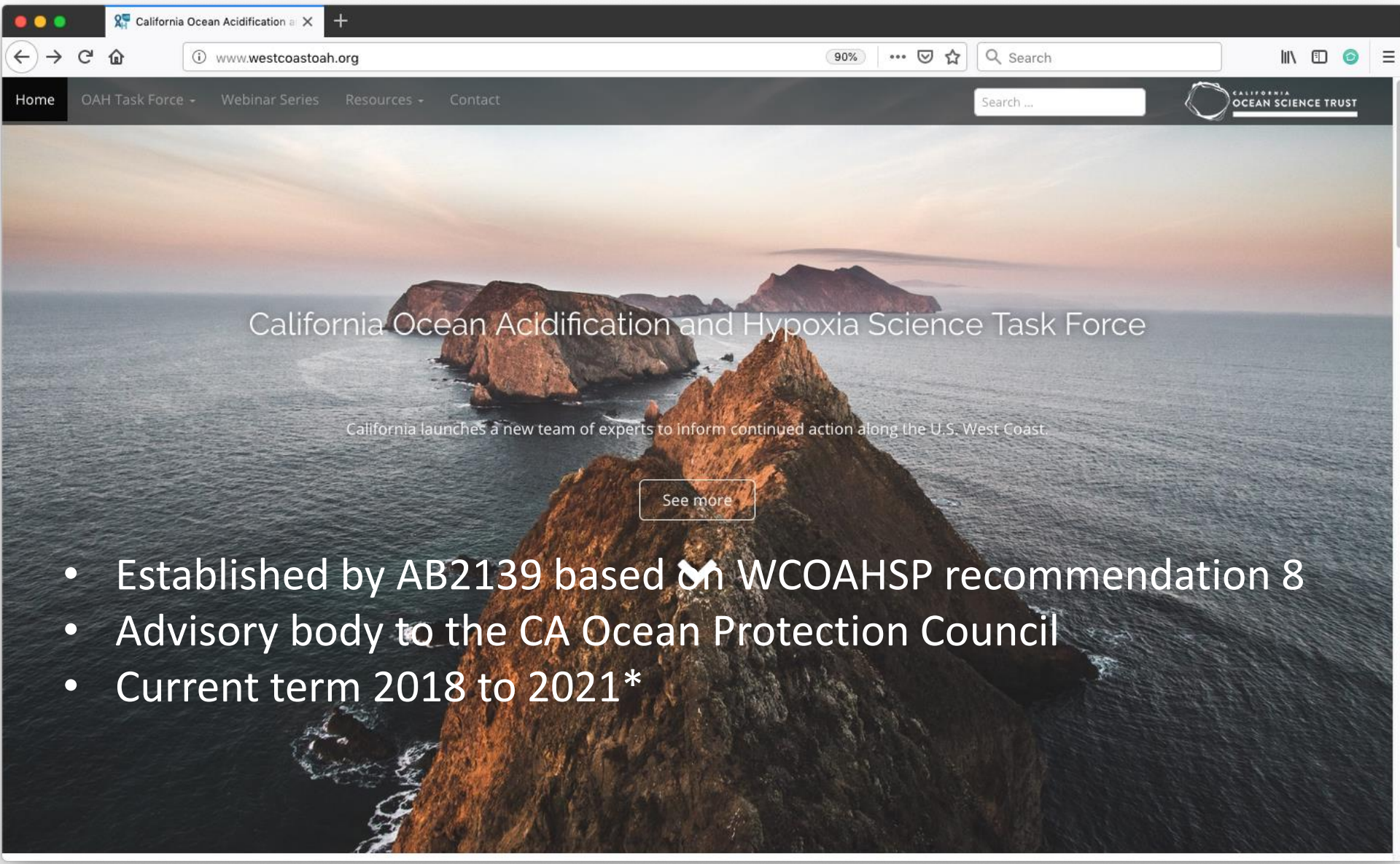


- Established by AB2139 based on WCOAHSP recommendation 8
- Advisory body to the CA Ocean Protection Council
- Current term 2018 to 2021*

OCEAN PROTECTION COUNCIL

Mission: ***The Task Force will serve as a responsive advisory body that will provide scientific guidance to the OPC in an ongoing manner to inform continued actions on ocean acidification and hypoxia in California and along the West Coast.***

TRACK SCIENTIFIC EFFORTS THAT ADVANCE WEST COAST PANEL RECOMMENDATIONS

PROVIDE A FORUM FOR ENGAGEMENT BETWEEN SCIENTISTS & DECISION-MAKERS

SERVE AS A GATEWAY TO THE BROADER OAH SCIENCE COMMUNITY

IDENTIFY FOLLOW-UP PROJECTS TO FILL KNOWLEDGE GAPS

Steve Weisberg

Co-chair

Southern California Coastal Water

Francis Chan

Co-chair

Oregon State University

Jim Barry

Monterey Bay Aquarium Research Institute

Alexandria Boehm

Stanford University

Shallin Busch

NOAA Northwest Fisheries Science Center

Sarah Cooley

Ocean Conservancy

Richard Feely

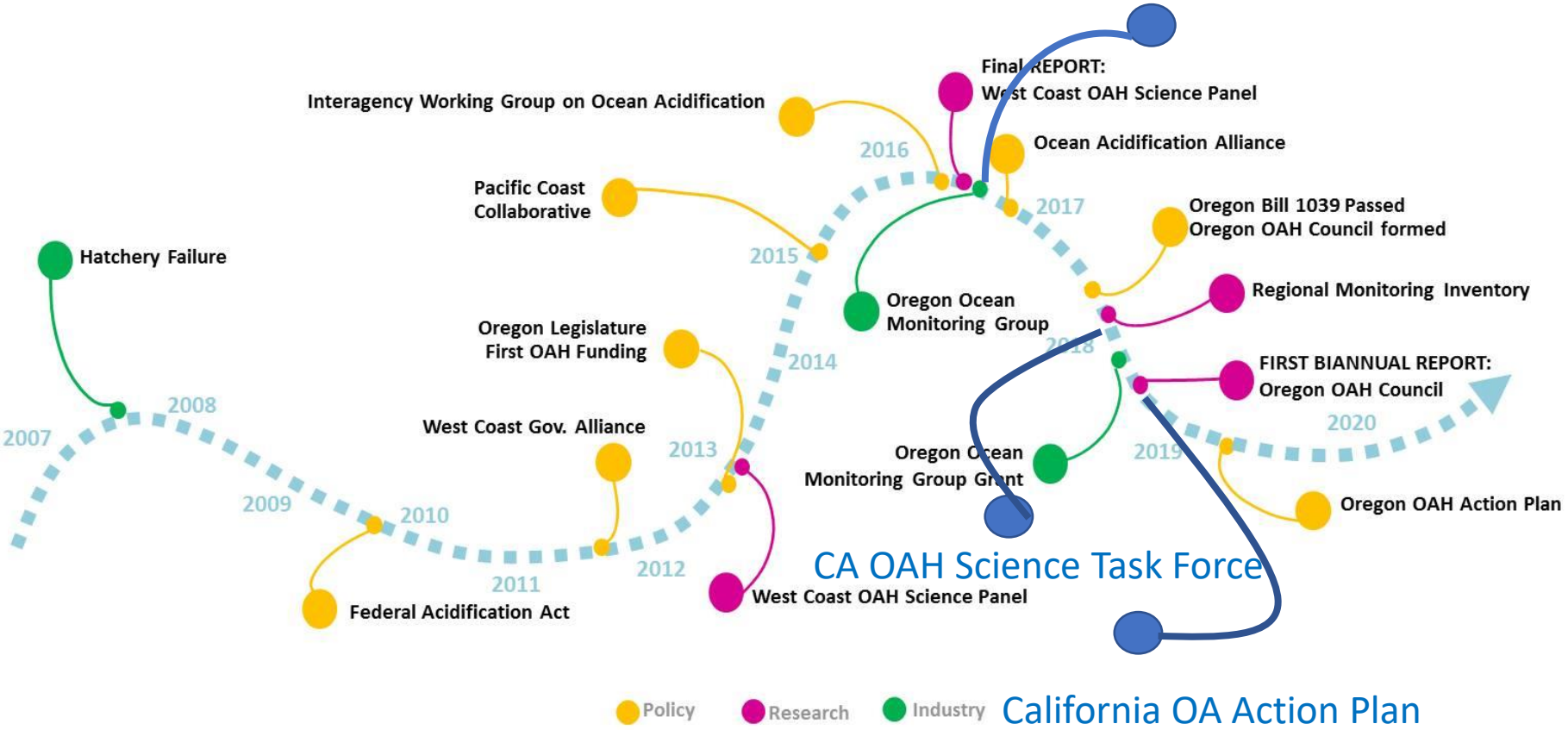
NOAA Pacific Marine Environmental Laboratory

Lisa Levin

University of California, San Diego

Oregon +California OAH Timeline

California OAH legislation (AB2139, SB1363)

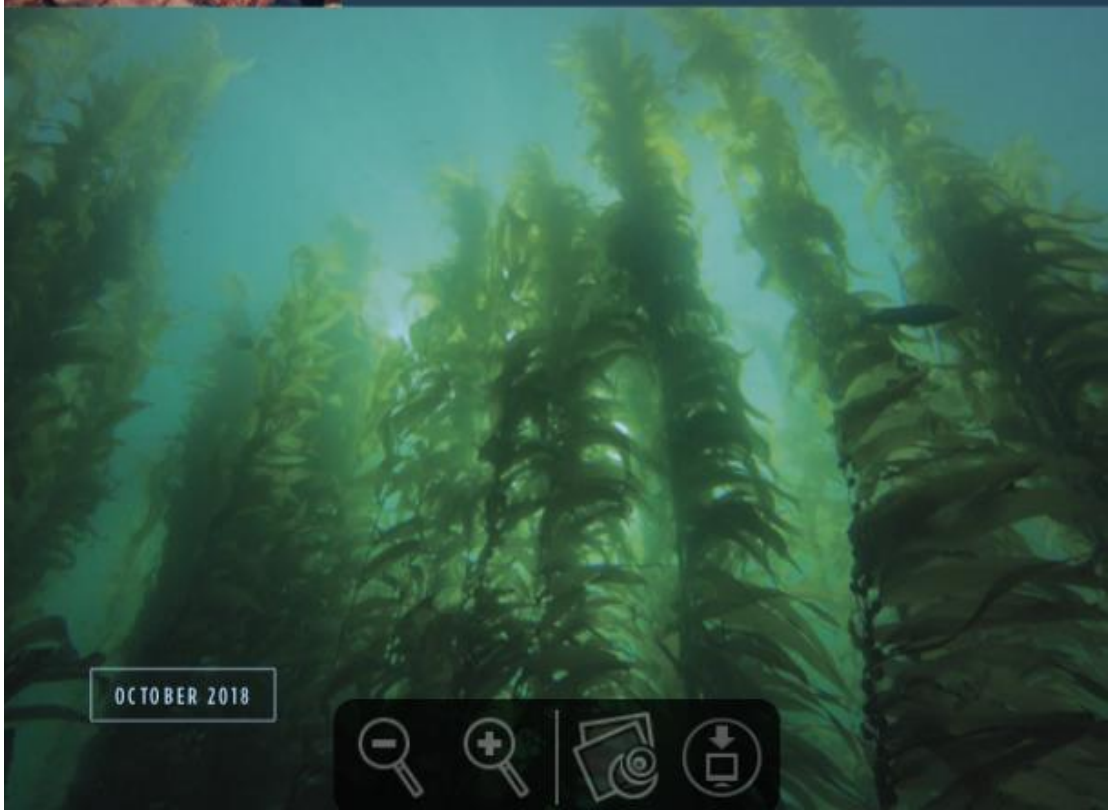


California OA Action Plan

STATE OF CALIFORNIA

OCEAN ACIDIFICATION

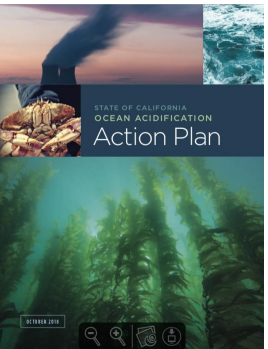
Action Plan



OCTOBER 2018

Six strategies for OA actions:

1. Prepare for a full range of OA risk and impacts
2. Activate responsible elements of state government
3. Reduce the pollution that causes OA
4. Deploy living systems to slow and store carbon
5. Build resilience of affected communities, industries and interests
6. Engage beyond state borders



Strategy 3. Reduce the pollution that causes OA

5-YEAR GOALS
Attention to coastal and ocean systems and to OA is elevated and systematically addressed in California's GHG reduction efforts.
No-regrets, near-term options for reducing local sources of acidifying pollutants (voluntary, incentive-based, or permitting) have been identified and are fully employed.
The state has the technical tools it needs – including scientifically robust water quality indicators and appropriate models for assessing contributions of local and global CO_2 – to measure and evaluate OA-related changes occurring along the California coast, to select water quality goals, and to initiate management or regulatory action to slow these rates, if feasible and appropriate.

ACTION 3.1 (CONTINUED)

3.1.6. Continue to advance collaborative dialogue on ocean-based production of renewable wind energy, where it is compatible with sustaining healthy ocean ecosystems, fisheries, and coastal economies.

ACTION 3.2

Identify sources and reduce local water-borne and airborne pollution that can exacerbate coastal OA.

3.2.1. Expand incentives for, and strongly encourage if the science justifies, for coastal infrastructure upgrades that are designed to simultaneously reduce or eliminate nutrient- and carbon-laden ocean discharges that exacerbate local acidification. Incentivize and advance California's climate adaptation goals for the water sector by improving energy efficiency of water reuse and recycling, and reducing brine and nutrient discharges.[24]

3.2.2. Assess whether local sources of acidifying airborne emissions (e.g., nitrogen oxides, sulfur oxides) are affecting the rate of OA in select regions of the coast, such as near California ports and harbors or coastal electric power plants. Identify and implement options for reducing these airborne pollutants under state law, as appropriate, which may also yield public health benefits in some places.

3.2.3. Support and highlight the significance for OA of integrated watershed planning and land management and protection activities (e.g., runoff reduction, protection of upland wetlands and riparian areas) that are likely to yield improved downstream water quality in bays and estuaries where risks of intensified OA from local inputs are greatest. Target communications towards key audiences demonstrating these linkages and highlighting the multiple potential benefits for coastal water quality and productivity.[25]

How do we get from strategies to goals?

What science should be done?

What science should be done?

It’s simple, all of it…

What science should be done?

OK, then just the really big stuff

What science should be done?

OK, then just the really big stuff

And maybe not overly prescribed, make room for black swans…

Some subtext 1:

Target recommendations for CA legislative staff

-be brief
-have clear priorities and not a long wish list
-justify investments in science (with costs and benefits)

Some subtext 2:

But…Prop 68 passed in June 2018 authorizing $4 billion parks, environment and water bond

OPC unlikely to be turning to legislature for funding in the near term

Science recommendations needed to inform next set of RFPs

Some subtext 3:

What's really important is that other state agencies are engaged

-This is not going to happen without evidence that OA matters to their mission

-The Action Plan also unlikely to move forward if there's no clarity on what can/should be done

Refined aim:

-specific priorities (*if we can't decide as a community why would others act or even care*)

-science that delivers results quickly (*if we can't show returns on investments in research for the first $5 million, we won't have a case for the next $50 million*)

-science that activates engagement (*if we do science that we like but not science that the state needs, then the Action Plan is not going to have an extended life*)

CA OA Action Plan Science Recommendations I

What should you care?

Recommendation 1.1: Identify the pattern of OA exposure in California, its progression, and the locations where the earliest and most detrimental changes in ocean chemistry will occur.

Recommendation 1.2: Characterize the vulnerability of marine life, habitats, and ecosystems of interest to California stakeholders.

Recommendation 1.3: Quantify the societal and economic consequences of OA.

Recommendation 1.4: Characterize OA's contribution to coastal ecosystem impacts in relation to other stressors.

Recommendation 1.2: Characterize the vulnerability of marine life, habitats, and ecosystems of interest to California stakeholders.

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OA science has focused primarily on characterizing changes to ocean chemistry; we are still early in the process of understanding which species within California's diverse ecosystems and productive fisheries are most threatened by these chemistry changes. For example, of the 200 species that support the bulk of California's commercial and recreational fisheries, less than 10 have been studied for OA sensitivity. This deficit can largely and quickly be corrected by conducting experimental and observational studies on a range of species of priority social concern expected to be harmed by OA's progression. A first-order understanding of vulnerability will need to grow quickly into a more complete picture of risks, where the scope, likelihood and timing of population- and ecosystem-level impacts are made clear to decisionmakers. Investments can start by supporting studies that quantify the sensitivity of responses in life stages that are most important for population dynamics, and that can be readily incorporated into management models. New understanding of vulnerability will accelerate and broaden stakeholder and agency engagement (S1, S2, S5). Also, because many marine life populations cross jurisdictional boundaries, improved knowledge of vulnerability will bring together neighboring states and federal agencies to develop coordinated actions beyond California's borders (S6).

CA OA Action Plan Science Recommendations II

What can you about it?

Recommendation 2.1: Identify where local pollution control actions will most effectively slow local acidification rates.

Recommendation 2.2: Explore how to maximize carbon reduction through natural and constructed living systems.

Recommendation 2.3: Develop the scientific foundation for managers to set ecologically protective water quality targets for OA.

Recommendation 2.4: Evaluate the use of existing management tools to preserve, support and enhance the resilience of fisheries and ecosystems in the face of intensifying OA.

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Two categories of actions are available to address OA. Managers can reduce stressors (S3, S4), or they can employ resilience management to assist ecological systems and dependent industries and communities in resisting and recovering from OA. Environmental scientists have a generalized understanding of how factors such as a diversified gene pool, broad population age structure, and intact ecological communities can help promote biological resilience. However, little research has been conducted on the specific biological attributes that can confer resilience against OA in California's coastal ecosystems. Similarly, there is limited understanding of the factors that make fisheries and communities more resilient to OA, and how socio-economic resilience scales from biological resilience. Although resilience management represents a broad research frontier, near-term investigations should focus on screening for whether existing management interventions – such as Marine Protected Areas, spatial quotas, habitat restoration, fishery mobility, and catch shares – can meaningfully influence biological and socioeconomic resilience to OA. The aim would be to identify a set of tractable actions with existing management benefits that can be readily employed to lessen OA's impacts. Strategies for enhancing resiliency will be crucial for broadening engagement by managers and other decision-makers (S2), who will need to work together to achieve greater resilience within affected industries and communities (S5).

Recommendation 2.4: Evaluate the use of existing management tools to preserve, support and enhance the resilience of fisheries and ecosystems in the face of intensifying OA.

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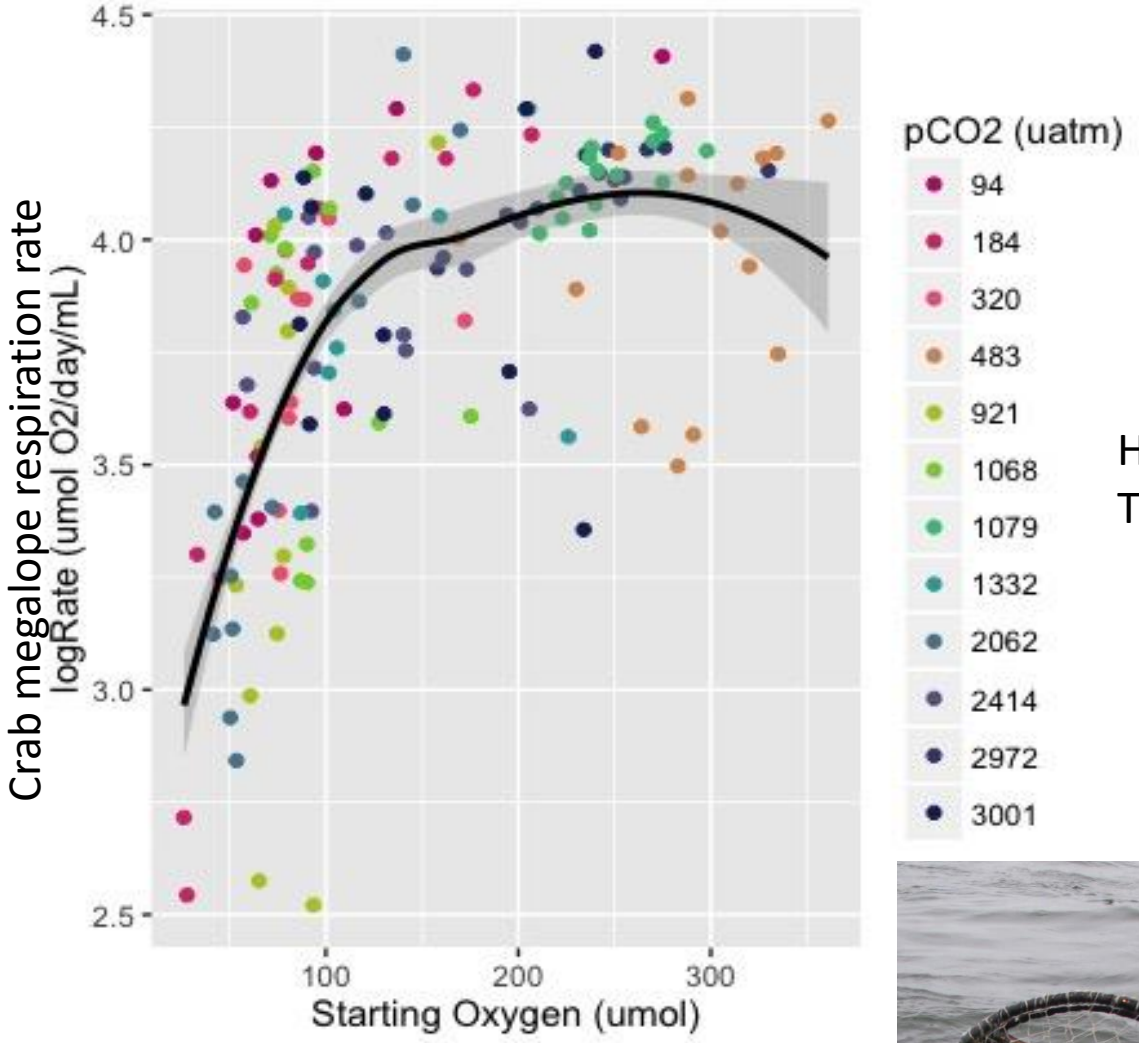

Hannah Gossner MS Thesis 2018 OSU