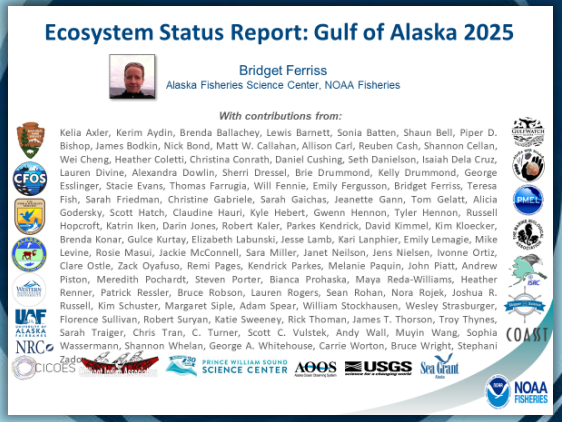
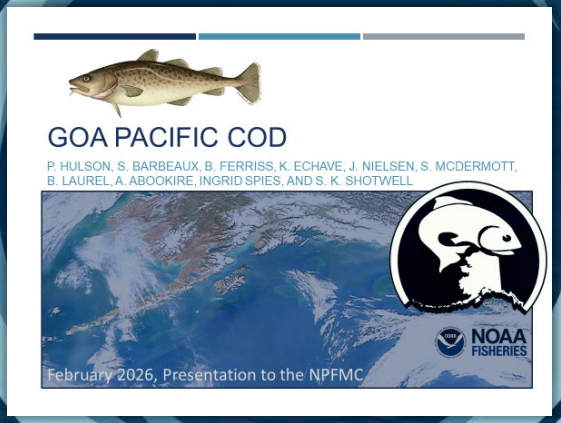
GOA Pacific cod assessment

ESR



ESP

SAFE



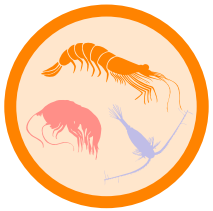
Ecosystem Status Report: Gulf of Alaska 2025

Bridget Ferriss
Alaska Fisheries Science Center, NOAA Fisheries

[*full ESR attached to e-agenda: list of contributors p.1; Ecosystem Assessment p.4*]

1. Warm at surface and depth, winter, spring and fall

- [*winter spawning; egg/larval survival; incr. demand for prey*]



2. Similarities to 2014-2016 in reduced lower trophic level productivity

- [*less productive food web to directly and indirectly support cod prey]*

3. Mixed upper trophic & ecosystem metrics

- [*cod body condition below average but some prey base and upper trophic indicators ok]*

4. Cooling in 2026 but concerns of residual heat & cumulative ecosystem effects

- [*elevated concerns of cumulative ecosystem response to warm year*]

Ecosystem and Socioeconomic Profile
REPORT CARD SUMMARY

PREDICTIVE

Spawning Habitat Suitability: DECREASED TO LOW

- Warmest temperature at depth since 2019, negative effect on egg survival, potentially poor 2025 year class

CONTEXTUAL

RECRUITMENT

- Spring larvae & summer YOY CPUE **below average**; potentially poor 2025 year class

ECOSYSTEM

- Overall average status: **mixed** directional trends from 2024 to 2025 conditions

ENVIRONMENTAL

- Increase to **average heatwave** events (below 2015/16/19 levels); **decrease** to below **average** eddy kinetic energy (reduced larval retention/transport).

PREY

- Average spring bloom, sufficient forage for seabrids; decrease to below average Pacific cod **body condition**, slightly increased metabolic demand

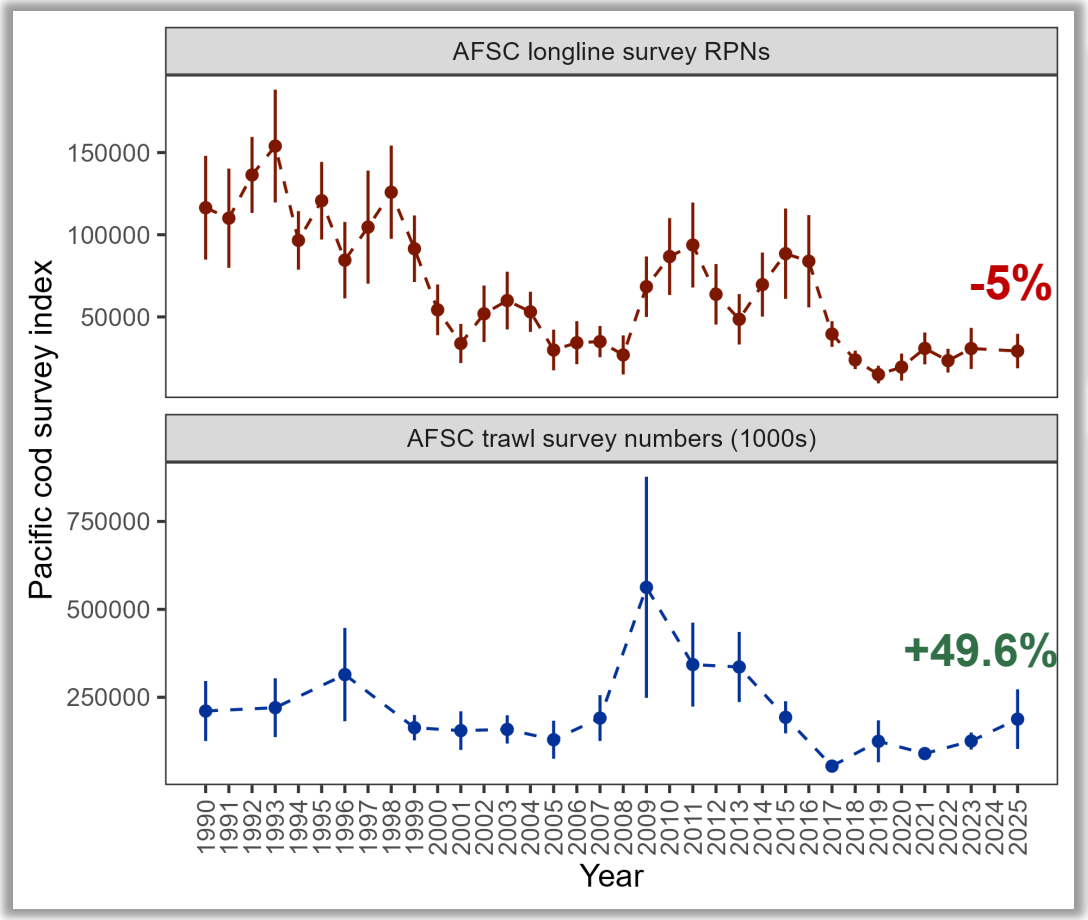
PREDATOR

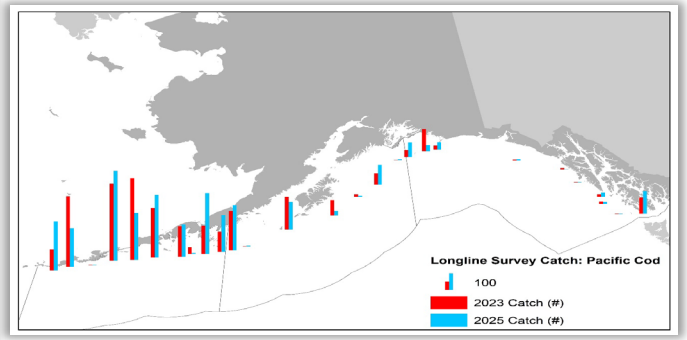
- Below average biomass consumed of Pacific cod (arrowtooth, cod, pollock multispecies model); steadily increasing Steller sea lion lion population in GOA

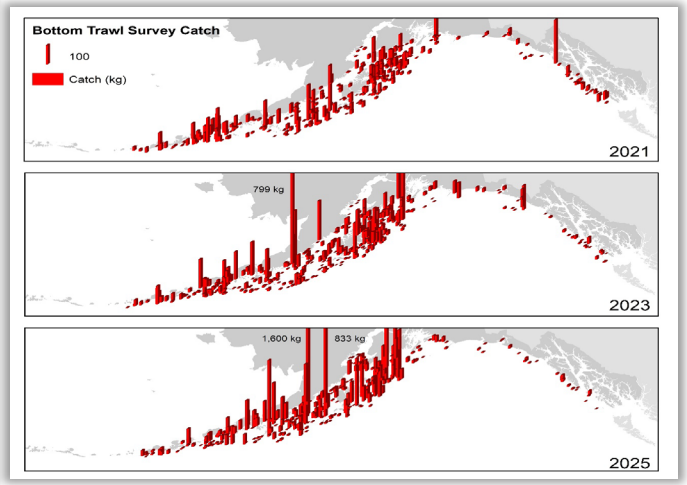
GOA COD ASSESSMENT OVERVIEW

- **BLUF:**
  - GOA Pacific cod: Tier 3b
  - 2025 estimated spawning biomass to be at $B_{34.3\%}$, projected in 2026 to be at $B_{33.1\%}$
  - 2026 recommended ABC (41,520 t) is a 29% increase from 2025 ABC (32,141 t)
  - Do not recommend reduction from maximum ABC
- From PT/SSC presentations, highlight:
  - Important data and risk table considerations

DATA – AFSC SURVEY INDICES



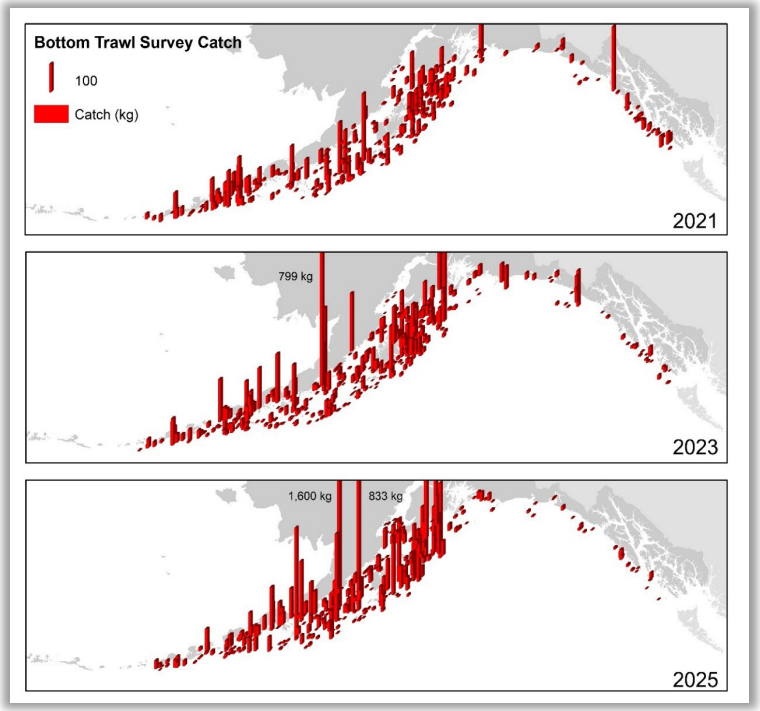




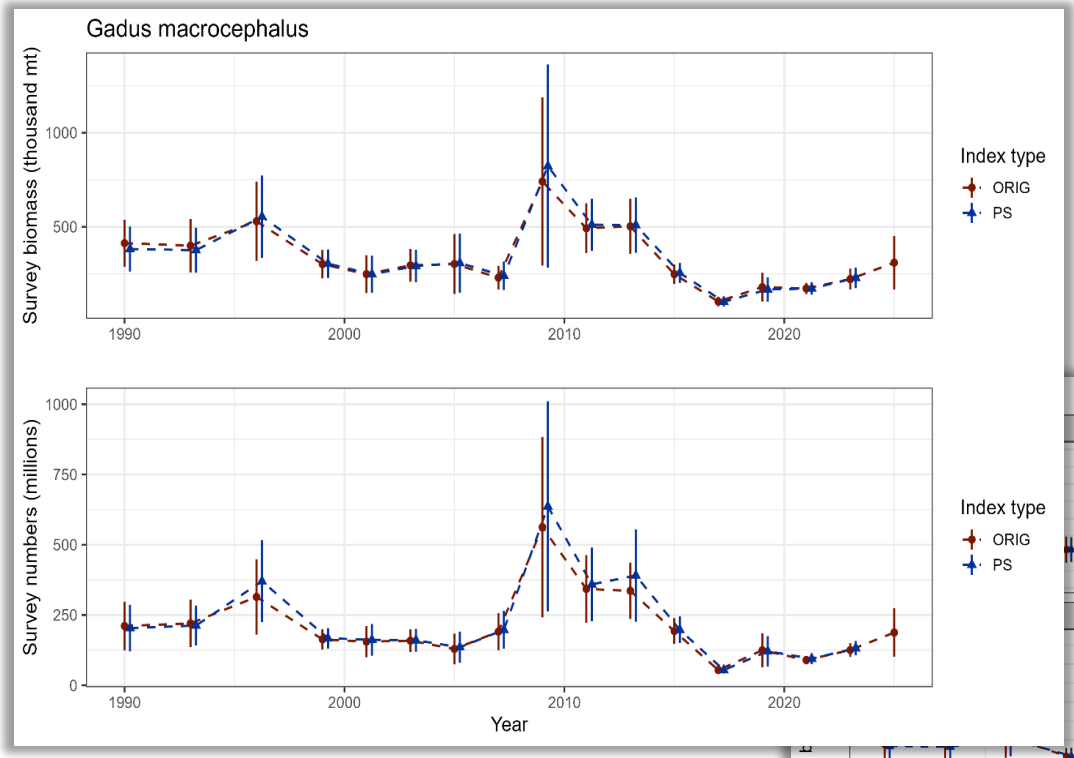
DATA – 2025 SURVEY CONTEXT

Was there an influence of the GOA bottom trawl survey restratification on 2025 results?

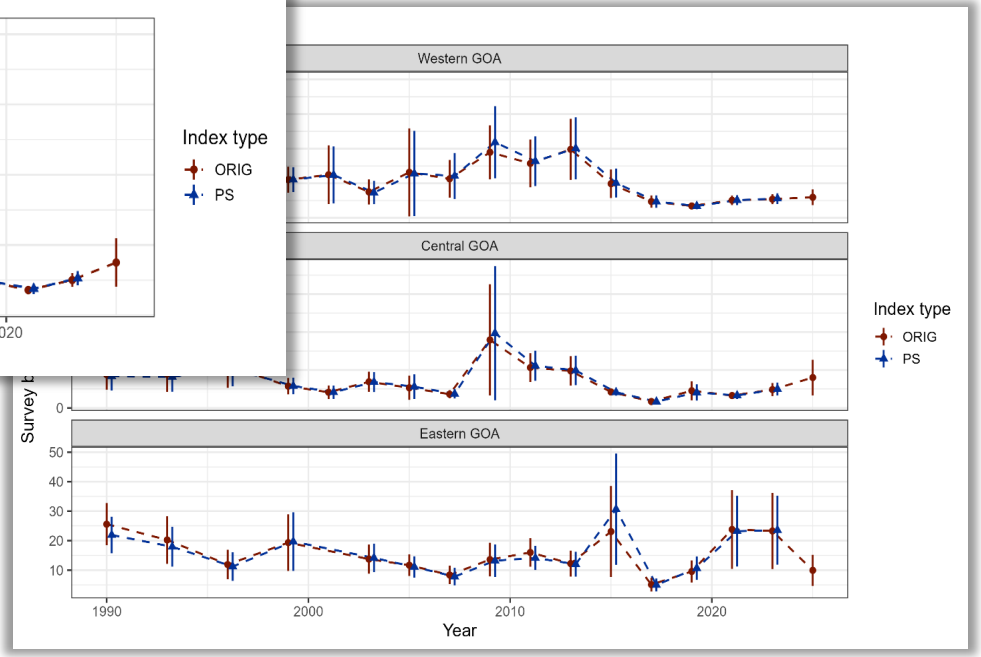
- Design implemented in 2025 has been extensively investigated and reviewed
- Using historical data, what would have happened if it were collected following new survey design? (Appendix 2.2)
  - *Does the restratification of the survey design induce any bias?*



DATA – AFSC BOTTOM TRAWL SURVEY



- Results indicate minor differences between time-series



DATA – AFSC BOTTOM TRAWL SURVEY

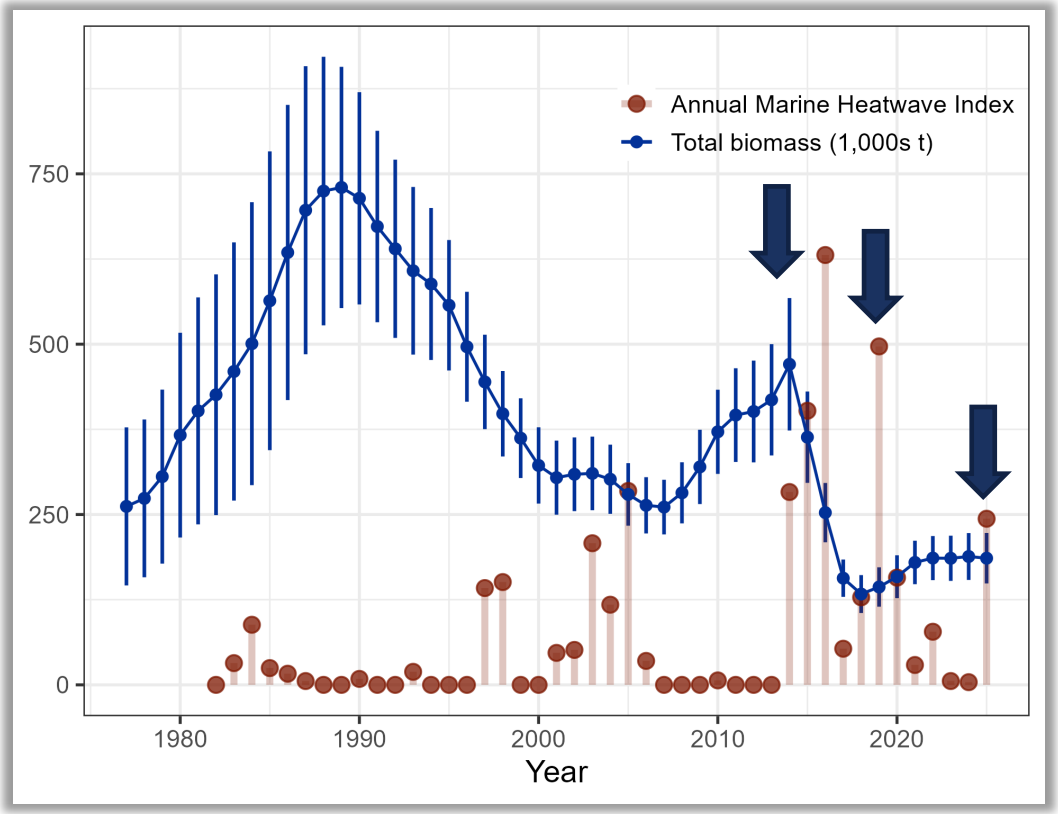
Was there an influence of the GOA bottom trawl survey restratification on 2025 results? **NO**

- The results from the 2025 survey continue trends we have recently observed and estimates that are within historical ranges
- GOA cod is one of best test cases, sampling variability for stocks that are more difficult to sample (i.e., rockfish) will remain a factor, regardless of restratification of survey

RISK TABLE

Have we been here before, and, what happened?

- 2014: severe marine heatwave follows, pop'n collapses
- 2019: marine heatwave decreases after, notable differences in assessment model since 2014, fishery closed in 2020



RISK TABLE

Should the 2026 ABC be reduced from maximum?

- Summary: There are several aspects of the current stock assessment that mitigate risk, including catch assumptions in projections, stock status and the HCR, and model development over time
- But, do these serve to mitigate the risk identified for the 2026 ABC?
  - It is not clear to what extent increased risk highlighted from environmental conditions in 2025 is mitigated by stock assessment
  - It remains unknown if environmental conditions in 2025 will persist into 2026

ABC RECOMMENDATION

Quantity	As estimated or *specified last* year for: 2025	2026	As estimated or *specified this* year for: 2026	2027
M (natural mortality rate)	0.49*	0.49*	0.5*	0.5*
F_{ABC}	0.46	0.43	0.54	0.47
OFL (t)	38,688	36,459	**49,782**	38,812
maxABC (t)	32,141	30,193	41,520	32,209
ABC (t)	32,141	30,193	**41,520**	32,209
Status	As determined *last* year for: 2023	2024	As determined *this* year for: 2024	2025
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

**Base natural mortality M varies between 0.5 and 0.84*
*** Assumed 2025 catch to be the 2025 ABC. For 2027 projections the 2026 catch was assumed to be at the projected ABC.*

Should the 2026 ABC be reduced from maximum?

Taken together, a reduction from maximum ABC in 2026 is not recommended, while at the same time acknowledge the ***increased risk*** associated with this recommendation

APPORTIONMENT

- Recommend changing to apportionment method followed by GOA Thornyhead complex

	Western	Central	Eastern	Total
2025 adopted apportionment	27.1% 8,710	63.8% 20,506	9.1% 2,925	100% 32,141
2026 status quo apportionment	20.6% 8,553	75.1% 31,182	4.3% 1,785	100% 41,520
2026 recommended apportionment	24.8% 10,297	69.2% 28,732	6% 2,491	100% 41,520

QUESTIONS?

APPORTIONMENT

- Recommended apportionment changes:
  1. Stabilize estimates of subregion biomass and uncertainty to be reflective of assessment model estimates of biomass,
  2. Provide apportionment estimates that do not result in drastic and improbable shifts in distribution that are inconsistent with our understanding of cod life history and movement