



**NOAA
FISHERIES**

**Alaska Fisheries
Science Center**

Report of the September 2019 GOA Groundfish Plan Team meeting

Jim Ianelli and Sara Cleaver

October 2, 2019

Meeting overview

Date: September 17-19

Place: AFSC Seattle

Jim Ianelli	AFSC REFM (Co-chair)
Chris Lunsford	AFSC ABL (co-chair)
Sara Cleaver*	NPFMC (coordinator)
<u>Obren Davis</u>	NMFS AKRO
Craig Faunce	AFSC FMA
Lisa Hillier	WDFW
<u>Pete Hulson</u>	AFSC ABL
Sandra Lowe	AFSC REFM

Nat Nichols	ADF&G
Jan Rumble	ADF&G
Paul Spencer	AFSC REFM
<u>Marysia Szymkowiak*</u>	AFSC REFM
Ben Williams	ADF&G
<u>Kresimir Williams</u>	AFSC RACE
Vacant	USFWS

Agenda for GOA Plan Team

- Dover sole and CIE Review
- GOA Shortraker
 - Random effects model with longline survey
- Multi-Species Model
- GOA Pollock
- GOA Pacific cod
- GOA Pacific Ocean perch
- 2020 and 2021 harvest specification recommendations



2019 Gulf of Alaska Bottom Trawl Survey Metadata and Preliminary Results

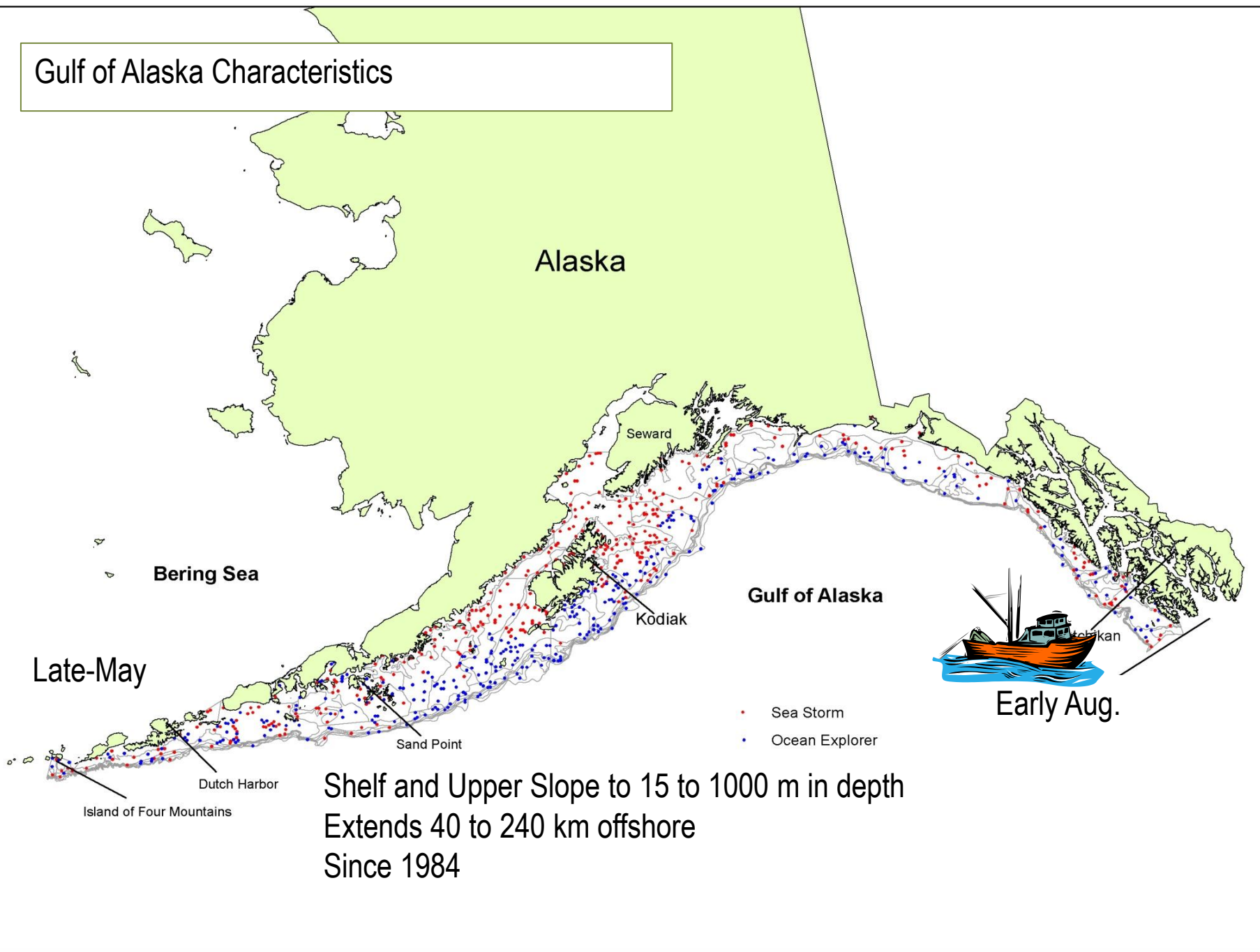
Wayne Palsson
GOA/AI Survey Leader



General Survey Design



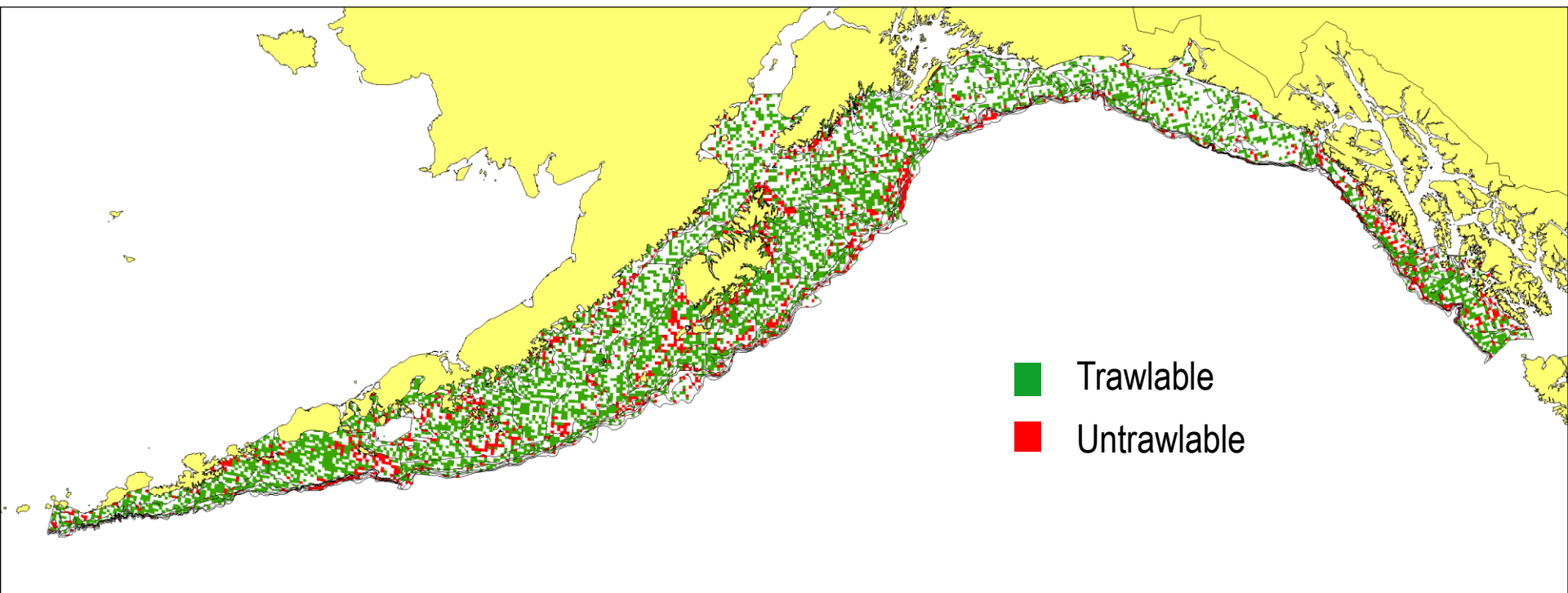
Gulf of Alaska Characteristics



General Survey Design

- Stratified-random survey of trawlable habitat
- 59 Strata based on geography, habitat, and depth
- Station allocation based upon abundance, variance, survey area, and economic value
- 15 minute trawl, usually 1.5 km distance
- Poly Nor 'Eastern net with rollers & bobbins
- Estimate catch per unit effort (kg/km²)
- Length, age, and other biological samples

GOA Trawlable Habitat

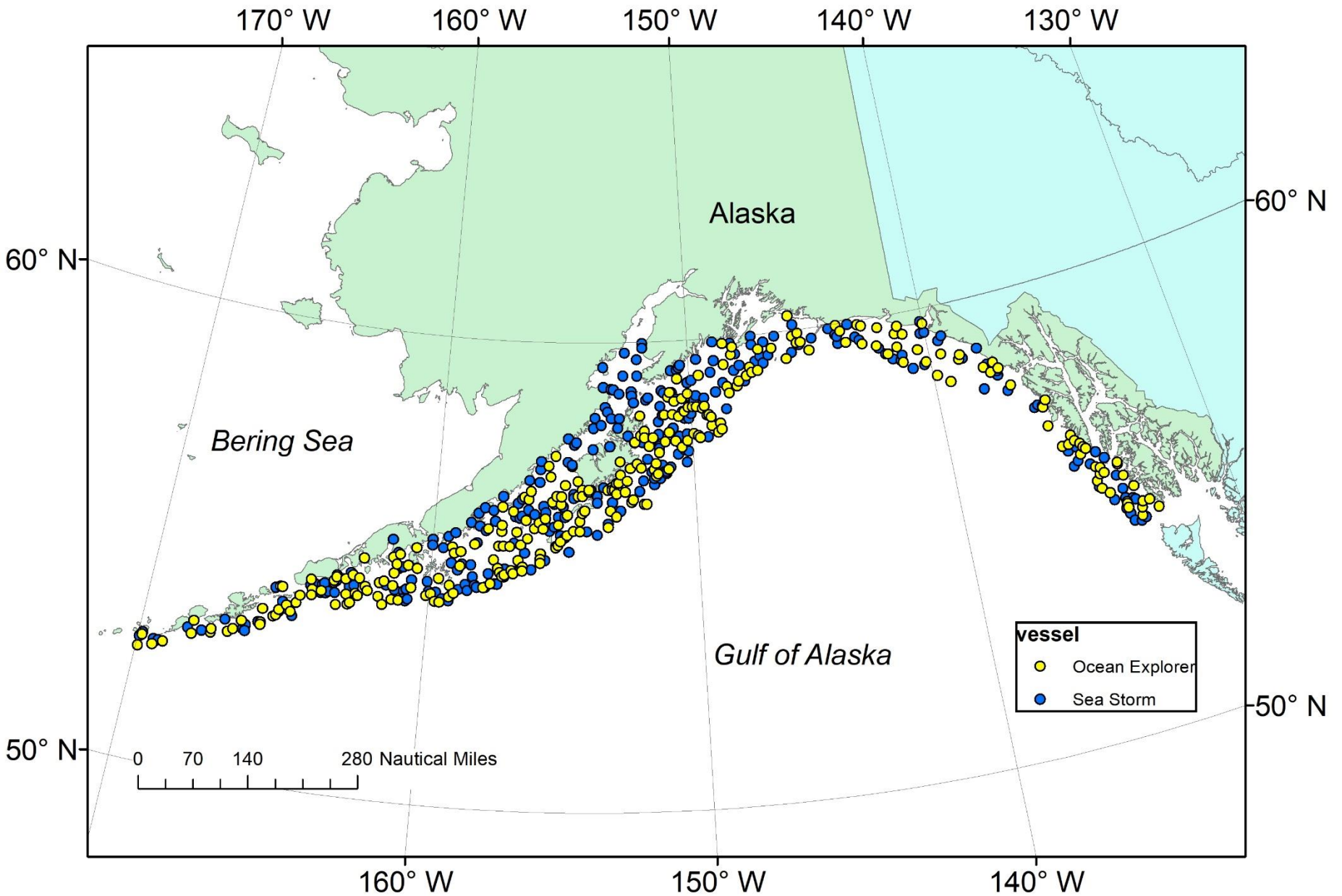


GOA Survey Start Dates

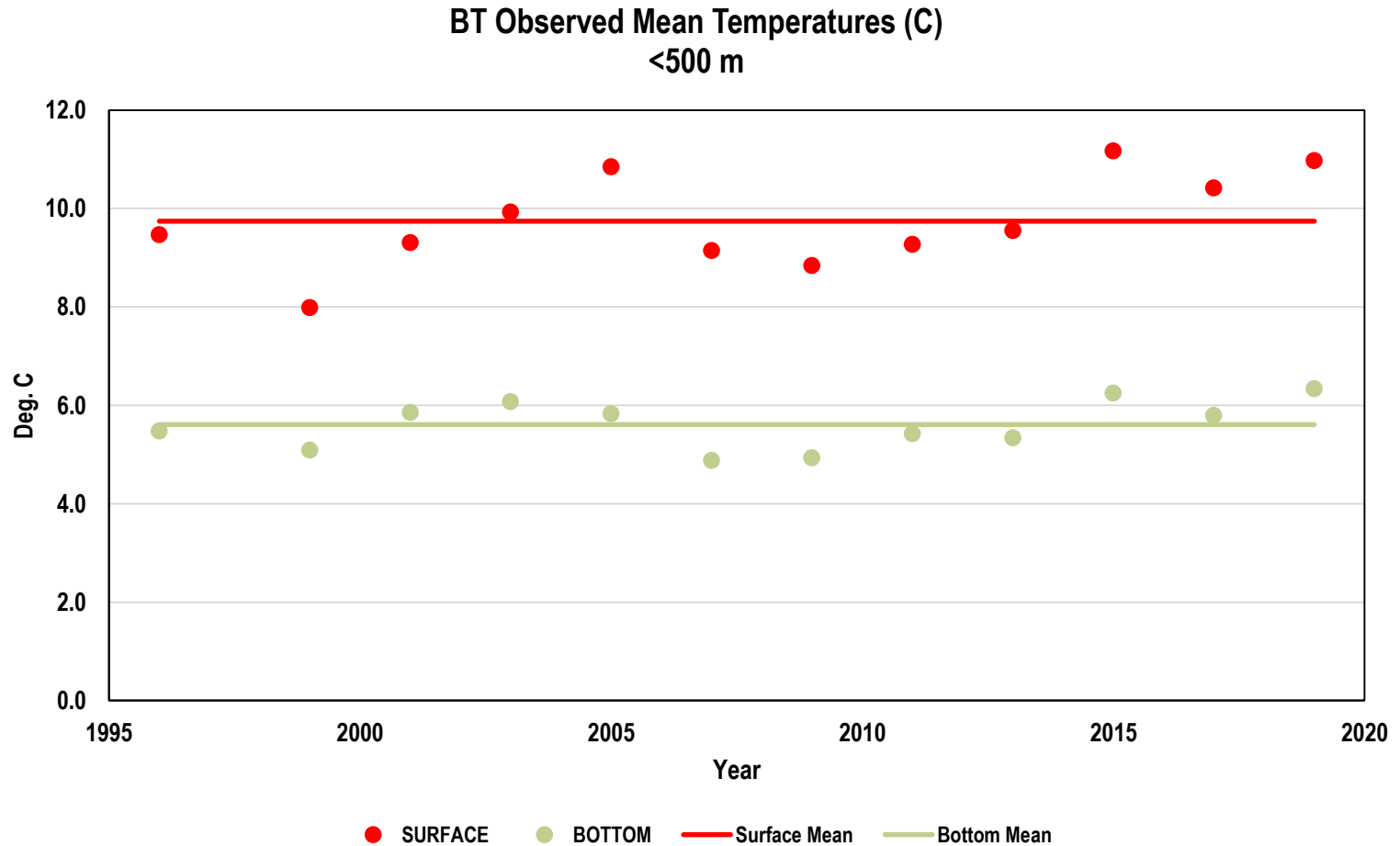


Year	Start Date	Vessel-Days	Boats
1984	3 June	235	4
1987	22 May	252	3
1990	4 June	204	3
1993	5 June	202	4
1996	22 May	210	3
1999	16 May	209	3
2001	20 May	129	2
2003	24 May	202	3
2005	21 May	210	3
2007	28 May	202	3
2009	21 May	212	3
2011	22 May	162	2
2013	29 May	132	2
2015	26 May	192	3
2017	27 May	138	2
2019	30 May	138	2

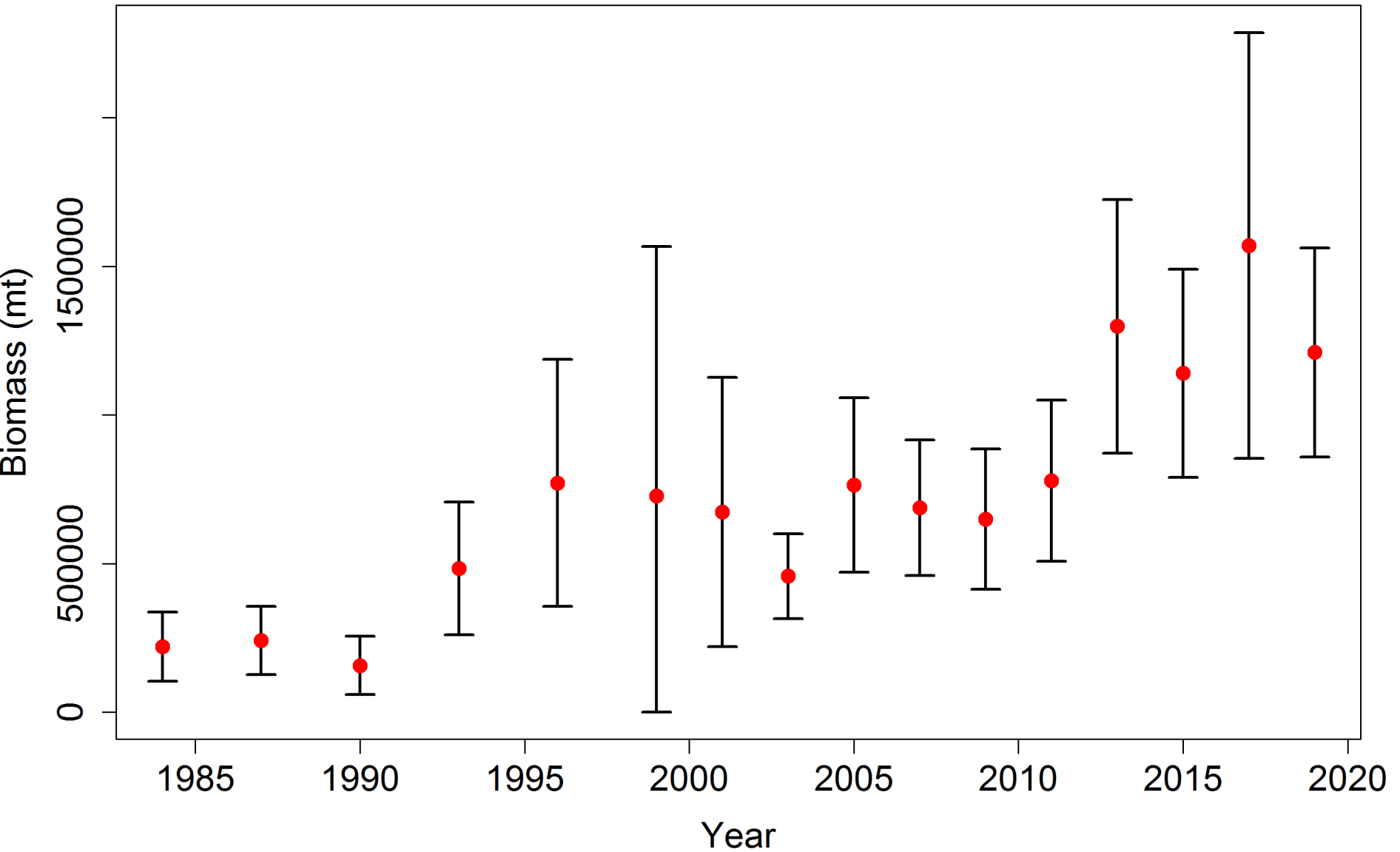
Successful 2019 Haul Locations



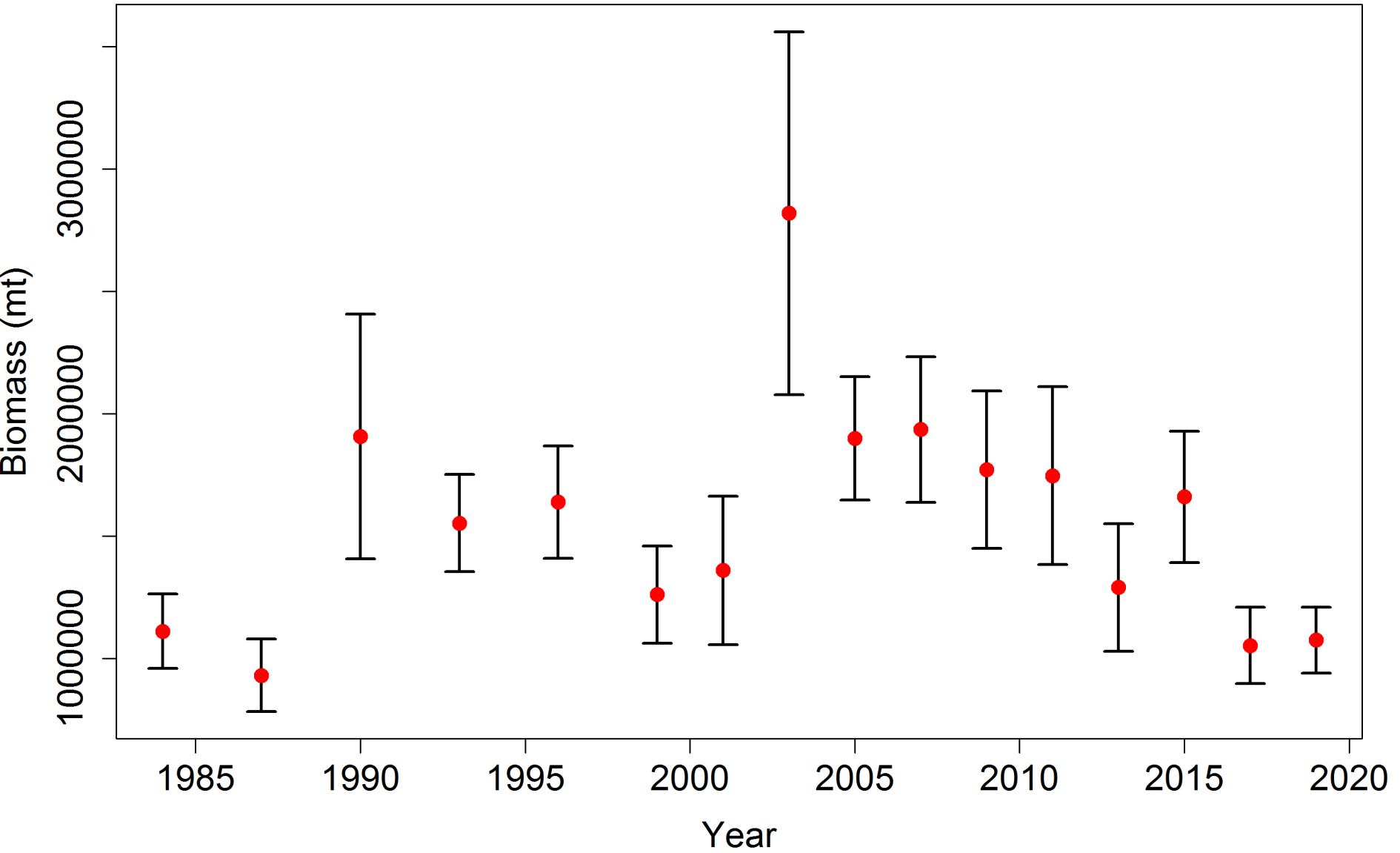
Mean SST and Bottom Temp (°C)



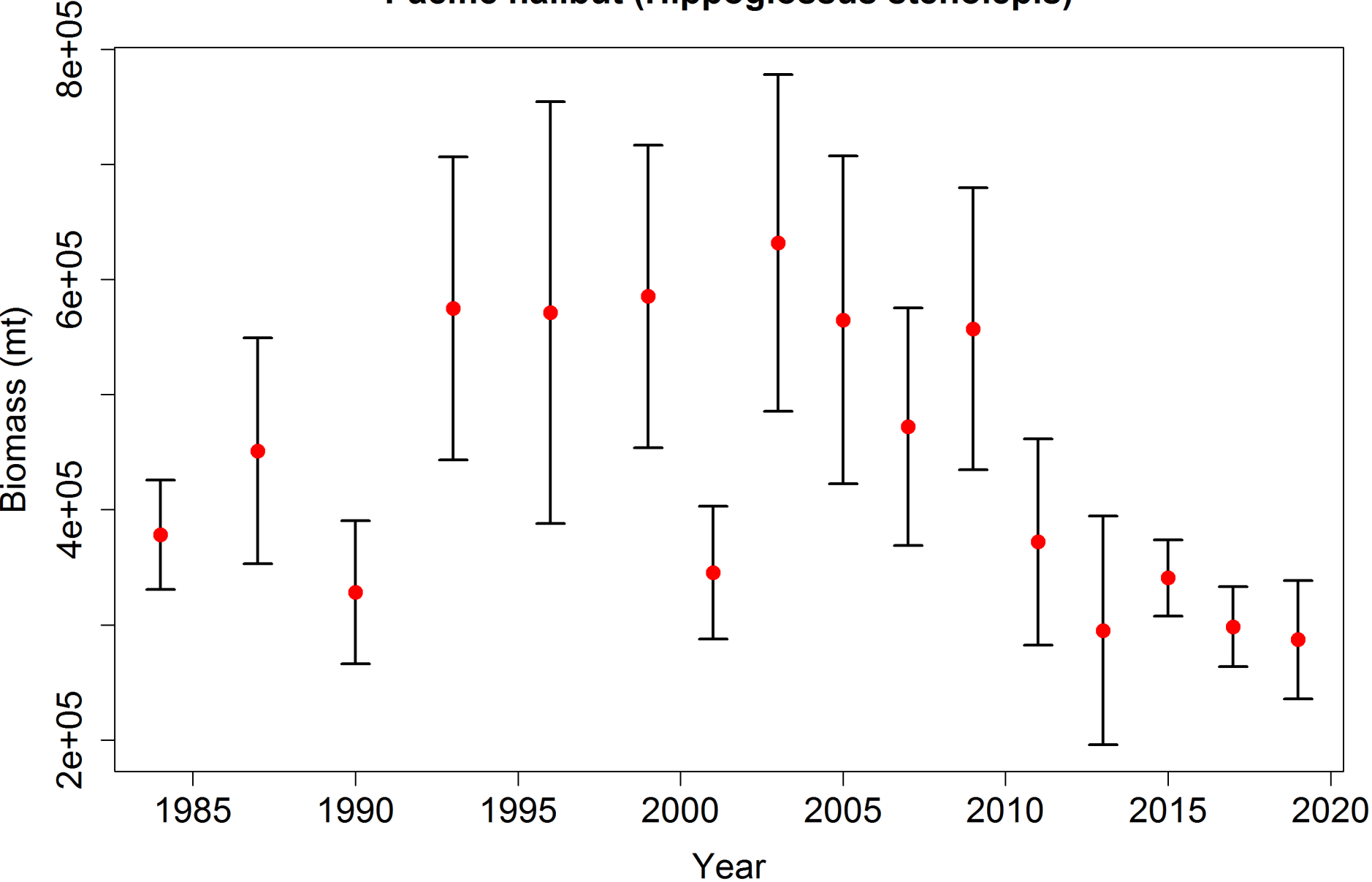
Pacific ocean perch (*Sebastes alutus*)



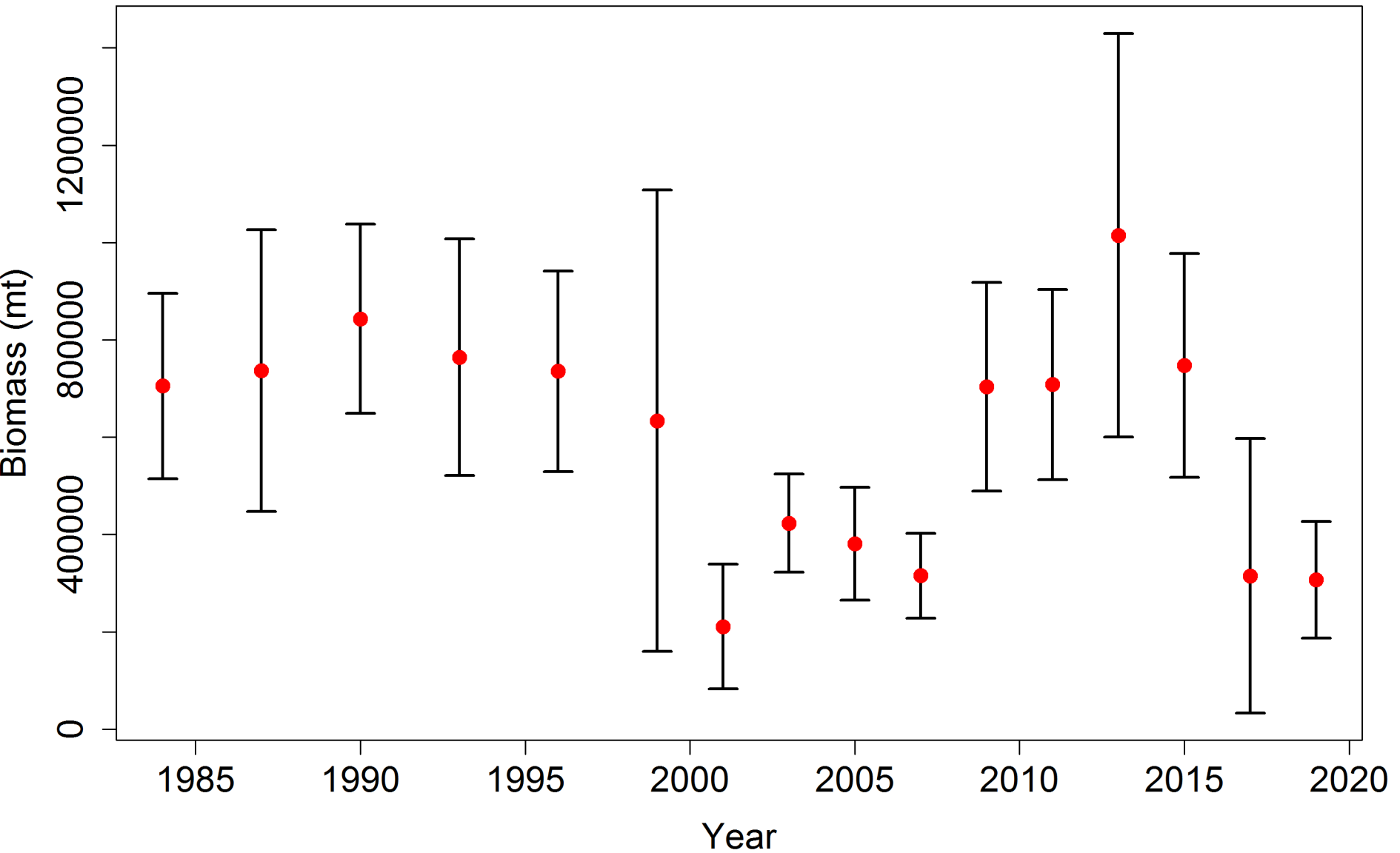
arrowtooth flounder (*Atheresthes stomias*)



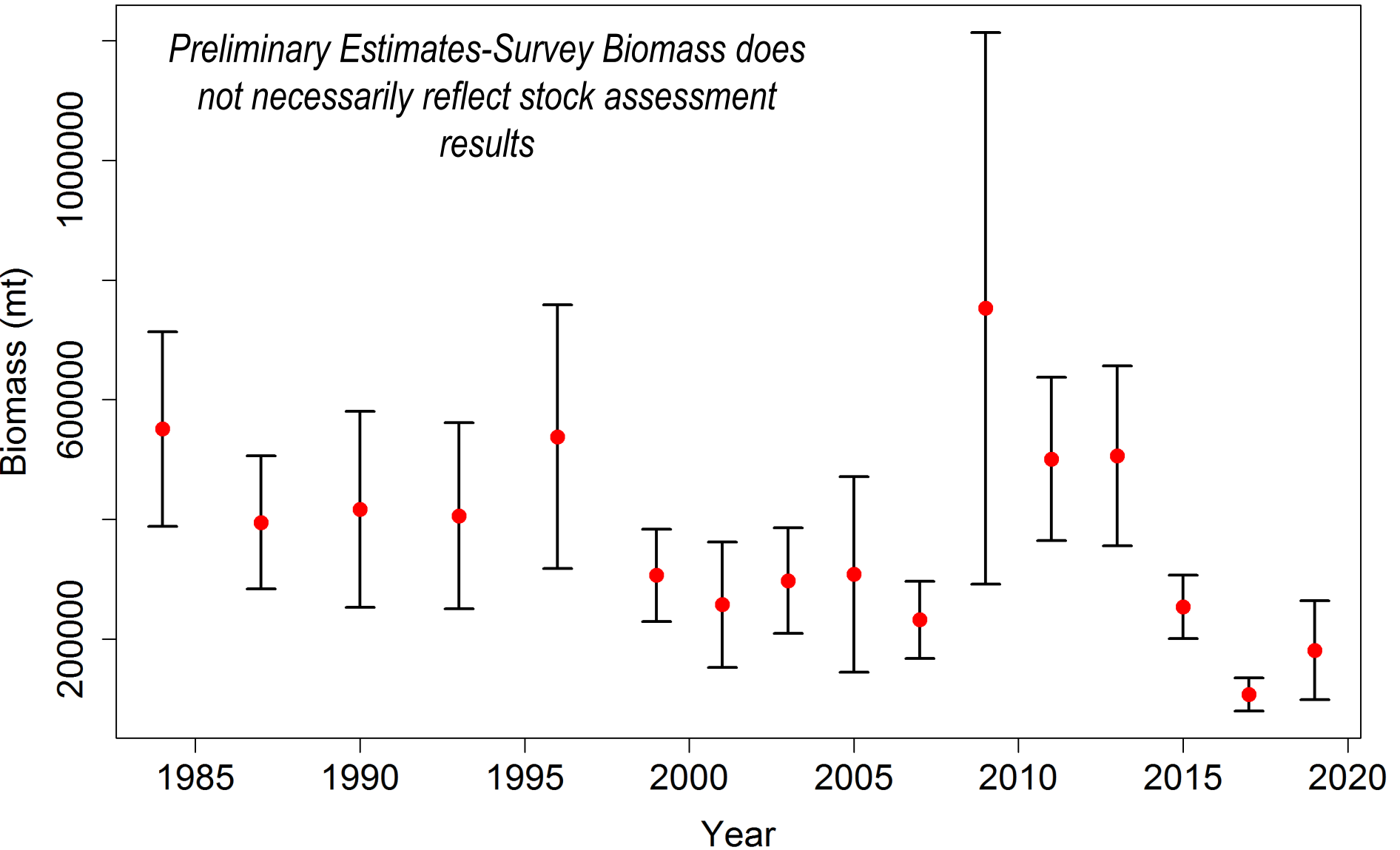
Pacific halibut (*Hippoglossus stenolepis*)



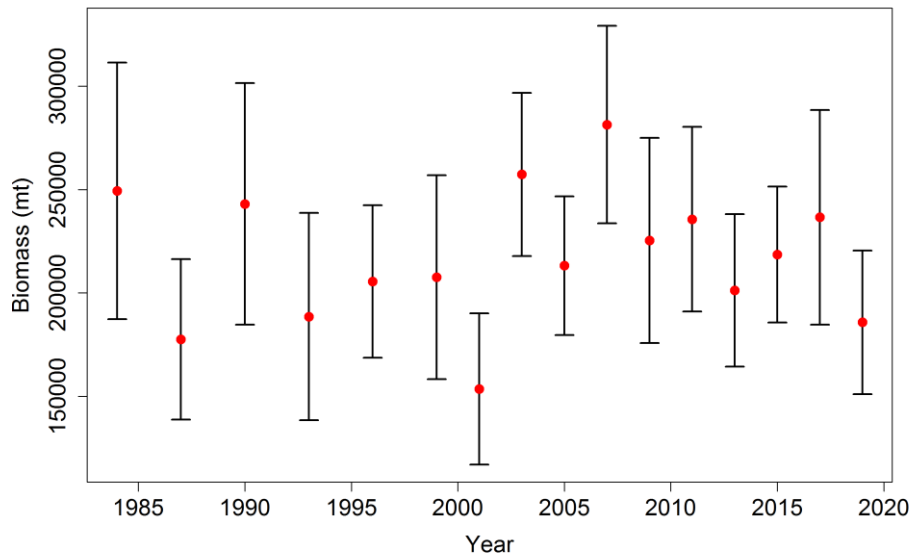
walleye pollock (*Gadus chalcogrammus*)



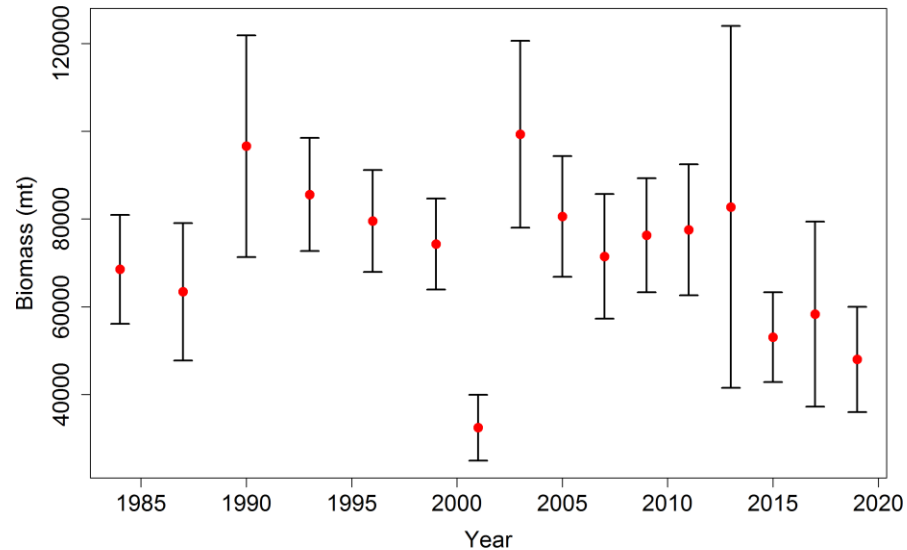
Pacific cod (*Gadus macrocephalus*)



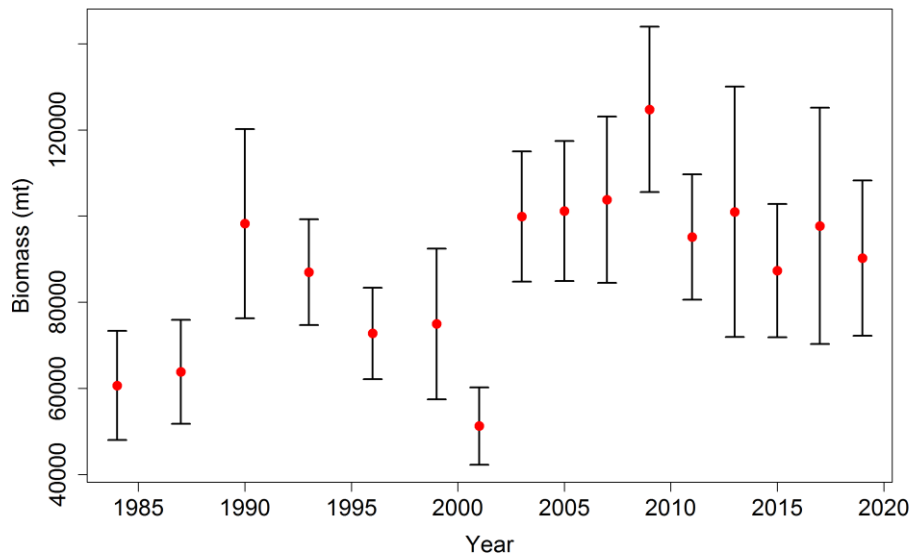
flathead sole (*Hippoglossoides elassodon*)



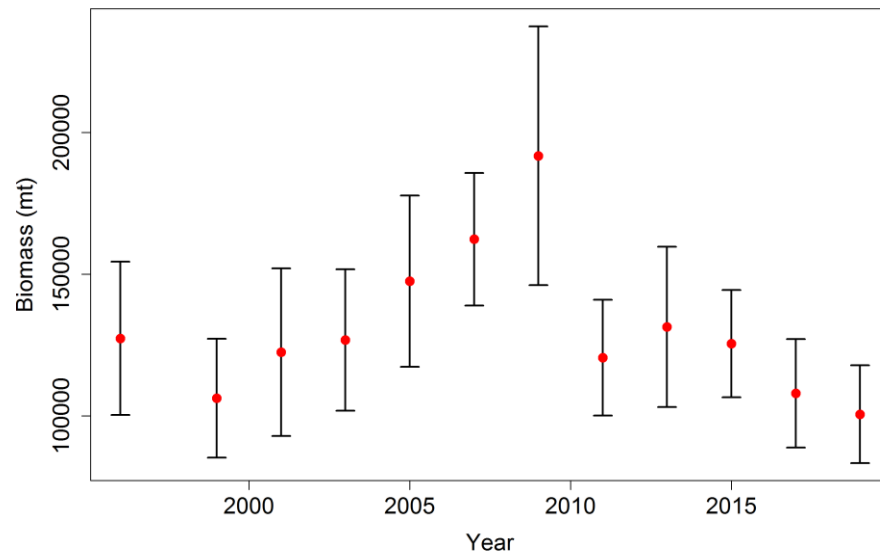
Dover sole (*Microstomus pacificus*)



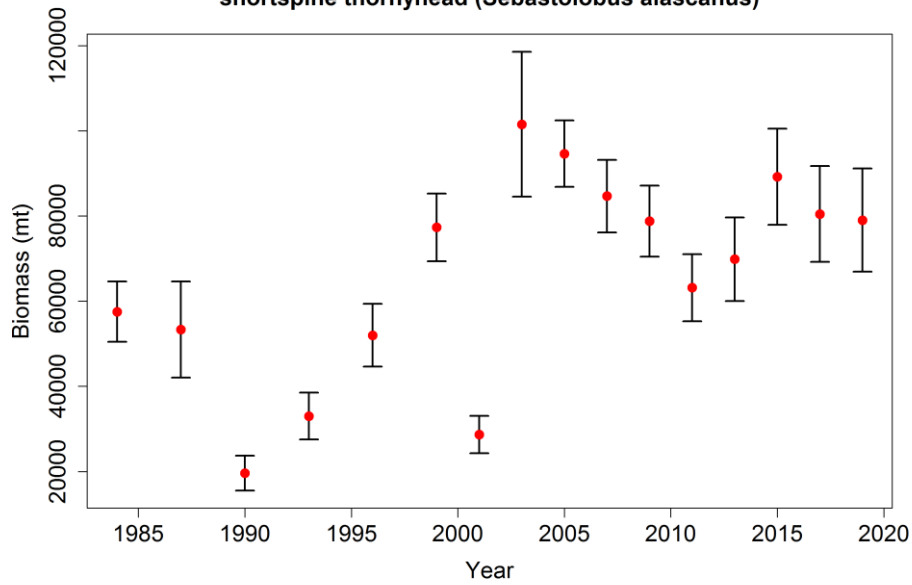
rex sole (*Glyptocephalus zachirus*)



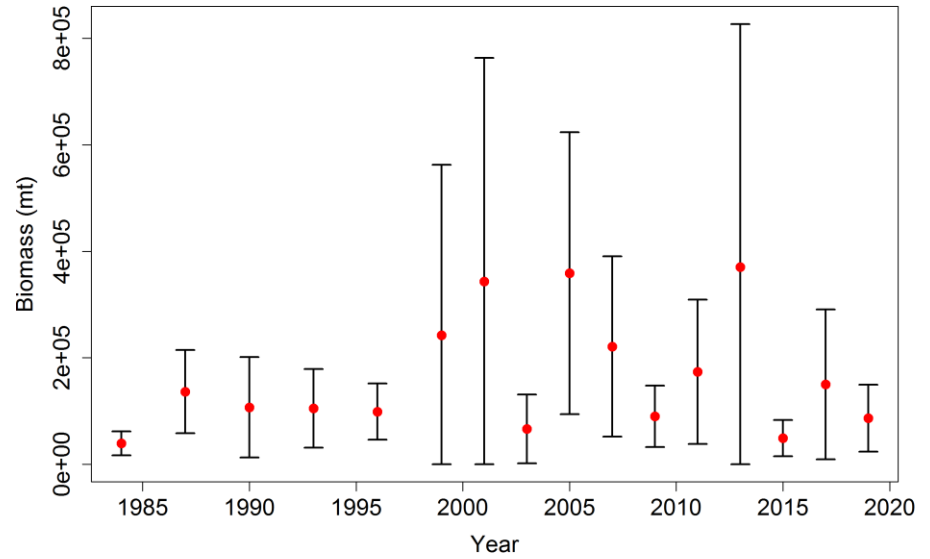
southern rock sole (*Lepidopsetta bilineata*)



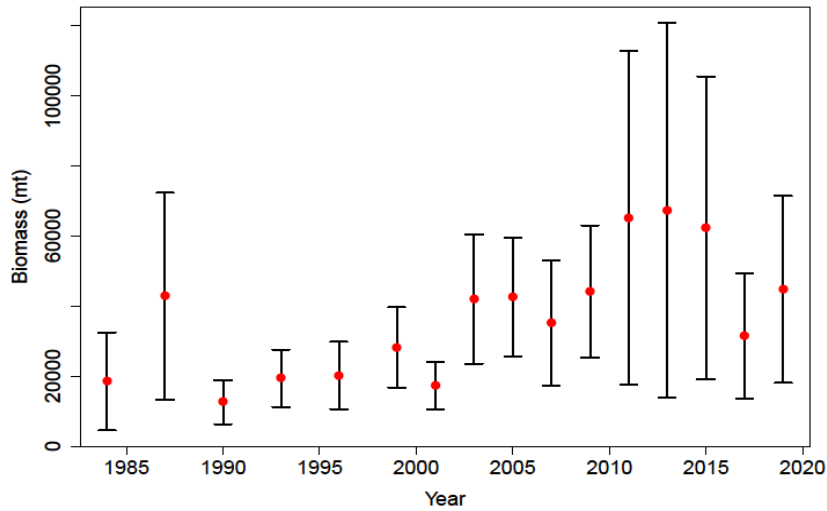
shortspine thornyhead (*Sebastolobus alascanus*)



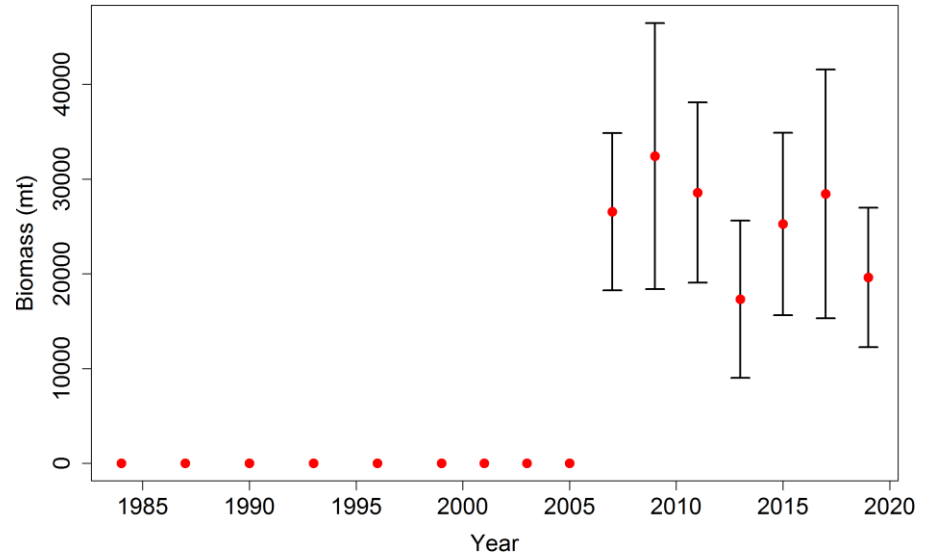
northern rockfish (*Sebastes polyspinis*)



shorttraker rockfish (*Sebastes borealis*)



rougheye rockfish (*Sebastes aleutianus*)

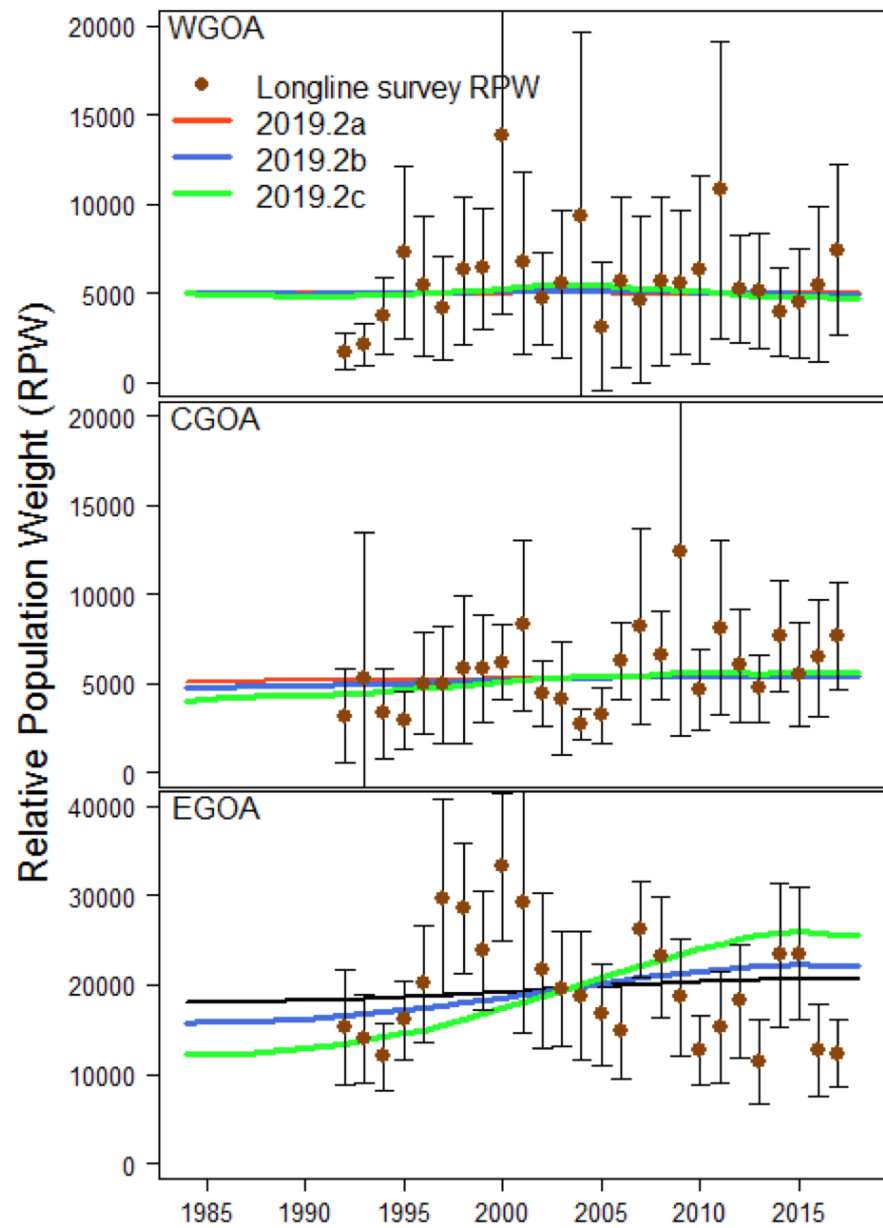
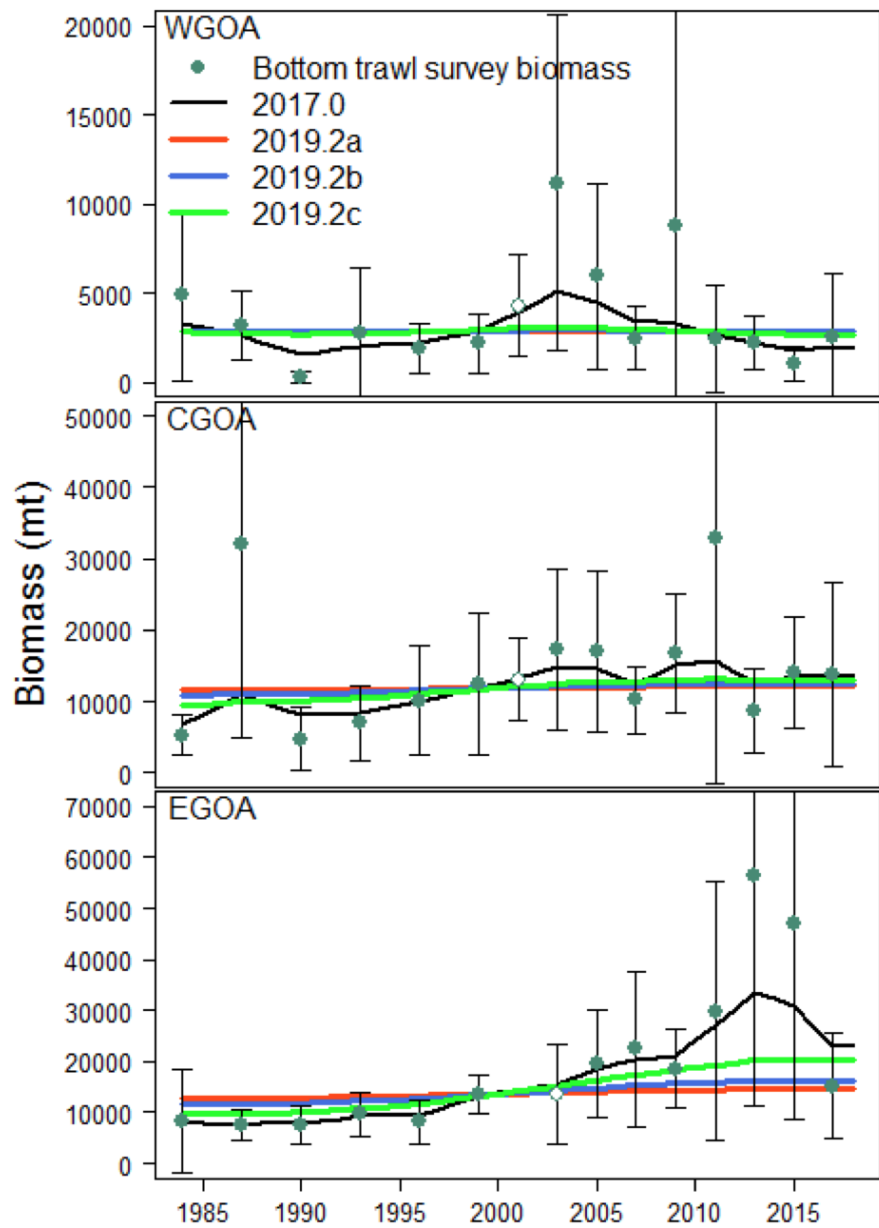


Dover sole and CIE Review

- CIE review for rex, flathead, and Dover sole completed
 - Requests addressed and presented to the Team
 - Author refined reviewer requested runs
 - Team agreed with preferred model
 - Team recommended (time permitting) research on 2-box model be presented in appendix

GOA Shortraker random effects model

- Presented modification of single-index version with two-indices
 - AFSC's longline survey and bottom trawl survey
- **The Team recommended that this approach with new data be presented for consideration in November.**



Multi-Species Model

- Extended GOA multi-species CEATTLE model
- Similar to that used in EBS
 - Refine results,
 - include halibut as a predator, and
 - conduct MSE to see if predation matters
- The Team encouraged development of the model

GOA Pollock

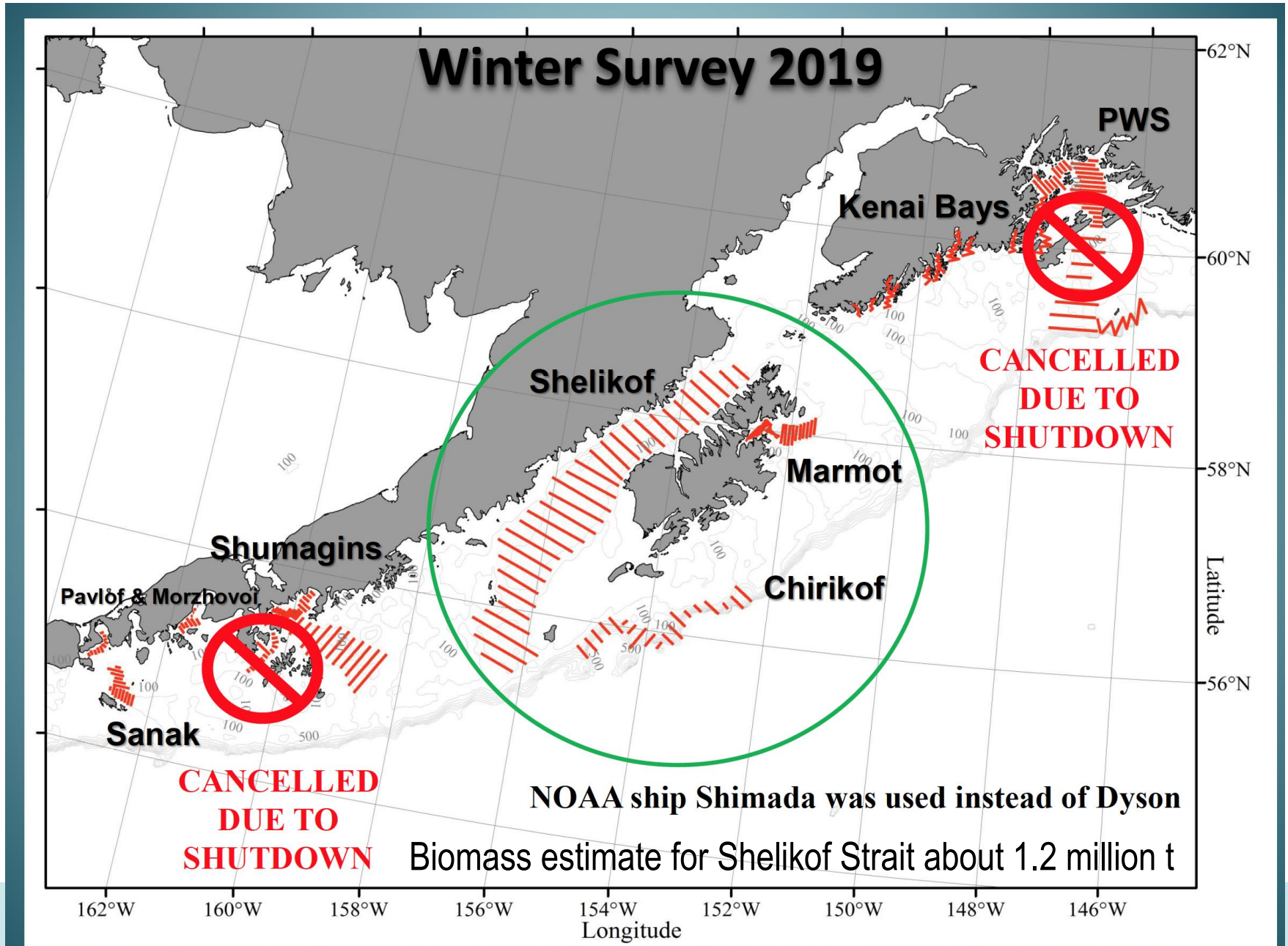
Winter 2019 acoustic-trawl survey

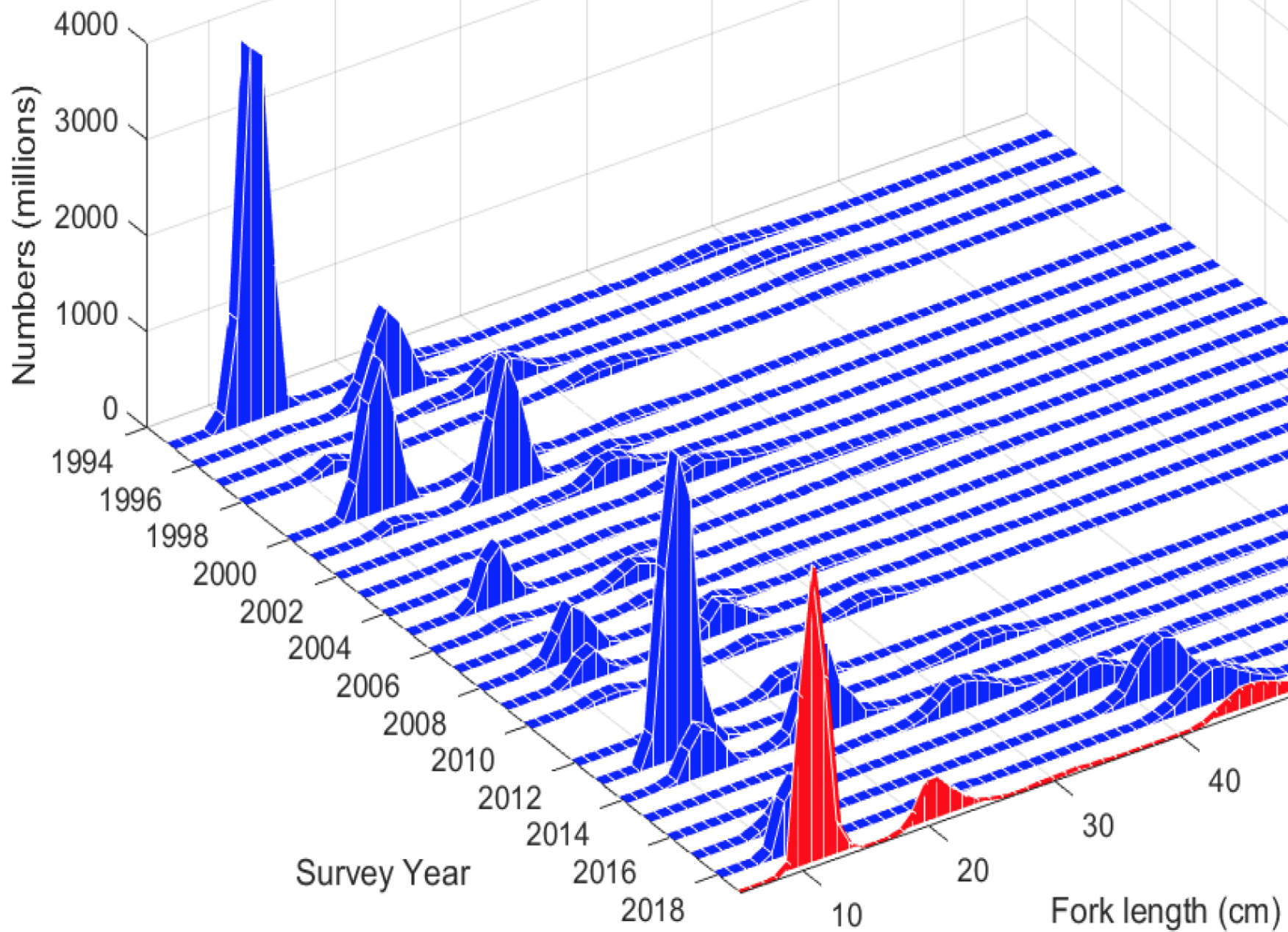
- Impacted by government shutdown
- Bell Shimada RV used
- Shelikof area started a week earlier in order to catch peak spawning
- Biomass estimate for Shelikof Strait about 1.2 million t

Summer 2019 acoustic trawl survey

- two types of nets used old and new, smaller LFS net tested for selectivity

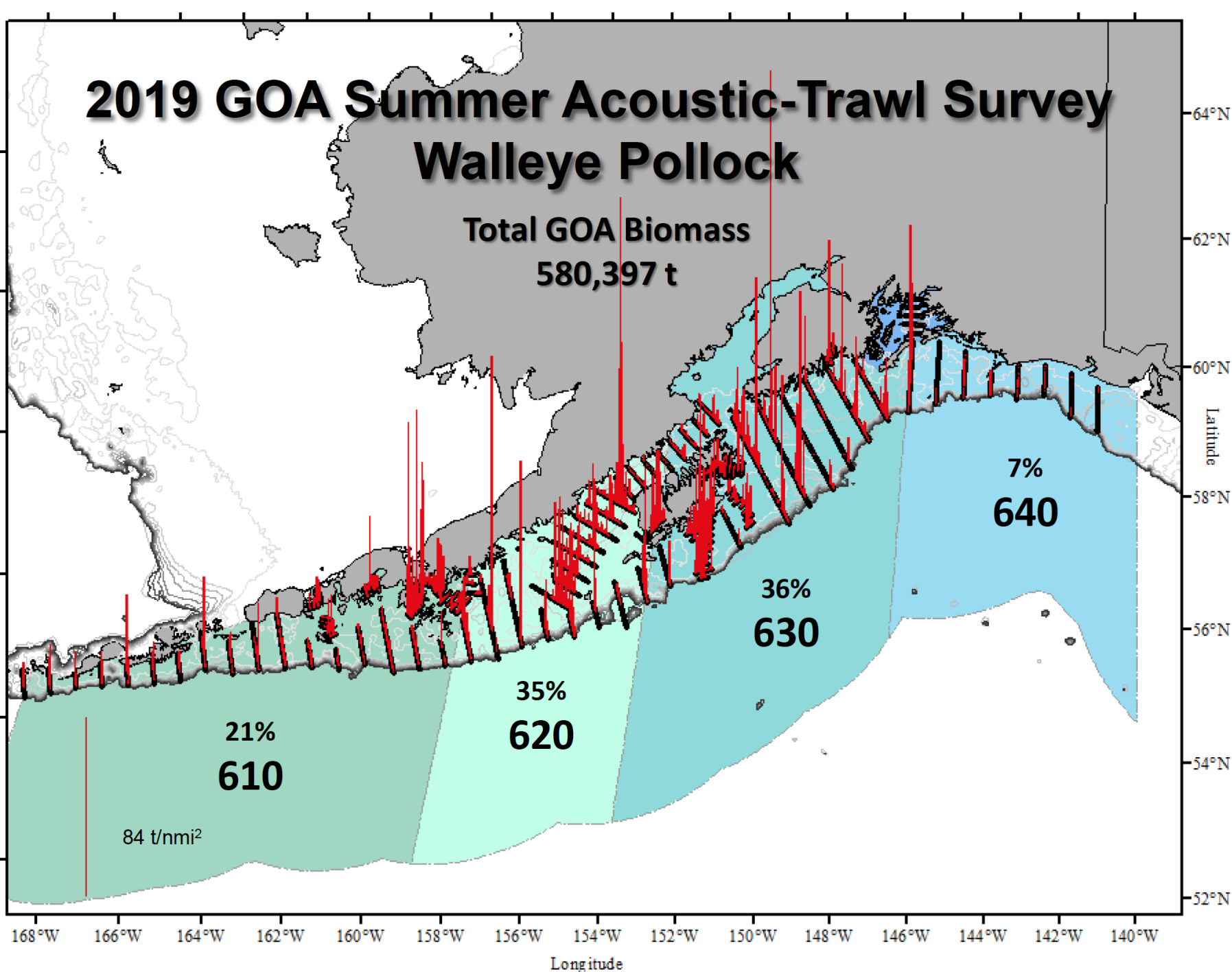
GOA Pollock





2019 GOA Summer Acoustic-Trawl Survey Walleye Pollock

Total GOA Biomass
580,397 t



2017

1.34 million t

84% Shelf
5% Shelikof

170 t/nmi²

37%
610

25%
620

34%
630

4%
640

168°W 166°W 164°W 162°W 160°W 158°W 156°W 154°W 152°W 150°W 148°W 146°W 144°W 142°W 140°W
Longitude

64°N
62°N
60°N
58°N
56°N
54°N
52°N
Latitude

2019

0.58 million t

72% Shelf
17% Shelikof

170 t/nmi²

21%
610

35%
620

36%
630

7%
640

168°W 166°W 164°W 162°W 160°W 158°W 156°W 154°W 152°W 150°W 148°W 146°W 144°W 142°W 140°W
Longitude

64°N
62°N
60°N
58°N
56°N
54°N
52°N
Latitude

GOA Pollock ESP Report

Appendix in SAFE report

- 1) Intro: justification, data
- 2) Metrics assessment: national, processes
- 3) Indicators assessment: time series, analyses
- 4) Recommendations; data gaps, future priorities

Appendix 1xx. Ecosystem and Socioeconomic Profile of the Walleye Pollock stock in the Gulf of Alaska

S. Kalei Shotwell, Martin Dorn, Alison L. Deary, Ben Eissel, Lauren Rogers, and Stephani Zador
September Draft 2019

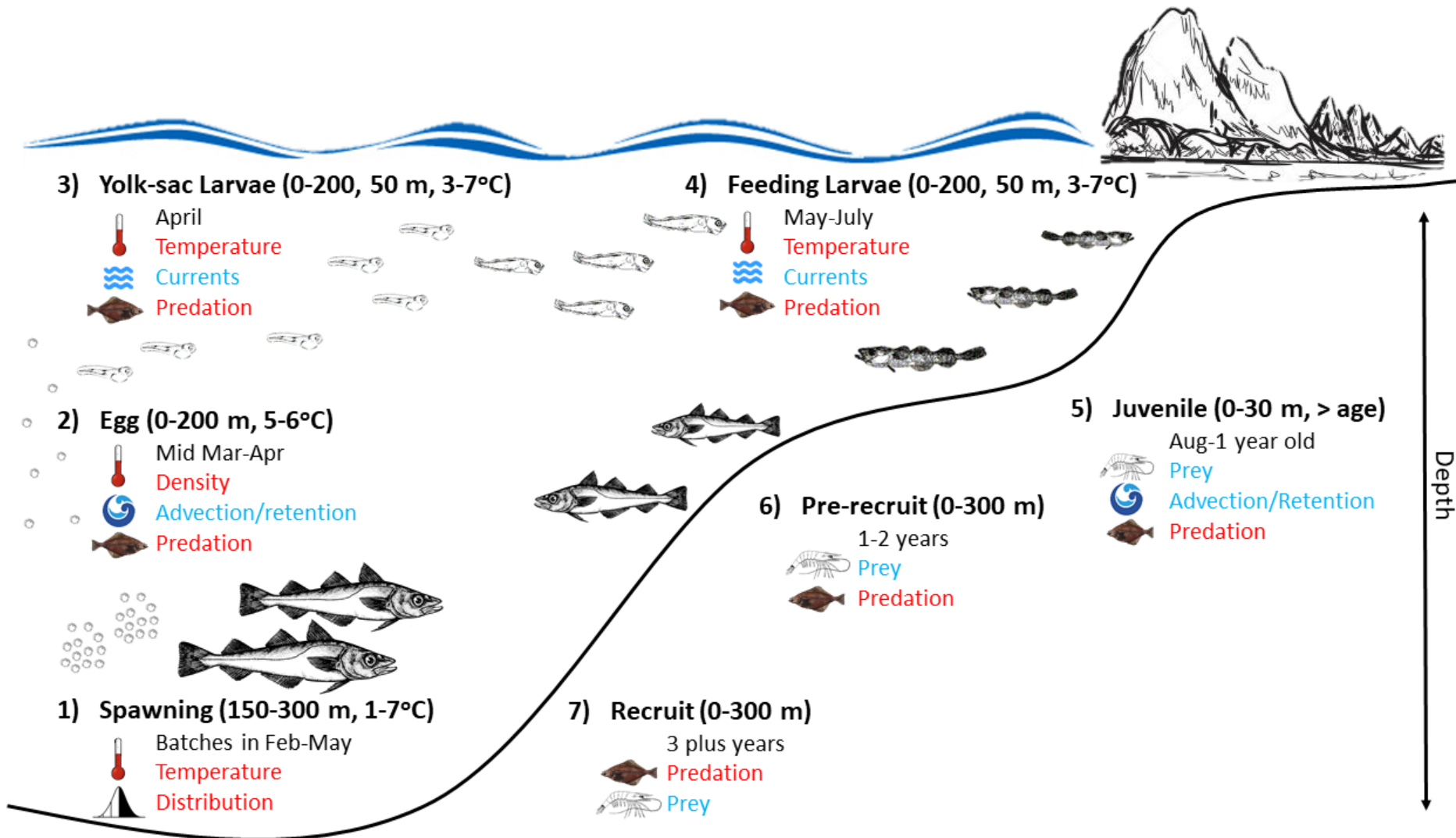


With Contributions from:

Grant Adams, Mayumi Arimisu, Kevin Aydin, Steve Barbeau, Lewis Barnett, Curry Cunningham, Dana Hanselman, Kirstin Holsman, David Kimmel, Ben Laurel, Jodi Pirtle, Patrick Ressler, Rob Suryan, James Thorson, Johanna Vollenweider, Sarah Wise

https://meetings.npfmc.org/CommentReview/DownloadFile?p=caaa62af-89e7-4ba7-97a2-f3c06066bc57.pdf&fileName=GOA_Pollock_ESP_Sept_2019.pdf

Ecosystem Processes



Ecosystem Traffic Light

Title	Description	Time Series	Recent
Annual Heatwave	Regional daily mean sea surface temperatures from NOAA climate model processed following Hobday et al., 2016 to obtain marine heatwave cumulative intensity. Please contact S. Barbeaux for more details.		+
Summer Bottom Temperature	Average summer bottom temperature (°C) over all hauls of the RACE GOA shelf bottom trawl survey. Available from AKFIN or online survey database.		●
Spring Copepods Larvae Shelikof	Mean abundance of small copepods (< 2 mm) in core Shelikof area measured in log scale numbers per meter cubed with associated rapid zooplankton assessment (Kimmel et al., 2019)		●
Summer Copepods YOY Shelikof	Mean abundance of large copepods (> 2 mm) in core Shelikof area measured in log scale numbers per meter cubed with associated rapid zooplankton assessment (Kimmel et al., 2019)		-
Summer Euphausiid Abundance Kodiak	Acoustic backscatter per unit area classified as euphausiids and integrated over the water column and across Kodiak core survey area from MACE summer survey (Ressler et al., 2019)		-
Auklet Reproductive Success Chowiet	Proportion of parakeet auklet nest sites with fledged chicks from total nest sites with eggs laid from Chowiet Island (Higgins et al., 2018)		●
Spring Pollock CPUE Larvae Shelikof	Mean abundance of larval pollock taken in bongos from core sampling area in Shelikof Strait during EcoFOCI spring survey with rapid assessment (Rogers et al., 2019)		-
Summer Pollock CPUE YOY Shelikof	Mean abundance of YOY pollock taken in midwater trawl from core area in WGOA area during EcoFOCI summer survey with rapid assessment (Rogers et al., 2019)		+

Socioeconomic Traffic Light

Title	Description	Time Series	Recent
Winter-Spring Pollock CPUE Fishery	Catch of pollock in tons/hour from the winter-spring (first trimester) of the pollock fishery (M. Dorn, <i>pers. commun.</i>)		+
Summer-Fall Pollock CPUE Fishery	Catch of pollock in tons/hour from the summer-fall (third trimester) of the pollock fishery (M. Dorn, <i>pers. commun.</i>)		●
Annual Pollock Real Ex-vessel Price	Estimate of real ex-vessel value in price per pound inflation adjusted to 2018 USD (B. Fissel, <i>pers. commun.</i>)		●
Annual Pollock Roe per unit Catch	Roe per-unit-catch calculated as $1000 * (\text{roe production}) / (\text{retained catch})$ (B. Fissel, <i>pers. commun.</i>)		●
Annual Percent Revenue Pollock in Kodiak	Percentage of the total revenue Kodiak gets from the GOA pollock fishery (aka, local quotient) (S. Wise, <i>pers. commun.</i>)		+

Indicator Considerations (Draft)

- Ecosystem (to be updated for November)
 - Return to heatwave conditions, early survey indicators suggest weak 2019 year class
 - Juvenile/adult condition low since 2015, euphausiids low, potential poor condition 2018 year class
- Socioeconomic (to be updated for November)
 - Fishery CPUE above average since 2016, consistent with stock biomass levels
 - Drop in roe/unit catch, possibly due to poor condition

ESP- Ecosystem and Socioeconomic Profile

- **For November, the Team recommends including the conceptual model in the ESP**
 - Visual summary of life history table
 - Consider community engagement indicators relative to species distribution shifts

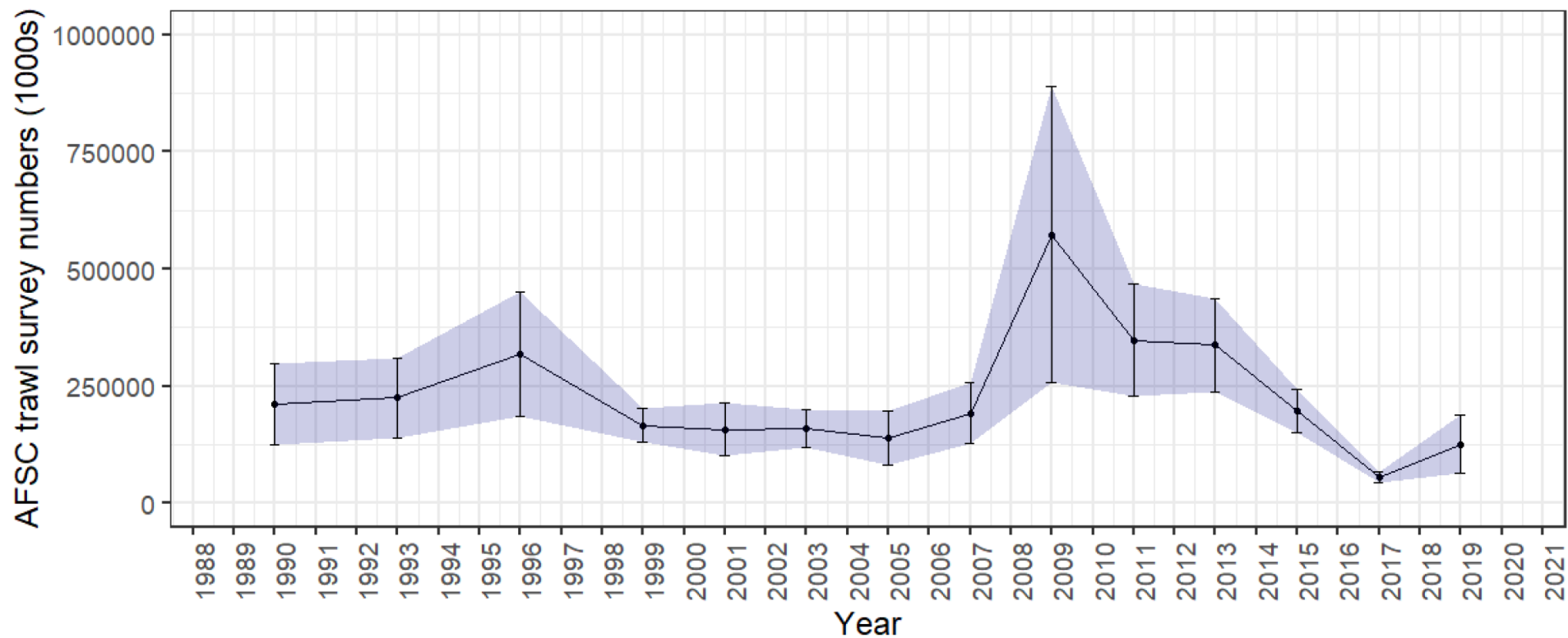
GOA Pacific cod

Model refinements presented

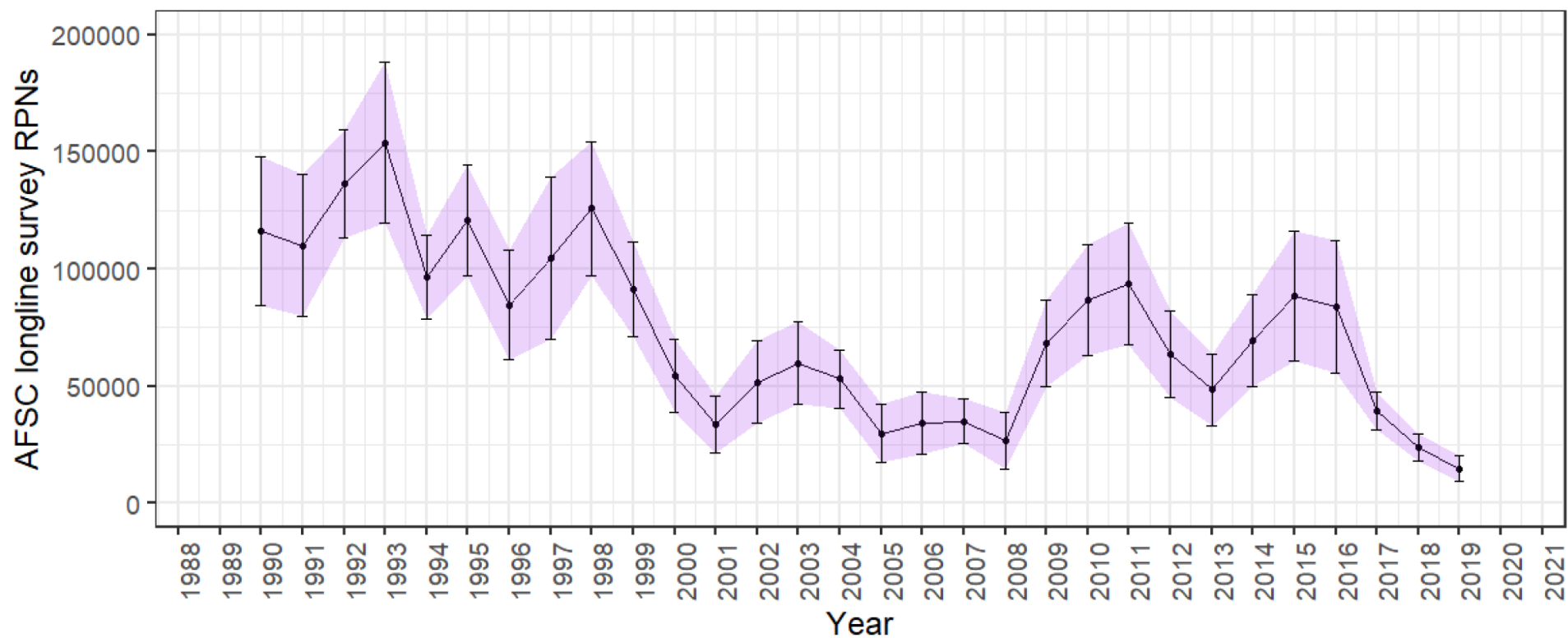
Topics identified

- Aging error/bias issues
- Explore whether inclusion of the IPHC length composition data are appropriate (how many tows/sample sizes, etc.)
- Consistency with research priorities
- A candidate species for a full ESP evaluation

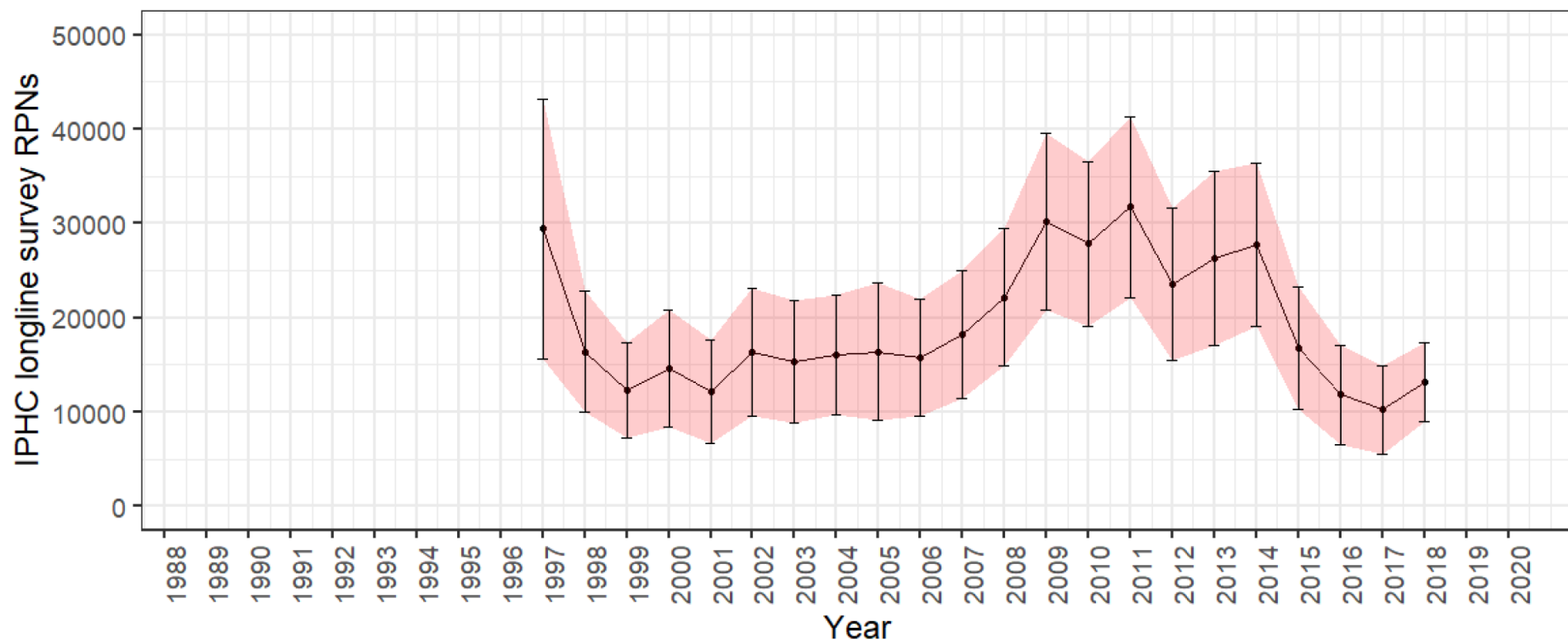
GOA Pacific cod trends bottom trawl survey



GOA Pacific cod trends AFSC longline survey



GOA Pacific cod trends IPHC setline survey



GOA Pacific cod summary

- Warm temperatures in GOA affect cod
 - Lower recruitment
 - Higher natural mortality
 - Increase growth rate
- Rebuilding plan (if needed) will need to consider these factors

GOA Pacific Ocean perch

Plans and discussion points

- Natural mortality sensitivity
- Plus age group study
- Compositional data weighting
- Investigation of VAST biomass index...
 - Evaluating acoustic survey biomass data
 - Prior on bottom trawl survey catchability based on stereo camera drops performed by the MACE
 - Exploration stanzas for mean recruitment.

Approval of harvest specifications

- Rolled over from 2018 values
- Noting updates in November meeting

Table 1. September GOA Groundfish Plan Team Proposed OFL and ABC Recommendations (metric tons) for 2020-2021 (Page 1)

Species	Area	2018			Catch	2019			Catch as of 8/31/19	2020 and 2021		
		OFL	ABC	TAC		OFL	ABC	TAC		OFL	ABC	TAC
Pollock	State GHL	n/a	4,037	-	-	n/a	3,396	-		n/a	2,722	
	W (610)	n/a	30,188	30,188	30,675	n/a	24,875	24,875	7,649	n/a	19,939	
	C (620)	n/a	79,495	79,495	80,057	n/a	67,388	67,388	50,131	n/a	57,279	
	C (630)	n/a	40,939	40,939	40,285	n/a	34,443	34,443	9,079	n/a	24,345	
	WYAK	n/a	6,833	6,833	4,125	n/a	5,748	5,748	6,612	n/a	4,607	
	Subtotal		187,059	161,492	157,455	155,142	194,230	135,850	132,454	73,471	148,968	108,892
	EYAK/SEO	11,697	8,773	8,773	-	11,697	8,773	8,773	-	11,697	8,773	
	Total	198,756	170,265	166,228	155,142	205,927	144,623	141,227	73,471	160,665	117,665	
Pacific Cod	W	n/a	8,082	5,657	5,043	n/a	7,633	5,343	3,251	n/a	9,695	
	C	n/a	8,118	6,089	5,755	n/a	7,667	5,750	3,727	n/a	9,738	
	E	n/a	1,800	1,350	101	n/a	1,700	1,275	181	n/a	2,159	
	Total	23,565	18,000	13,096	10,899	23,669	17,000	12,368	7,159	26,078	21,592	
Sablefish	W	n/a	1,544	1,544	1,397	n/a	1,581	1,581	889	n/a	2,105	
	C	n/a	5,158	5,158	5,775	n/a	5,178	5,178	3,783	n/a	6,931	
	WYAK	n/a	1,829	1,829	1,859	n/a	1,828	1,828	1,543	n/a	2,433	
	SEO	n/a	2,974	2,974	3,006	n/a	2,984	2,984	2,156	n/a	3,993	
	Total	22,703	11,505	11,505	12,037	25,227	11,571	11,571	8,371	34,782	15,462	
Shallow-Water Flatfish	W	n/a	25,206	13,250	56	n/a	25,620	13,250	57	n/a	25,952	
	C	n/a	25,315	25,315	2,914	n/a	25,731	25,731	1,369	n/a	26,065	
	WYAK	n/a	2,242	2,242	1	n/a	2,279	2,279	1	n/a	2,308	
	EYAK/SEO	n/a	1,925	1,925	1	n/a	1,957	1,957	1	n/a	1,983	
	Total	67,240	54,688	42,732	2,972	68,309	55,587	43,217	1,428	69,167	56,308	
Deep-Water Flatfish	W	n/a	413	413	3	n/a	416	416	1	n/a	420	
	C	n/a	3,400	3,400	189	n/a	3,443	3,443	42	n/a	3,488	
	WYAK	n/a	3,239	3,239	6	n/a	3,280	3,280	9	n/a	3,323	
	EYAK/SEO	n/a	2,332	2,332	5	n/a	2,362	2,362	1	n/a	2,393	
	Total	11,294	9,385	9,384	203	11,434	9,501	9,501	53	11,581	9,624	
Rex Sole	W	n/a	3,086	3,086	83	n/a	2,951	2,951	73	n/a	2,956	
	C	n/a	8,739	8,739	1,665	n/a	8,357	8,357	1,225	n/a	8,371	
	WYAK	n/a	1,737	1,737	2	n/a	1,657	1,657	2	n/a	1,664	
	EYAK/SEO	n/a	1,811	1,811	-	n/a	1,727	1,727	-	n/a	1,734	
	Total	18,706	15,373	15,373	1,750	17,889	14,692	14,692	1,300	17,942	14,725	
Arrowtooth Flounder	W	n/a	37,253	14,500	1,043	n/a	35,994	14,500	565	n/a	34,765	
	C	n/a	73,480	48,000	17,825	n/a	70,995	70,995	16,134	n/a	68,575	
	WYAK	n/a	16,468	6,900	40	n/a	15,911	6,900	82	n/a	15,368	
	EYAK/SEO	n/a	23,744	6,900	22	n/a	22,941	6,900	9	n/a	22,157	
	Total	180,697	150,945	76,300	18,930	174,598	145,841	99,295	16,790	168,634	140,865	
Flathead Sole	W	n/a	12,690	8,650	150	n/a	13,234	8,650	192	n/a	13,771	
	C	n/a	20,238	15,400	2,060	n/a	21,109	15,400	1,902	n/a	21,965	
	WYAK	n/a	1,932	1,932	-	n/a	2,016	2,016	-	n/a	2,097	
	EYAK/SEO	n/a	406	406	-	n/a	423	423	-	n/a	440	
	Total	43,011	35,266	26,388	2,210	44,865	36,782	26,489	2,094	46,666	38,273	

Sources: 2018 OFLs, ABCs, and TACs are from harvest specifications adopted by the Council in December 2017; 2019 OFLs, ABCs, and TACs are from the harvest specifications adopted by the Council in December 2018, 2018 catches through December 31, 2018 and 2019 catches through August 31, 2019 from AKR Catch Accounting.

Table 1. September GOA Groundfish Plan Team Proposed OFL and ABC Recommendations (metric tons) for 2020-2021 (Page 2)

Species	Area	2018			Catch	2019			Catch of 8/31/19	2020 and 2021		
		OFL	ABC	TAC		OFL	ABC	TAC		OFL	ABC	TAC
Pacific Ocean Perch	W	n/a	3,312	3,312	3,225	n/a	3,227	3,227	3,044	n/a	3,125	
	C	n/a	20,112	20,112	18,181	n/a	19,646	19,646	13,655	n/a	19,024	
	WYAK	n/a	3,371	3,371	3,352	n/a	3,296	3,296	3,288	n/a	3,192	
	W/C/WYAK	31,860	26,795	26,795	24,758	31,113	26,169	26,169	19,987	30,128	25,341	
	SEO	2,902	2,441	2,441	-	2,838	2,386	2,386	-	2,748	2,311	
	Total	34,762	29,236	29,236	24,758	33,951	28,555	28,555	19,987	32,876	27,652	
Northern Rockfish	W	n/a	420	420	297	n/a	1,190	1,190	649	n/a	1,122	
	C	n/a	3,261	3,261	2,067	n/a	3,338	3,338	1,350	n/a	3,147	
	E	n/a	4	-	-	n/a	1	-	-	n/a	1	
	Total	4,380	3,685	3,681	2,364	5,402	4,529	4,528	1,999	5,093	4,270	
Shortraker Rockfish	W	n/a	44	44	37	n/a	44	44	15	n/a	44	
	C	n/a	305	305	319	n/a	305	305	113	n/a	305	
	E	n/a	515	515	407	n/a	514	514	306	n/a	514	
	Total	1,151	864	864	763	1,151	863	863	434	1,151	863	
Dusky Rockfish	W	n/a	146	146	50	n/a	781	781	173	n/a	774	
	C	n/a	3,502	3,502	2,841	n/a	2,764	2,764	1,758	n/a	2,742	
	WYAK	n/a	232	232	12	n/a	95	95	93	n/a	94	
	EYAK/SEO	n/a	77	77	8	n/a	60	60	3	n/a	60	
	Total	4,841	3,957	3,957	2,911	4,521	3,700	3,700	2,027	4,484	3,670	
Rougheye and Blackspotted Rockfish	W	n/a	176	176	81	n/a	174	174	66	n/a	172	
	C	n/a	556	556	439	n/a	550	550	265	n/a	545	
	E	n/a	712	712	233	n/a	704	704	127	n/a	697	
	Total	1,735	1,444	1,444	753	1,715	1,428	1,428	458	1,699	1,414	
Demersal shelf rockfish	Total	394	250	250	138	411	261	261	123	411	261	
Thornyhead Rockfish	W	n/a	344	344	160	n/a	326	326	94	n/a	326	
	C	n/a	921	921	699	n/a	911	911	294	n/a	911	
	E	n/a	773	773	330	n/a	779	779	221	n/a	779	
	Total	2,717	2,038	2,038	1,189	2,688	2,016	2,016	609	2,688	2,016	
Other Rockfish	W/C	n/a	1,737	1,737	1,039	n/a	1,737	1,737	569	n/a	1,737	
	WYAK	n/a	368	368	135	n/a	368	368	173	n/a	368	
	EYAK/SEO	n/a	3,489	200	52	n/a	3,489	3,489	38	n/a	3,489	
	Total	7,356	5,594	2,305	1,226	7,356	5,594	5,594	780	7,356	5,594	
Atka mackerel	Total	6,200	4,700	3,000	1,437	6,200	4,700	3,000	776	6,200	4,700	
Big Skate	W	n/a	504	504	312	n/a	504	504	84	n/a	504	
	C	n/a	1,774	1,774	976	n/a	1,774	1,774	841	n/a	1,774	
	E	n/a	570	570	79	n/a	570	570	89	n/a	570	
	Total	3,797	2,848	2,848	1,367	3,797	2,848	2,848	1,014	3,797	2,848	
Longnose Skate	W	n/a	149	149	56	n/a	149	149	29	n/a	149	
	C	n/a	2,804	2,804	579	n/a	2,804	2,804	521	n/a	2,804	
	E	n/a	619	619	235	n/a	619	619	266	n/a	619	
	Total	4,763	3,572	3,572	870	4,763	3,572	3,572	816	4,763	3,572	
Other Skates	GOA-wide	1,845	1,384	1,384	758	1,845	1,384	1,384	611	1,845	1,384	
Sculpins	GOA-wide	6,958	5,301	5,301	631	6,958	5,301	5,301	476	6,958	5,301	
Sharks	GOA-wide	6,020	4,514	4,514	3,090	10,913	8,184	8,184	1,286	10,913	8,184	
Squids	GOA-wide	1,516	1,137	1,137	43	-	-	-	-	-	-	
Octopuses	GOA-wide	1,300	975	975	201	1,300	975	975	142	1,300	975	
Total		796,158	667,877	535,863	246,643	664,889	509,507	430,569	142,203	627,049	487,218	

Sources: 2018 OFLs, ABCs, and TACs are from harvest specifications adopted by the Council in December 2017; 2019 OFLs, ABCs, and TACs are from the harvest specifications adopted by the Council in December 2018, 2018 catches through December 31, 2018 and 2019 catches through August 31, 2019 from AKR Catch Accounting.