



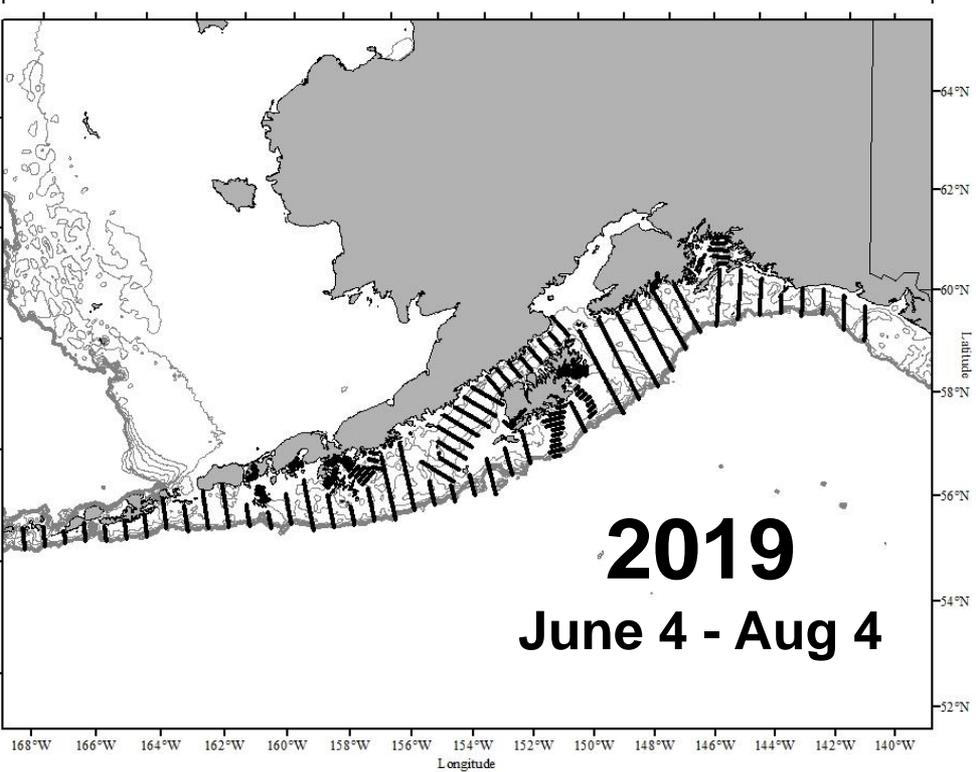
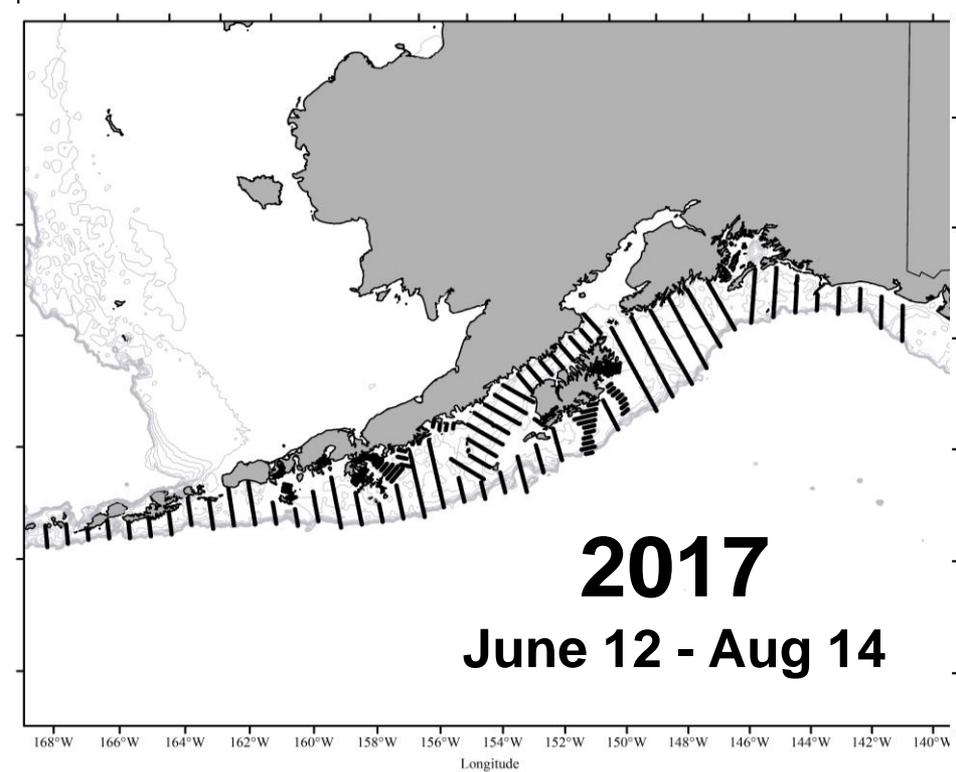
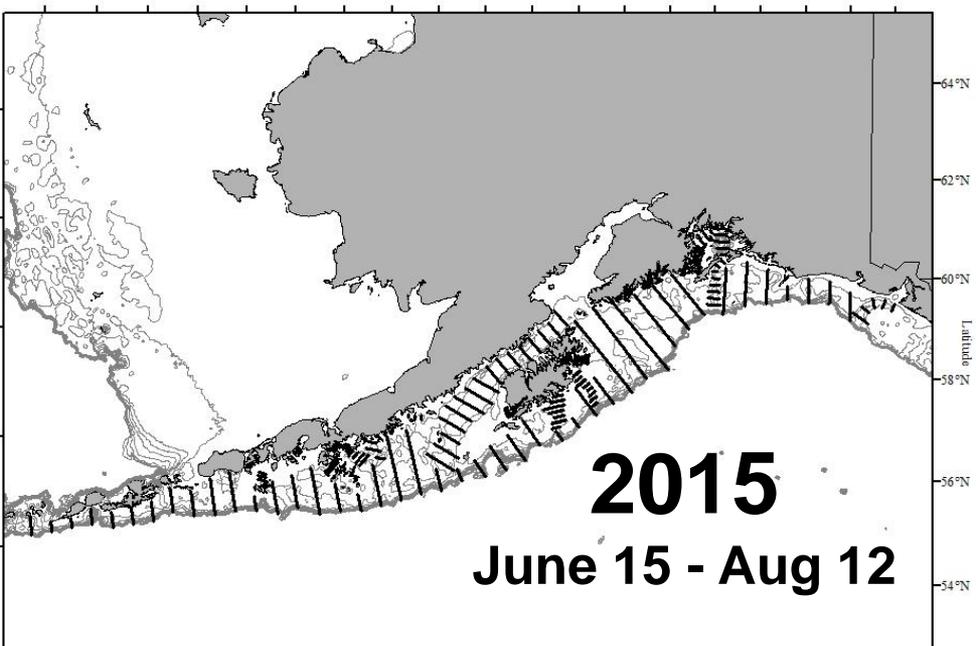
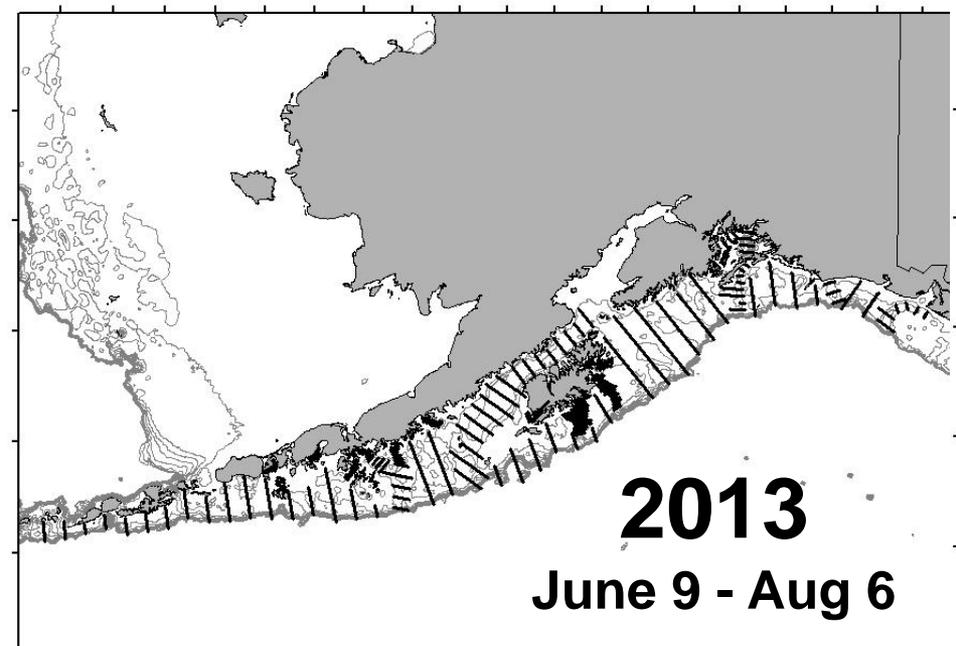
**NOAA
FISHERIES**

Preliminary Results of the Summer 2021 Acoustic-Trawl Survey of Walleye Pollock in the Gulf of Alaska

June 1 – July 11, 2021

**Midwater Assessment &
Conservation Engineering**

September 22, 2021



2021 Survey Challenges

- **Science party short staffed so could only staff 2 - 20 day legs resulting in dropping many smaller bays, increased transect spacing, and reduced the number of hauls**
- **Ships deck and survey departments short staffed so fishing and CTD operations only possible between 0600 - 2330**
- **Deck crew injury further reduced staffing so fishing and CTD operations reduced to 0800 - 2030**
- **If another leg could have been staffed would have had to break the bubble for ~14 days for crew rest and shelter in place to re-establish COVID-free bubble**

2021 Summer GOA Acoustic-Trawl Survey June 4 - July 9

Islands of Four
Mountains

Yakutat Trough

Area covered contained 98% of
the 2019 pollock biomass

- 41 days (early June – early July)
- 30-40 nmi spacing along shelf & shelfbreak
- 20 nmi spacing Shelikof
- 3-6 nmi spacing in Shumagins, Barnabas and Chiniak
- Abundance of pollock, POP, capelin
- Euphausiid distribution with confirmation tows

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

Latitude

58°N

56°N

54°N

52°N

2021 Summer GOA Acoustic-Trawl Survey June 4 - July 9

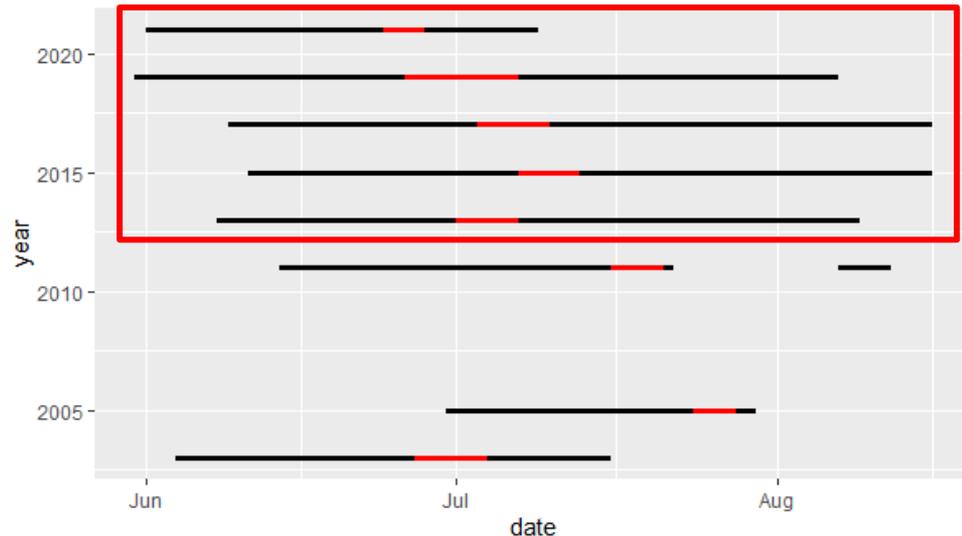
Islands of Four Mountains

Yakutat Trough

Area covered contained 98% of the 2019 pollock biomass

168°W 166°W 164°W 162°W 160°W 158°W 156°W 15
Long

64°N
62°N
60°N
58°N
Latitude



2021 Summer GOA Acoustic-Trawl Survey June 4 - July 9

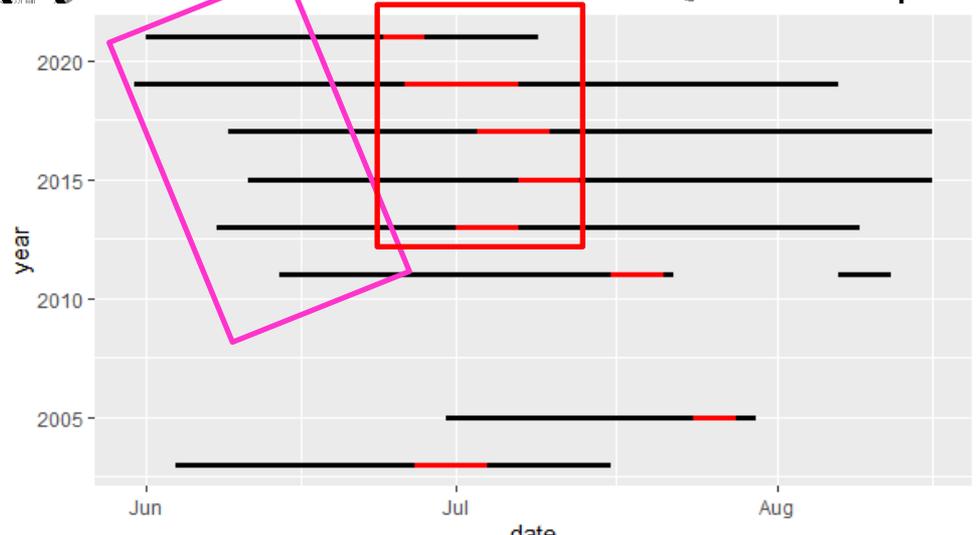
Islands of Four
Mountains

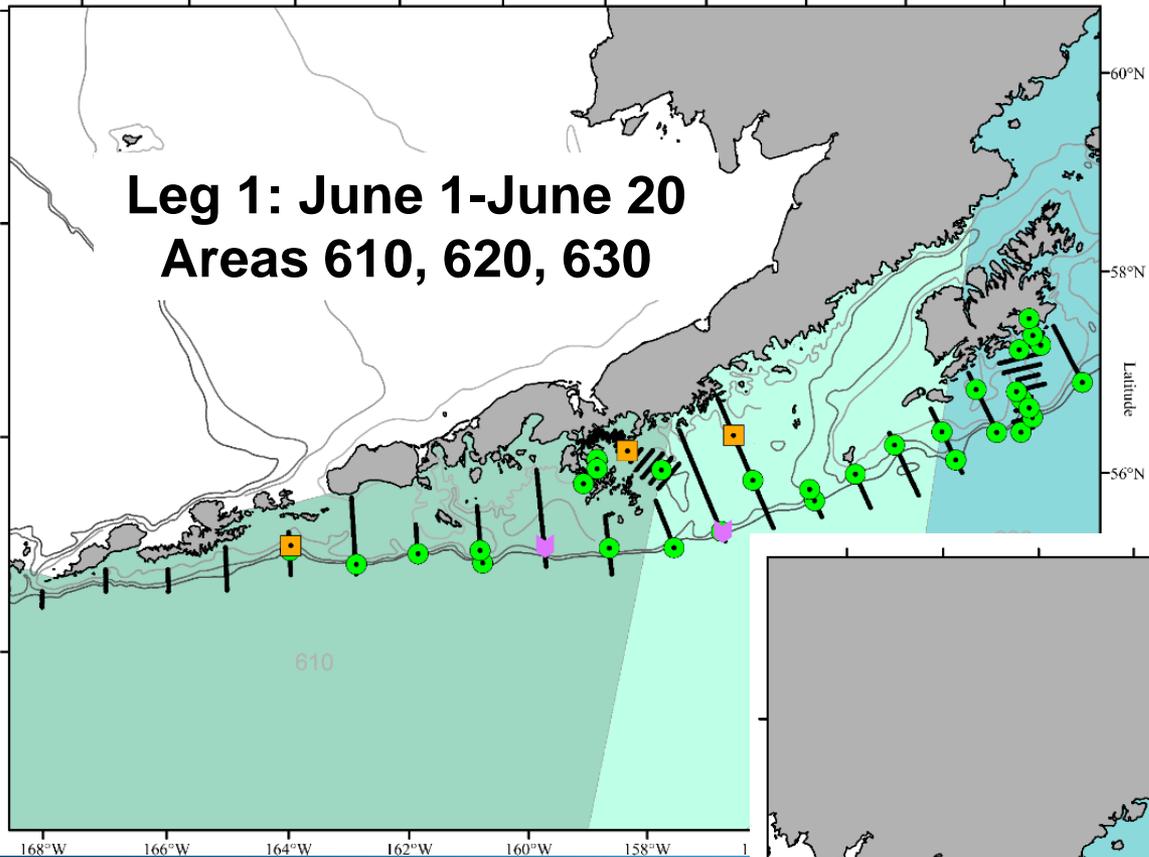
Yakutat Trough

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168°W 166°W 164°W 162°W 160°W 158°W 156°W 15
Long

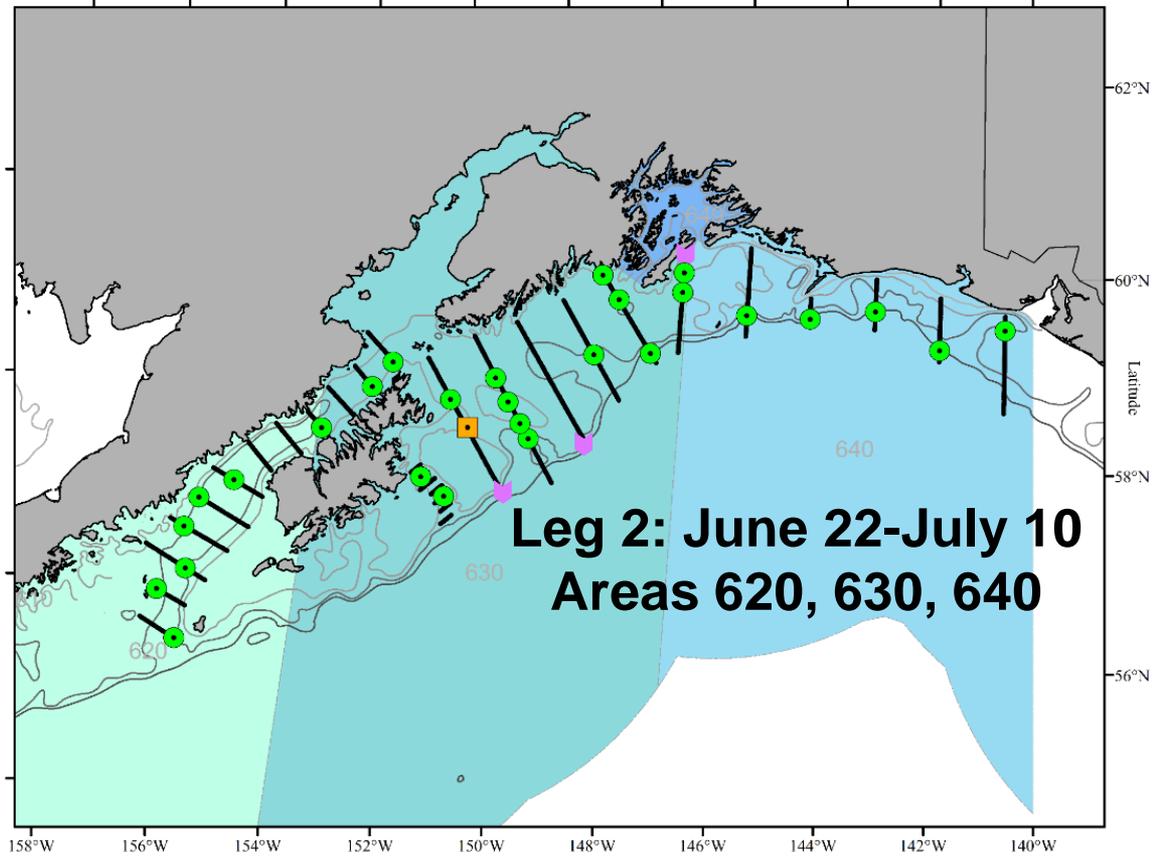
64°N
62°N
60°N
58°N
Latitude

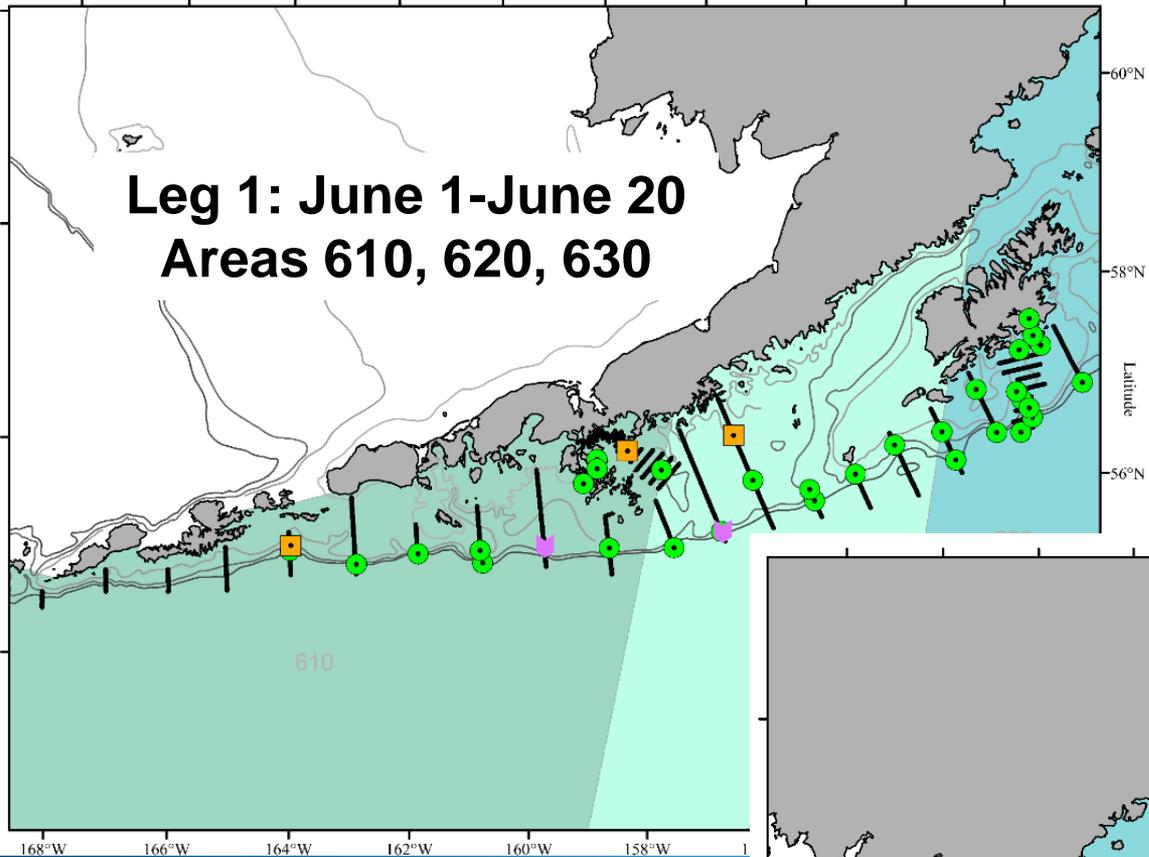




LFS1421
PNE
Methot

Gear Deployments
LFS1421 - 58
PNE - 5
Methot - 4





Leg 1: June 1-June 20
Areas 610, 620, 630

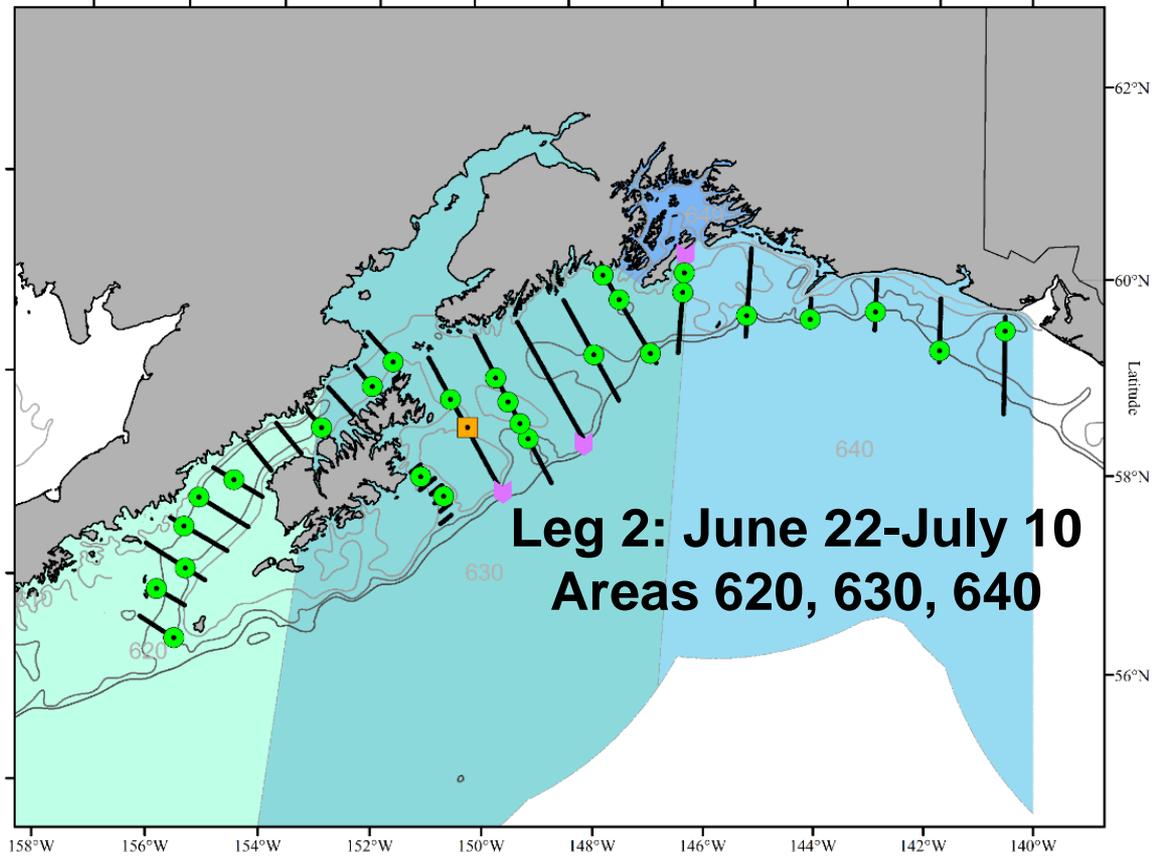


Gear Deployments

- LFS1421 - 58
- PNE - 5
- Methot - 4

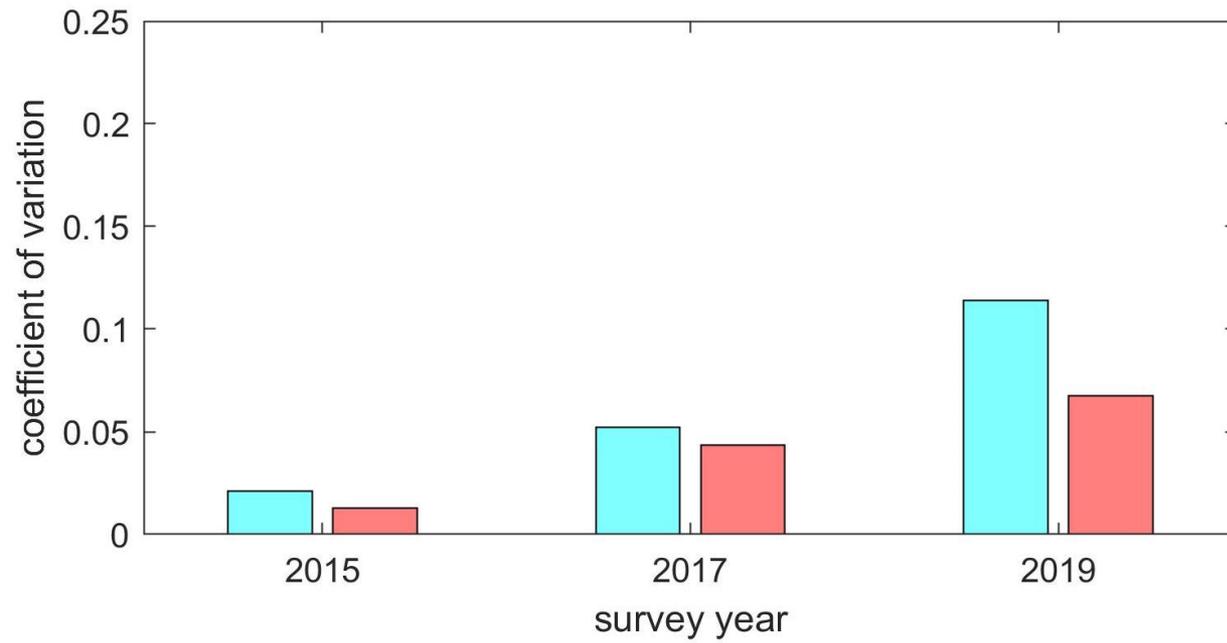
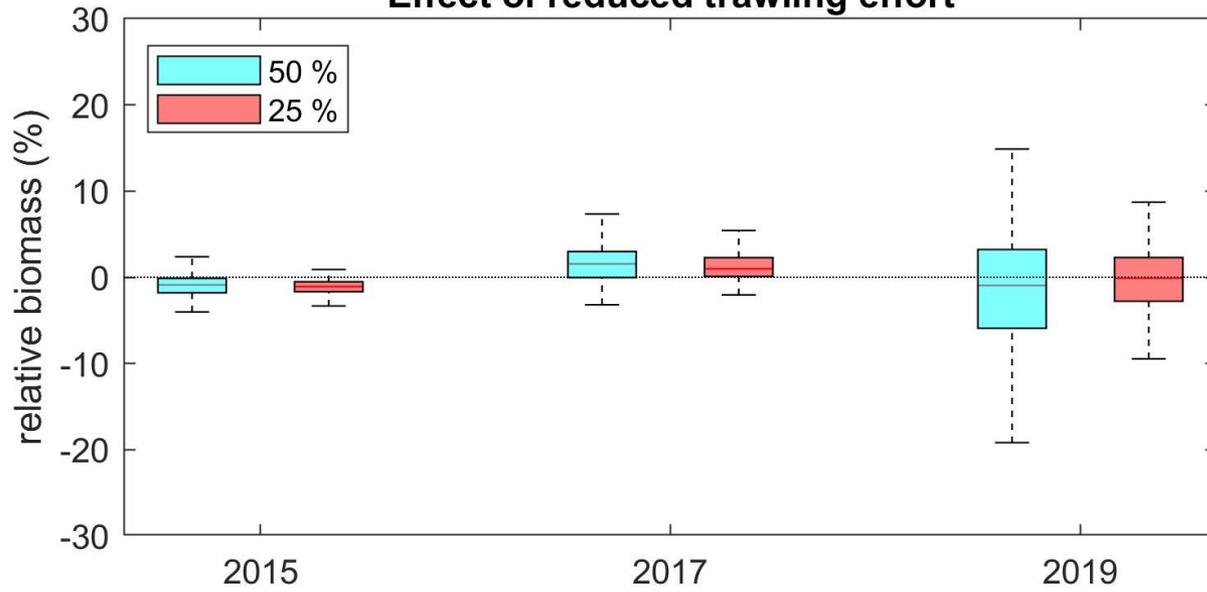
Similar areas in 2019

LFS1421 - 84



Leg 2: June 22-July 10
Areas 620, 630, 640

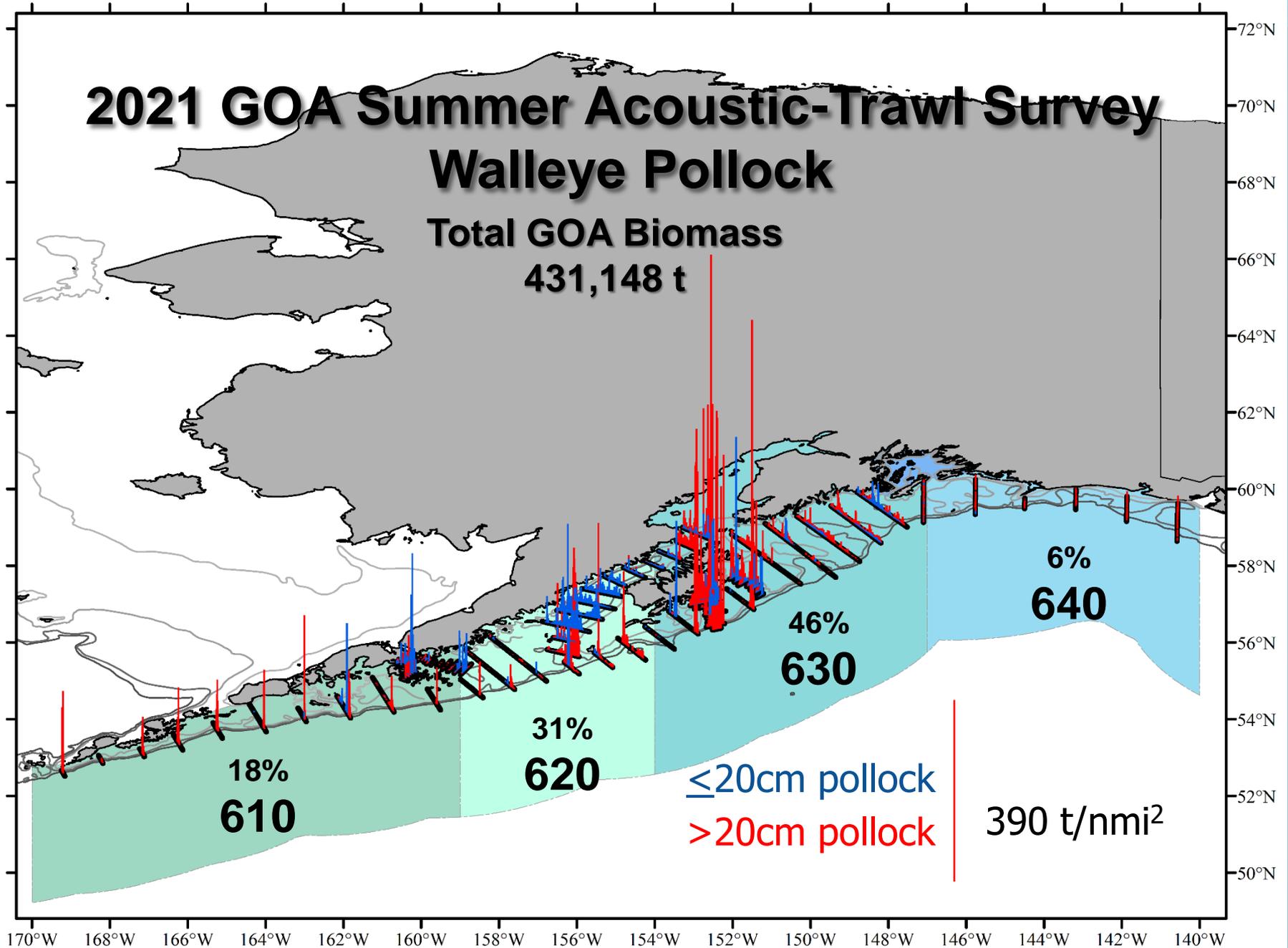
Effect of reduced trawling effort

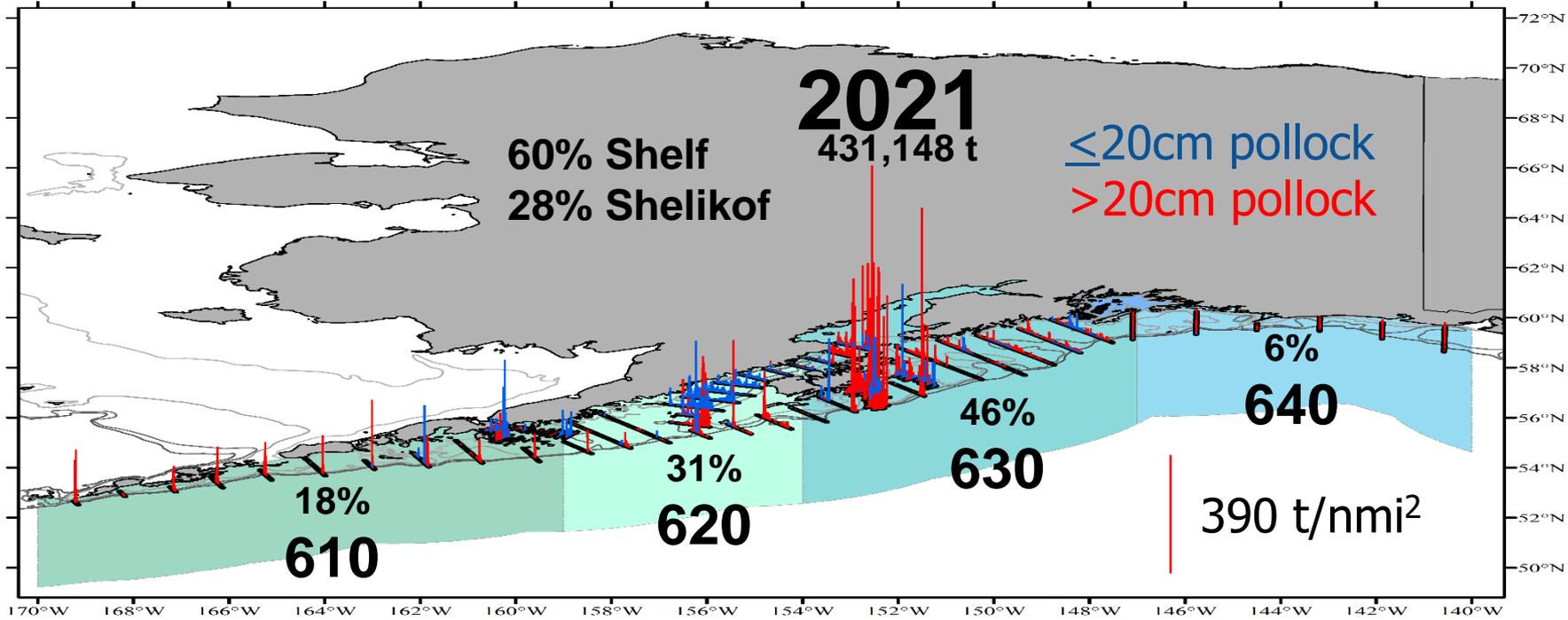
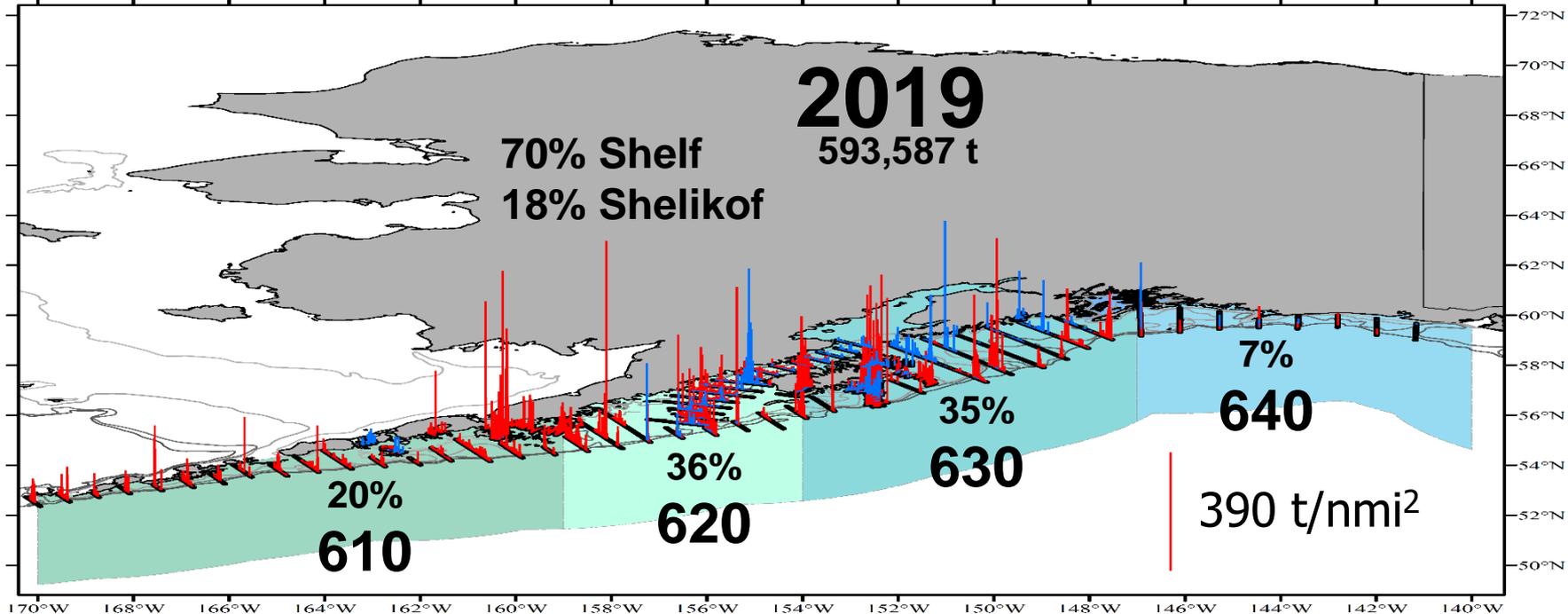


2021 GOA Summer Acoustic-Trawl Survey

Walleye Pollock

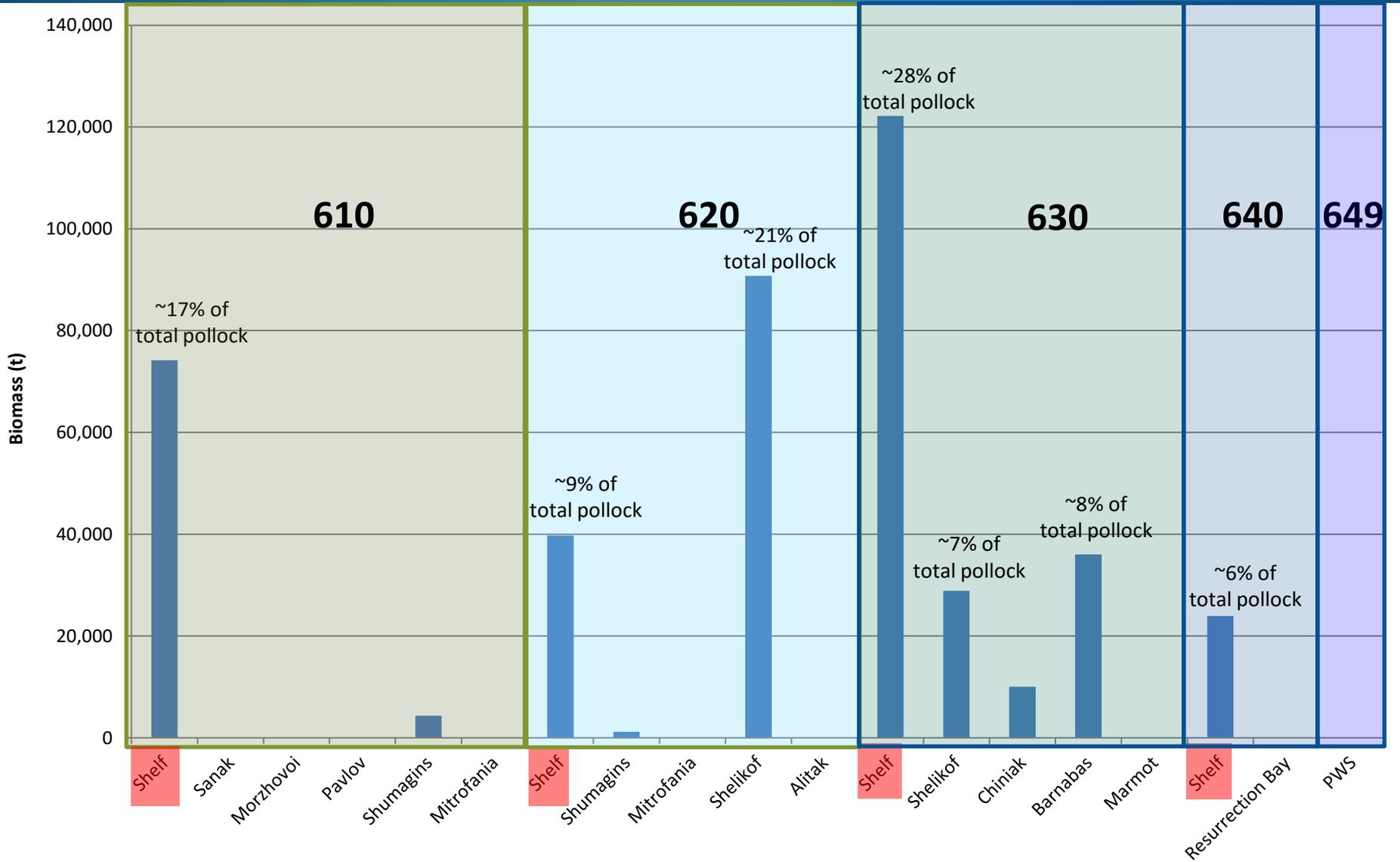
Total GOA Biomass
431,148 t





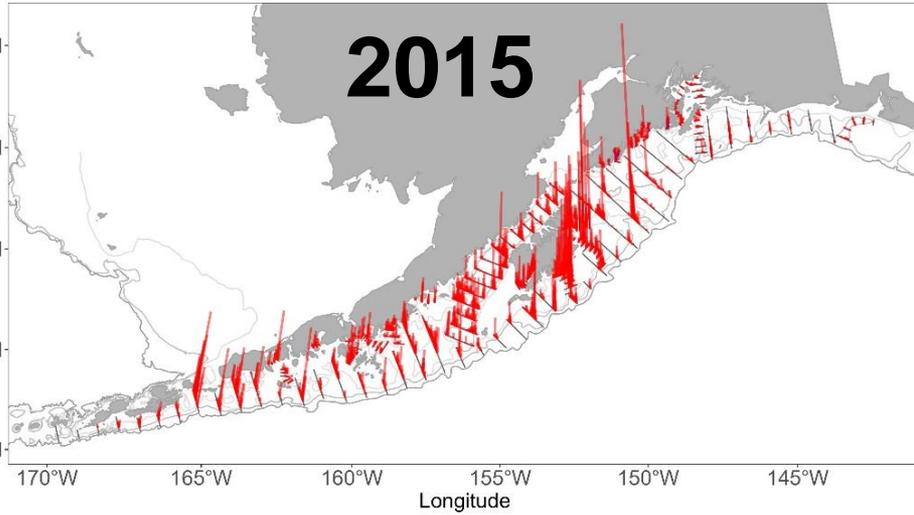
2021 GOA Biomass by Geographic Area

Total GOA Biomass
431,148 t



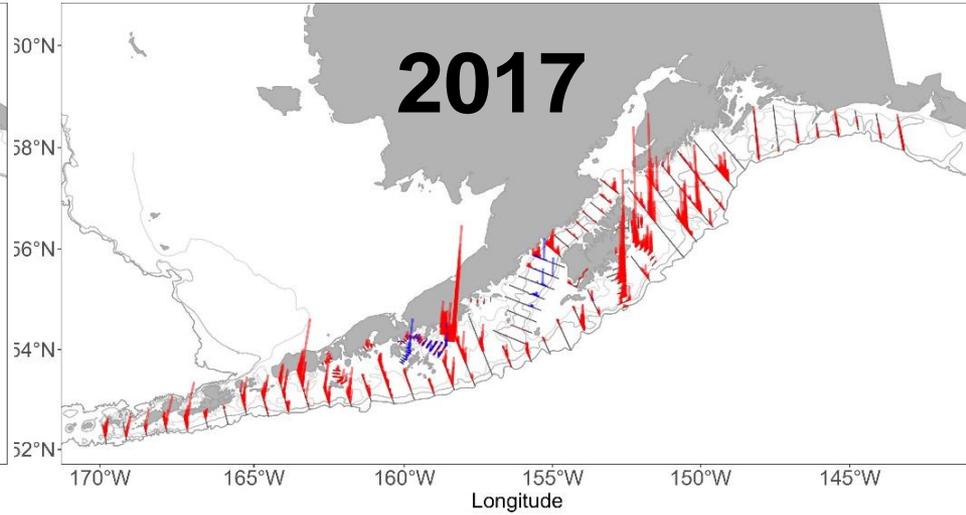
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2015



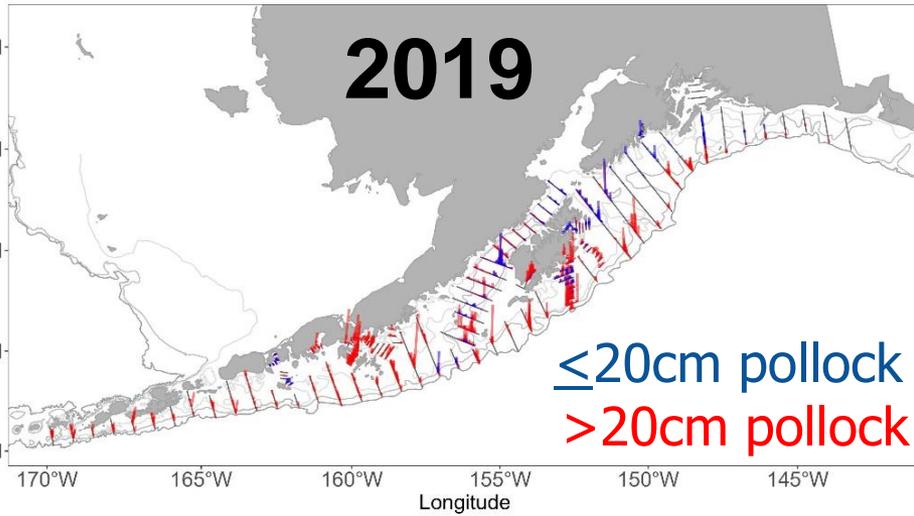
201706

2017



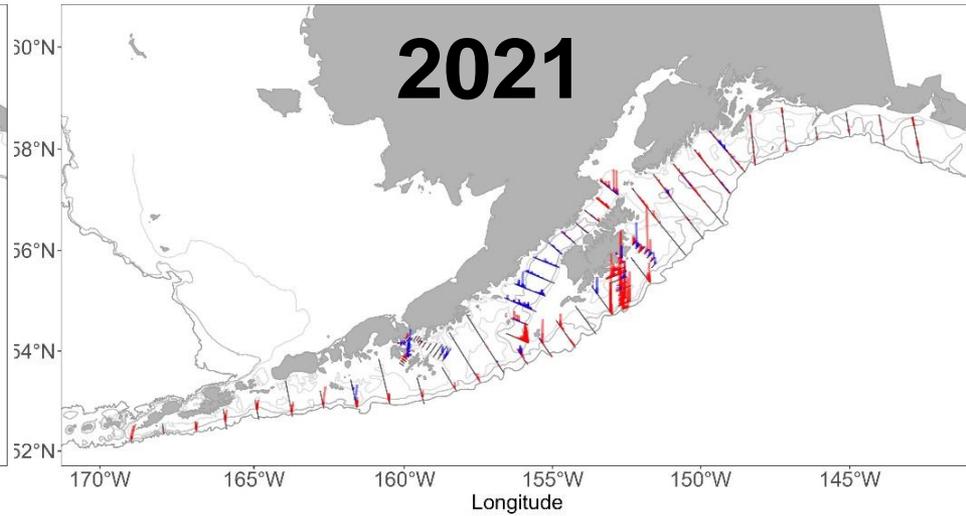
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2019



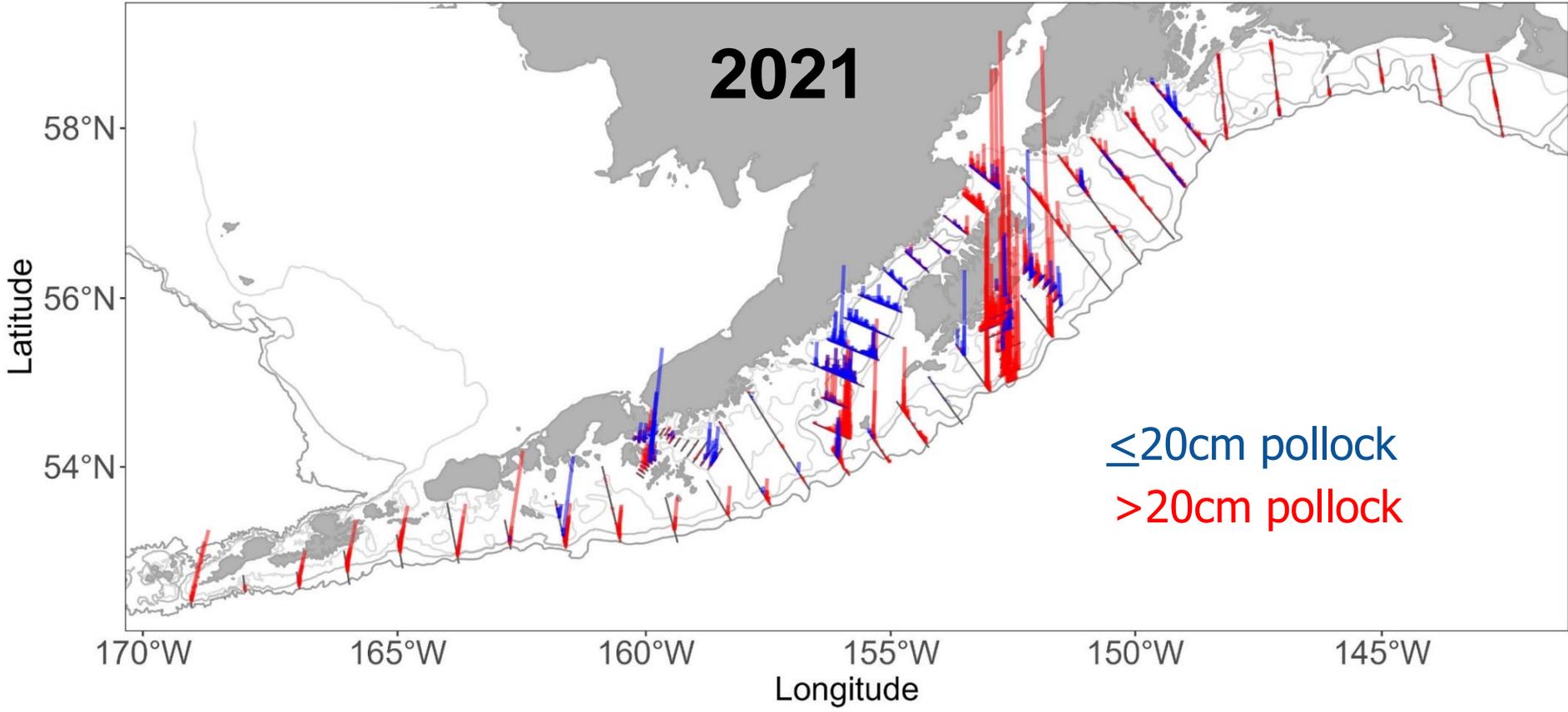
202104

2021

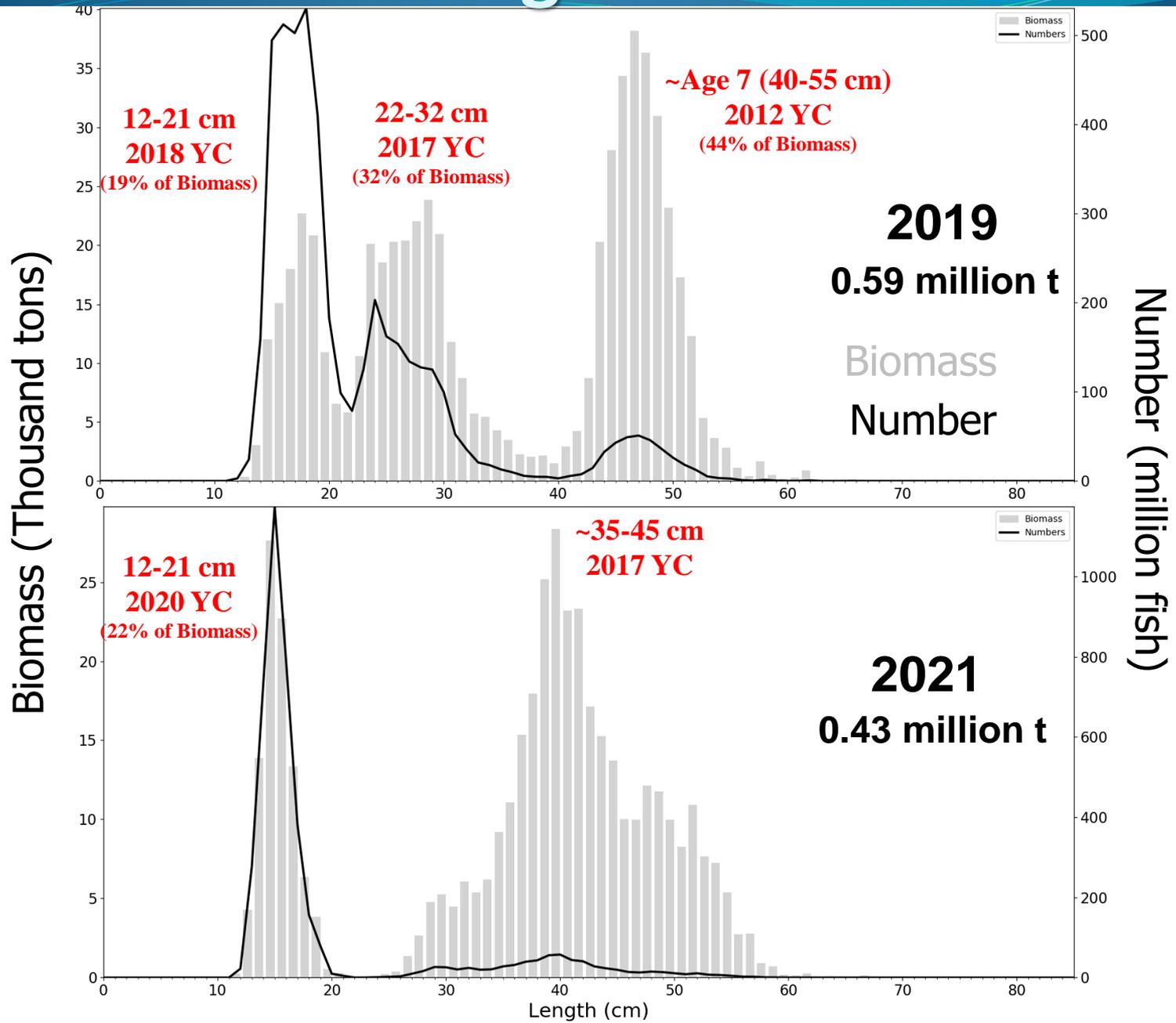


202104

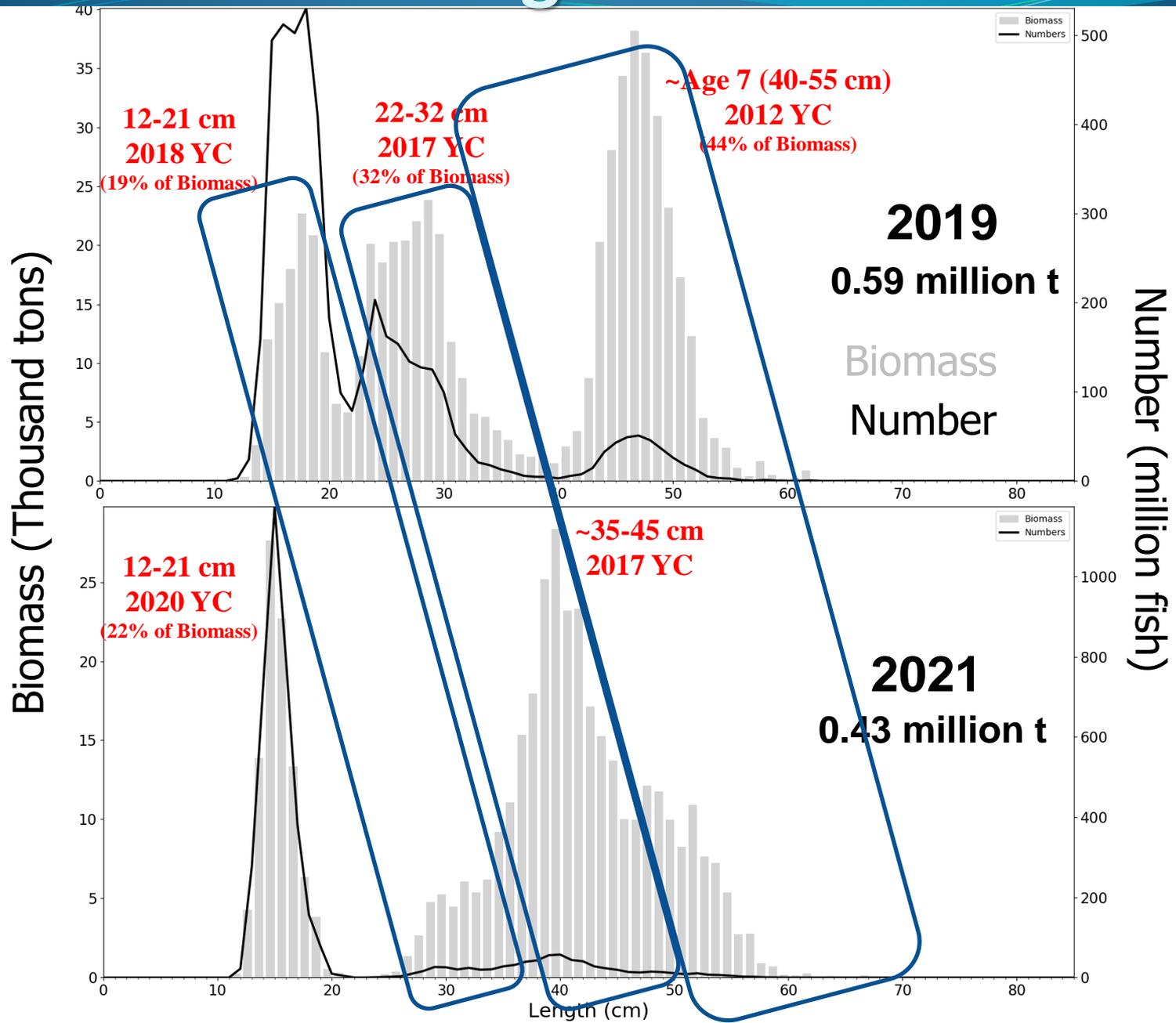
2021



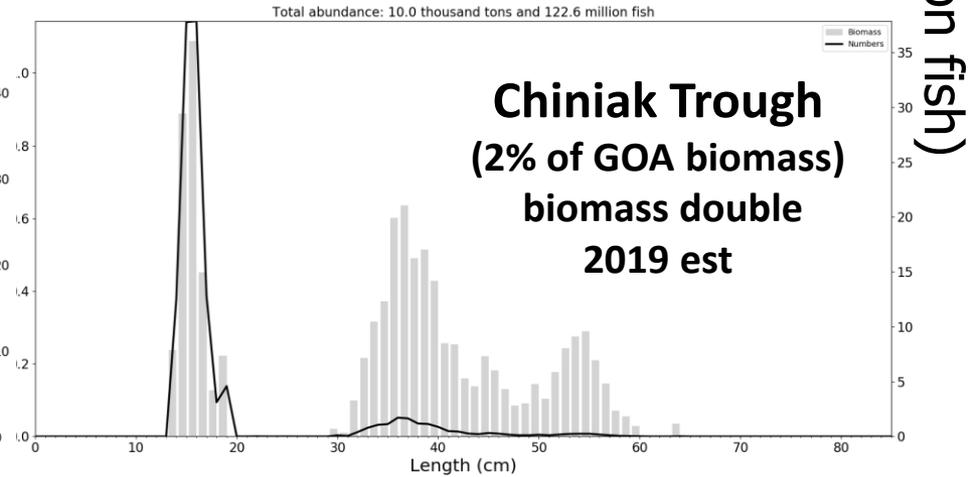
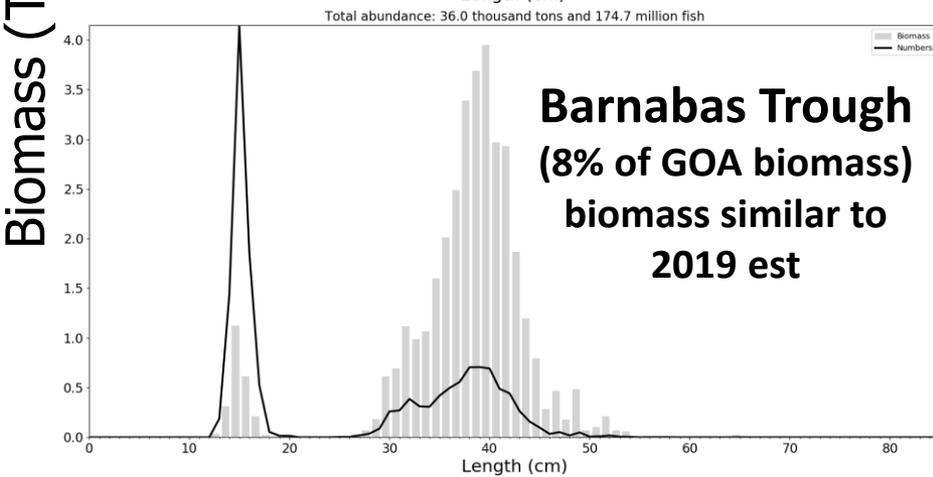
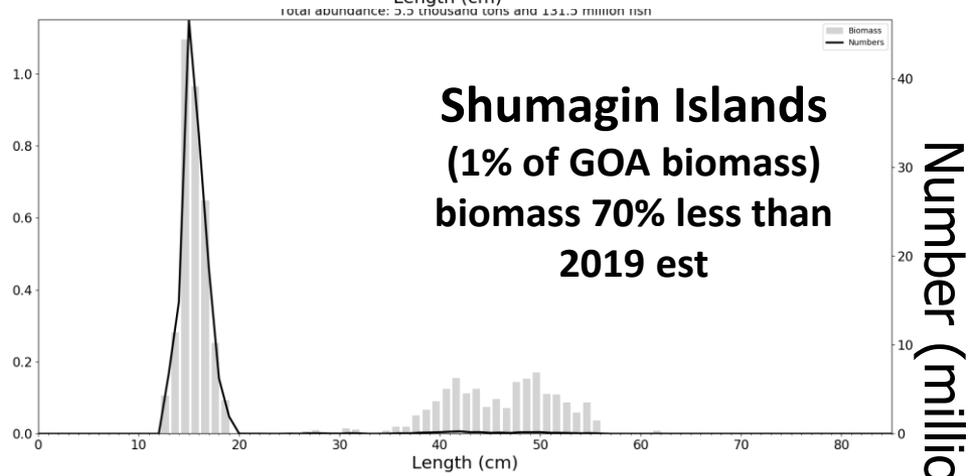
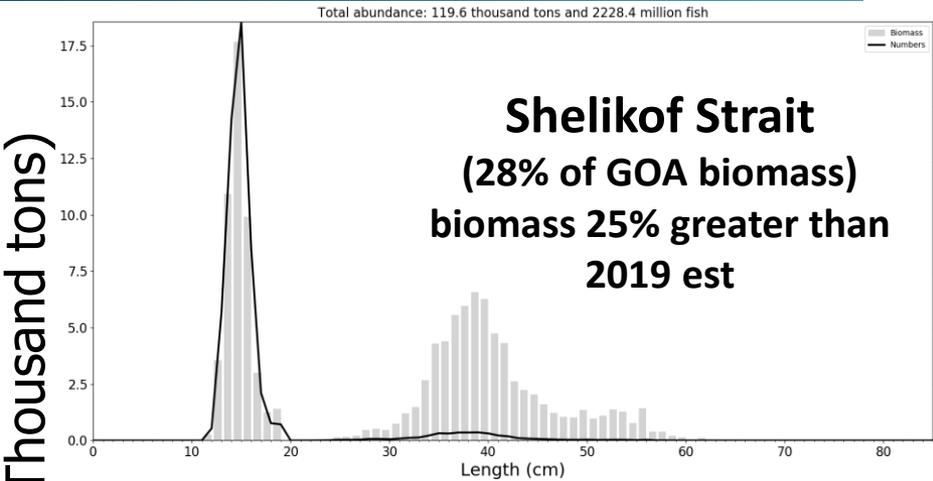
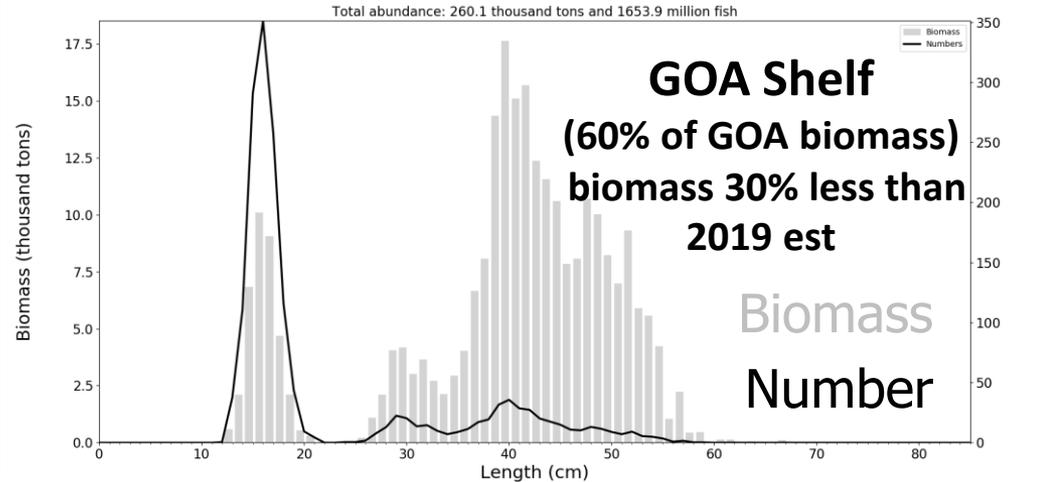
Pollock Length Distribution



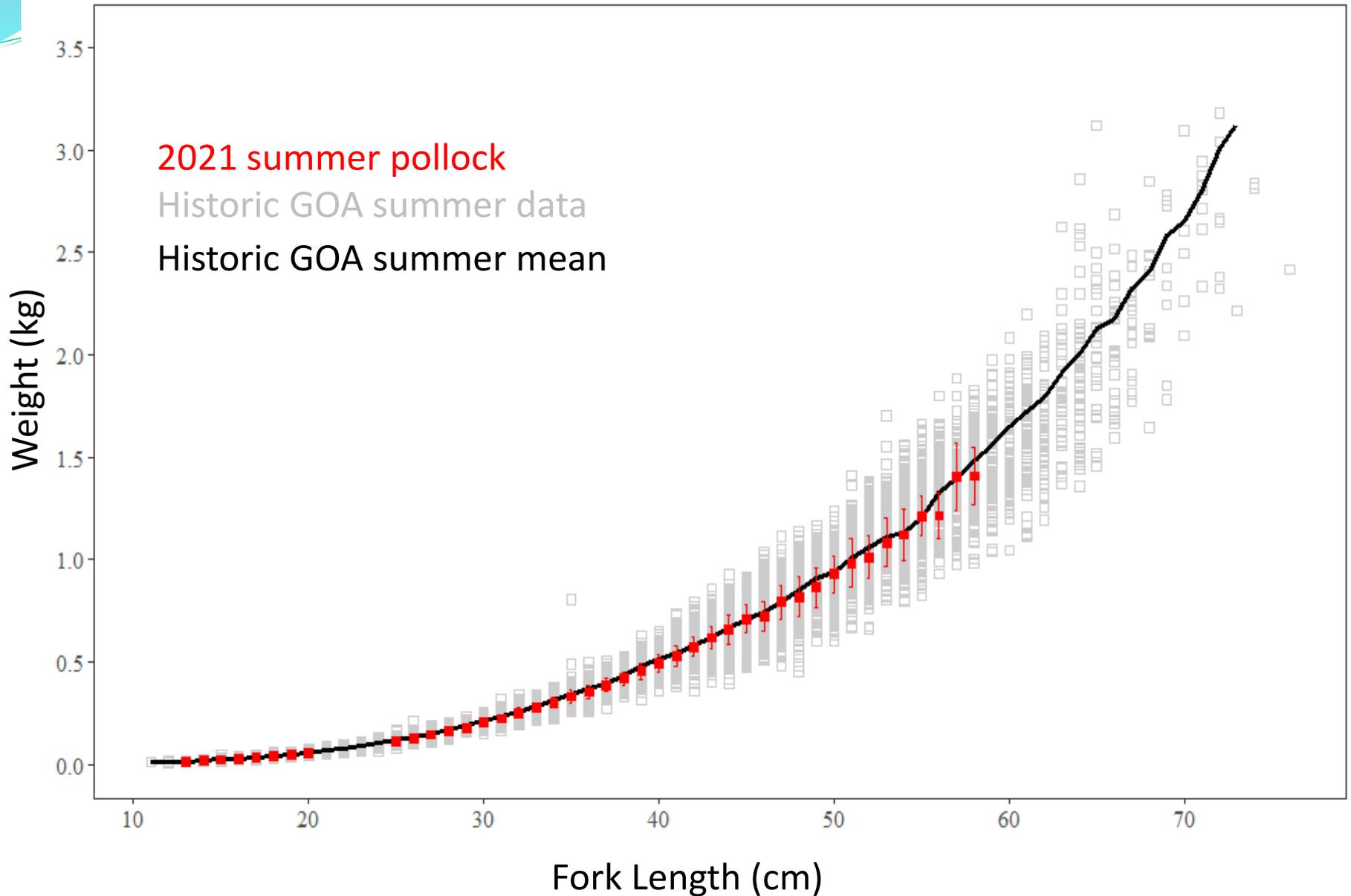
Pollock Length Distribution



Pollock Length Distributions by Area

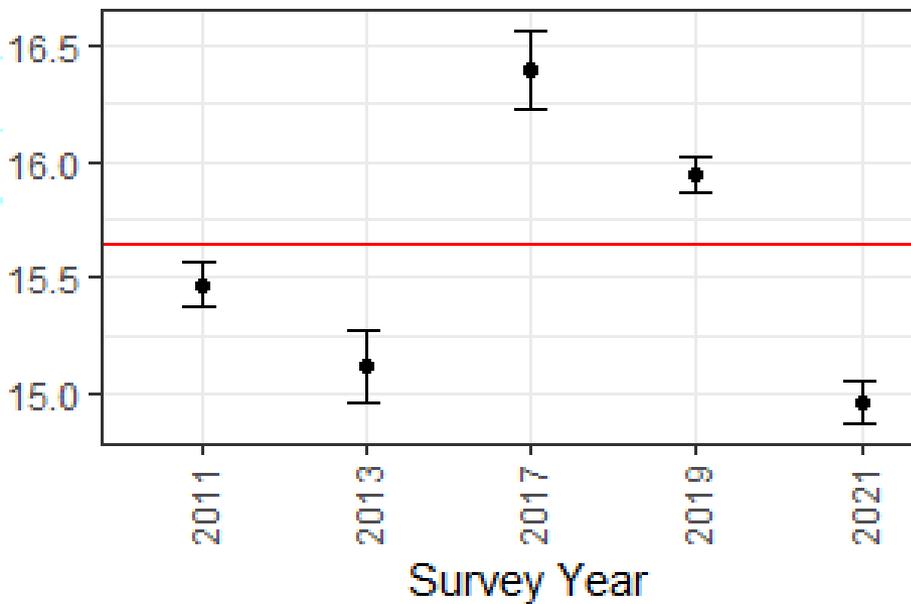


Summer GOA Pollock Weight at Length

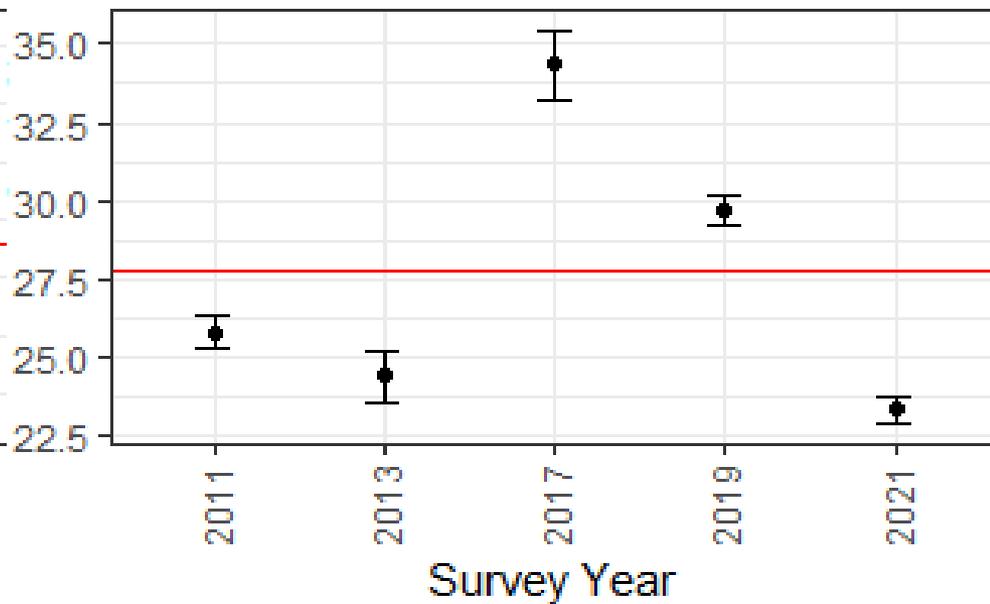


Summer Shelikof Pollock ≤ 20 cm (age-1)

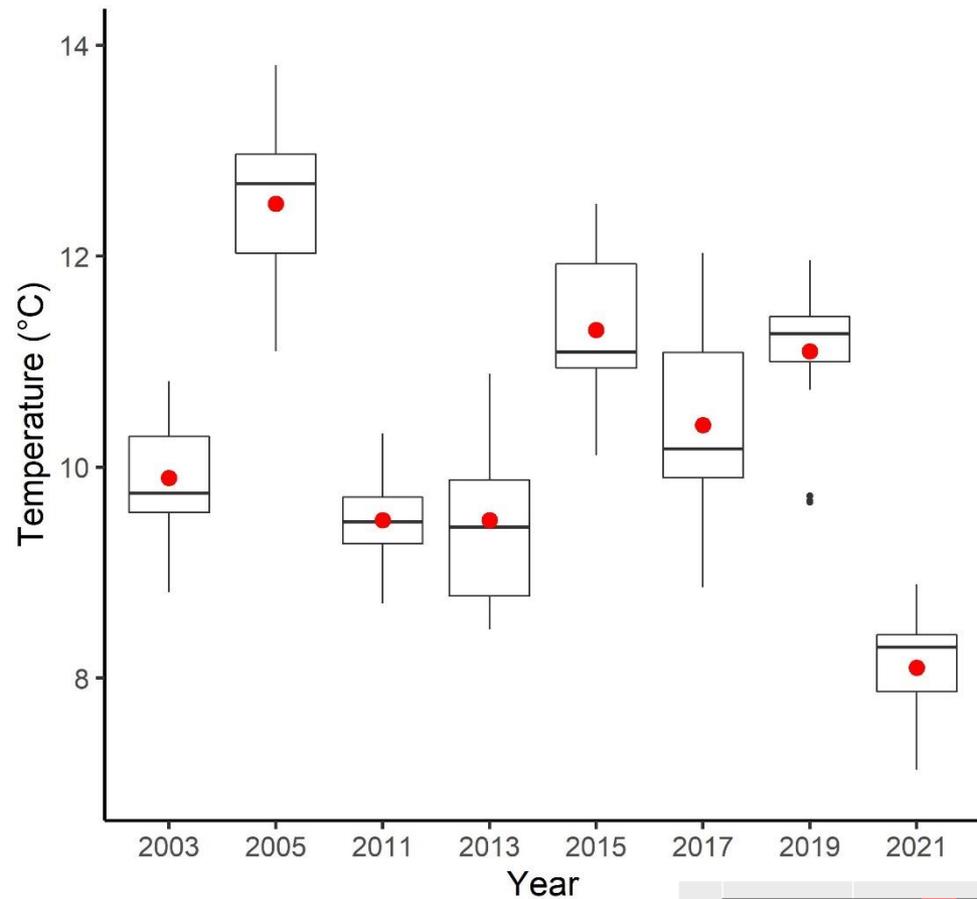
Mean Length (cm)



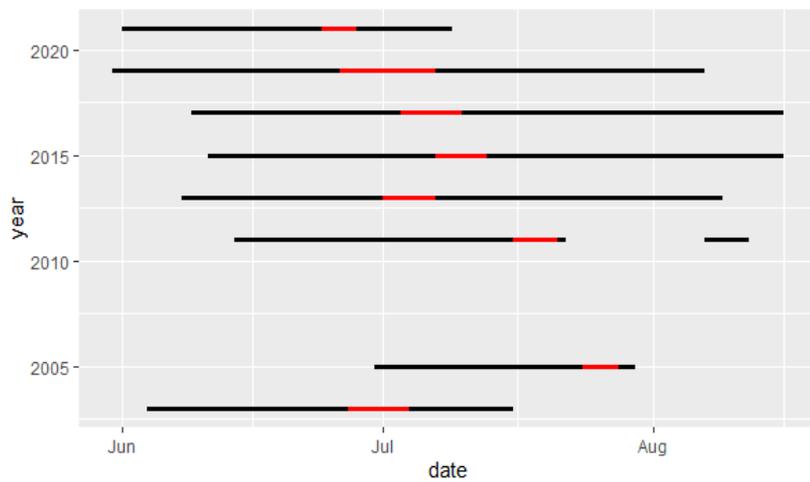
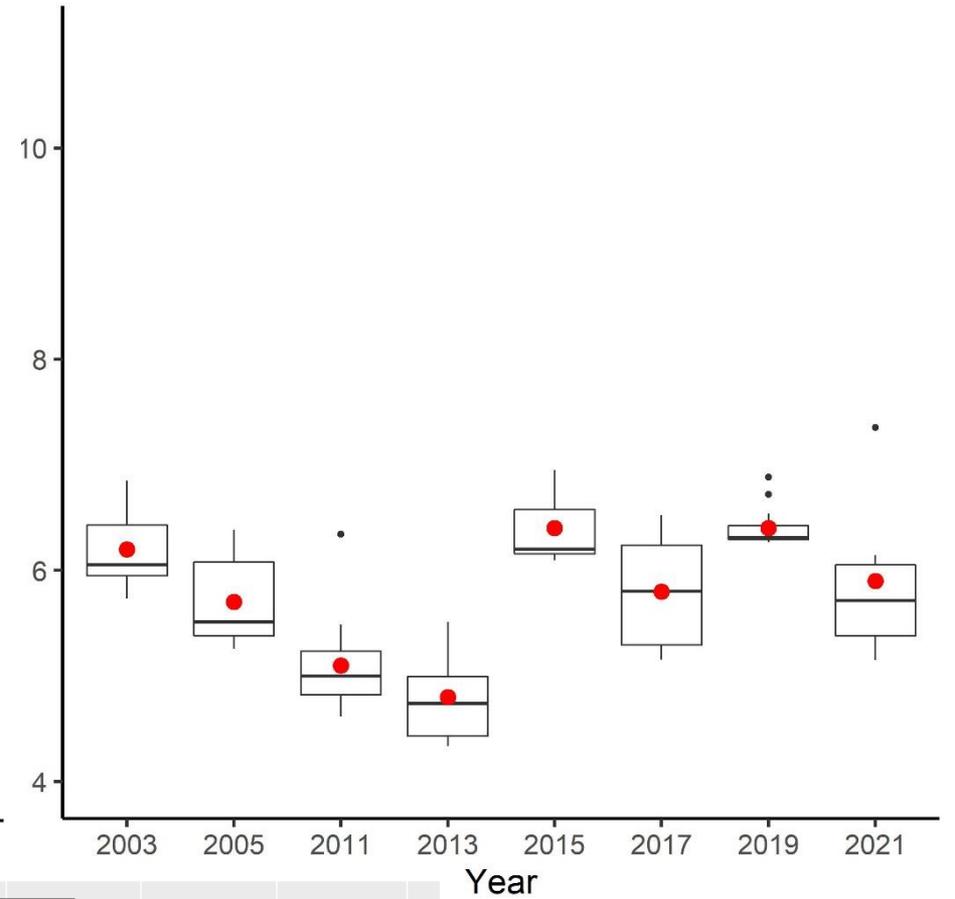
Mean Weight (g)



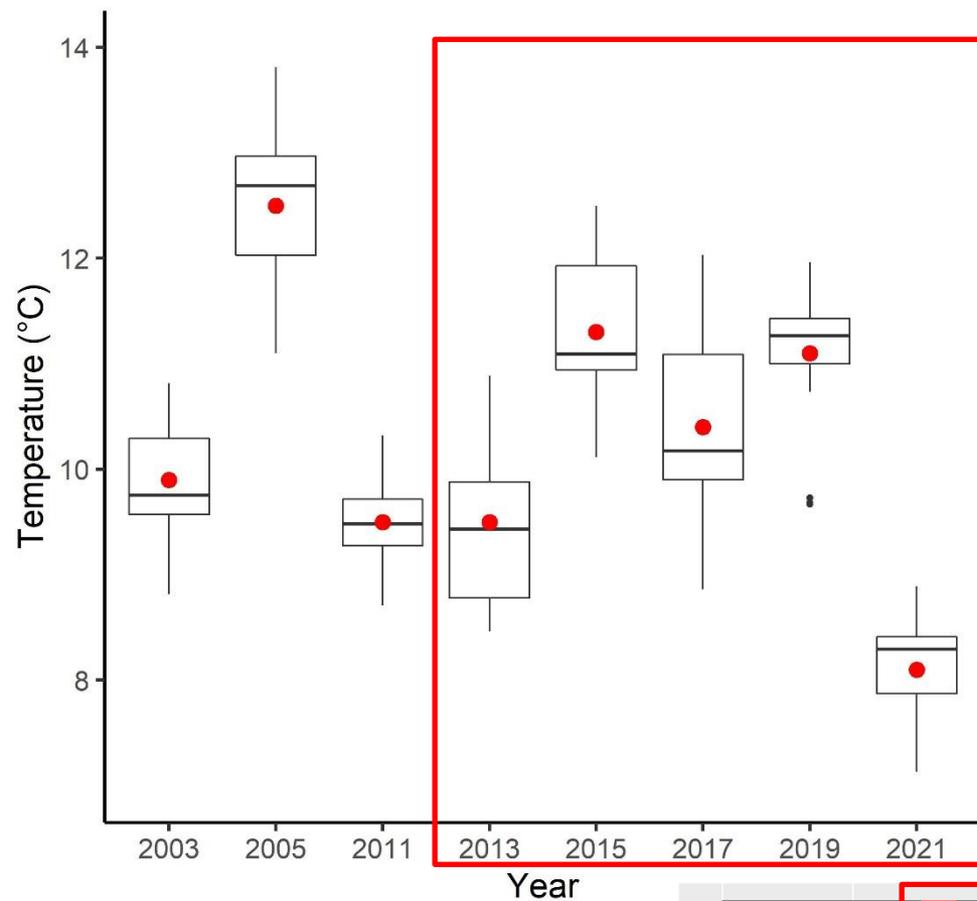
Avg SST ($^{\circ}\text{C}$) in Shelikof



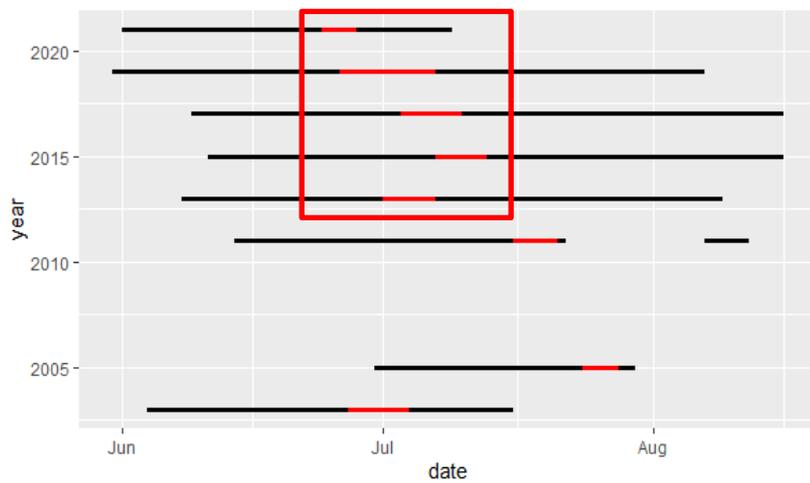
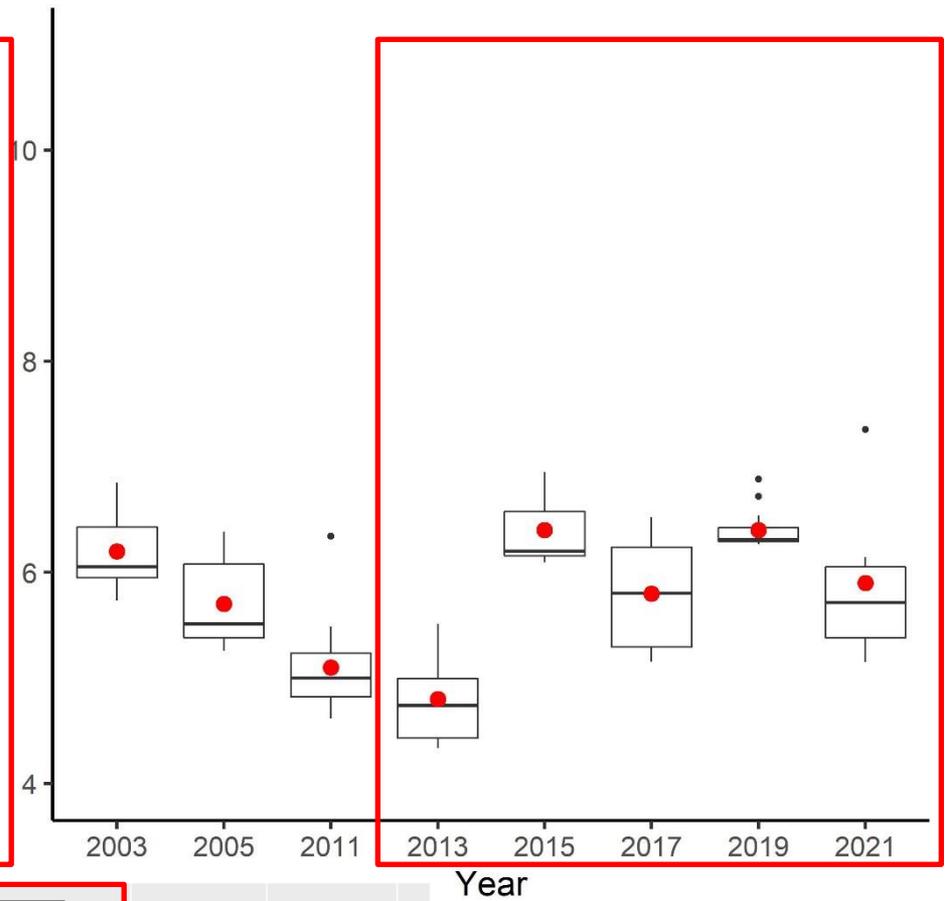
Avg Temperature ($^{\circ}\text{C}$) at 100m depth in Shelikof



Avg SST ($^{\circ}\text{C}$) in Shelikof



Avg Temperature ($^{\circ}\text{C}$) at 100m depth in Shelikof

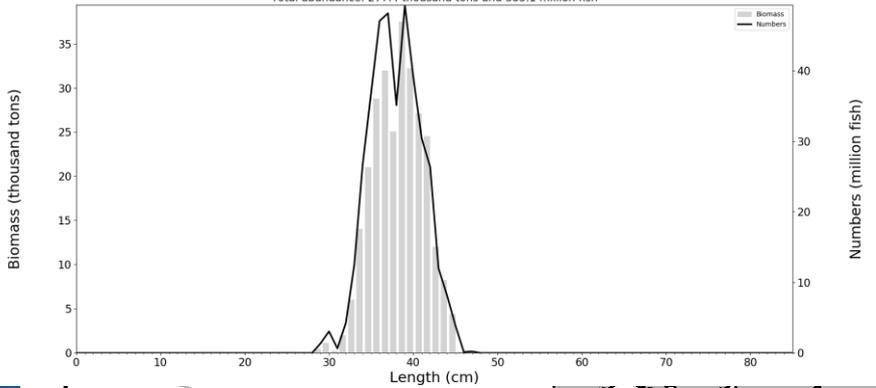


2021 POP

Total GOA Biomass

277,941 t

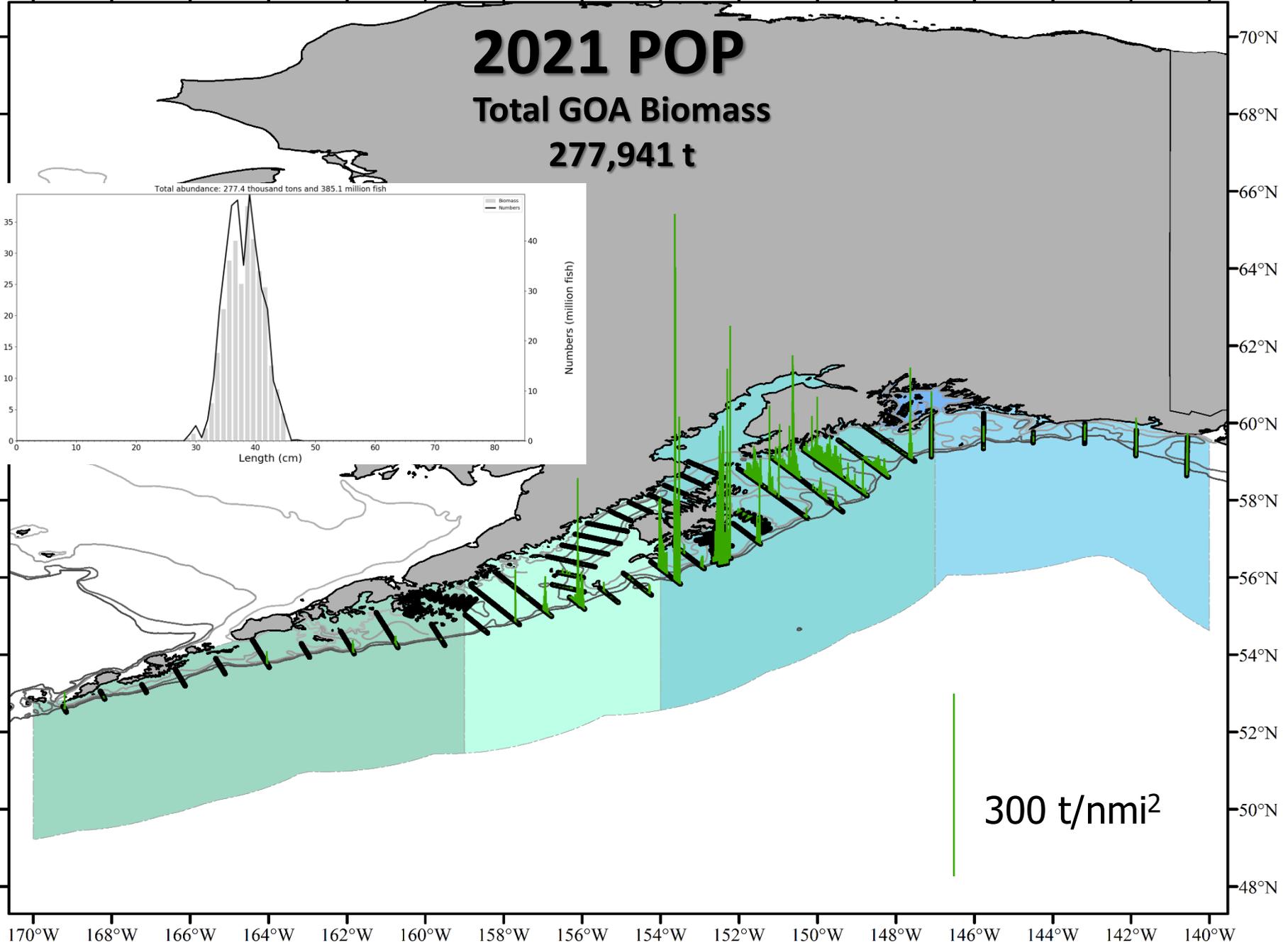
Total abundance: 277.4 thousand tons and 385.1 million fish



Biomass (thousand tons)

Numbers (million fish)

Length (cm)



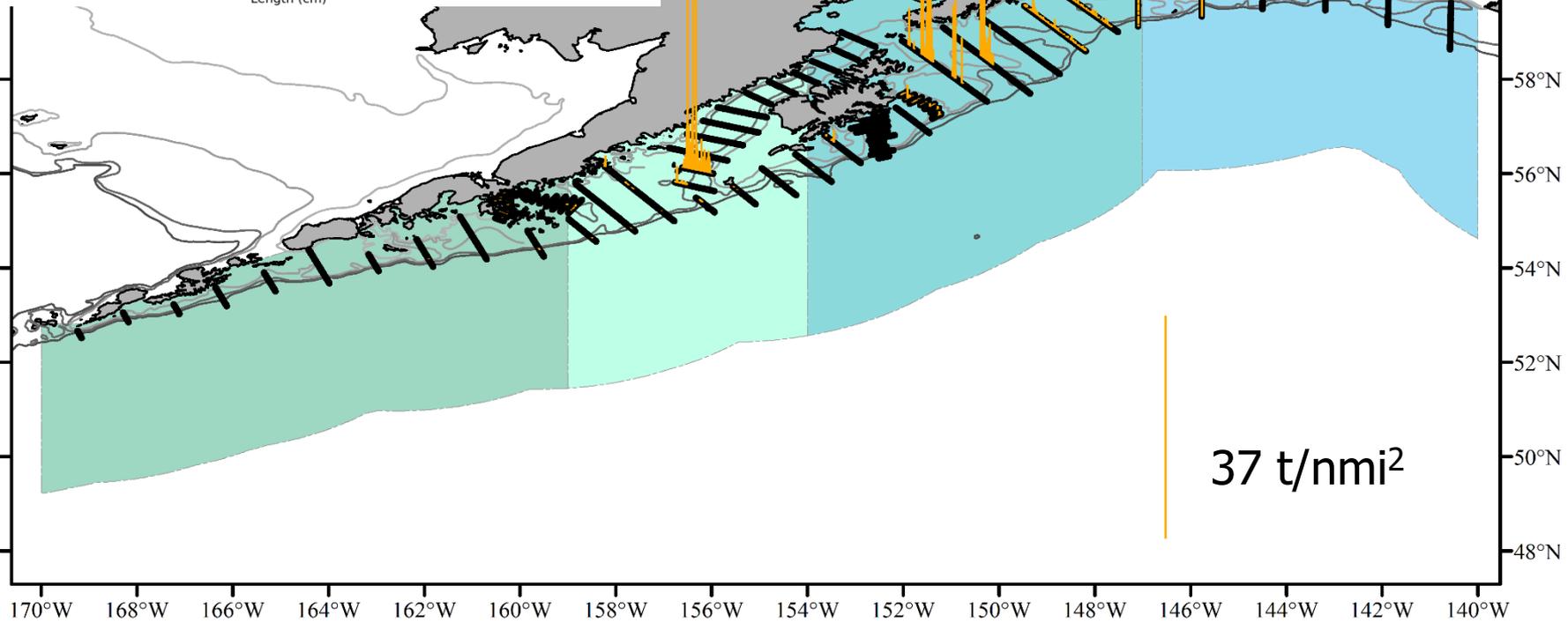
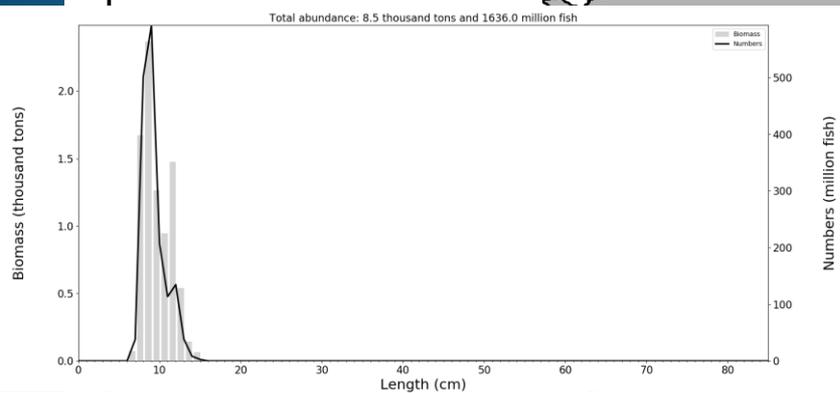
300 t/nmi²

2021 Capelin

Total GOA Biomass

13,223 t

Total abundance: 8.5 thousand tons and 1636.0 million fish



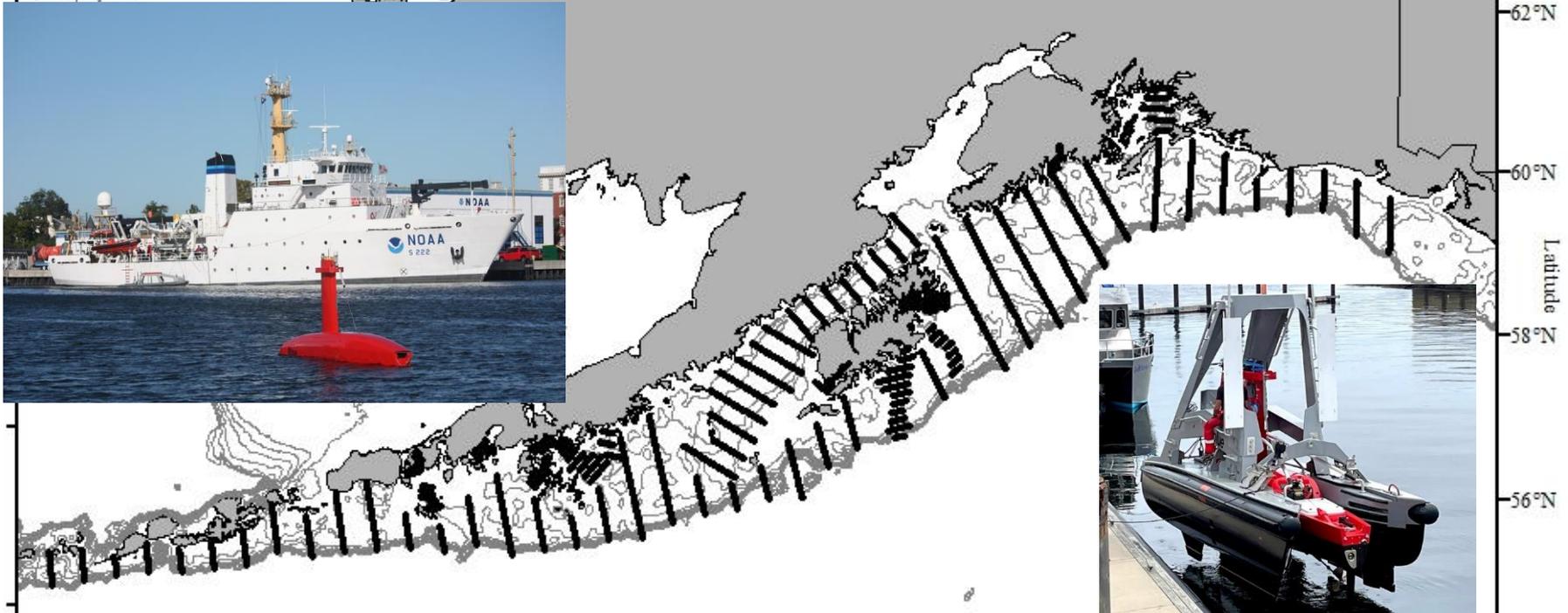
In Summary

Compared to Summer 2019 AT survey

- Pollock – <20 cm (age 1) numbers –  33%
- age1+ biomass –  26%
- POP biomass –  93%
- Capelin biomass –  20%

Summer GOA 2023

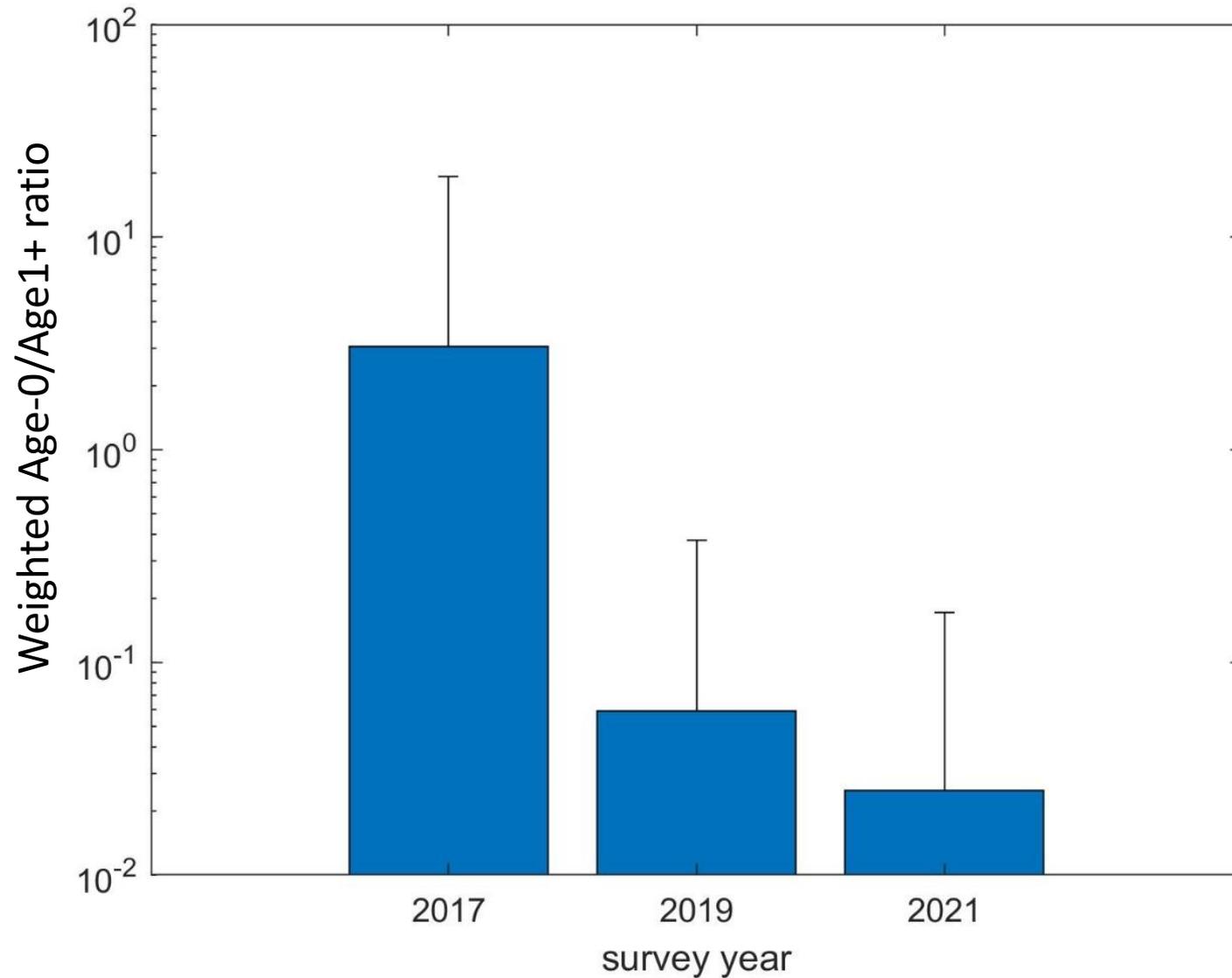
Experimental use of Uncrewed Surface Vehicles (USVs) in tandem with NOAA Ships



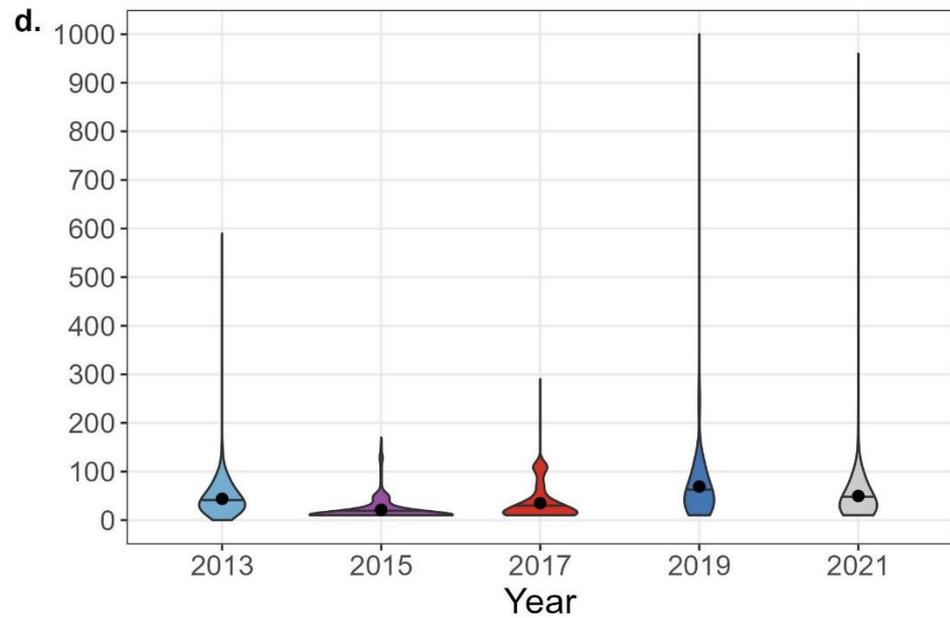
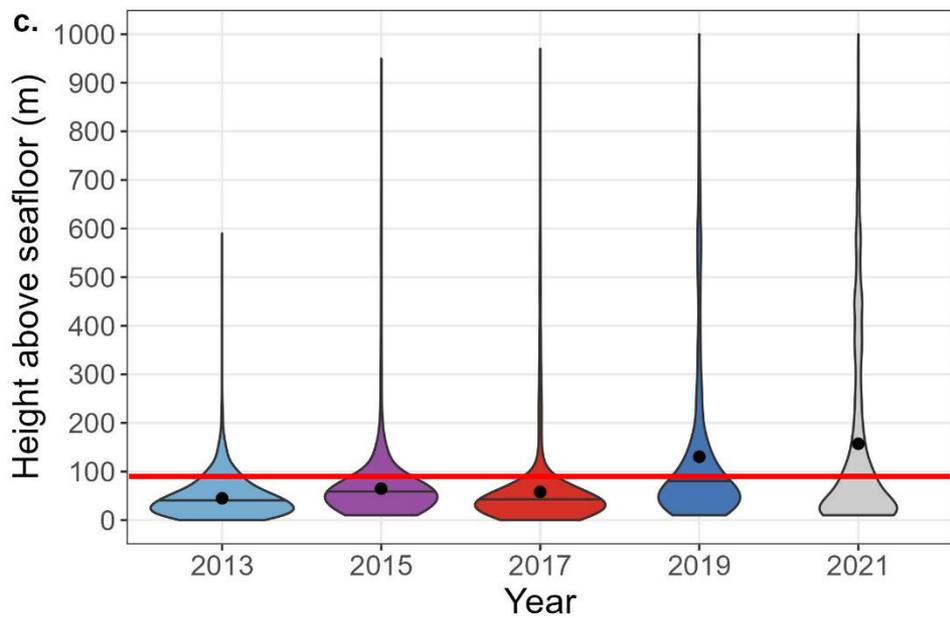
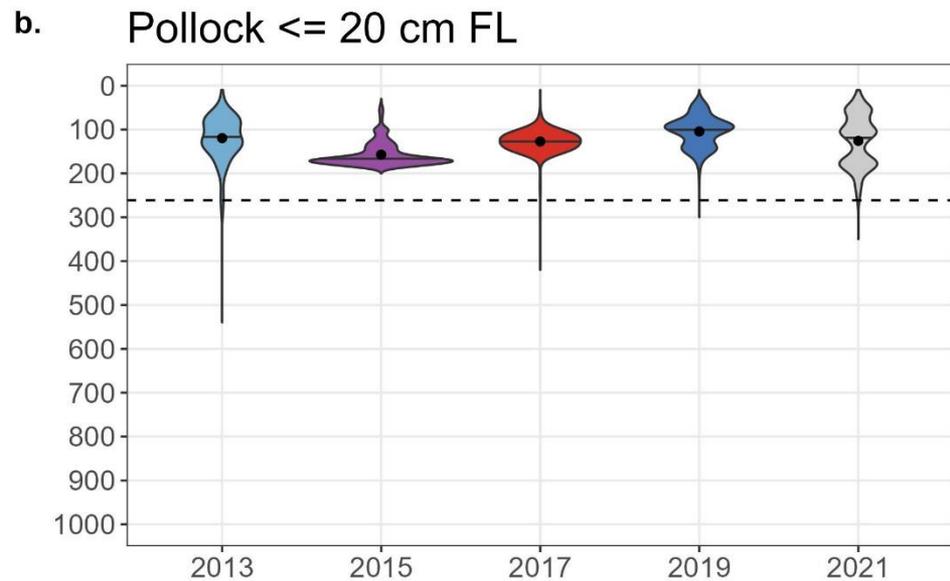
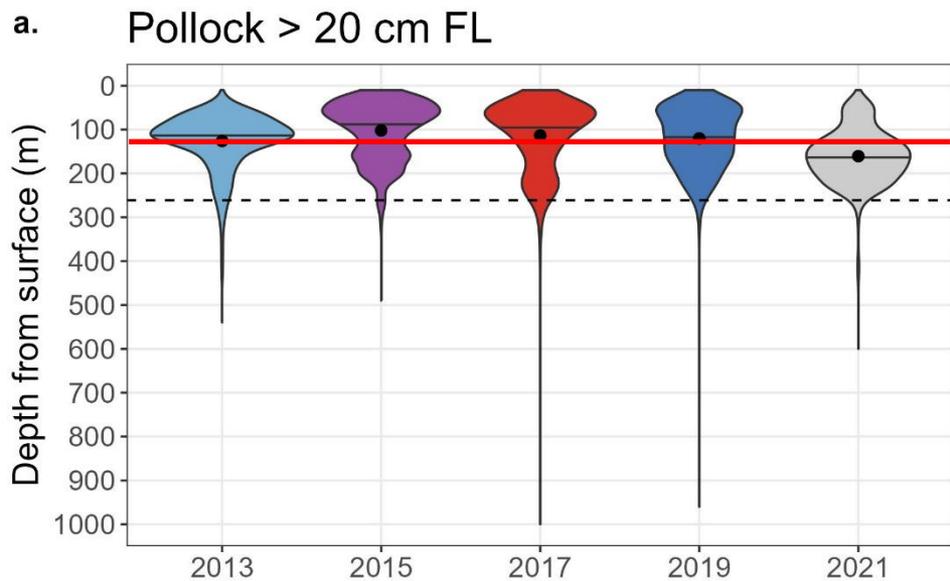
- A powered USV working in tandem with a NOAA ship has the potential to reduce ship time requirements for acoustic-trawl and ocean mapping surveys by $\sim 1/3$.
- The USV must be fast enough to keep up with the ship. The USV surveys adjacent transects while freeing up the ship to trawl.
- Specification and purchase of a suitable USV in progress, FY2021
- Initial testing of USV on 2023 GOA acoustic survey

Questions?

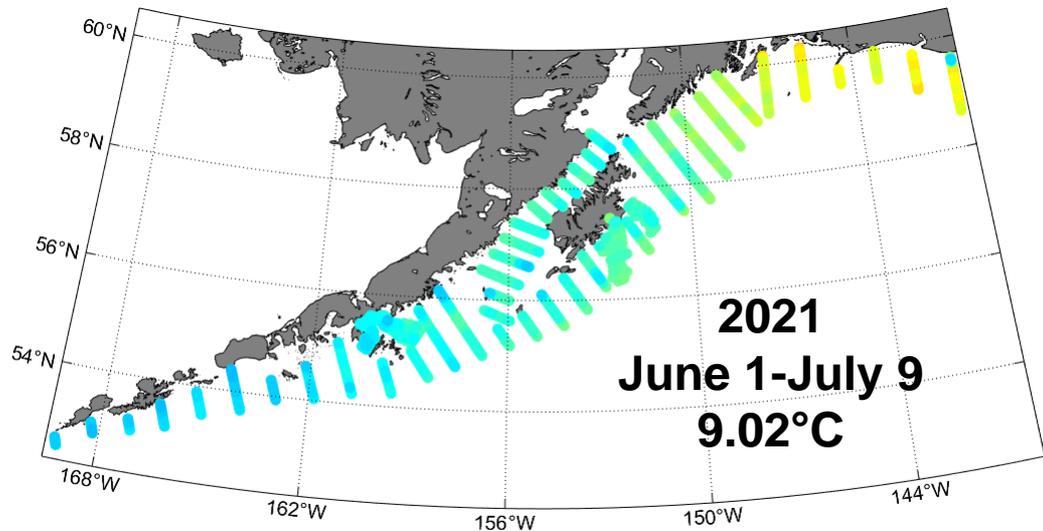
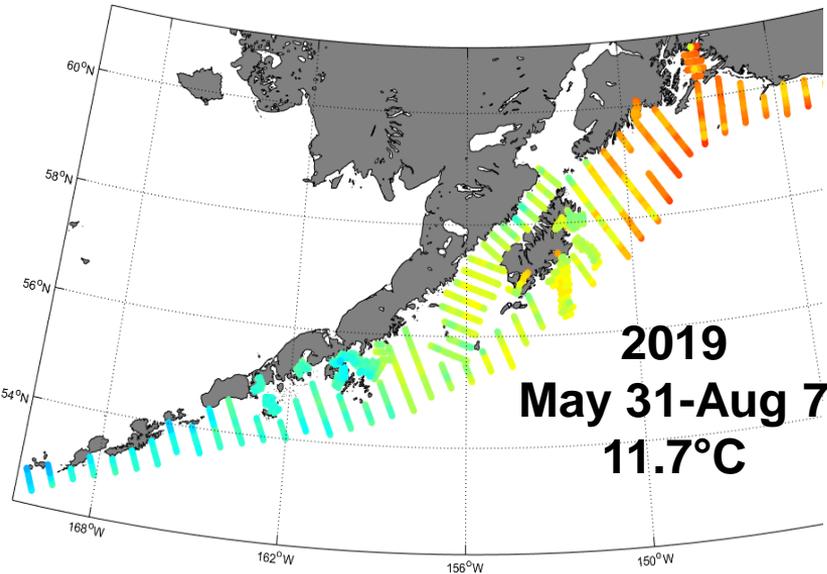
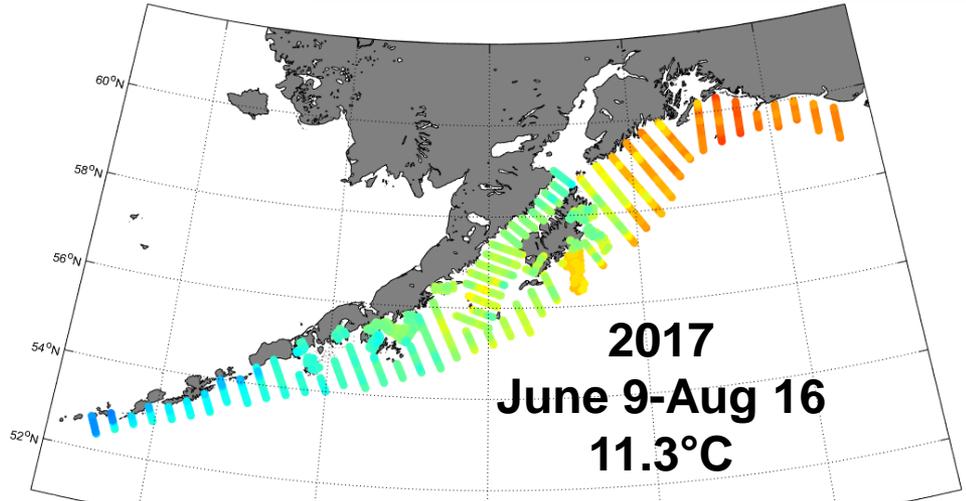
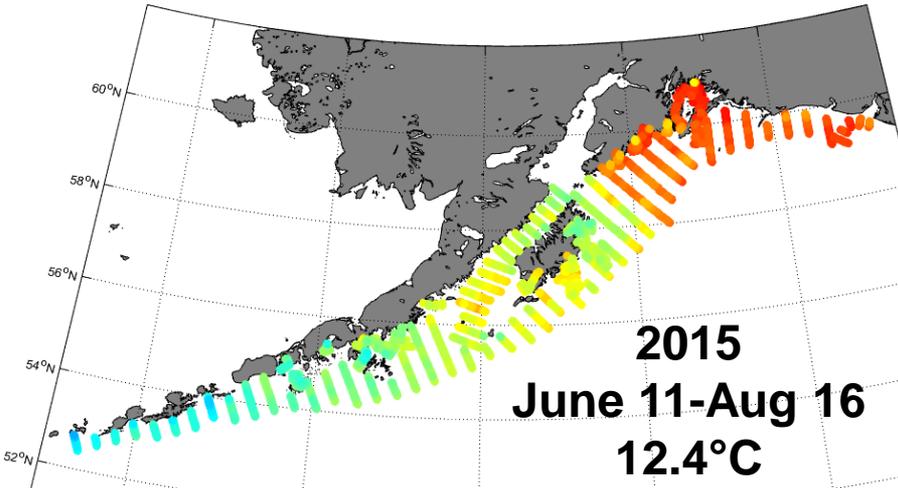
Ratio of Age0/Age 1+ Pollock from CamTrawl counts



Pollock Location in the Water Column on Shelf Transects



Sea Surface Temperatures



Temperature (°C)

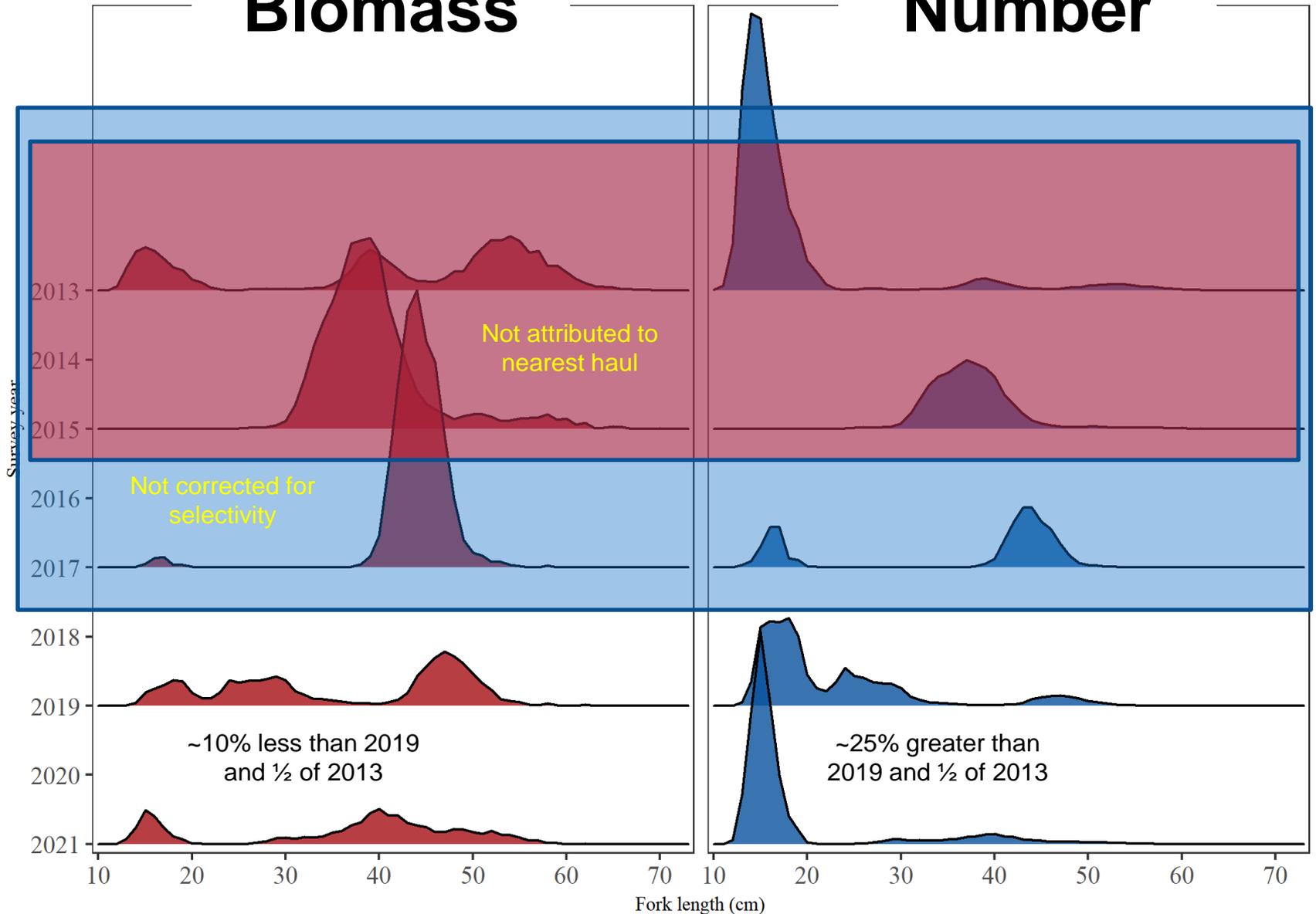
0 2 4 6 8 10 12 14 16 18 20



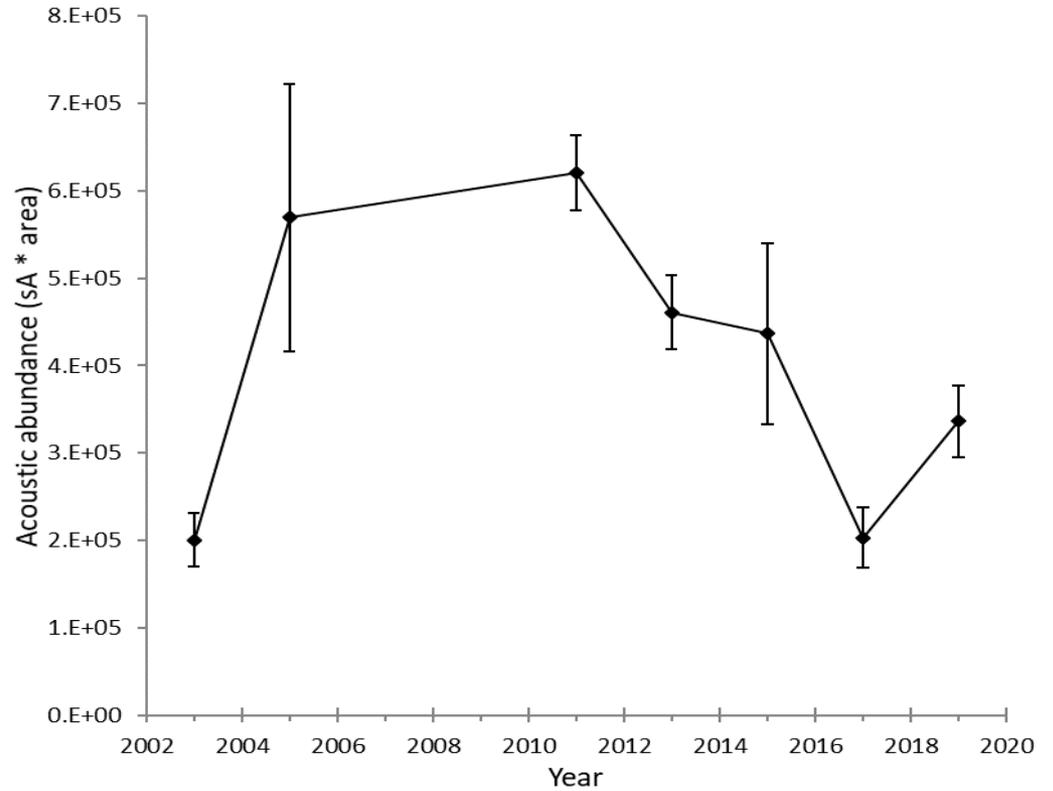
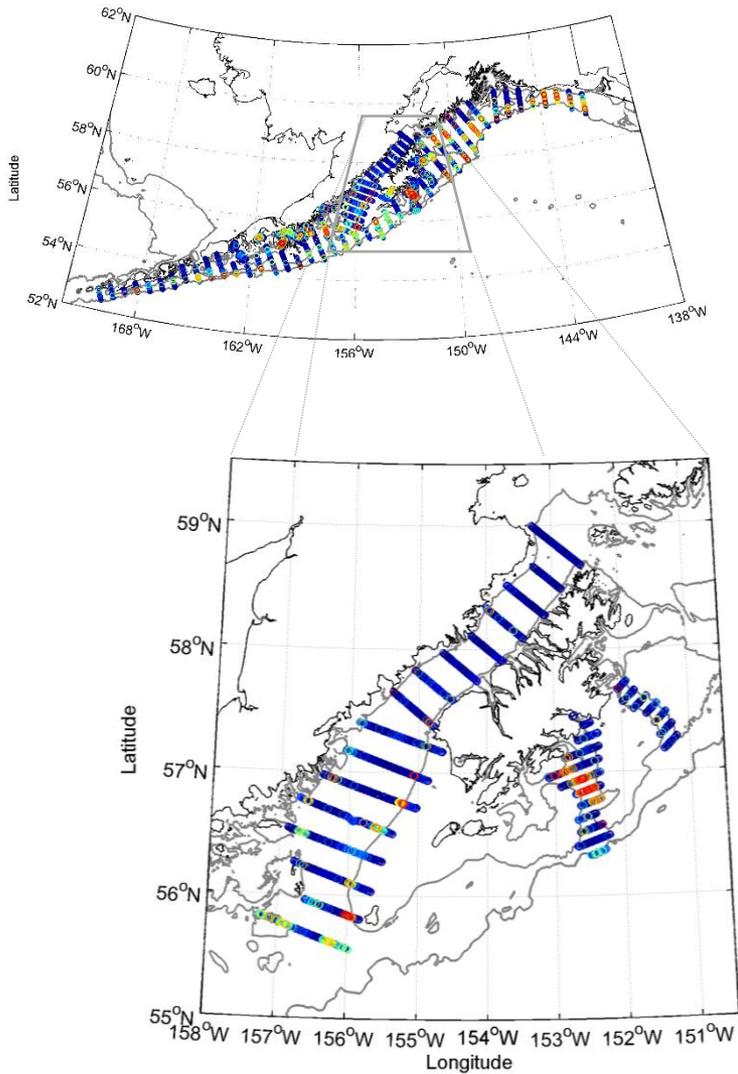
Biomass and numbers at length by year

Biomass

Number



Euphausiid ('krill') relative abundance index



Will update index
for GOA 2021