



BSAI Plan Team report

**NOAA
FISHERIES**

Alaska Fisheries
Science Center

Dana Hanselman, co-chair
Grant Thompson, co-chair
Diana Stram, coordinator

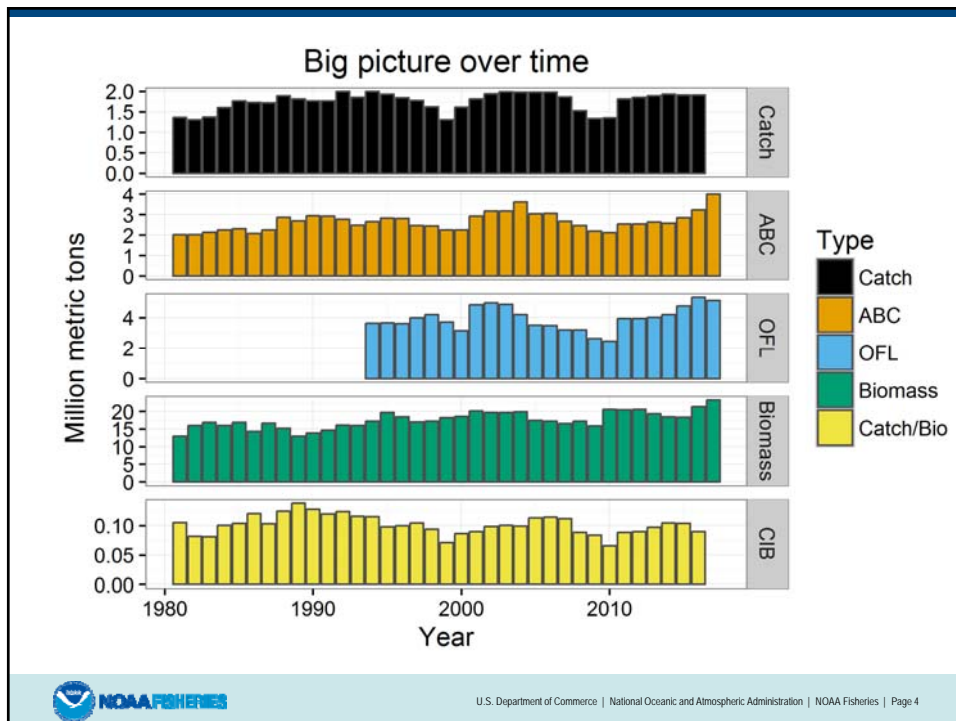
December 6, 2016

Team members

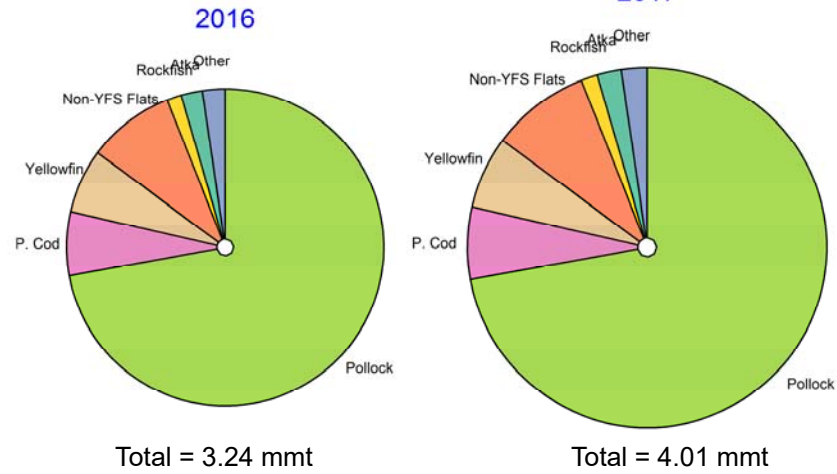
- Grant Thompson, co-chair (AFSC REFM)
- Dana Hanselman, co-chair (AFSC ABL)
- Diana Stram, coordinator (NPFMC)
- **David Barnard (ADF&G)—last meeting!**
- Liz Chilton (AFSC FMA)
- Mary Furuness (NMFS AKRO)
- Alan Haynie (AFSC REFM)
- **Allan Hicks (IPHC)—new in September (replacing Clark)**
- **Kirstin Holsman (AFSC REFM)—new in November (replacing Aydin)**
- Brenda Norcross (UAF)
- Chris Siddon (ADF&G)
- Cindy Tribuzio (AFSC ABL)



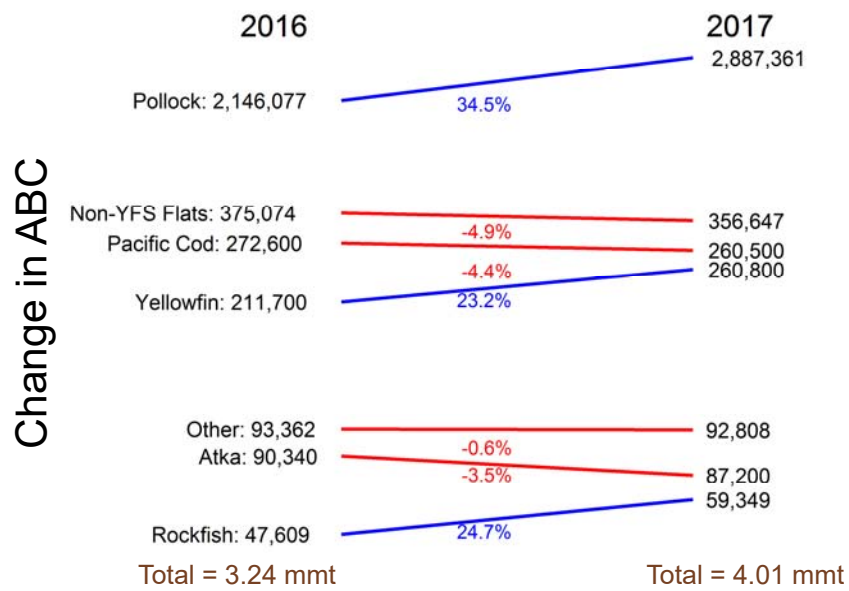
"Big picture" overview



Changes in ABC by major species/groups

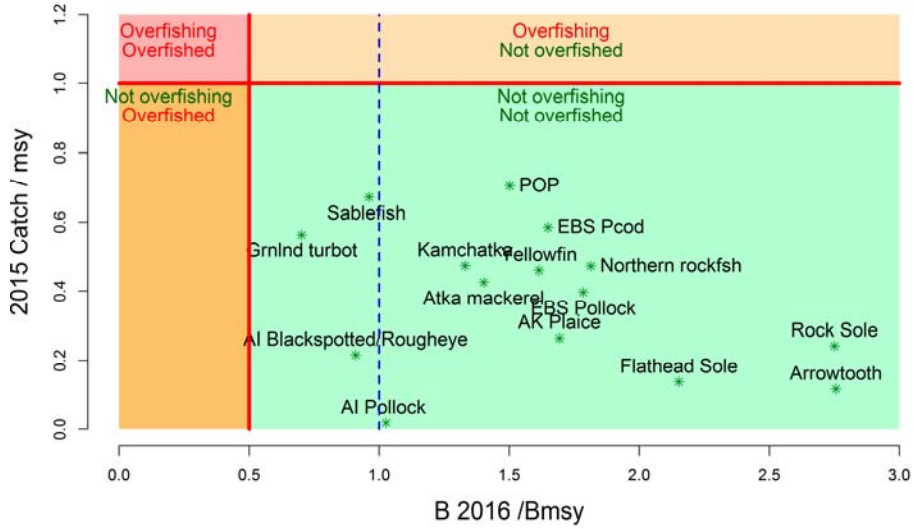


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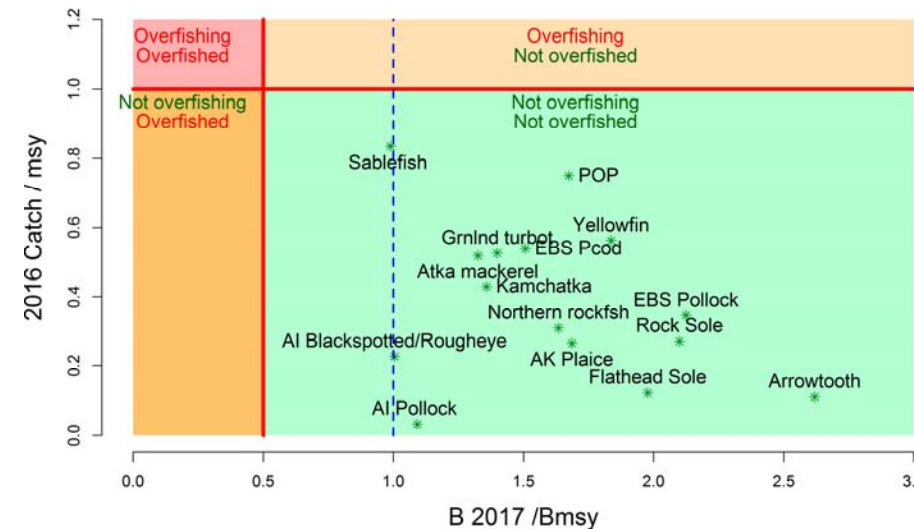


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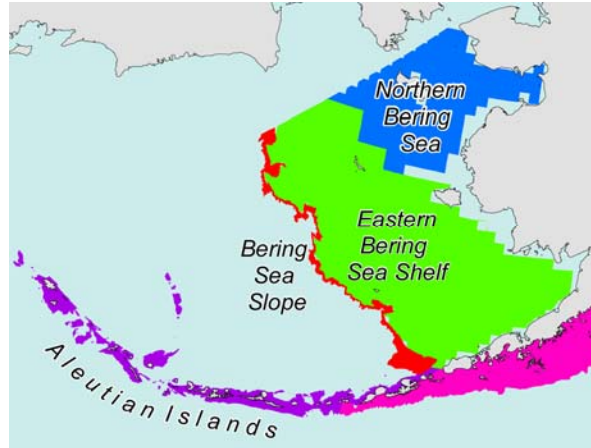
Quad plot (Tiers 1-3): 2015



Quad plot (Tiers 1-3): 2016

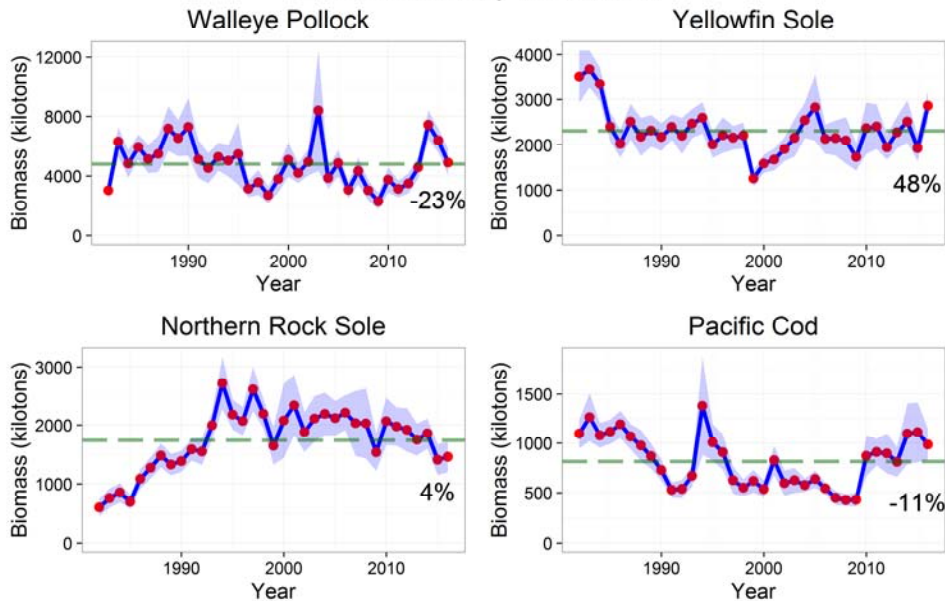


BSAI bottom trawl survey areas

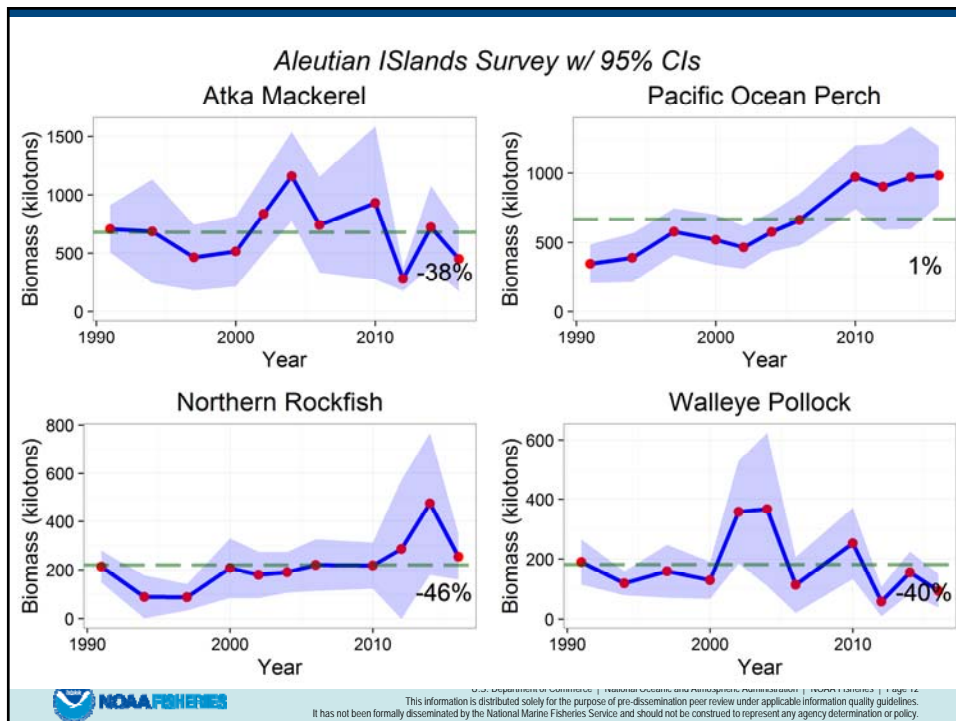
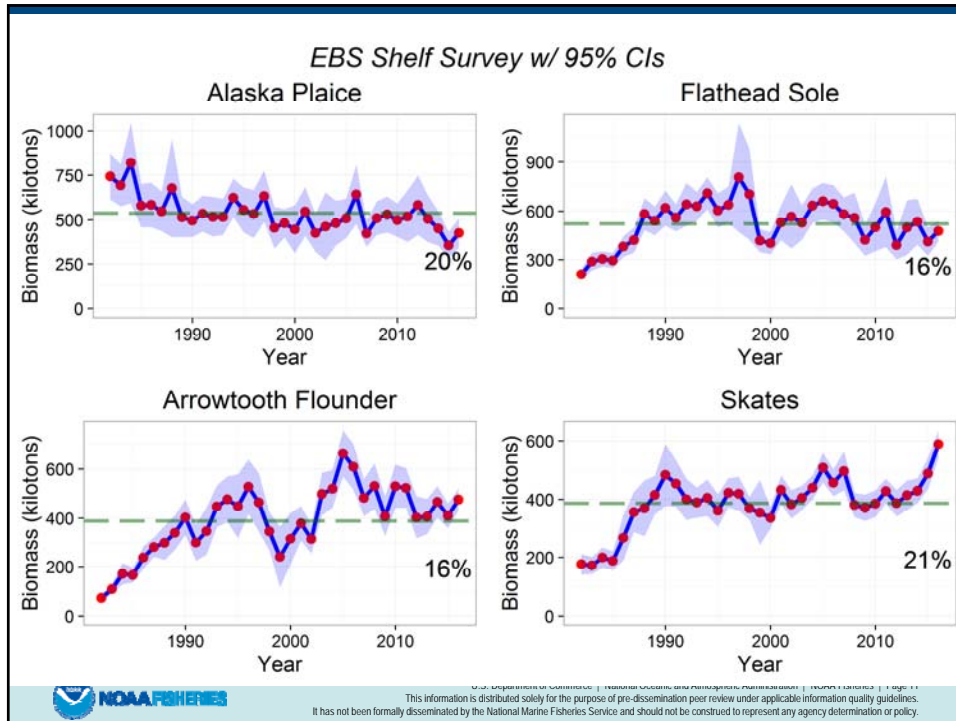


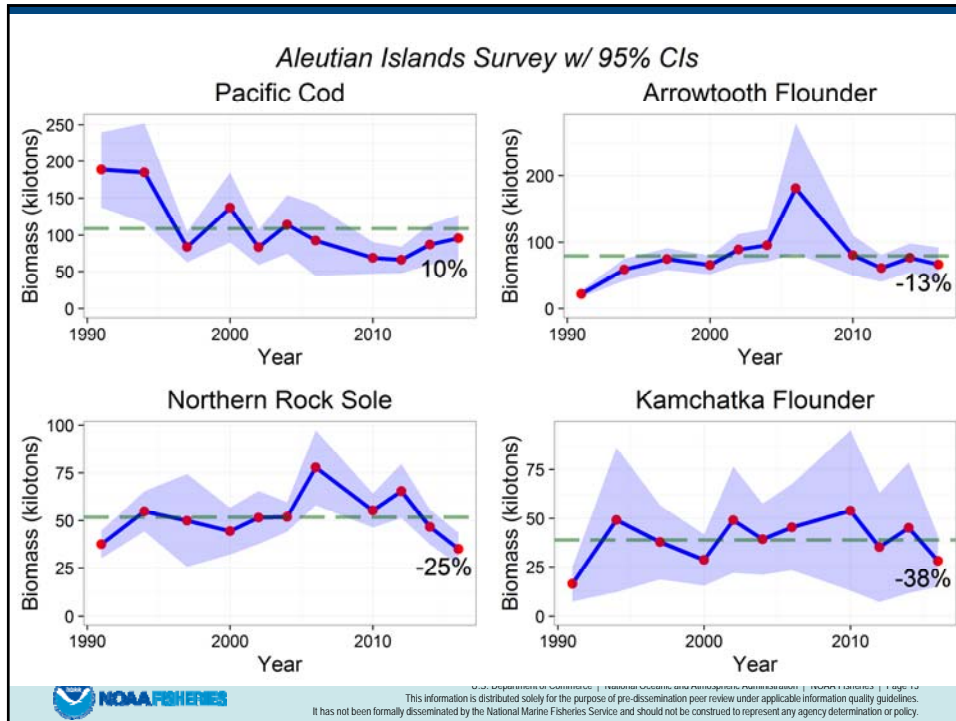
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EBS Shelf Survey w/ 95% CIs



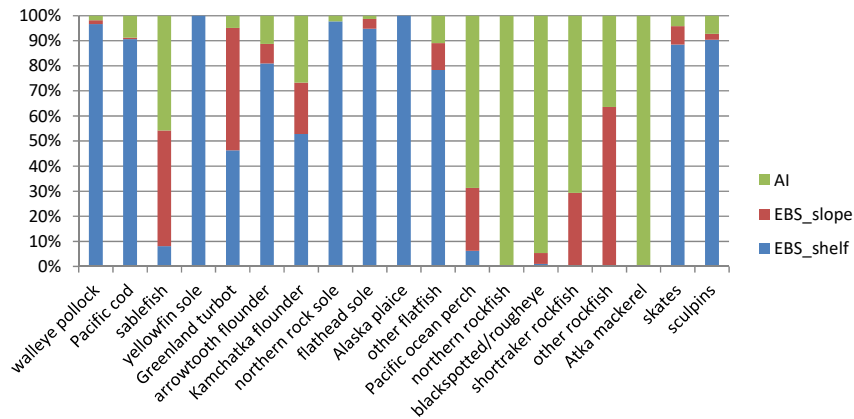
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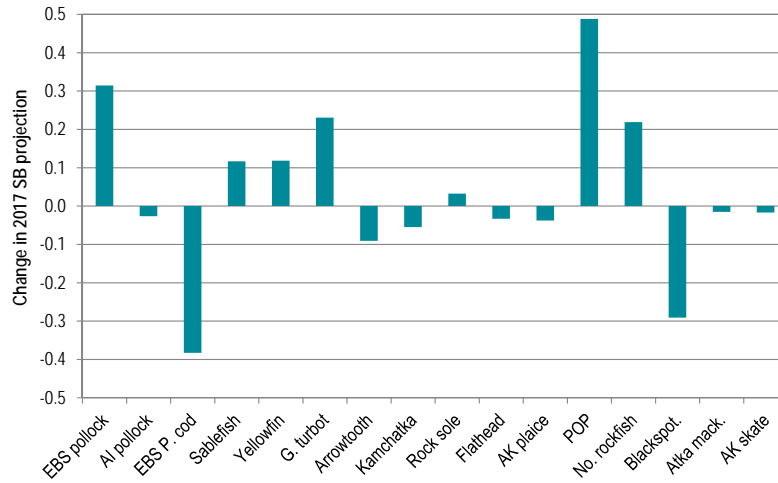


Area survey biomass percentages (2016)

- Not included: sharks, squid, octopus

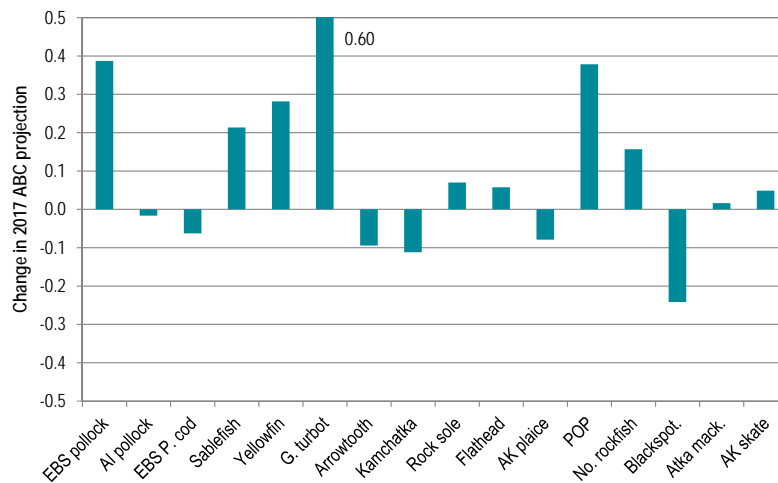


Change in 2017 spawning biomass projection



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Change in 2017 ABC projection



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A few final “big picture” items

- Team agreed with authors’ model recommendations in all cases
- Team agreed with authors’ ABC recommendations in all cases except Greenland turbot
- ABC recommendations correspond to maximum permissible values in all cases except EBS pollock, Bogoslof pollock, and sablefish
- Of the 16 stocks/complexes in Tiers 1-3, none are in Tier 1b and only 3 (AI pollock, sablefish, and blackspotted/rougheye) are in Tier 3b
- No stocks/complexes were subjected to overfishing in 2015, and no stocks/complexes are overfished or approaching a condition of being overfished as of 2016



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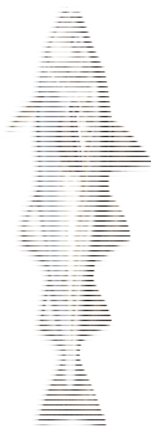
Chapter summaries



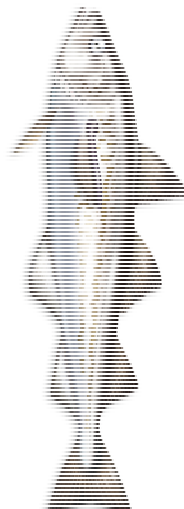
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Chapter 1: EBS walleye pollock

- All you need to know...



2016 ABC



2017 ABC



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Chapter 1: EBS walleye pollock

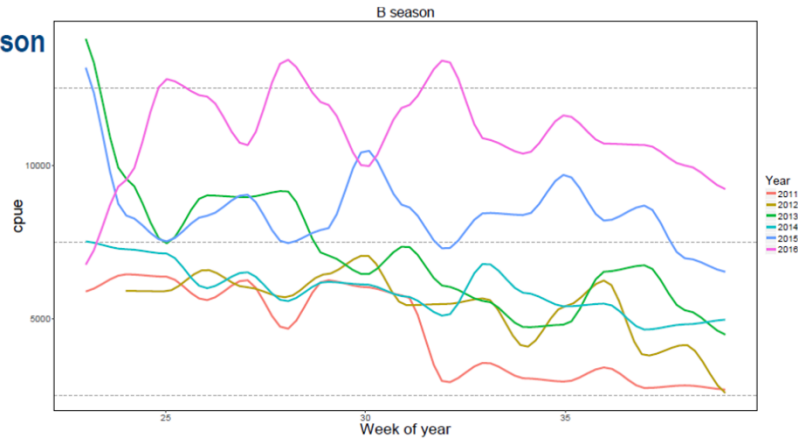
- New survey biomass estimates:
 - EBS shelf survey biomass down 23% from 2015
 - AT survey biomass up 18% from 2014
- CIE review this year
- Model changes:
 - Fit to survey biomass instead of survey abundance (number of fish)
 - Average emphasis given to size and age composition data revised
 - Method for estimating current and future weight at age improved
 - Fuller accounting for structural uncertainty



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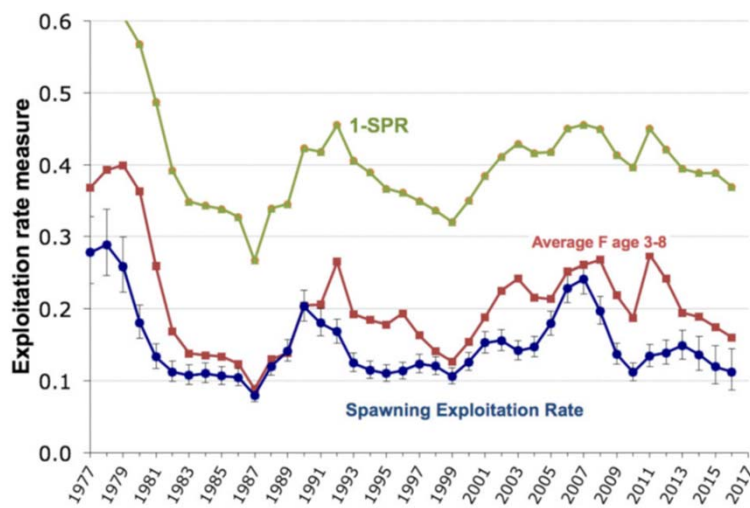
EBS walleye pollock, continued

B-Season
catch rates



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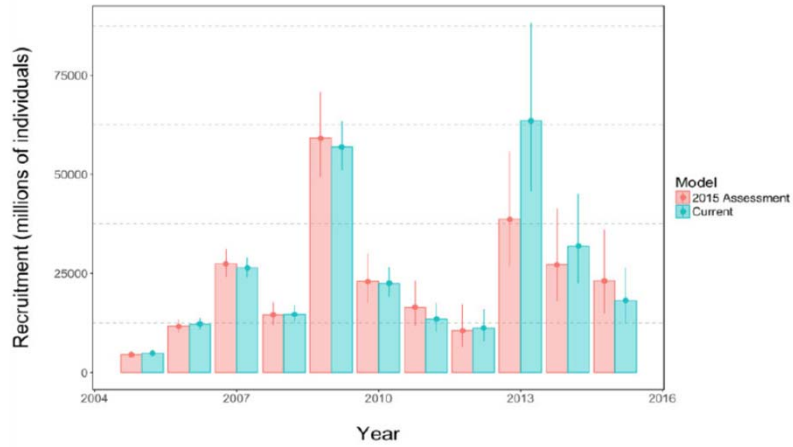
EBS walleye pollock, continued



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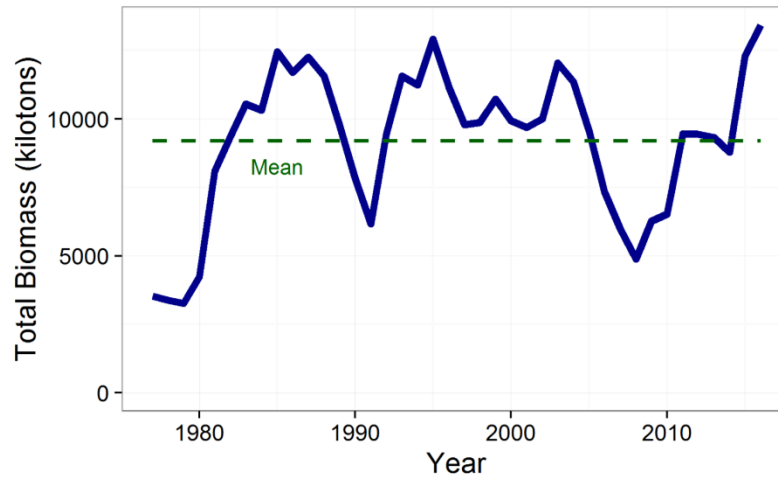
EBS walleye pollock, continued

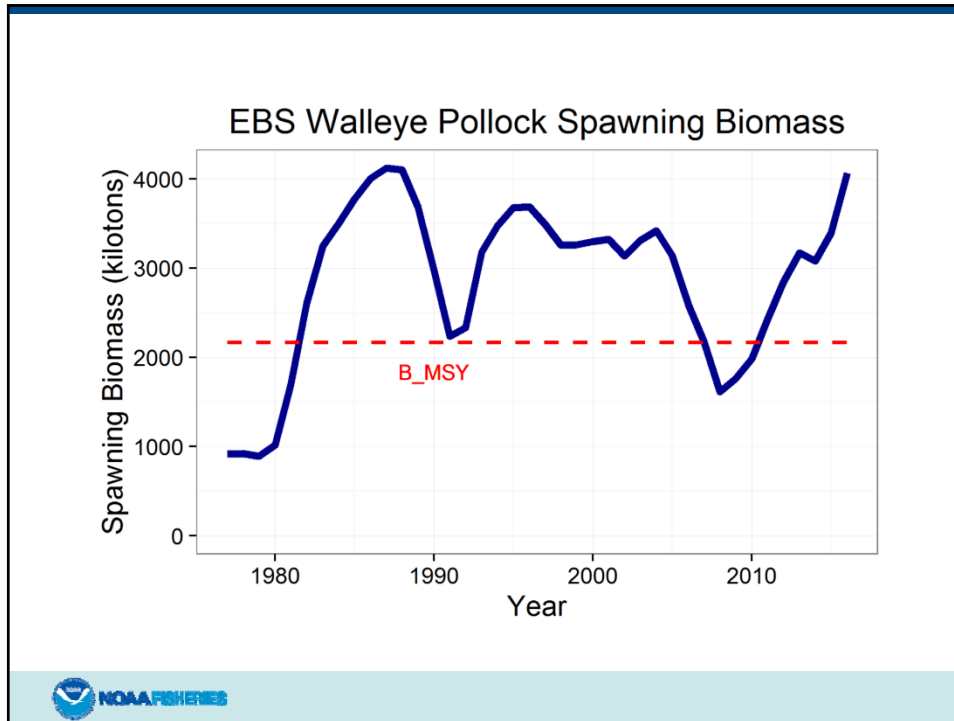
- Age 1 recruitment



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EBS Walleye Pollock Total Biomass





EBS walleye pollock, continued

Quantity	Last year	This year	Change
M	0.30	0.30	0.00
2016 tier	1a	n/a	none
2017 tier	1a	1a	none
2016 age+ biomass	11,300,000	n/a	0.15
2017 age+ biomass	11,000,000	13,000,000	0.18
2016 spawning biomass	3,540,000	n/a	0.30
2017 spawning biomass	3,500,000	4,600,000	0.31
B0	5,676,000	5,700,000	0.00
Bmsy	1,984,000	2,165,000	0.09
2017 FOFL	0.514	0.465	-0.10
2017 FABC	0.401	0.398	-0.01
2016 OFL	3,910,000	n/a	-0.07
2017 OFL	3,540,000	3,640,000	0.03
2016 ABC	2,090,000	n/a	0.34
2017 ABC	2,019,000	2,800,000	0.39



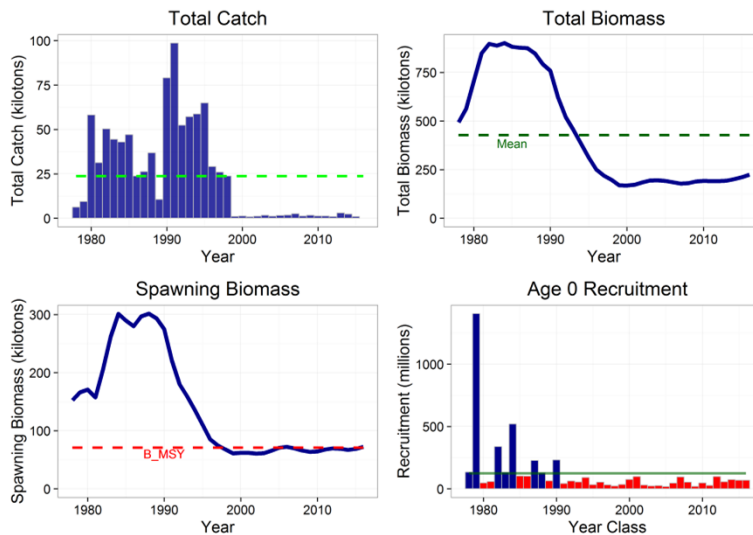
Chapter 1A: AI walleye pollock

- New survey biomass estimates:
 - AI survey biomass down 3% from 2014
- Model changes:
 - None

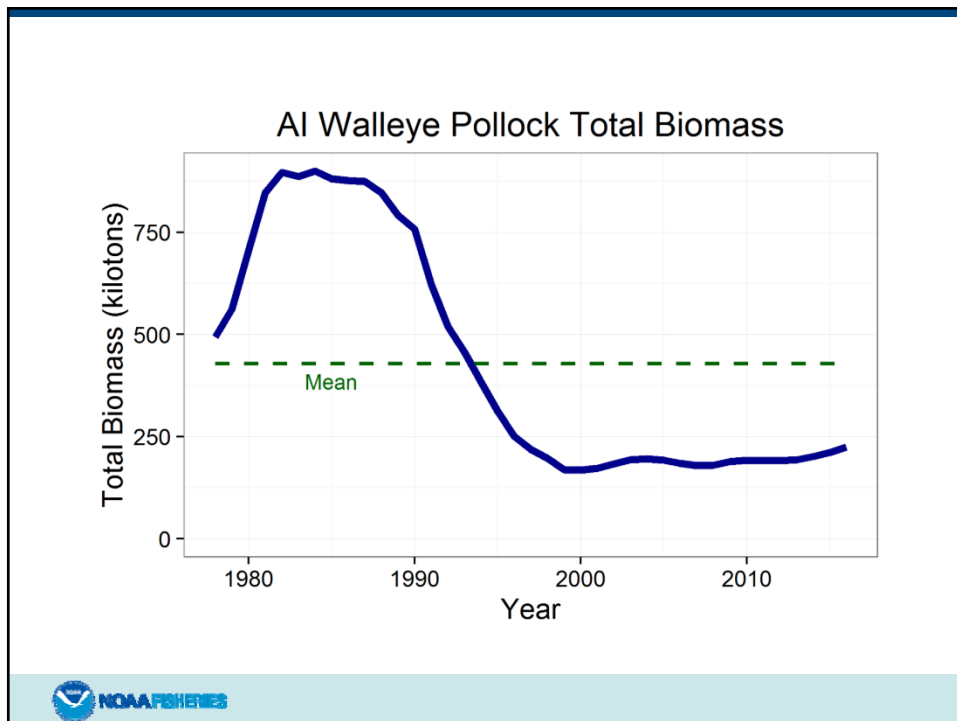
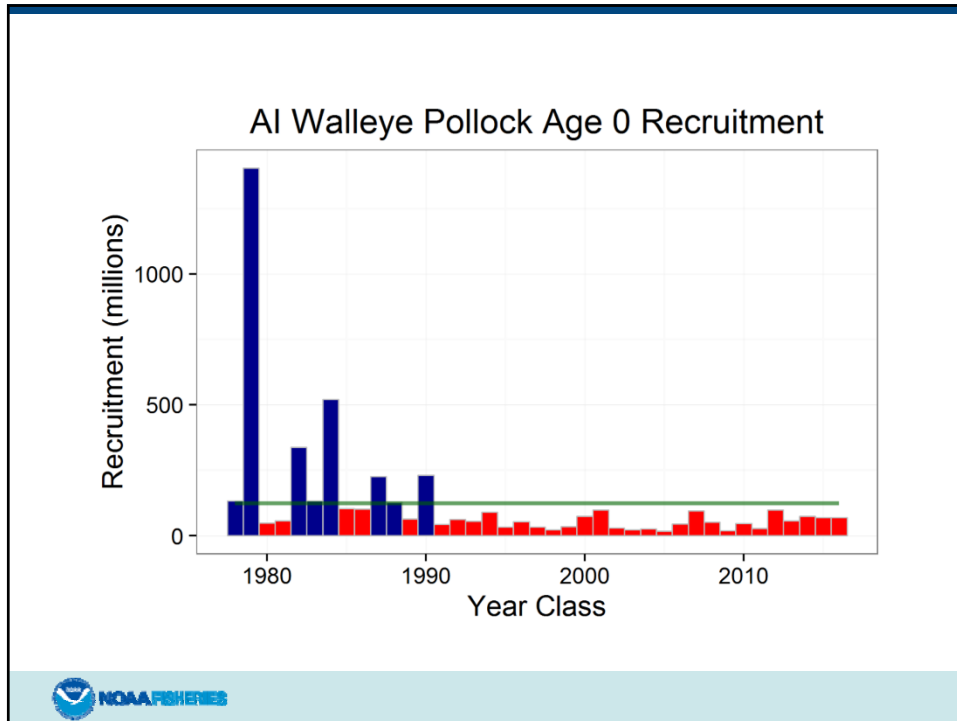


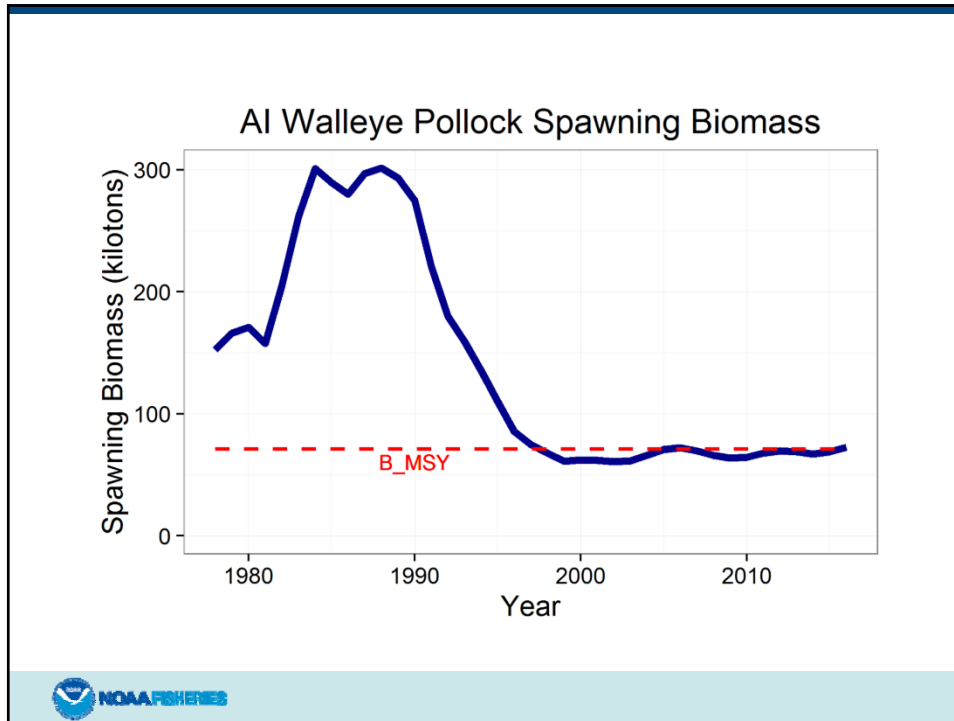
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AI walleye pollock, continued



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AI walleye pollock, continued

Quantity	Last year	This year	Change
M	0.18	0.19	0.06
2016 tier	3b	n/a	none
2017 tier	3b	3b	none
2016 age+ biomass	241,929	n/a	0.03
2017 age+ biomass	264,781	250,221	-0.05
2016 spawning biomass	74,377	n/a	0.04
2017 spawning biomass	79,693	77,579	-0.03
B100%	206,962	203,100	-0.02
B40%	82,785	81,240	-0.02
B35%	72,437	71,085	-0.02
2017 FOFL	0.37	0.378	0.02
2017 FABC	0.29	0.304	0.05
2016 OFL	39,075	n/a	0.12
2017 OFL	44,455	43,650	-0.02
2016 ABC	32,227	n/a	0.12
2017 ABC	36,664	36,061	-0.02



Chapter 1B: Bogoslof walleye pollock

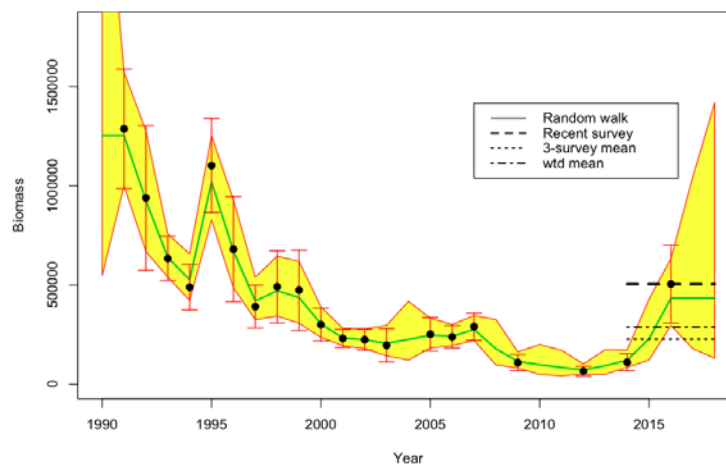
- New survey biomass estimates:
 - Bogoslof survey biomass up 352% from 2014
- Model changes:
 - None
- ABC recommendation:
 - Maximum permissible ABC based on biomass from standard Tier 5 random effects model
 - Biomass = 434,760 t, ABC = 97,821 t
 - Recommended ABC based on average biomass from 3 most recent surveys
 - Biomass = 228,000 t, ABC = 51,300 t
 - **SSC recommended stairstep (60,800 t)**



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Bogoslof walleye pollock, continued

- Survey biomass



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Bogoslof walleye pollock, continued

Quantity	Last year	This year	Change
M	0.30	0.30	0.00
2016 tier	5	n/a	none
2017 tier	5	5	none
Biomass	106,000	434,760	3.10
2017 FOFL	0.30	0.30	0.00
2017 FABC	0.225	0.225	0.00
2016 OFL	31,800	n/a	3.10
2017 OFL	31,800	130,428	3.10
2016 ABC	23,850	n/a	1.15
2017 ABC	23,850	51,300	1.15



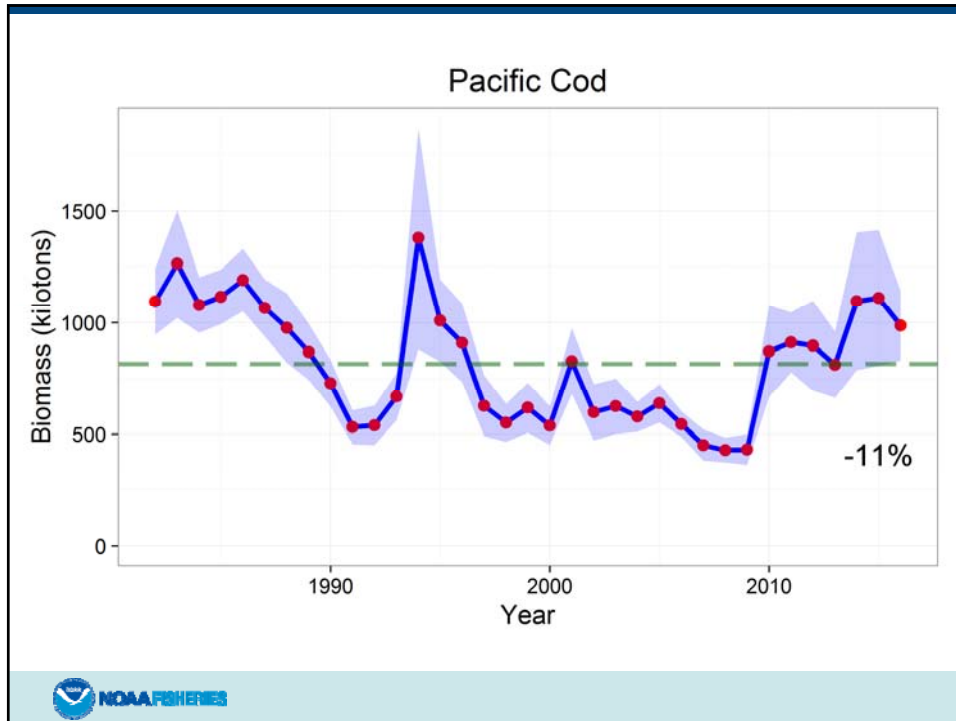
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Chapter 2: EBS Pacific cod

- New survey biomass estimates:
 - EBS shelf survey biomass down 11% from 2015
- CIE review this year; many suggestions for model changes
 - Base model was unchanged since 2011
- Model changes:
 - Much simpler model structure in general
 - One season per year, all gears combined into one fishery
 - Natural mortality rate estimated inside the model (slightly higher)
 - Survey catchability estimated inside the model (higher)
 - Flat-topped selectivity for fishery and survey (no "domes")
 - Selectivity constant over time for fishery and survey
 - Several minor changes

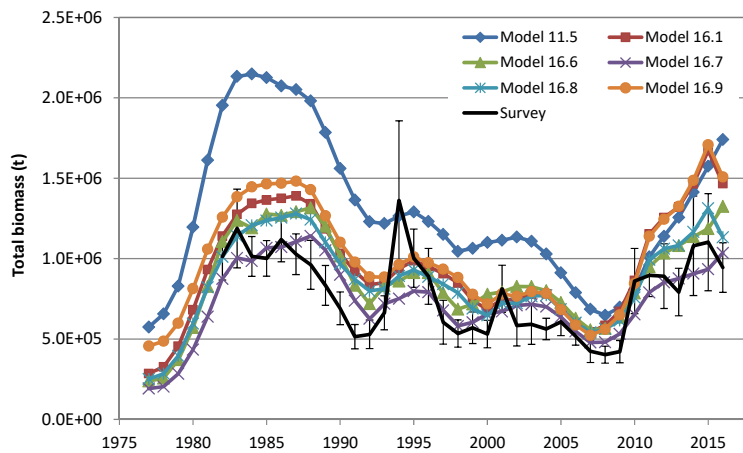


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EBS Pacific cod, continued

- Old model = blue diamonds, new model = green triangles



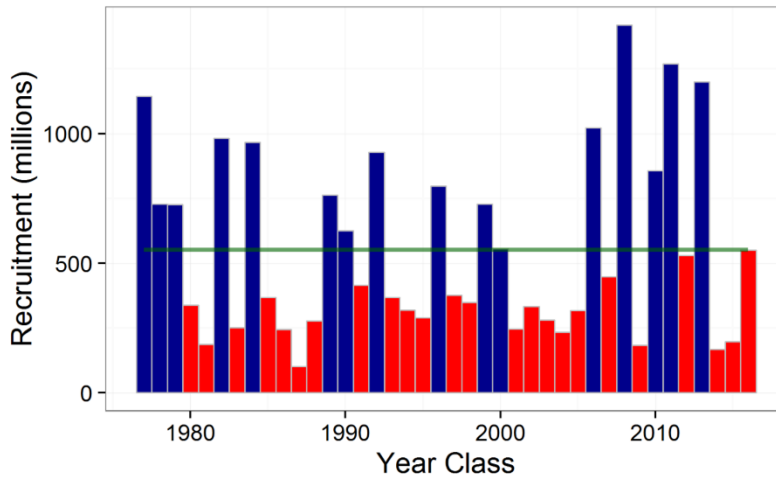
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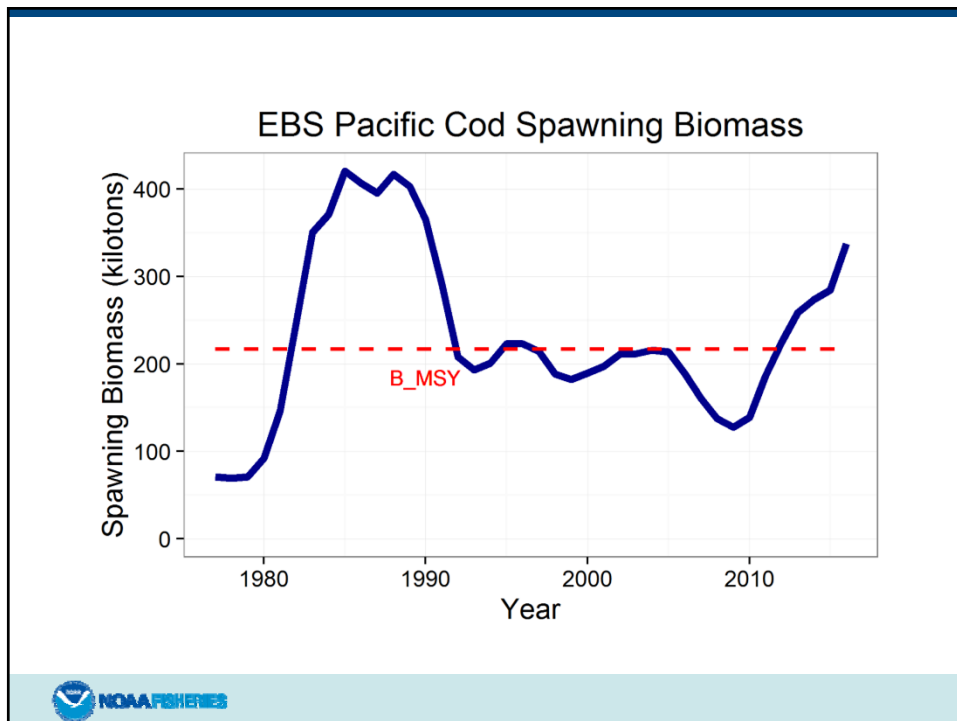
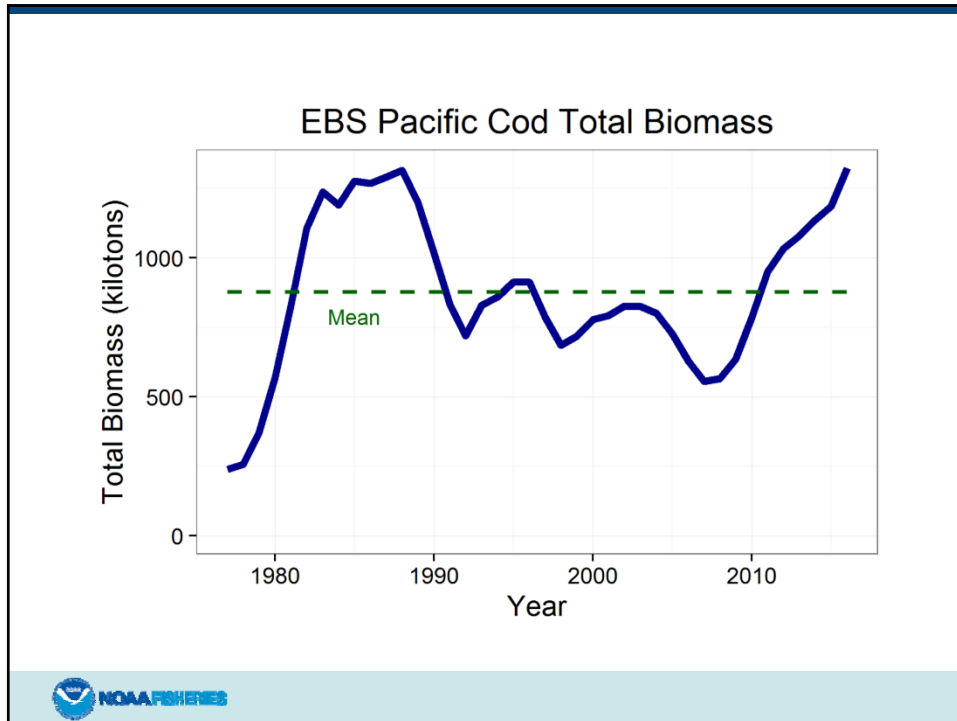
EBS Pacific cod, continued



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EBS Pacific Cod Age 0 Recruitment





EBS Pacific cod, continued

Quantity	Last year	This year	Change
M	0.34	0.36	0.06
2016 tier	3a	n/a	none
2017 tier	3a	3a	none
2016 age+ biomass	1,830,000	n/a	-0.31
2017 age+ biomass	1,780,000	1,260,000	-0.29
2016 spawning biomass	466,000	n/a	-0.30
2017 spawning biomass	530,000	327,000	-0.38
B100%	806,000	620,000	-0.23
B40%	323,000	248,000	-0.23
B35%	282,000	217,000	-0.23
2017 FOFL	0.35	0.38	0.09
2017 FABC	0.22	0.31	0.41
2016 OFL	390,000	n/a	-0.27
2017 OFL	412,000	284,000	-0.31
2016 ABC	255,000	n/a	-0.06
2017 ABC	255,000	239,000	-0.06



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Chapter 2A: AI Pacific cod

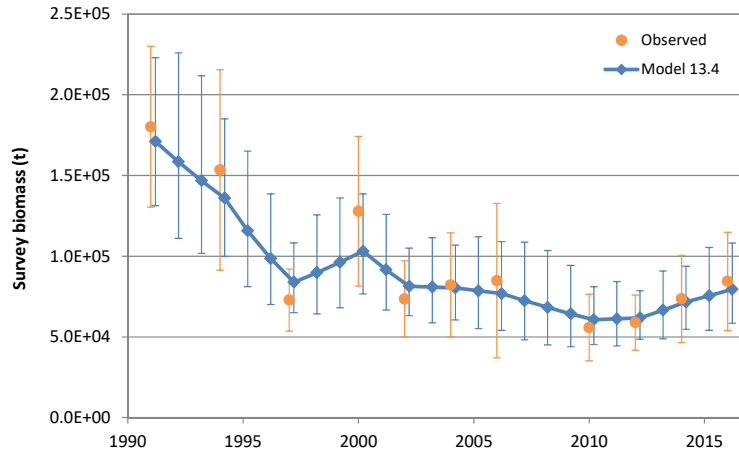
- New survey biomass estimates:
 - AI survey biomass up 15% from 2014
- Model changes:
 - None



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AI Pacific cod, continued

- Survey biomass



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AI Pacific cod, continued

Quantity	Last year	This year	Change
M	0.34	0.36	0.06
2016 tier	5	n/a	none
2017 tier	5	5	none
Biomass	68,900	79,600	0.16
2017 FOFL	0.34	0.36	0.06
2017 FABC	0.26	0.27	0.04
2016 OFL	23,400	n/a	0.23
2017 OFL	23,400	28,700	0.23
2016 ABC	17,600	n/a	0.22
2017 ABC	17,600	21,500	0.22

- If last year's value of M were retained, the 2017 OFL would be 27,100 t and the 2017 ABC would be 20,300 t (16% increases)



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Chapter 3: sablefish

- Covered in GOA Team presentation (Thanks Jon!)

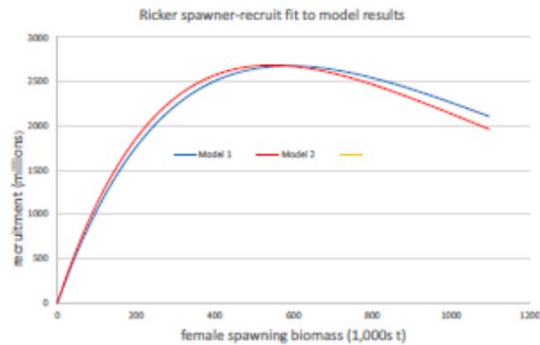
Quantity	Last year	This year	Change
M	0.10	0.097	-0.03
2016 tier	3b	n/a	none
2017 tier	3b	3b	none
2016 age+ biomass	204,796	n/a	0.17
2017 age+ biomass	214,552	239,244	0.12
2016 spawning biomass	86,471	n/a	0.06
2017 spawning biomass	81,986	91,553	0.12
B100%	257,018	264,590	0.03
B40%	102,807	105,836	0.03
B35%	89,956	92,606	0.03
2017 FOFL	0.086	0.097	0.13
2017 FABC	0.073	0.078	0.07
2016 OFL	13,397	n/a	0.19
2017 OFL	12,747	15,931	0.25
2016 ABC	11,795	n/a	0.11
2017 ABC	10,782	13,083	0.21



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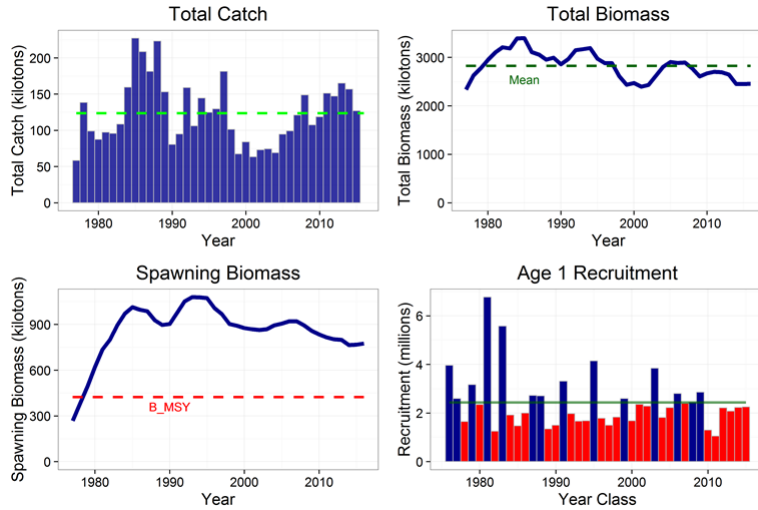
Chapter 4: yellowfin sole

- New survey biomass estimates:
 - EBS shelf biomass estimate for 2016 up 48% from 2015
- Model changes:
 - Revised fishery weight at age for 2008-14



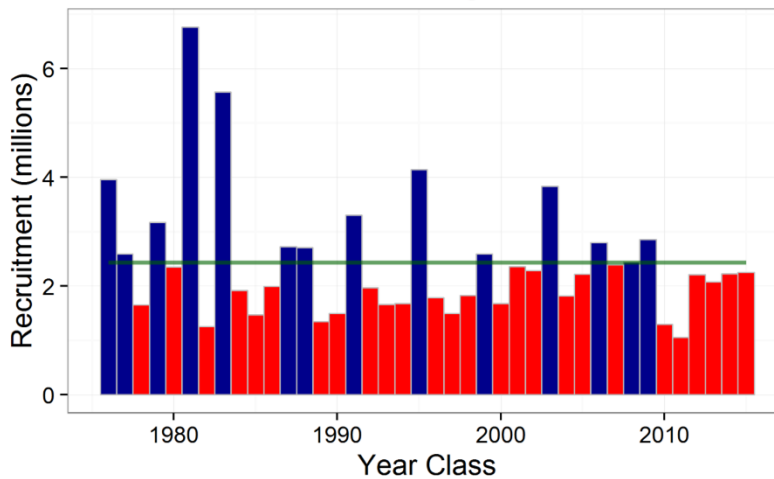
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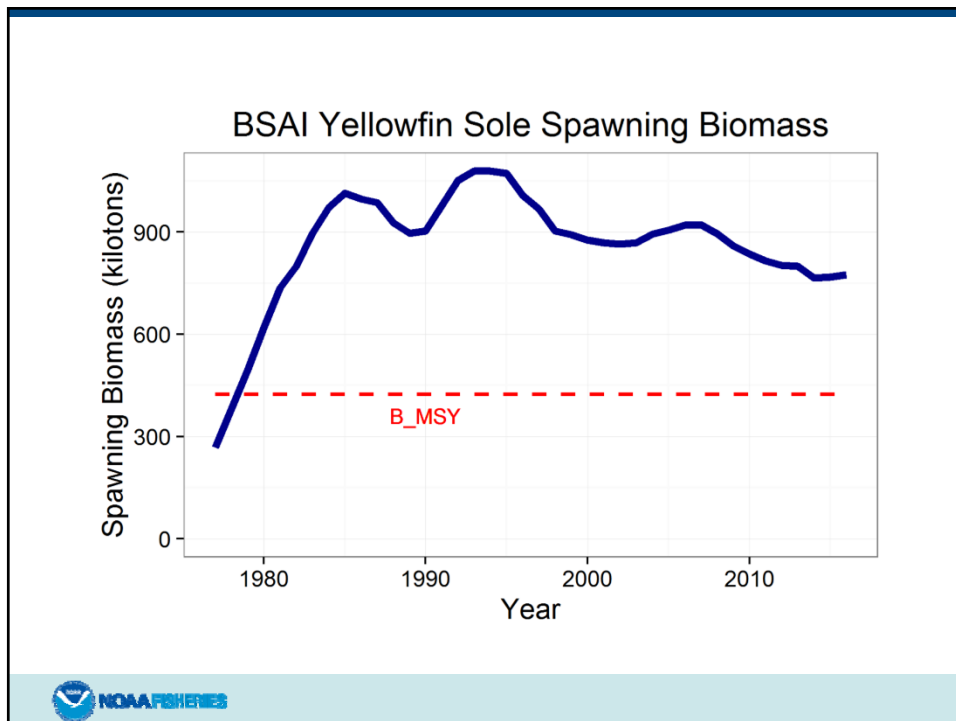
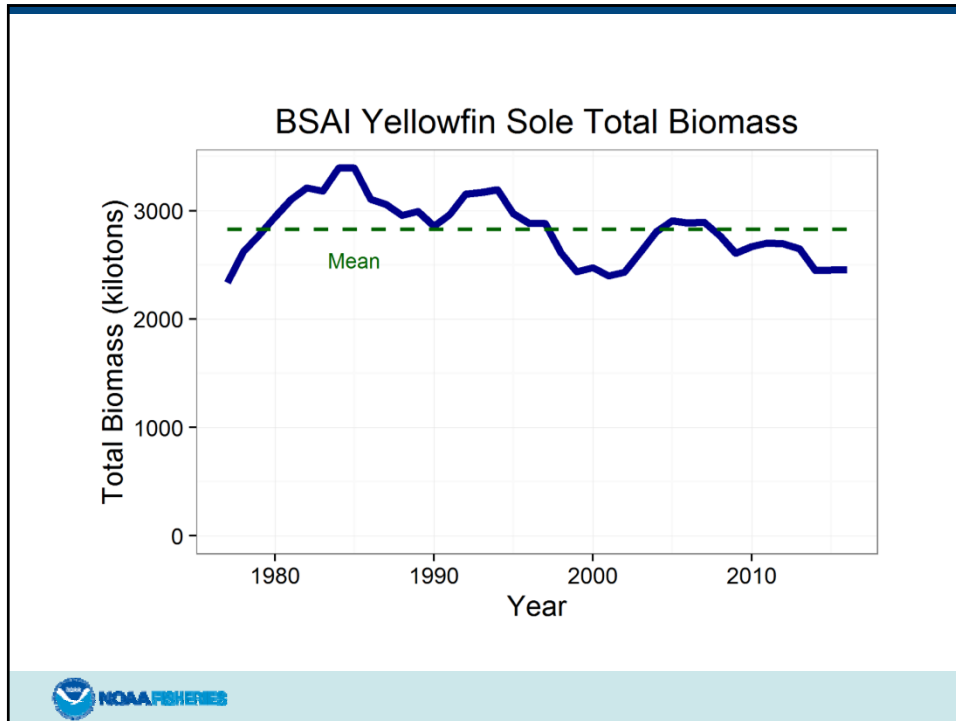
Yellowfin sole, continued



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BSAI Yellowfin Sole Age 1 Recruitment





Yellowfin sole, continued

Quantity	Last year	This year	Change
M	0.12	0.12	0.00
2016 tier	1a	n/a	none
2017 tier	1a	1a	none
2016 age+ biomass	2,170,000	n/a	0.06
2017 age+ biomass	2,086,200	2,290,100	0.10
2016 spawning biomass	702,200	n/a	0.11
2017 spawning biomass	696,200	778,600	0.12
B0	1,107,000	1,202,700	0.09
Bmsy	435,000	424,000	-0.03
2017 FOFL	0.105	0.125	0.19
2017 FABC	0.098	0.114	0.16
2016 OFL	228,100	n/a	0.26
2017 OFL	219,200	287,000	0.31
2016 ABC	211,700	n/a	0.23
2017 ABC	203,500	260,800	0.28



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Chapter 5: Greenland turbot

- New survey biomass estimates:
 - EBS shelf survey down 11% from 2015
 - EBS slope survey up 31% from 2012
 - 2016 distribution of survey biomass: 49% shelf, 51% slope
- Model changes:
 - Size composition data combined across sexes for sizes < 50 cm
 - Separate set of slope survey selectivity parameters for years > 2010
 - Flat-topped slope survey selectivity
 - NMFS longline survey data removed



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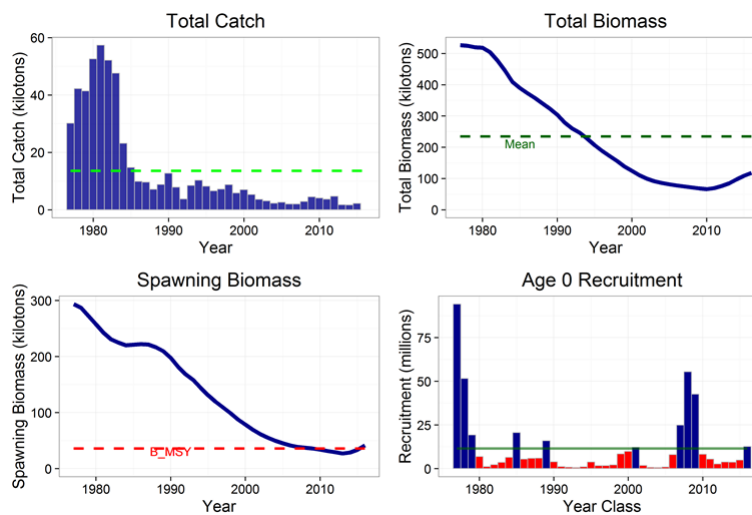
Greenland turbot, continued

- ABC recommendation:
 - The Team disagreed with the authors' recommended ABC of 7,000 t
 - While the Team agreed that capping harvests at the 7,000 t level would likely result in less variable future harvests and keep the stock above $B_{35\%}$, the Team felt that these were more appropriately viewed as TAC considerations than ABC considerations, and so proposed setting ABC at the maximum permissible level instead
 - **The SSC recommended a stairstep (halfway up)**

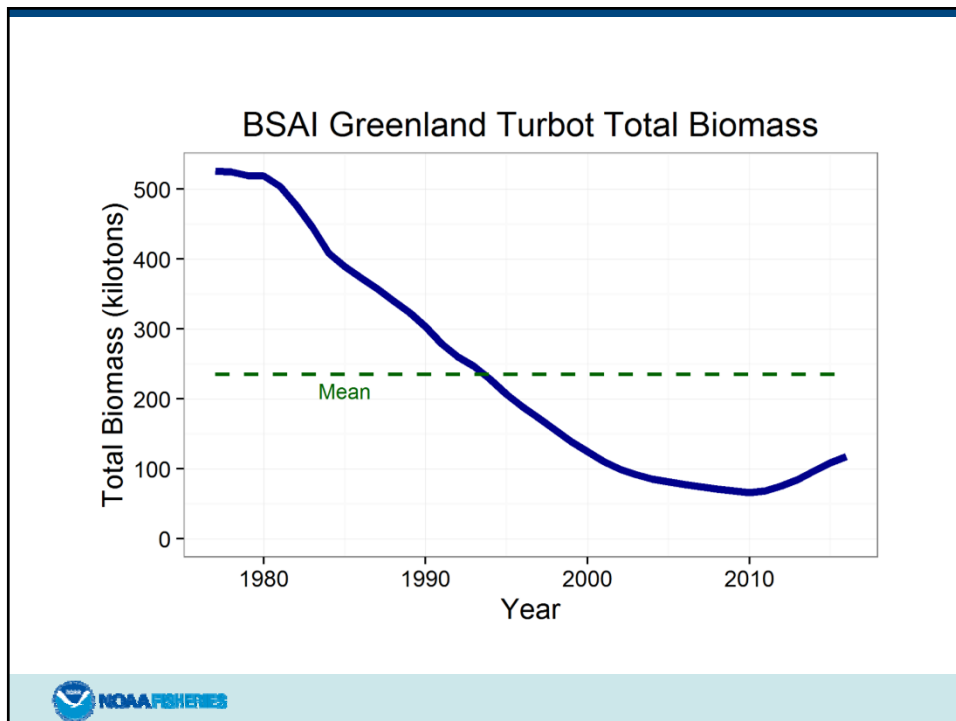
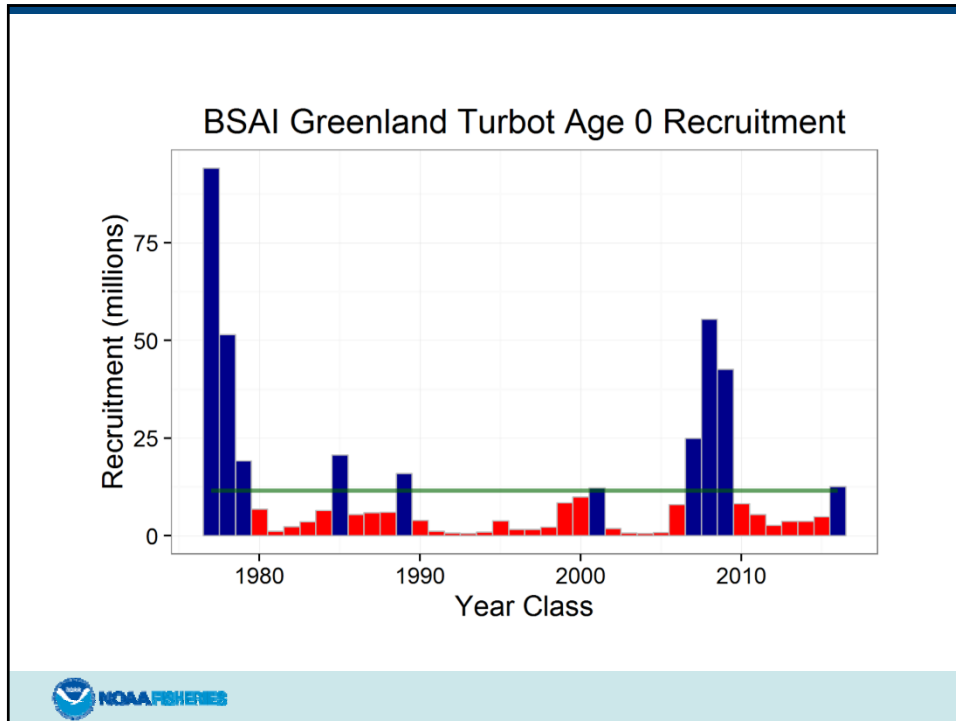


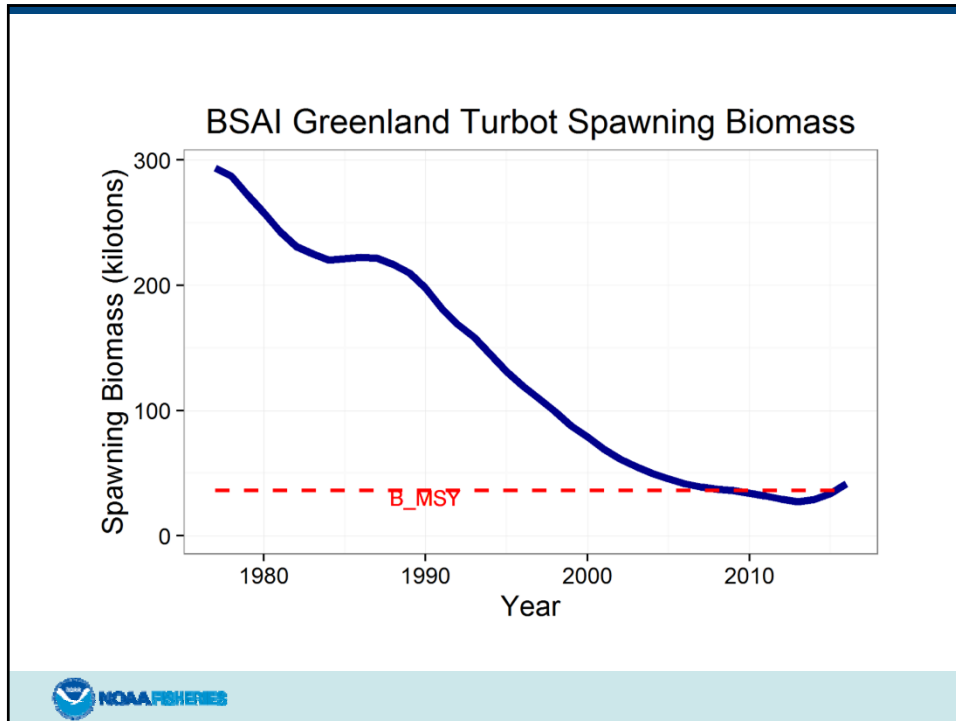
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Greenland turbot, continued



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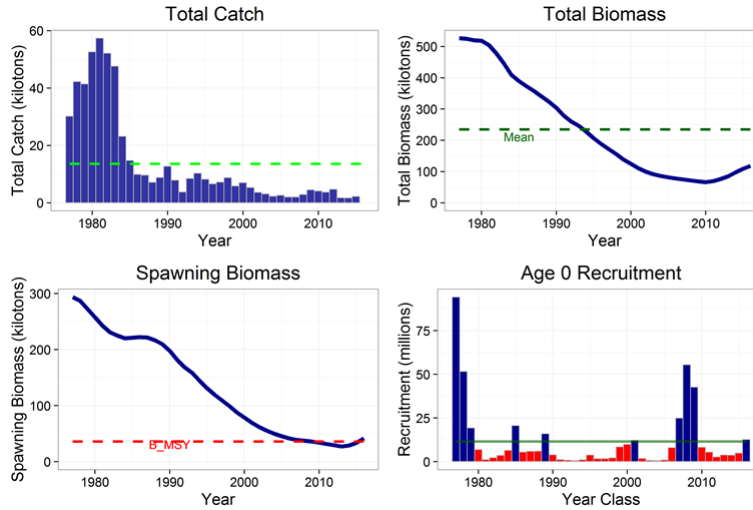


Greenland turbot, continued

Quantity	Last year	This year	Change
M	0.112	0.112	0.00
2016 tier	3b	n/a	3b→3a
2017 tier	3b	3a	3b→3a
2016 age+ biomass	114,438	n/a	0.06
2017 age+ biomass	123,494	121,804	-0.01
2016 spawning biomass	31,028	n/a	0.63
2017 spawning biomass	41,015	50,461	0.23
B100%	126,441	103,097	-0.18
B40%	50,577	41,239	-0.18
B35%	44,255	36,084	-0.18
2017 FOFL	0.14	0.29	1.07
2017 FABC	0.11	0.18	0.64
2016 OFL	4,194	n/a	1.77
2017 OFL	7,416	11,615	0.57
2016 ABC	3,462	n/a	1.84
2017 ABC	6,132	9,825	0.60



Greenland turbot, continued



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Greenland turbot, continued

Quantity	Last year	This year	Change
M	0.112	0.112	0.00
2016 tier	3b	n/a	3b→3a
2017 tier	3b	3a	3b→3a
2016 age+ biomass	114,438	n/a	0.06
2017 age+ biomass	123,494	121,804	-0.01
2016 spawning biomass	31,028	n/a	0.63
2017 spawning biomass	41,015	50,461	0.23
B100%	126,441	103,097	-0.18
B40%	50,577	41,239	-0.18
B35%	44,255	36,084	-0.18
2017 FOFL	0.14	0.29	1.07
2017 FABC	0.11	0.18	0.64
2016 OFL	4,194	n/a	1.77
2017 OFL	7,416	11,615	0.57
2016 ABC	3,462	n/a	1.84
2017 ABC	6,132	9,825	0.60



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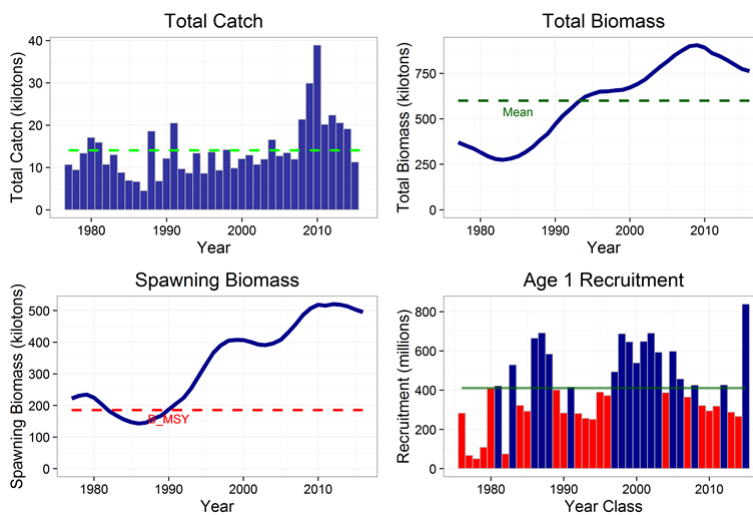
Chapter 6: arrowtooth flounder

- Last year, this assessment was a partial update only
- New survey biomass estimates:
 - EBS shelf survey biomass up 16% from 2015; up 2% from 2014
 - EBS slope survey biomass down 38% from 2012
 - AI survey biomass down 13% from 2014
 - 2016 distribution of survey biomass: 81% shelf, 8% slope, 11% AI
- Model changes:
 - EBS slope age composition data included for the first time
 - Improved age-length conversion matrix
 - Increased emphasis given to survey biomass data

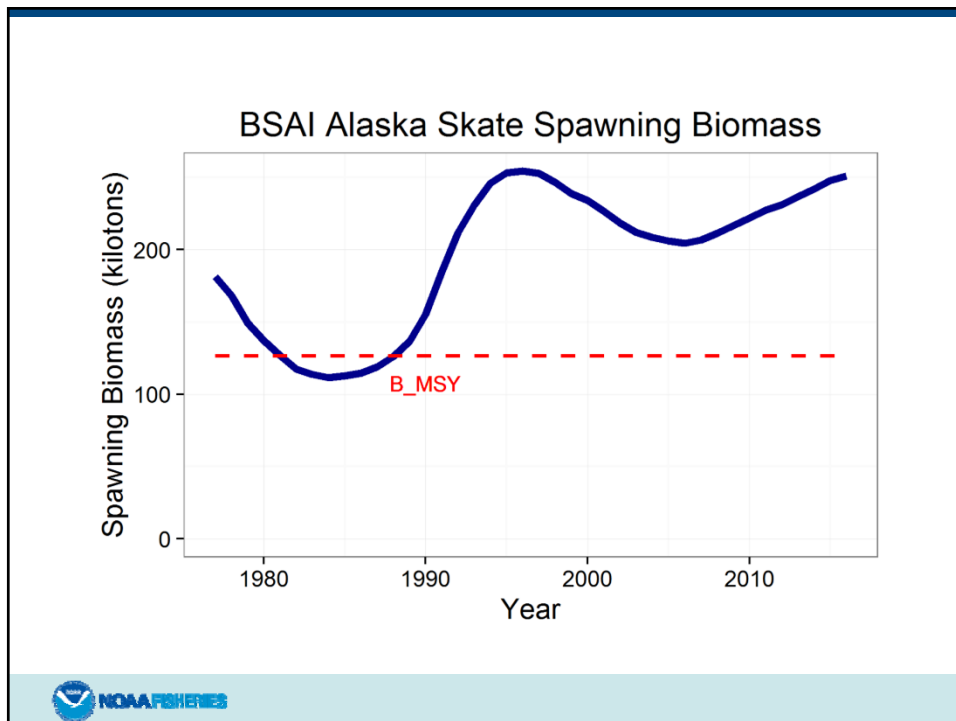
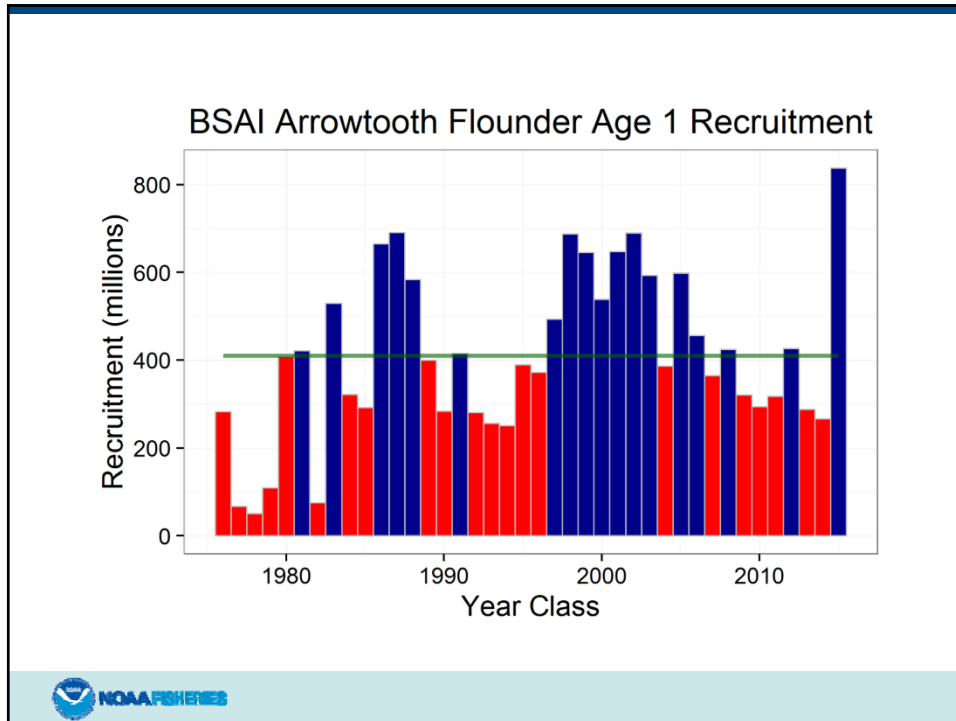


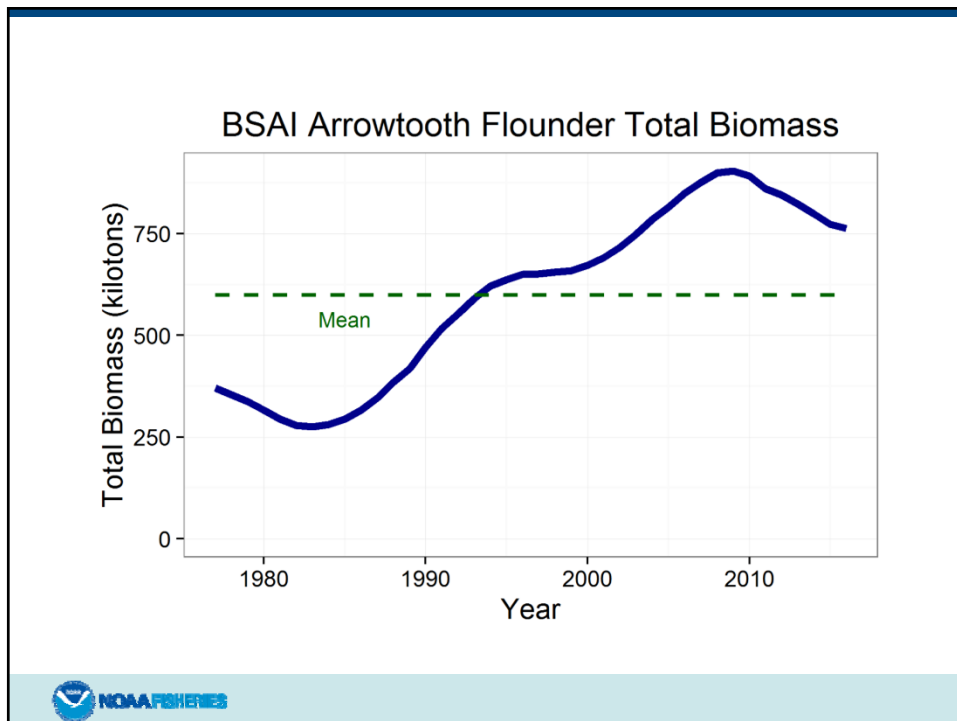
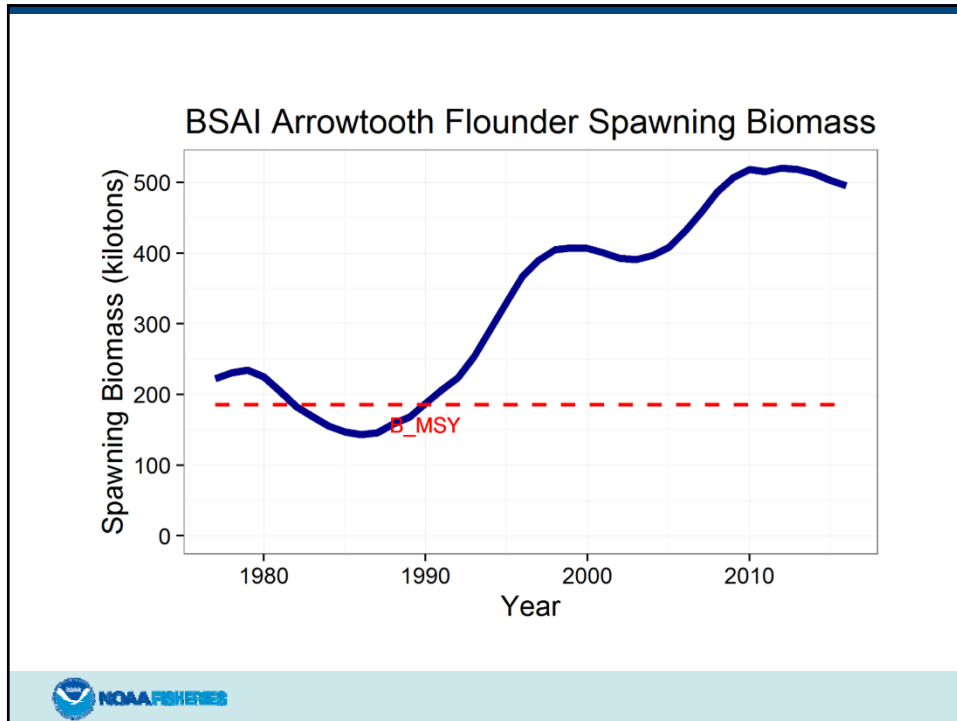
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Arrowtooth flounder, continued



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Arrowtooth flounder, continued

Quantity	Last year	This year	Change
M	0.35/0.20	0.35/0.20	0.00
2016 tier	3a	n/a	none
2017 tier	3a	3a	none
2016 age+ biomass	910,012	n/a	-0.14
2017 age+ biomass	920,920	779,195	-0.15
2016 spawning biomass	535,350	n/a	-0.09
2017 spawning biomass	534,347	485,802	-0.09
B100%	555,049	530,135	-0.04
B40%	222,019	212,054	-0.04
B35%	194,267	185,547	-0.04
2017 FOFL	0.180	0.151	-0.16
2017 FABC	0.153	0.129	-0.16
2016 OFL	94,035	n/a	-0.19
2017 OFL	84,156	76,100	-0.10
2016 ABC	80,701	n/a	-0.19
2017 ABC	72,216	65,371	-0.09



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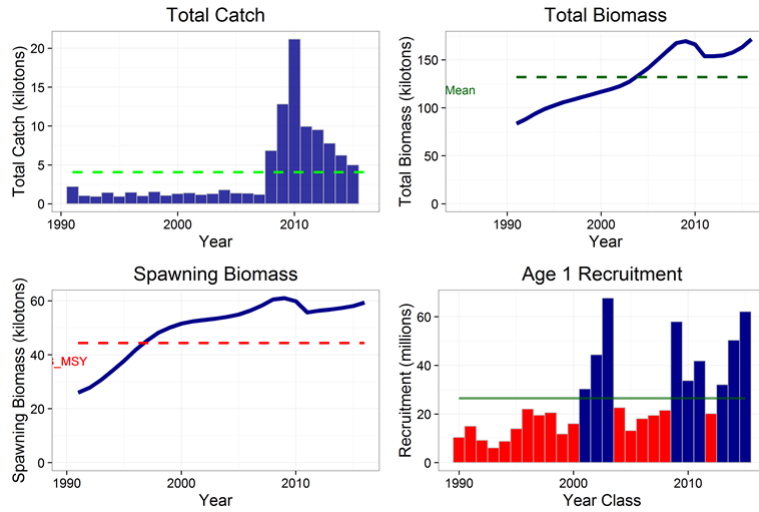
Chapter 7: Kamchatka flounder

- Last year, this assessment was a partial update only
- New survey biomass estimates:
 - EBS shelf survey biomass down 8% from 2015, down 5% from 2014
 - EBS slope survey biomass down 35% from 2012
 - AI survey biomass down 38% from 2014
 - 2016 distribution of survey biomass: 53% shelf, 20% slope, 27% AI
- Model changes/alternatives:
 - None



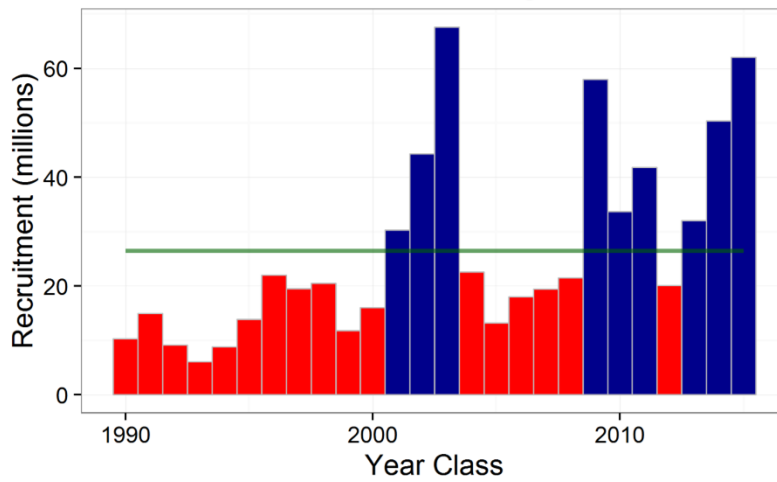
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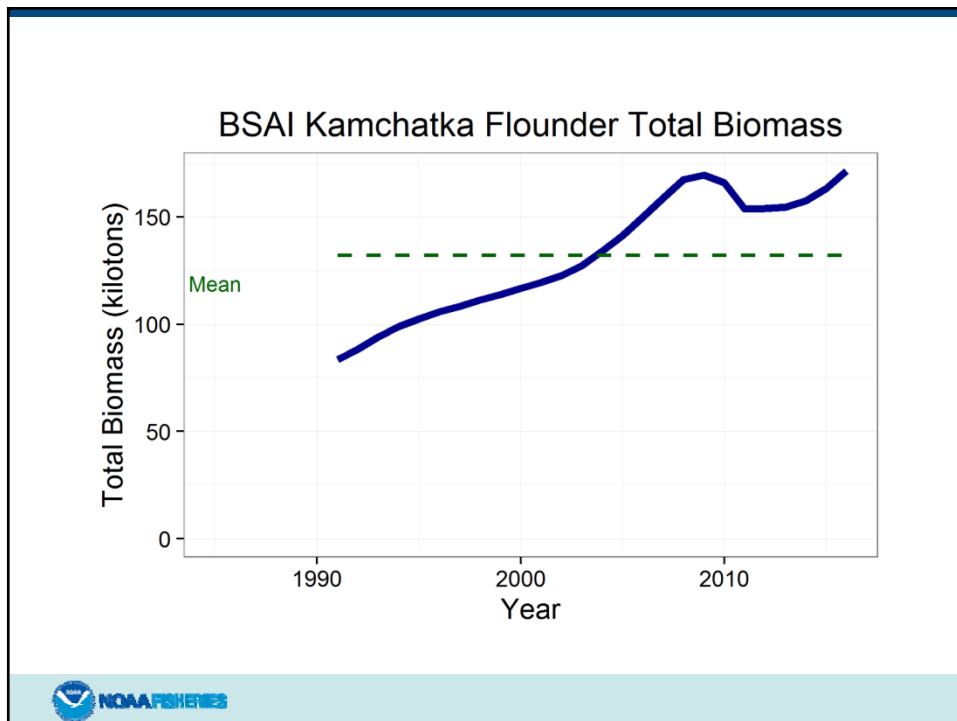
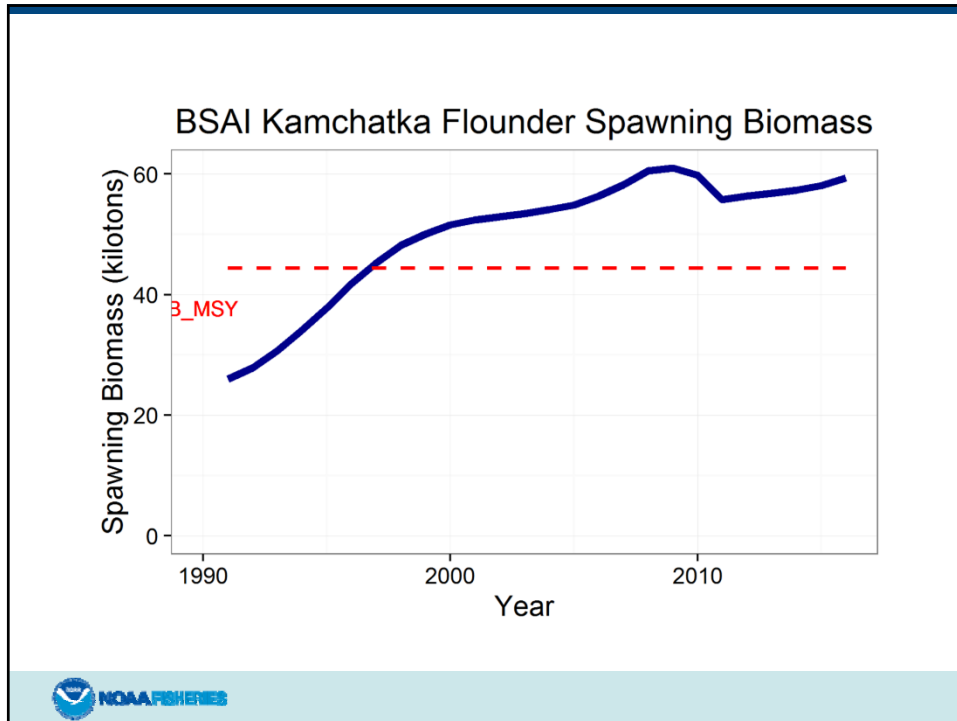
Kamchatka flounder, continued



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BSAI Kamchatka Flounder Age 1 Recruitment





Kamchatka flounder, continued

Quantity	Last year	This year	Change
M	0.11	0.11	0.00
2016 tier	3a	n/a	none
2017 tier	3a	3a	none
2016 age+ biomass	182,300	n/a	-0.07
2017 age+ biomass	189,100	170,300	-0.10
2016 spawning biomass	61,700	n/a	-0.02
2017 spawning biomass	63,800	60,300	-0.05
B100%	132,500	127,000	-0.04
B40%	53,000	50,800	-0.04
B35%	46,400	44,400	-0.04
2017 FOFL	0.076	0.078	0.03
2017 FABC	0.065	0.066	0.02
2016 OFL	11,100	n/a	-0.07
2017 OFL	11,700	10,360	-0.11
2016 ABC	9,500	n/a	-0.07
2017 ABC	10,000	8,880	-0.11



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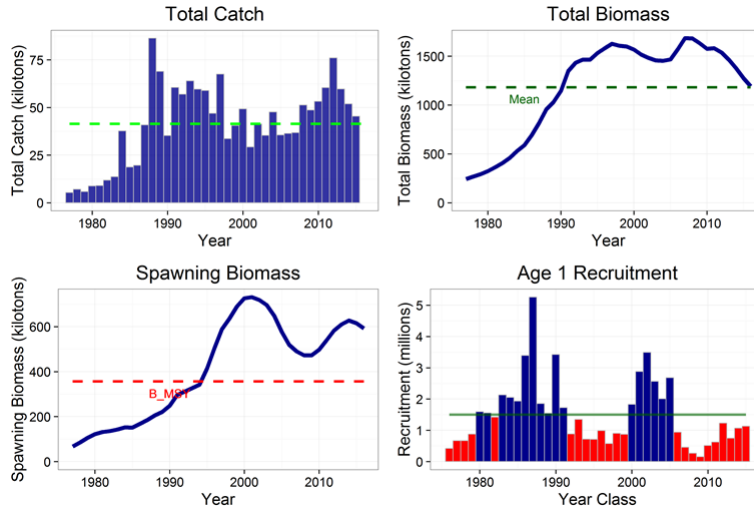
Chapter 8: northern rock sole

- New survey biomass estimates:
 - EBS shelf survey biomass up 4% from 2015
- Model changes:
 - None



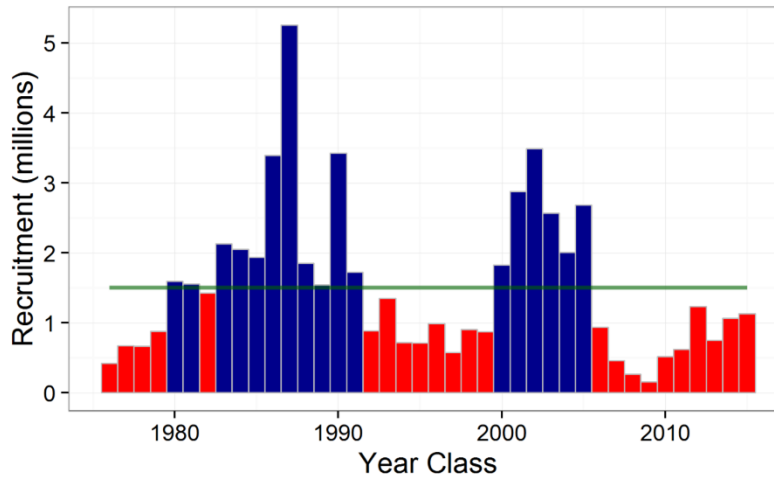
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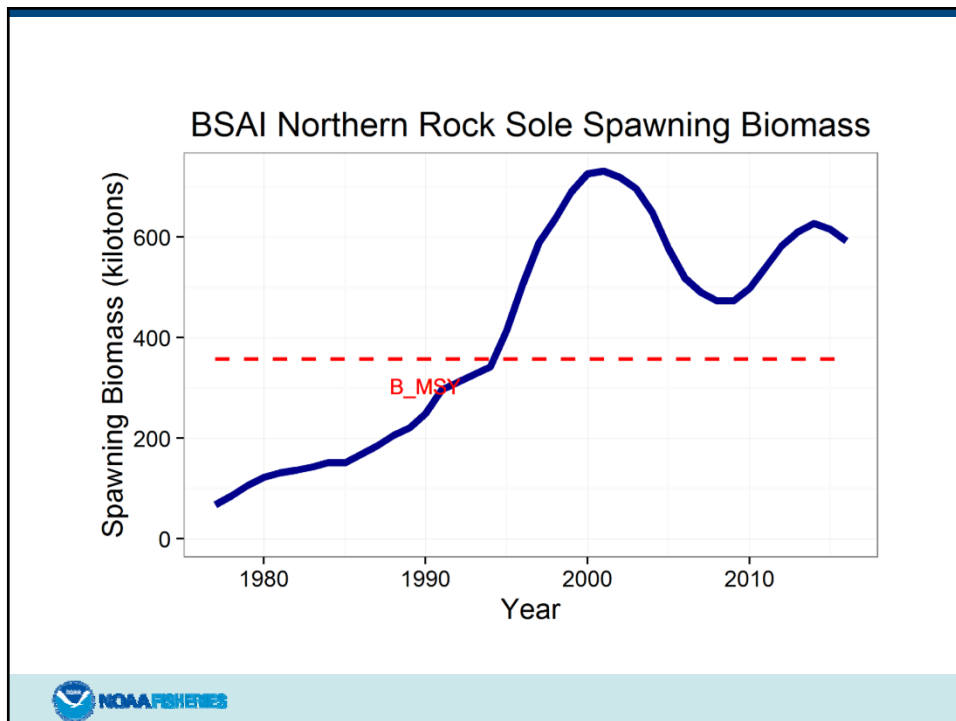
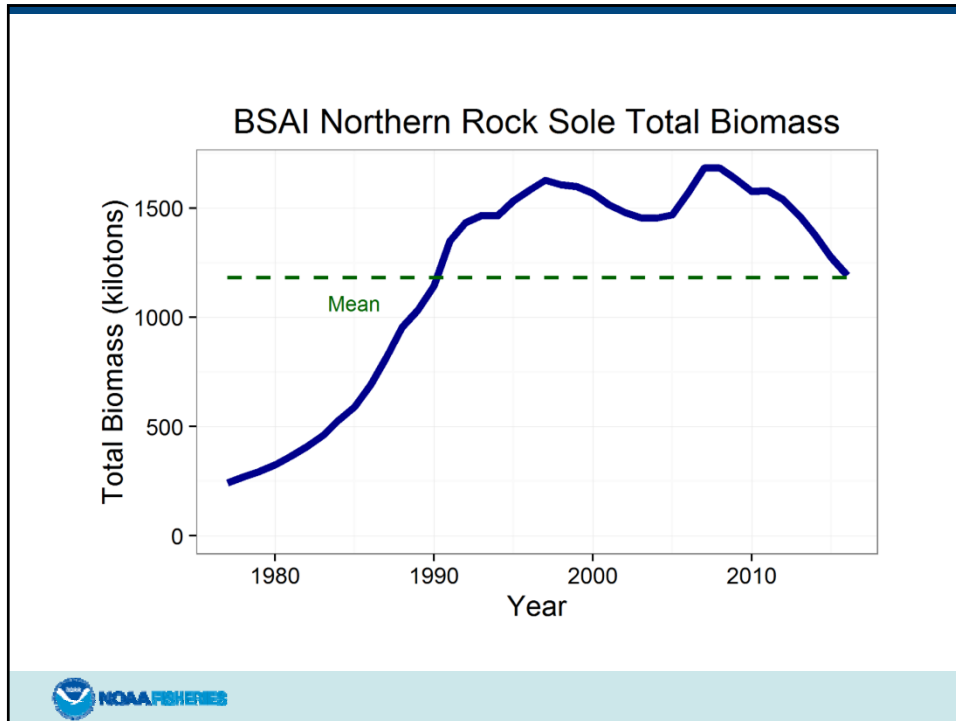
Northern rock sole, continued



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BSAI Northern Rock Sole Age 1 Recruitment





Northern rock sole, continued

Quantity	Last year	This year	Change
M	0.15	0.15	0.00
2016 tier	1a	n/a	none
2017 tier	1a	1a	none
2016 age+ biomass	1,085,200	n/a	-0.08
2017 age+ biomass	977,200	1,000,600	0.02
2016 spawning biomass	584,400	n/a	-0.08
2017 spawning biomass	522,600	539,500	0.03
B0	682,800	678,310	-0.01
Bmsy	257,000	257,000	0.00
2017 FOFL	0.152	0.16	0.05
2017 FABC	0.148	0.155	0.05
2016 OFL	165,900	n/a	-0.04
2017 OFL	149,400	159,700	0.07
2016 ABC	161,000	n/a	-0.04
2017 ABC	145,000	155,100	0.07

Value listed in chapter is incorrect.



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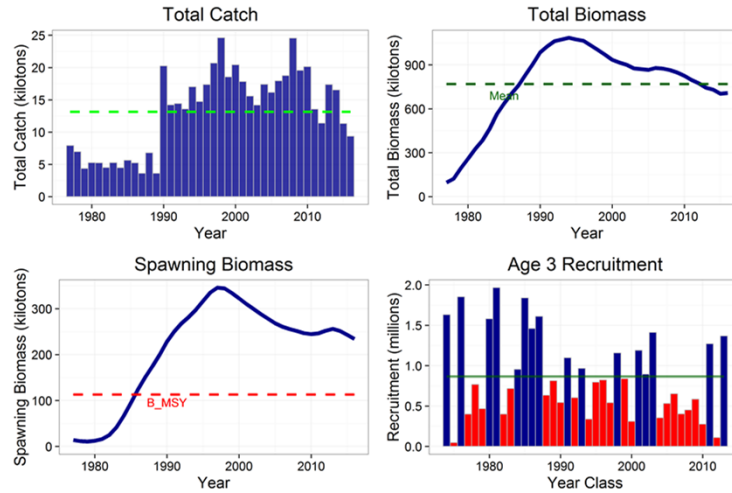
Chapter 9: flathead sole

- Last year, this assessment was a partial update only
- New survey biomass estimates:
 - EBS shelf survey biomass up 13% from 2015; down 15% from 2014
 - AI survey biomass down 50% from 2014
 - 2016 distribution of survey biomass: 99% shelf, 1% AI
- Model changes:
 - Average emphasis given to size and age composition data revised
 - Growth parameters updated



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Flathead sole, continued



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Flathead sole, continued

Quantity	Last year	This year	Change
M	0.20	0.20	0.00
2016 tier	3a	n/a	none
2017 tier	3a	3a	none
2016 age+ biomass	737,777	n/a	0.01
2017 age+ biomass	747,389	747,557	0.00
2016 spawning biomass	240,427	n/a	-0.07
2017 spawning biomass	231,139	223,469	-0.03
B100%	319,206	322,938	0.01
B40%	127,682	129,175	0.01
B35%	111,722	113,028	0.01
2017 FOFL	0.35	0.41	0.17
2017 FABC	0.28	0.34	0.21
2016 OFL	79,562	n/a	0.03
2017 OFL	77,544	81,654	0.05
2016 ABC	66,250	n/a	0.03
2017 ABC	64,580	68,278	0.06



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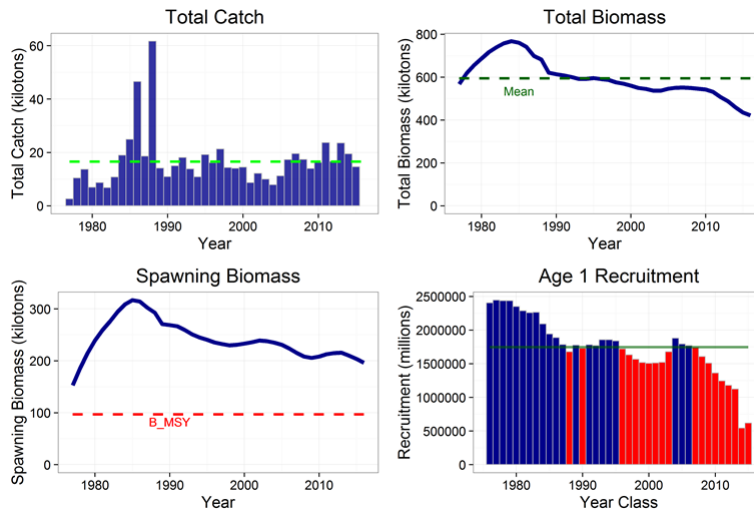
Chapter 10: Alaska plaice

- Last year, this assessment was a partial update only
- New survey biomass estimates:
 - EBS shelf survey biomass up 20% from 2015; down 6% from 2014
- Model changes:
 - None

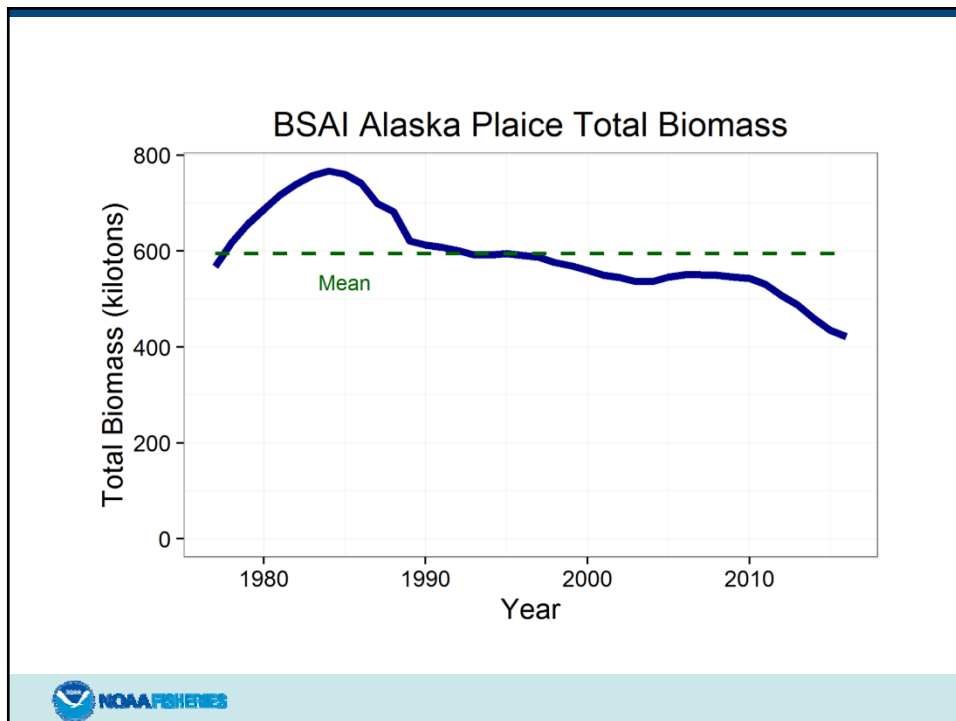
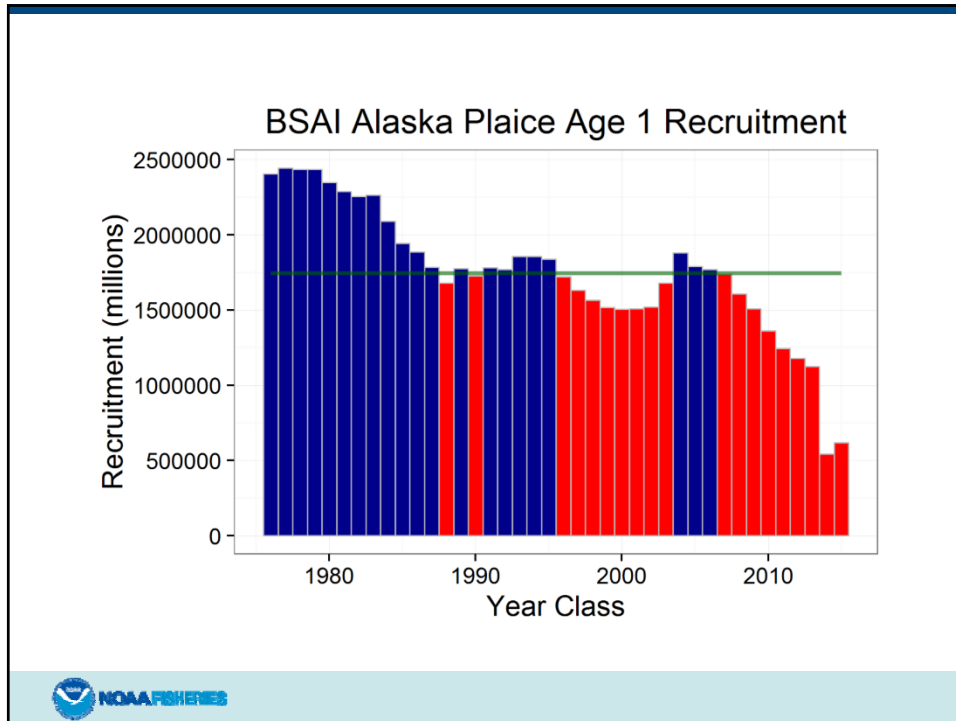


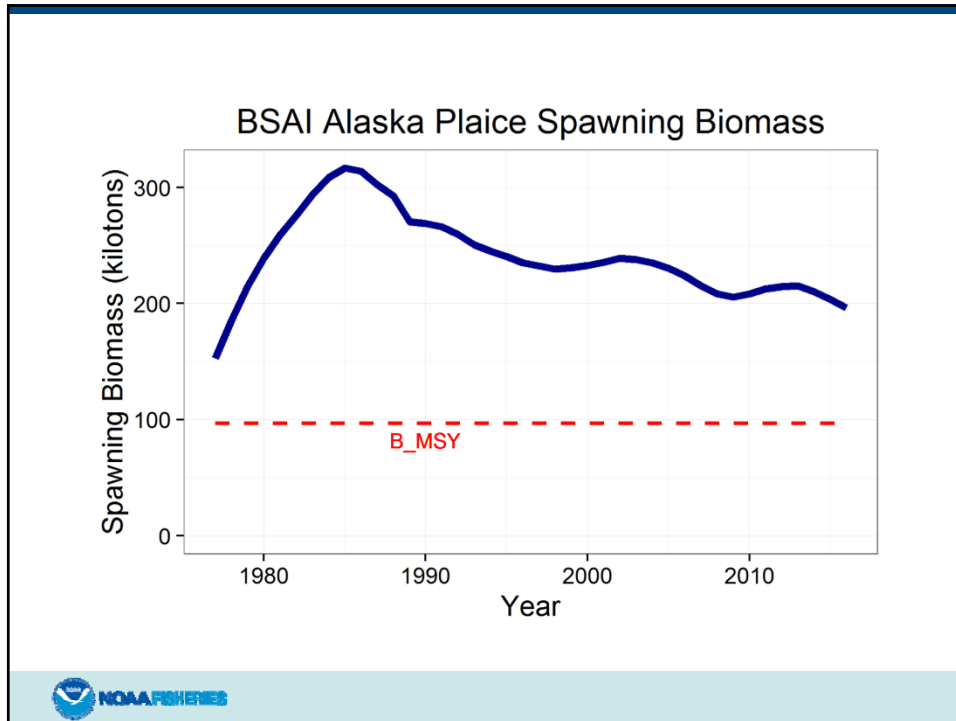
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Alaska plaice, continued



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Alaska plaice, continued

Quantity	Last year	This year	Change
M	0.13	0.13	0.00
2016 tier	3a	n/a	none
2017 tier	3a	3a	none
2016 age+ biomass	468,100	n/a	-0.12
2017 age+ biomass	465,400	412,600	-0.11
2016 spawning biomass	204,600	n/a	-0.09
2017 spawning biomass	193,600	186,300	-0.04
B100%	328,800	276,250	-0.16
B40%	131,500	110,500	-0.16
B35%	115,100	96,700	-0.16
2017 FOFL	0.175	0.154	-0.12
2017 FABC	0.143	0.128	-0.10
2016 OFL	49,000	n/a	-0.13
2017 OFL	46,800	42,800	-0.09
2016 ABC	41,000	n/a	-0.12
2017 ABC	39,100	36,000	-0.08



Chapter 11: other flatfish

- New survey biomass estimates:
 - EBS shelf survey biomass up 40% from 2015
 - EBS slope survey biomass down 9% from 2012
 - AI survey biomass down 2% from 2014
 - 2016 distribution of survey biomass: 79% shelf, 10% slope, 11% AI
- Model changes:
 - One minor change regarding treatment of years with no survey



Other flatfish, continued

Quantity*	Last year	This year	Change
M	0.155	0.155	0.00
2016 tier	5	n/a	none
2017 tier	5	5	none
Biomass	112,104	113,450	0.01
2017 FOFL	0.155	0.155	0.00
2017 FABC	0.117	0.116	0.00
2016 OFL	17,414	n/a	0.01
2017 OFL	17,414	17,591	0.01
2016 ABC	13,061	n/a	0.01
2017 ABC	13,061	13,193	0.01

*Instantaneous rates are biomass-weighted averages

Chapter lists survey estimate instead of RE estimate

Values listed in chapter are incorrect



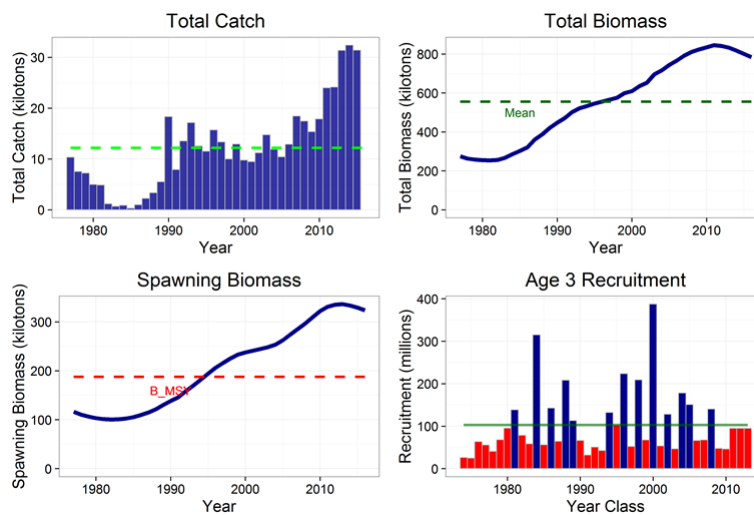
Chapter 12: Pacific ocean perch

- Last year, this assessment was a partial update only
- New survey biomass estimates:
 - EBS slope survey biomass up 55% from 2012
 - AI survey biomass up 1% from 2014
 - 2016 distribution of survey biomass: 27% slope, 73% AI
- Model changes:
 - Historic (1968-1979) fishery CPUE data removed
 - EBS slope survey data included for the first time
 - Age and size composition data recompiled
 - Growth matrices updated
 - Average emphasis given to size and age composition data revised

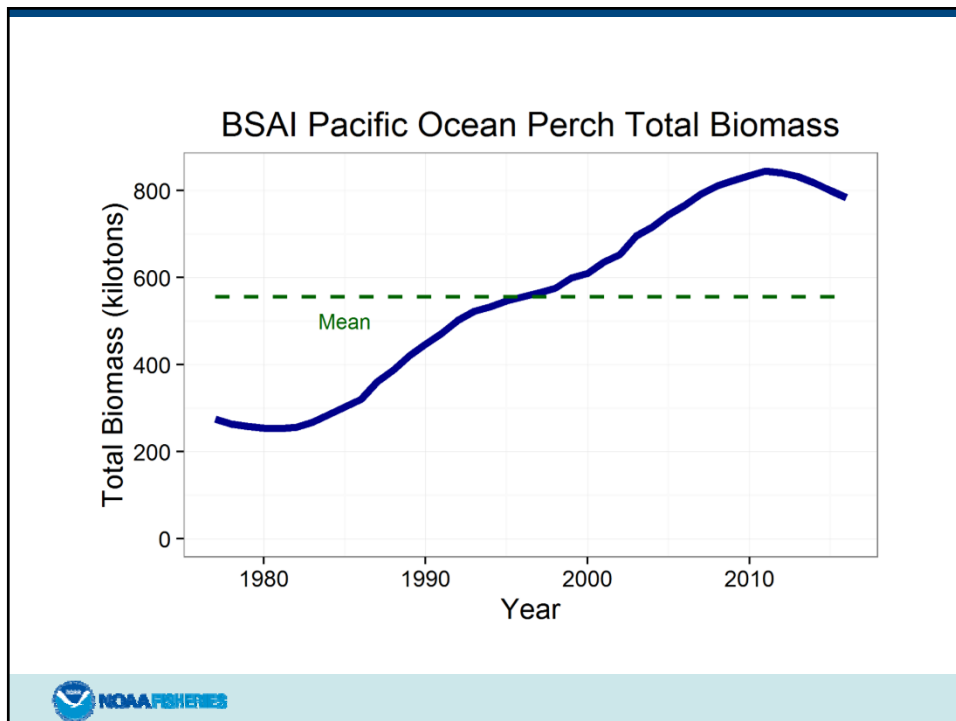
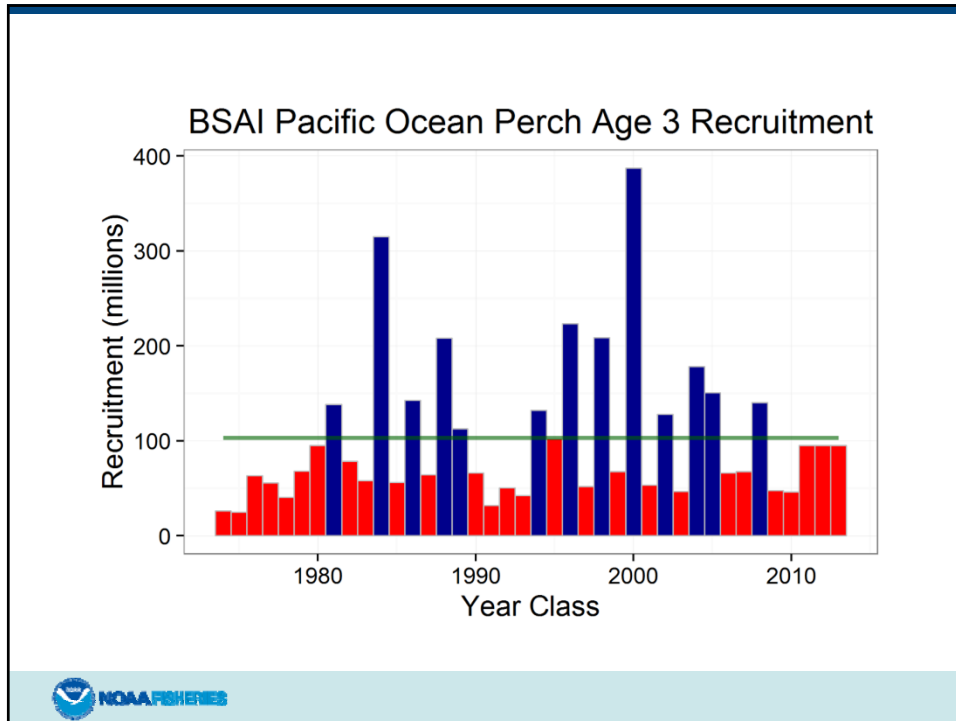


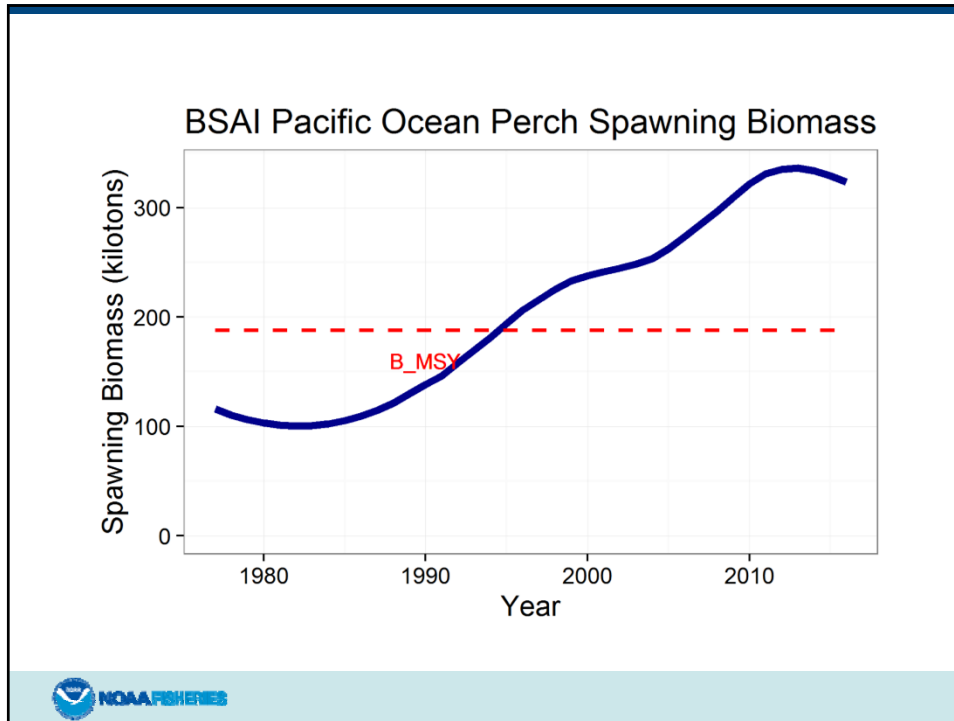
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Pacific ocean perch, continued



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Pacific ocean perch, continued

Quantity	Last year	This year	Change
M	0.062	0.058	-0.06
2016 tier	3a	n/a	none
2017 tier	3a	3a	none
2016 age+ biomass	557,886	n/a	0.38
2017 age+ biomass	542,162	767,767	0.42
2016 spawning biomass	222,369	n/a	0.41
2017 spawning biomass	211,339	314,489	0.49
B100%	423,008	536,713	0.27
B40%	169,203	214,685	0.27
B35%	148,053	187,849	0.27
2017 FOFL	0.109	0.101	-0.07
2017 FABC	0.089	0.082	-0.08
2016 OFL	40,529	n/a	0.31
2017 OFL	38,589	53,152	0.38
2016 ABC	33,320	n/a	0.31
2017 ABC	31,724	43,723	0.38



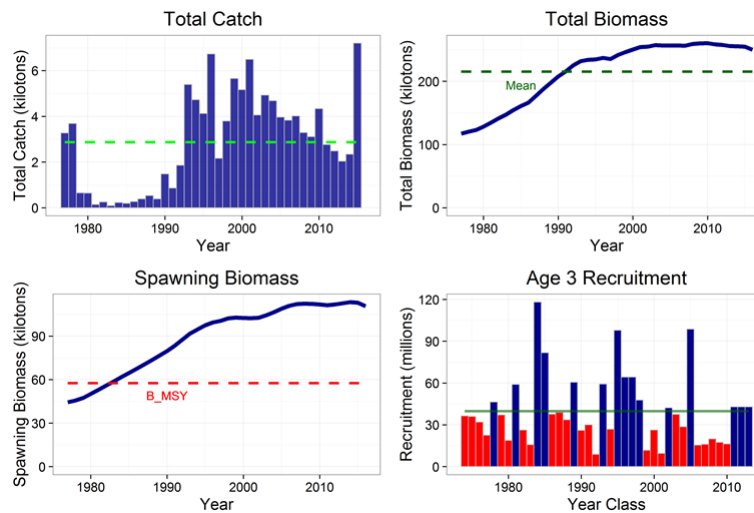
Chapter 13: northern rockfish

- Last year, this assessment was a partial update only
- New survey biomass estimates:
 - AI survey biomass down 46% from 2014
 - However, 2014 AI survey biomass was up 66% from 2012
- Model changes:
 - Age and size composition data recompiled
 - Growth matrices updated
 - Average emphasis given to size and age composition data revised

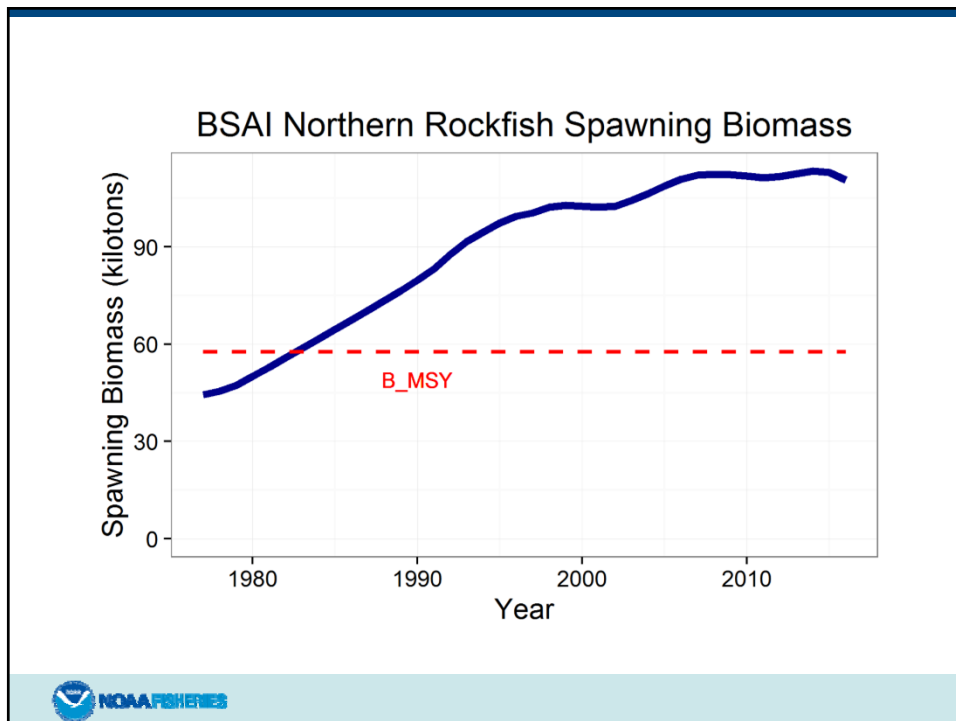
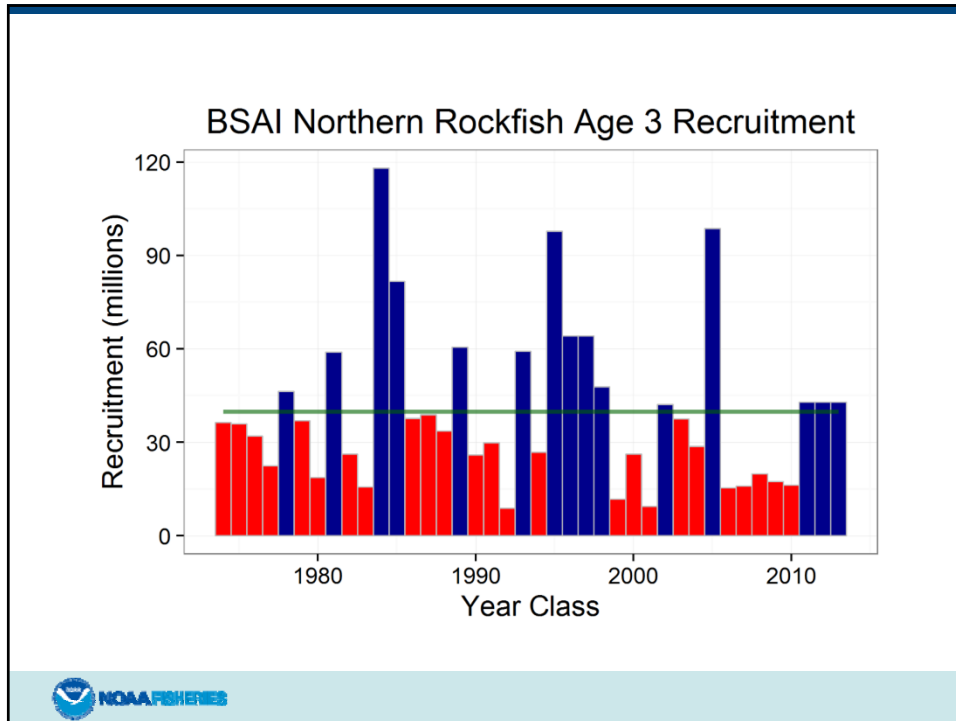


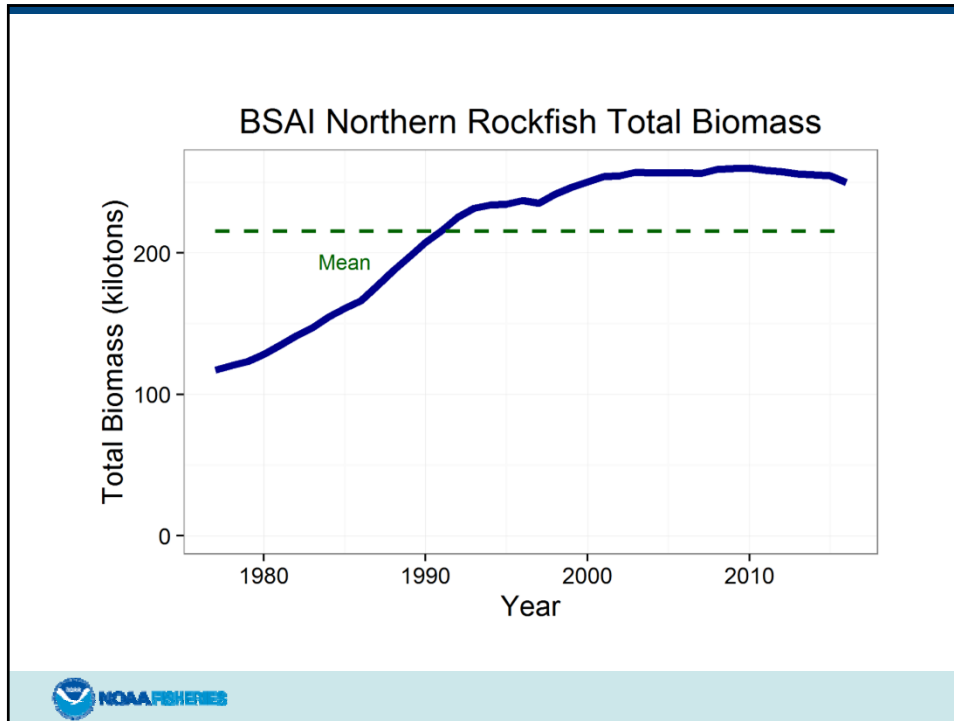
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Northern rockfish, continued



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Northern rockfish, continued

Quantity	Last year	This year	Change
M	0.049	0.046	-0.06
2016 tier	3a	n/a	none
2017 tier	3a	3a	none
2016 age+ biomass	213,674	n/a	0.16
2017 age+ biomass	209,369	248,160	0.19
2016 spawning biomass	91,648	n/a	0.17
2017 spawning biomass	88,326	107,660	0.22
B100%	144,420	164,674	0.14
B40%	57,768	65,870	0.14
B35%	50,547	57,636	0.14
2017 FOFL	0.087	0.08	-0.08
2017 FABC	0.070	0.065	-0.07
2016 OFL	14,689	n/a	0.11
2017 OFL	14,085	16,242	0.15
2016 ABC	11,960	n/a	0.11
2017 ABC	11,468	13,264	0.16



Chapter 14: blackspotted/rougheye

- Last year, this assessment was a partial update only
- New survey biomass estimates:
 - EBS slope survey biomass down 71% from 2012
 - AI survey biomass up 113% from 2014
 - However, 2014 estimate was down 63% from 2012
 - 2016 distribution of survey biomass: slope = 4%, AI = 96%
- Model changes:
 - EBS slope survey data included for the first time
 - Age and size composition data recompiled
 - Growth matrices updated
 - Average emphasis given to size and age composition data revised



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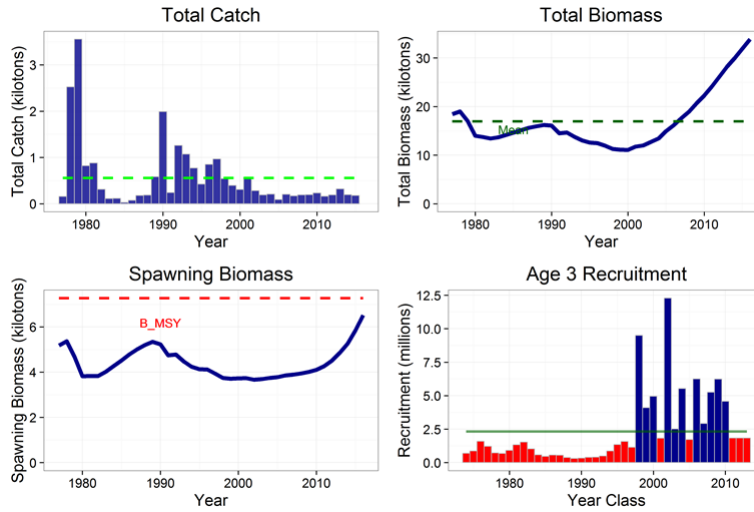
Blackspotted/rougheye, continued

- 2016 catch to date in the WAI (38 t) is less than the 2016 MSSC (58 t)
- The Team recommends that the 2017 MSSC in the WAI be set at a value of 31 t, as calculated in this year's assessment (29 t from SSC)
- Members of the public expressed that it may be difficult stay under the further reduced MSSC
- Extensive discussion regarding the objective of the MSSC, and whether genetic studies would provide more insight into whether the current split between the WAI and CAI is appropriate
- The Team recommends that the Council task staff with further analysis of possible alternative management measures if such analysis is desired

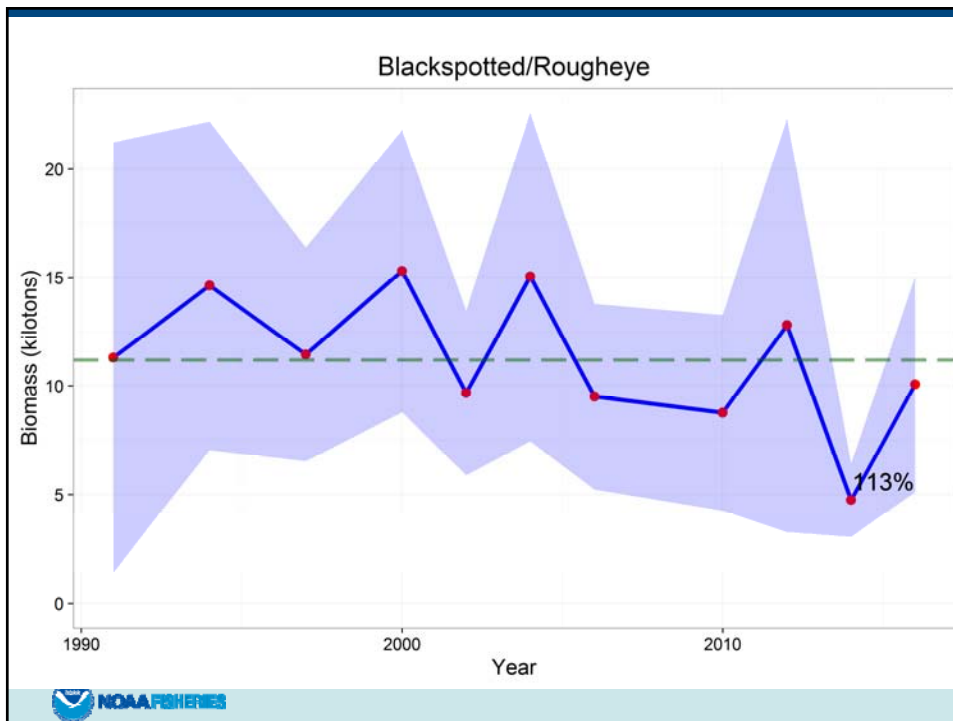


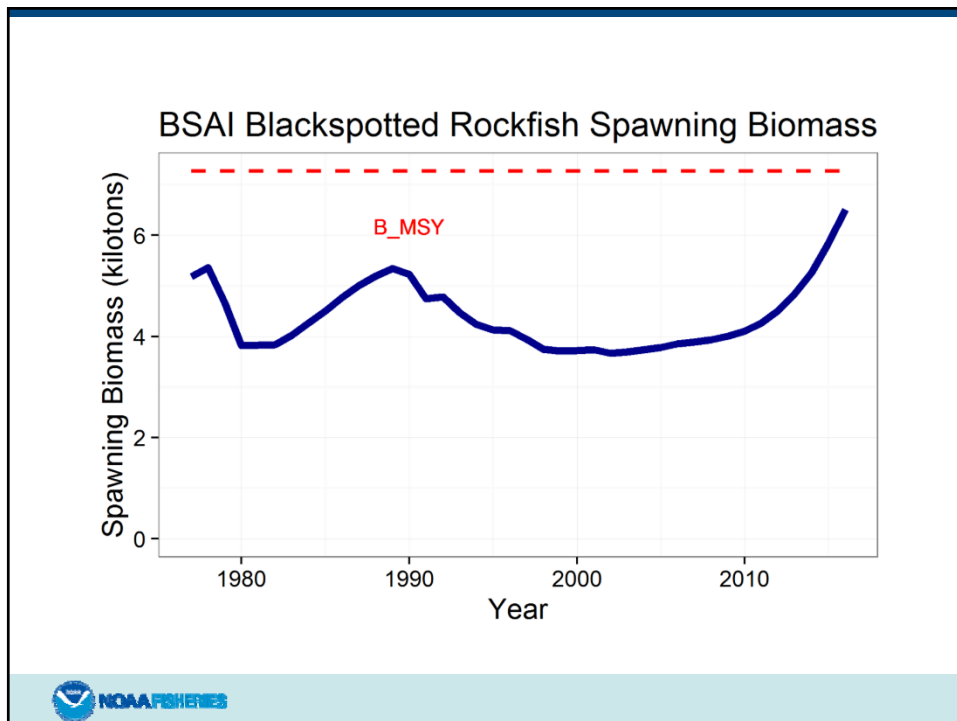
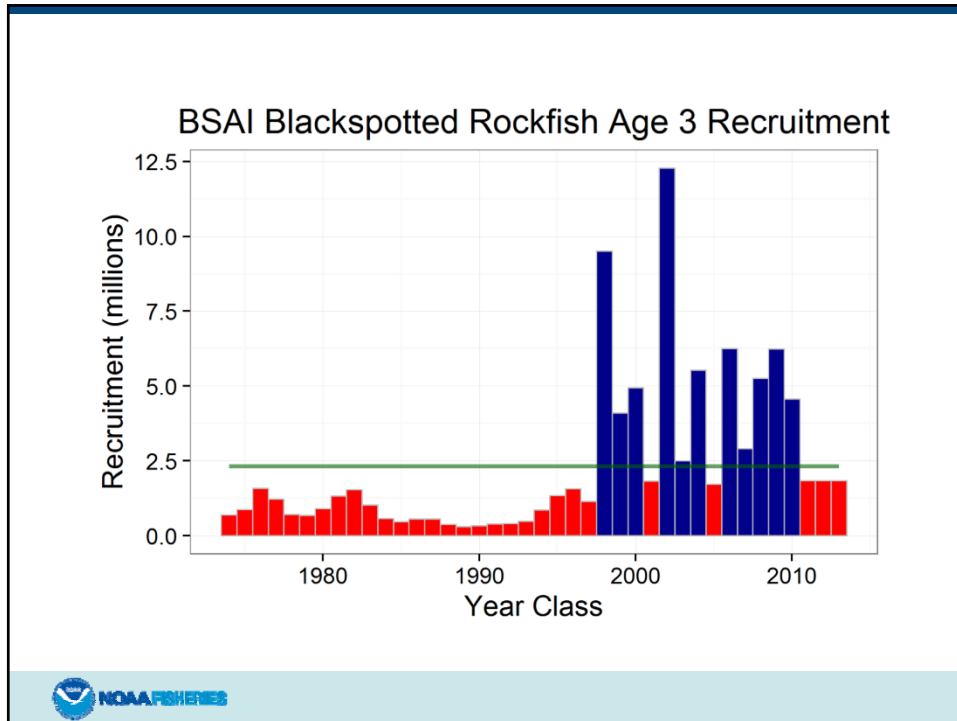
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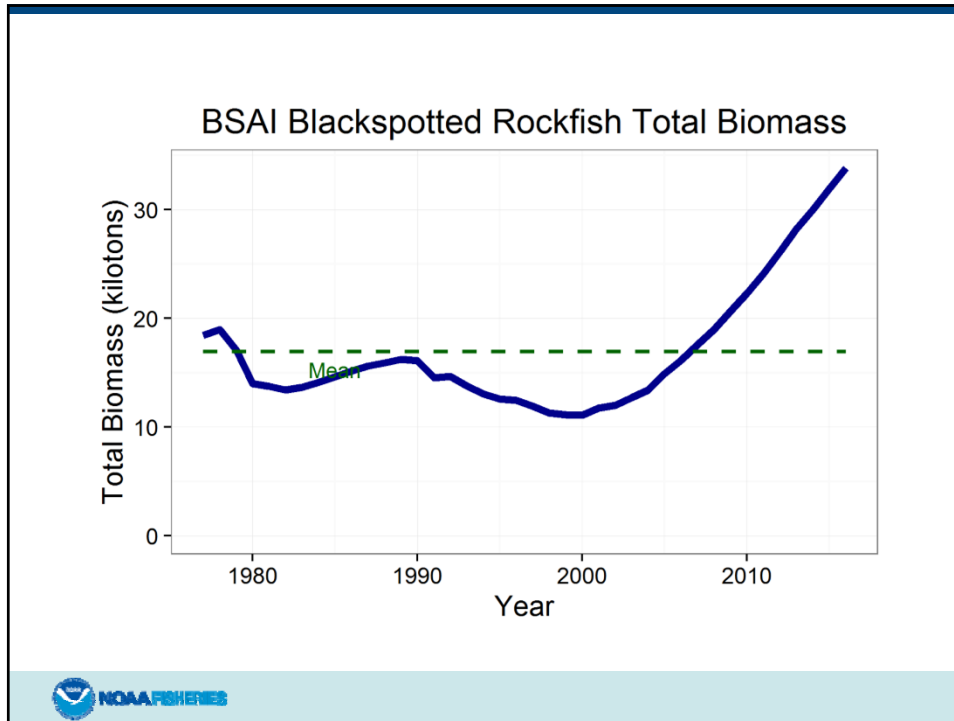
Blackspotted/rougheye, continued



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Blackspotted/rougheye

Quantity	Last year*	This year	Change
M	0.033	0.033	0.00
2016 tier	3b	n/a	none
2017 tier	3b	3b	none
2016 age+ biomass	42,605	n/a	-0.16
2017 age+ biomass	44,682	35,669	-0.20
2016 spawning biomass	9,076	n/a	-0.20
2017 spawning biomass	10,307	7,305	-0.29
B100%	28,507	20,777	-0.27
B40%	11,403	8,311	-0.27
B35%	9,977	7,272	-0.27
2017 FOFL	0.051	0.048	-0.06
2017 FABC	0.042	0.039	-0.07
2016 OFL	649	n/a	-0.06
2017 OFL	811	612	-0.25
2016 ABC	528	n/a	-0.05
2017 ABC	661	501	-0.24

*Last year = AI only



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Chapter 15: shorttraker rockfish

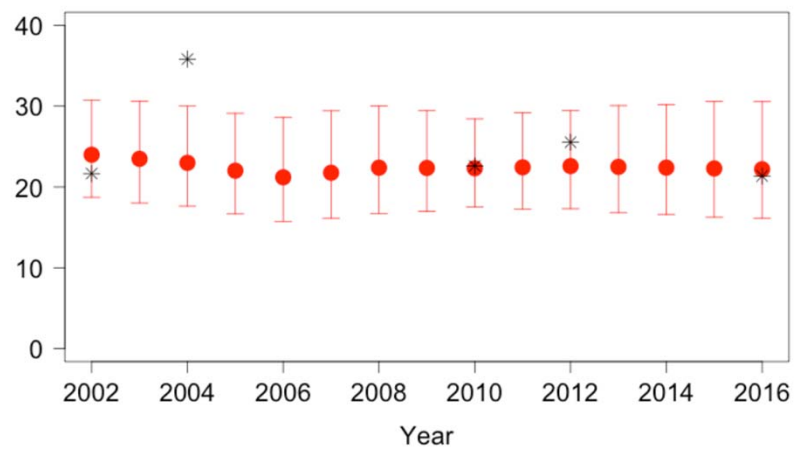
- Last year, this assessment was a partial update only
- New survey biomass estimates:
 - EBS slope survey biomass down 33% from 2012
 - AI survey biomass down 8% from 2014
 - 2016 distribution of survey biomass: slope = 29%, AI = 71%
- Model changes/alternatives:
 - None



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Shorttraker rockfish, continued

- Biomass estimates from random effects model



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Shortraker rockfish, continued

Quantity	Last year	This year	Change
M	0.030	0.030	0.00
2016 tier	5	n/a	none
2017 tier	5	5	none
Biomass	23,009	22,191	-0.04
2017 FOFL	0.030	0.030	0.00
2017 FABC	0.0225	0.0225	0.00
2016 OFL	690	n/a	-0.04
2017 OFL	690	666	-0.04
2016 ABC	518	n/a	-0.04
2017 ABC	518	499	-0.04



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Chapter 16: other rockfish

- Last year, this assessment was a partial update only
- New data:
 - EBS slope survey biomass up 21% from 2012
 - AI survey biomass down 23% from 2014
 - 2016 distribution of survey biomass: slope = 64%, AI = 36%
- Model changes/alternatives:
 - None



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Other rockfish, continued

Quantity*	Last year	This year	Change
M	0.034	0.033	-0.02
2016 tier	5	n/a	none
2017 tier	5	5	none
Biomass	49,630	55,312	0.11
2017 FOFL	0.034	0.033	-0.02
2017 FABC	0.025	0.025	-0.02
2016 OFL	1,667	n/a	0.09
2017 OFL	1,667	1,816	0.09
2016 ABC	1,250	n/a	0.09
2017 ABC	1,250	1,362	0.09

*Instantaneous rates are biomass-weighted averages



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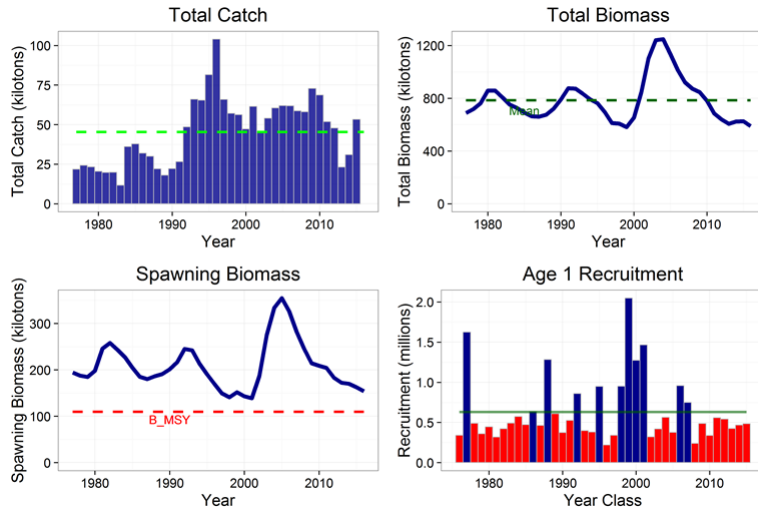
Chapter 17: Atka mackerel

- New survey biomass estimates:
 - AI survey biomass down 38% from 2014
 - However, 2014 biomass was up 161% from 2012
- Model changes:
 - Emphasis given to individual size and age compositions revised, although averages kept at 2014 levels
 - Minor adjustment to the set of years used to compute average selectivity for projections
 - Revised estimate of the ratio of catch to ABC used for projections

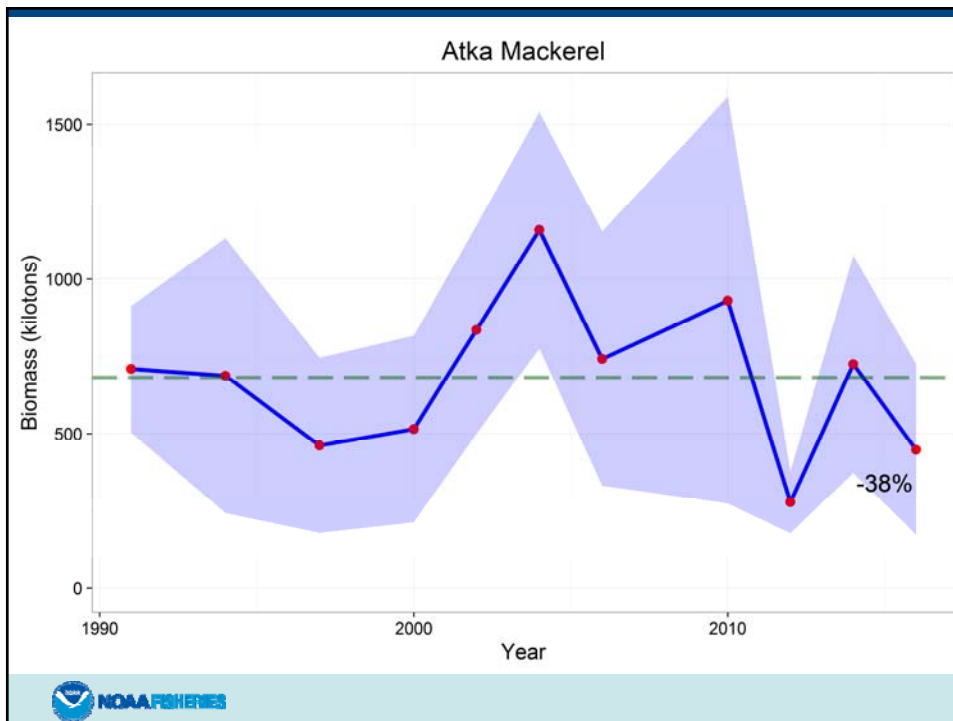


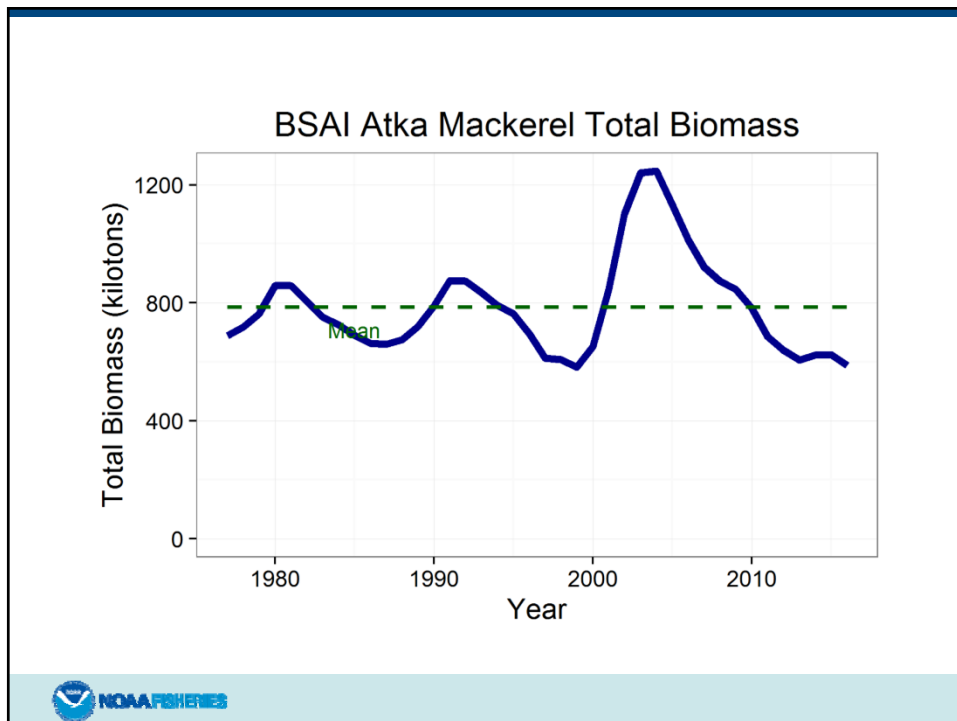
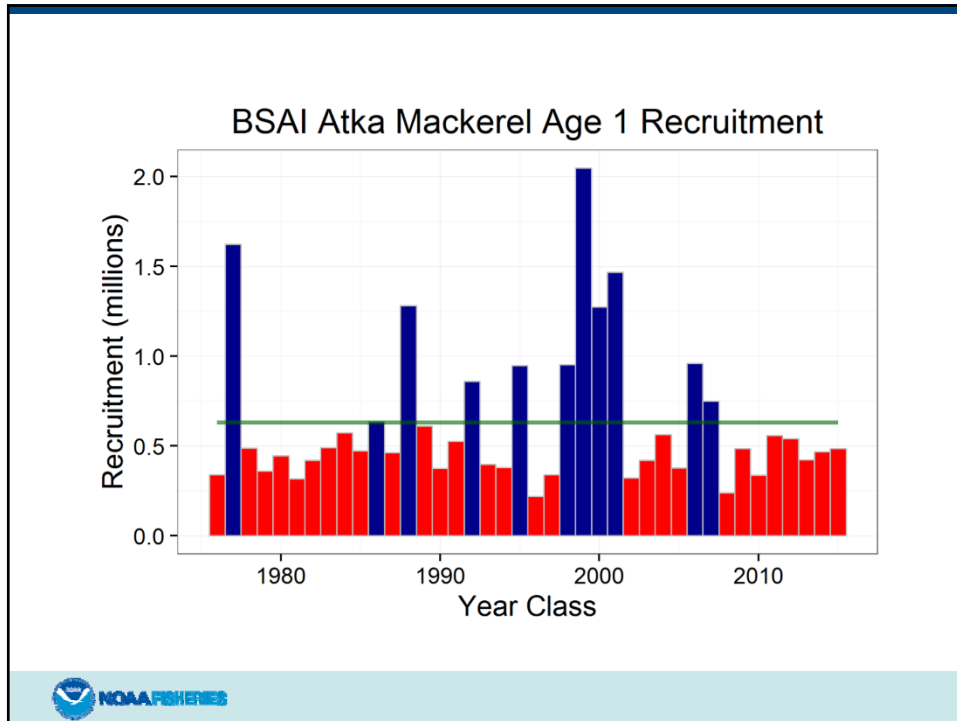
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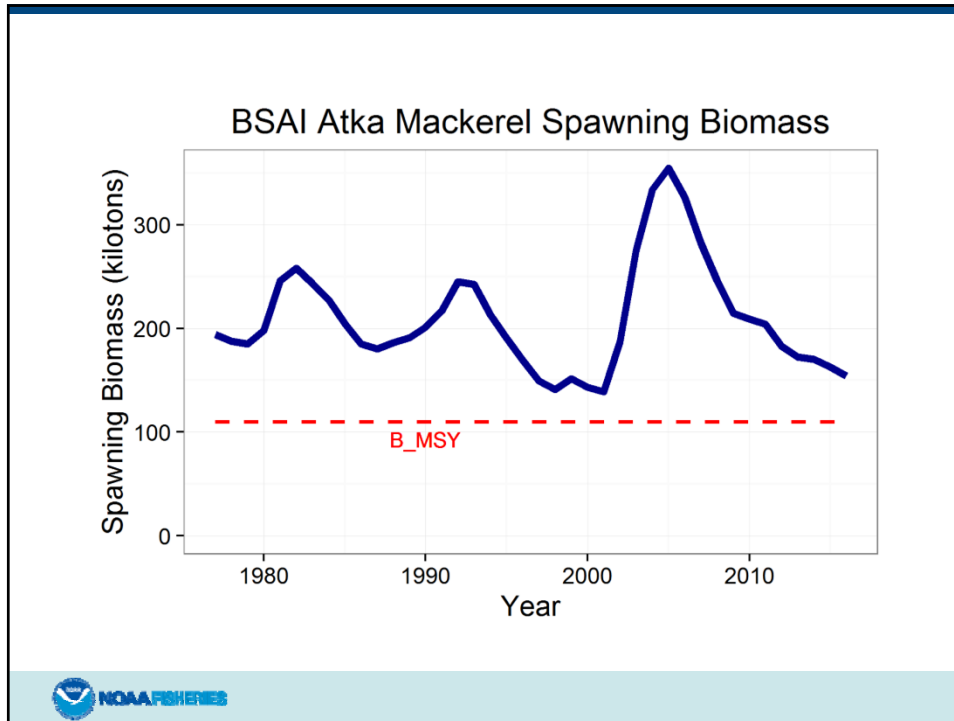
Atka mackerel, continued



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Atka mackerel, continued

Quantity	Last year	This year	Change
M	0.30	0.30	0.00
2016 tier	3a	n/a	none
2017 tier	3a	3a	none
2016 age+ biomass	672,184	n/a	-0.11
2017 age+ biomass	664,208	598,791	-0.10
2016 spawning biomass	166,407	n/a	-0.13
2017 spawning biomass	147,496	145,258	-0.02
B100%	339,135	313,220	-0.08
B40%	135,654	125,288	-0.08
B35%	118,697	109,627	-0.08
2017 FOFL	0.35	0.4	0.14
2017 FABC	0.30	0.34	0.13
2016 OFL	104,749	n/a	-0.02
2017 OFL	99,490	102,700	0.03
2016 ABC	90,340	n/a	-0.03
2017 ABC	85,840	87,200	0.02



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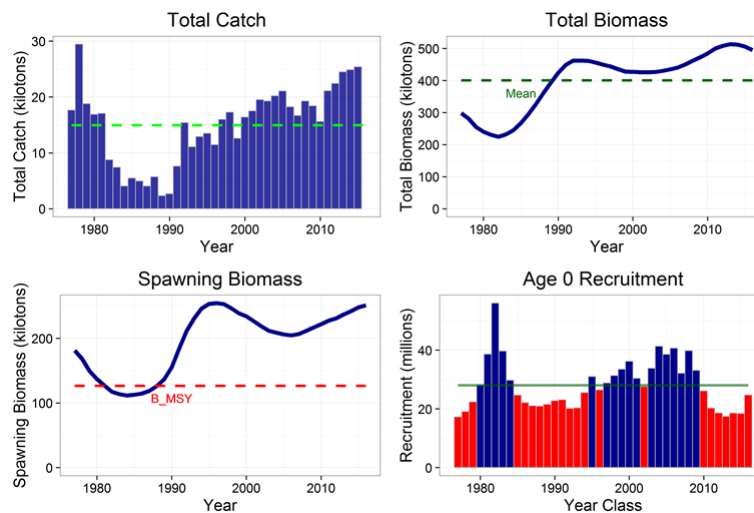
Chapter 18: skates

- Last year, this assessment was a partial update only
- New survey biomass estimates (Alaska skate):
 - EBS shelf survey biomass up 23% from 2015; up 35% from 2014
- New survey biomass estimates (other skates):
 - EBS shelf survey biomass down 6% from 2015; up 52% from 2014
 - EBS slope survey biomass down 1% from 2012
 - AI survey biomass down 34% from 2014
 - 2016 distribution of survey biomass: 36% shelf, 39% slope, 25% AI
- Model changes:
 - None (Alaska skate)
 - None (other skates)

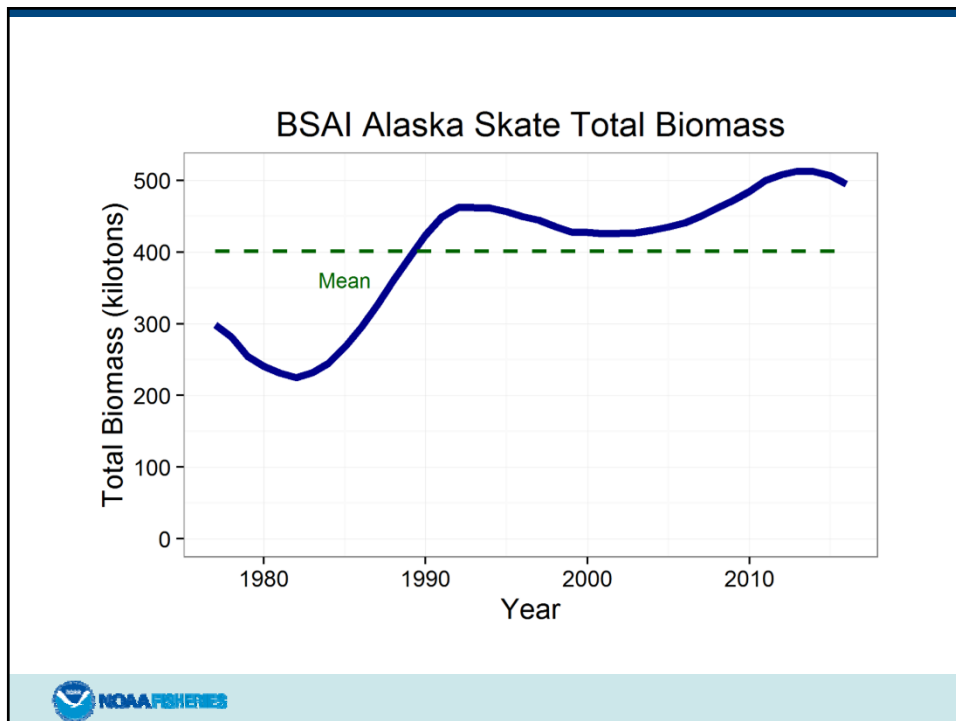
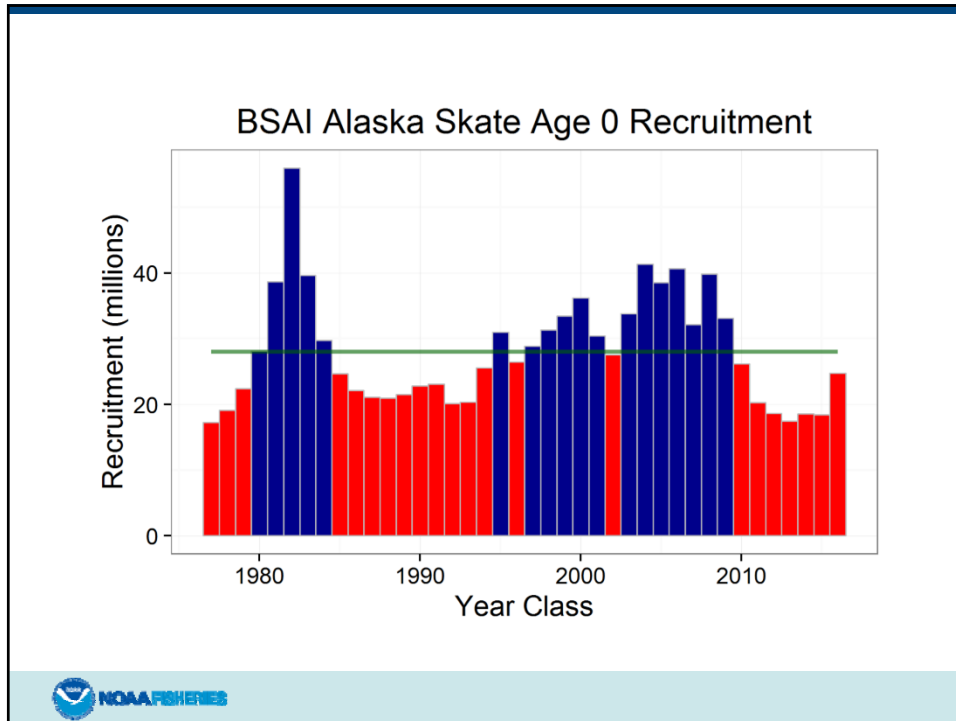


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Skates, continued (Alaska skate)



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Skates, continued (Alaska skate)

Quantity	Last year	This year	Change
M	0.13	0.13	0.00
2016 tier	3a	n/a	none
2017 tier	3a	3a	none
2016 age+ biomass	527,932	n/a	-0.04
2017 age+ biomass	498,546	506,921	0.02
2016 spawning biomass	115,378	n/a	-0.05
2017 spawning biomass	112,087	110,180	-0.02
B100%	186,923	180,556	-0.03
B40%	74,769	72,222	-0.03
B35%	65,423	63,195	-0.03
2017 FOFL	0.090	0.092	0.02
2017 FABC	0.077	0.079	0.03
2016 OFL	39,847	n/a	-0.02
2017 OFL	37,306	39,162	0.05
2016 ABC	34,358	n/a	-0.02
2017 ABC	32,167	33,731	0.05



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Skates, continued (other skates)

Quantity	Last year	This year	Change
M	0.10	0.10	0.00
2016 tier	5	n/a	none
2017 tier	5	5	none
Biomass	103,682	100,130	-0.03
2017 FOFL	0.10	0.10	0.00
2017 FABC	0.075	0.075	0.00
2016 OFL	10,368	n/a	-0.03
2017 OFL	10,368	10,013	-0.03
2016 ABC	7,776	n/a	-0.03
2017 ABC	7,776	7,510	-0.03



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Chapter 19: sculpins

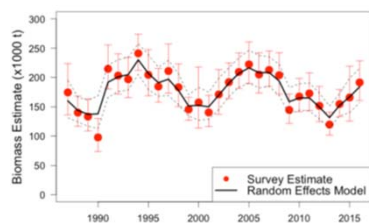
- Last year, this assessment was a partial update only
- New survey biomass estimates:
 - EBS shelf survey biomass up 14% from 2015; up 23% from 2014
 - EBS slope survey biomass down 32% from 2012
 - AI survey biomass down 21% from 2014
 - 2016 distribution of survey biomass: 91% shelf, 2% slope, 6% AI
- Model changes:
 - None



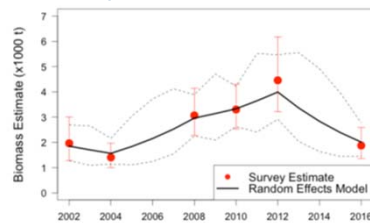
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Sculpins, continued

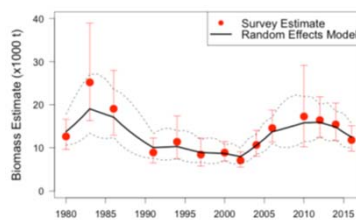
EBS shelf



EBS slope



Aleutian Islands



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Sculpins, continued

Quantity*	Last year	This year	Change
M	0.29	0.283	-0.02
2016 tier	5	n/a	none
2017 tier	5	5	none
Biomass	180,570	199,937	0.11
2017 FOFL	0.29	0.283	-0.02
2017 FABC	0.22	0.212	-0.04
2016 OFL	52,365	n/a	0.08
2017 OFL	52,365	56,582	0.08
2016 ABC	39,725	n/a	0.07
2017 ABC	39,725	42,387	0.07

*Instantaneous rates are biomass-weighted averages

Values listed in chapter are incorrect



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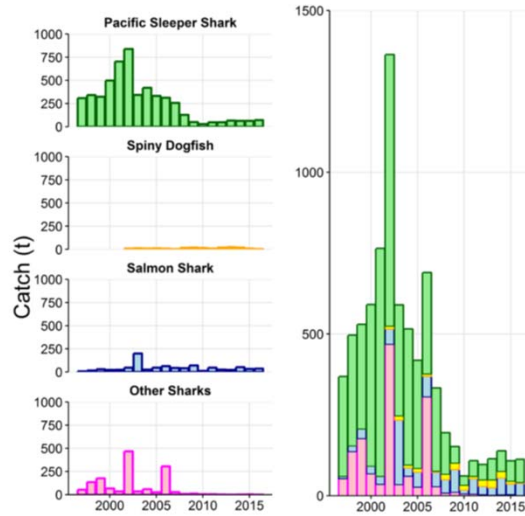
Chapter 20: sharks

- Last year, this assessment is a partial update only
- New survey biomass estimates:
 - None that are usable for setting harvest specifications
- Model changes:
 - Time period for defining maximum catch changed from 1997-2007 (maximum = 1,363 t) to 2003-2015 (maximum = 689 t)



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Sharks, continued



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Sharks, continued

Quantity	Last year	This year	Change
2016 tier	6	n/a	none
2017 tier	6	6	none
2016 OFL	1,363	n/a	-0.49
2017 OFL	1,363	689	-0.49
2016 ABC	1,022	n/a	-0.49
2017 ABC	1,022	517	-0.49



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Chapter 21: squids

- New data: none that relate directly to harvest specs
- Model changes/alternatives: none
- Features of the assessment:
 - The introduction contains expanded information regarding the ecology of the different species in the complex
 - The fishery section includes a discussion of fishing effort during the early part of the catch history and the implications for basing catch limits on historical catch
 - The analytical approach section includes a discussion of alternative approaches to harvest recommendations that have been considered for BSAI squids
 - A brief mention of environmental influences on squid has been added to the introduction (temperature affects on growth)



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Squids, continued

Quantity	Last year	This year	Change
2016 tier	6	n/a	none
2017 tier	6	6	none
2016 OFL	6,912	n/a	0.00
2017 OFL	6,912	6,912	0.00
2016 ABC	5,184	n/a	0.00
2017 ABC	5,184	5,184	0.00



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Chapter 22: octopus

- Last year, this assessment was a partial update only
- New survey biomass estimates:
 - None that are usable for setting harvest specifications
- Other new data:
 - Pacific cod diet data from 2007-2015 (9,000 stomachs)
- Model changes:
 - None



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Octopus, continued

Quantity	Last year	This year	Change
2016 tier	6	n/a	none
2017 tier	6	6	none
2016 OFL	3,452	n/a	0.38
2017 OFL	3,452	4,769	0.38
2016 ABC	2,589	n/a	0.38
2017 ABC	2,589	3,577	0.38



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Questions?

