

Summary of bycatch genetic analysis, technological improvements, and future directions

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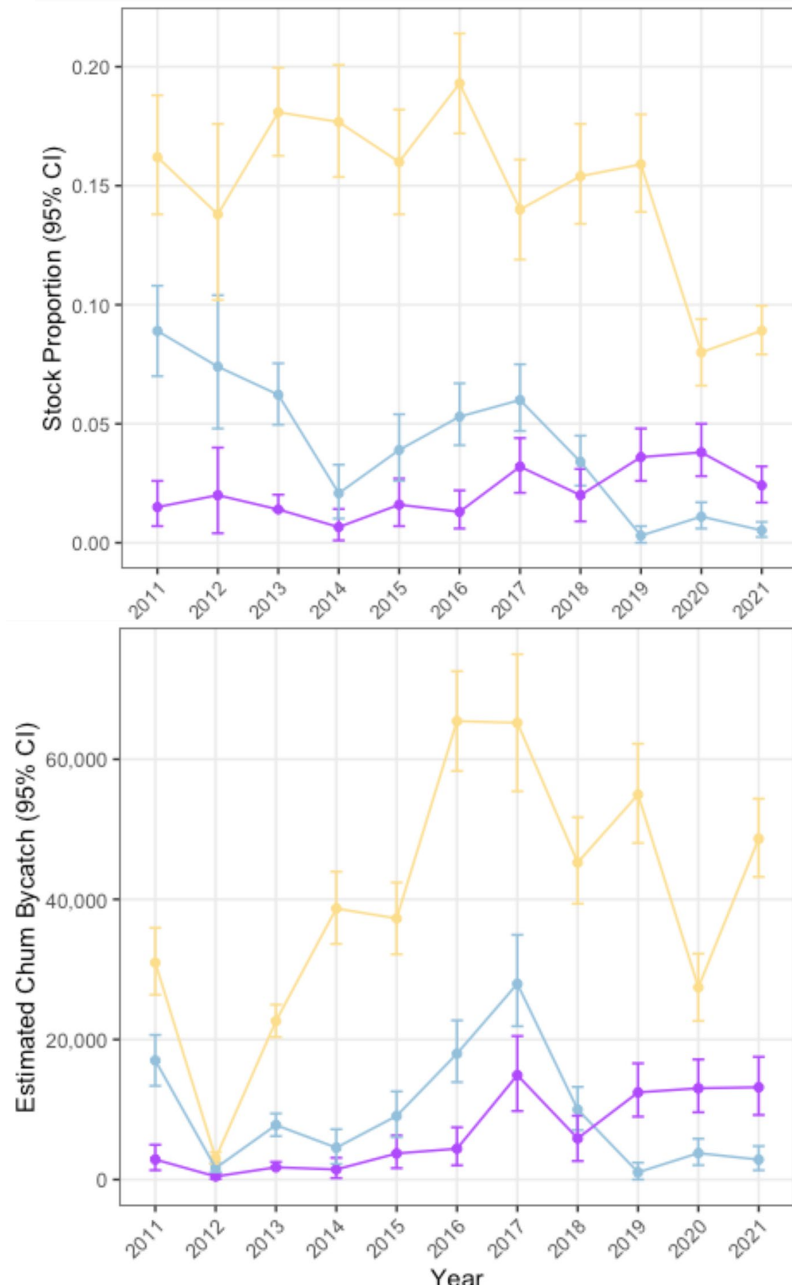
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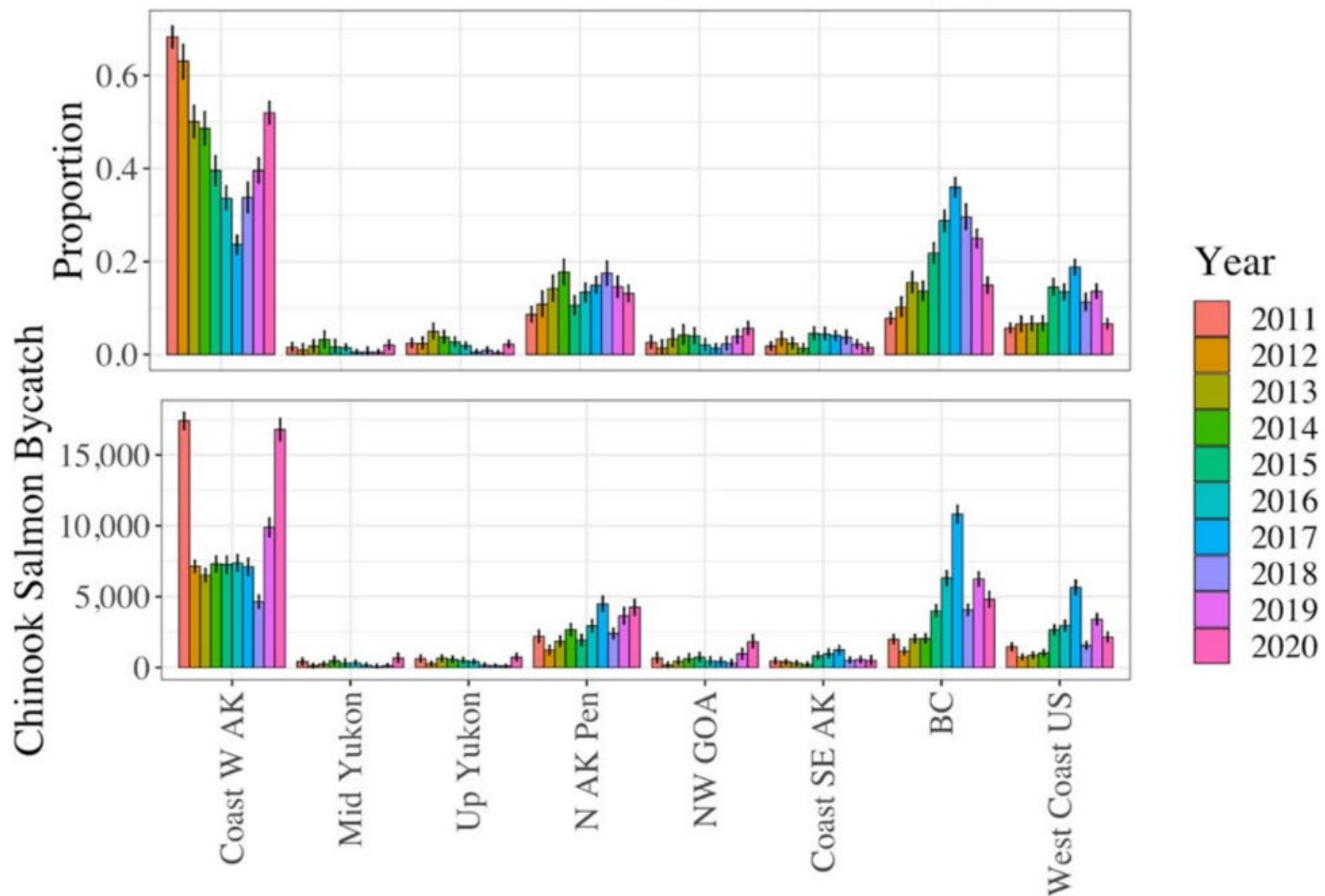
Major takeaways: chum salmon



● W Alaska
● Up/Mid Yukon
● SW Alaska

- Proportion of WAK and Yukon stocks much lower than average over the last two years
- Even with large bycatch in the last two years, catches of WAK and Yukon chum salmon have been below or near average
- Proportions of WAK and Yukon fish do vary across space and time within a year. We are planning to investigate this further with the goal of informing stock-specific avoidance.

Major takeaways: BSAI Chinook salmon



Spike in WAK catches, southern stocks decreasing after 2017 peak

Multiple advancements to improve utility of data

2021 SSC comments

The datasets that have been assembled thus far provide a rich source of information that has the potential to answer a variety of questions about not only stock composition of the bycatch and impacts on salmon stocks at a regional level, but also about what may be driving variation in bycatch rates. They also contain important information for regulatory analyses. However, as noted by the SSC in the past, the linkage between information presented in the reports and PSC management remains unclear. **The SSC reiterates its suggestion that a clear set of management objectives that take full advantage of the data be developed.**

Many pieces must be put in place before more complicated analyses integrating multiple data streams are possible

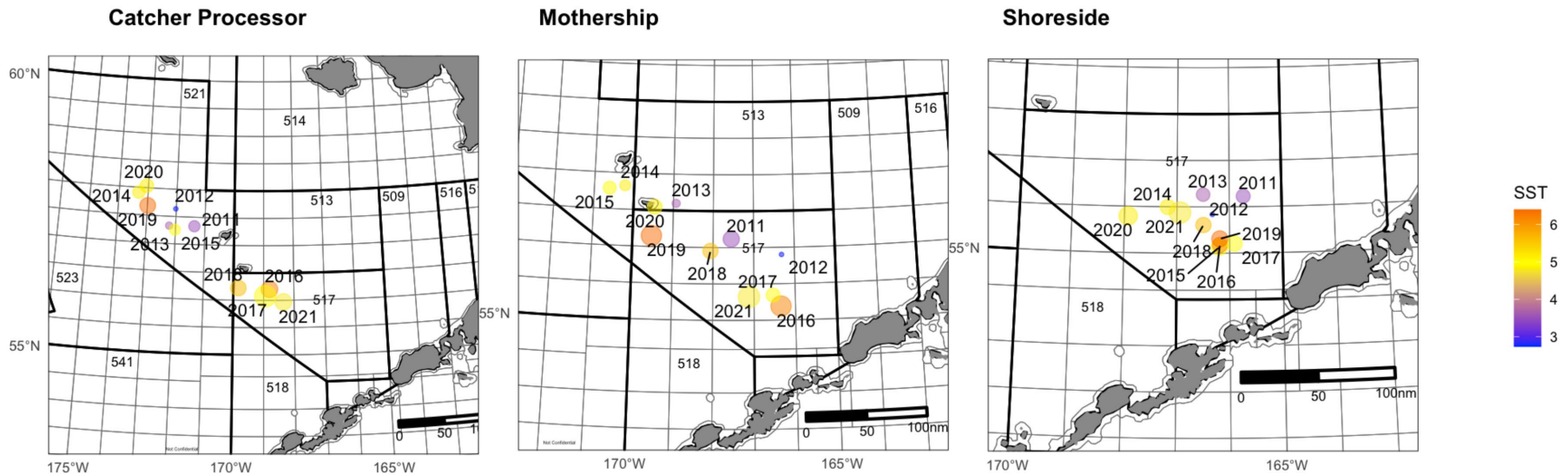
Increased efficiency of data processing and integrated new data

- Worked with AKFIN to develop comprehensive databases for Chinook and chum salmon
- Integrated new GTseq chemistry into laboratory workflow to decrease turnaround time
- Piloting dried DNA for more efficient sampling
- Contracted ADFG to age Chinook and chum salmon, integrated age data into database and updated AEQ analysis
- Developed R-based analytical pipeline with faster stock identification software to facilitate additional analyses and streamline reports

Improvements made possible by technological advances

- Reduced turnaround time for chum estimates by nearly a year, will attempt to do the same for Chinook next year
- Beginning integrative analyses to understand what causes variation in bycatch numbers and stock-specific patterns over time
- Working with industry to integrate stock-specific information into bycatch avoidance strategies

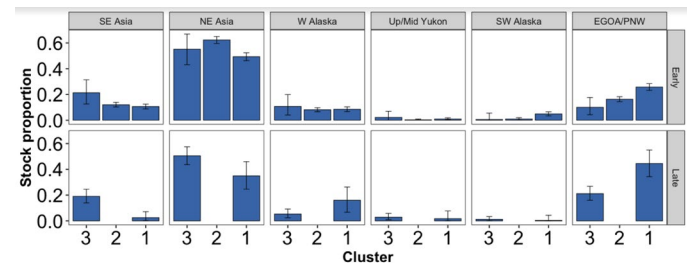
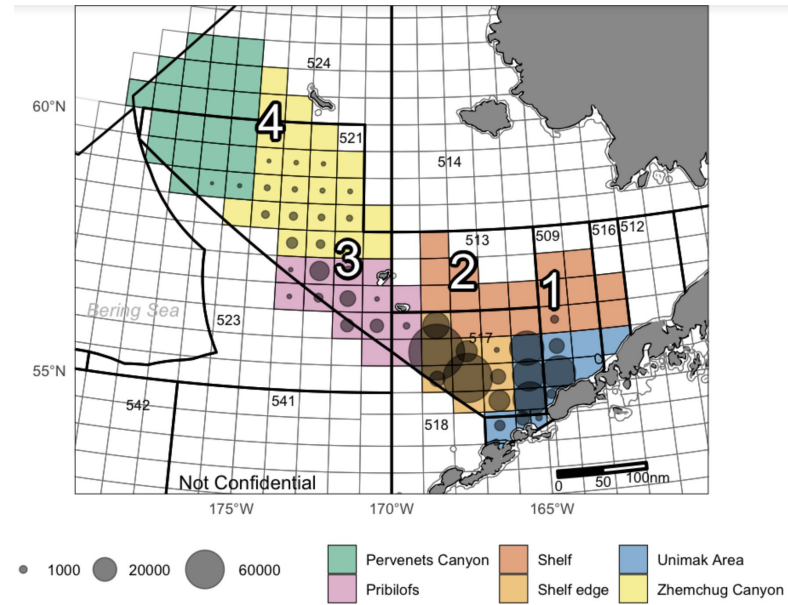
Understanding how environmental conditions influence bycatch location



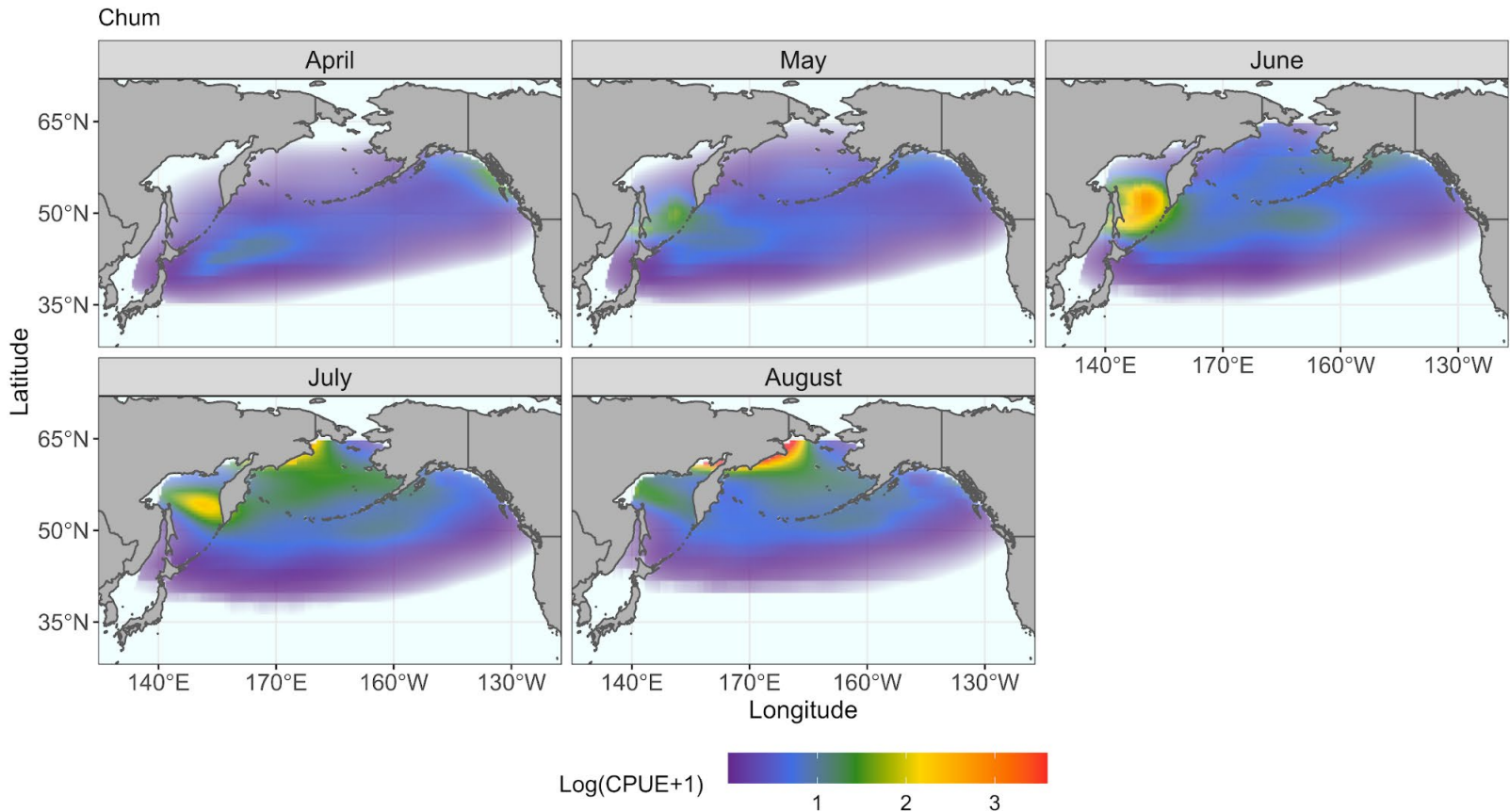
- Sea ice extent and sea surface temperature appear to be correlated with the location of chum bycatch
- Stock compositions change based on the location of bycatch, so understanding relationships like this might allow us to better predict stock compositions for given year

Cooperation with industry to improve stock-specific avoidance

- Meeting with SeaState indicated that our spatial clusters could be refined based on fishing effort
- SeaState defined fishing grounds, we produced estimates in hours (previously would have taken weeks)
- In past SeaState took coarse estimates from nearly two years ago into account when advising fleet, now targeted estimates based on more current data possible
- AFSC will continue coordinating with SeaState to improve stock-specific avoidance



Applied for funding to develop stock-specific models of chum salmon in Bering Sea



If funded, UAF postdoc Joe Langan will work with Dr. Curry Cunningham and AFSC to develop stock-specific models

Summary

- Major effort to modernize workflow is complete, more quantitative and integrative analyses are coming
- We will continue working closely with academic partners and industry to improve utility of estimates for stock-specific avoidance
- Suggestions for new/better ways to use data are welcome