

Fine-scale spatial and stock variations among juvenile Chinook salmon and steelhead in the Columbia River plume: May 2015

Cheryl A. Morgan¹, Brian R. Beckman², Brian J. Burke², Laurie A. Weitkamp³, Jessica A. Miller⁴, Kym C. Jacobson³, Elizabeth A. Daly⁴, Donald M. Van Doornik⁵, and Kurt L. Fresh²

¹ Cooperative Institute for Marine Resources Studies, Oregon State University, Newport, OR

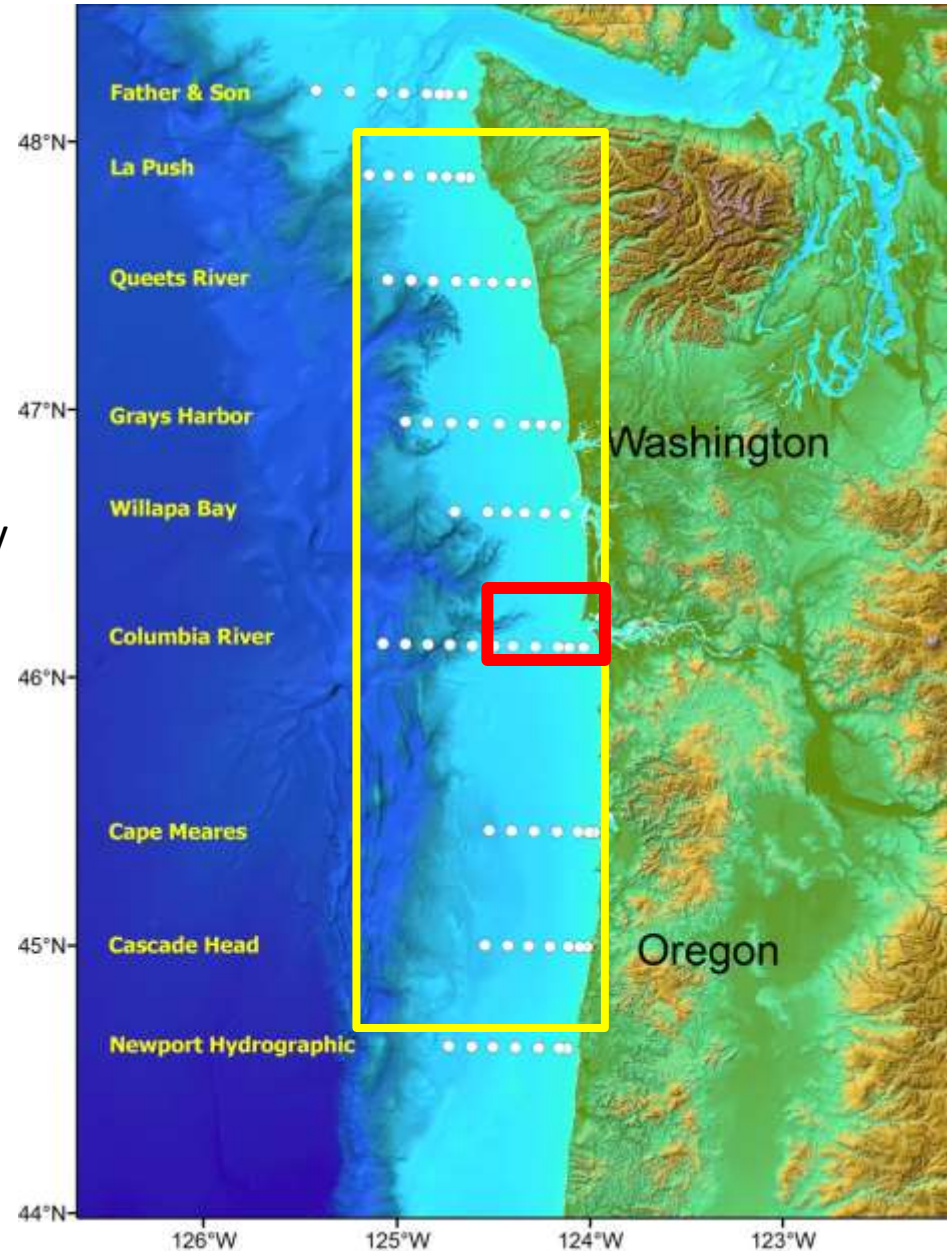
^{2-3, 5} NOAA Fisheries Service, Northwest Fisheries Science Center, Seattle, WA, Newport, OR & Manchester, WA

⁴ Oregon State University, Fisheries & Wildlife, Newport, OR

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WA & OR Juvenile Salmon Surveys

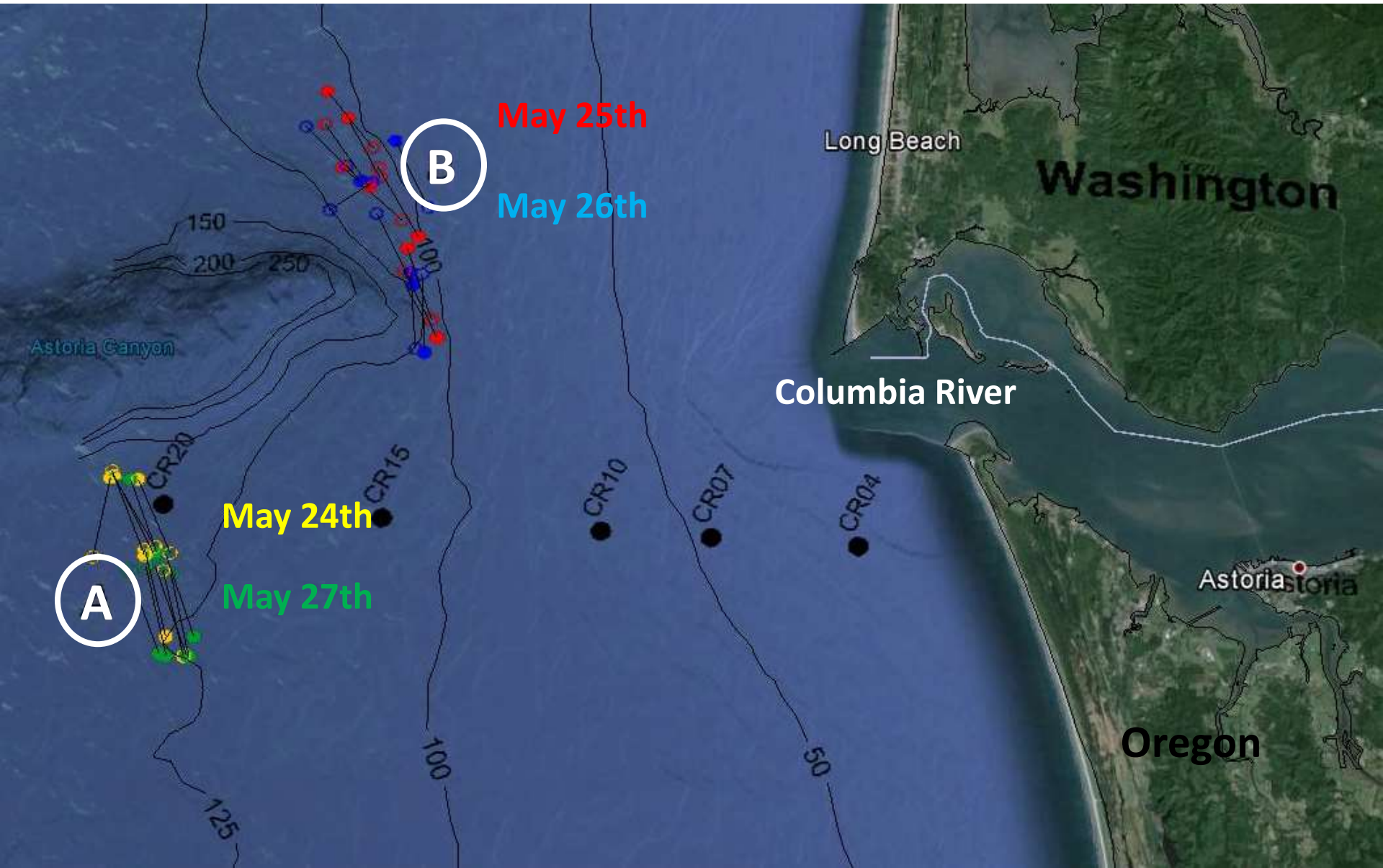
- Previous May Surveys (1999, 2006 – 2012)
- In 2015, we re-invented our May survey
 - Focus on assessing juveniles from Interior Columbia River stocks soon after they emigrated from the Columbia River Estuary and while they were still within the plume.



Take Home

- **We saw fine-scale spatial differences in biological attributes for Chinook**
- **But not for steelhead!**
- **Short term growth varies by steelhead stock**

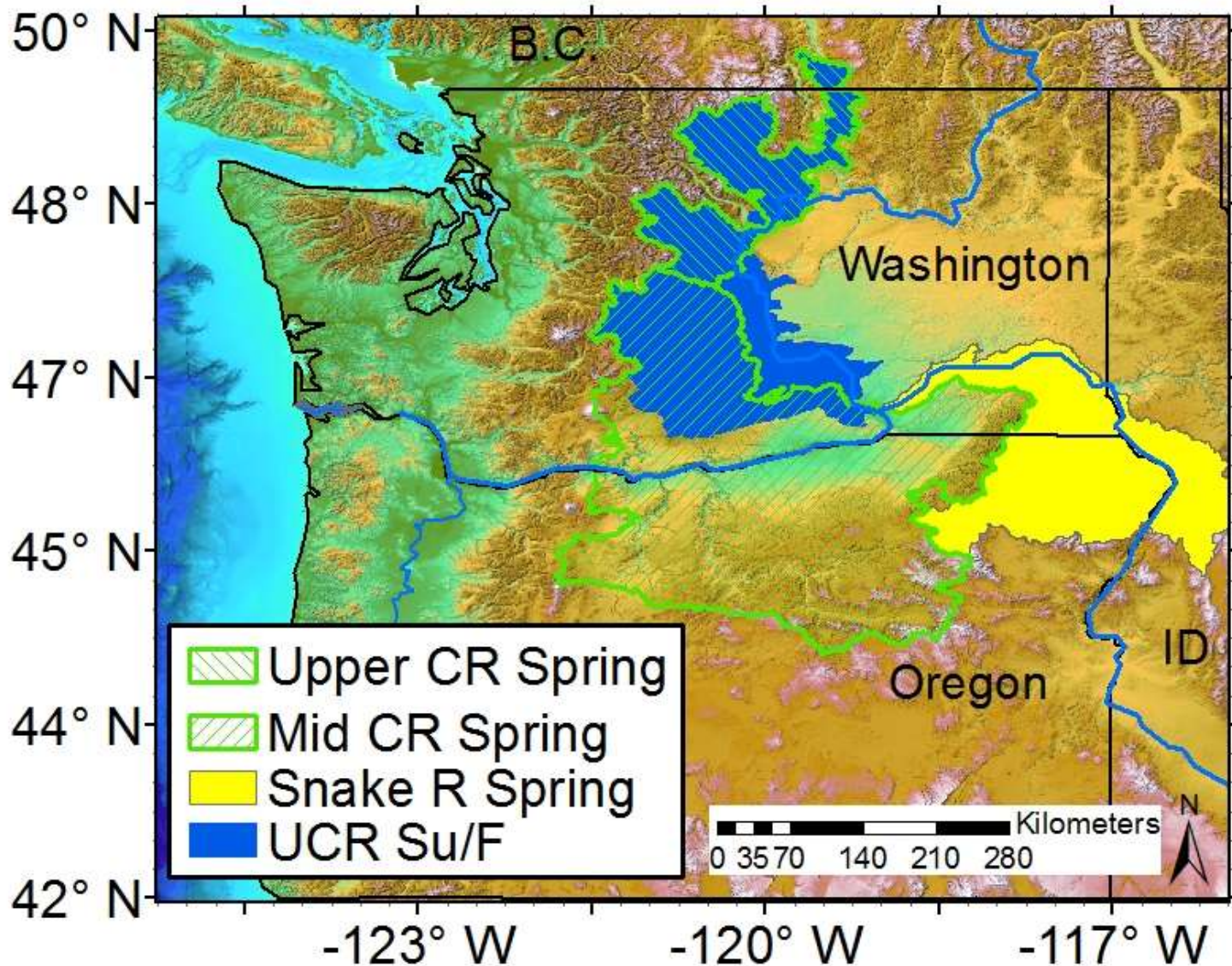
May 2015 Sampling Locations



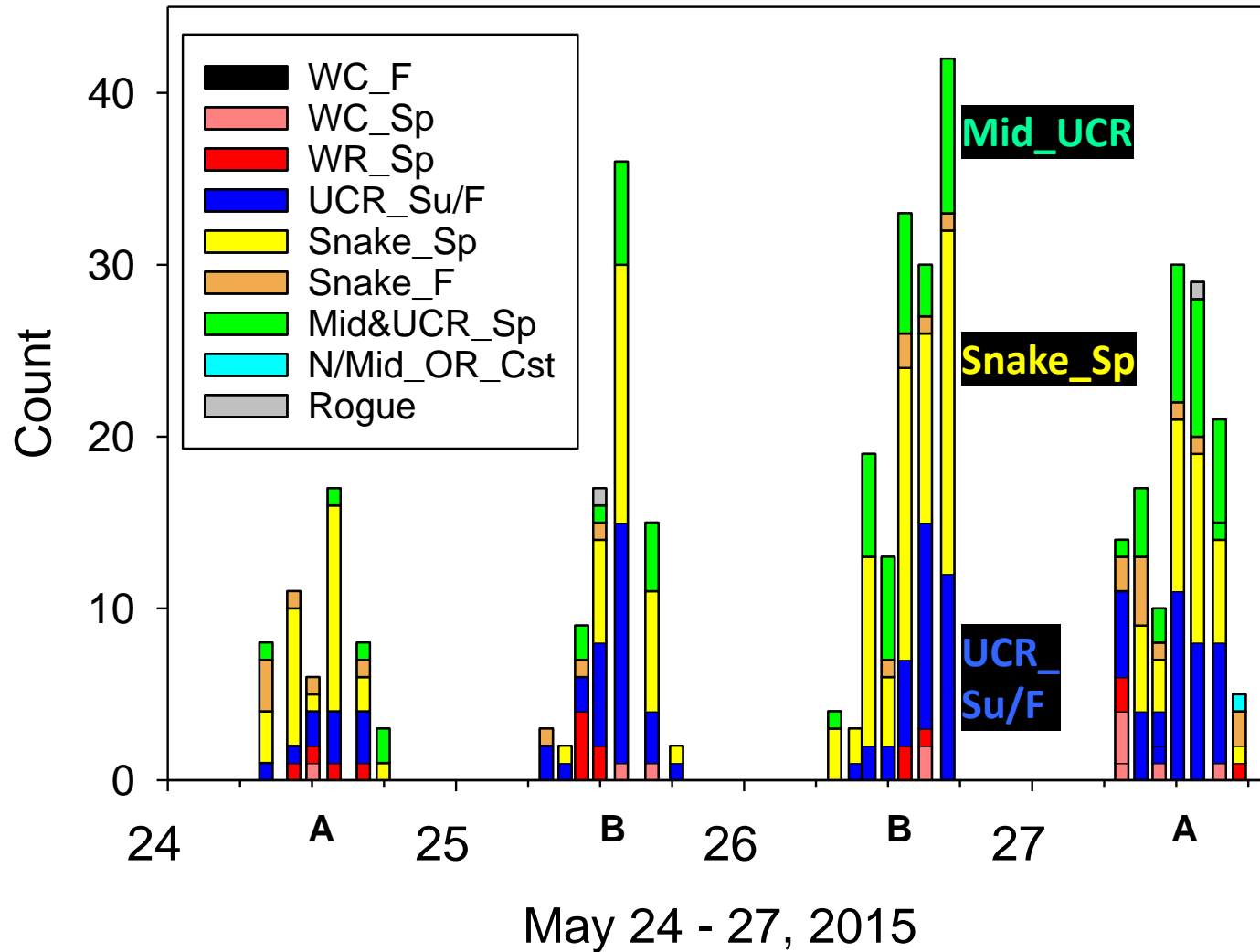
Two parts to this talk

1. Chinook
2. Steelhead

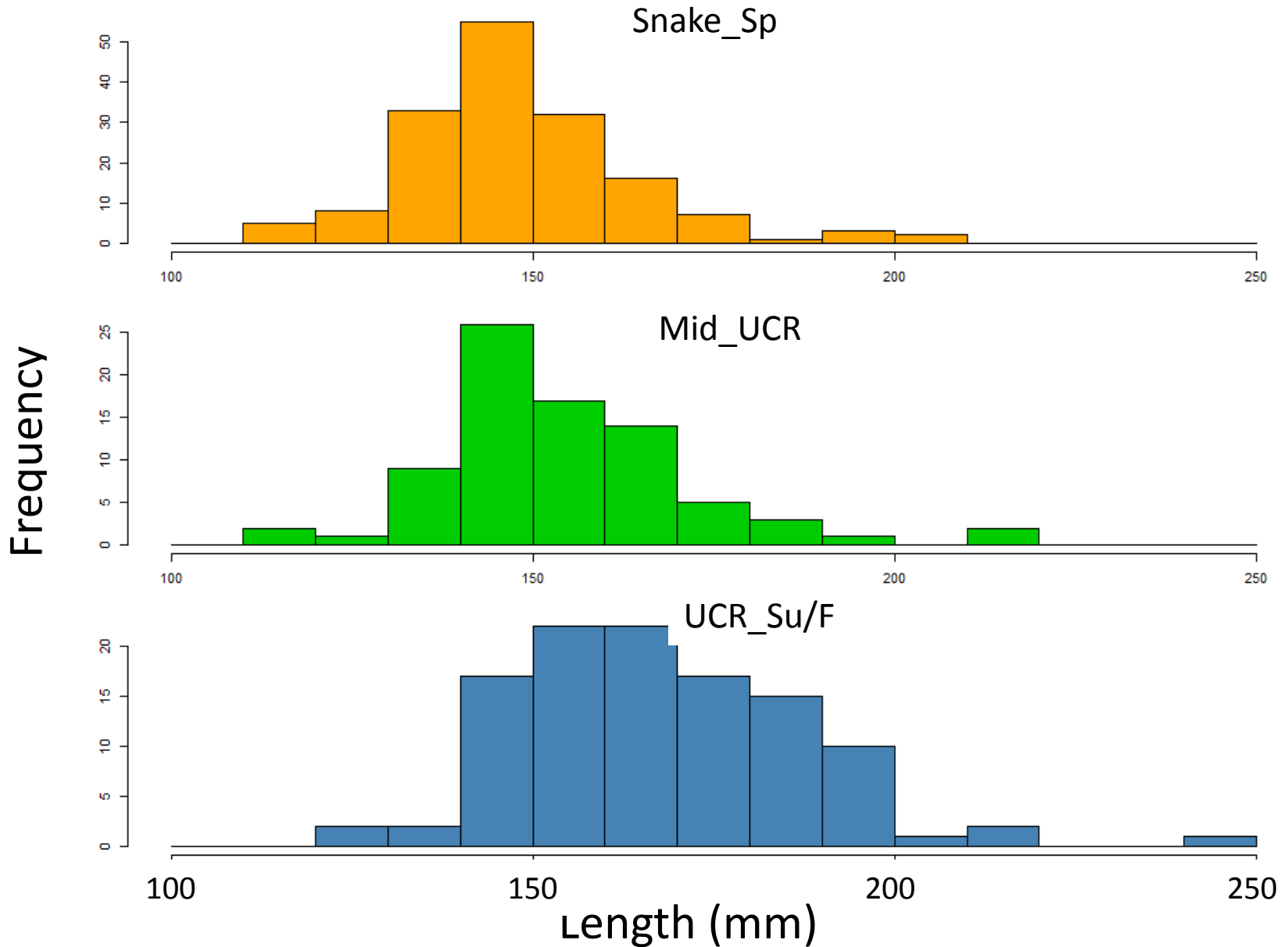
Chinook Focus Stocks



May 2015 Chinook Catches by Stock



Chinook Length- Varies by Stock

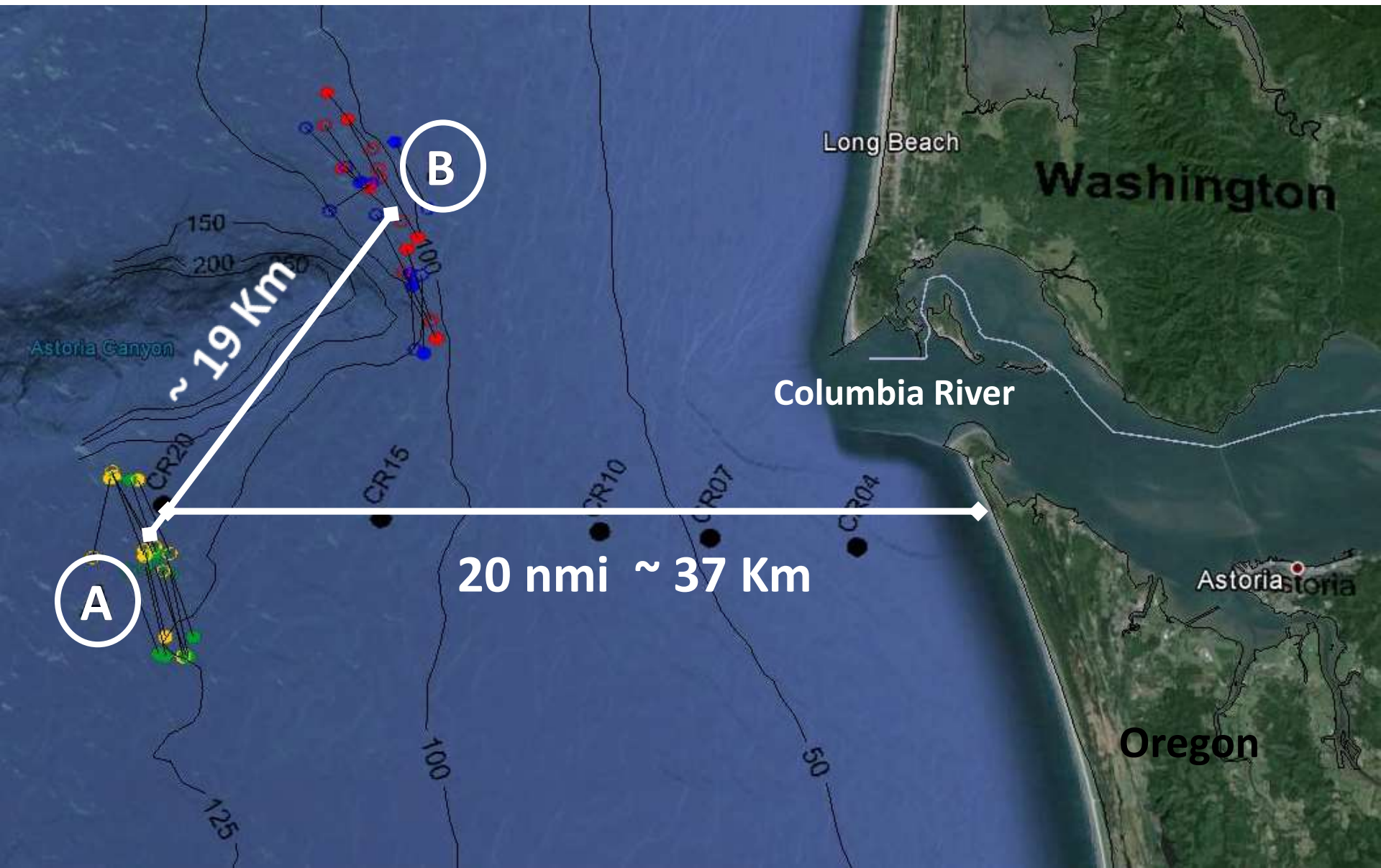


**Brian Burke ran a bunch of models
We'll show plots for the important
variables**

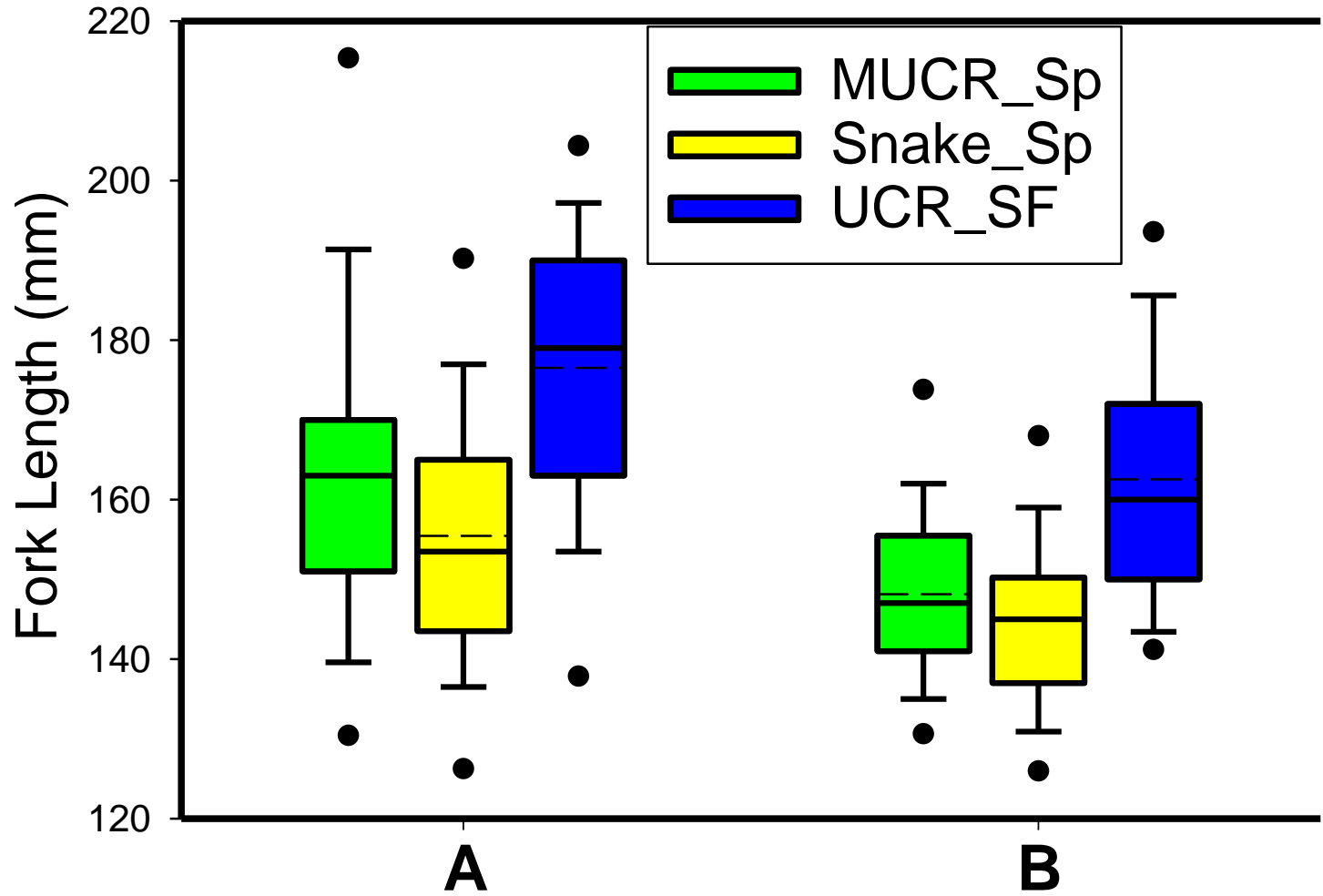
Model Variables

	Area	Mar_Sig	Stock	Length	Haul	Wild	Tide	Time	Stage	Day
Length	X	X	X			X	X	X		
Condition	X	X	X	X	X					
IGF	X	X	X			X			X	
Stom Empty				X	X		X			
Stom NoEmpty %BW	X						X	X		
H/W	X	X	X	X						

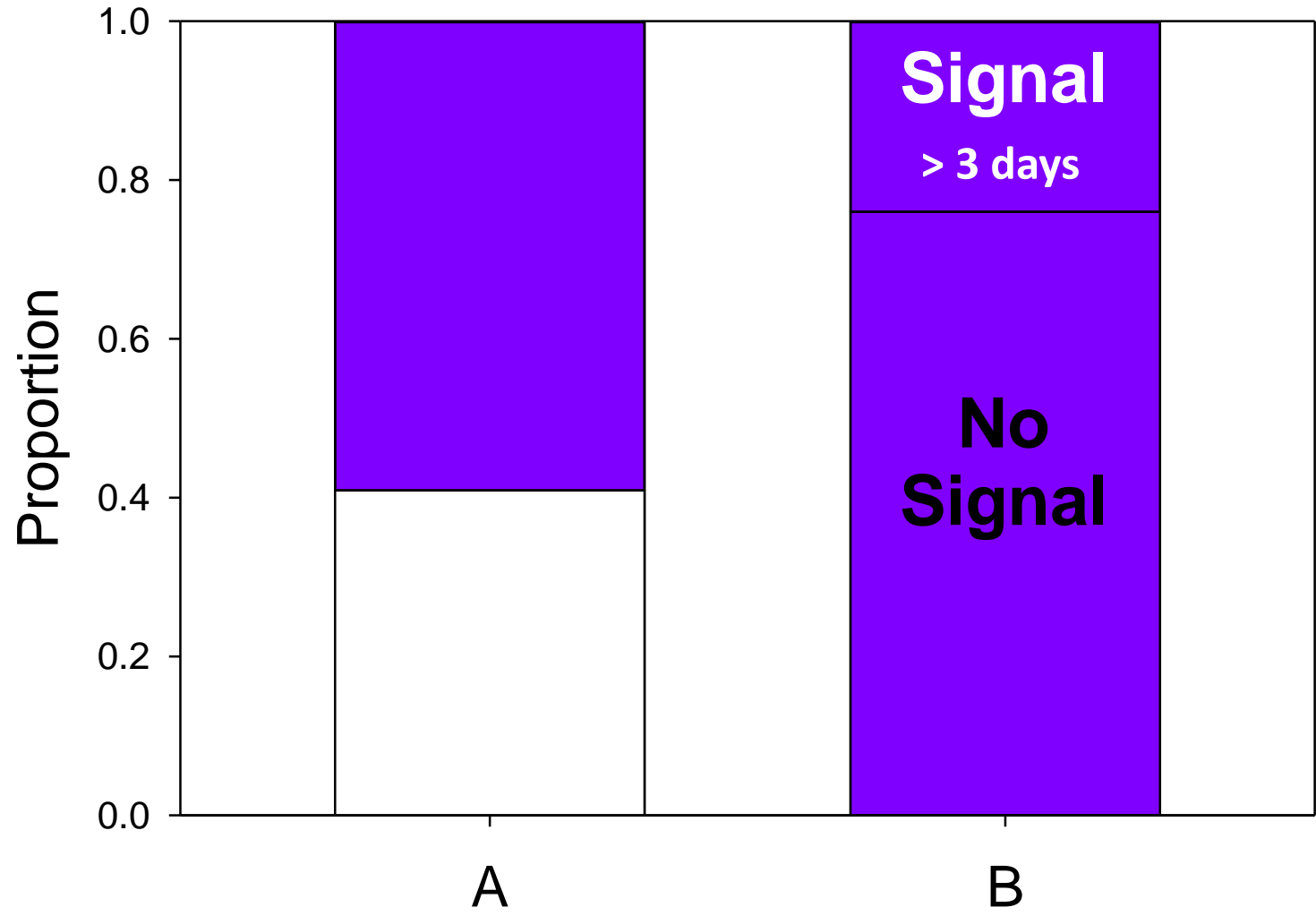
Site was important for Chinook



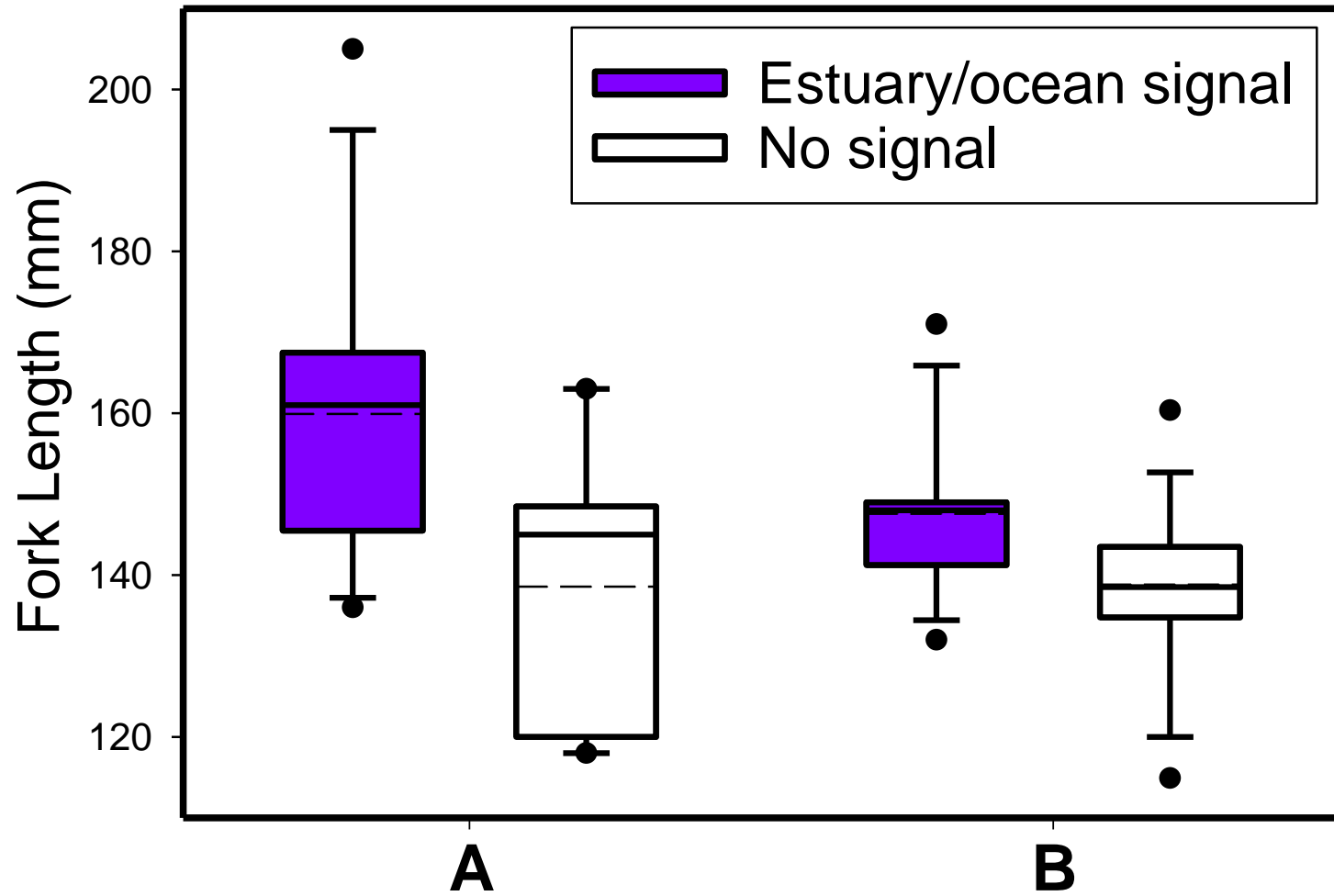
Fish longer at site A



Higher proportion with estuary/ocean signal at site A

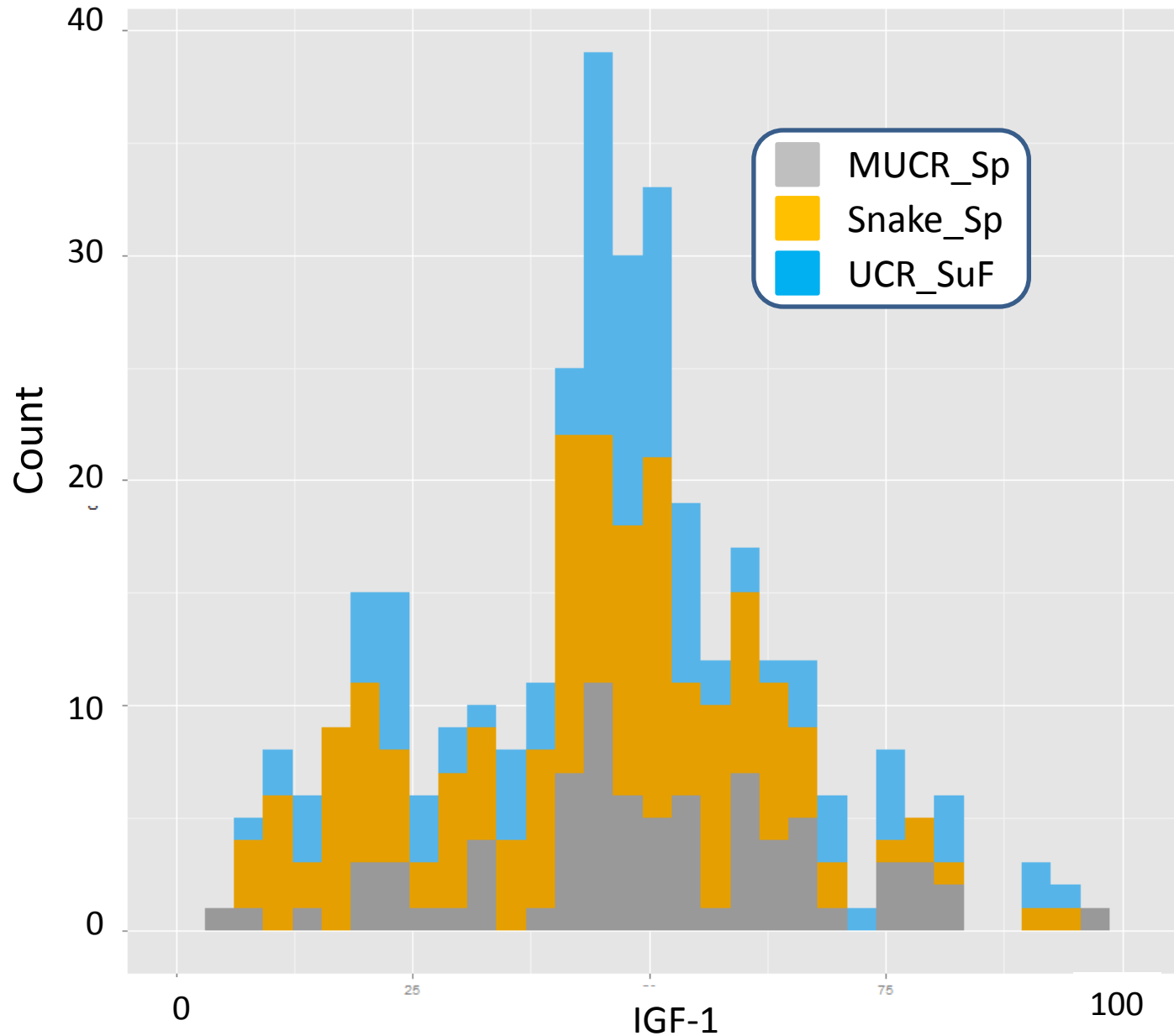


Fish with estuary/ocean signal are longer

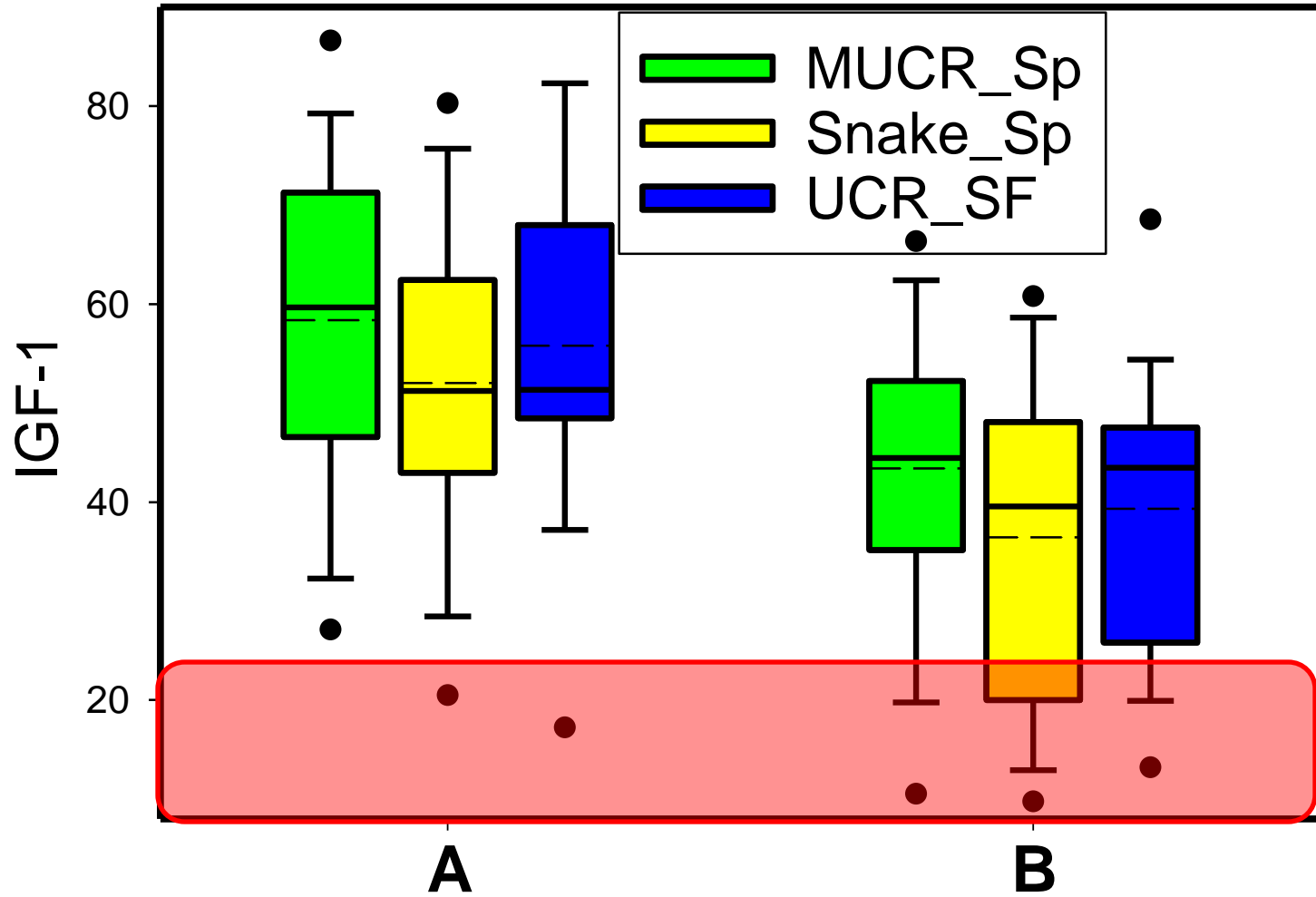


Chinook IGF

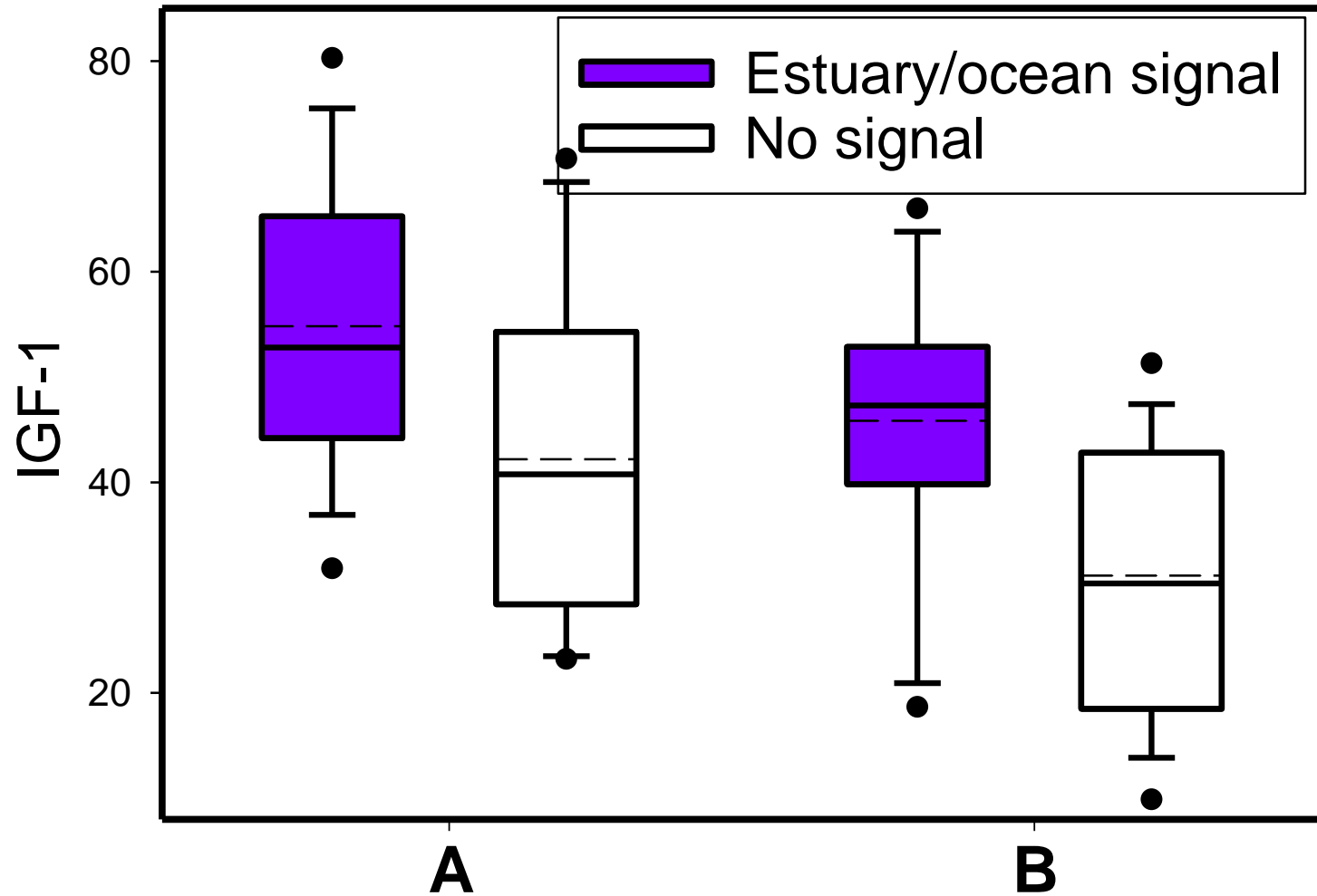
Large IGF range in all stocks



Higher IGF at site A

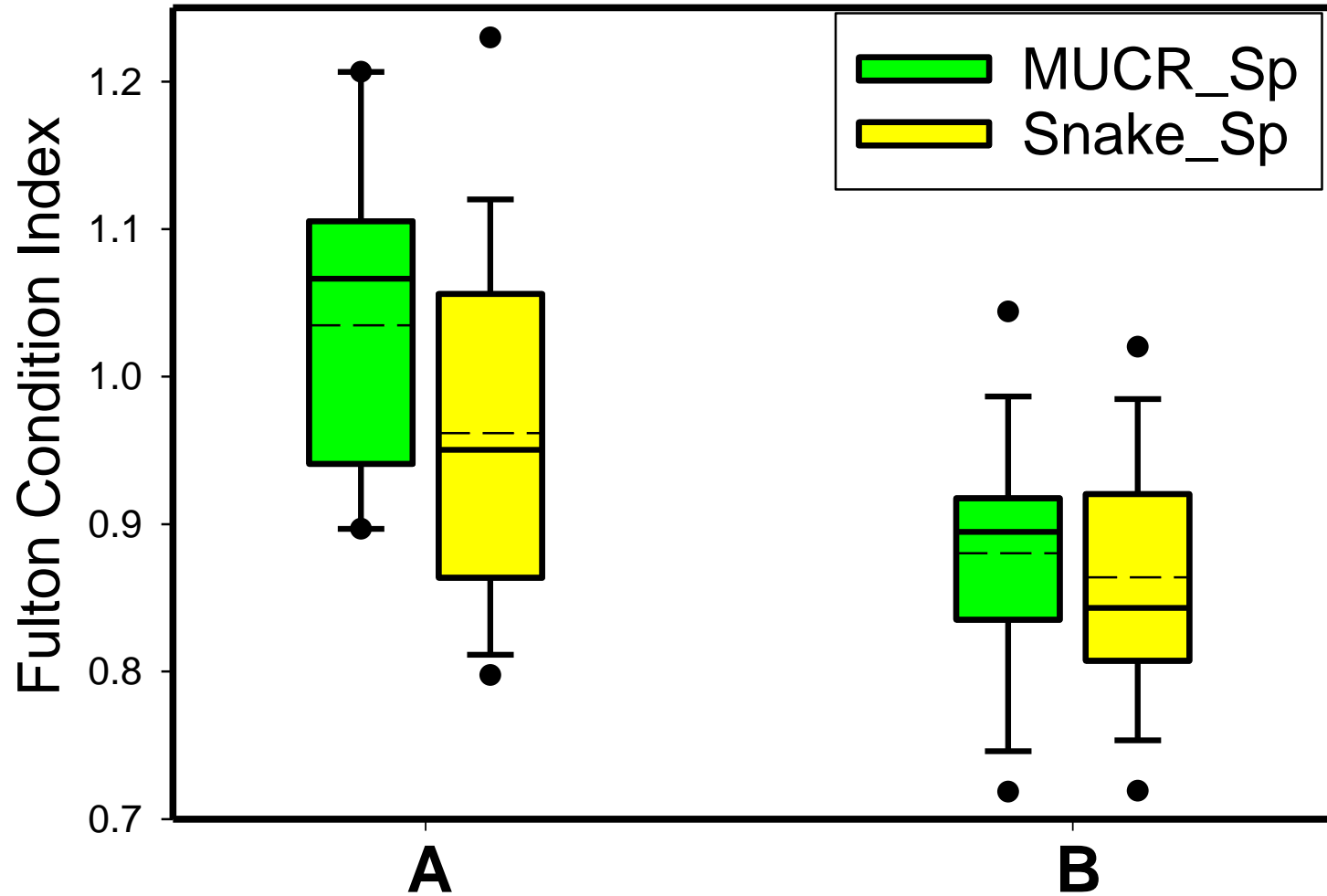


Higher IGF with estuary/ocean signal

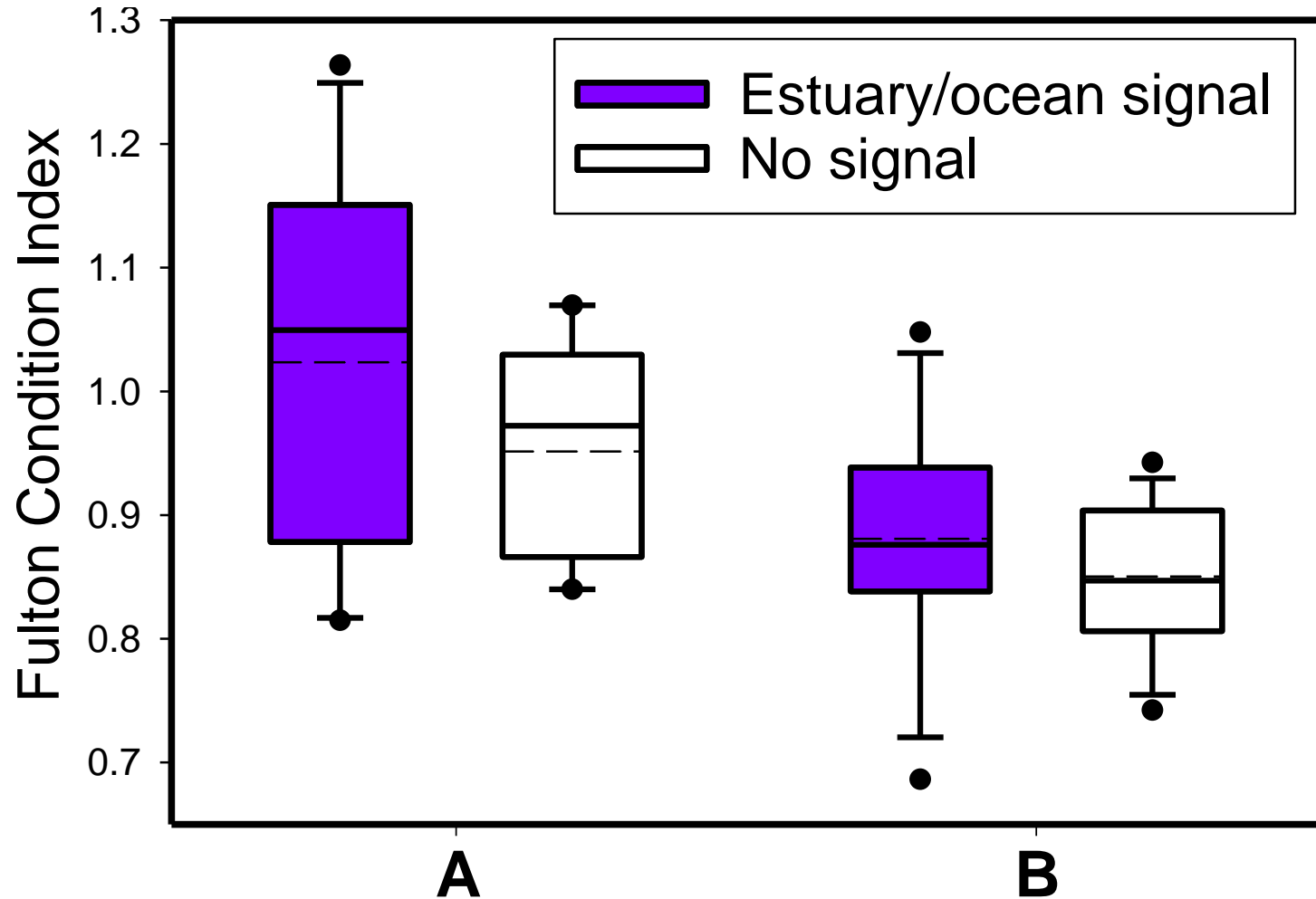


Chinook Condition

Higher condition at site A

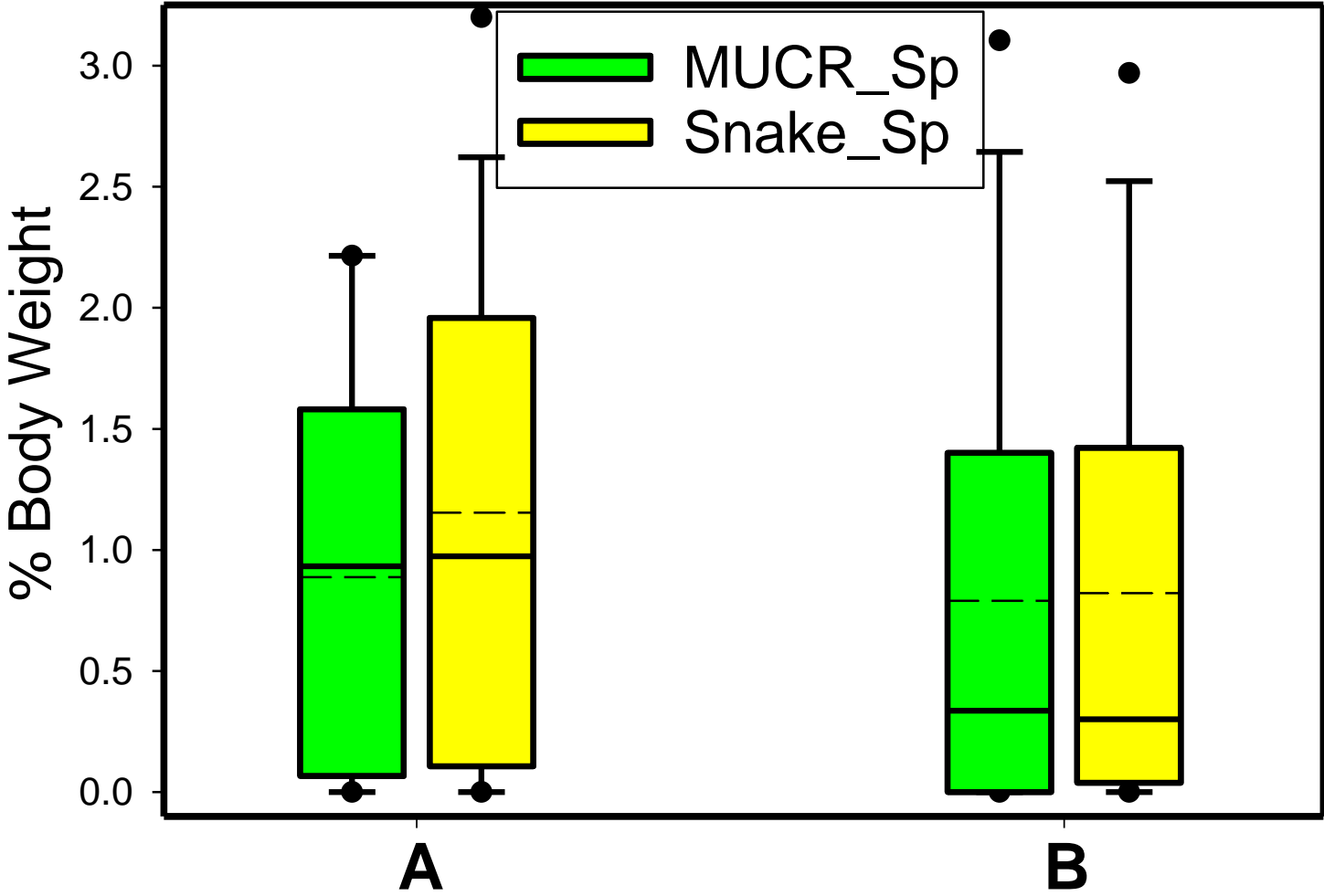


Higher condition with estuary/ocean signal

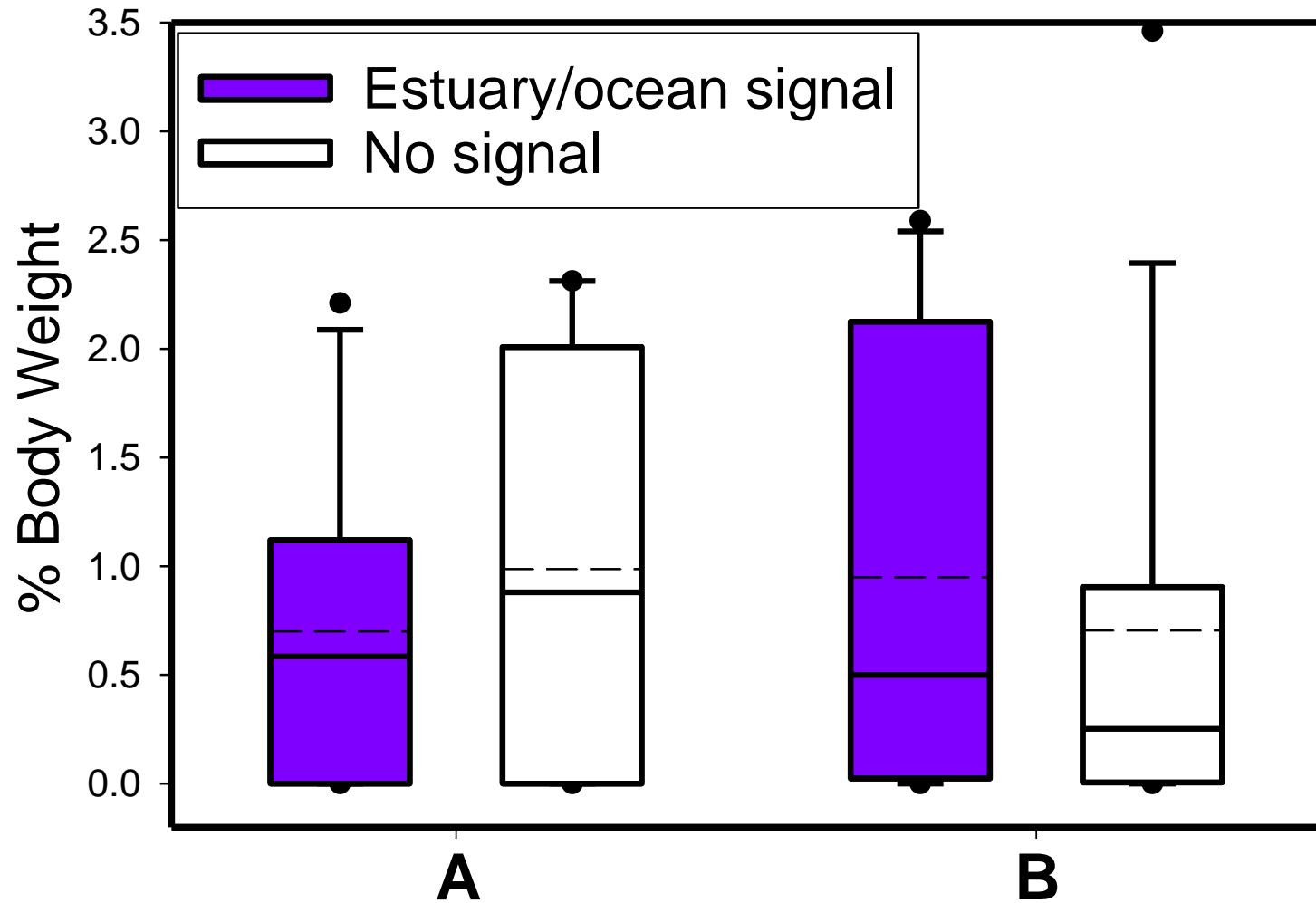


Chinook Stomach Fullness

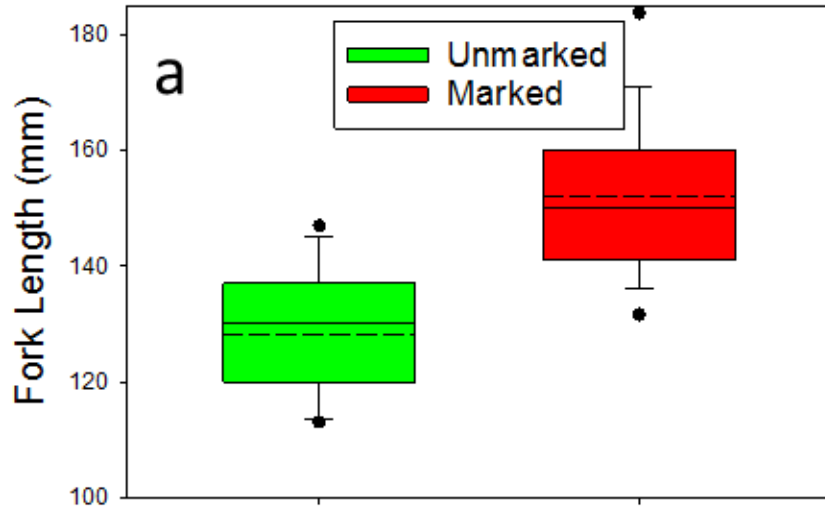
Higher stomach fullness at site A



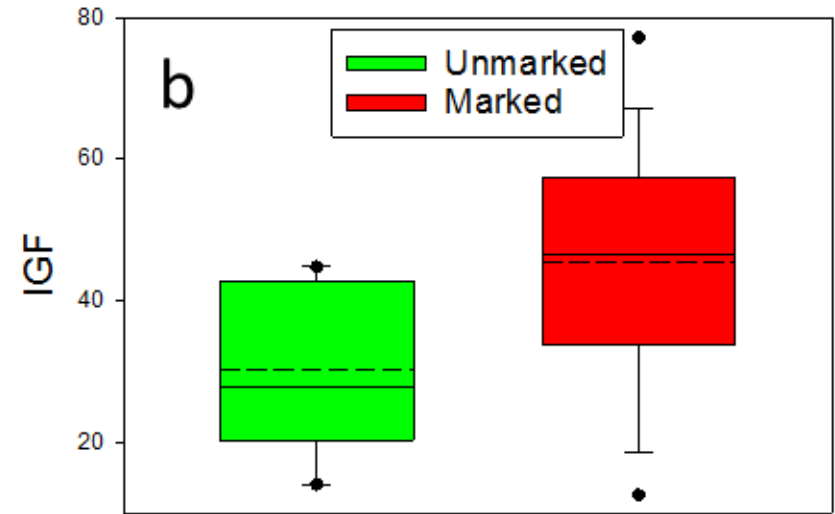
No difference in stomach fullness with estuary/ocean signal



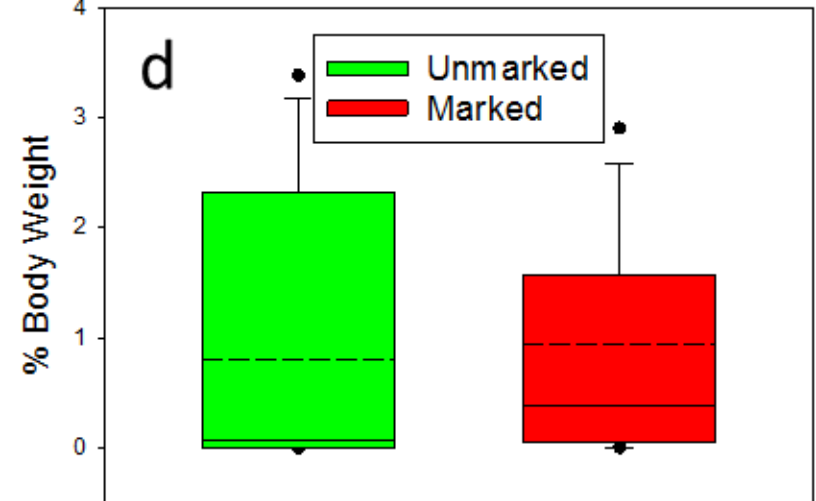
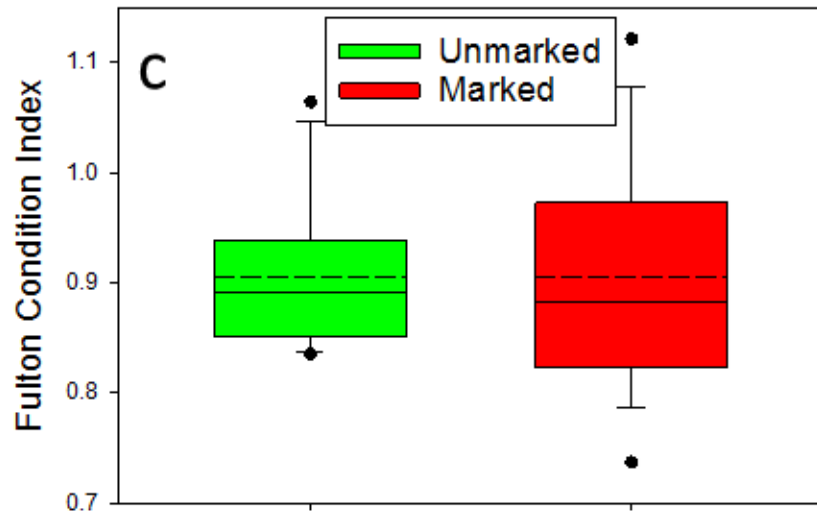
Marked vs Unmarked Chinook



Condition by Wild/Hatchery



Stomach Fullness by Wild/Hatchery



Chinook summary

**With only 4 days and in a small area
we saw differences by area and
estuary/ocean signal!**

- **Length**
- **IGF**
- **Condition**
- **Stomach fullness**

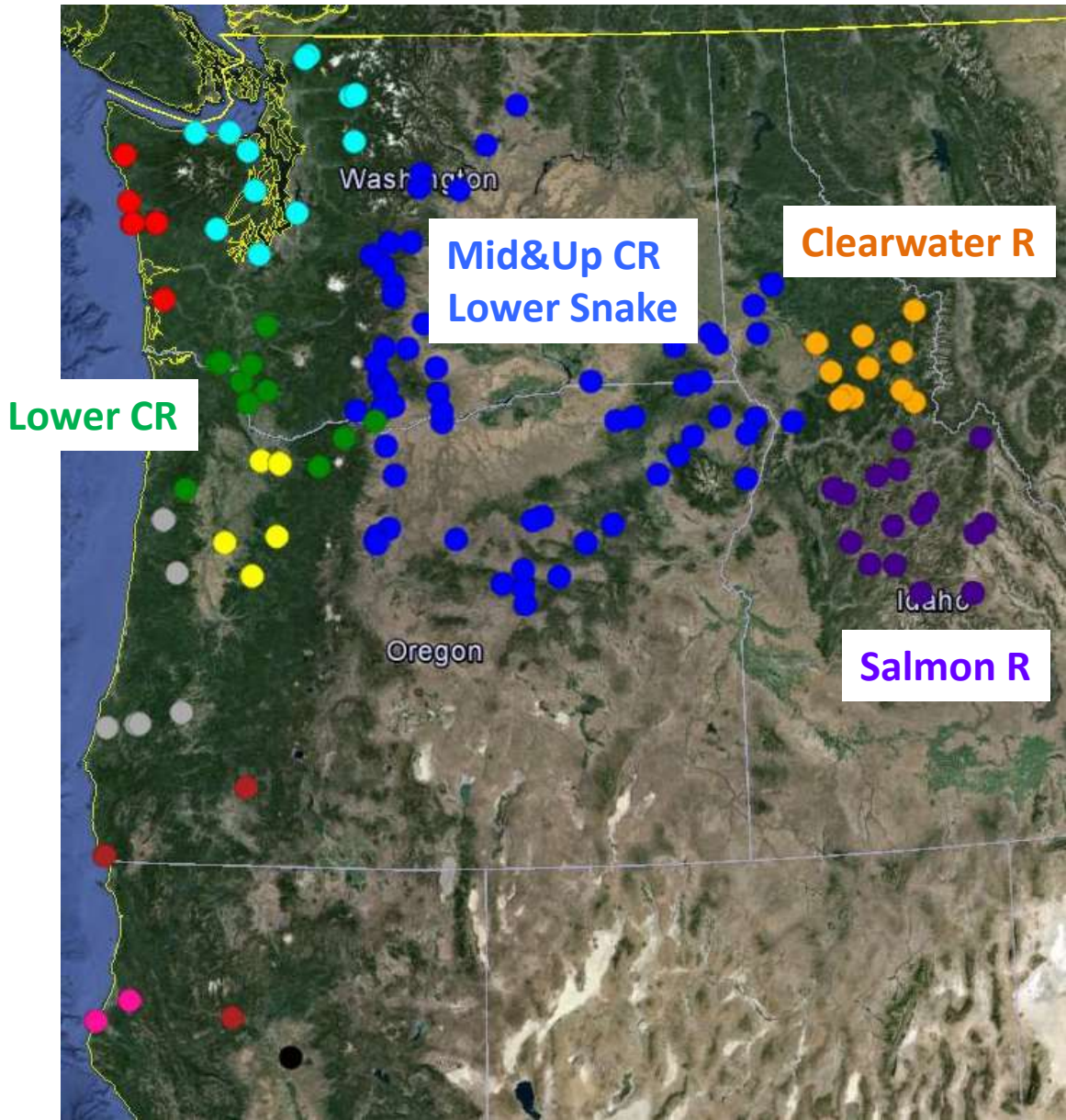
Chinook summary

Fish with estuary signal.

- More of these type of fish at site A.
- Fish longer at A and in better condition then at B.
- Growing better at A
- Are these fish mostly hatchery fish.

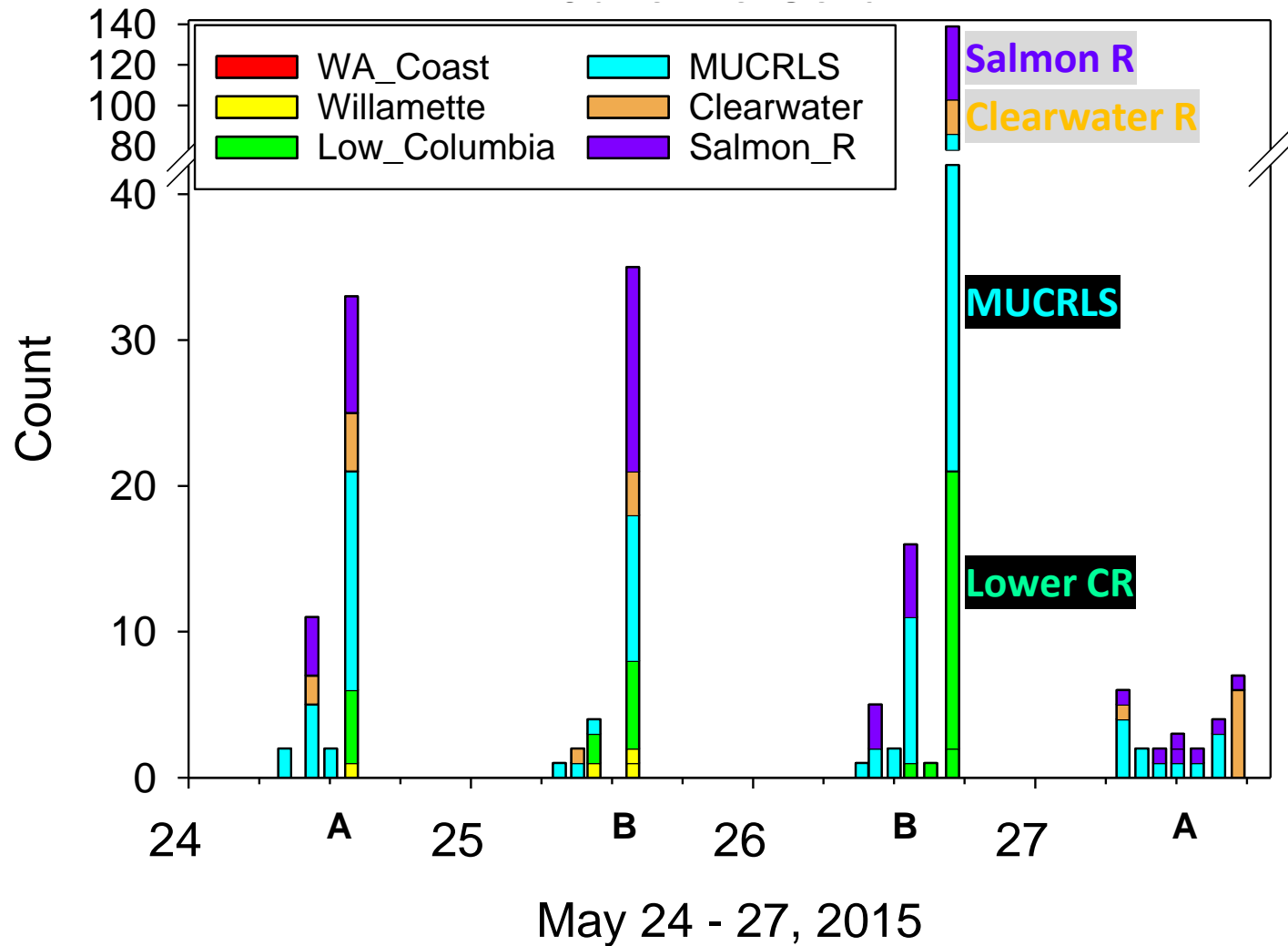
Steelhead

Steelhead Stocks



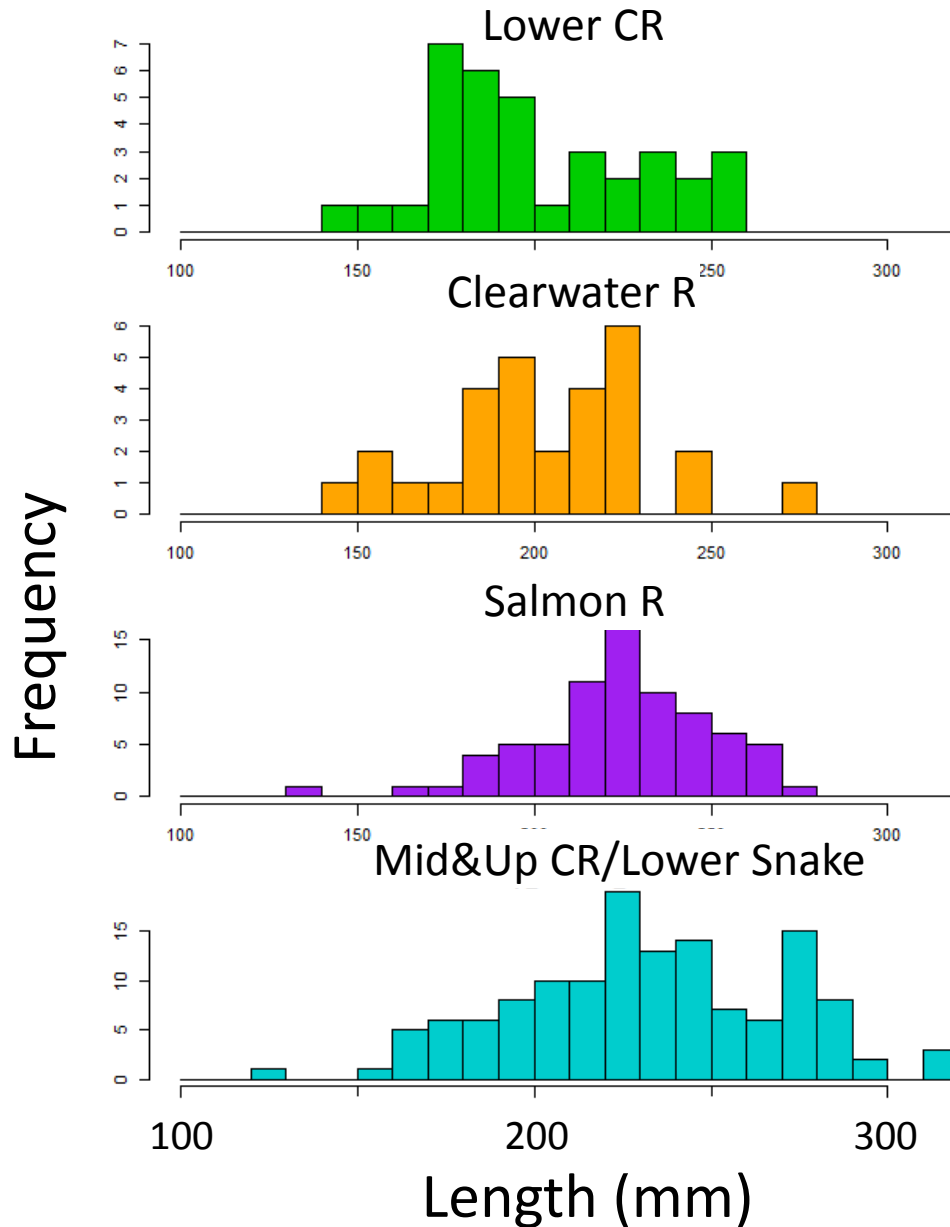
Steelhead Catch By Stock

May 2015 Steelhead Catches by Stock



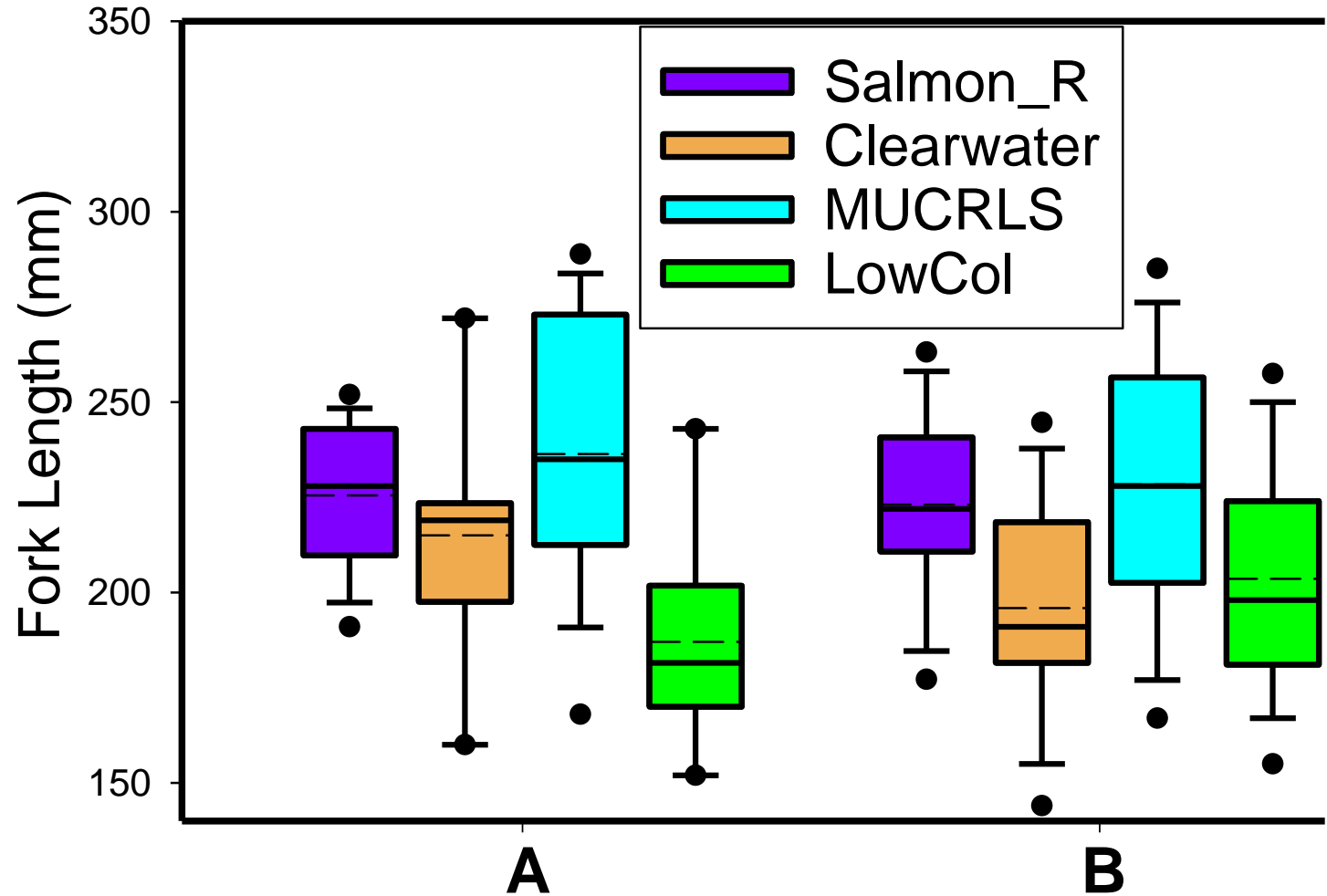
Steelhead Length

Steelhead length varies by stock



Steelhead lengths similar between sites

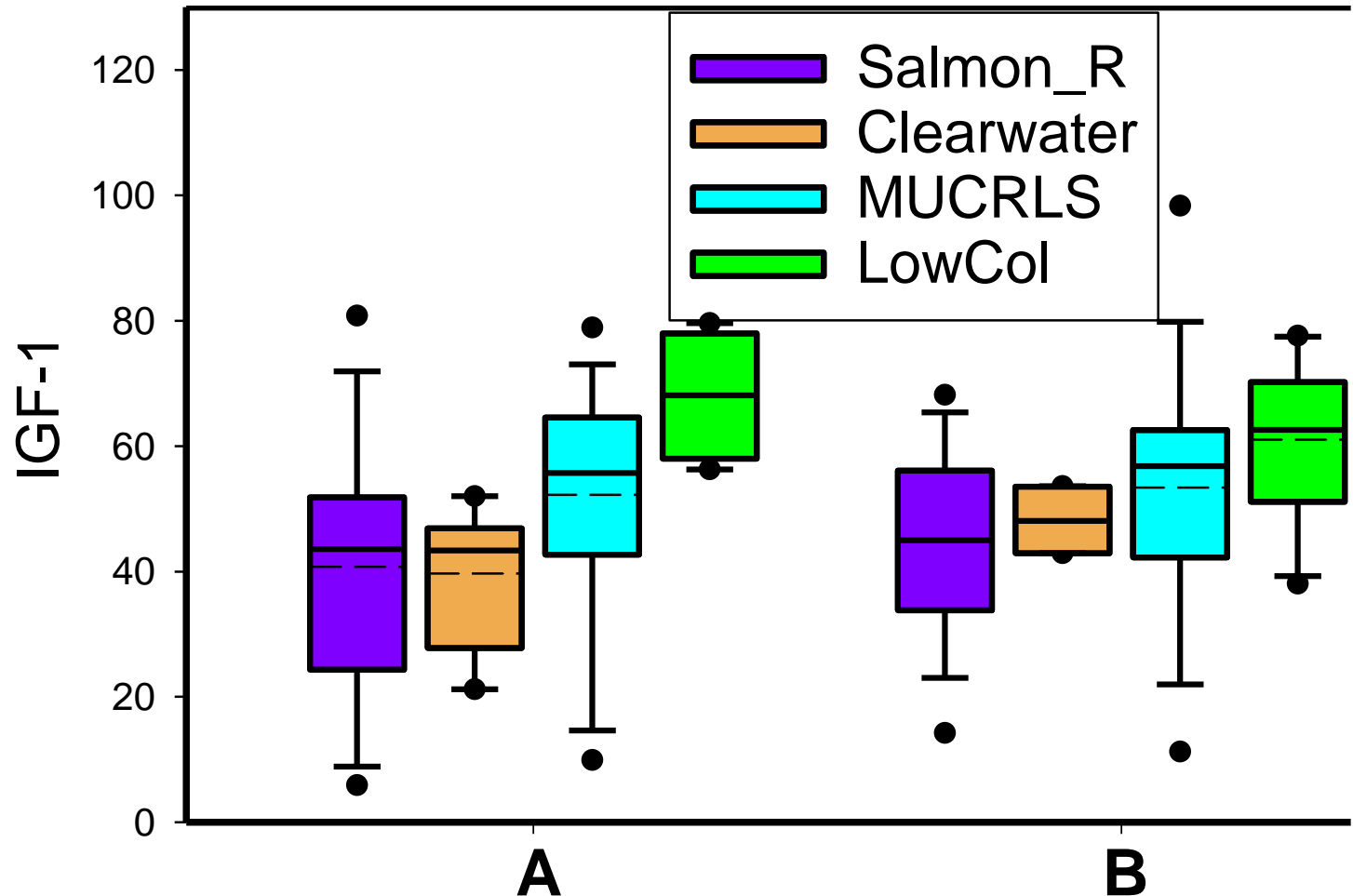
- lower river stock is shorter



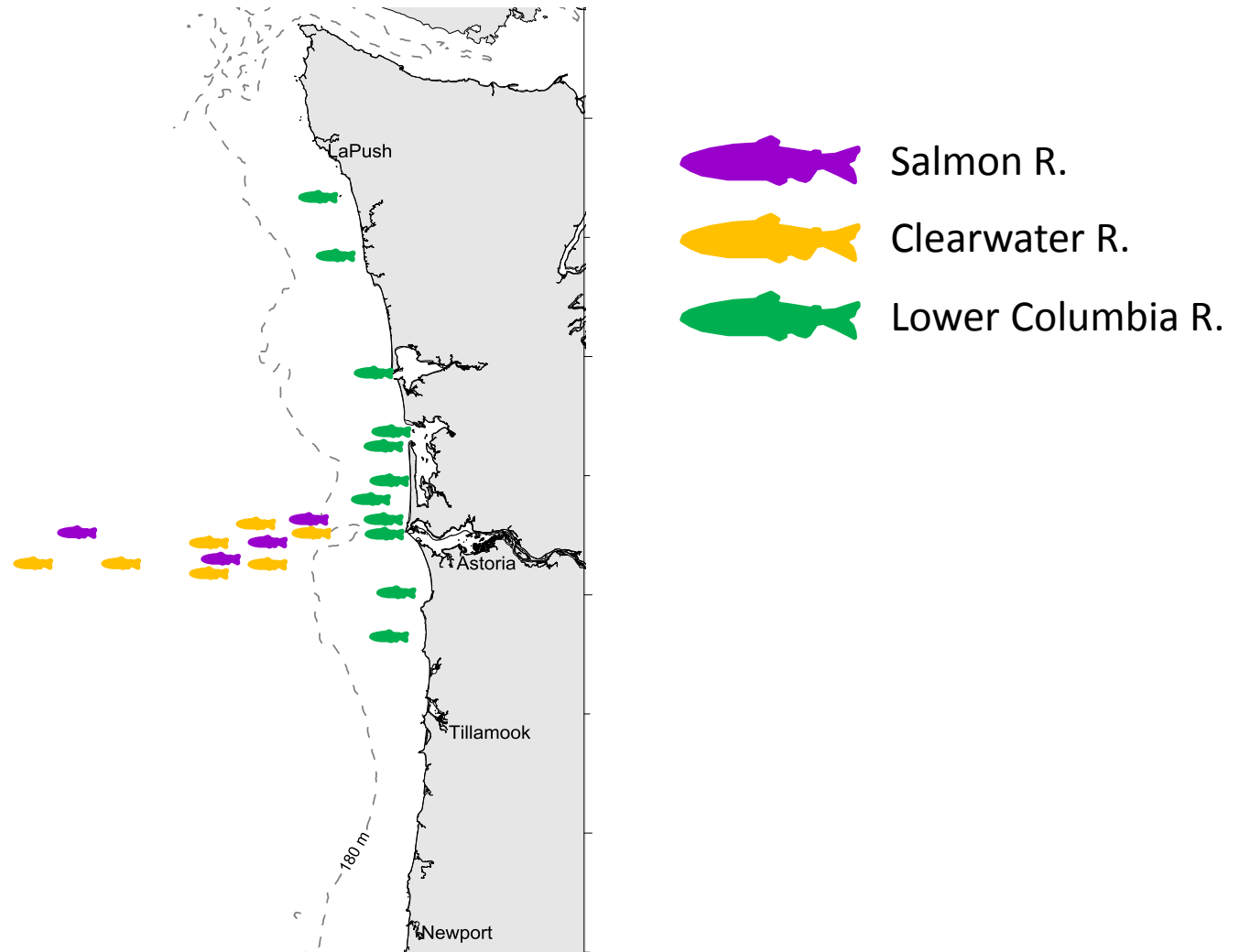
Steelhead IGF

Steelhead IGF similar between sites

- higher for lower river stocks

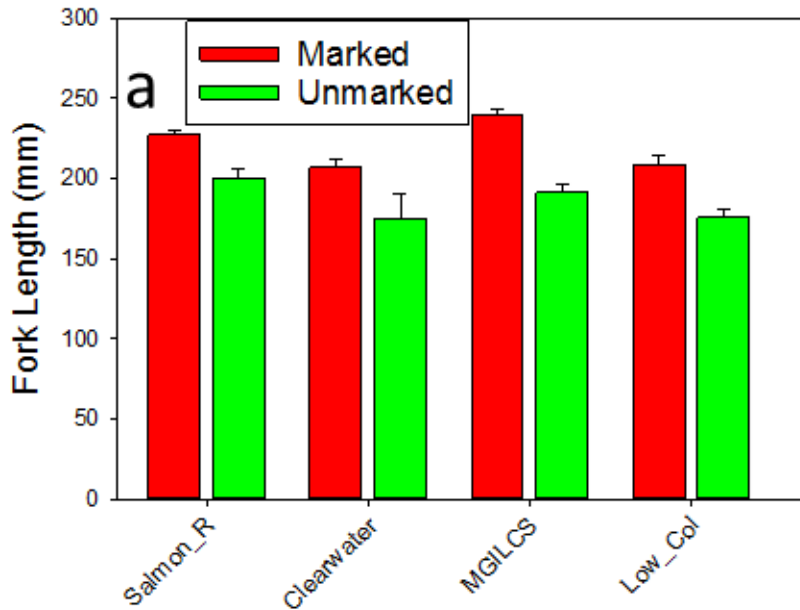


Does marine migration behavior explain differences we found

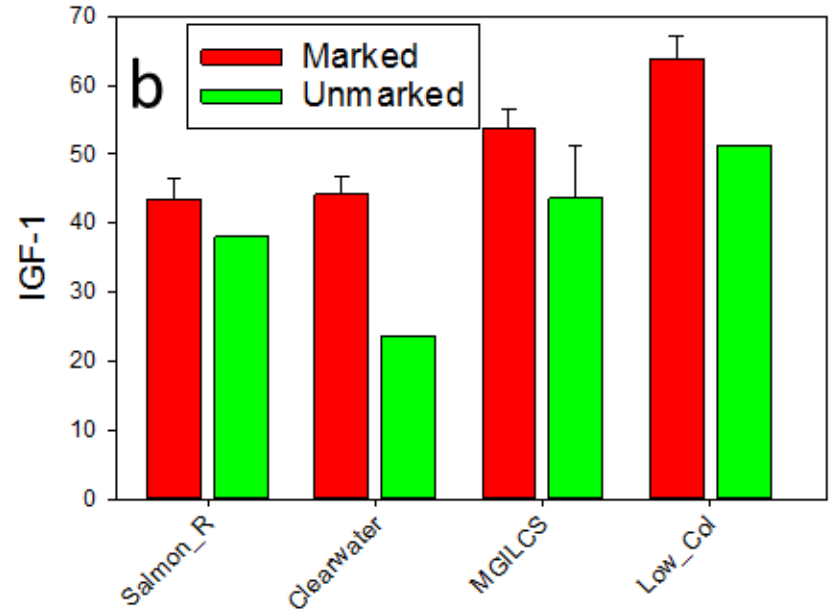


Marked vs Unmarked Steelhead

Steelhead Length by Stock and Marked Status



Steelhead IGF by Stock and Marked Status



Take Home

- **We saw fine-scale spatial differences in biological attributes for Chinook**
- **But not for steelhead!**
- **IGF varies by steelhead stock**

Implications

- **We saw fine-scale spatial differences in biological attributes for Chinook**
 - Survival may be set a small spatial scales and really soon after ocean entry
 - Implications for sampling design?
- **But not for steelhead!**
 - Steelhead behavior is different
 - Survival implications?
- **IGF varies by steelhead stock**
 - Steelhead behavior differs by stock
 - LCR, smaller, grow better.
 - Do LCR stocks have longer coastal residence times?

We are repeating our effort in 2016
Stay Tuned