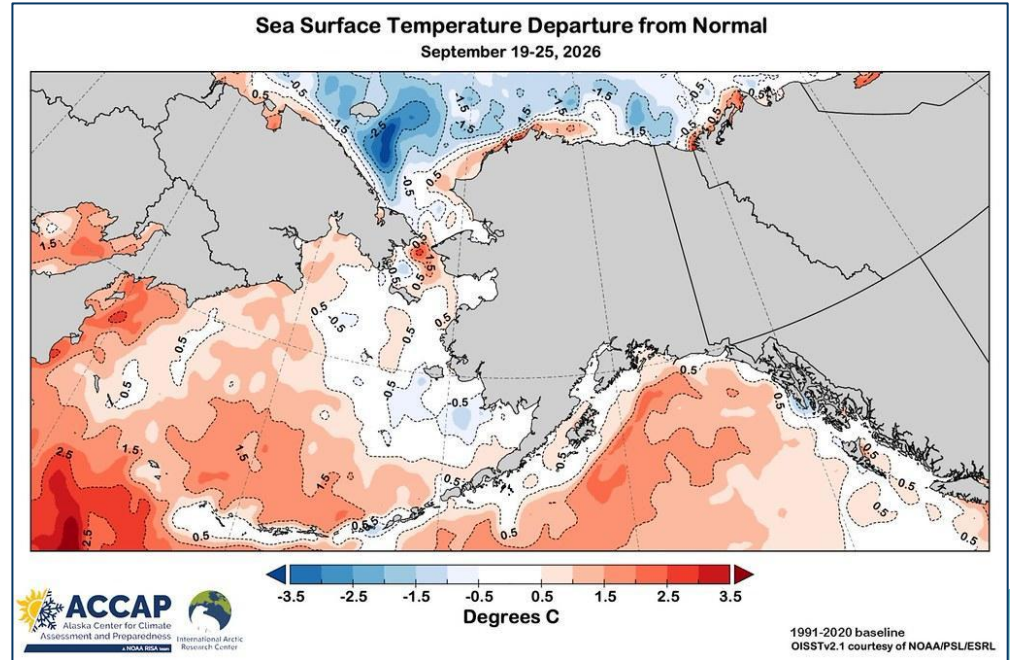


Ecosystem Status Report Preview



Elizabeth Siddon
Bridget Ferriss
Ivonne Ortiz

Scientific & Statistical Committee
October 5, 2026



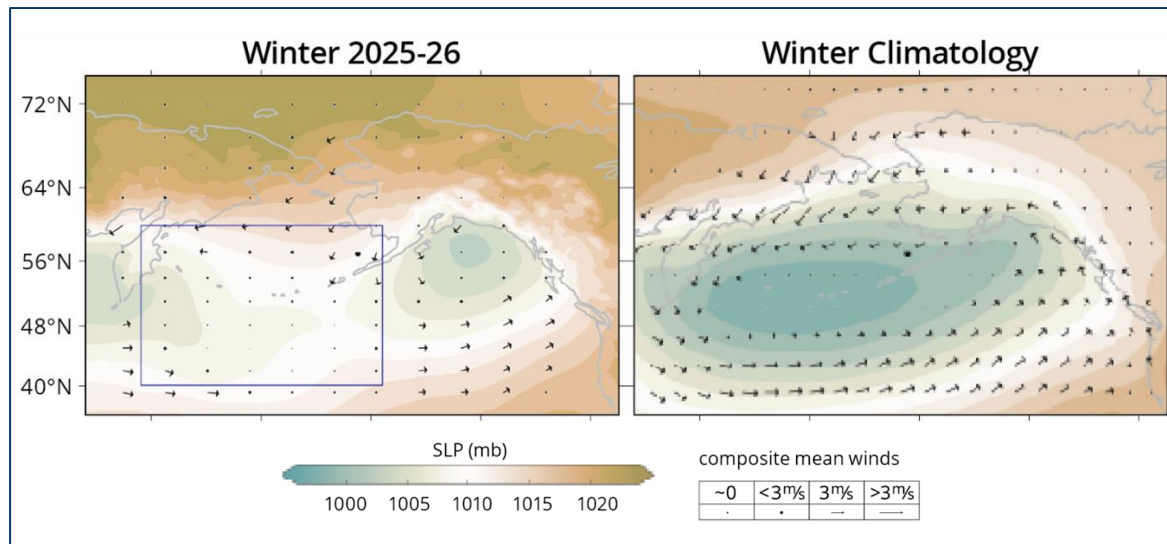
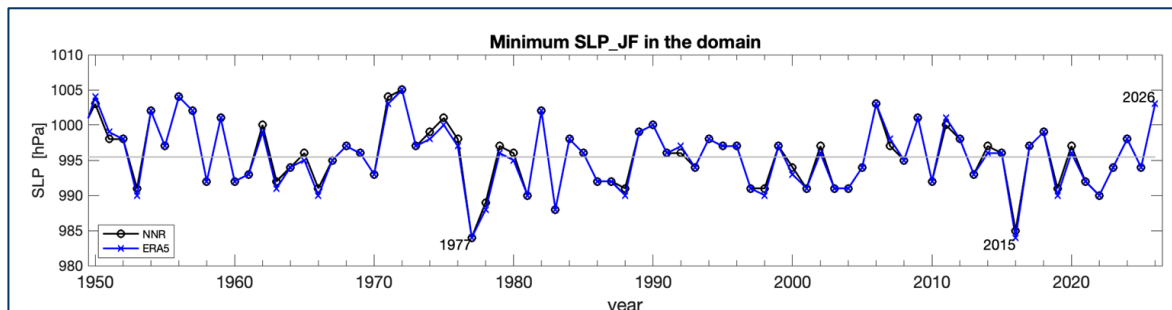
Outline

- Alaska-wide climate overview
- 2026 ESR Previews
 - Gulf of Alaska
 - Aleutian Islands
 - Eastern Bering Sea
- EBS crab-relevant ecosystem indicators
 - ★ Updated since CPT 9/14



- Very weak Aleutian Low in winter 2025/2026
- Similar to 2006, 1982, and early '70s
- Cool arctic air to EBS, AI, and GOA
- Extensive sea ice in EBS

Minimum Sea Level Pressure



Sea Surface Temperature and Winds

Fall 2025

- Started with warm anomalies across much of the GOA, AI, and EBS
- By Nov: cooler conditions in central GOA and NBS

Winter 2025/2026

- Weak Aleutian Low; cooling across North Pacific
- Warm anomalies in AI and SEAK remained

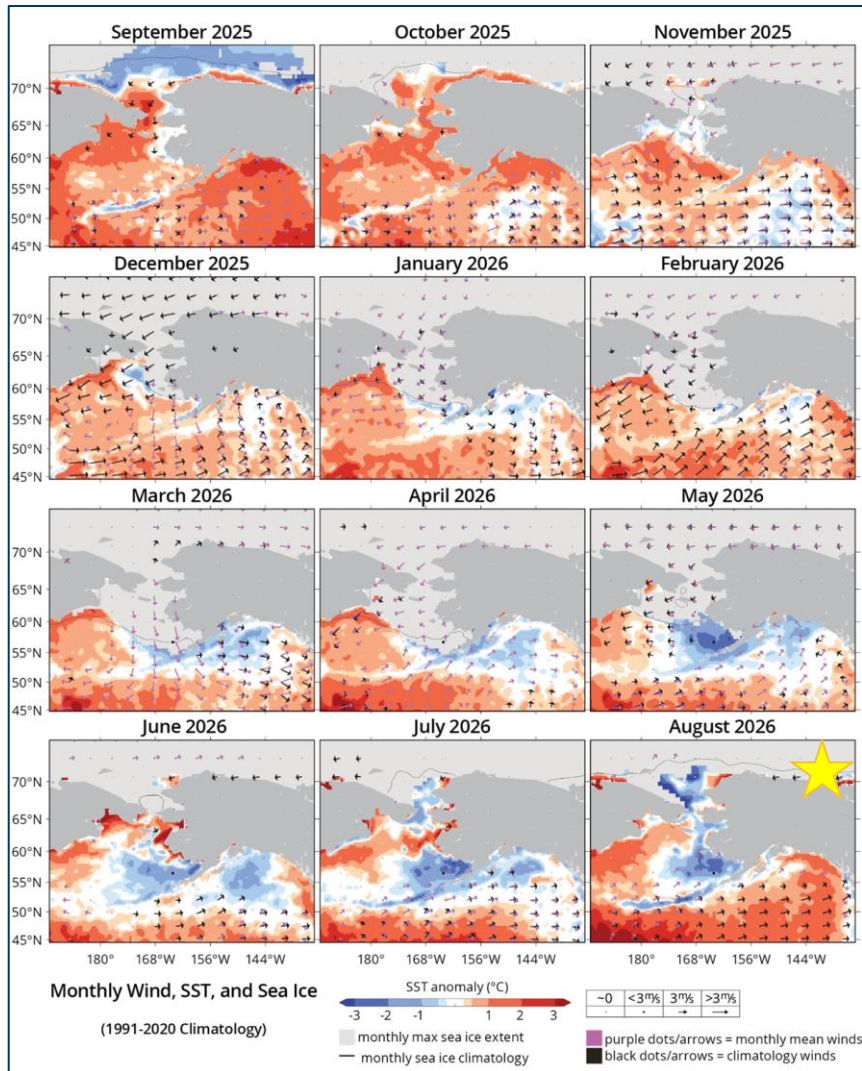
Spring 2026

- March-April winds drove sea ice south over EBS
- Cooler SSTs anomalies in AI, but subsurface warmth persisted

Summer 2026

- SST over SEBS shelf $>2^{\circ}\text{C}$ below average
- Aug warmth in EGOA from central N Pacific

(Lemagie)



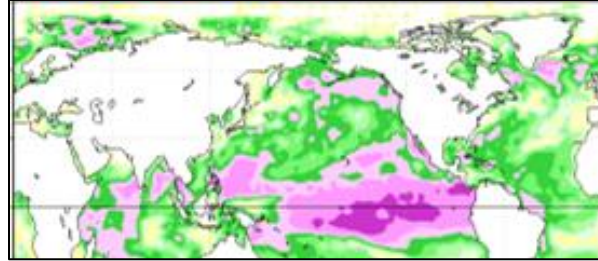
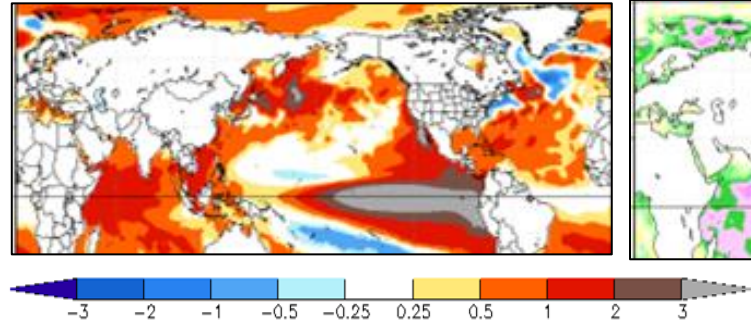
SST Projections from the National Multi-Model Ensemble

SST Anomalies

Nov 2026 - Jan 2027

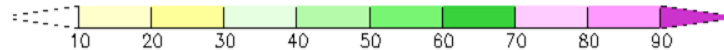
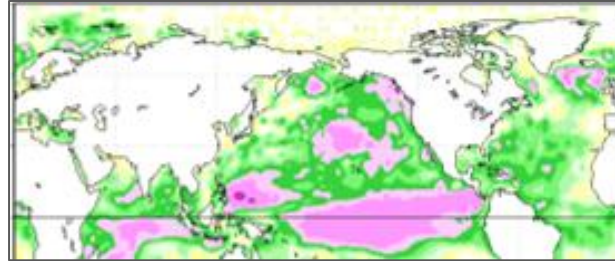
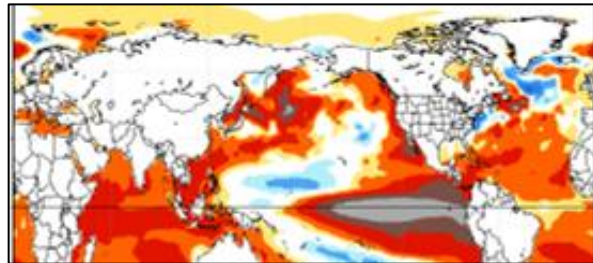
Model Skill

- **Warm SST** anomalies $\geq 2^{\circ}\text{C}$:
 - Central/western North Pacific
 - Western Bering Sea and western Aleutian Islands
 - Progressing along GOA shelf (east - west)



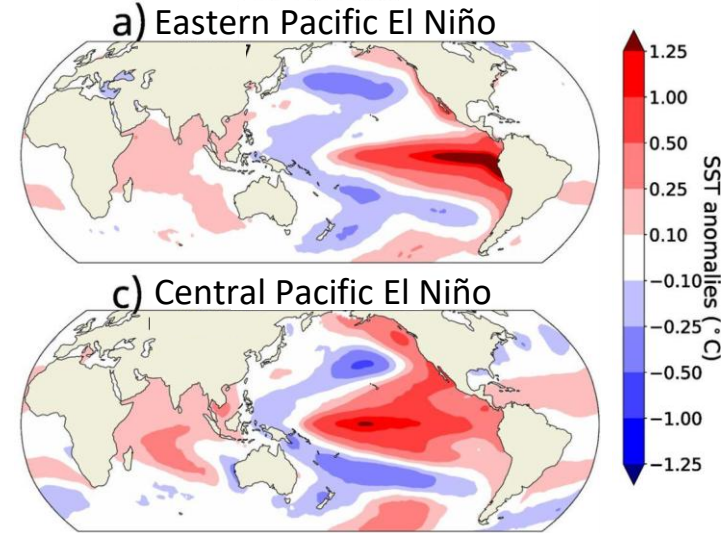
Jan - Mar 2027

- **Neutral SST** anomalies:
 - Eastern & northern Bering Sea shelves
 - Central/eastern Aleutian Islands



★ El Niño forecast for fall and winter 2026/2027

- >90% chance of a 'Very Strong' El Niño
- 75% chance of being strongest since 1950
- Now predicted as 'Central/Eastern Pacific' El Niño
- Impact on Alaskan waters is less predictable, but expect:
 - GOA: surface warming, increased circulation, prey limitations on seabirds & marine mammals, groundfish distribution shifts
 - EBS & AI: greater potential for warming as Central Pacific El Niño
- EBS, AI, and GOA entering El Niño event from a winter/spring/summer of relatively lower heat content



Modeled average SST anomalies during
(a) EP El Niño and (c) CP El Niño.
Figure 1 from [Gregory et al. 2024](#).

Full **ESR Climate Update** presentation to the September 2026 Groundfish Plan Teams is available at:

[ESR Climate Update](#)

- Alaska-wide: slides 5-8
- EBS: slides 9-14
- Aleutian Islands: slides 15-18
- GOA: slide 19-23



2026 Gulf of Alaska Preview

Bridget Ferriss



- 2026 average/cooler and more productive food web after warm 2025, although SEAK retained heat in 2026.



- El Niño: expect surface warming in late fall/winter on GOA shelf (EGOA first):
 - Ecological signals of a warmer year: shift to less productive base of food web, fish from the south (e.g., jack mackerel), larval groundfish dynamics.
 - Longer/more intense El Niño would impact forage fish, adult groundfish, seabirds, and marine mammals.



- 2026 Risk tables (GOA arrowtooth flounder, GOA rex sole, GOA skates)



- Ecosystem Considerations Risk Level 1
- Good 2026 conditions & no expected direct El Niño impacts on adults of these stocks in 2027: opportunistic predator (arrowtooth), deeper habitat range (all), age-0 may benefit from increased cross-shelf circulation (all).



2026 Aleutian Islands Preview

Ivonne Ortiz



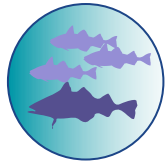
- 2026 cooling in SST: average summer temperatures across chain.
Bottom temperature: average in EAI but above average in CAI and WAI



- 2027: warm winter expected regardless of El Niño. *Potential impacts: earlier phenology, faster growth, higher energy demand particularly for pollock, P. cod, and Atka mackerel*



- El Niño potential impacts: warming would exacerbate ongoing trends of winter warming and heat retention and be in addition to ongoing lower fish prey availability for piscivorous fish, seabirds, Steller sea lions in CAI and WAI



- 2026 Risk table for Bogoslof pollock:
 - *Ecosystem Considerations Risk Level 1*
 - *Bogoslof area close to average temperatures in 2026, no MHW during spawning March - June 2026. Good condition of pollock <20cm*



2026 Bering Sea Preview



- 2026 was cooler than 2025, especially over the southern shelf



- Large copepod and krill abundances rebounding from recent lows; both had higher lipid content



- 2025 age-0 pollock biomass high in the NBS
- 2026 age-1 and age-2+ biomass high in SEBS
 - Strong recruitment of the 2025 year class?



- Groundfish condition above average for adult pollock, apex predators (P. cod, arrowtooth & Kamchatka flounder, Greenland turbot), and benthic foragers (yellowfin sole, flathead sole, AK plaice)

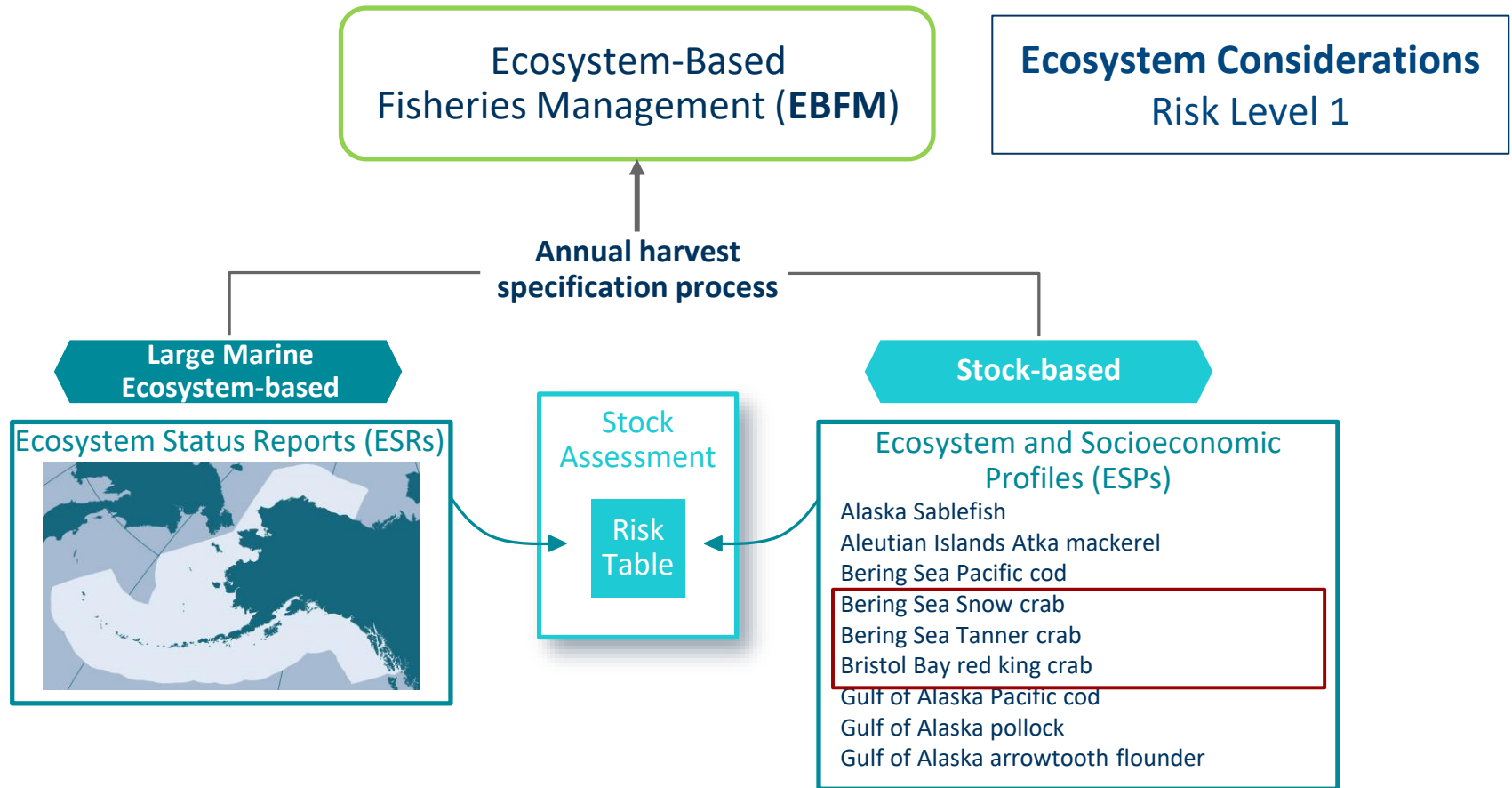


- St. Paul Island: shortest observed adult female fur seal foraging trip durations



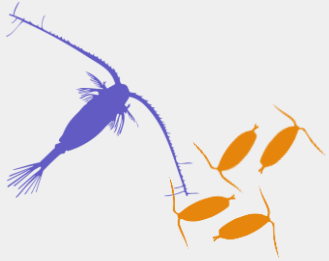
Photo credit: Erin Fedewa, NOAA

Ecosystem Status Reports (ESRs) & Ecosystem and Socioeconomic Profiles (ESPs)



Pelagic stage indicators

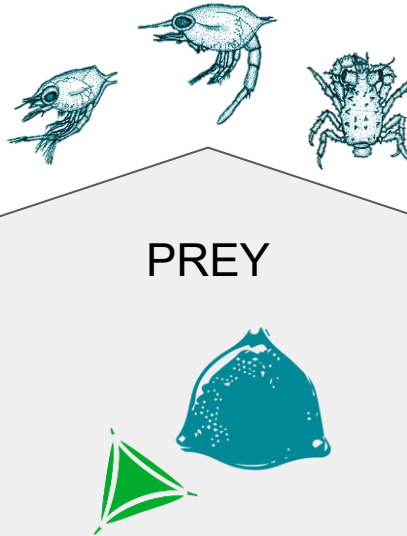
COMPETITORS



PREDATORS



PREY

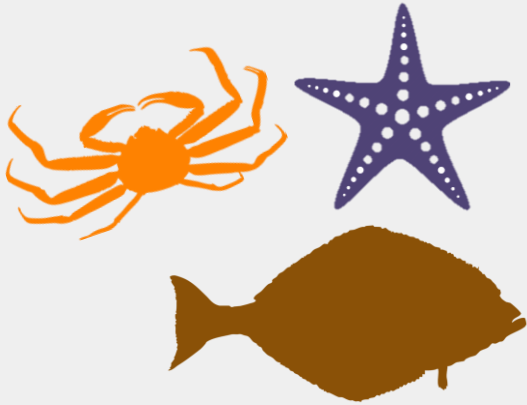


ENVIRONMENTAL PROCESSES

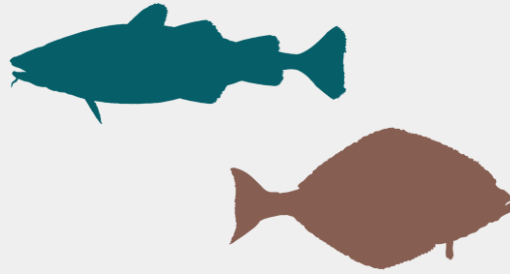


Benthic stage indicators

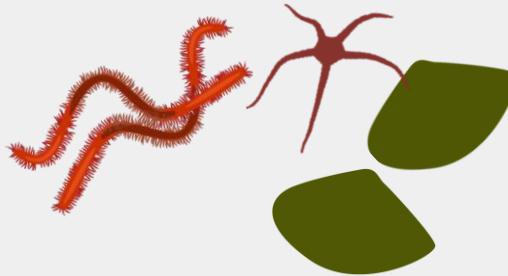
COMPETITORS



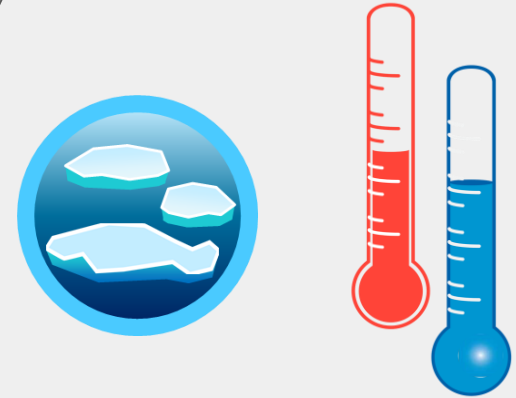
PREDATORS

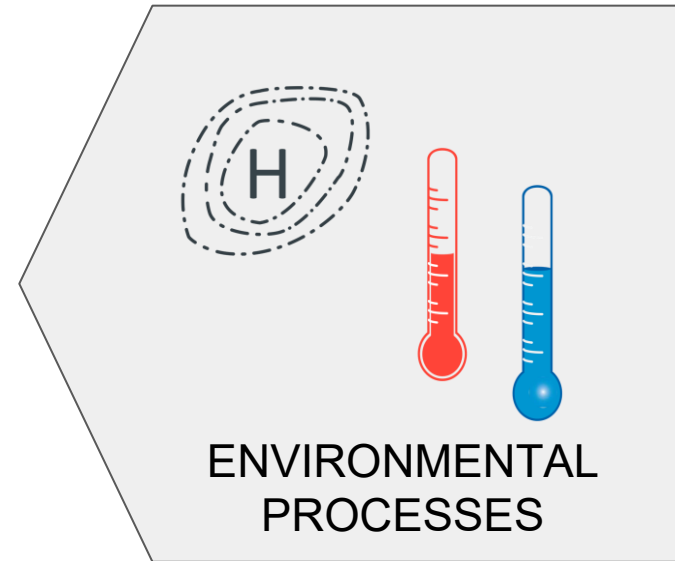
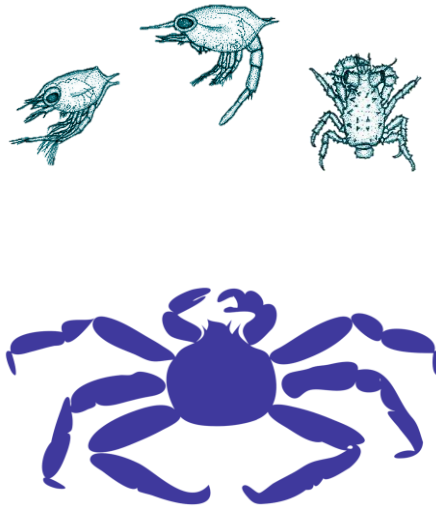


PREY

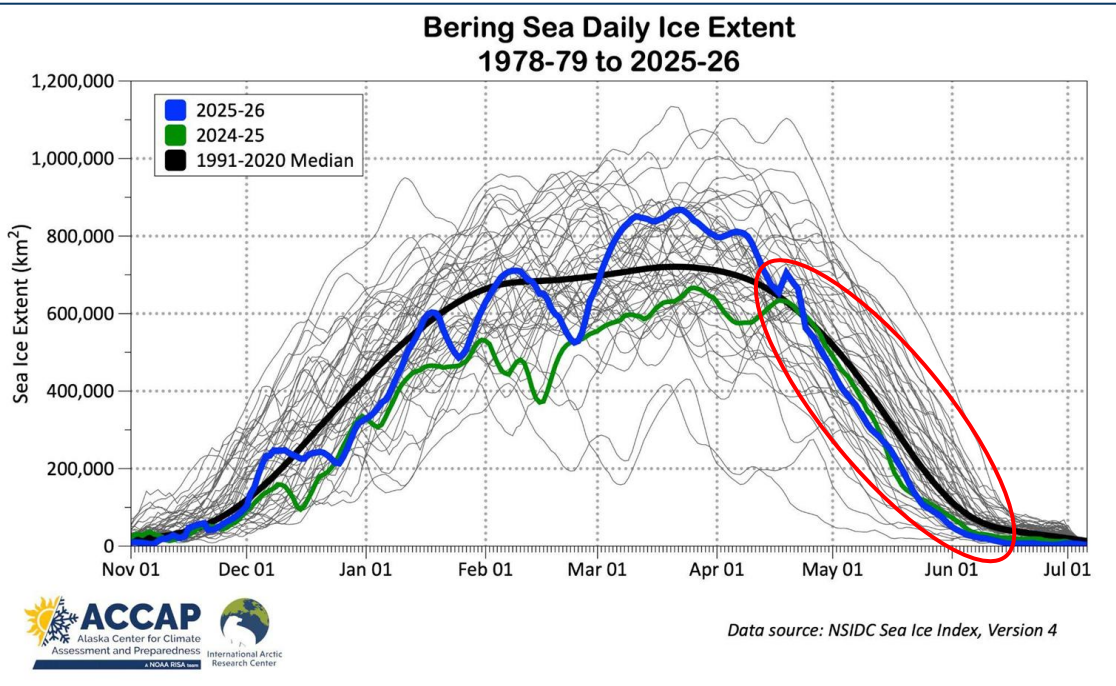


ENVIRONMENTAL PROCESSES





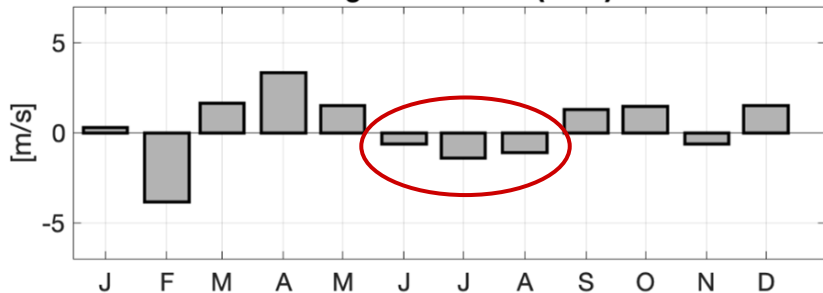
Sea ice extent was below average until early March 2026; March and April high ice extent.



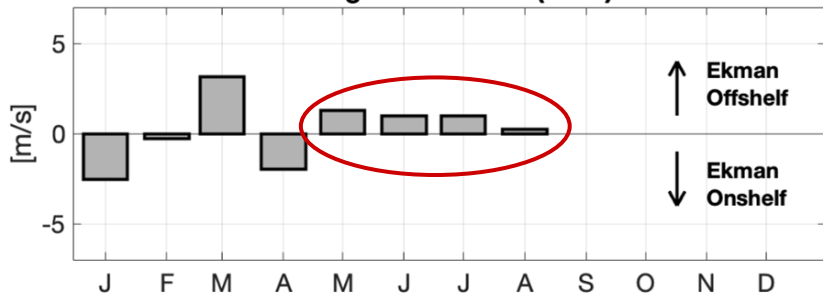
- Sea ice extent was largely below average until early March 2026.
- 6-week period of above average ice extent occurred between March and April (to Aleutian Islands and into Bristol Bay), but the ice was thin.
- Sea ice retreated quickly beginning in mid April and by late April ice extent was below average.

2025: on-shelf transport
2026: off-shelf transport

Along-Shelf Winds (2025)



Along-Shelf Winds (2026)



2025

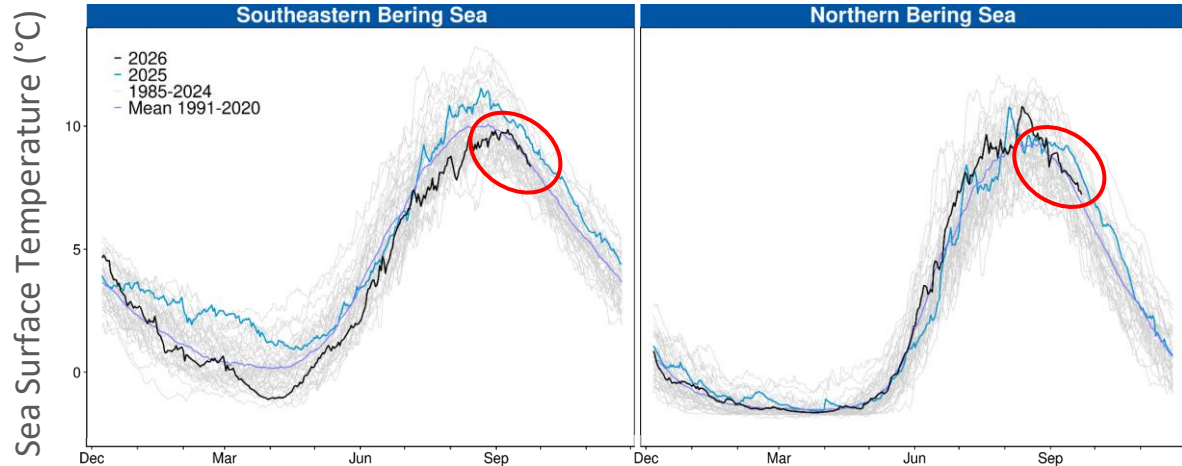
- Summer: weakly favorable on-shelf transport
 - *may have retained pelagic crab stages over the shelf and suitable benthic habitat*

2026 ★

- Summer: largely off-shelf transport
 - *may have dispersed pelagic crab stages away from suitable benthic habitat*



2026 was cold in the south; average/warm in the north



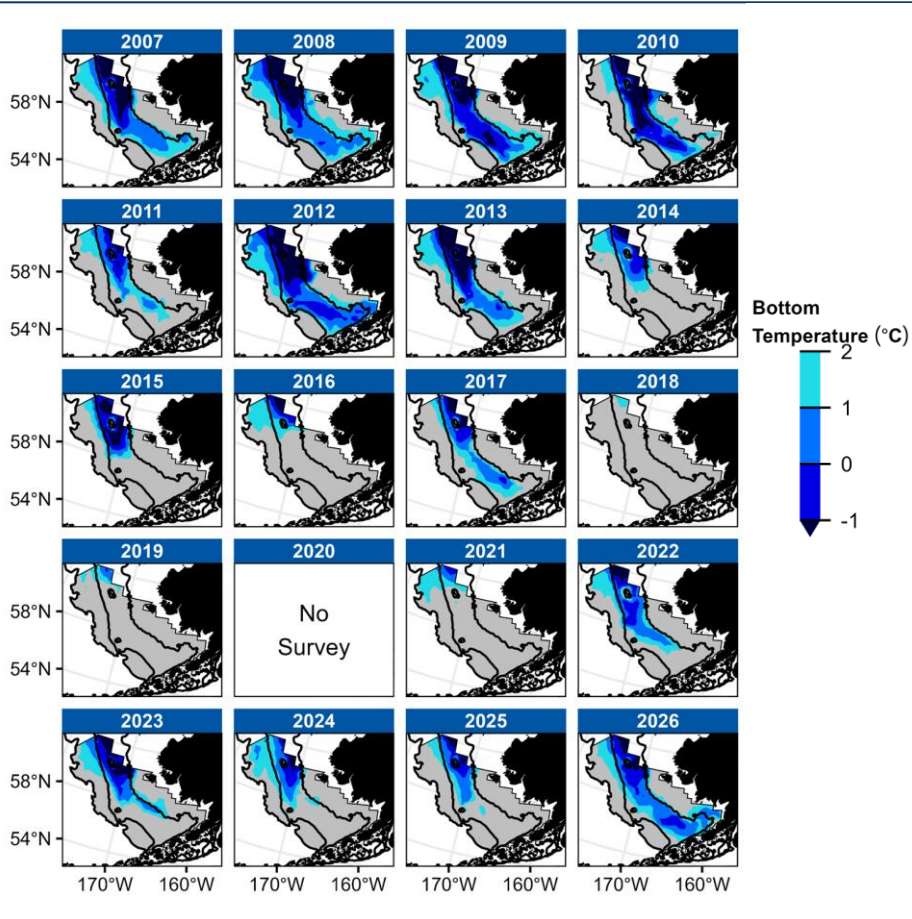
- **Southeastern Bering Sea**

- 2026 colder than 2025, especially Jan-Apr.
- Below average (1991-2020) for most of the year.
- No MHW conditions.
- Bottom trawl survey mean surface and bottom temps were within 1 SD

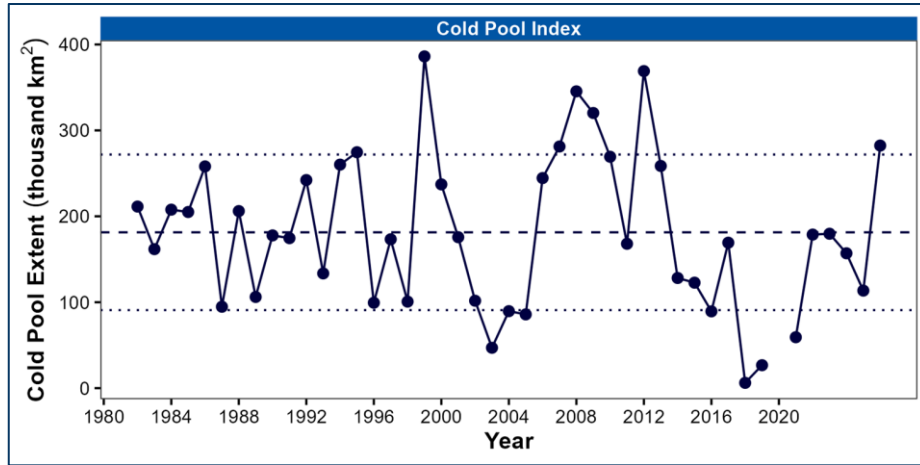
- **Northern Bering Sea**

- 2026 near-average Jan-Jun.
- Summer 2026 above average.
- No MHW conditions.

SEBS: cold pool extent was above average in 2026

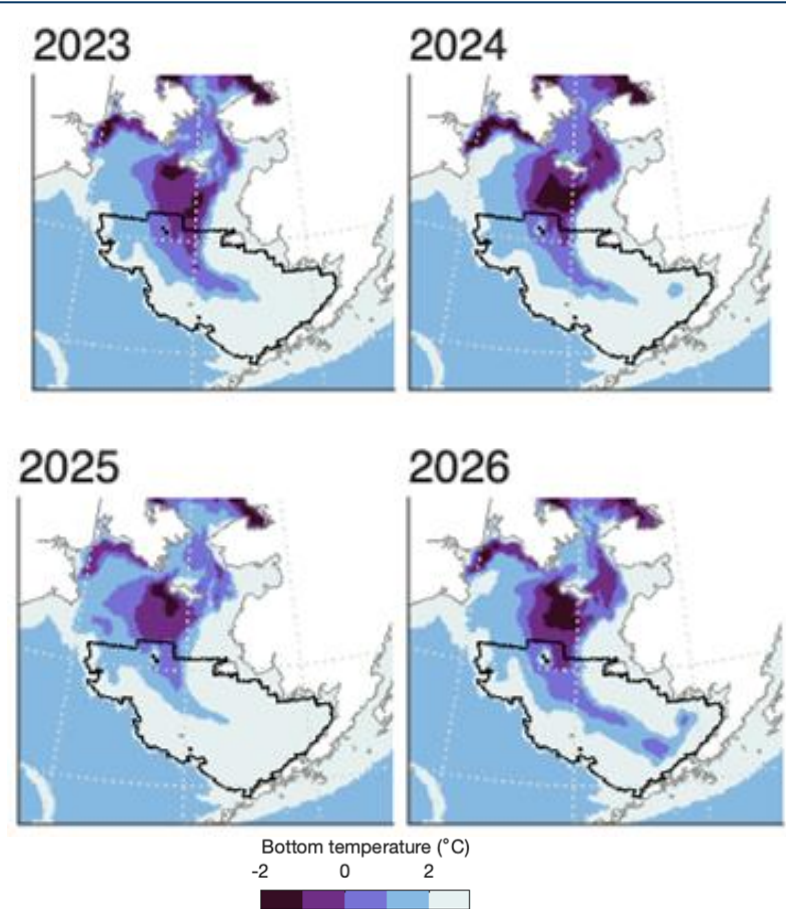
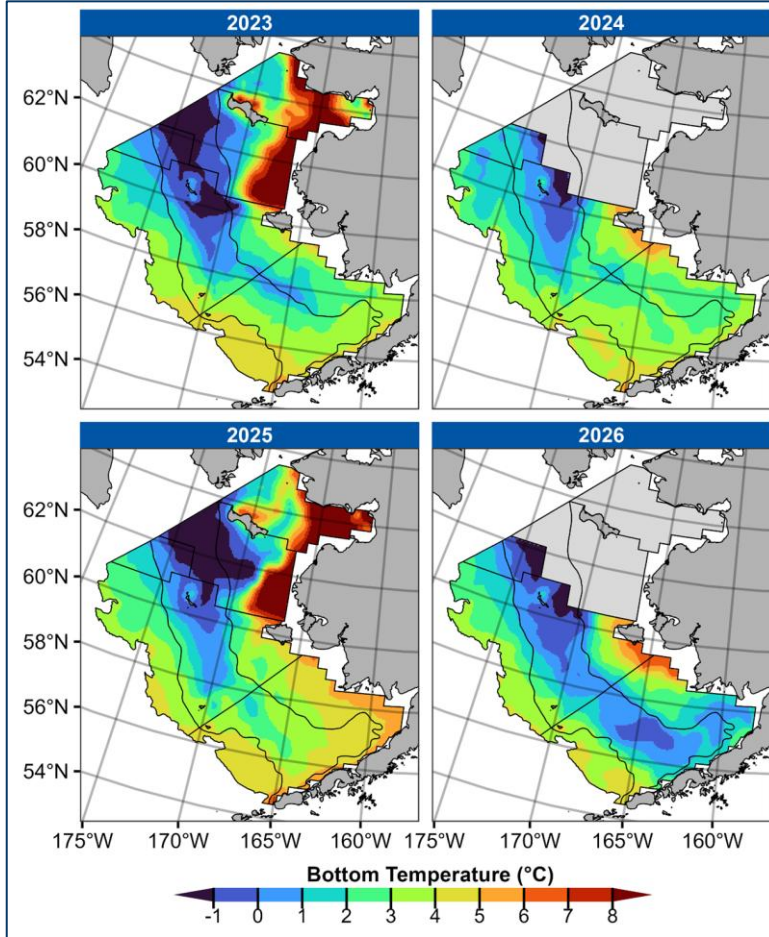


- 2° cold pool largest since 2012
- 0° cold pool largest since 2013



- 2026 bottom temperatures most similar to 1986, 1992, 2006, and 2010.

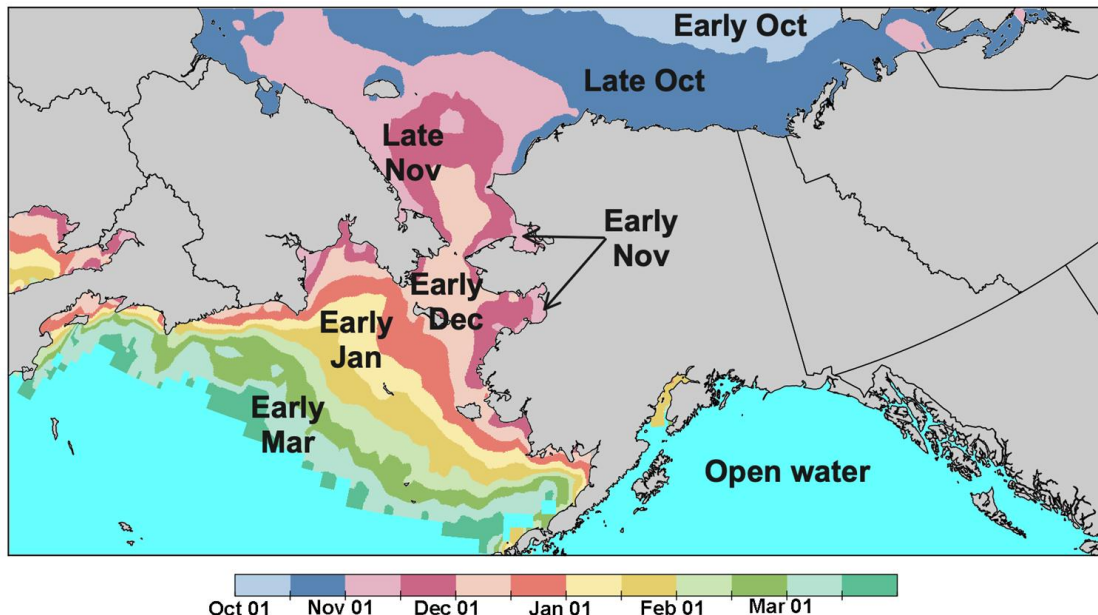
NBS bottom temperatures from MOM6



Later “freeze up” in the north; earlier ice arrival in the south

Date of First Sea Ice Concentration 15 Percent or Greater

Autumn/Winter 2026-27



Forecast made in late August

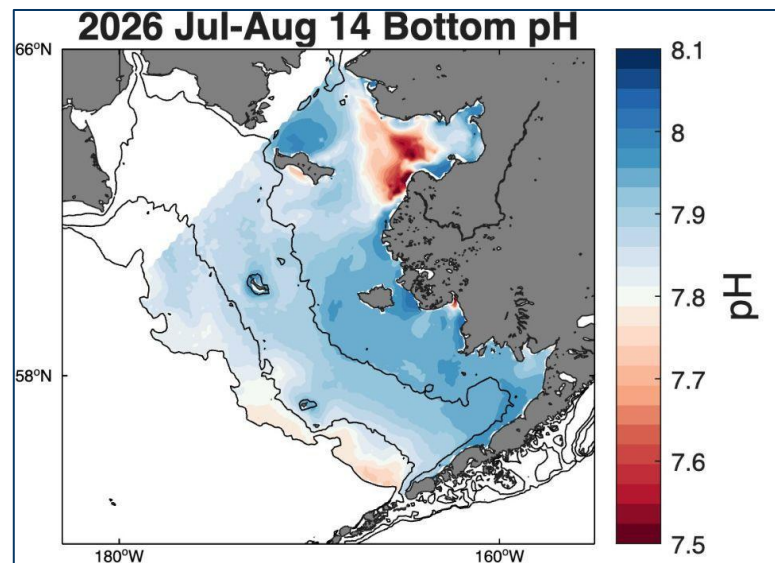
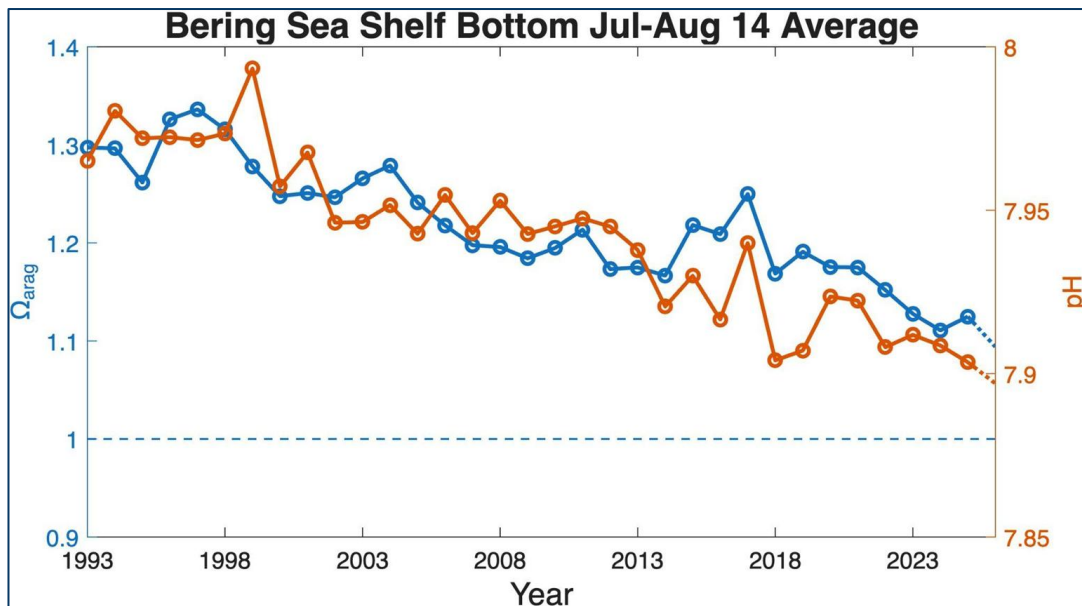
Data: NOAA/CPC Exp. Sea Ice Outlook

- Sea ice is ***expected to arrive later*** in the southern Chukchi Sea and northern Bering Sea.
- Sea ice is ***expected to arrive earlier*** near St. Matthews and over the central Bering Sea.

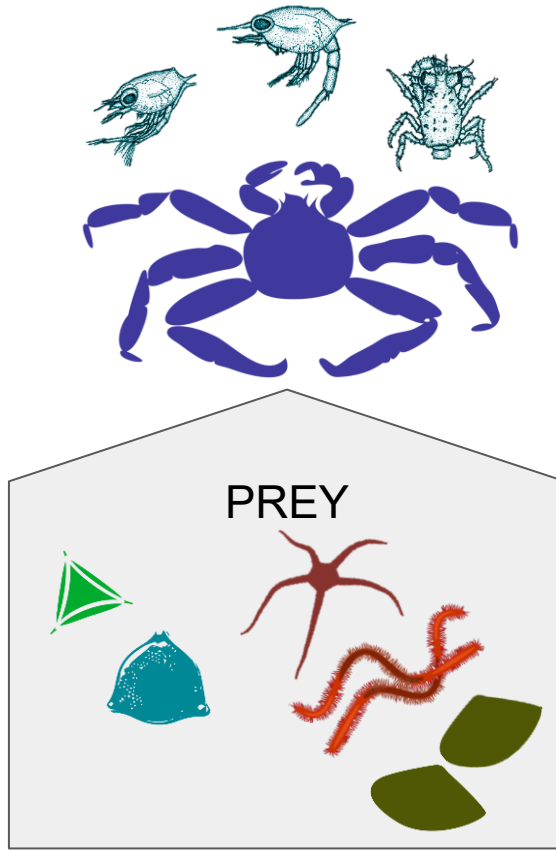


Corrosive bottom waters could negatively impact growth, shell hardening, and survival.
Red king crab may be more impacted; snow crab appear resilient to OA.

- pH continued to decline in 2026, driven by strong anomalies near the Yukon River delta
- Southern outer shelf and Yukon River delta / Norton Sound pH<7.8
- Continued multi-decadal decreasing trend
- Inner and middle domain and Bristol Bay relatively well buffered (pH>7.8)



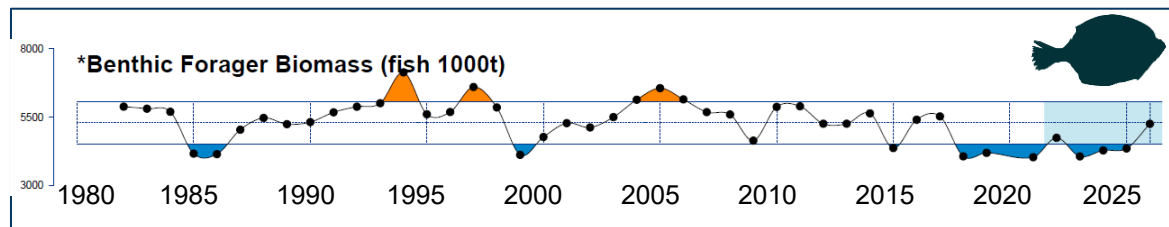
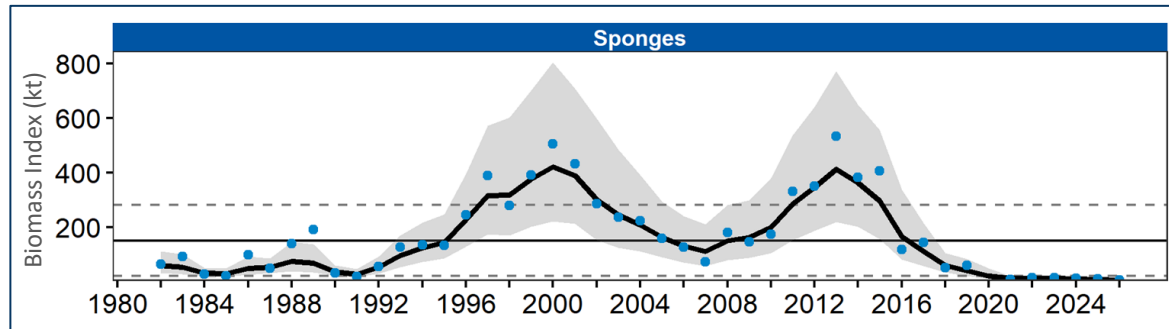
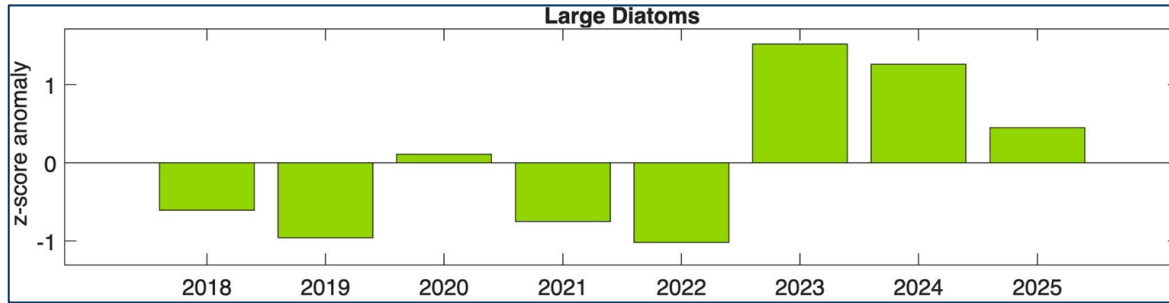
(Pilcher & Monacci)



Pelagic stage: *above-average feeding conditions in 2023 - 2025.*



Benthic stage: *low availability of prey in 2018 - 2025; improved conditions in 2026.*

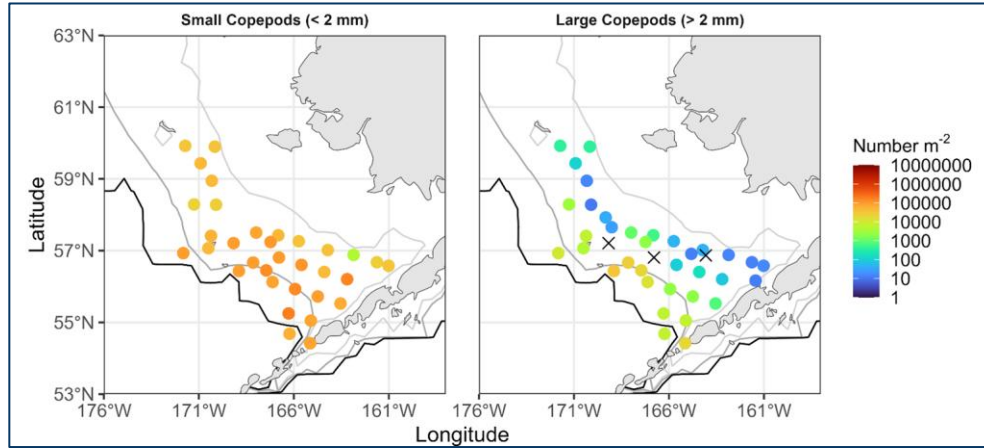


- Diatom abundance anomalies positive 2023 - 2025; *above-average feeding conditions for pelagic crab stages in 2023 to 2025.*
- Sponges remained very low in 2021 - 2026.
- Benthic foragers increased in 2026; *indicates improved prey conditions.*

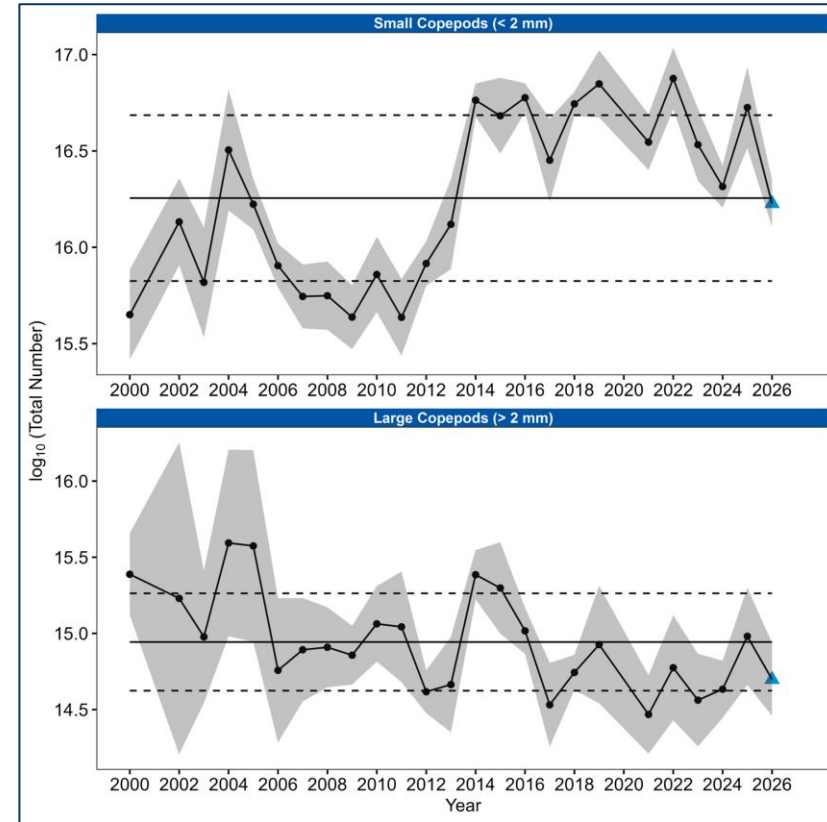
COMPETITORS



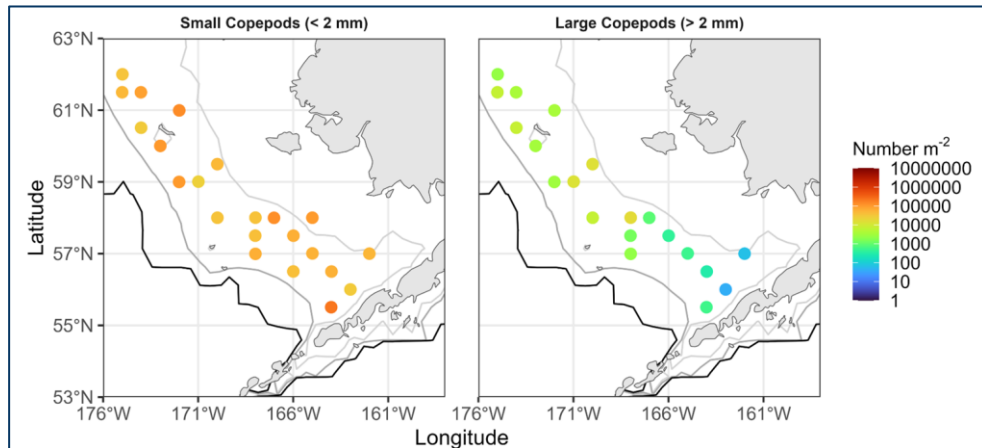
In spring 2026, pelagic competition was average/low



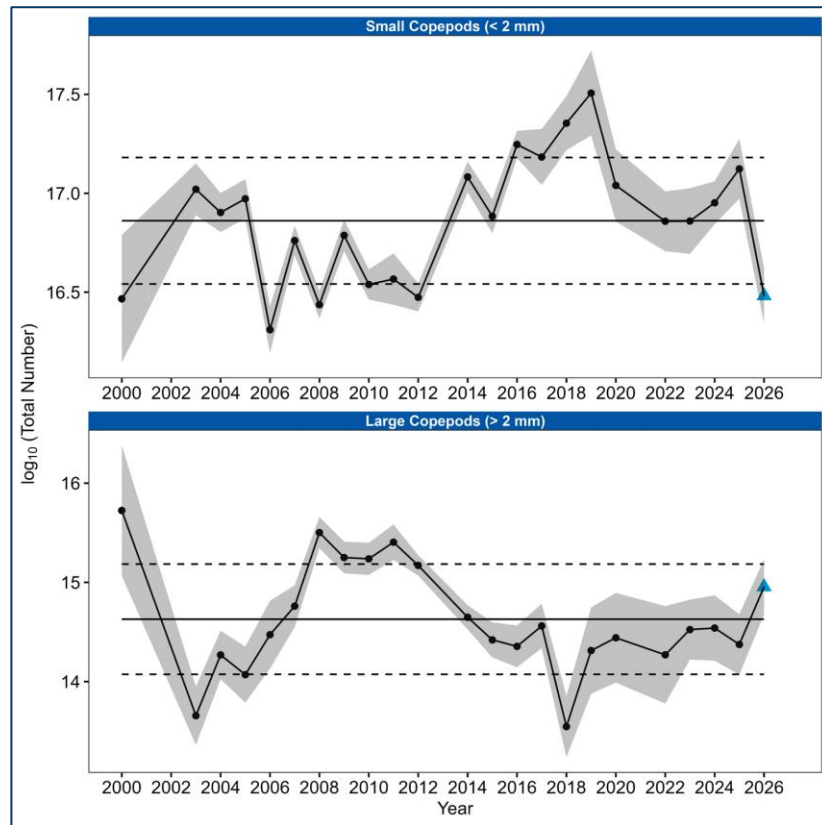
- Small copepods have been above average since 2014
○ *Decreased to average in 2026*
- Large copepods have been below average since 2017
(average in 2025)



In summer/fall 2026, small copepods decreased and large copepods increased

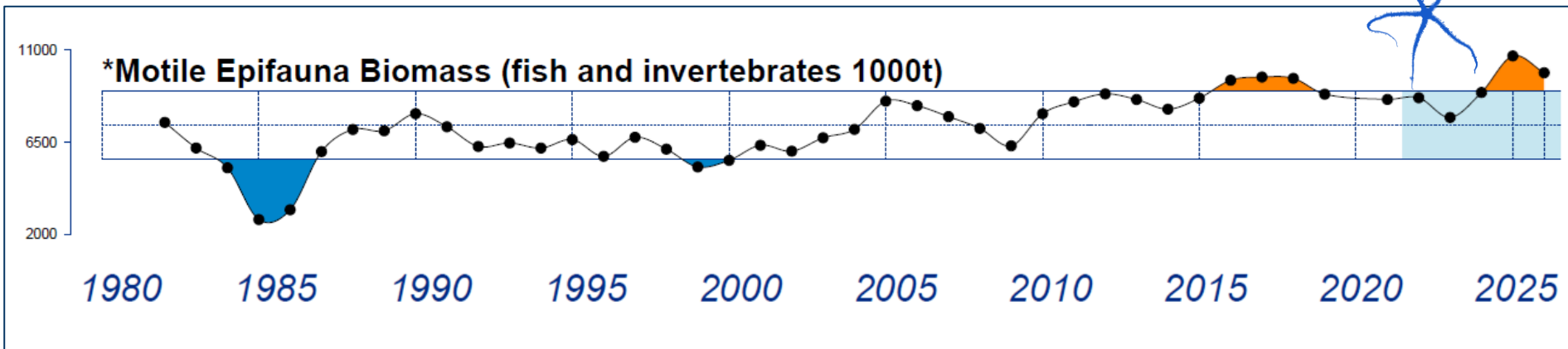


- Small copepods were well below average
- Large copepods were above average
 - Rebounding from low abundances since 2015

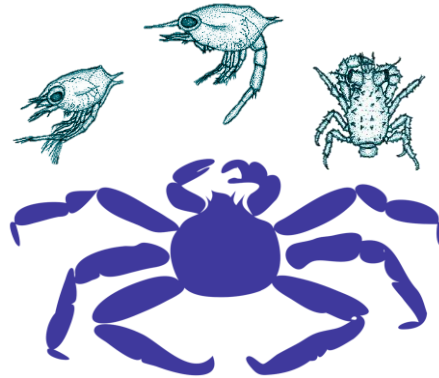
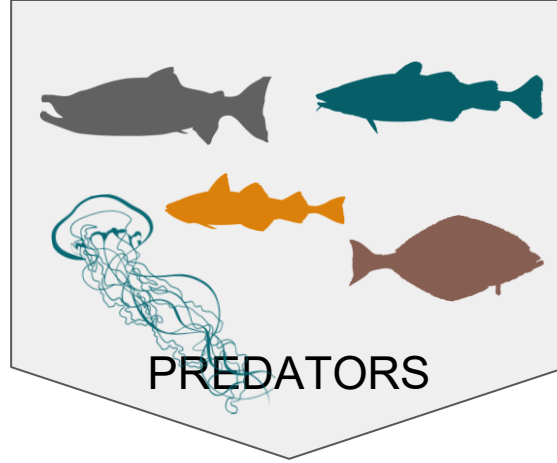




In 2026, competition for space remained high



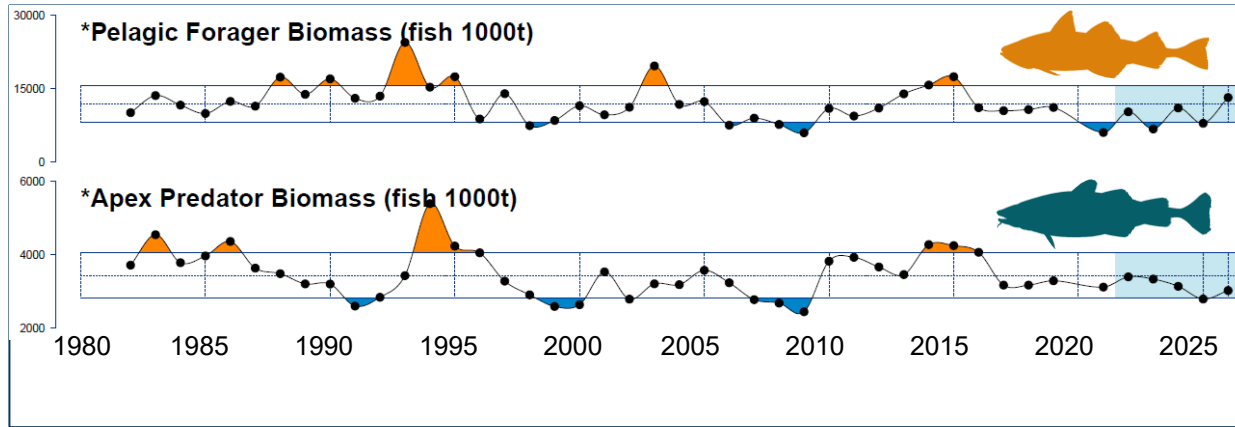
- Motile epifauna remains above +1SD above long term mean
- *Indicates increased competition for space*



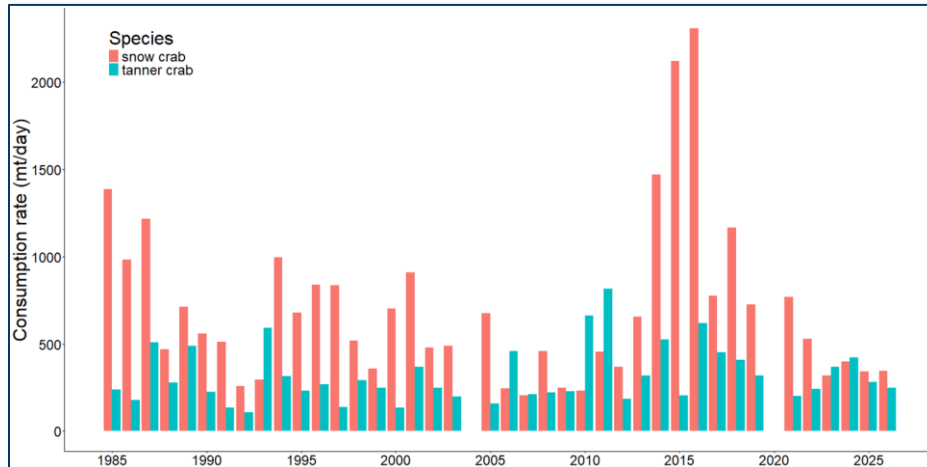


Indicators of pelagic predation were mixed in 2026

Indicators of benthic predation were low/average in 2026



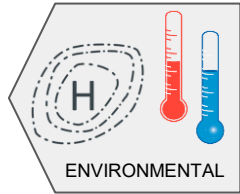
- 2026: Pelagic foragers increased to above long-term mean
- 2026: Bristol Bay sockeye salmon forecast 32% below 10-year average (not shown)



- 2026: Apex predator biomass increased; still below long-term mean
- 2026: Pacific cod condition remained above average (not shown)
- Pacific cod consumption of snow and Tanner crabs similar 2023-2026

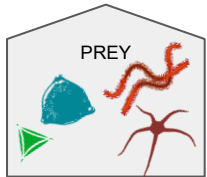
(Whitehouse, Cunningham, Prohaska, Aydin)

Summary



- 2021 - 2025 near-average thermal conditions
- 2026 cold in SEBS; average/warm in NBS
- Multi-decadal decreasing trend in pH

- 2026 cold in SEBS; average/warm in NBS
- Extensive cold pool (largest 2° since 2012)
- Multi-decadal decreasing trend in pH



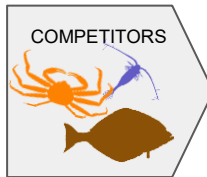
- Above average diatom abundance in 2023 through 2025



- *Indirect* evidence indicates low availability of prey in 2025; improved conditions in 2026



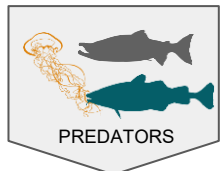
- Sponges remained low in 2026



- Pelagic competition low/average in spring
- Fall: competition driven by large copepods



- Motile epifauna increased in 2026
- Competition for space remained high



- Pelagic predators were mixed in 2026
 - Pollock biomass increased
 - Bristol Bay sockeye salmon decreased

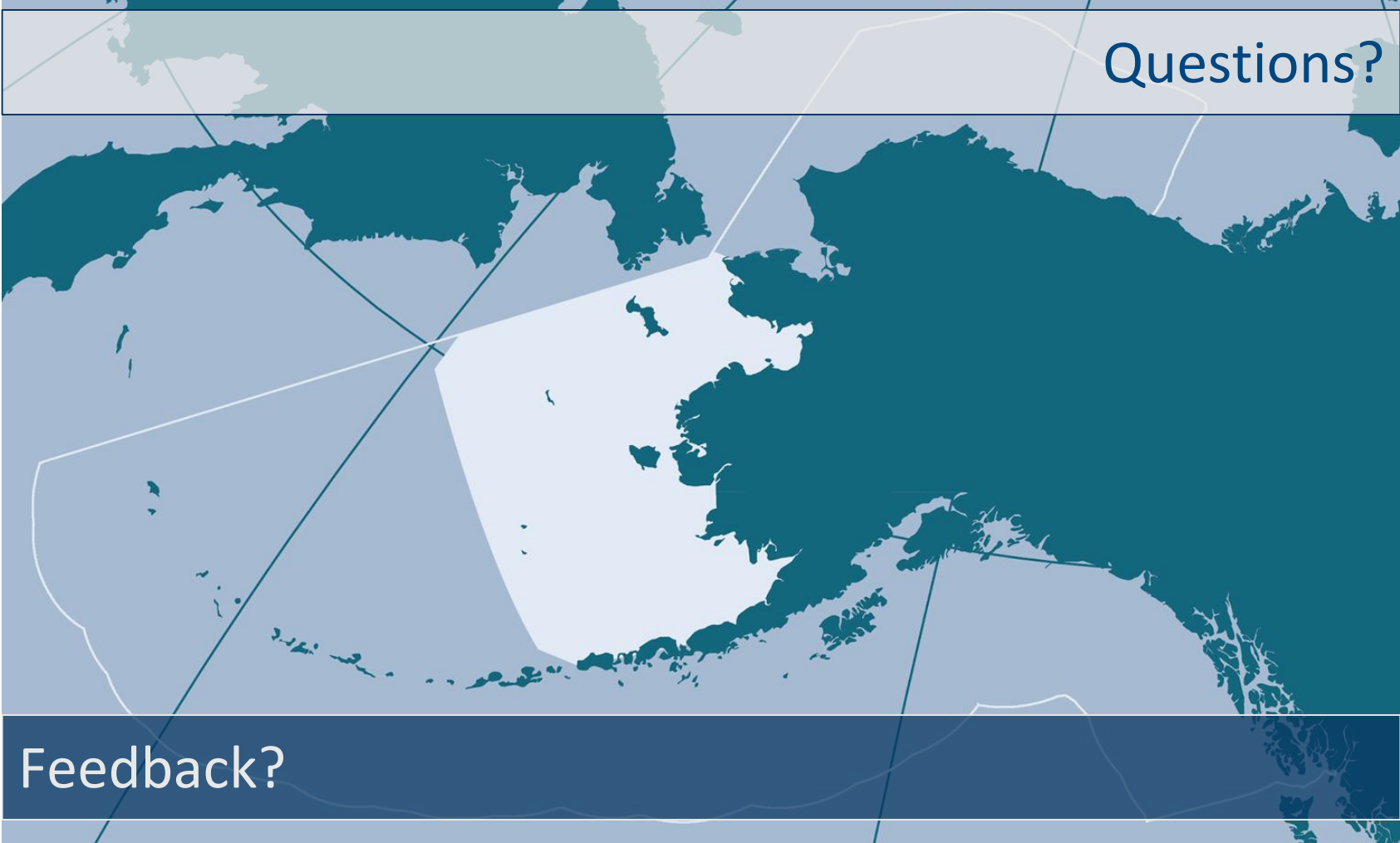


- Pacific cod abundance increased in 2026; condition remained above average in SEBS
- Pacific cod consumption of crab similar 2023-2026



Full **ESR** presentation to the September 2026
Crab Plan Team is available at:

[ESR Crab Plan Team](#)



Questions?

Feedback?