

Oregon's Coordinating Council on Ocean Acidification and Hypoxia (OAH)

Increasing Knowledge, Awareness, and Action on Ocean Change

Columbia River Estuary Conference, May 17th



Jenny Koester (Council Staff)
Oregon Department of Fish and
Wildlife



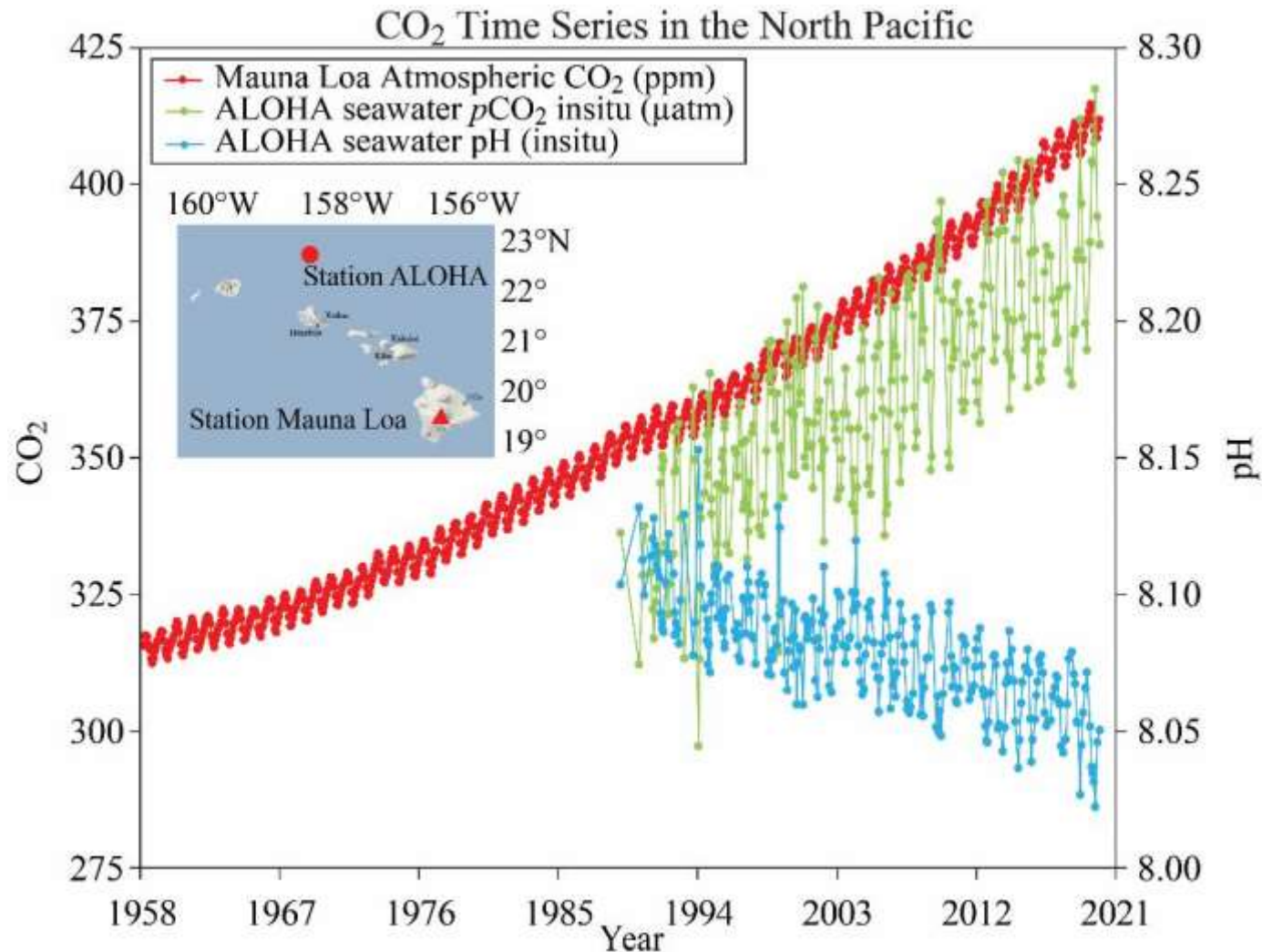
**Oregon Coordinating
Council on Ocean
Acidification & Hypoxia**

Today's presentation

- Brief science of ocean acidification and hypoxia
- Development of OAH Council
- OAH Council Action Plan accomplishments and future plans
- Questions and comments

BRIEF SCIENCE OF OAH

Increased CO₂ and CO₂/pH = Ocean Acidification

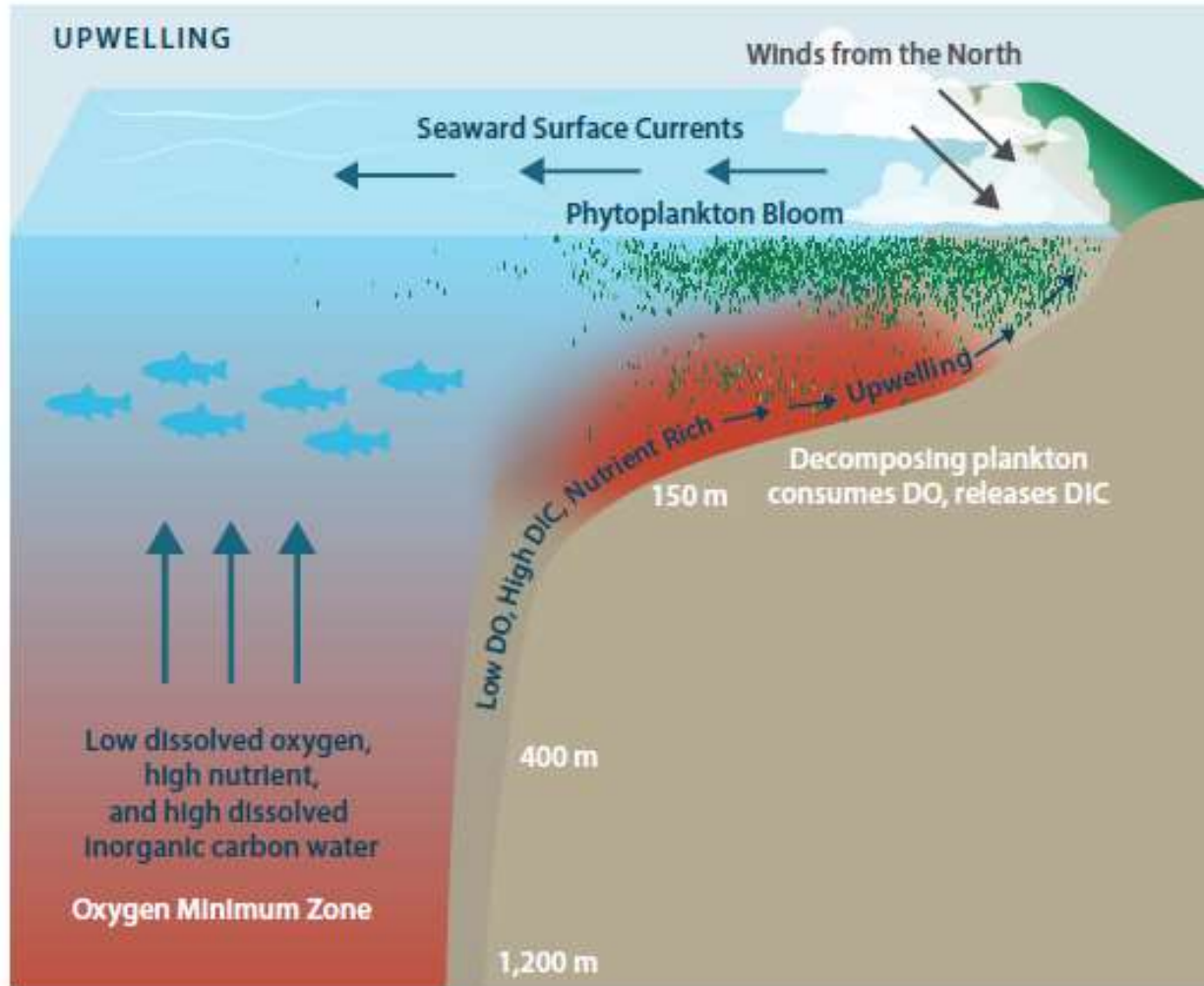


- Increasing CO₂ in atmosphere
- Increasing pCO₂ in ocean
- Decreasing pH in ocean

Data: Mauna Loa (ftp://afjp.cmdl.noaa.gov/products/trends/co2/co2_mm_mlo.txt) ALOHA (<http://hahana.soest.hawaii.edu/hot/hot-dogs/bextraction.html>) ALOHA pH & pCO₂ are calculated at in-situ temperature from DIC & TA (measured from samples collected on Hawaii Ocean Times-series (HOT) cruises) using co2sys (Pelletier, v25b06) with constants: Lueker et al. 2000, KSO4: Dickson, Total boron: Lee et al. 2010, & KF: seacarb

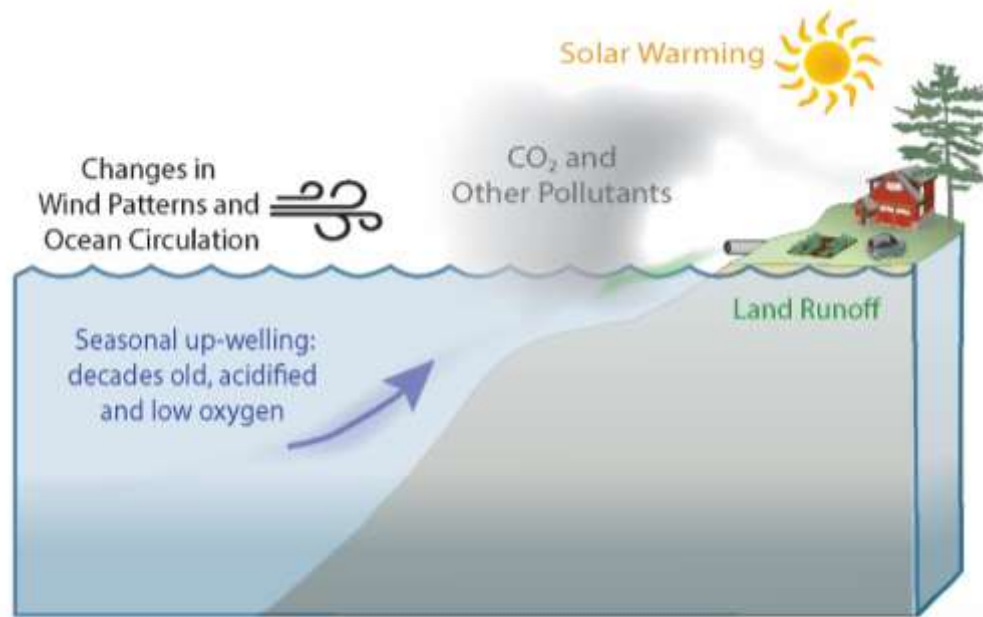
Ocean Hypoxia in PNW

North Pacific Coast

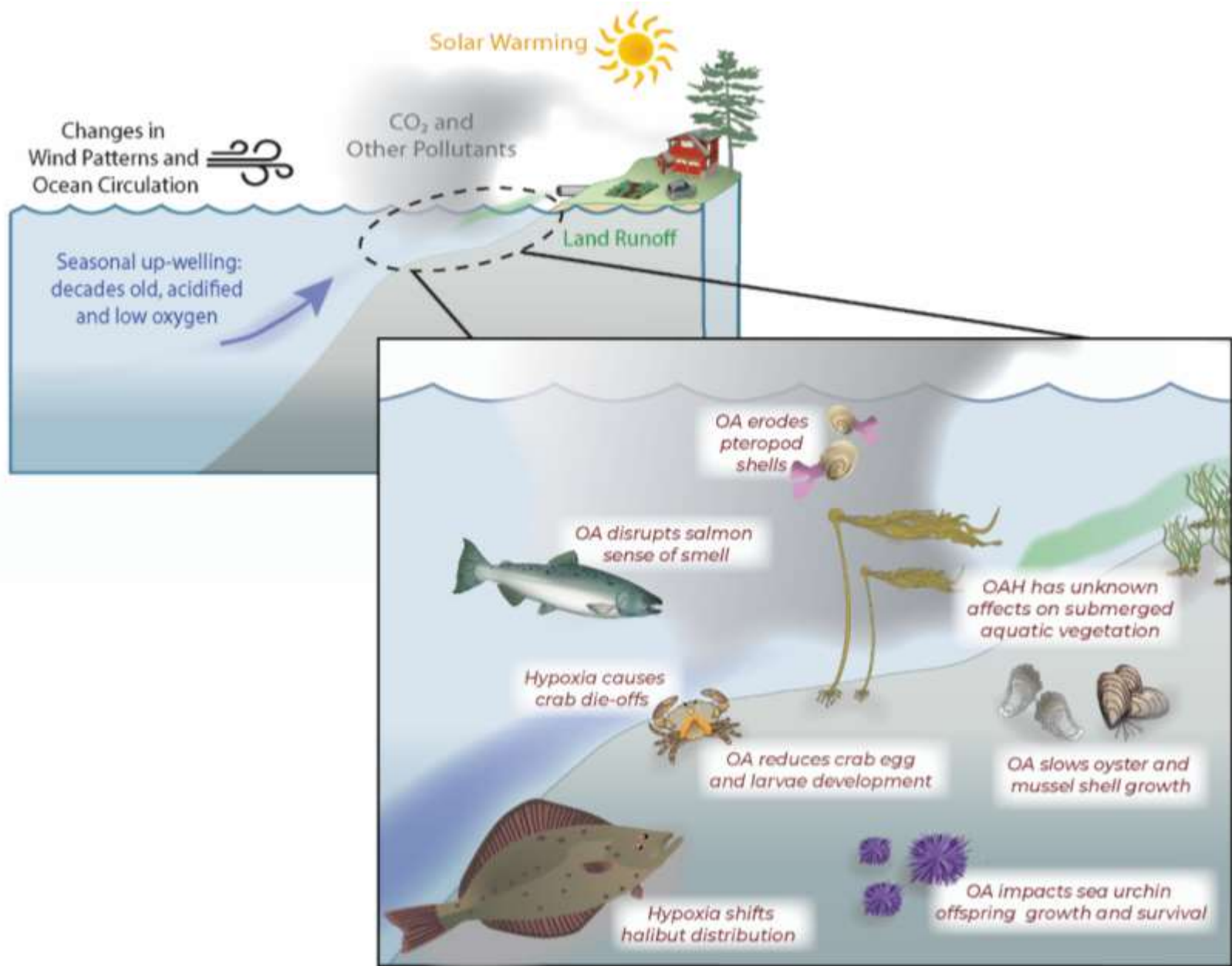


Hypoxia = 1.4 mL/L

Ocean Acidification and Hypoxia



Ocean Acidification and Hypoxia Impacts



DEVELOPMENT OF OAH COUNCIL

Oregon OAH Council established (2017)

79th OREGON LEGISLATIVE ASSEMBLY--2017 Regular Session

Enrolled Senate Bill 1039

Sponsored by Senators ROBLAN, KRUSE

CHAPTER

AN ACT

Relating to ocean chemistry.

Whereas Oregon is an epicenter for the global manifestation of ocean acidification and hypoxia; and

Whereas the natural seasonal process of upwelling transports corrosive waters into the nearshore and estuaries, causing marine waters within this state's jurisdiction to be especially vulnerable to ocean acidification; and

Whereas ocean acidification, hypoxia and changes in ocean temperature are intensifying; and

Whereas Oregon has rich and vibrant wild marine fisheries, including shellfish fisheries; and

Whereas ocean acidification and hypoxia are known to cause mortality and reduced growth and productivity in marine organisms, including in species that form the foundation of the marine food web; and

Whereas negative impacts from ocean acidification, hypoxia or both have already been observed in species that are commercially, culturally and economically important to this state, including oysters, mussels and crabs; and

Whereas Oregon's coastal communities and economies are important to this state and are dependent on a thriving marine ecosystem; and

Oregon OAH Council



OAH Action Plan Recommended Priorities

-  Support and maintain Oregon's monitoring of OAH oceanographic metrics and biological response metrics (Actions 1.1.a/c)
-  Incorporate OAH into CO₂ management and mitigation discussions in the state (Action 2.1.b)
-  Support new initiatives to promote natural ecosystem resilience (Actions 3.2.a/b)
-  Keep legislators and policy-makers up-to-date on the science, impacts of and solutions for OAH (Action 4.2.a)
-  Develop high-level policy guidance for the state's government agencies on prioritizing OAH in agency workload (Action 5.1.a)

OAH COUNCIL ACTION
PLAN ACCOMPLISHMENTS
AND FUTURE PLANS

Oregon Ocean Acidification Monitoring Group (OOMG)

2016

Collaboration
for OAH
monitoring programs



JOIN US!

Next meeting on OAH long-term monitoring: May 30th, 9-10 AM



Noteworthy Action Plan accomplishments

- **Produced 3 Biennial Reports to the Legislature on OAH (2018, 2020, 2022)**
- **Hosted 5 Fisherman-Scientist OAH Roundtables in collaboration with Oregon Sea Grant (2016, 2017, 2021, 2022, 2023)**
- **Coordinated the Multiagency Report on OAH Programs and Needs (2021)**
- **Supported the passage of House Bill 3114 (2021)**
- **Hosted first public OAH Symposium (2023)**

81st OREGON LEGISLATIVE ASSEMBLY--2021 Regular Session

House Bill 3114

Sponsored by Representative GOMBERG, Senator ANDERSON, Representatives SMITH DB, WRIGHT (at the request of Oregon State University)

SUMMARY

The following summary is not prepared by the sponsors of the measure and is not a part of the body thereof subject to consideration by the Legislative Assembly. It is an editor's brief statement of the essential features of the measure **as introduced**.

Appropriates moneys from General Fund to Oregon Ocean Science Trust, State Department of Fish and Wildlife and Higher Education Coordinating Commission in certain amounts for certain purposes related to ocean chemistry.

Declares emergency, effective July 1, 2021.

A BILL FOR AN ACT

1

2 Relating to ocean chemistry; and declaring an emergency.

3 Whereas Oregon is an epicenter for the global manifestation of ocean acidification and hypoxia;

4 and

5 Whereas the natural seasonal process of upwelling transports corrosive waters into the
6 nearshore and estuaries, causing marine waters within this state's jurisdiction to be especially vul-
7 nerable to ocean acidification; and

8 Whereas ocean acidification, hypoxia and changes in ocean temperature are intensifying; and

9 Whereas Oregon has rich and vibrant wild marine fisheries, including shellfish fisheries; and

10 Whereas ocean acidification and hypoxia are known to cause mortality and reduced growth and

Theme 1

Support and maintain monitoring of OAH and biological response

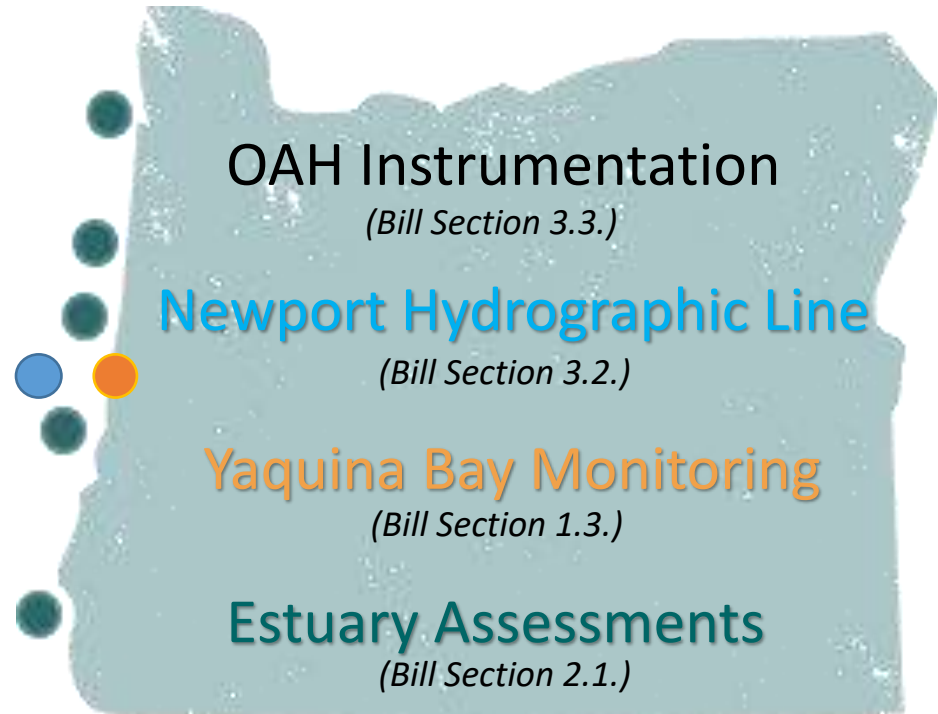


Intertidal monitoring at
Marine Reserves
(Bill Section 1.1.)



Subtidal monitoring at
Marine Reserves
(Bill Section 1.2.)

HB 3114: 7 Monitoring Projects



OAH Instrumentation
(Bill Section 3.3.)

Newport Hydrographic Line
(Bill Section 3.2.)

Yaquina Bay Monitoring
(Bill Section 1.3.)

Estuary Assessments
(Bill Section 2.1.)

OAH Report Actions: 1.1.a/c

Theme 3

Promote Ocean Acidification and Hypoxia Adaptation and Resilience

HB 3114: 3 Economic & Ecosystem Resilience Projects



Ecosystem modeling of submerged aquatic vegetation

(Bill Section 1.4.)



Life cycle research for wild and cultivated stocks

(Bill Section 1.7.)



Workshop to promote shellfish and aquatic vegetation

(Bill Section 1.5.)



Estuary mapping of native Olympia oysters

(Bill Section 2.2.)



Best Management Practices for Shellfish Cultivation

(Bill Section 1.6.)



Molluscan Broodstock Program restore and promote native oysters

(Bill Section 3.1.)

OAH Report Actions: 3.2a/b

Theme 4

Raise Awareness of Ocean Acidification and Hypoxia Science, Impacts, and Solutions

HB 3114: 1 Communications Project



Communications and outreach planning
(Bill Section 1.8.)

Come to an OAH Council Meeting!

Next meeting: TBD June

The screenshot displays the Oregon Ocean Information website. The top navigation bar includes links for Home, Ocean Policy, OPAC, Territorial Sea Plan, Continental Shelf, OAH Council (highlighted), Ocean Issues, Marine Reserves, and Data & Resources. Below this is the Oregon Ocean Information logo and a search bar. A secondary navigation bar contains links for OAH Action Plan, News, Reports, Council Members, Meetings, Resources, Stay Updated!, and ResourcesII. The main content area features the title "Oregon Coordinating Council on Ocean Acidification and Hypoxia" and a grid of ten member portraits. To the right, there is a section for "Upcoming OAH Council Events" listing a meeting on 13 Mar 2023 from 10:00AM to 12:00PM, and a section for "OAH Documents" listing three working group meeting documents with their respective download counts.

Home Ocean Policy OPAC Territorial Sea Plan Continental Shelf **OAH Council** Ocean Issues Marine Reserves Data & Resources

Oregon Ocean Information
A Resource for Planning
in the Territorial Sea

Search this web site . . .

OAH Action Plan News Reports Council Members Meetings Resources Stay Updated! ResourcesII

Oregon Coordinating Council on Ocean Acidification and Hypoxia

Upcoming OAH Council Events

📅 13 Mar 2023;
🕒 10:00AM - 12:00PM
📍 March OAH Council Meeting

OAH Documents

- 📄 Education & Outreach Working Group Meeting - 9/27/22
46 downloads
- 📄 Education & Outreach Working Group Meeting - 12/7/22
40 downloads
- 📄 Education & Outreach Working Group Meeting - 11/09/22
42 downloads

OregonOceanInfo.org



Comments or Questions? Please contact
Leif.K.Rasmuson@odfw.Oregon.gov or Laurie.Juranek@oregonstate.edu
or Council Staff
Jennifer.A.Koester@odfw.Oregon.gov



Ocean Acidification Impacts

abc NEWS VIDEO LIVE SHOWS 2020 ELECTIONS

Ocean Acidification Hits Northwest Oyster Farms

Scientists: Carbon dioxide in oceans could mean the end of shellfish.

By DARCY BOSTELS via [CBS](#)
April 20, 2010 10:25 AM • 4 min read

April 22, 2010 — Mark Wiegardt and Sue Cudd have each dedicated about 30 years of their lives to bringing oysters to our tables. Now the two have found themselves in the forefront of one of the newest, most pressing environmental issues of our time: [ocean acidification](#).


It all began with the oyster larvae at their Whiskey Creek Shellfish Hatchery in Tillamook, Ore.

"It first started in 2007. We had a situation here when all of a sudden, our larvae started dying," said Wiegardt.

Environment

Ocean acidification is impacting Dungeness crabs, Oregon's most-valuable fishery, study shows

Updated Jan 14, 2020 From Jan 14, 2020



The Pacific Ocean is so acidic that it's dissolving Dungeness crabs' shells

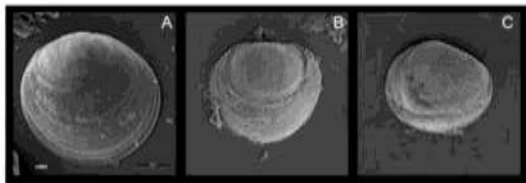
By Seattle Times Staff
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Summary Landing Page
The Pacific Ocean is so acidic that it's dissolving Dungeness crabs' shells. The study shows that the shells of crabs are dissolving in the water, which is a sign of ocean acidification. This is a major threat to the crab fishery in Oregon.

Related by Computer
Ocean acidification is a major threat to the world's oceans. It is caused by the absorption of carbon dioxide from the atmosphere. This leads to a decrease in the pH of the water, which can have a variety of effects on marine life.

2010



Common shell exposed to a pH of 7.5

- Day 1: Larvae are healthy (A)
- Day 2: Shells are dissolving (B)
- Day 3: Larvae are dead or dying (C)

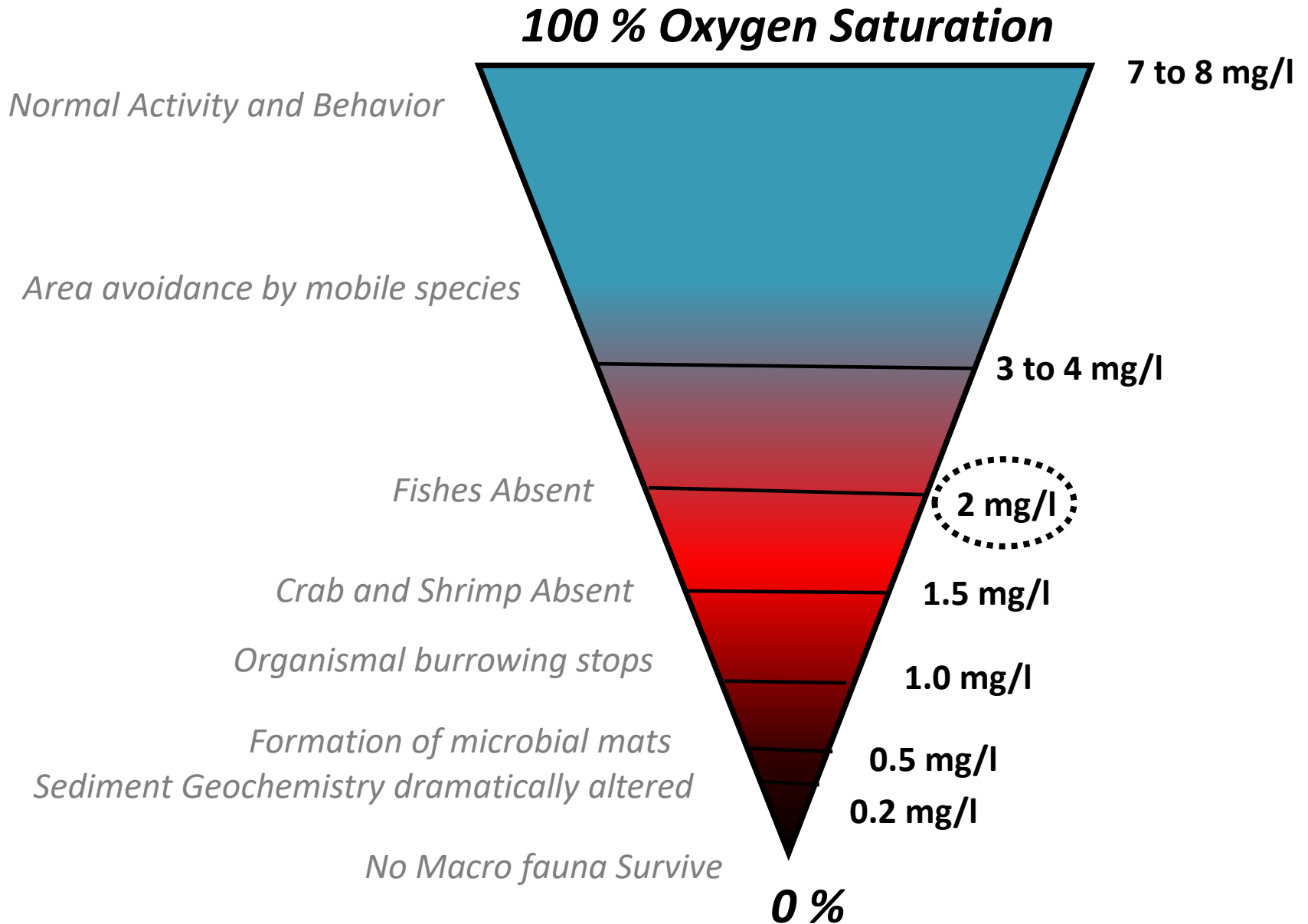
Larval Oyster Research

2020



Larval Crab Research

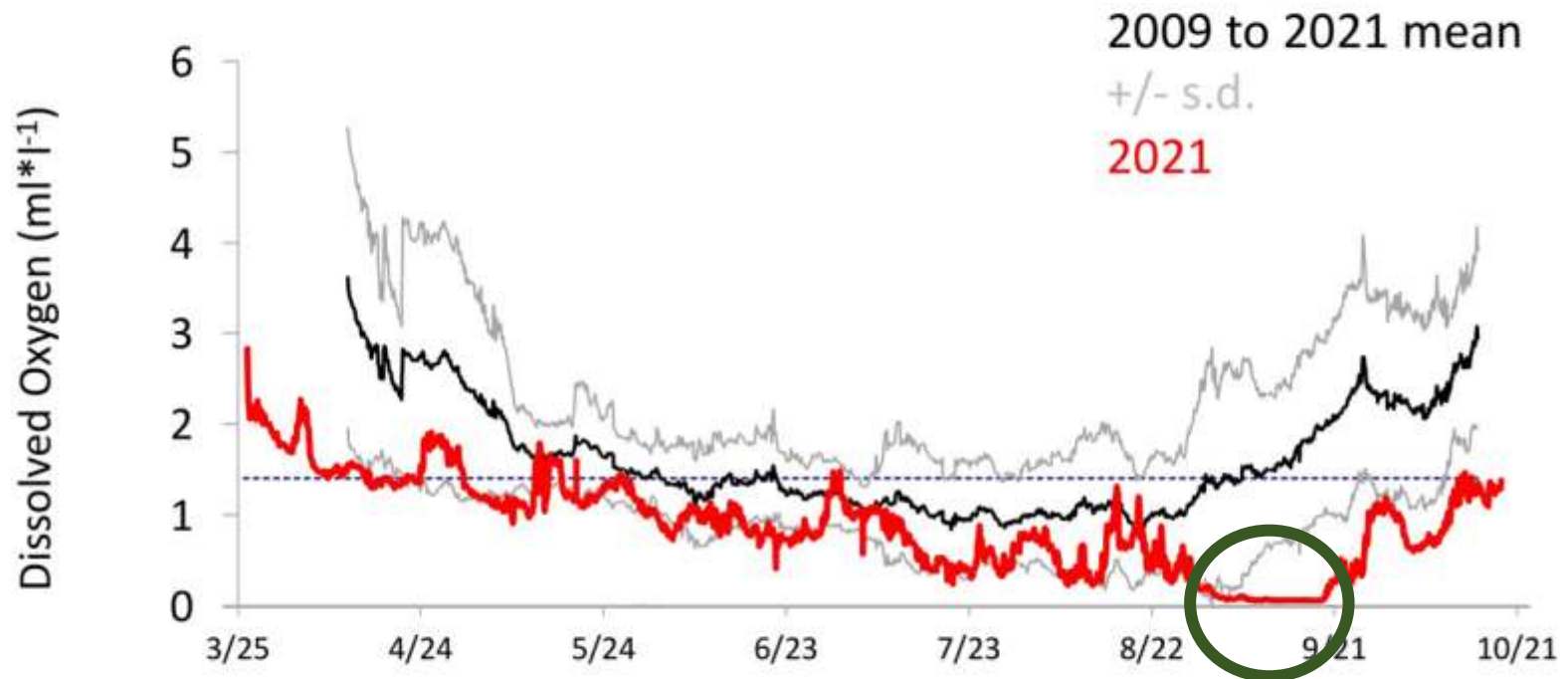
Ocean Hypoxia Impacts



(Hypoxia 1.4 mL/L **OR** 2.0 mg/L)

Hypoxia in Oregon

**PISCO observations (preliminary):
Near-bottom dissolved oxygen in 70 m off Cape
Perpetua, Oregon**



(Hypoxia 1.4 mL/L **OR** 2.0 mg/L)

Increased Ocean Acidification

