2015 CASA update
2016 scallop survey summary
ABC and OFL estimates for 2017-2018

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CASA Model Update through 2015

The CASA model (statistical catch at size model) was updated through the end of 2015, including survey, observer and landings data

Configuration was the same as in the 2014 benchmark assessment (through 2013). Three models: Mid-Atlantic, Georges Bank Open and Georges Bank Closed
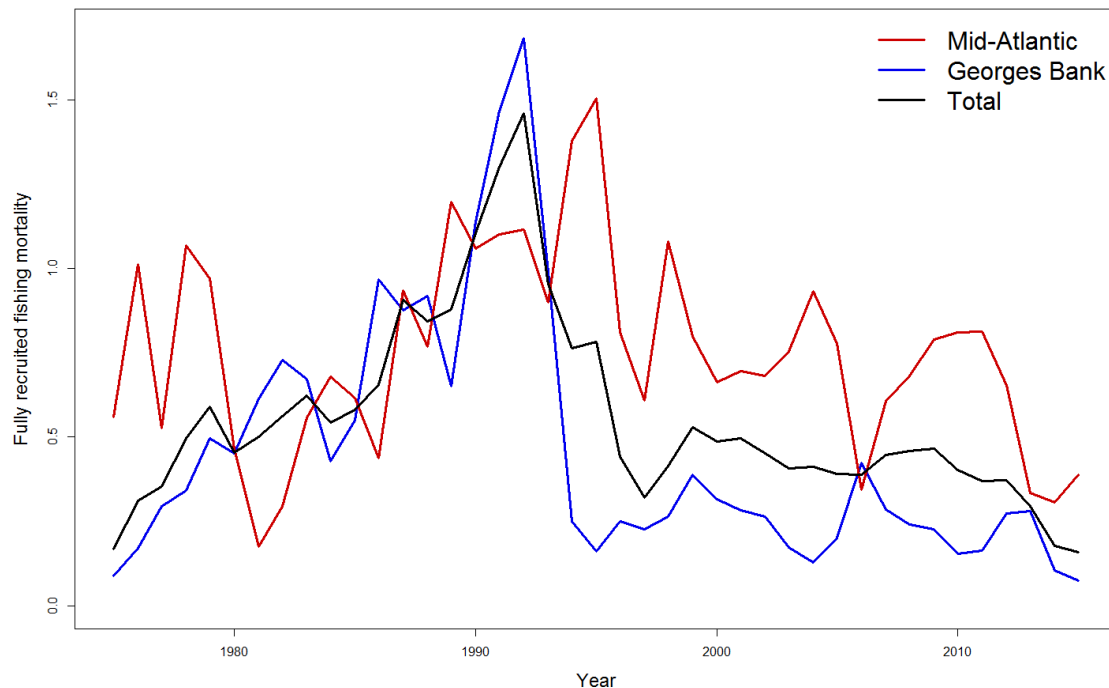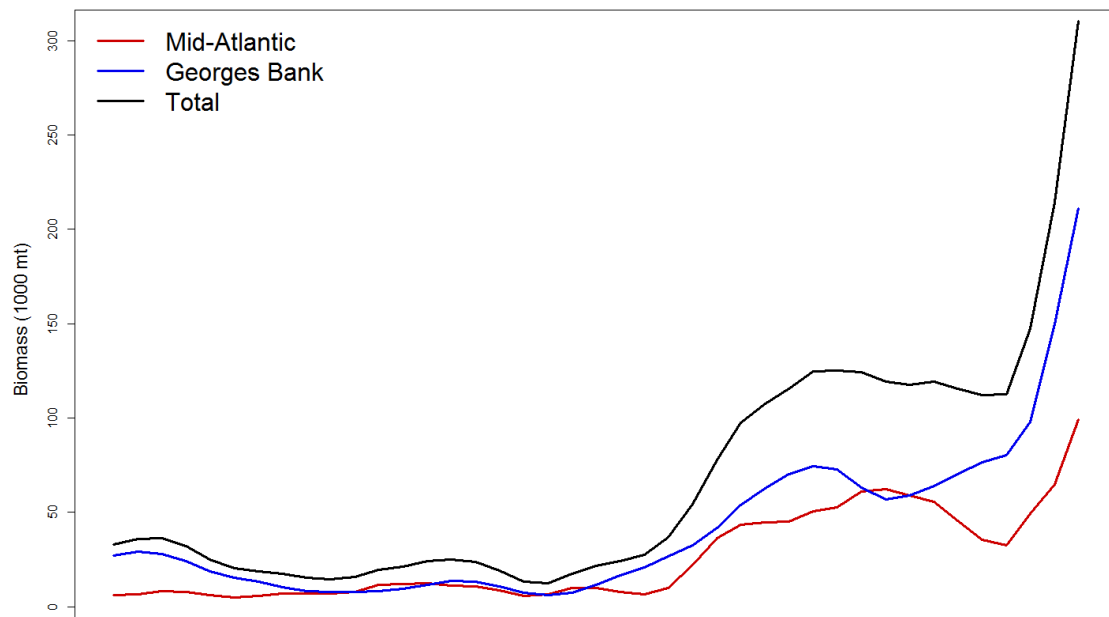
Biomass and fishing mortality by model
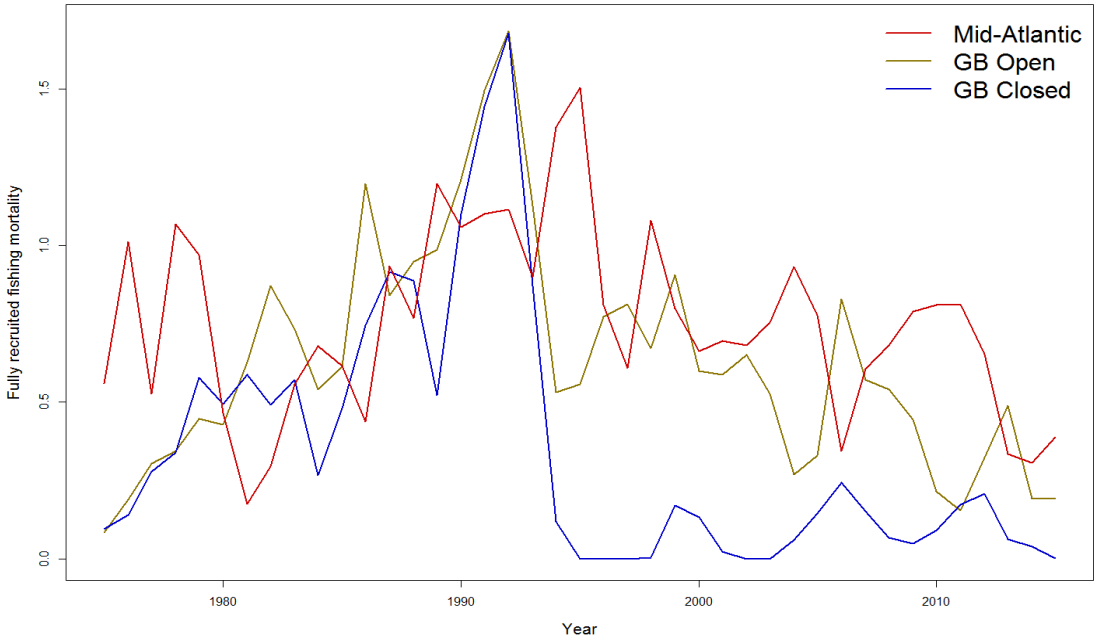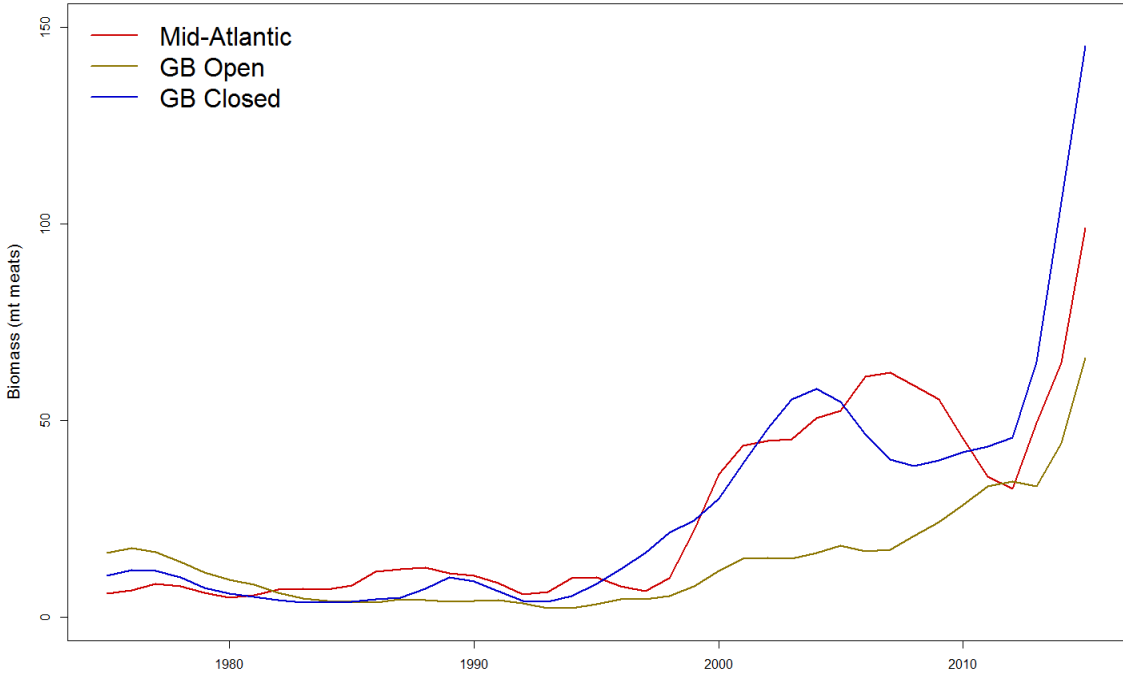
Biomass and fishing mortality by region and overall

Overall F_{15} = 0.16
No overfishing

Overall Bms_{15} = 310,000 mt
Above target, not overfished

Currently, almost no retrospective problem
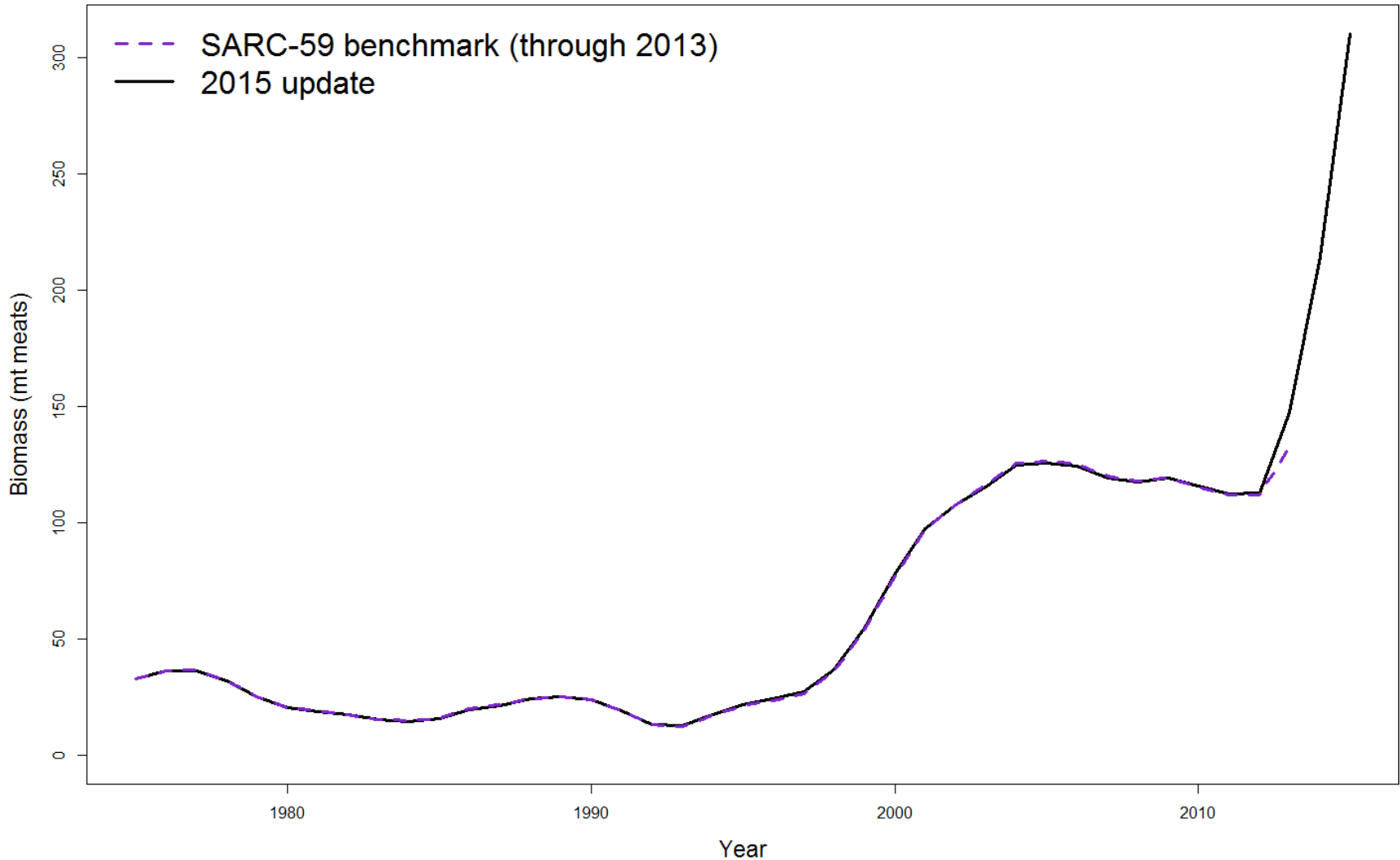
2016 Scallop Surveys Summary

Dredge survey of all areas (VIMS surveyed the Mid-Atlantic, Nantucket Lightship Area, Closed Area II South and extension with NEFSC survey of the remainder of Georges Bank).

Habcam surveys of all areas (Elephant Trunk and Delmarva by Habcam group towing the v3 vehicle, Northern Edge by WHOI, towing v4, and the remainder by NEFSC, towing v4)

Drop camera (SMAST) surveyed Closed Area I and Nantucket Lightship

2016 Scallop Surveys Summary

Consistent with previous surveys, very high densities of scallops were observed in portions of the Nantucket Lightship and Elephant Trunk areas. These densities were 1-2 orders of magnitude higher than that typically observed

Issues regarding high density scallop sites

1. Dredge surveys, and to a lesser extent the drop camera, are well below Habcam estimates in these areas. Preliminary analysis suggests dredges may operate at reduced efficiency at these unusually high densities. Some visibility issues for some drop camera photos.
   Pending further analysis of these issues, the PDT chose to use the simple mean of the biomass estimates from each survey for modeling purposes, including estimation of ABCs/OFLs

2016 Scallop Survey Estimates

| Georges Bank	Dredge NumMill	BmsMT	SE	MeanWt	Drop Camera (Digital) NumMill	BmsMT	SE	MeanWt	Habcam NumMill	BmsMT	SE	MeanWt	Means NumMil	BmsMT	SE	MeanWt	IVWMBms	SE
CL1ACC	82	2250	815	27.3	85	1374	283	16.2	41	1135	11	27.7	70	1586	862	22.8	1136	11
CL1NA	428	11539	4631	27.0	231	5524	1403	23.9	973	16518	1734	17.0	544	11194	5140	20.6	9961	1062
CL-2(N)	209	4391	1288	21.0					260	6887	1092	26.5	234	5639	1689	24.1	5843	833
CL-2(S)	688	13876	866	20.2					500	8632	765	17.3	594	11254	1156	18.9	10932	574
CL2Ext	478	4963	427	10.4					472	3877	154	8.2	475	4420	454	9.3	4002	145
NLSAccN	100	3580	297	35.7	168	6057	1234	35.6	150	6352	613	42.3	139	5330	1410	38.3	4196	261
NLSAccS	5598	27570	2760	4.9	7305	43307	10909	5.9	12559	64982	2453	5.2	8487	45287	11517	5.3	48333	1808
NLSNA	1274	13313	2394	10.5	1768	22499	11959	14.9	5229	76561	3046	14.6	2757	37458	12571	13.6	37107	1860
NLSExt	98	1415	427	14.4	291	4697	4227	16.1	256	6707	506	26.2	215	4273	4279	19.9	3621	325
NF	955	6476	3380	6.8					106	1033	735	9.8	530	3755	3460	7.1	1279	719
SCH	661	9166	3212	13.9					392	3015	214	7.7	526	6090	3219	11.6	3042	214
SF	429	5313	2	12.4					287	3774	146	13.2	358	4544	146	12.7	5313	2
Total Rotational	*7045*	*53655*	*3050*	*7.6*					*13978*	*91686*	*2690*	*6.6*	*9980*	*72150*	*12451*	*7.2*	*75049*	*2017*
Total EFH Closures	*1910*	*29243*	*5370*	*15.3*					*6462*	*99966*	*3671*	*15.5*	*3535*	*54290*	*13686*	*15.4*	*77437*	*3031*
Total Open	*2045*	*20955*	*4663*	*10.2*					*784*	*7823*	*780*	*10.0*	*1415*	*14389*	*4728*	*10.2*	*8180*	*769*
TOTAL	**11001**	**103852**	**8409**	**11.6**					**21224**	**199474**	**4620**	**9.4**	**14930**	**140828**	**19102**	**9.4**	**177301**	**4049**
MidAtlantic																		
Block Island	74	1510	83	20.4									74	1510	83	20.4	1510	83
Long Island	849	14711	735	17.3					1433	21883	10173	15.3	1141	18297	10200	16.0	14749	733
NYB	692	7600	978	11.0					396	6129	4	15.5	544	6865	978	12.6	6129	4
MA inshore	60	726	74	12.2					27	285	1	10.6	43	506	74	11.7	285	1
HCSAA	1171	13824	634	11.8					2046	22311	791	10.9	1609	18068	1013	11.2	17146	495
ET Open	981	11250	450	11.5					2300	26039	1922	11.3	1640	18645	1974	11.4	12018	438
ET Closed	990	10682	821	10.8					4235	39140	4342	9.2	2613	24911	4419	9.5	11665	807
DMV	382	4096	394	10.7					474	6070	1046	12.8	428	5083	1118	11.9	4341	369
Virginia	7	17	3	2.2									7	17	3	2.2	17	3
Total Access	*2534*	*29170*	*1197*	*11.5*					*4819*	*54421*	*4926*	*11.3*	*3677*	*41795*	*5069*	*11.4*	*30579*	*1164*
Total Open	*1682*	*24564*	*1228*	*14.6*					*1856*	*28298*	*10173*	*15.2*	*1810*	*27195*	*10247*	*15.0*	*24618*	*1220*
TOTAL	**5207**	**64416**	**1716**	**12.4**					**10910**	**121859**	**11303**	**11.2**	**8099**	**93901**	**11433**	**11.6**	**65710**	**1696**
OVERALL TOTAL	**16207**	**168268**	**8582**	**10.4**					**32134**	**321333**	**12211**	**10.0**	**23029**	**234729**	**22262**	**10.2**	**218876**	**7021**

Issues regarding high density scallop sites

2. Unusually slow growth observed in the southern portion of the Nantucket Lightship area. This appears to be related more to depth than density, since similar high density areas to the west and east of this area are growing more normally
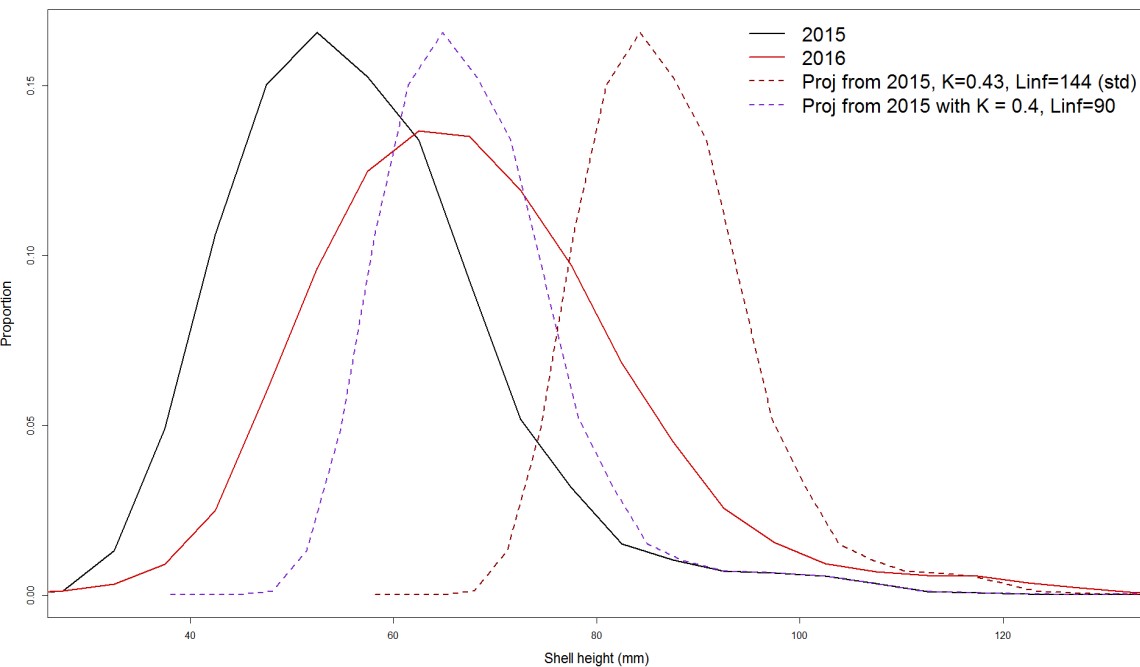
Assumed growth in the southern portion of the Nantucket Lightship area deeper than 70m was reduced to fit observations

Nantucket Lightship Access Area South 2016 shell heights by depth zone, from Habcam data

Nantucket Lightship Area South Shell Heights,
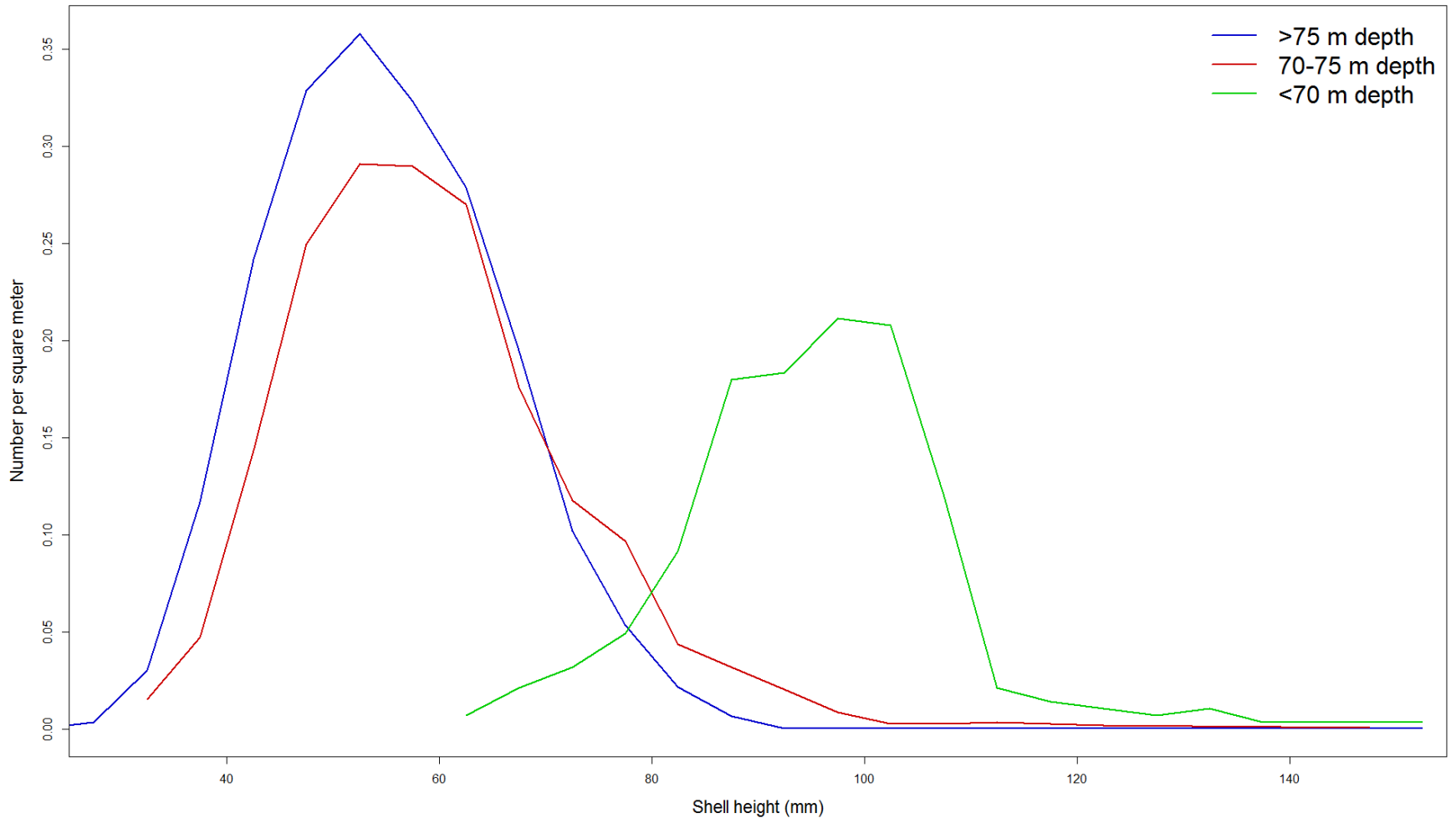
On the basis of the previous plot (and similar data from the SMAST survey), the Nantucket Lightship Access South was split by 70 m depth into shallow and deep parts. 18% of the biomass of this area is in the shallow portion

The shallow part was assumed to be growing normally and have a standard shell height to meat weight relationship from the last benchmark assessment.

The deep portion used a VIMS SH/MW relationship based on 2016 observations (which were ~40% smaller than that predicted by the standard relationship) and growth parameters of L_∞ = 90 and K = 0.4 consistent with the observed 2015-2016 growth. VIMS 2016 SH/MW relationships were also used in the EFH portion of Nantucket Lightship and the NLS extension, although the reduction in meat weight was less

2016 SAMS Model Configuration

13 subareas of Georges Bank region. Three in open areas: South Channel, Northern Edge, Southern Flank, two adaptive rotational areas: Nantuket Lightship Extension and Closed Area II Extension, and seven in groundfish closed areas: CA-I access and no access, CA-II access and no access, Nantucket Lightship no access, access north, access south deep and access south shallow

8 subareas of Mid-Atlantic region: Virginia, Delmarva, Elephant Trunk open, Elephant Trunk closed, Hudson Canyon South, New York Bight, Long Island, Inshore Mid-Atlantic

Model was initialized to averaged 2016 survey data and advanced to 2017 using estimated fishing mortality in each subarea

ABC/ACL and OFL estimates for Framework 28

ABC/ACL: F = 0.38 for all areas in 2017-2018

2017 OFL: F = 0.48 for all areas in 2017

2018 OFL: F = 0.38 in 2017 and F = 0.48 in 2018

All quantities in metric tons meats

Year	MABms	GBBms	TotBms	ExplBms	ABC_Land	ABC_Disc	ABC_Tot	OFL_Land	OFL_Disc	OFL_Tot
2016	93798	141174	234971	52503	37852					68418
2017	124645	183983	308628	106681	43142	13850	56992	52184	17494	69678
2018	127899	182259	310158	157768	50946	13461	64407	61265	17004	78269