

In-Water Cleaning

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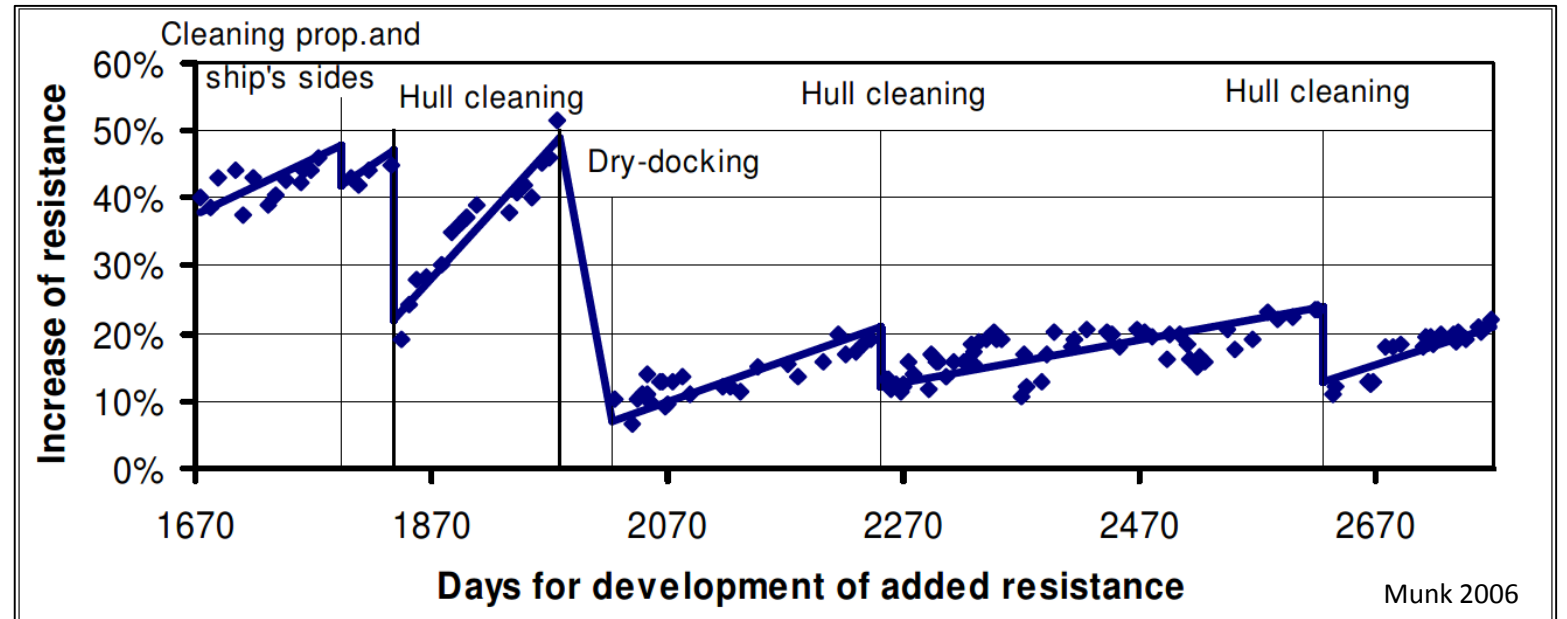
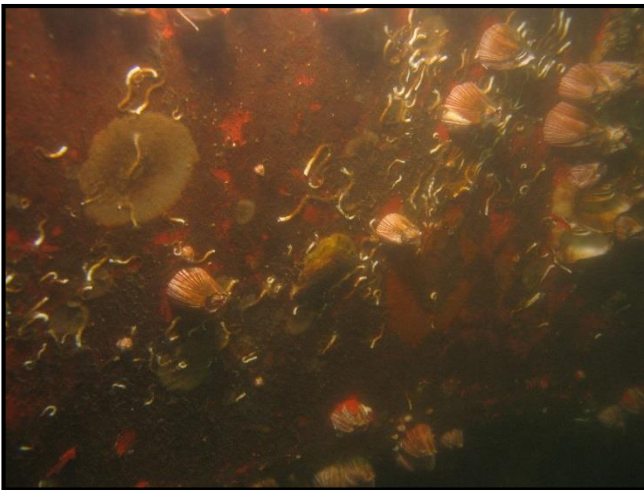
Pacific Ballast Water Group
April 13, 2017 – Portland, OR



In-Water Cleaning



Why Does In-Water Cleaning exist?



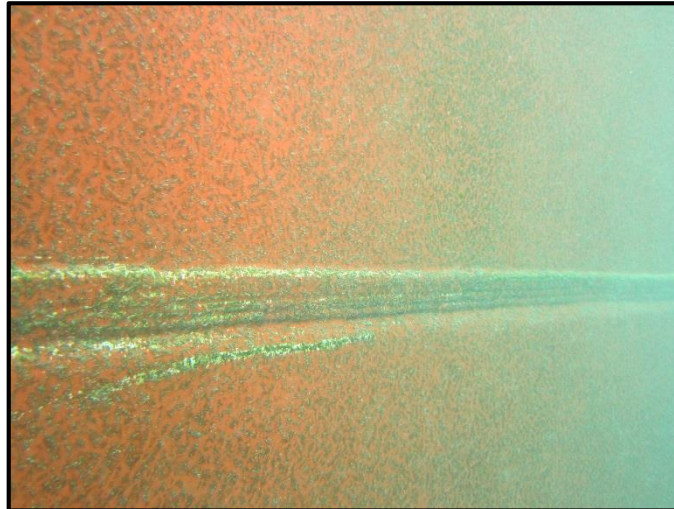
Hull biofouling = ↑ Drag = ↑ Fuel consumption = ↑ \$\$\$\$



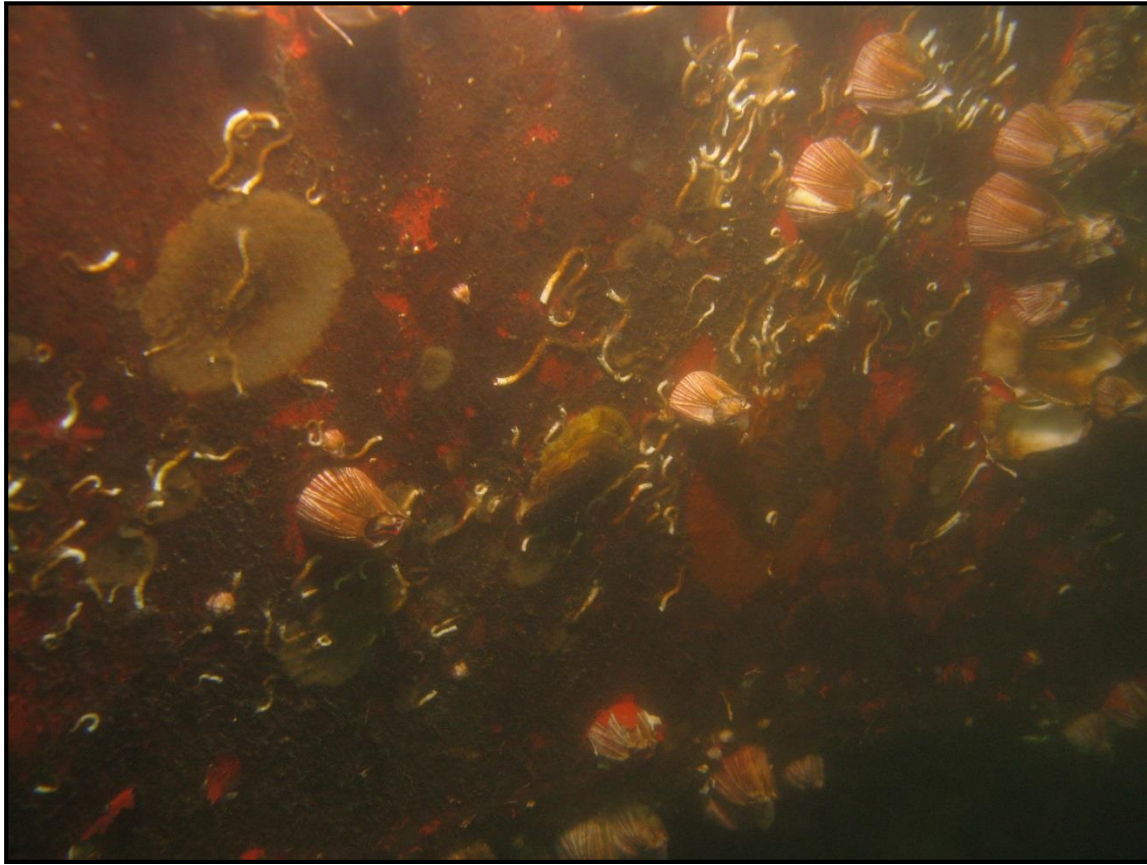
Why Does In-Water Cleaning exist?



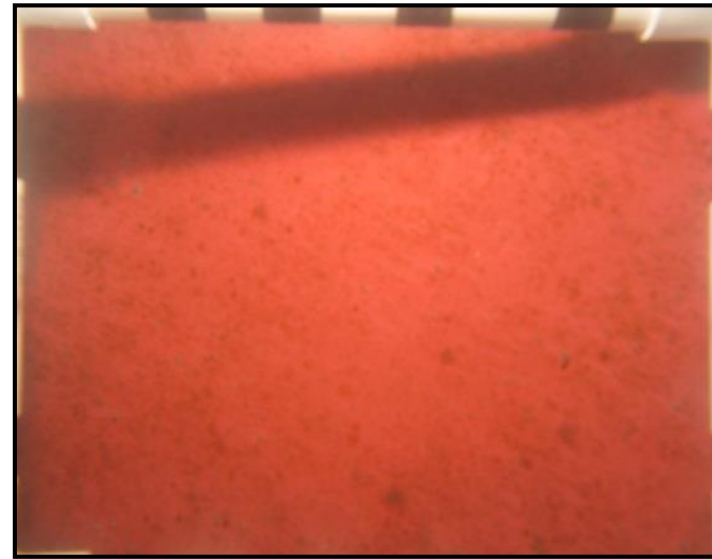
Inspections: UWILD (Underwater Inspection in Lieu of Drydock)



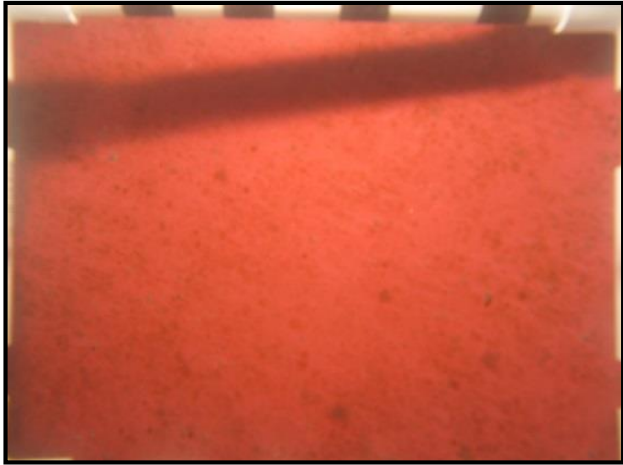
Why Does In-Water Cleaning exist?



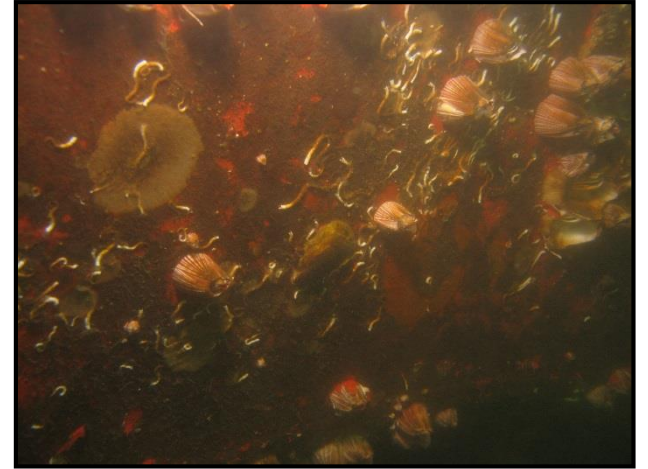
Reduce long-term
NIS introduction risk



Why Does In-Water Cleaning exist?



Inspections: UWILD
(Underwater
Inspection in Lieu of
Drydock)



Efficiency

Reduce long-term
NIS introduction risk



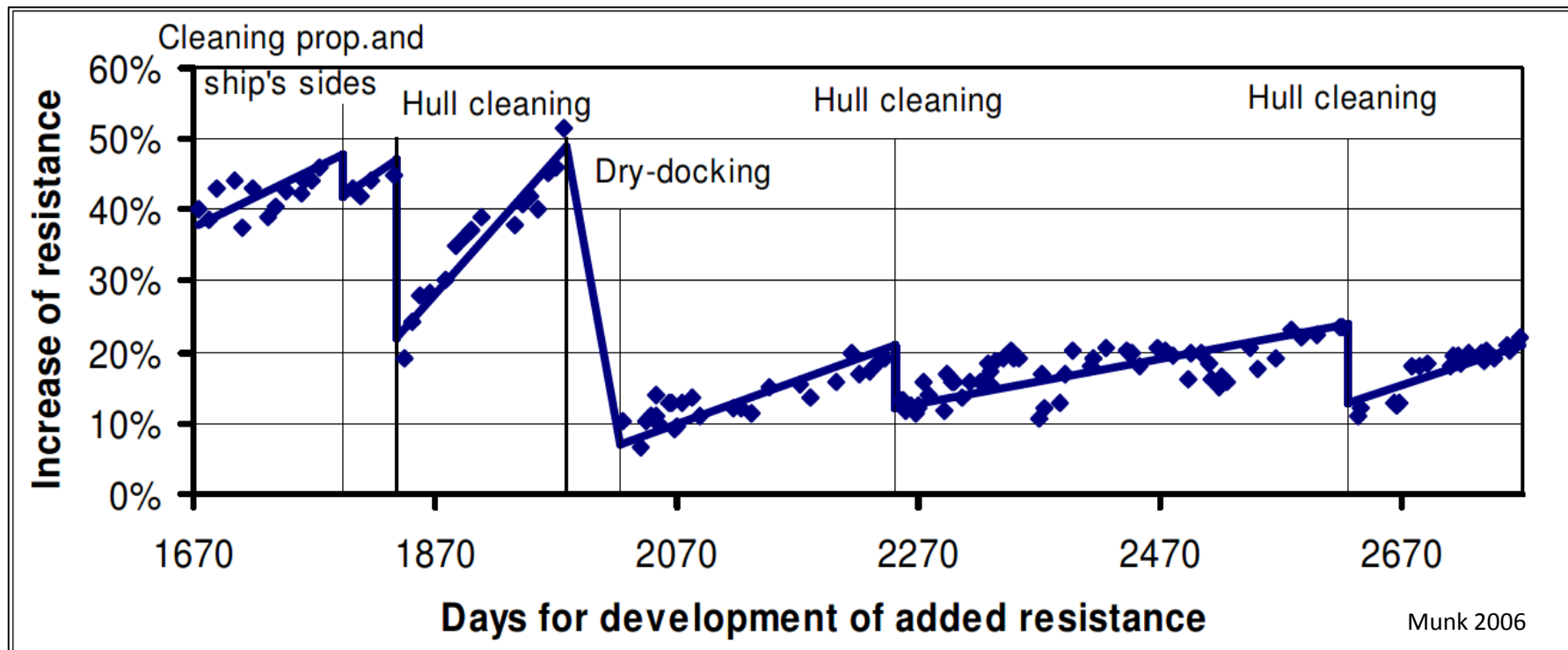
When Is In-Water Cleaning Needed?

Worst-case scenario: Contingency measure



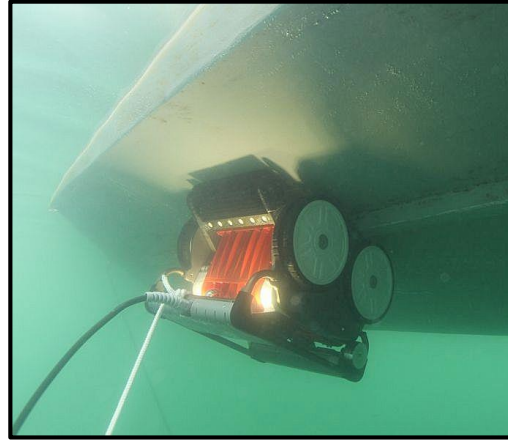
When Is In-Water Cleaning Needed?

To Improve Operational Efficiency



When Is In-Water Cleaning Needed?

Hull Grooming



“Beards on faces, not on vessels”



When Is In-Water Cleaning Needed?

Worst-case scenario: Contingency measure

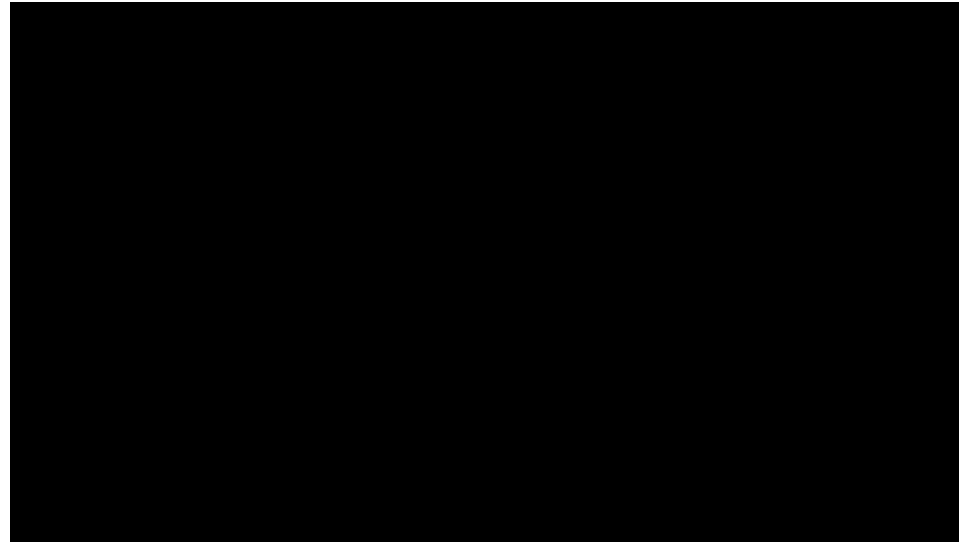
To Improve Operational Efficiency

Hull Grooming



In-Water Cleaning Systems

Traditional IWC: NO debris capture

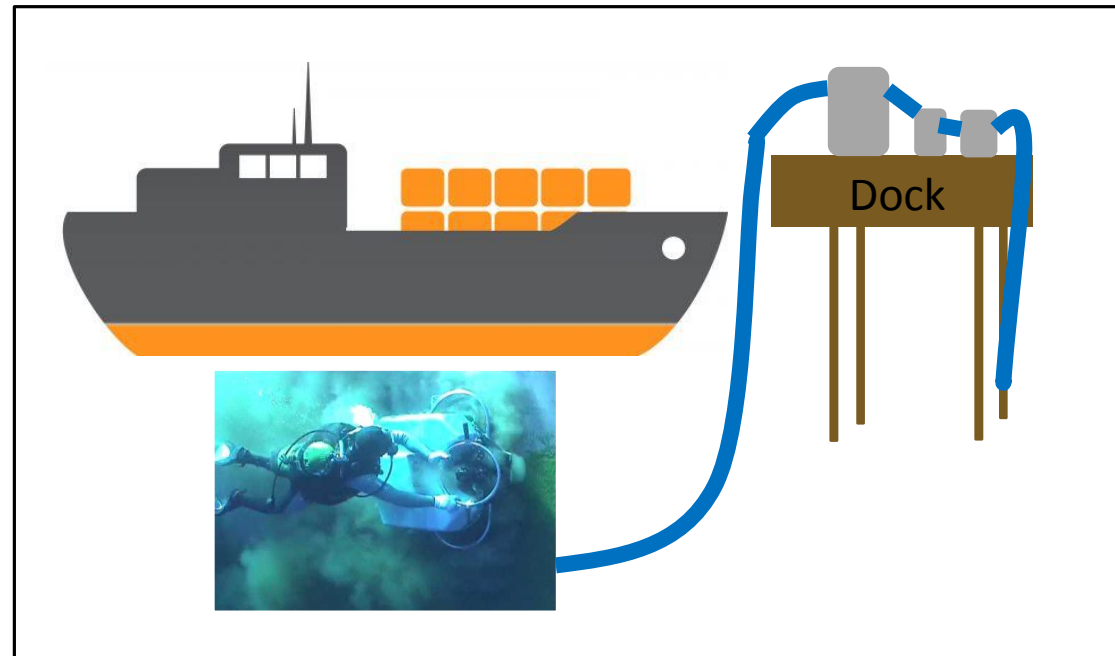


<https://www.youtube.com/watch?v=fqcyt2qr9x4>

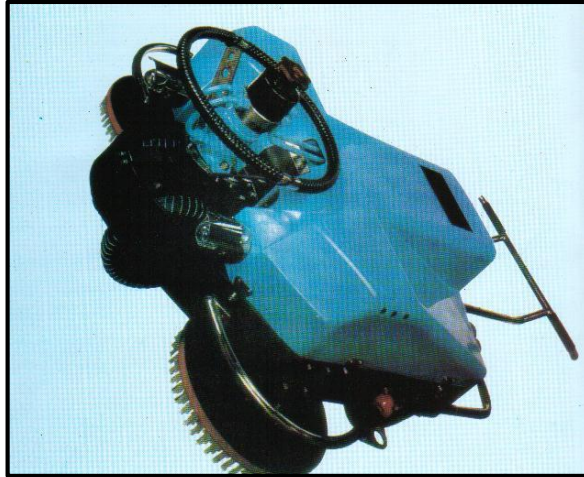


In-Water Cleaning Systems

IWC: With debris capture



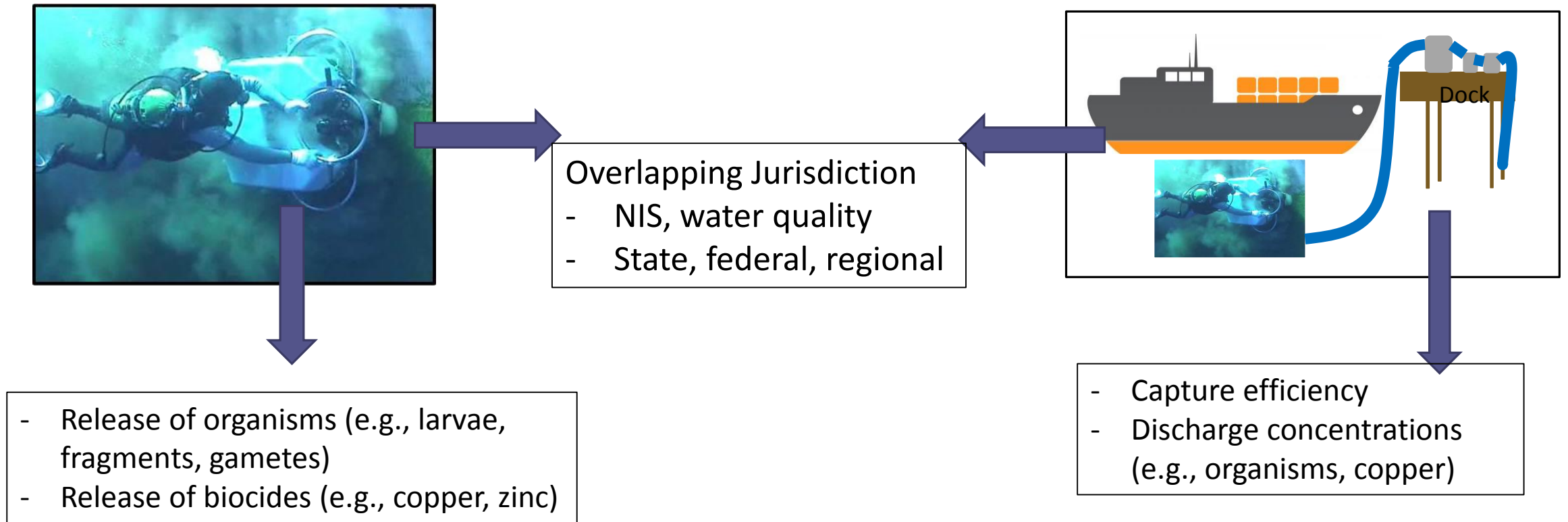
In-Water Cleaning Systems



In-Water Cleaning Systems

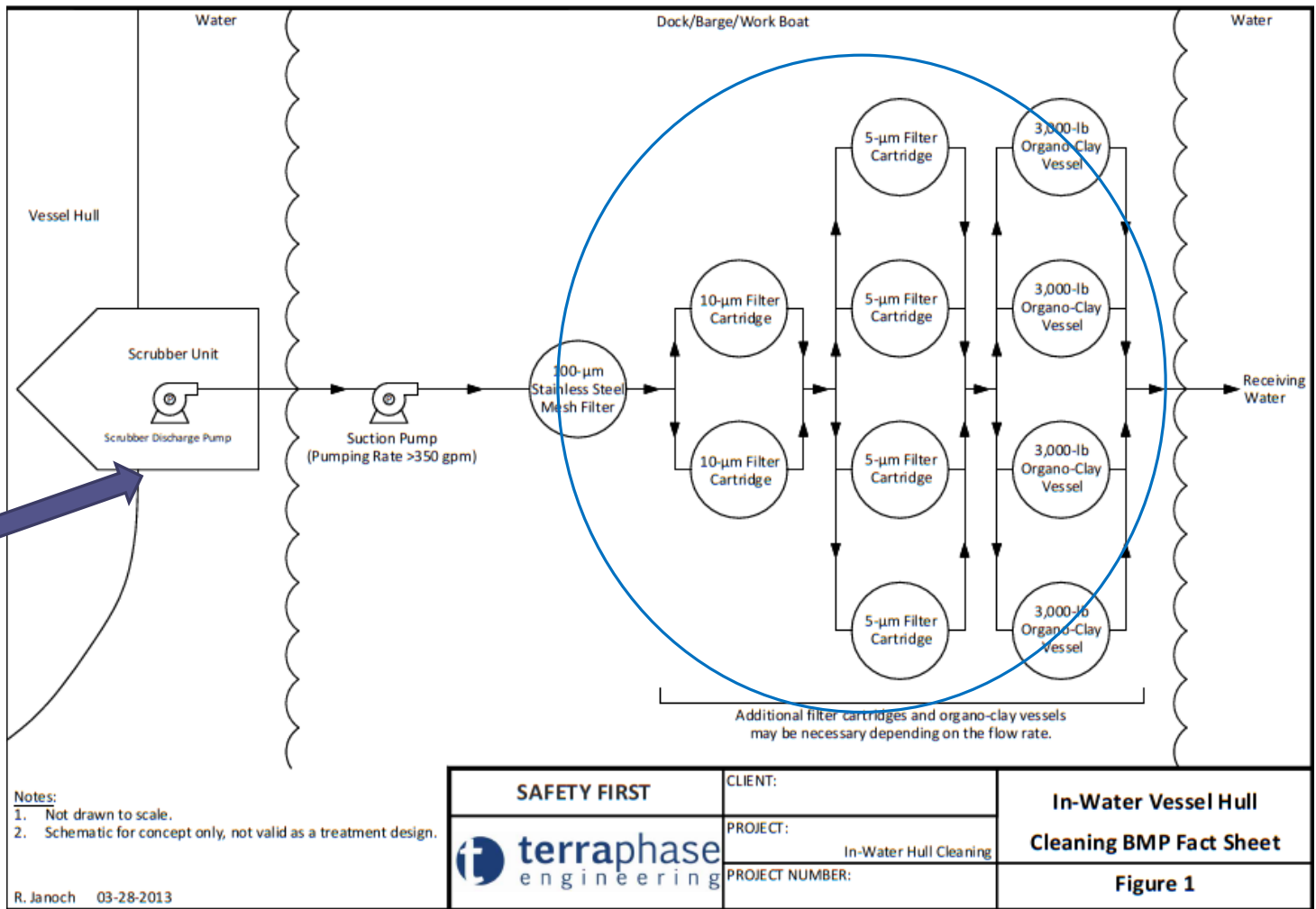
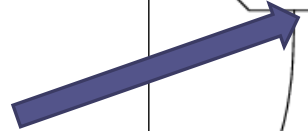


Issues With In-Water Cleaning

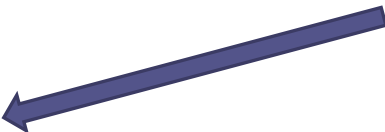


In-Water Cleaning: How Are Risks Realized?

- During removal
- Capture efficiency
 - Incidental release by diver or equipment

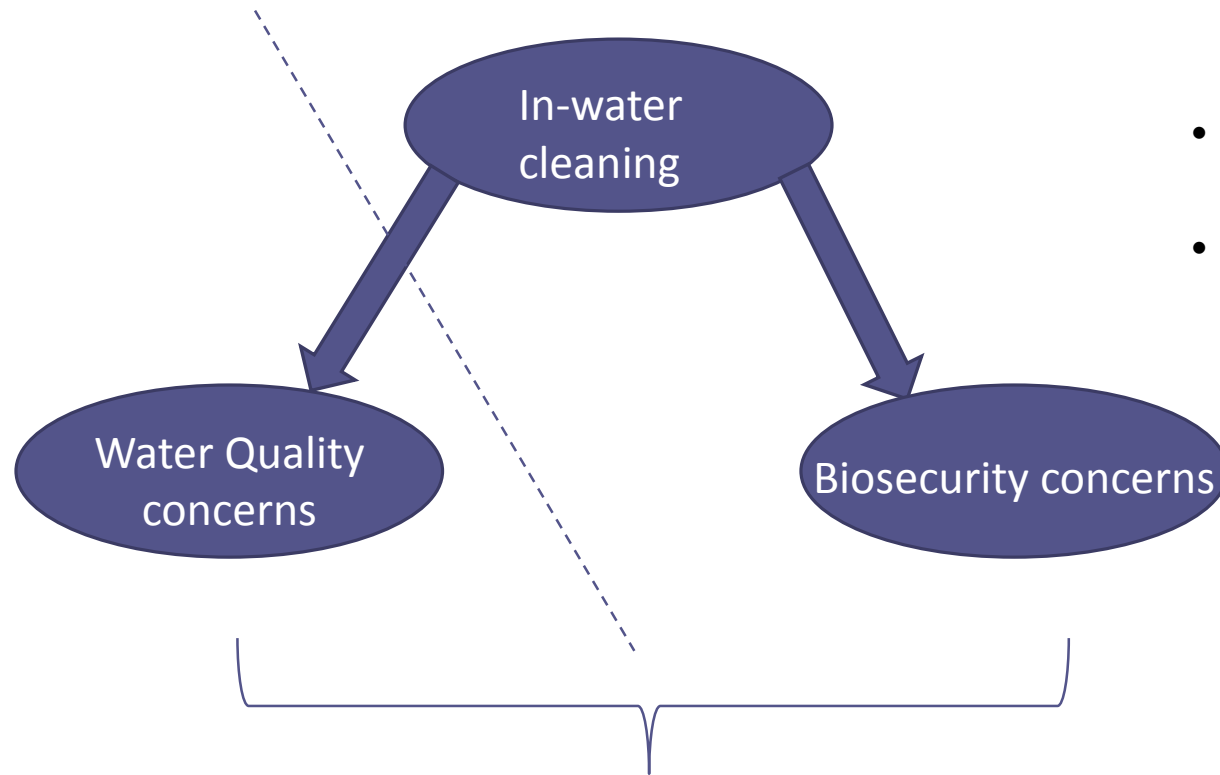


Upon discharge of the effluent



Possible Solution to IWC Issues

- Varies locally
- Permitted locally



- Can be addressed consistently across the region
- What level of protection are we looking for?
 - Discharge limits
 - Capture efficiency
 - What is the BAT?
 - Can it meet our expectations?



CSU COAST Summer Internship Project

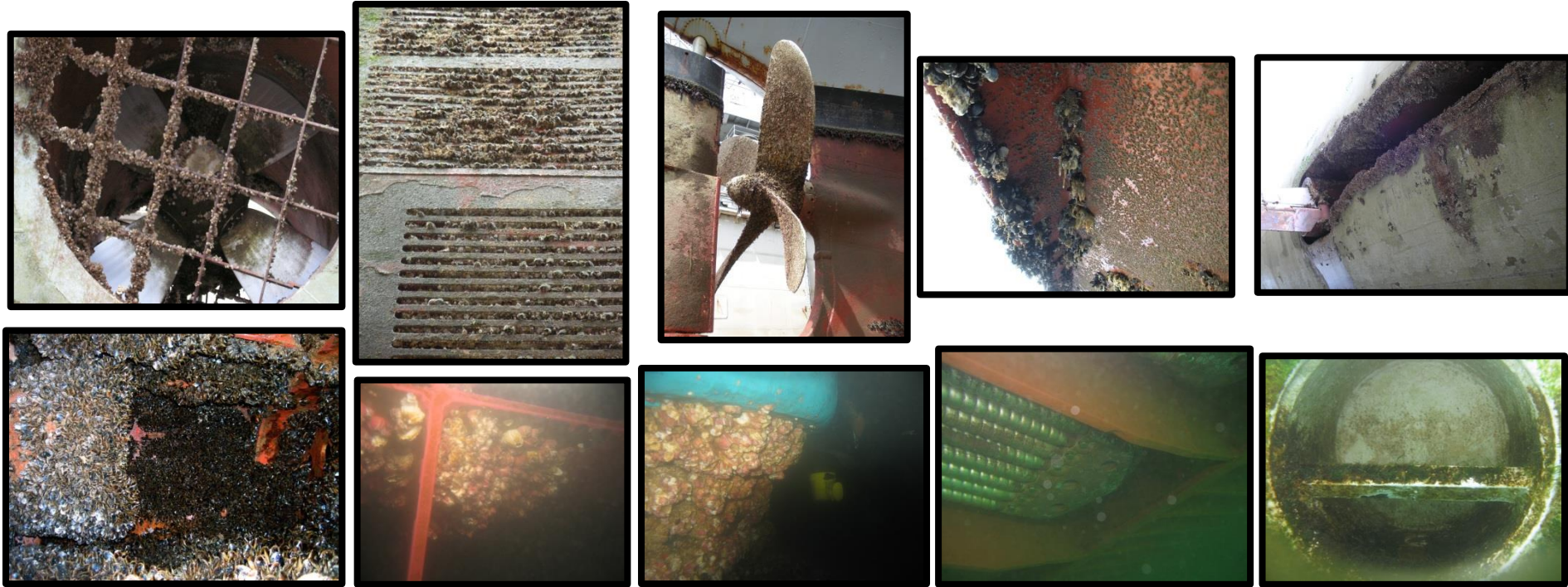
Status Report: Capabilities, limitations, and regulations surrounding in-water vessel cleaning technologies.



Summer 2017



Food For Thought



What about niche areas? Can they be cleaned?



Thank You

- For more information:

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www.slc.ca.gov

