Northwest Atlantic   Fisheries Organization

SCIENTIFIC COUNCIL MEETING – NOVEMBER 2023

New preliminary data on VME encounters in NAFO Regulatory Area (Divs. 3LMNO) from EU; EU-Spain and Portugal Groundfish Surveys (2023) and Canadian surveys (Fall 2022 & Spring 2023).

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Abstract

New preliminary data on deep-water corals and sponges from the 2023 EU, EU-Spain, and Portugal, as well as the 2022-2023 Canadian bottom trawl groundfish surveys, have been made available to improve the mapping of Vulnerable Marine Ecosystems (VMEs) indicator species in the NAFO Regulatory Area (Divs. 3LMNO). The results include distribution maps of new records of presence (both non-significant and significant catches) of VME indicator species by VME species group. Additionally, the species composition of VME taxa for significant catches has been included.

1. Introduction

During the 16th NAFO Working Group on Ecosystem Science and Assessment (WGESA) blended meeting (virtual and in presence) new preliminary data on deep-water corals and sponges were presented from the 2023 EU; EU-Spain and Portugal and 2022-2023 Canadian bottom trawl groundfish surveys. The data was made available to the NAFO WGESA to improve mapping of Vulnerable Marine Ecosystem (VME) indicator species in the NAFO Regulatory Area (Divs. 3LMNO).

During the 6th meeting of the NAFO Scientific Council WGESA, new quantitative spatial analyses were applied for corals and sponges for all the available data within the NAFO Regulatory Area (NAFO, 2013). Outcomes from those analyses produced the following thresholds for VME indicator species: 75 kg per tow for sponges, 0.6 kg per tow for large gorgonians, 0.15 kg per tow for small gorgonians, and 1.4 kg per tow for sea pens. Based on these thresholds, deep-water coral and sponge catches were identified and mapped, and overlaid with the current closed areas and VME polygons. New thresholds and VME polygons were presented at the 12th WGESA meeting using additional data since 2013 (NAFO, 2019). These are: 100 kg per tow for sponges, 0.6 kg per tow for large gorgonians, 0.2 kg per tow for small gorgonians, 1.3 kg per tow for sea pens, 0.35 kg for *Boltenia* sea squirts, 0.2 kg for bryozoans and 0.4 kg for black corals. Therefore, VME polygons illustrated on the figures below are the modified ones, accepted by SC.

Following the presentation, WG-ESA participants provided suggestions pertaining to the VME encounters SCR. One of the suggestions was to include the number of captures (non-significant and

significant) that fell inside closed areas for VME protection, in order to illustrate the accomplishment of the SC recommendation "minimize impacts of the sampling and maximize the collection of data in the hauls made in those vulnerable areas" (NAFO, 2023). It was also suggested to include the species composition of VME taxa for significant catches. Finally, it was suggested to investigate temporal trends for significant catches during WG-ESA's annual update on VME indicator species distribution in the NRA. The first two suggestions were incorporated to the 2023 SCR. The recommendation regarding assessing temporal trends has been considered, and the data are expected to be presented during the 2024 WG-ESA meeting. Discussion regarding DFO's comparative fishing also took place, including the need to consider the potential implications of using data from the new vessels in the WG-ESA VME work.

2. Survey Data

Regarding the EU data, during Summer 2023, RV Vizconde de Eza carried out three surveys (see survey methodology in **Durán Muñoz *et al.*, 2020**). In terms of the Canadian data, the Fall 2022 and Spring 2023 data are presented. Therefore, data used in this study were collected from 4 surveys:

1. The EU-Spain and Portugal Flemish Cap groundfish survey, conducted by the Instituto Español de Ocenografía (COV-IEO), CSIC, together with the Instituto de Investigaciones Marinas (IIM), CSIC, and Instituto Português do Mar e da Atmosfera (IPMA), sampled the Flemish Cap (NAFO Div. 3M) between 137 - 1455 m depth, with a total of 184 tows (181 valid).

2. The EU-Spain 3NO groundfish survey, conducted by the Instituto Español de Oceanografía (COV-IEO), CSIC, sampled the Grand Bank of Newfoundland (NAFO Divs. 3NO) between 43 - 1430 m depth, with a total of 106 tows (103 valid).

3. The EU-Spain 3L groundfish survey, conducted by the Instituto Español de Oceanografía (COV-IEO), CSIC, sampled Div. 3L between 129 - 1481 m depth, with a total of 100 tows (95 valid).

4. The Canadian Multispecies Surveys, conducted by Fisheries and Oceans Canada, DFO (**McCallum and Walsh, 1996**), sampled the Grand Bank of Newfoundland (NAFO Divs. 3LNO) between mean depths of 36 - 711 m, with a total of 129 tows (122 valid) (Fall 2022 & Spring 2023). For the Canadian surveys, a significant change took place in 2022. DFO is transitioning from the CCGS *Teleost* and CCGS *Alfred Needler* to new vessels, the CCGS *Capt Jacques Cartier* and CCGS *John Cabot* for its annual spring (Div. 3LNOPs) and fall (Div. 2HJ3KLNO) multispecies surveys. The new vessels use the same fishing protocols as previous (Needler and Teleost), but minor modifications have been made to the trawl (Wheeland et al. 2023). The Fall 2022 sets that fell within the NRA were conducted using the *CCGS Needler* (32% of all sets, with one unsuccessful set) and the *CCGS Cabot* (68% of all sets, with one unsuccessful set). The Spring 2023 sets that fell within the NRA were conducted using the *CCGS Teleost* (57% of all sets, with two unsuccessful sets) and the *CCGS Cabot* (43% of all sets, with three unsuccessful sets). Conversion factors between these vessels are not available for corals, bryozoans, and *Boltenia* sp., because the available data were insufficient for their development. For this reason, caution should be taken when interpreting the data presented here based on the new vessels. For sponges, on the other hand, analysis of the CCGS *Teleost-Cartier/Cabot* comparison (Fall 2021-2022, 2HJ3KL) and CCGS *Needler-Cabot* comparison (Fall 2021-2022, Fall 3KL) indicated no significant

difference in catchability of sponges, and conversion factors do not need to be applied for this taxa (DFO, in press). Of the two new vessels, only data collected with CCGS *Cabot* (Fall 2022/Spring 2023) contained VME records. For the Fall 2022 these correspond to 29 sets with sponges, one set with small gorgonians, one set with sea pens, three sets with *Boltenia*, and six sets with bryozoans. For the Spring 2023, these correspond to four sets with sponges and one set with bryozoans. None of these sets (Fall or Spring with the new vessels) had significant concentrations of any of these VME indicators.

There were a total of 390 bottom trawl tows carried out during 2023 EU; EU-Spain and Portugal groundfish survey in the NRA (Figure 1A). 11 of those tows were not valid due to technical problems during the fishing operation. 166 hauls out of 379 valid tows have shown zero catches (i.e. no presence) of VME indicator species. This represents 43.8% of the total valid hauls. A total of 129 tows were carried out in the NRA during the Fall 2022 & Spring 2023 Canadian surveys (Figure 1B). Seven of these were considered unsuccessful (Figure 1B).
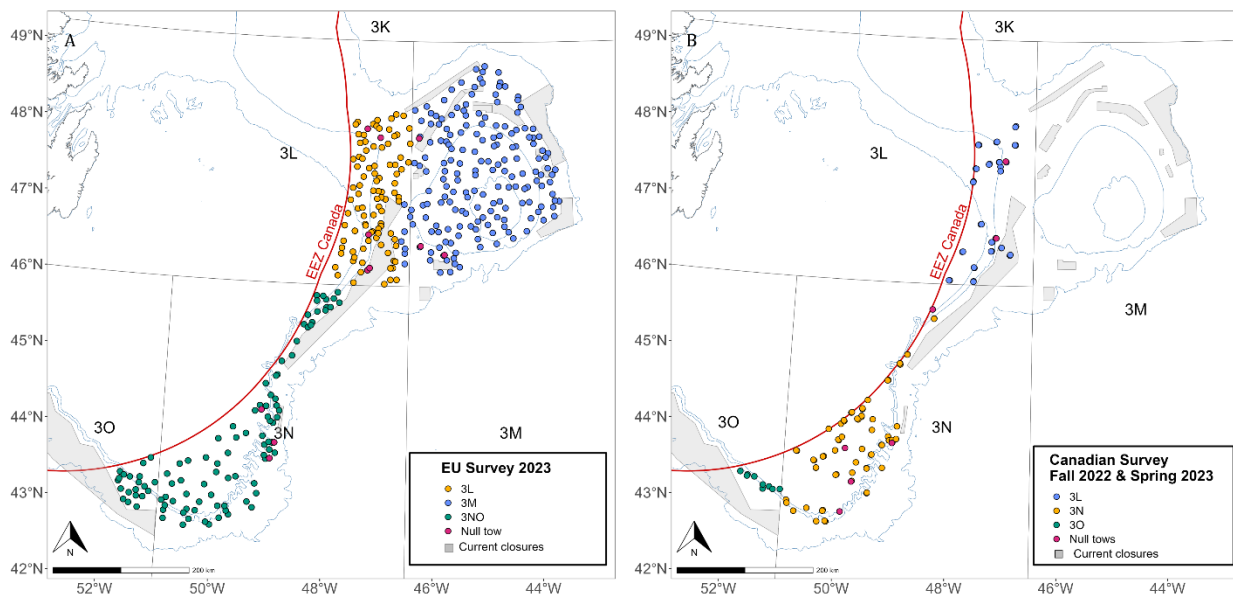

Figure 1. Distribution of sets (start positions) from A) 2023 EU; EU-Spain and Portugal groundfish survey (NAFO Divs. 3LMNO) and B) Fall 2022 & Spring 2023 Canadian surveys (NAFO Divs. 3LNO). Note that in B valid sets might be obscured by nearby null sets due to symbology limitations.

Following previous methodologies used by WGESA, deep water corals were grouped by VME species groups and include: large gorgonians and small gorgonians (Orders Scleralcyonacea & Malacalcyonacea; McFadden et al. (2022)), sea pens (Superfamily Pennatuloidea; McFadden et al. (2022)), black corals (Order Antipatharia), sponges and bryozoans are shown at the phylum level (Phylum Porifera and Phylum Bryozoa), *Boltenia* sea squirts are shown as "Sea squirts".

3. Results

Distribution maps of presence (non-significant and significant catches) for sponges, large gorgonians, small gorgonians, sea pens, black corals, sea squirts, and bryozoans are presented below (Figures 2-8). Black corals and bryozoans were not recorded during the Fall 2022 & Spring 2023 Canadian surveys. Location of each record was assigned by start position of each tow for EU; EU-Spain (**Durán Muñoz et al., 2020**) and Canadian groundfish surveys (**McCallum and Walsh, 1996**).

3.1. Sponges

EU; EU-Spain and Portugal 2023 Data: Sponges were recorded in 111 of the 379 valid tows (29.3% of valid tows analyzed), at mean depths between 51 and 1481 m (Figure 2A). There were two significant catches of sponges (≥ 100 kg/tow) in these tows (Figure 2A), both of which fell within the VME polygons for sponges (Table 2). Specimens belonging to Polymastidae, Tetillidae, *Asconema* sp., *Geodia* sp., *Thenea* sp., *Craniella* sp., *Stryphnus fortis* and *Stelleta* spp. were identified.

Canadian (DFO) Fall 2022 & Spring 2023 Data: Sponges were recorded in 66 of the 122 valid tows (54.1% of valid tows analyzed), at mean depths between 44 and 695 m (Figure 2B). There were no significant catches of sponges (≥ 100 kg/tow) in these tows (Figure 2B). Four sets fell within closure 2, which represents two pairs of the comparative fishing from Spring 2023 (CCGS *Cabot* and *Needler*).
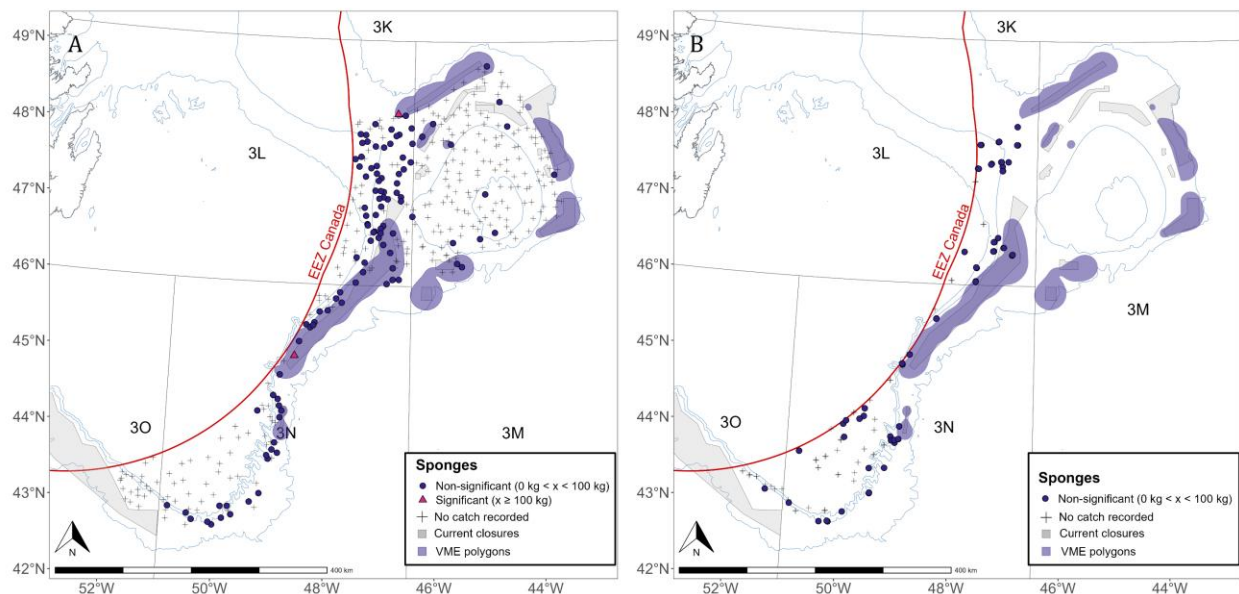

Figure 2. Distribution of catches of sponges in the study area from A) 2023 EU; EU-Spain and Portugal surveys (NAFO Divs. 3LMNO) and B) Fall 2022 & Spring 2023 Canadian surveys (NAFO Divs. 3LNO). Black crosses represent tows with no sponges recorded (no presence). Areas shaded in purple represent the VME polygons for sponges.

3.2. Large gorgonians

EU; EU-Spain and Portugal 2023 Data: Large gorgonians were recorded in 9 of the 379 valid tows (2.4% of valid tows analyzed), at mean depths between 463 and 959 m (Figure 3A). There was one significant catch of large gorgonians (≥ 0.6 kg/tow) in these tows (Figure 3A), which fell outside the VME polygons for large gorgonians. Specimens from this set were identified as *Paragorgia arborea*.

Canadian (DFO) Fall 2022 & Spring 2023 Data: No large gorgonians were recorded during the DFO Fall 2022 & Spring 2023 surveys.
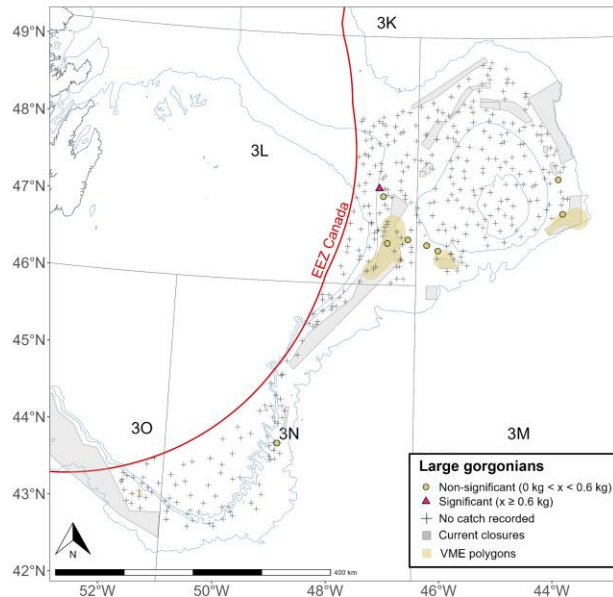

Figure 3. Distribution of catches of large gorgonians in the study area from 2023 EU; EU-Spain and Portugal surveys (NAFO Divs. 3LMNO). Black crosses represent tows with no large gorgonians by-catch recorded (no presence). Areas shaded in yellow represent the VME polygons for large gorgonians.

3.3. Small gorgonians

EU; EU-Spain and Portugal 2023 Data: Small gorgonians were recorded in 42 of the 379 valid tows (11.08% of valid tows analyzed), at mean depths between 227 and 1481 m (Figure 4A). There were no significant catches of small gorgonians (≥ 0.2 kg/tow) in these tows (Figure 4A).

Canadian (DFO) Fall 2022 & Spring 2023 Data: Small gorgonians were recorded in 4 of the 122 valid tows (3.28% of valid tows analyzed), at mean depths between 184 and 603 m (Figure 4B). There were two significant catches of small gorgonians (≥ 0.2 kg/tow) in these tows (Figure 4B), one of which fell within the VME polygons for small gorgonians (Table 2). Specimens from two sets were identified as *Acanella arbuscula*, but species id was not confirmed for the remainder two (including one of the significant concentration set). No small gorgonians were recorded inside of any of the VME closures.
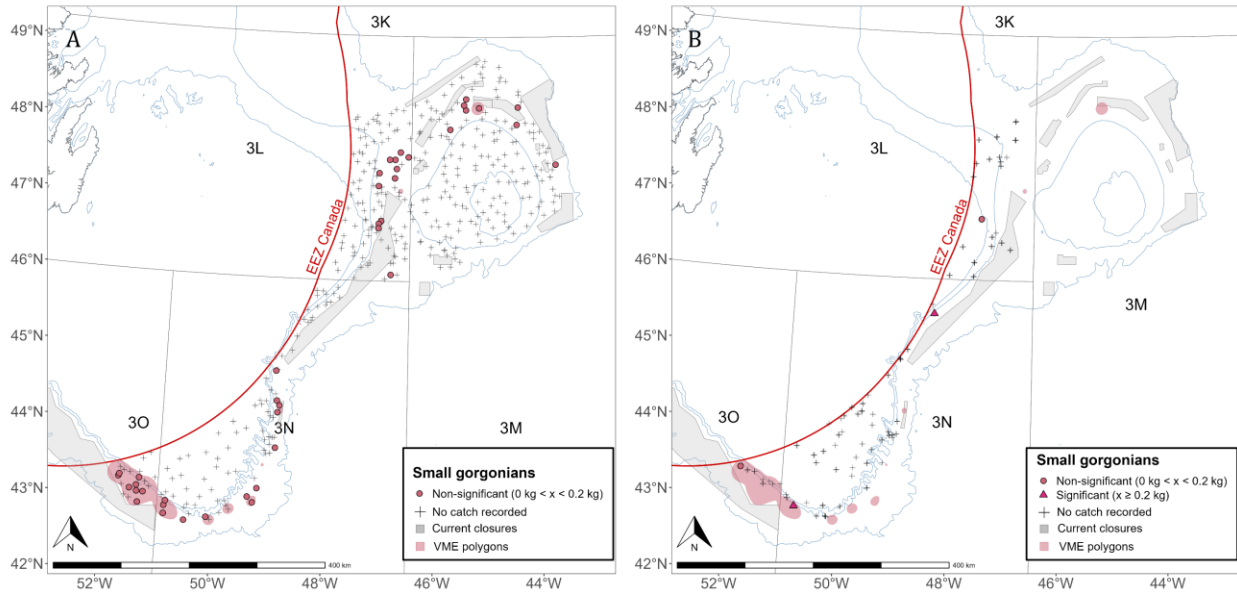
Figure 4. Distribution of catches of small gorgonians in the study area from A) 2023 EU; EU-Spain and Portugal surveys (NAFO Divs. 3LMNO) and B) Fall 2022 & Spring 2023 Canadian surveys (NAFO Divs. 3LNO). Black crosses represent tows with no small gorgonians recorded (no presence). Areas shaded in red represent the VME polygons for small gorgonians.

3.4. Sea pens

EU; EU-Spain and Portugal 2023 Data: Sea pens were recorded in 133 of the 379 valid tows (35.1% of valid tows analyzed), at mean depths between 63 and 1444 m (Figure 5A). There was one significant catch of sea pens (≥ 1.3 kg/tow) in these tows (Figure 5A), which fell within the VME polygons for sea pens (Table 2). Specimens from this set were identified as *Anthoptilum* sp. and *Ptillela grandis.*

Canadian (DFO) Fall 2022 & Spring 2023 Data: Sea pens were recorded in 16 of the 122 valid tows (13.11% of valid tows analyzed), at mean depths between 304 and 706 m (Figure 5B). There were no significant catches of sea pens (≥ 1.3 kg/tow) in these tows (Figure 5B). No sea pens were recorded inside of any of the VME closures.
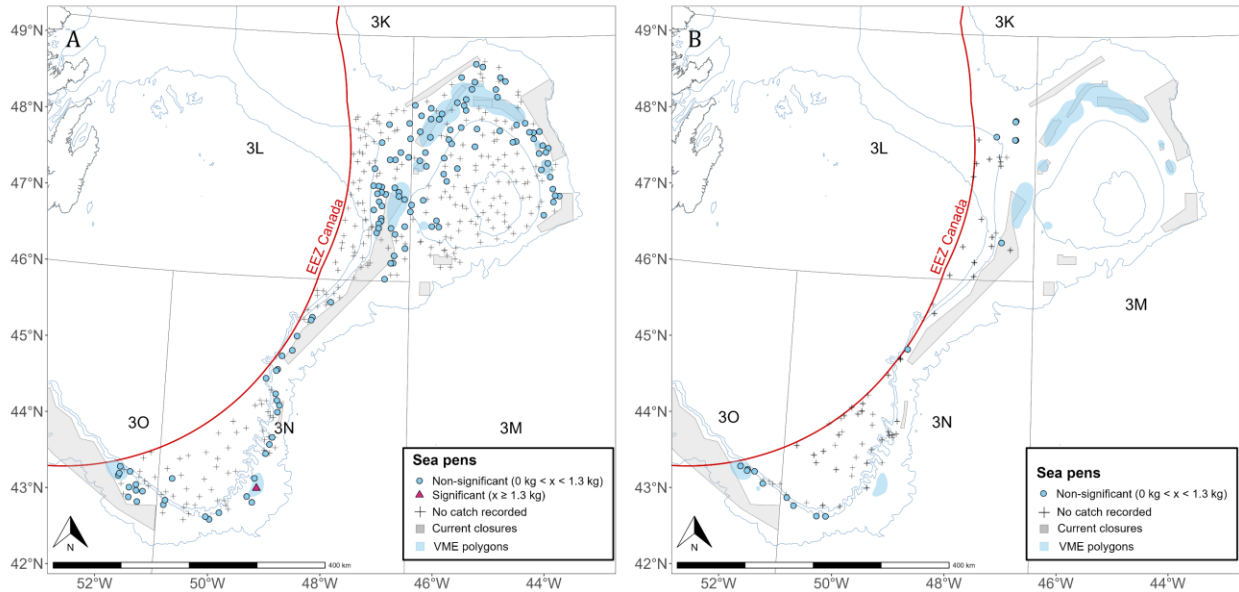
Figure 5. Distribution of catches of sea pens in the study area from A) 2023 EU; EU-Spain and Portugal surveys (NAFO Divs. 3LMNO) and B) Fall 2022 & Spring 2023 Canadian surveys (NAFO Divs. 3LNO). Black crosses represent tows with no sea pens recorded (no presence). Areas shaded in blue represent the VME polygons for sea pens.

3.5. Black corals

EU; EU-Spain and Portugal 2023 Data: Black corals were recorded in 15 of the 379 valid tows (4% of valid tows analyzed), at mean depths between 468 and 1187 m (Figure 6A). There were two significant catches of black corals (≥ 0.4 kg/tow) in these tows (Figure 6A), both of which fell outside the VME polygons for black corals. Specimens from these sets were identified as *Stauropathes arctica.*

Canadian (DFO) Fall 2022 & Spring 2023 Data: No black corals were recorded during the DFO Fall 2022 & Spring 2023 surveys.
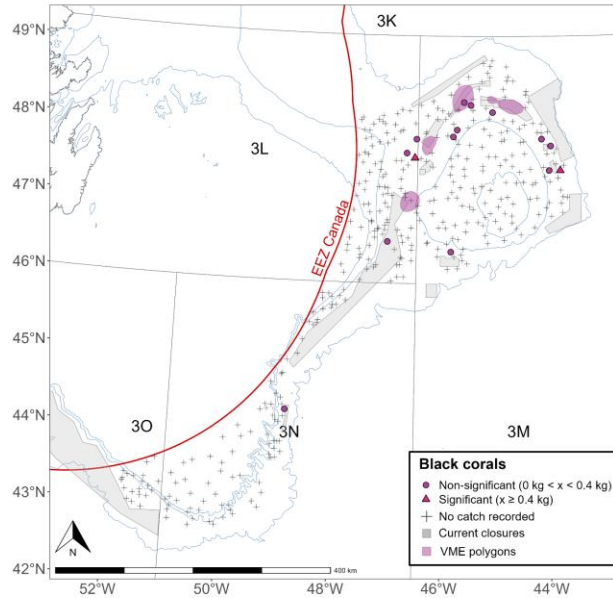
Figure 6. Distribution of catches of black corals in the study area from 2023 EU; EU-Spain and Portugal surveys (NAFO Divs. 3LMNO). Black crosses represent tows with no black corals by-catch recorded (no presence). Areas shaded in pink represent the VME polygons for black corals.

3.6. Sea squirts

EU; EU-Spain and Portugal 2023 Data: Sea squirts were recorded in 7 of the 379 valid tows (1.85% of valid tows analyzed), at mean depths between 43 and 228 m (Figure 7A). There was one significant catch of sea squirts (*Boltenia ovifera*) (≥ 0.35 kg/tow) in these tows (Figure 7A), which fell within the VME polygons for sea squirts (Table 2).

Canadian (DFO) Fall 2022 & Spring 2023 Data: Sea squirts were recorded in 3 of the 122 valid tows (2.46% of valid tows analyzed), at mean depths between 59 and 236 m (Figure 7B). There were no significant catches of sea squirts (≥ 0.35 kg/tow) in these tows (Figure 7B). No sea squirts were recorded inside of any of the VME closures.
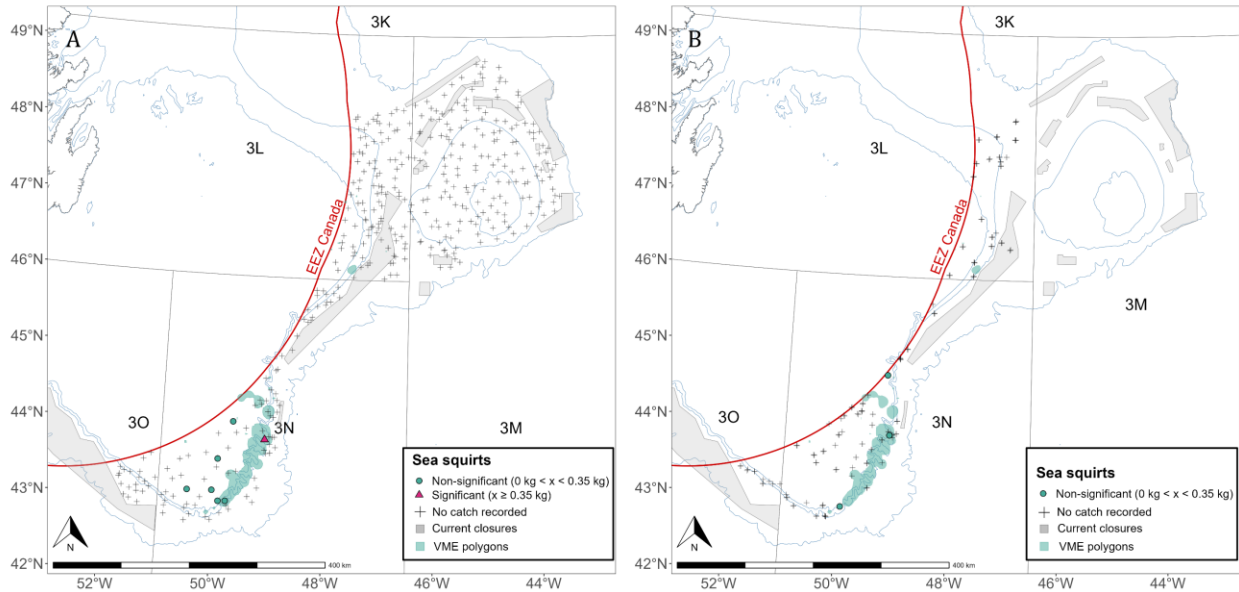
Figure 7. Distribution of catches of sea squirts in the study area from A) 2023 EU; EU-Spain and Portugal surveys (NAFO Divs. 3LMNO) and B) Fall 2022 & Spring 2023 Canadian surveys (NAFO Divs. 3LNO). Black crosses represent tows with no sea squirts recorded (no presence). Areas shaded in green represent the VME polygons for sea squirts.

3.7. Bryozoans

EU; EU-Spain and Portugal 2023 Data: Bryozoans were recorded in 31 of the 379 valid tows (8.18% of valid tows analyzed), at mean depths between 43 and 1225 m (Figure 8A). There were no significant catches of bryozoans (≥ 0.2 kg/tow) in these tows (Figure 8A).

Canadian (DFO) Fall 2022 & Spring 2023 Data: Bryozoans were recorded in 11 of the 122 valid tows (9.02% of valid tows analyzed), at mean depths between 44 and 427 m (Figure 8B). There were no significant catches of bryozoans (≥ 0.2 kg/tow) in these tows (Figure 8B). No bryozoans were recorded inside of any of the VME closures.
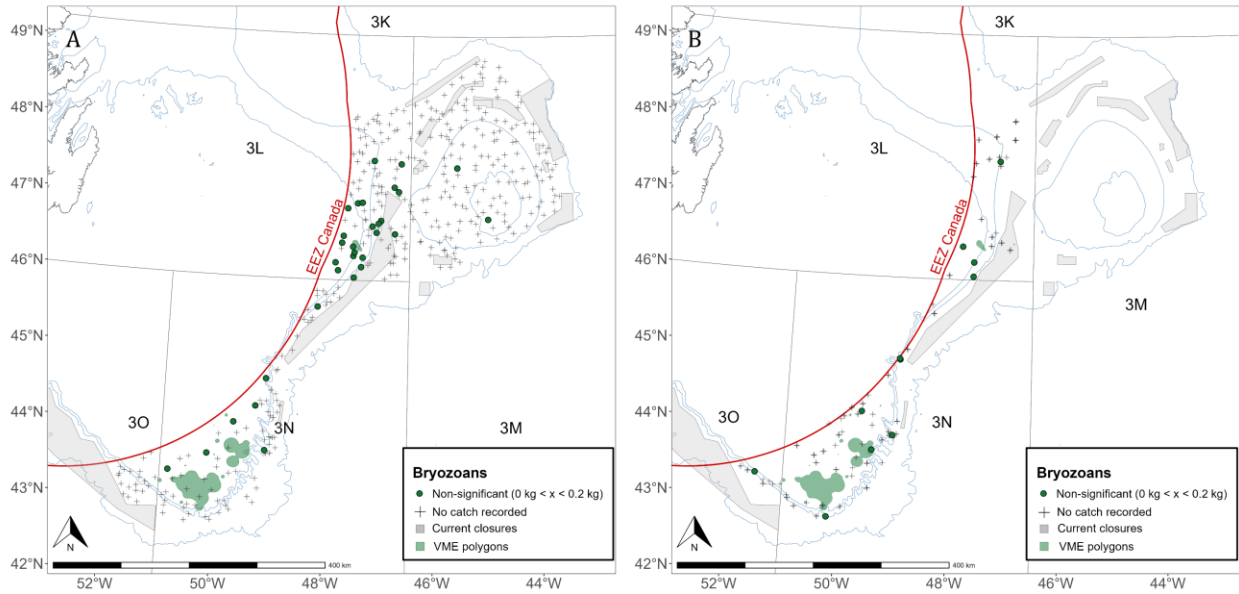
Figure 8. Distribution of catches of bryozoans in the study area from A) 2023 EU; EU-Spain and Portugal surveys (NAFO Divs. 3LMNO) and B) Fall 2022 & Spring 2023 Canadian surveys (NAFO Divs. 3LNO). Black crosses represent tows with no bryozoans recorded (no presence). Areas shaded in dark green represent the VME polygons for bryozoans.

Table 1. Summary of deep-water corals and sponges records for the NRA from Summer 2023 EU; EU-Spain and Portugal surveys and Fall 2022 & Spring 2023 Canadian surveys. Calculations were performed using valid tows.

VME	Presence [Significant and Non-Significant] (# of valid tows)	% of valid tows with presence	# of valid tows with Significant Concentrations	% of valid tows with Significant Concentrations	# of valid tows with Significant Concentrations inside VME corresponding polygon	# of valid tows inside VME closures (significant or not significant)
EU; EU-Spain and Portugal						
Sponges	111	29.3%	2	0.53%	2	1
Large gorgonians	9	2.4%	1	0.26%	0	0
Small gorgonians	42	11.1%	0	0.00%	0	0
Sea pens	133	35.1%	1	0.26%	1	2
Black corals	15	4.0%	2	0.53%	0	0
Sea squirts	7	1.9%	1	0.26%	1	0
Bryozoans	31	8.2%	0	0.00%	0	0
Canada						
Sponges	66	54.1%	0	0.00%	0	4
Large gorgonians	0	0.0%	0	0.00%	0	0
Small gorgonians	4	3.3%	2	0.02%	1	0
Sea pens	16	13.1%	0	0.00%	0	0
Black corals	0	0.0%	0	0.00%	0	0
Sea squirts	3	2.5%	0	0.00%	0	0
Bryozoans	11	9.0%	0	0.00%	0	0

Table 2. Significant catches of VME indicator species in the NRA (Divs. 3LMNO) with their corresponding depth (m) and weight (kg). Note that tow positions are expressed in decimal degrees (with two decimal places). NA : not available.

VME indicator species	Species id	Latitude (N)	Longitude (W)	Depth (m)	Weight (kg)
EU; EU-Spain and Portugal					
Sponges >= 100 kg	Tetillidae, *Geodia* sp., *Thenea* sp., *Craniella* sp., *Stryphnus fortis*, *Stelleta* spp.	48.3	-46.8	1379	1426.096
Sponges >= 100 kg	Polymastidae, Tetillidae, *Asconema* sp., *Geodia* sp., *Thenea* sp., *Stryphnus fortis*	45.0	-48.7	1326	106.833
Large gorgonians >= 0.6 kg	*Paragorgia arborea*	47.3	-47.2	534	4.330
Sea pens >= 1.3 kg	*Anthoptilum* sp., *Ptillela grandis*[1]	43.2	-49.2	915	1.625
Black corals >= 0.4 kg	*Stauropathes arctica*	47.6	-46.6	1186	0.488
Black corals >= 0.4 kg	*Stauropathes arctica*	47.5	-43.7	789	0.499
Sea Squirts >= 0.35 kg	*Boltenia ovifera*	43.8	-49.1	214	0.781
Canada					
Small gorgonians >= 0.2 kg	*Acanella arbuscula*	42.9	-50.8	570	0.221
Small gorgonians >= 0.2 kg	NA	45.5	-48.4	595	1.605

[1] *Ptilella grandis* was referred in previous documents as *Pennatula grandis* (García-Cárdenas *et al.*, 2019).

Acknowledgements

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Colophon

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#>   gtable             0.3.3       2023-03-21 [1]  CRAN  (R 4.2.3)
#>   hms                1.1.3       2023-03-21 [1]  CRAN  (R 4.2.3)
#>   htmltools          0.5.6       2023-08-10 [1]  CRAN  (R 4.2.3)
#>   htmlwidgets        1.6.2       2023-03-17 [1]  CRAN  (R 4.2.3)
#>   httpcode           0.3.0       2020-04-10 [1]  CRAN  (R 4.2.3)
#>   httpuv             1.6.11      2023-05-11 [1]  CRAN  (R 4.2.3)
#>   jsonlite           1.8.7       2023-06-29 [1]  CRAN  (R 4.2.3)
#>   knitr              1.43        2023-05-25 [1]  CRAN  (R 4.2.3)
#>   labeling           0.4.2       2020-10-20 [1]  CRAN  (R 4.2.0)
#>   later              1.3.1       2023-05-02 [1]  CRAN  (R 4.2.3)
#>   lifecycle          1.0.3       2022-10-07 [1]  CRAN  (R 4.2.1)
#>   magick             2.7.5       2023-08-07 [1]  CRAN  (R 4.2.3)
#>   magrittr           2.0.3       2022-03-30 [1]  CRAN  (R 4.2.1)
#>   memoise            2.0.1       2021-11-26 [1]  CRAN  (R 4.2.1)
#>   mime               0.12        2021-09-28 [1]  CRAN  (R 4.2.0)
#>   miniUI             0.1.1.1     2018-05-18 [1]  CRAN  (R 4.2.2)
#>   munsell            0.5.0       2018-06-12 [1]  CRAN  (R 4.2.1)
#>   NAFOdown         * 0.0.1.9000  2023-11-07 [1]  Github (nafc-assess/
NAFOdown@431ec8f)
#>   officer            0.6.2       2023-03-28 [1]  CRAN  (R 4.2.3)
#>   openssl            2.1.0       2023-07-15 [1]  CRAN  (R 4.2.3)
#>   pillar             1.9.0       2023-03-22 [1]  CRAN  (R 4.2.3)
#>   pkgbuild           1.4.2       2023-06-26 [1]  CRAN  (R 4.2.3)
#>   pkgconfig          2.0.3       2019-09-22 [1]  CRAN  (R 4.2.1)
#>   pkgload            1.3.2.1     2023-07-08 [1]  CRAN  (R 4.2.3)
#>   prettyunits        1.1.1       2020-01-24 [1]  CRAN  (R 4.2.1)
#>   processx           3.8.2       2023-06-30 [1]  CRAN  (R 4.2.3)
#>   profvis            0.3.8       2023-05-02 [1]  CRAN  (R 4.2.3)
#>   promises           1.2.1       2023-08-10 [1]  CRAN  (R 4.2.3)
#>   ps                 1.7.5       2023-04-18 [1]  CRAN  (R 4.2.3)
#>   purrr            * 1.0.2       2023-08-10 [1]  CRAN  (R 4.2.3)
#>   R6                 2.5.1       2021-08-19 [1]  CRAN  (R 4.2.1)
#>   ragg               1.2.5       2023-01-12 [1]  CRAN  (R 4.2.2)
#>   Rcpp               1.0.11      2023-07-06 [1]  CRAN  (R 4.2.3)
#>   readr            * 2.1.4       2023-02-10 [1]  CRAN  (R 4.2.2)
#>   remotes            2.4.2.1     2023-07-18 [1]  CRAN  (R 4.2.3)
#>   rlang              1.1.1       2023-04-28 [1]  CRAN  (R 4.2.3)
#>   rmarkdown          2.24        2023-08-14 [1]  CRAN  (R 4.2.2)
#>   rstudioapi         0.15.0      2023-07-07 [1]  CRAN  (R 4.2.3)
#>   scales             1.2.1       2022-08-20 [1]  CRAN  (R 4.2.1)
#>   sessioninfo        1.2.2       2021-12-06 [1]  CRAN  (R 4.2.2)
#>   shiny              1.7.5       2023-08-12 [1]  CRAN  (R 4.2.3)
#>   showtext           0.9-6       2023-05-03 [1]  CRAN  (R 4.2.3)
#>   showtextdb         3.0         2020-06-04 [1]  CRAN  (R 4.2.3)
#>   stringi            1.7.12      2023-01-11 [1]  CRAN  (R 4.2.2)
#>   stringr          * 1.5.0       2022-12-02 [1]  CRAN  (R 4.2.2)
```

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#>   sysfonts            0.8.8       2022-03-13 [1] CRAN (R 4.2.3)
#>   systemfonts         1.0.4       2022-02-11 [1] CRAN (R 4.2.2)
#>   textshaping         0.3.6       2021-10-13 [1] CRAN (R 4.2.2)
#>   tibble              3.2.1       2023-03-20 [1] CRAN (R 4.2.3)
#>   tidyselect          1.2.0       2022-10-10 [1] CRAN (R 4.2.1)
#>   tzdb                0.4.0       2023-05-12 [1] CRAN (R 4.2.3)
#>   urlchecker          1.0.1       2021-11-30 [1] CRAN (R 4.2.2)
#>   usethis             2.2.2       2023-07-06 [1] CRAN (R 4.2.3)
#>   utf8                1.2.3       2023-01-31 [1] CRAN (R 4.2.2)
#>   uuid                1.1-0       2022-04-19 [1] CRAN (R 4.2.0)
#>   vctrs               0.6.3       2023-06-14 [1] CRAN (R 4.2.3)
#>   vroom               1.6.3       2023-04-28 [1] CRAN (R 4.2.3)
#>   withr               2.5.0       2022-03-03 [1] CRAN (R 4.2.1)
#>   xfun                0.40        2023-08-09 [1] CRAN (R 4.2.3)
#>   xml2                1.3.5       2023-07-06 [1] CRAN (R 4.2.3)
#>   xtable              1.8-4       2019-04-21 [1] CRAN (R 4.2.2)
#>   yaml                2.3.7       2023-01-23 [1] CRAN (R 4.2.2)
#>   zip                 2.3.0       2023-04-17 [1] CRAN (R 4.2.3)
#>
#>   [1] C:/Users/nevesb/AppData/Local/R/win-library/4.2
#>   [2] C:/Program Files/R/R-4.2/library
#>
#> ─────────────────────────────────────────────────────────────────
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```