

# **Effectiveness of the Shellfish Standard in Newport Bay**

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# BACKGROUND

- **WQ standards for water contact recreation**
  - log mean of  $<200$  fecal coliforms /100 ml



- **WQ standards for recreational shellfish harvesting**
  - Monthly median of  $<14$  fecal coliforms/ 100 mL
  - No more 10% samples  $> 43$  fecal coliforms/ 100 mL





- Many clean areas fail the shellfish harvesting water quality objective

# THE TIME IS NOW

- 1<sup>st</sup> TMDL for failure of shellfish standard in Newport Bay
- Involved parties concerned standard doesn't have a firm scientific basis
- SCCWRP developed a study to evaluate shellfish standard efficacy

# APPROACH

Is there a correlation between fecal indicator microorganisms in water and fecal indicator microorganisms and pathogens in shellfish tissue?

SAMPLE	Microbe
	<ul style="list-style-type: none"><li>• <b>BACTERIA</b><ul style="list-style-type: none"><li>• Fecal coliforms</li><li>• <i>Enterococcus</i></li><li>• <i>E. coli</i></li><li>• HF183</li></ul></li><li>• <b>VIRUS</b><ul style="list-style-type: none"><li>• F+ coliphage</li><li>• Adenovirus</li><li>• Norovirus G1/G2</li></ul></li></ul>
	<ul style="list-style-type: none"><li>• <b>BACTERIA</b><ul style="list-style-type: none"><li>• Fecal coliforms</li><li>• <i>E. coli</i></li></ul></li><li>• <b>VIRUS</b><ul style="list-style-type: none"><li>• F+ coliphage</li><li>• Adenovirus</li><li>• Norovirus G1/G2</li></ul></li></ul>

# SHELLFISH FECAL COLIFORM STANDARD



Pathogens detected



Exceeding SHEL  
14 FC/ 100 mL

	YES	NO
YES	1	12
NO	1	34

# SHELLFISH FECAL COLIFORM STANDARD

Results hold true  
for wet weather  
conditions?





# METHODS



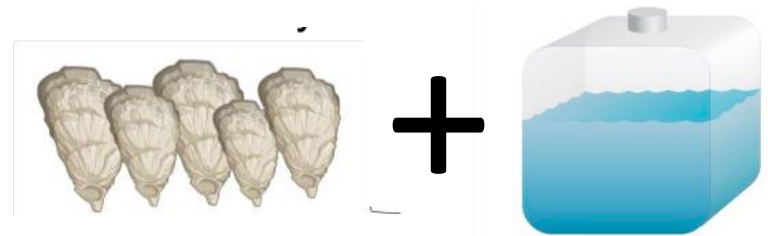
①. Oyster collection

③. Oyster deployment



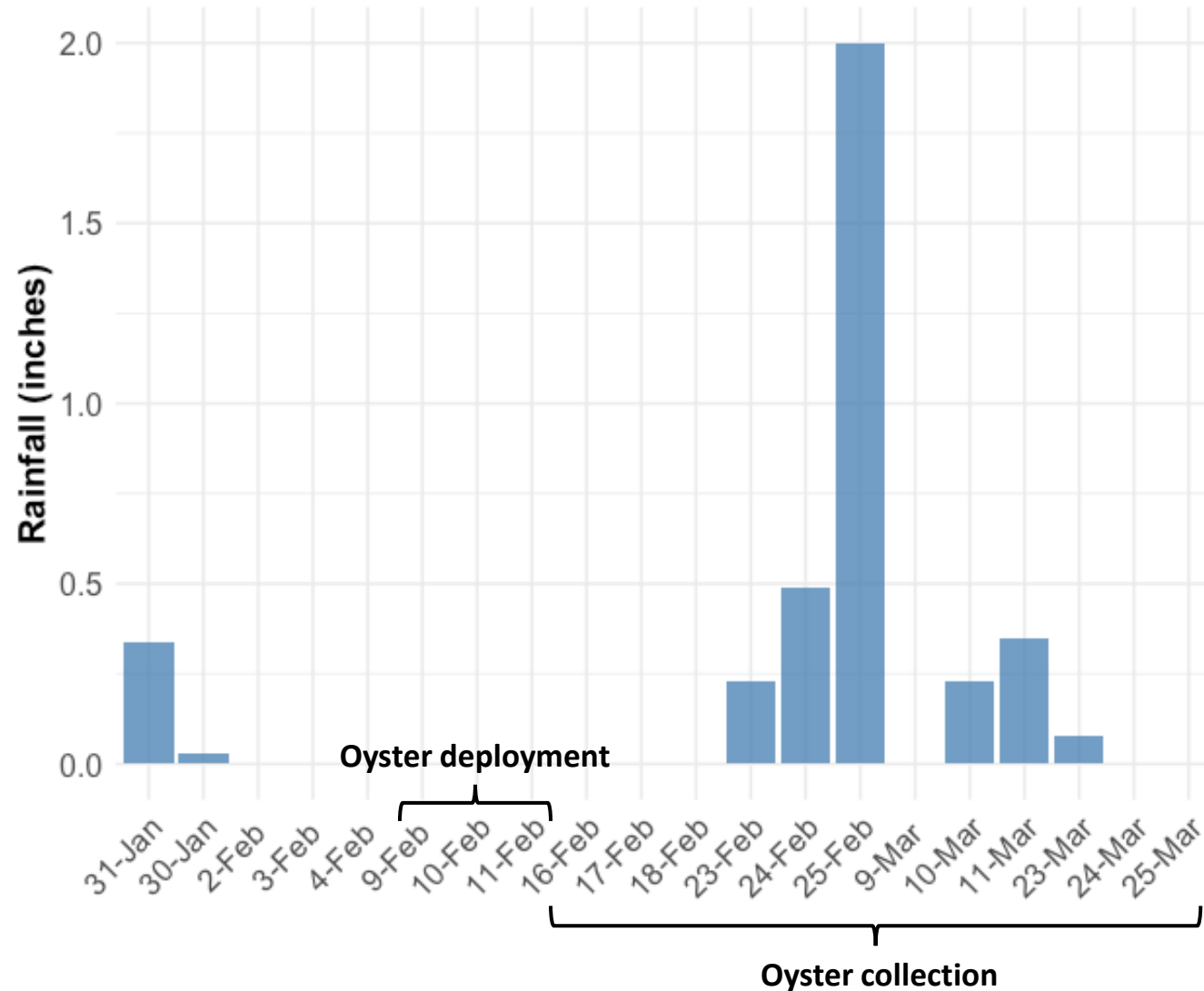
②. Oyster depuration

▶ Paired oyster and water samples



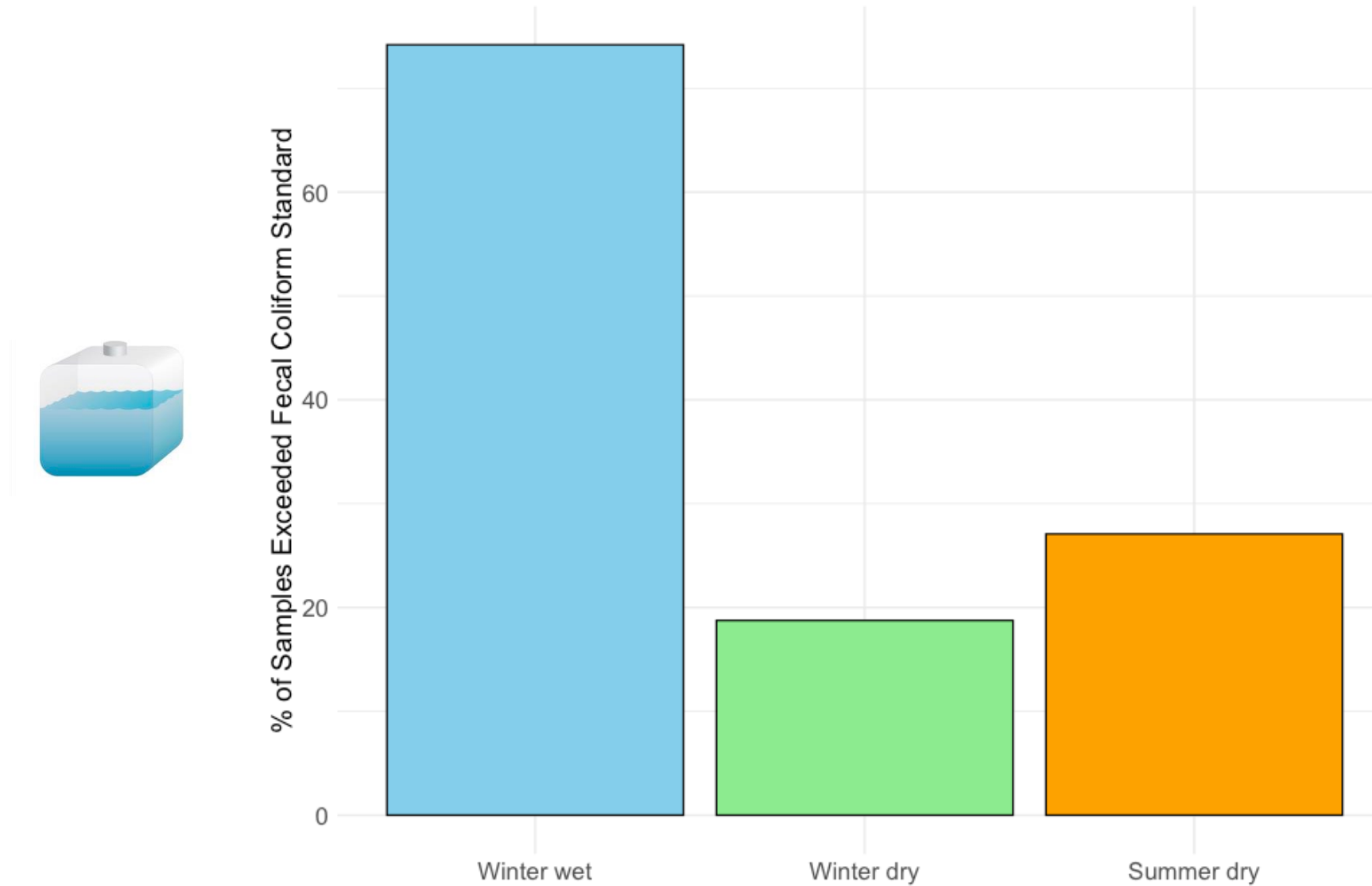
④. Sample gathering

# WET WEATHER STUDY ENCOMPASSED DIVERSE WEATHER CONDITIONS

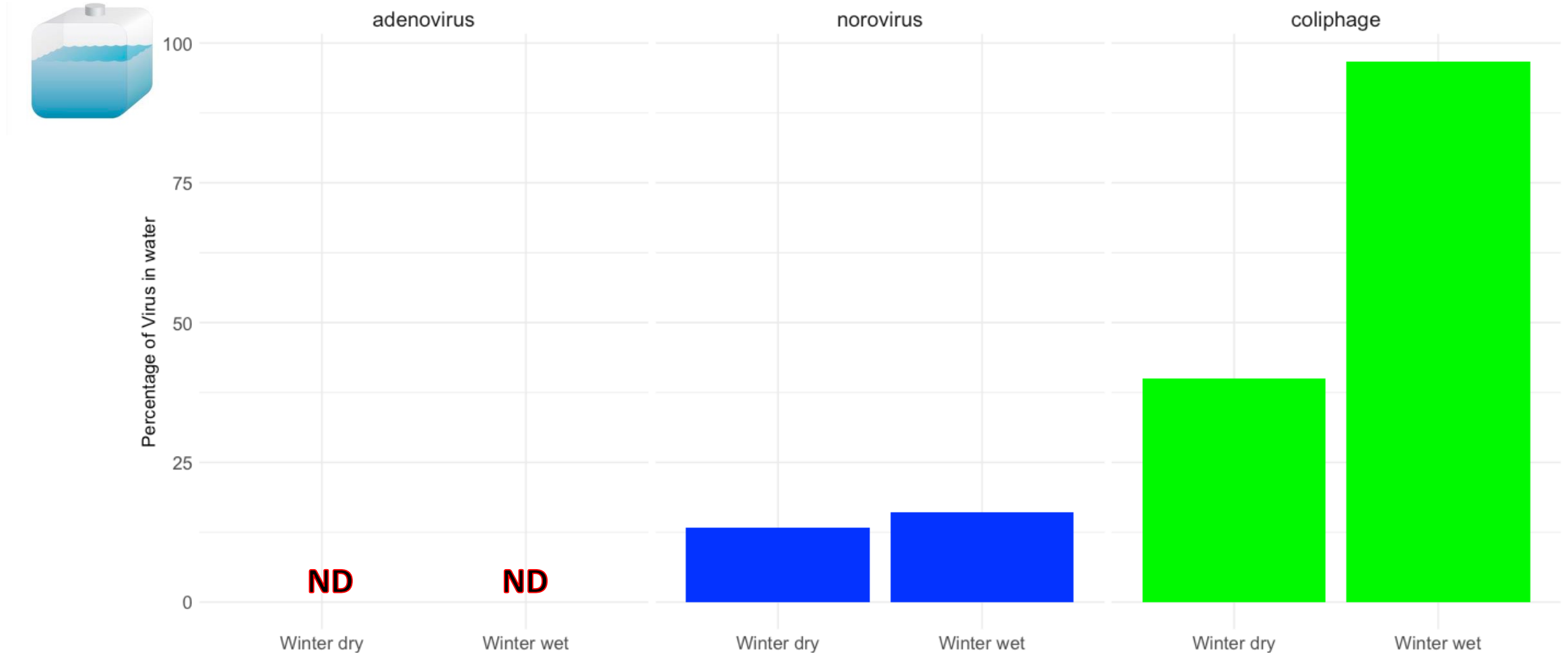




# MOST SITES EXCEEDED FECAL COLIFORM STANDARD DURING WET WEATHER

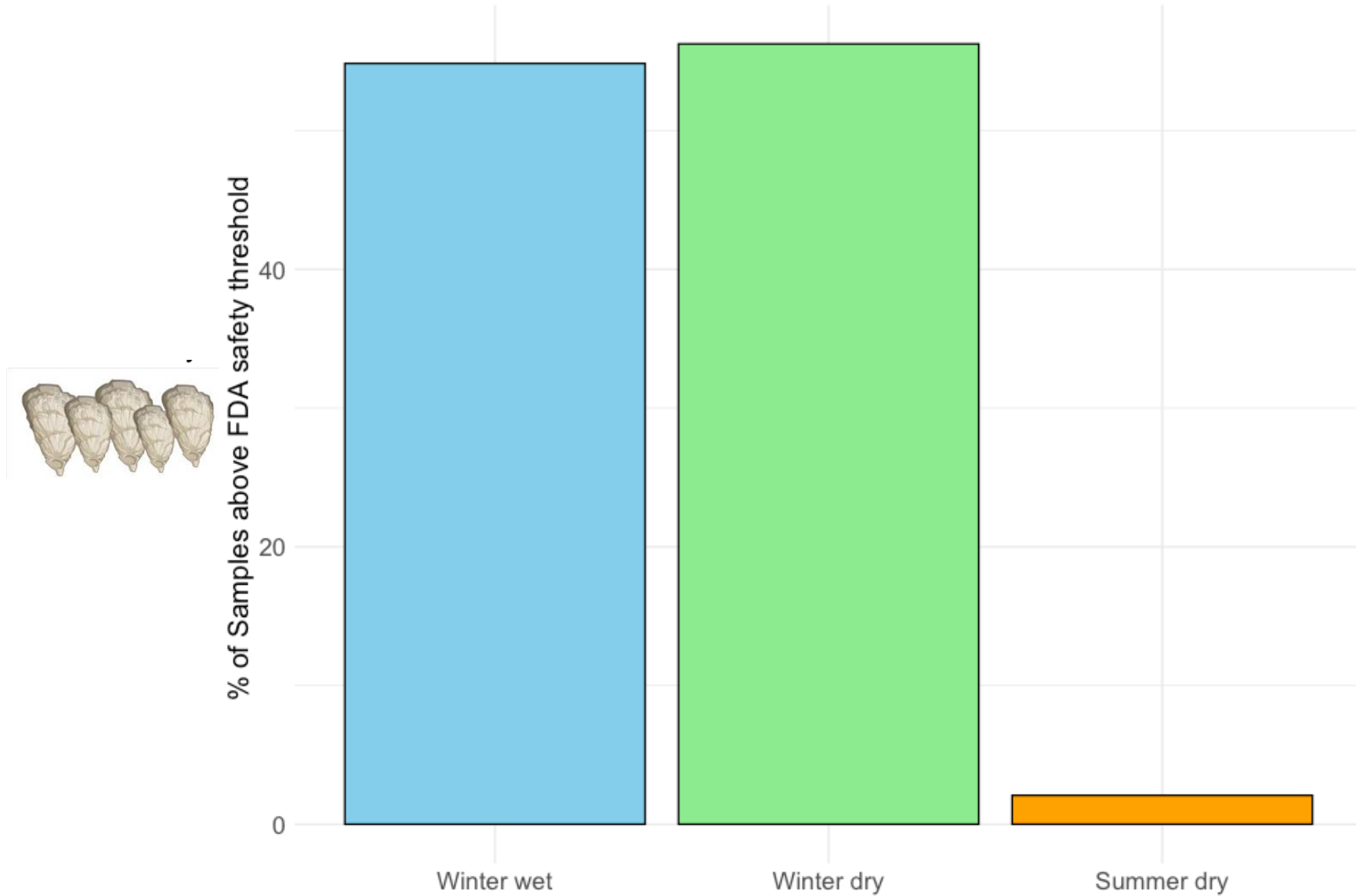


# VIRAL PREVALENCE IN WATER



**ND- Not detected**

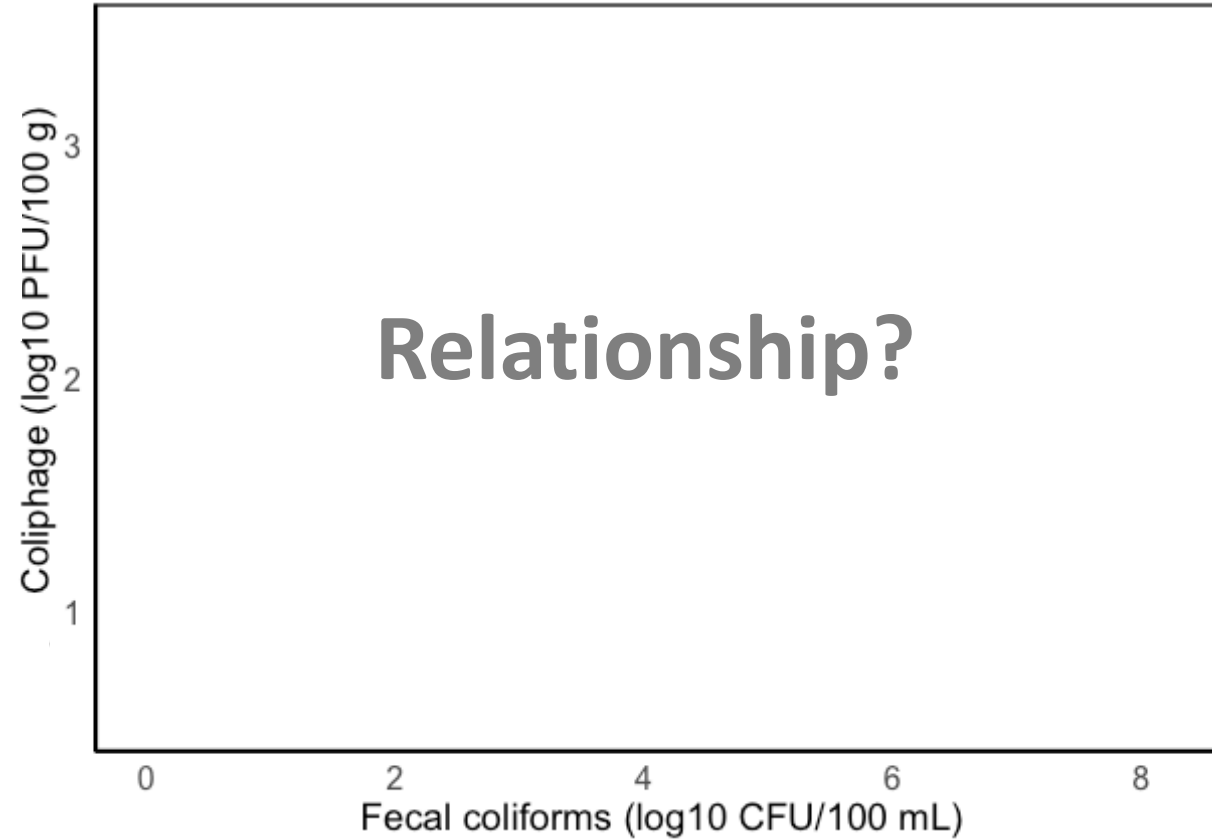
# EXCEEDANCE OF FDA THRESHOLD OF COLIPHAGE IN SHELLFISH



# BACTERIAL INDICATOR PREDICTIVE OF VIRAL INDICATOR IN SHELLFISH?



**Viral**  
indicator

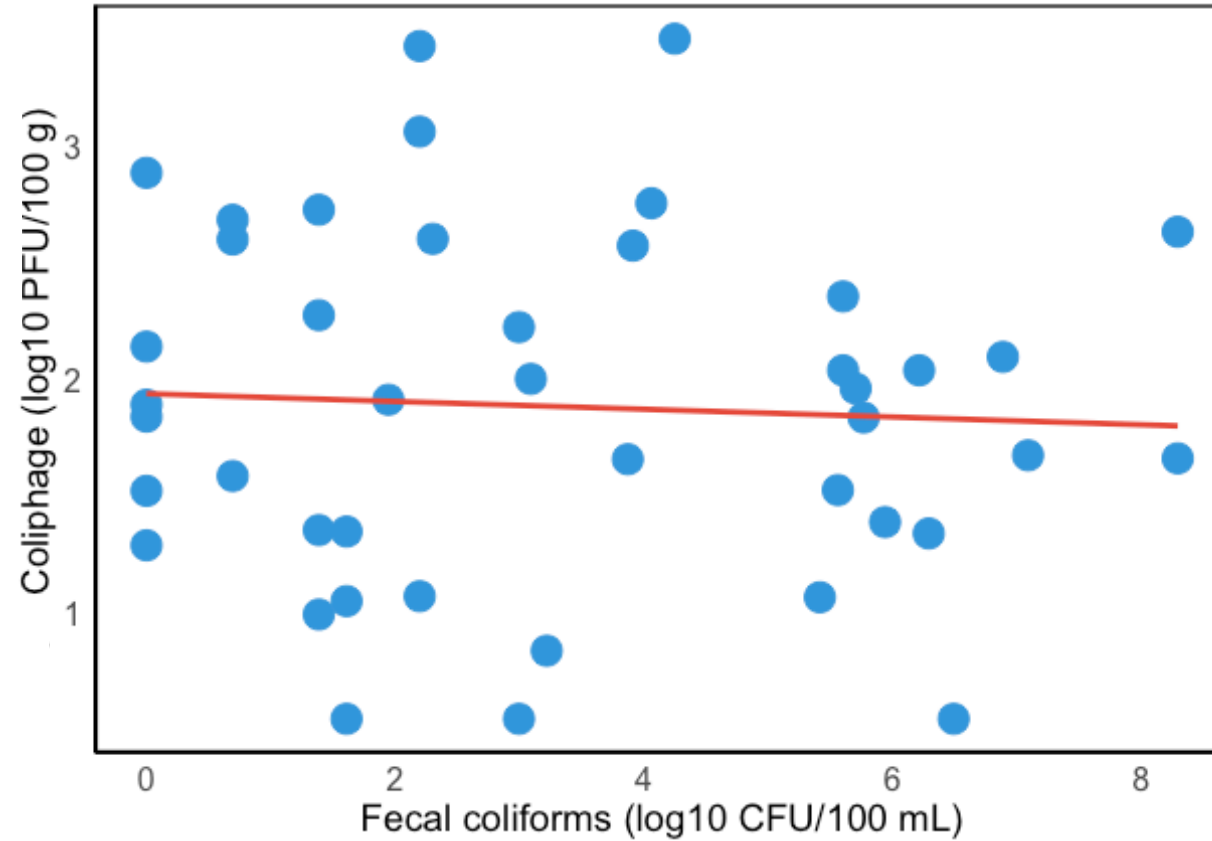


**Bacterial**  
indicator

# BACTERIAL INDICATOR IS NOT PREDICTIVE OF VIRAL INDICATOR IN SHELLFISH



**Viral**  
indicator

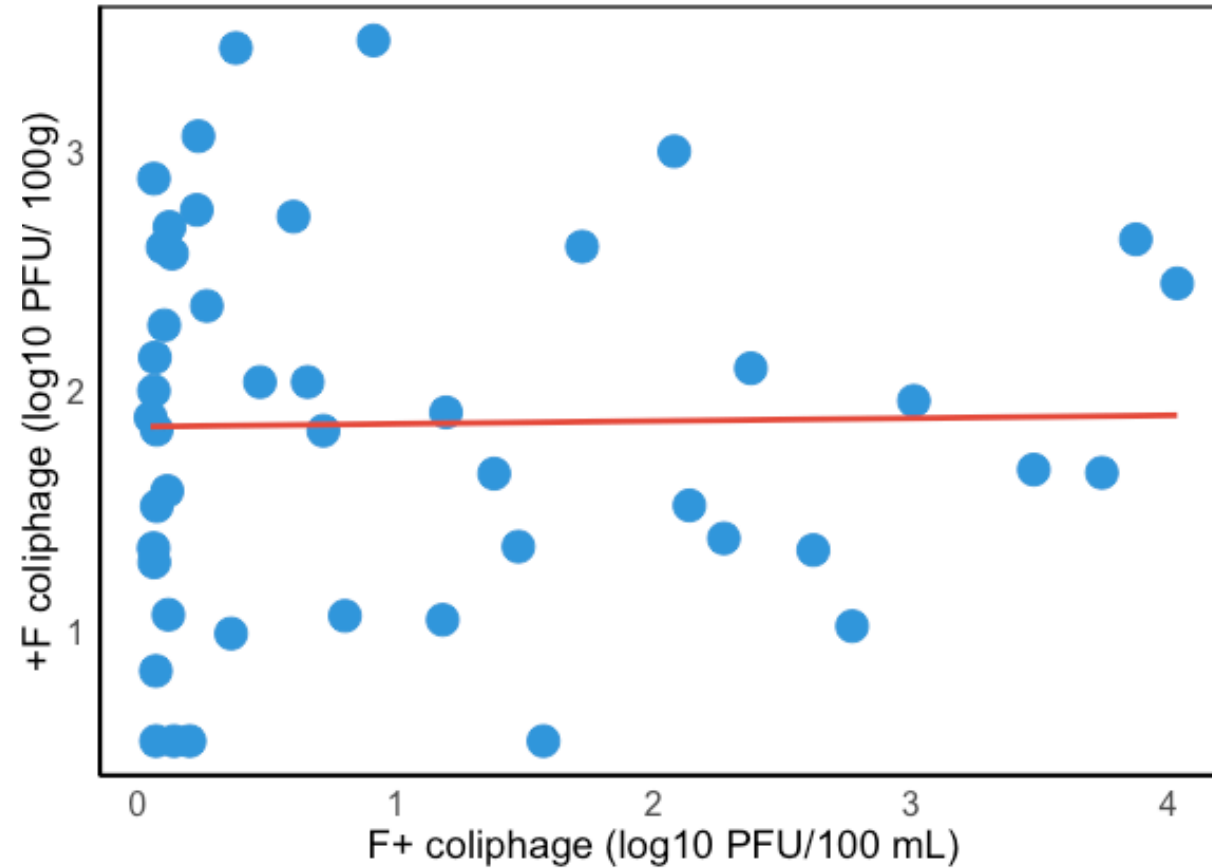


**Bacterial**  
indicator

# COLIPHAGE IN WATER ARE NOT PREDICTIVE OF COLIPHAGE IN SHELLFISH



**Viral**  
indicator





## NEXT STEPS

- SCCWRP: Analyze norovirus and adenovirus data in shellfish
- Newport Bay stakeholders: Site-specific objectives?
- Other waterbodies?



THANK YOU!





