Science, Service, Stewardship

Agenda Item F.1.b
Supplemental NMFS Presentation 1
April 2018

Groundfish Science Report

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Northwest Fisheries Science Center

April 7, 2018

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Overview

- On-line Tools for EFH
- Bottom Trawl Survey Status
- Science Updates

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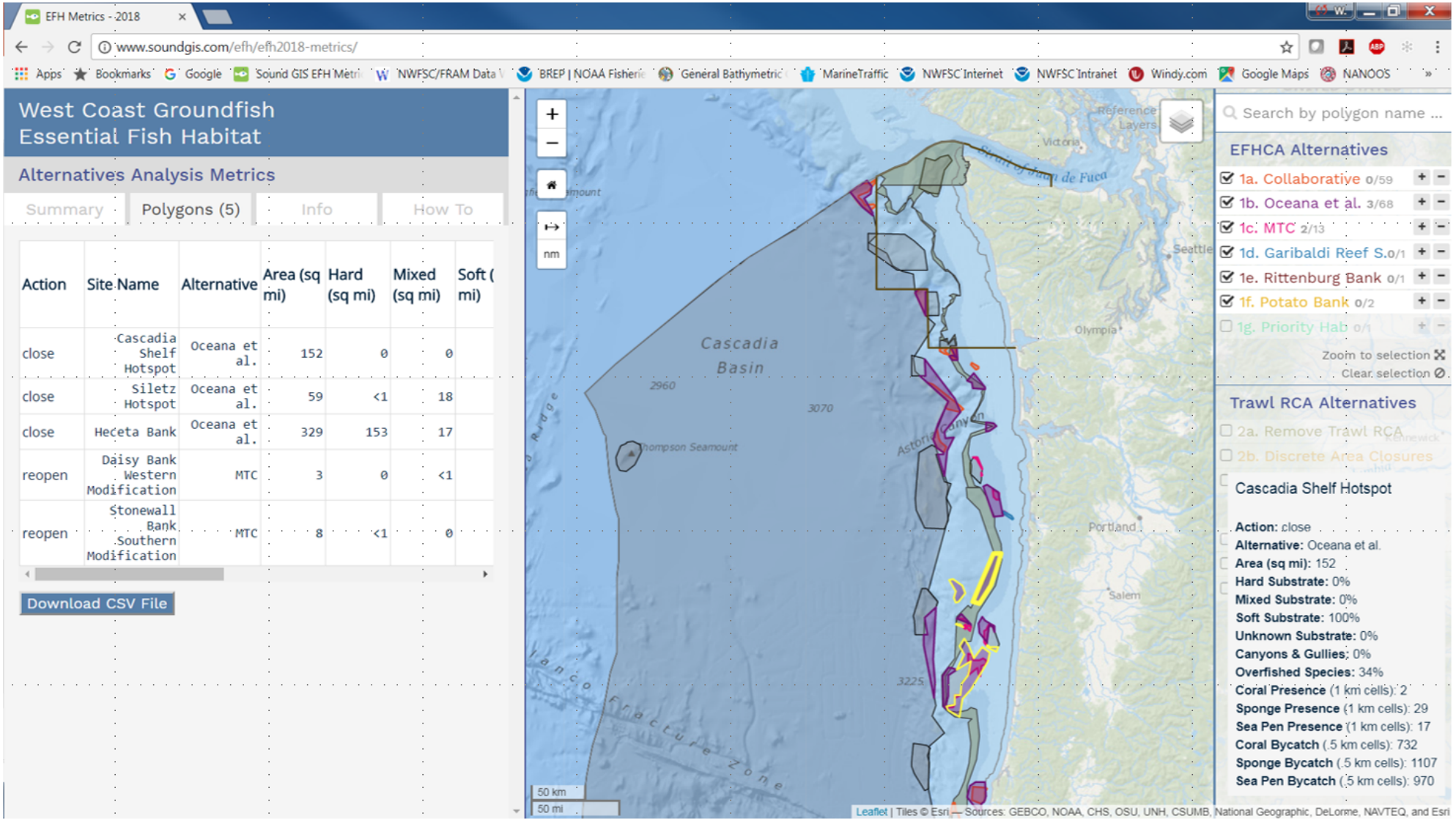
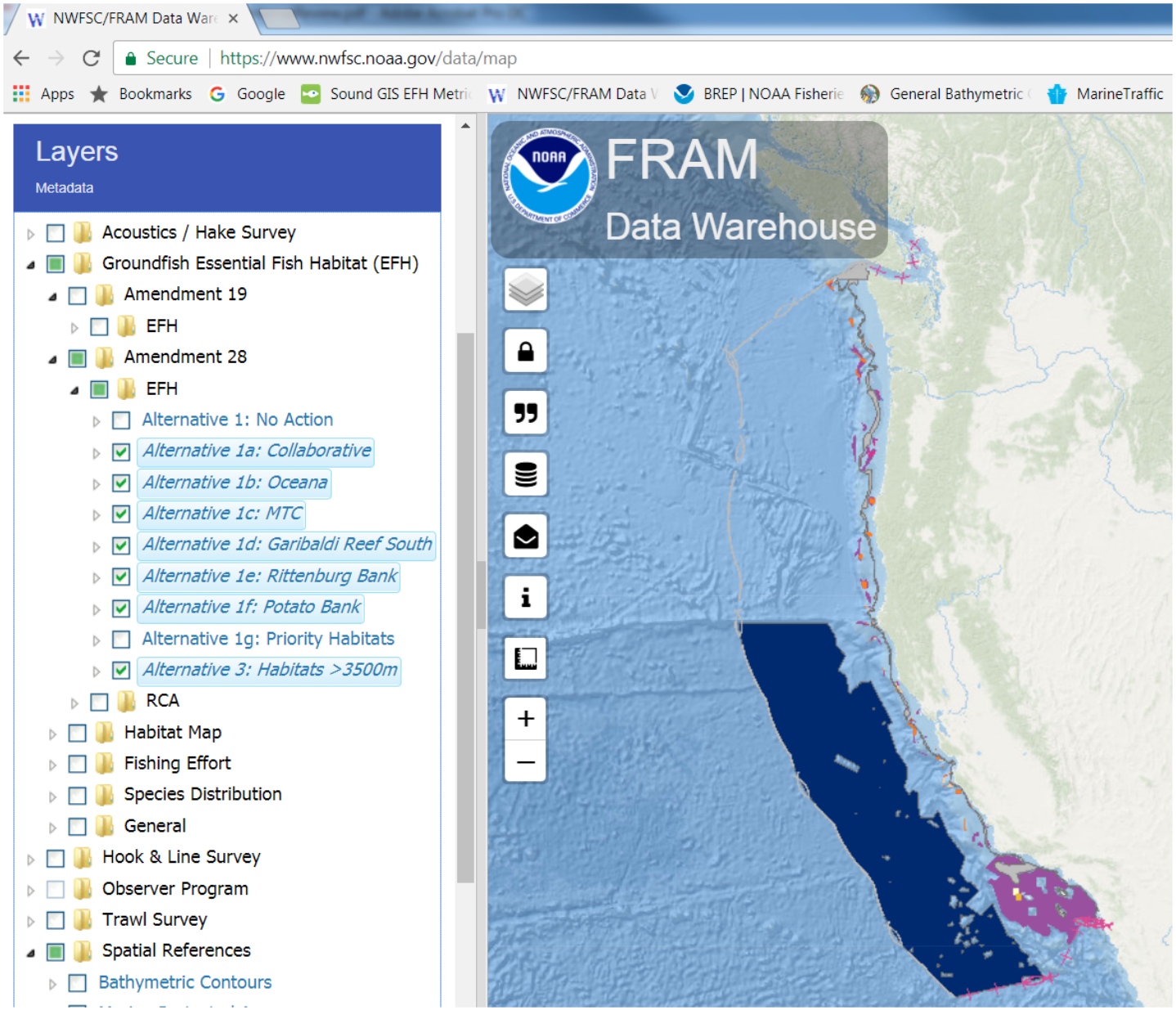
On-line Tools for EFH

Groundfish EFH Alternative Analysis Metrics Tool Developed for NMFS West Coast Region by Sound GIS



http://www.soundgis.com/efh/efh2018-metrics

Groundfish EFH application added to NWFSC FRAM Data Warehouse

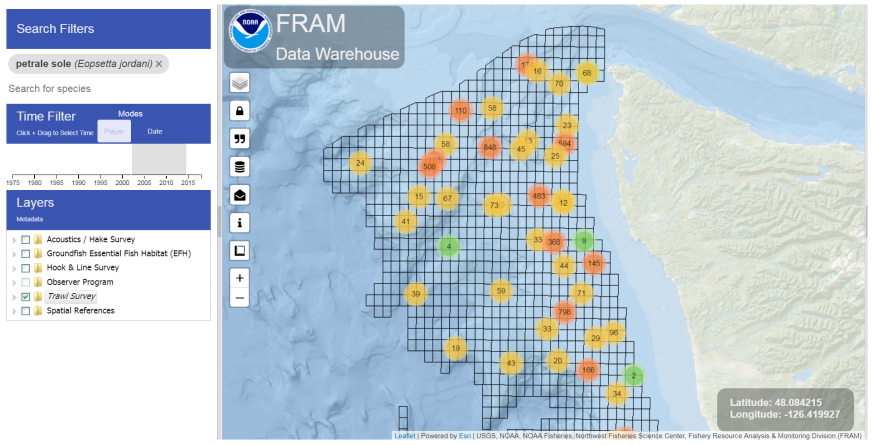


https://www.nwfsc.noaa.gov/data/map

The FRAM Warehouse is about more than groundfish EFH

Access and download data from:

- Integrated Hake Acoustics Survey
- Economics & Social Science Research (non-confidential EDC, other voluntary surveys)
- Southern California Bight Hook & Line Survey
- Marine Habitat
- West Coast Groundfish Observer Program
- West Coast Groundfish Bottom Trawl Survey



https://www.nwfsc.noaa.gov/data/map

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Bottom Trawl Survey Status

- 2018 as planned
- Funding status uncertain (and poor) for 2019
- Conducting analyses of alternative configurations
- Long-term strategies to be developed

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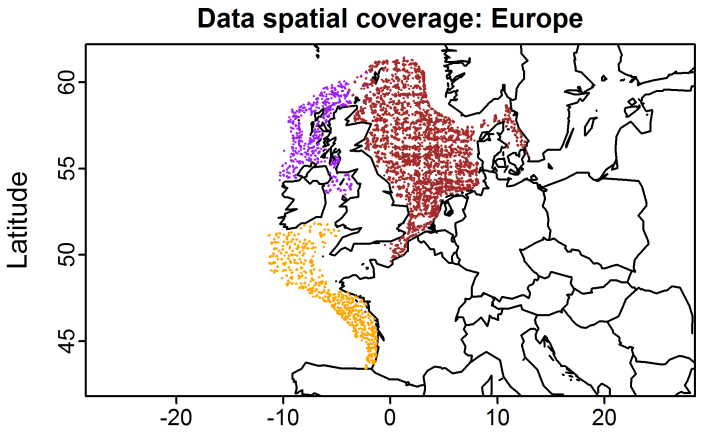
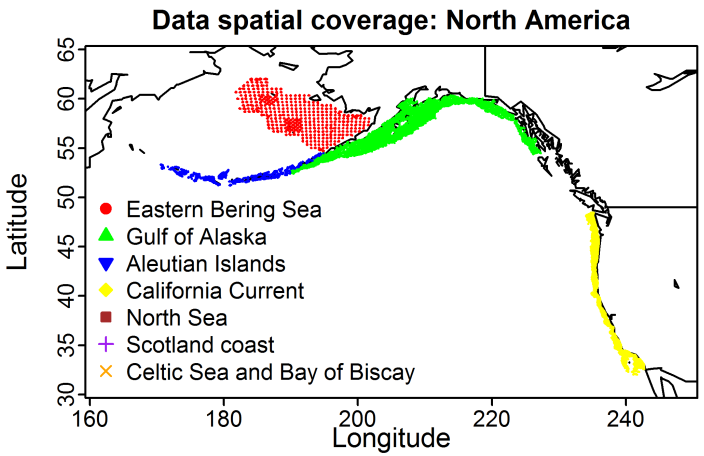
Science Updates: Recent Publications





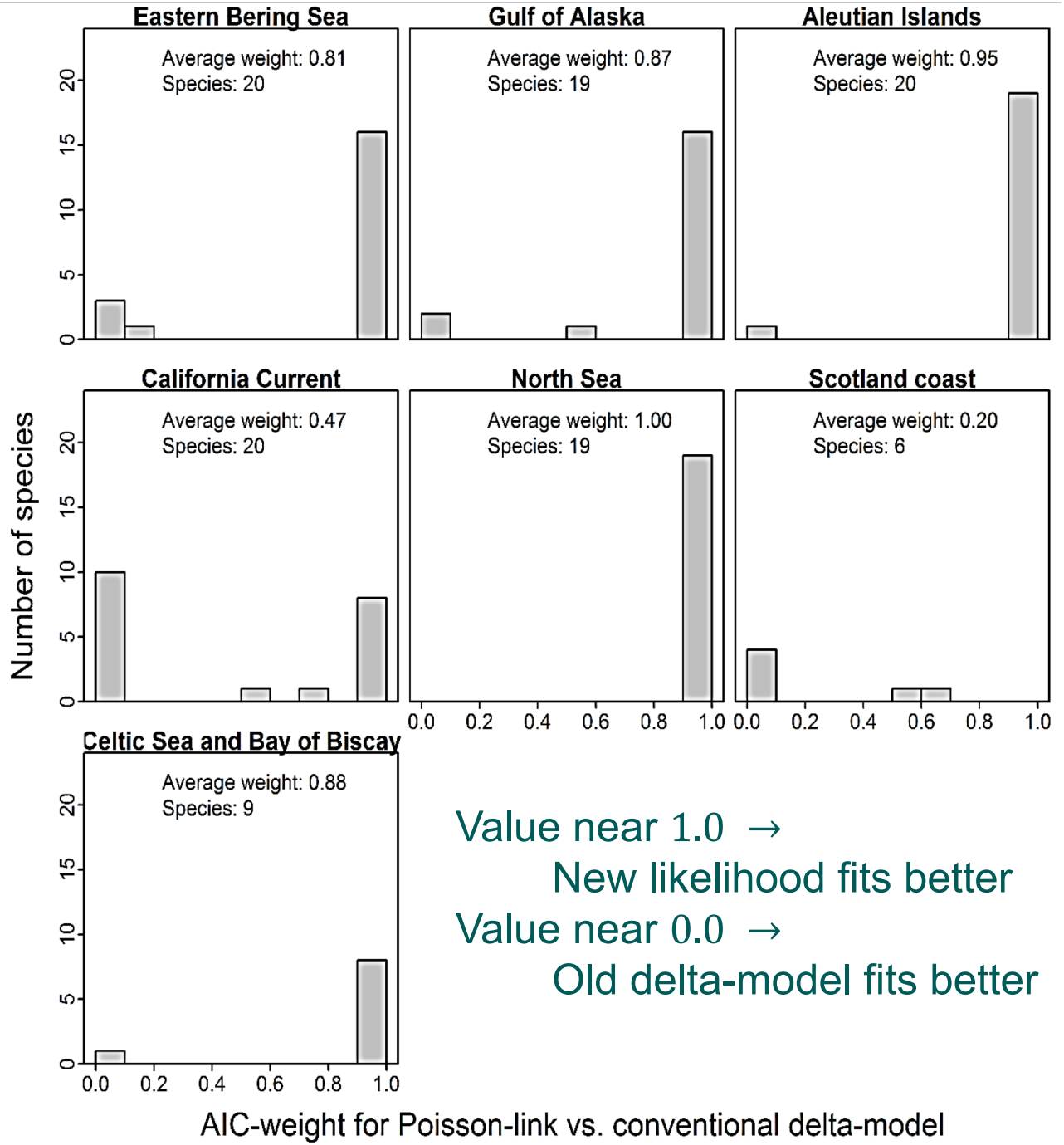
Three problems with the conventional delta-model for biomass sampling data, and a computationally efficient alternative

James Thorson

Fisheries Resource Assessment and Monitoring Division, NWFSC

Canadian Journal of Fisheries and Aquatic Sciences (In press)
http://www.nrcresearchpress.com/doi/abs/10.1139/cjfas-2017-0266

- I propose a new model for biological sampling data
- This model fits bottom trawl survey data better for >80% of species worldwide
  - Exception: US West Coast
- It is available for index standardization using package *VAST*
  - Recommended for use in 2019 assessment cycle



Value near 1.0 →
New likelihood fits better
Value near 0.0 →
Old delta-model fits better

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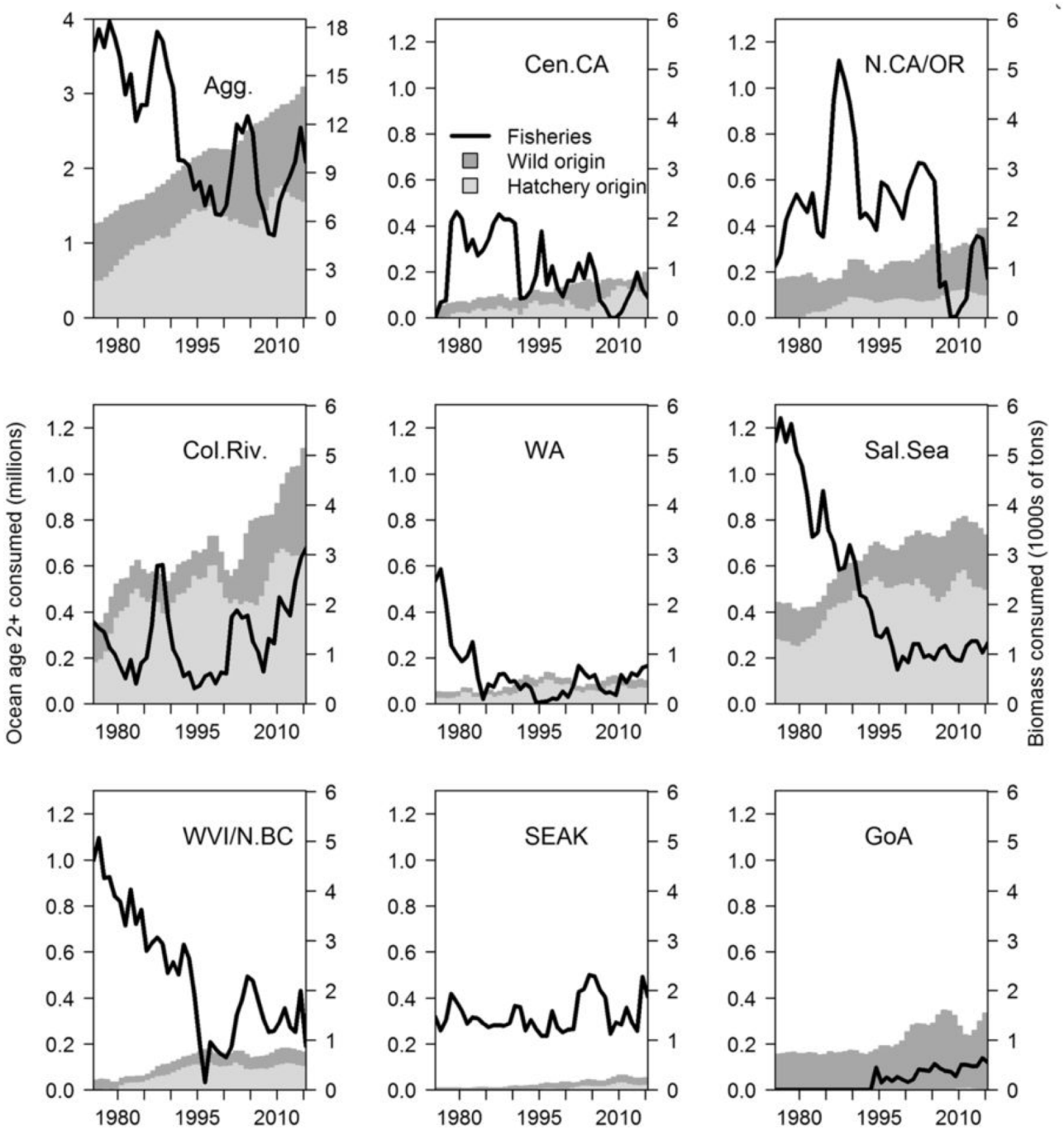
Competing tradeoffs between increasing marine mammal predation and fisheries harvest of Chinook salmon

Brandon E Chasco[1], Isaac C Kaplan[2], Austen C Thomas[3], Alejandro Acevedo-Gutiérrez[4], Dawn P Noren[2], Michael J Ford[2], M Bradley Hanson[2], Jonathan J Scordino[5], Steven J Jeffries[6], Kristin N Marshall[2], Andrew O Shelton[2], Craig Matkin[7], Brian J Burke[2], Eric J Ward[2]

[1] Oregon State University; [2] NOAA Fisheries Northwest Fisheries Science Center; [3] Smith-Root; [4] Western Washington University; [5] Makah Fisheries Management; [6] Washington Department of Fish and Wildlife; [7] North Gulf Oceanic Society

Scientific Reports (2017) 7: 15439, doi:10.1038/s41598-017-14984-8

- Chinook salmon consumption by marine mammals has increased with marine mammal abundance since inception of MMPA
- Fisheries harvests of Chinook have declined
- Chinook now face greater risks from predation than from fishing



Double or nothing: Plasticity in reproductive output in the chilipepper rockfish (*Sebastes goodei*)

Lyndsey Lefebvre, Sabrina Beyer, David Stafford, Neosha Kashef, E.J. Dick, Susan Sogard and John Field (FED/SWFSC and UCSC/CIMEC)

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Double or nothing: Plasticity in reproductive output in the chilipepper rockfish (*Sebastes goodei*)

Lyndsey S. Lefebvre[a,b,*], Sabrina G. Beyer[a,b], David M. Stafford[a,b], Neosha S. Kashef[a,b], Edward J. Dick[b], Susan M. Sogard[b], John C. Field[b]

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[b] Fisheries Ecology Division, Southwest Fisheries Science Center, National Marine Fisheries Service, National Oceanographic and Atmospheric Administration, 110 McAllister Way, Santa Cruz, CA 95060, United States

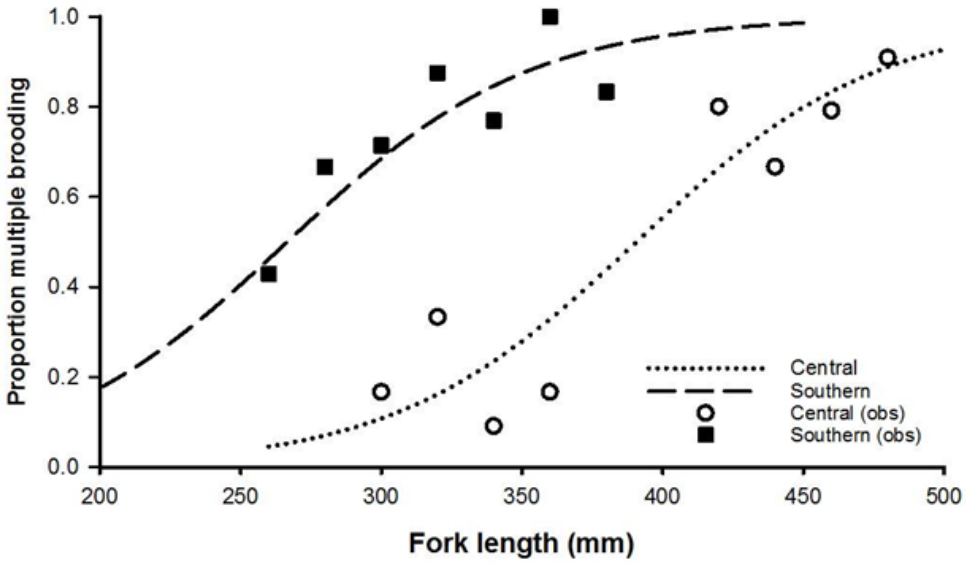

Figure: the proportion of female chilipepper multiple brooding at length off Central and Southern California.

- Documents both abortive maturation and multiple brooding in chilipepper rockfish using macroscopic and histological methods.
- Provides a revised fecundity function for use in stock assessments that accounts for the both greater fecundity and increased probability of producing multiple broods with size.
- Highlights importance of continued studies in reproductive ecology to better inform stock assessment models, as cowcod, bocaccio and several other species are also multiple brooders- this is a 50 year old research recommendation!

A closely related laboratory study of Rosy Rockfish by Susan Sogard and Sabrina Beyer (FED/SWFSC) has also found that

- Larger females produced disproportionately more larvae
- Larger females had both larger brood sizes and a greater number of annual broods (up to five broods per year)
- Much higher fecundity-length exponents when accounting for multiple broods,
- Females in a **Low Ration** treatment produced 60% fewer larvae a year compared with well-fed females in a **High Ration** treatment

Questions?