

Science, Service, Stewardship



Lower Yukon River Juvenile Chinook Outmigration

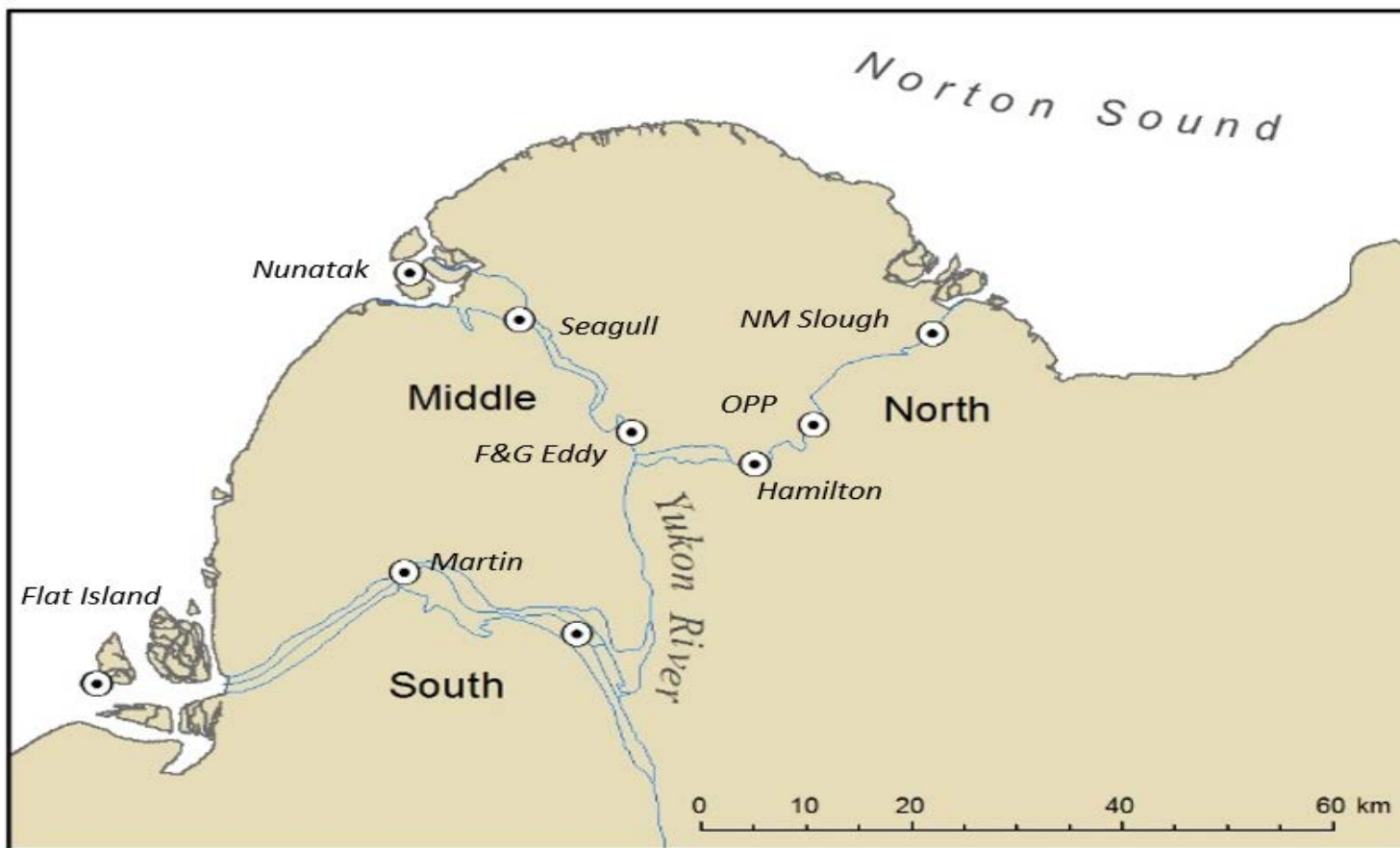
Katharine Miller, AFSC

Jennifer Williams, YDFDA

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Sampling Locations





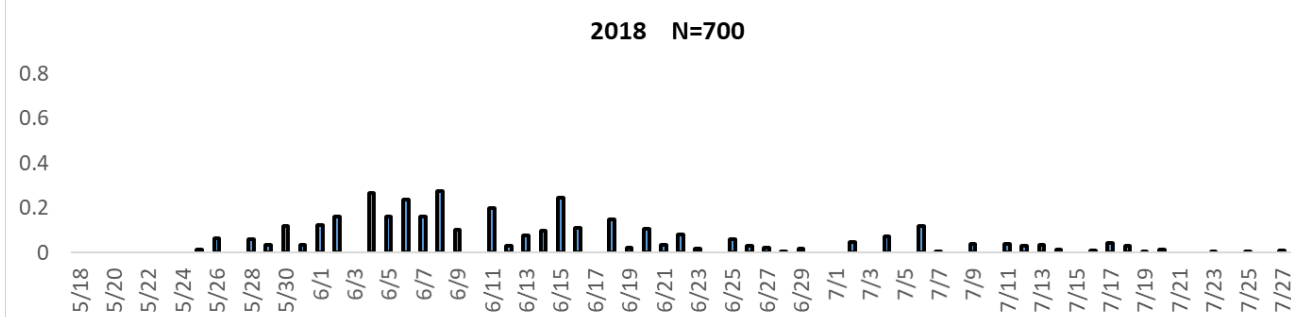
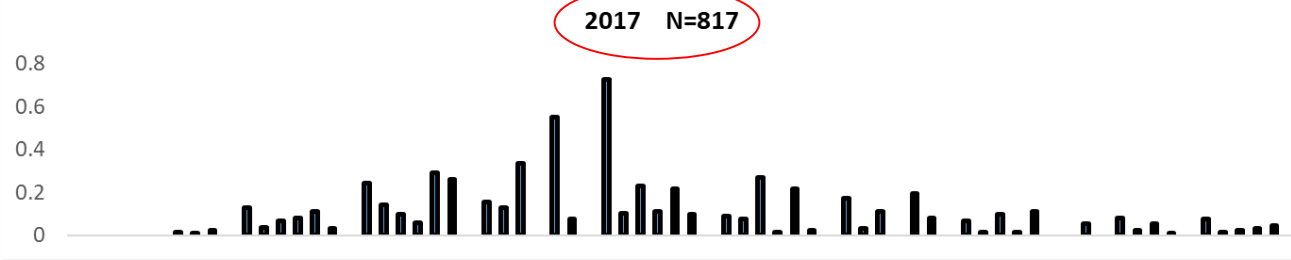
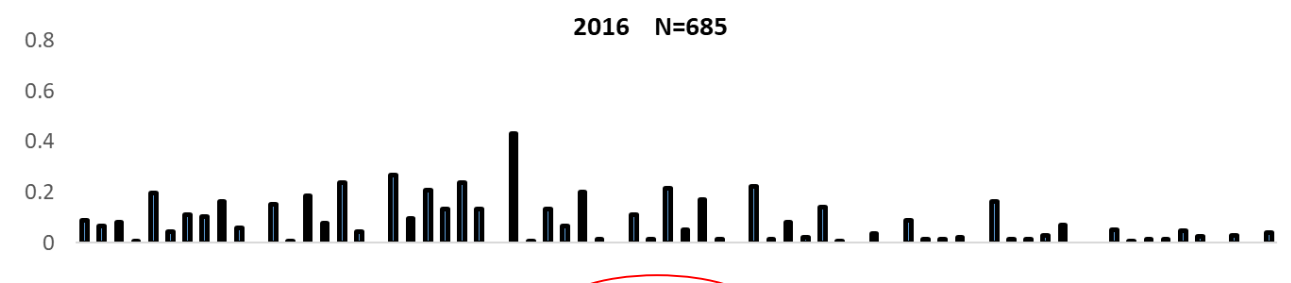
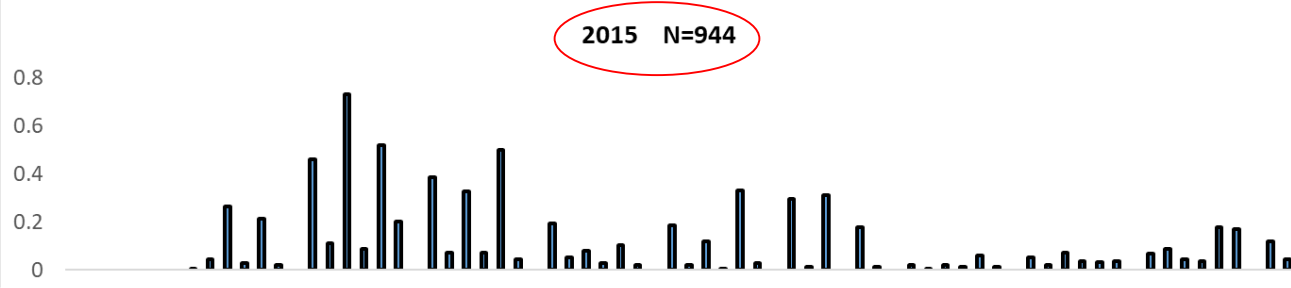
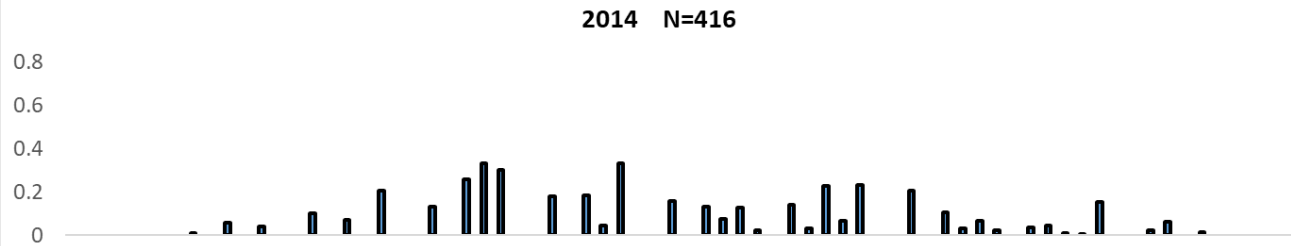
Objectives

2014 – 2015

- Not much known – Martin et al. study SM 1987
 - Outmigration phenology
 - Spatial distribution / habitat use
 - Size and condition

2016 and 18

- Spatial and temporal prey composition





Diet composition

- Diets/Prey composition similar between distributaries within a year
 - Composition different at Flat Island (SM)
- Temporal and interannual variation diets
 - Prey only sampled 2016



2016 Prey Study

- Diets/Prey composition similar between distributaries within a year

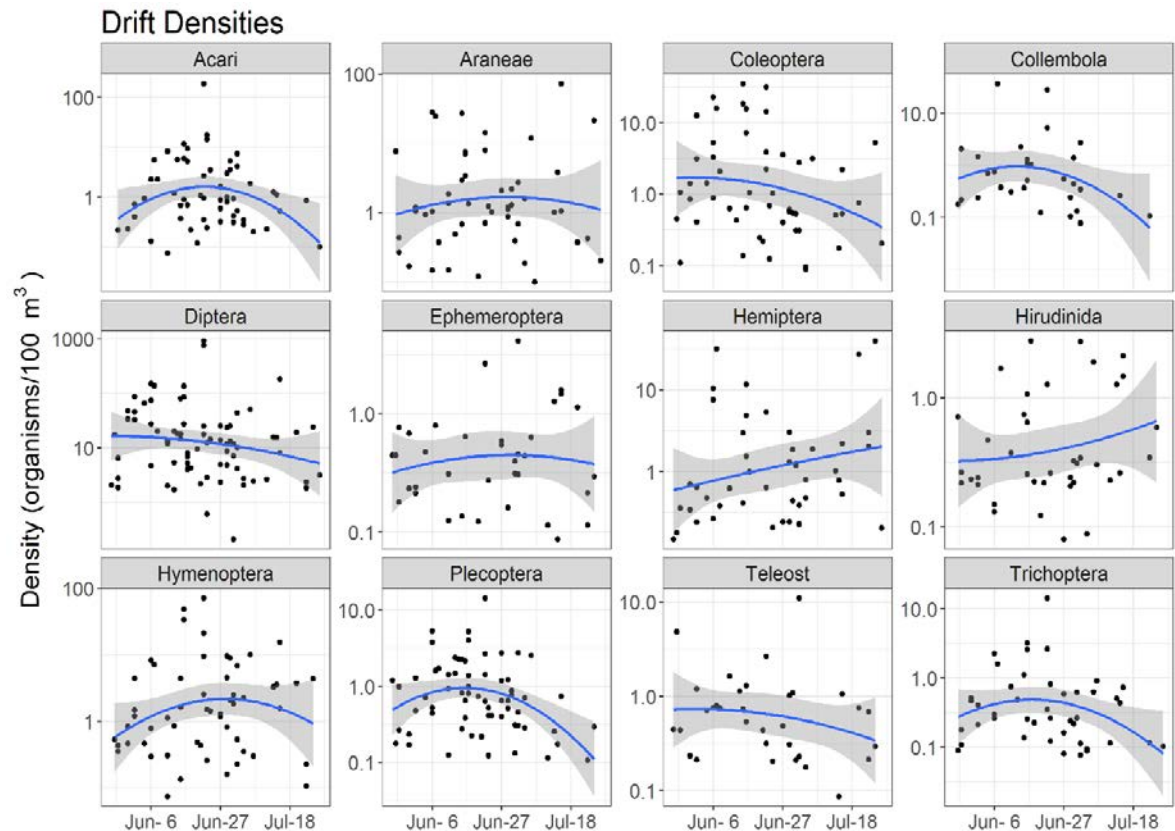
- Diet composition different at Flat Island (SM)

- Temporal and interannual variation diets

- Prey only sampled 2016

- Temporal variation in prey availability

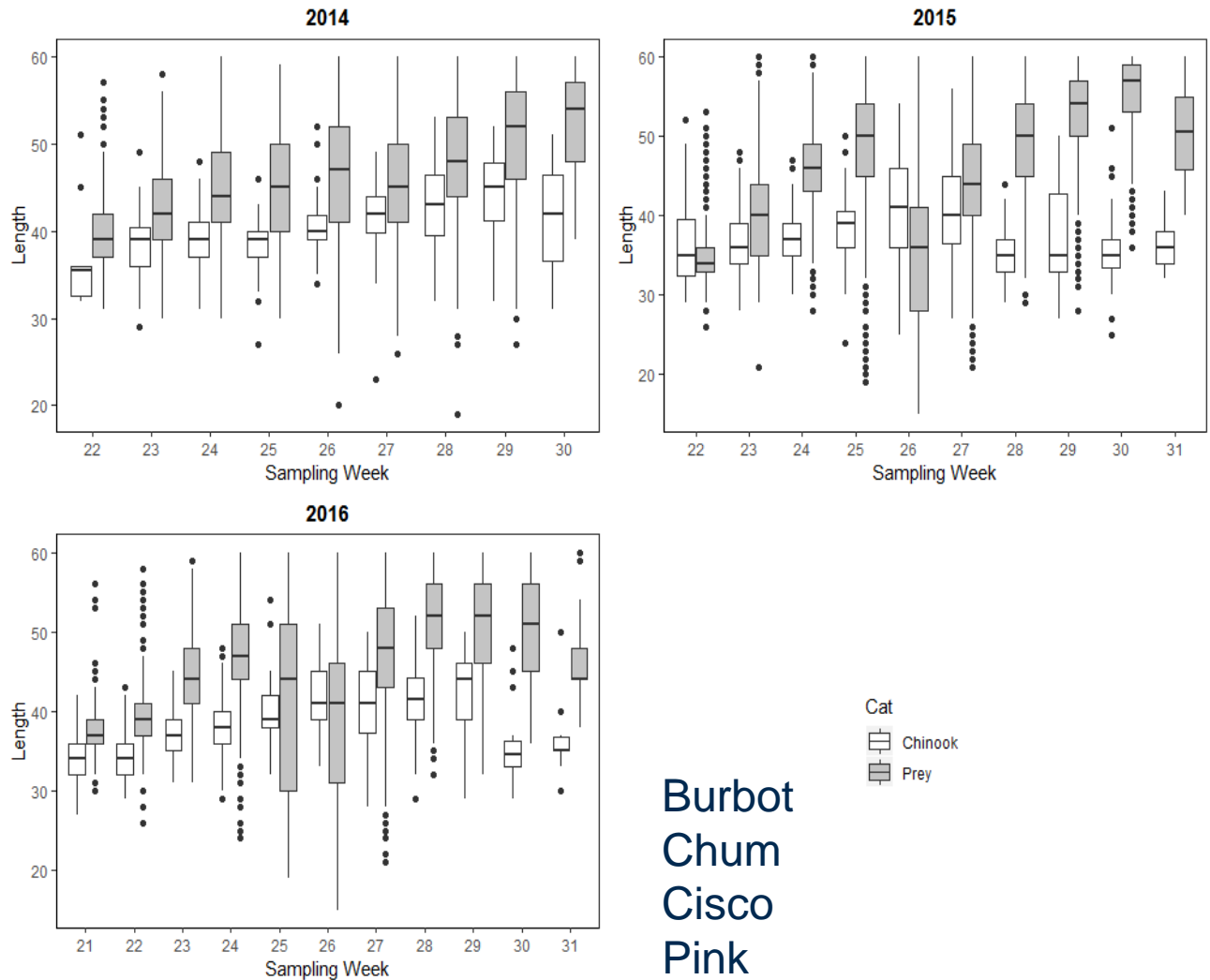
- Portion of Chinook piscivorous





- Fish prey rapidly outgrows susceptibility to predation
- Overlap varies with year
 - Size outmigrating fish

All Prey Species

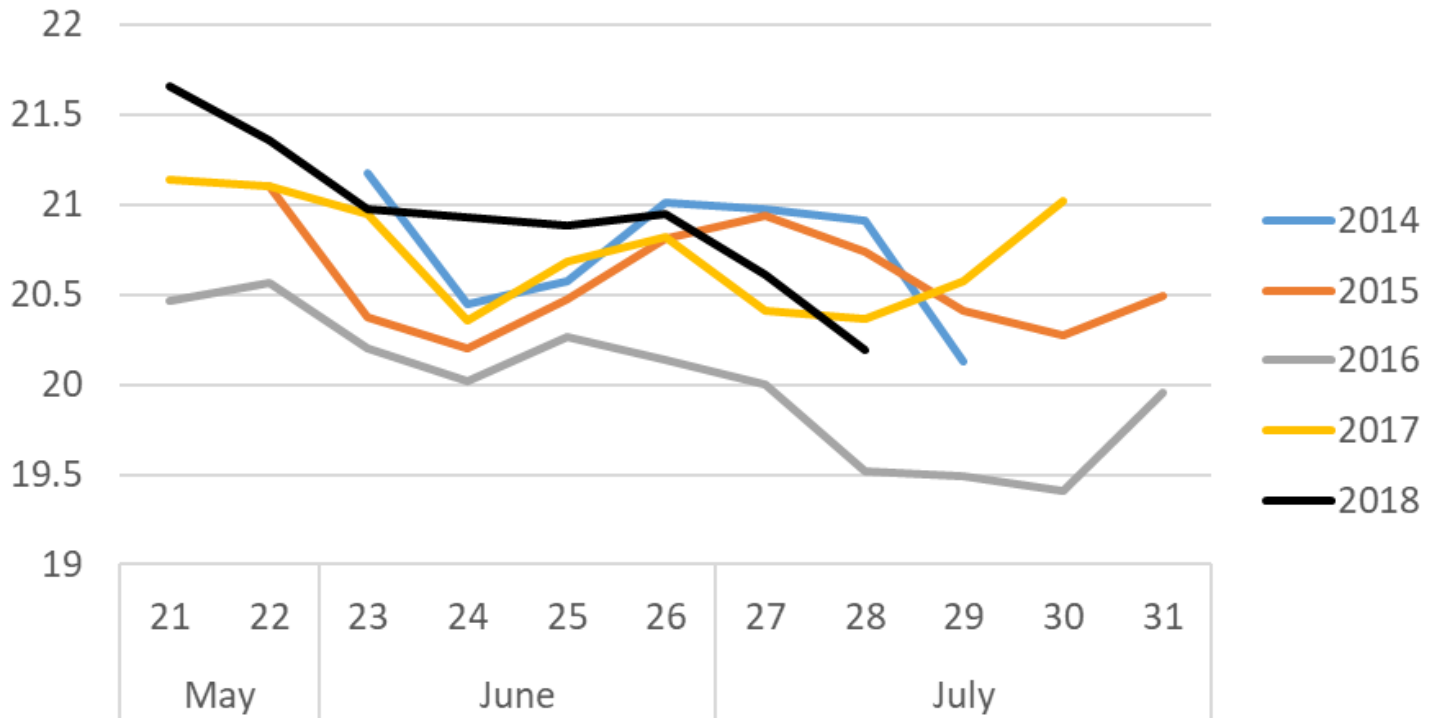


Burbot
Chum
Cisco
Pink
Whitefish

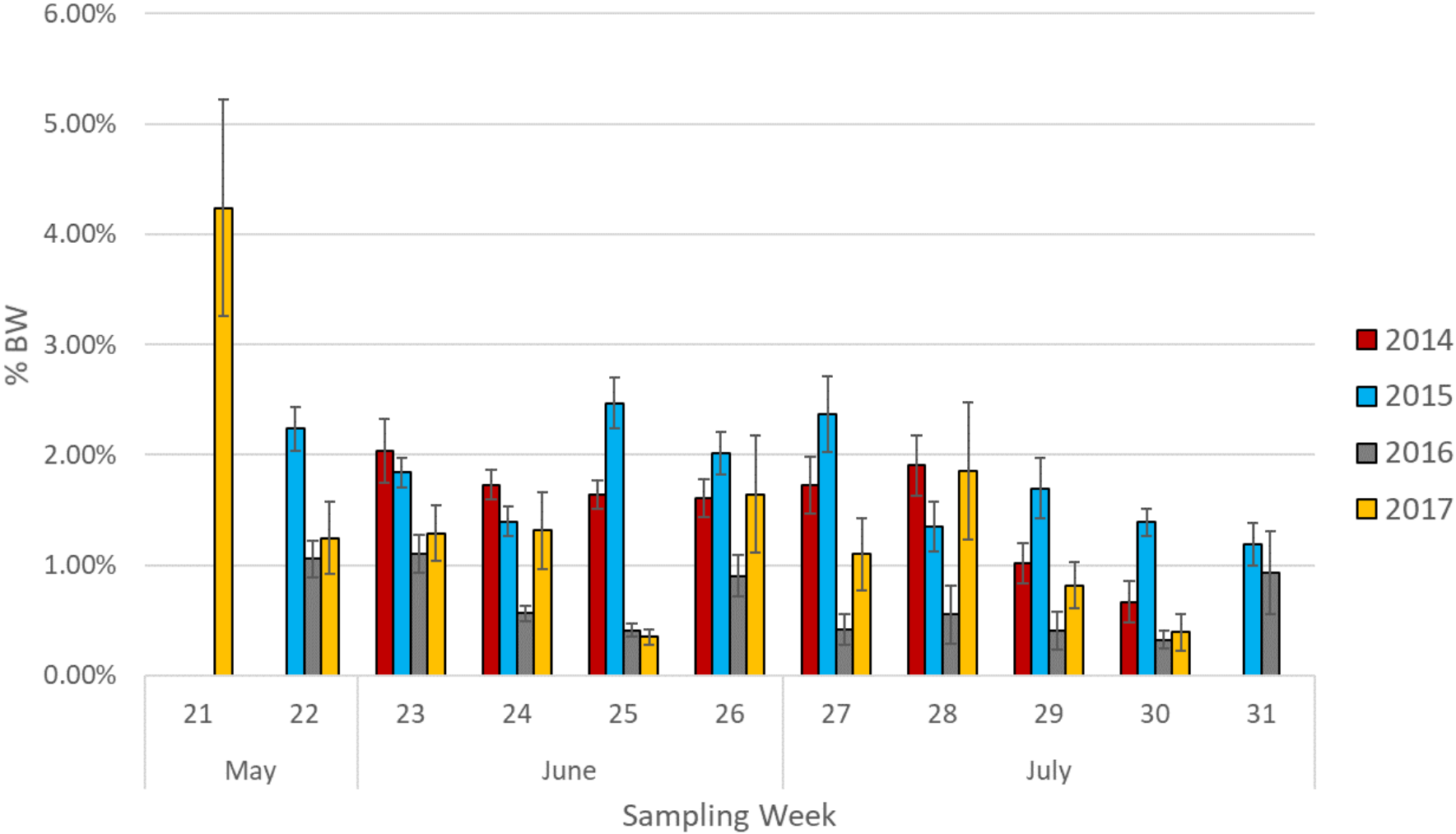


Energy content

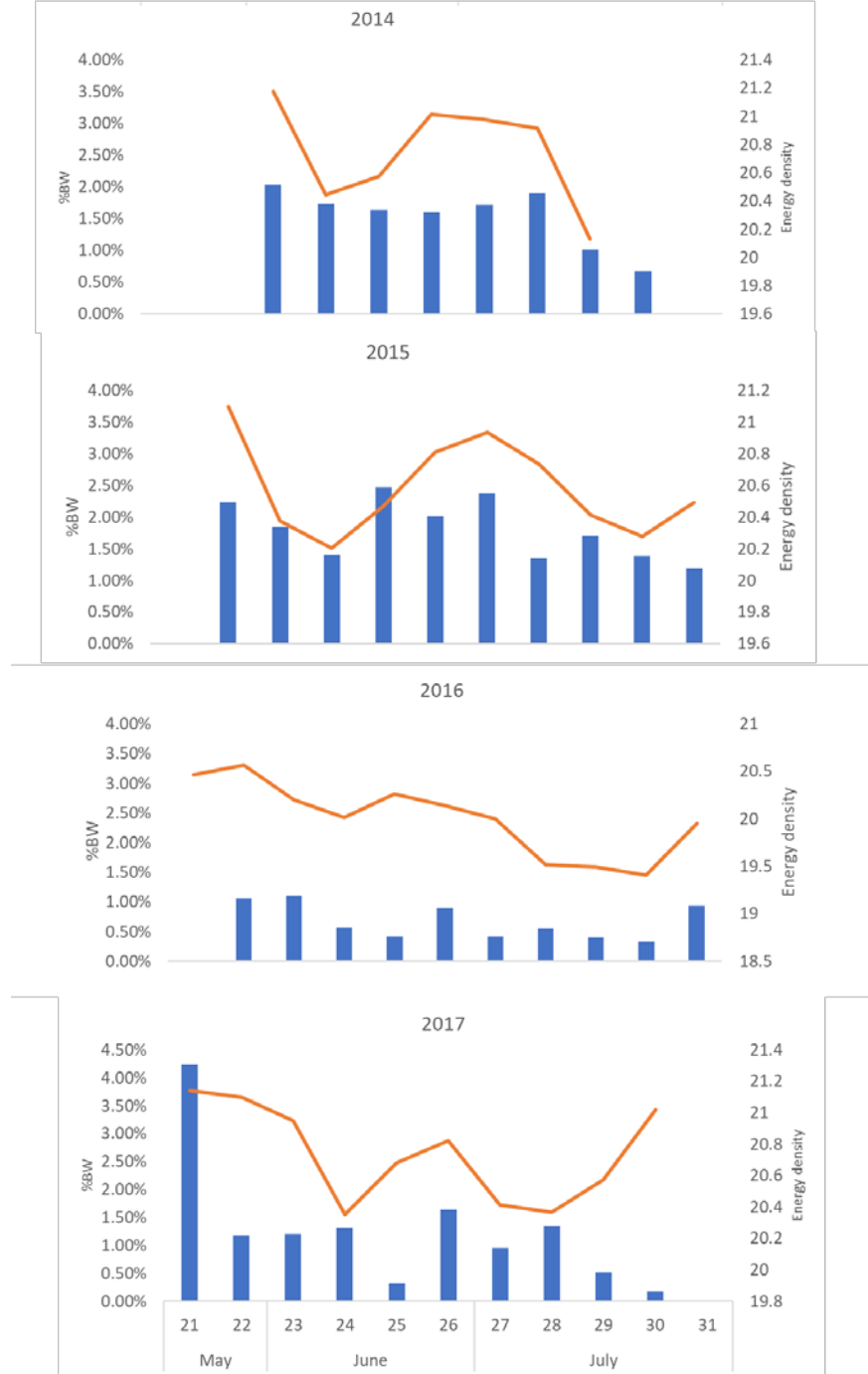
Median Energy Density by Week



Stomach fullness as a percent of body weight



- ED is stored energy
 - Lags
- Most years ED high at start
 - Smolting
- Longer diet history





- Energy density is metabolized energy
 - Expect a lag from diets
- Piscivory
 - 2016 and 2018
 - How does prey quality affect condition
 - How does prey type affect condition
 - Prey density
 - Ratio of predator and prey size

Yukon River Watershed



PRECIPITATION REGIONS

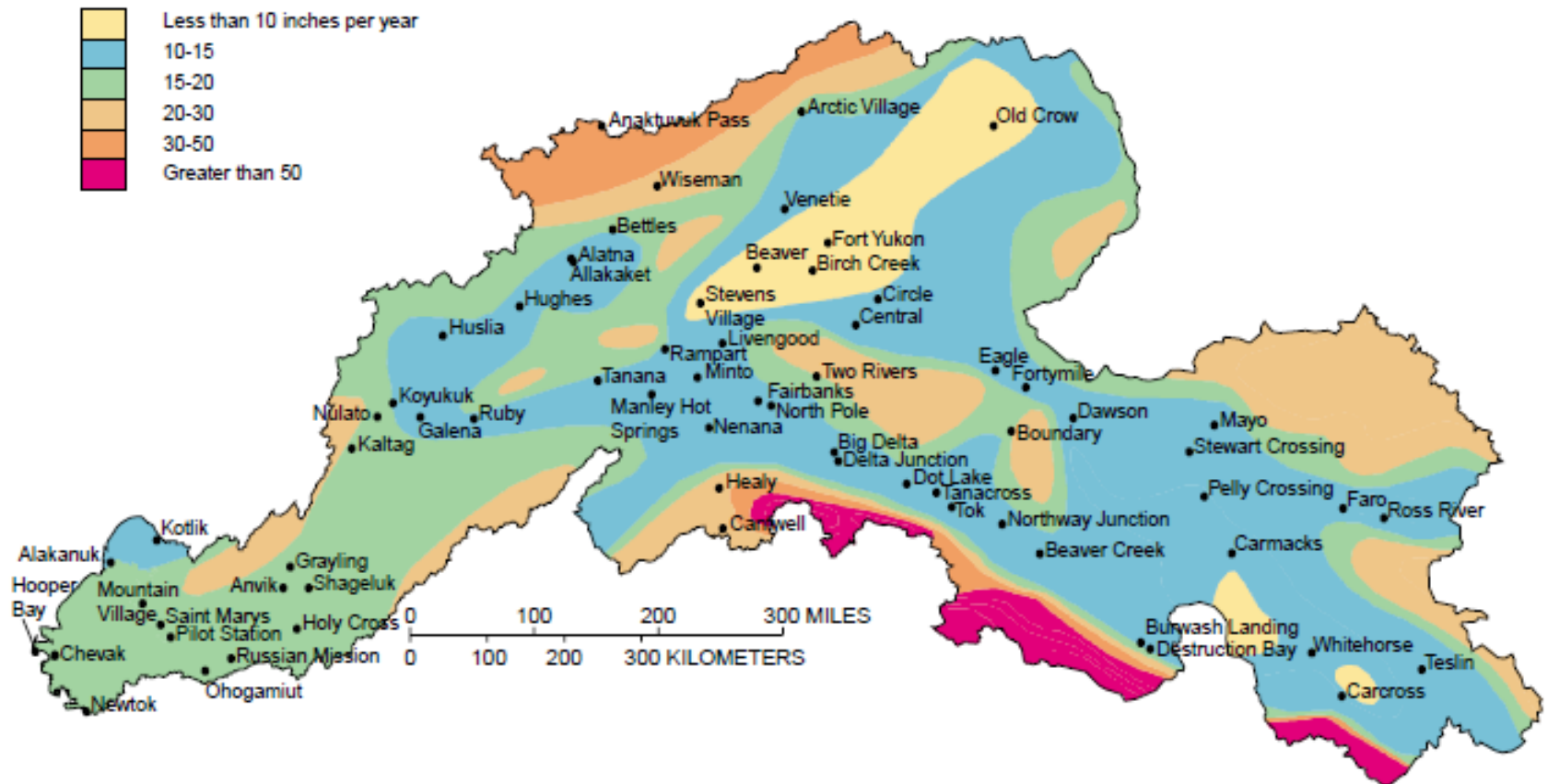


Figure 9. Precipitation regions in the Yukon River Basin (from Jones and Fahl, 1994).



Ongoing and Future work

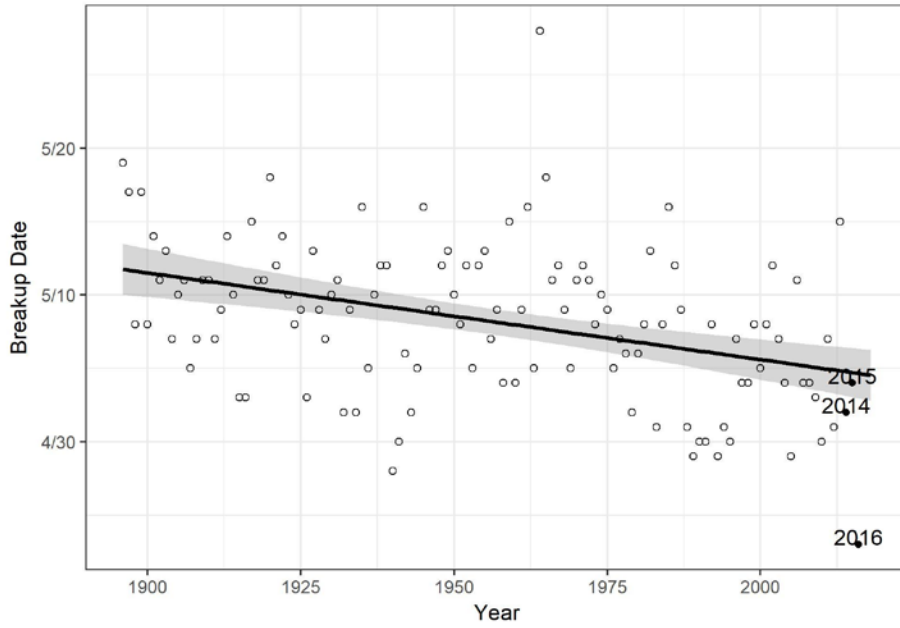
- Continuing prey studies
 - Add 2018 and 2019 to existing 2016 data
 - Prey density
 - Prey quality (lipids)
 - Temporal variability
- Stable isotopes
 - Longer diet information
 - Piscivory
 - Evaluate with other condition factors: ED, size



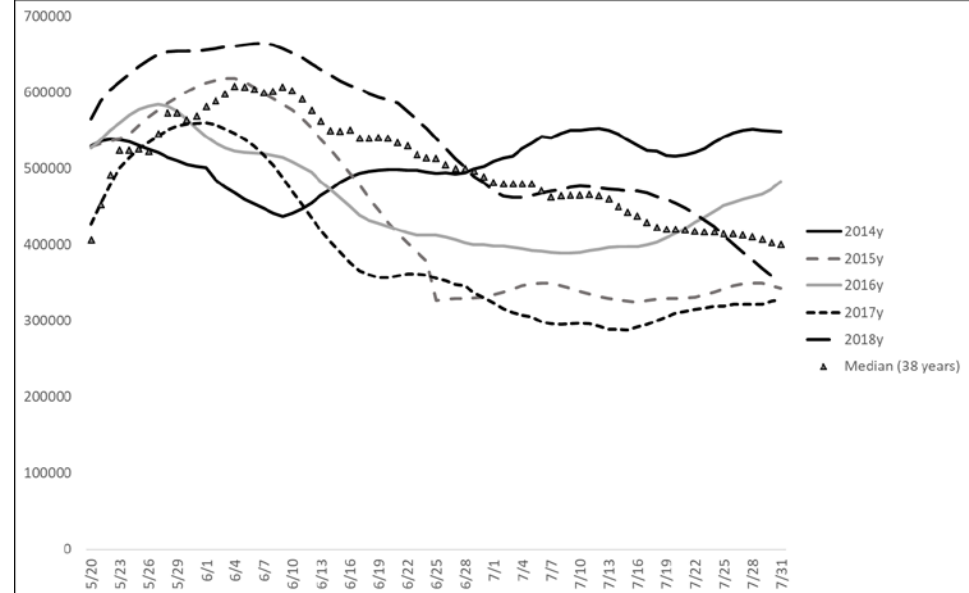
Ongoing and Future work

- Genomics
 - Grouping genetically similar individuals
 - Evaluate condition, growth, phenology within groups
- Require – Long Data Series

Breakup



Discharge

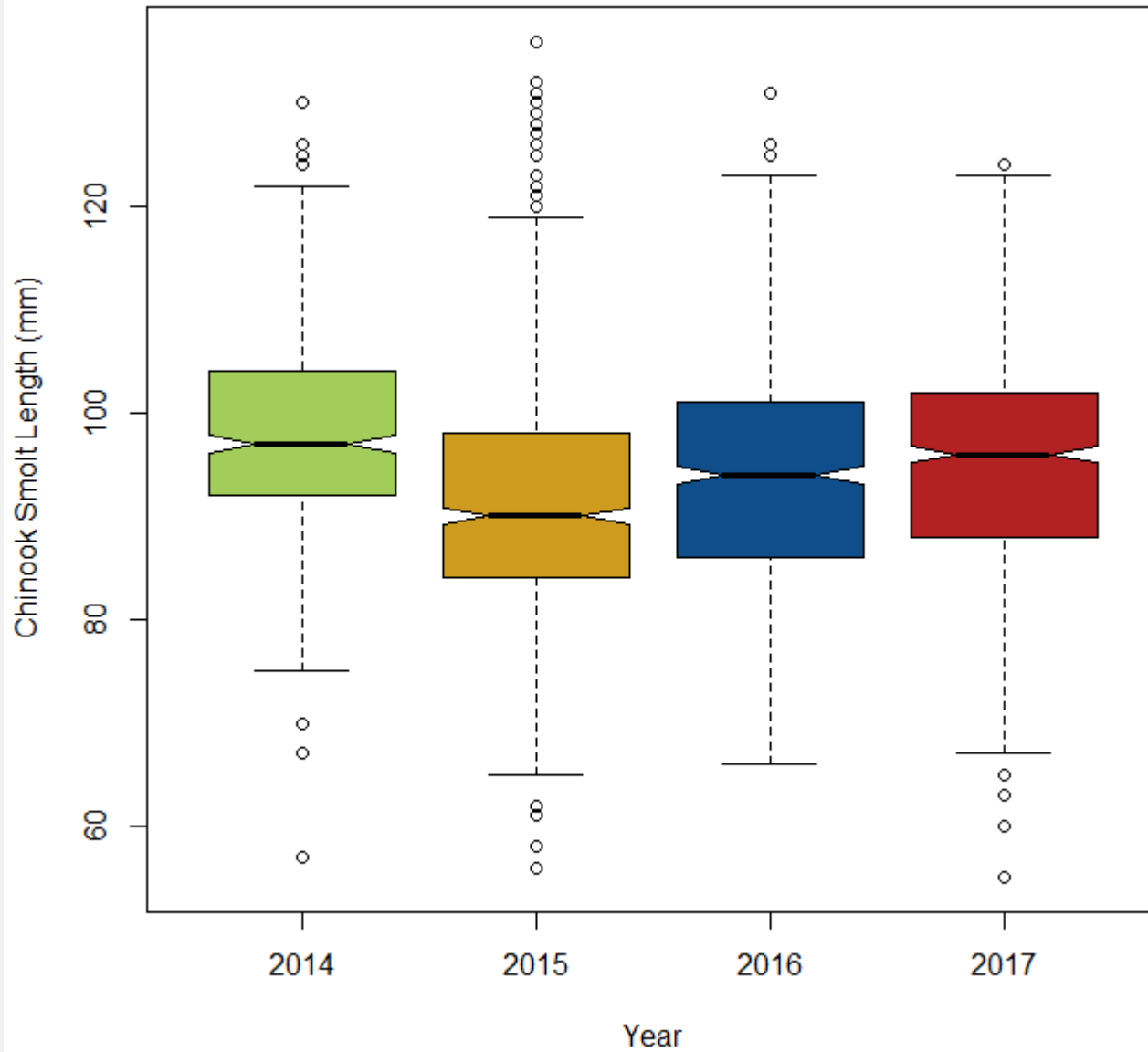


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Questions?

Juvenile Chinook Lengths



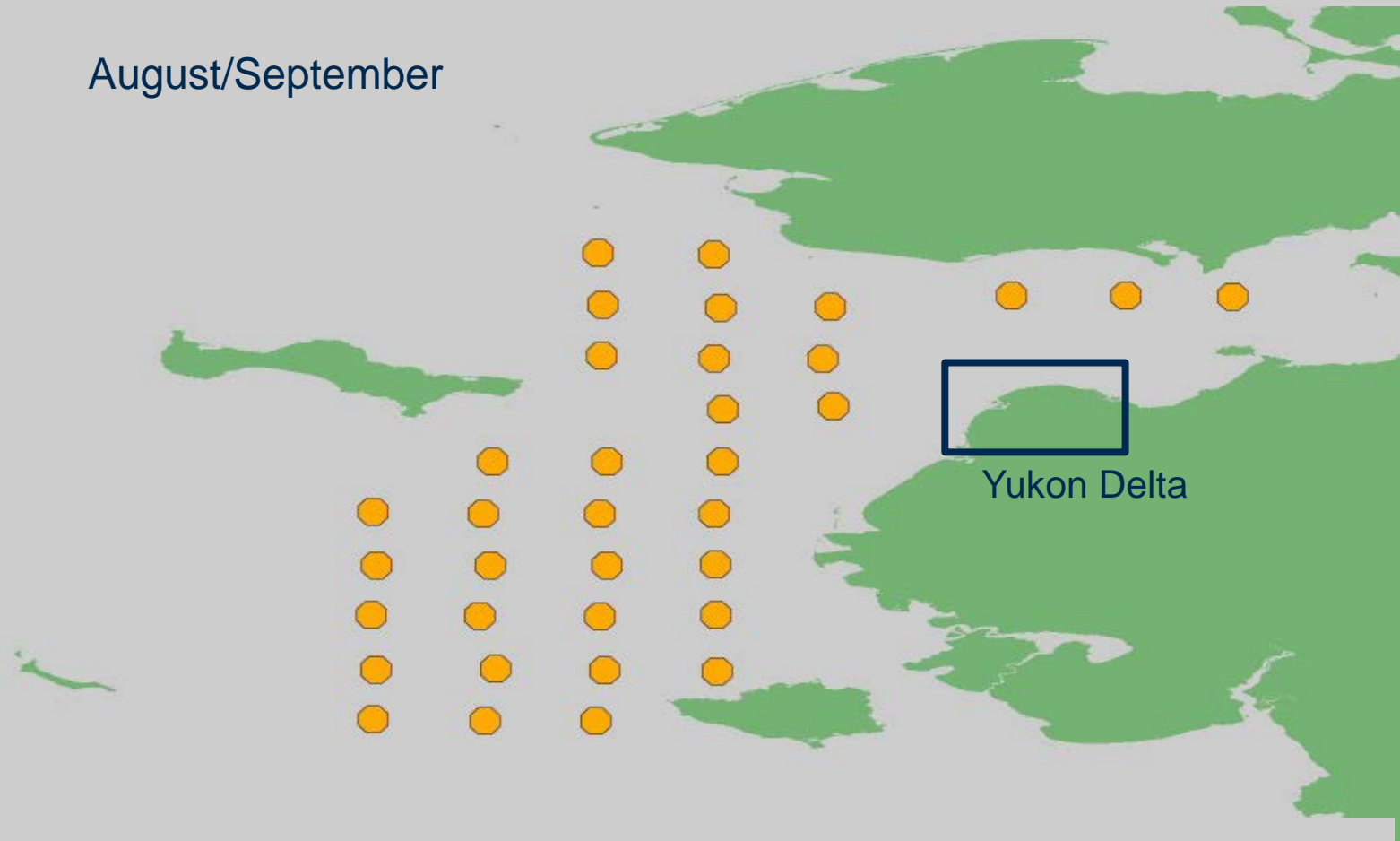
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Northern Bering Sea (NBS) Juvenile Salmon Surveys

ADF&G and NOAA

August/September





Comparing Delta and NBS Surveys

Spatial Scale:

- **NBS:** Spatial sampling grid of approximately 30nm. Survey area spans from 60N to 65.5N, and generally as far offshore as 170W or 171W.
- **Delta:** In-river stations within ~ 30 miles of tributary mouth

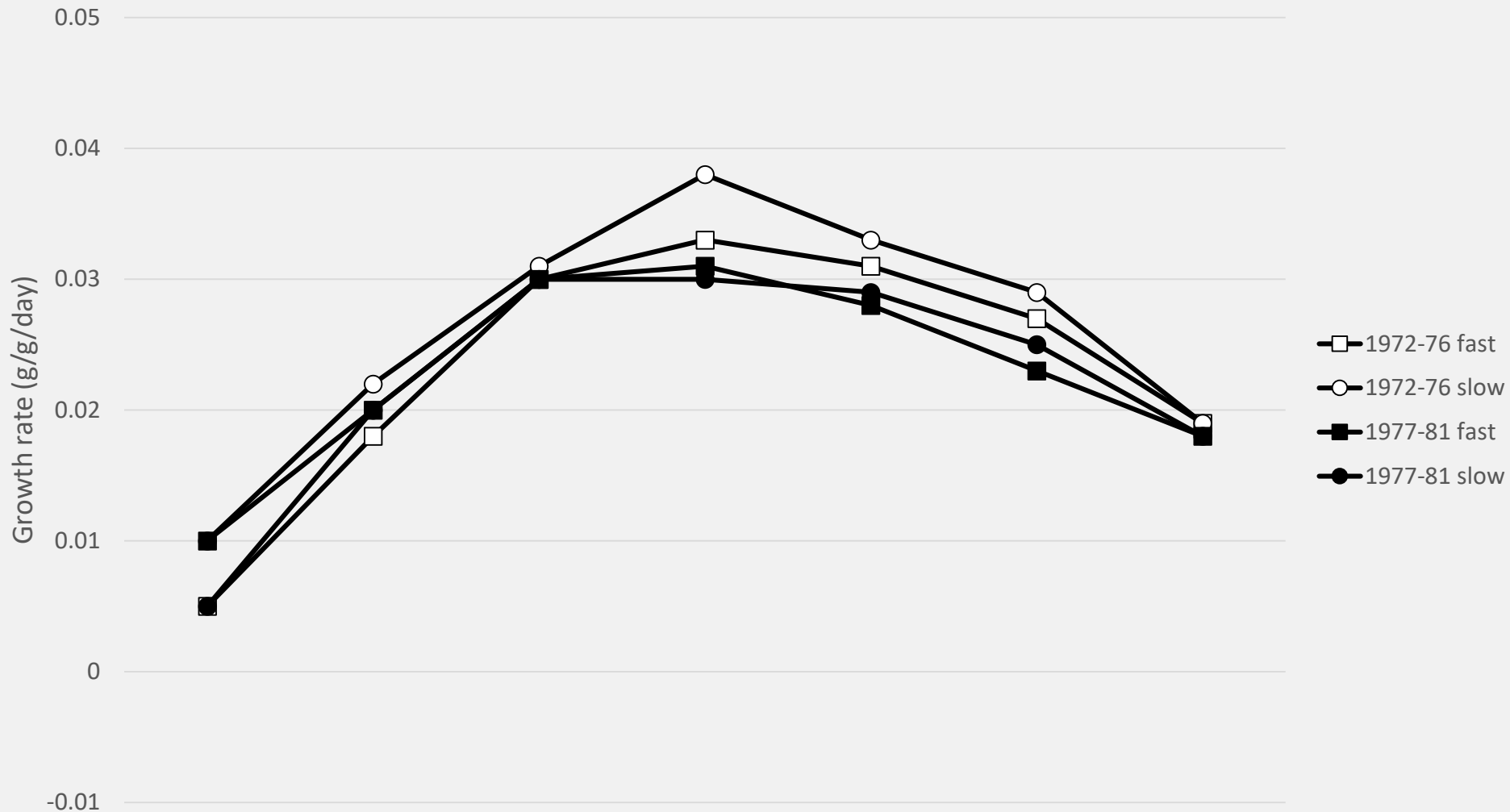
Temporal Scale:

- **NBS:** ~ 25 days starting in late August/early September
- **Delta:** near daily sampling from May through July

Gear:

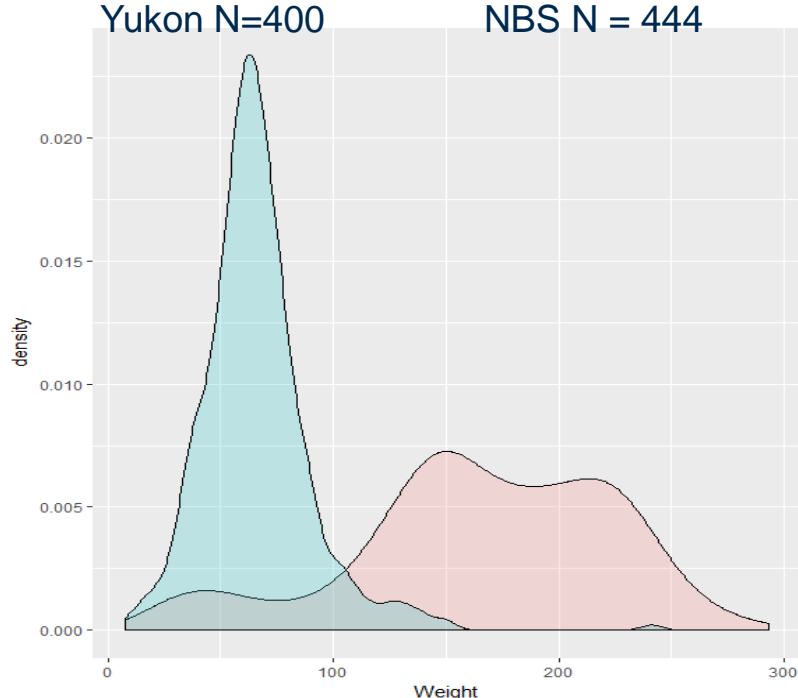
- **NBS:** Cantrawl 400/601 rope trawl, typical mouth opening (55m horizontal, 18m vertical)
- **Delta:** 2-boat tow net. 6.8m W X 3m D X 14m L

Change in female Chinook salmon growth rate (g/g/day)*

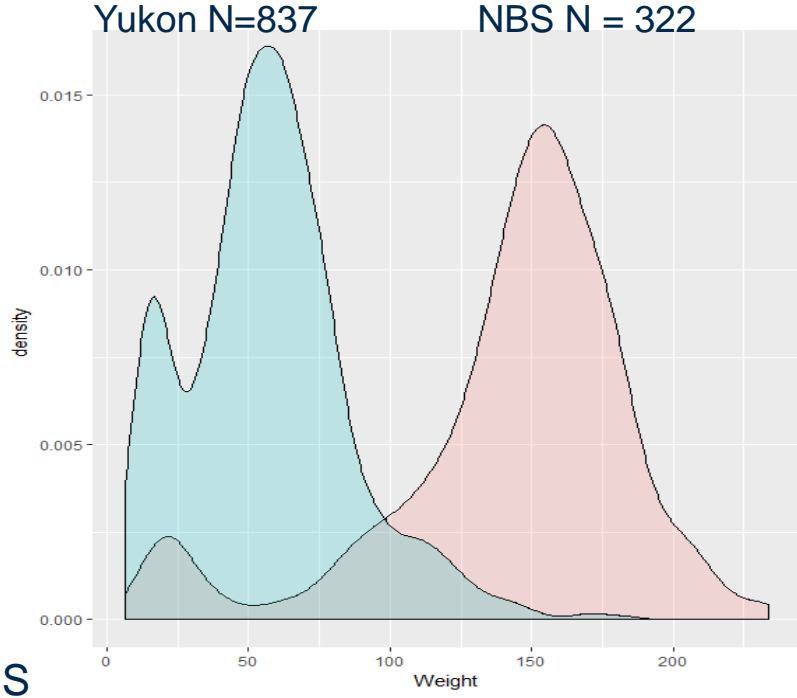


*Myers et al. 2010

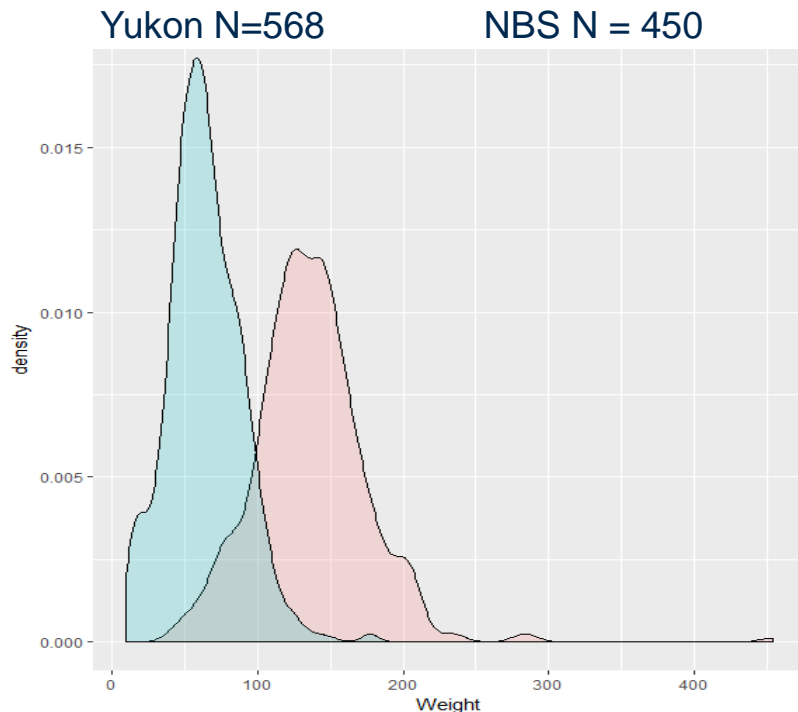




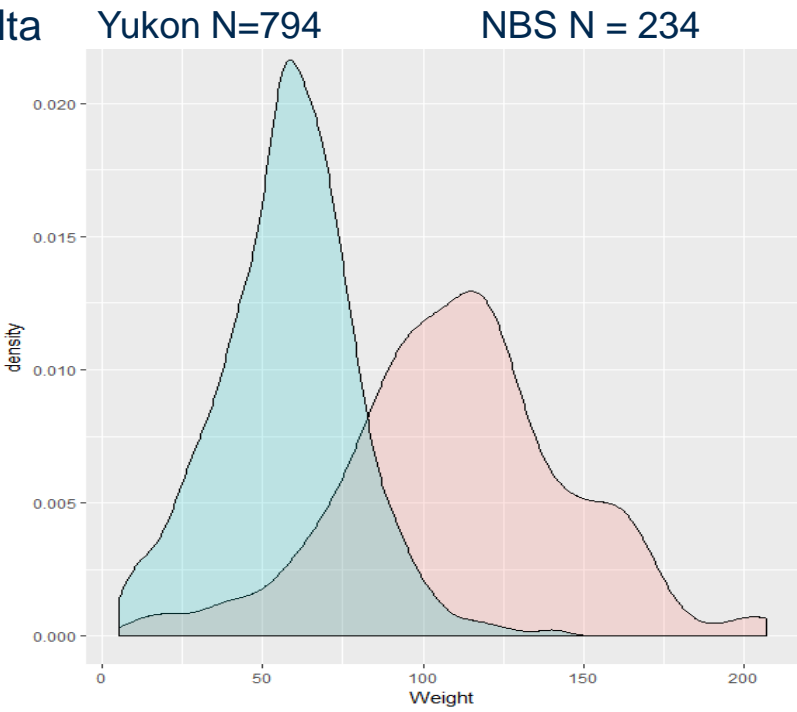
2014



2015

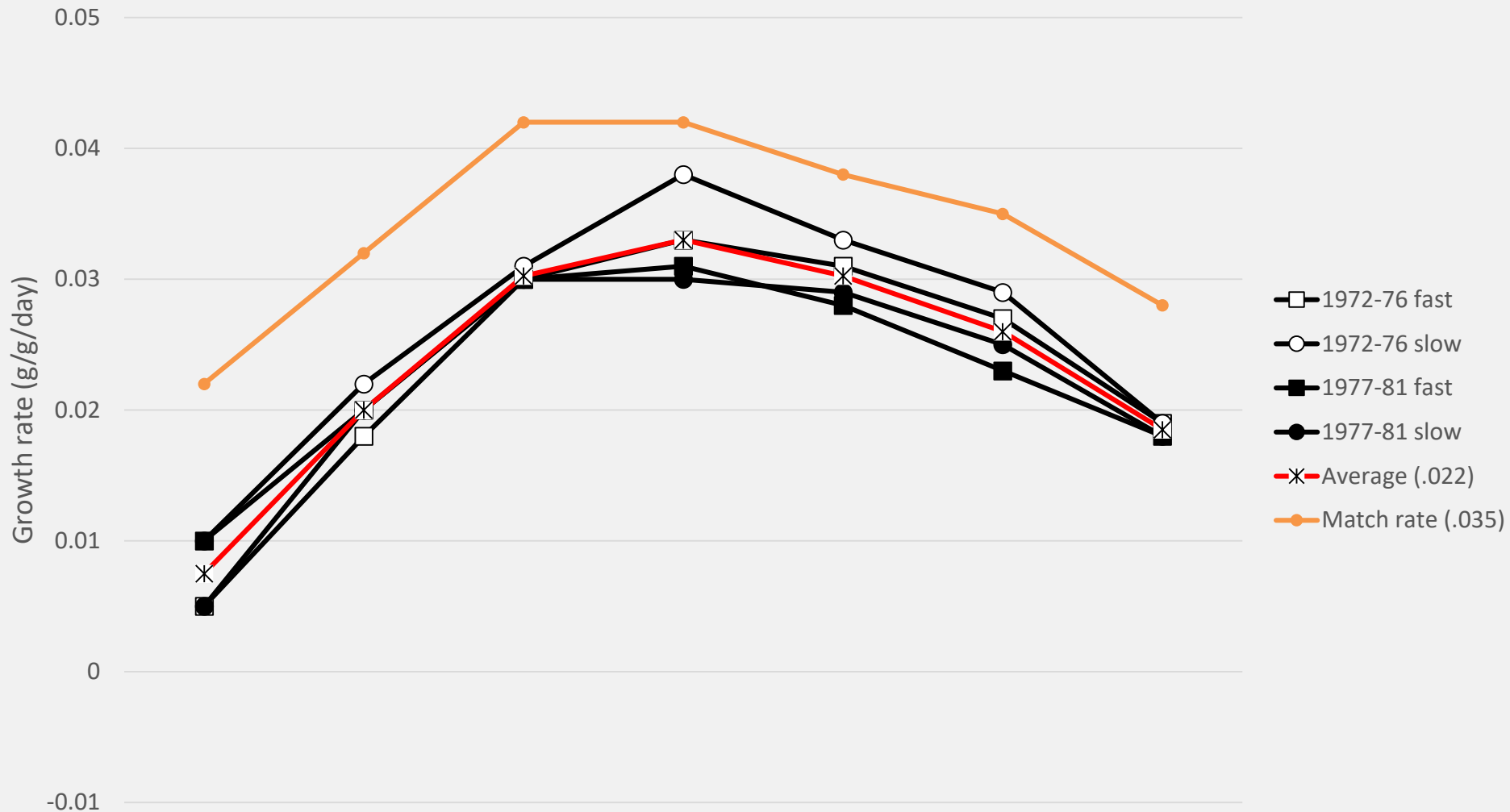


2016



2017

Change in female Chinook salmon growth rate (g/g/day)*



*Myers et al. 2010