



NOAA
FISHERIES

Assessment of BSAI Kamchatka flounder

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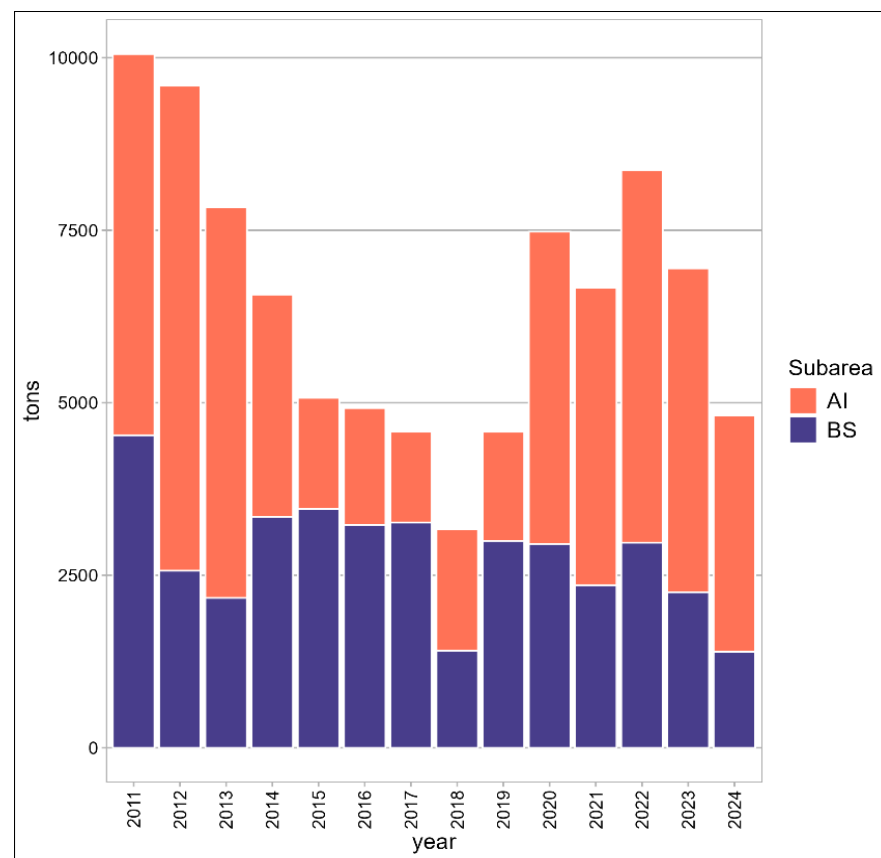
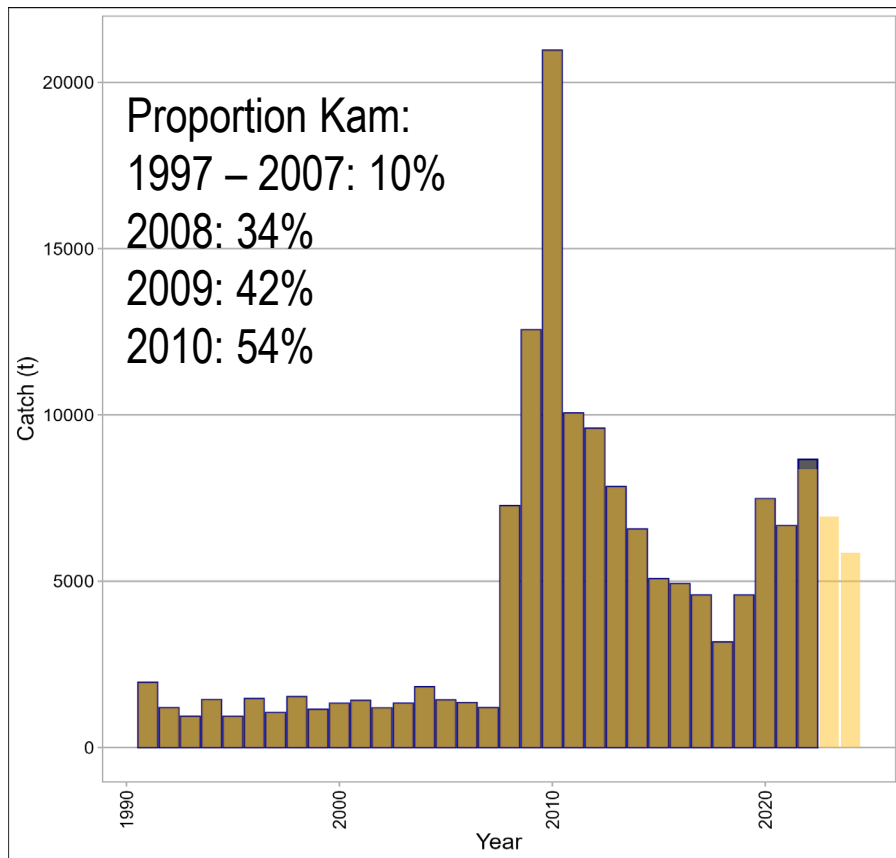
Base model structure

- Age structured model (age 2 - 25)
 - Estimated outside of the model:
 - Growth (sex-specific)
 - Age-length transition matrices
 - Length-weight relationship
 - Maturity (Stark 2011)
 - Natural mortality is fixed (0.11), same for females and males
 - Age-based, sex-specific selectivity estimated
 - Fishery - Logistic
 - EBS shelf survey – Double logistic
 - EBS slope survey - Logistic
 - AI survey – Logistic
 - Catchability estimated (EBS shelf survey and AI survey)
 - Log mean recruitment and annual deviations estimated

Data updates

- Fishery
 - 2023 – 2024 catch
 - 2023 lengths
- EBS shelf survey
 - 2023 – 2024 biomass and lengths
- Aleutian Islands survey
 - 2024 biomass and lengths
 - 2022 age data
- EBS slope survey
 - No updates

Catch

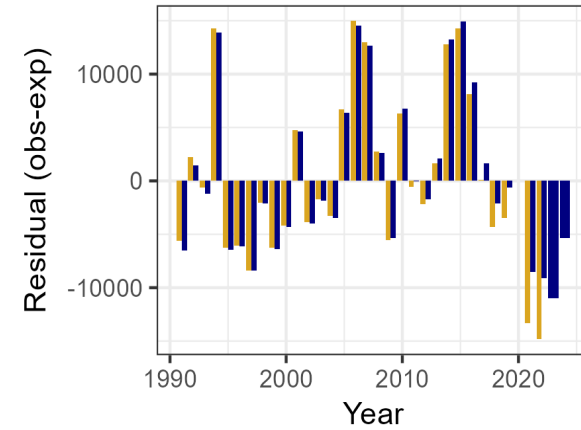
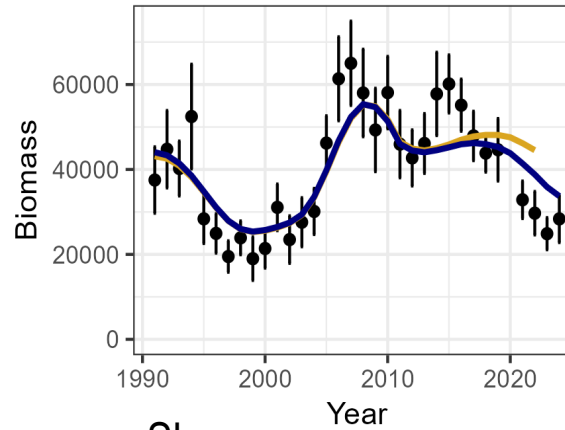


- TAC = ABC since 2021
 - Average of 85% obtained (2021-2023)

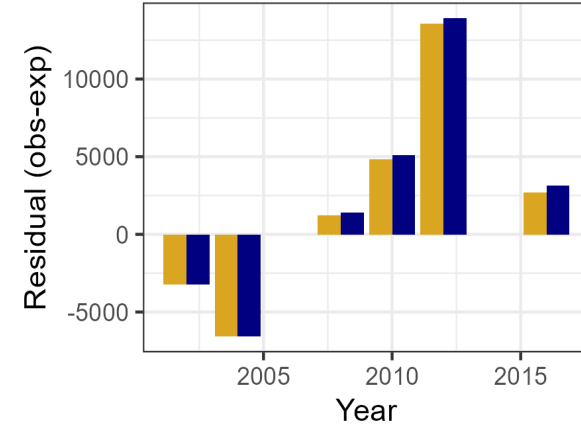
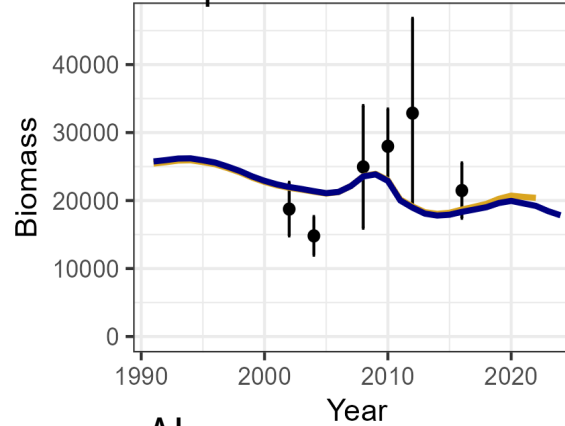
Survey biomass

- Fit to survey biomass generally unchanged since last assessment
- EBS shelf
 - Generally declining since 2015
 - 2023: -16% from 2022
 - 2024: +14% from 2023
- Aleutian Islands
 - 2024: +75% from 2022

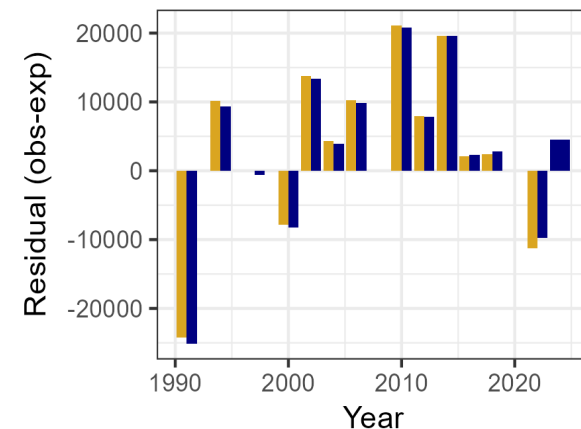
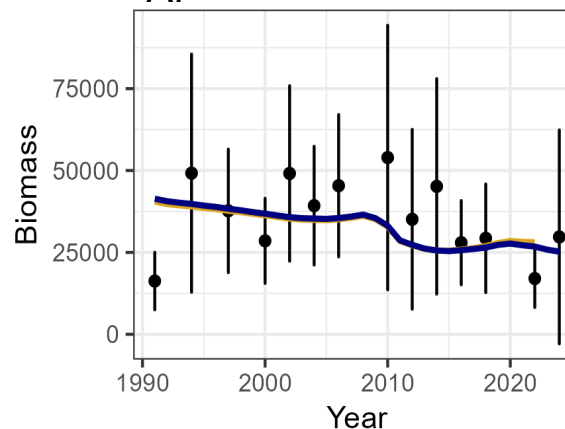
Shelf



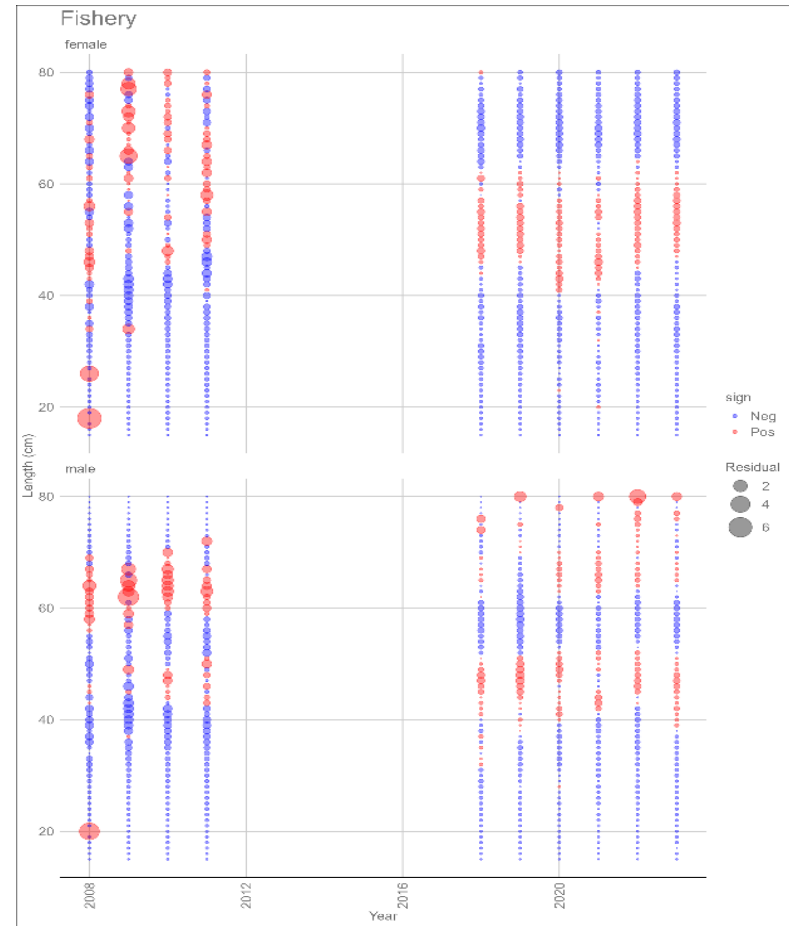
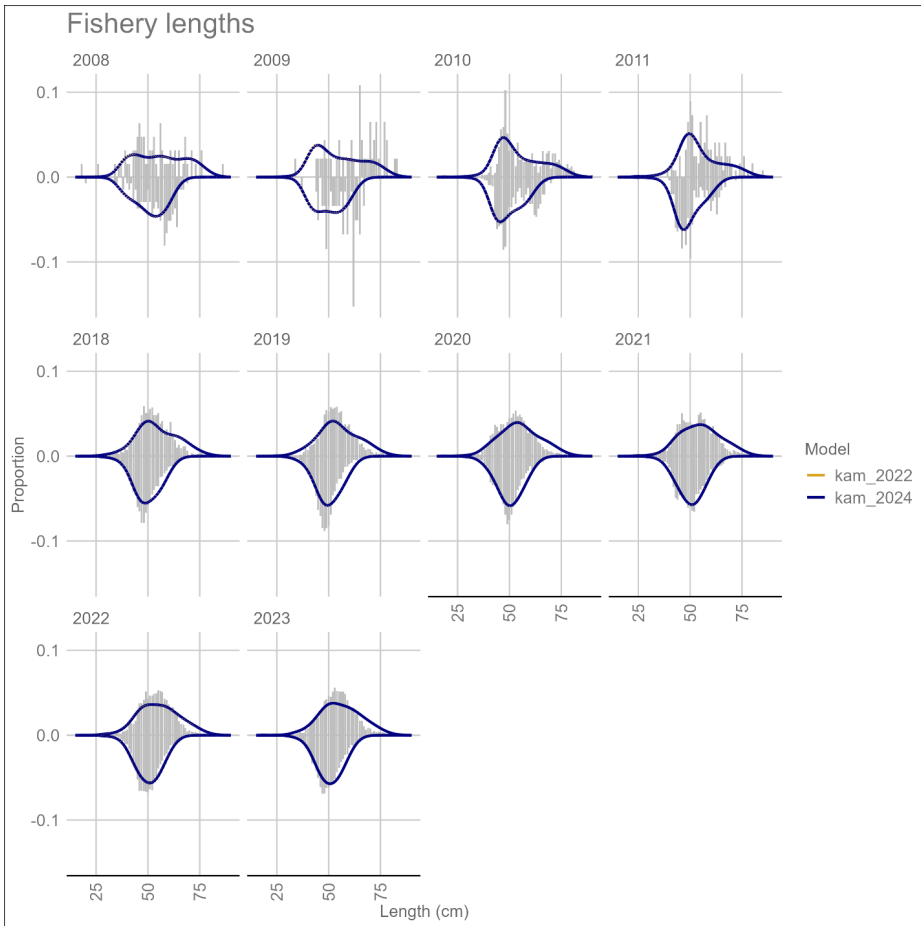
Slope



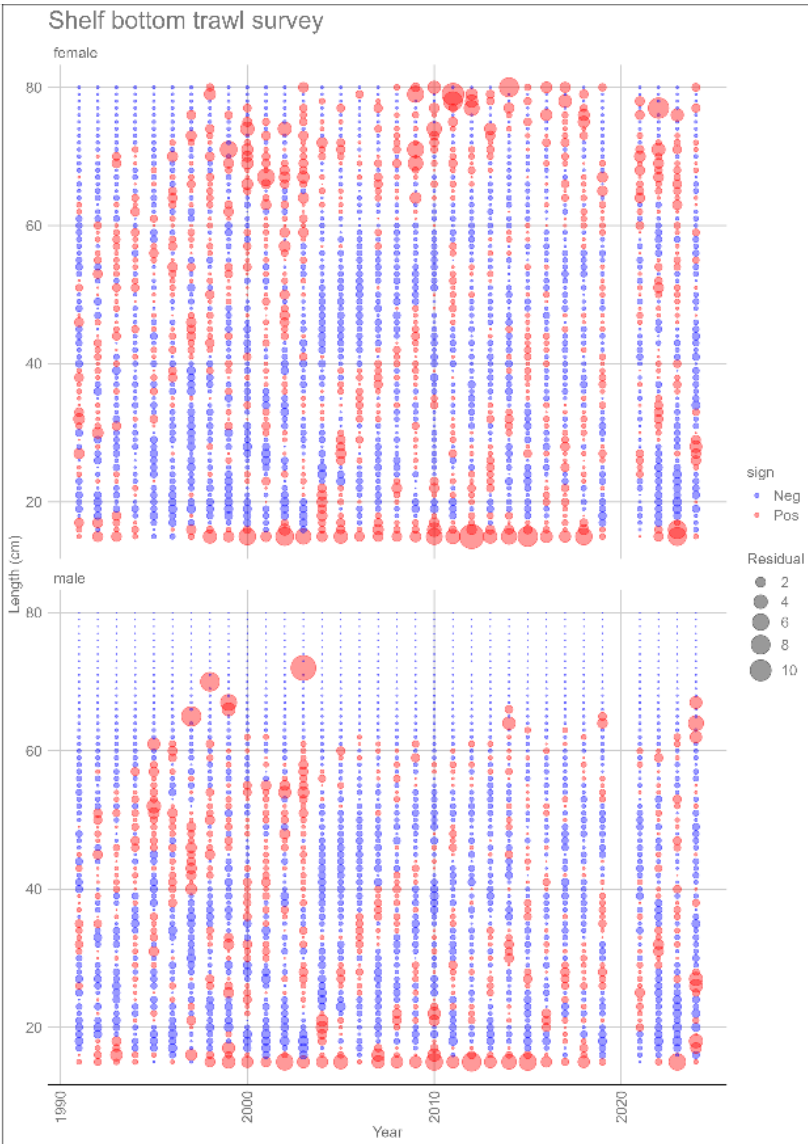
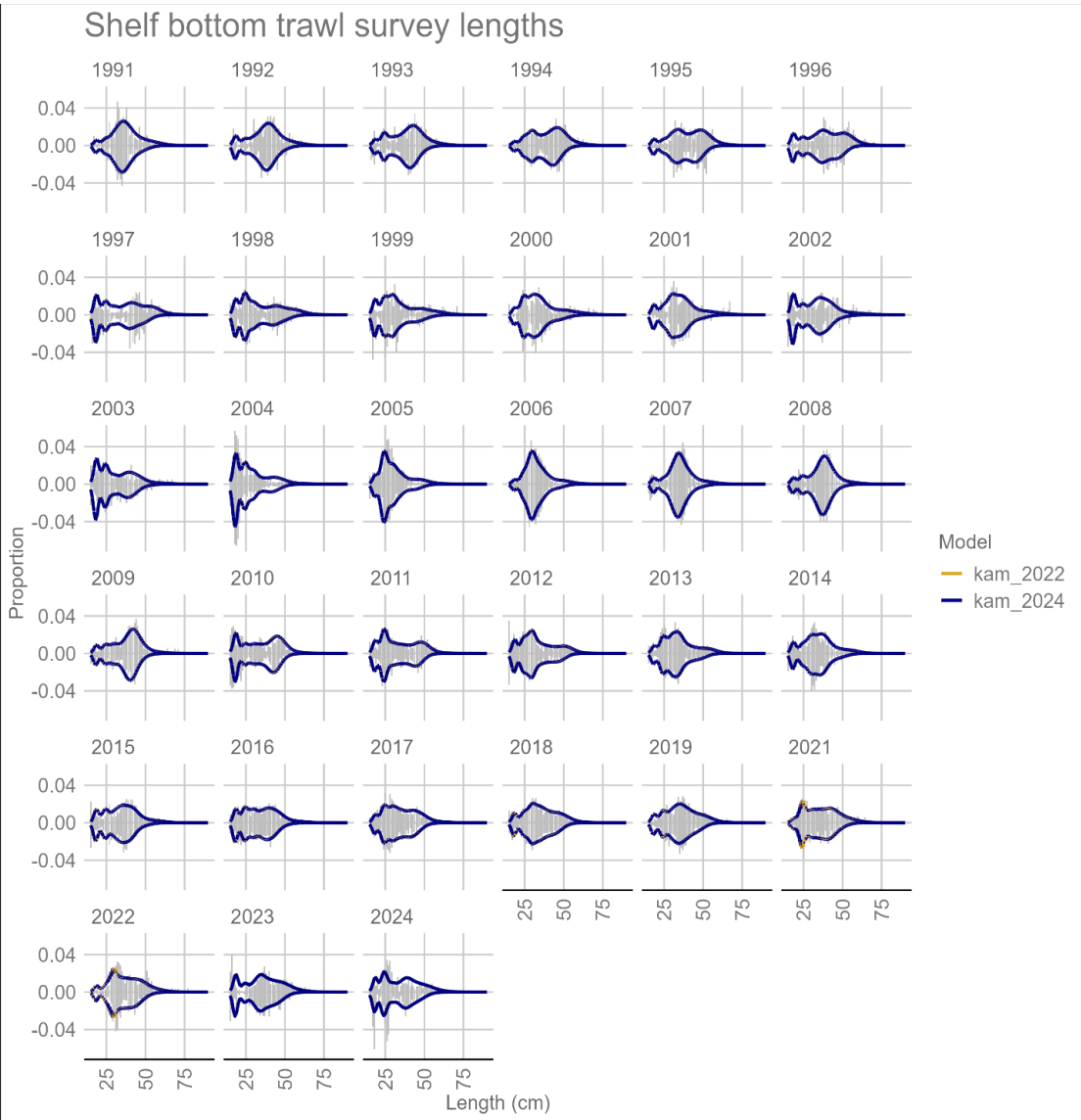
AI



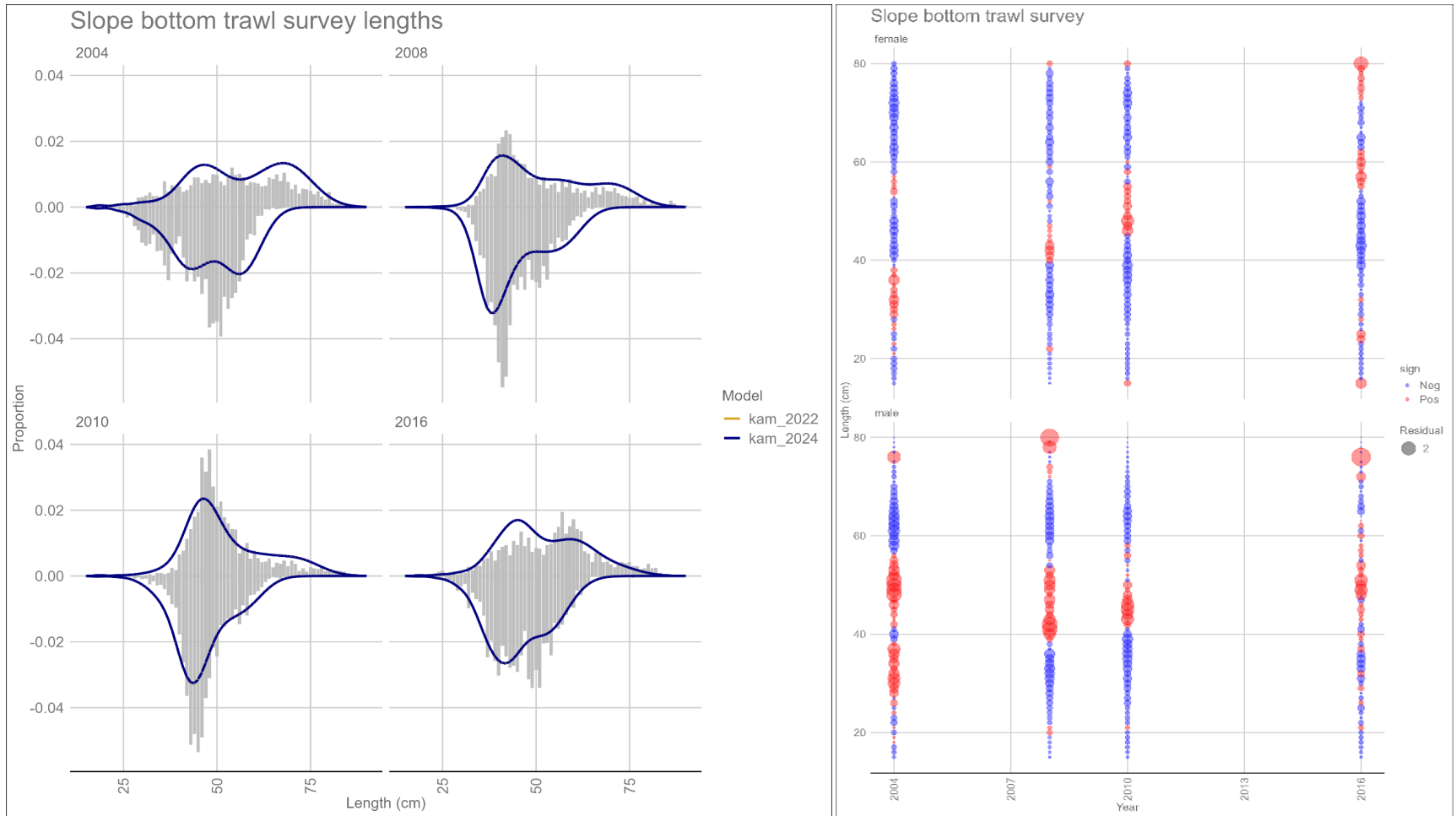
Fishery length



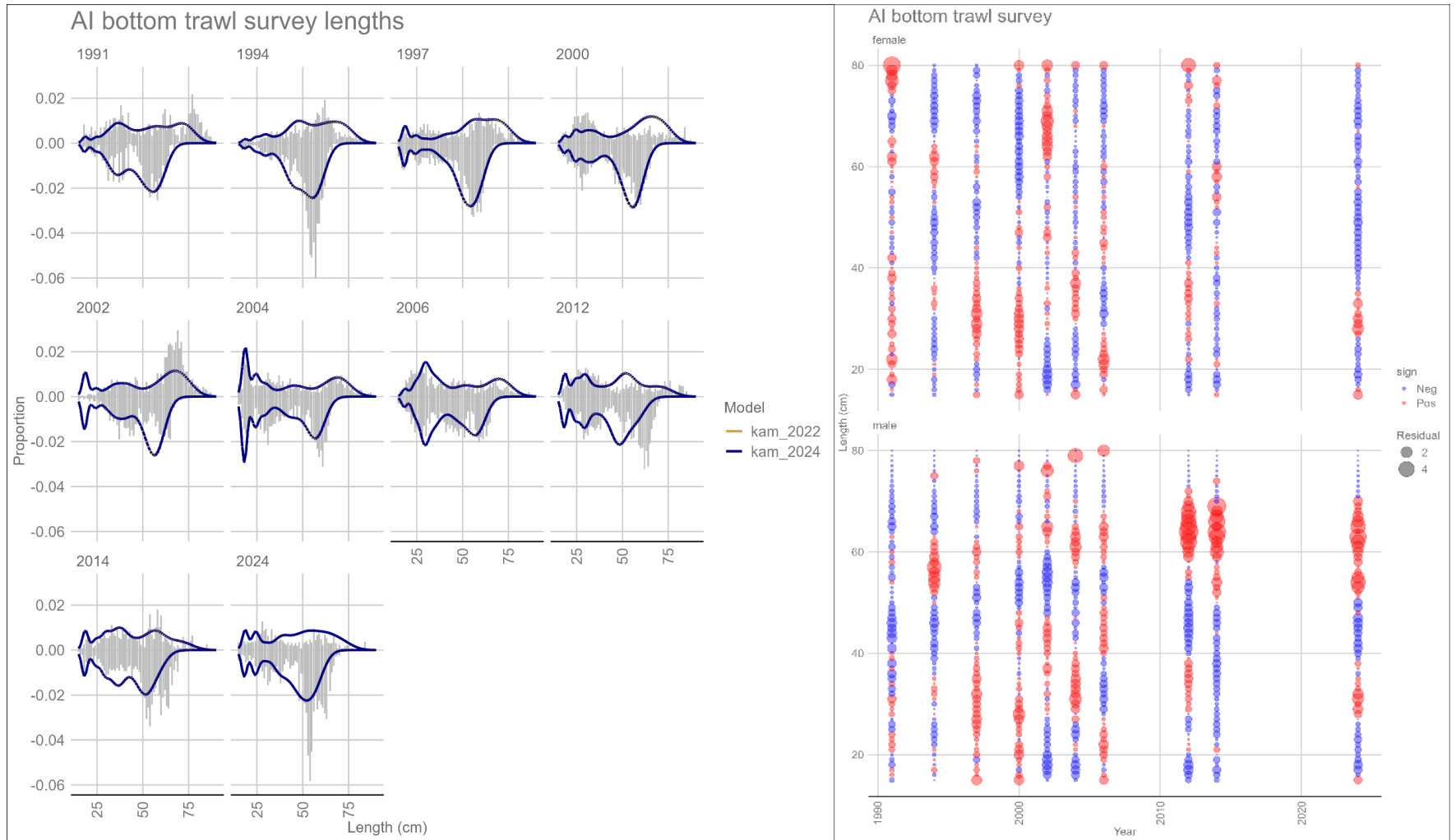
EBS shelf survey length estimates



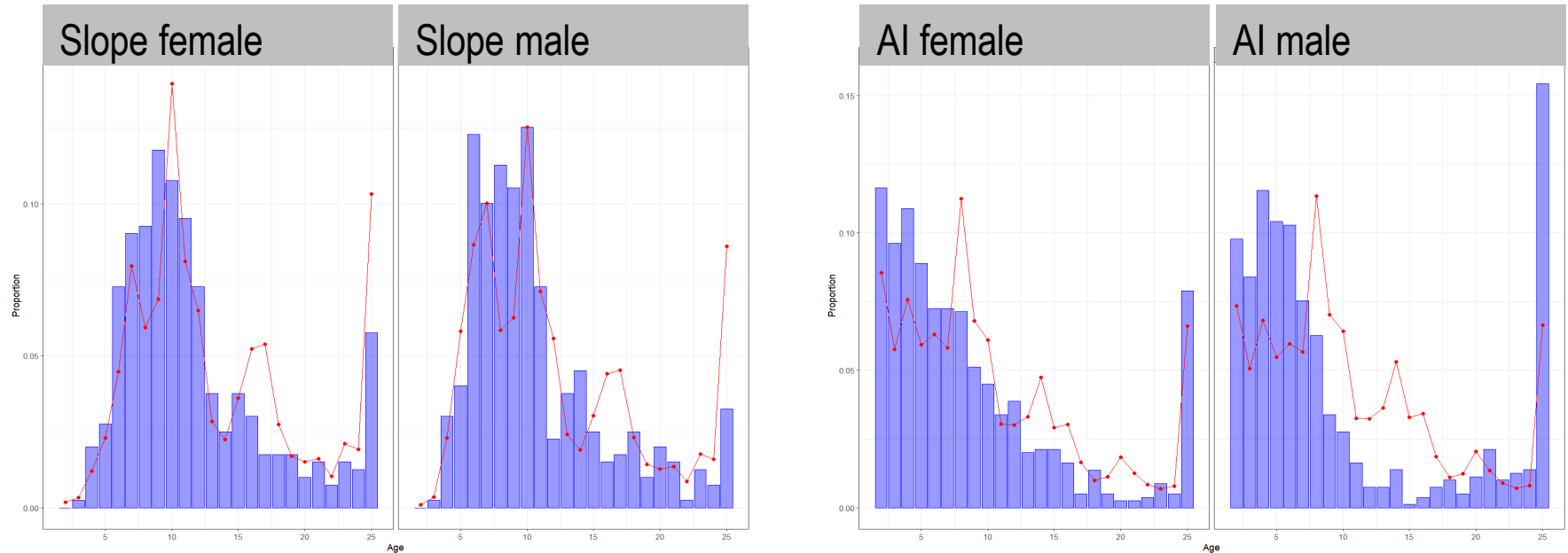
EBS slope survey length estimates



Aleutian Islands survey length estimates

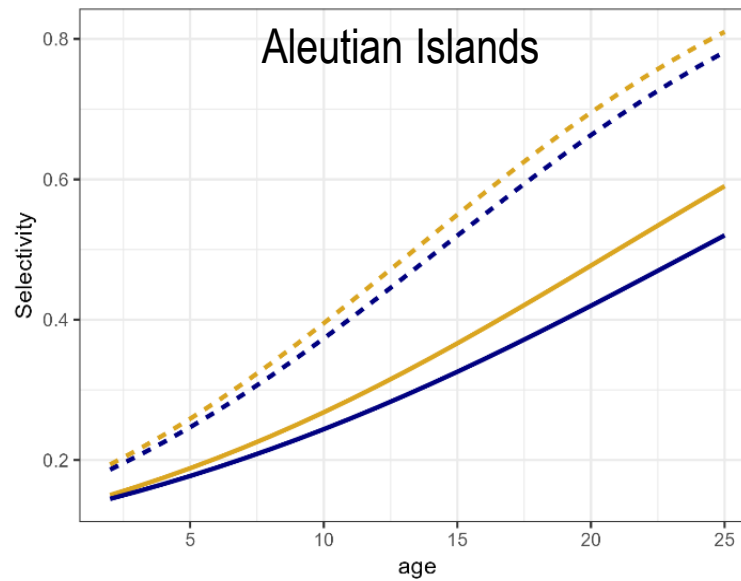
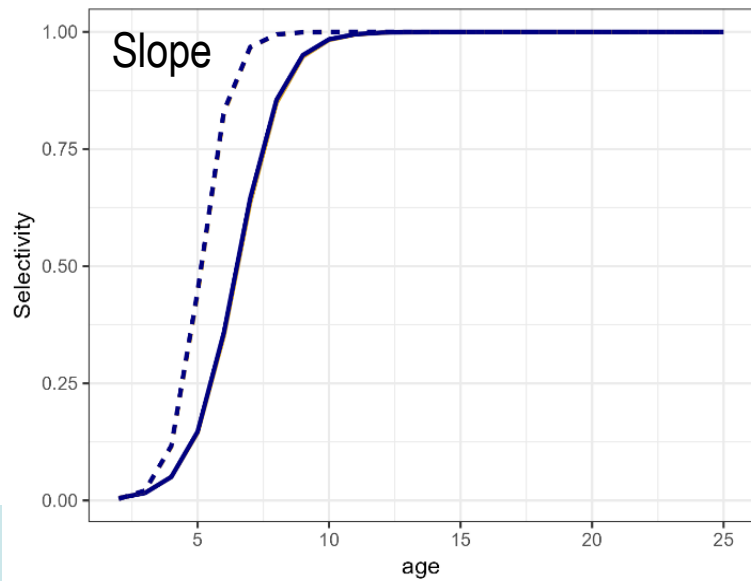
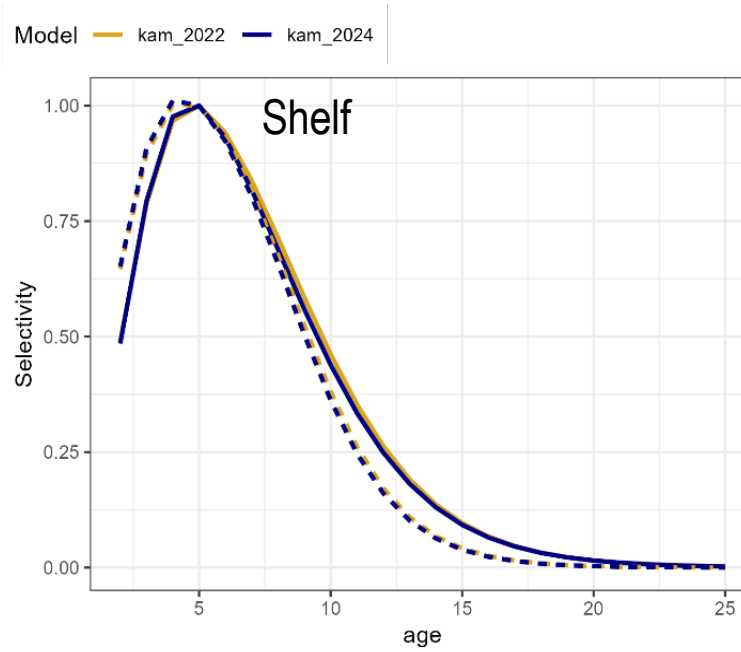
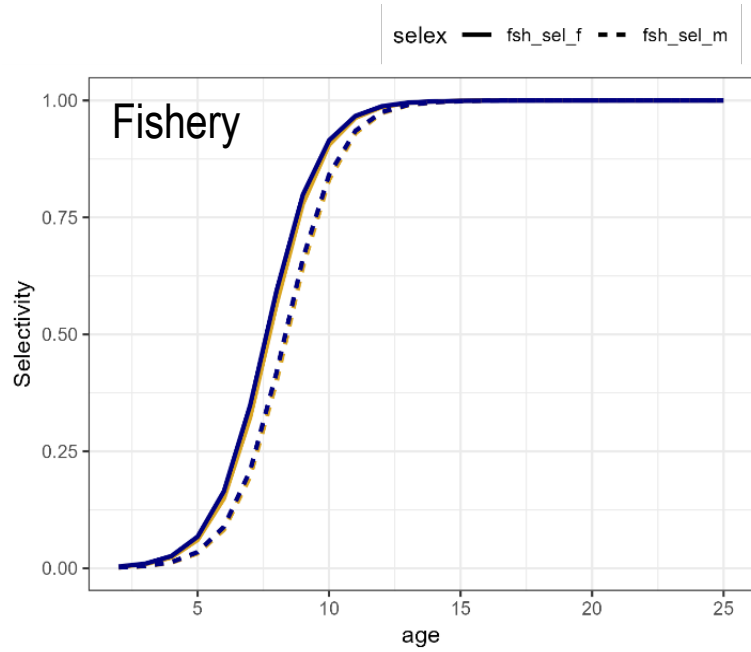


Model fit to age composition

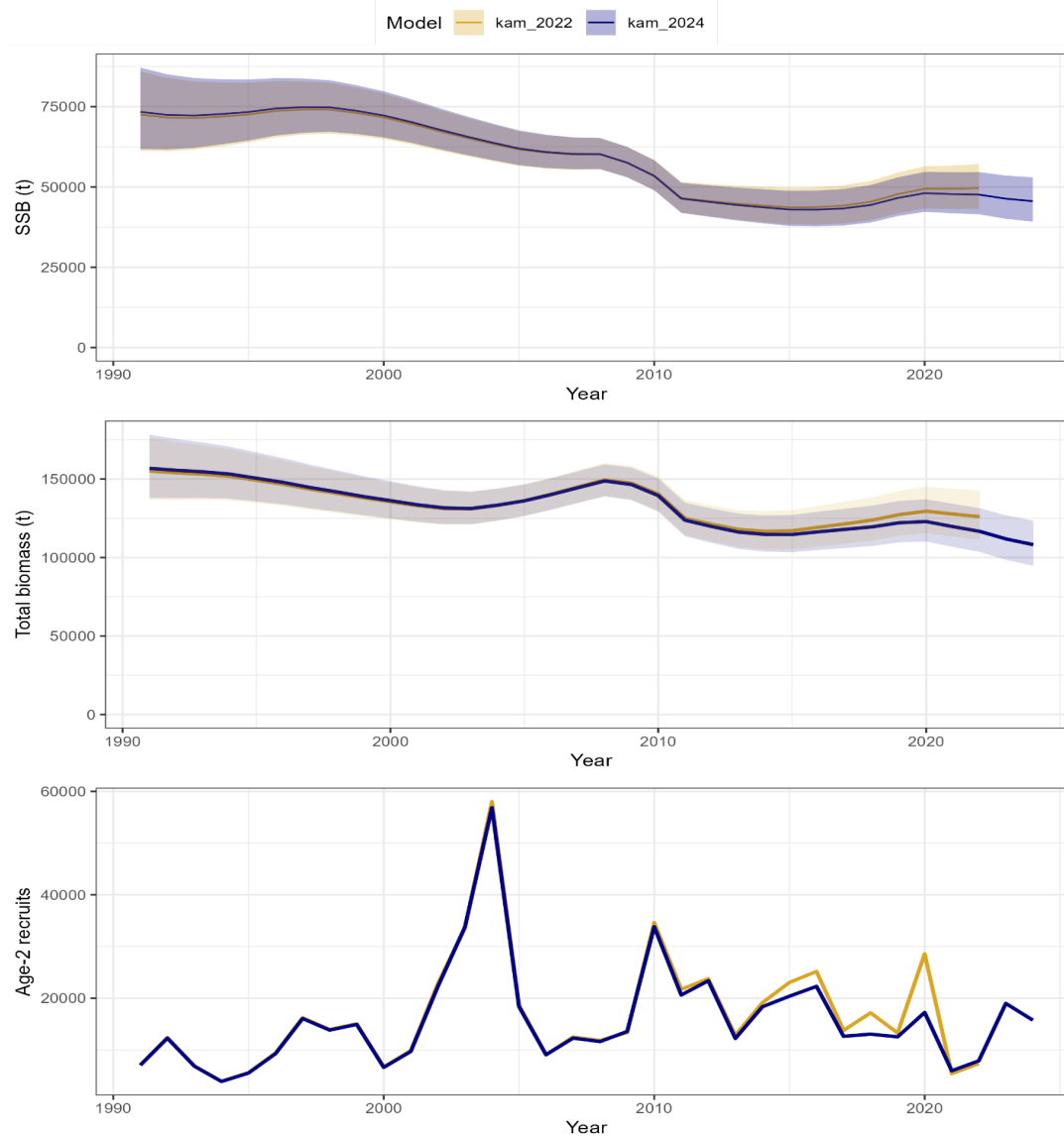


- Data years
 - Slope age data: 2002 and 2012
 - AI age data: 2010, 2016, 2018, 2022
- Growth
 - Fixed in model – In future, use length and CAAL to estimate growth internally
 - Are there differences in growth regionally? Will evaluate for next full assessment

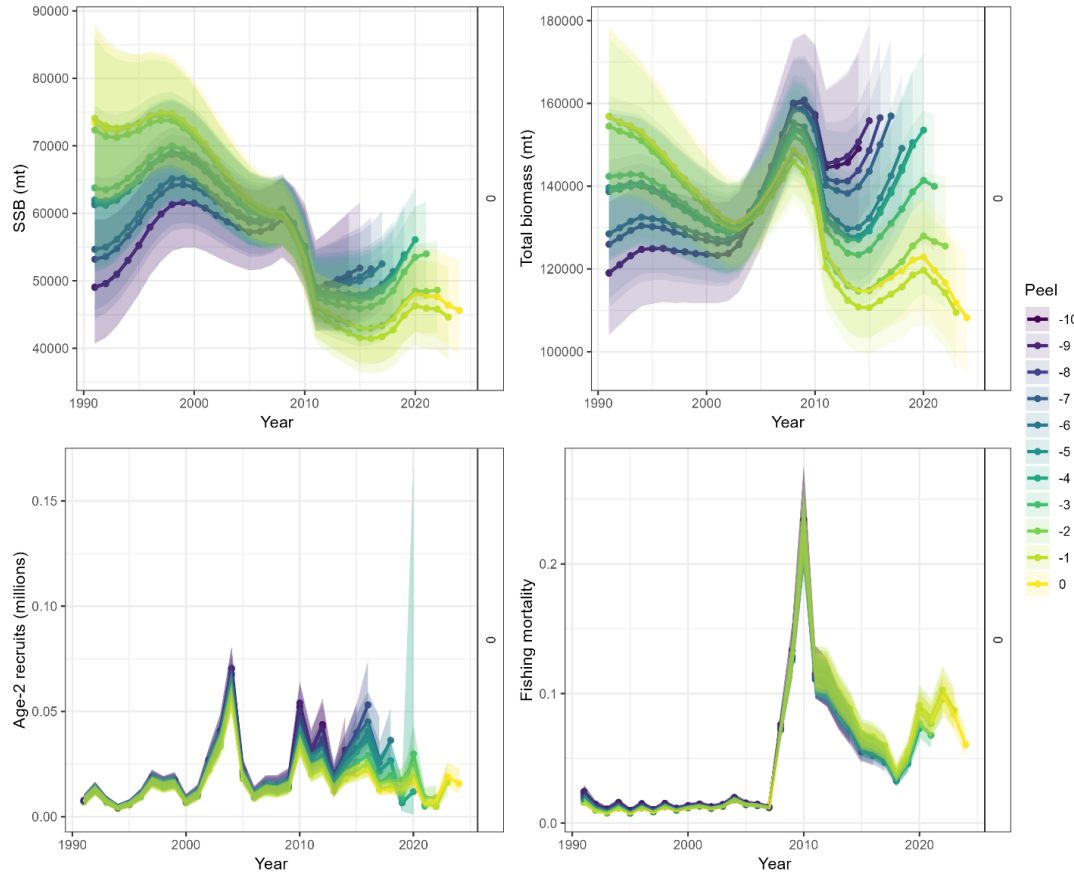
Selectivity



Time series results



Retrospective analysis



| | Mohn's rho | | | |
|--------------|------------|---------------|-------------|--------|
| Model | SSB | Total biomass | Recruitment | F |
| 16.0b (2022) | 0.116 | 0.210 | 0.383 | -0.102 |
| 16.0b (2024) | 0.137 | 0.228 | 0.498 | -0.117 |

Risk table

| Assessment-related considerations | Population dynamics considerations | Environmental/ ecosystem considerations | Fishery Performance considerations |
|-----------------------------------|------------------------------------|---|------------------------------------|
| Level 2- increased concerns | Level 1 – Normal | Level 1- Normal | Level 1- Normal |

- Assessment related considerations
 - Increased retrospective pattern
- Not recommending a reduction in ABC

Harvest recommendations

| | Tier 3 assessment model | | | |
|--------------------------------------|-------------------------------------|---------|-------------------------------------|---------|
| | As estimated last year for | | As estimated this year for | |
| Quantity | 2024 | 2025 | 2025 | 2026 |
| M (natural mortality rate) | 0.11 | 0.11 | 0.11 | 0.11 |
| Tier | 3a | 3a | 3a | 3a |
| Projected total (age 2+) biomass (t) | 119,565 | 116,651 | 106,850 | 104,888 |
| Projected female spawning biomass | 47,849 | 47,330 | 44,883 | 44,051 |
| Projected | | | | |
| $B_{100\%}$ | 94,370 | 94,370 | 85,751 | 85,751 |
| $B_{40\%}$ | 37,748 | 37,748 | 34,300 | 34,300 |
| $B_{35\%}$ | 33,029 | 33,029 | 30,013 | 30,013 |
| F_{OFL} | 0.103 | 0.103 | 0.101 | 0.101 |
| $maxF_{ABC}$ | 0.086 | 0.086 | 0.085 | 0.085 |
| F_{ABC} | 0.086 | 0.086 | 0.085 | 0.085 |
| OFL (t) | 8,850 | 8,687 | 8,019 | 7,790 |
| maxABC (t) | 7,498 | 7,360 | 6,800 | 6,606 |
| ABC (t) | 7,498 | 7,360 | 6,800 | 6,606 |
| Status | As determined <i>last</i> year for: | | As determined <i>this</i> year for: | |
| | 2023 | 2023 | 2023 | 2024 |
| Overfishing | no | n/a | no | n/a |
| Overfished | n/a | no | n/a | no |
| Approaching overfished | n/a | no | n/a | no |

- 2025 ABC 7% lower than expected from last year's projections

Data gaps and future directions

- Composition data is mainly length data – Evaluate length based selectivity
- Growth
 - Currently fixed in the model - Internally estimate – use length and conditional age at length data
 - External estimates used in current model and aggregates Bering and AI survey data – will evaluate potential regional differences in growth
- Composition input sample size should be updated to reflect best practices
- Ageing error is not accounted for in this assessment and should be considered during the next assessment and may help to resolve conflicts between the length and age data.
- In 2022, we showed there is some evidence of changing spatial distribution with the size of the cold pool
 - VAST index to account for spatial variation due to cold pool over time (Barnett and Bryan)