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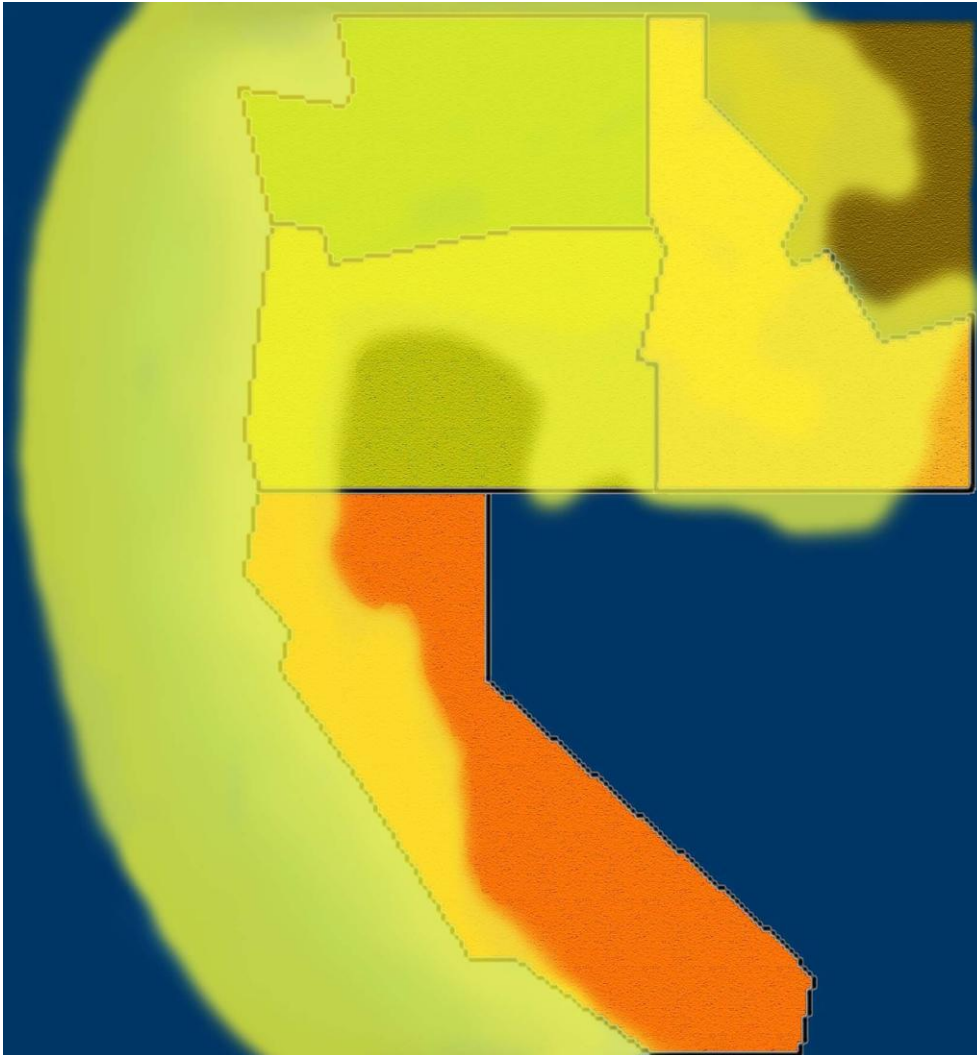
# **Northwest Fisheries Science Center**

## **Overview**

**John Stein**  
**Science and Research Director**



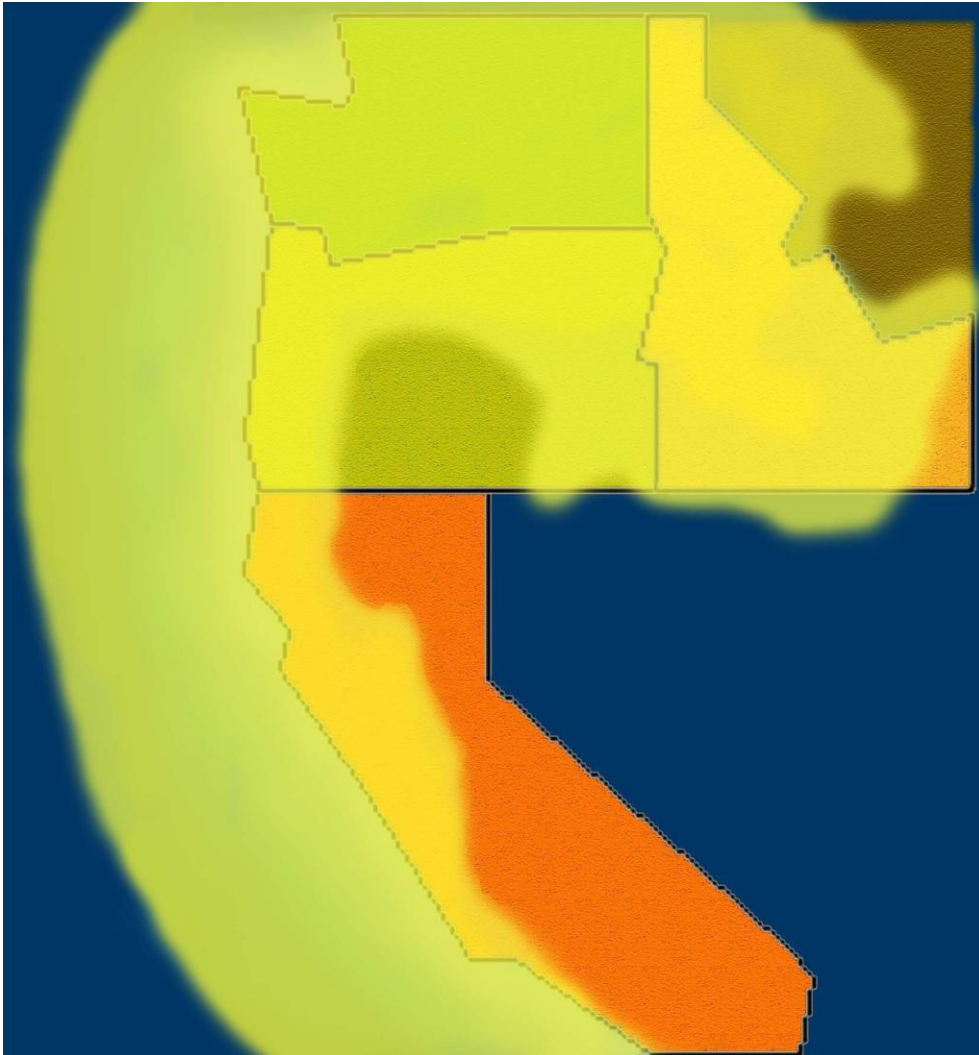
# NWFSC Strategic Science Plan - Themes



- *Sustainable, Safe and Secure Seafood for Healthy Populations and Vibrant Communities*
- *Ecosystem Approach to Improve Management of Marine Resources*
- *Recovery and Rebuilding of Marine and Coastal Species*
- *Habitats to Support Sustainable Fisheries and Recovered Populations*



# NWFSC Science



- *West Coast Groundfish*
- *Pacific Salmon*
- *Southern Resident Killer Whales*
- *IEA*
- *Aquaculture*
- *Ocean Acidification*



# OA Experimental Results

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Dungeness Crab: Lower Survival from Megalopae to 1<sup>st</sup> Instar)



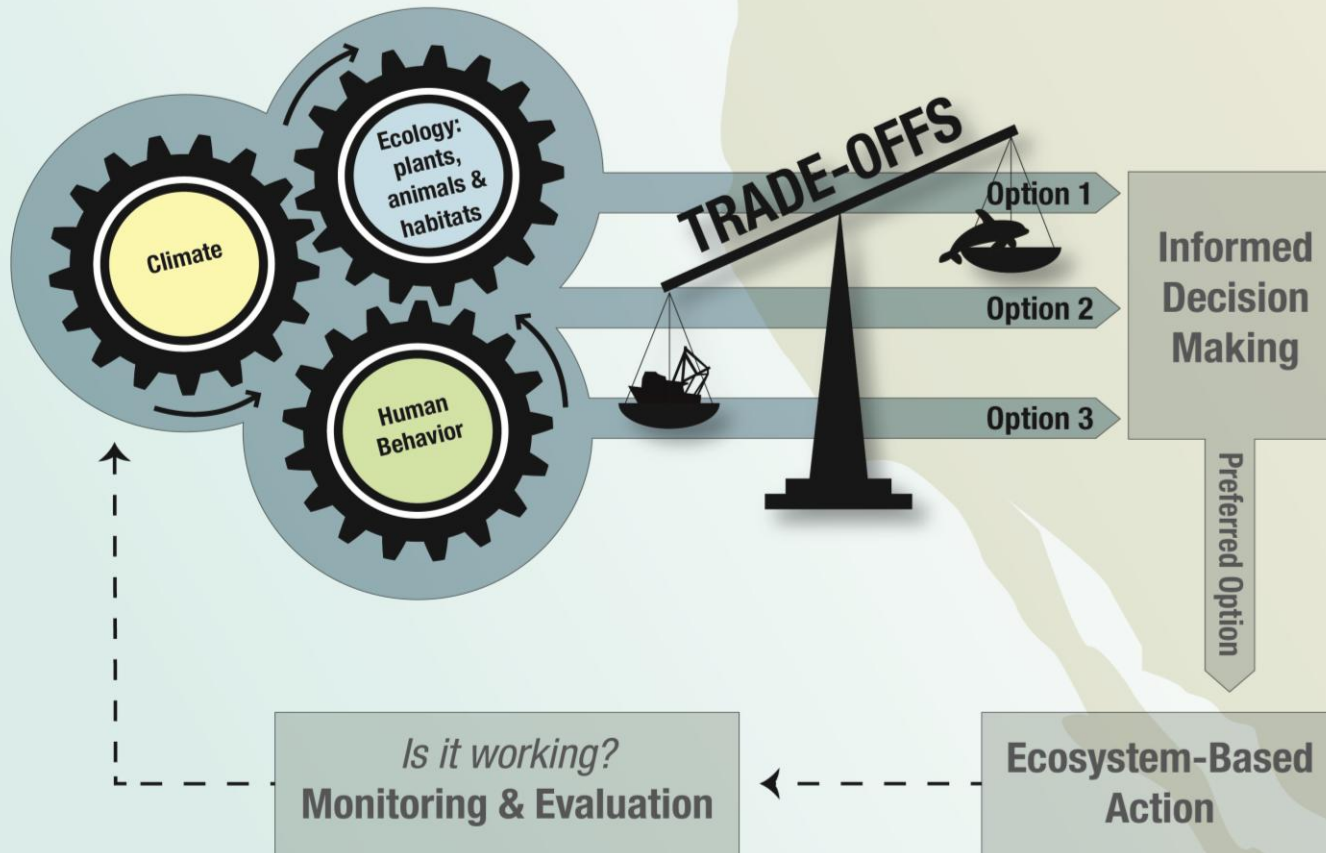
Pacific Oyster: Smaller size at high CO<sub>2</sub> in 1<sup>st</sup> two days of development



Surf Smelt: Higher survival with high CO<sub>2</sub>

# IEA – Significant Effort

Many management sectors simultaneously look at the system and what drives it. The goal is to minimize ecosystem impacts and maximize societal benefits.





# Where Has the NOAA Framework Been Adopted



- Fisheries Management Councils

- North Sea

- P

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**“ The Council is encouraged by the preliminary results and recommends continued coordination ... to further explore ways of bringing IEA products into stock assessments and Council decision making.”**  
- PFMC Decision Document, Nov. 2011

# **Aquaculture**



# Restoration Shellfish Hatchery



## Washington Shellfish Initiative

Tiger team proposal -- construct hatchery to provide 1+ million restoration grade Olympia oyster seed to plant 50 acres of Puget Sound

Operational staff from Puget Sound Restoration fund



## Additional Research



Future hatchery site

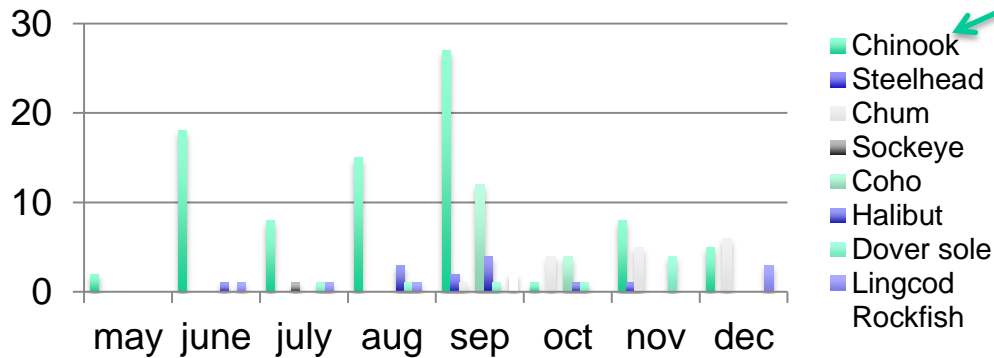
Pinto abalone restoration at Mukilteo lab (UW and PSRF)

Future research -- Genetics and local adaptation of Olympia oyster

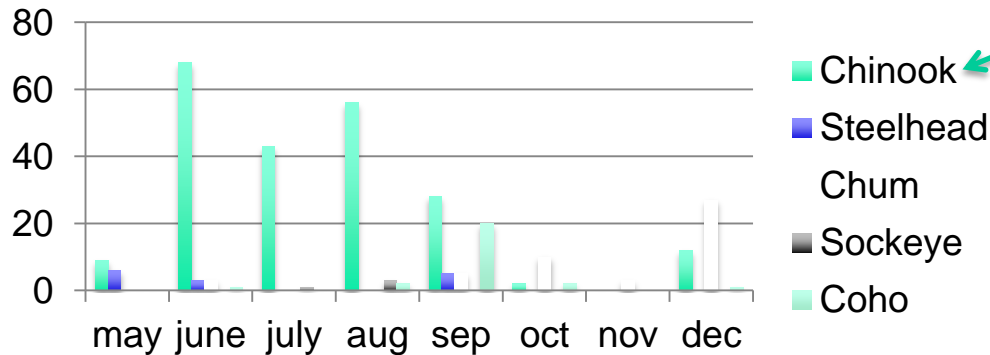
# **Southern Resident Killer Whales**



# Comparison of diets determined from fecal samples and prey remains (scales and tissue)

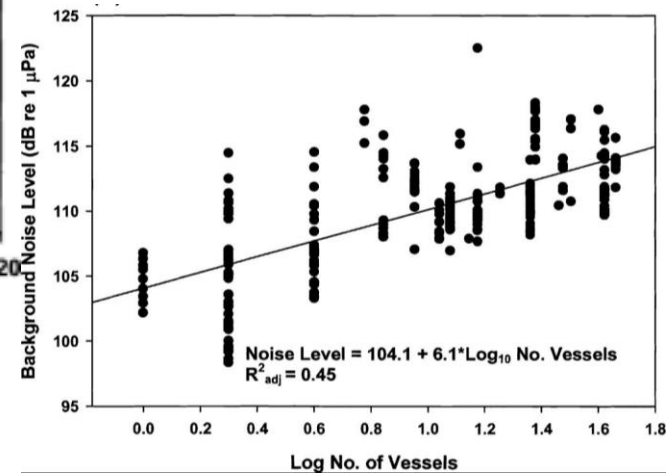
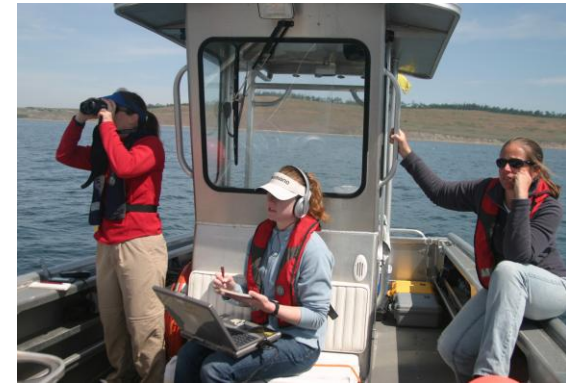
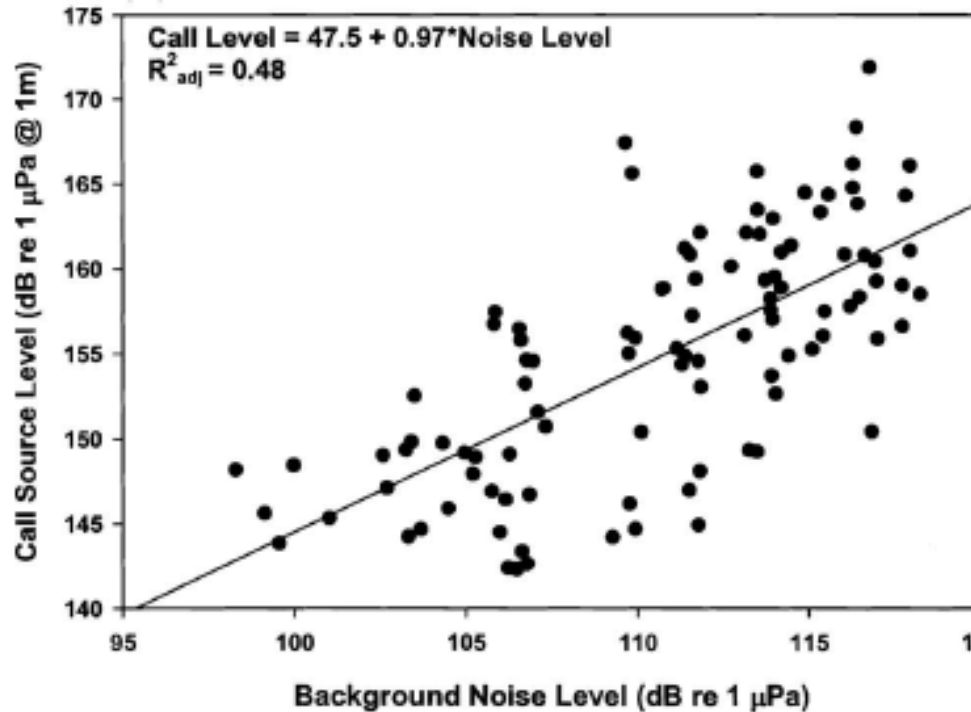


Fecal samples – species occurrence



Tissue/scale samples

# Do increases in noise change whale behavior?



SRKW call source levels increase with increasing ambient noise

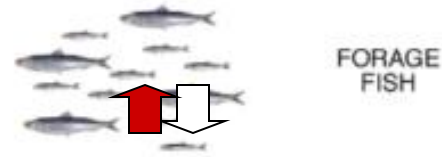
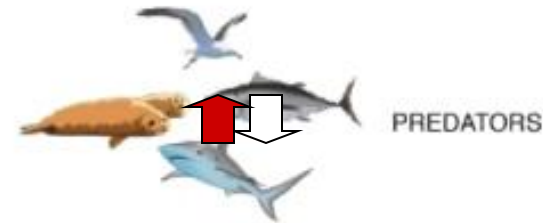
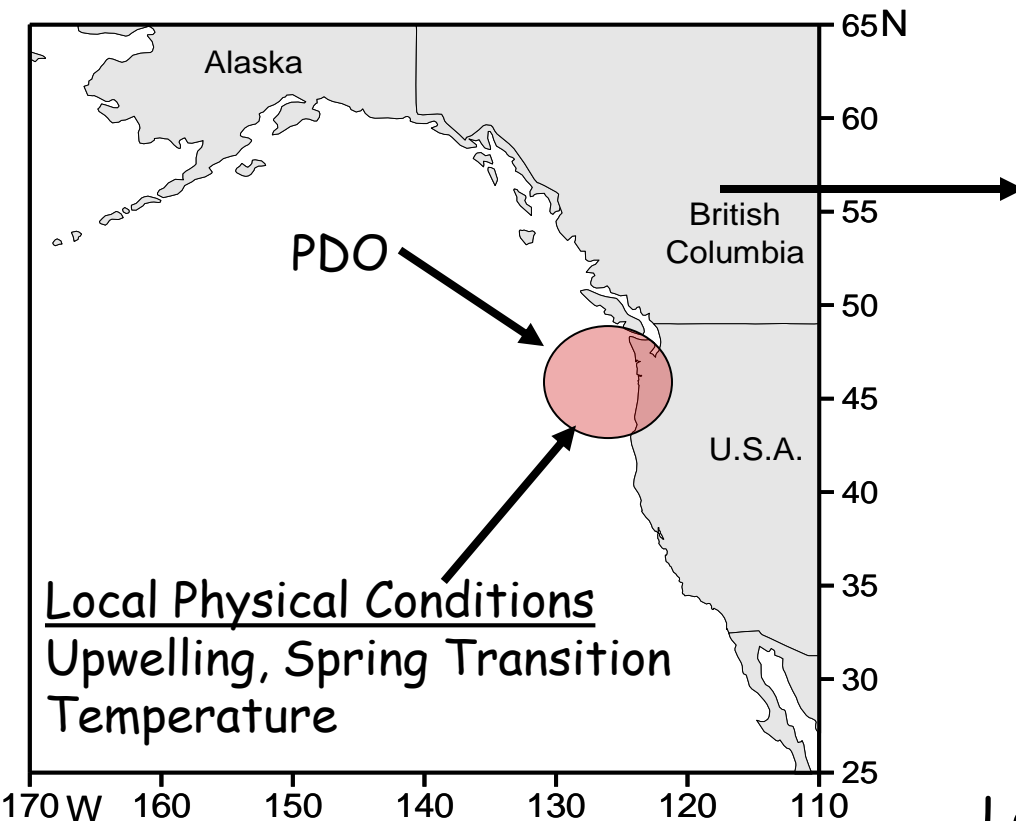
# **Pacific Salmon**



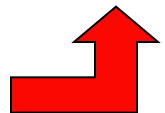
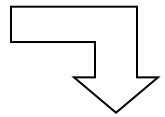
# Projecting Ocean Survival of Pacific salmon



Large scale forces acting at the local scale influence biological process important for salmon

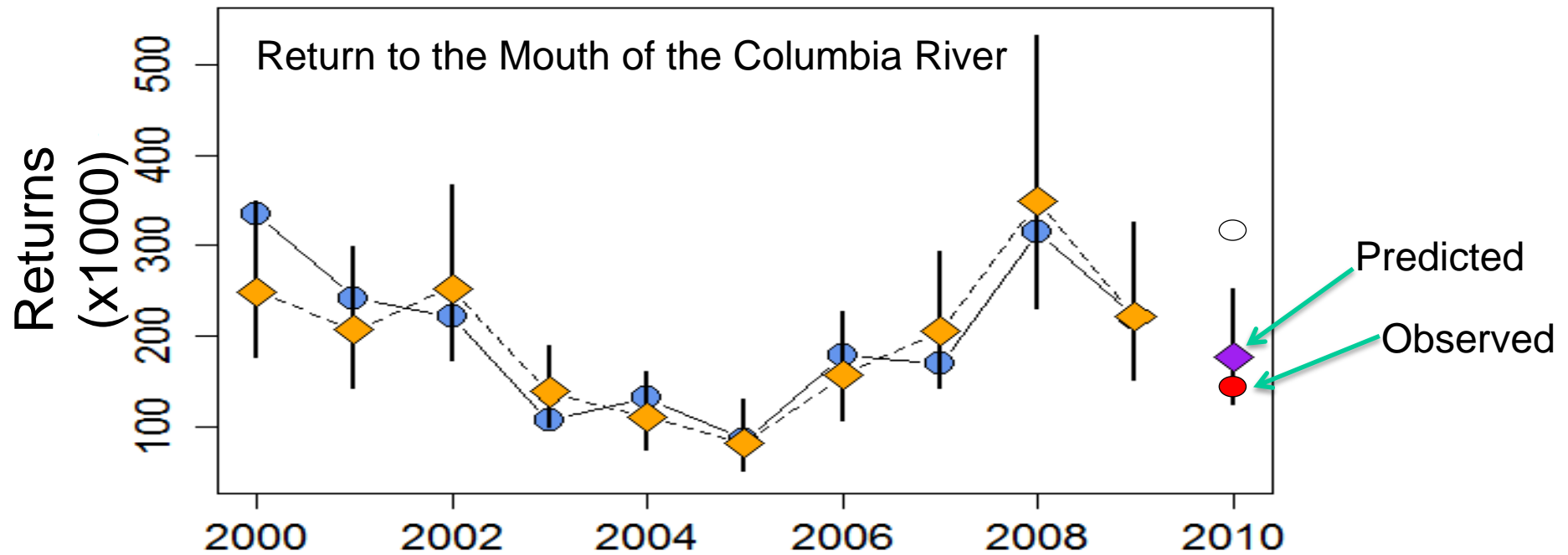


Local Biological Conditions





# Ocean Survival Model for Spring Chinook





ADVANCING RIVER RESTORATION AND MANAGEMENT

# Stream and Watershed Restoration

A Guide to Restoring Riverine  
Processes and Habitats

Edited by Philip Roni and Tim Beechie

## Watershed Ecology Research

Physical Habitat Quality

And

Chemical Habitat Quality

# The Synergistic Toxicity of Pesticide Mixtures: Implications for Risk Assessment and the Conservation of Endangered Pacific Salmon

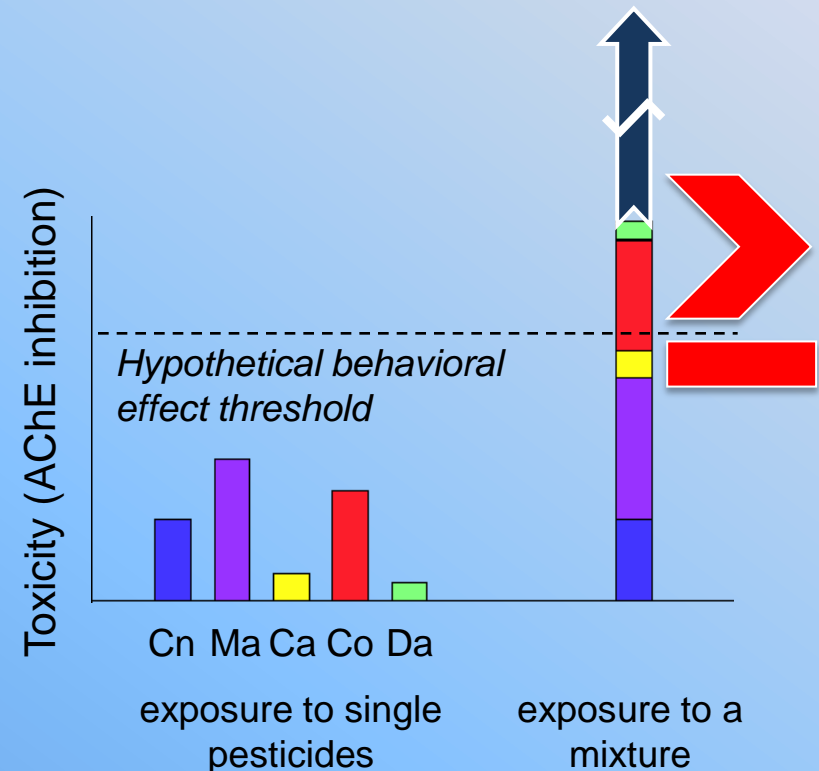
Cathy A. Laetz,<sup>1</sup> David H. Baldwin,<sup>1</sup> Tracy K. Collier,<sup>1</sup> Vincent Hebert,<sup>2</sup> John D. Stark,<sup>3</sup> and Nathaniel L. Scholz<sup>1</sup>

<sup>1</sup>NOAA (National Oceanic and Atmospheric Administration) Fisheries, Northwest Fisheries Science Center, Seattle, Washington, USA;

<sup>2</sup>Food and Environmental Quality Laboratory, Washington State University, Richland, Washington, USA; <sup>3</sup>Department of Entomology, Ecotoxicology Program, Washington State University, Puyallup, Washington, USA

*Environmental Health Perspectives, March 2009*

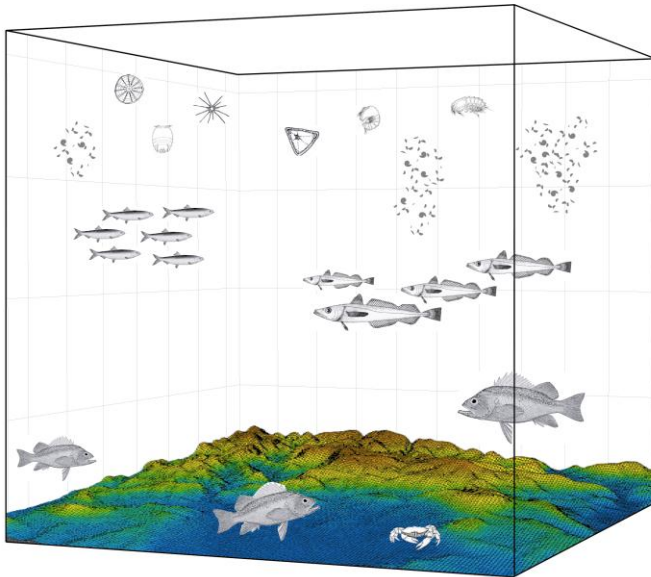
- Common organophosphate and carbamate insecticides interact in binary mixtures to greatly enhance toxicity to juvenile coho salmon.
- NOAA has repeated and extended the 2009 EHP study to lower exposure concentrations for mixtures of diazinon, malathion, and ethoprop.



# **West Coast Groundfish**



# California Current Surveys – Meet Fishery Independent Survey Needs while Moving to Ecosystem Surveys



- Acoustic Hake Survey
- Coast-wide Bottom Trawl
- Cooperative Hook and Line
- Juvenile rockfish
- Hypoxia
- *Hake and sardine – the future?*



# Public Engagement Approach

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**INFORM**

**INVITE**

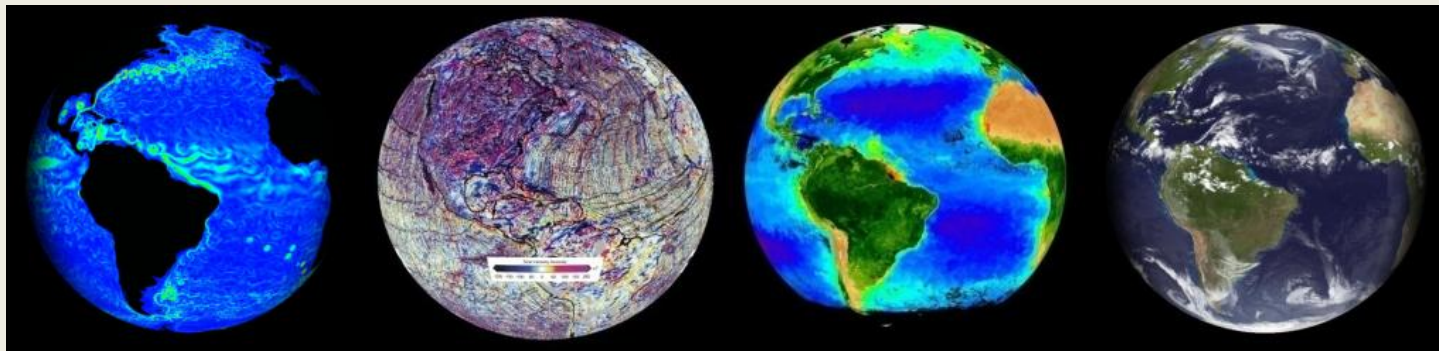
**INSPIRE**

# Inform



**EXPO DAY (June 2):** Forget the trade show approach of pitching programs. The public doesn't care about our Line Office structure. Let's talk about our science, service and stewardship mission in an integrated way; in the context of Earth System Science.

## *Science, Service, Stewardship*



*Hydrosphere*

*Lithosphere*

*Biosphere*

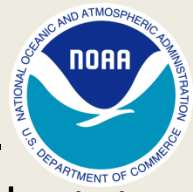
*Atmosphere*

## **Quick Stats:**

- Interactive “hands-on” activities. No program “pitches” or paper
- 29 cross-NOAA volunteers
- ~ 4,000 public visits (20,000 total festival estimate)



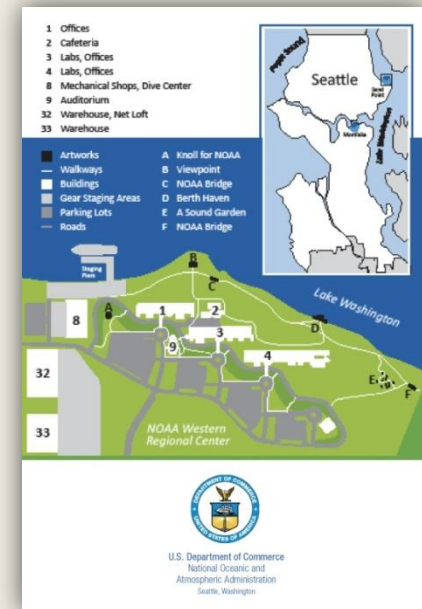
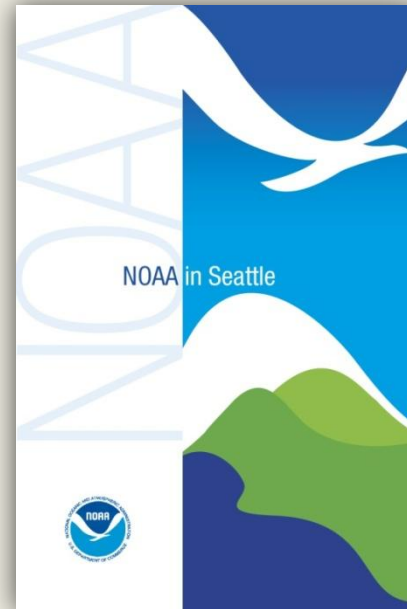
# Invite



**NOAA OPEN HOUSE (June 8):** Naysayers said it couldn't be done - no precedent, too much red tape, too hard to coordinate. Yes, it is a bit of work, but how can we expect the public to care about our house, when we never invite them over to see it?

## Quick Stats:

- Over 600 members of the public attended, including elected officials & staffs
- All program tours filled up; strong public demand
- 135 NOAA volunteers from all NOAA Staff and Program Offices
- 5 NOAA Partner organizations included



## Public Feedback:

- 110 surveys received; Over 90% positive
- ¼ of respondents asked us to make this an annual event. ***“Please do again!”***.

