



Marine Invasive Species Program COAST 2020

August 13, 2020
Long Beach, CA

Rose Her
California State Lands
Commission



The California State University
COUNCIL ON OCEAN AFFAIRS, SCIENCE & TECHNOLOGY (COAST)

California State
Lands Commission



My Background

- 2020 COAST Summer Intern
- Undergraduate at CSU, Sacramento
- Studying Environmental Science
- Previous Experience: Department of Parks and Recreation - Student Assistant, Solano County Water Agency
- Hobbies: Painting, photography, camping, skateboarding, currently getting scuba certified!





Agenda

- I. Marine Invasive Species Program [MISP]
- II. Risks Factors
- III. Project 1: Risk Assessment Comparison
- IV. Project 2: COVID-19 Impact
- V. My Takeaways and Experience
- VI. Acknowledgements

Marine Invasive Species Program [MISP]

- Created in 2000, the California Marine Invasive Species Program [MISP] is responsible for vessel ballast water and biofouling management
- California ports have ~11,000 arrivals per year, mandate to inspect 25% - 2,750 vessels annually
- Vessels submit pre-arrival report forms for ballast water and biofouling management



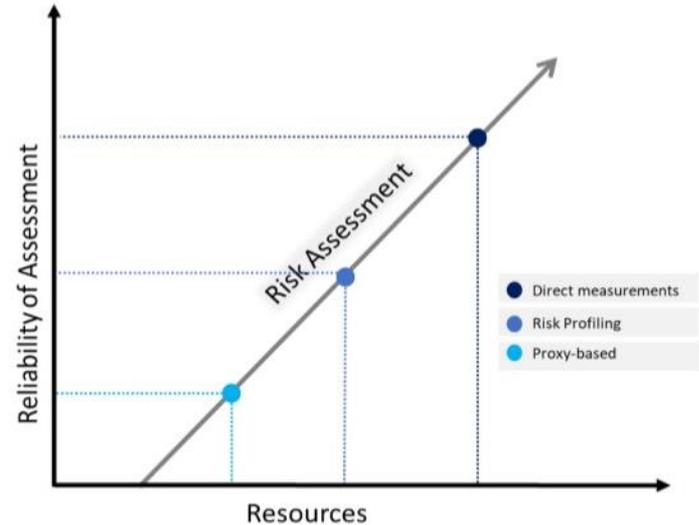
Risk Factors

- Nonindigenous species [NIS] pose a threat to human health, economy, and the environment due to the disruption of biodiversity

Risk	Why It's Important	Likelihood
Ballast Water [BW] Risk	Vessels can release water last collected from anywhere in the world – introduction of NIS that may be harmful to the ecosystem	Not every vessel discharges ballast water
Biofouling [BF] Risk	Communities of organisms attach and grow on a vessel's hard surfaces that are wet and may disperse or drop off onto coastal waters	Every vessel has a biofouling risk

Project 1: Risk Assessment

- **Goal:** Comparing different risk assessments and approaches to inspection prioritization for vessel arrivals in California ports
- Determining an accurate way to reflect potential risk
- Optimize prioritization thresholds
- Using assessments that are more vessel specific to history and size
- Incorporating biofouling risk into pre-arrival assessments

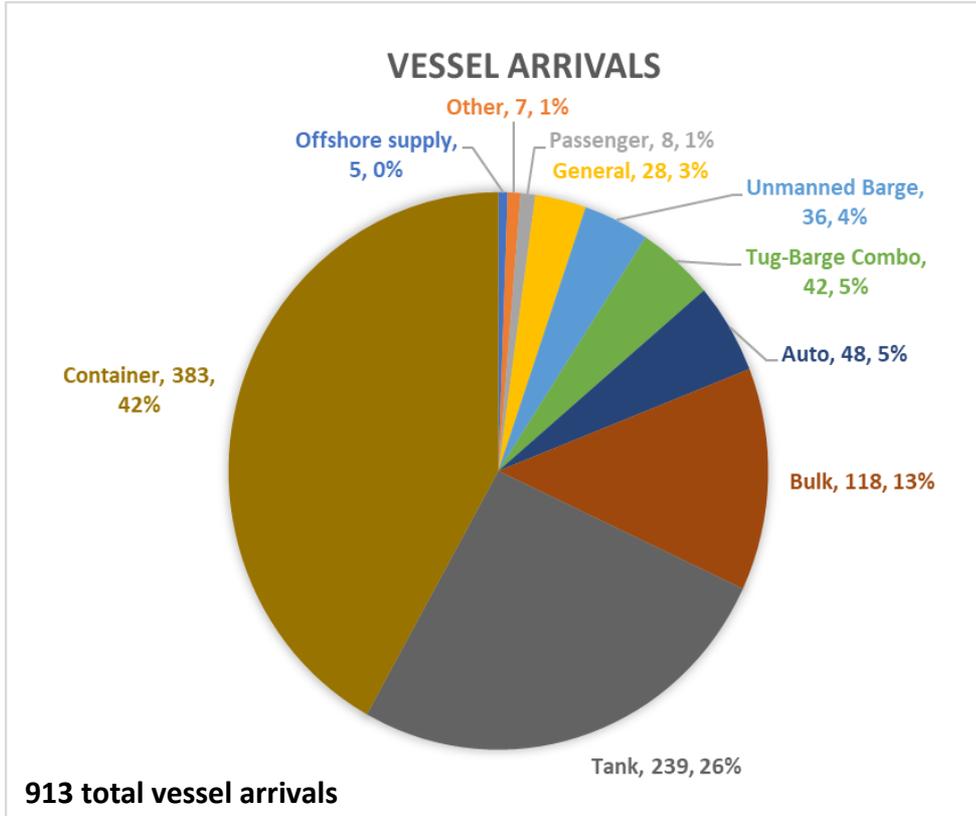


Methods

	Factors	Scoring Categories	Numerical Thresholds
Traditional	Outreach opportunities and assessing ballast water discharge	High, medium, low	
Weighted Risk Assessment [WRA]	Vessel specific risk factors: ballast water discharge, vessel type, last dry docks, anti-fouling coating and in-water cleaning	Critical, high, medium, low *upgrade and downgrade factors	No Priority: Below 0 Low: 0 to 5 Medium: 6 to 10 High: 11 to 20+
Proxy-based	Proxies from likelihood of introducing NIS through ballast water discharge and wetted surface area	High, medium, low	Low: 0.1 to 0.5 Medium: 0.6 to 1.0 High: 1.1+
PortShield [trial]	Commercial biofouling assessment tool on history of vessel and docking assumptions based on specific vessel patterns	High, low	No Priority: below 7 Low: 7 to 8.9 High: 9+

*Assessed every arrival for 6 weeks

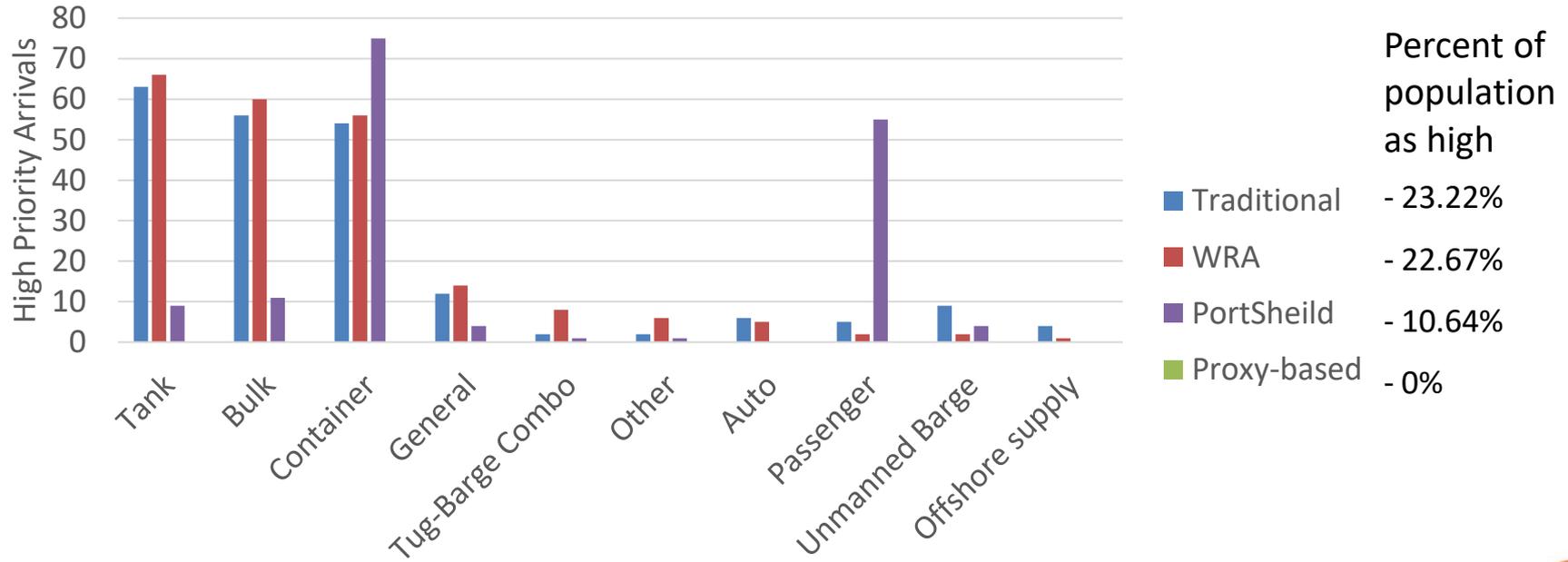
Results: Total Vessel Arrivals



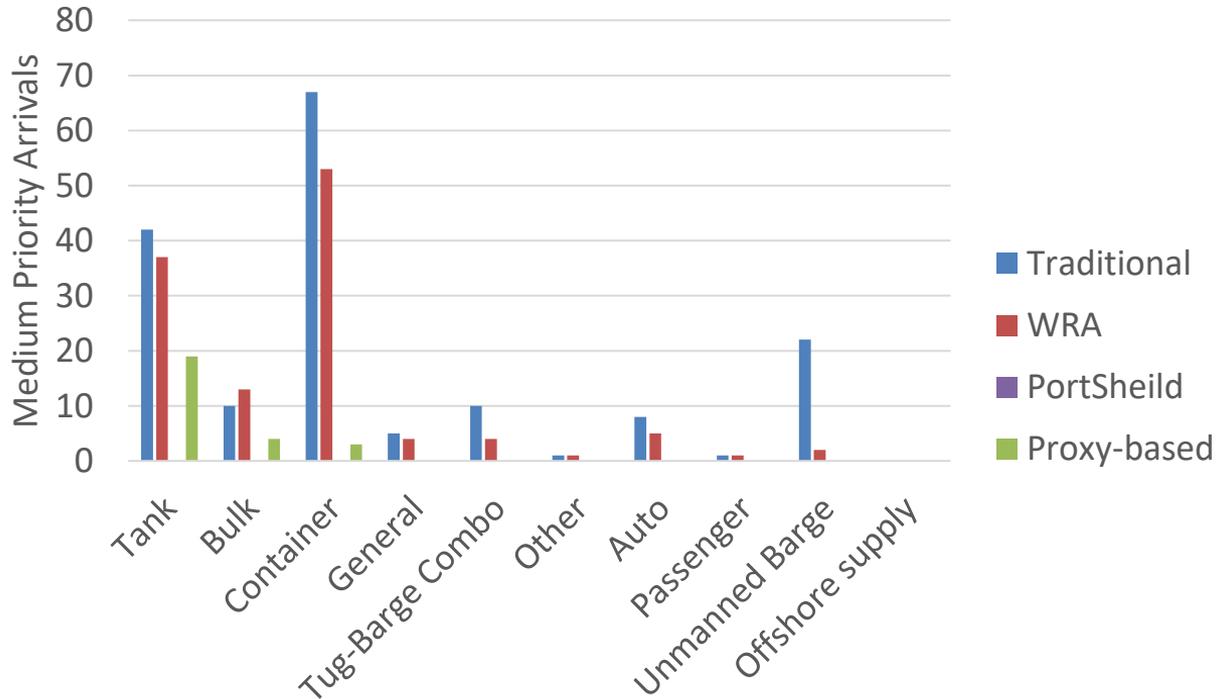
Data collected
between:
June 8, 2020 -
July 17, 2020

Majority of
arrivals were
containers, tanks,
and bulk vessels

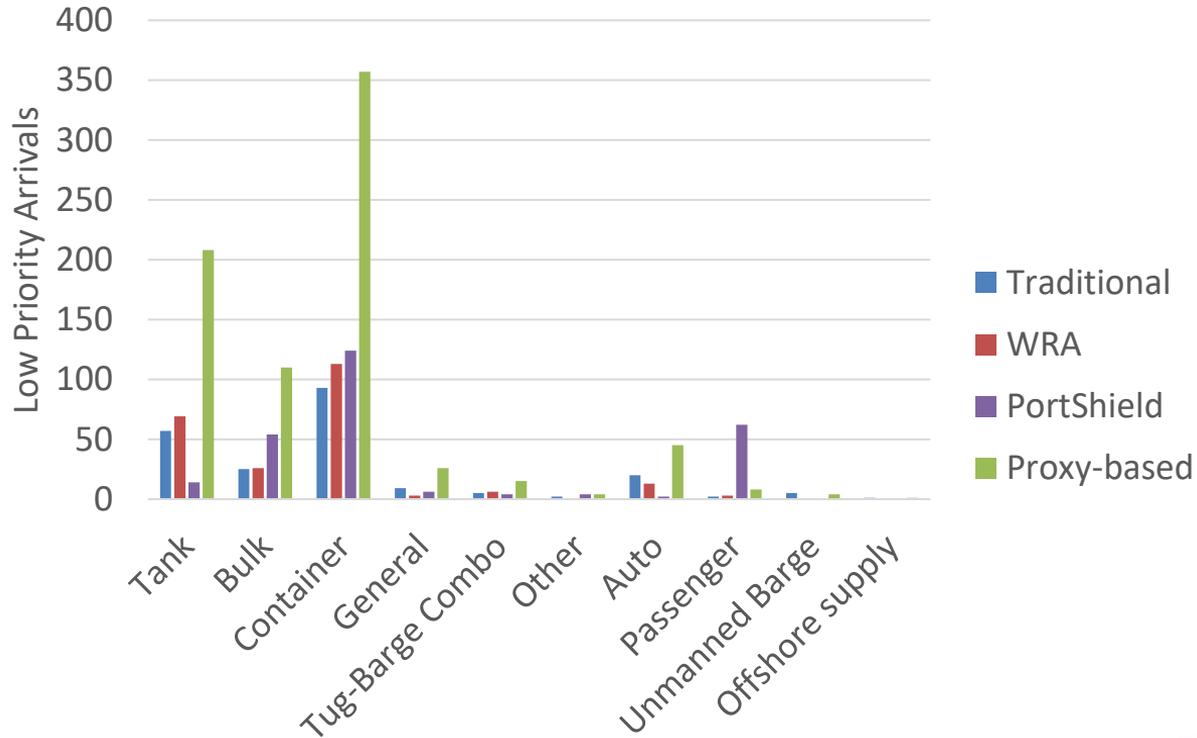
Results: High Priority Arrivals



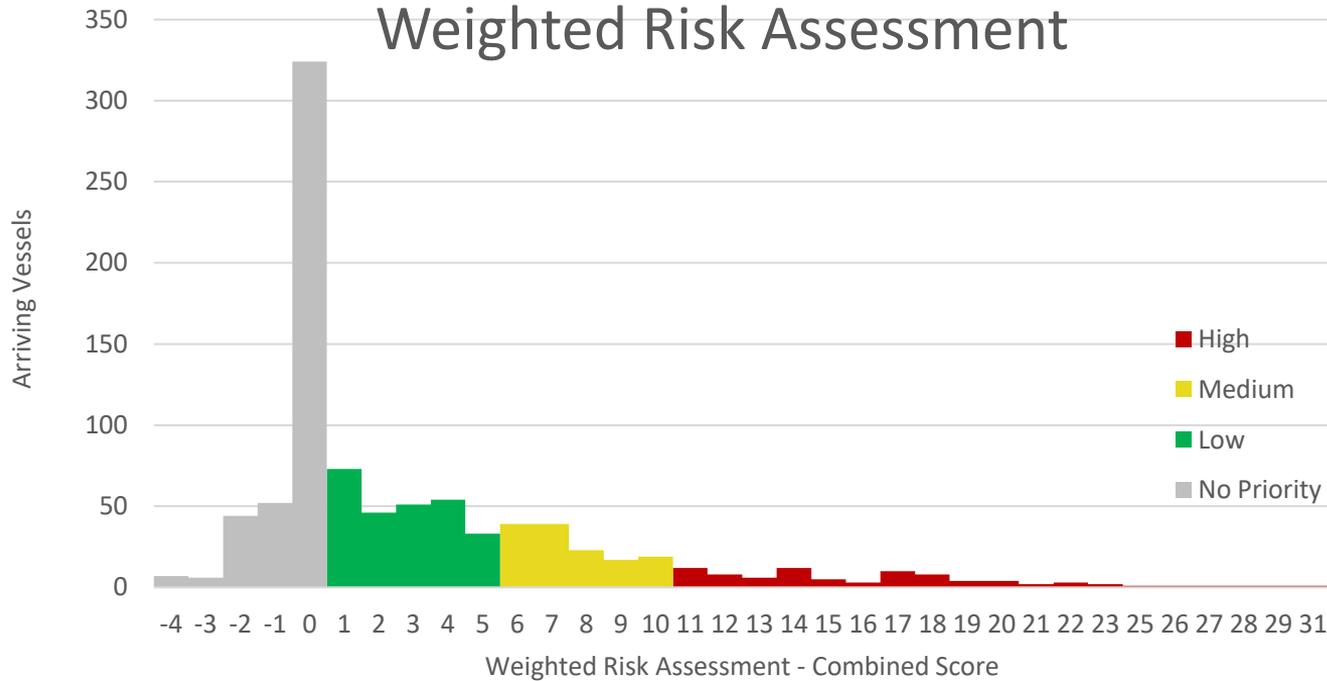
Results: Medium Priority Arrivals



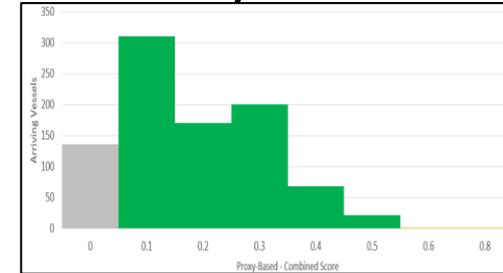
Results: Low Priority Arrivals



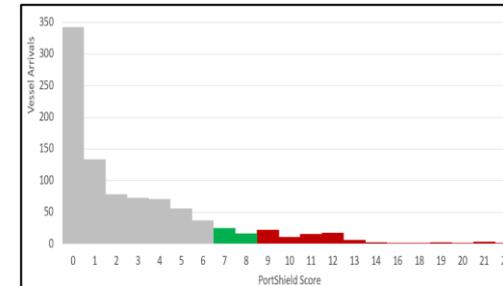
Results: Comparisons



Proxy-Based

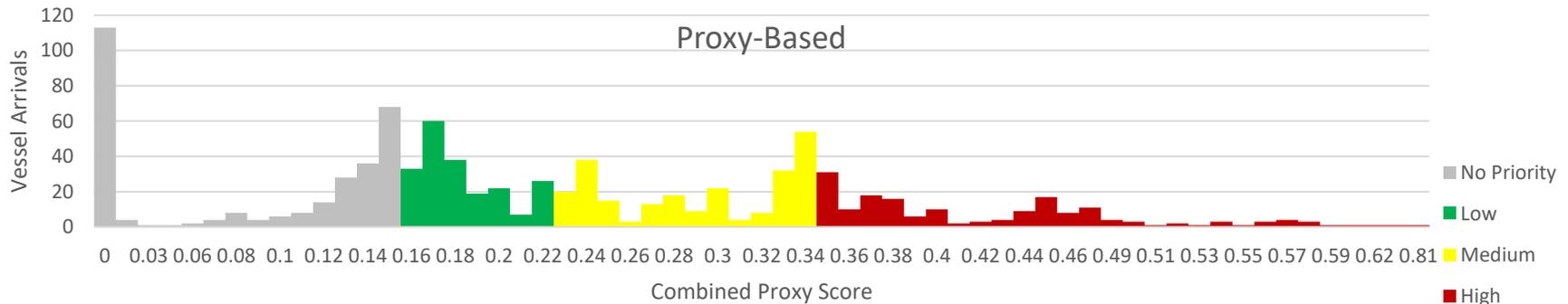


PortShield



Results - takeaway

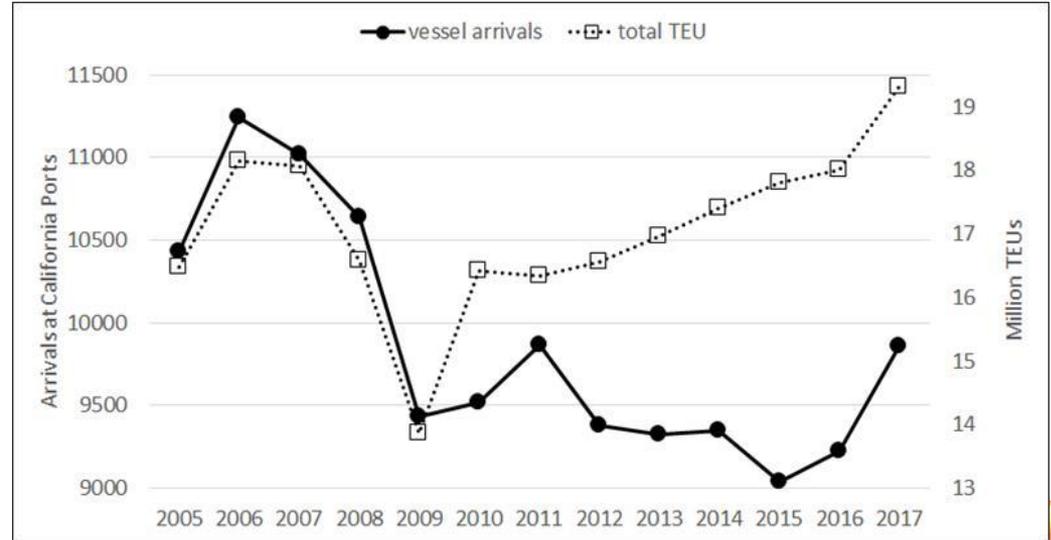
- WRA: produces similar scores to traditional scores – however it is associated with independent numerical scores and upgrade and downgrade rules
 - Numerical scores can also translate into other analysis
 - Reasonable to do the WRA daily with automated calculation with the reporting forms
- Proxy-based: Extensive amount of proxy-based low scores show that thresholds can be adjusted to capture highest risk population



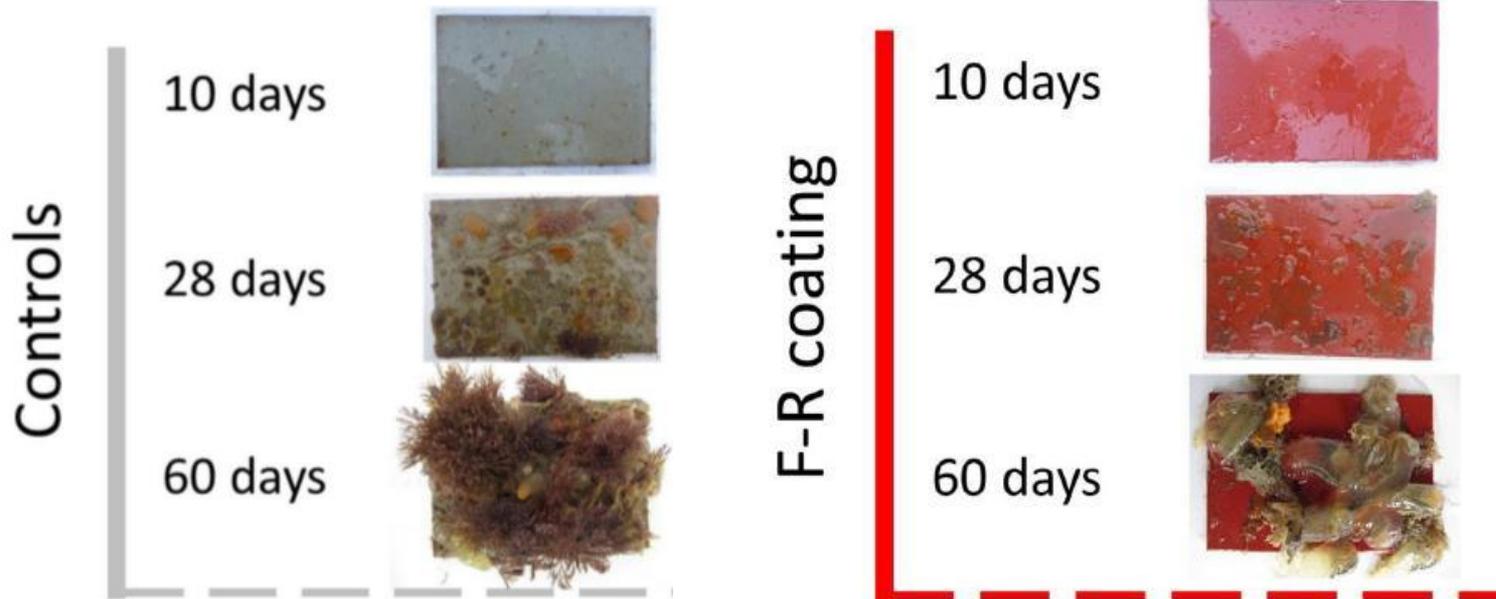
Project 2: Covid-19 Impact

Goal: Assessing the maritime economy impacted by COVID-19 from October 2019 to June 2020

- expect to see similar impact from Great Recession in 2008
- increased idle periods are one of biggest risk factors for biofouling

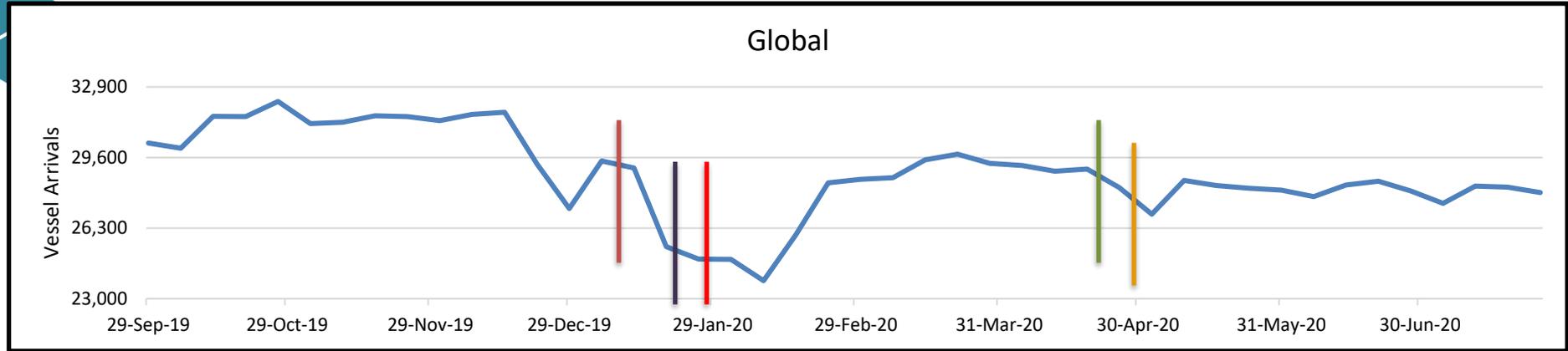


Biofouling



Davidson, I. C., Smith, G., Ashton, G. V., Ruiz, G. M., Scianni, C. (2020). An experimental test of stationary lay-up periods and simulated transit on biofouling accumulation and transfer on ships. *Biofouling*, 36(4). DOI: 10.1080/08927014.2020.1769612

Project 2: Vessel Arrivals and COVID-19



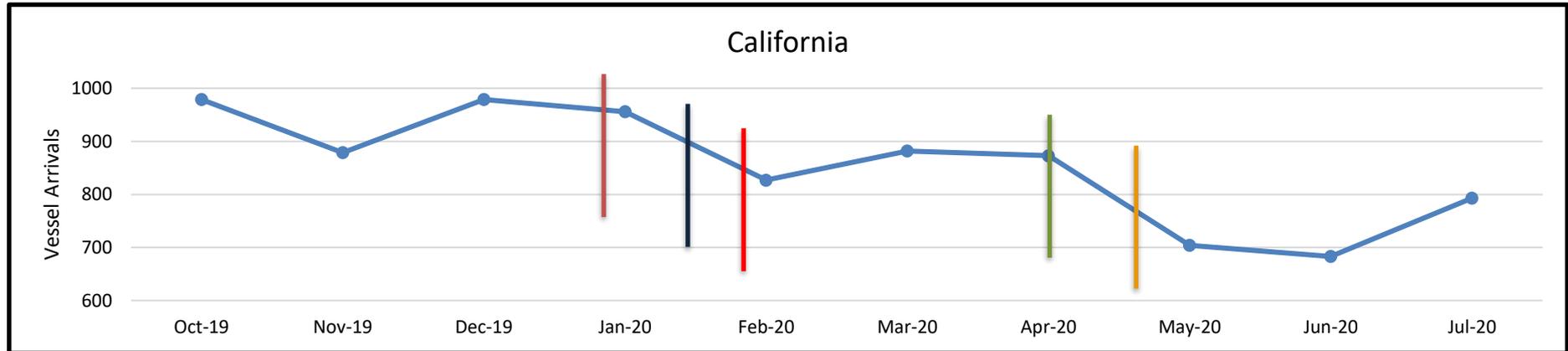
January 9th - Illness in Wuhan, China

January 21st/22nd - First US COVID case

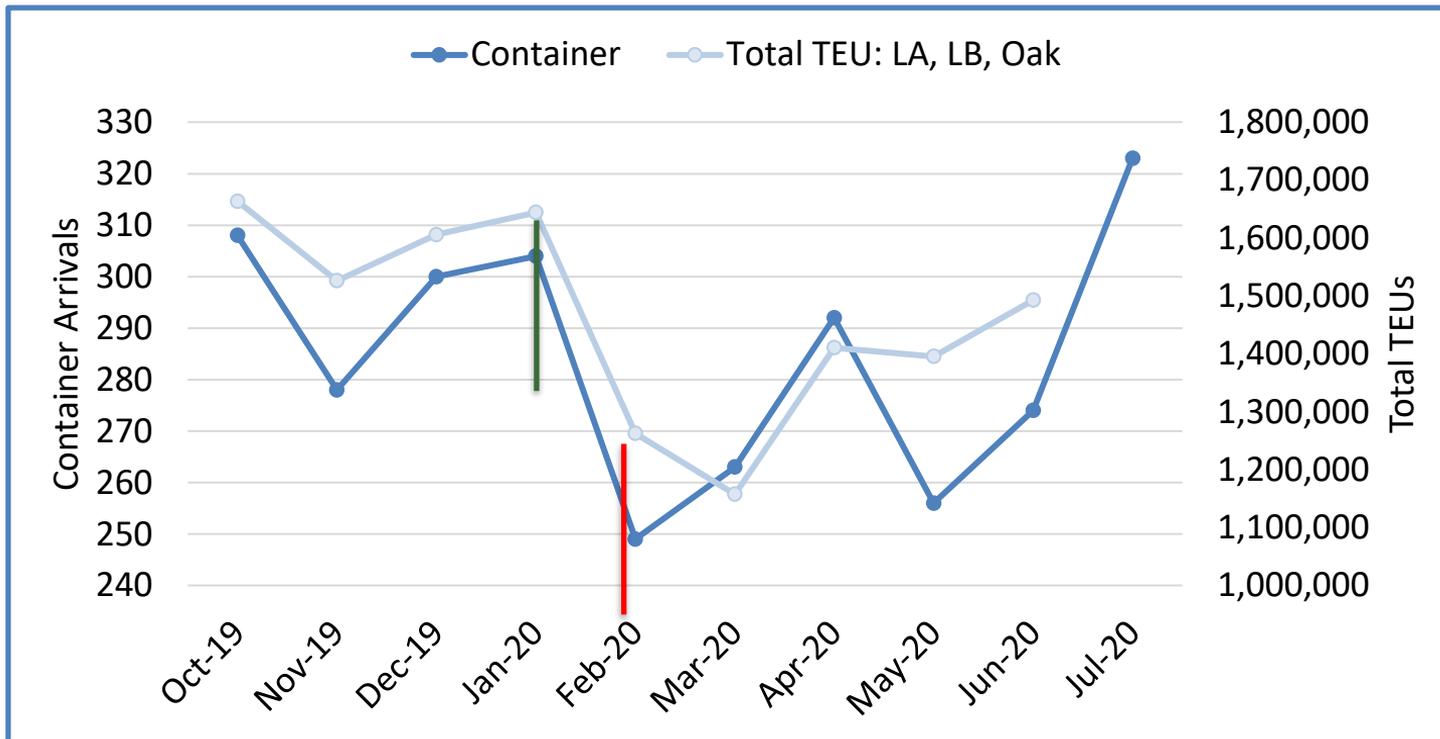
January 31st - Global Health Emergency

April 9th - No Sail order for US, cruise ships stall

April 20th - Oil recorded at negative prices

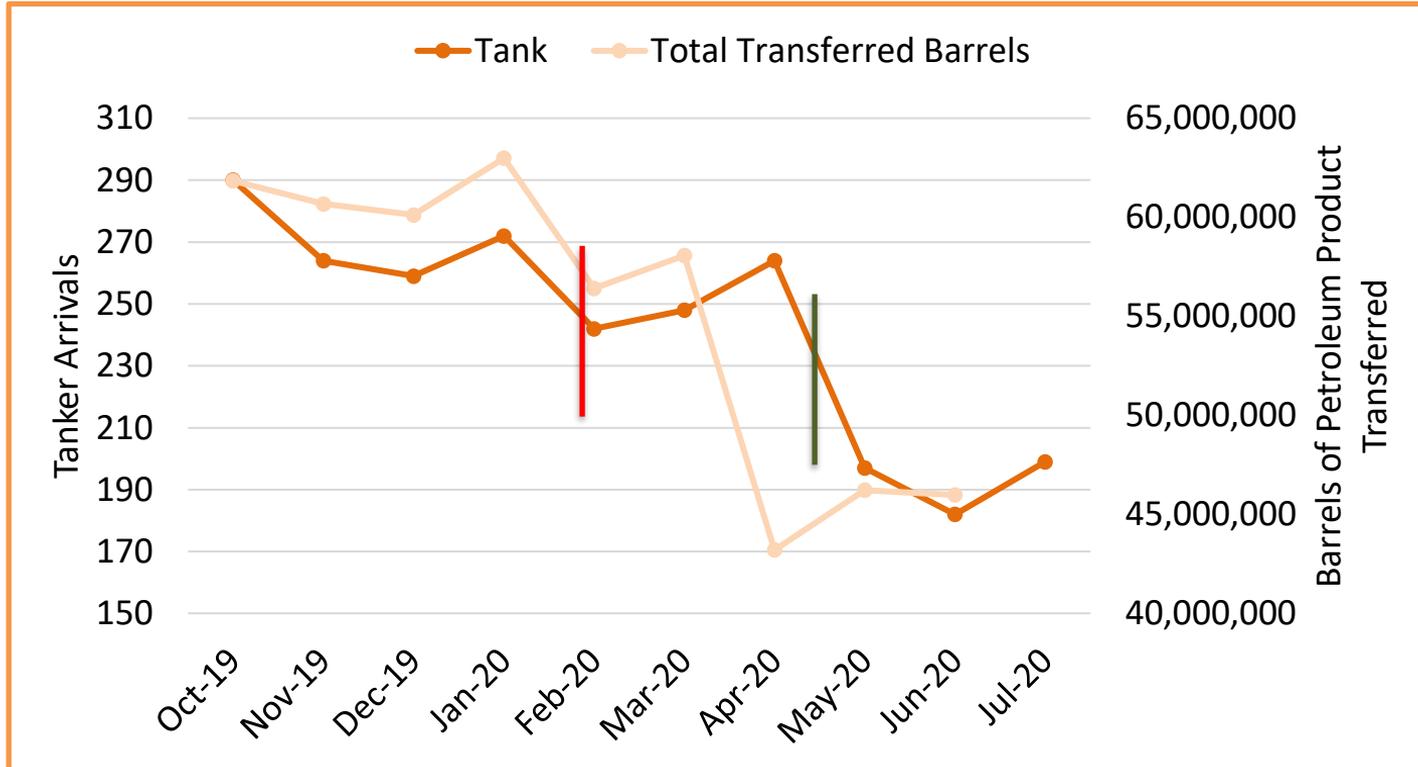


Container Vessels



January 9th—
Illness in Wuhan, China
January 31st— Global
Health Emergency

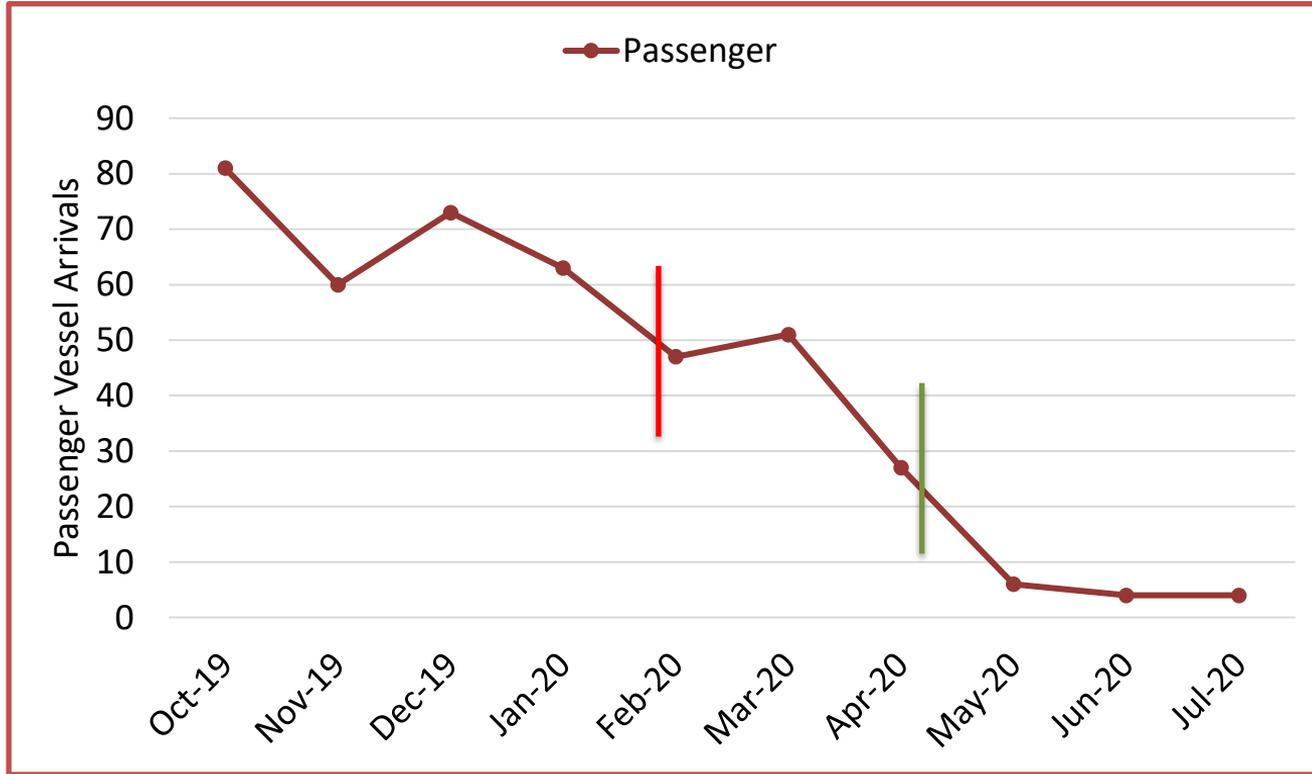
Tank Vessels



January 31st – Global Health Emergency

April 20th – Oil recorded at negative prices

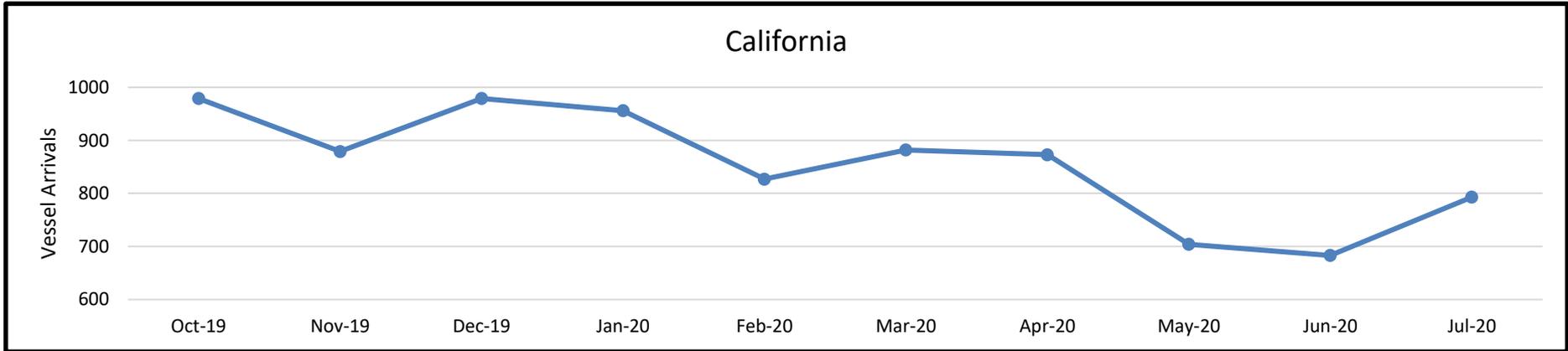
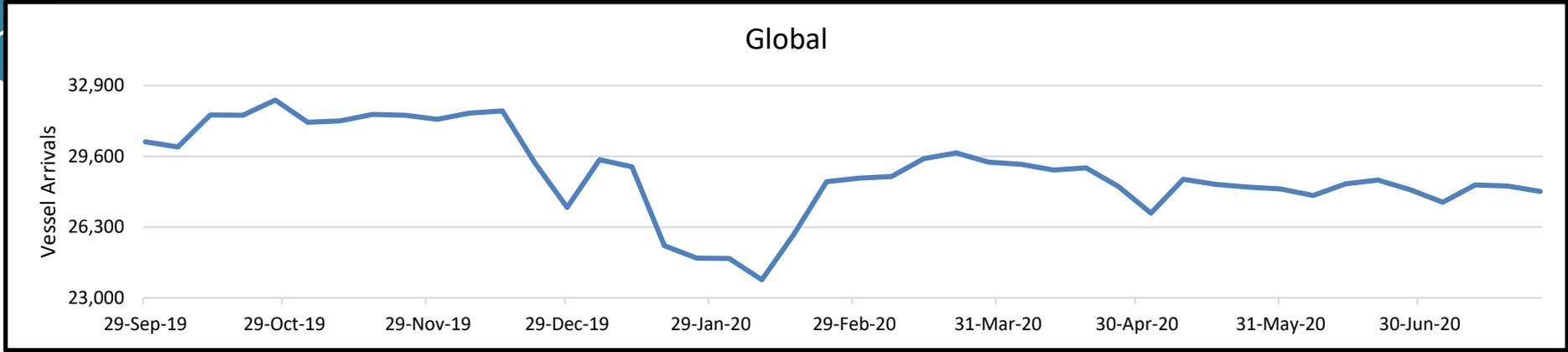
Passenger Vessels



January 31st – Global Health Emergency

April 9th – No Sail order from US CDC

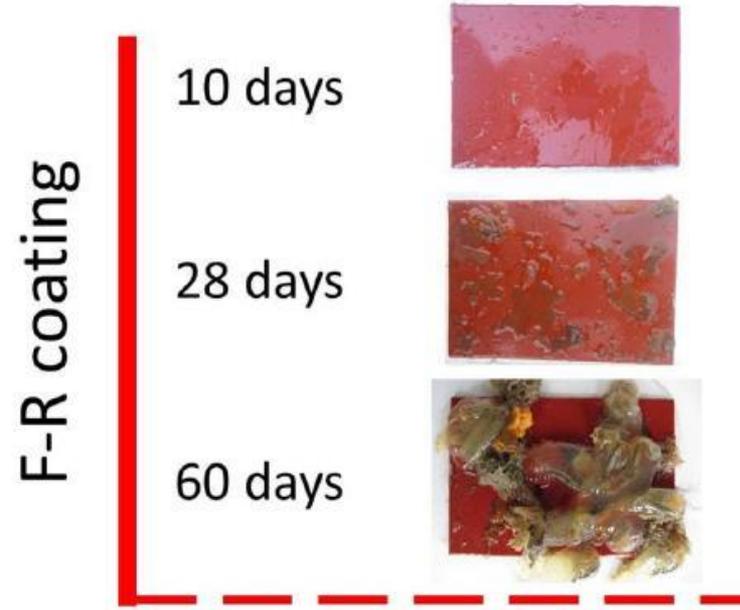
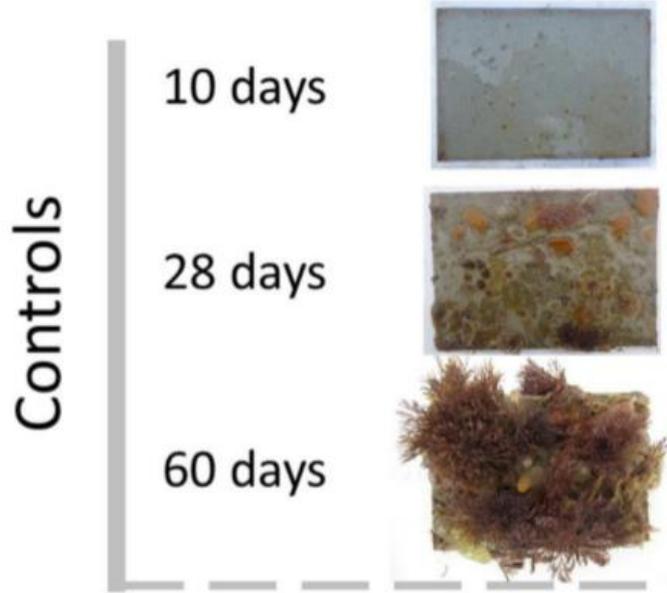
Project 2: Vessel Arrivals and COVID-19



Idled Vessels: Long Beach



Biofouling



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Project 2: Takeaway

- Global drop in arrivals likely forced ships into idling in large numbers, future trends can be tracked with reporting forms
- Decline in passenger and tank vessels in California follow a social and economic trend
- More idled ships = larger biofouling risk!



Overall Takeaway:

Recommendations:

- Adjusting thresholds for different places, recognizing niches for different locations
- Use of the WRA numerical scores for other vessel qualities and management practices
- Online reporting forms

Trends:

- WRA captures idled periods so it's able to prioritize those vessels – preparing for a post-coronavirus economy
- 1 to 2-year lag on an accurate COVID-19 analysis
- Ability to capture high priority population to inspect

My Experience!

Working remotely:

Pros:

- Reaching out normally
- Being able to be more confident asking for advice/assistance
- No commuting! 😊

Cons:

- Not being to meet the whole team in person
- No hands-on work
- Inability to ask for assistance in person
- No beaches in Sacramento 😞





Acknowledgements

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www.slc.ca.gov

THANK YOU & QUESTIONS

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