C3 BSAI CRAB STOCKS

KATIE PALOF & MIKE LITZOW (CPT CO-CHAIRS)

OCTOBER 2025 NPFMC MEETING (VIRTUAL)

CPT MEETING MINUTES - SEPT 8TH - 12TH (VIRTUAL)

BSAI Crab Stocks Management Timing

Aleutian Islands golden king crab
Pribilof Islands golden king crab *
Western Aleutian Islands(Adak) red king crab *

→ Assessed in May/June

→ Triennial cycle, next assessment in 2026

EBS snow crab
Bristol Bay red king crab
EBS Tanner crab
Pribilof Islands blue king crab *
Pribilof Islands red king crab *
St. Matthew blue king crab *

→ Biennial cycle, next assessment in 2025, next 2029

→ Assessed in September/ October

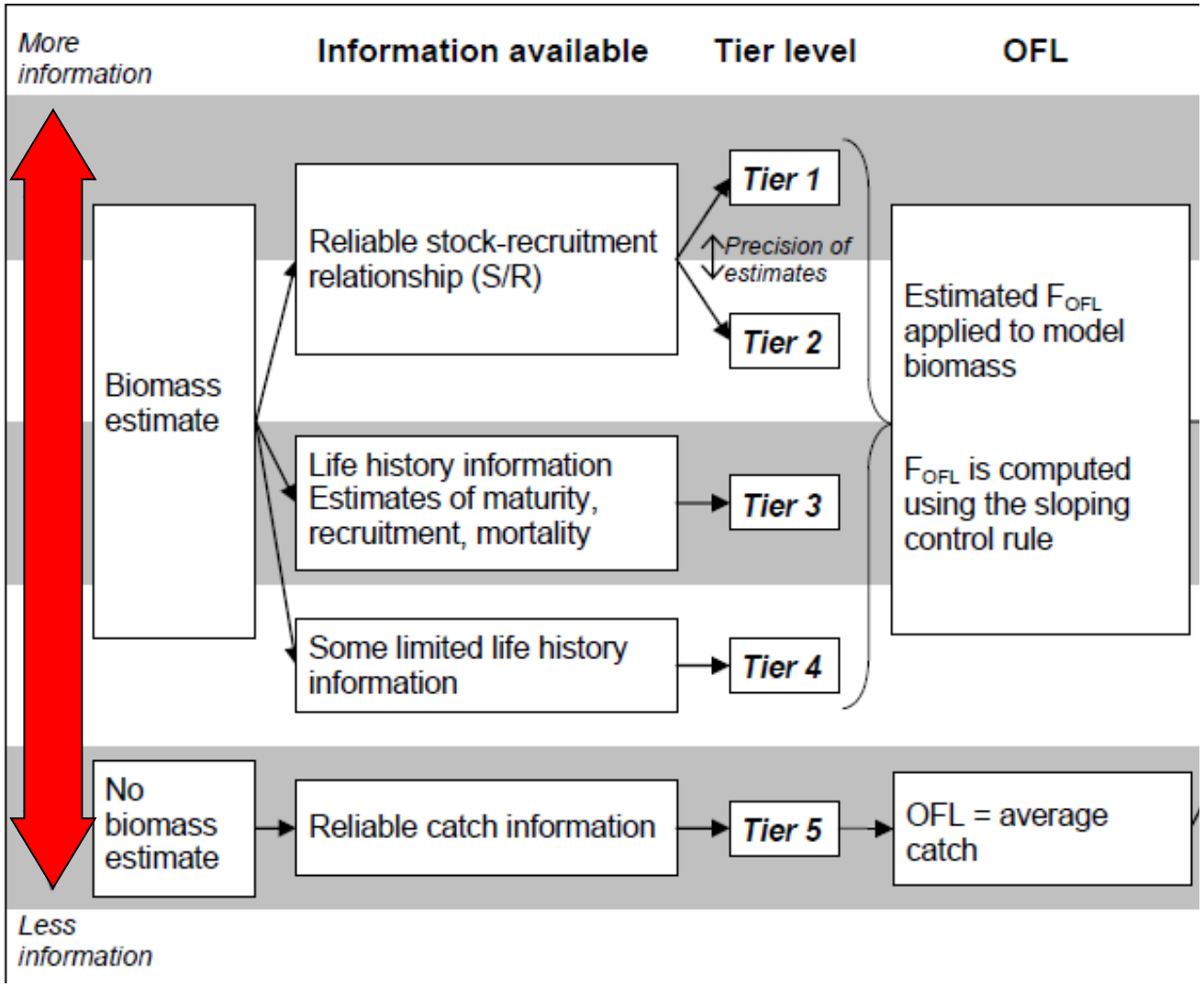
→ Triennial cycle, next assessment in 2025

→ Biennial cycle, next assessment in 2026

Norton Sound red king crab

→ Assessed in January/ February

Nov (virtual) / Dec council

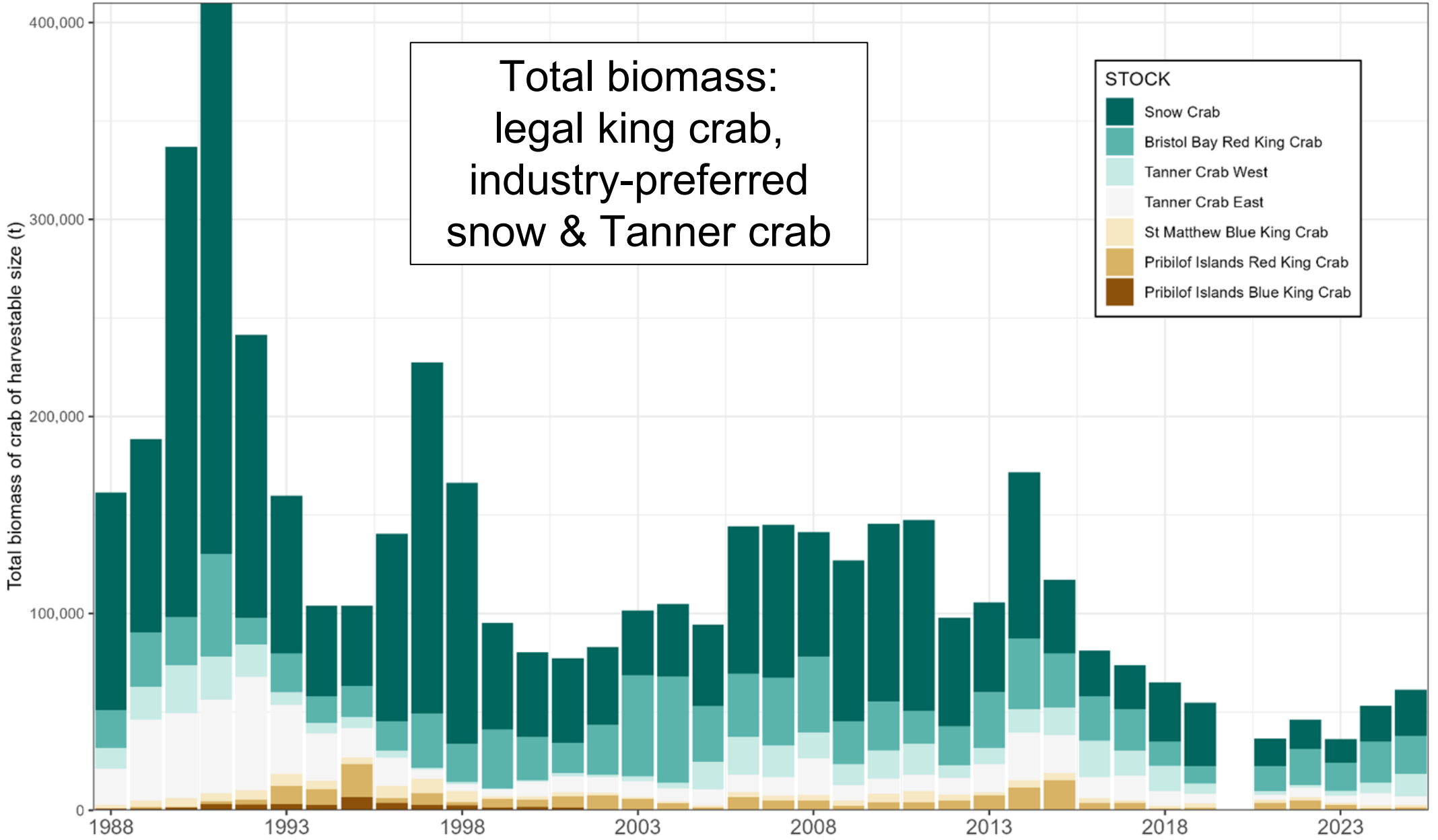

More information
Information available
Tier level
OFL
Biomass estimate
Reliable stock-recruitment relationship (S/R)
Tier 1
Precision of estimates
Tier 2
Life history information Estimates of maturity, recruitment, mortality
Tier 3
Some limited life history information
Tier 4
Estimated F_{OFL} applied to model biomass
F_{OFL} is computed using the sloping control rule
No biomass estimate
Reliable catch information
Tier 5
OFL = average catch
Less information

September 2025 Agenda

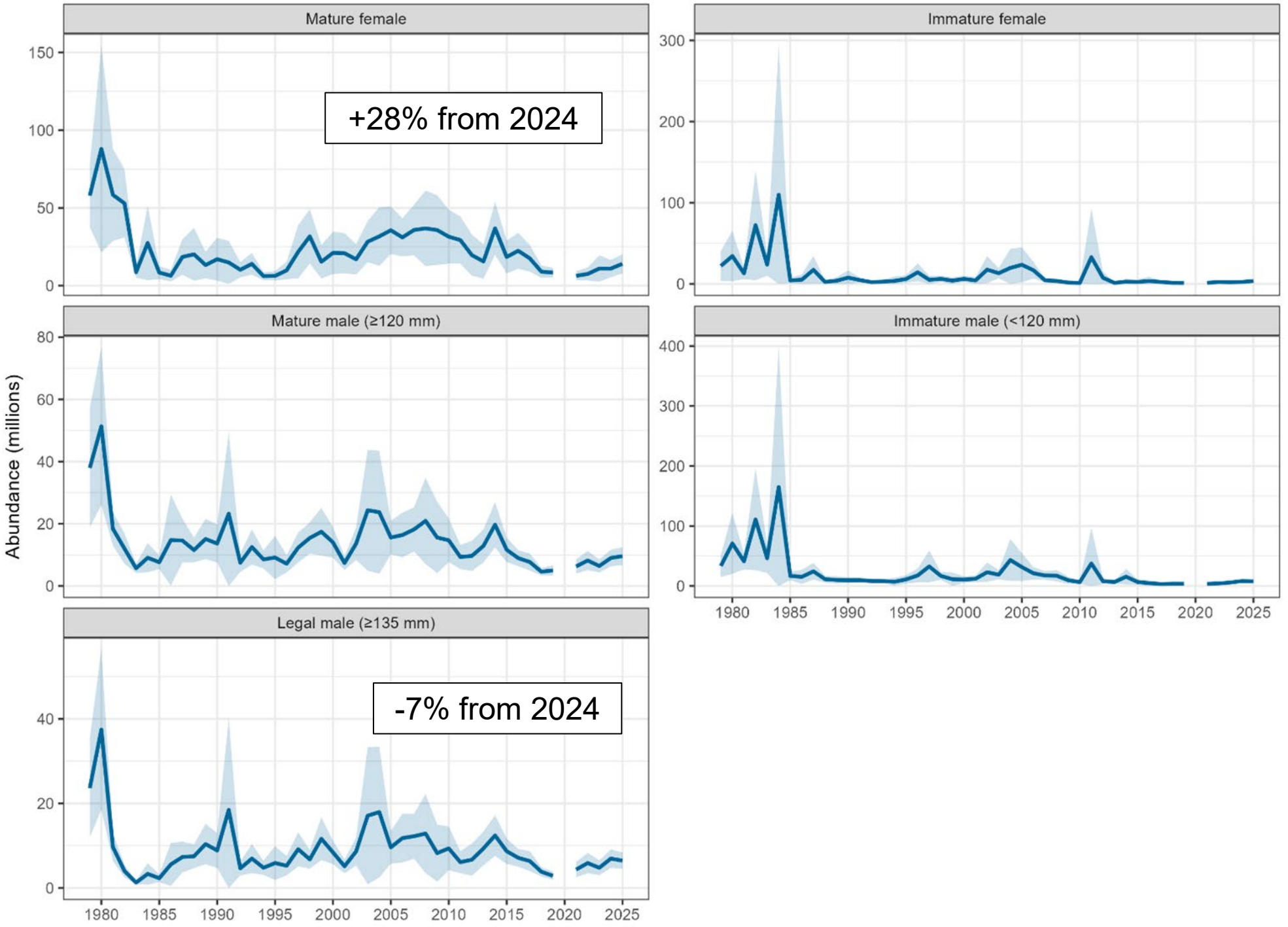
- ✓ Summer trawl survey results
- ✓ 2024/25 fishery season summary (taken up under each stock)
- ✓ **BBRKC final assessment, OFL and ABC,** and ESP report card
- ✓ **Tanner crab final assessment, OFL and ABC,** and ESP
- ✓ **Snow crab final assessment, OFL and ABC,** and ESP report card
- ✓ **PIRKC final assessment, OFL and ABC**
- ✓ **PIBKC final assessment, OFL and ABC**
- ✓ Overfishing updates on non-assessed stocks
- ✓ Risk table drafts and next steps
- ✓ Ecosystem status report – Bering Sea
- ✓ BSFRF research updates
- ✓ Skipper survey updates
- ✓ NSRKC research track model-based indices progress
- ✓ New business

Survey Results

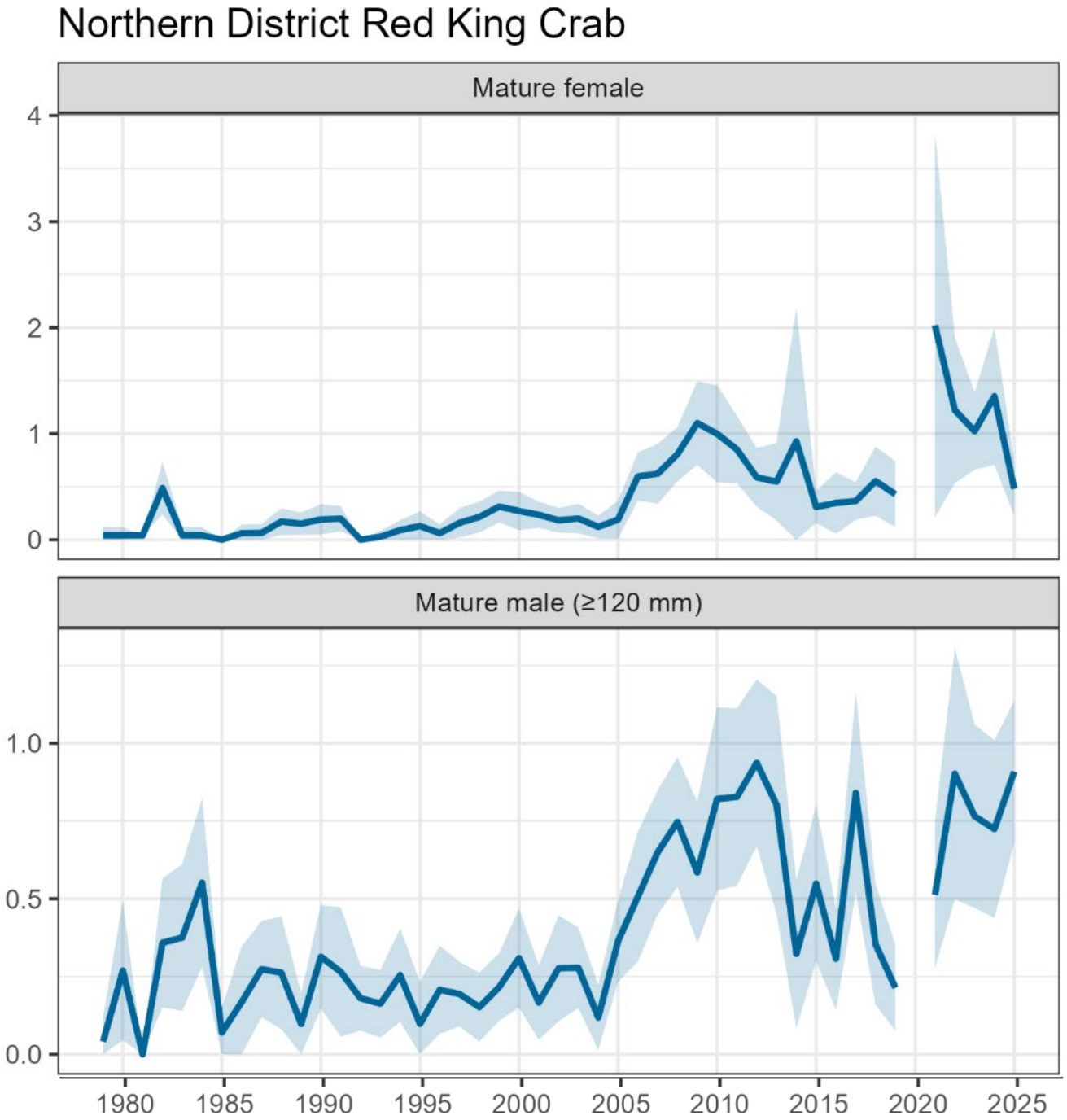
- 349 stations in Eastern Bering Sea, May - July
- Northern Bering Sea also surveyed, those results not presented to CPT
- Total harvestable biomass gradually recovering from 2021 low



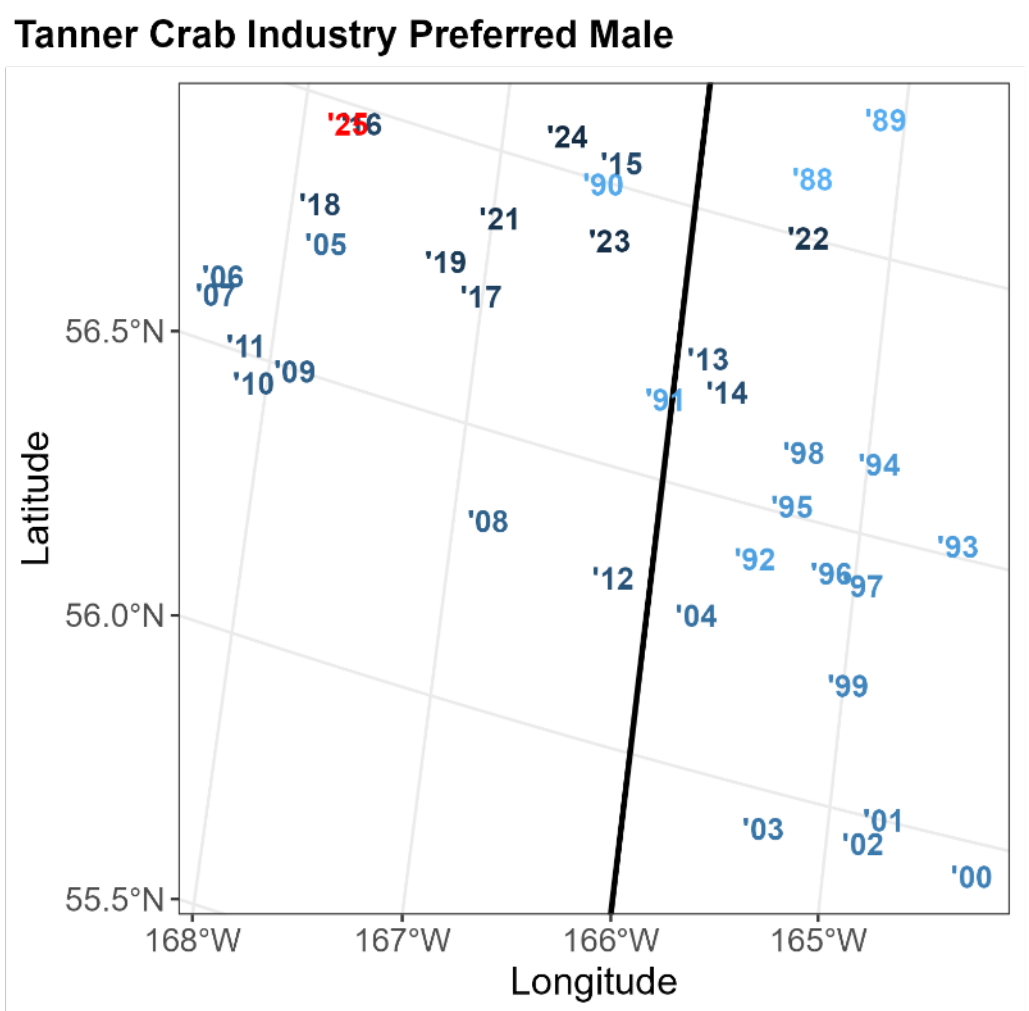
- Mature female & male abundance / legal abundance showing positive trend since 2021
- Immature abundance still extremely low

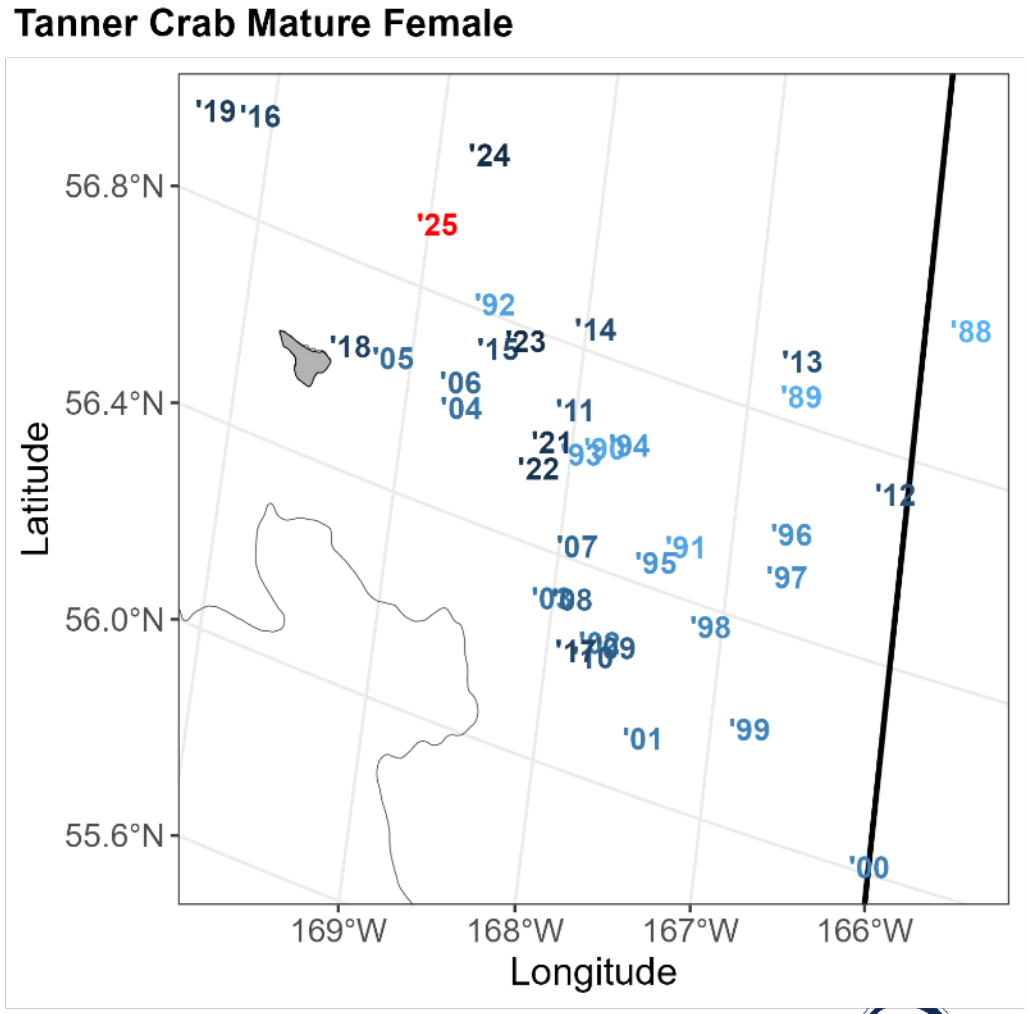


- Mature female & male abundance at elevated levels seen since ~2006
- Magnitude of abundance still much lower than Bristol Bay



Tanner crab range is shifting to the NW

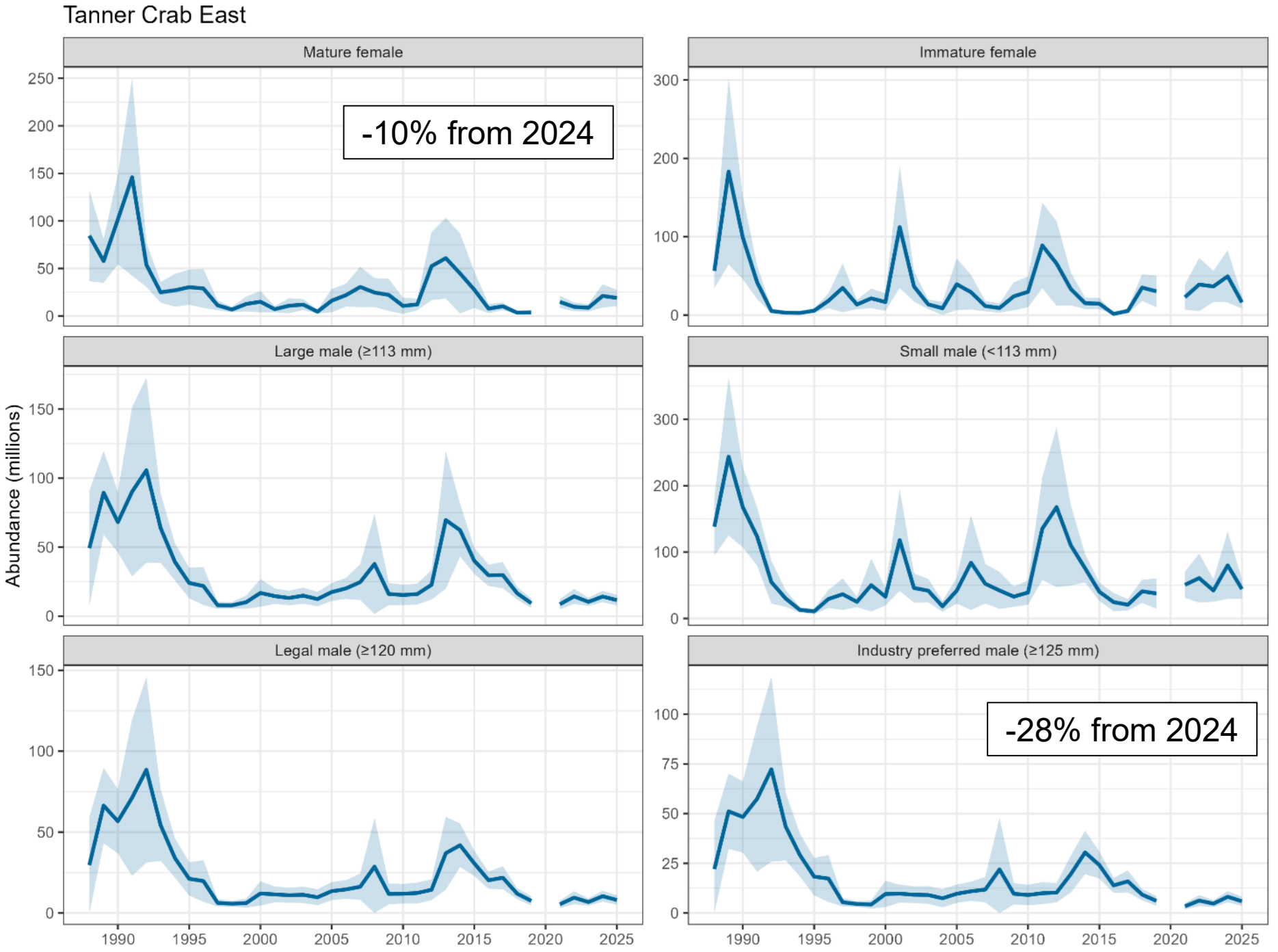




Centers of Abundance

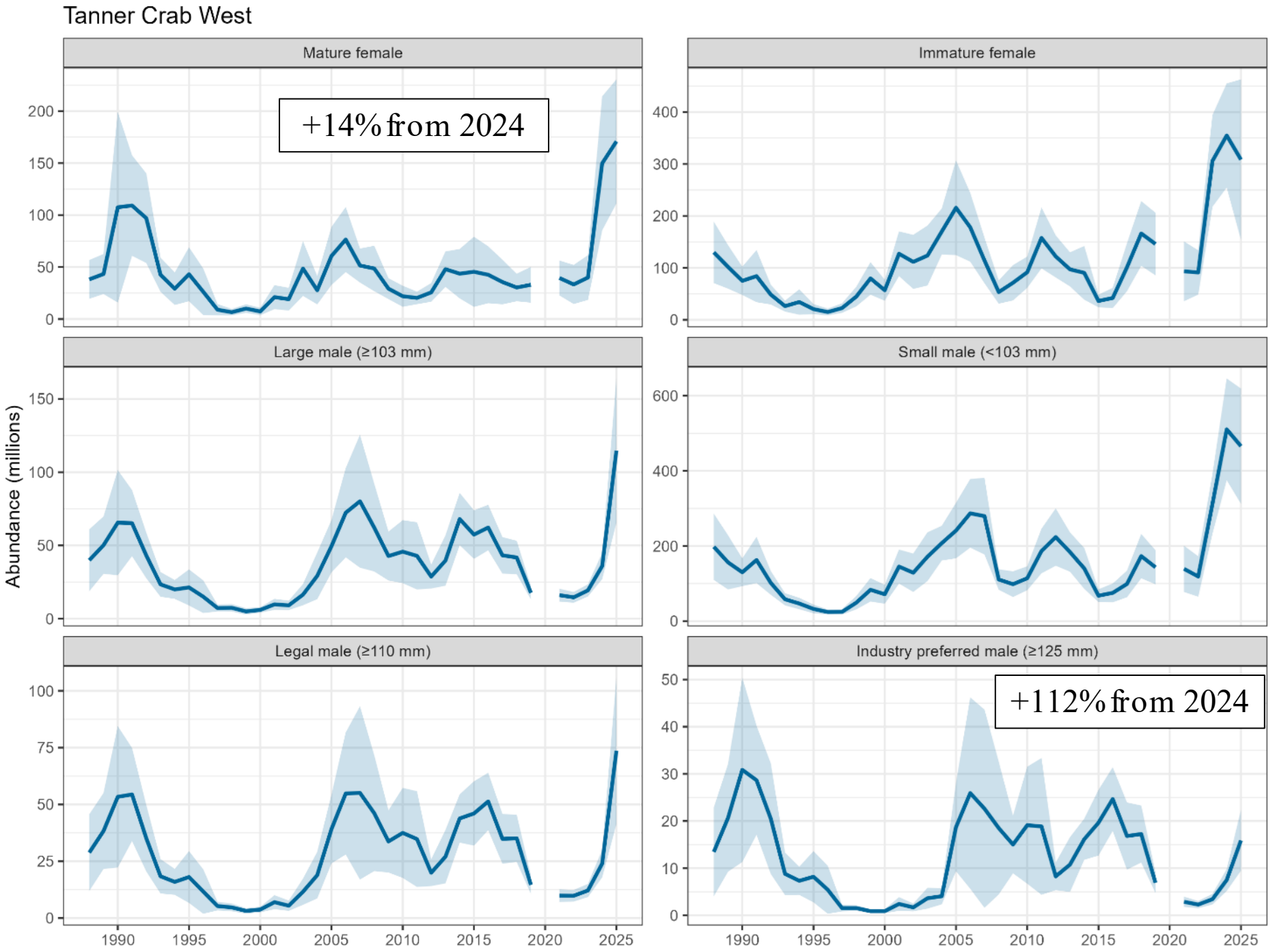
East of 166°

- Abundance at low levels, steady or declining
- No evidence of smaller size classes recruiting to survey in abundance



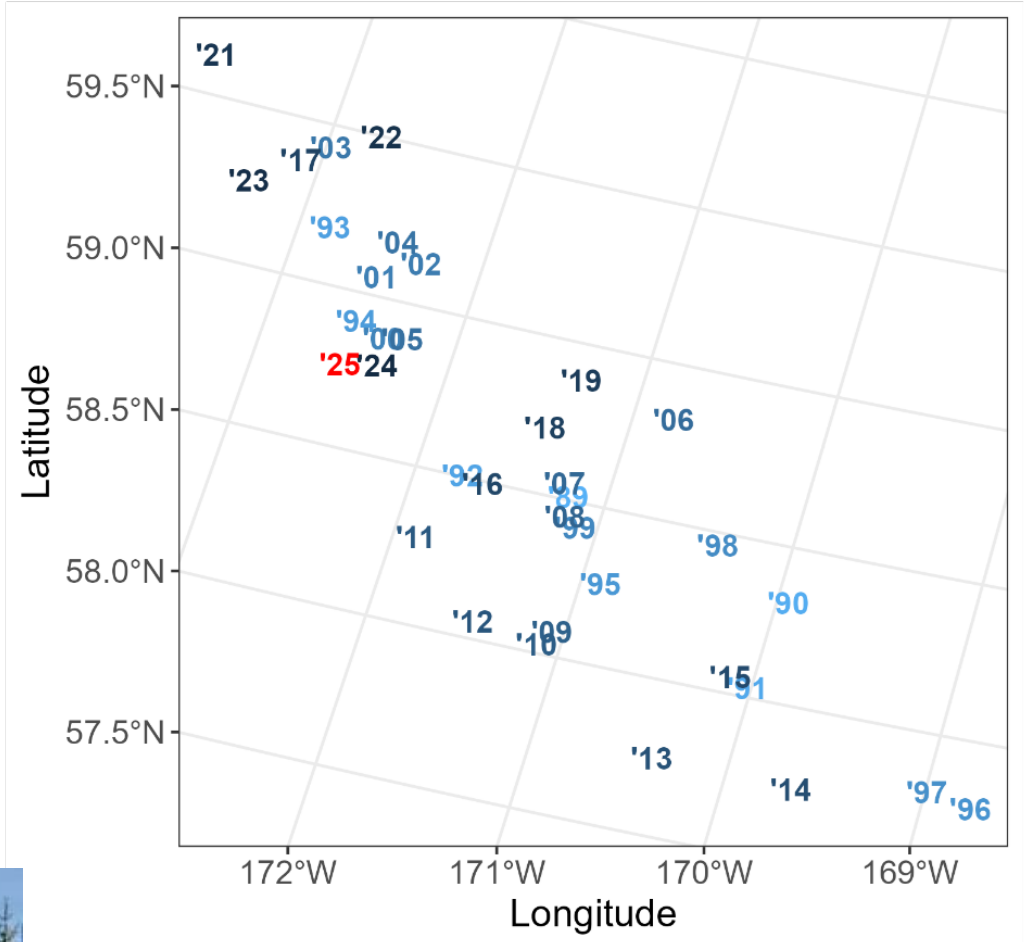
West of 166°

- Abundance at all-time highs
- Exception is industry-preferred size (5” carapace width
- Still evidence of smaller size classes recruiting to survey in abundance

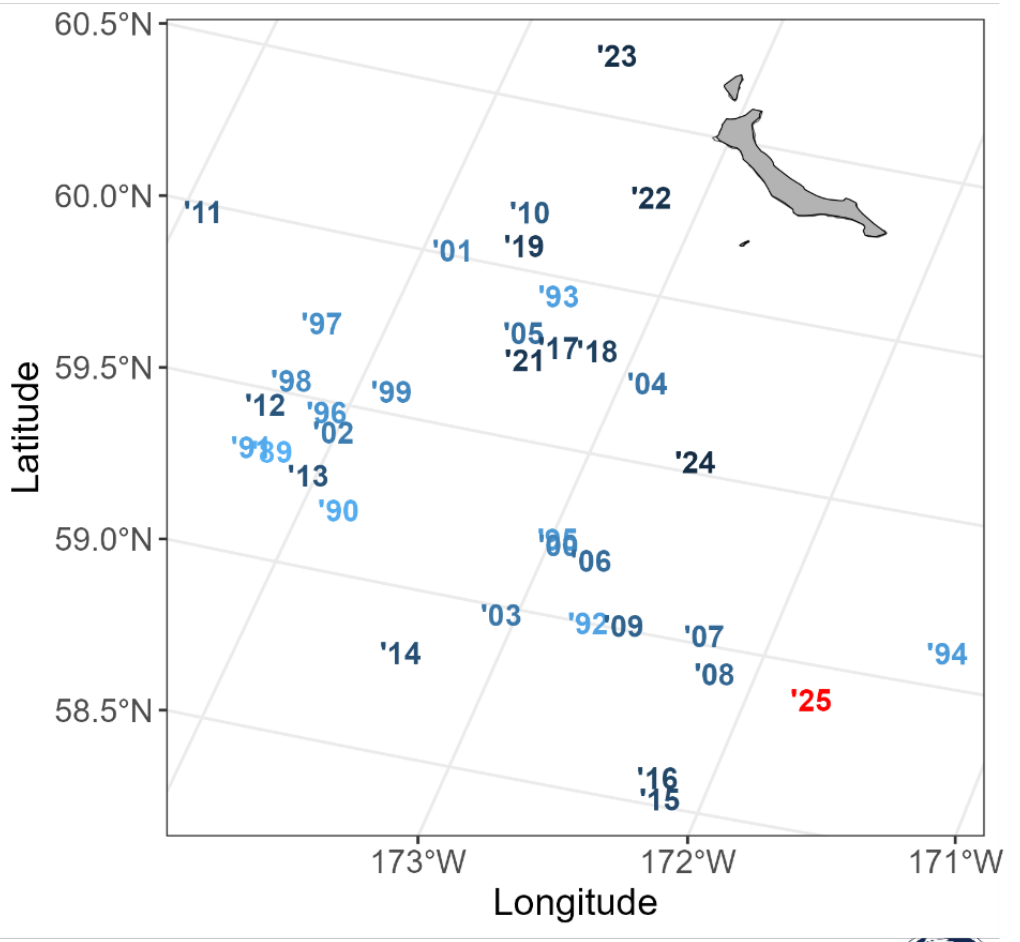


Snow crab range as the populations recovers

Snow Crab Industry Preferred Male



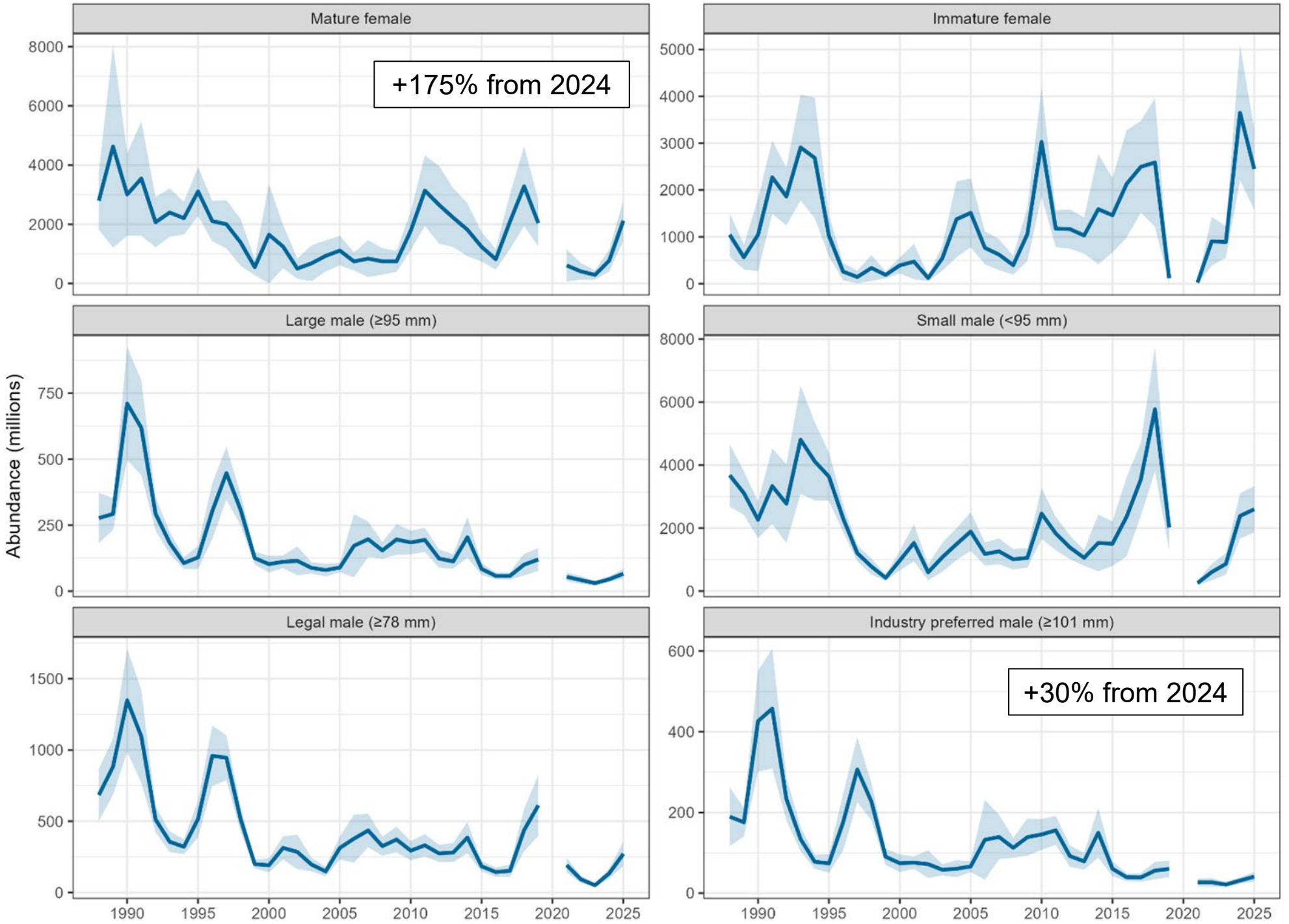
Snow Crab Mature Female



Centers of Abundance

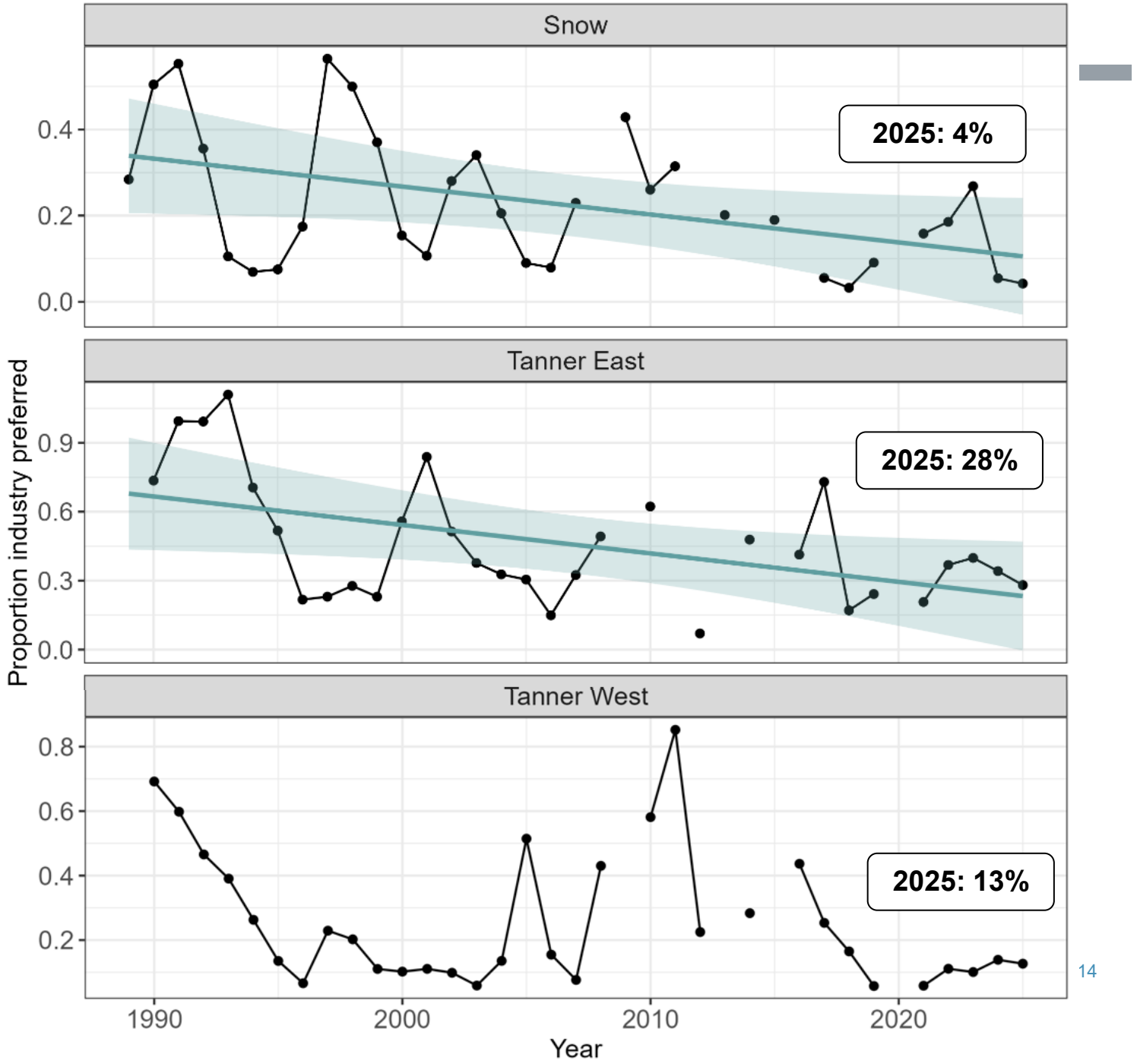
Snow Crab

- Recovery continues with high abundance of small size classes
- Mature female abundance near time series mean
- Abundance of morphometrically-mature males up 11-fold since 2023 (not plotted here)
- Industry-preferred male abundance still near time series low

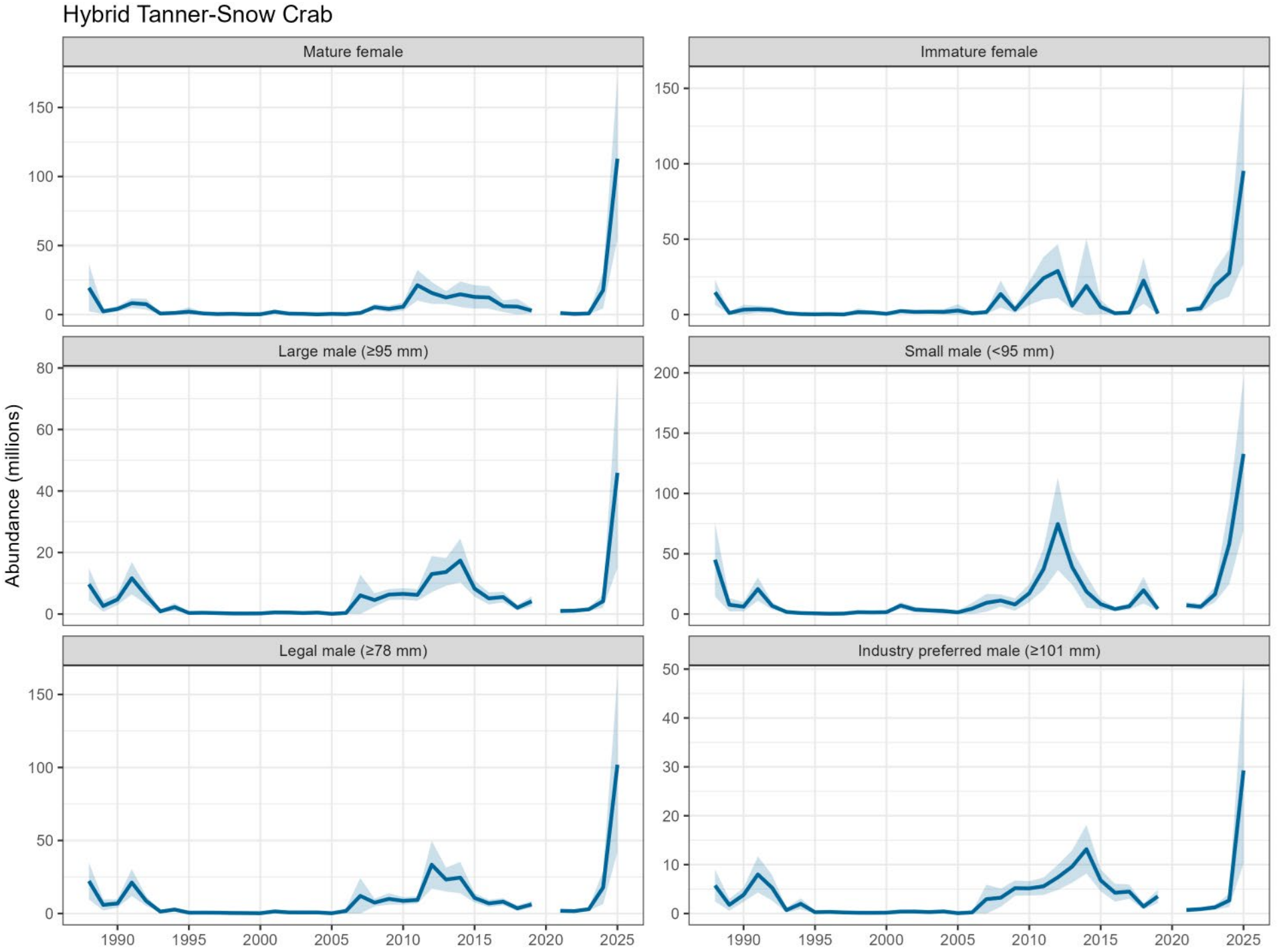


- Plots show proportion of males making the terminal molt to maturity at industry-preferred size
- After the terminal molt, crab stop growing, so smaller mature crab never grow to commercial size
- The proportions of snow crab and Tanner crab east of 166° maturing at industry-preferred size show meaningful linear declines

New-shell males: proportion maturing at industry-preferred size

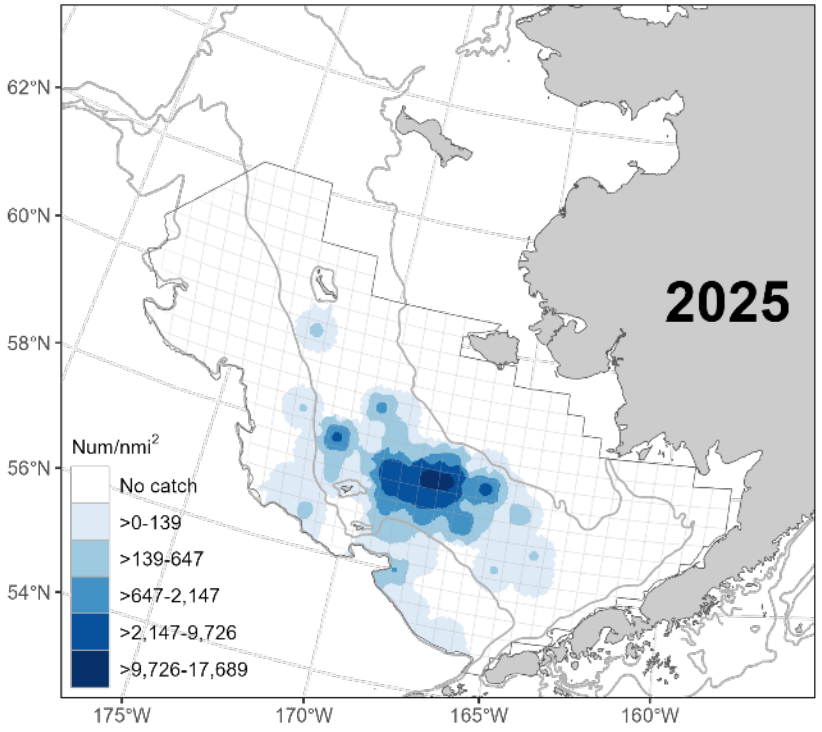


- Unprecedented abundance for all size-sex categories
- 20% of *Chionoecetes* males ≥ 101mm CW were hybrids
- High confidence that these results are not data artefacts

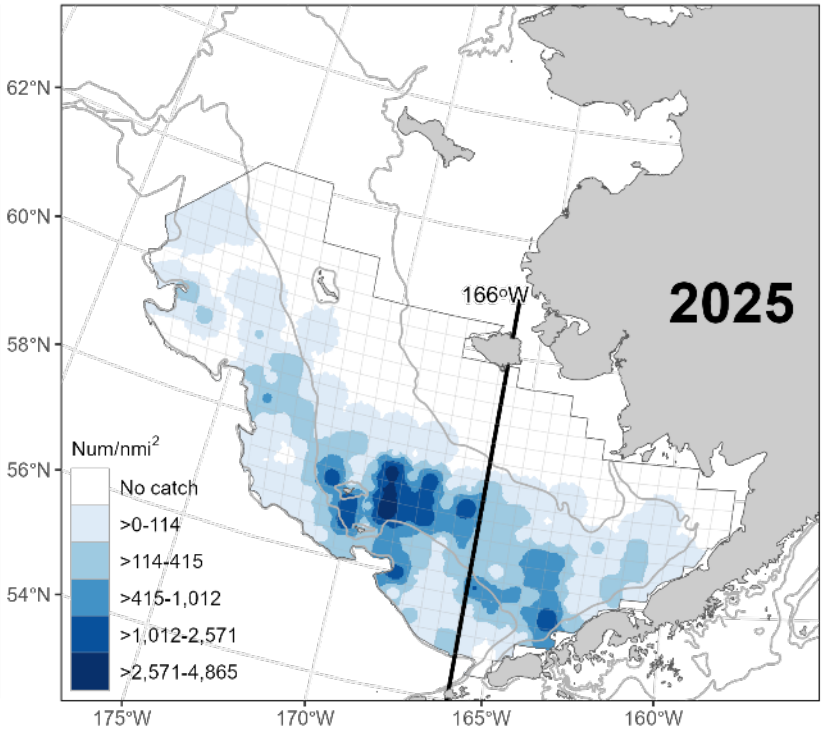


Industry-preferred sizes: strongest overlap with Tanner

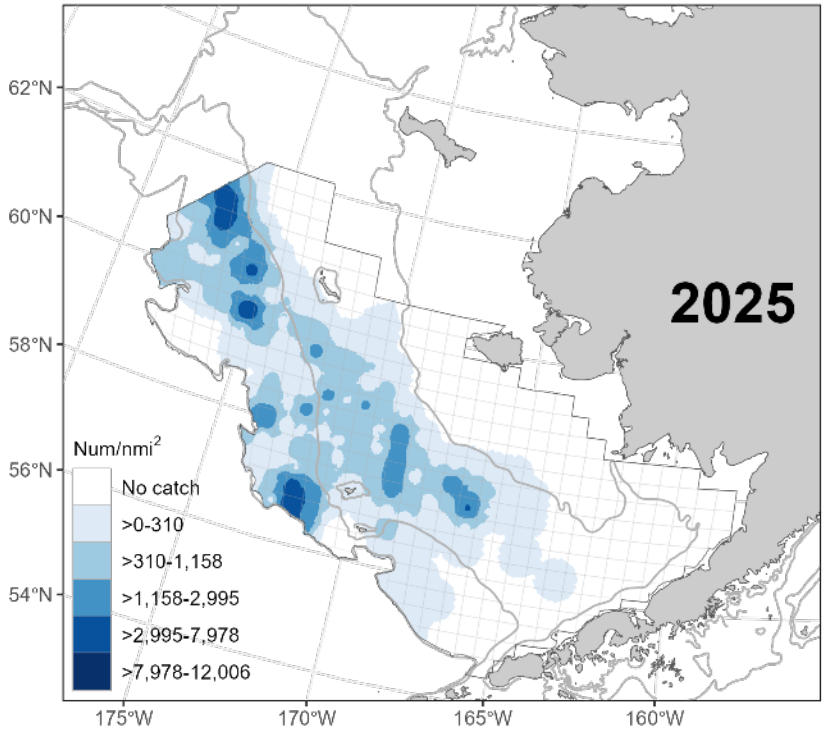
4” male hybrid



5” male Tanner



4” male snow



Hybrids: CPT discussion

- Awareness that this situation is unprecedented and motivates re-evaluation of hybrid considerations
- Spike in hybrid abundance co-occurs with unprecedented perturbations to snow crab stock: 2019-2021 collapse, 2024-2025 delayed maturation in females
- Stakeholder input requesting reconsideration of several topics
  - How hybrids are counted towards OFL/ABC
  - How hybrids can be accounted for in TACs and other State management considerations
- CPT placed hybrids on agenda for May 2026: biological and fisheries management considerations

BRISTOL BAY RED KING CRAB (BBRKC)

FINAL ASSESSMENT 2025

Bristol Bay ESP overview

Ecosystem Considerations

Predictive

- Elevated wind stress in Bristol Bay suggests **poor feeding conditions** for larval red king crab in 2025, and is predicted to result in a decline in recruitment to the fishery in ~6 to 8 years due to poor larval survival.

Contextual

- Bristol Bay was considerably warmer than the last four years, and corrosive bottom waters remain a concern for growth and survival of juvenile red king crab. Overall, **ecosystem concerns are minor** with uncertain impacts on the stock.
- The spatial extent of mature males has expanded with warming bottom temperatures over the past 40 years, and the ratio of red king crab in the Northern District relative to Bristol Bay remains above the 42-year historical average. **Northward stock distribution shifts and range expansion** may limit the utility of spatial closure areas and static management boundaries.
- An increase in the proportion of mature females with empty clutches in 2025 suggests a **potential reduction in reproductive potential** of the stock, although the proportion of empty clutches remains small (< 4%)

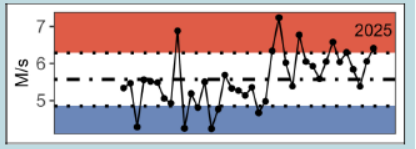
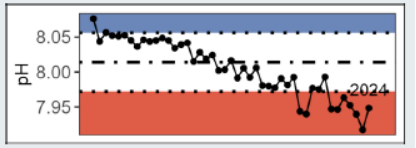
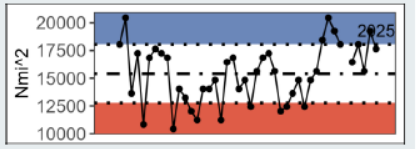
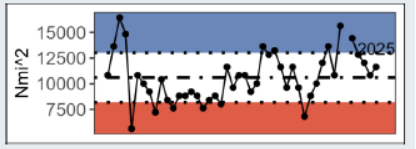
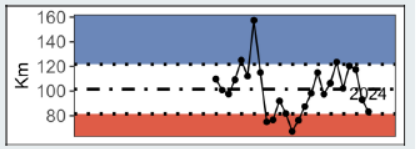
Socioeconomic Considerations

Fishery Informed

- Fishery-informed indicators are generally consistent with **stable or mildly improving stock condition** relative to the recent history of low population density.
- Crab vessel captain observations on fishing conditions in the 2024/25 Bristol Bay red king crab fishery are consistent with **high fishery CPUE**.

Bristol Bay Red King Crab ESP Report Card

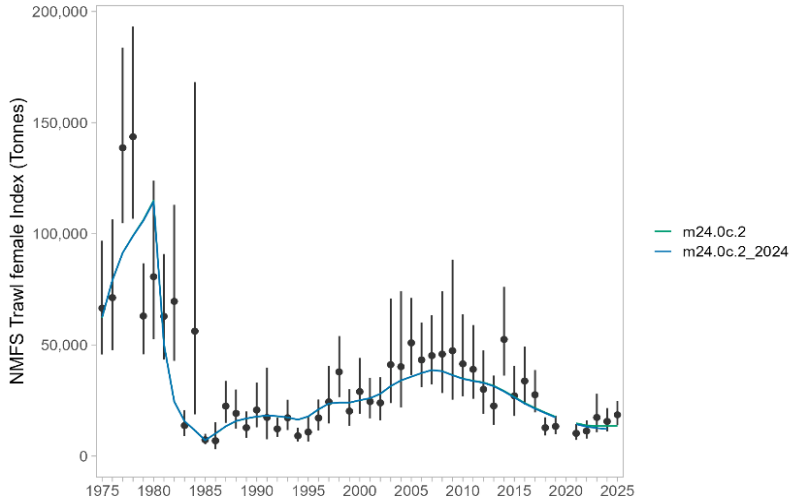
Ecosystem Indicators

	Indicator	Status	Trend
Predictive	Summer Wind Stress	Above long-term mean	
	Spring pH	Below long-term mean	
Contextual	BBRKC Mature Male Area Occupied	Near long-term mean	
	BBRKC Mature Female Area Occupied	Near long-term mean	
	Fishery Catch Distance from Shore	Near long-term mean	

Most recent year indicator status indicates good conditions, average conditions, or poor conditions for the stock

BBRKC overview

- **Tier 3 annual stock assessment, GMACS assessment** framework since 2018
- Mature male biomass increased from 2024, still low compared to long term average; Estimated mature female biomass is higher than recent years but still lower than it's been since the mid-90s
- Directed fishery was open in 2024/25 with TAC of 2.31 million lbs, with higher CPUE (crab/pot) than the previous season
- 2025 area-swept and State of Alaska LBA model estimates of mature female abundance are above the State Harvest strategy thresholds (8.4 million) this year.
- Low recruitment in recent years (last 8-12 years), projected decline in biomass without a large recruitment event



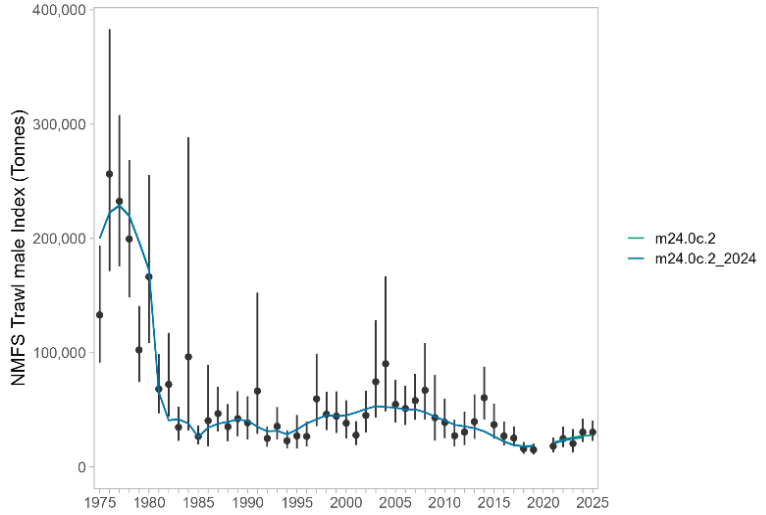
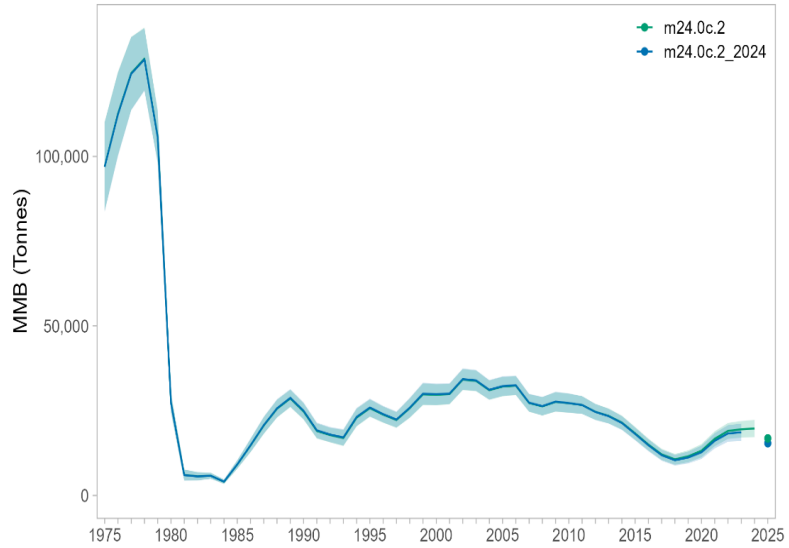


Table 1: Status and catch specifications (1000 t) for the CPT recommended model (24.0c.2).

Year	MSST	Biomass (MMB_{mating})	TAC	Retained Catch	Total Catch	OFL	ABC
2021/22	12.01	16.64	0	0.02	0.10	2.23	1.78
2022/23	9.68	18.34	0	0.02	0.11	3.04	2.43
2023/24	9.35	18.65	0.975	0.96	1.34	4.42	3.54
2024/25	9.26	19.74	1.05	1.05	1.20	5.02	4.02
2025/26		16.84				5.85	4.68

CPT / author recommendation: Model 24.0c.2, ABC buffer 20%
Total catch mortality (directed + bycatch) < OFL therefore overfishing did not occur in 2024/25



Buffer considerations:

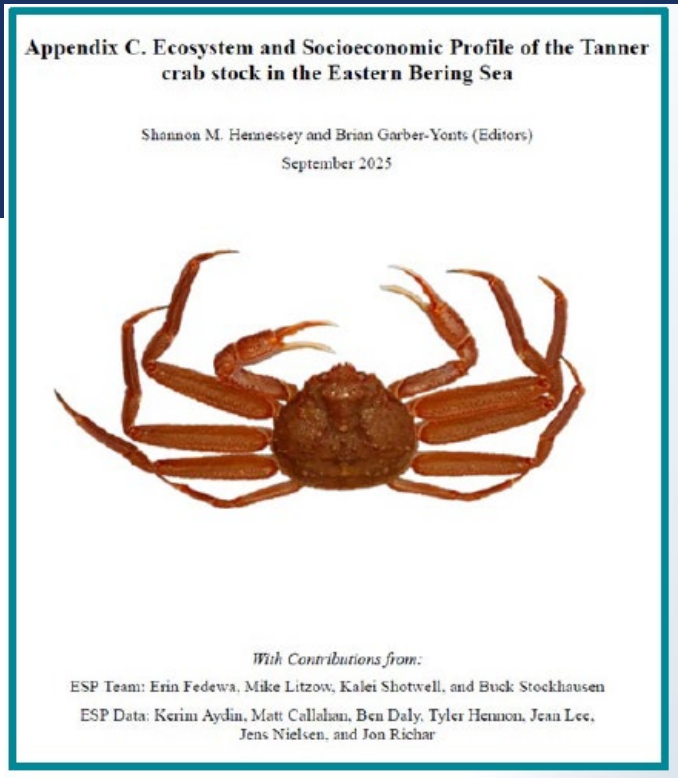
- Recommend staying with 20% for upcoming year (no large changes or improvements in uncertainty)
- Ecosystem considerations from ESP – wind stress and corrosive bottom water
- Declining trend or low levels of mature male biomass and mature female biomass
- Non-stationarity in recruitment expectations
- Retrospective pattern in MMB

TANNER CRAB

FINAL ASSESSMENT 2025

Tanner crab ESP

- Full ESP document
- Responses to CPT and SSC comments from June
- Ecosystem:
  - Three predictive indicators with recruitment:
    - benthic predator density – increasing from 2021-2024; suggests increasing predator-prey interactions and potential reduced survival
    - juvenile temperature occupied – temp of 3.5 C; suggests average growth and survival
    - along-shelf wind - unsure
  - Disease prevalence – 2nd highest to date (2.7%)
  - Northwest stock distribution shift and range expansion since 2021, males range contraction in 2025
  - Increased size at maturity for both male and female tanner crab
- Socioeconomic:
  - Marginally reduced fleet, increased potlifts
  - Center of gravity of fishing shifted towards W/E boundary
  - Both E and W fisheries fully utilized


Appendix C. Ecosystem and Socioeconomic Profile of the Tanner crab stock in the Eastern Bering Sea

Shannon M. Hennessey and Brian Garber-Yonts (Editors)

September 2025

With Contributions from:

ESP Team: Erin Fedewa, Mike Litzow, Kalei Shotwell, and Buck Stockhausen

ESP Data: Kerim Aydin, Matt Callahan, Ben Daly, Tyler Hennon, Jean Lee, Jens Nielsen, and Jon Richar

Tanner crab 2025 overview

Overview

- ADFG manages fishery in two areas
  - **fishery open in both areas**
  - East 166W: TAC: 803 t. RC: 803 t
  - West 166W: TAC: 2,041 t. RC: 2,049 t
- 2025 NMFS EBS Shelf Survey Biomass
  - male biomass: 111 kt (-E, +W, +T)
  - IP male biomass: 16 kt (-E, +W, +T)
  - imm fem biomass: 12 kt (-E, -W, -T)
  - mat fem biomass: 29 kt (-E,+W,+T)
  - **2023 recruitment moving into larger sizes**

- 2023/24 OFL: 41.29 kt
  - Total catch mortality: 3.09 kt
  - **overfishing did not occur**
- 2025 assessment
  - Same Tier 3 model as 2024 (22.03d5)
  - Tier 3a ($B>B_{MSY}$; **not overfished**)
  - OFL: 51.02 kt; ABC: 40.81 kt
  - Concerns: model **overly-optimistic**

Year	MSST	Biomass (MMB)	TAC	Retained Catch	Total Catch	OFL	ABC
2021/22	17.37	62.05	0.50	0.49	0.78	27.17	21.74
2022/23	18.19	74.17	0.91	0.91	1.19	32.81	26.25
2023/24	20.00	88.21	0.94	0.94	1.09	36.20	27.15
2024/25	21.61	99.53	2.84	2.85	3.09	41.29	33.03
2025/26	NA	75.96	NA	NA	NA	51.02	40.81

In 1,000's metric tons

12.54 10.66 TIER 4

Year	MSST	Biomass (MMB)	TAC	Retained Catch	Total Catch	OFL	ABC
2021/22	17.37	62.05	0.50	0.49	0.78	27.17	21.74
2022/23	18.19	74.17	0.91	0.91	1.19	32.81	26.25
2023/24	20.00	88.21	0.94	0.94	1.09	36.20	27.15
2024/25	21.61	99.53	2.84	2.85	3.09	41.29	33.03
2025/26	NA	75.96	NA	NA	NA	51.02	40.81

CPT recommendation: Model 22.03d5, ABC buffer 20%
Author recommended 22.03d5

Buffer considerations:

- Continuing concern over model performance (abundance of large crab still overestimated)
- Continuing concern over MMB as index of reproductive potential
- Continuing concern over F35%, B35% as metrics for sustainable fishery
- Positive: movement of recruits into larger sizes classes

SNOW CRAB

Final Stock Assessment and Fishery Evaluation 2025

Snow crab trends

Small increase in preferred males

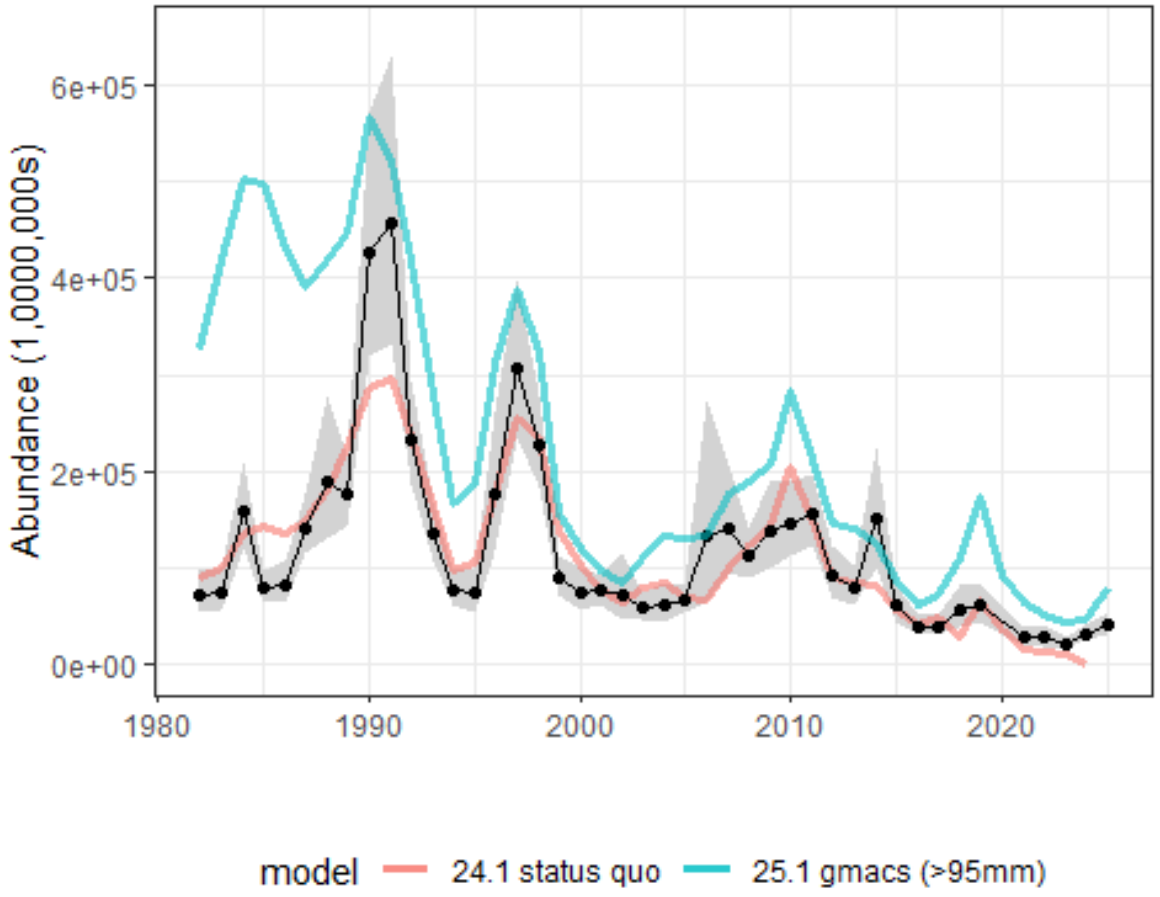
- 7th lowest on record
- 8% of the maximum observed

Last 9 years are the lowest on record

- In order: 2023, 2021, 2022, 2024, 2017, 2016, 2025, 2018, 2019

Large numbers of medium sized males

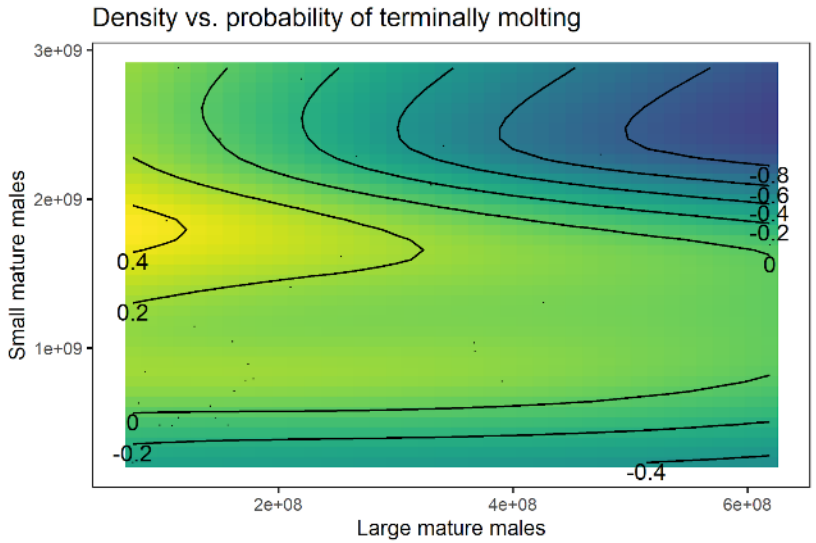
Terminal molt issues

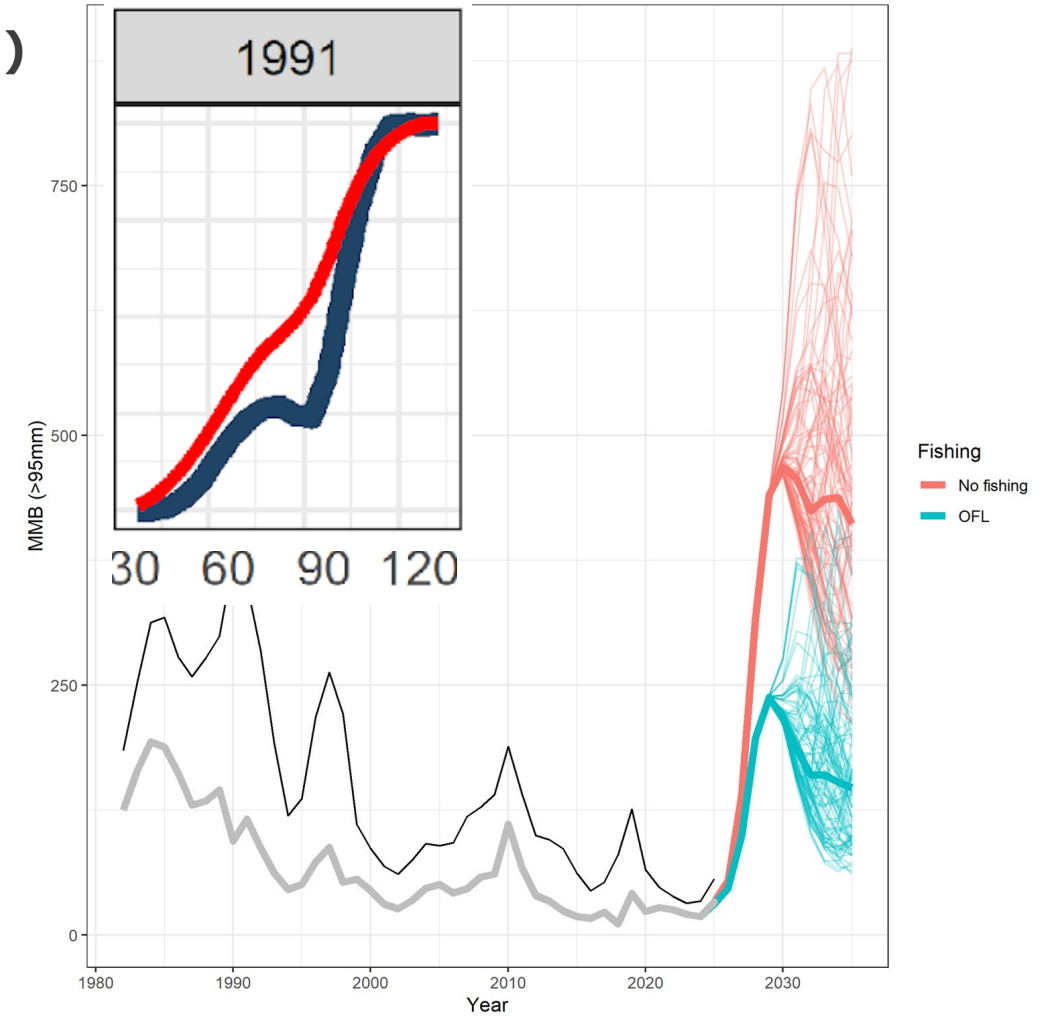


Author rationale for changing maturity definition to ≥ 95 mm CW

Biological concerns (in order of author concern)

- Density dependent terminal molt
- Mate limitation
  - hybridization
- Sperm limitation
- Directional selection

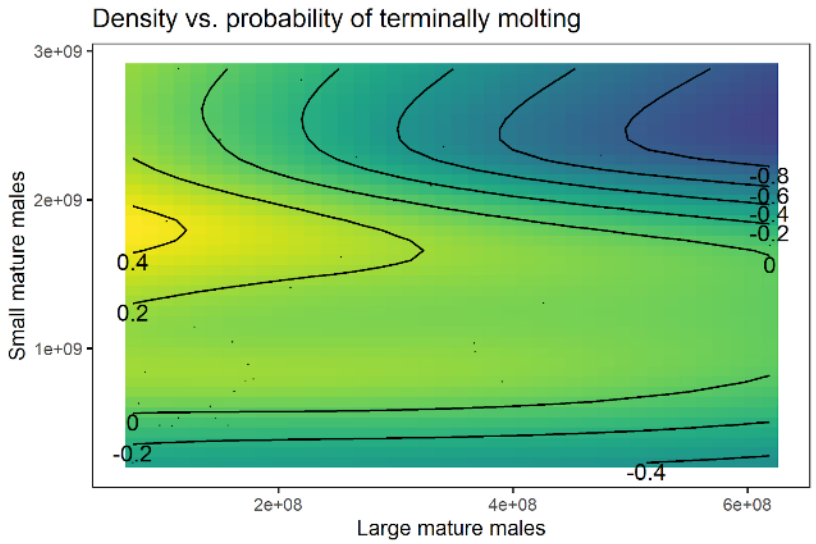


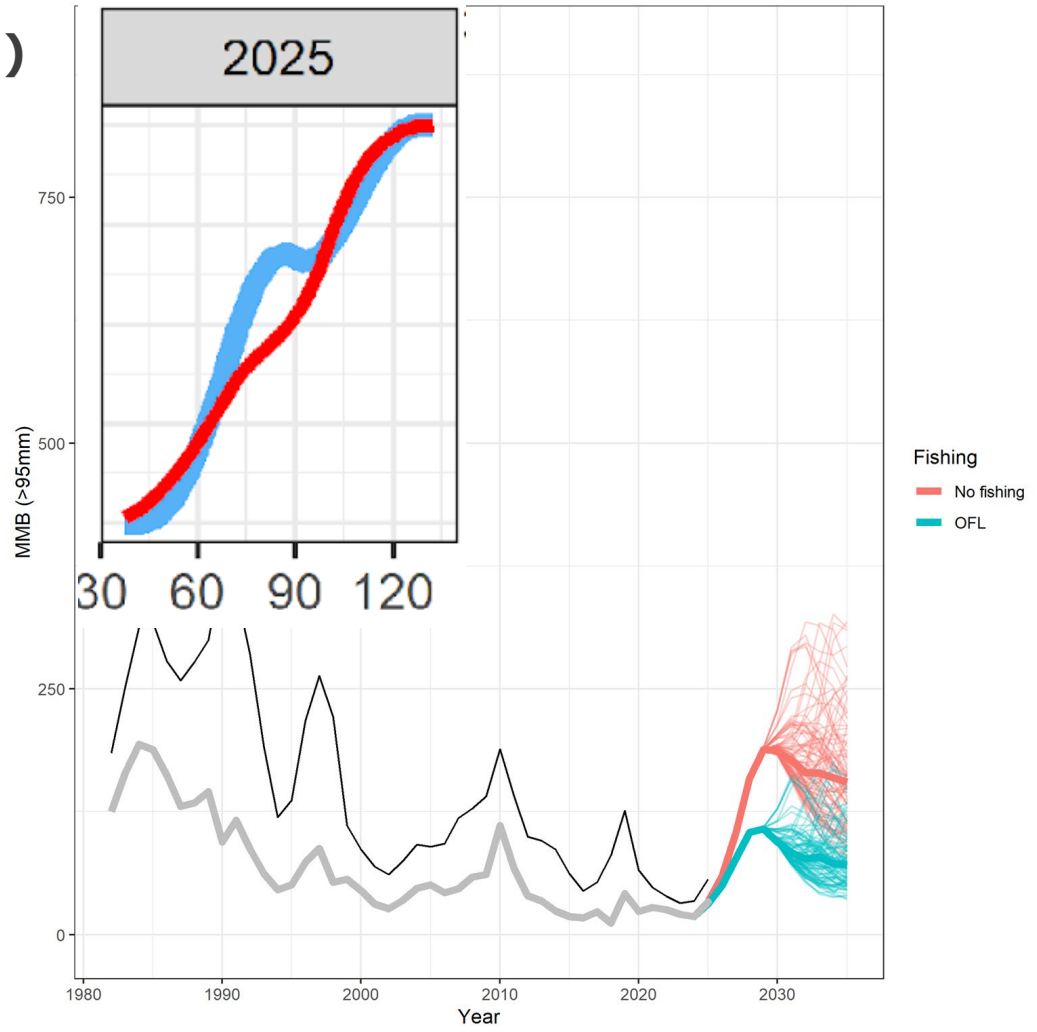


Author rationale for changing maturity definition to ≥ 95 mm CW

Biological concerns (in order of author concern)

- Density dependent terminal molt
- Mate limitation
  - hybridization
- Sperm limitation
- Directional selection





Snow crab CPT recommendations

- CPT recommends changing definition of male maturity to ≥ 95 mm carapace width
- Based on best available scientific information concerning importance of large males for reproductive status of the stock:
  - Most females mated with one (59%) or two (32%) males during 2007-2016 (Slater et al. 2024)
    - Lower average # of mates than observed in other populations
    - Suggests mating opportunities may be limiting and females may be at risk of sperm limitation
  - Smaller males have smaller sperm reserves than large males (Sainte-Marie et al. 1995)
  - Population with reduced proportion of large males is at increased risk of sperm limitation (Baker et al. 2022)
  - Size at terminal molt in males is density-dependent and inversely related to the abundance of large males (Mullowney and Baker 2021)
- Additional benefits noted for FMP Economic and Social Objective

Snow crab CPT recommendations

- CPT concurs with author-recommended 20% ABC buffer
  - Concerns over jittering analysis
  - Population dynamics concerns over male declining size at maturity
- Model 25.3 with ≥ 95 mm CW definition of maturity produces OFL = 3.26 kt, ABC = 2.6 kt
- SSC recommended Tier 4 assessment with morphometric definition of maturity and 40% buffer
- Produces OFL = 20.11 kt, ABC = 12.07 kt

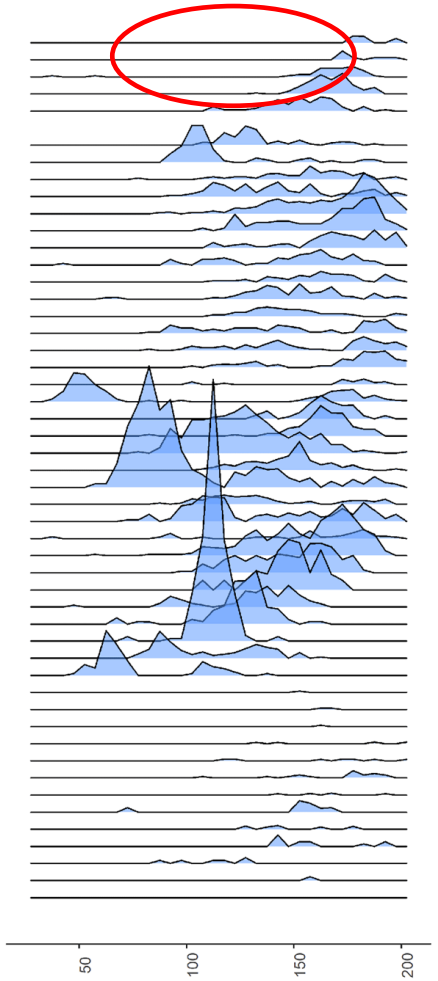
Pribilof Islands Red King Crab (PIRKC)

Final Stock Assessment and Fishery Evaluation

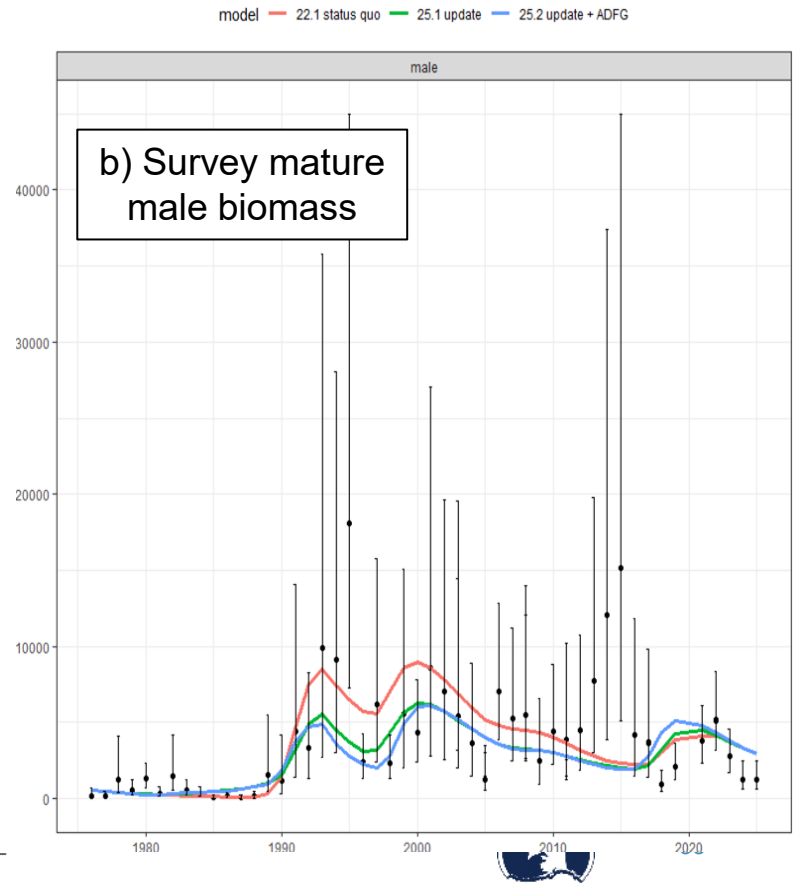
Overview

- Tier 4 stock
- B_{MSY} proxy = 35% of average model-estimated MMB for 2000 through present year - 1
- Last assessment in 2022; next in 2029
- Fishery closed over conservation concerns for blue king crab
- 2024/2025 OFL = 685 t; total catch = 0.87 t; overfishing did not occur
- 2025 updates:
  - Survey shows persistent absence of small size classes since 2019
  - Survey-estimated MMB has declined since 2022 and is approaching B_{MSY}

a) Male abundance at size



b) Survey mature male biomass



PIRKC: CPT recommendations

- CPT endorses model 25.2
  - Fits similar to 25.1
  - Utilizes all available data
- CPT recommends no changes to B_{MSY} year range
- CPT concurs with recommended 25% ABC buffer
  - Consistent with historical buffers for this stock; based on need to borrow life history information from other stocks
  - Loss of corner stations biases survey estimates downwards and does not justify an additional buffer
- Recommended OFL = 489 t; recommended ABC = 367 t
- 2025/2025 MMB = 1.76 x B_{MSY}; not overfished

Pribilof Islands Blue King Crab (PIBKC)

Final Stock Assessment and Fishery Evaluation

Overview & Recommendations

- Tier 4 stock; quadrennial assessment going forward
- Under a rebuilding plan; **remains at an overfished status at ~4% of B_{MSY}**
- OFL = 1.16 t (set in rebuilding plan), total catch = 0.03 t, **overfishing did not occur**
- Single model brought forward: GLMM fit in sdmTMB to estimate survey MMB
- CPT recommends adoption of this model for the next assessment
- CPT endorses continuing use of 25% ABC buffer (in place since 2014)
- For the next four crab years: OFL = 1.16 t; **recommended ABC = 0.87 t**
- CPT recommends that future assessments should apply 50% mortality for fixed gear groundfish bycatch, in line with other king crab stocks

BALANCE OF CPT REPORT

Overfishing status updates (2024/25 total catch)

- WAIRKC – Tier 5, directed fishery closed, total catch mortality was 0.01 t (bycatch in AIGKC and groundfish)
  - 0.01 t << OFL (56t) therefore overfishing did NOT occur
- SMBKC – directed fishery closed, total catch mortality was 0.0007 t
  - 0.0007 t << OFL (0.129 t) therefore overfishing did NOT occur
- PIGKC – directed fishery was open (2 vessels so confidential), TAC was set below ABC
  - Total catch mortality < OFL (114t) therefore overfishing did NOT occur
- AIGKC
  - Total catch mortality 2.43 mt < 3.73 mt OFL therefore overfishing did NOT occur

QUESTIONS?

- Thanks to all CPT members and crab assessment authors.