

## New information regarding vulnerable habitats in the NEAFC Regulatory Areas

### Advice summary

ICES advises to maintain the existing closed areas to protect vulnerable marine ecosystems (VMEs). No additions to, or extensions of, the existing closed areas to protect VMEs in the NEAFC Regulatory Areas are advised at this time.

ICES notes that bottom-fishing activity was observed in a VME closure area on Rockall Bank in 2020 and occurred outside of the existing NEAFC bottom-fishing areas on Hatton Bank and in NEAFC Regulatory Area 3 in the Barents Sea.

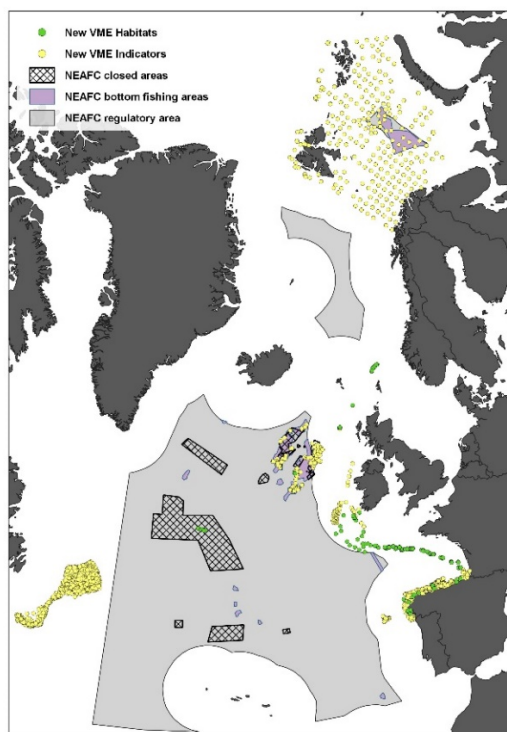
ICES advises that any bottom-contact fishing on VME habitats using static or mobile bottom-contacting gears will result in damage to these habitats and poses a risk of significant adverse impacts (as described by FAO [2009]). The inclusion of gear code in the daily catch reports would greatly improve the VMS data and understanding of potential adverse impacts of bottom-fishing activity on VMEs.

### Request

*NEAFC requests ICES to continue to provide all available new information on distribution of vulnerable habitats in the NEAFC Convention Area and fisheries activities in and in the vicinity of such habitats, including subareas closed to fishing for purposes other than VME protection, and provide advice relevant to help ensure the implementation by NEAFC of effective measures to prevent significant adverse impact of bottom fishing activity on vulnerable marine ecosystems known to occur or likely to occur in the NEAFC Regulatory Areas.*

### Elaboration on the advice

Vulnerable marine ecosystems (VMEs) are habitats sensitive to bottom-contacting fishing activities (FAO, 2009; ICES, 2021a). In 2021, a total of 273 new VME records (27 VME habitat records and 246 VME indicator records) were submitted to ICES VME database for NEAFC Regulatory Areas (RA) 1 and 3, including the Rockall Bank, Hatton Bank, the Charlie-Gibbs Fracture Zone on the Mid-Atlantic Ridge (NEAFC RA 1), and the Barents Sea 'Loophole' (NEAFC RA 3 [Figure 1]).



**Figure 1** NEAFC areas where new VME records have been submitted in 2021 are shown.

## New information on the distribution of VMEs and fishing activities in and in the vicinity of VMEs within NEAFC RA 1

### Rockall Bank

There were two new VME habitat records and 125 new VME indicator records for the Rockall Bank in 2021 (Figure 2 2). The VME habitat records occur outside of any existing VME closure areas and also outside of the existing NEAFC fishing area on the Rockall Bank. Therefore, no VME closure extension/proposal is advised at this stage. All new VME indicator records are also located outside of existing VME closures. Of the 125 new indicators records, 15 are located within the Haddock Box closure area. This brings the total number of VME indicator records within the NEAFC portion of the Haddock Box closure to 260 (and to 447 including the area within the EEZs of UK and Ireland). There are currently no VME habitat records for the Haddock Box, and the updated VME index indicates that there are 36 cells with a high likelihood of VME occurrence in the Haddock Box (including 24 cells within the NEAFC portion of the Haddock Box), none of which meet the high confidence criterion applied by ICES to identify new sensitive areas (ICES, 2017 [Figure 3]). As a result, no further extension of existing VME closures are advised for the Haddock Box. Should NEAFC wish to apply a precautionary approach (e.g. include cells with lower VME index and/or confidence level), the Haddock Box area would be included in the VME closures so as to prevent significant adverse impacts from bottom fishing activity on VMEs, should they occur.

The VME closures on the eastern side of the Rockall Bank are generally well observed and in 2020, fishing generally occurred within the existing NEAFC fishing area. The highest intensity of fishing occurred along the western boundary of the Haddock Box and extended northward along the boundary of the existing VME closure (4, 5, and 6). Vessels operating with no registered gears accounted for most of the effort (Figure 6). Bottom-contacting otter trawl activity extended southward of the Haddock Box and there were a number of tows in the larger VME closure in southwest Rockall (figures 4 and 5). Low levels of fishing activity were observed for vessels registered as using static gears within the existing fishing area outside any VME closure areas and the Haddock Box (**Error! Reference source not found.**).

## Hatton Bank

There were 96 new VME indicator records in 2021 for the Hatton Bank and no new VME habitat record (Figure 88). The majority of new VME indicator records occur outside or near the boundaries of existing VME closure areas and within the existing NEAFC fishing areas. No modifications to existing NEAFC VME closures in Hatton Bank area are advised as all new records were of VME indicators with varying degree of confidence, rather than *bona fide* VME habitats.

VME closures on Hatton Bank were generally well observed in 2020 (figures 9, 10, 11, and 12). All evidence of fishing activity was of vessels using bottom-contacting trawl gear, with fishing mainly occurring to the northwest of existing VME closures within the existing NEAFC fishing area. However, there is evidence of bottom trawling occurring outside the existing fishing area to the south of Hatton Bank (figures 10 and 12).

## Southwest of Iceland

In 2021, no new VME habitat or indicator records were submitted for the northwestern portion of NEAFC RA 1, including the Reykjanes Ridge.

In 2020 there was evidence of fishing activity by vessels registered as using bottom-trawling gears and no registered gear outside of the existing NEAFC fishing area to the southwest of Iceland (figures 13, 14, and 15). This fishing activity was concentrated in waters of depths of around 2000 m, near the boundary of the Icelandic EEZ. Activity was also observed from these vessels further west, in depths of 2500–3000 m, within the existing VME closure (Figure 13). The physical difficulty of bottom trawling in waters of such depths, coupled with the examination of daily catch reports from these vessels, which were reporting exclusive catches of redfish, suggests that this fishing activity represents midwater trawling for redfish which has been miscoded as bottom trawling.

## Charlie-Gibbs Fracture Zone and Mid-Atlantic Ridge

There were 25 new VME habitat records for the Charlie-Gibbs Fracture Zone on the Mid-Atlantic Ridge in 2021 (Figure 16), all of which occur within the existing VME closure and outside any existing NEAFC fishing areas.

The only fishing activity observed in and around the Mid-Atlantic Ridge area in 2020 occurred outside the existing NEAFC fishing areas and involved vessels operating with no registered gear in water depths in excess of 3000 m, outside the southeastern corner of the existing VME closure (Figure 17).

## Josephine Seamount

There were no new VME habitat or indicator records submitted for Josephine Seamount in 2021. New information on fishing activities is presented in a separate NEAFC special request advice document for the Josephine Seamount area (ICES, 2021b).

## New information on the distribution of VMEs and fishing activities in and in the vicinity of VMEs within NEAFC RA 3

There were 25 new VME indicator records submitted for the NEAFC Regulatory Area in the Barents Sea in 2021 (Figure 18). There are currently no VME closures in RA 3 and no proposal based on the available evidence.

Fishing activity mainly occurs within the existing NEAFC fishing area, although there is some evidence of low intensity bottom trawling and vessels operating with no registered gear in the northwest area (figures 19, 20, and 21). Vessels registered with bottom otter trawls are active in two main focus areas, with higher fishing intensities occurring in the southwest corner of the existing fishing area (Figure 20Error! Reference source not found.Error! Reference source not found.). Vessels with no registered gears are also active, with the highest intensities in the north of the existing fishing area (Figure 21).

## Basis of the advice

### Background

ICES applies a process for identifying sensitive areas of the seabed and advising on bottom fishing closures to protect VMEs (VME closures) within NEAFC regulatory areas. This process was defined in 2013 and updated in 2017 to account for the different information layers available, namely the VME habitat records and the VME index developed using the VME indicator weighting algorithm (ICES, 2018). The VME index has categorical values (low, medium or high likelihood of VME occurrence and confidence level) based on cumulative evidence of VME indicators. New sensitive areas are preferentially identified based on VME habitat records. In the absence of VME habitat records, grid cells corresponding to a high VME index and high confidence are considered as sensitive areas.

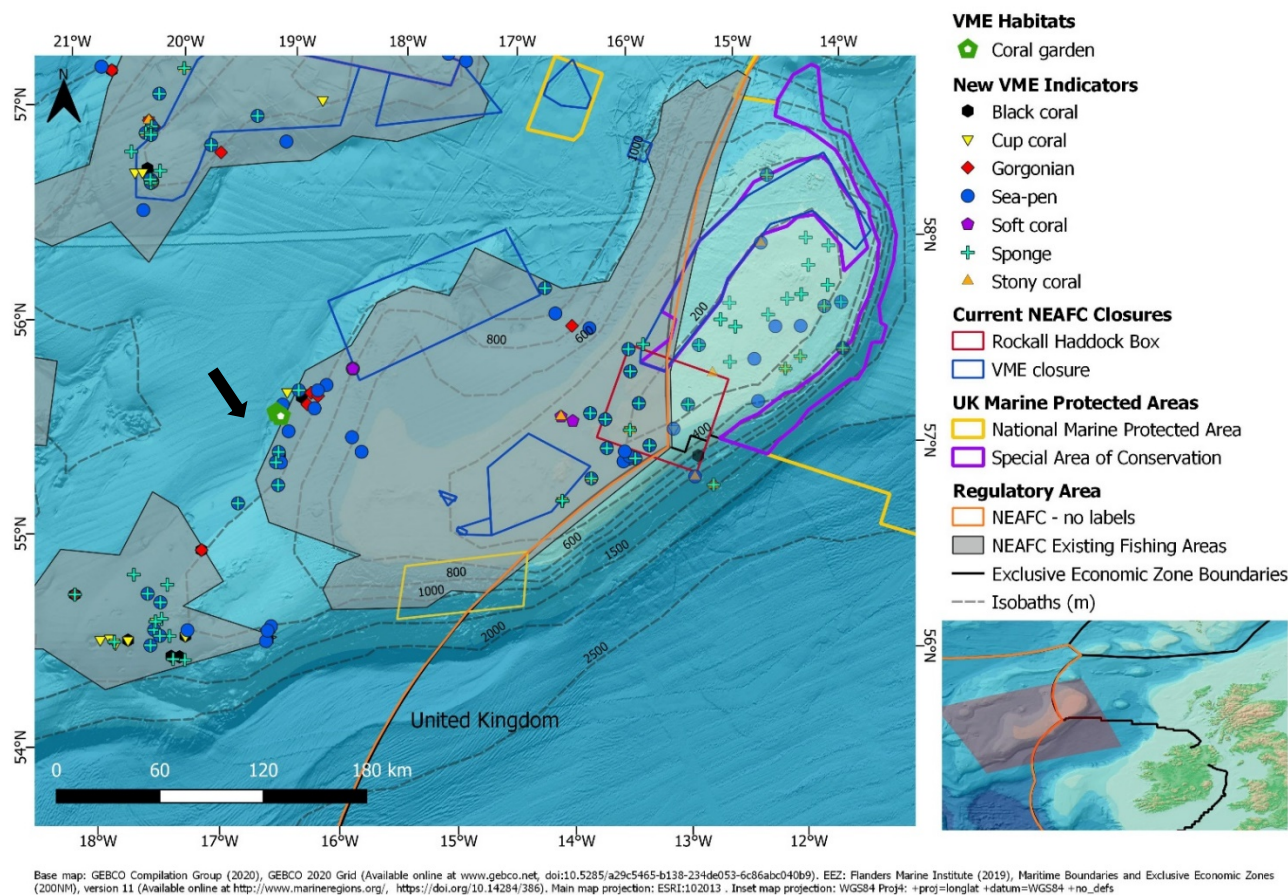
The NEAFC existing bottom fishing areas were adopted in 2009 based on bottom fishing activities in the period 1987 to 2007 (NEAFC, 2008).

### New information on the distribution of VMEs

Twenty-seven new VME habitat records were submitted in 2021 within NEAFC regulatory area (RA) 1, including 2 for the Rockall Bank and 25 in the Charlie-Gibbs Fracture Zone on the Mid Atlantic Ridge. New VME habitat records for the Rockall Bank were of a single area of coral garden habitat feature which was surveyed by two video tows during the Marine Scotland Science Rockall Haddock Survey (1320S) (Figure 2). The records are confirmed but the video footage of the VMEs is yet to be further analysed. VME habitat records submitted within the Charlie-Gibbs Fracture Zone on the Mid Atlantic Ridge included bryozoan patches, coral gardens, cold-water coral reefs, deep-sea sponge aggregations, sea-pen fields and xenophyophore aggregations and came from the Marine Institute Ireland's TOSCA survey (Figure 16).

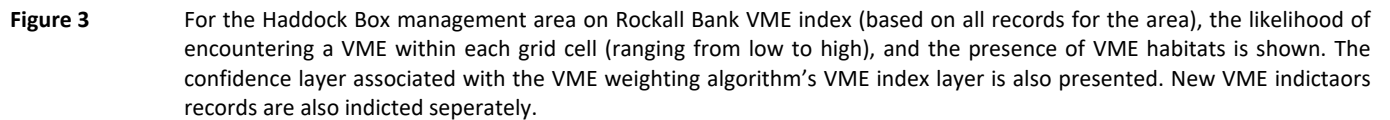
VME indicator records were submitted for the Rockall Bank, Hatton Bank and the NEAFC Regulatory Area 3 in the Barents Sea. The 125 new VME indicator records for Rockall Bank were comprised of black corals, cup corals, gorgonians, sea-pens, soft corals, sponges and stony corals (Figure 2). The 96 new VME indicators submitted for Hatton Bank included black corals, cup corals, gorgonians, sea-pens, soft corals, sponges, stony corals and xenophyophores (Figure 8). The 25 new VME indicator records for NEAFC RA 3 in the Barents Sea comprised a range of sponge and soft coral records (Figure 18).

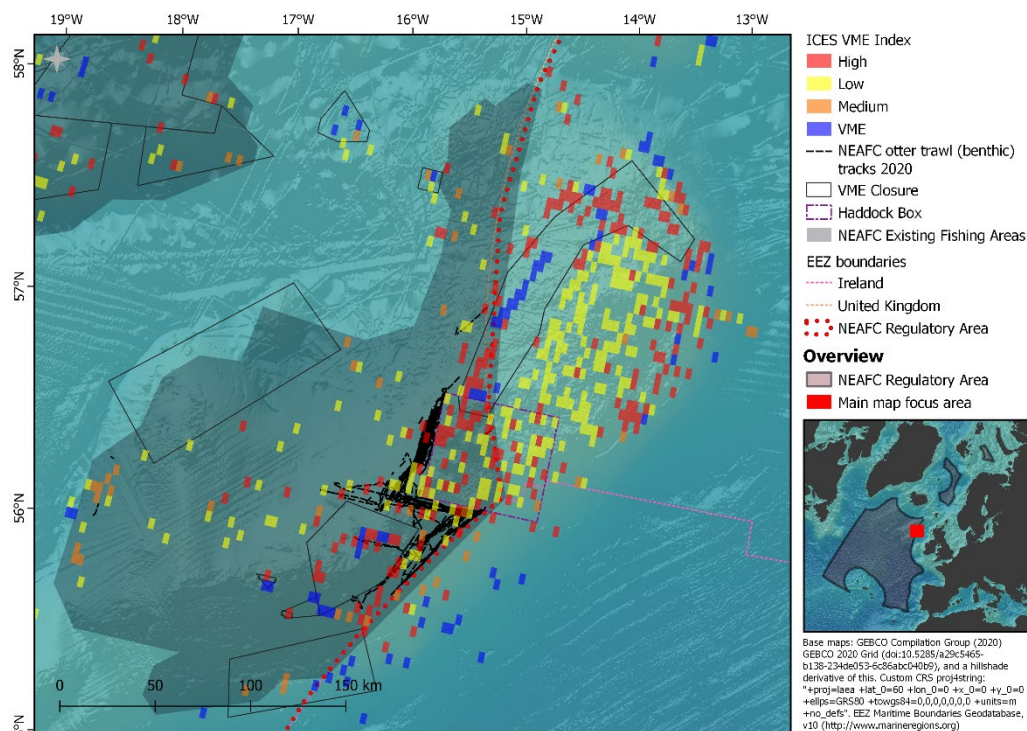
No new VME data were provided for NEAFC Regulatory Area 2 in 2021.



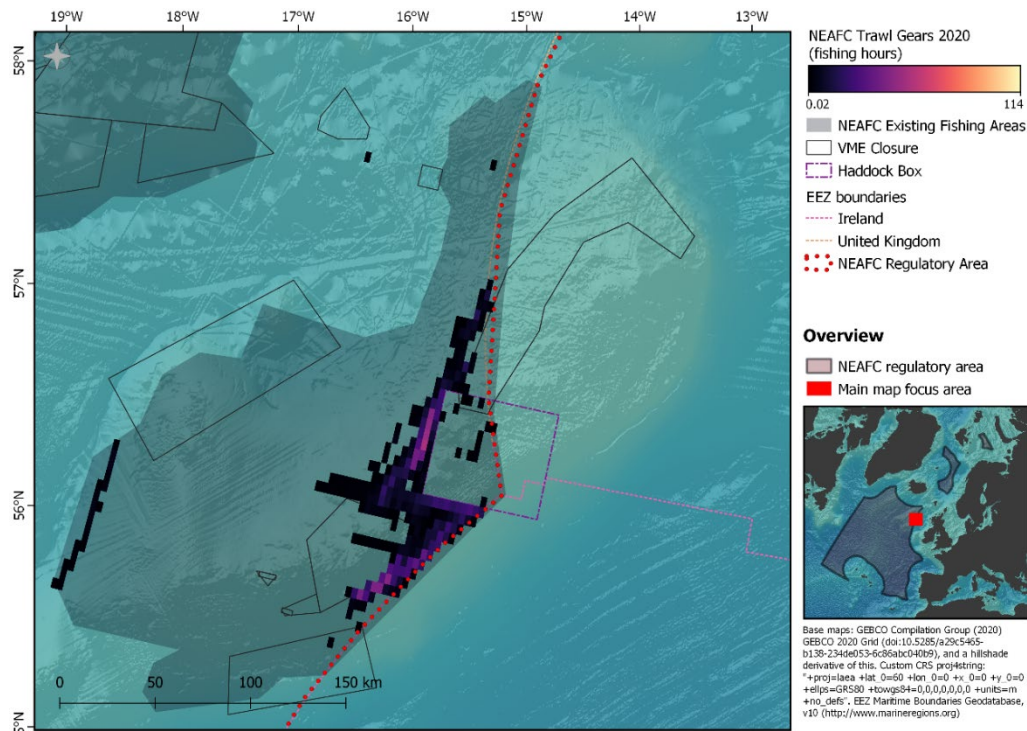
**Figure 2** New VME habitat and indicator records within the NEAFC Regulatory Area, submitted to the VME database in 2021 for Rockall Bank. The black arrow indicates the location of the coral garden VME habitats. Note: other existing VME indicator and habitat records from the VME database for this area are not displayed.





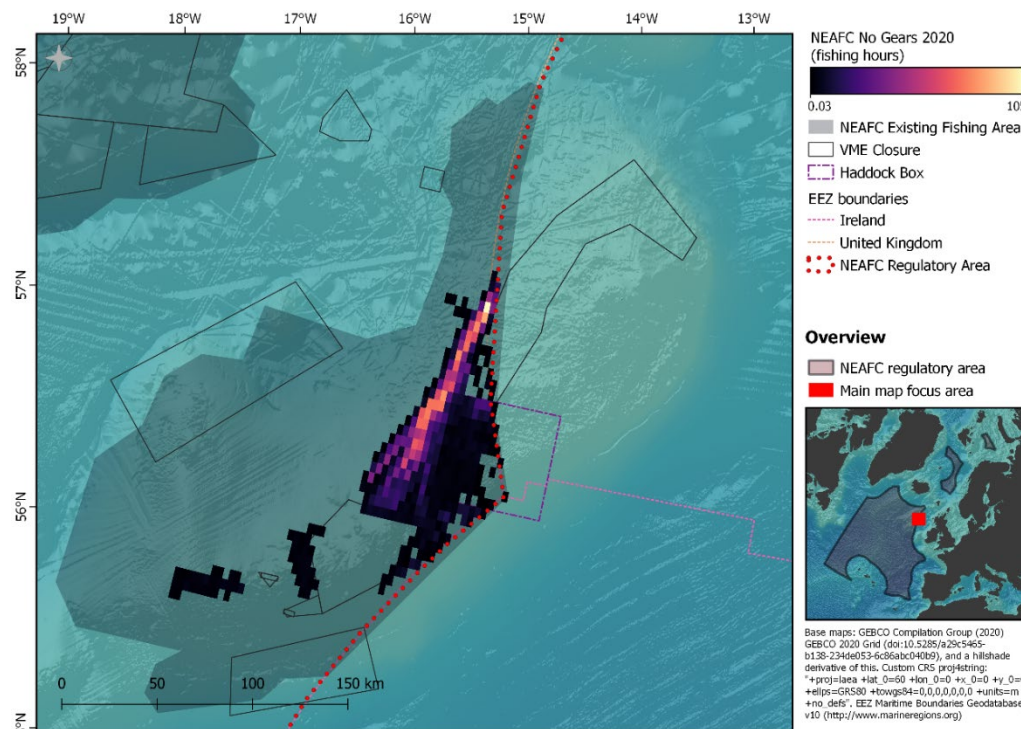


**Figure 4** Bottom contacting otter trawl tow tracks on Rockall Bank overlain with the VME index (based on all records for the area), the likelihood of encountering a VME within each grid cell (ranging from low to high), and the presence of VME habitats.

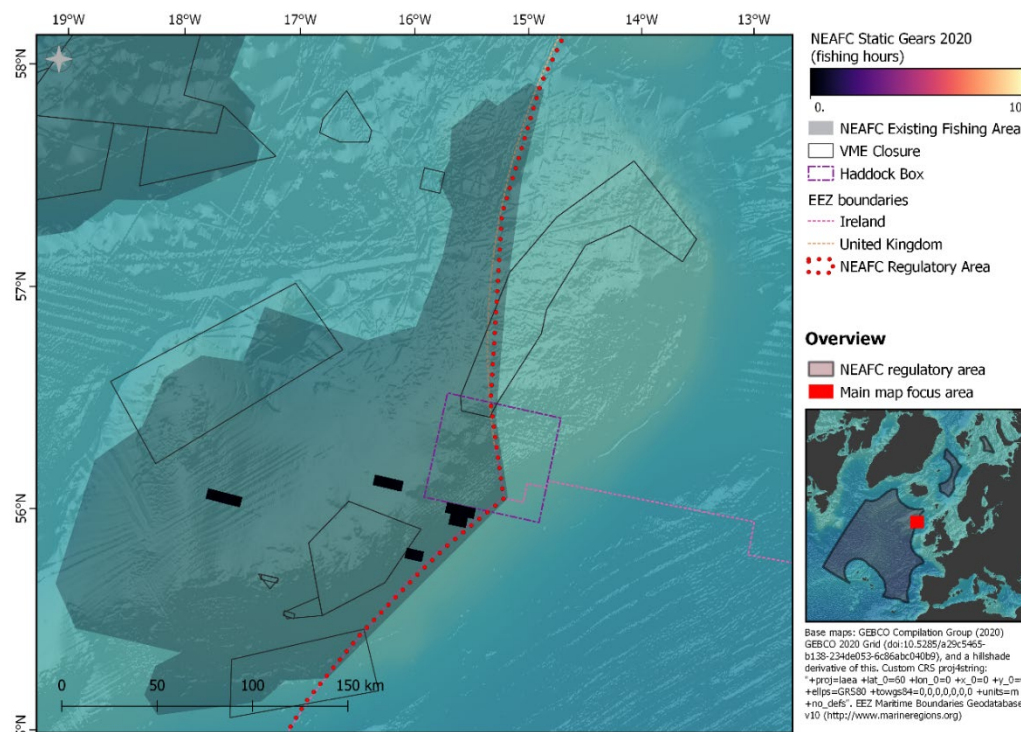


**Figure 5** Gridded data (fishing hours) for bottom-contacting trawl gears on Rockall Bank, overlain with VME closures, the Haddock Box, existing NEAFC fishing areas, and EEZ boundaries.



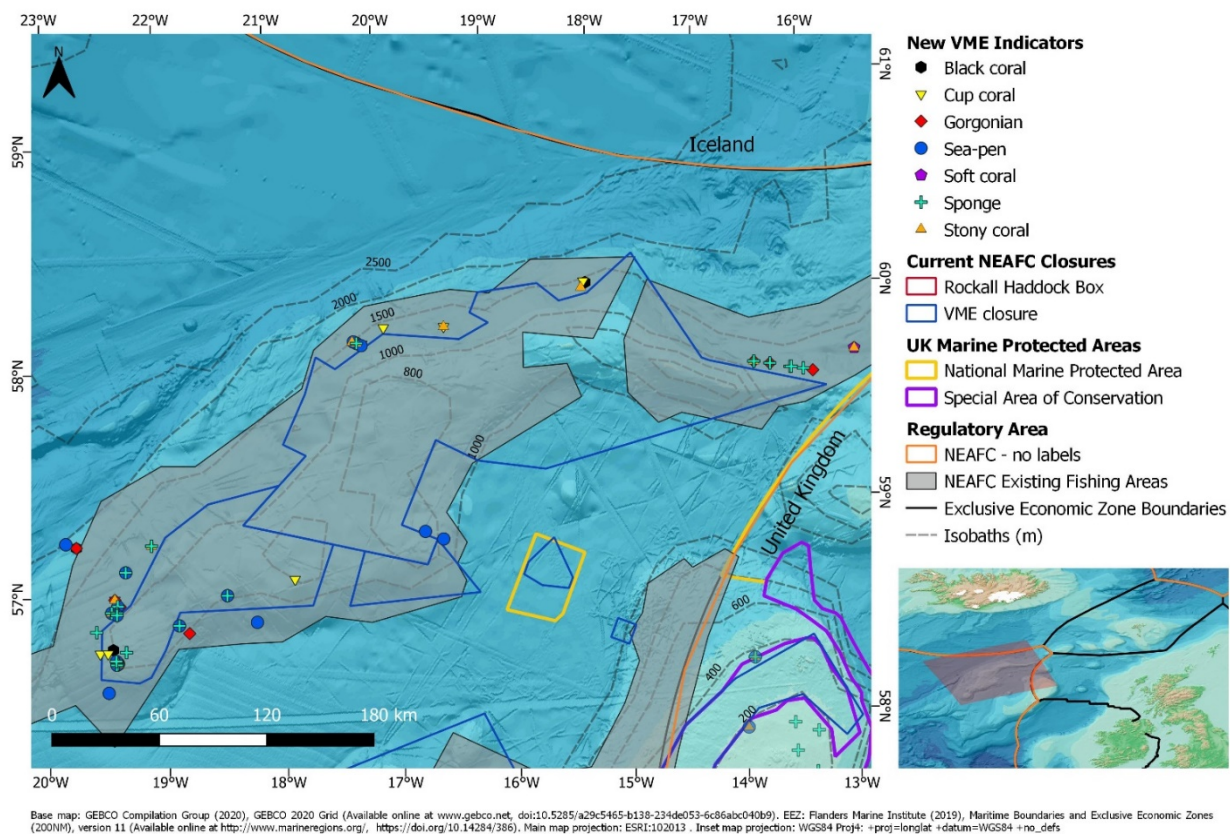


**Figure 6** Gridded data (fishing hours) where no gear was registered on Rockall Bank, overlain with VME closures, the Haddock Box, existing NEAFC fishing areas and EEZ boundaries.

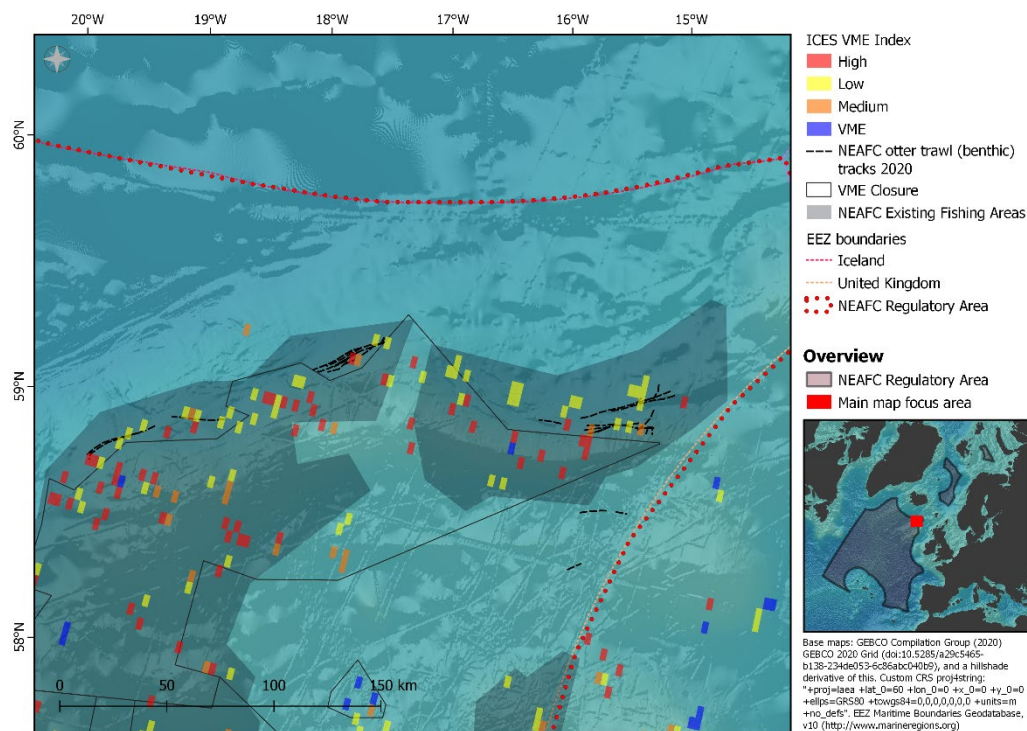


**Figure 7** Gridded data (fishing hours) for bottom contacting static gears on Rockall Bank, overlain with VME closures, the Haddock Box, existing NEAFC fishing areas and EEZ boundaries.

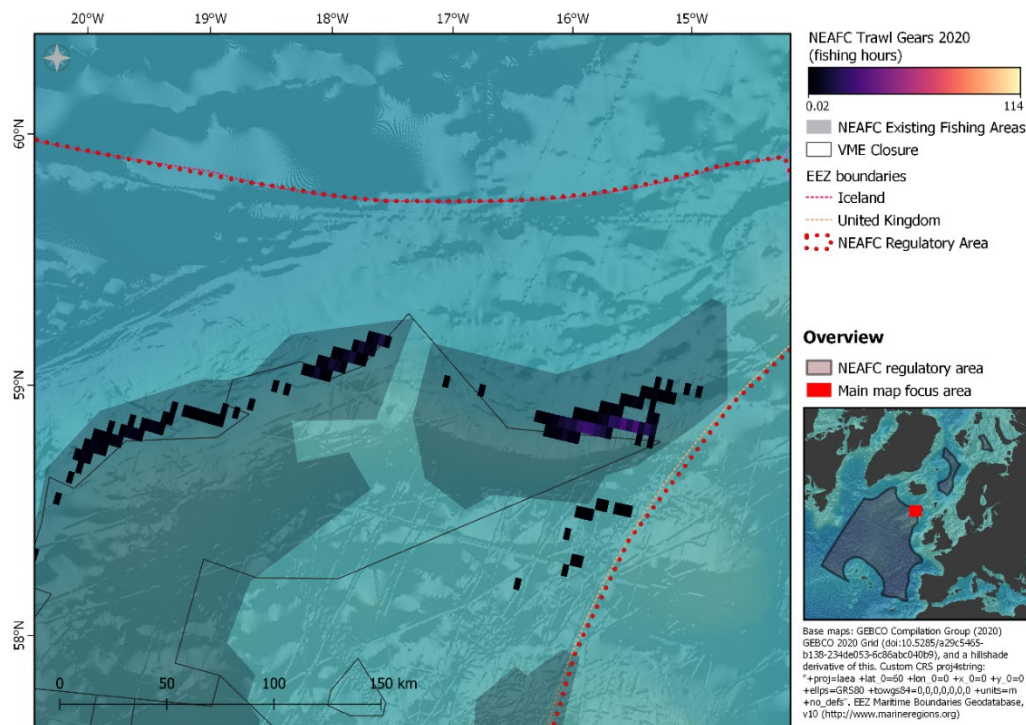




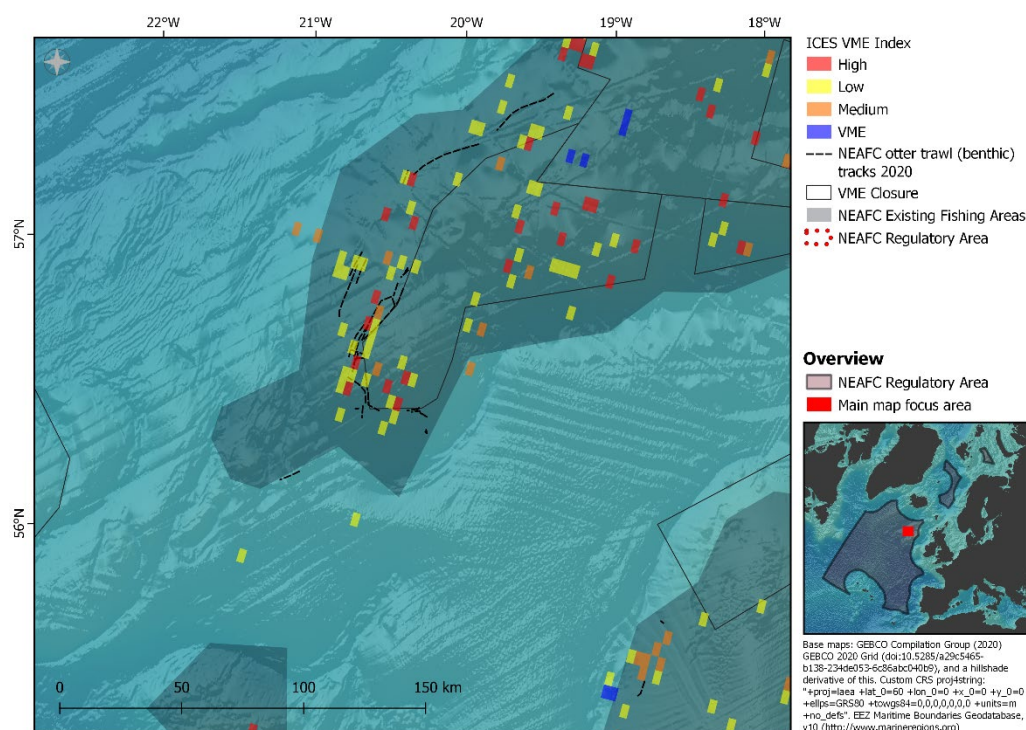
**Figure 8** New VME indicator record within the NEAFC Regulatory Area, submitted to the VME database in 2021 for the Hatton Bank. Note: other existing VME indicator and habitat records from the VME database for this area are not displayed



**Figure 9** Bottom contacting otter trawl tow tracks (black lines) to the north of Hatton Bank, overlain with the VME index (based on all records for the area), the likelihood of encountering a VME within each grid cell (ranging from low to high), and the presence of VME habitats.

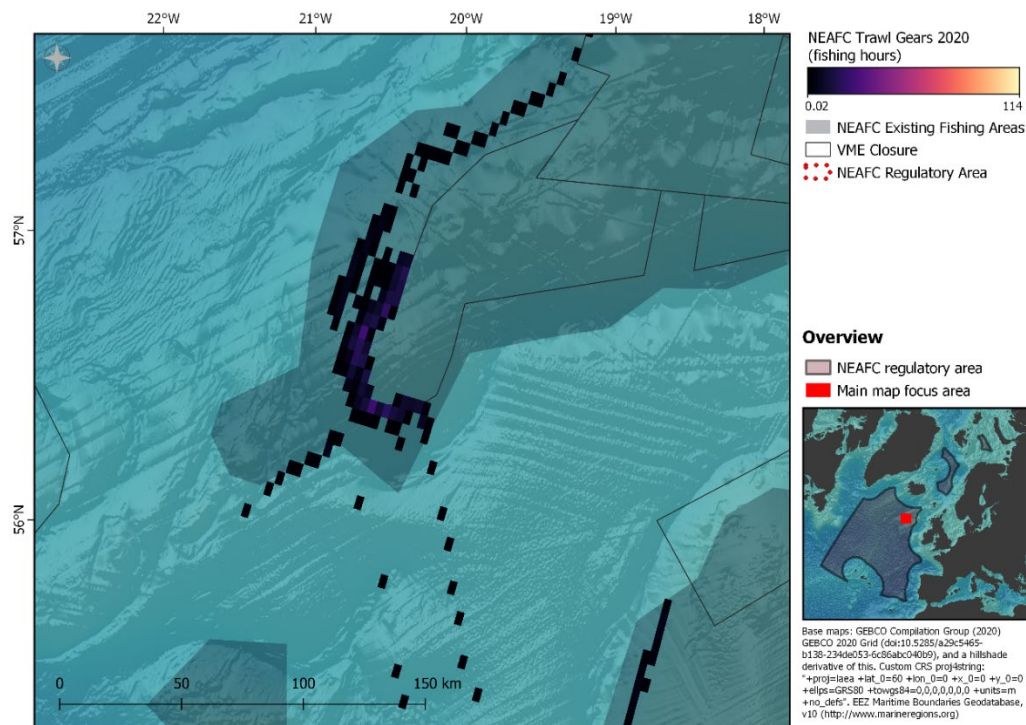


**Figure 10** Gridded data (fishing hours) for bottom contacting trawl gears to the north of Hatton Bank, overlain with existing NEAFC fishing areas and EEZ boundaries.

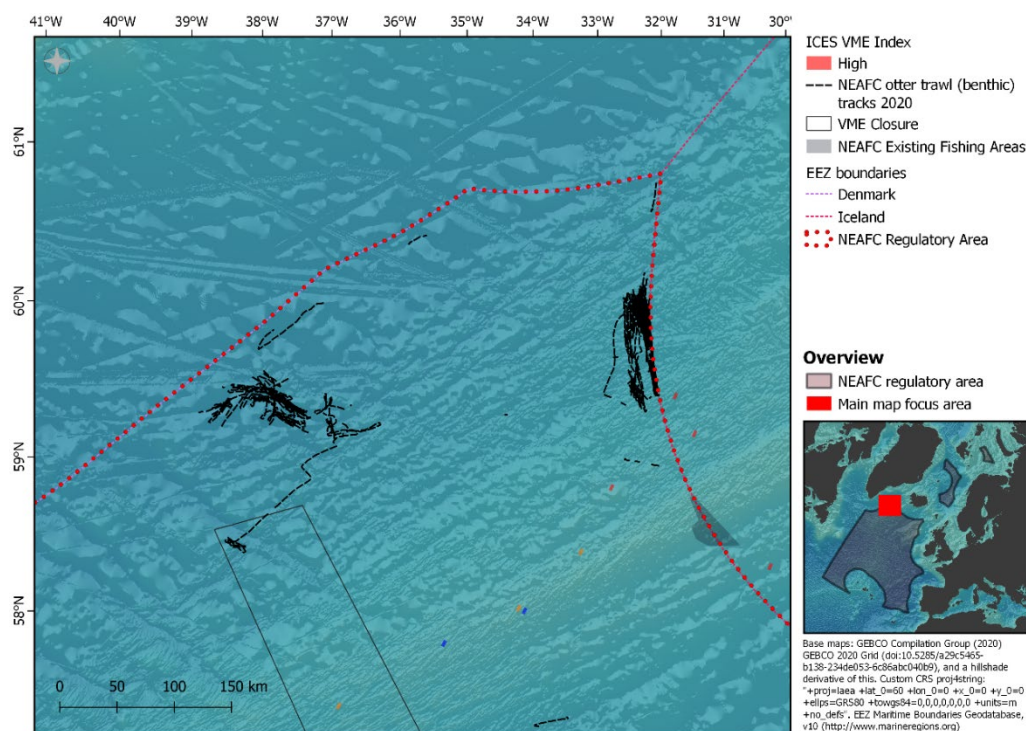


**Figure 11** Bottom-contacting otter trawl tow tracks to the west of Hatton Bank, overlain with the VME index (based on all records for the area), the likelihood of encountering a VME within each grid cell (ranging from low to high), and the presence of VME habitats.



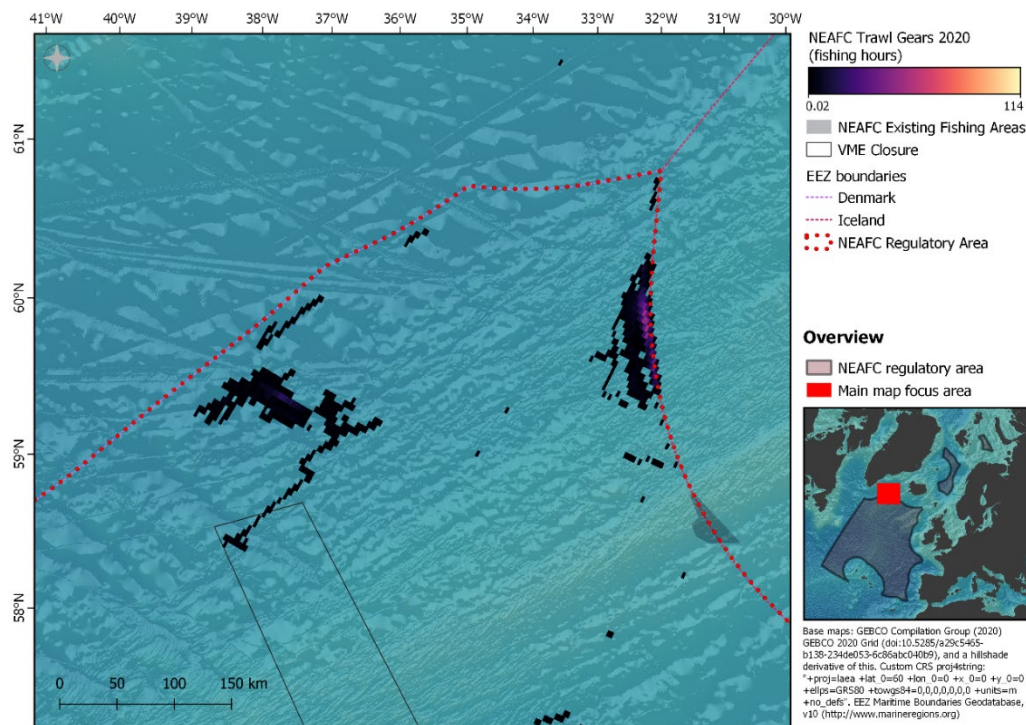


**Figure 12** Gridded data (fishing hours) for bottom contacting trawl gears to the west of Hatton Bank, overlain with VME closures and existing NEAFC fishing areas.

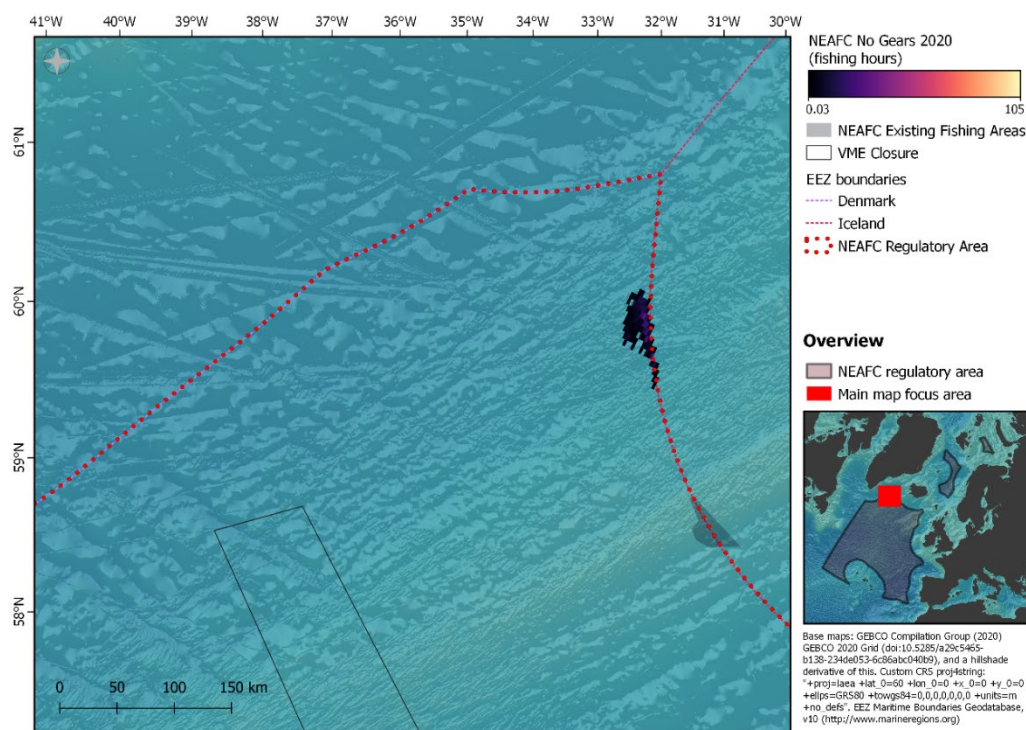


**Figure 13** Bottom-contacting otter trawl tow tracks southwest of Iceland overlain with the VME index (based on all records for the area), the likelihood of encountering a VME within each grid cell (ranging from low to high), and the presence of VME habitats.

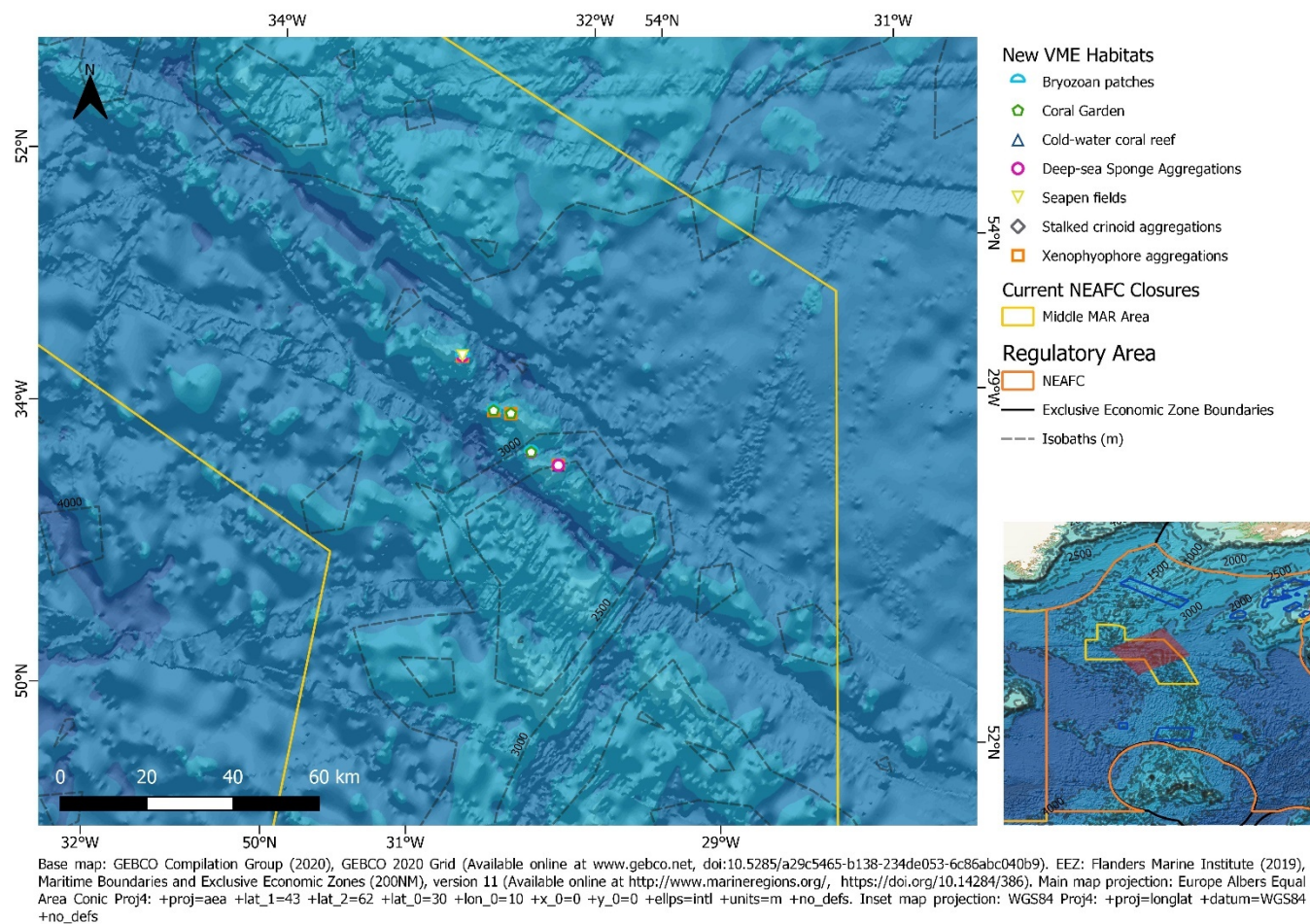




**Figure 14** Gridded data (fishing hours) for bottom-contacting trawl gears to the southwest of Iceland, overlain with VME closures, existing NEAFC fishing areas and EEZ boundaries.

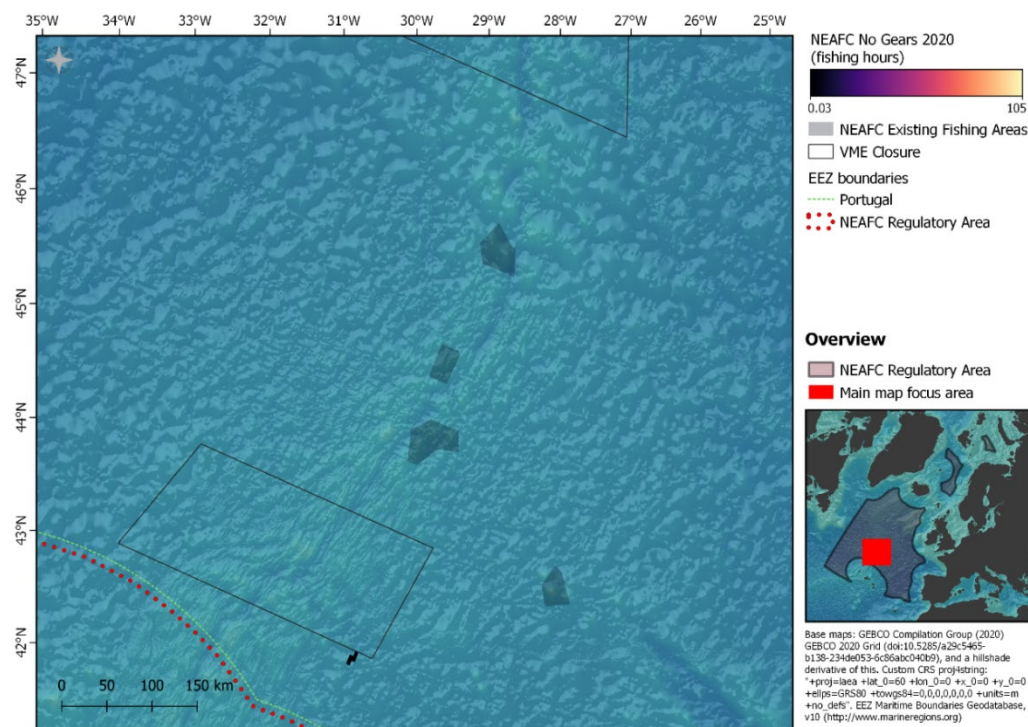


**Figure 15** Gridded data (fishing hours) where no gear was registered to the southwest of Iceland, overlain with VME closures, existing NEAFC fishing areas and EEZ boundaries.

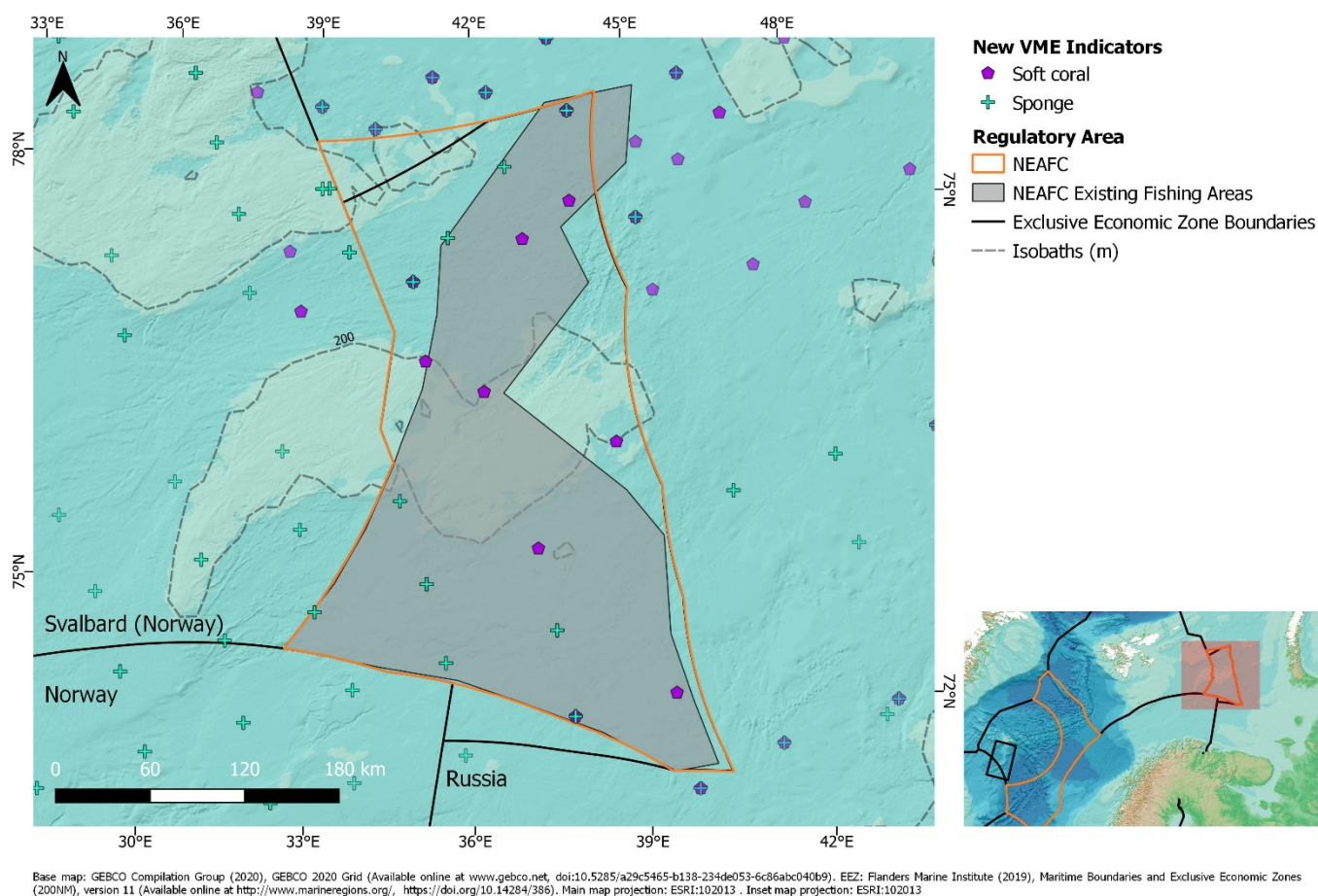


**Figure 16** New VME habitat records within the NEAFC Regulatory Area, submitted to the VME database in 2021 for the Charlie-Gibbs Fracture Zone on the Mid-Atlantic Ridge. Note: other existing VME indicator and habitat records from the VME database for this area are not displayed.



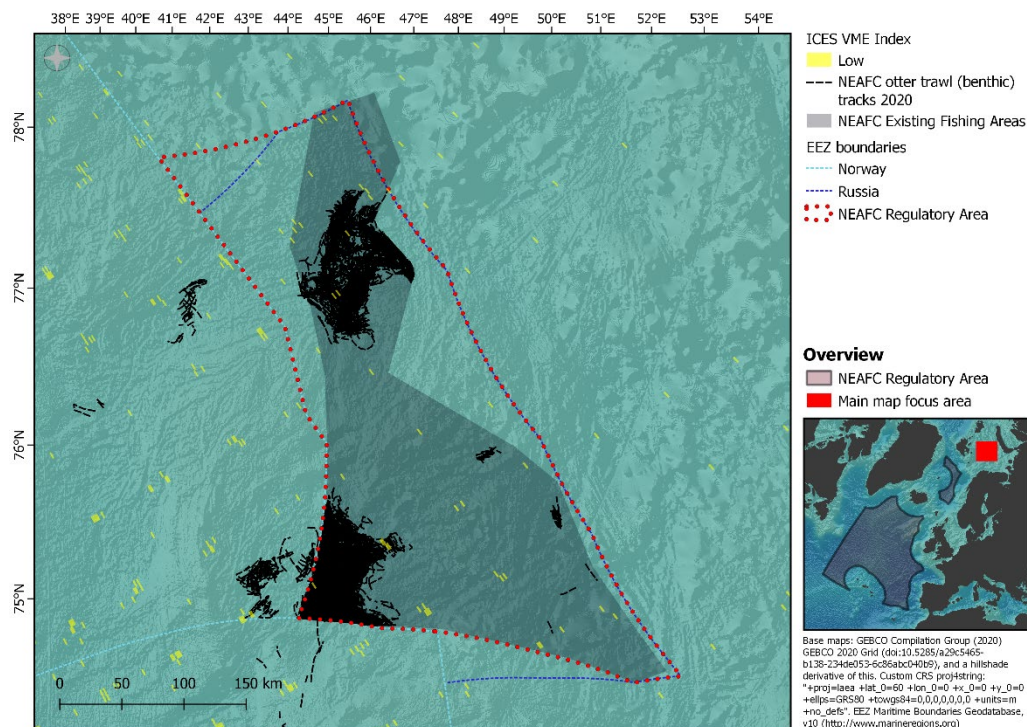


**Figure 17** Gridded data (fishing hours) where no gear was registered on the Mid-Atlantic Ridge seamounts, overlain with VME closures, existing NEAFC fishing areas and EEZ boundaries

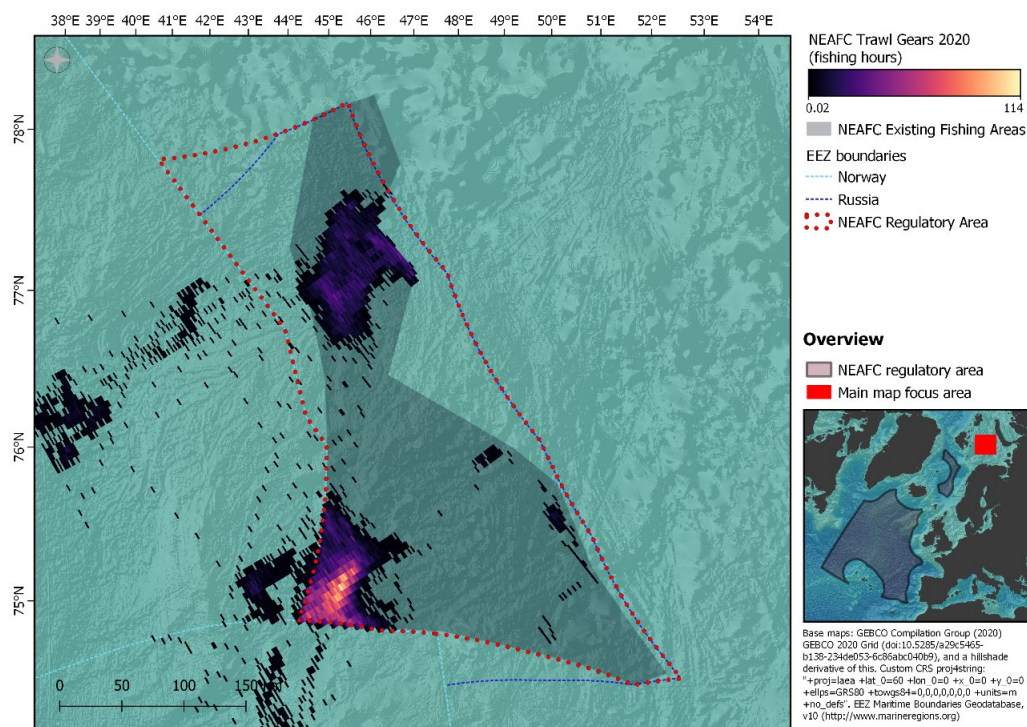


**Figure 18** New VME indicator records within the NEAFC Regulatory Area, submitted to the VME database in 2021 for the Barents Sea. Note: other existing VME indicator and habitat records from the VME database for this area are not displayed.

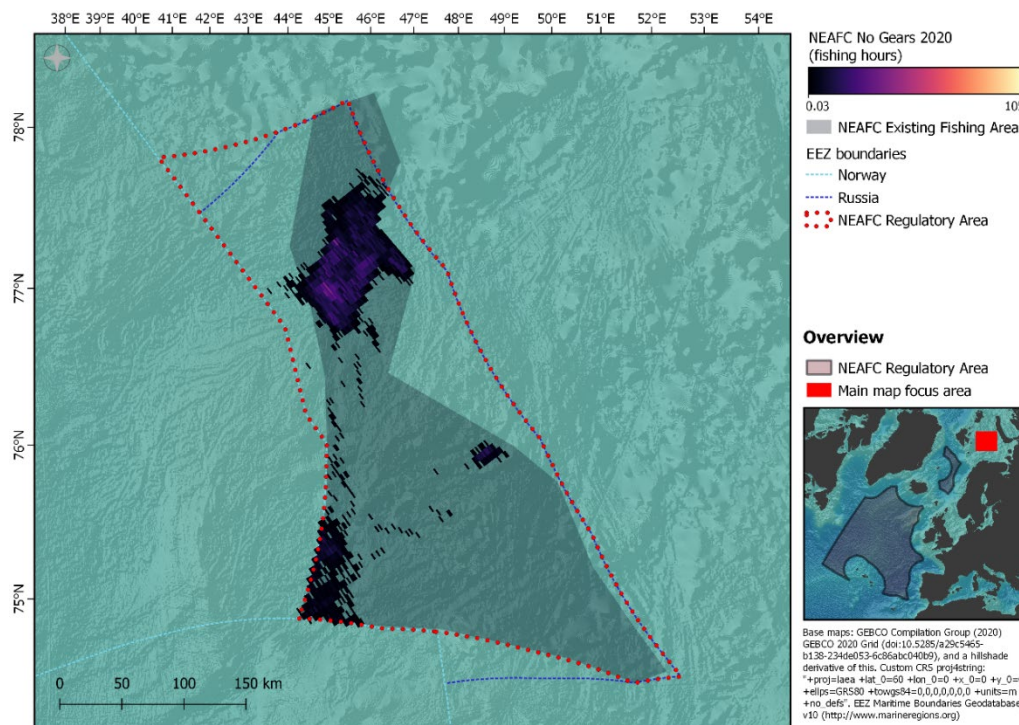




**Figure 19** Bottom-contacting otter trawl tow tracks in the Barents Sea area, overlain with the VME index, VME closures, existing NEAFC fishing areas and EEZ boundaries.



**Figure 20** Gridded data (fishing hours) for bottom-contacting trawl gears in the Barents Sea area, overlain with existing NEAFC fishing areas and EEZ boundaries.



**Figure 21** Gridded data (fishing hours) where no gear was registered in the Barents Sea area, overlain with VME closures, existing NEAFC fishing areas and EEZ boundaries

## Methods

### Reported fishing activities occurring in and in the vicinity of NEAFC VME closures

ICES plotted bottom-trawling tow tracks and gridded ( $0.05^\circ \times 0.05^\circ$ ) fishing hours for all bottom-contacting fishing gears from NEAFC VMS data received in 2020. Within NEAFC RA 1, this included data near the Rockall Bank (figures 4–7) and Hatton Bank VME closures (figures 9–12), data near the northern mid-Atlantic ridge VME closure southwest of Iceland (figures 13–15) and data near the southern Mid Atlantic Ridge VME closure (Figure 17). Only minor infringements were seen in the larger VME closure area in southwest Rockall (figures 4 and 5). Low to moderate levels of bottom fishing activity occurred outside of existing NEAFC fishing areas on the Hatton Bank (figures 9 and 10), in waters greater than 2000 m deep southwest of Iceland, and on the southern Mid-Atlantic Ridge near the existing VME closure. Bottom fishing information was also examined for NEAFC RA 3 in the Barents Sea (figures 19–21), where some fishing activity occurred outside the existing NEAFC fishing area.

### ICES VME weighted index.

ICES has applied its standard VME weighting algorithm (ICES, 2018) to new VME information submitted to the ICES VME database in 2021 for regions within NEAFC Regulatory Areas. This database consists of two main types of records: (1) confirmed VMEs that are based on, e.g. high quality underwater imagery; and (2) VME indicator records with varying degrees of confidence, e.g. trawl bycatch records or low-quality underwater imagery. The VME weighting system assigns each VME indicator a score between 1 and 5, based on expert judgement for each of the five FAO criteria for what classifies a habitat as a VME, and also examines whether the quantity of VME indicators is above or below the NEAFC VME encounter thresholds for corals and sponges (see Article 9, NEAFC Recommendation 19-2014). The final VME weighting output (VME index) shows the likelihood of encountering a VME for each c-square ( $0.05^\circ \times 0.05^\circ$ ) grid cell, delineated as high (red), medium (orange) or low (yellow) likelihood. Those grid cells that contain *bona fide* records of VME habitats are shaded blue and are excluded from the VME weighting algorithm. Associated with the VME index layer is a confidence layer which includes a consideration of the survey method, the number of surveys, and the age of the data. Confidence ranges from low (white) to high (black).

The Data Flow Schematics publication (ICES, 2020) shows the NEAFC VMS and catch data flow into the ICES data management systems and subsequent quality control steps used in the production of this advice. Vessel speed and course information in the VMS data is used to infer the location of fishing activities. For vessels with unknown or no registered gears, individual vessel speed profile, the composition of its daily catch reports, and the bathymetry of the area in which it appears to be fishing, is used to broadly classify its fishing activity as mobile or static gears. The inclusion of gear code in the daily catch reports would greatly improve the VMS data and understanding of potential adverse impacts of bottom fishing activity to VMEs. ICES plotted reported bottom-trawling tow tracks and fishing duration (as gridded fishing hours from the VMS data) is used as an indicator of fishing intensity.

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*Recommended citation:* ICES. 2021. New information regarding vulnerable habitats in the NEAFC Regulatory Areas. *In* Report of the ICES Advisory Committee, 2021. ICES Advice 2021, vme.neafc. <https://doi.org/10.17895/ices.advice.19345046>