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

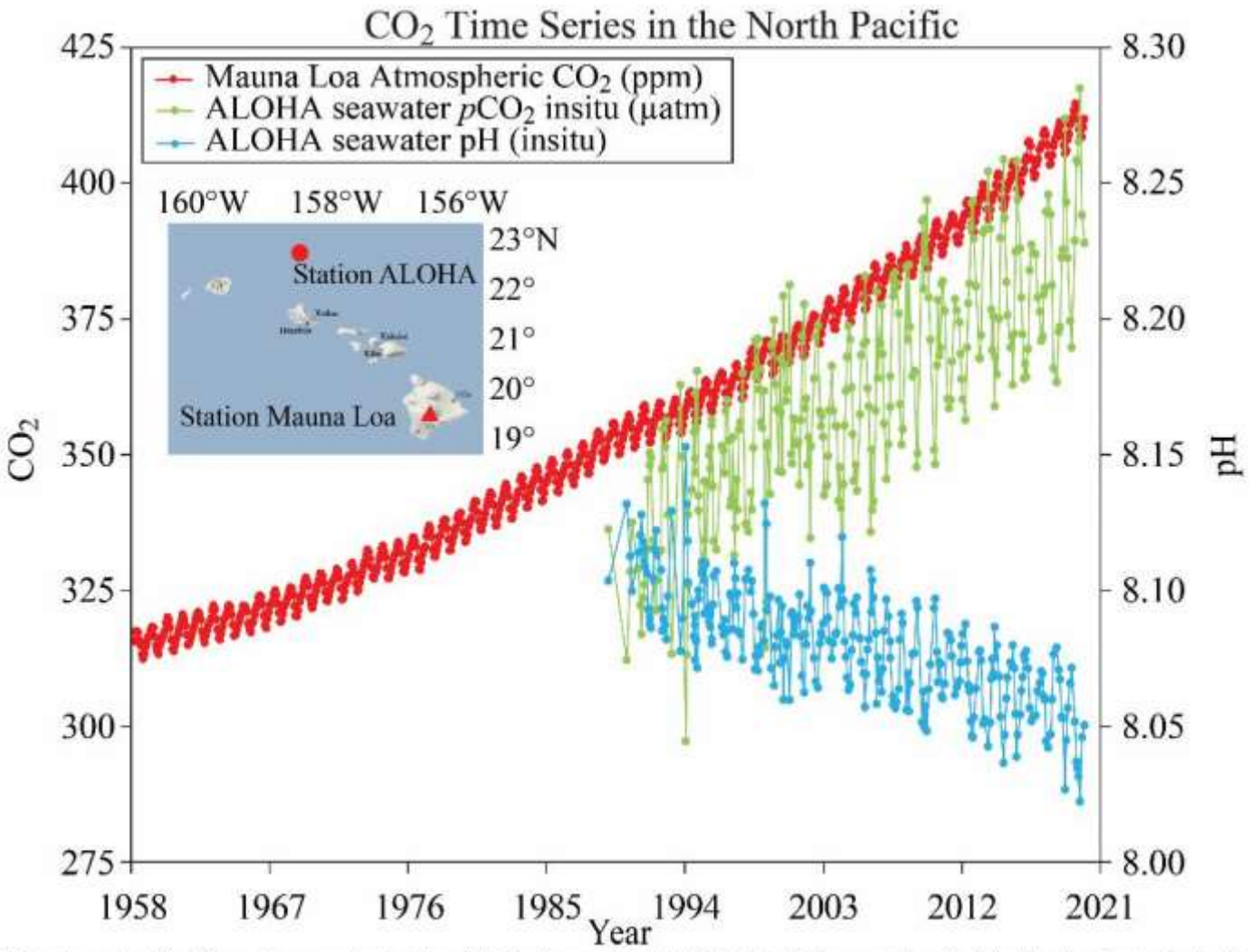
Oregon Coordinating Council on Ocean Acidification & Hypoxia

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 CO_2 and CO_2/pH = Ocean Acidification

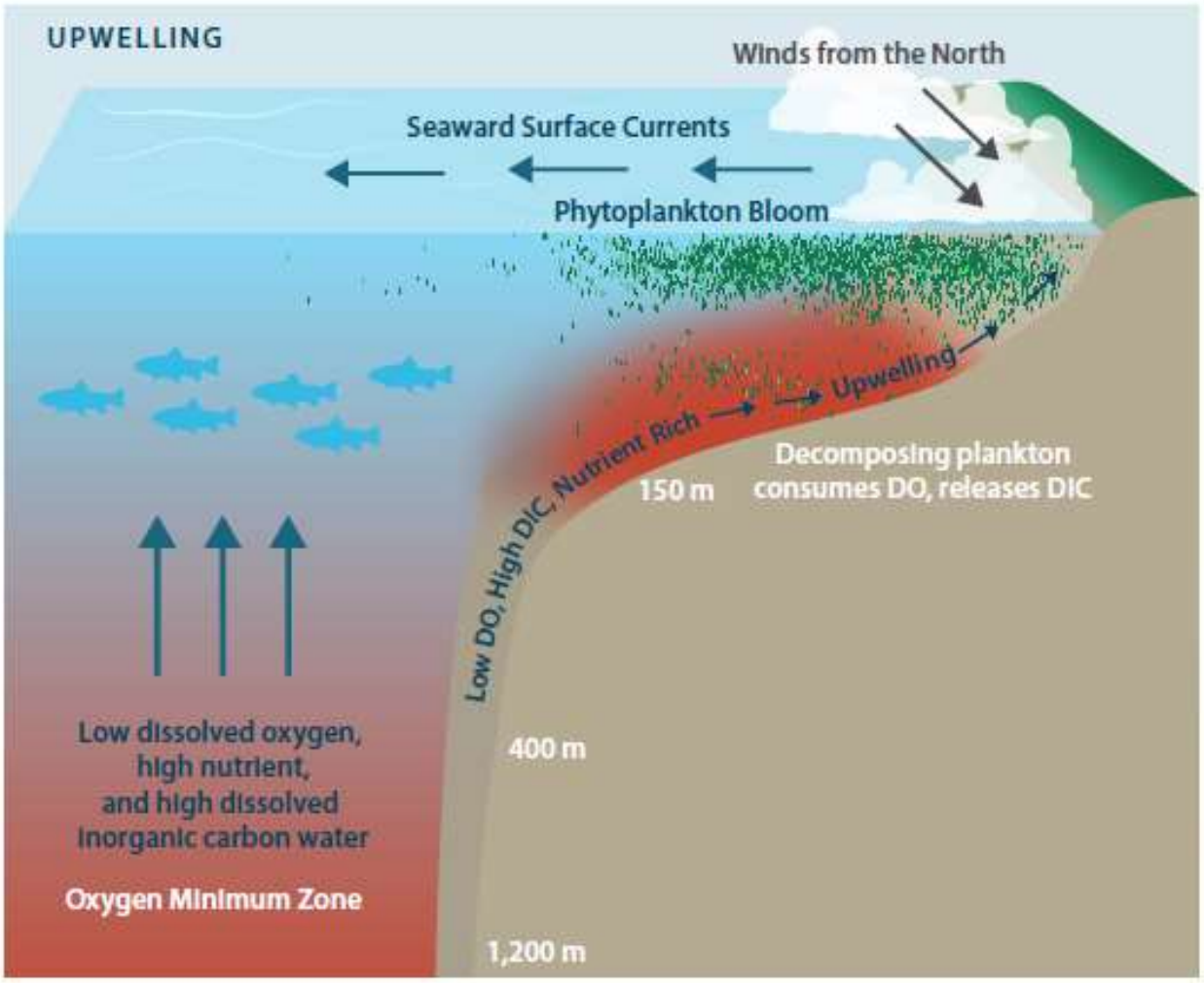


Data: Mauna Loa (ftp://aftp.cmdl.noaa.gov/products/trends/co2/co2_mm_mlo.txt) ALOHA (http://hahana.soest.hawaii.edu/hot/hot-dogs/bextraction.html)
ALOHA pH & pCO_2 are calculated at in-situ temperature from DIC & TA (measured from samples collected on Hawaii Ocean Times-series (HOT) cruises)
using co2sys (Pelletier, v25b06) with constants: Lueker et al. 2000, KSO4: Dickson, Total boron: Lee et al. 2010, & KF: seacarb

- **Increasing CO_2 in atmosphere**
- **Increasing pCO_2 in ocean**
- **Decreasing pH in ocean**

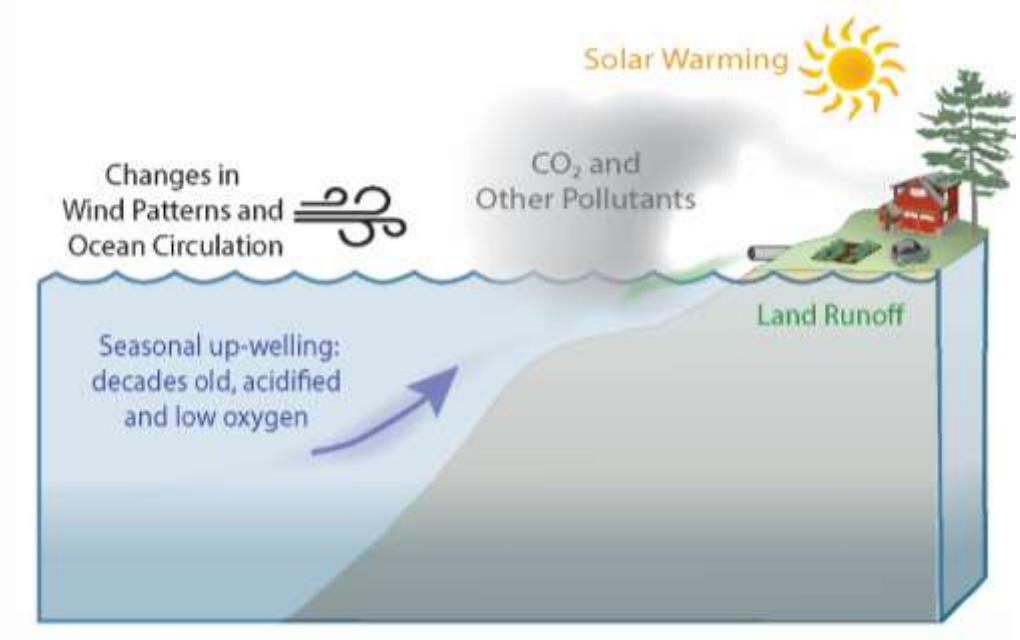
Ocean Hypoxia in PNW

North Pacific Coast

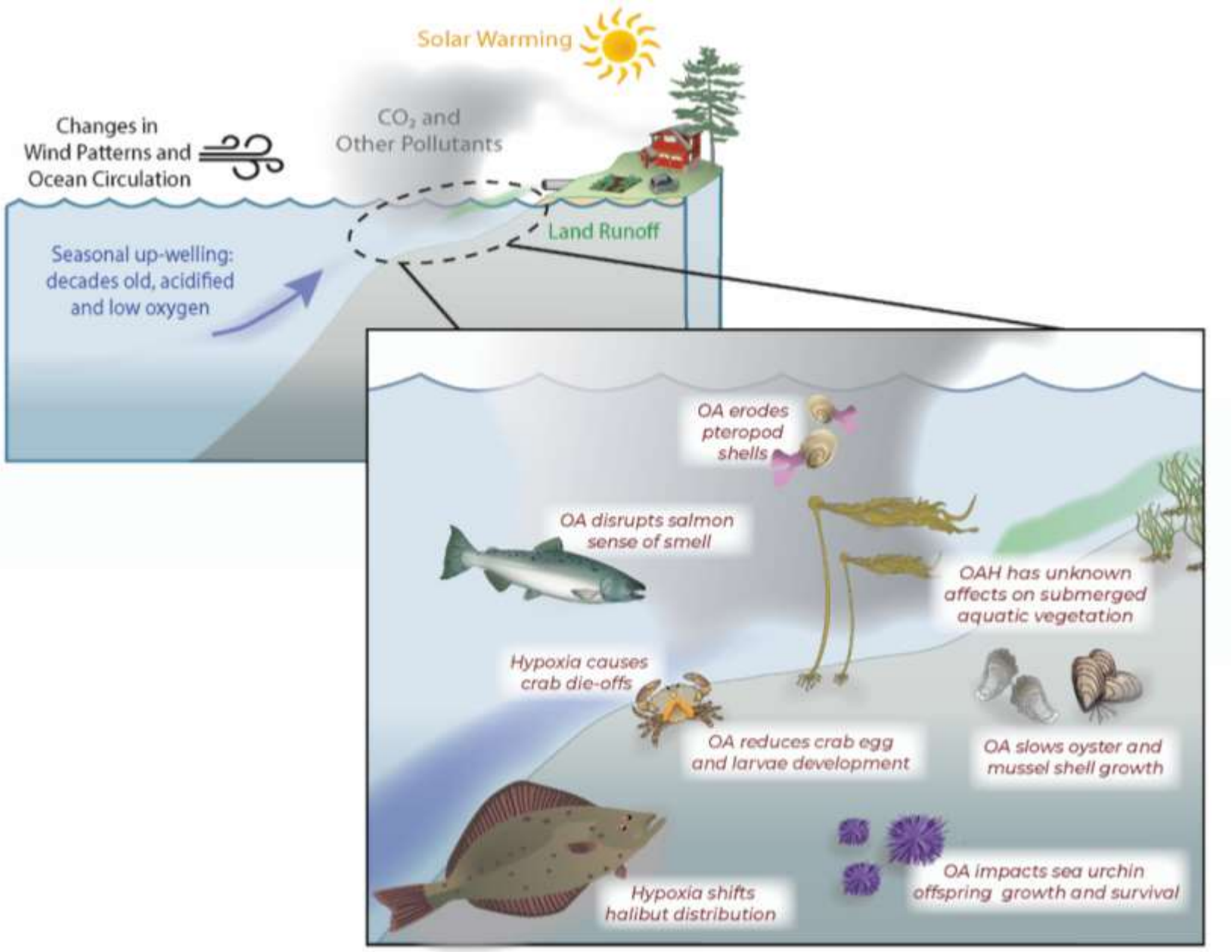


Hypoxia = 1.4 mL/L

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 CO_2 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

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

Collaboration for OAH monitoring programs

OREGON DEPARTMENT OF AGRICULTURE
FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE
DEQ
OSU Oregon State University
OREGON Fish & Wildlife
PISCO
NOAA
Lower Columbia Estuary Partnership
USDA
SURFRIDER FOUNDATION
PCSGA PACIFIC COAST SHELLFISH GROWERS ASSOCIATION
OREGON HEALTH & SCIENCE UNIVERSITY
Tillamook Estuaries Partnership
A National Estuary Project

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)

HB3114

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

Relating to ocean chemistry; and declaring an emergency.

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

Theme 1

Support and maintain monitoring of OAH and biological response

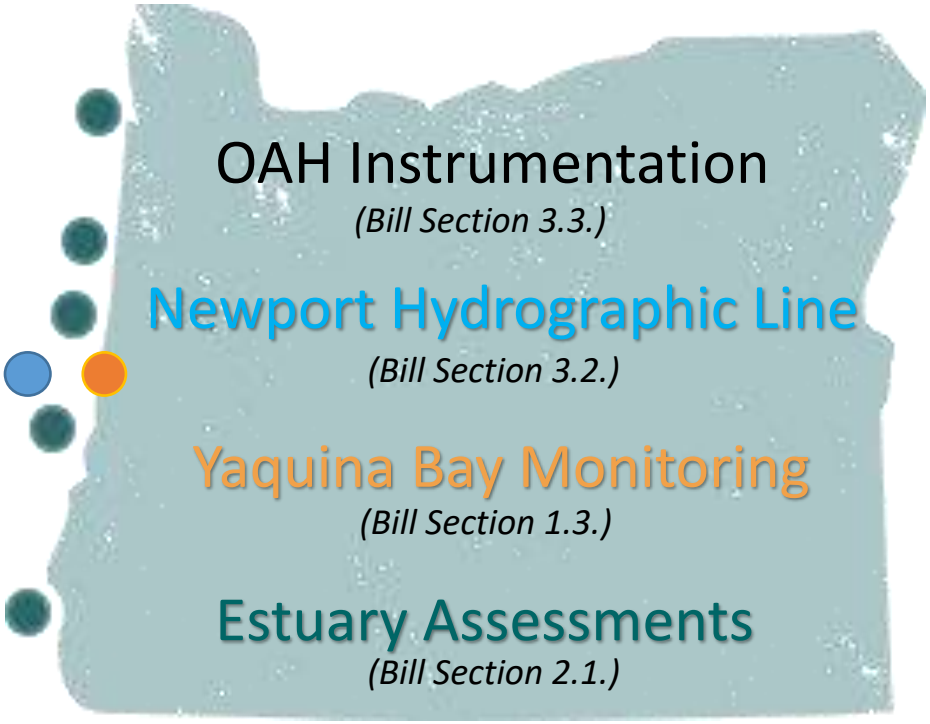
Intertidal monitoring at Marine Reserves

(Bill Section 1.1.)

Subtidal monitoring at Marine Reserves

(Bill Section 1.2.)

HB 3114: 7 Monitoring Projects



OAH 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

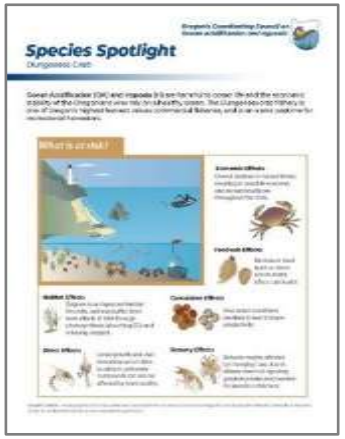
(Bill Section 3.1.)

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.)

OAH Report Action: 4.2.a

Come to an OAH Council Meeting!

Next meeting: TBD June

OregonOceanInfo.org

Comments or Questions? Please contact
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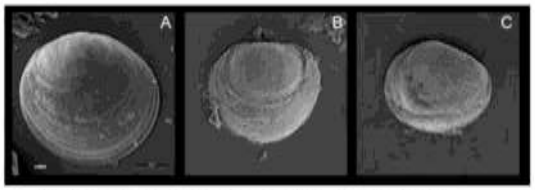
or Council Staff
Jennifer.A.Koester@odfw.Oregon.gov

Ocean Acidification Impacts

2010



Common shell exposed to a pH of 7.5

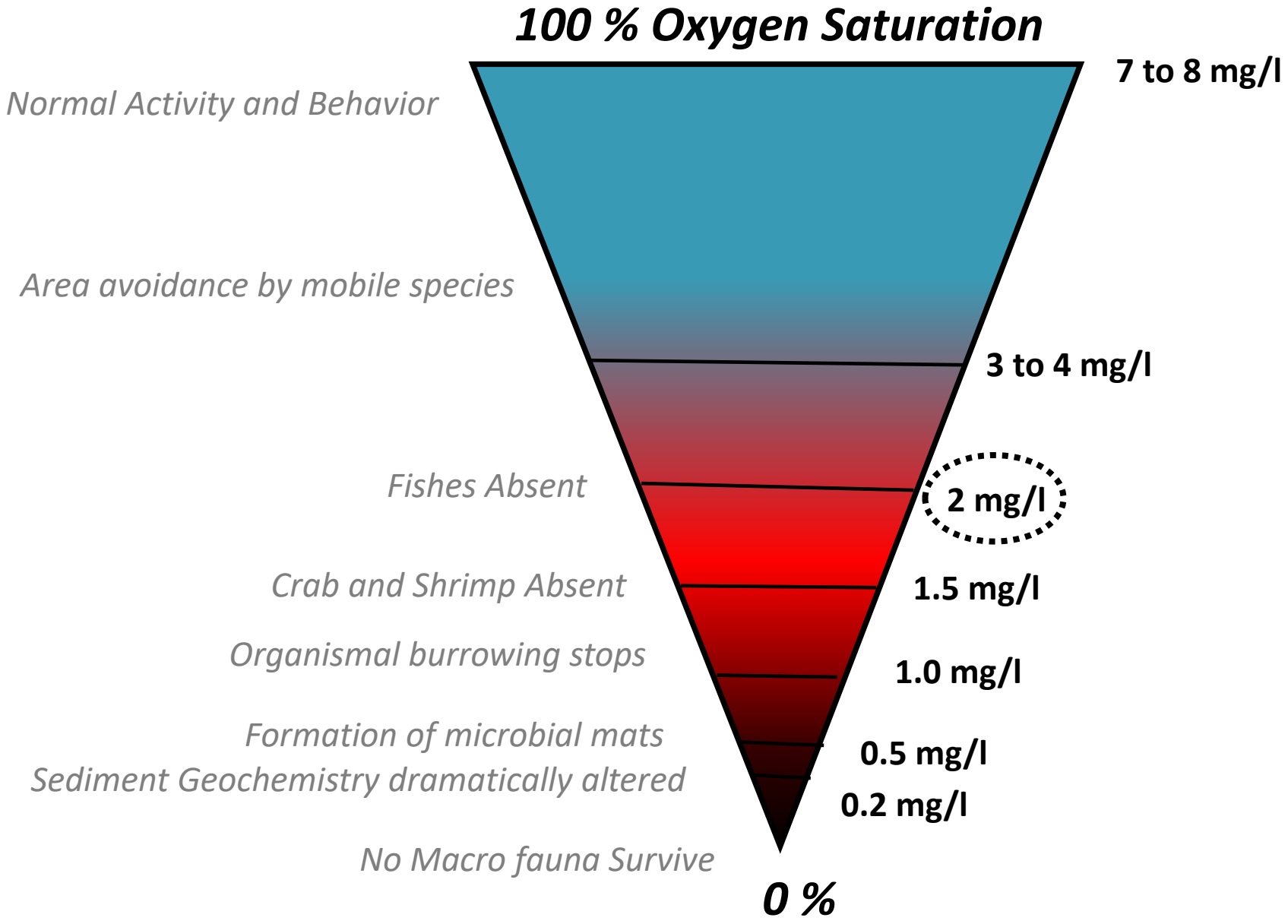
Day 1: Larvae are healthy (A)
Day 2: Shells are dissolving (B)
Day 3: Larvae are dead or dying (C)

Larval Oyster Research

2020

Larval Crab Research

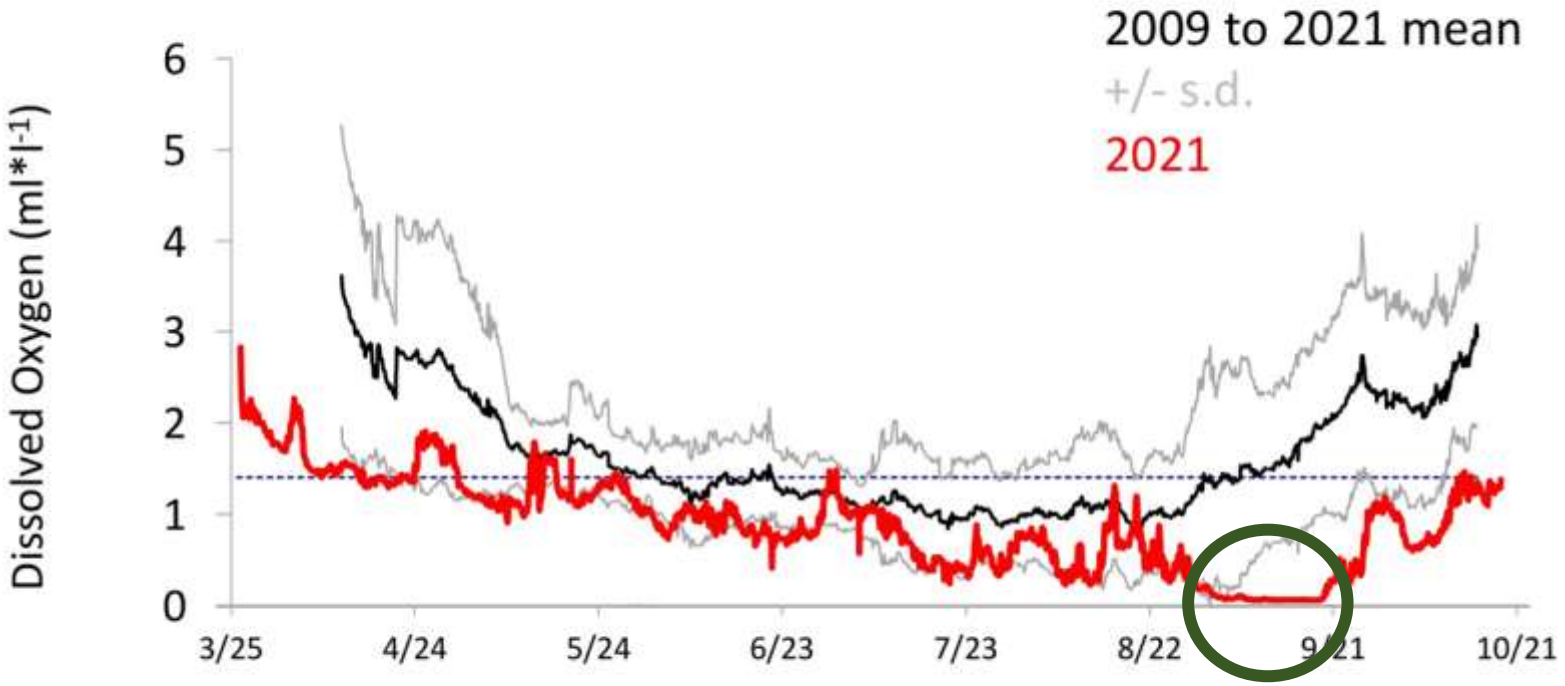
Ocean Hypoxia Impacts



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

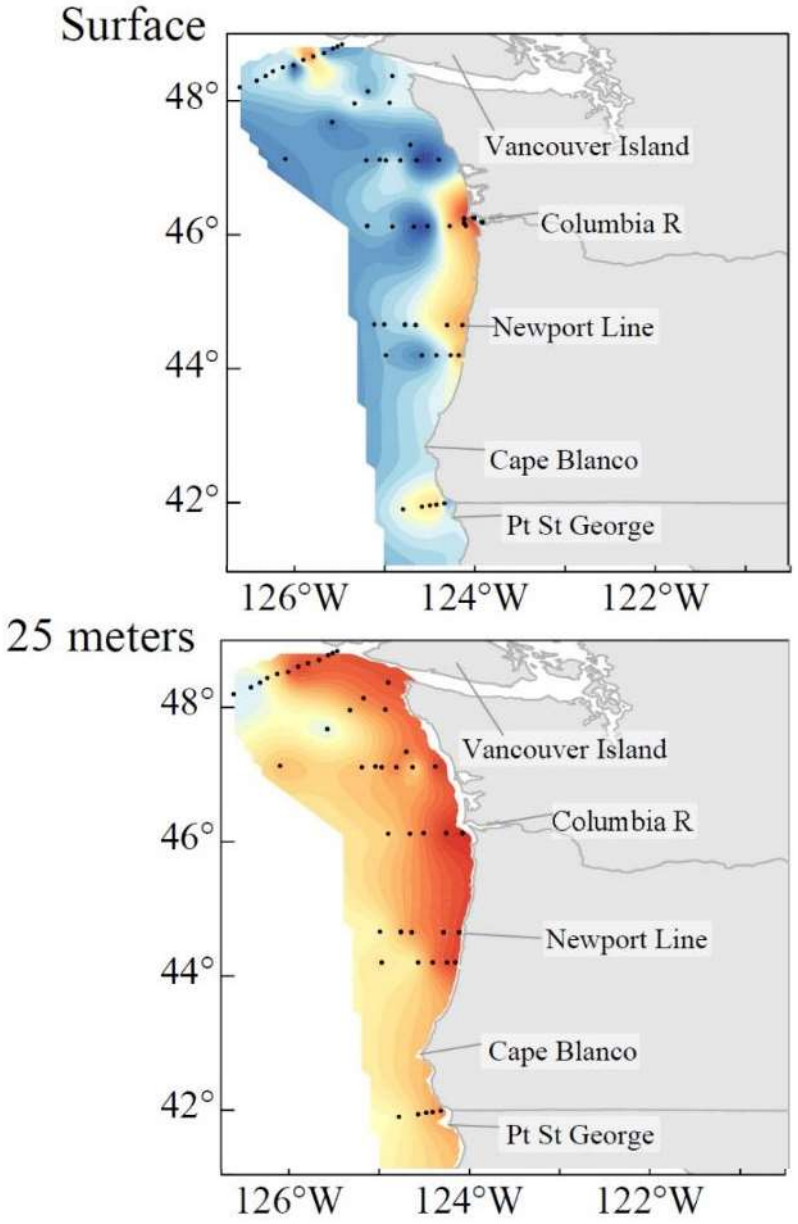
Hypoxia in Oregon

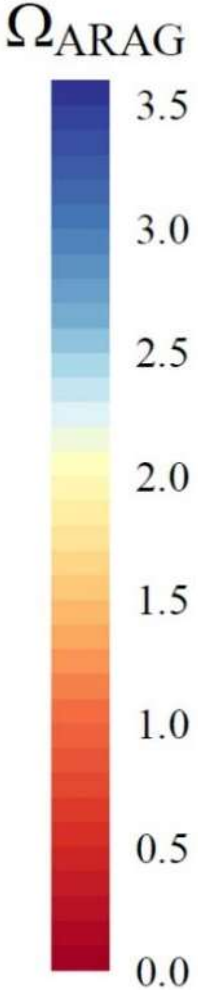
PISCO observations (preliminary):
Near-bottom dissolved oxygen in 70 m off Cape Perpetua, Oregon



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

Increased Ocean Acidification





Animals and shells are healthy

Animals become stressed but shells remain healthy

Shells show signs of weakening

Feely et al 2016