

## Foreword

The Northeast Regional Stock Assessment Workshop (SAW) process has three parts: preparation of stock assessments by the SAW Working Groups and/or by ASMFC Technical Committees / Assessment Committees; peer review of the assessments by a panel of outside experts who judge the adequacy of the assessment as a basis for providing scientific advice to managers; and a presentation of the results and reports to the Region's fishery management bodies. Starting with SAW-39 (June 2004), the process was revised in two fundamental ways. First, the Stock Assessment Review Committee (SARC) became smaller panel with panelists provided by the Independent System for Peer Review (Center of Independent Experts, CIE). Second, the SARC provides little management advice. Instead, Council and Commission teams (e.g., Plan Development Teams, Monitoring and Technical Committees, Science and Statistical Committee) formulate management advice, after an assessment has been accepted by the SARC. Starting with SAW-45 (June 2007) the SARC chairs were from external agencies, but not from the CIE. Starting with SAW-48 (June 2009), SARC chairs are from the Fishery Management Council's Science and Statistical Committee (SSC), and not from the CIE. Also at this time, some assessment Terms of Reference were revised to provide additional science support to the SSCs, as the SSC's are required to make annual ABC recommendations to the fishery management councils.

Reports that are produced following SAW/SARC meetings include: An *Assessment Summary Report* - a summary of the assessment results in a format useful to managers; an *Assessment Report* - a detailed account of the assessments for each stock;

and the SARC panelist reports - a summary of the reviewer's opinions and recommendations as well as individual reports from each panelist. SAW/SARC assessment reports are available online at

<http://www.nefsc.noaa.gov/nefsc/publications/series/crdlist.htm>. The CIE review reports and assessment reports can be found at <http://www.nefsc.noaa.gov/nefsc/saw/>.

The 55th SARC was convened in Woods Hole at the Northeast Fisheries Science Center, December 3-7, 2012 to review benchmark stock assessments of: Gulf of Maine and Georges Bank Atlantic cod stocks (*Gadus morhua*). CIE reviews for SARC55 were based on detailed reports produced by NEFSC Assessment Working Groups. This Introduction contains a brief summary of the SARC comments, a list of SARC panelists, the meeting agenda, and a list of attendees (Tables 1 - 3). Maps of the Atlantic coast of the USA and Canada are also provided (Figures 1 - 5).

### **Outcome of Stock Assessment Review Meeting:**

Text in this section is based on SARC-55 Review Panel reports (available at <http://www.nefsc.noaa.gov/nefsc/saw/> under the heading "SARC-55 Panelist Reports"). Two issues dominated discussion of the **Gulf of Maine Atlantic cod** assessment. Issue 1 involved the use of data prior to 1982 in the assessment and in determining the stock recruitment relationship. Issue 2 involved whether natural mortality (M) was changing over time. Concerns about use of the pre-1982 data (which were not of the same detail and quality as the post-1982 data) and concerns about results from fitting stock-recruitment curves based on early data led the Review Panel to eliminate that approach from consideration. Two

variations of an ASAP model, both based on data from 1982 to present are being put forward. One model has a time-varying  $M$  while the other does not. The consequences associated with using each model were outlined. The two models should be viewed separately rather than being averaged for decision making. Commercial and recreational LPUE from the fishery were explored as potential indices of population abundance to be used in the assessment. The Panel concluded that these LPUE data are not indicative of trends in the stock as a whole. Based on the reference points derived from both assessment models being put forward, the Gulf of Maine cod stock is overfished and overfishing is occurring (the same conclusion as SARC53 in 2011). The Review Panel notes a long history of overfishing this stock.

The Review Panel was able to reach consensus on a single assessment model for **Georges Bank Atlantic cod**. The assessment assuming  $M = 0.2$  with bias

correction was recommended. Nevertheless, the Review Panel remained uncertain about whether  $M$  has changed. Commercial and recreational LPUE were explored as potential indices of abundance to be used in the assessment. The Panel concluded that these LPUE time series are not indicative of trends in the stock as a whole. The Panel noted a reduction over time in mean weight at age in this stock, truncated age structure, and two decades of poor recruitment for this stock. The bridge from the previous assessment model to the current model was well described. As in the past, reference points were calculated using  $F_{40\%SPR}$  for stock status determination. The Georges Bank stock is overfished and overfishing is taking place.

The Review Panel was unanimous regarding its conclusions, and stated that the Gulf of Maine and Georges Bank cod stock assessments represent best available science.

**Table 1. 55th Stock Assessment Review Committee Panel.**

**SARC Chairman (NEFMC SSC):**

Dr. Patrick Sullivan  
Cornell University  
Dept. of Natural Resources  
Email: [pjs31@cornell.edu](mailto:pjs31@cornell.edu)

**SARC Panelists (CIE):**

Dr. Noel Cadigan  
Fisheries and Marine Institute of Memorial University of Newfoundland  
P.O. Box 4920  
St. John's, NL  
Canada A1C 5R3  
Email: [Noel.Cadigan@mi.mun.ca](mailto:Noel.Cadigan@mi.mun.ca)

Dr. John Casey  
Centre for Environment, Fisheries and Aquaculture Sciences (CEFAS)  
Pakefield Road Lowestoft, Suffolk NR33 0HT UK  
Email: [john.casey@cefas.co.uk](mailto:john.casey@cefas.co.uk)

Dr. Steven Holmes  
Marine Scotland – Science  
Scottish Government  
Marine Laboratory  
PO Box 101  
375 Victoria Road  
Aberdeen AB11 9DB  
Email: [S.Holmes@MARLAB.AC.UK](mailto:S.Holmes@MARLAB.AC.UK)

**Table 2. Agenda, 55th Stock Assessment Review Committee Meeting.**

**December 3-7, 2012**

Stephen H. Clark Conference Room – Northeast Fisheries Science Center  
Woods Hole, Massachusetts

**AGENDA\*** (version: 2 Dec. 2012)

---

TOPIC	PRESENTER(S)	SARC LEADER	RAPPORTEUR
-------	--------------	-------------	------------

---

**Monday, Dec. 3**

**1 – 1:30 PM**

Welcome	<b>James Weinberg</b> , SAW Chair		
Introduction	<b>Patrick Sullivan</b> , SARC Chair		
Agenda			
Conduct of Meeting			

<b>1:30 – 3:15</b>	Assessment Presentation (B. GB cod)		
	<b>Loretta O’Brien</b>	TBD	<b>Julie Nieland</b>

**3:15 – 3:30** Break

<b>3:30 – 4:45</b>	(cont.) Assessment Presentation (B. GB cod)		
	<b>Loretta O’Brien</b>	TBD	<b>Julie Nieland</b>

<b>4:45 – 6</b>	SARC Discussion w/ presenter (B. GB cod)		
	<b>Patrick Sullivan</b> , SARC Chair		<b>Julie Nieland</b>

**Tuesday, Dec. 4**

<b>8:30 – 9:30</b>	(cont.) SARC Discussion w/ presenter (B. GB cod)		
	<b>Patrick Sullivan</b> , SARC Chair		<b>Jessica Blaylock</b>

**9:30 – 9:45** Break

<b>9:45 – 10:15</b>	Assessment Presentation (A. GOM COD)		
	<b>Robert O’Boyle</b>	TBD	<b>Jessica Blaylock</b>

<b>10:15 – Noon</b>	(cont.) Assessment Presentation (A. GOM COD)		
	<b>Mike Palmer</b>	TBD	<b>Jessica Blaylock</b>

**Noon – 1** Lunch

<b>1 – 2:15</b>	(cont.) Assessment Presentation (A. GOM COD)		
	<b>Mike Palmer</b>	TBD	<b>Toni Chute</b>

<b>2:15 – 3:15</b>	(cont.) Assessment Presentation (A. GOM COD)		
	<b>Doug Butterworth</b>	TBD	<b>Toni Chute</b>

<b>3:15 – 4:15</b>	(cont.) Assessment Presentation (A. GOM COD)		
--------------------	--	--	--

<b>4:15 – 4:30</b>	Break	<b>Robert O’Boyle</b>	TBD	<b>Toni Chute</b>
<b>4:30– 6:15</b>		SARC Discussion w/ presenters (A. GOM COD) <b>Patrick Sullivan</b> , SARC Chair		<b>Toni Chute</b>
	<b>(7:15</b>	Social event –Coonamesset Inn )		

### **Wednesday, Dec. 5**

<b>9 - 11</b>		Revisit w/ presenter (B. GB cod) <b>Patrick Sullivan</b> , SARC Chair		<b>Tony Wood</b>
<b>11 – 11:15</b>	Break			
<b>11:15 – 12:15</b>		Revisit w/ presenters (A. GOM COD) <b>Patrick Sullivan</b> , SARC Chair		<b>Tony Wood</b>
<b>12:15 – 1:30</b>	Lunch			
<b>1:30 – 2:45</b>		(cont.) Revisit w/ presenters (A. GOM COD) <b>Patrick Sullivan</b> , SARC Chair		<b>Alicia Miller</b>
<b>2:45 -3</b>	Break			
<b>3 - 6</b>		Review/edit Assessment Summary Report (A. GOM cod) <b>Patrick Sullivan</b> , SARC Chair		<b>Alicia Miller</b>

### **Thursday, Dec. 6**

<b>9 - Noon</b>		Review/edit Assessment Summary Report (B. GBK COD) <b>Patrick Sullivan</b> , SARC Chair		<b>Kiersten Curti</b>
<b>Noon – 1:15</b>	Lunch			
<b>1:15 – 3</b>		Wrap up Assessment Summary Reports (A. and/or B.; as necessary) <b>Patrick Sullivan</b> , SARC Chair		<b>Michelle Traver</b>
<b>3 – 3:15</b>	Break			
<b>3:15 – 5:30</b>	SARC Report writing. (closed meeting)			

### **Friday, Dec. 7**

<b>9:00 - 3 PM</b>	(cont.) SARC Report writing. (closed meeting)
--------------------	---

\*All times are approximate, and may be changed at the discretion of the SARC chair. The meeting is open to the public, except where noted.

**Table 3. 55<sup>th</sup> SAW/SARC, List of Attendees**

<b>Name</b>	<b>Affiliation</b>	<b>Email</b>
Blaylock Jessica	NEFSC	<a href="mailto:Jessica.Blaylock@noaa.org">Jessica.Blaylock@noaa.org</a>
Brooks Liz	NEFSC	<a href="mailto:liz.brooks@noaa.gov">liz.brooks@noaa.gov</a>
Butterworth Doug	UCT	<a href="mailto:doug.butterworth@uct.ac.za">doug.butterworth@uct.ac.za</a>
Cadigan Noel	CIE	<a href="mailto:Noel.Cadigan@mi.mun.ca">Noel.Cadigan@mi.mun.ca</a>
Cadrin Steve	SMAST	<a href="mailto:scadrin@umassd.edu">scadrin@umassd.edu</a>
Casey John	CIE	<a href="mailto:John.Casey@cefas.co.uk">John.Casey@cefas.co.uk</a>
Crawford Jud	Pew Charitable Trusts	<a href="mailto:jcrawford@pewtrusts.com">jcrawford@pewtrusts.com</a>
Curti Kiersten	NEFSC	<a href="mailto:kiersten.curti@noaa.gov">kiersten.curti@noaa.gov</a>
Deroba Jon	NEFSC	<a href="mailto:jonathan.deroba@noaa.gov">jonathan.deroba@noaa.gov</a>
Giacolone Vito	GFCPF/NSC	<a href="mailto:summer-breeze@mindspring.com">summer-breeze@mindspring.com</a>
Hart Dvora	NEFSC	<a href="mailto:Deborah.hart@noaa.org">Deborah.hart@noaa.org</a>
Holmes Steven	CIE	<a href="mailto:S.Holmes@marlab.ac.uk">S.Holmes@marlab.ac.uk</a>
Kaplan Katherine	Cornell University	<a href="mailto:Kak323@cornell.edu">Kak323@cornell.edu</a>
Karp Bill	NEFSC	<a href="mailto:bill.karp@noaa.gov">bill.karp@noaa.gov</a>
Legault Chris	NEFSC	<a href="mailto:chris.legault@noaa.gov">chris.legault@noaa.gov</a>
Methot Richard	NMFS	<a href="mailto:richard.methot@noaa.gov">richard.methot@noaa.gov</a>
Miller Alicia	NEFSC	<a href="mailto:alicia.miller@noaa.gov">alicia.miller@noaa.gov</a>
Miller Tim	NEFSC	<a href="mailto:timothy.j.miller@noaa.gov">timothy.j.miller@noaa.gov</a>
Nieland Julie	NEFSC	<a href="mailto:julie.nieland@noaa.gov">julie.nieland@noaa.gov</a>
Nies Tom	NEFMC	<a href="mailto:tnies@nefmc.org">tnies@nefmc.org</a>
Nitschke Paul	NEFSC	<a href="mailto:paul.nitschke@noaa.gov">paul.nitschke@noaa.gov</a>
O'Boyle Bob	Beta Scientific/SAW WG Chair	<a href="mailto:betasci@eastlink.ca">betasci@eastlink.ca</a>
O'Brien Loretta	NEFSC	<a href="mailto:Loretta.O'Brien@noaa.gov">Loretta.O'Brien@noaa.gov</a>
Odell Jackie	NSC	<a href="mailto:Jackie.odell@yahoo.com">Jackie.odell@yahoo.com</a>
Palmer Mike	NEFSC	<a href="mailto:Michael.Palmer@noaa.gov">Michael.Palmer@noaa.gov</a>
Rago Paul	NEFSC	<a href="mailto:Paul.Rago@noaa.org">Paul.Rago@noaa.org</a>
Robillard Eric	NEFSC	<a href="mailto:Eric.Robillard@noaa.gov">Eric.Robillard@noaa.gov</a>
Serchuk Fred	NEFSC	<a href="mailto:fred.serchuk@noaa.gov">fred.serchuk@noaa.gov</a>
Sullivan Pat	Cornell NEFMC SSC	<a href="mailto:pjs31@cornell.edu">pjs31@cornell.edu</a>
Terceiro Mark	NEFSC	<a href="mailto:mark.terceiro@noaa.gov">mark.terceiro@noaa.gov</a>
Weinberg James	NEFSC	<a href="mailto:James.Weinberg@noaa.org">James.Weinberg@noaa.org</a>
Wigley Susan	NEFSC	<a href="mailto:susan.wigley@noaa.gov">susan.wigley@noaa.gov</a>
Wood Tony	NEFSC	<a href="mailto:anthony.wood@noaa.gov">anthony.wood@noaa.gov</a>

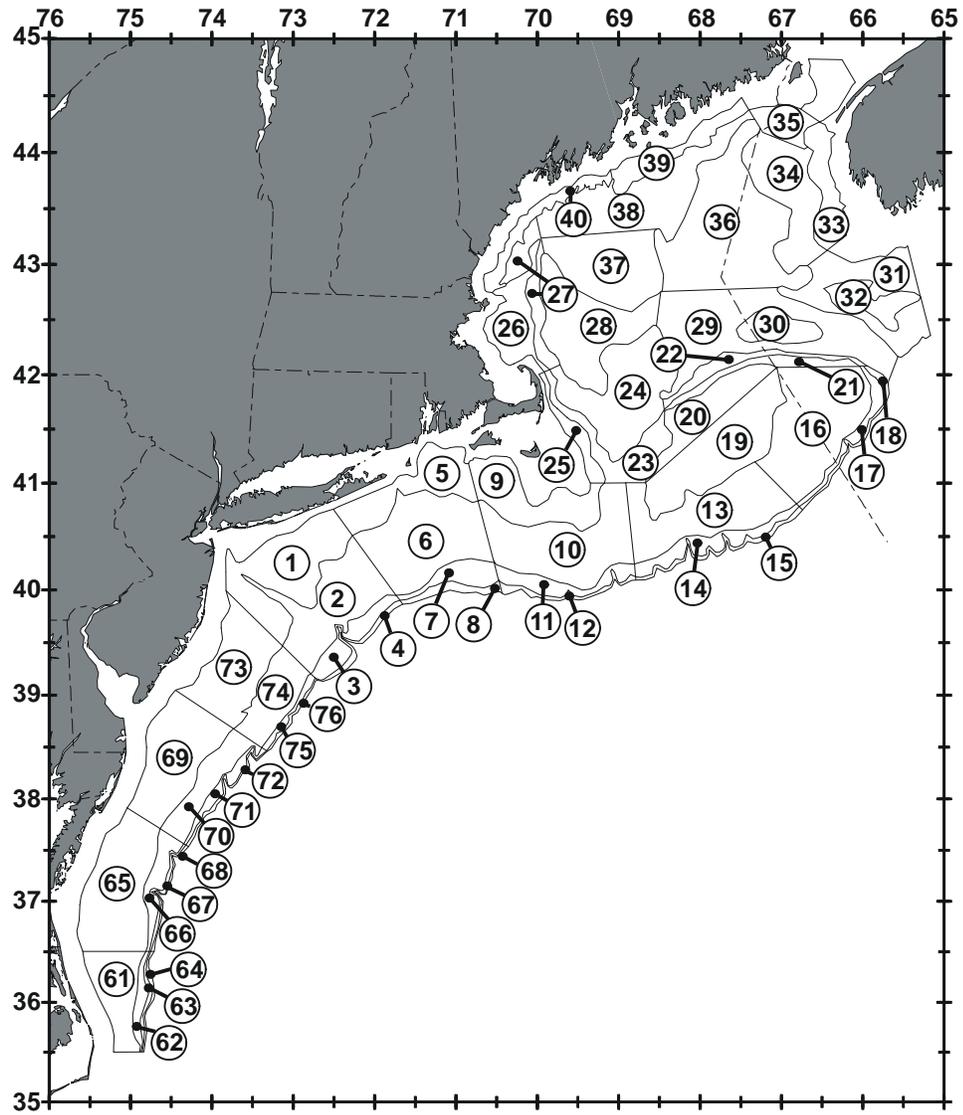


Figure 1. Offshore depth strata that have been sampled during Northeast Fisheries Science Center bottom trawl research surveys. Some of these may not be sampled presently.

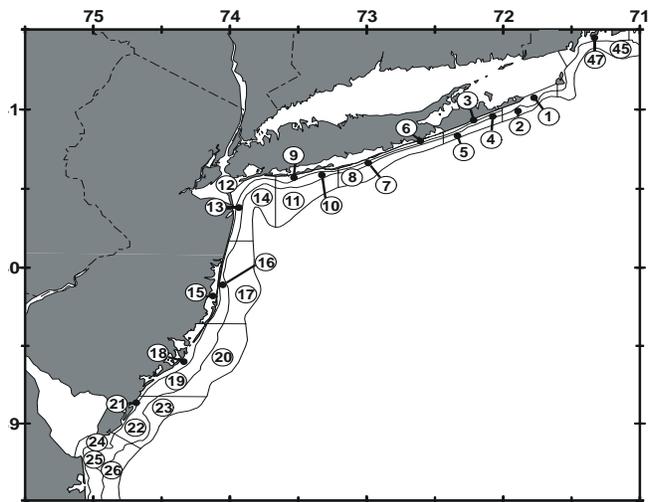
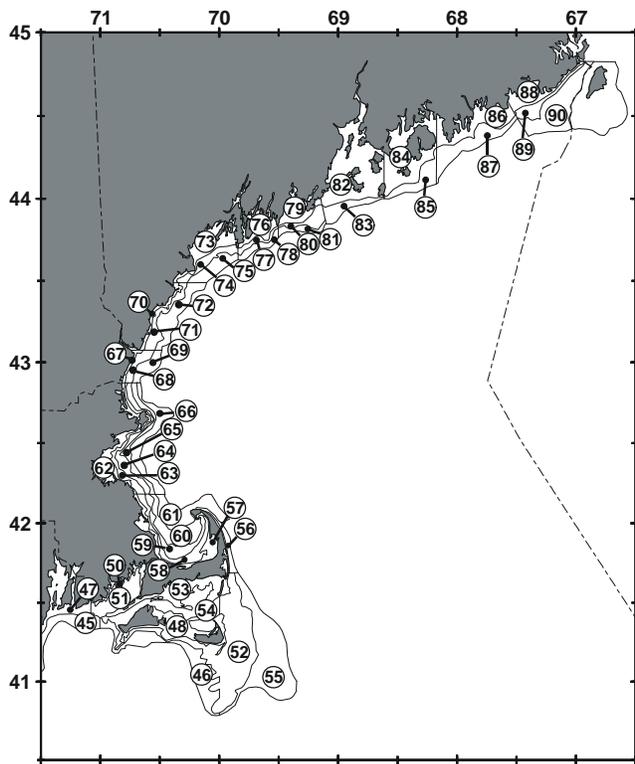
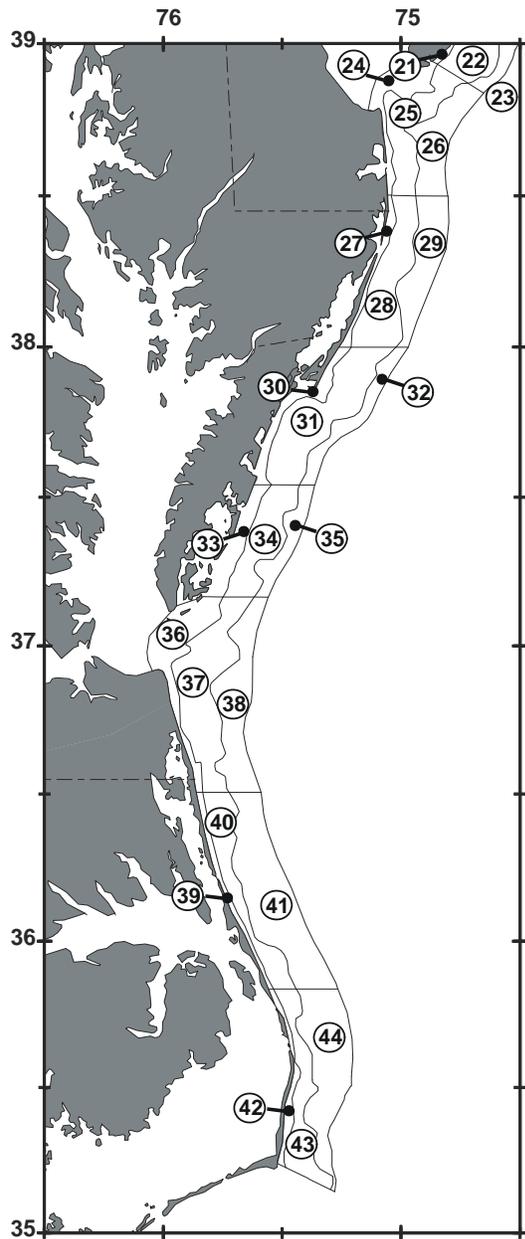


Figure 2. Inshore depth strata that have been sampled during Northeast Fisheries Science Center bottom trawl research surveys. Some of these may not be sampled presently.

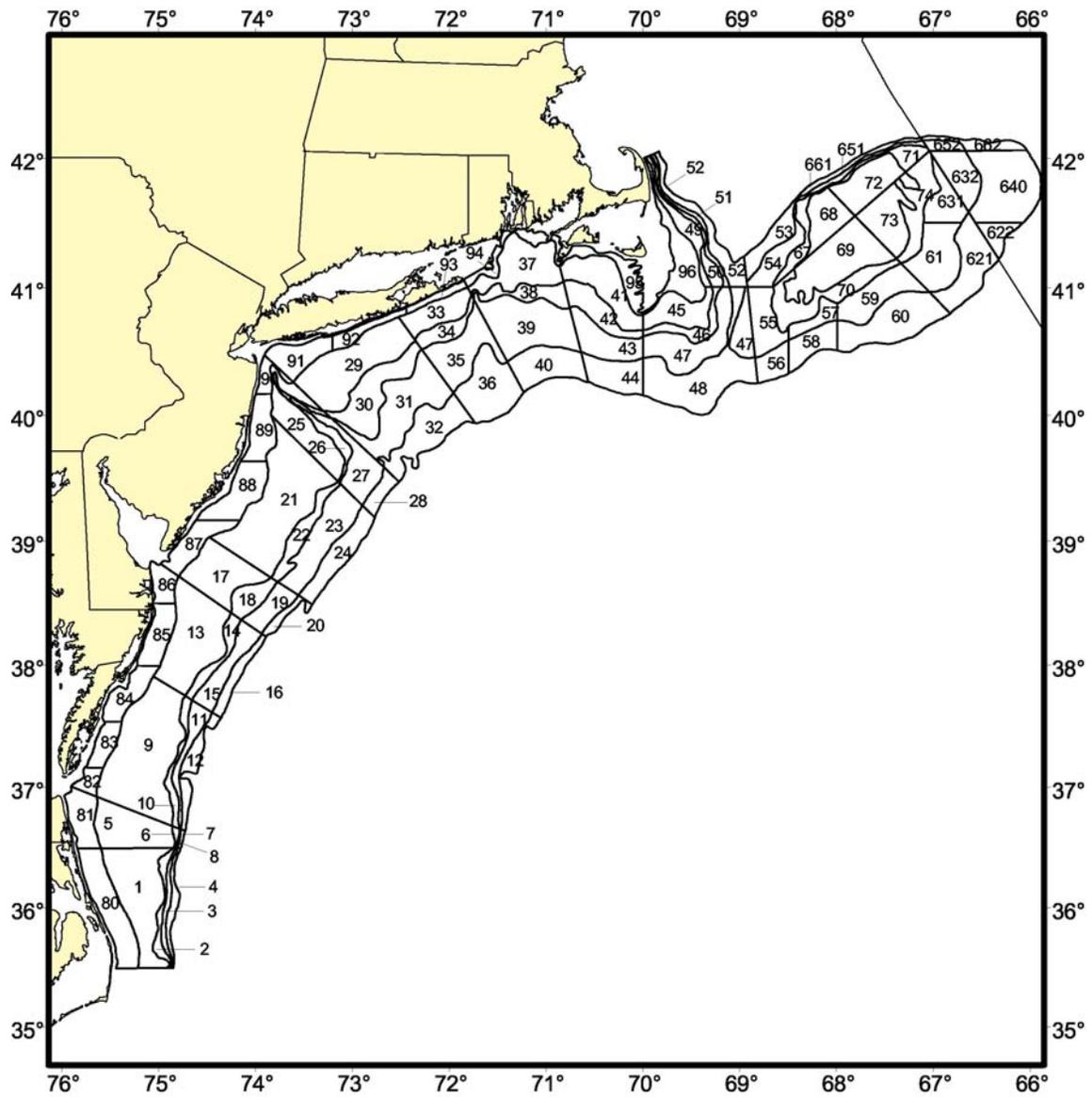


Figure 3. Depth strata sampled during Northeast Fisheries Science Center clam dredge research surveys.

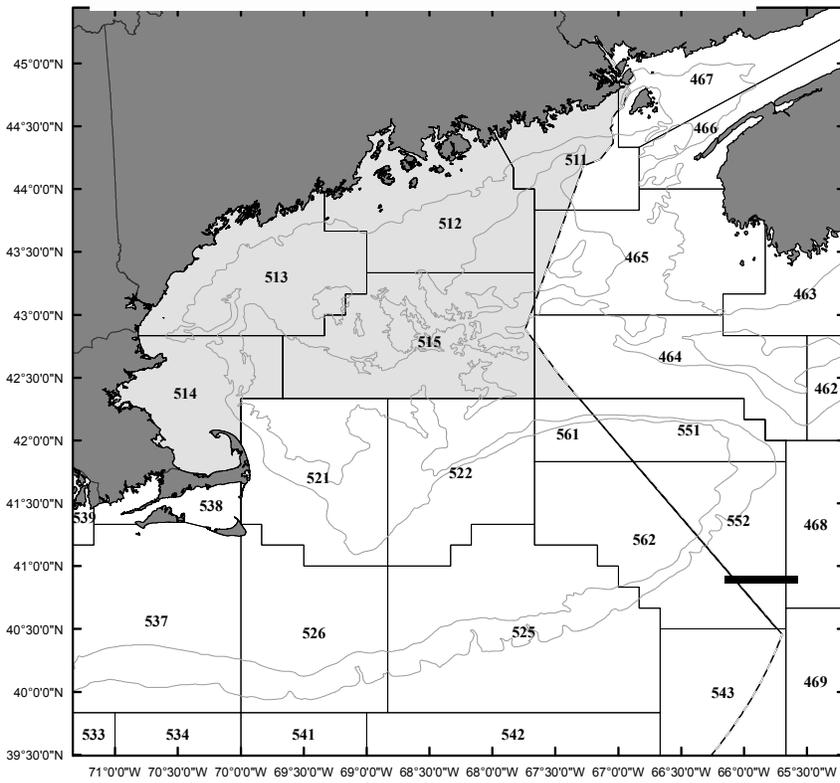
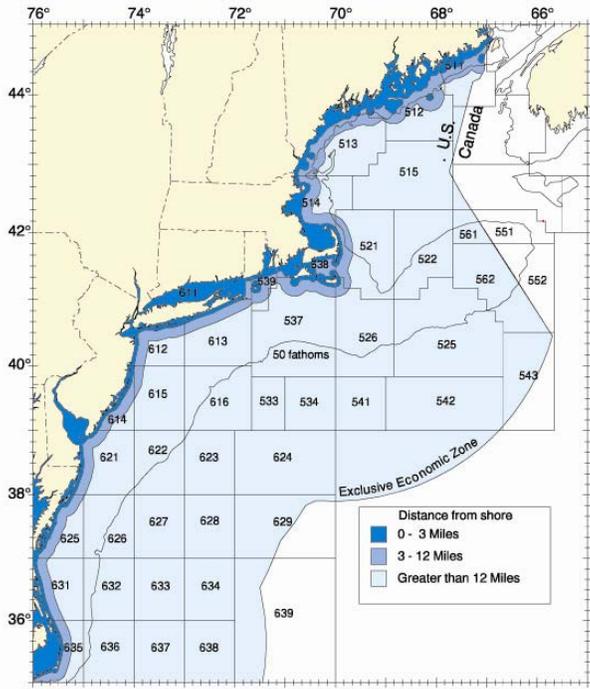


Figure 4. Statistical areas used for reporting commercial catches.

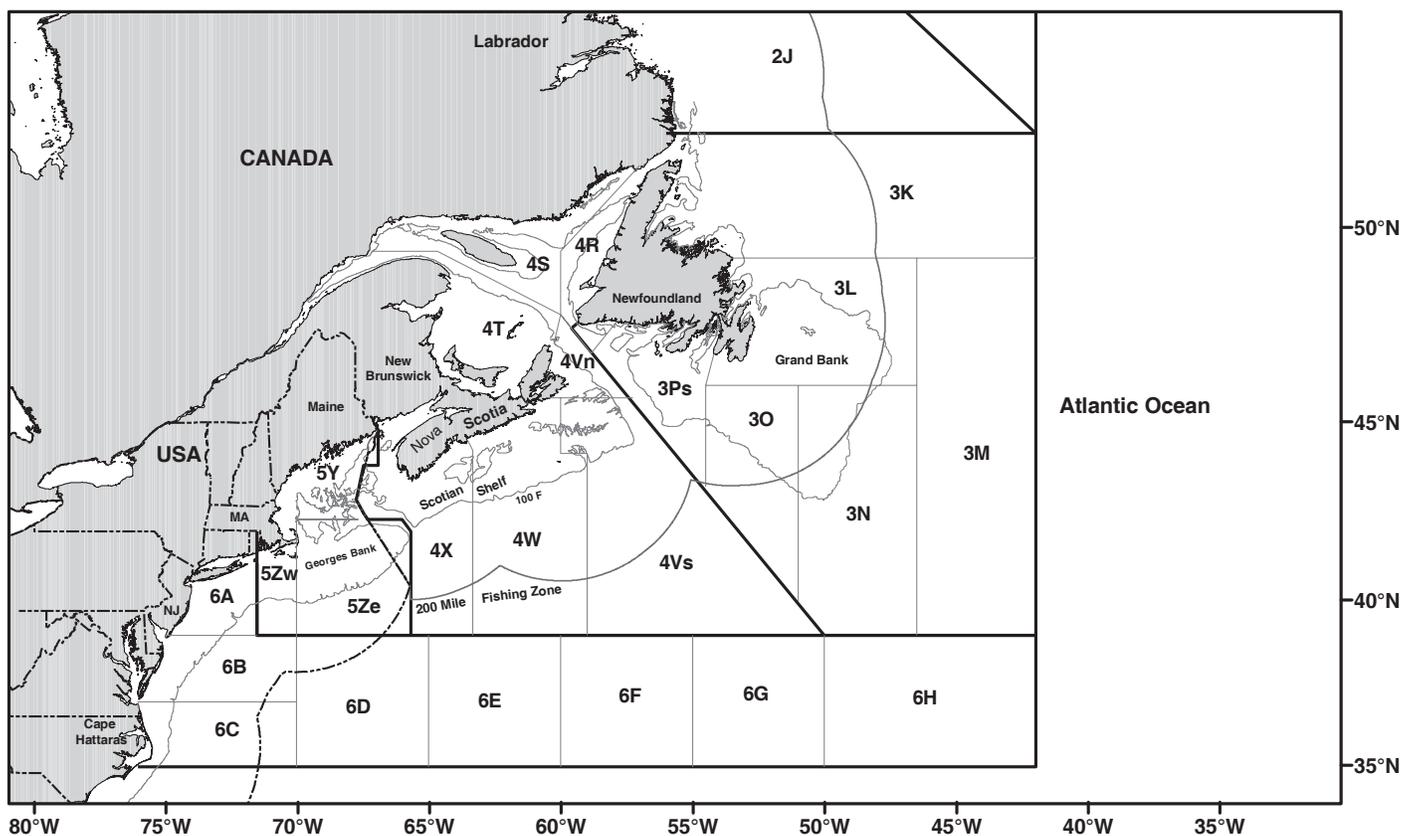


Figure 5. Catch reporting areas of the Northwest Atlantic Fisheries Organization (NAFO) for Subareas 3-6.