Apr 6th, 9:30 AM - 9:45 AM

Changes in hatchery subsidies of Chinook salmon in the Salish Sea: implications for predators, fisheries, and conservation

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Changes in hatchery subsidies of Chinook salmon in the Salish Sea: implications for ecology and conservation

Benjamin Nelson[1], Ole Shelton[1], Joe Anderson[2], Eric Ward[1]

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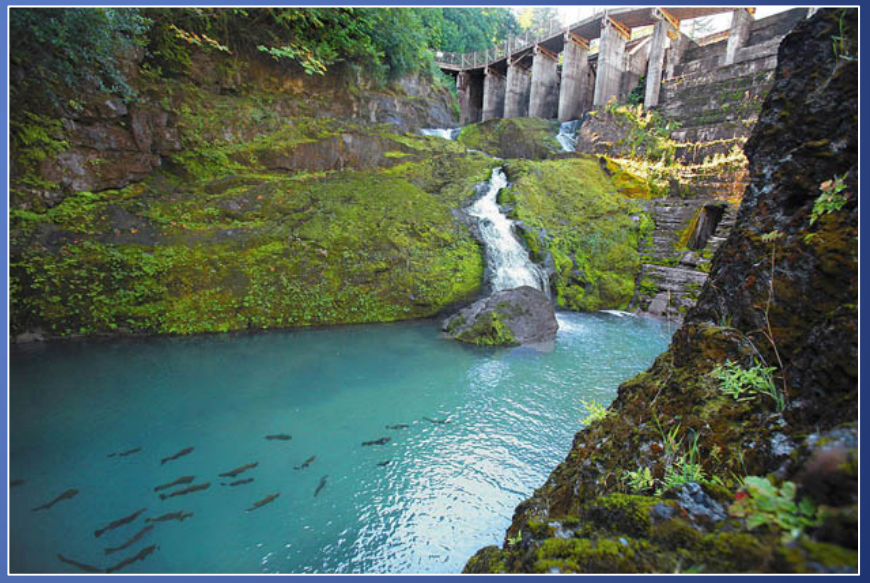
Salish Sea Ecosystem Conference
April 6th 2018 | Seattle, WA

Goals of Salish Sea hatcheries

Fishery supplementation

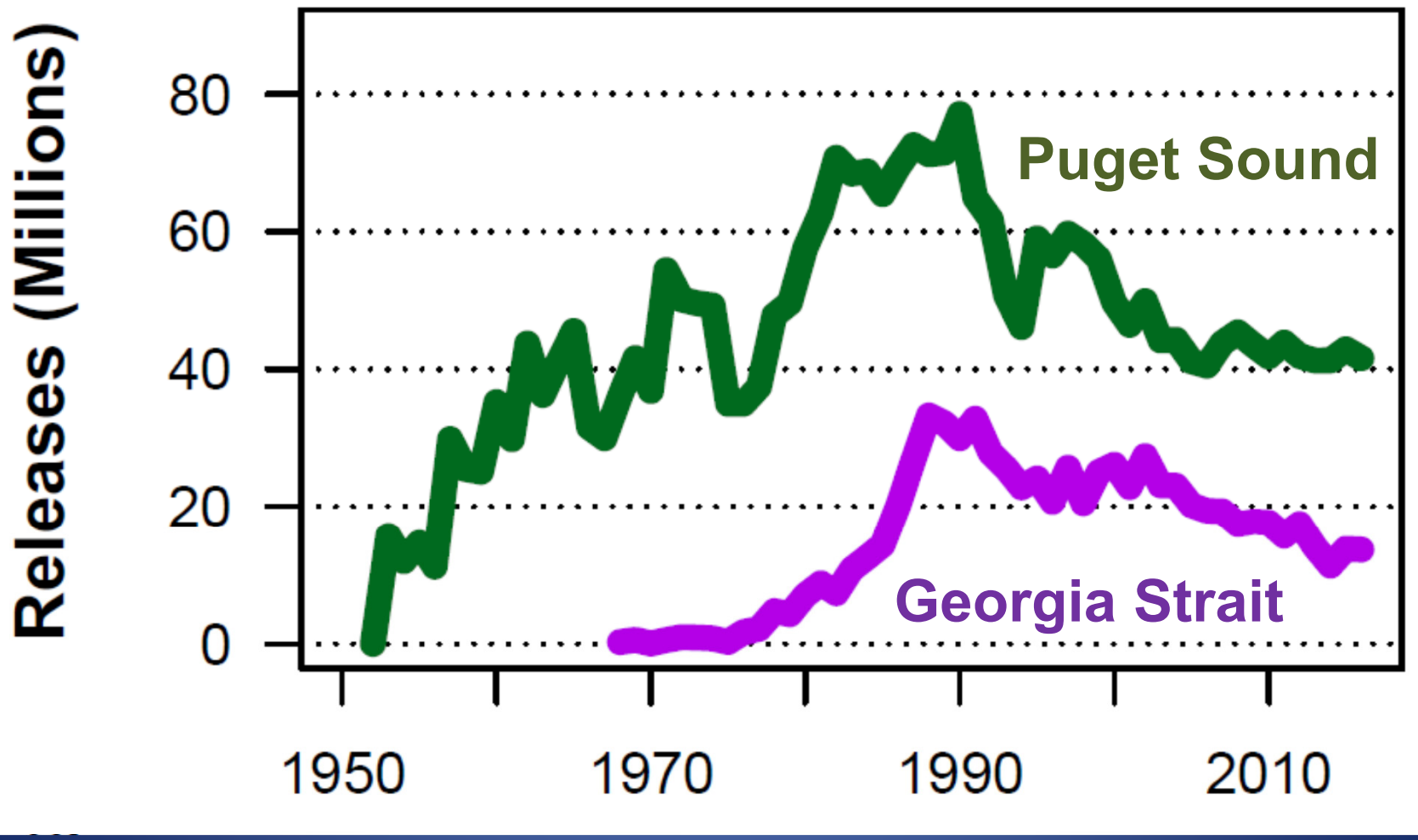
Recovery, mitigation



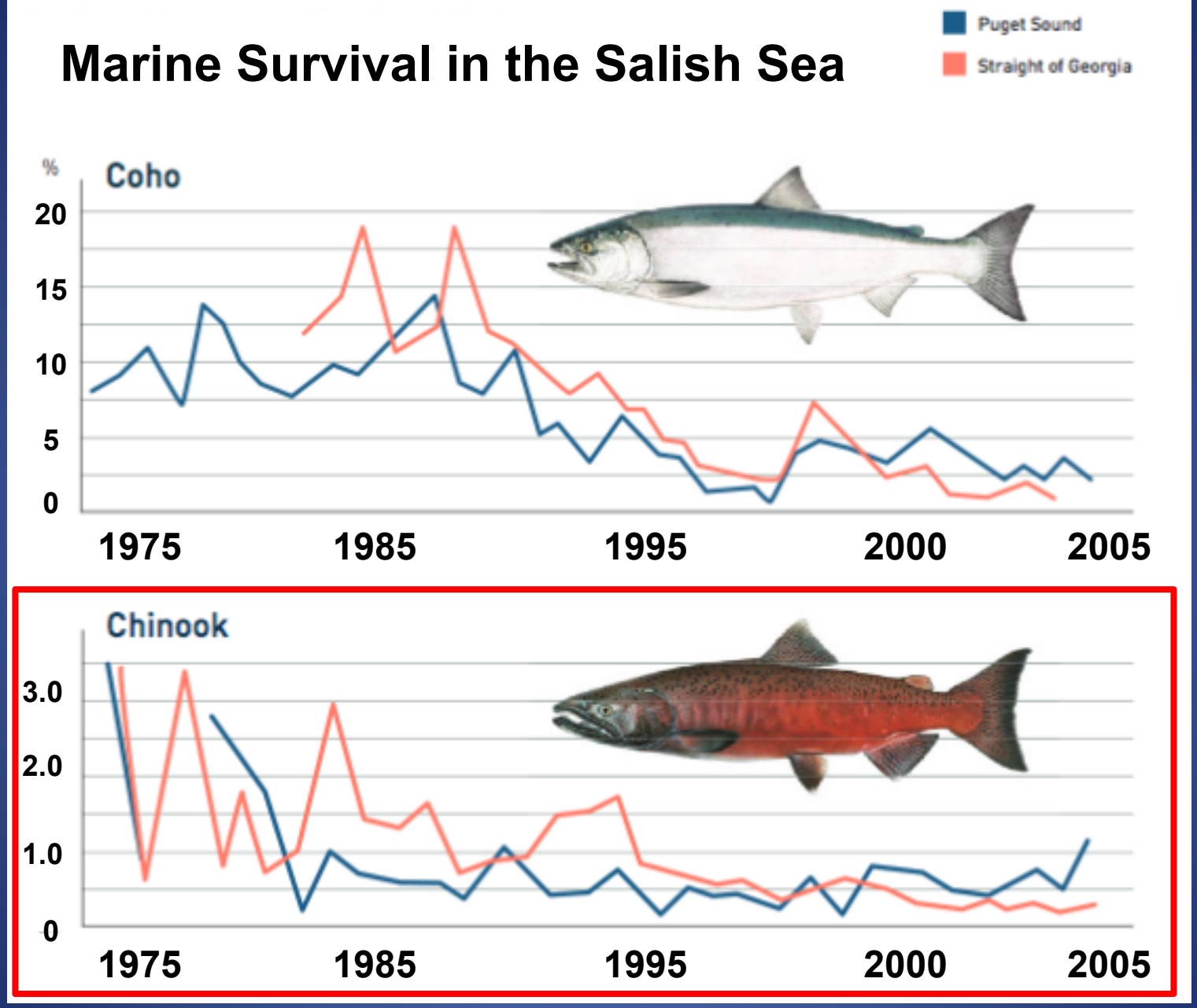
Photos: flylifemagazine.com


3.7 billion Chinook released since 1950
300 hatcheries
> 600 different locations
Pacific Ocean
Puget Sound
The Salish Sea

Salish Sea Chinook hatchery releases



Marine Survival in the Salish Sea



Credit: Pacific Salmon Foundation

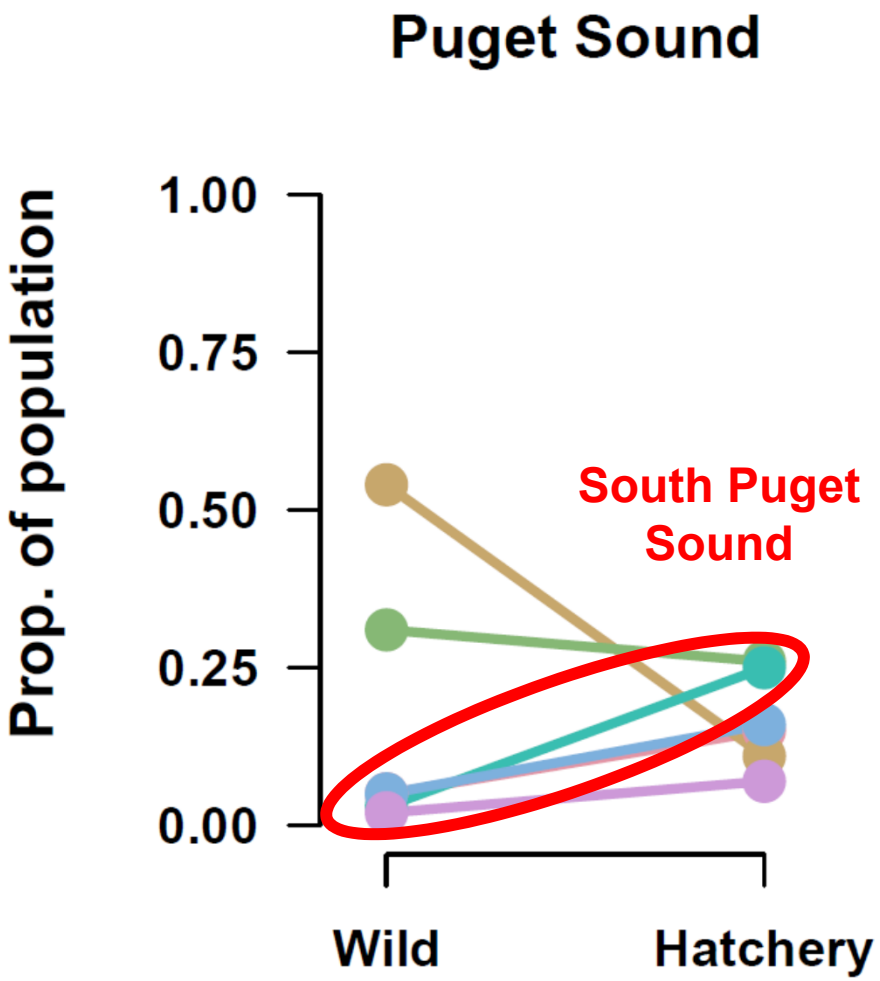
Project goals

1. Compile 65 years of data

2. How have hatchery practices changed?
   - Spatial distribution
   - Size and time of releases
   - Synchrony of releases
   - Wild vs. hatchery populations

3. What does this mean for the Salish Sea ecosystem, salmon conservation?

Hatcheries have re-distributed Chinook smolts throughout the Salish Sea



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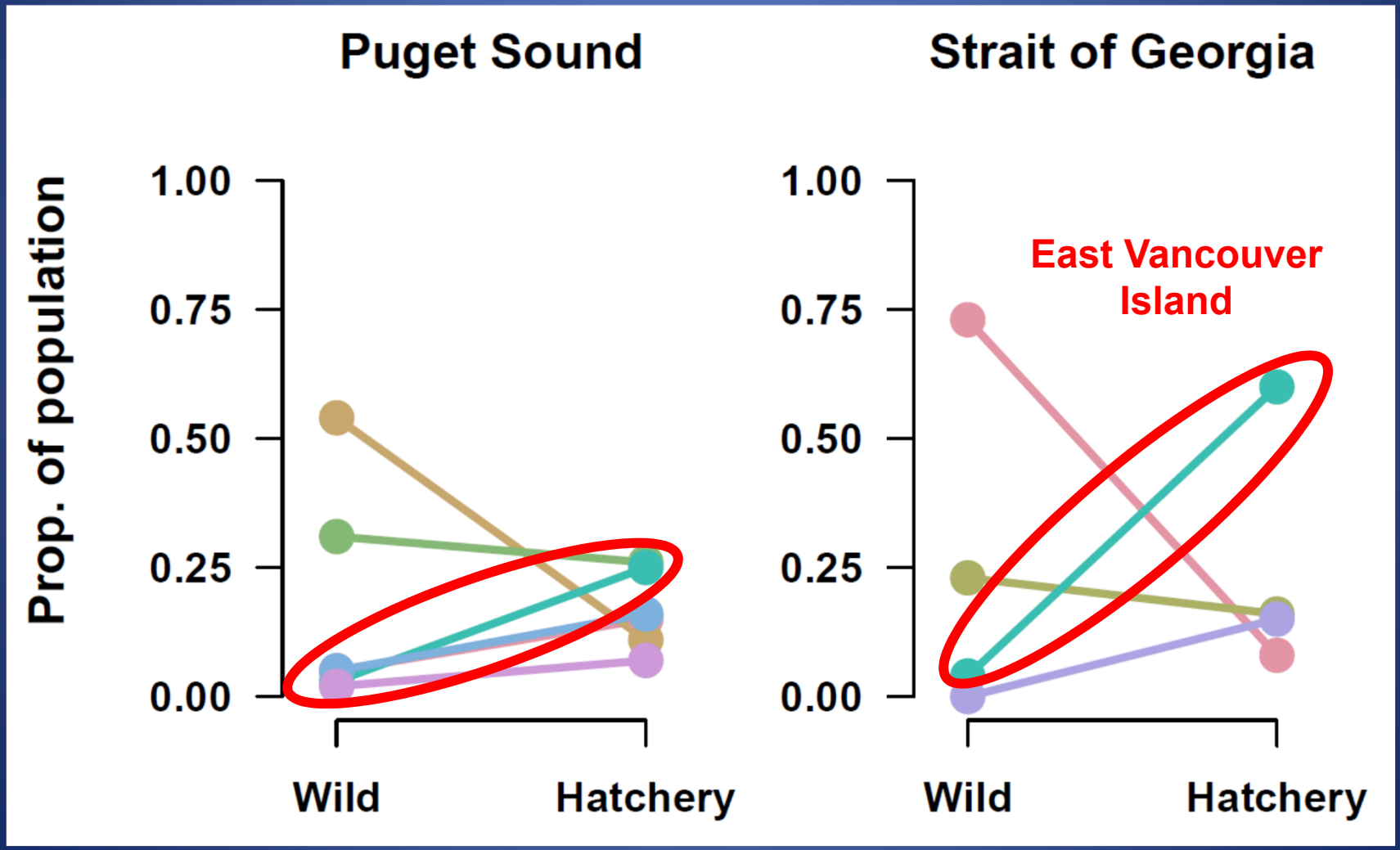
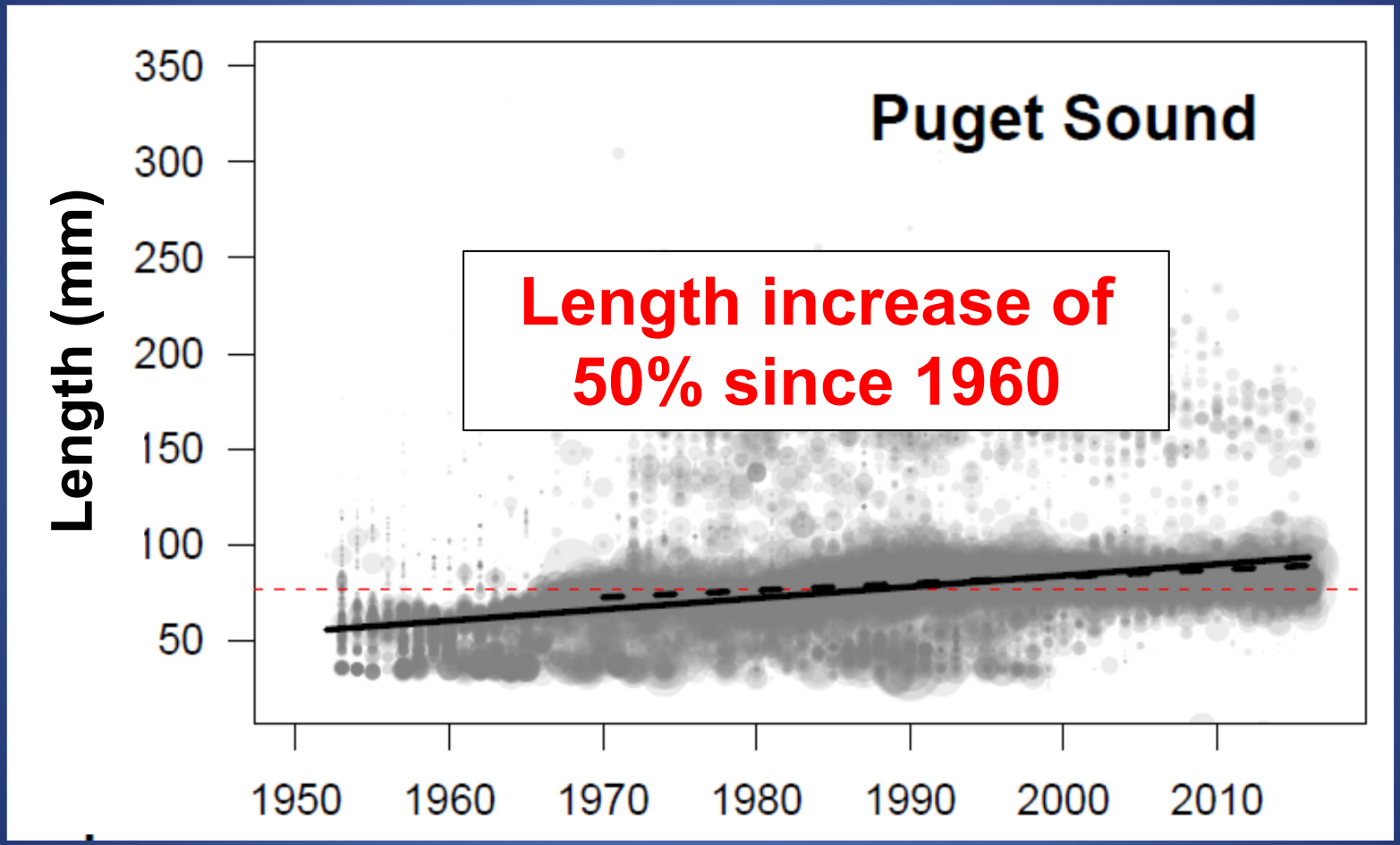


Change in release size of Chinook



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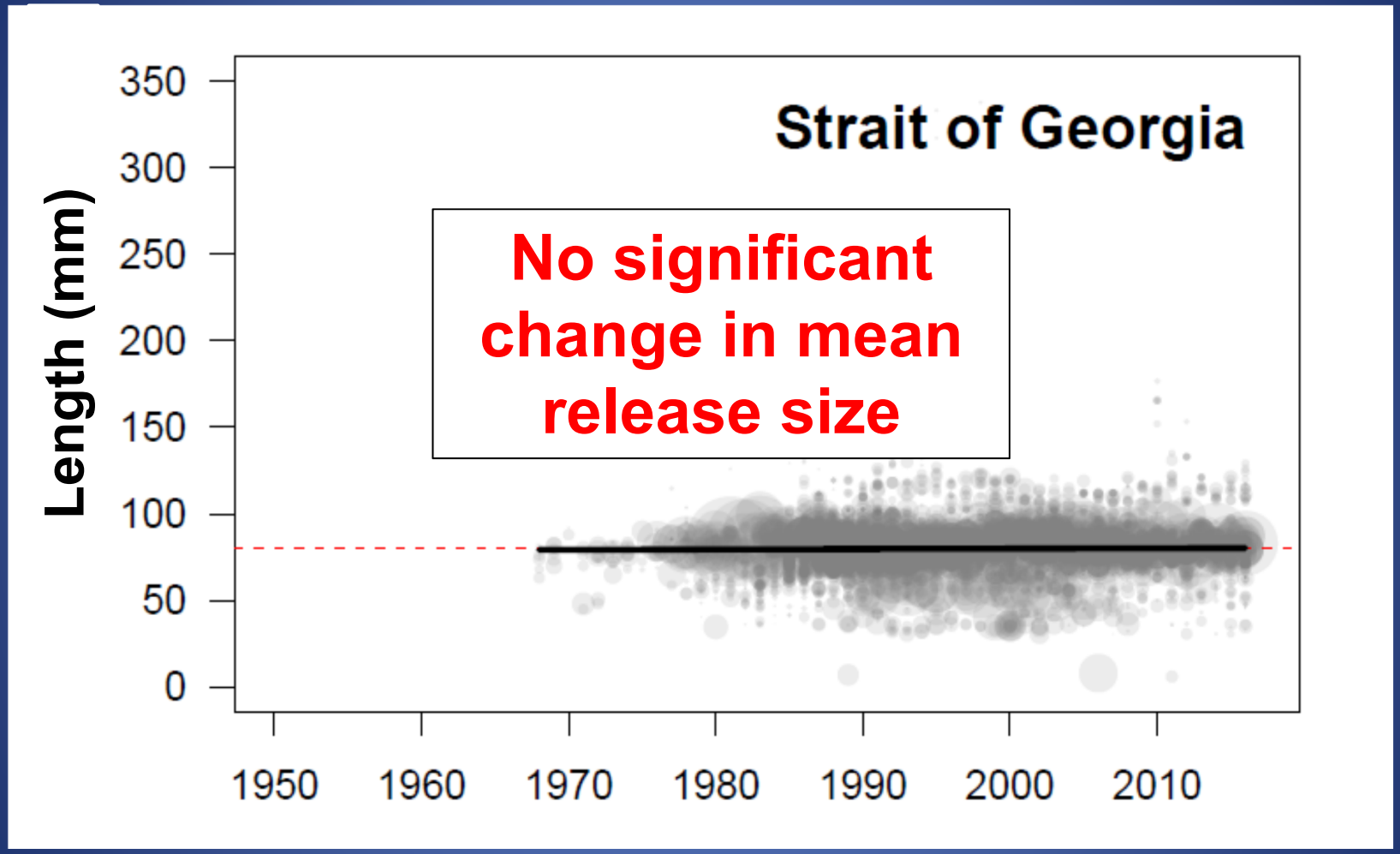
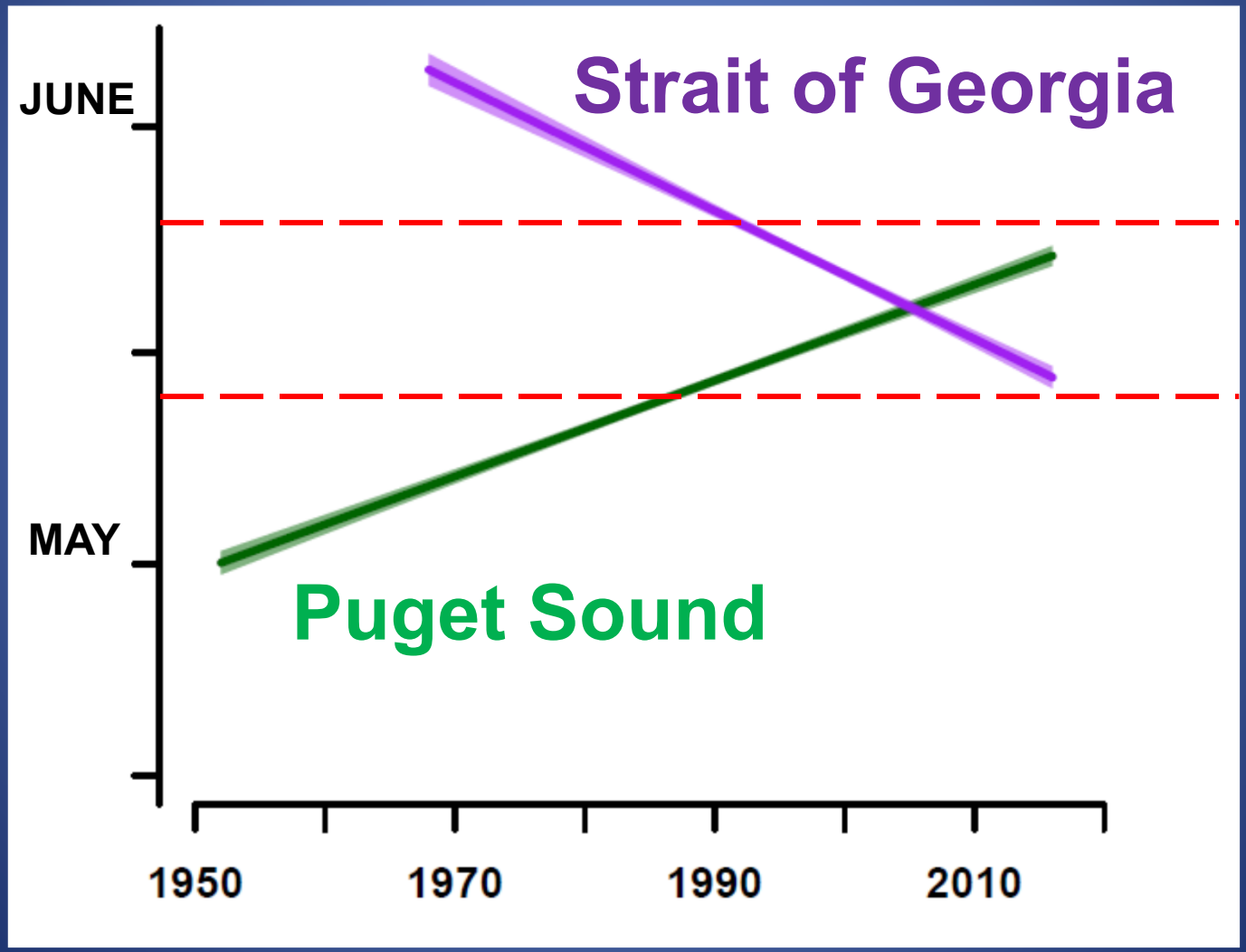
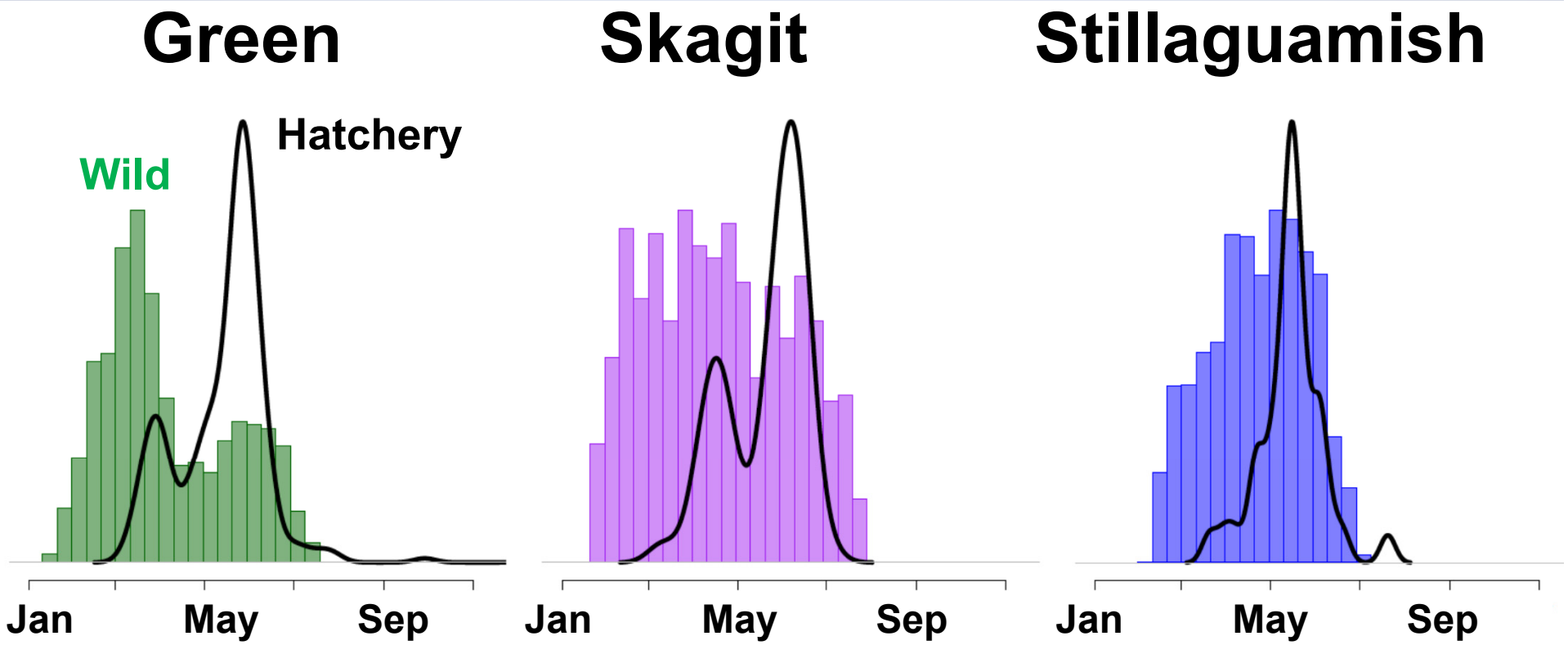


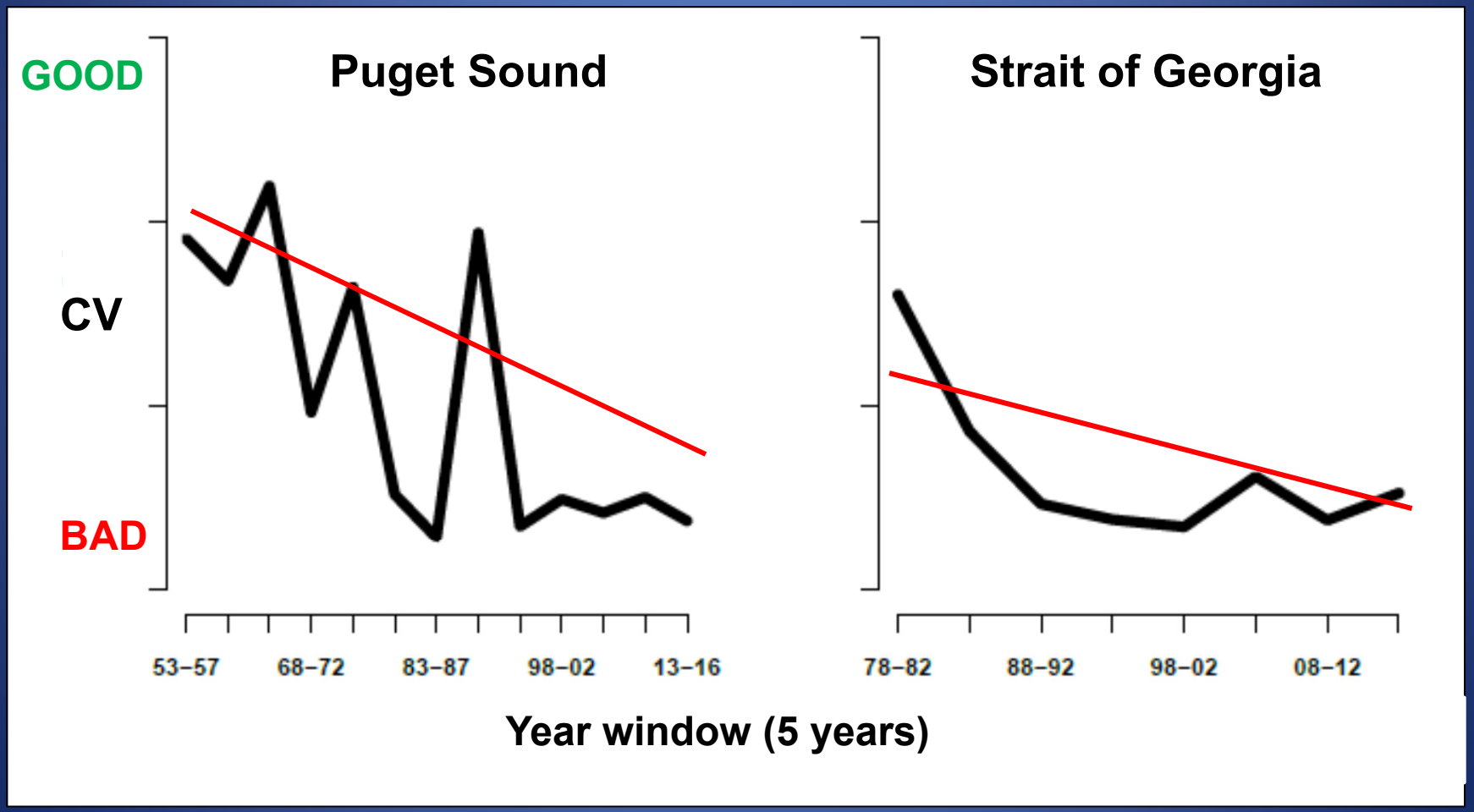
Change in release date of Chinook



Migration time of wild vs. hatchery Chinook smolts



Synchrony in release date has increased



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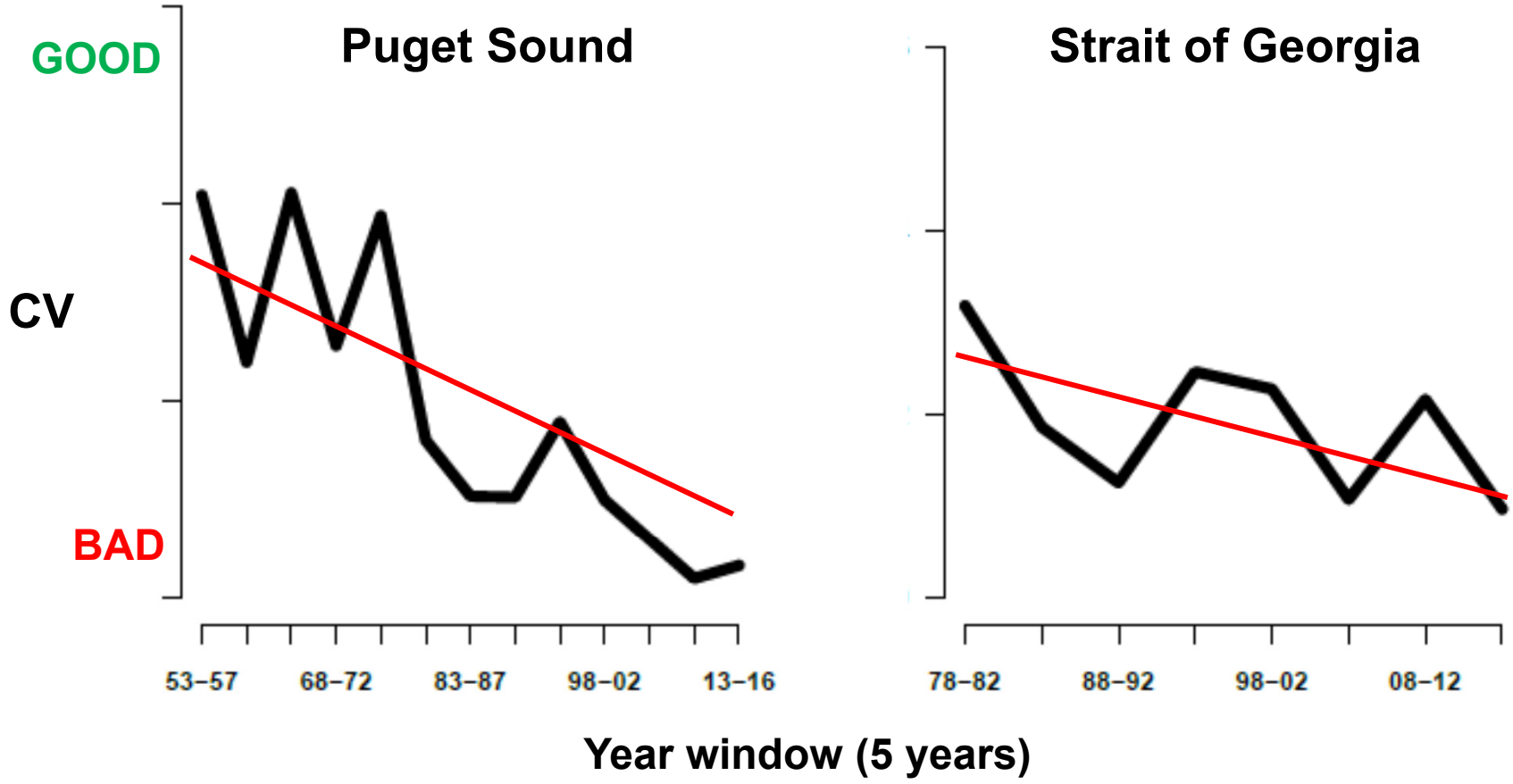

Results summary

	Puget Sound	Strait of Georgia
Release Size		NO CHANGE
Release Date	LATER	EARLIER

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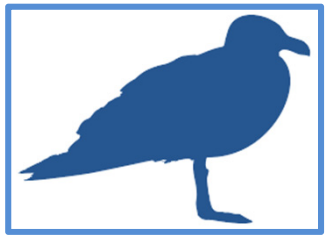
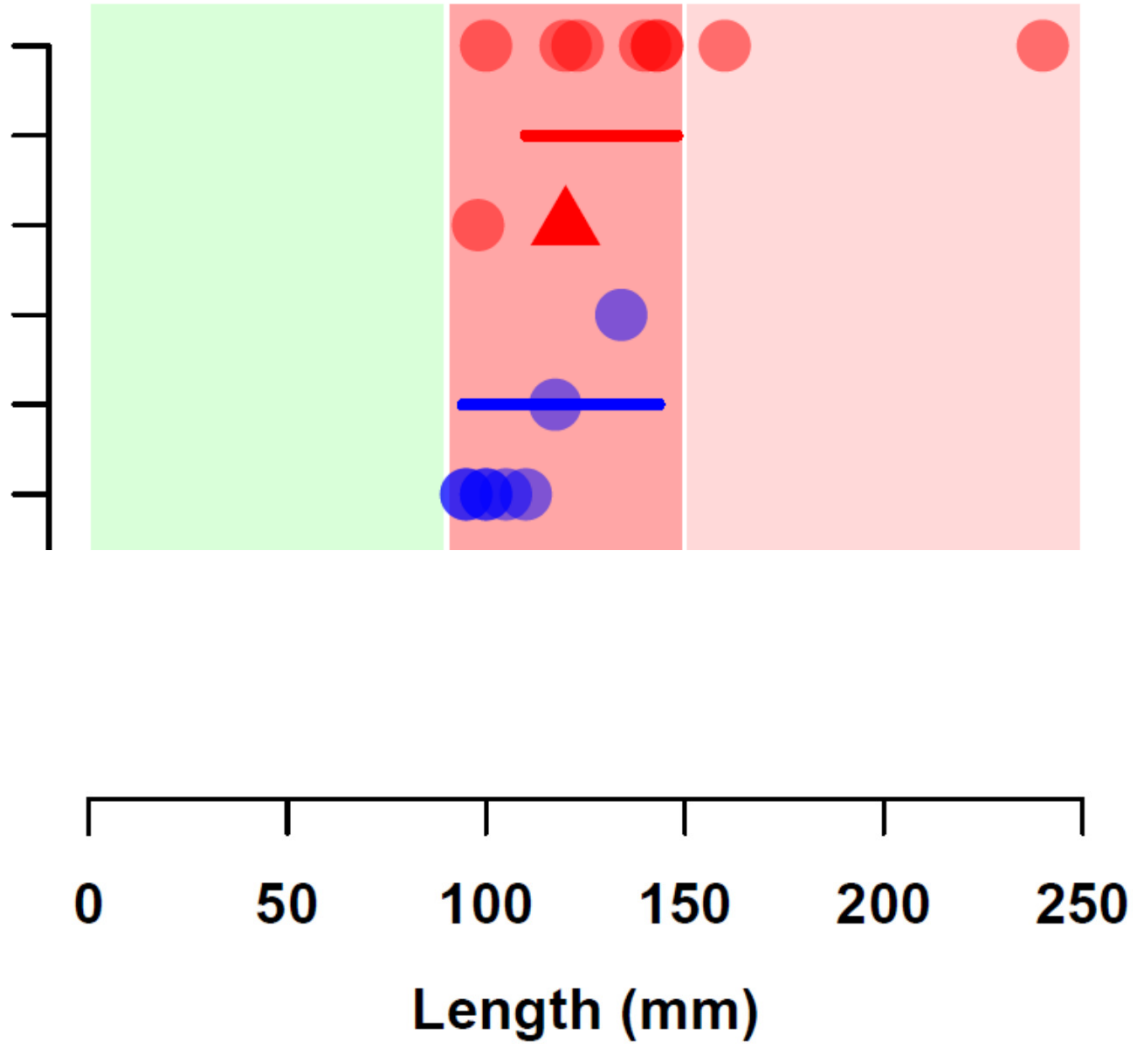
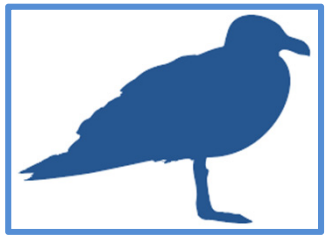
Synchrony Size		
Synchrony Date		

Size-selective predators





Size-selective predators



SOG Chinook

PS Chinook

Wild

Hatchery

0 50 100 150 200 250

Length (mm)

Multiple predators respond to high densities of smolts

Wood 1987

Beamish et al. 1992

Allegue 2017

Conclusions

- Hatchery-origin Chinook salmon have changed over the last 65 years
- Hatchery Chinook are different than wild conspecifics
- Chinook releases have become more synchronized– reduced portfolio effects
- Use hatcheries for controlled experiments

Acknowledgements

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