

Advice on locations and likely locations of VMEs in EU waters of the NE Atlantic, and the fishing footprint of 2009–2011

Advice summary

ICES advises on the deep-sea bottom fisheries footprint, for depths of 200 m and greater, based on VMS and logbook data for the years 2009–2011. This footprint is missing information from some fleets as some data were not supplied to ICES. ICES also advises on where this footprint is bisected by the 800 m depth contour, below which bottom trawling shall not be permitted under the EU deep-sea access regulation (EU) 2016/2336.

ICES advises on a method to identify areas with vulnerable marine ecosystems (VMEs) and those likely to contain VMEs that may be used as a basis for implementing the habitat protection aspects of regulation EU 2016/2336. In order to identify areas to close, the VME and VMS datasets must be completed. Managers, with support of science, need also to decide on how to prioritize which areas to close for habitat protection. ICES provides potential options for a prioritization scheme for an example area (off NW Scotland and the Rockall Bank).

Request

ICES is requested to advise on a list of areas where VMEs are likely to occur and should be closed off from bottom fishing, in particular in areas deeper than 800 m. This advice should also include a footprint analysis of where bottom fishing is occurring (and has occurred), by collating and describing bottom fishing activity in the North East Atlantic 2009-2011 (or other period 2012-2016). In this work ICES is requested to:

- a) Collect all relevant national VME data. Building on the existing ICES VME data base, prepare spatial layers and a list of areas where VMEs are likely to occur in the North East Atlantic, in particular in areas deeper than 800 m.*
- b) Collect all relevant national VMS and logbook data 2009-2011 (or other period 2012-2016). Prepare spatial layers on the intensity of bottom fishing, that describe the fishing footprint occurring (and that has occurred) in the North East Atlantic*. Issuing of a VMS and logbook data call, data collation, quality checks and analysis of data should be done in accordance with the standards developed by ICES (2017).*
- c) Combine information from (a) and (b) above to advice on a prioritised list of fisheries closures areas, and a set of management options in line with European Commission's deep-sea access regulation (see intended use section).*

**footprint analysis of bottom fishing is conditional to all countries successfully submitting requested VMS and logbook data, as set out in the ICES data call.*

Elaboration on the advice

The spatial extent of the deep-sea fisheries footprint for all bottom-contacting gears for 2009–2011 is presented. The data are available for depths of 200 m and greater, based on VMS and logbook data over the same period. The data are presented in depth intervals of 200–400 m, 400–800 m, and 800 m and deeper. Under regulation EU 2016/2336 Article 8.1, fishing with bottom-contacting gears shall be confined to this footprint.

The area beneath the 800 m depth contour which shall be closed to bottom trawling within EU waters under regulation (EU 2016/2336, Article 8.4) is shown in Figure 1. ICES has not presented the proportion represented by trawling in the footprint in waters deeper than 800 m. However, the data are available to perform such an analysis.

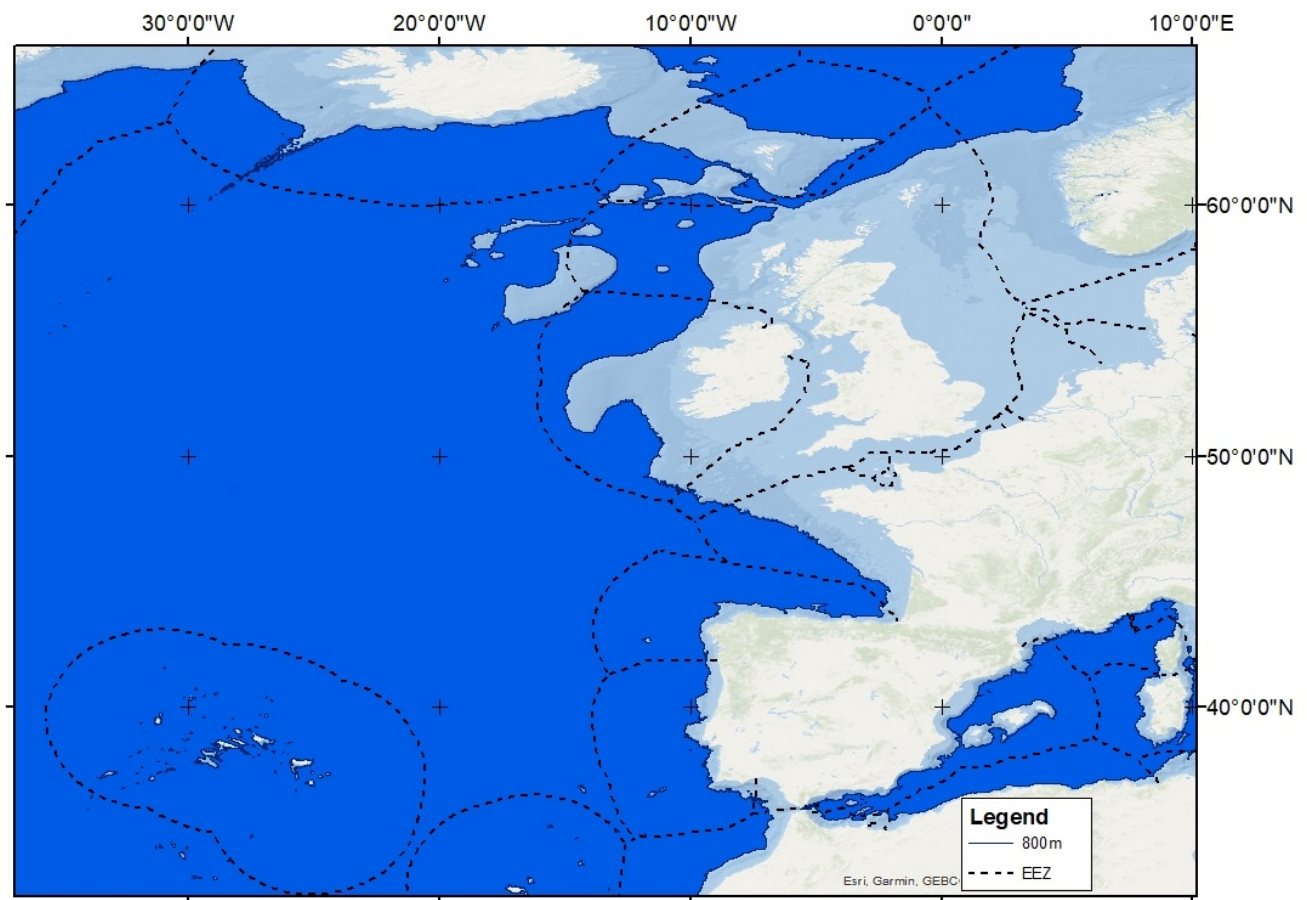


Figure 1 The area beneath the 800 m depth contour (dark blue) which shall be closed to bottom trawling under regulation (EU 2016/2336, Article 8.4).

Grid rectangles (c-squares), measuring approximately 3×5 km, where VMEs are known to occur are presented. This advice includes cold seeps and hydrothermal vents that are not currently listed on Annex III of Regulation 2016/2336, but which are included in the international guidelines for the management of fisheries in the high seas (FAO, 2009).

ICES is unable to provide a prioritized list of fisheries closures areas at present as such prioritization requires decisions from managers as to a) how to define “likely to contain VMEs” and b) how to prioritize in relation to fishing activities occurring in an area. ICES provides maps of three possible ways of interpreting the likelihood of VME occurrence for an example region within EU waters. Should areas containing such habitats presently outside the fishing footprint be prioritized (these may be relatively pristine), or should those habitats at risk from fishing within the footprint be given greater priority? Based on this information, ICES would be willing to discuss ways of resolving these choices and questions with managers.

ICES advises that bottom-contacting mobile gears pose the greatest risk of instantaneous physical impact on VME habitats. Impacts from the static gears (bottom-set gillnets, longlines, and pots/traps) may occur after repeated deployments. If VME habitats are to be guaranteed full protection, then a full fishery closure would be required, including a buffer zone around the habitat to avoid accidental inadvertent damage from gear deployments. ICES advises that such a buffer zone should have a width of at least twice the water depth.

ICES presents the available information by region in the section below. However, for likelihood of VME occurrence, ICES provides as an example, only information for an area off NW Scotland.

Faroe-Shetland Channel and Rockall Trough (ICES subareas 2, 4, 5, and the northern part of Subarea 6)

The fisheries footprint in the Faroe-Shetland Channel does not extend deeper than approximately 500 m, follows depth contours, and extends along the shelf break (Figure 2).

The fisheries footprint is extensive and continuous along the southern slopes of the Wyville-Thompson Ridge, the Rosemary Bank, the Anton Dohrn and Hebrides Terrace seamounts, and the eastern and southern slopes of the Rockall Trough (Figures 2 and 3). The Darwin Mounds UK marine protected area (MPA) is closed to fishing and little activity was recorded within it in 2009–2011. The top of the Wyville-Thompson Ridge is also a UK MPA and there was also little fishing in this area. Much of the footprint is in waters deeper than 800 m and represents trawling.

In these areas, there are extensive areas of known VME habitats (Figure 4), especially on the Rockall Bank and the other offshore banks. Along the continental slopes there are mainly medium and low indications of VMEs (Figures 5 and 6). However, on the Wyville-Thompson Ridge and especially the slopes of the Rockall Bank there are extensive areas with high indications of VMEs (Figure 7). On the Rockall Bank, much of the VME occurrence is within the 2009–2011 fisheries footprint.

West of Ireland (ICES Division 6.b and Subarea 7)

The fisheries footprint extends continuously into this region from the slopes of the Rockall Trough (Figure 3). Except for a few areas on the west side of the Porcupine Bank, the footprint extends below 800 m. The fisheries footprint is not continuous in the Porcupine Seabight, with areas of activity below 800 m being discrete from the main footprint.

VME occurrence data in this area are largely missing from ICES databases. Until these data become available, ICES cannot provide advice on VMEs in relation to the fisheries footprint.

Bay of Biscay for (ICES Subarea 8)

The fisheries footprint extends continuously into this region from the Porcupine Seabight and Goban Spur (Figure 8). The footprint extends below 800 m, but is not always continuous in those depths, with discrete outlying footprint areas.

There are isolated occurrences of known VME habitats all along the continental margin, from the Goban Spur to southwest France (Figure 9). VME data are incomplete for the southern part of Subarea 8. Until these and the relevant VMS and logbook data become available, ICES cannot provide advice on VMEs in relation to the fisheries footprint.

Iberia (ICES Division 8.c and Subarea 9)

The fisheries footprint is poorly estimated in Division 8.c, owing to a lack of data (Figure 10). In Division 9.a, the footprint occupies a narrow strip along the continental margin, much of it below 800 m.

Known VME habitats for the southern part of Subarea 9 are shown in Figure 11.

Azores (ICES Subarea 10)

The fisheries footprint is patchy across a wide area around the Azores archipelago (Figure 12) and is mostly below 800 m. This footprint mainly relates to static gear.

There are scattered isolated occurrences of known VME habitats in various places across the region (Figure 13).

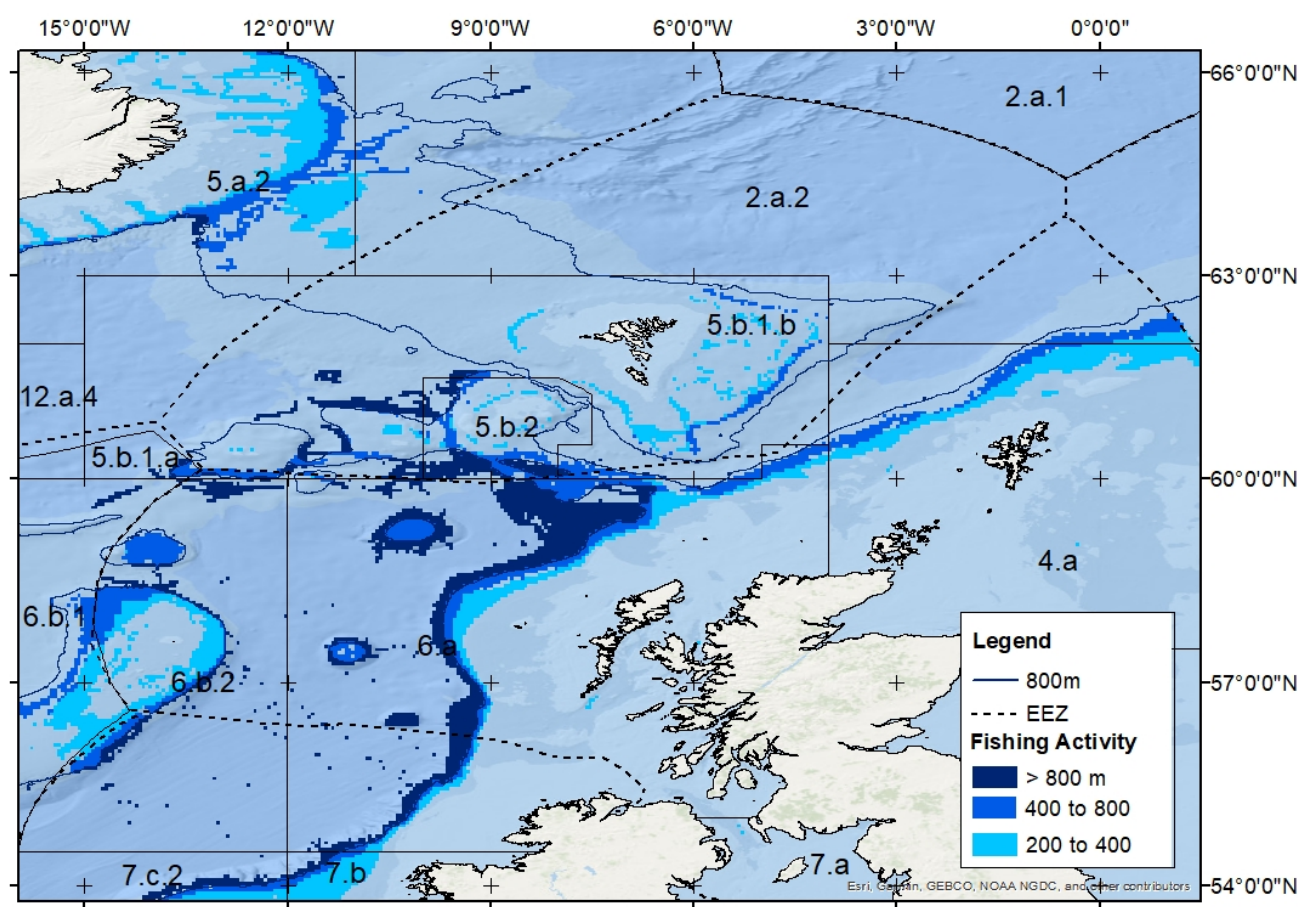


Figure 2 Fisheries footprint (2009–2011) in relation to the 800 m depth contour and the EU EEZ for ICES subareas 2, 4, 5, and the northern part of Subarea 6.

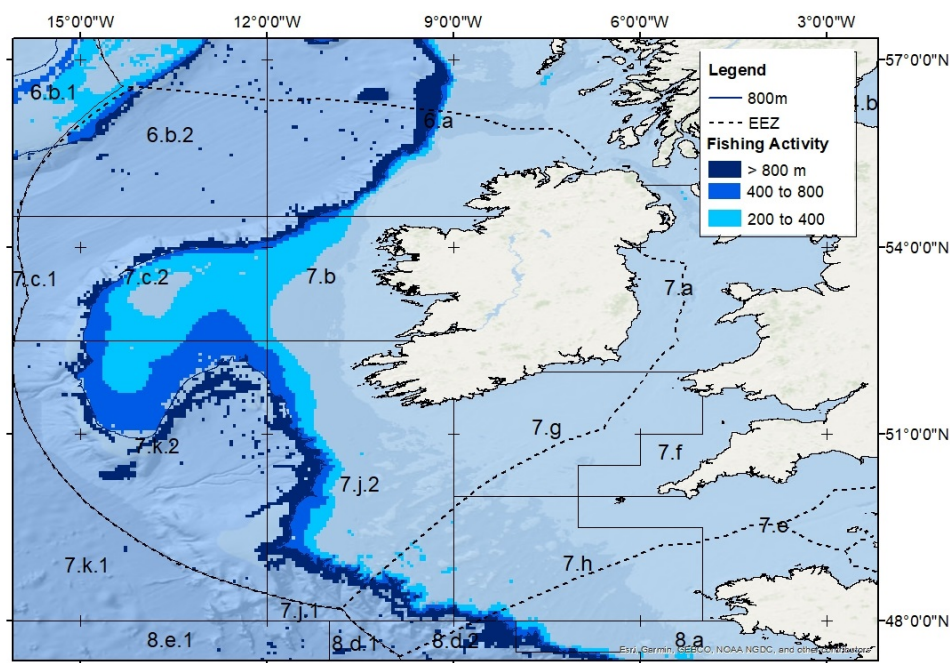


Figure 3 Fisheries footprint (2009–2011) in relation to the 800 m depth contour and the EU EEZ for ICES Division 6.b and Subarea 7.

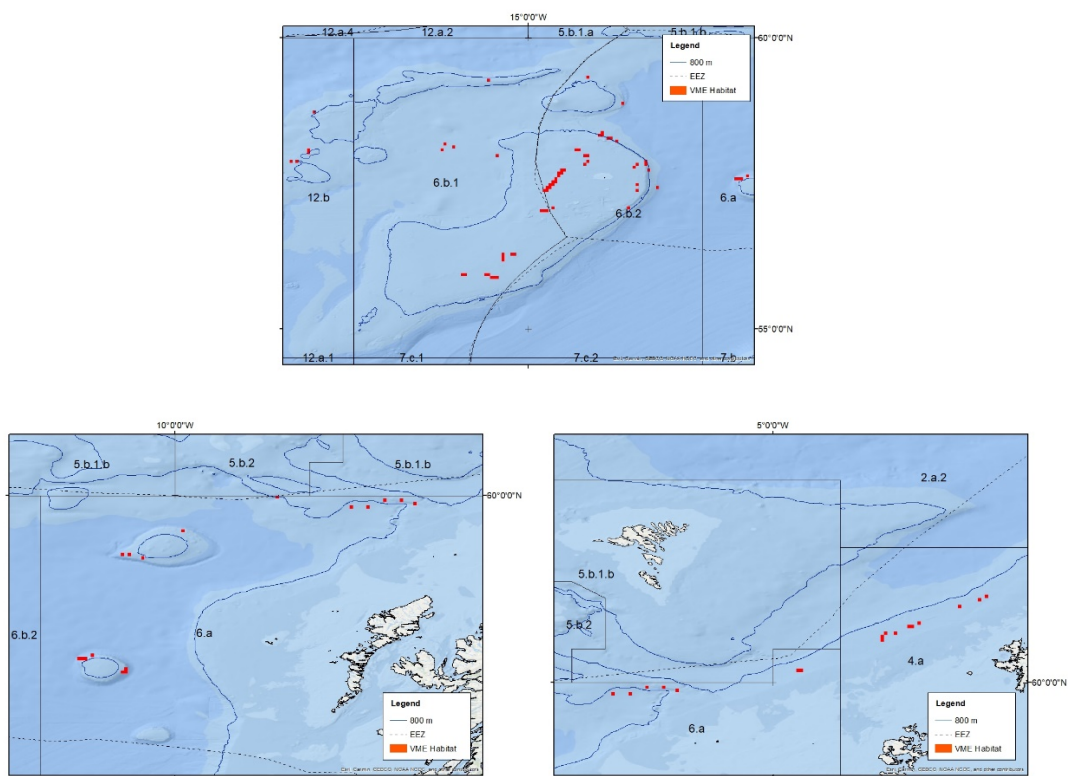


Figure 4 Three panels showing known VME habitat occurrence for ICES subareas 2, 4, and 5 and Division 6.a North.

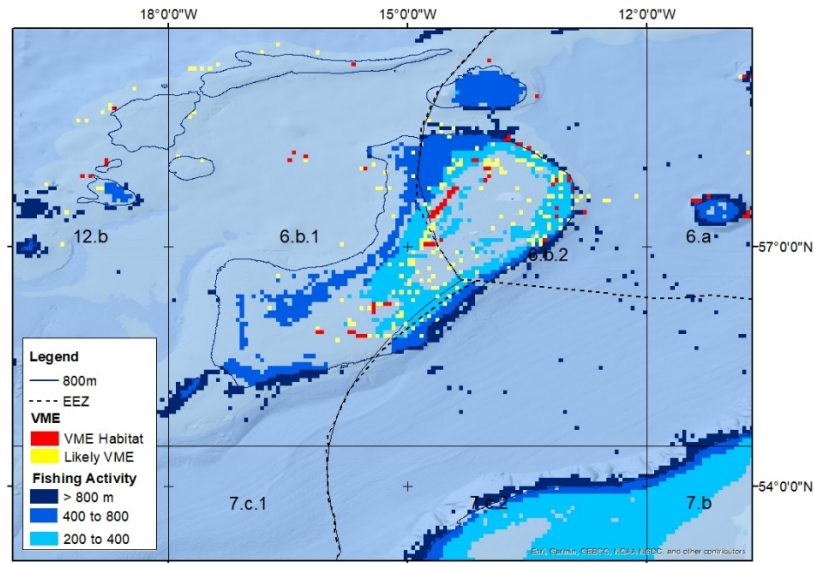


Figure 5 Known VME habitats and an example of expressing “likely VME” using c-squares with high VME index, with high and medium confidence levels, and the bottom fisheries footprint (2009–2011), for Division 6.b.

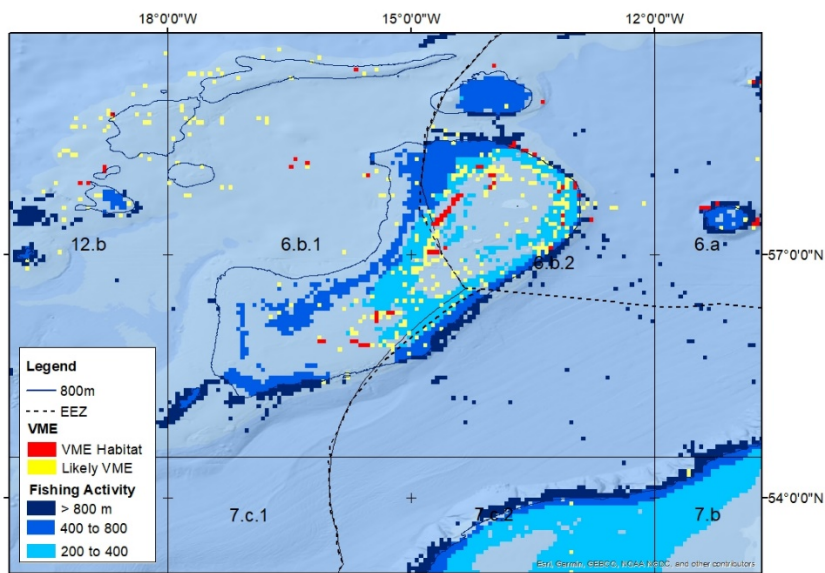


Figure 6 Known VME habitats and an example of expressing “likely VME” using c-squares with high and medium VME index, with any level of confidence, and the bottom fisheries footprint (2009–2011), for Division 6.b.

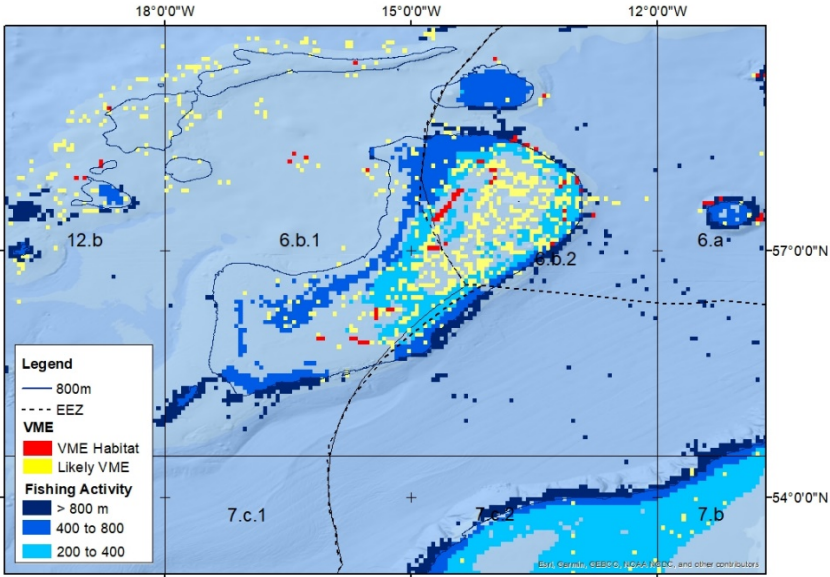


Figure 7 Known VME habitats and an example of expressing “likely VME” using c-squares with any VME index, with any level of confidence, and the bottom fisheries footprint (2009–2011), for Division 6.b.

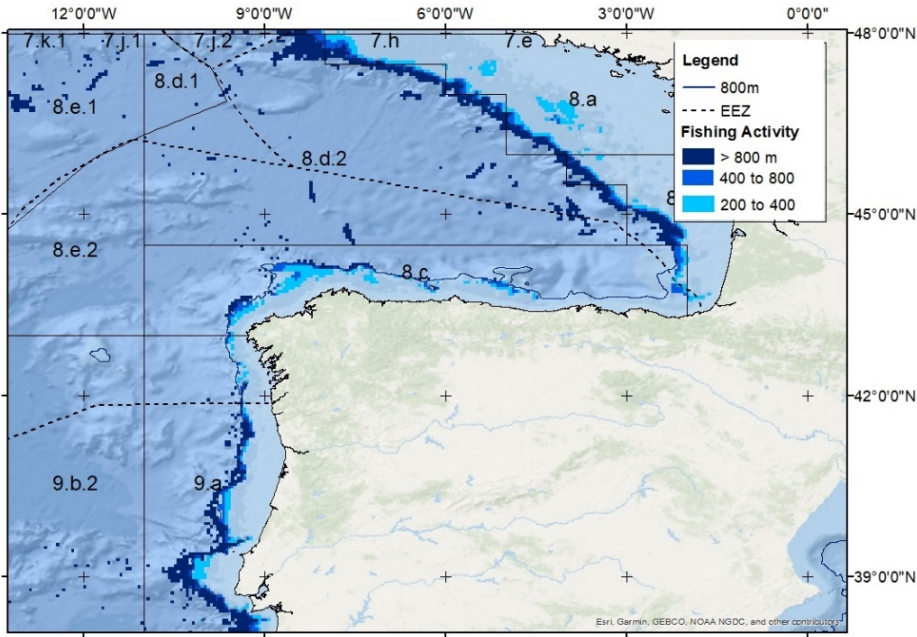


Figure 8 Fisheries footprint (2009–2011) in relation to the 800 m depth contour and the EU EEZ for subareas 8 and 9.

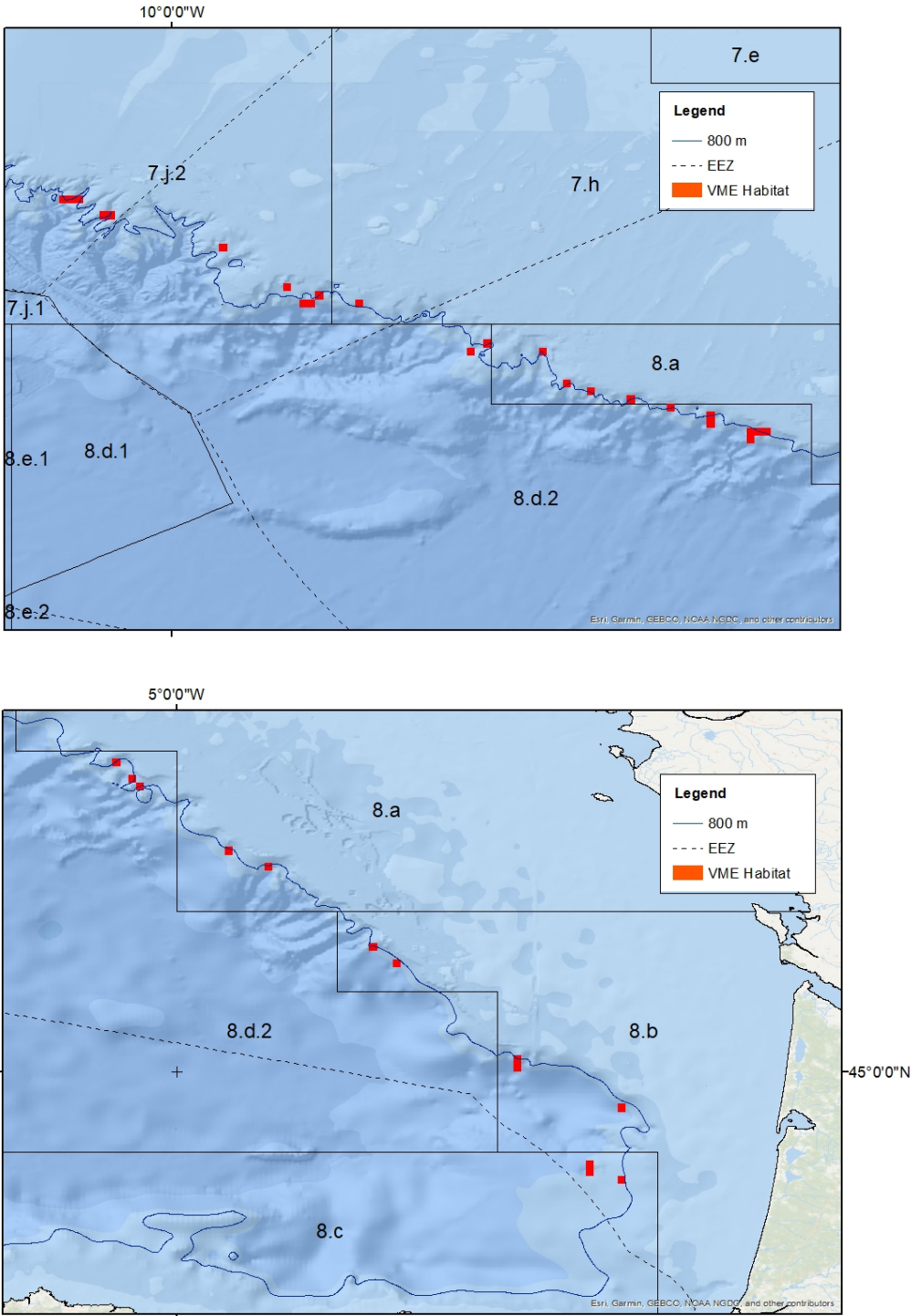


Figure 9 Two panels showing known VME habitat occurrence for Subarea 8.

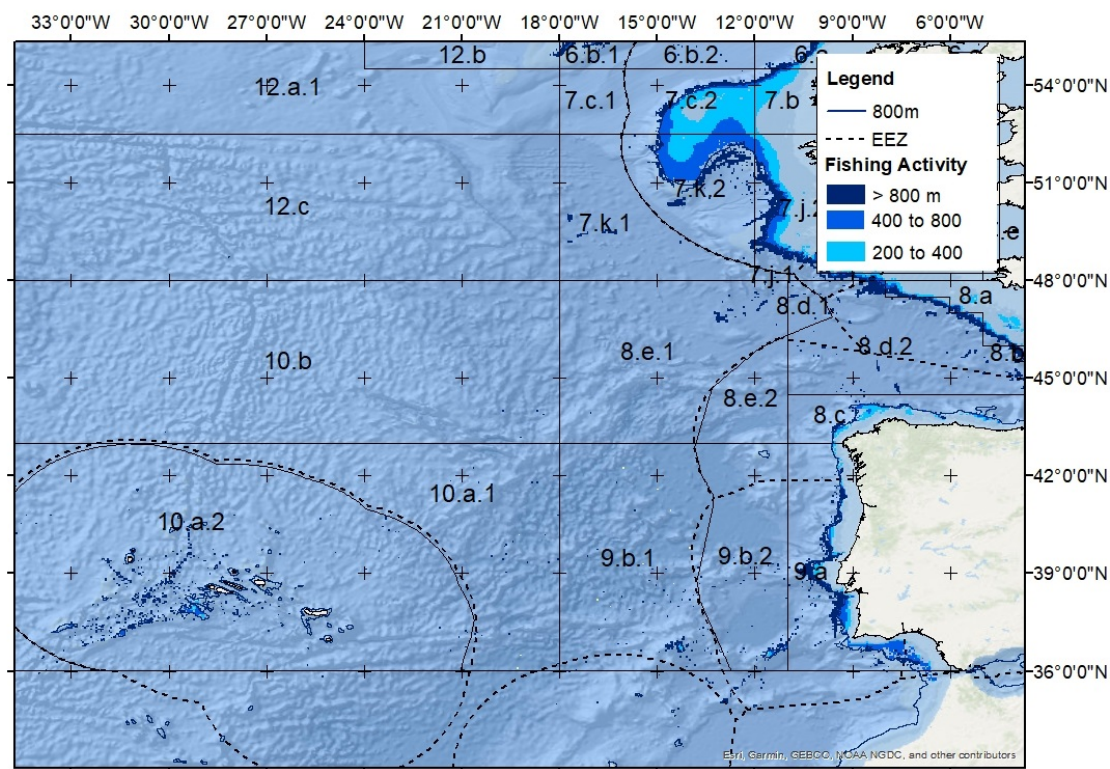


Figure 10 Fisheries footprint (2009–2011) in relation to the 800 m depth contour and the EU EEZ for subareas 8, 9, 10, and 12.

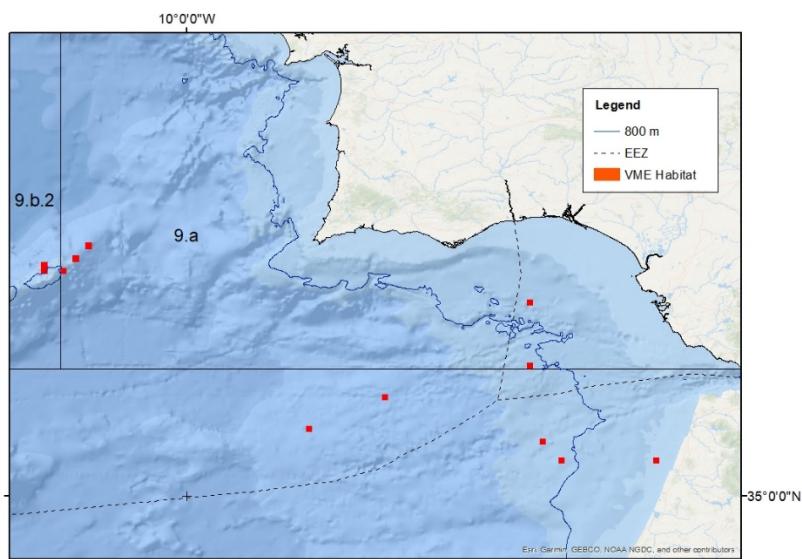


Figure 11 Known VME habitat occurrence for southern part of Subarea 9.

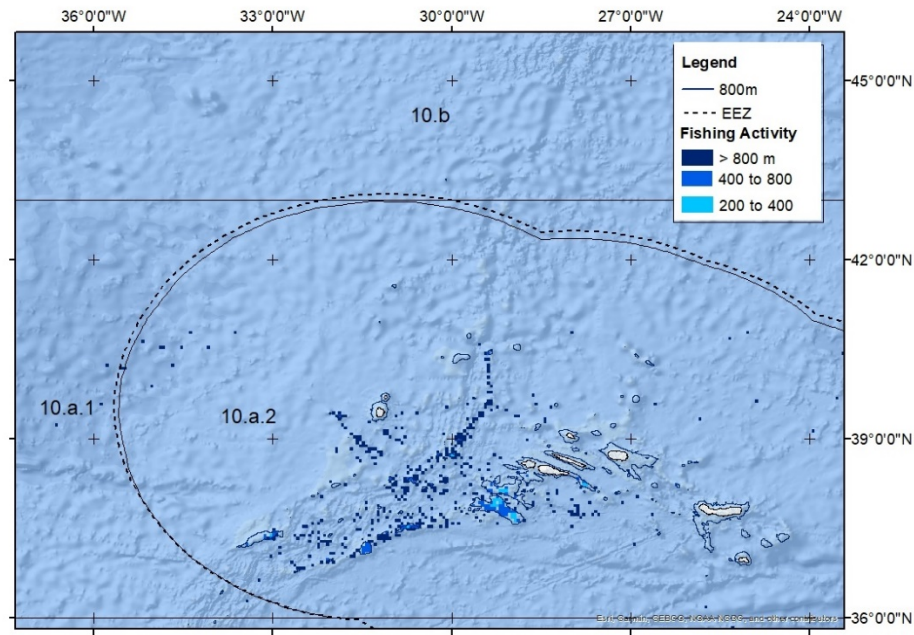


Figure 12 Fisheries footprint (2009–2011) in relation to the 800 m depth contour and the EU EEZ for Subarea 10.

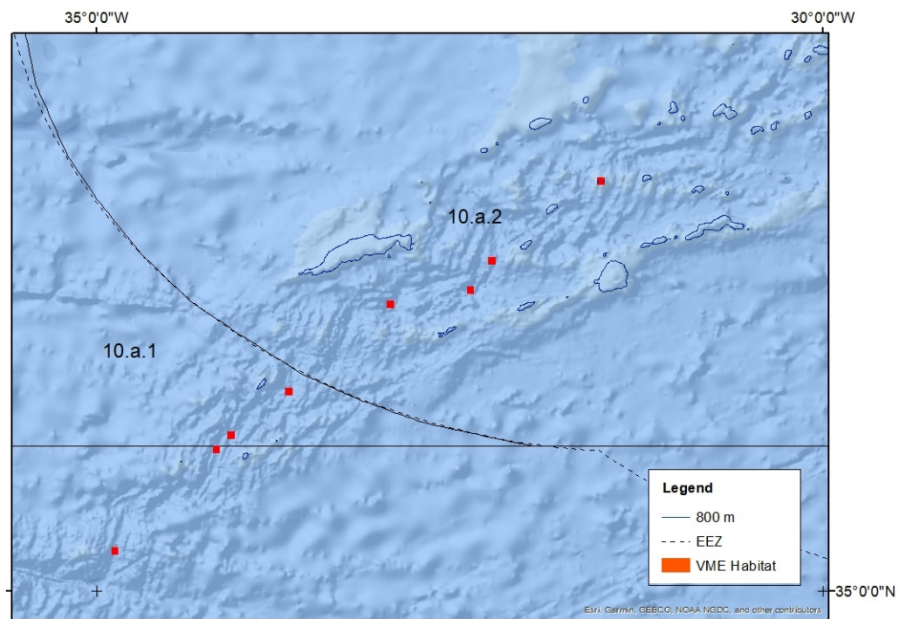


Figure 13 Known VME habitat occurrence for Subarea 10.

Suggestions

ICES notes a typographic error in Annex III of Regulation EU 2016/2336: under VME Habitat type 3, the first entry should read “Ostur sponge aggregations”, rather than “Other sponge aggregations”.

ICES notes the ability, provided under Article 9 of Regulation EU 2016/2336, to review and amend the list of VME indicators in Annex III of the Regulation. ICES suggests that the Commission add the following two VME Habitats to Annex III:

- Hydrothermal vents/fields with typical species including *Alvinocaris* spp., *Munidopsis* spp. and *Thyasira* spp.;

- Cold seeps with the same typical species groups. Both of these habitats are included on the FAO Vulnerable Habitat List and occur in EU waters. ICES can provide a full list of representative taxa if required.

ICES notes the absence of VMS data for vessels under 15 m in length, for the period 2009–2011 in this advice, and how this biases the understanding of the spatial fisheries footprint. ICES suggests that other means could be explored to address this problem. For vessels of 12–15 m, adopting a VMS reference period after 2012 could be considered. In addition, logbooks for vessels of 10–15 m could provide relatively coarse (to statistical rectangle) spatial information for the 2009–2011 reference period.

Basis of the advice

Background

This advice helps fulfil a requirement under the European Union's deep-sea access regulation (EU 2016/2336) for the European Commission to establish a fishing footprint for deep-sea fisheries (Article 7). Fishing with bottom trawls is prohibited at depths deeper than 800 m (Article 8), so these areas within the fishing footprint are also identified. Article 9 of the same Regulation requires the establishment of a list of areas where VMEs occur or are likely to occur. In this advice, ICES provides maps of VMEs that occur in European Union waters of the North Sea and the Atlantic. ICES is aware of some VMEs missing from these maps, but does not have access at present to the information on these sites.

Results and conclusions

Maps of total bottom fishing presence were produced for the reference calendar years 2009–2011 (Figures 2, 3, 8, 10, and 12).

Methods

Following a data call, VMS data were received from 16 countries (Table 1).

Table 1 VMS and logbook data received by ICES for 2009–2011.

Country	Data received	Country	Data received
Belgium	✓	Latvia	✓
Denmark	✓	Lithuania	✓
Estonia	✓	The Netherlands	✓
Faroe Islands	✗	Norway	✓
Finland	✓	Poland	✓
France	✓	Portugal	✓
Germany	✓	Russia	✗
Greenland	✗	Spain	✗
Iceland	✓	Sweden	✓
Ireland	✓	United Kingdom	✓

✓: data received.

✗: no data received.

All received data were quality controlled. Data which failed quality control were referred back to the submitting country for correction and resubmission. All countries from which data were received eventually passed quality control. Data that passed the quality control checks were used to produce shapefiles and maps. Bottom gears as defined by ICES (2017) for mobile gears and level 4 static gear codes, FPO (fishing pots), LLS (longlines), and GNS (set gillnets), were included. Métier level 5 codes were excluded for set gillnets: GNS_SPF and GNS_LPF, set gillnets targeting small and large pelagic fish.

Each c-square representing active fishing was allocated to a depth based on its centre point.

Several caveats should be taken into account when considering this advice:

- VMS data for vessels under 15 m in length were not required during the reference period. This represents a gap in understanding of the fisheries footprint. This introduces a bias in the analysis that is expected to be strongest in areas where deep waters occur close to the coast, e.g. Iberia and the Azores.

- VMS data from certain countries (Table 1) were not received, introducing a bias in footprint in areas fished by those countries. This is likely to be in the Bay of Biscay, southern Celtic Seas, and Iberian waters.

Following a data call to its member countries, ICES used its VME database to identify areas where VMEs are known to occur.

ICES defines three options for identifying areas (c-squares of 0.05×0.05 degrees) where VMEs are likely to occur, using available data and observations on the occurrence of VME indicators and the level of certainty associated with such observations. Each VME indicator was assigned a vulnerability score based on the FAO criteria for identifying VMEs in the High Seas. This vulnerability score was combined with a score for the abundance of that VME indicator for each c-square where a VME indicator occurs, to give each c-square a VME index score. These index scores were then assigned to a category of low, medium, and high scores and mapped. Measures of the confidence of these scores were assessed using information on the survey(s) that found the indicator: the type of survey, the number of surveys, the time-span between the first and last surveys, and the time since the last survey. Scores for each of these survey features were combined into a single confidence index for the record. These confidence index scores were then assigned to a category of low, medium, and high scores and mapped.

The three options for “areas where VMEs are likely to occur” are, by order of increasing precaution and uncertainty:

1. High VME index, with high and medium confidence (example shown in Figure 5);
2. High or medium VME index, with any level of confidence (Figure 6);
3. Any VME index, with any level of confidence (Figure 7).

The choice between these options depends on the balance of risks that managers are prepared to take.

Sources and references

European Parliament and Council, 2016. Regulation (EU) 2016/2336 of the European Parliament and of the Council of 14 December 2016 establishing specific conditions for fishing for deep-sea stocks in the north-east Atlantic and provisions for fishing in international waters of the north-east Atlantic and repealing Council Regulation (EC) No 2347/2002. 19 pp.

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