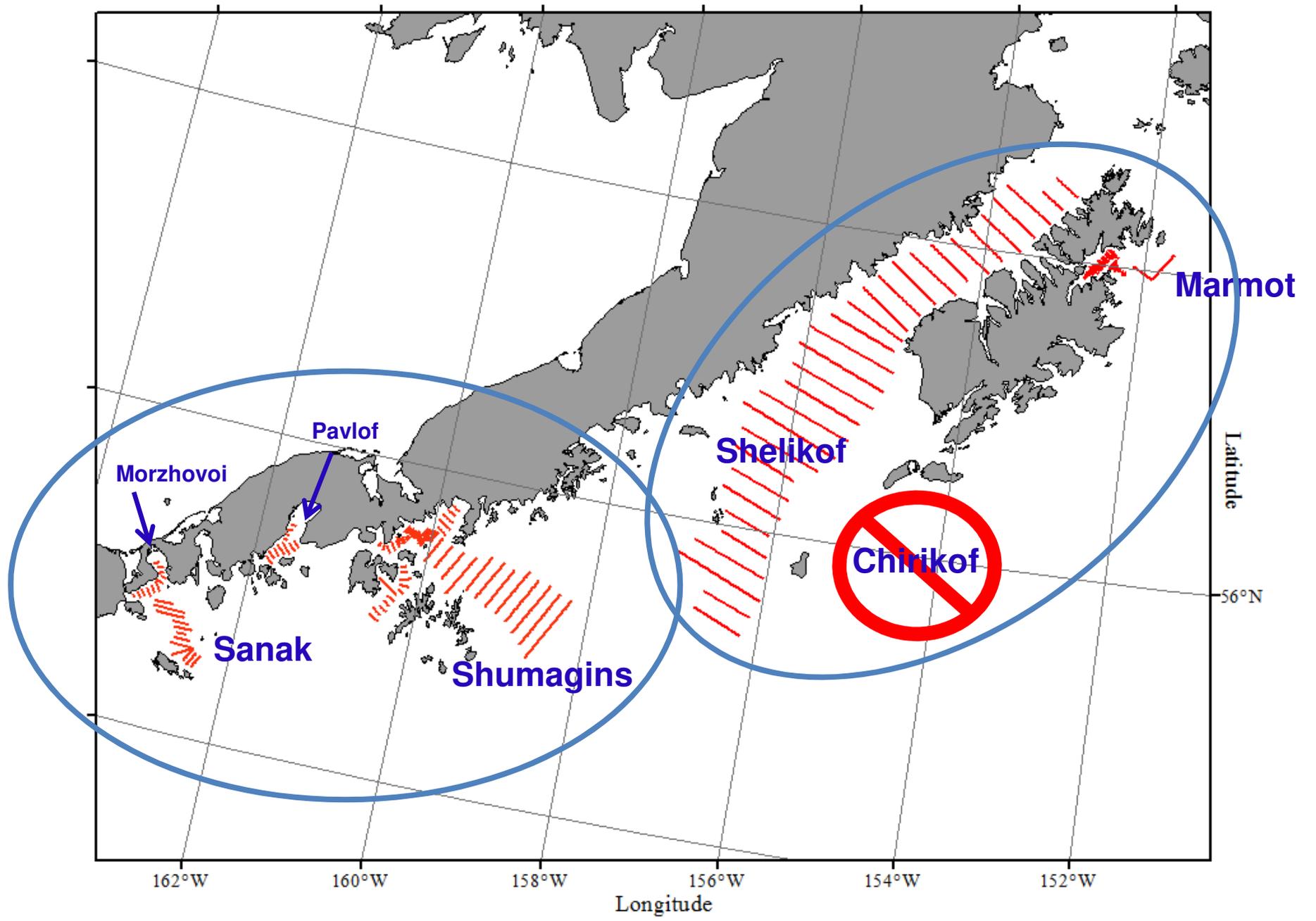


**Results of the winter 2016
Acoustic-Trawl Surveys of Walleye
Pollock in the Gulf of Alaska**

**Sarah Stienessen & MACE Staff
Midwater Assessment and Conservation Engineering
Alaska Fisheries Science Center**



Shumagins, Sanak, Morzhovoi, and Pavlof

1 tow, 38 nmi of trackline

Feb 16-17

Morzhovi Bay

Feb 17

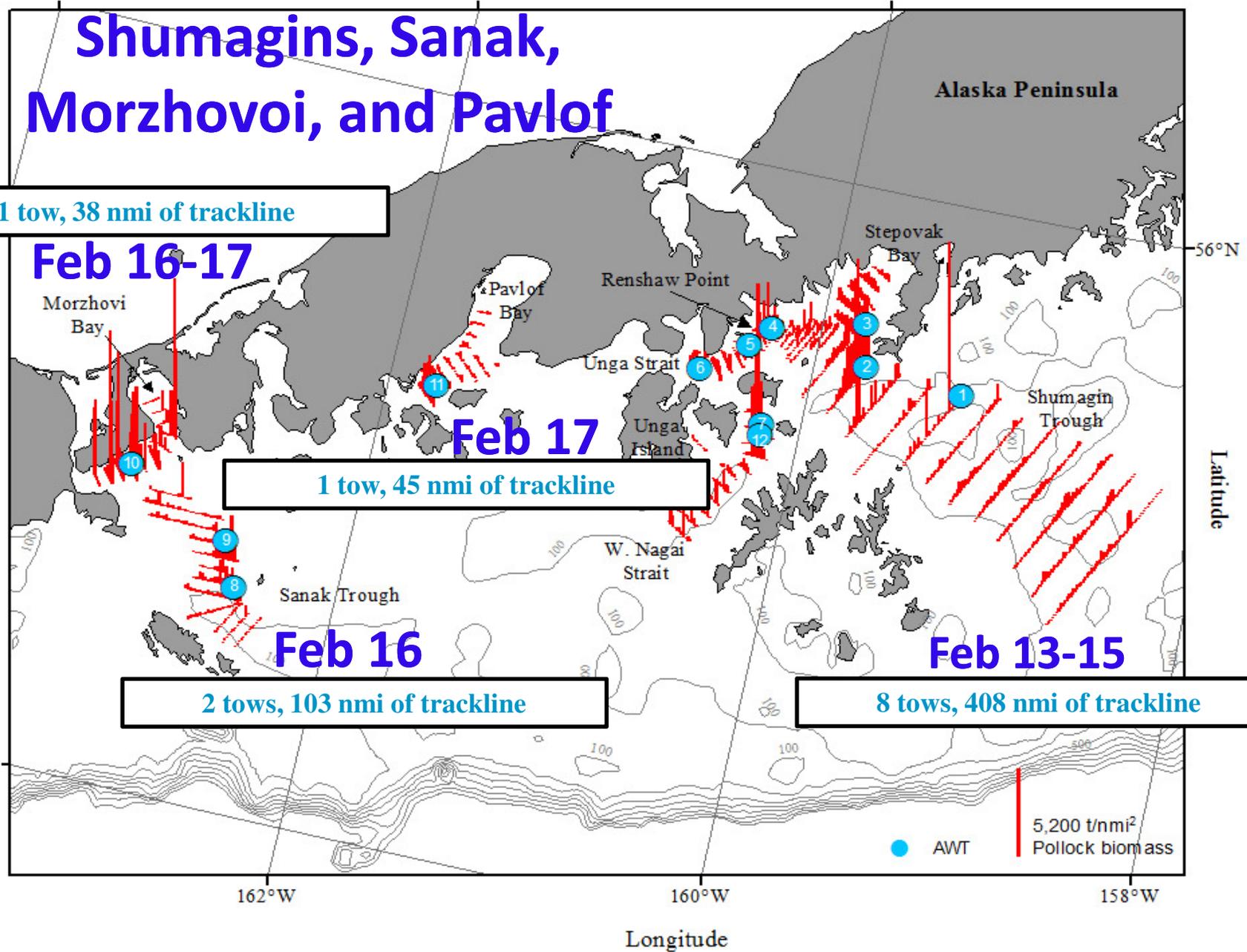
1 tow, 45 nmi of trackline

Feb 16

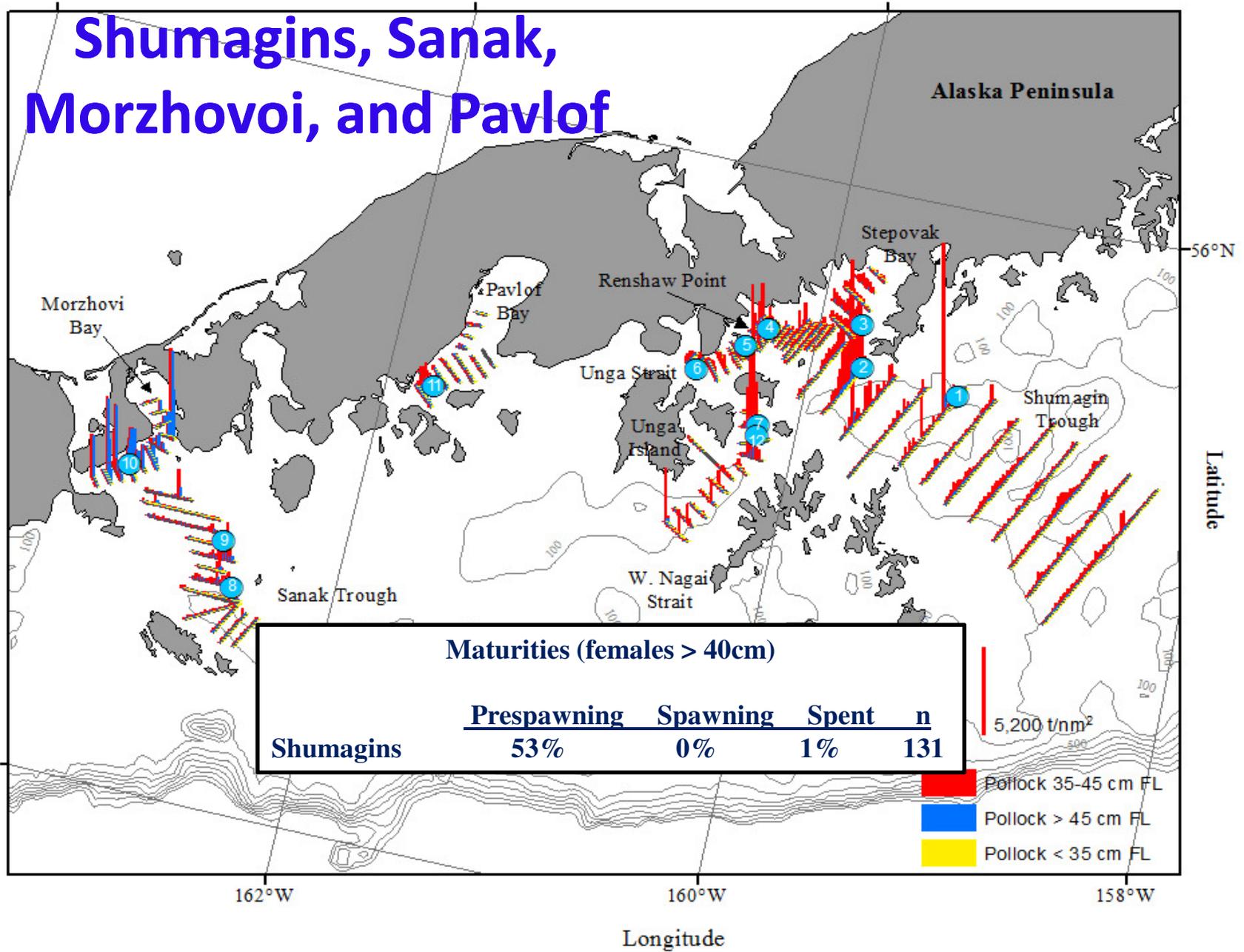
2 tows, 103 nmi of trackline

Feb 13-15

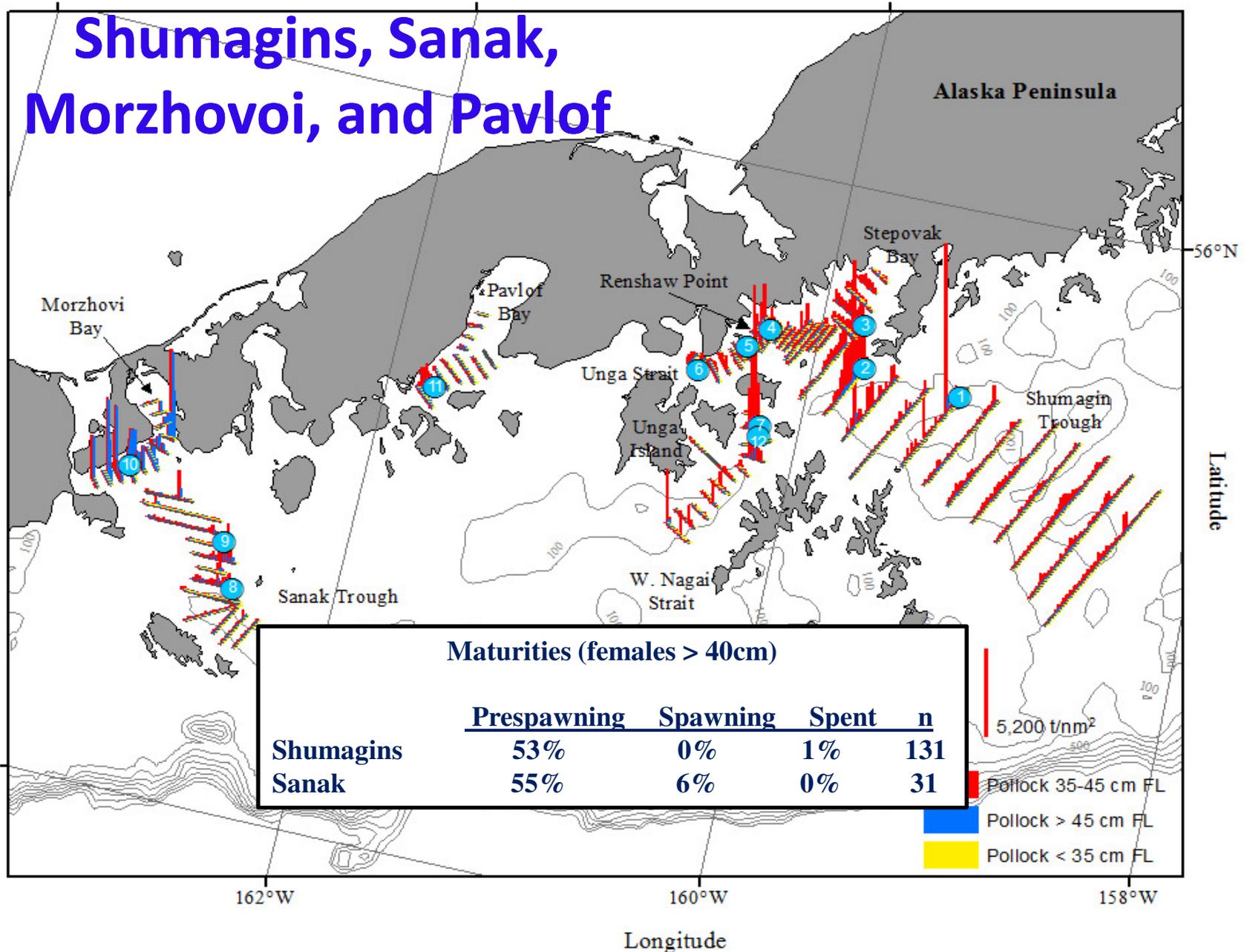
8 tows, 408 nmi of trackline



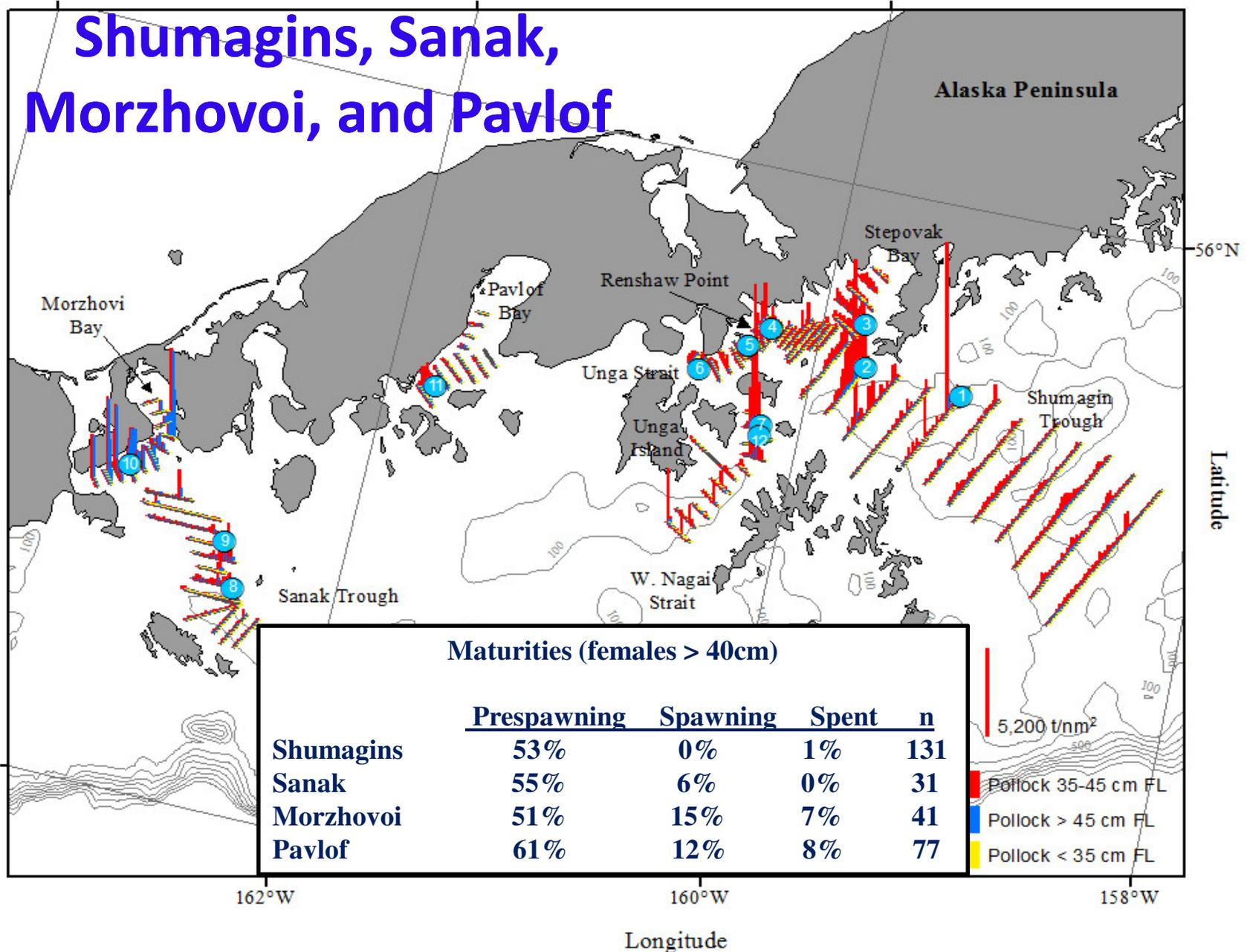
Shumagins, Sanak, Morzhovoi, and Pavlof



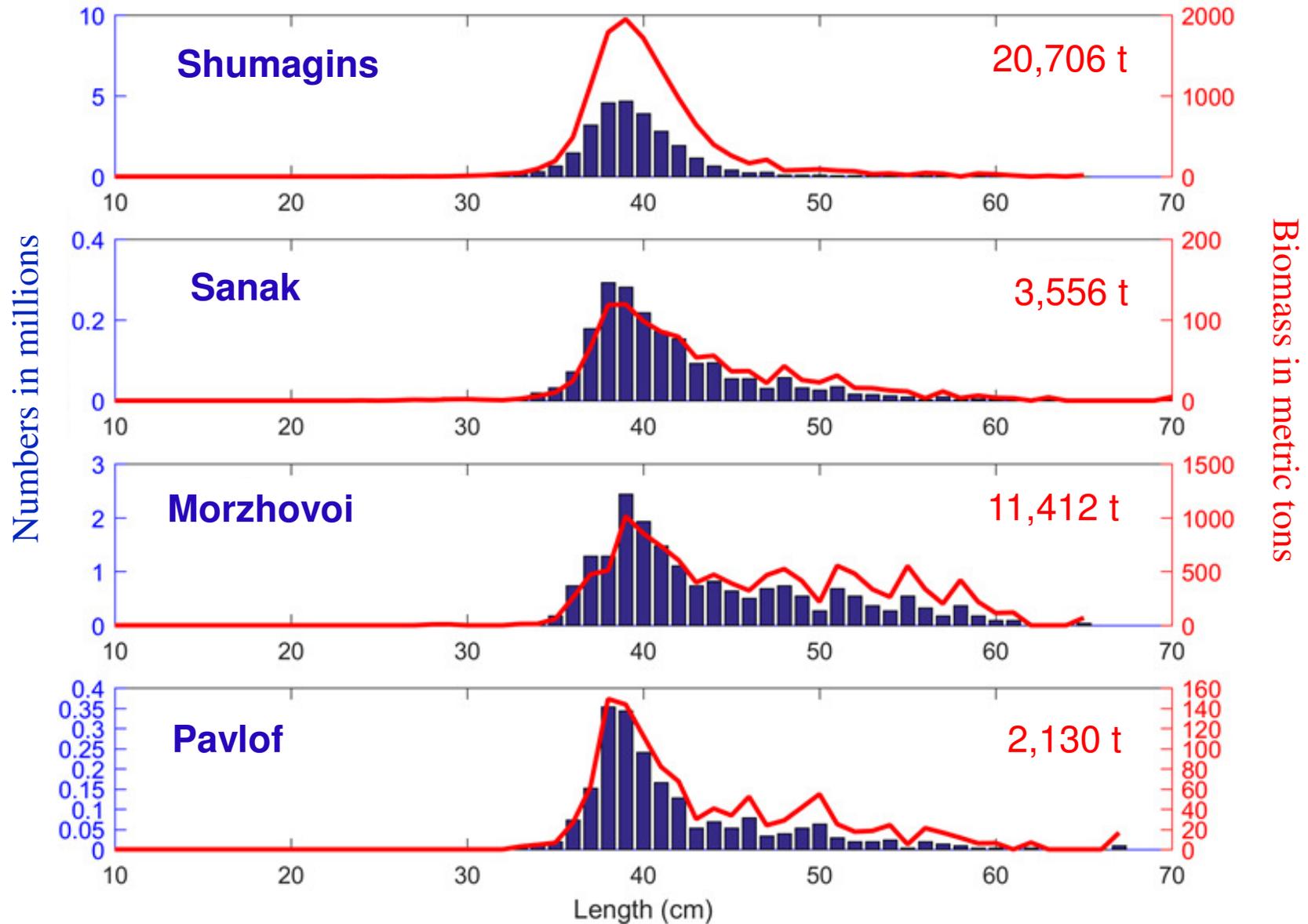
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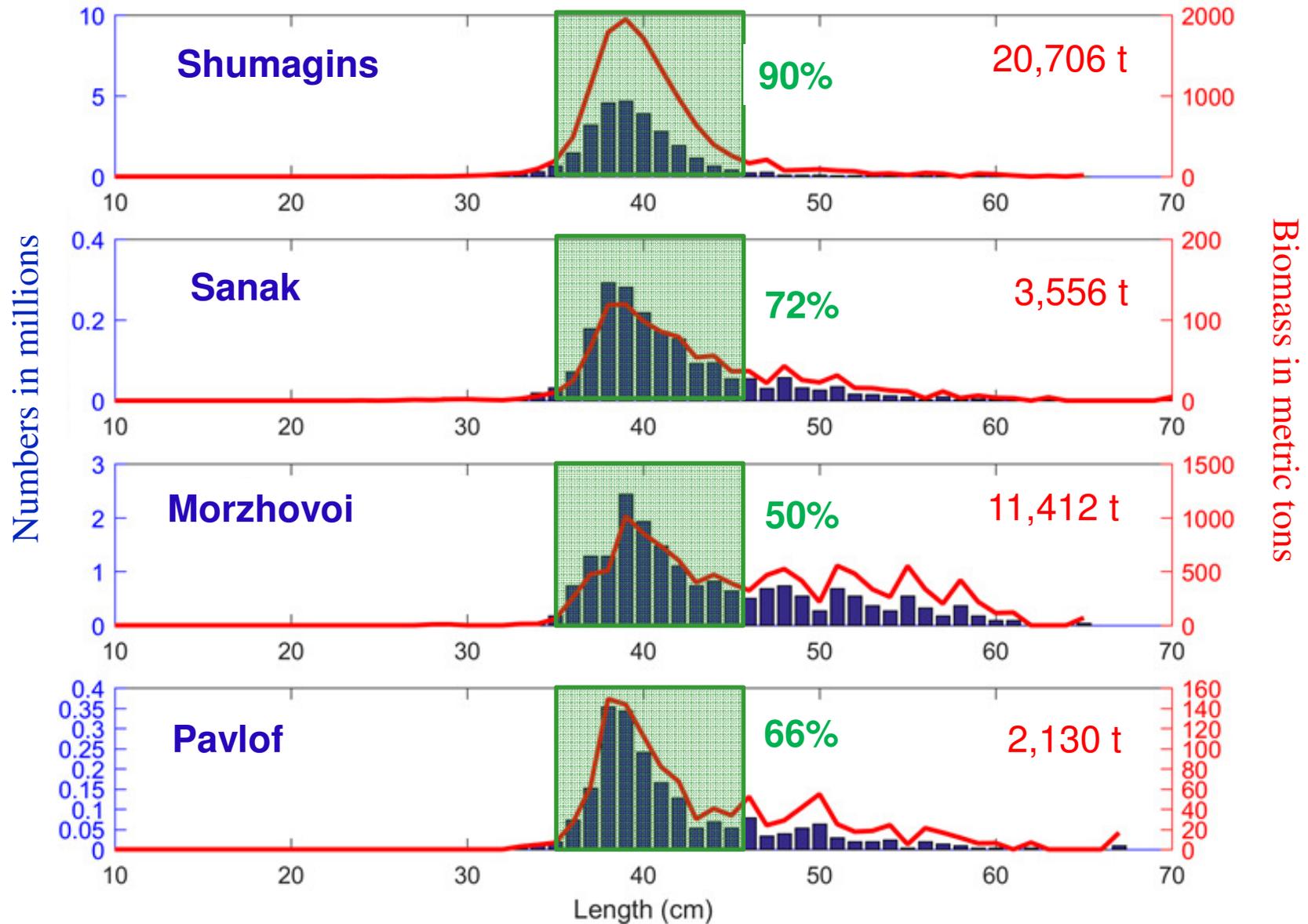
Shumagins, Sanak, Morzhovoi, and Pavlof



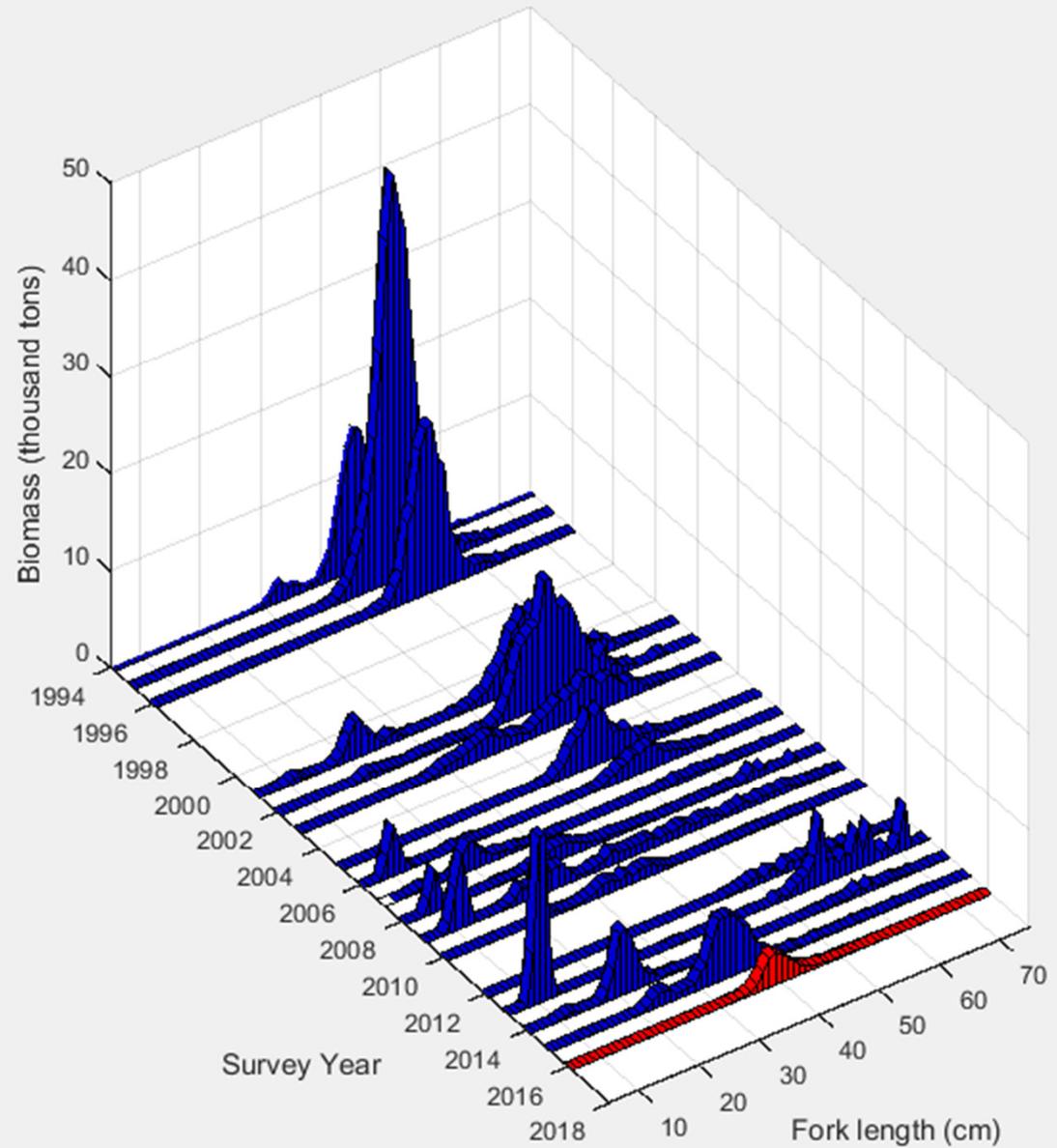
Length Distributions



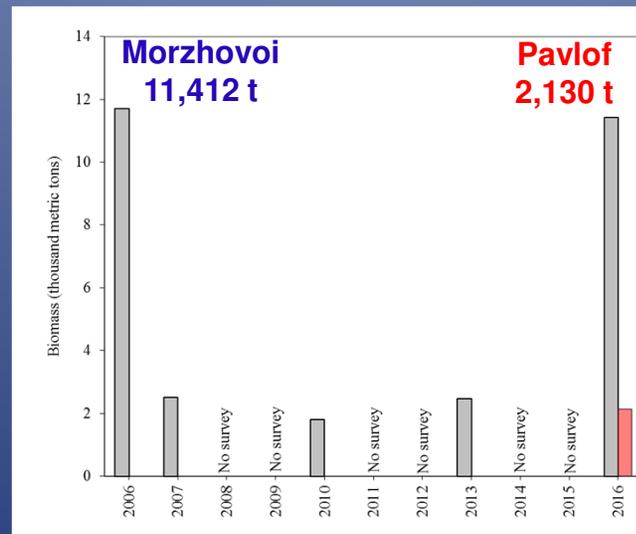
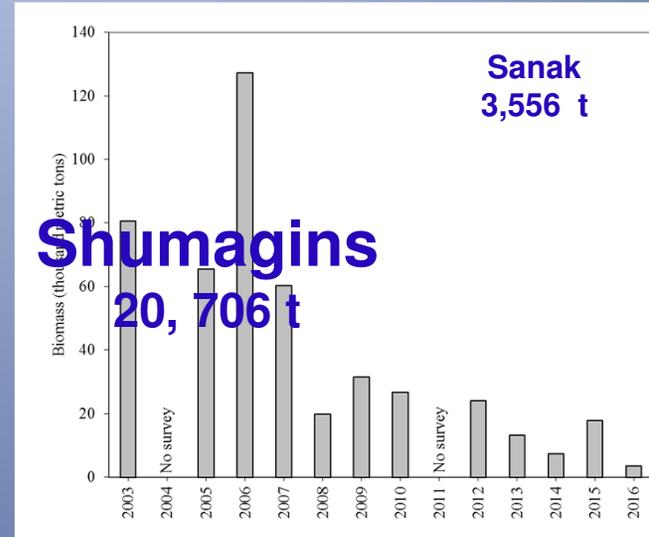
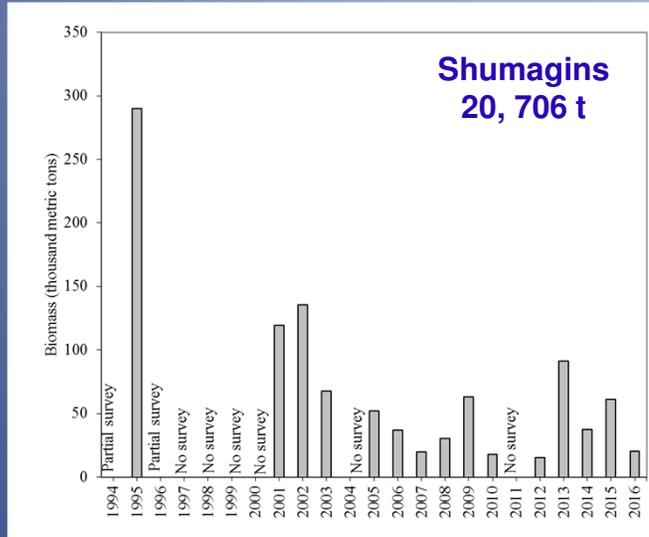
Length Distributions



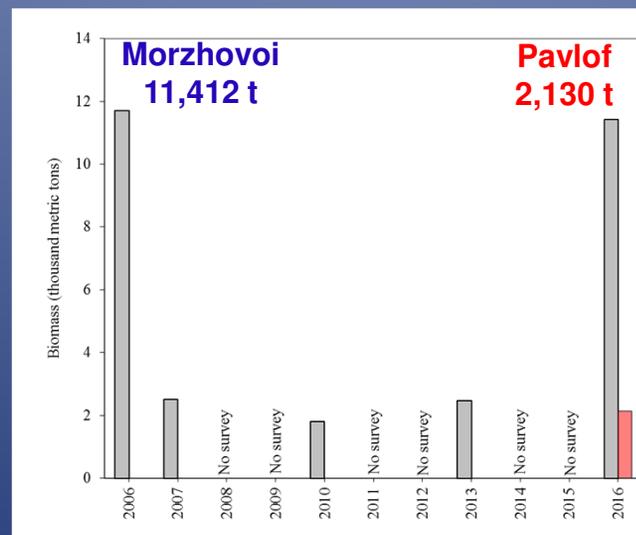
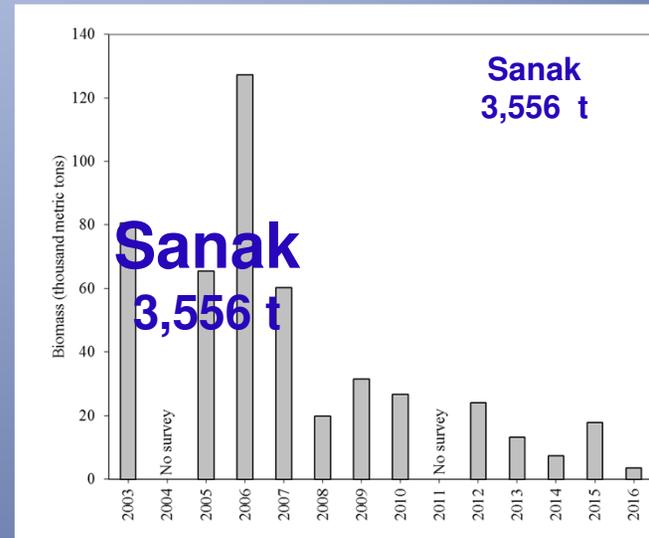
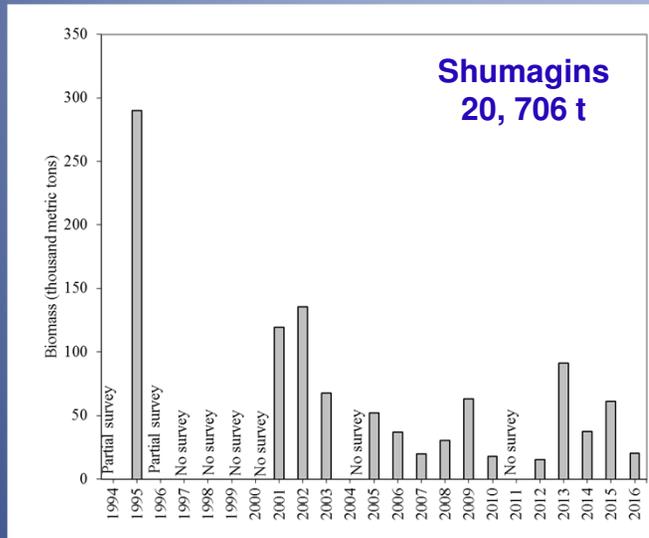
Shumagin Islands Historical Pollock Size Composition



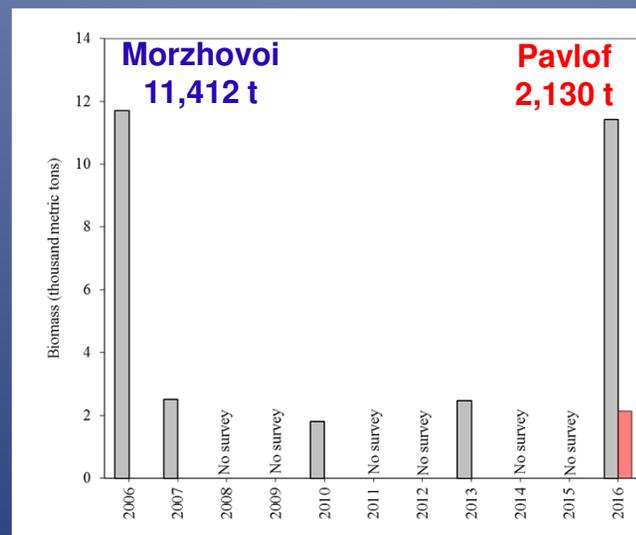
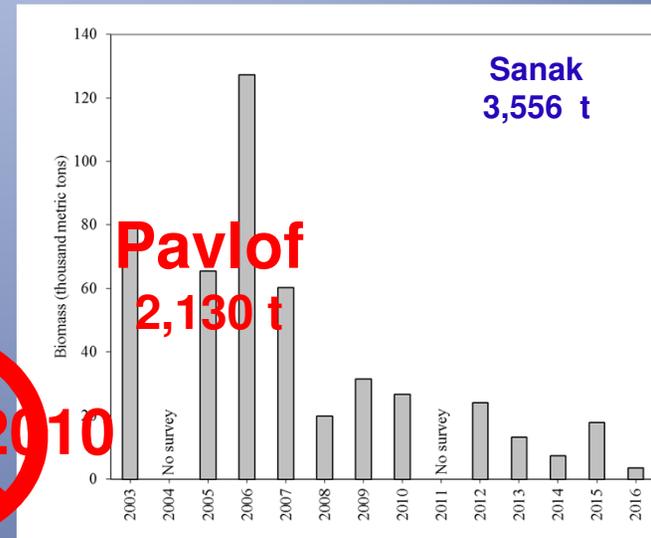
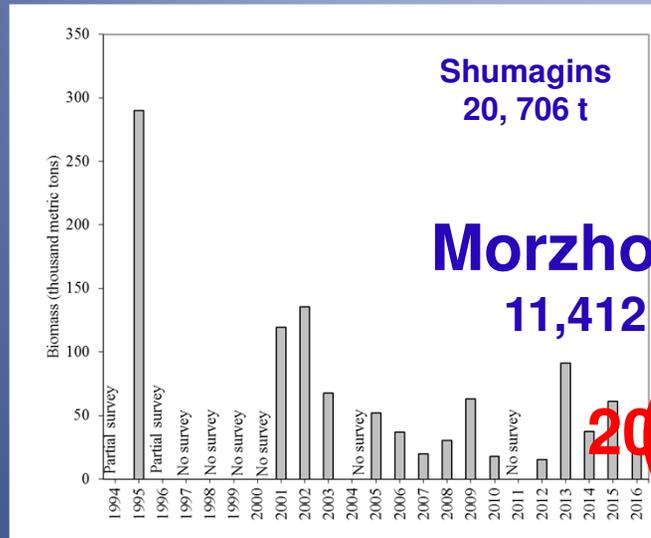
Pollock Biomass Estimates: Time Series



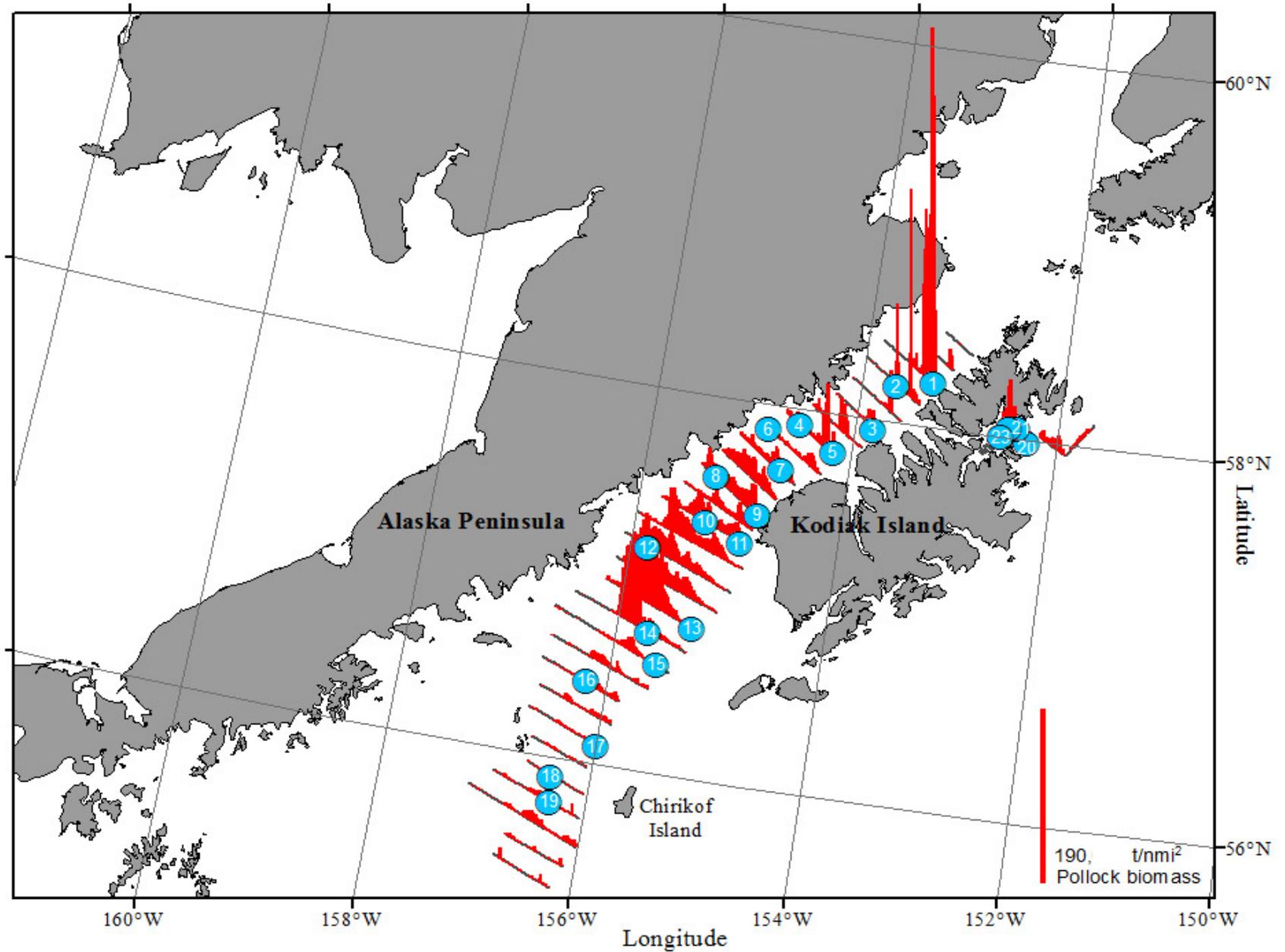
Pollock Biomass Estimates: Time Series



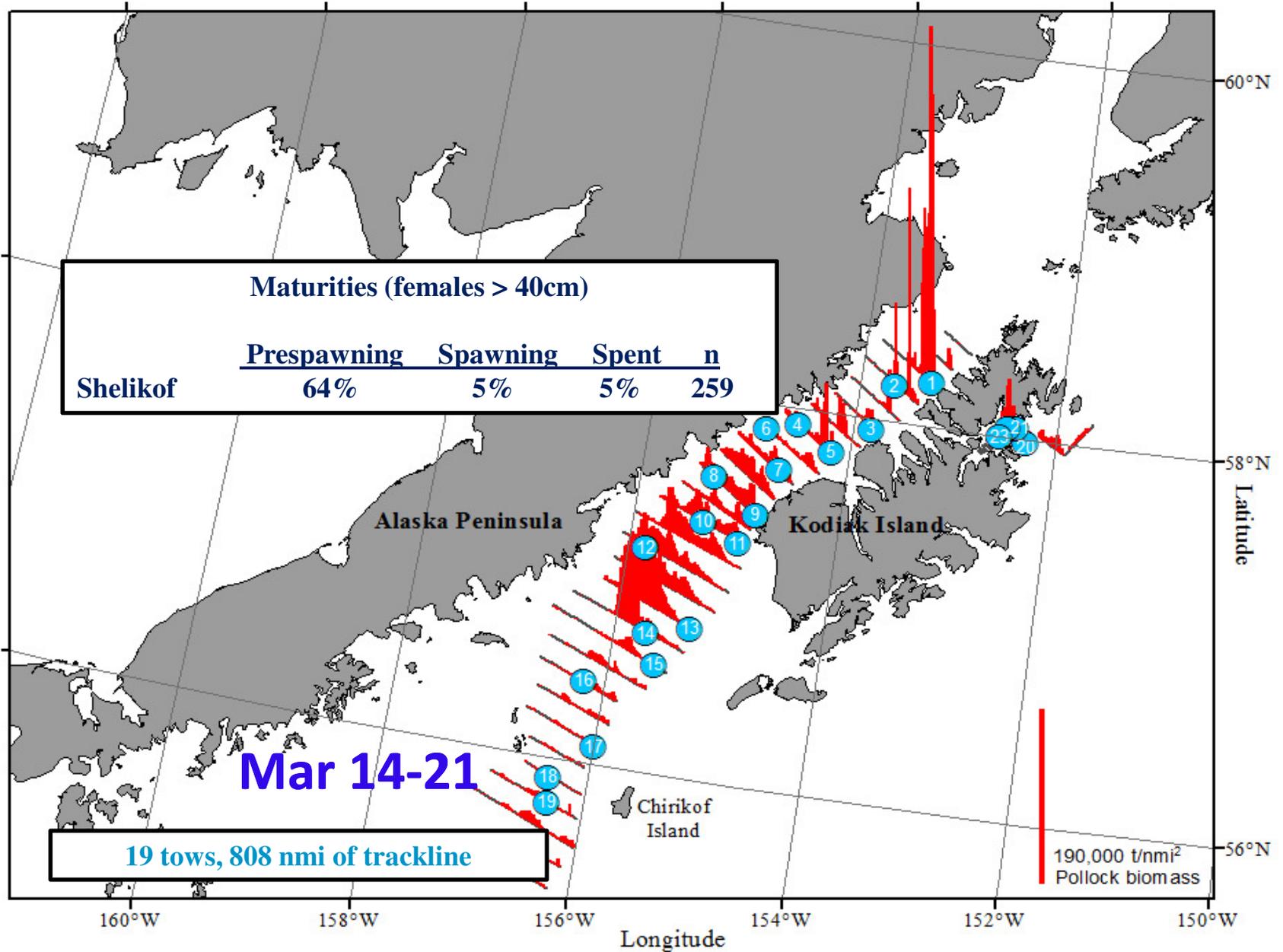
Pollock Biomass Estimates: Time Series



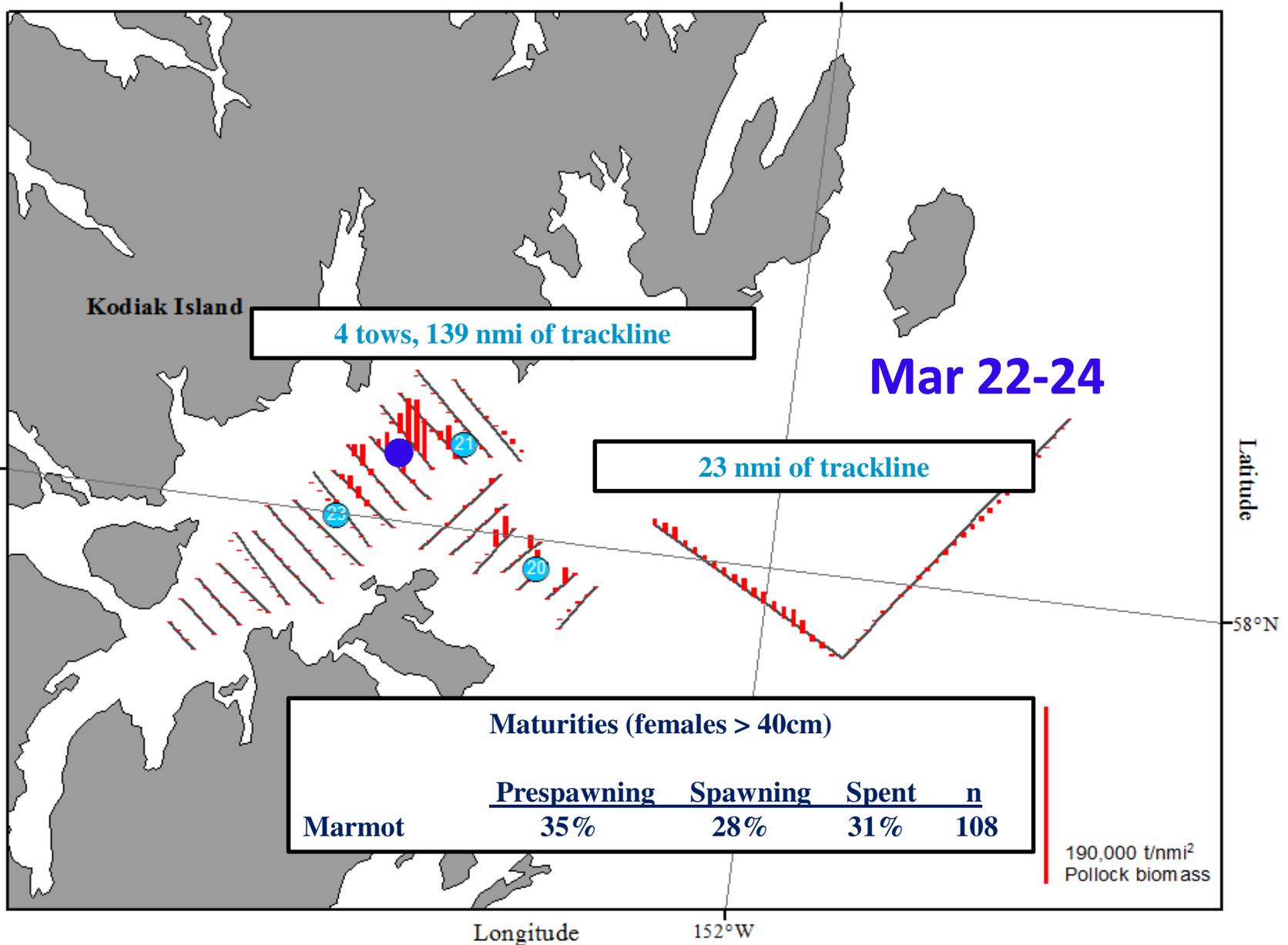
Shelikof and Marmot



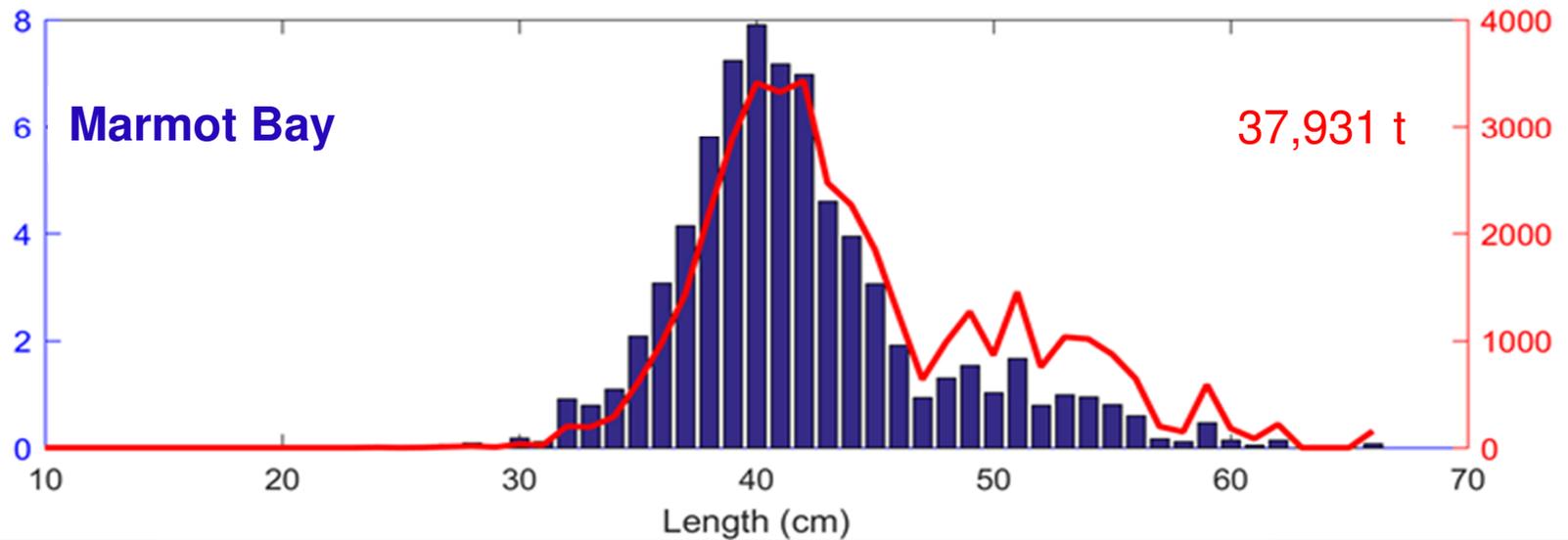
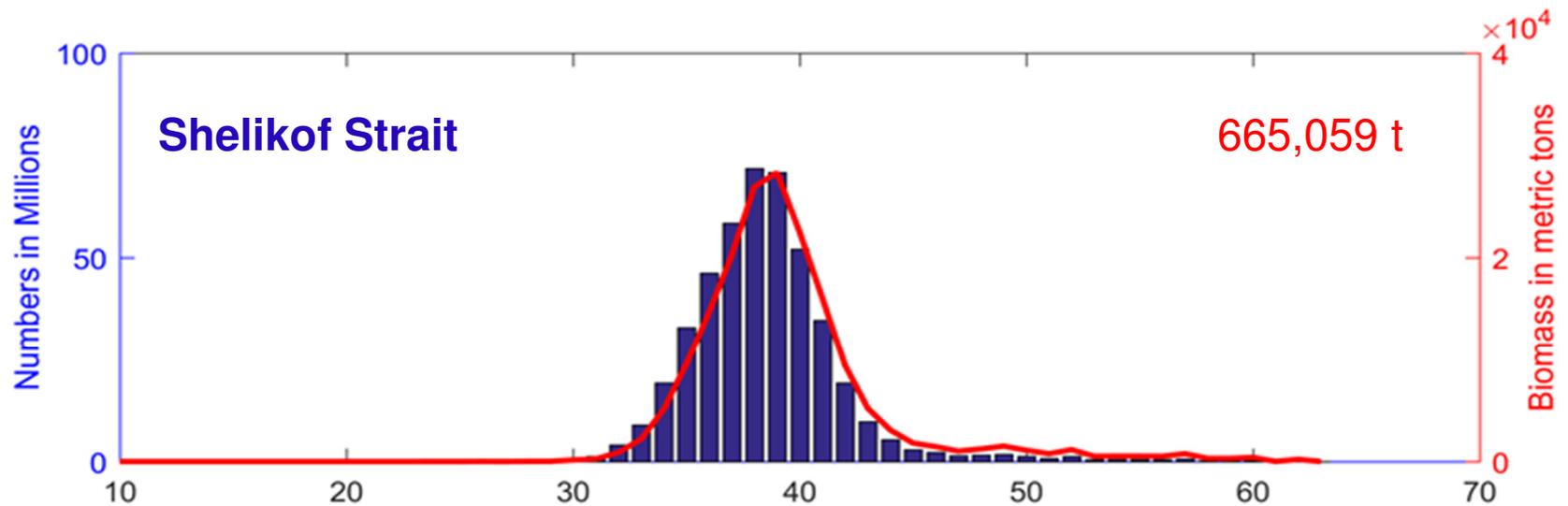
Shelikof



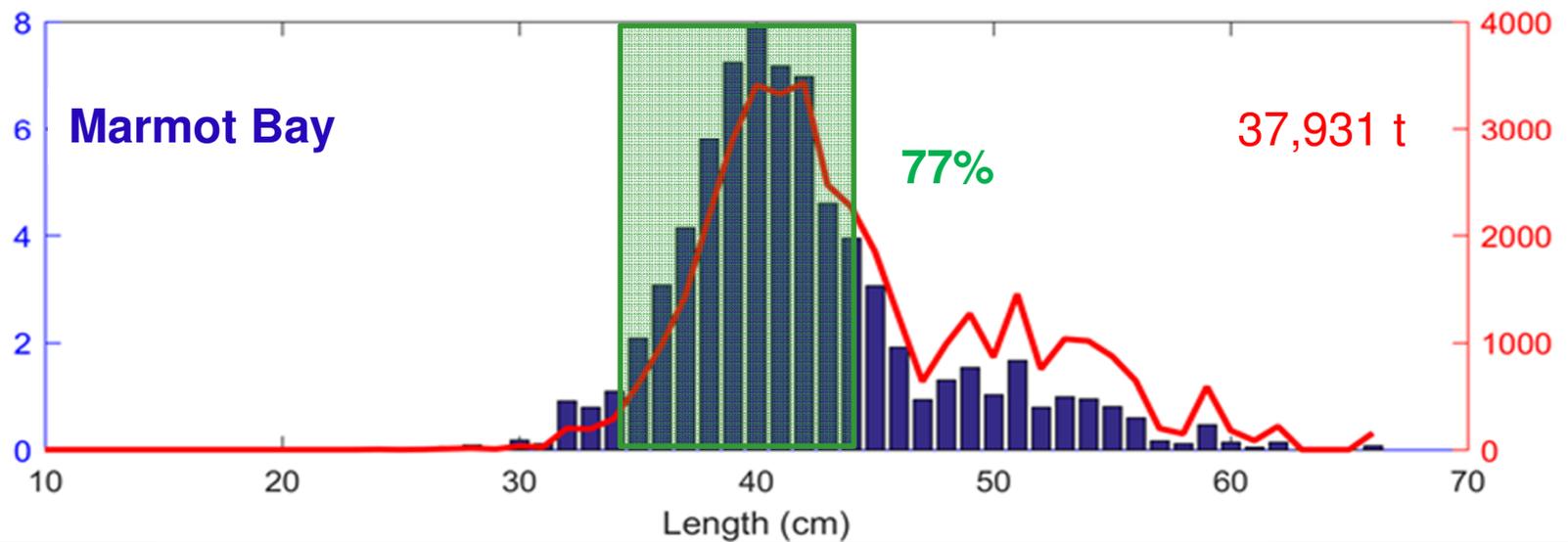
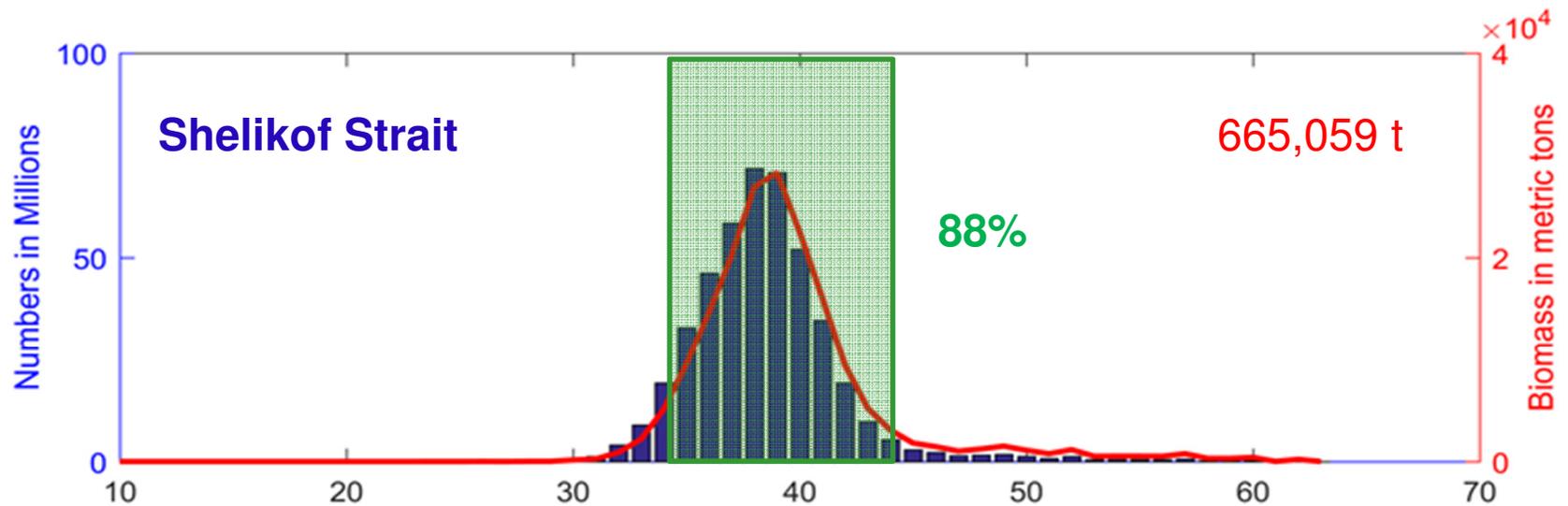
Marmot Bay

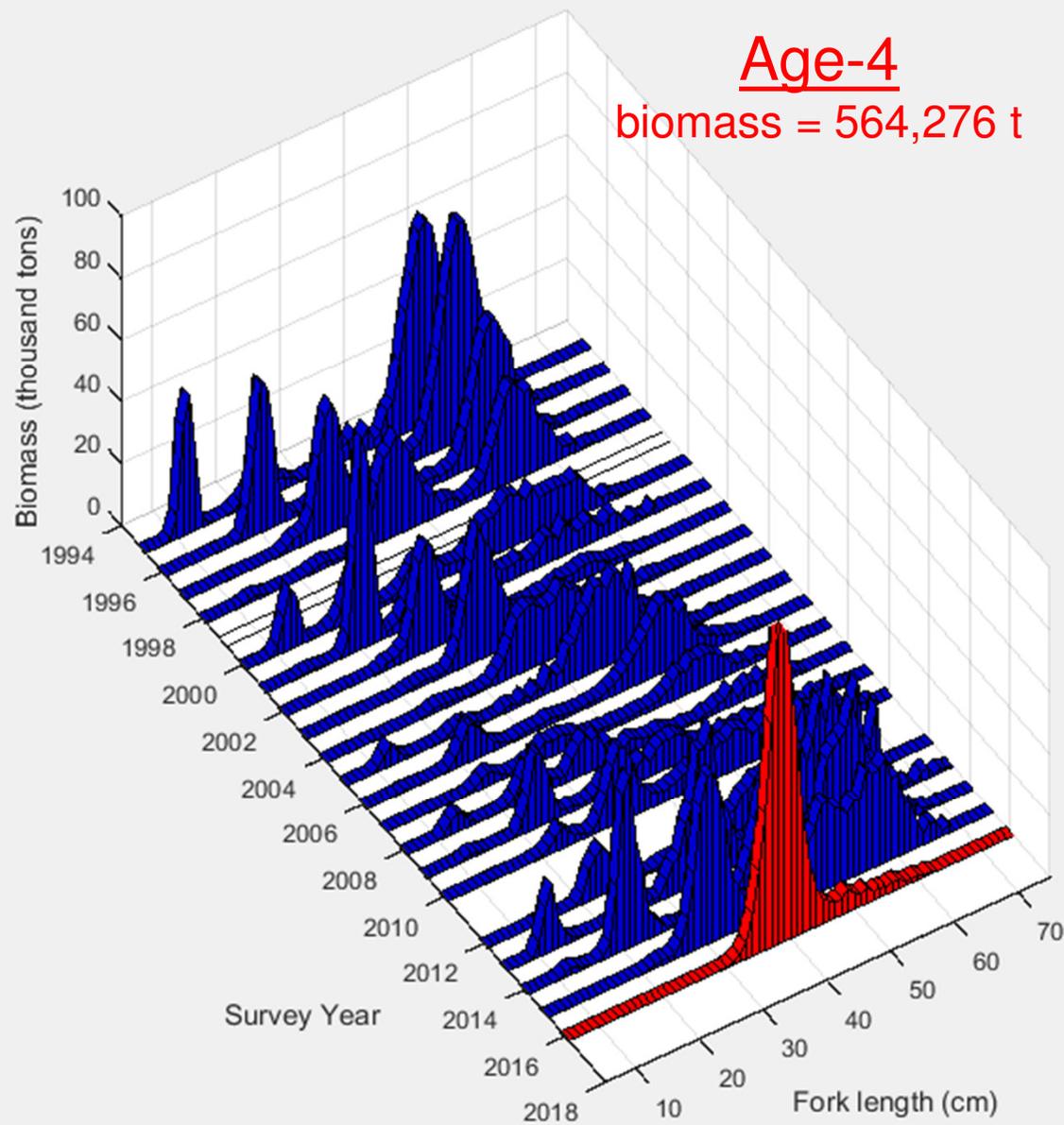


Length Distributions



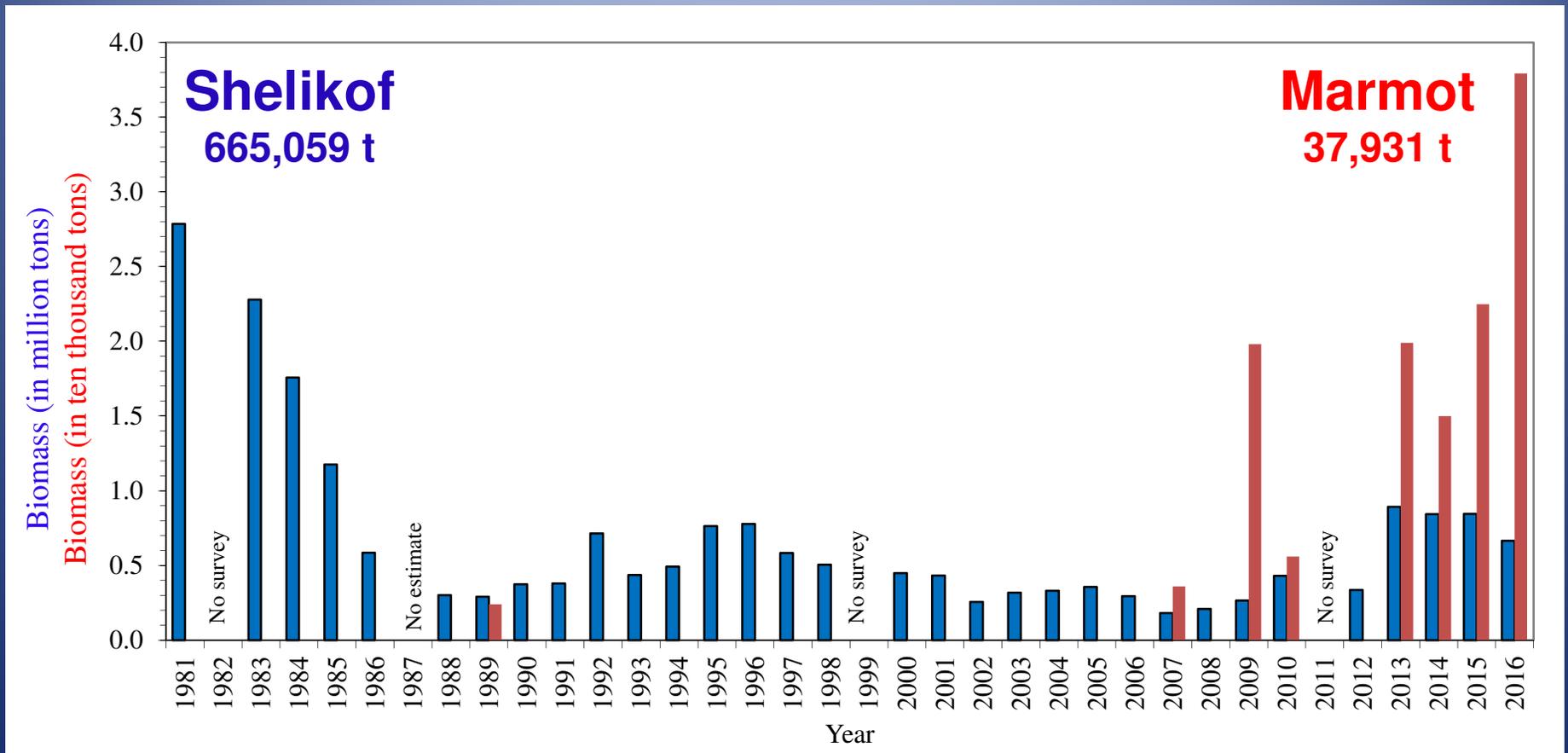
Length Distributions



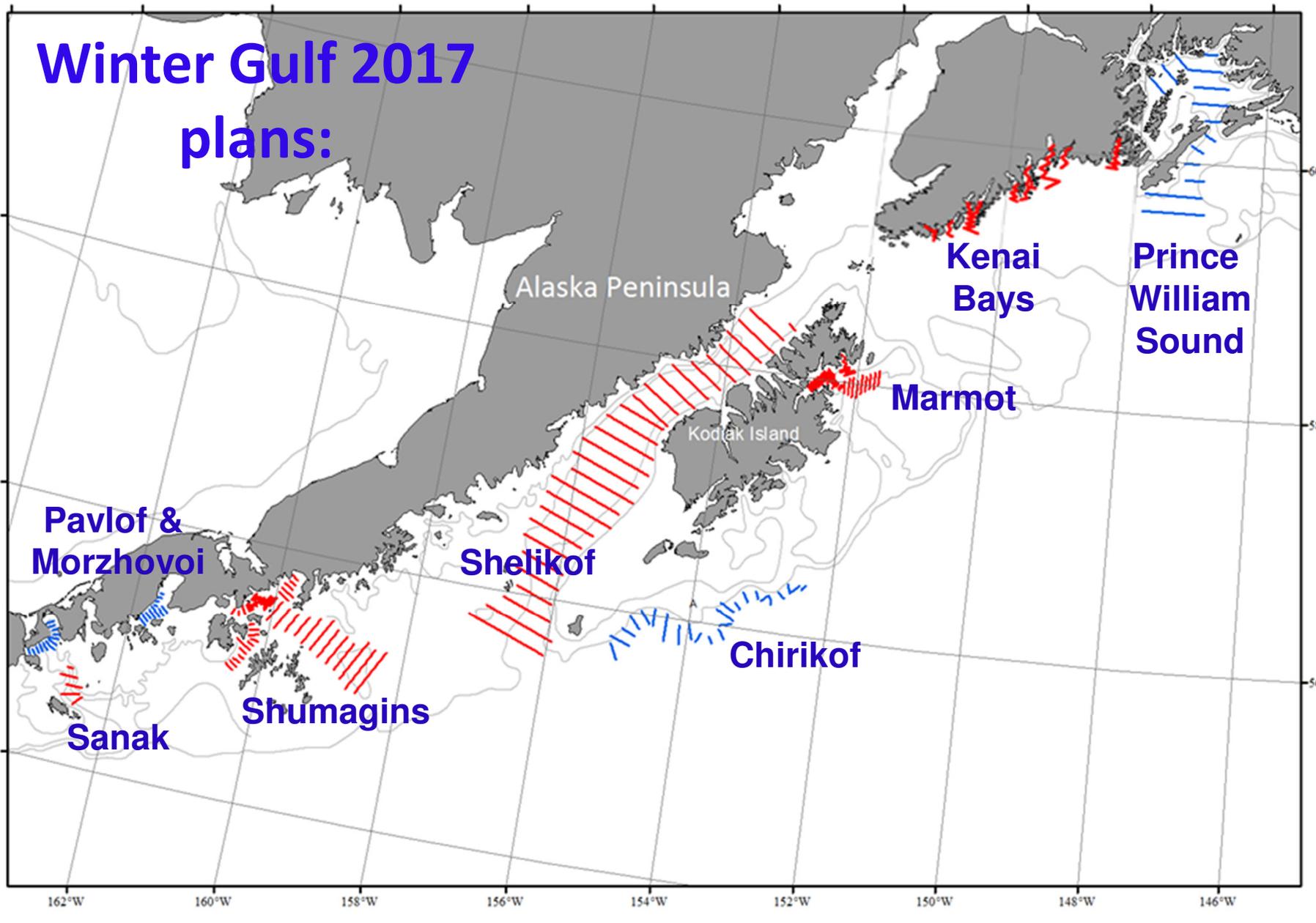


Shelikof Strait Historic Pollock Size Composition

Pollock Biomass Estimates: Time Series



Winter Gulf 2017 plans:



Moored echosounders: applications for fisheries assessment work

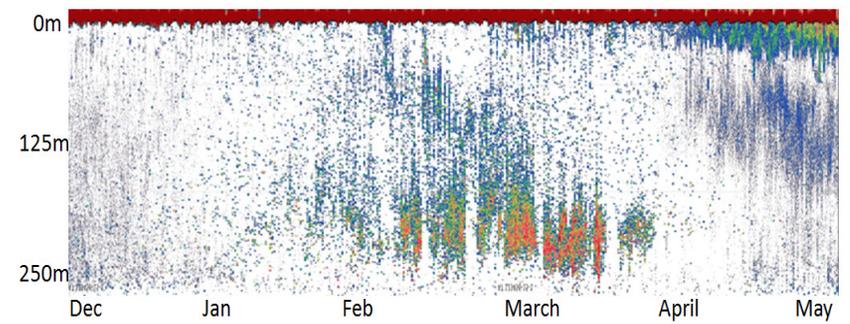
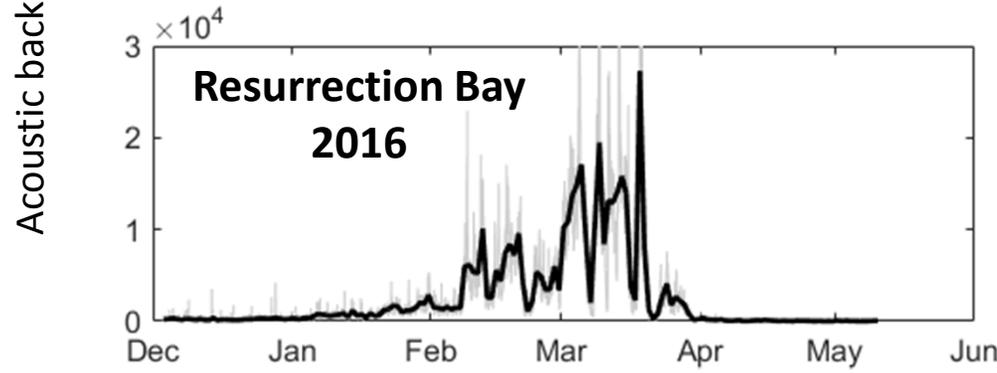
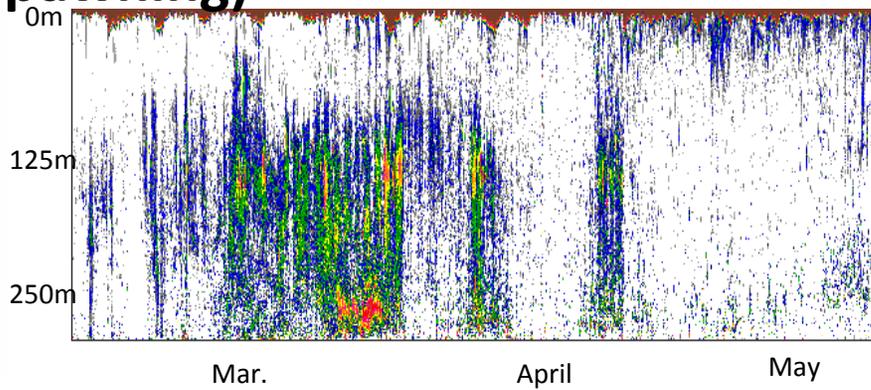
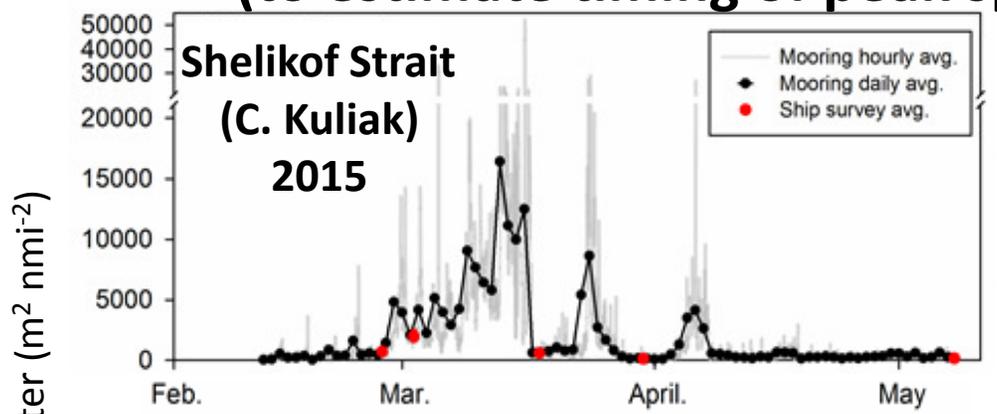
- Low-power battery-powered 70 kHz split-beam echosounder
- Deployed on seafloor up to 1 year
- Trawl-resistant mooring design
- Easily deployed and recovered
- Long time series of abundance and behavior in moored location.

Applications in GOA

1. Shelikof Strait, Gulf of Alaska – Evaluate whether *survey comparable* pollock abundance estimates are possible with bottom-mounted echosounders (deployment: Feb - May 2015).
2. Resurrection Bay, GOA - determine optimal time for ship-based pollock spawning surveys in Kenai Bays (deployment: Dec 2015 – May 2016).
3. Sanak Is. (“Shumagin” survey, GOA – determine optimal time for ship-based pollock spawning survey (deployment *Nov 2016 - May 2017*)).



Observations in GOA pollock spawning sites (to estimate timing of peak spawning)



Sanak Trough
2017
TBD

Questions?



First Mooring Project – Spring 2015

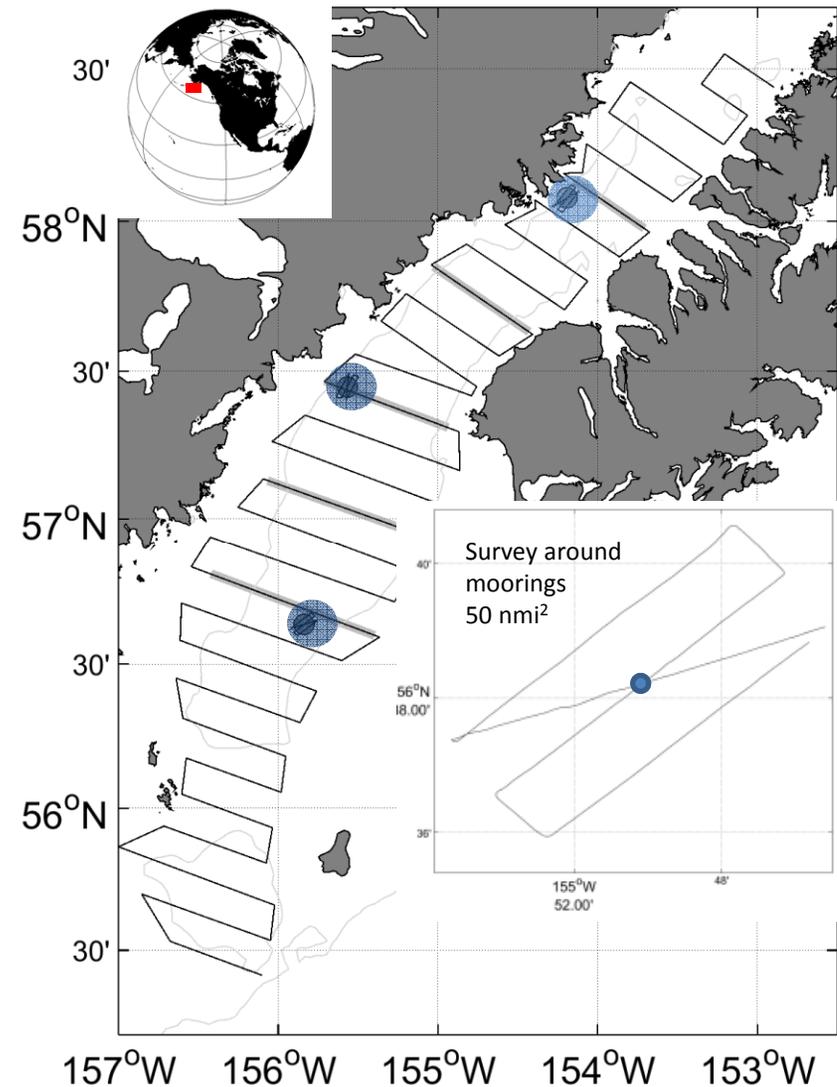
Shelikof Strait (Gulf of Alaska), pollock spawning grounds



Is a survey-comparable pollock abundance estimate possible w/moorings?

Experimental design:

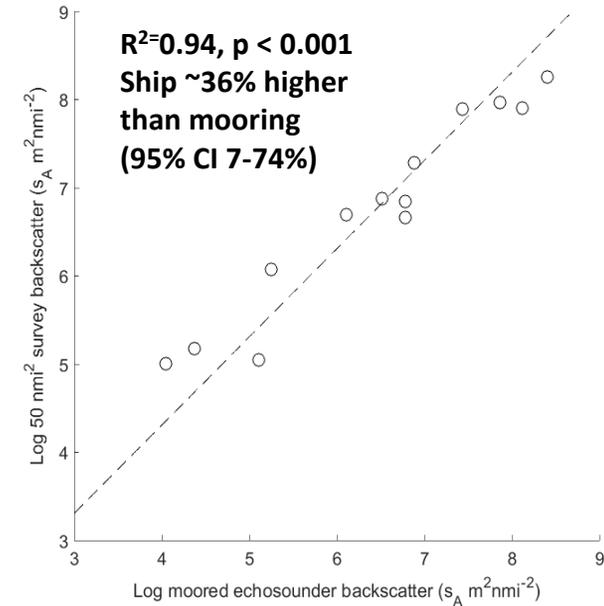
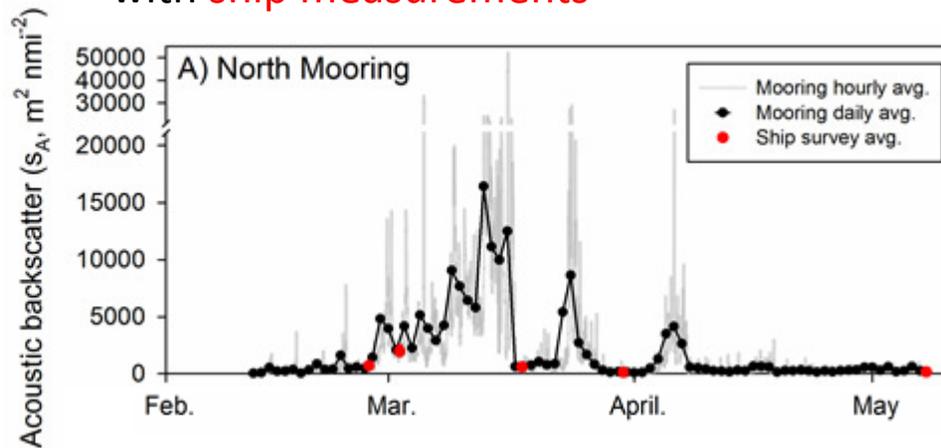
- Study Area: Shelikof Strait acoustic-trawl survey area of pre-spawning walleye pollock (March 2015; NOAA ship *Oscar Dyson*)
- 3 ea bottom-mounted echosounder moorings (Simrad 70 kHz WBAT; Feb-May 2015 = Dyson deployment, charter vessel recovery)
- 4-5 ea mini-surveys (50 nmi²) at each mooring site
- Retrospective analysis of last 20-years of Shelikof survey time series to optimize mooring number and placement(s).



Shelikof Result 1. Moored echosounders can describe fish abundance over a broad area.

Moorings and the Oscar Dyson 50 nmi² mini-surveys provide comparable results.

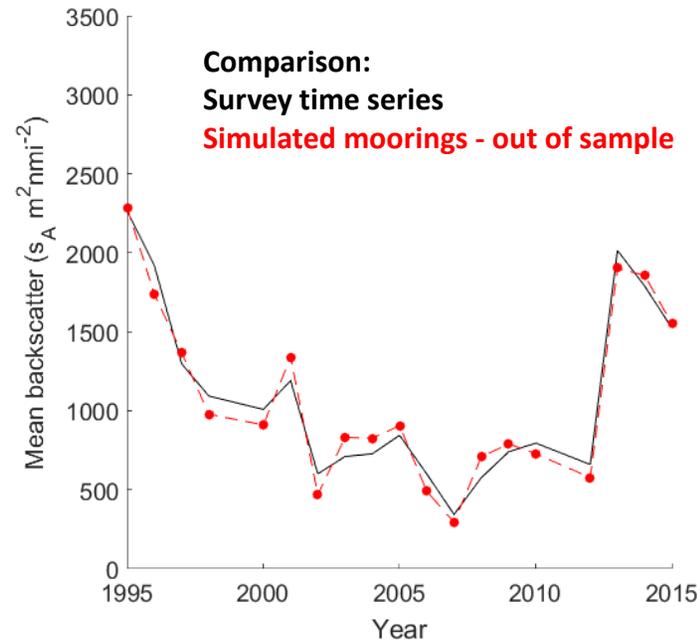
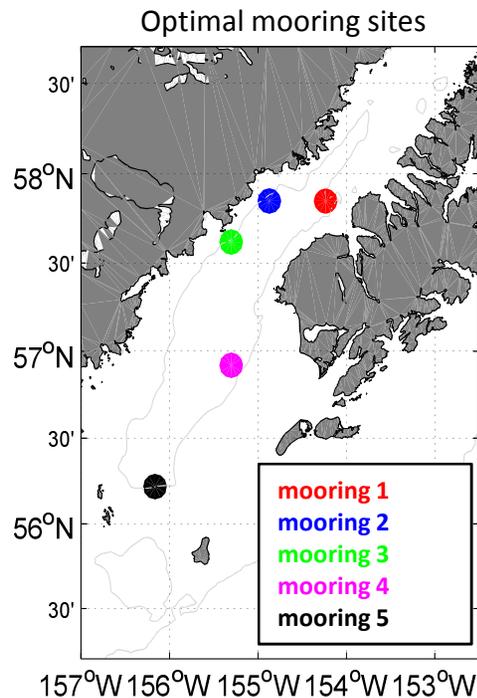
Moored echosounder, compares well
with ship measurements



- 1) Pre-spawning pollock backscatter levels peak in mid-march
- 2) Dyson mini-survey pollock estimates (red dots) match mooring estimates
- 3) Very high, significant correlation between 2 data sets validates mooring approach.
- 4) ~36% offset in data sets due to echosounder frequency differences and in down-looking (ship) vs up-looking (mooring) pollock target strengths

Shelikof Result 2. Retrospective analysis of vessel survey time-series data determined appropriate mooring number and location(s) to estimate pollock abundance index.

Analysis using 20 yrs of survey data suggests 5 moorings at same 5 locations (below) accurately predicted annual survey pollock backscatter

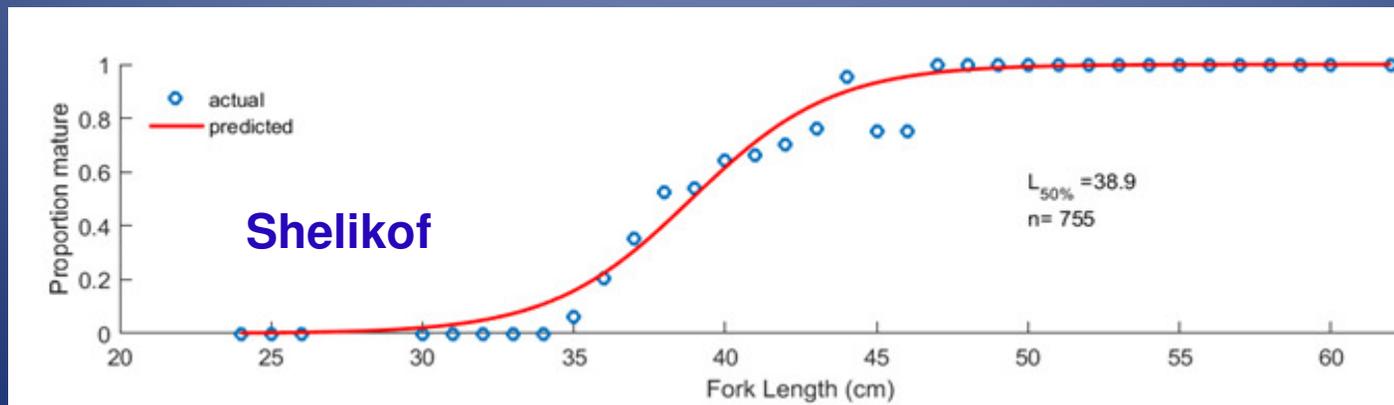
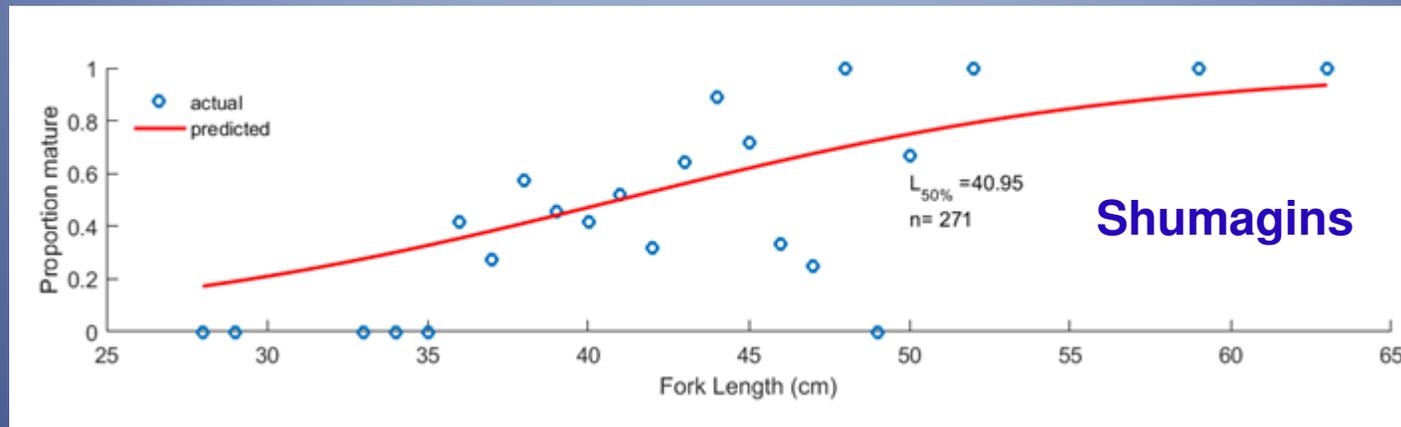


Result with actual mooring data was within ~ 10 % of the 2015 Dyson survey estimate!

Retrospective Analysis approach....

1. Simulate mooring using Dyson survey data (mooring = 50 nmi^2 Dyson subsample data)
2. Search for mooring location(s) to best predict pollock backscatter for entire survey area
3. Mooring location(s) are selected "out-of-sample" (i.e., w/o using data from that year)
4. Predict annual survey-wide pollock backscatter from the selected mooring location(s)

Maturity



Weight at Length

