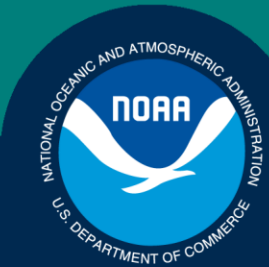


Science, Service, Stewardship



2019 Gulf of Alaska Bottom Trawl Survey Metadata and Preliminary Results

Wayne Palsson
GOA/AI Survey Leader

NOAA
FISHERIES
SERVICE

September 17, 2019



General Survey Design



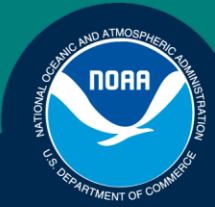
- Chartered commercial vessels: *Sea Storm*, *Ocean Explorer*
- Vessels must be at least 30.6 m in length, 1000 HP
- 5-6 crew + 6 scientists



Poly Nor'eastern Net Characteristics

- 12.7 cm mesh with
- 3.2 cm liner
- 4 seams/panels
- 3 bridles
- 36 cm bobbins
- 10 disks
- Net width 8 to 20 m
- Height ~ 7 m





Mensuration



- Spread Sensors at the wings
- Height Sensor at center headrope
- Bathythermograph on headrope (gear depth)
- Bottom Contact Sensor on Footrope (on/off bottom)
- GPS integrated wheelhouse program
- Separate Navigation Software (Globe)

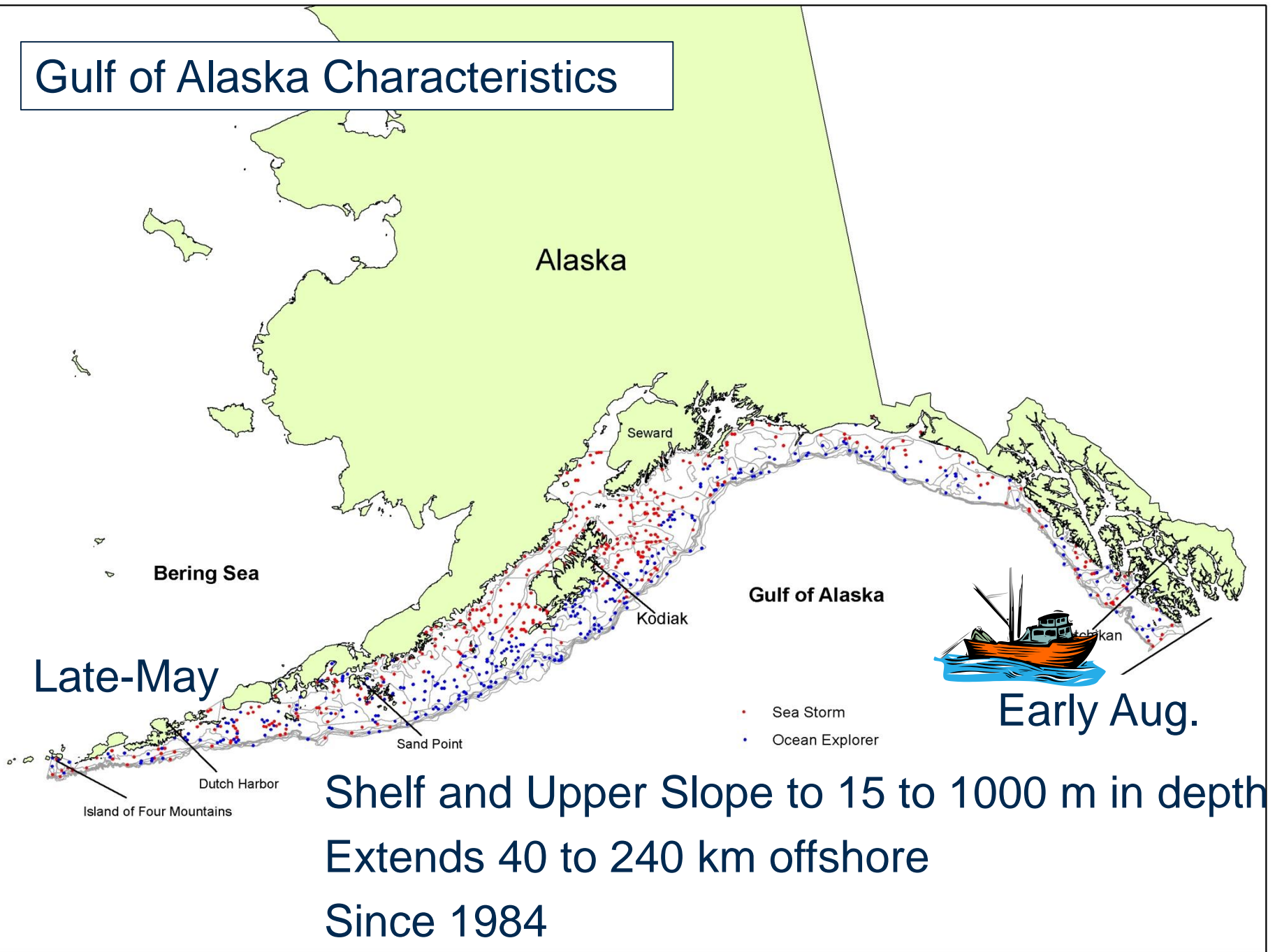
Catch Processing



- All living specimens are sorted to lowest possible taxon, weighed and counted
- Sub-sampling at various levels of catch and specimen numbers



Gulf of Alaska Characteristics



Late-May

Early Aug.

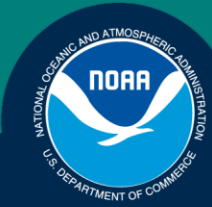
- Sea Storm
- Ocean Explorer

Shelf and Upper Slope to 15 to 1000 m in depth
Extends 40 to 240 km offshore
Since 1984

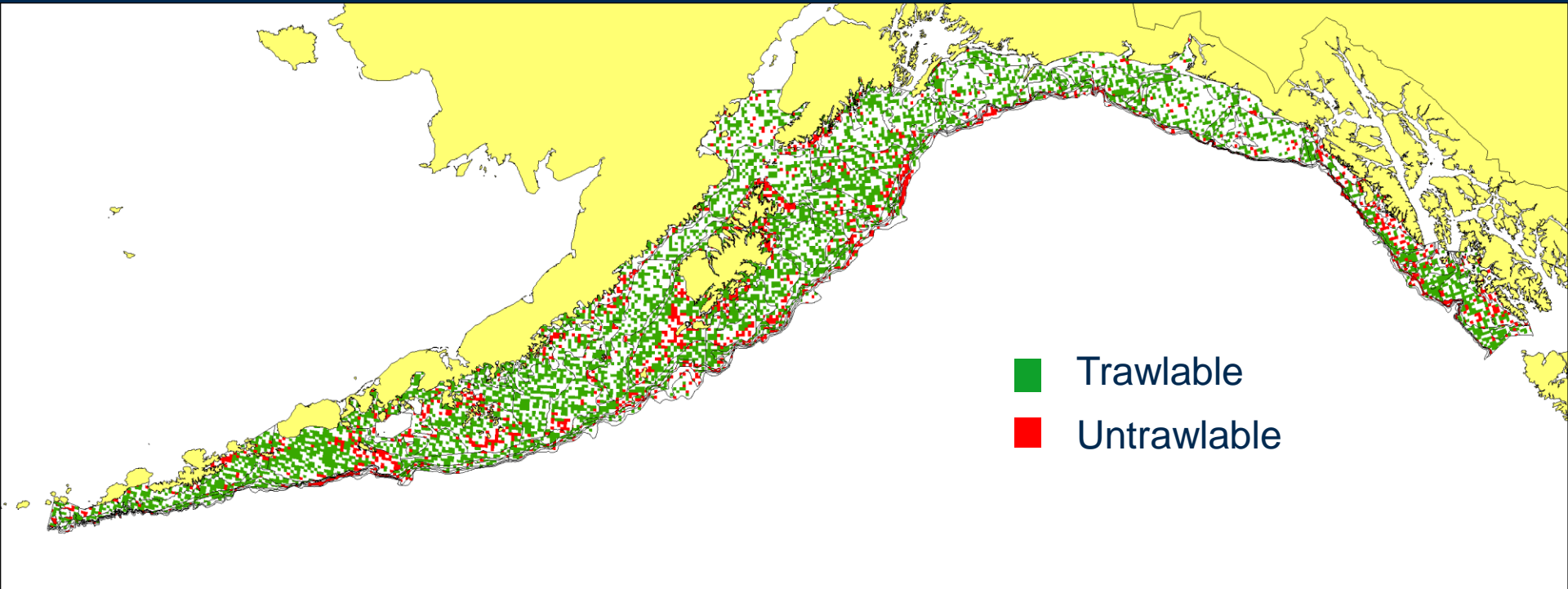


General Survey Design

- 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

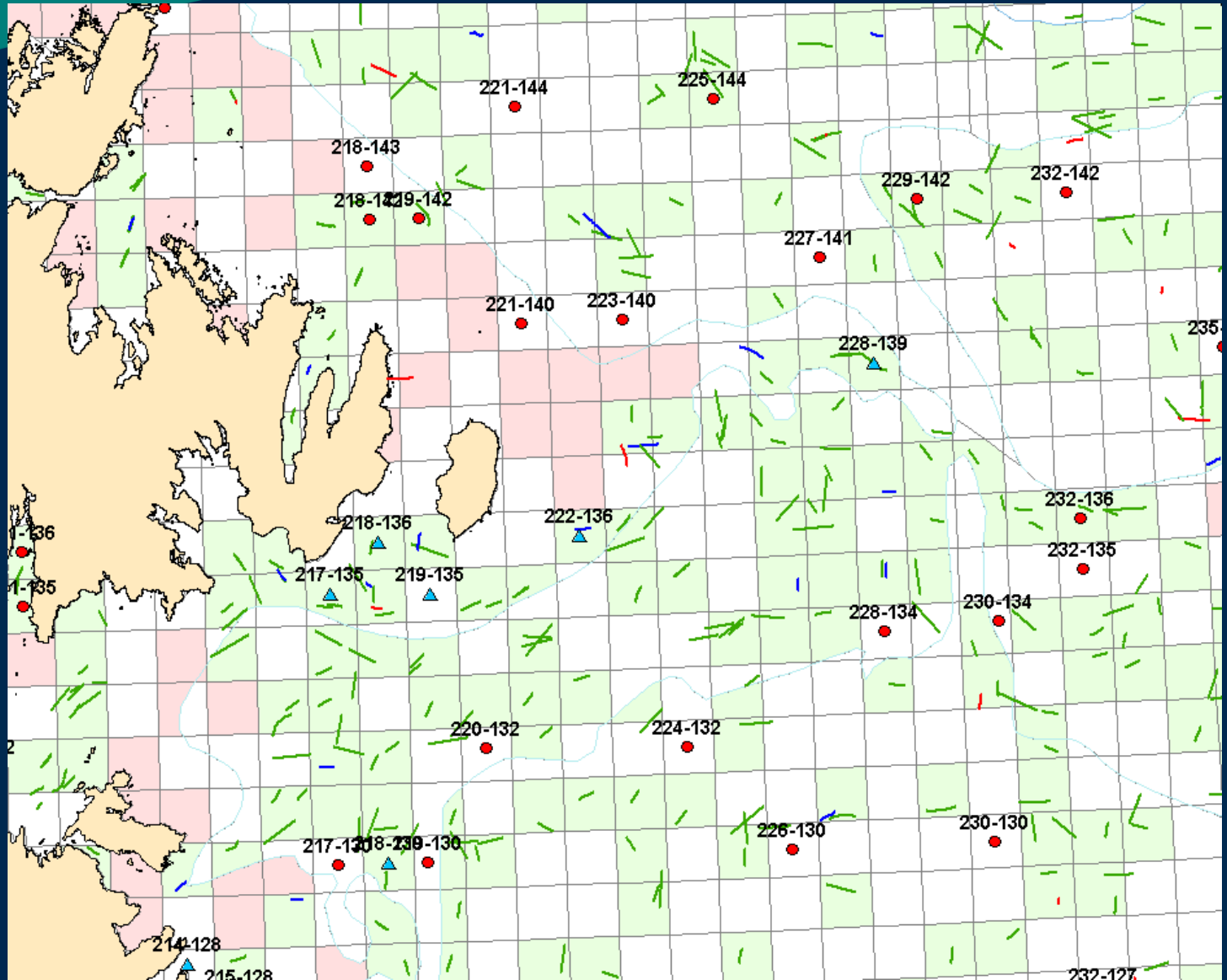
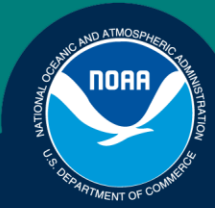


GOA Trawlable Habitat



- Trawlable
- Untrawlable

Overlaid 5x5 km grids = stations



GOA Survey Start Dates



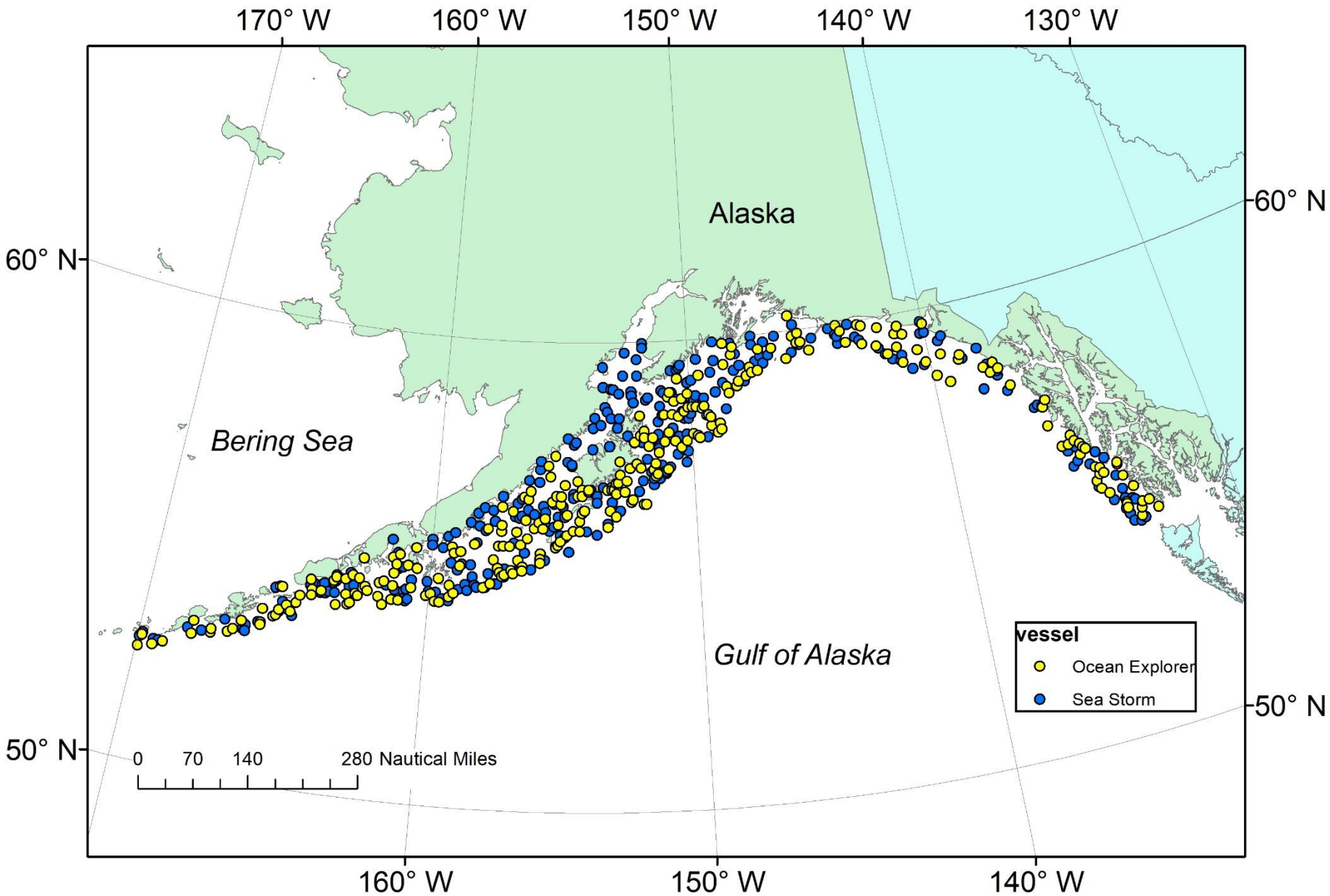
Year	Start Date	Vessel-Days	Boats
1984	3 June	235	4
1987	22 May	252	3
1990	4 June	204	3
1993	5 June	202	4
1996	22 May	210	3
1999	16 May	209	3
2001	20 May	129	2
2003	24 May	202	3
2005	21 May	210	3
2007	28 May	202	3
2009	21 May	212	3
2011	22 May	162	2
2013	29 May	132	2
2015	26 May	192	3
2017	27 May	138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

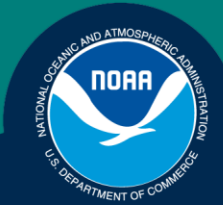
GOA Survey Characteristics



<u>Year</u>	<u>Stations</u>	<u>Max Depth (m)</u>	<u>Comment</u>
1984	929	1000	Duration 30 min
1987	783	1000	
1990	708	500	
1993	775	500	
1996	807	500	15 min duration
1999	764	1000	
2001	489	500	Not in SE AK
2003	809	700	
2005	835	1000	
2007	820	1000	
2009	823	1000	
2011	670	700	
2013	548	700	
2015	772	1000	
2017	536	700	
2019	541	700	

Successful 2019 Haul Locations





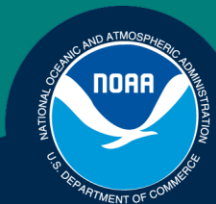
Depth Allocation

<u>Stratum Depth (m)</u>	<u>2019 Tows</u>	<u>2019 %</u>	<u>Mean %</u>
1-100	205	37.9	40.4
101-200	221	40.9	37.9
201-300	77	14.2	13.2
301-500	28	5.2	5.3
501-700	10	1.8	2.3
701-1000			0.8



Area Allocation

<u>Survey Area</u>	<u>2019 Tows</u>	<u>2019%</u>	<u>Mean%</u>
Shumagin	123	22.7	24.5
Chirikof	121	22.4	22.7
Kodiak	176	32.5	33.4
Yakutat	69	12.8	10.6
Southeastern	52	9.6	8.8

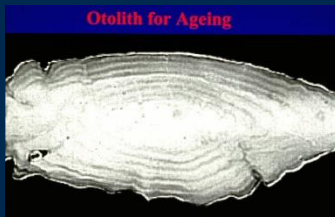
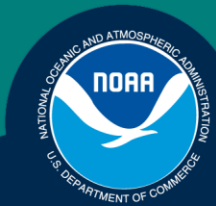


Length Collections



<u>Species</u>	<u>Number</u>
Arrowtooth flounder	38,862
Flathead sole	14,292
Dover sole	30,53
Rex sole	13,205
Northern rock sole	3,318
Southern rock sole	6,924
Atka mackerel	45
Walleye pollock	16,509
Pacific cod	3,755
Shortspine thornyhead	10,242
Sablefish	8,847
Rougheye rockfish	1,162
Blackspotted rockfish	907
Pacific Ocean Perch	26,445
Northern rockfish	2,237
Shorthead rockfish	589
Dusky rockfish	2,506
Sharpchin rockfish	1,272
Harlequin rockfish	585
Other	23,978
Total	178,688

**NOAA
FISHERIES
SERVICE**



**Otolith
Collections**

<u>Species</u>	<u>Collection Type</u>	<u>2019</u>	<u>Target</u>	<u>2017</u>
Arrowtooth flounder	Random	898	900	943
Flathead sole	Random	686	700	678
Dover sole	Random	336	500	347
Rex sole	Random	684	500	598
Northern rock sole	Random	329	560	625
Southern rock sole	Random	674	380	765
Atka mackerel	Random	42	400	148
Walleye pollock	Random	995	1,500	928
Pacific cod	Random	500	1,000	351
Shortspine thornyhead	Random	411	350	441
Sablefish	Random	1770	600	1,172
Rougheye rockfish	Random	666	400	769
Blackspotted rockfish	Random	451	500	515
Pacific Ocean Perch	Random	1232	1,000	1,090
Northern rockfish	Random	369	700	755
Shorthead rockfish	Stratified	350	400	340
Dusky rockfish	Stratified	548	500	654
Harlequin rockfish	Stratified	338	200	
Total		11,279	11,440	11,896



Special Projects

Voucher Requests

Sleeper and Salmon sharks

Snailfish

Sculpins

Gastropods

Sponges

Corals

Assorted

ES 60 Acoustics

Light intensity

Lampreys

Sand lance

Observer training

Crag and salmon training

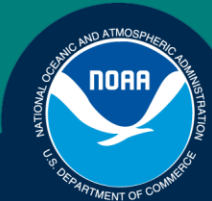
Outreach

Squid and ragfish

Rockfish genomics

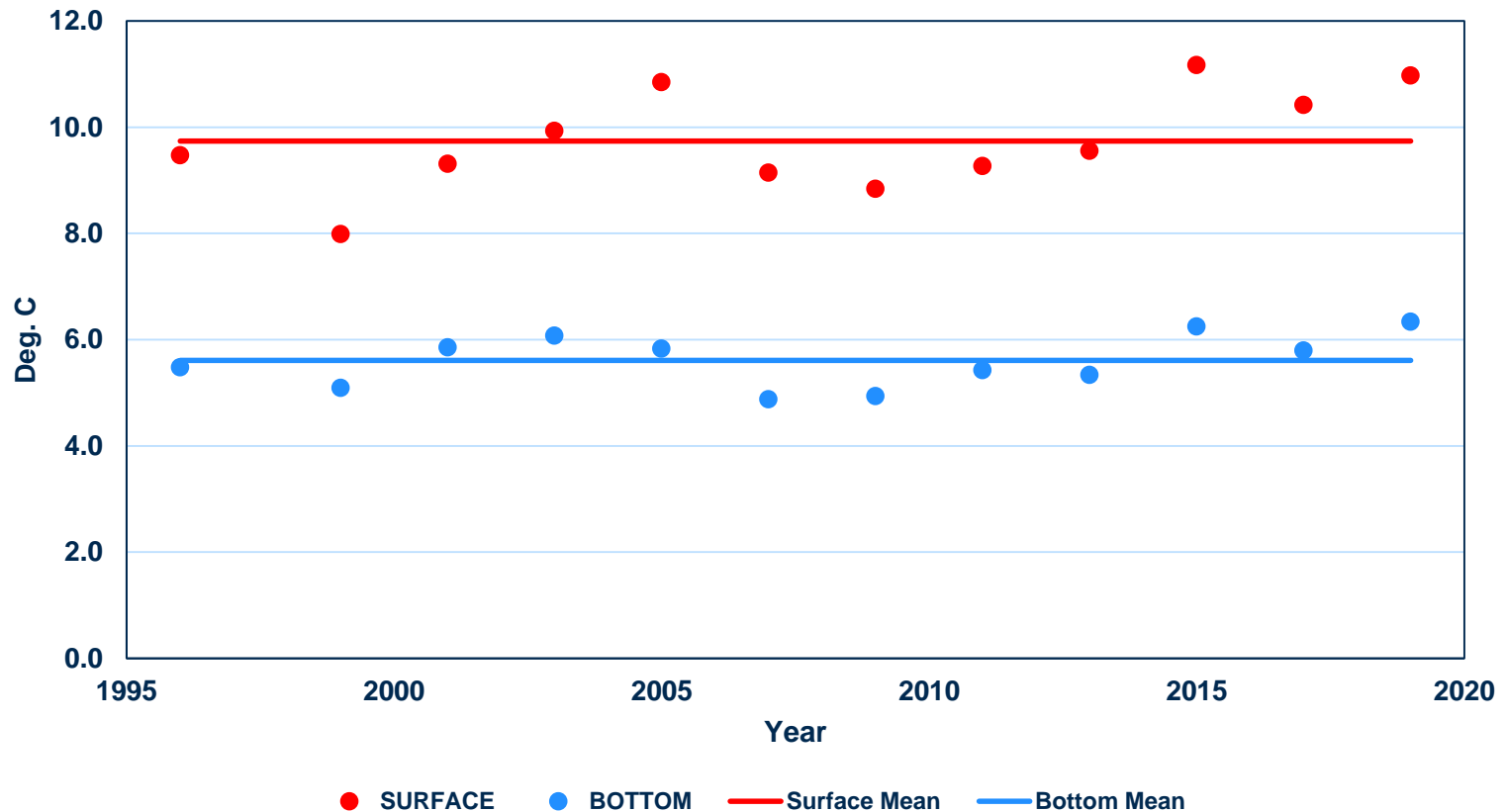
POP Tissues

Forensic genetics



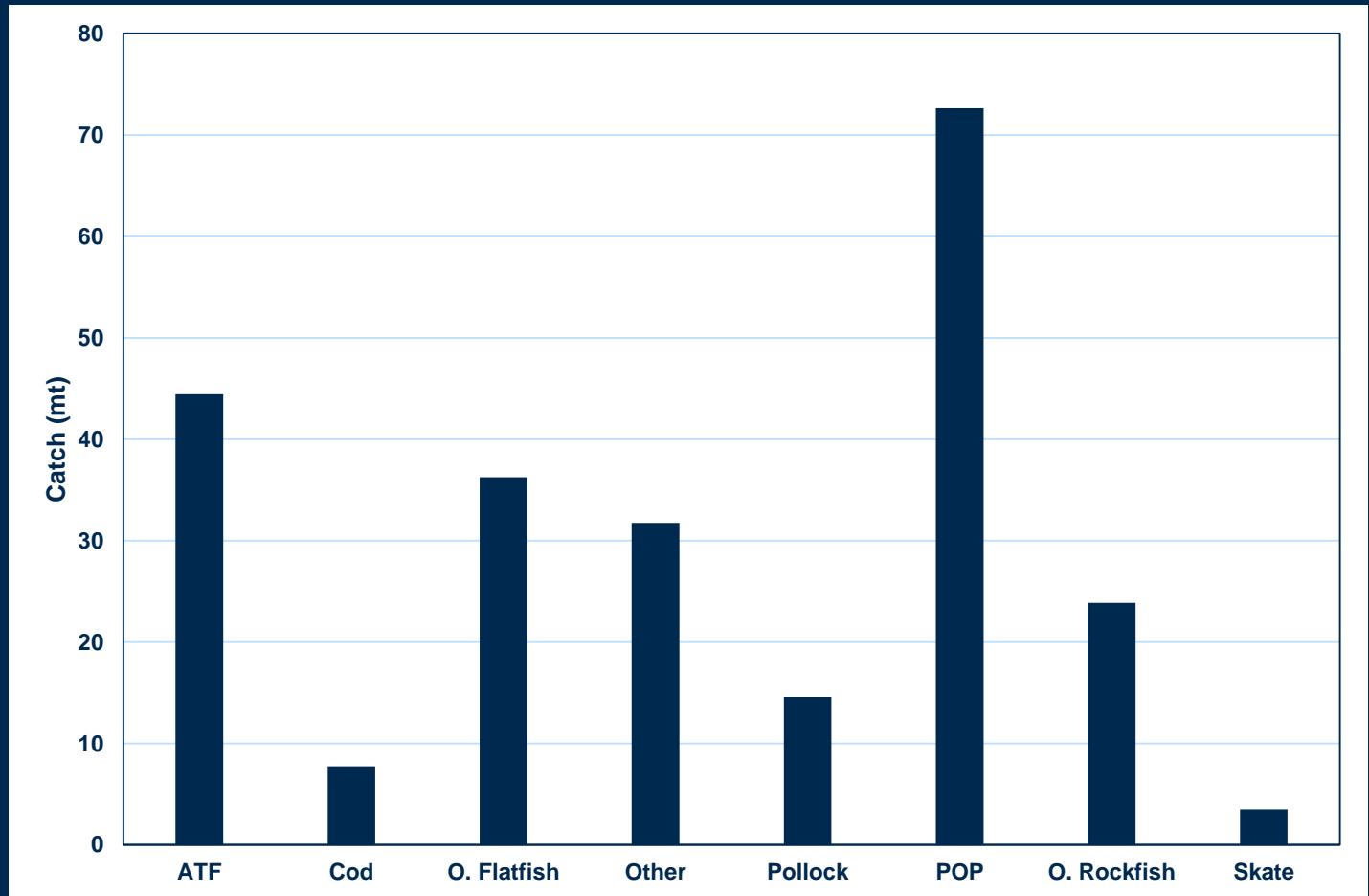
Mean SST and Bottom Temp (°C)

BT Observed Mean Temperatures (C)
<500 m





2019 GOA Catch Composition





Surface Temperatures

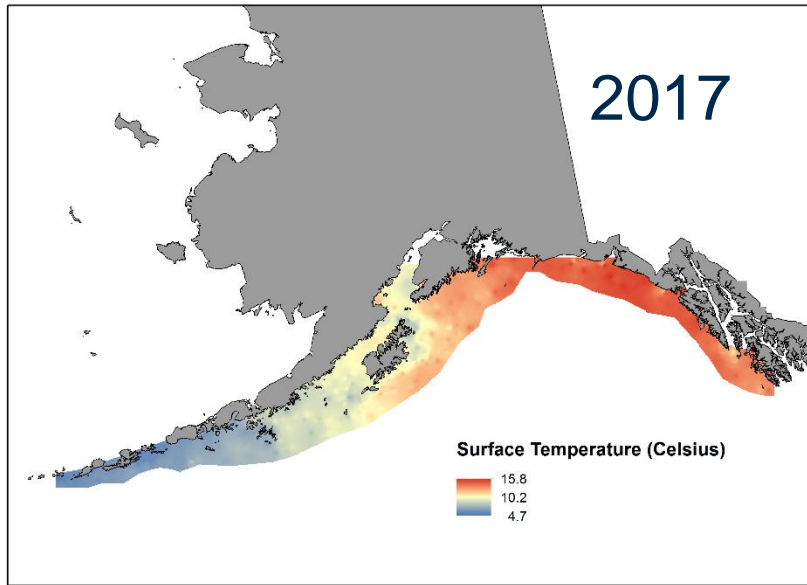


Figure D-2. -- Surface temperatures GOA 2017 bottom trawl survey

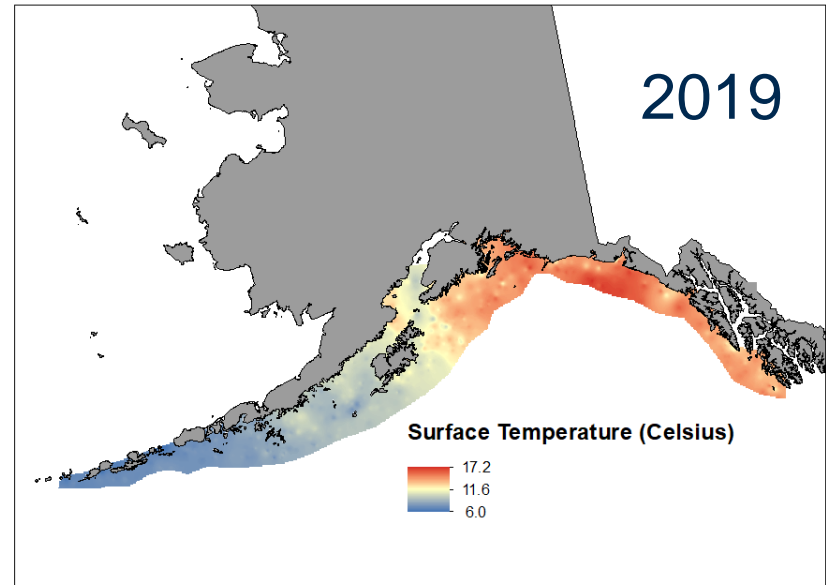


Figure D-2. -- Surface temperatures GOA 2019 bottom trawl survey



Bottom Temperatures

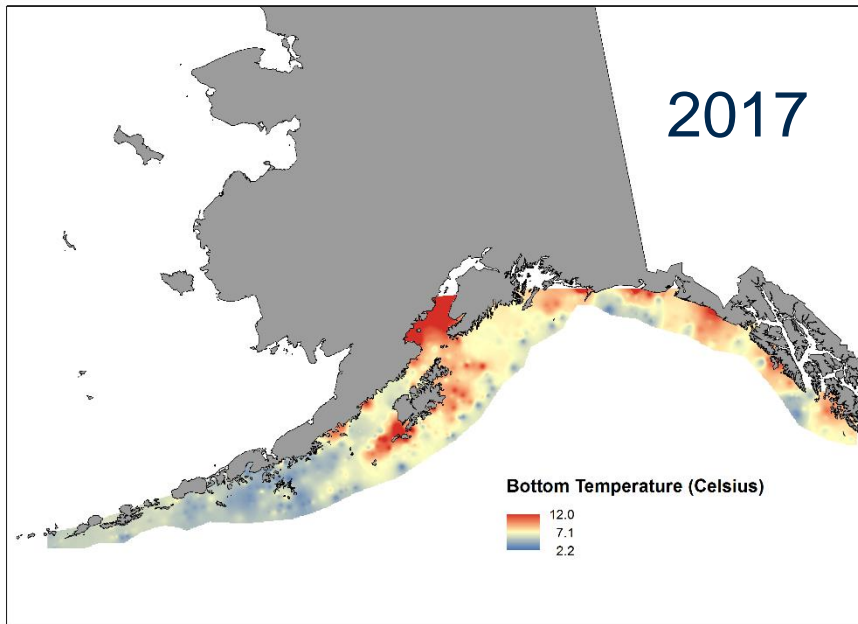


Figure D-1. -- Bottom temperatures GOA 2017 bottom trawl survey

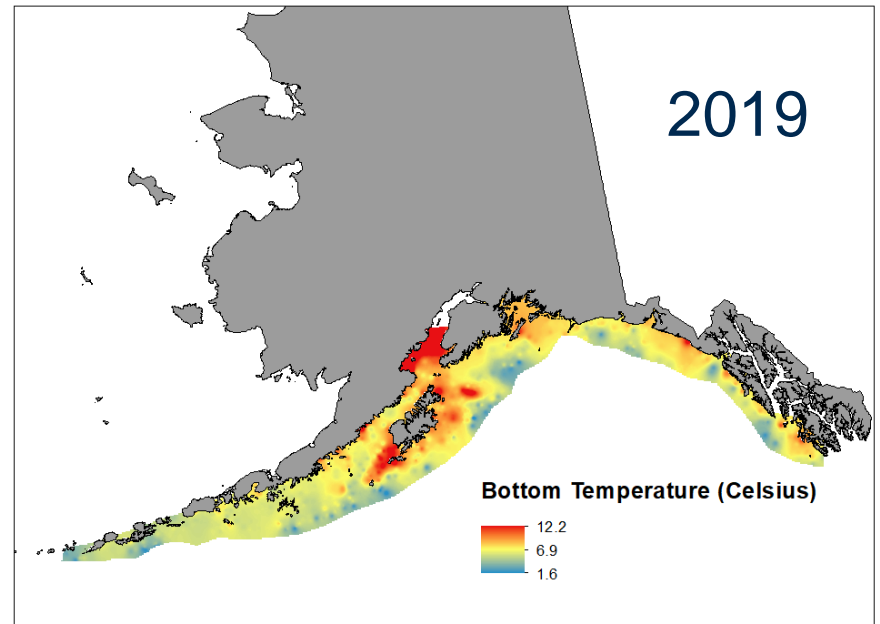
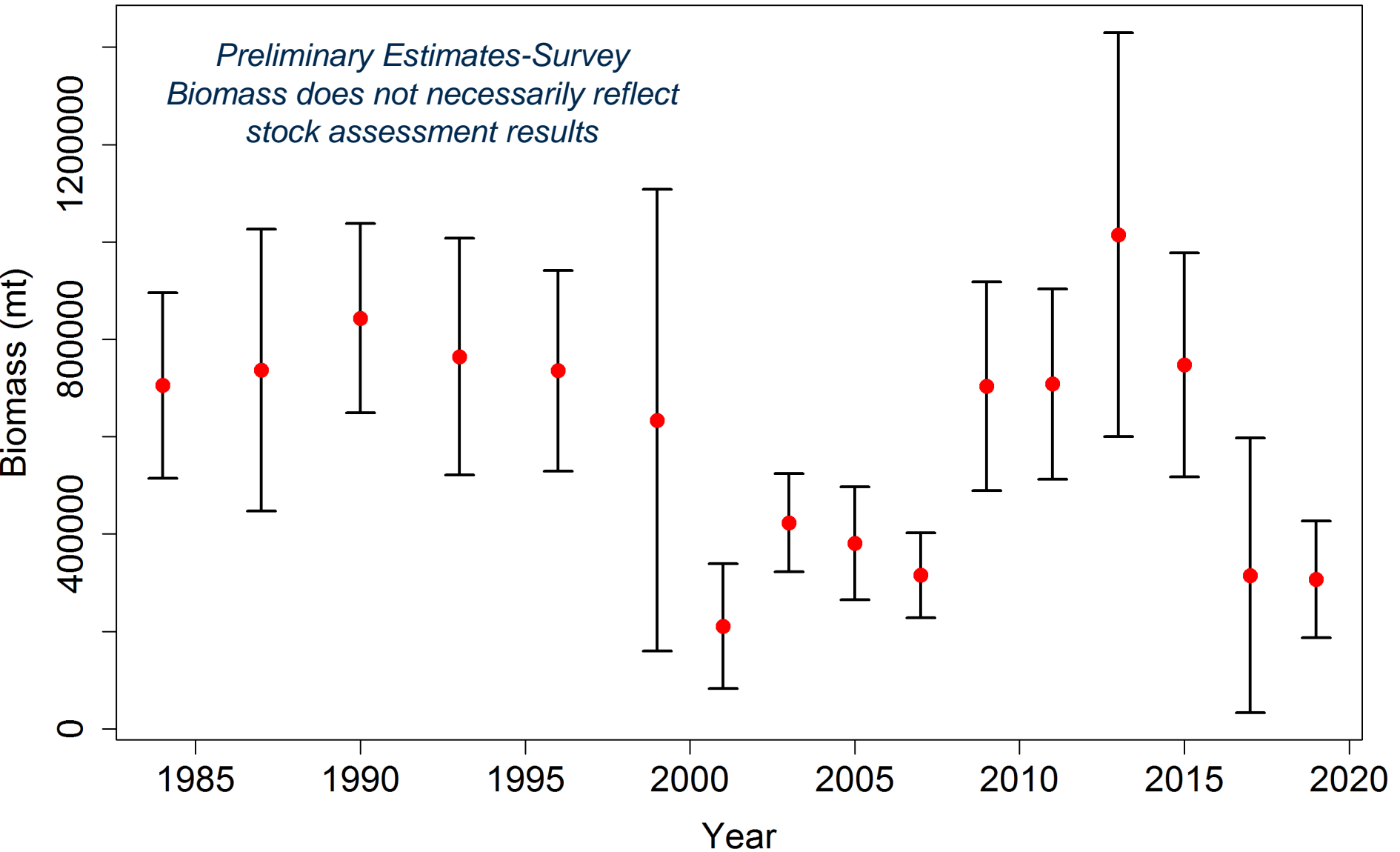
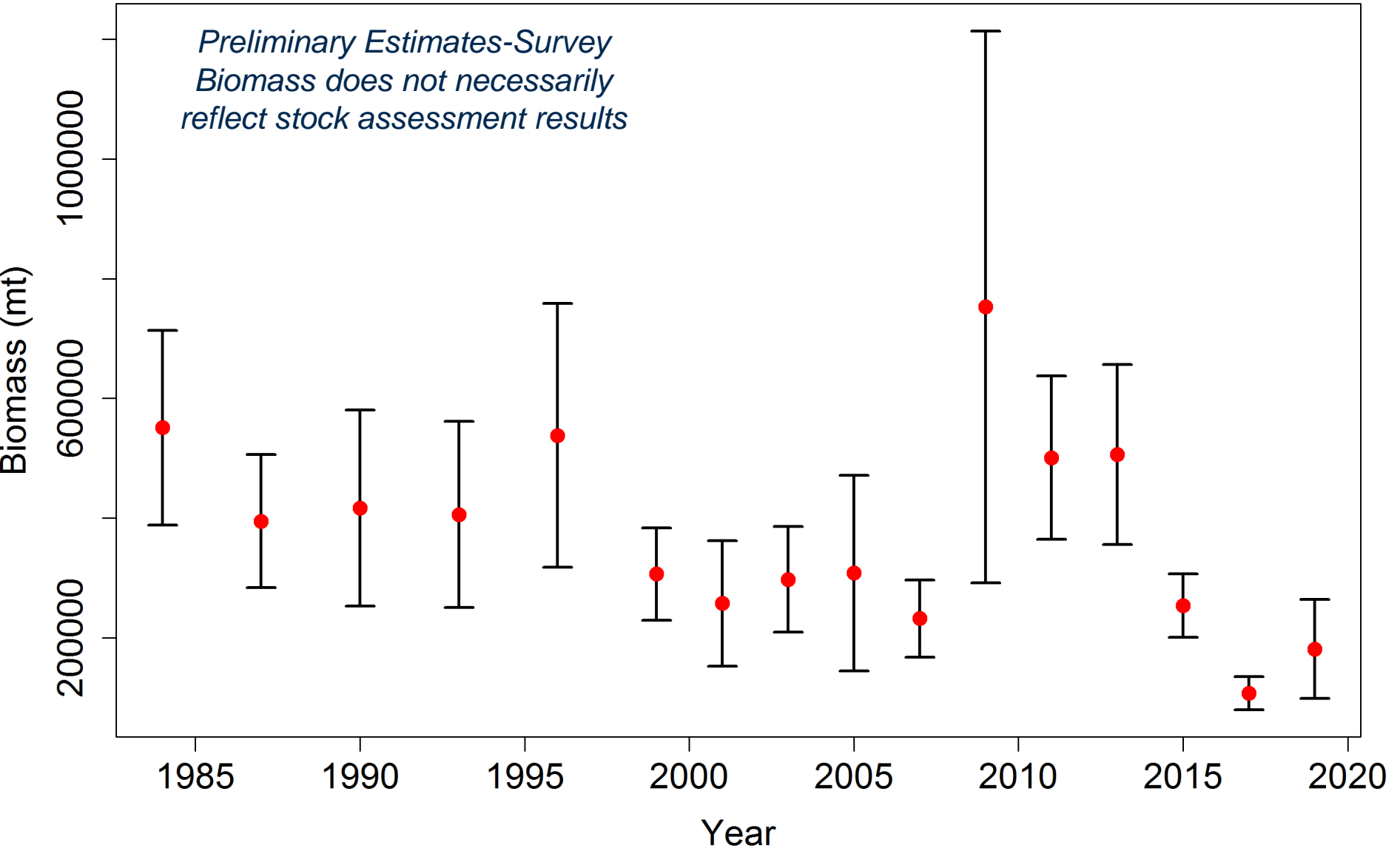


Figure D-1. -- Bottom temperatures GOA 2019 bottom trawl survey

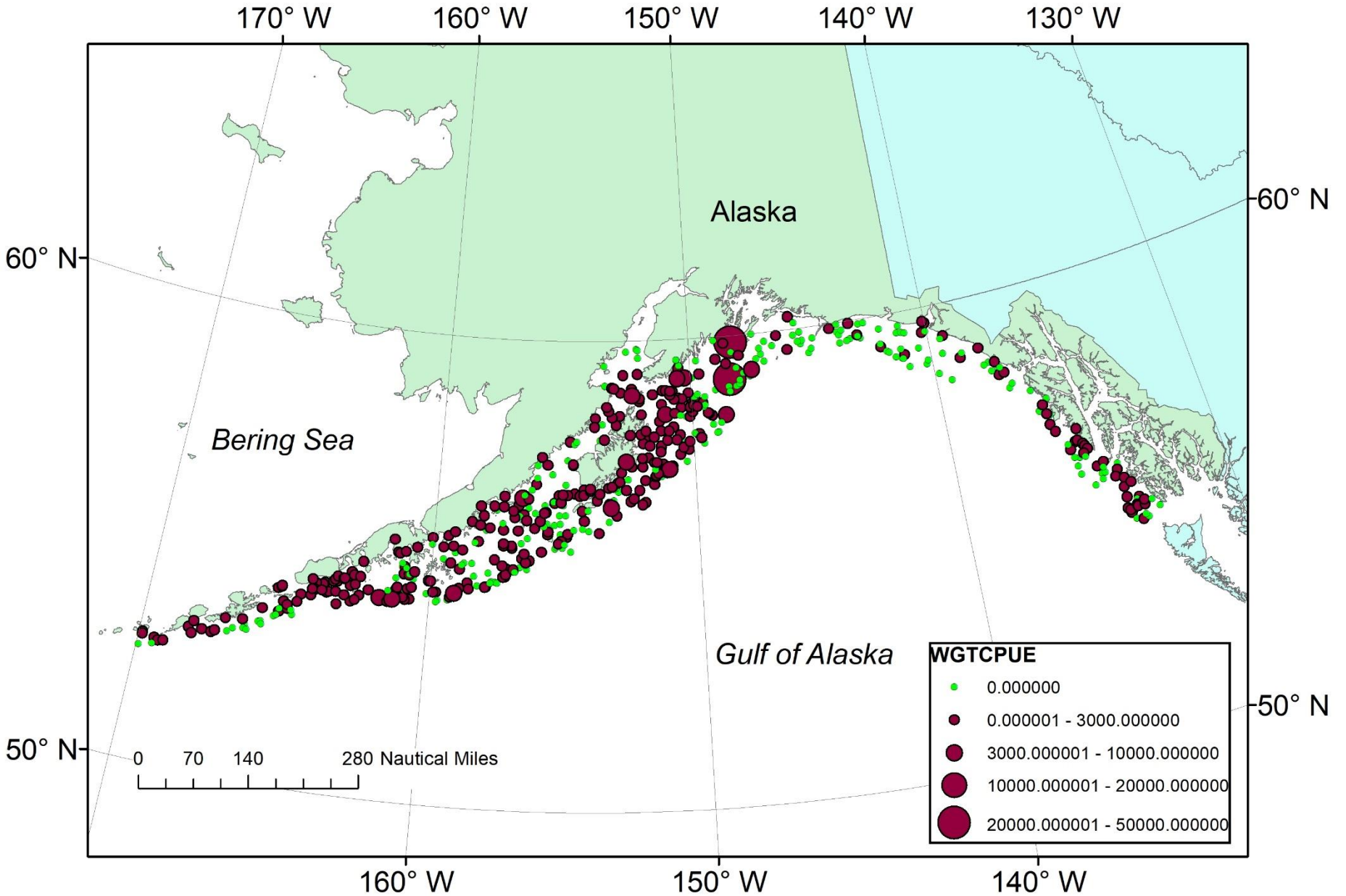
walleye pollock (*Gadus chalcogrammus*)



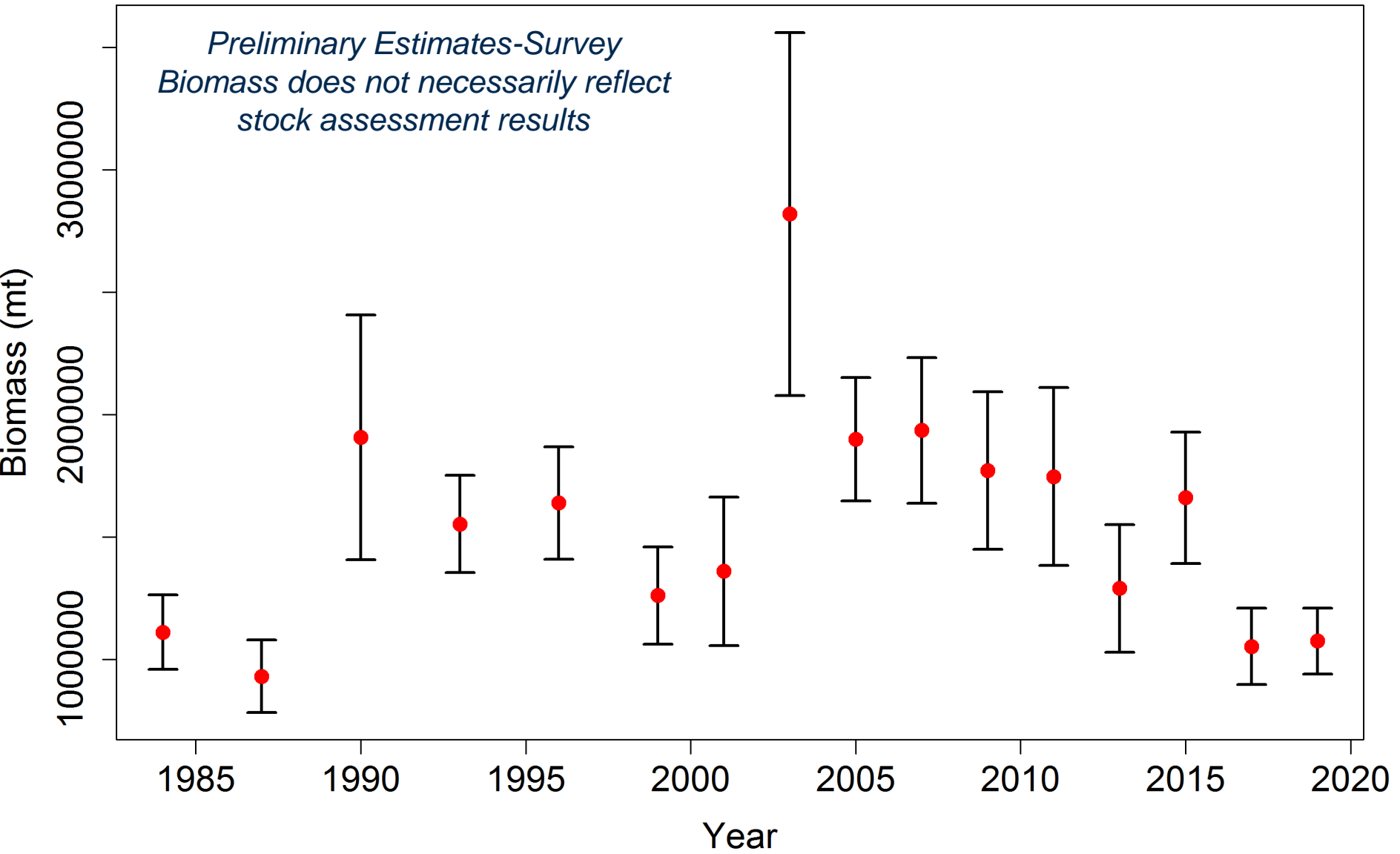
Pacific cod (*Gadus macrocephalus*)



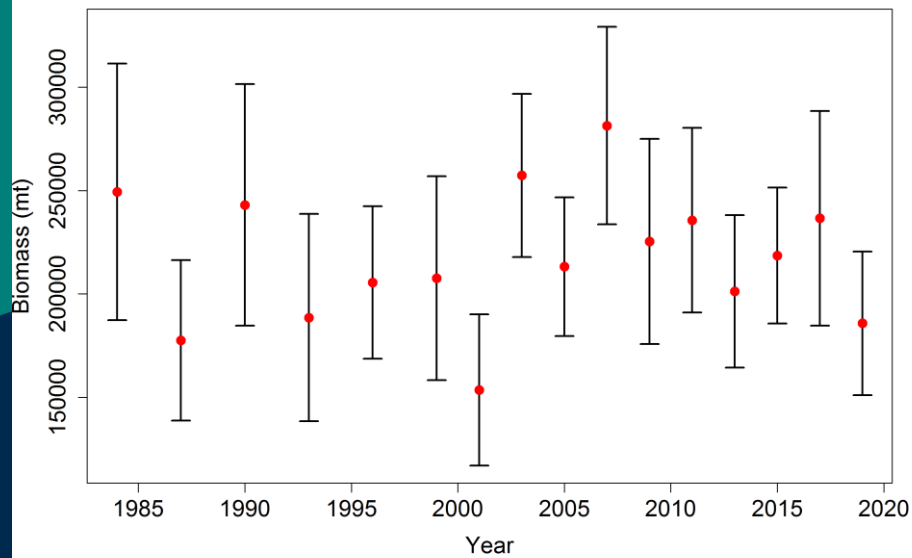
2019 Pacific Cod Density-kg/km2



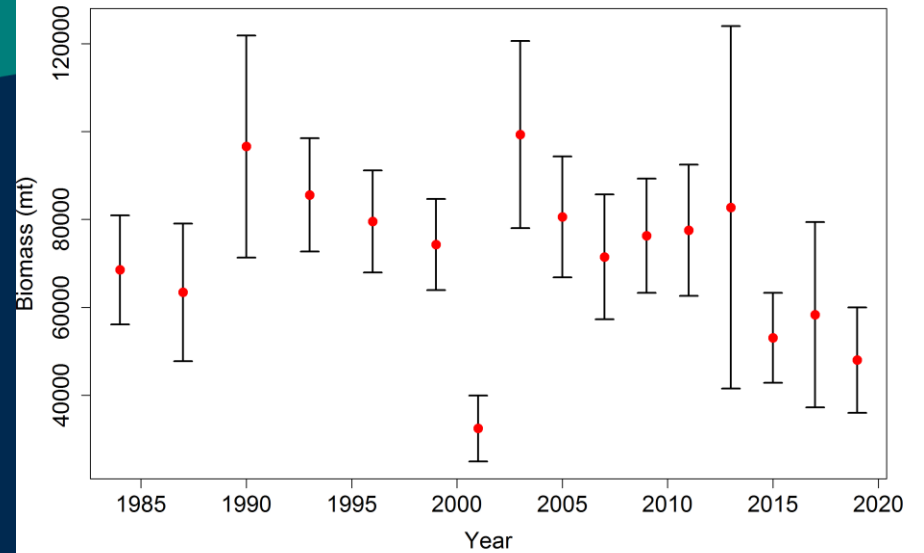
arrowtooth flounder (*Atheresthes stomias*)



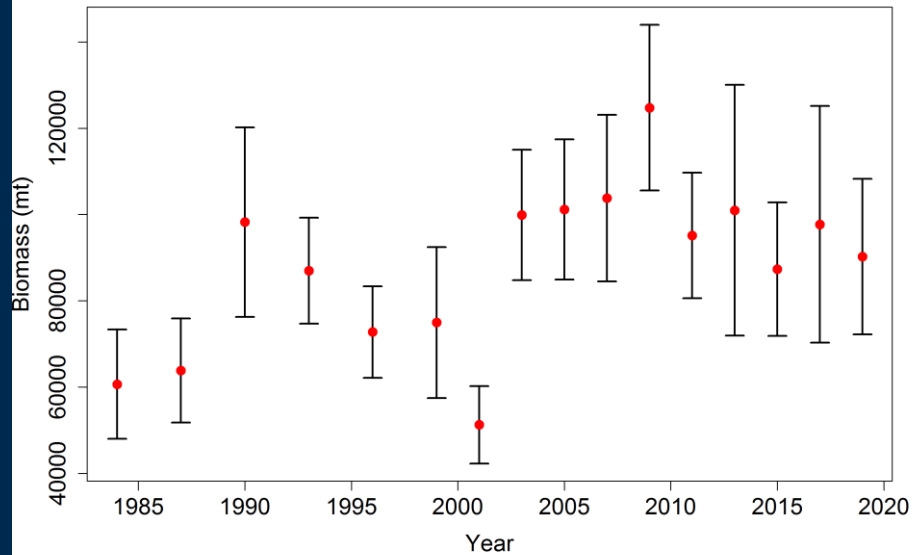
flathead sole (*Hippoglossoides elassodon*)



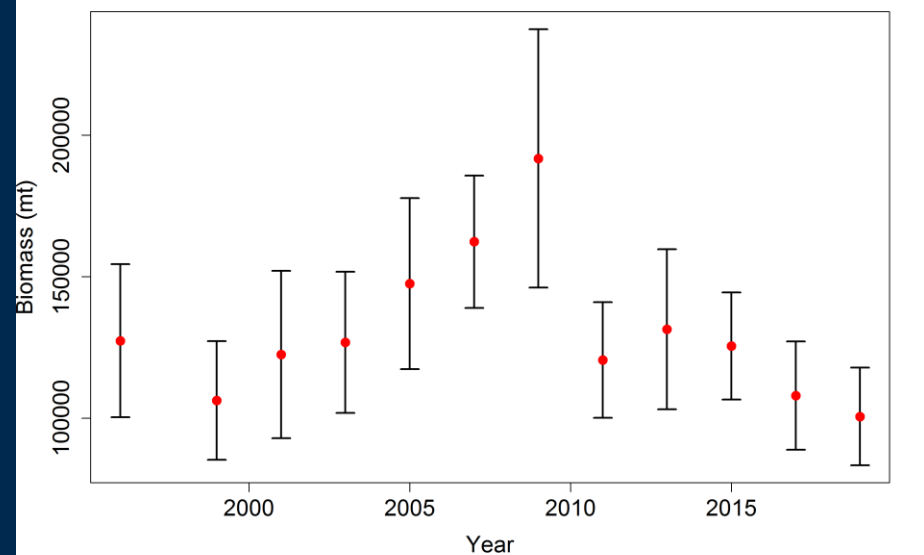
Dover sole (*Microstomus pacificus*)



rex sole (*Glyptocephalus zachirus*)

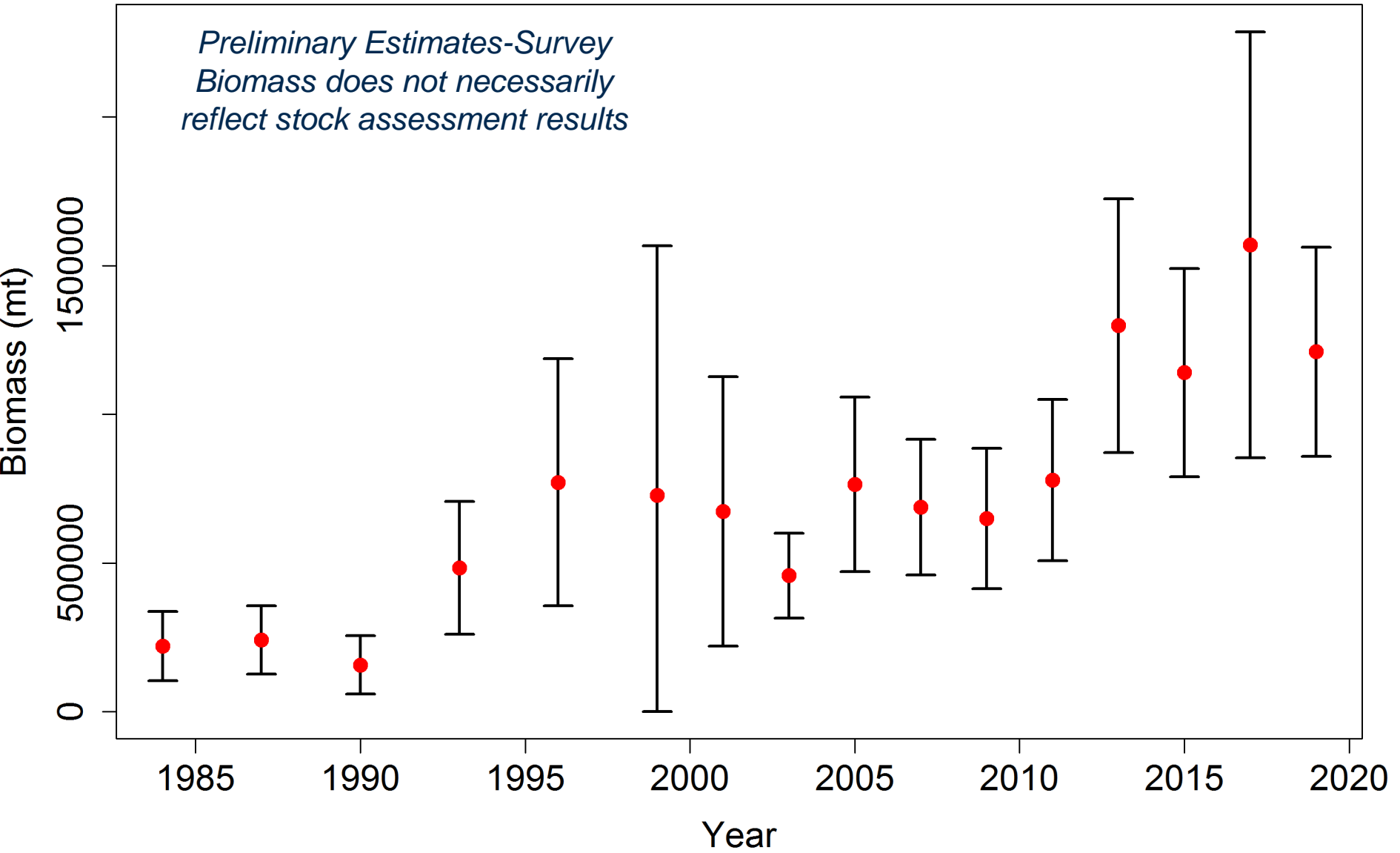


southern rock sole (*Lepidopsetta bilineata*)

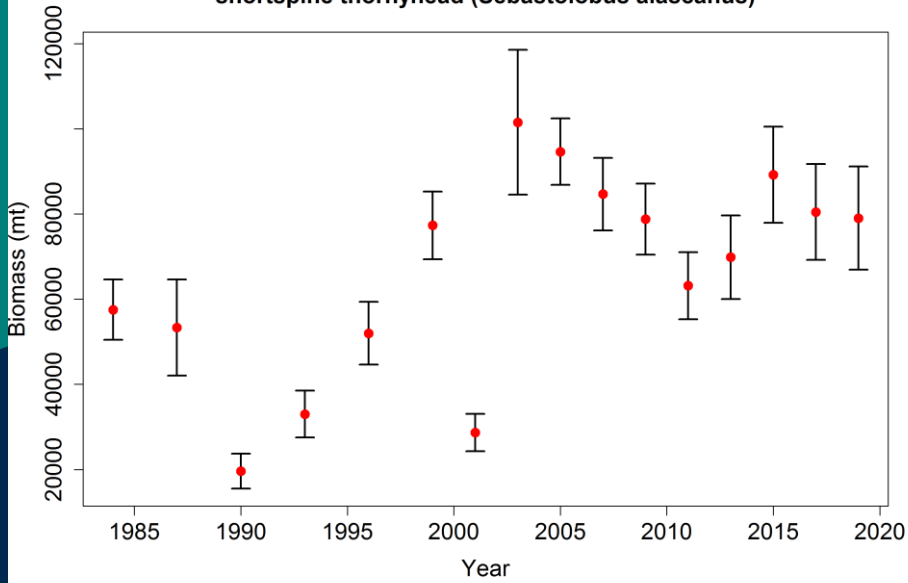


Preliminary Estimates-Survey Biomass does not necessarily reflect stock assessment results

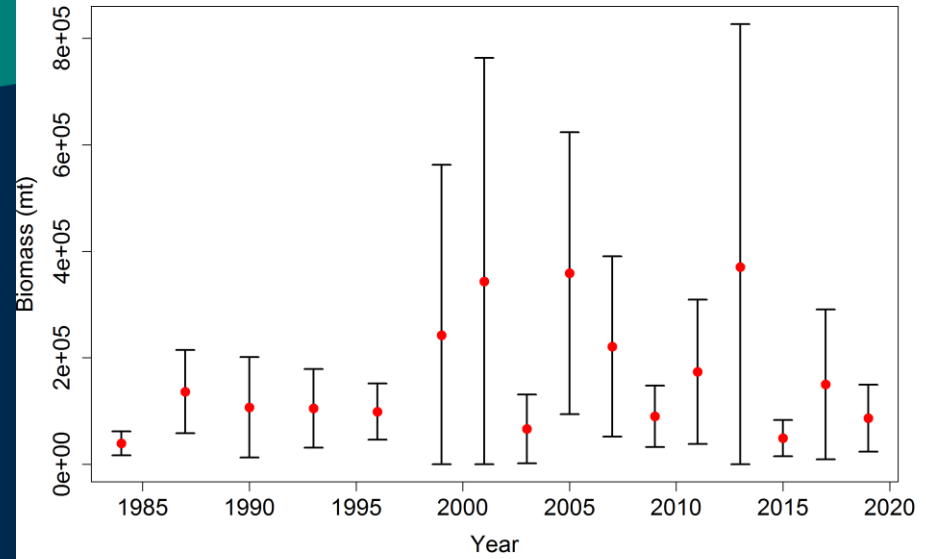
Pacific ocean perch (*Sebastes alutus*)



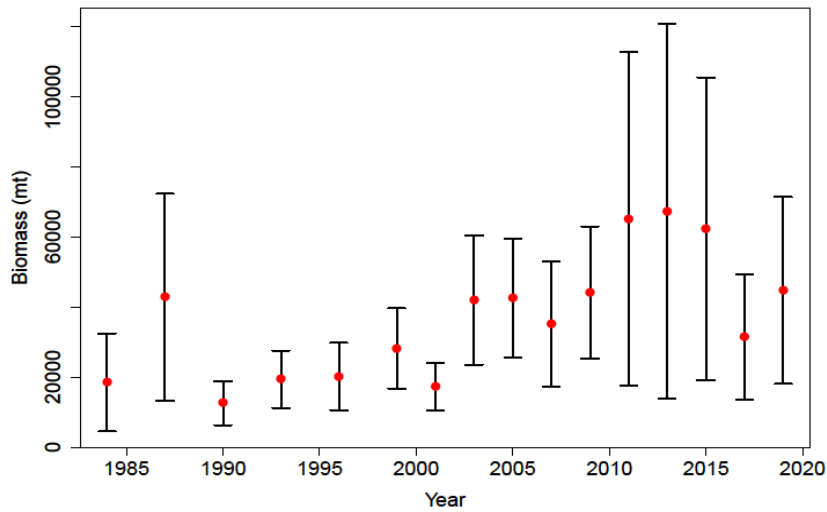
shortspine thornyhead (*Sebastolobus alascanus*)



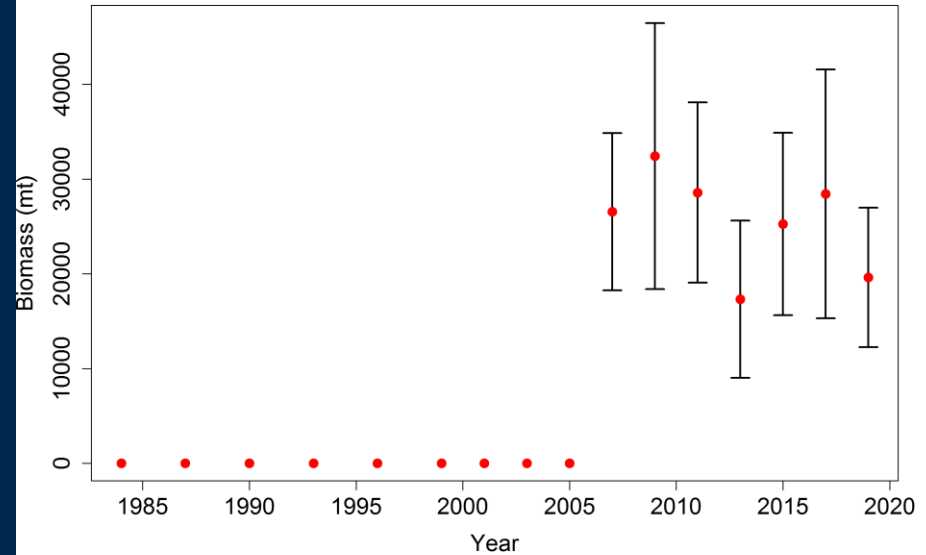
northern rockfish (*Sebastes polyspinis*)



shorttraker rockfish (*Sebastes borealis*)

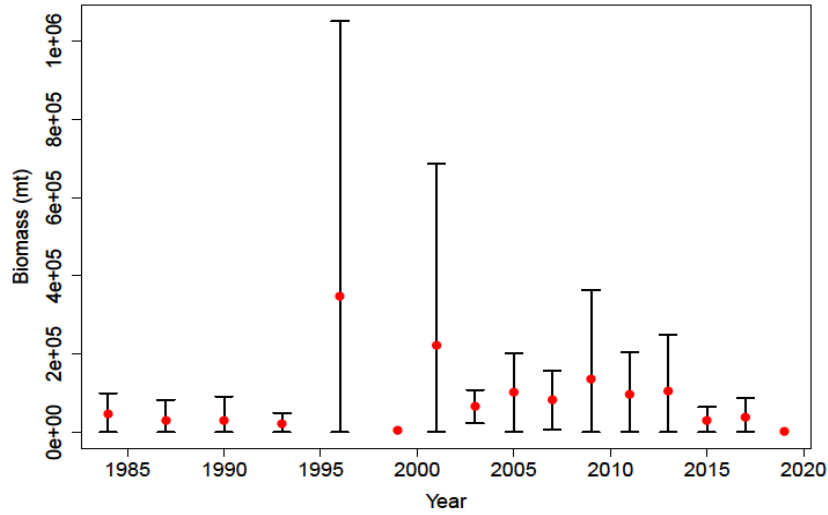


rougheye rockfish (*Sebastes aleutianus*)

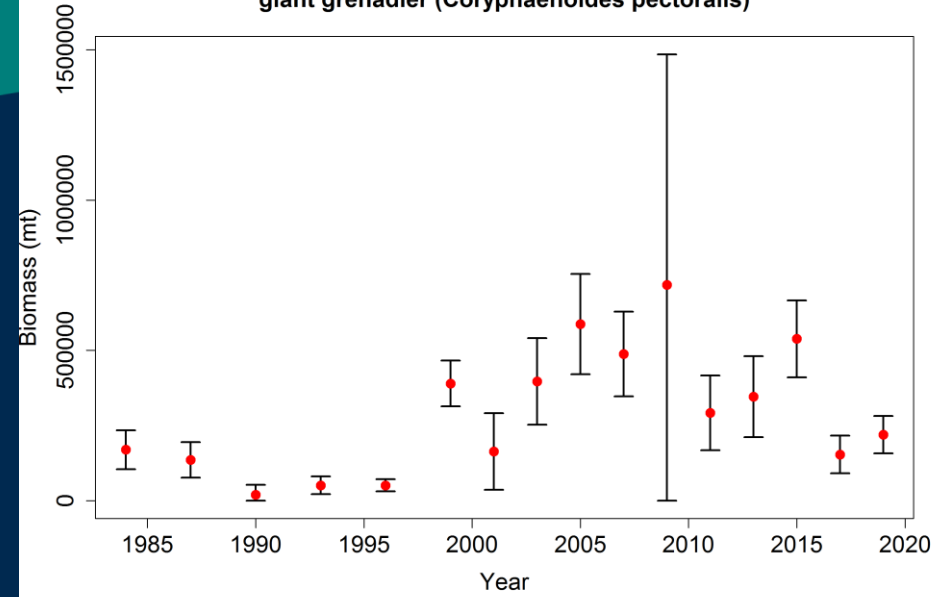


Preliminary Estimates-Survey Biomass does not necessarily reflect stock assessment results

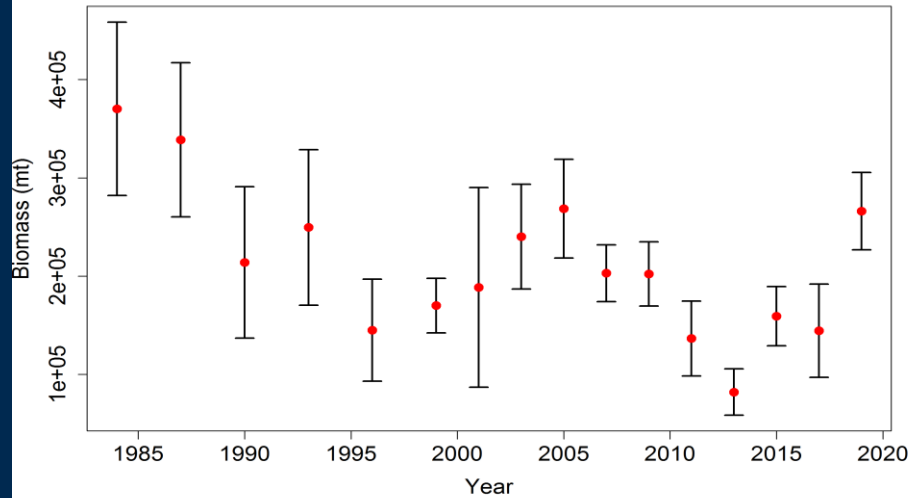
Atka mackerel (*Pleurogrammus monopterygius*)



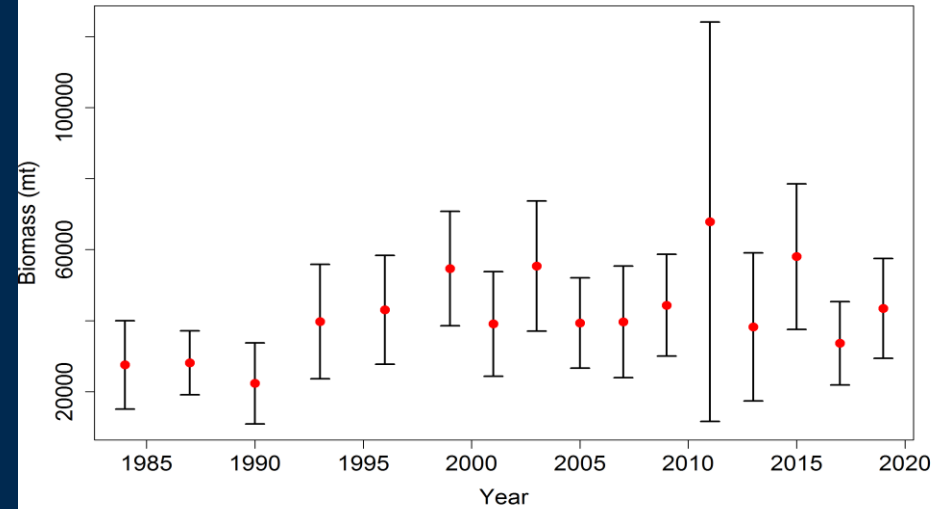
giant grenadier (*Coryphaenoides pectoralis*)



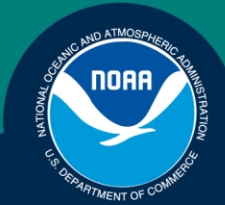
sablefish (*Anoplopoma fimbria*)



big skate (*Beringraja binoculata*)

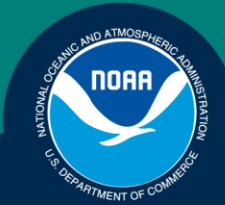


Preliminary Estimates-Survey Biomass does not necessarily reflect stock assessment results



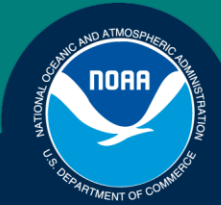
Next Steps

- Complete effort review
- Finalize data base
- Re-estimate survey biomass, size, split-factor, etc.
- Update age composition
- Upload data to AKFIN
- Available 9/27



Next Steps (cont.)

- Ecosystem Reports
 - GOA Temperature
 - Rockfish Distribution
 - Jellyfish
 - Miscellaneous species
 - Condition factor



GOA Survey Team

- Nate Raring, co-ord.
- Christina Conrath
- Ned Laman
- Susanne McDermott
- Peter Munro
- Jay Orr
- Sean Rooney
- Lou Rugolo
- Paul von Szalay
- Mark Zimmermann
- Nancy Roberson
- Heather Kenney
- Dennis Benjamin
- Joanna Magner
- Lewis Barnett
- Rick Hibpshman
- Charles Hutchinson
- Dustin Nadjkovic
- Todd Tenbrink
- Kevin Swicke
- Jakub Kircun (NEFSC)
- 2 IPHC
- 3 Observers
- 5 Volunteers