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2025 Ecosystem Surveys Bering Sea & Gulf of Alaska

Cross division/agency collaboration focused on ecosystem research to support ecosystem based fisheries management

- Ecosystem Monitoring and Assessment, Juneau/Seattle
- Recruitment Processes Program/EcoFOCI, Seattle
- Fisheries Behavioral Ecology, Newport
- Recruitment, Energetics & Coastal Assessment, Juneau
- Shellfish Assessment Program, Kodiak

Presenters: Rob Suryan, Lauren Rogers, Lia Domke

September 16, 2025

Goal & Objectives

Goal

Provide the most recent information on ecosystem conditions affecting groundfish.

Objectives

1. Provide an update on 2025 ecosystem survey observations of temperature, zooplankton, and fish.
2. Provide an update on new ecosystem research relevant to groundfish.
3. Encourage discussions of data/indicators most useful to the Groundfish Plan Teams.

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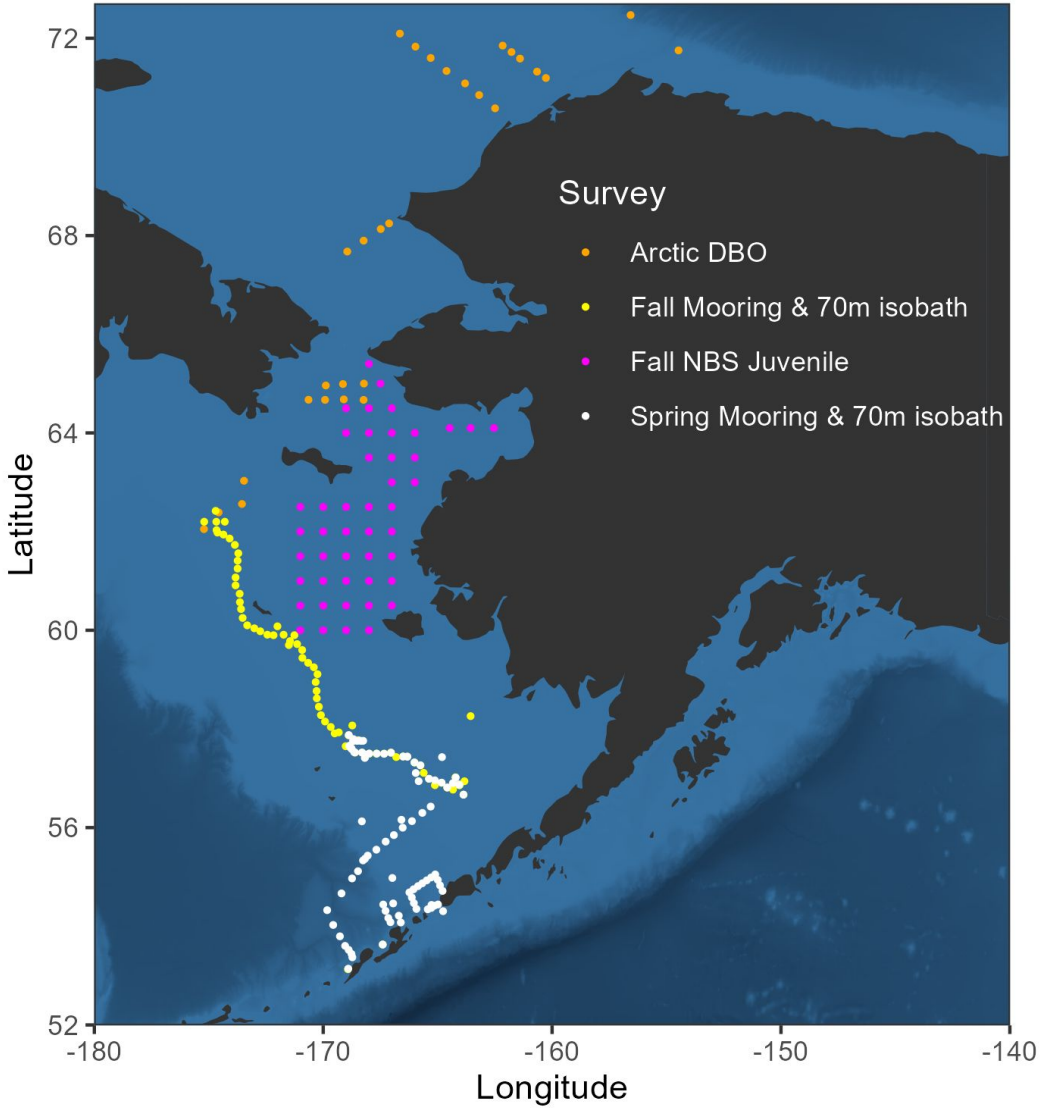
Bering Sea Surveys



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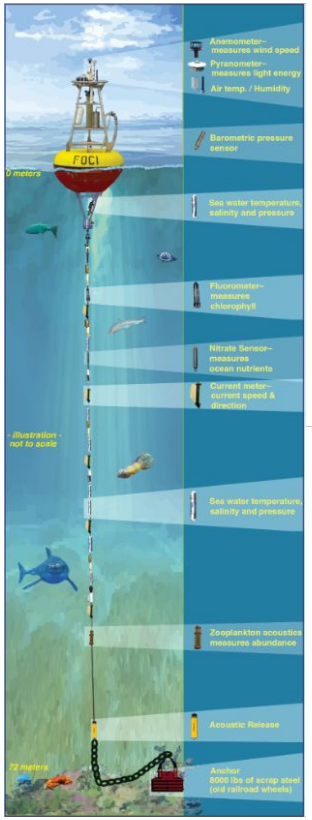
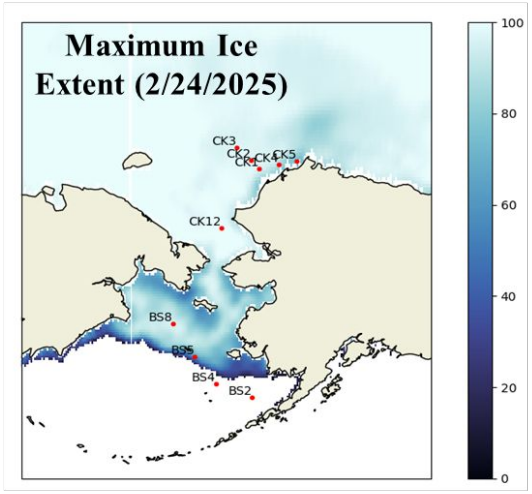
Moorings

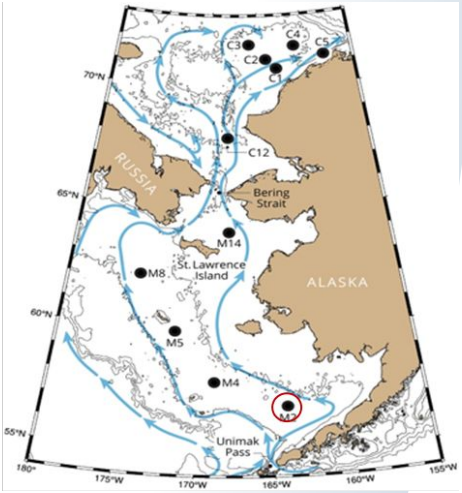


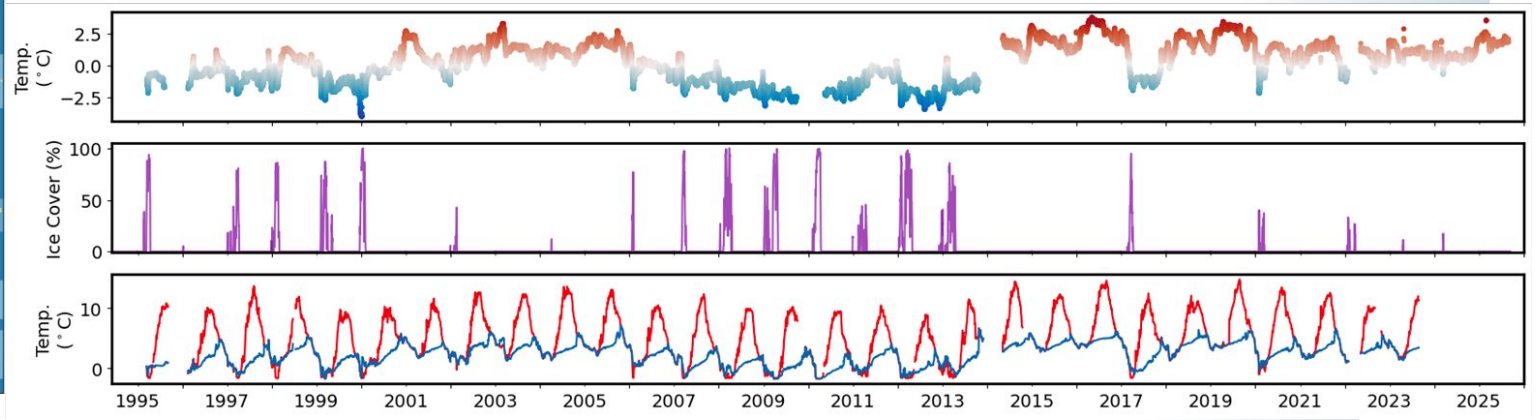


M2

(1995-2025)

31 years





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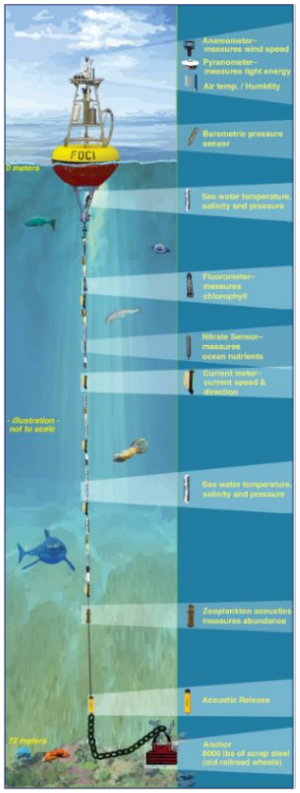
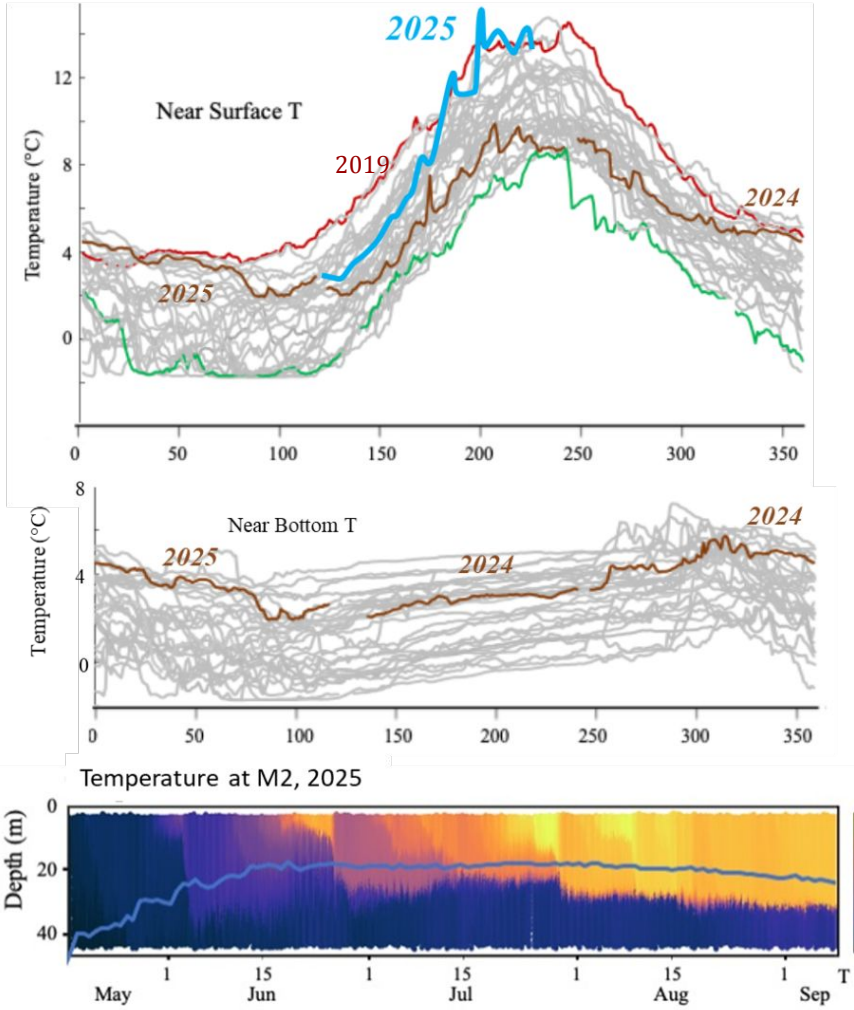
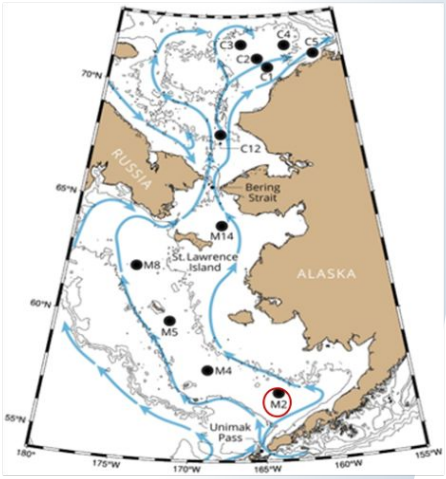
Moorings

M2







M2 mixed layer depth in 2025 appeared to be ~20 m deep, which is near normal. This is very unlike last year when the MLD was much deeper.

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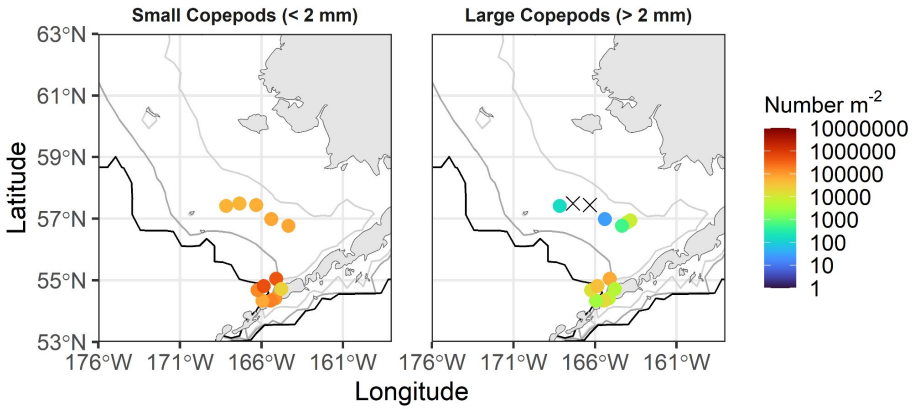
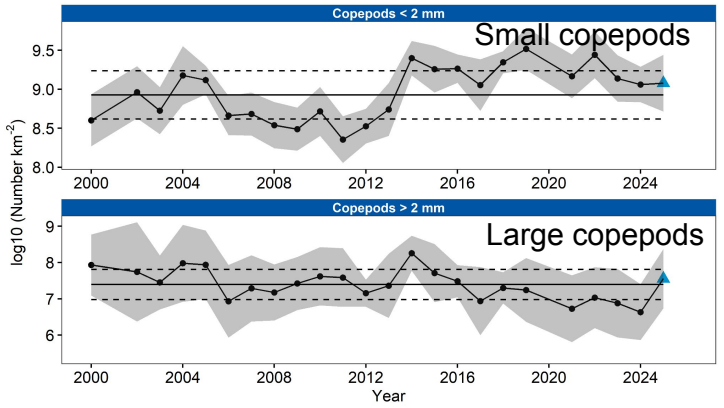
Spring - Rapid Zooplankton Assessment SEBS





- Small copepod abundances were highest in the Unimak Box region and slightly lower on the shelf. Numbers were similar to recent warm periods with abundances above average.
- Large copepod numbers were high in the Unimak Box region, pushing the area weighted index value above the long-term average; however, numbers of large copepods were low on the shelf, with lower numbers as the vessel moved north.

Take home: Small copepods were abundant and this indicates adequate forage for larval fish. Large copepod numbers should be viewed with caution due to low sample size on the shelf.

Contact : Dave Kimmel

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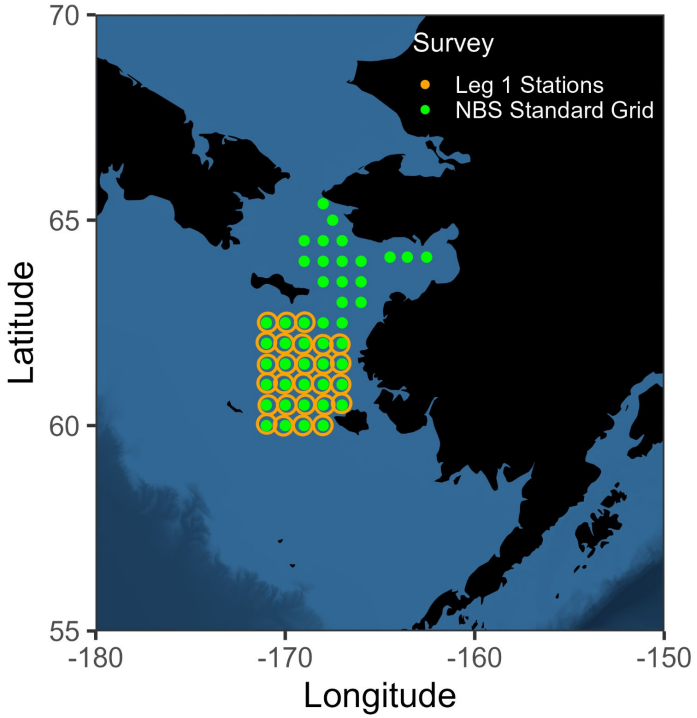
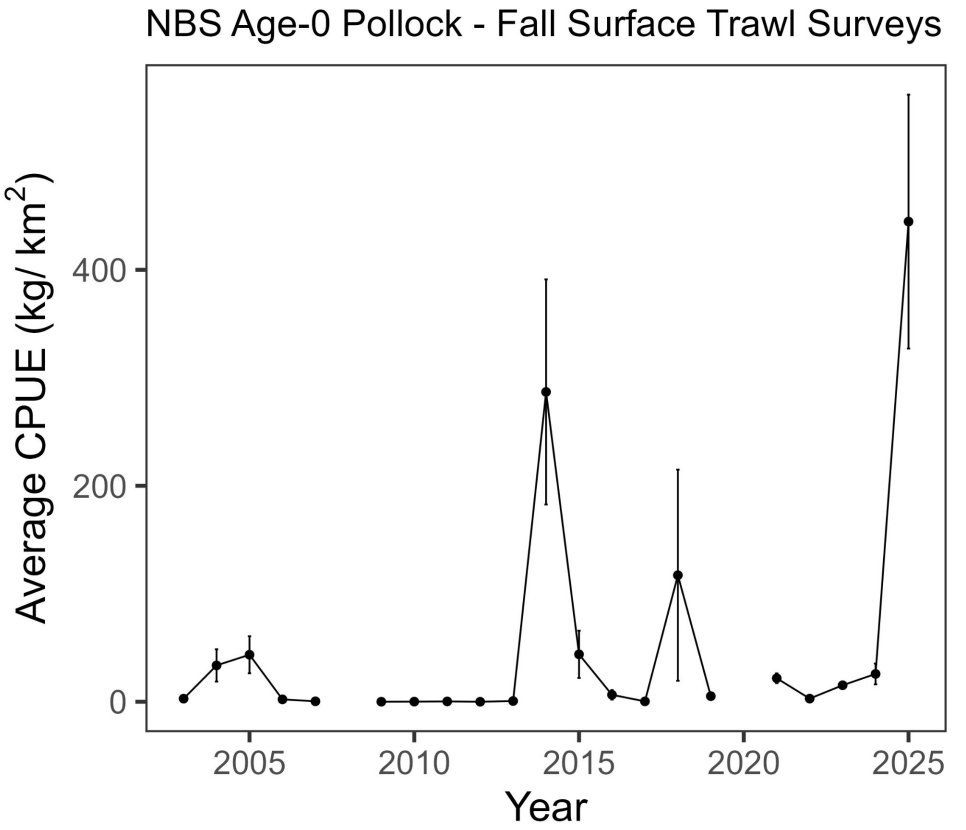
Fall - Northern Bering Sea





**2025 data preliminary pending completion of NBS Age-0 Fall survey*

Take home: Unusually large age-0 pollock catches - indicating northern movement of juveniles in 2025. Qualitatively: overall lengths appeared larger than typical in the NBS this time of year. Observed cold pool with surface waters near average (9.05 ℃ average).

Contact : Lia Domke, Alex Andrews, Jim Murphy

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2025 Bering Sea Summary

Ocean conditions

- SEBS: Ice did not reach M2, warm year overall, mixed layer depth variable @ ~20m
- NBS Fall: warmer than recent years, not as warm as heatwave years.

Zooplankton

- Small copepod densities were above average in spring, similar to recent warm years. Large copepod densities were average (limited sample size).

Fish densities

- Age-0 Pollock: Fall (NBS) - Very high densities of age-0 pollock.
- Capelin: Fall (NBS) - low prevalence, characteristic of a warm year, and notable decline from recent years.

More Results to Come - Surveys Still in Progress

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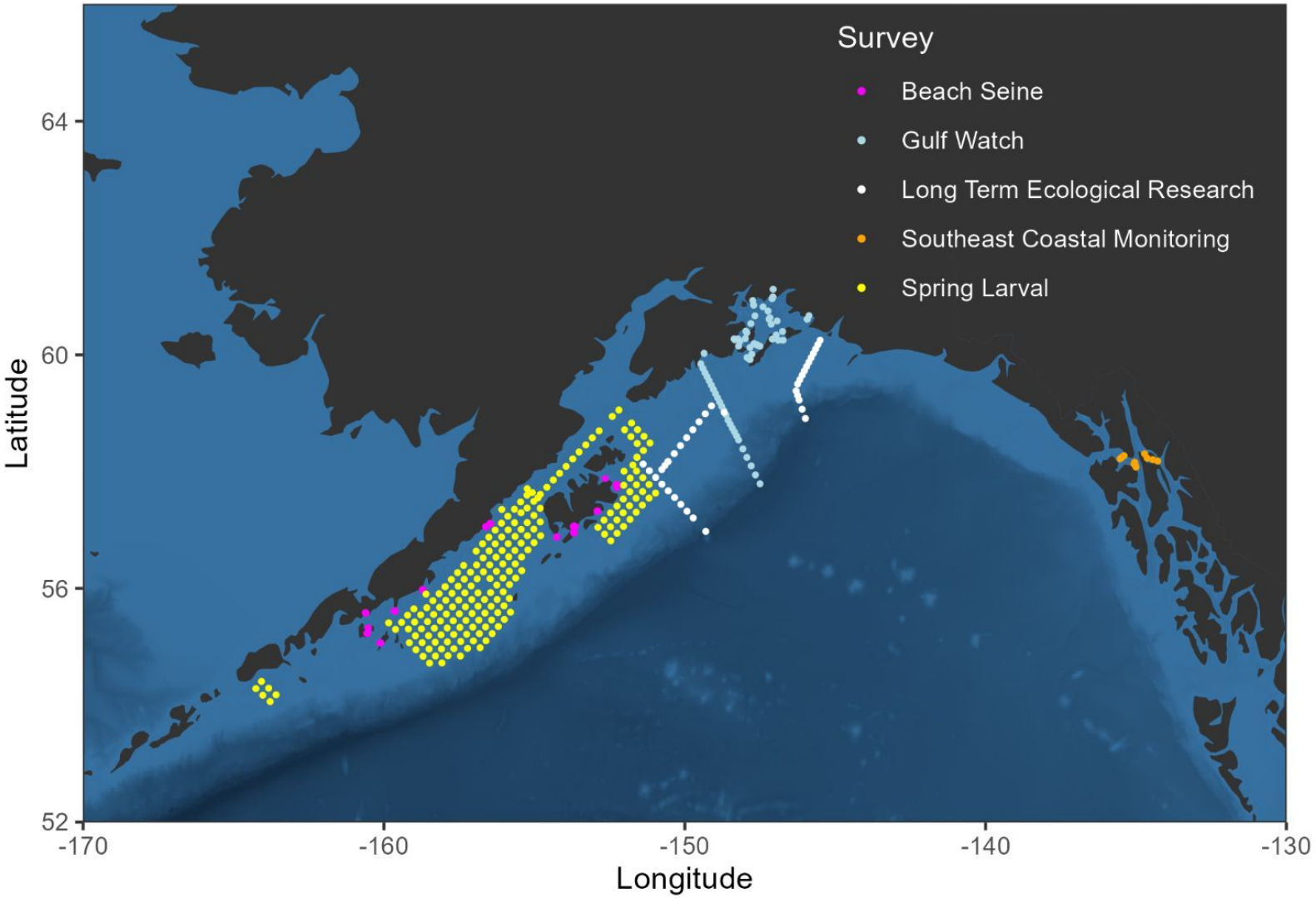
Gulf of Alaska Surveys



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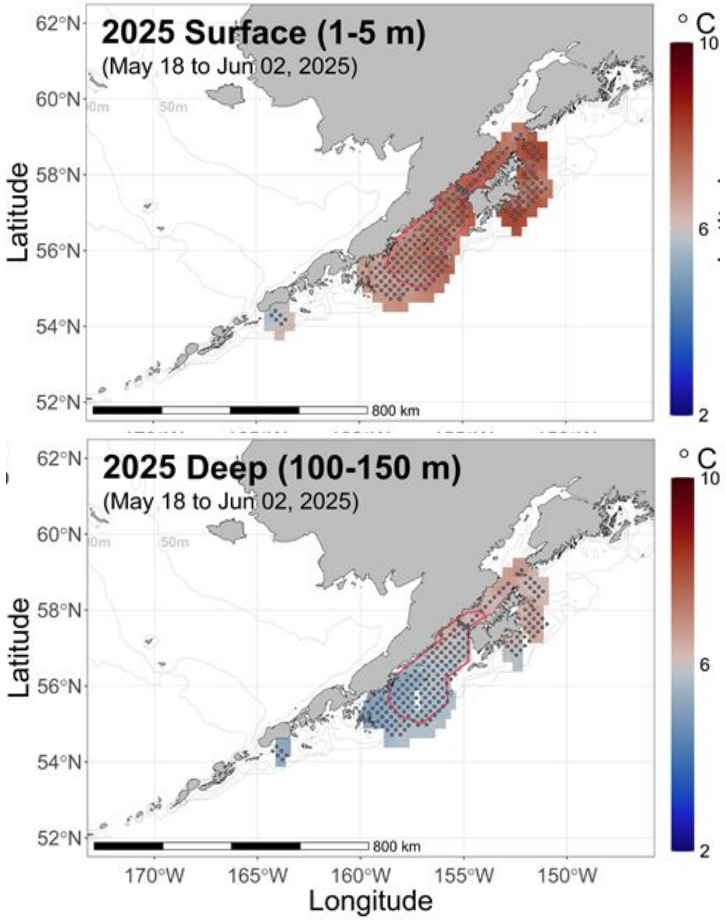
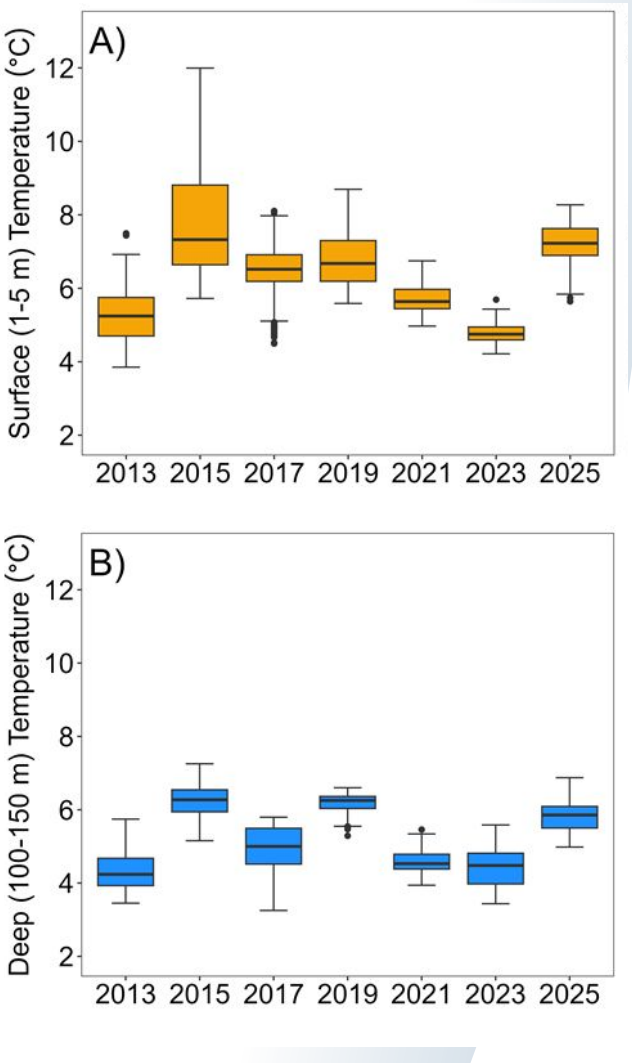
Spring - WGOA Temperatures





Take home: Spring temperatures were warm at the surface *and* at depth, similar to 2015 and 2019.

Contact : Kelia Axler

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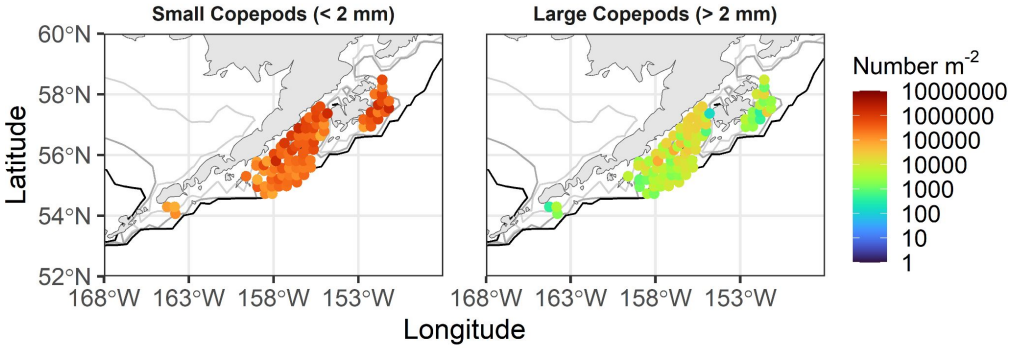
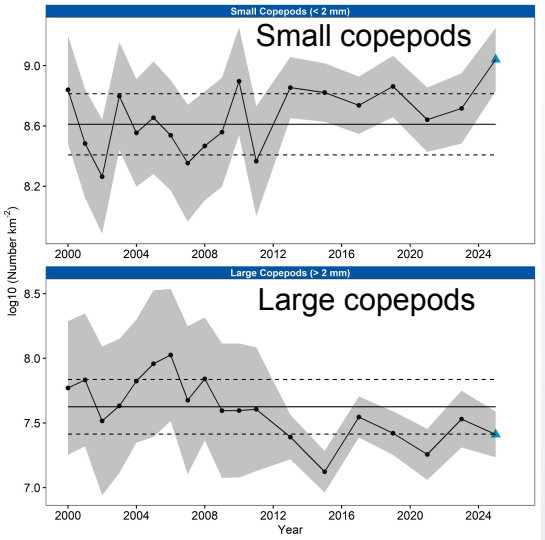
Spring - Rapid Zooplankton Assessment GOA



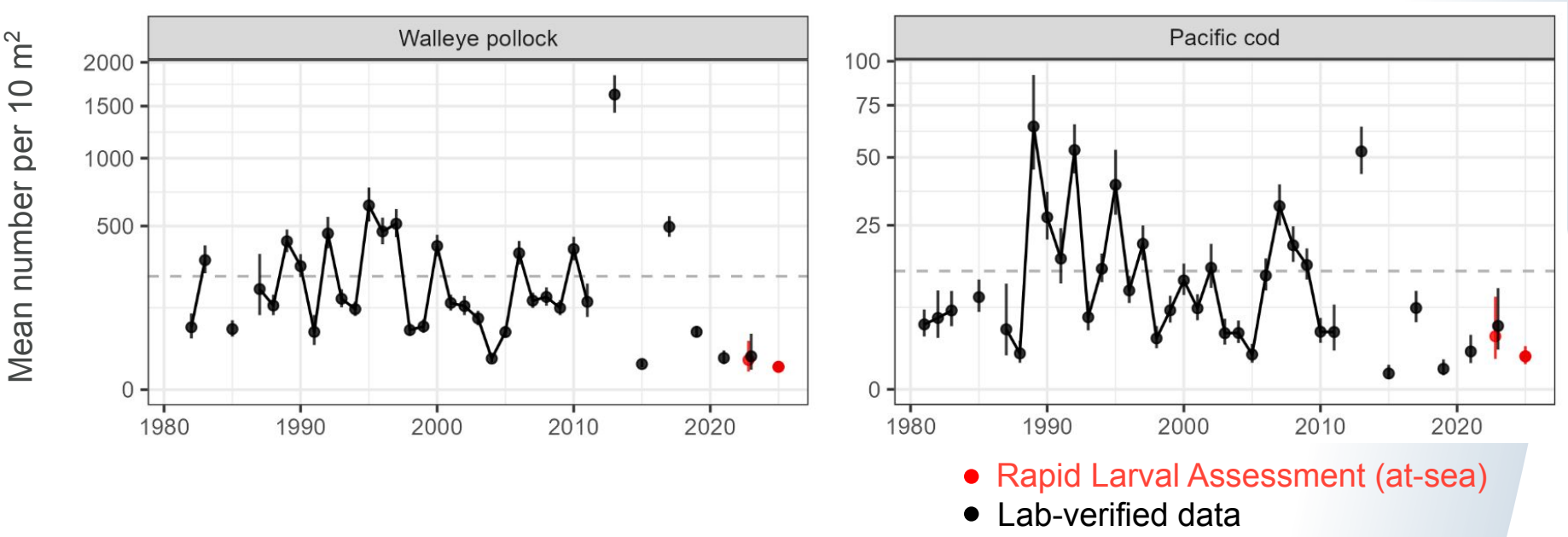


- Small copepod abundances were high during the spring larval survey
- Large copepod numbers were low relative to recent years, continuing the trend of below average abundances that began in 2013 and continued through the marine heatwave years.

Take home: Small copepods were abundant and this indicates adequate forage for larval fish. Large copepods were in low abundance. Both are indicative of warmer conditions in the Gulf of Alaska.

Contact : Dave Kimmel

Spring - Rapid Larval Assessment - gadids



Pollock and cod larvae were in low abundance throughout the WGOA survey region.

Take home: Gadid larval abundance was extremely low in 2025, and has been low in all sampled (odd numbered) years since 2019.

Contact : Lauren Rogers

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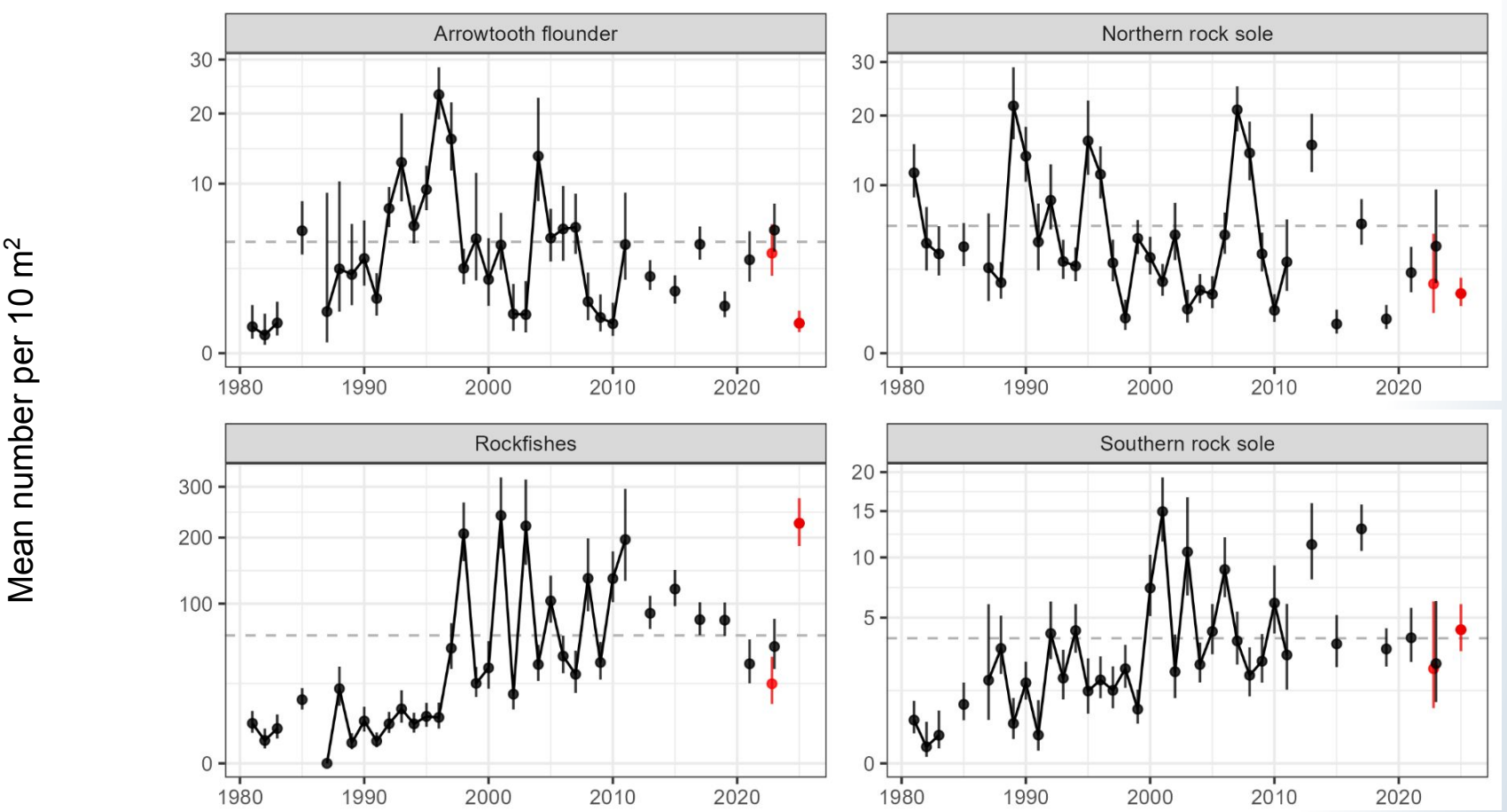
Spring - Rapid Larval Assessment - other spp.



Take home: Rockfishes were the only taxa with high abundance in 2025 (of 7 rapid assessment species).

Contact : Lauren Rogers

- Rapid Larval Assessment (at-sea)
- Lab-verified data

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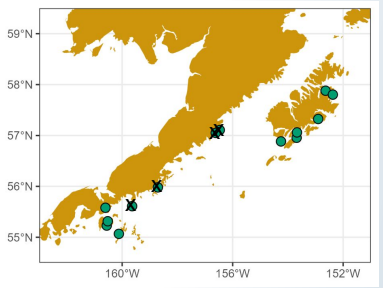
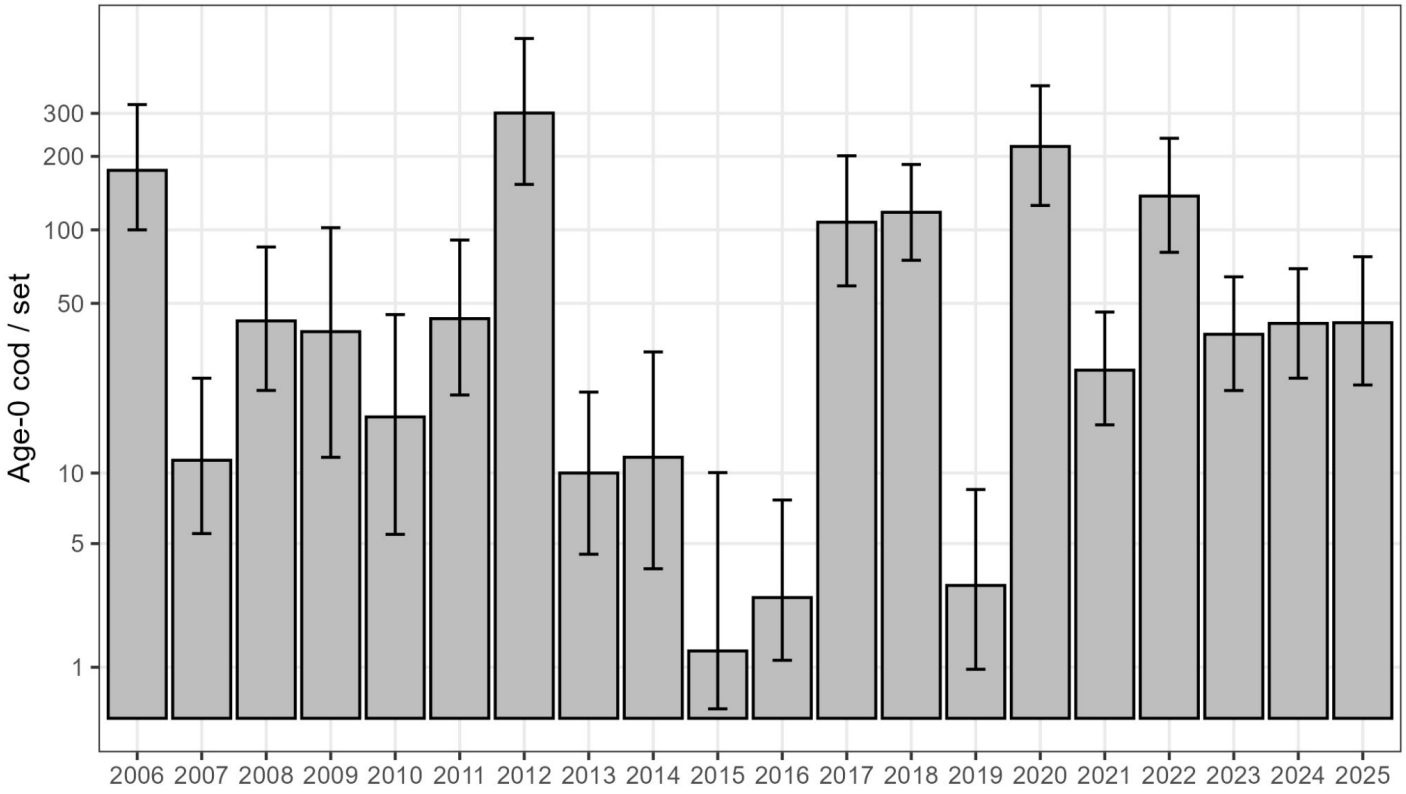
Beach seine: Age-0 Pacific cod





Take home: 2025 age-0 Pacific cod abundance was similar to 2023 & 2024, approx. average. CPUE has historically been correlated (+) with P. cod year-class strength.

Data and code at https://github.com/mikelitzow/seine-data

Contact : Ben Laurel, Alisa Abookire, Mike Litzow

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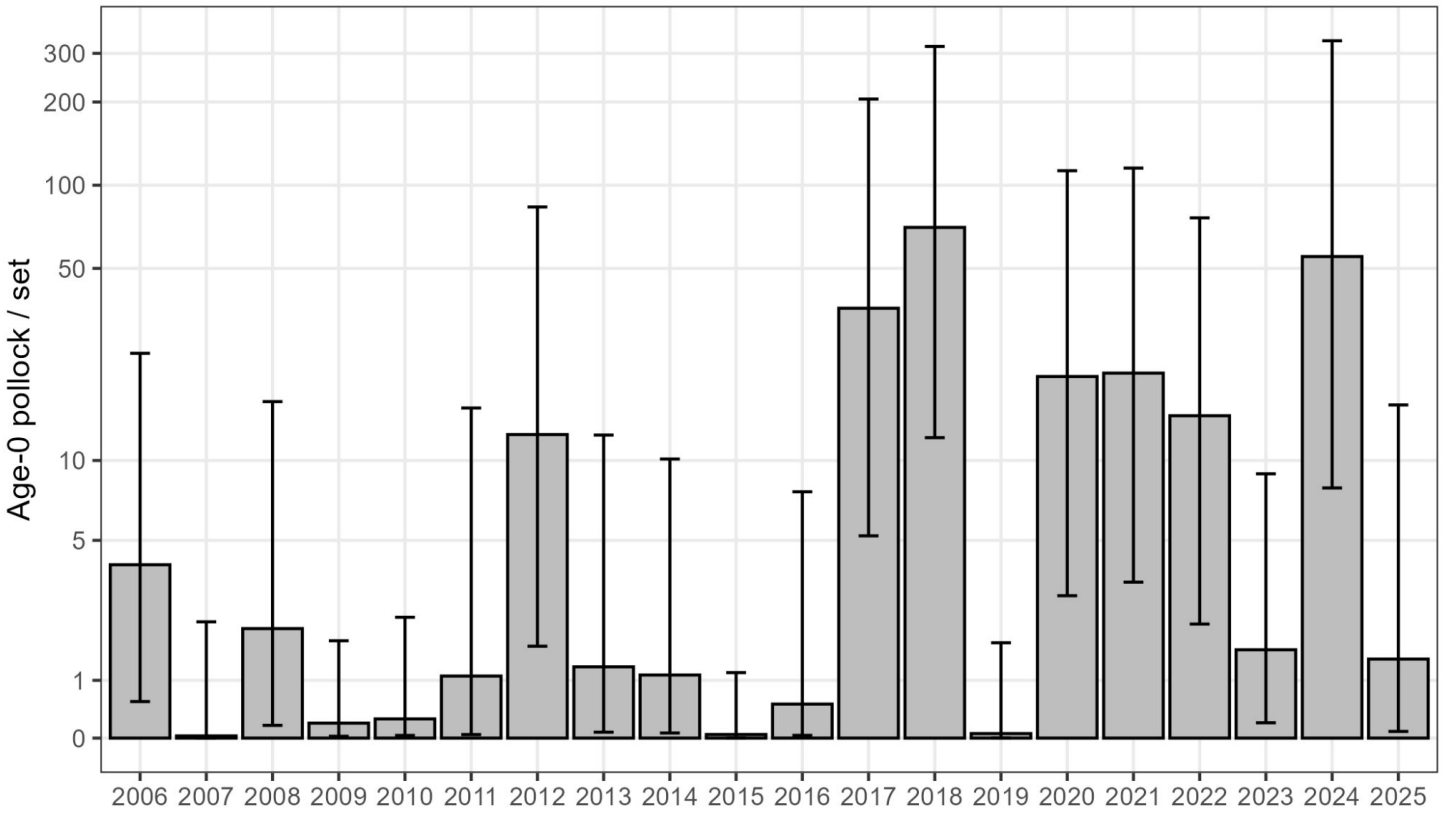
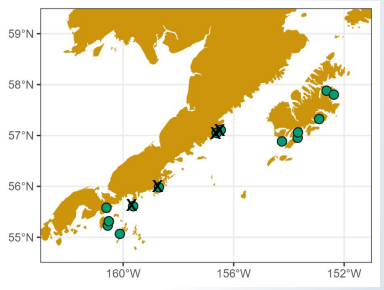
Beach seine: Age-0 Pollock





Take home: Low age-0 pollock catches in 2025 - may indicate a weaker year-class (see Litzow et al. 2022 *Fish. Res.*)

Data and code at https://github.com/mikelitzow/seine-data

Contact : Ben Laurel, Alisa Abookire, Mike Litzow

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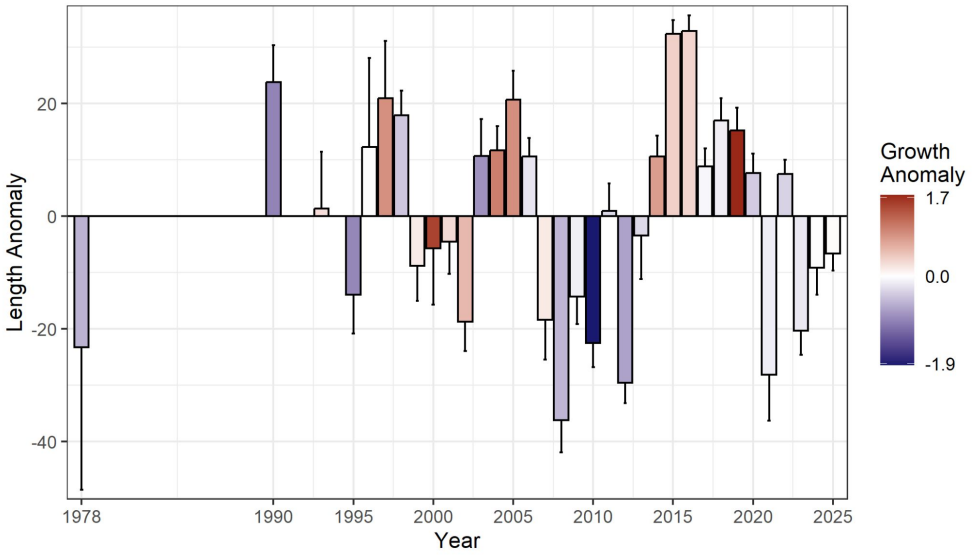
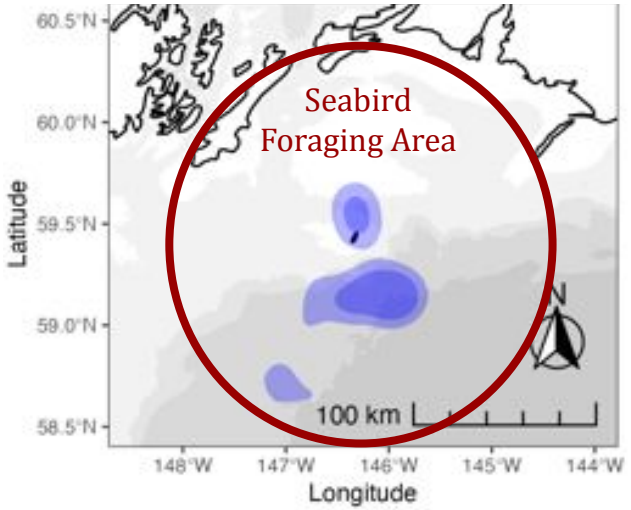
Sablefish condition

Rhinoceros Auklets and Tufted Puffins bringing fish in to feed chicks on Middleton island, sampled June-August.

- ↑ age-0 sablefish growth in warm years



Sablefish Capture Locations (2022)



Take home: During 2025, slightly below average length on median sample date and average growth over the season.

Contact : Yumi Arimitsu, Scott Hatch, Shannon Whelan, Katelyn Depot

2025 Gulf of Alaska summary

Ocean conditions

- Western GOA in spring was warm at surface and at depth. Similar to 2015 and 2019.

Zooplankton

- Springtime small copepod abundance was high, large copepod abundance was low - consistent with warm conditions.

Fish densities

- Larval: Gadids extremely low, continuing trend since 2019. Rockfishes only 1 of 7 assessed species with high abundance.
- Age-0 Pacific cod densities in the nearshore were moderate, while age-0 pollock densities were low.

Fish condition

- Age-0 sablefish below average length, but average growth rate.

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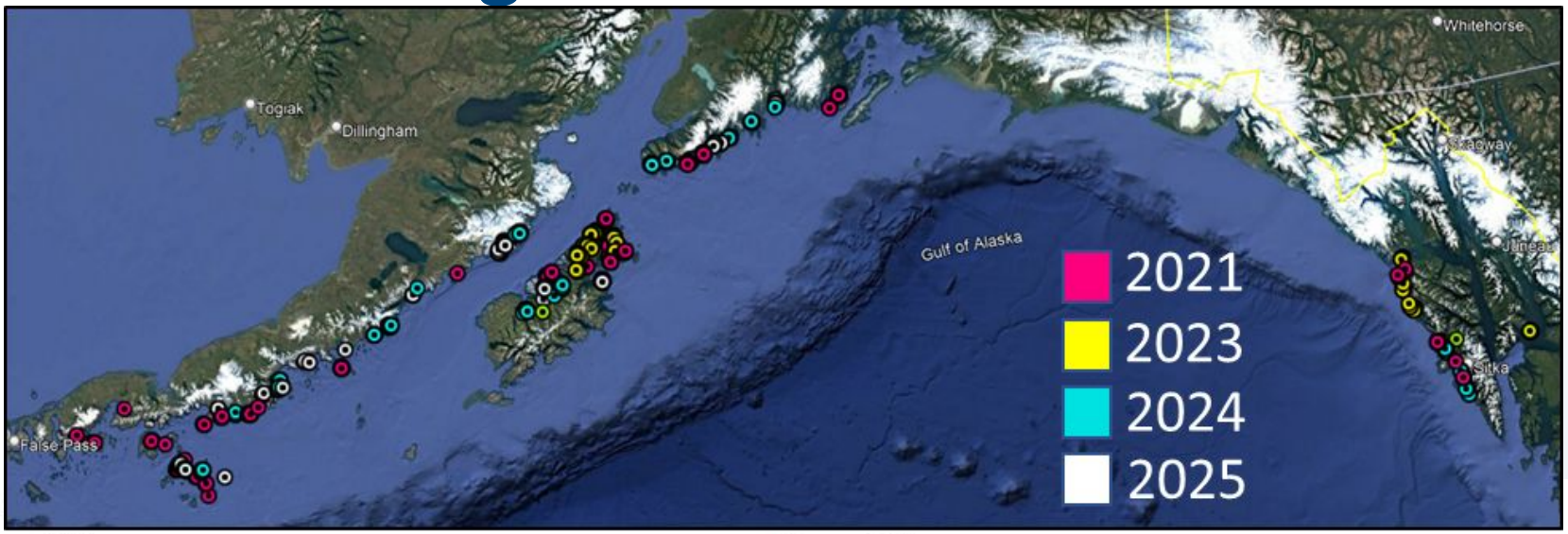
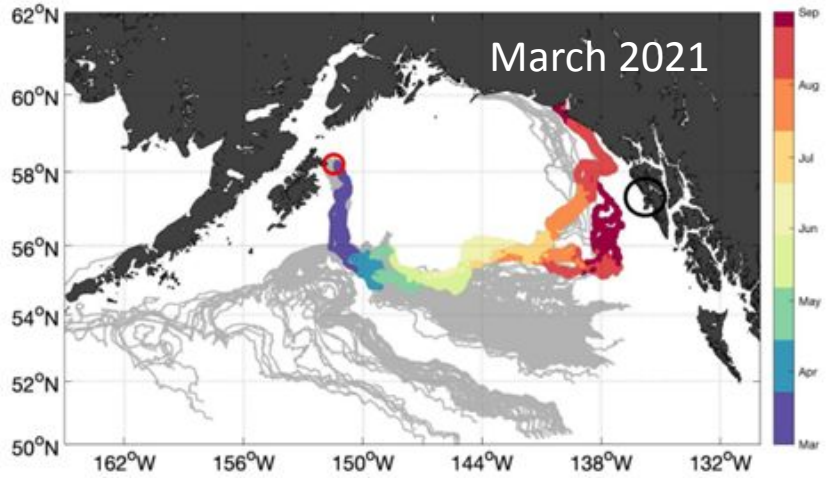
Highlighted projects

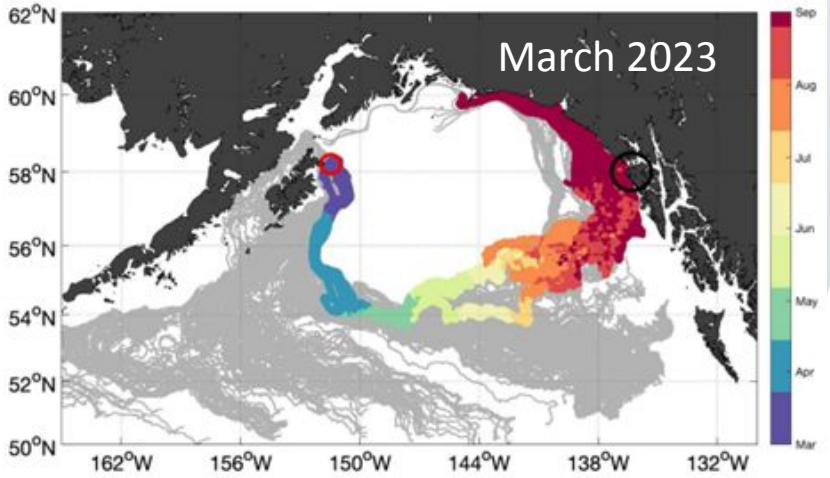
2025 GOA age-0 Pacific Cod IBM Validation



Beach seining

Underwater baited cameras





Schaal et al. In Press

Take home: Oceanographic modeling & genetics show eddies play major role in interannual variation of age-0 Pacific cod nearshore settlement areas

Contact: Buck Stockhausen, Katharine Miller, Jacek Maselko

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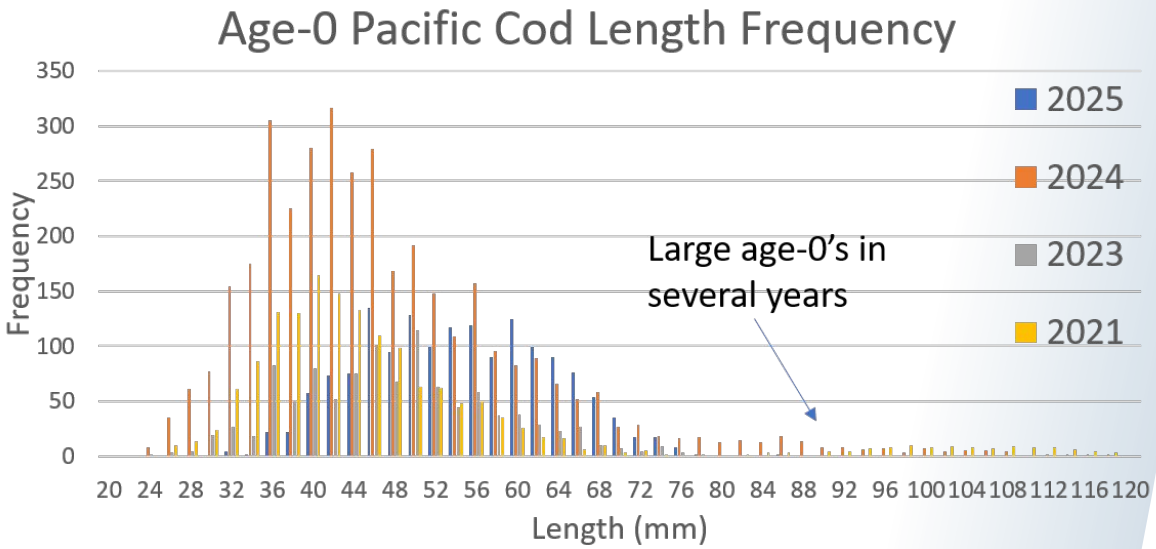
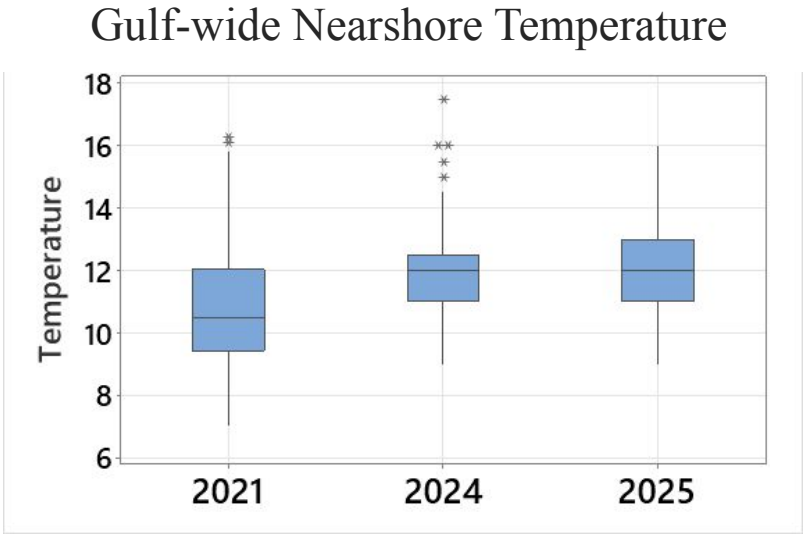
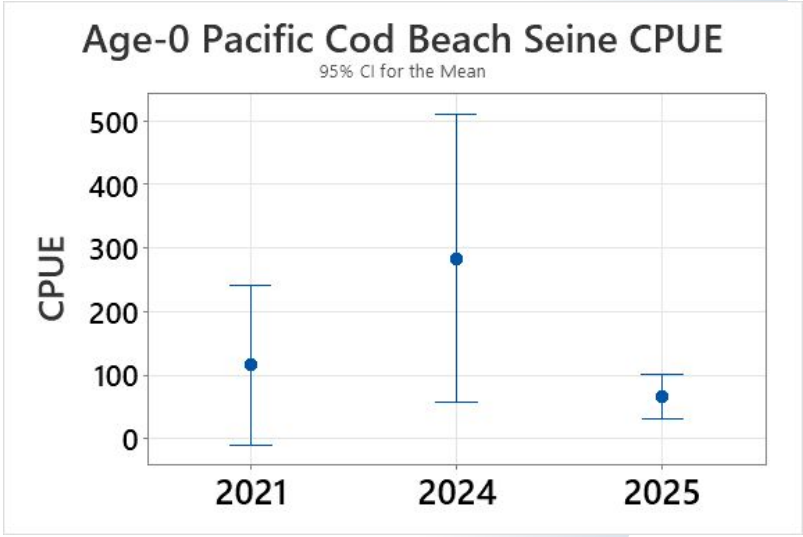
2025 GOA age-0 Pacific Cod IBM Validation

Does settlement area impact age-0 body condition with implications for survival to recruitment?

- Size
- Lipid Content (underway)







Take home: 2025: warm, fewer fish, generally large fish but not the large size group, lipids underway

Contact: Johanna Page, Darcie Neff, Katharine Miller, Karen Endres

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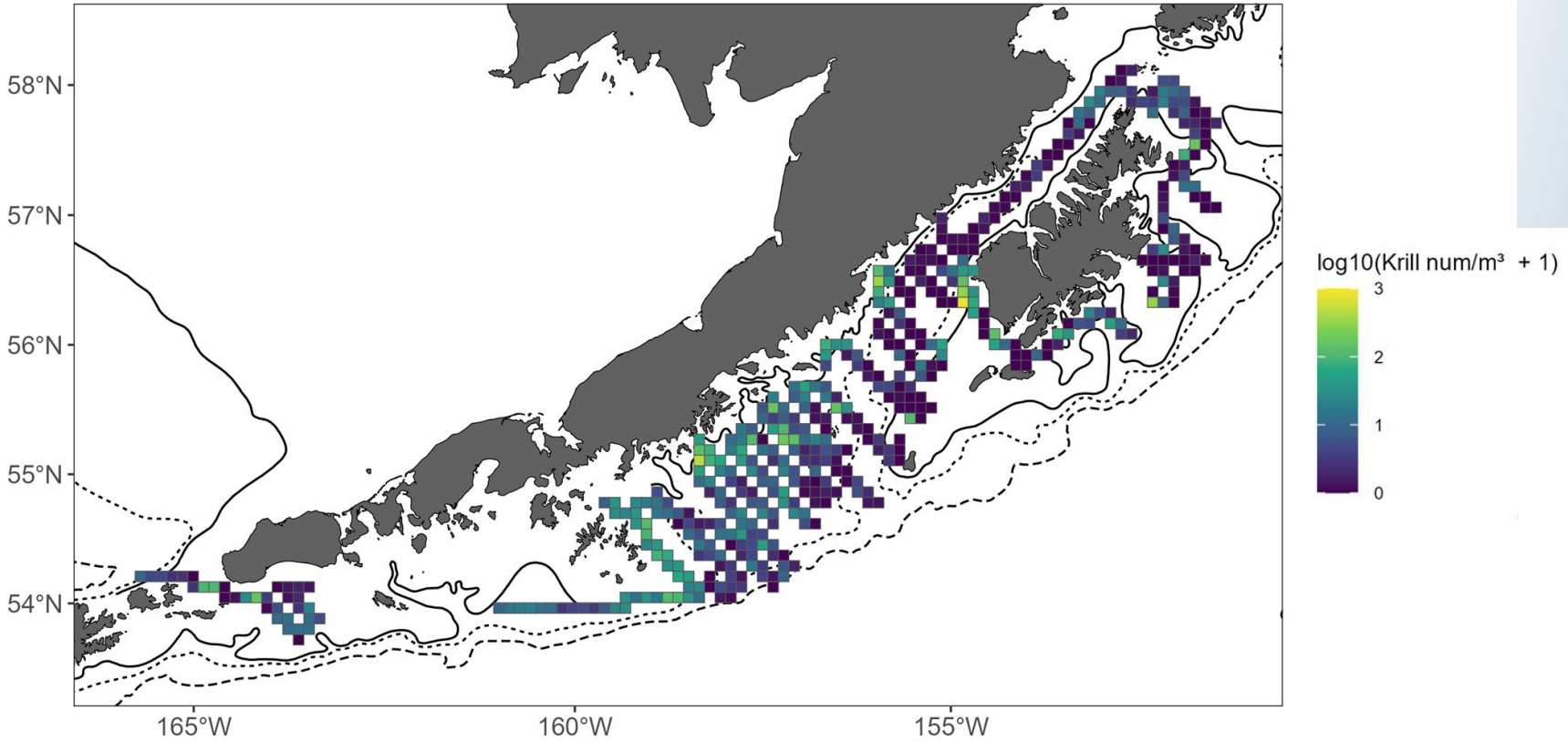
New krill estimates in the WGOA

Using acoustics + Methot trawl to estimate euphausiid density and species composition during the EcoFOCI spring larval survey.



Krill densities were highest SW of Shelikof Strait and generally higher inshore than offshore.

Contact : Adam Spear (with M. Levine, P. Ressler, J. Lamb)

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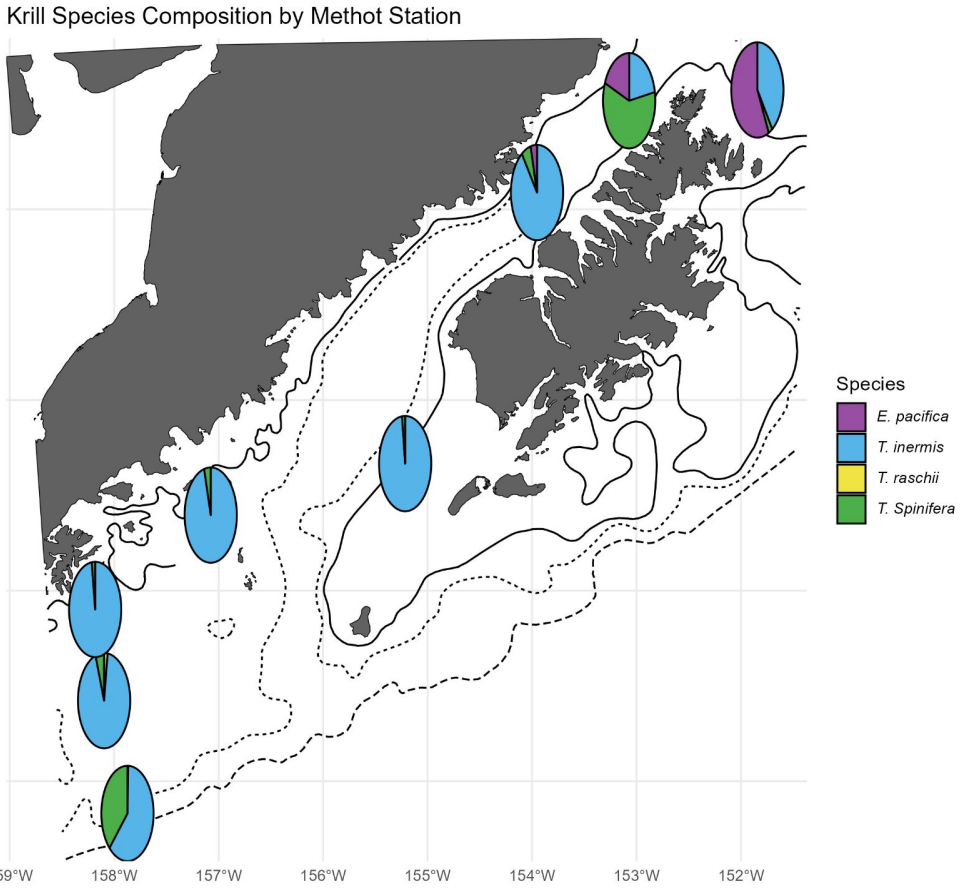
New krill estimates in the WGOA



Methot nets were used for species identification and size. *T. inermis* were the dominant species, with *T. spinifera* and *E. pacifica* in greater numbers in the northeast Shelikof Strait, consistent with previous research (Simenson et al., 2016).

Future plans include developing a time-series by analyzing acoustic data from previous surveys, and incorporating these methods into future surveys.

Contact : Adam Spear (with M. Levine, P. Ressler, J. Lamb)

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Acknowledgements

There’s more information, just ask!
Thank to everyone who helped collect these data (too many to list)! We appreciate your time, effort, and thoughtful insights.
NOAA Contacts:
Katie Howard
Rob Suryan
Julie Keister
Mike Litzow
Tom Hurst