

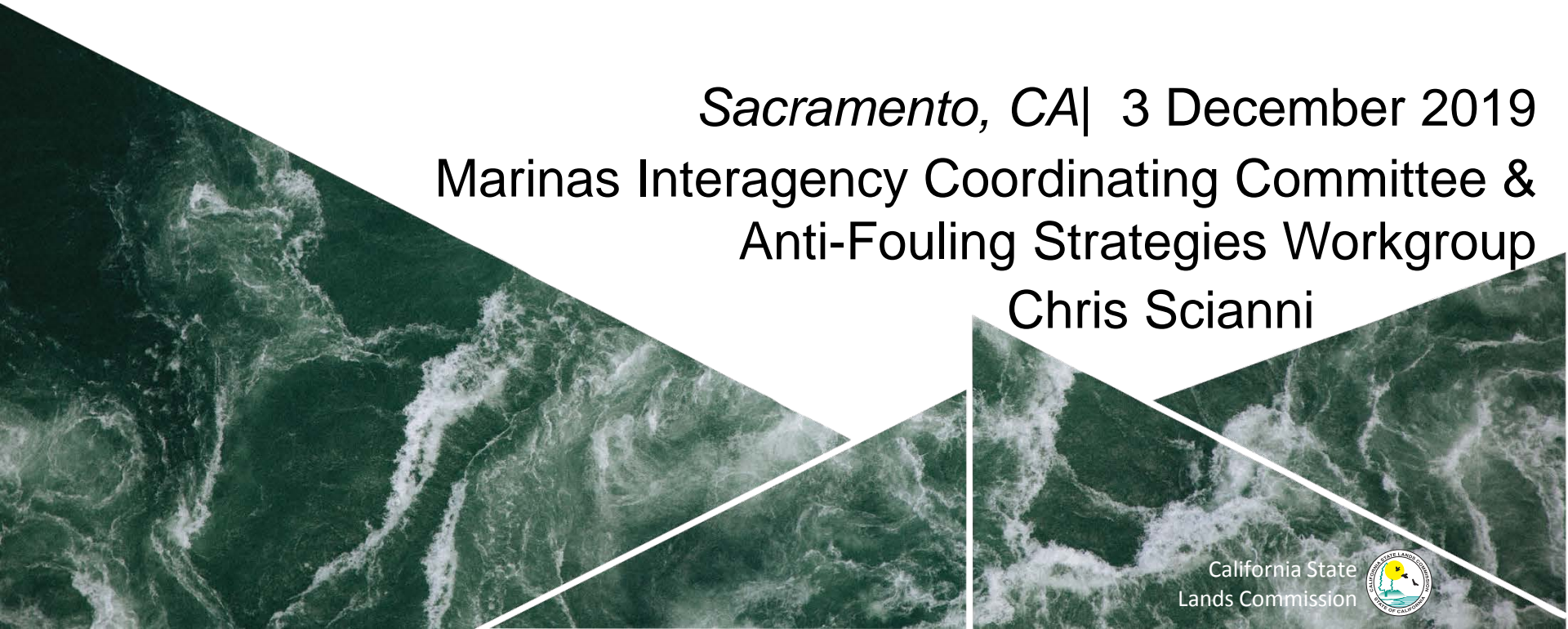


# Environmental Risks Associated with In-Water Cleaning

*Sacramento, CA* | 3 December 2019

Marinas Interagency Coordinating Committee &  
Anti-Fouling Strategies Workgroup

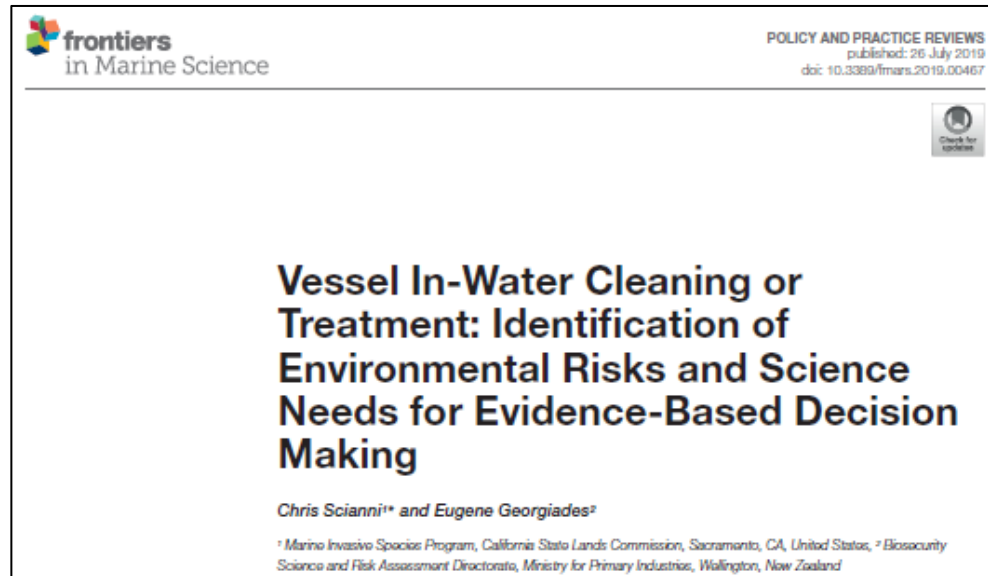
Chris Scianni



# Acknowledgement

Eugene Georgiades

- New Zealand Ministry for Primary Industries



Open Access: <https://doi.org/10.3389/fmars.2019.00467>

# What Are We Concerned About?



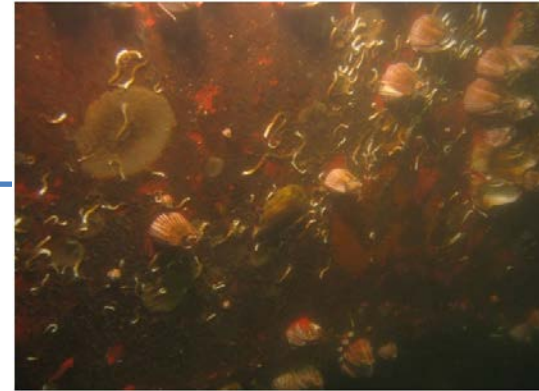
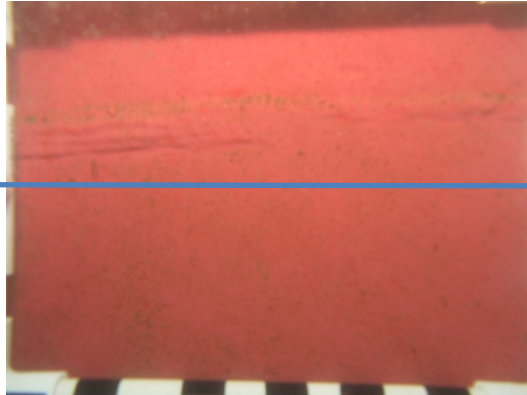
Biosecurity



Water Quality

# What Are The Approaches to Vessel In-Water Cleaning?

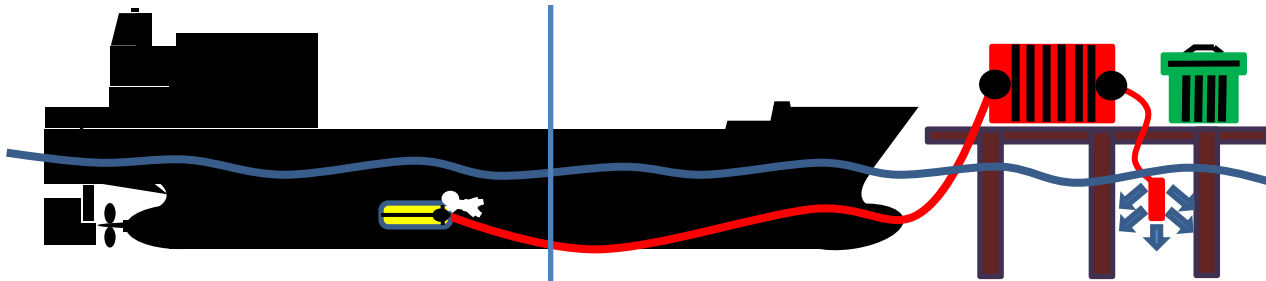
Proactive



Reactive

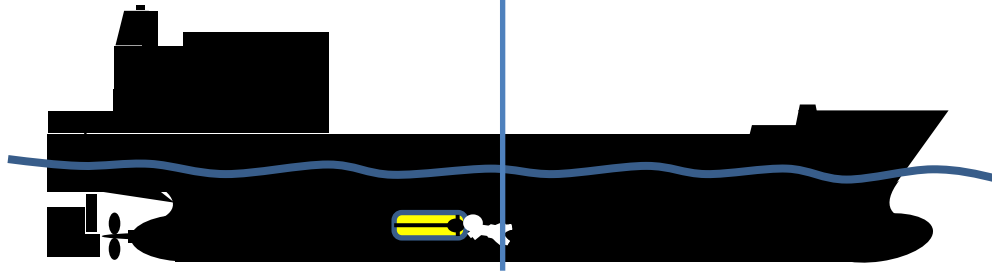
# What Are The Approaches to Vessel In-Water Cleaning?

With Capture



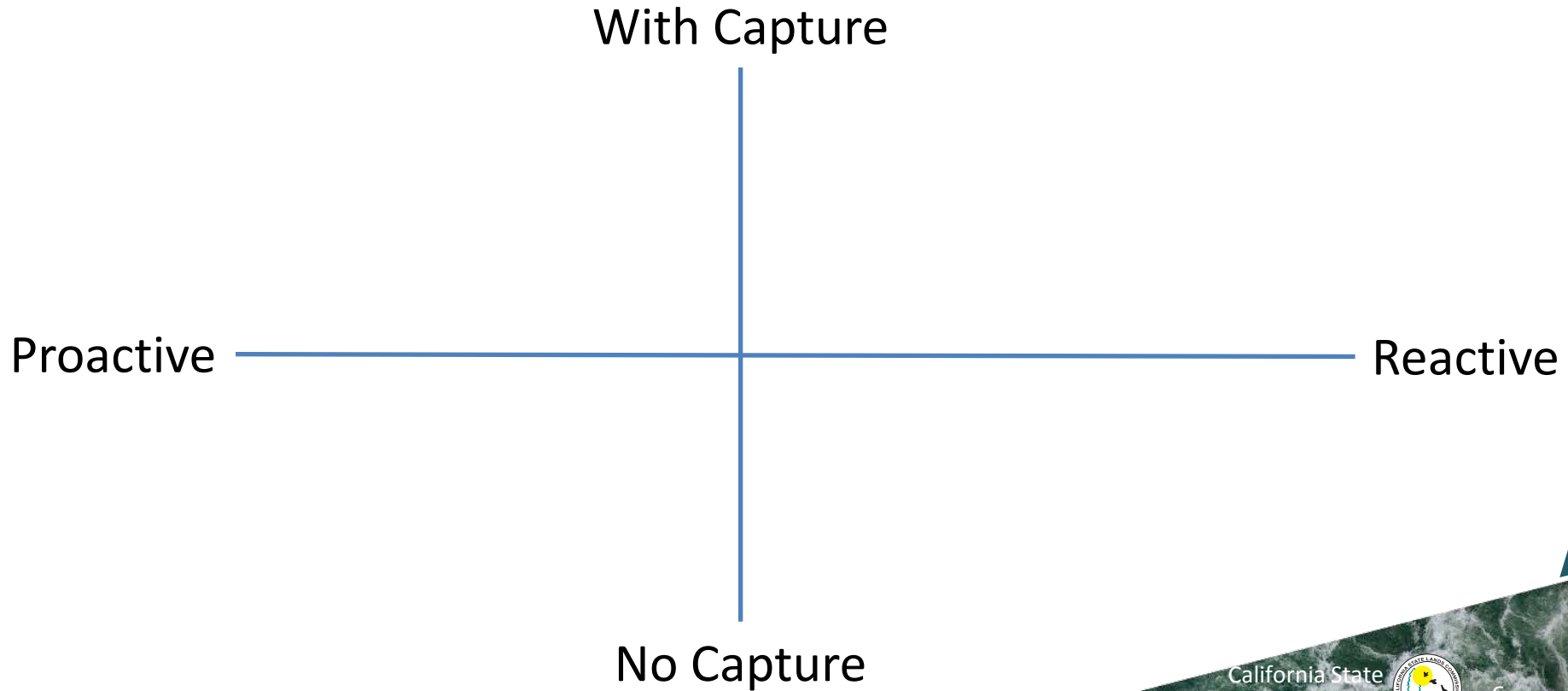
Proactive

Reactive

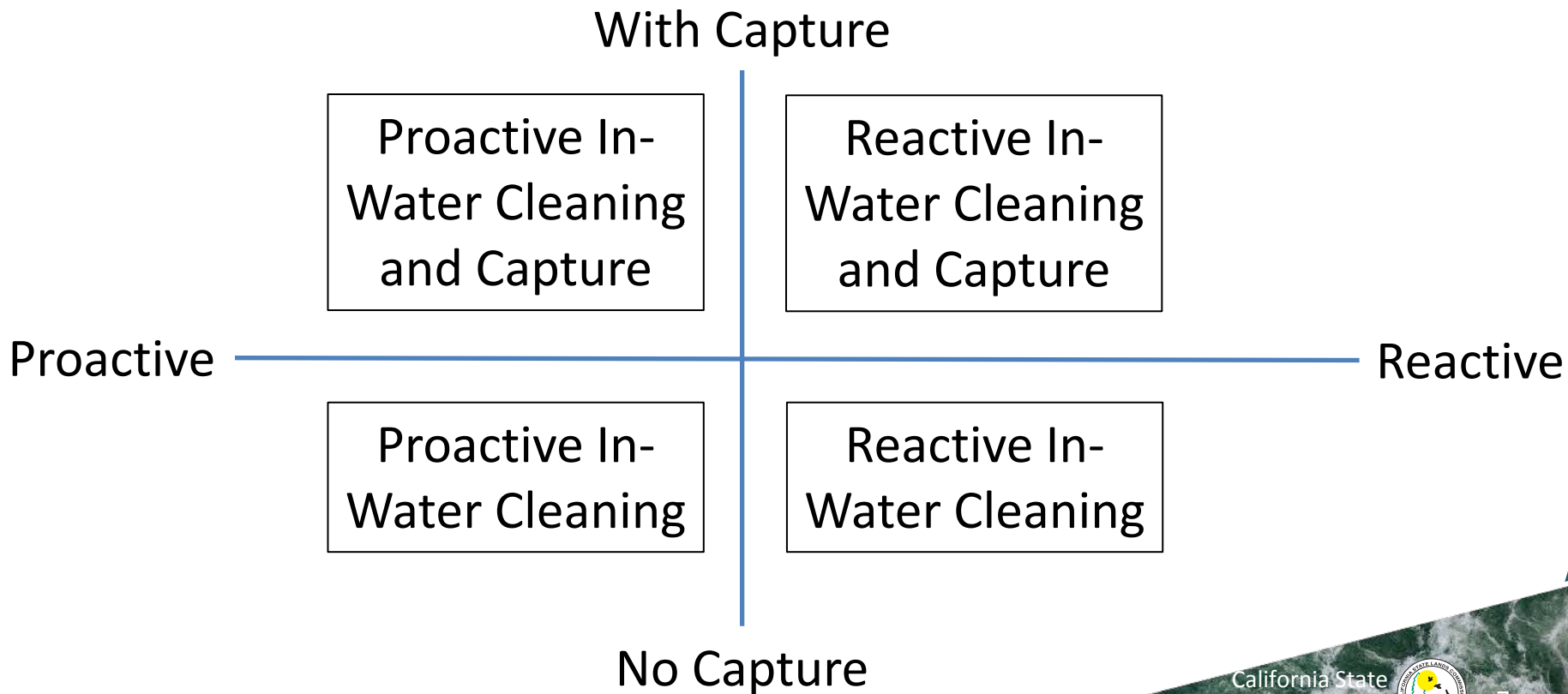


No Capture

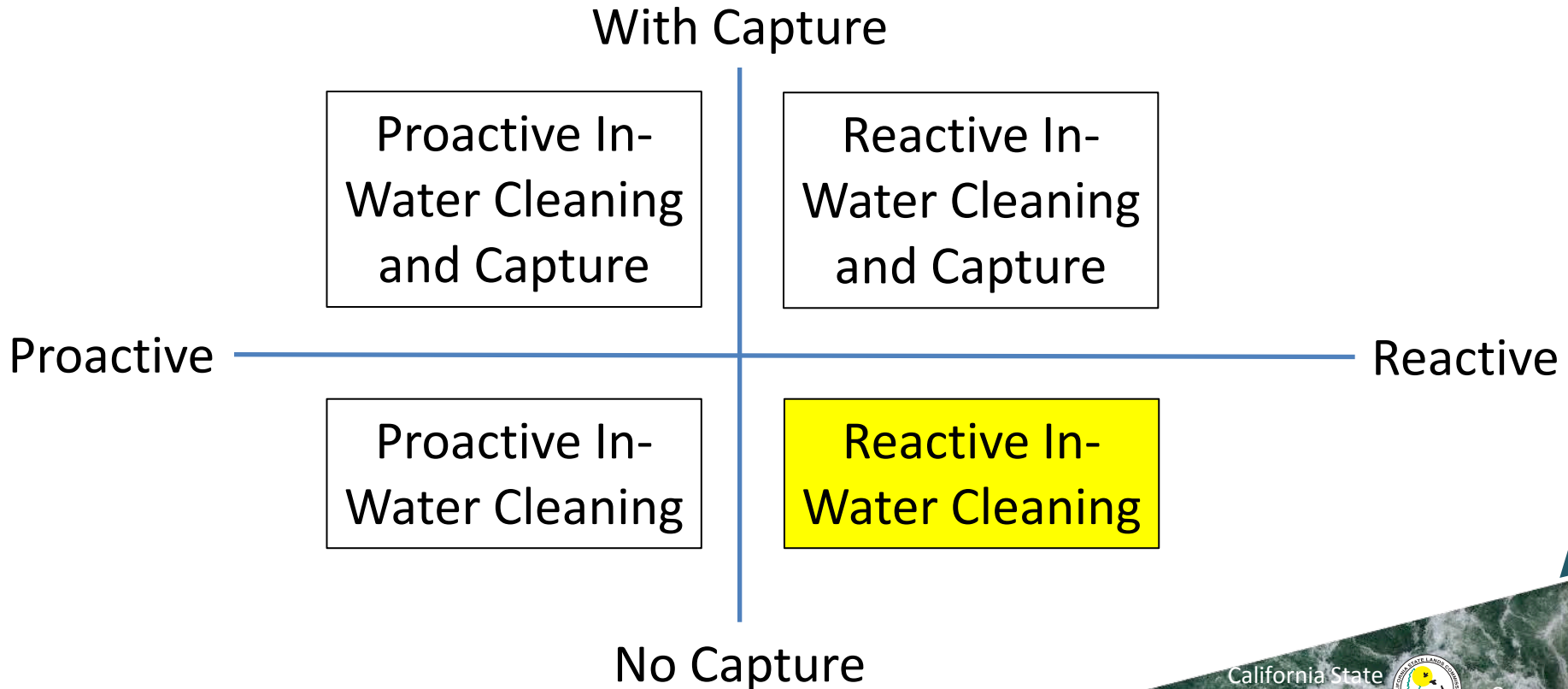
# What Are The Approaches to Vessel In-Water Cleaning?



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# What Are The Approaches to Vessel In-Water Cleaning?



Acceptable Biosecurity Risk?

Acceptable Water Quality Risk?

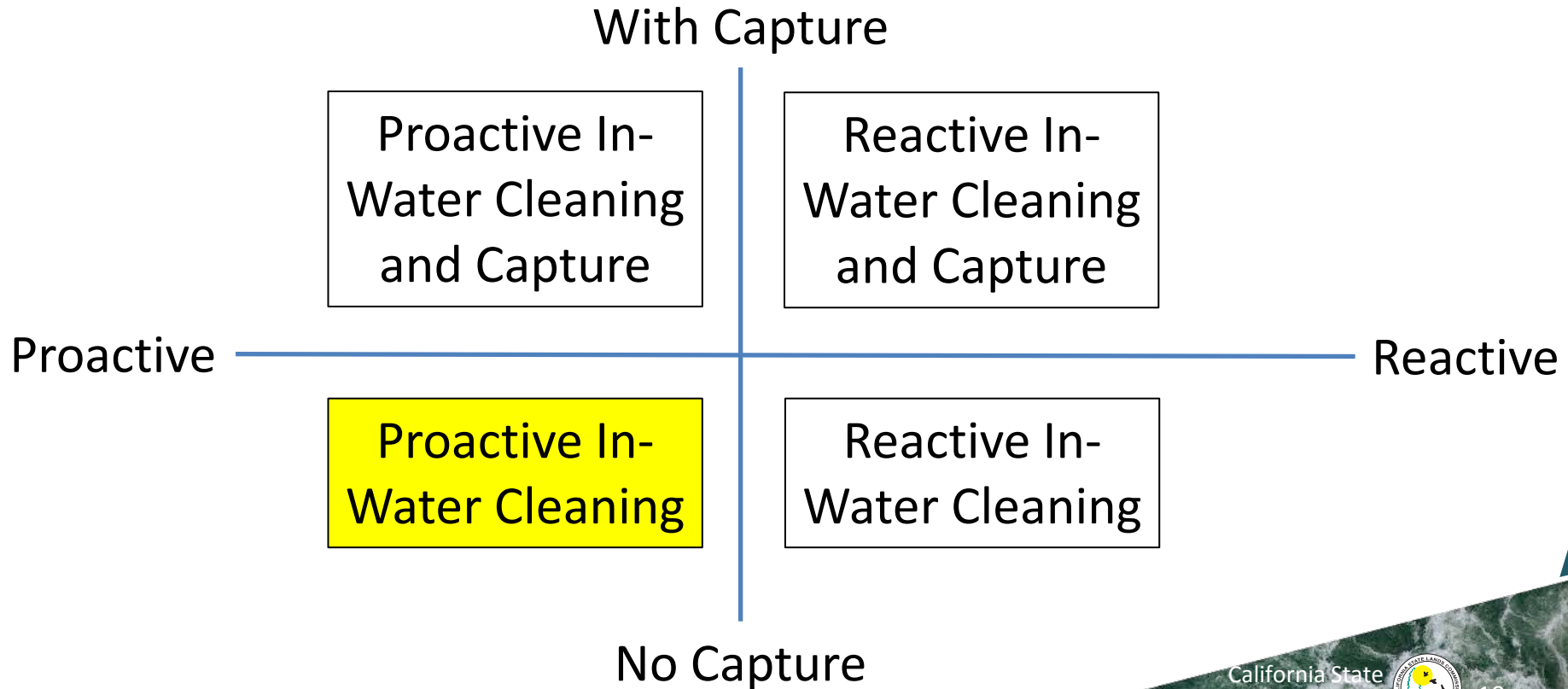


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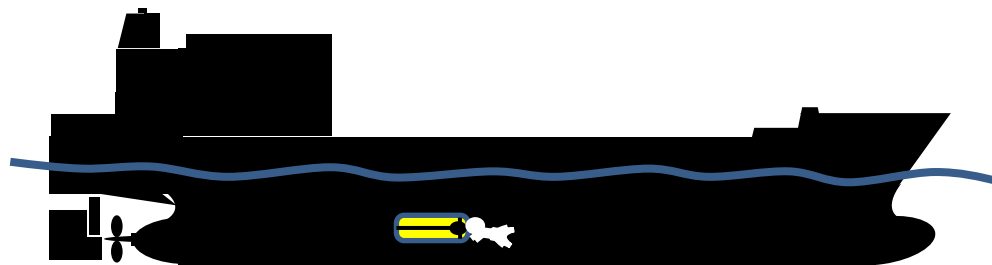
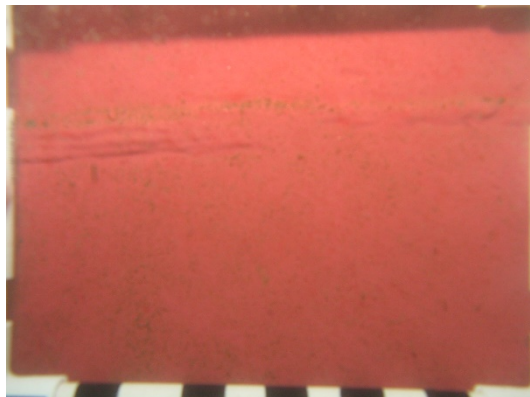
Reactive In-Water Cleaning

\* may be acceptable if biocide-free coating

# What Are The Approaches to Vessel In-Water Cleaning?



# What Are The Risks Associated With Each Approach?



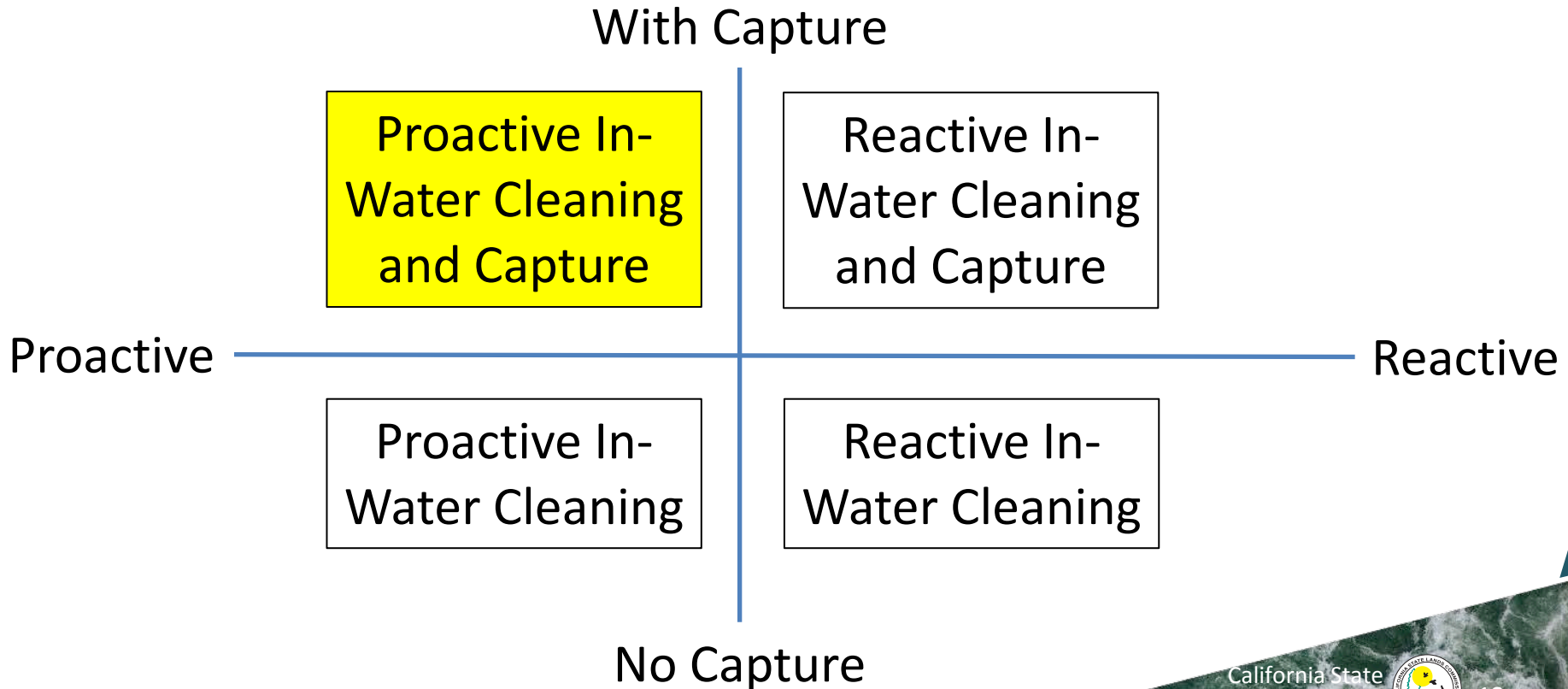
Proactive In-Water Cleaning

Acceptable Biosecurity Risk?  
Acceptable Water Quality Risk?



\*may be acceptable if biocide-free coating or in some jurisdictions dependent on concentration/quantity of biocide release

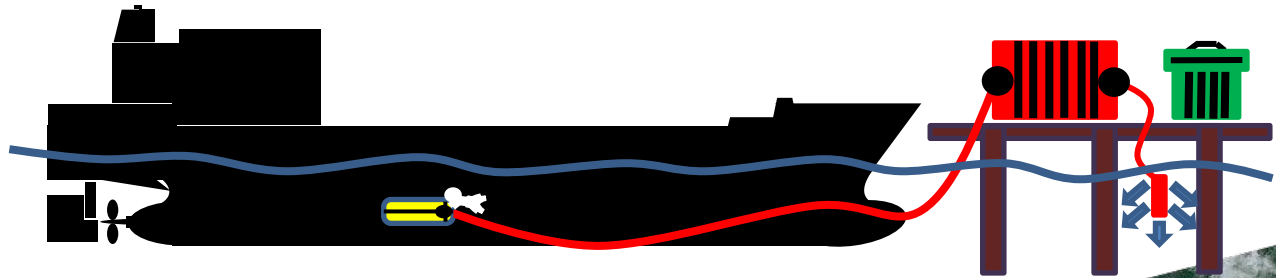
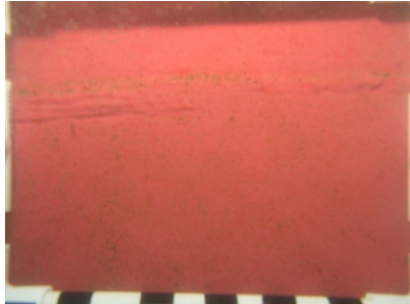
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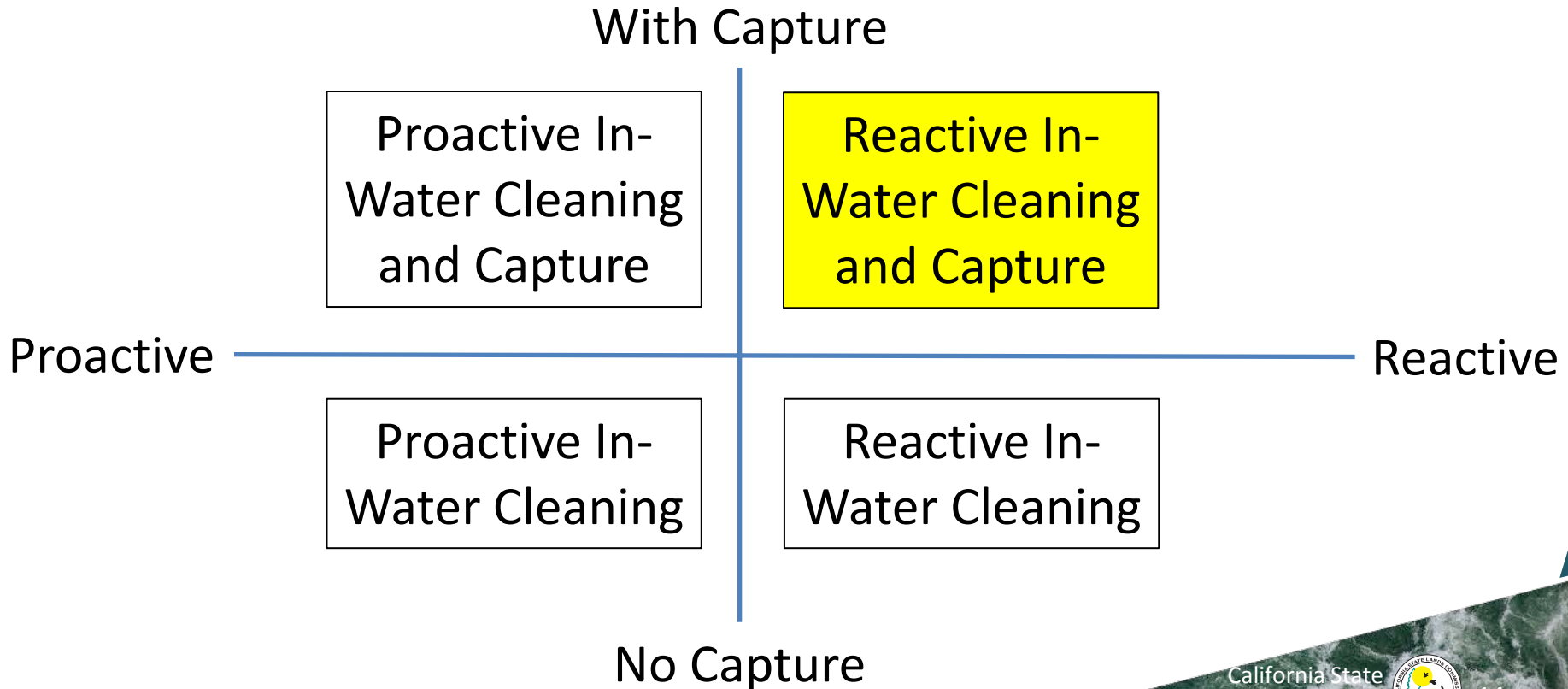
Proactive In-Water Cleaning and Capture

Acceptable Biosecurity Risk?  
Acceptable Water Quality Risk?



\*Assuming system appropriately minimizes risks

# What Are The Approaches to Vessel In-Water Cleaning?



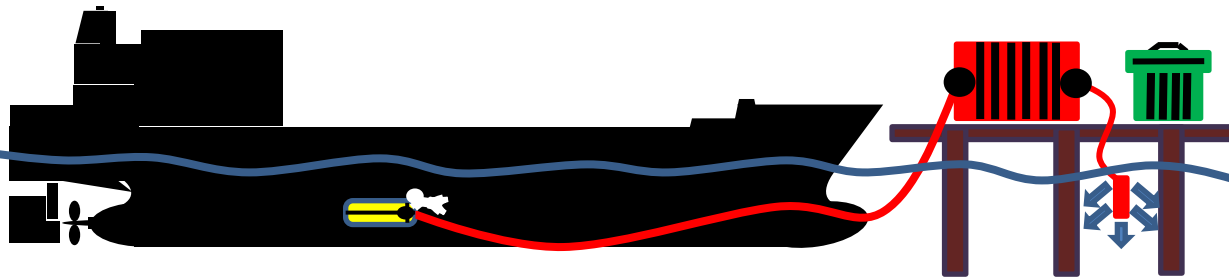
# What Are The Approaches to Vessel In-Water Cleaning?

Acceptable Biosecurity Risk?

Acceptable Water Quality Risk?



Reactive In-Water Cleaning and Capture



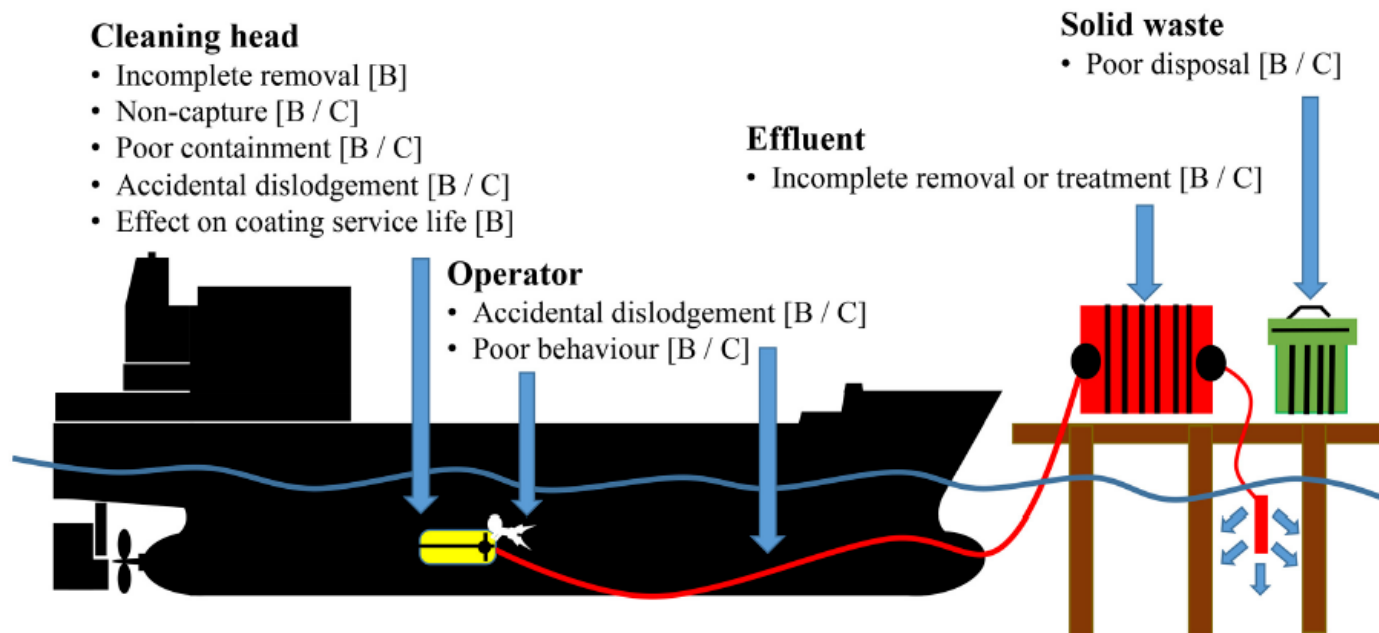
\*Assuming system appropriately minimizes risks

# Is it ever acceptable to not capture?

Fouling Type	Coating Type	Biosecurity	Water Quality	Result
Microfouling	Biocide-Free	No Capture	No Capture	No Capture
	Biocidal	No Capture	Capture	Capture
Macrofouling	Biocide-Free	Capture	No Capture	Capture
	Biocidal	Capture	Capture	Capture



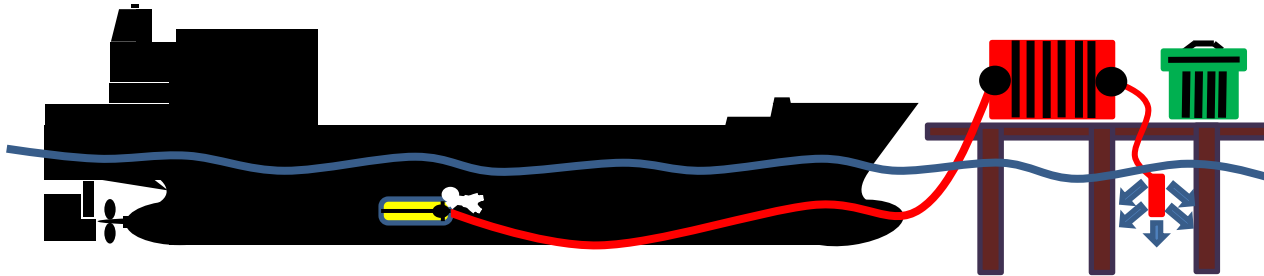
# Where do These Risks Occur?



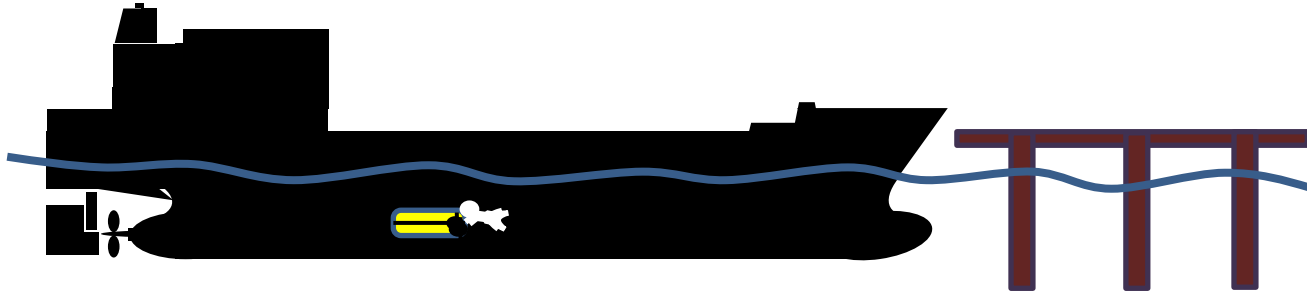
**FIGURE 1** | Identification of biosecurity [B] and chemical contamination [C] risks associated with operation of reactive in-water cleaning and capture (RICC) systems [Adapted from Morrisey and Woods (2015) and Alliance for Coastal Technologies Maritime Environmental Resource Center [ACT/MERC] (2019)].

# What Do We Need to Know?

- How well do they clean?
- How well do they reduce biosecurity risks?
- How well do they reduce water quality risks?



# How is this *currently* regulated in California?

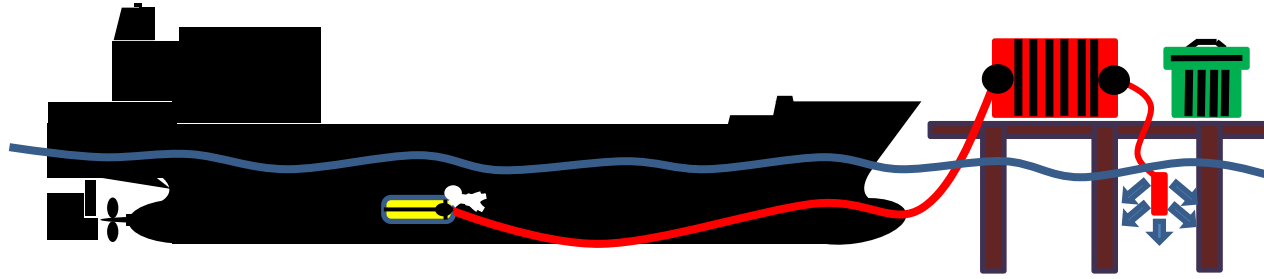


## Without Capture

- U.S. EPA Vessel General Permit requirements
  - California-specific conditions
  - Essentially not allowed in impaired waterbodies

\*\* DISCLAIMER: This represents my understanding.  
Seek EPA guidance for further clarity.

# How is this *currently* regulated in California? (2)



## With Capture

- National Pollutant Discharge Elimination System (NPDES)
  - U.S. Clean Water Act
  - Implemented by the State Water Resources Control Board



\*\* DISCLAIMER: This represents my understanding. Seek EPA guidance for further clarity.

# What's Our Role?



NPDES Permits



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY  
SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY  
LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY  
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD





# Final Thoughts

- Vessel Incidental Discharge Act uncertainty
- Other pollutants of concern
- How well do systems reduce risks?



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# THANK YOU & QUESTIONS

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California State  
Lands Commission

