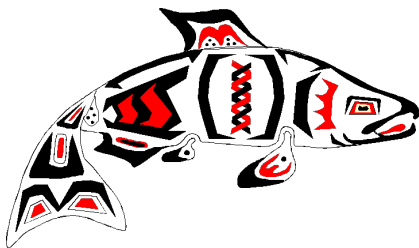


# Spring 2023 in-season Chinook bycatch: Evaluation of predicted ESU impacts

Pacific Fishery Management Council Meeting  
Agenda Item G.8.a Supplemental REVISED NMFS Report 1\*  
12 September 2023



Paul Moran  
Conservation Biology Division  
Northwest Fisheries Science Center  
Seattle, Washington

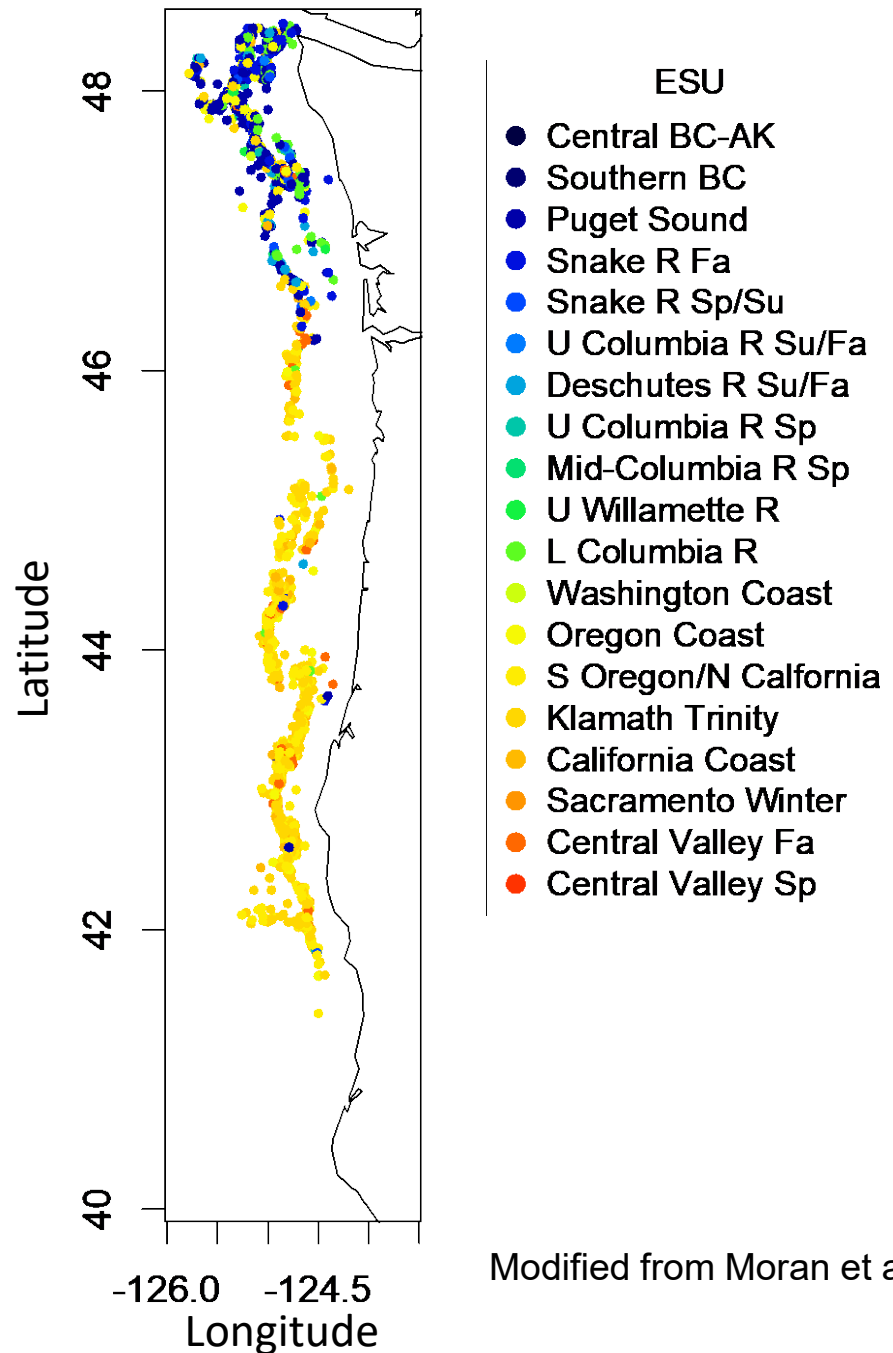


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# Multidisciplinary collaboration on bycatch at NWFSC

Chinook salmon taken in the at-sea sectors of the US West Coast Pacific hake fishery 2008 – 2015 (N = 3042)

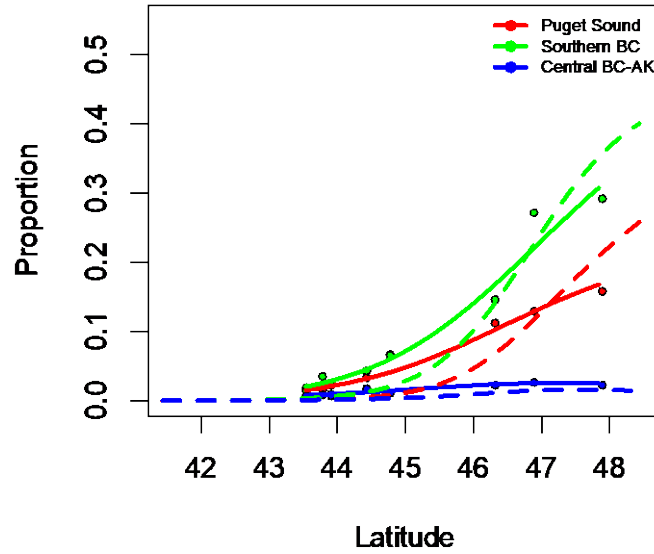
Clear *latitudinal cline* in stock composition, differing among *sensitive and abundant* ESUs



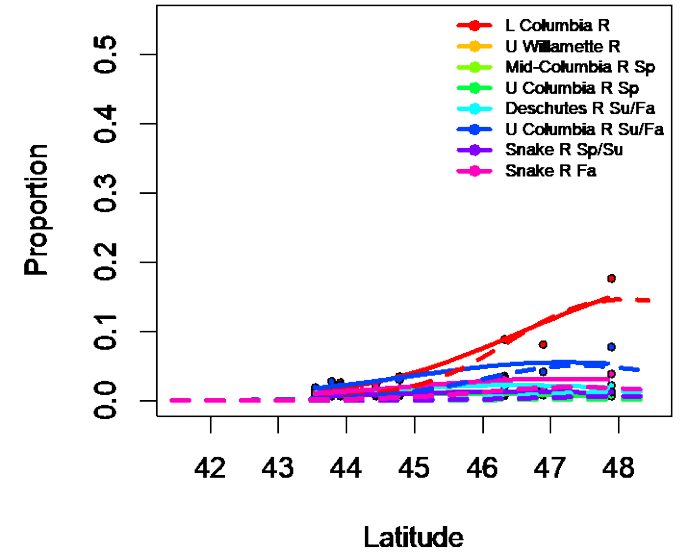
Modified from Moran et al. 2021

Stock  
proportion  
versus  
latitude,  
Dirichlet and  
multinomial  
logistic  
regression

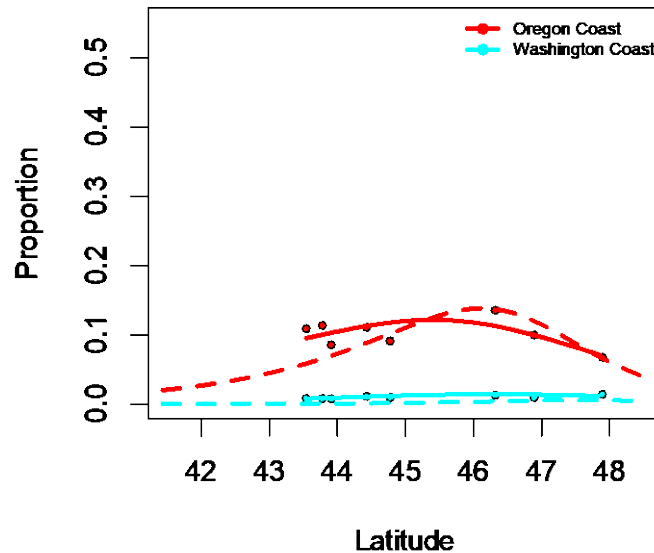
Northern ESUs



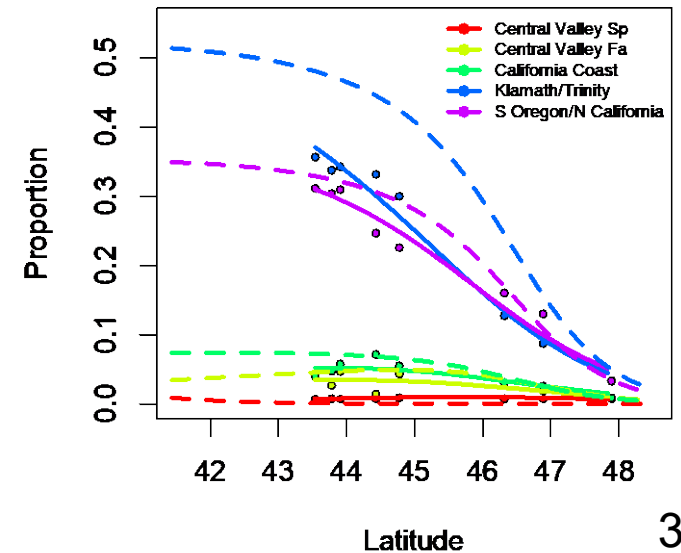
Columbia ESUs



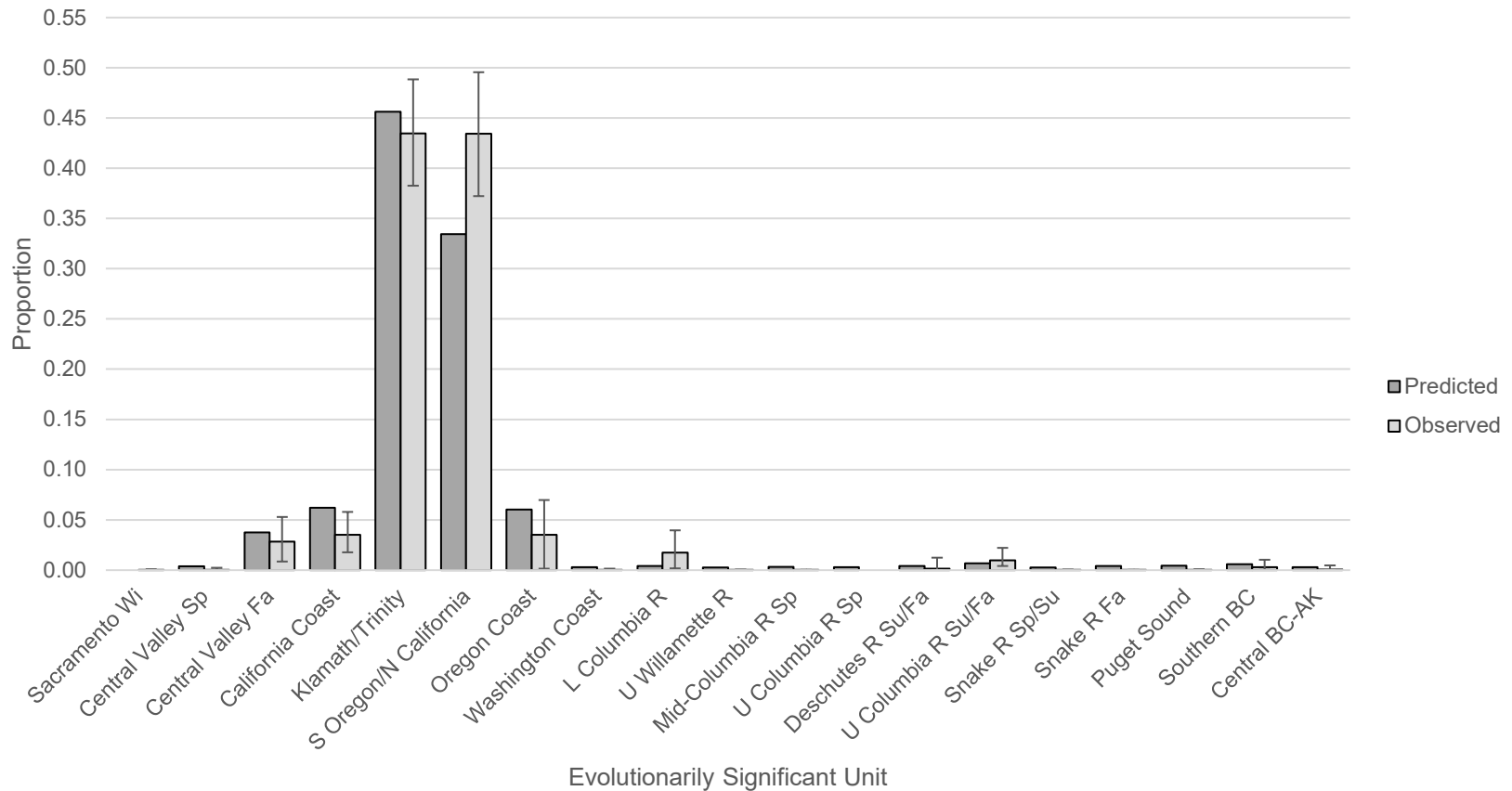
Coastal ESUs



Southern ESUs



# Predicted ESU proportions presented in the report versus observed genotypes in at-sea Pacific hake sectors, spring 2023



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# Incidental take estimates for spring bycatch at-sea and shoreside Pacific hake sectors 2023

A-SHOP					
ESU	Predicted	Observed	CMP	CMP-LBE	A-SHOP&CMP
<b>Sacramento Wi</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Central Valley Sp</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>
Central Valley Fa	43	32	65	2	100*
<b>California Coast</b>	<b>72</b>	<b>40</b>	<b>16</b>	<b>3</b>	<b>60</b>
Klamath/Trinity	527	502	132	10	644
S Oregon/N California	386	501	105	10	616
Oregon Coast	69	41	104	19	164
Washington Coast	3	0	2	3	5
<b>L Columbia R</b>	<b>5</b>	<b>20</b>	<b>28</b>	<b>64</b>	<b>113</b>
<b>U Willamette R</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>
Mid-Columbia R Sp	3	0	0	2	2
<b>U Columbia R Sp</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>
Deschutes R Su/Fa	5	1	7	6	14
U Columbia R Su/Fa	8	11	28	19	58
<b>Snake R Sp/Su</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>
<b>Snake R Fa</b>	<b>5</b>	<b>0</b>	<b>2</b>	<b>9</b>	<b>11</b>
<b>Puget Sound</b>	<b>5</b>	<b>0</b>	<b>4</b>	<b>92</b>	<b>97</b>
Southern BC	7	3	14	157	175
Central BC-AK	3	1	0	8	9
<b>Total listed</b>	<b>100</b>	<b>61</b>	<b>51</b>	<b>180</b>	<b>292</b>
<b>Total</b>	<b>1154</b>	<b>1154</b>	<b>509</b>	<b>413</b>	<b>2076</b>
<b>Percent listed</b>	<b>9%</b>	<b>5%</b>	<b>10%</b>	<b>44%</b>	<b>14%</b>

\* Apparent arithmetic errors due to rounding of modeled values