



# Results from 2023 winter Gulf of Alaska

pre-spawning pollock acoustic-trawl surveys  
Shumagin Islands/Shelikof Strait

Denise McKelvey\*

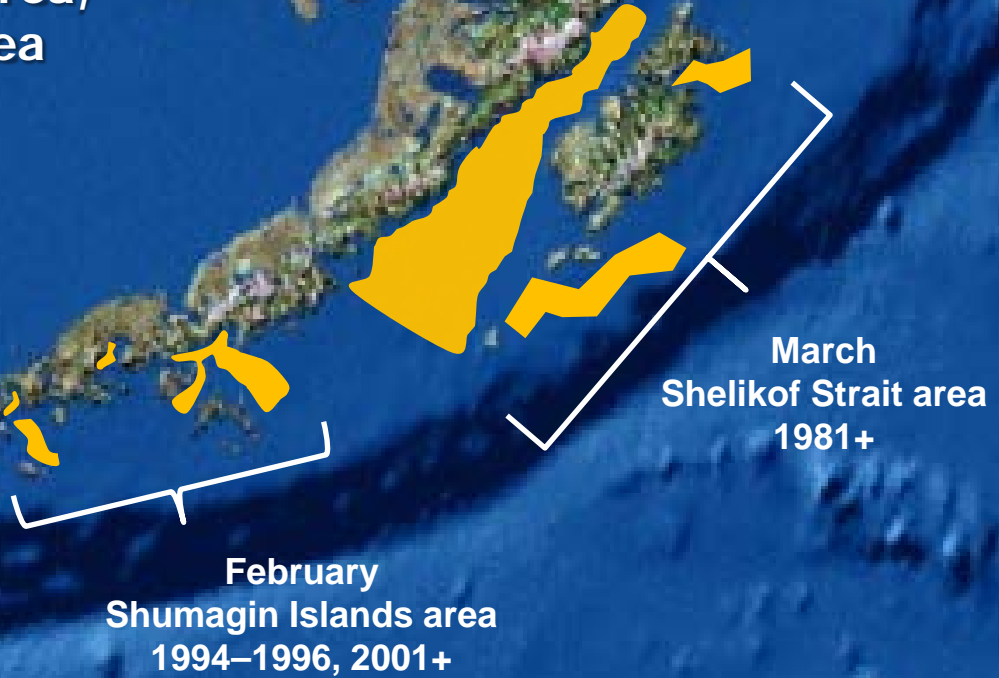
Taina Honkalehto

Darin Jones

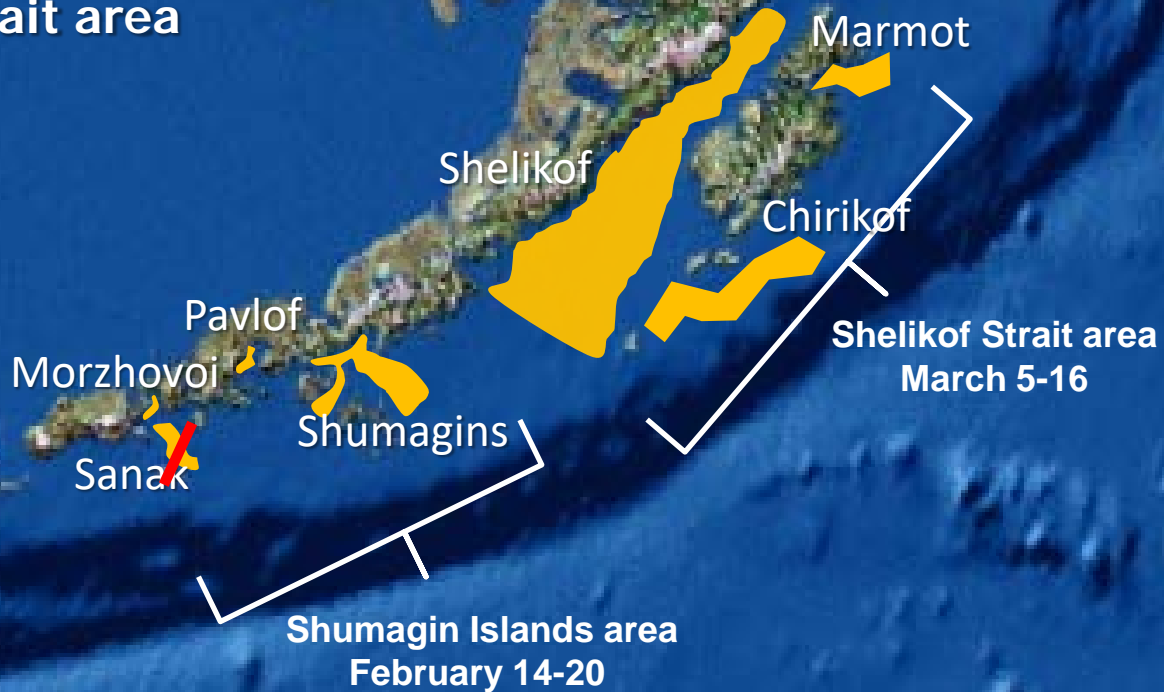
Abigail McCarthy

September 20, 2023

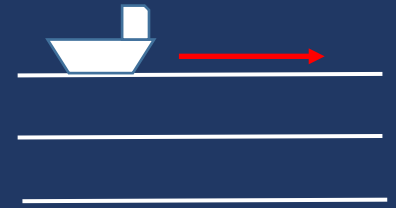
**2023**  
**Acoustic Trawl Surveys**  
**Shumagin Islands area,**  
**Shelikof Strait area**



**2023**  
**Shumagin Islands area,**  
**Shelikof Strait area**



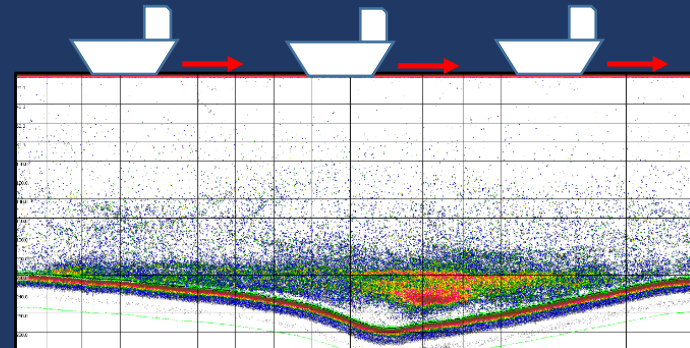
# Acoustic-Trawl Survey Methods



Platform: NOAA ship *Oscar Dyson*  
Winter surveys 24 hrs/day  
Transects spaced over specific areas

## Acoustics

Measure calibrated 38 kHz backscatter  
16 m below surface to 0.5 m above the seafloor



## Trawl

Sample backscatter using trawl nets to determine species  
midwater net (1/8 " liner)  
identify and measure lots of fish/inverts  
apply net selectivity corrections

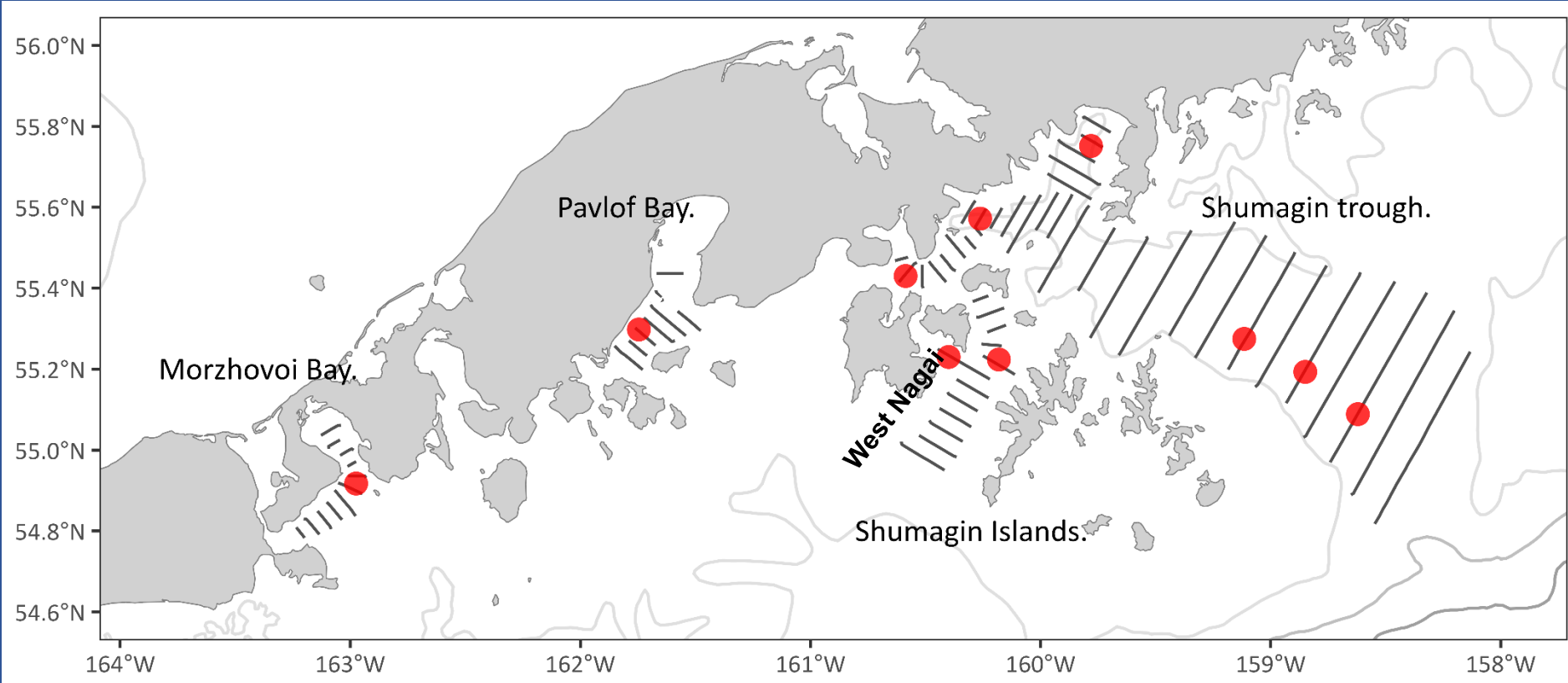


# Acoustic-Trawl Survey Methods

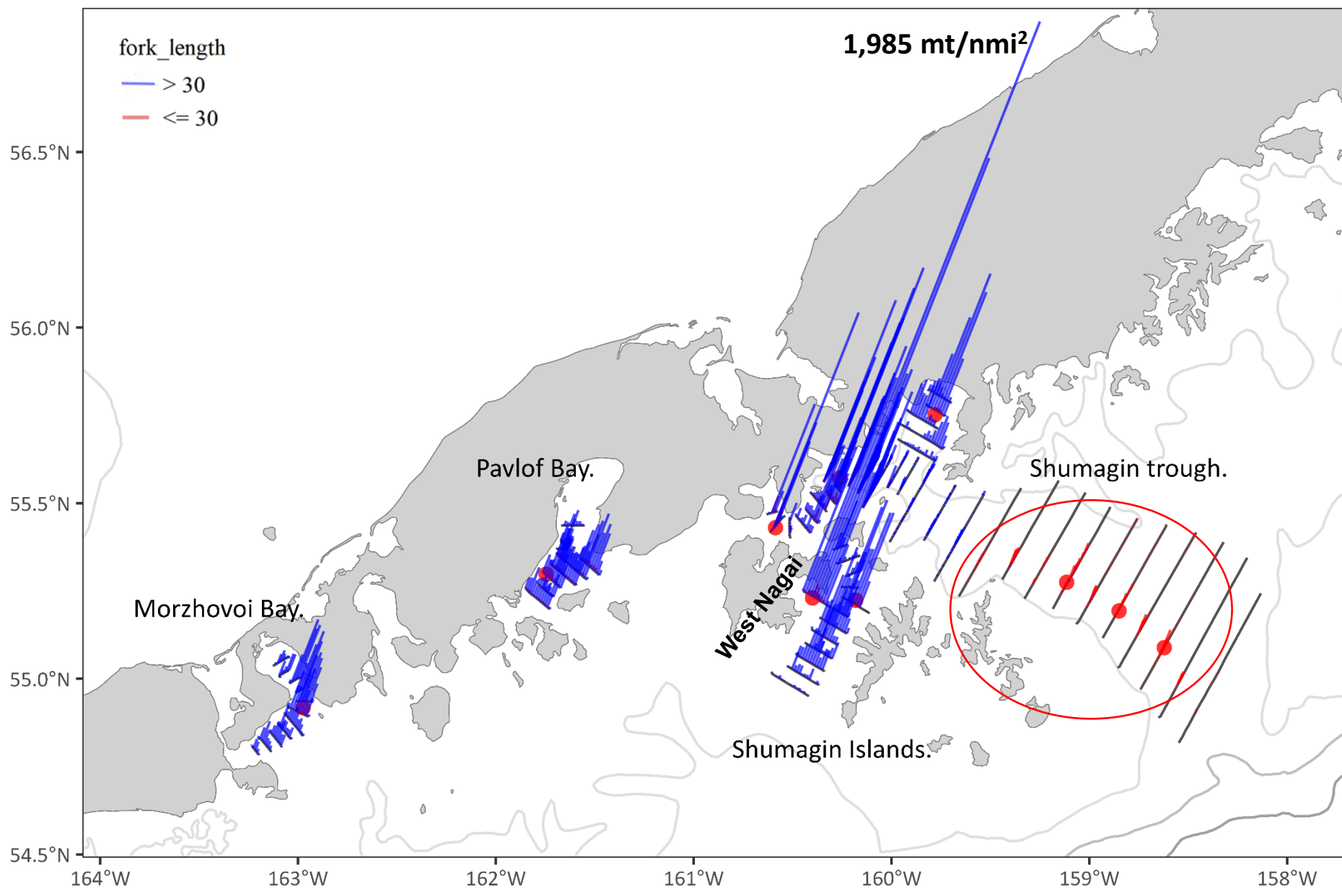
## Shumagin Area - February

- No survey in the Sanak trough area due to weather and medical emergency delays
- Transect coverage:
  - Shumagins: ~500 nmi
  - Pavlof Bay: ~38 nmi
  - Morzhovoi Bay: ~34 nmi
  - Variable transect spacing 1 nmi - 5 nmi
- Survey 24 hrs/day, but fishing 12 hrs/day due to vessel staff shortages
- 10 midwater samples

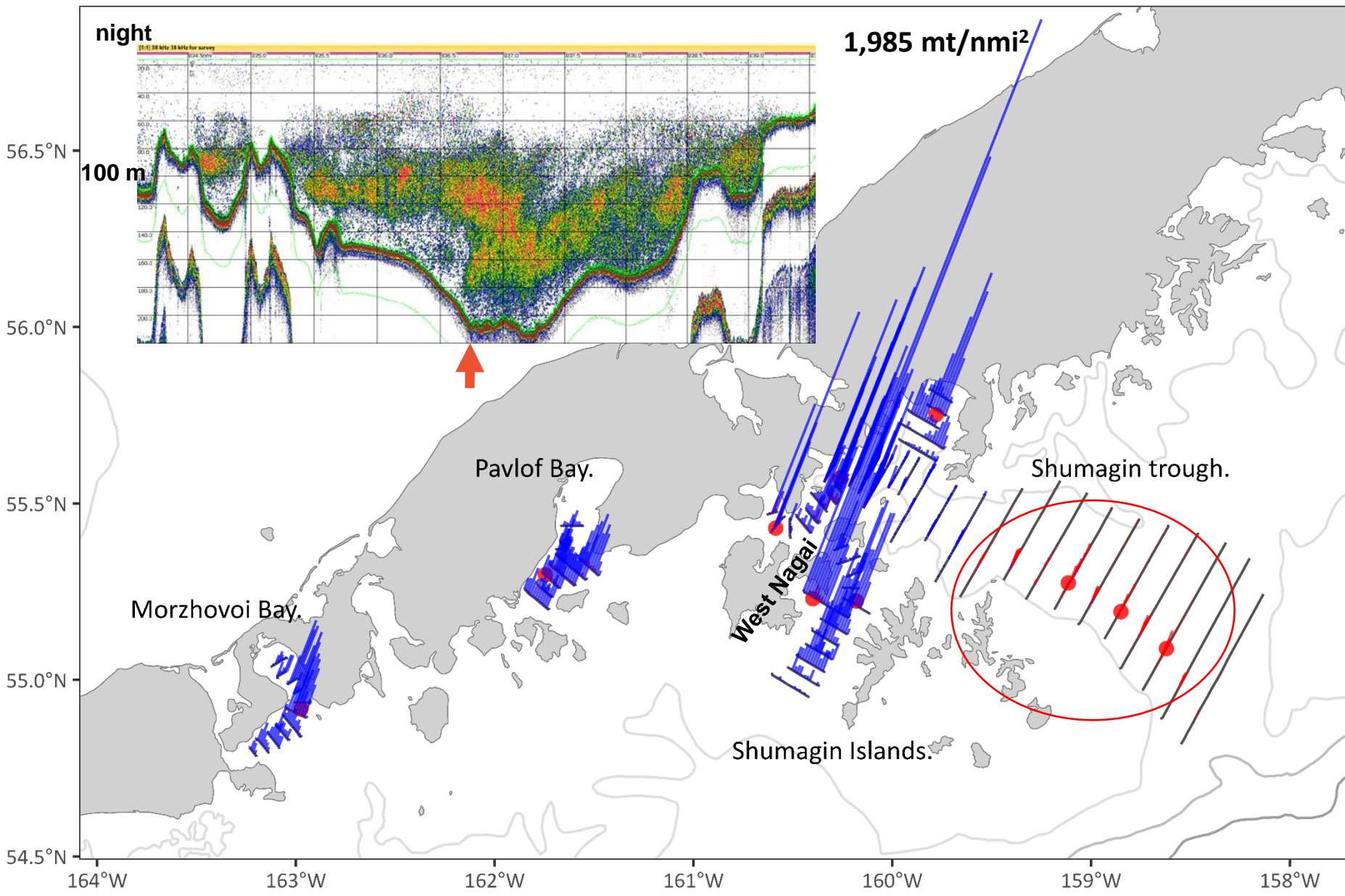
## 2023 Shumagin area transects and trawl locations



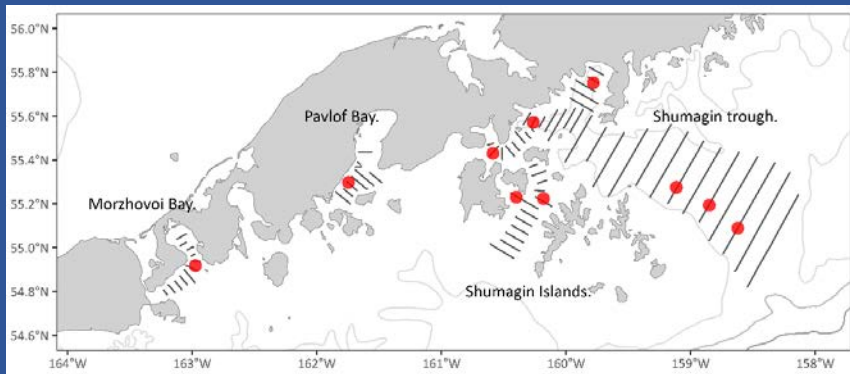
# 2023 Shumagin area biomass t/nmi<sup>2</sup>



# 2023 Shumagin area biomass t/nmi<sup>2</sup>

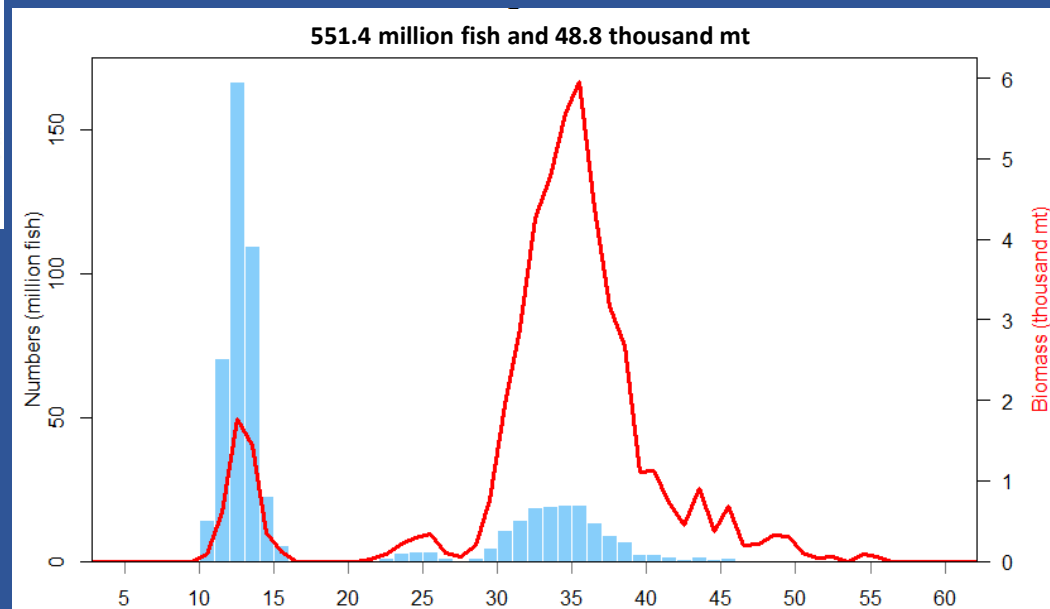






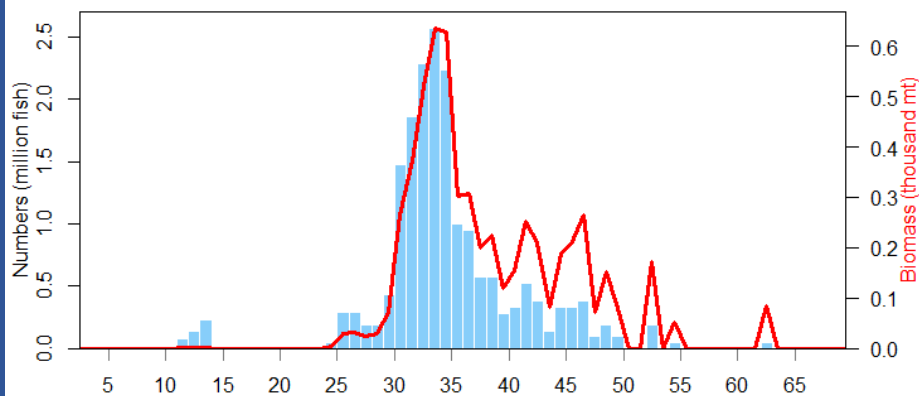
Most of juvenile pollock were in the Shumagin trough

## Shumagin Islands



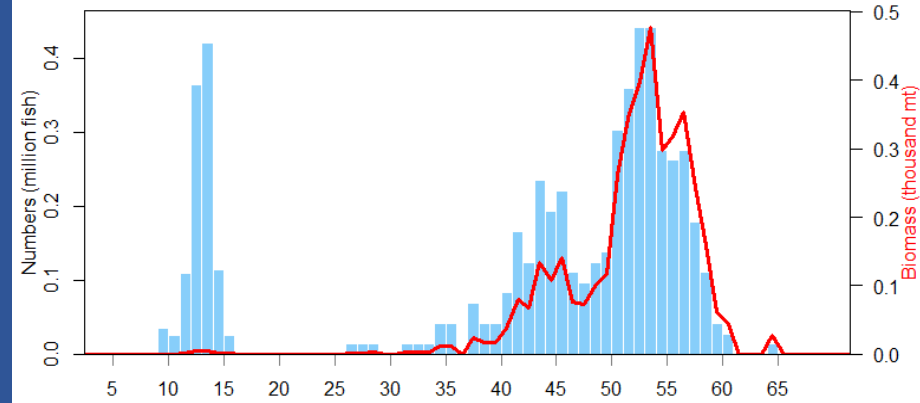
## Pavlof Bay

18.1 million fish and 5.5 thousand mt



## Morzhovoi Bay

5.6 million fish and 4 thousand mt



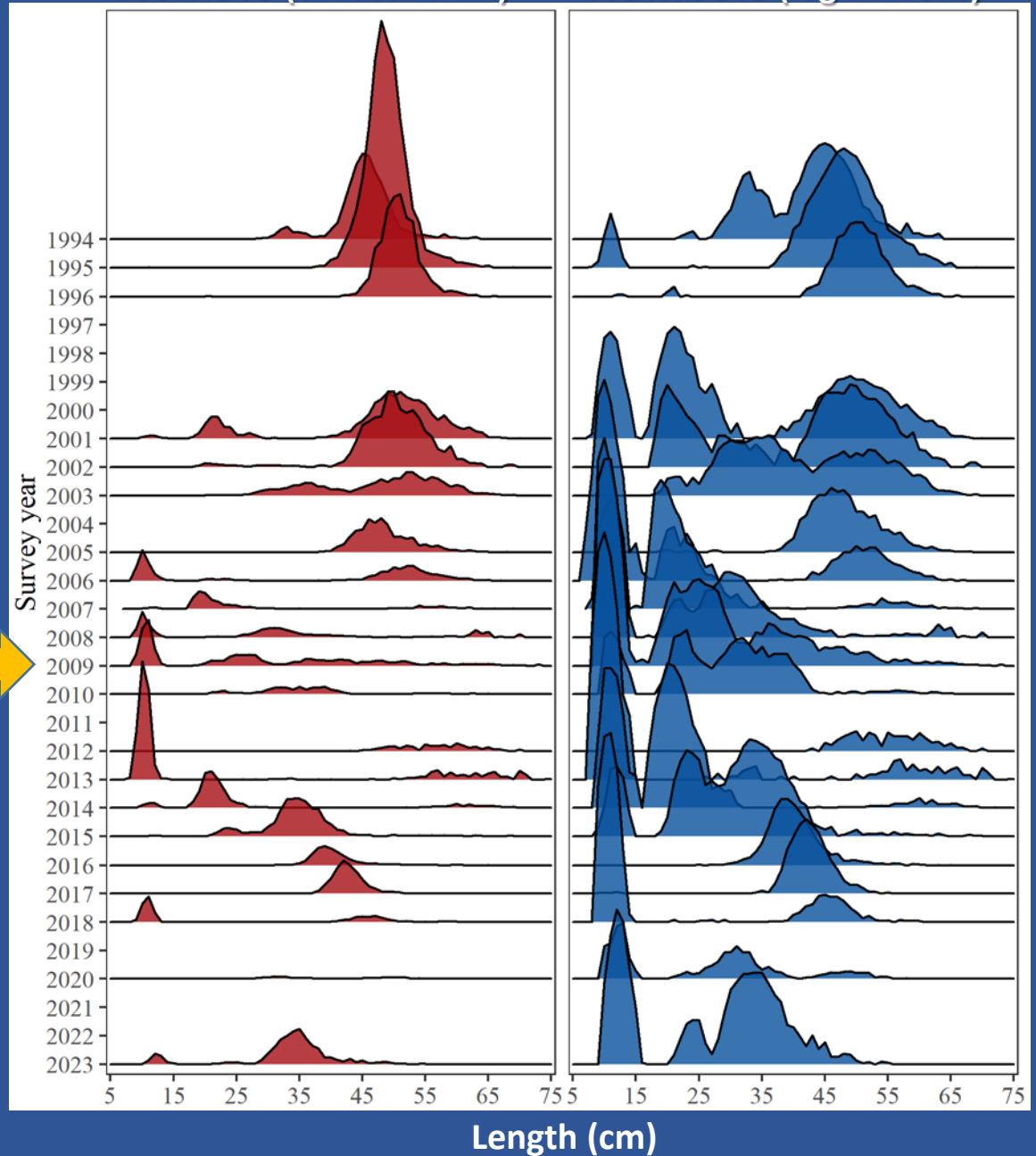
Length (cm)

# Shumagin Islands

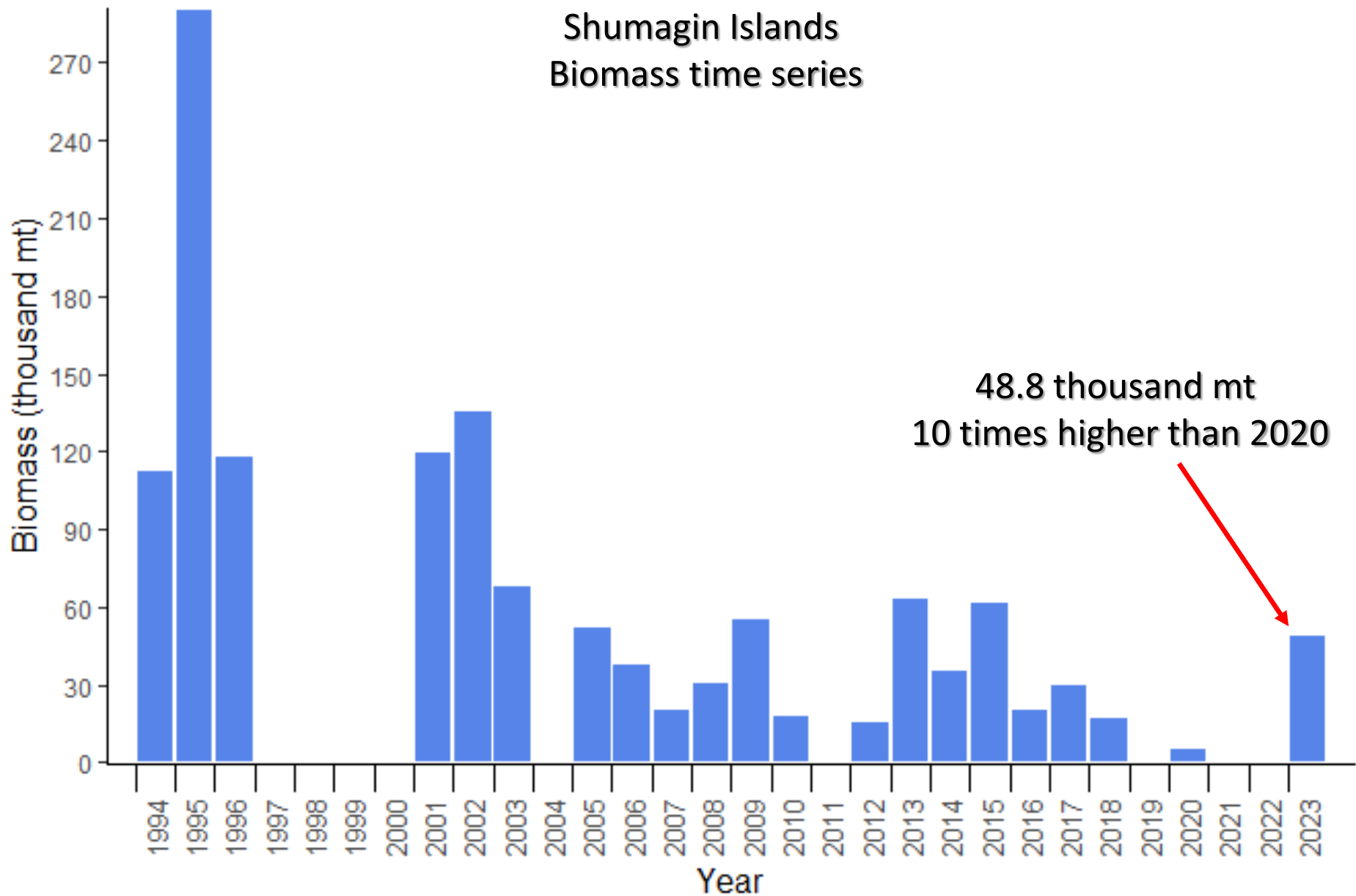
Biomass (thousand mt)

Numbers (log millions)

Net selectivity  
corrections  
included

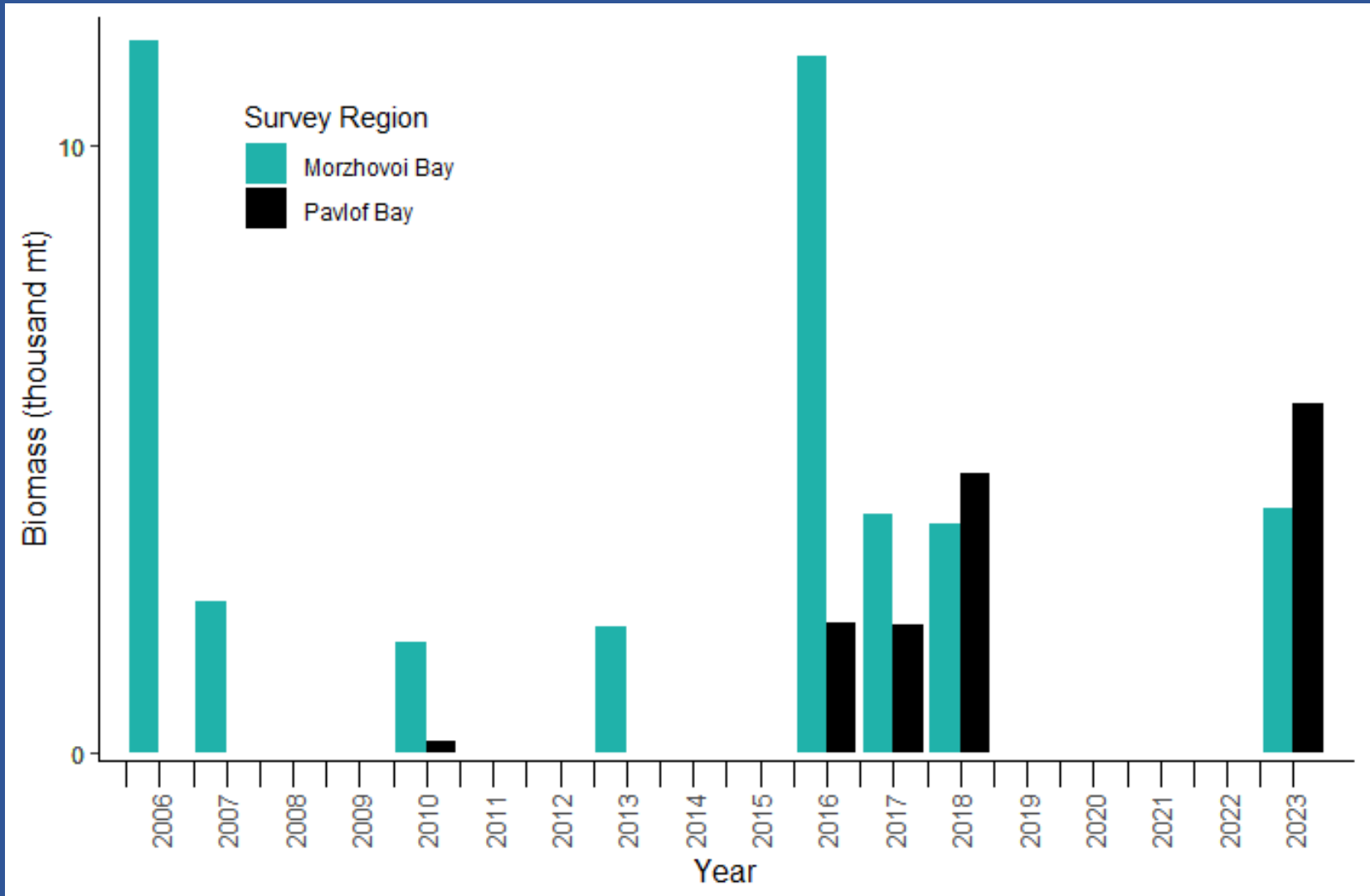


## Shumagin Islands Biomass time series

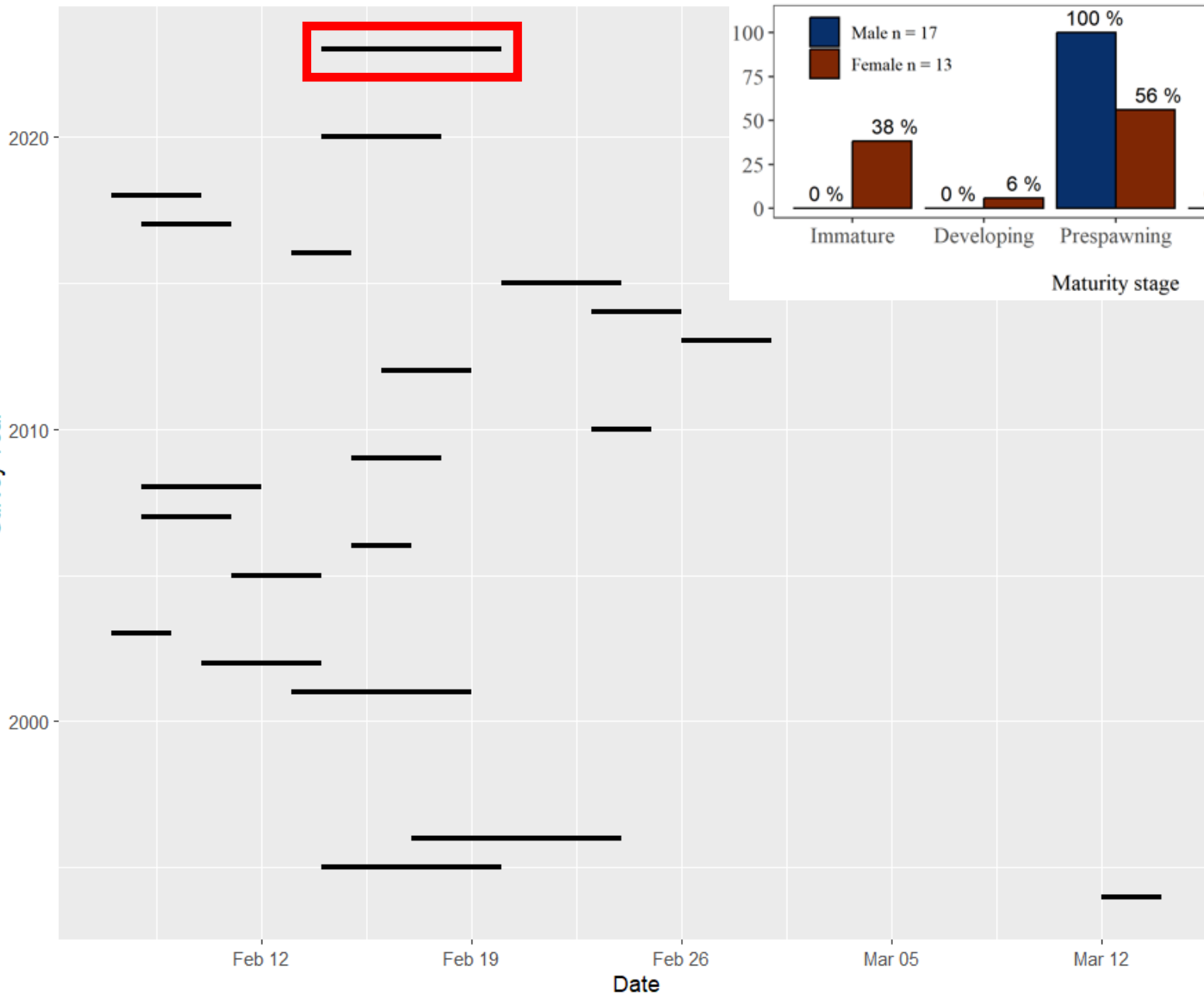


## Biomass time series

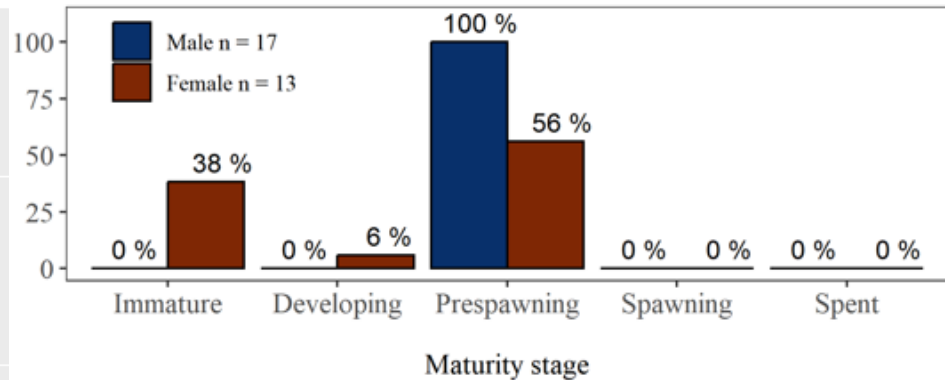
Pavlof Bay: 20% higher than 2018  
Morzhovoi Bay: 7% higher than 2018



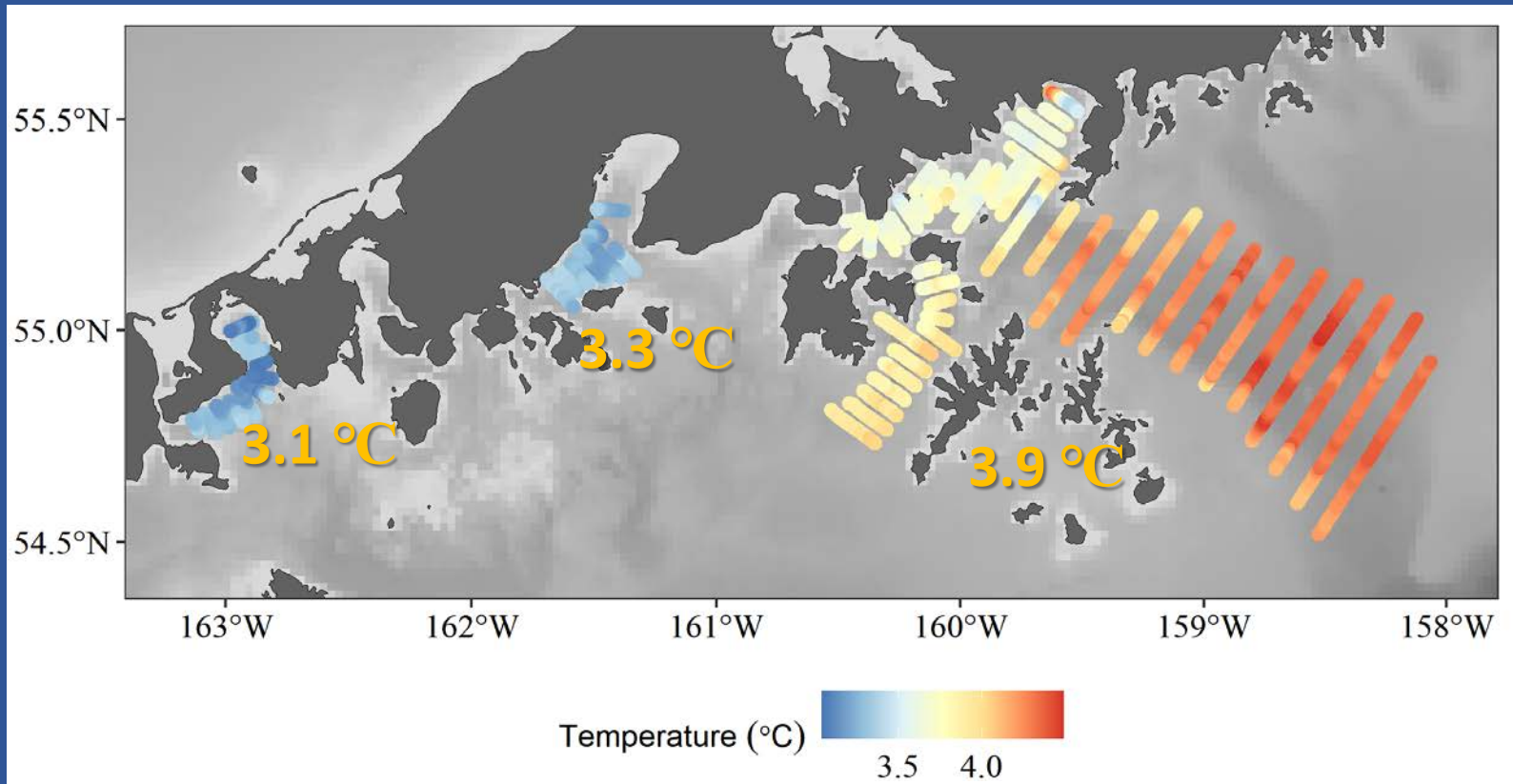
### Shumagin Winter AT Survey Dates



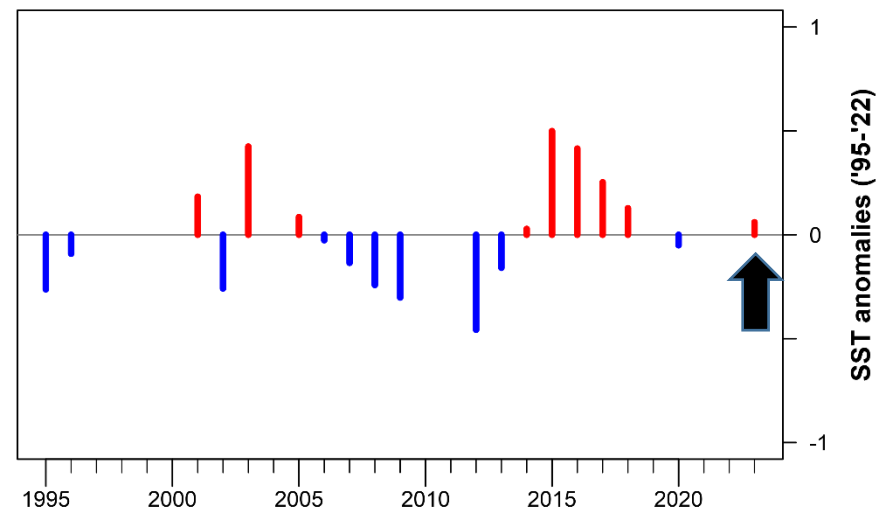
### Pollock > 40 cm



# 2023 Sea surface temperatures



## Shumagin Islands Sea surface temperature anomalies



# Acoustic-Trawl Survey Methods

## Shelikof Area - March

Transect coverage:

Shelikof: ~ 890 nmi

Chirikof shelf break: ~ 178 nmi

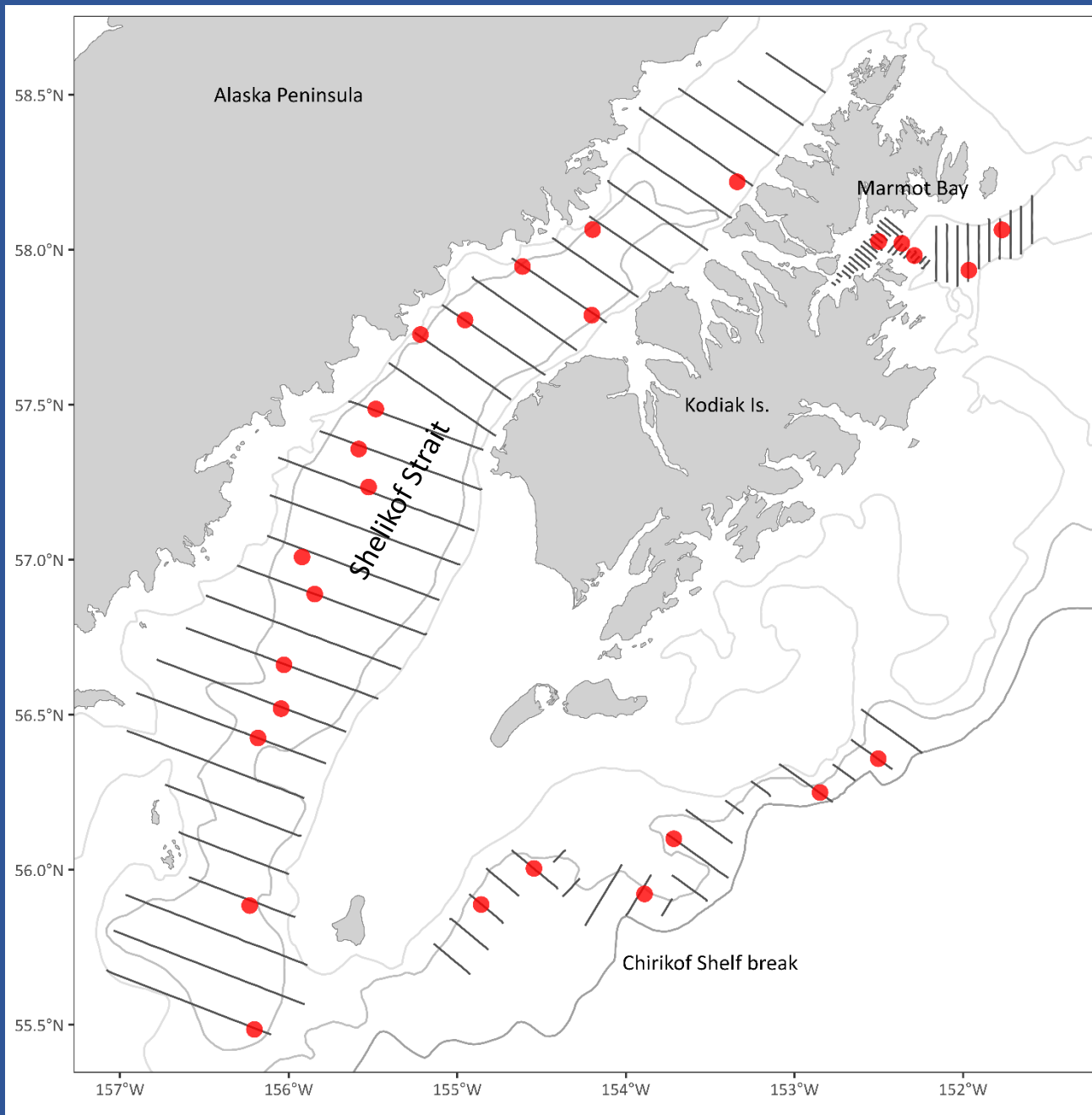
Marmot Bay: ~ 173 nmi

Variable transect spacing 1-7 nmi

Survey 24 hrs/day AND fishing 24 hrs/day

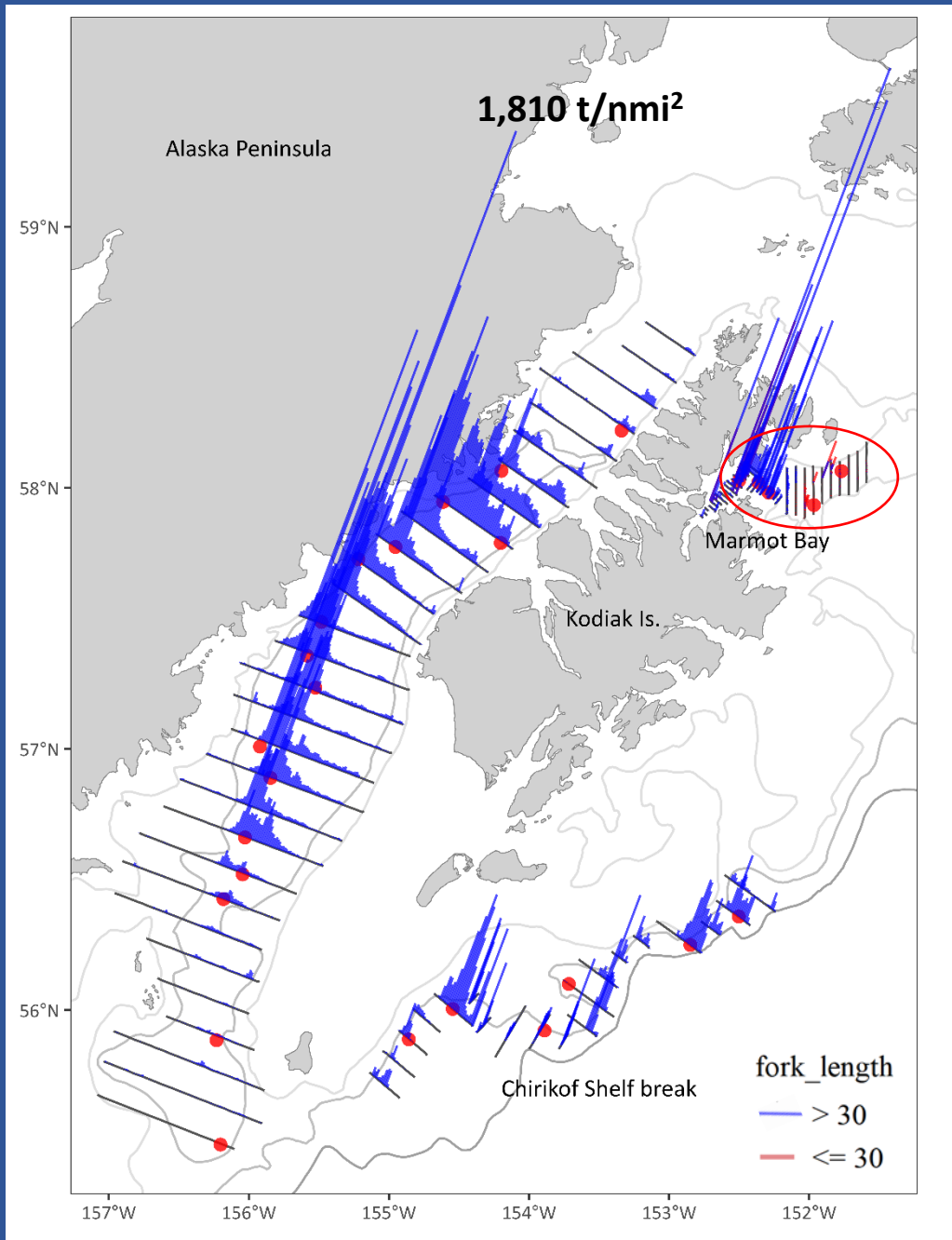
**27 midwater samples**

# 2023 Shelikof area transects and trawl locations

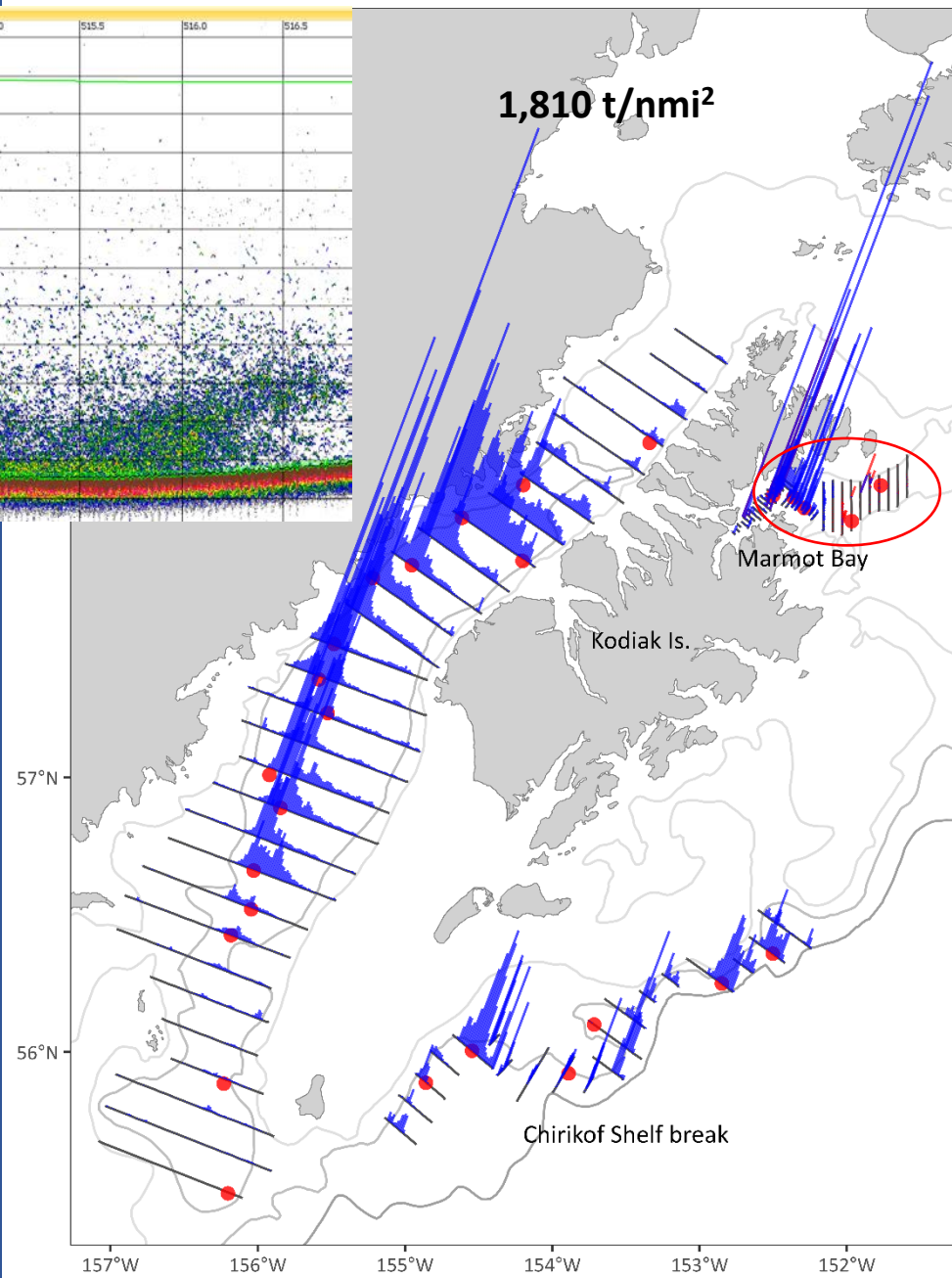
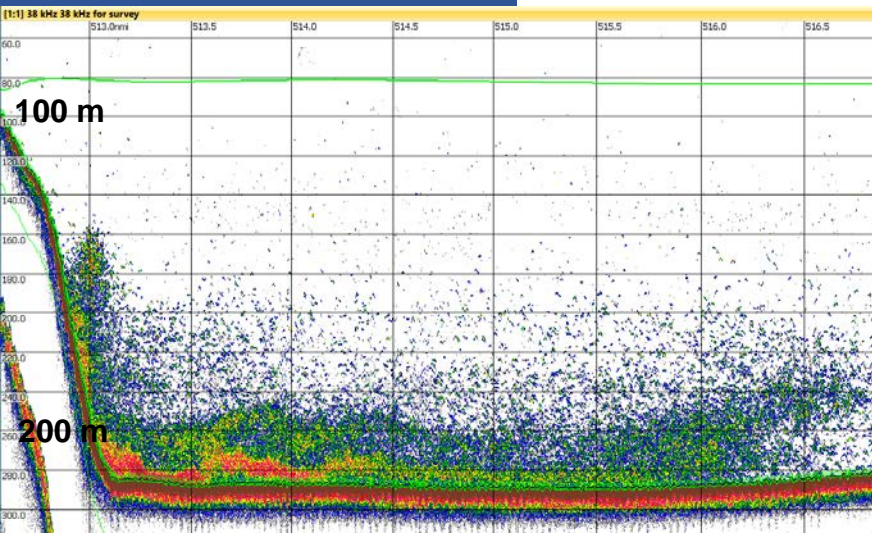




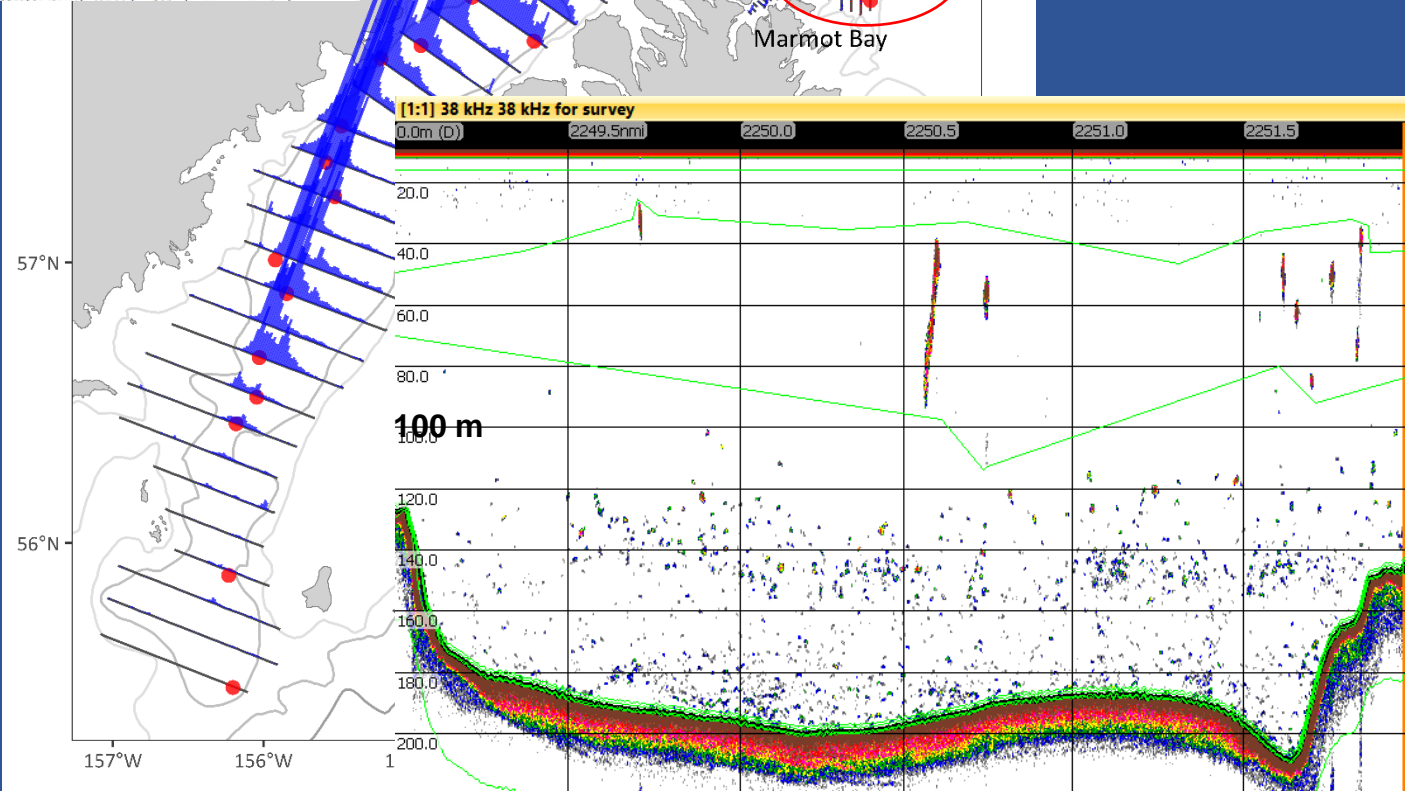
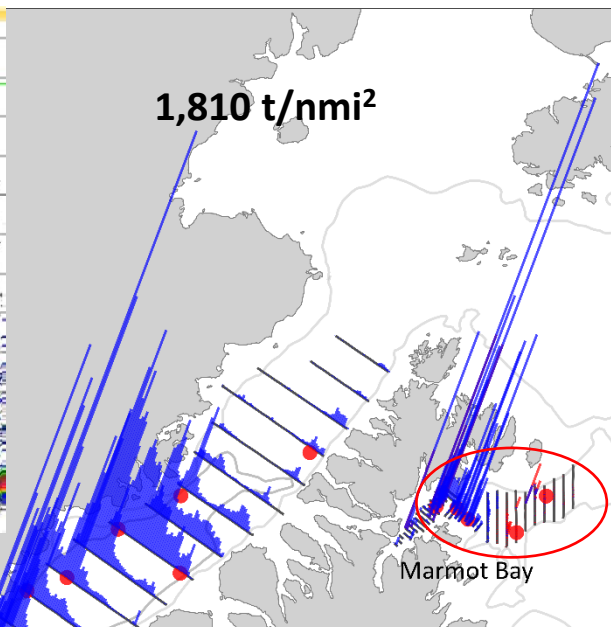
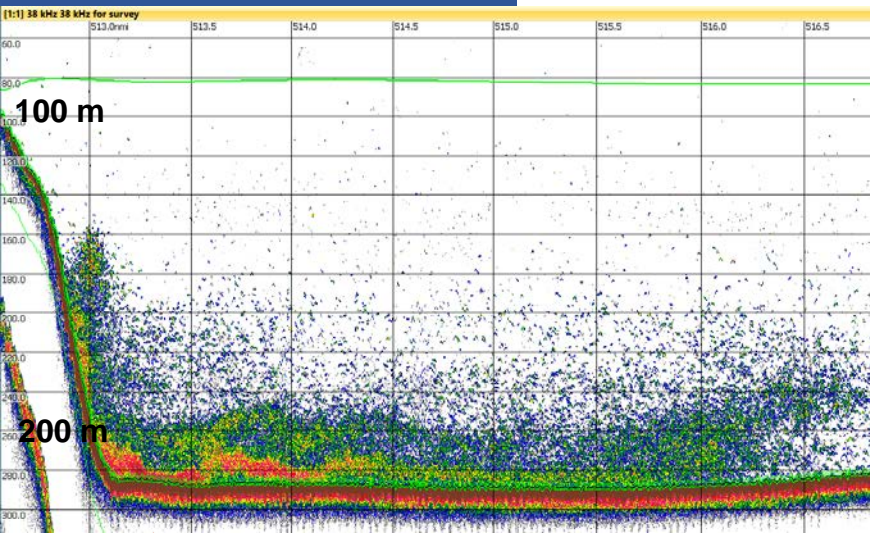
# 2023 Shelikof area biomass t/nmi<sup>2</sup>



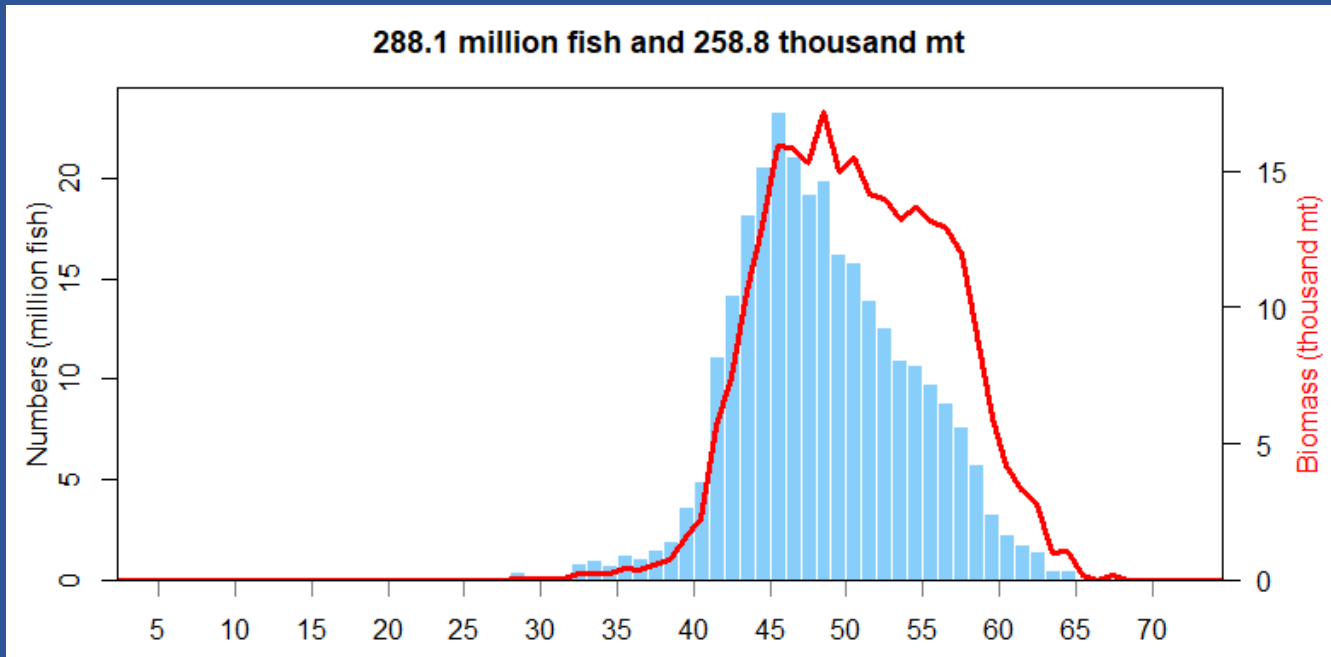
# 2023 Shelikof area biomass t/nmi<sup>2</sup>



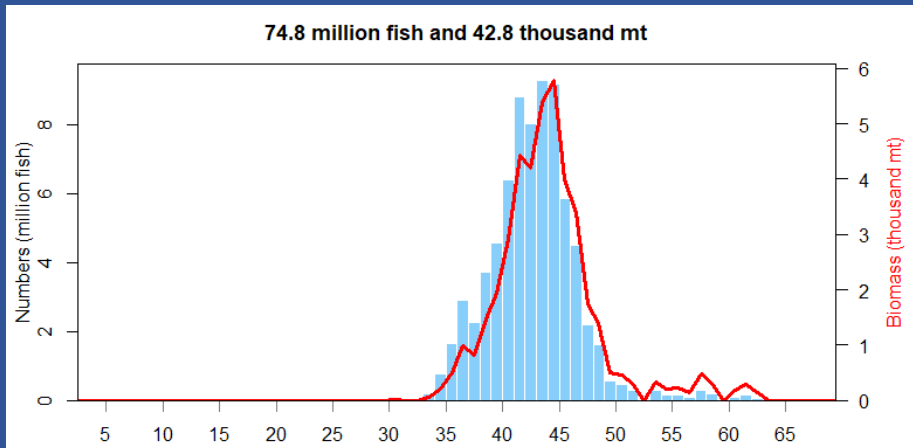
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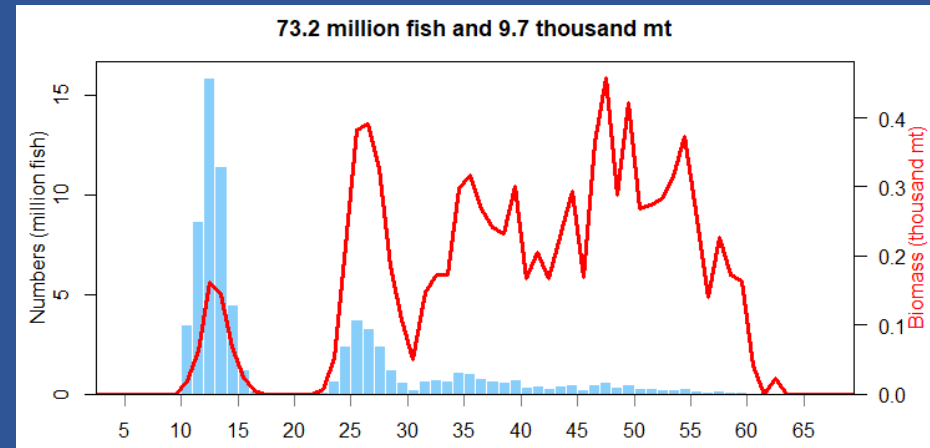
# Shelikof Strait



# Chirikof shelf break

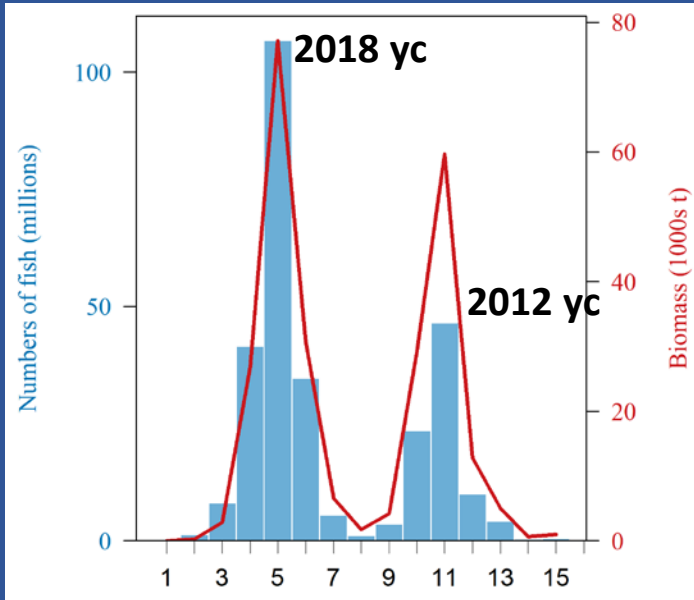


# Marmot Bay



Length (cm)

# Shelikof Strait 2023

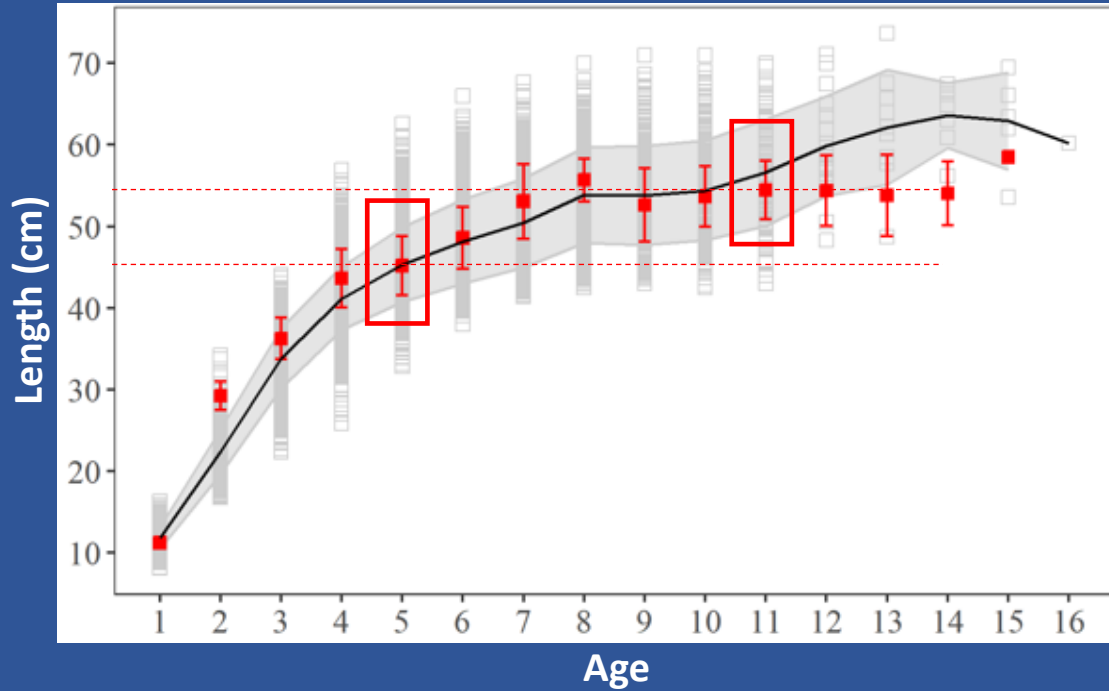
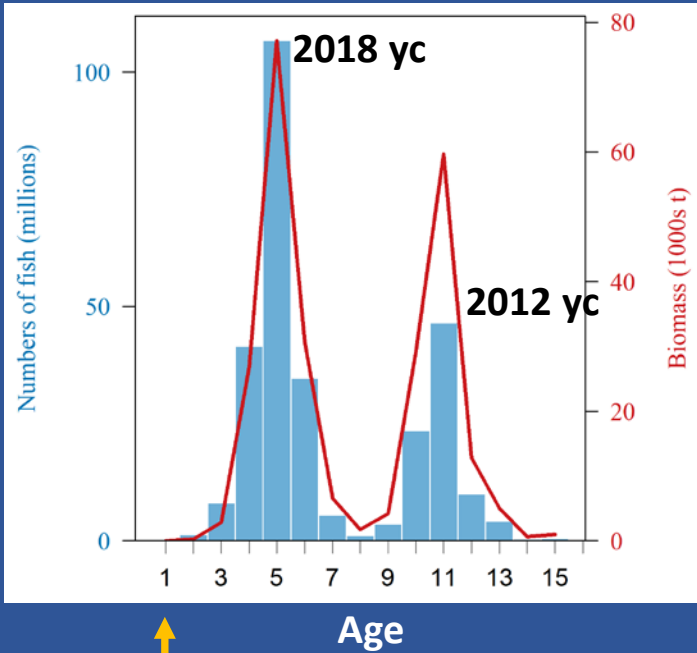


Age

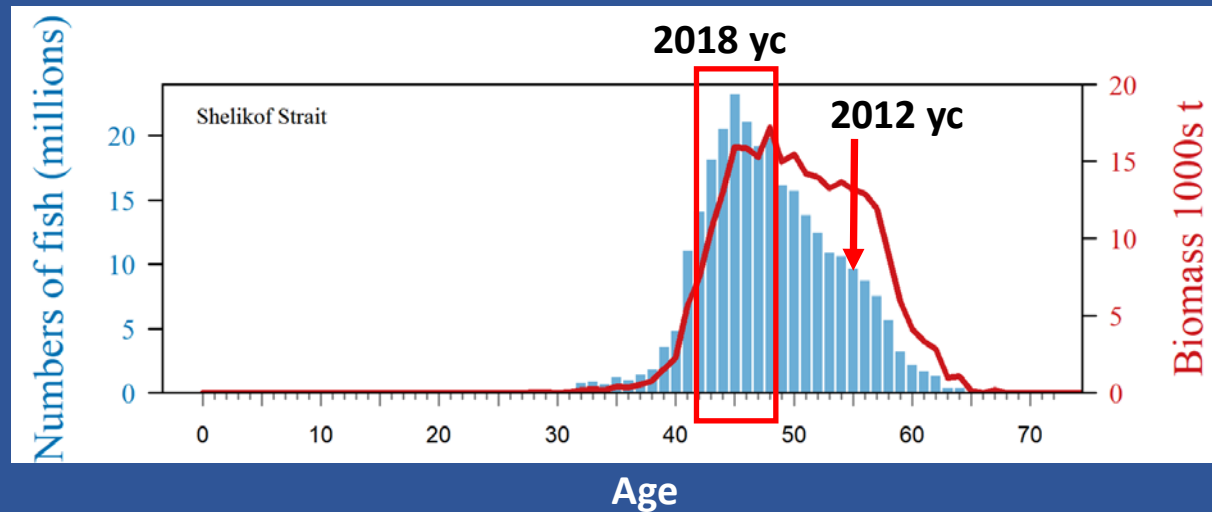


McKelvey  
index "low"

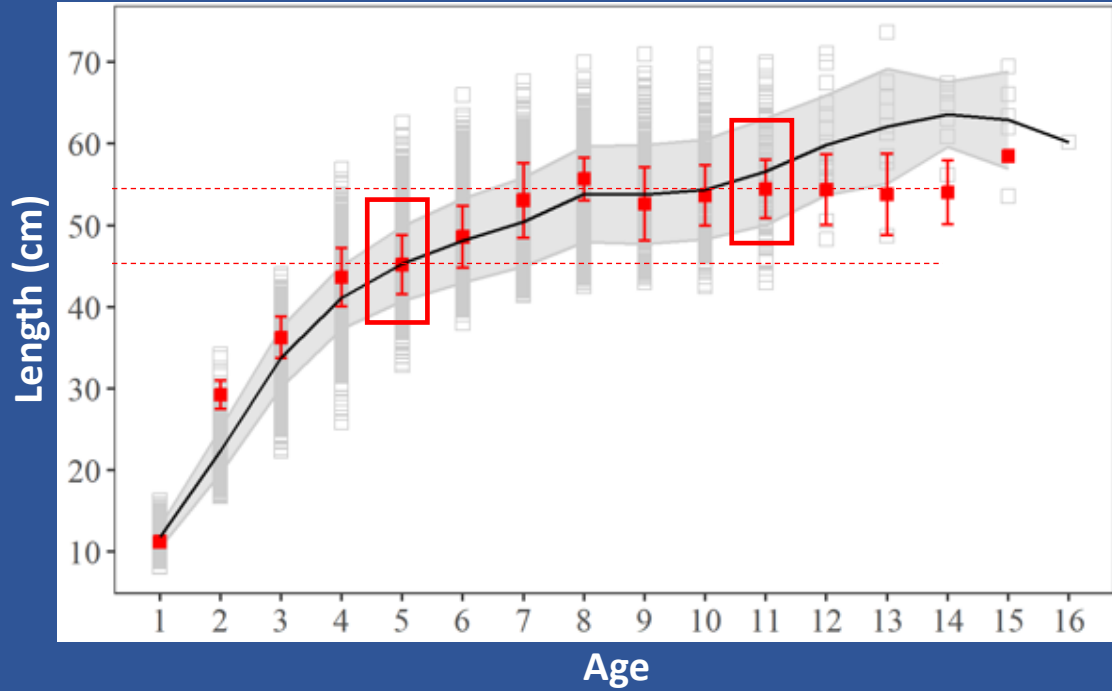
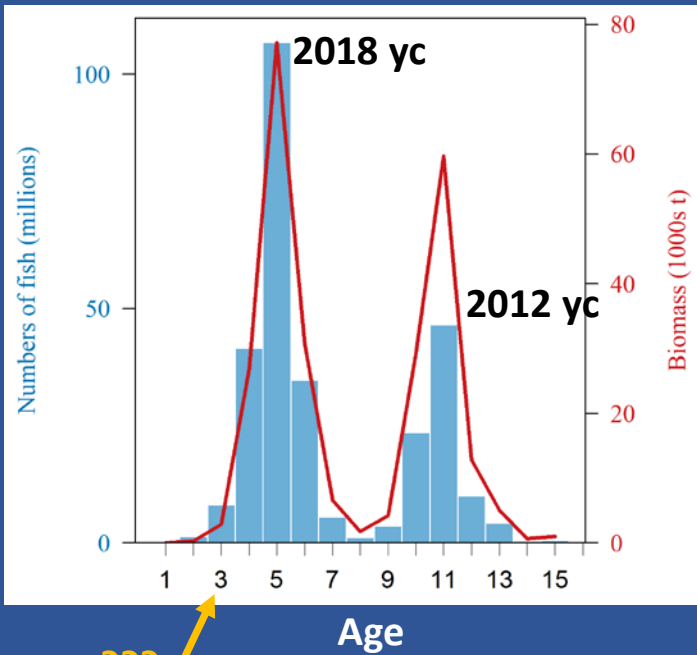
# Shelikof Strait 2023



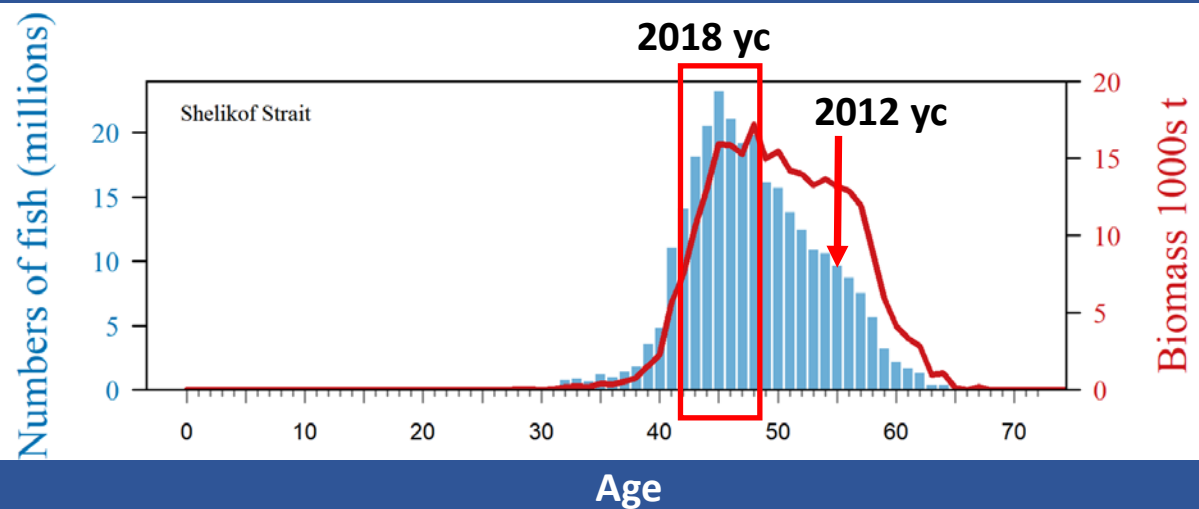
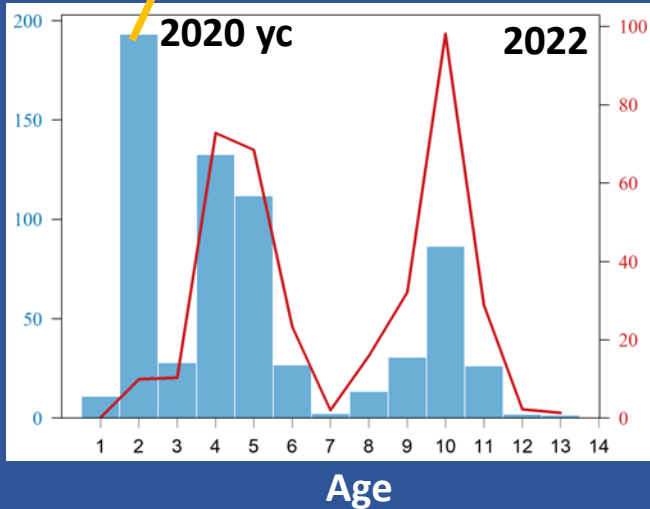
McKelvey  
index "low"



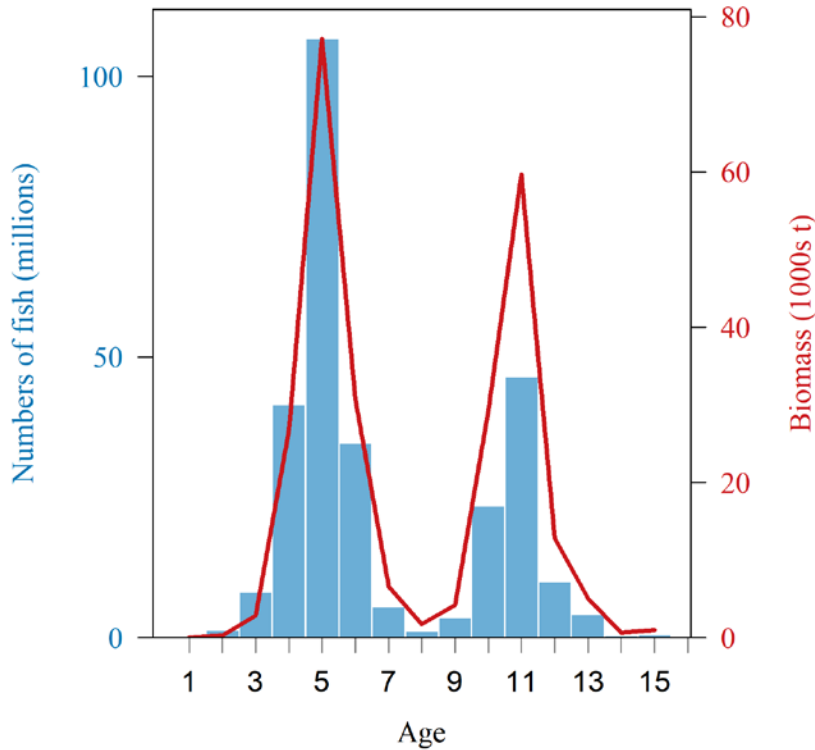
# Shelikof Strait 2023



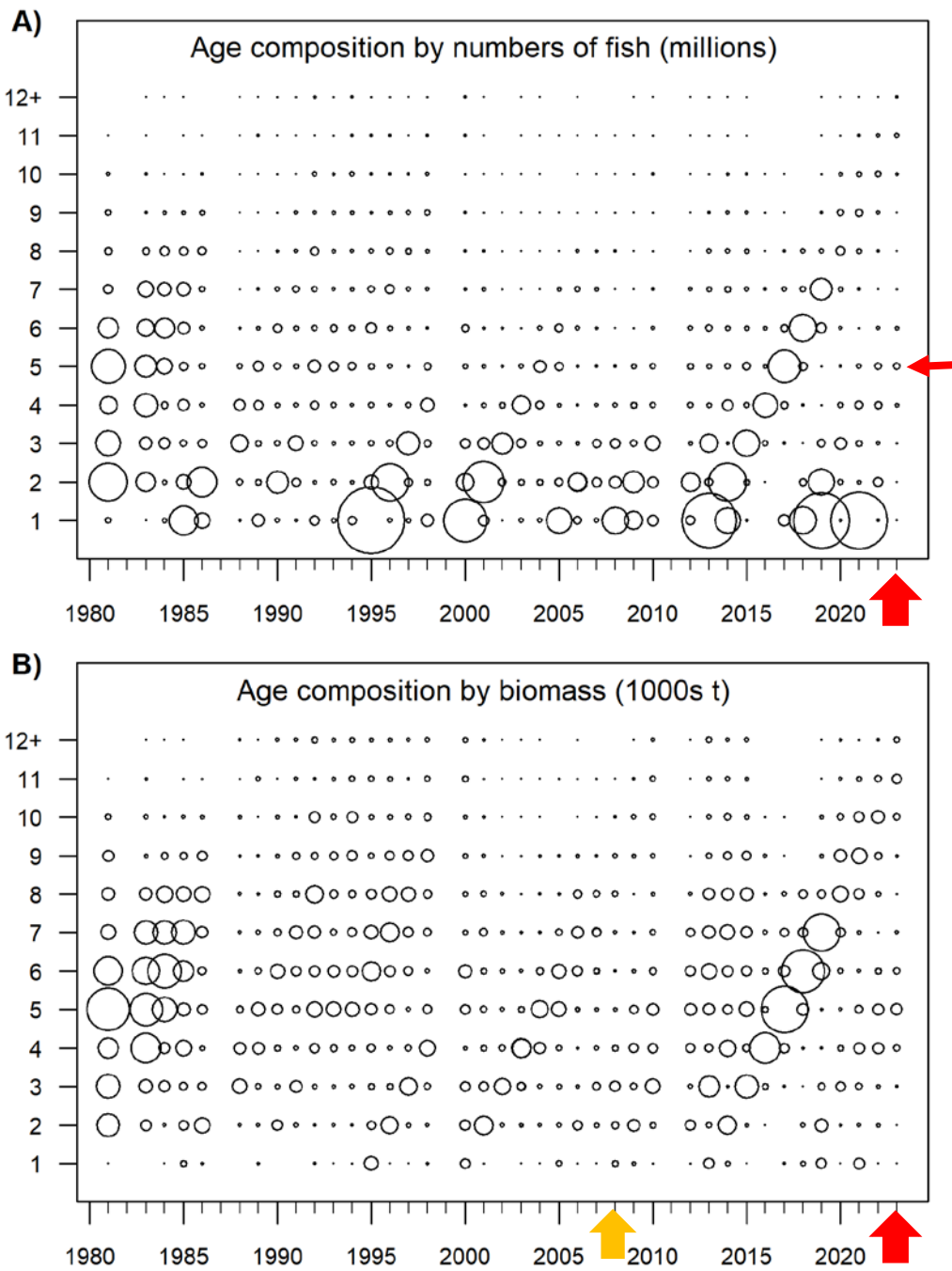
???



# Shelikof Strait 2023

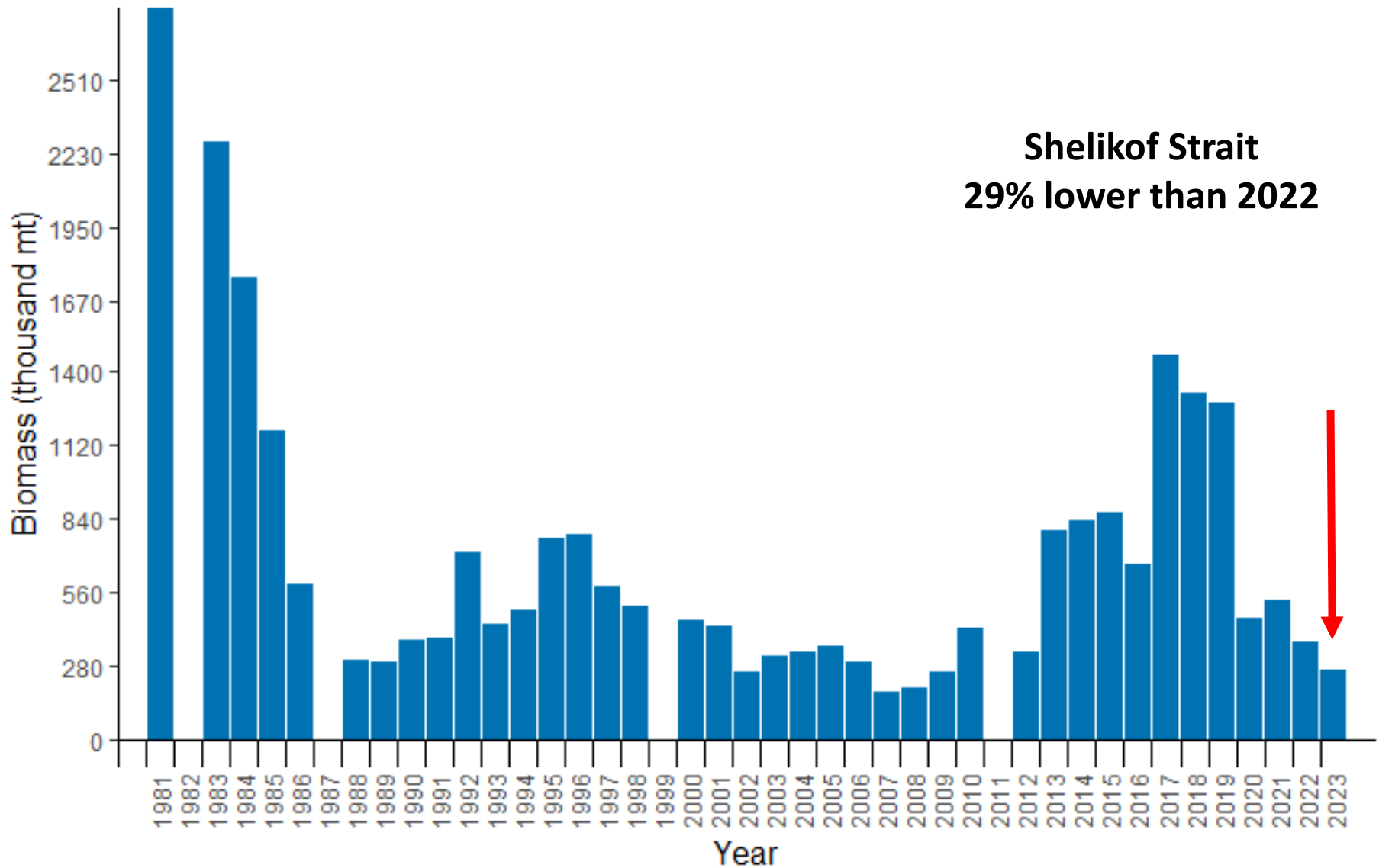


2008  
net selectivity  
corrections  
included

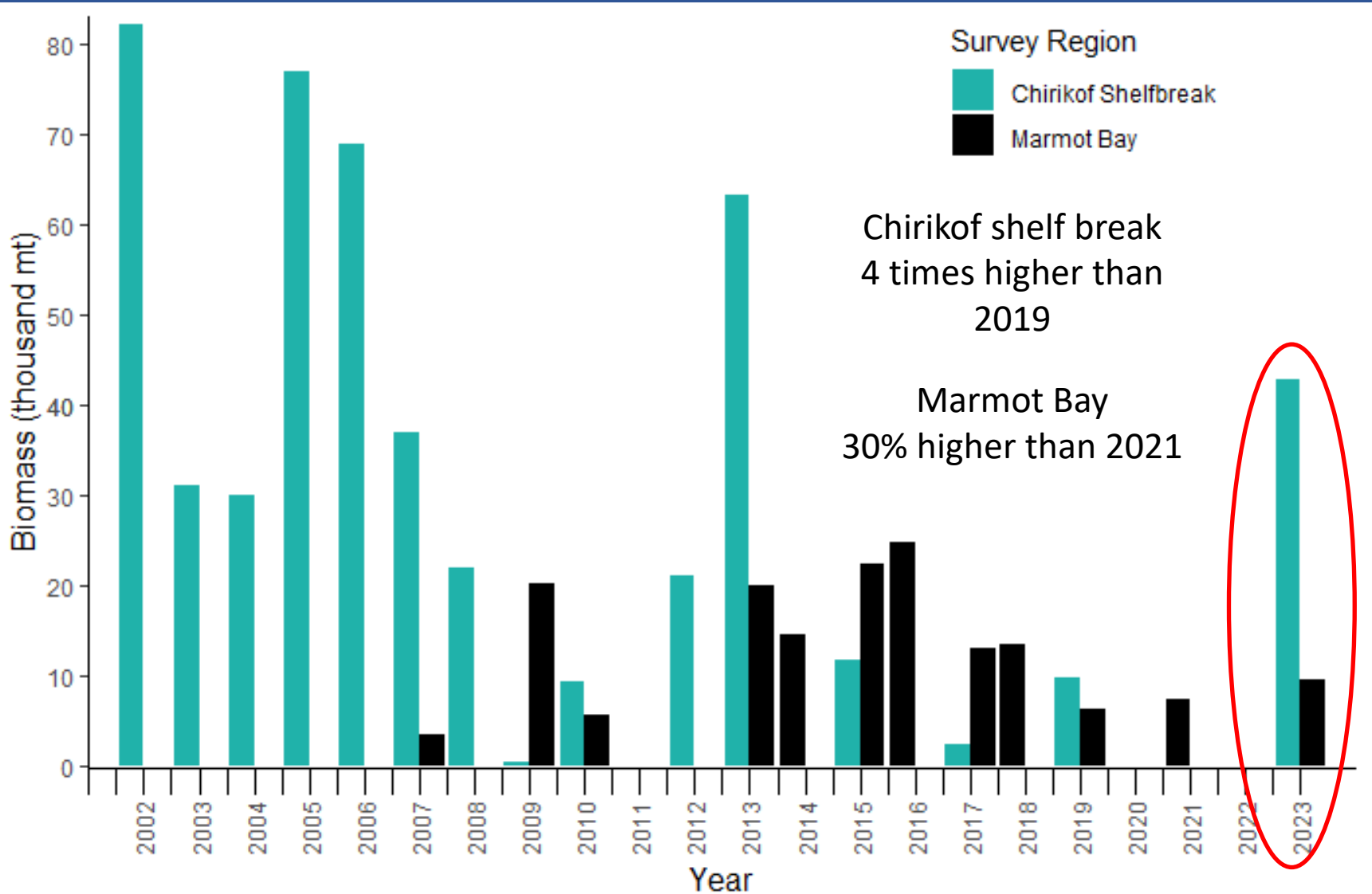




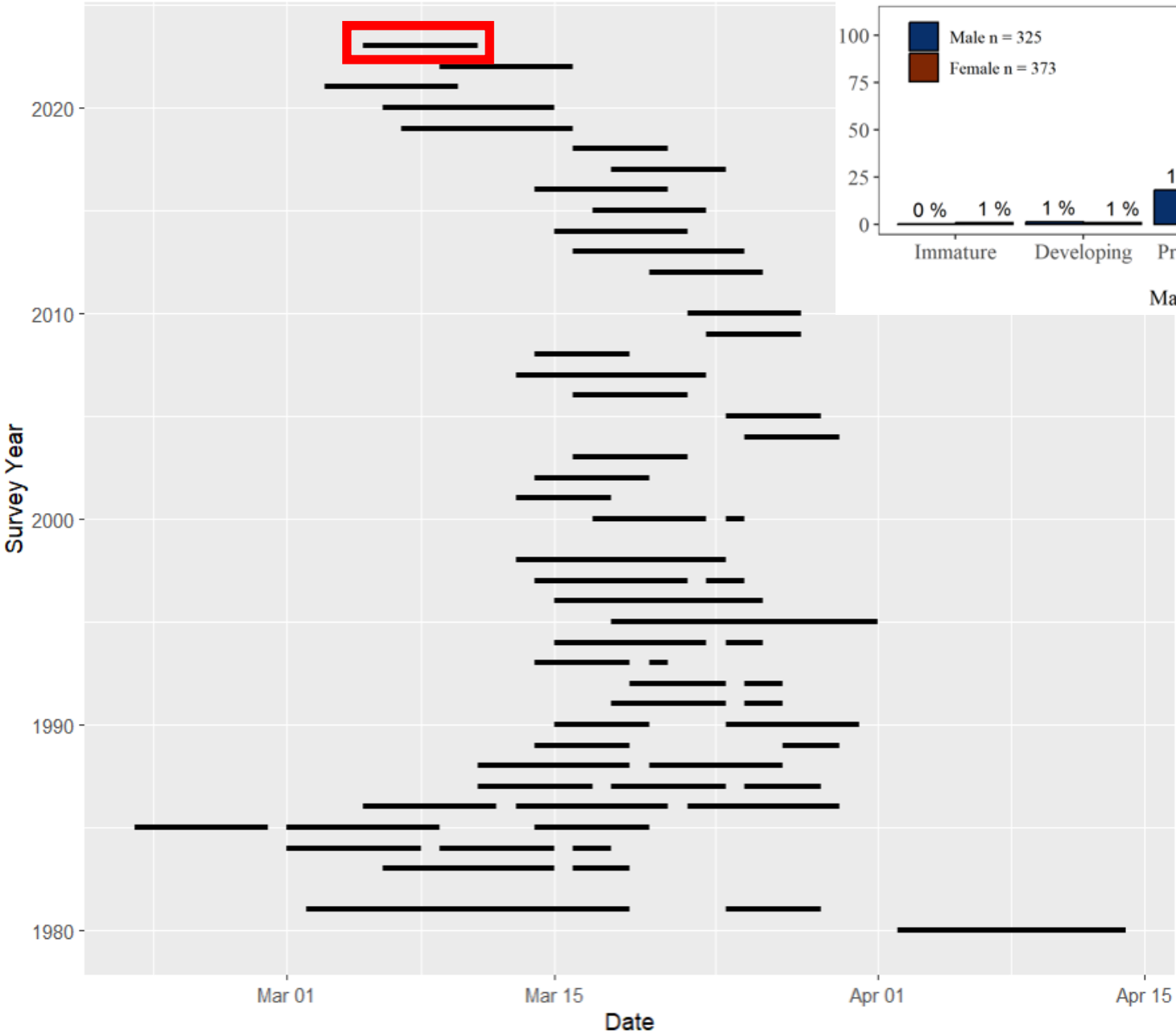
# Shelikof Strait Biomass



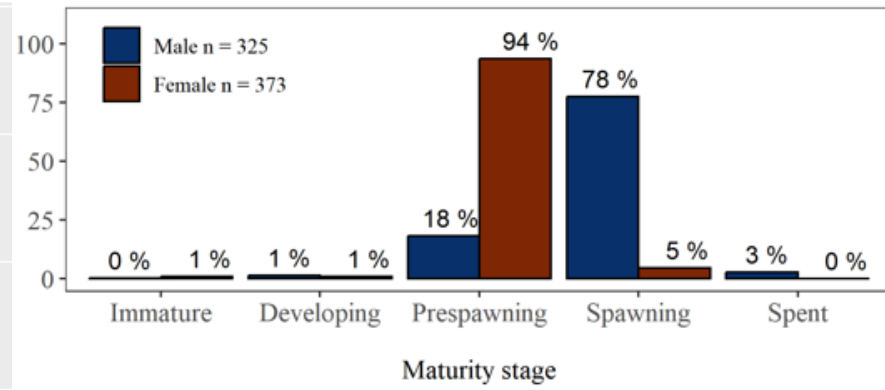
# Biomass time series



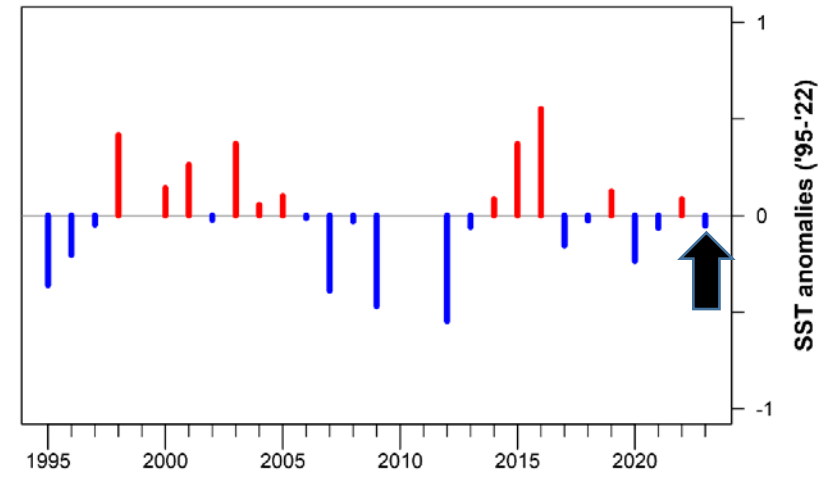
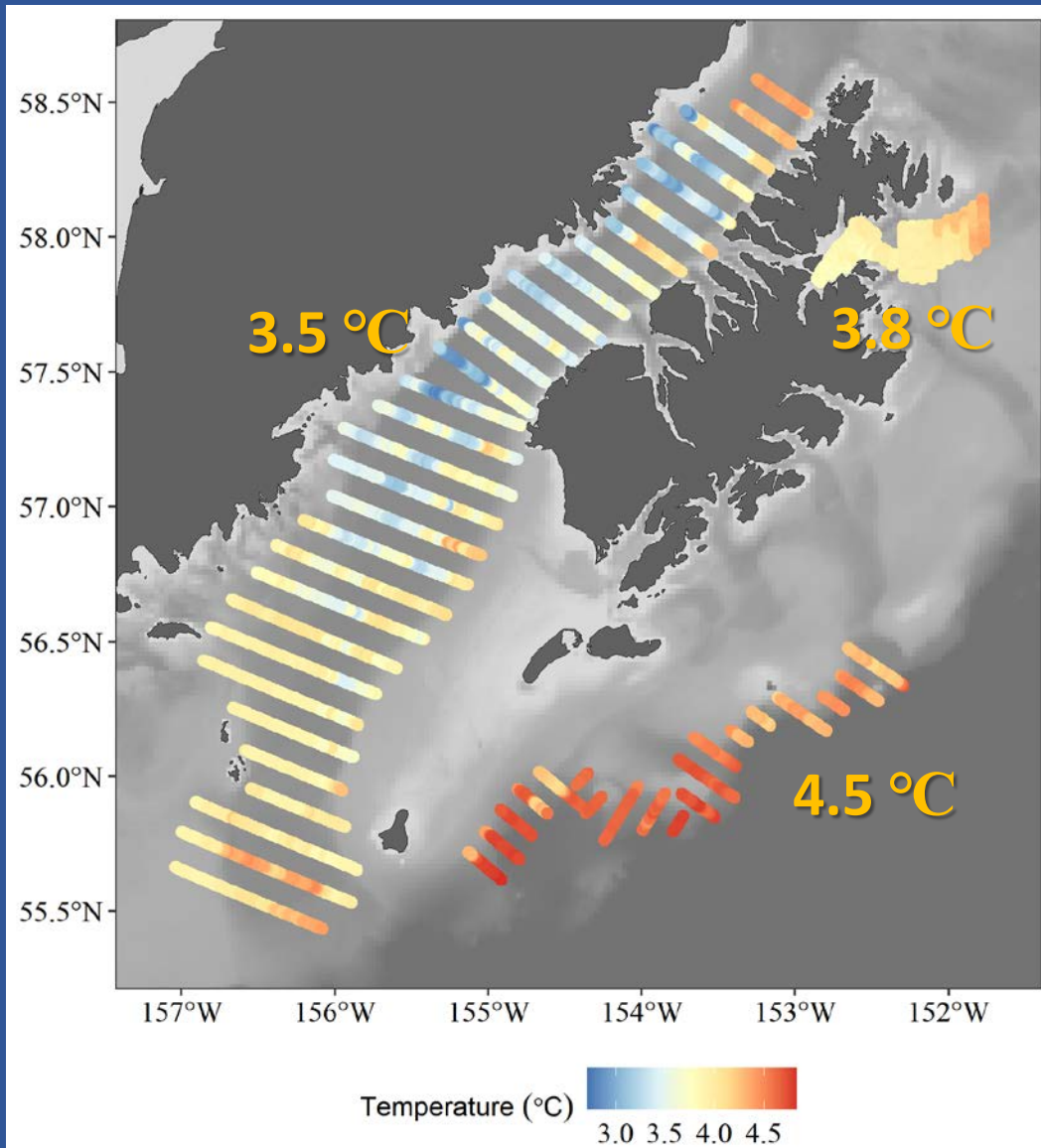
## Shelikof Winter AT Survey Dates



## Pollock > 40 cm

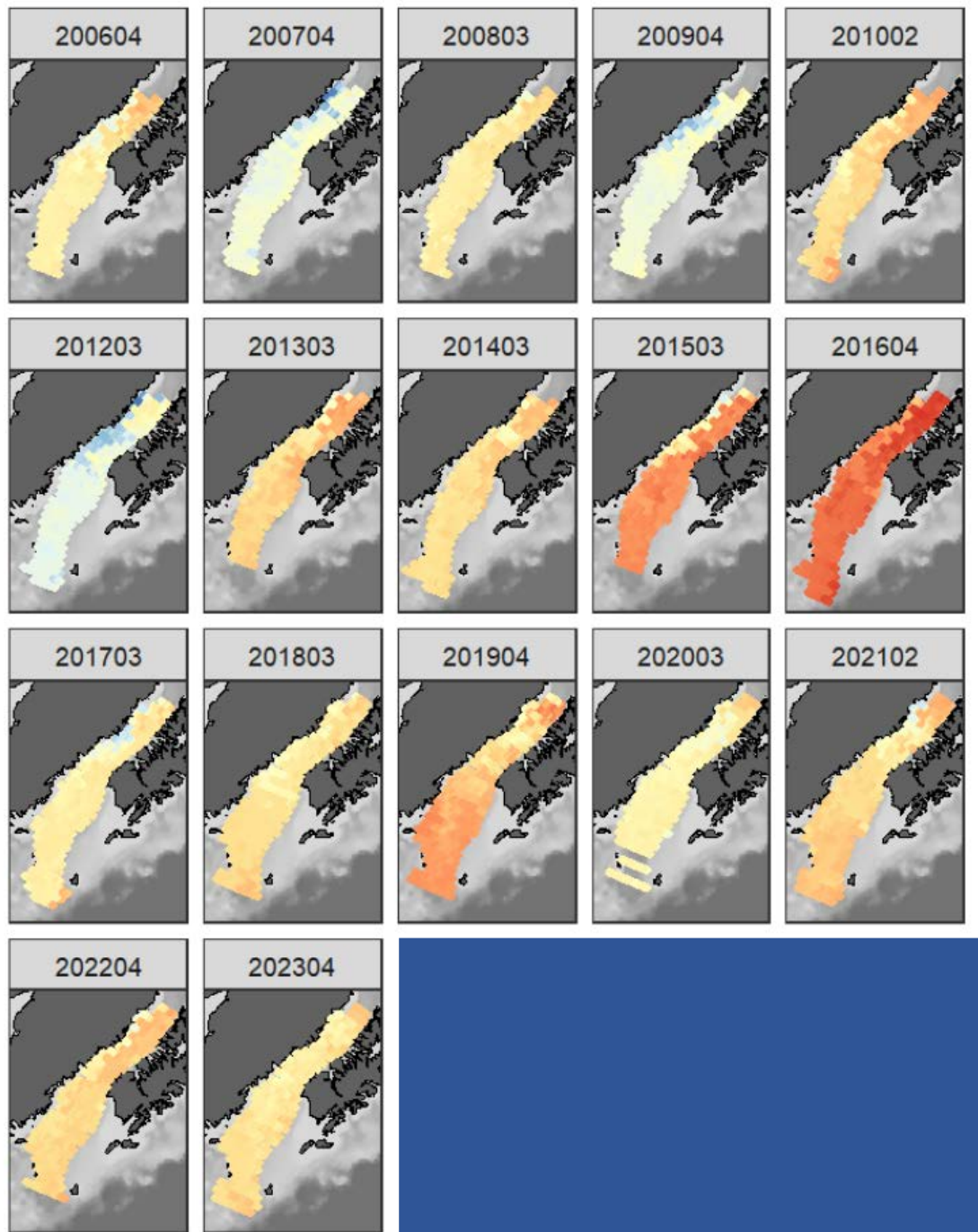


# 2023 Sea surface temperatures & sea surface temp. averages from trawl locations



**Shelikof Strait  
Sea surface temperature  
anomalies**

# Shelikof sea surface temperatures 2006-2023



**2024  
winter**

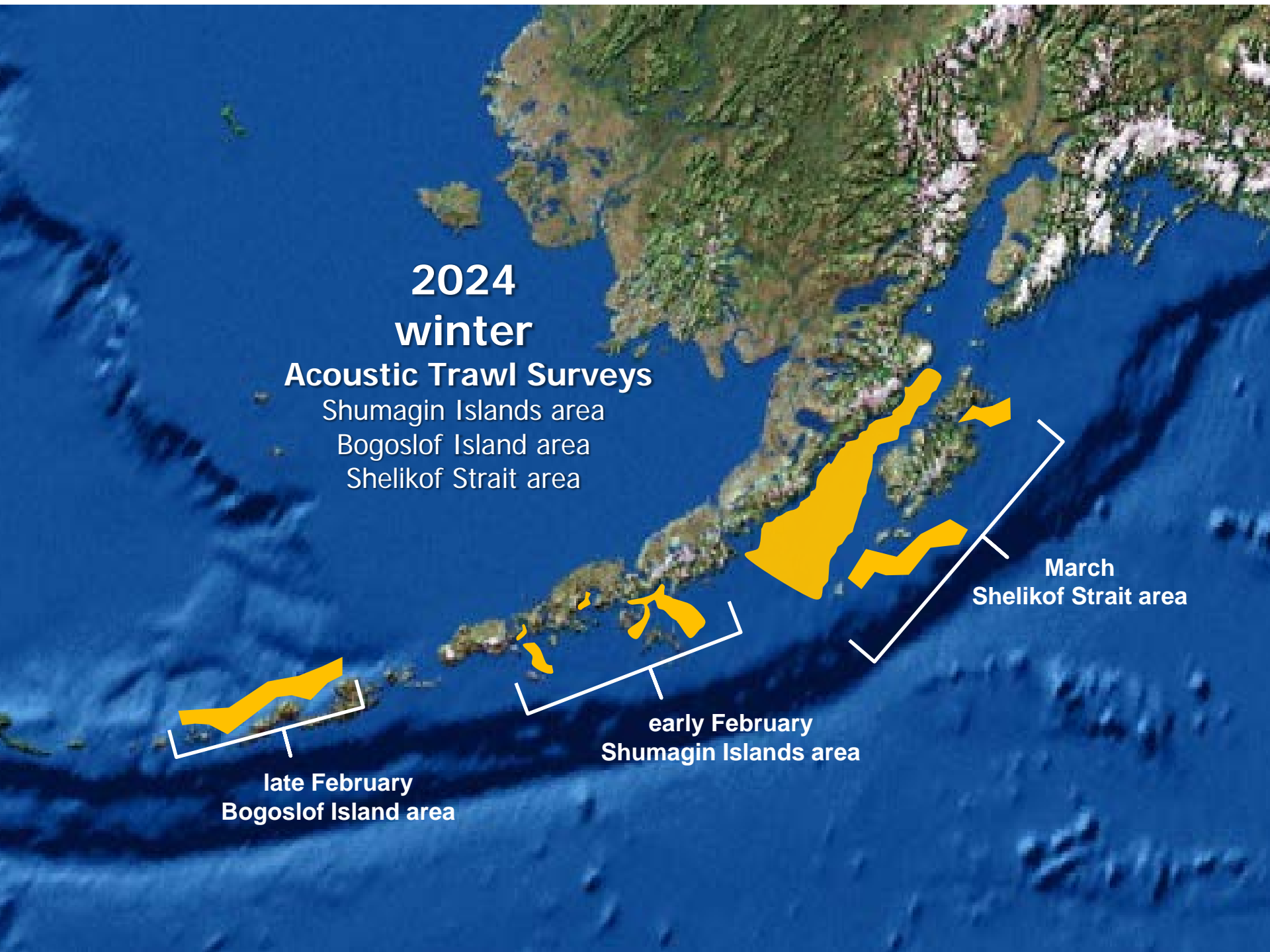
**Acoustic Trawl Surveys**

- Shumagin Islands area
- Bogoslof Island area
- Shelikof Strait area

late February  
Bogoslof Island area

early February  
Shumagin Islands area

March  
Shelikof Strait area



Thank you to all participants in our surveys!!



Photo by Matthew Phillips

Thank you to all participants in our surveys!!

Questions?



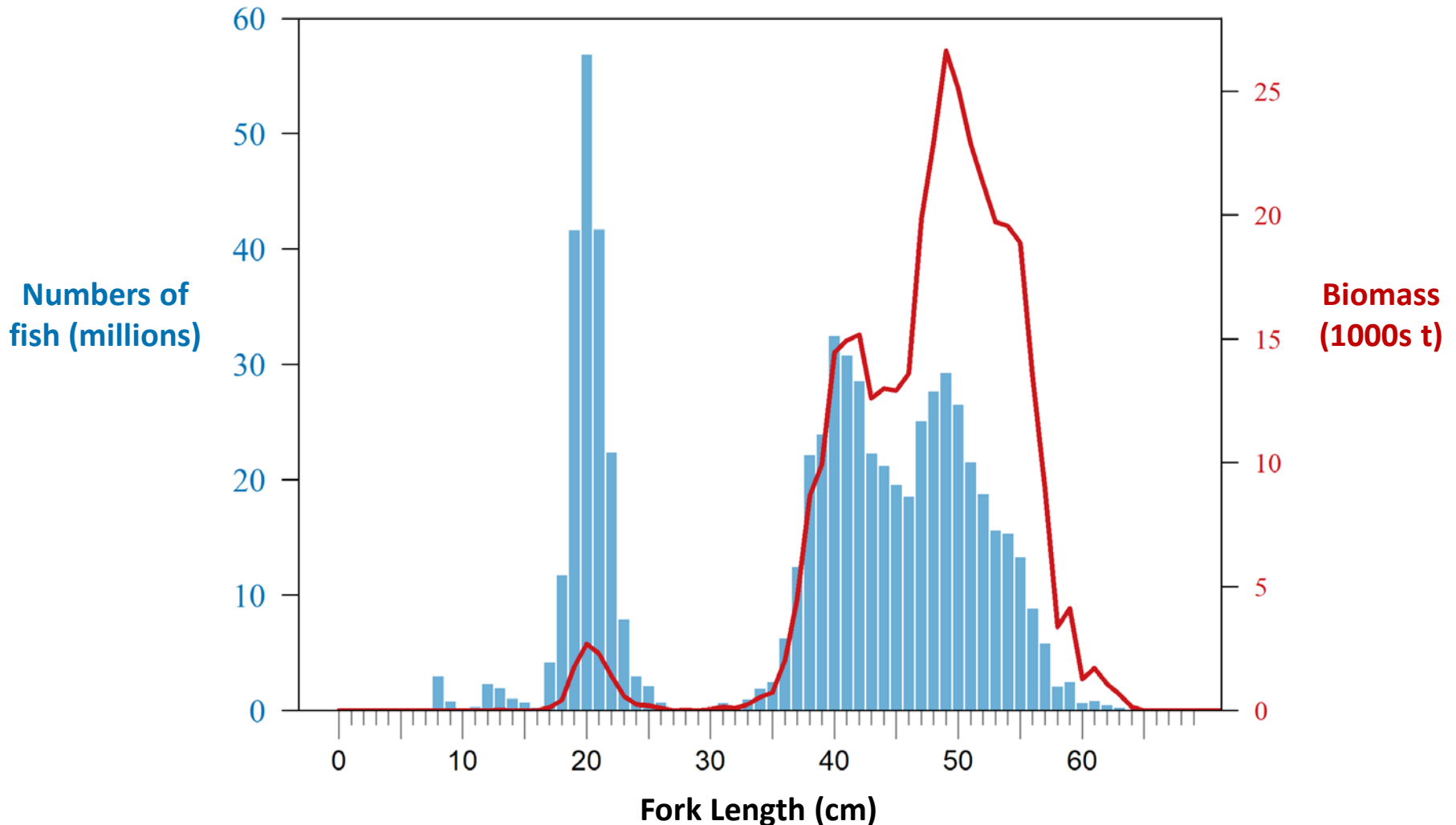
Photo by Matthew Phillips



## 2022 Survey Estimates by Length

**Abundance = 666.6 million age-1+ fish (length modes at 20, 40, 49 cm)**

**Biomass = 365,400 t (10.3% est. error) → 30.7% decrease from 2021**



# Survey Time Series – Net Selectivity Corrections

## Progression of Selectivity Corrections:

1981–2017 = no selectivity correction

2008–2018 = corrected for juv. Pollock escapement

2019 = corrected for juv. Pollock & eulachon

2020+ = corrected for all species\*

\* pollock updated in 2021

