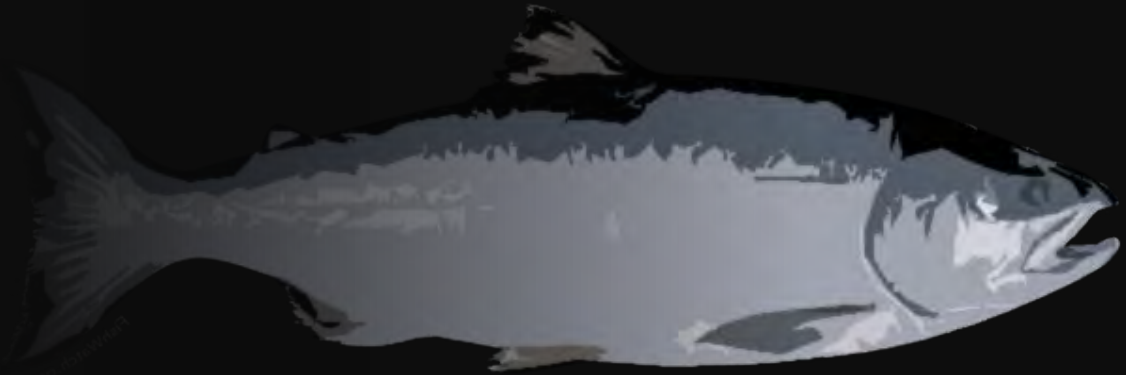


AYK Chinook and Chum Salmon Marine Research Overview



Ben Gray, Fishery Biologist
ADF&G Salmon Ocean Ecology
Program

YRDFA Preseason Meeting, May
2024



Salmon Ocean Ecology Program (SOEP)

Who We Are:

- Initiated over 2 years ago
- Statewide Fisheries Scientist, AYK Marine Biologist, Statewide Fishery Biologist

What We Do:

- Understand the marine life of Alaskan salmon
- Use this information to assist fishery management and decision making
- Answer pressing questions about what drives salmon populations

How We Do It:

- Build capacity and collaborations
- Support marine research programs
- Work to fill knowledge gaps





Chukchi Sea

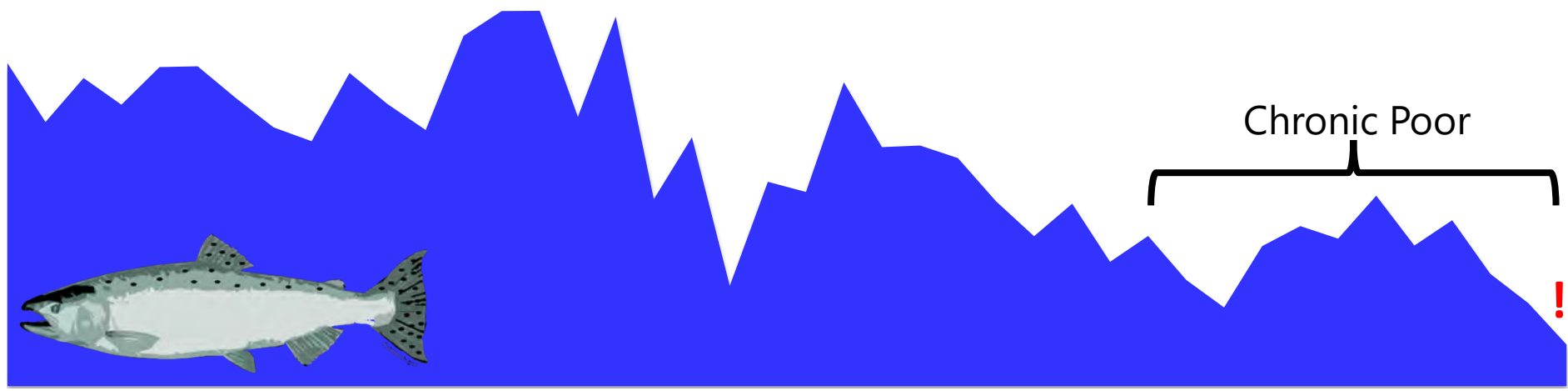
Juvenile salmon (1st summer at sea)

Immature and Maturing Chinook (2–4 years)

Bering Sea

Gulf of Alaska

Immature and Maturing Chum (3–4 years)

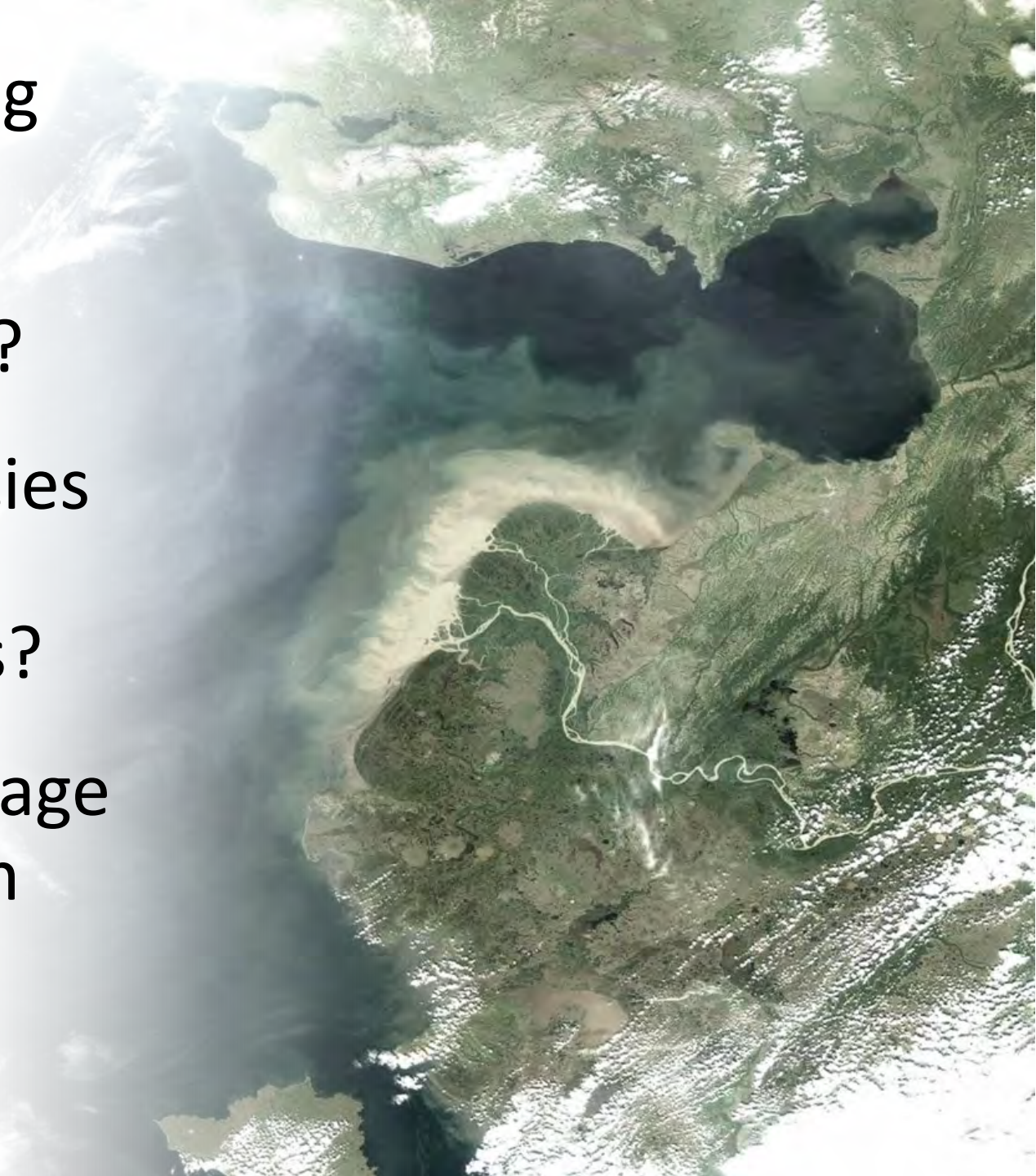


1981 2022

Yukon River stocks

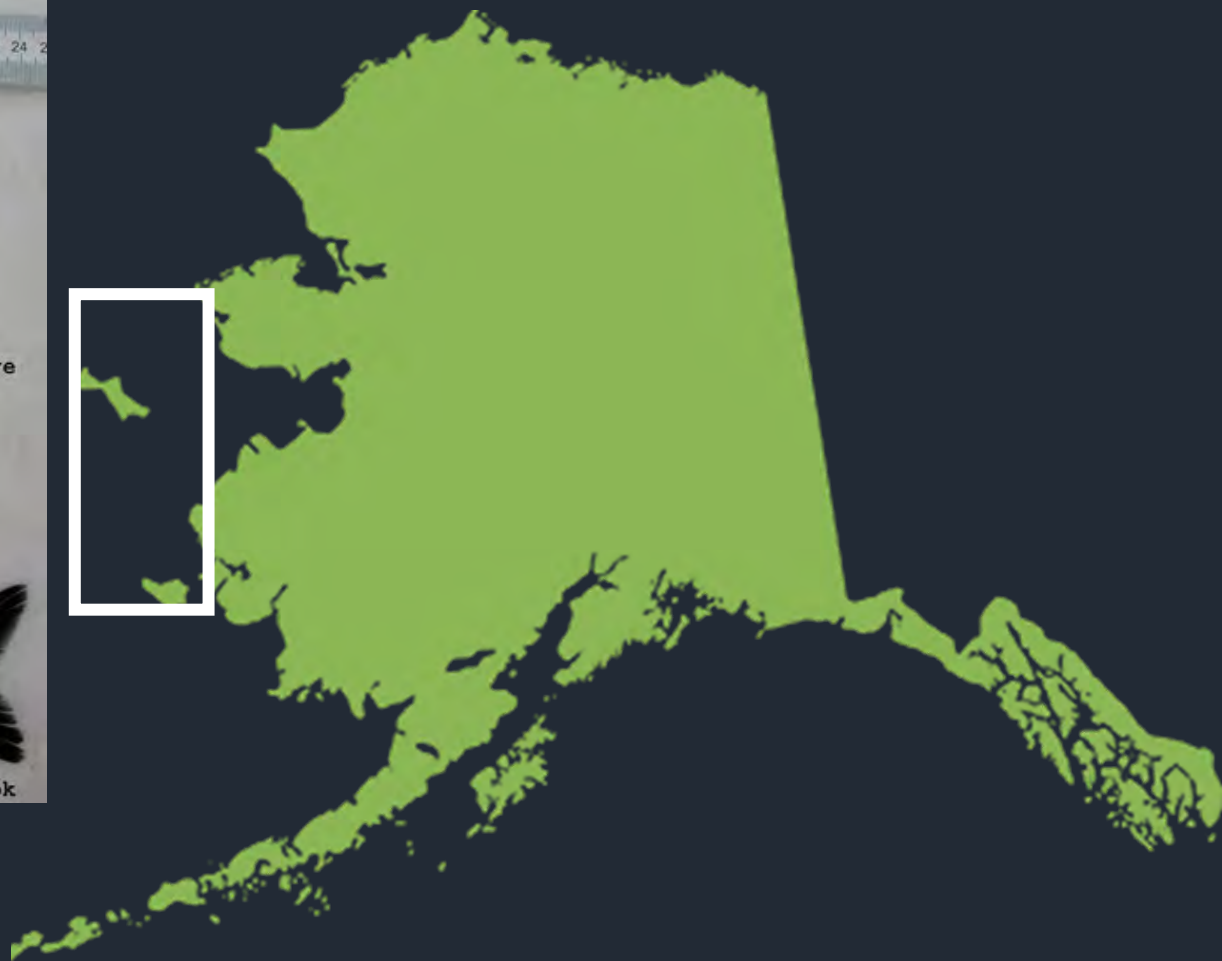


- What is driving declines in Chinook and chum salmon?
- Are both species responding to similar factors?
- At what life stage is the problem occurring?

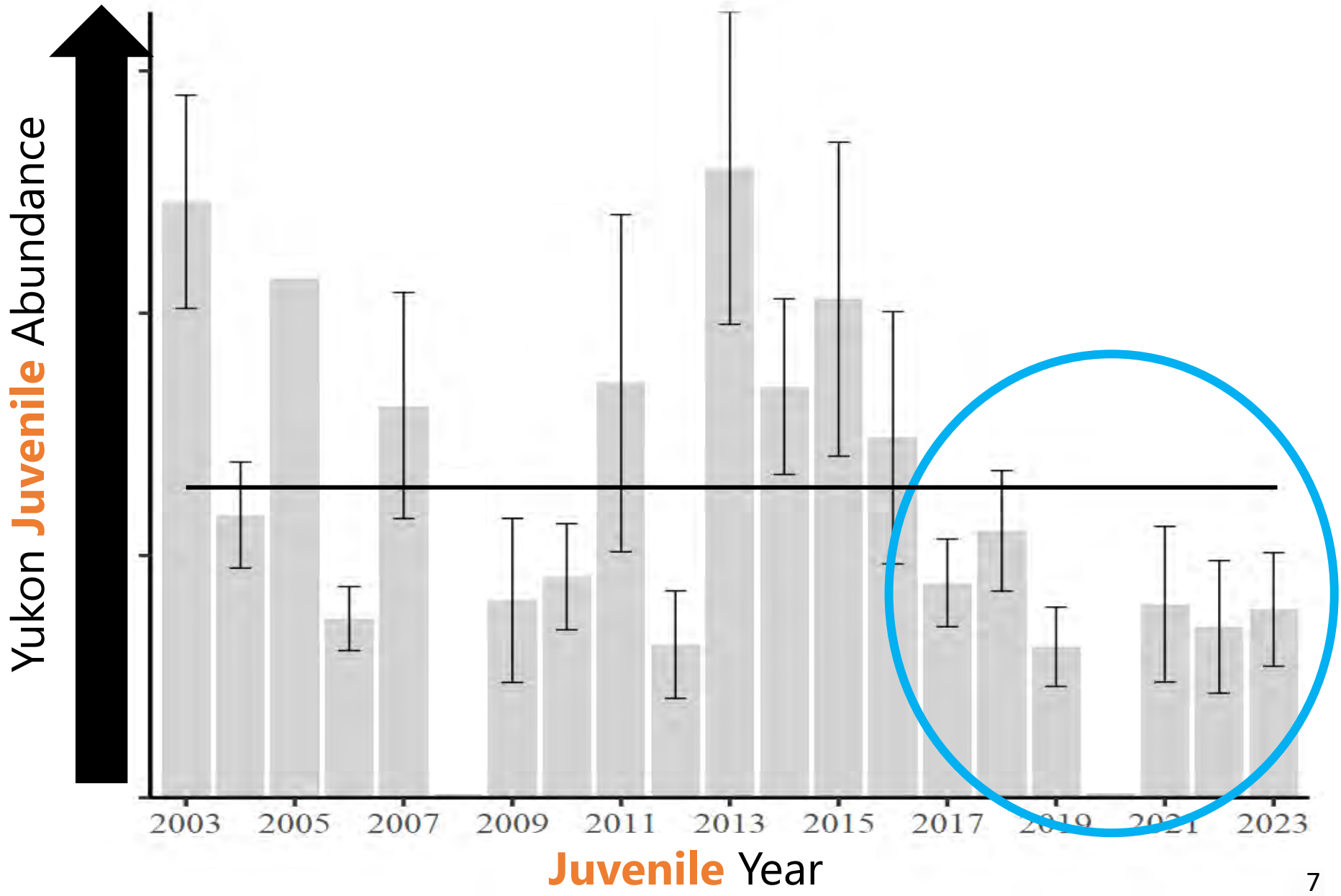


Northern Bering Sea Salmon and Ecosystem Survey

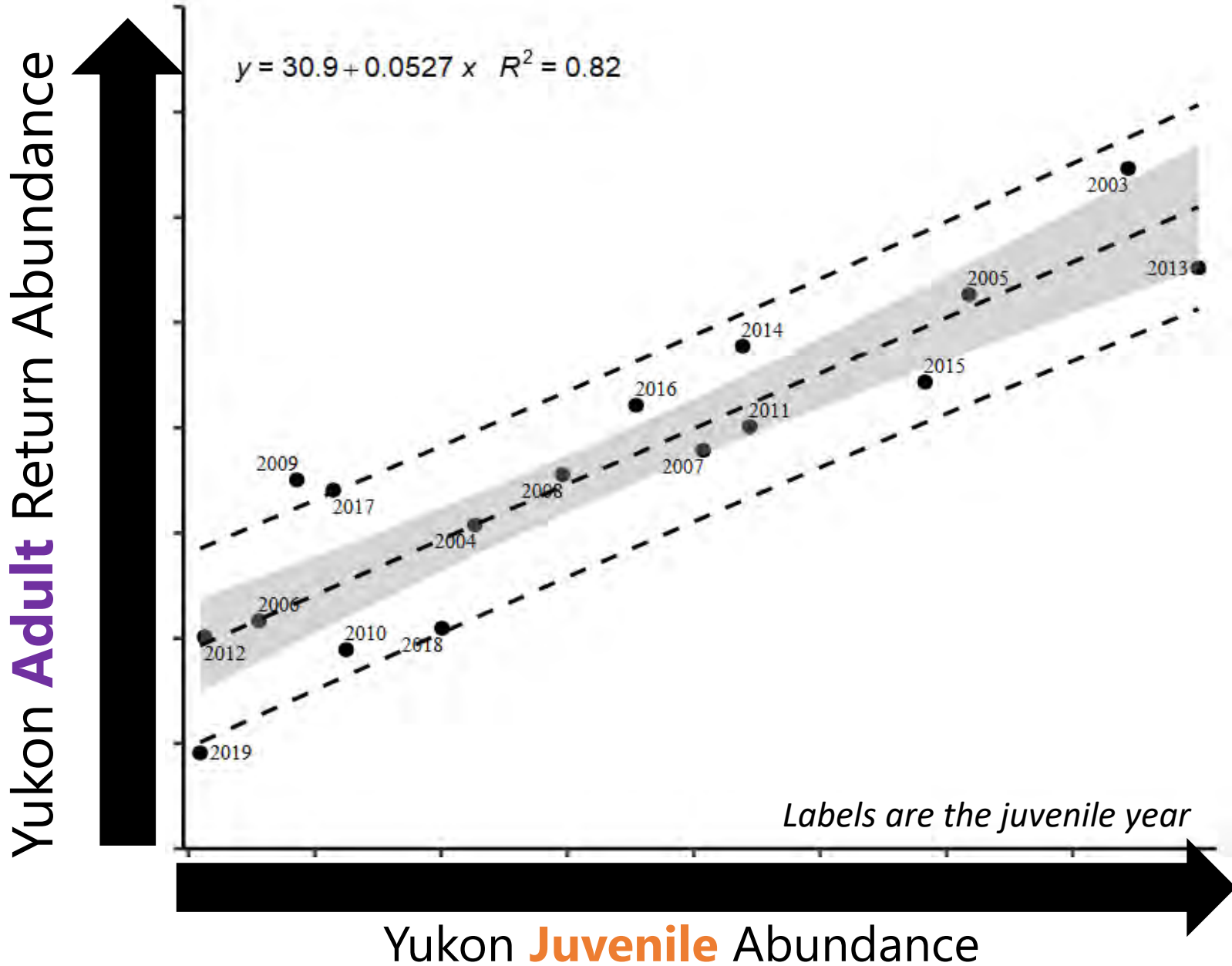
2002 - present



Chinook salmon



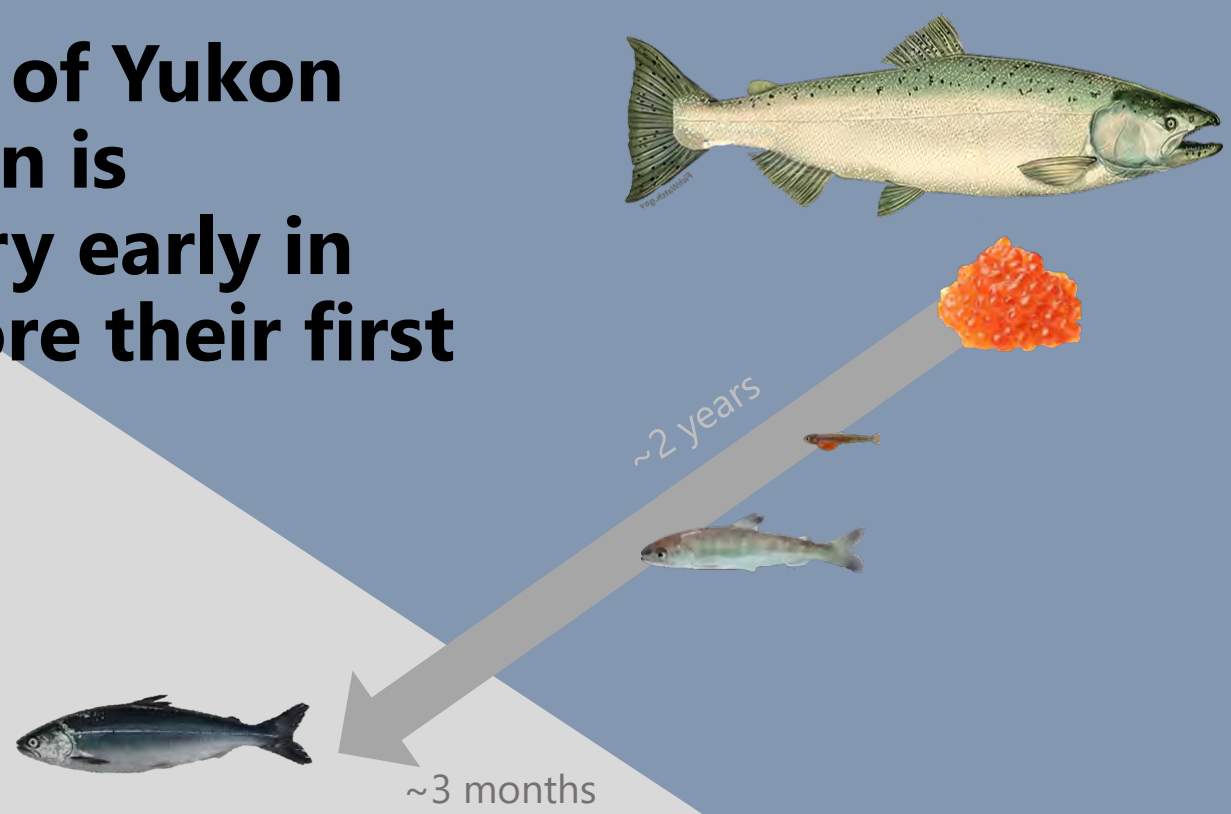
Chinook salmon



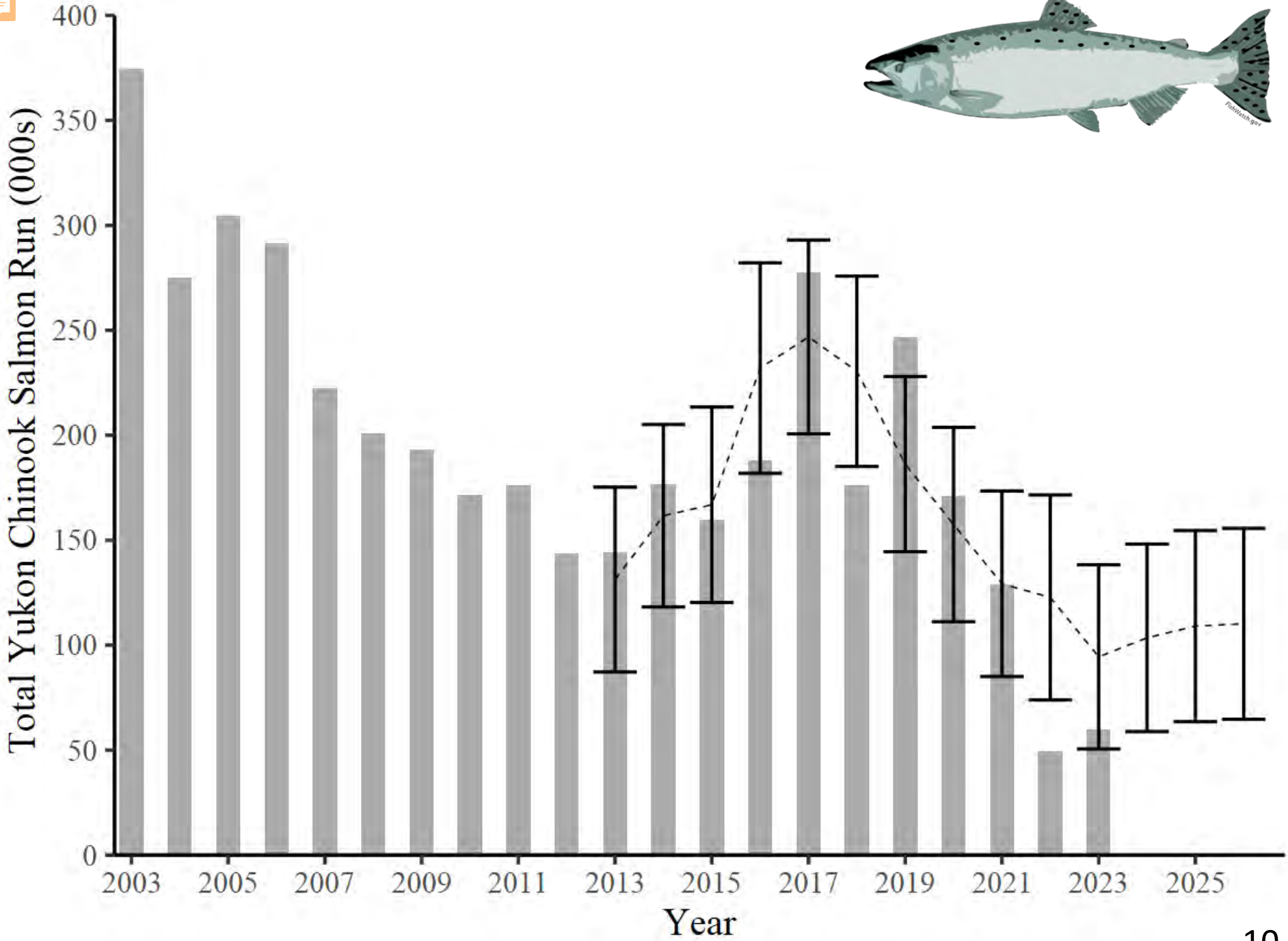


RIVER

Future run size of Yukon Chinook Salmon is determined very early in their life – before their first winter at sea

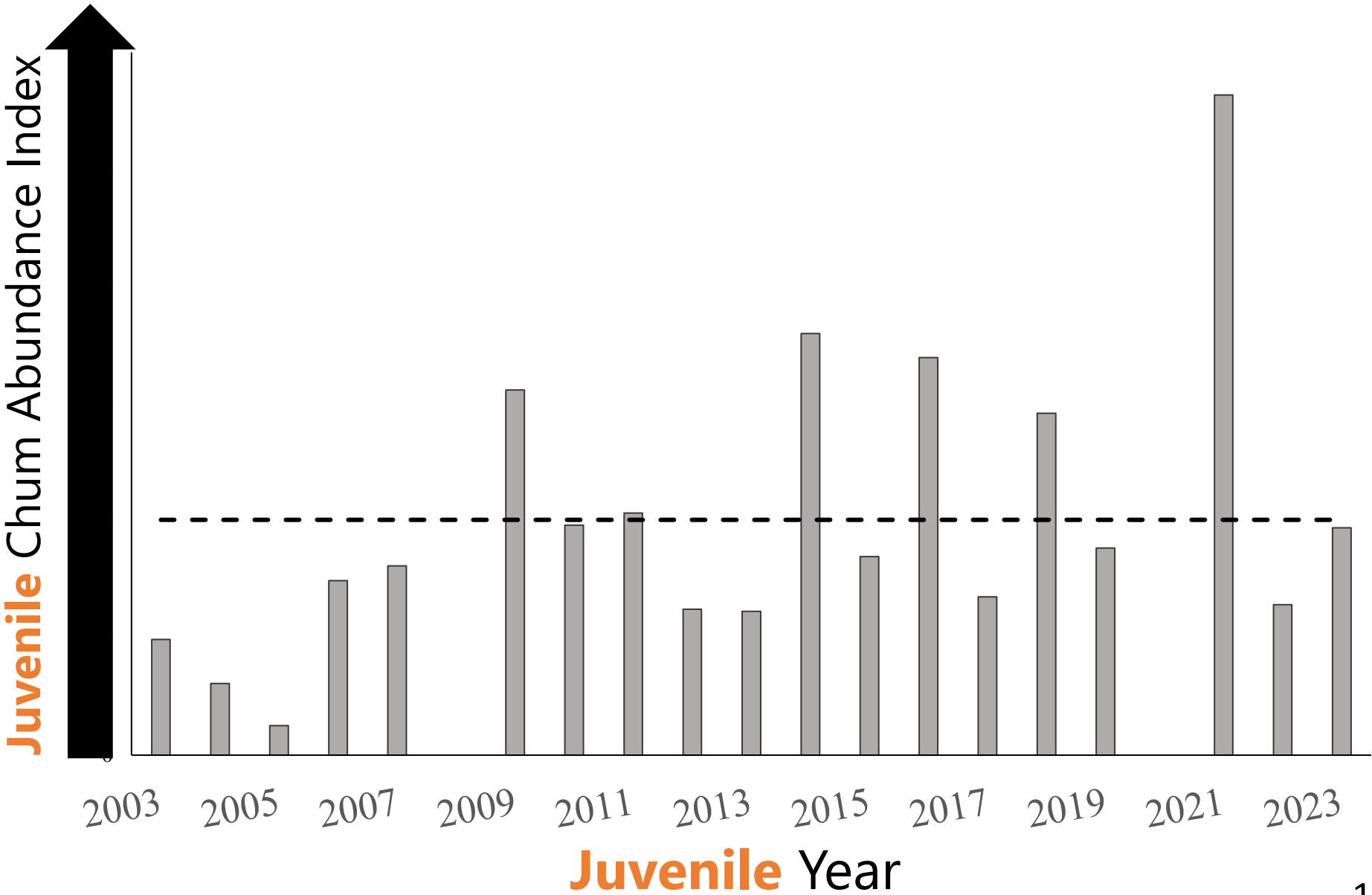


OCEAN



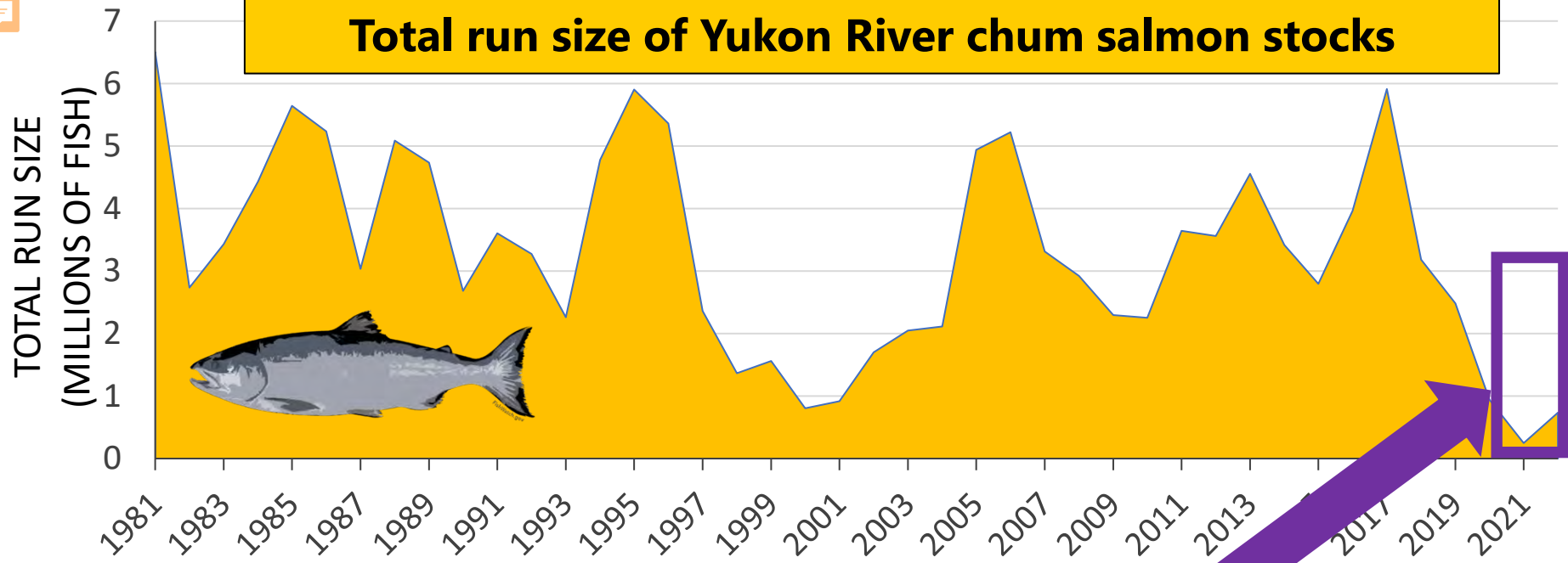


Fall chum salmon

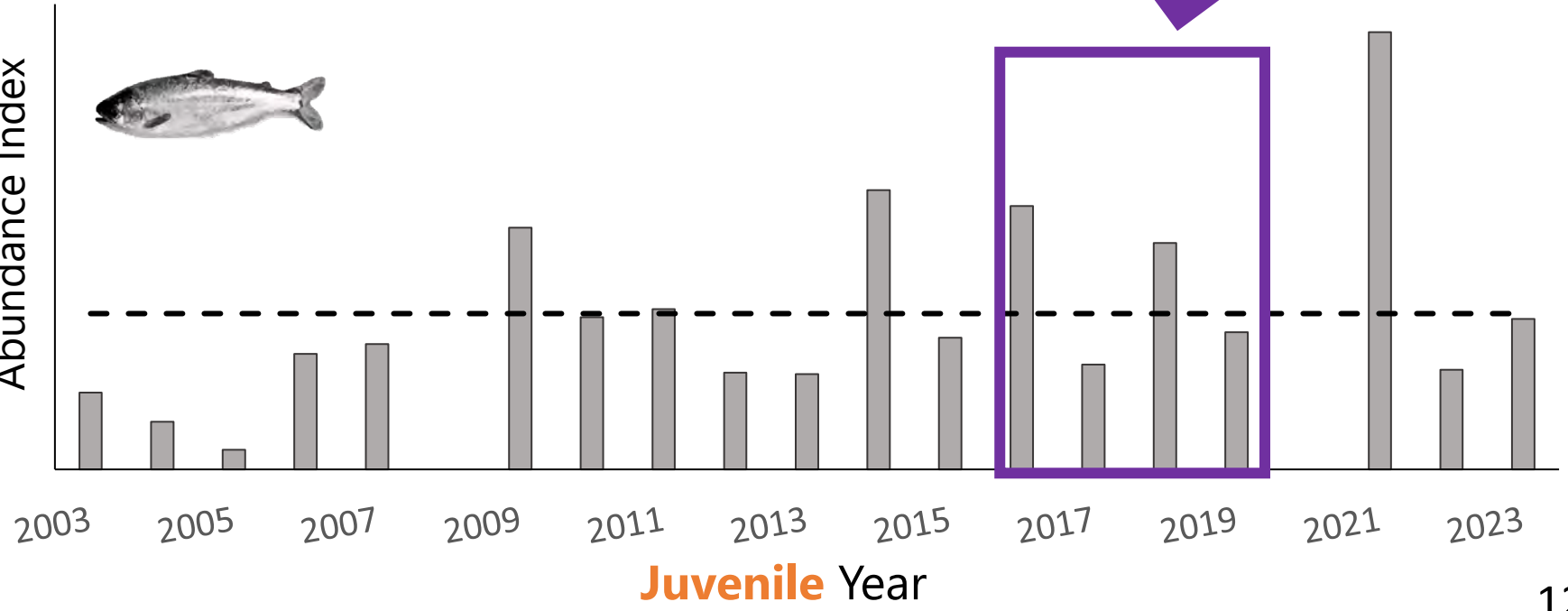




Total run size of Yukon River chum salmon stocks

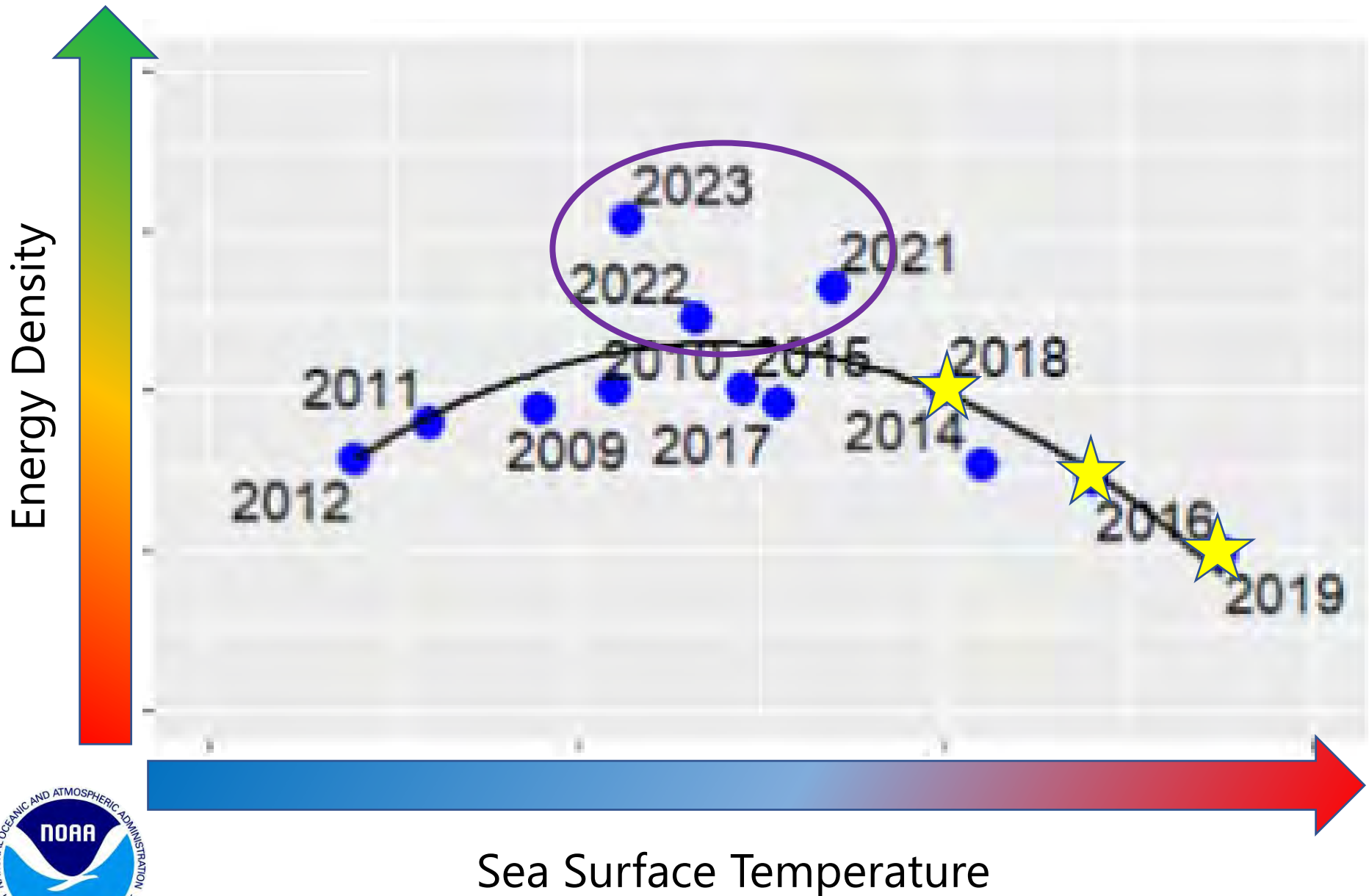


Juvenile Chum Abundance Index





Juvenile Chum Stored Energy (ED)



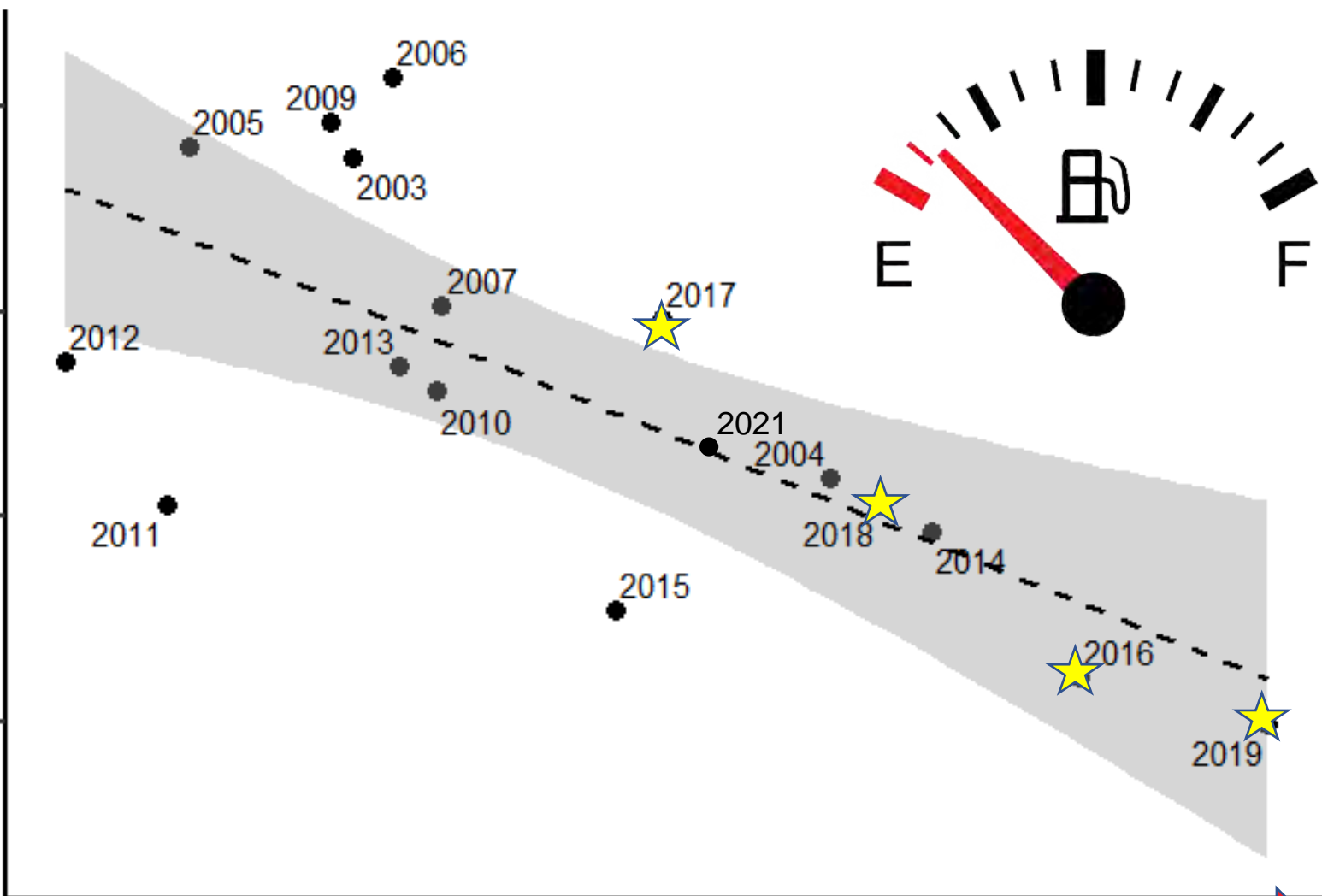
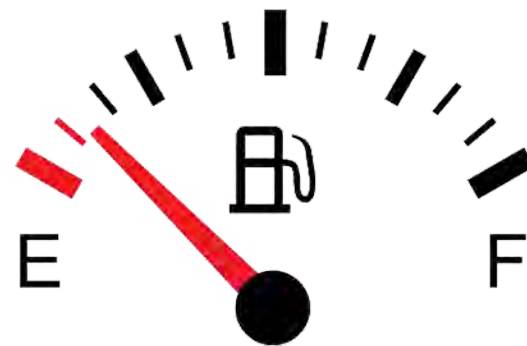
Sea Surface Temperature



Juvenile Chum Stomach Fullness

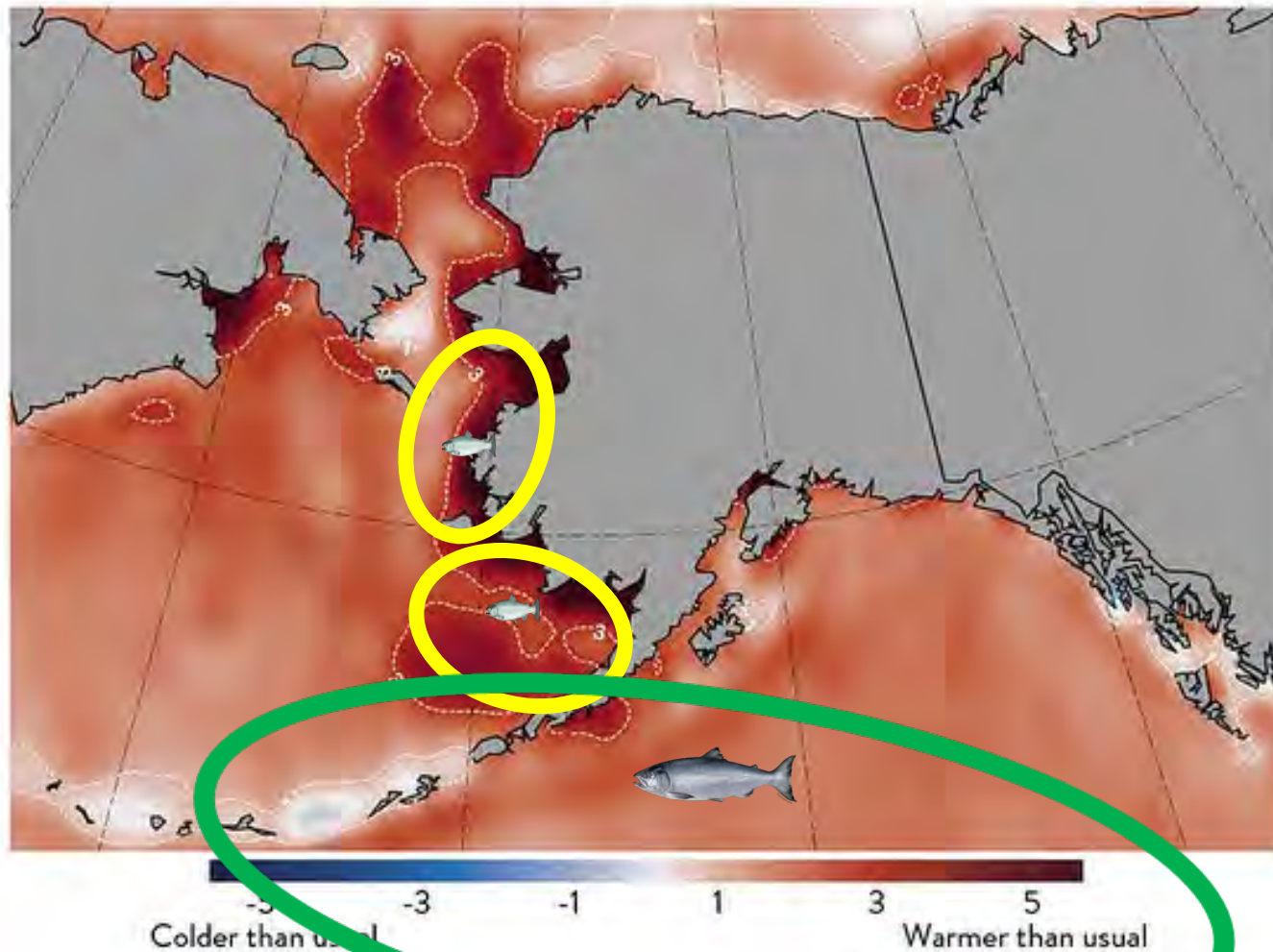


Stomach Fullness



Sea Surface Temperature

Summer sea surface temperatures off Alaska, 2014–2019



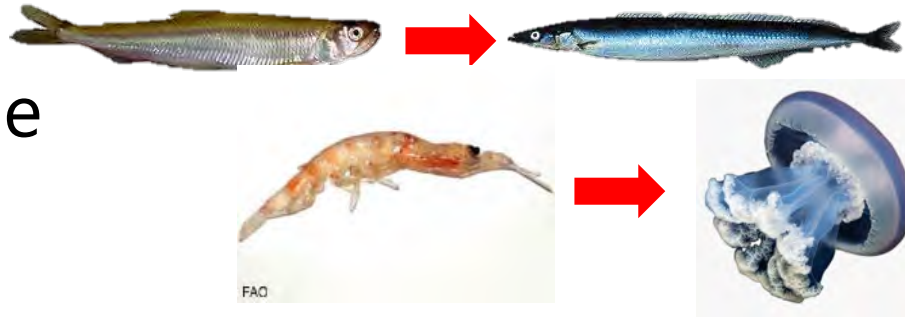
Data source: AMAP Ocean Acidification Report, 2016, *North American Climate Change, 2017*; *Progress in Oceanography*, 2015

Temperature Changes Affect Salmon

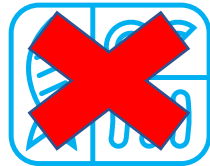
Stocks moving north



Different food available



Empty stomachs



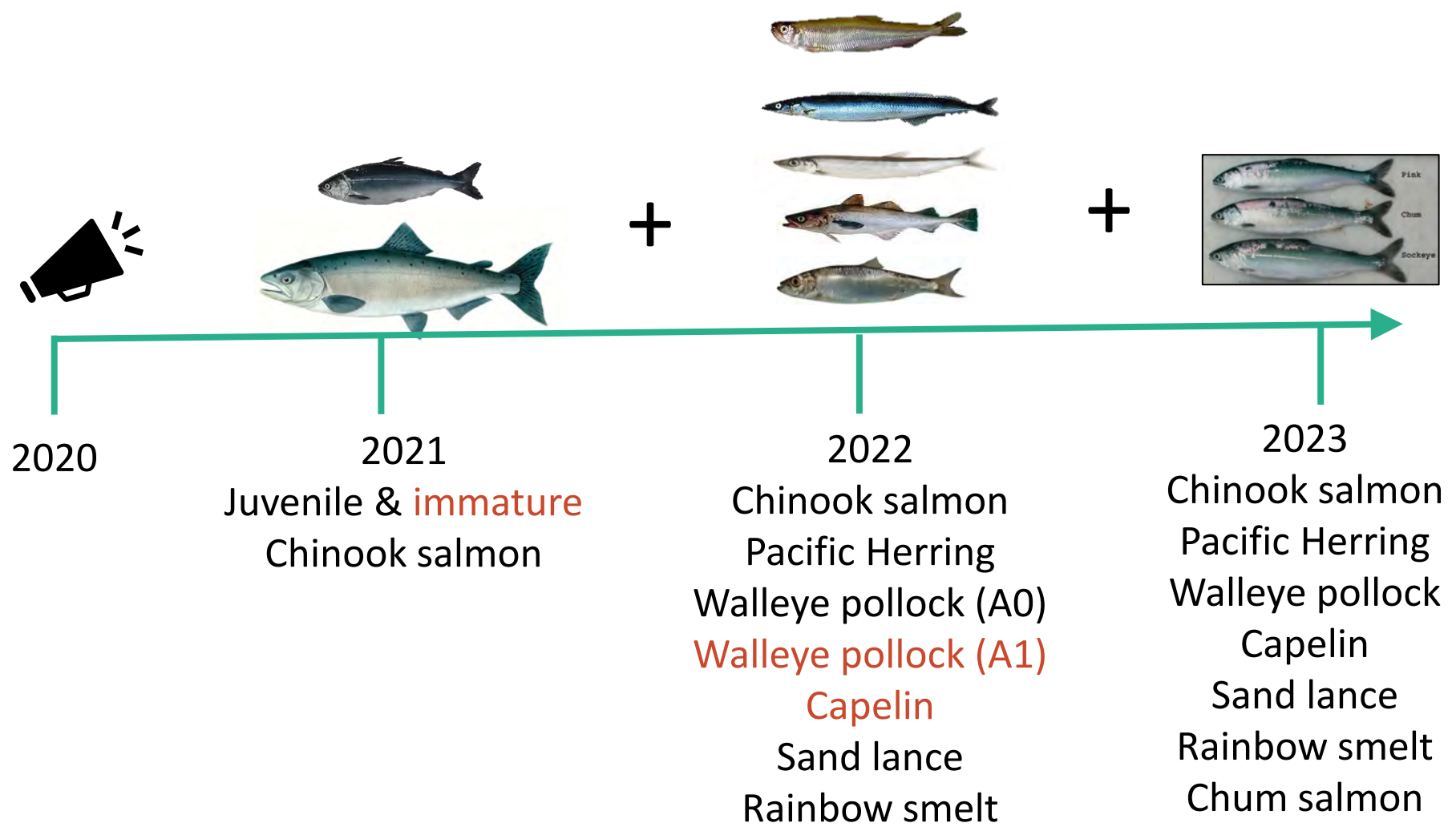
Increasing ocean temperatures



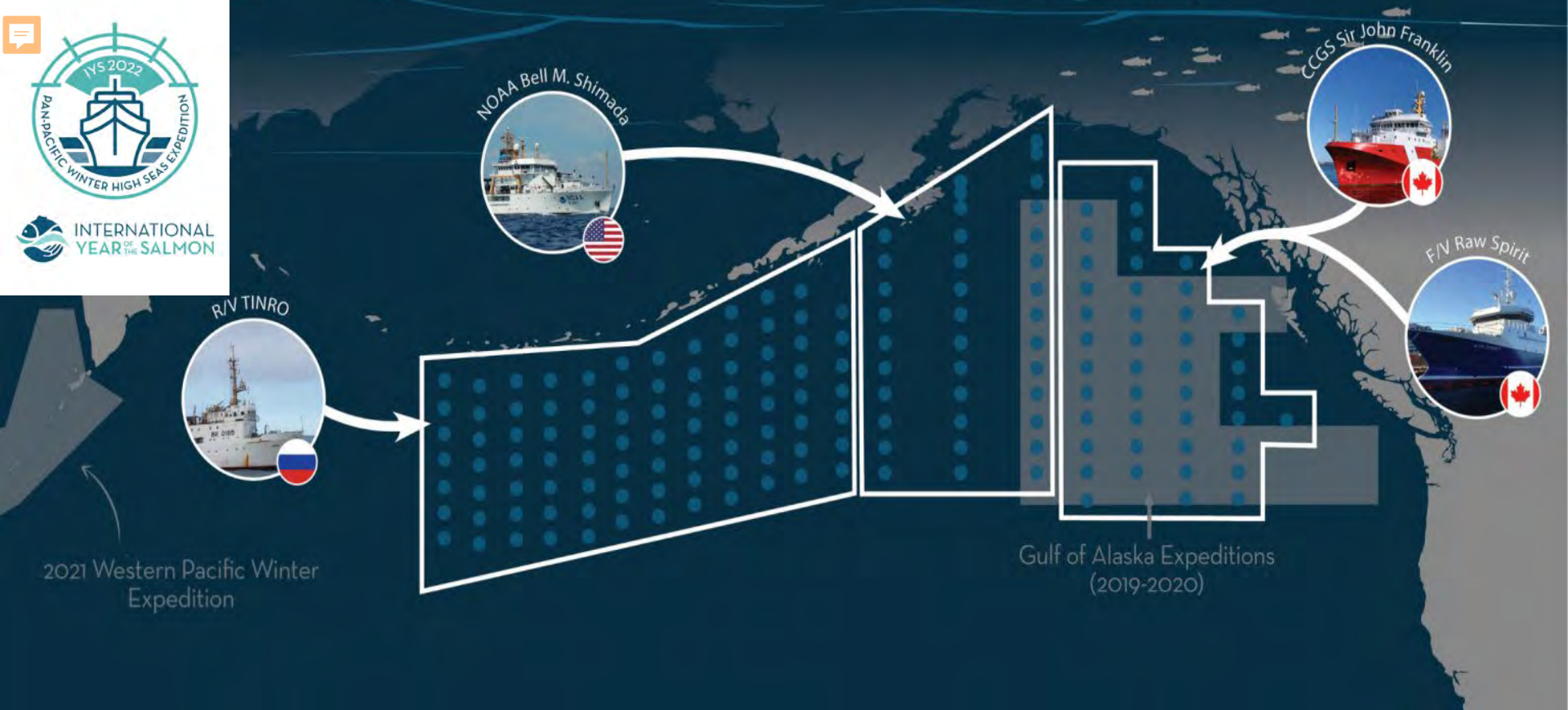
= poorer condition



Marine *Ichthyophonus* sampling

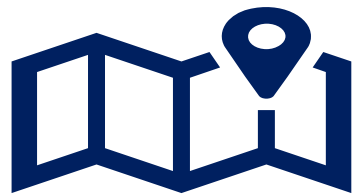
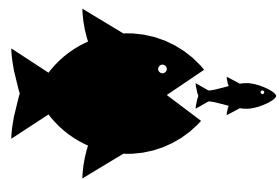


Species in red denote those where Ichthyophonus infection was present

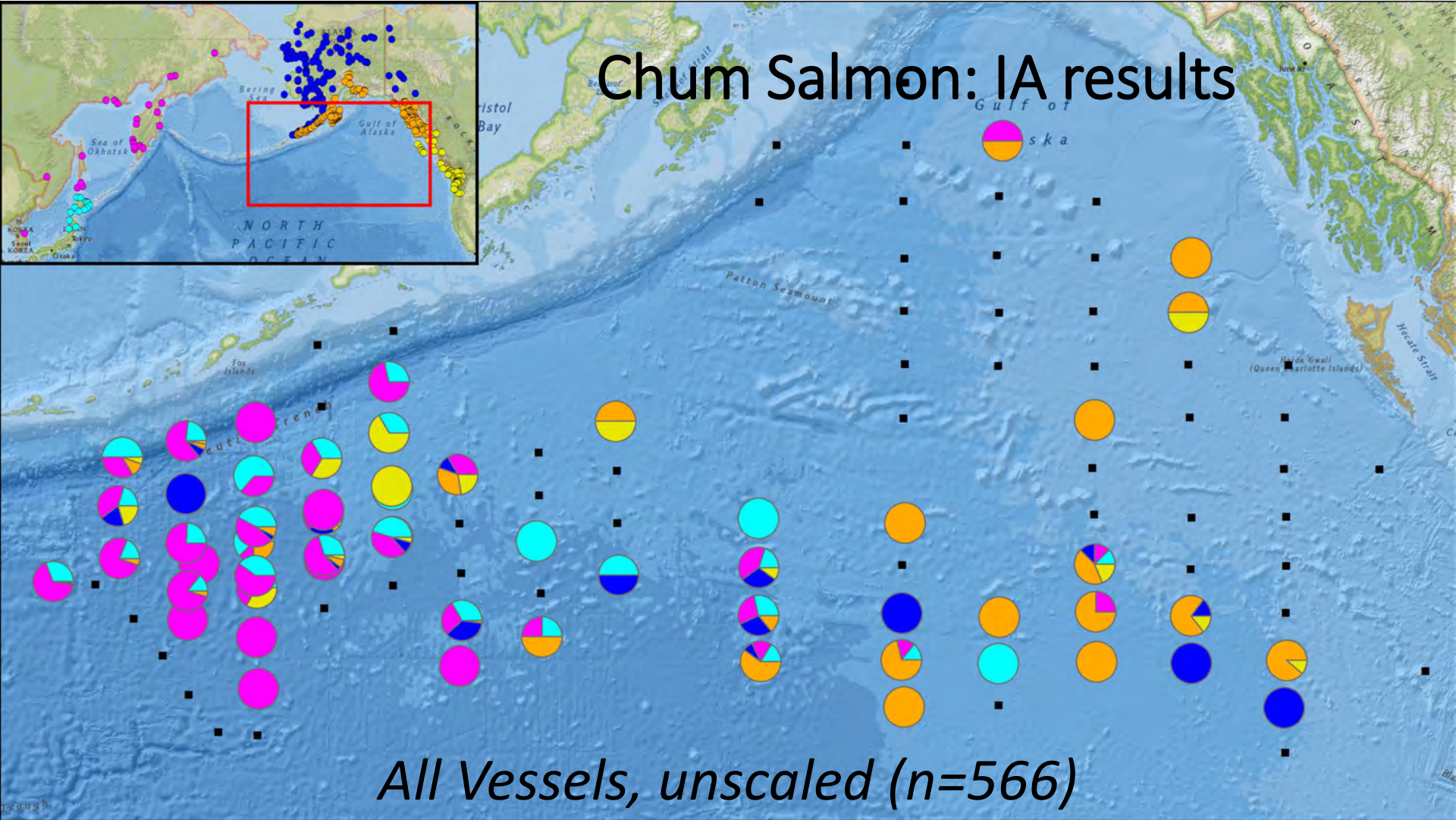
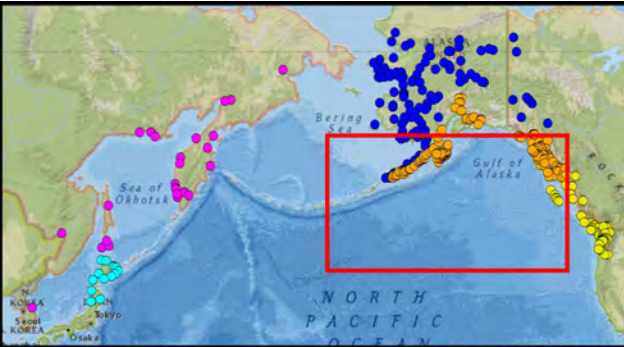


2022 Pan-Pacific Expedition

North Pacific Anadromous Fish Commission/International Year of the Salmon



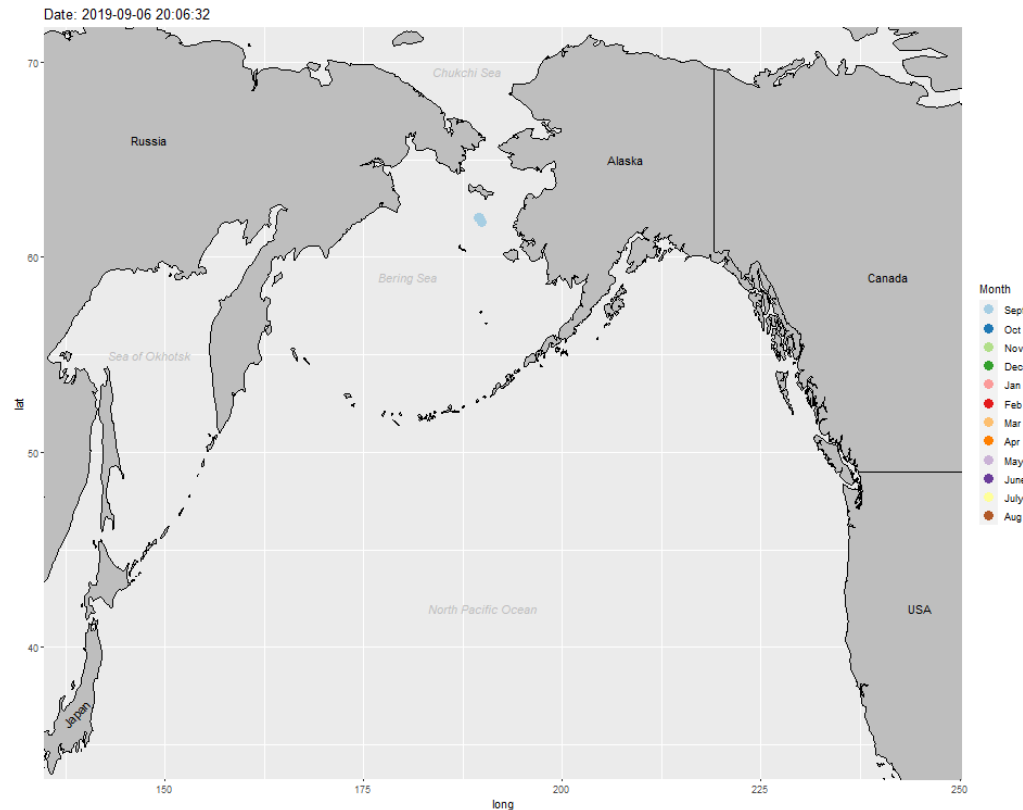
Chum Salmon: IA results



All Vessels, unscaled (n=566)

How do predators impact the marine survival of Alaskan salmon?

Study of salmon shark movement, distribution and overlap with salmon stocks (Garcia et al. 2021)



How do predators impact the marine survival of Alaskan salmon?

- Use wound and scar evidence from high seas surveys to assess predation on Pacific salmon (Weitkamp & Garcia 2022)
- Environmental DNA (eDNA) collected during marine surveys

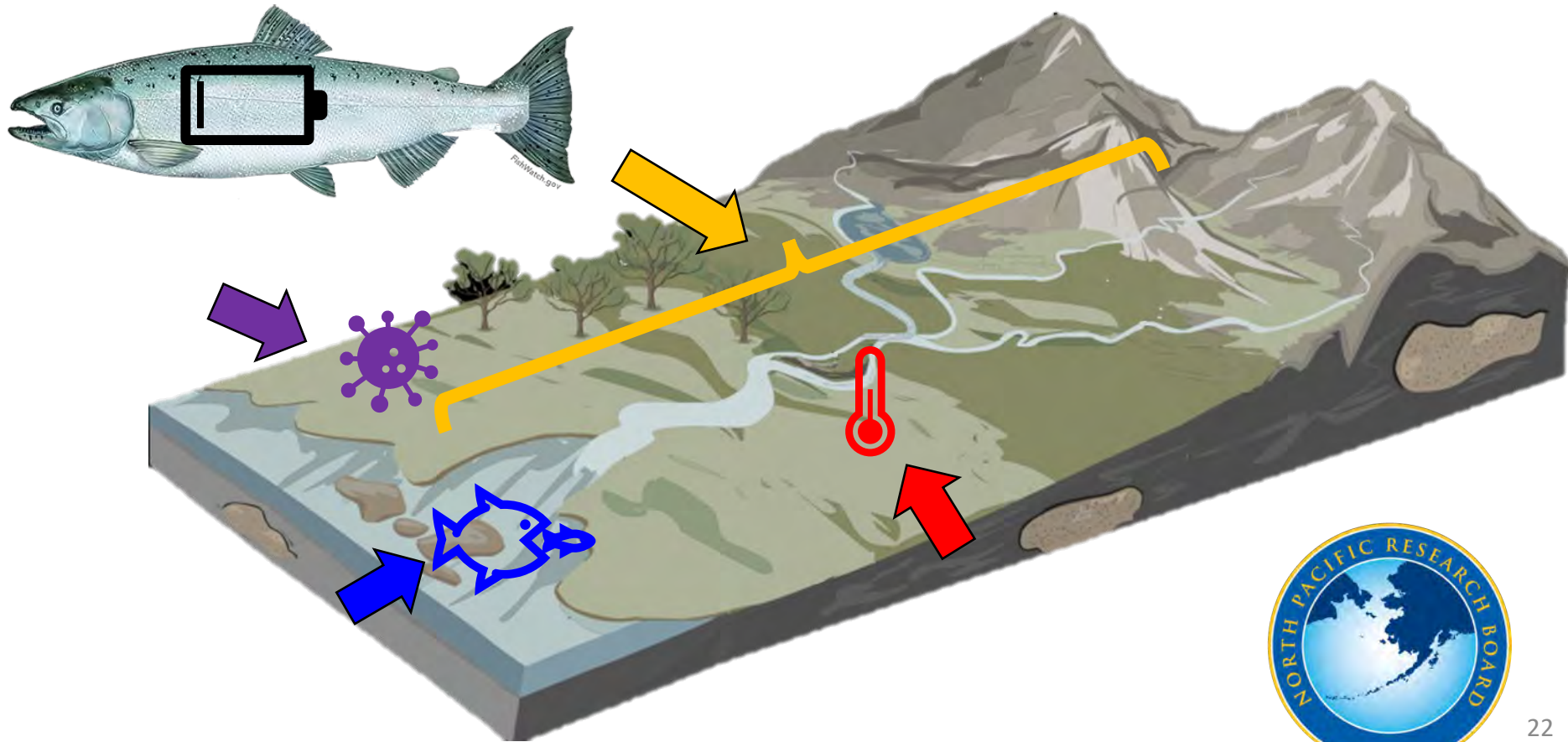


Wound photo: Siwicke & Seitz 2018





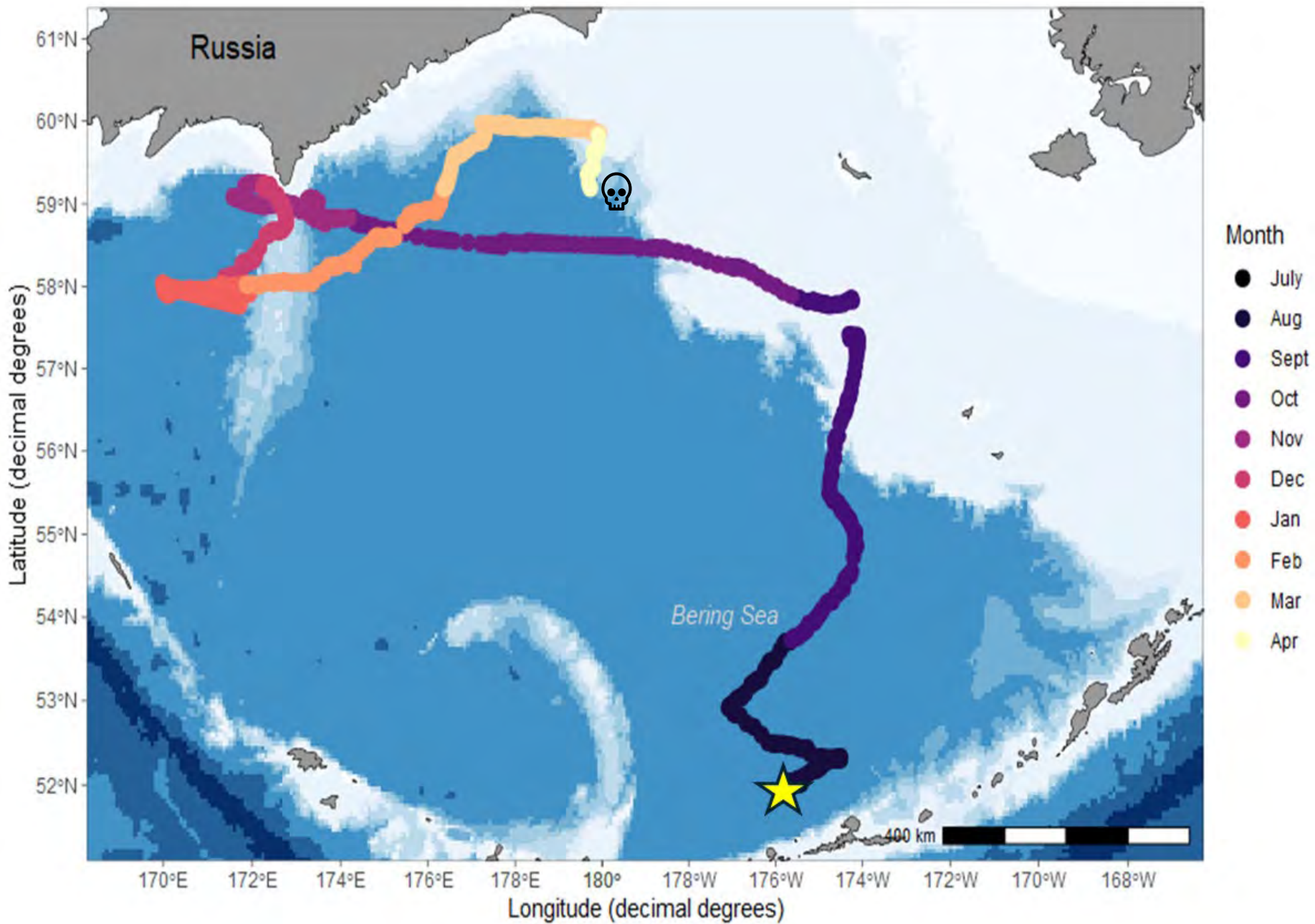
What is driving record poor Yukon River Chinook salmon runs?

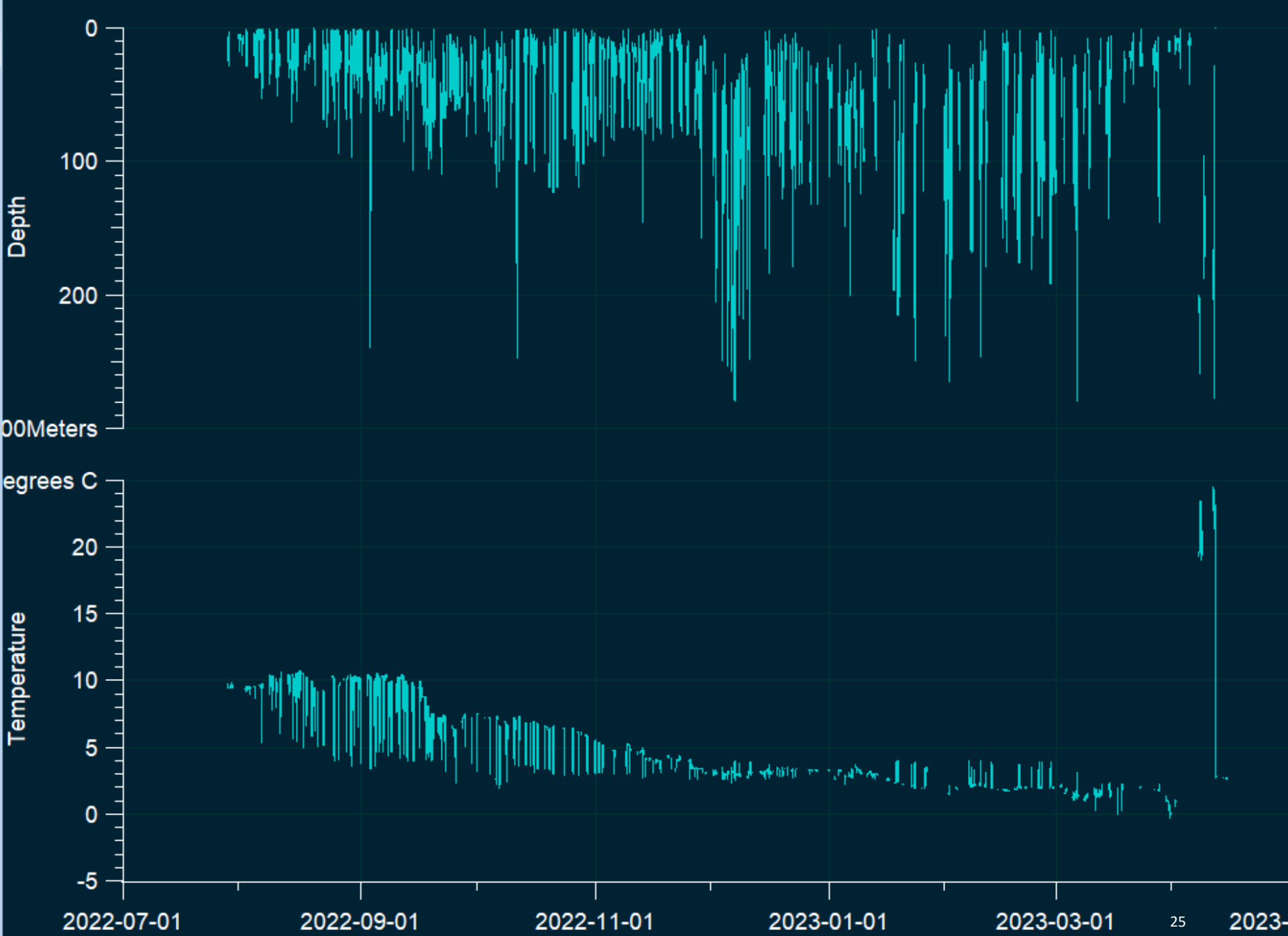


How is SOEP engaging in efforts to reduce salmon bycatch?

- Provide data, technical support, and scientific advice to NMFS, bycatch task force, and Council staff
- Developing predictive tools which would allow fisheries to more actively avoid Chinook salmon hotspots and reduce their bycatch
- Develop chum salmon predictive tools that may be useful for limiting Western Alaska chum salmon bycatch







Thank you!

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