



The Oregon Coordinating Council on Ocean Acidification and Hypoxia

OAH Species Spotlight: Salmon

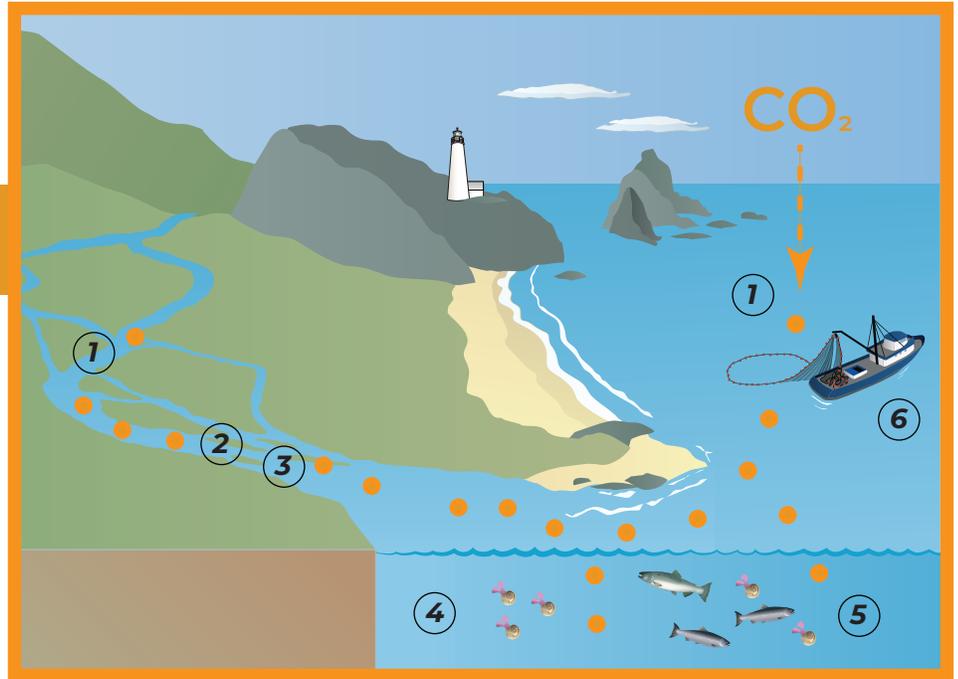
Salmon are one of the favorite pursuits of Oregon's recreational and commercial anglers, as well as being an essential cultural resource Northwest tribes.

What is at risk?

1 Habitat Effects

Changes in OA can not only affect oceans but are also experienced in estuarine, and river environments.

These environmental effects have carryover into all aspects of the Salmon life cycle.

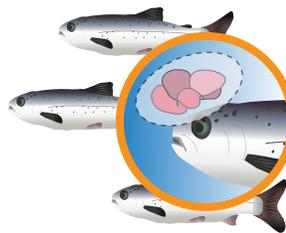


2 Direct Effects



Juveniles may experience reduced growth rates, which can increase the risk of predation.

3 Sensory Effects



Signaling in brains can be disrupted, causing fish to possibly not recognize prey, predators, or migration cues.

4 Foodweb Effects



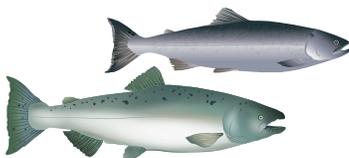
Pteropods (marine snails) are key prey, whose shells are sensitive to OA and are pitted by increased acidity.

5 Cumulative Effects



Early Salmon life stages' survival could be altered as a result of material diet changes.

6 Economic Effects



Fisheries managers and researchers are not certain how OA effects may compound across Salmon life stages and on habitats, or if there will be any effects on commercial and recreational Salmon harvests.

Selected Literature

Crozier, L., "Impacts of climate change on salmon of the Pacific Northwest." Technical Review, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Seattle, Washington(2015): 46.

Haigh, R., et al. "Effects of ocean acidification on temperate coastal marine ecosystems and fisheries in the Northeast Pacific." PLoS One 10.2(2015): e0117533.

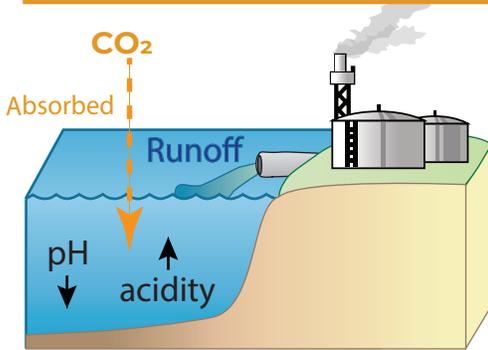
Ou, M., et al. "Responses of pink salmon to CO₂-induced aquatic acidification." Nature Climate Change 5.10 (2015): 950.

Sobocinski, L., et al. "Using a qualitative model to explore the impacts of ecosystem and anthropogenic drivers upon declining marine survival in Pacific salmon." Environmental Conservation 45.3 (2018): 278-290.

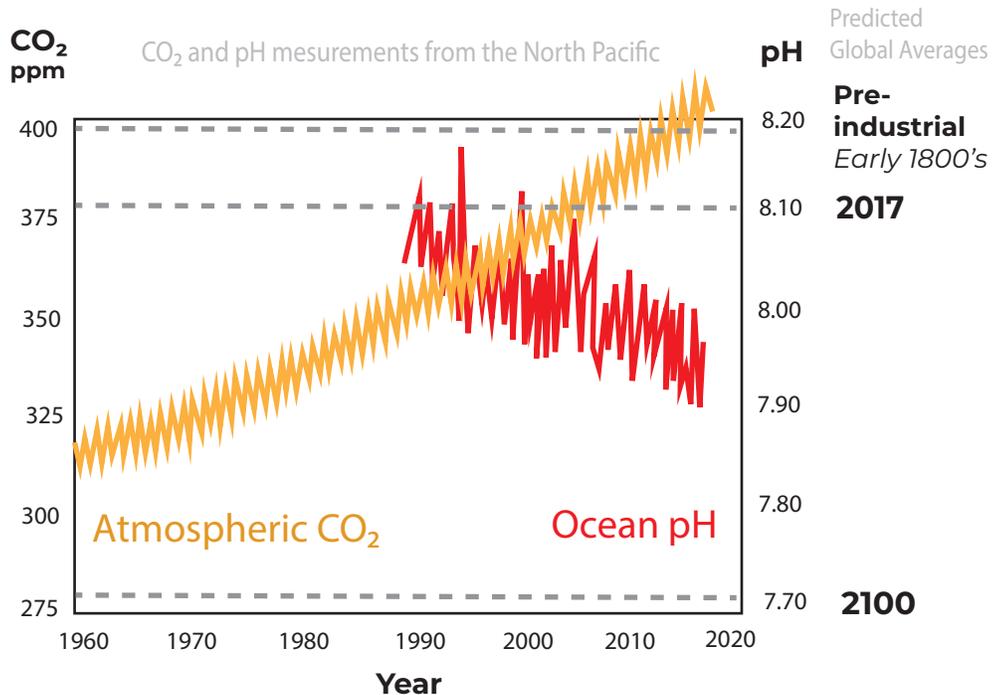
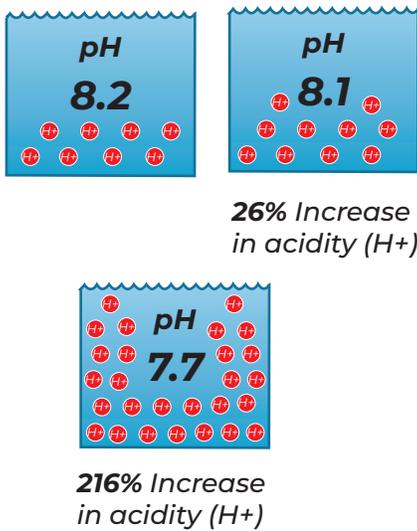
Williams, R., et al. "Elevated CO₂ impairs olfactory-mediated neural and behavioral responses and gene expression in ocean-phase coho salmon *Oncorhynchus kisutch*." Global Change Biology (2018).

Graphical Data: <https://www.esrl.noaa.gov/gmd/ccgg/trends/>

What is Ocean Acidification (OA)?



Atmospheric CO₂ has increased almost 40% since pre-industrialization. When CO₂ is absorbed by seawater from the atmosphere, chemical reactions occur that lower seawater pH (making it more acidic), while changing the saturation states of biologically important calcium carbonate minerals (ions needed for shell formation and for chemical signaling in some marine organisms).



Annual worth of Oregon Salmon Fishery
> \$15 M/yr

Solutions are needed to help Oregon's wild fisheries and marine resources withstand the projected changes in OA

OAH will not stop on its own, and actions must be taken by regional and national governments, communities, and scientists now in order to address the growing problems. Through coordination and collaboration, such as through Oregon OAH Action Plan, Oregon will be able to adapt and mitigate the effects of OAH.

To learn more about OAH in Oregon and ways to engage, please visit the Council's website or the following videos:

oregonocean.info/index.php/ocean-acidification



Oregon OAH
 Video PART 1
youtube.com/watch?v=7h08ok3hFSs



Oregon OAH
 Video PART 2
youtube.com/watch?v=2KLT9vFV0mc