

Dr. Katie Howard, Fisheries Scientist
House Fisheries Committee

March 16, 2023

Alaska Marine Salmon Research



Salmon Ocean Ecology Program (SOEP) Team



Dr. Katie Howard

SOEP Lead

Statewide, international,
or federal fisheries issues



Sabrina Garcia

AYK Marine
Research Lead



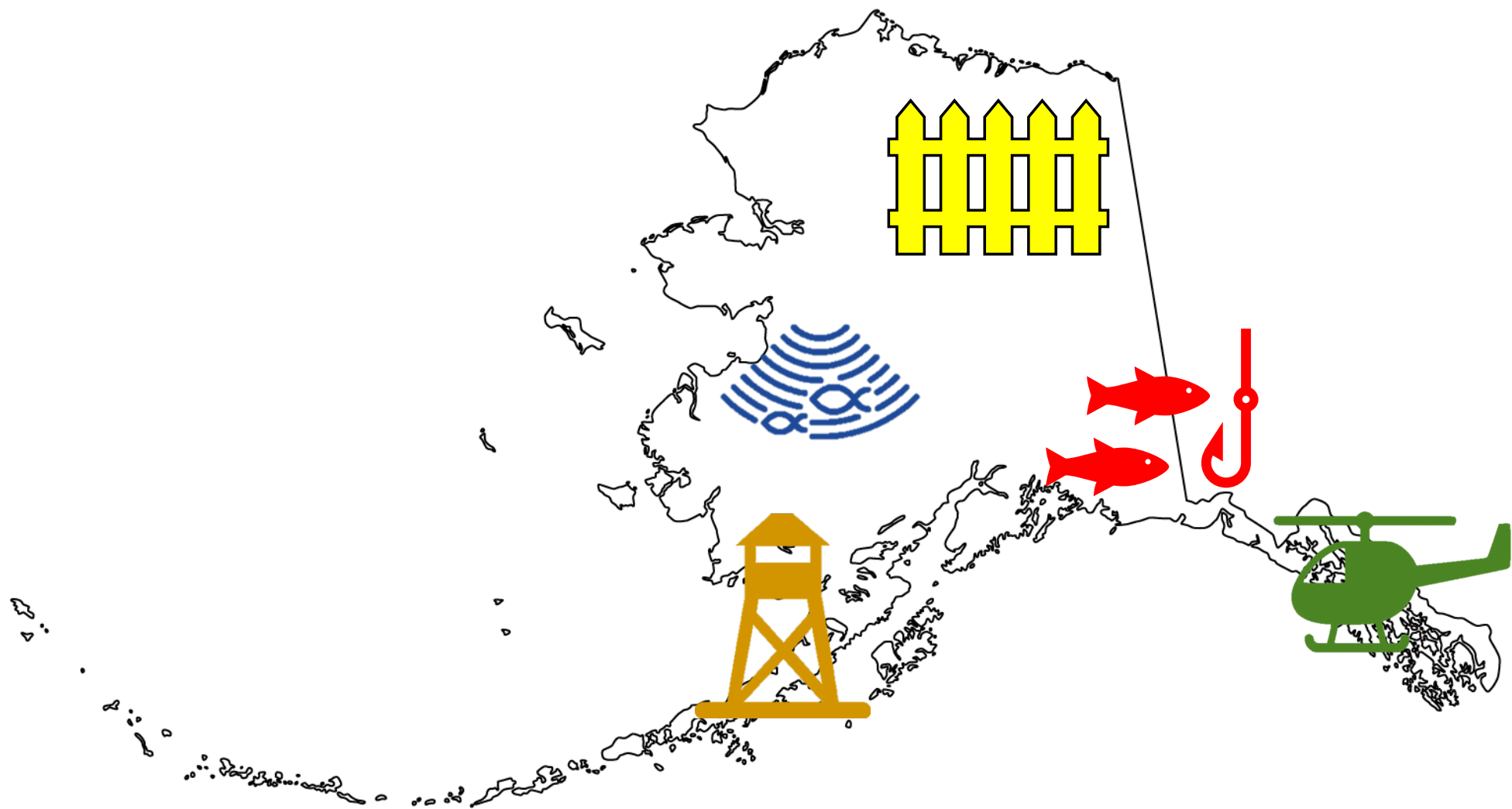
Ben Gray

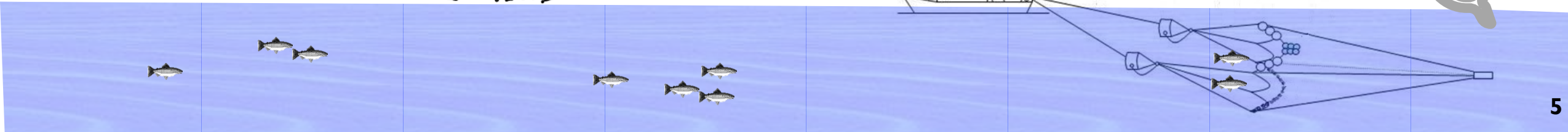
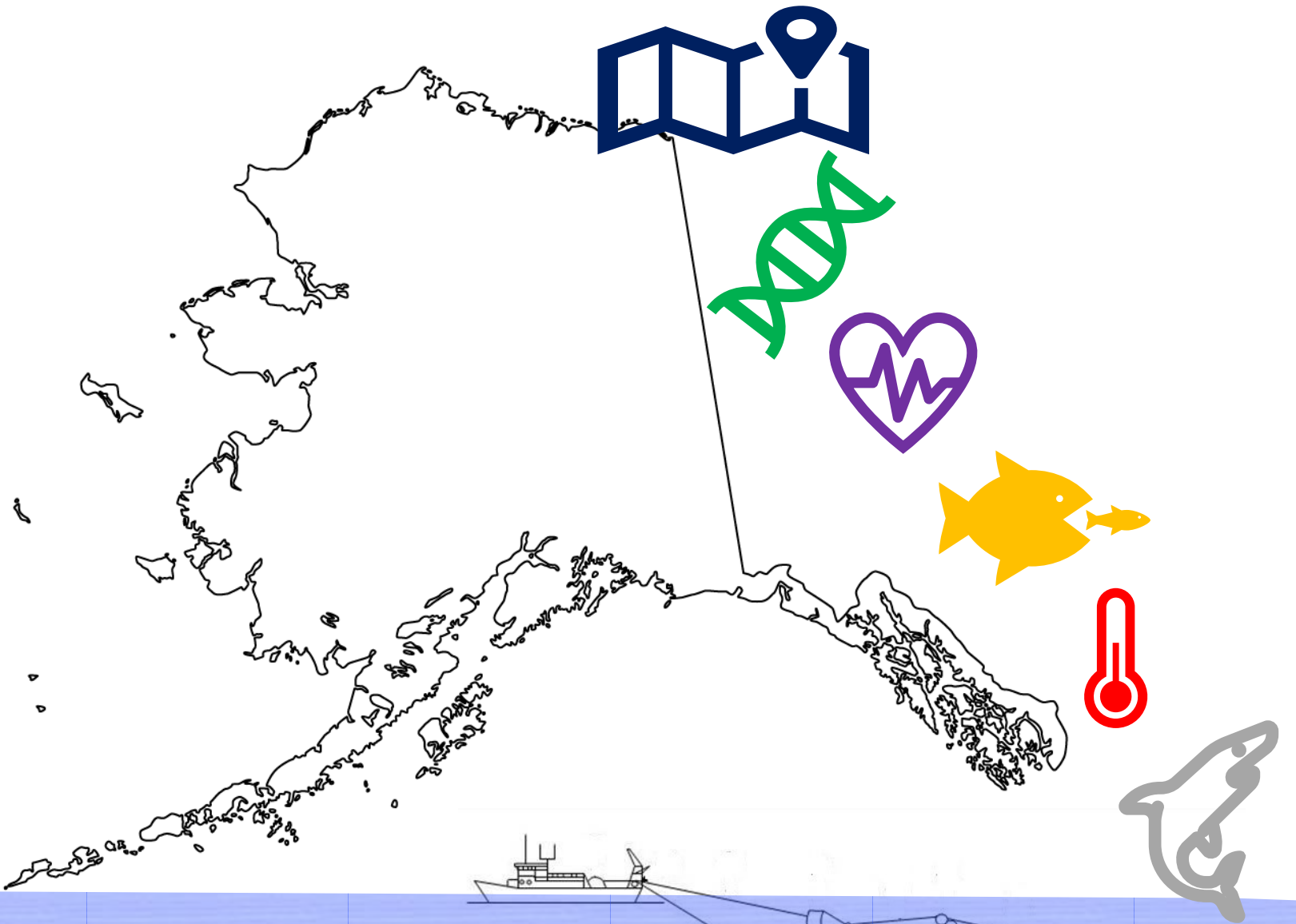
SOEP Research
Assistant

Salmon Ocean Ecology Program Objective

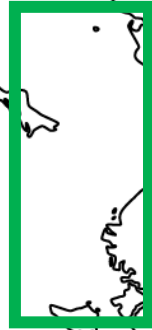


- Understand the marine life of Alaskan salmon
- Use this information to assist fishery management decision making
- Answer pressing questions about what drives Alaskan salmon abundance





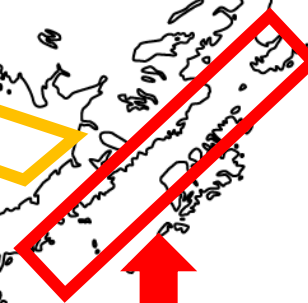
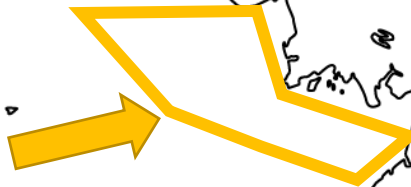
Northern Bering Sea Survey



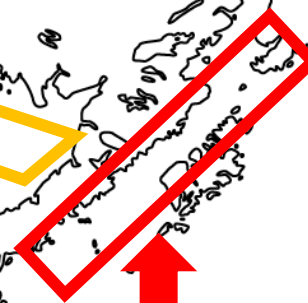
Southeast Alaska Coastal Monitoring (SECM)



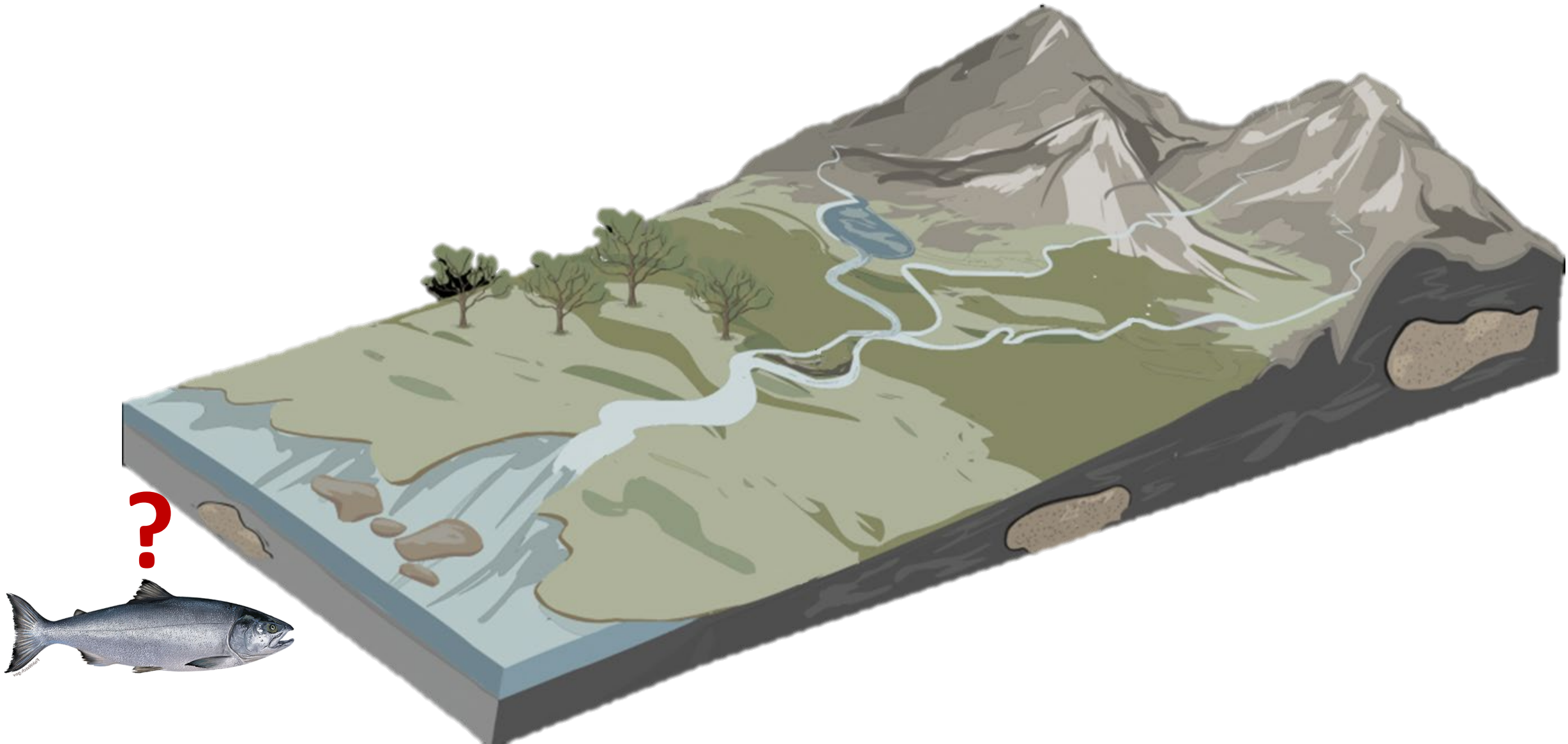
Southern Bering Sea Survey



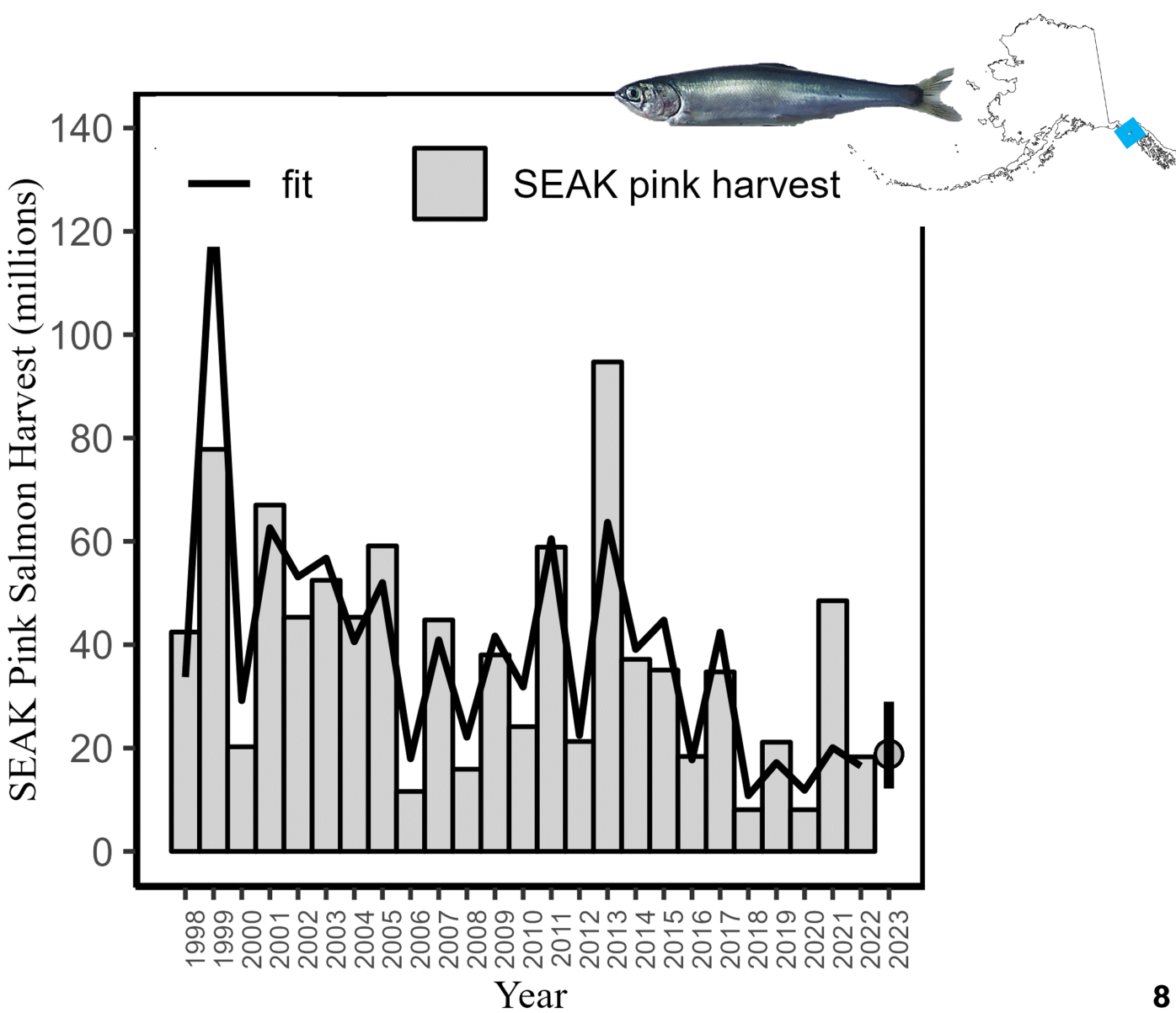
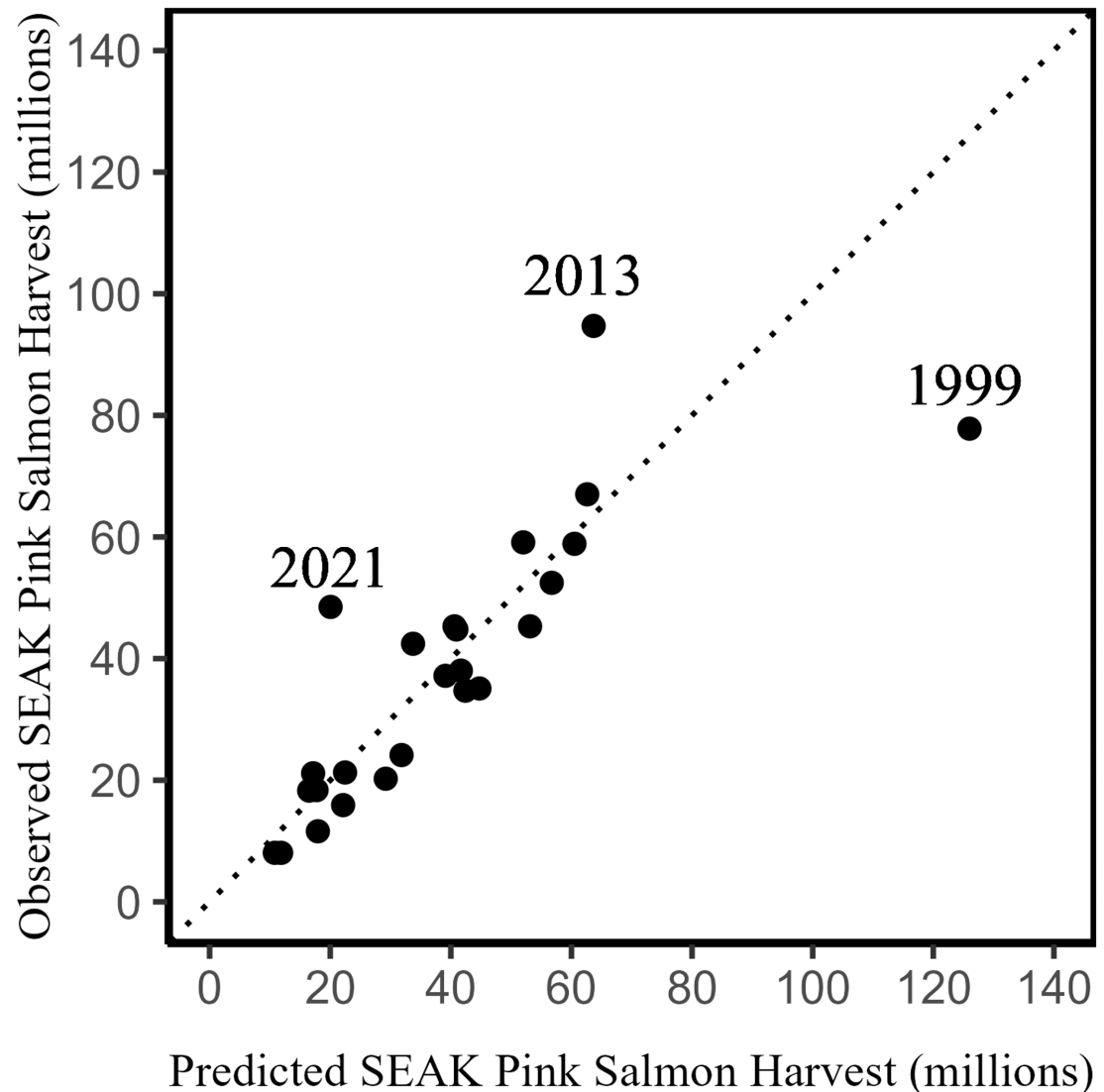
Western Gulf of Alaska Survey



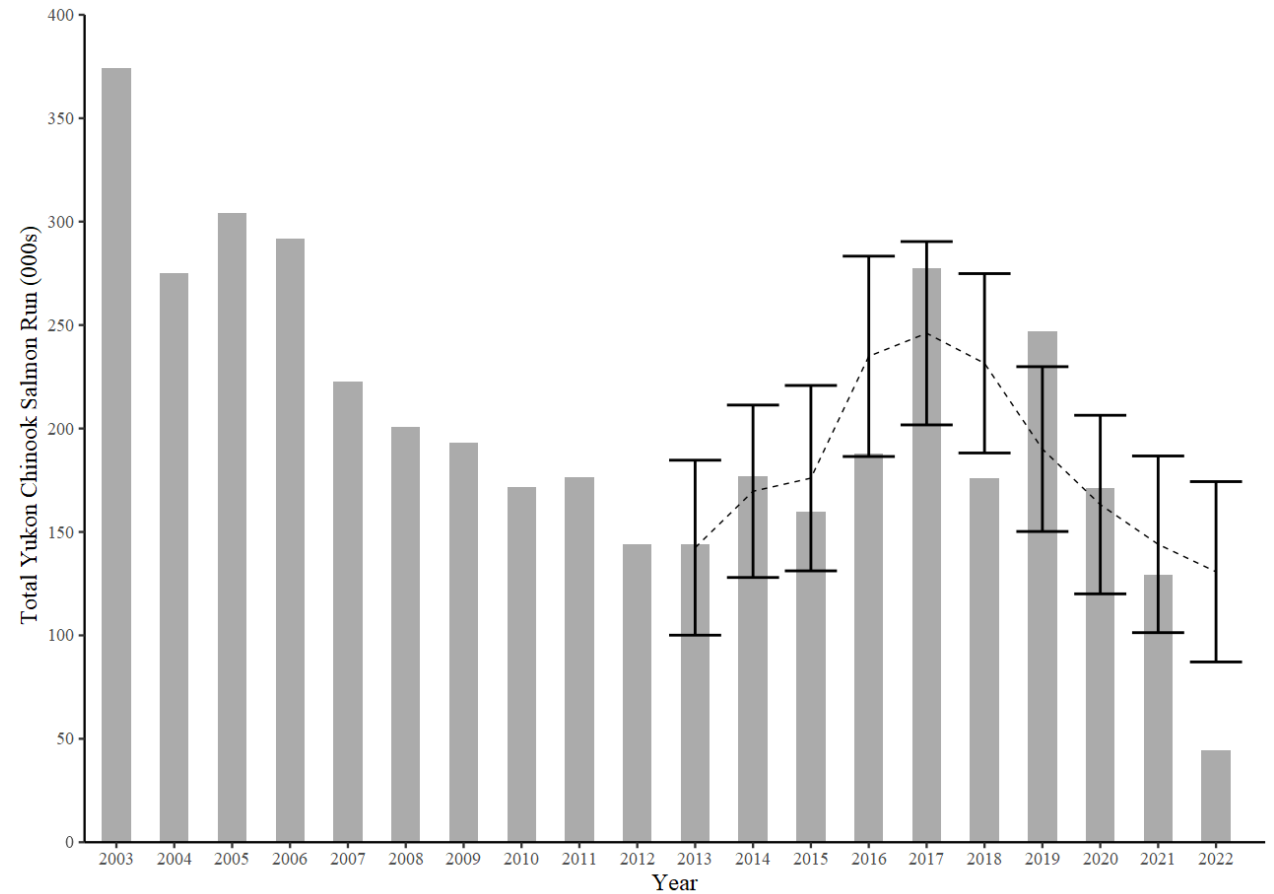
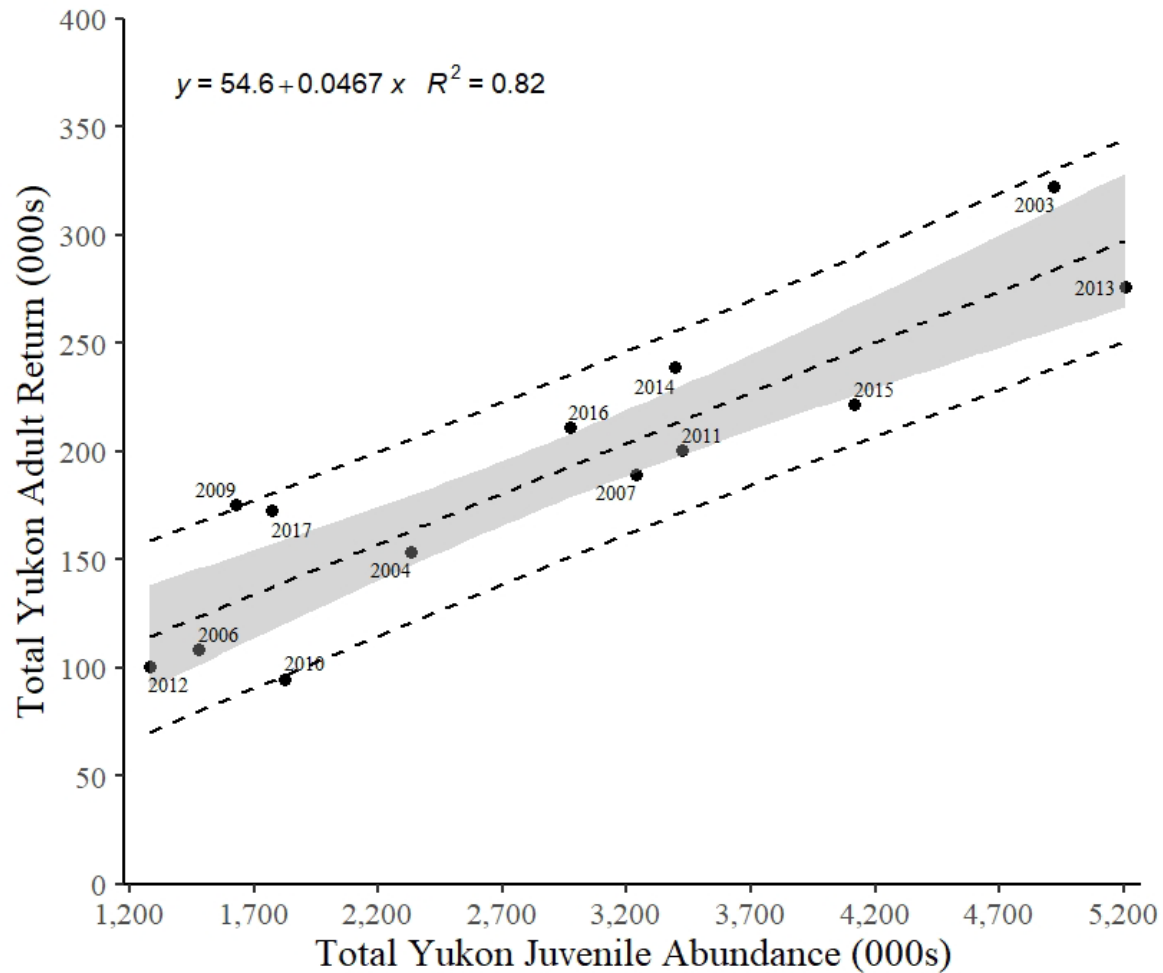
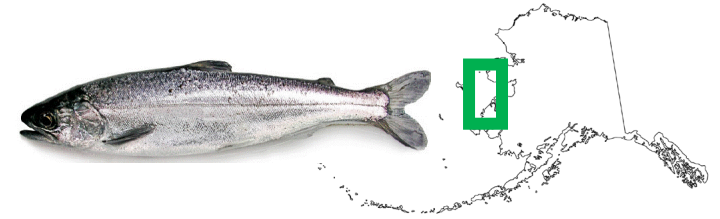
How can we better anticipate future run size?



How can we better anticipate future run size?



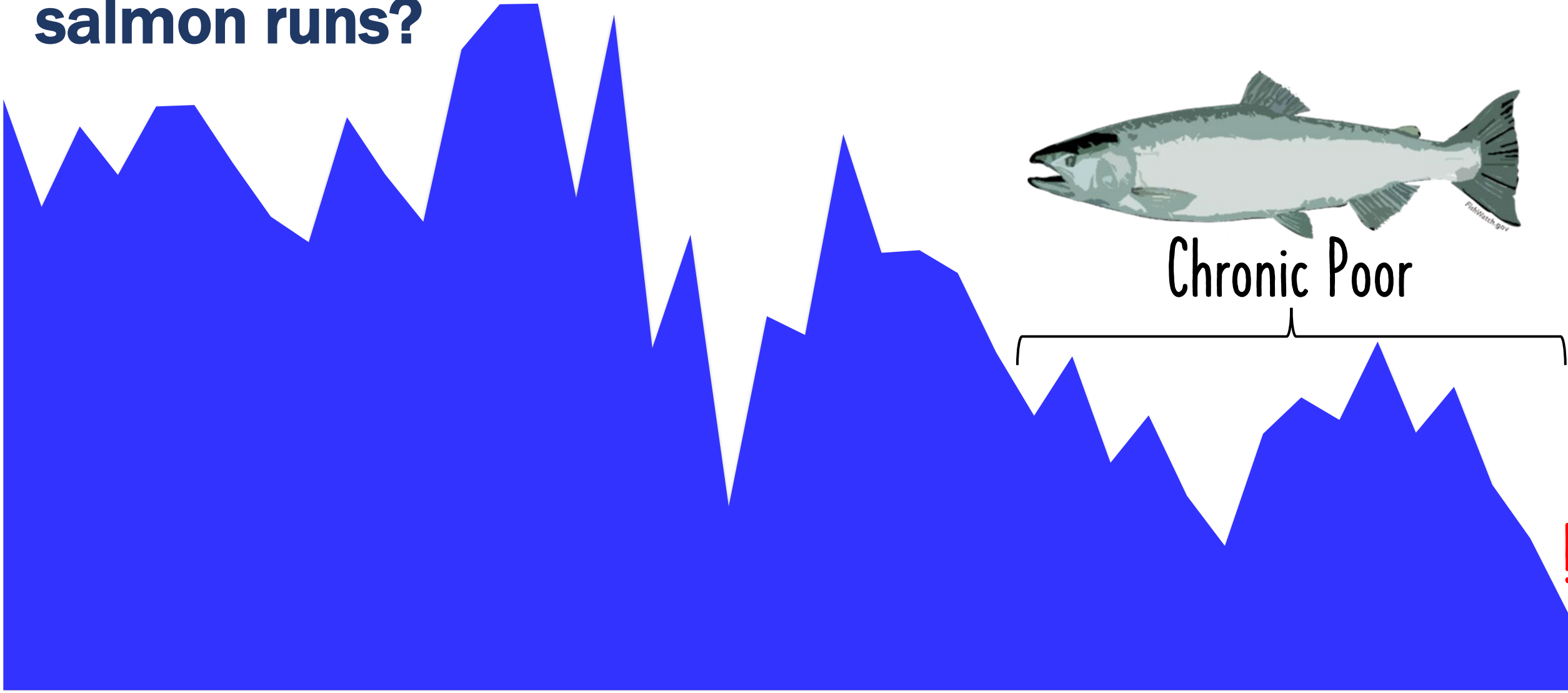
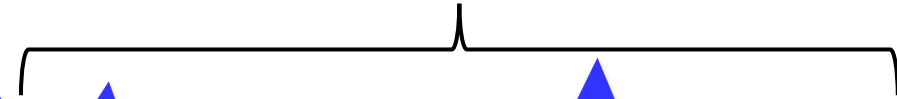
How can we better anticipate future run size?



What is driving record poor Yukon River Chinook salmon runs?

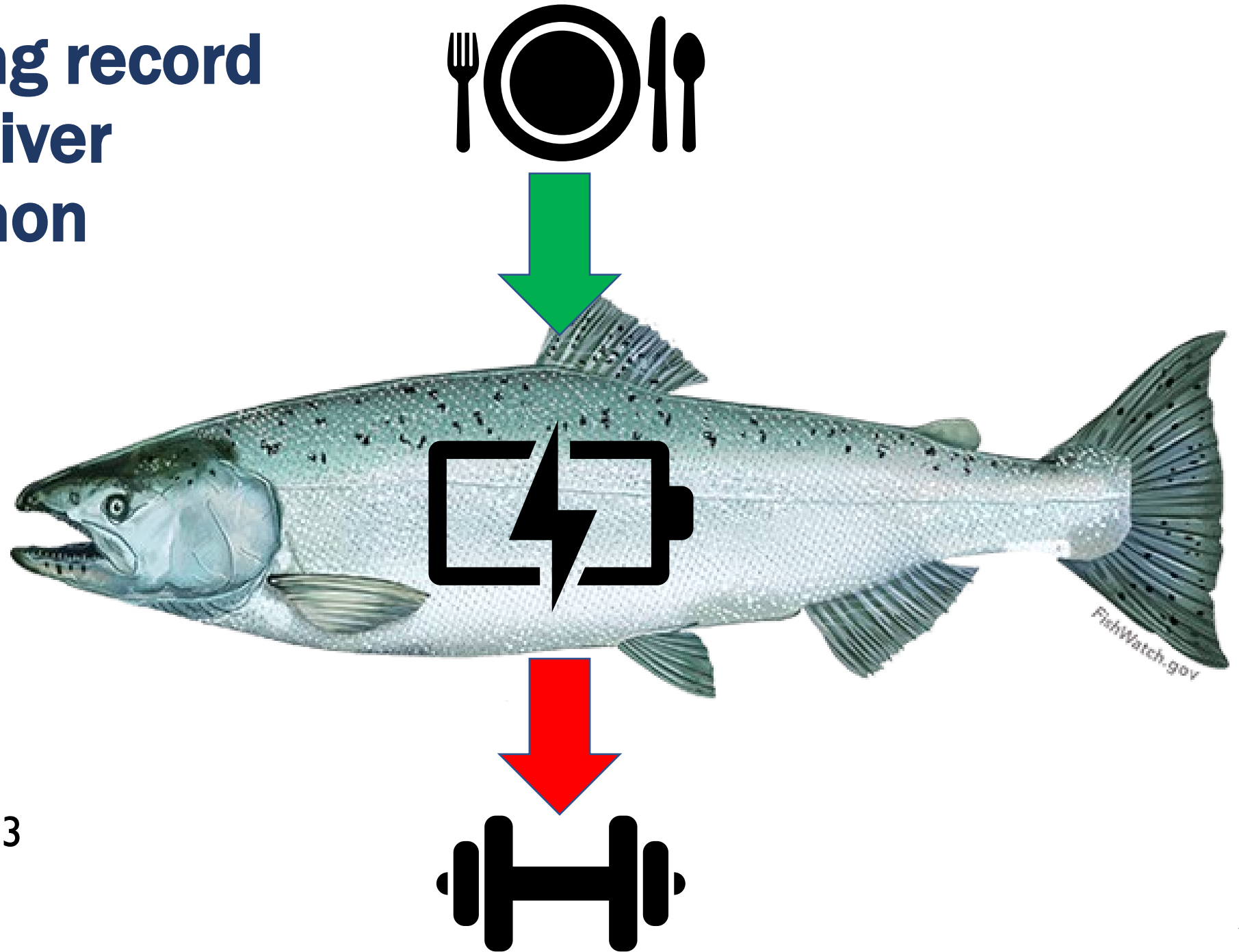


Chronic Poor

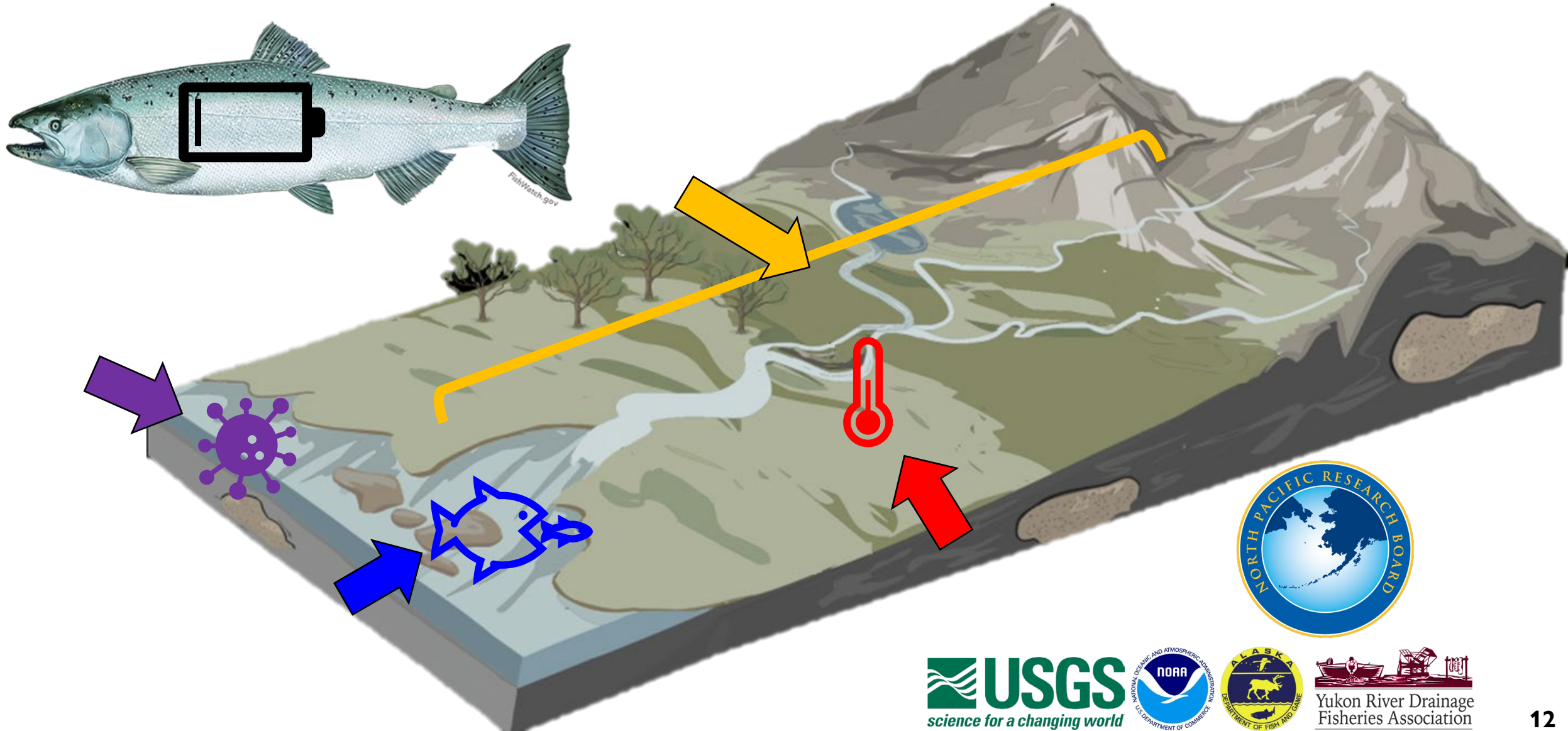


What is driving record poor Yukon River Chinook salmon runs?

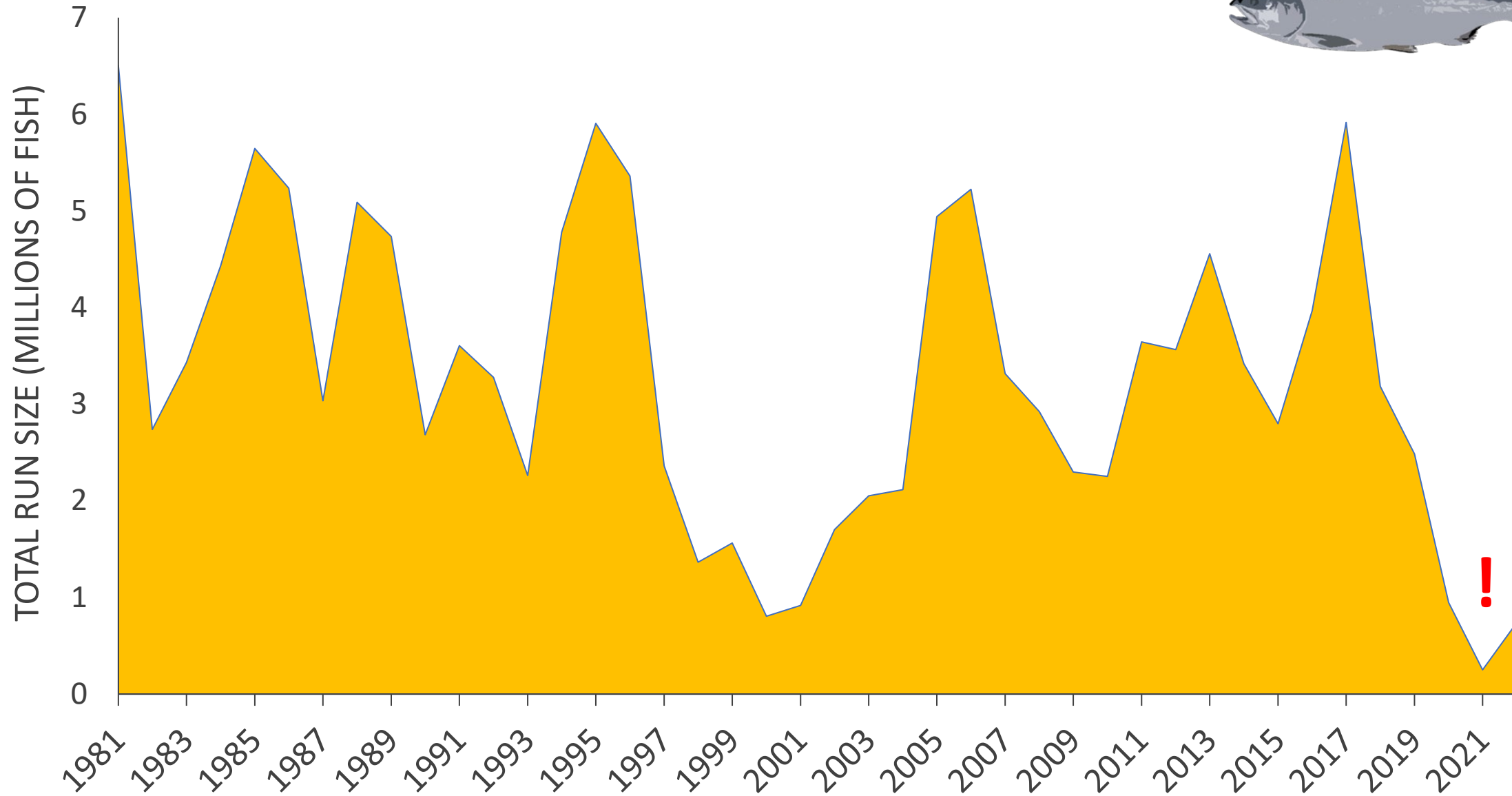
Honeyfield et al. 2016
Murphy et al. 2017
Larson & Howard 2019
Howard et al. 2020
von Biela et al. 2020
Murphy et al. 2022
Howard & von Biela 2023



What is driving record poor Yukon River Chinook salmon runs?

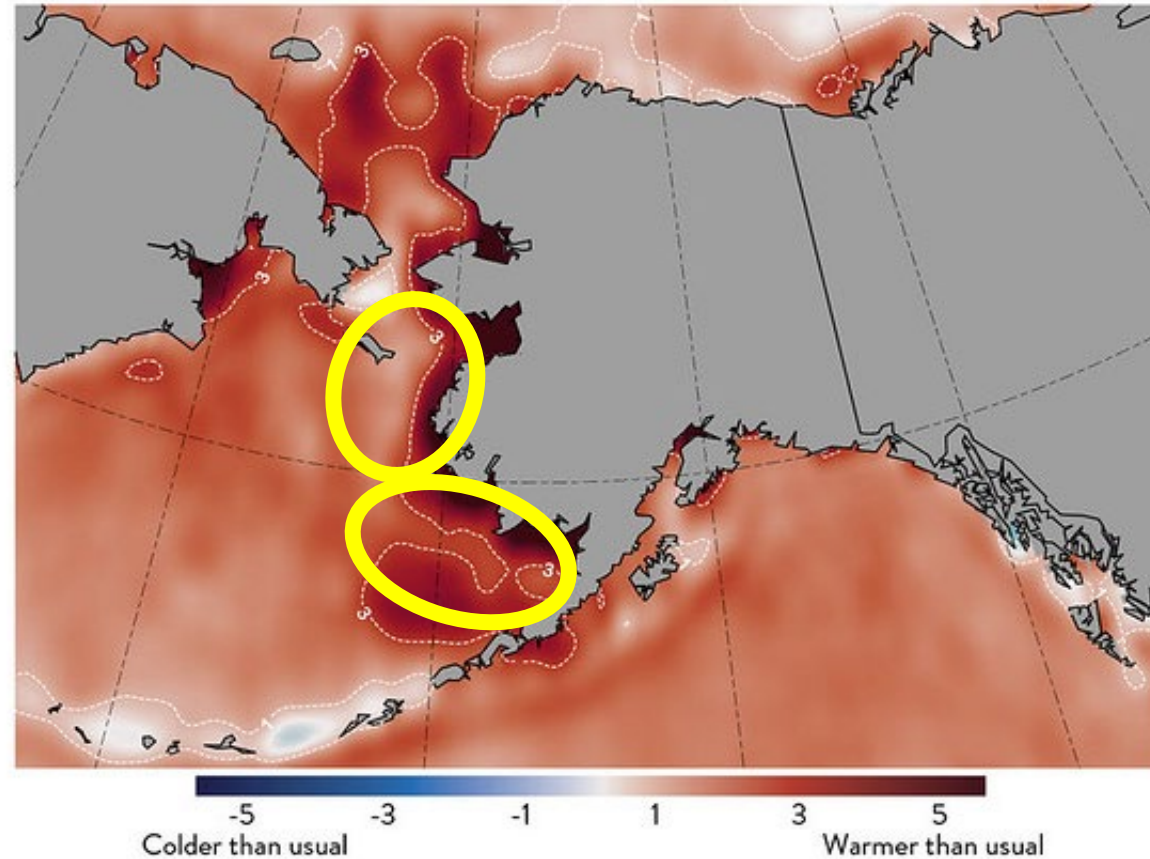


What is driving record poor western Alaska chum salmon runs?



What is driving record poor western Alaska chum salmon runs?

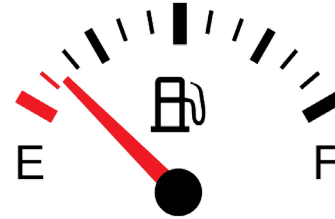
Summer sea surface temperatures off Alaska, 2014–2019



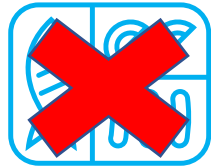
Data source: AMAP Ocean Acidification Report, 2018; Nature Climate Change, 2017; Progress in Oceanography, 2015

What is driving record poor western Alaska chum salmon runs?

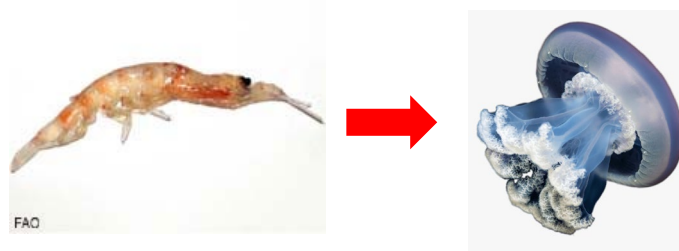
Juveniles in extremely poor condition



Empty stomachs



Different food available

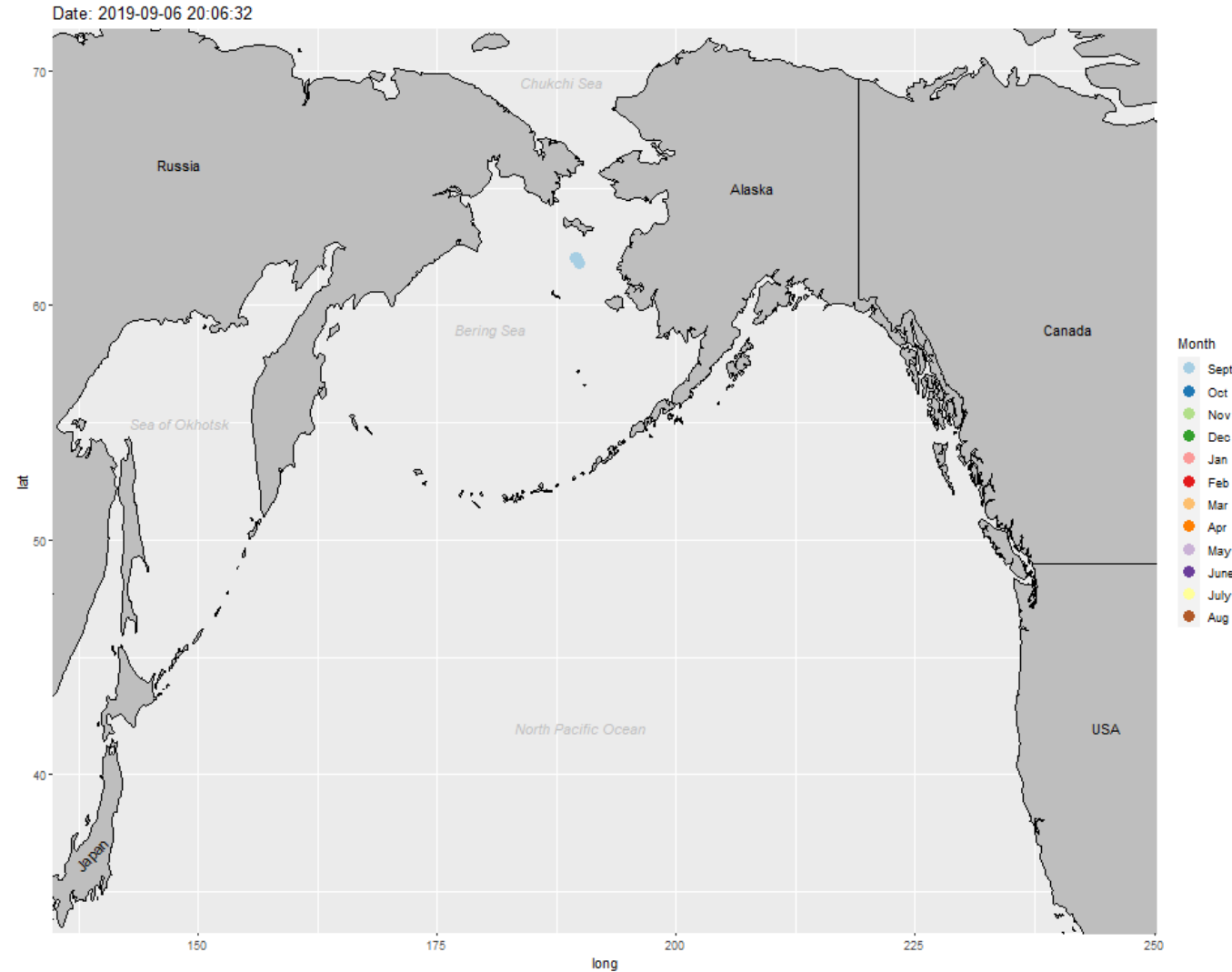


Species and stocks moving north – changing food and predators encountered by juvenile chum



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?

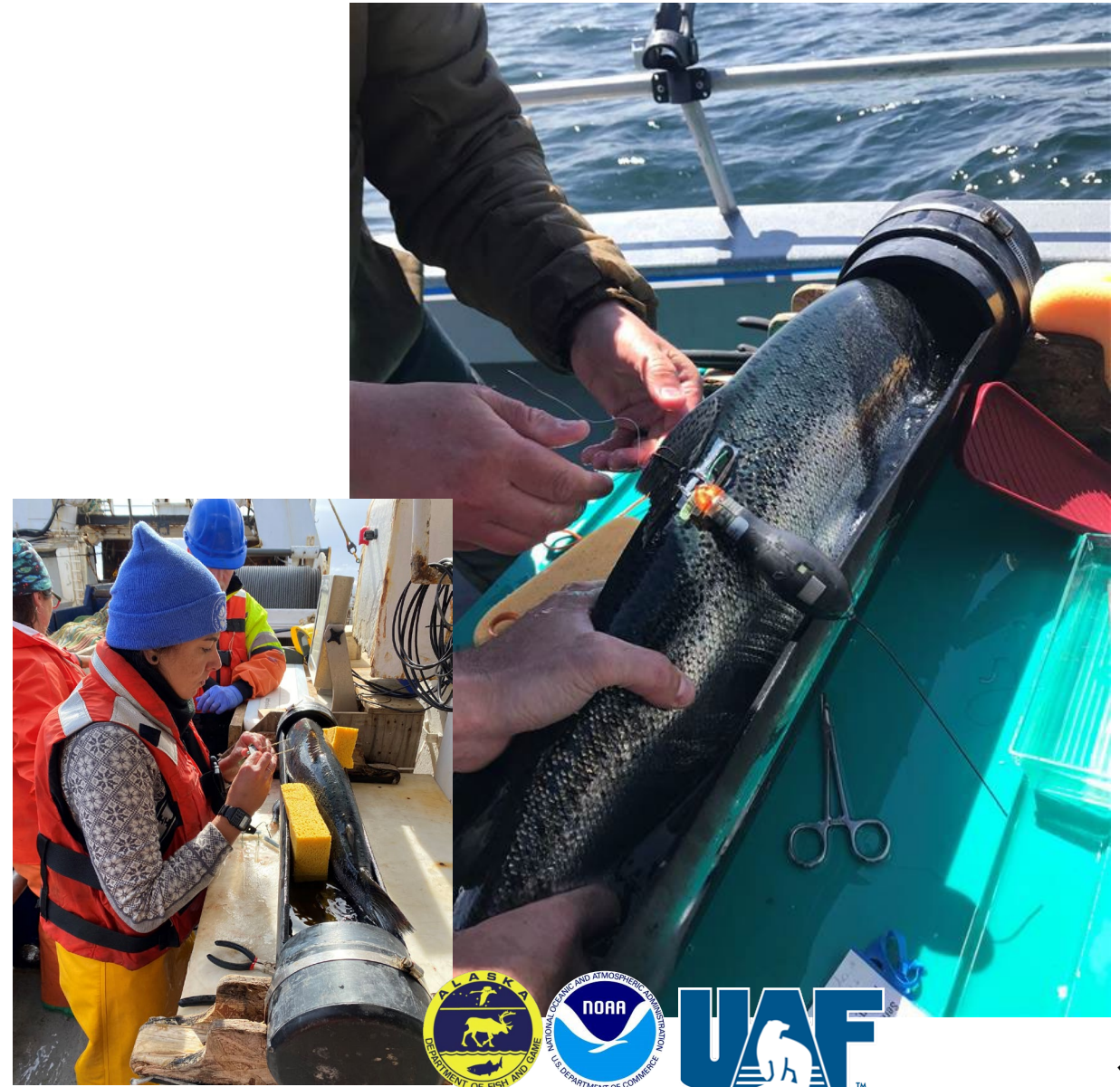
- Use wound and scar evidence from high seas surveys to assess predation on Pacific salmon (Weitkamp & Garcia 2022)
- Environmental DNA (eDNA) collected during marine surveys



Photo: Siwicke & Seitz 2018

Salmon Bycatch

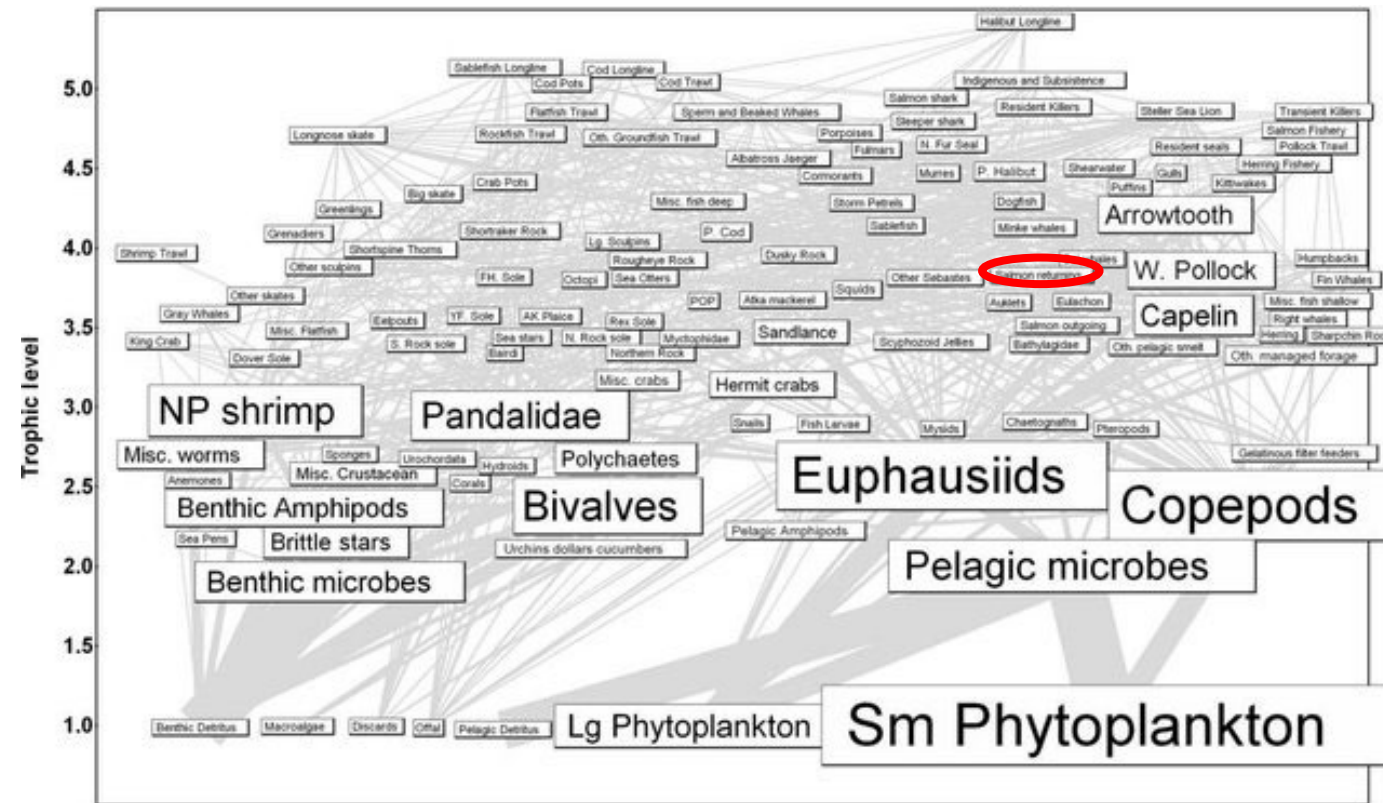
- Provide data, technical support and scientific advice to NMFS, bycatch task force, and Council staff
- Investigate Chinook salmon behavior to develop predictive tools which would allow fisheries to more actively avoid Chinook salmon hotspots and reduce their bycatch
- Develop chum salmon predictive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



Is Competition at Sea Impacting Alaska salmon?

- Provide information and technical advice to department leadership, the board and others
- Keep up to date and review scientific literature on interspecific salmon competition at sea and the role of salmon in marine food webs
- Participate in international expert groups assessing the role of pink salmon in marine ecosystems
- New research to better inform the issue

Gaichas et al., 2012



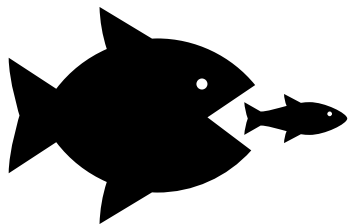


2021 Western Pacific Winter Expedition



2022 Pan-Pacific Expedition

North Pacific Anadromous Fish Commission/International Year of the Salmon



Competition between AYK chum and other stocks/species in winter



International Data Sharing and Collaborations



Weitkamp et al. in prep
(publish summer 2023)



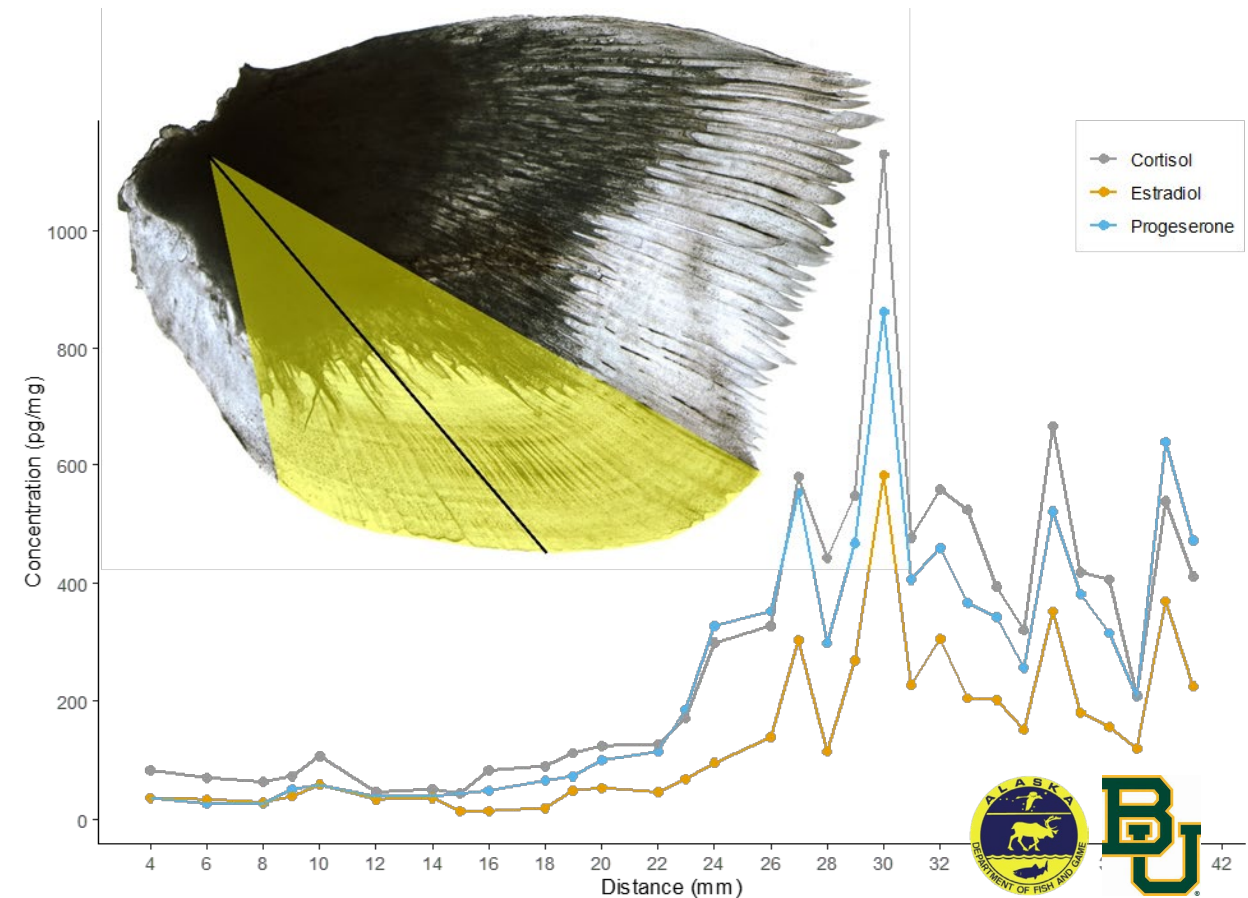
Munro et al. in prep
(publish summer 2023)



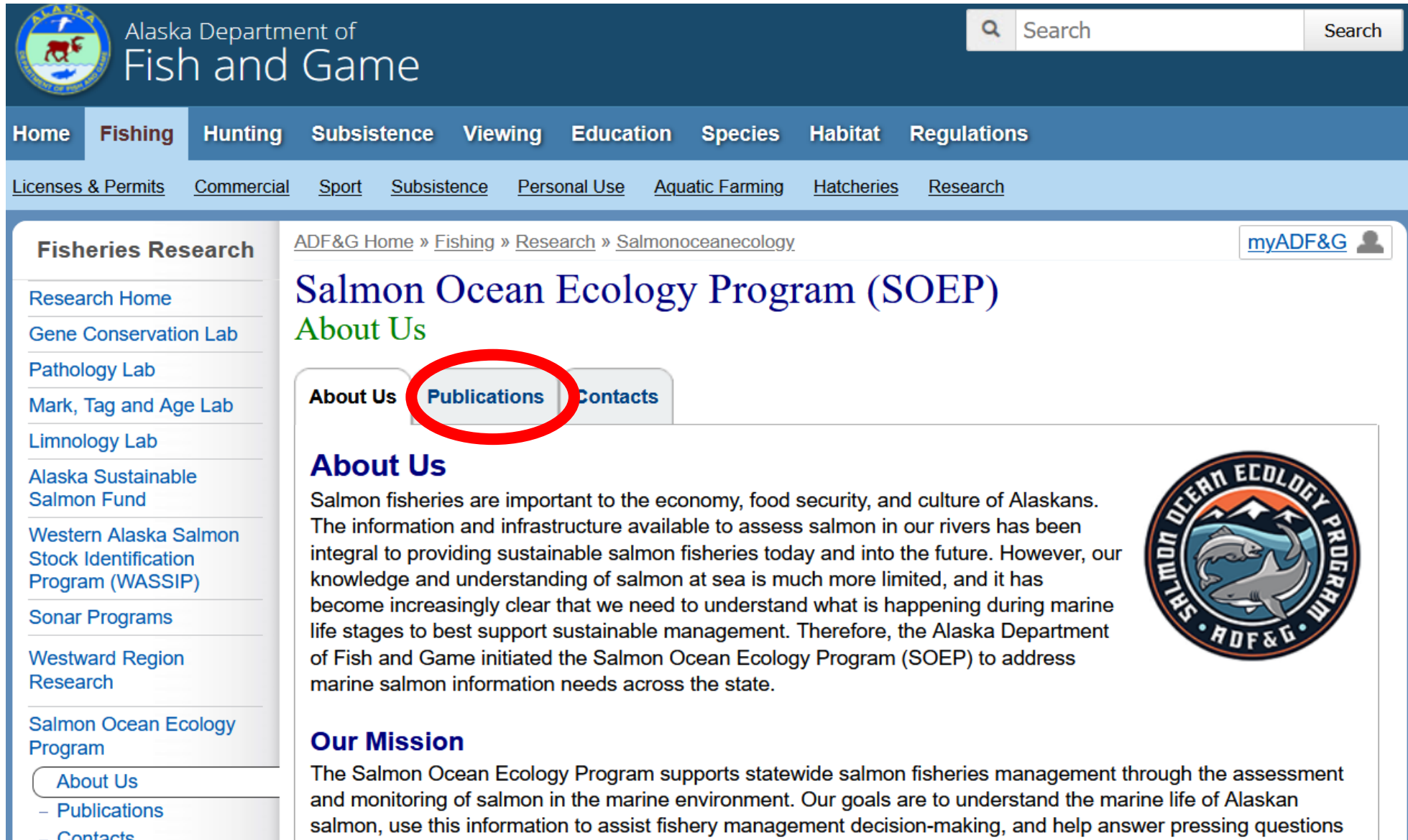
Chinook and salmon
shark tagging

Supporting Development of New Technologies

- Environmental DNA (eDNA)
- Environmental life histories from bones



Communications and Outreach



The screenshot shows the Alaska Department of Fish and Game website. The header includes the department's logo and name, a search bar, and a navigation menu with links to Home, Fishing, Hunting, Subsistence, Viewing, Education, Species, Habitat, and Regulations. Below this is a secondary menu with links to Licenses & Permits, Commercial, Sport, Subsistence, Personal Use, Aquatic Farming, Hatcheries, and Research.

The main content area is titled "Salmon Ocean Ecology Program (SOEP)" and includes a breadcrumb trail: ADF&G Home » Fishing » Research » Salmon Ocean Ecology. The "About Us" link is highlighted in green. Below the title, there are three tabs: "About Us", "Publications" (which is circled in red), and "Contacts".

The "About Us" section contains the following text:

About Us

Salmon fisheries are important to the economy, food security, and culture of Alaskans. The information and infrastructure available to assess salmon in our rivers has been integral to providing sustainable salmon fisheries today and into the future. However, our knowledge and understanding of salmon at sea is much more limited, and it has become increasingly clear that we need to understand what is happening during marine life stages to best support sustainable management. Therefore, the Alaska Department of Fish and Game initiated the Salmon Ocean Ecology Program (SOEP) to address marine salmon information needs across the state.

Our Mission

The Salmon Ocean Ecology Program supports statewide salmon fisheries management through the assessment and monitoring of salmon in the marine environment. Our goals are to understand the marine life of Alaskan salmon, use this information to assist fishery management decision-making, and help answer pressing questions

On the right side of the "About Us" section is the SOEP logo, which features a circular design with a mountain, a river, and a fish, surrounded by the text "SALMON OCEAN ECOLOGY PROGRAM" and "ADF&G".

The left sidebar contains a "Fisheries Research" section with links to Research Home, Gene Conservation Lab, Pathology Lab, Mark, Tag and Age Lab, Limnology Lab, Alaska Sustainable Salmon Fund, Western Alaska Salmon Stock Identification Program (WASSIP), Sonar Programs, Westward Region Research, and Salmon Ocean Ecology Program. Below this is a sub-menu with links to About Us, Publications, and Contacts.

<https://www.adfg.alaska.gov/index.cfm?adfg=salmonoceanecology.main>

Communications and Outreach

Find us on Facebook:



Thank you

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