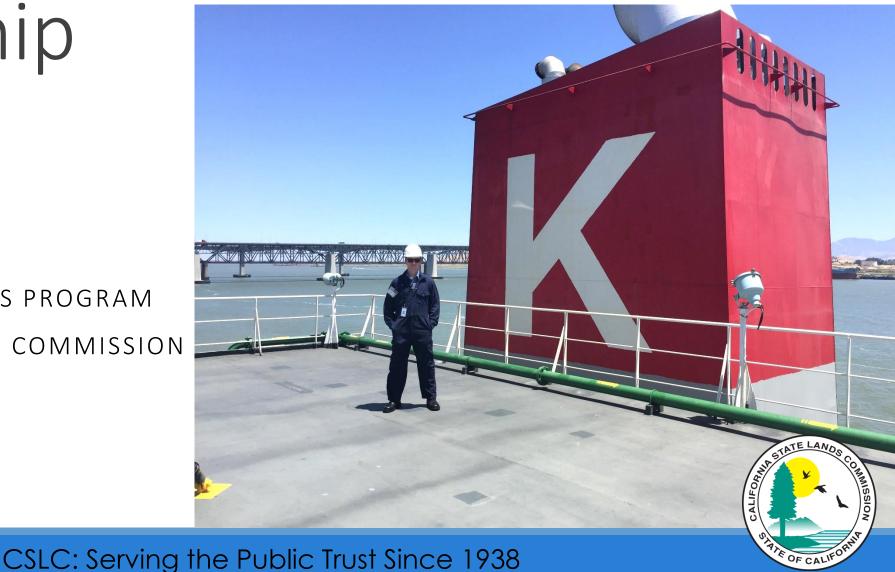
COAST Ballast Water Internship

AUGUST 17TH 2016

BENJAMIN POTTER

MARINE INVASIVE SPECIES PROGRAM

CALIFORNIA STATE LANDS COMMISSION



About Me

School

- CSU Maritime Academy 2017'
- Maritime Policy and Management
 - Marine Science

COAST

 Marine Invasive Species Program Ballast Water Internship











Work Assignments

- Data Entry
 - Realm & Province
 - Latitude & Longitude
- Ballast Water Data Analysis
 - No Exchange Data

ROV	Testing
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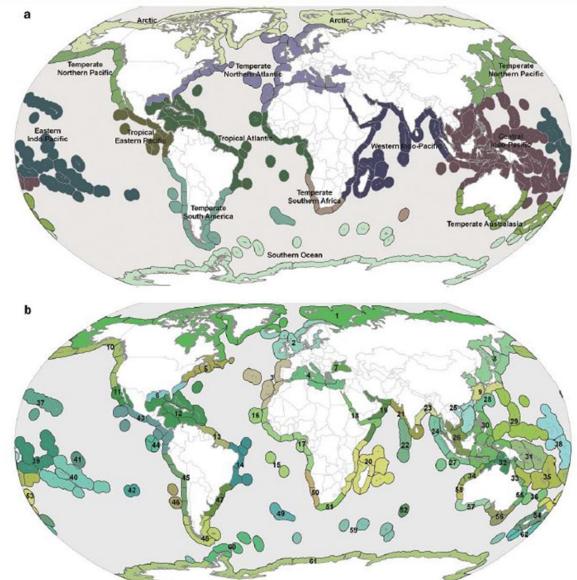


CSLC: Serving the Public Trust Since 1938

Car ship

Data Entry

- Marine Ecoregions
 Need for Classification
- Latitude & Longitude
- General Salinity Levels
 - Marine
 - Brackish
 - Fresh
- Other Characteristics
 Marine Oil Terminals

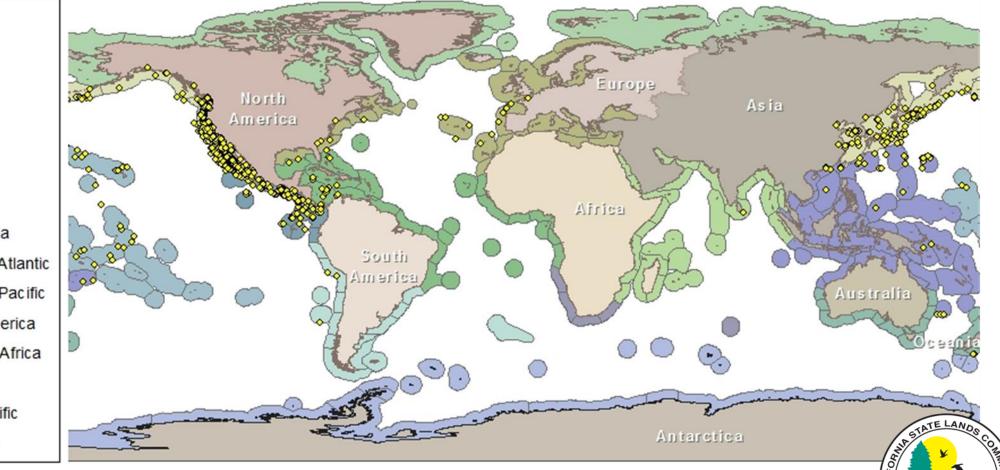


Spalding, M. D., et al. (2007, July/August). Marine Ecoregions of the World: A Bioregionalization of Coastal and Shelf Areas. *Bio Science*, *57*(7). doi:10.1641/B570707



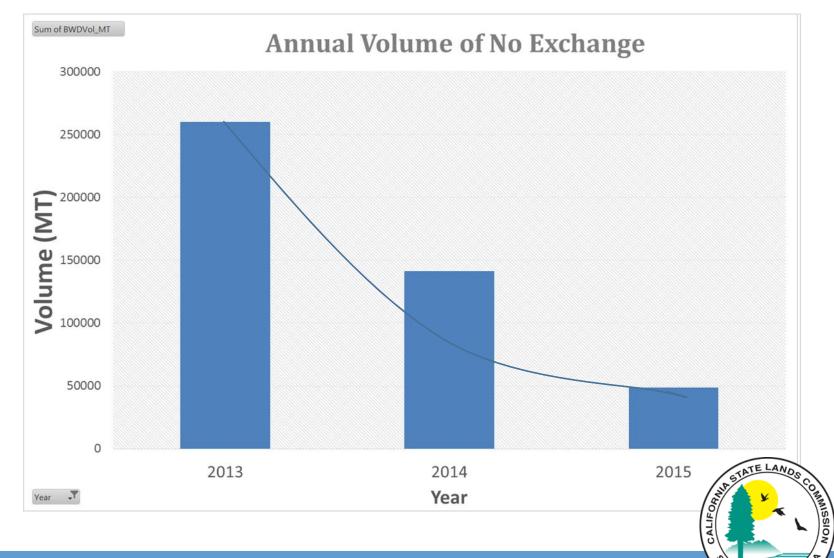
Ballast Water Analysis



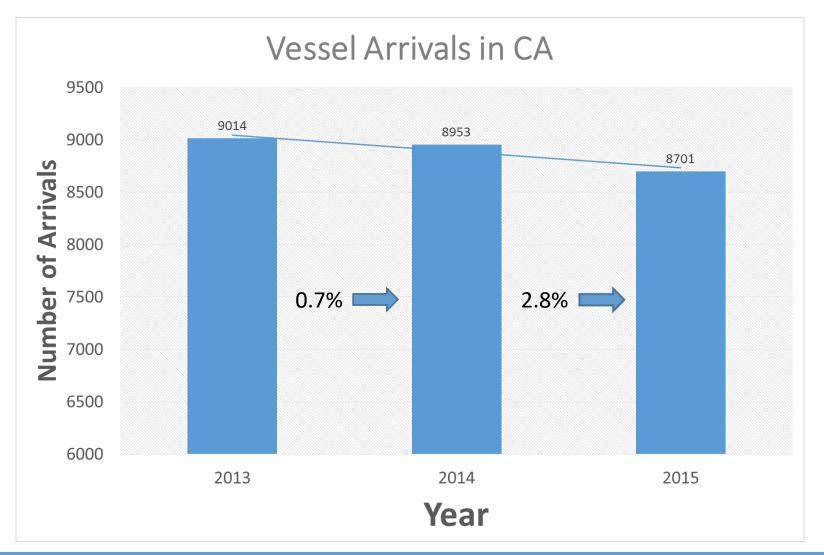


No Exchange Trends

- Post PCR Establishment
- Negative Growth Trend
- 2014 Reduction
 Almost Half of 2013
- 2015 Very Low
 A third of 2014
- Growing Enforcement

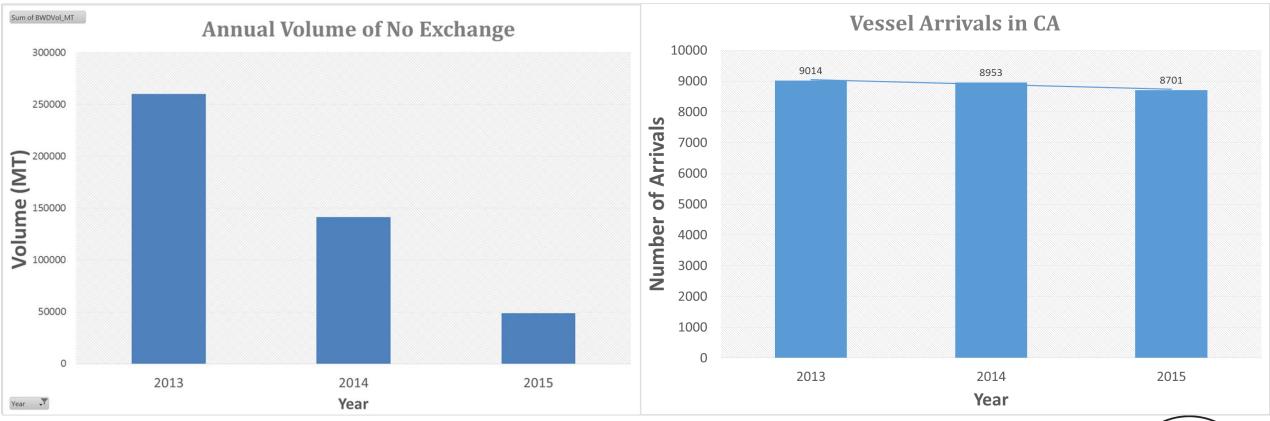


Commercial Activity





Volume Discharge Vs Arrivals





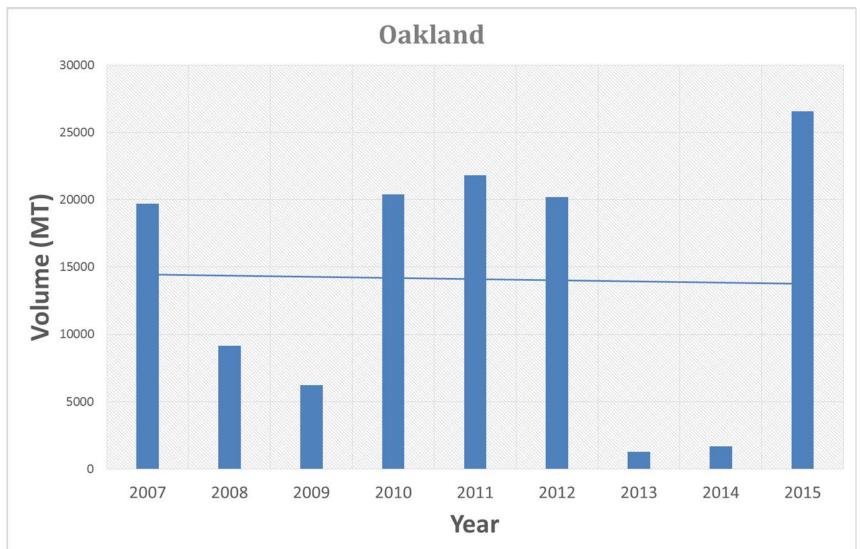
No Exchange Discharge Ports

Top 5 Ports Receiving Non-Exchanged Ballast

<u>Avg.</u>



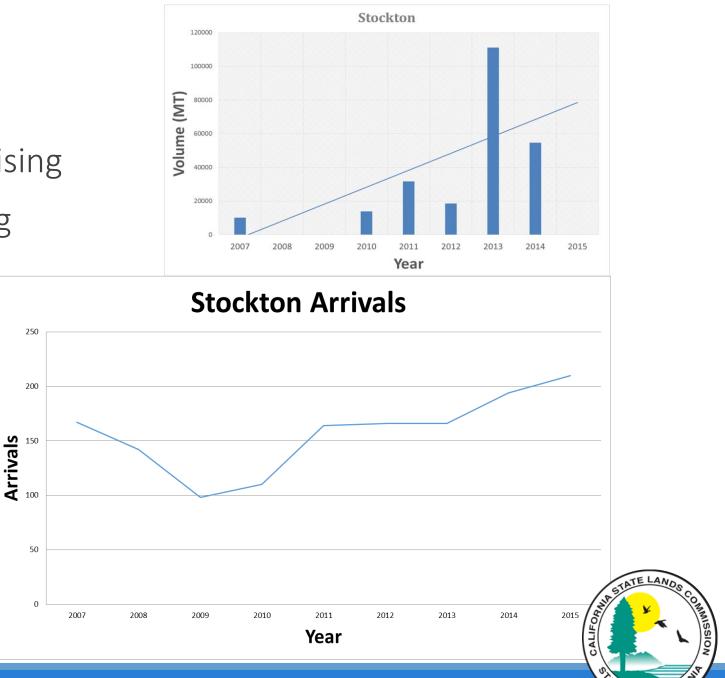
Port Trends





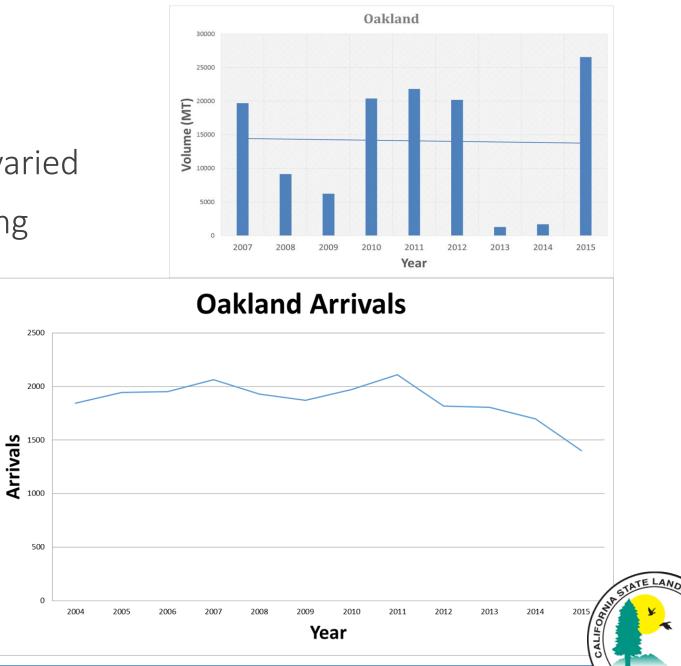
Stockton

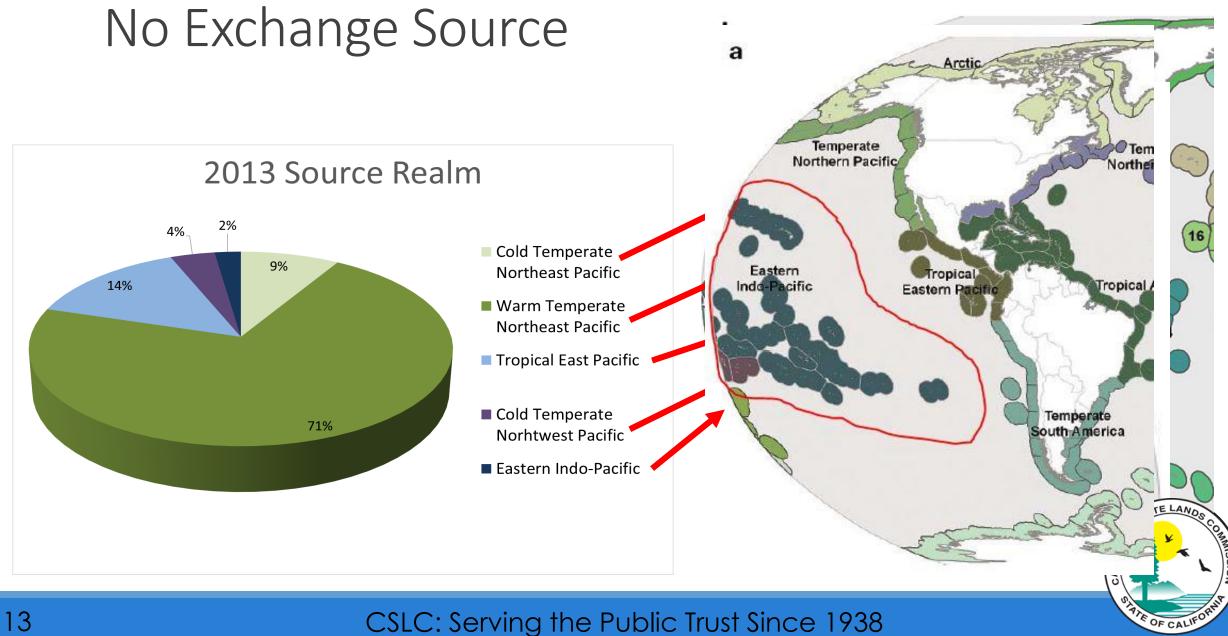
- No Exchange Discharge is rising
- Number of Arrivals Growing
- Mostly Bulk & Tank
- Year 2013
 - Only Three No Exchange Discharges
 - Bulk Carrier: Fu Kang Discharged over 110,000 MT

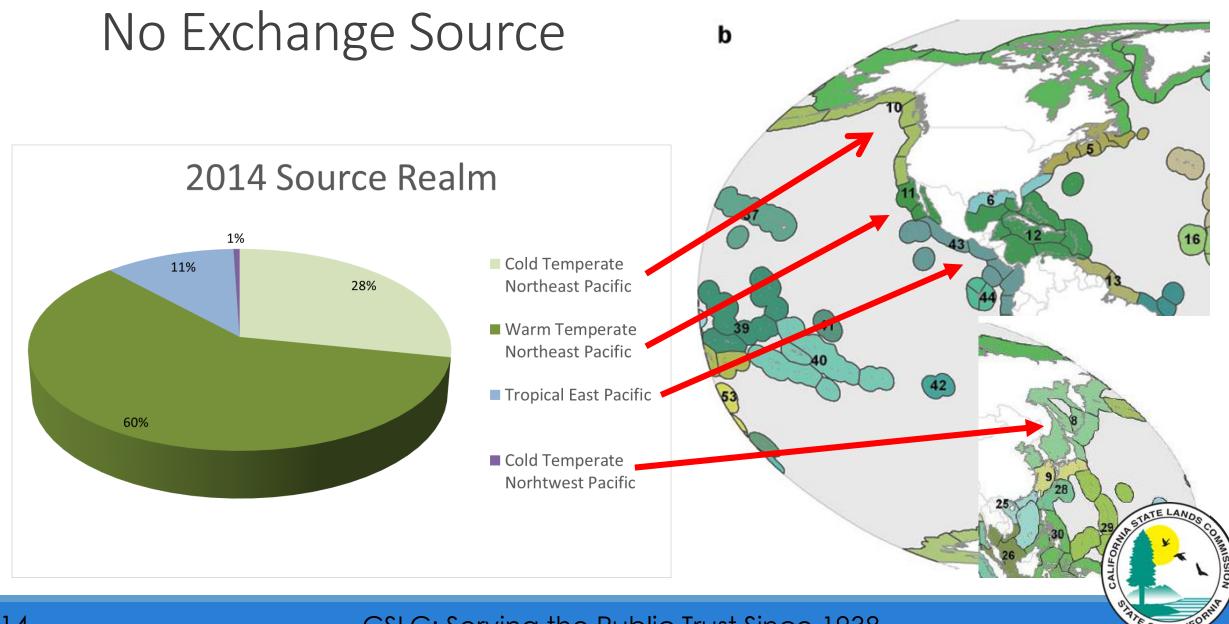


Oakland

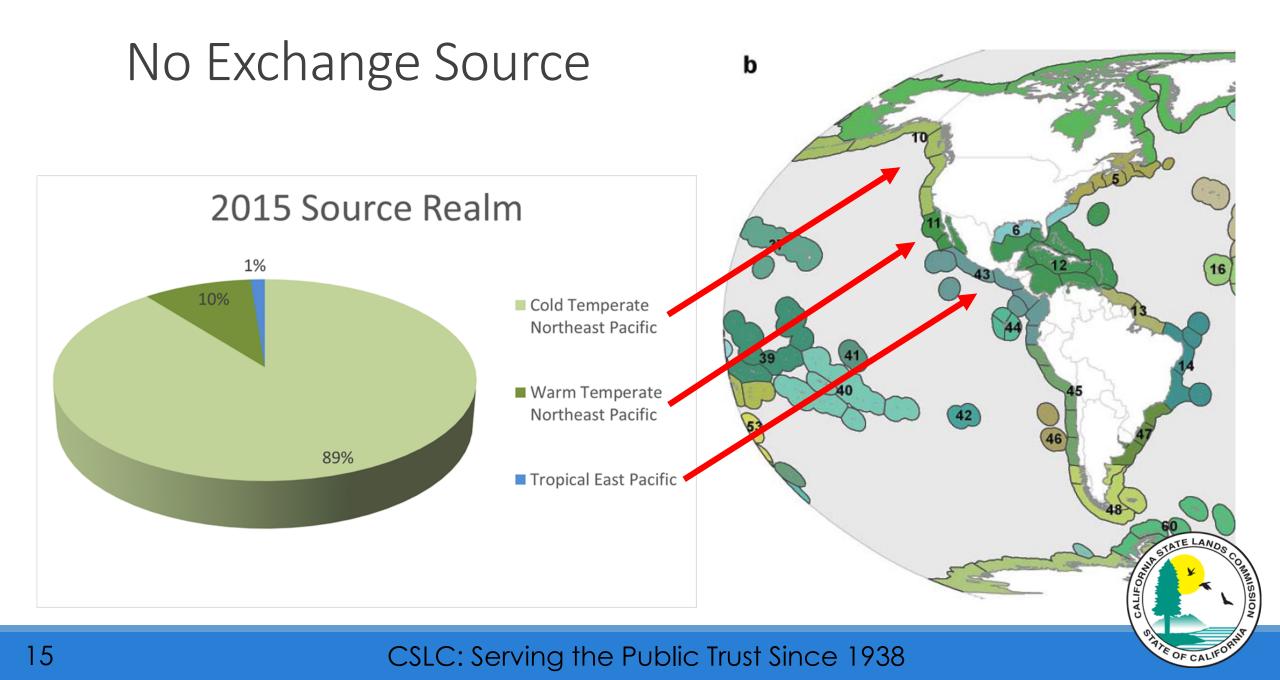
- No Exchange Discharge is varied
- Number of Arrivals Dropping
- Mostly Container
- Year 2015
 - Only Two No Exchange Discharges
 - Bulk Carrier: Atlantic Maya Discharged over 15,000 MT
 - Container Ship: Hatsu Crystal Discharged over 11,500 MT

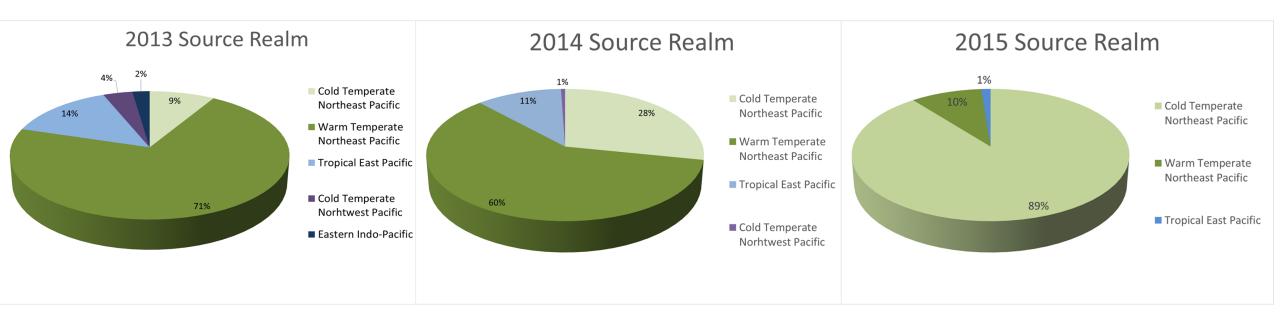






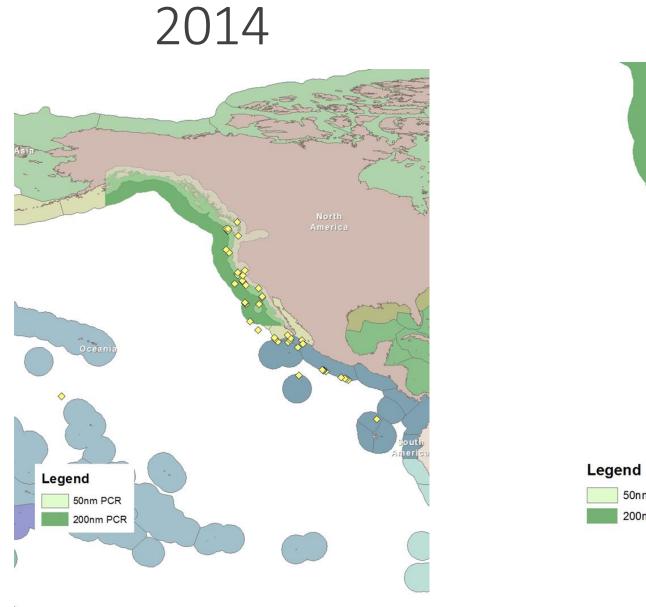
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- Cold Temperate Northeast Pacific growing
- Warm Temperate Northeast Pacific & Tropical East Pacific decreasing







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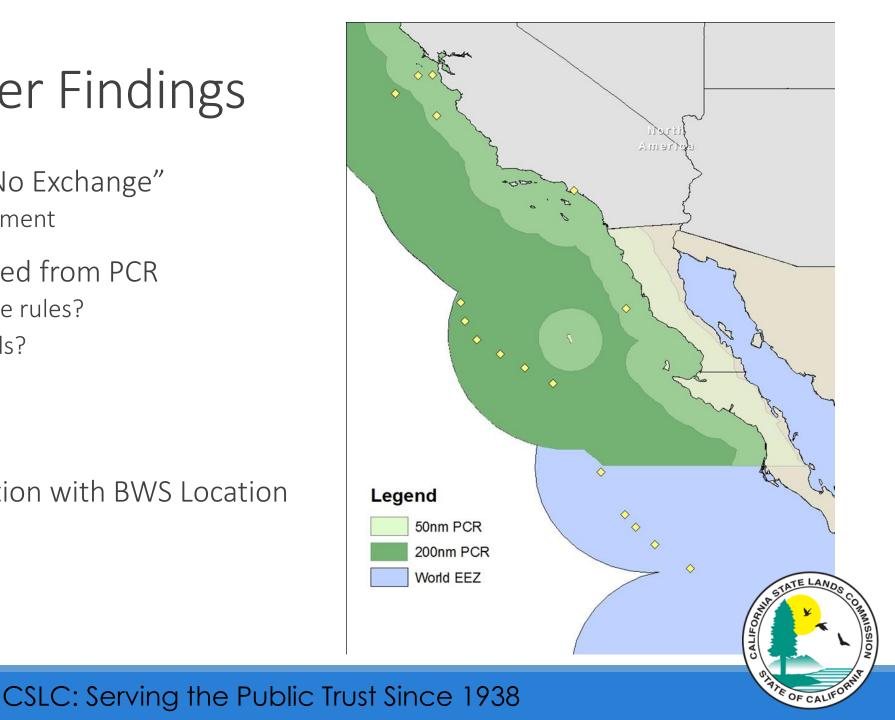
Ballast Water Findings

Exponential decline of "No Exchange"

- Growing levels of enforcement
- Significant amount sourced from PCR
 - Vessels unfamiliar with the rules?
 - Not considering islands?

What's Next?

Connecting BWD Location with BWS Location



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ROV Testing

Test Sites

- 1) HSU Aquatic Center
- 2) Eureka Chevron Terminal
- 3) Trinidad Harbor



Conclusions

■Greater enforcement → Greater compliance
 ○ ROV as a tool for enforcement

Program effectiveness is growing

The need for outreach remains

 Small mistakes from one vessel can cause big problems



Thank You

Any Questions?



