



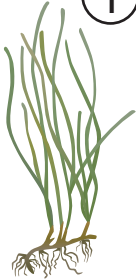
The Oregon Coordinating Council on Ocean Acidification and Hypoxia

OAH Species Spotlight: Dungeness Crab

The Dungeness crab fishery is one of Oregon's highest harvest values commercial fisheries, and is an iconic pastime for recreational harvesters.

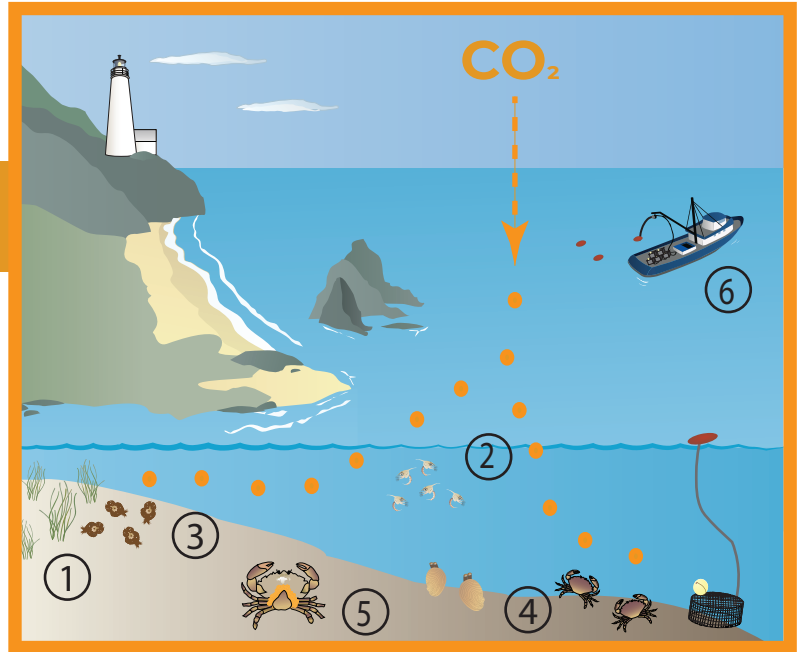
What is at risk?

1 **Habitat Effects**

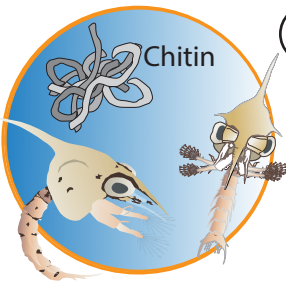


Eelgrass is important nursery ground habitat for juvenile crabs.

These marine plants may have the ability to short term buffer the effects of OA through photosynthesis (absorbing CO₂).

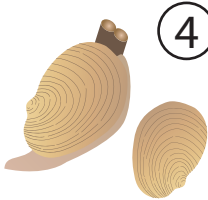


2 **Direct Effects**



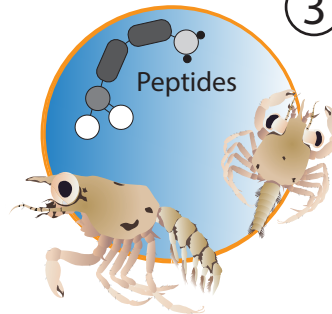
Larval growth and shell formation out of chitin (a calcium carbonate compound) can also be affected by lower acidity.

4 **Foodweb Effects**



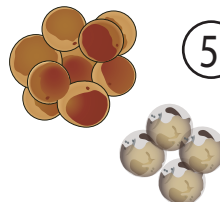
Declines in food (such as clams and mussels) affect crab health.

3 **Sensory Effects**



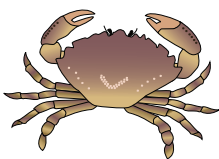
Behavior maybe affected by changing cues, due to altered chemical signaling (peptide production) needed for juvenile settlement

5 **Cumulative Effects**



Poor ocean conditions are likely to lead to lower productivity.

6 **Economic Effects**



Overall declines in harvest levels, resulting in possible economic and recreational losses throughout the State.

Selected Literature

Busch, D. Shalhin, and Paul McElhany. "Estimates of the direct effect of seawater pH on the survival rate of species groups in the California current ecosystem." *PLoS one* 11.8 (2016): e0160669.

Hodgson, E., et al. "Consequences of spatially variable ocean acidification in the California Current: Lower pH drives strongest declines in benthic species in southern regions while greatest economic impacts occur in northern regions." *Ecological Modelling* 383 (2018): 106-117.

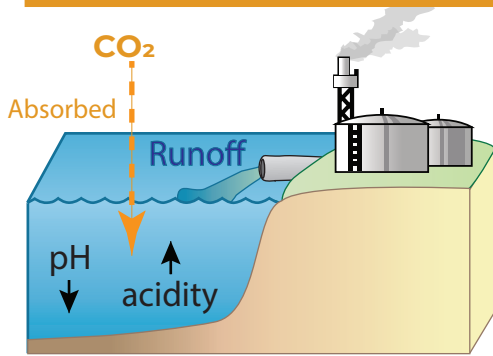
Marshall, K., et al. "Risks of ocean acidification in the California Current food web and fisheries: ecosystem model projections." *Global change biology* 23.4 (2017): 1525-1539.

Miller, J., et al. "Exposure to low pH reduces survival and delays development in early life stages of Dungeness crab (*Cancer magister*)." *Marine biology* 163.5 (2016): 118.

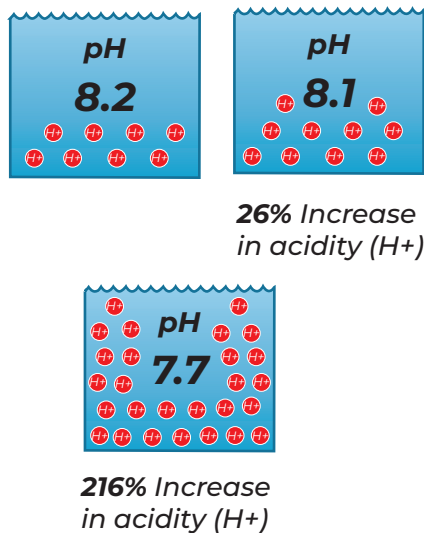
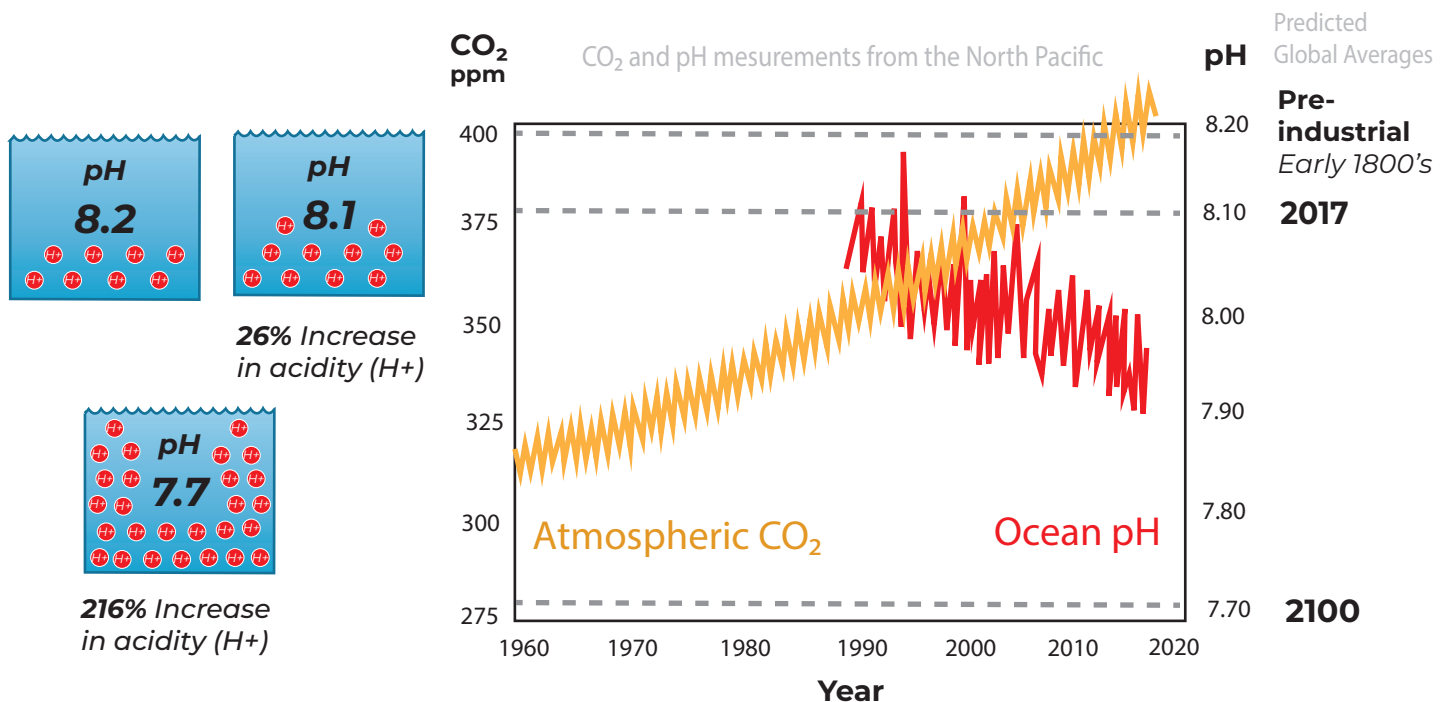
Pacella, S., et al. "Seagrass habitat metabolism increases short-term extremes and long-term offset of CO₂ under future ocean acidification." *Proceedings of the National Academy of Sciences* 115.15 (2018): 3870-3875.

<https://www.dfw.state.or.us/agency/docs/TRG%20OR%20Comm%20Fishing%20Econ%20contribution%20thr%202016%20narrative%20ver%201.5.pdf>

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 Crab Fishery
> \$60 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