Characterizing Physiological Effects of Multiple Stressors on *Crassostrea Gigas* in a Wild Setting

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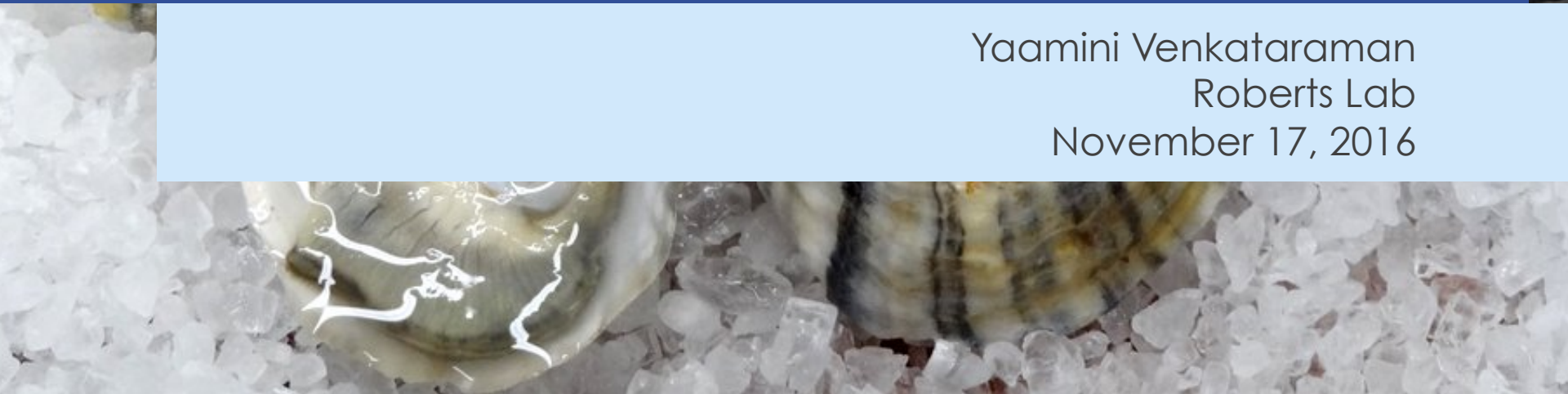
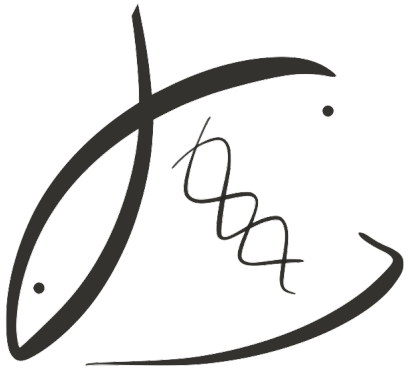
November 17, 2016



Outline

- Introduction to oysters
- Environmental threats
  - Ocean Acidification
  - Ocean Warming
- Experiment Proposal
  - Department of Natural Resources
- Example Analysis



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SCHOOL OF AQUATIC and FISHERY SCIENCES

Title Photo from Willapa Oysters

Oysters and the Ecosystem

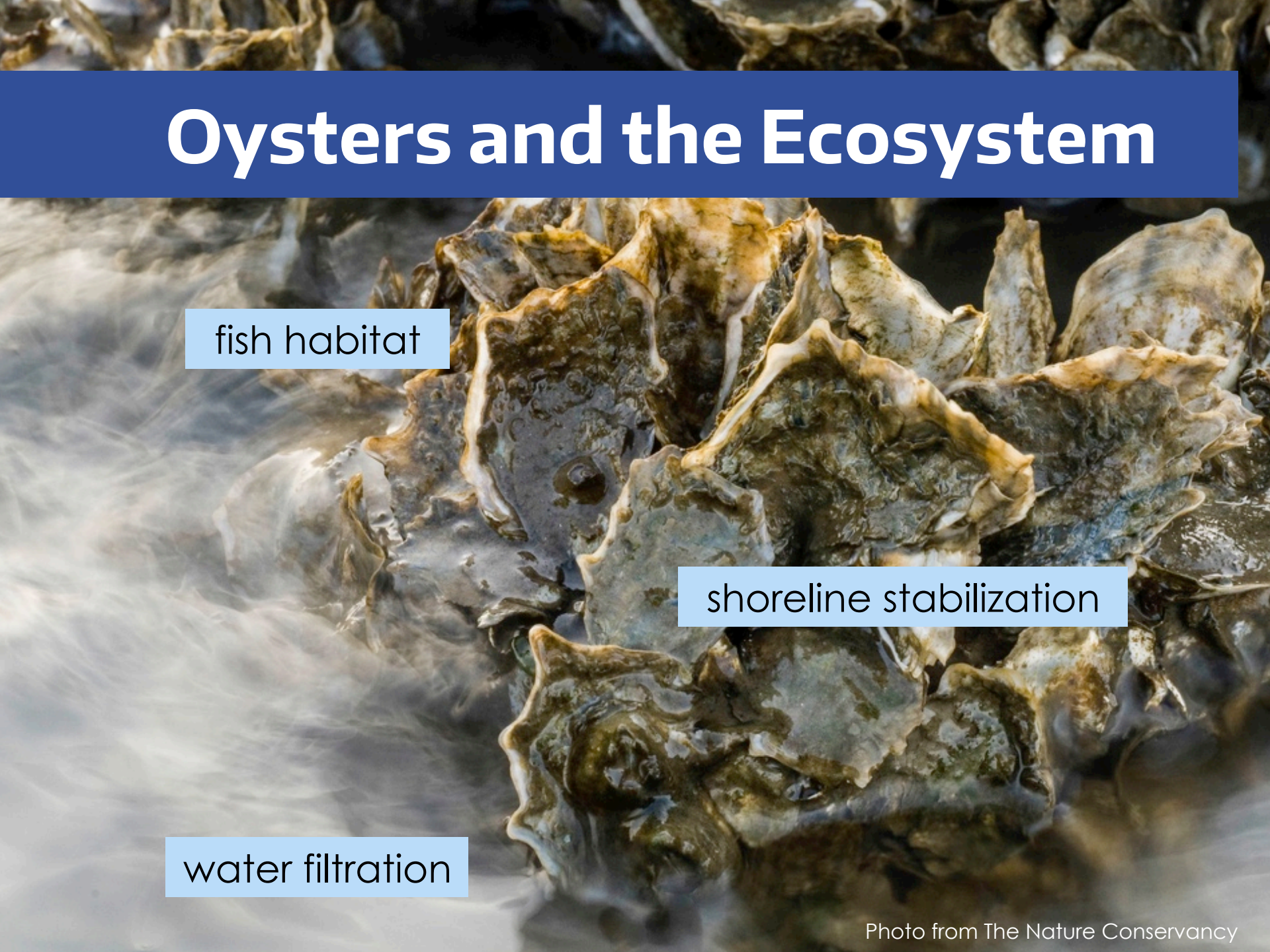
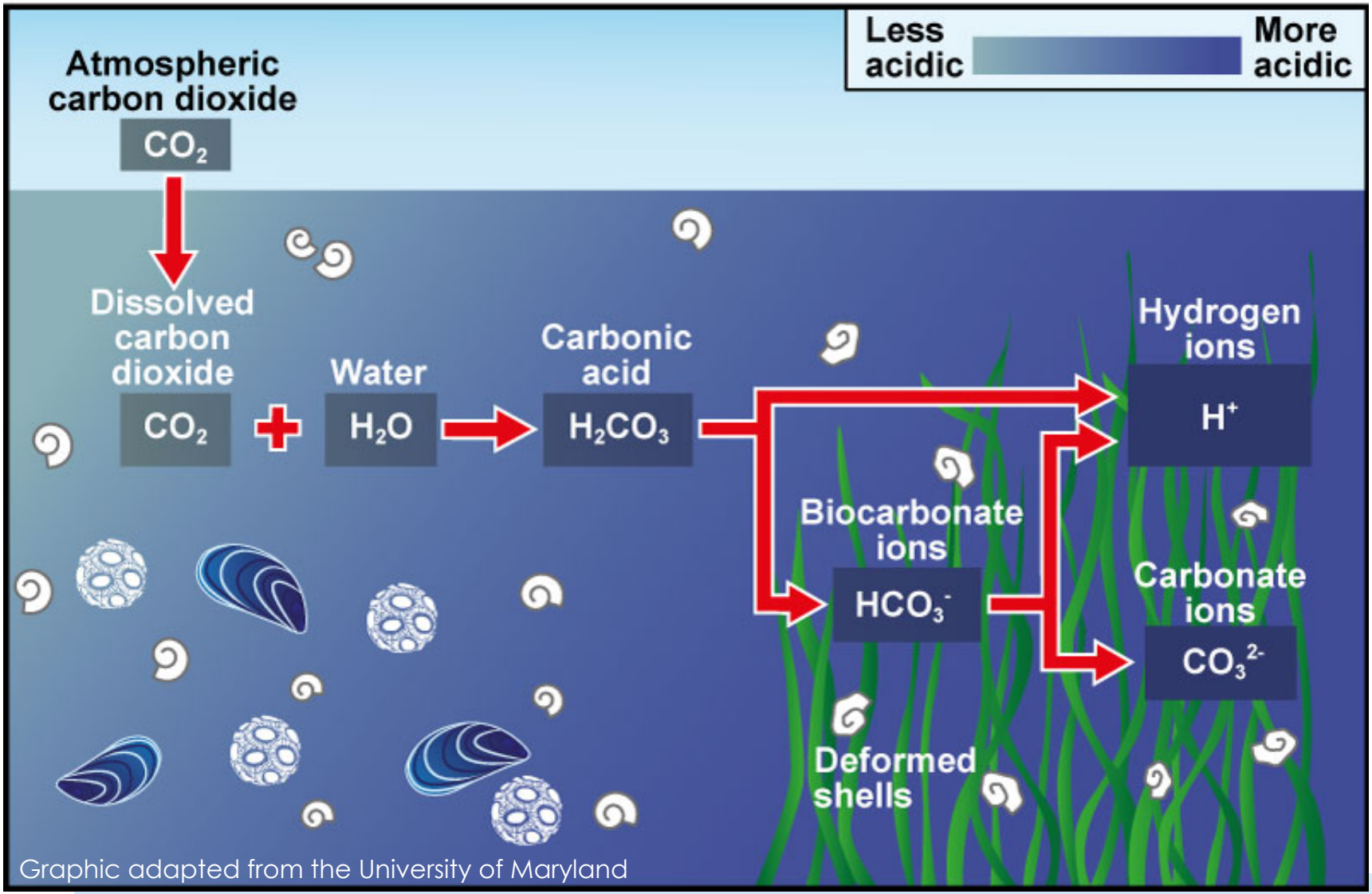
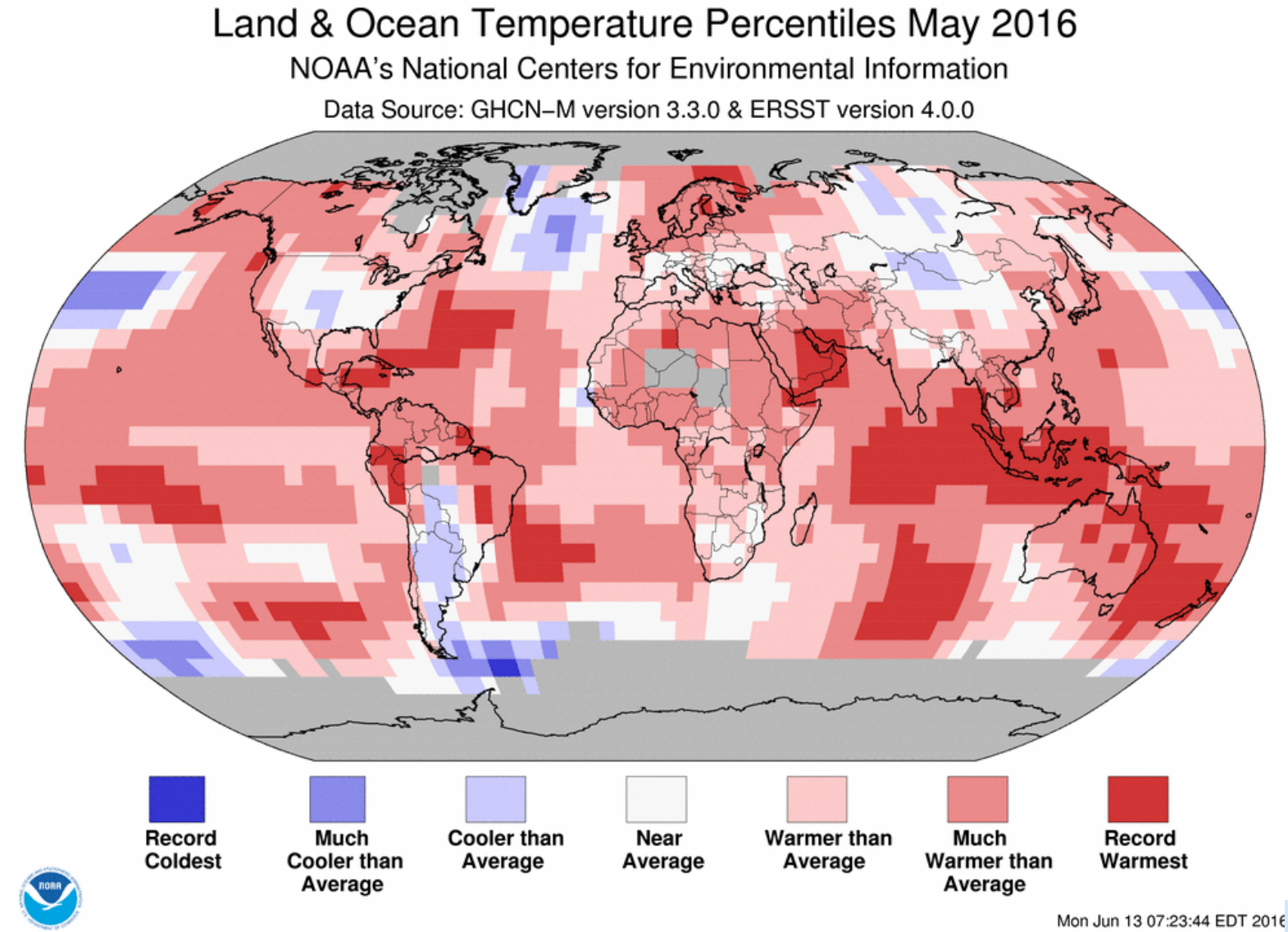


Photo from The Nature Conservancy

Climate Threats

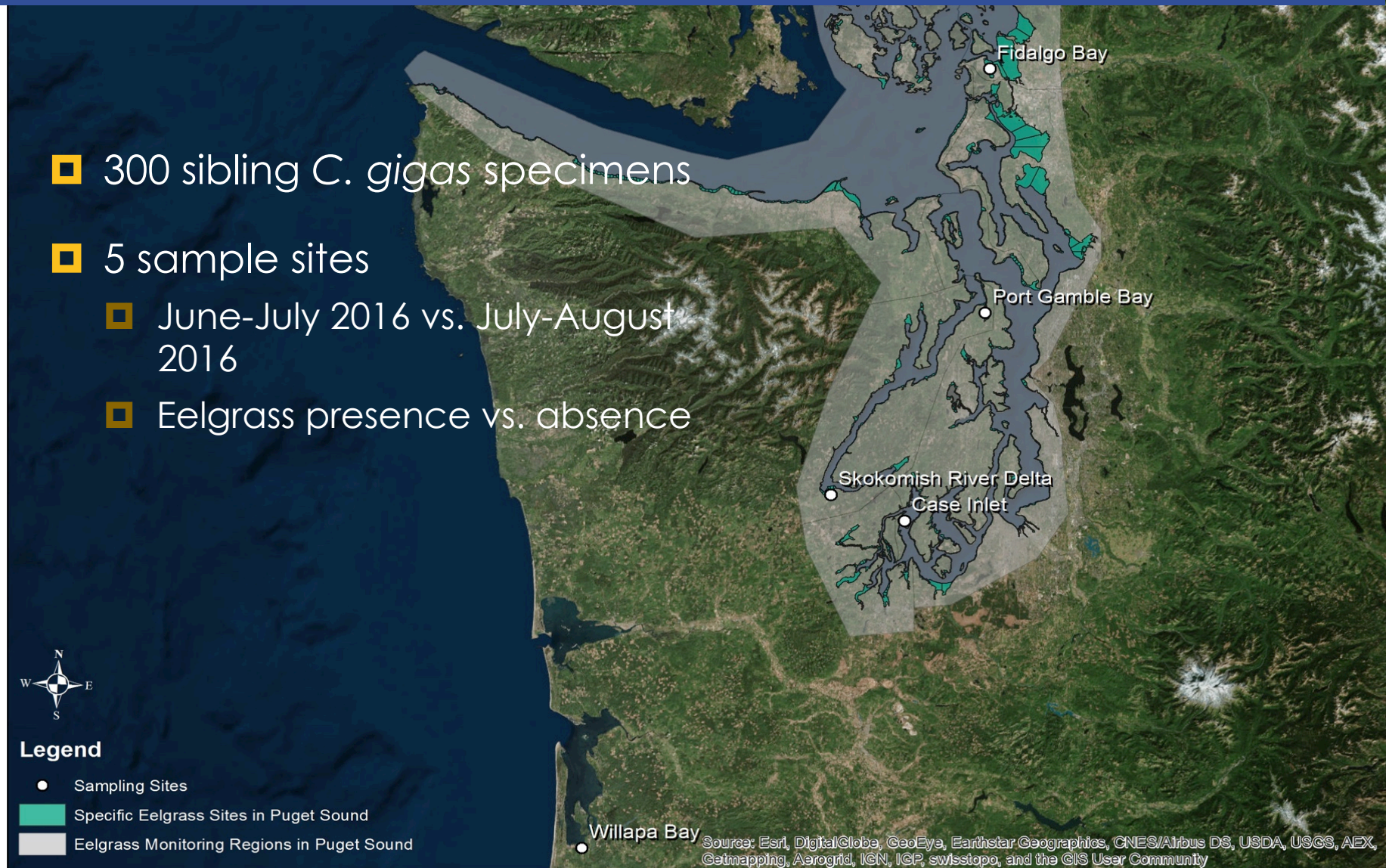


Climate Threats



Collaboration with DNR

- 300 sibling *C. gigas* specimens
- 5 sample sites
  - June-July 2016 vs. July-August 2016
  - Eelgrass presence vs. absence



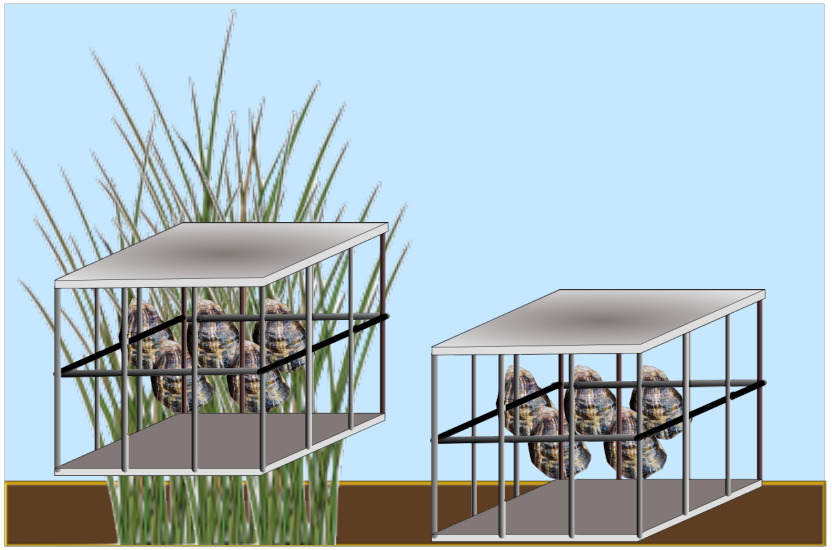
Experimental Overview

150 total oysters

2 Rounds: June and July

3 replicates

outplant to 5 sites



eelgrass vs. no eelgrass

DNA extraction

Protein extraction

Water chemistry data (temperature, dissolved oxygen)

Preliminary Data

	Outplant #	Site	Habitat	Mean Temp.	Mean [DO]
2	1	FB	B	14.9	12.2
3	1	FB	E	15	17
4	1	PG	B	15.2	12.1
5	1	PG	E	15.3	12.9
6	1	CI	B	16.3	8.5
7	1	CI	E	16.4	10.7
8	1	SK	B	15.4	10.6
9	1	SK	E	15.1	10.4
10	1	WB	B	17.9	10.1
11	1	WB	E	18	9.8
12	2	FB	B	16.4	9.4
13	2	FB	E	16.5	11.8
14	2	PG	B	15.5	10.7
15	2	PG	E	15.4	9.5
16	2	CI	B	17.2	8.9
17	2	CI	E	17.3	8.6
18	2	SK	B	17.3	9.9
19	2	SK	E	16.8	8.2
20	2	WB	B	19	9
21	2	WB	E	NA	NA

Plan: graphs comparing mean temp and DO for different sites

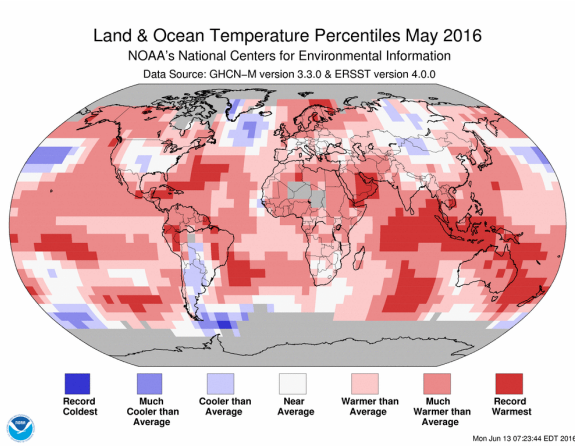
The second outplant (July to August) saw warmer waters than the first outplant (June to July), by about 1°C
The second outplant saw lower DO and probably lower pH than the first outplant, by about 2mg/L

Willapa Bay (WB) was consistently the warmest site
Fidalgo Bay (FB) & Port Gamble Bay (PG) were the coldest sites

Fidalgo Bay (FB) consistently had the highest DO and probably highest pH
Case Inlet (CI) had the lowest DO and probably lowest pH

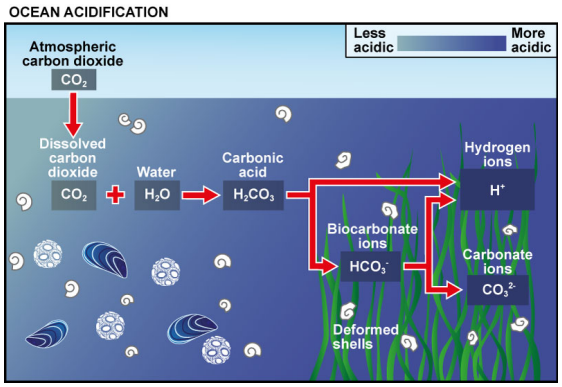
Hypotheses

Differences in gene expression, epigenetic and proteomic responses between the following:



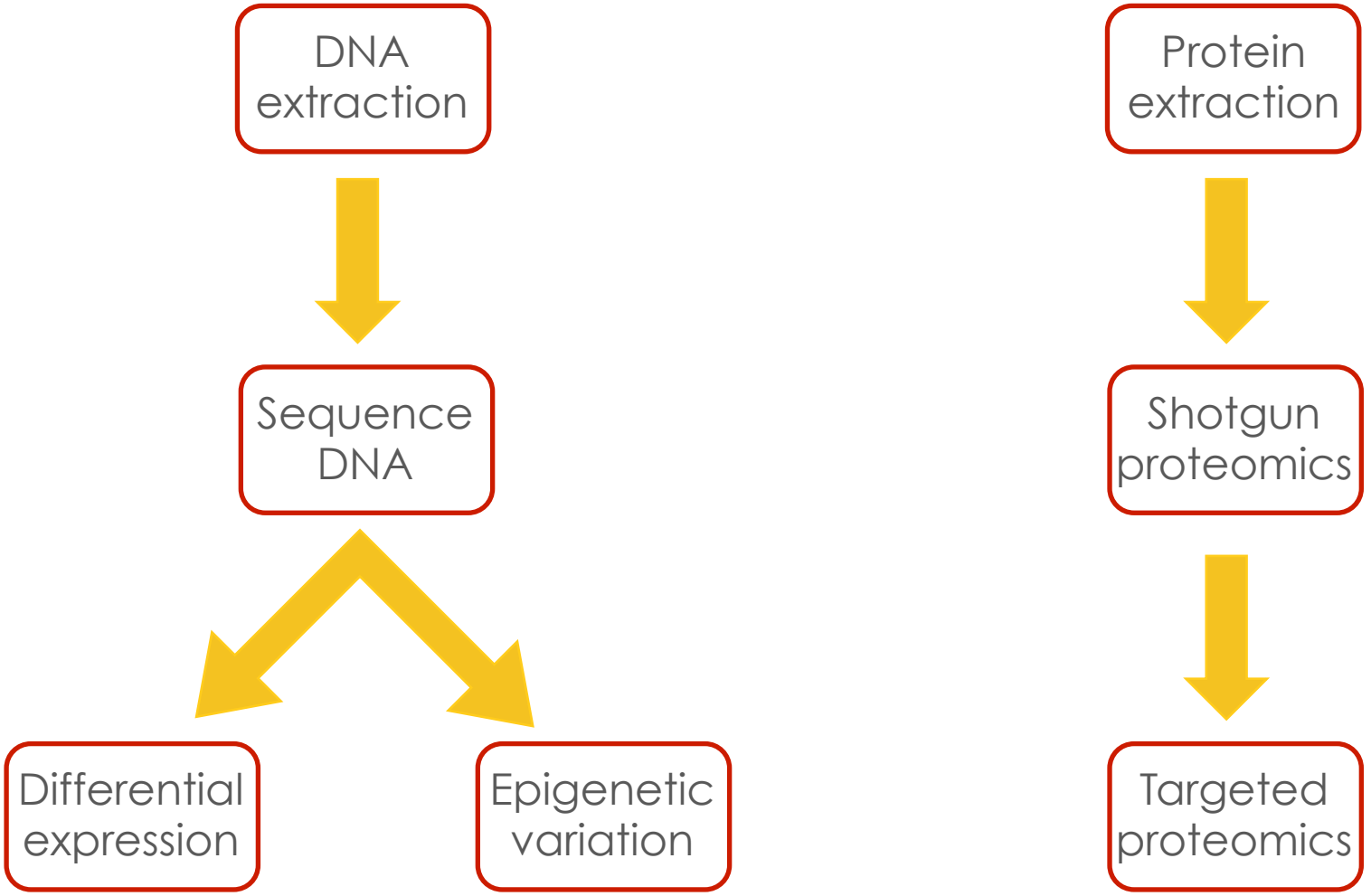
Experimental rounds (temperature)

Eelgrass presence



Water chemistry (pH)

Proposed Analyses



Analysis Example

- SCREENSHOT OF DNA METHYLATION/ SOME OTHER REALLY COOL VISUALLY APEALING ANALYSIS GOES HERE!!!!!!!!!!!!!!

Looking Forward

- Study effects of several environmental conditions in one experiment
- Hypotheses
  - Eelgrass
  - Temperature
  - pH
- Apply findings to mechanistic lab study

Thank You!

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https://github.com/RobertsLab/project-oyster-oa