Northwest Atlantic Fisheries Organization

Serial No. N5629 **NAFO SCS Doc. 09/7**

SCIENTIFIC COUNCIL MEETING – JUNE 2009

2009 Meeting of the Joint ICES-NAFO Working Group on Deepwater Ecology [WGDEC]

By

E. Kenchington

Fisheries and Oceans, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada

The WGDEC met from March 9-13, 2009 in Copenhagen, Denmark to address 11 terms of reference (see Appendix 1), many of relevance to NAFO. Thirteen scientists from 9 countries participated. The meeting was held jointly with the Working Group on the Biology and Assessment of Deep Sea Fisheries Resources (WGDEEP), with 5 terms of reference (ToRs) shared between the groups. The full WGDEC report will be available online at http://www.ices.dk/workinggroups/ViewWorkingGroup.aspx?ID=15, possibly by the end of May.

As for the 2008 meeting, the number of terms of reference was greater than the number of participants and this limited the depth to which some ToRs could be addressed in such a short time frame. Nevertheless, the WGDEC made significant contributions to a number of important NAFO issues.

Their ToR f) produced a list of 25 sponge species which are habitat-forming and can be considered indicators of sponge VMEs in the North Atlantic (Appendix 2). This list was prepared with the assistance of Dr. Ole Tendal, an internationally recognized authority on sponges, and a member of WGDEC. The WGDEC further examined the types of damage that fishing operations can inflict on sponges and assessed their impact. These impacts were classified as due to mechanical damage, dislodgement and sedimentation. From this report it is clear that sponges brought on deck and returned to the sea will not survive, nor will sponges dislodged from the seabed. The large sponges take decades to achieve their size and so sponges certainly are at risk of significant adverse impacts due to fishing. WGDEC also recommended that sponge grounds, rather than individual species, be considered as the operational unit for conservation. Most of the sponge species found within fishing depths in the North Atlantic are relatively common and widespread. Over much of their distribution they occur as isolated individuals, however, in some locations, where environmental conditions are favourable, they form dense, multi-species communities and these sponge grounds require protection. This means that while information on species composition of catches is desirable, it is not essential. Sponge bycatch weights alone are good indicators of sponge grounds. Lastly, WGDEC compiled all Canadian data on the location of sponges from the Northwest Atlantic for the first time and produced distribution maps (see Figure 1 below). The report also shows detailed maps for each of the areas shown in Figure 1. The map for the NAFO NRA Div. 3LMNO is provided in Figure 2. It was noted that Spain holds more data on sponges that would add some other locations on the eastern slopes of Flemish Cap, but there were no Spanish participants at the meeting. It was further noted that it appears that the upper limits of some of the sponge grounds have been heavily modified by past fishing. This was particularly evident on Sackville Spur where the upper depth limit of the sponges and the lower depth limit of the main fishing activities were more or less the same.

The WGDEC ToR h and k only introduced one new taxon not previously highlighted in NAFO WGEAFM or FAO reports (such as cerianthid anemones, sea pens, xenophyophore fields etc.). The new taxon is “Serpulid reefs”, specifically reefs formed by the tube-building worm *Filograna implexa*. These reefs are on the order of 10-50 cm

high and have been reported from the Gulf of Maine, Georges Bank and off Norway. Sabellid reefs are very prominent in some locations in the NE Atlantic in intertidal and shallow subtidal areas. They are constructed from a different family of tube-building worms. The Serpulid reefs are seen to be the deepwater equivalent although they do not form such dramatic structures.

The work on species diversity was less advanced owing to the lack of data, however, efforts have begun to collate data within ICES to further address this question.

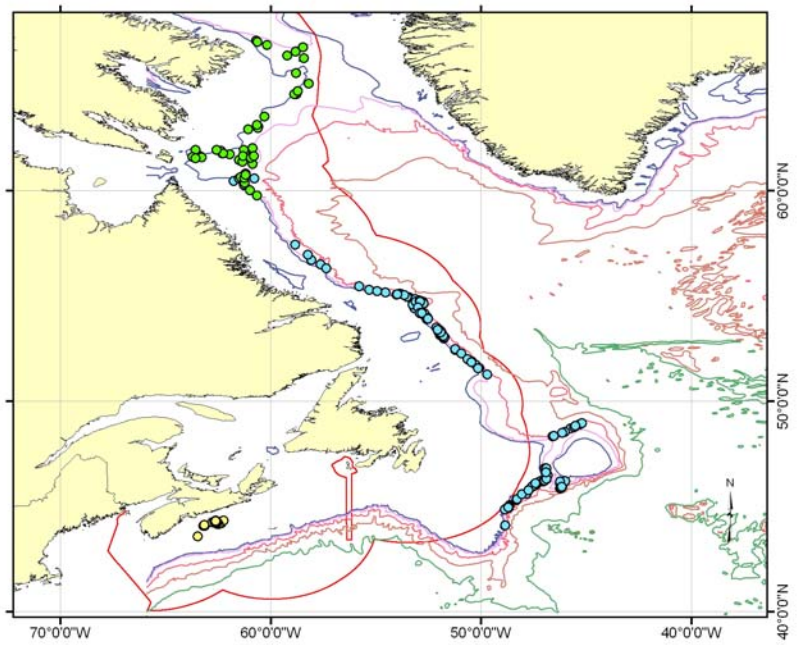

Figure 1 (8.2.2.3 of WGDEC). Distribution of large concentrations of *Geodia* spp. and related taxa (blue, green) and *Vazella pourtalesi* (yellow) as collected during Canadian trawl surveys and from observer records (*Vazella* only). Catches of over 100 kg per standard tow are indicated. Tows standardized to 15 min (blue) and 23391.04 m^2 (green). The red line indicates the Canadian EEZ. 500 m, 1000 m, 2000 m, 4000 m, 6000 m and 8000 m depth contours are indicated.

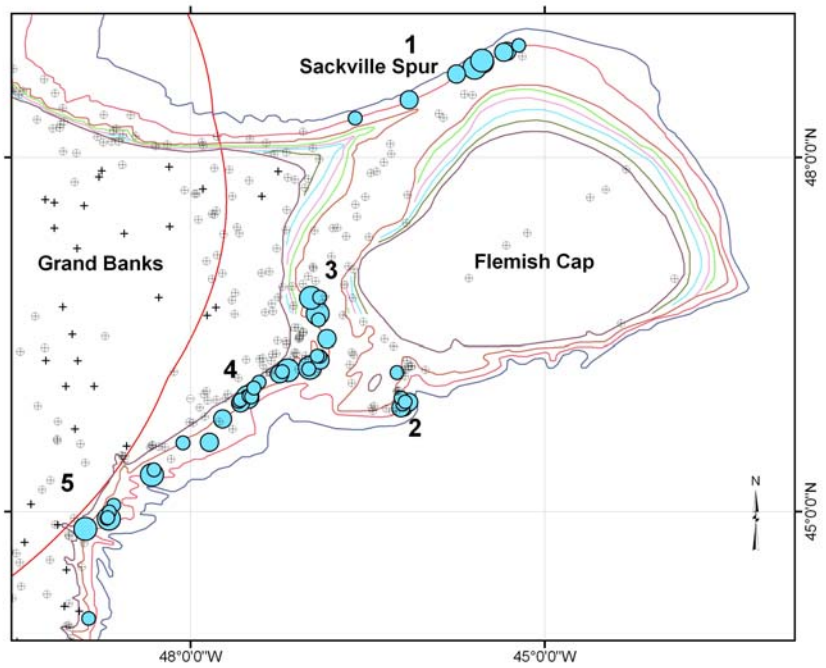

Figure 2 (8.2.2.7of WGDEC). Distribution of *Geodia*-like sponges ("ostur") relative to bathymetry in the NW Atlantic in the NAFO Regulatory area. Catches per standard tow of over 100 kg are indicated in blue. Catches less than 100 kg are indicated by grey circles while null catches are indicated by a cross. Where catches were relatively close to one another they were numbered and presented as 5 sponge grounds. Area 1: Sackville Spur, Area 2: Beothuk Knoll; Area 3: Flemish Pass; Areas 4 and 5: E Grand Banks. The red line indicates the Canadian EEZ. Contours begin at 500 m and increase by 100 m to 1000 m, followed by 1500 m and 2000 m.

Appendix 1. Terms of Reference for WGDEC 2009

2008/2/ACOM23 The **ICES-NAFO Working Group on Deepwater Ecology** [WGDEC] (Chair: Robert J. Brock, USA) will meet at ICES Headquarters, 9–13 March 2009 to:

a) Review and consider recent research into unaccounted mortality in commercial fisheries (in conjunction with WGDEEP).

b) Review ongoing work for reducing unintended effects on the seabed and associated communities of fishing operations and gears, including ghost fishing (in conjunction with WGDEEP).

c) Consider the nature of threats such as fish farming and eutrophication to coastal coral reef areas, for example those in Norway, Sweden, and Scotland.

d) Assess broader distribution patterns of species diversity of corals and sponges across the North Atlantic with a view to identifying 'hotspots' and variation in biodiversity and understanding biogeographic affinities.

e) Consider how the status of biodiversity of deepwater ecosystems could be measured, for example by using diversity indices (in conjunction with WGDEEP).

f) Define and map sponge associations based on taxonomic information and survey data. Assess the association of sponge fields with fish and other fauna. Provide a summary of sensitivity of different sponge species to impact and disturbance. Assess priorities areas for sponge distribution data and target areas for future surveys.

g) Consider the impact of deepwater fisheries in areas for which information has not been analysed to date, for example the orange roughy fishery on the shelf slope of the Porcupine bank and the roundnose grenadier fishery to the north of Hatton bank by using VMS and historic data. (In conjunction with WGDEEP).

h) Provide a list of structural habitats for the North Atlantic and assess the status of species such as Filograna (a polychaete) that are not currently considered as structural habitat forming organisms.

i) Review the development of fine scale VMS analysis in relation to habitats and assess vulnerability of deepwater banks, shelf slope and seamounts (in conjunction with WGDEEP).

j) Address the issue of scale: Advice giving when the scale of records does not match the scale of the feature/the scale of the activities to be regulated.

k) Provide a list of species that form structural habitats (e.g. hard corals, soft corals and sponges) for which information is particularly needed from new surveys.

WGDEC will report by 16 March to the attention of ACOM.

Appendix 2. Table of Sponge Species in the North Atlantic which form VME from the WGDEC 2009 Report

Table 8.2.1.2.1 from 2009 WGDEC Report. Large-sized (> 5 cm maximum dimension) sponge species frequently reported from sponge grounds in the North Atlantic. The nature of occurrence is different from one species to another: D = dominating on the ground; M = one of several dominating species on the ground; A = found on sponge ground in abundance, but not dominating as to biomass.

TAXON	SUBSTRATE	SIZE (RANGE OF ADULT)	ASSOCIATED WITH DENSE GROUNDS	GROWTH FORM
Hexactinellida				
Pheronema carpenteri (Thomson, 1869)	Mud	25 cm	D	Barrel-shaped, thick-walled
Asconema setubalense Kent, 1870	Gravel, stones	60 cm	M	Funnel-shaped, thin-walled
Vazella pourtalesi (Schmidt, 1870)	Mud	10 cm	D	Barrel-shaped, thin-walled
Schaudinnia rosea (Fristedt, 1887)	Gravel	20 cm	A	Barrel-shaped, thin-walled
Demospongiae				
Geodia barretti (Bowerbank,1858)	Gravel, stones	50 cm (100 cm)	D, M	Globular, often irregular
Geodia macandrewi Bowerbanki, 1858	Gravel, stones	45 cm	D,M	Globular, often faintly flattened
Geodia mesotriaena (Hentschel, 1929)	Gravel, stones	15 cm	M	Spherical
Geodia phlegraei (Sollas, 1880)	Gravel, stones	20 cm	M	Globular to funnel-shaped
Stryphnus ponderosus (Bowerbank, 1866)	Gravel, stones	50 cm	D, M	Lumpy, often irregular
Stelletta normani Sollas, 1880	Gravel, stones	20 cm	A	Spherical
Stelletta rhaphidiophora Hentschel,1929	Gravel, stones	15-20 cm	A	Spherical
Thenea muricata (Bowerbank, 1858)	Mud, sand	20 cm	D, A	Spherical
Thenea levis Von Lendenfeld, 1903	Mud, sand	15 cm	A	Oblong to crescent
Tetilla infrequens (Carter, 1876)	Gravel, other sponges	5 -10 cm	A	Spherical
Tetilla cranium (Müller, 1776)	Gravel, other sponges	10 cm	A	Spherical
Polymastia mammillaris	Gravel, stones	20 cm	A	Encrusting, cushion-shaped

(Müller, 1806)				
Polymastia uberrima (Scmidt, 1870)	Gravel, stones	10-15 cm	A	Spherical to cushion-shaped
Polymastia thielei (Koltun, 1964)	Gravel, stones	5-10 cm	A	Lumpy to spherical
Phakellia robusta Bowerbank, 1864	Stones	10-15 cm	A	Upright, foliate
Phakellia rugosa (Bowerbank, 1866)	Stones	20 cm	A	Upright, branched
Phakellia ventilabrum (Linnaeus, 1767)	Stones	45cm (60 cm)	A	Foliate, funnel-shaped
Mycale lingua (Bowerbank, 1866)	Sand, gravel	25-30 cm	A	Lumpy
Antho dichotoma (Esper, 1794)	Gravel stones	30-40 cm	A	Upright, branches
Petrosia crassa (Carter, 1876)	Gravel, stones	15cm (25 cm)	A	Lumpy
Oceanapia robusta (Bowerbank, 1866)	Sand	20cm (40 cm?)	A	Partly buried