

Synthesis: Salmon Distributions in the Pacific

Joe Langan

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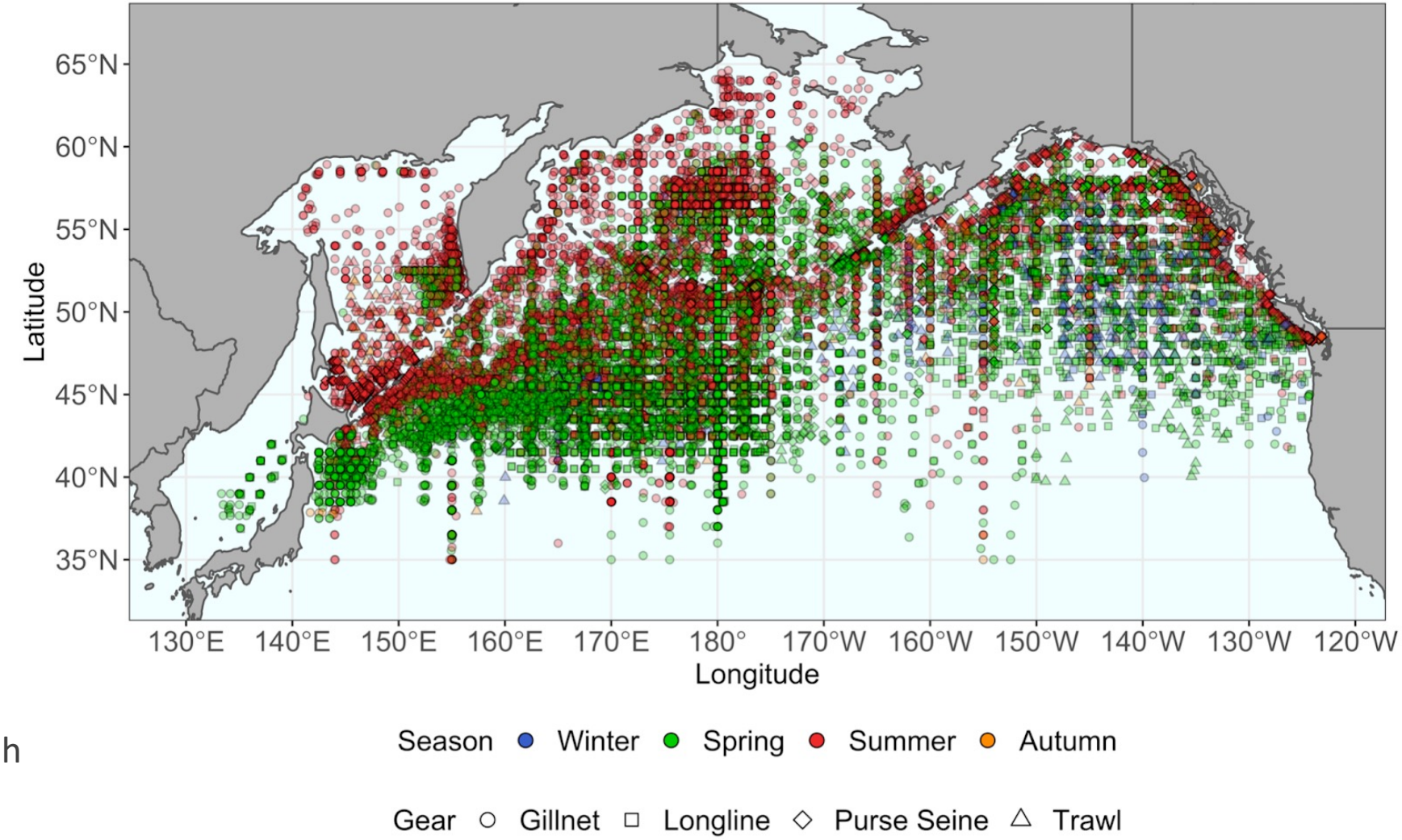
High Seas Catch Data 1953-Present



Data Assembly
Dr. Skip McKinnell

Special Thanks
Dr. Kate Myers
Prof. Sei-Ichi Saitoh
Dr. David Welch

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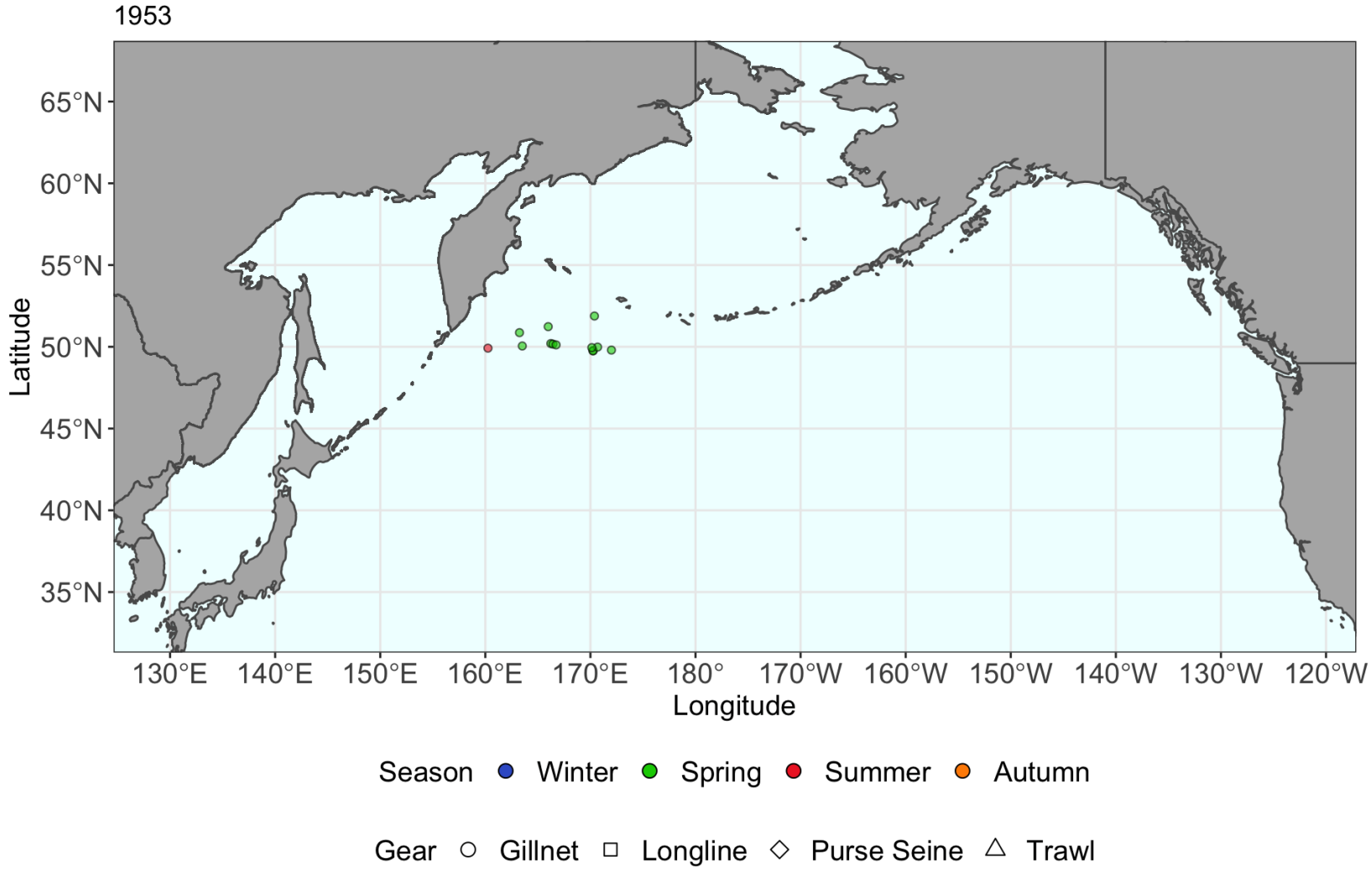
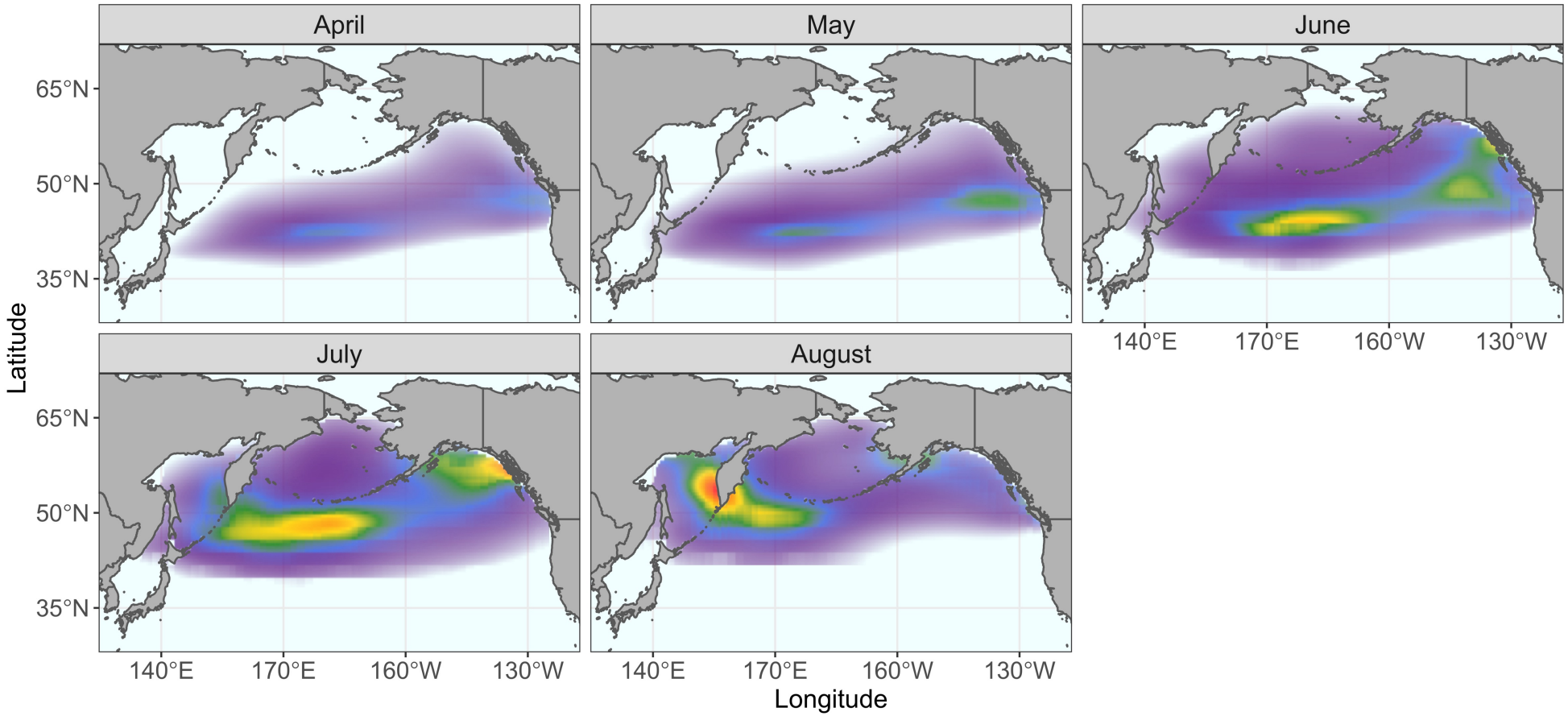


Putting the Data Together: Distribution Modeling (1955-2008)

Coho



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Evaluate Sampling Designs

Model:

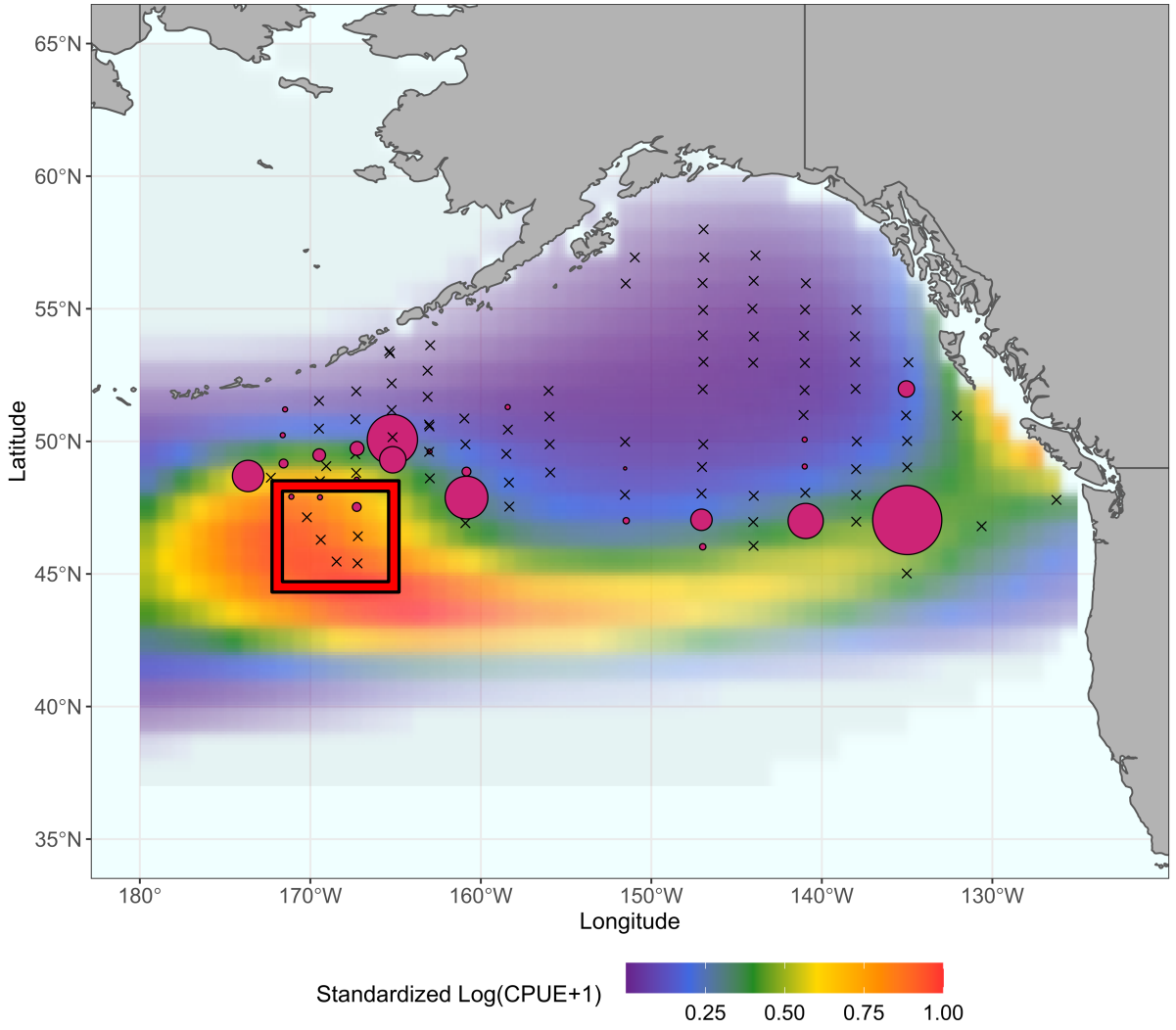
- Pink salmon in even years, 1956-2008
- April
- Prediction grid: SSTs from NOAA OI SST v2

Data:

- IYS 2022 (most samples from February-March)

Where were the pinks?

- Further south (probably)



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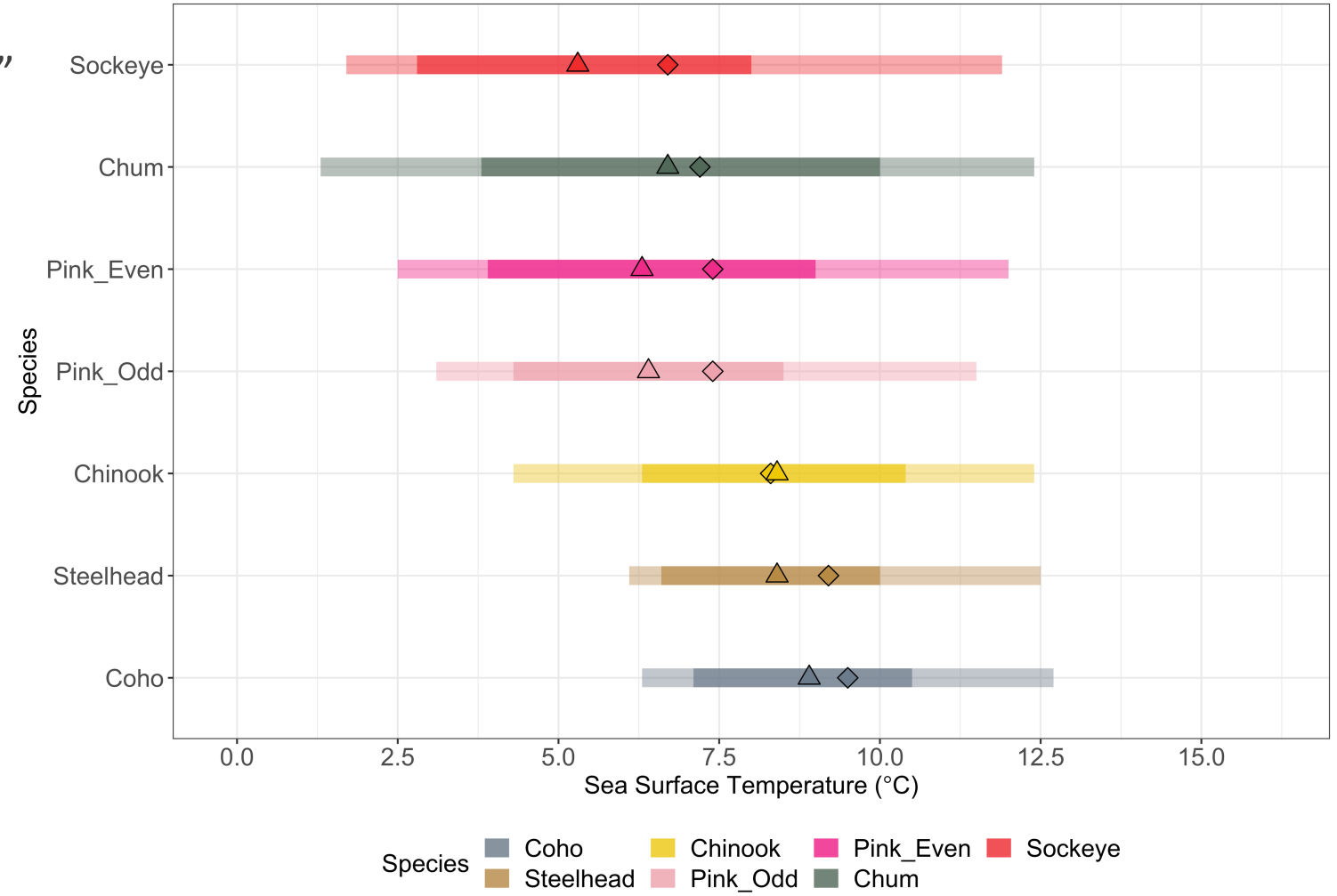
Assess Salmon Temperature Preferences

Transparent bars ≈ “Preferred Range”

Solid bars ≈ “Core Range”

What can this tell us about salmon distributions?



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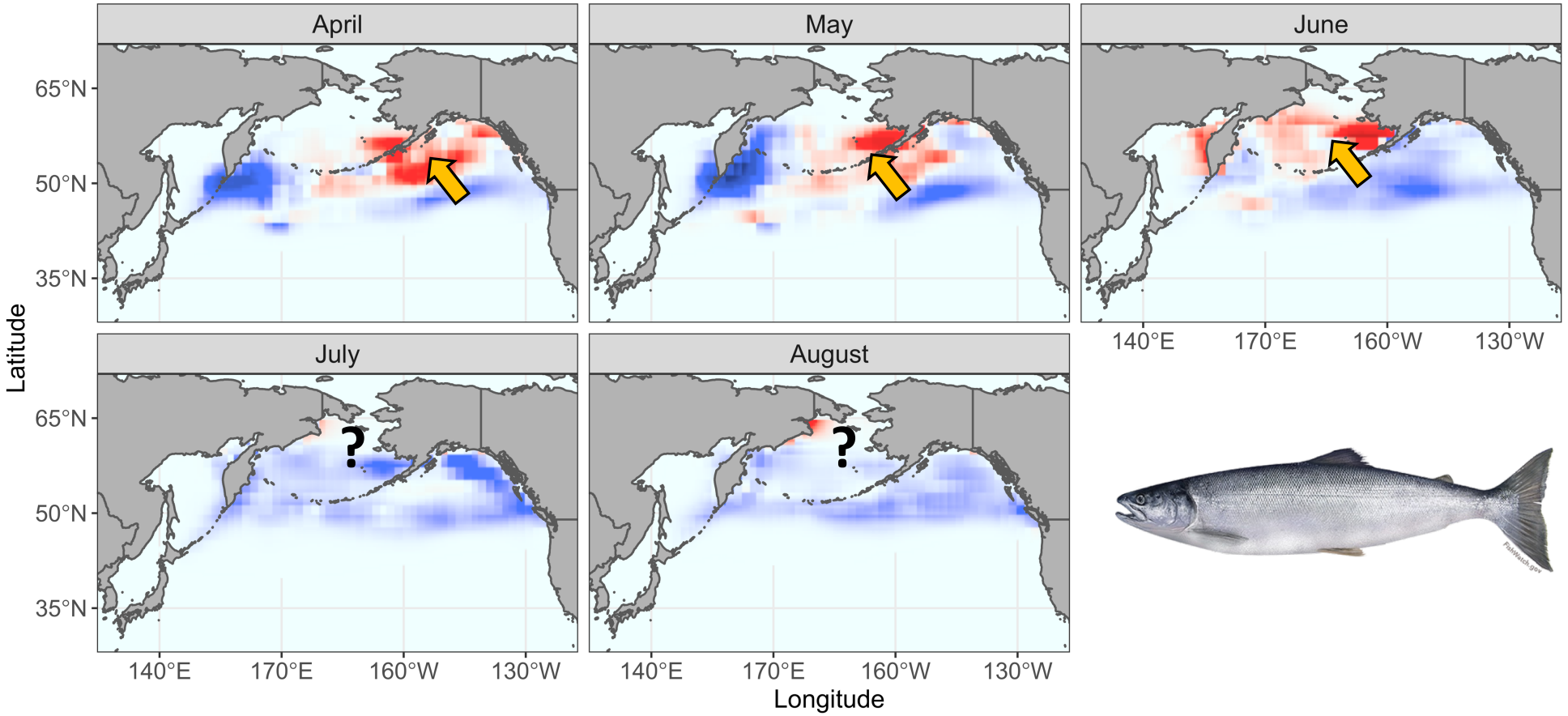
Potential Distribution Shift: Sockeye



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Scaled Log(CPUE+1) Change

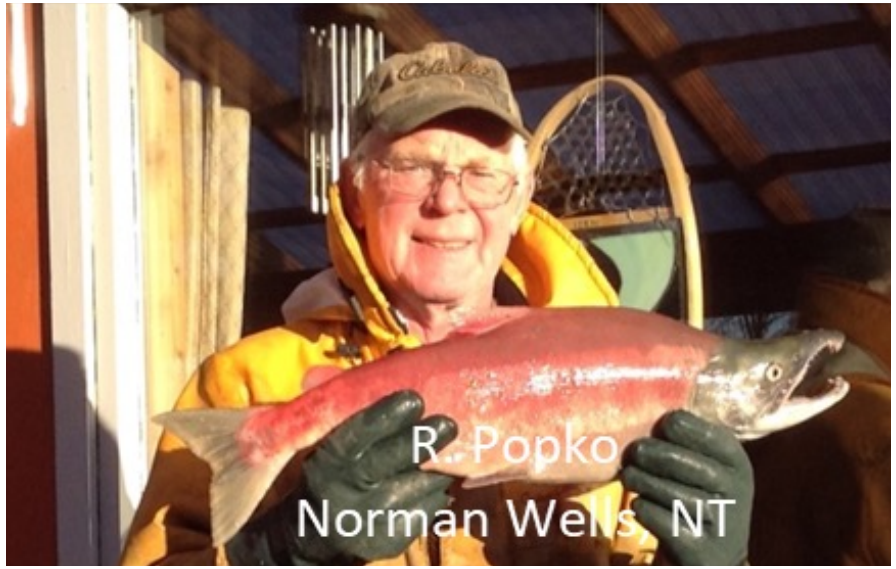
-0.2 -0.1 0.0 0.1 0.2

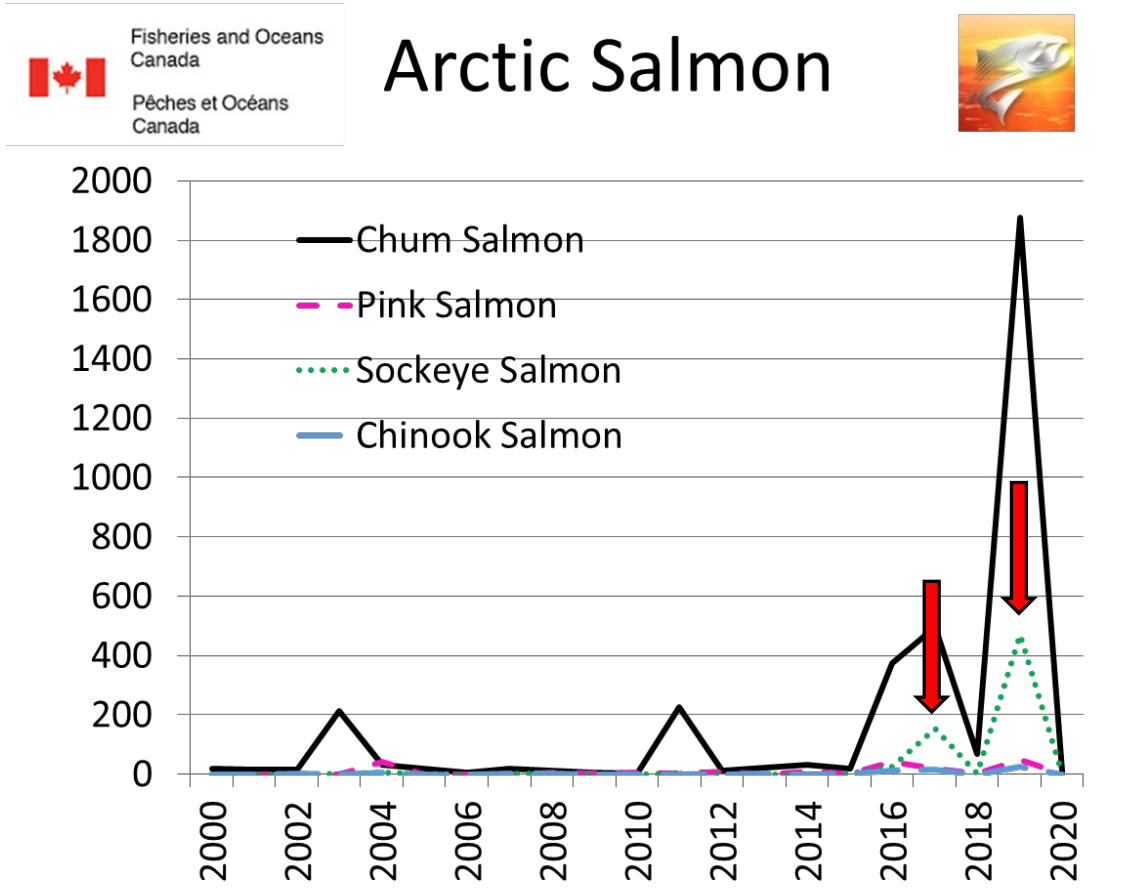
More Abundant in

1980s: cold period

2010s: warm period

Pacific Salmon in the Arctic



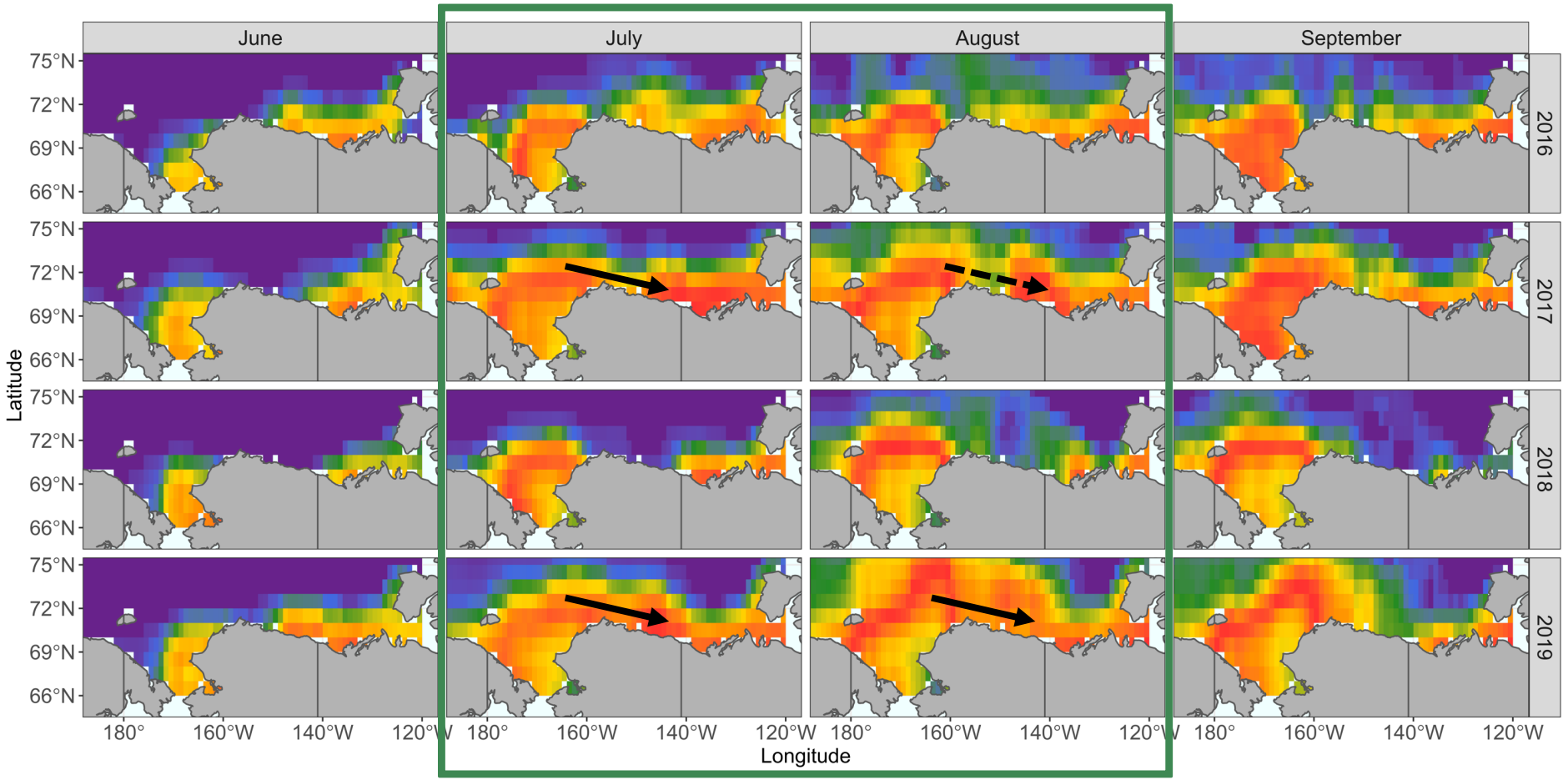


Total number of salmon provided by harvesters to Arctic Salmon from 2000 to 2020 across the Northwest Territories and Nunavut.

From: Dunmall et al. 2013; Dunmall et al. 2018

K. Dunmall, community harvesters, & the entire Arctic Salmon network

Sockeye in the Arctic- 2017 & 2019



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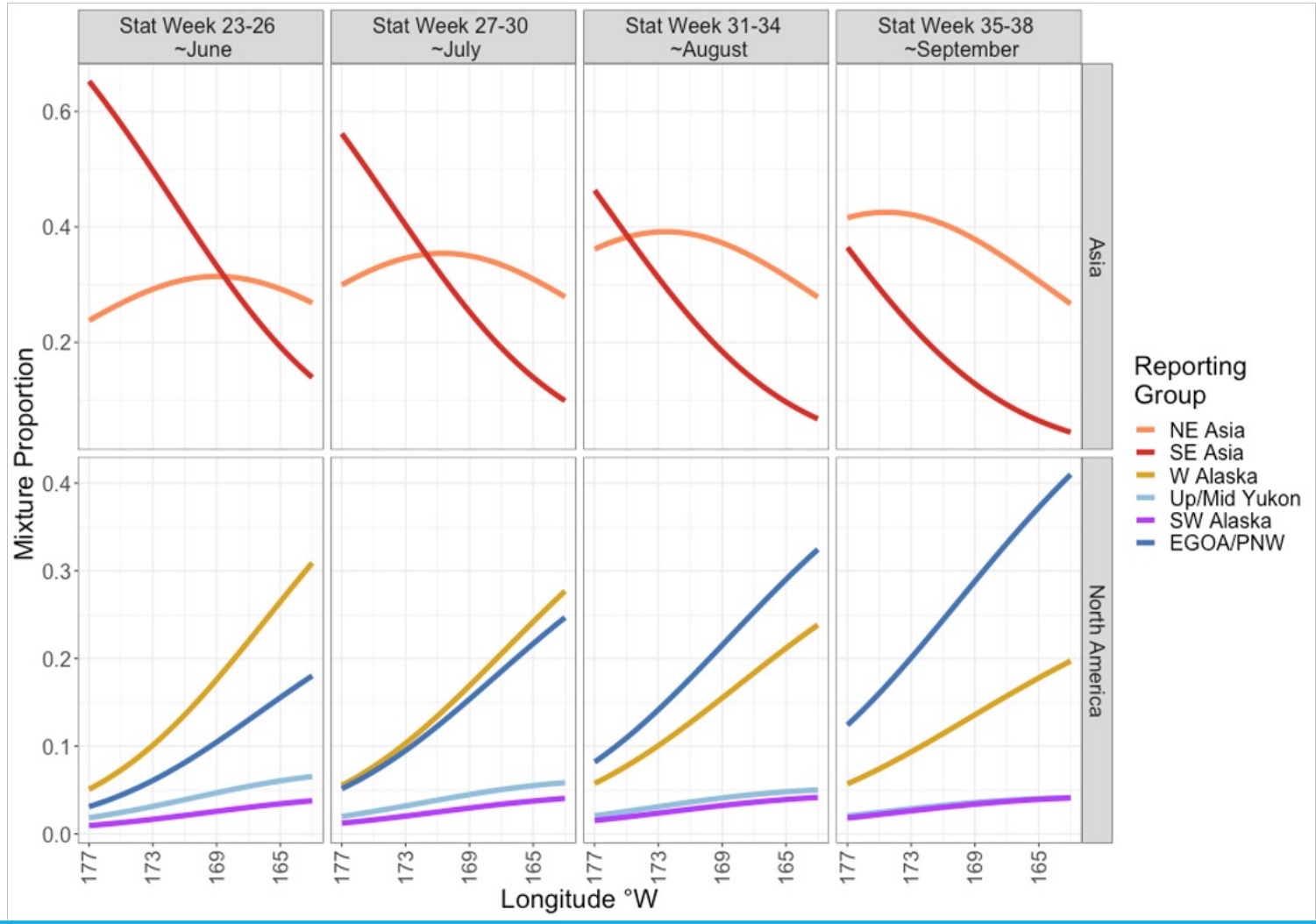
Stock-Specific Distributions

We have other data!

Genetic sampling of chum salmon bycatch in the Bering Sea pollock fishery

Proportions of regional stock groups vary across space and time

Individual salmon stocks have unique movements while at sea



P. Barry, C. Kondzela, J. Watson, E. Yasumiishi, W. Larson, & M. McPhee

Where are we now?

We have a lot of data and more and more tools with which to answer questions

- Synthesize existing data and plan future investigations

We have a basic understanding of ocean distributions

- Particularly during the early marine phase
- Beginning to probe stock-specific differences

We can estimate how salmon distributions relate to sea surface temperature

- Project habitat changes

Where are we going?

Priorities for the future?

Get better estimates of competition within and among species

- Pink salmon
- Hatchery vs wild

Investigate links between ocean conditions/fishing activities and productivity

- Look beyond early marine residence

Determine how salmon distributions are changing and what it means for individual stocks

What else?

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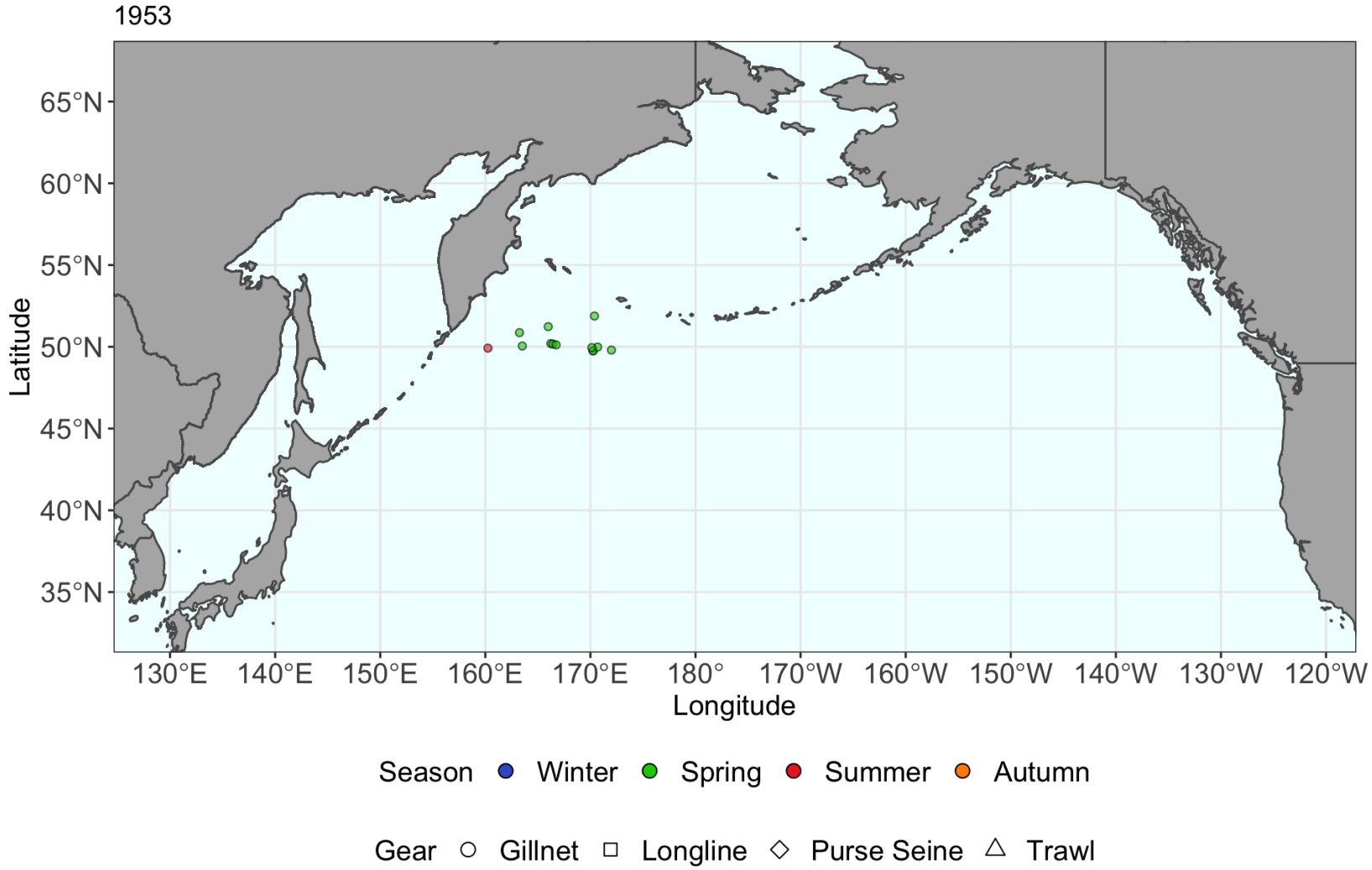

Questions?

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