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

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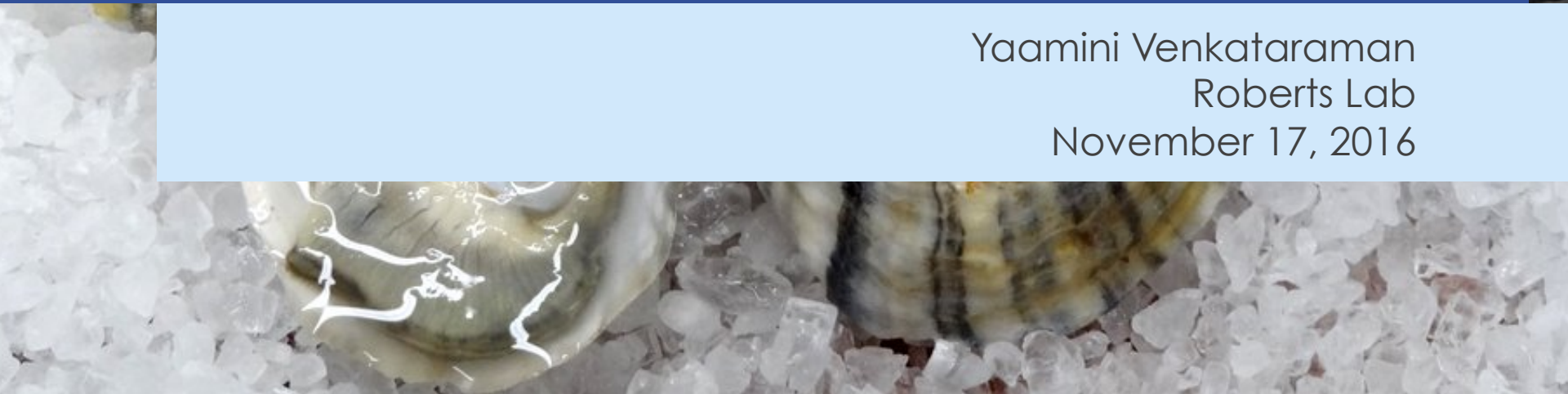
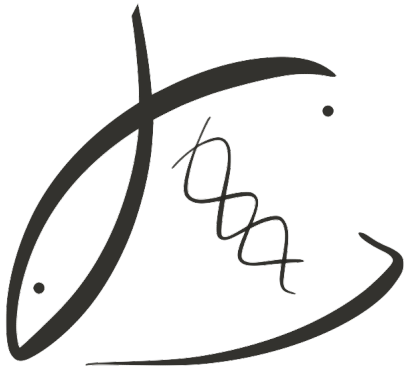


Outline

- Introduction to oysters
- Research objectives
- Proposed methods
- Looking forward



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Title Photo from Willapa Oysters

Oysters and the Ecosystem

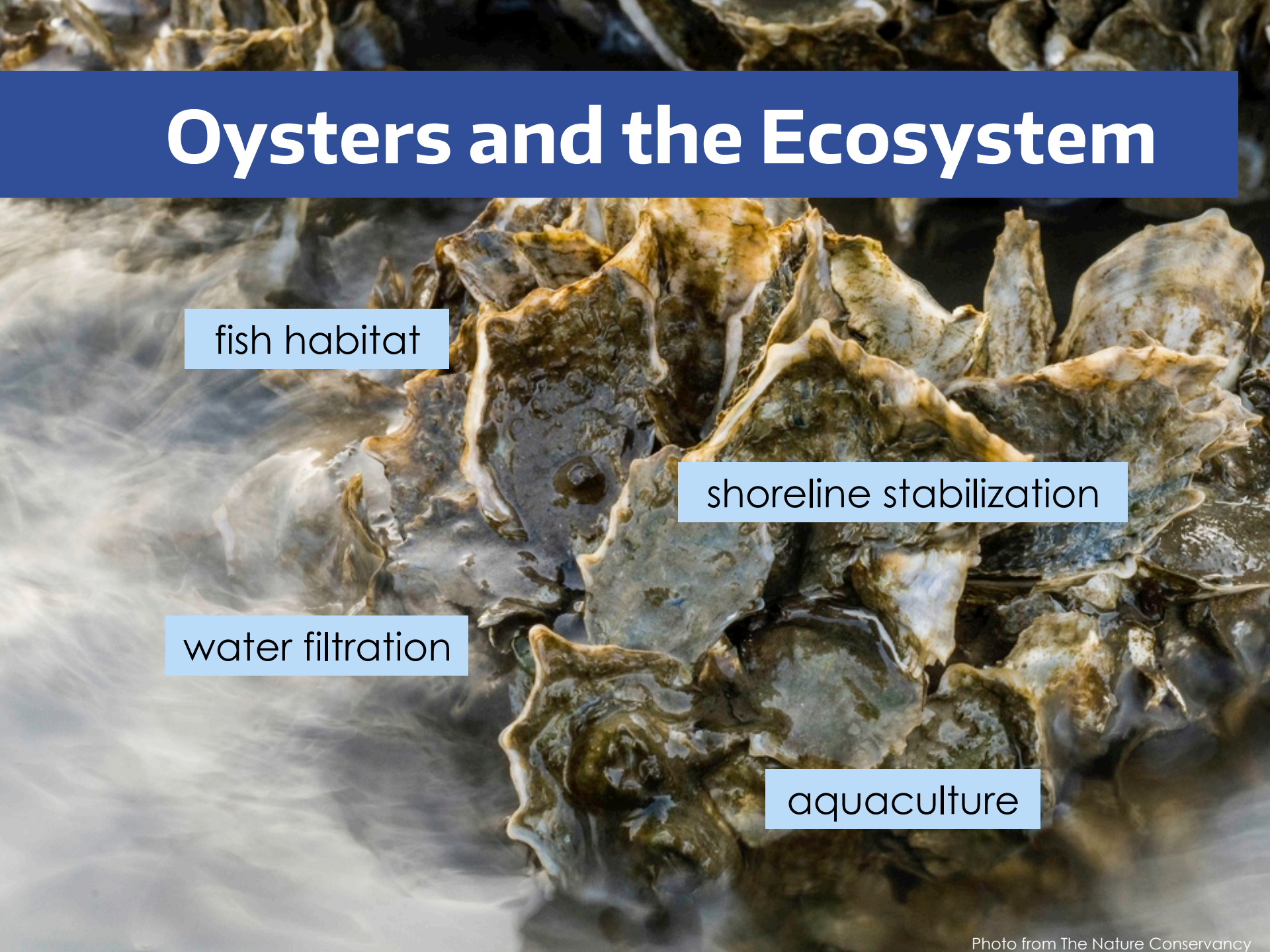


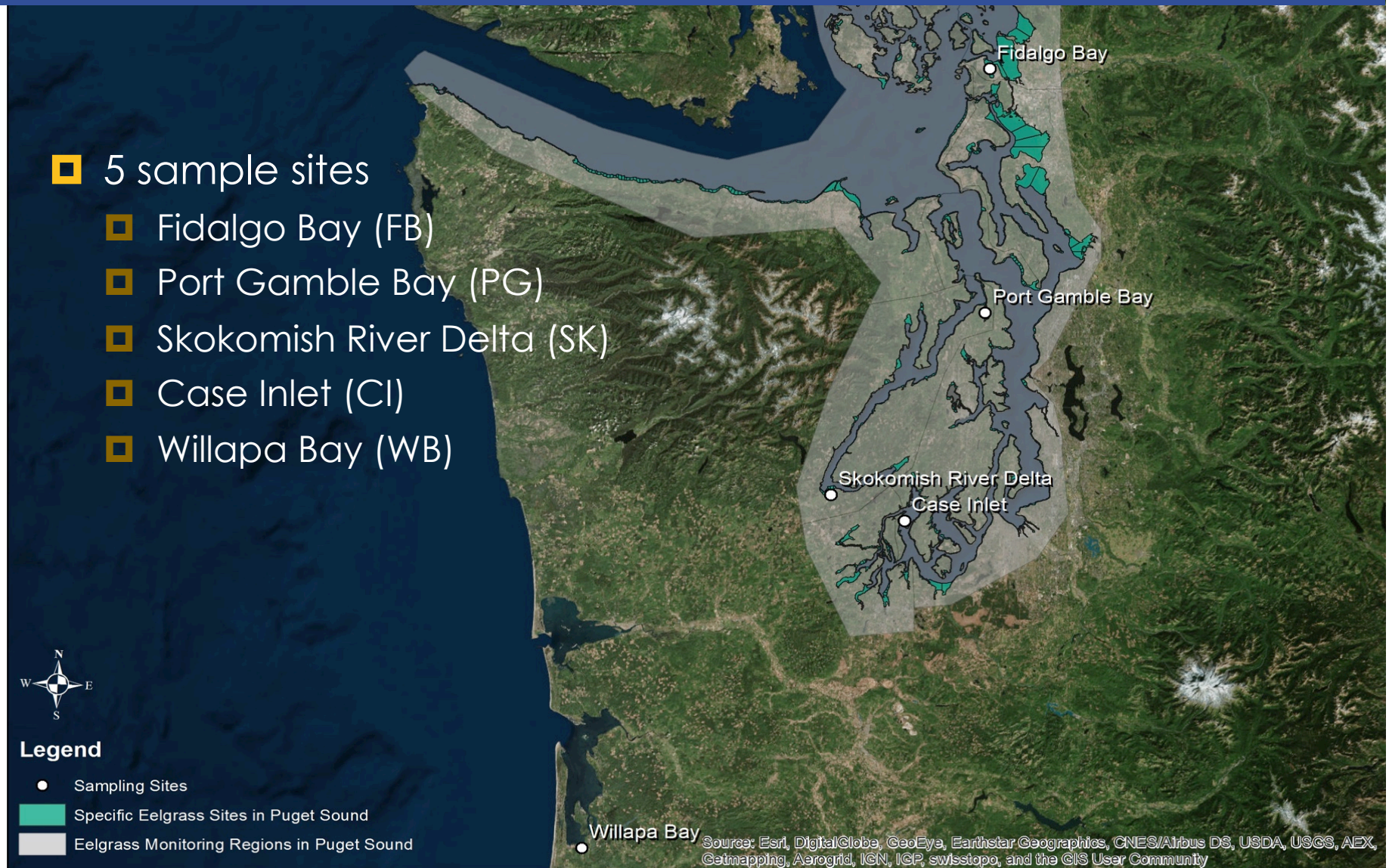
Photo from The Nature Conservancy

How does environmental variability affect *C. gigas*' stress response?

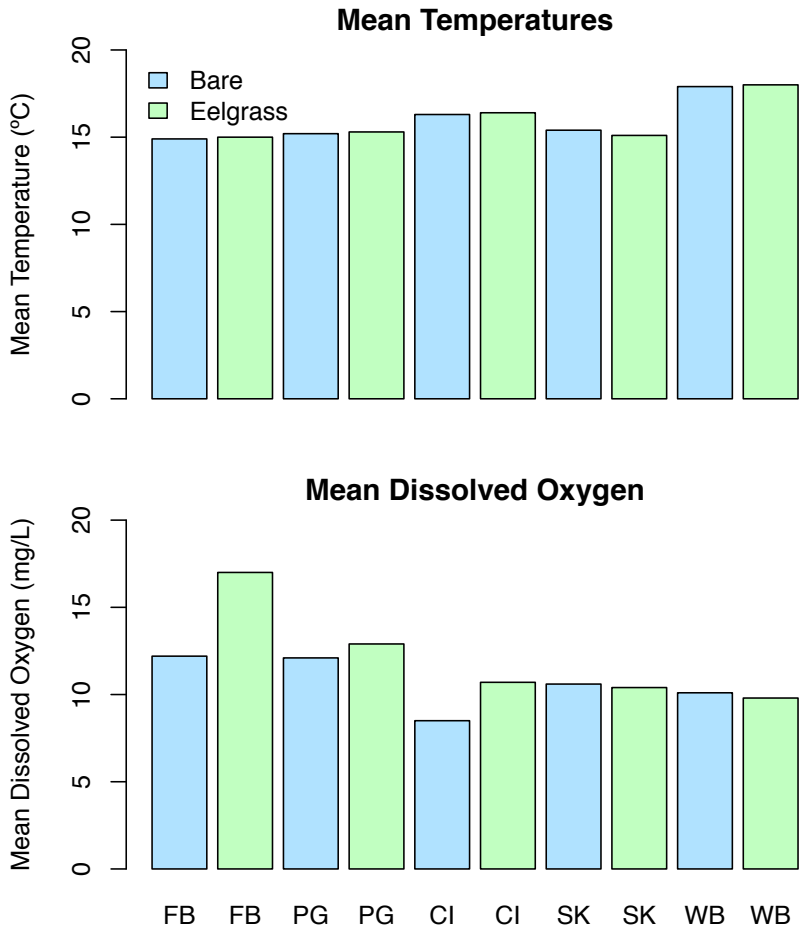
Differences in reproduction and immunity?
How can eelgrass presence shape these outcomes?
Can we detect differences in epigenetics and proteomics?

Environmental Variability

- 5 sample sites
  - Fidalgo Bay (FB)
  - Port Gamble Bay (PG)
  - Skokomish River Delta (SK)
  - Case Inlet (CI)
  - Willapa Bay (WB)



Environmental Variability

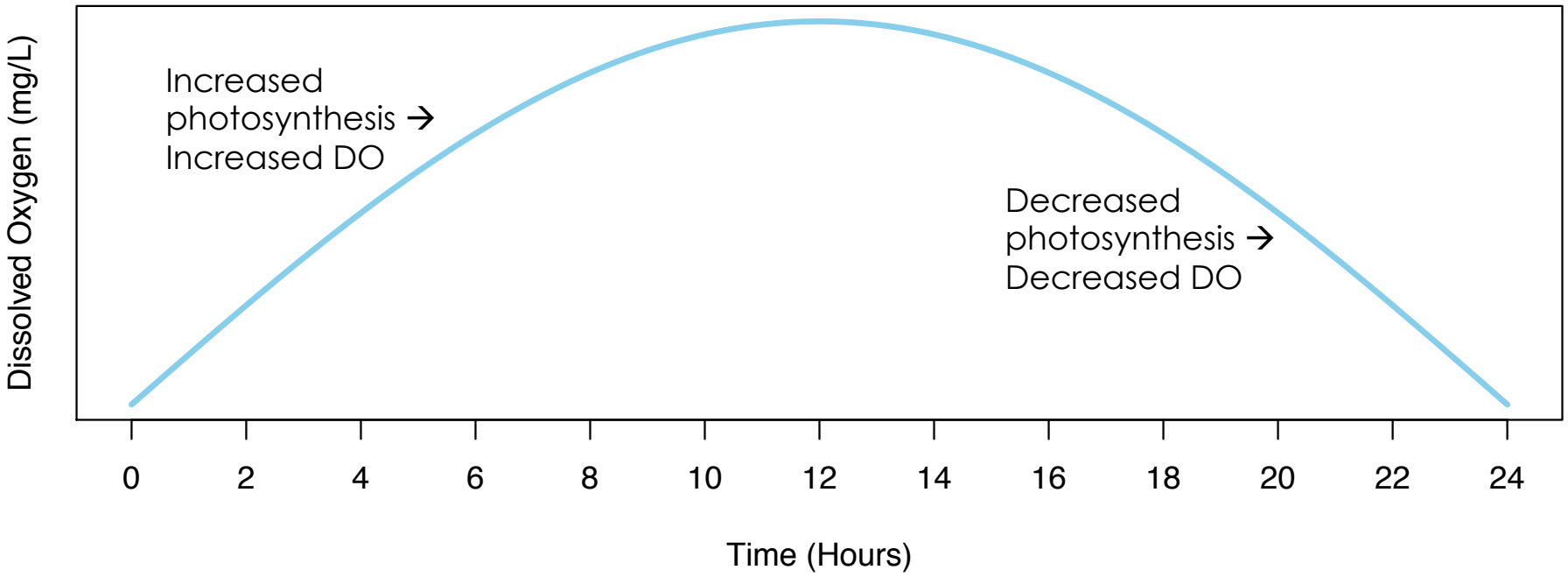


- WB warmest site (18°C)
- FB had highest DO
  - Bare: 12.2 mg/L
  - Eelgrass: 17 mg/L
- CI had lowest DO
  - Bare: 8.5 mg/L
  - Eelgrass: 10.7 mg/L

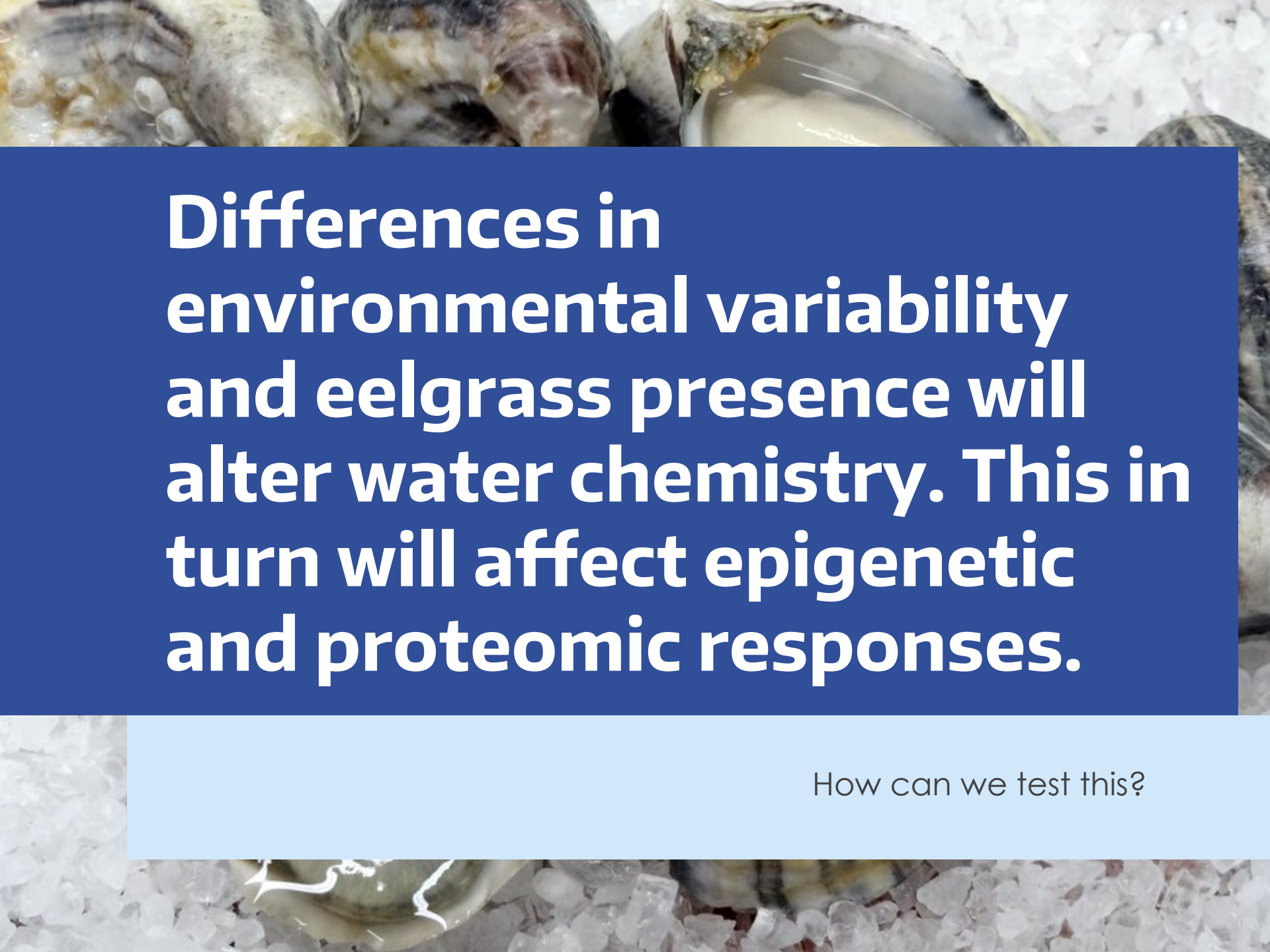
Eelgrass Presence

- White: Eelgrass monitoring region
- Green: Specific eelgrass sites

Eelgrass Presence



- Does eelgrass buffer or contribute to stress?
  - Buffer: Decreased expression of proteins for oxidative stress
  - Contribute: Increased expression of proteins for oxidative stress



Differences in environmental variability and eelgrass presence will alter water chemistry. This in turn will affect epigenetic and proteomic responses.

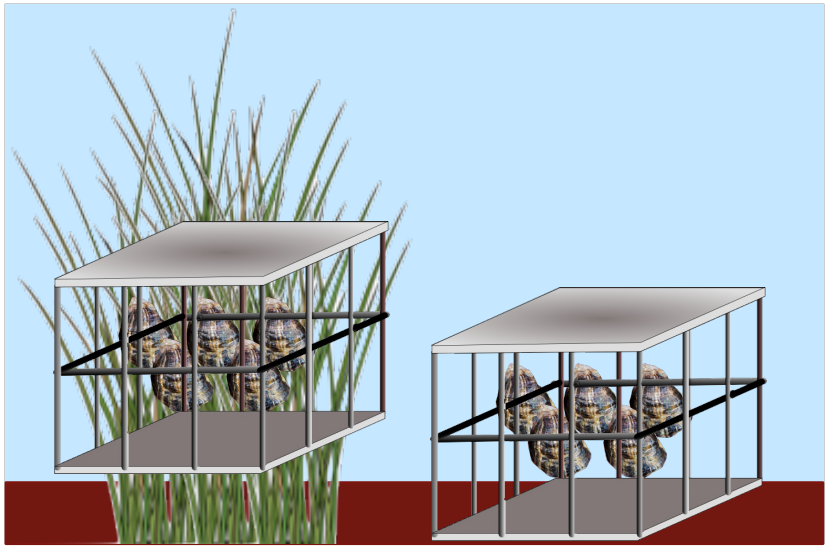
How can we test this?

Experimental Overview

150 oysters

3 replicates

outplant to 5 sites



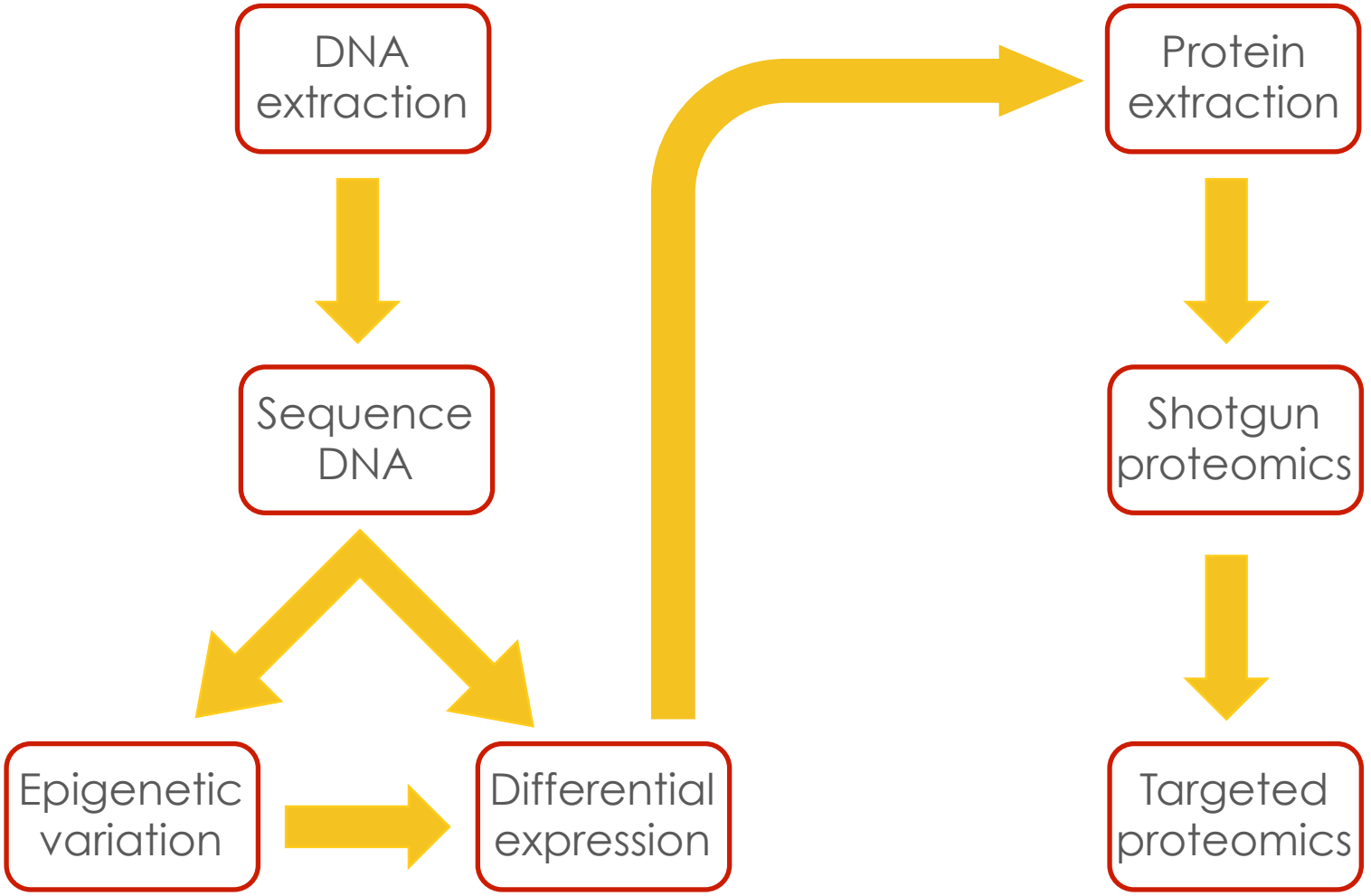
eelgrass vs. no eelgrass

DNA extraction

Protein extraction

Water chemistry data (temperature, dissolved oxygen)

Methods


DNA extraction
Sequence DNA
Epigenetic variation
Differential expression
Protein extraction
Shotgun proteomics
Targeted proteomics

Looking Forward

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

Photo from Capital Oysters

Photo from World Media Foundation

Thank You!

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