2025 COOK INLET SALMON STOCK ASSESSMENT MODELING WORKSHOP

MAY 2025

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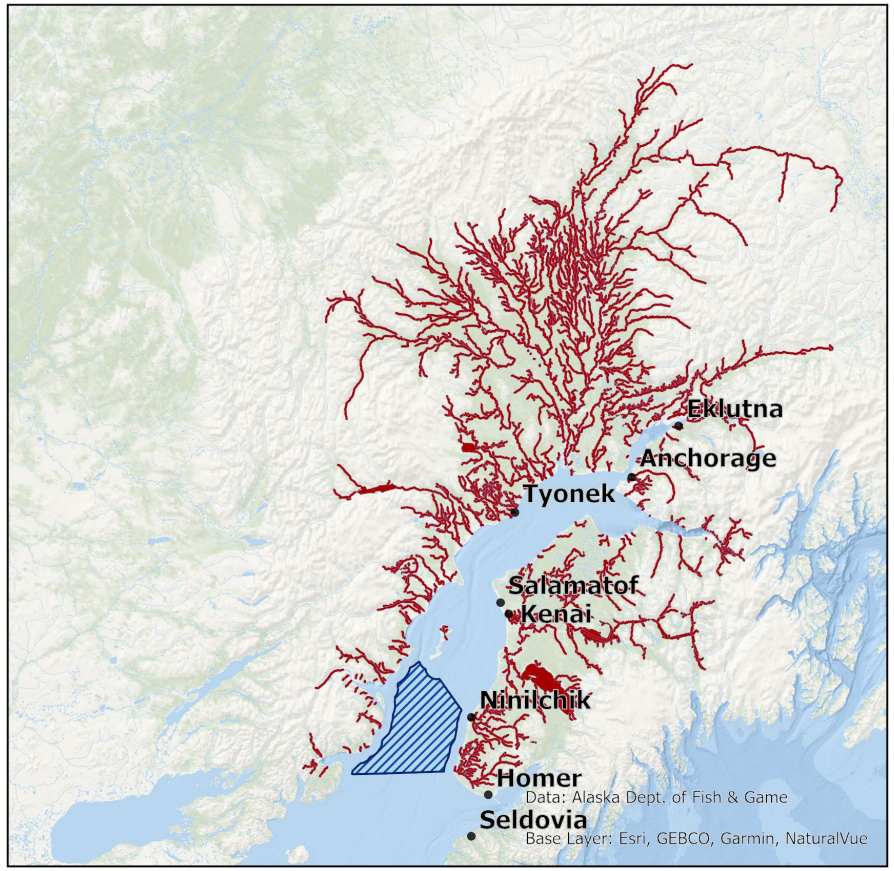
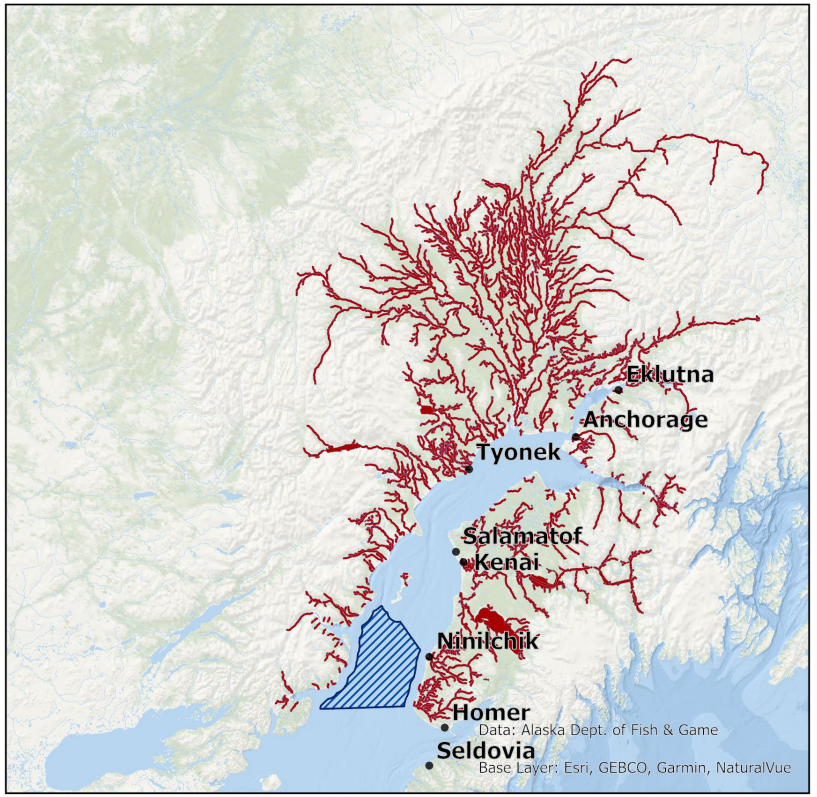


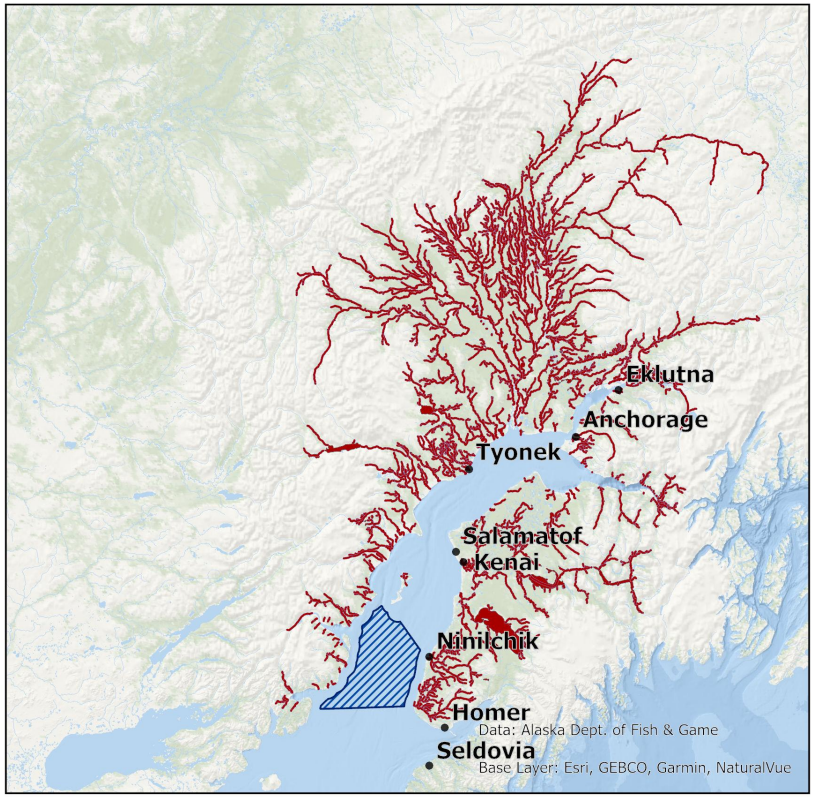
Scope and Goals

- ***'Reviewing the SAFE methodology for the first time at the same meeting where harvest specifications are set - without the benefit of independent review - poses a significant challenge.*** *Last year, the SSC highlighted the value of long-format Plan Team meetings for reviewing groundfish and crab stock assessments. These meetings serve as a critical forum for in-depth discussions, allowing for substantive progress in improving processes and models that support management decisions, as well as reviewing proposed methodological changes prior to harvest specifications.* ***The SSC reiterates its recommendation from last year that a workshop, or series of workshops, focused on further developing Cook Inlet Salmon harvest specification and status determination methods'…***
  - *SSC Report, Feb 2025*



PRESENTATION OUTLINE

1. Overview of Cook Inlet (CI) EEZ Stock Assessment methods and pre/post-season status determination criteria
   - Tier 1 stocks + 2025 SDC summary
   - Tier 3 stocks + 2025 SDC summary
2. 2025 SSC Recommendations (Feb. 2025 NPFMC meeting) and proposed or in-progress SAFE team responses
   - **Proposed Bayesian Tier-1 approach for 2026 preseason forecast and OFL-ABC buffer determination**
   - EEZ fishery sampling, in-season information
   - Socioeconomic considerations
   - Default buffers for tier-3 stocks
   - Dealing with missing data
   - Risk Tables
3. Additional considerations future stock assessment development



2025 Summary of Key SSC Recommendations

- Continue development of Bayesian methods for tier-1 stock assessment methodology
- Expanded/continued ASL and GSI sampling of salmon caught in the EEZ fishery, incorporation of in-season information, offshore test fishery
- Expanded information, consideration of socioeconomic factor, impacts of newly created federal fishery
- Default buffer for tier-3 stocks → *e.g.*, 25%, consistent with tier-6 crab and groundfish stocks, adjusted from here on case-by-case basis
- Consideration of how to deal with missing data in determining status determination criteria
- Further development of risk tables

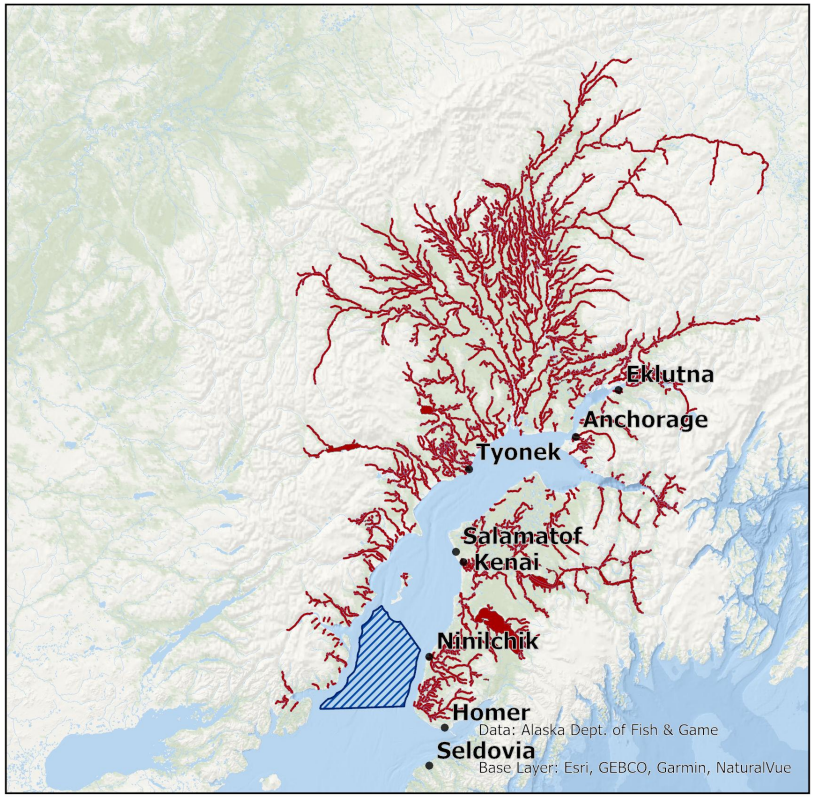
FEDERAL COOK INLET STOCKS AND STOCK COMPLEXES IN SALMON FMP

Tier I stocks

- Kenai Late Run Sockeye Salmon (KNSOCK)
- Kasilof Sockeye Salmon (KASOCK)

Tier 3 Stocks

- Aggregate "Other" Sockeye Salmon Stock Complex (AOSOCK)
- Aggregate Chinook Salmon Stock Complex (ACHIN)
- Aggregate Coho Salmon Stock Complex (COHO)
- Aggregate Chum Salmon Stock Complex (CHUM)
- Aggregate Pink Salmon Stock Complex (PINK)



Tier 1 Preseason Status Determination Criteria (SDC) (SAFE SECTIONS 4 - 6): Defining OFL & ABC

- **Preseason** overfishing limit (OFL_{PRE})
  - The predicted max EEZ harvest after escapement target and projected State harvest
  - $OFL_{PRE} = \hat{R} - G - (\hat{R} * \hat{F}_{STATE})$
  - Simplified: OFL_{PRE} = (Forecasted total run size)−(Escapement target)−(Projected State harvests)

- Acceptable biological catch (ABC)
  - OFL_{PRE} x Buffer that accounts for uncertainty to ensure that OFL_{PRE} is not exceeded

TIER 1 Preseason SDC (SAFE SECTIONS 4 - 6): Forecast Methodology

- Preseason run size forecast and projected State harvest (F_{STATE})
  - Generated using autoregressive models; arima(p,q)
    - p = auto-regressive(AR) component and q = moving average (MA) component

$$\eta_t = \phi_1 \eta_{t-1} + e_t + \theta_1 e_{t-1}$$

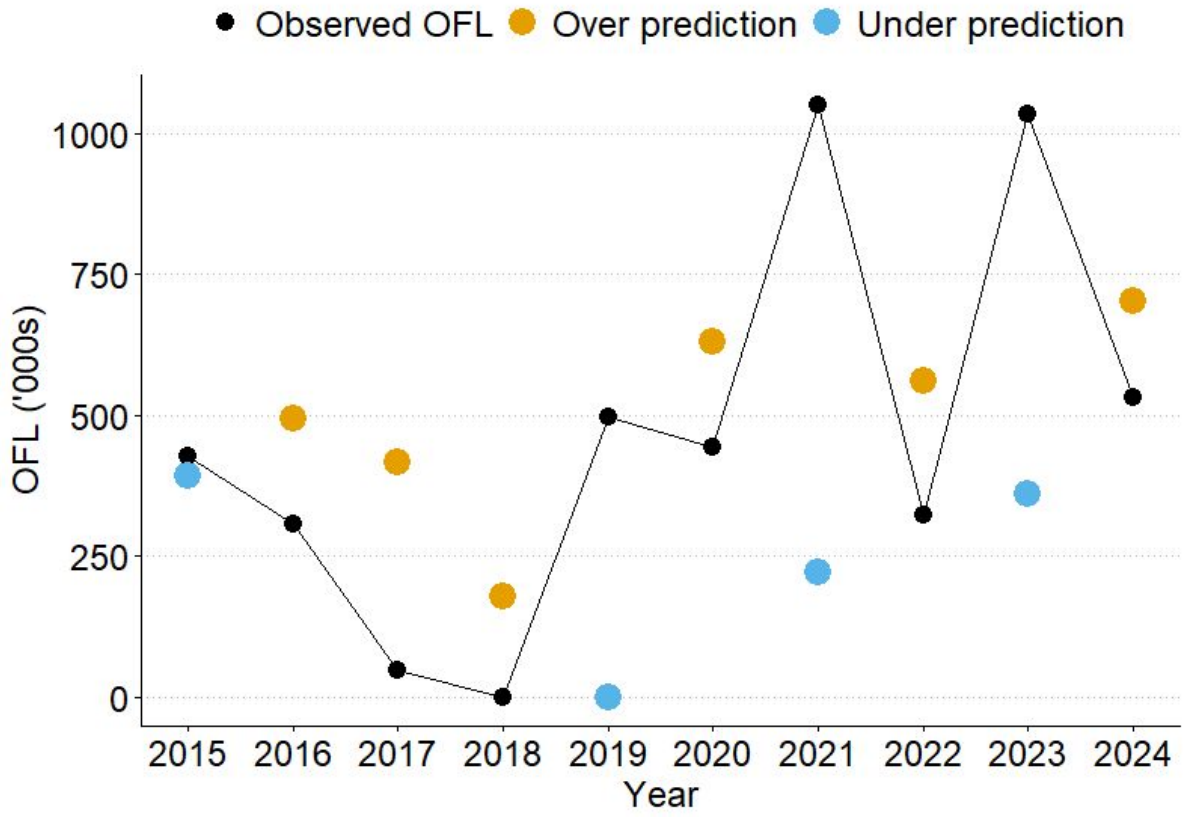
Current year value | AR coefficient | White noise error | MA coefficient

$$F_{State} = \frac{C_{total} - C_{EEZ}}{Run\ Size}$$

  - Fit in R using the auto.arima() function from the forecast package
    - Function selects the optimal forecast model using AIC
    - Uses the Hyndman-Khandakar algorithm

TIER 1 Preseason SDC (SAFE SECTIONS 4 - 6): Defining Tier 1 Buffer

- ABC Buffer (scientific uncertainty)
  - Uses retrospective error in one-step ahead out of sample preseason predictions of OFL (2015 - 2024).
  - Integrates forecasted run size and State harvest rate error.
  - NEW! Positive errors only (overforecasting)
  - Retrospective percent error using median symmetric accuracy of the log accuracy ratio (Morley et. al., 2018)
    - Describes the relative error



TIER 1 postseason SDC (SAFE SECTIONS 4 - 6): Defining Overfished

- Sockeye salmon generation time (T) = 5 years
  - Average time: egg → fry → smolt → adult → spawn

Overfished?

$$MSST > \sum_{i=t-T+1}^{t} Escapement_i = YES$$

$$MSST < \sum_{i=t-T+1}^{t} Escapement_i = NO$$

- Minimum Stock Size Threshold (MSST)
  - Postseason estimate used to assess **overfished status**
  - (Escapement Target x Generation Time)/ 2
  - Compared to the sum of the most recent observed escapement over a generation time (cumulative escapements)

TIER 1 postseason SDC (SAFE SECTIONS 4 - 6): Defining Overfishing

- Maximum Fishing Mortality Threshold (MFMT)
  - Postseason to make **overfishing determination**
  - MFMT = (sum of the realized potential yield in EEZ for the recent generation) / (sum of the total run size for the most recent generation)
  - MFMT compared to EEZ harvest rate, F_{EEZ}
  - Overfishing?
    - F_{EEZ} > MFMT = Yes
    - F_{EEZ} < MFMT = No

$$y_t = \max(0, R_t - G_t - C_{STATE,t})$$

$$MFMT = \sum_{i=t-T+1}^{t} \frac{y_i}{R_i}$$

$$F_{EEZ} = \sum_{i=t-T+1}^{t} \frac{C_{i,EEZ}}{R_i}$$

$T = generation\ time$

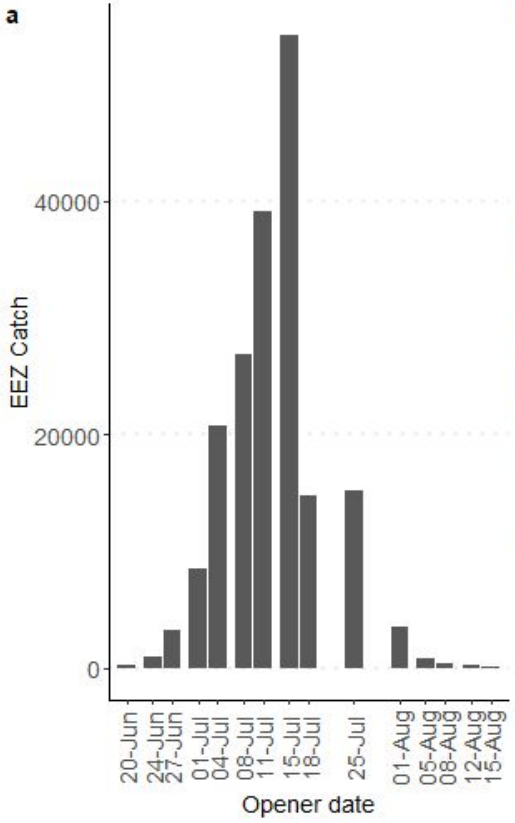
$y = realized\ potential\ yield$

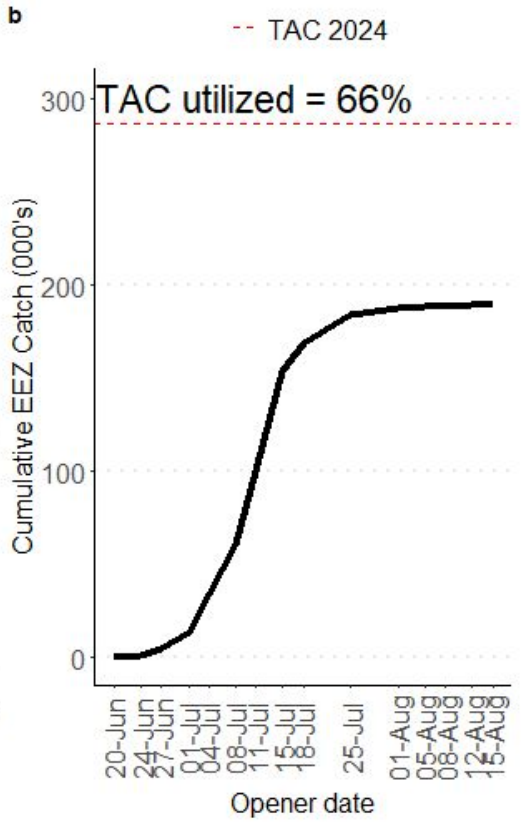
$R = total\ run\ size$

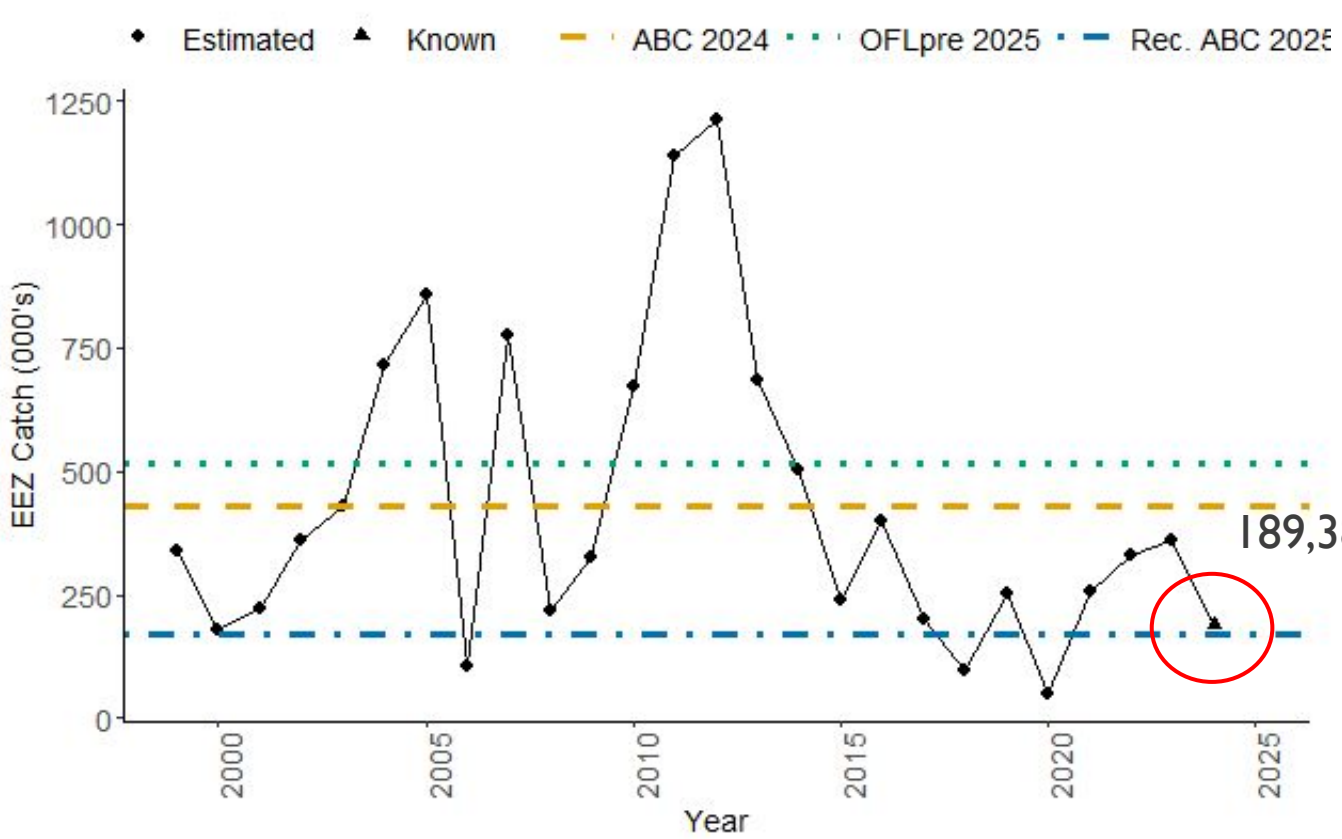
$G = escapement\ target$

$C = catch$

KENAI LATE RUN SOCKEYE SALMON (KNSOCK)
2024 CI EEZ FISHERY (Section 7.2)



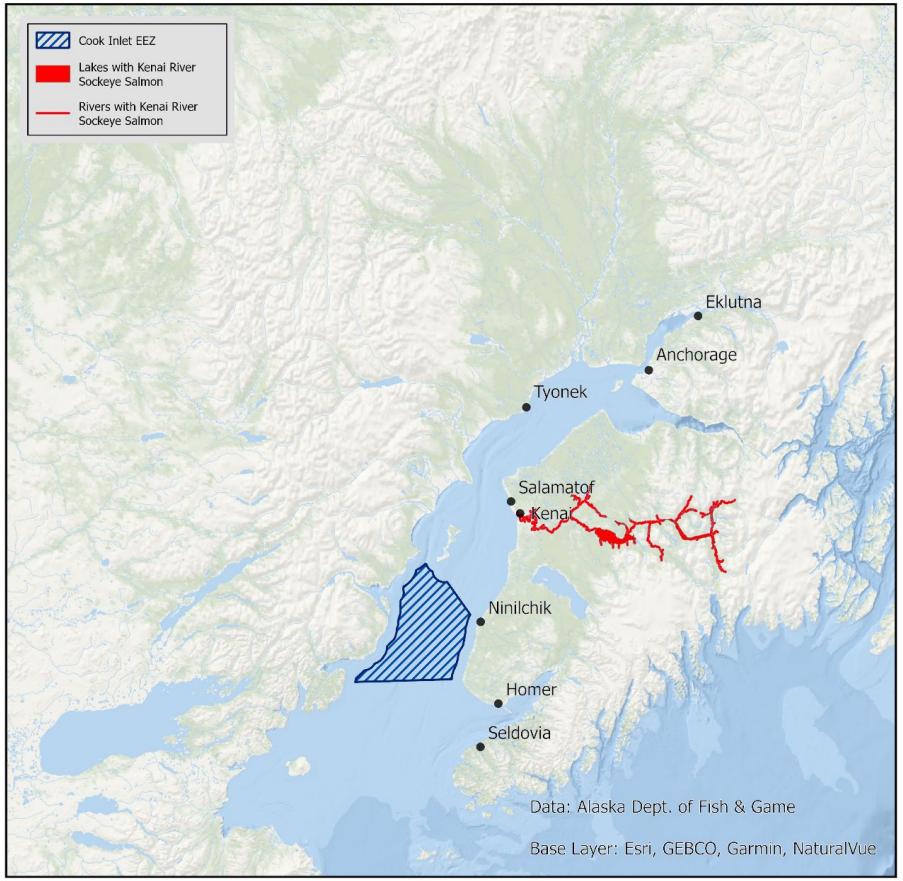




- Fishery opened June 20, closed August 15
- Max sockeye catch July 15
- 189,380 KNSOCK harvested

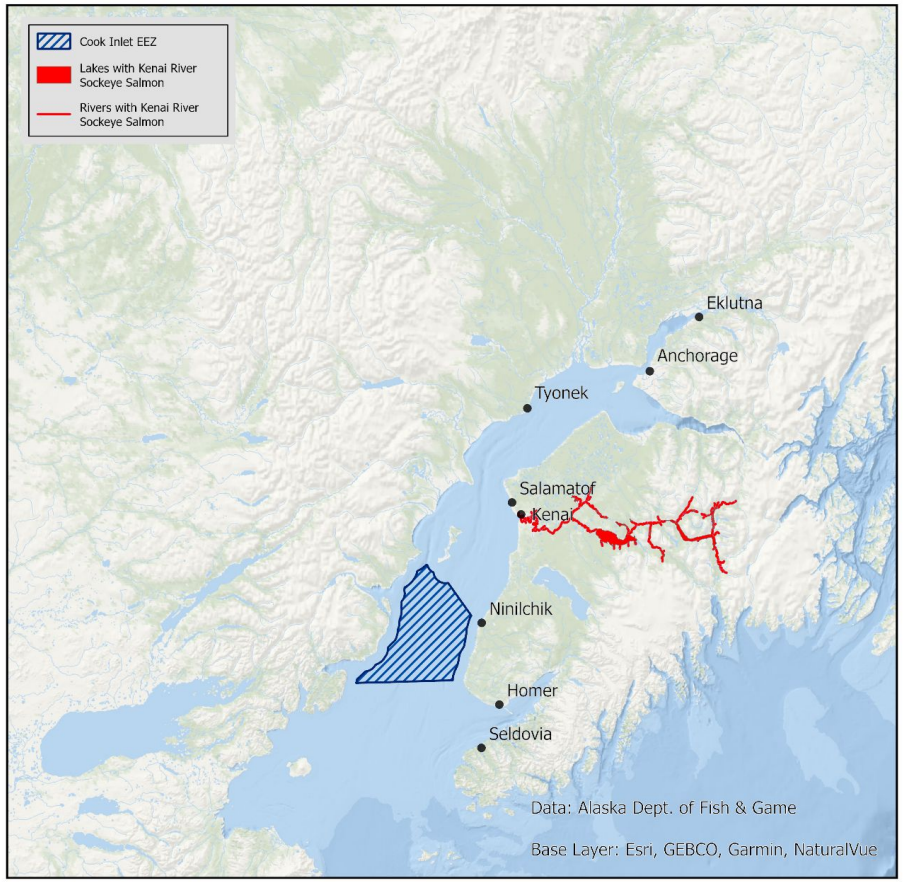
KENAI LATE RUN SOCKEYE SALMON (KNSOCK)
2024 CI EEZ FISHERY (Section 7.2)

- 2024 NMFS preseason forecast was 3.485M
- 2024 ADF&G total run size estimate is 3.724 M (difference of 239K)
- $S_{MSY\text{-}POINT}$ = 1.212M (close to the upper bound of range)
- 2024 escapement = ~1.6M (estimated using 5-year avg inriver harvest)
- 2024 **projected** State harvest rate (F_{STATE}) = 39.4%
- 2024 **realized** State harvest rate (F_{STATE})= 53%



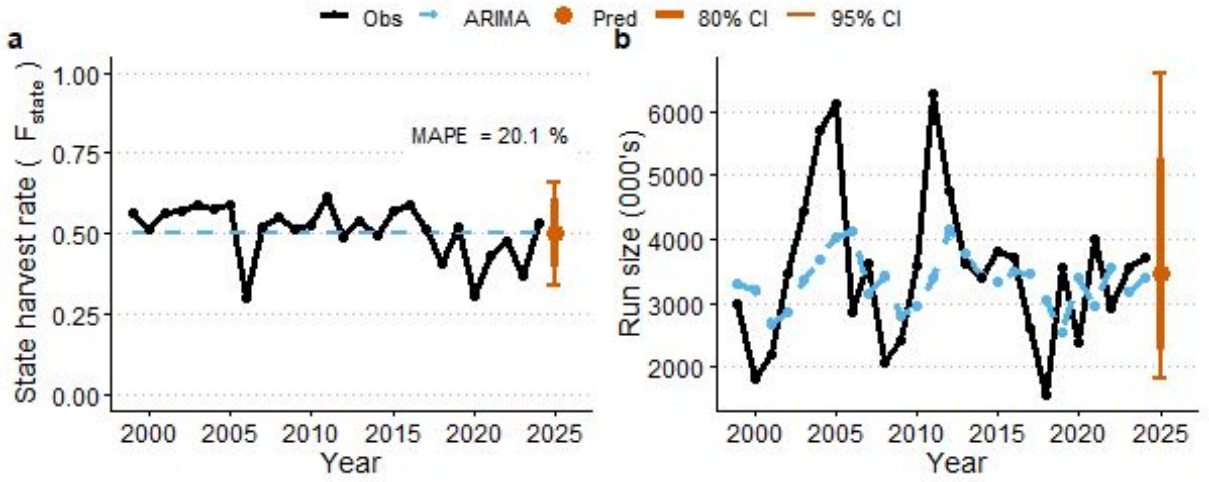
KENAI LATE RUN SOCKEYE SALMON (KNSOCK) STOCK SUMMARY (Section 7.2)

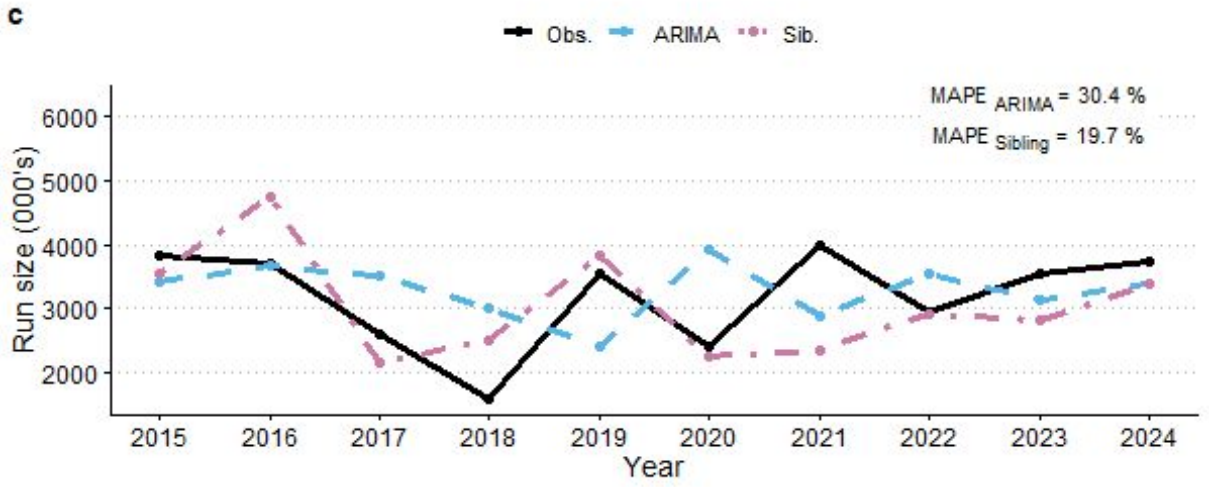
- Not overfished in 2024:
  - MSST (3.03M) << Cumulative Escapement (8.26M)
- No overfishing in 2024:
  - F_{EEZ} (0.072) << MFMT (0.204)



KENAI LATE RUN SOCKEYE SALMON (KNSOCK) FORECASTING RESULTS (Section 7.2)

- 2025 forecasted run size = 3.453M (b)
  - AR(1)
- 2025 forecasted F_{STATE} = 50% (a)
  - White noise model - AR(0,0,0)
- Comparison of forecast models (c)
  - State vs Federal run size forecast
  - State sib model MAPE = 19.7%
  - Federal AR1 MAPE = 30.4%
  - State forecast 4.19M (ensemble forecast)

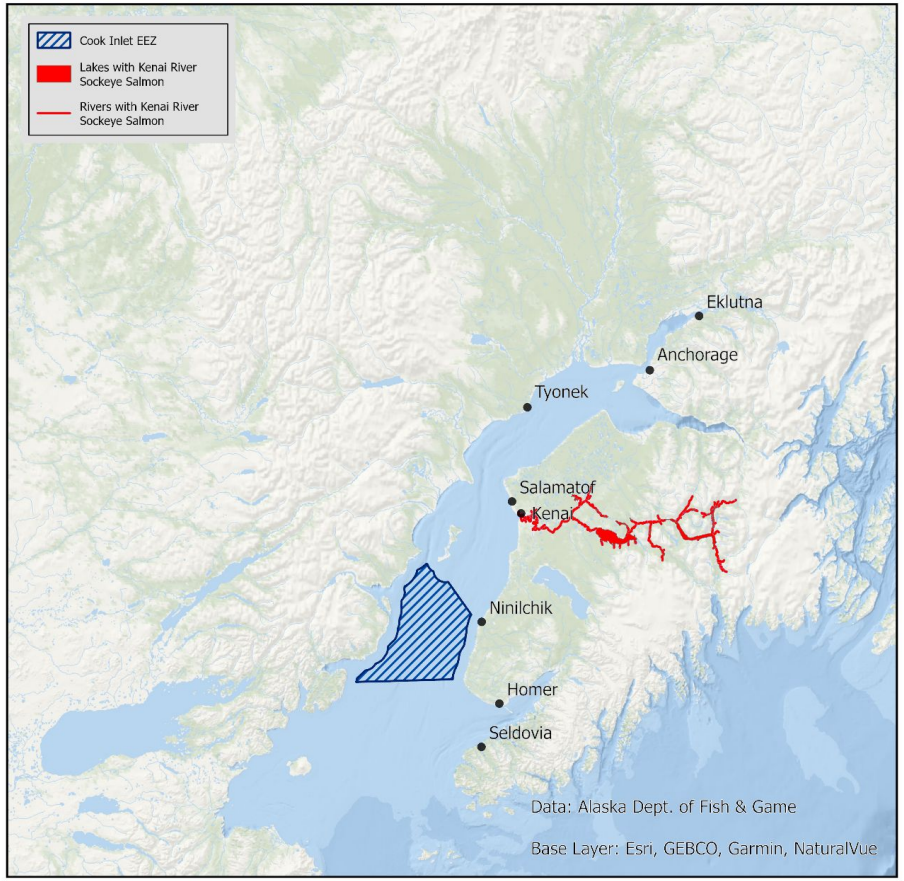




KENAI LATE RUN SOCKEYE SALMON (KNSOCK) TIER 1 ABC/ACL RECOMMENDATIONS (Section 7.2)

Recommendations:

- OFL_{PRE}……976,761 fish
- Buffer……27.3%
- ABC ……..……709,954

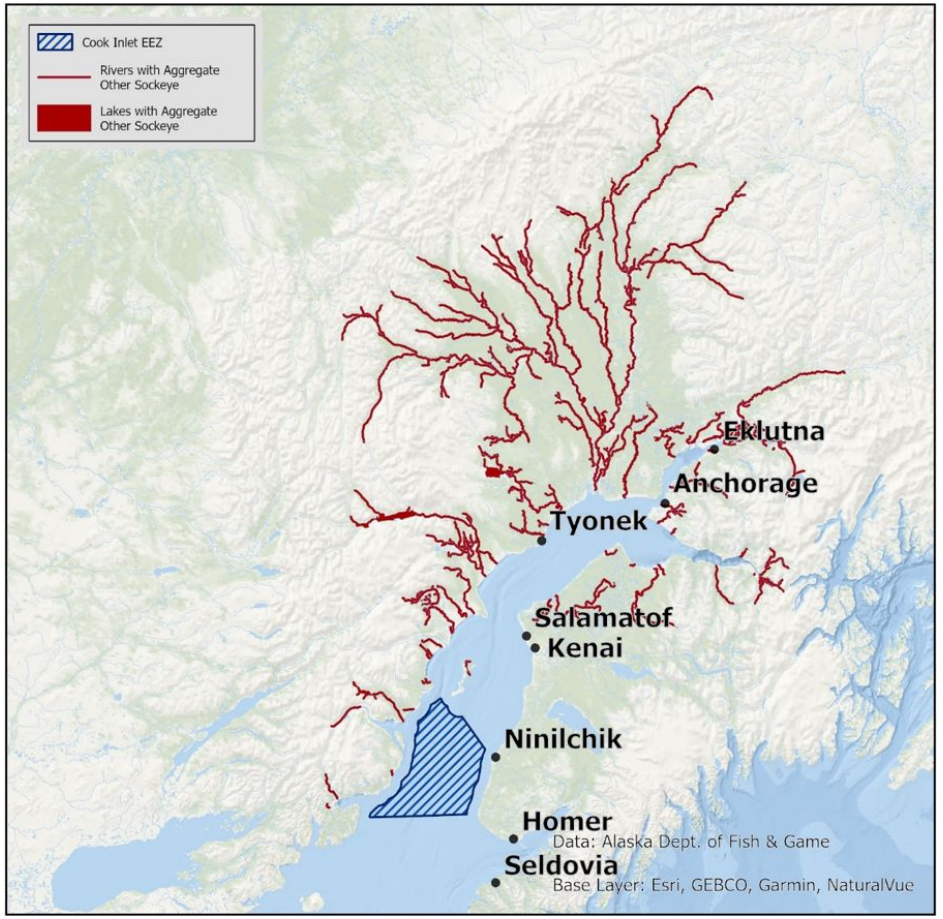


Tier 3 SDC EXPLAINED

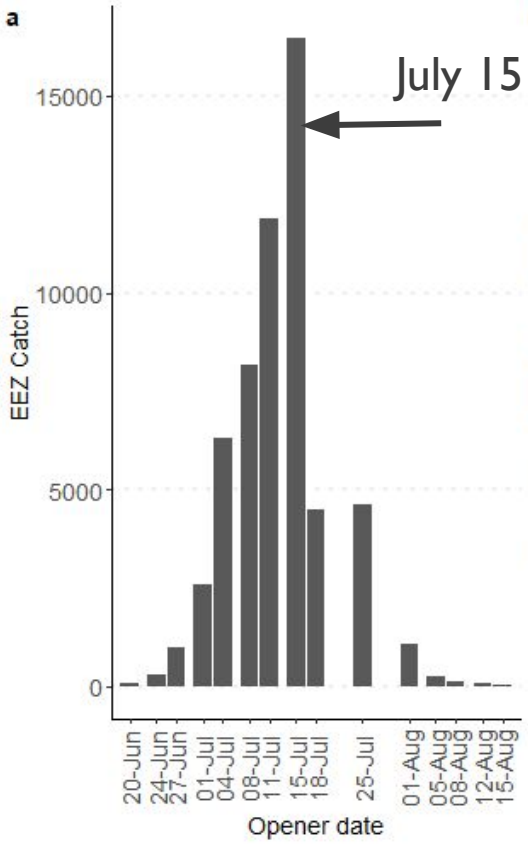
- Tier 3 SDC dependent on historic EEZ catch estimates
- OFL = max rolling sum of CI EEZ catch over a species generation time (1999 – 2024)
- OFL_{PRE} = average EEZ catch of OFL year range(max rolling average for a generation 1999 - 2024)
- ***Overfishing*** determined postseason based on the OFL
  - OFL vs. Cumulative Harvest (summed over a generation time)
- ***Overfished*** determination for Tier 3 stocks **with** indicator systems (AOSOCK, ACHIN, COHO)
    - MSST vs. Cumulative Escapement (summed over a generation time)
- Buffer Range = 10 - 90%

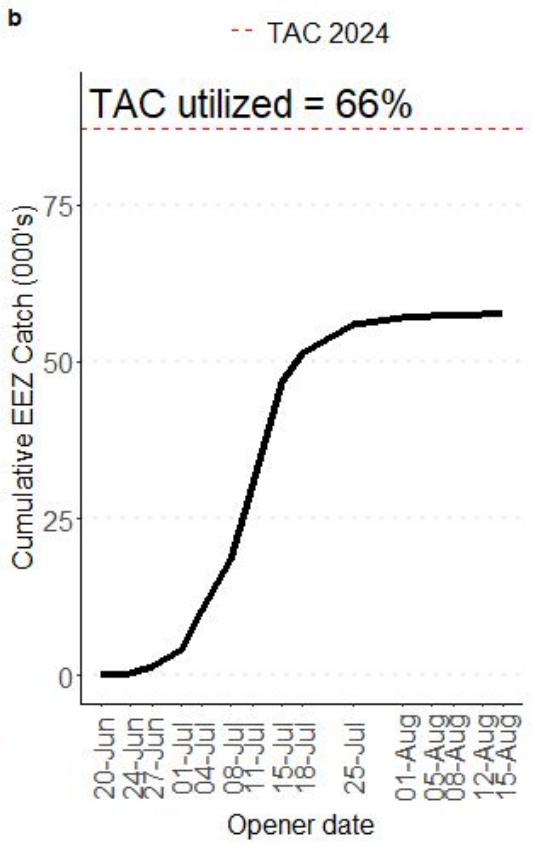
AGGREGATE "Other" SOCKEYE SALMON (AOSOCK) TIER 3 (Section 7.4)

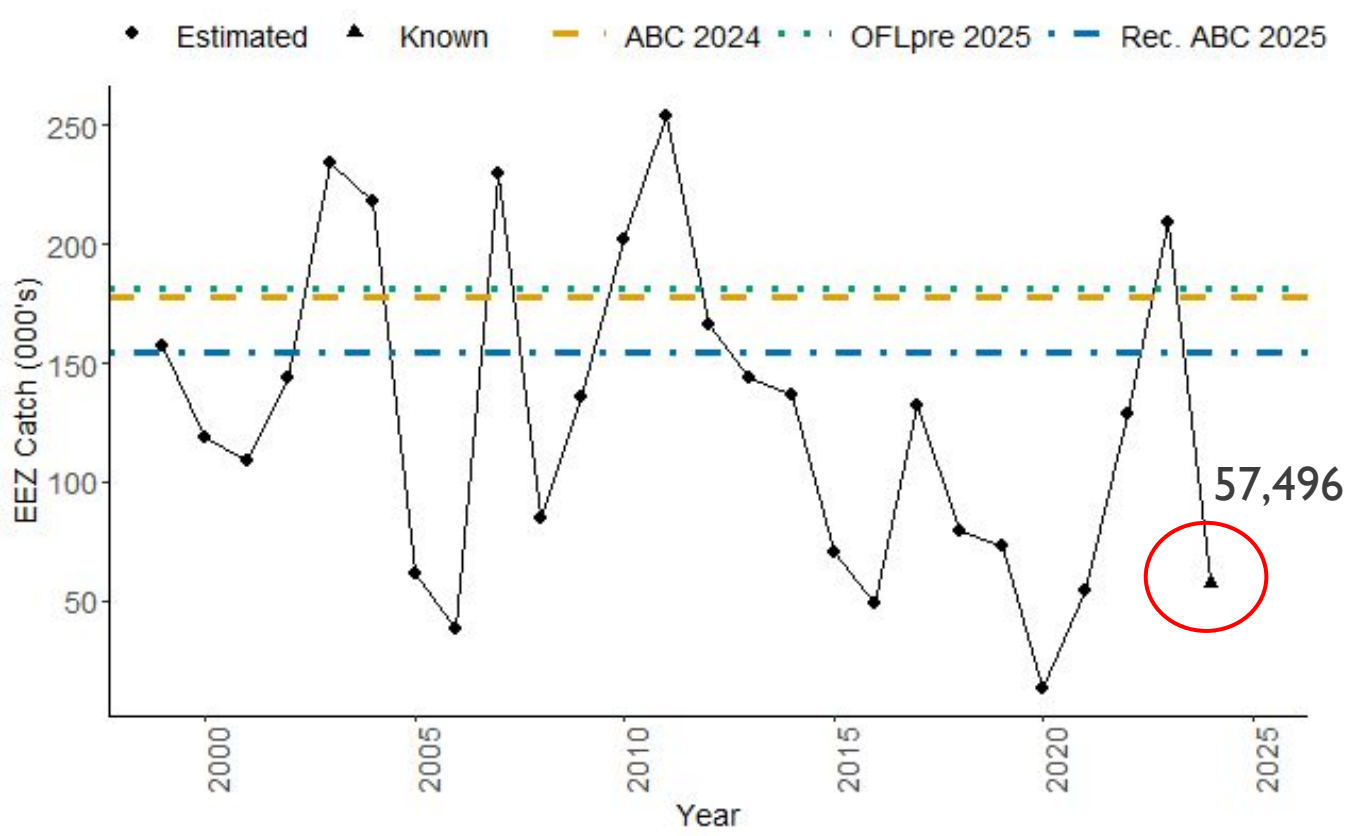
- All other UCI sockeye salmon harvested in the CI EEZ, except Kenai and Kasilof stocks.
- Four indicator stocks:
  - Fish Creek (15,000 - 45,000)
  - Chelatna Lake (20,000 - 45,000)
  - Judd Lake (15,000 - 40,000)
  - Larson Lake (15,000 - 35,000)
  - **Sum of lower bounds = 65K**
- Indicator stocks allow for making an Overfished determination (i.e., MSST vs. Cumulative Esc) for Tier 3 stocks.
  - Must have reliable indices of escapement



AGGREGATE "Other" SOCKEYE SALMON (AOSOCK) 2024 CI EEZ FISHERY (Section 7.4)

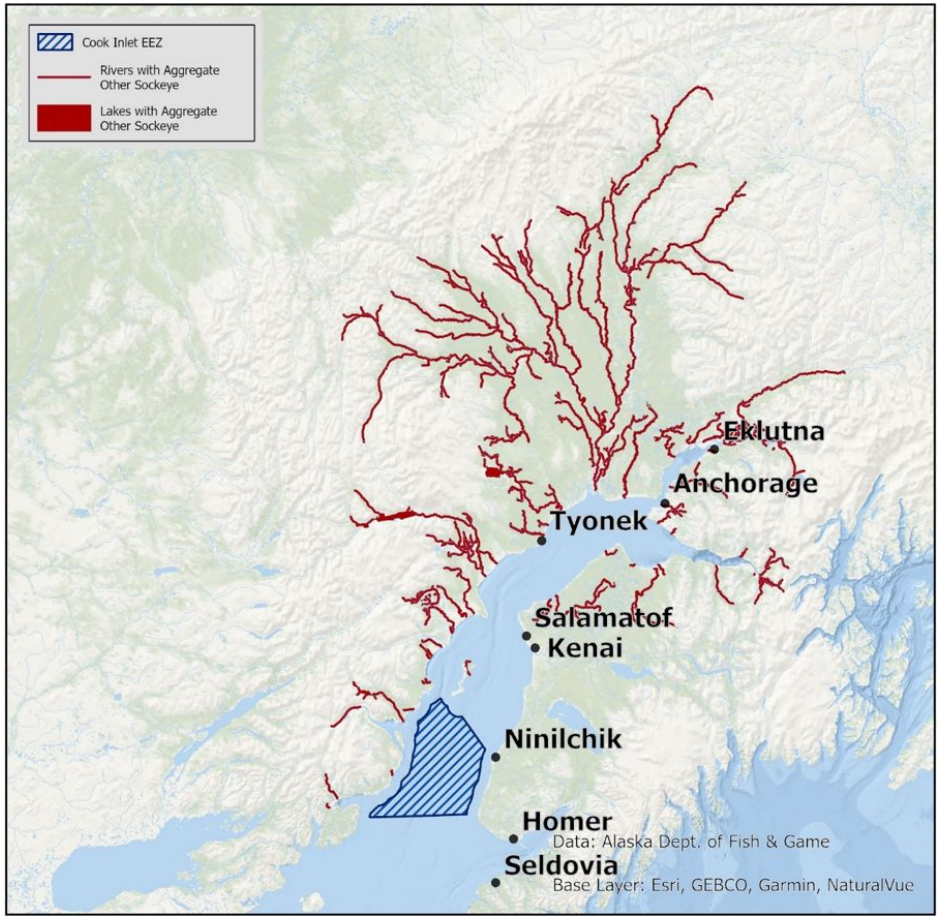






AGGREGATE "Other" SOCKEYE SALMON (AOSOCK) STOCK SUMMARY (Section 7.4)

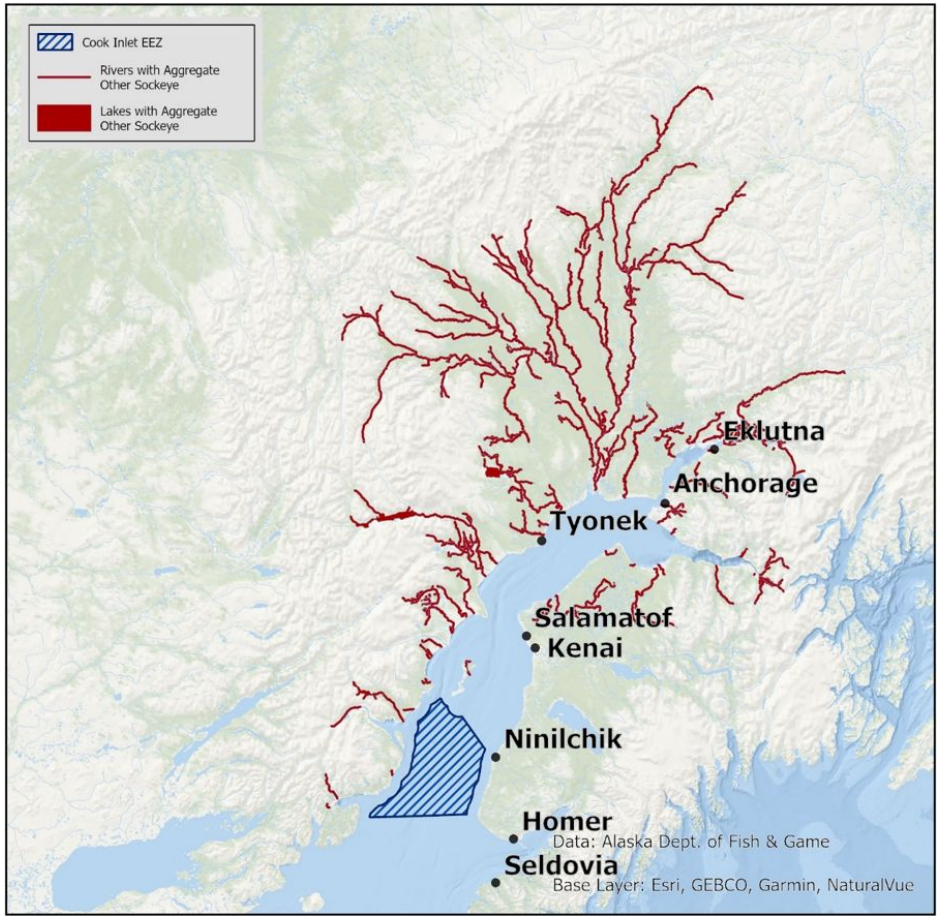
- Not overfished:
  - Cumulative Escapement (529K) >> MSST (163K)
- No overfishing in 2024:
  - Cumulative Harvest (463K) << OFL (1.271M)



AGGREGATE "Other" SOCKEYE SALMON (AOSOCK) 2025 TIER 3 ABC/ACL RECOMMENDATIONS (Section 7.4)

Recommendations:

- Tier……3
- MSST……..163,000
- OFL…….……906,757 fish
- OFL_{PRE}……181,351 fish
- Buffer……15%
- ABC ……..……154,148 fish
- ACL = ABC
- 2025 State forecast estimates: ~1.01M for total run size



AGGREGATE "Other" SOCKEYE SALMON (AOSOCK) TIER 3 ABC/ACL RECOMMENDATIONS (Section 7.4; Table 17)

Buffer justification (15%)

- Buffer range 10 - 90% (low concern - high concern)
- Indicator stocks have met escapement targets in recent years.
  - 2024: No Survey (NS) Chelatna or Judd Lk.
- Total run size likely comparable to KASOCK based on State publication (~1.01M for 2025)
- Buffer accounts for uncertainty in ensuring that OFL_{PRE} is not exceeded

	Chelatna Lk.		Judd Lk.		Larson Lk.		Fish Ck.			
Year	L.B	Esc.	L.B.	Esc.	L.B	Esc.	L.B.	Esc.	Sum of L.B.	Sum Esc.
2020	20	NS	15	31	15	**12**	15	64	65	108[a]
2021	20	NS	15	49	15	22	15	99	65	171[a]
2022	20	NS	15	38	15	17	15	59	65	115[a]
2023	20	NS	15	**NS**	15	38	15	45	65	83[a,b]
2024	20	NS	15	NS	15	16	15	38	65	54[a,b]

***Bolded** values indicate escapements below the lower bound of the goal.

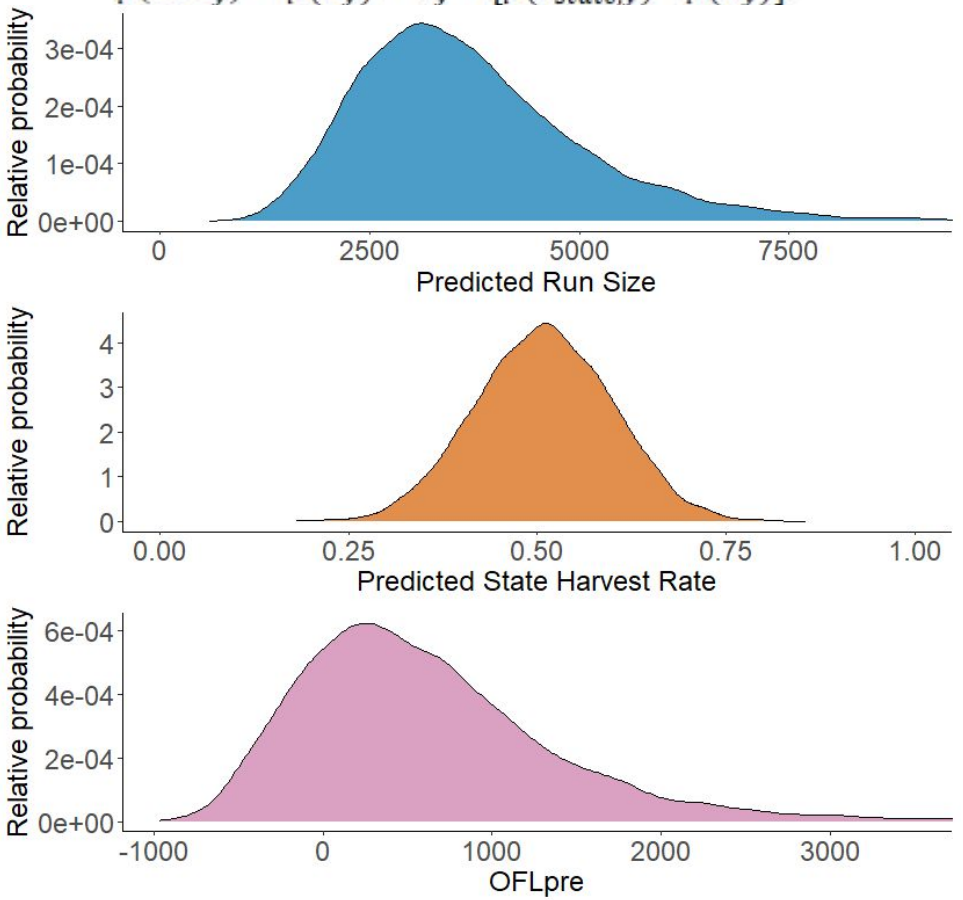
2025 Summary of Key SSC Recommendations

- **Continue development of Bayesian methods for tier-1 stock assessment methodology**
- Expanded/continued ASL and GSI sampling of salmon caught in the EEZ fishery incorporation of in-season information, offshore test fishery
- Expanded information, consideration of socioeconomic factor, impacts of newly created federal fishery
- Default buffer for tier-3 stocks → *e.g.*, 25%, consistent with tier-6 crab and groundfish stocks, adjusted from here on case-by-case basis
- Consideration of how to deal with missing data in determining status determination criteria
- Further development of risk tables

TIER 1 BAYESIAN OFL MODEL
Appendix B

- Similar to current Tier 1 method
  - AR1 model for forecast
  - White noise model (KNSOCK) or MA (KASOCK) to project State harvest rate
  - However, arima function picks optimal model for each retro year when calculating the buffer. Bayesian model would use same models for each retro year
- Benefits:
  - Results in a distribution of probable OFL values that account for uncertainty in the PF and F_{STATE}.
  - Can make probabilistic statements about potential yield and OFL

$$p(\widehat{OFL}_y) = p(\hat{R}_y) - G_y - [p(\hat{F}_{state,y}) * p(\hat{R}_y)].$$



TIER 1 BAYESIAN OFL MODEL
Appendix B

- How to determine the buffer?
  - Retrospective testing and the probability of overforecasting?
- Buffer
  - Predict OFL for previous ten years
  - Apply a range of buffers (10 - 90%)
  - Look at how many years the resulting ABC is larger than the observed postseason OFL (OFL_{POST})
  - Choose a buffer based on the risk of overforecasting

Buffer (%) $OFL_{PRE} \rightarrow ABC$	$P(ABC>OFL_{POST})$
10	.40
20	.40
30	.40
40	.20
50	.20
60	.20
70	.20
80	.20
90	.10

2025 Summary of Key SSC Recommendations

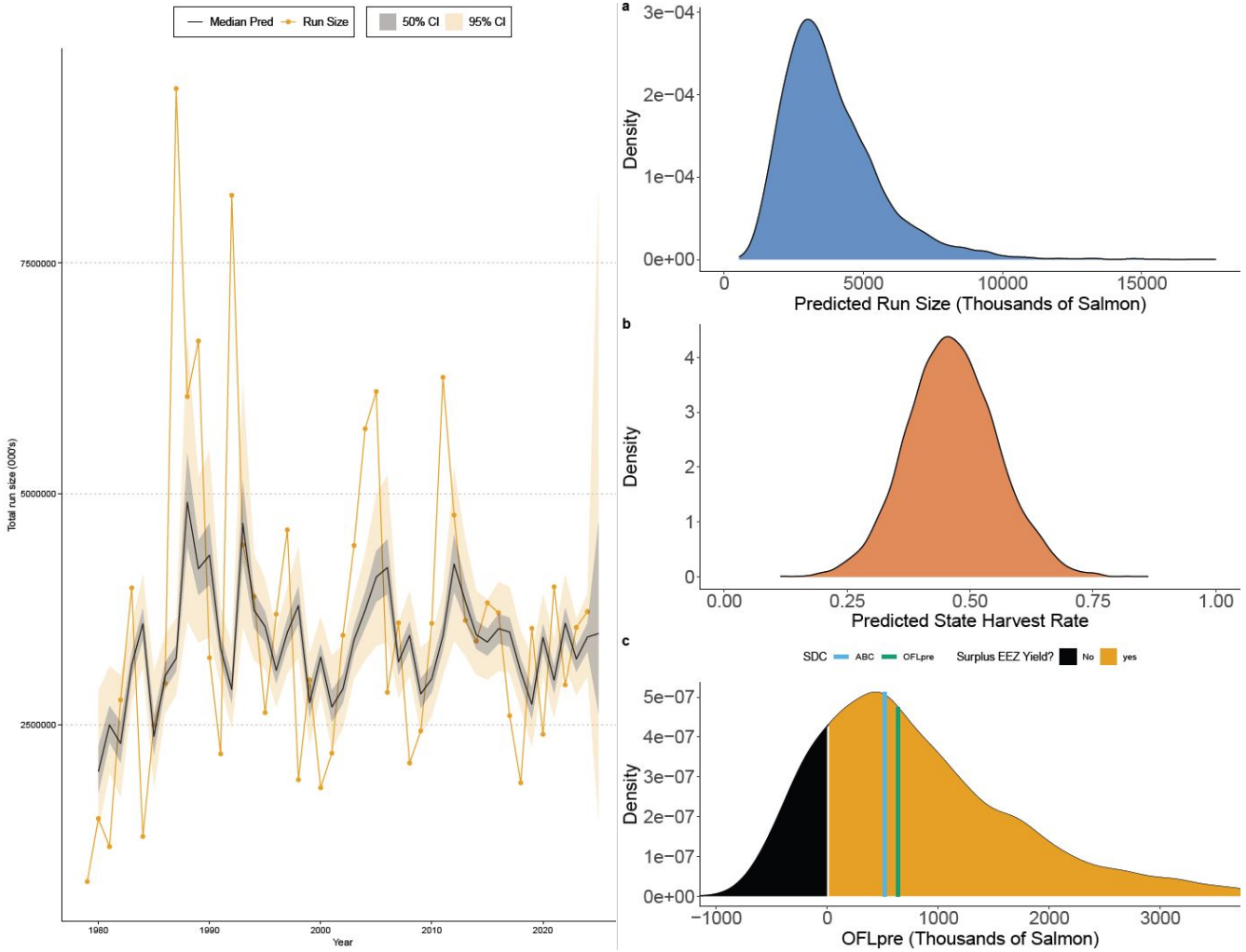
'The SAFE team also provided a Bayesian approach that retrospectively evaluated the probability that an ABC exceeded the post-season OFL under different buffers on the preseason OFL. The SSC appreciates the SAFE team's work on this analysis, and supports further efforts to develop this model, including consideration of a longer time series where available. The SSC further recommends the SAFE team consider whether the ***magnitude of the buffer could be scaled relative to the cumulative probability of a preseason OFL<0 under the posterior distribution for this quantity****, rather than the proportion of years in which the ABC was over forecasted.'*

- *SSC Report, Feb 2025*

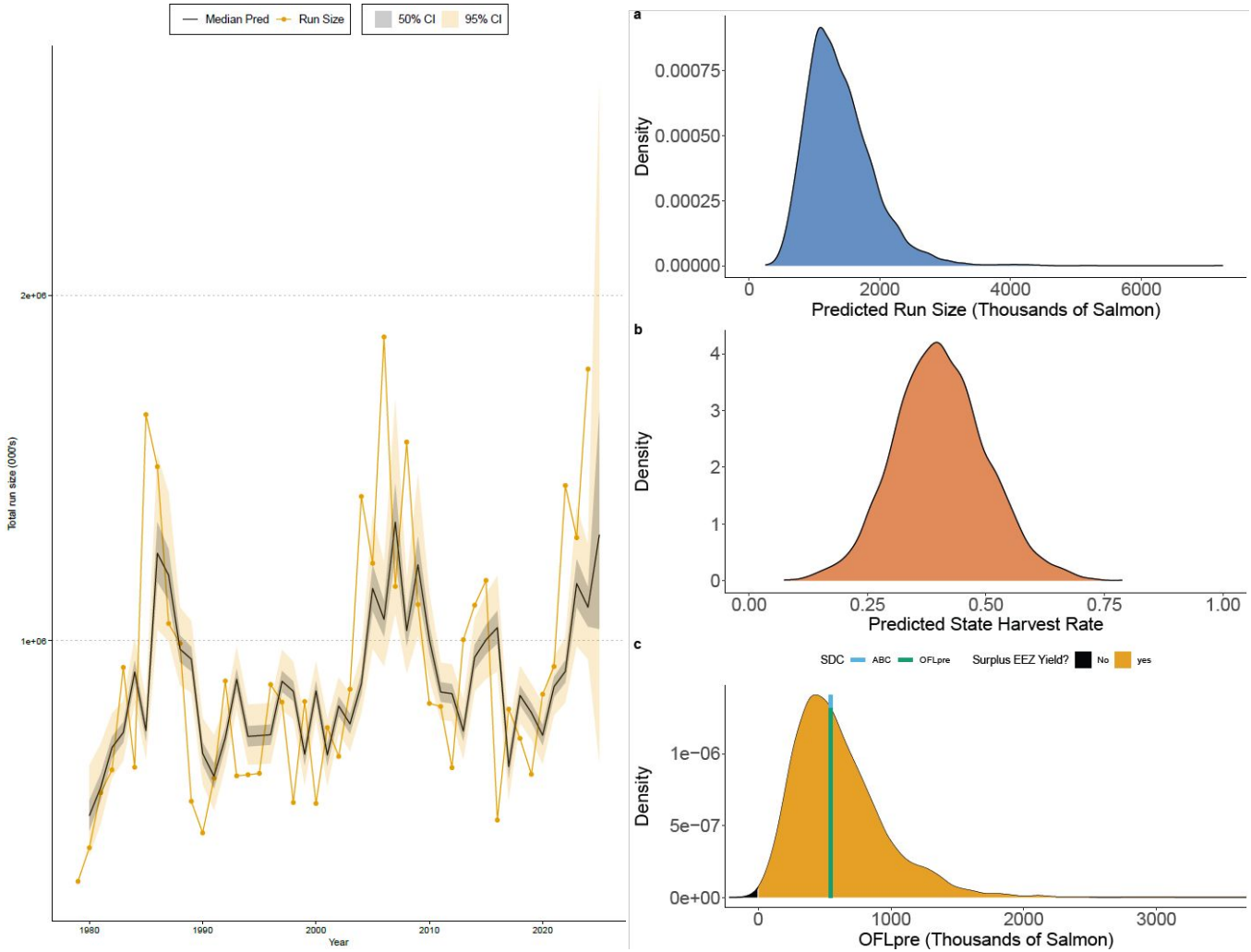
SSC recommendations for advancement of Bayesian approach

- AR1 model for run size forecast
- Posterior predictive distribution of state harvest rate (beta(a,b))
- $p(\widehat{OFL}_y) = p(\hat{R}_y) - G_y - [p(\hat{F}_{state,y}) * p(\hat{R}_y)].$
- OFL-ABC buffer → cumulative probability that preseason OFL ≤ 0

Revised Tier-1 Bayesian approach: 2025 Kenai sockeye



Revised Tier-1 Bayesian approach: 2025 Kasilof sockeye



Revised Tier-1 Bayesian approach: Retrospective evaluation (Kenai)

Year	Run	Esc	C_total	C_EEZ	C_state	F_state	Potential_Yield_EEZ	F_EEZ	MFMT	MSST	Overfished	Overfishing	OFL_post	buffer
1999	2984568	1223311	1761257	67257	1694000	0.5676	78568	NA	NA	NA	NA	NA	NA	0.4422
2000	1814779	633344	1181435	244435	937000	0.5163	0	NA	NA	NA	NA	NA	NA	0.3272
2001	2189670	931267	1258403	28403	1230000	0.5617	0	NA	NA	NA	NA	NA	NA	0.4704
2002	3466762	1396726	2070036	90036	1980000	0.5711	274762	NA	NA	NA	NA	NA	NA	0.422
2003	4439571	1544403	2895168	289168	2606000	0.587	621571	0.04829	0.065	3030000	NO	NO	974901	0.3022
2004	5705141	1975116	3730025	431025	3299000	0.5783	1194141	0.061482	0.119	3030000	NO	NO	2090474	0.2524
2005	6109173	1844263	4264910	666910	3598000	0.589	1299173	0.068714	0.155	3030000	NO	NO	3389647	0.1874
2006	2848597	1203685	1644912	794912	850000	0.2984	786597	0.10067	0.185	3030000	NO	NO	4176244	0.158
2007	3601777	1505027	2096750	232750	1864000	0.5175	525777	0.106357	0.195	3030000	NO	NO	4427259	0.3234
2008	2082431	570275	1512156	358156	1154000	0.5542	0	0.122069	0.187	3030000	NO	NO	3805688	0.2716
2009	2430414	1081808	1348606	94606	1254000	0.516	0	0.125778	0.153	3030000	NO	NO	2611547	0.4048
2010	3596458	1580024	2016434	130434	1886000	0.5244	498458	0.110638	0.124	3030000	NO	NO	1810832	0.3786
2011	6263091	2078416	4184675	342675	3842000	0.6134	1209091	0.06446	0.124	3030000	NO	NO	2233326	0.2652
2012	4769681	1650760	3118921	775921	2343000	0.4912	1214681	0.088903	0.153	3030000	NO	NO	2922230	0.1546
2013	3628121	1077014	2551107	586107	1965000	0.5416	451121	0.093279	0.163	3030000	NO	NO	3373351	0.1892
2014	3404034	1353153	2050881	368881	1682000	0.4941	510034	0.101749	0.179	3030000	NO	NO	3883385	0.2514
2015	3819016	1304403	2514613	333613	2181000	0.5711	426016	0.109998	0.174	3030000	NO	NO	3810943	0.2698
2016	3711842	1087327	2624515	430515	2194000	0.5911	305842	0.129058	0.15	3030000	NO	NO	2907694	0.2376
2017	2595720	843641	1752079	415079	1337000	0.5151	46720	0.12438	0.101	3030000	NO	YES	1739733	0.236
2018	1867998	1031026	836972	198972	638000	0.3415	17998	0.113456	0.085	3030000	NO	YES	1306610	0.3322
2019	3542442	1671885	1870557	37557	1833000	0.5174	497442	0.09112	0.083	3030000	NO	YES	1294018	0.4548
2020	2394018	1305345	1088673	350673	738000	0.3083	444018	0.10153	0.093	3030000	NO	YES	1312020	0.2514
2021	3992341	2111536	1880805	150805	1730000	0.4333	1050341	0.080117	0.143	3030000	NO	NO	2056519	0.3576
2022	2929479	1104481	1824998	431998	1393000	0.4755	324479	0.07945	0.159	3030000	NO	NO	2334278	0.226
2023	3552933	2013961	1538972	232972	1306000	0.3676	1034933	0.073365	0.204	3030000	NO	NO	3351213	0.302
2024	3724000	1401149	2322851	342851	1980000	0.5317	532000	0.090961	0.204	3030000	NO	NO	3385771	0.2468

1) Retrospectively apply Bayesian tier-1 forecast + buffer approach from 1999-2024
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3) Run size, State harvest fixed at true historical values
4) Escapement = Run - (state harvest + EEZ catch)
5) Determine frequency of overfished/overfishing designation

Revised Tier-1 Bayesian approach: Retrospective evaluation (Kasilof)

Year	Run	Esc	C_total	C_EEZ	C_state	F_state	Potential_Yield_EEZ	F_EEZ	MFMT	MSST	Overfished	Overfishing	OFL_post	buffer
1999	824071	345544	478527	75014	403513	0.4897	198558	NA	NA	NA	NA	NA	NA	0.2148
2000	528846	166777	362069	154489	207580	0.3925	99266	NA	NA	NA	NA	NA	NA	0.1022
2001	748493	322430	426063	74321	351742	0.4699	174751	NA	NA	NA	NA	NA	NA	0.2154
2002	665026	177918	487108	131594	355514	0.5346	87512	NA	NA	NA	NA	NA	NA	0.1216
2003	859551	312265	547286	116129	431157	0.5016	206394	0.152109	0.211	555000	NO	NO	766481	0.1348
2004	1417988	525584	892404	155622	736782	0.5196	459206	0.149803	0.243	555000	NO	NO	1027129	0.0956
2005	1224551	150543	1074008	278327	795681	0.6498	206870	0.153794	0.231	555000	NO	NO	1134733	0.0426
2006	1879917	187418.4	1692499	263242	1E+06	0.7603	228660	0.156261	0.197	555000	NO	NO	1188642	0.04
2007	1157209	115466.7	1041742	442359	599383	0.518	335826	0.192023	0.22	555000	NO	NO	1436956	0.0154
2008	1575445	221297.8	1354147	266166	1E+06	0.6906	265464	0.193755	0.206	555000	NO	NO	1496026	0.0438
2009	1104972	25321.41	1079651	387957	691694	0.626	191278	0.235959	0.177	555000	NO	YES	1228098	0.0202
2010	818623	106036.5	712587	262147	450440	0.5502	146183	0.248138	0.179	555000	NO	YES	1167412	0.038
2011	809736	143042.4	666694	177620	489074	0.604	98662	0.281056	0.19	555000	NO	YES	1037414	0.0824
2012	632426	262390.2	370036	177147	192889	0.305	217537	0.257232	0.186	555000	NO	YES	919125.3	0.0834
2013	1003071	425961	577110	114579	462531	0.4611	318540	0.256236	0.223	555000	NO	YES	972201.6	0.1424
2014	1102934	278751.6	824182	235731	588451	0.5335	292483	0.221495	0.246	555000	NO	NO	1073406	0.0462
2015	1174899	220173.8	954725	268125	686600	0.5844	266299	0.206053	0.253	555000	NO	NO	1193521	0.0348
2016	480774	0	526882	286988	239894	0.499	18880	0.246369	0.253	555000	NO	NO	1113738	0.0348
2017	801901	327559	474342	70277	404065	0.5039	175836	0.213802	0.235	555000	NO	NO	1072037	0.2204
2018	717164	245818.4	471346	172406	298940	0.4168	196224	0.24161	0.222	555000	NO	YES	949721.3	0.0904
2019	613252	238517.7	374734	144615	230119	0.3752	161133	0.248789	0.216	555000	NO	YES	818371.4	0.103
2020	845000	432047.2	412953	115923	297030	0.3515	325970	0.22851	0.254	555000	NO	NO	878042.8	0.1396
2021	925474	352810.7	572663	185340	387323	0.4185	316151	0.176428	0.301	555000	NO	NO	1175314	0.0676
2022	1449662	810004	639658	207981	431677	0.2978	795985	0.181575	0.395	555000	NO	NO	1795463	0.0596
2023	1298588	682738	615850	320950	294900	0.2271	781688	0.189948	0.464	555000	NO	NO	2380927	0.0272
2024	1787000	828413	958587	297640	660947	0.3699	904053	0.178859	0.495	555000	NO	NO	3123847	0.027

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Revised Tier-1 Bayesian approach: Retrospective evaluation

- Note: retrospective analyses do not account for link between escapement size and future production, other feedbacks → possible to incorporate these in future analyses
- Bayesian tier-1 approach avoided overfished designation in all years, but overfishing occurred in several years for both tier-1 stocks
  - Note: postseason evaluation based on lower bound resulted in zero years of overfishing for Kenai, and only ~ ½ as many for Kasilof → suggests that incongruence of state and federal management targets at least partially responsible for these events
- Alternative ways to formulate a buffer?
  - 1) Specific quantiles? → *e.g.* P* approach
  - 2) Hybrid approach?

2025 Summary of Key SSC Recommendations

- Continue development of Bayesian methods for tier-1 stock assessment methodology
- **Expanded/continued ASL and GSI sampling of salmon caught in the EEZ fishery incorporation of in-season information, offshore test fishery**
- Expanded information, consideration of socioeconomic factor, impacts of newly created federal fishery
- Default buffer for tier-3 stocks → *e.g.*, 25%, consistent with tier-6 crab and groundfish stocks, adjusted from here on case-by-case basis
- Consideration of how to deal with missing data in determining status determination criteria
- Further development of risk tables

2025 Summary of Key SSC Recommendations

'The SSC also discussed the need for continued research and data collection, especially ***genetics and age-sex-length data of the salmon harvested in the EEZ fishery.*** *Priorities include* ***genetic sampling of sockeye to identify the stock structure and timing of the different sockeye runs in the EEZ fishery, and Chinook sampling to assess the importance of Kenai large late run Chinook in EEZ fishery****, and to evaluate the prevalence of non-Cook Inlet Chinook in the fishery. Given the number of Chinook salmon reported to be harvested, it would be reasonable to obtain a census sample from the fishery. The SSC acknowledges the value of* ***in-season information*** *that could be provided by a* ***test fishery****, as noted during public testimony. A test fishery could help characterize the timing, magnitude, and distribution of returning salmon, as well as support* ***stock composition estimates if in-season genetic stock composition analysis are feasible****.'*

- *SSC Report, Feb 2025*

2025 Summary of Key SSC Recommendations

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2025 Summary of Key SSC Recommendations

'The SSC looks forward to the SAFE incorporating a summary of scientific information on the most recent ***social and economic condition of the relevant fishing interests, fishing communities, and the fish processing industries.*** *The SSC recognizes the capacity challenges facing the analysts in the absence of a plan team. However, it is important in the context of NS8 to capture the differential distribution of impacts associated with the change to federal management in the early years, especially if there are substantial changes in patterns of engagement or dependency for fishing communities, fishery sectors, and/or fishery support sectors. It is difficult in general to capture information on correlation or causation of changes seen in retrospect, especially with respect to those who exit the fishery. Further, it is important to* ***capture changes in participation across commercial, sport, personal use, and subsistence fisheries, as well as the potential for new or returning entrants****, including those represented in evolving Tribal fishery initiatives.'*

- *SSC Report, Feb 2025*

2025 Summary of Key SSC Recommendations

- Environmental assessment includes economic and community considerations, information on:
  - Harvest and participation, price, ex-vessel value
  - State and federal waters catch comparison, value, permits/participation
  - Community distribution/impacts
- Possible to include some or all of this information in future SAFE reports?

2025 Summary of Key SSC Recommendations

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2025 Summary of Key SSC Recommendations

*'Overall, the **SSC is concerned that a 15% default buffer does not adequately recognize the severe limitations of basing harvest specifications on historical catch statistics**. These specifications do not respond to changes in the stock abundance due to varying environment conditions, and their relationship to sustainable yield is highly uncertain. In some cases, there is no adequate basis for determining overfished status. These limitations are the same as for Tier 6 groundfish, implying that the default 25% buffer to obtain the ABC for these stocks would be applicable to Tier 3 salmon stocks to maintain a consistent approach to uncertainty across FMPs. **The SSC therefore requests the SAFE team adopt a default 25% buffer for developing harvest recommendations next year.** Departures from the 25% buffer (both higher and lower) should be justified based on specific issues for each aggregate stock complex such as data availability and quality.'*

- SSC Report, Feb 2025

2025 Summary of Key SSC Recommendations

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- Further development of risk tables

2025 Summary of Key SSC Recommendations

'The SAFE team requested input from the SSC on how to treat overfished determinations with missing or incomplete weir data. The SSC recommends that the calculation of the cumulative escapement goal ***omit the indicator goal in years when the index is missing or incomplete****. For example, when a weir count is missing, the escapement goal for that site in that year is not counted towards the cumulative escapement target over a generation.'*

- SSC Report, Feb 2025

2025 Summary of Key SSC Recommendations

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- **Further development of risk tables**

2025 Summary of Key SSC Recommendations

'The SSC appreciates the draft risk table for the aggregate coho salmon complex. While the risk table served to highlight the serious concerns regarding the status of Cook Inlet coho, the scoring was elevated compared to how the risk table has been used for groundfish. ***Attributes that are typical of Tier 3 stocks should not result in an elevated risk score as they are reflected in the default buffer.*** *The SSC looks forward to further refinement of risk tables for the aggregate salmon stocks in the Cook Inlet EEZ.'*

- *SSC Report, Feb 2025*

DRAFT RISK TABLE* (Appendix A): AGGREGATE COHO SALMON STOCK COMPLEX (COHO)

Assessment-related	*Population dynamics*	*Ecosystem*	*Fishery-informed stock*
Level 2 – Increased Concern	**Level 3 – Extreme Concern**	**Level 2 – Increased Concern**	**Level 3 – Extreme Concern**
• Tier 3 Stock uses historical EEZ harvest to set SDC. • EEZ harv. prior to 2024 is estimated, resulting in uncertainty. • Elevated concern.	• Coho life history known. • COHO run size unknown. • Little escapement monitoring. • Indicator systems have incomplete monitoring. • Poor returns in 2023 & 2024.	• Short-lived warmer ocean temps in 2024. • Competition with pink salmon (PWS). • Reduced marine survival in other regions (i.e., SE AK). • Avg prey abund. • PDO in negative trend.	• Size makes them susceptible to gillnet harvest. • Total UCI and CI EEZ harvest were historically low (86% and 96% below 20-year avg.). • However, first year of known EEZ harvest.

***Example taken from assessments for other Federally managed species.**

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***Example taken from assessments for other Federally managed species.**

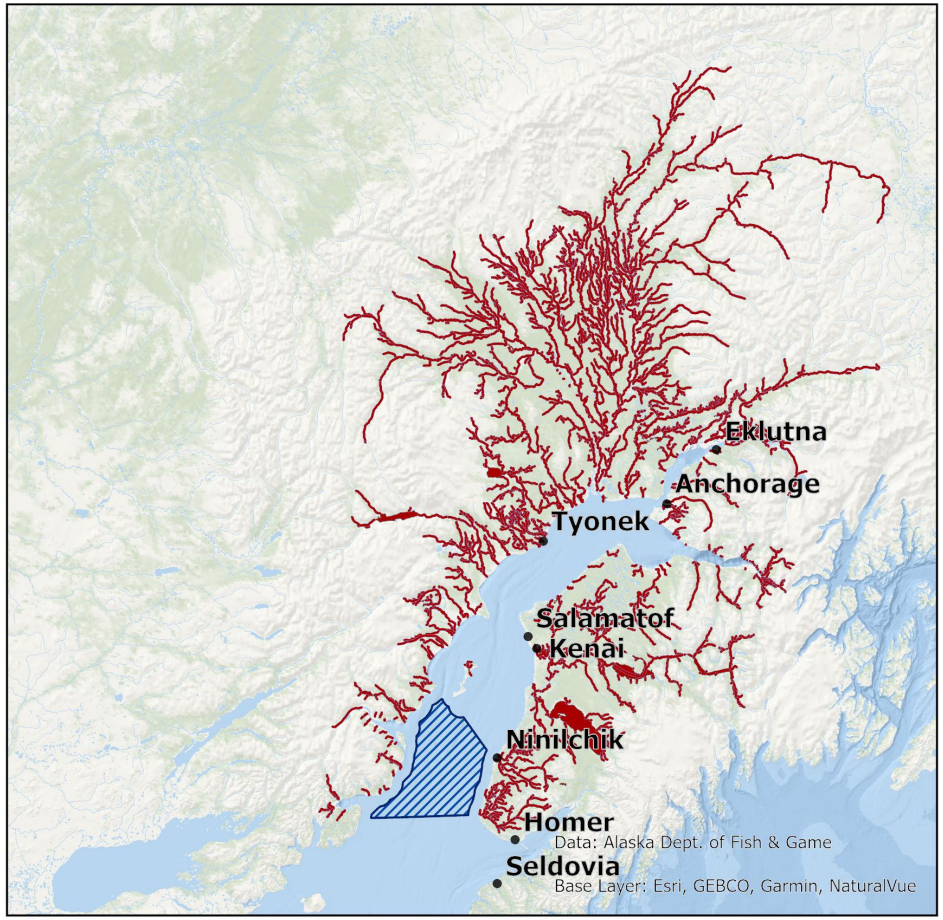
Longer-term areas for continued research

- Exploring incorporation of in-season information (GSI, test fishery) → Bayesian updating approach
- Closed-loop simulations (*e.g.* MSE) →
  - Explore key uncertainties, outcome error, develop robust management procedures
  - Explore tradeoffs between precaution vs. foregone yield in OFL→ ABC buffers
  - Identify risks of data loss, explore countermeasures, prioritize sampling needs
  - Explore management performance across range of uncertainties (e.g. EEZ harvest, stock composition)
  - Balancing mixed stock/'weak stock' management considerations → e.g. sockeye vs. Chinook, coho
  - Economic and social considerations, balancing across diverse user groups

Thank you!


NOAA Fisheries


NOAA Fisheries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Base Layer: Esri, GEBCO, Garmin, NaturalVue


NOAA Fisheries


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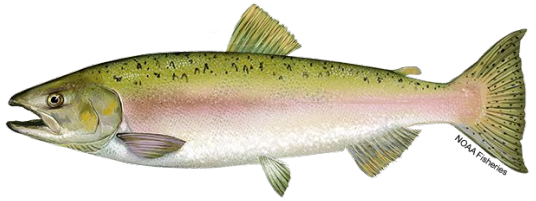
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