



**NOAA
FISHERIES**

- **Northeast
Fisheries
Science
Center**

Overview of Groundfish Assessments and Management during Output Controls



https://www.nefsc.noaa.gov/saw/sasi/sasi_report_options.php

Management Track

Assess half of the 20 groundfish stock every year for the estimation of OFLs & ABCs for 3 years. Three levels of assessment flexibility determined by the AOP.

Research Track (SAW SARC Benchmarks)

YEAR	"SPRING" STOCKS/TOPIC	"FALL" STOCKS/TOPIC
2020	Red/Silver Hake stock structure	Evaluating Index Based Methods and Control Rules
2021	Haddock- GOM, GB, EGB (TRAC)	Butterfish and Shortfin Squid*
2022	American Plaice, Spiny Dogfish	Black Sea Bass, Bluefish
2023	Cod- GOM, GB & EGB (TRAC)	Applying State-Space Models
2024	Golden Tilefish, Scallops	Yellowtail Flounder - CC/GOM, SNE/MA, and GB (TRAC)

Data Portal



Assessment Search Tool
SAW and SARC Reports
Related Assessments
Related Links

SAW Home
Dr. James Weinberg, Chair

Stock Assessment Support Information (SASINF)

Notice: The findings and conclusions in the new papers have not been formally disseminated by NMFS and should not be construed to represent any agency determination or policy.

Please select your search options and then click the SEARCH button.

Please note: Files are current as of the date and time you that you download them. There may be subsequent revisions until the assessments are final.

Assessment Year:

Species Name:

Stock Area:

Information Type:

SEARCH

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https://www.nefsc.noaa.gov/saw/sasi/sasi_report_options.php

Data Portal Output

Search Criteria

Assessment Year

Species

Stock

Information Type

OUTPUTS

Zip File=Everything

Assessment Report

Figures

Tables

Model info: inputs,
outputs, diagnostics

Maps—Survey

Maps –Commercial

Background Reports



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Groundfish Operational Assessment Peer Review Meeting September 9-13 10 Stocks

Pat Sullivan (Chair)

Steve Cadrin

Chris Legault

Stock Assessment Models

VPA

- Georges Bank haddock
- Plaice
- Georges Bank winter flounder *
- Cape Cod-Gulf of Maine yellowtail flounder

OTHER

- GB cod
- ~~• Ocean Pout~~
- Witch flounder
- N Windowpane *
- S Windowpane *
- ~~• GOM winter flounder *~~
- ~~• Wolffish*~~
- GB yellowtail flounder (TRAC)*
- Halibut *

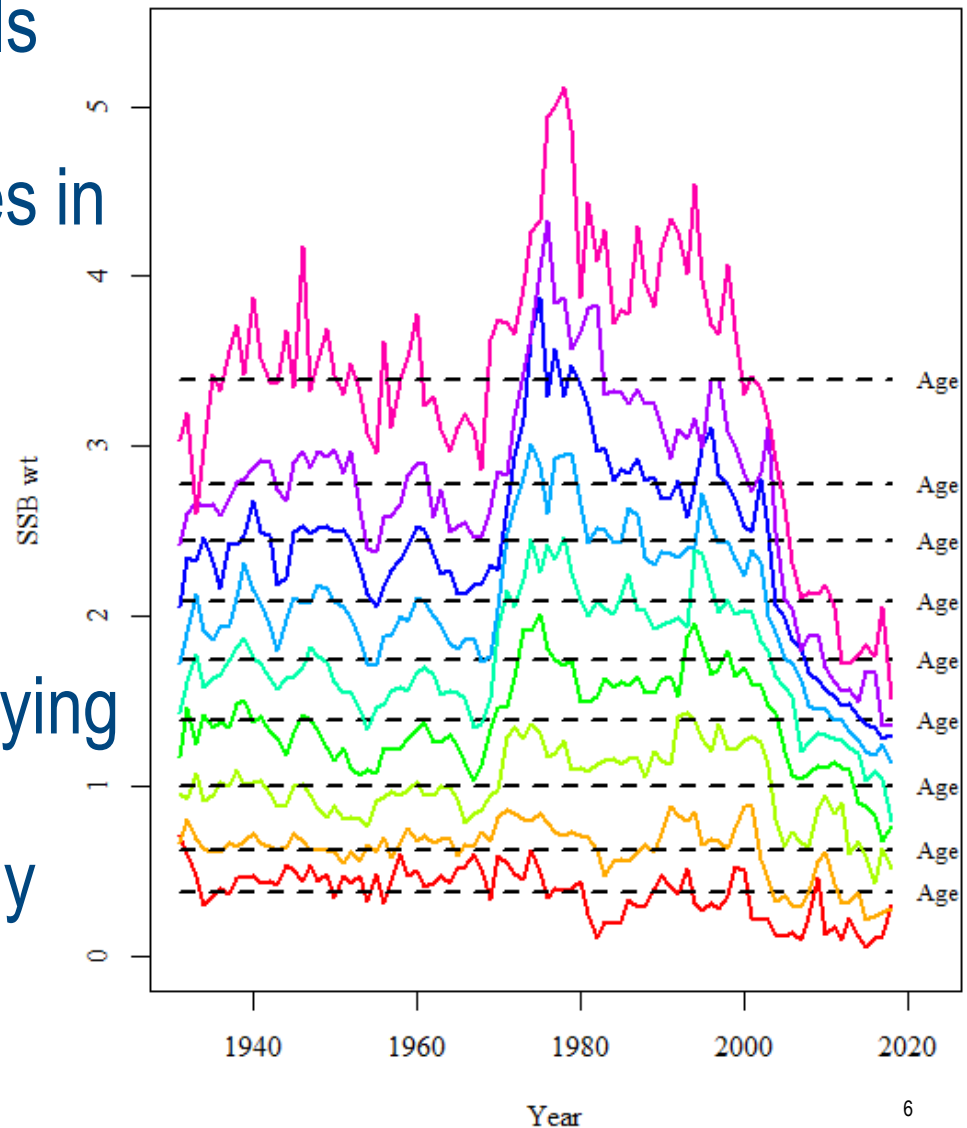
ASAP

- Gulf of Maine cod
- Gulf of Maine haddock
- Pollock
- ~~• Redfish*~~
- White hake
- ~~• Southern New England-Mid Atlantic winter flounder*~~
- Southern New England-Mid Atlantic yellowtail flounder

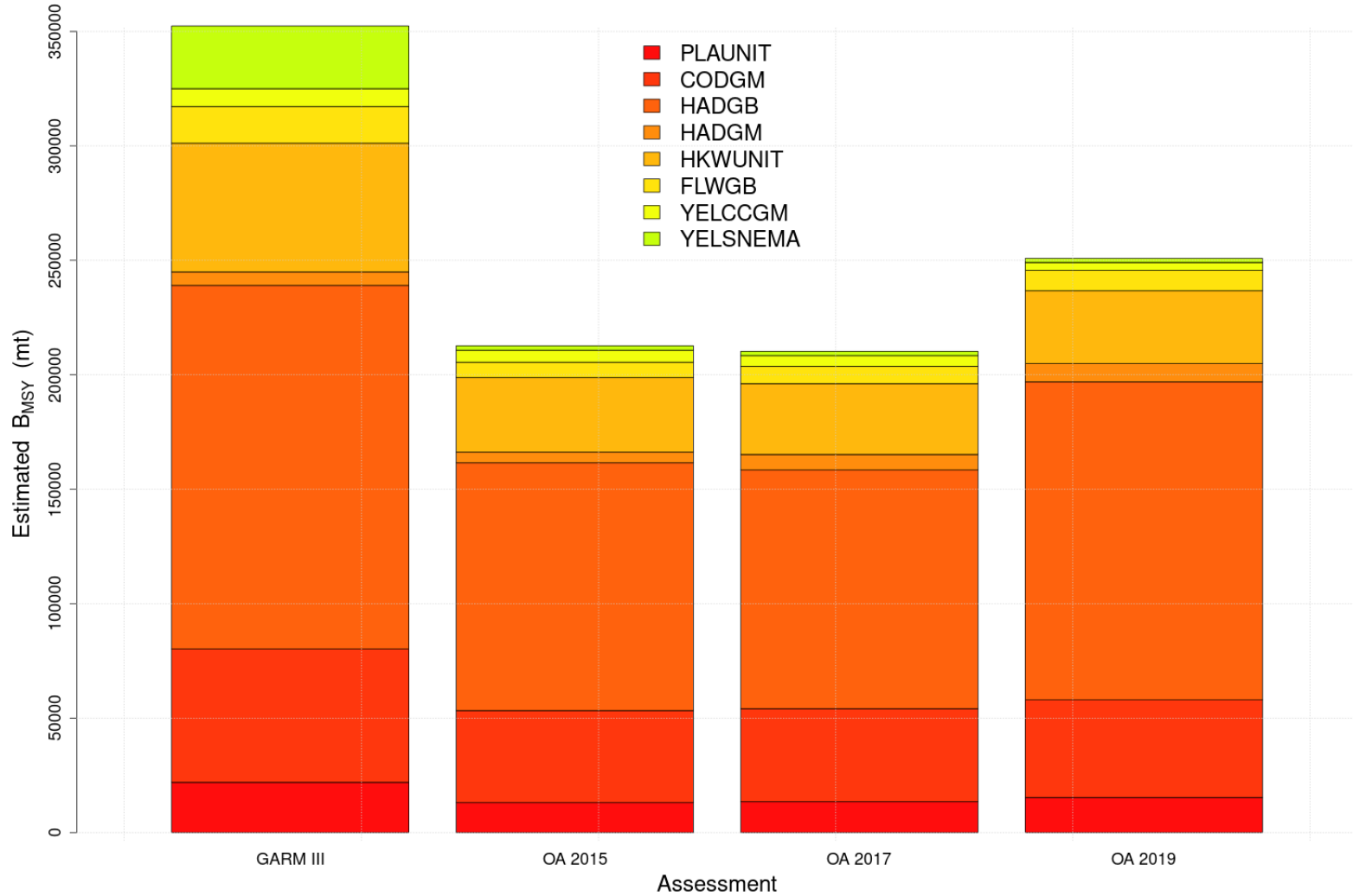
* 2020 Stocks

Keeping up with a Changing Environment

- Stock assessment models incorporate the primary consequences of changes in the environment.
 - Growth
 - Maturity
 - Recruitment
- Irrespective of the underlying cause, the updated information is immediately relevant to management.

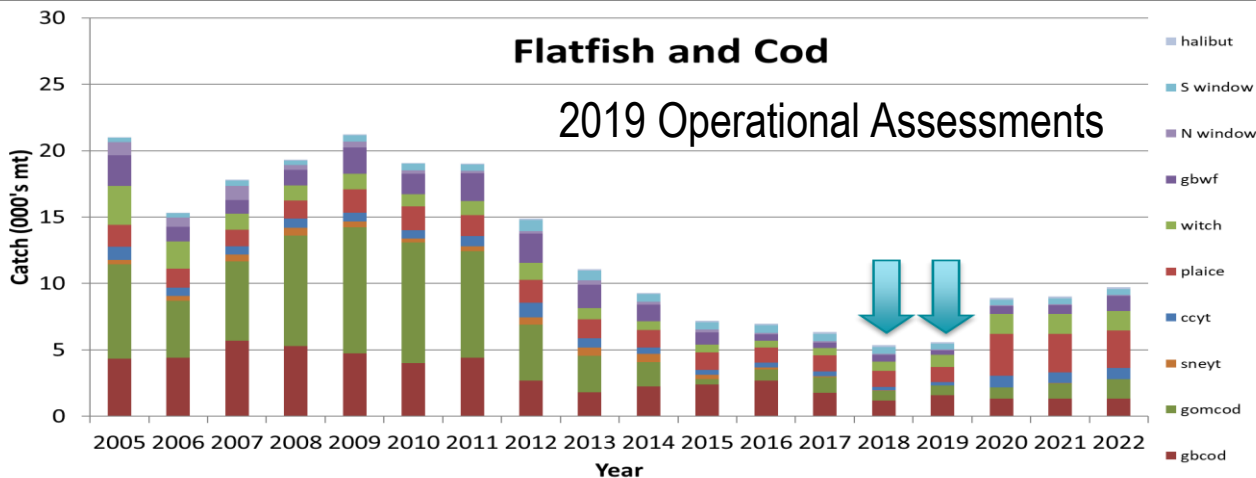
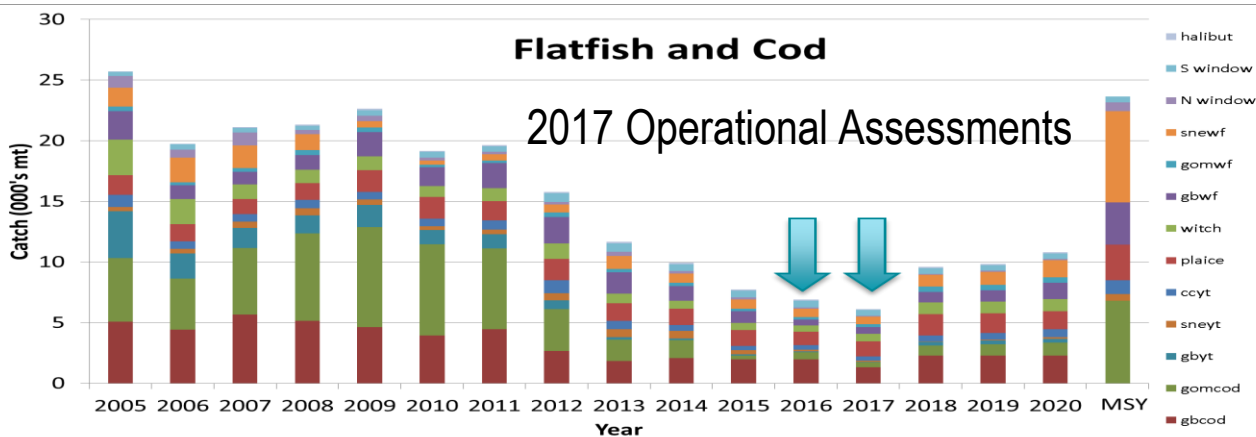
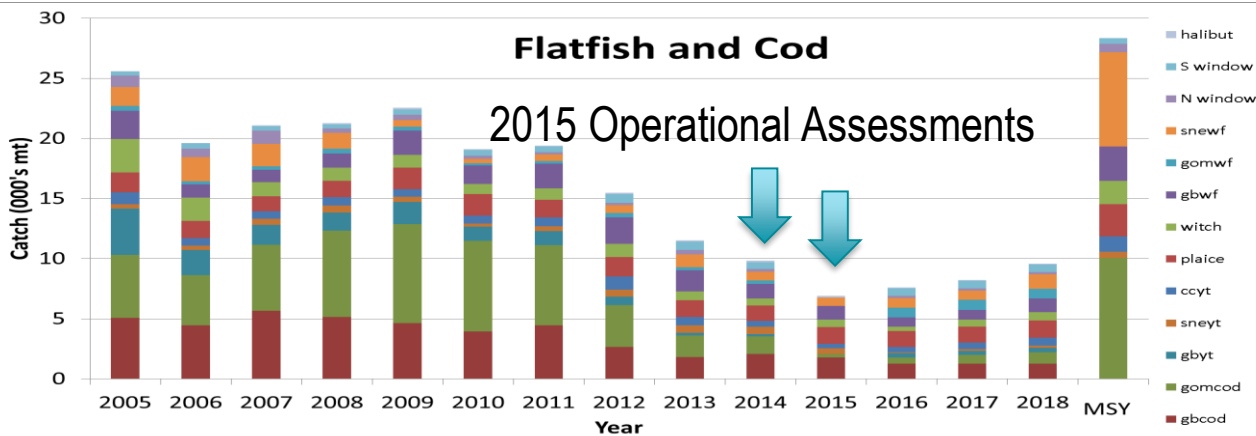


ΣB_{MSY}

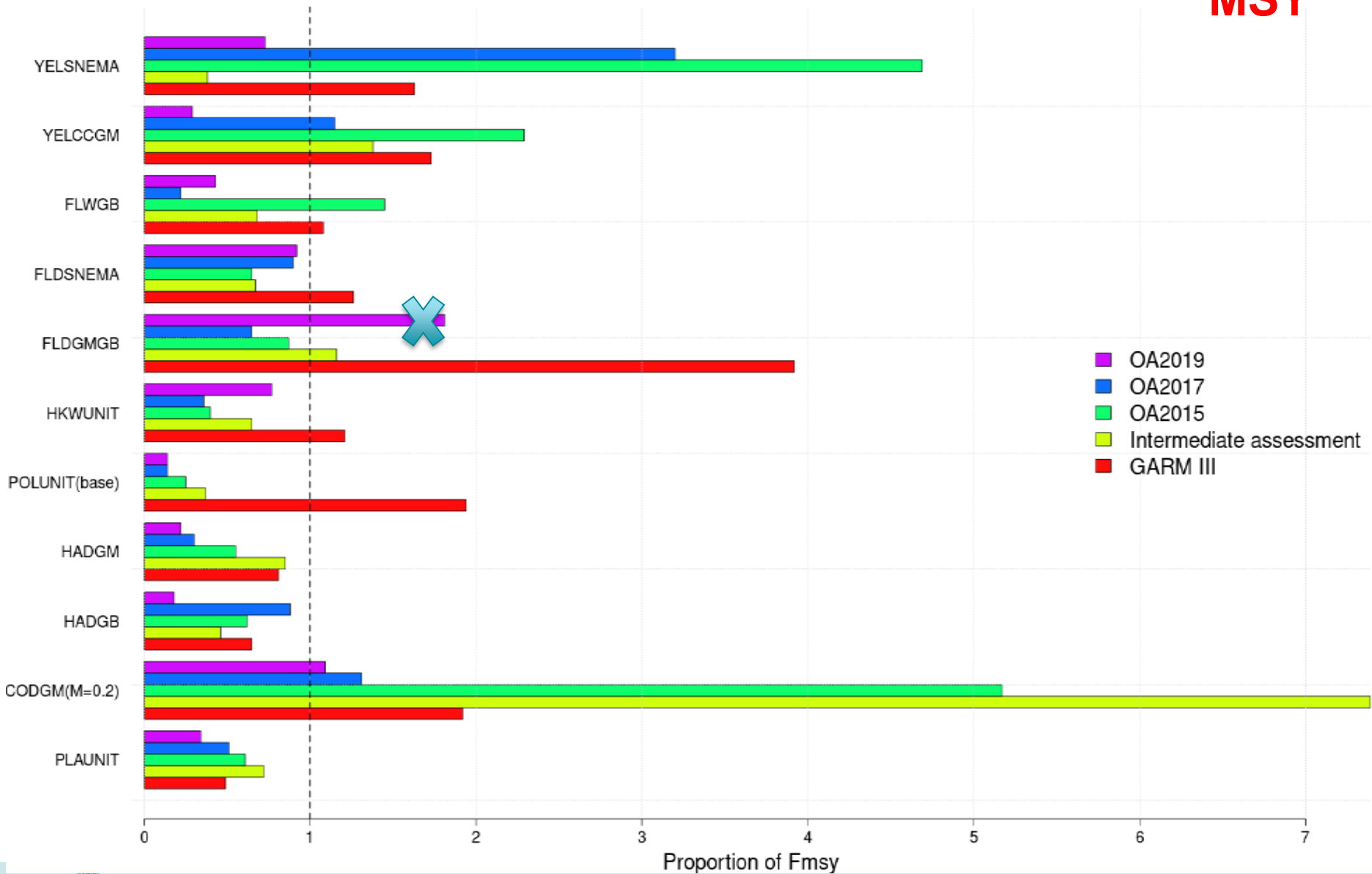


Retro Rule

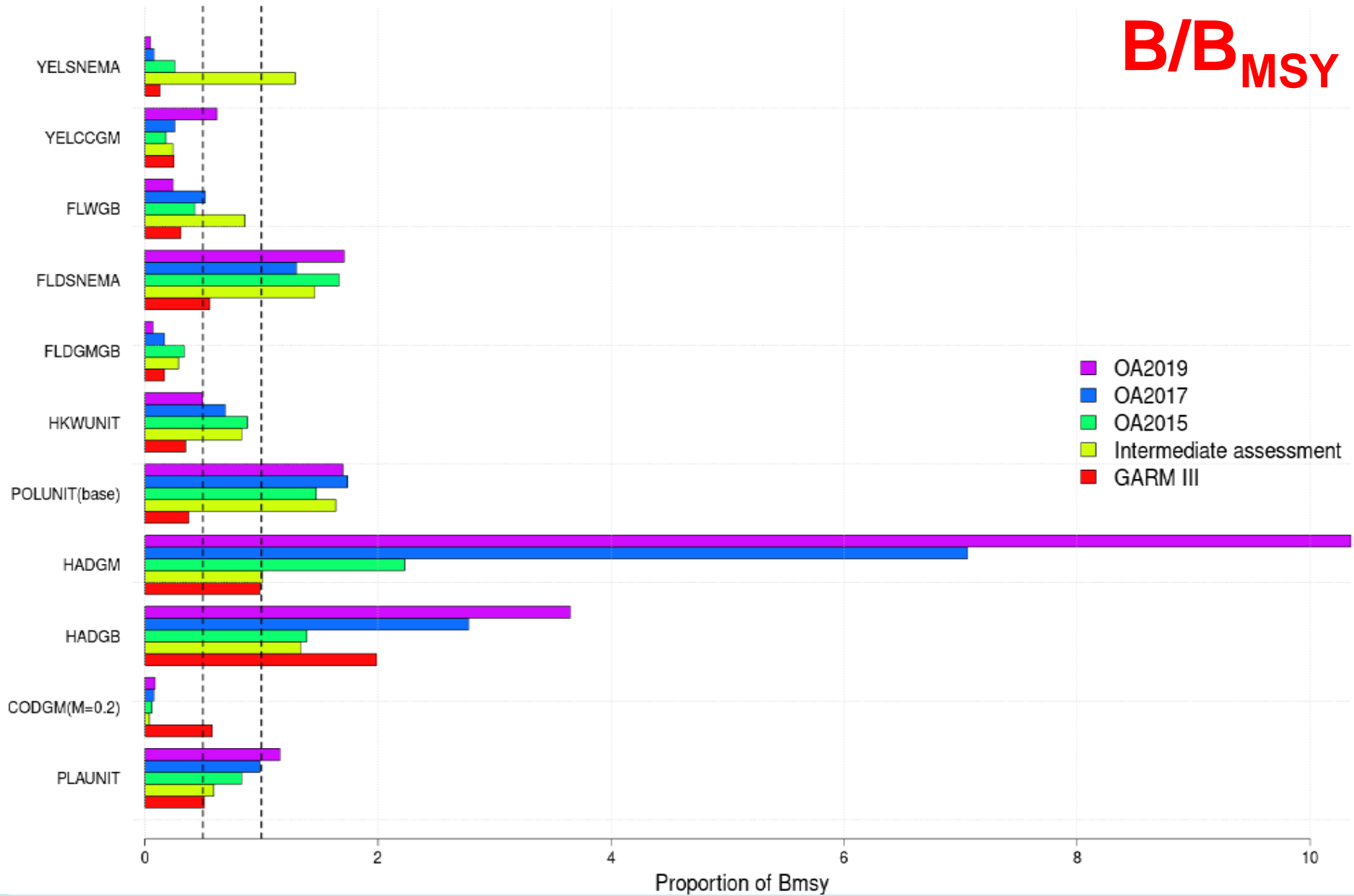
“Decisions to apply a retrospective adjustment to estimates of terminal year biomass and fishing mortality rates were based on whether the rho adjusted value was outside the 90% joint confidence region for the model estimates.”



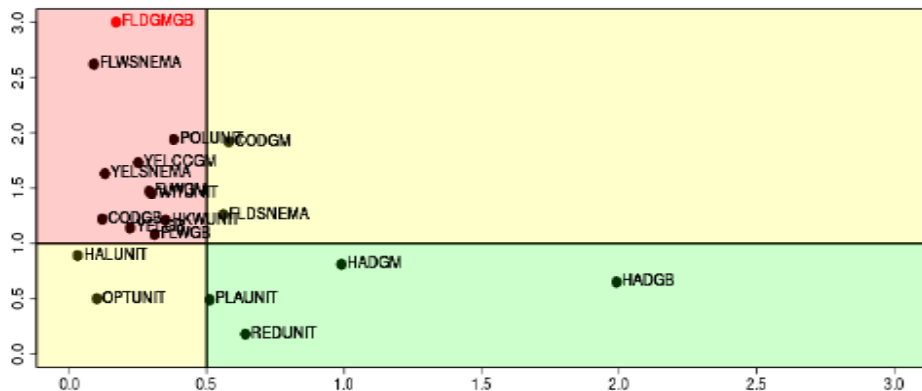
F/F_{MSY}



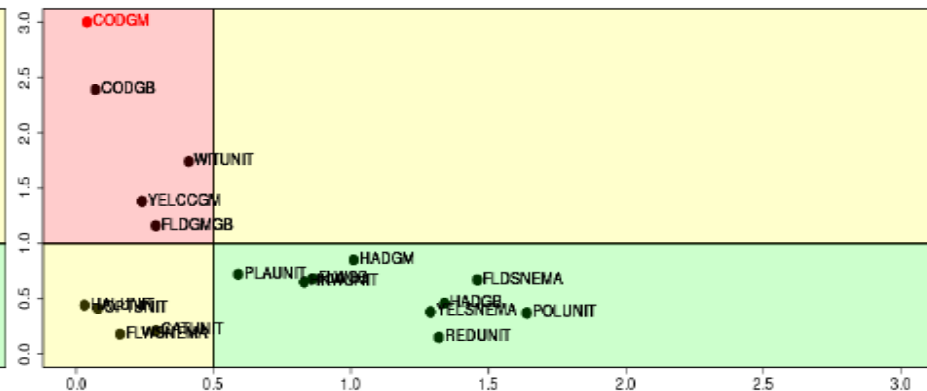
B/B_{MSY}



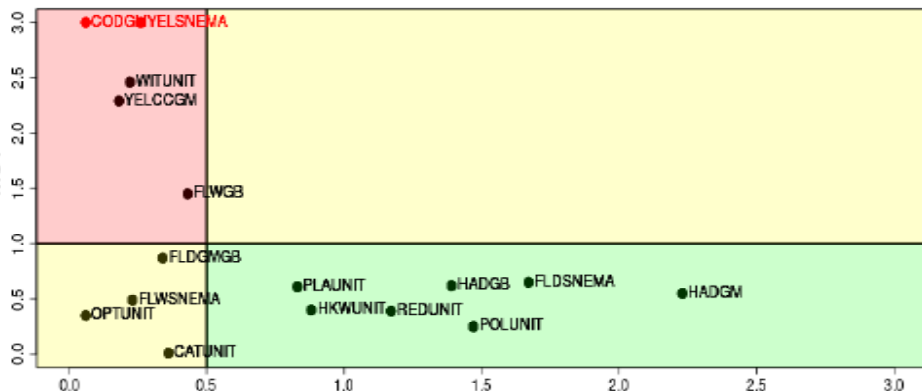
GARM III



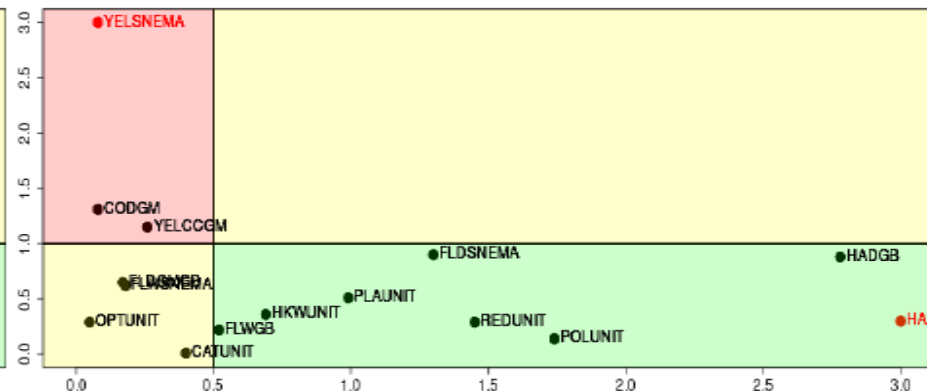
Intermediate assessment



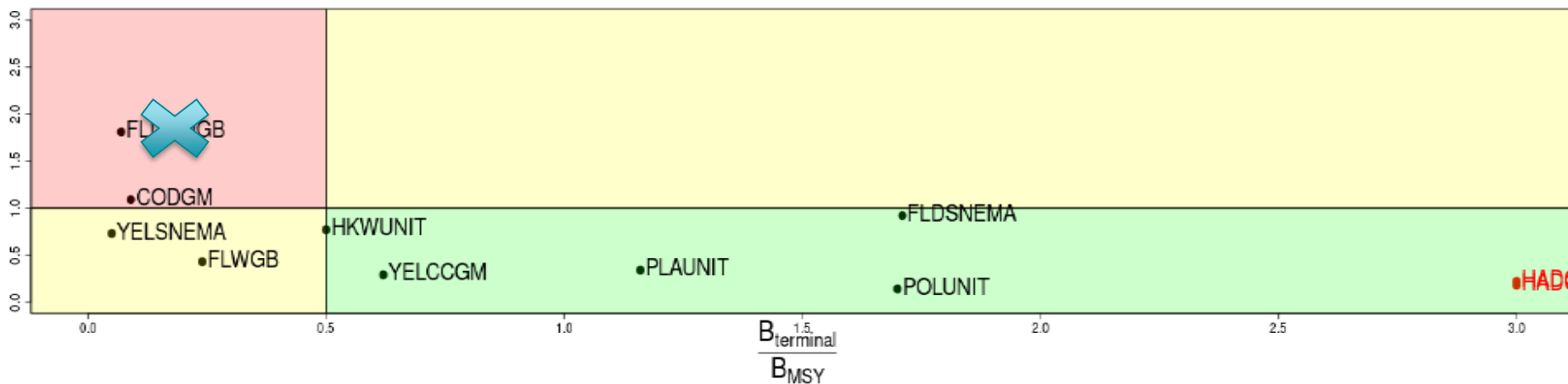
OA 2015



OA 2017



OA 2019



Long Term Performance of Projections

- Projections used to set future catches and plan rebuilding strategies do not perform well (projected catch does not result in the desired fishing mortality, and stock growth does not occur as expected).
- In 2011 the NEFSC augmented the PDT to examine an alternative to using updated assessments for setting FY 2012 – 2014 ABCs. Simulation analyses showed that projections tend to be biased high – that is, they over-estimated stock growth and future catches.

(Brooks and Legault 2015; Wiedenmann and Jensen 2017)

Acceptable Biological Catch (ABC) US+Canada

stock	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
GB cod	4,812	5,616	5,616	2,506	2,506	2,506	1,249	1,249	2285	2285	2285
GOM cod	8,530	9,012	6,700	1,550	1,550	386	500	500	703	703	703
GB Haddock	62,515	46,784	39,846	35,783	35,699	43,606	77,898	77,898	73,114	73,114	73,114
GOM Haddock	1,265	1,206	1,013	290	677	1,454	3,630	4,534	13,131	12,490	10,186
GB Yellowtail Flounder	1,500	2,650	1150	500	400	354	354	300	300	140	140
SNE Yellowtail Flounder	493	687	1,003	700	700	700	267	267	68	68	68
CC/GOM Yellowtail Flounder	863	1,041	1,159	548	548	548	427	427	511	511	511
Plaice	3,156	3,444	3,632	1,557	1,515	1,544	1,297	1,336	1,732	1,609	1,492
Witch Flounder	944	1,369	1,639	783	783	783	460	878	993	993	993
GB Winter Flounder	2,052	2,224	3,753	3,750	3,598	2,124	755	755	855	855	855
GOM Winter Flounder	238	1,078	1,078	1,078	1,078	510	810	810	447	447	447
SNE/MA Winter Flounder	644	897	626	1,676	1,676	1,676	780	780	727	727	727
Redfish	7,586	8,356	9,224	10,995	11,465	11,974	10,338	11,050	11,552	11,785	11,942
White Hake	2,832	3,295	3,638	4,177	4,642	4,713	3,816	3,686	2,971	2,971	2,971
Pollock	19,800	16,900	15,400	15,600	16,000	16,600	21,312	21,312	40,172	40,172	40,172
Northern Windowpane Flounder	169	169	173	151	151	151	182	182	92	92	92
Southern Windowpane Flounder	237	237	386	548	548	548	623	623	473	473	473
Ocean Pout	271	271	256	235	235	235	165	165	127	127	127
Halibut	71	78	85	99	109	119	158	158	137	137	137
Wolffish	83	83	83	70	70	70	82	82	90	90	90

T = TRAC
 B = benchmark
 O = Operational assessment
 M = Management track



Assessment Terminal Year

	GARM3			op-2012		op-2015				op-2017	M-2019		M-2020	M-2021
	effort 2007	effort 2008	effort 2009	ABC 2010	ABC 2011	ABC 2012	ABC 2013	ABC 2014	ABC 2015	ABC 2016	ABC 2017	ABC 2018	ABC 2019	ABC 2020
Stock														
GB cod	B			O	B			O		O		M		M
GOM cod	B			B	B		O	O		O		O		M
GB Haddock	B			O				O		O		M		M
GOM Haddock	B			O			B	O		O		M		M
GB Yellowtail Flounder	B	T	T	T	T	T	B	T	T	T	T	T	T	T
SNE Yellowtail Flounder	B				B			O		O		M		M
CC/GOM Yellowtail Flounder	B			O				O		O		M		M
Plaice	B			O				O		O		M		M
Witch Flounder	B			O				O	B	O		M		M
GB Winter Flounder	B			B			O	O		O		M	M	
GOM Winter Flounder	B			B			O	O		O			M	
SNE/MA Winter Flounder	B			B				O		O			M	
Redfish	B			O				O		O			M	
White Hake	B				B			O		O		M		M
Pollock	B		B				O	O		O		M		M
Northern Windowpane Flounder	B			O				O		O		M	M	
Southern Windowpane Flounder	B			O				O		O		M	M	
Ocean Pout	B			O				O		O			M	
Halibut	B			O				O		O		M	M	
Wolffish	B			O				O		O			M	
overfishing	13	1	1	7	3	1	1	5		3		1		
not overfishing	7		1	10	2		4	12		13		10		
unknown (cannot quantify)							1	3	2	3		4		

GARM 3 projection (2 year catch assumption) to estimate ABCs 2010-2012

13 stock op-2012 (2 year catch assumption) to estimate ABCs 2013-2015

Groundfish Control Rule

- A. *ABC should be determined as the catch associated with 75% of F_{MSY}*
- B. *If fishing at 75% of F_{MSY} does not achieve the mandated rebuilding requirements for overfished stocks, ABC should be determined as the catch associated with the fishing mortality that meets rebuilding requirements ($F_{rebuild}$).*
- C. *For stocks that cannot rebuild to B_{MSY} in the specified rebuilding period, even with no fishing, the ABC should be based on incidental bycatch, including a reduction in bycatch rate (i.e., the proportion of the stock caught as bycatch).*
- D. *Interim ABCs should be determined for stocks with unknown status according to case- by case recommendations from the SSC*

Groundfish Rebuilding Schedules

stock	Rebuild End date	F-Rebuild	B _{MSY}	
GB cod	2026	NA	Unknown	no projection
GOM cod	2024	dynamic	Known	
GB Haddock	rebuilt		Known	
GOM Haddock	rebuilt		Known	
GB Yellowtail Flounder	2032	NA	Unknown	no projection
SNE Yellowtail Flounder	2029	70%F _{MSY}	Known	
CC/GOM Yellowtail Flounder	2023	dynamic	Known	
Plaice	2024		Known	
Witch Flounder	2043	exp rate	Unknown	no projection
GB Winter Flounder	2029	70%F _{MSY}	Known	
GOM Winter Flounder	NA		Unknown	no projection
SNE/MA Winter Flounder	2023	dynamic	Known	
Redfish	rebuilt		Known	
White Hake	2014	75%F _{msy}	Known	
Pollock	rebuilt		Known	
Northern Windowpane Flounder	2029	70%F _{MSY}	Known	no projection
Southern Windowpane Flounder	rebuilt		Known	
Ocean Pout	2029	70%F _{MSY}	Known	no projection
Halibut	2056	NA	Unknown	no projection
Wolffish	undefined		Known	no projection

Rebuilt Stocks

6

Overfished Stocks

- 3 On schedule from projection at 75%F_{MSY} or 70%F_{MSY}
- 7 Overfished and no projection
- 2 Overfished and doesn't rebuild with F=0 from projection
- 1 Overfished, past rebuilding deadline

Unknown Biomass Status Stocks

1

ABC Estimation

Groundfish Stock	Control Rule Prior to 2015	Contol Rule 2015	Contol Rule 2017	Overfishing in 2018	Comments	Projected catch higher than 2018 ABCs?	Pojected catch higher than recent catch?	Biomass and Rebuilding Comments
GB cod	75%Fmsy constant	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	unk	Plan-B smooth	no	stable	Relatively low biomass
GOM cod	average 75%Fmsy constant (3 projections)	average 75%Fmsy constant (3 projections)	average 75%Fmsy constant (2 projections)	yes	F has declined	stabe	stable	Low recent recruitment, cannot rebuild
GB Haddock	75%Fmsy	sensitivity projection 75%Fmsy constant	75%Fmsy constant (short term projection)	no	not constraining	yes	yes	Rebuilt
GOM Haddock	75%Fmsy	75%Fmsy	75%Fmsy	no	not constraining	yes	yes	Rebuilt
GB Yellowtail Flounder	75%Fmsy constant (no projection)	constant catch (no projection, TRAC 2017)	exploitation * area-swept (2 surveys)	unk	empirical	NA	NA	Near record lows
SNE Yellowtail Flounder	long term 75%Fmsy constant	averaging	average Plan-B & projection	no	low recruitment	no	stable	5% SSB _{MSY} , 70%F _{MSY} F _{Rebuild}
CC/GOM Yellowtail Flounder	75%Fmsy constant	75%Fmsy constant	75%Fmsy constant	no	constant seemed to work	yes	yes	on schedule to rebuild
Plaice	75%Fmsy	75%Fmsy	75%Fmsy	no	higher biomass	yes	yes	Rebuilt
Witch Flounder	Frebuild constant	constant ABC (no projection, SARC 62)	exploitation * Area-swept	unk	empirical	yes	yes	no BRPs
GB Winter Flounder	Frebuild	75%Fmsy constant	75%Fmsy constant	no	low recruitment	no	yes	70%F _{MSY}
GOM Winter Flounder	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	NA	empirical	NA	NA	Little response to low catch and F
SNE/MA Winter Flounder	long term 75%Fmsy constant, different recruitment	75%Fmsy constant	3 year average catch	NA	NA	NA	NA	Biomass is declining, cannot rebuild
Redfish	75%Fmsy	75%Fmsy	75%Fmsy	NA	not constraining	NA	NA	Rebuilt
White Hake	75%Fmsy	75%Fmsy	75%Fmsy (short term projection)	no		no	yes	did not rebuild in 2014
Pollock	75%Fmsy constant	75%Fmsy constant	75%Fmsy constant	no	not constraining	no	yes	Rebuilt
Northern Windowpane Flounder	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	no	index assessment	no	no	70%F _{MSY}
Southern Windowpane Flounder	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	no	index assessment	no	no	Rebuilt
Ocean Pout	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	NA	index assessment	NA	NA	Little response to low catch and F
Halibut	Frebuild	averaging	FSD rate * catch	unk	FSD model	yes	no	Relatively low biomass
Wolffish	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	NA	Data poor, SCALE	NA	NA	Little response to low catch and F

75%Fmsy or Frebuild	7	4	4
75%Fmsy or Frebuild and held constant	5	6	5
75%Fmsy and held constant, no projection	6	7	6
other	2	3	5

Note that no Frebuild ABCs were used in 2015 or 2017

2019 Bridge Year Catch Assumption

Stock	US Catch Estimate	Canadian Catch Estimate	Total Catch Estimate
GB Cod	1,117	482	1,599
GOM cod	710		710
GB Haddock	6,929	12,516	19,445
GOM Haddock	5,239		5,239
GB Yellowtail Flounder	21	6	27
SNE/MA Yellowtail Flounder	16		16
CC/GOM Yellowtail Flounder	271		271
American Plaice	1,131		1,131
Witch Flounder	896		896
GB Winter Flounder	308	26	334
GOM Winter Flounder	257		257
SNE/MA Winter Flounder	338		338
Redfish	6,035		6,035
White Hake	2,101	39	2,140
Pollock	5,140		5,140
Northern Windowpane	77		77
Southern Windowpane	426		426
Ocean Pout	53		53
Halibut	126		126
Wolffish	3		3

Outlook

- Hopefully updating of the groundfish assessment more often will continue to show improvements in the overfishing status which will continue to result in improvements in recruitment and subsequent rebuilding.
- General concern remains with the loss of analytical assessments through peer review which tend to result in overly simple empirical data poor approaches (survey area swept, survey trends).

Questions?



**An assorted catch of groundfish
from the Gulf of Maine**