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

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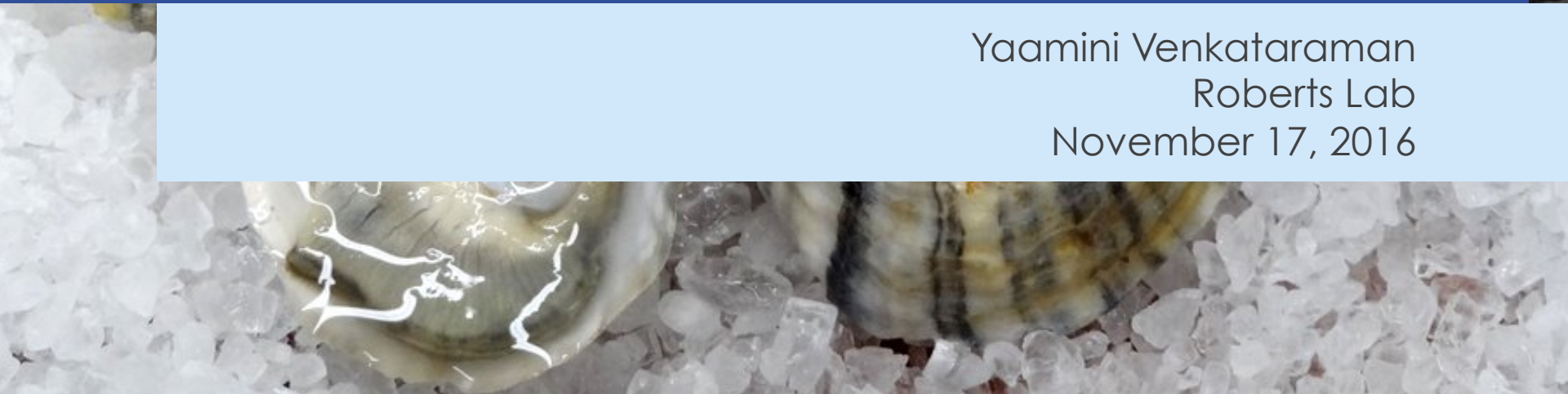
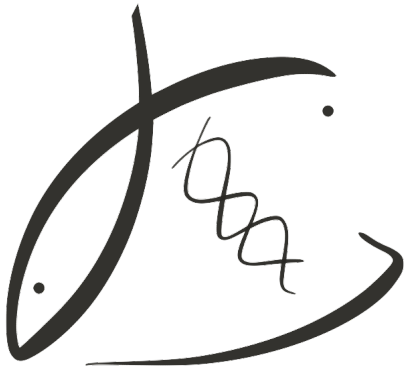


Outline

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



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Title Photo from Willapa Oysters

Oysters and the Ecosystem

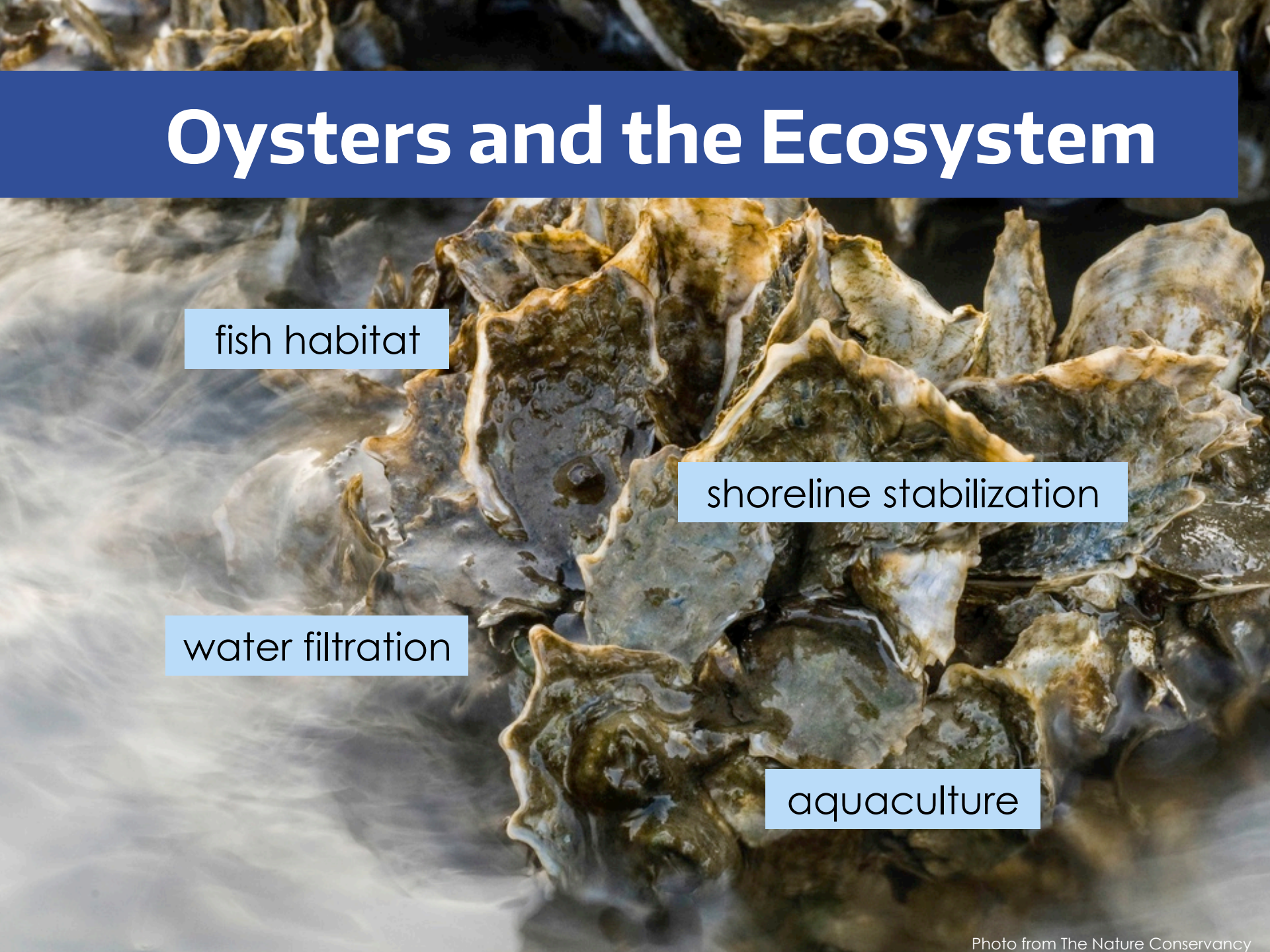


Photo from The Nature Conservancy

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?

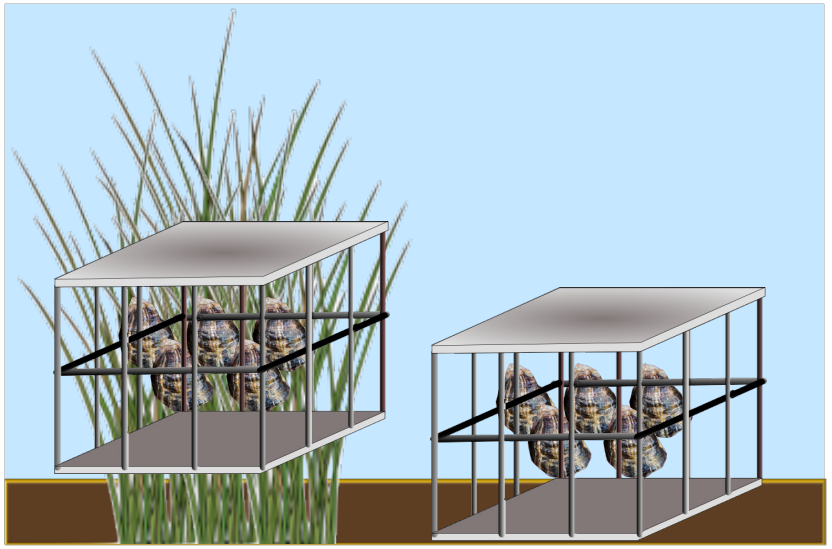
Experimental Overview

150 oysters per round

2 Rounds: June and July

3 replicates

outplant to 5 sites



eelgrass vs. no eelgrass

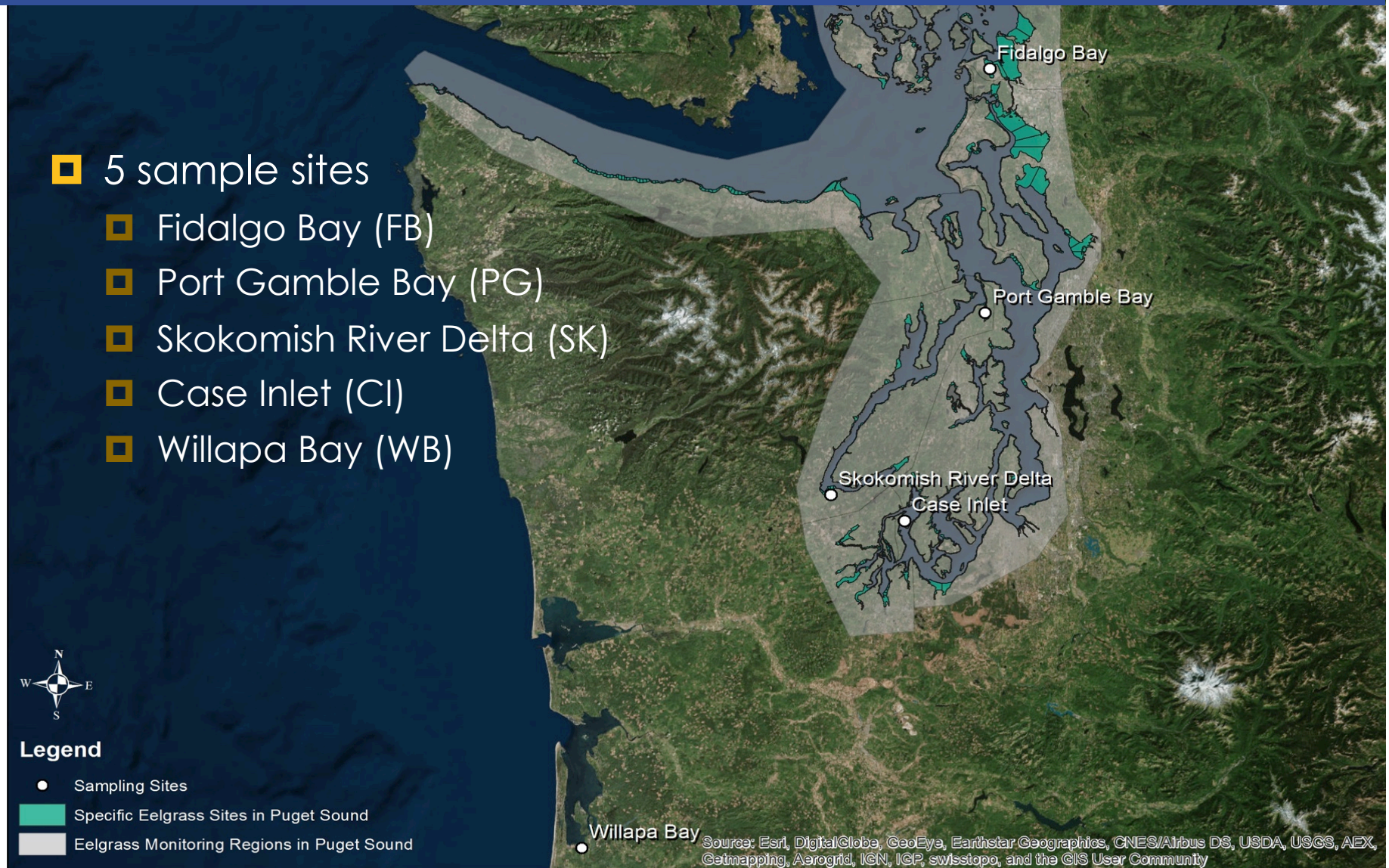
DNA extraction

Protein extraction

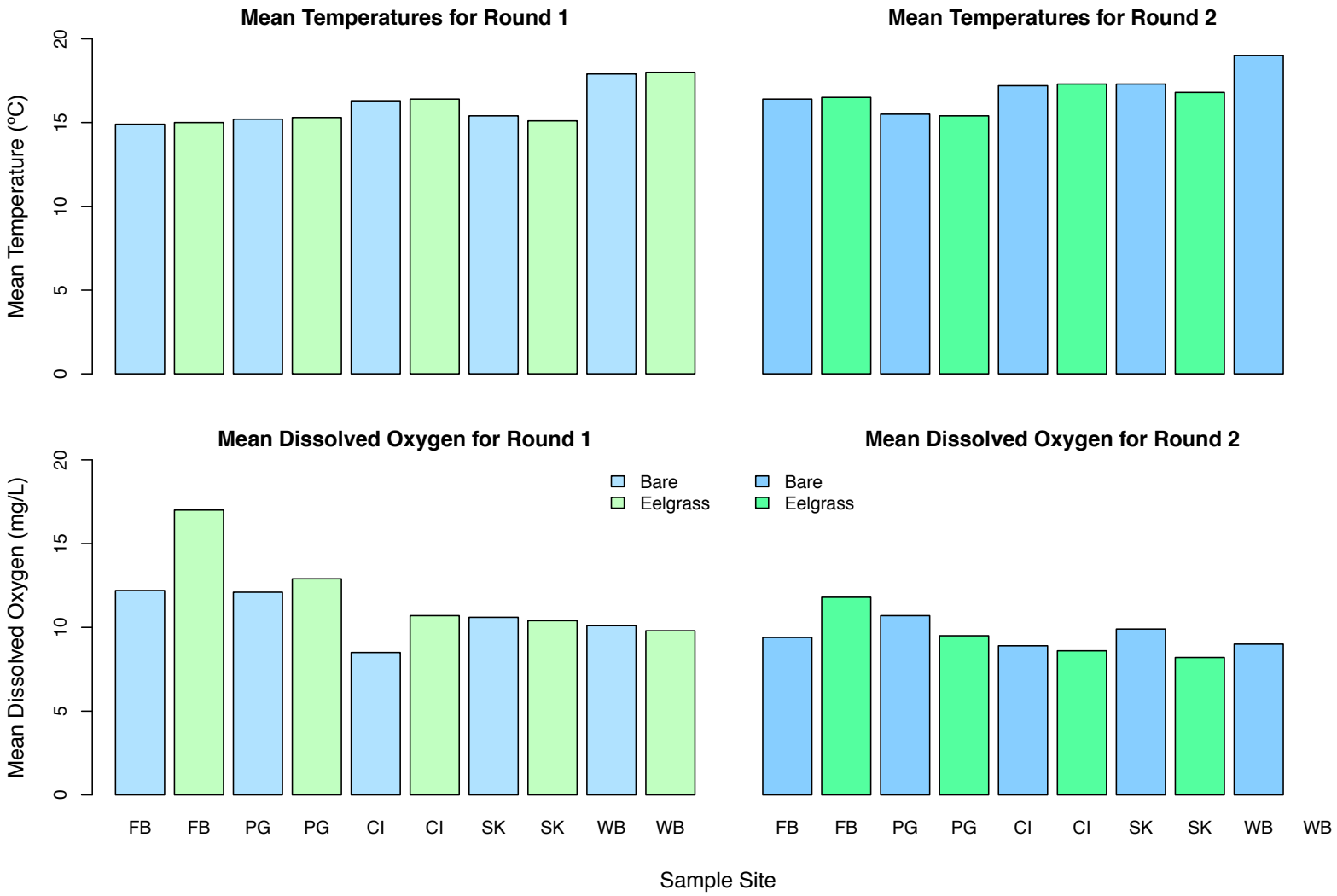
Water chemistry data (temperature, dissolved oxygen)

Environmental Variability

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



Environmental Variability

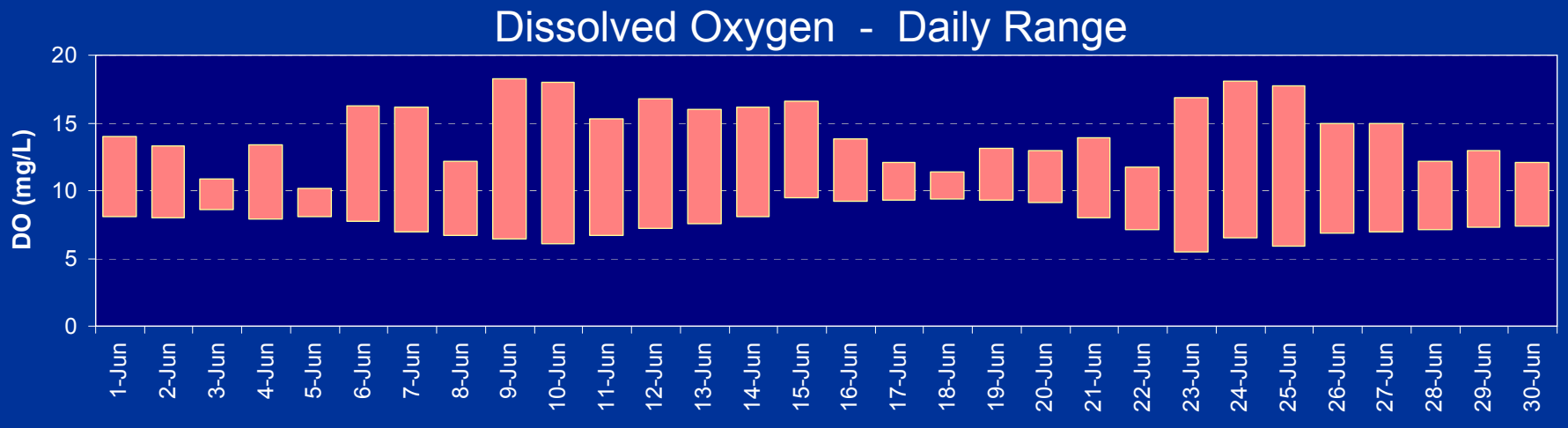


Eelgrass Presence

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

Eelgrass Presence

Bayview - June 2005



Nearshore Dissolved Oxygen Presentation (2007), Washington Department of Natural Resources

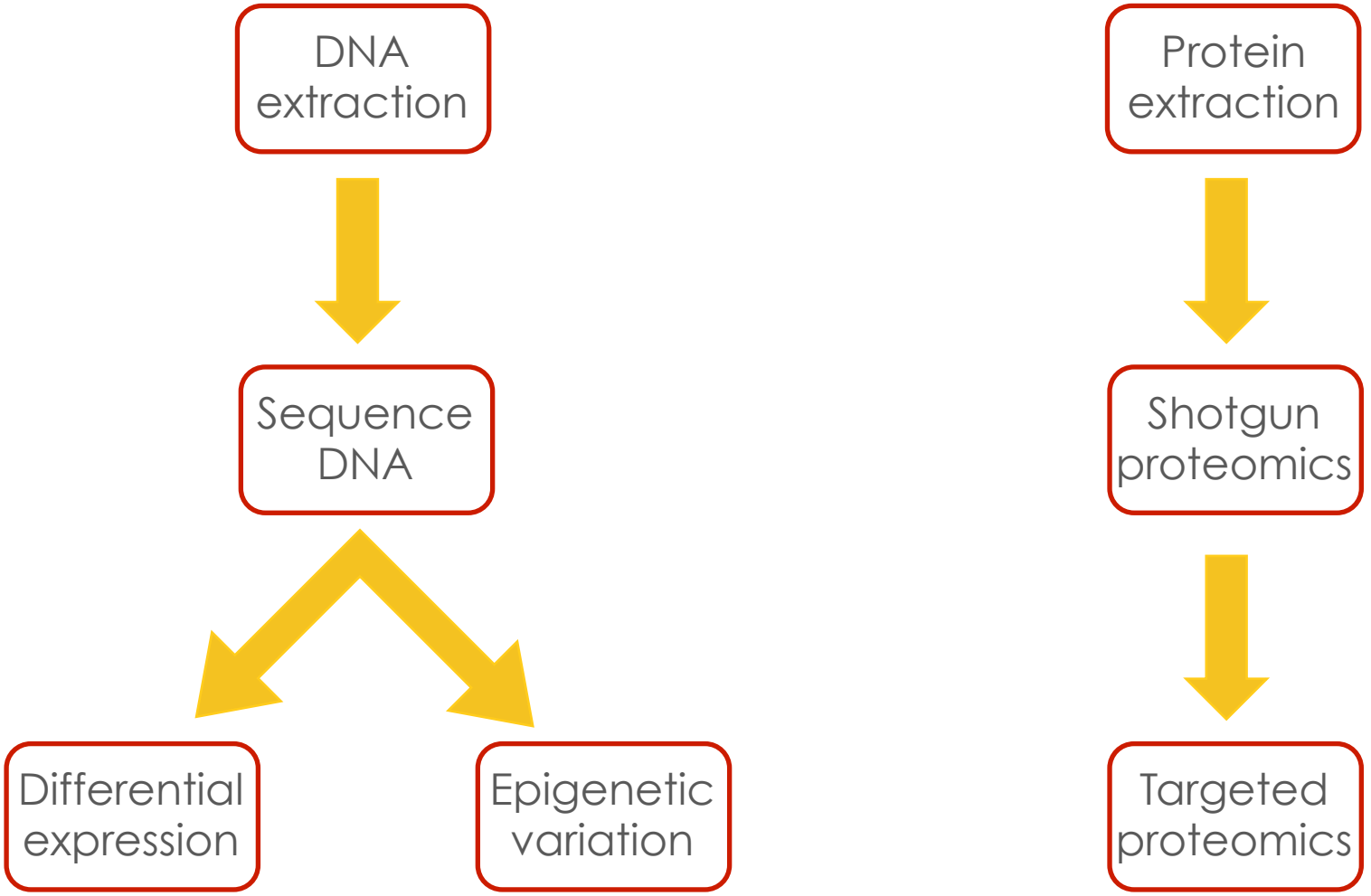
- Does eelgrass buffer or contribute to stress?
  - Buffer: Decreased expression of proteins for oxidative stress
  - Contribute: Increased expression of proteins for oxidative stress

Hypotheses

Differences in water chemistry and eelgrass presence at each site will affect the following:

Stressor	Expression of oxidative stress proteins	Epigenetic regulation
Increased Temperature (°C)	Increase	Decrease
Decreased Dissolved Oxygen (mg/L)	Increase	Decrease
Eelgrass: Buffers stress	Decrease	Increase
Eelgrass: Adds to stress	Increase	Decrease

Methods


DNA extraction
Sequence DNA
Differential expression
Epigenetic variation
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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