2023 Southeast Alaska Pink Salmon Harvest Forecast

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NOAA FISHERIES
Alaska Fisheries Science Center
Auke Bay Laboratories

Alaska Department of Fish and Game

2022 Purse Seine Task Force Meeting

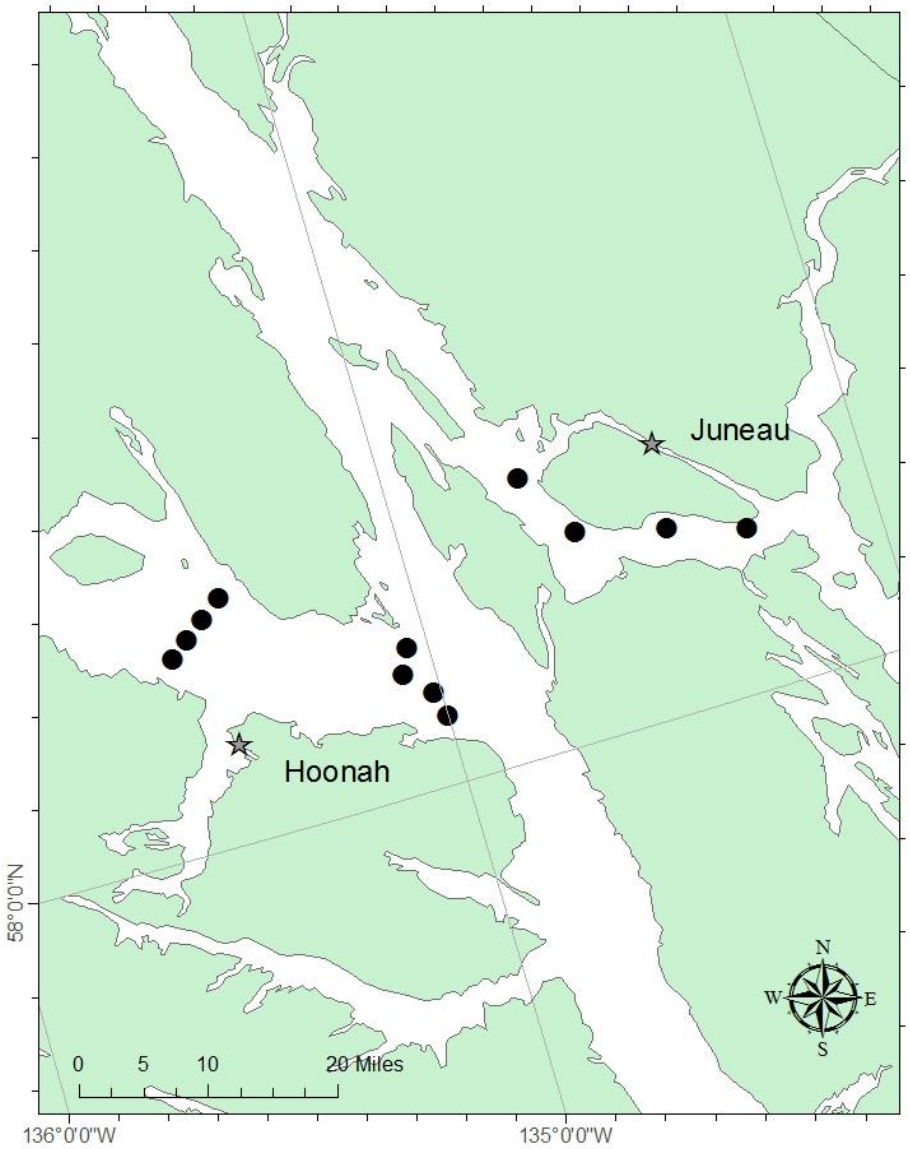
November 30, 2022

Southeast Alaska Coastal Monitoring Research

- Surveys conducted aboard ADF&G Research Vessel Medeia.
- Continued collaboration between NOAA and ADF&G to provide valuable information for the fishing industry.

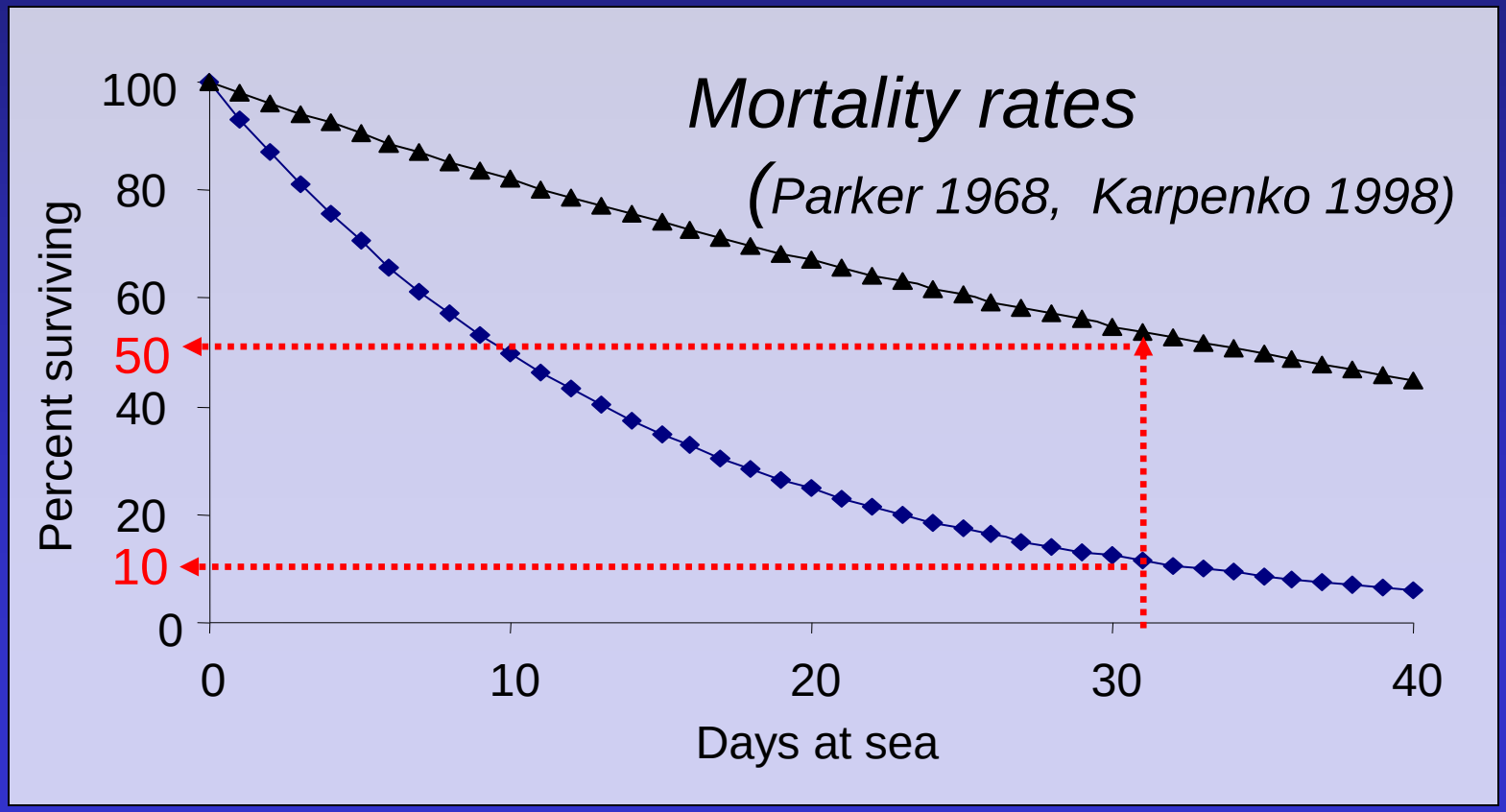
Photo by master photographer Jim Murphy

Southeast Alaska Coastal Monitoring Research



Paradigm of Pink Salmon Biology:

Mortality during early marine life is high, variable, and a major determinant of year class strength



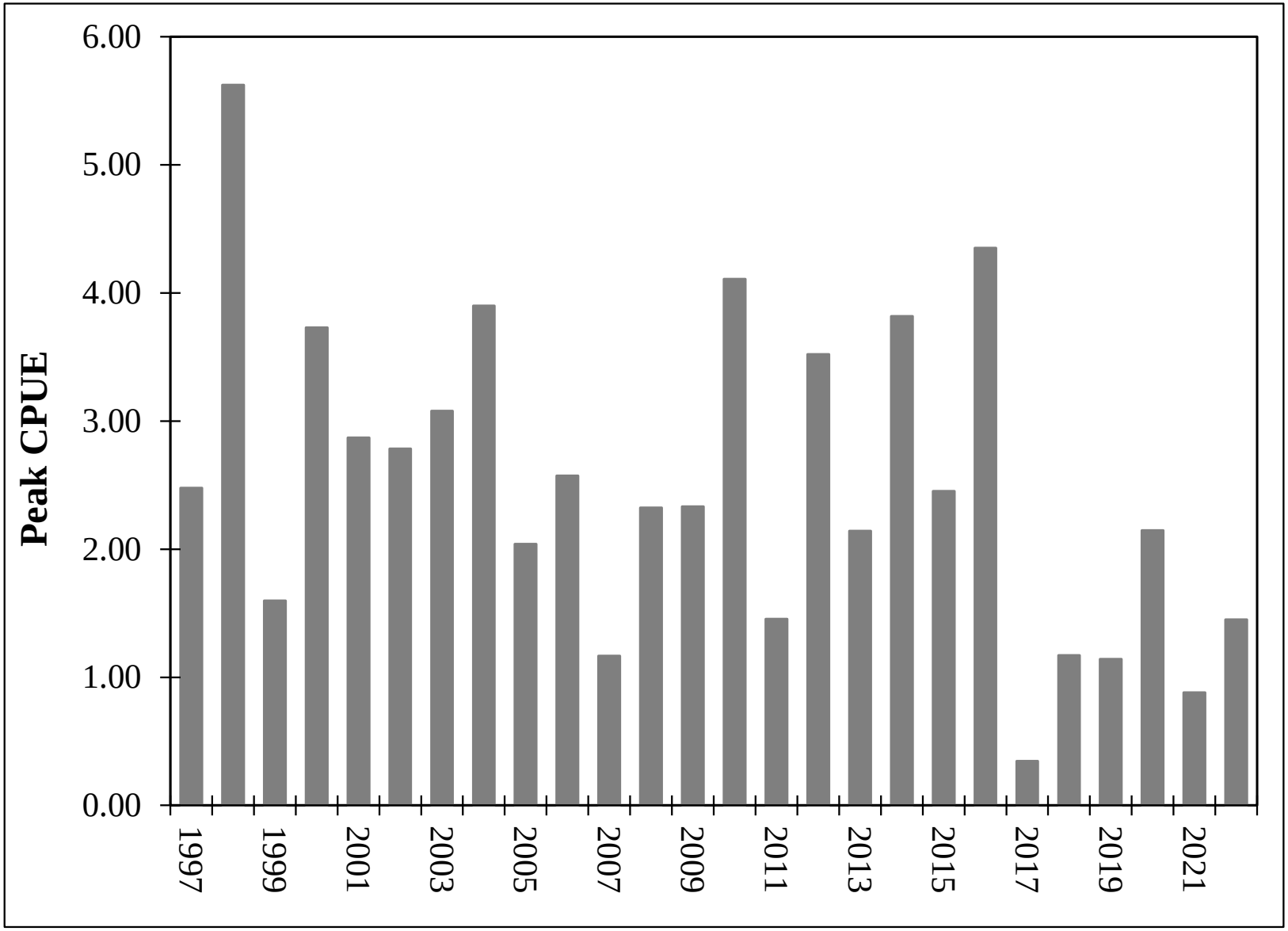
Pink Salmon Harvest Forecast Model Structure

- Peak surface trawl catch rates (CPUE) in June or July.
- Temperature Variable (Icy Strait Temperature Index (ISTI)) or a variety of potential satellite sea surface temperature indices.

Forecast Model Considerations

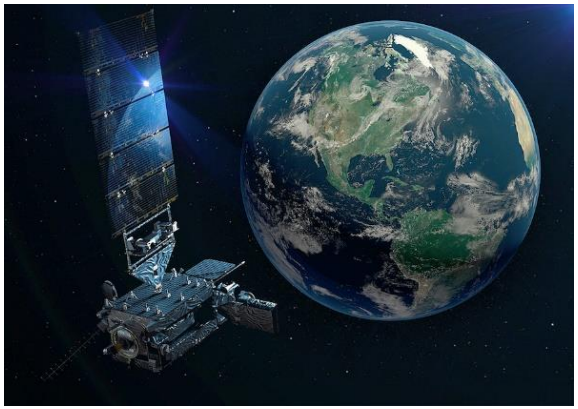
- There are several ways that temperature (ISTI or Satellite sea surface temperature indices) could be important to the forecast model.
  - Survival: reduced survival during warm years. However, growth is higher in warm years, and it seems unlikely that smaller fish have better survival.
  - Migration: Increased movement of SEAK stocks through Icy Strait during warm years.

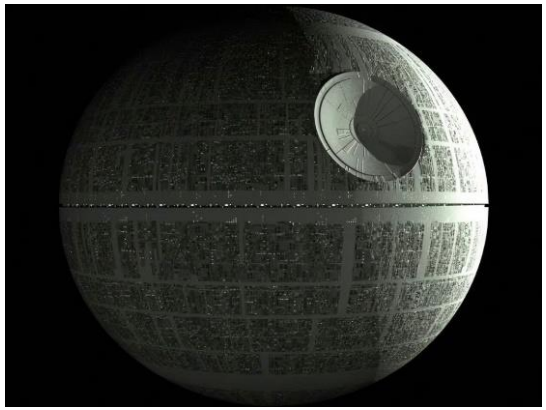
Peak CPUE (calibrated) of Juvenile Pink Salmon



Satellite Sea Surface Temperature Data

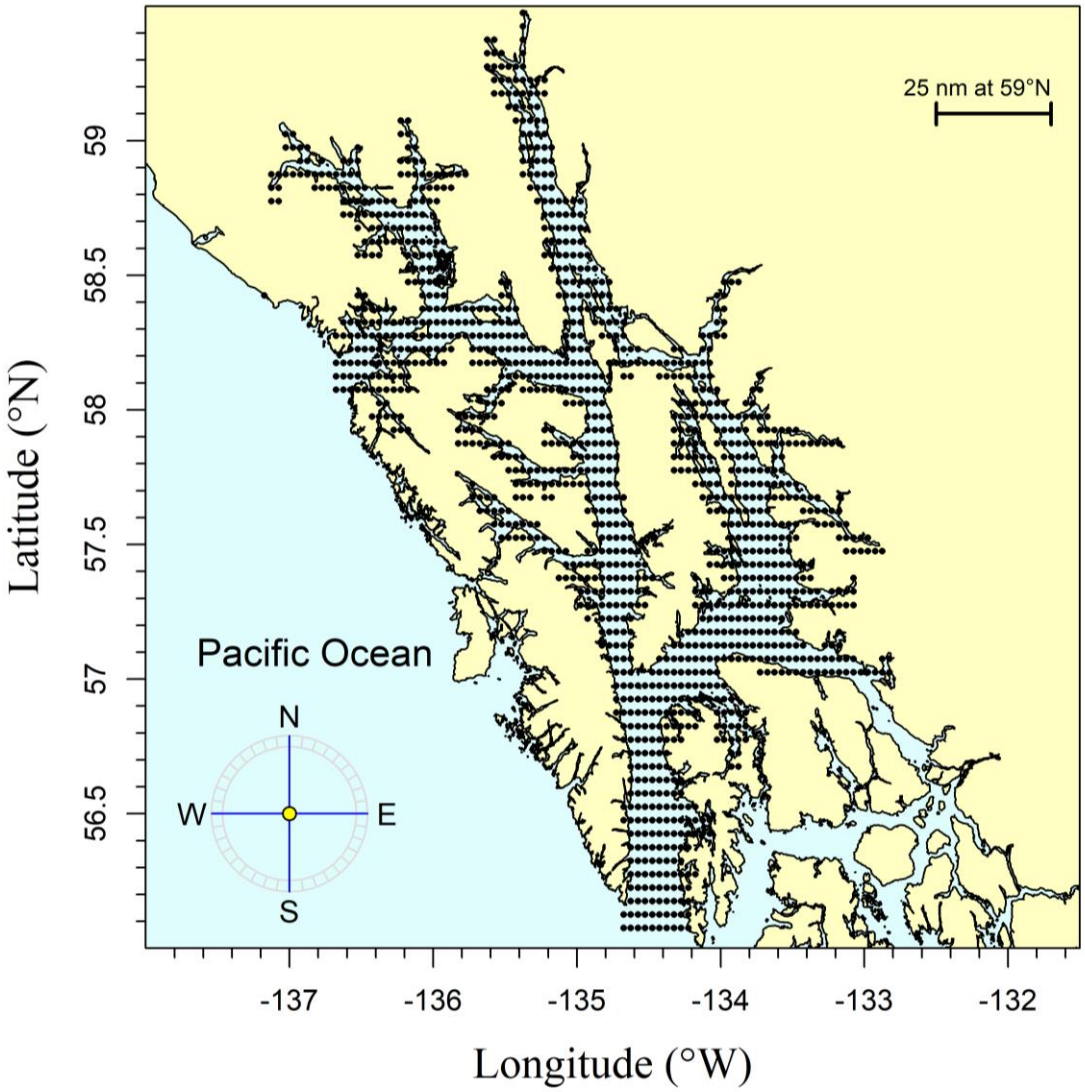
- Compared 17 models incorporating marine water temperature.
- Sixteen models incorporated satellite sea surface temperature data.
- Evaluated models using one step ahead mean absolute percent error for 5- and 10-year periods.
- Best performing models used May satellite derived sea surface temperatures.



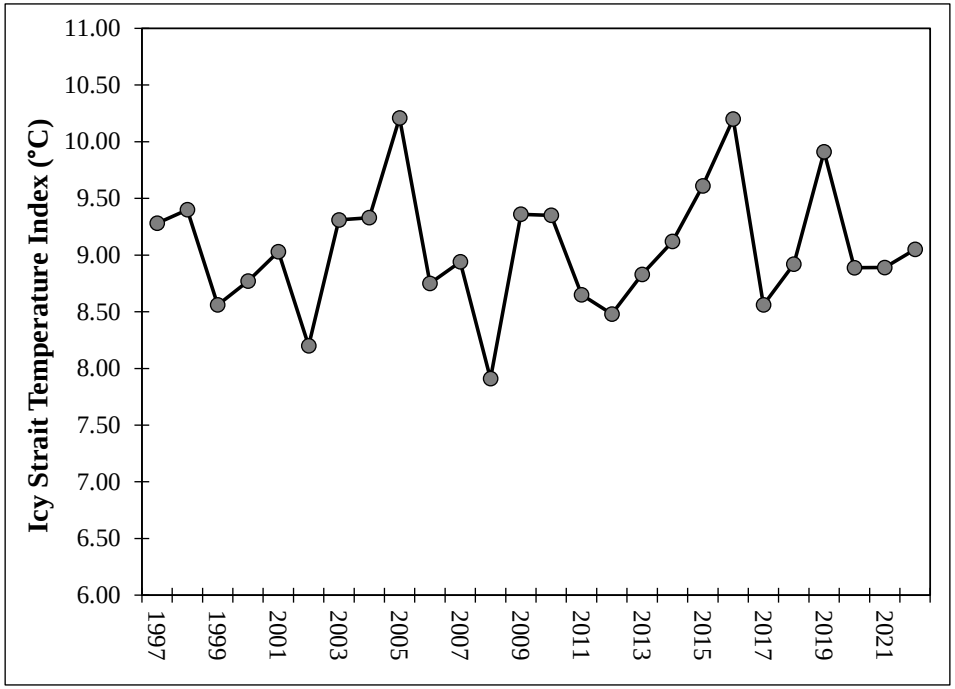


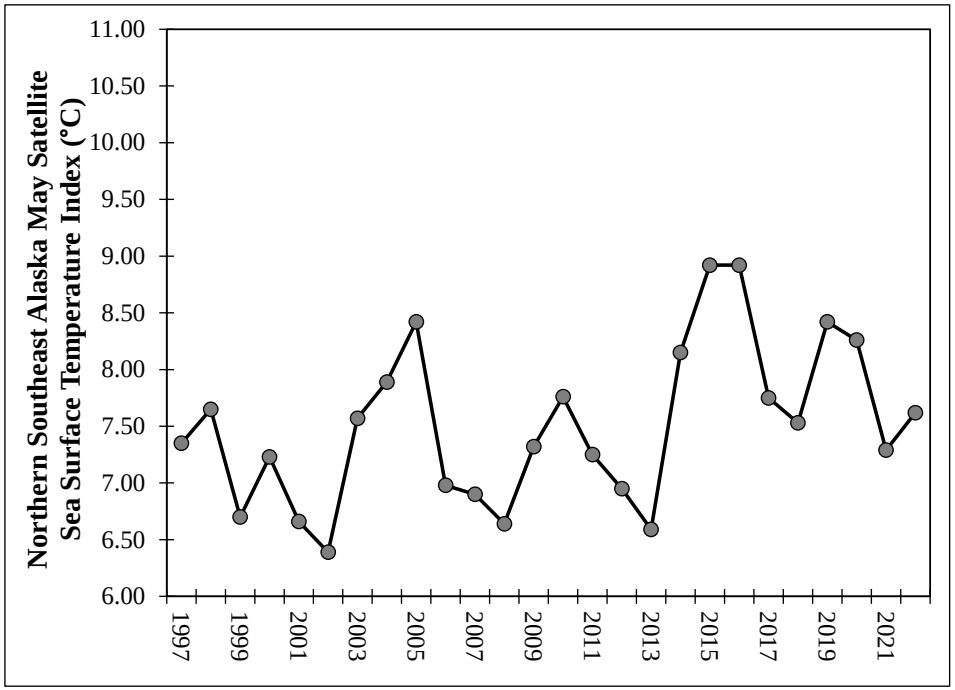
Satellite Sea Surface Temperature Data Points

(Northern Southeast Alaska)

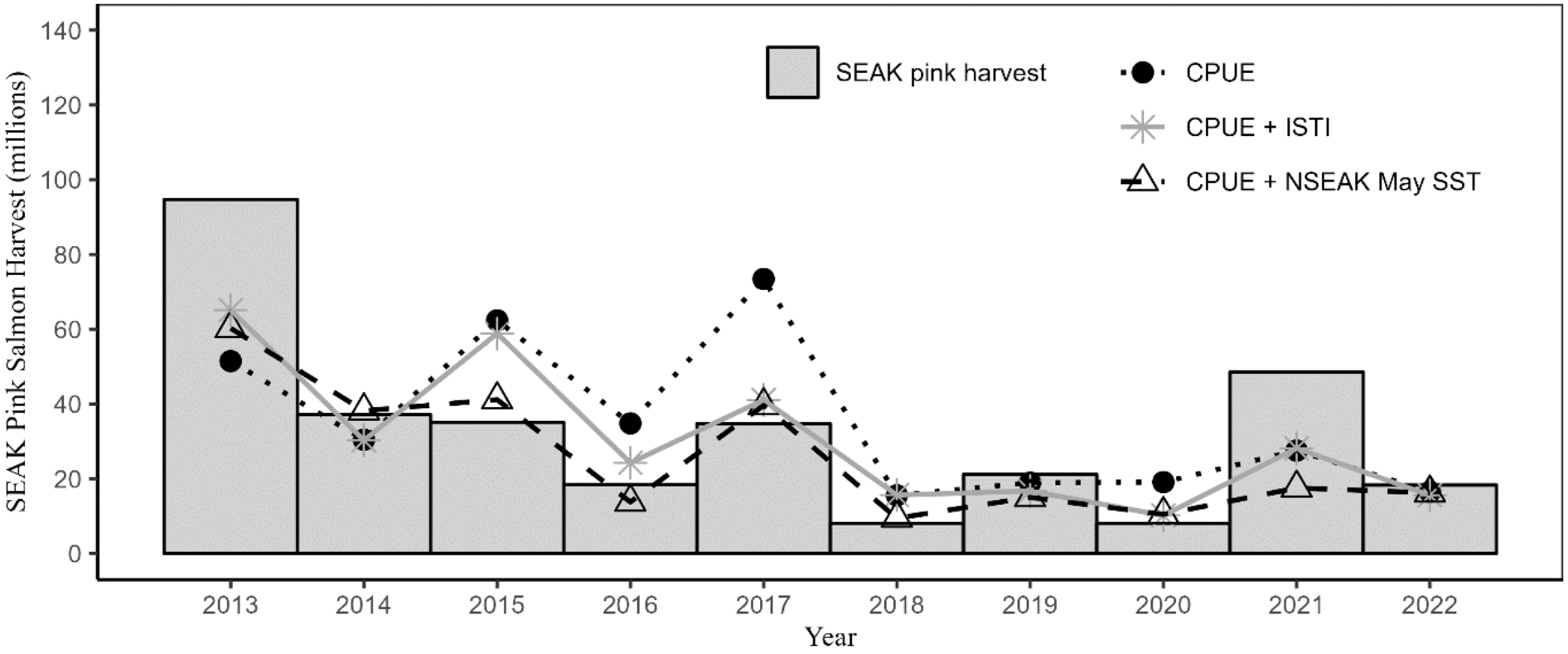


Icy Strait Temperature Index (ISTI; Left) and Northern SEAK Satellite Sea Surface Temperature Index (Right)



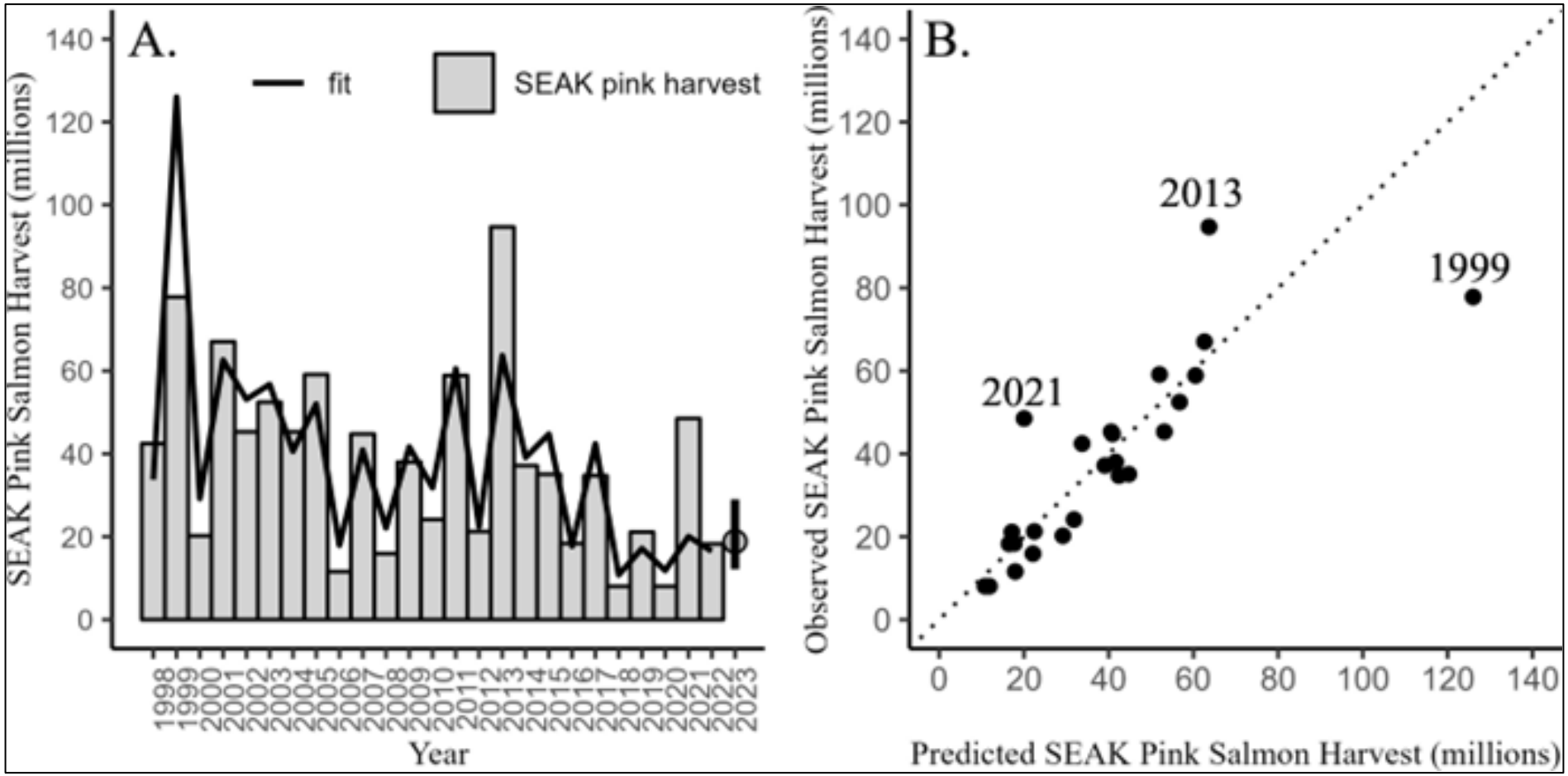


Model Forecast Comparison

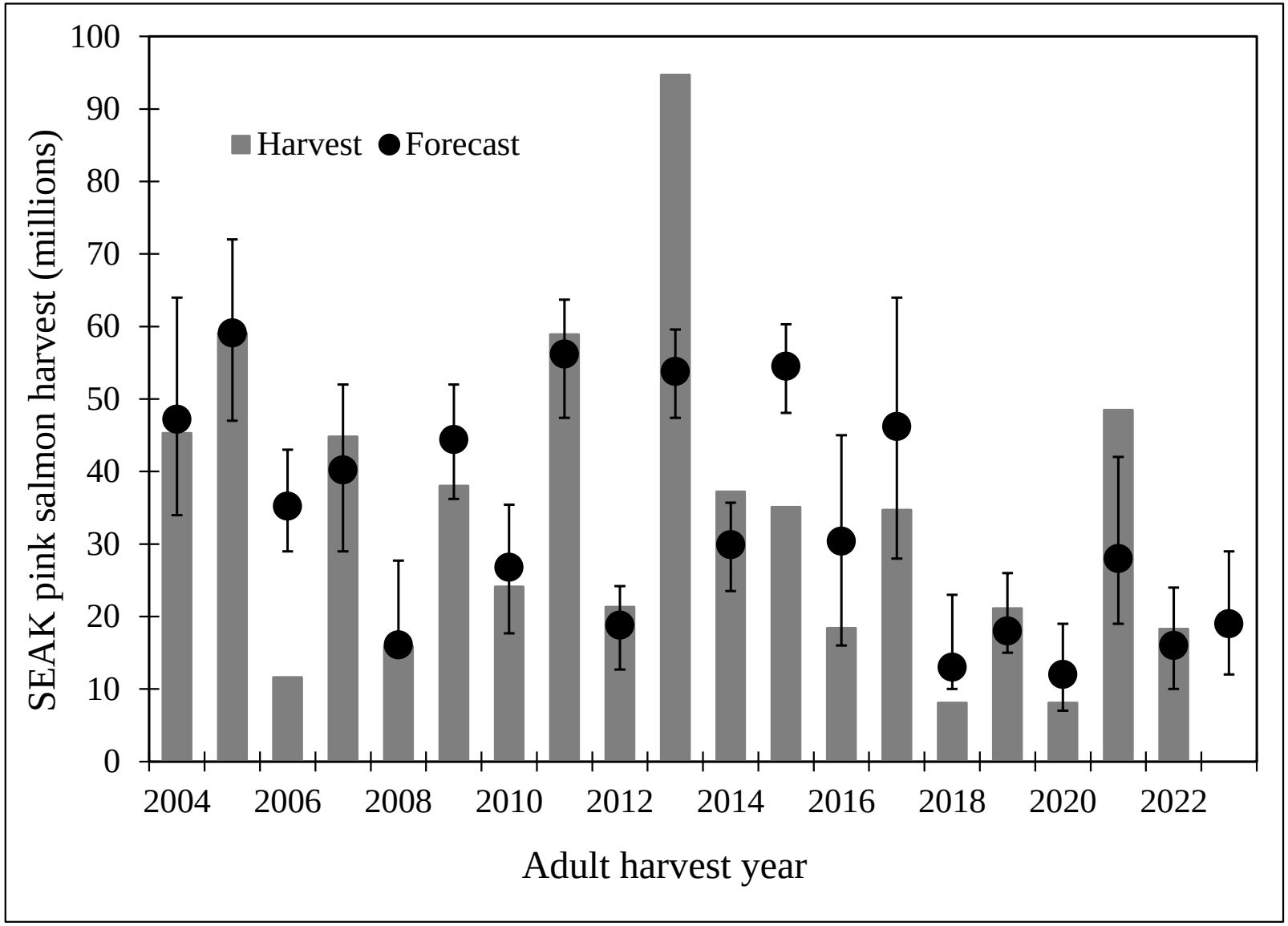


Southeast Alaska Pink Salmon Harvest Forecast Model (Calibrated CPUE + NSE Inside Satellite Sea Surface Temperature)

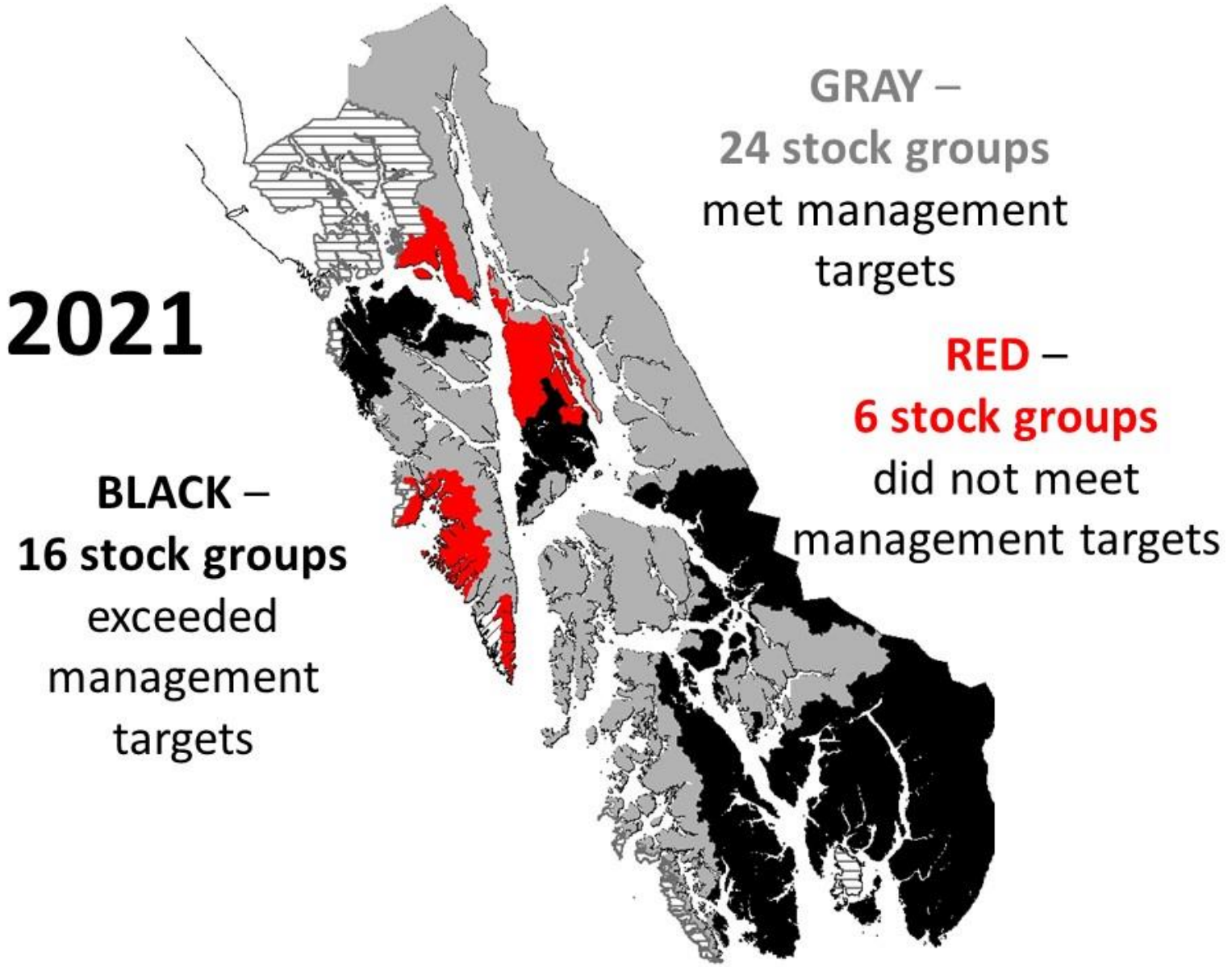
2023 Forecast = 19 million (12-29 million 80% Prediction Interval)



Southeast Alaska Pink Salmon Harvest Forecast Performance



Parent Year Pink Salmon Escapement Performance by Stock Group



Early Winter Major Cold Snap Possibly Contributes to Low Juvenile Abundance?

- Low temperatures at Juneau were in the teens or single digits in all but one day from 12 December 2021 to 9 January 2022, including three days near the end of the cold snap that were more than 20°F below normal (minimum -8°F).
- At Ketchikan, low temperatures were below freezing from 2 December 2021 to 10 January 2022, and new record lows were set in December.
- Cold snap followed by record rainfall in some areas.

Yakutat declares disaster as hazardous winter weather hits Southeast Alaska

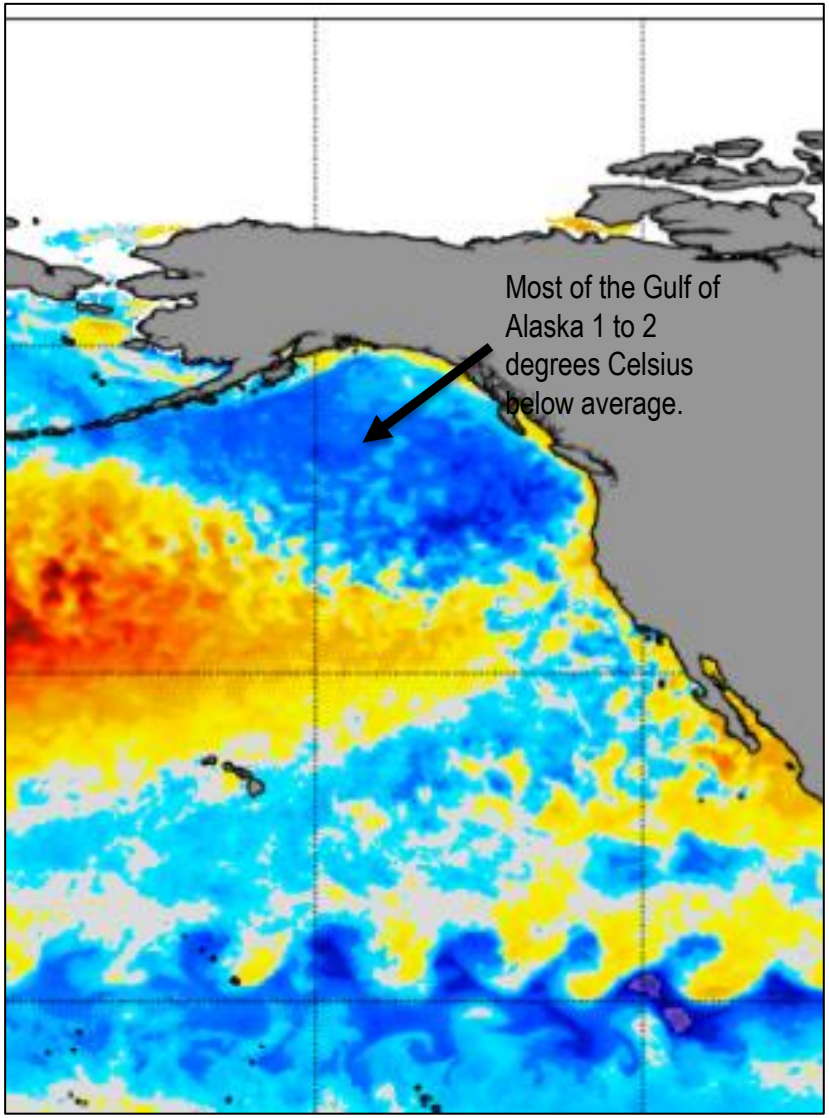
Near-record cold spills into Southeast Alaska

Juneau falls below zero for only the second time since 2009

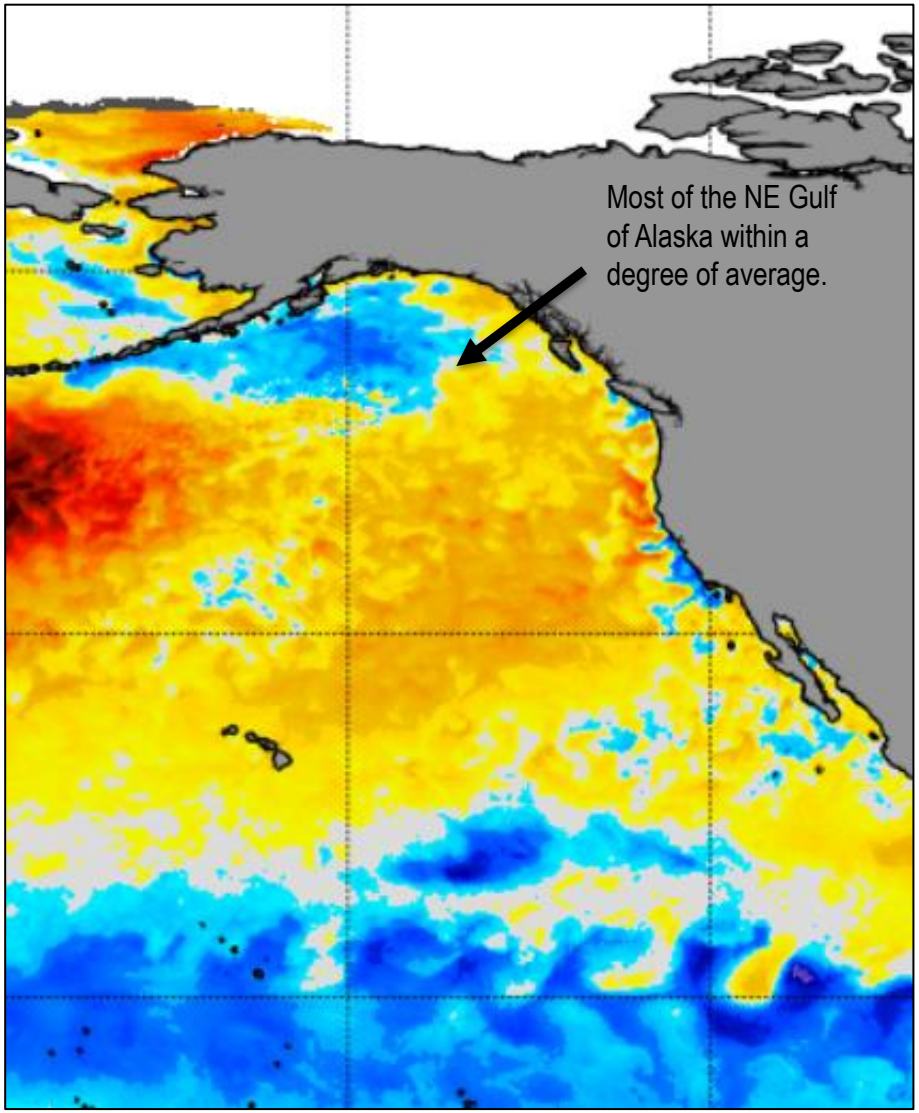
Weather service reports January 2022 as wettest on record for Juneau

North Pacific Sea Surface Temperature

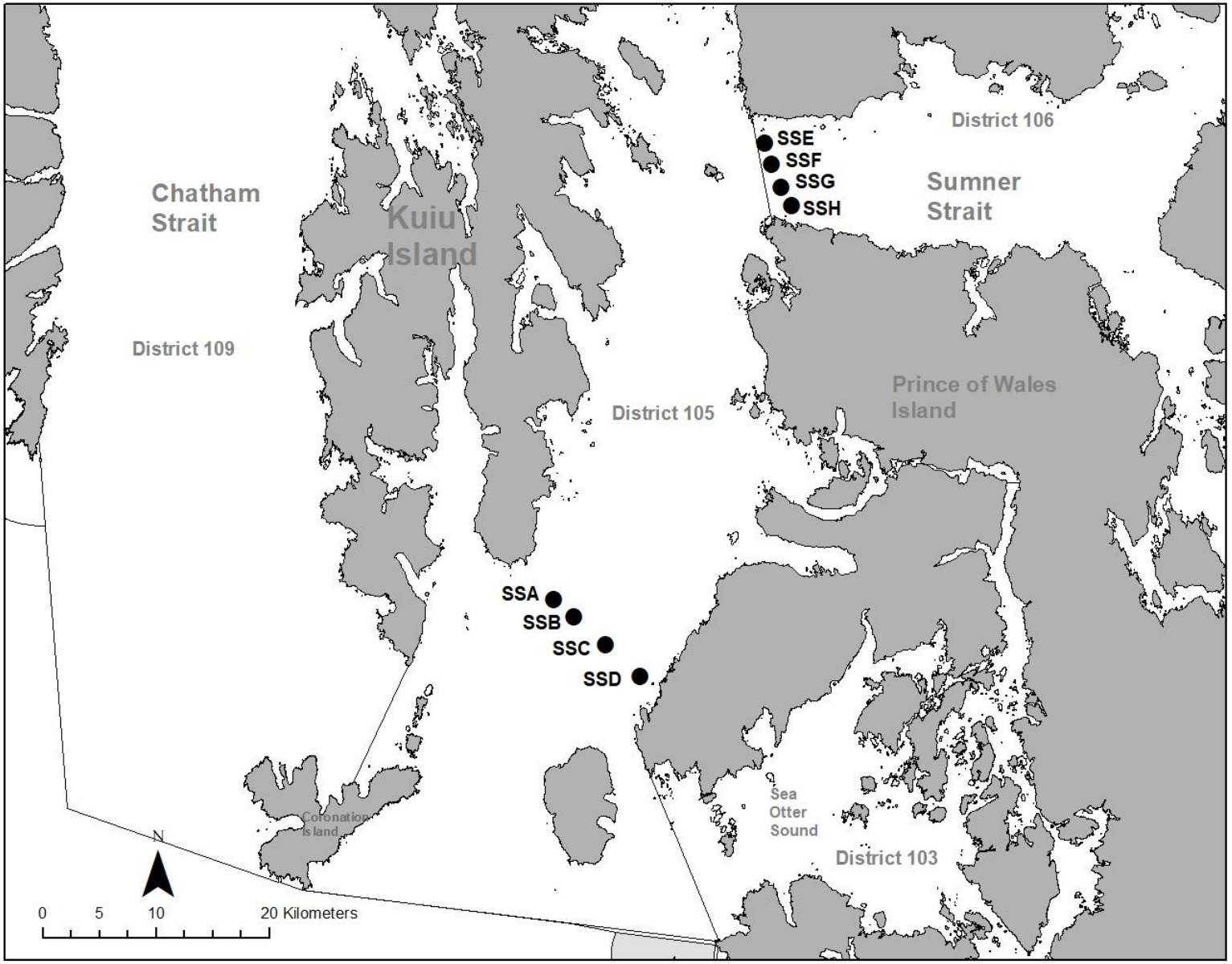
November 2021



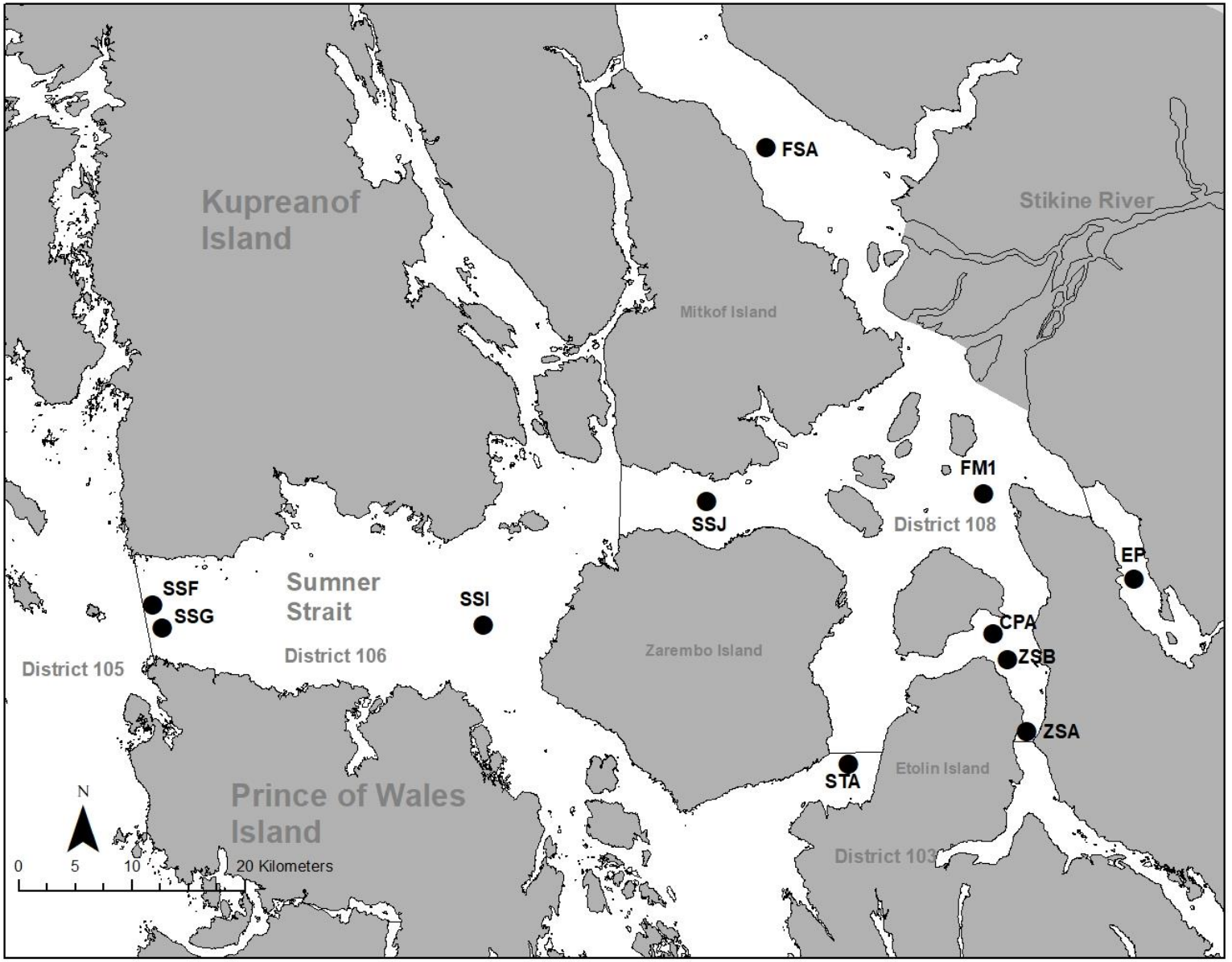
November 2022



Experimental Southern Transects June 2022



Experimental Southern Transects July 2022



2023 SECM Pink Salmon Forecast Summary

- The 2023 Southeast Alaska pink salmon harvest forecast is:
  - **19 million (80% PI = 12 – 29 million).**