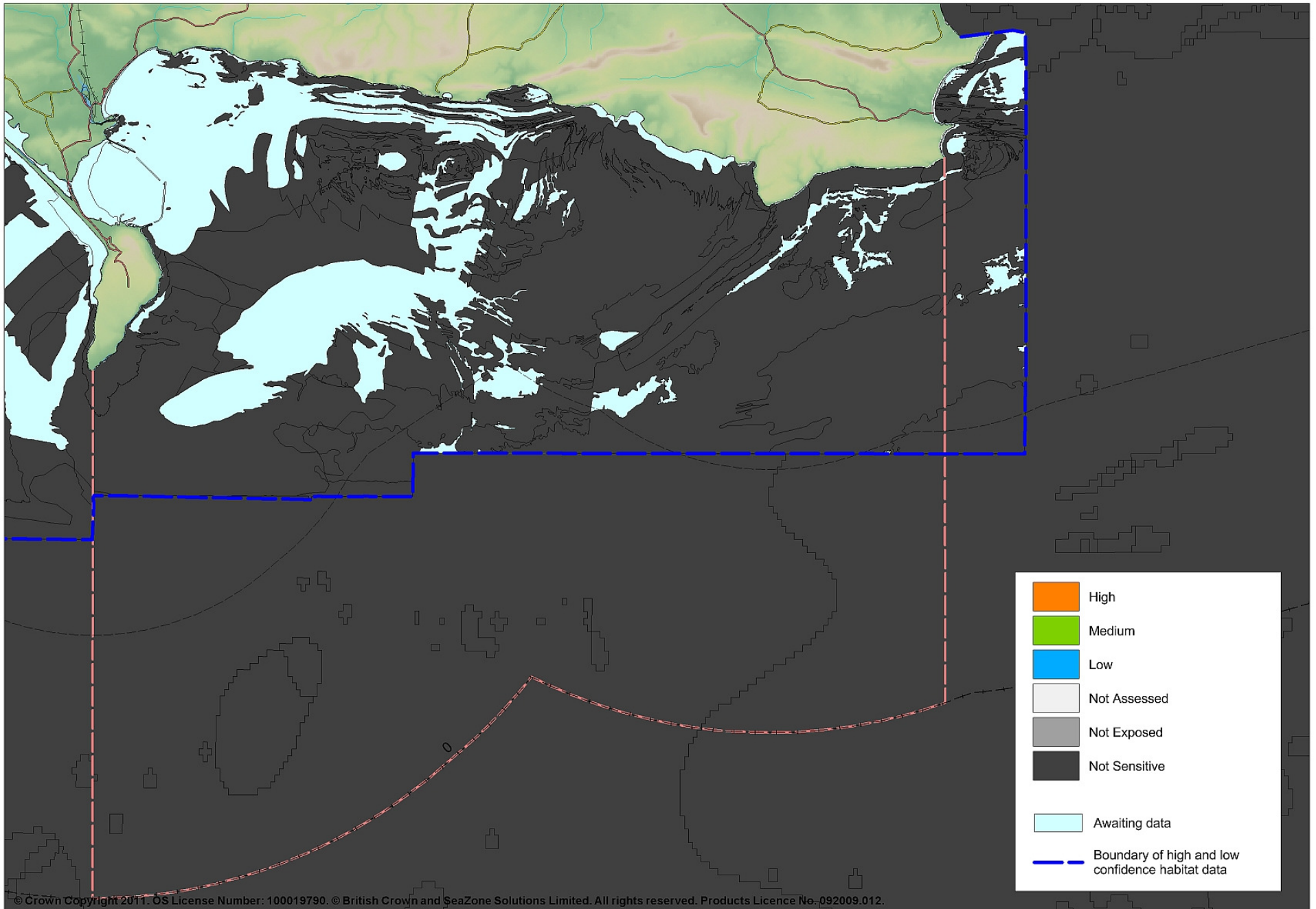


Figure 5 Electromagnetic changes

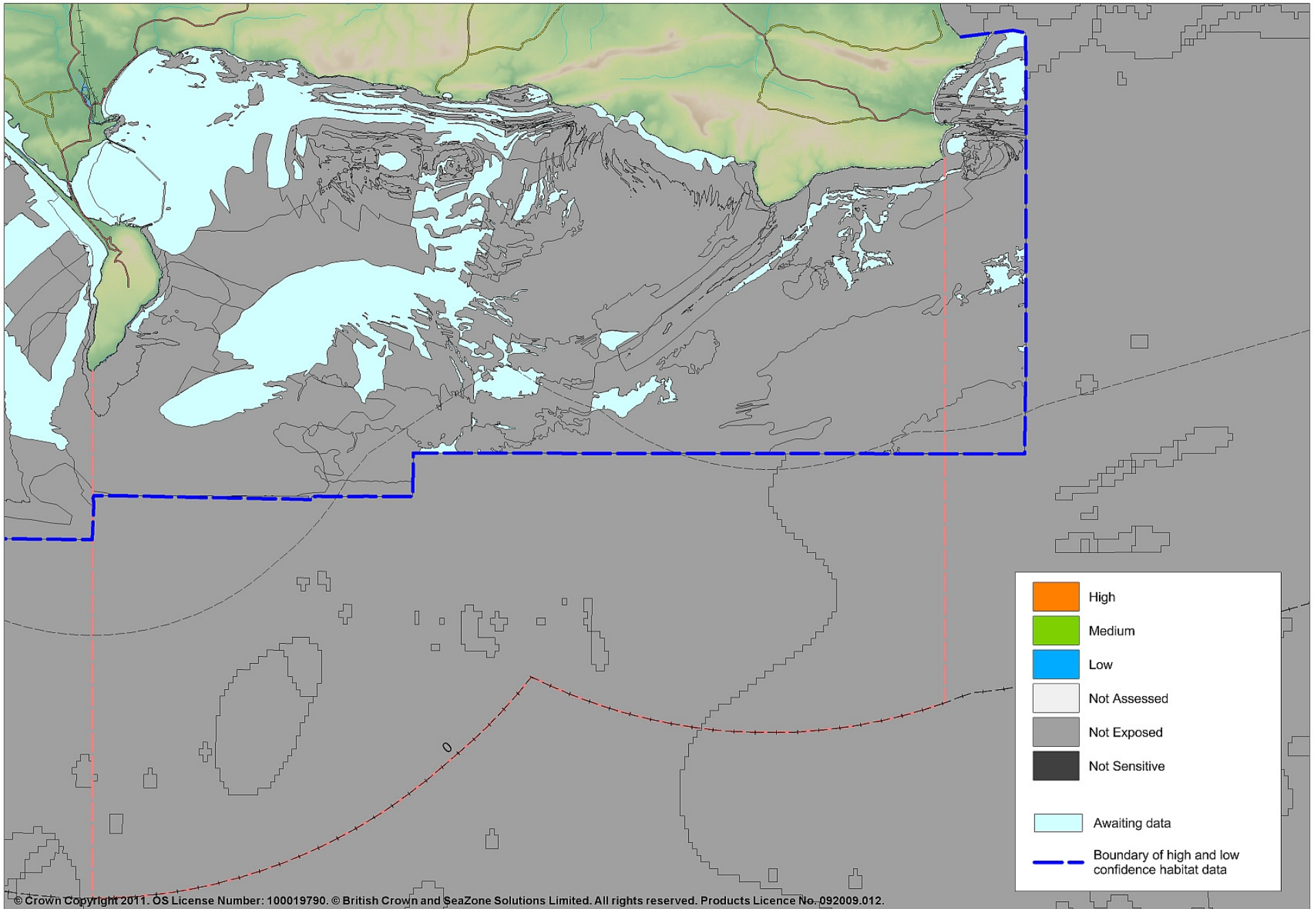


Figure 6 Emergence regime changes – local

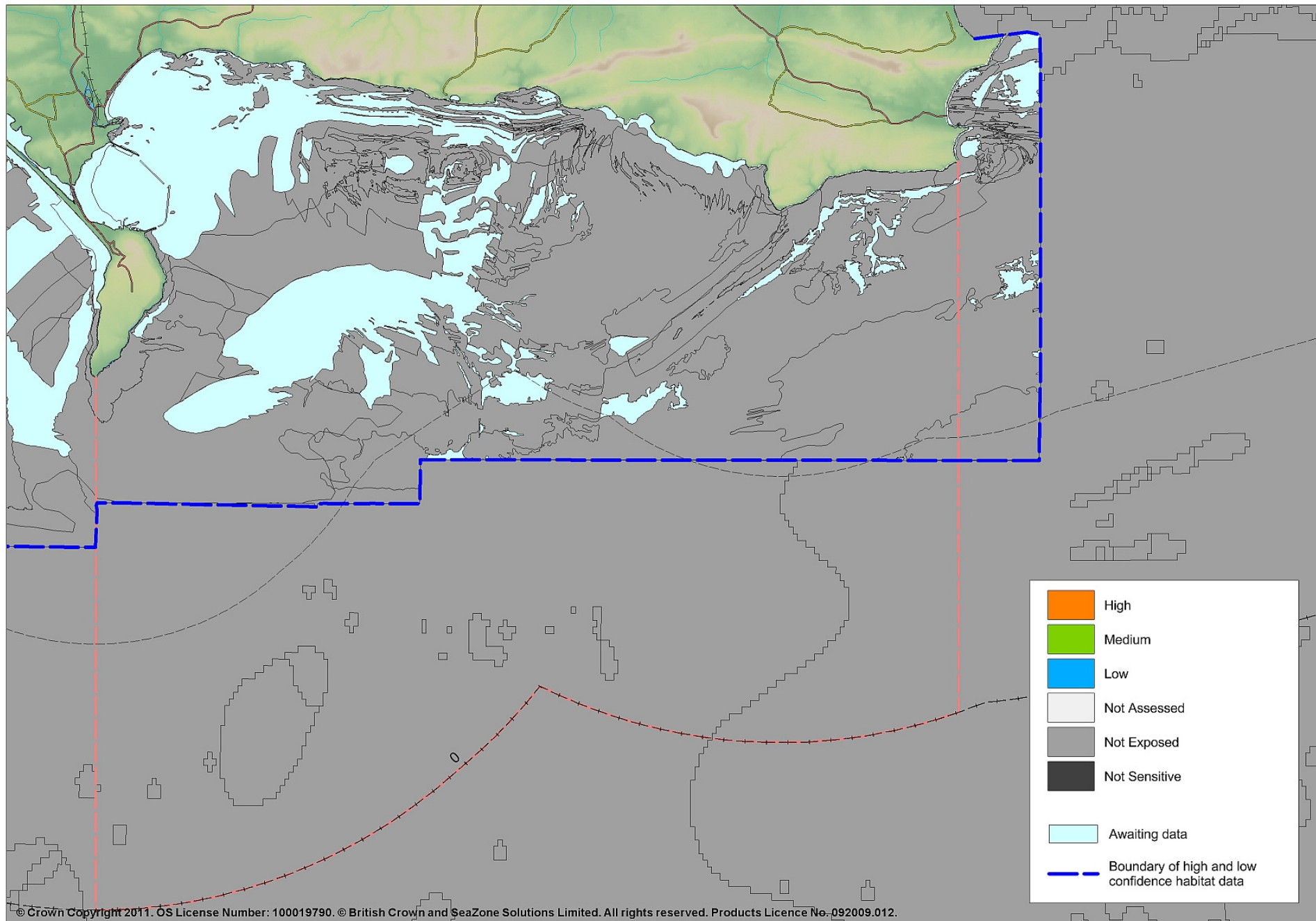


Figure 7 Emergence regime changes (sea level) - regional/national

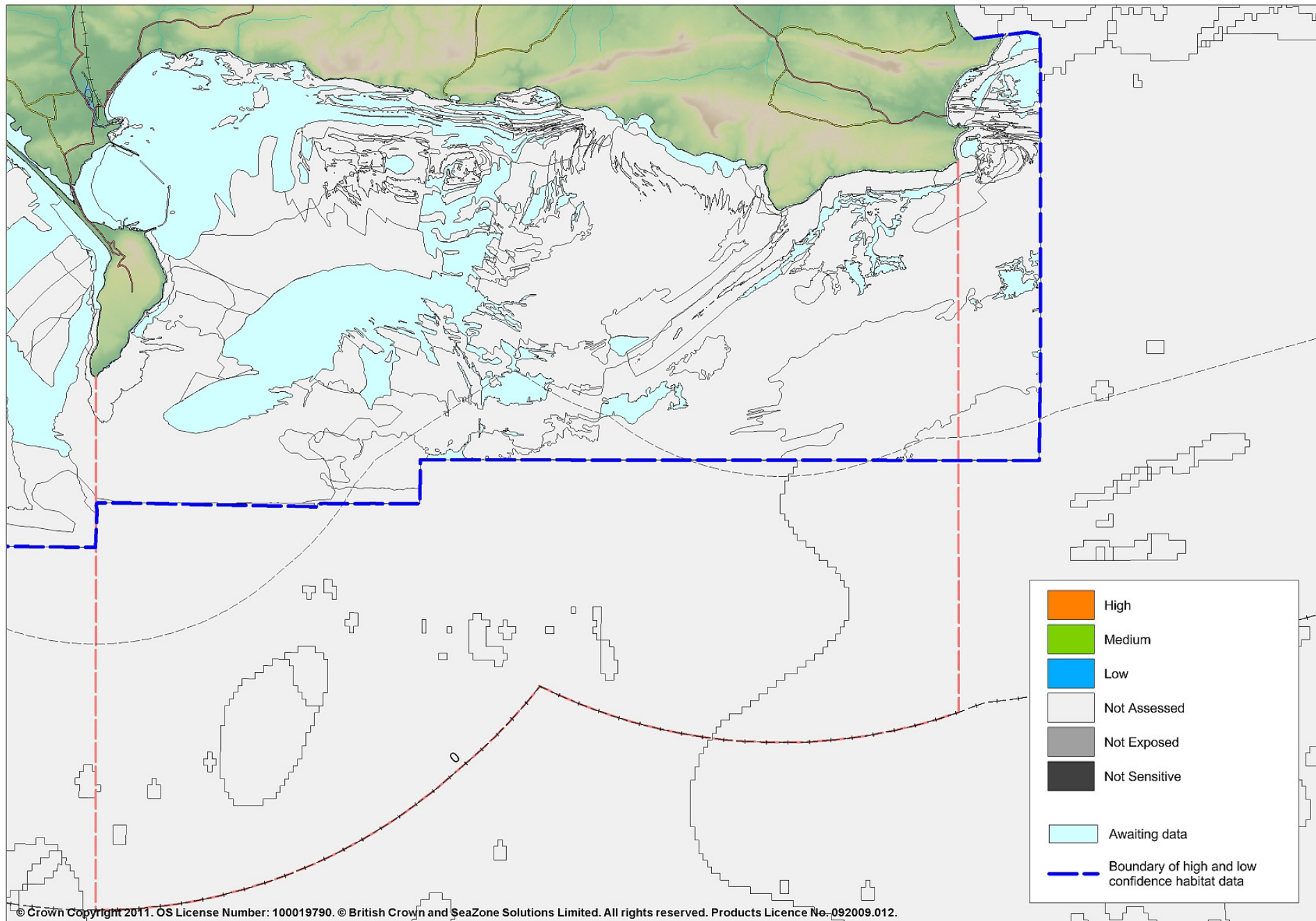


Figure 8 Genetic modification & translocation of indigenous species

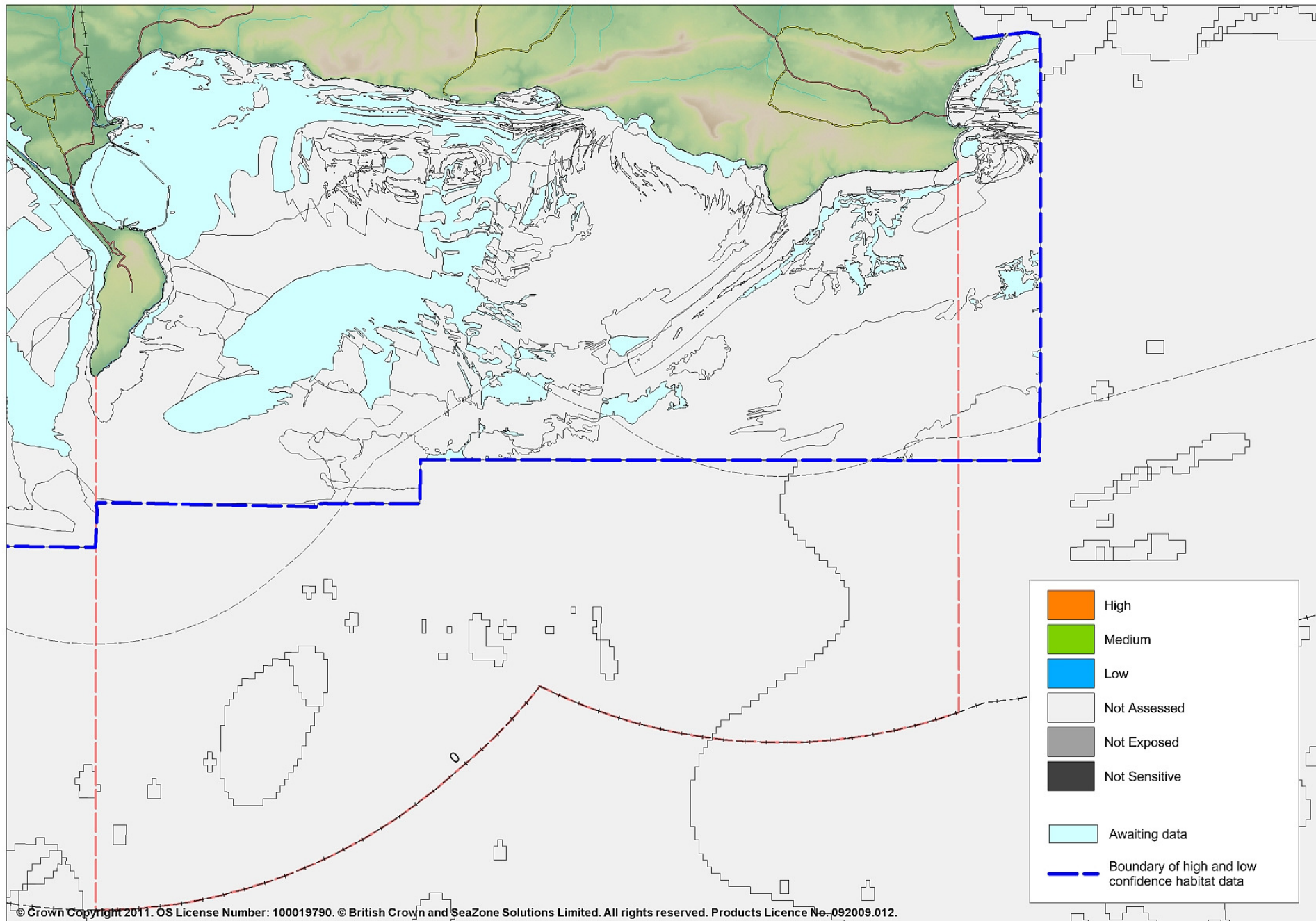


Figure 9 Introduction of light

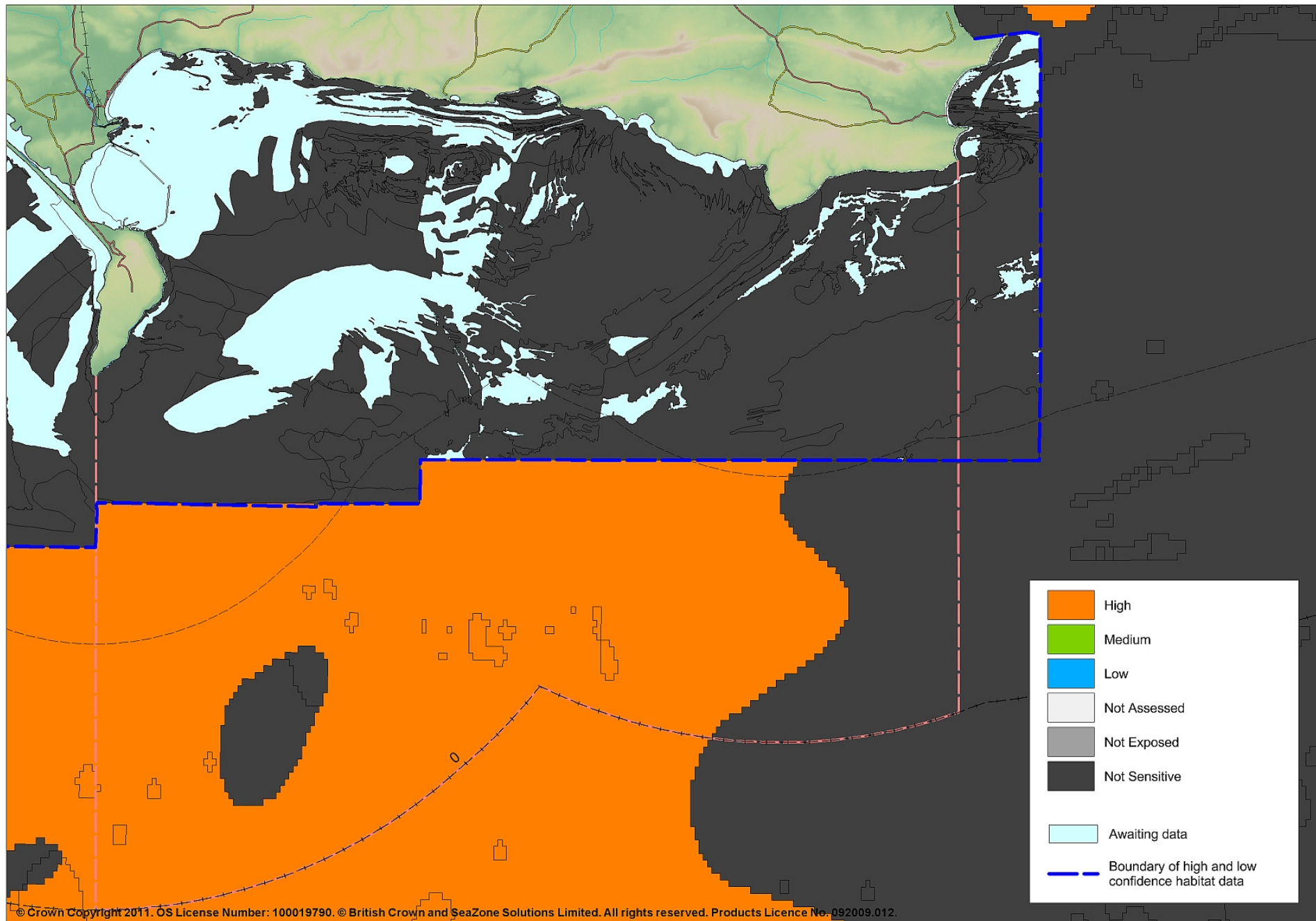


Figure 10 Introduction of microbial pathogens (disease)

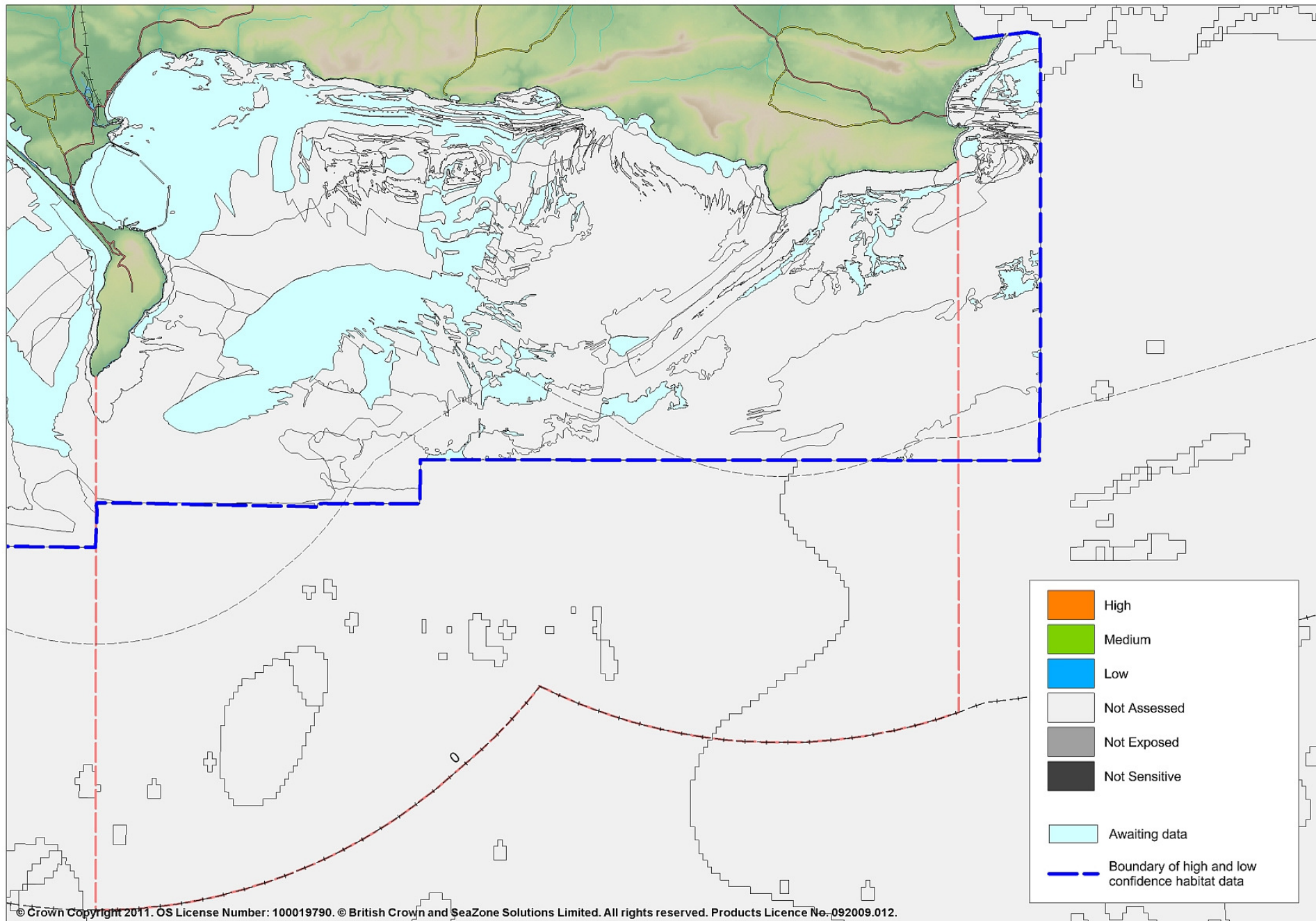


Figure 11 Introduction of other substances (solid, liquid or gas)

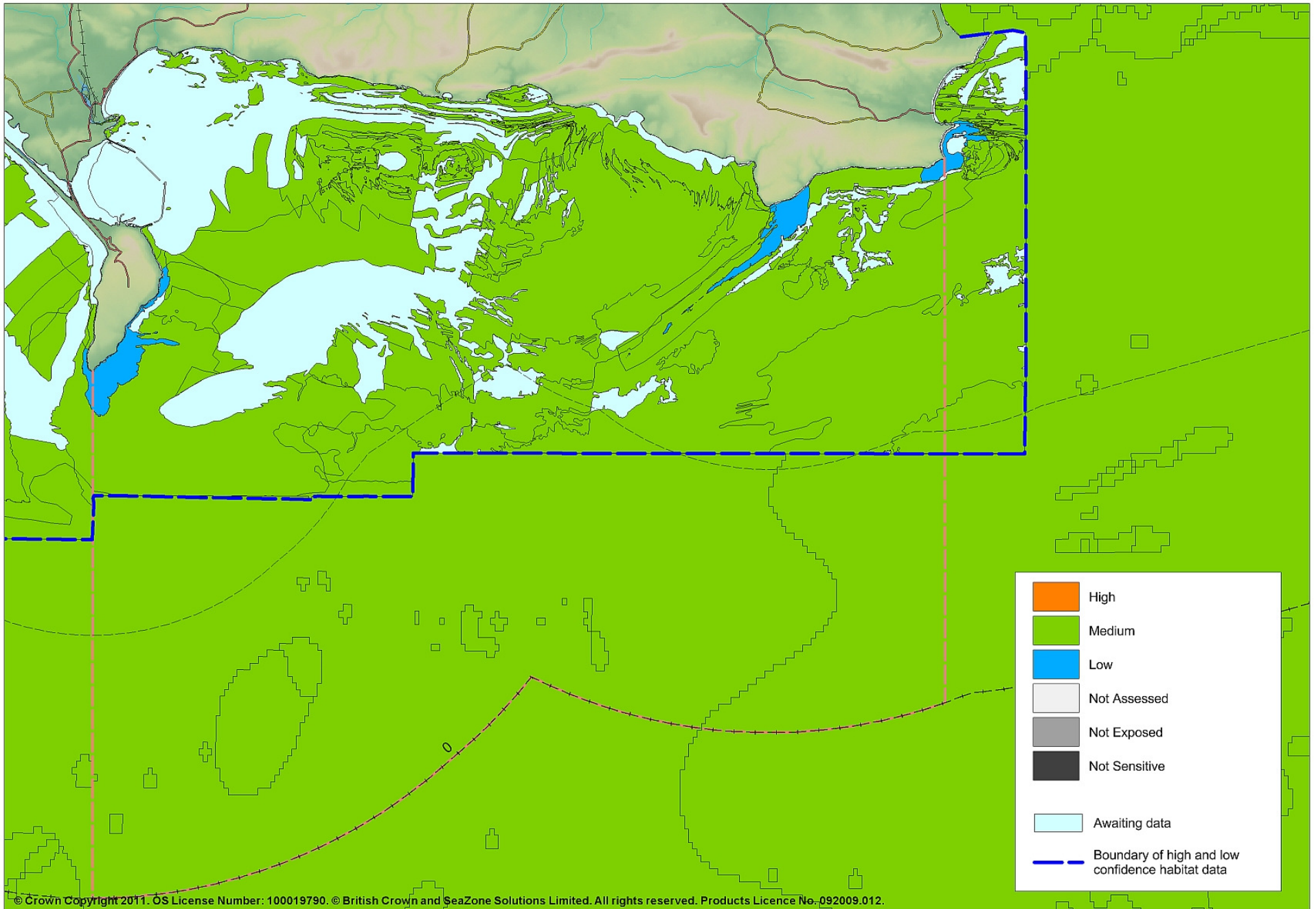


Figure 12 Introduction or spread of non-indigenous species & translocations (competition)

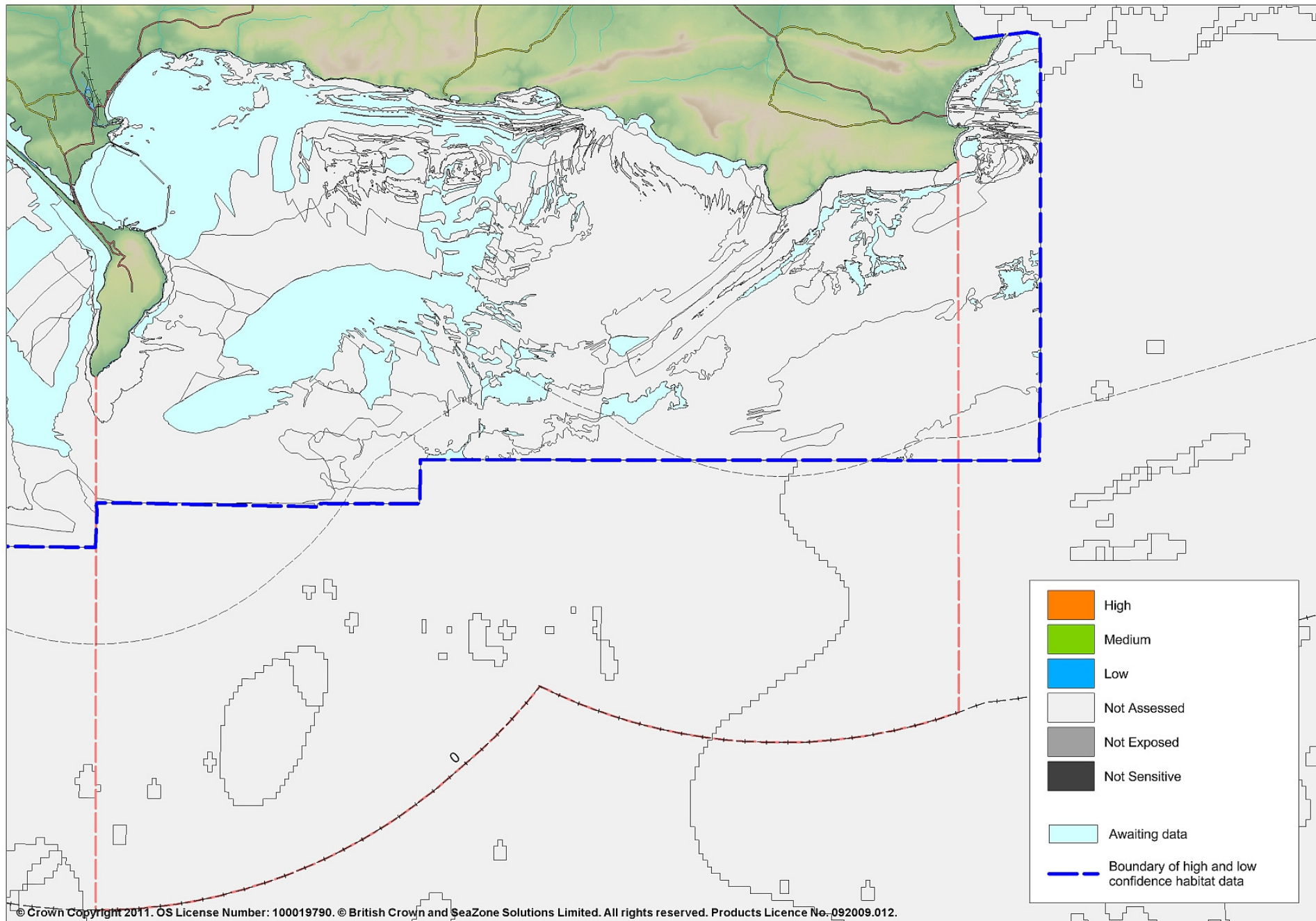


Figure 13 Litter

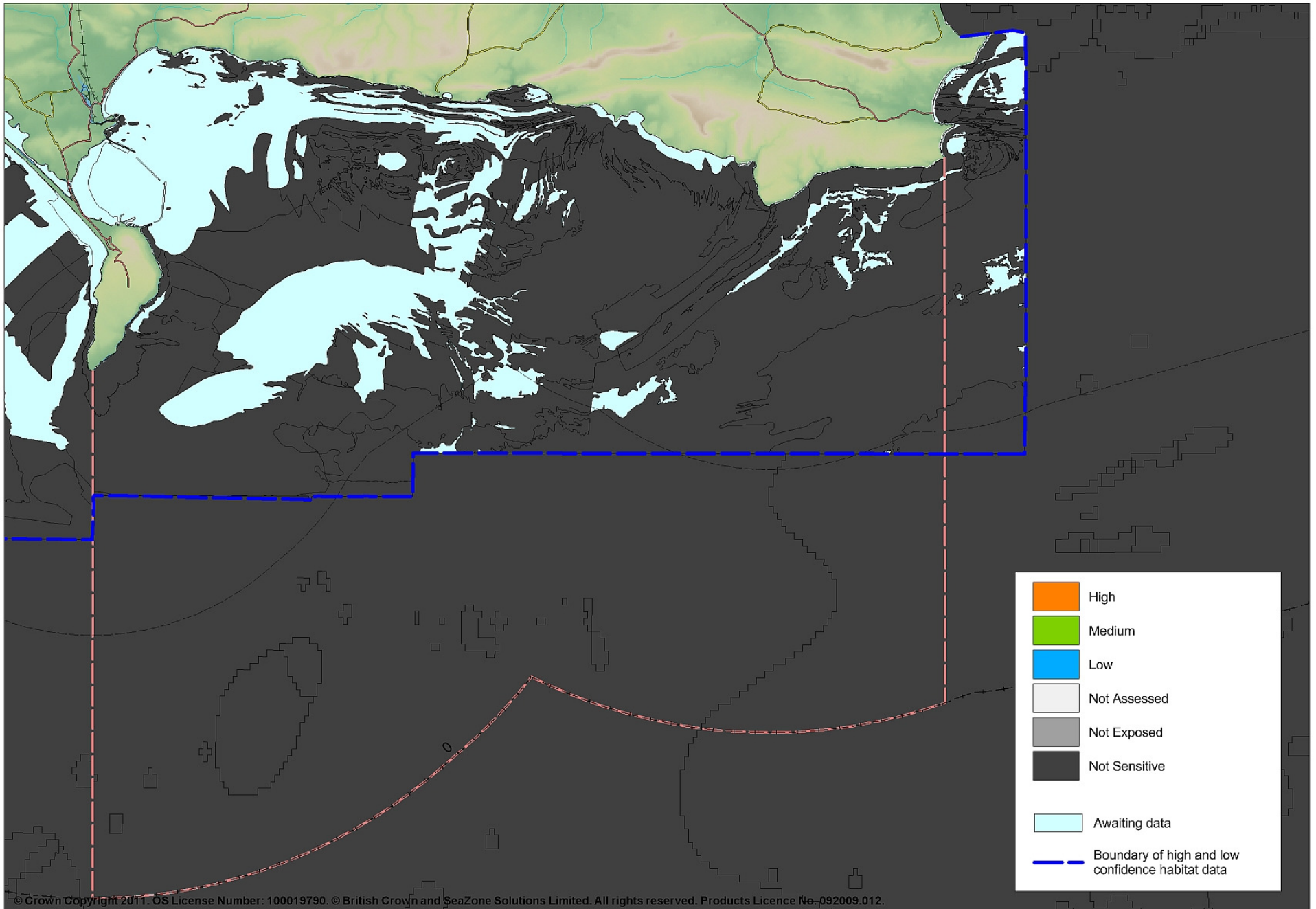


Figure 14 Nitrogen & phosphorus enrichment

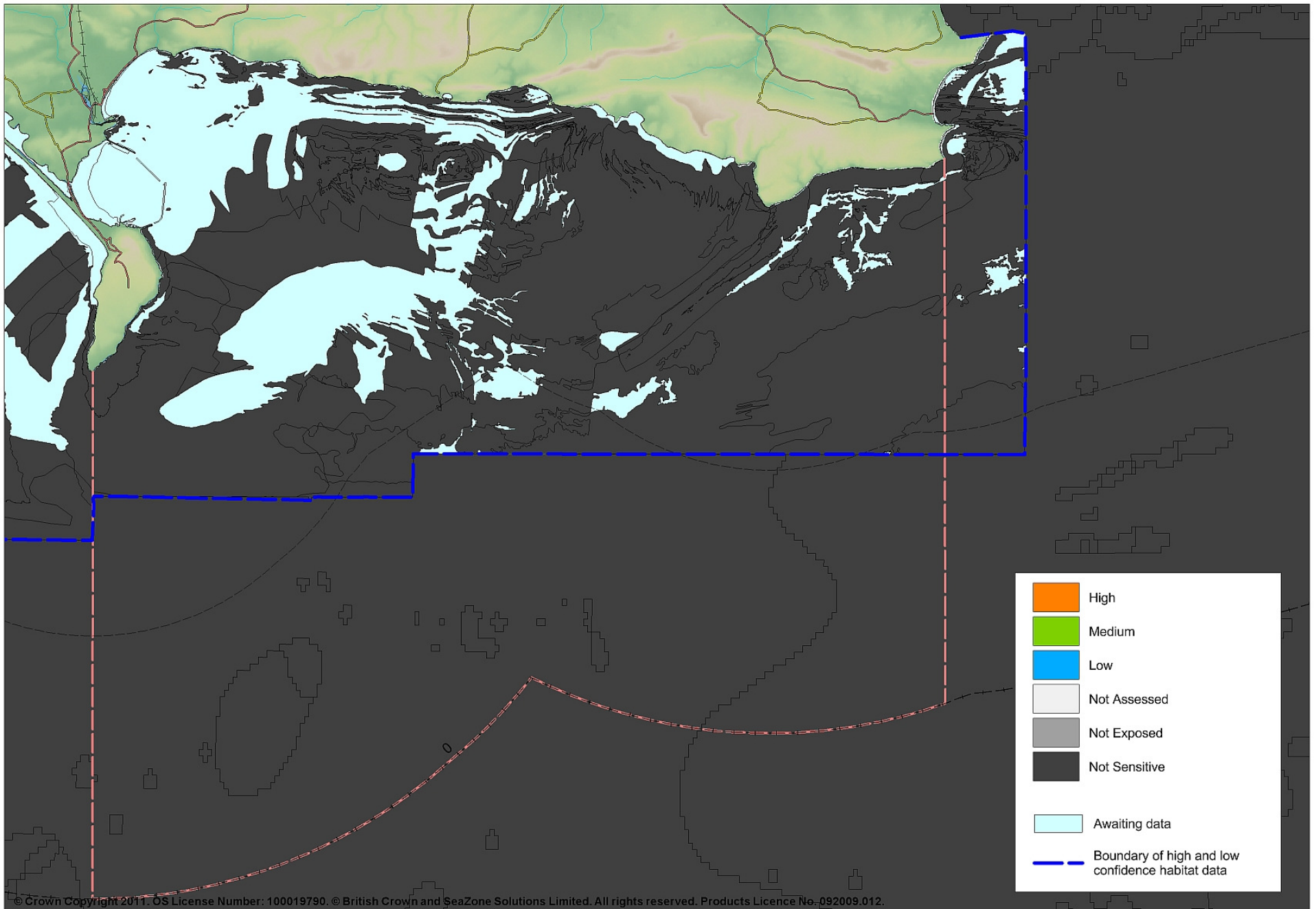


Figure 15 Non-synthetic compound contamination (inc. heavy metals, hydrocarbons, produced water)

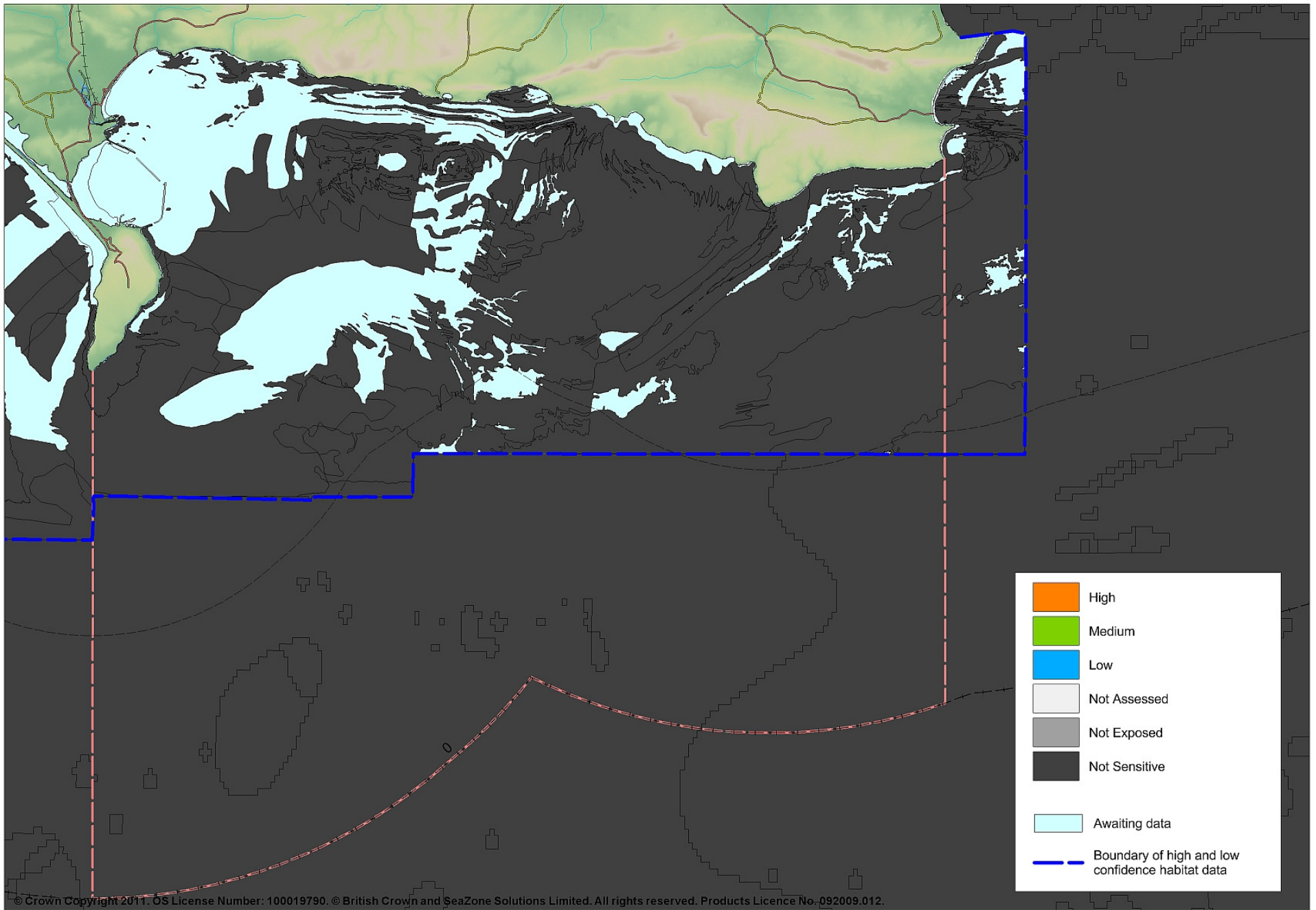


Figure 16 Organic enrichment

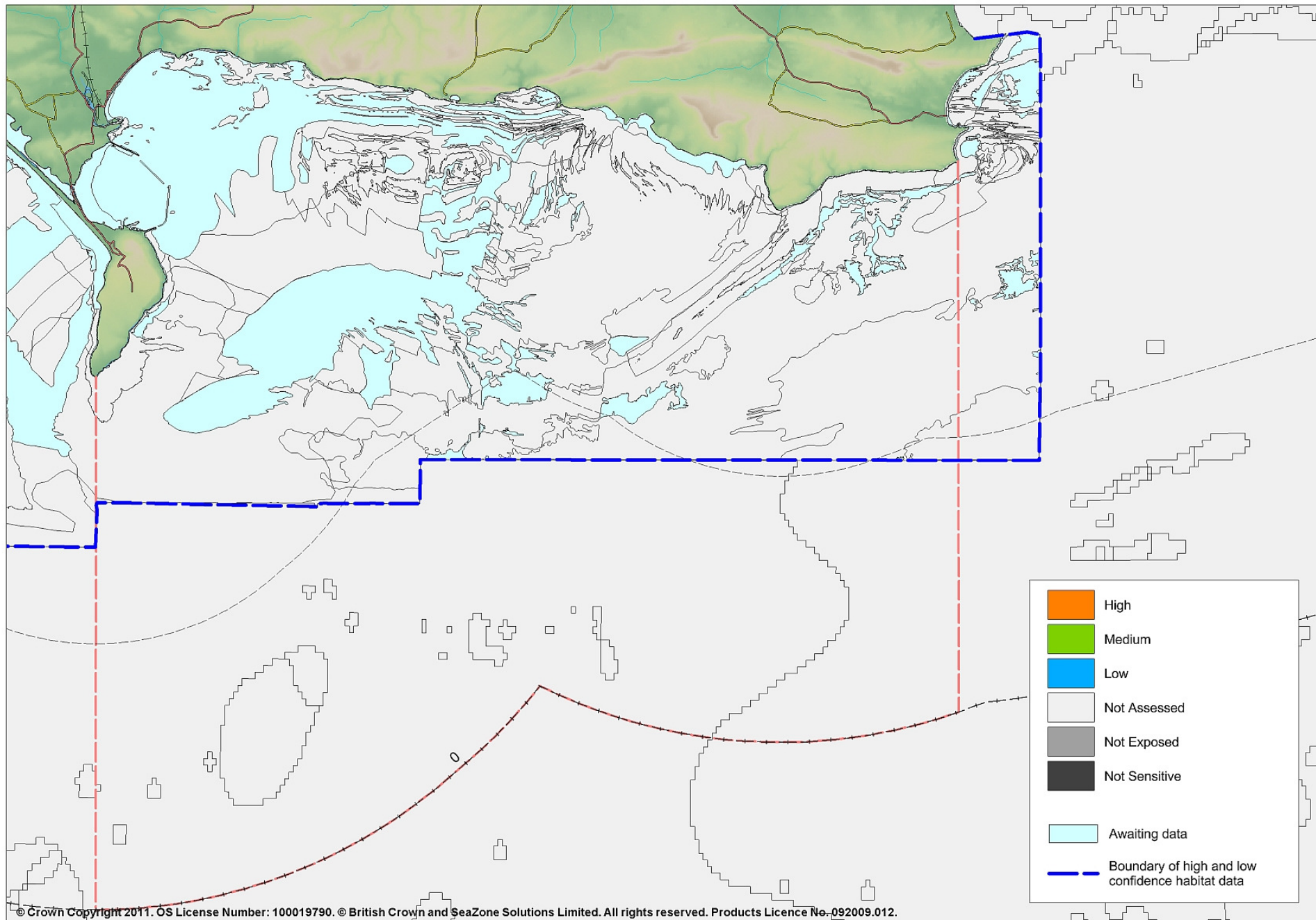


Figure 17 pH changes

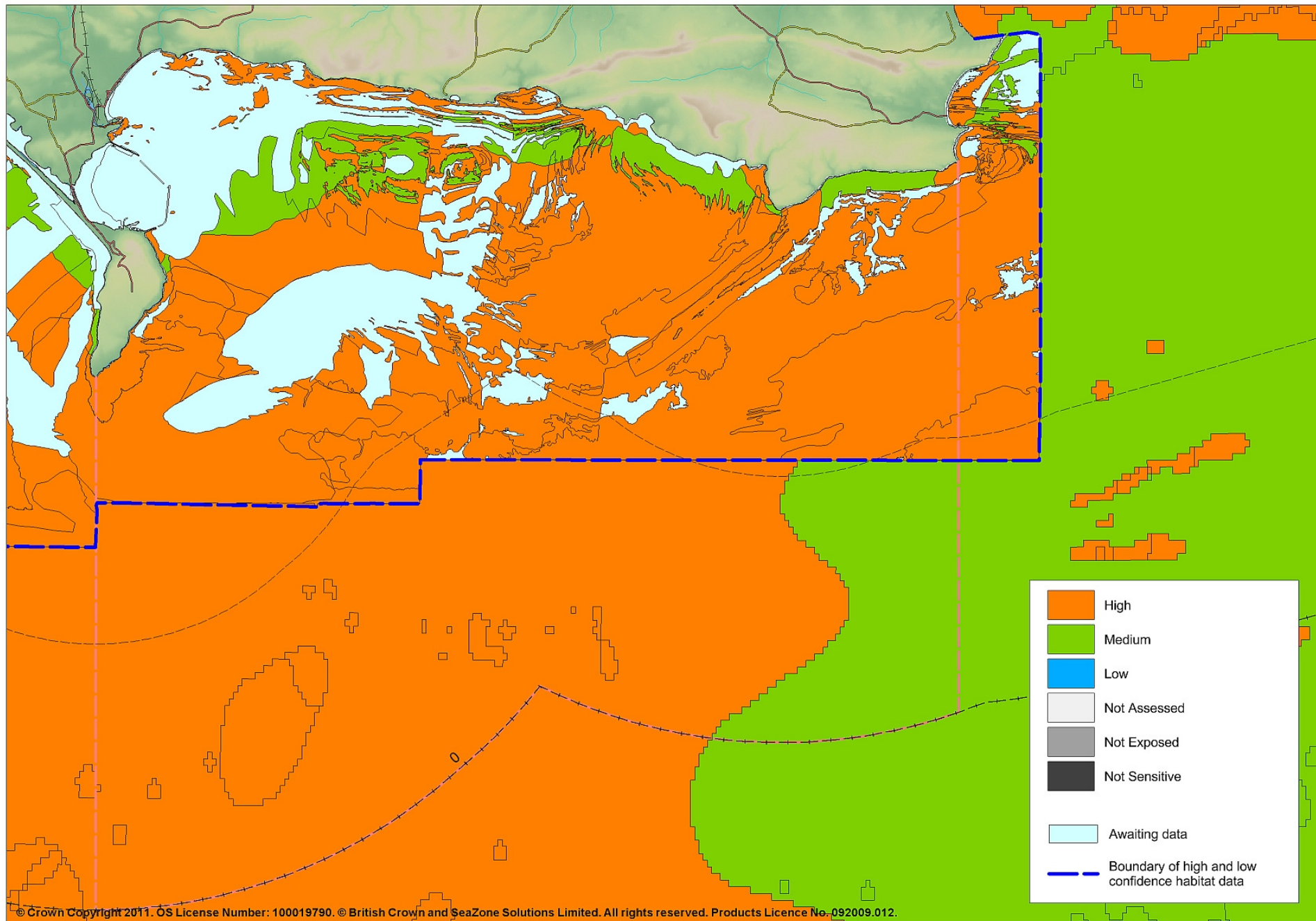


Figure 18 Physical change (to a another seabed type)

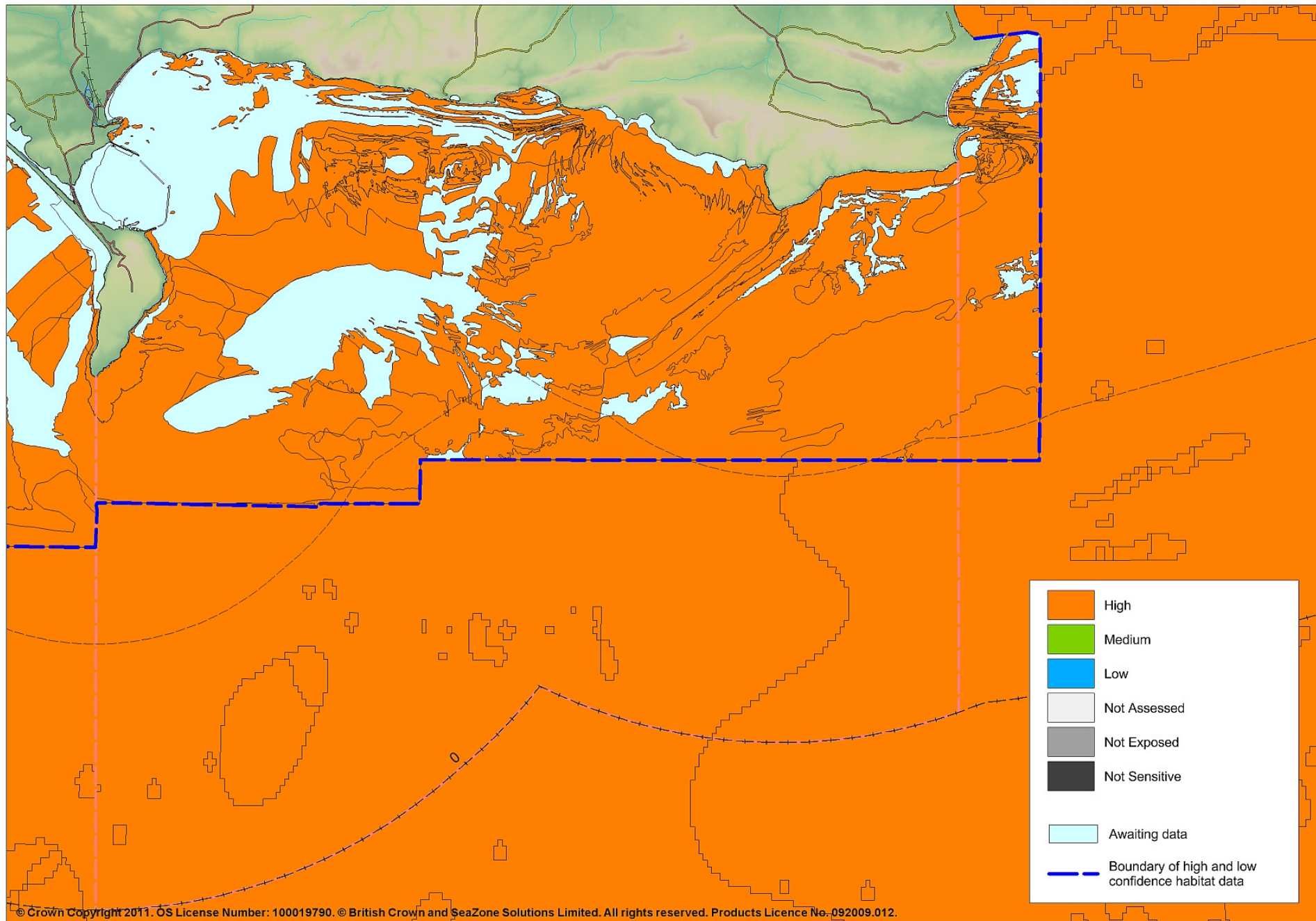


Figure 19 Physical loss (to land or freshwater habitat)

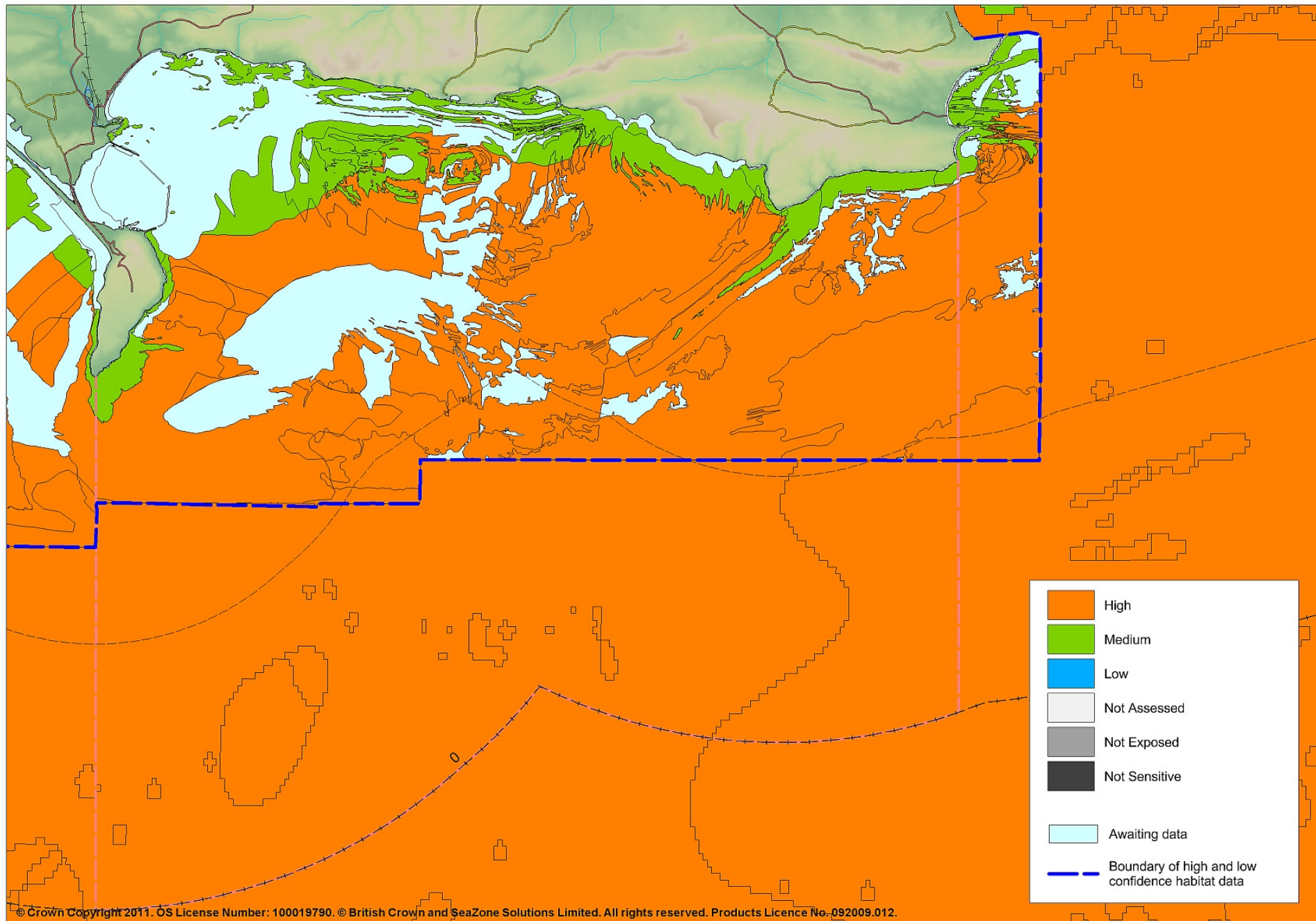


Figure 20 Physical removal (extraction of substratum)

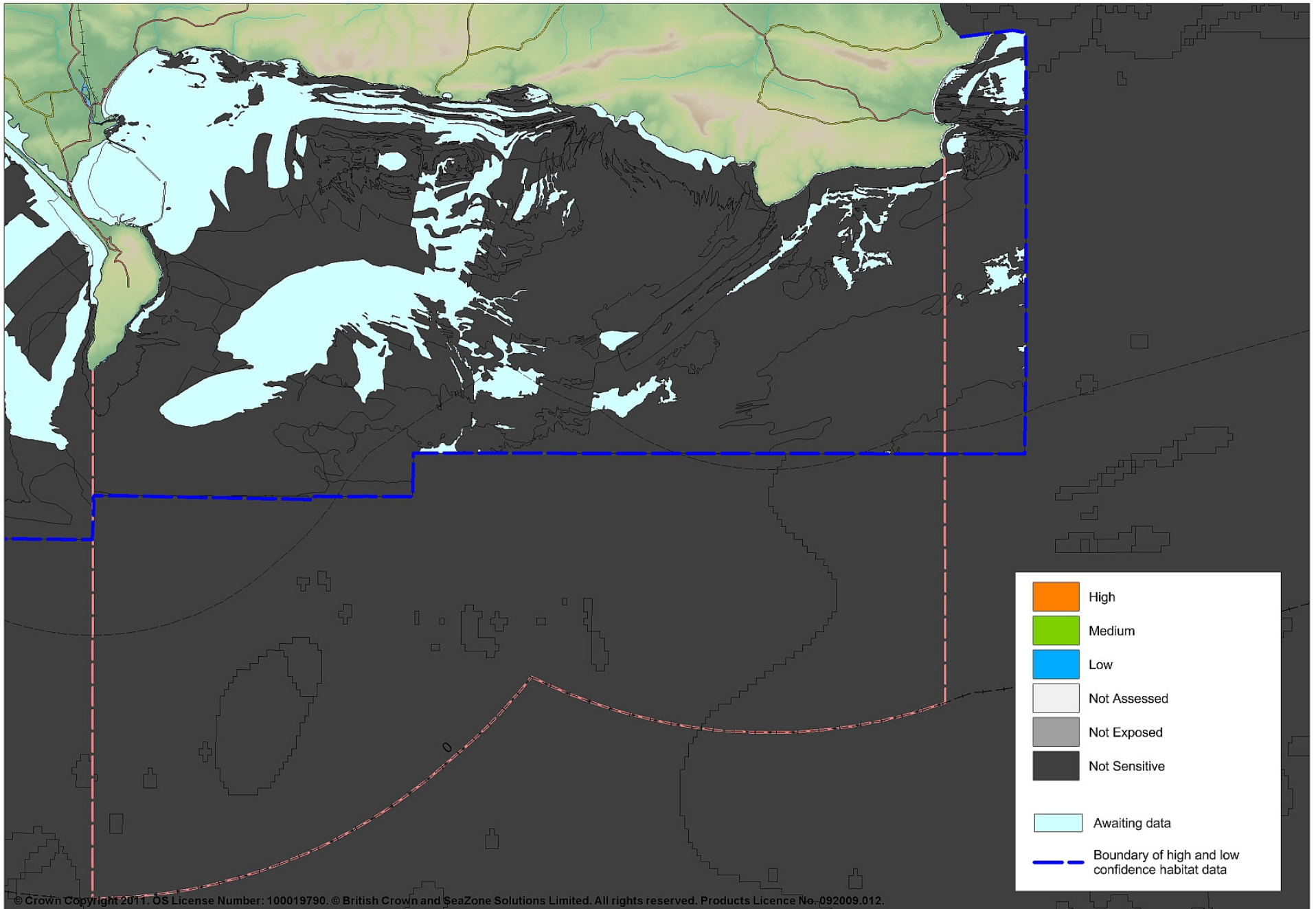


Figure 21 Radionuclide contamination

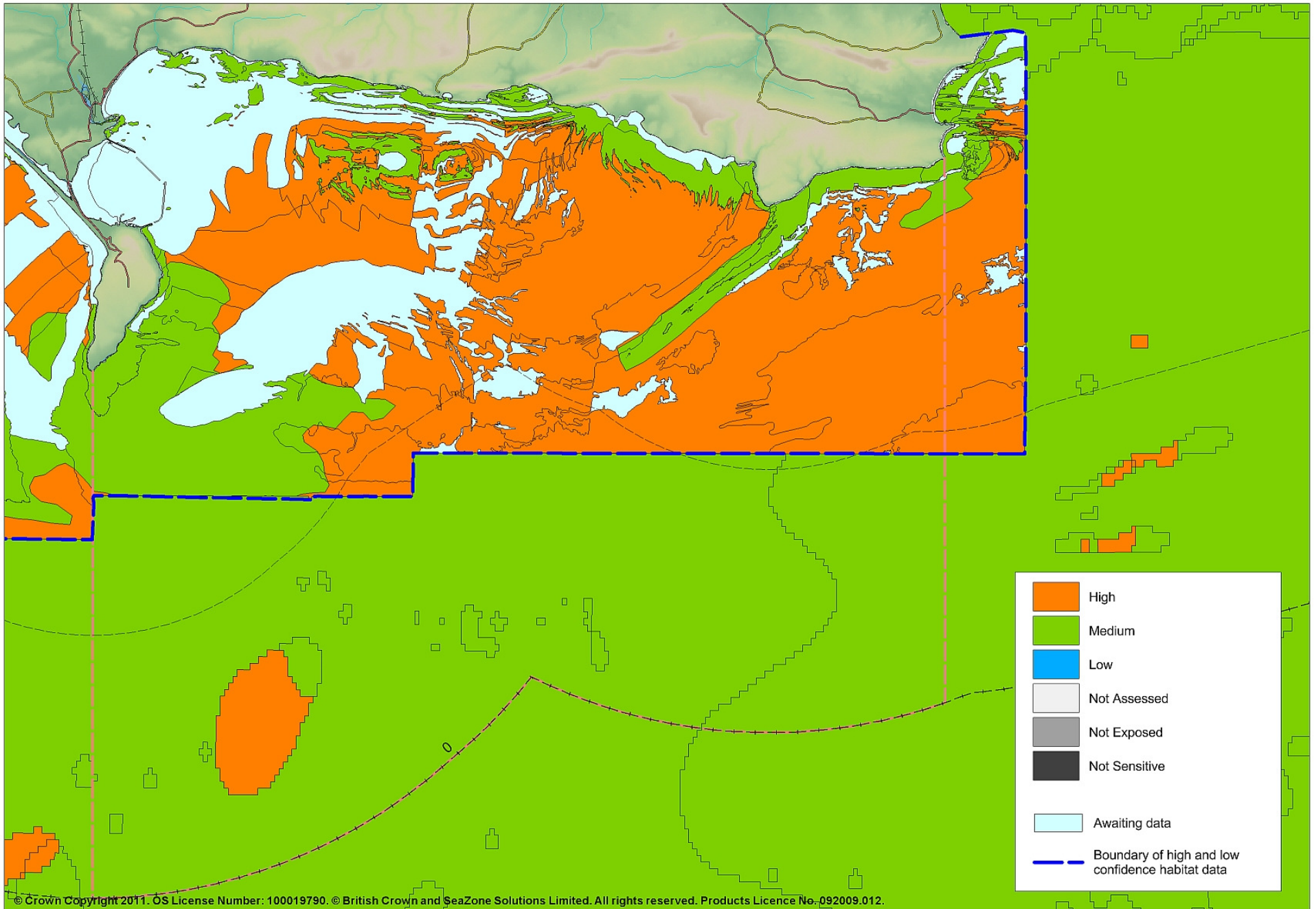


Figure 22 Removal of non-target species (lethal)

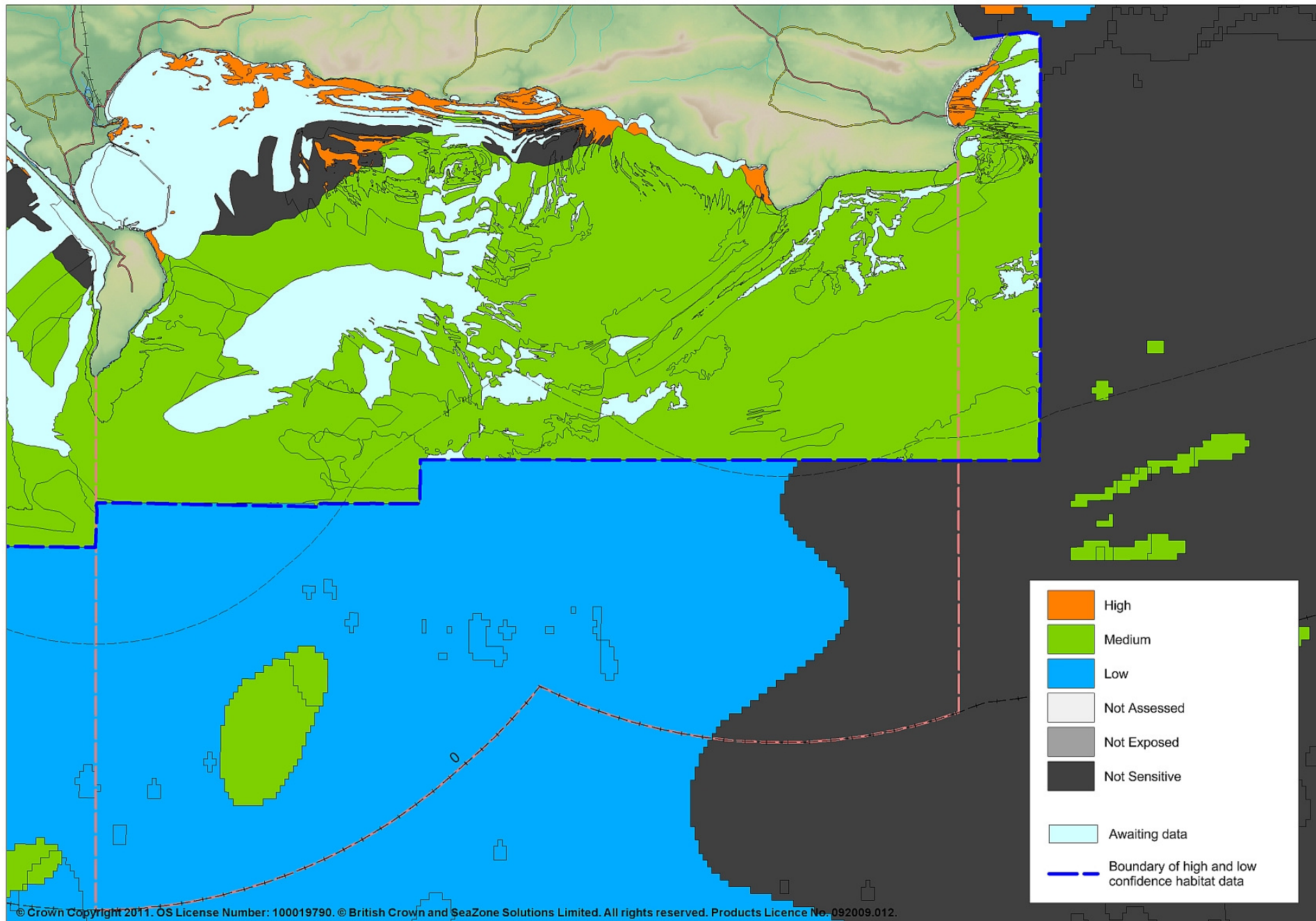


Figure 23 Removal of target species (lethal)

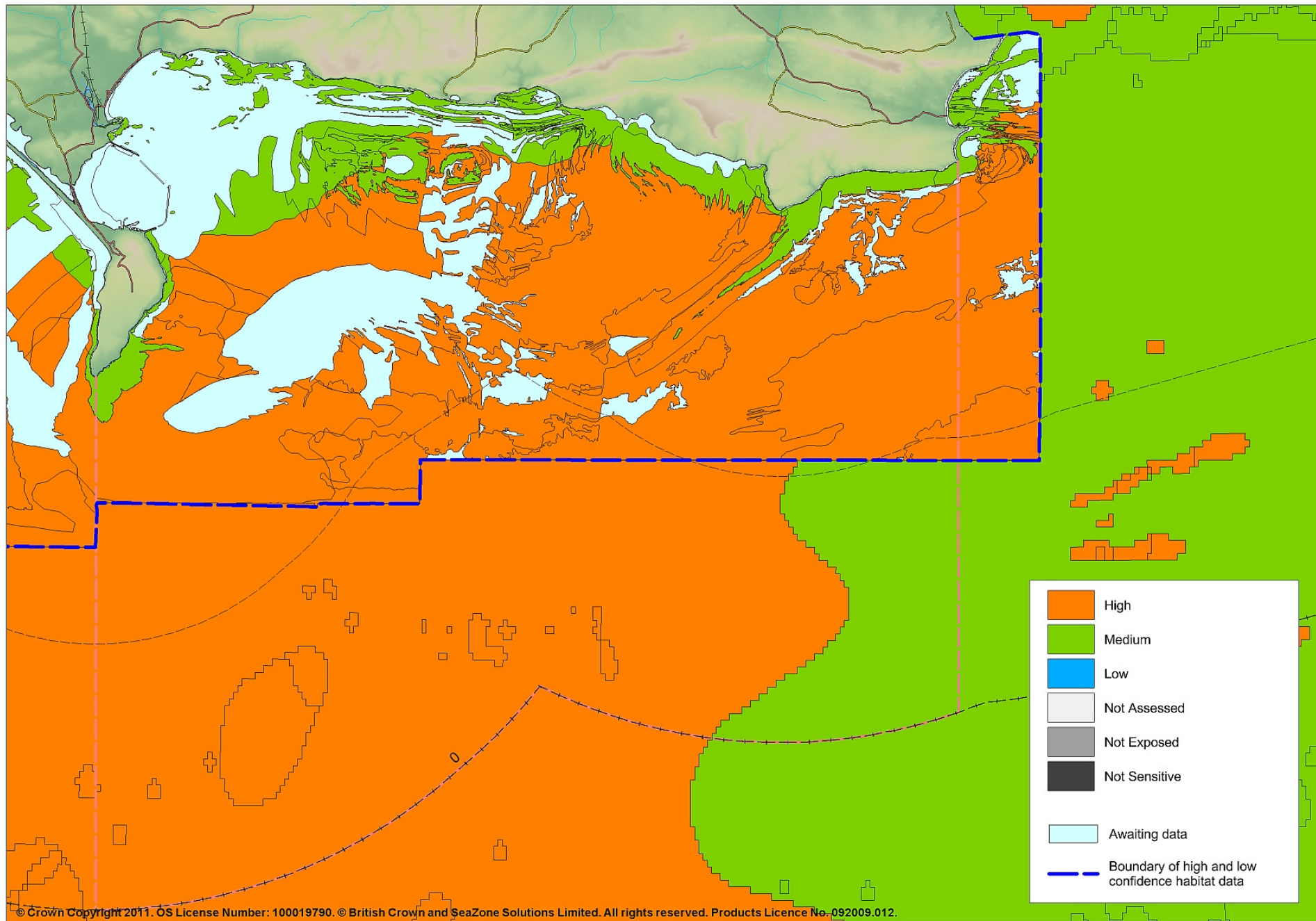


Figure 24 Salinity changes - local

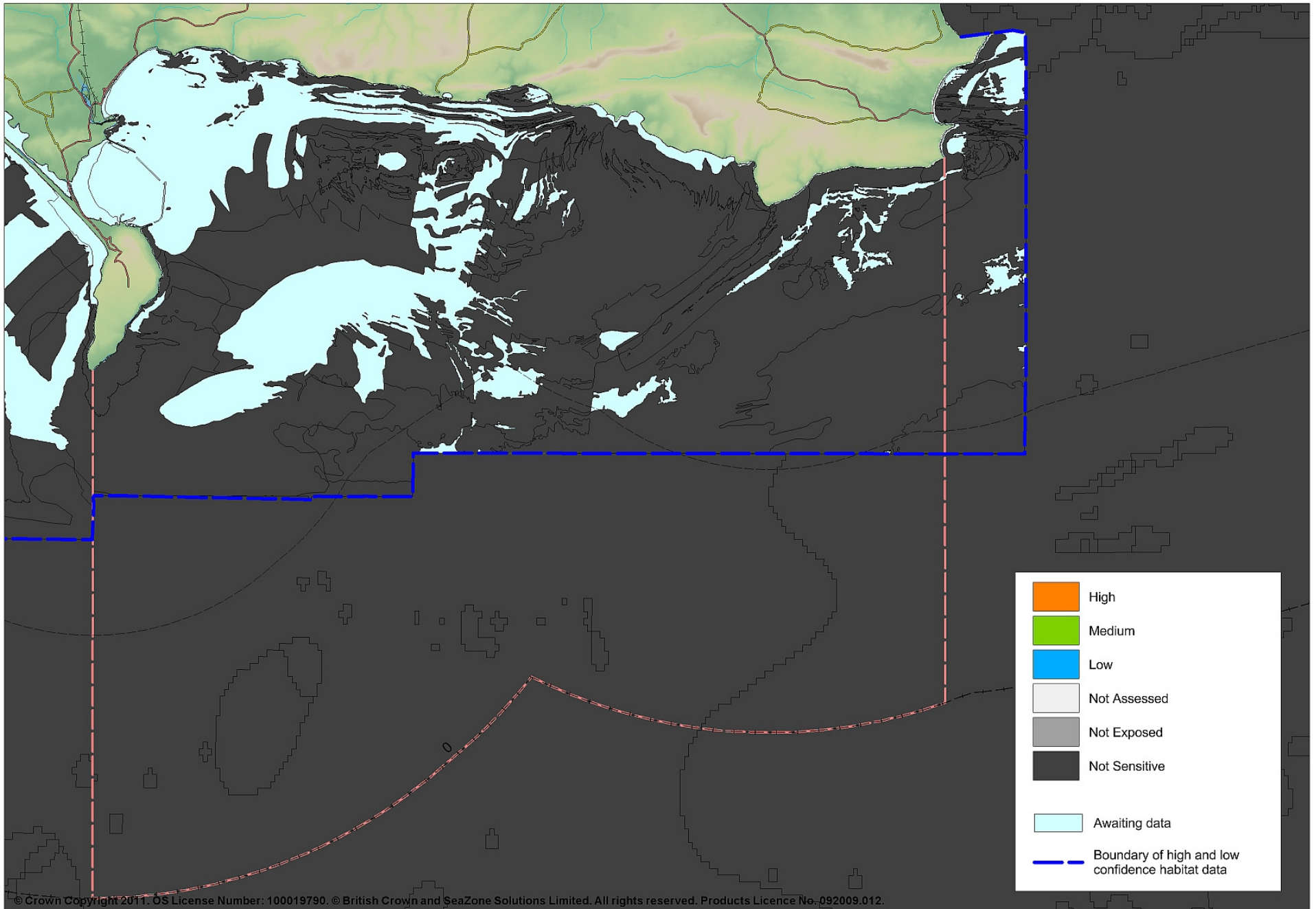


Figure 25 Salinity changes - regional/national

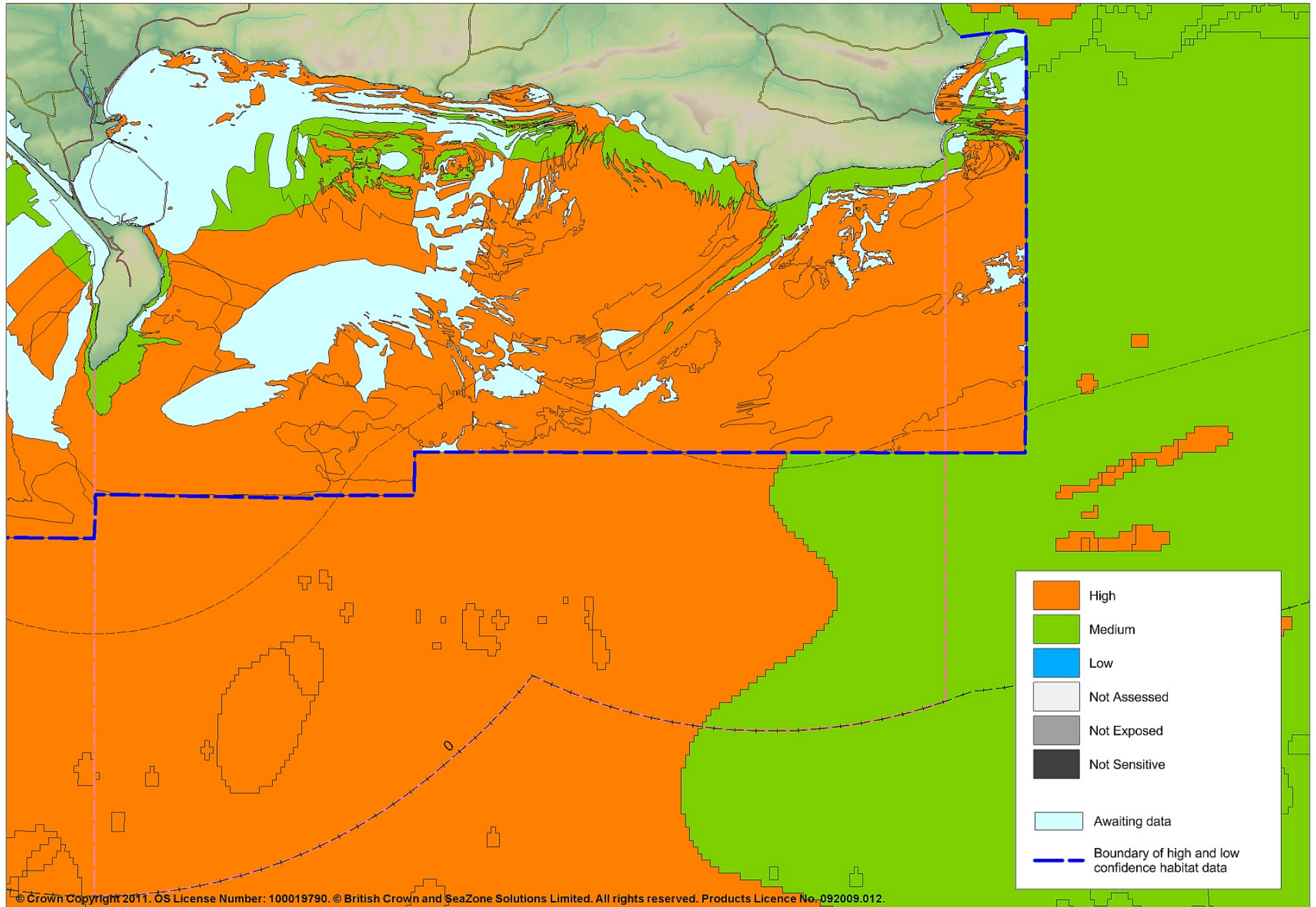


Figure 26 Shallow abrasion/penetration: damage to seabed surface and penetration  $\leq 25\text{mm}$

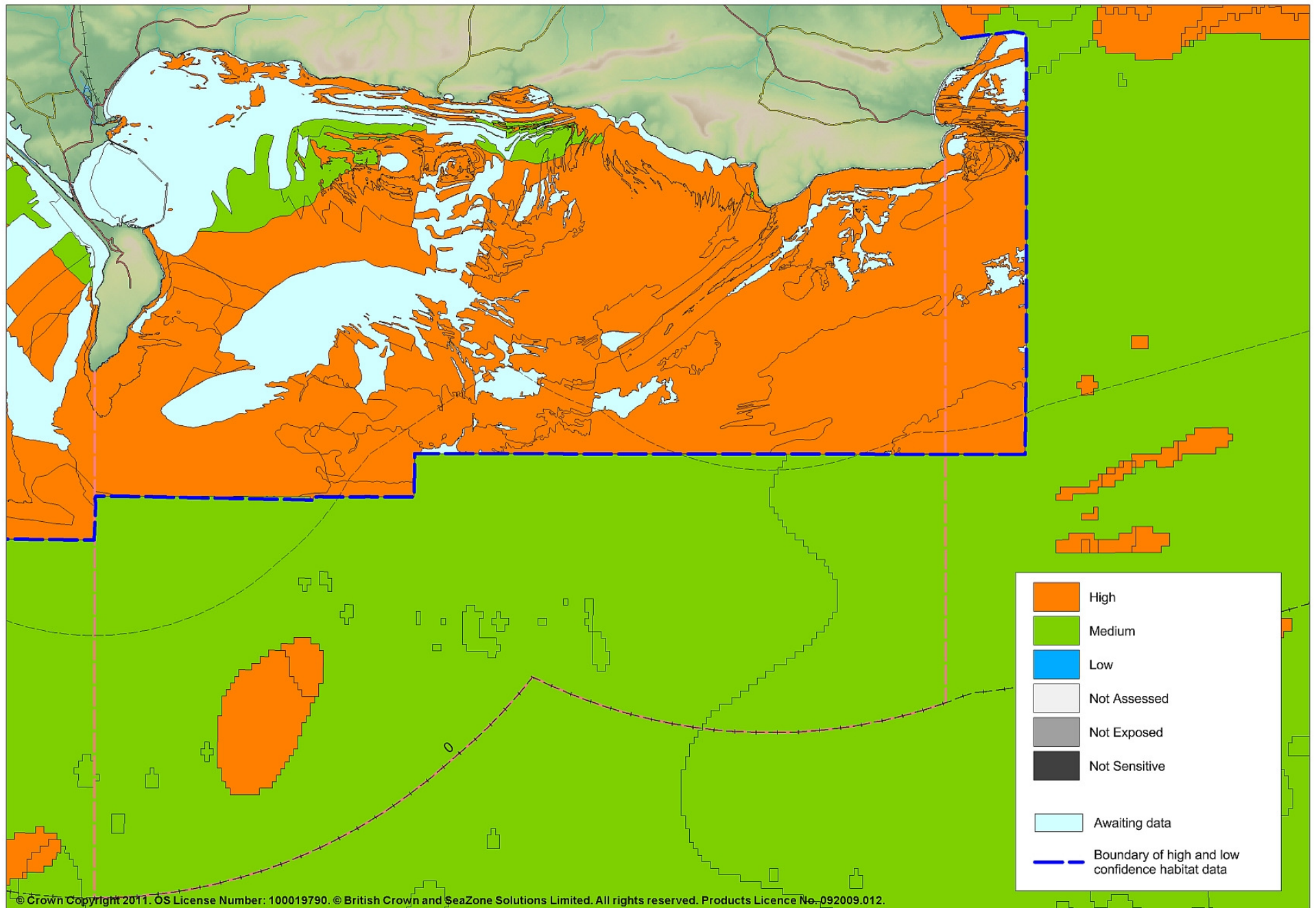


Figure 27 Siltation rate changes (high)

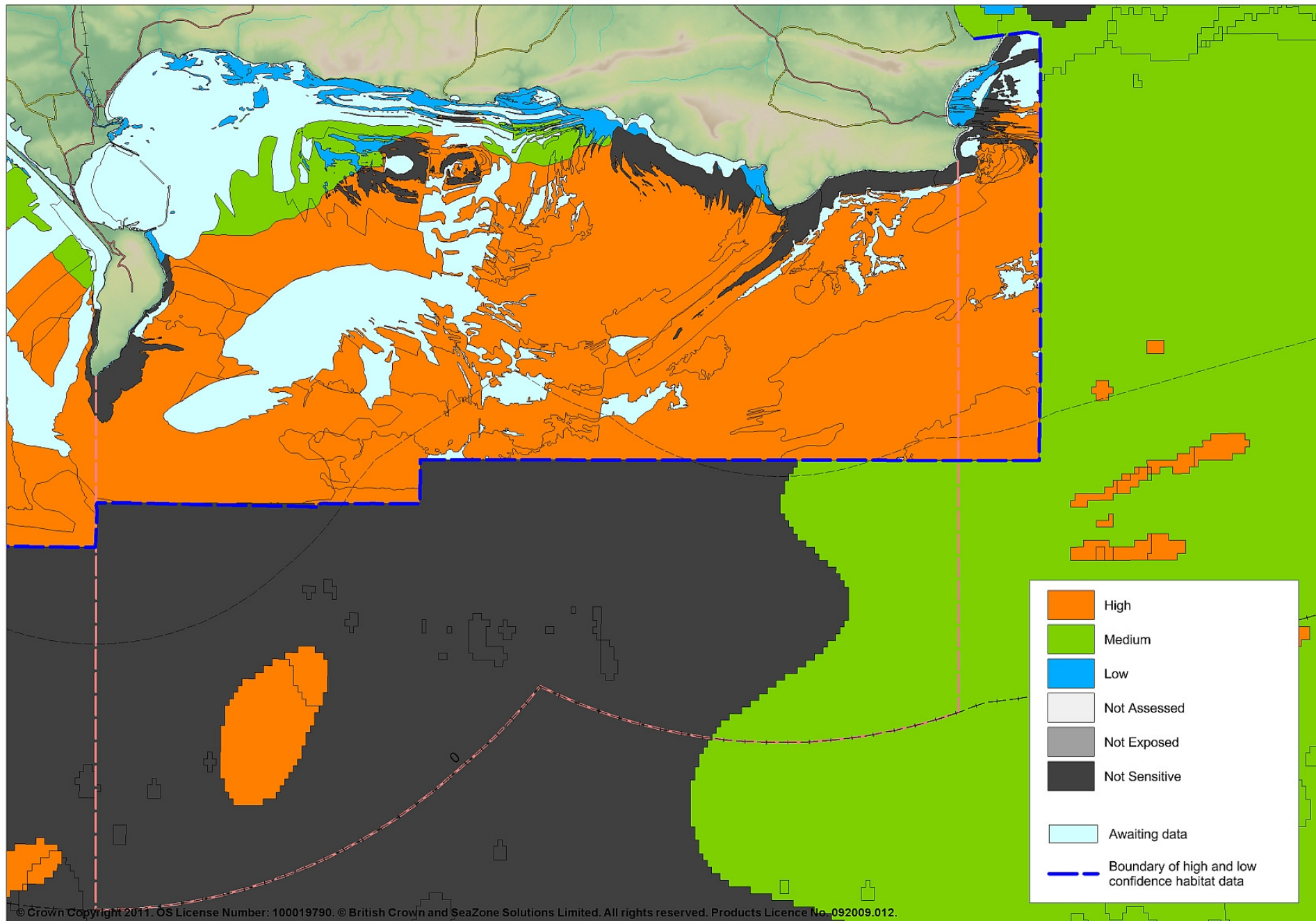


Figure 28 Siltation rate changes (low)

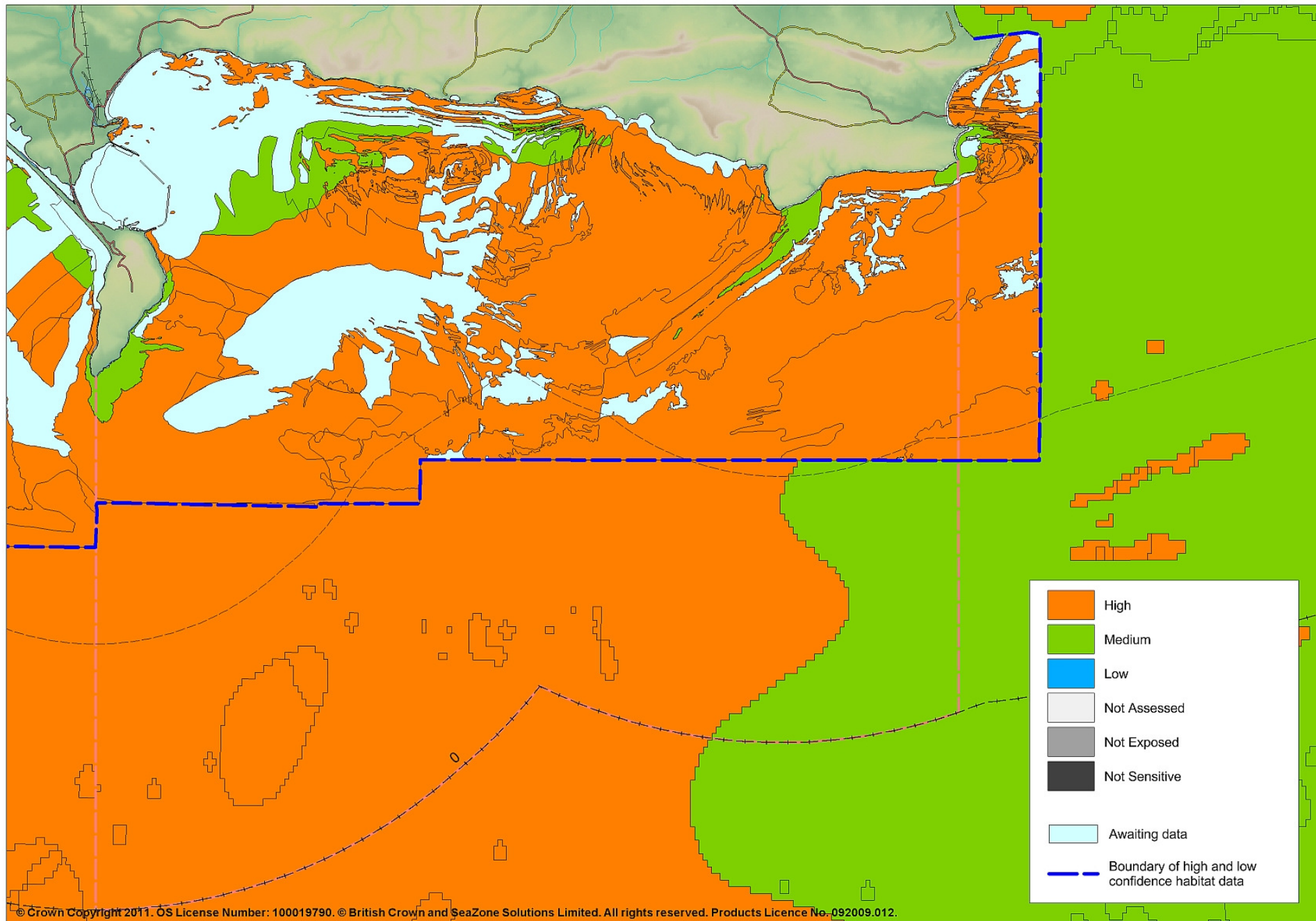


Figure 29 Structural abrasion/penetration: S structural damage to sea bed >25 mm

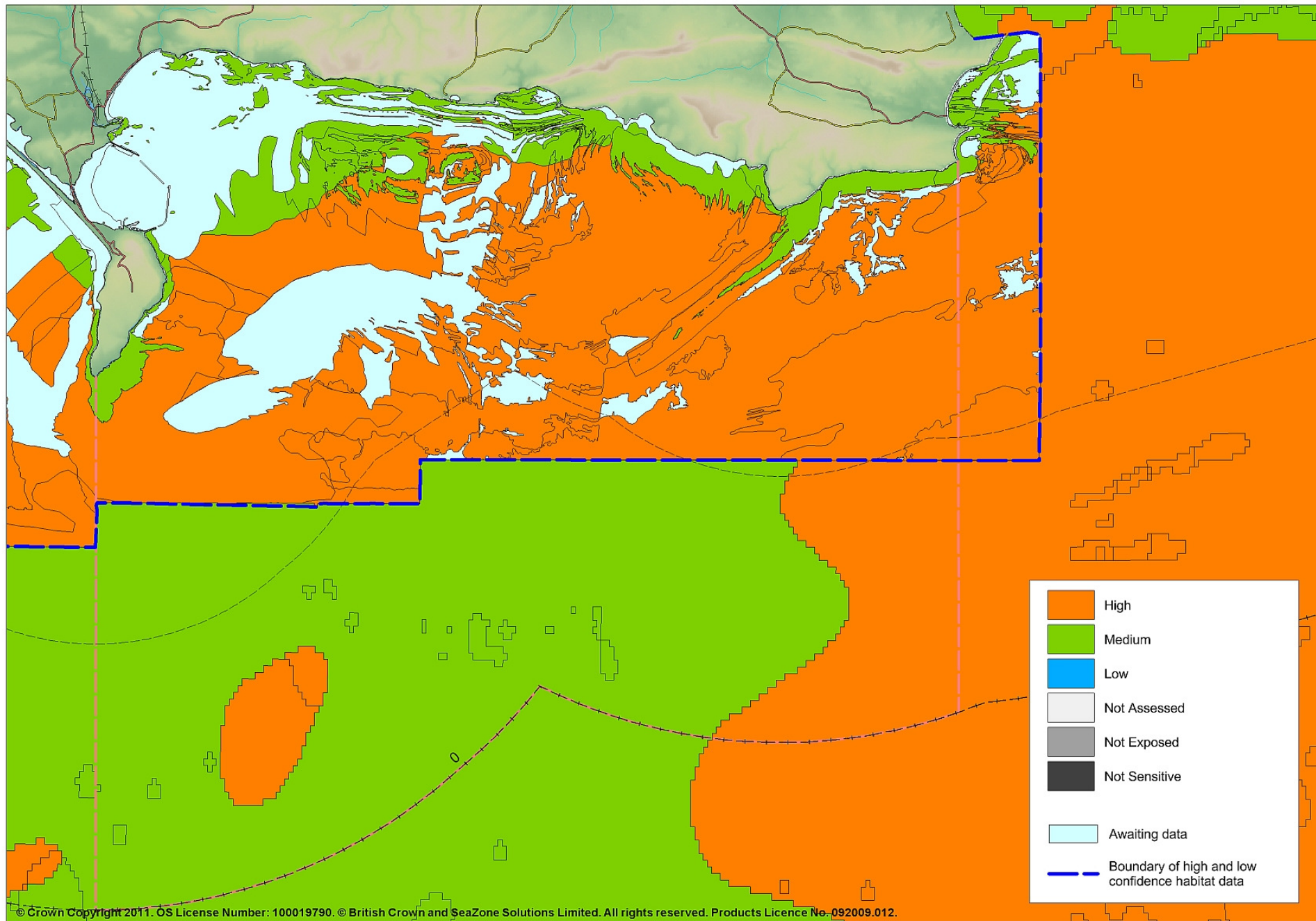


Figure 30 Surface abrasion: damage to seabed surface features

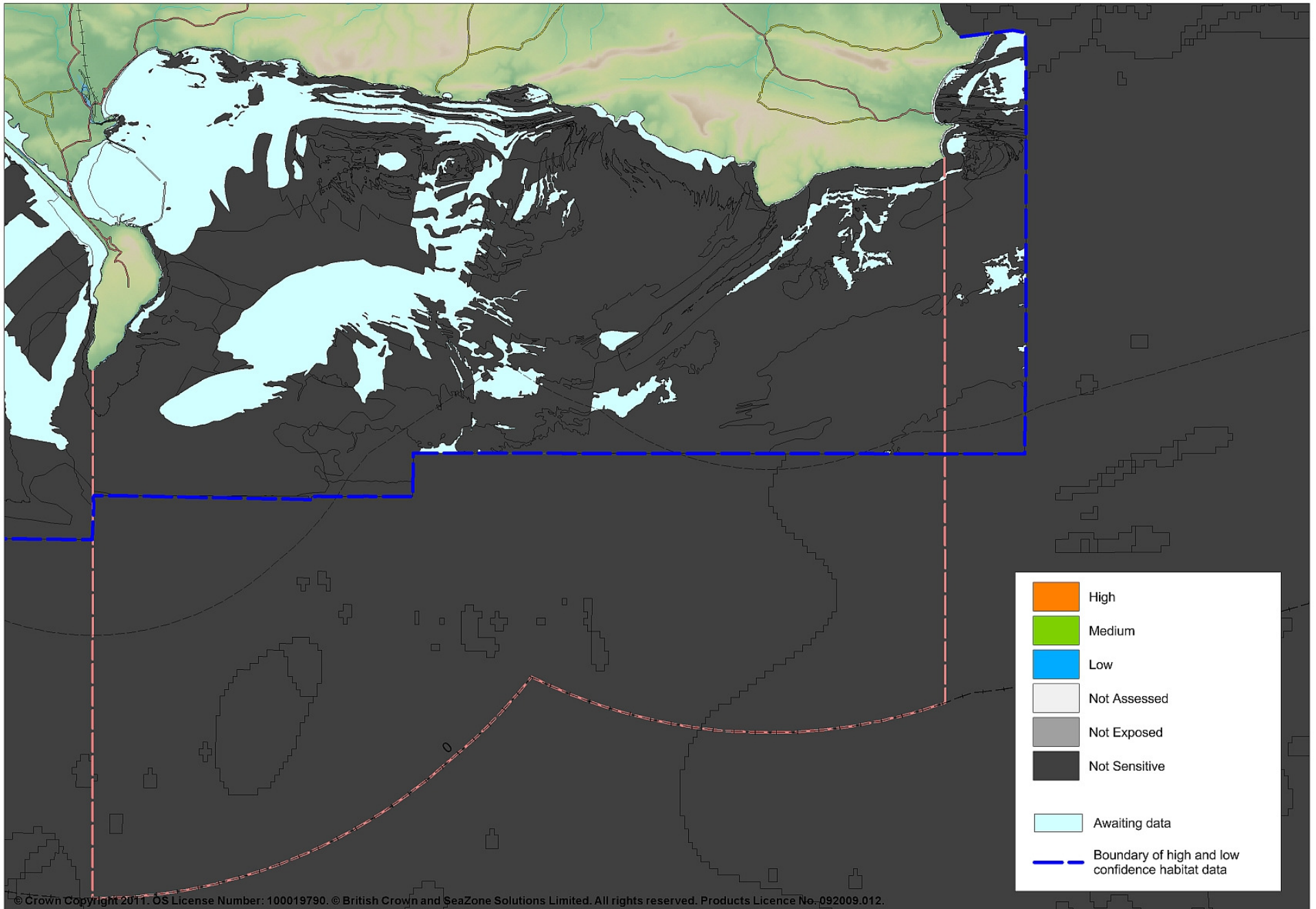


Figure 31 Synthetic compound contamination (inc. pesticides, antifoulants, pharmaceuticals)

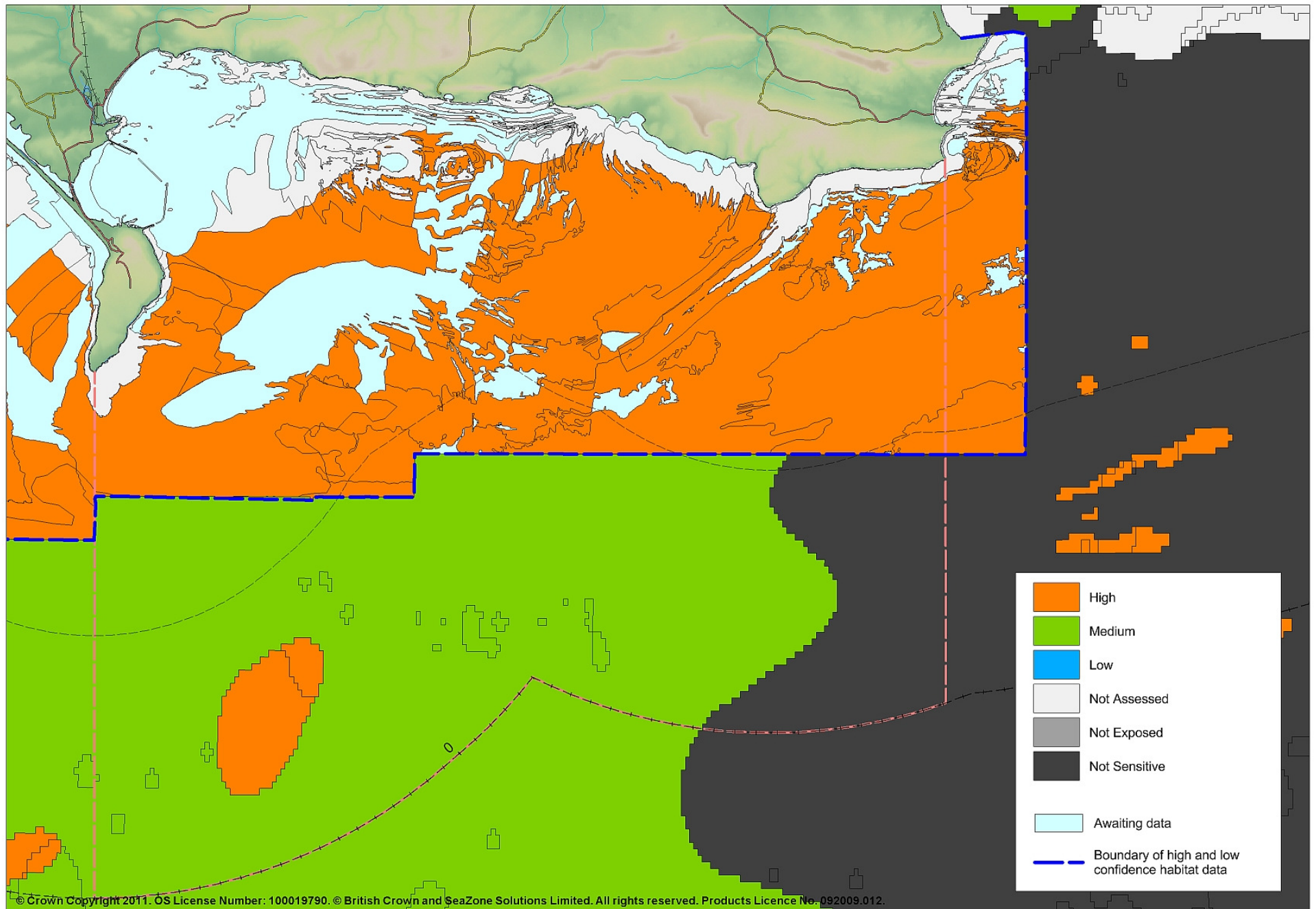


Figure 32 Temperature changes - local

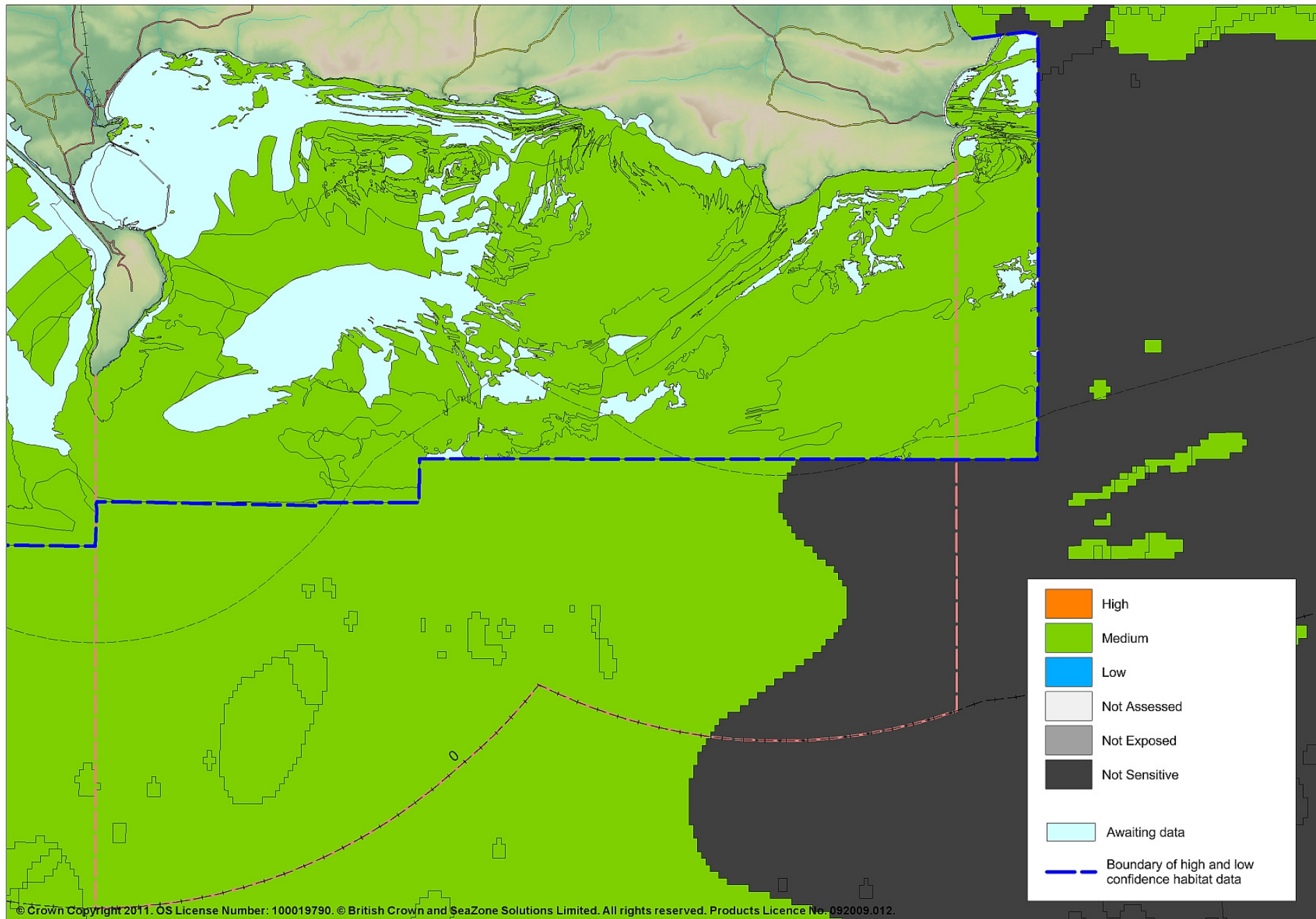


Figure 33 Temperature changes - regional/national

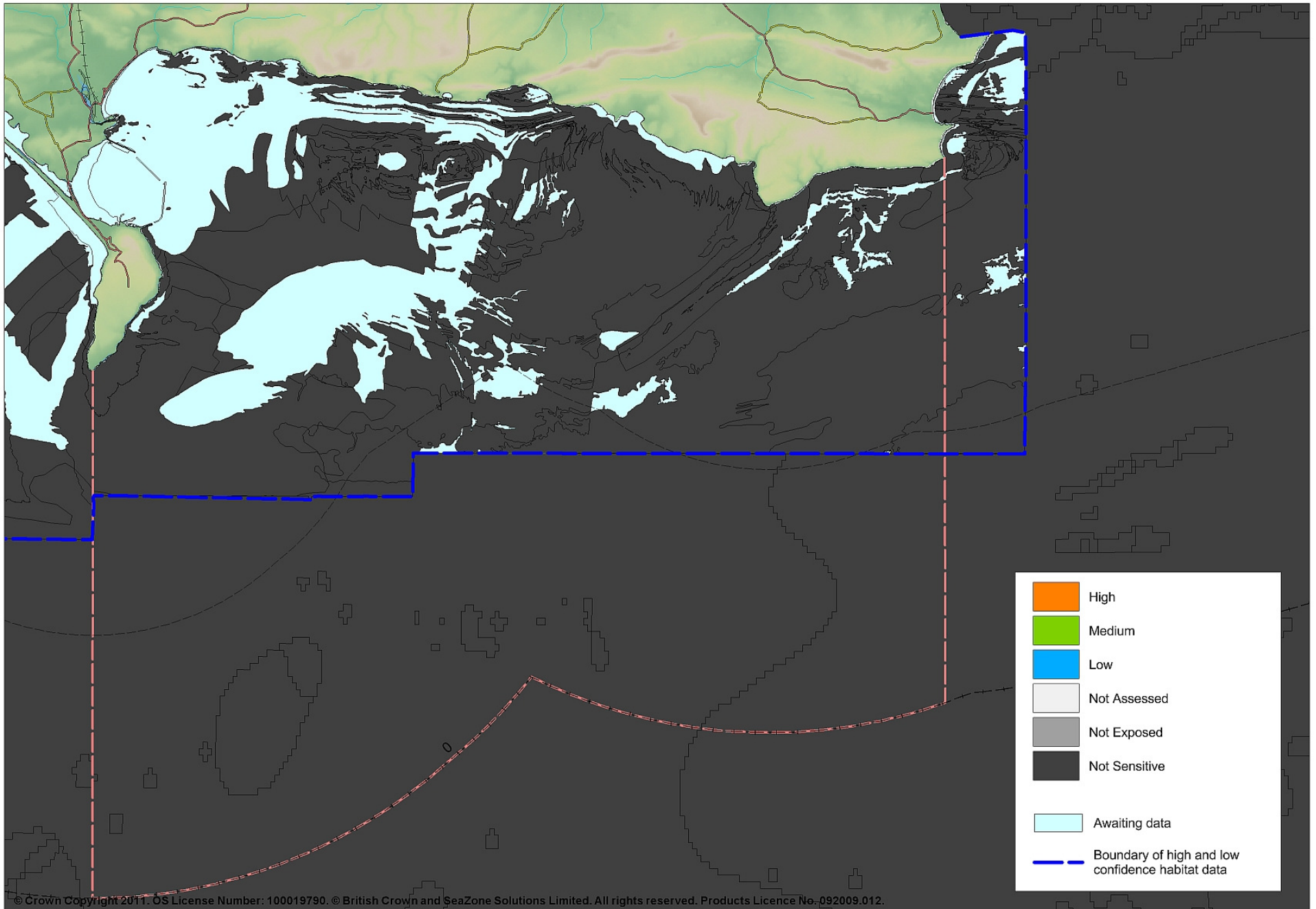


Figure 34 Underwater noise

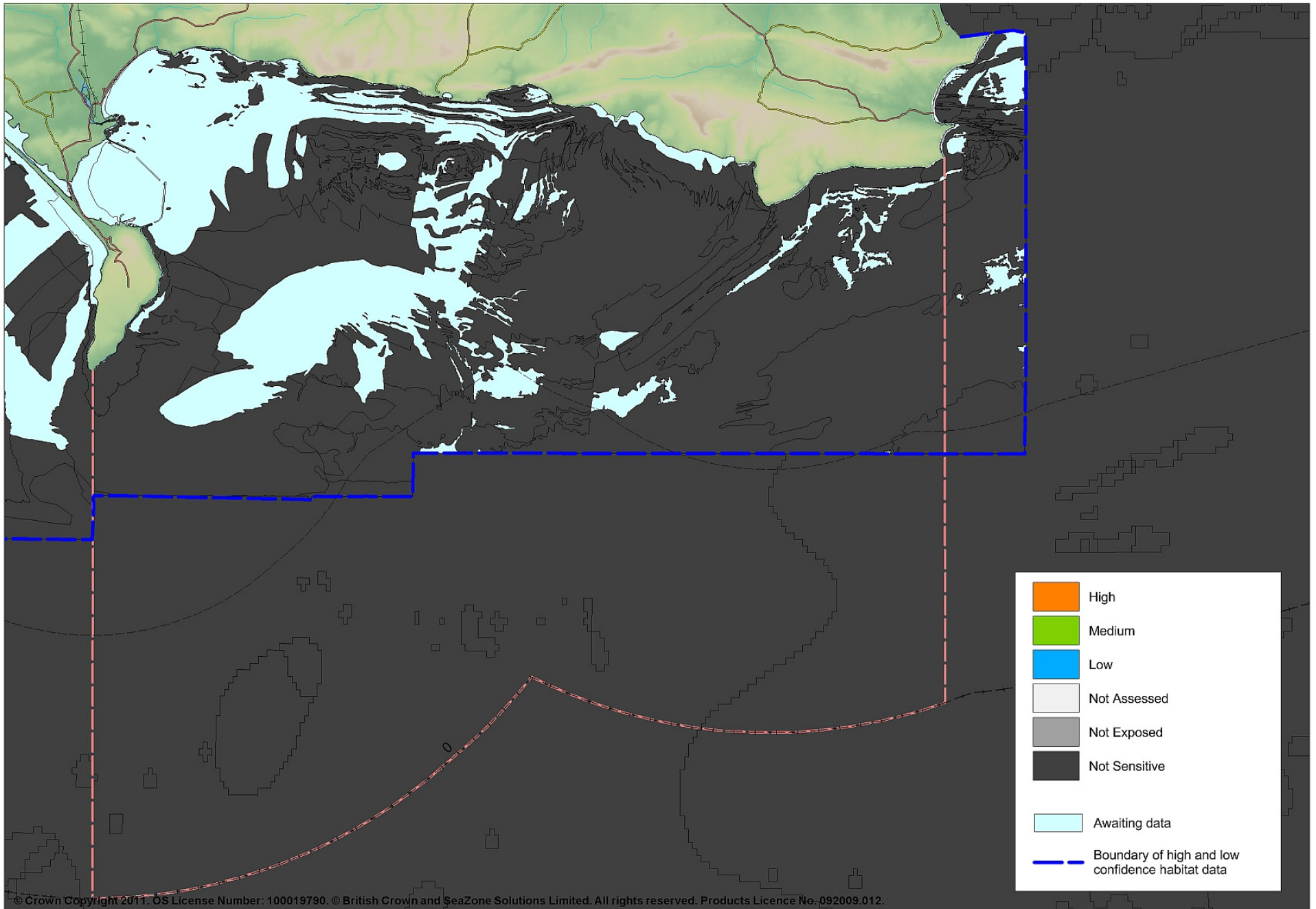


Figure 35 Visual disturbance (behaviour)

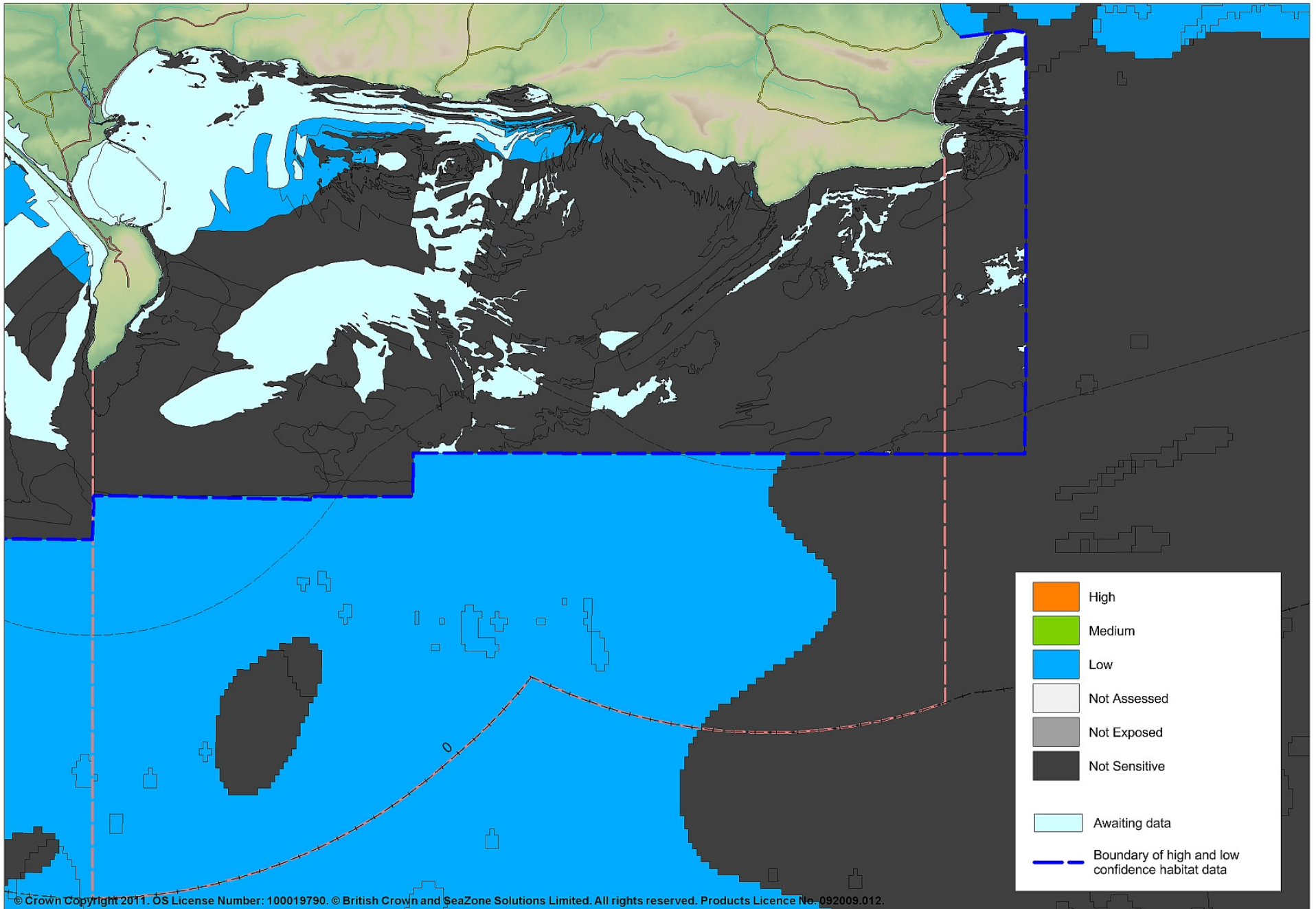


Figure 36 Water clarity changes

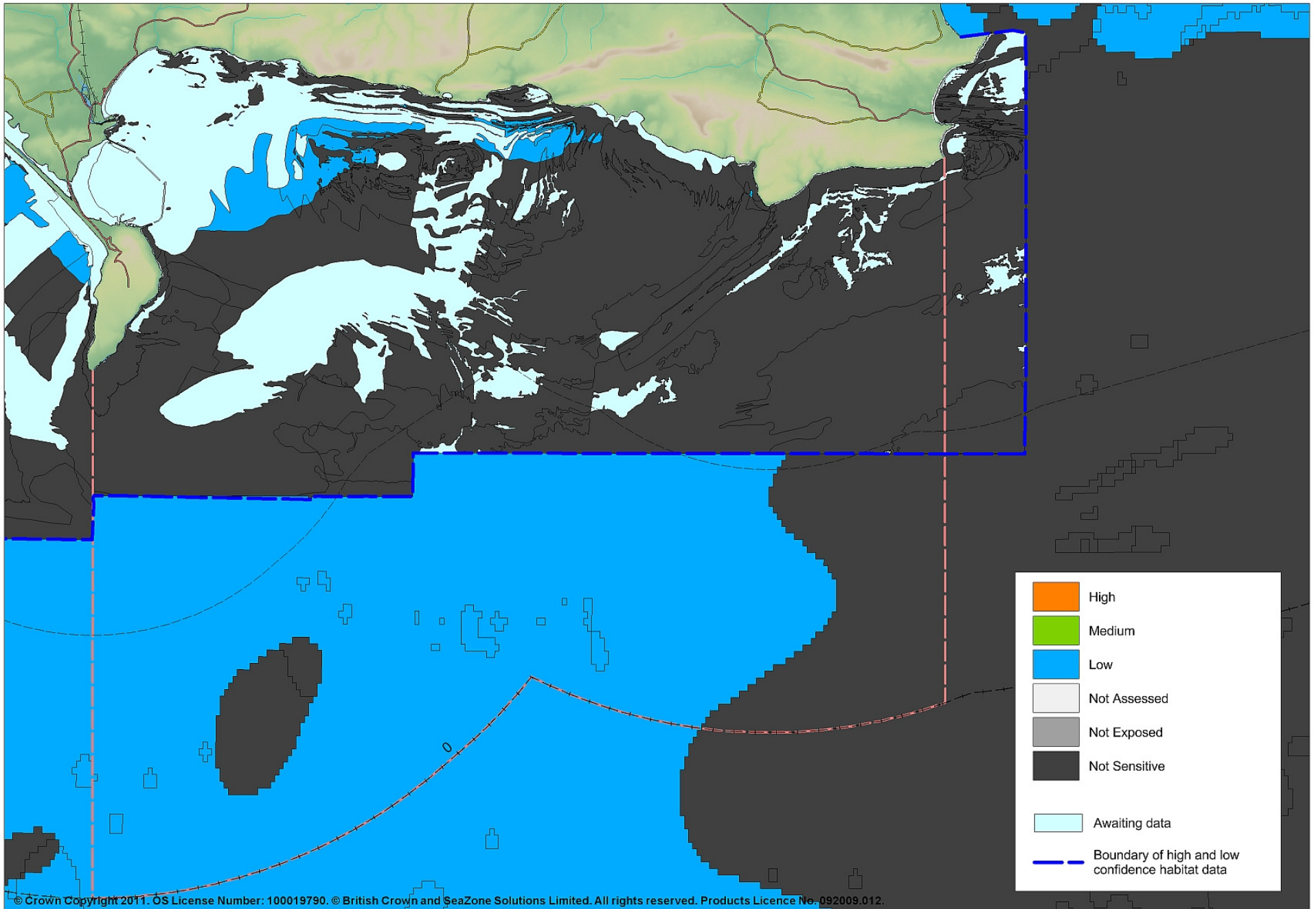


Figure 37 Water flow (tidal & ocean current) changes - regional/national

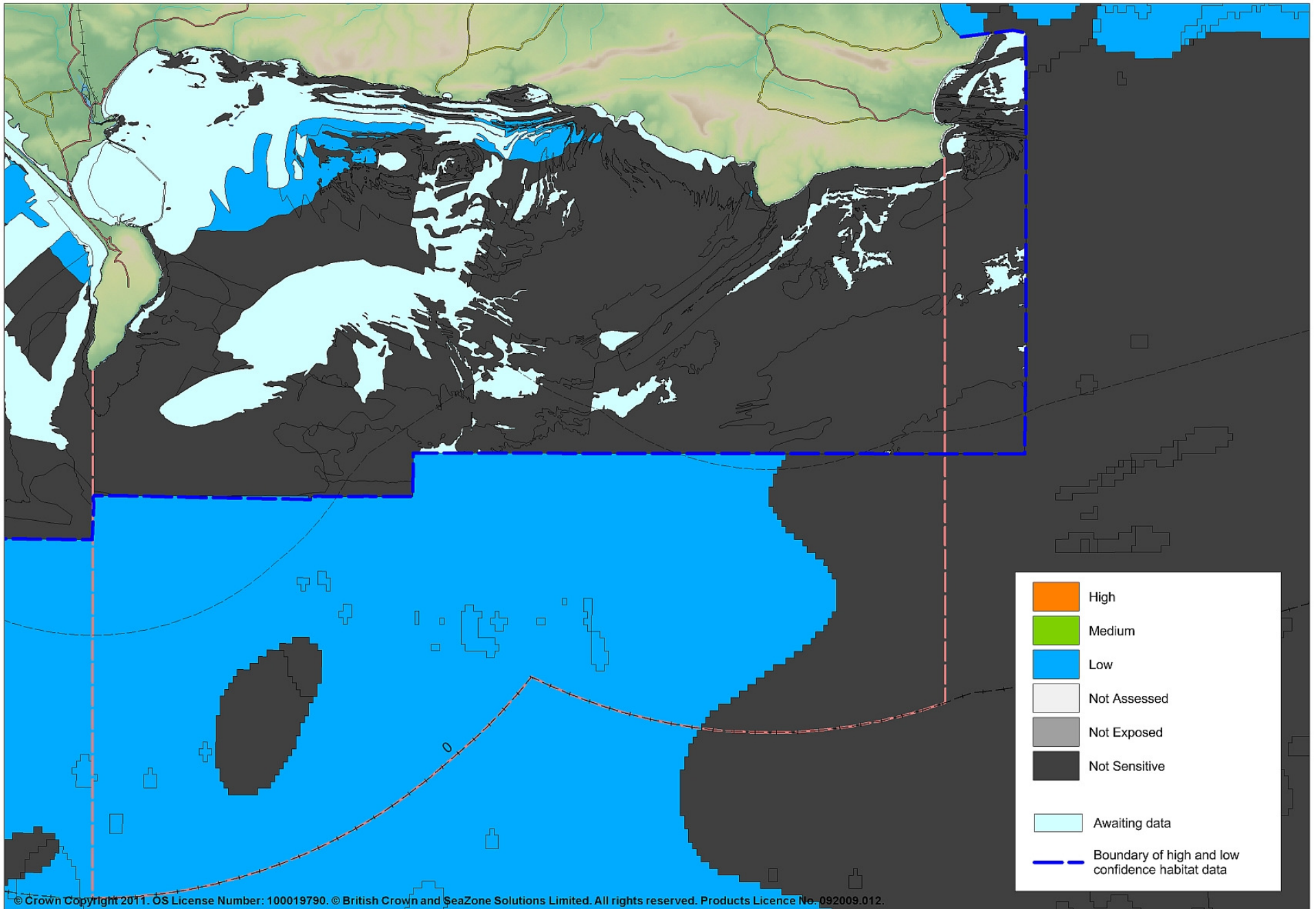


Figure 38 Water flow (tidal current) changes - local

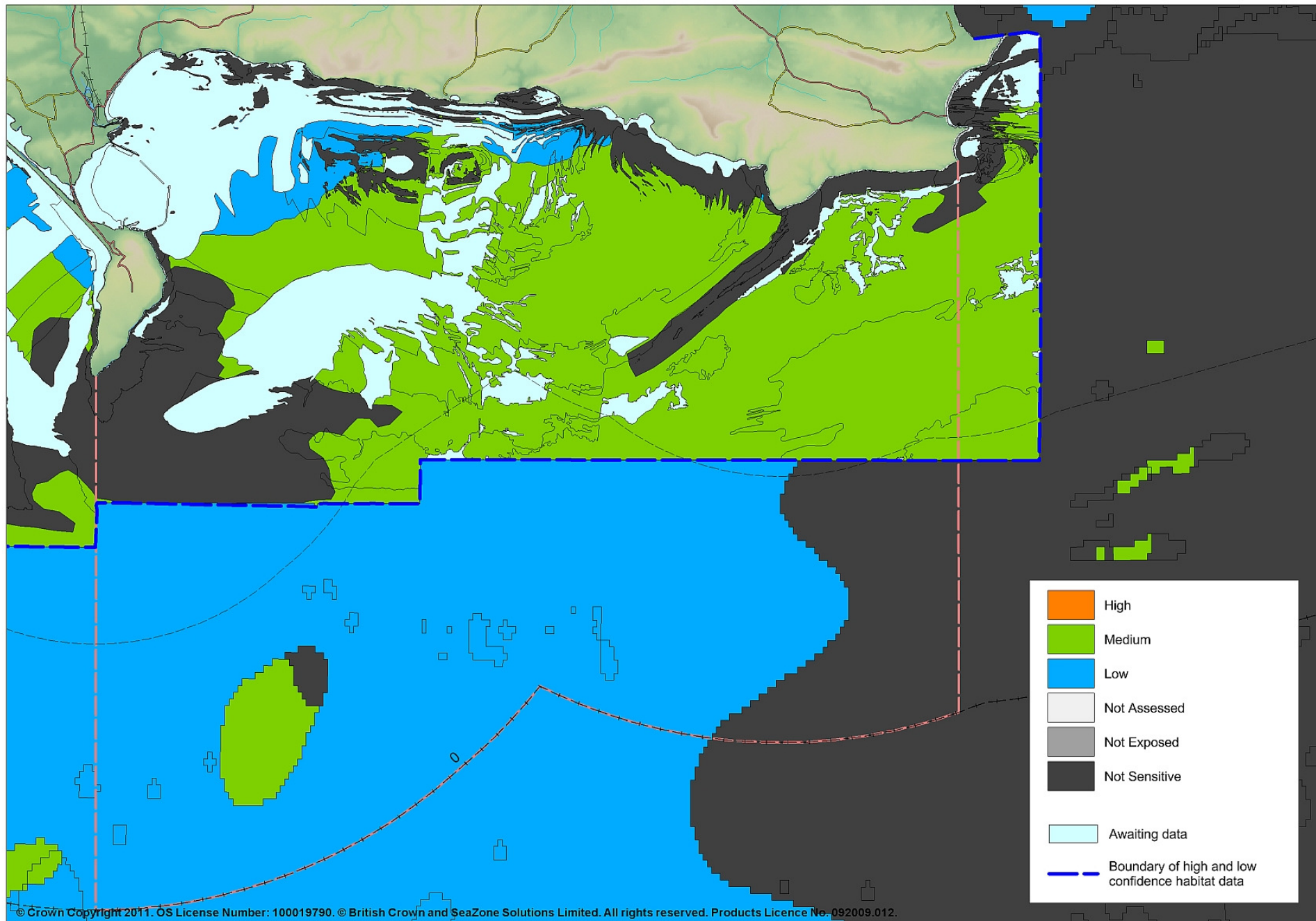


Figure 39 Wave exposure changes - local

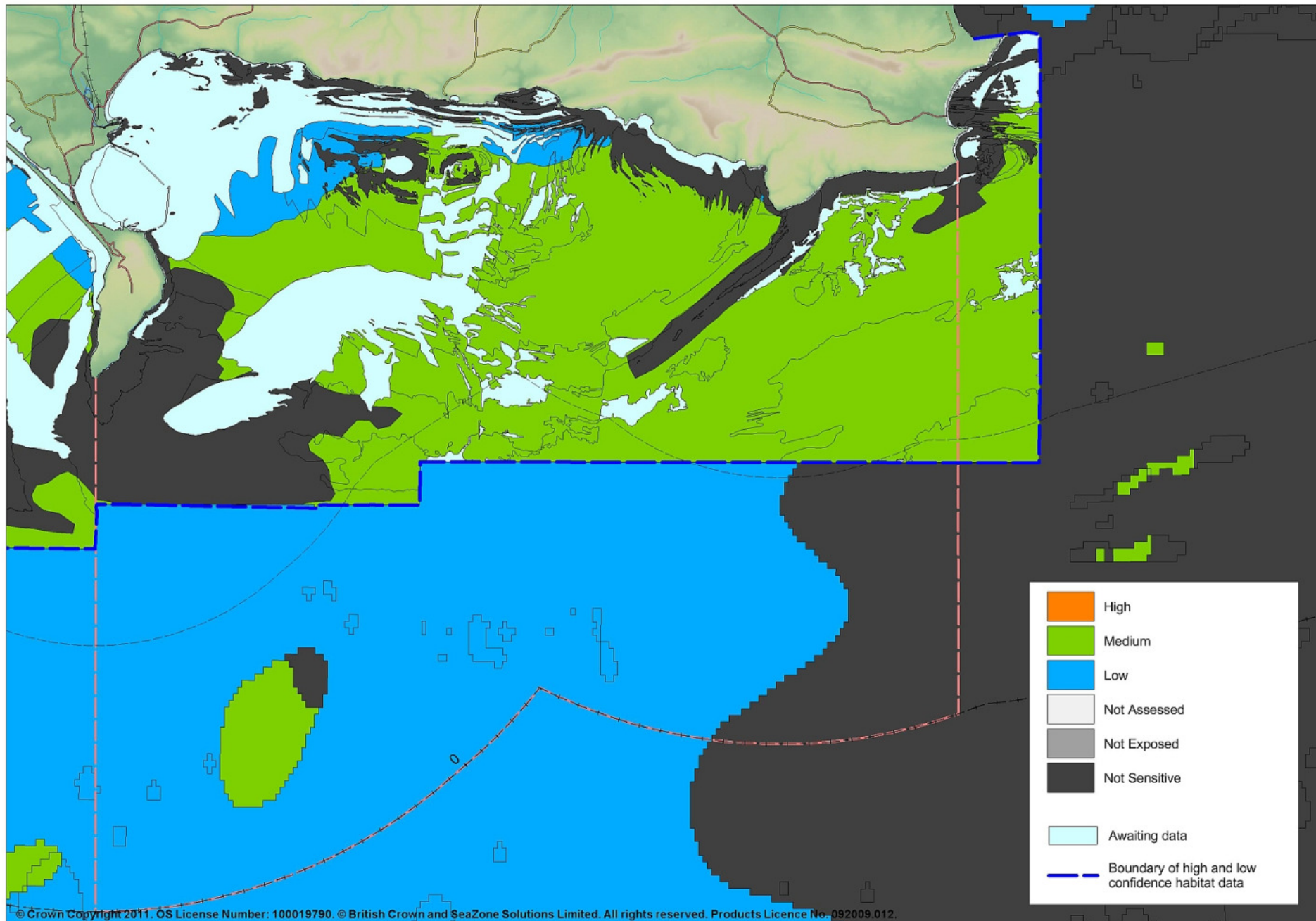


Figure 40 Wave exposure changes - regional/national