

Survey update

Crab Plan Team

5/10/24

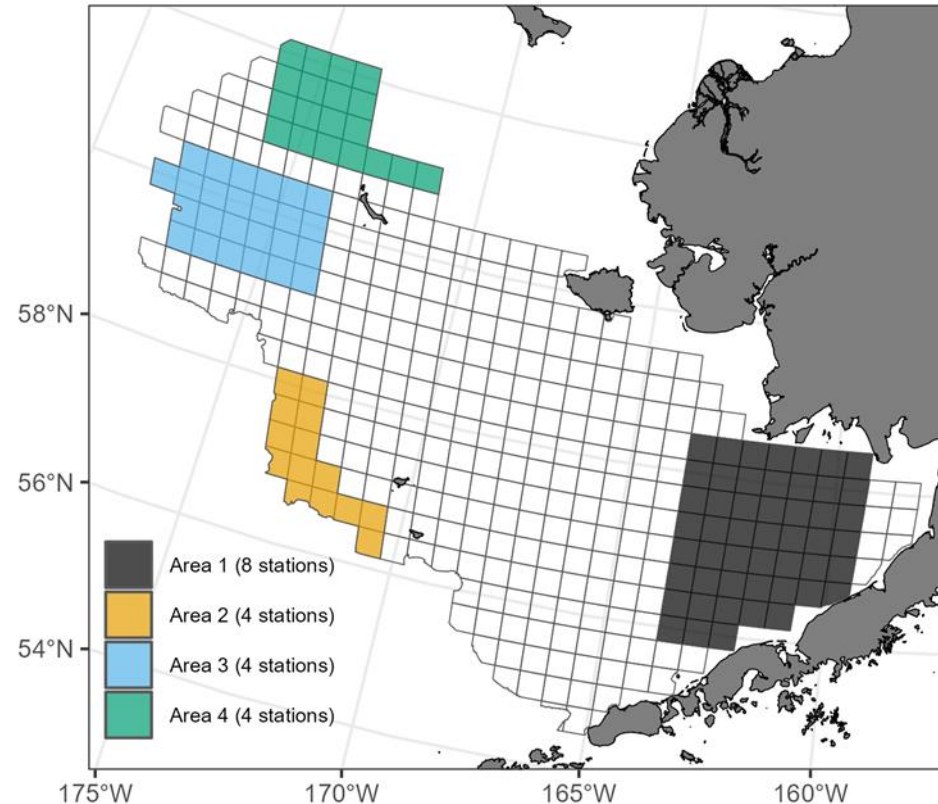
Outline

1. Survey modernization
2. Updating weight-length regressions
3. Chela measurement protocol (SSC request)

1. Survey modernization

Survey modernization: 15/30 minute tows

- 20 side-by-side comparisons in 2024
- Focus on increasing BBRKC samples
- Goal is to calibrate 15-minute tows for introduction in 2026
- Gradual implementation discussed (e.g., 25% 15 minute in 2026, 50% in 2027, 75% in 2028, 100% in 2028)
- Collaboration / coordination with ADF&G and AFSC assessment groups under way

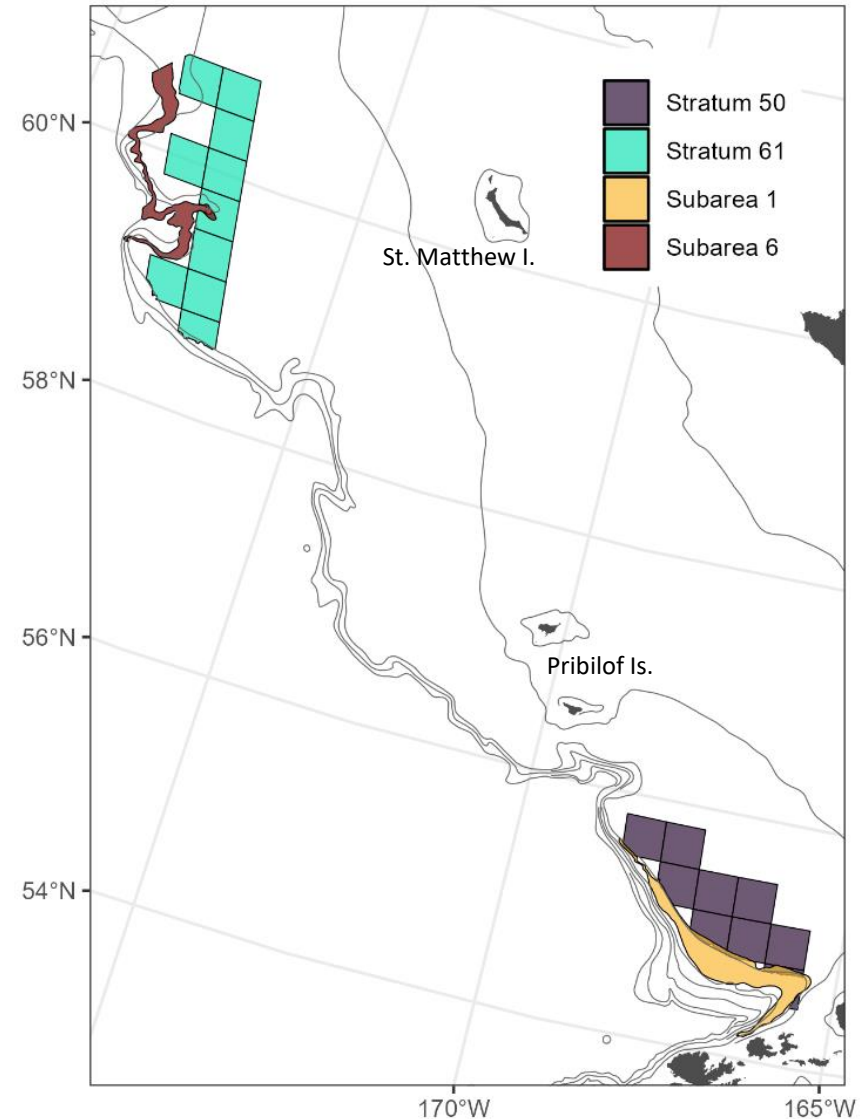


History of 15/ 30 minute comparison tows

- **1995:** 25 'usable' pairs of tows; only 'target' fish and crab species; no usable RKC data.
- **1998:** 70 pairs; single vessel; only crab data collected.
- **2021:** 16 pairs; single vessel; no usable RKC or snow crab data.
- **2022:** 8 pairs; side-by-side tows; no usable snow crab data.
- **2023:** 4 pairs; single vessel; some RKC, very little Tanner crab, no usable snow crab.
- **2024:** 20 pairs planned

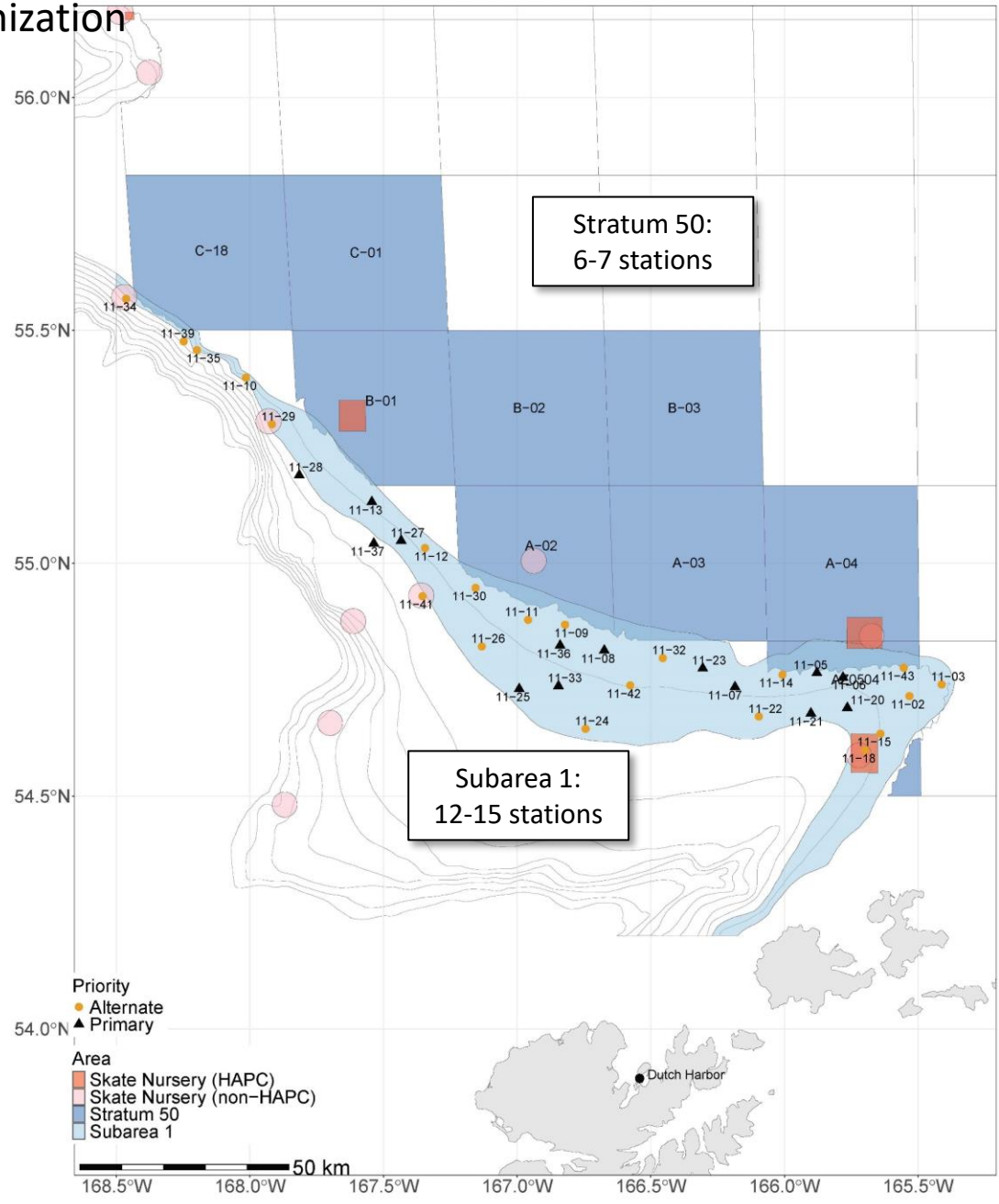
Survey modernization: slope/shelf comparison

- Overall goal: integrate sampling between shelf and upper slope
- 2024 fieldwork: side by side 83-112 / Poly Nor'eastern comparison
- Comparison tows on shelf and slope to 400 m

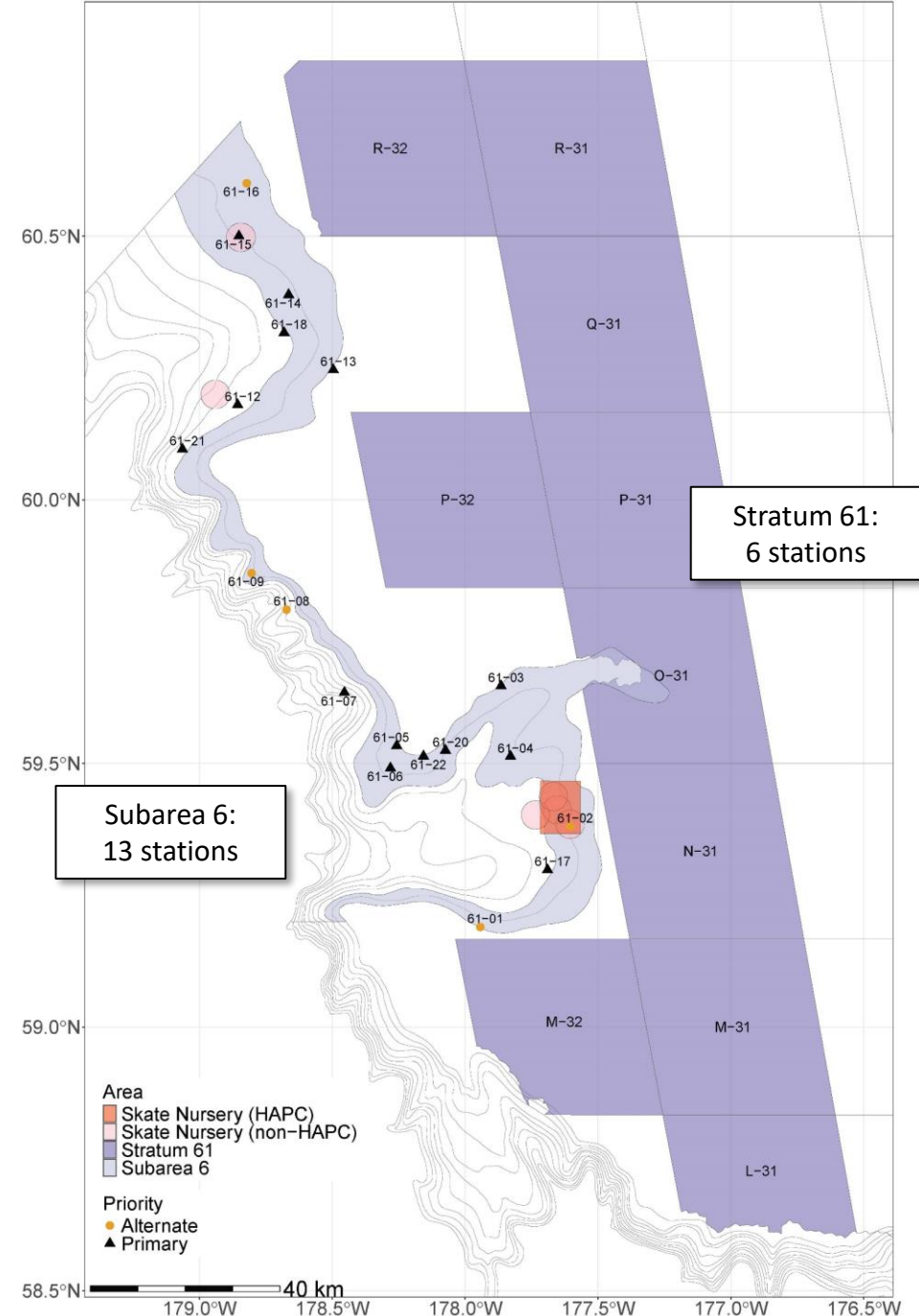


1. Survey modernization

Shelf/Slope Gear Comparison Project Sample Areas
Subarea 1 and Stratum 50



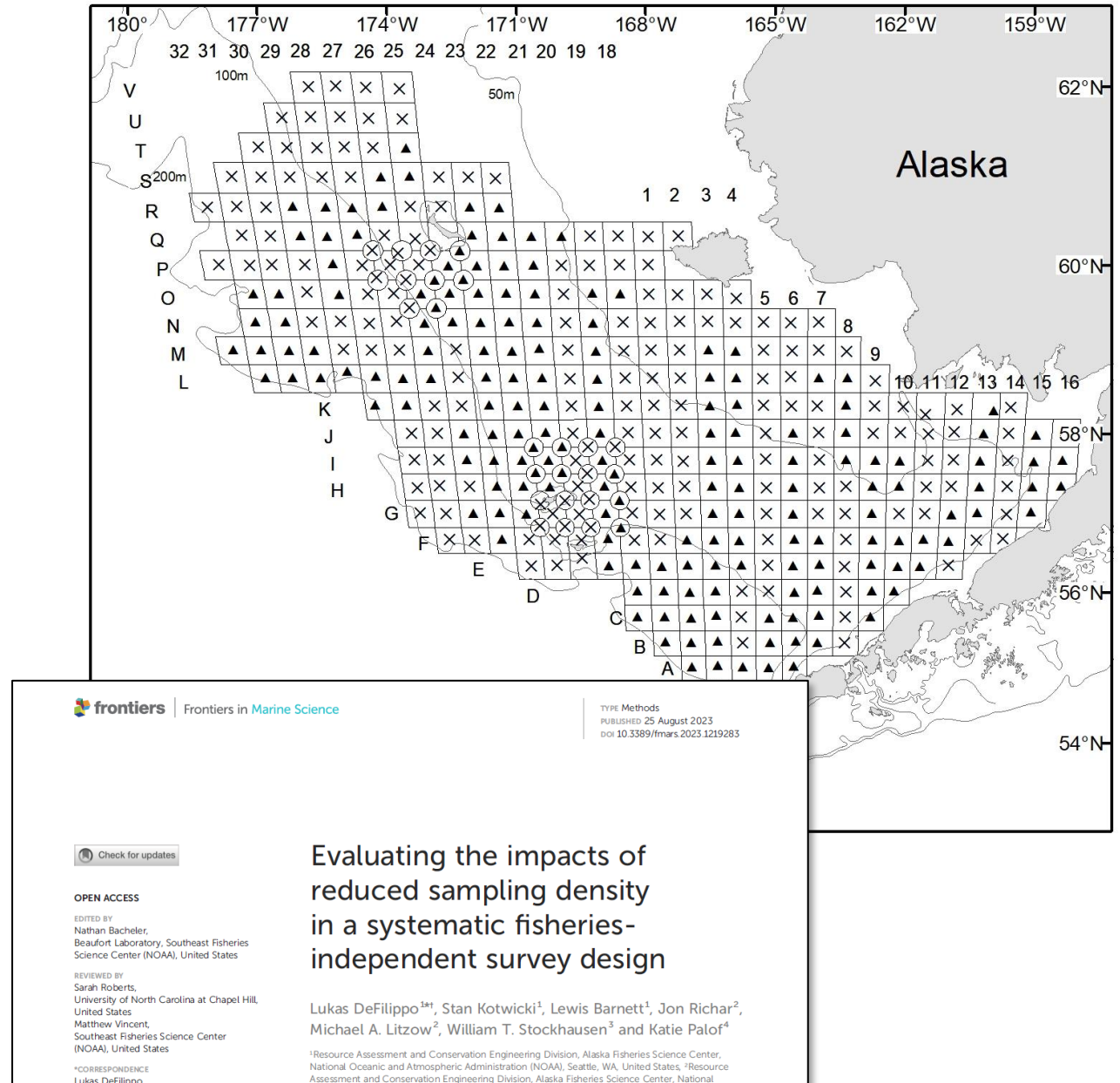
Shelf/Slope Gear Comparison Project Sample Areas
Subarea 6 and Stratum 61



1. Survey modernization

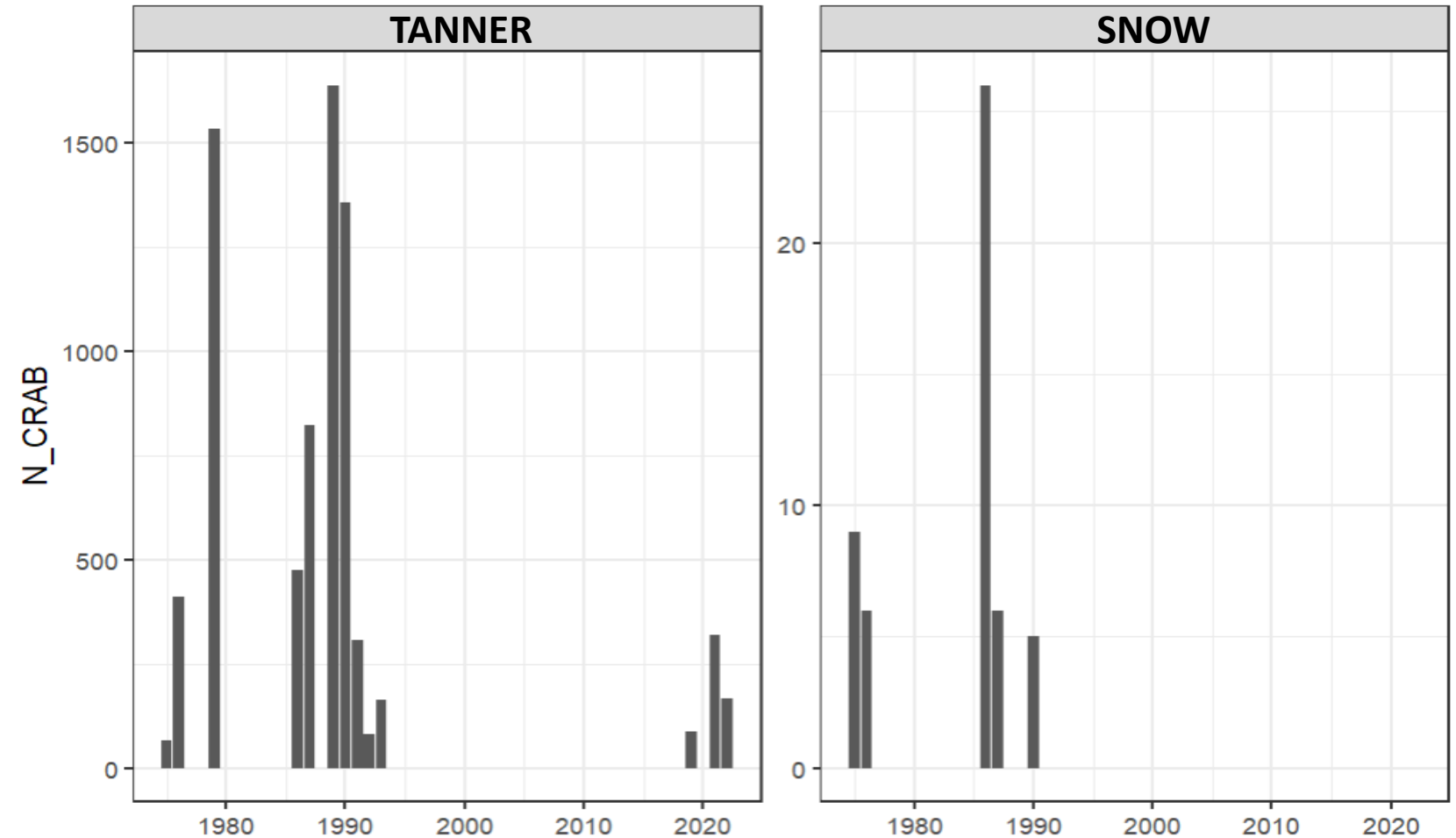
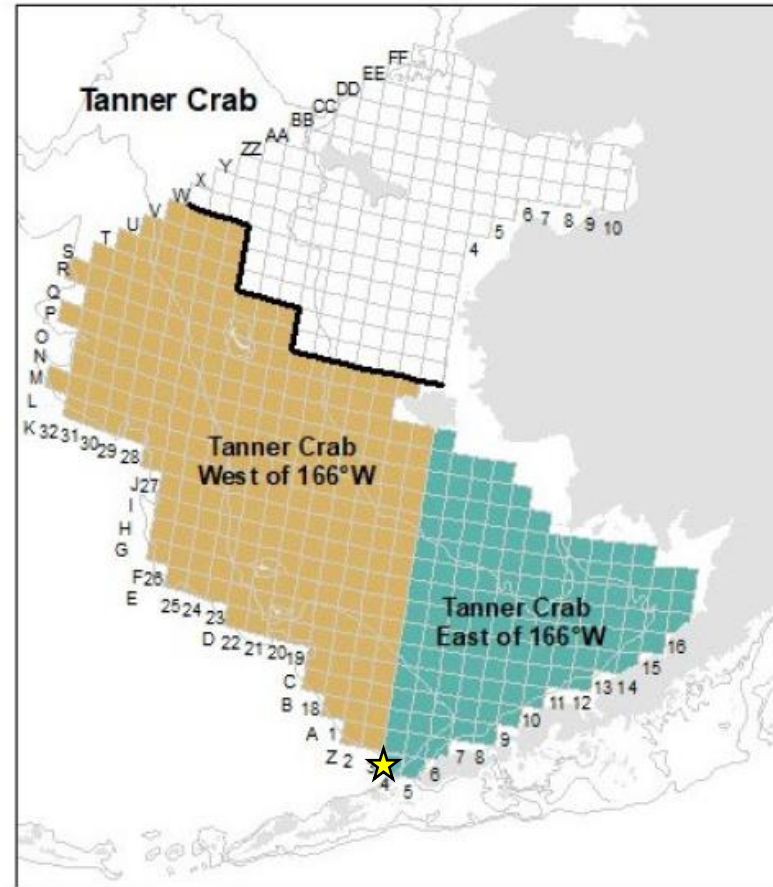
Corner stations

- Will be dropped from survey in 2024
- Sea days are needed for survey modernization effort
- High-density strata will be replaced by single strata covering entire management areas for design-based estimates
- DeFilippo et al. analysis (2023)
 - Little / no impact on snow & Tanner assessment
 - Larger effect on SMBKC, but trends coherent with / without corner stations



1. Survey modernization: revisiting legacy data-processing decisions

of crab historically sampled at Station Z-04



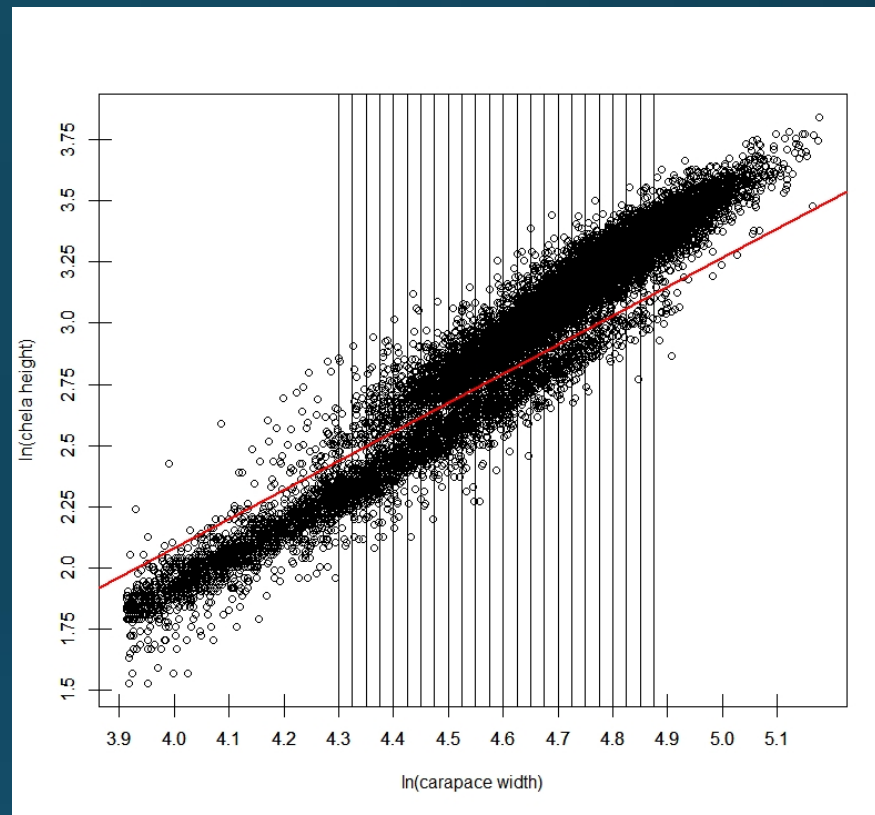
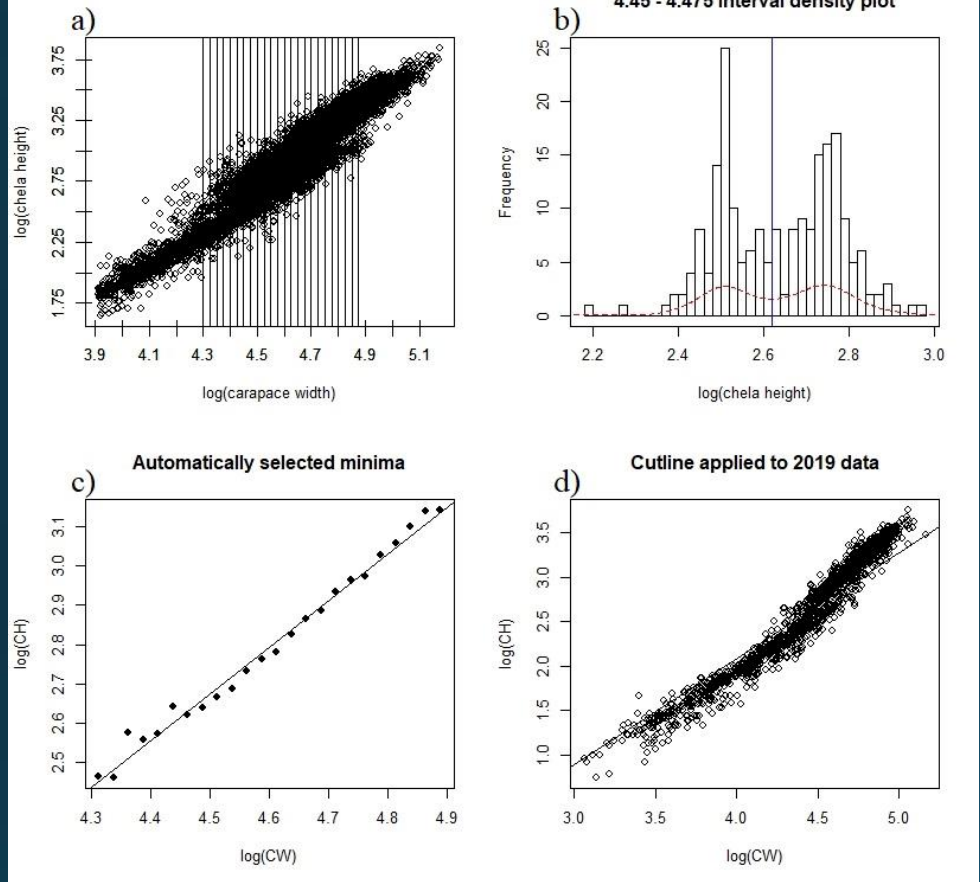
Station Z-04 is sampled annually on the EBS bottom trawl survey, but data has been historically dropped from crab haul and strata tables because the station has a “limited area of crab habitat”

Proposed 2025 survey time series revision: Inclusion of Z-04 in snow, tanner and RKC strata and crab haul tables + biomass and abundance estimates

Updating weight-length data

Field protocol - individual length-weight relationships

- BKC & RKC every year (~400 / year BBRKC)
- Tanner crab odd years (~1,100 / year)
- Snow crab even years (~1,100 / year)
- Sampling spread across space, size classes, sex, clutch status
- Currently, only 2000-2009 data used in abundance-biomass conversions
- Propose a moving window approach, using data from the last 10 years
 - Currently little effect on estimated length-weight relationships
 - Would allow for changing biomass at size/abundance to be reflected in survey going forward



- a.) Time series dataset with intervals
- b.) example histogram depicting distribution of data extracted from given interval
- c.) minima dataset with fitted linear model cutline
- d.) cutline applied to example year

- Time series data set with intervals used for extracting distributions and final cutline

Richar and Foy (2022)

FACETS
a multidisciplinary open access science journal

RESEARCH ARTICLE

A novel morphometry-based method for assessing maturity in male Tanner crab, *Chionoecetes bairdi*

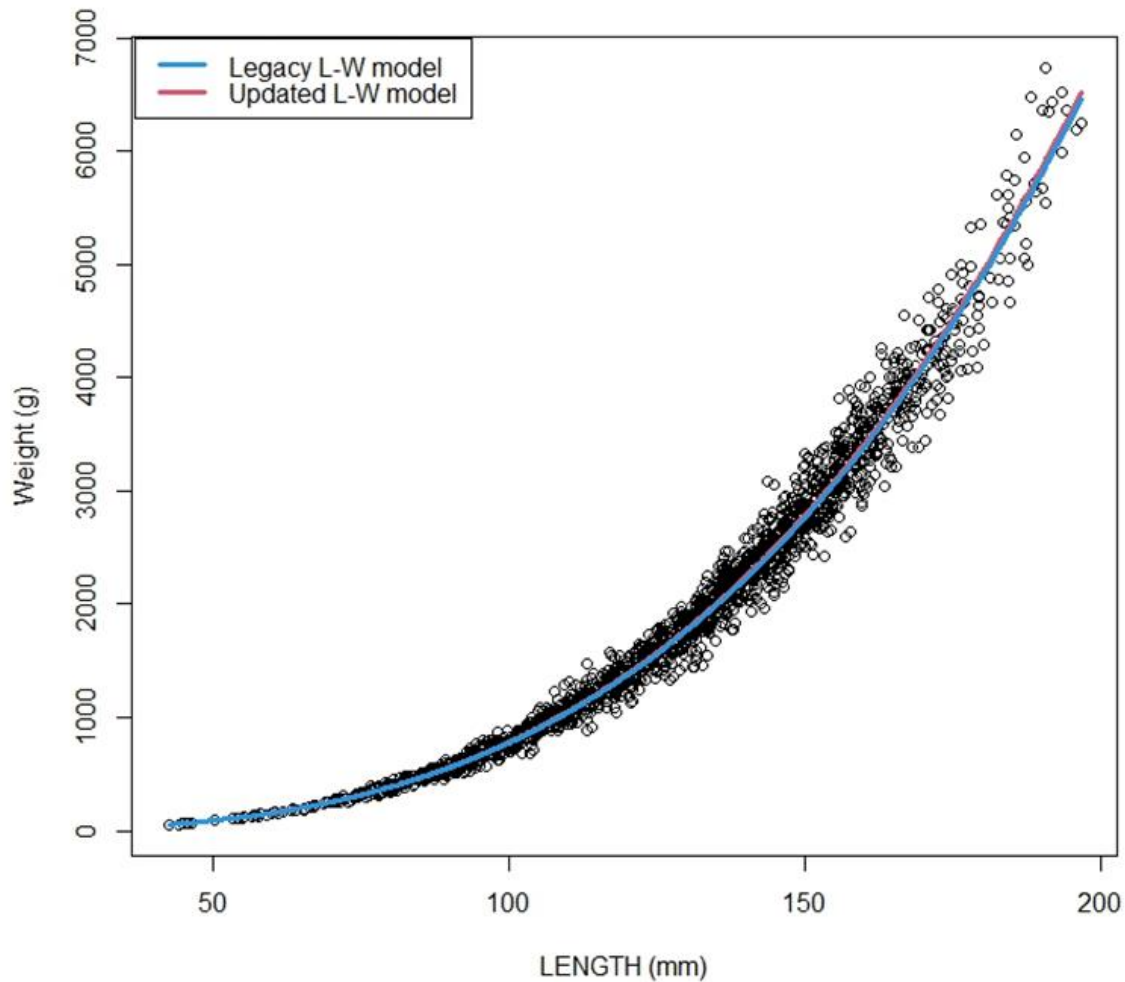
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^aKodiak Laboratory, Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, 301 Research Court, Kodiak, AK 99615, USA; ^bAlaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, 17109 Pt. Lena Loop Road, Juneau AK 99801, USA

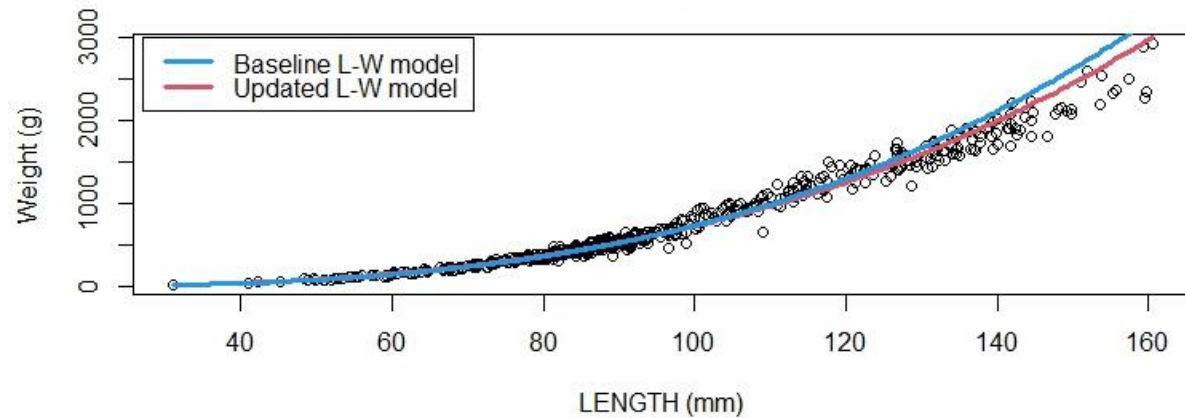
*jon.richar@noaa.gov

2. Weight-length regressions

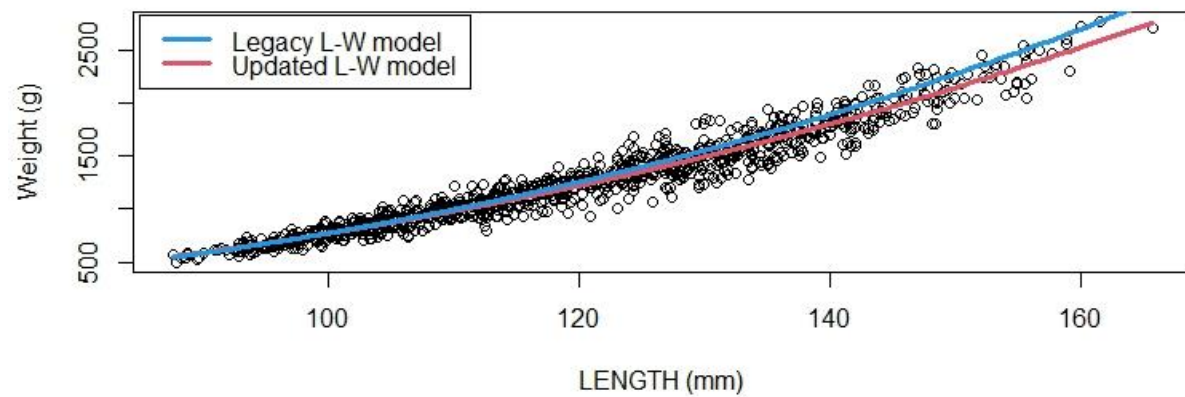
Male BBRKC



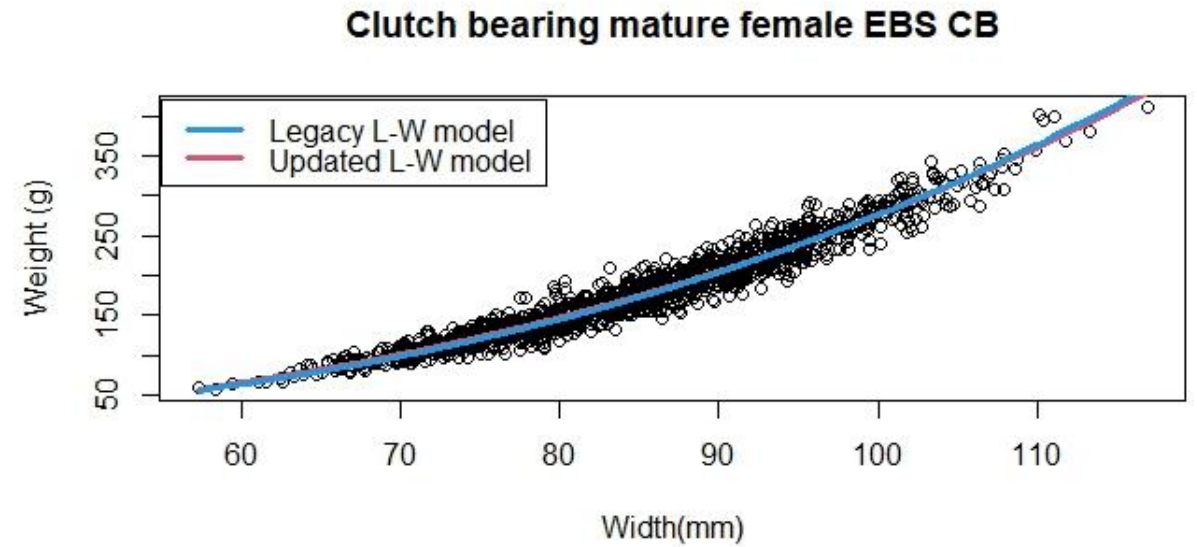
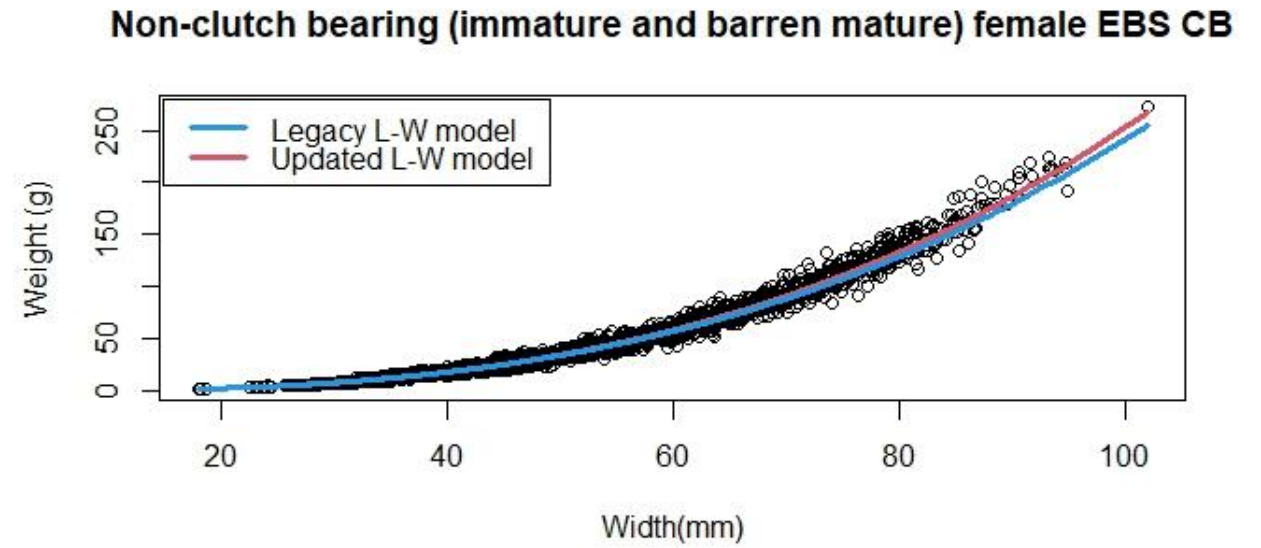
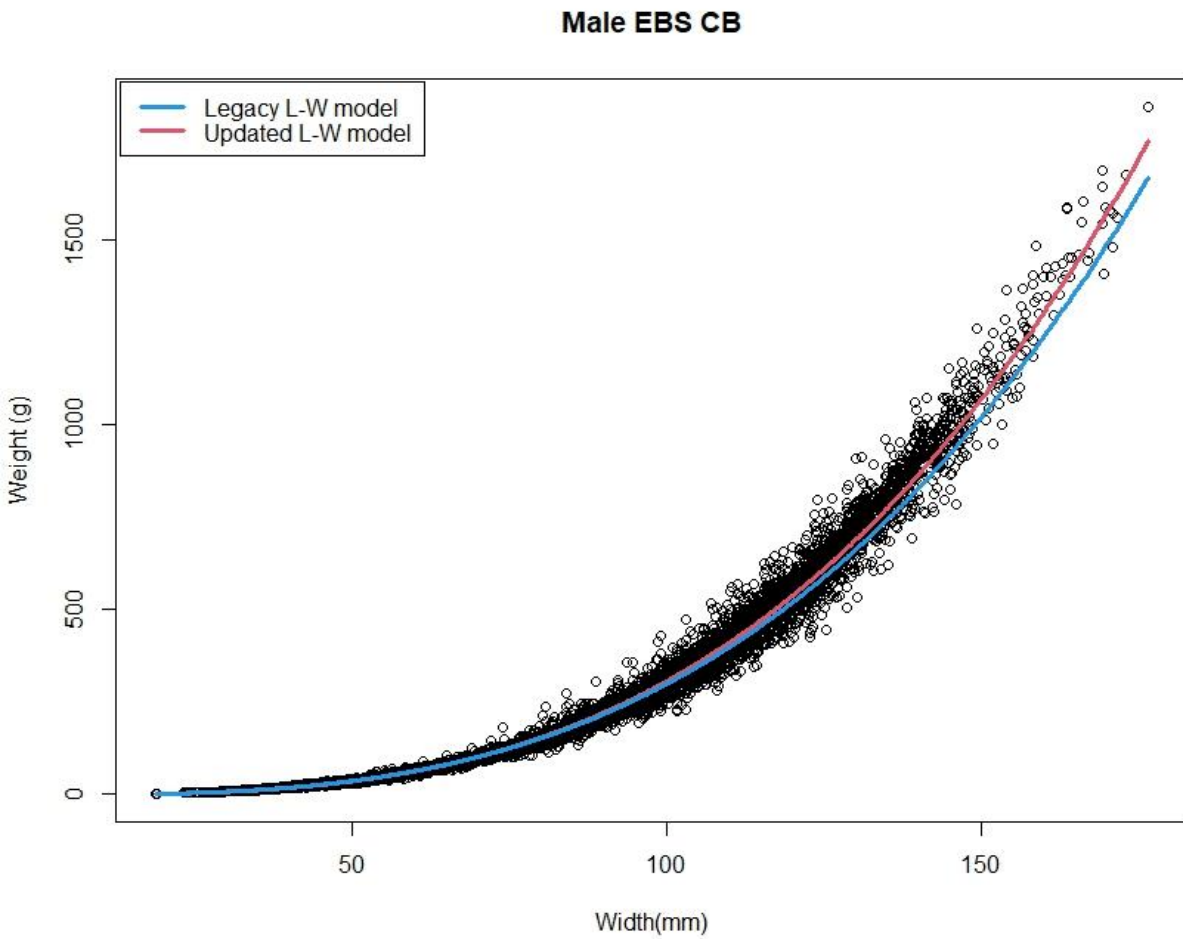
Non-clutch bearing female BBRKC



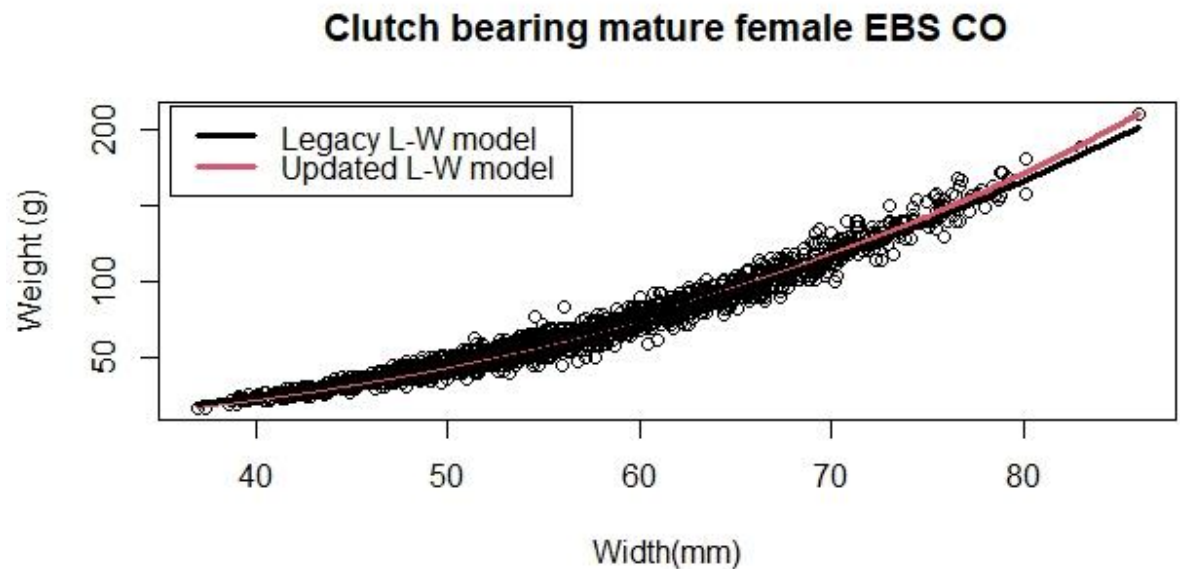
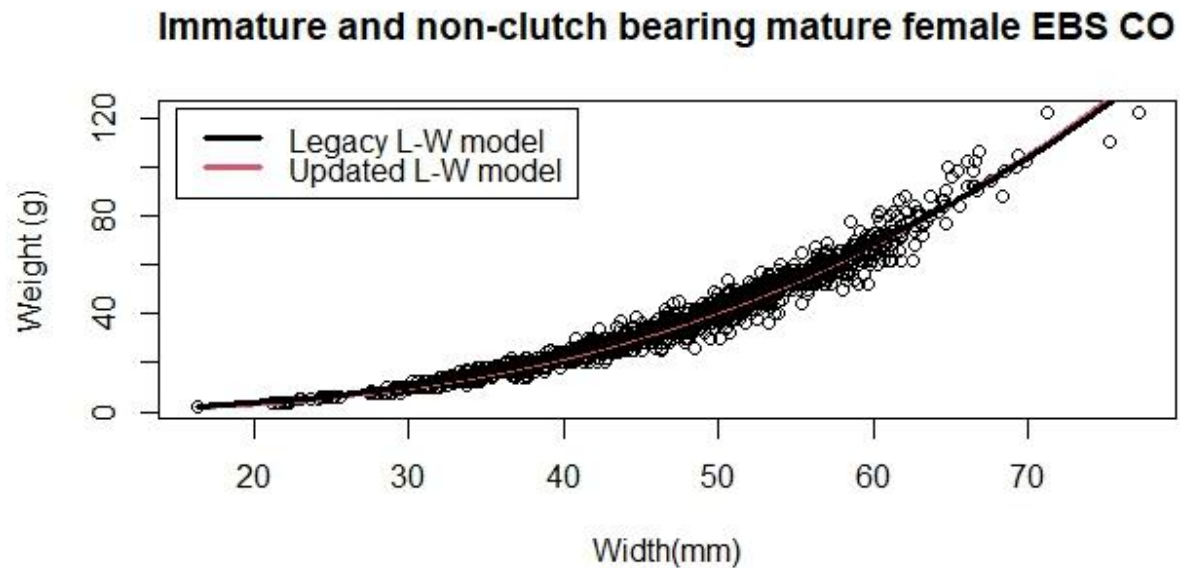
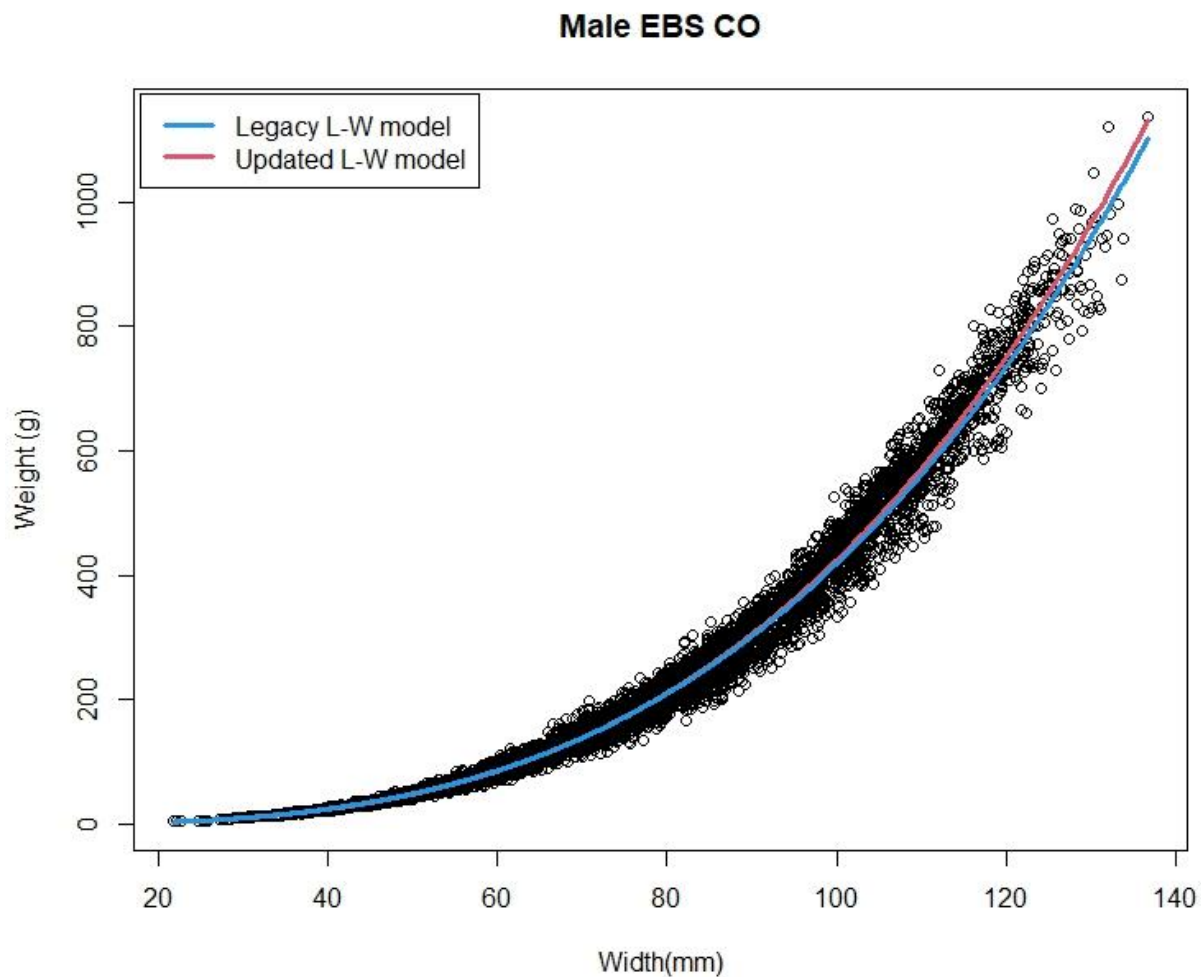
Clutch bearing mature female BBRKC



2. Weight-length regressions



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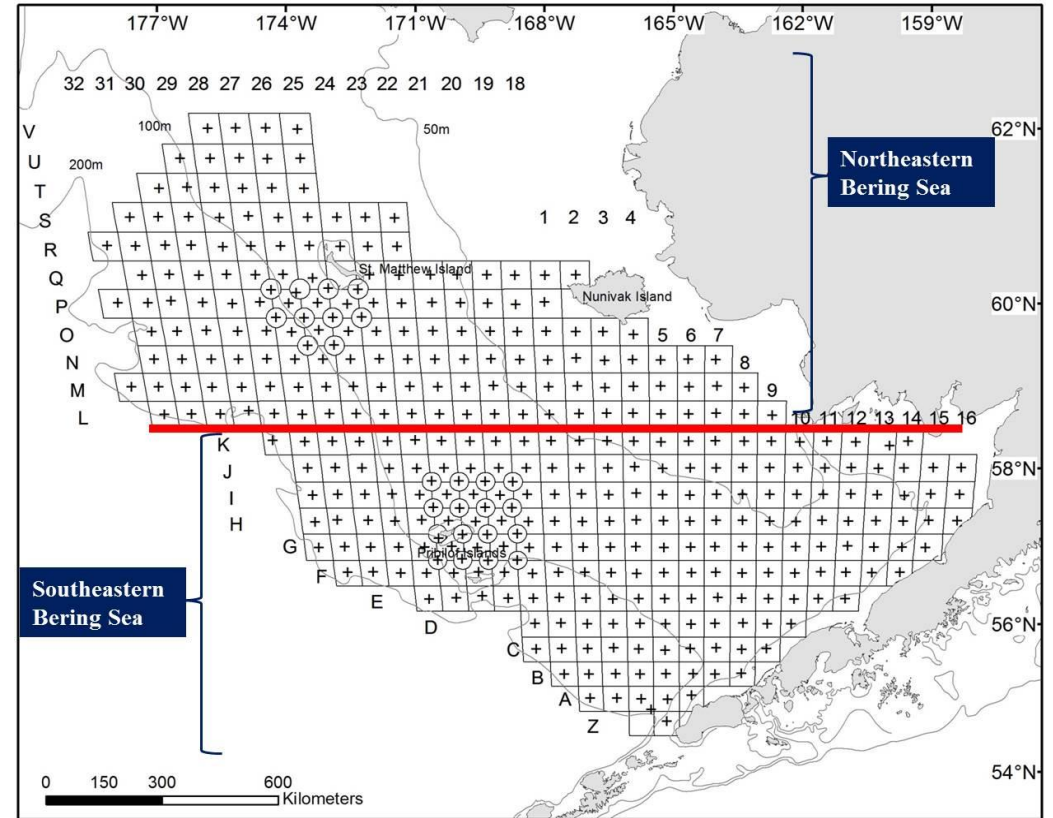
SSC Final Report, October 2023

The SSC would like to better understand the sampling design for molt data and is concerned about the weighting of the spatial samples in the analysis; weighting should be based on abundance if the sampling rate differs by area (which it would, unless abundance were uniform and/or the targets were in direct proportion to abundance). Hierarchical fit to molt data might be better than annual independent GAMs.

3. Chela measurement protocol

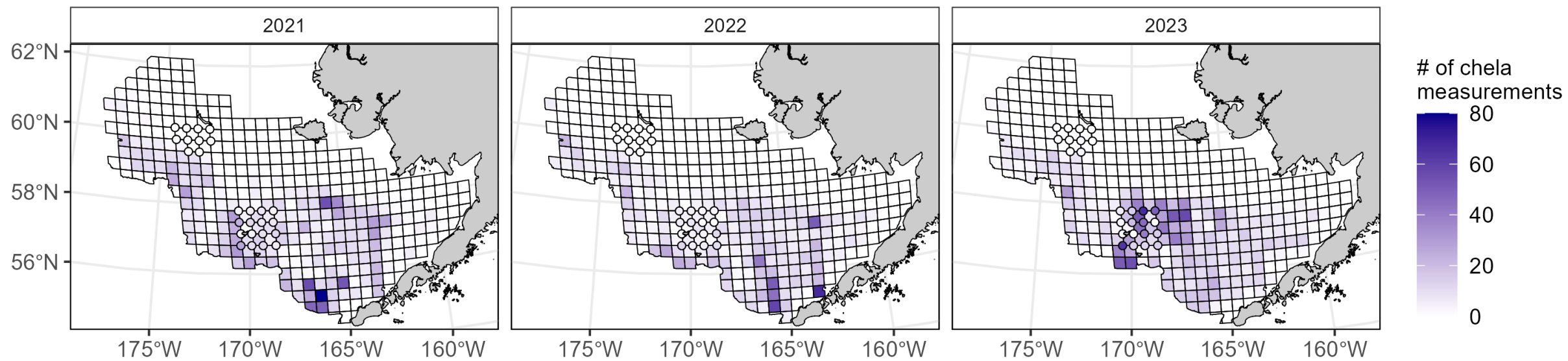
Survey protocol

- Tanner
 - Each tow: 5 measurements each for three size classes (< 85 mm CW, 85-124 mm CW, > 124 mm CW)
 - Entire survey: at least 10 measurements per 5mm bin (50-165 mm range) in southern and northern areas of EBS grid
- Snow
 - Each tow: 5 measurements each for three size classes (40-59 mm CW, 60-99 mm CW, 100-119 mm CW)
 - Entire survey: at least 10 measurements per 5mm bin (40-119 mm range) in southern and northern areas of EBS grid



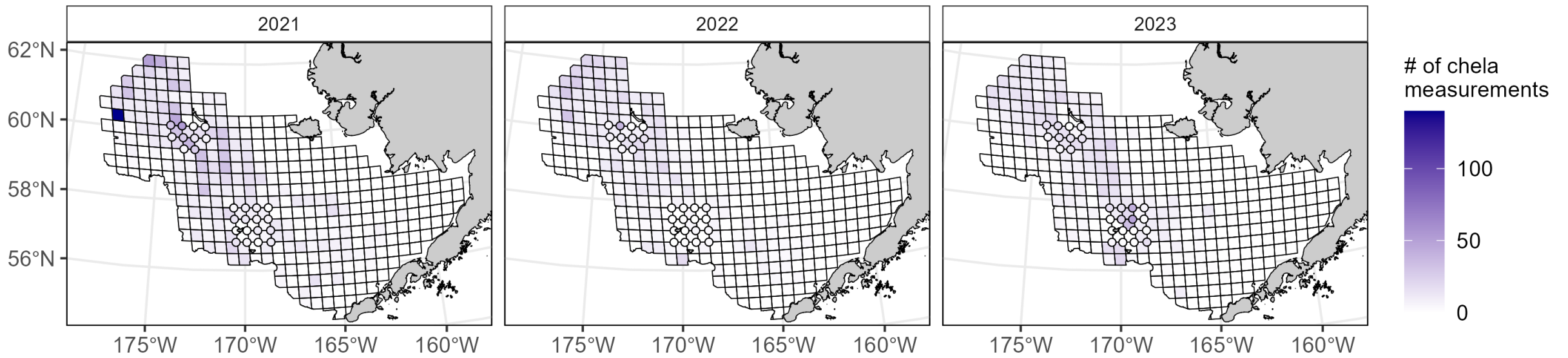
Tanner crab chela measurements 2021-2023

Tanner Crab



Snow crab chela measurements 2021-2023

Snow Crab



Questions

