

**v) Encounter thresholds for VME indicator species (Item 7)**

*Recognizing the work accomplished by the Scientific Council in 2012 on sea pens and sponges, Fisheries Commission requests the Scientific Council to complete request 17 of 2011 by making recommendations for encounter thresholds and move on rules for small gorgonian corals, large gorgonian corals, sea squirts, erect bryozoans, crinoids and cerianthid anemone which are VME indicator species that meet the FAO Guidelines for VME and SAI. Consider thresholds for 1) inside the fishing footprint and outside of the closed areas and 2) outside the fishing footprint in the NRA, and 3) for the exploratory fishing area of seamounts if applicable. In the case of sea pens and sponges make recommendations for encounter thresholds and move on rules for the exploratory fishing area of seamounts.*

Scientific Council responded:

**General comment regarding encounter protocols and closed areas**

Scientific Council reiterates its June 2012 statement that management through the closing of areas with significant concentrations of VME indicator species is the most effective measure for protecting VMEs in the NRA and that the need to implement encounter protocols gradually becomes redundant as the locations of the benthic VMEs becomes increasingly well-defined. This avoids issues associated with the implementation of complex move-on rules.

Scientific Council notes that a number of closed areas are currently in effect protecting VMEs, and additional new areas and extensions are proposed to the next Fisheries Commission meeting by the FC WGFMS-VME to cover zones of significant catches of large gorgonian corals and sea pens.

**Response summary**

A GIS model-based encounter threshold of 0.2 kg/rawl was calculated for small gorgonian corals inside the fishing footprint and proposed outside, on the continental slopes of the NRA. Issues with catchability and data quality prevented similar analyses being performed on large gorgonian corals and the other VME indicator taxa inside the fishing footprint. This candidate threshold for the small gorgonian corals is a good example of a threshold value likely to be impractical. Maps of their distribution in the NRA have been provided for informational purposes and Scientific Council is not making explicit recommendations regarding closures via these maps.

For areas outside of the fishing footprint along the continental slopes, the same thresholds calculated inside the footprint should be considered for those taxa where thresholds have been provided. Specifically: 300 kg/rawl for Sponges, 7 kg/rawl for Sea Pens and 0.2 kg /rawl for Small Gorgonian Corals. For the Large Gorgonian corals an encounter threshold of 2 kg/ trawl could be used based on RV cumulative catch data from inside the fishing footprint. For all other VME indicator species, outside of the fishing footprint, the presence of the VME indicator should be considered as the threshold, given the high risk of significant adverse impact.

For seamounts, presence of any of the VME indicator species should be considered to trigger move-on rules.

In 2012, candidate move-on rules for sponges and sea pens were provided based on information on their spatial distribution. Those move-on rules were not applicable to the seamounts. Scientific Council was unable to provide further recommendations on the move-on rule for other VME indicator species.

**General Comments on Commercial Encounter Protocols**

Scientific Council notes that the encounter thresholds recommended thus far were developed to identify significant concentrations of VME indicator species (i.e. VMEs). They were not developed as conservation thresholds and Scientific Council considers that closures, not encounter thresholds and complex move on rules, are the most effective measure to protect VME in the fishing footprint.

In June 2012, Scientific Council stated that “encounter thresholds are a very useful tool to identify VMEs in areas where there is little survey information and the fishing activity is the main source of new data. This applies especially to new fishing areas outside of the fishing footprint. However, as the locations of the benthic VMEs become increasingly well-defined in the NRA to support informed management through closed areas the need to implement encounter protocols gradually become redundant. Scientific Council considers management through the

closing of areas with significant concentrations of VME is the most effective measure for protecting VMEs in the NRA as it would avoid issues associated with the implementation of complex move-on rules”.

Scientific Council notes that a number of closed areas are currently in effect protecting VMEs, and additional new areas and extensions are proposed to the next Fisheries Commission by the FC WGFMS-VME to cover zones of significant catches of large gorgonian corals and sea pens. Although single observations suffice to identify the presence of VME species in a given location, defining realistic areas of VME for closure purposes is better achieved by integrating all available habitat and species distribution data.

Scientific Council notes a review of all available information will be undertaken in 2014.

### **Inside the Fishing Footprint in the NRA and Outside of Closed Areas**

#### *Small Gorgonian Corals*

A GIS model-based commercial encounter threshold for Small Gorgonian Corals was calculated using methodology applied to EU research vessel biomass survey data (2006-2012). Application of the GIS model to Small Gorgonian corals yields a result of 0.2 kg (200 g) per commercial tow (based on the median tow length of 13.8 nm as determined from VMS data) as the candidate encounter threshold for identification of significant concentrations of Small Gorgonian Coral. The small value of this threshold would likely render it impractical for real life application.

Scientific Council was not able to develop move-on rules for the small gorgonian corals. Move-on rules for the small gorgonian corals would be very complex to apply. Area-specific values based on the distribution map (Fig. 2) could be provided but the task of integrating the effects across the different VME indicator species and fisheries would render move-on rules impractical in real life applications.

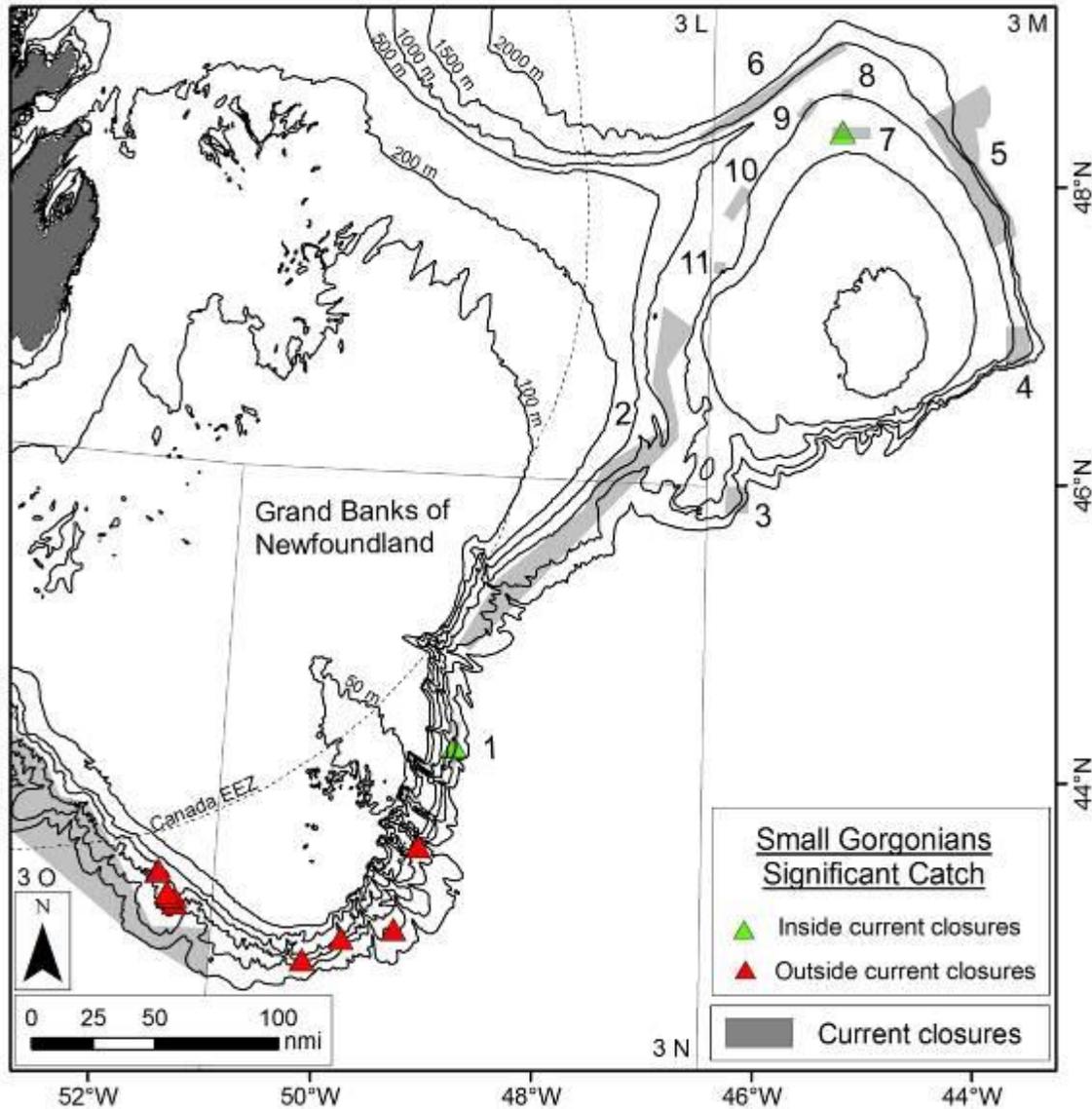


Fig. 2. Location of significant catches ( $\geq 0.2$  kg/trawl) of small gorgonian corals from research vessel surveys in the NRA (Div. 3LMNO) from 2006-2012 in relation to the current closed areas.

*Large Gorgonian Corals, Sea Squirts, Erect Bryozoans, Crinoids and Cerianthid Anemones*

Scientific Council was not able to produce model-based commercial encounter thresholds or move on rules for Large Gorgonian Corals, Sea Squirts, Erect Bryozoans, Crinoids and Cerianthid Anemones inside the fishing footprint in the NRA and outside of closed areas at this time due to data quality issues. Catchability is believed to be very low for these taxa and trawls are not the appropriate gear to sample them.

The Scientific Council has illustrated the known locations for these VME indicator taxa, according to their relative abundance in the trawl surveys (Fig. 3, Fig. 4). For comparative purposes the location of the Sea Squirts, Erect Bryozoans, Crinoids and Cerianthid Anemones are shown in relation to the fishing locations from (2010-2012) from the response to FC request 16 (Fig. 5). Crinoids and Cerianthid Anemones were caught in the NEREIDA rock dredges which sampled some areas (Beothuk Knoll) not sampled in the EU surveys (Fig. 6).

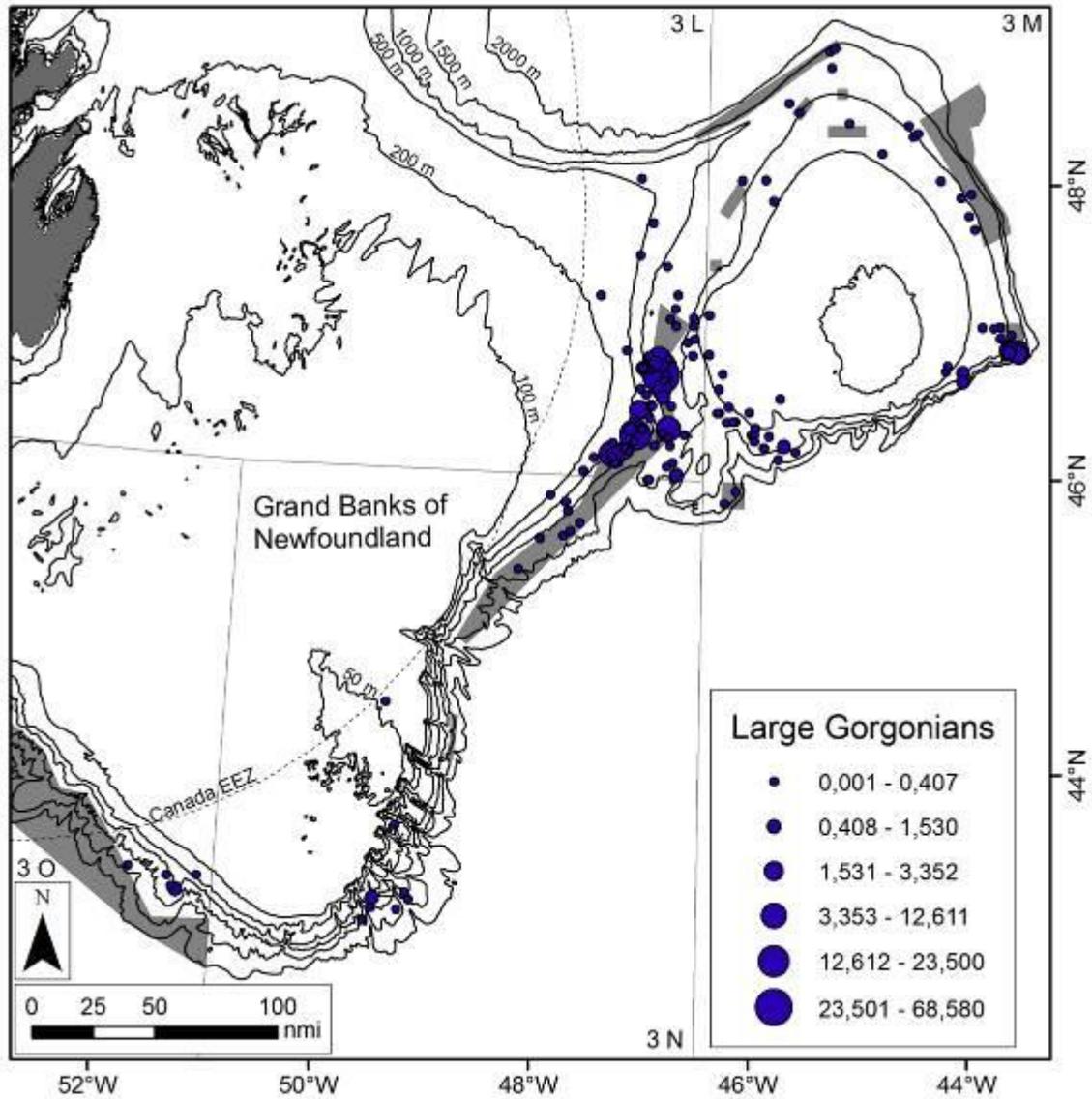


Fig. 3. Relative abundance (kg/RV trawl) of large gorgonians from EU research trawl surveys from 2006-2012 in the NRA in relation to closed areas.

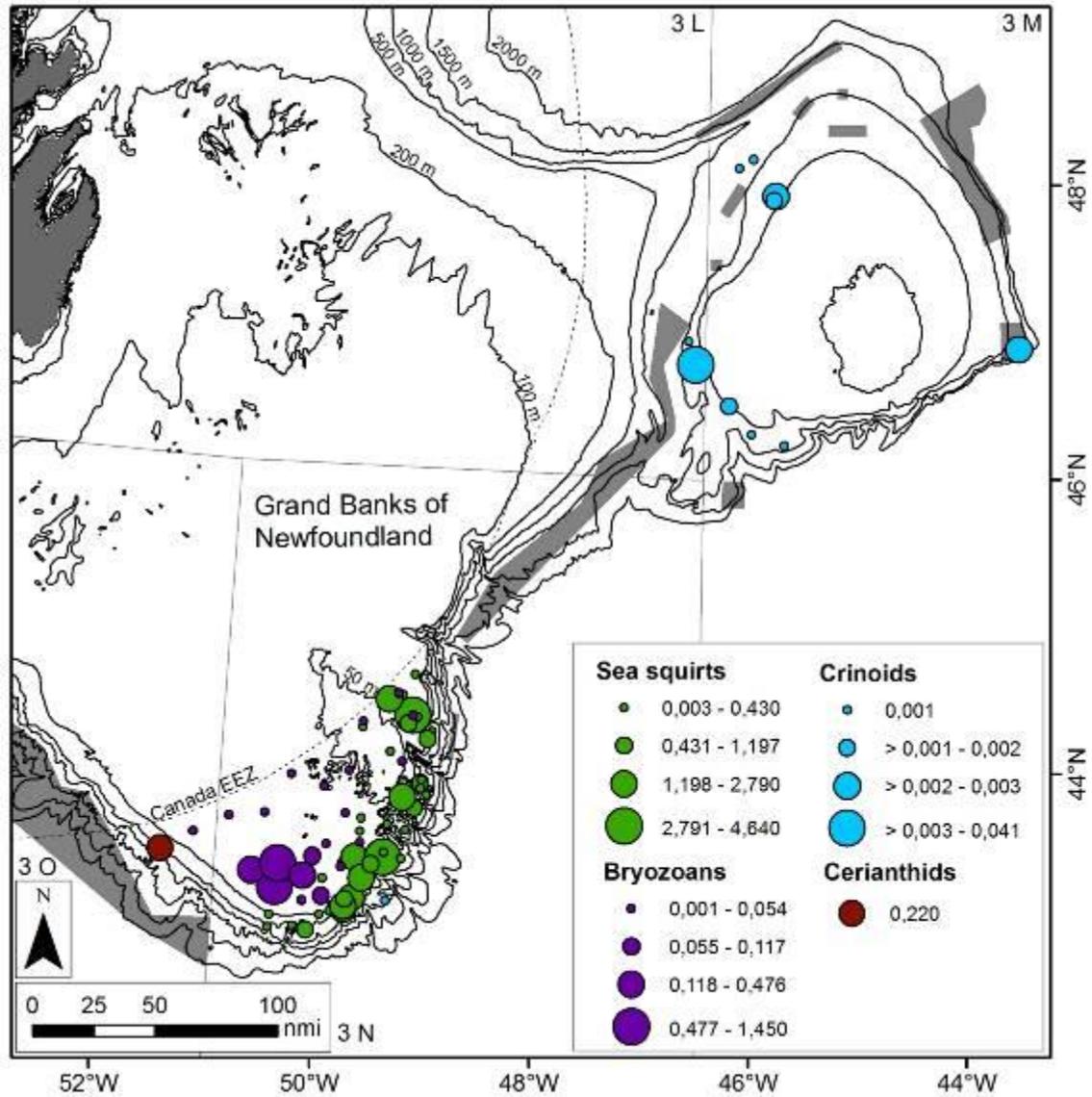


Fig. 4. Relative abundance (kg/RV trawl) of sea squirts, crinoids, bryozoans and cerianthid anemones collected from EU research trawl surveys from 2006-2012 in the NRA in relation to closed areas.

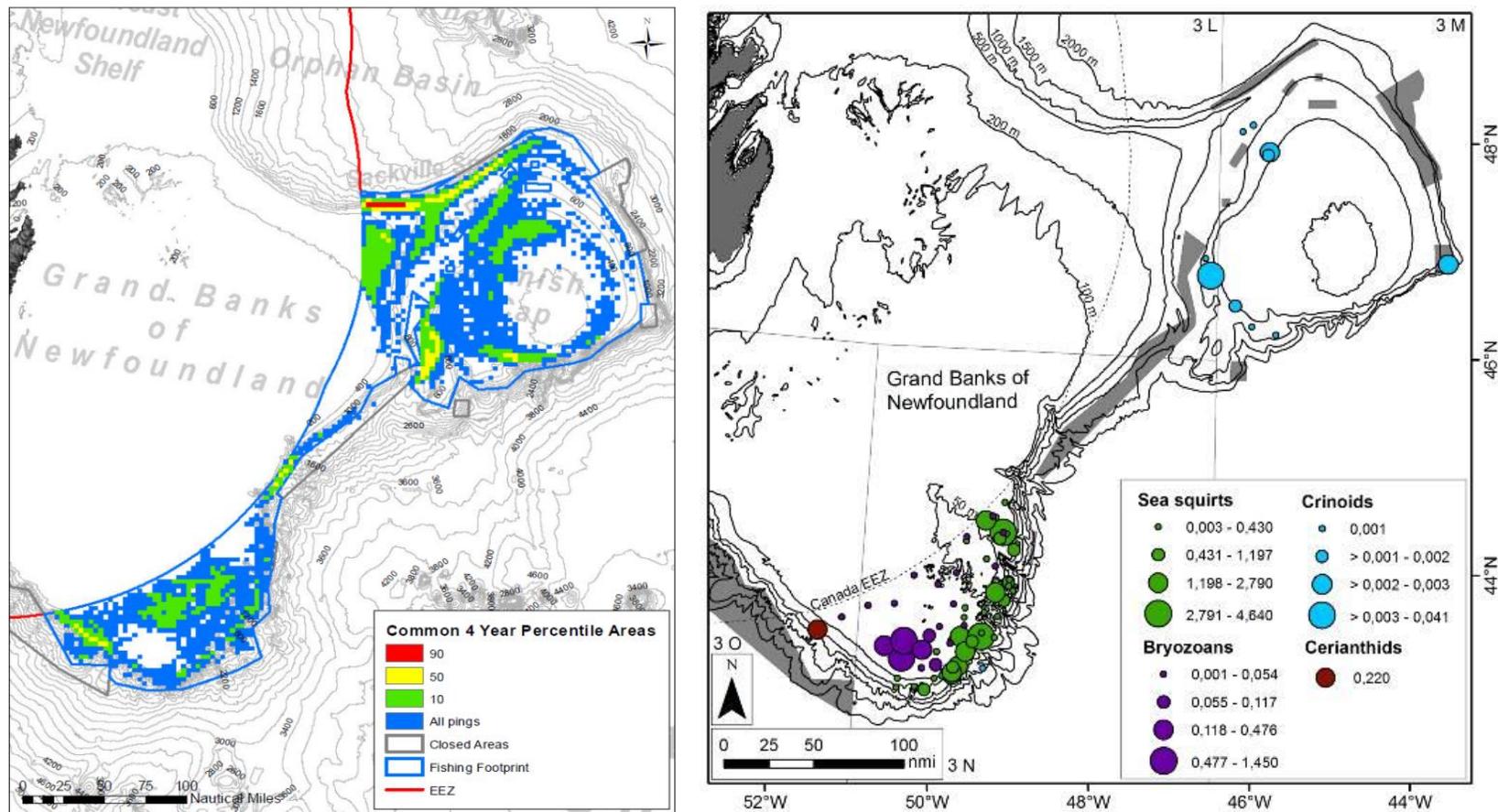


Fig. 5. **Left.** Map showing the area occupied by the 90<sup>th</sup>, 50<sup>th</sup> and 10<sup>th</sup> percentiles of bottom fishing activity, and all cells with fishing less than the 10<sup>th</sup> percentile (e.g. all cells with VMS pings, 2008 - 2011). Note the area occupied in blue has exactly the same amount of fishing effort as the area occupied in red indicating that the intensity of fishing activity is much higher in the red area compared to the blue area. **Right.** Relative abundance (kg/RV trawl) of sea squirts, crinoids, bryozoans and cerianthid anemones collected from EU research trawl surveys from 2006-2012 in the NRA in relation to closed areas. Catchability issues render it difficult to relate these values to *in situ* biomass of each group, between groups and even to evaluate the relative abundance from different depths and bottom types within a group (Fig. 3 above).

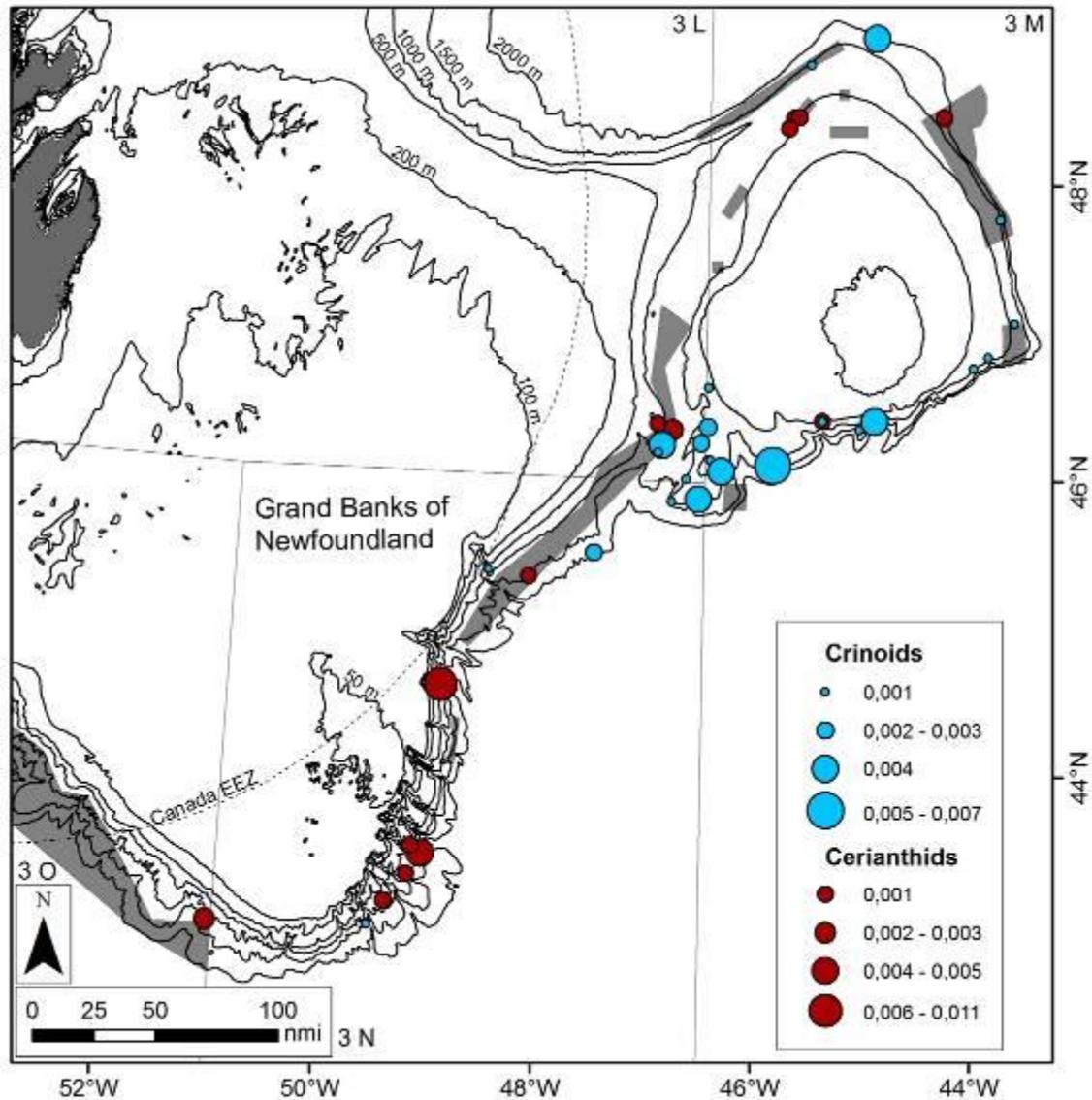


Fig. 6. Relative abundance (kg/rock dredge set) of crinoids and cerianthid anemones collected from NEREIDA Project (Rock dredge sampler) during 2009 and 2010 in the NRA.

### Outside the Fishing Footprint in the NRA

There are not enough data available on the distribution of VME and VME indicator taxa outside the fishing footprint in the NRA to develop scientifically based encounter thresholds and move on rules, with most data coming from the NEREIDA underwater video/images.

#### *Sponges, Sea Pens, Small and Large Gorgonian Corals*

In the absence of data outside of the fishing footprint on the continental slopes of Grand Bank and Flemish Cap, the same threshold defined for inside the fishing footprint should be considered for the slope areas outside of the fishing footprint in the NRA. This is a reasonable assumption as similar sponge and other VME species straddle the fishing footprint along the slope, although new information obtained through exploratory fishing and full analysis of the NEREIDA data could alter this recommendation. Specifically: 300 kg/trawl for Sponges, 7 kg/trawl for Sea Pens and 0.2 kg /trawl for Small Gorgonian Corals.

Previously, a threshold of 2 kg of Large Gorgonian Coral/RV trawl was calculated from the cumulative RV catch distribution to identify significant concentrations of large gorgonian corals. The Scientific Council recommends considering a 2 kg/trawl as the commercial encounter threshold for large gorgonian corals outside of the fishing footprint on the continental slopes of the NRA given their fragility, extreme longevity and vulnerability to fishing gear impacts. This value cannot be scaled to reflect commercial trawl lengths as the relationship between bycatch weight and trawl length is not linear.

*Sea Squirts, Erect Bryozoans, Crinoids and Cerianthid Anemones*

Until protection measures are in place the presence of any of these taxa in the catch may be used to trigger the move on rule and associated encounter reporting outside of the fishing footprint along the continental slopes of the NRA.

**Exploratory Fishing area of Seamounts**

Presence of any of the VME indicator taxa (including *Lophelia* or other reef-building stony corals which to date have not been identified in the fishing footprint or on the continental slopes of the NRA) may be used to trigger move-on rules and reporting.

**Summary of Existing and Candidate Encounter Thresholds:**

	<b>Inside Fishing Footprint</b>	<b>Outside Fishing Footprint in NRA (Continental Slopes)</b>	<b>Exploratory Fishing on Seamounts</b>
Large Gorgonian Corals		2 kg/trawl	presence
Small Gorgonian Corals	0.2 kg/trawl	0.2 kg/trawl	presence
Sea squirts		presence	presence
Erect Bryozoans		presence	presence
Crinoids		presence	presence
Sponges	300 kg/trawl*	300 kg/trawl	presence
Sea Pens	7 kg/trawl*	7kg/trawl	presence
<i>Lophelia</i> and other Reef Building Stony Corals**		presence	presence

\* Currently in 2013 Conservation and Enforcement Measures \*\* Not known to occur inside the fishing footprint